

**Toshiba Personal Computer  
Satellite R10  
Maintenance Manual**

**TOSHIBA CORPORATION**

**File Number 960-509**

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Toshiba Satellite R10 Maintenance Manual

First edition January 2005

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## Preface

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This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer Satellite R10, referred to as Satellite R10 in this manual.

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

### SAFETY PRECAUTIONS

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

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

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

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

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

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

- ✍ Be sure to fasten screws securely with the right screwdriver. Be sure to use the PH Point size “0” and “1” screwdrivers complying with the ISO/DIS 8764-1:1996. 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 R10 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 assignment
  - ✍ 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 Satellite R10 that appears on its display is presented in the type face below:

Format complete  
System transferred

---

# Table of Contents

---

## Chapter 1 Hardware Overview

1.1	Features .....	1-1
1.2	2.5-inch Hard Disk Drive.....	1-10
1.3	Optical Drive.....	1-12
1.4	Keyboard.....	1-23
1.5	TFT Color Display.....	1-24
1.6	Power Supply .....	1-26
1.7	Batteries .....	1-29
1.8	AC Adapter .....	1-32

## Chapter 2 Troubleshooting Procedures

2.1	Troubleshooting .....	2-1
2.2	Troubleshooting Flowchart.....	2-2
2.3	Power Supply Troubleshooting.....	2-6
2.4	System Board Troubleshooting.....	2-17
2.5	USB 3.5" FDD Troubleshooting.....	2-33
2.6	2.5" HDD Troubleshooting.....	2-36
2.7	Keyboard Troubleshooting .....	2-41
2.8	Display Troubleshooting.....	2-42
2.9	Touch Pad Troubleshooting .....	2-45
2.10	Selectable bay(optical drive) Troubleshooting .....	2-46
2.11	Modem Troubleshooting.....	2-47
2.12	LAN Troubleshooting .....	2-48
2.13	Sound Troubleshooting.....	2-49
2.14	SD Card Slot Troubleshooting.....	2-50
2.15	Tablet Pen Troubleshooting .....	2-51
2.16	Wireless LAN Troubleshooting .....	2-53

## Chapter 3 Tests and Diagnostics

3.1	The Diagnostic Test .....	3-1
3.2	Executing the Diagnostic Test .....	3-4
3.3	Setting of the hardware configuration.....	3-8
3.4	Heatron Test .....	3-11
3.5	Subtest Names.....	3-12
3.6	System Test.....	3-14
3.7	Memory Test.....	3-16
3.8	Keyboard Test.....	3-17
3.9	Display Test .....	3-18
3.10	Floppy Disk Test.....	3-21
3.11	Printer Test .....	3-23
3.12	Async Test.....	3-25
3.13	Hard Disk Test .....	3-26
3.14	Real Timer Test.....	3-29
3.15	NDP Test.....	3-31
3.16	Expansion Test .....	3-32
3.17	CD-ROM/DVD-ROM Test .....	3-34
3.18	Error Code and Error Status Names.....	3-35
3.19	Hard Disk Test Detail Status .....	3-38
3.20	Only One Test .....	3-40
3.21	Head Cleaning.....	3-48
3.22	Log Utilities .....	3-49
3.23	Running Test.....	3-51
3.24	Floppy Disk Drive Utilities.....	3-52
3.25	System Configuration .....	3-57
3.26	Wireless LAN Test Program (Intel-made b/g) .....	3-59
3.27	Wireless LAN Test Program (Intel-made a/b/g).....	3-63
3.28	Wireless LAN Test Program (Askey-made).....	3-68
3.29	LAN/Modem/Bluetooth/IEEE1394 Test Program .....	3-72
3.30	Sound Test Program.....	3-86
3.31	SETUP .....	3-92

## Chapter 4 Replacement Procedures

4.1	Overview .....	4-1
4.2	Battery pack .....	4-8
4.3	PC card/SD card.....	4-10
4.4	Memory module .....	4-12
4.5	HDD.....	4-14
4.6	Selectable bay module .....	4-16
4.7	Keyboard.....	4-19
4.8	Bottom cover assembly.....	4-21
4.9	Battery latch assembly/Selectable bay lock .....	4-23
4.10	QI button assembly/PC card slot brace.....	4-25
4.11	MDC/Modem cable.....	4-27
4.12	Mini PCI module.....	4-30
4.13	Fan/CPU.....	4-32
4.14	DC-IN jack.....	4-35
4.15	Pen holder/RTC battery .....	4-36
4.16	LCD harness holder .....	4-38
4.17	Mic (L) cable guide.....	4-41
4.18	QI board/CN board.....	4-42
4.19	System board.....	4-44
4.20	PC card slot cover .....	4-46
4.21	Speaker.....	4-47
4.22	Microphone/Front panel.....	4-48
4.23	Lens holder.....	4-50
4.24	Touch pad .....	4-51
4.25	LCD unit & FL inverter .....	4-52
4.26	Application switch board .....	4-56
4.27	LCD latch assembly .....	4-57
4.28	Digitizer .....	4-58
4.29	LCD harness/Digitizer harness/Wireless LAN antenna cable .....	4-64
4.30	Hinge switch Board.....	4-68

4.31 Fluorescent Lamp ..... 4-69

**Appendices**

Appendix A Handling the LCD Module ..... A-1  
Appendix B Board Layout ..... B-1  
Appendix C Pin Assignment ..... 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**

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**Chapter 1 Contents**

---

1.1	Features .....	1-1
1.2	2.5-inch Hard Disk Drive.....	1-10
1.3	Optical Drive.....	1-12
	1.3.1 DVD-ROM Drive .....	1-12
	1.3.2 DVD-ROM & CD-R/RW Drive.....	1-16
	1.3.3 DVD Super Multi Drive .....	1-19
	1.3.4 DVD Super Multi Drive (Double-layer) .....	1-21
1.4	Keyboard.....	1-23
1.5	TFT Color Display.....	1-24
	1.5.1 LCD Module.....	1-24
	1.5.2 FL Inverter Board .....	1-25
1.6	Power Supply .....	1-26
1.7	Batteries .....	1-29
	1.7.1 Main Battery.....	1-29
	1.7.2 Battery Charging Control.....	1-30
	1.7.3 RTC Battery.....	1-31
1.8	AC Adapter.....	1-32

**Figures**

Figure 1-1	Front of the computer.....	1-5
Figure 1-2	System units configuration.....	1-5
Figure 1-3	System Block Diagram.....	1-6
Figure 1-4	2.5-inch HDD.....	1-10
Figure 1-5	DVD-ROM drive.....	1-12
Figure 1-6	DVD-ROM & CD-R/RW drive.....	1-16
Figure 1-7	DVD Super Multi drive.....	1-19
Figure 1-8	DVD Super Multi drive (Double-layer).....	1-21
Figure 1-9	Keyboard.....	1-23
Figure 1-10	LCD module.....	1-24

**Tables**

Table 1-1	2.5-inch HDD dimensions.....	1-10
Table 1-2	2.5-inch HDD Specifications.....	1-11
Table 1-3	DVD-ROM drive outline dimensions.....	1-12
Table 1-4	DVD-ROM drive specifications.....	1-13
Table 1-5	DVD-ROM & CD-R/RW drive outline dimensions.....	1-16
Table 1-6	DVD-ROM & CD-R/RW drive specifications.....	1-17
Table 1-7	DVD Super Multi drive outline dimensions.....	1-19
Table 1-8	DVD Super Multi drive specifications.....	1-20
Table 1-9	DVD Super Multi drive (Double-layer) outline dimensions.....	1-21
Table 1-10	DVD Super Multi drive (Double-layer) specifications.....	1-22
Table 1-11	LCD module specifications (14.1 TFT).....	1-24
Table 1-12	FL inverter board specifications.....	1-25
Table 1-13	Power supply output specifications.....	1-27
Table 1-14	Battery specifications.....	1-29
Table 1-15	Time required for charges of main battery.....	1-30
Table 1-16	Data preservation time.....	1-30

Table 1-17 RTC battery charging/data preservation time ..... 1-31  
Table 1-18 AC adapter specifications ..... 1-32



## 1.1 Features

The Satellite R10 is an ultra thin and lightweight tablet PC realizing cable-less environment on a table by wireless function with a Pentium-M/Celeron-M processor realizing high performance.

### ✍ Microprocessor

Microprocessor that is used will be different of the model.

#### ✍ Intel® Mobile Pentium®-M

Pentium-M	1.60GHz (Processor Number ; 725)
	1.70GHz (Processor Number ; 735)
	1.80GHz (Processor Number ; 745)
	2.00GHz (Processor Number ; 755)

L1 cache : 64KB (32KB + 32KB)

L2 cache : 2MB

#### ✍ Intel® Mobile Celeron®-M

Celeron-M	1.30GHz (Processor Number ; 350)
	1.40GHz (Processor Number ; 360)

L1 cache : 64KB (32KB + 32KB)

L2 cache : 1MB

### ✍ Chipset

Equipped with Intel 855GME (Montara-GM+) as North Bridge, Intel ICH4-M as South Bridge and Texas Instrument PCI7411ZHK as Card Controller.

### ✍ GPU Controller

Internal graphic controller in north bridge. VRAM 16-64MB

### ✍ Memory

Two DDR SO-DIMM slots support DDR333/DDR226. Memory modules can be installed to a maximum of 2GB (2,048MB). Memory modules in 256MB, 512MB and 1GB sizes are available.

### ✍ HDD

Single 40/60/80/100GB internal drive. 2.5-inch x 9.5mm height

✎ Selectable Bay

Supporting hotswap with DVD-ROM drive, DVD-ROM & CD-R/RW drive, DVD Super Multi drive and 2nd HDD adapter.

✎ USB FDD

3.5 inch USB FDD supports 720KB/1.44MB formats.

✎ Display

Display swivels automatically 0/90/180/270 degrees by display driver. LCD and CRT can be displayed at the same time.

LCD Built-in 14.1 inch, 16M colors, XGA (1,024?768 dots), thin type low temperature poly-silicon TFT color display.

CRT Supported via an RGB connector

TV-out Supported via an S-Video connector

✎ Digitizer

Digitizer is installed at the rear of LCD unit. The supplied tablet pen enables pen computing.

✎ Keyboard

Keyboard has 85(US)/86(UK)-key and supports Windows key and Hot key.

✎ Touch pad

Touch pad is installed as a pointing device.

✎ Tablet pen (Tablet PC pen)

Tablet pen can be used as a mouse by touching the display softly with the pen tip. Tablet button on the side of the pen corresponds to the right click of the mouse. Erase button on the pen tail can be used as an eraser depending on the application.

✎ Batteries

The computer has two batteries: a rechargeable Lithium-Ion main battery pack and an RTC battery (that backs up the Real Time Clock and CMOS memory).

✎ USB (Universal Serial Bus)

Three USB ports are usable. 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.

✎ PC card slot

The PC card slot (PCMCIA) accommodates one 5mm Type II card. (Based on PC Card Standard, supporting CardBus)

✎ SD card slot

A SD Card Slot can accommodate Secure Digital flash memory cards with various capacities. Supporting memory card and I/O card.

✎ Sound system

The sound system is equipped with the following features:

- Built in stereo speakers
- Built-in monaural microphone
- Stereo Headphone jack (3.5mm mini headphone jack)
- External microphone jack (3.5mm mini microphone jack)

✎ Switch/Button

Windows Security tablet button, ESC/Rotation button, Cross Function button, Toshiba Assist button and Wireless communication switch are available.

✎ Internal Modem

The internal modem is equipped as a modem daughter card (MDC).

The internal modem provides capability for data and fax communication and supports ITU-T V.90 standard. For data reception it operates at 56Kbps and for data transmission it operates at 33.6Kbps. For fax transmission, it operates at 14,4Kbps. The speed of data transfer and fax depends on analog telephone line condition. It has an RJ11 modem jack for connecting to a telephone line.

✎ LAN

The internal LAN supports 10/100Mbit Ethernet.

✍ Wireless LAN

Wireless LAN Card can be equipped with mini-PCI slot. Based on IEEE802.11b/g, a/b/g with 2.45GHz/5.0GHz Dual-band antenna.

✍ i.LINK (IEEE1394)

This port enables high-speed data transfer directly from external devices such as digital video cameras.

✍ Docking port

Advanced Port Replicator III can be connected through docking port on the bottom.

Figure 1-1 shows the front of the computer and Figure 1-2 shows the system units configuration.

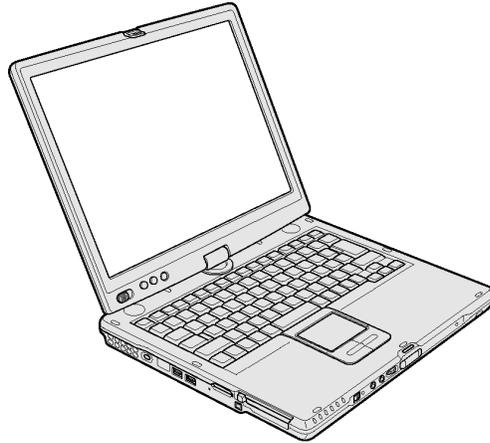


Figure 1-1 Front of the computer

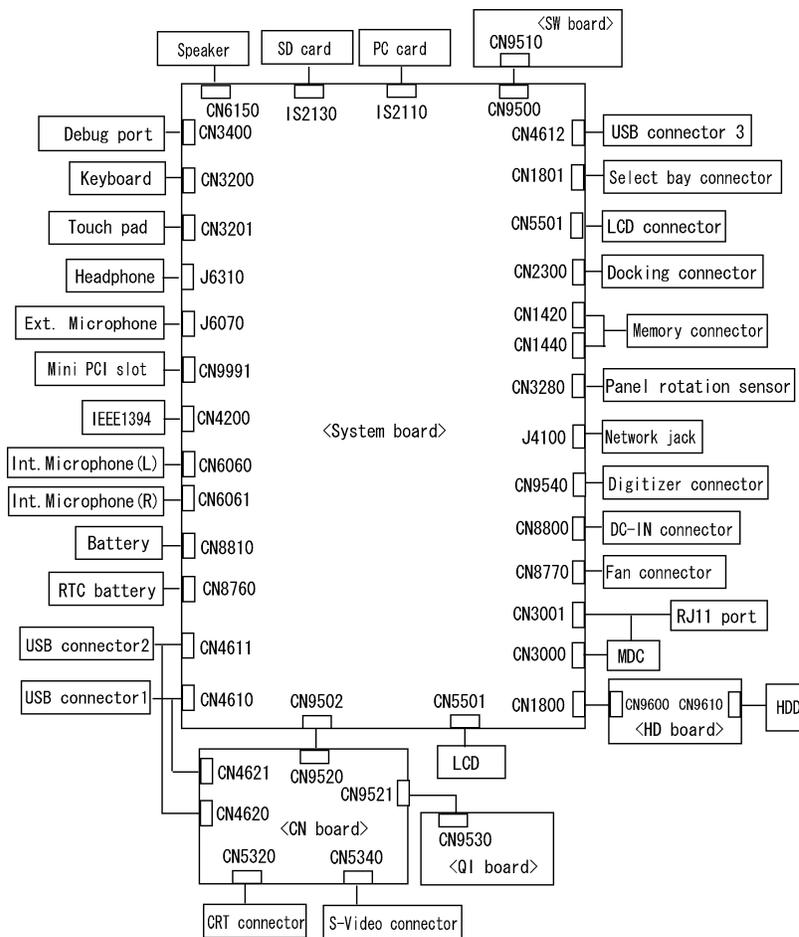


Figure 1-2 System units configuration

Figure 1-3 shows the system block diagram.

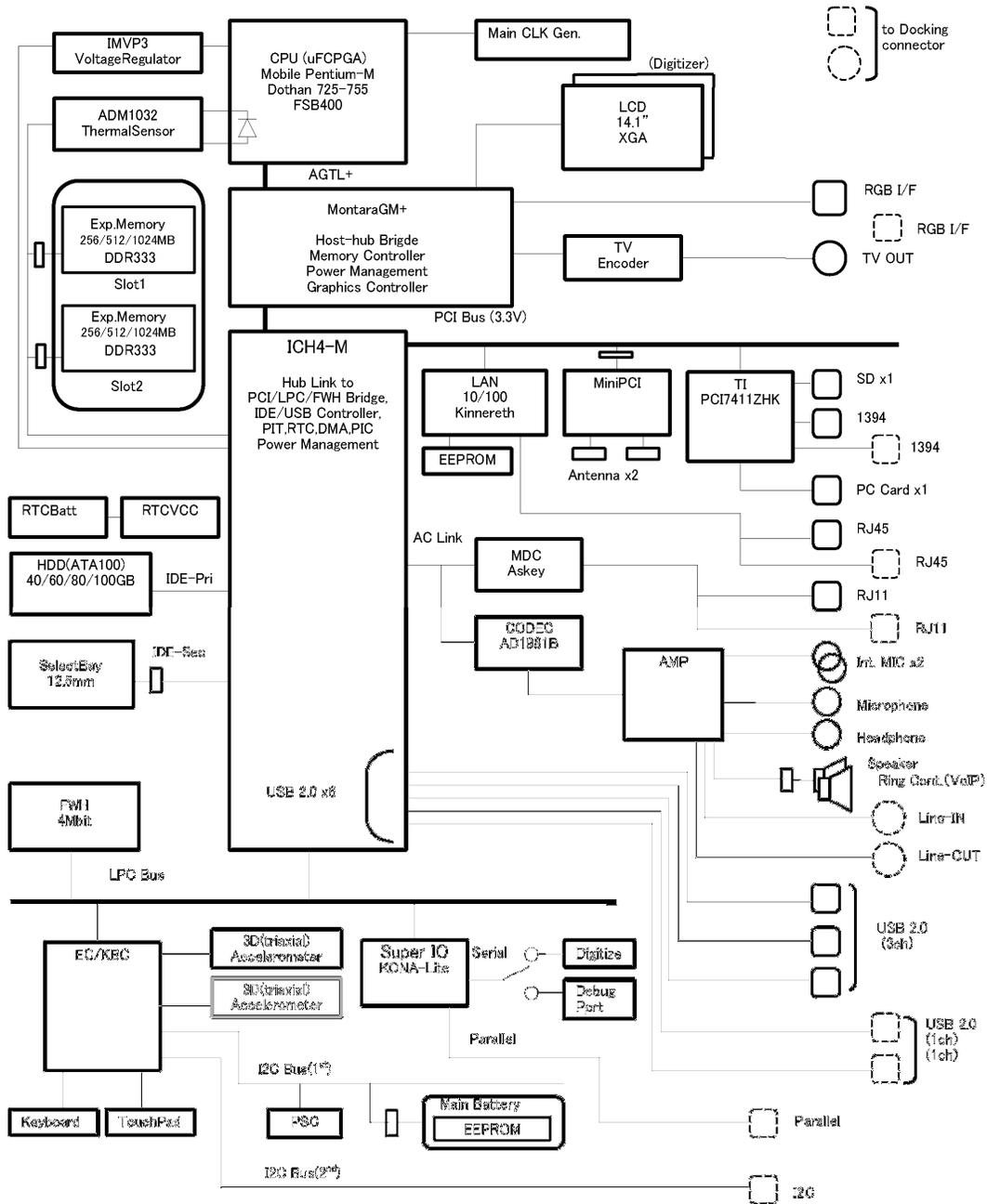


Figure 1-3 System Block Diagram

The PC contains the following components.

✎ CPU

- ✎ Intel® Mobile Pentium®-M Processor 1.60GHz (Processor Number ; 725)  
1.70GHz (Processor Number ; 735)  
1.80GHz (Processor Number ; 745)  
2.00GHz (Processor Number ; 755)

Core voltage : 1.05V  
FSB : 400MHz  
L1 cache : 64KB [32KB (Code) + 32KB (Data)]  
L2 cache : 2MB  
Support : Enhanced Intel® SpeedStep technology

- ✎ Intel® Mobile Celeron®-M Processor 1.30GHz (Processor Number ; 350)  
1.40GHz (Processor Number ; 360)

Core voltage : 0.748V  
FSB : 400MHz  
L1 cache : 64KB [32KB (Code) + 32KB (Data)]  
L2 cache : 1MB

✎ Memory

Two DDR SO-DIMM slots support DDR333/DDR226. Memory modules in 256MB, 512 MB and 1GB can be installed to a maximum of 2GB (2,048MB).

2.5V operation  
200 pin, SO Dual In-line Memory Modules (SO-DIMM)  
Supports PC2700/PC2100

✎ BIOS ROM (Flash memory)

4Mbit (256K? 16-bit chip)

- 64KB used for logo
- 64KB used for setup and checksum
- 128KB used for system BIOS
- 64KB used for VGA-BIOS
- 64KB used for ACPI
- 8KB used for PnP
- 8KB used for password security
- 16KB used for booting
- 64KB used for LAN
- 32KB are reserved

5.0V operation  
Access time : 120 ns or 90 ns  
Data transfer: 8-bit

---

✎ PCI chipset

This gate array incorporates the following elements and functions

Intel 855GME (Montara-GM+) (North Bridge)

- Dothan Processor System Bus Support
- DRAM Controller supporting DDR333/DDR266, 2GB max
- Accelerated Graphics Port Interface: adheres to AGP2.0, AGP?4 mode
- Hub Link Interface
- 732-ball 37.5?37.5 mm FC-BGA package

Intel ICH4-M (South Bridge)

- Hub Link Interface
- PCI Rev2.2 Interface (6 PCI REQ/GNT Pairs)
- BusMaster IDE Controller (Ultra ATA 100/66/33)
- USB 1.1/2.0 Controller 6 Ports (EHCI: Enhanced Host Controller)
- I/O APIC (ACPI 1.06)
- SMBus2.0 Controller
- FWH Interface (BIOS)
- LPC Interface (EC/KBC, Super I/O)
- IRQ Controller
- Serial Interrupt Controller
- Power Management Controller
- Deeper Sleep (C4) Support
- Suspend/Resume Control
- AC'97 2.2 Interface
- Internal RTC
- Internal LAN Controller (WfM2.0)
- 421-ball 31?31mm BGA Package

✎ PC Card Controller (Texas Instruments-made PCI7411ZHK)

PCI interface

CardBus/Ultra Media controller

SD card controller

IEEE1394 controller

288-ball (16x16x1.4) BGA package

✎ GPU controller (Internal graphic controller)

VRAM 16-64MB

AGP V2.0 standard x4 mode

LCD I/F LVDS 2ch

S-video support

✍ Batteries

The main battery is a detachable lithium-ion main battery (10.8V, 4700mAh, 6 cell) and the RTC battery is a lithium ion battery (2.4V-16mAh).

✍ Modem controller

Supported by MDC. Using of the secondary AC97 Line

✍ LAN controller (ICH4-M Kinnerth 82562EP)

Controls LAN and supports 100BASE-TX (Fast Ethernet)/10BASE-T (Ethernet).

✍ Other main system chips

- EC/KBC (Mitsubishi-made LPC microcontroller M306K5F8LRP)
- PSC (Toshiba-made TMP87PM48UG)
- Temperature sensor (ADM-made ADM1032ARMZ)
- Acceleration sensor (ST Micro-made LIS3L02AQ)
- Super I/O (SMSC-made LPC47N217-JN)
- SOUND CODEC (ADM-made AD1981B)
- AMP (Matsushita-made MM1667XHFE) + HP AMP (MAX4410)
- CLK Generator (ICS-made ICS950812CGLFT)

## 1.2 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 1-4 shows a view of the 2.5-inch HDD and Tables 1-1 and 1-2 list the specifications.

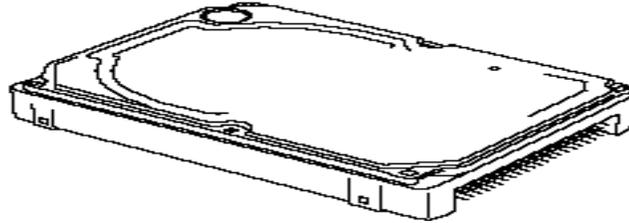


Figure 1-4 2.5-inch HDD

Table 1-1 2.5-inch HDD dimensions

Parameter		Standard value			
		TOSHIBA HDD2188BZE02	TOSHIBA HDD2189BZE02	TOSHIBA HDD2190BZE02	TOSHIBA HDD2D08BZE02
Outline dimensions	Width (mm)	69.85			
	Height (mm)	9.5			
	Depth (mm)	100			
	Weight (g)	99 (max)	95		102 (max)

Parameter		Standard value			
		HGST G8BC0001E411	HGST G8BC0001N611	HGST G8BC0001N811	HGST G8BC0001NA10
Outline dimensions	Width (mm)	69.85±0.25			
	Height (mm)	9.5±0.2			
	Depth (mm)	100.2±0.25			
	Weight (g)	95 (max)			102 (max)

Table 1-2 2.5-inch HDD Specifications

Parameter	Specification			
	TOSHIBA HDD2190BZE02	TOSHIBA HDD2189BZE02	TOSHIBA HDD2188BZE02	TOSHIBA HDD2D08BZE02
Storage size (formatted)	40GB	60GB	80GB	100GB
Speed (RPM)	4,200			5,400
Data transfer speed (Mbits/s)	175.0-341.7			230.6-445.9
Interface transfer rate (MB/s)	100 (Ultra DMA mode)			
Storage density(Kbpi)	735	-	735( max)	756
Track density (Ktpi)	96	88.1		110
Average seek time (Read) (ms)	12			
Average seek time (Write) (ms)	12			
Start time (sec)	4.0			

Parameter	Specification			
	HGST G8BC0001E411	HGST G8BC0001N611	HGST G8BC0001N811	HGST G8BC0001NA10
Storage size (formatted)	40GB	60GB	80GB	100GB
Speed (RPM)	4,200			5,400
Data transfer speed (Mbits/s)	512	493		
Interface transfer rate (MB/s)	100 (Ultra DMA mode)			
Storage density(Kbpi)	702	717		764
Track density (Ktpi)	96	96.6		113.2
Average seek time (Read) (ms)	12			
Average seek time (Write) (ms)	14			
Start time (sec)	3.0	3.5		

## 1.3 Optical Drive

### 1.3.1 DVD-ROM Drive

The DVD-ROM drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD/DVD-ROM and CD-R/RW and DVD-RAM (read-only).

The DVD-ROM drive is shown in Figure 1-5. The dimensions and specifications of the DVD-ROM & CD-R/RW drive are described in Table 1-3, Table 1-4.

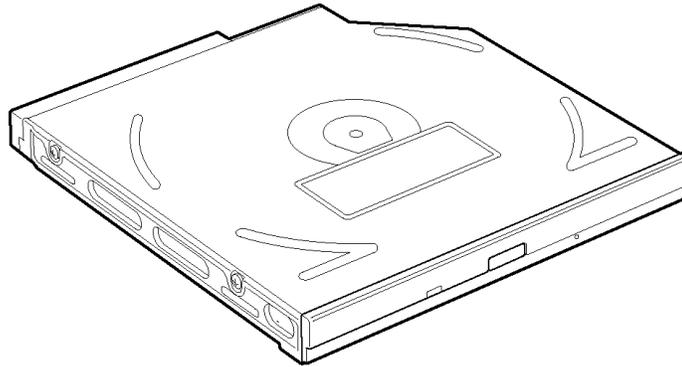


Figure 1-5 DVD-ROM drive

Table 1-3 DVD-ROM drive outline dimensions

Parameter		Standard value		
Outline dimensions	Maker (code)	TSST (G8CC0000R410)	TSST (G8CC0002B410)	TEAC (G8CC0002E410)
	Width (mm)	128±0.2		128
	Height (mm)	12.7±0.2 (excluding projections)		12.7
	Depth (mm)	126.1		129.4
	Mass (g)	200	170	180

Table 1-4 DVD-ROM drive specifications (1/3)

Parameter		Drive Specification
		TSST (G8CC0000R410)
Data transfer speed	Read	DVD-ROM(Single-L) MAX 8x(CAV) [MAX 10820KB/s] DVD-ROM(Double-L) MAX 6x(CAV) [MAX 8112KB/s] DVD-VIDEO(CSS) MAX 4x(CAV) [MAX 5408KB/s] DVD-R/RW MAX 4x(CAV) [MAX 5408KB/s] DVD-RAM(Ver1.0) MAX 2x(ZCLV) [MAX 2704KB/s] DVD-RAM(Ver2.1) MAX 1x(ZCLV) [MAX 2704KB/s] CD(Mode1) MAX 5.7x(PCAV) [MAX 855KB/s] MAX 24x(CAV) [MAX 3600KB/s] CD(Mode2) MAX 5.7x(PCAV) [MAX 975.3KB/s] MAX 24x(CAV) [MAX 4104KB/s] CD-RW MAX 8.6x(CLV) [MAX 1293KB/s]
	ATAPI interface (MB/s)	PIO mode16.7 MB/s PIO-MODE4 supported DMA mode16.7 MB/s MultiwordDMA-MODE2 supported Ultra DMA mode 33.3 MB/s UltraDMA-MODE2 supported
Access time (ms)	CD-ROM	95 (Random)
	DVD-ROM	100 (Random)
	DVD-RAM	170 (Random)
Buffer memory		192KByte
Supported disk format	CD	CD-Audio, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, CD-I, CD-I Bridge(Photo-CD, Video-CD), Multi-session CD(Photo-CD, CD-EXTRA, CD-R, CD-RW), CD-R(read), CD-RW (read)
	DVD	DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R (read), DVD-RW (read), DVD-RAM (read, Version2.1), DVD-RAM (read, Version1.0)

Table 1-4 DVD-ROM drive specifications (2/3)

Parameter		Drive Specification
		TSST (G8CC0002B410)
Data transfer speed	Read	DVD-ROM(Single-L) MAX 8x(CAV) [MAX 10816KB/s] DVD-ROM(Double-L) MAX 6x(CAV) [MAX 8112KB/s] DVD-R/-RW MAX 4x(CAV) [MAX 5408KB/s] DVD+R/+RW MAX 4x(CAV) [MAX 5408KB/s] DVD-RAM(Ver2.1) MAX 2x(ZCLV) [MAX 2704KB/s] CD(Mode1) MAX 24x(CAV) [MAX 3600KB/s] CD(Mode2) MAX 24x(CAV) [MAX 4104KB/s] CD-DA(Mode1) MAX 10x(CLV) [MAX 1500KB/s] CD-DA(Mode2) MAX 10x(CLV) [MAX 1710KB/s]
	ATAPI interface (MB/s)	PIO mode16.7 MB/s PIO-MODE4 supported DMA mode16.7 MB/s MultiwordDMA-MODE2 supported Ultra DMA mode 33.3 MB/s UltraDMA-MODE2 supported
Access time (ms)	CD-ROM	110 (Random)
	DVD-ROM	110 (Random)
	DVD-RAM	140 (Random)
Buffer memory		256KByte
Supported disk format	CD	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, CD-I, CD-I Bridge(Photo-CD, Video-CD), Multi-session CD(Photo-CD, CD-EXTRA, CD-R, CD-RW, Portfolio), CD-R, CD-RW
	DVD	DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R (Ver1.0, Ver2.1), DVD-RW (Ver1.0, Ver1.1), DVD+R, DVD+RW, DVD-RAM (Version2.1)

Table 1-4 DVD-ROM drive specifications (3/3)

Parameter		Drive Specification
		TEAC (G8CC0002E410)
Data transfer speed	Read	DVD-ROM MAX 8x(CAV) [MAX 4594KB/s] DVD-VIDEO MAX 4x(CAV) [MAX 2297KB/s] DVD-R/RW MAX 8x(CAV) [MAX 4594KB/s] DVD-RAM(4.7GB) MAX 5x(CAV) [MAX 3246KB/s] DVD-RAM(2.6GB) MAX 2.5x(CAV) [MAX 1626KB/s] CD(Mode1) MAX 24x(CAV) [MAX 5137KB/s] CD(Mode2) MAX 20x(CAV) [MAX 4280KB/s] CD-RW MAX 24x(CLV) [MAX 5137KB/s]
	ATAPI interface (MB/s)	PIO mode16.7 MB/s PIO-MODE4 supported DMA mode16.7 MB/s MultiwordDMA-MODE2 supported Ultra DMA mode 33.3 MB/s UltraDMA-MODE2 supported
Access time (ms)	CD-ROM	120 (Random)
	DVD-ROM	130 (Random)
Buffer memory		-
Supported disk format	CD	CD-DA, CD-ROM MODE1, CD-ROM MODE2, Multi-session CD, CD, CD-I, Video-CD, Enhanced CD, CD-TEXT, Photo-CD, addressing Method 2
	DVD	DVD-R (General, Authoring, Single/Multi-boarder), DVD-Video, DVD-RW (Single/Multi-boarder, Packet), DVD-RAM (4.7GB, 2.6GB), DVD+R/RW (Single/Multi-boarder, Packet)

### 1.3.2 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.

The DVD-ROM & CD-R/RW drive is shown in Figure 1-6. The dimensions and specifications of the DVD-ROM & CD-R/RW drive are described in Table 1-5, Table 1-6.

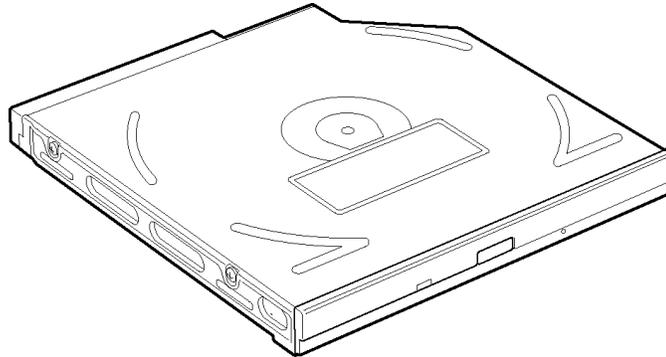


Figure 1-6 DVD-ROM & CD-R/RW drive

Table 1-5 DVD-ROM & CD-R/RW drive outline dimensions

Parameter		Standard value	
Outline dimensions	Maker (code)	PCC (G8CC0001X410)	TEAC (G8CC0001Y411)
	Width (mm)	128	
	Height (mm)	12.7 (excluding projections)	
	Depth (mm)	129.0	
	Mass (g)	190±10	

Table 1-6 DVD-ROM &amp; CD-R/RW drive specifications (1/2)

Parameter		Drive Specification
		PCC (G8CC0001X411)
Data transfer speed	Read	DVD-ROM MAX 8x(CAV) [MAX 10800 KB/s] CD-ROM MAX 24x(CAV) [MAX 3600 KB/s]
	Write	CD-R 4x/8x(CLV), 16x(PCAV), MAX24x(CAV) CD-RW 4x(CLV) High Speed CD-RW 4x/8x/10x(CLV) Ultra Speed CD-RW 10x(CLV), MAX24x(CAV)
	ATAPI interface (MB/s)	PIO mode16.6 MB/s PIO MODE4 supported DMA mode16.6 MB/s Multiword MODE2 supported Ultra DMA mode 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, CD-Extra(CD+), CD-text
	DVD	DVD-R (DVD-R Multi-boarder supported) DVD-RW(Ver.1.2), DVD-Video, DVD+R, DVD+RW, DVD-RAM(2.6GB/4.7GB), DVD+R, DVD+RW

Table 1-6 DVD-ROM &amp; CD-R/RW drive specifications (2/2)

Parameter		Drive Specification
		TEAC (G8CC0001Y411)
Data transfer speed	Read	DVD-ROM MAX 8x(CAV) [MAX 10800 KB/s] CD-ROM MAX 24x(CAV) [MAX 3600 KB/s]
	Write	CD-R 4x/8x(CLV), 16x(PCAV), MAX24x(CAV) CD-RW 4x(CLV) High Speed CD-RW 4x/8x/10x(CLV) Ultra Speed CD-RW 10x(CLV), MAX 24x(CAV)
	ATAPI interface (MB/s)	PIO mode16.6 MB/s PIO MODE4 supported DMA mode16.6 MB/s Multiword MODE2 supported Ultra DMA mode 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, CD-Extra(CD+), CD-text
	DVD	DVD-R (DVD-R Multi-boarder supported) DVD-RW(Ver.1.2), DVD-Video, DVD+R, DVD+RW, DVD-RAM(2.6GB/4.7GB)

### 1.3.3 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.

The DVD Super Multi drive is shown in Figure 1-7. The dimensions and specifications of the DVD Super Multi drive are described in Table 1-7, Table 1-8.

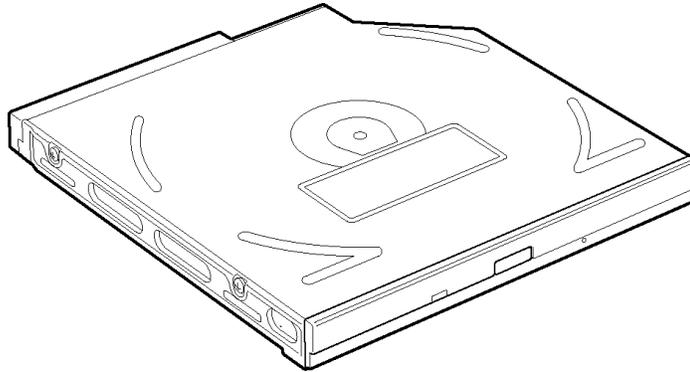


Figure 1-7 DVD Super Multi drive

Table 1-7 DVD Super Multi drive outline dimensions

Parameter		Standard value
Outline dimensions	Maker	PCC (G8CC00021410)
	Width (mm)	128
	Height (mm)	12.7 (excluding projections)
	Depth (mm)	129.0
	Mass (g)	210±10

Table 1-8 DVD Super Multi drive specifications

Parameter		Drive Specification
		PCC (G8CC00021410)
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), 24x (ZCLV) CD-RW 4x (CLV) High Speed CD-RW 4x/8x/10x (CLV) Ultra Speed CD-RW 10x (CLV) DVD-R 1x/2x (CLV), MAX 8x (CLV) DVD-RW 1x/2x (CLV), MAX 4x (CLV) DVD+R 2.4x (CLV), MAX 8x (CLV) DVD+RW 2.4x (CLV), MAX 4x (CLV) DVD-RAM 3x (ZCLV) (4.7GB/9.4GB)
	ATAPI interface (MB/s)	PIO mode 16.6 MB/s (PIO MODE4 supported) DMA mode 16.6 MB/s (Multi-ward MODE2 supported) Ultra DMA mode 33.3 MB/s(Ultra DMA MODE2 supported)
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, CD-Extra(CD+), CD-text
	DVD	DVD-R(3.9GB), DVD-RW (Ver1.1), DVD Video, DVD+R, DVD+RW, DVD-RAM (2.6GB/4.7GB)

### 1.3.4 DVD Super Multi Drive (Double-layer)

The DVD Super Multi drive (Double-layer) accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD/DVD-ROM, CD-R/RW, DVD±R/±RW, DVD-RAM and DVD+R (Double-layer).

The DVD Super Multi drive (Double-layer) is shown in Figure 1-8. The dimensions and specifications of the DVD Super Multi drive (Double-layer) are described in Table 1-9, Table 1-10.

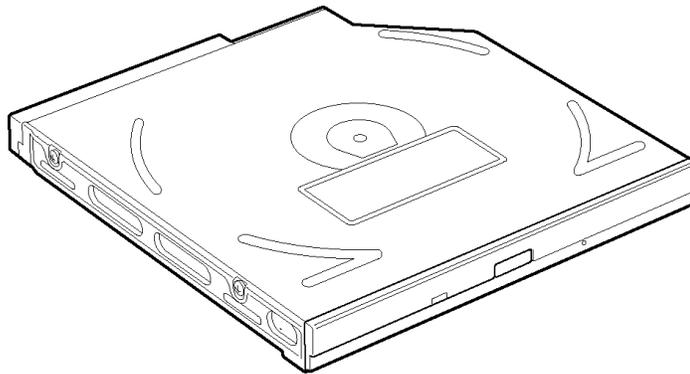


Figure 1-8 DVD Super Multi drive (Double-layer)

Table 1-9 DVD Super Multi drive (Double-layer) outline dimensions

Parameter		Standard value
Outline dimensions	Maker	PCC (G8CC00021411)
	Width (mm)	128
	Height (mm)	12.7 (excluding projections)
	Depth (mm)	129.0
	Mass (g)	210±10

Table 1-10 DVD Super Multi drive (Double-layer) specifications

Parameter		Drive Specification
		PCC (G8CC00021411)
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), 24x (ZCLV) CD-RW 4x(CLV) High Speed CD-RW 4x/8x/10x(CLV) Ultra Speed CD-RW 10x(CLV) DVD-R 1x/2x(CLV), MAX 8x(CLV) DVD-RW 1x/2x(CLV), MAX 4x(CLV) DVD+R 2.4x(CLV), MAX 8x(CLV) DVD+R Double Layer 2.4x(CLV) DVD+RW 2.4x(CLV), MAX 4x(CLV) DVD-RAM 3x(ZCLV) (4.7GB/9.4GB)
	ATAPI interface (MB/s)	PIO mode 16.6 MB/s (PIO MODE4 supported) DMA mode 16.6 MB/s (Multi-ward MODE2 supported) Ultra DMA mode 33.3 MB/s(Ultra DMA MODE2 supported)
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, CD-Extra(CD+), CD-text
	DVD	DVD-R(3.9GB), DVD-RW (Ver1.1), DVD Video, DVD+R, DVD+RW, DVD-RAM (2.6GB/4.7GB)

## **1.4 Keyboard**

The keyboard is mounted 85(US)/86(UK) keys that consist of character key and control key, and in conformity with JIS. The keyboard is connected to membrane connector on the system board and controlled by the keyboard controller.

Figure1-9 is a view of the keyboard.

See Appendix E about a layout of the keyboard.



*Figure 1-9 Keyboard*

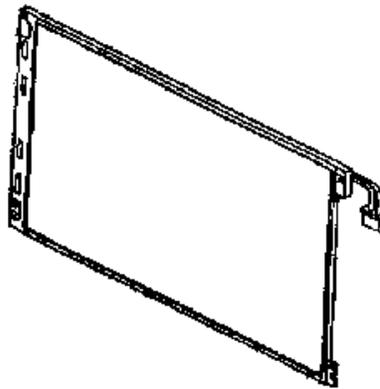
## 1.5 TFT Color Display

The TFT color display consists of a LCD module and FL inverter board.

### 1.5.1 LCD Module

The LCD module used for the TFT color display uses a backlight as the light source and can display images and characters of 16M colors with 1024x768 resolution.

Figure 1-10 shows a view of the LCD module and Table 1-11 lists the specifications.



*Figure 1-10 LCD module*

*Table 1-11 LCD module specifications (14.1 TFT)*

Item	Specifications
	G33C0002J110
Number of Dots	1,024 (W) x 768 (H)
Dot spacing (mm)	0.279 (H) x 0.279 (V)
Display range (mm)	285.7 (H) x 214.3 (V)
Outline dimensions	299 (w) x 229 (H) x 7.7 (D)

### 1.5.2 FL Inverter Board

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

Table 1-12 lists the FL inverter board specifications.

*Table 1-12 FL inverter board specifications*

Item		Specifications
		<b>G71C00011110</b>
Input	Voltage (V)	5 (DC)
	Power (W)	7
Output	Voltage (V)	750 (r.m.s)
	Power	5.0W / 7VA
	Current (mA) (f=70KHz)	6.00 (r.m.s)

## **1.6 Power Supply**

The power supply supplies 27 different voltages to the system board.

The power supply microcontroller has the following functions.

1. Judges that 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 1-13 lists the power supply output specifications.

Table 1-13 Power supply output specifications (1/2)

Name	Power supply ( Yes/No)				
	Voltage [V]	Power OFF (Suspend mode)	Power OFF (Boot mode)	No battery	Object
PPV	1.340 - 0.748	No	No	No	CPU
PTV	1.05	No	No	No	CPU, GMCH, ICH4-M
1R25-B1V	1.25	<b>Yes</b>	No	No	DDR-SDRAM Termination
1R35-P1V	1.35	No	No	No	GMCH
1R5-S1V	1.5	<b>Yes</b>	<b>Yes</b>	No	ICH4-M
1R5-P1V	1.5	No	No	No	GMCH, ICH4-M, TV-Encoder
1R8-P1V	1.8	No	No	No	CPU
2R5-B2V	2.5	<b>Yes</b>	No	No	GMCH, DDR-SDRAM
S3V	3.3	<b>Yes</b>	<b>Yes</b>	No	ICH4-M, EC/KBC, Acceleration sensor
E3V	3.3	<b>Yes</b>	No	No	Card Cont, Mini-PCI, MDC
SD-E3V	3.3	No	No	No	SD Card
P3V	3.3	No	No	No	Clock Generator, Thermal Sensor, GMCH, SDRAM(SPD), ICH4-M, Mini-PCI, FWH, Super I/O, LAN, TV-Encoder, AD1981B, Headphone AMP, Digitizer
PNL-P3V	3.3	No	No	No	LCD
A4R7-P4V	4.7	No	No	No	AD1981B, MM1667
E5V	5	<b>Yes</b>	No	No	PC-Card
USB0PS-E5V	5	No	No	No	USB
USB1PS-E5V	5	No	No	No	USB
SND-P5V	5	No	No	No	MM1667
P5V	5	No	No	No	Mini-PCI, HDD, KB, T-PAD,
SB-P5V	5	No	No	No	Select Bay
FL-P5V	5	No	No	No	FL Inverter
IF-P5V	5	No	No	No	Dock

Table 1-13 Power supply output specifications (2/2)

Name	Power supply ( Yes/No)				
	Voltage [V]	Power OFF (Suspend mode)	Power OFF (Boot mode)	No battery	Object
FANVCC	2.7-5	No	No	No	FAN
DSKDC	10.0 -15.0	No	No	No	Dock
MCV	5	<b>Yes</b>	<b>Yes</b>	No	PSC
M5V	5	<b>Yes</b>	<b>Yes</b>	No	System LED, Dock
R3V	2.0 - 3.6	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	ICH4-M(RTC)

## 1.7 Batteries

The PC has the following two batteries.

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

Table 1-14 lists the specifications for these two batteries.

*Table 1-14 Battery specifications*

Battery Name		Battery Element	Output Voltage	Capacity
Main battery	G71C0004S110	Lithium ion (6 cell)	10.8 V	4,700 mAh
	G71C0004S210			
Real time clock (RTC) battery	P71035009115	Nickel hydrogen	2.4V	16mAh

### 1.7.1 Main Battery

The main battery is the primary power supply for the computer when the AC adapter is not connected. In standby (instant recovery) mode, the main battery maintains the current status of the computer.

## 1.7.2 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 adapter and battery are connected to the computer.

### ✎ Quick 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 or in standby mode. Table 1-15 lists the main battery charging time.

*Table 1-15 Time required for charges of main battery*

Battery Capacity	Charging Time	
	Normal charge	Quick charge
4700mAh	about 5.5 to 13.0	about 3.0

Quick battery 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

### ? Data preservation time

When turning off the power in being charged fully, the preservation time is as following Table 1-16.

*Table 1-16 Data preservation time*

Condition		preservation time
4700mAh	Standby mode	About 3 days
	Boot mode	About 20 days

### 1.7.3 RTC Battery

The RTC battery provides the power supply to maintain the date, time, and other system information in memory. Table 1-17 lists the battery charging time and data preservation times.

*Table 1-17 RTC battery charging/data preservation time*

		<b>Time</b>
Charging time	AC adapter or main battery in use (Power ON)	about 8 hours
Data preservation time (when fully charged)		about 30 days

## 1.8 AC Adapter

The AC adapter is also used to charge the battery.

Table 1-18 lists the AC adapter specifications.

*Table 1-18 AC adapter specifications*

Parameter	Specification	
	G71C0002S310	G71C0004A210
Power	60W	
Input rated voltage	100V/240V	
Input frequency range	50Hz/60Hz	
Input current	1.5A or less	
Output rated voltage	DC 15V	
Output current	0A to 4.0A	

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## **Chapter 2**

# **Troubleshooting Procedures**

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## Chapter 2 Contents

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2.1	Troubleshooting .....	2-1
2.2	Troubleshooting Flowchart.....	2-2
2.3	Power Supply Troubleshooting.....	2-6
	Procedure 1    Power Supply Icon Check.....	2-7
	Procedure 2    Error Code Check.....	2-9
	Procedure 3    Connection Check.....	2-15
	Procedure 4    Quick Charge Check .....	2-15
	Procedure 5    Replacement Check.....	2-16
2.4	System Board Troubleshooting.....	2-17
	Procedure 1    Message Check .....	2-18
	Procedure 2    Debug Port (D port) Check on Boot Mode .....	2-20
	Procedure 3    Diagnostic Test Program Execution Check .....	2-32
	Procedure 4    Replacement Check.....	2-32
2.5	USB 3.5" FDD Troubleshooting.....	2-33
	Procedure 1    FDD Head Cleaning Check.....	2-33
	Procedure 2    Diagnostic Test Program Execution Check .....	2-34
	Procedure 3    Connector Check and Replacement Check.....	2-35
2.6	2.5" HDD Troubleshooting.....	2-36
	Procedure 1    Partition Check.....	2-36
	Procedure 2    Message Check .....	2-37
	Procedure 3    Format Check .....	2-38
	Procedure 4    Diagnostic Test Program Execution Check .....	2-39
	Procedure 5    Connector Check and Replacement Check.....	2-40
2.7	Keyboard Troubleshooting .....	2-41
	Procedure 1    Diagnostic Test Program Execution Check .....	2-41
	Procedure 2    Connector Check and Replacement Check.....	2-41

## 2 Troubleshooting Procedures

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2.8	Display Troubleshooting.....	2-42
	Procedure 1    External Monitor Check.....	2-42
	Procedure 2    Diagnostic Test Program Execution Check .....	2-42
	Procedure 3    Connector and Cable Check.....	2-43
	Procedure 4    Replacement Check.....	2-43
2.9	Touch Pad Troubleshooting .....	2-45
	Procedure 1    Diagnostic Test Program Execution Check .....	2-45
	Procedure 2    Connector and Cable Check.....	2-45
	Procedure 3    Replacement Check.....	2-45
2.10	Selectable bay(optical drive) Troubleshooting .....	2-46
	Procedure 1    Diagnostic Test Program Execution Check .....	2-46
	Procedure 2    Connector Check and Replacement Check .....	2-46
2.11	Modem Troubleshooting.....	2-47
	Procedure 1    Diagnostic Test Program Execution Check .....	2-47
	Procedure 2    Connector Check and Replacement Check .....	2-47
2.12	LAN Troubleshooting.....	2-48
	Procedure 1    Diagnostic Test Program Execution Check .....	2-48
	Procedure 2    Connector Check and Replacement Check .....	2-48
2.13	Sound Troubleshooting.....	2-49
	Procedure 1    Diagnostic Test Program Execution Check .....	2-49
	Procedure 2    Connector Check.....	2-49
	Procedure 3    Replacement Check.....	2-49
2.14	SD Card Slot Troubleshooting.....	2-50
	Procedure 1    Check on Windows XP Tablet PC Edition.....	2-50
	Procedure 2    Connector/ Replacement Check.....	2-50
2.15	Tablet Pen Troubleshooting .....	2-51
	Procedure 1    Check on Windows XP Tablet PC Edition.....	2-51
	Procedure 2    Replacement Check.....	2-51
	Procedure 3    Connector/ Replacement Check.....	2-52
2.16	Wireless LAN Troubleshooting .....	2-53
	Procedure 1    Trancemitting- Receiving Check .....	2-53
	Procedure 2    Antennas' Connection Check .....	2-54

Procedure 3 Replacement Check..... 2-54

**Figures**

Figure 2-1 Troubleshooting flowchart ..... 2-3  
Figure 2-2 A set of tool for debug port test ..... 2-20

**Tables**

Table 2-1 Battery icon..... 2-7  
Table 2-2 DC IN icon..... 2-7  
Table 2-3 Debug port (Boot mode) error status ..... 2-22  
Table 2-4 FDD error code and status ..... 2-34  
Table 2-5 2.5" HDD error code and status ..... 2-39



## 2.1 Troubleshooting

Chapter 2 describes how to determine which Field Replaceable Unit (FRU) in the computer is causing the computer to malfunction. (The “FRU” means the replaceable unit in the field.)

The FRUs covered are:

- |                 |                  |
|-----------------|------------------|
| 1. Power supply | 8. Optical drive |
| 2. System Board | 9. Modem         |
| 3. 3.5" USB FDD | 10. LAN          |
| 4. 2.5" HDD     | 11. Sound        |
| 5. Keyboard     | 12. SD card slot |
| 6. Display      | 13. Tablet pen   |
| 7. Touch pad    | 14. Wireless LAN |

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

**NOTE:** After replacing the system board or CPU, it is necessary to execute the subtest 01 Initial configuration of 3.3 Setting of the hardware configuration in Chapter 3.

The following tools are necessary in addition to tools described in Chapter 3 for implementing the Diagnostics procedures:

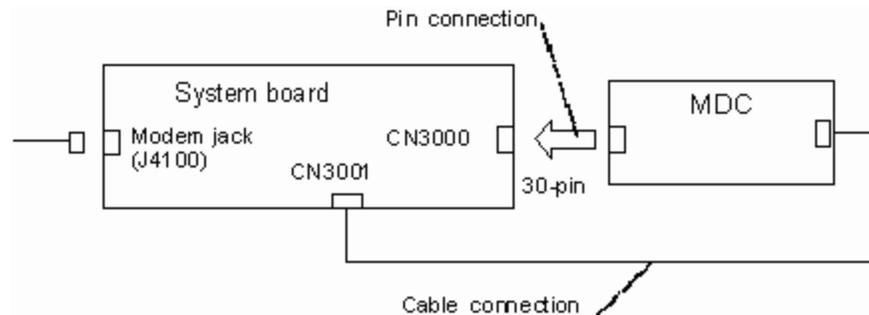
1. Phillips screwdrivers
2. Toshiba MS-DOS system FD
3. Debug test cable (for debug port test)
4. RS-232C cross-cable (for debug port test)
5. Test board (for debug port test)
6. External monitor (for display check)

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

(1) Cable connection is described as line in the figures.

(2) Pin connection is described as arrow in the figure.

<e.g> Connection of modem



## **2.2 Troubleshooting Flowchart**

Use the flowchart in Figure 2-1 as a guide for determining which FRU malfunctions. Before going through the flowchart steps, check the following:

- ✍ Make sure that Toshiba Windows<sup>®</sup> XP Tablet PC Edition is installed on the hard disk. Other operating systems can cause the computer malfunction.
  
- ✍ Make sure all optional equipment is removed from the computer.

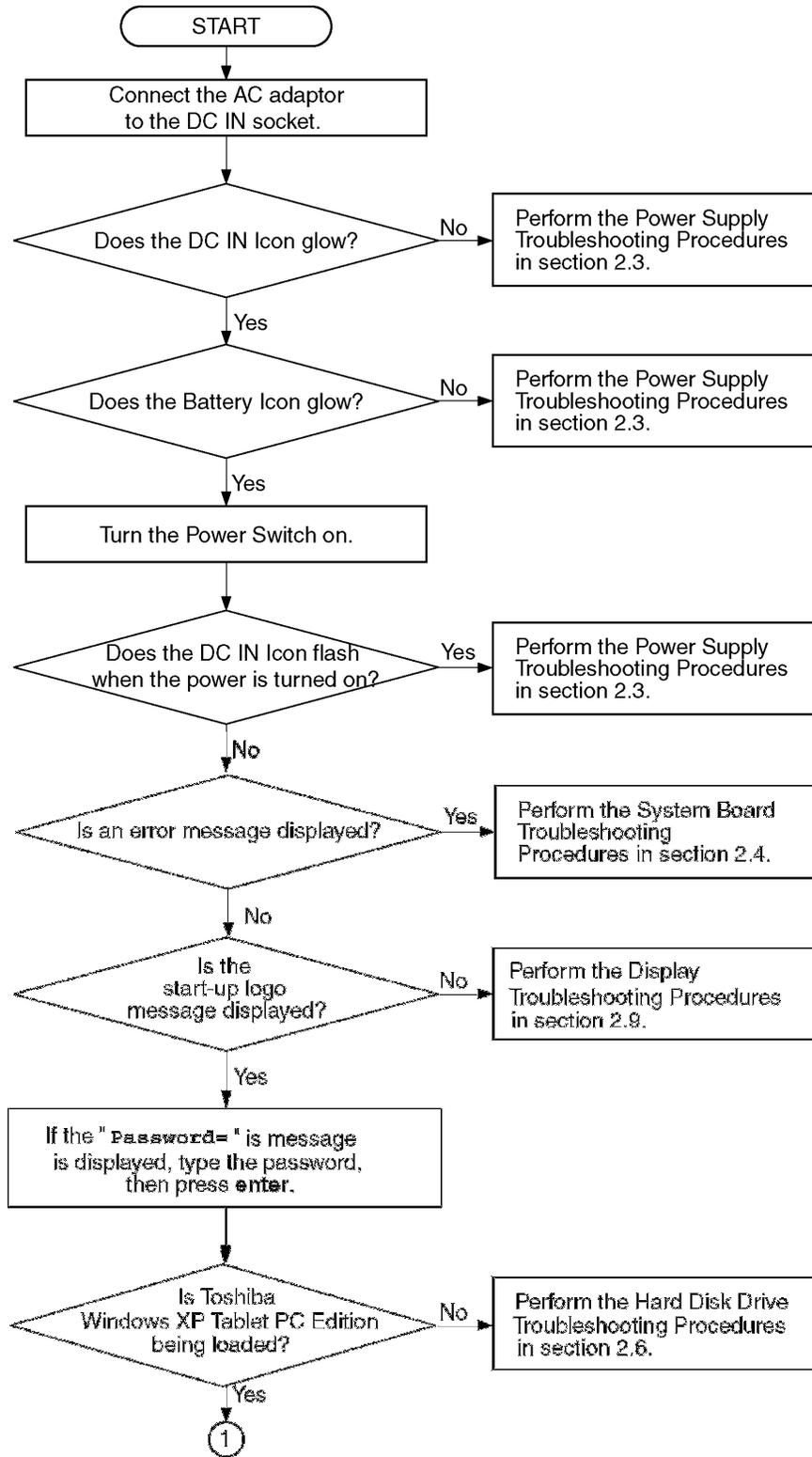


Figure 2-1 Troubleshooting flowchart (1/2)

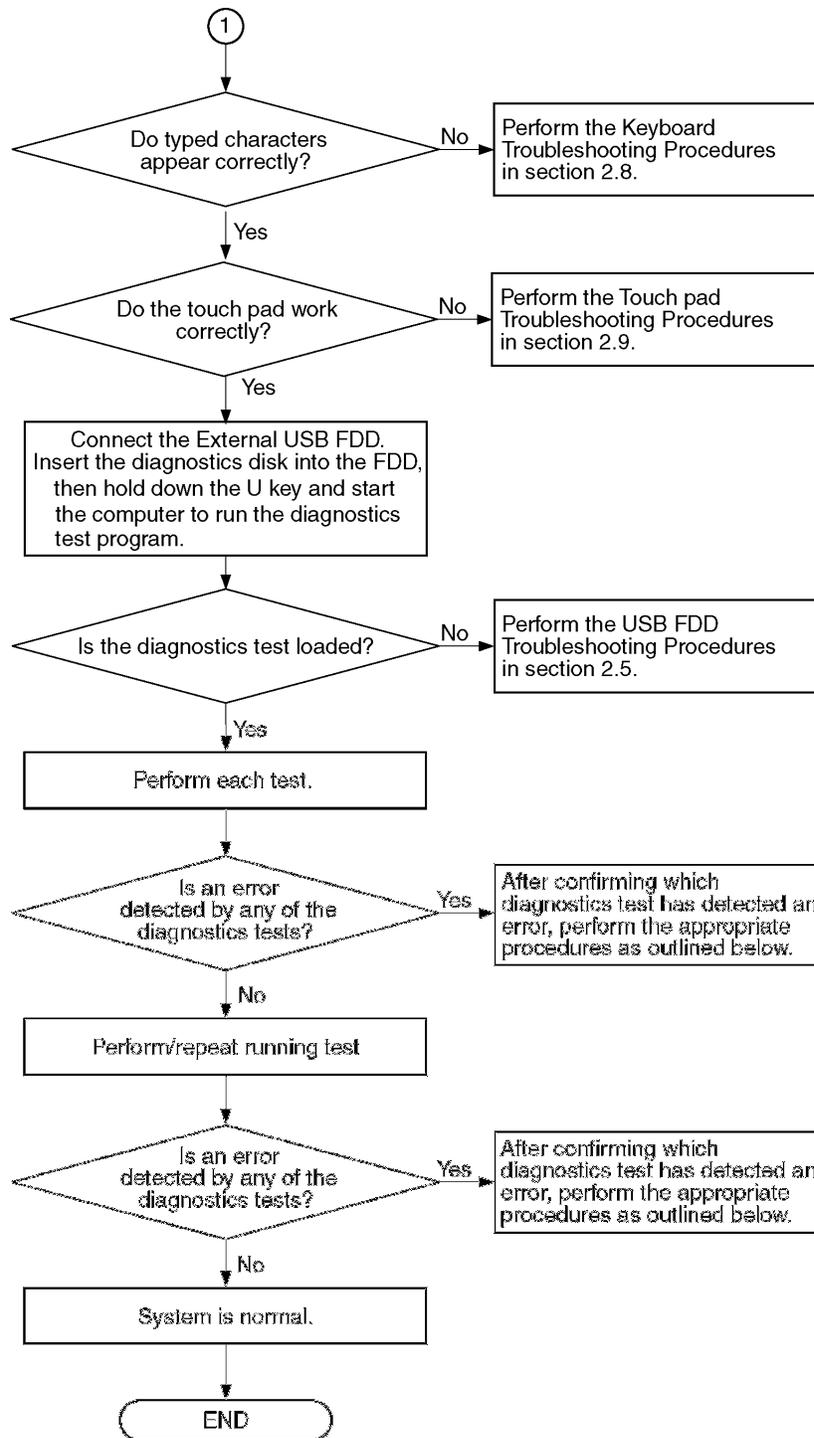


Figure 2-1 Troubleshooting flowchart (2/2)

If the diagnostics program cannot detect an error, the problem may occur intermittently. 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 perform the appropriate troubleshooting procedures as follows:

1. If an error is detected on the System test, Memory test, ASYNC test, Real timer test, NDP test or expansion test, perform the System Board Troubleshooting Procedures in Section 2.4.
2. If an error is detected on the Keyboard test, perform the Keyboard Troubleshooting Procedures in Section 2.7.
3. If an error is detected on the Display test, perform the Display Troubleshooting Procedures in Section 2.8.
4. If an error is detected on the Floppy disk test, perform the USB FDD Troubleshooting Procedures in Section 2.5.
5. If an error is detected on the Hard disk test, perform the HDD Troubleshooting Procedures in Section 2.6.
6. If an error is detected on the modem test, perform the Modem Troubleshooting Procedures in Section 2.10.
7. If an error is detected on the LAN test, perform the LAN Troubleshooting Procedures in Section 2.11.
8. If an error is detected on the sound test, perform the Sound Troubleshooting Procedures in Section 2.12.
9. If an error is detected on the wireless LAN test, perform the Wireless LAN Troubleshooting Procedures in Section 2.15.

## **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 Supply Icon Check

Procedure 2: Error Code Check

Procedure 3: Connection Check

Procedure 4: Quick Charge Check

Procedure 5: Replacement Check

**Procedure 1 Power Supply Icon Check**

The following two icons indicate the power supply status:

- ✎ Battery icon
- ✎ DC IN icon

The power supply controller uses the power supply status with the Battery icon and the DC IN icon as listed in the tables below.

*Table 2-1 Battery icon*

<b>Battery icon</b>	<b>Power supply status</b>
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.
Flashes orange (at being switched on)	The battery level is low and the power is turned on only with the battery.
Doesn't light	Any condition other than those above.

*Table 2-2 DC IN icon*

<b>DC IN icon</b>	<b>Power supply status</b>
Lights green	DC power is being supplied from the AC adapter.
Blinks orange	Power supply malfunction * 1
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 icons are blinking, perform the following procedure.

1. Remove the battery pack and the AC adapter and cut off the power supply to the computer by force.
2. Re-attach the battery pack and the AC adapter.

If icons are 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.

<b>CAUTION:</b> Use a recommended AC adapter (G71C0002S310 or G71C0004A210).
--

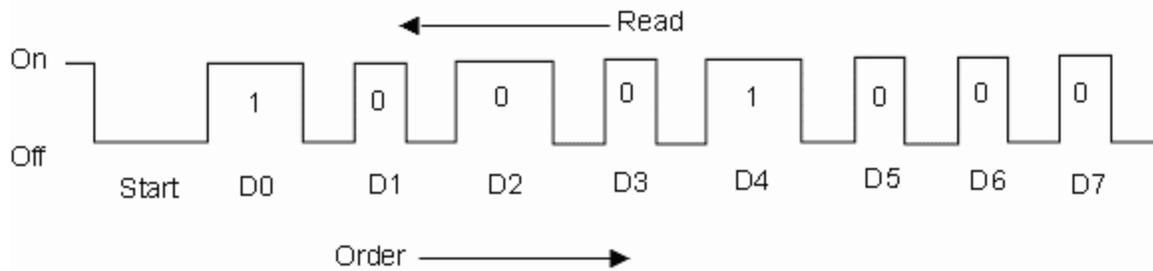
**Procedure 2 Error Code Check**

If the power supply microprocessor detects a malfunction, the DC IN icon blinks orange. The blink pattern indicates an error as shown below.

- ✍ Start Off for 2 seconds
- ✍ Error code (8 bit)
  - “1” On for one second
  - “0” On for half second
  - Interval between data bits On for half second

The error code begins with LSB (Least Significant bit)

Example: Error code 11h (Error codes are given in hexadecimal format.)



Check 1 Convert the DC IN icon blink pattern into the hexadecimal error code and compare it to the tables below. Then go to Check 2.

- ✍ DC power supply (AC adapter)

Error code	Meaning
10h	AC Adapter output voltage is over 16.5V.
11h	Tablet multi dock output voltage is over 16.5V.
12h	Current from the DC power supply is over 7.0A.
13h	Current from the DC power supply is over 0.5A when there is no load.
14h	Abnormal current has been sensed 0[A].

## ✎ Main Battery

Error code	Meaning
20h	Overvoltage is detected. (This is not supported.)
21h	Main battery charge current is over 7.00A.
22h	Main battery discharge current is over 0.5A when there is no load.
23h	Main battery charge current is over 3.9A when AC adapter is not connected.
24h	Abnormal current has been sensed 0[A].
25h	Main battery charge current is over 0.3A.

## ✎ Second Battery

Error code	Meaning
30h	Overvoltage is detected. (This is not supported.)
31h	Second battery charge current is over 7.00A.
32h	Second battery discharge current is over 0.5A when there is no load.
33h	Second battery charge current is over 3.1A when AC adapter is not connected.
34h	Abnormal current has been sensed 0[A].
35h	Second battery charge current is over 0.3A.

## ✎ S3V output (P60)

Error code	Meaning
40h	S3V voltage is 3.14V or less when the computer is powered on/off.
45h	S3V voltage is 3.14V or less when the computer is booting up. (CV support)

## ✎ 1R5-C1V output (P61)

Error code	Meaning
50h	1R5-C1V voltage is over 1.80V when the computer is powered on/off.
51h	1R5-C1V voltage is 1.275V or less when the computer is powered on.
52h	1R5-C1V voltage is 1.275V or less when the computer is booting up.
53h	1R5-C1V voltage is 1.275V or less when the computer is suspended.
54h	1R5-C1V voltage is abnormal during shutdown (CV support)
55h	1R5-C1V voltage is 1.275V or less when the computer is booting up. (CV support)

## ✎ .R5-C1V output (P62)

Error code	Meaning
60h	1R5-C1V voltage is over 1.50V when the computer is powered on/off.
61h	1R5-C1V voltage is 1.275V or less when the computer is powered on.
62h	1R5-C1V voltage is 1.275V or less when the computer is booting up.
63h	1R5-C1V voltage is 1.275V or less when the computer is suspended.
64h	1R5-C1V voltage is abnormal during shutdown (CV support)
65h	1R5-C1V voltage is 1.275V or less when the computer is booting up. (CV support)

## ✎ PPV output (P63 : MUX\_CH0)

Error code	Meaning
70h	PPV voltage is over 1.80V when the computer is powered on/off.
71h	PPV voltage is 0.56V or less when the computer is powered on.
72h	PPV voltage is 0.56V or less when the computer is booting up.
73h	PPV voltage is 0.56V or more when the computer is powered off.

## ✎ PTV output (P64)

Error code	Meaning
80h	PTV voltage is over 1.26V when the computer is powered on/off.
81h	PTV voltage is 0.89V or less when the computer is powered on.
82h	PTV voltage is 0.89V or less when the computer is booting up.
83h	PTV voltage is 0.89V or more when the computer is powered off.
84h	PTV voltage is 0.89V or less when the computer is suspended.

## ✎ E5V output (P65)

Error code	Meaning
90h	E5V voltage is over 6.00V when the computer is powered on/off.
91h	E5V voltage is 4.50V or less when the computer is powered on.
92h	E5V voltage is 4.50V or less when the computer is booting up.
93h	E5V voltage is 4.50V or more when the computer is powered off.
94h	E5V voltage is 4.50V or less while the computer is suspended.

## ✎ E3V output (P66)

Error code	Meaning
A0h	E3V voltage is over 3.96V when the computer is powered on/off.
A1h	E3V voltage is 2.81V or less when the computer is powered on.
A2h	E3V voltage is 2.81V or less when the computer is booting up.
A3h	E3V voltage is 2.81V or more when the computer is powered off.
A4h	E3V voltage is 2.81V or less while the computer is suspended.

## ✎ PPV output (P63 : MUX\_CH1)

Error code	Meaning
B0h	PPV voltage is over 1.80V when the computer is powered on.
B1h	PPV voltage is 0.56V or less when the computer is powered on.
B2h	PPV voltage is 0.56V or less when the computer is booting up.
B3h	PPV voltage is 0.56V or more when the computer is powered off.

## ✎ PMV output (P64)

Error code	Meaning
C0h	PMV voltage is over 1.62V when the computer is powered on.
C1h	PMV voltage is 1.02V or less when the computer is powered on.
C2h	PMV voltage is 1.02V or less when the computer is booting up.
C3h	PMV voltage is 1.02V or more when the computer is powered off.
C4h	PMV voltage is 1.02V or less while the computer is suspended.

## ✎ 1R25-B1V output (P65 : MUX\_CH1)

Error code	Meaning
D0h	1R25-B1V voltage is over 1.50V when the computer is powered on.
D1h	1R25-B1V voltage is 1.063V or less when the computer is powered on.
D2h	1R25-B1V voltage is 1.063V or less when the computer is booting up.
D3h	1R25-B1V voltage is 1.063V or more when the computer is powered off.
D4h	1R25-B1V voltage is 1.063V or less while the computer is suspended.

## ✎ 2R5-B2V output (P66 : MUX\_CH1)

Error code	Meaning
E0h	2R5-B2V voltage is over 3.00V when the computer is powered on.
E1h	2R5-B2V voltage is 2.125V or less when the computer is powered on.
E2h	2R5-B2V voltage is 2.125V or less when the computer is booting up.
E3h	2R5-B2V voltage is 2.125V or more when the computer is powered off.
E4h	2R5-B2V voltage is 2.125V or less while the computer is suspended.

Check 2 In the case of error code 10h or 12h:

- ✎ Make sure the AC adapter and AC power cord are firmly plugged into the DC IN 15 V socket and wall outlet. If the cables are connected correctly, go to the following step:
- ✎ Connect a new AC adapter and AC power cord. If the error still exists, go to Procedure 5.

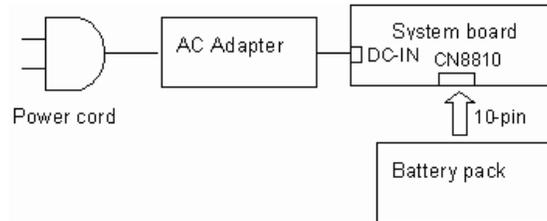
Check 3 In the case of error code 21h:

✍ Go to Procedure 3.

Check 4 For any other errors, go to Procedure 5.

### Procedure 3 Connection Check

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



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

- Check 1 Make sure the AC adapter and the AC power cord are firmly plugged into the DC IN 15 V socket and wall outlet. If these cables are connected correctly, 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 Quick Charge 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.
- Check 2 Make sure the battery pack is properly installed to the PC. If the battery 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 to the PC. If the battery pack is still not charged, go to Check 4.
- Check 4 The battery's temperature is too high or low. Return the temperature to normal operating condition. 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.

Check 1 Replace the AC adapter with a new one. If power is not supplied properly to the PC, perform Check 2.

Check 2 Replace the system board with a new one.

## **2.4 System Board Troubleshooting**

This section describes how to determine if the system board is defective. 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: Debug port (D port) Check on Boot Mode

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 Initial Reliability Test (IRT) installed in the BIOS ROM. The IRT 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 Tablet PC Edition 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 any other error message is displayed, perform Check 2.

- (a)\*\*\* Bad HDD type \*\*\*  
Check system. Then press [F1] key .....
- (b)\*\*\* Bad configuration \*\*\*  
Check system. Then press [F1] key .....
- (c)\*\*\* Bad memory size \*\*\*  
Check system. Then press [F1] key .....
- (d)\*\*\* Bad time function \*\*\*  
Check system. Then press [F1] key .....
- (e)\*\*\* Bad check sum (CMOS) \*\*\*  
Check system. Then press [F1] key .....
- (f)\*\*\* Bad check sum (ROM) \*\*\*  
Check system. Then press [F1] key .....
- (g)RTC battery is low or CMOS checksum is inconsistent  
Press [F1] key to set Date/Time

**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 is displayed, 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 5.

If error message (18) is displayed, go to the Keyboard Troubleshooting Procedures in Section 2.7.

If error message (19), (20) or (21) is displayed, go to the 2.5” HDD Troubleshooting Procedures in Section 2.6.

- (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) TIMER INTERRUPT ERROR
- (23) RTC UPDATE ERROR

**Procedure 2 Debug Port (D port) Check on Boot Mode**

Check the D port status by a debug port test. The tool for debug port test is shown below.

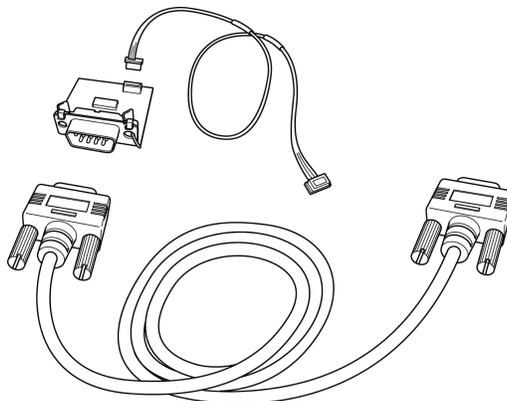
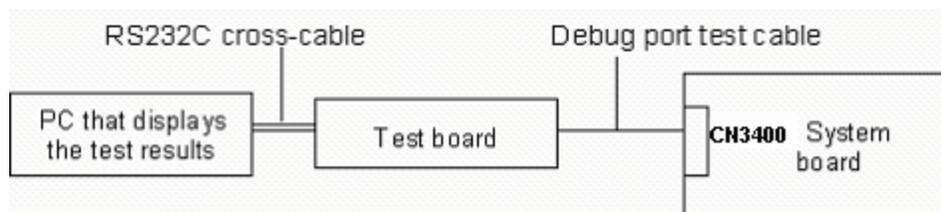


Figure 2-2 A set of tool for debug port test

The test procedures are follows;

1. Connect the debug test cable to the connector CN3400 of the system board. For disassembling the PC to connect the test cable, refer to Chapter 4.
2. Connect the debug port test cable and RS-232C cross-cable to the test board.
3. Connect the RS-232C cross-cable to the PC that displays the results.



4. Boot the computer in MS-DOS mode.

- Execute GETDPORT.COM in the text menu in CPU REAL mode. (Insert the FD for starting D port into FDD and input "FD starting drive:>dport".)  
The D port status is displayed in the following form;

F100 : 000.000382	IRT_CHK_INI\SYSI_START
D port status	Contents of process

- When the D port status is FFFFh (normal status), go to Procedure 3.
- When the D port status falls into any status in Table 2-3, execute Check 1.

Table 2-3 Debug port (Boot mode) error status (1/9)

D port status	Inspection items	Details
	Permission of A20 and Clear of software reset bit	
	Prohibition of APIC	
	Initialization of MCHM, ICHM	
	Initialization of Super I/O	
	Initialization of debug port	
	Dummy read of 3 <sup>rd</sup> Bus data	
	Setting of printer port (for models supporting printer)	
B0h	PIT CH0 initialization (for HOLD_ON)	
	BIOS rewrite factor flag initialization	
	CHECK SUM CHECK	Transition to protected mode
		Boot block checksum (skipped when returned to S3) Halts when error occurs
	Checksum other than boot block (skip when returned to S3)	
B1h	EC/KBC rewrite check	If "rewrite" is requested, go to "BIOS rewrite process".
	Transition of process to System BIOS IRT when returned to S3	
	Key input	When a key is pressed, check if it is Tilde key or Tab key.
B2h	BIOS rewrite request check	If Checksum check error occurred on except Boot Block or rewrite is required by user, go to "BIOS rewrite process".
B3h	Transits to System BIOS IRT.	
	BIOS rewrite process	Initialization of ICHM. D31
		DRAM configuration
		Permission of cache (L1 cache only)
		Memory clear
	Transition to real mode and copy of BIOS to RAM	

Table 2-3 Debug port (Boot mode) error status (2/9)

D port status	Inspection items	Details	
B4h/B5h	Saving key scan code		
	Setting TASK_1ms_TSC		
	Controlling fan		
	Initializing sound items (for BEEP)		Enabling system speaker
			Releasing mute
			Making the volume max.
	When BIOS, EC/KBC rewriting is requested		Blinks green (cycle:2s, on:1s, off:1s)
	When BIOS ROM is abnormal		Blinks orange (cycle:2s, on:1s, off:1s)
	Key input		Temporary prohibition of USB
			BEEP
			Waiting for key input
	Reading CHGBIOSA.EXE / CHGFIRMA.EXE		FDC reset
			Setting parameters for 2HD(1.44MB)
			Reading of first sector, If it is the data of 1.44MB (2HD), the media type is definite.
			Setting of parameters for 2DD (720KB)
		Retrieval of "CHGBIOSA.EXE" from the root directory. Calculation of directory start head and sector Read 1 sector of the root directory Retrieval of entry of "CHGBIOSA.EXE" / "CHGFIRMA.EXE" from the sector read.	
		Reading of EXE header of "CHGBIOSA.EXE" and "CHGFIRMA.EXE" Key input when error occurred.	
		Execution of "CHGBIOSA.EXE" and "CHGFIRMA.EXE"	
(B3h)			
00h	Cache control processing for HyperThreading		
	Prohibition of cache		

Table 2-3 Debug port (Boot mode) error status (3/9)

D port status	Inspection items	Details
(00h)	Initialization of H/W (before DRAM recognition)	Initialization of MCHM
		Initialization of ICH4M.D31.Func0
		Initialization of ICH4M.D31.Func1
		Initialization of USB.Func0,1,2,7
		Initialization of ICH4M.D31.Func3
		Initialization of ICH4M.D31.Func5
	Initialization of TI	
	Initialization of PIT channel 1	(Setting the refresh interval to "30?s")
01h	Checking DRAM type and size (at cold boot)	When unsupported memory is connected, the system beeps and halts. When DRAM size = 0, halts.
	Testing the stack area of SM-RAM	When it can not be used as stack area, halts.
02h	Configuring cache memory	
	Permission of L1/L2 cache memory	
	Checking the access of a CMOS (Only in Cold Boot)	When error is detected, halts
	Examining the battery level of CMOS	
	Checksum check of CMOS	
	Initializing data in CMOS (1)	
	Setting up of IRT status	(Setting of boot status and IRT busy flag, The rest bits are set to 0)
Storing the size of DRAM		
03h	Branch of resuming (only in Cold Boot)	When a CMOS error is detected, it does not resume.
		If "resume status code" is not set, no resume occurs.

Table 2-3 Debug port (Boot mode) error status (4/9)

D port status	Inspection items	Details
(03h)		Resume error check S3 recovery error (ICH) Resume error 7AH SM-RAM checksum check Resume error 73H Memory configuration change check Resume error 73H Checksum check of system BIOS RAM area Resume error 79H Checksum check of expansion memory Resume error 76H Checksum check of PnP RAM Resume error 77H To resume process (RESUME_MAIN)
	To resume error process	Returns the CPU clock to "Low"
		Prohibition of all SMIs
		Clears resume status
		Returns to ROM
		Forwards the area of C0000h to EFFFFh to PCI (prohibition of DRAM)
		Sets resume error request
Copying ROM/RAM of system BIOS	Halts, when error occurred	
04h	SMRAM initialization	
	Check if CPU corresponds to HyperThreading	
	Update of micro code	
	Initialization of APIC	
	WakeUp factor check	
	SMRAM base rewriting and CPU state map saving for BIOS	
	Permission of SMI based on ASMI	

Table 2-3 Debug port (Boot mode) error status (5/9)

D port status	Inspection items	Details		
05h	Initialization of devices which need initialization before PCI bus initialization	PIT test (at Cold boot only) and initialization Setting of test pattern to channel 0 of PIT#0 Check whether the set test pattern can be read. Initialization of PIT channel 0 (Setting of timer interruption interval to 55ms) Initialization of PIT channel 2 (Setting of the sound generator frequency to 664Hz) Test of PIT channel 1 (Check whether the refresh signal works properly in 30 micro-s refresh interval.) The system halts when the time is out. Test of PIT channel 2 (Check whether the speaker gate works properly)		
		CPU clock measurement		
		Check of parameter block A		
		Permission of SMI except auto-off function		
		Control of excess of rated input power		
		Battery discharge current control (1CmA)		
		AC adapter rated over current control		
		Dividing procedures for time measuring by IRT		
		Setting for clock generator		
		CPU Initialization Judging of CPU type Geyserville support check Setting of CPU clock to "high"		
		Graphics Aperture Size setting		
		06h	Saving memory configuration to buffer	
			Reading of EC version	
Update of flash ROM type				
Judging of destination (Japan or except Japan) based on DMI data				
CMOS default setting check	Sets default setting if bad battery or bad checksum (ROM, CMOS) is detected)			
ACPI table initialization (for execution of option ROM)				

Table 2-3 Debug port (Boot mode) error status (6/9)

D port status	Inspection items	Details
06h	Initialization of devices which need initialization before PCI bus initialization	AC'97 control
		Initialization of temperature control information
		KBC initialization
		VGA display off, Reset control
		Sound initialization
		PC multi-box status acquisition
		HC initialization, USB device connection recognition and initialization
		Control of built-in LAN permission/prohibition
	PIC initialization	
	PIC test	
Password Initialization		
07h	PCI bus initialization (connection of DS Bus)	
	Initialization of LAN information	
	Check of WakeUp factor	
08h	Task generation for waiting INIT_PCI completion	
	CMOS data initialization (2)	
	PnP initialization	
	Setting of setup items	
	Waiting for the completion of Multi-box status check	
	H/W setting based on resource	
09H	Task generation for waiting PnP resource making completion	
	Serial interruption control	(before use of interruption) (for models supporting YEBISU)
	PnP H/W initialization	PC card slot initialization
		SIO initialization (for models supporting SIO)
		FIR initialization (for models supporting FIR)
	PCI automatic configuration	Making of work for automatic configuration
		Acquisition of PCI IRQ

Table 2-3 Debug port (Boot mode) error status (7/9)

D port status	Inspection items	Details
09h		Configuration
		Saving of VGA configuration result
0Ah	Task generation for waiting PCI_CONFIGURATION completion	
	Initialization of H/W needed after PCI configuration	Printer port setting (for models supporting printer)
		HDD initialization sequence start
		FDD initialization sequence start (for models supporting built-in FDD)
	Enabling power off	
Output code generation		
0Bh	FIRST_64KB_CHECK	(Check of first 64KB memory)
0Ch	INIT_INT_VECTOR	(Initialization of vectors)
0Dh	INIT_NDP	(Initialization of NDP)
0Eh	INIT_SYSTEM (Initialization of system)	Storing of CMOS error status to IRT_ERR_STS_BUF
		Timer initialization start
		EC initialization & Reading of battery information
		Update of system BIOS (Update of EDID information for LCD)
0Fh	INIT_DISPLAY (Waiting for VGA chip initialization completion, VGA BIOS initialization)	
10h	Calling VGA BIOS	
11h/12h	DISP_LOGO	Displaying logo
13h	SYS_MEM_CHECK (boot mode)	Check of convention memory
14h	EXT_MEM_CHECK (boot mode)	Check of exception in the protected mode
15h	Check of exception in the protected mode	DPORT=16h when error occurs
	INIT_SYS_MEM (reboot mode)	Initialization of conventional memory
17h	CHK_DMA_PAGE (boot mode)	Check of DMA Page Register
18h	CHECK_DMAC (boot mode)	Check of DMAC
19h	INIT_DMAC (boot mode)	Initialization of DMAC

Table 2-3 Debug port (Boot mode) error status (8/9)

D port status	Inspection items	Details
1Ah	CHECK_PRT (for models supporting printer)	Check of printer port existence
1Bh	CHECK_SIO (for models supporting SIO)	Check of SIO
1Ch	BOOT_PASSWORD (password check)	Waiting for FDD initialization completion (for models supporting built-in FDD)
		(In the case of "Reboot") Waiting for HDD initialization completion Check of key input during IRT (waiting for KBC initialization completion) I/O LOCK process (for models supporting I/O lock) ATA priority initialization (In the case of "Boot") BM loading process (for models supporting fingerprint authentication) Initialization of BM (for models supporting fingerprint authentication) Check of key input during IRT (waiting for KBC initialization completion) Input of password I/O LOCK process (for models supporting I/O lock) BM open (for models supporting fingerprint authentication)
1Dh	EX_IO_ROM_CHECK	Check of option I/O ROM
1Eh	PRE_BOOT_SETUP	Saving of value in 40:00h (for SIO saving/restoring)
		Setting of font address for resume password
		Setting of repeat parameter for USB KB
		Final check of key input during IRT
		Storing of T_SHADOW_RAM_SIZE
		Update of system resource before boot
		Rewriting of memory map data of INT15h E820h function
		Waiting for AC-Link initialization completion
		Renewal of table for DMI
		Copying ACPI table to uppermost of extension memory
		Waiting for completion of BIOS rewriting of PSC version
Waiting for completion of setting clock generator When error occurred, halts at DPORT=1FH		

Table 2-3 Debug port (Boot mode) error status (9/9)

D port status	Inspection items	Details
1Eh		Waiting for completion of initialization of Serial port (for models supporting SIO)
		Cancel of NMI Mask
		TIT check sum
		Clear of the IRT flag of Runtime side
		Update of check sum of Runtime side
		Hibernation branch (for models supporting BIOS Hibernation)
		Initialization of Bluetooth (for models supporting Bluetooth)
		Check of existence of target maintenance card
		Prohibition of unused PC card
		Setting Wakeup status data for ACPI
		HW initialization before Boot, Waiting for initialization completion Notifies the DVI connection status to VGA BIOS (for models supporting DVI) Setting of battery save mode Setting of date Waiting for Bluetooth initialization completion (for models supporting Bluetooth) Update of DMI Wakeup factor, Update of SM-BIOS structure table PCI device configuration space close Cache control Update of parameter block A Process for CPU Make the CPU clock to be set by SETUP Waiting of motor-off completion of disabled HDD Final decision of USB FDD drive information Post processing of PRE_BOOT_SETUP Clear of PWRBTN_STS Enabling POWER Button
20h	Clear of IRT status	
	Update of check sum of Runtime side	
FFFFh	End	

Check 1 If the D port status error code F119h is displayed, go to the 3.5" USB FDD Troubleshooting Procedures in Section 2.5 or the 2.5" HDD Troubleshooting Procedures in Section 2.6.

Check 2 If any other D port status error code is displayed, perform Procedure 3.

D port error status is as follows:

<b>Error code</b>	<b>Contents</b>
F160h	Timer CH2 error
F161h	PIT error
F162h	PIC #1 error
F163h	PIC #2 error
F120h	Clock generator setting error

**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. USB Floppy Disk test
6. ASYNC test
7. Hard Disk test
8. Real Timer test
9. NDP test
10. Expansion test
11. Wireless LAN test
12. Bluetooth test
13. Sound/LAN/Modem test

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

**Procedure 4 Replacement Check**

The system board connectors may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform Check 1.

Check 1 Visually check for the following:

- a) Cracked or broken connector housing
- b) Damaged connector pins

If connectors are in good condition, but there is still a problem, go to Check 2.

Check 2 The system board may be damaged. Replace the system board with a new one following the steps described in Chapter 4, *Replacement Procedures*.

## 2.5 USB 3.5" FDD Troubleshooting

This section describes how to determine if the USB 3.5" FDD is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

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.

Insert the Diagnostics Disk in the USB 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 2-4. If any other errors occur while executing the FDD diagnostics test, go to Check 1.

*Table 2-4 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.

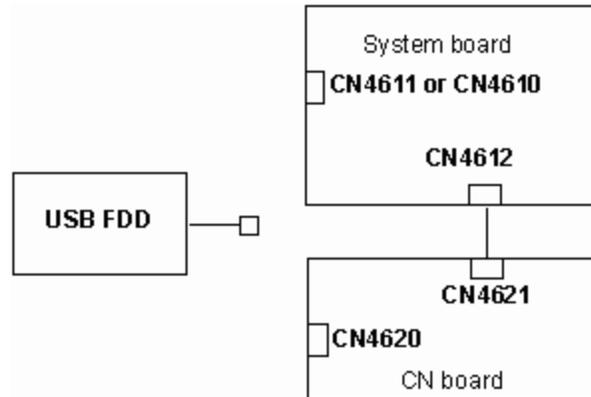
Write protected

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

**Procedure 3 Connector Check and Replacement Check**

The USB FDD connector may be disconnected from the connector on the system board. Check visually that the connector is connected firmly.

- Check 1 Make sure the USB FDD cable is firmly connected to the CN4611 (port 3) or CN4610 (port 0) of the system board, or CN4620 (port 5) of the CN board.



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

- Check 2 The USB FDD may be defective or damaged. Replace it with a new one. If the FDD is still not functioning properly, perform Check 3.
- Check 3 When the USB FDD is connected to CN4620 (port 5), connection between the CN board and the system board may be loose. Reconnect the cable between them firmly. If the FDD is still not functioning properly, perform Check 4.
- Check 4 When the USB FDD is connected to CN4620 (port 5), the CN board may be defective or damaged. Replace it with a new one. If the FDD is still not functioning properly, perform Check 5.
- Check 5 Replace the system board with a new one following the steps in Chapter 4, *Replacement Procedures*.

## 2.6 2.5" HDD Troubleshooting

This section describes how to determine if the 2.5" HDD is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

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 2.5" 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 Type **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 Type **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 exists, 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 exists, go to Procedure 2. Otherwise, the 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 of no floppy disk 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 5.

Check 4 The 2.5" HDD, HD board and the connector of the system board may be disconnected (Refer to the steps described in Chapter 4, *Replacement Procedures* for disassembling the PC.). Reconnect them firmly. If they are firmly connected, go to Procedure 3.

**Procedure 3    Format Check**

The computer's 2.5" HDD is formatted using the MS-DOS FORMAT program or the physical format program of the test program. To format the 2.5" 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 the 2.5" HDD using MS-DOS FORMAT command. Type as **FORMAT C:/S/U**.

          If the 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 the 2.5" HDD using MS-DOS FORMAT command.

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

          If you cannot format the 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 2-5. If an error code is not displayed but the problem still exists, go to Procedure 5.

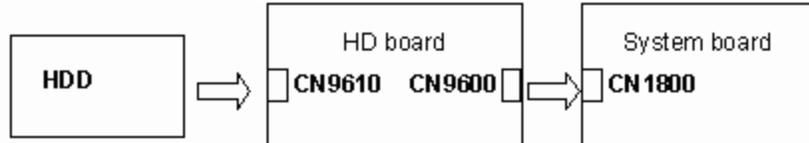
Table 2-5 2.5" HDD error code and status

Code	Status
01h	Bad command
02h	Address mark not found
04h	Record not found
05h	HDC not reset
07h	Drive not initialized
08h	HDC overrun error (DRQ)
09h	DMA boundary error
0Ah	Bad sector error
0Bh	Bad track error
10h	ECC error
11h	ECC recover enable
20h	HDC error
40h	Seek error
80h	Time out error
AAh	Drive not ready
BBh	Undefined error
CCh	Write fault
E0h	Status error
EEh	Access time out error
DAh	No HDD

**Procedure 5 Connector Check and Replacement Check**

The HDD is connected to the HD board and the HD board is connected to the connector CN1800 of the system board. The connecting portions may be loose. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks to check the connecting portions:

- Check 1 Make sure the HDD is firmly connected to the connector CN9610 of the HD board and the HD board is connected to the connector CN1800 of the system board.



If connection is loose, reconnect firmly and repeat Procedure 4. If there is still an error, go to Check 2.

- Check 2 The 2.5" HDD may be damaged. Replace it with a new one and check the operation. If the problem still exists, perform Check 3.
- Check 3 The HD board may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 4.
- Check 4 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

## 2.7 Keyboard Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

### Procedure 1 Diagnostic Test Program Execution Check

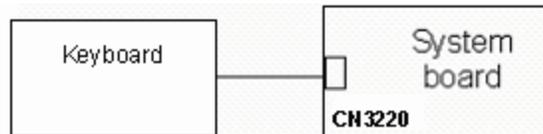
Execute the Keyboard Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

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

### Procedure 2 Connector Check and Replacement Check

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

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



If the connection is loose, reconnect the cable firmly and repeat Procedure 1. If there is still an error, go to Check 2.

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

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

## 2.8 Display Troubleshooting

This section describes how to determine if the computer's display is functioning properly. Start with Procedure 1 and continue with the other procedures 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, and then boot the computer. The computer automatically detects the external monitor.

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

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

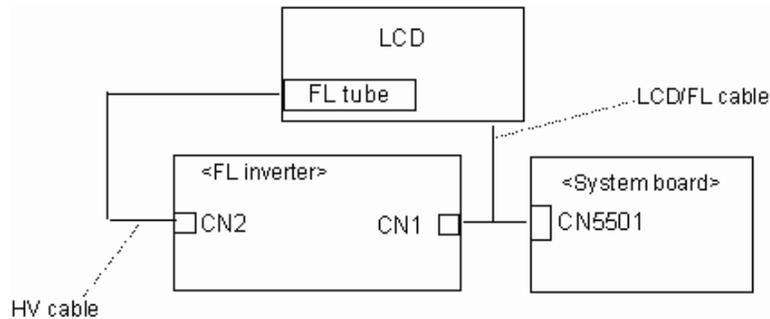
### Procedure 2 Diagnostic Test Program Execution Check

The Display Test program is stored on the Diagnostics disk. Insert the Diagnostics disk in the USB floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics* for details.

This program checks the display controller on the system board. If an error is detected, go to Procedure 3.

### Procedure 3 Connector and Cable Check

The LCD module is connected to the system board through the LCD/FL cable. Also FL inverter is connected the system board through the LCD/FL cable. The cable may be disconnected from the board or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*. If the connection is loose, reconnect the cable firmly and repeat Procedure 2. If there is still an error, go to Procedure 4.



### Procedure 4 Replacement Check

The display unit has an FL tube, FL inverter, LCD module, System board, LCD/FL cable and Display ON/OFF switch. Any of the components may be damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

- (1) If characters or graphics are not displayed on the internal display, perform Check 1.
- (2) If characters or images are displayed on the internal display but the display is not normal, perform Check 2.
- (3) If characters or images are displayed on the internal display but the display is dark (the back-light does not light), perform Check 5.

Check 1 The display ON/OFF switch may be damaged. Remove the display ON/OFF switch and repeat Procedure 4. If there is still an error, go to Check 2.

Check 2 The LCD/FL cable may be damaged. Replace the damaged cable with a new one and repeat Procedure 4. If there is still an error, go to Check 3.

Check 3 The LCD module may be damaged. Replace it with a new one and repeat Procedure 4. If there is still an error, go to Check 4.

Check 4 The FL inverter may be damaged. Replace it with a new one and repeat Procedure 4. If there is still an error, go to Check 5.

- Check 5 The FL tube may be damaged. Replace it with a new one and repeat Procedure 4. If there is still an error, go to Check 6.
  
- Check 6 The display controller of the system board may be damaged. Replace the system board with a new one.

## 2.9 Touch Pad Troubleshooting

To determine whether the Touch Pad is faulty or not, perform the following procedures:

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector and Cable Check

Procedure 3: Replacement Check

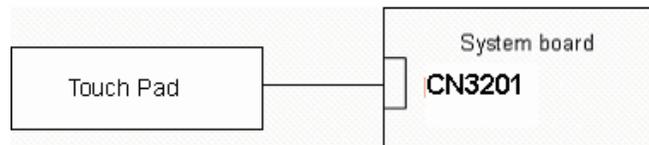
### Procedure 1 Diagnostic Test Program Execution Check

Execute the test for touch pad in 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, the touch pad keyboard is functioning properly.

### Procedure 2 Connector and Cable Check

The touch pad is connected to the system board (CN3201) with a flexible cable. This cable may have come off the connector of the touch pad or of the system board. Disassemble the computer and check the cable connections. See Chapter 4 for the disassembly procedure. If the cable has come off, connect firmly it and make sure the operation. If there is still an error, go to Procedure 3.



### Procedure 3 Replacement Check

Check 1 The touch pad may be damaged. Replace it with a new one and repeat Procedure 1. If there is still an error, go to Check 2.

Check 2 The system board may be damaged. Replace the system board with a new one according to the procedure in Chapter 4.

## 2.10 Selectable bay (optical drive) Troubleshooting

The Selectable bay can be installed in this model and the Selectable bay optical drive is installed as standard. Here explains the troubleshooting for the optical drive.

To check if the optical drive is defective 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

Prepare the tools before the test. (Refer to tools for implementing the Diagnostics procedures on Chapter 3.)

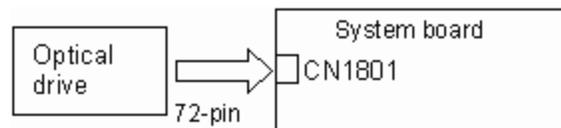
Execute the CD-ROM/DVD-ROM Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

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

### Procedure 2 Connector Check and Replacement Check

The optical drive may be disconnected from the system board or faulty. Disassemble the computer following the steps described in Chapter 4 and perform the following checks:

Check 1 Make sure the optical drive and the system board are firmly connected.



If the connection is loose, reconnect it firmly and return to Procedure 1. If there is still an error, perform Check 2.

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

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

## 2.11 Modem Troubleshooting

To check if the modem is defective or malfunctioning, 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 Modem test program available as part of the maintenance test program. This program checks the modem. See Chapter 3 for information on how to perform the test.

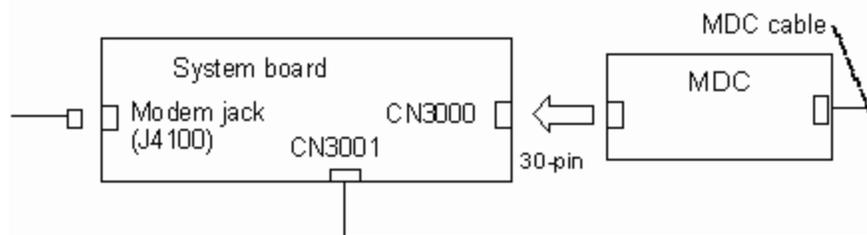
If any error is detected by the test, go to Procedure 2.

### Procedure 2 Connector Check and Replacement Check

The Modem jack (RJ11) is mounted on the system board and MDC is connected to the system board. If the modem malfunctions, the connection may be bad or the MDC or system board might be faulty.

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

Check 1 Make sure the MDC is firmly connected to the PJ3020 and the MDC cable is connected to the PJ3021 on the system board.



If any connector is disconnected, connect it firmly and return to Procedure 1. If there is still an error, perform Check 2.

Check 2 The MDC may be faulty. Replace it with a new one following the steps in Chapter 4. If the modem is not still working properly, perform Check 3.

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

## 2.12 LAN Troubleshooting

To check if the computer's LAN is defective or malfunctioning, 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

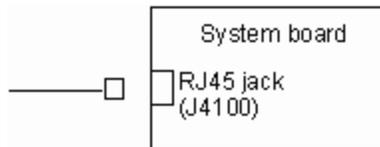
To check the LAN function, execute the Sound/LAN/modem test program subtest 04 (LAN test). See Chapter 3 for information on how to perform the test.

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

### Procedure 2 Connector Check and Replacement Check

The LAN function is installed on the system board and the RJ45 jack and the controller is mounted on the system board. If the LAN malfunctions, the system board might be faulty.

Disassemble the computer following the steps described in Chapter 4 and replace the system board.



## 2.13 Sound Troubleshooting

To check if the sound function is defective or malfunctioning, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check

Procedure 3: Replacement Check

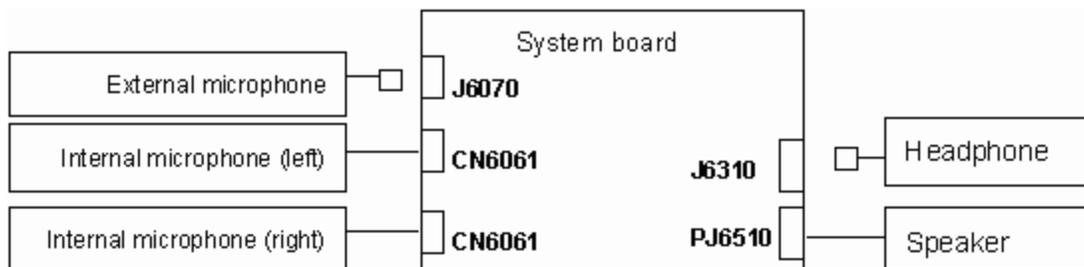
### Procedure 1 Diagnostic Test Program Execution Check

Execute the Sound test program available as part of the maintenance test program. See Chapter 3 for information on how to perform the test.

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

### Procedure 2 Connector Check

The speaker, internal microphones, external microphone and headphone are connected to the system board shown in the following figure. These connections may be loose or cables may come off. Disassemble the computer referring to the steps described in Chapter 4 and make sure each connection. If there is still an error, perform Procedure 3.



### Procedure 3 Replacement Check

Check 1 If the speaker or internal microphones is not working properly, the part may be faulty. Replace it with a new one following the step in Chapter 4. If there is still an error, go to Check 2.

Check 2 The system board may be faulty. Replace it with a new one following the step in Chapter 4. If there is still an error, perform Check 3.

Check 3 The external speaker or headphone may be faulty. Replace it with a new one.

## 2.14 SD Card Slot Troubleshooting

To check if the SD card slot is good or no good, follow the troubleshooting procedures below as instructed.

Procedure 1: Check on Windows XP Tablet PC Edition

Procedure 2: Connector/Replacement Check

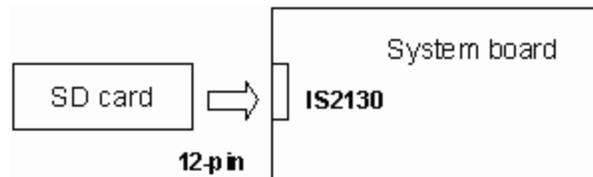
### Procedure 1 Check on Windows XP Tablet PC Edition

Insert an SD card into the slot. Check if the installed Windows XP Tablet PC Edition recognizes automatically the SD card and the data in the SD card can be read.

If the card is not recognized or data are not read, go to Procedure 2.

### Procedure 2 Connector/Replacement Check

The SD card is connected to the connector IS2130 of the connector board.



- Check 1 The SD card and the system board may be disconnected. Make sure the SD card is firmly inserted to the IS2130 of the system board. If the SD card is still not functioning properly, perform Check 2.
- Check 2 The SD card may be faulty. Replace it with a new one following the step in Chapter 4. If the problem continues, perform Check 3.
- Check 3 The system board may be faulty. Replace it with a new one following the step in Chapter 4.

## 2.15 Tablet Pen Troubleshooting

To check if the Tablet Pen is defective or not, follow the troubleshooting procedures below as instructed.

**CAUTION:** Use the Tablet Pen supplied to this model.

Procedure 1: Check on Windows XP Tablet PC Edition

Procedure 2: Replacement Check

Procedure 3: Connector/Replacement Check

### Procedure 1 Check on Windows XP Tablet PC Edition

This procedure checks if the tablet pen is working properly by using the function of Windows XP Tablet Edition.

Check 1 Make sure the mouse cursor is following the tablet pen when you move the pen on the display. If it does not work properly, go to Procedure 2.

Check 2 Make sure the "click" function works properly when you tap (touch) the display with the tablet pen. If it does not work properly, go to Procedure 2.

When both the functions work correctly, the tablet pen is not defective.

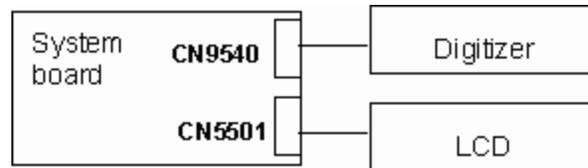
### Procedure 2 Replacement Check

Check 1 The core of the tablet pen might be worn out. Replace the core with a new one following the steps in the User's manual, and check the tablet pen is working properly. If there is still an error, go to Check 2.

Check 2 The tablet pen might be defective. Replace the tablet pen with a new one and check if the tablet pen is working properly. If there is still an error, execute Procedure 3.

**Procedure 3 Connector/Replacement Check**

The Digitizer and LCD are connected to the system board as below.



- Check 1 The Digitizer might be disconnected. Make sure the Digitizer is connected to the CN9540 on the system board. If there is still an error, go to Check 2.
- Check 2 The LCD might be disconnected. Make sure the LCD is connected to the CN5501 on the system board. If there is still an error, go to Check 3.
- Check 3 The Digitizer, the LCD or the system board might be defective. Replace it with a new one following the steps in Chapter 4. Then check the tablet pen is working properly.

## 2.16 Wireless LAN Troubleshooting

To check if the Wireless LAN is defective 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

Make sure the wireless communication switch on the computer is turned ON. If it is not, turn ON.

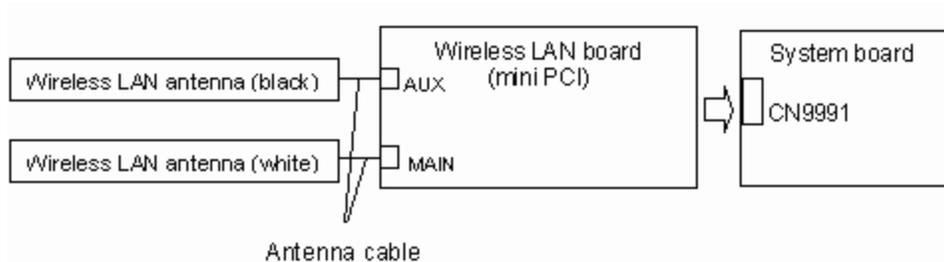
Check 1 Execute test program for the wireless LAN function to check the transmitting-receiving function of the wireless LAN. You will need another computer that can communicate by the wireless LAN.

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

- Check 1 The wireless LAN board and the system board may be disconnected. Make sure the wireless LAN board is firmly connected to the CN9991 of the system board.
- If the board connector is disconnected, connect it firmly and return to Procedure 1. If there is still an error, go to Check 2.
- Check 2 Make sure the wireless LAN antennas (black and white) are firmly connected to the Wireless LAN board. If the antennas are disconnected, connect firmly then return to Procedure 1. If there is still an error, perform Procedure 3.

### Procedure 3 Replacement Check

Check if the wireless LAN board and the system board are connected properly. If they are properly connected but there is still an error, any of these components may be damaged. Disassemble the computer following the steps described in Chapter 4 and replace the board with a new one.

- Check 1 The wireless LAN board may be defective or damaged. Disassemble the computer following the steps described in Chapter 4 and replace the board with a new one. If there is still an error go to Check 2.
- Check 2 The wireless LAN antennas may be defective or damaged. Disassemble the computer following the steps described in Chapter 4 and replace the board with a new one. If there is still an error go to Check 3.
- Check 3 The system board may be defective or damaged. Disassemble the computer following the steps described in Chapter 4 and replace the board with a new one.

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## **Chapter 3**

# **Tests and Diagnostics**

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## Chapter 3 Contents

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3.1	The Diagnostic Test.....	3-1
3.1.1	Diagnostics menu.....	3-1
3.1.2	H/W(hardware) initial information setting tool.....	3-3
3.1.3	Heatrun test program.....	3-3
3.2	Executing the Diagnostic Test .....	3-4
3.2.1	Diagnostics menu (T&D).....	3-5
3.2.2	H/W initial information setting tool.....	3-7
3.2.3	Heatrun test program.....	3-7
3.3	Setting of the hardware configuration.....	3-8
3.4	Heatrun Test.....	3-11
3.5	Subtest Names.....	3-12
3.6	System Test.....	3-14
3.7	Memory Test.....	3-16
3.8	Keyboard Test.....	3-17
3.9	Display Test.....	3-18
3.10	Floppy Disk Test .....	3-21
3.11	Printer Test.....	3-23
3.12	Async Test.....	3-25
3.13	Hard Disk Test .....	3-26
3.14	Real Timer Test.....	3-29
3.15	NDP Test.....	3-31
3.16	Expansion Test.....	3-32
3.17	CD-ROM/DVD-ROM Test .....	3-34
3.18	Error Code and Error Status Names.....	3-35
3.19	Hard Disk Test Detail Status .....	3-38
3.20	Only One Test .....	3-40
3.20.1	Program Description.....	3-40
3.20.2	Operations .....	3-40

3.21	Head Cleaning .....	3-48
	3.21.1 Function Description.....	3-48
	3.21.2 Operations .....	3-48
3.22	Log Utilities.....	3-49
	3.22.1 Function Description.....	3-49
	3.22.2 Operations .....	3-50
3.23	Running Test.....	3-51
	3.23.1 Function Description.....	3-51
	3.23.2 Operations .....	3-51
3.24	Floppy Disk Drive Utilities.....	3-52
	3.24.1 Function Description.....	3-52
	3.24.2 Operations .....	3-53
3.25	System Configuration .....	3-57
	3.25.1 Function Description.....	3-57
	3.25.2 Operations .....	3-58
3.26	Wireless LAN Test Program (Intel-made b/g).....	3-59
3.27	Wireless LAN Test Program (Intel-made a/b/g).....	3-63
3.28	Wireless LAN Test Program (Askey-made).....	3-68
3.29	LAN/Modem/Bluetooth/IEEE1394 Test Program.....	3-72
	3.29.1 LAN test.....	3-72
	3.29.2 Modem test.....	3-75
	3.29.3 Bluetooth test .....	3-76
	3.29.4 IEEE1394 test.....	3-85
3.30	Sound Test Program.....	3-86
	3.30.1 Sound (Standard) test.....	3-86
	3.30.2 Sound (Legacy) test.....	3-88
	3.30.3 CD Sound (Standard) test .....	3-89
	3.30.4 CD Sound (Legacy) test .....	3-91
3.31	SETUP .....	3-92
	3.31.1 Function Description.....	3-92

3.31.2	Accessing the SETUP Program.....	3-94
--------	----------------------------------	------

## Figures

Figure 3-1	Name and positions of each side.....	3-45
------------	--------------------------------------	------

## Tables

Table 3-1	Subtest names.....	3-12
Table 3-2	Error codes and error status names.....	3-35
Table 3-3	Hard disk controller status register contents .....	3-38
Table 3-4	Error register contents .....	3-39
Table 3-5	Error message .....	3-78
Table 3-6	Error code for Bluetooth test (BD_ADDR).....	3-79
Table 3-7	Error code for Bluetooth test (BD_ADDR of the DUT) .....	3-83



## 3.1 The Diagnostic Test

This chapter explains how to use the Diagnostic Test programs to test the functions of the computer's hardware modules. The Diagnostics Programs are stored on some Diagnostic Disks. There are Service Program Modules (DIAGNOSTIC MENU) and the Test Program Modules (DIAGNOSTIC TEST MENU) on the Diagnostic Disk.

The Hardware Initial information Setting Tool consists of some programs which write the hardware information or displays the current information of the computer. It is also included in one of Diagnostic Disks.

The heatrun test is automatic test program which executes the some tests successively.

**NOTE:** Before starting the diagnostics, be sure to follow these steps:

1. Check all cables are connected firmly.
2. Exit any application and close Windows.
3. Check if "ALL Device" is selected in the item [Device Config.] in SETUP menu. After checking the diagnostics, be sure to select "Setup by OS".

### 3.1.1 Diagnostics menu

The DIAGNOSTIC MENU consists of the following functions.

- ✎ DIAGNOSTIC TEST
- ✎ ONLY ONE TEST
- ✎ HEAD CLEANING
- ✎ LOG UTILITIES
- ✎ RUNNING TEST
- ✎ FDD UTILITIES
- ✎ SYSTEM CONFIGURATION
- ✎ EXIT TO MS-DOS

The DIAGNOSTIC TEST MENU contains the following functional tests:

- ✎ SYSTEM TEST
- ✎ MEMORY TEST
- ✎ KEYBOARD TEST
- ✎ DISPLAY TEST
- ✎ FLOPPY DISK TEST
- ✎ PRINTER TEST

- ✍ ASYNC TEST
- ✍ HARD DISK TEST
- ✍ REAL TIMER TEST
- ✍ NDP TEST
- ✍ EXPANSION TEST
- ✍ CD-ROM/DVD-ROM TEST

Other tests are:

- ✍ Wireless LAN TEST (Wireless LAN test disk)
- ✍ LAN/Modem/Bluetooth/IEEE1394 TEST (LAN/Modem/Bluetooth/IEEE1394 test disk)
- ✍ Sound TEST (Sound test disk)

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

- ✍ USB FDD
- ✍ The Diagnostic Disks  
(T&D for maintenance, LAN/Modem/Bluetooth/IEEE1394 test disk for maintenance, Wireless LAN test disk for maintenance and Sound test disk for maintenance)
- ✍ A formatted working disk (Floppy disk test)
- ✍ A cleaning kit to clean the floppy disk drive heads (Head Cleaning)
- ✍ An external CRT monitor supporting monitor ID (Expansion test)
- ✍ A CD test media TOSHIBA CD-ROM TEST DISK or ABEX TEST CD-ROM (Sound test)
- ✍ A DVD test media (DVD-ROM TEST DISK TSD-1) (Sound test)
- ✍ A music CD (Sound test)
- ✍ A CD-RW test media (CD-ROM/DVD-ROM test)
- ✍ A USB test module (USB test )
- ✍ A USB cable (USB test)
- ✍ LAN wraparound connector (LAN test)
- ✍ Module cable and RJ11 connector checker (Modem test)
- ✍ Headphones (Sound test)
- ✍ A microphone (Sound test)
- ✍ A PC for wraparound test (Wireless LAN test/Bluetooth test/IEEE1394 test)
- ✍ PC card wraparound connector (Expansion test)
- ✍ RS-232C wraparound connector (Async test)

### 3.1.2 H/W (Hardware) initial information setting tool

The H/W initial information setting tool consists of the following programs.

- ✍ Initial configuration
- ✍ Region write
- ✍ DMI information save
- ✍ DMI information recovery
- ✍ System configuration display
- ✍ E2PROM test (MAC/GUID/DMI)

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

- ✍ The Diagnostics Disk (Main T&D)

### 3.1.3 Heatrun test program

The heatrun test starts automatically after the selection.

You will need the following equipment to perform this program.

- ✍ The Diagnostics Disk (Main T&D)

## 3.2 Executing the Diagnostic Test

To start the DIAGNOSTIC PROGRAM, follow these steps:

1. Insert the Diagnostics disk in the floppy disk drive.
2. Release the lock of the power switch and turn on the computer with pressing the **F12**. Select the FDD in the display for selecting booting unit. Then, press **Enter** and the following menu appears.

```
Microsoft Windows XX Startup Menu
```

- ```
-----  
1. Repair Main (T&D)  
2. Repair initial config set  
3. Repair Heatrun (T&D)
```

```
Enter a choice: 1
```

To start the Diagnostics menu (T&D), press **1** and **Enter** .

To start the H/W initial information setting tool, press **2** and **Enter**.

To start the Heatrun test, press **3** and **Enter**.

**NOTE:** When replacing the system board, be sure to execute the following procedures.

(1) Before replacing the system board, execute subtest03 "DMI information save" in 3.3 Setting of the hardware configuration in order to save the DMI information from system board to floppy disk.

(2) After replacing the system board, execute the subtest04 "DMI information recovery" and subtest08 "System configuration display" in 3.3 Setting of the hardware configuration in order to copy the DMI information and system information from the floppy disk.

### 3.2.1 Diagnostics menu (T&D)

After pressing **1** and **Enter** in the startup menu, the following menu appears.

```
TOSHIBA personal computer Common DIAGNOSTICS
Version X.XX (c) copyright TOSHIBA Corp. 20XX
```

```
DIAGNOSTICS MENU :
```

- 1 - DIAGNOSTIC TEST
- 2 - ONLY ONE TEST
- 3 -
- 4 - HEAD CLEANING
- 5 - LOG UTILITIES
- 6 - RUNNING TEST
- 7 - FDD UTILITIES
- 8 - SYSTEM CONFIGURATION
- 9 - EXIT TO MS-DOS

```
↑↓→← : Select items
Enter  : Specify
Esc    : Exit
```

**NOTE:** To exit the DIAGNOSTIC TEST MENU, press the **Esc** key. If a test program is in progress, press **Ctrl + Break** to exit the test program. If a test program is in progress, press **Ctrl + C** to stop the test program.

Set the highlight bar to **1**, and press **Enter**. The following DIAGNOSTIC TEST MENU will appear:

```
TOSHIBA personal computer Common DIAGNOSTICS
version X.XX (c) copyright TOSHIBA Corp. 20XX
```

```
DIAGNOSTIC TEST MENU :
```

- 1 - SYSTEM TEST
- 2 - MEMORY TEST
- 3 - KEYBOARD TEST
- 4 - DISPLAY TEST
- 5 - FLOPPY DISK TEST
- 6 - PRINTER TEST
- 7 - ASYNC TEST
- 8 - HARD DISK TEST
- 9 - REAL TIMER TEST
- 10 - NDP TEST
- 11 - EXPANSION TEST
- 12 - CD-ROM/DVD-ROM TEST
- 88 - ERROR RETRY COUNT SET [FDD & HDD]
- 99 - EXIT TO DIAGNOSTICS MENU

↑↓→← : Select items  
Enter : Specify  
Esc : Exit

Functions 1 through 12 are the Diagnostic Tests. Function 88 sets the floppy disk drive and hard disk drive error retry count (0-255).

To exit the submenu of the Diagnostic Test and returns to the Diagnostics Menu, set the highlight bar to function 99 and press **Enter**.

Select the option you want to execute and press **Enter**. When you select 1- SYSTEM TEST, the following message will appear:

```

SYSTEM TEST NAME   XXXXXX  xxxxxxxx DIAGNOSTIC TEST VX.XX
                               [Ctrl]+[Break] ; test end
                               [Ctrl]+[C]   ; key stop

SUB-TEST   : XX
PASS COUNT : XXXXX   ERROR COUNT : XXXXX
WRITE DATA : XX     READ DATA  : XX
ADDRESS    : XXXXXX   STATUS      : XXX

SUB-TEST MENU :

01 - ROM checksum
02 - Fan ON/OFF
03 - Geyserville
04 - Quick charge
05 - DMI read
99 - Exit to DIAGNOSTIC TEST MENU

                               ↑↓→← : Select items
                               Enter  : Specify
                               Esc    : Exit

```

**NOTE:** The menu displayed by your computer may be slightly different from the one shown above.

Select the desired subtest number from the subtest menu and press **Enter**. The following message will appear:

```

TEST LOOP   : YES (or NO)
ERROR STOP  : YES (or NO)

```

Use the right and left arrow keys to move the cursor to the desired option.

Selecting **YES** of TEST LOOP increases the pass counter by one, each time the test cycle ends and restarts the test cycle.

Selecting **NO** returns the process to the subtest menu after the test is complete.

Use the up and down arrow keys to move the cursor to “ERROR STOP”.

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

Selecting **YES** of ERROR STOP stops the test program when an error is found and displays the operation guide on the right side of the display screen as shown below:

```

ERROR STATUS NAME  [[ HALT OPERATION ]]

                                1: Test end
                                2: Continue
                                3: Retry

```

These three selections have the following functions respectively:

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

Selecting **NO** keeps the test running even if an error is found. When an error occurred, the error status is displayed and one error is added to the error counter.

Table 3-1 in section 3.5 describes the function of each test on the subtest menu. Table 3-2 in section 3.18 describes the error codes and error status for each error.

### 3.2.2 H/W initial information setting tool

After selecting this test, the following menu appears in the display.

```

#####
#
#####   H/W initial information setting tool   VX.XX
#####
#####
#
*      1 ..... Initial configuration
*
*      2 ..... Region write                      *
*      3 ..... DMI information save                *
*      4 ..... DMI information recovery
*
*      8 ..... System configuration display
*      *      9 ..... E2PROM test (MAC/GUID/DMI)
*
*****
*
... Press test number[1-4,8,9] ?

```

For more details on this test, refer to the section 3.3.

### **3.2.3 Heatrun test program**

Heatrun test starts executing the same subtest as 3.23 RUNNING TEST.

For more details on this test, refer to the section 3.4.

### 3.3 Setting of the hardware configuration

To execute this program, select `2-Repair initial config test` in the startup menu, press **Enter** and follow the directions on the screen. The H/W initial information setting tool consists of four subtests. Move the highlight bar to the subtest you want to execute and press **Enter**.

#### Subtest 01 Initial configuration

This subtest executes the following items and shows their contents in the display. When an item ends normally, the program proceeds automatically to the next one. When an error is found, the program stops and waits for key input. (After solving the problem, the program executes the item again.)

Setting of the CPU set table  
Setting of the microcode  
Setting of the EHSS  
Inputting and writing of DMI information

When the DMI information is displayed, the following messages appear in order. Input each information. (If you do not replace the PCB, the DMI information should not be changed.)

1. "Enter Model Name ?" is displayed. Input the computer's model name and press **Enter**. (e.g. PORTEGE)
2. "Enter Version Number ?" is displayed. Input the computer's version number and press **Enter**. (e.g. PC18070C313S)
3. "Enter Serial Number ?" is displayed. Input the computer's serial number and press **Enter**. (e.g. 12345678)
4. "Enter Model Number ?" is displayed. Input the computer's sales model number and press **Enter**. (e.g. PP200-AAAAA)
5. "Enter Bundle Number ?" is displayed. Input the computer's PCN/Bundle number and press **Enter**. (e.g. PMSREQ3Q34H/S0123456789)
6. "Write data OK (Y/N) ?" is displayed. To write the DMI information to the Flash ROM, press **Y**, and then **Enter**.
7. "Create DMIINFO TXT (Y/N) ?" is displayed. Press **Y**, then the DMI information (text data) is written to the Floppy disk, etc.

Setting of the HWSC  
 Setting of the UUID  
 Display of the DMI information (including UUID)  
 Setting of DVD region code (Yes/No)

After completion of the above settings, H/W configuration & DMI information are appeared in order. Check the contents and press **Enter**.

Following message appears in the display. Press any key, then return to the H/W initial information setting tool menu.

```
+-----+
+  It switches off the power on automatically.  +
+-----+
Press any key to continue...
```

#### Subtest 02 Region write

This subtest executes the setting of the region code for DVD drive based on the destination of the machine.

When the region code is already written, test ends without setting.

The following message appears in the display after setting the region code. Press any key to return to the H/W initial information setting tool menu.

```
*****
*****      It completed      *****
*****
*                               *
Press any key to continue...
```

#### Subtest 03 DMI information save

**NOTE:** Before replacing the system board, be sure to execute this subtest and save the DMI information to the floppy disk.

This is one of tools to copy the DMI information to a new PCB after replacing.

This subtest saves all the DMI data in a floppy disk.

## Subtest 04 DMI information recovery

**NOTE:** 1. After replacing the system board, be sure to execute this subtest and copy the DMI information to a new system board.

2. Since the data of UUID is updated every time when this subtest, DMI information recovery, is done, the saved UUID data is not written

This is one of tools to copy the DMI information to a new PCB after replacing.

This subtest writes all the DMI data in the floppy disk into the new PCB.

## Subtest 08 System configuration display

This subtest displays the information of the system configuration.

Confirm the contents and press **Enter**.

For more details on the system configuration information, refer to 3.25 "System configuration".

## Subtest 09 E2PROM test (MAC/GUID/DMI)

It checks whether the MAC address, GUID of IEEE1394 and DMI information are written.

### 3.4 Heatrun Test

To execute this program, select 3-Repair heatrun in the startup menu, press **Enter**.

After selecting the test, the same subtests as 3.23 RUNNING TEST are executed successively.

For more details on the procedure and test content, refer to RUNNING TEST.

When the heatrun test ends, following message appears in the display.

```
*****  
HEATRUN TEST END  
*****  
Press any key to continue...
```

Press any key and return to the startup menu.

**NOTE:** The test result (*Errorlog.txt*) is stored in the floppy disk. The result is displayed in the same way as 3.22 LOG UTILITIES. For more detail in the display, refer to LOG UTILITIES.

### 3.5 Subtest Names

Table 3-1 lists the subtest names for each test program in the DIAGNOSTIC TEST MENU.

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

| No. | Test Name   | Subtest No. | Subtest Name                  |
|-----|-------------|-------------|-------------------------------|
| 1   | SYSTEM      | 01          | ROM checksum                  |
|     |             | 02          | Fan ON/OFF                    |
|     |             | 03          | Geyserville                   |
|     |             | 04          | Quick charge                  |
|     |             | 05          | DMI read                      |
| 2   | MEMORY      | 01          | Conventional memory           |
|     |             | 02          | Protected Mode                |
|     |             | 03          | Protected Mode (cache off)    |
|     |             | 04          | Cache memory (on/off)         |
|     |             | 05          | Stress                        |
| 3   | KEYBOARD    | 01          | Pressed key code display      |
| 4   | DISPLAY     | 01          | VRAM read/write for VGA       |
|     |             | 02          | Gradation for VGA             |
|     |             | 03          | Gradation for LCD             |
|     |             | 04          | Gradation & Mode test for VGA |
|     |             | 05          | All dot on/off for LCD        |
|     |             | 06          | "H" pattern display           |
|     |             | 07          | LCD Brightness                |
| 5   | FLOPPY DISK | 01          | Sequential read               |
|     |             | 02          | Sequential read/write         |
|     |             | 03          | Random address/data           |
|     |             | 04          | Write specified address       |
|     |             | 05          | Read specified address        |

Table 3-1 Subtest names (2/2)

| No. | Test Name          | Subtest No. | Subtest Name                       |
|-----|--------------------|-------------|------------------------------------|
| 6   | PRINTER            | 01          | Ripple pattern                     |
|     |                    | 02          | Function                           |
|     |                    | 03          | Wrap around                        |
| 7   | ASYNC              | 01          | FIR/SIR Point to point (send)      |
|     |                    | 02          | FIR/SIR Point to point (receive)   |
|     |                    | 03          | Wrap around (board)                |
| 8   | HARD DISK          | 01          | Sequential read                    |
|     |                    | 02          | Address uniqueness                 |
|     |                    | 03          | Random address/data                |
|     |                    | 04          | Cross talk & peak shift            |
|     |                    | 05          | Partial Read                       |
|     |                    | 06          | Write specified address            |
|     |                    | 07          | Read specified address             |
|     |                    | 08          | Sequential write                   |
|     |                    | 09          | W-R-C specified address            |
| 9   | REAL TIMER         | 01          | Real time                          |
|     |                    | 02          | Backup memory                      |
|     |                    | 03          | Real time carry                    |
| 10  | NDP                | 01          | NDP test                           |
| 11  | EXPANSION          | 01          | PCMCIA wrap around [Not supported] |
|     |                    | 03          | RGB monitor ID                     |
| 13  | CD-ROM<br>/DVD-ROM | 01          | Sequential read                    |
|     |                    | 02          | Read specified address             |
|     |                    | 03          | Random address/data                |
|     |                    | 04          | RW 1point W/R/C                    |

## 3.6 System Test

To execute the System Test select **1** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

### Subtest 01 ROM Checksum

This subtest executes a checksum test of the BIOS ROM (range: F0000h to FFFFFh, 64KB) on the System Board.

### Subtest 02 Fan ON/OFF

This subtest turns on/off the fan motor by force with Fan ON/OFF commands.

The following message will appear.

```
Fan number select (1;FAN#1(CPU), 2;FAN#2(GPU), 0; FAN#1&#2)?
```

To check the CPU fan, press **1** and **Enter**.

To check the GPU fan, press **2** and **Enter**.

To check both CPU fan and GPU fan, press **0** and **Enter**.

The following message will appear.

```
*** Test Fan Revolution 0000RPM start
```

Make sure the fan does not rotate, then press **Enter**.

The following message will appear.

```
*** Test Fan Revolution Low speed Start
```

Make sure the fan rotates at low speed, then press **Enter**.

The following message will appear.

```
*** Test Fan Revolution High speed Start
```

Make sure the fan rotates at high speed, then press **Enter**.

After a while, the fan rotating will stop.

### Subtest 03 Geyserville

If the CPU supports Gerserville (SpeedStep), this Subtest checks that the CPU operating clock speed can be changed.

Subtest 04 Quick Charge

This subtest checks the status for the quick charge.

Subtest 05 DMI read

This subtest displays the information in the Flash-ROM in the following format.

```
*** DMI Data Display Ver X.XX ***  
Model Name       : XXXXXXXXXXXX  
Version Number  : XXXXXXXXXXXX  
Serial Number   : XXXXXXXX  
Model Number    : XXXXXX-XXXXX  
UUID Number     : XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
Press [Enter] to EXIT
```

To exit this subtest and return to the SYSTEM test menu, press **Enter**.

## 3.7 Memory Test

To execute the Memory Test, select **2** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01      Conventional memory

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

Subtest 02      Protected Mode

***NOTE:** The CONFIG.SYS file must be configured without expanded memory manager programs such as EMM386.EXE, EMM386.SYS or QEMM386.SYS. Also, the HIMEM.SYS must be deleted from the CONFIG.SYS file.*

This subtest writes constant data and address data (from 1MB to maximum MB), and reads the new data and compares the result with the original data.

Subtest 03      Protected Mode (Cache off)

This subtest executes the same way as the subtest02 with the cache off.

Subtest 04      Cache Memory

To test the cache memory, a pass-through write-read comparison of '5Ah' data is run repeatedly to the test area ('7000':'Program' size to '7000':'7FFF' (32 KB)) to check the hit-miss ratio (on/off status) for CPU cache memory. One test takes 3 seconds.

Number of misses ? Number of hits ?    OK

Number of misses ? Number of hits ?    Fail

Subtest 05      Stress

Data (from 1MB to the maximum MB) is written from the 16KB write buffer to the 16KB read buffer and compared the data in the buffers. The read buffer starts from 0001 and the comparison is continued with the following read buffer addresses: 0001, 0003, 0005, 0007, 0009, 000b, 000d and 000f.

## 3.8 Keyboard Test

To execute the Keyboard Test, select **3** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

### Subtest 01 Pressed key code display

When a key is pressed, the scan code, character code, and key top name are displayed on the screen in the format shown below. The **Ins Lock**, **Caps Lock**, **Num Lock**, **Scroll Lock**, **Alt**, **Ctrl**, **Left Shift**, and **Right Shift** keys are displayed in reverse screen mode when pressed. The scan codes, character codes, and key top names are shown in Appendix D.

```
KEYBOARD TEST  IN PROGRESS  302000
      Scan code      =
      Character code  =
      Keytop          =
Ins Lock  Caps Lock  Num Lock   Scroll Lock
Alt       Ctrl       Left Shift  Right Shift
PRESS [Enter] KEY
```

## 3.9 Display Test

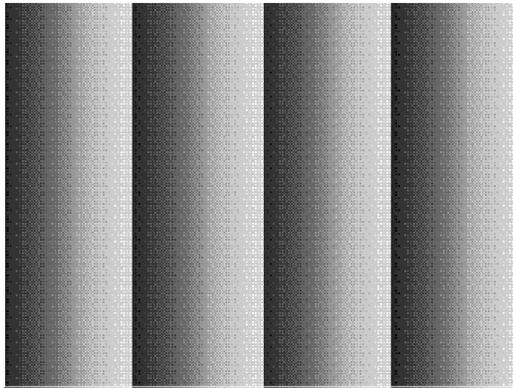
To execute the Display Test, select **4** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

### Subtest 01 VRAM read/write for VGA

This subtest writes the constant data (AAh and 55h) to the video RAM. The data is read and compared to the original data.

### Subtest 02 Gradation for VGA

This subtest displays four colors: red, green, blue and white from left to right across the screen from black to maximum brightness. The display below appears on the screen, when this subtest is executed.



To exit this subtest and return to the DISPLAY TEST menu, press **Enter**.

### Subtest 03 Gradation for LCD

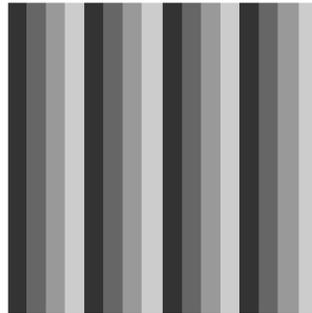
This subtest displays bands of gradations for mixed colors, then for red, green, and blue. Next, it displays eight solid colors full screen: red, semi-red, green, semi-green, blue, semi-blue, white, and semi-white. Each color displays for three seconds.

## Subtest 04 Gradation &amp; Mode test for VGA

This subtest displays gradations for following modes. To change the mode, press **Enter**.

```
[Mode 12]
[Mode 13]
[Mode 3]
[Mode 111  640*480   64K]
[Mode 112  640*480   16M]
[Mode 114  800*600   64K]
[Mode 115  800*600   16M]
[Mode 117 1024*768   64K]
[Mode 118 1024*768  16M]
```

The display below appears on the screen when this subtest is executed.



[ Mode 12 ]

(Display example: Mode 12)

To exit this subtest and return to the DISPLAY TEST menu, press **Enter** after displaying the Mode 118.

## Subtest 05 All dot on/off for LCD

This subtest displays an all-white screen then an all-black screen. The display changes automatically every three seconds, then returns to the DISPLAY TEST menu.



### 3.10 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 **5** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions displayed on the screen. After selecting the Floppy Disk Test from the DIAGNOSTIC TEST MENU, messages to execute the test drive number, media type and test start track will be displayed successively. Answer each question with an appropriate response to execute the test.

1. The following message will appear. Select the media mode and start track to be tested, then press **Enter**.

```
Test start track      (Enter:0/dd:00-79) ?
```

2. The Floppy Disk test contains five subtests that test the FDD.

The floppy disk test menu will appear after you select FDD test parameters.

```
FLOPPY DISK          XXXXXXXX
```

```
XXX DIAGNOSTIC TEST VX.XX
[Ctrl]+[Break] : test end
[Ctrl]+[C]     : key stop
```

```
SUB-TEST           : XX
PASS COUNT        : XXXXX   ERROR COUNT   : XXXXX
WRITE DATA       : XX      READ DATA  : XX
ADDRESS          : XXXXXXX   STATUS       : XXX
```

SUB-TEST MENU :

```
01 - Sequential read
02 - Sequential read/write
03 - Random address/data
04 - Write specified address
05 - Read specified address
99 - Exit to DIAGNOSTIC TEST MENU
```

```
↑↓←→ : Select items
Enter : Specify
Esc   : Exit
```

Select the number of the subtest you want to execute and press **Enter**. The following message will appear during the floppy disk test.

```
FLOPPY DISK  IN PROGRESS  XXXXXXXX  xxx DIAGNOSTIC TEST VX.XX
   [Ctrl]+[Break] : test end
   [Ctrl]+[C]   : key stop

SUB-TEST      : XX
PASS COUNT    : XXXXX  ERROR COUNT   : XXXXX
WRITE DATA   : XX     READ DATA    : XX
ADDRESS       : XXXXXX  STATUS        : XXX
```

When the subtest 04 or 05 is selected, the following messages will appear on the screen. Select the test data ( subtest 04 only), track number and head number you want to test.

```
Test data     ?? (subtest 04 only)
Track No.     ??
Head No.      ?
```

#### Subtest 01 Sequential read

This subtest performs a Cyclic Redundancy Check (CRC) that continuously reads all the tracks (track: 0 to 39/0 to 79) on a floppy disk.

#### Subtest 02 Sequential read/write

This subtest continuously writes data pattern B5ADADh to all the tracks (track: 0 to 39/0 to 79) on a floppy disk. The data 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 (track: 0 to 39/0 to 79) on a floppy disk. The data is then read and compared to the original data.

#### Subtest 04 Write specified address

This subtest writes the data specified by an operator to a specified track, head, and address.

#### Subtest 05 Read specified address

This subtest reads data from a track, head, and address specified by an operator.

### 3.11 Printer Test

**CAUTION:** Printer Test is not supported for this model.

To execute the Printer Test, select **6** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. The following messages will appear after selecting the Printer Test from the DIAGNOSTIC TEST MENU. Answer each of the questions with an appropriate response to execute the test.

**NOTE:** An IBM compatible printer must be connected to the system to execute this test. Also, printer port wraparound connector must be connected.

The following message will appear, after selecting the subtest 01 to 03 of the printer test:

```
channel#1 = XXXXh
channel#2 = XXXXh
channel#3 = XXXXh
```

Select the channel number (1-3) ?

The printer I/O port address is specified by the XXXXh number. The computer supports three printer channels. Select the printer channel number, and press **Enter** to execute the selected subtest.

#### Subtest 01 Ripple Pattern

This subtest prints characters for codes 20h through 7Eh line-by-line while shifting one character to the left at the beginning of each new line.

```
:"#$%E'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnop
:"#$%E'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnop
:"#$%E'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopq
#$%E'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqr
#$%E'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
%E'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrst
E'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstu
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuv
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvw
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwx
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxy
```

## Subtest 02      Function

This subtest is for IBM compatible printers, and tests the following functions:

Normal print  
 Double-width print  
 Compressed print  
 Emphasized print  
 Double-strike print  
 All characters print

This subtest prints the various print types shown below:

```

PRINTER TEST
1.  THIS LINE SHOWS NORMAL PRINT.
2.  THIS LINE SHOWS DOUBLE-WIDTH PRINT.
3.  THIS LINE SHOWS COMPRESSED PRINT.
4.  THIS LINE SHOWS EMPHASIZED PRINT.
5.  THIS LINE SHOWS DOUBLE-STRIKE PRINT.
6.  ALL CHARACTERS PRINT
   !"#$$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN OPQRSTUVWXYZ[\]^_`abcdefghijklmnop
opqrstuvwxyz{|}~

```

## Subtest 03      Wraparound

**NOTE:** To execute this subtest, a printer wraparound connector must be connected to the computer's printer port.

This subtest checks the output and bi-directional modes of the data control and status lines through the parallel port wraparound connector (34M741986G01). (Both output and bi-directional modes are tested.)

## 3.12 Async Test

To execute the Async Test, select **7** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions displayed on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 and 02 require the following data format:

|               |                                  |
|---------------|----------------------------------|
| Method:       | Asynchronous                     |
| Speed:        | 38400BPS                         |
| Data:         | 8 bits and one parity bit (EVEN) |
| Data pattern: | 20h to 7Eh                       |

Subtest 01      FIR/SIR Point to point (send)

**NOTE:** *To execute subtests 01 and 02, each computer must have access to the other computer's infrared port.*

This subtest sends 20h through 7Eh data to the receive side, then receives the sent data and compares it to the original data through the FIR/SIR port.

Subtest 02      FIR/SIR Point to point (receive)

This subtest is used with subtest 01 described above. This subtest receives the data from the send side, then sends the received data through the FIR/SIR port.

Subtest 03      Wraparound (on board)

**NOTE:** *To execute this subtest, an RS-232C wraparound connector must be connected to the RS-232C port.*

This subtest checks the data send/receive function through the wraparound connector.

### 3.13 Hard Disk Test

To execute the Hard Disk Test, select **8** from the DIAGNOSTIC TEST MENU, press **Enter**, and follow the directions on the screen.

**CAUTION:** *When executing subtest02, 03, 04, 06, 08 and 09, the message [The hard disk will be destroyed.] will be displayed. The contents of the hard disk will be erased when these tests are executed. Before running the test, the customer should transfer the contents of the hard disk to floppy disk or another hard disk. If the customer has not or cannot perform the back-up, create back-up disks as described below.*

*Check to see if the Microsoft Create System Disks Tools (MSCSD.EXE) still exists in the System Tools Folder. (This tool can be used only once.) If it exists, use it to back up the pre-installed software, then use the Backup utility in the System Tools folder to back up the entire disk, including the user's files.*

*Refer to the operating system instructions.*

When a 2nd HDD is installed, the following messages will appear after selecting the hard disk test from the DIAGNOSTIC TEST MENU.

Test drive number select (1:HDD#1, 2:HDD#2, 0:HDD#1&2) ?

1. Input the number of HDD test and press **Enter**.
2. This message is used to select the error dump operation when a data compare error is detected. Select **1** or **2**.

Data compare error dump (1:no, 2:yes)

3. This message is used to select whether or not the HDD status is displayed on the screen. The HDC status is described in section 3.19. Select **1** or **2**.

Detail status display (1:no, 2:yes)

4. The Hard Disk Test message will appear after you respond to the Detail Status prompt. Select the number of the subtest you want to execute and press Enter. The following message will appear during each subtest.

HARD DISK TEST XXXXXXXX

|                                                                                 |
|---------------------------------------------------------------------------------|
| XXX DIAGNOSTIC TEST VX.XX<br>[Ctrl]+[Break] : test end<br>[Ctrl]+[C] : key stop |
|---------------------------------------------------------------------------------|

|            |   |        |             |   |       |
|------------|---|--------|-------------|---|-------|
| SUB TEST   | : | XX     |             |   |       |
| PASS COUNT | : | XXXXX  | ERROR COUNT | : | XXXXX |
| WRITE DATA | : | XX     | READ DATA   | : | XX    |
| ADDRESS    | : | XXXXXX | STATUS      | : | XXX   |

The first three digits of the ADDRESS indicate which cylinder is being tested, the fourth digit indicates the head and the last two digits indicate the sector.

The first digit of the STATUS number indicates the drive being tested and the last two digits indicate the error status code as explained in table 3-2 of the section 3.18.

#### Subtest 01 Sequential read

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

#### Subtest 02 Address uniqueness

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:

1. Forward sequential
2. Reverse sequential
3. Random

#### Subtest 03 Random address/data

This subtest writes random data in a random length to random addresses. This data is then read and compared to the original data.

## Subtest 04 Cross talk &amp; peak shift

This subtest writes eight types of worst pattern data (listed below) to a cylinder, then reads the data while moving from cylinder to cylinder. (Test the data interference in the neighbor track)

| Worst pattern data | Cylinder   |
|--------------------|------------|
| 'B5ADAD'           | 0 cylinder |
| '4A5252'           | 1 cylinder |
| 'EB6DB6'           | 2 cylinder |
| '150449'           | 3 cylinder |
| '63B63B'           | 4 cylinder |
| '9C49C4'           | 5 cylinder |
| '2DB6DB'           | 6 cylinder |
| 'D25044'           | 7 cylinder |

## Subtest 05 Partial Read

This subtest reads 1GB data which is in minimum, middle and maximum address of the HDD area.

## Subtest 06 Write specified address

This subtest writes specified data to a specified cylinder and head on the HDD.

## Subtest 07 Read specified address

This subtest reads data, which has been written to a specified cylinder and head on the HDD.

## Subtest 08 Sequential write

This subtest writes specified 2-byte data to all of the cylinders on the HDD.

## Subtest 09 W-R-C specified address

This subtest writes data to a specified cylinder and head on the HDD, then reads the data and compares it to the original data.

### 3.14 Real Timer Test

To execute the Real Timer Test, select **9** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

#### Subtest 01 Real time

A new date and time can be input during this subtest. To execute the real time subtest, follow these steps:

1. Select subtest 01 and the following messages will appear:

```
Current date : XX-XX-XXXX
```

```
Current time : XX:XX:XX
```

```
Enter new date:
```

```
PRESS [ENTER] KEY TO EXIT TEST
```

2. If the current date is not correct, input the correct date at the “Enter new date” prompt and press **Enter**.
3. The date is updated and the following messages will appear:

```
Current date : XX-XX-XXXX
```

```
Current time : XX:XX:XX
```

```
Enter new time:
```

```
PRESS [ENTER] KEY TO EXIT TEST
```

4. If the current time is not correct, input the correct time in 24-hour format. To enter ":", press **Shift + ;**. The time is updated.

To exit the test, press **Enter**.

#### Subtest 02 Backup memory

This subtest checks the following backup memories:

Writes 1-bit of “on” data (01h through 80h) to address 0Eh through 7Fh

Writes 1-bit of “off” data (FEh through 7Fh) to address 0Eh through 7Fh

Writes the data pattern AAh and 55h to the address 0Eh to 7Fh

Then the subtest reads and compares this data with the original data.

Subtest 03    Real time carry

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

This subtest checks the real time clock increments. Make sure the date and time are displayed in the following format:

```
Current date : 12-31-1999
Current time : 23:59:58
```

The real time increments are automatically executed and the following is displayed:

```
Current date : 01-01-2000
Current time : 00:00:00
```

```
PRESS [Enter] KEY TO EXIT TEST
```

To exit the test, press **Enter**.

### 3.15 NDP Test

To execute the NDP test, select **10** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen.

Subtest 01      NDP

This test checks the following functions of NDP:

- ✍ Control word
- ✍ Status word
- ✍ Bus
- ✍ Addition
- ✍ Multiplication

### 3.16 Expansion Test

To execute the expansion test, select **11** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen.

Subtest 01 PCMCIA wraparound

**CAUTION:** PCMCIA wraparound test is not supported for this model.

**NOTE:** To execute this subtest, the PC card wraparound connector is required.

This subtest checks the following signal line of the PC card slot:

- ✍ Address line
- ✍ REG#, CE#1, CE#2 line
- ✍ Data line
- ✍ Speaker line
- ✍ Wait line
- ✍ BSY#, BVD1 line

This subtest is executed in the following order:

| Sub# | Address        | Good     | Bad      | Contents                                              |
|------|----------------|----------|----------|-------------------------------------------------------|
| 01   | 00001<br>00001 | nn<br>nn | xx<br>xx | Address line<br>REG#, CE#1, CE#2<br>nn=A0, 90, 80, 00 |
| 02   | 00002          | ww       | rr       | Data line<br>ww=write data, rr=read data              |
| 03   | 00003          | —        | —        | Speaker line                                          |
| 04   | 00004          | 40,80    | xx       | Wait line (40<xx<80)                                  |
| 05   | 00005          | nn       | xx       | Other lines (BSY#, BVD1)<br>NN=21, 00                 |

**NOTE:** When selecting the subtest number 01, the following message will appear:  
Test slot number select (1:slot0, 2:slot1, 0:slot0&1)?

## Subtest 02     RGB monitor ID

**NOTE:** *To execute this subtest, an external monitor with monitor ID function is required.*

Connect the external monitor to the PC for the test of ID acquisition.

The judgment of acquisition is based on the panel data. In simultaneous display mode or internal display mode, in which the panel data is acquired, this subtest will fail. Therefore, make sure only the external display is selected when executing this subtest.

### 3.17 CD-ROM/DVD-ROM Test

To execute the CD-ROM/DVD-ROM test, select **13** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen.

***NOTE:** For the subtest 01, 02 and 03, use the TOSHIBA CD-ROM TEST DISK TDY-01 or ABEX TEST CD-ROM TCDR-702 and DVD-ROM TEST DISK TSD-1. For the subtest 04, use a CD-RW media on the market.*

- |            |                        |                                                                                                  |
|------------|------------------------|--------------------------------------------------------------------------------------------------|
| Subtest 01 | Sequential read        | This subtest is a sequential reading of one-block units (2K bytes) of all the logical addresses. |
| Subtest 02 | Read specified address | This subtest reads one-block data from a specified address.                                      |
| Subtest 03 | Random address/data    | This subtest reads one-block data and multi-block data from random addresses 200 times.          |
| Subtest 04 | RW 1point W/R/C        | This subtest writes, reads and compares data at one point on a CD-RW media.                      |

### 3.18 Error Code and Error Status Names

Table 3-2 lists the error codes and error status names for the Diagnostic Test.

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

| Device name | Error code                                                                             | Error status name                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (Common)    | FF                                                                                     | Data Compare Error                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| System      | 01<br>03<br>04<br>05<br>06<br>07<br>08<br>09<br>10                                     | ROM - CHECKSUM ERROR<br>ROM - SERIAL ID WRITE ERROR<br>ROM - NOT SUPPORTED PS-SYSTEM<br>ROM - SENSING ERROR(AC-ADAPT)<br>ROM - SENSING ERROR(1st Batt)<br>ROM - SENSING ERROR(2nd Batt)<br>ROM - THORMISTOR ERROR(1)<br>ROM - THORMISTOR ERROR(2)<br>ROM - THORMISTOR ERROR(3)                                                                                                                                                                                                     |
| Memory      | 01<br>02<br>DD                                                                         | RAM - PARITY ERROR<br>RAM - PROTECTED MODE NO CHANGE'<br>RAM - CACHE MEMORY ERROR                                                                                                                                                                                                                                                                                                                                                                                                  |
| Keyboard    | FE<br>FD<br>F0<br>F1<br>F2<br>F3<br>F4<br>F5<br>F6<br>F7<br>F8<br>F9<br>FA<br>EF<br>ED | USB - GET DESCR.ERROR (FIRST)<br>USB - SET ADDRESS ERROR<br>HUB - GET DESCR.ERROR(Top 8B)<br>HUB - GET DESCR.ERROR (Whole)<br>HUB - SET CONFIGURATION ERROR<br>HUB - GET DESCR.ERROR(DESCR.)<br>HUB - SET FEATURE ERROR(P ON)<br>HUB - GET STATUS ERROR<br>HUB - SET FEATURE ERROR(RESET)<br>HUB - CLEAR FEATURE ERROR<br>HUB - CLEAR FEATURE1 ERROR<br>HUB - SET FEATURE ERROR(Enab.)<br>HUB - CLEAR FEATURE2 ERROR<br>USB - OVER CURRENT ERROR<br>USB - GET DESCR.ERROR(SECOND)' |
| Display     | EE                                                                                     | VRAM SIZE NOT SUPPORT                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

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

| Device name | Error code                                                                             | Error status name                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FDD         | 01<br>02<br>03<br>04<br>08<br>09<br>10<br>20<br>40<br>80<br>60<br>06<br>EE             | FDD - BAD COMMAND ERROR<br>FDD - ADDRESS MARK NOT FOUND<br>FDD - WRITE PROTECTED<br>FDD - RECORD NOT FOUND<br>FDD - DMA OVERRUN ERROR<br>FDD - DMA BOUNDARY ERROR<br>FDD - CRC ERROR<br>FDD - FDC ERROR<br>FDD - SEEK ERROR<br>FDD - TIME OUT ERROR<br>FDD - NOT DRIVE ERROR<br>FDD - MEDIA REMOVED<br>FDD - WRITE BUFFER ERROR                                                                         |
| Printer     | 01<br>08<br>10<br>20<br>40<br>80                                                       | PRT - TIME OUT<br>PRT - FAULT<br>PRT - SELECT LINE<br>PRT - OUT OF PAPER<br>PRT - POWER OFF<br>PRT - BUSY LINE                                                                                                                                                                                                                                                                                          |
| ASYNC       | 01<br>02<br>04<br>08<br>10<br>20<br>40<br>80<br>88<br>05<br>06                         | RS232C - [DTR ON] TIME OUT<br>RS232C - [CTS ON] TIME OUT<br>RS232C - [RX READY] TIME OUT<br>RS232C - [TX FULL] TIME OUT<br>RS232C - PARITY ERROR<br>RS232C - FRAMING ERROR<br>RS232C - OVERRUN ERROR<br>RS232C - LINE STATUS ERROR<br>RS232C - MODEM STATUS ERROR<br>SIR - TIME OUT ERROR<br>FIR - TIME OUT ERROR                                                                                       |
| HDD         | 05<br>07<br>09<br>0B<br>BB<br>08<br>01<br>02<br>04<br>10<br>20<br>40<br>80<br>11<br>AA | HDD - HDC NOT RESET ERROR<br>HDD - DRIVE NOT INITIALIZE<br>HDD - DMA BOUNDARY ERROR<br>HDD - BAD TRACK ERROR<br>HDD - UNDEFINED ERROR<br>HDD - OVERRUN ERROR (DRQ ON)<br>HDD - BAD COMMAND ERROR<br>HDD - ADDRESS MARK NOT FOUND<br>HDD - RECORD NOT FOUND ERROR<br>HDD - ECC ERROR<br>HDD - HDC ERROR<br>HDD - SEEK ERROR<br>HDD - TIME OUT ERROR<br>HDD - ECC RECOVER ENABLE<br>HDD - DRIVE NOT READY |

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

| Device name        | Error code                                                                 | Error status name                                                                                                                                                                                                                   |
|--------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (HDD)              | CC<br>E0<br>0A<br>EE<br>DA<br>12                                           | HDD - WRITE FAULT<br>HDD - STATUS ERROR<br>HDD - BAD SECTOR<br>HDD - ACCESS TIME ERROR<br>HDD - NO HDD<br>HDD - DMA CRC ERROR                                                                                                       |
| NDP                | 01<br>02<br>03<br>04<br>05<br>06                                           | NDP - NO CO-PROCESSOR<br>NDP - CONTROL WORD ERROR<br>NDP - STATUS WORD ERROR<br>NDP - BUS ERROR<br>NDP - ADDITION ERROR<br>NDP - MULTIPLAY ERROR                                                                                    |
| EXPANSION          | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8<br>CB<br>CC<br>CE<br>CF             | ADDRESS LINE ERROR<br>CE#1 LINE ERROR<br>CE#2 LINE ERROR<br>DATA LINE ERROR<br>WAIT LINE ERROR<br>BSY# LINE ERROR<br>BVD1 LINE ERROR<br>ZV-Port ERROR<br>NO PCMCIA<br>CARD TYPE ERROR<br>ZV_CONT# ERROR                             |
| CD-ROM<br>/DVD-ROM | 01<br>02<br>03<br>04<br>05<br>06<br>09<br>11<br>20<br>40<br>80<br>90<br>B0 | BAD COMMAND<br>ILLEGAL LENGTH<br>UNIT ATTENTION<br>MEDIA CHANGE REQUEST<br>MEDIA DETECTED<br>ADDITIMAL SENSE<br>BOUNDARY ERROR<br>CORRECTED DATA ERROR<br>DRIVE NOT READY<br>SEEK ERROR<br>TIME OUT<br>RESET ERROR<br>ADDRESS ERROR |

### 3.19 Hard Disk Test Detail Status

When an error occurs in the hard disk test, the following message is displayed:

```
HDC status = XXXXXXXX
```

Detailed information about the hard disk test error is displayed on the screen by an eight-digit number. The first four digits represent the hard disk controller (HDC) error status number and the last four digits are not used.

The hard disk controller error status is composed of two bytes; the first byte displays the contents of the HDC status register in hexadecimal form and the second byte displays the HDC error register.

The contents of the HDC status register and error register are listed in Tables 3-3 and 3-4.

*Table 3-3 Hard disk controller status register contents*

| Bit | Name                         | Description                                                                                                                    |
|-----|------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| 7   | BSY<br>(Busy)                | "0" ... HDC is ready.<br>"1" ... HDC is busy.                                                                                  |
| 6   | DRY<br>(Drive ready)         | "0" ... Hard disk drive is not ready to accept any command.<br>"1" ... Hard disk drive is ready.                               |
| 5   | DWF<br>(Drive write fault)   | "0" ... DWF error is not detected.<br>"1" ... Write fault condition occurred.                                                  |
| 4   | DSC<br>(Drive seek complete) | "0" ... The hard disk drive heads are not settled over a track.<br>"1" ... The hard disk drive heads are settled over a track. |
| 3   | DRQ<br>(Data request)        | "0" ... Drive is not ready for data transfer.<br>"1" ... Drive is ready for data transfer.                                     |
| 2   | COR<br>(Corrected data)      | "0" ... Not used<br>"1" ... Correctable data error is corrected.                                                               |
| 1   | IDX<br>(Index)               | "0" ... Not used<br>"1" ... Index is sensed.                                                                                   |
| 0   | ERR<br>(Error)               | "0" ... Normal<br>"1" ... The previous command was terminated with an error.                                                   |

Table 3-4 Error register contents

| Bit | Name                    | Description                                                                                                                                     |
|-----|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 7   | BBK<br>(Bad block mark) | "0" ... Not used<br>"1" ... A bad block mark is detected.                                                                                       |
| 6   | UNC<br>(Uncorrectable)  | "0" ... There is no uncorrectable data error.<br>"1" ... Uncorrectable data error has been detected.                                            |
| 5   | —                       | Not used                                                                                                                                        |
| 4   | IDN<br>(Identification) | "0" ... Not used<br>"1" ... There is no ID field in the requested sector.                                                                       |
| 3   | —                       | Not used                                                                                                                                        |
| 2   | ABT<br>(Abort)          | "0" ... Not used<br>"1" ... Illegal command error or command abort.                                                                             |
| 1   | TK0<br>(Track 0)        | "0" ... The hard disk found track 0 during a recalibrate command.<br>"1" ... The hard disk could not find track 0 during a recalibrate command. |
| 0   | —                       | Not used                                                                                                                                        |

## 3.20 Only One Test

### 3.20.1 Program Description

This program tests the unique functions of this model.

### 3.20.2 Operations

Select test **2** from the DIAGNOSTIC MENU and press **Enter**. The following menu appears in the display.

```
#####
#
#####          Only One Test Menu (XXXXXXXXXX)
#####
#####
#
*
*
*   1 ..... Pressed Key Display
*
*   2 ..... Touch Pad
*   3 ..... Kill Switch
*   4 ..... USB
*   5 ..... LED
*   6 ..... Acceleration sensor
*   7 ..... Button
*
*   9 ..... Common Test
*
*****
*
.... Press test number[1-7, 9] ?
```

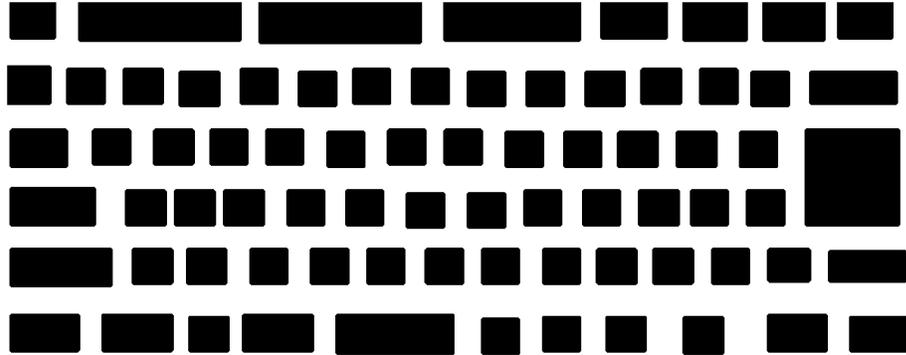
Input the subtest number you want to test and press **Enter**.

To return to the DIAGNOSTIC TEST menu, select **9** and press **Enter**.

## Subtest 01      Pressed key display

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

Press **Del + Enter** to end the test.



IF TEST OK, Press [Del][Enter]key

Subtest 02 Touch Pad

This subtest checks the functions of the touch pad as shown below.

- A) Direction and parameter
- B) Switching function check.

This test displays the response from the touch pad and touch pad switch. When moving your finger on the touch pad towards the upper left, the <POINTING> display changes according to the following illustration. If a touch pad switch is pressed, the <BUTTONS> displays appear on the right side one by one. The parameters appear above the <BUTTONS> (1) or (2) corresponding to the pressed touch pad switch highlights. To end this subtest, press two touch pad switches at the same time.

```

*** IPS (PAD) TEST PROGRAM (Vx.xx) ***

<POINTING>
<PARAMETER>
STATUS:0000h
X-RATE:0000h
Y-RATE:0000H

<BUTTON>
(1) (2)

<< PRESS BUTTON1+BUTTON2 THEN END >>

*** IPS (PAD) TEST PROGRAM (Vx.xx) ***

< POINTING >
<PARAMETER>
STATUS: 0018h
X-RATE: OK
Y-RATE: OK

<BUTTON>
(1) (2)

<< PRESS BUTTON1+BUTTON2 THEN END >>

```

## Subtest 03 Kill Switch

This subtest checks if the Wireless communication switch works properly.

If the test is started with the switch ON, the following message appears in the display.

```
Kill switch is set to a start position (OFF)
```

Slide the switch to OFF position. Then, the following message appears in the display.

```
KILL SWITCH ON !!
```

Slide the switch to ON position. Then, the following message appears in the display.

```
KILL SWITCH OFF !!
```

After Sliding the switch to OFF position, the screen returns to the Only One Test menu automatically.

## Subtest 04 USB

**NOTE:** When executing this subtest, USB test module and USB cable must be connected.

This subtest checks if USB ports work properly.

The following menu appears in the display.

```
#####
#
#####          USB Port Select (XXXXXXXX)          #####
#####
#
*
*   0 ..... Port 0 (Back)
*   1 ..... Port 1 (Left side back)
*
*   2 ..... Port 2 (Left side front)
*
*   9 ..... EXIT to Only One Menu
*
*
*****
*
.... Press test number[0-2, 9] ?
```

Connect the USB test module and USB cable to the computer.

Input the test port number and press **Enter**.

**OK** message appears in the display if the test ends without an error.

**NG** message appears in the display if an error is found during the test. Confirm the connection of cable, and then execute the test again.

Press **9** and **Enter** to return to Only One Test menu.

#### Subtest 05 LED

This subtest checks if each LED lights properly.

The following message appears in the display in order. Follow the instructions in the display to execute the test.

```
[HDD Access LED test]
```

Confirm the LED of HDD status blinks properly.

Press any key and following message appears in the display.

```
[Caps/Num/Overlay BT/W-LAN LED test]
```

- (1) Press [Caps Lock ] key ! ...Caps (on/off)
- (2) Press [Fn + F10 ] key ! ...Arrow (on/off)
- (3) Press [Fn + F11 ] key ! ...Num (on/off)
- (4) Slide [BT/W-LAN switch L&R]! (on/off)

Confirm corresponding LED lights properly.

Press **Enter** and following message appears in the display.

```
Check [DC-IN]&[Power]&[Main Battery] LED=  
Green/Orange
```

Check if the each LED lights in the same color shown in the display (Message switches Green <-> Orange).

Press **Enter** to return to the Only One Test menu.

## Subtest 06 Acceleration sensor

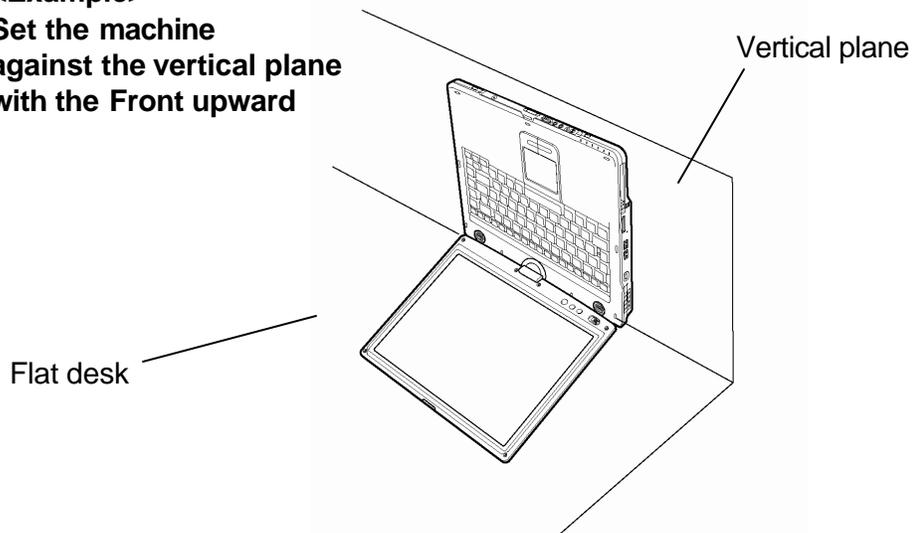
This subtest detects and corrects the each axis (X, Y, Z).

**NOTE:** Make sure that this subtest is executed on the following condition:

1. Flat desk with vertical plane to get the stability of machine.
2. Prevent the machine from shake or shock.

**<Example>**

**Set the machine  
against the vertical plane  
with the Front upward**



The figure below shows the name and position of each side.

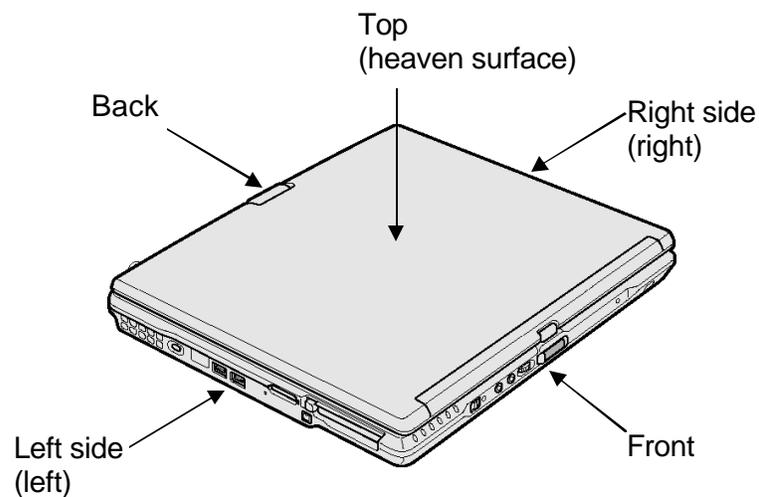


Figure 3-1 Name and positions of each side

When this subtest is selected, the following message appears in the display.

The heaven surface establishes in the upper direction  
Press [Enter] key

**NOTE:** Be sure to execute the test with the display panel opened.

Set the machine on the flat desk. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

The back establishes in the upper direction  
Press [Enter] key

Set the machine against the vertical plane on the flat desk with the back of machine upward. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

The right establishes in the upper direction  
Press [Enter] key

Set the machine against the vertical plane on the flat desk with the right side of machine upward. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

The front establishes in the upper direction  
Press [Enter] key

Set the machine against the vertical plane on the flat desk with the front of machine upward. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

The left establishes in the upper direction  
Press [Enter] key

Set the machine against the vertical plane on the flat desk with the left side of machine upward. Then press **Enter** to detect the data on this setting of machine.

When there is no defective during the all checks above, the following message appears in the display. Then press **Enter** and return to the Only One Test menu.

\*\* Setting OK! \*\*  
Press [Enter] key

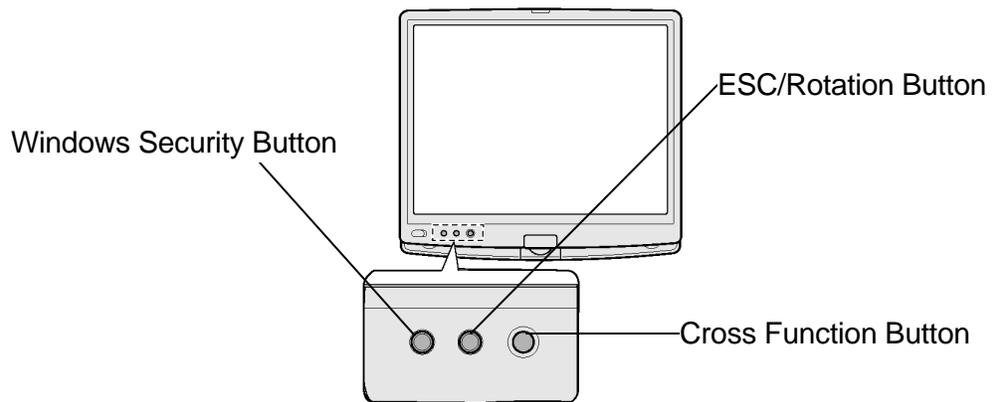
When a defective is found during the each check above, the following message appears in the display. The test is halted at the point when the defective is found.

```
** Setting ERROR! **  
Press [Enter] key
```

Press **Enter** and return to the Only One Test menu. Then execute the test again.

#### Subtest 07 Button

This subtest checks if the buttons in the following figure work properly.



The following message appears in the display.

```
Press [Windows Security Button] key
```

Press Windows security button. Then the following message appears in the display.

```
Press [Escape/Rotation Button] key
```

Press Escape/Rotation button. Then the following message appears in the display.

```
Press [Cross Function Button] key
```

Press Cross Function button. If the test ends successfully, the screen returns to the ONLY ONE TEST menu automatically.

## 3.21 Head Cleaning

### 3.21.1 Function Description

This function cleans the heads in the FDD by executing a series of head load/seek and read operations. A cleaning kit is necessary to perform this program.

### 3.21.2 Operations

1. Selecting test **4** from the DIAGNOSTIC MENU and pressing **Enter** displays the following messages:

```
DIAGNOSTICS - FLOPPY DISK HEAD CLEANING : VX.XX  
Mount cleaning disk(s) on drive(s).  
Press any key when ready.
```

2. Remove the Diagnostics Disk from the FDD, then insert the cleaning disk and press **Enter**.
3. When the "cleaning start" message appears, the FDD head cleaning has begun.
4. The display automatically returns to the DIAGNOSTIC MENU when the program is completed.

## 3.22 Log Utilities

### 3.22.1 Function Description

This function logs error information generated while a test is in progress and stores the results in RAM. This function can store data on a floppy disk, or output the data to a printer or the display.

The error information is displayed in the following order:

1. Error count (CNT)
2. Test name, Subtest number (TS-No)
3. Pass count (PASS)
4. Error status (STS)
5. FDD/HDD or memory address (ADDR)
6. Write data (WD)
7. Read data (RD)
8. HDC status (HSTS)
9. Error status name (ERROR STATUS NAME)

If the power switch is turned off, the error information will be lost.



## 3.23 Running Test

### 3.23.1 Function Description

This function automatically executes the following tests in sequence:

1. System test (subtest 01)
2. Memory test (subtests 01, 02, 06)
3. Display test (subtest 01)
4. Real timer test (subtest 02)
5. HDD test (subtests 01)

The system automatically detects the number of floppy disk drives connected to the computer for the FDD test.

### 3.23.2 Operations

1. Select **6** from the Diagnostic Menu and press **Enter**, the following messages for selectable tests will appear in the display in order.

```
FDD write/read test (Y/N)?  
Printer wrap around test (Y/N)?  
Serial wrap around test (Y/N)?  
CD-ROM/DVD-ROM test (Y/N)?
```

2. To execute the test, press **Y** and **Enter**. To cancel the test, press **N** and **Enter**. If you select the selectable tests, follow the instruction message in the display.
3. After selecting the selectable tests, the running test starts automatically. To terminate the program, press **Ctrl + Break**.

## 3.24 Floppy Disk Drive Utilities

### 3.24.1 Function Description

This function formats the FDD, copies the floppy disk and displays the dump list for both the FDD and HDD.

#### 1. FORMAT

**NOTE:** *This program is only for testing a floppy disk drive. It is different from the Toshiba MS-DOS FORMAT command.*

This program can format a floppy disk in the following formats:

- (a) 2DD: Double-sided, double-density, double-track, 96/135 TPI, MFM mode, 512 bytes, 9 sectors/track.
- (b) 2HD: Double-sided, high-density, double-track, 96/135 TPI, MFM mode, 512 bytes, 18 sectors/track.

#### 2. COPY

This program copies data from a source floppy disk to a target floppy disk.

#### 3. DUMP

This program displays the contents of the floppy disk and the designated sectors of the hard disk on the display.

#### 4. HDD ID READ

This program reads the hard disk ID and displays hard disk model number.

### 3.24.2 Operations

1. Selecting **7** from the DIAGNOSTIC MENU and pressing **Enter** displays the following message:

```
[ FDD UTILITIES ]  
  
1 - FORMAT  
2 - COPY  
3 - DUMP  
4 - HDD-ID READ  
9 - EXIT TO DIAGNOSTICS MENU
```

2. FORMAT program

- (a) Selecting FORMAT displays the following message:

```
DIAGNOSTICS - FLOPPY DISK FORMAT : VX.XX  
Drive number select (1:A, 2:B) ?
```

- (b) Select a drive number to display the following message:

```
Type select (0:2DD, 3:2HD) ?
```

- (c) Select a media/drive type number and press **Enter**. A message similar to the one below will be displayed:

```
Warning : Disk data will be destroyed.  
Insert work disk into drive A:  
Press any key when ready.
```

- (d) Remove the Diagnostics Disk from the FDD, insert the work disk and press any key.

The following message will be displayed when the FDD format is executed:

```
[ FDD TYPE ] : TRACK = XXX  
[ FDD TYPE ] : HEAD = X  
[ FDD TYPE ] : SECTOR = XX  
  
Format start  
[[track, head = XXX X]]
```

After the floppy disk is formatted, the following message will appear:

```
Format complete  
Another format (1:Yes/2:No) ?
```

- (e) Typing **1** displays the message from step (c) above. Typing **2** returns the test to the DIAGNOSTIC MENU.

## 3. COPY program

- (a) When COPY is selected, the following message appears:

```
FLOPPY DISK FORMAT & COPY : VX.XX
Type select (0:2DD,3:2HD) ?
```

- (b) Selecting a media/drive type number will display a message similar to the one below:

```
Insert source disk into drive A:
Press any key when ready.
```

- (c) Remove the Diagnostics Disk from the FDD, insert the source disk and press any key. The following message will appear, indicating the program has started.

```
[ FDD TYPE ] : TRACK      = XXX
[ FDD TYPE ] : HEAD       = X
[ FDD TYPE ] : SECTOR    = XX

Copy start
                [[ track,head = XXX X ]]
```

- (d) The following message will appear.

```
Insert target disk into drive A:
Press any key when ready.
```

- (e) Remove the source disk from the FDD, then insert a formatted work disk and press any key. The following message will appear and start copying to the target disk.

```
                [[ track,head = XXX X ]]
```

- (f) When the amount of data is too large to be copied in one operation, the message from step (b) is displayed again. After the floppy disk has been copied, the following message will appear:

```
Copy complete
Another copy (1:Yes/2:No) ?
```

- (g) To copy another disk, type **1** and the message from step (a) is displayed again. Entering **2** returns the test program to the DIAGNOSTIC MENU.

## 4. DUMP program

- (a) When DUMP is selected, the following message appears:

```
DIAGNOSTICS-HARD DISK & FLOPPY DISK DUMP : VX.XX
Drive type select (1:FDD, 2:HDD) ?
```

- (b) Select a drive type. If 2:HDD is selected, the display will go to step (h). If 1:FDD is selected, the following message will appear:

```
Select drive number (1:A, 2:B) ?
```

- (c) Select a drive number and the following message will be displayed.

```
Format type select (1:2DD, 3:2HD) ?
```

- (d) If 3:2HD is selected, the following message will appear. Select a media mode.

```
2HD media mode (1:1.20MB, 2:1.44MB, 3:1.23MB)?
```

- (e) The following message will appear:

```
Insert source disk into drive A:
Press any key when ready.
```

- (f) Insert a source disk and press any key and the following message will appear:

```
— Max. address —
[Track ] = XXXX
[Head  ] = XX
[Sector] = XX
Track number ????
```

- (g) Set the track number, head number and sector number you want to dump. The system will access the disk and dump a list. Then the message shown in (k) will appear.

- (h) The following message will appear when selecting 2:HDD in (a).

```
Select drive number (1:C, 2:D) ?
```

- (i) Select a drive number and the following message will be displayed.

```
---Max. address ---
[LBA ] = XXXXXXXXXXXX
LBA number ?????????
```

- (j) Set the LBA number you want to dump. The system will access the disk and dump a list.

- (k) The following message will appear. To finish the dump, select **3**.

Press number key (1:up,2:down,3:end) ?

- (l) The following message will appear. Selecting **2** returns to the FDD UTILITIES MENU.

Another dump (1:Yes,2:No) ?

#### 5. HDD ID READ program

Selecting HDD ID displays the following HDD ID configuration:

```
[HDD ID Read (VX.XX)] [Drive #1]      [Drive #2]
Model No.                = XXXXXXXX   = YYYYYYYY
```

Press **Enter** to return to the FDD UTILITIES MENU.

## 3.25 System Configuration

### 3.25.1 Function Description

The System Configuration program contains the following configuration information for the computer:

1. Processor Type [Code/L2 cache]
2. Chip set [VRAM]
3. BIOS ROM version [1st ID, 2nd ID]
4. Boot ROM version
5. EC/KBC version
6. PS Microprocessor version
7. SVP parameter version [Panel/Manufacture code/Product code]
8. Microcode revision [Processor number]
9. Total Memory Size [Conventional memory]
10. Battery code
11. HWSC
12. FSB [Voltage]
13. The number of printer ports
14. The number of ASYNC ports
15. Math co-processors
16. Floppy Disk Drive [Track/Head/Sector]
17. Hard Disk Drive [Sector/Drive size/Manufacture code]
18. Optical Disk Drive [Maker/Drive type/Manufacture code/Product code]
19. T&D total version
20. Date/Time

### 3.25.2 Operations

Select **8** from the DIAGNOSTIC MENU and press **Enter**. Then, the following system configuration appears in the display.

```
System Configuration Display : Ver X.XX [Machine Name ???]

* - Processor Type      = XXXXXX-XXXXXXMHz      Code = XX      L2 Cache = XXXXXXKB
* - Chip set           = XXXXXX                      VRAM = XXXXXXMB
* - BIOS ROM Version   = VX.XX      1st ID = XXH, 2nd ID = XXH
* - BOOT ROM Version   = VX.XX
* - EC/KBC Version     = VX.XX
* - PS Micom Version   = VX.XX
* - SVP Par. Version   = VX.XX      (Panel=XXXXXXXXX, Manu=XXXX, Prod=XXXX)
* - Microcode Revision = VX.XX      (Processor=XXXh)
* - Total Memory Size  = XXXXXXMB (Conventional Memory = XXXKB)
* - Battery Code       = XXXXXXXXXXXX
* - HWSC               = XXXXXXXX
* - FSB                = XXXXXXMHz (Voltage = XEh)
* - X Printer Adapter  LPT1 = XXXX LPT2 = XXXX LPT3 = XXXX
* - X ASYNC Adapter    COM1 = XXXX COM2 = XXXX COM3 = XXXX
* - X Math CO-Processor
* - X Floppy Disk Drive(s) Track = XX Head = XX, Sector = XX
* - X Hard Disk Drive(s) #1 Sectors = XXXXXXXXXXXX (XXXGB) [XXXXXXXXXXXXXXXXXXXX]
                        #2 Sectors = XXXXXXXXXXXX (XXXGB) [XXXXXXXXXXXXXXXXXXXX]
* - ODD Drive          = XXXX XXXXXXXXXXXX XXXXXXXXXXXX [XXXXXXXXXXXXXXXX]

* - T&D Total Version  = VX.XX

Press [Enter] Key      [Date = XXXX-YY-ZZ, XX:YY:ZZ]
```

Press **Enter** to return to the DIAGNOSTIC MENU.

### 3.26 Wireless LAN Test Program (Intel-made b/g)

This section describes how to perform the wireless LAN transmitting-receiving test (Intel-made Calexico 802.11b/g). To execute the wireless LAN test, use the Diagnostics disk for wireless LAN test. Finish the tests of the Main test program by selecting 99 - EXIT TO DIAGNOSTICS MENU in the DIAGNOSTIC TEST MENU. Then in the DIAGNOSTICS MENU, select 9 - EXIT TO MS-DOS.

Insert the Diagnostics disk for wireless LAN test into the Floppy Disk Drive. Turn on the power while pressing **U**.

The following menu appears in the display.

```
*****Intel Calexico 11b/g Card Maintenance test Menu*****
*
*   1 : SKU check of Module
*
*   2 : MAC Address Check
*
*   3 : Antenna Check & communication test of 11b mode
*
*   4 : Communication test of 11g mode
*
*   5 : All the tests of Calexico 11g Card
*       (SKU & MAC Check, 11b/g communication test)
*
*****
SELECT TEST No, (1-5) :
```

To execute the subtest, input the subtest number and press **Enter**.

Subtest01      SKU check of module

This subtest displays SKU information on the wireless LAN card installed. Selecting this subtest, following message will appear in the display. Confirm if the right information on the wireless LAN card is described.

```
*****
*
*   Module   : Intel Calexico 802.11b/g (MoW)
*   G-code   : G36C0000X310
*   PBA No.  : C55369
*
*****
```

If a defective is found during the test, **NG** message will appear in the display.

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Connection of wireless LAN card
- ? Using a wrong wireless LAN card (Using unspecified card)
- ? Defective wireless LAN card

Checking the connection, execute the subtest again.

#### Subtest02 MAC Address Check

This subtest displays the MAC address. Selecting this subtest, following message will appear in the display.

```
*****
MAC = XXXXXXXXXXXXX
*****
*****
*
* MAC Address Check : OK !!
*
*****
```

Press any key and return to the test menu.

If a defective is found during the test, following message will appear in the display.

```
*****
ERROR: MAC all 0
MAC = XXXXXXXXXXXXX
*****
*****
*
* MAC Address Check : NG !!
*
*****
```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Connection of wireless LAN card
- ? Defective wireless LAN card
- ? Disappearance of MAC address data

Checking the connection, execute the subtest again.

Subtest03      Antenna check & communication test of 11b mode

**Caution:** *To execute subtest 03-05, use another computer (with Callexico wireless LAN card) that can communicate by the wireless LAN as a responder machine to perform those tests. Access points are also required. (Access point for 802.11b and 802.11g)*

*Be sure to turn the wireless communication switch ON before executing wireless LAN communication test. (The wireless communication LED lights orange.)*

*Release the write-protection of floppy disk for the test.*

### Setting the responder machine

Connect the responder machine to the access points (for 802.11b and 802.11g) with a cross cable and turn on the access points.

Insert the floppy disk containing the wireless LAN test program into the FDD of the responder machine and turn on the responder machine.

This subtest checks the connection and communication of wireless LAN antenna of Callexico 802.11b mode.

After finishing the test, **OK** message will appear in the display. Press any key and return to the test menu.

When a defective is found during the test, **NG** message will appear in the display. Press any key and following message will appear in the display. Check which antenna (Main/Aux) is defective.

```
*****
*
*           Main Antenna Test : NG !!
*
*****
```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Connection of wireless LAN card
- ? Connection of wireless LAN antenna cable (Main/Aux)
- ? Condition of wireless LAN communication (Interference/obstruction)
- ? Defective wireless LAN card

Checking the connection and condition, execute the subtest again.

#### Subtest04 Communication test of 11g mode

This subtest checks the communication of wireless LAN antenna of Calxico 802.11g mode.

After finishing the test, **OK** message will appear in the display. Press any key and return to the test menu.

When a defective is found during the test, **NG** message will appear in the display. Press any key and following message will appear in the display.

```
*****
*
*           11g Communication Test : NG !!           *
*
*****
```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Connection of wireless LAN card
- ? Connection of wireless LAN antenna cable (Main)
- ? Condition of wireless LAN communication (Interference/obstruction)
- ? Defective wireless LAN card

Checking the connection and condition, execute the subtest again.

#### Subtest05 All the tests of Calxico 11b/g Card

This subtest checks SKU information, MAC address, connection and communication of wireless LAN antenna of Calxico 802.11b/g card. The test stops at when a defective is found. For more details, refer to each subtest.

### 3.27 Wireless LAN Test Program (Intel-made a/b/g)

This section describes how to perform the wireless LAN transmitting-receiving test (Intel-made Calexico 802.11a/b/g). To execute the wireless LAN test, use the Diagnostics disk for wireless LAN test. Finish the tests of the Main test program by selecting 99 - EXIT TO DIAGNOSTICS MENU in the DIAGNOSTIC TEST MENU. Then in the DIAGNOSTICS MENU, select 9 - EXIT TO MS-DOS.

Insert the Diagnostics disk for wireless LAN test into the Floppy Disk Drive. Turn on the power while pressing **U**.

The following menu appears in the display.

```
*****
*      Intel Calexico2 11a/g Maintenance T&D Menu      *
*   *
*      1 : SKU check of Module                          *
*   *
*      2 : MAC Address Check                            *
*   *
*      3 : Antenna Check & communication test of 11b mode *
*   *
*      4 : Communication test of 11a mode                *
*   *
*      5 : Communication test of 11g mode                *
*   *
*      6 : All the tests of Calexico2 11a/g Card        *
*      (SKU & MAC Check, 11a/b/g communication test)   *
*   *
*****
```

SELECT TEST No, (1-6) :

To execute the subtest, input the subtest number and press **Enter**.

Subtest01      SKU check of module

This subtest displays SKU information on the wireless LAN card installed. Selecting this subtest, following message will appear in the display. Confirm if the right information on the wireless LAN card is described.

```
*****
*   *
*      Module   : Intel Calexico 802.11a/g (MoW)        *
*      G-code   : G36C00018510                          *
*      PBA No.  : C67287                                 *
*   *
*****
```

Press any key and return to the test menu.

If a defective is found during the test, NG message will appear in the display.

Press any key and following message will appear in the display.

```

*****
*
*           SKU NG !!
*
*   Other Card or Module not found
*
*****

```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Connection of wireless LAN card
- ? Using a wrong wireless LAN card (Using unspecified card)
- ? Defective wireless LAN card

Checking the connection, execute the subtest again.

Subtest02 MAC Address Check

This subtest displays the MAC address. Selecting this subtest, following message will appear in the display.

```

*****
MAC = XXXXXXXXXXXXX
*****
*
*   MAC Address Check : OK !!
*
*****

```

Press any key and return to the test menu.

If a defective is found during the test, following message will appear in the display.

```

*****
ERROR: MAC all F
MAC = XXXXXXXXXXXXX
*****
*
*   MAC Address Check : NG !!
*
*****

```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Connection of wireless LAN card
- ? Defective wireless LAN card
- ? Disappearance of MAC address data

Checking the connection, execute the subtest again.

Subtest03      Antenna check & communication test of 11b mode

**Caution:** *To execute subtest 03-06, use another computer (with Callexico wireless LAN card) that can communicate by the wireless LAN as a responder machine to perform those tests. Access points are also required. (Access point for 802.11a, 802.11b and 802.11g )*

*Be sure to turn the wireless communication switch ON before executing wireless LAN communication test. (The wireless communication LED lights orange.)*

*Release the write-protection of floppy disk for the test.*

### Setting the responder machine

Connect the responder machine to the access points (for 802.11a, 802.11b and 802.11g) with a cross cable and turn on the access points.

Insert the floppy disk containing the wireless LAN test program into the FDD of the responder machine and turn on the responder machine.

This subtest checks the connection and communication of wireless LAN antenna of Callexico 802.11b mode.

After finishing the test, **OK** message will appear in the display. Press any key and return to the test menu.

When a defective is found during the test, **NG** message will appear in the display. Press any key and following message will appear in the display. Check which antenna (Main/Aux) is defective.

```
*****
*
*           Aux Antenna Test : NG !!
*
*****
```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Connection of wireless LAN card
- ? Connection of wireless LAN antenna cable (Main/Aux)
- ? Condition of wireless LAN communication (Interference/obstruction)
- ? Defective wireless LAN card

Checking the connection and condition, execute the subtest again.

#### Subtest04 Communication test of 11a mode

This subtest checks the communication of wireless LAN antenna of Calexico 802.11a mode.

After finishing the test, **OK** message will appear in the display. Press any key and return to the test menu.

When a defective is found during the test, **NG** message will appear in the display. Press any key and following message will appear in the display.

```
*****
*
*           11a Communication Test : NG !!           *
*
*
*****
```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Connection of wireless LAN card
- ? Connection of wireless LAN antenna cable (Main)
- ? Condition of wireless LAN communication (Interference/obstruction)
- ? Defective wireless LAN card

Checking the connection and condition, execute the subtest again.

Subtest05      Communication test of 11g mode

This subtest checks the communication of wireless LAN antenna of Calexico 802.11g mode.

For more details on procedure and contents of this subtest, refer to Subtest04 Communication test of 11a mode.

Subtest06      All the tests of Calexico 11a/b/g Card

This subtest checks SKU information, MAC address of Calexico 802.11a/b/g card, antenna connection and communication test of Calexico 802.11b card and communication test of Calexico 802.11a and Calexico 802.11g. The test stops at when a defective is found. For more details, refer to each subtest.

### 3.28 Wireless LAN Test Program (Askey-made)

This section describes how to perform the wireless LAN transmitting-receiving test (Askey-made Atheros b/g, a/b/g).

**Caution:** To execute subtest 03-07, use another computer (with Atheros wireless LAN card) that can communicate by the wireless LAN as a responder machine to perform those tests.

Another wireless communication tool with 2.4GHz like Bluetooth is interfering with the test. Execute this test in the condition where no interference around the computer.

Be sure to turn the wireless communication switch ON before executing wireless LAN communication test. (The wireless communication LED lights orange.)

Release the write-protection of floppy disk for the test.

#### Setting the responder machine

To execute subtest 03-07, responder machine with wireless LAN communication function (Atheros-made) is required. To set the responder machine, follow the procedures below.

1. Insert the test program disk to the FDD of responder machine and turn on the power.
2. Start the program for responder machine automatically.
3. The program for responder machine is set.

#### Setting the tester (DUT) machine

1. Insert the test program disk 1 to the FDD of tester machine and turn on the power.
2. The program disk 1 is executed and following message will appear in the display.

```
*****
*
*           Atheros MB4x Maintenance T&D (DUT)           *
*
*           Please exchange for DUT media 2                *
*****
```

Please input the "S" key and push the "Enter" key :

3. Take out the program disk 1 and insert program disk 2. Then, press **S** and **Enter**.
4. Executing program disk 2, following menu will appear in the display. To execute the subtest, press test number and **Enter**.

```

*****
*   Atheros MB4x(MB44ag/43g) Maintenance T&D Menu   *
*   *   *
*   1 : SKU check of Module                         *
*   *   *
*   2 : MAC Address Check                           *
*   *   *
*   3 : Communication test of 11a mode(MB44ag)      *
*   *   *
*   4 : Communication test of 11b mode(MB44ag/MB43g) *
*   *   *
*   5 : Communication test of 11g mode(MB44ag/MB43g) *
*   *   *
*   6 : All the tests of MB43g Module                *
*   (SKU & MAC Check, 11b/g communication test)    *
*   *   *
*   7 : All the tests of MB44ag Module              *
*   (SKU & MAC Check, 11a/b/g communication test)  *
*   *   *
*****

```

SELECT TEST No, (1-7) :

#### Subtest01 SKU check of module

This subtest displays SKU information on the wireless LAN card installed. Selecting this subtest, following message will appear in the display. Confirm if the right information on the wireless LAN card is described.

```

*****
*
*   Module   : Atheros MB44ag (RoW)                 *
*   G code   : G36C00010310                         *
*
*****

```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Connection of wireless LAN card
- ? Using a wrong wireless LAN card (Using unspecified card)
- ? Defective wireless LAN card

Checking the connection, execute the subtest again.

Subtest02 MAC Address Check

This subtest displays the MAC address. Selecting this subtest, following message will appear in the display.

```

*****
*
*           MAC Address Check : OK !!
*
*****

```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- ? Connection of wireless LAN card
- ? Defective wireless LAN card
- ? Disappearance of MAC address data

Checking the connection, execute the subtest again.

Subtest03 Communication test of 11a mode (MB44ag)

This subtest checks the connection and communication of wireless LAN antenna of Atheros 802.11a mode. Check the packet, throughput and RSSI and compare them with the standard.

After finishing the test, **OK** message will appear in the display. Press any key and return to the test menu.

When a defective is found during the test, **NG** message will appear in the display. Press any key and following message will appear in the display.

```

*****
*
*           11a Communication Test : NG !!
*
*           Please refer to log. txt
*
*****

```

Press any key and return to the test menu.

Open the log file (log.txt) and check the result.

When a defective is detected in the test, following typical cause is considered.

- ? Connection of wireless LAN card
- ? Connection of wireless LAN antenna cable (Main/Aux)
- ? Condition of wireless LAN communication (Interference/obstruction)
- ? Defective wireless LAN card

Checking the connection and condition, execute the subtest again.

Subtest04      Communication test of 11b mode (MB44ag/MB43g)

This subtest checks the connection and communication of wireless LAN antenna of Atheros 802.11b mode.

For more details on the contents, refer to subtest 03.

Subtest05      Communication test of 11g mode (MB44ag/MB43g)

This subtest checks the connection and communication of wireless LAN antenna of Atheros 802.11g mode.

For more details on the contents, refer to subtest 03.

Subtest06      All the tests of MB43g Module

This subtest checks SKU information, MAC address, connection and communication of wireless LAN antenna of Atheros 802.11b mode and Atheros 802.11g mode. The test stops at when a defective is found. For more details, refer to each subtest.

Subtest07      All the tests of MB44ag Module

This subtest checks SKU information, MAC address, connection and communication of wireless LAN antenna of Atheros 802.11a mode, Atheros 802.11b mode and Atheros 802.11g mode. The test stops at when a defective is found. For more details, refer to each subtest.

## 3.29 LAN/Modem/Bluetooth/IEEE1394 Test Program

This section describes how to perform the LAN/Modem/Bluetooth/IEEE1394 test with the test program.

Insert the test program disk for LAN/Modem/Bluetooth/IEEE1394 test in FDD and turn on the power. The following message will appear:

```
Microsoft Windows XX Startup Menu
-----
```

1. LAN
2. Modem
3. Bluetooth
4. IEEE1394

Enter a choice:

Press the number you want to test and press **Enter**.

***NOTE:** It is impossible to go back to startup menu once you choose the test. Therefore, LAN/Modem/Bluetooth/IEEE1394 test can not be executed successively.*

### 3.29.1 LAN test

To execute LAN test, press **1** and **Enter**. The following message will appear:

```
#####
##### i82562 ICHx Gbe (i82540) Diagnostics program #####
#####
*
* 1 ..... (i82562 + ICHx) *
*
* 2 ..... (Gbe)
*
*****
.... Press test number[1-2] ?
```

Press the number you want to test and press **Enter**.

Subtest01 (i82562 + ICHx)

This subtest checks the operation of mini-PCI I/F by the loopback test in the chip.

The following message will appear:

```
[LAN transmit & receive test !]
                                COMPLETED Repeat count =    00000
                                Error count   =    00000

LOOPBACK TEST

100Mbps Auto-negotiation TxRx Test
Destination Address   = xxxxxxxxxxxxxxxx
Source Address        = xxxxxxxxxxxxxxxx

  ** 100Base-TX Full-Duplex **
< TRANSMIT >
< RECEIVE >
```



**NOTE:** *The menu displayed by your computer may be slightly different from the one shown above.*

If a defective is found, **NG** message will appear in the display.

Subtest02 (GbE)

**CAUTION:** Gigabit Ethernet test is not supported for this model.

This subtest checks the operation of mini-PCI I/F by the loopback test in the chip. Select **2** to execute and press **Enter**.

The following message will appear:

```
Testing adaptor...hit <ESC> to abort.  
*  
External Loopback Test...PASSED  
Testing completed.  
*  
*  
Loopback Test Complete  
*  
*  
* 1000Base Auto-negotiation TxRx Test  
*  
* CE Test Complete
```



**NOTE:** The menu displayed by your computer may be slightly different from the one shown above.

If a defective is found, **NG** message will appear in the display.

### 3.29.2 Modem test

For this subtest, connect the modem PCB and RJ11 connector with a harness. Use the dedicated ‘FAT-MODE inspection device (product code: QE2000P01 made by Nitto Denki Seisakusyo)’ for the tests.

To execute Modem test, press **2** and **Enter**. Following message will appear:

```
[Modem loopback test !]
ICHx MDC Test Program with Modem Sound (Line Test)
Version X.X
* Scorpio Modem Initialize           :OK
* Digital Loopback Test              :OK
* RJ11 Connector Check (LED)         :(Operator's Check!!)
```

**NOTE:** *The menu displayed by your computer may be slightly different from the one shown above.*

RJ11 Connection Check (LED) (Operator's Check LED) test will be executed, and the following message will appear:

```
...Press Key (Y = OK , N =NG)
```

If the color in the LED of the connection checker is orange, press **Y**, otherwise, press **N**.

### 3.29.3 Bluetooth test

**CAUTION:** Bluetooth test is not supported for this model.

To execute this test, input **3** and press **Enter**.

**Note:** Use another computer that can communicate by the Bluetooth as a reference machine to perform this test.

Insert a floppy disk containing the test program into the target machine and turn on the target machine. The following Bluetooth test menu will appear:

```
#####
#### Bluetooth sub system test program VX.XX ####
#####
*
*          1...BD_ADDR check
*
*          3... Communications test (DUT mode)
*
*          T...communications test (TEST mode)
*
*****
...Press test number [1, 3, T] ? _
```

Press **1** or **3** key to perform the corresponding subtest. To quit the Bluetooth test program, eject the floppy disk and turn the computer off while the menu above is displayed.

## Subtest01 BD\_ADDR check

This subtest checks the BD\_ADDR functions. When the Bluetooth test menu is displayed, press **1** to select the test and press **Enter**. The following message will appear:

```

-----
-
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA
Co.
-----
-

Initializing ...

```

When the machine has passed the test, it displays BD\_ADDR. If BD\_ADDR has no problem, the following message is displayed.

```

-----
-
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA
Co.
-----
-

My BD_ADDR = XXXXXXXXXXXX [h]

PPPPPP  A    SSSSS  SSSSS
P      P  A A  S    S  S    S
P      P  A  A  S      S
PPPPPP  A    A  SSSSS  SSSSS
P      AAAAAA  S      S
P      A    A  S    S  S    S
P      A    A  SSSSS  SSSSS

```

If the target machine has any problem, it displays Error CODE. The following message is displayed.

```

-----
-
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA
Co.
-----
-

My BD_ADDR = XXXXXXXXXXXX [h]

FFFFFF      A      III  L
F           A A      I  L
F           A  A      I  L
FFFFFF      A      A  I  L
F           AAAAAA  I  L
F           A  A      I  L
F           A  A      III LLLLLL

```

Table 3-5 Error message

| Message                              | Contents        |
|--------------------------------------|-----------------|
| Invalid BD_ADDR (all 00)             | 0x000000000000  |
| Invalid BD_ADDR (all FF)             | 0xFFFFFFFFFFFF  |
| Invalid BD_ADDR (bit0=1)             | bit40=1b        |
| Invalid BD_ADDR (bit1=1)             | bit41=1b        |
| Invalid BD_ADDR (define in the file) | Defined BD_ADDR |

If the machine detects a malfunction, it indicates the error code as shown below.

The error code begins with the least significant digit.

Error code

Table 3-6 Error code for Bluetooth test (BD\_ADDR) (1/2)

| Error code | Meaning                                                       |
|------------|---------------------------------------------------------------|
| 0x01       | Unknown HCI Command.                                          |
| 0x02       | No Connection.                                                |
| 0x03       | Hardware Failure.                                             |
| 0x04       | Page Timeout.                                                 |
| 0x05       | Authentication Failure.                                       |
| 0x06       | Key Missing.                                                  |
| 0x07       | Memory Full.                                                  |
| 0x08       | Connection Timeout.                                           |
| 0x09       | Max Number Of Connections.                                    |
| 0x0a       | Max Number Of SCO Connections To A Device.                    |
| 0x0b       | ACL Connection already exists.                                |
| 0x0c       | Command Disallowed.                                           |
| 0x0d       | Host Rejected due to limited resources.                       |
| 0x0e       | Host Rejected due to security reasons.                        |
| 0x0f       | Host Rejected due to remote device is only a personal device. |
| 0x10       | Host Timeout.                                                 |
| 0x11       | Unsupported Feature or Parameter Value.                       |
| 0x12       | Invalid HCI Command Parameters.                               |
| 0x13       | Other End Terminated Connection: Used Ended Connection.       |
| 0x14       | Other End Terminated Connection: Low Resources.               |
| 0x15       | Other End Terminated Connection: About to Power Off.          |
| 0x16       | Connection Terminated by Local Host.                          |
| 0x17       | Repeated Attempts.                                            |
| 0x18       | Paring Not Allowed.                                           |
| 0x19       | Unknown LMP PDU.                                              |
| 0x1a       | Unsupported Remote Feature.                                   |
| 0x1b       | SCO Offset Rejected.                                          |
| 0x1c       | SCO Interval Rejected.                                        |
| 0x1d       | SCO Air Mode Rejected.                                        |
| 0x1e       | Invalid LMP Parameters.                                       |
| 0x1f       | Unspecified Error.                                            |

\*\* See the Specification of the Bluetooth System for details.



[ESC] : Stop

When the Bluetooth test menu is displayed, press **T** to select the test and press **Enter** in the test machine. The following message will appear:

```

-----
-
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX Copyright (C) by TOSHIBA
Co.
-----
-
+-----+
|               |
|      Tester   |
|               |
+-----+

[ESC]:Finish Tester  [SPACE]:Start
Is DUT ready?
    
```

Then press **Space** to start the Bluetooth communication test.

When the machine has passed the test, it displays BD\_ADDR of the DUT. If the connection with the tester is completed, the progress bar stops. The following message is shown.

```

-----
-
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX Copyright (C) by TOSHIBA
Co.
-----
-
+-----+
|          DUT          |  BD_ADDR of the DUT = XXXXXXXXXXXXX [h]
+-----+

      CCCC      OOO      M      M PPPPPP  L      EEEEEEE TTTTTTT EEEEEEE DDDDD
      C   C  O   O  MM   MM P   P  L      E           T   E           D   D
      C           O   O  M  M  M  M  P   P  L      E           T   E           D   D
      C           O   O  M  M  M  PPPPPP  L      EEEEEEE  T   EEEEEEE  D   D
      C           O   O  M      M  P      L      E           T   E           D   D
      C   C  O   O  M      M  P      L      E           T   E           D   D
      CCCC      OOO      M      M  P      LLLLLLL EEEEEEE  T   EEEEEEE  DDDDD
    
```

```

Testing is finished

A>_
    
```

If the target machine has any problem, the following message “INCOMPLETE” is displayed with the Error Code.

```

-----
-
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX Copyright (C) by TOSHIBA
Co.
-----
-
+-----+
|          DUT          |  BD_ADDR of the DUT = XXXXXXXXXXXXX [h]
+-----+

III  N      N  CCCC   OOO  M      M  PPPPPP  L      EEEEEEE TTTTTTT EEEEEEE
I   NN    N  C   C  O   O  MM   MM  P    P  L      E          T    E
I   N N   N  C       O    O  M  M  M  M  P    P  L      E          T    E
I   N N   N  C       O    O  M  M  M  PPPPPP  L      EEEEEEE  T    EEEEEEE
I   N   NN  C   C  O   O  M      M  P      L      E          T    E
I   N      NN  C   C  O   O  M      M  P      L      E          T    E
III  N      N  CCCC   OOO  M      M  P      LLLLLLL EEEEEEE  T    EEEEEEE

Testing is finished

_Press any key to continue. . .
    
```

If the machine detects a malfunction, it indicates the error code as shown below.

The error code begins with the least significant digit.

Error code

Table 3-7 Error code for Bluetooth test (BD\_ADDR of the DUT) (1/2)

| Error code | Meaning                                                       |
|------------|---------------------------------------------------------------|
| 0x01       | Unknown HCI Command.                                          |
| 0x02       | No Connection.                                                |
| 0x03       | Hardware Failure.                                             |
| 0x04       | Page Timeout.                                                 |
| 0x05       | Authentication Failure.                                       |
| 0x06       | Key Missing.                                                  |
| 0x07       | Memory Full.                                                  |
| 0x08       | Connection Timeout.                                           |
| 0x09       | Max Number Of Connections.                                    |
| 0x0a       | Max Number Of SCO Connections To A Device.                    |
| 0x0b       | ACL Connection already exists.                                |
| 0x0c       | Command Disallowed.                                           |
| 0x0d       | Host Rejected due to limited resources.                       |
| 0x0e       | Host Rejected due to security reasons.                        |
| 0x0f       | Host Rejected due to remote device is only a personal device. |
| 0x10       | Host Timeout.                                                 |
| 0x11       | Unsupported Feature or Parameter Value.                       |
| 0x12       | Invalid HCI Command Parameters.                               |
| 0x13       | Other End Terminated Connection: Used Ended Connection.       |
| 0x14       | Other End Terminated Connection: Low Resources.               |
| 0x15       | Other End Terminated Connection: About to Power Off.          |
| 0x16       | Connection Terminated by Local Host.                          |
| 0x17       | Repeated Attempts.                                            |
| 0x18       | Paring Not Allowed.                                           |
| 0x19       | Unknown LMP PDU.                                              |
| 0x1a       | Unsupported Remote Feature.                                   |
| 0x1b       | SCO Offset Rejected.                                          |
| 0x1c       | SCO Interval Rejected.                                        |
| 0x1d       | SCO Air Mode Rejected.                                        |
| 0x1e       | Invalid LMP Parameters.                                       |
| 0x1f       | Unspecified Error.                                            |

\*\* See the Specification of the Bluetooth System in detail.

Table 3-7 Error code for Bluetooth test (BD\_ADDR of the DUT) (2/2)

| Error code | Meaning                          |
|------------|----------------------------------|
| 0x20       | Unsupported LMP Parameter Value. |
| 0x21       | Role Change Not Allowed.         |
| 0x22       | LMP Response Timeout.            |
| 0x23       | LMP Error Transaction Collision. |
| 0x24       | LMP PDU Not Allowed.             |
| 0x25       | Not Exist                        |
| 0x26       | Not Exist                        |
| 0x27       | Not Exist                        |
| 0x28       | Not Exist                        |
| 0x29       | Not Exist                        |
| 0x2a       | Not Exist                        |
| 0x2b       | Not Exist                        |
| 0x2c       | Not Exist                        |
| 0x2d       | Not Exist                        |
| 0x2e       | Not Exist                        |
| 0x2f       | Not Exist                        |

\*\* See the Specification of the Bluetooth System in detail.

**3.29.4 IEEE1394 test**

To execute this test, input **4** and press **Enter**.

**NOTE:** Use another computer that can communicate by IEEE1394 (i. Link) cable as a reference machine to perform this test.

The following menu will appear:

```

*****
*****      IEEE1394[XXXXX] Diagnostics program      *****
*****
*   *
*      1 ....(Transmit & Receive test)                *
*   *
*      2 ....(Responder set)                          *
*   *
*      3 ....(1394 GUID Display)                      *
*   *
*****
.... Press test number[1-3] ?

```

To execute the TEST, select the test number you want to execute and press **Enter**.

Subtest01      Transmit & Receive test

**NOTE:** Before executing subtest 01, be sure to execute subtest 02 in the responder machine.

This program checks the data transporting between responder machine and target machine and compare them with the original data through the IEEE1394 cable.

Subtest02      Responder set

This program is executed in the responder machine to initialize the responder machine with the IEEE1394 cable connected to the target machine before executing subtest 01.

Subtest03      IEEE1394 GUID Display

This program checks the GUID of IEEE1394.

### 3.31 Sound Test program

This section describes how to perform the Sound test. To execute the sound test, refer to the following description.

Insert the test program disk for Sound test in the floppy disk drive and turn on the power. The following message will appear:

```
#####
#####      WSS, Sound blaster pro Diagnostics program      #####
#####
*  *
*      1 .....      Sound (Standard)                    *
*  *
*      2 .....      Sound (Legacy)                       *
*  *
*      3 .....      CD Sound (Standard)                  *
*  *
*      4 .....      CD Sound (Legacy)                    *
*  *
*      ---It outputs at the speaker and lineout---      *
*  *
*****
.... Press test number[1-4] ?
```

Input the test number and press **Enter**.

#### 3.31.1 Sound (Standard) test

To execute the Sound (Standard) test, press **1** and **Enter**. The following menu will appear in the display.

```
#####
#####      ICH4-M + AD1981A Diagnostics program      #####
#####
*  *
*      1 .....      ( Microphone recording & play )      *
*      2 .....      ( Sine wave )                       *
*      3 .....      ( Line IN recording & play )          *
*  *
*      9 .....      Exit to Main                        *
*  *
*****
.... Press test number[1-3, 9] ?
```

To return to the Sound test menu, Press **9** and **Enter**. Then following message will appear in the display.

```
*****
*****  May I Restart ?  *****
*****
Press any key to continue...
```

After pressing any key, the machine starts rebooting and sound test menu will appear in the display.

#### Subtest01 Microphone recording & play

This subtest checks the function of the CODEC A/D, D/A converter.

When this subtest is selected, the following message will appear.

```
[Recording & play test !]
```

And the following message will appear.

```
DOS/4GW Protected Mode Run-time Version X.XX
Copyright (c) Tenberry Software, Inc. XXXX
```

After this message appears, display stops briefly. In this timing, sound is recorded from internal microphone.

After the recording is completed, the computer plays back the sound recorded after the following message.

```
STACWAVE Version X.XX
Build data: XXX XX XXXX at XX:XX:XX
Loading "mic.wav".
```

|                                                                                                      |
|------------------------------------------------------------------------------------------------------|
| <p><b>NOTE:</b> <i>The message in the display might have slight difference from those above.</i></p> |
|------------------------------------------------------------------------------------------------------|

The display returns to the Sound (Standard) test menu after the test ends.

**Subtest02 Sine Wave**

This subtest is executed by loading the COM file (ADSIN.COM). The program expands sine wave data table from 16KB to 64KB, and creates the play data. Then it transfers the data between the DMA and the CODEC to play the sine wave. (It sounds like a continuous beep). By using wave measurable devices such as an oscilloscope, the data can be measured as a sine wave.

When the subtest is executed, the sine wave is played while expanding sine wave from 16KB to 64KB.

The display returns to the Sound (Standard) test menu after the test ends.

**Subtest03 Line IN recording & play**

This subtest executes the same test as the subtest01 by recorded sound from the different port (Line-in port).

For more details on the subtest, refer to the subtest01 Microphone recording & play.

The display returns to the Sound (Standard) test menu after the test ends.

**3.31.2 Sound (Legacy) test**

To execute the Sound (Legacy) test, select **2** and press **Enter**.

**CAUTION:** *Sound (Legacy) test is not supported in this model.*

### 3.31.3 CD Sound (Standard) test

To execute the CD Sound (Standard) test, press **3** and **Enter**. Insert the test media (TOSHIBA TEST CD-ROM or ABEX TEST CD-ROM) or music CD on the market (if the test media can not be prepared). Following menu appears in the display.

For details on use of test media, refer to (1) Test media (Toshiba-made test media).

For details on use of audio CD on the market, refer to (2) Audio CD.

#### (1) Test media (Toshiba-made test media)

```

CD/DVD TEST  IN PROGRESS XXXXXXXX

```

```

xxxxxxx DIAGNOSTIC TEST VX.XX
[Ctrl]+[Break] ; test end
[Ctrl]+[C]      ; key stop

```

```

SUB-TEST      : XX
PASS COUNT   : XXXXX      ERROR COUNT: XXXXX
WRITE DATA  : XX         READ DATA  : XX
ADDRESS      : XXXXXX     STATUS      : XXX

```

- 01 - Japanese Narration
- 02 - English Narration
- 03 - Test Tone A (100Hz - 20Hz)
- 04 - Test Tone B (400Hz - 3KHz L-R)

```

Drive # = 0, ATAPI status =00
Command = XX
[[Block address = XXXXXXXXX]]
[[Block length  = XXXXXXXXX]]
Final : Block address = XXXXXXXXX

```

#### Subtest01 Japanese Narration

Selected this subtest, narration in Japanese starts and following message appears in the display.

```

Play start CD sound !
Press any key <Play stop>.

```

Press any key and stop the narration. Then return to the CD Sound (Standard) test menu.

Subtest02 English Narration

Selected this subtest, narration in English starts.

For more details on the procedure, refer to the subtest01.

Subtest03 Test Tone A

**Caution:** Before starting subtest03, be sure to set the sound at proper volume.

This subtest plays sine wave while changing its table from 100Hz to 20Hz.

Return to the CD Sound (Standard) menu after the test ends.

Subtest 04 Test Tone B

This subtest plays sine wave while changing its table from 400Hz to 3KHz and also changing the channel from left speaker to right speaker.

Return to the CD Sound (Standard) menu after the test ends.

## (2) Audio CD

Insert an audio CD and the following menu appears in the display.

```

CD/DVD TEST   IN PROGRESS  XXXXXXXX
XXXXXXXXX DIAGNOSTIC TEST VX.XX
[Ctrl]+[Break] ; test end
[Ctrl]+[C]      ; key stop

SUB-TEST      : XX
PASS COUNT    : XXXXX      ERROR COUNT: XXXXX
WRITE DATA   : XX         READ DATA  : XX
ADDRESS       : XXXXXX     STATUS      : XXX

```

CD Sound track number (01-98 : Track) ?

```

Drive # = 0, ATAPI status =00
Command = XX
[[Block address = XXXXXXXXX]]
[[Block length  = XXXXXXXXX]]
Final : Block address =

```

XXXXXXXXXX

Select the track number you want to test and press **Enter** twice.

The following message appears in the display and selected track is played.

```

Play start CD sound !
Press any key <play stop>

```

After pressing any key, the music stops and the display returns to the selection menu of the track number.

**NOTE:** When the CD-ROM test is executed, "ALL DEVICE" must be selected in the [Device Config.] of the BIOS SETUP. If the "ALL DEVICE" is not selected, music can not be played.

### 3.31.4 CD Sound (Legacy) test

To execute the CD Sound (Legacy) test, select **4** and press **Enter**.

**CAUTION:** *Sound (Legacy) test is not supported in this model.*

## 3.32 **SETUP**

### 3.32.1 **Function Description**

This program displays the current system setup information as listed below:

1. Memory
2. System Date/Time
3. Battery
4. Password
6. Boot Priority
  - (a) Boot Priority
  - (b) HDD Priority
  - (c) Network Boot Protocol
7. Others
  - (a) Power-up Mode
  - (b) CPU Cache
  - (c) Level 2 Cache
  - (d) Dynamic CPU Frequency Mode
  - (e) Auto Power On
  - (f) Panel power On/Off
  - (g) Performance/Battery Life Setting
8. Configuration
9. I/O Ports
  - (a) Serial
  - (b) Parallel
10. Drives I/O
  - (a) Built-in HDD
  - (b) CD-ROM
11. PCI Bus
12. Display
  - (a) Power On Display
  - (b) LCD Display Stretch
13. Peripheral

- (a) Internal Pointing Device
- (b) External keyboard "Fn"
- (c) Parallel Port Mode

14. LEGACY EMULATION

- (a) USB KB/Mouse Legacy Emulation
- (b) USB-FDD Legacy Emulation

15. PCI LAN

### 3.32.2 Accessing the SETUP Program

Selecting **0** from the DIAGNOSTICS MENU and pressing **Enter** displays the followings:

SYSTEM SETUP (1/2) ACPI BIOS version = X.XX

|                                                                                                                      |                                                                                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p style="text-align: center;">MEMORY</p> <p>Total = XXXXX KB</p>                                                    | <p style="text-align: center;">BOOT PRIORITY</p> <p>Boot Priority = HDD→FDD→CD-ROM→LAN<br/>HDD Priority = Built-in HDD→Second HDD<br/>Network Boot Protocol = PXE</p>                       |
| <p style="text-align: center;">SYSTEM DATE/TIME</p> <p>Date(MM-DD-YY) = XX-XX-XXXX<br/>Time(HH:MM:SS) = XX:XX:XX</p> | <p style="text-align: center;">OTHERS</p> <p>Power-up mode = Boot<br/>CPU Cache = Enabled<br/>Level 2 Cache = Enabled *1<br/>Dynamic CPU Frequency Mode *2<br/>= Dynamically Switchable</p> |
| <p style="text-align: center;">BATTERY</p> <p>Battery Save Mode = Full Power</p>                                     | <p>Auto Power On = Disabled<br/>Panel Power On/Off = Disabled *3<br/>Standby = Fast<br/>Language During Bootup = English *4</p>                                                             |
| <p style="text-align: center;">PASSWORD</p> <p>Not Registered</p>                                                    |                                                                                                                                                                                             |

↓↑←→: Select items    Space, BkSp: Change values    PgDn, PgUp: Change pages  
Esc: Exit without saving    Home: Set default values    End: Save changes and Exit

SYSTEM SETUP (2/2) ACPI BIOS version = X.XX

|                                                                                                                                           |                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p style="text-align: center;">CONFIGURATION</p> <p>Device Config. = Setup by OS</p>                                                      | <p style="text-align: center;">DISPLAY</p> <p>Power On Display = Auto-Selected<br/>LCD Display Stretch = Enabled<br/>TV Type = NTSC (JAPAN)</p>                   |
| <p style="text-align: center;">I/O PORTS</p> <p>Parallel = LPT1 (378H/IRQ7/CH3) *5</p>                                                    | <p style="text-align: center;">PERIPHERAL</p> <p>Internal Pointing Device = Enabled<br/>Parallel Port Mode = ECP *6<br/>Hard Disk Mode = Enabled IDE (Normal)</p> |
| <p style="text-align: center;">DRIVERS I/O</p> <p>Built-in HDD = Primary IDE (1F0H/IRQ14)<br/>Select Bay = Secondary IDE (170H/IRQ15)</p> | <p style="text-align: center;">LEGACY EMULATION</p> <p>USB KB/Mouse Legacy Emulation = Enabled<br/>USB-FDD Legacy Emulation = Enabled</p>                         |
| <p style="text-align: center;">PCI BUS</p> <p>PCI BUS = IRQ10, IRQ11</p>                                                                  | <p style="text-align: center;">PCI LAN</p> <p>Built-in LAN = Enabled</p>                                                                                          |

↓↑←→: Select items    Space, BkSp: Change values    PgDn, PgUp: Change pages  
Esc: Exit without saving    Home : Set default values    End: Save changes and Exit

**NOTE:**

- \*1. This item is displayed only when "Enabled" is set as [CPU Cache].
- \*2. This item is displayed only when Pentium model is used for CPU.
- \*3. This item is displayed only when "Resume" is set as [Power-up mode] in [OTHERS] menu box.
- \*4. This item is displayed only for the computer for TCL (Canada).
- \*5. \*6. These items are displayed only when Advanced Port Replicator III is

*connected to the computer.*

### Moving Within the SETUP Menu and Changing Values

1. Press **←** and **→** to move between the two columns. Press **↑** and **↓** to move between items in a column. Press **Fn+? ??PgUp)** and **Fn + ? ??PgDn)** to move between the two pages.
2. Press either the **Space bar** or **Back Space** to change the value.

### Accepting Changes and Exiting the SETUP Window

1. Press **End** to accept the changes you made.

If the changed item does not require the system to reboot, the following message is displayed:

Are you sure? (Y/N)

If the changed item requires the system to reboot, the following message is displayed:

Are you sure? (Y/N)  
The changes you made will cause the system to reboot.

2. To make other changes, press **N**. Repeat the steps above.
3. To accept the changes, press **Y**.

**NOTE:** You can press **Esc** to quit at any time without saving changes. SETUP asks you to confirm that you do not want to save your changes. When SETUP is displayed at the next time, the current configuration appears.

### The Factory Preset Configuration

When you access SETUP, the current configuration is displayed.

1. To show the factory preset configuration, press **Home**.
2. To accept the default settings, press **End** and then press **Y**.

**NOTE:** When you execute the default setting, the following settings are not changed:

- (1) HDD Mode
- (2) Password
- (3) Write Policy

## SETUP Options

The SETUP screen is divided into 15 functionally related groups. This section describes each group and its options.

### 1. Memory

This group of options displays the computer's memory.

This field displays the total amount of memory installed and is automatically calculated by the computer. You cannot change this value.

### 2. System Date/Time

Sets the date and time.

**System Date**            Sets date.

**System Time**           Sets time.

### 3. Battery

This option is used to select **Full Power**, **Low Power** or **User Setting** of the battery save mode. When you select the battery save mode, the followings will appear.

**Full Power**    The following shows full power settings.

| BATTERY SAVE OPTIONS |                       |
|----------------------|-----------------------|
| Processing Speed     | = High                |
| CPU Sleep Mode       | = Enabled             |
| Display Auto off     | = 30Min.              |
| HDD Auto off         | = 30Min.              |
| System Auto off      | = Disabled            |
| LCD Brightness       | = Bright (*1)         |
|                      | = Super-Bright (*2)   |
| Cooling Method       | = Maximum Performance |

**Low Power**    The following shows low power settings.

| BATTERY SAVE OPTIONS |                     |
|----------------------|---------------------|
| Processing Speed     | = Low               |
| CPU Sleep Mode       | = Enabled           |
| Display Auto off     | = 03Min.            |
| HDD Auto off         | = 03Min.            |
| System Auto off      | = 30Min.            |
| LCD Brightness       | = Semi-Bright (*1)  |
|                      | = Bright (*2)       |
| Cooling Method       | = Battery Optimized |

**NOTE:** Display of the LCD Brightness will be changed in the condition below:  
(\*1) Operating the battery

*(\*2) Using the AC adapter*

**User Setting** Use this option to set the battery save parameters on the sub-window, **BATTERY SAVE OPTIONS**.

#### Battery Save Options

##### Processing Speed

This feature changes the CPU processing speed.

**High** CPU operates at 1.6/1.7/1.8/2.0GHz (Pentium-M),  
at 1.3/1.4GHz (Celeron-M)  
(Default in Full Power Mode)

**Low** CPU operates at half processing speed.  
(Default in Low Power Mode)

##### CPU Sleep Mode

Use this option to enable or disable the CPU sleep function.

**Enabled** Enables sleep mode. (Default)

**Disabled** Disables sleep mode.

##### Display Auto Off

Use this option to disable or set the duration of the display automatic power off function. This function causes the computer to turn the LCD panel's illumination off if you make no entry (including no operation of a mouse or touch pad) for the set period of time.

**Disabled** Disables display automatic power off function.

**xx Min.** Automatically turns off the power to the LCD panel's illumination if the panel is not used for the duration set. The duration **xx** can be set to **1, 3, 5, 10, 15, 20** or **30** minutes.

##### HDD Auto Off

Use this option to set the duration of the HDD automatic power off function.

**xx Min.** Automatically turns off the power to the hard disk drive if it is not used for the duration set. The duration **xx** can be set to **1, 3, 5, 10, 15, 20** or **30** minutes.

System Auto Off

Use this option to set the duration of the HDD automatic power off function.

It can be set only when the “Resume” id selected in [Power-up mode].

|                 |                                                                                                                                                   |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Disabled</b> | Disables system automatic off function.                                                                                                           |
| <b>xx Min.</b>  | Automatically turns off the system if it is not used for the duration set. The duration <b>xx</b> can be set from <b>10</b> to <b>60</b> minutes. |

LCD Brightness

Use this option to set the level of LCD brightness.

|                     |                                             |
|---------------------|---------------------------------------------|
| <b>Super-Bright</b> | Full brightness for maximum visibility.     |
| <b>Bright</b>       | Full brightness for high visibility.        |
| <b>Semi-Bright</b>  | Less than full brightness for saving power. |

Cooling Method

|                            |                                                                                                                                                                                                                                     |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Maximum Performance</b> | If the CPU becomes too hot, the fan turns on automatically in a high speed to cool down the CPU.                                                                                                                                    |
| <b>Performance</b>         | If the CPU becomes too hot, the fan turns on automatically. When the CPU temperature falls to a normal range, the fan turns off.                                                                                                    |
| <b>Battery optimized</b>   | If the CPU becomes too hot, the processing speed is lowered. If the temperature is still too high, the fan turns on. When the CPU temperature falls to a normal range, the fan is turned off and the processing speed is increased. |

**NOTE:** Too hot condition may cause defect on the CPU. When the hot condition continues, the power is automatically turned off in resume mode.

## 4. Password

This option sets or resets the user password for power on and instant security (**Fn+F1**).

|                       |                                            |
|-----------------------|--------------------------------------------|
| <b>Registered</b>     | The user password has been registered.     |
| <b>Not registered</b> | The user password has not been registered. |

For details on setting the user password, refer to the User’s Manual.

## 5. Boot Priority

## (a) Boot Priority

Use this option to set the priority for booting of the computer and the priority for the HDD for booting.

**FDD? HDD? CD-ROM? LAN:** The computer looks for bootable files in the following order: FDD, HDD, CD-ROM (\*1) and LAN

**HDD? CD-ROM? LAN? FDD:** The computer looks for bootable files in the following order: HDD, CD-ROM, LAN and FDD.

**FDD? CD-ROM? LAN? HDD:** The computer looks for bootable files in the following order: FDD, CD-ROM, LAN and HDD.

**CD-ROM? LAN? HDD? FDD:** The computer looks for bootable files in the following order: CD-ROM, LAN, HDD and FDD.

**CD-ROM? LAN? FDD? HDD:** The computer looks for bootable files in the following order: CD-ROM, LAN, FDD and HDD.

**HDD? FDD? CD-ROM? LAN:** The computer looks for bootable files in the following order: HDD, FDD, CD-ROM and LAN. (Default)

(\*1) CD-ROM refers to a Optical Disk Drive.

***NOTE:** When a floppy disc drive is not connected, it boots up from SD memory card in spite of selecting FDD.*

## (b) HDD Priority

Use this option to set the starting method from hard disk drive.

**Built-in HDD ? Second HDD**

: Detecting boot command from Built-in HDD (Default)

**Second HDD ? Built-in HDD**

: Detecting boot command from Second HDD

***NOTE:** If the boot command can not be detected from the prior HDD, booting target changes to other devices.*

## (c) Network Boot Protocol

Use this option to set the starting method via a network.

**PXE** Sets to PXE protocol. (Default)

**RPL** Sets to RPL protocol.

## 6. Others

Whether or not you need to configure the computer with these options depends primarily on the kind of software or peripherals you use.

## (a) Power-up Mode

Use this option to choose between resume and boot mode.

**Boot** Turns on boot mode. (Default)

**Resume** Turns on resume mode.

## (b) CPU Cache

Use this option to enable or disable the CPU cache.

**Enabled** Enables the CPU cache. (Default)

**Disabled** Disables the CPU cache.

## (c) Level 2 Cache

Use this option to enable or disable the level 2 cache. When "CPU Cache" is set to "Disabled", this option cannot be changed.

**Enabled** Enables the level 2 cache. (Default)

**Disabled** Disables the level 2 cache.

## (d) Dynamic CPU Frequency mode

Use this option to choose a setting from the followings. When the CPU of the computer is Celeron-M, this option is not displayed.

**Dynamically Switchable**

Enables Pentium-M processor featuring Intel SpeedStep technology. (Default)

|                    |                                                                                                                       |
|--------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Always High</b> | Disables Pentium-M processor featuring Intel SpeedStep technology and always runs the processor at its maximum speed. |
| <b>Always Low</b>  | Disables Pentium-M processor featuring Intel SpeedStep technology and always runs the processor at its default speed. |

## (e) Auto Power On

This option displays setting for Auto Power On.

**Disabled** Indicates auto power on is not set.

**Enabled** Indicates auto power on is set.

When “Enabled” is selected, the following sub-window appears.

| OPTIONS           |            |
|-------------------|------------|
| Alarm Time        | = 00:00:00 |
| Alarm Date Option | = Disabled |
| Ring Indicator    | = Disabled |

Set the parameters for the Auto Power On (automatic power on) function in the “OPTIONS” window. To set the time, use **Space** or **BackSpace**. Press ? to move the cursor to the right and ? to move the cursor to the left when you set the date and time.

For the **Alarm Time**, set the time to turn on the power automatically. The “second” cannot be set. When it is set to “Disabled”, the time to turn on automatically is not set.

For the **Alarm Date Option**, set the date to turn on the power automatically. When it is set to “Disabled”, the time to turn on automatically is not set.

The **Ring Indicator** is displayed only when the computer is in Resume mode and this function cannot be used for a PC card-type modem. When any modem is not installed, it is not displayed.

- NOTE:**
1. Do not remove the AC adaptor and battery pack at the same time when you use this feature. If you do so, data saved by the resume function will be lost. You must also reset this option.
  2. If you have set a password and the computer boots by the Auto Power On function and Standby is on, the computer will start with the instant security function enabled. The **password =** message is not displayed; however, you must enter the password to use the computer.
  3. This option is enabled only once, the setting is reset, after booting up.

## (f) Panel Power On/Off

This option is displayed only in the resume mode.

**Enabled** Enables the Panel Power On/Off.

**Disabled** Disables the Panel Power On/Off. (Default)

## (g) Standby mode

Use this option to set the start speed of operation from standby mode.

**Normal** Normal speed of start to Windows operation. (Default)

**Fast** Quick start to Windows operation. It consumption more electricity than normal mode. It lights orange during standby mode.

**NOTE:** You can not choose standby mode with the setting [Fast] when the PC is running with battery.

## 7. Configuration

This option lets you set the device configuration.

**All Devices** BIOS sets all devices.

**Setup by OS** Initializes devices, which is needed to load an operating system. Operating system initializes other devices.

**NOTE:** (1) When using installed OS, selecting "Setup by OS" is recommended.  
(2) When executing test programs, be sure to select "ALL Device.

## 8. I/O ports

## (b) Parallel

This option sets the interrupt request level and I/O port base address for the parallel port. When the parallel port mode is set to **Std. Bi-direct**, the options are as follows:

| LPT setting | Interrupt level | I/O address   |
|-------------|-----------------|---------------|
| LPT 1       | 7               | 378H          |
| LPT 2       | 5               | 278H          |
| LPT 3       | 7               | 3BCH          |
| Not Used    |                 | Disables port |

When the parallel port mode (see settings below) is set to **ECP**, the DMA channel can also be set to **1** or **3**. The default is **3**.

| LPT setting | Interrupt level | I/O address   | DMA channel |
|-------------|-----------------|---------------|-------------|
| LPT 1       | 7               | 378H          | 3 (Default) |
| LPT 2       | 5               | 278H          | 3           |
| LPT 3       | 7               | 3BCH          | 3           |
| Not Used    |                 | Disables port |             |

When you select one of the above options, except for **Not Used**, a subwindow similar to the one below appears to let you set the DMA. The options for this setting are Channel 1 and Channel 3 (Default).

| OPTIONS |                       |
|---------|-----------------------|
| DMA     | = Channel 3 (Default) |

For most printers, the port should be set to **ECP**. With some other parallel devices, the setting should be **Std. Bi-Direct**.

## 9. Drives I/O

This option displays the address and interrupt level for hard disk drive and optical disk drive. It is for information only and cannot be changed.

|                     |                              |
|---------------------|------------------------------|
| <b>Built-in HDD</b> | This item cannot be changed. |
| <b>Select Bay</b>   | This item cannot be changed. |

## 10. PCI Bus

This option displays the interrupt level for the Card Bus in the computer. It is for information only and cannot be changed.

PCI BUS = IRQ10, IRQ11

## 11. Display

This group of options configures the computer's display.

## (a) Power On Display

This option is used to select the display when booting up.

**Auto-Selected** Selects an external monitor if one is connected. Otherwise it selects the internal LCD. (Default)

**LCD+AnalogRGB** Selects both the internal LCD and the external CRT for simultaneous display.

**System LCD only** Selects only internal LCD display.

**NOTE:** When starting the computer in Standby or Hibernation, the last configuration is saved. If data does not appear on the display you are using after starting in Standby or Hibernation, pressing **Fn+F5**.

Pressing **Fn+F5** changes the display setting as follows in order: the internal LCD, the external CRT, both the internal LCD and the external CRT.

When an external CRT display, which does not support SVGA mode is connected and "LCD+AnalogRGB" is selected, the external display is not displayed.

## (b) LCD Display Stretch

LCD Display Stretch enables or disables a larger display area of the screen.

**Enabled** Enables the LCD display stretch feature. (Default)

**Disabled** Disables the LCD display stretch feature.

## (c) TV type

This option allows you to select the type of TV.

**NTSC (Japan)** ; TV in Japanese system

**NTSC (US)** ; TV in the U.S. system

**PAL** ; TV in Europe etc. system



## 12. Peripheral

Use this option to select the peripheral's mode.

## (a) Internal Pointing Device

This option enables or disables the touch pad

**Enabled** Enables the touch pad. (Default)

**Disabled** Disables the touch pad.

## (b) Parallel Port Mode

Use this option to set information of Parallel Port Mode.

**ECP** Sets the port mode to Extended Capabilities Port (ECP). For most printers, the port should be set to ECP. (Default)

**Std. Bi-Direct.** Sets the bi-directional setting. This setting should be used with some other parallel devices.

**NOTE:** When using Windows, the setting of "Toshiba HW setup" is enabled and the setting of "Parallel Port Mode" is disabled.

## (c) Hard Disk Mode

Use this option to select the hard disk mode.

**Enhanced IDE (normal)**

Select this mode when the HDD is used for MS-DOS? , Windows 95/98/2000/XP, or OS/2? . (Default)

**Standard IDE** Select this mode when using an OS which does not support the Enhanced IDE. When this mode is selected, up to 528MB is logically available and the rest of the capacity is not usable.

**NOTE:** Formats for Enhanced IDE and Standard IDE are different, so if you change the setting, you will have to reformat the hard disk for the appropriate setting.

## 13. LEGACY EMULATION

## (a) USB KB/Mouse Legacy Emulation

This option sets the Legacy support condition of the USB keyboard and the USB mouse.

**Enabled** Enables LEGACY support. (Default)  
USB keyboard/USB mouse are available without the driver.

**Disabled** Disables LEGACY support

## (b) USB-FDD Legacy Emulation

This option sets the Legacy support condition of the USB floppy disk drive. When a computer is FDD built-in model, this option is not displayed.

**Enabled** Enables LEGACY support. (Default)  
USB floppy disk is available without the driver.

**Disabled** Disables LEGACY support

## 14. PCI LAN

This option sets the Enable / Disable of the built-in LAN functions.

**Enabled** Enables built-in LAN functions. (Default)

**Disabled** Disables built-in LAN functions.

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## **Chapter 4**

# **Replacement Procedures**

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**Chapter 4 Contents**


---

|      |                                                 |      |
|------|-------------------------------------------------|------|
| 4.1  | Overview .....                                  | 4-1  |
|      | Safety Precautions .....                        | 4-2  |
|      | Before you Begin .....                          | 4-3  |
|      | Disassembly Procedures .....                    | 4-4  |
|      | Assembly Procedures .....                       | 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/SD card.....                            | 4-10 |
|      | 4.3.1 PC card.....                              | 4-10 |
|      | 4.3.2 SD card.....                              | 4-11 |
| 4.4  | Memory module .....                             | 4-12 |
| 4.5  | HDD.....                                        | 4-14 |
| 4.6  | Selectable baymodule .....                      | 4-16 |
| 4.7  | Keyboard.....                                   | 4-19 |
| 4.8  | Bottom cover assembly .....                     | 4-21 |
| 4.9  | Battery latch assembly/Selectable bay lock..... | 4-23 |
|      | 4.9.1 Battery latch assembly .....              | 4-23 |
|      | 4.9.2 Selectable bay lock.....                  | 4-24 |
| 4.10 | QI button assembly/PC card slot brace .....     | 4-25 |
|      | 4.10.1 QI button assembly .....                 | 4-25 |
|      | 4.10.2 PC card slot brace .....                 | 4-26 |
| 4.11 | MDC/Modem cable .....                           | 4-27 |
| 4.12 | Mini PCI module .....                           | 4-30 |
| 4.13 | Fan/CPU.....                                    | 4-32 |
|      | 4.13.1 Fan.....                                 | 4-32 |
|      | 4.13.2 CPU.....                                 | 4-33 |
| 4.14 | DC-IN jack.....                                 | 4-35 |
| 4.15 | Pen holder/RTC battery .....                    | 4-36 |
|      | 4.15.1 Pen holder .....                         | 4-36 |

## 4 Replacement Procedures

---

|                                                                     |      |
|---------------------------------------------------------------------|------|
| 4.15.2 RTC battery.....                                             | 4-37 |
| 4.16 LCD harness holder .....                                       | 4-38 |
| 4.17 Mic (L) cable guide.....                                       | 4-41 |
| 4.18 QI board/CN board.....                                         | 4-42 |
| 4.18.1 QI board.....                                                | 4-42 |
| 4.18.2 CN board.....                                                | 4-43 |
| 4.19 System board.....                                              | 4-44 |
| 4.20 PC card slot cover .....                                       | 4-46 |
| 4.21 Speaker.....                                                   | 4-47 |
| 4.22 Microphone/Front panel.....                                    | 4-48 |
| 4.22.1 Microphone .....                                             | 4-48 |
| 4.22.2 Front panel .....                                            | 4-49 |
| 4.23 Lens holder.....                                               | 4-50 |
| 4.24 Touch pad.....                                                 | 4-51 |
| 4.25 LCD unit & FL inverter .....                                   | 4-52 |
| 4.26 Application switch board .....                                 | 4-56 |
| 4.27 LCD latch assembly .....                                       | 4-57 |
| 4.28 Digitizer .....                                                | 4-58 |
| 4.29 LCD harness/Digitizer harness/Wireless LAN antenna cable ..... | 4-64 |
| 4.30 Hinge switch Board.....                                        | 4-68 |
| 4.31 Fluorescent Lamp.....                                          | 4-69 |
| 4.31.1 Replacing the 14.1 inch CMO-made fluorescent Lamp .....      | 4-70 |

## Figures

|                                                   |      |
|---------------------------------------------------|------|
| Figure 4-1 Removing the battery pack.....         | 4-8  |
| Figure 4-2 Removing a PC card.....                | 4-10 |
| Figure 4-3 Removing a SD card .....               | 4-11 |
| Figure 4-4 Removing the memory module .....       | 4-12 |
| Figure 4-5 Removing the HDD FPC.....              | 4-14 |
| Figure 4-6 Removing the HDD holder .....          | 4-15 |
| Figure 4-7 Removing a selectable bay module ..... | 4-16 |
| Figure 4-8 Removing the plastic frame .....       | 4-17 |

|                                                        |      |
|--------------------------------------------------------|------|
| Figure 4-9 Removing the keyboard .....                 | 4-19 |
| Figure 4-10 Removing the touch pad cable .....         | 4-21 |
| Figure 4-11 Removing the bottom cover assembly .....   | 4-22 |
| Figure 4-12 Removing the battery latch assembly .....  | 4-23 |
| Figure 4-13 Removing the selectable bay lock.....      | 4-24 |
| Figure 4-14 Removing the QI button assembly .....      | 4-25 |
| Figure 4-15 Removing the PC card slot brace .....      | 4-26 |
| Figure 4-16 Removing the MDC .....                     | 4-27 |
| Figure 4-17 Removing the modem cable .....             | 4-28 |
| Figure 4-18 Removing the Mini PCI module .....         | 4-30 |
| Figure 4-19 Removing the fan .....                     | 4-32 |
| Figure 4-20 Removing the heat sink.....                | 4-33 |
| Figure 4-21 Removing the CPU .....                     | 4-33 |
| Figure 4-22 Applying silicon grease.....               | 4-34 |
| Figure 4-23 Removing the DC-IN jack.....               | 4-35 |
| Figure 4-24 Removing the penholder .....               | 4-36 |
| Figure 4-25 Removing the RTC battery .....             | 4-37 |
| Figure 4-26 Removing the LCD harness holder .....      | 4-39 |
| Figure 4-27 Removing the mic (L) cable guide.....      | 4-41 |
| Figure 4-28 Removing the QI board.....                 | 4-42 |
| Figure 4-29 Removing the CN board.....                 | 4-43 |
| Figure 4-30 Removing the system board .....            | 4-44 |
| Figure 4-31 Removing the PC card slot cover .....      | 4-46 |
| Figure 4-32 Removing the speaker .....                 | 4-47 |
| Figure 4-33 Removing the microphone .....              | 4-48 |
| Figure 4-34 Removing the front panel.....              | 4-49 |
| Figure 4-35 Removing the lens holder.....              | 4-50 |
| Figure 4-36 Removing the touch pad.....                | 4-51 |
| Figure 4-37 Removing the LCD mask.....                 | 4-52 |
| Figure 4-38 Removing the LCD unit .....                | 4-53 |
| Figure 4-39 Removing the FL inverter .....             | 4-54 |
| Figure 4-40 Removing the application switch board..... | 4-56 |
| Figure 4-41 Removing the LCD latch assembly .....      | 4-57 |
| Figure 4-42 Removing the digitizer.....                | 4-63 |
| Figure 4-43 Removing the cover assembly .....          | 4-64 |

#### ***4 Replacement Procedures***

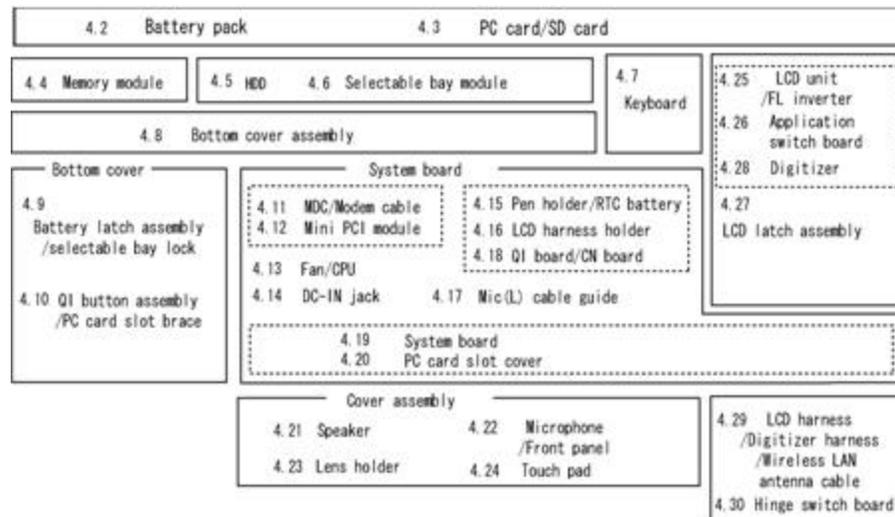
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|                                                                     |              |
|---------------------------------------------------------------------|--------------|
| Figure 4-44 Removing the hinge assembly .....                       | 4-65         |
| Figure 4-45 Arranging the wireless LAN antenna cables.....          | 4-66         |
| Figure 4-46 Removing the hinge switch board.....                    | 4-68         |
| Figure 4-47 to 4-53 Replacing CMO fluorescent lamp (1) to (7) ..... | 4-70 to 4-73 |

### 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.



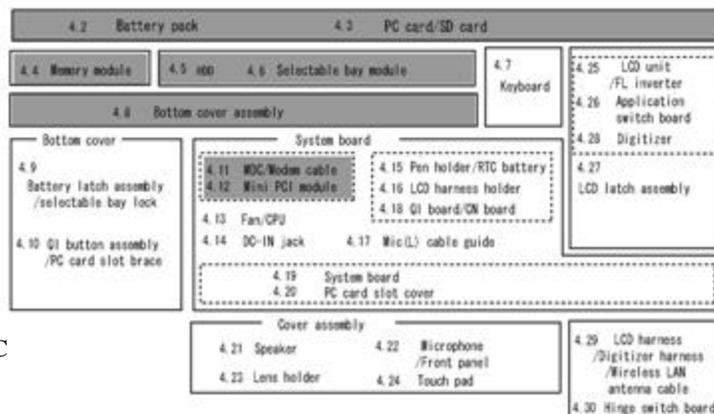
?Chart Notation

The chart shows the case for the following example:

?Removing the Mini PCI module

All FRUs down to the “4.11 MDC/Modem cable” unit immediately above the Mini PCI module must be removed.

Similarly, as this requires the removal of all the units from “4.2 PC card/SD card” to “4.8 Bottom cover assembly” must be also 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 and 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 re-assembly 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.

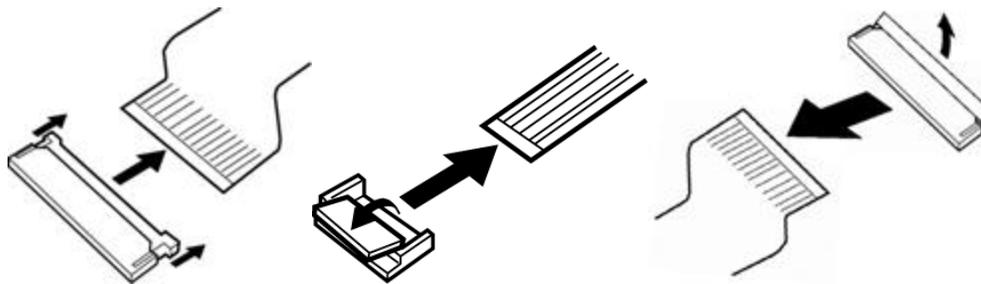
- ? Pressure plate connector
- ? Spring connector
- ? Normal pin connector

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.

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

Back flip 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
- ? A pair of needle-nose pliers
- ? Air-ionizers in highly static sensitive areas
- ? Antenna coaxial cable disconnecter

## 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.

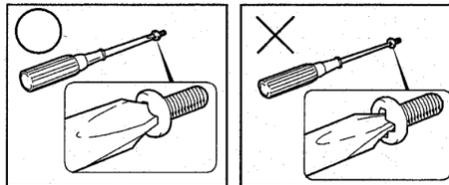
**Note:** To tighten screws quickly and accurately, an electric screwdriver is recommended.

? M2 (2mm) 0.167 N·m (1.7 kgf·cm)

? M2.5 (2.5mm) 0.294 N·m (3.0 kgf·cm)

? M3 (3mm) 0.549 N·m (5.6 kgf·cm)

**Note:** To prevent damage to THIN HEAD screws, use type 0 pit philips screwdriver. Use, however, the PH point size “1” screwdriver for screws fixing the expansion memory slot cover and the keyboard.. 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 2.5mm, 2.6mm and so on.



Grip area

### 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: Flat 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 other external devices from the computer.
3. Turn the computer upside down.
4. Release the **battery lock switch**.
5. Pull out the **battery pack** while sliding the **battery latch** toward the arrow pointing.

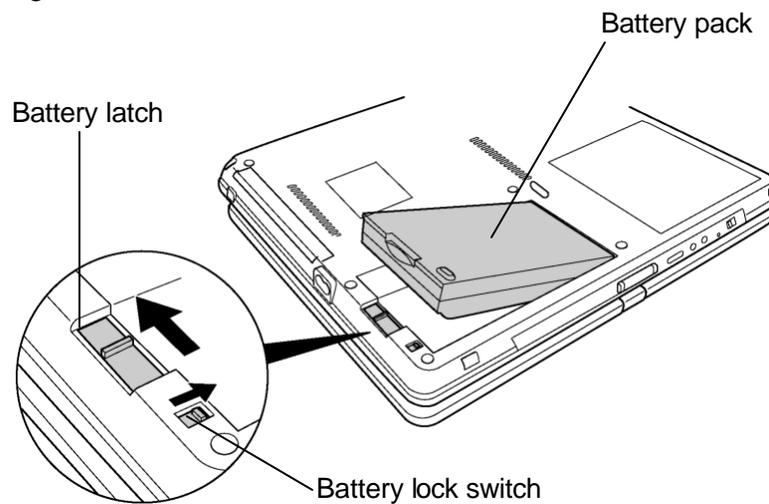


Figure 4-1 Removing the battery pack

**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 of used batteries 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 other external devices from the computer.
3. Inset the connector of the battery pack to the connector of the computer. Press the **battery pack** until the battery is locked.
4. Slide the **battery lock** into the lock position.

## 4.3 PC card/SD card

### 4.3.1 PC card

#### Removing a PC card

The following describes the procedure for removing a PC card. (See Figure 4.2.)

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

1. Push the **ejection button**. It will pop out when you release it. Press it once more to eject a PC card.
2. Pull out a **PC card** and remove it.
3. Push in the ejection button again.

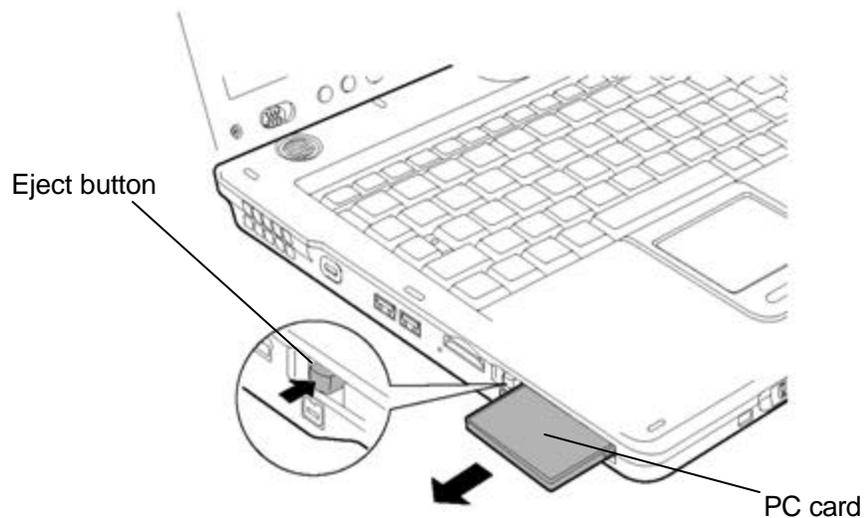


Figure 4-2 Removing a PC card

#### Installing a PC card

The following describes the procedure for installing a PC card. (See Figure 4.2.)

1. Make sure the eject button does not stick out.
2. Insert a **PC card** carefully to ensure a firm connection.

### 4.3.2 SD card

#### Removing a SD card

The following describes the procedure for removing a SD memory card. (See Figure 4-3.)

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

1. Push a **SD card**. It will pop out partly when you release, so pull out the card.

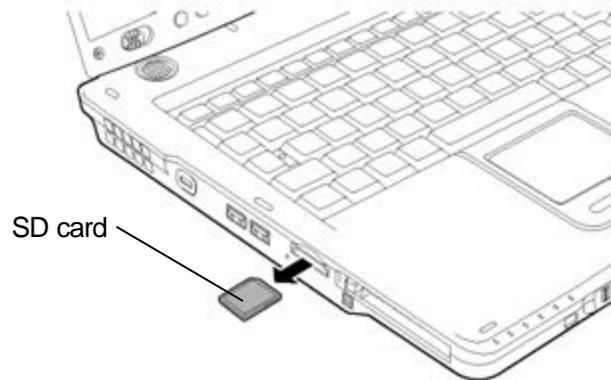


Figure 4-3 Removing a SD card

#### Installing a SD card

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

1. Insert a SD card and press it until it securely connected.

## 4.4 Memory module

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

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

Never press hard or bend the memory module.

### Removing the memory module

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

1. Turn the computer upside down.
2. Loosen the **screw** (with e-ring) fixing the memory slot cover.
3. Remove the **memory slot cover**.
4. Open the left and right **latches** and remove the **memory module(s)**.

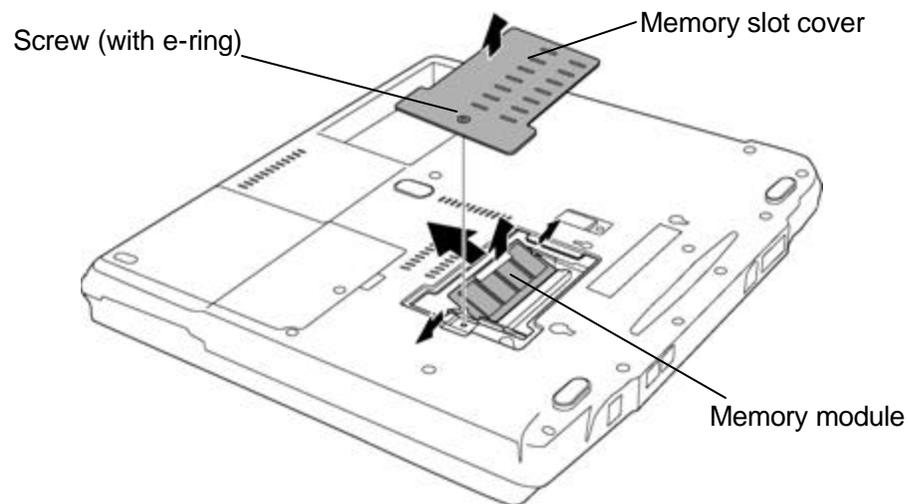


Figure 4-4 Removing the memory module

### Installing the memory module

To install the memory module(s), confirm that the computer is in boot mode. Then perform the following procedure. (See Figure 4.4.)

1. Insert the **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 the memory module. Inserting a memory module with the power on risks damaging the module or the computer itself.*

*Never press hard or bend the memory module.*

*When installing a memory module, be careful not to insert a memory module into the expansion memory slot (inner slot).*

2. Install the **memory slot cover**.
3. Secure the **screw** (with e-ring) to fix the memory slot cover.

## 4.5 HDD

### Removing the HDD

The following describes the procedure for removing the HDD. (See Figure 4-5 and 4-6.)

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

1. Turn the computer upside down.
2. Loosen the **screw** (with e-ring) fixing the HDD slot cover and remove the **HDD slot cover**.
3. Pull out the **HDD assembly** from the slot of the computer.

**Note:** When removing the HDD assembly, be careful not to tear the laminate. If the laminate is torn, replace it with a new one.

4. Disconnect the **HDD FPC** from the connector **CN1800** of system board and the connector of HDD assembly.

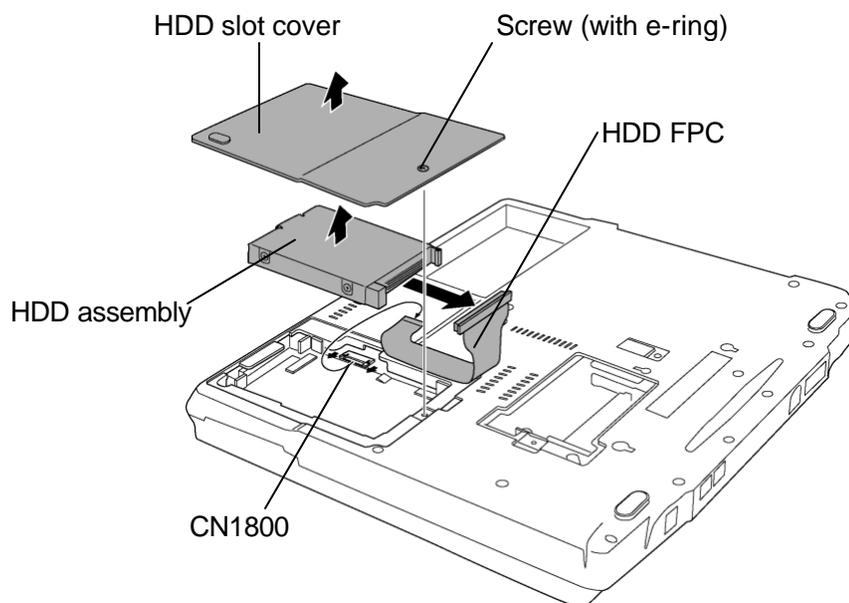


Figure 4-5 Removing the HDD FPC

- Remove the following **screws** fixing the HDD holder.

≈ M3.0x4.0S FLAT BIND screw x4

- Detach the **HDD holder** from the **HDD**.

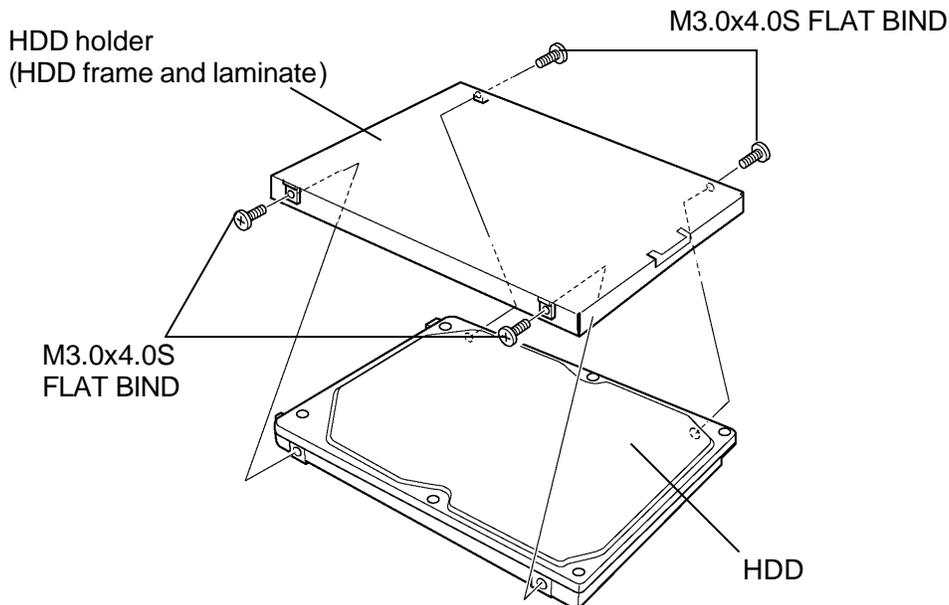


Figure 4-6 Removing the HDD holder

### Installing the HDD

The following describes the procedure for installing the HDD. (See Figure 4-5 and 4-6.)

**CAUTION:** HDD frame and laminate can not be reused. If you detach the laminate package from HDD frame, be sure to use a new HDD frame and laminate package when replacing.

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

≈ M3.0x4.0S FLAT BIND screw x4
- Connect the **HDD FPC** to the connector **CN1800** on the system board and the connector of the HDD assembly.
- Set the HDD assembly to the HDD slot from the opposite side of the connector.
- Insert the **HDD assembly** into the HDD slot of computer.
- Install the **HDD slot cover** and secure it with the **screw** (with e-ring).

## 4.6 Selectable bay module

### Removing a selectable bay module

The following describes the procedure for removing a selectable bay module. (See Figure 4-7 and 4-8.)

1. Turn the computer upside down.
2. Move the following **screw** (if the screw is secured in the lock screw hole) from **lock position** to **unlock position**.

⌘ M2.5x4.0B FLAT BIND screw x1

3. Pull out a **selectable bay module** from the selectable bay while sliding the **lever**.

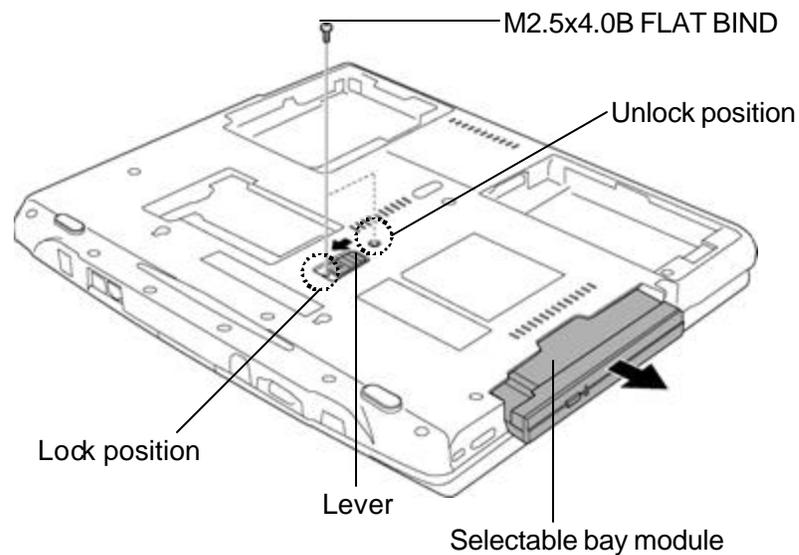


Figure 4-7 Removing a selectable bay module

- Remove the following **screws** securing the **plastic brace** and the **OD board** and remove them.

≈ M2.0x8.0S BIND screw x2

- Remove the following **screws** securing the **plastic frame** and remove it.

≈ M2.0x3.0S S-THIN FLAT BIND screw x5

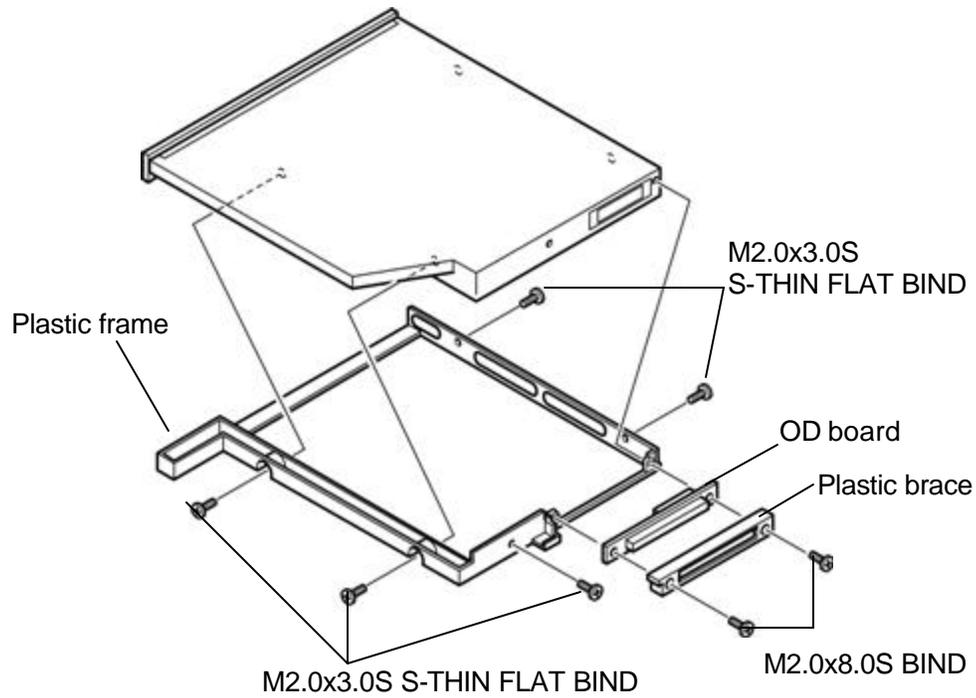


Figure 4-8 Removing the plastic frame

### Installing a selectable bay module

The following describes the procedure for installing a selectable bay module. (See Figure 4-7 and 4-8.)

1. Install the **plastic frame** to the selectable bay module and secure them with following **screws**.

⌘ M2.0x3.0S S-THIN FLAT BIND screw x5

2. Install the **OD board** and **plastic brace** to the selectable bay module and secure them with following screws.

⌘ M2.0x8.0S BIND screw x2

3. Insert a **selectable bay module** into the selectable bay of the computer.

4. Turn the following **screw** (if you want to lock the selectable bay) from **unlock position** to **lock position**.

⌘ M2.5x4.0B FLAT BIND screw x1

## 4.7 Keyboard

### Removing the keyboard

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

1. Open the display.
2. Insert your nails in the slot of both sides of the **keyboard holder** and lift it up.
3. Remove the following **screws** securing the keyboard.
  - ≈ M2.5x2.8B FLAT BIND screw x2
4. Lift the top edge of the keyboard and bring the edge to the front to lay on the computer. Unlock the connector and disconnect the **keyboard flexible cable** from the connector **CN3200** on the system board.
5. Remove the **keyboard**.

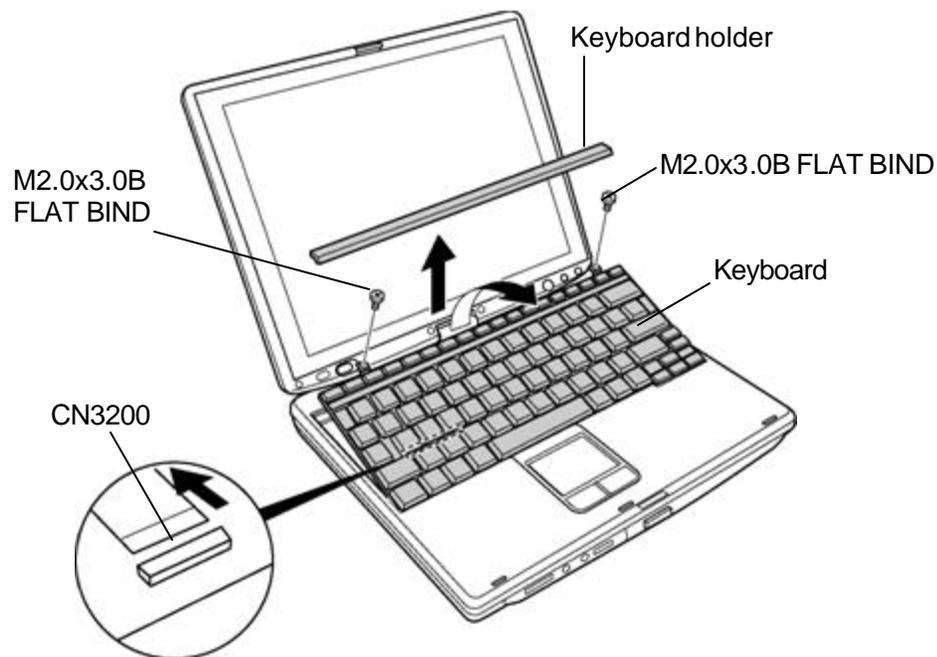


Figure 4-9 Removing the keyboard

### Installing the keyboard

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

1. Put the keyboard on the palm rest as its face is down. Connect **the keyboard flexible cable** to **CN3200** on the system board and lock the connector.
2. Hook the bottom edge of the keyboard to the palm rest. Place the **keyboard** on the computer and secure it with the following **screws**.

⌘ M2.5x2.8B FLAT BIND screw x2

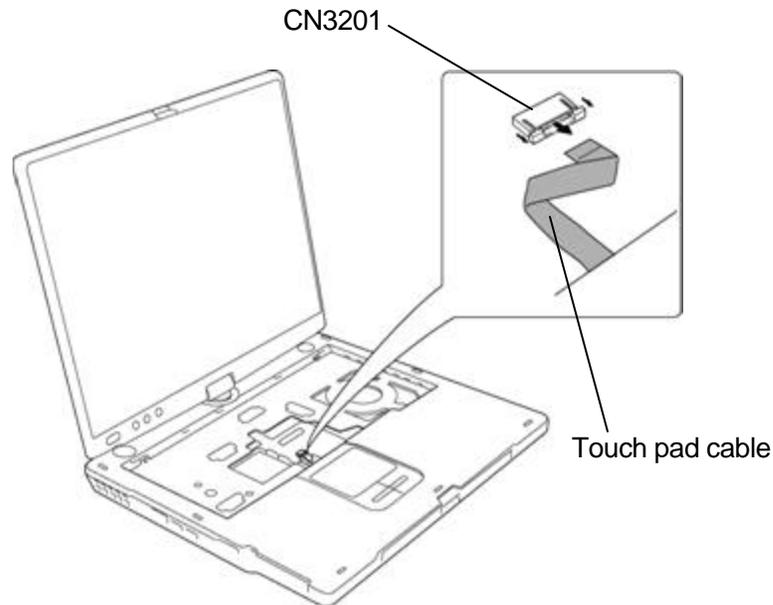
3. Fit to install the **keyboard holder**

## 4.8 Bottom cover assembly

### Removing the bottom cover assembly

The following describes the procedure for removing the bottom cover assembly. (See Figure 4-10 and 4-11.)

1. Disconnect the **touch pad cable** from the connector **CN3201** on the system board.



*Figure 4-10 Removing the touch pad cable*

2. Close the display and turn the computer upside down.
3. Remove the following **screws** securing the bottom cover assembly.
  - ⌘ M2.0x6.0B FLAT BIND screw x19 (Described as "6" in figure)
  - ⌘ M2.0x3.0B S-THIN FLAT BIND screw x2 (Described as "3" in figure)
4. Pull up to remove the **bottom cover assembly** from the computer.

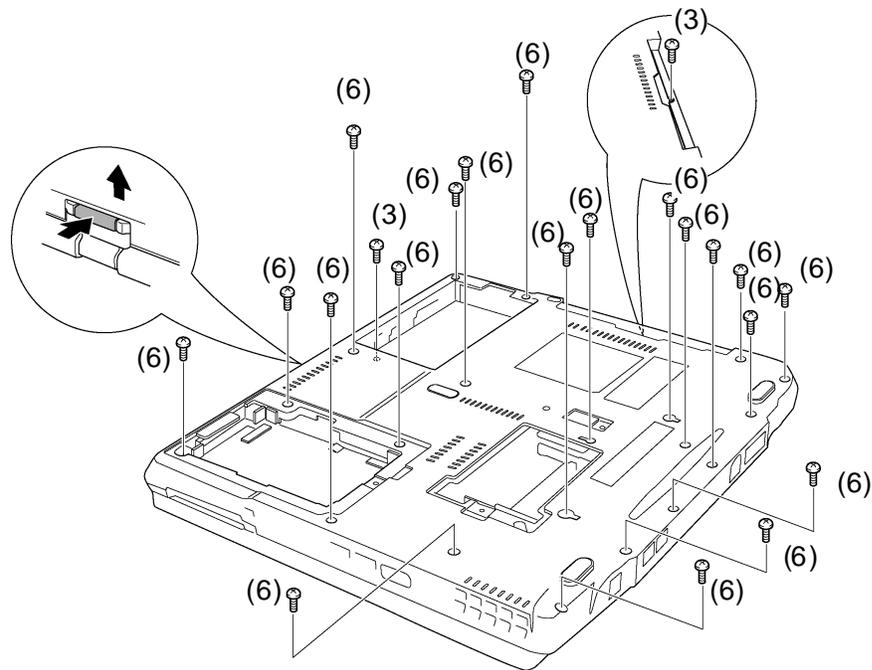


Figure 4-11 Removing the bottom cover assembly

### Installing the bottom cover assembly

The following describes the procedure for installing the bottom cover assembly. (See Figure 4-10 and 4-11.)

1. Install the **bottom cover assembly** to the computer.

**Note:** Install the bottom cover assembly from the *i.LINK (IEEE1394)* slot first.

2. Secure the bottom cover assembly with the following screws
  - ≈ M2.0x6.0B FLAT BIND screw x19 (Described as "6" in figure)
  - ≈ M2.0x3.0B S-THIN FLAT BIND screw x2 (Described as "3" in figure)
3. Turn over the computer and open the display.
4. Connect the **touch pad cable** to the connector **CN3201** on the system board.

## 4.9 Battery latch assembly / Selectable bay lock

### 4.9.1 Battery latch assembly

#### Removing the battery latch assembly

The following describes the procedure for removing the battery latch assembly. (See Figure 4-12.)

1. Remove the following **screw** securing the battery latch assembly.  
    ⚙ M2.5x4.0B      FLAT BIND screw      x1
2. Pull up to remove the **battery latch assembly** from the bottom cover assembly.

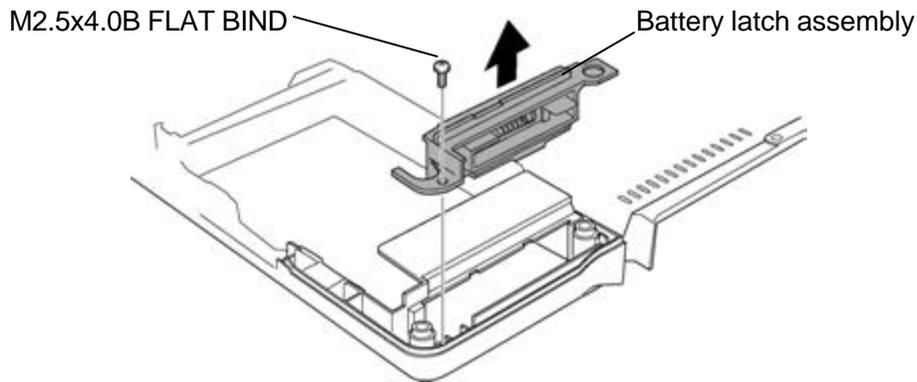


Figure 4-12 Removing the battery latch assembly

#### Installing the battery latch assembly

The following describes the procedure for installing the battery latch assembly. (See Figure 4-12.)

1. Install the **battery latch assembly** to the bottom cover assembly.
2. Secure the battery latch assembly with the following **screw**.

    ⚙ M2.5x4.0B      FLAT BIND screw      x1

## 4.9.2 Selectable bay lock

### Removing the selectable bay lock

The following describes the procedure for removing the selectable bay lock. (See Figure 4-13.)

1. Release the **tabs** (2 points) and detach the selectable bay lock.
2. Remove the **selectable bay lock** from the bottom cover assembly.

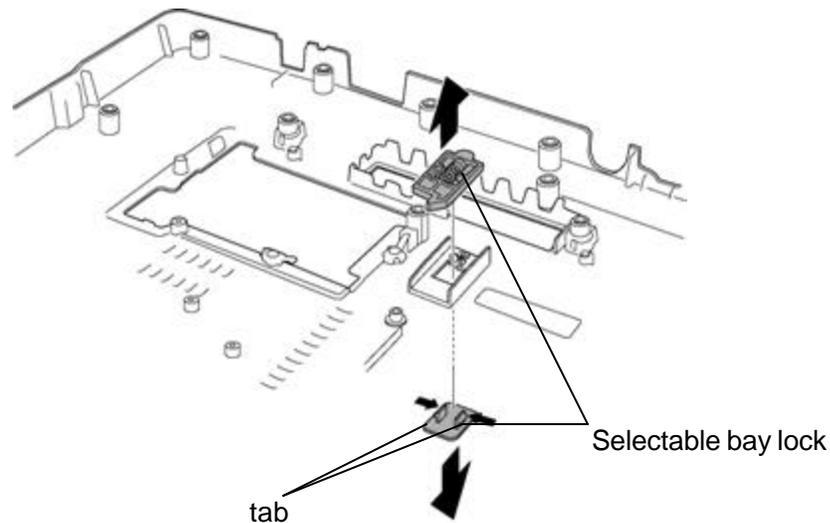


Figure 4-13 Removing the selectable bay lock

### Installing the selectable bay lock

The following describes the procedure for installing the selectable bay lock. (See Figure 4-13.)

1. Hook the **tabs** (2 points) and install the **selectable bay lock** to the bottom cover assembly.

**Caution:** Selectable bay lock has different shapes of tabs for each side (2 points). Therefore, be sure to fit their shapes for installation.

## 4.10 QI button assembly / PC card slot brace

### 4.10.1 QI button assembly

#### Removing the QI button assembly

The following describes the procedure for removing the QI button assembly. (See Figure 4-14.)

1. Remove the following **screw** securing the QI button assembly and remove the **QI button assembly**.

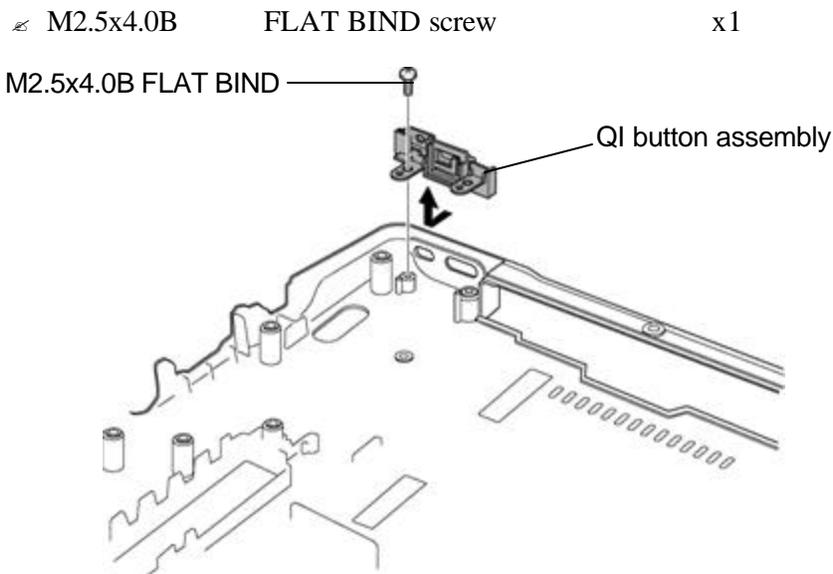


Figure 4-14 Removing the QI button assembly

#### Installing the QI button assembly

The following describes the procedure for installing the QI button assembly. (See Figure 4-14.)

1. Install the **QI button assembly** to the slot of bottom cover assembly and secure it with the following **screw**.

≈ M2.5x4.0B      FLAT BIND screw      x1

**Note:** When installing the QI button assembly, be sure to fit the button portion to the slot of bottom cover assembly.

### 4.10.2 PC card slot brace

#### Removing the PC card slot brace

The following describes the procedure for removing the PC card slot brace. (See Figure 4-15.)

1. Remove the following **screws** securing the PC card slot brace and remove the **PC card slot brace**.

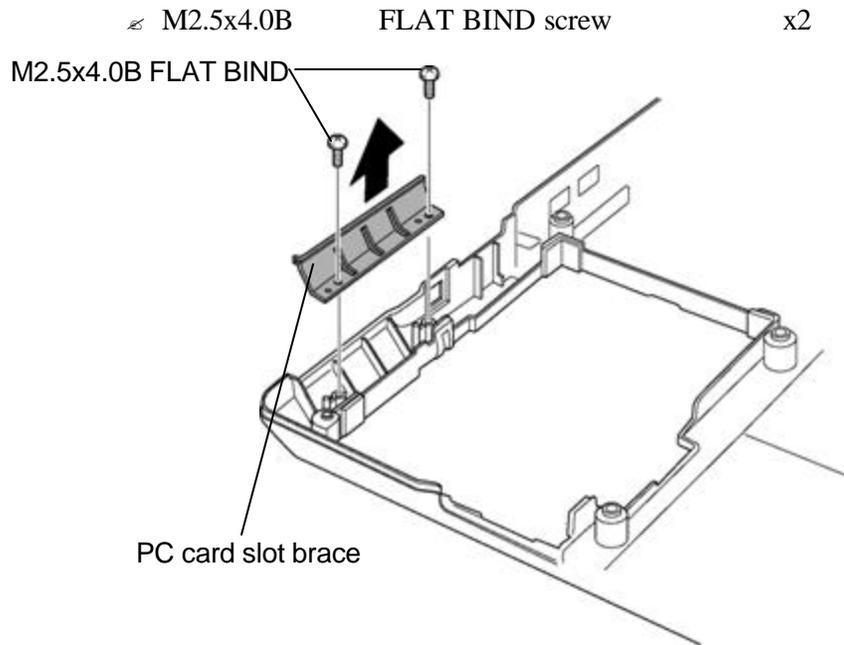


Figure 4-15 Removing the PC card slot brace

#### Installing the PC card slot brace

The following describes the procedure for installing the PC card slot brace. (See Figure 4-15.)

1. Install the **PC card slot brace** to the bottom cover assembly.
2. Secure the PC card slot brace with the following **screws**.

⚡ M2.5x4.0B      FLAT BIND screw      x2

## 4.11 MDC / modem cable

### Removing the MDC / modem cable

The following describes the procedure for removing an MDC / modem cable. (See Figure 4-16 and 4-17.)

1. Remove the following **screws** securing the MDC.
 

|             |            |    |
|-------------|------------|----|
| ≈ M2.0x4.0Z | BIND screw | x2 |
|-------------|------------|----|
2. Pull up the **MDC** straight and remove it from the connector **CN3000** on the system board.
3. Disconnect the **modem cable** from the connector of MDC.

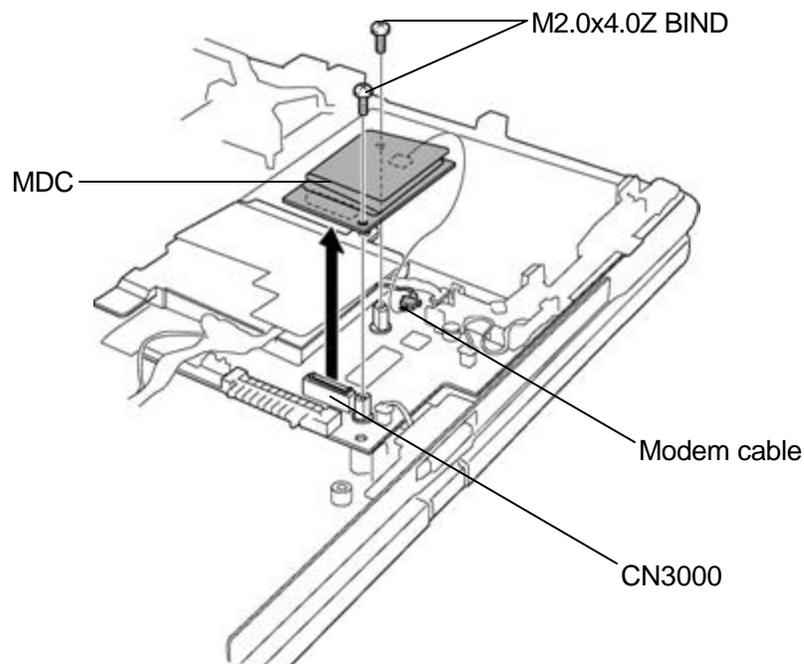


Figure 4-16 Removing the MDC

4. Pull out the modem cable from the guide of mini PCI cover.
5. Remove the following **screw** and disconnect the **drain cable 1** from the stud of system board.

|             |            |    |
|-------------|------------|----|
| ≈ M2.0x4.0Z | BIND screw | x1 |
|-------------|------------|----|

or

|             |          |    |
|-------------|----------|----|
| ≈ M2.0x4.0B | LH STICK | x1 |
|-------------|----------|----|

6. Open the **insulators** and pull out the modem cable from the insulators.
7. Remove the following **screw** and disconnect the **drain cable 2** from the stud of hinge assembly.

≈ M2.0x4.0Z BIND screw x1

8. Disconnect and remove the **modem cable** from the connector **CN3001** on the system board.

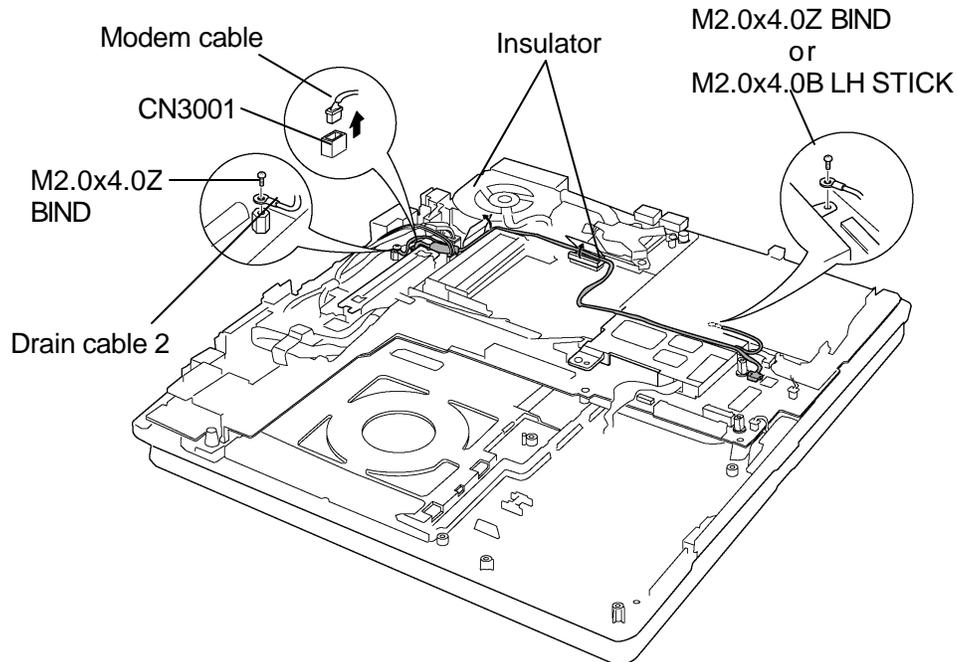


Figure 4-17 Removing the modem cable

### Installing the MDC / modem cable

The following describes the procedure for installing an MDC / modem cable. (See Figure 4-16 and 4-17.)

1. Connect the **modem cable** to the connector **CN3001** on the system board.
2. Secure the **drain cable 2** to the stud of hinge assembly with the following **screw**.

|             |            |    |
|-------------|------------|----|
| ≈ M2.0x4.0Z | BIND screw | x1 |
|-------------|------------|----|
3. Arrange the modem cable inside the **insulators** and close the insulators.
4. Arrange the modem cable along the guide of mini PCI cover.
5. Secure the **drain cable 1** to the stud of system board with the following **screw**.

|             |            |    |
|-------------|------------|----|
| ≈ M2.0x4.0Z | BIND screw | x1 |
| α           |            |    |
| ≈ M2.0x4.0B | LH STICK   | x1 |
6. Connect the **modem cable** to the connector of MDC.
7. Install the **MDC** to the connector **CN3000** on the system board and secure it with the following **screws**.

|             |            |    |
|-------------|------------|----|
| ≈ M2.0x4.0Z | BIND screw | x2 |
|-------------|------------|----|

## 4.12 Mini PCI module

### Removing the Mini PCI module

The following describes the procedure for removing a Mini PCI module. (See Figure 4-18.)

1. Disconnect the **speaker cable** from the connector **CN6150** on the system board and pull out the cable from the guide of mini PCI cover.
2. Remove the following **screws** securing the mini PCI cover and remove the **mini PCI cover**.

≈ M2.0x4.0Z      BIND screw      x1

3. Disconnect the **wireless LAN antenna cables** from the connectors on the wireless LAN card.
4. Open the left and right latches securing the wire less LAN card and remove the **wireless LAN card** from the connector **CN9991** of mini PCI.

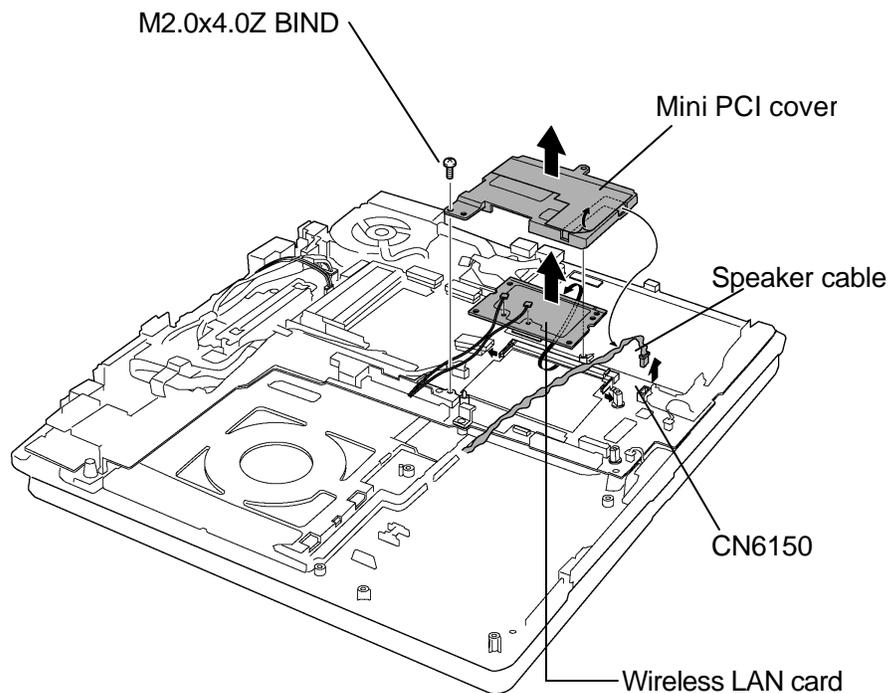


Figure 4-18 Removing the Mini PCI module

### Installing the Mini PCI module

The following describes the procedure for removing a Mini PCI module. (See Figure 4-18.)

1. Insert the **wireless LAN card** slantwise into the connector **CN9991** of mini PCI. Press the wireless LAN card until it hooks surely.
2. Connect the **wireless LAN antenna cables** to the connectors of wireless LAN card. (White cable to MAIN connector, Black cable to AUX connector)
3. Secure the mini PCI cover with the following **screws**.  

|             |            |    |
|-------------|------------|----|
| ⚡ M2.0x4.0Z | BIND screw | x1 |
|-------------|------------|----|
4. Arrange the **speaker cable** along the guide of mini PCI cover and connect the speaker cable to the connector **CN6150** on the system board.

## 4.13 Fan / CPU

### 4.13.1 Fan

#### Removing the fan

The following describes the procedure for removing the fan. (See Figure 4-19.)

1. Disconnect the **fan cable** from the connector **CN8770** on the system board.
2. Remove the following **screws** securing the fan and remove the **fan**.

⚡ M2.0x4.0B      FLAT BIND screw      x2

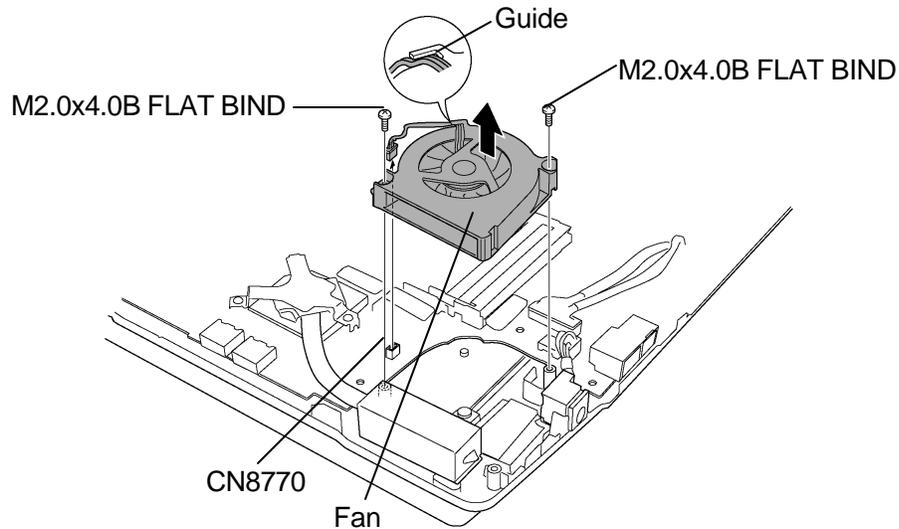


Figure 4-19 Removing the fan

#### Installing the fan

The following describes the procedure for installing the fan. (See Figure 4-19.)

1. Install the fan while fitting the screw holes and secure it with the following **screws**.

⚡ M2.0x4.0B      FLAT BIND screw      x2

2. Hook the **fan cable** to the guide and connect it to the connector **CN8770** on the system board.

## 4.13.2 CPU

## Removing the CPU

The following describes the procedure for removing the CPU. (See Figure 4-20 and 4-21.)

1. Remove the following **screws** securing the CPU hold plate in the reverse order of the number (3? 1) on the CPU hold plate and remove the **CPU hold plate**.

≈ M2.0x4.0B BIND screw x3

2. Remove the **heat sink** on the CPU.

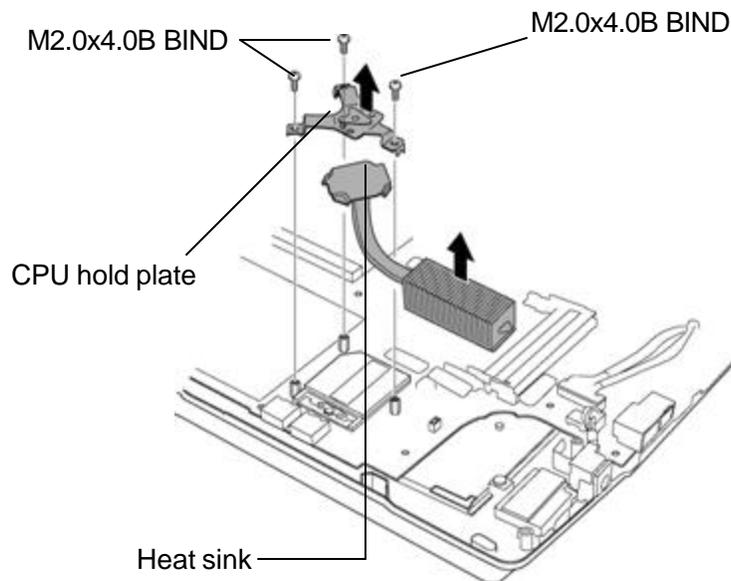


Figure 4-20 Removing the heat sink

3. Unlock the CPU by rotating counterclockwise the cam on the CPU socket by 90 degrees with a flat-blade driver.
4. Remove the **CPU**.

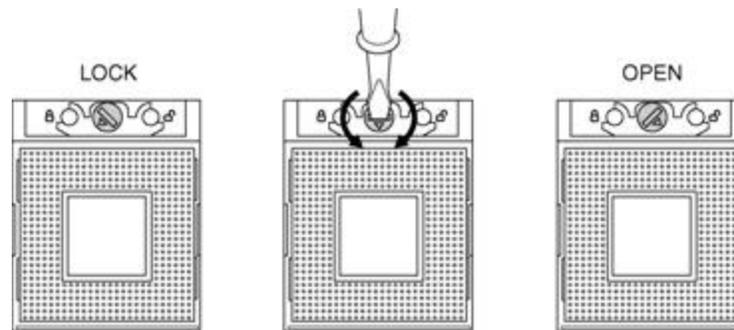


Figure 4-21 Removing the CPU

### Installing the CPU

The following describes the procedure for installing the CPU. (See Figure 4-20 to 4-22.)

1. Make sure that the cam of the CPU socket is in the unlock position.
2. Install the CPU on the CPU socket and check the CPU is installed on the right position.
3. Lock the CPU by rotating clockwise the cam on the CPU socket by 90 degrees with a flat-blade driver.
4. If there is already silicon grease on the CPU and FIN, 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 4-22 Applying silicon grease

5. Install the heat sink on the CPU.
6. Install the CPU hold plate and secure it with the following screws in the order of the number (1? 3) on the CPU hold plate.

⑤ M2.0x4.0B      BIND screw      x3

## 4.14 DC-IN jack

### Removing the DC-IN jack

The following describes the procedure for removing the DC-IN jack. (See Figure 4-23.)

1. Pull up the **DC-IN jack** straight from the slot of cover assembly.
2. Disconnect the DC-IN jack from the connector **CN8800** on the system board

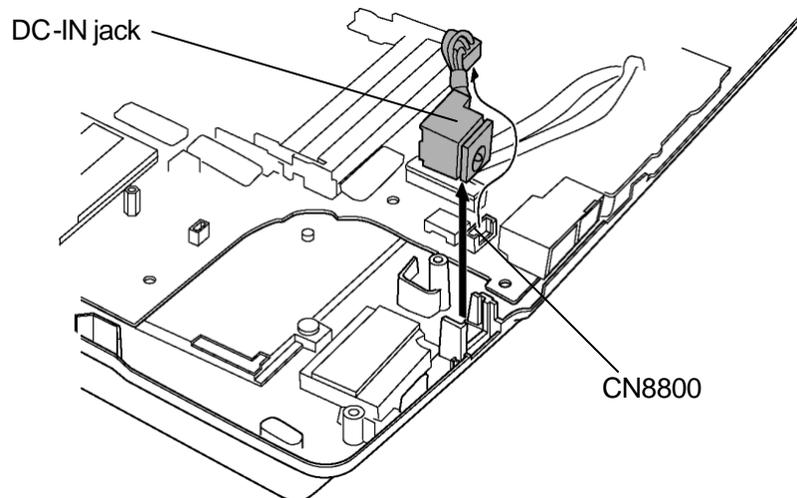


Figure 4-23 Removing the DC-IN jack

### Installing the DC-IN jack

The following describes the procedure for installing the DC-IN jack. (See Figure 4-23.)

1. Connect the DC-IN jack to the connector **CN8800** on the system board.
2. Install the **DC-IN jack** by fitting guide of slot of cover assembly.

## 4.15 Penholder / RTC battery

### 4.15.1 Penholder

#### Removing the penholder

The following describes the procedure for removing the penholder. (See Figure 4-24.)

1. Disconnect the **RTC batter cable** from the connector **CN8760** on the system board.
2. Remove the following **screws** securing the penholder and remove the **penholder** from the cover assembly.

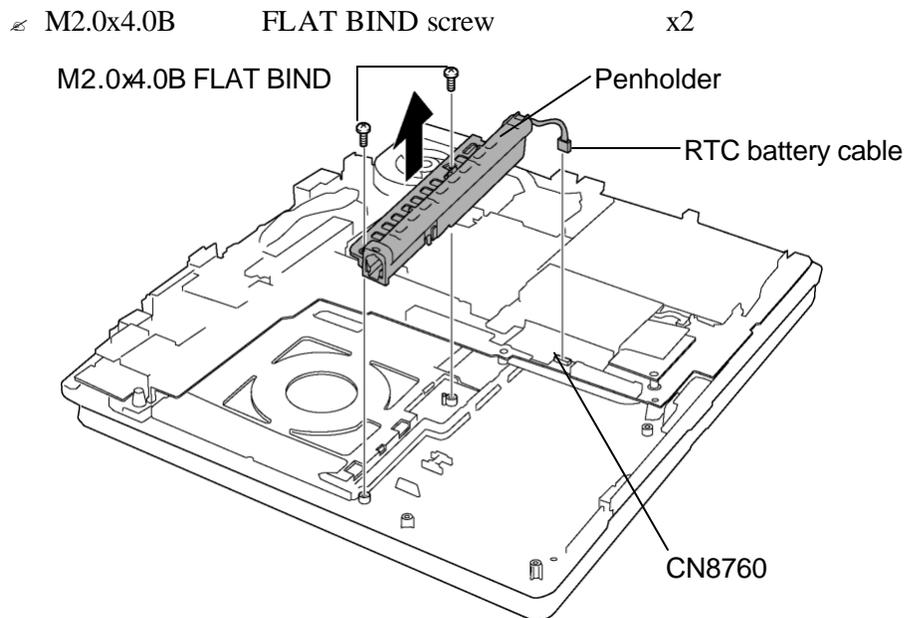


Figure 4-24 Removing the penholder

#### Installing the penholder

The following describes the procedure for installing the penholder. (See Figure 4-24.)

1. Install the **penholder** to the cover assembly and secure it with the following **screws**.

⚡ M2.0x4.0B FLAT BIND screw x2

**Caution:** When installing the penholder, be careful not to catch the wireless LAN antenna cables and speaker cable arranged on the cover assembly.

2. Connect the **speaker cable** to the connector **CN8760** on the system board.

### 4.15.2 RTC battery

#### Removing the RTC battery

The following describes the procedure for removing the RTC battery. (See Figure 4-25.)

1. Pull out the **RTC batter cable** from the guide of penholder.
2. Remove the **RTC battery** from the slot of penholder.

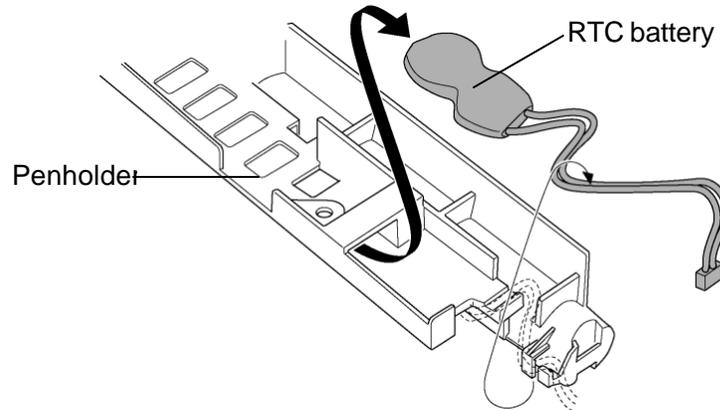


Figure 4-25 Removing the RTC battery

#### Installing the RTC battery

The following describes the procedure for installing the RTC battery. (See Figure 4-25.)

1. Install the **RTC battery** to the slot of penholder.
2. Arrange the **RTC battery cable** to the guide of penholder.

## 4.16 LCD harness holder

### Removing the LCD harness holder

The following describes the procedure for removing the LCD harness holder. (See Figure 4-26.)

1. Disconnecting the **USB harness** from the connector **CN4612** on the system board and from **CN4612** on the CN board, turn up the **insulator** and pull out the USB harness from the guide of LCD harness holder.
2. Disconnect the **LCD harness** from the connector **CN5501** on the system board and pull out the LCD harness from the LCD harness holder.
3. Disconnecting the **CN board harness** from the connector **CN9512** on the system board and from the connector **CN9520** on the CN board, pull out the CN board harness from the guide of LCD harness holder.
4. Disconnecting the **QI board cable** from the connector **CN9521** on the CN board and from the connector **CN9530** on the QI board, pull out the QI board cable from the guide of LCD harness holder.
5. Remove the following **screws** securing and remove the **LCD harness holder**.

⚙ M2.0x6.0B FLAT BIND screw x2

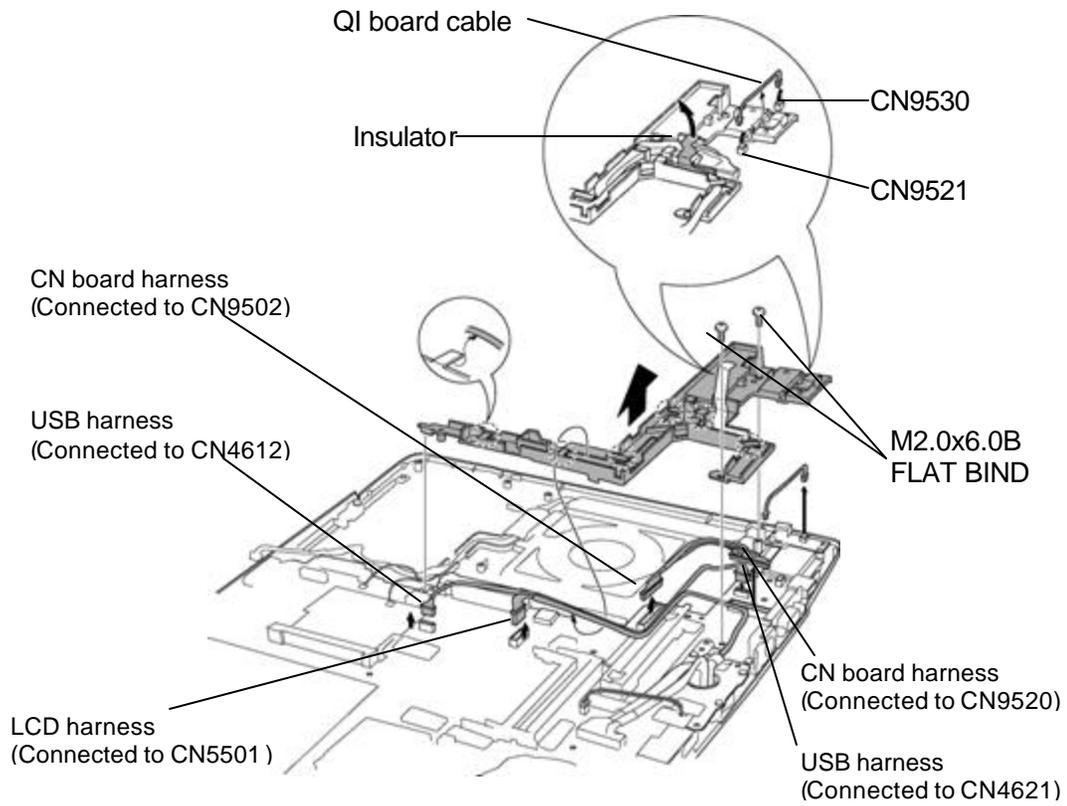


Figure 4-26 Removing the LCD harness holder



## 4.17 Mic (L) cable guide

### Removing the mic (L) cable guide

The following describes the procedure for removing the mic (L) cable guide. (See Figure 4-27.)

1. Disconnect the **mic (L) cable** from the connector **CN6060** on the system board and pull it out from the mic (L) cable guide.
2. Remove the following **screws** and **mic (L) cable guide** .

⚡ M2.0x6.0B FLAT BIND screw x2

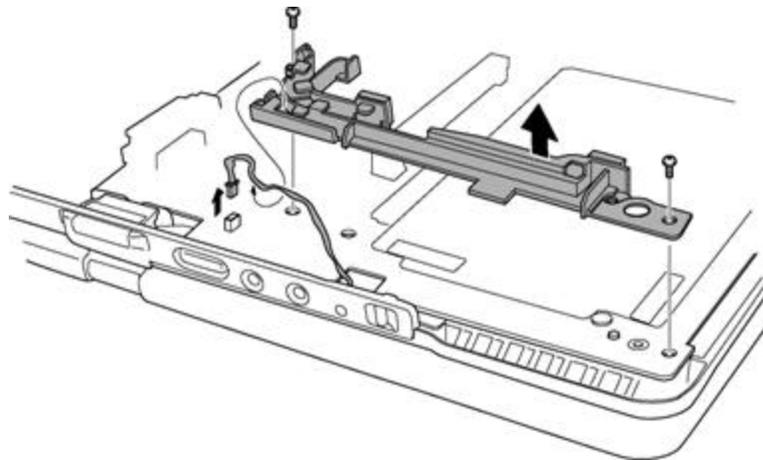


Figure 4-27 Removing the mic (L) cable guide

### Installing the mic (L) cable guide

The following describes the procedure for installing mic (L) cable guide (See Figure 4-27).

1. Install the **mic (L) cable guide** to the system board and secure it with the following **screws** .  
⚡ M2.0x6.0B FLAT BIND screw x2
2. Connecting the **mic (L) cable** to the connector **CN6060** on the system board, arrange the cable along the mic (L) cable guide.

## 4.18 QI board / CN board

### 4.18.1 QI board

#### Removing the QI board

The following describes the procedure for removing the QI board. (See Figure 4-28.)

1. Remove the following **screws** securing the QI board.

⚡ M2.0x6.0B FLAT BIND screw x2

2. Pull up the QI board straight and remove the **QI board** from the cover assembly.

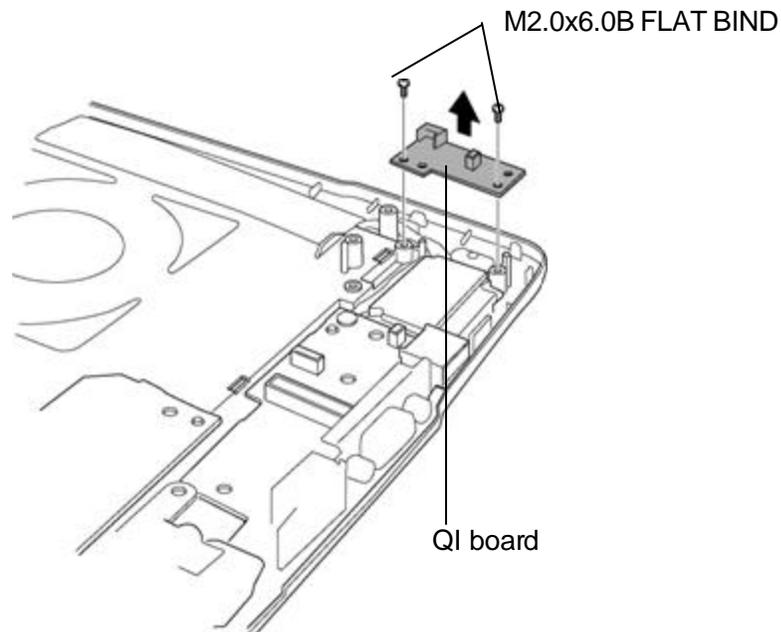


Figure 4-28 Removing the QI board

#### Installing the QI board

The following describes the procedure for installing the QI board. (See Figure 4-28.)

1. Install the **QI board** to the cover assembly and secure it with the following **screws**.

⚡ M2.0x6.0B FLAT BIND screw x2

### 4.18.2 CN board

#### Removing the CN board

The following describes the procedure for removing the CN board. (See Figure 4-29.)

1. Remove the following **screws** securing the CN board.

⚡ M2.0x6.0B FLAT BIND screw x2

2. Pull up to remove the **CN board** from the cover assembly.

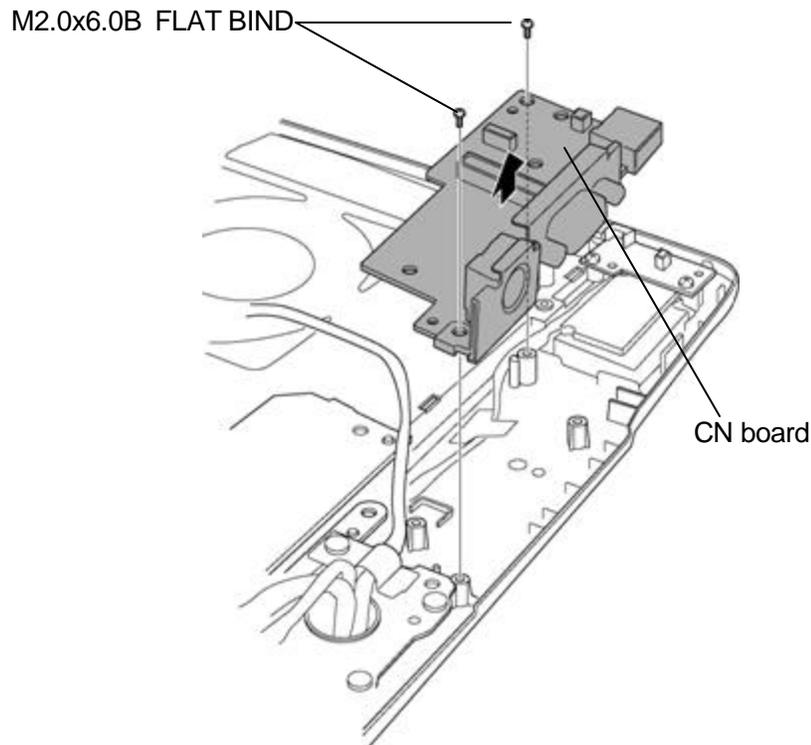


Figure 4-29 Removing the CN board

#### Installing the CN board

The following describes the procedure for installing the CN board. (See Figure 4-29.)

1. Install the **CN board** to the cover assembly and secure it with the following **screws**.

⚡ M2.0x6.0B FLAT BIND screw x2

## 4.19 System board

### Removing the system board

The following describes the procedure for removing the system board. (See Figure 4-30.)

1. Disconnect the **mic (R) cable** from the connector **CN6061** on the system board
2. Disconnect the **rotation sensor cable** from the connector **CN3280** on the system board
3. Disconnect the **digitizer cable** from the connector **CN9540** on the system board
4. Remove the following **screws** securing the system board.

⚡ M2.0x6.0B FLAT BIND screw x1

5. Remove the **system board** from the cover assembly while pulling it up toward arrow pointing.

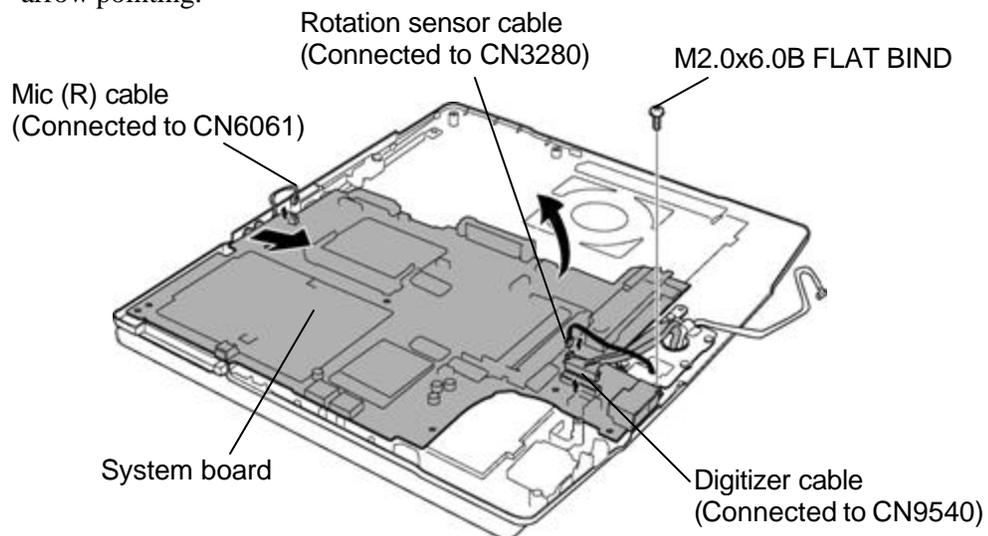


Figure 4-30 Removing the system board

### Installing the system board

The following describes the procedure for installing the system board. (See Figure 4-30.)

1. Install the **system board** to the cover assembly and secure it with the following **screw**.

⚡ M2.0x6.0B FLAT BIND screw x1

***NOTE:** When installing the system board, be careful not to catch the mic (L&R) cable, rotation sensor cable and digitizer cable between the system board and cover assembly. Also confirm that these cables are not hidden under the system board.*

2. Connect the **digitizer cable** to the connector **CN9540** on the system board.
3. Connect the **rotation sensor cable** to the connector **CN3280** on the system board.
4. Connect the **mic (R) cable** to the connector **CN6061** on the system board.

## 4.20 PC card slot cover

### Removing the PC card slot cover

The following describes the procedure for removing the PC card slot cover. (See Figure 4-31.)

1. Remove the following **screws** securing the PC card slot cover.
  - ⚡ M2.0x3.0S S-THIN FLAT BIND screw x2
2. Release the **hook** (2 points) and remove the **PC card slot cover**

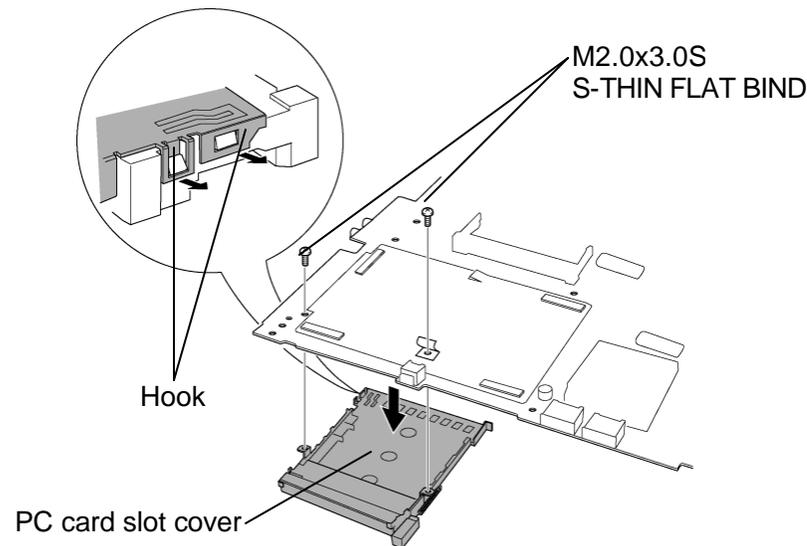


Figure 4-31 Removing the PC card slot cover

### Installing the PC card slot cover

The following describes the procedure for installing the PC card slot cover. (See Figure 4-31.)

1. Secure the **hook** (2 points) and install the **PC card slot cover**
2. Secure the PC card slot cover with the following **screws**.

⚡ M2.0x3.0S S-THIN FLAT BIND screw x2

## 4.21 Speaker

### Removing the speaker

The following describes the procedure for removing the speaker. (See Figure 4-32.)

1. Turn up the **insulator**.
2. Pull out the **speaker cable** from the **guide insulator** of cover assembly.
3. Pull out the speaker from the slot of cover assembly.

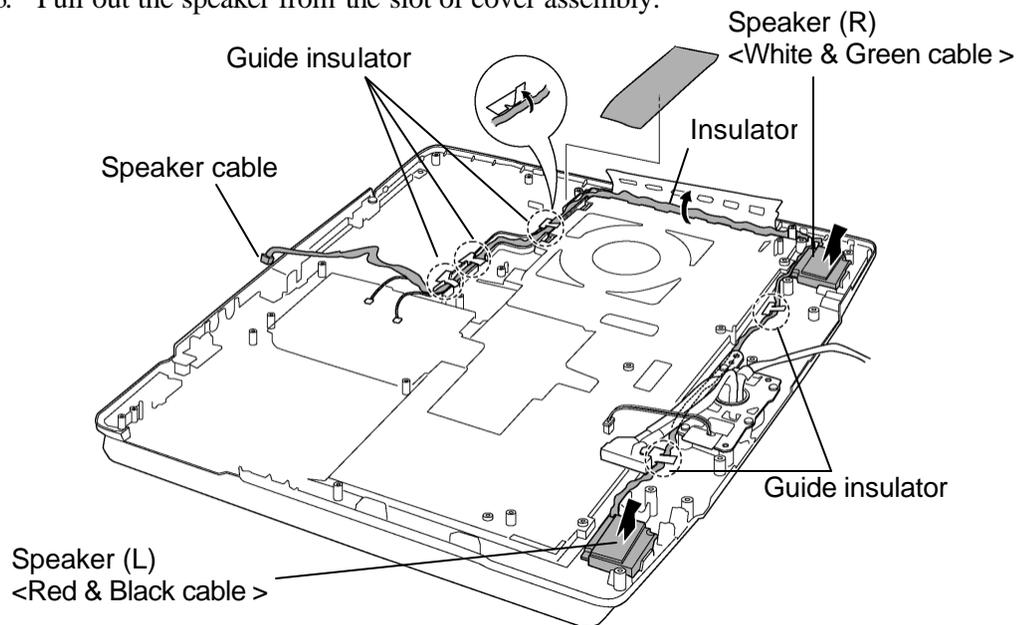


Figure 4-32 Removing the speaker

### Installing the speaker

The following describes the procedure for installing the speaker. (See Figure 4-32.)

1. Install the **speaker** to the slot of cover assembly.

**NOTE:** When installing the speaker, confirm the right installation of right and left speaker. (Right = Red and Green cable, Left = White and Green cable).

2. Arrange the **speaker cable** along the **guide insulator**.
3. Stick the **insulator** over the guide of speaker cable.

## 4.22 Microphone / Front panel

### 4.22.1 Microphone

#### Removing the microphone

The following describes the procedure for removing the speaker. (See Figure 4-33.)

1. Remove the following **screws** securing the both right and left mic holder.
  - ≈ M2.0x4.0B FLAT BIND screw x2 (x1 for each side)
2. Pull up the **mic holder** straight and remove the mic holder from the cover assembly.
3. Remove the **microphone** from the slot of cover assembly.

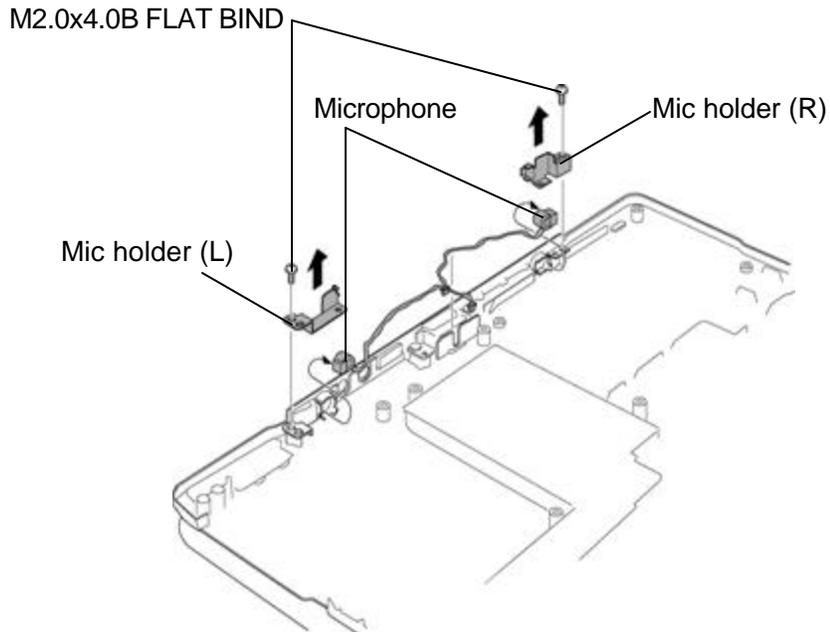


Figure 4-33 Removing the microphone

#### Removing the microphone

The following describes the procedure for removing the speaker. (See Figure 4-33.)

1. Fitting the microphone to the shapes of slot, install the **microphone** to the cover assembly.

Install the **mic holder** to the cover assembly while fitting it to the slit of cover assembly and secure them with the following **screws**.

- ≈ M2.0x4.0B FLAT BIND screw x2 (x1 for each side)

### 4.22.2 Front panel

#### Removing the front panel

The following describes the procedure for removing the front panel. (See Figure 4-34.)

1. Remove the following **screws** and **front panel** from the cover assembly.

⚡ M2.5x6.0B FLAT BIND screw x2

2. Detach the **display latch** from the front panel.

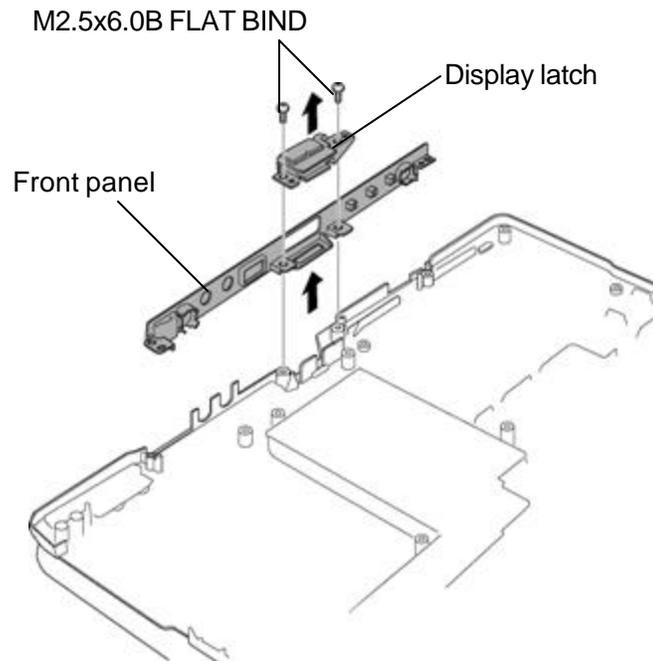


Figure 4-34 Removing the front panel

#### Installing the front panel

The following describes the procedure for installing the front panel. (See Figure 4-34.)

1. Install the display latch to the **front panel**
2. Install the **front panel** to the cover assembly and secure it with the following **screws**.

⚡ M2.5x6.0B FLAT BIND screw x2

## 4.23 Lens holder

### Removing the lens holder

The following describes the procedure for removing the lens holder. (See Figure 4-35.)

1. Remove the following **screw** securing the lens holder.

⌀ M2.5x4.0B S-THIN FLAT BIND screw x1

Remove the **lens holder** from the cover assembly.

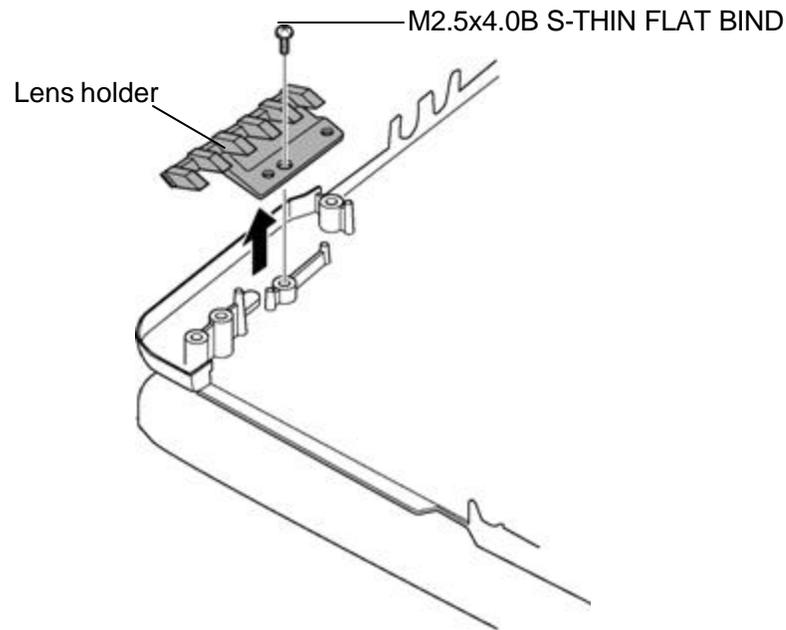


Figure 4-35 Removing the lens holder

### Installing the lens holder

The following describes the procedure for installing the lens holder. (See Figure 4-35.)

1. Install the **lens holder** to the cover assembly.
2. Secure the lens holder with the following **screw**.

⌀ M2.5x4.0B S-THIN FLAT BIND screw x1

## 4.24 Touch pad

### Removing the touch pad

The following describes the procedure for removing the touch pad (See Figure 4-36.)

1. Remove the following **screws** securing the touch pad.
  - ≈ M2.0x4.0B S-THIN FLAT BIND screw x3
2. Remove the **touch pad holder** and **touch pad** from the cover assembly.
3. Peel off the **glass tape** and disconnect the **touch pad cable** from the touch pad.

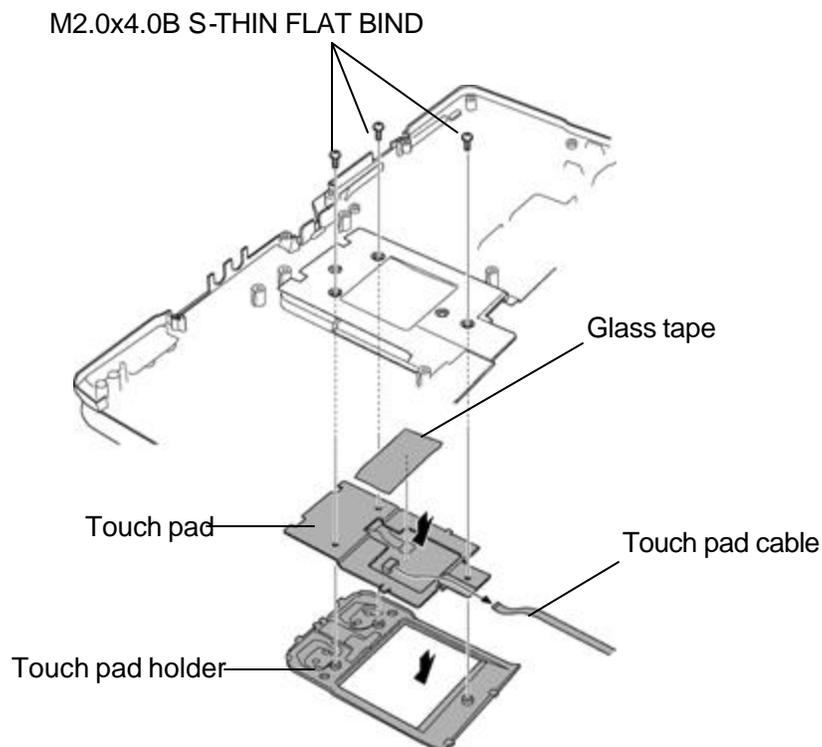


Figure 4-36 Removing the touch pad

### Installing the touch pad

The following describes the procedure for installing the touch pad (See Figure 4-5.).

1. Connect the **touch pad cable** to the touch pad and stick the **glass tape**.

Install the touch pad and touch pad holder to the cover assembly.

Secure the touch pad with the following screws.

- ≈ M2.0x4.0B S-THIN FLAT BIND screw x3

## 4.25 LCD unit & FL inverter

### Removing the LCD unit & FL inverter

The following describes the procedure for removing the LCD unit & FL inverter. (See Figure 4-37 to 4-39.)

**NOTE:** When replacing the LCD unit, do not give the hinge portion a strong press. It may cause the breakage of the hinge assembly. Also, Use a stand or something under the LCD part to keep the LCD part level while replacing it.

1. Peel off the **mask seals** (6 points) from the LCD mask.
2. Remove the following **screws** securing the LCD mask.
 

|   |           |           |       |    |
|---|-----------|-----------|-------|----|
| ✎ | M2.0x6.0B | FLAT BIND | screw | x6 |
|---|-----------|-----------|-------|----|
3. Laying down the LCD to make the LCD and the cover assembly flat, release the latches and remove the **LCD mask**.
4. Remove the **cross function button** from the application switch board.

**NOTE:** When removing the LCD mask, be careful not to lose the cross function button because the button is easily removed.

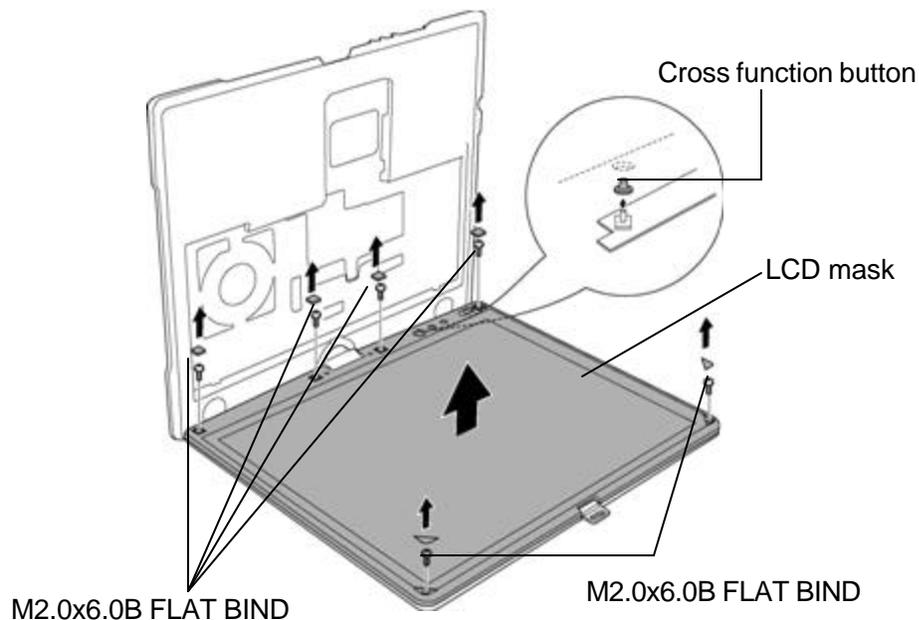


Figure 4-37 Removing the LCD mask

5. Turn up the **insulator** and disconnect the **HV cable** from the connector of FL inverter.
6. Remove the following **screws** securing the LCD unit.  

|             |                 |    |
|-------------|-----------------|----|
| ≈ M2.0x4.0B | FLAT BIND screw | x4 |
|-------------|-----------------|----|
7. With the bottom edge of the LCD unit on the display cover, raise the top edge of the LCD unit.

**NOTE:** When putting the LCD unit on the display cover, lay a mat or something under the LCD unit to protect the computer and the LCD from a scratch or breakage.

8. Peeling off the **glass tapes** (2 tapes), disconnect the **LCD harness** and **digitizer harness** from the connectors on the back of LCD unit.
9. Remove the **LCD unit** from the display cover.

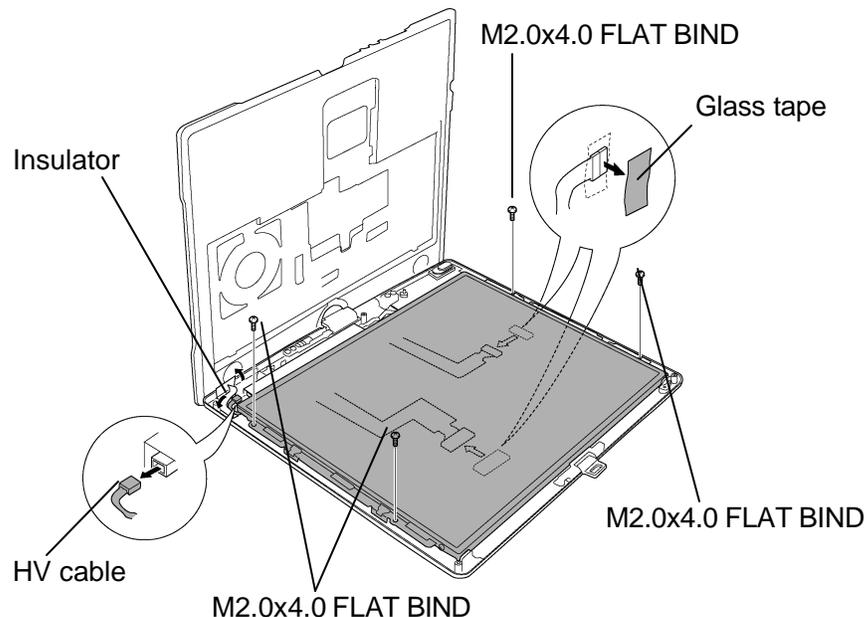
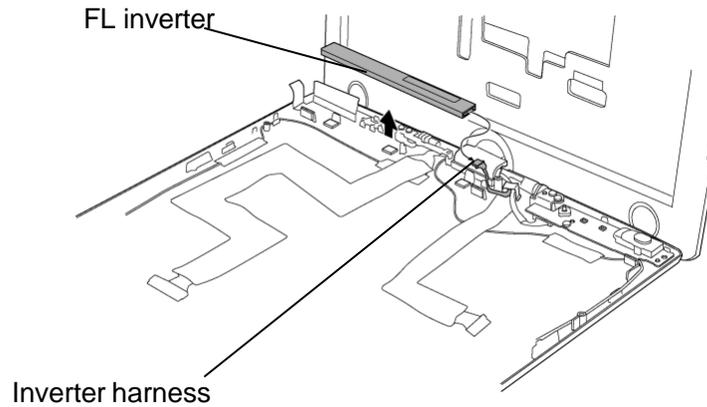


Figure 4-38 Removing the LCD unit

10. Pull up the FL inverter while peeling off the double-sided tape.

**CAUTION:** *The removed FL inverter is not reusable. Therefore when installing the FL inverter, it must be a new one.*

11. Disconnect the **inverter harness** and remove the **FL inverter** from the display cover.



*Figure 4-39 Removing the FL inverter*

### Installing the LCD unit & FL inverter

The following describes the procedure for installing the LCD unit & FL inverter. (See Figure 4-37 to 4-39.)

1. Connecting the **inverter harness** to the connector of FL inverter, install the **FL inverter** to the display cover.

**CAUTION:** *The FL inverter once removed from the computer is not reusable. When installing the FL inverter, be sure to use a new one.*

2. Standing the LCD unit on the display cover, connect digitizer harness and LCD harness on the back of LCD and secure them with two glass tapes.
3. Stick the **glass tapes** (2 tapes) on the each connector.
4. Install the **LCD unit** on the display cover and secure it with the following **screws**.  

|             |                 |    |
|-------------|-----------------|----|
| ⚡ M2.0x4.0B | FLAT BIND screw | x4 |
|-------------|-----------------|----|
5. Connect the **HV cable** to the connector of FL inverter and stick the **insulator**.
6. Set the **cross function button** to the application switch board by fitting the cross slit of the button.
7. Install the **LCD mask** to the display cover while securing the latches.

**NOTE:** *When installing the LCD mask, wipe the LCD with a soft cloth and make the back of the LCD mask clean with an ionizer.  
And also, confirm that the cross function button is installed.*

8. Secure the LCD mask with the following **screws** and stick the **mask seals** (6 points).

⚡ M2.0x6.0B    FLAT BIND screw    x6

## 4.26 Application switch board

### Removing the application switch board

The following describes the procedure for removing the application switch board. (See Figure 4-40.)

1. Remove the following **screws** securing the application switch board and pull up the **application switch board**.

⚡ M2.0x4.0B FLAT BIND screw x1

2. Disconnect the **switch harness** from the connector **CN9510** on the application switch board.

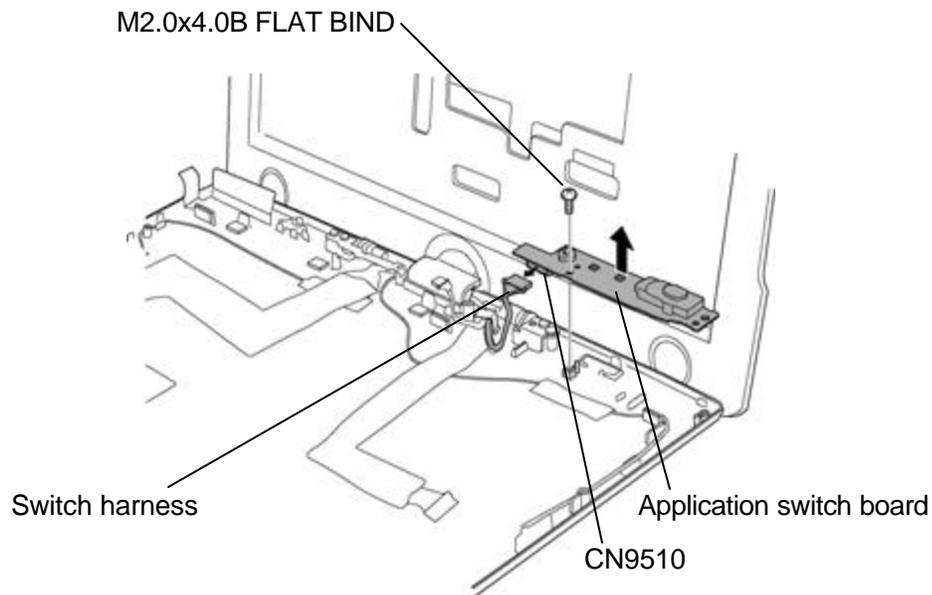


Figure 4-40 Removing the application switch board

### Installing the application switch board

The following describes the procedure for installing the application switch board. (See Figure 4-40.)

1. Connect the **switch harness** to the connector **CN9510** on the application switch board.
2. Install the **application switch board** to the display cover and secure it with the following **screws**.

⚡ M2.0x4.0B FLAT BIND screw x1

## 4.27 LCD latch assembly

### Removing the LCD latch assembly

The following describes the procedure for removing the LCD latch assembly. (See Figure 4-41.)

1. Remove the following **screw** and **LCD latch assembly** from the display cover.

⚡ M2.0x4.0B FLAT BIND screw x1

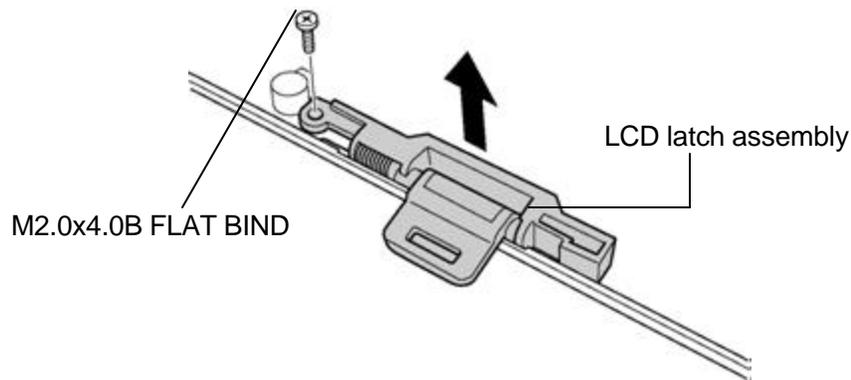


Figure 4-41 Removing the LCD latch assembly

### Installing the LCD latch assembly

The following describes the procedure for installing the LCD latch assembly. (See Figure 4-41.)

1. Install the **LCD latch assembly** and secure it with the following **screw**.

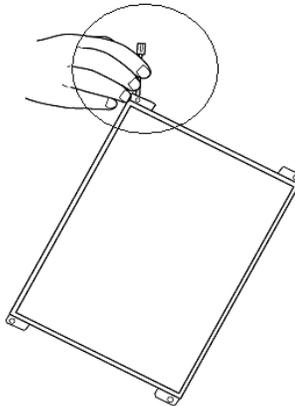
⚡ M2.0x4.0B FLAT BIND screw x1

## 4.28 Digitizer

**Caution:** Read following instructions before handling the Digitizer.

Do not carry the LCD module by holding the FL cable in one's hand because it may result to cut the FL cable, and cause display function failure or lighting failure.

**NO**

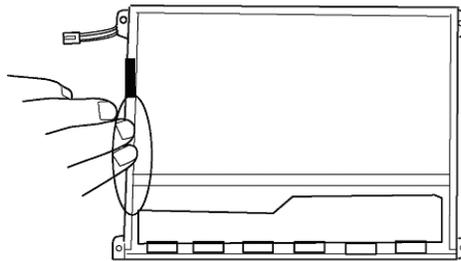


Do not carry the LCD module by holding the FL cable in one's hand.

Be careful to use the bezel guide.

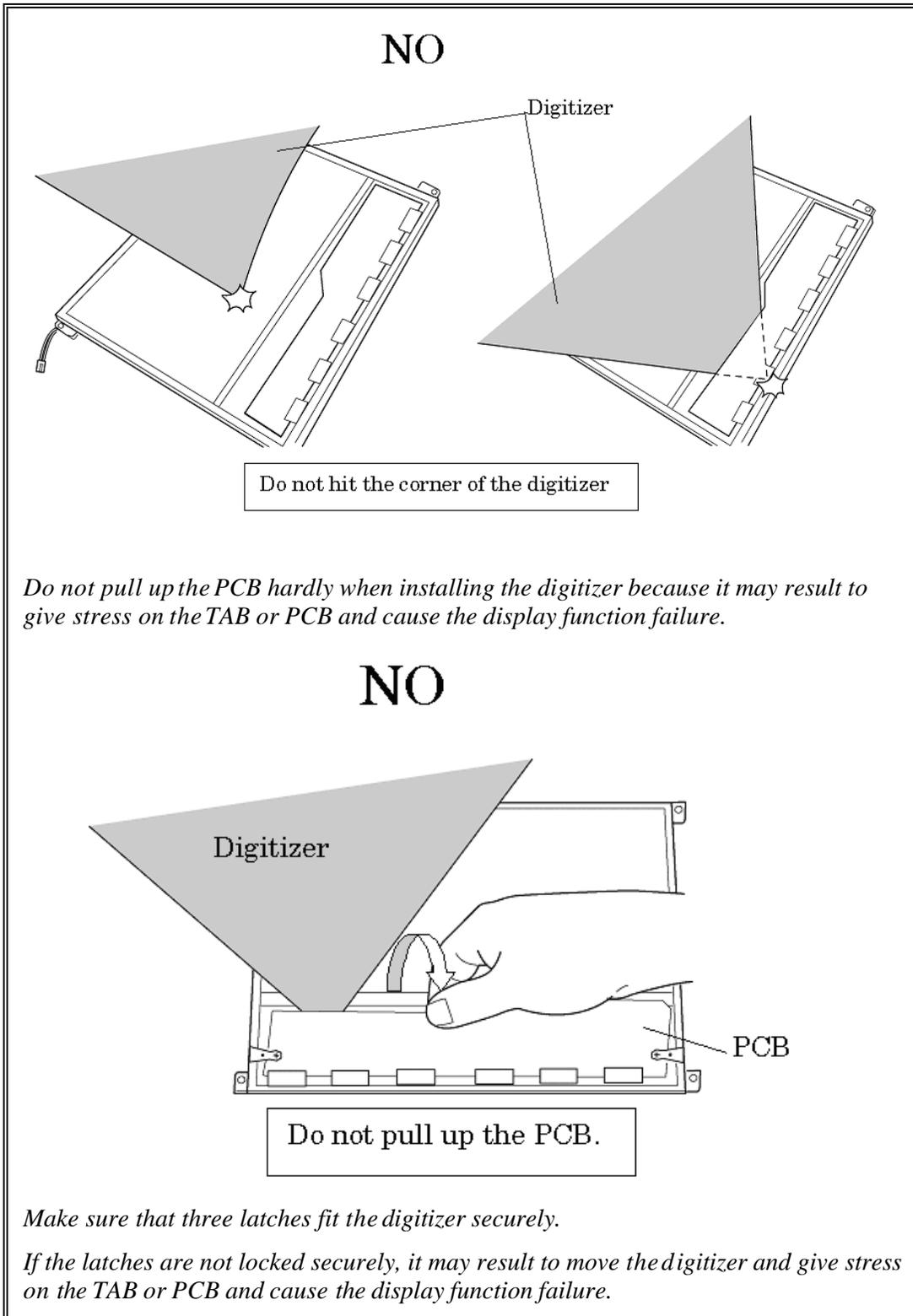
There is a portion where the bezel is sticking out because of the digitizer guide. Do not press and rub the portion with bare hands or it may result cut your finger.

**NO**

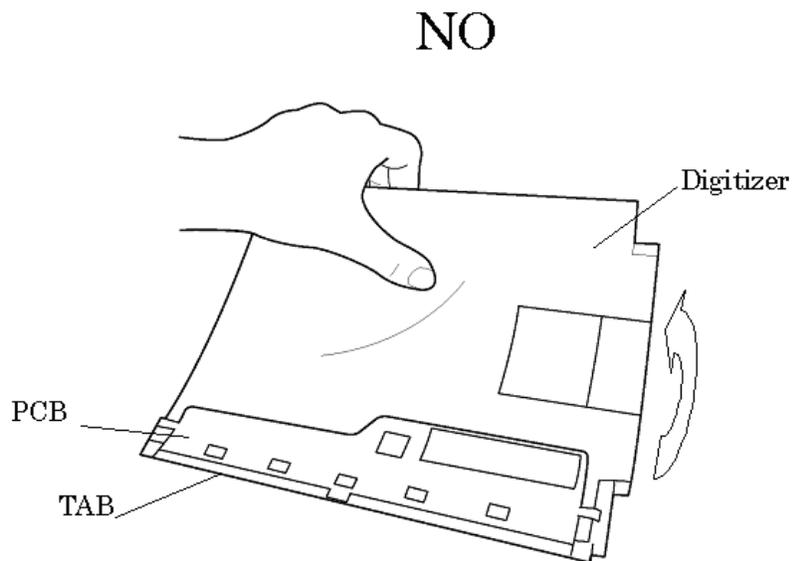


Be careful to use the bezel guide.

Do not make any scratches on the B/L and TAB by the edge of the digitizer when installing the digitizer because it may result to break the TAB or make scratches on the B/L and cause display function failure.

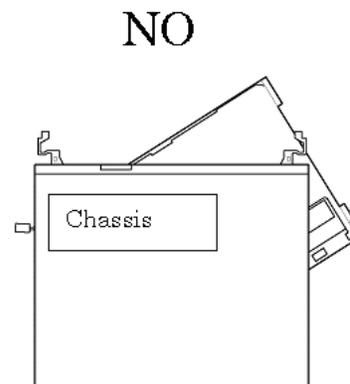


*Do not turn up the digitizer because it may result to give stress on the TAB or PCB and cause the display function failure.*

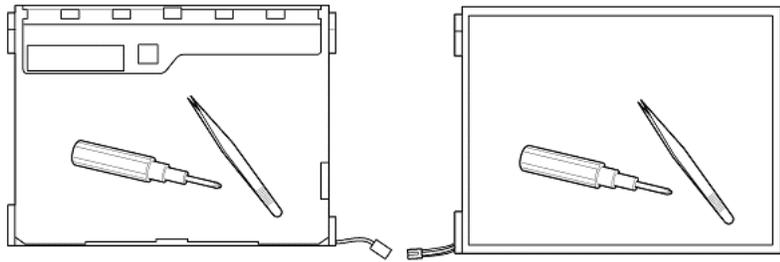


Do not turn up the digitizer to avoid the warp of the PCB.

*Do not put any instrument on the LCD module because it may result to make scratch on the cell, polarization sheet or B/L and break the TAB and may cause the display function failure.*



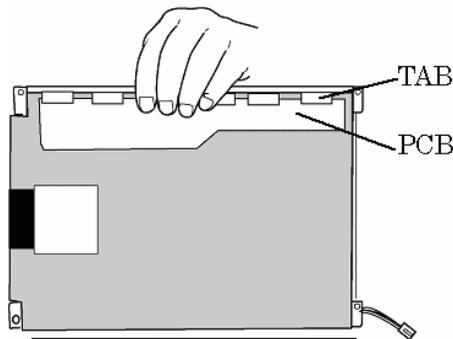
Do not put the chassis on the LCD.



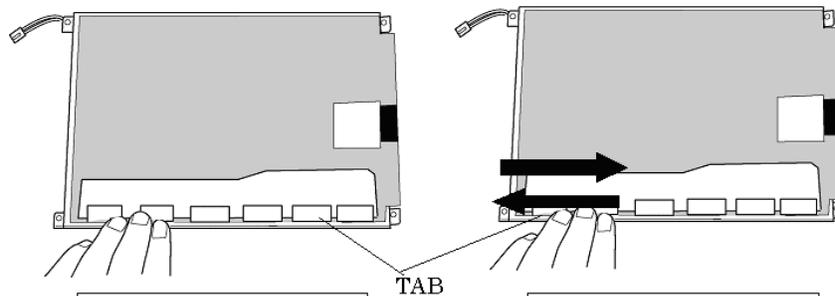
Do not put the instrument on the LCD.

*Do not hold, press and rub the TAB because it may result to break the TAB and cause the display function failure.*

**NO**



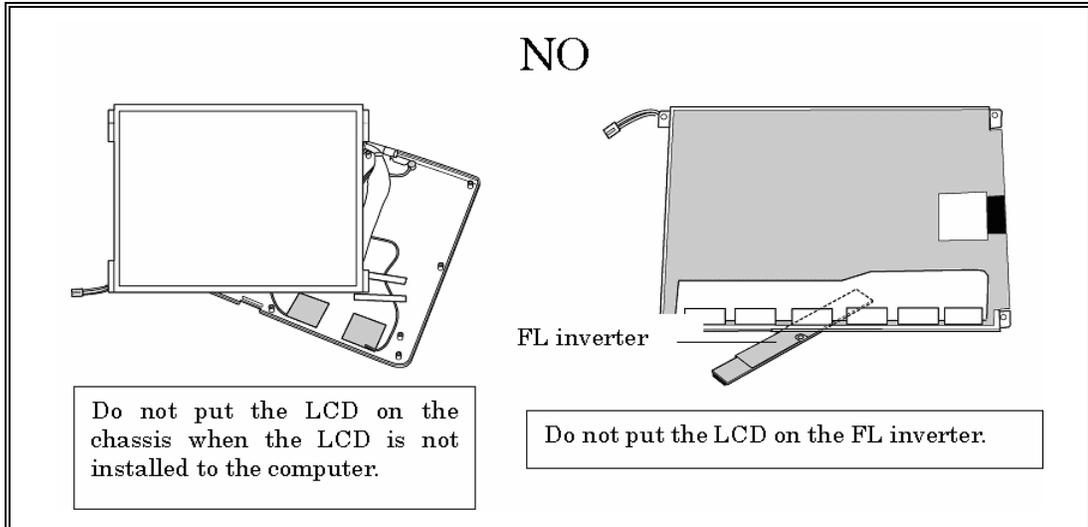
Do not hold the TAB.



Do not press the TAB.

Do not rub the TAB.

*Make sure to put the LCD module on the flat place. If the LCD module is put on the uneven place, it may result to break the TAB, make scratch on the B/L or polarization sheet and cause the display function failure.*



### Removing the Digitizer

The following describes the procedure for removing the digitizer. (See Figure 4-42.)

1. Remove the following **screws** securing the digitizer.

⚡ M2.0x3.0Z BIND screw x3

2. Slide out the **digitizer** toward the arrow pointing.

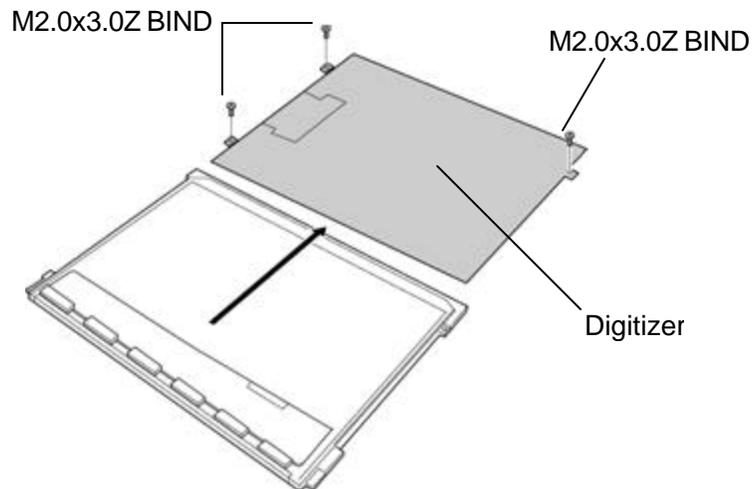


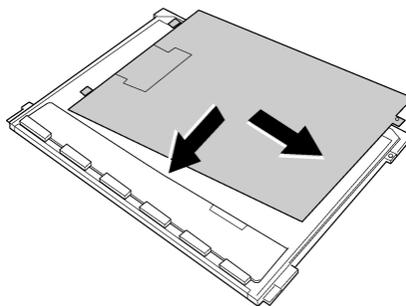
Figure 4-42 Removing the digitizer

### Installing the digitizer

The following describes the procedure for installing the digitizer. (See Figure 4-42.)

1. Slide the **digitizer** into the back pocket of LCD.

**Caution:** When replacing the digitizer, fit the digitizer into the back of LCD toward the arrow pointing.



2. Secure the digitizer with the following **screws**.

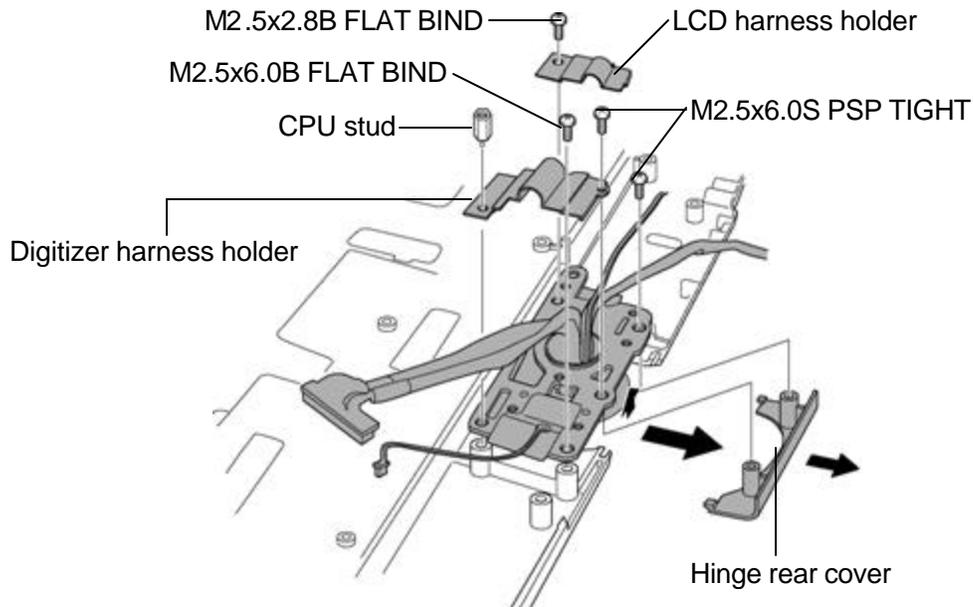
⚡ M2.0x3.0Z BIND screw x3

## **4.29 LCD/digitizer harness & Wireless LAN antenna cables**

### **Removing the LCD/digitizer harness & wireless LAN antenna cables**

The following describes the procedure for removing the LCD/digitizer harness & wireless LAN antenna cables. (See Figure 4-43 and 4-44.)

1. Pull out the **wireless LAN antenna cables** from the guide.
2. Remove the following **screws** and **LCD harness holder**
  - ✎ M2.5x2.8B FLAT BIND screw x1
3. Remove the following **screws** and **digitizer harness holder**.
  - ✎ Unique screw CPU stud screw x1
  - ✎ M2.5x6.0S PSP TIGHT screw x1
4. Remove the following **screws** securing the hinge assembly.
  - ✎ M2.5x6.0B FLAT BIND screw x1
  - ✎ M2.5x6.0S PSP TIGHT screw x1
5. Remove the **hinge rear cover** from the hinge assembly.
6. Detach the **cover assembly** from the display cover.



*Figure 4-43 Removing the cover assembly*

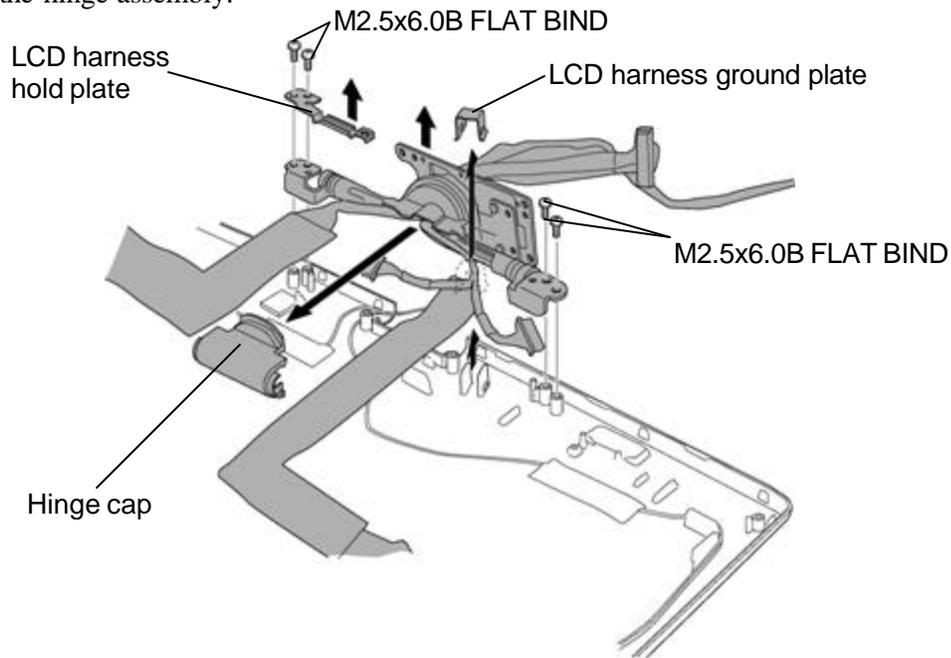
7. Remove the **LCD harness ground plate** from the display cover.
8. Remove the following **screws** and **LCD harness hold plate** from the display cover.

≈ M2.5x6.0B FLAT BIND screw x2

9. Remove the following **screws** securing the hinge assembly.

≈ M2.5x6.0B FLAT BIND screw x2

10. Detaching the **hinge assembly** from the display cover, remove the **hinge cap** from the hinge assembly.



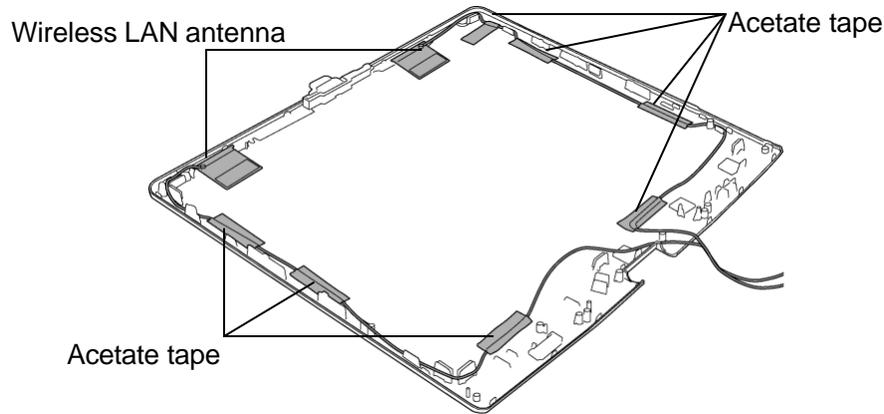
*Figure 4-44 Removing the hinge assembly*

11. Pull out the **LCD harness** through the hole of hinge assembly.
12. Pull out the **digitizer harness** through the hole of hinge assembly
13. Pull out the **wireless LAN antenna cables** through the hole of hinge assembly
14. Peel off the wireless LAN antennas and remove them from the display cover.

### **Installing the LCD/digitizer harness & wireless LAN antenna cables**

The following describes the procedure for installing the LCD/digitizer harness & wireless LAN antenna cables. (See Figure 4-43 and 4-45.)

1. Stick the **wireless LAN antennas** on the display cover and arrange their cables.
2. Stick the **acetate tape** (5 points) on the display cover.



*Figure 4-45 Arranging the wireless LAN antenna cables*

3. Pass the **LCD harness** through the hole of hinge assembly.
4. Pass the **digitizer harness** through the hole of hinge assembly.
5. Pass the **wireless LAN antenna cables** through the hole of hinge assembly.
6. Installing the **hinge cap** to the hinge assembly, secure the hinge assembly to the display cover with the following **screws**.

⚡ M2.5x6.0B FLAT BIND screw x2

**Caution:** Before installing the hinge cap, confirm the right arrangement of each harnesses and cables.

7. Arranging the **LCD harness** on the display cover, secure the **LCD harness ground plate** with the following **screws**.

⚡ M2.5x6.0B FLAT BIND screw x2

8. Arranging the **digitizer harness** on the display cover, install the **digitizer harness hold plate**.
9. Install the **cover assembly** and **hinge rear cover** to the display cover.

10. Secure the cover assembly to the hinge assembly with the following **screws**.

|   |           |                 |    |
|---|-----------|-----------------|----|
| ⌘ | M2.5x6.0B | FLAT BIND screw | x1 |
| ⌘ | M2.5x6.0S | PSP TIGHT screw | x1 |
  
11. Install the **digitizer harness holder** to the hinge assembly and secure it with the following **screws**.

|   |           |                 |    |
|---|-----------|-----------------|----|
| ⌘ | M2.5x6.0B | FLAT BIND screw | x1 |
| ⌘ | M2.5x6.0S | PSP TIGHT screw | x1 |
  
12. Install the **LCD harness holder** to the hinge assembly and secure it with the following **screws**

|   |           |                 |    |
|---|-----------|-----------------|----|
| ⌘ | M2.5x2.8B | FLAT BIND screw | x1 |
|---|-----------|-----------------|----|
  
13. Arrange the **wireless LAN antenna cables** along the guide of cover assembly.

## 4.30 Hinge Switch Board

### Removing the hinge switch board

The following describes the procedure for removing the hinge switch board. (See Figure 4-46.)

1. Remove the following **screws** and **hinge switch board**.

⚡ M2.0x3.0B FLAT BIND screw x2

2. Remove the plate placed under the hinge switch board.

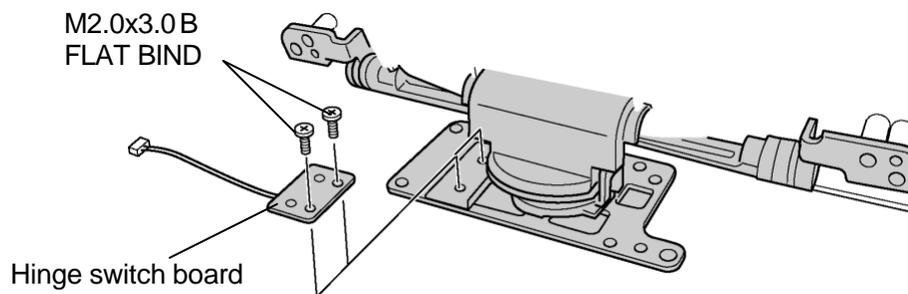


Figure 4-46 Removing the hinge switch board

### Installing the hinge switch board

The following describes the procedure for installing hinge switch board. (See Figure 4-46.)

1. Install the plate fitting to the bosses on the hinge assembly.
2. Install the hinge switch board and secure it with the following **screws**.

⚡ M2.0x3.0B FLAT BIND screw x2

### 4.31 Fluorescent Lamp

This system uses LCD modules from the following suppliers. The procedure for replacing the fluorescent lamp is different for each LCD module. Refer to the appropriate procedure.

| Type      | Part. No     | Supplier | Section |
|-----------|--------------|----------|---------|
| 14.1 inch | G33C0002J110 | CMO      | 4.31.1  |

**Note:** - When working with an LCD module, always use a flat, grounded table.

- Handle the backlight unit in the environment without dust, such as on the clean bench. Keep the work table free from any screws or other material that may scratch the LCD surface.
- Use an anti-static or protective sheet.
- When replacing the FL unit, cover with a finger protector or similar to prevent dirtying or scratching the LCD panel.
- Take care when handling the lamp. Excessive force may break the lamp.
- Take care not to dirty or deform the lamp reflector.
- Ensure always that the power of the LCD module is turned off before connecting or disconnecting cables and connectors.

### 4.31.1 Replacing the 14.1 inch CMO-made Fluorescent Lamp

#### Disassembling the fluorescent lamp

The following describes the procedure for replacing the fluorescent lamp. (See Figure 4-47 to 4-53.)

1. Peel off the **CU tape** and **protector film** from the LCD unit.

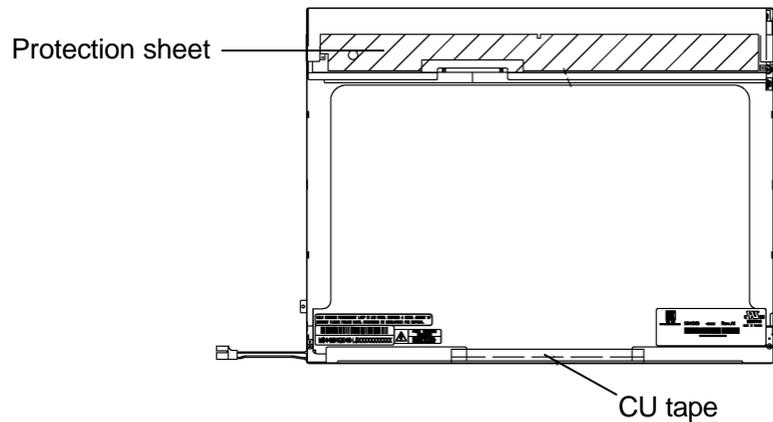


Figure 4-47 Replacing CMO fluorescent lamp (1)

2. Peel off the **CU tapes** (2 sheets) from the LCD unit.

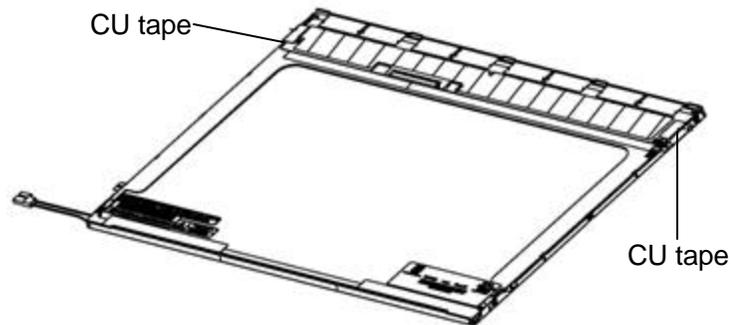


Figure 4-48 Replacing CMO fluorescent lamp (2)

3. Remove the **screws** (6 screws) securing the metal frame.

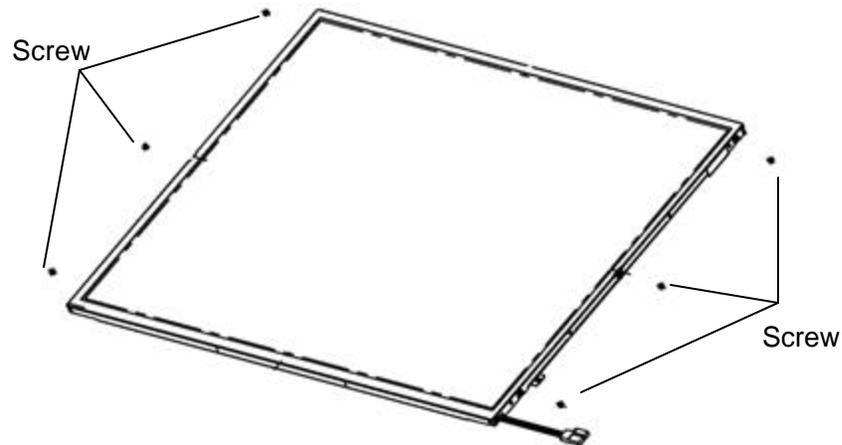


Figure 4-49 Replacing CMO fluorescent lamp (3)

4. Release the **hooks** of metal frame from the upper side and remove the **metal frame** from the LCD unit.

**NOTE:** When removing the hooks, be careful not to bend the metal frame.

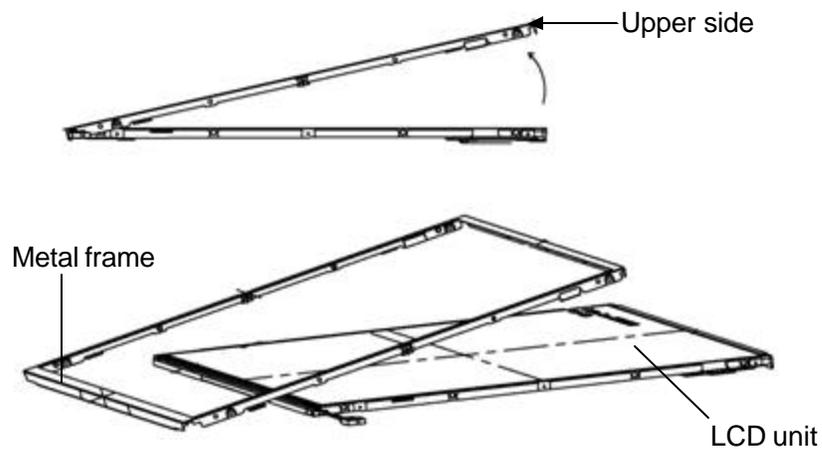


Figure 4-50 Replacing CMO fluorescent lamp (4)

5. Open the **panel PCB** and remove the **panel** from the back light unit.

**NOTE:** When removing the panel, be careful not to deform the panel PCB.

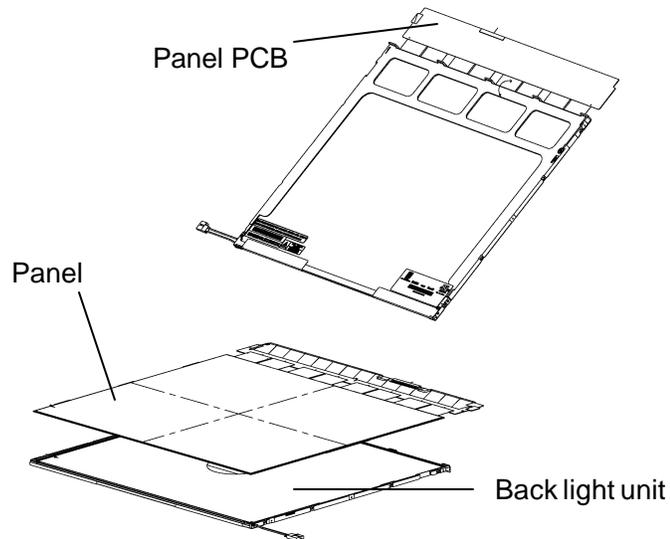


Figure 4-51 Replacing CMO fluorescent lamp (5)

6. Detaching the **spacers** (5 points), remove the **tapes** (3 tapes), **lens (M)**, **lens (T)**, **diffuser sheet**, **light guide sheet**, **reflection sheet** and **mold frame**.

**NOTE:** When removing the sheets, be careful not to damage them.

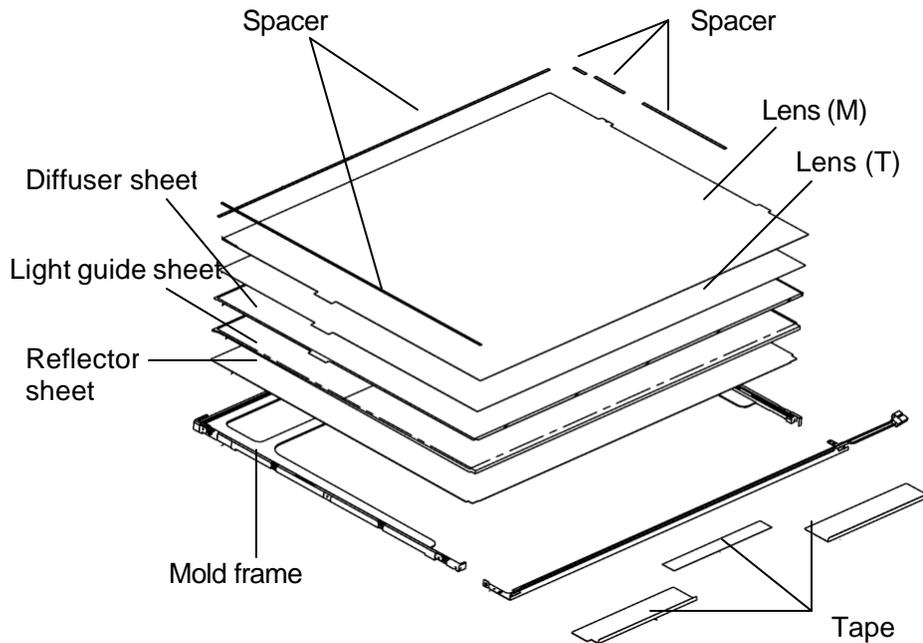
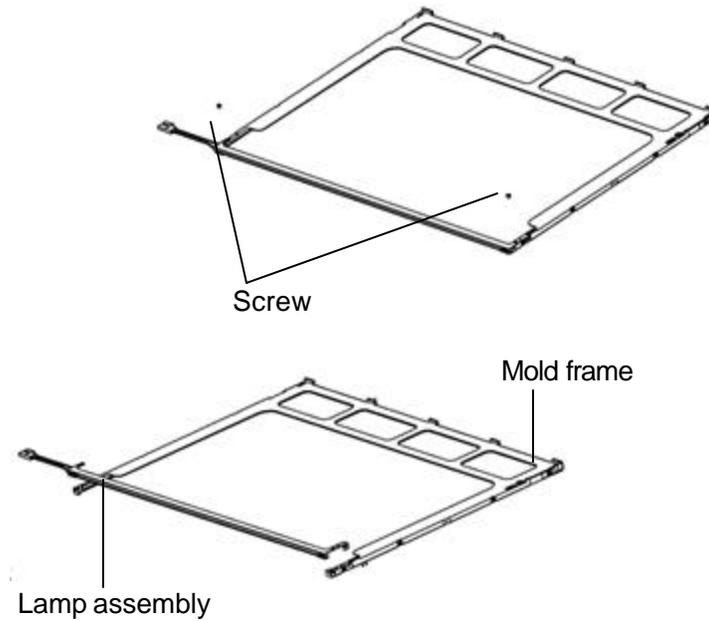


Figure 4-52 Replacing CMO fluorescent lamp (6)

7. Remove the **screws** (2 screws) and detach the **lamp assembly** from the mold frame.



*Figure 4-53 Replacing CMO fluorescent lamp (7)*

### **Assembling the fluorescent lamp**

For the assembling fluorescent lamp, refer to the reverse procedure of 14.1-inch CMO fluorescent lamp.



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# Appendices

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## Appendix Contents

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**Appendix A Handling the LCD Module.....A-1**

**Appendix B Board Layout.....B-1**

B.1 System Board Front View.....B-1

B.2 System Board Back View .....B-3

B.3 CN Board Front and Back View .....B-5

B.4 QI Board Front and Back View .....B-6

B.5 SW Board Front and Back View .....B-7

B.6 HD Board Front View.....B-8

**Appendix C Pin Assignment .....C-1**

### System Board

C.1 CN1420 Memory 1 connector (200-pin) ..... C-1

C.2 CN1440 Memory 2 connector (200-pin) ..... C-4

C.3 CN5501 LCD connector (20-pin) ..... C-7

C.4 CN4610 USB 1 connector (Port0) (4-pin) ..... C-7

C.5 CN4611 USB 2 connector (Port3) (4-pin) ..... C-7

C.6 CN4612 USB 3 connector (Port5) (6-pin) ..... C-8

C.7 CN3400 Debug port connector (4-pin) ..... C-8

C.8 CN1800 HDD I/F connector (50-pin) ..... C-9

C.9 IS2110 PC card I/F connector (70-pin)..... C-10

C.10 CN3200 Keyboard connector (34-pin) ..... C-11

C.11 CN3201 PAD connector (8-pin) ..... C-12

C.12 CN3280 Panel sensor connector (3-pin) ..... C-12

C.13 J4100 Network I/F connector (14-pin) ..... C-12

C.14 CN9991 Mini PCI I/F connector (124-pin) ..... C-13

C.15 CN8800 DC-IN connector (4-pin) ..... C-15

C.16 CN8810 1st battery connector (10-pin) ..... C-15

|          |        |                                               |      |
|----------|--------|-----------------------------------------------|------|
| C.17     | CN8760 | RTC battery connector (3-pin)                 | C-15 |
| C.18     | CN8770 | FAN connector (3-pin)                         | C-15 |
| C.19     | CN6150 | Speaker connector (4-pin)                     | C-16 |
| C.20     | J6070  | External microphone connector (6-pin)         | C-16 |
| C.21     | CN6060 | Internal microphone (left) connector (2-pin)  | C-16 |
| C.22     | CN6061 | Internal microphone (right) connector (2-pin) | C-16 |
| C.23     | J6310  | Headphone connector (6-pin)                   | C-17 |
| C.24     | IS2130 | SD card I/F connector (12-pin)                | C-17 |
| C.25     | CN3000 | MDC I/F connector (30-pin)                    | C-18 |
| C.26     | CN3001 | RJ11 connector (2-pin)                        | C-18 |
| C.27     | CN2300 | Docking I/F connector (240-pin)               | C-19 |
| C.28     | CN9540 | Digitizer switch I/F connector (40-pin)       | C-23 |
| C.29     | CN1801 | Selectable bay I/F connector (72-pin)         | C-24 |
| C.30     | CN4200 | IEEE1394 connector (4-pin)                    | C-25 |
| C.31     | CN9502 | CN board I/F connector (40-pin)               | C-26 |
| CN Board |        |                                               |      |
| C.32     | CN4621 | USB I/F connector 1 (6-pin)                   | C-27 |
| C.33     | CN4620 | USB I/F connector 2 (4-pin)                   | C-27 |
| C.34     | CN5320 | CRT I/F connector (15-pin)                    | C-27 |
| C.35     | CN5340 | S-VIDEO I/F connector (4-pin)                 | C-28 |
| C.36     | CN9520 | System board I/F connector (40-pin)           | C-28 |
| C.37     | CN9521 | QI board I/F connector (2-pin)                | C-29 |
| QI Board |        |                                               |      |
| C.38     | CN9530 | CN board I/F connector (2-pin)                | C-30 |
| SW Board |        |                                               |      |
| C.39     | CN9510 | System board I/F connector (12-pin)           | C-30 |
| HD Board |        |                                               |      |
| C.40     | CN9600 | System board I/F connector (50-pin)           | C-31 |
| C.41     | CN9610 | HDD I/F connector (44-pin)                    | C-32 |

**Appendix D Keyboard Scan/Character Codes..... D-1**

**Appendix E Key Layout .....E-1**

**Appendix F Wiring Diagrames..... F-1**

**Appendix G BIOS Rewrite Procedures ..... G-1**

**Appendix H EC/KBC Rewrite Procedures ..... H-1**

**Appendix I Reliability .....I-1**

**Figures**

|            |                                      |     |
|------------|--------------------------------------|-----|
| Figure B-1 | System board layout (front) .....    | B-1 |
| Figure B-2 | System board layout (back) .....     | B-3 |
| Figure B-3 | CN board layout .....                | B-5 |
| Figure B-4 | QI board layout .....                | B-6 |
| Figure B-5 | SW board layout.....                 | B-7 |
| Figure B-6 | HD board layout.....                 | B-8 |
|            |                                      |     |
| Figure E-1 | Key layout (UK).....                 | E-1 |
| Figure E-2 | Key layout (US) .....                | E-1 |
|            |                                      |     |
| Figure F-1 | LAN Loopback Connector.....          | F-1 |
| Figure F-2 | RS-232C Cable (9-pin to 9-pin).....  | F-1 |
| Figure F-3 | RS-232C Cable (9-pin to 25-pin)..... | F-2 |

---

**Tables**

|           |                            |     |
|-----------|----------------------------|-----|
| Table B-1 | System board (front) ..... | B-2 |
| Table B-2 | System board (back).....   | B-4 |
| Table B-3 | CN board.....              | B-5 |
| Table B-4 | QI board .....             | B-6 |
| Table B-5 | SW board.....              | B-7 |
| Table B-6 | HD board.....              | B-8 |

## System board

|            |                                                            |      |
|------------|------------------------------------------------------------|------|
| Table C-1  | CN1420 Memory 1 connector (200-pin) .....                  | C-1  |
| Table C-2  | CN1440 Memory 2 connector (200-pin) .....                  | C-4  |
| Table C-3  | CN5501 LCD connector (20-pin) .....                        | C-7  |
| Table C-4  | CN4610 USB 1 connector (Port0) (4-pin) .....               | C-7  |
| Table C-5  | CN4611 USB 2 connector (Port3) (4-pin) .....               | C-7  |
| Table C-6  | CN4612 USB 3 connector (Port5) (6-pin) .....               | C-8  |
| Table C-7  | CN3400 Debug port connector (4-pin) .....                  | C-8  |
| Table C-8  | CN1800 HDD I/F connector (50-pin).....                     | C-9  |
| Table C-9  | IS2110 PC card I/F connector (70-pin).....                 | C-10 |
| Table C-10 | CN3200 Keyboard connector (34-pin) .....                   | C-11 |
| Table C-11 | CN3201 PAD connector (8-pin) .....                         | C-12 |
| Table C-12 | CN3280 Panel sensor connector (3-pin) .....                | C-12 |
| Table C-13 | J4100 Network I/F connector (14-pin) .....                 | C-12 |
| Table C-14 | CN9991 Mini PCI I/F connector (124-pin) .....              | C-13 |
| Table C-15 | CN8800 DC-IN connector (4-pin).....                        | C-15 |
| Table C-16 | CN8810 1st battery connector (10-pin) .....                | C-15 |
| Table C-17 | CN8760 RTC battery connector (3-pin) .....                 | C-15 |
| Table C-18 | CN8770 FAN connector (3-pin) .....                         | C-15 |
| Table C-19 | CN6150 Speaker connector (4-pin) .....                     | C-16 |
| Table C-20 | J6070 External microphone connector (6-pin) .....          | C-16 |
| Table C-21 | CN6060 Internal microphone (left) connector (2-pin).....   | C-16 |
| Table C-22 | CN6061 Internal microphone (right) connector (2-pin) ..... | C-16 |

|            |                                                     |      |
|------------|-----------------------------------------------------|------|
| Table C-23 | J6310 Headphone connector (6-pin).....              | C-17 |
| Table C-24 | IS2130 SD card I/F connector (12-pin) .....         | C-17 |
| Table C-25 | CN3000 MDC I/F connector (30-pin) .....             | C-18 |
| Table C-26 | CN3001 RJ11 connector (2-pin).....                  | C-18 |
| Table C-27 | CN2300 Docking I/F connector (240-pin).....         | C-19 |
| Table C-28 | CN9540 Digitizer switch I/F connector (40-pin)..... | C-23 |
| Table C-29 | CN1801 Selectable bay I/F connector (72-pin) .....  | C-24 |
| Table C-30 | CN4200 IEEE1394 connector (4-pin) .....             | C-25 |
| Table C-31 | CN9502 CN board I/F connector (40-pin).....         | C-26 |

CN Board

|            |                                                 |      |
|------------|-------------------------------------------------|------|
| Table C-32 | CN4621 USB I/F connector 1 (6-pin).....         | C-27 |
| Table C-33 | CN4620 USB I/F connector 2 (4-pin).....         | C-27 |
| Table C-34 | CN5320 CRT I/F connector (15-pin).....          | C-27 |
| Table C-35 | CN5340 S-VIDEO I/F connector (4-pin) .....      | C-28 |
| Table C-36 | CN9520 System board I/F connector (40-pin)..... | C-28 |
| Table C-37 | CN9521 QI board I/F connector (2-pin) .....     | C-29 |

QI Board

|            |                                            |      |
|------------|--------------------------------------------|------|
| Table C-38 | CN9530 CN board I/F connector (2-pin)..... | C-30 |
|------------|--------------------------------------------|------|

SW Board

|            |                                                 |      |
|------------|-------------------------------------------------|------|
| Table C-39 | CN9510 System board I/F connector (12-pin)..... | C-30 |
|------------|-------------------------------------------------|------|

HD Board

|            |                                                 |      |
|------------|-------------------------------------------------|------|
| Table C-40 | CN9600 System board I/F connector (50-pin)..... | C-31 |
| Table C-41 | CN9610 HDD I/F connector (44-pin).....          | C-32 |

|           |                  |     |
|-----------|------------------|-----|
| Table D-1 | Scan codes ..... | D-1 |
|-----------|------------------|-----|

|           |                                     |     |
|-----------|-------------------------------------|-----|
| Table D-2 | Scan codes with left Shift key..... | D-5 |
|-----------|-------------------------------------|-----|

|           |                                  |     |
|-----------|----------------------------------|-----|
| Table D-3 | Scan codes in Numlock mode ..... | D-6 |
| Table D-4 | Scan codes with Fn key.....      | D-6 |
| Table D-5 | Scan codes in overlay mode.....  | D-7 |
| Table D-6 | No. 124 Key scan code .....      | D-7 |
| Table D-7 | No. 126 Key scan code .....      | D-8 |
| Table G-1 | MTBF .....                       | G-1 |



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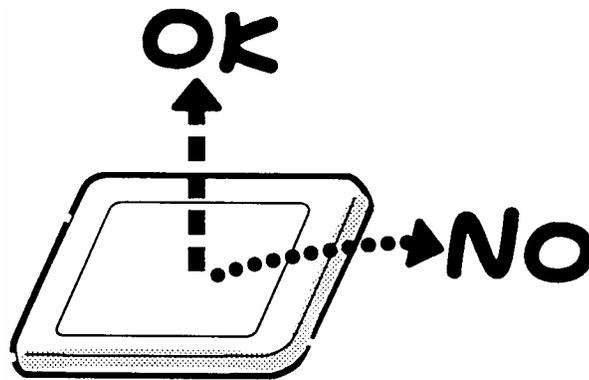
## Appendix A Handling the LCD Module

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### Precautions for handling the LCD module

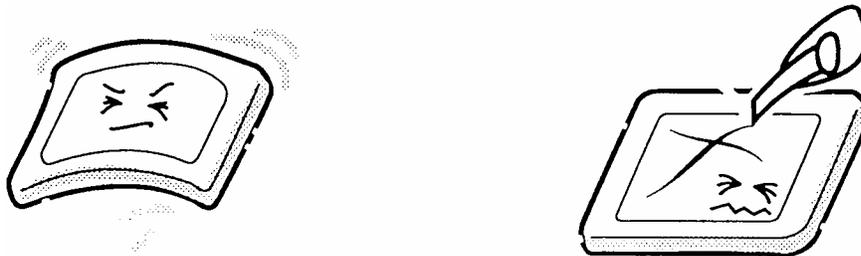
The LCD module can be easily damaged during assembly or disassembly. Observe the following precautions when handling the LCD module:

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.



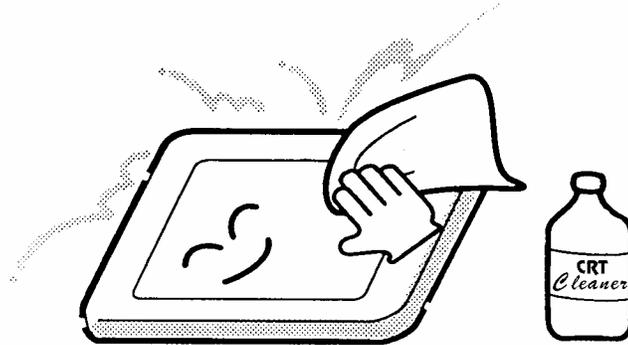
2. Be careful to align the holes at the four corners of the LCD module with the corresponding holes in the LCD cover before securing the module with screws. Do not force the module into place, because stress can affect its performance.

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.

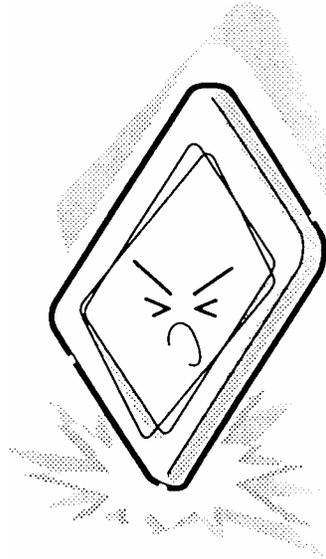
If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.



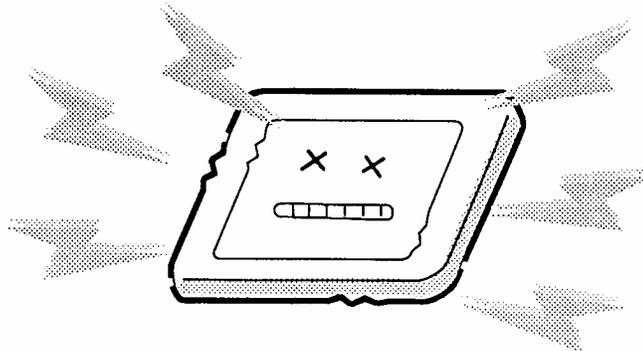
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.



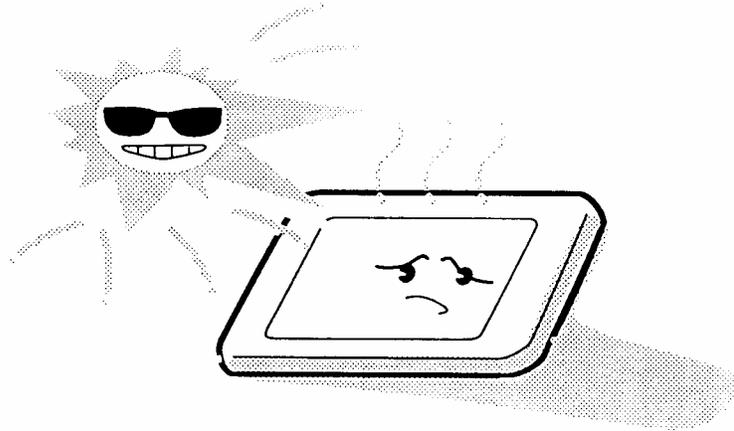
5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



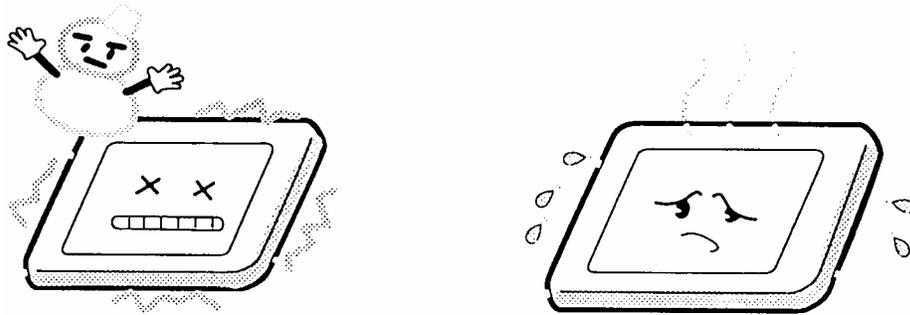
6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle ground when handling the module.



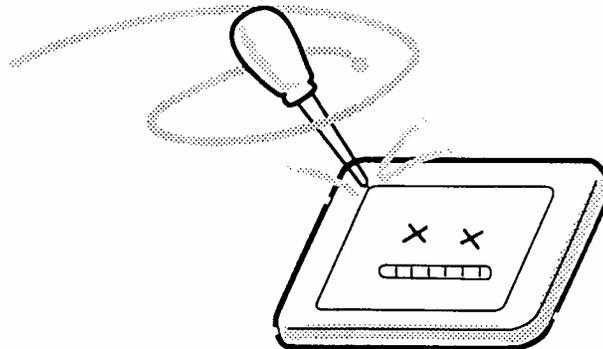
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.



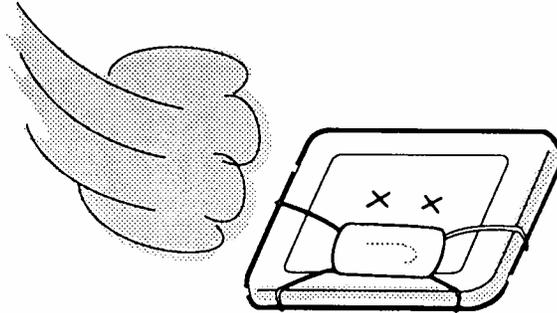
8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



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 oxime). These materials can release gas that can damage the panel's polarization.





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# Appendix B Board Layout

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## B.1 System Board Front View

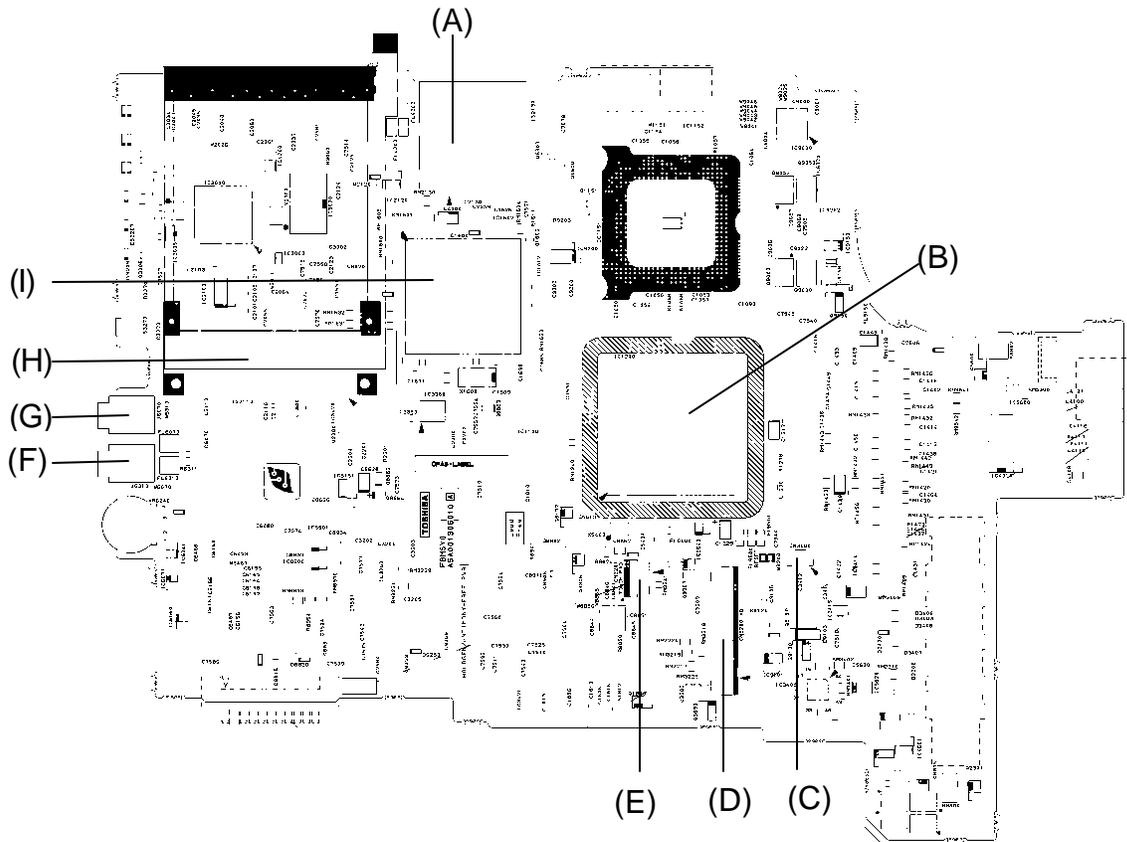


Figure B-1 System board layout (front)

*Table B-1 System board (front)*

| <b>Mark</b> | <b>Number</b> | <b>Part's name</b>            |
|-------------|---------------|-------------------------------|
| (A)         | IS2130        | SD card slot                  |
| (B)         | IC1200        | Montara-GM+                   |
| (C)         | CN3400        | Debug port (D port) connector |
| (D)         | CN3200        | Keyboard connector            |
| (E)         | CN3201        | Touch pad connector           |
| (F)         | J6310         | Headphone jack                |
| (G)         | J6070         | External microphone jack      |
| (H)         | IS2110        | PC card connector             |
| (I)         | IC1600        | ICH4-M                        |

## B.2 System board Back View

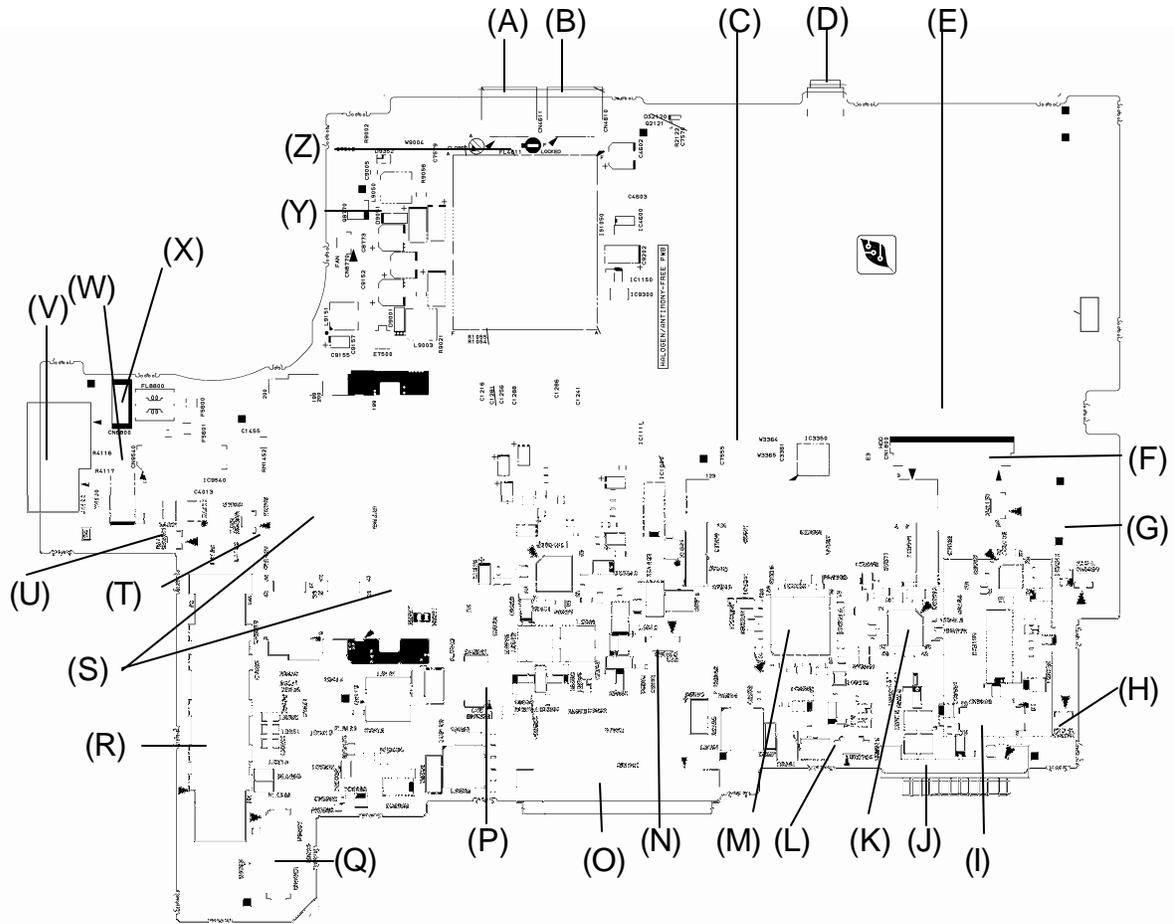


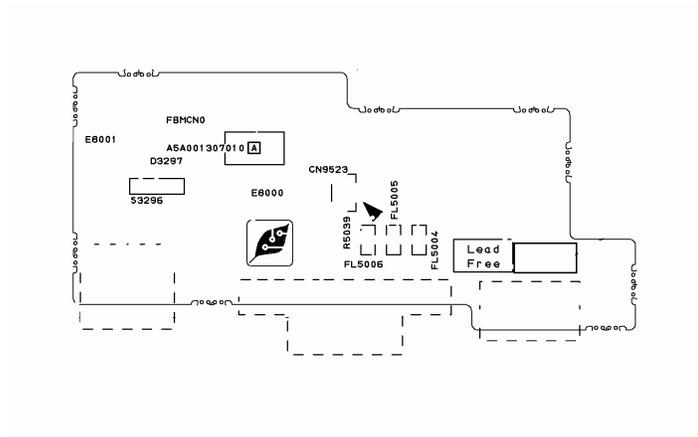
Figure B-2 System board layout (back)

Table B-2 System board (back)

| Mark | Number         | Name                                  |
|------|----------------|---------------------------------------|
| (A)  | CN4611         | USB connector 2                       |
| (B)  | CN4610         | USB connector 1                       |
| (C)  | CN9991         | Mini PCI connector                    |
| (D)  | CN4200         | IEEE1394 connector                    |
| (E)  | CN1800         | HDD I/F connector                     |
| (F)  | CN6150         | Speaker connector                     |
| (G)  | CN6060         | Internal microphone (left) connector  |
| (H)  | CN6061         | Internal microphone (right) connector |
| (I)  | CN3000         | MDC connector                         |
| (J)  | CN8810         | Battery connector                     |
| (K)  | IC8972         | PSC                                   |
| (L)  | CN8760         | RTC battery connector                 |
| (M)  | IC3200         | EC/KBC                                |
| (N)  | CN4612         | USB connector 3                       |
| (O)  | CN1801         | Selectable bay connector              |
| (P)  | CN5501         | LCD connector                         |
| (Q)  | CN9502         | CN board I/F connector                |
| (R)  | CN2300         | Docking connector                     |
| (S)  | CN1420, CN1440 | Memory connector                      |
| (T)  | CN3280         | Panel sensor connector                |
| (U)  | CN3001         | RJ11 relay connector                  |
| (V)  | J4100          | Network jack                          |
| (W)  | CN9540         | Digitizer connector                   |
| (X)  | CN8800         | DC IN connector                       |
| (Y)  | CN8770         | FAN connector                         |
| (Z)  | IS1050         | CPU                                   |

### B.3 CN Board Front and Back View

<Front layout>



<Back layout>

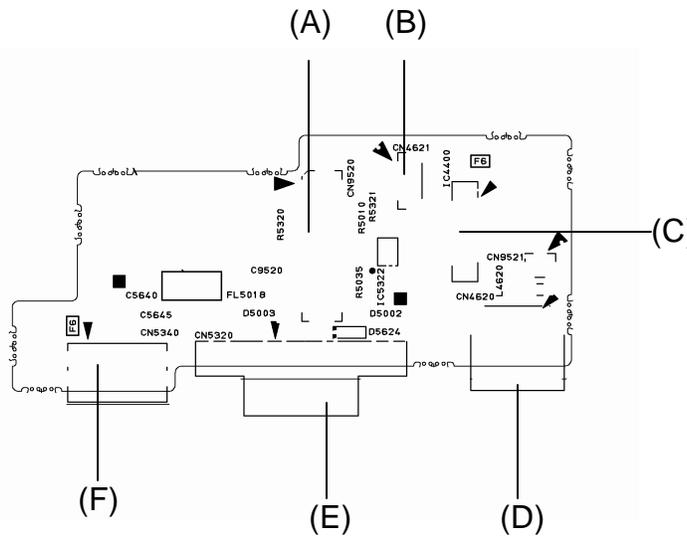


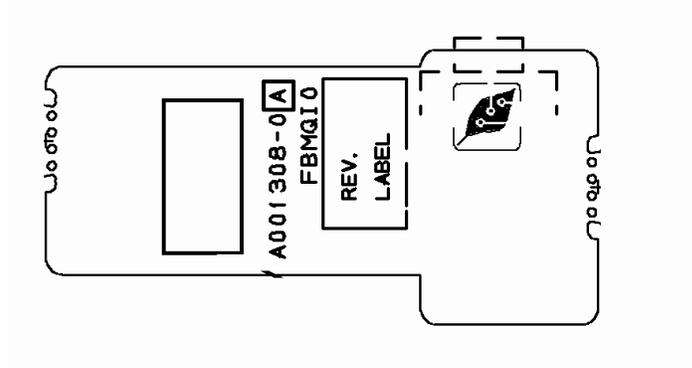
Figure B-3 CN board layout

Table B-3 CN Board

| Mark | Number | Name                       |
|------|--------|----------------------------|
| (A)  | CN9520 | System board I/F connector |
| (B)  | CN4621 | USB 1 relay connector      |
| (C)  | CN9521 | QI board I/F connector     |
| (D)  | CN4620 | USB 2 connector            |
| (E)  | CN5320 | CRT connector              |
| (F)  | CN5340 | S-VIDEO connector          |

### B.4 QI Board Front and Back View

<Front layout>



<Back layout>

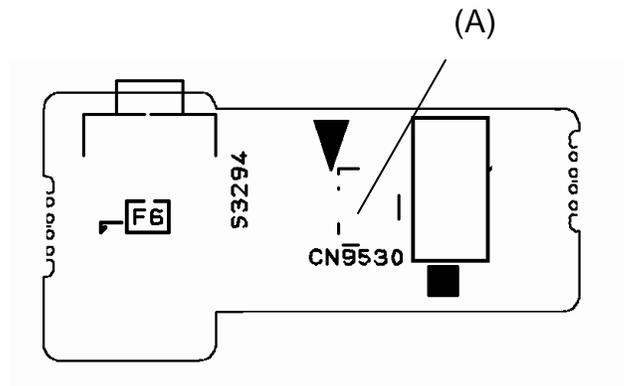


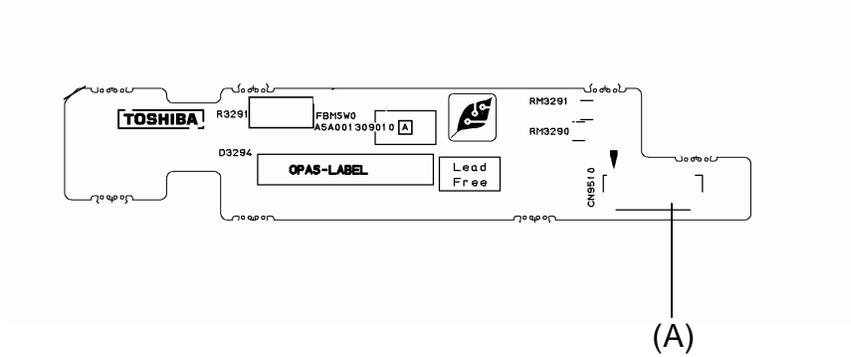
Figure B-4 QI Board layout

Table B-4 QI Board

| Mark | Number | Name                   |
|------|--------|------------------------|
| (A)  | CN9530 | CN board I/F connector |

## B.5 SW Board Front and Back View

### <Front layout>



### <Back layout>

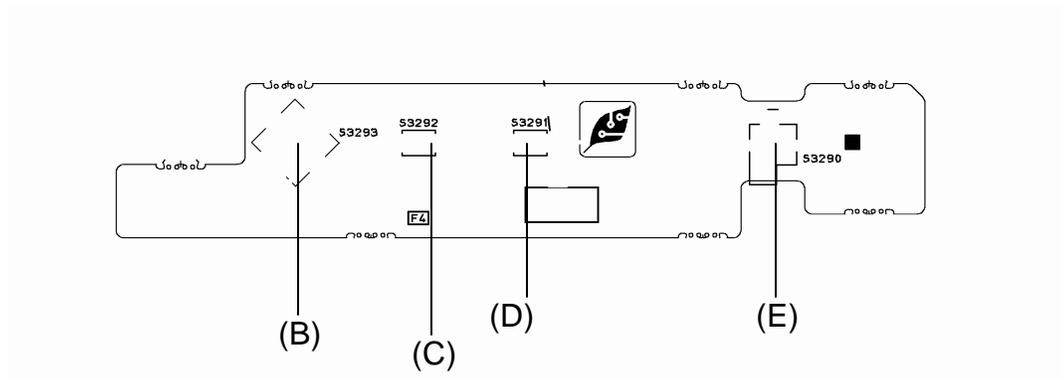


Figure B-5 SW Board layout

Table B-5 SW Board

| Mark | Number | Name                       |
|------|--------|----------------------------|
| (A)  | CN9510 | System board I/F connector |
| (B)  | S3293  | Direction button           |
| (C)  | S3292  | ESC button                 |
| (D)  | S3291  | SAS button                 |
| (E)  | S3290  | POWER-ON switch            |

**B.6 HD Board**

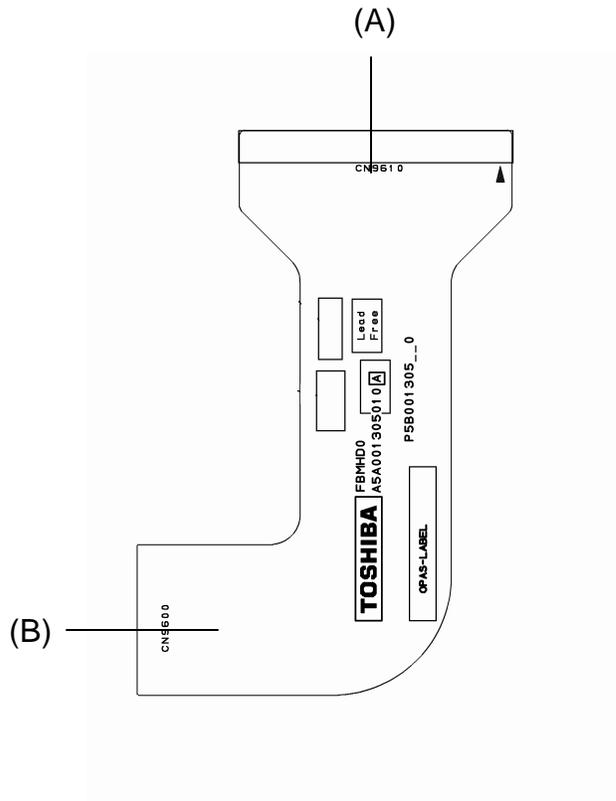


Figure B-6 HD Board layout

Table B-6 HD Board

| Mark | Number | Name                       |
|------|--------|----------------------------|
| (A)  | CN9610 | HDD I/F connector          |
| (B)  | CN9600 | System board I/F connector |

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## Appendix C Pin Assignment

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### System Board

#### C.1 CN1420 Memory 1 connector (200-pin)

Table C-1 Memory 1 connector (200-pin) (1/3)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | MR1R25-B1V  | I   | 2       | MRVREF-B1V  | I   |
| 3       | GND         | -   | 4       | GND         | -   |
| 5       | SDQ05-B2P   | I/O | 6       | SDQ04-B2P   | I/O |
| 7       | SDQ01-B2P   | I/O | 8       | SDQ00-B2P   | I/O |
| 9       | 2R5-B2V     | I   | 10      | 2R5-B2V     | I   |
| 11      | SDQS0-B2P   | I/O | 12      | SDM00-B2P   | I   |
| 13      | SDQ03-B2P   | I/O | 14      | SDQ07-B2P   | I/O |
| 15      | GND         | -   | 16      | GND         | -   |
| 17      | SDQ02-B2P   | I/O | 18      | SDQ06-B2P   | I/O |
| 19      | SDQ15-B2P   | I/O | 20      | SDQ09-B2P   | I/O |
| 21      | 2R5-B2V     | I   | 22      | 2R5-B2V     | I   |
| 23      | SDQ12-B2P   | I/O | 24      | SDQ13-B2P   | I/O |
| 25      | SDQS1-B2P   | I/O | 26      | SDM01-B2P   | I   |
| 27      | GND         | -   | 28      | GND         | -   |
| 29      | SDQ11-B2P   | I/O | 30      | SDQ08-B2P   | I/O |
| 31      | SDQ10-B2P   | I/O | 32      | SDQ14-B2P   | I/O |
| 33      | 2R5-B2V     | I   | 34      | 2R5-B2V     | I   |
| 35      | SCK0-B2P    | I   | 36      | 2R5-B2V     | I   |
| 37      | SCK0-B2N    | I   | 38      | GND         | -   |
| 39      | GND         | -   | 40      | GND         | -   |
| 41      | SDQ16-B2P   | I/O | 42      | SDQ20-B2P   | I/O |
| 43      | SDQ17-B2P   | I/O | 44      | SDQ21-B2P   | I/O |
| 45      | 2R5-B2V     | I   | 46      | 2R5-B2V     | I   |
| 47      | SDQS2-B2P   | I/O | 48      | SDM02-B2P   | I/O |
| 49      | SDQ19-B2P   | I/O | 50      | SDQ23-B2P   | I/O |
| 51      | GND         | -   | 52      | GND         | -   |
| 53      | SDQ18-B2P   | I/O | 54      | SDQ22-B2P   | I/O |
| 55      | SDQ24-B2P   | I/O | 56      | SDQ25-B2P   | I/O |

Table C-1 Memory 1 connector (200-pin)(2/3)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 57      | 2R5-B2V     | I   | 58      | 2R5-B2V     | I   |
| 59      | SDQ28-B2P   | I/O | 60      | SDQ29-B2P   | I/O |
| 61      | SDQS3R-B2P  | I/O | 62      | SDM03-B2P   | I   |
| 63      | GND         | -   | 64      | GND         | -   |
| 65      | SDQ26-B2P   | I/O | 66      | SDQ27-B2P   | I/O |
| 67      | SDQ30-B2P   | I/O | 68      | SDQ31-B2P   | I/O |
| 69      | 2R5-B2V     | I   | 70      | 2R5-B2V     | I   |
| 71      | SCB5A-B2P   | I/O | 72      | SCB0A-B2P   | I/O |
| 73      | SCB4A-B2P   | I/O | 74      | SCB1A-B2P   | I/O |
| 75      | GND         | -   | 76      | GND         | -   |
| 77      | SDQS8A-B2P  | I/O | 78      | GND         | -   |
| 79      | SCB2A-B2P   | I/O | 80      | SCB3A-B2P   | I/O |
| 81      | 2R5-B2V     | -   | 82      | 2R5-B2V     | I   |
| 83      | SCB6A-B2P   | I/O | 84      | SCB7A-B2P   | I/O |
| 85      | N.C.        | -   | 86      | N.C.        | -   |
| 87      | GND         | -   | 88      | GND         | -   |
| 89      | 2R5-B2V     | I   | 90      | GND         | -   |
| 91      | GND         | -   | 92      | 2R5-B2V     | I   |
| 93      | 2R5-B2V     | I   | 94      | 2R5-B2V     | I   |
| 95      | SCKE1-B2P   | I   | 96      | SCKE0-B2P   | I   |
| 97      | N.C.        | -   | 98      | N.C.        | -   |
| 99      | SMA12-B2P   | I   | 100     | SMA11-B2P   | I   |
| 101     | SMA09-B2P   | I   | 102     | SMA08-B2P   | I   |
| 103     | GND         | -   | 104     | GND         | -   |
| 105     | SMA07-B2P   | I   | 106     | SMA06-B2P   | I   |
| 107     | SMA05-B2P   | I   | 108     | SMA04-B2P   | I   |
| 109     | SMA03-B2P   | I   | 110     | SMA02-B2P   | I   |
| 111     | SMA01-B2P   | I   | 112     | SMA00-B2P   | I   |
| 113     | 2R5-B2V     | I   | 114     | 2R5-B2V     | I   |
| 115     | SMA10-B2P   | I   | 116     | SBS1-B2P    | I   |
| 117     | SBS0-B2P    | I   | 118     | SRAS-B2N    | I   |
| 119     | SWE-B2N     | I   | 120     | SCAS-B2N    | I   |
| 121     | SCS0-B2N    | I   | 122     | SCS1-B2N    | I   |
| 123     | N.C.        | -   | 124     | N.C.        | -   |
| 125     | GND         | -   | 126     | GND         | -   |
| 127     | SDQ36-B2P   | I/O | 128     | SDQ33-B2P   | I/O |

Table C-1 Memory I connector (200-pin) (3/3)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 129     | SDQ37-B2P   | I/O | 130     | SDQ32-B2P   | I/O |
| 131     | 2R5-B2V     | I   | 132     | 2R5-B2V     | I   |
| 133     | SDQS4-B2P   | I/O | 134     | SDM04-B2P   | I   |
| 135     | SDQ34-B2P   | I/O | 136     | SDQ38-B2P   | I/O |
| 137     | GND         | -   | 138     | GND         | -   |
| 139     | SDQ39-B2P   | I/O | 140     | SDQ35-B2P   | I/O |
| 141     | SDQ45-B2P   | I/O | 142     | SDQ41-B2P   | I/O |
| 143     | 2R5-B2V     | -   | 144     | 2R5-B2V     | I   |
| 145     | SDQ40-B2P   | I/O | 146     | SDQ46-B2P   | I/O |
| 147     | SDQS5-B2P   | I/O | 148     | SMD05-B2P   | I   |
| 149     | GND         | -   | 150     | GND         | -   |
| 151     | SDQ44-B2P   | I/O | 152     | SDQ43-B2P   | I/O |
| 153     | SDQ47-B2P   | I/O | 154     | SDQ42-B2P   | I/O |
| 155     | 2R5-B2V     | I   | 156     | 2R5-B2V     | I   |
| 157     | 2R5-B2V     | I   | 158     | SCK1-B2N    | I   |
| 159     | GND         | -   | 160     | SCK1-B2P    | I   |
| 161     | GND         | -   | 162     | GND         | -   |
| 163     | SDQ48-B2P   | I/O | 164     | SDQ52-B2P   | I/O |
| 165     | SDQ49-B2P   | I/O | 166     | SDQ53-B2P   | I/O |
| 167     | 2R5-B2V     | I   | 168     | 2R5-B2V     | I   |
| 169     | SDQS6-B2P   | -   | 170     | SDM06-B2P   | I   |
| 171     | SDQ50-B2P   | I/O | 172     | SDQ51-B2P   | I/O |
| 173     | GND         | -   | 174     | GND         | -   |
| 175     | SDQ55-B2P   | I/O | 176     | SDQ54-B2P   | I/O |
| 177     | SDQ56-B2P   | I/O | 178     | SDQ61-B2P   | I/O |
| 179     | 2R5-B2V     | I   | 180     | 2R5-B2V     | I   |
| 181     | SDQ60-B2P   | I/O | 182     | SDQ57-B2P   | I/O |
| 183     | SDQS7-B2P   | I/O | 184     | SDM07-B2P   | I   |
| 185     | GND         | -   | 186     | GND         | -   |
| 187     | SDQ58-B2P   | I/O | 188     | SDQ62-B2P   | I/O |
| 189     | SDQ59-B2P   | I/O | 190     | SDQ63-B2P   | I/O |
| 191     | 2R5-B2V     | I   | 192     | 2R5-B2V     | I   |
| 193     | SMBDT1-P3P  | I/O | 194     | GND         | -   |
| 195     | SMBCK1-P3P  | I   | 196     | GND         | -   |
| 197     | P3V         | I   | 198     | GND         | -   |
| 199     | N.C         | -   | 200     | N.C         | -   |

**C.2 CN1440 Memory 2 connector (200-pin)***Table C-2 Memory 2 connector (200-pin)(1/3)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | MRVREF-B1V  | I   | 2       | MRVREF-B1V  | I   |
| 3       | GND         | -   | 4       | GND         | -   |
| 5       | SDQ05-B2P   | I/O | 6       | SDQ04-B2P   | I/O |
| 7       | SDQ01-B2P   | I/O | 8       | SDQ00-B2P   | I/O |
| 9       | 2R5-B2V     | I   | 10      | 2R5-B2V     | I   |
| 11      | SDQS0-B2P   | I/O | 12      | SDM00-B2P   | I   |
| 13      | SDQ03-B2P   | I/O | 14      | SDQ07-B2P   | I/O |
| 15      | GND         | -   | 16      | GND         | -   |
| 17      | SDQ02-B2P   | I/O | 18      | SDQ06-B2P   | I/O |
| 19      | SDQ15-B2P   | I/O | 20      | SDQ09-B2P   | I/O |
| 21      | 2R5-B2V     | I   | 22      | 2R5-B2V     | I   |
| 23      | SDQ12-B2P   | I/O | 24      | SDQ13-B2P   | I/O |
| 25      | SDQS1-B2P   | I/O | 26      | SDM01-B2P   | I   |
| 27      | GND         | -   | 28      | GND         | -   |
| 29      | SDQ11-B2P   | I/O | 30      | SDQ08-B2P   | O   |
| 31      | SDQ10-B2P   | I/O | 32      | SDQ14-B2P   | I/O |
| 33      | 2R5-B2V     | I   | 34      | 2R5-B2V     | I   |
| 35      | SCK3-B2P    | I   | 36      | 2R5-B2V     | I   |
| 37      | SCK3-B2N    | I   | 38      | GND         | -   |
| 39      | GND         | -   | 40      | GND         | -   |
| 41      | SDQ16-B2P   | I/O | 42      | SDQ20-B2P   | I/O |
| 43      | SDQ17-B2P   | I/O | 44      | SDQ21-B2P   | I/O |
| 45      | 2R5-B2V     | I   | 46      | 2R5-B2V     | I   |
| 47      | SDQS2-B2P   | I/O | 48      | SDM02-B2P   | I   |
| 49      | SDQ19-B2P   | I/O | 50      | SDQ23-B2P   | I/O |
| 51      | GND         | -   | 52      | GND         | -   |
| 53      | SDQ18-B2P   | I/O | 54      | SDQ22-B2P   | I/O |
| 55      | SDQ24-B2P   | I/O | 56      | SDQ25-B2P   | I/O |
| 57      | 2R5-B2V     | I   | 58      | 2R5-B2V     | I   |
| 59      | SDQ28-B2P   | I/O | 60      | SDQ29-B2P   | I/O |
| 61      | SDQS3-B2P   | I/O | 62      | SDM03-B2P   | I   |
| 63      | GND         | -   | 64      | GND         | -   |
| 65      | SDQ26-B2P   | I/O | 66      | SDQ27-B2P   | I/O |
| 67      | SDQ30-B2P   | I/O | 68      | SDQ31-B2P   | I/O |

Table C-2 Memory 2 connector (200-pin)(2/3)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 69      | 2R5-B2V     | I   | 70      | 2R5-B2V     | I   |
| 71      | SCB5B-B2P   | I/O | 72      | SCB0B-B2P   | I/O |
| 73      | SCB4B-B2P   | I/O | 74      | SCB1B-B2P   | I/O |
| 75      | GND         | -   | 76      | GND         | -   |
| 77      | SDQS8B-B2P  | I/O | 78      | GND         | -   |
| 79      | SCB2B-B2P   | I/O | 80      | SCB3B-B2P   | I/O |
| 81      | 2R5-B2V     | I   | 82      | 2R5-B2V     | I   |
| 83      | SCB6B-B2P   | I/O | 84      | SCB7B-B2P   | I/O |
| 85      | N.C.        | -   | 86      | N.C.        | -   |
| 87      | GND         | -   | 88      | GND         | -   |
| 89      | 2R5-B2V     | I   | 90      | GND         | -   |
| 91      | GND         | -   | 92      | 2R5-B2V     | I   |
| 93      | 2R5-B2V     | I   | 94      | 2R5-B2V     | I   |
| 95      | SCKE3-B2P   | I   | 96      | SCKE2-B2P   | I   |
| 97      | N.C.        | -   | 98      | N.C.        | -   |
| 99      | SMA12-B2P   | I   | 100     | SMA11-B2P   | I   |
| 101     | SMA09-B2P   | I   | 102     | SMA08-B2P   | I   |
| 103     | GND         | -   | 104     | GND         | -   |
| 105     | SMA07-B2P   | I   | 106     | SMA06-B2P   | I   |
| 107     | SMAB05-B2P  | I   | 108     | SMAB04-B2P  | I   |
| 109     | SMA03-B2P   | I   | 110     | SMAB02-B2P  | I   |
| 111     | SMAB01-B2P  | I   | 112     | SMA00-B2P   | I   |
| 113     | 2R5-B2V     | I   | 114     | 2R5-B2V     | I   |
| 115     | SMA10-B2P   | I   | 116     | SBS1-B2P    | I   |
| 117     | SBS0-B2P    | I   | 118     | SRAS-B2N    | I   |
| 119     | SWE-B2N     | I   | 120     | SCAS-B2N    | I   |
| 121     | SCS2-B2N    | I   | 122     | SCS3-B2N    | I   |
| 123     | N.C.        | -   | 124     | N.C.        | -   |
| 125     | GND         | -   | 126     | GND         | -   |
| 127     | SDQ36-B2P   | I/O | 128     | SDQ33-B2P   | I/O |
| 129     | SDQ37-B2P   | I/O | 130     | SDQ32-B2P   | I/O |
| 131     | 2R5-B2V     | I   | 132     | 2R5-B2V     | I   |
| 133     | SDQS4-B2P   | I/O | 134     | SDM04-B2P   | -   |
| 135     | SDQ34-B2P   | I/O | 136     | SDQ38-B2P   | I/O |
| 137     | GND         | -   | 138     | GND         | -   |
| 139     | SDQ39-B2P   | I/O | 140     | SDQ35-B2P   | I/O |

Table C-2 Memory 2 connector (200-pin )(3/3)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 141     | SDQ45-B2P   | I/O | 142     | SDQ41-B2P   | I/O |
| 143     | 2R5-B2V     | I   | 144     | 2R5-B2V     | I   |
| 145     | SDQ40-B2P   | I/O | 146     | SDQ46-B2P   | I/O |
| 147     | SDQS5-B2P   | I/O | 148     | SDM05-B2P   | I   |
| 149     | GND         | -   | 150     | GND         | -   |
| 151     | SDQ44-B2P   | I/O | 152     | SDQ43-B2P   | I/O |
| 153     | SDQ47-B2P   | I/O | 154     | SDQ42-B2P   | I/O |
| 155     | 2R5-B2V     | I   | 156     | 2R5-B2V     | I   |
| 157     | 2R5-B2V     | I   | 158     | SCK4-B2N    | I   |
| 159     | GND         | -   | 160     | SCK4-B2P    | I   |
| 161     | GND         | -   | 162     | GND         | -   |
| 163     | SDQ48-B2P   | I/O | 164     | SDQ52-B2P   | I/O |
| 165     | SDQ49-B2P   | I/O | 166     | SDQ53-B2P   | I/O |
| 167     | 2R5-B2V     | I   | 168     | 2R5-B2V     | I   |
| 169     | SDQS6-B2P   | I/O | 170     | SDM06-B2P   | I   |
| 171     | SDQ50-B2P   | I/O | 172     | SDQ51-B2P   | I/O |
| 173     | GND         | -   | 174     | GND         | -   |
| 175     | SDQ55-B2P   | I/O | 176     | SDQ54-B2P   | I/O |
| 177     | SDQ56-B2P   | I/O | 178     | SDQ61-B2P   | I/O |
| 179     | 2R5-B2V     | I   | 180     | 2R5-B2V     | I   |
| 181     | SDQ60-B2P   | I/O | 182     | SDQ57-B2P   | I/O |
| 183     | SDQS7-B2P   | I/O | 184     | SDM07-B2P   | I   |
| 185     | GND         | -   | 186     | GND         | -   |
| 187     | SDQ58-B2P   | I/O | 188     | SDQ62-B2P   | I/O |
| 189     | SDQ59-B2P   | I/O | 190     | SDQ63-B2P   | I/O |
| 191     | 2R5-B2V     | I   | 192     | 2R5-B2V     | I   |
| 193     | SMBDT1-P3P  | I/O | 194     | P3V         | I   |
| 195     | SMBCK1-P3P  | I   | 196     | GND         | -   |
| 197     | P3V         | I   | 198     | GND         | -   |
| 199     | N.C         | -   | 200     | N.C         | -   |

**C.3 CN5501 LCD connector (20-pin)***Table C-3 LCD connector (20-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | GND         | -   | 2       | GND         | -   |
| 3       | TXCLKA-PYP  | I   | 4       | TXCLKB-PYP  | I   |
| 5       | TXCLKA-PYN  | I   | 6       | TXCLKB-PYN  | I   |
| 7       | TXDTA0-PYP  | I   | 8       | TXDTB1-PYN  | I   |
| 9       | TXDTA0-PYN  | I   | 10      | TXDTB1-PYP  | I   |
| 11      | TXDTA2-PYN  | I   | 12      | TXDTB0-PYN  | I   |
| 13      | TXDTA2-PYP  | I   | 14      | TXDTB0-PYP  | I   |
| 15      | TXDTA1-PYN  | I   | 16      | TXDTB2-PYN  | I   |
| 17      | TXDTA1-PYP  | I   | 18      | TXDTB2-PYP  | I   |
| 19      | GND         | -   | 20      | GND         | -   |

**C.4 CN4610 USB 1 connector (Port0) (4-pin)***Table C-4 USB 1 connector (Port0) (4-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | USB0PS-E5V  | I   | 2       | USBP0-S3N   | I   |
| 3       | USBP0-S3P   | I   | 4       | GND         | -   |

**C.5 CN4611 USB 2 connector (Port3) (4-pin)***Table C-5 USB 2 connector (Port3) (4-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | USB0PS-E5V  | I   | 2       | USBP3-S3N   | I   |
| 3       | USBP3-S3P   | I   | 4       | GND         | -   |

**C.6 CN4612 USB 3 connector (Port5) (6-pin)***Table C-6 USB 3 connector (Port5) (6-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | GND         | -   | 2       | GND         | -   |
| 3       | USBP5-S3N   | I   | 4       | USBP5-S3P   | I   |
| 5       | GND         | -   | 6       | GND         | -   |

**C.7 CN3400 Debug port connector (4-pin)***Table C-7 Debug port connector (4-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | P3V         | -   | 2       | DBGRX-P3P   | O   |
| 3       | DBGTX-P3P   | I   | 4       | GND         | -   |

**C.8 CN1800 HDD I/F connector (50-pin)***Table C-8 HDD I/F connector (50-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | GND         | -   | 2       | IDRSTA-P5N  | I   |
| 3       | PDD07-P3P   | I/O | 4       | GND         | -   |
| 5       | PDD08-P3P   | I/O | 6       | PDD06-P3P   | I/O |
| 7       | PDD09-P3P   | I/O | 8       | GND         | -   |
| 9       | PDD05-P3P   | I/O | 10      | PDD10-P3P   | I/O |
| 11      | PDD04-P3P   | I/O | 12      | GND         | -   |
| 13      | PDD11-P3P   | I/O | 14      | PDD03-P3P   | I/O |
| 15      | PDD12-P3P   | I/O | 16      | GND         | -   |
| 17      | PDD02-P3P   | I/O | 18      | PDD13-P3P   | I/O |
| 19      | PDD01-P3P   | I/O | 20      | GND         | -   |
| 21      | PDD14-P3P   | I/O | 22      | PDD00-P3P   | I/O |
| 23      | PDD15-P3P   | I/O | 24      | GND         | -   |
| 25      | PDDREQ-P3P  | I   | 26      | PDIOW-P3N   | I   |
| 27      | GND         | -   | 28      | PDIOR-P3N   | I   |
| 29      | GND         | -   | 30      | PIORDY-P3P  | I   |
| 31      | GND         | -   | 32      | PDDACK-P3N  | I   |
| 33      | IRQ14-P3P   | I   | 34      | GND         | -   |
| 35      | PDA1-P3P    | I   | 36      | PDA0-P3P    | I   |
| 37      | PDA2-P3P    | O   | 38      | GND         | -   |
| 39      | PDCS1-P3N   | I   | 40      | PDCS3-P3N   | O   |
| 41      | P5V         | -   | 42      | P5V         | -   |
| 43      | P5V         | -   | 44      | P5V         | -   |
| 45      | P5V         | -   | 46      | HDDLED-P5N  | I   |
| 47      | GND         | -   | 48      | GND         | -   |
| 49      | GND         | -   | 50      | GND         | -   |

**C.9 IS2110 PC card I/F connector (70-pin)**

Table C-9 PC card I/F connector (70-pin) (1/2)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | GND         | -   | 2       | ACAD00-EYP  | I/O |
| 3       | ACAD01-EYP  | I/O | 4       | ACAD03-EYP  | I/O |
| 5       | ACAD05-EYP  | I/O | 6       | ACAD07-EYP  | I/O |
| 7       | ACCBEO-EYN  | I/O | 8       | ACAD09-EYP  | I/O |
| 9       | ACAD11-EYP  | I/O | 10      | ACAD12-EYP  | I/O |
| 11      | ACAD14-EYP  | I/O | 12      | ACCBE1-EYN  | I/O |
| 13      | ACPAR-EYP   | I/O | 14      | ACPERE-EYN  | I/O |
| 15      | ACGNT-EYN   | I/O | 16      | ACINT-EYN   | I/O |
| 17      | MCVCCA-EYV  | I/O | 18      | MCVPPA-EYV  | I/O |
| 19      | ACCLK-EYP   | I/O | 20      | ACIRDY-EYN  | I/O |
| 21      | ACCBE2-EYN  | I/O | 22      | ACAD18-EYP  | I/O |
| 23      | ACAD20-EYP  | I/O | 24      | ACAD21-EYP  | I/O |
| 25      | ACAD22-EYP  | I/O | 26      | ACAD23-EYP  | I/O |
| 27      | ACAD24-EYP  | I/O | 28      | ACAD25-EYP  | I/O |
| 29      | ACAD26-EYP  | I/O | 30      | ACAD27-EYP  | I/O |
| 31      | ACAD29-EYP  | I/O | 32      | ACD02-EYP   | I/O |
| 33      | ACCLKR-EYN  | I/O | 34      | GND         | -   |
| 35      | GND         | -   | 36      | ACCD1-E3N   | I/O |
| 37      | ACAD02-EYP  | I/O | 38      | ACAD04-EYP  | I/O |
| 39      | ACAD06-EYP  | I/O | 40      | ACD14-EYP   | I/O |
| 41      | ACAD08-EYP  | I/O | 42      | ACAD10-EYP  | I/O |
| 43      | ACVS1-E3P   | I/O | 44      | ACAD13-EYP  | I/O |
| 45      | ACAD15-EYP  | I/O | 46      | ACAD16-EYP  | I/O |
| 47      | ACA18-EYP   | I/O | 48      | ACLOCK-EYN  | I/O |
| 49      | ACSTOP-EYN  | I/O | 50      | ACDEVS-EYN  | I/O |
| 51      | MCVCCA-EYV  | I   | 52      | MCVPPA-EYV  | I/O |
| 53      | ACTRDY-EYN  | I/O | 54      | ACFRAM-EYN  | I/O |
| 55      | ACAD17-EYP  | I/O | 56      | ACAD19-EYP  | I/O |
| 57      | ACVS2-E3P   | I/O | 58      | ACRST-EYN   | I/O |
| 59      | ACSERR-EYN  | I/O | 60      | ACREQ-EYN   | I/O |

Table C-10 PC card I/F connector (70-pin) (2/2)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 61      | ACCBE3-EYN  | I/O | 62      | ACAUDI-EYP  | O   |
| 63      | ACSTSC-EYP  | O   | 64      | ACAD28-EYP  | I/O |
| 65      | ACAD30-EYP  | I/O | 66      | ACAD31-EYP  | I/O |
| 67      | ACCD2-E3N   | O   | 68      | GND         | -   |
| 69      | GND         | -   | 70      | GND         | -   |

**C.10 CN3200 Keyboard connector (34-pin)**

Table C-11 Keyboard connector (34-pin)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | NUMLED-P5N  | I   | 2       | ARWLED-P5N  | I   |
| 3       | CAPLED-P5N  | I   | 4       | P5V         | I   |
| 5       | KBSC00-S3N  | O   | 6       | KBSC01-S3N  | O   |
| 7       | KBSC02-S3N  | O   | 8       | KBSC03-S3N  | O   |
| 9       | KBSC04-S3N  | O   | 10      | KBSC05-S3N  | O   |
| 11      | KBSC06-S3N  | O   | 12      | KBRT00-S3N  | O   |
| 13      | KBSC07-S3N  | O   | 14      | KBSC08-S3N  | O   |
| 15      | KBSC09-S3N  | O   | 16      | KBRT01-S3N  | O   |
| 17      | KBRT02-S3N  | O   | 18      | KBRT03-S3N  | O   |
| 19      | KBSC10-S3N  | O   | 20      | KBSC11-S3N  | O   |
| 21      | KBRT04-S3N  | O   | 22      | KBRT05-S3N  | O   |
| 23      | KBSC12-S3N  | O   | 24      | KBSC13-S3N  | O   |
| 25      | KBRT06-S3N  | O   | 26      | KBRT07-S3N  | O   |
| 27      | KBSC14-S3N  | O   | 28      | KBSC15-S3N  | O   |
| 29      | P5V         | I   | 30      | SP-P5V      | I   |
| 31      | SPX-PXP     | I   | 32      | SP-GND      | I   |
| 33      | SPY-PXP     | I   | 34      | P5V         | I   |

**C.11 CN3201 PAD connector (8-pin)***Table C-12 PAD connector (8-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | SP-P5V      | O   | 2       | SPX-PXP     | O   |
| 3       | SPY-PXP     | O   | 4       | SP-GND      | O   |
| 5       | GND         | -   | 6       | IPDCLK-P5P  | I/O |
| 7       | IPDDAT-P5P  | I/O | 8       | P5V         | I   |

**C.12 CN3280 Panel sensor connector (3-pin)***Table C-13 Panel sensor connector (3-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | GND.        | -   | 2       | PNLTRN-S3N  | O   |
| 3       | GND         | -   |         |             |     |

**C.13 J4100 Network I/F connector (14-pin)***Table C-14 Network I/F connector (14-pin)*

| Pin No. | Signal Name           | I/O | Pin No. | Signal Name           | I/O |
|---------|-----------------------|-----|---------|-----------------------|-----|
| A1      | TDP-P3P/<br>BIDAP-PXP | I   | A2      | TDN-P3N/<br>BIDAN-PXN | I   |
| A3      | RDP-P3P/<br>BIDBP-PXP | I   | A4      | CND/<br>BIDCP-PXP     | -   |
| A5      | GND/<br>BIDCN-PXP     | -   | A6      | RDN-P3N/<br>BIDBN-PXN | I   |
| A7      | GND/<br>BIDDP-PXP     | -   | A8      | N.C./<br>BIDDN-PXN    | -   |
| A9      | LNK-P3N               | I   | A10     | P3V                   | I   |
| A11     | ACT-P3N               | I   | A12     | P3V                   | I   |
| B1      | MDMTIP-E3P            | I/O | B2      | MDMRNG-E3P            | I/O |

**C.14 CN9991 Mini PCI I/F connector (124-pin)**

Table C-15 Mini PCI I/F connector (124-pin) (1/2)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | N.C.        | -   | 2       | N.C.        | -   |
| 3       | N.C.        | -   | 4       | N.C.        | -   |
| 5       | N.C.        | -   | 6       | N.C.        | -   |
| 7       | N.C.        | -   | 8       | N.C.        | -   |
| 9       | N.C.        | -   | 10      | N.C.        | -   |
| 11      | N.C.        | -   | 12      | N.C.        | -   |
| 13      | WLON-S3N    | I   | 14      | N.C.        | -   |
| 15      | GND         | -   | 16      | N.C.        | -   |
| 17      | PIRQD-P3N   | I   | 18      | P5V         | I   |
| 19      | P3V         | I   | 20      | PIRQG-P3N   | O   |
| 21      | N.C.        | -   | 22      | N.C.        | -   |
| 23      | GND         | -   | 24      | E3V         | I   |
| 25      | X33MPC-P3P  | I   | 26      | PCIRS3-P3N  | O   |
| 27      | GND         | -   | 28      | P3V         | I   |
| 29      | PREQ2-P3N   | I   | 30      | PGNT2-P3N   | O   |
| 31      | P3V         | I   | 32      | GND         | -   |
| 33      | AD31-P3P    | I/O | 34      | PME-S3N     | O   |
| 35      | AD29-P3P    | I/O | 36      | N.C.        | -   |
| 37      | GND         | -   | 38      | AD30-P3P    | I/O |
| 39      | AD27-P3P    | I/O | 40      | P3V         | I   |
| 41      | AD25-P3P    | I/O | 42      | AD28-P3P    | I/O |
| 43      | N.C.        | -   | 44      | AD26-P3P    | I/O |
| 45      | CBE3-P3N    | I   | 46      | AD24-P3P    | I/O |
| 47      | AD23-P3P    | I/O | 48      | AD21-P3P    | I/O |
| 49      | GND         | -   | 50      | GND         | -   |
| 51      | AD21-P3P    | I/O | 52      | AD22-P3P    | I/O |
| 53      | AD19-P3P    | I/O | 54      | AD20-P3P    | I/O |
| 55      | GND         | -   | 56      | PAR-P3P     | O   |
| 57      | AD17-P3P    | I/O | 58      | AD18-P3P    | I/O |
| 59      | CBE2-P3N    | I/O | 60      | AD16-P3P    | I/O |
| 61      | IRDY-P3N    | I/O | 62      | GND         | -   |
| 63      | P3V         | I   | 64      | FRAME-P3N   | I/O |

|    |            |     |    |          |     |
|----|------------|-----|----|----------|-----|
| 65 | CLKRUN-P3N | I/O | 66 | TDRY-P3N | I/O |
|----|------------|-----|----|----------|-----|

Table C-14 Mini PCI I/F connector (124-pin)(2/2)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 67      | SERR-P3N    | I/O | 68      | STOP-P3N    | I/O |
| 69      | GND         | -   | 70      | P3V         | I   |
| 71      | PERR-P3N    | I/O | 72      | DEVSEL-P3N  | I/O |
| 73      | CBE1-P3N    | I   | 74      | GND         | -   |
| 75      | AD14-P3P    | I/O | 76      | AD15-P3P    | I/O |
| 77      | GND         | -   | 78      | AD13-P3P    | I/O |
| 79      | AD12-P3P    | I/O | 80      | AD11-P3P    | I/O |
| 81      | AD10-P3P    | I/O | 82      | GND         | -   |
| 83      | GND         | -   | 84      | AD09-P3P    | I/O |
| 85      | AD08-P3P    | I/O | 86      | CBE0-P3N    | O   |
| 87      | AD07-P3P    | I/O | 88      | P3V         | I   |
| 89      | P3V         | -   | 90      | AD06-P3P    | I/O |
| 91      | AD05-P3P    | I/O | 92      | AD04-P3P    | I/O |
| 93      | N.C.        | -   | 94      | AD02-P3P    | I/O |
| 95      | AD03-P3P    | I/O | 96      | AD00-P3P    | I/O |
| 97      | P5V         | I   | 98      | N.C.        | -   |
| 99      | AD01-P3P    | I/O | 100     | N.C.        | -   |
| 101     | GND         | -   | 102     | GND         | -   |
| 103     | N.C.        | -   | 104     | GND         | -   |
| 105     | N.C.        | -   | 106     | N.C.        | -   |
| 107     | N.C.        | -   | 108     | N.C.        | -   |
| 109     | N.C.        | -   | 110     | N.C.        | -   |
| 111     | N.C.        | -   | 112     | N.C.        | -   |
| 113     | GND         | -   | 114     | GND         | -   |
| 115     | N.C.        | -   | 116     | N.C.        | -   |
| 117     | GND         | -   | 118     | N.C.        | -   |
| 119     | GND         | -   | 120     | GND         | -   |
| 121     | N.C.        | -   | 122     | N.C.        | -   |
| 123     | N.C.        | -   | 124     | E3V         | I   |

**C.15 CN8800 DC-IN connector (4-pin)***Table C-16 DC-IN connector (4-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | PVL         | O   | 2       | PVL         | O   |
| 3       | GND         | -   | 4       | GND         | -   |

**C.16 CN8810 1st battery connector (10-pin)***Table C-17 1st battery connector (10-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | PVBH1       | I   | 2       | BTMP1       | I   |
| 3       | PVBL1       | I   | 4       | M5V         | I   |
| 5       | PSCL-S5P    | I   | 6       | PSDA-S5P    | I   |
| 7       | GND         | -   | 8       | DBT10V-S5N  | I   |
| 9       | GND         | -   | 10      | GND         | -   |

**C.17 CN8760 RTC battery connector (3-pin)***Table C-18 RTC battery connector (3-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | R3V         | O   | 2       | N.C.        | -   |
| 3       | R3V         | O   |         |             |     |

**C.18 CN8770 FAN connector (3-pin)***Table C-19 FAN connector (3-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | P5V         | I   | 2       | GND         | -   |
| 3       | FANG0-P3P   | I   |         |             |     |

**C.19 CN6150 Speaker connector (4-pin)***Table C-20 Speaker connector (4-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | SP OUT (L-) | I   | 2       | SP OUT (L+) | I   |
| 3       | SP OUT (R-) | I   | 5       | SP OUT (R+) | I   |

**C.20 J6070 External microphone connector (6-pin)***Table C-21 External microphone connector (6-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | A-GND       | -   | 4       | A-GND       | I   |
| 2       | MICINR-PXP  | O   | 5       | A4R7-P4V    | I   |
| 3       | MICBIS-P2V  | O   | 6       | MICBIS-P2V  | O   |

**C.21 CN6060 Internal microphone (left) connector (2-pin)***Table C-22 Internal microphone (left) connector (2-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | IMICL-PXP   | O   | 2       | A-GND       | -   |

**C.22 CN6061 Internal microphone (right) connector (2-pin)***Table C-23 Internal microphone (right) connector (2-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | IMICR-PXP   | O   | 2       | A-GND       | -   |

**C.23 J6310 Headphone connector (6-pin)***Table C-24 Headphone connector (6-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | A-GND       | -   | 4       | A-GND       | -   |
| 2       | HEADL-PXP   | I   | 5       | A4R7-P4V    | I   |
| 3       | HEADR-PXP   | I   | 6       | N.C.        | -   |

**C.24 IS2130 SD card I/F connector (12-pin)***Table C-25 SD card I/F connector (12-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | SDAT3-E3P   | I/O | 2       | SDCMD-E3P   | I/O |
| 3       | GND         | -   | 4       | SD-E3V      | I   |
| 5       | SDCLK-E3P   | I   | 6       | GND         | -   |
| 7       | SDAT0-E3P   | I/O | 8       | SDAT1-E3P   | I/O |
| 9       | SDAT2-E3P   | I/O | 10      | SDCD-E3N    | O   |
| 11      | SDWP-E3P    | O   | 12      | GND         | -   |

**C.25 CN3000 MDC I/F connector (30-pin)***Table C-26 MDC I/F connector (30-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | N.C.        | -   | 2       | GND         | -   |
| 3       | GND         | -   | 4       | N.C.        | -   |
| 5       | N.C.        | -   | 6       | N.C.        | -   |
| 7       | N.C.        | -   | 8       | GND         | -   |
| 9       | N.C.        | -   | 10      | N.C.        | -   |
| 11      | N.C.        | -   | 12      | N.C.        | -   |
| 13      | N.C.        | -   | 14      | N.C.        | -   |
| 15      | GND         | -   | 16      | E3V         | I   |
| 17      | E3V         | I   | 18      | N.C.        | -   |
| 19      | GND         | -   | 20      | GND         | -   |
| 21      | N.C.        | -   | 22      | M97SY2-P3P  | I   |
| 23      | M97OT2-P3P  | I   | 24      | N.C.        | -   |
| 25      | M97RS2-S3N  | I   | 26      | M97IN2-E3P  | O   |
| 27      | GND         | -   | 28      | GND         | -   |
| 29      | GND         | -   | 30      | X97BC2-P3P  | I/O |

**C.26 CN3001 RJ11 connector (2-pin)***Table C-27 RJ11 connector (2-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | MDMRNG      | I/O | 2       | MDMTIP      | I/O |

**C.27 CN2300 Docking I/F connector (240-pin)**

Table C-28 Docking I/F connector (240-pin) (1/4)

| Pin No. | Signal Name  | I/O | Pin No. | Signal Name  | I/O |
|---------|--------------|-----|---------|--------------|-----|
| A1      | DSKDC        | I   | A2      | GND          | -   |
| A3      | DSKDC        | I   | A4      | GND          | -   |
| 1       | DCOUT        | I   | 2       | DCOUT        | I   |
| 3       | DOCDT1-S3N   | O   | 4       | P5V          | I   |
| 5       | N.C.         | -   | 6       | N.C.         | -   |
| 7       | GND          | -   | 8       | PHYRST-E3N   | I-  |
| 9       | DPCONF-S5P   | O   | 10      | GND          | -   |
| 11      | GND          | -   | 12      | DDCACK-P3P   | I/O |
| 13      | DRED-PXP     | I   | 14      | DGREEN-PXP   | I   |
| 15      | DBLUE-PXP    | I   | 16      | DVSYNC-P3P   | I   |
| 17      | (DVISC-P3P)  | I/O | 18      | Reserved     | -   |
| 19      | GND          | -   | 20      | (DVI-PRTCT2) | -   |
| 21      | (DVI-PRTCT1) | -   | 22      | (DVITX2-P3P) | -   |
| 23      | (DVITX2-P3N) | -   | 24      | (DVITX1-P3P) | -   |
| 25      | (DVITX1-P3N) | -   | 26      | (DVITX0-P3P) | -   |
| 27      | (DVITX0-P3N) | -   | 28      | GND          | -   |
| 29      | GND          | -   | 30      | (DVITXC-P3P) | I   |
| 31      | (DVITXC-P3N) | -   | 32      | (DVIDET-S3N) | -   |
| 33      | (DVIPD0)     | -   | 34      | Reserved     | -   |
| 35      | (QSWON-B3P)  | -   | 36      | (DIRQD-S3N)  | -   |
| 37      | GND          | -   | 38      | (PCM2SP-B3P) | -   |
| 39      | (DPMRST-S3N) | -   | 40      | (DAD00-P3P)  | -   |
| 41      | GND          | -   | 42      | (DAD00-P3P)  | -   |
| 43      | (DAD02-P3P)  | -   | 44      | (DAD06-P3P)  | -   |
| 45      | GND          | -   | 46      | (XDPCI-P3P)  | -   |
| 47      | (DAD09-P3P)  | -   | 48      | (DAD11-P3P)  | -   |
| 49      | GND          | -   | 50      | (DAD11-P3P)  | -   |
| 51      | (DAD15-P3P)  | -   | 52      | (DINTA-P3N)  | -   |
| 53      | VOID         | -   | 54      | VOID         | -   |
| 55      | BIDDP-PXP    | I/O | 56      | BIDDN-PXN    | I/O |
| 57      | VOID         | -   | 58      | VOID         | -   |
| 59      | MDMRNG-E3P   | I/O | 60      | MDMTIP-E3P   | I/O |

Table C-27 Docking I/F connector (240-pin) (2/4)

| Pin No. | Signal Name  | I/O | Pin No. | Signal Name   | I/O |
|---------|--------------|-----|---------|---------------|-----|
| 61      | DCOUT        | -   | 62      | DCOUT         | -   |
| 63      | EJCTRQ-S3N   | I/O | 64      | IF-P5V        | I   |
| 65      | (EXMSDT-P5P) | -   | 66      | (EXKBDT-P5P)  | -   |
| 67      | GND          | -   | 68      | GND           | -   |
| 69      | DILSON-S3P   | I/O | 70      | (NVPCNF-S3P)  | O   |
| 71      | GND          | -   | 72      | DDCADA-P3P    | I/O |
| 73      | GND          | -   | 74      | GND           | -   |
| 75      | GND          | -   | 76      | DHSYNC-P3P    | I   |
| 77      | (DVISD-P3P)  | -   | 78      | (DVI_PRTCT3)  | -   |
| 79      | GND          | -   | 80      | (DVITX5-P3P)  | -   |
| 81      | (DVITX5-P3N) | -   | 82      | (DVITX4-P3P)  | -   |
| 83      | (DVITX4-P3N) | -   | 84      | (DVITX3-P3P)  | -   |
| 85      | (DVITX3-P3N) | -   | 86      | (DVI16)       | -   |
| 87      | (DVI17)      | -   | 88      | GND           | -   |
| 89      | GND          | -   | 90      | (DOC_ON_LED1) | -   |
| 91      | Reserved     | -   | 92      | (DOC_ON_LED2) | -   |
| 93      | (DVIPD1)     | -   | 94      | (DVI_PRTCT4)  | -   |
| 95      | (DCADIO-S3P) | -   | 96      | (DSMI-B3P)    | -   |
| 97      | GND          | -   | 98      | (DCKRUN-P3N)  | -   |
| 99      | (PME-S3P)    | -   | 100     | (DADO1-P3P)   | -   |
| 101     | GND          | -   | 102     | (DADO3-P3P)   | -   |
| 103     | (DADO5-P3P)  | -   | 104     | (DADO7-P3P)   | -   |
| 105     | GND          | -   | 106     | (DADO8-P3P)   | -   |
| 107     | (DAD10-P3P)  | -   | 108     | (DAD12-P3P)   | -   |
| 109     | GND          | -   | 110     | (DAD14-P3P)   | -   |
| 111     | (DCBE1-P3N)  | -   | 112     | (DPAR-P3P)    | -   |
| 113     | VOID         | -   | 114     | VOID          | -   |
| 115     | BIDCN-EXN    | I/O | 116     | VOID          | -   |
| 117     | BIDCP-EXP    | I/O | 118     | VOID          | -   |
| 119     | VOID         | -   | 120     | VOID          | -   |

Table C-27 Docking I/F connector (240-pin) (3/4)

| Pin No. | Signal Name  | I/O | Pin No. | Signal Name  | I/O |
|---------|--------------|-----|---------|--------------|-----|
| 121     | DCOUT        | I   | 122     | DCOUT        | I   |
| 123     | DSSCL-S5P    | I/O | 124     | IF-P5V       | I   |
| 125     | M5V          | I   | 126     | DTPA-E3P     | I/O |
| 127     | GND          | -   | 128     | DTPB-E3P     | I/O |
| 129     | (USBON1-E5N) | -   | 130     | (USBOC1-E5N) | -   |
| 131     | GND          | -   | 132     | (USBON2-E5N) | I   |
| 133     | (USBOC2-E5N) | -   | 134     | SNDMUT-S3N   | I   |
| 135     | DMBCHG-S3P   | O   | 136     | DOUTL-PXP    | I/O |
| 137     | DINL-PXP     | I/O | 138     | DINR-PXN     | I/O |
| 139     | GND          | -   | 140     | PWRSW-S3N    | O   |
| 141     | (DCD-PYP)    | -   | 142     | (DSR-PYP)    | -   |
| 143     | (TXD-EYN)    | -   | 144     | (RING-PYP)   | -   |
| 145     | PE-P5P       | O   | 146     | PDB07-P5P    | I/O |
| 147     | PDB06-P5P    | I/O | 148     | GND          | -   |
| 149     | GND          | -   | 150     | PDB04-P5P    | I/O |
| 151     | PDB01-P5P    | I/O | 152     | PDB02-P5P    | I/O |
| 153     | PDB00-P5P    | I/O | 154     | STROB-P5N    | I   |
| 155     | (DPGNT-P3N)  | -   | 156     | (DAD30-P3P)  | -   |
| 157     | GND          | -   | 158     | (DAD28-P3P)  | -   |
| 159     | (DAD26-P3P)  | -   | 160     | (DAD24-P3P)  | -   |
| 161     | GND          | -   | 162     | (DIDSL-P3P)  | -   |
| 163     | (DAD22-P3P)  | -   | 164     | (DAD20-P3P)  | -   |
| 165     | GND          | -   | 166     | (DCBE0-P3N)  | -   |
| 167     | (DAD18-P3P)  | -   | 168     | (DAD16-P3P)  | -   |
| 169     | GND          | -   | 170     | (DCBE2-P3N)  | -   |
| 171     | (DTRDY-P3N)  | -   | 172     | (DSTOP-P3N)  | -   |
| 173     | GND          | -   | 174     | VOID         | -   |
| 175     | P3V          | I   | 176     | VOID         | -   |
| 177     | VOID         | -   | 178     | N.C.         | -   |
| 179     | BIDAP-PXP    | O   | 180     | BIDAN-PXN    | O   |

Table C-27 Docking I/F connector (240-pin) (4/4)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name  | I/O |
|---------|-------------|-----|---------|--------------|-----|
| 181     | DCOUT       | I   | 182     | DCOUT        | I   |
| 183     | DSSDA-S5P   | I/O | 184     | IF-P5V       | I   |
| 185     | Reserved    | -   | 186     | DTPA-E3N     | I/O |
| 187     | GND         | -   | 188     | DTPB-E3N     | I/O |
| 189     | USBP1-S3P   | I/O | 190     | USBP1-S3N    | I/O |
| 191     | GND         | -   | 192     | USBP2-S3P    | I/O |
| 193     | USBP2-S3N   | I/O | 194     | DOUTR-PXP    | I/O |
| 195     | DOUTR-PXN   | -   | 196     | DOUPL-PXN    | I/O |
| 197     | DINL-PXN    | -   | 198     | DINR-PXP     | I/O |
| 199     | GND         | -   | 200     | (RXD-PYN)    | -   |
| 201     | (RTS-EYP)   | -   | 202     | (CTS-PYP)    | -   |
| 203     | (DTR-EYP)   | -   | 204     | SELCT-P5P    | O   |
| 205     | BUSY-P5P    | O   | 206     | ACK-P5N      | O   |
| 207     | PDB05-P5P   | I/O | 208     | GND          | -   |
| 209     | GND         | -   | 210     | PDB03-P5P    | I/O |
| 211     | SLIN-P5N    | I   | 212     | -PINIT-P5N   | I   |
| 213     | ERROR-P5N   | O   | 214     | AUTFD-P5N    | I   |
| 215     | (DPREQ-P3N) | -   | 216     | (DAD31-P3P)  | -   |
| 217     | GND         | -   | 218     | (DAD29-P3P)  | -   |
| 219     | (DAD27-P3P) | -   | 220     | (DAD25-P3P)  | -   |
| 221     | GND         | -   | 222     | (DCBE23-P3N) | -   |
| 223     | (DAD23-P3P) | -   | 224     | (DAD21-P3P)  | -   |
| 225     | GND         | -   | 226     | (DCPCLR-P3P) | -   |
| 227     | (DAD19-P3P) | -   | 228     | (DAD17-P3P)  | -   |
| 229     | GND         | -   | 230     | (DFRAME-P3N) | -   |
| 231     | (DIRDY-P3N) | -   | 232     | (DDEVSL-P3N) | -   |
| 233     | GND         | -   | 234     | ACT-P3N      | O   |
| 235     | LINK-P3N    | O   | 236     | DOCDT2-S3N   | O   |
| 237     | VOID        | -   | 238     | VOID         | -   |
| 239     | BIDBP-PXP   | I   | 240     | BIDBN-PXN    | I   |

**C.28 CN9540 Digitizer switch I/F connector (40-pin)**

Table C-29 Digitizer switch I/F connector (40-pin)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | GND         | -   | 21      | GND         | -   |
| 2       | GND         | -   | 22      | DGDTR-P3N   | I   |
| 3       | GND         | -   | 23      | DGRTS-P3N   | I   |
| 4       | GND         | -   | 24      | DGRXD-P3P   | O   |
| 5       | GND         | -   | 25      | DGTXD-P3P   | I   |
| 6       | GND         | -   | 26      | GND         | -   |
| 7       | GND         | -   | 27      | PCIRS1-S3N  | I   |
| 8       | GND         | -   | 28      | P3V         | I   |
| 9       | GND         | -   | 29      | GND         | -   |
| 10      | GND         | -   | 30      | PWRSW-S3N   | O   |
| 11      | GND         | -   | 31      | GND         | -   |
| 12      | PNL2-P3P    | O   | 32      | KBRT00-S3N  | O   |
| 13      | BRT1-P5P    | I   | 33      | KBRT01-S3N  | O   |
| 14      | BRT2DA-S3P  | I   | 34      | KBRT02-S3N  | O   |
| 15      | BRT0-P5P    | I   | 35      | KBRT03-S3N  | O   |
| 16      | FL-P5V      | I   | 36      | KBRT04-S3N  | O   |
| 17      | PNL-P3V     | I   | 37      | KBRT05-S3N  | O   |
| 18      | FL-P5V      | I   | 38      | KBRT06-S3N  | O   |
| 19      | PNL-P3V     | I   | 39      | GND         | -   |
| 20      | FL-P5V      | I   | 40      | KBSC16-S3N  | I   |

**C.29 CN1801 Selectable bay I/F connector (72-pin)**

Table C-30 Selectable bay I/F connector (72-pin) (1/2)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | GND         | -   | 37      | GND         | -   |
| 2       | GND         | -   | 38      | SIORDY-P3P  | O   |
| 3       | N.C.        | -   | 39      | (CSEL)      | -   |
| 4       | N.C.        | -   | 40      | SDDACK      | I   |
| 5       | GND         | -   | 41      | GND         | -   |
| 6       | N.C.        | -   | 42      | IRQ15       | O   |
| 7       | IDRSTB-P5N  | I   | 43      | N.C.        | -   |
| 8       | GND         | -   | 44      | SDA1-P3P    | I   |
| 9       | GND         | -   | 45      | MBVON-E5N   | I   |
| 10      | SDD07-P3P   | I/O | 46      | MBVON-E5N   | I   |
| 11      | SDD08-P3P   | I/O | 47      | MBVON-E5N   | I   |
| 12      | SDD06-P3P   | I/O | 48      | SDA0-P3P    | I   |
| 13      | SDD09-P3P   | I/O | 49      | SDA2-P3P    | I   |
| 14      | SDD05-P3P   | I/O | 50      | SDCS1-P3N   | I   |
| 15      | SDD10-P3P   | I/O | 51      | SDCS3-P3N   | I   |
| 16      | GND         | -   | 52      | CDRLED-P5N  | O   |
| 17      | GND         | -   | 53      | GND         | -   |
| 18      | SDD04-P3P   | I/O | 54      | MSSTS2-S3N  | I   |
| 19      | SDD11-P3P   | I/O | 55      | MSSTS1-S3N  | I   |
| 20      | SDD03-P3P   | I/O | 56      | MSSTS0-S3N  | I   |
| 21      | SDD12-P3P   | I/O | 57      | GND         | -   |
| 22      | SDD02-P3P   | I/O | 58      | N.C.        | -   |
| 23      | SDD13-P3P   | I/O | 59      | N.C.        | -   |
| 24      | MBVON-E5N   | I   | 60      | N.C.        | -   |
| 25      | MBVON-E5N   | I   | 61      | N.C.        | -   |
| 26      | SDD01-P3P   | I/O | 62      | N.C.        | -   |
| 27      | SDD14-P3P   | I/O | 63      | N.C.        | -   |
| 28      | SDD00-P3P   | I/O | 64      | GND         | -   |
| 29      | SDD15-P3P   | I/O | 65      | GND         | -   |
| 30      | GND         | -   | 66      | N.C.        | -   |
| 31      | GND         | -   | 67      | GND         | -   |
| 32      | SDDREQ-P3P  | O   | 68      | N.C.        | -   |

Table C-31 Selectable bay I/F connector (72-pin) (2/2)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 33      | GND         | -   | 69      | GND         | -   |
| 34      | SDIOW-P3N   | I   | 70      | GND         | -   |
| 35      | GND         | -   | 71      |             |     |
| 36      | SDIOR-P3N   | I   | 72      | N.C.        | -   |

**C.30 CN4200 IEEE1394 connector (4-pin)**

Table C-32 IEEE1394 connector (4-pin)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | TPB0-E3N    | I/O | 2       | TPB0-E3P    | I/O |
| 3       | TPA0-E3N    | I/O | 4       | TPA0-E3P    | I/O |

**C.31 CN9502 CN board I/F connector (40-pin)**

Table C-33 CN board I/F connector (40-pin)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | GND         | -   | 21      | GPBTNA-S3N  | I   |
| 2       | GND         | -   | 22      | GND         | -   |
| 3       | GND         | -   | 23      | GND         | -   |
| 4       | GND         | -   | 24      | GND         | -   |
| 5       | MRED-PXP    | I   | 25      | GND         | -   |
| 6       | LUMINA-PYP  | I   | 26      | GND         | -   |
| 7       | VGAGND      | -   | 27      | PNLOFF-S3N  | I   |
| 8       | TV-GND      | -   | 28      | GND         | -   |
| 9       | MGREEN-PXP  | I   | 29      | USB1PS-E5V  | I   |
| 10      | CHROMA-PYP  | I   | 30      | N.C.        | -   |
| 11      | VGAGND      | -   | 31      | USB1PS-E5V  | I   |
| 12      | TV-GND      | -   | 32      | N.C.        | -   |
| 13      | MBLUE-PXP   | I   | 33      | N.C.        | -   |
| 14      | SHSYNC-P3P  | I   | 34      | GND         | -   |
| 15      | VGAGND      | -   | 35      | N.C.        | -   |
| 16      | SVSYNC-P3P  | I   | 36      | N.C.        | -   |
| 17      | PVON-S5P    | I   | 37      | N.C.        | -   |
| 18      | CRTSCL-P5P  | I   | 38      | N.C.        | -   |
| 19      | E5V         | I   | 39      | GND         | -   |
| 20      | CRTSDA-P5P  | I   | 40      | GND         | -   |

**CN board****C.32 CN4621 USB I/F connector 1 (6-pin)***Table C-34 USB I/F connector 1 (6-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | GND         | -   | 2       | GND         | -   |
| 3       | (CN4620-2)  | I/O | 4       | (CN4620-3)  | I/O |
| 5       | GND         | -   | 6       | GND         | -   |

**C.33 CN4620 USB I/F connector 2 (4-pin)***Table C-35 USB I/F connector 2 (4-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | USB1PS-E5V  | I   | 2       | (CN4621-3)  | I/O |
| 3       | (CN4621-4)  | I/O | 4       | GND         | -   |

**C.34 CN5320 CRT I/F connector (15-pin)***Table C-36 CRT I/F connector (15-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | MRED-PXP    | I   | 2       | MGREEN-PXP  | I   |
| 3       | MBLUE-PXP   | I   | 4       | N.C         | -   |
| 5       | GND         | -   | 6       | VGAGND      | -   |
| 7       | GND         | -   | 8       | GND         | -   |
| 9       | DDC-P5V     | I   | 10      | GND         | -   |
| 11      | N.C         | -   | 12      | CRTSDA-P5P  | I   |
| 13      | SHSYNC-P3P  | I   | 14      | SVSYNC-P3P  | I   |
| 15      | CRTSCL-P5P  | I   |         |             |     |

**C.35 CN5340 S-VIDEO I/F connector (4-pin)***Table C-37 S-VIDEO I/F connector (4-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | GND         | -   | 2       | GND         | -   |
| 3       | LUMINA-PYP  | I   | 4       | CHROMA-PYP  | I   |

**C.36 CN9520 System board I/F connector (40-pin)***Table C-38 System board I/F connector (40-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name  | I/O |
|---------|-------------|-----|---------|--------------|-----|
| 1       | GND         | -   | 21      | GPBTNA-S3N   | O   |
| 2       | GND         | -   | 22      | GND          | -   |
| 3       | GND         | -   | 23      | GND          | -   |
| 4       | GND         | -   | 24      | GND          | -   |
| 5       | MRED-PXP    | O   | 25      | GND          | -   |
| 6       | LUMINA-PYP  | O   | 26      | GND          | -   |
| 7       | VGAGND      | -   | 27      | PNLOFF-S3N   | O   |
| 8       | TV-GND      | -   | 28      | GND          | -   |
| 9       | MGREEN-PXP  | O   | 29      | USB1PS-E5V   | O   |
| 10      | CHROMA-PYP  | O   | 30      | (USBP4-S3N)  | -   |
| 11      | VGAGND      | -   | 31      | USB1PS-E5V   | O   |
| 12      | TV-GND      | -   | 32      | (USBP4-S3N)  | -   |
| 13      | MBLUE-PXP   | O   | 33      | (BTMDL-P3N)  | -   |
| 14      | SHSYNC-P3P  | O   | 34      | GND          | -   |
| 15      | VGAGND      | -   | 35      | (BT-P3V)     | -   |
| 16      | SVSYNC-P3P  | O   | 36      | (BTRST-S3N)  | -   |
| 17      | PVON-S5P    | O   | 37      | (WCHDAT-P3P) | -   |
| 18      | CRTSCL-P5P  | O   | 38      | (WCHCLK-P3P) | -   |
| 19      | E5V         | I   | 39      | GND          | -   |
| 20      | CRTSDA-P5P  | O   | 40      | GND          | -   |

**C.37 CN9521 QI board I/F connector (2-pin)**

*Table C-39 QI board I/F connector (2-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | GPBTNA-S3N  | I   | 2       | GND         | -   |

**QI board****C.38 CN9530 CN board I/F connector (2-pin)***Table C-40 CN board I/F connector (2-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | GPBTNA-S3N  | I   | 2       | GND         | -   |

**SW board****C.39 CN9510 System board I/F connector (12-pin)***Table C-41 System board I/F connector (12-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | PWRSW-S3N   | I   | 7       | KBRT03-S3N  | O   |
| 2       | GND         | -   | 8       | KBRT04-S3N  | O   |
| 3       | KBSC16-S3N  | I   | 9       | KBRT05-S3N  | O   |
| 4       | KBRT00-S3N  | O   | 10      | KBRT06-S3N  | O   |
| 5       | KBRT01-S3N  | O   | 11      | GND         | -   |
| 6       | KBRT02-S3N  | O   | 12      | GND         | -   |

## HD board

## C.40 CN9600 System board I/F connector (50-pin)

Table C-42 System board I/F connector (50-pin)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | GND         | -   | 2       | IDRSTA-P5N  | O   |
| 3       | PDD07-P3P   | I/O | 4       | GND         | -   |
| 5       | PDD08-P3P   | I/O | 6       | PDD06-P3P   | I/O |
| 7       | PDD09-P3P   | I/O | 8       | GND         | -   |
| 9       | PDD05-P3P   | I/O | 10      | PDD10-P3P   | I/O |
| 11      | PDD04-P3P   | I/O | 12      | GND         | -   |
| 13      | PDD11-P3P   | I/O | 14      | PDD03-P3P   | I/O |
| 15      | PDD12-P3P   | I/O | 16      | GND         | -   |
| 17      | PDD02-P3P   | I/O | 18      | PDD13-P3P   | I/O |
| 19      | PDD01-P3P   | I/O | 20      | GND         | -   |
| 21      | PDD14-P3P   | I/O | 22      | PDD00-P3P   | I/O |
| 23      | PDD15-P3P   | I/O | 24      | GND         | -   |
| 25      | PDDREQ-P3P  | I   | 26      | PDIOW-P3N   | O   |
| 27      | GND         | -   | 28      | PDIOR-P3N   | O   |
| 29      | GND         | -   | 30      | PIORDY-P3P  | I   |
| 31      | GND         | -   | 32      | PDDACK-P3N  | O   |
| 33      | IRQ14-P3P   | O   | 34      | GND         | -   |
| 35      | PDA1-P3P    | O   | 36      | PDA0-P3P    | O   |
| 37      | PDA2-P3P    | O   | 38      | GND         | -   |
| 39      | PDCS1-P3N   | O   | 40      | PDCS3-P3N   | O   |
| 41      | P5V         | I   | 42      | P5V         | I   |
| 43      | P5V         | I   | 44      | P5V         | I   |
| 45      | P5V         | I   | 46      | DASP-P5N    | O   |
| 47      | P3V         | -   | 48      | P3V         | -   |
| 49      | P3V         | -   | 50      | P3V         | -   |

**C.41 CN9610 HDD I/F connector (44-pin)**

Table C-43 HDD I/F connector (44-pin)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1       | IDRSTA-P5N  | I   | 2       | GND         | -   |
| 3       | PDD07-P3P   | I/O | 4       | PDD08-P3P   | I/O |
| 5       | PDD06-P3P   | I/O | 6       | PDD09-P3P   | I/O |
| 7       | PDD05-P3P   | I/O | 8       | PDD10-P3P   | I/O |
| 9       | PDD04-P3P   | I/O | 10      | PDD11-P3P   | I/O |
| 11      | PDD03-P3P   | I/O | 12      | PDD12-P3P   | I/O |
| 13      | PDD02-P3P   | I/O | 14      | PDD13-P3P   | I/O |
| 15      | PDD01-P3P   | I/O | 16      | PDD14-P3P   | I/O |
| 17      | PDD00-P3P   | I/O | 18      | PDD15-P3P   | I/O |
| 19      | GND         | -   | 20      | N.C.        | -   |
| 21      | PDDREQ-P3P  | O   | 22      | GND         | -   |
| 23      | PDIOW-P3N   | I   | 24      | GND         | -   |
| 25      | PDIOR-P3N   | I   | 26      | GND         | -   |
| 27      | PIORDY-P3P  | O   | 28      | GND         | -   |
| 29      | PDDACK-P3N  | O   | 30      | GND         | -   |
| 31      | IRQ14-P3P   | I   | 32      | N.C.        | -   |
| 33      | PDA1-P3P    | I   | 34      | N.C.        | -   |
| 35      | PDA0-P3P    | I   | 36      | PDA2-P3P    | I   |
| 37      | PDCS1-P3N   | I   | 38      | PDCS3-P3N   | I   |
| 39      | DASP-P5N    | I   | 40      | GND         | -   |
| 41      | P5V         | I   | 42      | P5V         | I   |
| 43      | GND         | -   | 44      | N.C.        | -   |

## Appendix D Keyboard Scan/Character Codes

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

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

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

| Cap No. | 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 |      |

**Appendix D Keyboard Scan/Character Codes**

*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. \* Combination 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.

**Appendix D Keyboard Scan/Character Codes**

*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 |

**Appendix D Keyboard Scan/Character Codes**

*Table D-5 Scan codes in overlay mode*

| Cap No. | Keytop |     | Code set 1 |  |       |  | Code set 2 |       |       |    |
|---------|--------|-----|------------|--|-------|--|------------|-------|-------|----|
|         |        |     | Make       |  | Break |  | Make       |       | Break |    |
| 08      | 7      | (7) | 47         |  | C7    |  | 6C         | F0    |       | 6C |
| 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 Key Layout

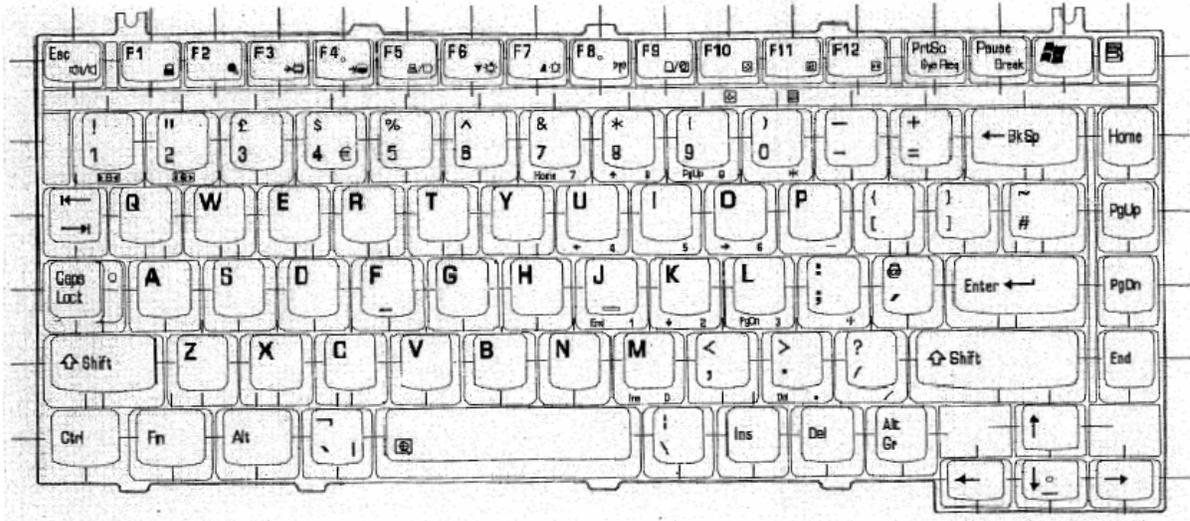


Figure E-1 Key layout (UK)

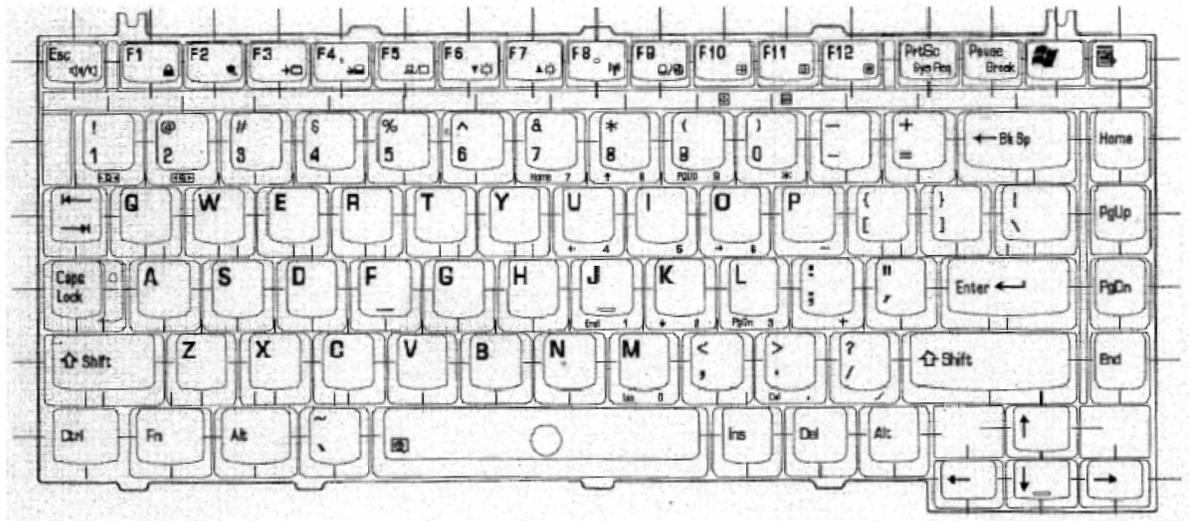


Figure E-2 Key layout (US)

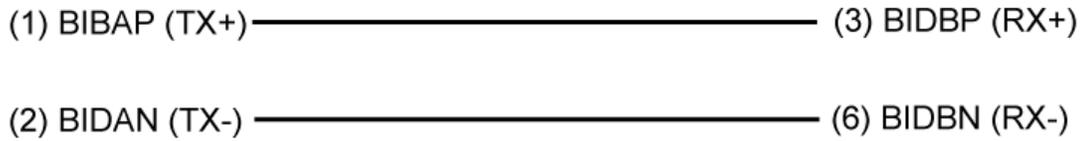


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## Appendix F Wiring Diagrams

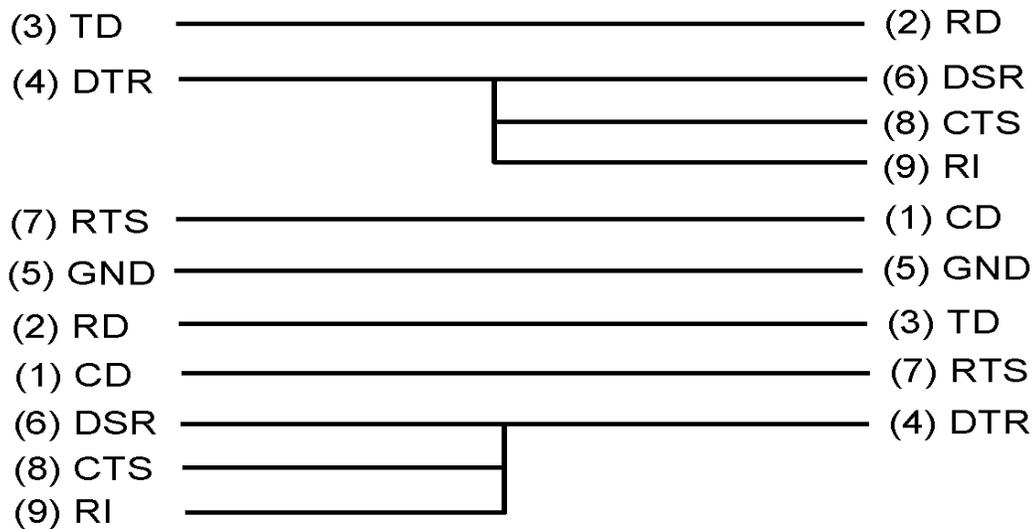
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### F.1 LAN Loopback Connector



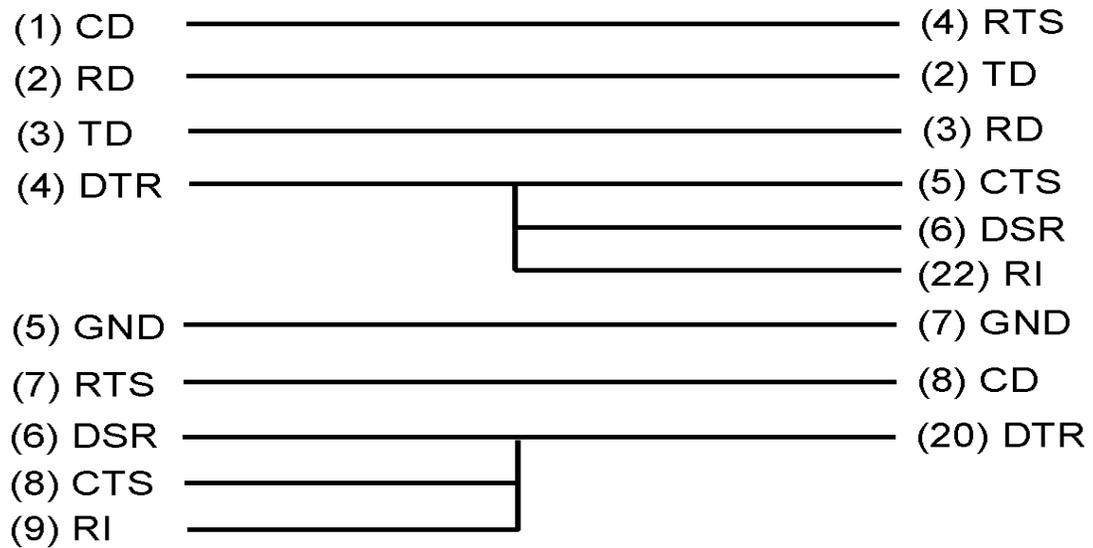
*Figure F-1 LAN loopback Connector*

### F.2 RS-232C Cable (9-pin to 9-pin)



*Figure F-2 RS232C cable (9-pin to 9-pin)*

**F.3 RS-232C Cable (9-pin to 25-pin)**



*Figure F-3 RS232C cable (9-pin to 25-pin)*

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## Appendix G BIOS Rewrite Procedures

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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 rewriting disk for the computer that has renewed BIOS data.

### Rewriting the BIOS

**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 damaged. In this case, insert the BIOS rewriting disk and the BIOS will be rewritten.*

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cable and PC card.
4. Connect a USB FDD and insert the BIOS rewriting disk into either the USB FDD.
5. Turn on the power while holding down the  key (US) or  key (UK). The BIOS rewriting starts.
6. When the process is completed, eject the BIOS rewriting disk and the system is reset. The



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## Appendix H EC/KBC Rewrite Procedures

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This Appendix explains how to rewrite the EC/KBC system program when you update the EC/KBC system.

### Tools

To rewrite the EC/KBC, you need the following tool:

- ✍ EC/KBC rewriting disk for the computer

### Rewriting the EC/KBC

- NOTE:**
- 1. Rewrite the EC/KBC only when instructed by a diagnostic disk release notice.*
  - 2. Be sure to connect both battery and AC adapter to the computer when you rewrite the EC/KBC.*
  - 3. Do not turn off the power while you are rewriting the EC/KBC. If the rewrite fails, it might be impossible to start up the computer.*
  - 4. If you fail to rewrite EC/KBC, then when you next turn on the power, a message may be displayed that the content of the EC/KBC has been erased. In this case, insert the EC/KBC rewriting disk, and the EC/KBC will be rewritten.*
  - 5. The time of rewriting EC/KBC depends on the conditions of the computer or ICs. The computer is not hung up. Allow sufficient time. Never reboot or turn off the power to the computer before the rewriting is completed.*

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cable and PC Card.
4. Connect a USB FDD and insert the EC/KBC rewriting disk into the USB FDD.
5. Turn on the power while holding down the **Tab** key. The EC/KBC rewriting starts.
6. When the EC/KBC rewrite is completed, the system is automatically turned off.



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## Appendix I Reliability

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The following table shows MTBF (Mean Time between Failures).

*Table I-1 MTBF*

| <b>MTBF</b> | <b>Time (hours)</b> |
|-------------|---------------------|
| System      | 6,625               |

