

**Toshiba Personal Computer  
Satellite P100 Series  
Maintenance Manual**

**TOSHIBA CORPORATION**

**File Number 960-Q02**

## **Copyright**

© 2003 by Toshiba Corporation. All rights reserved. Under the copyright laws, this manual cannot be reproduced in any form without the prior written permission of Toshiba. No patent liability is assumed with respect to the use of the information contained herein.

Toshiba Personal Computer Satellite P100 Series Maintenance Manual

First edition January 2006

## **Disclaimer**

The information presented in this manual has been reviewed and validated for accuracy. The included set of instructions and descriptions are accurate for the Satellite P100 Series at the time of this manual's production. However, succeeding computers and manuals are subject to change without notice. Therefore, Toshiba assumes no liability for damages incurred directly or indirectly from errors, omissions, or discrepancies between any succeeding product and this manual.

## **Trademarks**

Intel, Intel SpeedStep, Pentium and Celeron are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries/regions.

Windows and Microsoft are registered trademarks of Microsoft Corporation.

Photo CD is a trademark of Eastman Kodak.

i Link is a trademark of Sony Corporation.

TruSurround XT, Trubass, Dialog Clarity, SRS and (●)symbol are trademarks of SRS Labs, Inc.

TruSurround XT technology is incorporated under license from SRS Labs, Inc.

Other trademarks and registered trademarks not listed above may be used in this manual.

---

## Preface

---

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer Satellite P100 Series.

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

### SAFETY PRECAUTIONS

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

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

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

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

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

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

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

The manual is divided into the following parts:

- Chapter 1     Hardware Overview describes the Satellite P100 system unit and each FRU.
- Chapter 2     Troubleshooting Procedures explains how to diagnose and resolve FRU problems.
- Chapter 3     Test and Diagnostics describes how to perform test and diagnostic operations for maintenance service.
- Chapter 4     Replacement Procedures describes the removal and replacement of the FRUs.
- Appendices   The appendices describe the following:
  - Handling the LCD Module
  - Board layout
  - Pin assignments
  - Keyboard scan/character codes
  - Key layout
  - Wiring diagrams
  - BIOS Rewrite Procedures
  - EC/KBC Rewrite Procedures
  - Reliability

## Conventions

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

### *Acronyms*

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

Read Only Memory (ROM)

### *Keys*

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

### *Key operation*

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

### *User input*

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

**DISKCOPY A: B:**

### *The display*

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

```
Format complete  
System transferred
```

---

# Table of Contents

---

## Chapter 1 Hardware Overview

1.1	Features .....	1
1.2	System Block Diagram .....	7
1.3	2.5-inch Hard Disk Drive.....	11
1.4	Optical Drive.....	16
1.4.1	DVD-ROM & CD-R/RW Drive.....	16
1.4.2	DVD Super Multi Drive .....	21
1.5	Keyboard.....	27
1.6	TFT Color Display .....	28
1.6.1	LCD Module .....	28
1.6.2	FL Inverter Board.....	29
1.7	Power Supply .....	30
1.8	Batteries .....	32
1.8.1	Main Battery .....	32
1.8.2	Battery Charging Control .....	33
1.8.3	RTC battery .....	34
1.9	AC Adapter .....	35

## Chapter 2 Troubleshooting Procedures

2.1	Troubleshooting .....	1
2.2	Troubleshooting Flowchart.....	3
2.3	Power Supply Troubleshooting .....	7
Procedure 1	Power Status Check .....	7
Procedure 2	Error Code Check .....	9
Procedure 3	Connection Check.....	10
Procedure 4	Charging Check .....	10
Procedure 5	Replacement Check .....	12
2.4	System Board Troubleshooting .....	13

	Procedure 1	Message Check .....	14
	Procedure 2	Debugging Port Check .....	16
	Procedure 3	Diagnostic Test Program Execution Check .....	21
	Procedure 4	Replacement Check .....	21
2.5	USB FDD Troubleshooting .....		22
	Procedure 1	FDD Head Cleaning Check .....	22
	Procedure 2	Diagnostic Test Program Execution Check .....	23
	Procedure 3	Connector Check and Replacement Check.....	24
2.6	2.5" HDD Troubleshooting.....		26
	Procedure 1	Partition Check.....	26
	Procedure 2	Message Check .....	27
	Procedure 3	Format Check.....	28
	Procedure 4	Diagnostic Test Program Execution Check .....	29
	Procedure 5	Connector Check and Replacement Check.....	30
2.7	Keyboard Troubleshooting .....		31
	Procedure 1	Diagnostic Test Program Execution Check .....	31
	Procedure 2	Connector Check and Replacement Check.....	32
2.8	Touch pad Troubleshooting .....		33
	Procedure 1	Diagnostic Test Program Execution Check .....	33
	Procedure 2	Connector Check and Replacement Check.....	34

2.9	Display Troubleshooting.....	35
	Procedure 1    External Monitor Check.....	35
	Procedure 2    Diagnostic Test Program Execution Check .....	35
	Procedure 3    Connector and Cable Check .....	36
	Procedure 4    Replacement Check .....	37
2.10	Optical Disk Drive Troubleshooting.....	38
	Procedure 1    Diagnostic Test Program Execution Check .....	38
	Procedure 2    Connector Check and Replacement Check.....	38
2.11	Modem Troubleshooting.....	39
	Procedure 1    Diagnostic Test Program Execution Check .....	39
	Procedure 2    Connector Check and Replacement Check.....	39
2.12	LAN Troubleshooting.....	41
	Procedure 1    Diagnostic Test Program Execution Check .....	41
	Procedure 2    Connector Check and Replacement Check.....	41
2.13	Wireless LAN Troubleshooting.....	42
	Procedure 1    Transmitting-Receiving Check .....	42
	Procedure 2    Antennas' Connection Check .....	43
	Procedure 3    Replacement Check .....	44
2.14	Sound Troubleshooting.....	45
	Procedure 1    Diagnostic Test Program Execution Check .....	45
	Procedure 2    Connector Check.....	45
	Procedure 3    Replacement Check .....	46
2.15	VGA Troubleshooting.....	47
	Procedure 1    Diagnostic Test Program Execution Check .....	47
	Procedure 2    Connector Check and Replacement Check.....	47
2.16	Fingerprint Troubleshooting.....	49
	Procedure 1    Diagnostic Test Program Execution Check .....	49
	Procedure 2    Connector Check and Replacement Check.....	49
2.17	Bluetooth Troubleshooting .....	50
	Procedure 1    Diagnostic Test Program Execution Check .....	50
	Procedure 2    Connector Check and Replacement Check.....	50



## Chapter 3 Test Program for Field

3.1	Tests and Diagnostics Software Overview .....	3-3
3.2	Executing the Diagnostic Test .....	3-4
3.3	Subtest names.....	3-8
3.4	System Test.....	3-11
3.5	Memory Test.....	3-13
3.6	Keyboard Test.....	3-16
3.7	Display Test .....	3-19
3.8	Floppy Disk Test.....	3-34
3.9	Hard Disk Test .....	3-36
3.10	Real Time Clock Test .....	3-39
3.11	Cache Memory Test.....	3-41
3.12	High Resolution Display Test.....	3-43
3.13	Multimedia Test.....	3-49
3.14	MEMORY2 Test.....	3-50
3.15	Error Codes and Error Status Names .....	3-52
3.16	Running Test.....	3-54
3.17	DMI INFORMATION.....	3-55
	3.17.1    Check DMI Information.....	3-55
	3.17.2    Write DMI Information.....	3-55
3.18	Log Utilities .....	3-57
	3.18.1    Operations.....	3-57
3.19	System Configuration .....	3-59
3.20	Running Test Edit Item.....	3-60
	3.20.1    Function Description.....	3-60
	3.20.2    Operation Description.....	3-60
3.21	Common Tests an Operation .....	3-62

3.21.1	How to operate a window .....	3-62
3.21.2	How to Stop the Test Program .....	3-62
3.21.3	Test Status Screen .....	3-62
3.21.4	Test Stop Display.....	3-64
3.21.5	How to enter data .....	3-64

## Chapter 4 Replacement Procedures

4.1	Overview.....	4-1
	Safety Precautions.....	4-2
	Before You Begin .....	4-3
	Disassembly Procedure.....	4-4
	Assembly Procedure .....	4-5
	Tools and Equipment .....	4-5
	Screw Tightening Torque .....	4-6
	Grip Color .....	4-6
	Screw Notation .....	4-7
4.2	Battery pack .....	4-8
4.3	PC card.....	4-10
4.4	HDD.....	4-12
4.5	Wireless LAN card .....	4-16
4.6	Memory module.....	4-18
4.7	Keyboard.....	4-21
4.8	LED Board.....	4-24
4.9	Optical disk drive.....	4-26
4.10	Display assembly .....	4-28
4.11	Bluetooth assembly.....	4-33
4.12	Cover assembly.....	4-38
4.13	Touch pad.....	4-40
4.14	Audio board .....	4-40
4.15	Fingerprint board .....	4-41
4.16	USB board.....	4-42
4.17	System board.....	4-45

4.18	CPU.....	4-47
4.19	VGA heat sink.....	4-50
4.20	LCD unit / FL inverter .....	4-52

## Appendices

Appendix A	Handling the LCD Module .....	A-1
Appendix B	Board Layout .....	B-1
Appendix C	Pin Assignments.....	C-1
Appendix D	Keyboard Scan/Character Codes .....	D-1
Appendix E	Key Layout.....	E-1
Appendix F	Wiring Diagrams.....	F-1
Appendix G	BIOS Rewrite Procedures .....	G-1
Appendix H	EC/KBC Rewrite Procedures.....	H-1
Appendix I	Reliability.....	I-1



---

# **Chapter 1**

## **Hardware Overview**

---



---

**Chapter 1 Contents**

---

1.1	Features .....	1
1.2	System Block Diagram .....	7
1.3	2.5-inch Hard Disk Drive.....	11
1.4	Optical Drive.....	16
	1.4.1 DVD-ROM & CD-R/RW Drive .....	16
	1.4.2 DVD Super Multi Drive.....	21
1.5	Keyboard.....	27
1.6	TFT Color Display .....	28
	1.6.1 LCD Module .....	28
	1.6.2 FL Inverter Board.....	29
1.7	Power Supply .....	30
1.8	Batteries .....	32
	1.8.1 Main Battery.....	32
	1.8.2 Battery Charging Control .....	33
	1.8.3 RTC battery .....	34
1.9	AC Adapter .....	35



**Figures**

Figure 1-1	Front of the computer and the system units configuration .....	6
Figure 1-2	System block diagram.....	7
Figure 1-3	2.5-inch HDD.....	11
Figure 1-4	DVD-ROM & CD-R/RW drive .....	16
Figure 1-5	DVD Super Muti drive.....	21
Figure 1-6	Keyboard.....	27
Figure 1-7	LCD module.....	28

**Tables**

Table 1-1	2.5-inch HDD dimensions .....	11
Table 1-2	2.5-inch HDD specifications.....	12
Table 1-3	DVD-ROM & CD-R/RW drive outline dimensions.....	16
Table 1-4	DVD-ROM & CD-R/RW drive specifications .....	17
Table 1-5	DVD Super Multi drive outline dimensions .....	21
Table 1-6	DVD Super Multi drive specifications .....	22
Table 1-7	LCD module specifications.....	28
Table 1-8	FL inverter board specifications .....	29
Table 1-9	Power supply output rating .....	31
Table 1-10	Battery specifications.....	32
Table 1-11	Time required for charges of main battery .....	33
Table 1-12	Data preservation time .....	33
Table 1-13	Time required for charges of RTC battery.....	34
Table 1-14	AC adapter specifications .....	35

## 1.1 Features

The Satellite P100 (Intel Platform) series are 2 spindle PCs running  
Intel® Celeron® M Processor 410 or higher.  
Intel® Core™ Solo Processor T1300 or higher.  
Intel® Core™ Duo Processor T2300 or higher.

The features are listed below.

θ Microprocessor

Microprocessor that is used will be different by the model.

It supports processors as follows

Intel Core Duo  
T2300(1.66GHz)  
T2400(1.83GHz),  
T2500 (2GHz),  
T2600(2.16Gz) ,  
T2700(2.33Gz)

Intel Core Solo  
T1400(1.83GHz)  
T1300 (1.66GHz)

FSB : 667MHz

Intel Celeron-M (Yonah core based)

410  
420  
430

FSB 533MHz

Max. power consumption : 31W

θ Memory

Two DDRII SO-DIMM (533/667MHz specification compliant) up to 4GB can be upgraded through Memory Module Slot. Maximum upgradeable system memory may depend on the model

θ VRAM

Shared with System RAM for Intel 945 GM.

NVIDIA G71M /G72MV/G73M external graphics for Intel 945 PM.

θ HDD

40GB, 60GB, 80GB, 100GB, and 120GB internal drives. 2.5 inch x 9.5mm height.  
160GB internal drives. 2.5 inch x 12.7mm height.

θ USB FDD (Option)

Toshiba external USB FDD for option

θ Display

LCD

17.1-inch, WXGA+ (1,440x 900 dots), High-brightness, CSV, amorphous silicon TFT color display.

17.1-inch, WSXGA+ (1,680x1,050 dots), High-brightness, CSV, amorphous silicon TFT color display.

CRT

Supported via a RGB connector.

TV-out

The 4-pin S-Video port is compatible with PAL or NTSC TV standard.

DVI

Digital Video Interface port supported

θ Keyboard

Toshiba Standard keyboard with 103 keys (desktop-style), Support Windows keys & Application keys. (Toshiba standard layout) Standard pitch, 2.5mm travel length.  
Multi-langue support

θ PC card slot

The PC card slot (PCMCIA) accommodates one 5mm Type II card. The slot support 16-bit PC cards and Card Bus PC cards. Card Bus supports 32-bit PC cards.

θ Optical devices

A DVD-ROM & CD-R/RW drive or DVD Super Multi drive is equipped.

θ Battery

The RTC battery is equipped inside the computer.  
It is good with no external power source for 1month on average.

The main battery is a detachable lithium ion battery.

6 cell Li-Ion 10.8v/4000mAh

9 cell Li-Ion 10.8v/6000mAh

θ USB (Universal Serial Bus)

4 USB ports are provided. The ports comply with the USB2.0 standard, which enables data transfer speeds 40 times faster than USB1.1 standard. USB1.1 is also supported.

θ Sound system

Internal stereo speaker, Harman/Kardon (Odessey II) –GGEC, external monaural microphone connector, Line in, stereo headphone connector/SPDIF is also equipped.

θ Wireless LAN

The wireless LAN is equipped on the mini card slot.

θ LAN/MODEM

Connectors for LAN and Modem are separately mounted.

θ CIR

CIR is equipped for Remote controller

θ 1394

One 1394 port is equipped.

θ Express Card

ExpressCard/34 and ExpressCard/54 are supported.

θ Multiple Digital Media Card Slot

MD/MS/MS pro/SDIO/MMC are supported

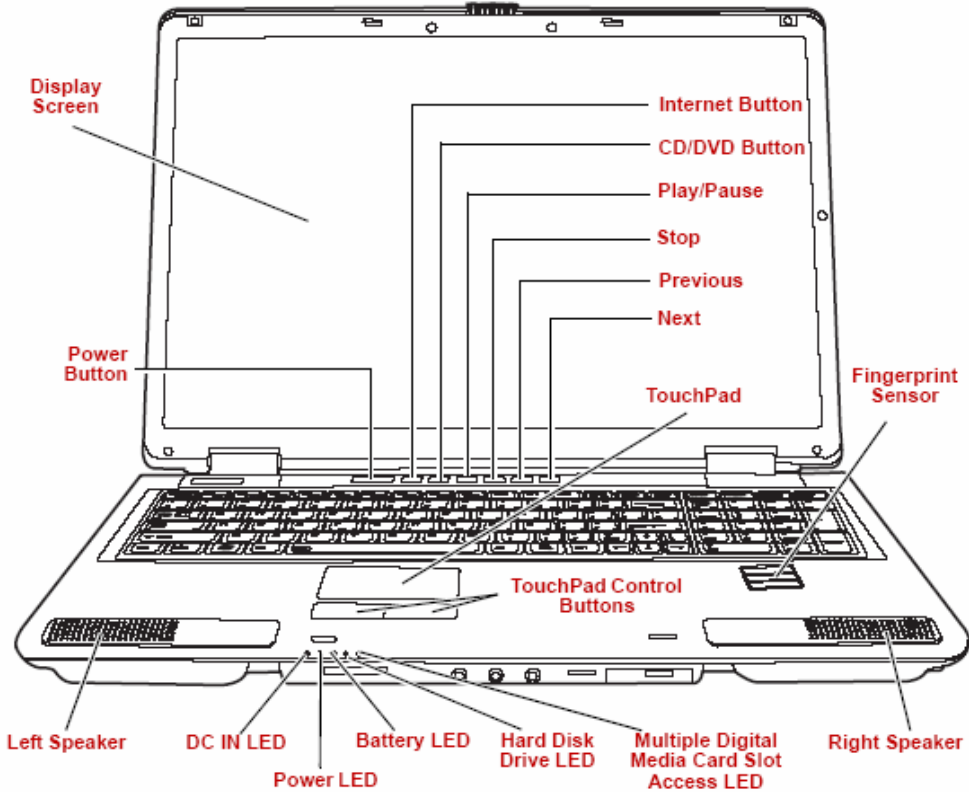
θ Bluetooth

USB Bluetooth Module (BTO) V2.0 & EDR(Enhanced Data Rate) equipped

θ Security

Kensington Lock,

Fingerprint –Enhanced Lock is also equipped.



The front with the display open

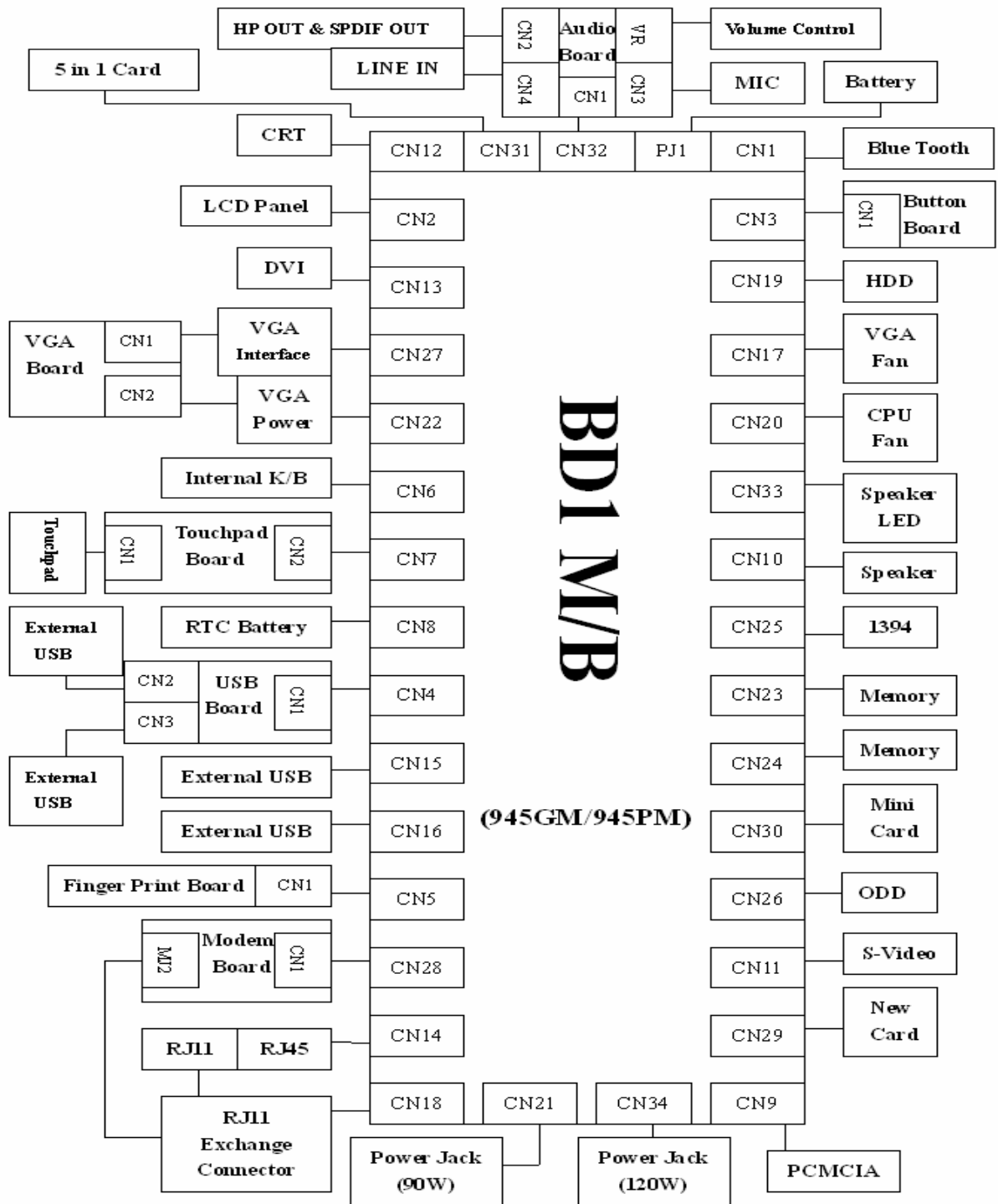


Figure 1-1 Front of the computer and the system units' configuration

## 1.2 System Block Diagram

Figure 1-2 shows the system block diagram.

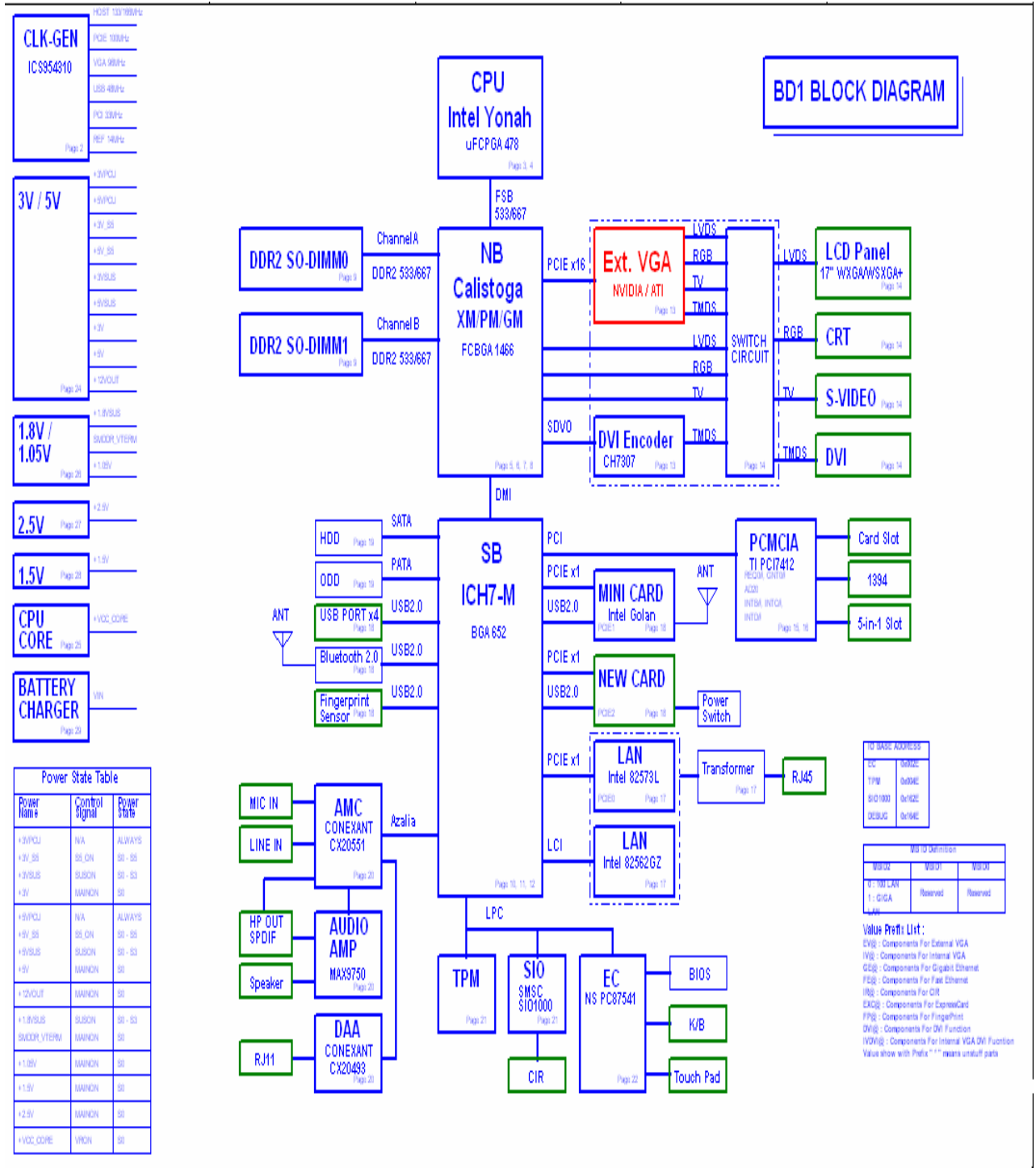


Figure 1-2 System block diagram for Intel Platform Platform



The PC contains the following components.

θ CPU

Intel Core Duo                      T2300(1.66GHz)  
  T2400(1.83GHz),  
  T2500 (2GHz),  
  T2600(2.16Gz) ,  
  T2700(2.33Gz)

Intel Core Solo                      T1400(1.83GHz)  
  T1300 (1.66GHz)

FSB : 667MHz

Intel Celeron-M (Yonah core based)  
  410  
  420  
  430

FSB 533MHz

θ Memory

Two memory slots capable of accepting DDRII-SDRAM 256MB, 512MB or 1GB memory modules for a maximum of 4GB.

- 200-pin SO-DIMM
- 1.8V operation
- PC2 4200 support/PC2

θ BIOS ROM (Flash memory)

- 8Mbit

θ Chipset

This gate array has the following elements and functions.

- North Bridge (Intel 945GM/945PM (GMCH, C-step))
  - Dothan-M processor System Bus support
  - DRAM Controller : DDRII 533/667 support
  - DMI
  - 1466-ball 37.5mmx37.5mm Mirco FC-BGA Package

- South Bridge (Intel 82801GBM (ICH7-M))
  - PCI slot
  - PCI Express
  - IDE controller
  - Serial ATA Host Controller
  - DMA controller
  - USB host interface
  - USB 2.0 host controller
  - UHCI host controller
  - Interrupt controller
  - SM Bus interface
  - ACPI Power management
  - Firmware Hub interface
  - Low Pin count (LPC) interface
  - Real time clock
  - Intel High Definition Audio Interface
  - 652-pin 31mmx31mm mBGA Package
  
- θ PC card controller (PCI7412, Texas Instrument-made)
  - PCI Interface (PCI Rev. 2.3)
  - PC Card Controller
  
- θ VGA controller
  - Intel VGA
    - VRAM 64MB/128MB
    - LVDS
  
  - NVIDIA G71M /G72MV/G73M
    - VRAM 128MB/256MB/512MB
    - LVDS
  
- θ Other main system chips
  - Clock Generator (ICS-made ICS954206 x 1)
  - EC/KBC (NS97551 x 1)
  - HD Audio
  - Audio AMP (Maxim 9750x1)

θ Mini Card

Wireless LAN card (BTO)

2.4GHz DSSS/OFDM LAN card is equipped. Conformity with IEEE 802.11b/g and IEEE 802.11a/b/g.. Transfer speed maximum is 54Mbit/sec. supports 128bit WEP.

θ LAN (Intel)

Controls LAN.

Intel EP82562T (Ekron) supports 10/100M LAN

Intel 82573L (Vidalia) supports GigaLan.

θ MODEM (Conexant x 1)

Supported by on board Modem + DAA daughter card.

Data and FAX transmission is available.

Supports ITU-TV.90.

The transfer speed of data receiving is 56kbps, of data sending is 33.6kbps and of FAX is 14.4kbps. Actual speed depends on the quality of the line used.

Connected to telephone line through RJ11 MOD

θ Blue tooth

Mini USB Bluetooth Module (BTO) V2.0.

### 1.3 2.5-inch Hard Disk Drive

A compact, high-capacity HDD with a height of 9.5mm. Contains a 2.5-inch magnetic disk and magnetic heads.

Figure 1-3 shows a view of the 2.5-inch HDD and Tables 1-1 and 1-2 list the specifications.

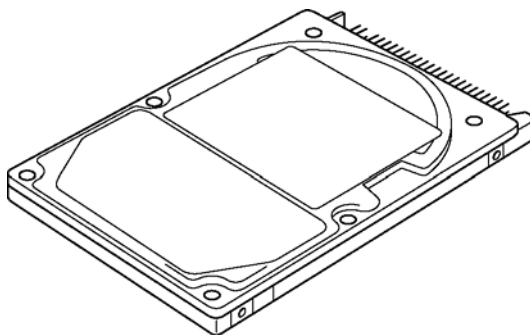


Figure 1-3 2.5-inch HDD

Table 1-1 2.5-inch HDD dimensions

Parameter		Standard value				
		TOSHIBA MK1032GS X	TOSHIBA MK8032GS X	TOSHIBA MK6032GS X	TOSHIBA MK4032GS X	TOSHIBA MK1234GS X
Outline dimens ions	Width (mm)	69.85				
	Height (mm)	9.5				
	Depth (mm)	100.0				
	Weight (g)	101/102	101/102	101//102	97/98	101/102

Parameter		Standard value					
		FUJITSU MHV2040 BH	FUJITSU MHV2060 BH	FUJITSU MHV2080 BH	FUJITSU MHV2100 BH	FUJITSU MHV2120 BH	FUJITSU MHV2160 BT
Outline dimensi ons	Width (mm)	70.0					
	Height (mm)	9.5				12.7	
	Depth (mm)	100.0					
	Weight (g)	96 (min.)			101(Max)		135 (max)

Parameter		Standard value			
		HITACHI HTS541040G9 SA00	HITACHI HTS541060G9 SA00	HITACHI HTS541080G9 SA00	HITACHI HTS541010G9 SA00
Outline dimensions	Width (mm)	69.85			
	Height (mm)	9.5			
	Depth (mm)	100.0			
	Weight (g)	97/ 98 (max.)	101/102(max.)	101/102(max.)	101/102(max.)

Parameter		Standard value		
		HITACHI HTS721060G9AT00	HITACHI HTS721080G9AT00	HITACHI HTS721010G9AT00
Outline dimensions	Width (mm)	69.85		
	Height(mm)	9.5		
	Depth (mm)	100.2		
	Weight (g)	115 Max		

Table 1-2 2.5-inch HDD specifications

Parameter	Specification				
	Toshiba MHV2100 BH	Toshiba MK1032G SX	Toshiba MK8032G SX	Toshiba MK6032G SX	Toshiba MK4032GS X
Storage size (formatted)	120GB	100GB	80GB	60GB	40 GB
Speed (RPM)	5,400				
Data transfer speed (Mbits/s)	236-456			218-419	
Interface transfer rate (MB/s)	150 (Ultra DMA Mode)				
Storage density (Kbpi)	-		-		
Track density (Ktpi)	433-		393.7		
Average random seek time (read) (ms)	12				
Average random seek time (write) (ms)	-				
Power-on-to-ready (sec)	4 (typical)/10 sec (Max)				

Specification						
Parameter	FUJITSU MHV2120B H	FUJITSU MHV2100B H	FUJITSU MHV2080B H	FUJITSU MHV2060B H	FUJITSU MHV2040B H	FUJITSU MHV2160BT
Storage size (formatted)	120GB	100GB	80GB	60GB	40GB	160GB
Speed (RPM)	5,400					4,200
Data transfer speed (Mbits/s)	236.1~ 465.0		218~ 429	218~ 429	218~ 429	150 (Max).
bus transfer rate (MB/s)	150 ATA7/SERIAL ATA1.0a/Serial ATAII 1.2 interface support					
Buffer Size	8MB					
Number of Sectors	-	195,371,568	117,210,240	156,301,488	78,140,160	312,581,808
Average random seek time (read) (ms)	12					7.14
Average random seek time (write) (ms)	5.56					
Power-on-to-ready (sec)	3.5/ 10 (max.)					

Specification				
Parameter	HITACHI HTS541040G9SA 00	HITACHI HTS541040G9S A00	HITACHI HTS541040G9 SA00	HITACHI HTS541040G9S A00
Storage size (formatted)	40GB	60GB	80GB	100GB
Speed (RPM)	5,400			
Data transfer speed(Mbits/s)	493	493	493	493
bus transfer rate (MB/s)	150 ATA7/SERIAL ATA1.0a/Serial ATAII 1.2 interface support			
Buffer Size	8192	8192	8192	16384
Track /mm density (TPI)	195,371,568	156,301,488	117,210,240	78,140,160
Average random seek time (read) (ms)	12			
Average random seek time (write) (ms)	5.55			
Power-on-to-ready (sec)	4 (typ.) / 10 (max.)			

Specification			
Parameter	HITACHI HTS721060G9AT00	HITACHI HTS721080G9AT00	HITACHI HTS721010G9AT00
Storage size (formatted)	60GB	80GB	100GB
Speed (RPM)	7,200		
Data transfer speed(Mbits/s)	267-629		
bus transfer rate (MB/s)	150 ATA7/SERIAL ATA1.0a/Serial ATAII 1.2 interface support		
Buffer Size	16385	16385	16385
Track /mm density (TPI)	117,210,240	156,301,488	195,371,568
Average random seek time (read) (ms)	10		
Average random seek time (write) (ms)	11		
Power-on-to-ready (sec)	4		



## 1.4 Optical Drive

### 1.4.1 DVD-ROM & CD-R/RW Drive

The DVD-ROM & CD-R/RW drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD/DVD-ROM and CD-R/RW. It is a high-performance drive that reads DVD at maximum 8-speed and CD at maximum 24-speed.

The DVD-ROM & CD-R/RW drive is shown in Figure 1-4. The dimensions and specifications of the DVD-ROM & CD-R/RW drive are described in Table 1-3, Table 1-4.



Figure 1-4 DVD-ROM & CD-R/RW drive

Table 1-3 DVD-ROM & CD-R/RW drive outline dimensions

Parameter		Standard value		
Outline dimensions	Maker	<b>MATSUSHITA (UJDA770TT-A)</b>	<b>HLDS (GCC-4244N.ATAKN0)</b>	<b>TSST (TS-L462C/TOHJ.I.)</b>
	Width (mm)	128		
	Height (mm)	12.7 (excluding projections)		
	Depth (mm)	129	127	127
	Mass (g)	180±10g	160±10g	180g

Table 1-4 DVD-ROM &amp; CD-R/RW drive specifications (1/3)

Parameter		Drive Specification
		MATSUSHITA (UJDA770TT-A)
Data transfer speed	Read (KB/s)	DVD-ROM MAX 8X CAV (MAX 10800 KB/s) CD-ROM MAX 24X CAV (MAX 3600 KB/s)
	Write	CD-R 4X, 8X (CLV), 16XZCLV, MAX. 24X(CAV) CD-RW 4X (CLV) High Speed CD-RW 4X, 8X, 10X (CLV) Ultra Speed CD-RW 8X, 10X (CLV), MAX. 24X (CAV)
	ATAPI interface (MB/s)	16.6 MB/s :PIO mode4 16.6 MB/s :Multi word mode2 33.3 MB/s :Ultra DMA mode2
Access time (ms) (Random)	CD-ROM	130ms
	DVD-ROM	180ms
Buffer memory		2MB
Supported disk format	CD	CD-DA, CD-ROM, CD-R, CD-RW CD-ROM XA, Disc. PhotoCD(Multi Session) Video CD, CD-Extra(CD+), CD-text
	DVD	DVD-ROM, DVD-Video DVD-RAM(2.6GB/4.7GB) DVD-R, DVD-RW (Ver. 1.1) (Supporting Multi Border) DVD+R, DVD+RW (Supporting Multi Session)

Table 1-4 DVD-ROM & CD-R/RW drive specifications (2/3)

Parameter		Drive Specification
		HLDS (GCC-4244N.ATAKN0)
Data transfer speed	Read (KB/s)	<b>DVD-ROM</b> Single Layer 3.3x -8x (CAV): Approx. 4,710 r/min Dual Layer 3.3x -8x (CAV): Approx. 5,180 r/min <b>DVD-Video</b> 1.7x -4x (CAV): Approx. 2,600 r/min <b>DVD-R</b> 3.95GB 1.7x -4x (CAV): Approx. 2,600 r/min 4.7GB 1.7x -4x (CAV): Approx. 2,360 r/min <b>DVD-RW</b> 4.7GB 1.7x -4x (CAV): Approx. 2,360 r/min <b>DVD-RAM</b> 2.6GB 2x (ZCLV): Approx. 2,120 -4,700 r/min 4.7GB 2x (ZCLV): Approx. 1,400 -3,230 r/min <b>DVD+R</b> Single Layer 1.7x -4x (CAV): Approx. 2,360 r/min Double Layer 1.7x -4x (CAV): Approx. 2,360 r/min <b>DVD+RW</b> 1.7x -4x (CAV): Approx. 2,360 r/min <b>CD-ROM</b> 10.3x -24x (CAV): Approx. 4,860 -5,670 r/min <b>CD-R</b> 10.3x -24x (CAV): Approx. 4,860 -5,200 r/min <b>CD-RW</b> 10.3x -24x (CAV): Approx. 4,860 -5,200 r/min
	Write	<b>CD-R</b> 4xCLV, 10xCLV, 10-16xPCAV, 24xMAX.CAV <b>CD-RW</b> Normal Disc 4xCLV High speed Disc 4x, 10xCLV Ultra speed Disc 10xCLV, 10-16xPCAV, 24xMAX.CAV <b>Rotational Speed (CD-R/RW) 4xCLV:</b> Approx. 800 -2,020 r/min 10xCLV: Approx. 2,000-5,050 r/min 24xMAX.CAV: Approx. 4,860 -5,200 r/min
	ATAPI interface (MB/s)	33.3 Mbytes/s max. (Ultra DMA Mode 2) 16.6 Mbytes/s max. (DMA MW Mode 2) 16.6 Mbytes/s max. (PIO Mode 4)
Access time (ms) (Random)	CD-ROM	110ms (typ.)
	DVD-ROM	120ms (typ.)
Buffer memory		2MB

Supported disk format	CD	CD-ROM Mode1&2S CD-ROM XA Modo2 (Form1&2) CD-DA, CD-I, CD-Extra/CD-Plus, Video-CD
	DVD	DVD-ROM DVD Video DVD-R (General, Authoring) DVD-RW (Single/Multi-boarder, Packet) DVD-RAM DVD+R/RW

Table 1-4 DVD-ROM &amp; CD-R/RW drive specifications (3/3)

Parameter		Drive Specification
		TSST (TS-L462C/TOHJ,I.)
Data transfer speed	Read (KB/s)	<b>CD-ROM</b> Max. 24X (3,600 KB/sec) CAV 24X <b>CD-RW</b> Max. 24X (3,600 KB/sec) CAV 24X <b>DVD-Single</b> Max 8X (10,800 KB/sec) <b>DVD-Dual</b> Max 6 (10,800 KB/sec)
	Write	<b>CD-R</b> Max. 24X (3,600 KB/sec) P-CAV 24X/20X/16X CLV 0X/8X/4X <b>CD-RW</b> Max. 4X (600 KB/sec) CLV 4X <b>HS CD-RW</b> Max. 10X (1,500 KB/sec) CLV 10X <b>US CD-RW</b> Max. 24X (3,600 KB/sec) P-CAV 24X/16X
	ATAPI interface (MB/s)	PIO Mode4 Max 16.6 MB/sec DMA Multiword Mode2 Max 16.6 MB/sec ULTRA DMA Mode2 Max 33.2 MB/sec
Access time (ms) (Random)	CD-ROM	130ms (typ.)
	DVD-ROM	150ms (typ.)
Buffer memory		2MB
Supported disk format	CD	CD-DA (Red Book) - Standard Audio CD & CD-TEXT CD-ROM (Yellow Book Mode1 & 2) - Standard Data CD-ROM XA (Mode2 Form1 & 2) - Photo CD, Multi-Session CD-I (Green Book, Mode2 Form1 & 2, Ready, Bridge) CD-Extra/ CD-Plus (Blue Book) - Audio & Text/Video Video-CD (White Book) - MPEG1 Video CD-R (Orange Book Part II) CD-RW & HSRW (Orange Book Part III Volume1 & Volume2) Super Audio CD (SACD) Hybrid type US & US+ RW
	DVD	DVD-ROM (Book 1.02), DVD-Dual DVD-Video (Book 1.1) DVD-R (Book 1.0, 3.9G) DVD-R (Book 2.0, 4.7G) - General & Authoring DVD+R (Version 1.0), DVD+R DL DVD+RW DVD-RW (Non CPRM & CPRM)

## 1.4.2 DVD Super Multi Drive

The DVD Super Multi drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD/DVD-ROM, CD-R/RW, DVD±R/±RW and DVD-RAM. It is a high-performance drive that reads DVD-ROM at maximum 8-speed and CD at maximum 24-speed. Write speed of DVD±R/±RW and DVD-RAM is different depending on the drive.

The DVD Super Multi drive is shown in Figure 1-5. The dimensions and specifications of the DVD Super Multi drive are described in Table 1-5, Table 1-8.



Figure 1-5 DVD Super Multi drive

Table 1-5 DVD Super Multi drive outline dimensions

Parameter		Standard value			
Outline Dimensions	Maker	<b>Panasonic UJ-850BTJV-A</b>	<b>HLDS GMA-4082N-ATAKK0</b>	<b>Pioneer DVR-K16TBS</b>	<b>TEAC DV-W28EA</b>
	Width (mm)	128			
	Height (mm)	12.7			
	Depth (mm)	129.0	127	127	129.4
	Mass (g)	190±10g	185±7g	190±10g	190±10g

Table 1-6 DVD Super Multi drive specifications (1/4)

Parameter		Drive Specification
		Panasonic (UJ-850BTJV-A)
Data transfer speed	Read(KB/s)	<b>DVD-ROM</b> MAX 8X CAV (MAX 10800 KB/s) <b>CD-ROM</b> MAX 24X CAV (MAX 3600 KB/s)
	Write	<b>CD-R</b> 4X , 8X (CLV) , MAX. 12x, 16x, 24X (ZCLV) <b>CD-RW</b> 4X (CLV) <b>HS-RW</b> 4X, 8X, 10X (CLV) <b>US-RW</b> 8x, 10X (CLV) ,Max.16X <b>DVD-R</b> 1X, 2X (CLV), MAX.4x, 6x, 8X (ZCLV) <b>DVD-R DL</b> 2X (CLV) ,MAX.4X ( ZCLV) <b>DVD-RW</b> 1X, 2X (CLV), MAX.6X (ZCLV) <b>DVD+R</b> 2.4X (CLV), MAX.4x, 6x, 8X (ZCLV) <b>DVD+R DL</b> 2.4X (CLV) ,MAX.4X ( ZCLV) <b>DVD+RW</b> 2.4X (CLV), MAX.4x, 6x ( ZCLV), 8X (CAV) <b>DVD-RAM</b> 2X, 3X,3X-5X (ZCLV) <b>8cm media</b> 2X ( CLV)
	ATAPI interface (MB/s)	<b>PIO mode</b> 16.6 MB/s :PIO mode4 <b>DMA mode</b> 16.6 MB/s :Multi word mode2 <b>Ultra DMA mode</b> 33.3 MB/s :Ultra DMA mode2
Access time (ms)	CD-ROM	150 (Random)
	DVD-ROM	180 (Random)
Buffer memory		2MB
Supported disk format	CD	CD-DA,CD-ROM,CD-ROM XA Photo CD (Multi-Session) Video CD, CD-Extra(CD+),CD-text Hybrid SACD
	DVD	DVD-VIDEO, DVD-ROM, DVD-R(3.9GB, 4.7GB), DVD-R DL DVD-R:3.9GB Read Only DVD-RW(Ver.1.1) , DVD-RAM DVD-RAM:2.6GB:Read Only DVD+R, DVD+R DL, DVD+RW

Table 1-2 DVD Super Multi drive specifications (2/4)

Parameter		Drive Specification
		HLDS (GSA-4082N.ATAKN0)
Data transfer speed	Read(KB/s)	<b>DVD-R/RW/ROM</b> 8x/8x/8x max. <b>DVD-RAM</b> (Ver.1.0)2x (Ver.2.2)2x, 3x, 5x <b>DVD-Video</b> (CSSS Compliant Disc)4x max.(Single/Dual layer) <b>DVD+R/+RW</b> 8x/8x max. <b>DVD+R</b> DL4x max. <b>CD-R/RW/ROM</b> 24x/24x/24x max. <b>CD-DA</b> (DAE) 20x max.
	Write	<b>DVD-R</b> 2x CLV, 4x ZCLV, 8x CAV <b>DVD-R</b> DL2x CLV <b>DVD-RW</b> 1x, 2x CLV, 4x ZCLV <b>DVD-RAM</b> 2x, 3x ZCLV, 5x PCAV(Ver.2.2) <b>DVD+R</b> 2.4x CLV, 4x ZCLV, 8x PCAV <b>DVD+R</b> DL2.4x CLV <b>DVD+RW</b> 2.4x, 3x CLV, 4x ZCLV <b>CD-R</b> 10x CLV, 16x, 24x ZCLV <b>CD-RW</b> 4x, 10x CLV (High Speed: 10x ) ( Ultra Speed and Ultra Speed Plus: 10x )
	ATAPI interface (MB/s)	33.3 Mbytes/s max. (Ultra DMA Mode 2) 16.6 Mbytes/s max. (DMA MW Mode 2) 16.6 Mbytes/s max. (PIO Mode 4)
Access time (ms)	CD-ROM	140 (Random)
	DVD-ROM	160 (Random)
Buffer memory		2MB
Supported disk format	CD	<b>CD-ROM, CD-ROM XA, CD-I, Video CD, CD-Extra</b> and <b>CD-Text, Photo CD</b> (Single and Multi session), <b>CD-DA</b> <b>Super Audio CD</b> (Compatible layer in Hybrid type) <b>CD-R</b> discs conforming to "Orange Book Part 2" <b>CD-RW</b> discs conforming to "Orange Book Part 3"
	DVD	<b>DVD-ROM, DVD-R</b> (Ver.1.0, Ver. 2.0 for Authoring) , <b>DVD-RAM</b> (Ver.1.0) <b>DVD-R</b> (Ver. 2.1 for General), <b>DVD-R DL, DVD-RW, DVD-RAM</b> (Ver.2.2), <b>DVD+R</b> (SL/DL) and <b>DVD+RW</b>



Table 1-6 DVD Super Multi drive specifications (3/4)

Parameter		Drive Specification
		Pioneer(DVR-K16TBA)
Data transfer speed	Read(KB/s)	8X CAV at DVD-ROM (Single Layer),DVD-R/ RW and +R / RW 6X CAV at DVD-ROM (Dual-Layer), DVD-R DL and +R DL 5X Zone CLV at DVD-RAM 24XCAV at CD-ROM andCD-R/ RW
	Write	8X Zone CLV at DVD-R / +R and +RW 6X Zone CLV at DVD-RW 5X Zone CLV at DVD-RAM 4X Zone CLV at DVD-R DL (Dual Layer) and +R DL (Double Layer) 24X Zone CLV at CD-R / RW
	ATAPI interface (MB/s)	SFF-8020,SFF-8090 Ver.5 IDE Data Transfer Mode PIO Mode 4, Multi Word DMA Mode 2, UltraDMA Mode2
Access time (ms)	CD-ROM	130 (Random)
	DVD-ROM	150 (Random)
Buffer memory		2MB
Supported disk format	CD	KODAK Photo CD Single and Multi-session CD Extra (CD PLUS) Video CD CD text data (Read / Write) CD-R discs (Read/ Write) CD-RW discs (Read/ Write)
	DVD	DVD-ROM DVD-R Ver.2.00 for General(Read/ Write) DVD-R DL Ver.3.0 (Read/Write) DVD-RW Ver.1.0 & 1.1 & 1.2(Read/ Write) DVD+R Ver.1.0 & 1.1& 1.2 (Read/Write) DVD+RDL Ver1.0(Read / Write) DVD+RW Ver.1.1& 1.2 (Read/Write) DVD+RW high speed Ver.1.0 (Read/Write) DVD-RAM Ver.2.0 & 2.1 (Read/ Write)

Table 1-6 DVD Super Multi drive specifications (4/4)

Parameter		Drive Specification
		TEAC (DV-W28EA)
Data transfer speed	Read(KB/s)	8X CAV at DVD-ROM (Single Layer),DVD-R/ +R 4X CAV at DVD-RW/ +RW 4X CAV at DVD+R (Dual Layer), DVD-R DL and +R DL 3X-5X Zone CLV at DVD-RAM 24XCAV at CD-ROM 20XCAV at CD-R/ RW
	Write	CD-R 10-24X (ZCLV),10X(CLV),4X(CLV) CD-RW 10X(CLV) DVD-R 2-8X (ZCLV),2X(CLV),1X ( CLV) DVD-RW 2-4X (ZCLV), 2X(CLV),1X ( CLV) DVD-RAM 35X (ZCLV),2.4X(CLV) DVD+R 2.4-8X ( ZCLV),2.4X( CLV) DVD+R( Double layer) 2.4( CLV ) DVD+RW 2.4-4X ( ZCLV ),2.4X ( CLV )
	ATAPI interface (MB/s)	SFF-8020,SFF-8090 Ver.5 IDE Data Transfer Mode PIO Mode 4, Multi Word DMA Mode 2, UltraDMA Mode2
Access time (ms)	CD-ROM	130 (Random)
	DVD-ROM	130 (Random)
Buffer memory		2MB
Supported disk format	CD	CD-DA CD-ROM Mode 1,Mode 2 CD-ROM XA Mode2 ( Form 1, Form 2) Photo CD (signal/multi-session) Enhanced CD, CD-tEXT
	DVD	DVD-ROM DVD-R (General .Authoring ) DVD-RW DVD-Video DVD-RAM ( 4.7G,2.6GB) DVD+R,DVD+R ( Double layer),DVD+RW



### 1.5 Keyboard

The Satellite P100 comes with a "desktop-style" keyboard built into it. This means it is full-sized and features a full set of numeric function keys (also known as calculator keys) on the right-hand side. Unlike other notebooks computers with smaller keyboards, there is no 'Numeric Mode' or any numeric keyboard overlay.

Figure 1-6 is a view of the keyboard.



*Desktop-style Keyboard*

*Figure 1-6 Keyboard*

See Appendix E for details of the keyboard layout.

## 1.6 TFT Color Display

The TFT color display is 17.1 inch and consists of LCD module and FL inverter board.

### 1.6.1 LCD Module

The LCD module used for the TFT color display uses a backlight as the light source and can display with 1,440x 900 dots (WXGA+) or 1,680x1,050 dots(WSXGA+) resolution.

Figure 1-7 shows a view of the LCD module and Table 1-8 lists the specifications.

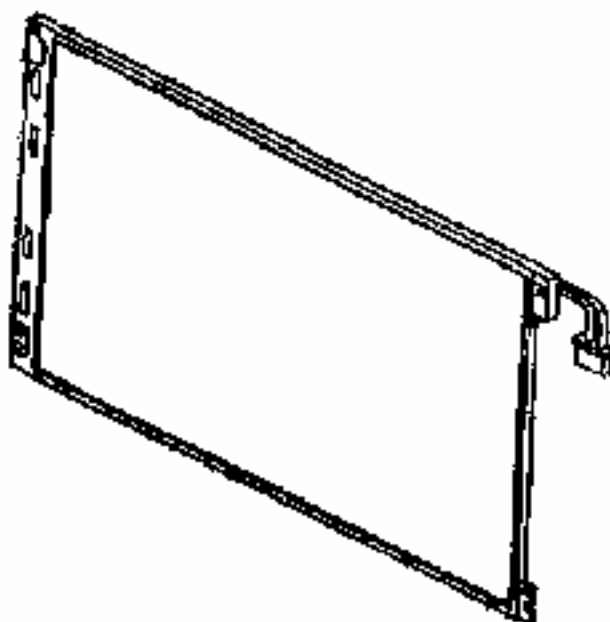


Figure 1-7 LCD Module

Table 1-7 LCD module specifications

Item	Specifications(WSXGA+)		Specifications(WXGA+)		
	LG-Philips LP171WE02- TL05	Samsung LTN170WP- L02-E	LG-Philips LP171WX2- A4K7	Samsung LTN170WX- L05-E	AU B170PW0 3 V1
Number of Dots	1,680x1,050		1,440x 900		
Dot spacing (mm)	0.297(H)× 0.297(V)				

## 1.6.2 FL Inverter Board

The FL inverter board supplies a high frequency current to illuminate the LCD module FL.

Table 1-10 lists the FL inverter board specifications.

*Table 1-8 FL inverter board specifications*

Item		Specifications	
		PI FL9030	SUMIDA IV002
Input	Voltage (V)	8 ~ 20	7.5 ~ 21
	Power (W)	5	
Output	Voltage (Vrms)	1500	1500 ~ 1900
	Current (f=55KHz) (mArms)	6	

## **1.7 Power Supply**

The power supply supplies 23 different voltages to the system board.

The power supply microcontroller has the following functions.

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

Table 1-9 lists the power supply output specifications.

Table 1-9 Power supply output rating

Name	Power supply ( Yes/No )				
	Voltage [V]	Power OFF Suspend mode	Power OFF Boot mode	No Battery	Object
VCC_CORE	1.484 - 0.748	No	No	No	CPU
VTT	1.05	No	No	No	CPU, 915GM, ICH4-M
+1.8V	1.8	No	No	No	CPU, 915GM, ICH4-M
+1.5V	1.2	No	No	No	915GM, ICH4-M
+0.9V	0.9	Yes	No	No	DDR2-SDRAM
+1.8VSUS	1.8	Yes	No	No	RC410MB, DDR2-SDRAM
+1.5V_S5	1.8	Yes	Yes	No	SB400
USBPWR0	5	Yes	No	No	USB
USBPWR1	5	Yes	No	No	USB
USBPWR2	5	Yes	No	No	USB
AVDD	5	No	No	No	MAX9750
+3V	3.3	No	No	No	Clock Generator, Thermal Sensor, Mini-PCI, SDRAM(SPD), 915GM, SB400, FWH, LAN, LCD, PCMCIA, EC, LED, Audio Codec
+5V	5	No	No	No	Mini-PCI, HDD, ODD, TP, CRT, PCMCIA, FAN
3VSUS	3.3	Yes	No	No	Card Cont, Mini-PCI, MDC
5VSUS	5	Yes	No	No	PC-Card, USB
3V_S5	3.3	Yes	Yes	No	ICH4-M
3VPCU	3	Yes	Yes	No	EC/KBC, System LED
VCCRTC	2.0 - 3.6	Yes	Yes	Yes	ICH4-M (RTC)
+2.5V	2.5	NO	NO	NO	915GM



## 1.8 Batteries

The PC has the following two batteries.

- θ Main battery
- θ Real time clock (RTC) battery

Table 1-10 lists the specifications for these two batteries.

*Table 1-10 Battery specifications*

Battery Name		Battery Element	Output Voltage	Capacity
Main battery	Sanyo 9 cell	Lithium ion	10.8v	6000mAh
	Sanyo 6 Cells		10.8v	4000mAh
Real time clock (RTC) battery	693013	Lithium ion	3V	16mAh

### 1.8.1 Main Battery

The main battery is the primary power supply for the computer when the AC adapter is not connected. In Standby, the main battery maintains the current status of the computer.

## 1.8.2 Battery Charging Control

Battery charging is controlled by a power supply microprocessor. The power supply microprocessor controls power supply and detects a full charge when the AC adaptor and battery are connected to the computer.

### θ Battery Charge

When the AC adapter is connected, normal charging is used while the system is turned on and quick charge is used while the system is turned off. Refer to the following Table 1-11.

*Table 1-11 Time required for charges of main battery*

Condition	Charging Time
Power On Charge	About 6 hours
Power Off Charge	About 3 hours

Charge is stopped in the following cases.

1. The main battery is fully charged
2. The main battery is removed
3. Main battery or AC adapter voltage is abnormal
4. Charging current is abnormal

### θ Data preservation time

When turning off the power in being charged fully, the preservation time is as following Table 1-12.

*Table 1-12 Data preservation time*

Condition	preservation time
Standby	About 3 days
Hibernation	About 1 month

### 1.8.3 RTC Battery

The RTC battery provides the power supply to maintain the date, time, and other system information in memory.

Table 1-13 lists the Time required for charges of RTC battery and data preservation time.

*Table 1-13 Time required for charges of RTC battery*

<b>Condition</b>	<b>Time</b>
Power ON (Lights Power LED)	About 24 hours
Data preservation tome (Full-charged)	About a month

## 1.9 AC Adapter

The AC adapter is used to charge the battery.

Table 1-14 lists the AC adapter specifications.

*Table 1-14 AC adapter specifications*

Parameter	Specification		
With Led	<b>DELTA/ LITE-ON</b>	<b>DELTA/ LITE-ON</b>	<b>DELTA/LITE-ON</b>
Power	75W	90W	120W
Input voltage	AC 100V/240V	AC 100V/240V	AC 100V/240V
Input frequency	50Hz/60Hz		
Input current	$\leq 1.5A$	$\leq 1.8A$	$\leq 1.8A$
Output voltage	DC 15V		
Output current	5A	6A	8A

---

# **Chapter 2**

## **Troubleshooting Procedures**

---



---

## Chapter 2 Contents

---

2.1	Troubleshooting .....	1
2.2	Troubleshooting Flowchart.....	3
2.3	Power Supply Troubleshooting.....	7
	Procedure 1    Power Status Check .....	7
	Procedure 2    Error Code Check .....	9
	Procedure 3    Connection Check.....	10
	Procedure 4    Charging Check .....	10
	Procedure 5    Replacement Check .....	12
2.4	System Board Troubleshooting.....	13
	Procedure 1    Message Check .....	14
	Procedure 2    Debugging Port Check.....	16
	Procedure 3    Diagnostic Test Program Execution Check .....	21
	Procedure 4    Replacement Check .....	21
2.5	USB FDD Troubleshooting .....	22
	Procedure 1    FDD Head Cleaning Check .....	22
	Procedure 2    Diagnostic Test Program Execution Check .....	23
	Procedure 3    Connector Check and Replacement Check.....	24
2.6	2.5” HDD Troubleshooting.....	26
	Procedure 1    Partition Check.....	26
	Procedure 2    Message Check .....	27
	Procedure 3    Format Check.....	28
	Procedure 4    Diagnostic Test Program Execution Check .....	29
	Procedure 5    Connector Check and Replacement Check.....	30
2.7	Keyboard Troubleshooting .....	31
	Procedure 1    Diagnostic Test Program Execution Check .....	31
	Procedure 2    Connector Check and Replacement Check.....	32
2.8	Touch pad Troubleshooting .....	33
	Procedure 1    Diagnostic Test Program Execution Check .....	33
	Procedure 2    Connector Check and Replacement Check.....	34





2.9	Display Troubleshooting.....	35
	Procedure 1    External Monitor Check.....	35
	Procedure 2    Diagnostic Test Program Execution Check .....	35
	Procedure 3    Connector and Cable Check.....	36
	Procedure 4    Replacement Check .....	37
2.10	Optical Disk Drive Troubleshooting.....	38
	Procedure 1    Diagnostic Test Program Execution Check .....	38
	Procedure 2    Connector Check and Replacement Check.....	38
2.11	Modem Troubleshooting.....	39
	Procedure 1    Diagnostic Test Program Execution Check .....	39
	Procedure 2    Connector Check and Replacement Check.....	39
2.12	LAN Troubleshooting.....	41
	Procedure 1    Diagnostic Test Program Execution Check .....	41
	Procedure 2    Connector Check and Replacement Check.....	41
2.13	Wireless LAN Troubleshooting.....	42
	Procedure 1    Transmitting-Receiving Check .....	42
	Procedure 2    Antennas' Connection Check .....	43
	Procedure 3    Replacement Check .....	44
2.14	Sound Troubleshooting.....	45
	Procedure 1    Diagnostic Test Program Execution Check .....	45
	Procedure 2    Connector Check.....	45
	Procedure 3    Replacement Check .....	46
2.15	VGA Troubleshooting.....	47
	Procedure 1    Diagnostic Test Program Execution Check .....	47
	Procedure 2    Connector Check and Replacement Check.....	47
2.16	Fingerprint Troubleshooting.....	49
	Procedure 1    Diagnostic Test Program Execution Check .....	49
	Procedure 2    Connector Check and Replacement Check.....	49
2.17	Bluetooth Troubleshooting .....	50
	Procedure 1    Diagnostic Test Program Execution Check .....	50
	Procedure 2    Connector Check and Replacement Check.....	50



### 2.1 Troubleshooting

Chapter 2 describes how to determine which Field Replaceable Unit (FRU) in the computer is causing the computer to malfunction.

The FRUs covered are:

- |                 |                       |                        |
|-----------------|-----------------------|------------------------|
| 1. Power supply | 6. Touch pad          | 11. Wireless LAN       |
| 2. System Board | 7. Display            | 12. Sound              |
| 3. USB FDD      | 8. Optical Disk Drive | 13. VGA Board          |
| 4. 2.5" HDD     | 9. Modem              | 14. Finger Print Board |
| 5. Keyboard     | 10. LAN               | 15. Bluetooth          |

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

**NOTE:** *After replacing the system board or CPU, it is necessary to execute the subtest 01 initial configuration of the 3.3 Setting of the hardware configuration in Chapter 3. Also update with the latest BIOS as described in Appendix G "BIOS Rewrite Procedures"*

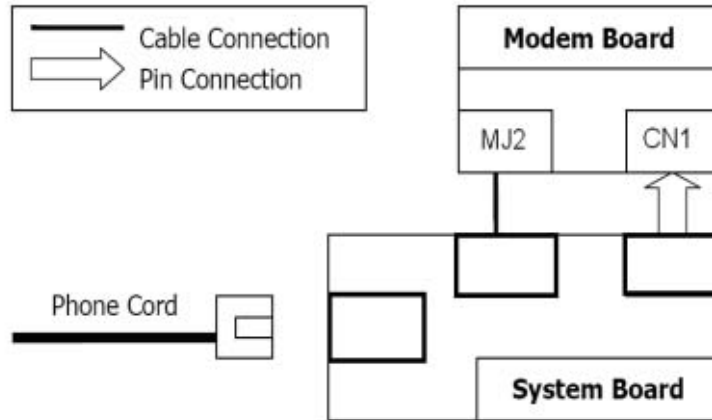
*After replacing the LCD, update with the latest EC/KBC as described in Appendix H "EC/KBC Rewrite Procedures" to set the SVP parameter.*

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

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

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

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



## **2.2 Troubleshooting Flowchart**

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

- Ask him or her to enter the password if a password is registered.
- Verify with the customer that Toshiba Windows is installed on the hard disk. Non-Windows operating systems can cause the computer to malfunction.
- Make sure all optional equipment is removed from the computer.

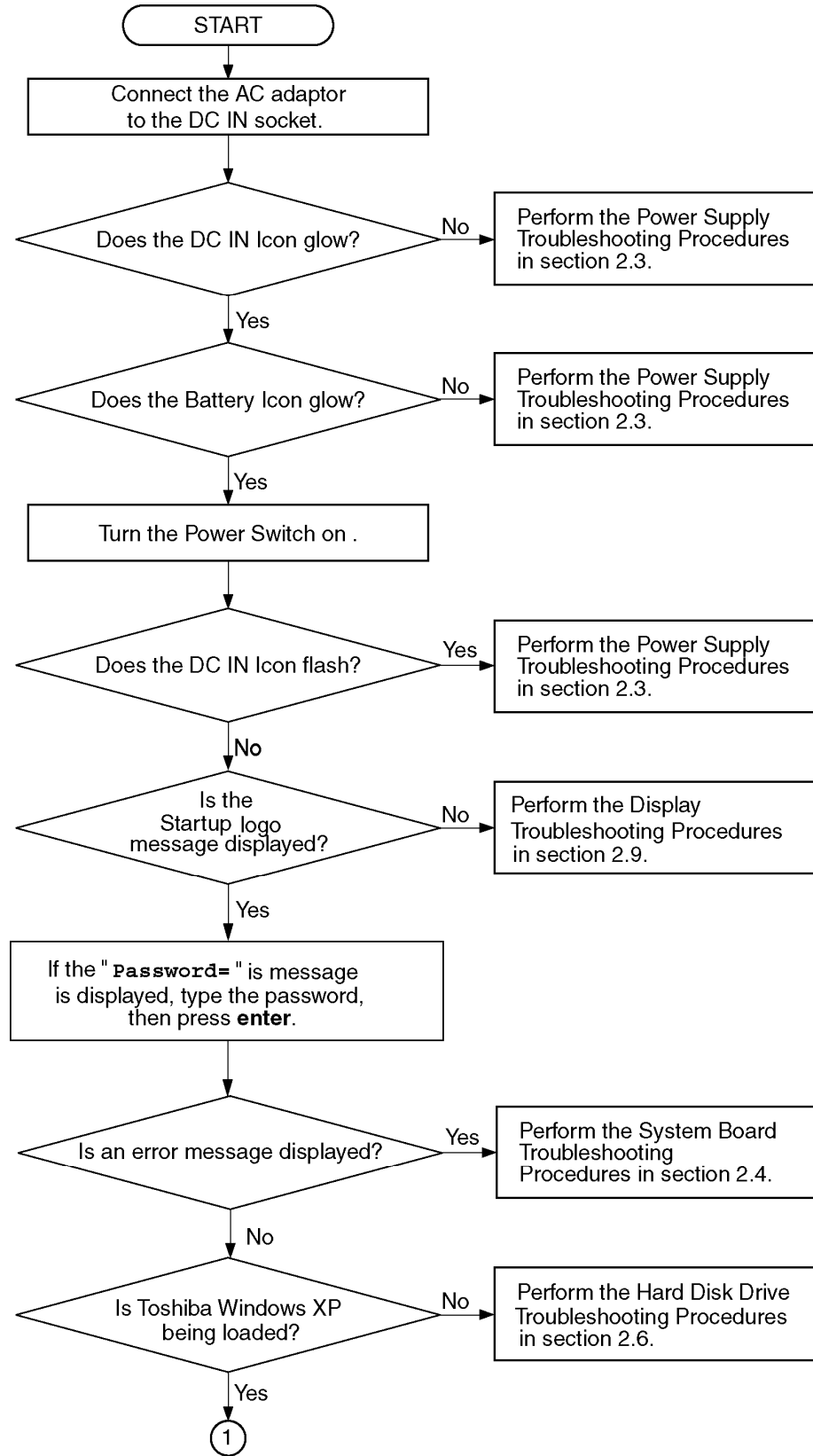


Figure 2-1 Troubleshooting flowchart (1/2)

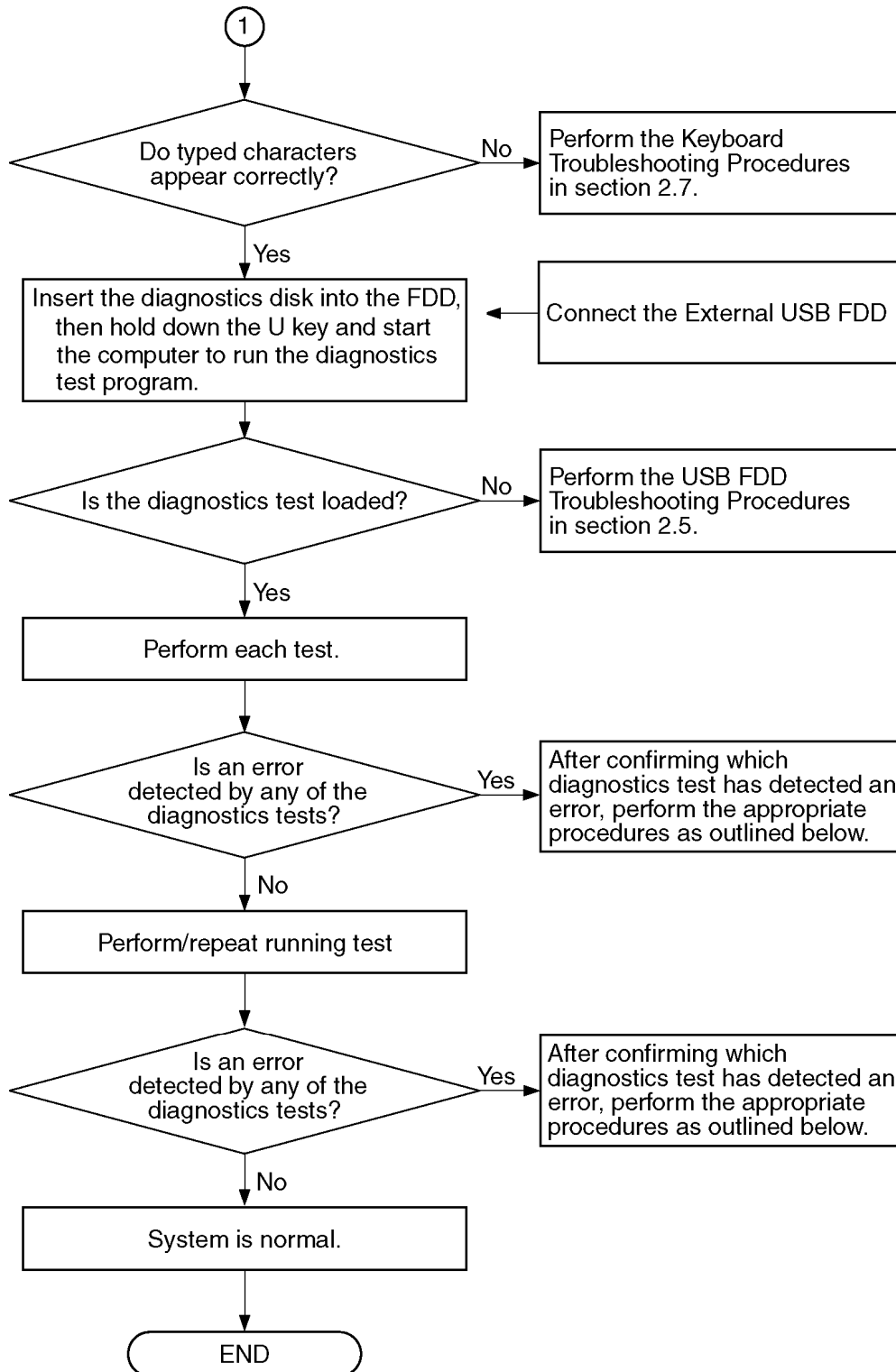


Figure 2-1 Troubleshooting flowchart (2/2)

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

1. If an error is detected on the system test, memory test, display test, CD-ROM/DVD-ROM test, expansion test, real timer test, sound test or Modem/LAN/Bluetooth /IEEE1394 test, perform the System Board Troubleshooting Procedures in Section 2.4.
2. If an error is detected on the floppy disk test, perform the USB FDD Troubleshooting Procedures in Section 2.5.
3. If an error is detected on the hard disk test, perform the HDD Troubleshooting Procedures in Section 2.6.
4. If an error is found on the keyboard test (DIAGNOSTICS TEST) and pressed key display test (ONLY ONE TEST), perform the Keyboard Troubleshooting Procedures in Section 2.7.
5. If an error is found on the touch pad test (ONLY ONE TEST), perform the touch pad Troubleshooting Procedures in Section 2.8.
6. If an error is detected on the display test, perform the Display Troubleshooting Procedures in Section 2.9.
7. If an error is detected on the CD-ROM/DVD-ROM test, perform the Optical Disk Drive Troubleshooting Procedures in Section 2.10.
8. If an error is detected on the modem test, perform the Modem Troubleshooting Procedures in Section 2.11.
9. If an error is detected on the LAN test, perform the LAN Troubleshooting Procedures in Section 2.12.
10. If an error is detected on the wireless LAN test, perform the Wireless LAN Troubleshooting Procedures in Section 2.13.
11. If an error is detected on the sound test, perform the Sound Troubleshooting Procedures in Section 2.14.
12. If an error is detected on the VGA daughter card test, perform the VGA Troubleshooting Procedures in Section 2.15.
13. If an error is detected on the fingerprint test, perform the fingerprint Troubleshooting Procedures in Section 2.16.
14. If an error is detected on the Bluetooth test, perform the Bluetooth Troubleshooting Procedures in Section 2.17.



## 2.3 Power Supply Troubleshooting

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

- Procedure 1: Power Status Check
- Procedure 2: Error Code Check
- Procedure 3: Connection Check
- Procedure 4: Charging Check
- Procedure 5: Replacement Check

### Procedure 1 Power Status Check

The following LED indicates the power supply status:

- Battery LED
- DC IN LED

The Power Supply control displays the power supply status with the Battery LED and the DC IN LED as listed in the tables below.

*Table 2-1 Battery icon*

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

Table 2-2 DC IN icon

DC IN icon	Power supply status
Lights green	DC power is being supplied from the AC adapter.
Blinks orange	Power supply malfunction <sup>*1</sup>
Doesn't light	Any condition other than those above.

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

When the icon is blinking, perform the following procedure.

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

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

Check 1 If the DC IN icon blinks orange, go to Procedure 2.

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

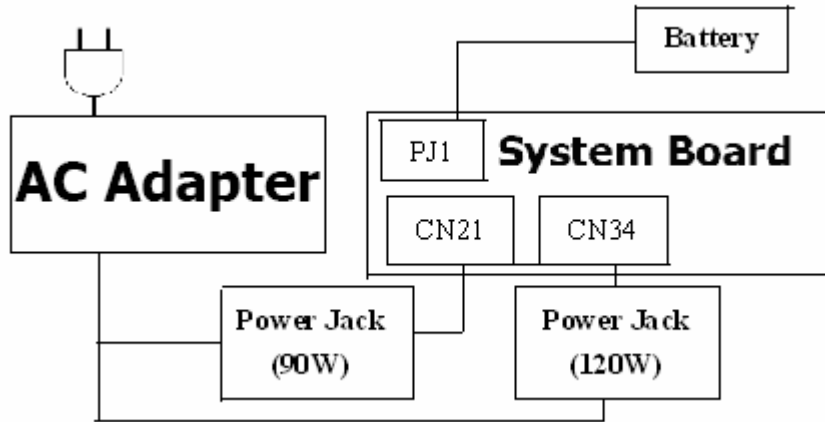
Check 3 If the battery icon does not light orange or green, go to Procedure 4.

**NOTE:** Use a supplied AC adapter.

Procedure 2

### Procedure 3 Connection Check

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



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

Check 1 Make sure the AC adapter and the AC power cord is firmly plugged into the DC IN socket (CN21/34) and wall outlet. If these cables are connected firmly, go to Check 2.

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

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

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

### Procedure 4 Charging Check

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

Check 1 Make sure the AC adapter is firmly plugged into the DC IN socket (W8800).

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

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

## *2 Troubleshooting Procedures*

---

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

### **Procedure 5 Replacement Check**

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

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

When AC adapter is connected;

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

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

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

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

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

## **2.4 System Board Troubleshooting**

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

Procedure 1: Message Check

Procedure 2: Debugging Port Check

Procedure 3: Diagnostic Test Program Execution Check

Procedure 4: Replacement Check

### Procedure 1 Message Check

When the power is turned on, the system performs the Power On Self Test (POST) installed in the BIOS ROM. The POST tests each IC on the system board and initializes it.

- If an error message is shown on the display, perform Check 1.
- If there is no error message, go to Procedure 2.
- If MS-DOS or Windows XP is properly loaded, go to Procedure 4.

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

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

- (a) **\*\*\* Bad HDD type \*\*\***  
Check system. Then press [F1] key .....
- (b) **\*\*\* Bad RTC battery \*\*\***  
Check system. Then press [F1] key .....
- (c) **\*\*\* Bad configuration \*\*\***  
Check system. Then press [F1] key .....
- (d) **\*\*\* Bad memory size \*\*\***  
Check system. Then press [F1] key .....
- (e) **\*\*\* Bad time function \*\*\***  
Check system. Then press [F1] key .....
- (f) **\*\*\* Bad check sum (CMOS) \*\*\***  
Check system. Then press [F1] key .....
- (g) **\*\*\* Bad check sum (ROM) \*\*\***  
Check system. Then press [F1] key .....

**Check 2** If the following error message is displayed on the screen, press any key as the message instructs.

The following error message appears when data stored in RAM under the resume function is lost because the battery has become discharged or the system board is damaged. Go to Procedure 3.

```
WARNING: RESUME FAILURE.  
PRESS ANY KEY TO CONTINUE.
```

If any other error message displays, perform Check 3.



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

If one of the following error messages (1) through (17), (24) or (25) is displayed, go to Procedure 4.

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

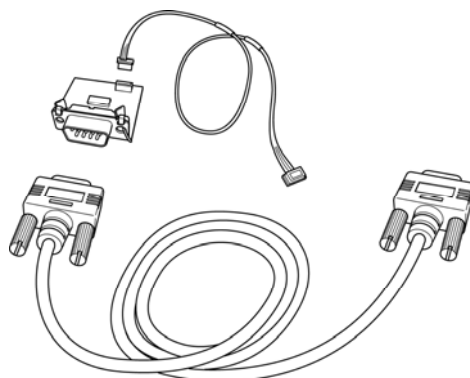
If error message (19), (20) or (21) is displayed, go to the 2.5" HDD Troubleshooting Procedures.

If error message (22) or (23) is displayed, go to the USB FDD Troubleshooting Procedures.

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

## Procedure 2 Debugging Port Check

Check the MiniPCI Debug board. The tool for debug port test is shown below.



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

The test procedures are follows:

1. Replace Mini PCI debug port with Wireless LAN card, check LED in the Mini PCI debug board

The following is a list of the Test Point codes written to port 80h at the start of each routine, the beep codes issued for terminal errors, and a description of the POST routine. Unless otherwise noted, these codes are valid for Phoenix BIOS 4.0 Release 6.0.

NOTE: The following routines are sorted by their test point numbers were assigned in the BIOS code. Their actual order as executed during POST can Be quite different.

### Code Beeps POST Routine Description

02h	Verify Real Mode
03h	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize caches to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE
10h	Initialize Power Management
11h	Load alternate registers with initial POST values
12h	Restore CPU control word during warm boot
13h	Initialize PCI Bus Mastering devices

### Code Beeps POST Routine Description

14h	Initialize keyboard controller
16h 1-2-2-3	BIOS ROM checksum
17h	Initialize cache before memory autosize
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h 1-3-1-1	Test DRAM refresh
22h 1-3-1-3	Test 8742 Keyboard Controller
24h	Set ES segment register to 4 GB
26h	Enable A20 line
28h	Autosize DRAM
29h	Initialize POST Memory Manager
2Ah	Clear 512 KB base RAM
2Ch 1-3-4-1	RAM failure on address line <b>xxxx</b> *
2Eh 1-3-4-3	RAM failure on data bits <b>xxxx</b> * of low byte of memory bus
2Fh	Enable cache before system BIOS shadow
30h 1-4-1-1	RAM failure on data bits <b>xxxx</b> * of high byte of memory bus
32h	Test CPU bus-clock frequency
33h	Initialize Phoenix Dispatch Manager
36h	Warm start shut down
38h	Shadow system BIOS ROM
3Ah	Autosize cache
3Ch	Advanced configuration of chipset registers
3Dh	Load alternate registers with CMOS values
42h	Initialize interrupt vectors
45h	POST device initialization
46h 2-1-2-3	Check ROM copyright notice
48h	Check video configuration against CMOS
49h	Initialize PCI bus and devices
4Ah	Initialize all video adapters in system
4Bh	QuietBoot start (optional)
4Ch	Shadow video BIOS ROM
4Eh	Display BIOS copyright notice
50h	Display CPU type and speed
51h	Initialize EISA board
52h	Test keyboard
54h	Set key click if enabled
58h 2-2-3-1	Test for unexpected interrupts
59h	Initialize POST display service
5Ah	Display prompt "Press F2 to enter SETUP"
5Bh	Disable CPU cache
5Ch	Test RAM between 512 and 640 KB
60h	Test extended memory
62h	Test extended memory address lines
64h	Jump to UserPatch1

66h	Configure advanced cache registers
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
6Eh	Display possible high address for UMB recovery
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Set up hardware interrupt vectors
7Eh	Initialize coprocessor if present
80h	Disable onboard Super I/O ports and IRQs
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC-compatible PnP ISA devices
86h	Re-initialize onboard I/O ports.
87h	Configure Motheboard Configurable Devices (optional)
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMIs)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller (optional)
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
97h	Fixup Multi Processor table
98h 1-2	Search for option ROMs. One long, two short beeps on checksum failure
99h	Check for SMART Drive (optional)
9Ah	Shadow option ROMs
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts
9Fh	Determine number of ATA and SCSI drives
A0h	Set time of day
A2h	Check key lock
A4h	Initialize Typematic rate
A8h	Erase F2 prompt

Code	Beeps	POST Routine	Description
AAh		Scan for F2 key stroke	
ACh		Enter SETUP	
A Eh		Clear Boot flag	
B0h		Check for errors	
B2h		POST done - prepare to boot operating system	
B4h	1	One short beep before boot	
B5h		Terminate QuietBoot (optional)	
B6h		Check password (optional)	
B9h		Prepare Boot	
Bah		Initialize DMI parameters	
BBh		Initialize PnP Option ROMs	
BCh		Clear parity checkers	
BDh		Display MultiBoot menu	
BEh		Clear screen (optional)	
BFh		Check virus and backup reminders	
C0h		Try to boot with INT 19	
C1h		Initialize POST Error Manager (PEM)	
C2h		Initialize error logging	
C3h		Initialize error display function	
C4h		Initialize system error handler	
C5h		PnPnd dual CMOS (optional)	
C6h		Initialize notebook docking (optional)	
C7h		Initialize notebook docking late	
C8h		Force check (optional)	
C9h		Extended checksum (optional)	
D2h		Unknown interrupt	

**Code Beeps For Boot Block in Flash ROM**

E0h	Initialize the chipset
E1h	Initialize the bridge
E2h	Initialize the CPU
E3h	Initialize system timer
E4h	Initialize system I/O
E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialize Multi Processor
EAh	Initialize OEM special code
EBh	Initialize PIC and DMA
ECh	Initialize Memory type
EDh	Initialize Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialize interrupt vectors
F1h	Initialize Run Time Clock
F2h	Initialize video
F3h	Initialize System Management Mode
F4h	1 Output one beep before boot
F5h	Boot to Mini DOS
F6h	Clear Huge Segment
F7h	Boot to Full DOS

### **Procedure 3 Diagnostic Test Program Execution Check**

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

1. System test
2. Memory test
3. Keyboard test
4. Display test
5. Floppy Disk test
6. VGA test
7. VGA Memory test
8. Hard Disk test
9. CPU Temperature test
10. Main Battery test
11. BIOS test
12. CD-ROM/DVD-ROM test
13. System Status LED test
14. Wireless LAN test
15. LAN/Modem/Sound test
16. UUID test-DMI Information (Write DMI)

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

### **Procedure 4 Replacement Check**

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

## **2.5 USB FDD Troubleshooting**

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

Procedure 1: FDD Head Cleaning Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Replacement Check

### **Procedure 1 FDD Head Cleaning Check**

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

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

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

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



**Procedure 2 Diagnostic Test Program Execution Check**

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

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

*Table 2-7 FDD error code and status*

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

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

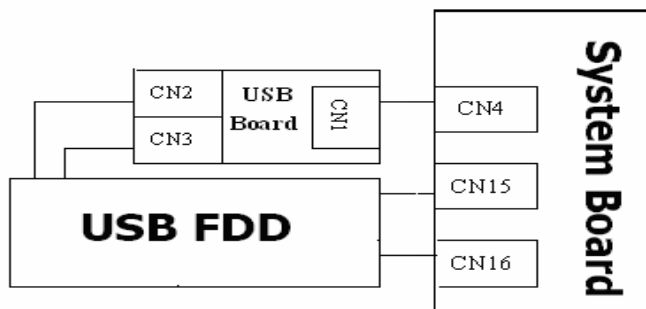
Write protected

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

**Procedure 3 Connector Check and Replacement Check**

USB FDD is connected to USB port on system board and US board. US board is also connected to system board by cable. The connection of cable and board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks.

USB FDD can be connected to the following 4 ports on system board.



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

**NOTE:** When checking the connection, be sure to check it with care for the followings.

1. Cable can not be disconnected from the connector.
2. Cable is connected straight to the connector.
3. Cable is connected all the way seated in the connector.
4. Cable can not be broken.

## *2 Troubleshooting Procedures*

---

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

Check 3 Connect USB FDD to each port embedded on system board.

If it does not work properly when connected to CN12, CN19, CN20 or all ports, perform Check 4.

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

## 2.6 2.5" HDD Troubleshooting

To check if 2.5" HDD is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Partition Check

Procedure 2: Message Check

Procedure 3: Format Check

Procedure 4: Diagnostic Test Program Execution Check

Procedure 5: Connector Check and Replacement Check

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

### Procedure 1 Partition Check

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

- Check 1 Input **C:** and press **Enter**. If you cannot change to drive C, go to Check 2. If you can change to drive C, go to Procedure 2.
- Check 2 Input **FDISK** and press **Enter**. Choose Display Partition Information from the FDISK menu. If drive C is listed in the Display Partition Information, go to Check 3. If drive C is not listed, return to the FDISK menu and choose the option to create a DOS partition or a logical DOS drive on drive C. If the problem still occurs, go to Procedure 2.
- Check 3 If drive C is listed as active in the FDISK menu, go to Check 4. If drive C is not listed as active, return to the FDISK menu and choose the option to set the active partition for drive C. Then go to Procedure 2.
- Check 4 Remove the system disk from the FDD and reboot the computer. If the problem still occurs, go to Procedure 2. Otherwise, the 2.5" HDD is operating normally.

### Procedure 2 Message Check

When the power is turned on, the system performs the Initial Reliability Test (IRT) installed in the BIOS ROM. When the test detects an error, an error message is displayed on the screen.

Make sure no floppy disk is in the FDD. Turn on the computer and check the message on the screen. When an OS starts from the 2.5" HDD, go to Procedure 3. Otherwise, start with Check 1 below and perform the other checks as instructed.

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

HDC ERROR

or

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

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

Insert system disk in drive  
Press any key when ready .....

or

Non-System disk or disk error  
Replace and press any key when ready

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

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

System Transferred

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

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

### **Procedure 3    Format Check**

The computer's HDD is formatted using the MS-DOS FORMAT program or the physical format program of the test program. To format the HDD, start with Check 1 below and perform the other steps as required.

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

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

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

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

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

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

**Procedure 4 Diagnostic Test Program Execution Check**

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

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

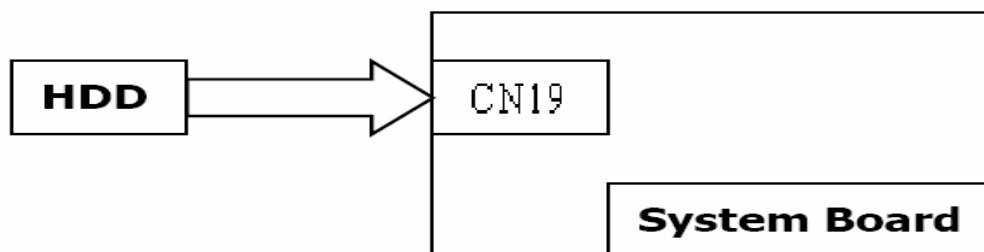
*Table 2-8 2.5" Hard disk drive error code and status*

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

### Procedure 5 Connector Check and Replacement Check

HDD(s) is/are connected to the connector(s) on the system board. The connection of HDD(s) and board may be defective. Otherwise, they may be faulty. Disassemble the computer following instructions in Chapter 4, *Replacement Procedures* and perform the following checks.

- Check 1 Make sure HDD(s) is/are firmly connected to the connector(s) on the system board.



If any of the connections are loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Check 2.

- Check 2 (One of) HDD(s) may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures* and check the operation. If the problem still occurs, perform Check 3.
- Check 3 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.



## **2.7 Keyboard Troubleshooting**

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector and Replacement Check

### **Procedure 1 Diagnostic Test Program Execution Check**

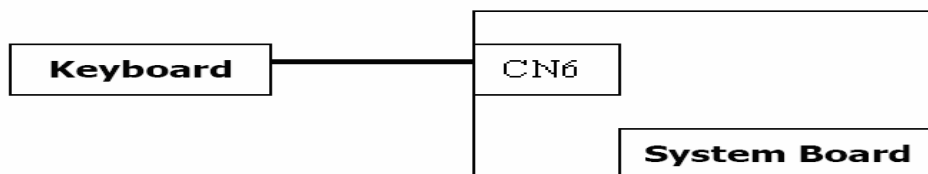
Execute the Keyboard Test (DIAGNOSTIC TEST) and Pressed key display test (ONLY ONE TEST) in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

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

## Procedure 2 Connector and Replacement Check

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

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



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

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

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

## **2.8 Touch pad Troubleshooting**

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector and Replacement Check

### **Procedure 1 Diagnostic Test Program Execution Check**

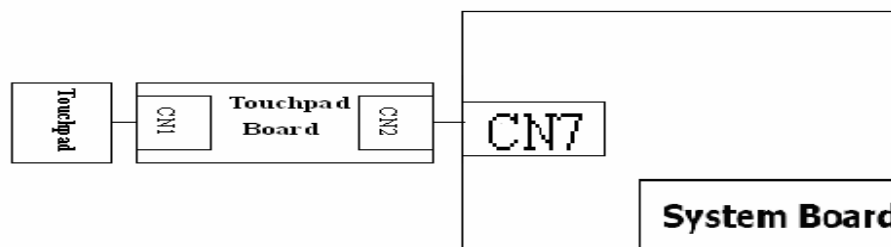
Execute the Touch pad test (ONLY ONE TEST) in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

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

## Procedure 2 Connector and Replacement Check

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

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



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

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

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

## **2.9 Display Troubleshooting**

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

Procedure 1: External Monitor Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector and Cable Check

Procedure 4: Replacement Check

### **Procedure 1 External Monitor Check**

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

If the external monitor works correctly, the internal LCD may be faulty. Go to Procedure 3.

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

### **Procedure 2 Diagnostic Test Program Execution Check**

The Display Test program is stored in Diagnostics disk. This program checks the display controller on system board. Insert the Diagnostics disk in the USB FDD, 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.

### **Procedure 3 Connector and Cable Check**

LCD Module is connected to system board by an LCD/FL cable. FL inverter board is also connected to system board by an LCD/FL cable. And, fluorescent lamp is connected to FL inverter board by HV cable. Their cables may be disconnected from system board or FL inverter board. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*.

If the connection is loose, reconnect firmly and restart the computer. If the problem still occurs, go to Procedure 4.



#### **Procedure 4 Replacement Check**

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

If fluorescent lamp does not light, perform Check 1.

If characters or graphics on the internal display are not displayed clearly, perform Check 4.

If some screen functions do not operate properly, perform Check 4.

If fluorescent lamp remains lit when the display is closed, perform Check 5.

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

Check 2 LCD/FL cable may be faulty. Replace FL/LCD cable with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 3.

Check 3 FL inverter may be faulty. Replace FL inverter with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 4.

Check 4 LCD module may be faulty. Replace LCD module with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 5.

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

## 2.10 Optical Disk Drive Troubleshooting

To check if optical disk drive is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

### Procedure 1 Diagnostic Test Program Execution Check

Execute the CD-ROM/DVD-ROM Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

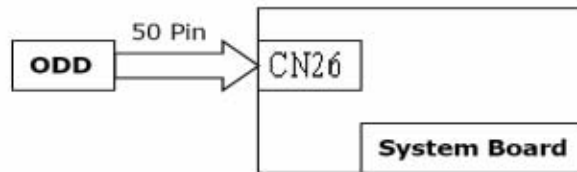
Prepare the tools before the test.

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

### Procedure 2 Connector Check and Replacement Check

The connection of optical disk drive and system board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4 and perform the following checks:

Check 1 Make sure optical disk drive is firmly connected to the connector on system board.



If the connection is loose, reconnect it firmly and return to Procedure 2. If the problem still occurs, perform Check 2.

Check 2 Optical disk drive may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 3.

Check 3 System board may be faulty. Replace it with new one following the instructions in Chapter 4.



## 2.11 Modem Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

### Procedure 1 Diagnostic Test Program Execution Check

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

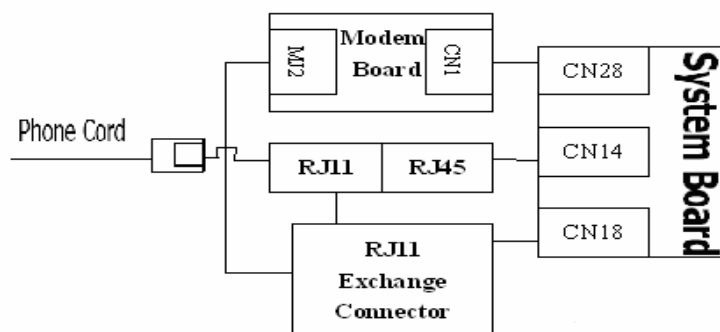
If any error is detected, perform Procedure 2.

### Procedure 2 Connector Check and Replacement Check

MDC (Modem Daughter Card) is used as the modem for this computer. MDC is connected to system board by connector (CN1&CN28). And also, MDC is connected to system board by modem cable (MJ2&CN14). If modem malfunctions, the connection of cable, board and module may be defective. Otherwise, they may be faulty.

Disassemble the computer following the steps described in Chapter 4 and perform the following checks:

Check 1 Make sure the following connections are firmly connected.



If any connector is disconnected, connect it firmly and return to Procedure 1. If the problem still occurs, perform Check 2.

## *Troubleshooting Procedures*

---

- Check 2 Modem cable may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.
- Check 3 MDC may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 4.
- Check 4 Cable between MDC and system board may be faulty. Replace it with a new one following the instructions in Chapter 4. If the problem still occurs, perform Check 5.
- Check 6 System board may be faulty. Replace it with a new one following the instruction in Chapter 4.

## 2.12 LAN Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

### Procedure 1 Diagnostic Test Program Execution Check

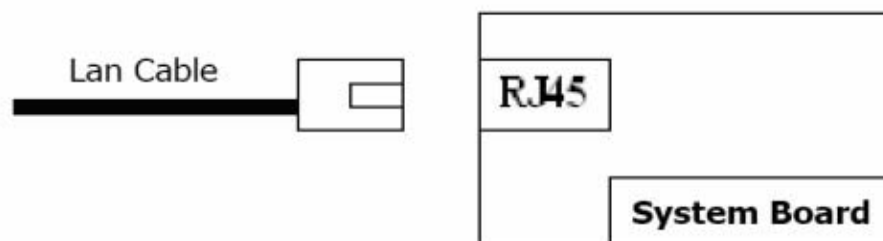
Execute LAN test in the LAN/Modem test program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

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

### Procedure 2 Connector Check and Replacement Check

The LAN function is embedded on system board. If LAN malfunctions, its connection is defective or LAN cable and system board may be faulty.

Check 1 Make sure LAN cable is firmly connected to the connector CN9. If the problem still occurs, perform Check 2.



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

Check 3 System board may be faulty. Replace it with a new one following the instruction in Chapter 4.

## **2.13 Wireless LAN Troubleshooting**

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

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antennas' Connection Check

Procedure 3: Replacement Check

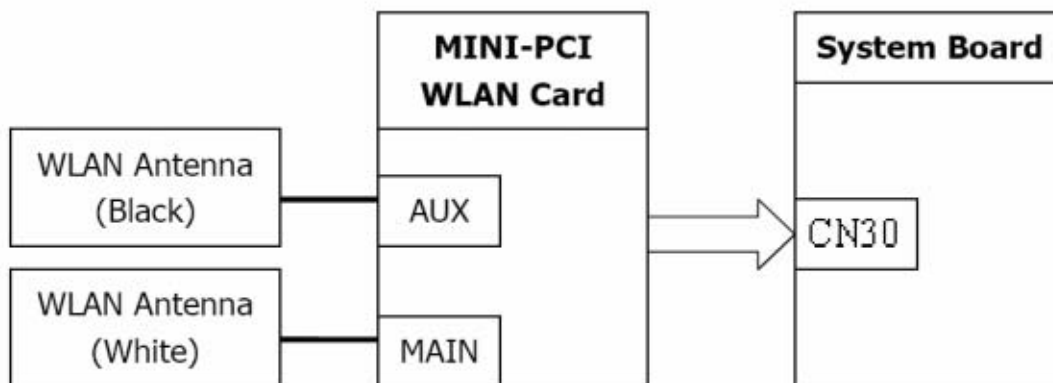
### **Procedure 1      Transmitting-Receiving Check**

Before starting the test, make sure the wireless communication switch is set in the ON position.

- Check 1    Execute Wireless LAN test program to check the transmitting-receiving function of wireless LAN. You will need a second computer that can communicate by wireless LAN. Perform the test following the instructions described in Chapter 3. If the computer passes the test, the function is correctly working. If the computer does not pass the test, perform Procedure 2.

## Procedure 2      Antennas' Connection Check

The wireless LAN function-wiring diagram is shown below:



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

- Check 1    Make sure the wireless communication switch is “On”.  
            If the switch is “Off”, turn it “On”. If the problem still occurs, perform Check 2.
  
- Check 2    Make sure wireless LAN card (Mini-PCI) is firmly connected to the CN2200 on system board. If the connector is defective, connect it firmly and perform Procedure 1. If the problem still occurs, perform Check 3.
  
- Check 3    Make sure that wireless LAN antenna cables (black and white) are firmly connected to the connectors on Wireless LAN card. If wireless LAN antenna cables are not connected properly, connect them firmly and perform Procedure 1. If the problem still occurs, go to the procedure 3.

### **Procedure 3      Replacement Check**

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

- Check 1    Wireless LAN antenna may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 2.
  
- Check 2    Wireless LAN card may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 3.
  
- Check3    System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

## 2.14 Sound Troubleshooting

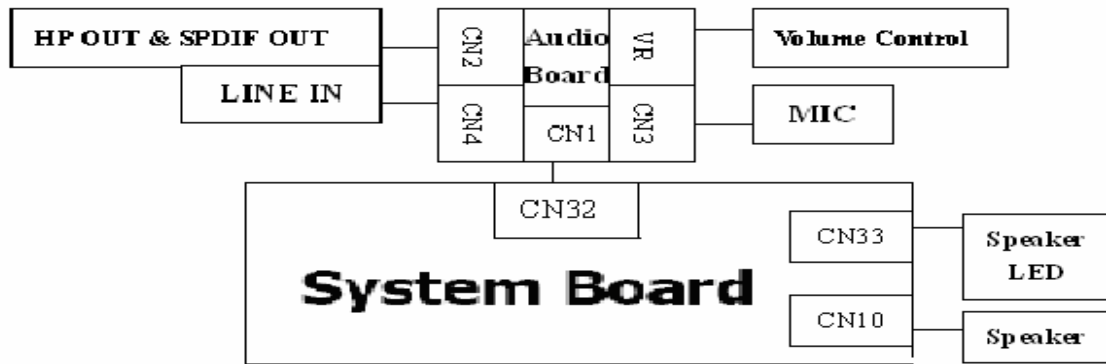
To check if the sound function is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Connector Check

Procedure 2: Replacement Check

### Procedure 1 Connector Check

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



As the connection may be defective, disassemble the PC and check each connection.

If the problem still occurs, go to Procedure 2.

## **Procedure 2 Replacement Check**

- If External microphone/Headphone does not work properly, perform check 1.
- If Internal microphone /Speaker does not work properly, perform check 2.
- If HP out & SPDIF does not work properly, perform check 3.
- If Line in/ Volume control does not work properly, perform check 4.

Check 1 External microphone/Headphone may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5.

Check 2 Internal microphone /Speaker may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5.

Check 3 HP out & SPDIF out may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5.

Check 4 Line in/ Volume control may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 6.

Check 5 Flat cable between AD board/Speaker and system board may be faulty. Replace it with new cable following the instructions in Chapter 4. If the problem still occurs, perform Check 6.

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



## 2.15 VGA Troubleshooting

### Procedure 1 Diagnostic Test Program Execution Check

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

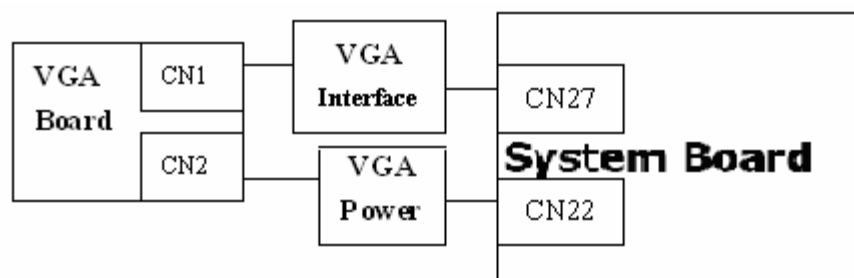
If any error is detected, perform Procedure 2.

### Procedure 2 Connector Check and Replacement Check

VDC (VGA Daughter Card) is used as the VGA for this computer. VDC is connected to system board by connector (CN1&CN27) . And also, VDC is connected to system board by VDC power cable (CN2&CN22) . If VDC malfunctions, The connection of cable, board and module may be defective. Otherwise, they may be faulty.

Disassemble the computer following the steps described in Chapter 4 and perform the following checks:

Check 1 Make sure the following connections are firmly connected.



As the connection may be defective, disassemble the PC and check each connection.

If the problem still occurs, go to Check 5.

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

Check 3 VDC may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 4.

Check 4 Cables between VDC and system board may be faulty. Replace it with new cable following the instructions in Chapter 4. If the problem still occurs, perform Check 5.

Check 5 System board may be faulty. Replace it with a new one following the instruction in Chapter 4.

## 2.16 Fingerprint Troubleshooting

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

Procedure 1: Connector Check and Replacement Check

### Procedure 1 Diagnostic Test Program Execution Check

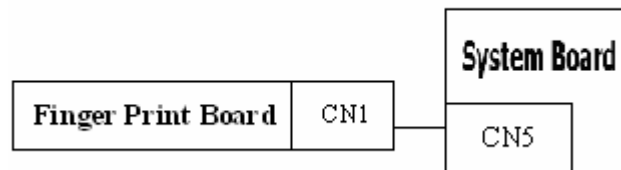
Execute Fingerprint test in the test program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

If any error is detected, perform Procedure 2.

### Procedure 2 Connector Check and Replacement Check

The Fingerprint function is embedded on system board. If Fingerprint malfunctions, its connection is defective or Fingerprint cable and system board may be faulty.

Check 1 Make sure Fingerprint cable is firmly connected to the connector CN5. If the problem still occurs, perform Check 2.



Check 2 Fingerprint cable may be faulty. Replace it with a new one. If the problem still occurs, perform Check4.

Check 3 Fingerprint may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 4.

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

## 2.17 Bluetooth Troubleshooting

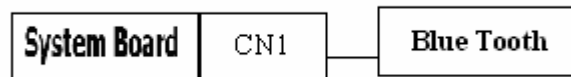
To check if the computer's Bluetooth is malfunctioning or not, follow the troubleshooting procedure below as instructed.

Procedure 1: Connector Check and Replacement Check

### Procedure 1 Connector Check and Replacement Check

The Bluetooth function is connected to system board. If Bluetooth malfunctions, its connection is defective or Bluetooth cable and system board may be faulty.

Check 1 Make sure Bluetooth cable is firmly connected to the connector CN1. If the problem still occurs, perform Check 2.



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

Check 3 Bluetooth may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 4.

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

---

# **Chapter 3**

## **Diagnostic Programs**

---

---

## **Chapter 3 Contents**

---

3.1	Tests and Diagnostics Software Overview .....	3-3
3.2	Executing the Diagnostic Test .....	3-4
3.3	Subtest names.....	3-8
3.4	System Test.....	3-11
3.5	Memory Test.....	3-13
3.6	Keyboard Test.....	3-16
3.7	Display Test .....	3-19
3.8	Floppy Disk Test.....	3-34
3.9	Hard Disk Test .....	3-36
3.10	Real Time Clock Test .....	3-39
3.11	Cache Memory Test.....	3-41
3.12	High Resolution Display Test.....	3-43
3.13	Multimedia Test .....	3-49
3.14	MEMORY2 Test.....	3-50
3.15	Error Codes and Error Status Names .....	3-52
3.16	Running Test.....	3-54
3.17	DMI INFOEMATION .....	3-55
3.17.1	Check DMI Information .....	3-55
3.17.2	Write DMI Information.....	3-55
3.18	Log Utilities .....	3-57
3.18.1	Operations .....	3-57
3.19	System Configuration .....	3-59
3.20	Running Test Edit Item.....	3-60
3.20.1	Function Description.....	3-60
3.20.2	Operation Description.....	3-60
3.21	Common Tests and Operation .....	3-62
3.21.1	How to operate a window .....	3-62
3.21.2	How to Stop the Test Program.....	3-62
3.21.3	Test Status Screen .....	3-62
3.21.4	Test Stop Display .....	3-64
3.21.5	How to enter data.....	3-64

### 3.1 Tests and Diagnostics Software Overview

This chapter explains how to use the Tests and Diagnostics Software for the Satellite P100 and Satellite Pro P100 computer systems.

**NOTES:** *Before starting the Tests and Diagnostics software:*

1. *Check all cables for loose connections.*
2. *Exit any application and close Windows.*

The Diagnostics Menu consists of the following options:

- Diagnostic Test
- Running Test
- DMI Information
- Log Utilities
- System Configuration
- Option

The Diagnostic Test Menu consists of the following functional tests:

- System Test
- Memory Test
- Keyboard Test
- Display Test
- Floppy Disk Test
- Hard Disk Test
- Real Time Clock Test
- Cache Memory Test
- High Resolution Display Test
- Multimedia Test
- Memory2 Test
- FDD & HDD Error Retry Count Set

The following equipment is required to perform some of the diagnostic test programs:

- The Diagnostics Disk (all tests)
- A formatted working disk for the floppy disk drive test (all tests)
- A CD test media (Toshiba Backup CD ROM for the CD-ROM test)

The following sections detail the tests contained within the Diagnostic Test Menu. Refer to Sections 3.18, 3.19, 3.20 and, 3.21 for detailed information on the remaining functions of the Tests and Diagnostics software.

## 3.2 Executing the Diagnostic Test

DOS is required to run the Diagnostics Program. To start the programs follow these steps:

1. Create a DOS bootable disk and copy all the files from the Tests and Diagnostics software to the disk.
2. Insert the boot disk into the computer's floppy disk drive and turn on the computer.

The following screen displays:

```
TOSHIBA Satellite(Pro) P100 Diagnostics
Version v1.00 (C) Copyright QUANTA Corp. 2005-

[ DIAGNOSTICS MENU ]

01.DIAGNOSTIC TEST
02.RUNNING TEST
03.DMI INFORMATION
04.LOG UTILITIES
05.SYSTEM CONFIGURATION
06.OPTION
99.EXIT

↑ ↓ → ← :Select item
ESC      :Escape
```

3. To select the Diagnostic Test from the Diagnostics Menu use the arrow keys to set the highlight bar to **01** and press **Enter**.



The following menu displays:

TOSHIBA Satellite(P) P100 Diagnostics  
Version V1.00 (C) Copyright QUANTA Corp. 2005-

↑ ↓ → ← : Select item  
ESC : Escape

[ DIAGNOSTICS MENU ]

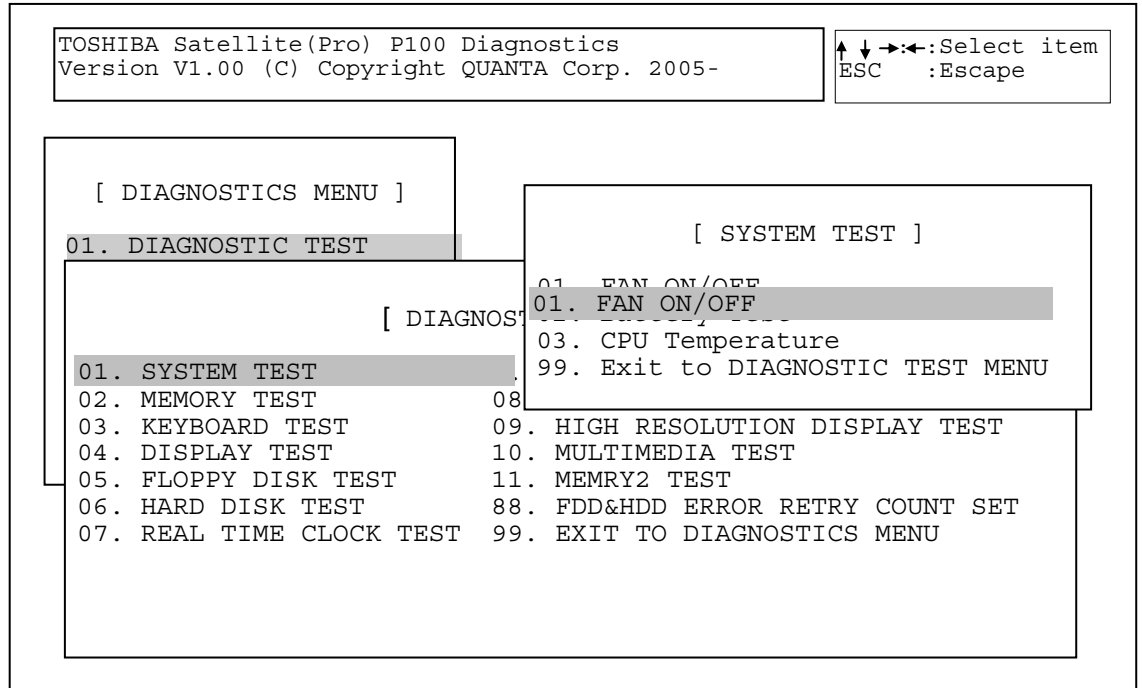
01. DIAGNOSTIC TEST

[ DIAGNOSTIC TEST MENU ]

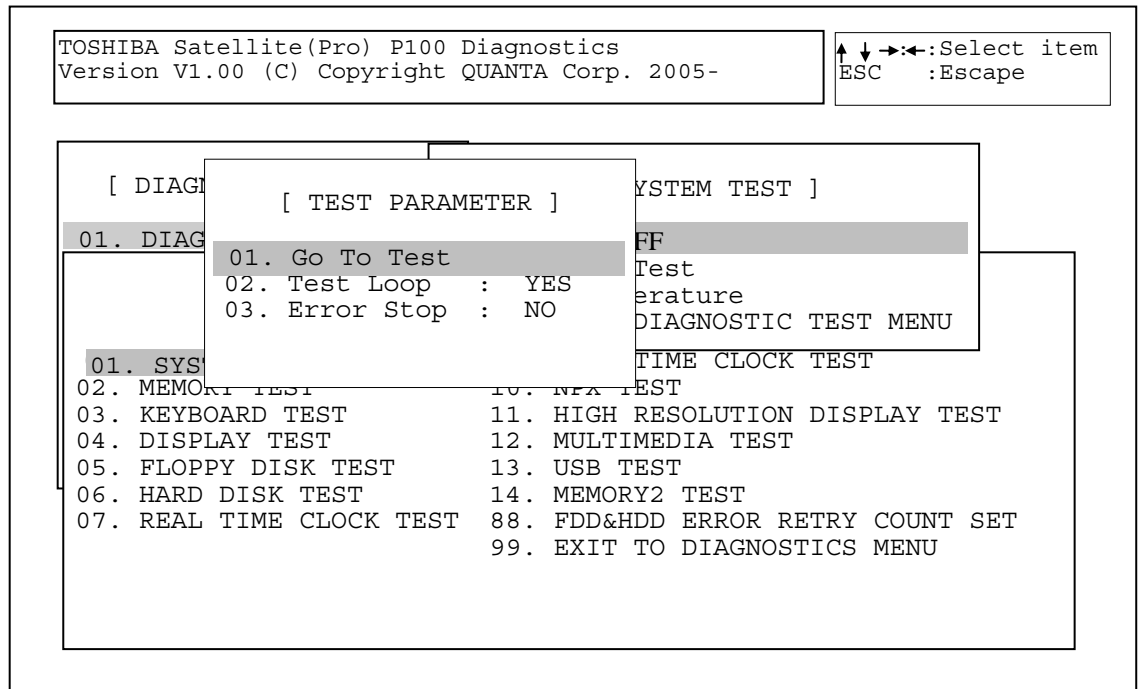
01. SYSTEM TEST	08. CACHE MEMORY TEST
02. MEMORY TEST	09. HIGH RESOLUTION DISPLAY TEST
03. KEYBOARD TEST	10. MULTIMEDIA TEST
04. DISPLAY TEST	11. MEMORY2 TEST
05. FLOPPY DISK TEST	88. FDD&HDD ERROR RETRY COUNT SET
06. HARD DISK TEST	99. EXIT TO DIAGNOSTICS MENU
07. REAL TIME CLOCK TEST	

Refer to Sections 3.4 through 3.14 for detailed descriptions of Diagnostics Tests 1 through 11. Item 88 sets the floppy disk drive and hard disk drive error retry count. Item 99 exits the submenu of the Diagnostic Test and returns to the Diagnostics Menu.

4. Select the subtest you want to execute and press **Enter**. The following menu displays:



5. Select the desired test from the subtest menu and press **Enter**. The following Test Parameter menu displays:



Use the arrow keys to highlight the desired option and press **Enter**.

### **Go To Test**

Move the highlight bar to *Go To Test* and press **Enter** to start executing the test.

### **Test Loop**

Select **NO** to return the screen to the subtest menu after the test is complete.  
Select **YES** to set the test to run continuously until it is halted by the user.

### **Error Stop**

Select **NO** to keep the test running even if an error is found.  
Select **YES** to stop the test program when an error is found and display the HALT OPERATION screen as shown below:

```
[[ HALT OPERATION ]]  
1: Test end  
2: Continue  
3: Retry
```

These three selections have the following functions:

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

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

Table 3-1 in Section 3.3 lists the function of each test on the subtest menu. Table 3-2 in Section 3.15 lists the error codes and error status for each error.

### 3.3 Subtest names

Table 3-1 lists the subtest names for each test program in the Diagnostic Test menu.

*Table 3-1 Subtest Names(1/3)*

No.	Test Name	No.	Subtest Name
01	SYSTEM TEST	01	FAN ON/OFF check
		02	Battery TEST
		03	CPU Temperature
		04	CIR Remote Control Test
		05	FINGERPRINT TEST
02	MEMORY TEST	01	Conventional Memory
		02	Protected Mode
		03	Protected Mode (32MB-MAX)
		04	RAM Refresh
		05	Stress Test
03	KEYBOARD TEST	01	Pressed Key Display [106]
		02	Pressed Key Display [103]
		03	Hot Key Display [6 Key]
		04	Hot Key Display [7 Key]
		05	Keyboard LED
		06	PS/2 Mouse (Pointing 2Button)
04	DISPLAY TEST	01	Character Attributes
		02	Character Set
		03	80* 25 Character Display
		04	320* 200 Graphics Display
		05	640* 200 Graphics Display
		06	640* 480 Graphics Display
		07	Display Page
		08	"H" Pattern Display
		09	Video DAC Register W/R/C
		10	Color Graphics Display
		11	Color Attributes Display
		12	Color Tiling

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

<b>No.</b>	<b>Test Name</b>	<b>No.</b>	<b>Subtest Name</b>
05	FLOPPY DISK TEST	01	Sequential Read
		02	Sequential W/R/C
		03	Random Address/Data
		04	Write Specified Address
		05	Read Specified Address
06	HARD DISK TEST	01	Sequential Read
		02	Address Uniqueness
		03	Random Address Data
		04	Cross Talk and Peek Shift
		05	Write Specified Address
		06	Read Specified Address
		07	Sequential Write
		08	W-R-C Specified Address
07	REAL TIME CLOCK TEST	01	Real Time Test
		02	Backup Memory Test
		03	Real Time Carry Test
08	CACHE MEMORY TEST	01	Constant Data Test
		02	Address Pattern Test
		03	Increment/Decrement Test
		04	Bit Shift Pattern Test
		05	*Write Disturb Test
		06	Checker Board Test
		07	Marching Test
		08	Working Data Test
09	HIGH RESOLUTION DISPLAY TEST	01	VRAM W/R/C Test
		02	640* 480 Mode Display
		03	800* 600 Mode Display
		04	1024* 768 Mode Display
		05	"H" Pattern Display
		06	Focus Test ("E" Pattern)

*Table 3-1 Subtest Names(3/3)*

<b>No.</b>	<b>Test Name</b>	<b>No.</b>	<b>Subtest Name</b>
10	MULTIMEDIA TEST	01	Sequential Read Test
		02	Random Read Test
		03	Read Specified Address Test
		04	1 point W/R/C Test
11	MEMORY2	01	All one/zero Test
		02	Walking 1/Walking 0 Test(Left)
		03	Walking 1/Walking 0 Test(Right)
		04	Walking 1/Walking 0 Test(Left /Right)

*\*This test cannot support.*

### 3.4 System Test

To execute the System Test select **01** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The System Test contains two subtests. Move the highlight bar to the subtest you want to execute and press **Enter**.

#### Subtest 01 FAN ON/OFF Checking

Select 1,2,3 to control FAN on/off , 1=Fan on , 2=Fan off , 3=Exit .

[BD1FAN.EXE] Program Version : 1.0

1: Fan On 2: Fan Off 3: Exit

Fan1 Status On Fan1RPM : 5000 or Fan1 Status OFF Fan1RPM : 0

Fan2 Status On Fan2RPM : 4000 or Fan2 Status OFF Fan2RPM : 0

#### Subtest 02 Battery Test

This will display battery information for check , press [ESC] to exit .

voltage	: 12522 mV	Remaining capacity alarm	: 400 mAh
temperature	: 24.4 °C	Remaining time alarm	: 10 min
current	: 1330 mA	Battery mode	: 0
average current	: 1327 mA	AtRate	: 0 mA
relative state of charge	: 93 %	At rate time to full	: 65535 min
absolute state of charge	: 89 %	At rate time to empty	: 65535 min
remaining capacity	: 3546 mAh	At rate O. K.	: FFFF
full charge capacity	: 3800 mAh	Maximun error	: 2 %
run time to empty	: -1 min.	Charging current	: 2800 mA
average time to empty	: -1 min.	Charging voltage	: 12600 mV
average time to full	: 101 min.	Manufacturer name	: SANYO
cycle count	: 10 times	Device name	: NS2P3SZDENVWR
design capacity	: 4000 mAh	Device chemistry	: LION
design voltage	: 11100 mV	Manufacturer data	: 0
specification information	: 2.1	Manufacture date	: 9/13/2005
serial no.	: 32009		
STATUS	: INIT		

Press [ESC] KEY to exit

Subtest 03 CPU Temperature

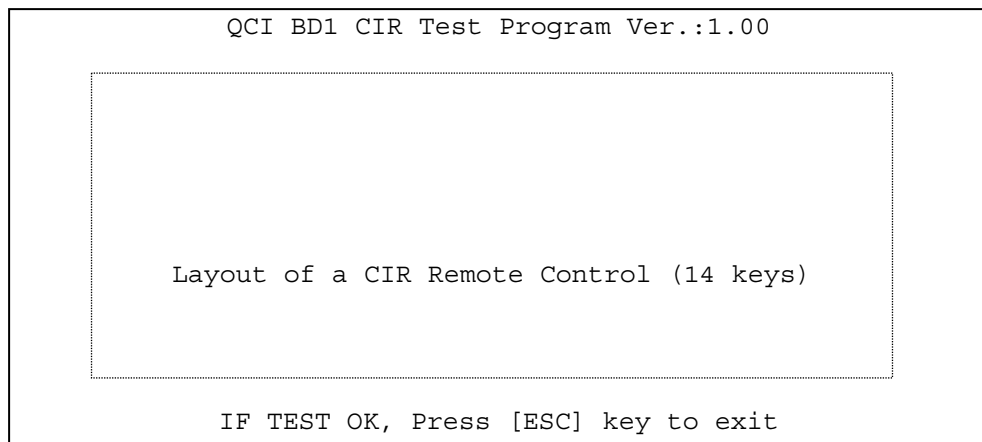
This will display CPU Temperature for check , press [ESC] to exit .

[CPU\_TEMP.EXE] Program Version : 1.0 08-08-2005

CPU Temperature : XX

Subtest 04 CIR Remote Control Test

When you execute this subtest, the remote control layout is drawn on the display. When any key is pressed, the corresponding key on the screen changes from light to dark , press [ESC] key to exit .



Subtest 05 Fingerprint Test

This program will scan your define finger 3 times to get default finger data , and rescan to verify again , so you may need to scan 5 times , if error , it will retry and get right finger .

***NOTE: Execution of this program destroys fingerprint data .***



### 3.5 Memory Test

To execute the Memory Test select **02** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Memory Test contains five subtests that test the computer's memory. Move the highlight bar to the subtest you want to execute and press **Enter**.

***NOTE:** If **NO** is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the test is executing. When the test is complete the Memory Test menu displays.*

*If **YES** is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the test is executing. Press **Ctrl + break** to return to the Memory Test menu.*

#### Subtest 01 Conventional Memory

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

If a compare error occurs, the write data, read data, and test address display on the screen. Addresses are displayed in 4KB increments during the test.

#### **Test Process:**

1. Byte Enable Test  
"One bit write/ 8 bit read" is executed and the new data is compared with the original data.  
Test data = CCAA5533H, 80000000H
2. Byte Enable Test  
"One bit write/16 bit read" is executed and the new data is compared with the original data.  
Test data = CCAA5533H, 80000000H
3. Data bus test  
"One bit write/16 bit read" is executed and the new data is compared with the original data.  
Test data = 1H, 2H, 4H, 8H, 10H, through 80000000H.
4. Fixed data test  
"16 bit write/ 16 bit read" is executed and the new data is compared to the original data.  
Test data = FFFFFFFFH, 00000000H, 80018001H

5. Address pattern test  
“16 bit write and 16 bit read” of address pattern data is executed and the new data is compared with the original data.  
Test data = 0000H, 0004H, 0008H, 000CH,...8000H, 8004H, through FFECH

Subtest 02      Protected Mode

This subtest first writes data patterns and address data from 1 to 32 MB, then reads the new data and compares the result with the original data patterns. Addresses are displayed in 64KB increments during the test.

**Test Process:**

1. Switch to Protected Mode. (INT 15H)
2. Tests 256KB - 640KB and 1MB to 32MB of installed memory. Executes Step 1 through Step 5 of Subtest 1. The test data is the same as Subtest 1.

Subtest 03      Protected Mode [32MB - MAX]

This subtest first writes data patterns and address data from 32MB to the maximum installed memory, reads the new data, and then compares the result with the original data patterns. Addresses are displayed in 64KB increments during the test.

**Test Process:**

1. Switch to Protected Mode. (INT 15H)
2. Tests from 32MB to the maximum installed memory (extended memory). Executes Step 1 through Step 5 of Subtest 1. The test data is the same as Subtest 1.

Subtest 04      RAM Refresh

This subtest writes a data pattern (CCAA5533H ) in 4KB from 0 to the maximum installed memory, then waits for a memory refresh cycle (16 ms or more), reads the new data, and compares the result with the original data pattern.

**Test Process:**

1. Checks the memory size to determine the maximum size of installed memory.
2. Tests memory addresses 0 to the maximum installed.
3. Writes, reads, and compares test data after a memory refresh cycle (16ms or more).

***NOTE:** There may be a short delay between write and read operations, depending on the memory size.*

Subtest 05      Stress Test

This subtest writes the following 16KB data patterns to the Write/Read Buffer in conventional memory.

```
data:  FFFFFFFFFFFFFFFFFF0000000000000000
       5555555555555555AAAAAAAAAAAAAAAA
       CCCCCCCCCCCCCCCC3333333333333333
       0000000000000000FFFFFFFFFFFFFFFF
       AAAAAAAAAAAAAAAAAA55555555555555
       3333333333333333CCCCCCCCCCCCCCCC
       FFFFFFFFFFFFFFFFFF0000000000000000
       0000000000000000FFFFFFFFFFFFFFFF
       5555555555555555AAAAAAAAAAAAAAAA
       AAAAAAAAAAAAAAAAAA55555555555555
       CCCCCCCCCCCCCCCC3333333333333333
       3333333333333333CCCCCCCCCCCCCCCC
```

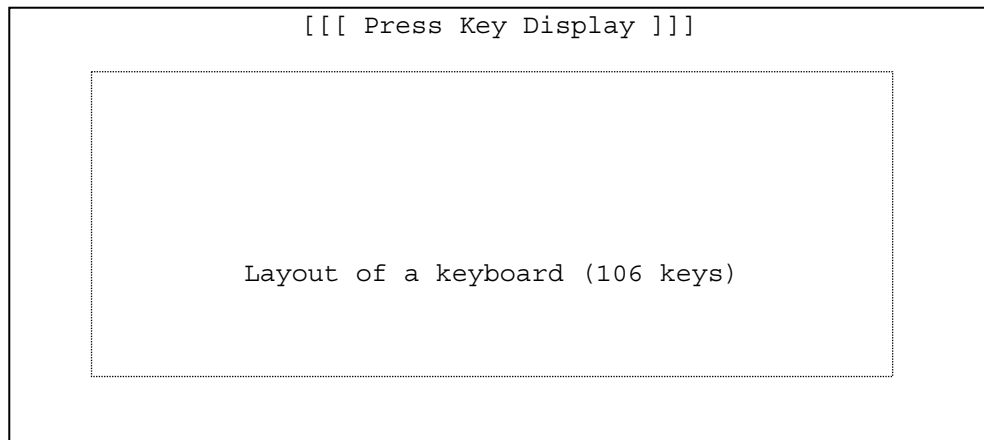
### 3.6 Keyboard Test

To execute the Keyboard Test select **03** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Keyboard Test contains seven subtests that test the computer's keyboard and mouse actions. Move the highlight bar to the subtest you want to execute and press **Enter**.

**NOTE:** *The Test Loop and Error Stop parameters are not enabled for the Keyboard test.*

#### Subtest 01    Pressed Key Display [106 Keyboard]

When you execute this subtest, the keyboard layout is drawn on the display. When any key is pressed, the corresponding key on the screen changes from light to dark. Holding a key down enables the auto-repeat function which causes the key's display character to blink.



#### Subtest 02    Pressed Key Display [103 Keyboard]

This subtest is used for the 103 keyboard and functions the same as Subtest 1.

Subtest 03 Hot Key Display [6 Key]

This subtest is used for the 6 hot key and functions the same as Subtest 1.

Subtest 04 Hot Key Display [7 Key]

This subtest is used for the 7 hot key and functions the same as Subtest 1.

Subtest 05 Keyboard LED

The LED display for **Num Lock**, **Caps Lock**, and **Scroll Lock** (in that order) will flash repeatedly. Confirm this visually. The following screen displays while this test executes.

```
Keyboard LED "ON" CHECK !  
  
Press ANY KEY
```

Subtest 06 PS/2 Mouse (Pointing)

This subtest checks the function of mouse as shown below.

- A) Pointing device (mouse)
- B) Mouse buttons

Please move cursor to upper left and press left button , screen will display <PRESS> in left rectangle , move cursor to lower right and press right button , screen will display <PRESS> in right rectangle , the program exit .

If left and right button short , screen will display <Left and Right Button maybe short > , the program exit .

LEFT  
PRESS

↖

TOUCH\_PAD TEST

RIGHT  
PRESS

Please Do Not Press the Left and Right Button At The Same Time



Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.  
Press **Ctrl + break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 02 Character Set

This subtest displays the character codes 00H - FFH, using Mode 01H (40\*25). The screen below displays when this subtest is executed.

CHARACTER SET IN 40\*25

```
  @  @  ♥  ♦  ♣  ♠  •  □  ○  ♂  ♀  ♪  ♫  ♬  ♭  ♮  ♯  ▶  ◀  ⤵  ⤴  ⤶  ⤷  ⤸  ⤹  ⤺  ⤻  ⤼  ⤽  ⤾  ⤿  !  "  #  $  %  &  '
( ) * + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B C D E F G H I J K L M N O
P Q R S T U V W X Y Z [ \ ] ^ _ ` a b c d e f g h i j k l m n o p q r s t u v w
x y z { | } ~ Δ Ç ü é â ã ä å ç è ë ì í î ï Ñ Ò Ó Ô Õ Ö Ù Ú Û Ü Ý Þ ß à á â ã
ä å æ ç è é ê ë ì í î ï Ñ Ò Ó Ô Õ Ö Ù Ú Û Ü Ý Þ ß à á â ã
ä å æ ç è é ê ë ì í î ï Ñ Ò Ó Ô Õ Ö Ù Ú Û Ü Ý Þ ß à á â ã
ä å æ ç è é ê ë ì í î ï Ñ Ò Ó Ô Õ Ö Ù Ú Û Ü Ý Þ ß à á â ã
ä å æ ç è é ê ë ì í î ï Ñ Ò Ó Ô Õ Ö Ù Ú Û Ü Ý Þ ß à á â ã
ä å æ ç è é ê ë ì í î ï Ñ Ò Ó Ô Õ Ö Ù Ú Û Ü Ý Þ ß à á â ã
ä å æ ç è é ê ë ì í î ï Ñ Ò Ó Ô Õ Ö Ù Ú Û Ü Ý Þ ß à á â ã
ä å æ ç è é ê ë ì í î ï Ñ Ò Ó Ô Õ Ö Ù Ú Û Ü Ý Þ ß à á â ã
ä å æ ç è é ê ë ì í î ï Ñ Ò Ó Ô Õ Ö Ù Ú Û Ü Ý Þ ß à á â ã
ä å æ ç è é ê ë ì í î ï Ñ Ò Ó Ô Õ Ö Ù Ú Û Ü Ý Þ ß à á â ã
ä å æ ç è é ê ë ì í î ï Ñ Ò Ó Ô Õ Ö Ù Ú Û Ü Ý Þ ß à á â ã
ä å æ ç è é ê ë ì í î ï Ñ Ò Ó Ô Õ Ö Ù Ú Û Ü Ý Þ ß à á â ã
ä å æ ç è é ê ë ì í î ï Ñ Ò Ó Ô Õ Ö Ù Ú Û Ü Ý Þ ß à á â ã
ä å æ ç è é ê ë ì í î ï Ñ Ò Ó Ô Õ Ö Ù Ú Û Ü Ý Þ ß à á â ã
```

Press [Enter] Key

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.  
Press **Ctrl + break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.





Subtest 04    320 \* 200 Character Display

This subtest uses 320\*200 video resolution to display green, red and yellow followed by cyan, magenta, and white. The screen below shows the displays when this subtest is executed.

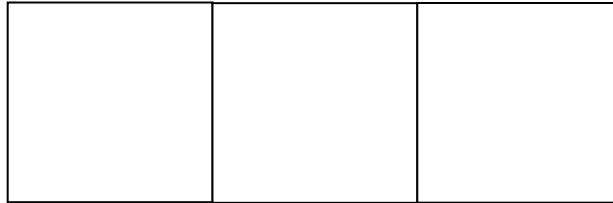
320 \* 200 GRAPHICS DISPLAY

COLOR SET 0 : [ 4 ]

GREEN  
CYAN

RED  
MAGENTA

YELLOW  
WHITE



Press **ENTER** to display the following sixteen colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white.

*Test Program for Field.*

---

320\*200 GRAPHICS DISPLAY : [ D ]

BLACK	<input type="text"/>	<input type="text"/>	D	GRAY
BLUE	<input type="text"/>	<input type="text"/>	L	BLUE
GREEN	<input type="text"/>	<input type="text"/>	L	GREEN
CYAN	<input type="text"/>	<input type="text"/>	L	CYAN
RED	<input type="text"/>	<input type="text"/>	L	RED
MAGENTA	<input type="text"/>	<input type="text"/>	L	MAGENTA
BROWN	<input type="text"/>	<input type="text"/>		YELLOW
WHITE	<input type="text"/>	<input type="text"/>	I	WHITE

Press [Enter] KEY

Press **ENTER** to display 64 gradations of red, green, blue and white on the screen

320\*200 GRAPHICS DISPLAY : [ 13 ]

64 gradations of red are displayed.
64 gradations of green are displayed.
64 gradations of blue are displayed.
64 gradations of white are displayed.

Press [Enter] KEY

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.  
Press **Ctrl + break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 05     640 \* 200 Character Display

This subtest uses 640\*200 video resolution to display three windows, each window drives a different set of dots: even dots, odd dots and all dots. The screen below displays when this subtest is executed.

640 \* 200 GRAPHICS DISPLAY : [ 6 ]

EVEN DOTS DRIVEN	ODD DOTS DRIVEN	ALL DOTS DRIVEN

Press **ENTER** to display the following 16 colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white.

640\*200 GRAPHICS DISPLAY : [ E ]

BLACK			DARK GRAY
BLUE			LIGHT BLUE
GREEN			LIGHT GREEN
CYAN			LIGHT CYAN
RED			LIGHT RED
MAGENTA			LIGHT MAGENTA
BROWN			YELLOW
WHITE			INTENSIFIED WHITE

Press [Enter] KEY

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.  
 Press **Ctrl + break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 06 640 \* 480 Character Display

This subtest uses 640\*350 video resolution to display 16 colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white. The screen below displays when this subtest is executed.

640\*350 GRAPHICS DISPLAY : [10 ]

BLACK	<input type="text"/>	<input type="text"/>	DARK GRAY
BLUE	<input type="text"/>	<input type="text"/>	LIGHT BLUE
GREEN	<input type="text"/>	<input type="text"/>	LIGHT GREEN
CYAN	<input type="text"/>	<input type="text"/>	LIGHT CYAN
RED	<input type="text"/>	<input type="text"/>	LIGHT RED
MAGENTA	<input type="text"/>	<input type="text"/>	LIGHT MAGENTA
BROWN	<input type="text"/>	<input type="text"/>	YELLOW
WHITE	<input type="text"/>	<input type="text"/>	INTENSIFIED WHITE

Press [Enter] KEY

Press **ENTER** to display the following 16 colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white using 640\*480 video resolution.

640\*480 GRAPHICS DISPLAY : [12 ]

BLACK	<input type="text"/>	<input type="text"/>	DARK GRAY
BLUE	<input type="text"/>	<input type="text"/>	LIGHT BLUE
GREEN	<input type="text"/>	<input type="text"/>	LIGHT GREEN
CYAN	<input type="text"/>	<input type="text"/>	LIGHT CYAN
RED	<input type="text"/>	<input type="text"/>	LIGHT RED
MAGENTA	<input type="text"/>	<input type="text"/>	LIGHT MAGENTA
BROWN	<input type="text"/>	<input type="text"/>	YELLOW
WHITE	<input type="text"/>	<input type="text"/>	INTENSIFIED WHITE

Press [Enter] KEY

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.  
Press **Ctrl + break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.







Subtest 10    Color Graphics Display

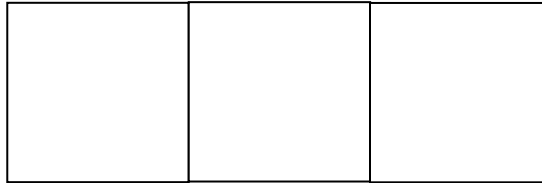
This subtest displays three colors, cyan, white and yellow on the screen as shown below.

640 \* 480 GRAPHICS DISPLAY

CYAN

WHITE

YELLOW



To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.  
Press **Ctrl + break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 11      Color Attributes Display

This subtest displays 16 colors: black, blue, green, cyan, red, magenta, brown, white, dark gray, light blue, light green, light cyan, light red, light magenta, yellow, and intensified white. The screen below displays when this subtest is executed.

640\*480 COLOR ATTRIBUTE DISPLAY

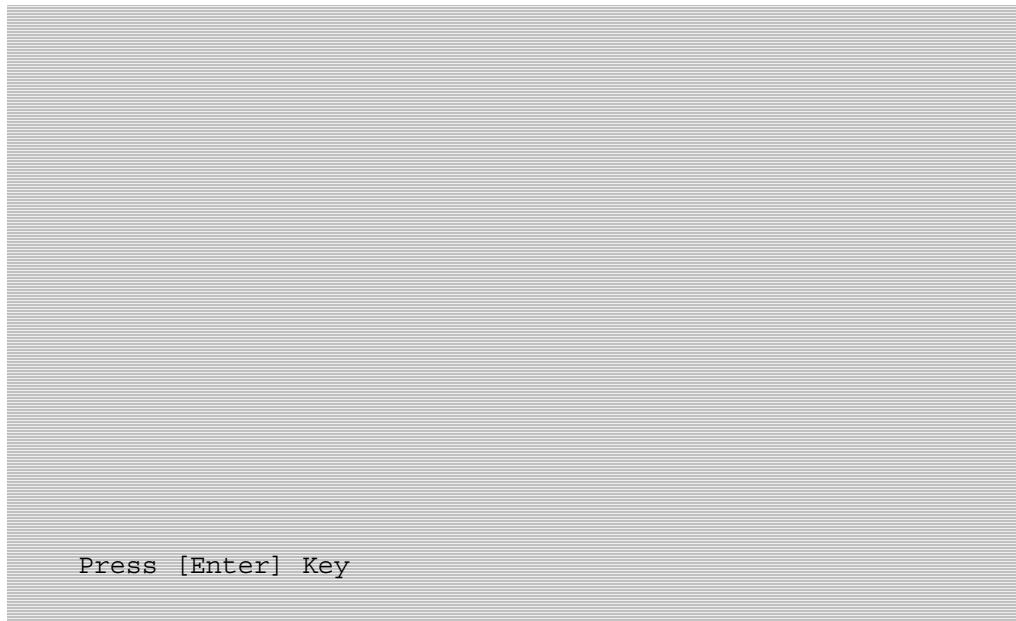
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Press [Enter] Key

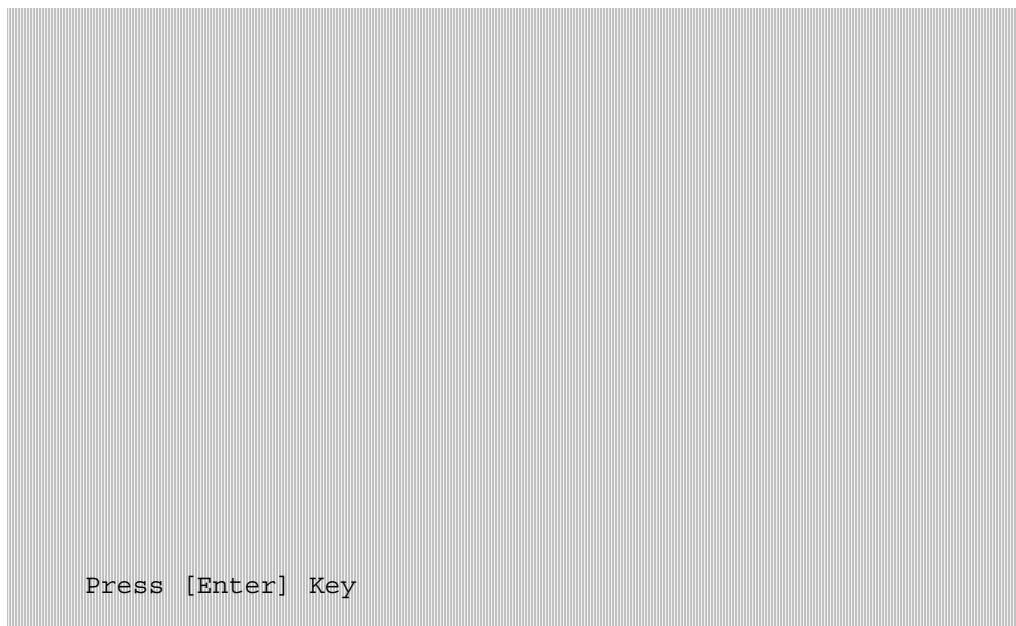
Pressing **Enter** executes VRAM mapping test which indicates vertical lines

Press **Enter** to execute the VRAM mapping test which displays a horizontal line at one dot intervals using Mode 12.

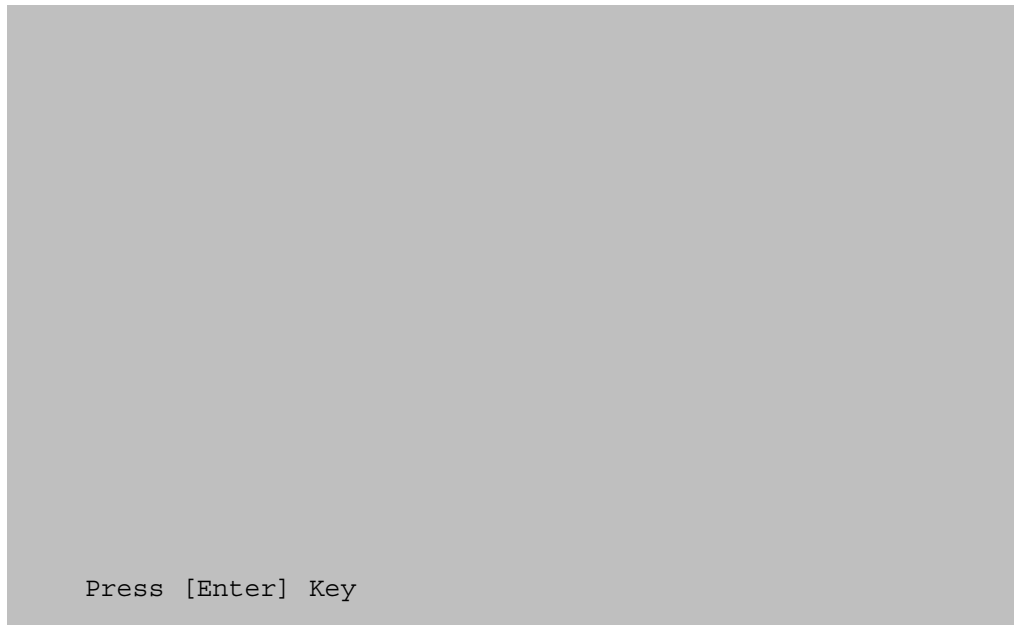
**NOTE:** *The following screen does not display correctly. It will be amended in the next version.*



Press **Enter** to execute the VRAM mapping test which displays a vertical line at four dot intervals using Mode 12.



Press **Enter** to display VRAM mapping test using the all dots Mode.



To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.  
Press **Ctrl + break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 12    Color Tiling

This subtest displays black, gray, white, and 3 gradations of red, green, and blue as shown in the following display.

Black	Red	Green	Blue
Gray	Red Gradation	Green Gradation	Blue Gradation
White	Red Gradation	Green Gradation	Blue Gradation

To exit this subtest and return to the Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.  
Press **Ctrl + break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

### **3.8 Floppy Disk Test**

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

To execute the Floppy Disk Test select 05 from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Floppy Disk Test contains five subtests that test the FDD. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01      Sequential Read

This subtest sequentially reads all the tracks (Tracks 0 to 79) on the floppy disk.

Subtest 02      Sequential W/R/C

This subtest continuously writes the data pattern B5ADADh to all the specified tracks selected in Subtest 01. The data pattern is then read and compared to the original data.

Subtest 03      Random Address/Data

This subtest writes random data to random addresses on all tracks defined in Subtest 01. The data is then read and compared to the original data.

Subtest 04 Write Specified Address

***NOTE:** The first two digits of the ADDRESS indicate which track is being tested, the next two digits indicates the head, and the last two digits indicate the sector.*

This subtest allows you to verify the errors from Subtest 02. It writes specified data to a specified track and head. Use the Log Utilities (see Section 3.21) to specify the track number and head number where the error(s) occurred during Subtest 02. The following message displays on the screen to enter the test data, track number, and head number.

```
TEST DATA ??  
TRACK NO (00~79) ??  
HEAD NO (0~1) ?
```

Subtest 05 Read Specified Address

This subtest reads data from a specified track and head.

The following message displays on the screen to enter the test track number and head number.

```
TRACK NO (00~79) ??  
HEAD NO (0~1) ?
```

### **3.9 Hard Disk Test**

To execute the Hard Disk Test select **06** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Hard Disk Test contains eight subtests that test the functions of the hard disk drive. Move the highlight bar to the subtest you want to execute and press **Enter**.

***NOTES:** The contents of the hard disk will be erased when subtest 02, 03, 04, 05, 07 or 08 is executed. Before running the test, transfer the contents of the hard disk to other disk.*

*A password is necessary to execute the Hard Disk Test. The password is: **hard disk***

Subtest 01      Sequential Read

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

Subtest 02      Address Uniqueness (This subtest need very long time)

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

- Forward sequential
- Reverse sequential
- Random

Subtest 03      Random Address Data

This subtest writes random data to 1000 different random addresses on the HDD. This data is then read and compared to the original data.



Subtest 04 Cross Talk and Peak Shift

This subtest writes eight of the most likely to fail data patterns (shown below) to a cylinder on the HDD, then reads the data while moving from cylinder to cylinder.

**Data Pattern**  
B5ADADH  
4A5252H  
EB6DB6H  
149249H  
63B63BH  
9C49C4H  
2DB6DBH  
D24924H

Subtest 05 Write Specified Address

***NOTE:** This subtest is designed to run with the Test Loop set to **NO**. This subtest is a debug tool and the operator should enter the Test Parameters each time.*

This subtest allows you to verify the errors from Subtest 01. It writes specified data to a specified LBA. Use the Log Utilities (see Section 3.18) to specify the LBA number where the error(s) occurred during Subtest 01. The following message displays on the screen to enter the test data, and Sector count.

```
TEST DATA          ??  
SECTOR COUNT (01~39) ??  
START ADDRESS (00000000~MAX Address) ?
```

Subtest 06 Read Specified Address

***NOTE:** This subtest is designed to run with the Test Loop set to **NO**. This subtest is a debug tool and the operator should enter the Test Parameters each time.*

This subtest allows you to verify the errors from Subtest 01. It reads specified data (Subtest 06) from a specified LBA. Use the Log Utilities (see Section 3.18) to specify the LBA number where the error(s) occurred during Subtest 01. The following message displays on the screen to enter the test sector count.

```
SECTOR COUNT (01~39) ??  
START ADDRESS (00000000~MAX Address) ?
```

Subtest 07      Sequential Write

This subtest writes specified data to all cylinders on the HDD. The following message displays on the screen to enter the test data.

TEST DATA    ???? (=37b3H)

Subtest 08      W-R-C Specified Address

This subtest writes specified data to a specified sector count, then reads and compares the result. The following message displays on the screen to enter the test data, sector count.

TEST DATA    ???? (=37b3H)  
SECTOR COUNT (01~39) ??  
START ADDRESS (00000000~Max Address) ?

### 3.10 Real Time Clock Test

To execute the Real Time Clock Test select **07** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Real Time Clock Test contains three subtests that test the computer's real time functions. Move the highlight bar to the subtest you want to execute and press **Enter**.

#### Subtest 01 Real Time

This subtest allows you to change the date and time. To execute the Real Time Subtest, follow these steps:

1. Select Subtest **01** and the following displays:

```
[ REAL TIME TEST ]  
  
Current date : mm-dd-yyyy  
Current time : hh:mm:ss  
  
Enter new date : mm-dd-yyyy  
Enter new time : hh:mm:ss  
  
Press [Enter] key to exit test
```

2. If the current date is not correct, enter the correct date at the "Enter new date" prompt and press **Enter**. The following prompt displays:

```
Enter new time :
```

3. If the current time is not correct, enter the correct time using a 24-hour format and press **Enter**.

**NOTE:** If **NO** is selected for Test Loop on the Test Parameter menu, the Real Time Clock Test menu displays.

If **YES** is selected for Test Loop on the Test Parameter menu, the screen above displays and the test is executed again. Press **Ctrl + break** to return to the Real Time Clock Test menu.

Subtest 02 Backup Memory

This subtest writes 50 bytes of test data (FFH, AAH, 55H, and 00H) to the CMOS 14<sup>th</sup> address, then reads the new data and compares it to the original data.

Subtest 03 Real Time Carry

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

This subtest checks the clock's carry function.

```
                [ REAL TIME CARRY TEST ]  
  
Current date : 12-31-1999  
Current time : 23:59:55  
  
Press [Enter] key to exit test
```

The following is the display after the date carry function is executed.

```
                [ REAL TIME CARRY TEST ]  
  
Current date : 01-01-2000  
Current time : 00:00:01  
  
Press [Enter] key to exit test
```

To exit this subtest and return to the Real Time Clock menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.  
Press **Ctrl + break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

### 3.11 Cache Memory Test

To execute the Cache Memory Test select **08** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Cache Memory Test contains eight subtests that test the computer's cache memory. Move the highlight bar to the subtest you want to execute and press **Enter**.

***NOTE:** If **NO** is selected for Test Loop on the Test Parameter menu, the screen will remain blank while the subtest is executing. When the test is complete the Cache Memory Test menu displays.*

*If **YES** is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the subtest is executing. Press **Ctrl + break** to return to the Cache Memory Test menu.*

#### Subtest 01 Constant Data Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes constant data (FFFFH, AAAAH, 5555H, 0101H, 0000H), reads the new data and compares the result with the original data pattern. The original cache memory content is then restored to the cache memory.

#### Subtest 02 Address Pattern Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes address data patterns (0000H, 0001H, 0002H, through 3FFDH, 3FFEH, 3FFFH), reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

#### Subtest 03 Increment/Decrement Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the increment data (00H, 01H, 02H, through FDH, FEH, FFH), reads the new data and compares the result with the original data. After comparing the incremental data, decrement data (FFH, FEH, FEH, through 02H, 01H, 00H) is written and the new data is read and compared with the original data. The original cache memory content is then restored to the cache memory.

Subtest 04 Bit Shift Pattern Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the bit shift data patterns (1 bit shifted every 4 bytes), reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

Subtest 05 Write Disturb Test (We can't support this time)

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the "write disturb data," reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

Subtest 06 Checker Board Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the "checker board data," (data which is inverted front/back and left/right) reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

Subtest 07 Marching Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the "marching data," (00H through 01H and 01H through 00H) reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

Subtest 08 Working Data Test

This subtest reads the contents of cache memory and saves it into RAM. The subtest then writes the "working data," reads the new data and compares the result with the original data. The original cache memory content is then restored to the cache memory.

## 3.12 High Resolution Display Test

To execute the High Resolution Display Test select **09** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The High Resolution Display Test contains six subtests that test the computer's high resolution video display. Move the highlight bar to the subtest you want to execute and press **Enter**.

### Subtest 01 VRAM W/R/C Test

This subtest writes address and data patterns to Video RAM, then reads the values from the Video RAM and compares them to the original test patterns. During the execution of this test 13 different color screens display: black, green, green, blue, blue, red, red, red, black, white, pink, cyan, and black.

#### Test Process:

1. Sets the video display to 1024\*768 mode
2. Bank change test  
Writes 1 byte data in order 0, 1, through Fh, and compares the result, at every bank, to the original data patterns.
3. Bit shift data test  
Writes 01h data into addresses A000:0000h through A000:FFFFh for each bank, reads the new data and, then compares the results with the original data. Data is then shifted 1 bit to the left, and all bits (01h, 02h, 04h, 08h, through 80h) are tested again.
4. Fixed data test  
Writes test data (in order FFh, AAh, 55h, 00h) into addresses A000:0000h through A000:FFFFh for each bank by, reads the new data and, then compares the results with the original data. Data is then shifted 1 bit to the left, and all bits are tested again

**NOTE:** If **NO** is selected for Test Loop on the Test Parameter menu, the screen displays the colors listed above and then the High Resolution Display Test menu displays.

If **YES** is selected for Test Loop on the Test Parameter menu, the screen displays the colors listed above. Press **Ctrl + break** to return to the High Resolution Display Test menu.

Subtest 02 640\*480 Mode Display

This subtest uses 640\*480 video resolution to display a high resolution white frame, 256 letter types (8\*16 pixels) and 64 gradations of white, red, green, and blue as shown below.

[ 640\*480 256 ]

Press [ Enter ]key

256 letter types indication

	0---+---1---+---2---+---3---+---4---+---5---+---6---
WHITE	64 gradations
RED	64 gradations
GREEN	64 gradations
BLUE	64 gradations

To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.  
 Press **Ctrl + break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.



*Test Program for Field.*

Subtest 03 800 \* 600 Mode Display

This subtest uses 800\*600 video resolution to display a high resolution white frame, 256 letter types (8\*16 pixels) and 256 gradations of white, red, green, and blue as shown below.

[ 800\*600 256 ]

Press [ Enter ] key

256 letter types indication

	0---+---1---+---2---+---3---+---4---+---5---+---6---
WHITE	64 gradations
RED	64 gradations
GREEN	64 gradations
BLUE	64 gradations

To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.  
 Press **Ctrl + break** if **YES** was selected for *Test Loop* on the Test Parameter Menu

Subtest 04 1024\* 768 Mode Display

This subtest uses 1024\*768 video resolution to display a high resolution white frame, 256 letter types (8\*16 pixels) and 64 gradations of white, red, green, and blue as shown below.

[ 1024\*768 256 ]

Press [ Enter ] key

256 letter types indication

0-----1-----2-----3-----4-----5-----6-----

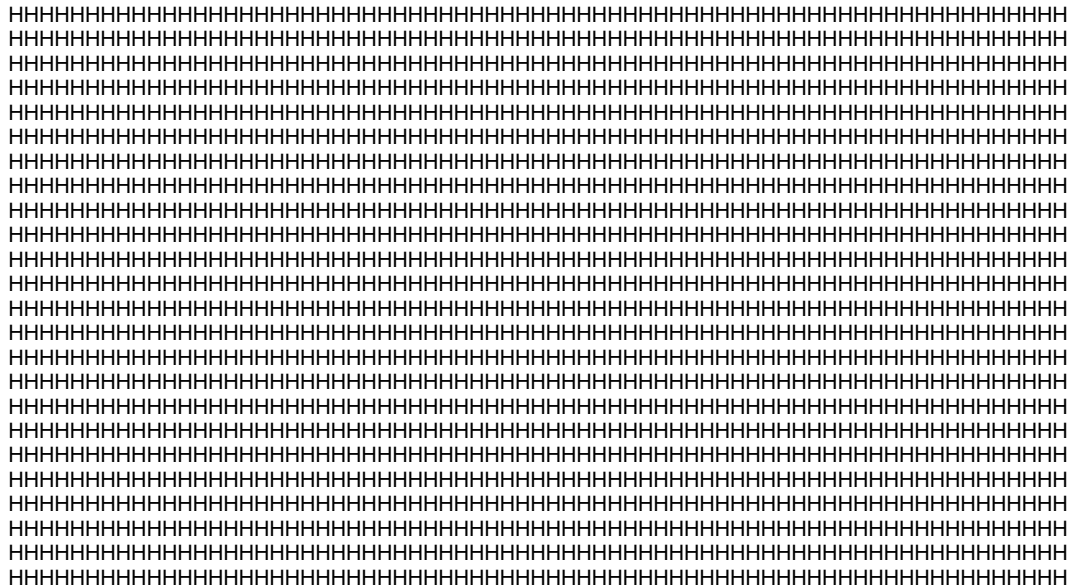
WHITE	64 gradations
RED	64 gradations
GREEN	64 gradations
BLUE	64 gradations

To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.  
 Press **Ctrl + break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 05 “H” Pattern Display

This subtest uses the 1024\*768 Mode to display a high resolution white frame, “H” letters (8\*16 pixels fonts), at 128 letters by 48 lines.

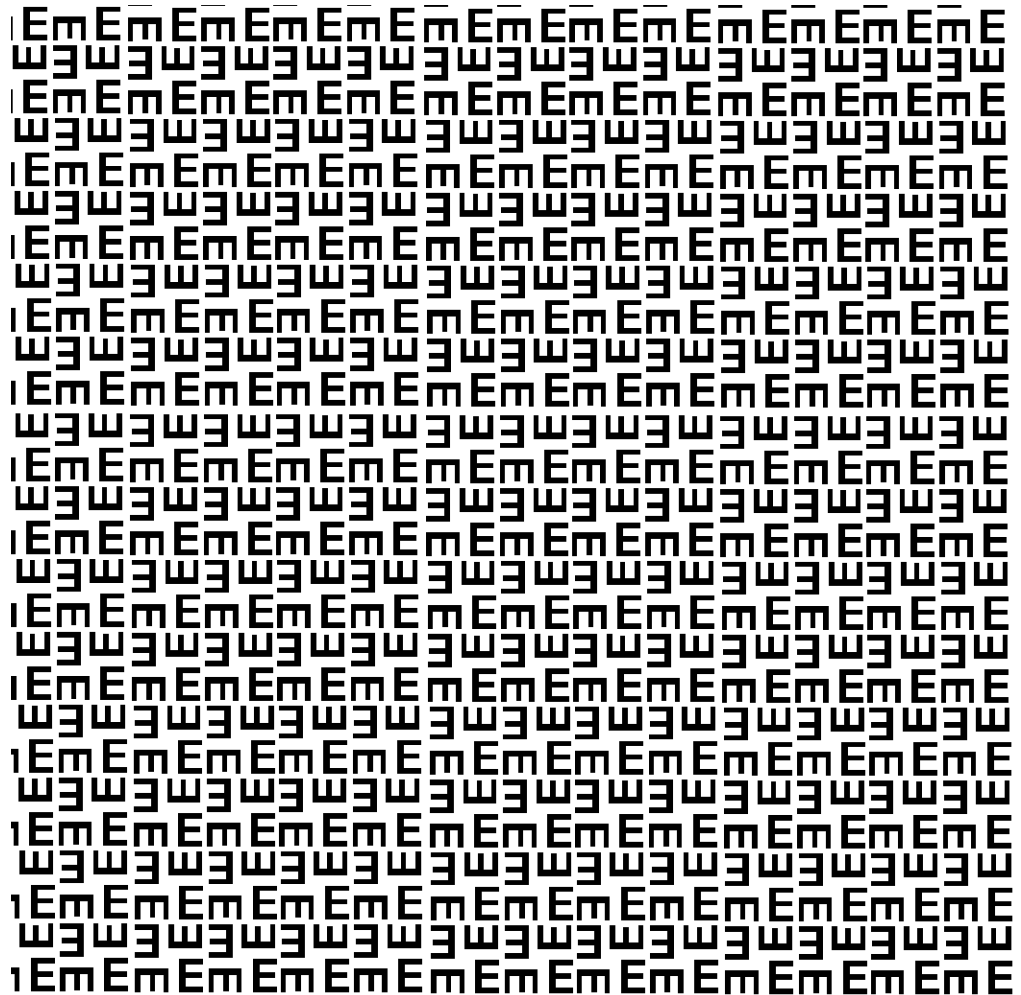


To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.  
Press **Ctrl + break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

Subtest 06 Focus Test ( "E" Pattern)

This subtest sets the 1024\*768 Mode and displays "E" patterns (18\*18 dot fonts), at 56 letters \*42 lines surrounded by a high resolution white frame.



To exit this subtest and return to the High Resolution Display Test menu:

Press **Enter** if **NO** was selected for *Test Loop* on the Test Parameter Menu.  
Press **Ctrl + break** if **YES** was selected for *Test Loop* on the Test Parameter Menu.

### 3.13 Multimedia Test

To execute the Multimedia Test select **10** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The Multimedia Test contains four subtests that test the computer's multimedia functions. Move the highlight bar to the subtest you want to execute and press **Enter**.

**NOTE:** Use the Toshiba Backup CD-ROM for Subtests 01, 02, and 03.

#### Subtest 01 Sequential Read Test

This subtest sequentially reads one block unit (2K bytes) of all logical addresses from the test CD.

**NOTE:** If **NO** is selected for Test Loop on the Test Parameter Menu, the screen will remain blank while the subtest is executing. When the test is complete the Multimedia Test menu displays.

If **YES** is selected for Test Loop on the Test Parameter Menu, the Test Status screen displays while the subtest is executing. Press **Ctrl + break** to return to the Multimedia Test menu.

#### Subtest 02 Random Read Test

This subtest randomly reads all addresses.

#### Subtest 03 Read Specified Address Test

This subtest reads data from a specified block of addresses.

The following message displays on the screen to enter the start and end block addresses:

```
START BLOCK ADDRESS ?  
END BLOCK ADDRESS  ?
```

#### Subtest 04 1 Point W/R/C (R/RW Media)

**NOTE:** Use CD-R or CD-RW, the CD-ROM and DVD cannot be used for this subtest, and some DVD-dual can't support this test.

This subtest writes specified data to a specified block count, then reads and compares the result.

### 3.14 MEMORY2 Test

To execute the Expansion Test select **11** from the Diagnostic Test Menu, press **Enter** and follow the directions on the screen. The MEMORY2 Test contains four subtests that test the computer's. Move the highlight bar to the subtest you want to execute and press **Enter**.

***NOTE:** If **NO** is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the test is executing. When the test is complete the Memory Test menu displays.*

*If **YES** is selected for Test Loop on the Test Parameter menu, the Test Status screen displays while the test is executing. Press **Ctrl + break** to return to the Memory Test menu*

Subtest 01 All one/All zero test

This subtest performs pseudorandom data read/write. The data consists of “all ones”/”all zero” patterns produced by pseudorandom sequence generator. The test checks address error.

```
FFFFFFFFFFFFFFFFF0000000000000000000
0000000000000000FFFFFFFFFFFFFFFFF
```

Subtest 02 Walking 1/Walking 0 test (Left)

This subtest uses “running one”/”running zero” patterns. This test sequence allows also to checking system bus in maximum noise conditions. The following test sequence is written.

```
7FFF7FFF7FFF7FFF8000800080008000
BFFFBFFFBFFFBFFF4000400040004000
```

After all the memory being tested is filled with the pattern, it is read in descending direction and compared with reference data. As the memory is read, the data is replaced with inverse test pattern. After all the memory is read and replaced with inverted pattern, it is read in descending direction and compare with new reference data. As the memory is read, the data is replaced with next pattern, which is like first one shifted to right.

Subtest 03 Walking 1/Walking 0 test (Right)

The test method is the same as Subtest2. However, the data to be used differs.

```
80008000800080007FFF7FFF7FFF7FFF
4000400040004000BFFFBFFFBFFFBFFF
```

Subtest 04 Walking 1/Walking 0 test (Left/ Right)

The test method is the same as Subtest2. However, the data to be used differs.

```
7FFF7FFF7FFF7FFF8000800080008000
BBBBBBBBBBBBBBBB4000400040004000
DDDDDDDDDDDDDDDD2000200020002000
```

```
FFFBFFFBFFFBFFFB0004000400040004
FFFDFFFDFFFDFFFD0002000200020002
FFFFFFFFFFFFFFFFE0001000100010001
80008000800080007FFF7FFF7FFF7FFF
4000400040004000BBBBBBBBBBBBBBBB
```

```
0004000400040004FFFBFFFBFFFBFFFB
0002000200020002FFFDFFFDFFFDFFFD
0001000100010001FFFFFFFFFFFFFFFFE
```

### 3.15 Error Codes and Error Status Names

The following table lists the error codes and error status names for the Diagnostic Tests.

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

Device Name	Error Code	Error Status Name
(Common)	FF	Data Compare Error
Memory	02	Protected Mode Not Changed
	??	Other Error
FDD	01	Bad Command Error
	02	Address Mark Not Found
	03	Write Protected
	04	Record Not Found
	06	Media Change Line Error
	08	DMA Overrun Error
	09	DMA Boundary Error
	0C	Select Media Error
	10	CRC Error
	20	FDC Error
	40	Seek Error
	80	Time Out Error
??	Other Error	
HDD	01	Bad Command Error
	02	Bad Address Mark Error
	04	Record Not Found
	05	HDC Not Reset Error
	07	Drive Not Initialized
	09	DMA Boundary Error
	0A	Bad Sector
	0B	Bad Track Error
	10	ECC Error
	11	ECC Recover Enabled
	20	HDC Error
	40	Seek Error
	80	Time Out Error
	AA	Drive Not Ready



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

<b>Device Name</b>	<b>Error Code</b>	<b>Error Status Name</b>
HDD	BB	Undefined Error
	CC	Write Fault
	E0	Status Error
	F0	No Sense Error
	??	Other Error
Cache Memory	02	Protect Mode Error
	03	Caching Error
	??	Other Error
Multimedia	01	Write Error
	0F	Invalid Drive
	15	Drive Not Ready
	??	Other Error

***NOTE:** If error status name is **Other Error**, please reference the **Error Code** for error information*

### **3.16 Running Test**

***NOTES:***

- 1. You may add or delete subtests using the Running Test Edit Item function, see Section 3.20.*
- 2. Do not forget to insert a work disk in the FDD. If a work disk is not inserted an error will be generated during the Floppy Disk Test.*
- 3. If the test completes successfully an “PASS” sign with blue letters displays on the screen.*
- 4. If the test fails or is interrupted before completion an “FAIL” sign with red letters displays on the screen.*
- 5. If running item not select an “NOITEM” sign with green letters display on the screen.*
- 6. All errors which occur during execution of the Running Test are logged in the Log File.*
- 7. This program is executed according to the Count Loop number selected in the Running Test Edit Item, see Section 3.20. To terminate the program, press **Ctrl + Break**.*

## 3.17 DMI INFOEMATION

Select **03** from the Diagnostics Menu and press **Enter** to Check or Write DMI Information Data:

### 3.17.1 Check DMI Information

The Check DMI Configuration program contains the following configuration information for the computer:

***NOTE:** Please set the media of DVD before starting a test.*

#### System information (Type 1)

1. Manufacture : TOSHIBA
2. Product Name : Satellite XXXXXX
3. Version : (TOSHIBA Part Number)
4. Serial Number : Serial Number
5. UUID Number: xxx

#### OEM Strings (Type 11)

1. OEM String : xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

#### On Board LAN MAC

1. MAC ADR : xxxxxxxxxxx

#### DVD Region Code

1. User Change Time : X
2. Region Code : X

### 3.17.2 Write DMI Information

The Write DMI Information program contains the following information for the computer :

1. Manufacture Name ( TOSHIBA )
2. Product Name ( Satellite XXXXXX )
3. Part Number ( PSL20X-XXXXXX )
4. Serial Number ( 12345678W )
5. OEM String ( PSL20X-XXXXXX,XXXXXXXXXXXX )
6. Write UUID ( XXXXXXXXXXXXXXXXXXX )
7. Brightness Write ( XXXXXXX )

Select 1 ~ 7 to keyin new data , select 8 to exit program , program will compare input data

length with the max length , if over will retry keyin

Note : Please Check New DMI Information After System Restart !!

1. \*\*\*\* Manufacture Name ( TOSHIBA ) - (15)
2. \*\*\*\* Product Name ( Satellite XXXXXX ) - (31)
3. \*\*\*\* Part Number ( PSL20X-XXXXXX ) - (15)
4. \*\*\*\* Serial Number ( 12345678W ) - (9)
5. \*\*\*\* OEM String ( PSL20X-XXXXX,SXXXXXXXXXXXX ) - (31)
6. \*\*\*\* Write UUID ( XXXXXXXXXXXXXXXXXXXX ) - (16)
7. \*\*\*\* Brightness Write ( XXXXXXXXX ) - (8)
8. \*\*\*\* Exit

Please Select (1 ~ 7) To Modify DMI String :

Current Data of EEPROM : Toshiba

1. Enter the Manufacture Name : TOSHIBA

Your Keyin is : TOSHIBA ..... This is your keyin data

EEPROM return : TOSHIBA ..... This is read from eeprom back

Press any key to continue

Note : Please Check New DMI Information After System Restart !!

*If Keyin length too long will retry :*

Current Data of EEPROM : 12345678W

4. Enter the Serial Number : 12345678901234

Your Keyin String Length Not Correct 14 > 9 !!!

Current Data of EEPROM : 12345678W

4. Enter the Serial Number :

### 3.18 Log Utilities

This function logs error information generated while a test is in progress and stores the results in RAM (Maximum error log : 500 times). This function can store data on a floppy disk. If the power switch is turned off, the error information will be lost. Error information is displayed in the following order:

1. Error count (CNT)
2. Test name and subtest number (TEST)
3. Pass count (PASS)
4. Error status (STS)
5. FDD/HDD or memory address (ADDR)
6. Write data (WD)
7. Read data (RD)
8. Error Name ( ERROR NAME/DETAILS)

#### 3.18.1 Operations

1. Select **04** and press **Enter** in the Diagnostics Menu to log error information into RAM or onto a floppy disk. Error information is displayed in the following format:

XXXX ERRORS				PASSCOUNT = XXXX			
CNT	TEST	PASS	STS	ADDR	WD	RD	ERROR NAME/DETAILS
001	FDD 02	0000	180	0000001	00	00	WRITE PROTECTED
002	FDD 01	0000	120	0000001	00	00	TIME OUT ERROR

		Pass Count	Error Status	Address			
	Subtest Number				Write Data	Read Data	
Error Count	Test Name						Error Name and Detail

[[1:Next, 2:Prev, 3:Exit, 4;Clear, 5:FD Log Read, 6:FD Log Write, 7:Log Save]]

2. Error information displayed on the screen can be manipulated with the following number keys:

The **1** key scrolls the display to the next page.  
The **2** key scrolls the display to the previous page.  
The **3** key returns to the Diagnostics Menu.  
The **4** key erases all error log information in RAM.  
The **5** key reads the log information from a floppy disk.  
The **6** key writes the log information to a floppy disk.  
The **7** key save the log information to a floppy disk.

The following are the test abbreviations for each Diagnostics Test.

<b>Test Name</b>	<b>Test Abbreviations</b>
System Test	ROM
Memory Test	RAM
Keyboard Test	KBD
Display Test	CRT
Floppy Disk Test	FDD
Hard Disk Test	HDD
Real Time Clock Test	RTM
Cache Memory Test	CAH
Height Resolution Display Test	KIF
Multimedia Test	MLT
Memory2 Test	RAM

### 3.19 System Configuration

Select **05** from the Diagnostics Menu and press **Enter** to display the following system configuration:

```
SYSTEM CONFIGURATION :

* - BIOS VER = VX.XX   KBC VER = XXXX
* - MAC ADDRESS : XXXXXXXXXXXXX
* - 0 ASYNC ADAPTER
* - 1 HDD DRIVE(S):XXXXXXXXXXXXXXXXXXXXXXXXXXXX
      FW Rev.:XXXXXXXX
      CUR LBA:XXXXXXXX   ORG LBA:XXXXXXXX
* - BATTERY TYPE:XXXXXXXX
* - XXXMB MEMORY SIZE
* - XXX CPU
* - 1 Vedio Chip XXXXXXXXXXXXXXX
* - 1 ODD DRIVE(S):XXXXXXXX
      FW Rev.:XXXX
```

Press **Enter** to return to the Diagnostics Menu.

## 3.20 Running Test Edit Item

### 3.20.1 Function Description

Function description lets you add or delete the subtests used to execute the Running Test. The following screen displays after pressing the **Tab** key to edit an item in the Running Test.

KEY OPERATION

↓ Cursor Down  
 ↑ Cursor Up  
**PgDn** Page Down  
**PgUp** Page Up  
**Home** Top of ITEM  
**End** End of ITEM  
**Ins** Insert ITEM  
**Del** Delete ITEM  
**Enter** End

### 3.20.2 Operation Description

Select **05** from the Diagnostics Menu and press **Enter** to display the following:

```

                                Test Item Editor                                [RUNNING TEST]
Loop Count (1-65535, 0 = infinity)  Error Stop 

T-No      Test Name                S-No      Subtest Name
01         System Test              Subtest 01 ROM Checksum
02         Memory Test              Subtest 01 Conventional Memory
02         Memory Test              Subtest 02 Protect Mode
02         Memory Test              Subtest 03 Protect Mode (32MB Max)
02         Memory Test              Subtest 04 RAM Refresh
04         Display Test             Subtest 01 VRAM W/R/C
04         Display Test             Subtest 02 Character Attribute Set
04         Display Test             Subtest 03 Character Set
04         Display Test             Subtest 04 80 * 25 Character Display
04         Display Test             Subtest 05 320 * 200 Graphics Display
04         Display Test             Subtest 06 640 * 200 Graphics Display
04         Display Test             Subtest 07 640 * 480 Graphics Display
04         Display Test             Subtest 08 Display Page
05         Floppy Disk Test         Subtest 02 Sequential W/R/C
08         Hard Disk Test           Subtest 01 Sequential Read
08         Real Time Clock Test     Subtest 02 Backup Memory Test
  
```

Tab: HELP (Key Operation)



1. Enter a **number** or **0** for **Loop Count** and press **Enter**.

Select a number from 1 to 65535 to define the number of times the Running Test executes.

Select 0 to run the test continuously until halted by the user.

2. Select the **NO** or **YES** for **Error Stop** and press **Enter**.

Select **NO** to keep the test running even if an error is found.

Select **YES** to stop the test program when an error is found.

***NOTE:** All errors which occur during execution of the Running Test are logged in the Log File.*

3. Press **Insert** to add a subtest.
4. Press **Delete** to remove the selected subtest.
5. Press **Enter** when you have finished editing the Running Test list.
6. The following message displays:

Do you want to save the data?

Save to disk  
Do not save

7. Select the option and press **Enter**.
8. Select **03** from the Diagnostics Menu and press **Enter** to execute the Running Test.

***NOTE:** If press **Ctrl+break** in the runin process, please press more one any key to exit.*

## 3.21 Common Tests and Operation

### 3.21.1 How to operate a window

To input parameters, or open a window use the following keys.

- ↑ ↓ → ← key : to move a highlight bar
- [Enter] key : to select an item at the highlight bar
- [Esc] key : to close the current window and go back to the previous window

### 3.21.2 How to Stop the Test Program

To stop a test:

- [Ctrl]+[Break] Press the Ctrl key and the Break key simultaneously.

### 3.21.3 Test Status Screen

***NOTE:** The Test Status Screen does not display during all the tests. See the specific test description Sections 3.4 through 3.14.*

The following Test Status screen displays during most tests. See the description of each test Sections 3.4 through 3.14 for specific screen information.

Test Name			
Sub Test	:0101		
Pass Count	:00000	Error Count	:00000
Write Data	:00	Read Data	:00
Address	:00000000	Status	:00

- Test Name Displays the name of the test being executed.
- Subtest No. Displays the Subtest number in the following format:

ffgg

ff = Subtest No.

gg = Step Number (Will be blank if the test does not have a Step Number.)

*Test Program for Field.*

---

Pass Count	Displays the number of times the test has been executed.
Error Count	Displays the number of errors which have occurred during the test.
Write Data	Displays only the test data that has failed to compare during the test while being written during the test.
Read Data	Displays test data that has failed to compare during the test while being read during the test.
Test Address	Displays the Test Address. (The format differs for each test.)
Error Status	Displays the error status.
Error Name	Displays the name of the error.

### **3.21.4 Test Stop Display**

If an error occurs during a Subtest and YES is selected for Error Stop, the following message displays:

```
[HALT OPERATION]

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

\* Select 1, 2, or 3

The three selections have the following functions:

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

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

### **3.21.5 How to enter data**

Letters which must be entered are always shown in [ ]. Simultaneous entries are displayed by a “+” mark. For example:

**[a] [Enter]**

Press the “a” key, then press the [Enter] key.

**[Ctrl] + [c]**

Press the [Ctrl] key and the “c” key simultaneously.

---

# **Chapter 4**

## **Replacement Procedures**

---



---

## Chapter 4 Contents

---

4.1	Overview.....	4-1
	Safety Precautions.....	4-2
	Before You Begin.....	4-3
	Disassembly Procedure.....	4-4
	Assembly Procedure.....	4-5
	Tools and Equipment.....	4-5
	Screw Tightening Torque.....	4-6
	Grip Color.....	4-6
	Screw Notation.....	4-7
4.2	Battery pack.....	4-8
4.3	PC card.....	4-10
4.4	HDD.....	4-12
4.5	Wireless LAN card.....	4-16
4.6	Memory module.....	4-18
4.7	Keyboard.....	4-21
4.8	LED Board.....	4-24
4.9	Optical disk drive.....	4-26
4.10	Display assembly.....	4-28
4.11	Bluetooth assembly.....	4-33
4.12	Cover assembly.....	4-38
4.13	Touch pad.....	4-40
4.14	Audio board.....	4-40
4.15	Fingerprint board.....	4-41
4.16	USB board.....	4-42
4.17	System board.....	4-45
4.18	CPU.....	4-47
4.19	VGA heat sink.....	4-50
4.20	LCD unit / FL inverter.....	4-52

## Figures

Figure 4-1	Removing the battery pack.....	4-8
Figure 4-2-1	Removing a PC card .....	4-10
Figure 4-3-2	Insert a PC card.....	4-11
Figure 4-4	Removing the HDD assembly.....	4-13
Figure 4-4	Removing a HDD.....	4-14
Figure 4-5	Removing a wireless LAN card .....	4-16
Figure 4-6	Removing a memory module .....	4-19
Figure 4-7	Insert a memory module.....	4-20
Figure 4-8	Removing screws for KBD cover/keyboard .....	4-22
Figure 4-9	Removing the keyboard/KBD cover .....	4-22
Figure 4-10	Removing the Function board.....	4-24
Figure 4-11	Removing an optical disk drive.....	4-26
Figure 4-12	Disassembling the side bracket .....	4-27
Figure 4-13	Removing the screws (securing display assembly).....	4-28
Figure 4-14	Removing keyboard cover .....	4-29
Figure 4-15	Removing the Wireless Antenna and Bluetooth .....	4-29
Figure 4-16	Removing the hinge screw .....	4-30
Figure 4-17	Removing the LCD harness and remove display assembly .....	4-31
Figure 4-18	Removing the Bluetooth .....	4-33
Figure 4-19	Removing the screws cable from connect (front) .....	4-36
Figure 4-20	Removing the screws (back) .....	4-35
Figure 4-21	Removing the cover assembly .....	4-36
Figure 4-22	Removing the touch pad.....	4-38
Figure 4-23	Removing the Audio Board .....	4-40
Figure 4-24	Removing the Fingerprint .....	4-41
Figure 4-25	Removing the USB board .....	4-42
Figure 4-26	Removing the system board.....	4-45
Figure 4-27	Removing the CPU heat sink .....	4-47
Figure 4-28	Removing the CPU .....	4-48
Figure 4-29	Applying silicon grease.....	4-49
Figure 4-30	Removing the VGA heat sink .....	4-50



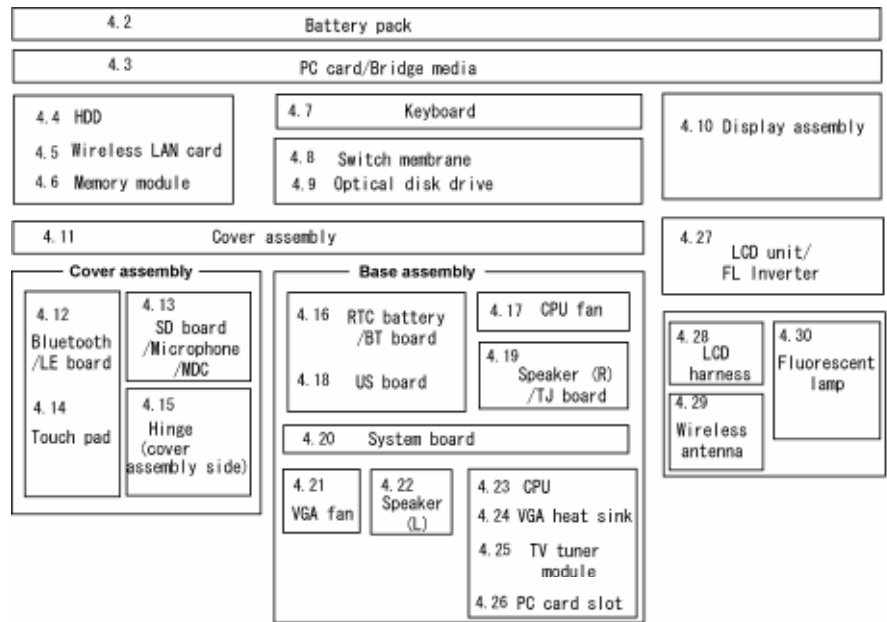
Figure 4-31 Removing the display mask ..... 4-52  
Figure 4-32 Removing the FL inverter ..... 4-53  
Figure 4-33 Removing the LCD unit ..... 4-54  
Figure 4-34 Removing the LCD supports..... 4-55

## 4.1 Overview

This chapter describes the procedure for removing and replacing the field replaceable units (FRUs) in the PC. It may not be necessary to remove all the FRUs in order to replace one. The chart below provides a guide as to which other FRUs must be removed before a particular FRU can be removed. The numbers in the chart indicate the relevant section numbers in this manual.

In all cases when removing an FRU, the battery pack must also be removed. When repairing an FRU that is the potential cause of a computer fault, use the chart to determine the order in which FRUs need to be removed.

The tilt stand, if it is installed, can be removed without any other FRUs removed.

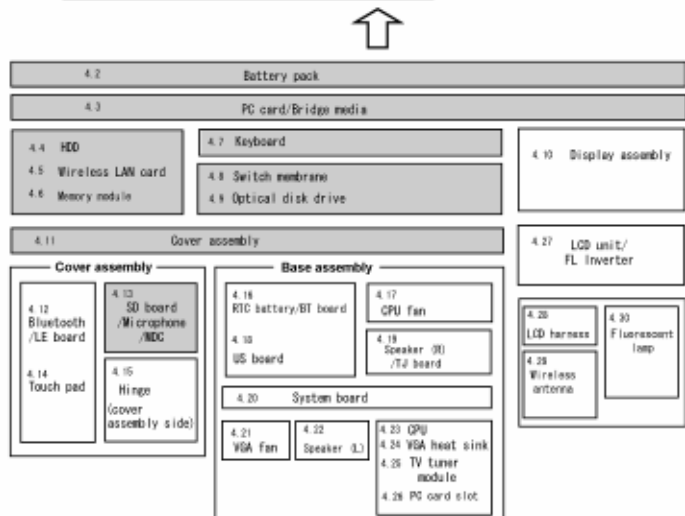


- Chart Notation

The chart shows the case for the following example:

- Removing a MDC

All FRUs down to the “4.2 Battery pack” to “4.11 Cover assembly” above a SD board/Microphone/MDC must be removed.



## **Safety Precautions**

Please read the following safety instructions before disassembling the computer and always follow the instructions while working on the computer.

**DANGER:**

- 1. In the case of the battery, always use authentic parts or equivalent parts approved by Toshiba. Other batteries may have different specifications that are incompatible with the computer and may result in fire or explosion.  
Due to the risk of alkali fluid leaks, never attempt to heat or disassemble the battery. Similarly, due to the risk of explosion, never expose the battery to flame.*
- 2. Some parts including the power supply and FL inverter generate high voltages. If you need to turn on the power while disassembling the computer, do not touch any connectors or other components due to the risk of electric shock. Also, do not disassemble individual parts when performing routine maintenance.*

**WARNING:**

- 1. To prevent electric shock, turn off the power unplug the AC adapter from the power source.*
- 2. As the battery installed to the computer is typically already charged, the risk of electric shock remains even when the AC adapter is unplugged from the socket. To prevent electric shock, always take off any metal jewelry or accessories such as necklaces, bracelets or rings before working on the computer. Never work with wet or moist hands.*
- 3. Take care not to injury yourself on any edges or corners.*

**CAUTION:**

- 1. Confirm that replacement parts have compatible specifications before replacing on the computer. Never use incorrect parts as these may cause faults on the computer.*
- 2. To prevent internal damage such as short circuits or burning, do not allow any screws, paper clips, or other metal objects to fall into the computer. When removing screws, always replace with the same size screw. Ensure that all screws are fully tightened. Loose screws may result in short circuits leading to overheating, smoke or flame.*
- 3. To prevent electric shock, check that you have disconnected all cables from a part before removing the part.*
- 4. When connecting to the AC power supply, use only an AC adapter and cable approved by Toshiba.*
- 5. To prevent electric shock, ensure that all replacement parts are compatible with the computer and that all cables and connectors are securely connected.*

## **Before You Begin**

Take note of the following points before starting work. Always remove the AC adapter and battery pack before commencing any of the procedures. The procedure for removing the battery pack is described in section “4.2.1 Battery Pack”.

1. Do not disassemble the computer unless it is operating abnormally.
2. Use the designated tools.
3. Ensure that the environment for working on and storing parts does not contain any of the following.
  - Dust or dirt
  - Static electricity
  - Extremely hot, cold or humid conditions
4. Perform the diagnostic tests described in Chapter 2 to determine which FRU is the cause of the fault.
5. Do not perform any unnecessary work. Always work in accordance with the disassembly and reassembly procedures in this manual.
6. Keep parts removed from the computer in a safe place away from the computer where they will not be damaged or interfere with your work.
7. Disassembling requires the removal of a large number of screws. Keep removed screws in a safe place such that you can determine which screws belong to which part.
8. When reassembling, ensure that you use the correct screws and fit parts in the correct position. Screw sizes are noted in the text and figures.
9. As all parts have sharp edges and corners, take care not to cut yourself.
10. After replacing an FRU, check that the computer and replaced part operate correctly.

## **Disassembly Procedure**

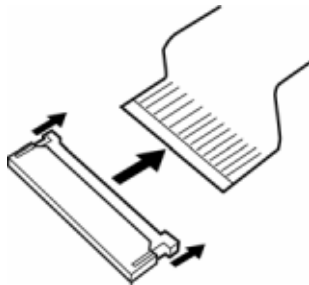
Three main types of cable connector are used.

- Pressure plate connector
- Spring connector
- Normal pin connector

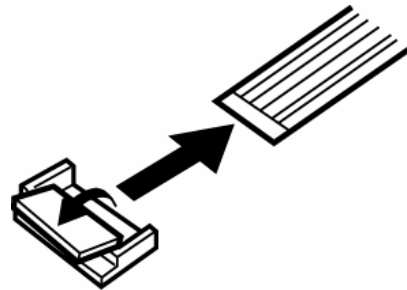
When disconnecting a pressure plate connector, lift up the tag on one side of the plastic pressure plate on the connector and pull the cable out from the connector. When reconnecting a cable to a pressure plate connector, lift up the pressure plate to a suitable height and insert the cable into the connector. Press down on both sides of the pressure plate such that both sides of the plate and connector are at the same height and that the cable is fixed in the correct position. Pull the cable to ensure that it is securely connected. If the cable is disconnected from the connector, reconnect it making sure that you lift the pressure plate high enough to insert fully the cable.

For spring connectors, lifting up the stopper frees the cable and allows it to be pulled out. To reconnect, hold the stopper in the up position and insert the cable, then lower the stopper to secure the cable.

Normal pin connectors are used for all other cables. Simply pull out or push in these connectors to disconnect or reconnect.



Pressure plate connector



Spring connector

### **Assembly Procedure**

After the computer has been disassembled and the part that caused the fault has been repaired or replaced, the computer must be reassembled.

Take note of the following general points when assembling the computer.

- Take your time and follow the instructions carefully. Hurrying the assembly work will only introduce new problems.
- Check that all cables and connectors are securely connected.
- Before fastening FRUs or other parts in place, ensure that no cables are caught on screws or the FRU.
- Check that all latches are securely closed.
- Ensure that you have installed all FRUs correctly and do not have any screws left over. Using an incorrect screw may damage the thread or screw head and result in the FRU not being securely fastened in place.

After installing FRUs, check that the computer operates correctly.

### **Tools and Equipment**

For your safety and the safety of the people around you, it is important that you use Electrostatic Discharge (ESD) equipment. Correctly utilizing of the equipment increases the percentage of successful repairs and saves on the cost of damaged or destroyed parts. The following equipment is required for disassembly and assembly.

- One Philips screwdriver with type 0 bit (for THIN HEAD screws)
- One Philips screwdriver with type 1 bit (for screws other than above)
- Tweezers (for lifting screws)
- ESD mats (lay on work table or floor)
- An ESD wrist strap and heel grounder
- Anti-static carpet or flooring

## Screw Tightening Torque

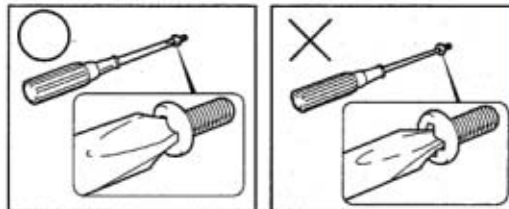
Use the following torque when tightening screws.

**CAUTION:** *Overtightening may damage screws or parts. Undertightening may allow screws to loosen (and possibly fall out) causing a short circuit or other damage.*

**NOTE:** *To tighten screws quickly and accurately, an electric screwdriver is recommended.*

- M2 (2mm)                    0.167 N·m (1.7 kgf·cm)
- M2.5 (2.5mm)            0.245 N·m(2.5 kgf·cm)
- M2.5 (2.5mm)            0.392 N·m(4.0 kgf·cm) for Hinge support
- M3.0 (3mm)                0.245 N·m (2.5 kgf·cm)

**NOTE:** *To prevent damage to THIN HEAD screws, press along the axis of the screwdriver while turning the screw. This is because the contact area between the screw and driver is less than for a pan head screw (standard pan-shaped screw head).*



## Grip Color

Some screws have a colored grip area to help you determine the length of the screw.

- Even numbered length screws: Brown
- Odd numbered length screws: White
- Special length screw: Blue



“Special length screw” means screws whose length is indicated in an integral number to the first decimal places such as 2.5 mm, 2.8 mm and so on.

## **Screw Notation**

To make maintenance of the computer easier, markings of the kinds of the screws including the types and lengths of the screws are indicated on the computer body.

Format:

Screw shape + Screw length (mm)

Screw shape

B: Bind screw

F: Thin head screw

S: Super thin head screw

T: Tapping screw

U: Other screws (Unique screws: pan head, stud, etc.)

Example: B6 ... 6mm bind screw



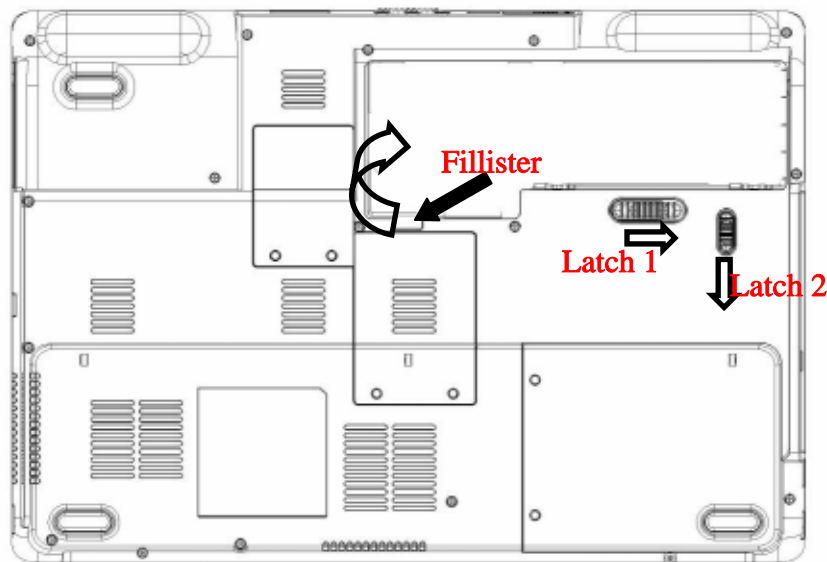
## 4.2 Battery pack

### Removing the battery pack

The following describes the procedure for removing the battery pack (See Figure 4-1).

**CAUTION:** Take care not to short circuit the terminals when removing the battery pack. Similarly, do not drop, knock, scratch, disassemble, twist, or bend the battery pack.

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all external devices from the computer.
3. Turn the computer upside down.
4. Slide and hold the battery release latch (1) to free the battery pack after moving the battery release lock (2) into it unlock position – pick the battery pack out of the computer from fillister.



*Figure 4-1 Removing the battery pack*

**NOTE:** *Dispose of the used battery pack in accordance with the laws and ordinances of your local authority.*

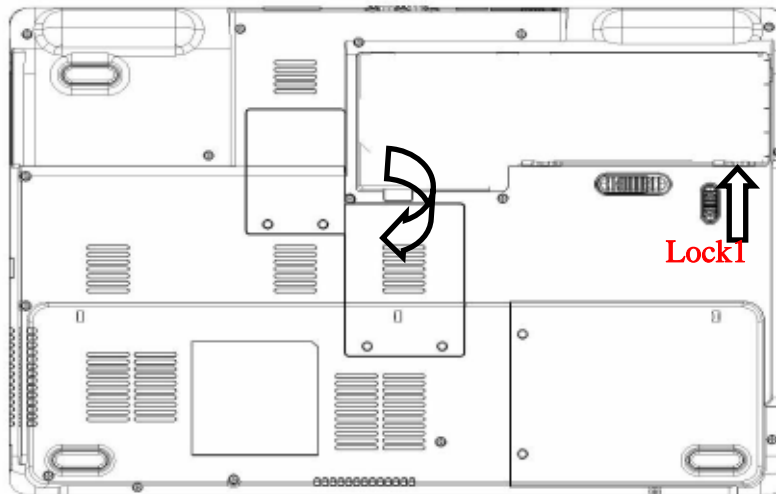
### **Installing the battery pack**

The following describes the procedure for installing the battery pack (See Figure 4-1).

**CAUTION:** *There is a danger that the lithium ion battery pack may explode if not fitted, operated, handled, or disposed correctly. Dispose always the used battery pack in accordance with the laws and ordinances of your local authority. Use only the batteries approved by Toshiba.*

**NOTE:** *Check visually the battery terminals and clean off any dirt with a dry cloth.*

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all external devices from the computer.
3. Attach the **battery cover** to the **battery pack**.
4. Insert the battery pack
5. Ensure the battery release lock (1) is moved into its locked position



## 4.3 PC card

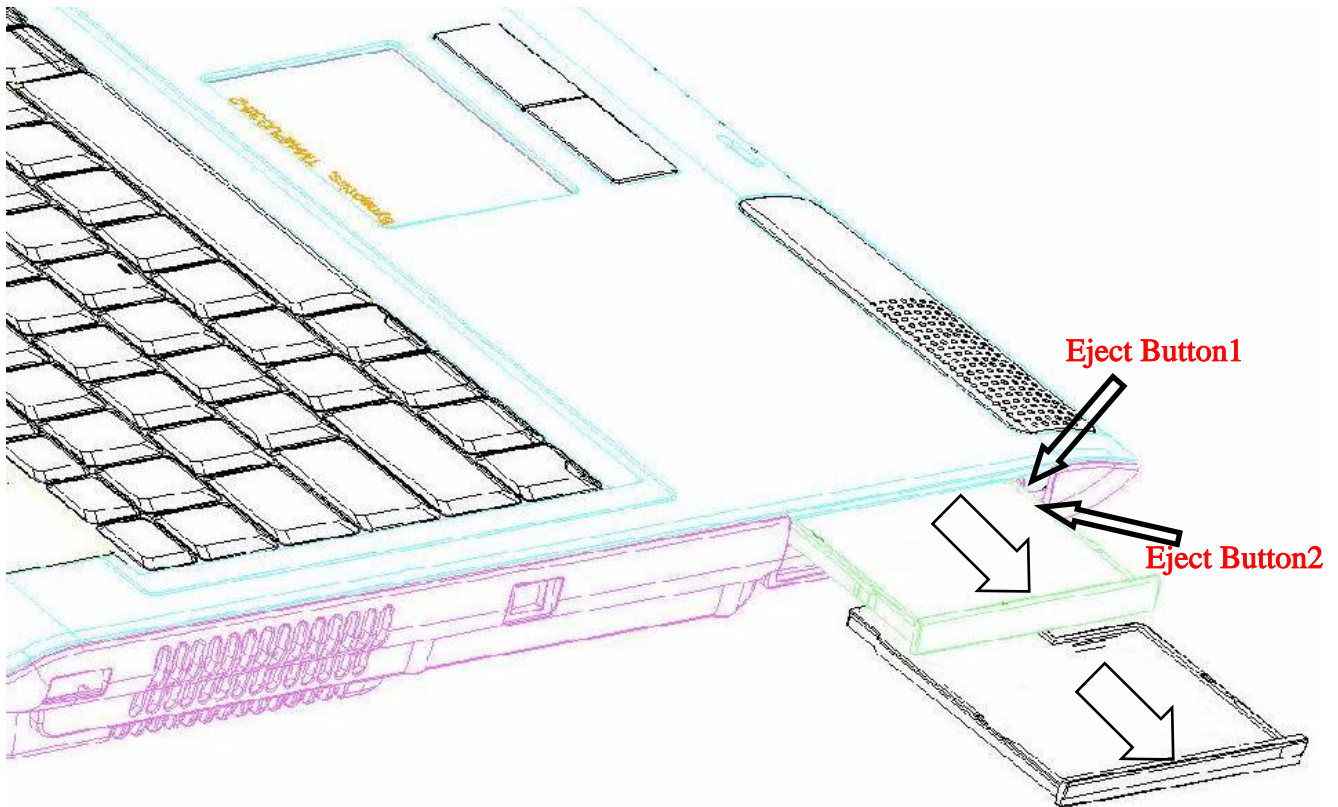
### Removing a PC card

The following describes the procedure for removing a PC card (See Figure 4-2-1).

**CAUTION:** *Insert or remove a PC card in accordance with any instructions in a PC card manual or the manuals of the computer system you are using.*

1. Push the **eject button 1**. It will pop out PCMCIA Card when you release it. And **eject button 2** for NEW Card Then press the eject button once more to eject a PC card.
2. Grasp one of **PC card** and remove it.

**NOTE:** *If a PC card is not inserted all the way, the eject button may not pop out. Be sure to push a PC card firmly and press the eject button again.*

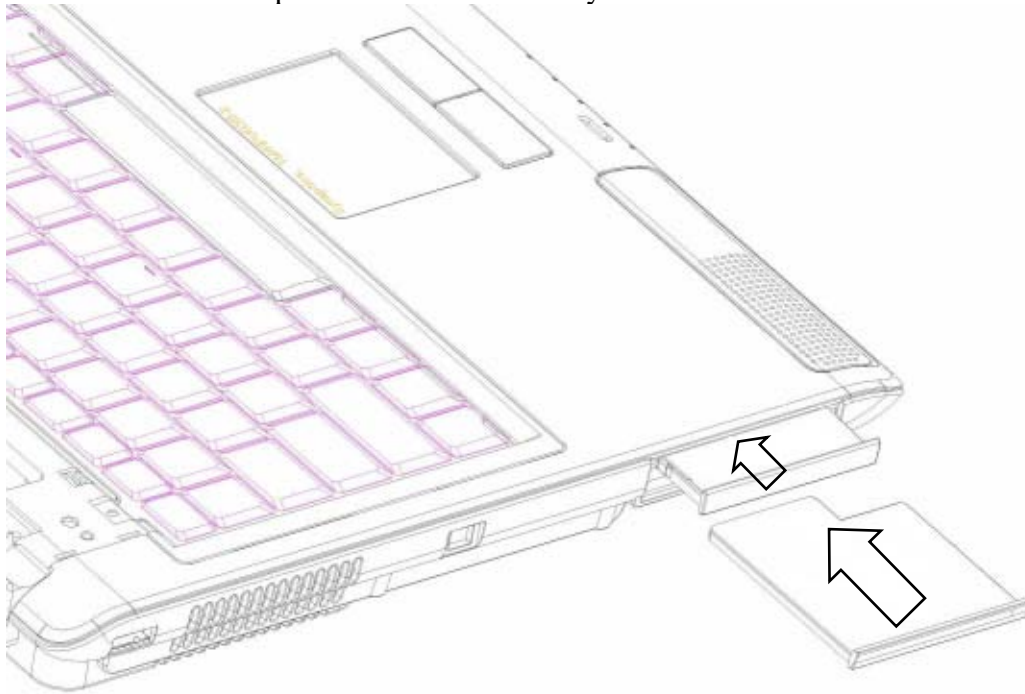


*Figure 4-2-1 Removing a PC card*

### **Installing a PC card**

The following describes the procedure for inserting a PC card (See Figure 4-2-2).

1. Make sure the **eject button** does not stick out.
2. Insert a **PC card** and press it until it is securely connected.



*Figure 4-2-2 Insert a PC card*

## 4.4 HDD

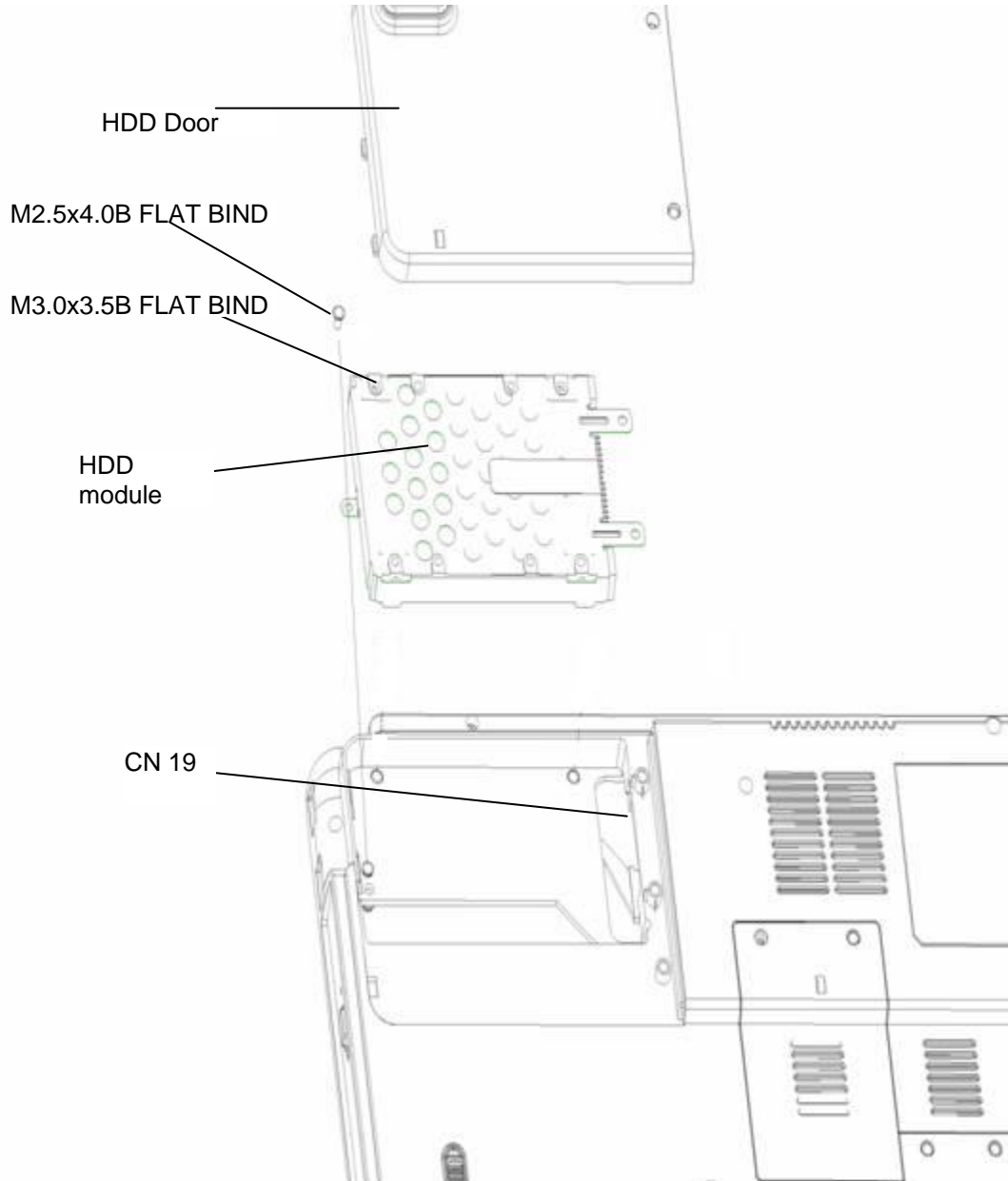
### Removing a HDD

The following describes the procedure for removing a HDD (See Figure 4-3 to 4-4).

**CAUTION:** *Take care not to press on the top or bottom of a HDD. Pressure may cause data loss or damage to the device.*

1. Turn the computer upside down.
2. Remove the following **screws** securing a HDD slot cover and remove a **HDD slot cover**.
  - M2.5×4.0B      FLAT BIND screw      x4
3. Remove the following **screws** securing the **HDD assembly**.
  - M2.5×4.0B      FLAT BIND screw      x2
4. Disconnect the **HDD assembly** from the connector on the system board **CN19**.

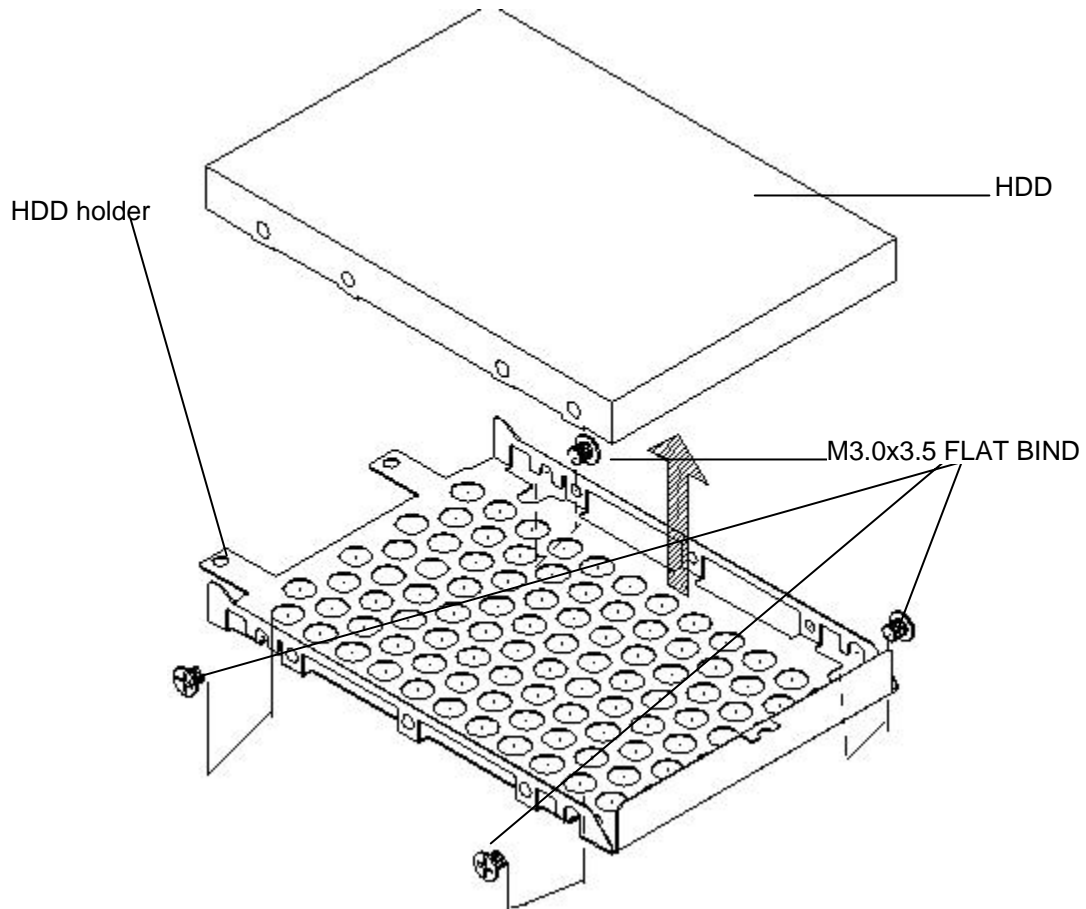
**CAUTION:** When a HDD is installed, they are installed in the position as the following figure.



*Figure 4-3 Removing the HDD assembly*

5. Remove the following **screws** securing the HDD holder and remove the **HDD holder**.

- M3.0×3.5B      FLAT BIND screw      x4



*Figure 4-4 Removing a HDD*

## **Installing a HDD**

The following describes the procedure for installing a HDD (See Figure 4-3 to 4-4).

1. Install a HDD to the **HDD holder** and secure it with the following **screws**.

- M3.0×3.5F FLAT BIND screw x4

<p><b>NOTE:</b> <i>Although they are 3mm head screws, screw torque must be set in 2.5kg-cm for four screws securing the HDD holder.</i></p>
---

2. Insert the **HDD assembly** into the HDD slot and connect it carefully to the **CN19** on the system board.
3. Secure the **HDD assembly** with the following **screw**.

- M2.5×4.0B FLAT BIND screw x2

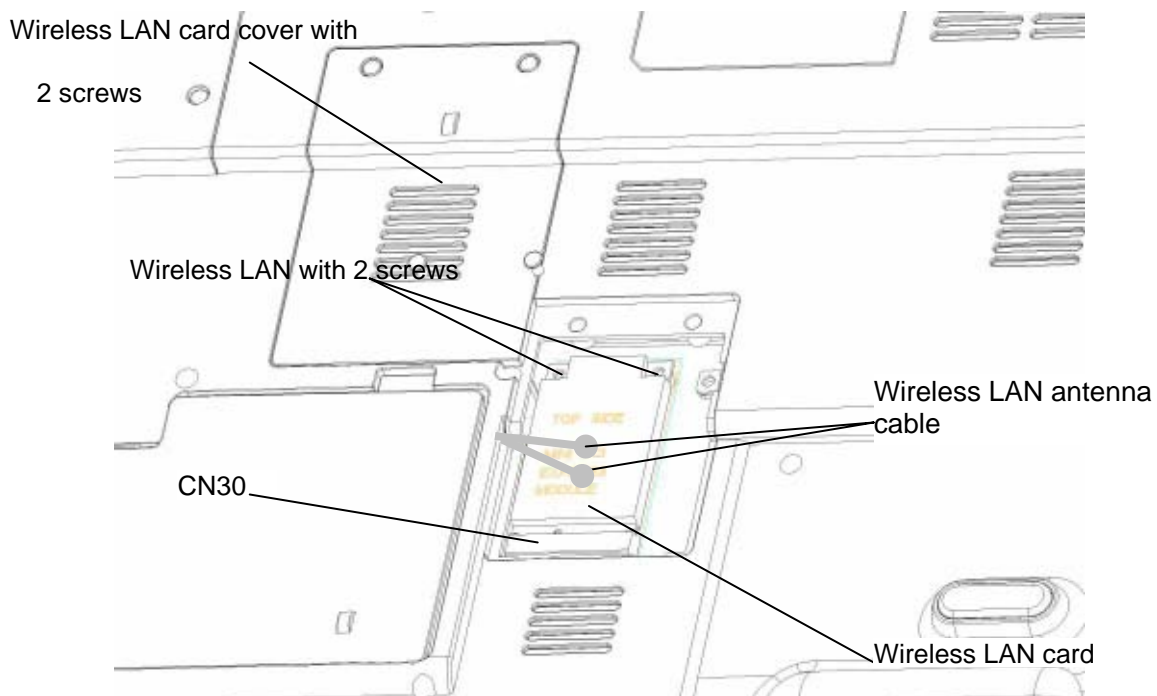


## 4.5 Wireless LAN card

### Removing a Wireless LAN card

The following describes the procedure for removing a Wireless LAN card (See Figure 4-5).

1. Remove the following **screw** of wireless cover securing **wireless LAN card cover** and remove it. And remove screw of wireless board
  - 2.5.0 x 4.0B BIND screw x2
2. Disconnect the **wireless LAN antenna cable** from the connectors on a wireless LAN card.
3. Open the left and right latches holding a wireless LAN card and remove a **wireless LAN card** from the **connector CN30** on the system board.



*Figure 4-5 Removing a wireless LAN card*

### **Installing a Wireless LAN card**

The following describes the procedure for installing a Wireless LAN card (See Figure 4-5).

1. Insert a **wireless LAN card** terminals slantwise into the connector **CN30** on the computer and press a wireless LAN card and lock the secure screws.
2. Connect the **wireless LAN antenna cables** to the terminals on a wireless LAN card.
3. Install the **wireless LAN card cover** and secure it with the following **screw**.

## 4.6 Memory module

**CAUTION:** *The power of the computer must be turned off when you remove a memory module. Removing a memory module with the power on risks damaging the module or the computer itself.*

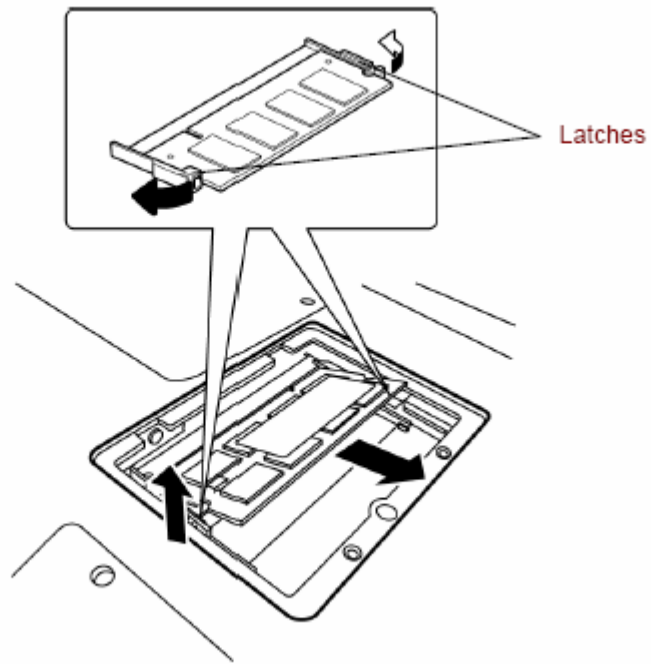
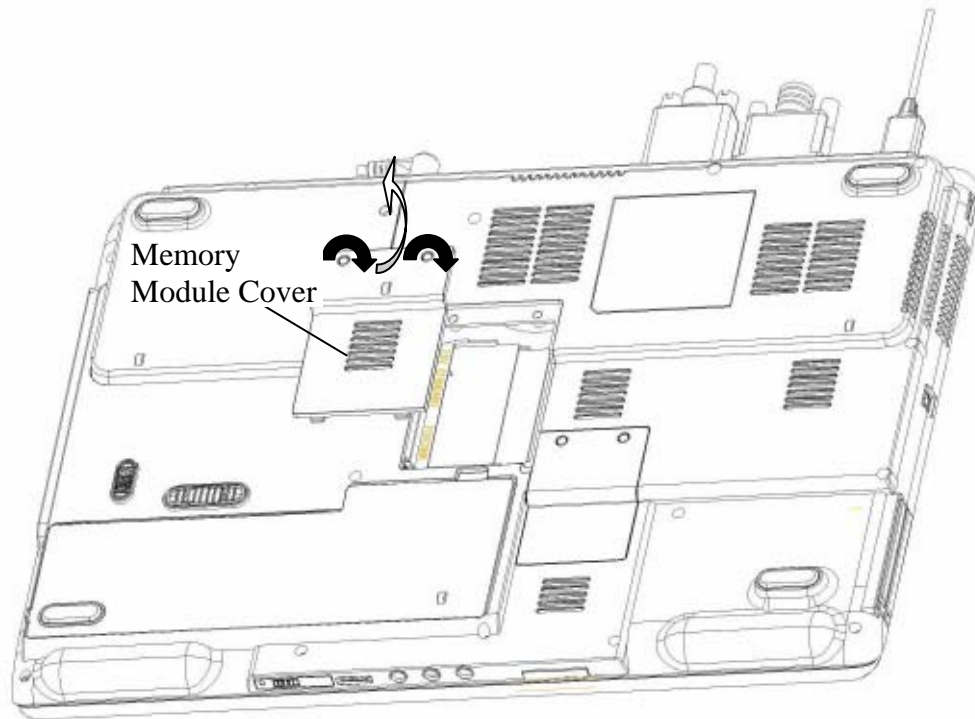
*Do not touch memory module terminals. Any dirt on the terminals may cause memory access problems.*

*Never press hard or bend a memory module.*

### Removing a memory module

To remove a memory module, confirm that the computer is in boot mode. Then perform the following procedure (See Figure 4-6).

1. Loose the **screw** securing the **memory slot cover**.
2. Remove the **memory slot cover**.
3. Open the left and right **latches** and remove a **memory module**.



*Removing the memory module*

*Figure 4-6 Removing a memory module*

## Installing a memory module

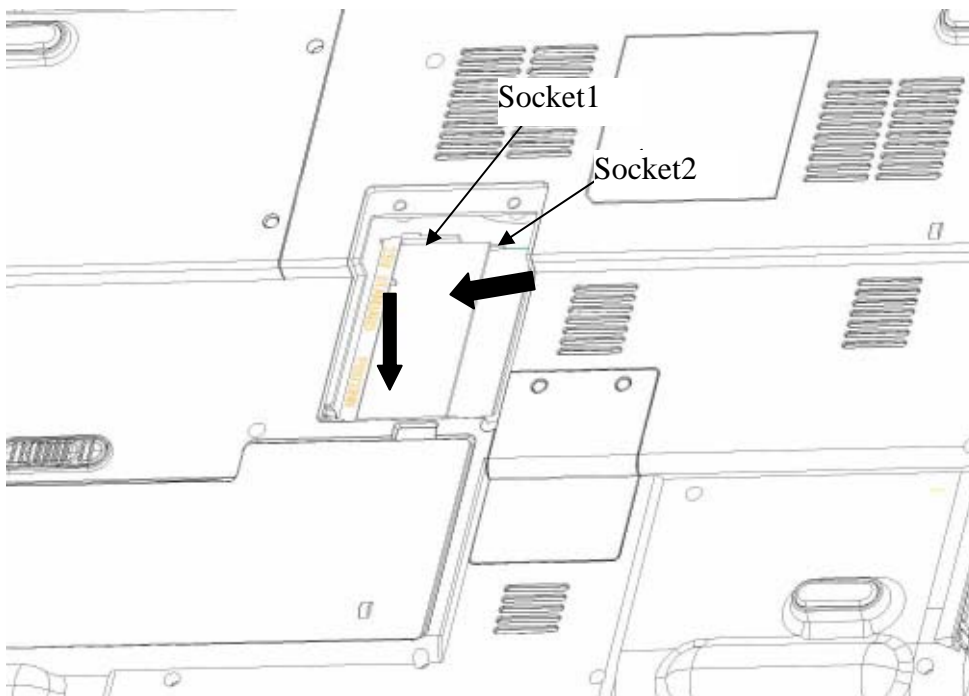
To install a memory module, confirm that the computer is in boot mode. Then perform the following procedure (See Figure 4-7).

1. Insert a **memory module** into the connector of the computer slantwise (terminal side first) and press it to connect firmly.

**CAUTION:** *The power must be turned off when you insert a memory module. Inserting a memory module with the power on might damage the module or the computer itself.*

*Never press hard or bend a memory module.*

2. Install the **memory slot cover** and secure it with the **screw**.
3. When the power of the computer is turned on, the computer checks automatically the memory size. Confirm that the new memory is detected correctly.
4. If the memory is not detected, check that it is connected correctly.



*Figure 4-7 Insert a memory module*

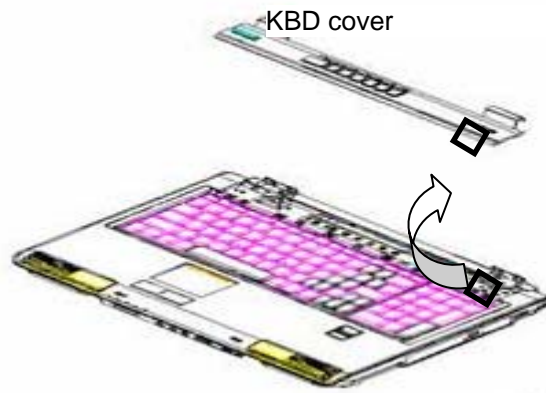
## 4.7 Keyboard

### Removing the keyboard

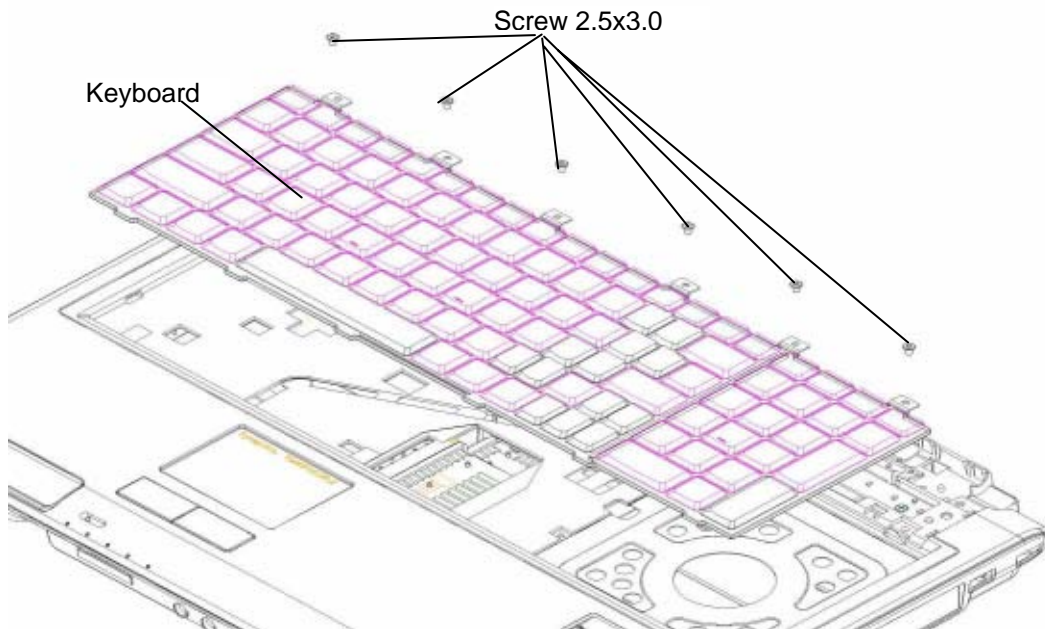
The following describes the procedure for removing the keyboard (See Figure 4-8 to 4-9).

**CAUTION:** *As the keycap may fall out, when handling the keyboard always hold it by the frame and do not touch the keycap.*

1. Turn the computer upside down
2. Open the display.
3. Remove KBD cover. Insert your finger into the slot between the keyboard cover and the keyboard. Then, lift up the keyboard cover to remove it. Remove six screws 2.5x3.0 securing the keyboard.
4. Insert your finger into the keyboard slot and keyboard. Then lift up the keyboard to remove it.
5. Disconnect keyboard cable.



*Figure 4-8 Removing screws for KBD cover/keyboard*



*Figure 4-9 Removing the keyboard/KBD cover*

## **Installing the keyboard**

The following describes the procedure for installing the keyboard (See Figure 4-8 to 4-9).

1. Turn the **keyboard** upside down and place it on the palm rest as its face down.  
Connect the **keyboard flexible cable** to the connector **CN3200** on the system board.
2. Slide and set the **speaker cover assembly** and secure it with the following **screw**.
  - M2.5×3.0B FLAT BIND screw x6
3. Install the **keyboard brace** by pressing it from the topside.

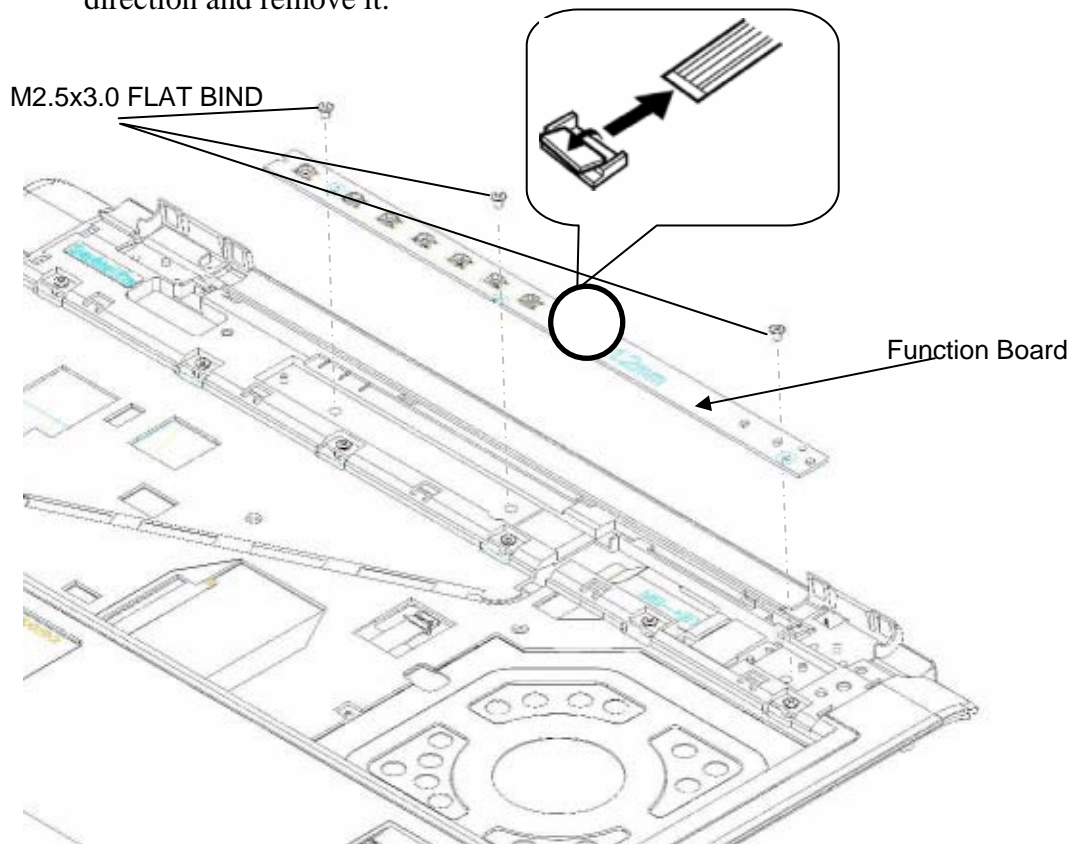


## 4.8 Function Button Board

### Removing the Function Board

The following describes the procedure for removing the Function board (See Figure 4-10).

1. Remove the following **screw** securing the switch membrane.
  - M2.5×3.0B FLAT BIND screw x3
2. Unlock the **Function board** cable and Push up the **Function board** to the arrow direction and remove it.



*Figure 4-10 Removing the Function board*

## **Installing the Function Board**

The following describes the procedure for installing the switch membrane.

1. Press Function board in the computer.
2. Secure the Function board with the following **screw**.
  - M2.5×3.0B FLAT BIND screw x3

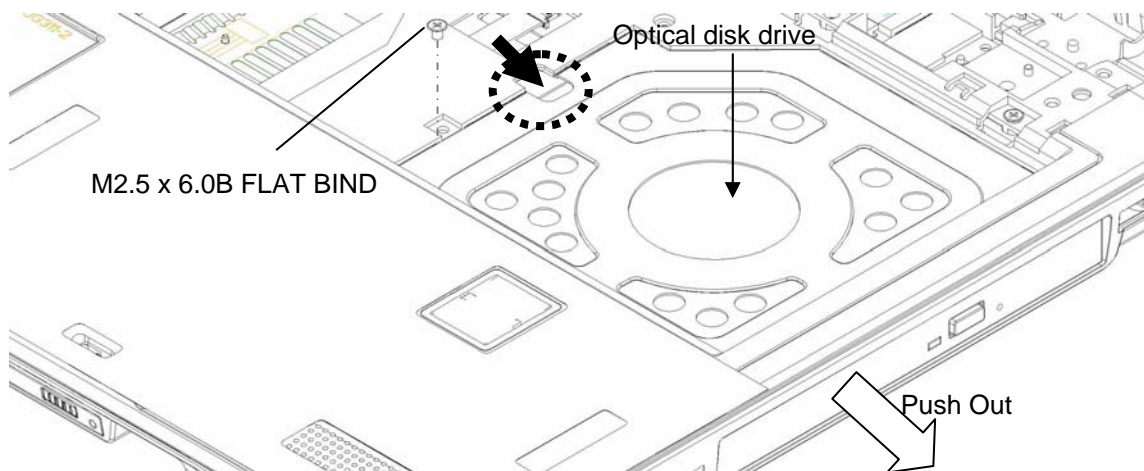
## 4.9 Optical disk drive

**NOTE:** Do not apply excessive force to the top of an optical disk drive.  
Do not touch the shaded portion of the figure below, when the drive is removed or installed.

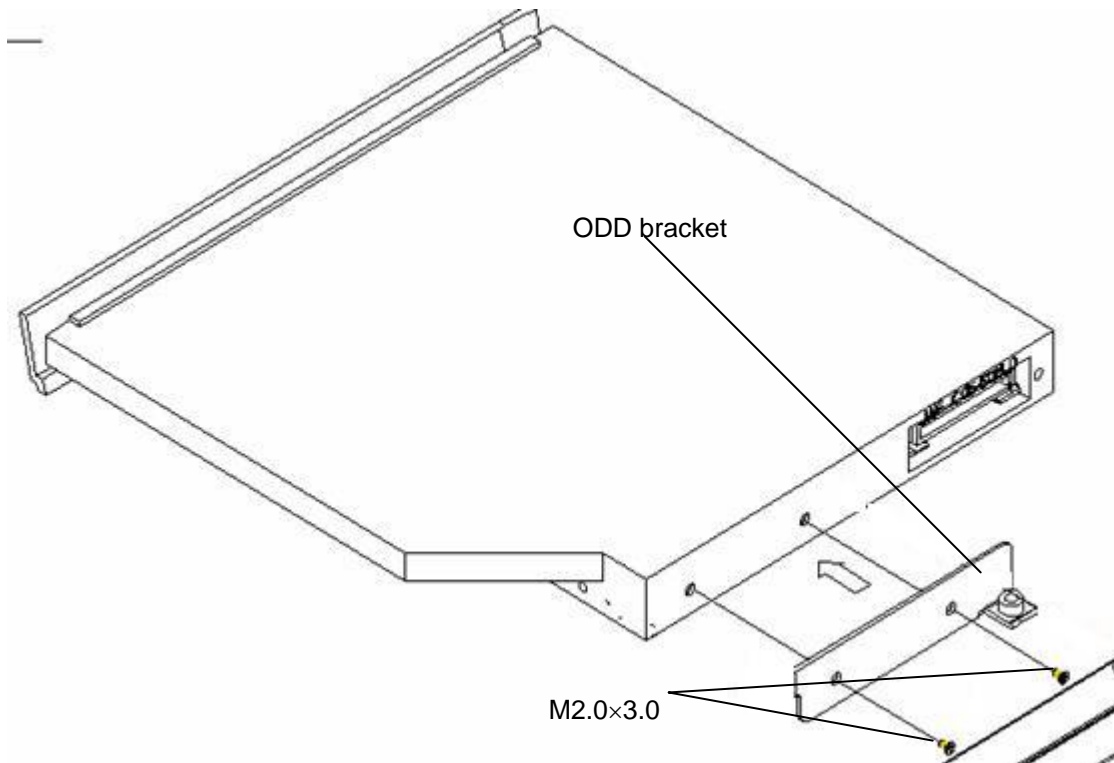
### Removing an optical disk drive

The following describes the procedure for removing an optical disk drive (See Figure 4-11 and 4-12).

1. Remove **Keyboard** and next remove the following **screws** securing an optical disk drive.
  - M2.0×6.0B FLAT BIND screw x1
2. Disconnect an **optical disk drive** toward the arrow direction from the connector **CN26** on the system board.



*Figure 4-11 Removing an optical disk drive*



*Figure 4-12 Disassembling the side bracket*

### **Installing an optical disk drive**

The following describes the procedure for installing an optical disk drive (See Figure 4-11 and 4-12).

1. Attach the **ODD bracket** to an optical disk drive and secure it with the following **screws**.

- M2.0x3.0 Flat BIND screw            x2

2. Insert an optical disk drive assembly into the slot and connect it to the connector **CN26** on the system board.

3. Secure the ODD drive with the following **screw**.

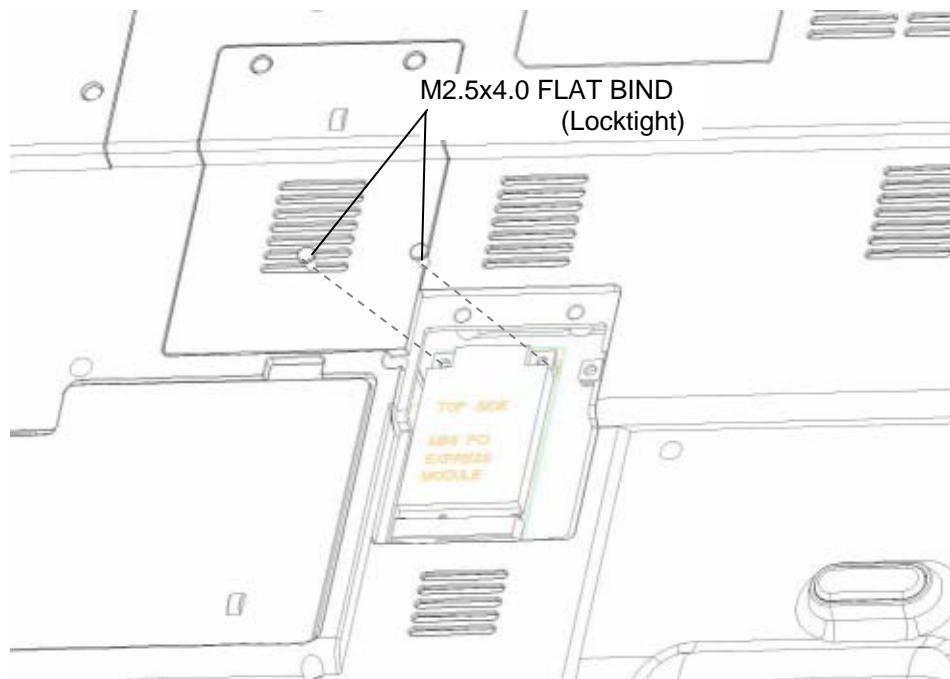
- M2.5X6.0            Flat BIND screw    X1

## 4.10 Display assembly

### Removing the display assembly

The following describes the procedure for removing the display assembly (See Figure 4-13 to 4-17).

1. Close the display and turn the computer upside down.
2. Open the **MINIPCI Door** and remove the **wireless LAN screws and antenna connector**.



*Figure 4-13 Removing the screws (securing display assembly)*

3. Open the display and removing the **k/b cover** and **keyboard**.

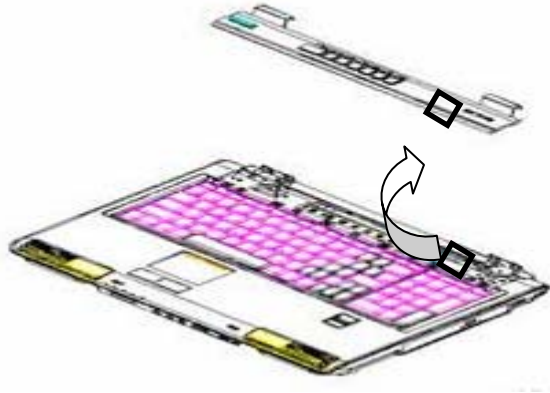


Figure 4-14 Removing keyboard cover

4. Disassembly Function board and pull out the **wireless LAN antenna** and **LCD cables** from the guide, If there was Bluetooth Antenna, pls. also remove it ( the 5th point)

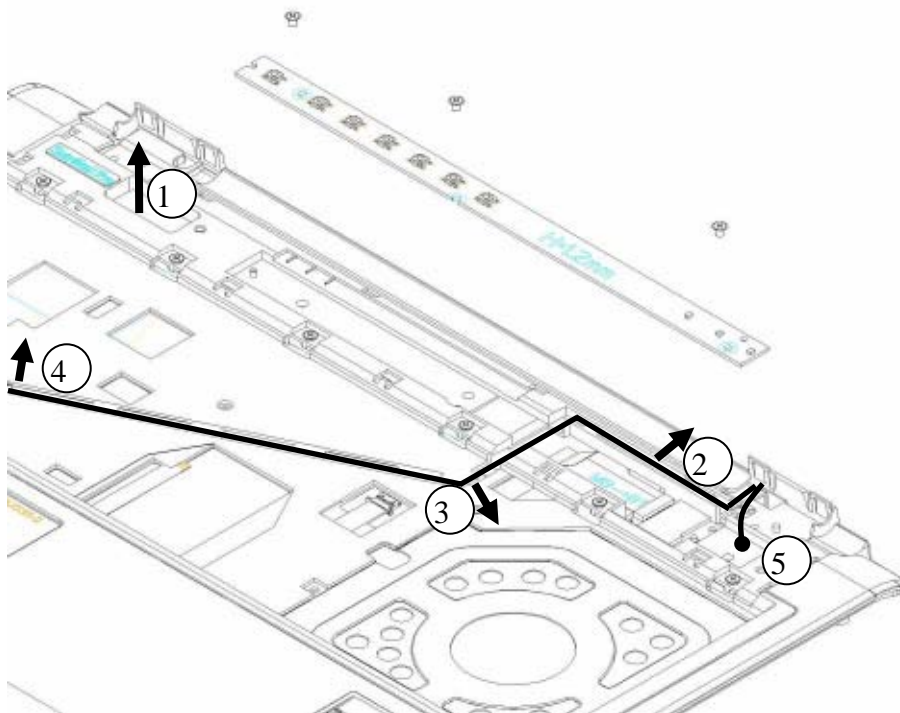
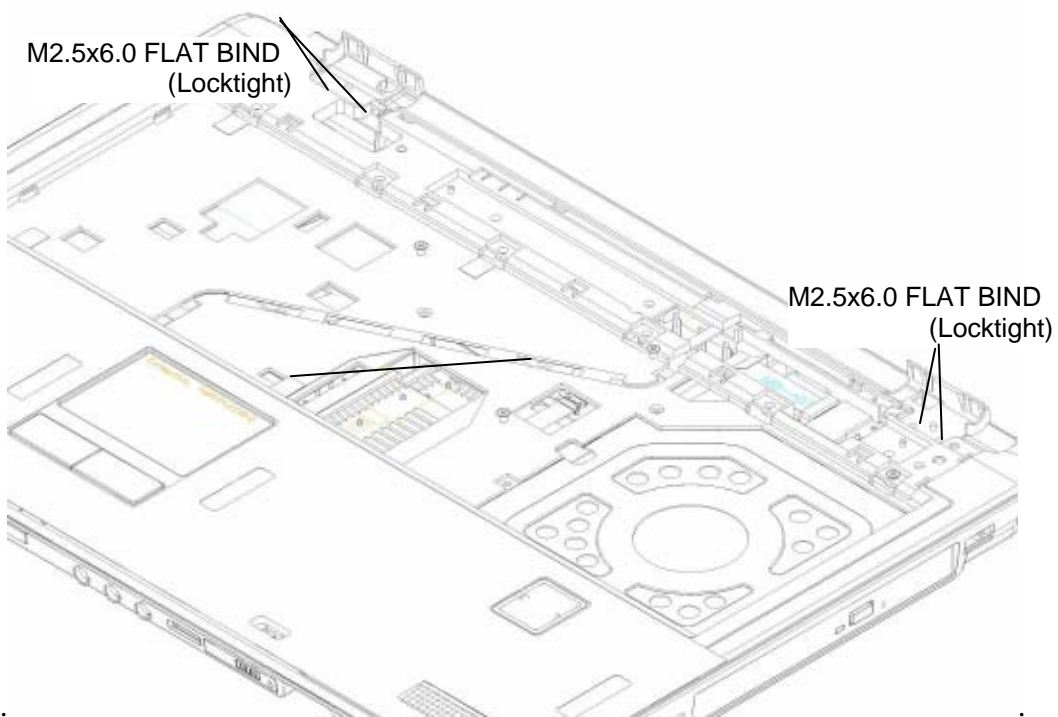


Figure 4-25 Removing the Wireless Antenna and Bluetooth

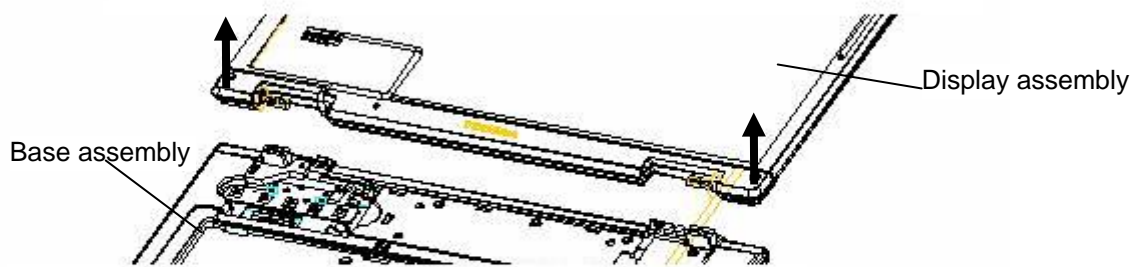
4. Opening the display to 180 degree, and remove the hinge screw .

- M2.5x6.0 FLAT BIND screw      x4    (Locktight)



*Figure 4-36 Removing the hinge screw*

5. Remove the **LCD harness** from the connector on the system board and pulling out the **pole of hinge** from the **hole** of hinge assembly, remove the **display assembly** from the base assembly.



*Figure 4-17 Removing the LCD harness and remove display assembly*



## **Installing the display assembly**

The following describes the procedure for installing the display assembly (See Figure 4-13 to 4-17).

1. Inserting the **pole of hinge** to the **hole** of hinge assembly, set the **display assembly** on the base assembly.
2. Secure the **hinges** with the following **screws** , Secure the **display mask** with the following **screws** and stick the **mask seal** on them.

- M2.5×6.0B FLAT BIND screw x4  
(Locktight)

**NOTE:** *Be sure to apply the locktight to the screws instructed in the figure above.*

3. Connect the **LCD harness** to the connector on the system board.
4. Arrange the wireless antenna cables along the guide (front) and secure them with **guide**.
5. Pass the cables to the back of computer through the **slot**.
6. Install the keyboard and k/b cover of the system.
7. Arrange the **wireless LAN antenna and Bluetooth cables** along the guide and contact with the connector.
8. Secure the display assembly from the back of computer with the following **screws**.

- M2.5×6.0B FLAT BIND screw x4  
(Locktight)

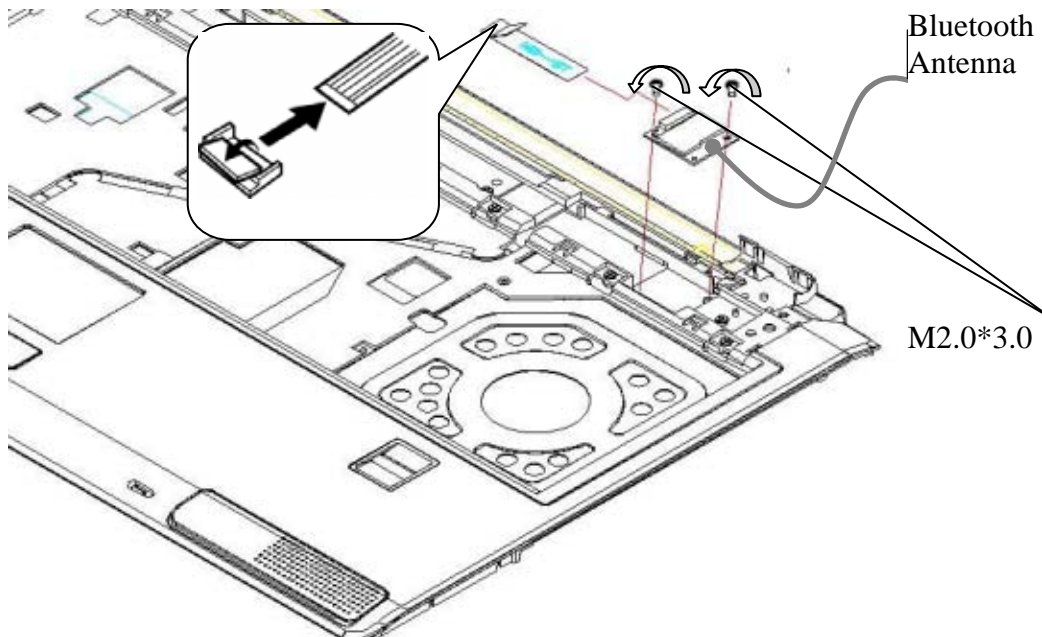
## 4.11 Bluetooth

The following describes for installing the display assembly (See Figure 4-18).

### Removing the Bluetooth

1. Pull out the Bluetooth cable connect from Bluetooth board
2. Loose the below screw and pull out the MB->BT cable.

- M2.3x3.0 x2



*Figure 4-18 Removing the Bluetooth*

### Installing the Bluetooth

1. Fix the below screw

- M2.3x3.0 x2

2. Connect Bluetooth cable with MB and press Bluetooth antenna tight with Bluetooth connect

**NOTE:** Be sure to apply the locktight to the screws instructed in the figure above.

## 4.12 Cover assembly

### Removing the cover assembly

The following describes the procedure for removing the cover assembly (See Figure 4-19 to 4-21).

1. Turn over the computer.
2. Remove the following **screws** securing the cover assembly from the back and bottom of computer.
  - M2.5×6.0 FLAT BIND screw Front x3
  - M2.5×6.0B FLAT BIND screw Back x18
  - M2.5x4.0 FLAT BIND screw x1

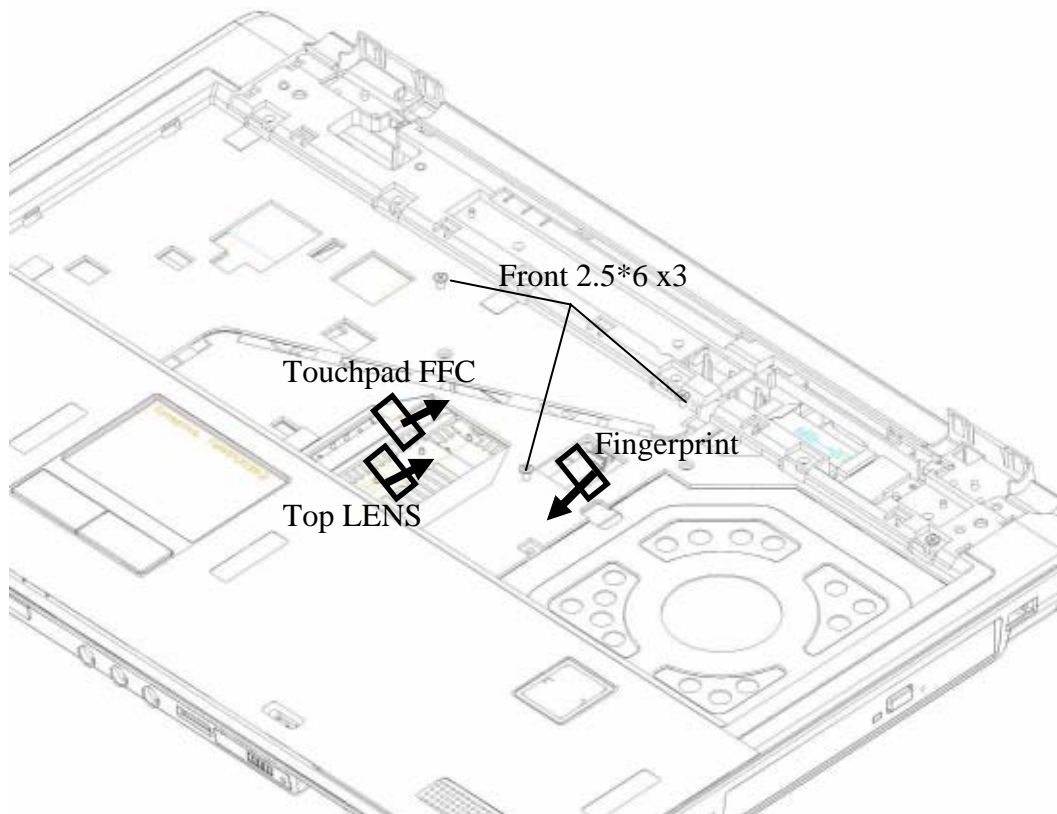
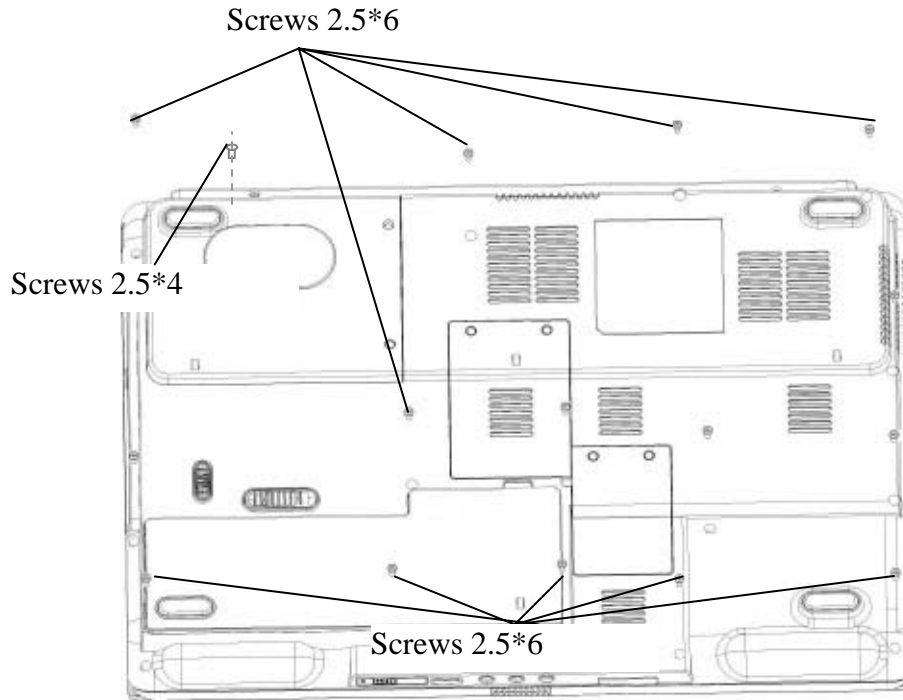


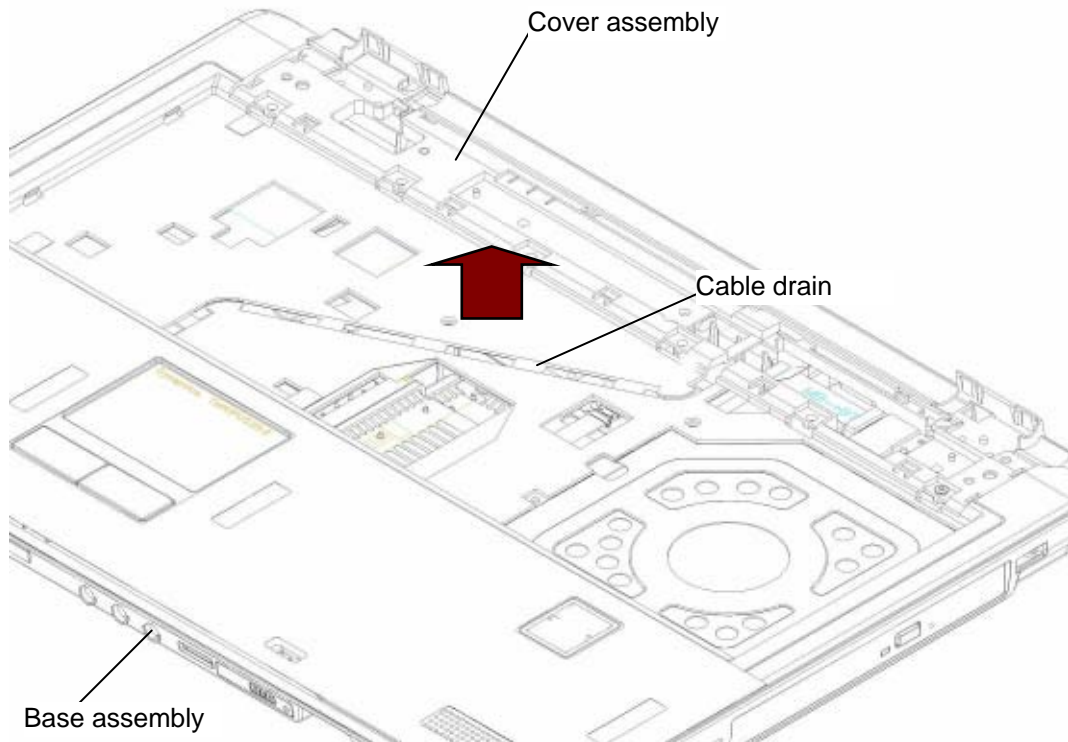
Figure 4-19 Removing the screws cable from connect (front)



*Figure 4-40 Removing the screws (back)*

3. Disconnect the **touch pad flat cable/Fingerprint cable/Top LENS** from the connector on the system board.

4. Pull up and remove the **cover assembly** from the **base assembly**.



*Figure 4-21 Removing the cover assembly*

## **Installing the cover assembly**

The following describes the procedure for installing the cover assembly (See Figure 4-19 to 4-21).

1. Install the **cover assembly** to the base assembly.

**NOTE:** *Be careful not to catch the cables between cover assembly and base assembly.*

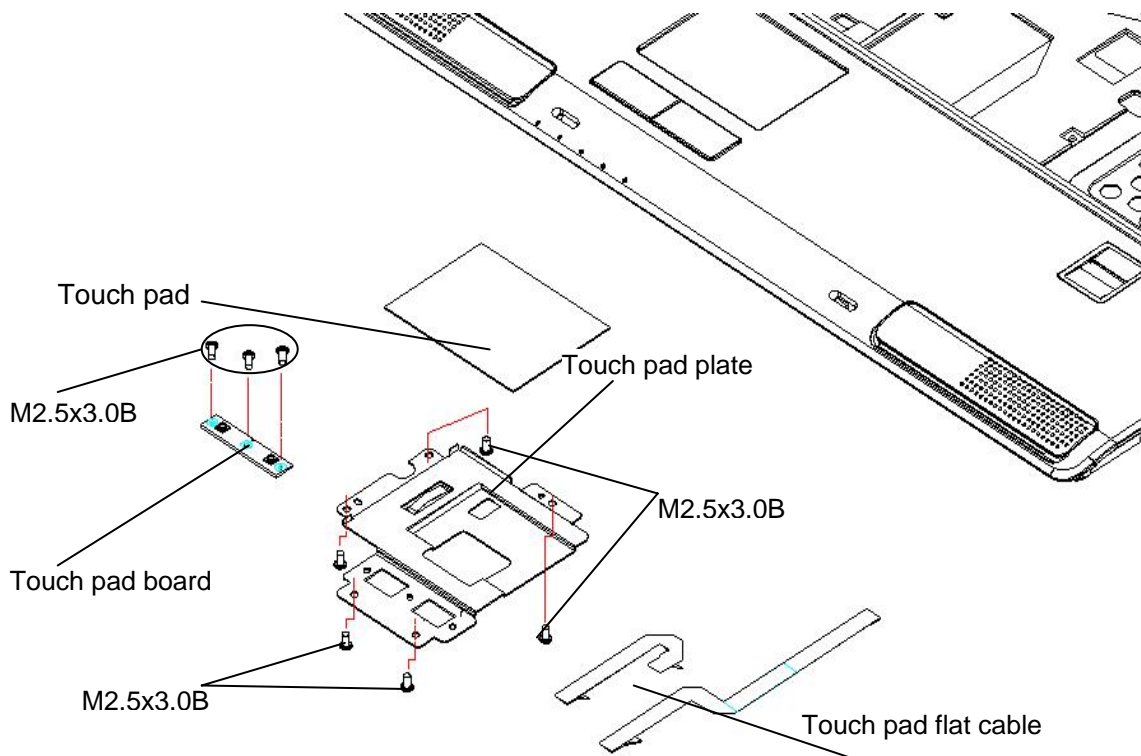
2. Connect the **touch pad flat cable** to the connector on the system board.
3. Secure the cover assembly with the following **screws** from the back and bottom of computer.
  - M2.5×6.0B FLAT BIND screw Front x3
  - M2.5×6.0B FLAT BIND screw Back x18
  - M2.5x4.0 B FLAT BIND screw x1
4. Free the cable from cable-drain when through the antenna cable to PCB hole.

## 4.13 Touch pad

### Removing the touch pad

The following describes the procedure for removing the touch pad (See Figure 4-22).

1. Peel off the **glass tape** and disconnect the **touch pad flat cable** from the connector on the touch pad and peel the al foil.
2. Remove the following **screws** securing the touch pad plate.
  - M2.5x3.0B SUPER THIN HEAD screw x7
3. Turning up the **insulator**, remove the **touch pad plate**.
4. Peel off and remove the **touch pad** from the cover assembly.



*Figure 4-22 Removing the touch pad*

## **Installing the touch pad**

The following describes the procedure for installing the touch pad (See Figure 4-22).

1. Peel off the separator covering on the sensor portion of a new touch pad.

**NOTE:** *Do not reuse the touch pad so that it can not be used after peeling off from the computer. Be sure to stick a new touch pad.*

*When sticking the touch pad, be careful not to get the bubbles under the touch pad.*

2. Stick and install the **touch pad** on the cover assembly.
3. Install the **touch pad plate** and secure it with the following **screws**.
  - M2.5×3.0B SUPER THIN HEAD screw x7
4. Stick the **insulator** on the touch pad plate.
5. Connect the **touch pad flat cable** to the connector on the touch pad and stick the **glass tape** on the connector.



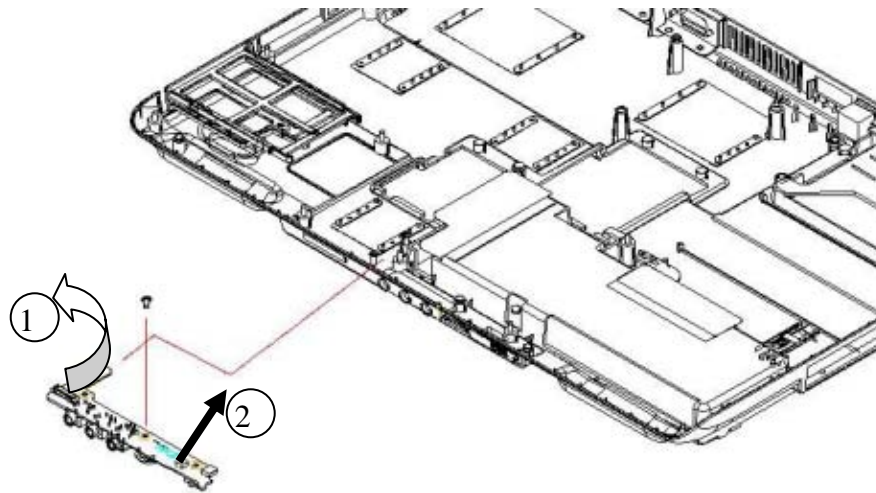
## 4.14 Audio Board

The following describes for removing the cover assembly (See Figure 4-23).

### Removing the audio board

1. Pull out the **audio board cable** from audio board connect CN4
2. Loose the below **screws** and then incline pull out **audio board**.

- M2.5x4.0      FLAT BIND screw      x1



*Figure 4-23 Removing the Audio Board*

### Installing the audio board

1. Insert the **audio board** into base case and connect audio board cable with CN4
2. Fix the below **screws**

- M2.5x4.0      FLAT BIND screw      x1

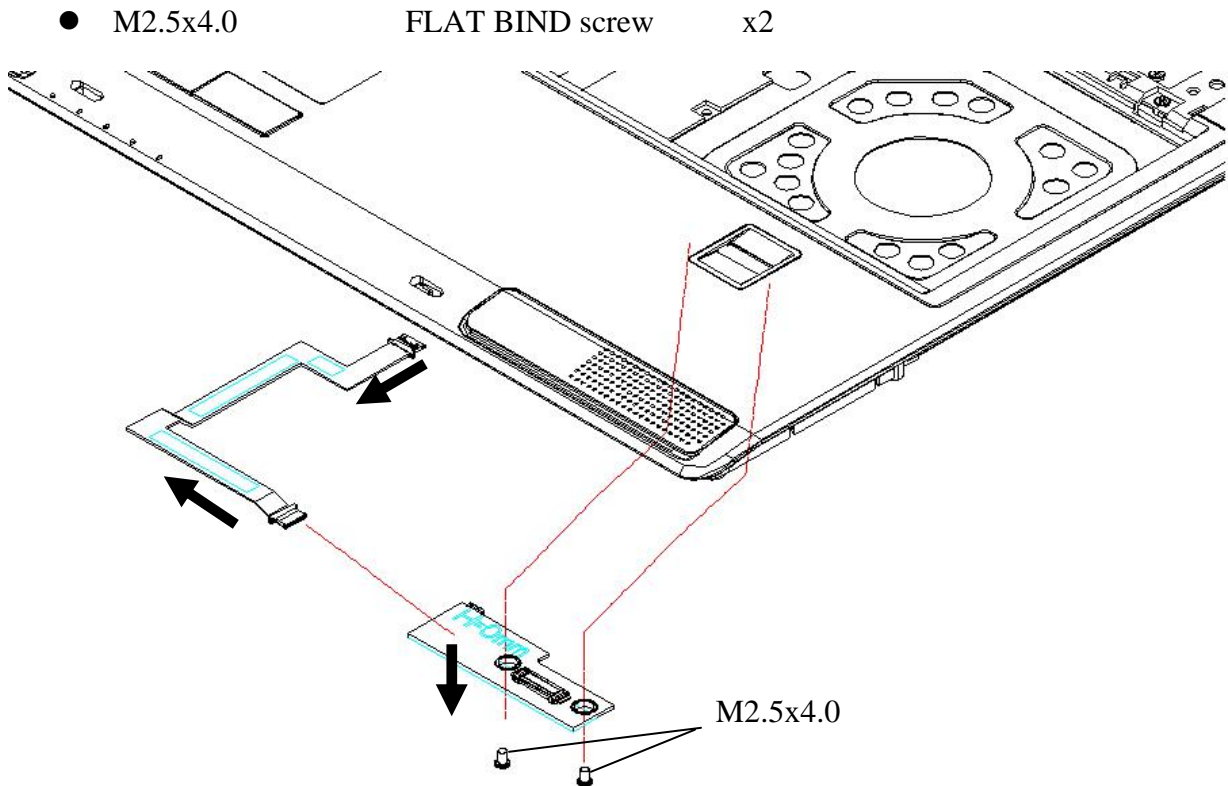
**NOTE:** *Be careful not to catch the cables between cover assembly and base assembly.*

## 4.15 Fingerprint

The following describes for removing the cover assembly (See Figure 4-24).

### Remove the Fingerprint

1. Pull out the **fingerprint cable** from connect CN5
2. Loose below **screws** from fingerprint board and take it out top case



*Figure 4-24 Removing the Fingerprint*

### Installing the Fingerprint

1. Turn over top case and put fingerprint in correct location
2. Fix below screws and connect the fingerprint cable CN5

- M2.5x4.0      FLAT BIND screw      x2

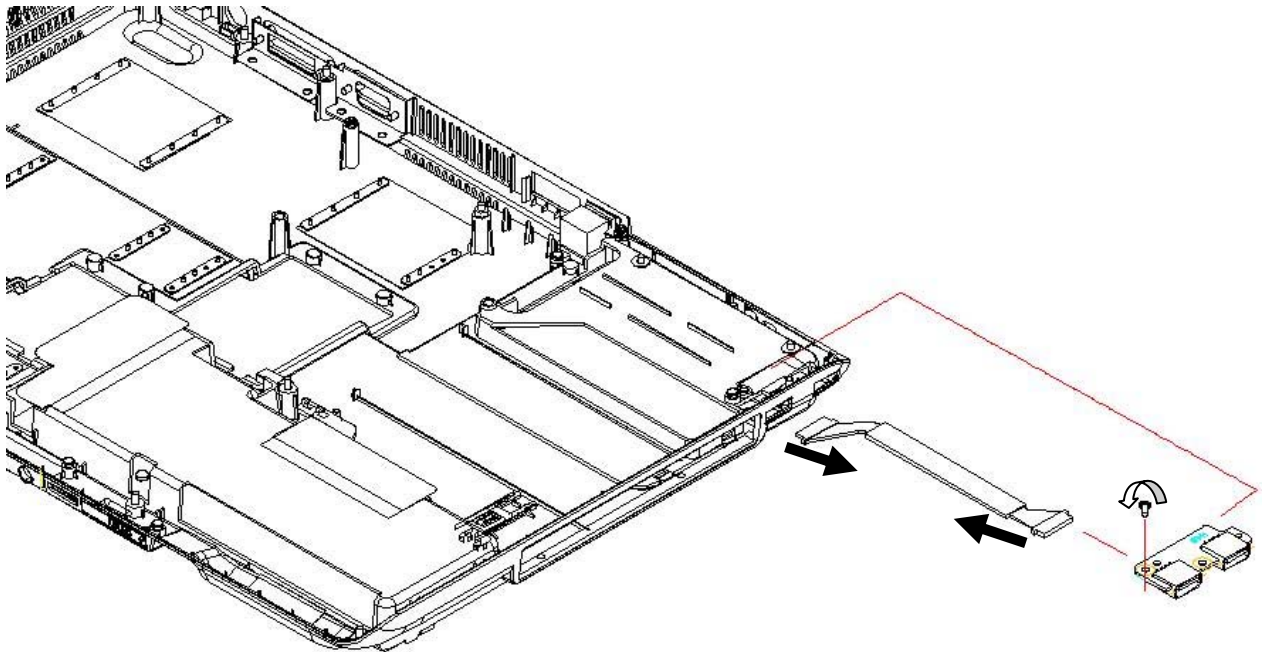
## 4.16 USB Board

The following describes for removing the cover assembly (See Figure 4-25).

### Removing USB board

1. Remove the USB cable from CN4 and USBCN1
2. Loose below screw from USB board

- M2.5x4.0                      FLAT BIND screw                      x1



*Figure 4-25 Removing the USB board*

### Installing the USB Board

1. Put USB board in correct location and fix below screw

- M2.5x4.0                      FLAT BIND screw                      x1

2. Connect the USB cable between CN4 and USBCN1





## 4.17 System board

**CAUTION:** 1. When handling the system board, always hold by the edges. Do not touch the printed circuit face.

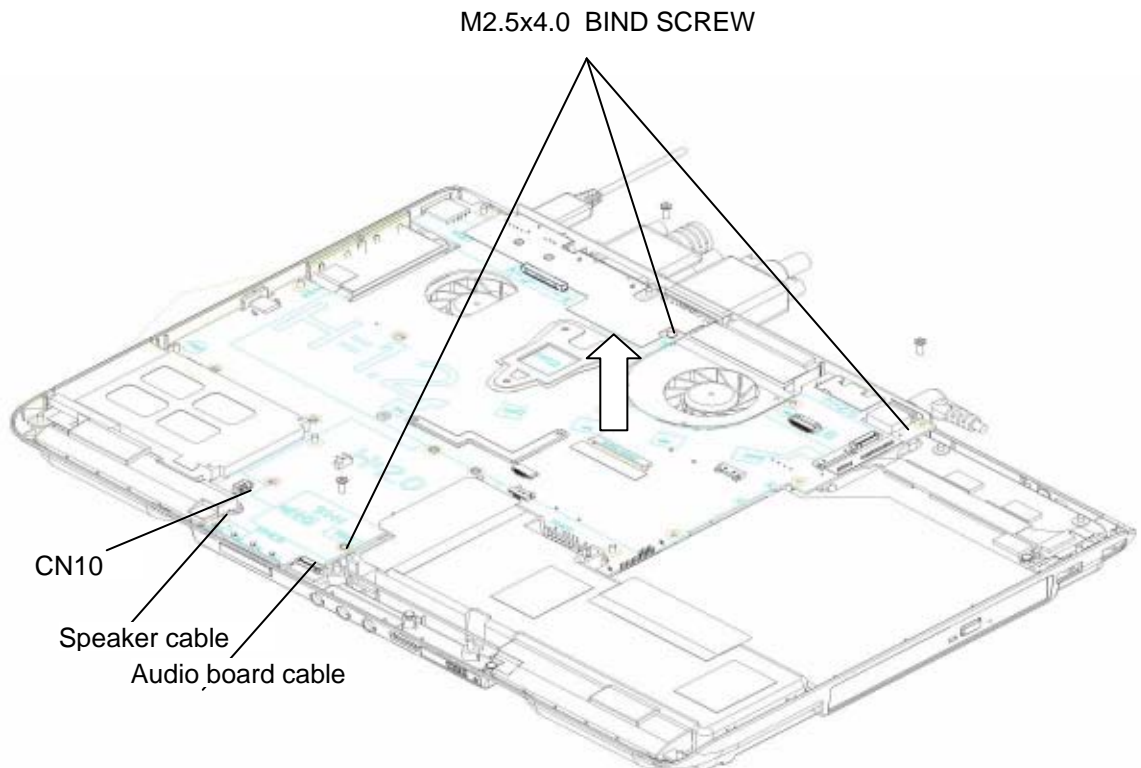
2. If replacing with a new system board, execute the substest01 Initial configuration in section 3.3 “Setting of the hardware configuration”. Also update with the latest BIOS as described in Appendix G “BIOS Rewrite Procedures” and with the latest EC/KBC as described in Appendix H “EC/KBC Rewrite Procedures”.

### Removing the system board

The following describes the procedure for removing the system board (See Figure 4-26).

1. Disconnect the **speaker cable** from the connector **CN10** on the system board.
2. Remove the following **screws** securing the system board and remove the **system board**.

- M2.5×4.0 BIND screw x3



*Figure 4-26 Removing the system board*

## **Installing the system board**

The following describes the procedure for installing the system board (See Figure 4-26).

1. Secure the system board with the following **screws**.
  - M2.5×4.0 BIND screw x3
2. Connect the **speaker cable** to the connector **CN 10** on the system board.

## 4.18 CPU

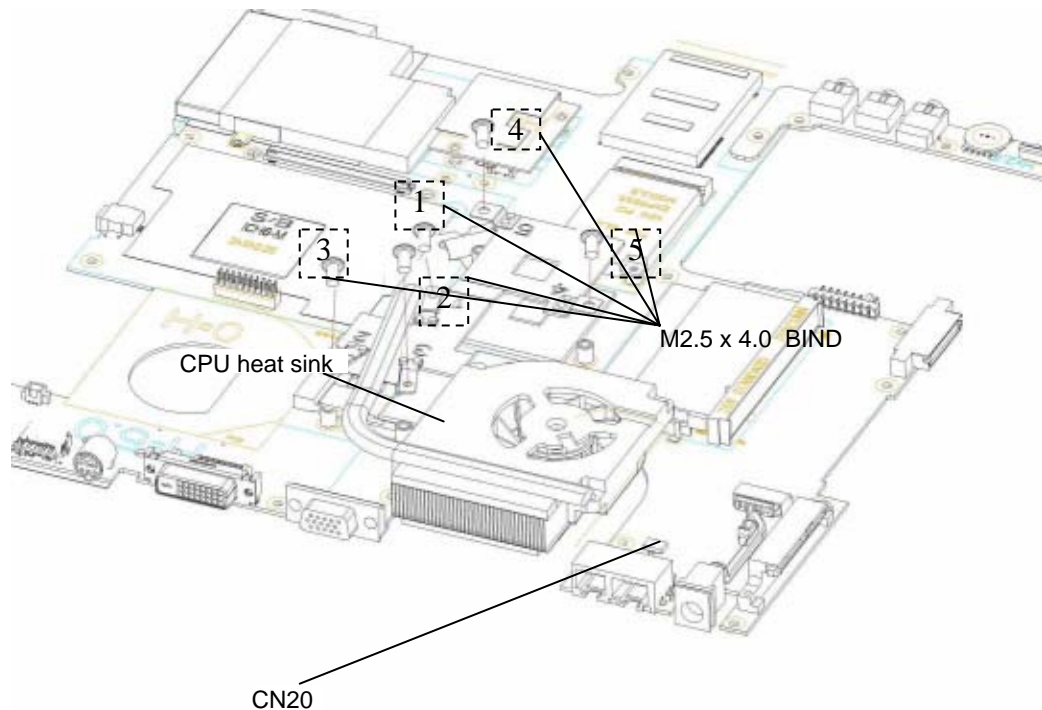
### Removing the CPU heat sink

The following describes the procedure for removing the CPU heat sink (See Figure 4-27 ).

1. Disconnect the **Heat sink cable** from the connector **CN20** on the system board
2. Remove the following **screws** securing the heat sink holder along 1 to 3.
  - M2.5×4.0 BIND screw x3

**NOTE:** *When removing the heat sink holder, be sure to remove the screws in the reverse order of the number marked on the holder.*

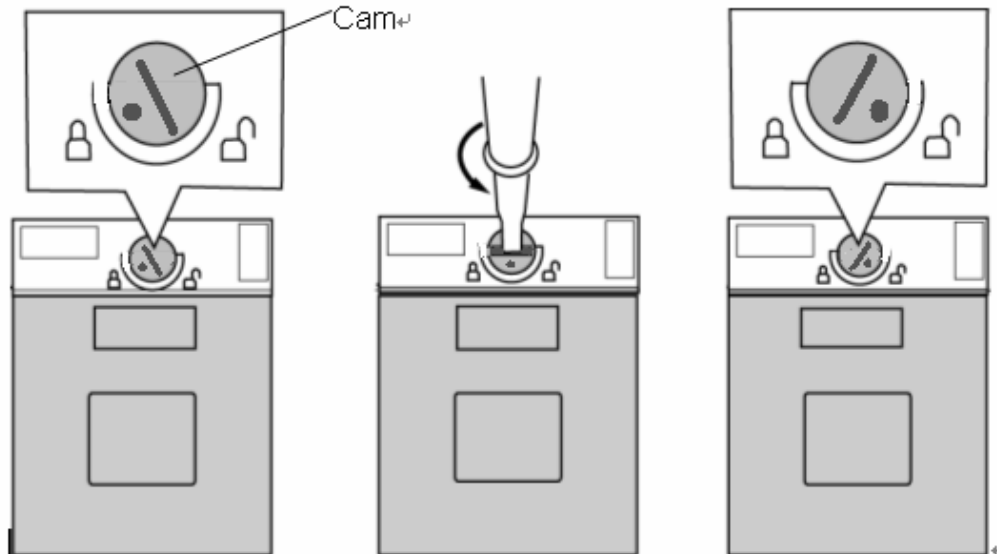
3. Remove the **CPU heat sink**.



*Figure 4-27 Removing the CPU heat sink*



4. Unlock the **CPU** by rotating the **cam** on the CPU socket 120 degrees to the counterclockwise with a flat-blade screwdriver.
5. Remove the **CPU**.



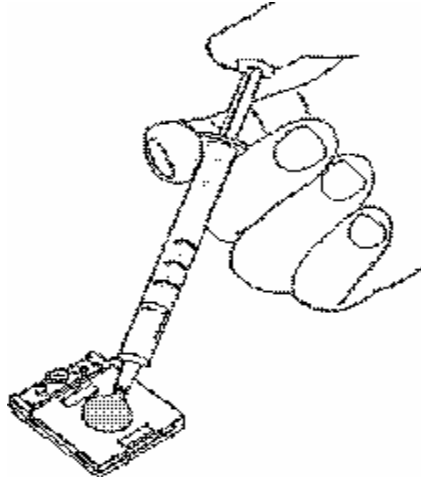
*Figure 4-28 Removing the CPU*

### **Installing the CPU**

The following describes the procedure for installing the CPU (See Figure 4-27 to 4-29).

1. Check that the mark of cam is in the unlocking position.
2. Attach the **CPU** to the correct position in the **CPU socket**.
3. Fix the **CPU** by rotating the cam 120 degrees to the clockwise with a flat-blade screwdriver.
4. If there is already silicon grease on the CPU, clean it with a cloth.  
Using a special applicator, apply silicon grease so that the CPU chip on the CPU is completely covered.

**NOTE:** *Apply the silicon grease enough to cover the chip surface using the special applicator.*



*Figure 4-29 Applying silicon grease*

5. Install the **CPU heat sink** and **heat sink holder** and secure them with the following **screws** along 1 to 5.

M2.5×4.0BIND screw                      x5

6. Connect the **Heat sink cable** to the connector **CN 20** on the system board

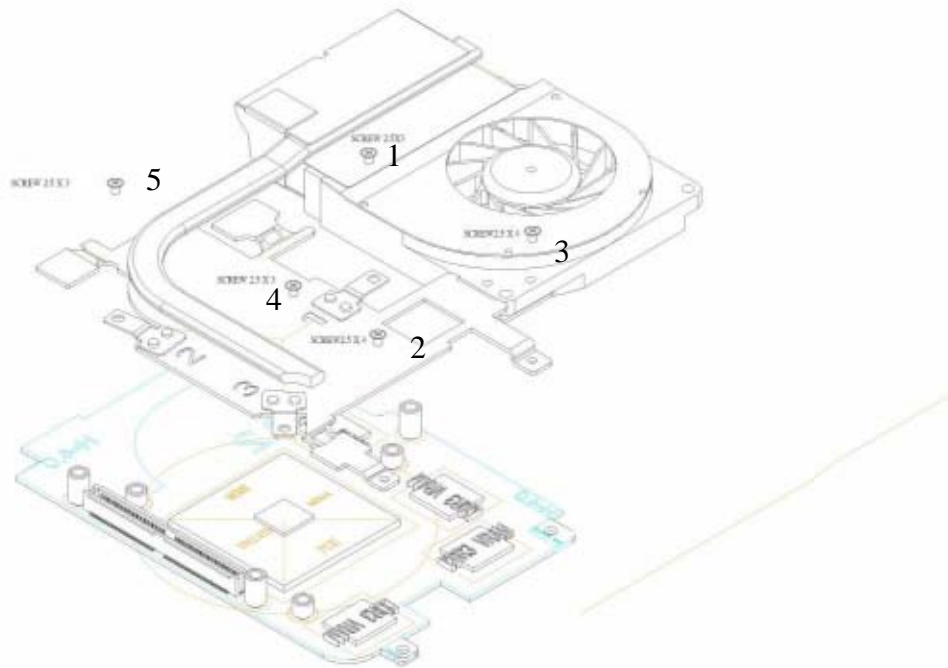
**NOTE:** *When securing the heat sink holder, be sure to secure the screws in the order of the number marked on the holder.*

## 4.19 VGA heat sink

### Removing the VGA heat sink

The following describes the procedure for removing the VGA heat sink (See Figure 4-30).

1. Remove the following **screws** securing the VGA heat sink along 1 to 5.
  - M2.5×3.0 BIND screw x5
2. Pull up the **VGA heat sink** straight and remove it.



*Figure 4-30 Removing the VGA heat sink*

## **Installing the VGA heat sink**

The following describes the procedure for installing the VGA heat sink (See Figure 4-30).

1. Install the **VGA heat sink**.

**NOTE:** *For details on applying the silicon grease, refer to Installing the CPU.*

2. Secure the VGA heat sink with the following **screws** along 1 to 5.

- M2.5×3.0 BIND screw      x5

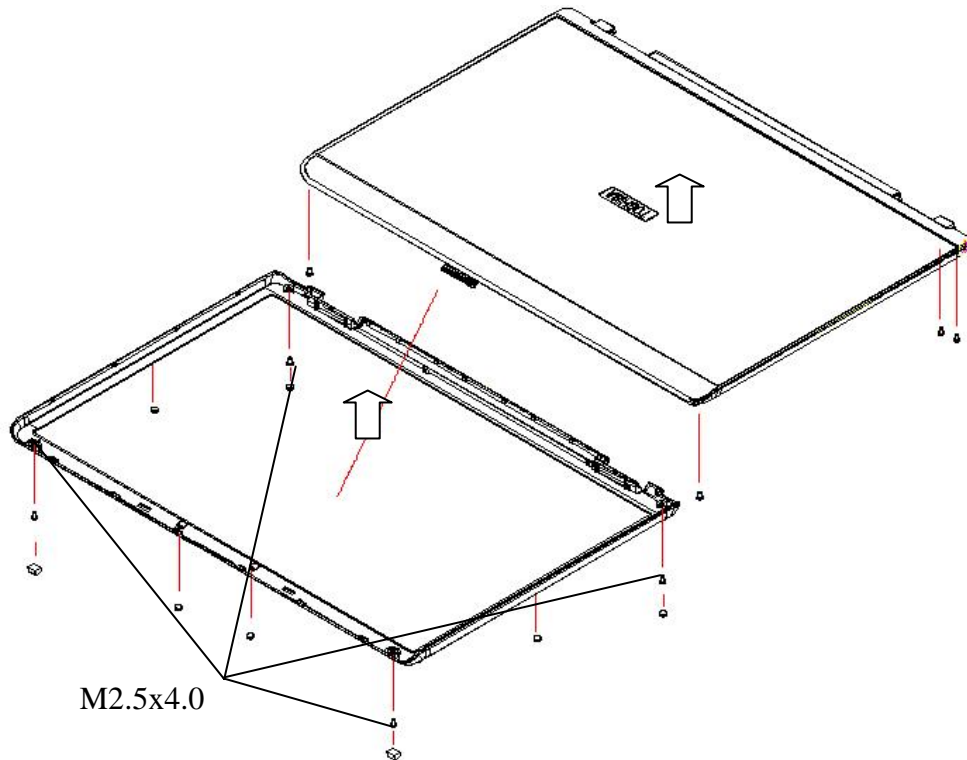
## 4.20 LCD unit / FL inverter

**CAUTION:** When replacing a LCD, it is required that SVP parameter is set. Update with the latest EC/KBC as described in Appendix H “EC/KBC Rewrite Procedures”.

### Removing the LCD unit / FL inverter

The following describes the procedure for removing the LCD unit and FL inverter (See Figure 4-31 to 4-34).

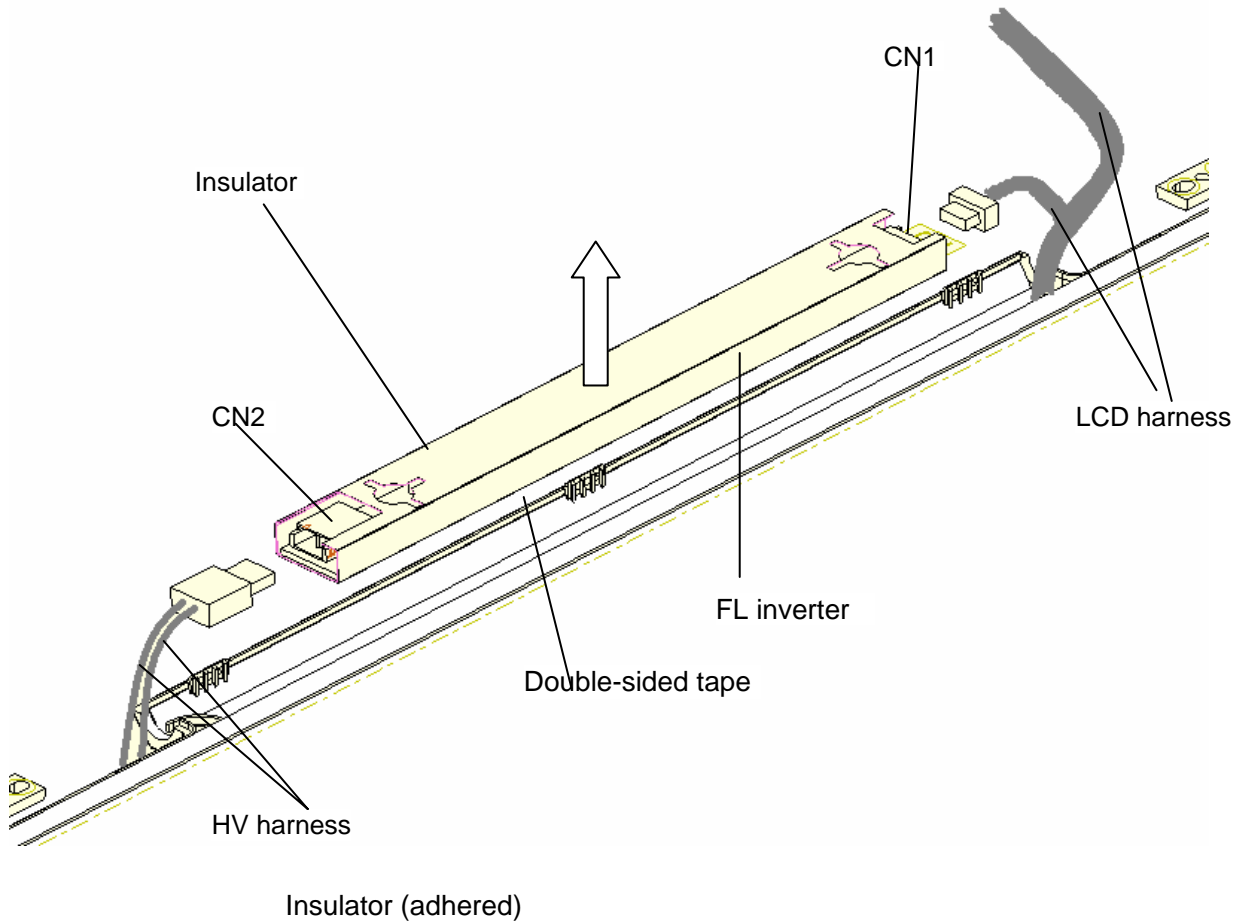
1. Remove Screw rubber cover X4
2. Remove the following screws securing the display mask  
M2.5x4.0 BIND screw X4
3. Insert your finger between the edge of the display mask and the LCD, and remove the display mask while releasing the latches of display mask.



M 2.5X6.0 BIND screw

Figure 4-31 Removing the display mask

4. Pull out one **insulator** and peel off the other one adhered to the FL inverter.
5. Disconnect the **LCD harnesses** from the connectors **CN1** on the FL inverter.
6. Disconnect the **HV harnesses** from the connectors **CN2** on the FL inverter.
7. Remove the **FL inverter** while peeling off the **double-sided tape**.



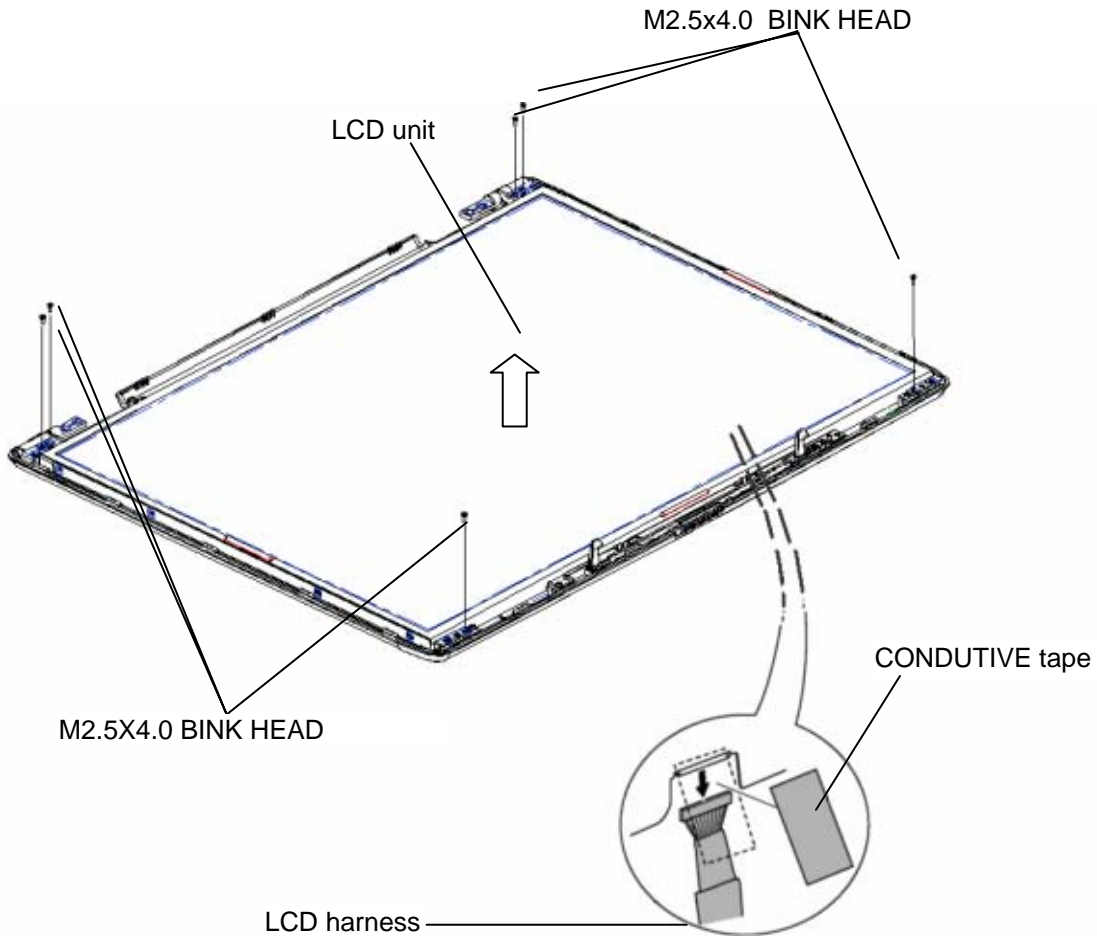
*Figure 4-32 Removing the FL inverter*

8. Remove the following **screws** securing the LCD unit.

- M2.5x4.0 BINK HEAD screw                      x6

9. With the bottom edge of the LCD unit on the display cover, lift only the top edge of the LCD unit. After peeling off the **CONDUTIVE tape**, disconnect the LCD harness from the connector on the back of the LCD.

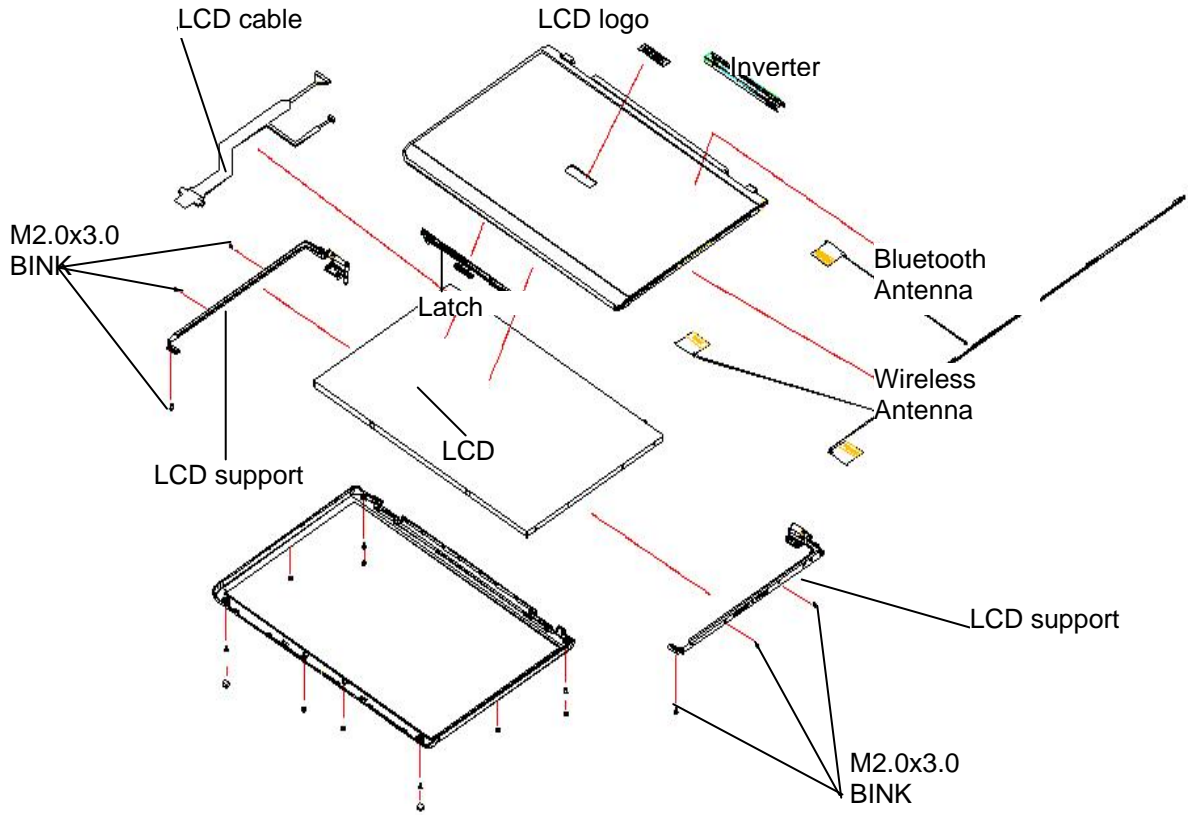
10. Remove the **LCD unit**.



*Figure 4-33 Removing the LCD unit*

11. Remove the following **screws** securing the LCD support (LCD unit side) and remove the **LCD supports** from the LCD unit.

- M2.0x3.0 BINK screw                      x4



*Figure 4-34 Removing the LCD supports*



## Installing the LCD unit/FL Inverter

The following describes the procedure for installing the LCD unit and FL inverter (See Figure 4-31 to 4-34).

1. Install the LCD supports (LCD unit side) to the LCD and secure them with the following **screws**.
  - M2.0×3.0 BINK screw x4
2. Stand the **LCD unit** on the display cover and connect the **LCD harness** to the connector on the back of LCD.
3. Stick the **conductive tape** on the connector of LCD harness.
4. Secure the LCD unit with the following **screws**.
  - M2.5×4.0 BINK screw x6
5. Connect **LCD harnesses** to the connector **CN1** of the FL inverter.

**CAUTION:** *Be careful not to connect the LCD harnesses to the wrong connectors of FL inverter.*

6. Connect **HV harnesses** to the connector **CN2** of the FL inverter.
7. Install the **display mask** while fitting the latches.
8. Secure the display mask with following **screws**
  - M2.5×6.0 BIND screw X4
9. Cover screws with Screw rubber cover X4

**NOTE:** *When installing the display mask, make sure there is no gap between the display mask and the display cover.*

---

# Appendices

---



---

## Appendix Contents

---

<b>Appendix A</b>	<b>Handling the LCD Module .....</b>	<b>A-1</b>
<b>Appendix B</b>	<b>Board Layout.....</b>	<b>B-1</b>
B.1	System Board.....	B-1
B.2	Function Button Board Back View.....	B-4
B.3	Modem Board .....	B-5
B.4	Touch Pad Board.....	B-6
B.5	Audio Board.....	B-7
B.6	VGA Board.....	B-9
B.7	Fingerprint Board.....	B-11
B.8	USB Board.....	B-12
<b>Appendix C</b>	<b>Pin Assignment.....</b>	<b>C-1</b>
C.1	CN1 Bluetooth Connector.....	1
C.2	CN2 LCD Panel Connector .....	1
C.3	CN3 Button Board Connector.....	2
C.4	CN4 USB Board Connector.....	3
C.5	CN5 Finger Print Board Connector .....	4
C.6	CN6 Internal K/B Connector .....	4
C.7	CN7 Touchpad Board Connector.....	5
C.8	CN8 RTC Battery Connector.....	5
C.9	CN9 PCMCIA Connector .....	5
C.10	CN10 Speaker Connector .....	7
C.11	CN11 S-Video Connector .....	7
C.12	CN12 CRT Connector.....	8
C.13	CN13 DVI Connector .....	8
C.14	CN14 RJ11/RJ45 Connector.....	9

C.15	CN15 USB Port-1 .....	10
C.16	CN16 USB Port-2 .....	10
C.17	CN17/ CN20 Fan Connector.....	10
C.18	CN18 RJ11 Exchange Connector .....	10
C.19	CN19 HDD connector.....	10
C.21	CN21 Power Jack Connector .....	12
C.22	CN22 VGA Power Connector .....	12
C.23	CN23 DDR2 Connector .....	12
C.24	CN24 DDR2 connector.....	17
C.25	CN25 1394 connector .....	21
C.26	CN26 ODD Board connector.....	22
C.27	CN27 VGA Interface connector .....	23
C.28	CN 28 Modem Board connector .....	27
C.29	CN 29 New Card connector.....	28
C.30	CN 30 Mini Card connector.....	28
C.31	CN 31 5 in 1 Card connector .....	30
C.32	CN 32 Audio Board connector .....	31
C.33	CN 33 Speaker LED connector.....	31
C.31	PJ1 Battery connector .....	32
<b>Appendix D</b>	<b>Display Codes.....</b>	<b>D-1</b>
D.1	Display Codes .....	D-1
<b>Appendix E</b>	<b>Key Layout.....</b>	<b>E-1</b>
E.1	United States (US) Keyboard.....	E-1
E.2	United Kingdom (UK) Keyboard .....	E-1
E 3	Arabia (AR) Keyboard .....	E-2
E 4	Belgium (BB) Keyboard.....	E-2
E 5	Czech (CZ) Keyboard.....	E-3
E 6	German (GR) Keyboard .....	E-3
E 7	Danish (DK) Keyboard.....	E-4
E 8	Spanish (SP) Keyboard.....	E-4

E 9	French (FR) Keyboard.....	E-5
E 10	Hungary(HU) Keyboard.....	E-5
E 11	Italian (IT) Keyboard.....	E-6
E 12	Korean (KR) Keyboard .....	E-6
E 13	Norwegian (NO) Keyboard .....	E-7
E 14	Portuguese (PT) Keyboard .....	E-7
E 15	Traditional Chinese (TC) Keyboard.....	E-8
E 16	Swedish (SW) Keyboard .....	E-8
E 17	Russian (RU) Keyboard .....	E-9
E 18	Turkish (TR) Keyboard .....	E-9
E 19	Japanese (JP) Keyboard.....	E-10
E 20	Swiss-German(SL) Keyboard .....	E-10
E 21	Hebrew Keyboard.....	E-11
E 22	Greek Keyboard.....	E-11

<b>Appendix F</b>	<b>Wiring Diagrams .....</b>	<b>F-1</b>
F.1	RGB Monitor ID Wraparound Connector .....	F-1
F.2	LAN Loopbak Connector .....	F-1
<b>Appendix G</b>	<b>BIOS Rewrite Procedures.....</b>	<b>G-1</b>
<b>Appendix H</b>	<b>EC/KBC Rewrite Procedures.....</b>	<b>H-1</b>
<b>Appendix I</b>	<b>Reliability.....</b>	<b>I-1</b>

---

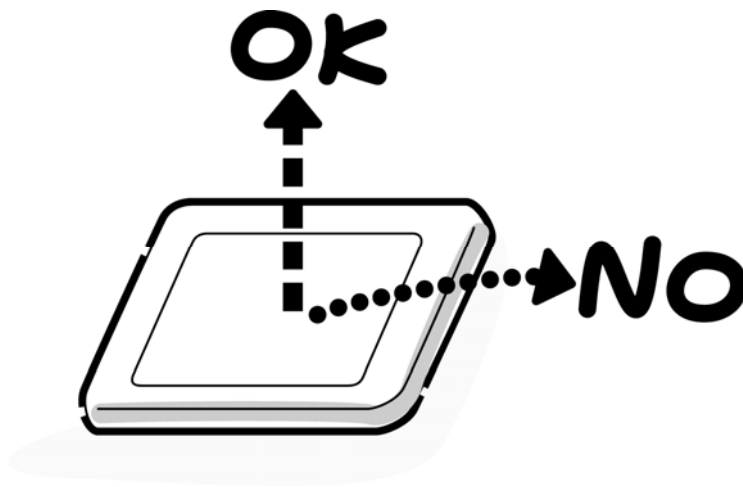
## Appendix A Handling the LCD Module

---

### Precautions for handling the LCD module

The LCD module can be easily damaged during assembly or disassembly. Observe the following precautions when handling the LCD module:

1. When installing the LCD module in the LCD cover, be sure to seat it so that it is properly aligned and maximum visibility of the display is maintained.



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

Also, the panel's polarized surface is easily scarred, so be careful when handling it.





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

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



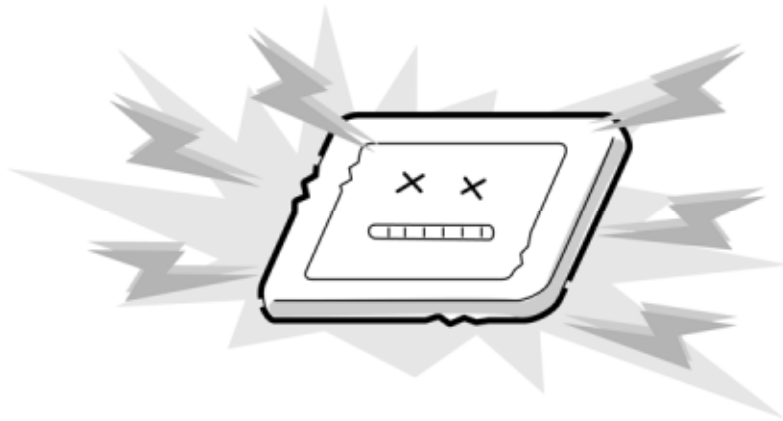
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.



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



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



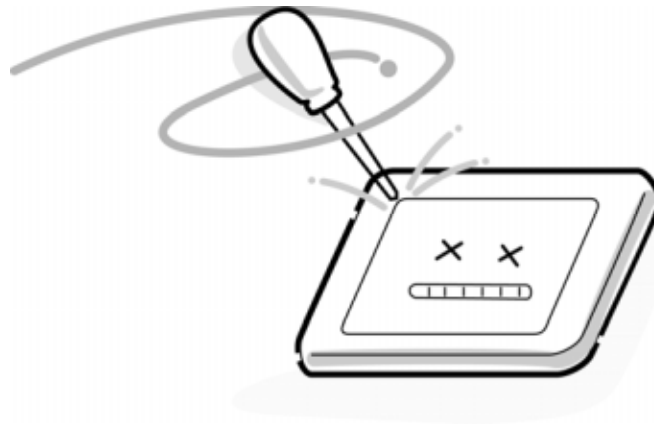
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.



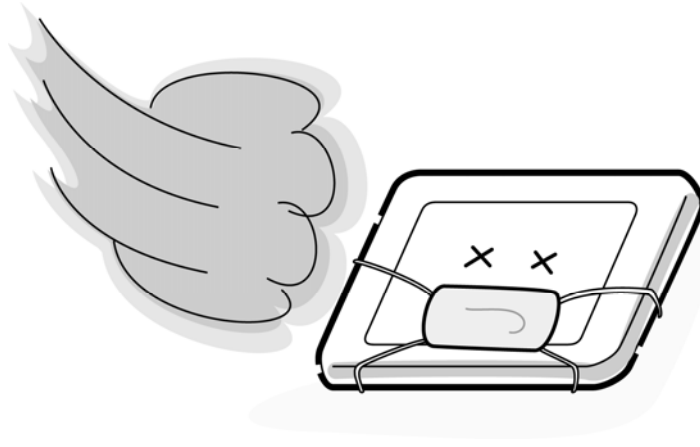
8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



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



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



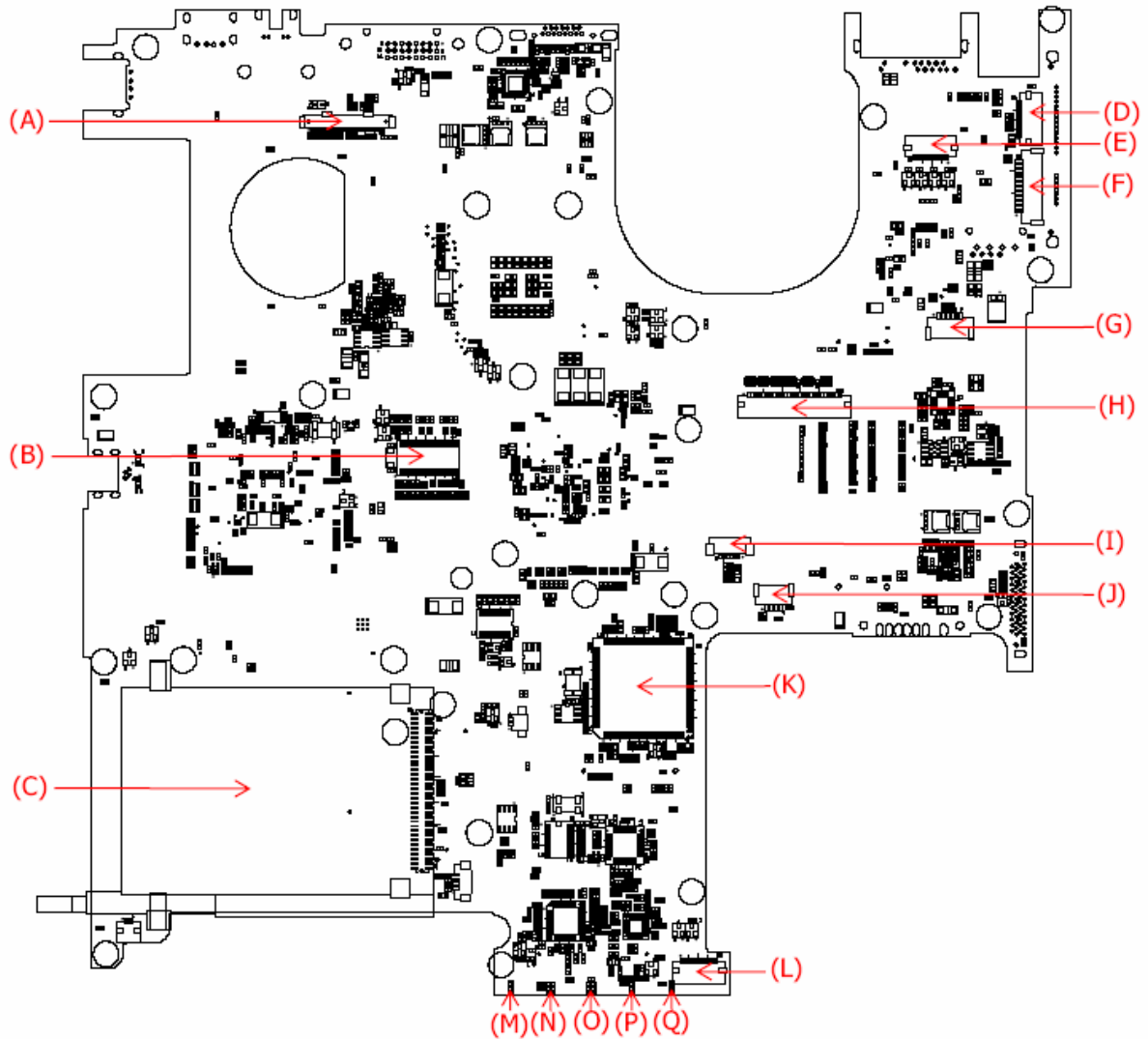


---

## Appendix B Board Layout

---

### B.1 System Board



*Figure B-1 System board layout (front)*

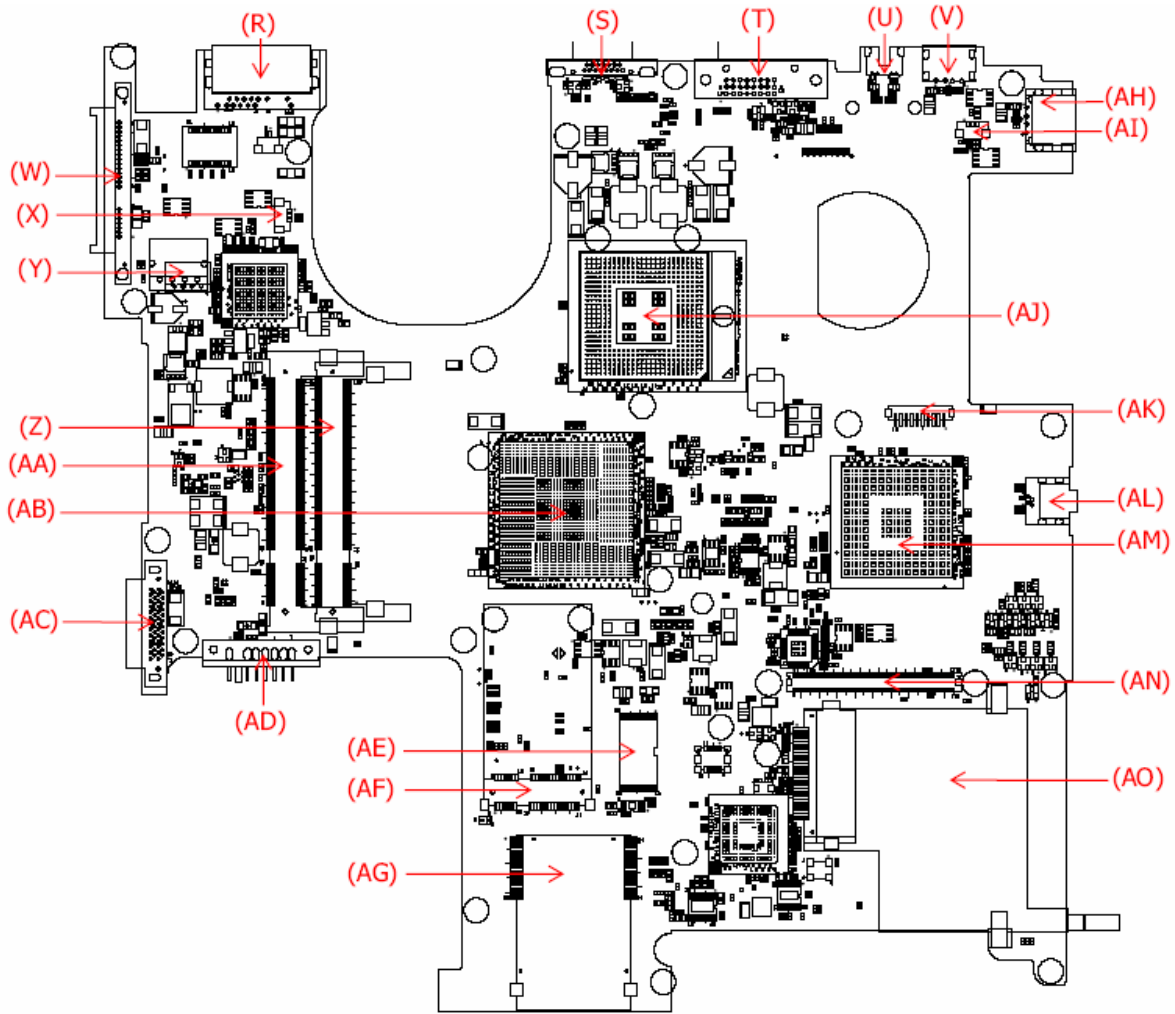


Figure B-2 System board layout (Back)

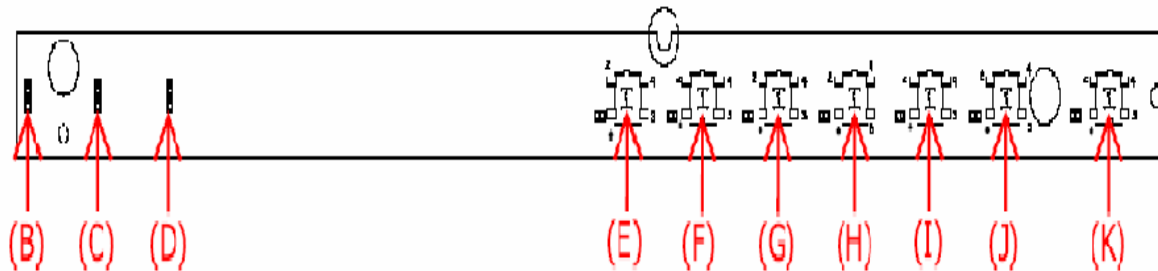
*Table B-1-1 System board ICs and connectors*

	Location	Function
(A)	CN2	M/B to LCD panel connector
(B)	U7	Clock generator
(C)	CN9	PC Card slot
(D)	CN1	Bluetooth connector
(E)	CN3	Button/B connector
(F)	CN4	USB/B connector
(G)	CN5	FP/B connector
(H)	CN6	Internal K/B connector
(I)	CN7	TP/B connector
(J)	CN33	Speaker LED connector
(K)	U9	EC PC87541V
(L)	CN32	Audio/B connector
(M)	LED3	ACIN LED
(N)	LED1, LED2	PowerOn / Suspend LED
(O)	LED6, LED7	Battery LED
(P)	LED4	HDD / ODD LED
(Q)	LED5	5IN1 LED
(R)	CN14	RJ45 / RJ11 connector
(S)	CN12	CRT connector
(T)	CN13	DVI connector
(U)	CN11	TVOUT connector
(V)	CN15	USB connector (TypeA)
(W)	CN19	HDD connector (SATA)
(X)	CN20	CPU fan connector
(Y)	CN21, CN34	Power cable connector (CN21 : 75W/90W, CN34 : 120W)
(Z)	CN23	DDR2 DIMM socket
(AA)	CN24	DDR2 DIMM socket
(AB)	U24	NorthBridge (945GM / 945PM)
(AC)	CN26	ODD connector
(AD)	PJ1	Battery connector
(AE)	U30	System bios rom
(AF)	CN30	MINI Card socket
(AG)	CN31	5IN1 memory card slot
(AH)	CN16	USB connector (TypeA)
(AI)	CN17	VGA fan connector
(AJ)	U21	CPU socket
(AK)	CN22	VGA/B power connector
(AL)	CN25	1394 connector
(AM)	U25	SouthBridge (ICH7-M)
(AN)	CN27	VGA/B connector
(AO)	CN29	NewCard slot



## B.2 Function Button board

<Front layout>



<Back layout>

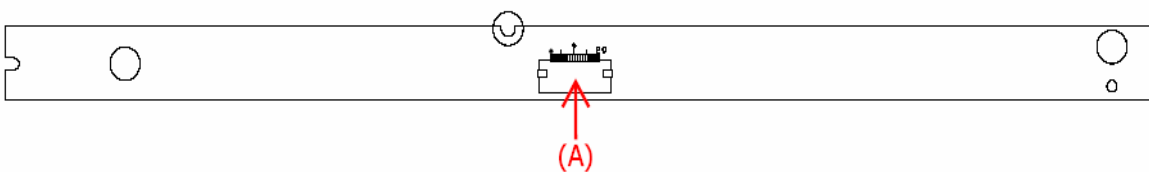


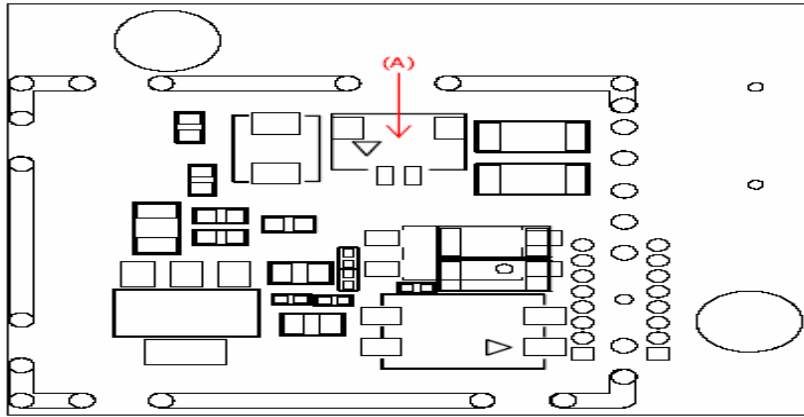
Figure B-3 Function Button board layout

Table B-2 Function Button board connectors

	Location	Function
(A)	CN1	M/B to Button/B connector
(B)	LED2	NUM lock LED
(C)	LED3	SCR lock LED
(D)	LED1	CAP lock LED
(E)	SW7	Forward
(F)	SW6	Rewind
(G)	SW4	Stop
(H)	SW2	Play / Pause
(I)	SW5	Media button
(J)	SW3	WWW button
(K)	SW1	Power button

### B.3 Modem board

<Front layout>



<Back layout>

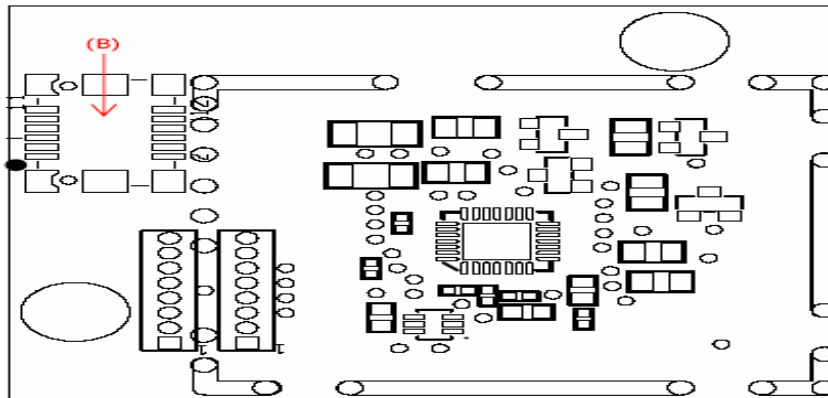


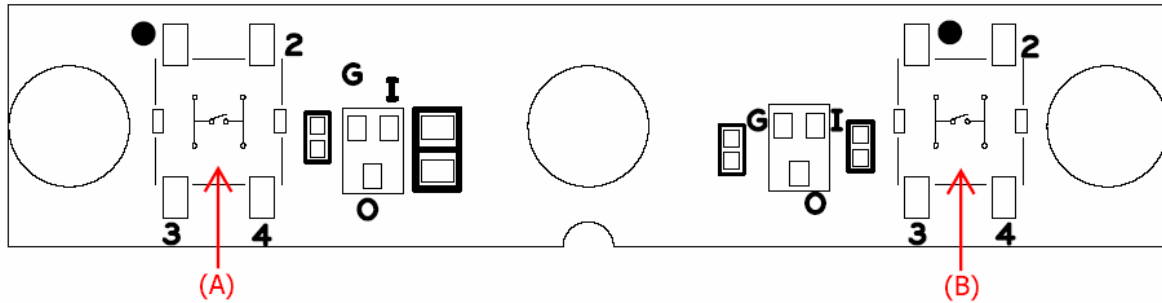
Figure B-3 Modem board layout

Table B-3 Modem board connectors

	Location	Function
(A)	MJ2	Phone signal connector
(B)	CN1	M/B to Modem/B connector

## B.4 Touch Pad Board

<Front layout>



<Back layout>

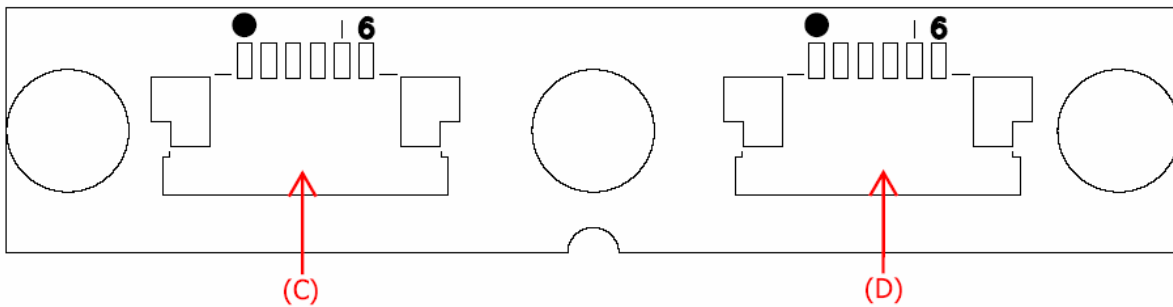


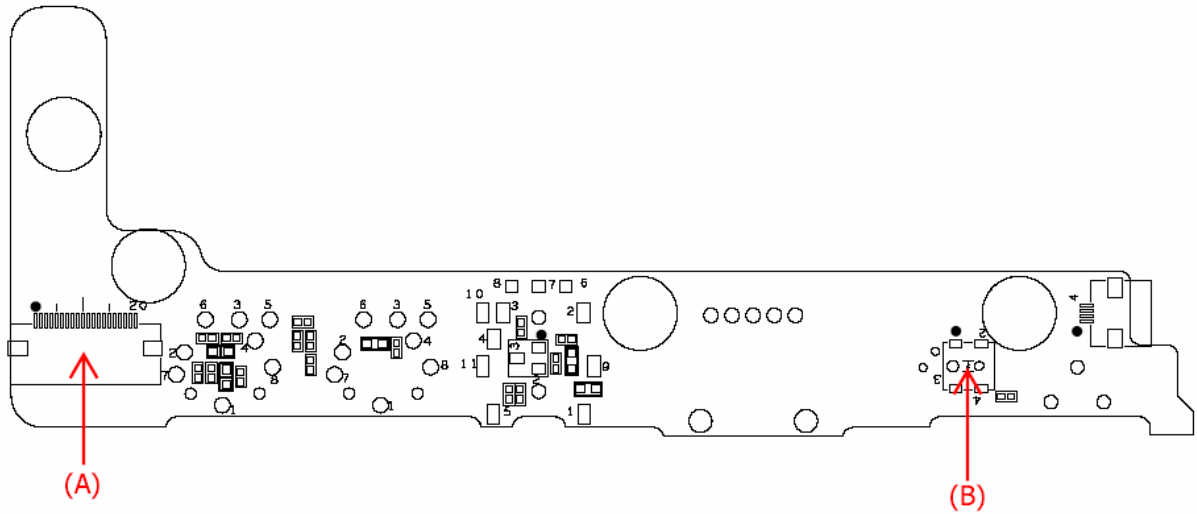
Figure B-4 Touch pad board layout

Table B-4 Touch pad board connectors

	Location	Function
(A)	SW2	Touchpad right button
(B)	SW1	Touchpad left button
(C)	CN1	TP/B to Touchpad connector
(D)	CN2	M/B to TP/B connector

## B.5 Audio Board

<Front layout>



<Back layout>

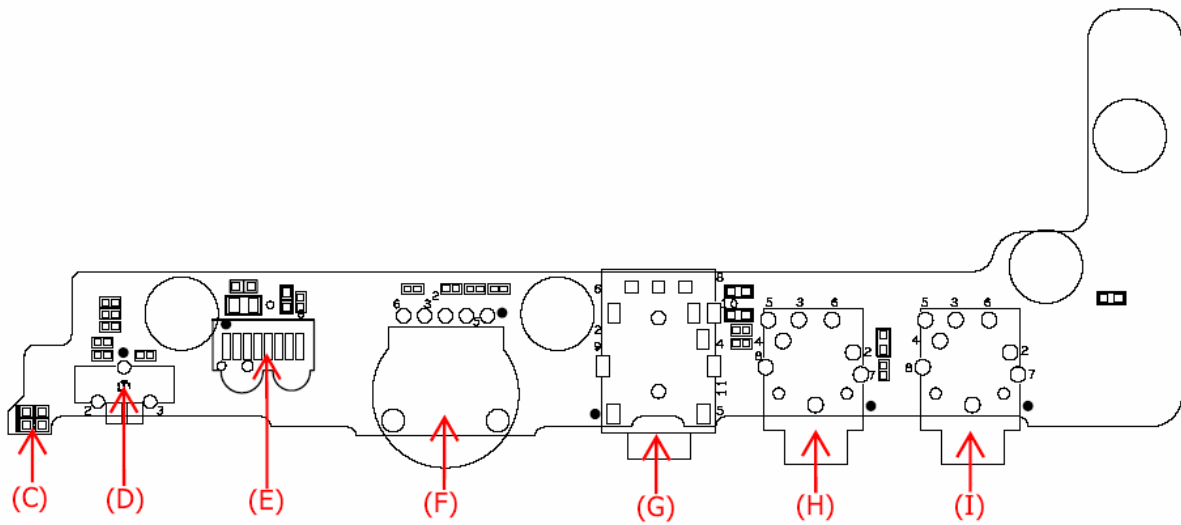


Figure B-5 Audio board layout

*Table B-5 Audio board connectors*

	Location	Function
(A)	CN1	M/B to Audio/B connector
(B)	SW2	Lid switch
(C)	LED2	Kill switch LED
(D)	SW1	Kill switch
(E)	U1	CIR
(F)	VR1	VR for adjusting volume
(G)	CN2	LineOut / SPDIF Out
(H)	CN3	MIC IN
(I)	CN4	LineIn

## B.6 VGA Board

<Front layout>

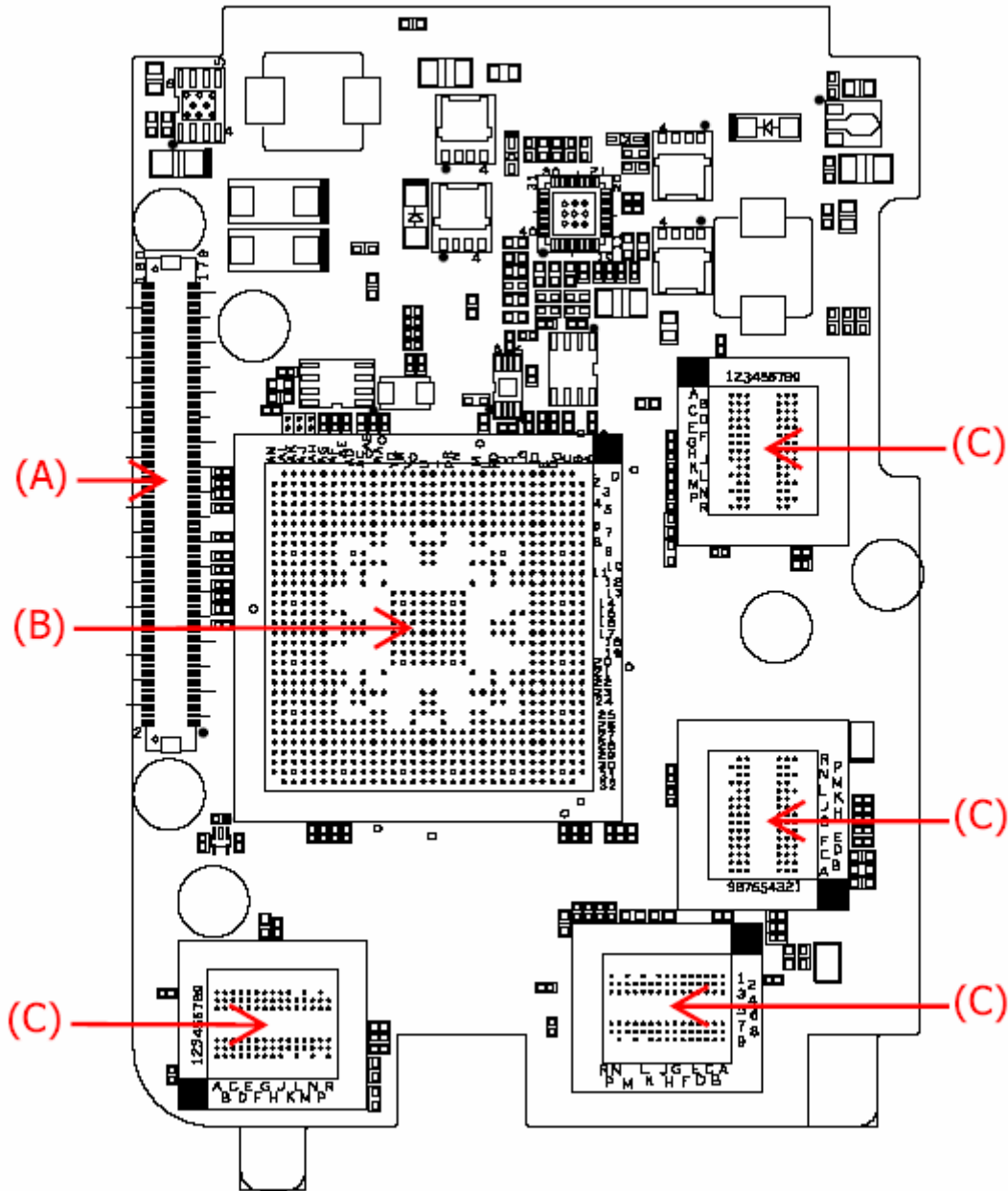
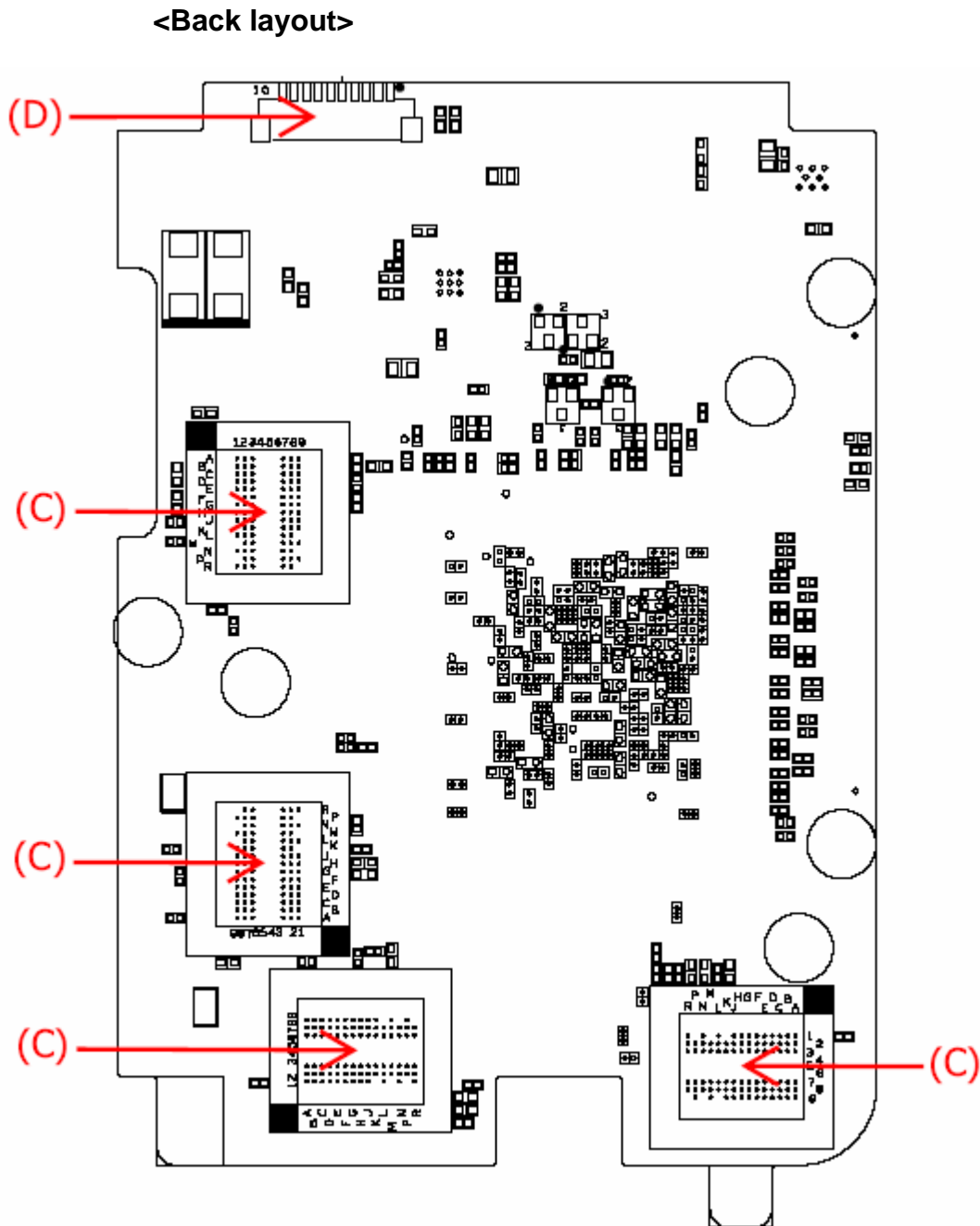


Figure B-6-4 VGA board layout (front)



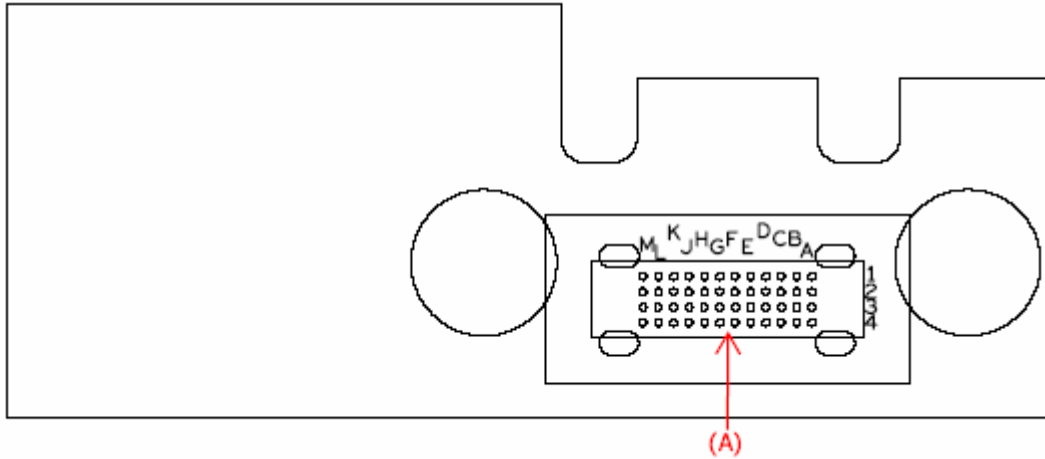
*Figure B-6-2 VGA board layout (back)*

*Table B-6 VGA board connectors*

	Location	Function
(A)	CN1	M/B to VGA/B connector
(B)	U5	VGA controller
(C)	U4, U6 ~ U8, U10 ~ U13	VRAM
(D)	CN2	VGA/B power connector

## B.7 Fingerprint Board

<Front layout>



<Back layout>

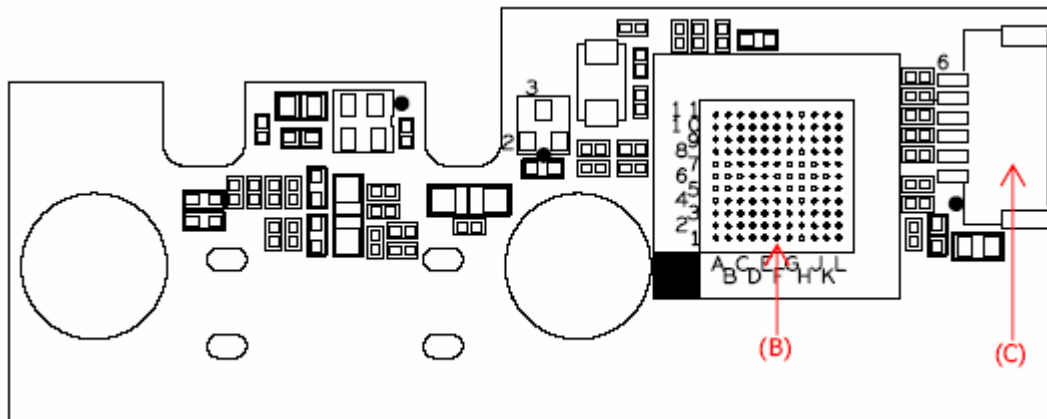


Figure B-7 Fingerprint board layout

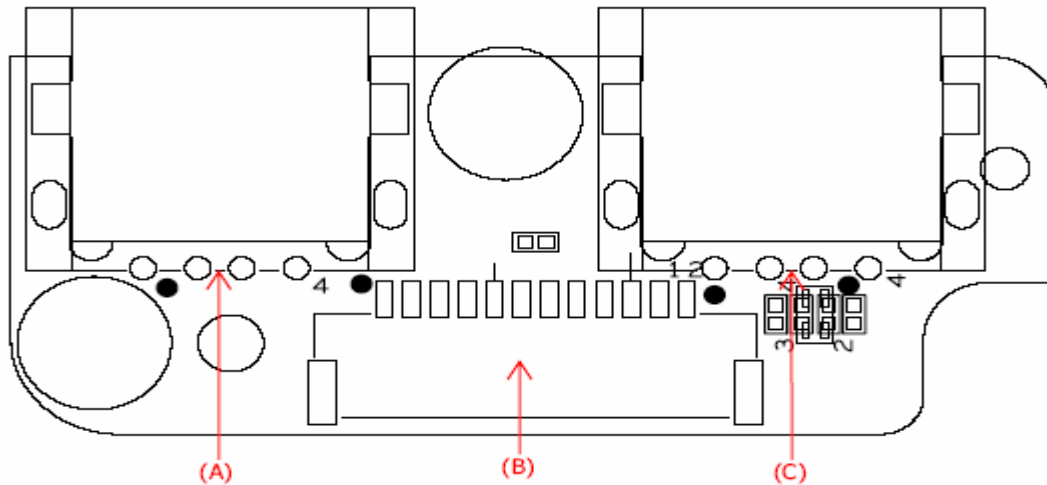
Table B-7 Fingerprint board connectors

	Location	Function
(A)	U2	Fingerprint sensor
(B)	U1	Fingerprint controller
(C)	CN1	M/B to FP/B connector



## B.8 USB Board

### <Front layout>



### <Back layout>

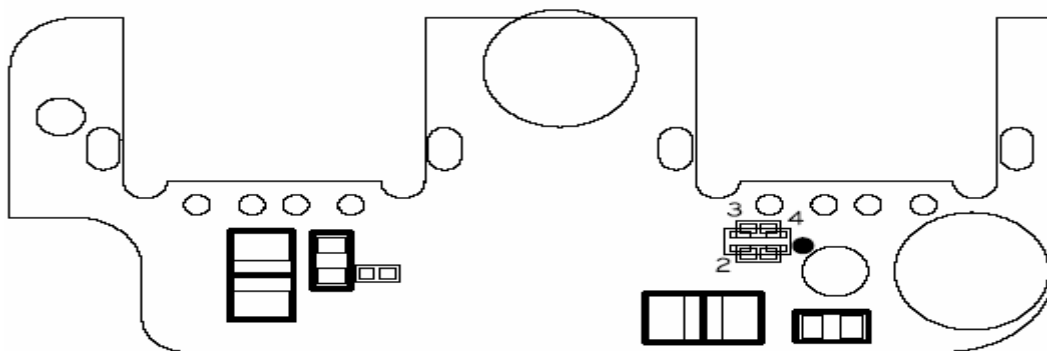


Figure B-8 USB board layout

Table B-8 USB board connectors

	Location	Function
(A)	CN2	USB connector (TypeA)
(B)	CN1	M/B to USB/B connector
(C)	CN3	USB connector (TypeA)

---

## Appendix C Pin Assignment

---

### CN1 Bluetooth Connector

CONN SMD FFC 20P 1R FR (P0.5, H2.0)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+3V	---	2	NC	---
3	WCS_DAT	---	4	USBP-	I/O
5	USBP+	I/O	6	NC	---
7	WCS_CLK	---	8	NC	---
9	NC	---	10	GND	---
11	NC	---	12	NC	---
13	BT_RESET#	I	14	NC	---
15	NC	---	16	NC	---
17	NC	---	18	GND	---
19	NC	---	20	GND	---

### CN2 LCD Panel Connector

CONN SMD HOUSING 40P 2R FS (P0.5, H2.6)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	LVDS_TXUCK#	I	2	LVDS_TXUCK	I
3	GND	---	4	LVDS_TXU#0	I
5	LVDS_TXU0	I	6	GND	---

7	LVDS_TXL#2	I	8	LVDS_TXL2	I
9	GND	---	10	LVDS_TXL#1	I
11	LVDS_TXL1	I	12	GND	---
13	LVDS_TXL#0	I	14	LVDS_TXL0	I
15	GND	---	16	LVDS_TXLCK#	I
17	LVDS_TXLCK	I	18	GND	---
19	PNL_CLK	I/O	20	PNL_DAT	I/O
21	LVDS_TXU#2	I	22	LVDS_TXU2	I
23	GND	---	24	LVDS_TXU#1	I
25	LVDS_TXU1	I	26	GND	---
27	INVCC0	---	28	INVCC0	---
29	VADJ	I	30	PNL_BLON	I
31	NC	---	32	NC	---
33	LCDVCC	---	34	LCDVCC	---
35	+5V	---	36	+5V	---
37	GND	---	38	NC	---
39	+3V	---	40	+3V	---
41	GND	---	42	GND	---
43	GND	---	44	GND	---
45	NC	---	46	NC	---

### CN3 Button Board Connector

CONN SMD FFC 20P 1R FR (P0.5, H2.0)

## *Pin Assignment*

---

<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>	<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>
1	NBSWON#	O	2	BT1#	O
3	BT2#	O	4	BT3#	O
5	BT4#	O	6	BT_IE#	O
7	BT_WWW#	O	8	CAPSLED	I
9	NUMLED	I	10	SCRLED	I
11	EMAIL_LED	I	12	NC	---
13	NC	---	14	NC	---
15	NC	---	16	NC	---
17	GND	---	18	GND	---
19	GND	--	20	GND	---

### **CN4 USB Board Connector**

CONN SMD WAFER 12P 1R MR (P1.25, H1.85)

<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>	<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>
1	USBP+	I/O	2	USBP-	I/O
3	GND	---	4	USBP+	I/O
5	USBP-	I/O	6	GND	---
7	GND	---	8	GND	---
9	USBPWR	---	10	USBPWR	---
11	USBPWR	---	12	USBPWR	---

### CN5 Finger Print Board Connector

CONN SMD HOUSING 6P 1R FR (P1.25, H1.85) EP

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+3VSUS	---	2	+3VSUS	---
3	BUSBP+	I/O	4	BUSBP-	I/O
5	GND	---	6	GND	---

### CN6 Internal K/B Connector

CONN SMD FPC 26P 1R FR (P1.0, H2.2)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	MY3	O	2	MY4	O
3	MY2	O	4	MY5	O
5	MY6	O	6	MY7	O
7	MY8	O	8	MY9	O
9	MY10	O	10	MY11	O
11	MY12	O	12	MY13	O
13	MY14	O	14	MY15	O
15	MY1	O	16	MY0	O
17	MY16	O	18	MX7	O
19	MX6	O	20	MX5	O
21	MY17	O	22	MX4	O
23	MX0	O	24	MX1	O
25	MX2	O	26	MX3	O

### CN7 Touchpad Board Connector

CONN SMD FFC 6P 1R FR (P1.0, H1.95)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+5V_TP	---	2	+5V_TP	---
3	TPDATA	I/O	4	TPCLK	I/O
5	GND	---	6	GND	---

### CN8 RTC Battery Connector

CONN SMD HEADER 2P MS (P1.25)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	RTC_N	---	2	GND	---

### CN9 PCMCIA Connector

CONN SMD HD, 68P, 2R, MS (P0.635, H3.35)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	A_CAD0	I/O
3	A_CAD1	I/O	4	A_CAD3	I/O
5	A_CAD5	I/O	6	A_CAD7	I/O
7	A_CC/BE0#	O	8	A_CAD9	I/O
9	A_CAD11	I/O	10	A_CAD12	I/O

11	A_CAD14	I/O	12	A_CC/BE1#	O
13	A_CPAR	I/O	14	A_CPERR#	O
15	A_CGNT#	I	16	A_CINT#	O
17	A_VCC	---	18	AVPP	---
19	A_CCLK	I	20	A_CIRDY#	O
21	A_CC/BE2#	O	22	A_CAD18	I/O
23	A_CAD20	I/O	24	A_CAD21	I/O
25	A_CAD22	I/O	26	A_CAD23	I/O
27	A_CAD24	I/O	28	A_CAD25	I/O
29	A_CAD26	I/O	30	A_CAD27	I/O
31	A_CAD29	I/O	32	A_RSVD_D2	I/O
33	A_CCLKRUN#	I	34	GND	---
35	GND	---	36	A_CCD1#	I/O
37	A_CAD2	I/O	38	A_CAD4	I/O
39	A_CAD6	I/O	40	A_RSVD_D14	I/O
41	A_CAD8	I/O	42	A_CAD10	I/O
43	A_CVS1#	O	44	A_CAD13	I/O
45	A_CAD15	I/O	46	A_CAD16	I/O
47	A_RSVD_A18	I/O	48	A_CBLOCK#	I
49	A_CSTOP#	O	50	A_CDEVSEL#	I
51	A_VCC	---	52	AVPP	---
53	A_CTRDY#	O	54	A_CFRAME#	I
55	A_CAD17	I/O	56	A_CAD19	I/O
57	A_CVS2#	O	58	A_CRST#	I

## *Pin Assignment*

---

59	A_CSERR#	I	60	A_CREQ#	I
61	A_CC/BE3#	O	62	A_CAUDIO	I
63	A_CSTSCHG	I	64	A_CAD28	I/O
65	A_CAD30	I/O	66	A_CAD31	I/O
67	A_CCD2#	I/O	68	GND	---

### **CN10 Speaker Connector**

CONN SMD HD 4P 1R MR (P1.25, H3.2)

<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>	<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>
1	INSPKR+	O	2	INSPKR-	O
3	INSPKL+	O	4	INSPKL-	O
5	AUDGND	---	6	AUDGND	---

### **CN11 S-Video Connector**

CONN DIP MINI-DIN 4P FR (P1.0, H10.5)

<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>	<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>
1	GND	---	2	GND	---
3	TV_LUMA	I	4	TV_CHROMA	I
5	GND	---	6	GND	---

### **CN12 CRT Connector**



CONN DIP D-SUB 15P 2R FR (P0.76) L-F

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	CRT_R	I	2	CRT_G	I
3	CRT_B	I	4	NC	---
5	GND	---	6	GND	---
7	GND	---	8	GND	---
9	+5V_CRT	---	10	GND	---
11	CRT_SENSE#	O	12	CRTDDAT	I
13	CRTHSYNC	I	14	CRTVSYNC	I
15	CRTDCLK	I	16	GND	---
17	GND	---			

**CN13 DVI Connector**

CONN D-SUB DIP 30P 3R FR (P1.9, H10.04)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	DVI_TX2-	I	2	DVI_TX2+	I
3	GND	---	4	NC	---
5	NC	---	6	DVIDDCCLK	I/O
7	DVIDDCDAT	I/O	8	NC	---
9	DVI_TX1-	I	10	DVI_TX1+	I
11	GND	---	12	NC	---
13	NC	---	14	+5V_DVI	I
15	GND	---	16	DVI_DET	O

## *Pin Assignment*

---

17	DVI_TX0-	I	18	DVI_TX0+	I
19	GND	---	20	NC	---
21	NC	---	22	GND	---
23	DVI_CLK+	I	24	DVI_CLK-	I
25	GND	---	26	GND	---
27	NC	---	28	NC	---

### **CN14 RJ11/RJ45 Connector**

CONN RJ11/RJ45 14P2R FR (L: G, R: Y, H10.1) LF

<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>	<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>
1	+3V_S5	---	2	LANACT_LED#	---
3	X-TX3N	I/O	4	X-TX3P	I/O
5	X-TX1N	I/O	6	X-TX2N	I/O
7	X-TX2P	I/O	8	X-TX1P	I/O
9	X-TX0N	I/O	10	X-TX0P	I/O
11	+3V_S5	---	12	LAN_LINK#	O
13	TIPL_R	---	14	RINGL_R	---
15	GND	---	16	GND	---

### **CN15 USB Port-1**

CONN DIP USB HS 4P 1R MR (P2.5, H5.75)

---

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	USBPOWER	---	2	USBP-	I/O
3	USBP+	I/O	4	GND	---
5	GND	---	6	GND	---
7	GND	---	8	GND	---

### **CN16 USB Port-2**

CONN DIP (USB) 4P 1R MR (L=13.60, H5.70)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	USBPOWER	---	2	USBP-	I/O
3	USBP+	I/O	4	GND	---
5	GND	---	6	GND	---
7	GND	---	8	GND	---

### **CN17/CN20 Fan Connector**

CONN SMD WAFER, 3P, 1R, MS (P1.25)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+5V_FAN	---	2	GND	---
3	FANSIG	O			

### **CN18 RJ11 Exchange**

## *Pin Assignment*

---

CONN SMD HEADER 2P 1R MR (P1.25, H1.95)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	TIPL	---	2	RINGL	---

### **CN19 HDD Connector**

CONN DIP HS 22P 1R FR (P1.27, H13.99)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	SATA_TXP0	I
3	SATA_TXN0	I	4	GND	---
5	SATA_RXN0	O	6	SATA_RXP0	O
7	GND	---	8	+3V_HDD	---
9	+3V_HDD	---	10	+3V_HDD	---
11	GND	---	12	GND	---
13	GND	---	14	+5V_HDD	---
15	+5V_HDD	---	16	+5V_HDD	---
17	GND	---	18	NC	---
19	GND	---	20	NC	---
21	NC	---	22	NC	---

### **CN21 Power Jack**

CONN DIP HOUSING 4P FR (P2.5, H4.9)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
---------	-------------	-----	---------	-------------	-----

---

1	GND	---	2	GND	---
3	VA	---	4	VA	---

### **CN22 VGA Power Connector**

CONN SMD HEADER 10P MS (P1.5, H5.0)

<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>	<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>
1	GND	---	2	GND	---
3	GND	---	4	GND	---
5	GND	---	6	VIN	---
7	VIN	---	8	VIN	---
9	VIN	---	10	VIN	---

### **CN23 DDR2 Connector**

IC SKT DDRII SO-DIMM (200P, H4.0, RVS) EP

<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>	<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>
1	SM_VREF_DIMM	---	2	GND	---
3	GND	---	4	SM_DQ4	I/O
5	SM_DQ1	I/O	6	SM_DQ0	I/O
7	SM_DQ5	I/O	8	GND	---
9	GND	---	10	SM_DM0	I
11	SM_DQS#0	I/O	12	GND	---
13	SM_DQS0	I/O	14	SM_DQ7	I/O

## *Pin Assignment*

15	GND	---	16	SM_DQ6	I/O
17	SM_DQ2	I/O	18	GND	---
19	SM_DQ3	I/O	20	SM_DQ13	I/O
21	GND	---	22	SM_DQ14	I/O
23	SM_DQ12	I/O	24	GND	---
25	SM_DQ8	I/O	26	SM_DM1	I
27	GND	---	28	GND	---
29	SM_DQS#1	I/O	30	SM_CLK0	I
31	SM_DQS1	I/O	32	SM_CLK#0	I
33	GND	---	34	GND	---
35	SM_DQ9	I/O	36	SM_DQ10	I/O
37	SM_DQ15	I/O	38	SM_DQ11	I/O
39	GND	---	40	GND	---
41	GND	---	42	GND	---
43	SM_DQ21	I/O	44	SM_DQ20	I/O
45	SM_DQ17	I/O	46	SM_DQ16	I/O
47	GND	---	48	GND	---
49	SM_DQS#2	I/O	50	PM_EXTTTS#0	O
51	SM_DQS2	I/O	52	SM_DM2	I
53	GND	---	54	GND	---
55	SM_DQ23	I/O	56	SM_DQ18	I/O
57	SM_DQ19	I/O	58	SM_DQ22	I/O
59	GND	---	60	GND	---
61	SM_DQ24	I/O	62	SM_DQ29	I/O

63	SM_DQ25	I/O	64	SM_DQ28	I/O
65	GND	---	66	GND	---
67	SMA_DM3	I	68	SM_DQS#3	I/O
69	NC	---	70	SM_DQS3	I/O
71	GND	---	72	GND	---
73	SM_DQ26	I/O	74	SM_DQ30	I/O
75	SM_DQ27	I/O	76	SM_DQ31	I/O
77	GND	---	78	GND	---
79	M_CKE0	I	80	M_CKE1	I
81	+1.8VSUS	---	82	+1.8VSUS	---
83	NC	---	84	NC	---
85	SM_BS2	I	86	NC	---
87	+1.8VSUS	---	88	+1.8VSUS	---
89	SM_MA12	I/O	90	SM_MA11	I/O
91	SM_MA9	I/O	92	SM_MA7	I/O
93	SM_MA8	I/O	94	SM_MA6	I/O
95	+1.8VSUS	---	96	+1.8VSUS	---
97	SM_MA5	I/O	98	SM_MA4	I/O
99	SM_MA3	I/O	100	SM_MA2	I/O
101	SM_MA1	I/O	102	SM_MA0	I/O
103	+1.8VSUS	---	104	+1.8VSUS	---
105	SM_MA10	I/O	106	SM_BS1	I
107	SM_BS0	I	108	SM_RAS#	I
109	SM_WE#	I	110	M_CS#0	I

## *Pin Assignment*

---

111	+1.8VSUS	---	112	+1.8VSUS	---
113	SM_CAS#	I	114	M_ODT0	I
115	M_CS#1	I	116	SM_MA13	I/O
117	+1.8VSUS	---	118	+1.8VSUS	---
119	M_ODT1	I	120	NC	---
121	GND	---	122	GND	---
123	SM_DQ35	I/O	124	SM_DQ32	I/O
125	SM_DQ37	I/O	126	SM_DQ36	I/O
127	GND	---	128	GND	---
129	SM_DQS#4	I/O	130	SM_DM4	I
131	SM_DQS4	I/O	132	GND	---
133	GND	---	134	SM_DQ33	I/O
135	SM_DQ38	I/O	136	SM_DQ34	I/O
137	SM_DQ39	I/O	138	GND	---
139	GND	---	140	SM_DQ44	I/O
141	SM_DQ40	I/O	142	SM_DQ45	I/O
143	SM_DQ41	I/O	144	GND	---
145	GND	---	146	SM_DQS#5	I/O
147	SM_DM5	I	148	SM_DQS5	I/O
149	GND	---	150	GND	---
151	SM_DQ42	I/O	152	SM_DQ43	I/O
153	SM_DQ46	I/O	154	SM_DQ47	I/O
155	GND	---	156	GND	---
157	SM_DQ48	I/O	158	SM_DQ52	I/O



159	SM_DQ49	I/O	160	SM_DQ53	I/O
161	GND	---	162	GND	---
163	NC	---	164	SM_CLK1	I
165	GND	---	166	SM_CLK#1	I
167	SM_DQS#6	I/O	168	GND	---
169	SM_DQS6	I/O	170	SM_DM6	I
171	GND	---	172	GND	---
173	SM_DQ50	I/O	174	SM_DQ54	I/O
175	SM_DQ51	I/O	176	SM_DQ55	I/O
177	GND	---	178	GND	---
179	SM_DQ56	I/O	180	SM_DQ61	I/O
181	SM_DQ60	I/O	182	SM_DQ57	I/O
183	GND	---	184	GND	---
185	SM_DM7	I	186	SM_DQS#7	I/O
187	GND	---	188	SM_DQS7	I/O
189	SM_DQ62	I/O	190	GND	---
191	SM_DQ58	I/O	192	SM_DQ59	I/O
193	GND	---	194	SM_DQ63	I/O
195	CGDAT_SMB	I/O	196	GND	---
197	CGCLK_SMB	I/O	198	SA0	---
199	+3V	---	200	SA1	---

**CN24 DDR2 Connector**

## *Pin Assignment*

---

IC SKT DDRII SO-DIMM (200P, H8.0MM, 1.8V)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	SM_VREF_DIMM	---	2	GND	---
3	GND	---	4	SM_DQ4	I/O
5	SM_DQ1	I/O	6	SM_DQ0	I/O
7	SM_DQ5	I/O	8	GND	---
9	GND	---	10	SM_DM0	I
11	SM_DQS#0	I/O	12	GND	---
13	SM_DQS0	I/O	14	SM_DQ7	I/O
15	GND	---	16	SM_DQ6	I/O
17	SM_DQ2	I/O	18	GND	---
19	SM_DQ3	I/O	20	SM_DQ13	I/O
21	GND	---	22	SM_DQ14	I/O
23	SM_DQ12	I/O	24	GND	---
25	SM_DQ8	I/O	26	SM_DM1	I
27	GND	---	28	GND	---
29	SM_DQS#1	I/O	30	SM_CLK0	I
31	SM_DQS1	I/O	32	SM_CLK#0	I
33	GND	---	34	GND	---
35	SM_DQ9	I/O	36	SM_DQ10	I/O
37	SM_DQ15	I/O	38	SM_DQ11	I/O
39	GND	---	40	GND	---
41	GND	---	42	GND	---
43	SM_DQ21	I/O	44	SM_DQ20	I/O

45	SM_DQ17	I/O	46	SM_DQ16	I/O
47	GND	---	48	GND	---
49	SM_DQS#2	I/O	50	PM_EXTTTS#0	O
51	SM_DQS2	I/O	52	SM_DM2	I
53	GND	---	54	GND	---
55	SM_DQ23	I/O	56	SM_DQ18	I/O
57	SM_DQ19	I/O	58	SM_DQ22	I/O
59	GND	---	60	GND	---
61	SM_DQ24	I/O	62	SM_DQ29	I/O
63	SM_DQ25	I/O	64	SM_DQ28	I/O
65	GND	---	66	GND	---
67	SMA_DM3	I	68	SM_DQS#3	I/O
69	NC	---	70	SM_DQS3	I/O
71	GND	---	72	GND	---
73	SM_DQ26	I/O	74	SM_DQ30	I/O
75	SM_DQ27	I/O	76	SM_DQ31	I/O
77	GND	---	78	GND	---
79	M_CKE0	I	80	M_CKE1	I
81	+1.8VSUS	---	82	+1.8VSUS	---
83	NC	---	84	NC	---
85	SM_BS2	I	86	NC	---
87	+1.8VSUS	---	88	+1.8VSUS	---
89	SM_MA12	I/O	90	SM_MA11	I/O
91	SM_MA9	I/O	92	SM_MA7	I/O

## *Pin Assignment*

---

93	SM_MA8	I/O	94	SM_MA6	I/O
95	+1.8VSUS	---	96	+1.8VSUS	---
97	SM_MA5	I/O	98	SM_MA4	I/O
99	SM_MA3	I/O	100	SM_MA2	I/O
101	SM_MA1	I/O	102	SM_MA0	I/O
103	+1.8VSUS	---	104	+1.8VSUS	---
105	SM_MA10	I/O	106	SM_BS1	I
107	SM_BS0	I	108	SM_RAS#	I
109	SM_WE#	I	110	M_CS#0	I
111	+1.8VSUS	---	112	+1.8VSUS	---
113	SM_CAS#	I	114	M_ODT0	I
115	M_CS#1	I	116	SM_MA13	I/O
117	+1.8VSUS	---	118	+1.8VSUS	---
119	M_ODT1	I	120	NC	---
121	GND	---	122	GND	---
123	SM_DQ35	I/O	124	SM_DQ32	I/O
125	SM_DQ37	I/O	126	SM_DQ36	I/O
127	GND	---	128	GND	---
129	SM_DQS#4	I/O	130	SM_DM4	I
131	SM_DQS4	I/O	132	GND	---
133	GND	---	134	SM_DQ33	I/O
135	SM_DQ38	I/O	136	SM_DQ34	I/O
137	SM_DQ39	I/O	138	GND	---
139	GND	---	140	SM_DQ44	I/O

141	SM_DQ40	I/O	142	SM_DQ45	I/O
143	SM_DQ41	I/O	144	GND	---
145	GND	---	146	SM_DQS#5	I/O
147	SM_DM5	I	148	SM_DQS5	I/O
149	GND	---	150	GND	---
151	SM_DQ42	I/O	152	SM_DQ43	I/O
153	SM_DQ46	I/O	154	SM_DQ47	I/O
155	GND	---	156	GND	---
157	SM_DQ48	I/O	158	SM_DQ52	I/O
159	SM_DQ49	I/O	160	SM_DQ53	I/O
161	GND	---	162	GND	---
163	NC	---	164	SM_CLK1	I
165	GND	---	166	SM_CLK#1	I
167	SM_DQS#6	I/O	168	GND	---
169	SM_DQS6	I/O	170	SM_DM6	I
171	GND	---	172	GND	---
173	SM_DQ50	I/O	174	SM_DQ54	I/O
175	SM_DQ51	I/O	176	SM_DQ55	I/O
177	GND	---	178	GND	---
179	SM_DQ56	I/O	180	SM_DQ61	I/O
181	SM_DQ60	I/O	182	SM_DQ57	I/O
183	GND	---	184	GND	---
185	SM_DM7	I	186	SM_DQS#7	I/O
187	GND	---	188	SM_DQS7	I/O

## *Pin Assignment*

---

189	SM_DQ62	I/O	190	GND	---
191	SM_DQ58	I/O	192	SM_DQ59	I/O
193	GND	---	194	SM_DQ63	I/O
195	CGDAT_SMB	I/O	196	GND	---
197	CGCLK_SMB	I/O	198	SA0	---
199	+3V	---	200	SA1	---

### **CN25 1394 Port**

CONN DIP (1394) 4P 2R FR(P1.6,H5.6) L-F

<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>	<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>
1	1394_TPBO-	O	2	1394_TPBO+	O
3	1394_TPA0-	O	4	1394_TPA0+	O
5	GND	---	6	GND	---

### **CN26 ODD Connector**

CONN DIP HOUSING50P 4R FR (P0.8, H6.0)

<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>	<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>
1	NC	---	2	NC	---
3	NC	---	4	GND	---
5	IDERST#	O	6	PDD8	I/O
7	PDD7	I/O	8	PDD9	I/O

9	PDD6	I/O	10	PDD10	I/O
11	PDD5	I/O	12	PDD11	I/O
13	PDD4	I/O	14	PDD12	I/O
15	PDD3	I/O	16	PDD13	I/O
17	PDD2	I/O	18	PDD14	I/O
19	PDD1	I/O	20	PDD15	I/O
21	PDD0	I/O	22	PDDREQ	O
23	GND	---	24	PDIOR#	I
25	PDIOW#	I	26	GND	---
27	PIORDY	O	28	PDDACK#	I
29	IRQ14	O	30	NC	---
31	PDA1	I/O	32	PDIAG#	---
33	PDA0	I/O	34	PDA2	I/O
35	PDCS1#	I	36	PDCS3#	O
37	ODDLED#	O	38	+5V_ODD	---
39	+5V_ODD	---	40	+5V_ODD	---
41	+5V_ODD	---	42	+5V_ODD	---
43	GND	---	44	GND	---
45	GND	---	46	GND	---
47	RCSEL	---	48	GND	---
49	NC	---	50	NC	---
51	GND	---	52	GND	---

**CN27 VGA Interface Connector**

CONN SMD HS 180P FR (P0.5, H4.15) EP

<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>	<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>
1	PEG_TXP0	I/O	2	PEG_RXP0	I/O
3	PEG_TXN0	I/O	4	PEG_RXN0	I/O
5	GND	---	6	GND	---
7	PEG_TXP1	I/O	8	PEG_RXP1	I/O
9	PEG_TXN1	I/O	10	PEG_RXN1	I/O
11	GND	---	12	GND	---
13	PEG_TXP2	I/O	14	PEG_RXP2	I/O
15	PEG_TXN2	I/O	16	PEG_RXN2	I/O
17	GND	---	18	GND	---
19	PEG_TXP3	I/O	20	PEG_RXP3	I/O
21	PEG_TXN3	I/O	22	PEG_RXN3	I/O
23	GND	---	24	GND	---
25	PEG_TXP4	I/O	26	PEG_RXP4	I/O
27	PEG_TXN4	I/O	28	PEG_RXN4	I/O
29	GND	---	30	GND	---
31	PEG_TXP5	I/O	32	PEG_RXP5	I/O
33	PEG_TXN5	I/O	34	PEG_RXN5	I/O
35	GND	---	36	GND	---
37	PEG_TXP6	I/O	38	PEG_RXP6	I/O
39	PEG_TXN6	I/O	40	PEG_RXN6	I/O
41	GND	---	42	GND	---



43	PEG_TXP7	I/O	44	PEG_RXP7	I/O
45	PEG_TXN7	I/O	46	PEG_RXN7	I/O
47	GND	---	48	GND	---
49	PEG_TXP8	I/O	50	PEG_RXP8	I/O
51	PEG_TXN8	I/O	52	PEG_RXN8	I/O
53	GND	---	54	GND	---
55	PEG_TXP9	I/O	56	PEG_RXP9	I/O
57	PEG_TXN9	I/O	58	PEG_RXN9	I/O
59	GND	---	60	GND	---
61	PEG_TXP10	I/O	62	PEG_RXP10	I/O
63	PEG_TXN10	I/O	64	PEG_RXN10	I/O
65	GND	---	66	GND	---
67	PEG_TXP11	I/O	68	PEG_RXP11	I/O
69	PEG_TXN11	I/O	70	PEG_RXN11	I/O
71	GND	---	72	GND	---
73	PEG_TXP12	I/O	74	PEG_RXP12	I/O
75	PEG_TXN12	I/O	76	PEG_RXN12	I/O
77	GND	---	78	GND	---
79	PEG_TXP13	I/O	80	PEG_RXP13	I/O
81	PEG_TXN13	I/O	82	PEG_RXN13	I/O
83	GND	---	84	GND	---
85	PEG_TXP14	I/O	86	PEG_RXP14	I/O
87	PEG_TXN14	I/O	88	PEG_RXN14	I/O
89	GND	---	90	GND	---

## *Pin Assignment*

91	PEG_TXP15	I/O	92	PEG_RXP15	I/O
93	PEG_TXN15	I/O	94	PEG_RXN15	I/O
95	GND	---	96	GND	---
97	27M_VGA	I	98	PECLK_VGA	I
99	27MSS_VGA	I	100	PECLK_VGA#	I
101	GND	---	102	GND	---
103	GND	---	104	PLTRST#	I
105	GND	---	106	SYSFANON#	O
107	EXT_CRTDDCCLK	I/O	108	MAINON	I
109	EXT_CRTDDCDAT	I/O	110	DVI_HPD	I
111	GND	---	112	HWPG_VGA	O
113	DVI_DDCDAT	I/O	114	MBDATA	I/O
115	DVI_DDCCLK	I/O	116	MBCLK	I/O
117	GND	---	118	EV_BLON	O
119	LVDS_PNLCLK	I/O	120	EV_PNLON	O
121	LVDS_PNLDAT	I/O	122	GND	---
123	GND	---	124	+3V	---
125	EXT_HSYNC	O	126	+3V	---
127	EXT_VSYNC	O	128	+3V	---
129	GND	---	130	+3V	---
131	EXT_VGA_RED	O	132	+3V	---
133	EXT_VGA_GRN	O	134	+2.5V	---
135	EXT_VGA_BLU	O	136	+2.5V	---
137	GND	---	138	+2.5V	---

139	NC	---	140	+2.5V	---
141	EXT_TV_Y/G	O	142	+2.5V	---
143	EXT_TV_C/R	O	144	GND	---
145	GND	---	146	GND	---
147	EXT_DVI_TX2+	O	148	EXT_DVI_TX0+	O
149	EXT_DVI_TX2-	O	150	EXT_DVI_TX0-	O
151	GND	---	152	GND	---
153	EXT_DVI_CLK+	O	154	EXT_DVI_TX1+	O
155	EXT_DVI_CLK-	O	156	EXT_DVI_TX1-	O
157	GND	---	158	GND	---
159	EXT_LVDS_TXL0	O	160	EXT_LVDS_TXU0	O
161	EXT_LVDS_TXL#0	O	162	EXT_LVDS_TXU#0	O
163	GND	---	164	GND	---
165	EXT_LVDS_TXL1	O	166	EXT_LVDS_TXU1	O
167	EXT_LVDS_TXL#1	O	168	EXT_LVDS_TXU#1	O
169	GND	---	170	GND	---
171	EXT_LVDS_TXL2	O	172	EXT_LVDS_TXU2	O
173	EXT_LVDS_TXL#2	O	174	EXT_LVDS_TXU#2	O
175	GND	---	176	GND	---
177	EXT_LVDS_TXLCK	O	178	EXT_LVDS_TXUCK	O
179	EXT_LVDS_TXLCK#	O	180	EXT_LVDS_TXUCK#	O
181	GND	---	182	GND	---

### CN28 Modem Board Connector

CONN SMD HEADER 12P, 2R, MS (P0.8, H2.4)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	PWRCLKN	I/O	2	GND	---
3	PWRCLKP	I/O	4	GND	---
5	NC	---	6	GND	---
7	DIB_DATAP	I/O	8	GND	---
9	DIB_DATAN	I/O	10	GND	---
11	NC	---	12	GND	---
13	GND	---	14	GND	---
15	GND	---	16	GND	---
17	GND	---	18	GND	---

### CN29 New Card Connector

CONN SMD HEADER 26P1R MR (P1.0, H4.75)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	---	2	USBP-	I/O
3	USBP+	I/O	4	CPUSB#	O
5	NC	---	6	NC	---
7	NEW_SMCLK	O	8	NEW_SMDATA	O
9	+NEW_1.5V	---	10	+NEW_1.5V	---

11	WAKW#	---	12	+NEW_3VAUX	---
13	PERST#	O	14	+NEW_3V	---
15	+NEW_3V	---	16	NEW_CLKREQ#	O
17	CPPE#	O	18	PECLK_NEW#	I
19	PECLK_NEW	I	20	GND	---
21	PCIE_RXN	O	22	PCIE_RXP	O
23	GND	---	24	PCIE_TXN	I
25	PCIE_TXP	I	26	GND	---
27	GND	---	28	GND	---
29	GND	---	30	GND	---

### CN30 Mini Card Connector

CONN DIP HOUSING 52P 2R FR (P0.8, H5.6) EP

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	WAKE#	O	2	+3V	---
3	WCS_DATR	---	4	GND	---
5	WCS_CLKR	---	6	+1.5V	---
7	MINI_CLKREQ#	O	8	NC	---
9	GND	---	10	NC	---
11	PECLK_MINI#	I	12	NC	---
13	PECLK_MINI	I	14	NC	---
15	GND	---	16	NC	---
17	NC	---	18	GND	---

## *Pin Assignment*

19	NC	---	20	RF_EN	I
21	GND	---	22	PLTRST#	I
23	PCIE_RXN	O	24	+3VSUS	---
25	PCIE_RXP	O	26	GND	---
27	GND	---	28	+1.5V	---
29	GND	---	30	PCLK_SMB	I/O
31	PCIE_TXN	I	32	PDAT_SMB	I/O
33	PCIE_TXP	I	34	GND	---
35	GND	---	36	USBP-	I/O
37	NC	---	38	USBP+	I/O
39	NC	---	40	GND	---
41	NC	---	42	LED_WWAN#	---
43	NC	---	44	WL_LED	O
45	NC	---	46	BT_LED	O
47	NC	---	48	+1.5V	---
49	NC	---	50	GND	---
51	NC	---	52	+3V	---

### **CN31 5 in 1 Card Connector**

CONN HEADER 46P 2R MS (P0.8, H6.2)

<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>	<b>PIN No.</b>	<b>Signal name</b>	<b>I/O</b>
1	GND	---	2	MSBS_SDCMD_SMWE#	O

3	MSD1_SDD1_SMD1	I/O	4	MSD0_SDD0_SMD0	I/O
5	MSD2_SDD2_SMD2	I/O	6	MS_CD#	O
7	MSD3_SDD3_SMD3	I/O	8	MSCK_SDCK_SMWP#	I
9	VCC_FM	---	10	GND	---
11	MSD2_SDD2_SMD2	I/O	12	MSD3_SDD3_SMD3	I/O
13	MSBS_SDCMD_SMWE#	O	14	GND	---
15	VCC_FM	---	16	MSCK_SDCK_SMWP#	I
17	GND	---	18	NC	---
19	MSD0_SDD0_SMD0	I/O	20	MSD1_SDD1_SMD1	I/O
21	SD_CD#	O	22	GND	---
23	XD_CD#	O	24	GND	---
25	SM_R/B#	I	26	SM_RE#	O
27	SDWP_SMCE#	O	28	SM_CLE	I/O
29	SM_ALE	I/O	30	MSBS_SDCMD_SMWE#	I/O
31	MSCK_SDCK_SMWP#	I	32	GND	---
33	MSD1_SDD1_SMD0	I/O	34	MSD1_SDD1_SMD1	I/O
35	MSD1_SDD1_SMD2	I/O	36	MSD3_SDD3_SMD3	I/O
37	SM_D4	I/O	38	SM_D5	I/O
39	SM_D6	I/O	40	SM_D7	I/O
41	VCC_FM	---	42	NC	---
43	SDWP_SMCE#	I/O	44	GND	---

**CN32 Audio Board Connector**

## *Pin Assignment*

---

CONN SMD FFC 20P 1R FR (P0.5, H2.0)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	SPKL	O	2	SPKR	O
3	PORT_B_L	O	4	PORT_B_R	O
5	MIC_R	O	6	MIC_L	O
7	SENSEA	O	8	SENSEB	O
9	AUD_VOL	---	10	GND	---
11	IRRX	O	12	WLAN_LED	O
13	Kill_LED	O	14	LID591#	O
15	WL_SW#	O	16	SPKPLG	O
17	SPDIF_OUT	O	18	+5V	---
19	+3V_S5	---	20	+5V_SP	---

### **CN33 Speaker LED Connector**

CONN SMD HOUSING 4P 1R FR (P1.25, H1.85)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	+VSPKLED	---	2	GND	---
3	+VSPKLED	---	4	GND	---

### **PJ1 Battery Connector**

CONN DIP HD 7P 1R MR (P2.5, H4.0)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	MBAT	---	2	BATT_IN	O



3	NC	---	4	TEMP_MBAT	O
5	DATA	I/O	6	CLK	O
7	GND	---			

## Appendix D Display Codes

### D.1 Display Codes

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

Cap No.	Keytop	Code set 1		Code set 2		Note	
		Make	Break	Make	Break		
01	‘ ~	29	A9	0E	F0	0E	
02	1 !	02	82	16	F0	16	
03	2 @	03	83	1E	F0	1E	
04	3 #	04	84	26	F0	26	
05	4 \$	05	85	25	F0	25	
06	5 %	06	86	2E	F0	2E	
07	6 ^	07	87	36	F0	36	
08	7 &	08	88	3D	F0	3D	*2
09	8 *	09	89	3E	F0	3E	*2
10	9 (	0A	8A	46	F0	46	*2
11	0 )	0B	8B	45	F0	45	
12	- _	0C	8C	4E	F0	4E	
13	= +	0D	8D	55	F0	55	
15	BkSp	0E	8E	66	F0	66	
16	Tab	0F	8F	0D	F0	0D	
17	Q	10	90	15	F0	15	
18	W	11	91	1D	F0	1D	
19	E	12	92	24	F0	24	
20	R	13	93	2D	F0	2D	
21	T	14	94	2C	F0	2C	
22	Y	15	95	35	F0	35	
23	U	16	96	3C	F0	3C	*2
24	I	17	97	43	F0	43	*2
25	O	13	98	44	F0	44	*2
26	P	19	99	4D	F0	4D	*2
27	[ {	1A	9A	54	F0	54	
28	] }	1B	9B	5B	F0	5B	

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

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

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

Cap No.	Keytop	Code set 1				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	
202	Fn	—	—	—	—				*4	
203	Win	E0	5B	E0	DB	E0	1F	E0	F0	1F
204	App	E0	5D	E0	DD	E0	2F	E0	F0	2F

Notes:

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

Table D-2 Scan codes with left Shift key

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

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

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

Table D-3 Scan codes in Numlock mode

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

Table D-4 Scan codes with Fn key

Cap No.	Keytop	Code set 1		Code set 2	
		Make	Break	Make	Break
43	ENT	E0 1C	E0 9C	E0 5A	E0 F0 5A
58	CTRL	E0 1D	E0 9D	E0 14	E0 F0 14
60	LALT	E0 38	E0 B8	E0 11	E0 F0 11
121	ARROW	45	C5	77	F0 77
122	NUMERIC	45	C5	77	F0 77
123	Scrl	46	C5	7E	F0 7E

Table D-5 Scan codes in overlay mode

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

Table D-6 No.124 key scan code

Key top	Shift	Code set 1				Code set 2			
		Make		Break		Make		Break	
Prt Sc	Common	E0 2A	E0 37	E0 B7	E0 AA	E0 12	E0 7C	E0 F0	7C E0 F0 12
	Ctrl +	E0 37		E0 B7		E0 7C		E0 F0	7C
	Shift +	E0 37		E0 B7		E0 7C		E0 F0	7C
	Alt +		54	D4		84		F0	B4



*Table D-7 No.126 key scan code*

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

\*: This key generates only make codes.

---

## Appendix E Keyboard Layout

---

### E.1 United States (US) Keyboard



Figure E-1 US Keyboard layout

### E.2 United Kingdom (UK) Keyboard



Figure E-2 UK Keyboard layout

### E.3 Arabia (AR) Keyboard

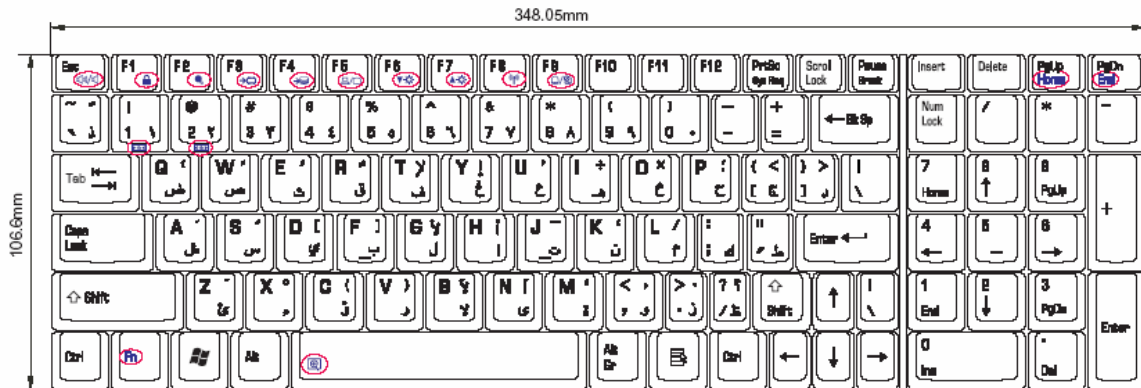


Figure E-3 AR Keyboard layout

### E.4 Belgium (BB) Keyboard



Figure E-4 BB Keyboard layout

### E.5 Czech (CZ) Keyboard

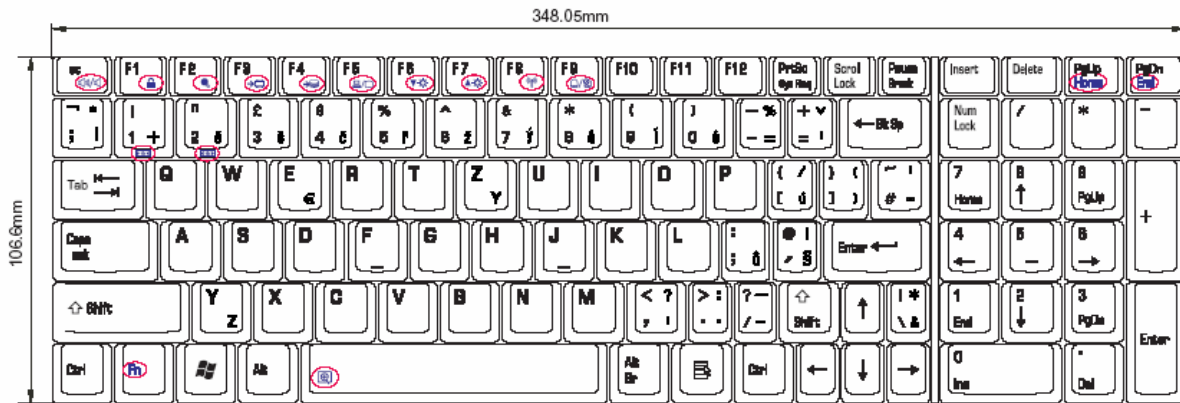


Figure E-5 CZ Keyboard layout

### E.6 German (GR) Keyboard



Figure E-6 GR Keyboard layout

### E.7 Danish (DK) Keyboard



Figure E-7 DK Keyboard layout

### E.8 Spanish (SP) Keyboard



Figure E-8 SP Keyboard layout

### E.9 French (FR) Keyboard



Figure E-9 FR Keyboard layout

### E.10 Hungary(HU) Keyboard



Figure E-10 HUR Keyboard layout

### E.11 Italian (IT) Keyboard



Figure E-11 IT Keyboard layout

### E.12 Korean (KR) Keyboard



Figure E-12 KR Keyboard layout

### E.13 Norwegian (NO) Keyboard



Figure E-13 NO Keyboard layout

### E.14 Portuguese (PT) Keyboard



Figure E-14 PT Keyboard layout



### E.15 Traditional Chinese (TC) Keyboard



Figure E-15 TC Keyboard layout

### E.16 Swedish (SW) Keyboard



Figure E-16 SW Keyboard layout

### E.17 Russian (RU) Keyboard



Figure E-17 RU Keyboard layout

### E.18 Turkish (TR) Keyboard



Figure E-18 TR Keyboard layout

### E.19 Japanese (JP) Keyboard



Figure E-19 JP Keyboard layout

### E.20 Swiss-German(SL) Keyboard



Figure E-20 SL Keyboard layout

### E.21 Hebrew Keyboard



Figure E-21 Keyboard layout

### E.22 Greek Keyboard



Figure E-22 GK Keyboard layout

---

## Appendix F Wiring Diagrams

---

### F.1 RGB Monitor ID Wraparound connector

(1) RED	_____	RED	(1)
(2) GREEN	_____	GREEN	(2)
(3) BLUE	_____	BLUE	(3)
(4) NC	_____	NC	(4)
(5) GND	_____	GND	(5)
(6) GND	_____	GND	(6)
(7) GND	_____	GND	(7)
(8) GND	_____	GND	(8)
(9) 5V	_____	5V	(9)
(10) GND	_____	GND	(10)
(11) NC	_____	NC	(11)
(12) SDA	_____	SDA	(12)
(13) HSYNC	_____	HSYNC	(13)
(14) VSYNC	_____	VSYNC	(14)
(15) SDL	_____	SCL	(15)

*Figure F-1 RGB Monitor ID Wraparound connector (15PIN to 15PIN)*

### F.2 LAN Loopback Connector

(1) BIBAP (TX+)	_____	(3) BIDBP (RX+)
(2) BIDAN (TX-)	_____	(4) BIDBN (RX-)

*Figure F-2 LAN loopback connector*



---

## Appendix G BIOS Rewrite Procedures

---

This Appendix explains how to rewrite the system BIOS program when you update the system BIOS.

### Tools

To rewrite the BIOS, you need the following tool:

- BIOS/EC/KBC rewriting disk
- USB doggle

### Rewriting the BIOS

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cables and cards.
4. Connect an external FDD and insert the BIOS rewriting disk into the external FDD.
5. Connect the USB doggle special for BIOS rewrite
6. Turn on the power
7. The BIOS rewriting starts.
8. When the process is completed, it beeps and the system automatically reboots.

**NOTE:**

1. *Connect the AC adaptor to the computer when you rewrite the BIOS.*
2. *Do not turn off the power while you are rewriting the BIOS. If the rewrite fails, it might be impossible to start up the computer.*
3. *If you fail to rewrite BIOS, then when you next turn on the power, a message may be displayed that the contents of the BIOS have been erased or system can not boot . In this case, insert the BIOS rewriting disk, and the BIOS will be rewritten.*

---

## **Appendix H EC/KBC Rewrite Procedures**

---

Same as BIOS rewrite Procedures, please refer appendix G



---

## Appendix I Reliability

---

The following table shows MTBF (Mean Time Between Failures) in maximum configuration.

*Table I-1 MTBF*

<b>Component</b>	<b>Time (hours)</b>
System	6678.69



## Free Manuals Download Website

<http://myh66.com>

<http://usermanuals.us>

<http://www.somanuals.com>

<http://www.4manuals.cc>

<http://www.manual-lib.com>

<http://www.404manual.com>

<http://www.luxmanual.com>

<http://aubethermostatmanual.com>

Golf course search by state

<http://golfingnear.com>

Email search by domain

<http://emailbydomain.com>

Auto manuals search

<http://auto.somanuals.com>

TV manuals search

<http://tv.somanuals.com>