

Toshiba Personal Computer
QOSMIO G10
Maintenance Manual

TOSHIBA CORPORATION

File Number 960-497

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Toshiba QOSMIO G10 Maintenance Manual

First edition September 2004

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Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer QOSMIO G10.

NOTE: *Each model of QOSMIO G10 has a different configuration. For each model's configuration, refer to the parts list dedicated to it.*

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 QOSMIO G10 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
 - Display 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 QOSMIO G10 that appear on its display is presented in the type face below:

```
Format complete
System transferred
```

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Hardware Overview

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1.1 Features

The QOSMIO G10 series are high performance all-in-one PCs running a Pentium-M processor.

The features are listed below.

Microprocessor

Microprocessor that is used will be different of the model.

Intel[®] Mobile Pentium[®]-M

Pentium-M 1.50GHz (Processor Number ; 715)
1.60GHz (Processor Number ; 725)
1.70GHz (Processor Number ; 735)
1.80GHz (Processor Number ; 745)
2.00GHz (Processor Number ; 755)
2.10GHz (Processor Number ; 765)

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

L2 cache : 2MB

Memory

Two DDR333 SO-DIMM slots. Memory modules can be installed to provide a maximum of 2GB. Memory modules are available in 256MB, 512MB and 1024MB sizes.

VRAM

nVIDIA NV36m is mounted.

HDD

Double (or single) 40GB, 60GB 80GB or 100GB internal drives. 2.5 inch x 9.5mm height.

USB FDD

USB FDD supports 720KB and 1.44MB.

S/PDIF

This port can send or receive the digital sound data with the equipment like CD, MD Player. (This port is also used for headphone I/F.)

Display

LCD

Built-in 17.0-inch, WXGA+ (1,440 x 900 dots), 320,000 colors, amorphous silicon TFT color display.

CRT

Supported via a RGB connector.

TV-out

S-VIDEO OUT port supported.

D-VIDEO port supported.

 Monitor-IN port

AV input terminal is supported (for composite cable). This port can be also used as LINE-IN port enables connection of a stereo device for audio input.

 TV-tuner (Mini PCI slot)

This enables to watch TV and record it. (Supporting world wide signal : NTSC, PAL and SECAM)

According to the government regulation, it is not permitted to bring PAL/SECAM TV tuner into Korea.

 Remote controller

A remote controller for watching TV is equipped.

 Keyboard

An-easy-to-use 85(US)/86(UK)-key keyboard provides a numeric keypad overlay for fast numeric data entry or for cursor and page control. The keyboard also includes two keys that have special functions in Microsoft® Windows® XP. It supports software that uses a 101- or 102-key enhanced keyboard.

 PC card slot

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

Optical devices

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

 Battery

The RTC battery is equipped inside the computer.

The main battery is a detachable lithium ion battery (4,400mAh:Li-Ion, 6cell).

 USB (Universal Serial Bus)

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

 Bridge Media slot

One SD card/Memory stick (PRO)/xDPicture card/MultiMedia card/SDIO card slot. Data can be read and written by inserting each media to the slot. Memory stick Duo/PRO Duo and memory stick adapter is not supported.

 Sound system

Harman/Kardon-made stereo speaker is equipped. An internal microphone, external monaural microphone connector, stereo headphone connector is also equipped.

 Wireless LAN (Mini PCI slot)

The wireless LAN is equipped on the mini PCI slot.

 LAN/MODEM

Connectors for LAN and Modem are separately mounted.

 IEEE1394 port

The computer has one IEEE 1394 port. It enables high-speed data transfer directly from external devices such as digital video cameras.

 Bluetooth

Depending on the model, the computer is equipped with a dedicated Bluetooth module. This enables a communication to devices that support Bluetooth Version 1.2/1.1/. Adopting AFH (Adaptive Frequency Hopping), reduce the interference with the wireless communication in 2.4GHz. It can be switched on or off with a switch on the computer.

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

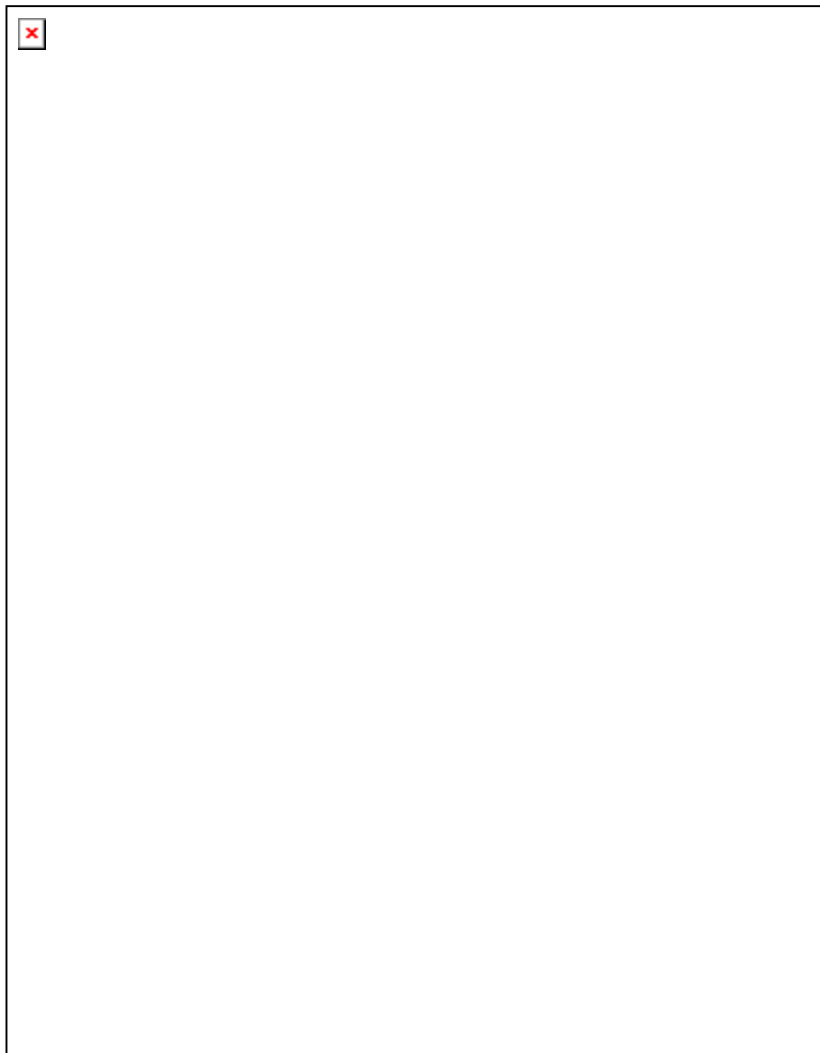


Figure 1-1 Front of the computer and the system units configuration

1.2 System Block Diagram

Figure 1-2 shows the system block diagram.

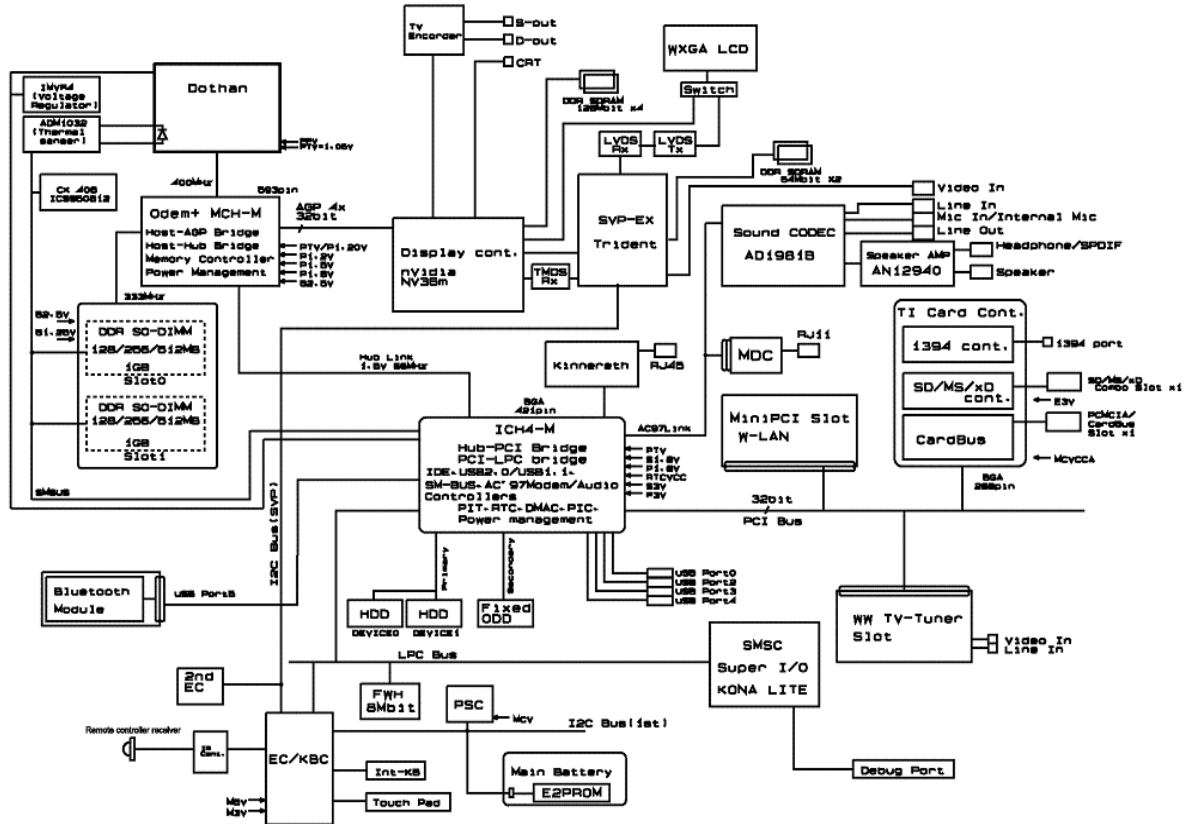


Figure 1-2 System block diagram

The PC contains the following components.

❑ CPU

Intel® Mobile Pentium®-M

Pentium-M 1.50GHz (Processor Number ; 715)
1.60GHz (Processor Number ; 725)
1.70GHz (Processor Number ; 735)
1.80GHz (Processor Number ; 745)
2.00GHz (Processor Number ; 755)
2.10GHz (Processor Number ; 765)
L1 cache : 64KB (32KB + 32KB)
L2 cache : 2MB
FSB : 400MHz Core voltage : 1.340~0.748V

❑ Memory

Two memory slots capable of accepting DDR-SDRAM 256MB, 512MB, or 1024MB memory modules for a maximum of 2GB.

- 200-pin small-size DIMM
- 2.5V operation
- PC2100/PC2700 support

❑ BIOS ROM (Flash memory)

- 8Mbit (512K×16-bit chip)
 - 64KB used for logo/icon
 - 224KB used for system BIOS
 - 64KB used for VGA-BIOS
 - 60KB used for Intel PXE
 - 32KB used for ACPI
 - 16KB used for MBI
 - 17KB used for booting
 - 16KB used for Parameter Block
 - 19KB are reserved

❑ Chipset

This gate array has the following elements and functions.

- North Bridge (Intel 855PM (MCH-M, B-step))
 - Pentium-M processor System Bus support
 - DRAM Controller : DDR333/DDR266/DDR200 support
 - AGP Interface (AGP R2.0, AGP x 4mode)
 - Hub Link Interface
 - 593-ball 37.5mmx37.5mm FC-BGA Package

- South Bridge (Intel 82801DBM (ICH4-M))
 - PCI slot
 - IDE controller
 - DMA controller
 - USB host interface
 - USB 2.0 host controller
 - UHCI host controller
 - Interrupt controller
 - SM Bus interface
 - ACPI Power management
 - Firmware Hub interface
 - Low Pin count (LPC) interface
 - Real time clock
 - AC'97 Rev. 2.3 interface
 - Alert ON LAN (AOL)
 - 421-pin 31mmx31mm BGA Package

❑ PC card controller (PCI7411, Texas Instrument-made)

- PCI Interface (PCI Rev. 2.3)
- PC Card Controller
- IEEE1394 Controller
- Flash Media Controller
- SD Host Controller

❑ Super I/O (SMSC-made LPC47N217)

- Two serial ports (NS16C550 compatible)
(1 port is used as Debug port)

VGA controller

- nVIDIA NV36m
 - VRAM 64MB/128MB
 - AGP 4x (32bit)
 - TMDS
 - TV Encoder

 Other main system chips

- PSC (Toshiba-made TMP87PM48U x 1)
- Clock Generator (ICS-made 950812CGT x 1)
- EC/KBC (Renesas-made HD64F2163BVTG10V x 1)
- FWH (ATM-made AT49LW080-33TL/AT49LW080-33TC
ST-Micro-made M50FW080N1 x 1)
- AC97-CODEC (ADI-made AD1981 x 1)
- Audio AMP (Panasonic-made AN12941A-VF x1)
- TV Encoder (Conexant-made CX25875 x 1)
- SVP EX (Trident-made 7052-LF x 1)

 Mini PCI

Wireless LAN card

2.4GHz DSSS/OFDM, 5.0GHz OFDM wireless LAN card is equipped.
Conformity with IEEE 802.11b/g or IEEE 802a/b/g. Transfer speed is maximum
of 11Mbit/sec. Supports 128bit WEP.

TV tuner

Some signals (NTSC, PAL and SECAM) are supported for worldwide use and
MPEG2 hardware encoding function are also supported.

 LAN (Intel-made ED82562 (Kinnereth) x 1)

Controls LAN.
Supports 100Base-TX and 10Base-T.

- ❑ MODEM (Askey-made 1456VQL4 x 1)

Supported by MDC.

Uses secondary AC97 line.

Data and FAX transmission is available.

Supports ITU-TV.90.

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

Connected to telephone line through RJ11 MODEM jack.

1.3 2.5-inch Hard Disk Drive

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

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

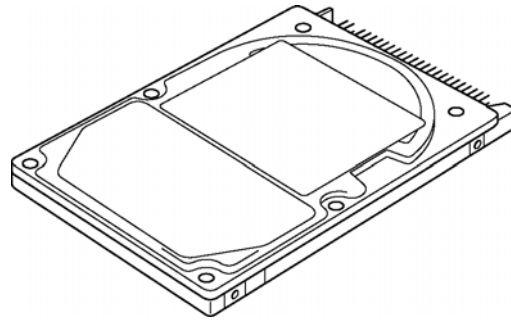


Figure 1-3 2.5-inch HDD

Table 1-1 2.5-inch HDD dimensions

Parameter		Standard value		
		TOSHIBA HDD2188B	TOSHIBA HDD2189B	TOSHIBA HDD2190B
Outline dimensions	Width (mm)	69.85		
	Height (mm)	9.5		
	Depth (mm)	100.0		
	Weight (g)	99 (max)	95	95

Parameter		Standard value			
		TOSHIBA HDD2191V	TOSHIBA HDD2193V	TOSHIBA HDD2194V	TOSHIBA HDD2A02B
Outline dimensions	Width (mm)	69.85			
	Height (mm)	9.5			
	Depth (mm)	100.0			
	Weight (g)	95			99 (max)

Parameter		Standard value		
		HGST G8BC0000Z411	HGST G8BC0000Z611	HGST G8BC0000Z811
Outline dimensions	Width (mm)	69.85±0.25		
	Height (mm)	9.5±0.2		
	Depth (mm)	100.0±0.25		
	Weight (g)	95 (max)	99 (max)	

Parameter		Standard value		
		HGST G8BC0001N610	HGST G8BC0001N810	HGST G8BC0001NA10
Outline dimensions	Width (mm)	69.85±0.25		
	Height (mm)	9.5±0.2		
	Depth (mm)	100.2±0.25		
	Weight (g)	102		

Parameter		Standard value			
		FUJITSU G8BC0001HA10	FUJITSU G8BC00019410	FUJITSU G8BC00019610	FUJITSU G8BC00019810
Outline dimensions	Width (mm)	70.0			
	Height (mm)	9.5			
	Depth (mm)	100.0			
	Weight (g)	99 (max)			

Table 1-2 2.5-inch HDD Specifications

Specification				
Parameter	TOSHIBA HDD2190B	TOSHIBA HDD2189B	TOSHIBA HDD2188B	TOSHIBA HDD2A02B
Storage size (formatted)	40GB	60GB	80GB	100GB
Speed (RPM)	4,200			
Data transfer speed (Mbits/s)	175.0-341.7			170.0-373.0
Interface transfer rate (MB/s)	100 (Ultra DMA mode)			
Storage density (Kbpi)	735	-	735 (MAX)	759 (MAX)
Track density (Ktpi)	88.1			110-120
Average random seek time (read) (ms)	12			
Average random seek time (write) (ms)	-			
Power-on-to-ready (sec)	4			

Specification			
Parameter	TOSHIBA HDD2193V	TOSHIBA HDD2194V	TOSHIBA HDD2191V
Storage size (formatted)	40GB	60GB	80GB
Speed (RPM)	5,400		
Data transfer speed (Mbits/s)	154.3-298.0	202.9-373.3	154.3-298.0
Interface transfer rate (MB/s)	100 (Ultra DMA mode)		
Storage density (Kbpi)	-	-	-
Track density (Ktpi)	78.9	88.8	78.9
Average random seek time (read) (ms)	12		
Average random seek time (write) (ms)	-		
Power-on-to-ready (sec)	4		

Specification			
Parameter	HGST G8BC0000Z411	HGST G8BC0000Z611	HGST G8BC0000Z811
Storage size (formatted)	40GB	60GB	80GB
Speed (RPM)	4,200		
Data transfer speed (Mbits/s)	350		
Interface transfer rate (MB/s)	100 (Ultra DMA mode)		
Storage density (Kbpi)	712 (MAX)		
Track density (Ktpi)	96		
Average random seek time (read) (ms)	12		
Average random seek time (write) (ms)	14		
Power-on-to-ready (sec)	5		

Specification			
Parameter	HGST G8BC0001N610	HGST G8BC0001N810	HGST G8BC0001NA10
Storage size (formatted)	60GB	80GB	100GB
Speed (RPM)	5,400		
Data transfer speed (Mbits/s)	493		
Interface transfer rate (MB/s)	100 (Ultra DMA mode)		
Storage density (Kbpi)	764		
Track density (Ktpi)	113.2		
Average random seek time (read) (ms)	12		
Average random seek time (write) (ms)	14		
Power-on-to-ready (sec)	3.5		

Specification				
Parameter	FUJITSU G8BC00019410	FUJITSU G8BC00019610	FUJITSU G8BC00019810	FUJITSU G8BC0001HA10
Storage size (formatted)	40GB	60GB	80GB	100GB
Speed (RPM)	5,400			
Data transfer speed (Mbits/s)	443.2			
Interface transfer rate (MB/s)	100 (Ultra DMA mode)			
Storage density (Kbpi)	-			
Track density (Ktpi)	-			
Average random seek time (read) (ms)	12			
Average random seek time (write) (ms)	-			
Power-on-to-ready (sec)	4			

1.4 Optical Drive

1.4.1 DVD-ROM & CD-R/RW Drive

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

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



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

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

Parameter		Standard value	
Outline dimensions	Maker	MATSUSHITA (G8CC0001X610)	TEAC (G8CC0001Y610)
	Width (mm)	128	
	Height (mm)	12.7 (excluding projections)	
	Depth (mm)	129.0	129.4
	Mass (g)	200±10	190 or less

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

Parameter		Drive Specification
		MATSUSHITA (G8CC0001X610)
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), 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 Multi-word 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 CD-R,CD-RW Photo CD CD-Extra(CD+),CD-text
	DVD	DVD-ROM,DVD-R (DVD-R Multi-boarder supported) DVD-RW(Ver.1.1) DVD-RAM(2.6GB/4.7GB) DVD+R, DVD+RW

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

Parameter		Drive Specification
		TEAC (G8CC0001Y610)
Data transfer speed	Read (KB/s)	DVD-ROM MAX 8X CAV (4,469 to 10,816KB/s) CD-ROM MAX 24X CAV (1,545 to 3,600KB/s)
	Write	CD-R 4X, 10X (CLV), 16x, MAX24x (CAV) CD-RW 4X (CLV) High Speed CD-RW 4X, 10X (CLV), 10x (CAV) Ultra Speed CD-RW 24x (CAV)
	ATAPI interface (MB/s)	PIO mode 16.7 MB/s (PIO MODE4 supported) DMA mode 16.7 MB/s (Multi-word MODE2 supported) Ultra DMA mode 33.3 MB/s
Access time (ms)	CD-ROM	90 (Average)
	DVD-ROM	110 (Average)
Buffer memory		2MB
Supported disk format	CD	CD-DA, CD-I CD-ROM Mode1, CD-ROM XA Mode2 (form1, Form2) Multi-session Photo CD, Video CD, Enhanced CD, CD-text
	DVD	DVD-ROM, DVD-R (General, Authoring, Single/Multi-boarder) DVD Video, DVD-RW (Single/Multi-boarder, Packet) DVD-RAM (2.6GB/4.7GB) DVD+R/RW (Single/Multi-boarder, Packet)

1.4.2 DVD Super Multi Drive

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

The DVD Super Multi drive is shown in Figure 1-5. The dimensions and specifications of the DVD Super Multi drive are described in Table 1-5, Table 1-6.

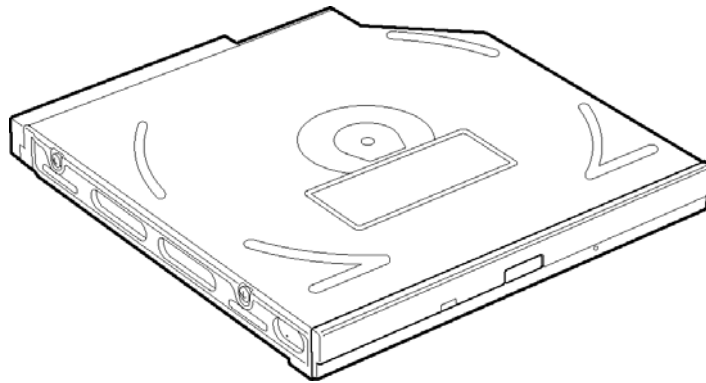


Figure 1-5 DVD Super Multi drive

Table 1-5 DVD Super Multi drive outline dimensions

Parameter		Standard value	
Outline dimensions	Maker	MATSUSHITA (G8CC00021610)	MATSUSHITA (G8CC0001S610)
	Width (mm)	128	
	Height (mm)	12.7 (excluding projections)	
	Depth (mm)	129.0	
	Mass (g)	210±10	

Table 1-6 DVD Super Multi drive specifications (1/2)

Parameter		Drive Specification
		MATSUSHITA (G8CC00021610)
Data transfer speed	Read(KB/s)	DVD-ROM MAX 8X CAV CD-ROM MAX 24X CAV
	Write	CD-R 24x (Zone CLV) CD-RW 4X (CLV) High Speed CD-RW 10X (CLV) Ultra Speed CD-RW 10X (CLV) DVD-R 8x (Zone CLV) DVD-RW 4x (Zone CLV) DVD+R 8x (Zone CLV) DVD+RW 4x (Zone CLV) DVD-RAM 3x (ZCLV) (4.7GB)
	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, DVD-RW (Ver1.1) DVD+R/+RW, DVD Video, DVD-RAM (2.6GB/4.7GB)

Table 1-6 DVD Super Multi drive specifications (2/2)

Parameter		Drive Specification
		MATSUSHITA (G8CC0001S610)
Data transfer speed	Read(KB/s)	DVD-ROM MAX 8X CAV CD-ROM MAX 24X CAV
	Write	CD-R 16x (Zone CLV) CD-RW 4X (CLV) High Speed CD-RW 8X (CLV) DVD-R 4x (Zone CLV) DVD-RW 2x (CLV) DVD+R 2.4x (CLV) DVD+RW 2.4x (CLV) DVD-RAM 2x (ZCLV) (4.7GB)
	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, Video CD, CD-Extra(CD+),CD-text
	DVD	DVD-ROM, DVD-R (3.9GB/4.7GB), DVD-RW (Ver1.1) DVD+R/+RW, DVD Video, DVD-RAM (2.6GB/4.7GB/9.4GB)

1.4.3 DVD Super Multi Drive (supporting Double-Layer)

The DVD Super Multi drive (supporting Double Layer) accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD/DVD-ROM, CD-R/RW, DVD±R/±RW and DVD-RAM. It is a high-performance drive that reads DVD-ROM at maximum 8-speed and CD-ROM at maximum 24-speed. It writes CD-R at maximum 24-speed, CD-RW at maximum 10-speed, DVD±R at maximum 8-speed, DVD±RW at maximum 4-speed, DVD-RAM at maximum 3-speed and DVD+R (Double Layer) at maximum 2.4-speed.

The DVD Super Multi drive is shown in Figure 1-6. The dimensions and specifications of the DVD Super Multi drive are described in Table 1-7, Table 1-8.



Figure 1-6 DVD Super Multi drive (Double-Layer)

Table 1-7 DVD Super Multi drive (Double-Layer) outline dimensions

Parameter		Standard value	
Outline dimensions (excluding projections)	Maker	MATSUSHITA (G8CC00021611)	TEAC (G8CC00024611)
	Width (mm)	128	
	Height (mm)	12.7	
	Depth (mm)	129.0	129.4
	Mass (g)	210 (±10)	

Table 1-8 DVD Super Multi drive (Double-Layer) specifications (1/2)

Parameter		Drive Specification
		MATSUSHITA (G8CC00021611)
Data transfer speed	Read(KB/s)	DVD-ROM MAX 8X CAV CD-ROM MAX 24X CAV
	Write	CD-R 24x (Zone CLV) CD-RW 4X (CLV) High Speed CD-RW 10X (CLV) Ultra Speed CD-RW 10X (CLV) DVD-R 8x (Zone CLV) DVD-RW 4x (Zone CLV) DVD+R 8x (Zone CLV) DVD+R Double Layer 2.4x (CLV) DVD+RW 4x (Zone CLV) DVD-RAM 3x (ZCLV) (4.7GB)
	ATAPI interface (MB/s)	PIO mode 16.6 MB/s (PIO MODE4 supported) DMA mode 16.6 MB/s (Multi-word 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, DVD-RW (Ver1.1) DVD+R/+RW, DVD Video, DVD-RAM (2.6GB/4.7GB)

Table 1-8 DVD Super Multi drive (Double-Layer) specifications (2/2)

Parameter		Drive Specification
		TEAC (G8CC00024611)
Data transfer speed	Read(KB/s)	DVD-ROM MAX 8X CAV CD-ROM MAX 24X CAV
	Write	CD-R 24x (Zone CLV) CD-RW 4X (CLV) High Speed CD-RW 10X (CLV) Ultra Speed CD-RW 10X (CLV) DVD-R 8x (Zone CLV) DVD-RW 4x (Zone CLV) DVD+R 8x (Zone CLV) DVD+R Double Layer 2.4x (CLV) DVD+RW 4x (Zone CLV) DVD-RAM 3x (Zone CLV) (4.7GB)
	ATAPI interface (MB/s)	PIO mode 16.7 MB/s (PIO MODE4 supported) DMA mode 16.7 MB/s (Multi-word MODE2 supported) Ultra DMA mode 33.3 MB/s(Ultra DMA MODE2 supported)
Access time (ms)	CD-ROM	130 (Random)
	DVD-ROM	130 (Random)
Buffer memory		8MB
Supported disk format	CD	CD-DA, CD-ROM (Mode1, Mode2), CD-ROM XA Mode2 (Form1, Form2), Photo CD, Enhanced CD, CD-text
	DVD	DVD-ROM, DVD-R (General/Authoring), DVD-RW, DVD+R/+RW, DVD Video, DVD-RAM (4.7GB, 2.6GB/Read Only)

1.5 Keyboard

A keyboard which consists of 85(US)/86(UK) keys is mounted on the system unit. The keyboard is connected to membrane connector on the system board and controlled by the keyboard controller.

Figure 1-7 is a view of the keyboard.



Figure 1-7 Keyboard

See Appendix E for details of the keyboard layout.

1.6 TFT Color Display

The TFT color display is 17.0 inch and consists of LCD module and FL inverter board.

1.6.1 LCD Module

The LCD module used for the TFT color display uses a backlight as the light source and can display a maximum of 320,000 colors with 1,440 x 900 resolution.

Figure 1-8 shows a view of the LCD module and Table 1-9 lists the specifications.

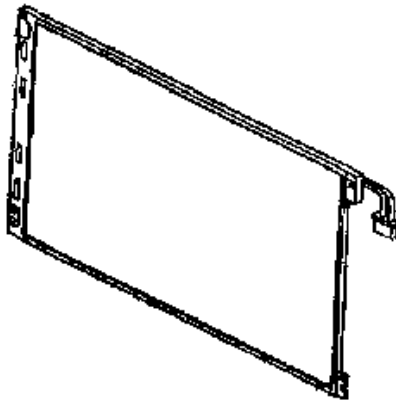


Figure 1-8 LCD module

Table 1-9 LCD module specifications

Item	Specifications
	LG-Philips G33C00029110
Number of Dots	1,440(W) × 900(H)
Dot spacing (mm)	0.25875(H) × 0.25875(V)

1.6.2 FL Inverter Board

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

Table 1-10 lists the FL inverter board specifications.

Table 1-10 FL inverter board specifications

Item		Specifications
		G71C0004F310
Input	Voltage (V)	5 (DC)
	Power (W)	18
Output	Voltage (V)	900 (rms)
	Power (W/VA)	7W / 10VA (x 2 output ; MAX 13W)
	Current (f=70KHz)(mA)	7 (rms) (x 2 output)

1.7 Power Supply

The power supply supplies 28 different voltages to the system board.

The power supply microcontroller has the following functions.

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

Table 1-11 lists the power supply output specifications.

Table 1-11 Power supply output rating

Name	Power supply (Yes/No)				Object
	Voltage [V]	Power OFF Suspend mode	Power OFF Boot mode	No Battery	
PPV	1.484 - 0.748	No	No	No	CPU
PTV	1.05	No	No	No	CPU, MCH, ICH4-M
PGV	1.10	No	No	No	GPU
1R8-P1V	1.8	No	No	No	CPU, MCH, ICH4-M
1R2- P1V	1.2	No	No	No	MCH
1R25-B1V	1.25	Yes	No	No	DDR-SDRAM Termination
1R25-P1V	1.25	No	No	No	SDRAM (GFX), Termination
1R5-P1V	1.5	No	No	No	MCH, ICH4-M, GPU
1R5-S1V	1.5	Yes	Yes	No	ICH4-M
2R5-P2V	2.5	No	No	No	GPU,SDRAM(GFX), SVP EX, LVDS
2R5-B2V	2.5	Yes	No	No	MCH, DDR-SDRAM
FM-E3V	3.3	No	No	No	Media Bridge
BT-P3V	3.3	No	No	No	Bluetooth
FMT-P3V	3.3	No	No	No	(FM tuner)
USB0PS-E5V	5	Yes	No	No	USB
USB1PS-E5V	5	Yes	No	No	USB
SND-P5V	5	No	No	No	AN12941
A4R7-P4V	4.7	No	No	No	AD1981B, AN12941
TUNER-P5V	5	No	No	No	WW-Tuner
MCV	5	Yes	Yes	No	PSC
P3V	3.3	No	No	No	Clock Generator, Thermal Sensor, Mini-PCI, SDRAM(SPD), ICH4-M, WW-Tuner, FWH, Super I/O, LAN,IEEE1394, TV Encoder, LCD, AD1981B,GPU, SVP EX, TMDS, Headphone AMP
P5V	5	No	No	No	Mini-PCI, HDD, ODD, KB, T-PAD, GPU
E3V	3.3	Yes	No	No	Card Cont, Mini-PCI, MDC
E5V	5	Yes	No	No	PC-Card, USB
S3V	3.3	Yes	Yes	No	ICH4-M, IR Cont.
M3V	3.3	Yes	Yes	No	EC/KBC
M5V	5	Yes	Yes	No	EC/KBC, System LED

R3V	2.0 -3.6	Yes	Yes	Yes	ICH4-M (RTC)
-----	----------	------------	------------	------------	--------------

1.8 Batteries

The PC has the following two batteries.

- Main battery
- Real time clock (RTC) battery

Table 1-12 lists the specifications for these two batteries.

Table 1-12 Battery specifications

Battery Name		Battery Element	Output Voltage	Capacity
Main battery	G71C0004H110	Lithium ion	10.8V	4,400mAh
	G71C0004H210			
	G71C0004H510			
	G71C0004H610			
Real time clock (RTC) battery	P71035009115	Nickel hydrogen	2.4V	16mAh

1.8.1 Main Battery

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

1.8.2 Battery Charging Control

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

Battery Charge

When the AC adapter is connected, normal charging is used while the system is turned on and quick charge is used while the system is turned off. Refer to the following Table 1-13.

Table 1-13 Time required for charges of main battery

Condition	Charging Time
Normal charge	About 3.5 or longer (hours)
Quick charge	About 3.0 (hours)

Charge is stopped in the following cases.

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

Data preservation time

When turning off the power in being charged fully, the preservation time is as following Table 1-14.

Table 1-14 Data preservation time

Condition	preservation time
Standby	About 3 days
Shutdown	About 15 days

1.8.3 RTC Battery

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

Table 1-15 lists the Time required for charges of RTC battery and data preservation time.

Table 1-15 Time required for charges of RTC battery

Condition	Time
Power ON (Lights Power LED)	About 8 hours
Data preservation tome (Full-charged)	About a month

1.9 AC Adapter

The AC adapter is used to charge the battery.

Table 1-16 lists the AC adapter specifications.

Table 1-16 AC adapter specifications

Parameter	Specification
	G71C0002R610
Power	120W (Peak 150W)
Input voltage	AC 100 to 240V
Input frequency	50Hz/60Hz
Input current	1.7A or less
Output voltage	DC 15V
Output current	8.0A

Chapter 2

Troubleshooting Procedures

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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 | 6. Touch pad | 11. Wireless LAN |
| 2. System Board | 7. Display | 12. Sound |
| 3. USB FDD | 8. Optical Disk Drive | 13. TV Tuner |
| 4. 2.5” HDD | 9. Modem | |
| 5. Keyboard | 10. LAN | |

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

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

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

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

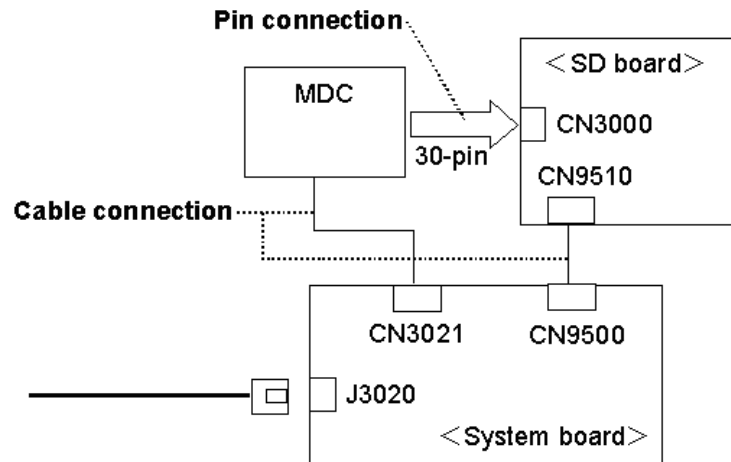
1. Phillips screwdrivers (For replacement procedures)
2. Implements for debugging port check
 - Toshiba MS-DOS system FD
 - RS-232C cross cable
 - Test board with debug port test cable
 - PC for displaying debug port test result

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

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

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

<e.g> Connection of modem



2.2 Troubleshooting Flowchart

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

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

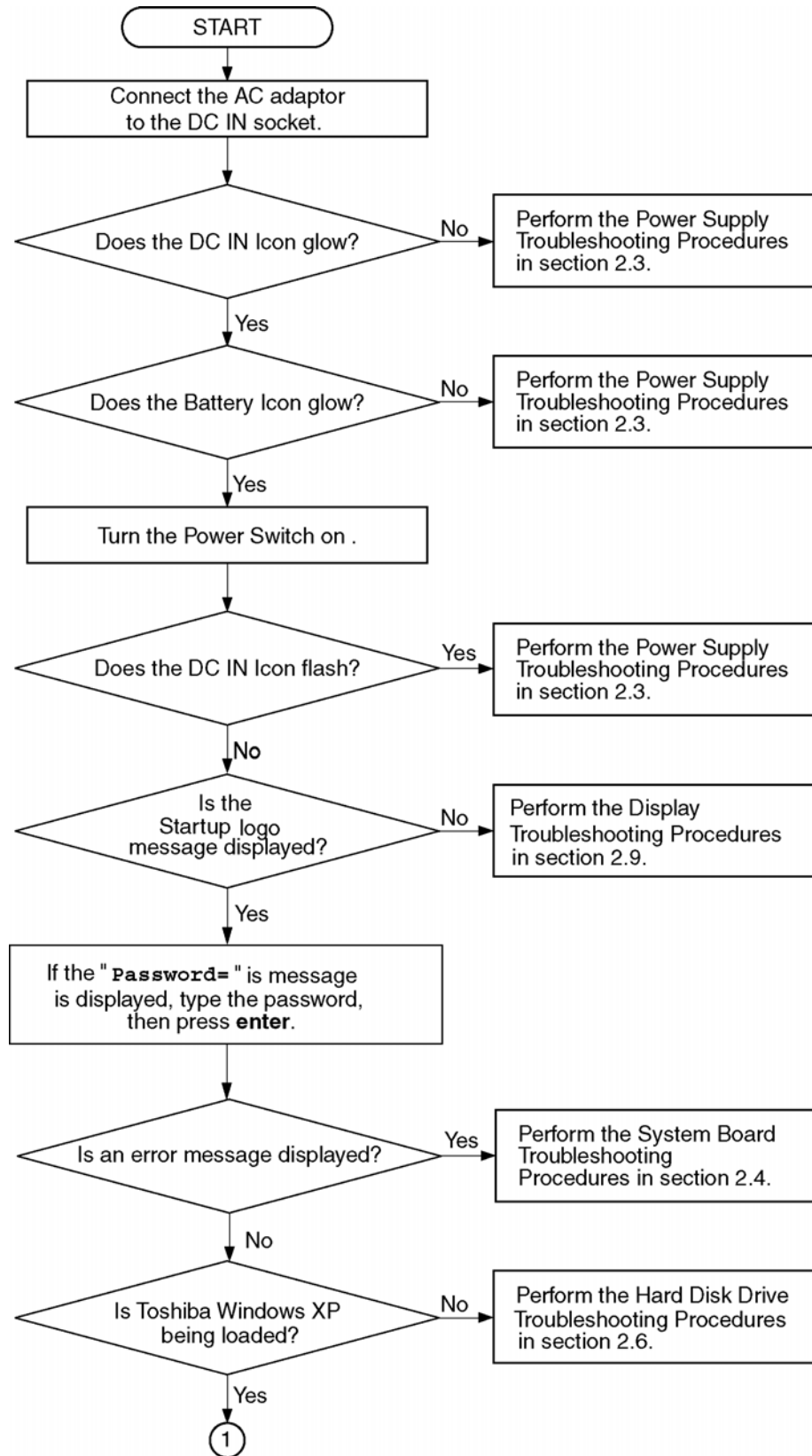


Figure 2-1 Troubleshooting flowchart (1/2)

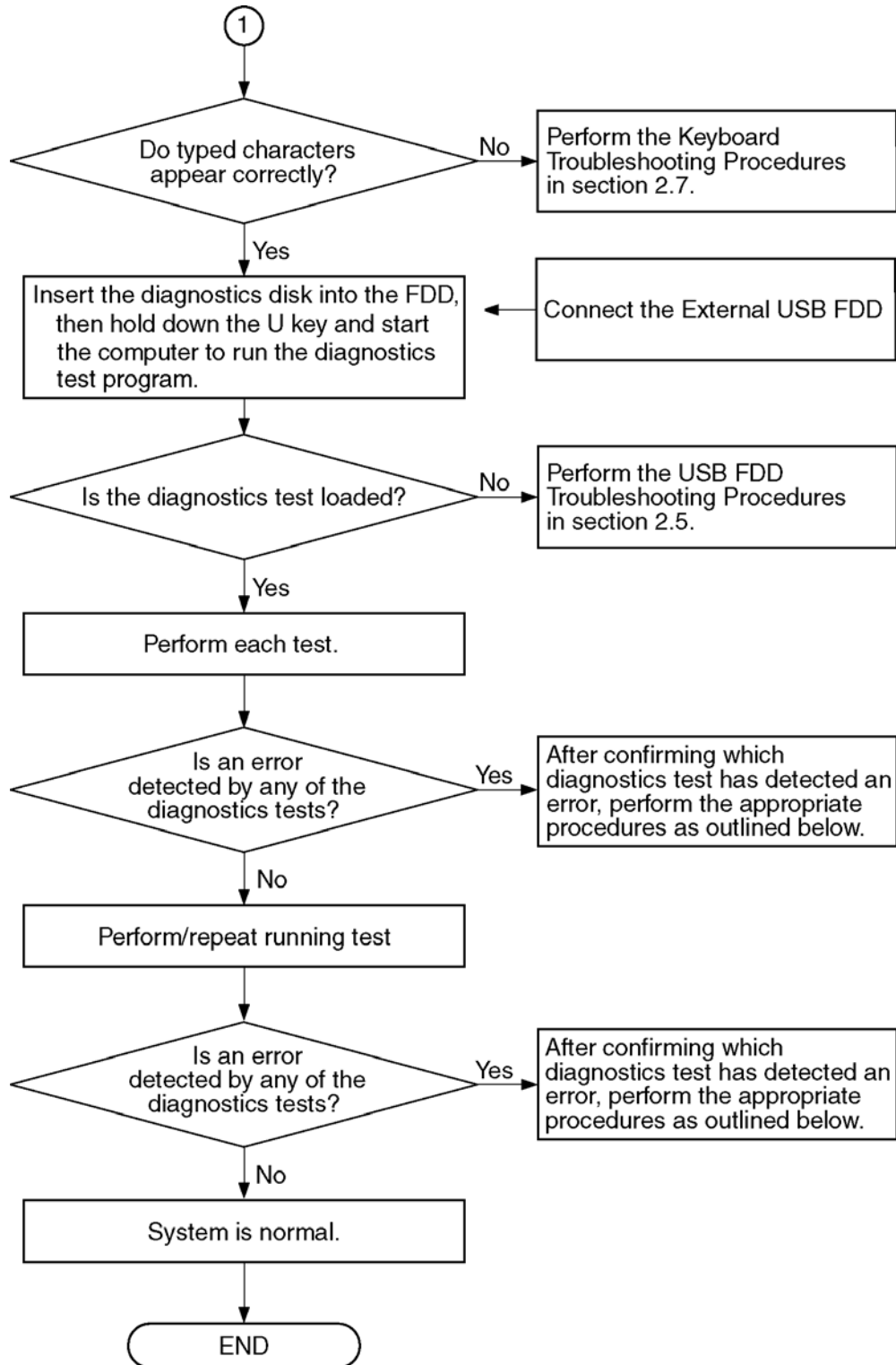


Figure 2-1 Troubleshooting flowchart (2/2)

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

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

Procedure 1 Power Status Check

The following icons indicate the power supply status:

- Battery icon
- DC IN icon

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

Table 2-1 Battery icon

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

Table 2-2 DC IN icon

DC IN icon	Power supply status
Lights green	DC power is being supplied from the AC adapter.
Blinks orange	Power supply malfunction**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 the icon is blinking, perform the following procedure.

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

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

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

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

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

NOTE: Use a supplied AC adapter G71C0002R610.

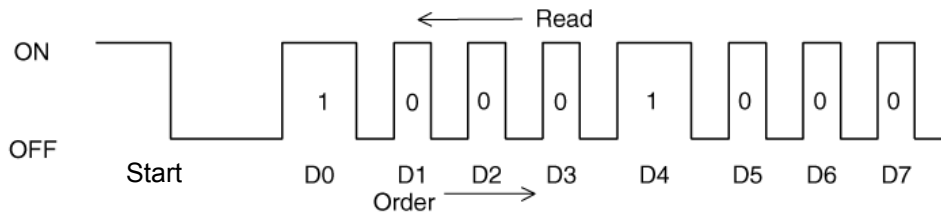
Procedure 2 Error Code Check

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

- | | |
|---------------------------------------------|---------------------|
| <input type="checkbox"/> Start | Off for 2 seconds |
| <input type="checkbox"/> Error code (8 bit) | |
| “1” | On for one second |
| “0” | On for half second |
| Interval between data bits | Off for half second |

The error code begins with the least significant digit.

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.

Table 2-3 Error code

Error code	Where error occurs
1*h	DC Power (AC Adapter)
2*h	Main battery
3:h	2nd battery
4*h	S3V output
5*h	1R5-C1V output
6*h	1R5-C1V output
7*h	PPV output
8*h	PTV output
9*h	E5V output
A*h	E3V output
B*h	1R8-P1V output
C*h	PGV output
D*h	1R25-B1V output
E*h	2R5-B2V output
F*h	-

DC power supply (AC adapter)

Error code	Meaning
10h	AC Adapter output voltage is over 16.5V.
11h	Common Dock output voltage is over 16.5V.
12h	Current from the DC power supply is over 12.0A.
13h	Current from the DC power supply is over 0.5A when there is no load.
14h	Abnormal current has been sensed.

Main Battery

Error code	Meaning
20h	Over voltage has been sensed. (Error code 20h is not supported.)
21h	Main battery charge current is over 12.0A.
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.
25h	Main battery charge current is over 0.3A when the charging is off.

 Second Battery

Error code	Meaning
30h	Over voltage has been sensed. (Error code 30h is not supported.)
31h	Second battery charge current is over 12.0A.
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.
35h	Second battery charge current is over 0.3A when the charging is off.

 S3V output

Error code	Meaning
40h	S3V voltage is 2.81V or less when the computer is powered on/off.
45h	S3V voltage is 2.81V or less when the computer is booting up.(CV support)

 1R5-C1V output

Error code	Meaning
50h	1R5-C1 voltage is over 1.80V when the computer is powered on/off.
51h	1R5-C1 voltage is 1.275V or less when the computer is powered on.
52h	1R5-C1 voltage is 1.275V or less when the computer is booting up.
53h	1R5-C1 voltage is 1.275V or less while the computer is suspended.
54h	1R5-C1 voltage is abnormal while the computer is shutdown. (CV support)
55h	1R5-C1 voltage is 1.275V or less when the computer is booting up. (CV support)

1R5-C1V output

Error code	Meaning
60h	1R5-C1V voltage is over 2.16V 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 while the computer is suspended.
64h	1R5-C1V voltage is abnormal while the computer is shutdown. (CV support)
65h	1R5-C1V voltage is 1.275V or less when the computer is booting up. (CV support)

PPV output

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

Error code	Meaning
80h	PTV voltage is over 1.26V when the computer is powered on/off.
81h	PTV voltage is 0.68V or less when the computer is powered on.
82h	PTV voltage is 0.68V or less when the computer is booting up.
83h	PTV voltage is 0.68V or more when the computer is powered off.
84h	PTV voltage is 0.68V or less while the computer is suspended.

E5V output

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

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 when the computer is suspended.

1R8-P1V output

Error code	Meaning
B0h	2R5-P2V voltage is over 3.00V when the computer is powered on/off.
B1h	PPV voltage is 1.53V or less when the computer is powered on.
B2h	PPV voltage is 1.53V or less when the computer is booting up.
B3h	PPV voltage is 1.53V or more when the computer is powered off.

PGV output

Error code	Meaning
C0h	PGV voltage is over 1.62V when the computer is powered on/off.
C1h	PGV voltage is 0.68V or less when the computer is powered on.
C2h	PGV voltage is 0.68V or less when the computer is booting up.
C3h	PGV voltage is 0.68V or more when the computer is powered off.
C4h	PGV voltage is 0.68V or less while the computer is suspended.

1R25-B1V output

Error code	Meaning
D0h	1R25-B1V voltage is over 1.50V when the computer is powered on/off.
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

Error code	Meaning
E0h	2R5-B2V voltage is over 3.00V when the computer is powered on/off.
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 firmly, go to the following step:
- Connect a new AC adapter and AC power cord. If the problem still occurs, go to Procedure 5.

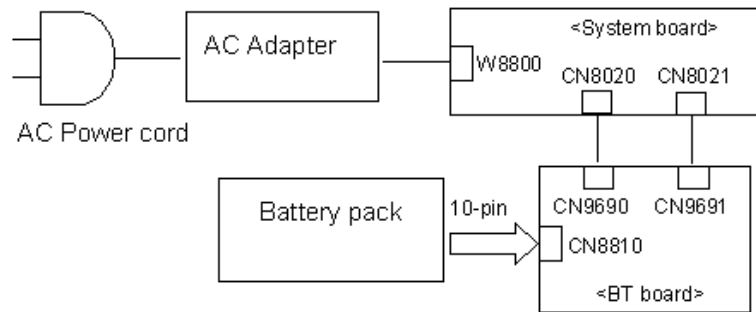
Check 3 In the case of error code 21h:

- 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 Check 1.

Check 1 Make sure the AC adapter and the AC power cord are firmly plugged into the DC IN socket (W8800) and wall outlet. If these cables are connected firmly, go to Check 2.

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

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

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

Procedure 4 Charging Check

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

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

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

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

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

Check 5 Replace the battery pack with a new one. If the battery pack is still not charged, go to Procedure 5.

Procedure 5 Replacement Check

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

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

When AC adapter is connected ;

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

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

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

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

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

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

2.4 System Board Troubleshooting

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

Procedure 1: Message Check

Procedure 2: Debugging Port Check

Procedure 3: Diagnostic Test Program Execution Check

Procedure 4: Replacement Check

Procedure 1 Message Check

When the power is turned on, the system performs the 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 is properly loaded, go to Procedure 4.

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

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

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

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

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

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

If any other error message displays, perform Check 3.

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

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

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

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

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

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

Procedure 2 Debugging Port Check

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

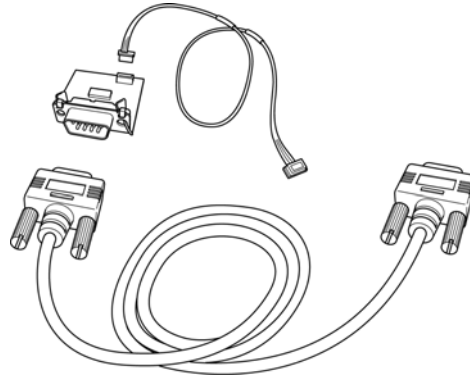
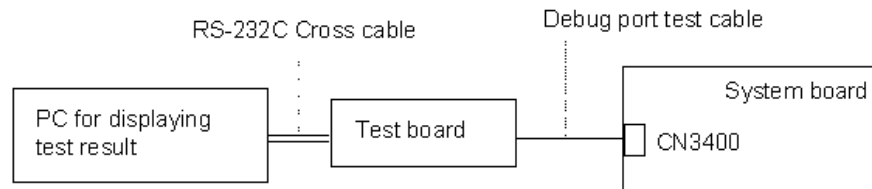


Figure 2-2 A set of tool for debug port test

The test procedures are follows:

1. Connect the debug port test cable to the connector CN3400 of the system board. For disassembling 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.
5. 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	Time (second) to process

	Contents of process

6. When the D port status is FFFFh (normal status), go to Procedure 4.
7. When the D port status falls into any status in Table 2-4, execute Check 1.

Table 2-4 Debug port (Boot mode) error status (1/8)

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 rd Bus data	
F000h	PIT CH0 initialization (for HOLD_ON)	
	BIOS rewrite factor flag initialization	
	CHECK SUM CHECK	Transition to protected mode
		Boot block checksum (halts when error)
	Checksum other than boot block (skip when returned to S3)	
F001h	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 Check of Tilde key, Tab key if a key is pressed
F002h	BIOS rewrite request check BIOS rewrite request check if Checksum check error occurred on except Boot Block or rewrite is required by user. "BIOS rewrite process".	
F003h	Transits to System BIOS IRT.	
	BIOS rewrite	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 2-4 Debug port (Boot mode) error status (2/8)

D port status	Inspection items	Details	
F005h	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 request BIOS, EC/KBC rewriting	Blinks green (cycle:2s, on:1s, off:1s)	
	When BIOS ROM abnormal	Blinks orange (cycle:2s, on:1s, off:1s)	
	Key input		Prohibition of USB
			BEEP
			Waiting for key
	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.	
		Read 1 sector of the root directory	
		directory start header and calculates the sector	
Reading of EXE header of "CHGBIOSA.EXE" and "CHGFIRMA.EXE", key input when error occurred.	Retrieval of entry of "CHGBIOSA.EXE" / "CHGFIRMA.EXE" from the sector read.		
Execution of "CHGBIOSA.EXE" and "CHGFIRMA.EXE"			
F100h	Prohibition of cache		
	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 FLUTE		
Initialization of PIT channel 1 (Setting the refresh interval "30μs")			

Table 2-4 Debug port (Boot mode) error status (3/8)

D port status	Inspection items	Details
F101h	Checking DRAM type and size (at cold boot)	When unsupported memory connected, beeps and halts. When DRAM size = 0, halts.
	Testing the stack area of SM-RAM	When it can not be used, halts.
F102h	Configuring cache memory	
	Permission of L1/L2 cache memory	
	Checking the access of a CMOS (Only in Cold Boot)	When error detected, halts
	Examining the battery level of CMOS	
	Checksum check of CMOS	
	Initializing data in CMOS (1)	
	Setting up IRT status	(Setting of boot status and IRT busy flag, The rest bit is 0)
	Storing the size of DRAM	
F103h	Branch of resuming(only in Cold Boot)	When a CMOS error is detected, it does not branch.
		If "resume status code" is not set, no resume occurs.
		Resume error check S3 recovery error (ICH) Resume error F17AH SM-RAM checksum check Resume error F173H Memory configuration change check Resume error F173H Checksum check of system BIOS RAM area Resume error F179H Checksum check of expansion memory Resume error F176H Checksum check of PnP RAM Resume error 177H To resume process (RESUME_MAIN)
	To resume error process	Returns the CPU clock to "Low"
		Prohibition of all SMI
		Clears resume status
		Returns to ROM

Table 2-4 Debug port (Boot mode) error status (4/8)

D port status	Inspection items	Details
		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
F104h	SMRAM initialization	
	WakeUp factor check	
	SMRAM base rewriting and CPU state map saving for BIOS	
	Permission of SMI based on ASMI	
F105h	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 normally in 30 micro-s refresh interval) The system halts when the time is out.
		CPU clock measurement
		Check of parameter block A
		Control on excess of rated input power
		Permission of SMI except auto-off function
		Battery discharge current control (1CmA)
		AC adapter rated over current control
		Dividing procedures for time measuring by IRT
		Setting for clock generator
		CPU Initialization Update of micro code Geyserville support check Setting of CPU clock to "high"
		Graphics Aperture Size setting

Table 2-4 Debug port (Boot mode) error status (5/8)

D port status	Inspection items	Details	
F106h	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	Defaults set if bad battery, bad checksum (ROM, CMOS) is detected)	
	ACPI table initialization (for execution of option ROM)		
	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	
		HC initialization, USB Device recognition and initialization	
		Control of built-in LAN permission/prohibition	
	PIC initialization		
PIC test			
Password Initialization			
F107h	PCI bus initialization	(connection of DS Bus)	
	Initialization of LAN information		
	Check of WakeUp factor		
F108h	Task generation for waiting INIT_PCI completion		
	CMOS data initialization (2)		
	PnP initialization		
	Setting of setup items		
	H/W setting based on resource		
F109h	Task generation for waiting PnP resource making completion		
	PnP H/W initialization	PC card slot initialization	
	PCI automatic configuration	Making of work for automatic configuration	
Acquisition of PCI IRQ			

Table 2-4 Debug port (Boot mode) error status (6/8)

D port status	Inspection items	Details
(F109h)		Configuration
		Saving of VGA configuration result
F10Ah	Task generation for waiting PCI_CONFIGURATION completion	
	Initialization of H/W needed after PCI configuration	HDD initialization sequence start
	Enabling power off	
	Output code generation	
F10Bh	FIRST_64KB_CHECK	(Check of first 64KB memory)
F10Ch	INIT_INT_VECTOR	(Initialization of vectors)
F10Dh	INIT_NDP	(Initialization of NDP)
F10Eh	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)
F10Fh	INIT_DISPLAY	Waiting for VGA chip initialization completion
		Waiting for Display access completion
F110h	Calling VGA BIOS	
F112h	DISP_LOGO	Displaying logo
F113h	SYS_MEM_CHECK	Check of convention memory in the protected mode (boot)
F114h	EXT_MEM_CHECK	Check of exception in the protected mode (boot)
F115h	Check of exception in the protected mode	DPORT= F116H when error
	INIT_SYS_MEM	Initialization of conventional memory (Reboot)

Table 2-4 Debug port (Boot mode) error status (7/8)

D port status	Inspection items	Details
F117h	CHK_DMA_PAGE	Check of DMA Page Register (Boot)
F118h	CHECK_DMAC	Check of DMAC (Boot)
F119h	INIT_DMAC Initialization of DMAC (Boot)	(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 ATA priority initialization
F11Ch	BOOT_PASSWORD (password check)	(In the case of "Boot") Check of key input during IRT (waiting for KBC initialization completion) Input of password (Waiting for completion of initializing HDD)
F11Dh	EX_IO_ROM_CHECK	Check of option I/O ROM
F11Eh	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 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=F11FH
		Waiting for completion of initialization of Serial port (PC supporting SIO)
		Cancel of NMI Mask

Table 2-4 Debug port (Boot mode) error status (8/8)

D port status	Inspection items	Details
(F11Eh)		TIT check sum
		Clearance of the IRT flag of Runtime side
		Update of check sum of Runtime side
		Hibernation branch
		Initialization of Bluetooth
		Check of target maintenance card
		Prohibition of unused PC card
		Setting Wakeup status data for ACPI
		<p>HW initialization before Boot, Waiting for initialization completion</p> <p>Notifies the DVI connection status to VGA BIOS</p> <p>Setting of battery save mode</p> <p>Setting of date</p> <p>Waiting for Bluetooth initialization completion</p> <p>Update of DMI Wakeup factor, Update of SM-BIOS structure table</p> <p>PCI device configuration space close</p> <p>Cache control</p> <p>Process for CPU (Make the CPU clock to be set by SETUP)</p> <p>Waiting of motor-off completion of disabled HDD</p> <p>Final decision of USB FDD drive information</p> <p>Post processing of PRE_BOOT_SETUP</p> <p>Clearance of PWRBTN_STS</p> <p>Enabling POWER Button</p> <p>Measure on chip set defective</p>
	F120h	Clearance of IRT status
	Update of check sum of Runtime side	
F1FFh	End	

Table 2-5 Debug port (Suspend mode) error status (1/3)

D port status	Inspection items	Details
F130h	When powering-off request from OS is required, waiting for the completion of dividing process because waiting in SUSPEND of Runtime returns the process to OS.	
	Forced execution of dividing (Permission of SMI for dividing)	
	Waiting for completion of dividing	
F131h	After prohibiting of all SMI, permits I/O trap(EHCI) and external SMI.	
	Starts dividing to transmit periodically extension command (every 25 seconds) not to generate time-out of power-off.	
	Clears resume/power-off status.	
	Storing and initializing of special configuration register	
	Prohibits clock control.	
	Recognition of suspending for boot/ resume	
	Branch of resume mode (DPORT= F132h) or boot mode(DPORT=F133h)	
F132h	Powering-off during resuming	Halts HC. If in password process, recovers display information.
		Starts sequence for storing display system.
F133h	Resume error check in suspend mode.	Checks if in IRT.
		Checks if external cards are connected (If PNP OS exists, does not check.)
	Execution of driver for suspend	
	Clearing of data for Remote Lockout	
	Storing of USB register	
	Halt of HC.	

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

LED Status	Test item	Contents
(F133h)	Storing CPU register	
	Permission of system area, memory cache	(to work at high-speed)
	Suspending of HDD	
	Storing KBC,SCC and MOUSE	
	Storing of PCI device	
	Storing of PIT	
	Starts sequence for storing display system.	
	Storing of PIC	
	Storing of DMAC	
	Storing of system status command port	
	Storing of PCMCIA card	
	Storing of RTC	
	Storing of original HW for system	
	Calculation of check sum (conventional memory)	
	F134h	Suspending for boot mood
F137h	Processing of VGA –off (boot)	
	Suspending of HDD (boot)	
	Transition to S5 of Bluetooth (boot)	(For models supporting Bluetooth)
F138h	Suspending of boot/ resume for PnP	(Stores PnP resource information into Flash ROM.)
	Suspending of boot /resume for password	(Stores password information into Flash ROM.)
F139h	Waiting for completion of suspending for HDD password	
F13Ah	Prohibition of PCI arbiter	
	Setting of Wakeup event	
	Power-off of PC card	
	Re-setting backup current	
	Forced off of fan	
	Checks whether off-process for resume is needed	

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

LED Status	Test item	Contents
(F13Ah)	Power LED control during suspending	
	Isolates built-in LAN.	
	Makes the power of sound off.	
F13Bh	Model-unique processing just before suspending	
	Waiting for completion of dividing for suspending	
	Stops dividing of extension command for power off.	
F13Ch	Measure for USB over current	
	Calculation of check sum of PnP RAM area	Not work in suspending for boot
	Acquires how to turn the power off.	
	Resets by EC.	(when required)
	Makes not to send Eject Power Off command when turn the power off by the date check of alarm power on.	
	Prohibition of all SMI	
	Initializing of special register in suspending	
	Calculates the check sum of SMRAM and stores it in SMRAM.	
F13Dh	Calculates the checksum of system BIOS in the IRT side.	Checksum does not match during IRT
	Setting status of suspend completion	
	Prohibition of L1&L2	
	Power off	Completion of BIOS

Table 2-6 Debug port (Resume mode) error status (1/4)

LED Status	Test item	Contents
F100h	Refer to IRT	
F101h	Refer to IRT	
F102h	Refer to IRT	
F103h	Refer to IRT	
	Clears flag for SMI control.	
	Renewal of Resume counter	
F121h	Checks the WakeUp factors.	
	Rewriting of SMRAM BASE	
F122h	Initializing devices necessary for initialization before initializing PCI bus	Initializing of PIT
		Initializing of PIT channel 0 (Sets the interval of timer interruption to 55ms)
		Initializing of PIT channel 2 (Sets the sound generator frequency to 664Hz)
		Measuring CPU clock
		Permission of SMI other than auto-off function
		Control of excess of rated input power
		Control of battery discharging current (1CmA)
		Control of excess of rated current of AC adapter
		Dividing for measuring of IRT time
		Setting to clock generator
		Check of parameter block A
		Initializing of CPU
		Updating micro-code
		Judge of CPU type
		Check of supporting Geyserville
		Sets the CPU clock to High.
		Setting of Graphics Aperture Size
	Recovery of PIC register	
F122h	Initialization of devices necessary for initialization before initializing PCI bus 2	AC'97 control
		Initializing of temperature control information
		Initializing of KBC
		VGA display-off and Reset control, Starts VGA recovery.
		Start recovery of VGA

Table 2-6 Debug port (Resume mode) error status (2/4)

LED Status	Test item	Contents
(F122h)		Initializing of sound
		Acquires the multi-box status.
		Initializing of HC, recognizing of USB devices connection and initializing the USB devices
		Control of permission/prohibition for built-in LAN
	Check of the checksum of conventional memory	Resume error DPORT=F174H
F123h	Initializing of PCI devices	
	Check of WakeUp factors after initializing PCI bus	
F124h	Waiting for initializing of devices which have to be initialized before setting HW by PnP resource	
	Recovery of each device (1)	Processing of RESUME for PnP
		Waiting for the completion of VGA power-down control (because the VGA configuration can not be seen)
		Processing of RESUME for PCI
		Checks slots that were in ON status during suspending (for fingerprint identification)
		Recovery of PCMCIA card
		Error when an ATA card is pulled out Resume error DPORT=17BH
		Executing of dividing process of device detection of PC card
Check of HDD pack connection	Resume error when HDD is mounted DPORT=F172h	
Start of IDE device resume sequence		
F125h	Recovery of user alarm setting and cancel of alarm power-on function	(only one time)
	Enable of power-off switch	
	Initializing EC and start of reading battery information	

Table 2-6 Debug port (Resume mode) error status s (3/4)

LED status	Test item	Contents
(F125h)	Recovery of each device(2)	Setting of setup items
		Initializing of DMAC
	Initializing of VGA BIOS in resume	Waiting for VGA power on
F126h	Call of VGA BIOS	
F128h	Processing of password for RESUME	
F129h	Recovery of each device(3)	Recovery of DMAC register
		PnP Resume processing (2 nd)
	Motor-off of disabled HDD	
F12Ah	Waiting for completion of KBC initializing	(not in ACPI mode)
	Waiting for completion of USB initializing	
	Recovery of USB register	
	Recovery of CPU register	
	Resetting NDP interruption	
	Recovery of system, status, command and port	
	Wakeup check	Notifies the device change status to the high rank.
		Setting WAKEUP status data for ACPI
	Initializing HW just before booting or waiting for the completion	Notifies the DVI connection status to VGA BIOS
		Setting battery saving mode
		Setting of date
		Waiting for the completion of Bluetooth initializing (models supporting Bluetooth)
		Renewal of Wakeup factor of DMI and SM-BIOS structure table
		Closing PCI device configuration area
		Cache control
Update of parameter block A		
Process related to CPU		
Setting of CPU clock to SETUP designation		
Waiting for motor-off of disabled HDD		

Table 2-6 Debug port (Resume mode) error status (4/4)

LED status	Test item	Contents
(12Ah)		Final decision of USB FDD information
		Post-process of PRE_BOOT_SETUP Clears PWRBTN_STS. Enables Power Button. Measures against chip set defective
		Waiting for the completion of recovery of VGA register
		Recovery of PIT register
		Recovery of PCI configuration register
		Recovery of PIC MASK
		Executing of driver for RESUME Waiting for FDD recovery completion (for models supporting built-in FDD)
F12Bh	Checks if the power-off switch is pressed or not during resume processing (Suspends if pressed)	
	Executes HOTKEY F1 processing when booting in instant security	
F12Ch	(Not in ACPI mode) Clears key buffer	
F12Dh	(In ACPI mode) Clears IRT status	
F12Eh	(In ACPI mode) Clears flag in Resume process Acquires Wake Up Vector address. Clears key buffer. Update of date/time ACPI mode on Recovery of write-protected status before.	
FFFFh	(In ACPI mode / not in ACPI mode) Initialization of printer port (for models supporting printer) Returning to the main process	

NOTE: Status outputted by the test means the last error detected in the debug port test.

Procedure 3 Diagnostic Test Program Execution Check

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

1. System test
2. Memory test
3. Keyboard test
4. Display test
5. Floppy Disk test
6. Printer test [It is not supported]
7. Async test [It is not supported]
8. Hard Disk test
9. Real Timer test
10. NDP test
11. Expansion test
12. CD-ROM/DVD-ROM test
13. Only One test
14. Wireless LAN test
15. LAN/Modem/Bluetooth/IEEE1394 test
16. Sound test

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

Procedure 4 Replacement Check

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

2.5 USB FDD Troubleshooting

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

Procedure 1: FDD Head Cleaning Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Replacement Check

Procedure 1 FDD Head Cleaning Check

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

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

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

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

Procedure 2 Diagnostic Test Program Execution Check

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

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

Table 2-7 FDD error code and status

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

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

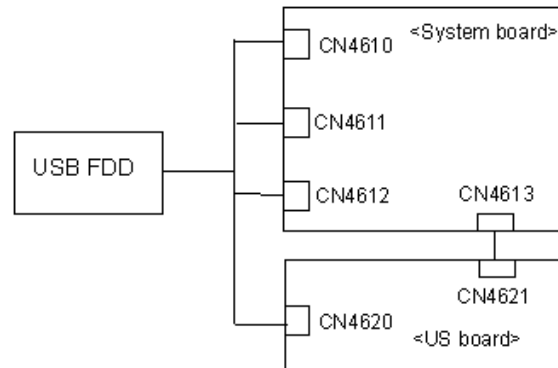
Write protected

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

Procedure 3 Connector Check and Replacement Check

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

USB FDD can be connected to the following 4 ports.
(System board x 3 ports, US board x 1 port)



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

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

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

- Check 2 USB FDD may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.
- Check 3 Connect USB FDD to each port embedded on system board and on US board. Then, check whether it works properly. If it does not work properly when connected to CN4620, perform Check 4. If it does not work properly when connected to CN4610, CN4611, CN4612 or all ports, perform Check 5.
- Check 4 US board may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still occurs, perform Check 5.
- Check 5 System board may be faulty. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.6 2.5" HDD Troubleshooting

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

Procedure 1: Partition Check

Procedure 2: Message Check

Procedure 3: Format Check

Procedure 4: Diagnostic Test Program Execution Check

Procedure 5: Connector Check and Replacement Check

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

Procedure 1 Partition Check

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

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

Procedure 2 Message Check

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

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

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

HDC ERROR

or

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

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

Insert system disk in drive
Press any key when ready

or

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

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

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

System Transferred

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

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

Procedure 3 Format Check

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

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

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

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

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

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

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

Procedure 4 Diagnostic Test Program Execution Check

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

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

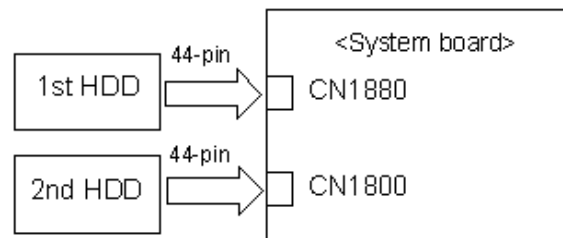
Table 2-8 2.5" Hard disk drive error code and status

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

Procedure 5 Connector Check and Replacement Check

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

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



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

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

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

2.7 Keyboard Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

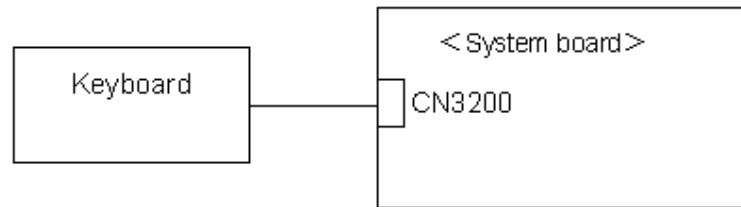
Execute the Keyboard Test (DIAGNOSTIC TEST) and Pressed key display test (ONLY ONE TEST) in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

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

Procedure 2 Connector and Replacement Check

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

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



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

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

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

2.8 Touch pad Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

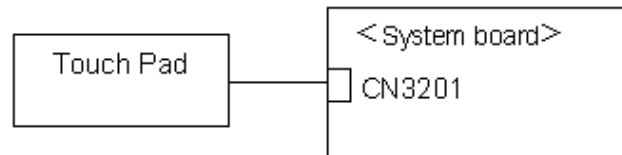
Execute the Touch pad test (ONLY ONE TEST) in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

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

Procedure 2 Connector and Replacement Check

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

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



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

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

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

2.9 Display Troubleshooting

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

Procedure 1: External Monitor Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector and Cable Check

Procedure 4: Replacement Check

Procedure 1 External Monitor Check

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

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

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

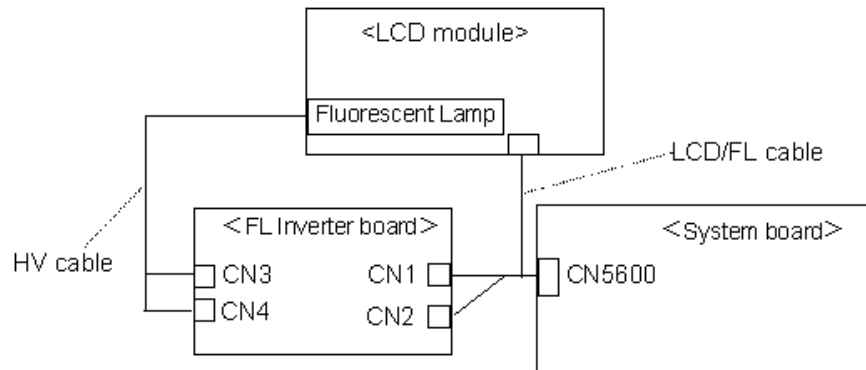
Procedure 2 Diagnostic Test Program Execution Check

The Display Test program is stored in Diagnostics disk. This program checks the display controller on system board. Insert the Diagnostics disk in the USB FDD, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics* for details. If an error is detected, go to Procedure 3.

Procedure 3 Connector and Cable Check

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

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



Procedure 4 Replacement Check

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

If fluorescent lamp does not light, perform Check 1.

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

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

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

- Check 1 Replace fluorescent lamp with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still occurs, perform Check 2.
- Check 2 LCD/FL cable may be faulty. Replace FL/LCD cable with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 3.
- Check 3 FL inverter may be faulty. Replace FL inverter with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 4.
- Check 4 LCD module may be faulty. Replace LCD module with a new one following the instructions in Chapter 4, *Replacement Procedure* and test the display again. If the problem still occurs, perform Check 5.
- Check 5 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedure*.

2.10 Optical Disk Drive Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

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

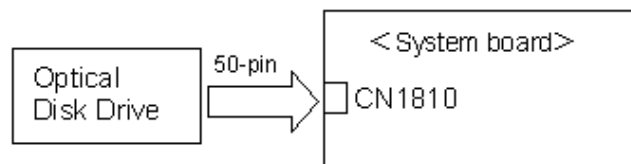
Prepare the tools before the test.

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

Procedure 2 Connector Check and Replacement Check

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

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



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

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

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

2.11 Modem Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

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

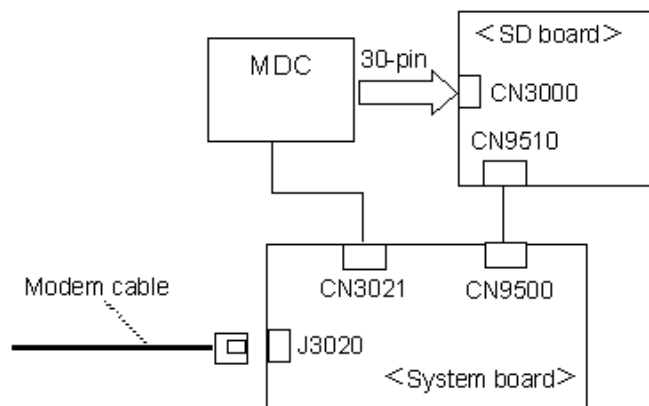
If any error is detected, perform Procedure 2.

Procedure 2 Connector Check and Replacement Check

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

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

Check 1 Make sure the following connections are firmly connected.



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

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

2.12 LAN Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

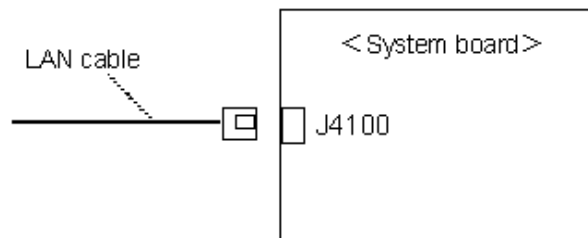
Execute LAN test in the LAN/Modem/Bluetooth/IEEE1394 test program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

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

Procedure 2 Connector Check and Replacement Check

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

Check 1 Make sure LAN cable is firmly connected to the connector J4100. If the problem still occurs, perform Check 2.



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

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

2.13 Wireless LAN Troubleshooting

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

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antennas' Connection Check

Procedure 3: Replacement Check

Procedure 1 Transmitting-Receiving Check

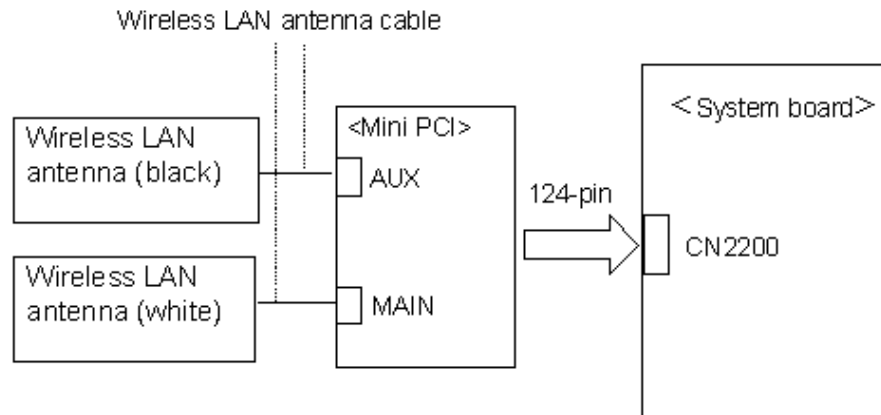
Before starting the test, make sure the wireless communication switch is set in the ON position.

Check 1 Execute Wireless LAN test program to check the transmitting-receiving function of wireless LAN. You will need a second computer that can communicate by wireless LAN. Perform the test following the instructions described in Chapter 3.

If the computer passes the test, the function is correctly working. If the computer does not pass the test, perform Procedure 2.

Procedure 2 Antennas' Connection Check

The wireless LAN function-wiring diagram is shown below:



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

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

Procedure 3 Replacement Check

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

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

2.14 Sound Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check

Procedure 3: Replacement Check

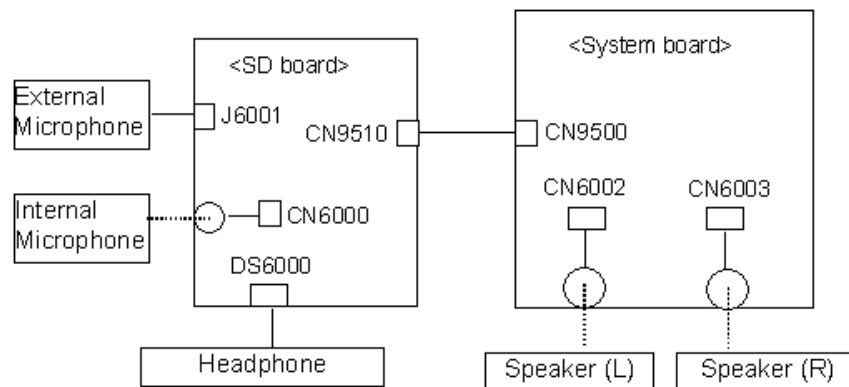
Procedure 1 Diagnostic Test Program Execution Check

Execute the Sound test in Sound Test program disk. 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

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



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

If the problem still occurs, go to Procedure 3.

Procedure 3 Replacement Check

- If external microphone does not work properly, perform check 1.
- If headphone does not work properly, perform check 2.
- If internal microphone does not work properly, perform check 3.
- If speaker does not work properly, perform check 4.

- Check 1 External microphone may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5.
- Check 2 Headphone may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5.
- Check 3 Internal microphone may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5.
- Check 4 Speaker may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 7.
- Check 5 SD board may be faulty. Replace it with a new one following the instructions in Chapter 4. If the problem still occurs, perform Check 6.
- Check 6 Flat cable between SD board and system board may be faulty. Replace it with a new one following the instructions in Chapter 4. If the problem still occurs, perform Check 7.
- Check 7 System board may be faulty. Replace it with a new one following the instructions in Chapter 4.

2.15 TV tuner Troubleshooting

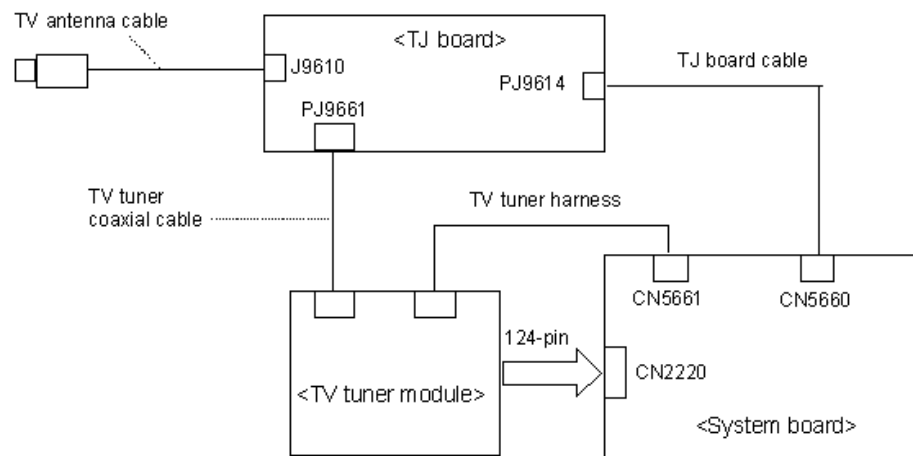
To check if TV tuner is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Connector Check and Replacement Check

Procedure 1 Connector Check and Replacement Check

The connection of cables, boards and module may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4 and perform the following checks:

Check 1 Make sure the following connectors are firmly connected.



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

- Check 2 TV antenna cable may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 3.
- Check 3 TV tuner module may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 4.
- Check 4 TJ board may be faulty. Replace it with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 5.
- Check 5 Cables among TJ board, system board and TV tuner module may be faulty. Replace them with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 6.
- Check 6 System board may be faulty. Replace it with new one following the instructions in Chapter 4.

Chapter 3

Tests and Diagnostics

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3.1 The Diagnostic Test

This chapter explains how to use the 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 "Device Config." in SET UP menu. After checking the diagnostics, be sure to select [Setup by OS] in the "Device Config."

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 for maintenance, wireless LAN for maintenance and Sound 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 (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)
- RGB wraparound connector (Expansion 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) [Not necessary for this model]

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
- 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)
- A LAN wraparound connector (E2PROM test)

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

3.2.1 Diagnostics menu (T&D)

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

```
TOSHIBA personal computer XXXXXX 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 XXXXXX 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           [It is not supported]
7 - ASYNC TEST            [It is not supported]
8 - HARD DISK TEST        [There is a second hard disk]
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
```

NOTE: Only when a 2nd HDD is installed in the computer, [There is a second hard disk] message appears in the display.

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
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

```

```

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                              *
*          8 ..... System configuration display              *
*          9 ..... E2PROM test (MAC/GUID/DMI)                *
*****
... Press test number[1,2,8,9] ?

```

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 micro code
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. DynaBook)
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**.

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 08 System configuration display

This subtest displays the information of the system configuration.

When the following message appears, confirm the contents and press **Enter**.

```
Press [Enter] key
```

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 this test, the same subtests as 3.23 RUNNING TEST is 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.

```
*****  
HEATRAN 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 [Not supported]	01	Ripple pattern
		02	Function
		03	Wrap around
7	ASYNC [Not supported]	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 /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, 2;FAN#2, 0; FAN#1&#2) ?
```

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

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

To check both CPU fan and VGA 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 Geyserville (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 subtest 02 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

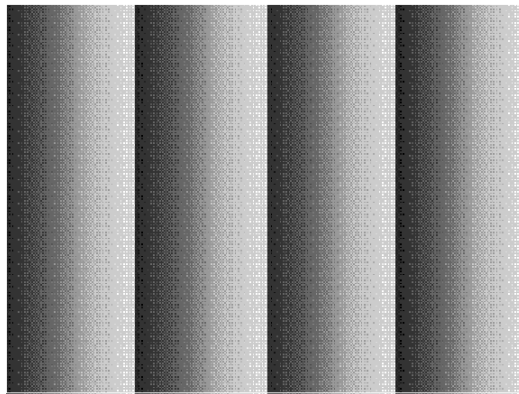
To execute the Display Test, select **4** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

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 & 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 truck 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      : XXXXXX  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.

```
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnop
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnop
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopq
r
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqr
s
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrst
e
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstu
v
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstu
v
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstu
vw
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstu
vwxy
```

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
! "# $ % & ' ( ) * + , . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [ \ ] ^ _ ` a b c d e f g h i j k l m n
o p q r s t u v w x y z { | } ~

```

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

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

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**.

Subtests 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, a 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: *The contents of the hard disk will be erased when subtest 02, 03, 04, 06, 08, or 09 is 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) ?

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

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
[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
```

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 & 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
'149749'	3 cylinder
'63B63B'	4 cylinder
'9C49C4'	5 cylinder
'2DB6DB'	6 cylinder
'D24974'	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 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, making 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 00001	nn nn	xx xx	Address line REG#, CE#1, CE#2 nn=A0, 90, 80, 00
02	00002	ww	rr	Data line 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) NN=21, 00

NOTE: Select 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, RGB monitor ID wraparound connector is required. The wiring diagram of the connector is described in Appendix F.*

Connect a wraparound connector to CRT monitor for the test of ID acquisition. This subtest is executed by using VESA command.

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 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 03 04 05 06 07 08 09 10	ROM - CHECKSUM ERROR ROM - SERIAL ID WRITE ERROR ROM - NOT SUPPORTED PS-SYSTEM ROM - SENSING ERROR(AC-ADAPT) ROM - SENSING ERROR(1st Batt) ROM - SENSING ERROR(2nd Batt) ROM - THORMISTOR ERROR(1) ROM - THORMISTOR ERROR(2) ROM - THORMISTOR ERROR(3)
Memory	01 02 DD	RAM - PARITY ERROR RAM - PROTECTED MODE NO CHANGE' RAM - CACHE MEMORY ERROR
Keyboard	FE FD F0 F1 F2 F3 F4 F5 F6 F7 F8 F9 FA EF ED	USB - GET DESCR.ERROR (FIRST) USB - SET ADDRESS ERROR HUB - GET DESCR.ERROR(Top 8B) HUB - GET DESCR.ERROR (Whole) HUB - SET CONFIGURATION ERROR HUB - GET DESCR.ERROR(DESCR.) HUB - SET FEATURE ERROR(P ON) HUB - GET STATUS ERROR HUB - SET FEATURE ERROR(RESET) HUB - CLEAR FEATURE ERROR HUB - CLEAR FEATURE1 ERROR HUB - SET FEATURE ERROR(Enab.) HUB - CLEAR FEATURE2 ERROR USB - OVER CURRENT ERROR 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 02 03 04 08 09 10 20 40 80 60 06 EE	FDD - BAD COMMAND ERROR FDD - ADDRESS MARK NOT FOUND FDD - WRITE PROTECTED FDD - RECORD NOT FOUND FDD - DMA OVERRUN ERROR FDD - DMA BOUNDARY ERROR FDD - CRC ERROR FDD - FDC ERROR FDD - SEEK ERROR FDD - TIME OUT ERROR FDD - NOT DRIVE ERROR FDD - MEDIA REMOVED FDD - WRITE BUFFER ERROR
Printer	01 08 10 20 40 80	PRT - TIME OUT PRT - FAULT PRT - SELECT LINE PRT - OUT OF PAPER PRT - POWER OFF PRT - BUSY LINE
ASYNC	01 02 04 08 10 20 40 80 88 05 06	RS232C - [DTR ON] TIME OUT RS232C - [CTS ON] TIME OUT RS232C - [RX READY] TIME OUT RS232C - [TX FULL] TIME OUT RS232C - PARITY ERROR RS232C - FRAMING ERROR RS232C - OVERRUN ERROR RS232C - LINE STATUS ERROR RS232C - MODEM STATUS ERROR SIR - TIME OUT ERROR FIR - TIME OUT ERROR
HDD	05 07 09 0B BB 08 01 02 04 10 20 40 80 11 AA	HDD - HDC NOT RESET ERROR HDD - DRIVE NOT INITIALIZE HDD - DMA BOUNDARY ERROR HDD - BAD TRACK ERROR HDD - UNDEFINED ERROR HDD - OVERRUN ERROR (DRQ ON) HDD - BAD COMMAND ERROR HDD - ADDRESS MARK NOT FOUND HDD - RECORD NOT FOUND ERROR HDD - ECC ERROR HDD - HDC ERROR HDD - SEEK ERROR HDD - TIME OUT ERROR HDD - ECC RECOVER ENABLE HDD - DRIVE NOT READY

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

Device name	Error code	Error status name
(HDD)	CC E0 0A EE DA 12	HDD - WRITE FAULT HDD - STATUS ERROR HDD - BAD SECTOR HDD - ACCESS TIME ERROR HDD - NO HDD HDD - DMA CRC ERROR
NDP	01 02 03 04 05 06	NDP - NO CO-PROCESSOR NDP - CONTROL WORD ERROR NDP - STATUS WORD ERROR NDP - BUS ERROR NDP - ADDITION ERROR NDP - MULTIPLAY ERROR
EXPANSION	C1 C3 C4 C5 C6 C7 C8 CB CC CE CF	ADDRESS LINE ERROR CE#1 LINE ERROR CE#2 LINE ERROR DATA LINE ERROR WAIT LINE ERROR BSY# LINE ERROR BVD1 LINE ERROR ZV-Port ERROR NO PCMCIA CARD TYPE ERROR ZV_CONT# ERROR
CD-ROM /DVD-ROM	01 02 03 04 05 06 09 11 20 40 80 90 B0	BAD COMMAND ILLEGAL LENGTH UNIT ATTENTION MEDIA CHANGE REQUEST MEDIA DETECTED ADDITIMAL SENSE BOUNDARY ERROR CORRECTED DATA ERROR DRIVE NOT READY SEEK ERROR TIME OUT RESET ERROR 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 (Busy)	"0" ... HDC is ready. "1" ... HDC is busy.
6	DRY (Drive ready)	"0" ... Hard disk drive is not ready to accept any command. "1" ... Hard disk drive is ready.
5	DWF (Drive write fault)	"0" ... DWF error is not detected. "1" ... Write fault condition occurred.
4	DSC (Drive seek complete)	"0" ... The hard disk drive heads are not settled over a track. "1" ... The hard disk drive heads are settled over a track.
3	DRQ (Data request)	"0" ... Drive is not ready for data transfer. "1" ... Drive is ready for data transfer.
2	COR (Corrected data)	"0" ... Not used "1" ... Correctable data error is corrected.
1	IDX (Index)	"0" ... Not used "1" ... Index is sensed.
0	ERR (Error)	"0" ... Normal "1" ... The previous command was terminated with an error.

Table 3-4 Error register contents

Bit	Name	Description
7	BBK (Bad block mark)	"0" ... Not used "1" ... A bad block mark is detected.
6	UNC (Uncorrectable)	"0" ... There is no uncorrectable data error. "1" ... Uncorrectable data error has been detected.
5	—	Not used
4	IDN (Identification)	"0" ... Not used "1" ... There is no ID field in the requested sector.
3	—	Not used
2	ABT (Abort)	"0" ... Not used "1" ... Illegal command error or command abort.
1	TK0 (Track 0)	"0" ... The hard disk found track 0 during a recalibrate command. "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 (XXXXXXXX)          #####
#####
*
*  1 ..... Pressed Key Display                          *
*  2 ..... Touch Pad                                    *
*  3 ..... GP Button                                     *
*  4 ..... Kill Switch                                  *
*  5 ..... USB                                          *
*  6 ..... Touch Pad ( Scroll Button )                  *
*  7 ..... LED                                          *
*  8 ..... Remocon ( Sound, onsei/onta )                *
*
*  9 ..... Common Test                                  *
*
*****
.... Press test number[1-8, 9] ?
```

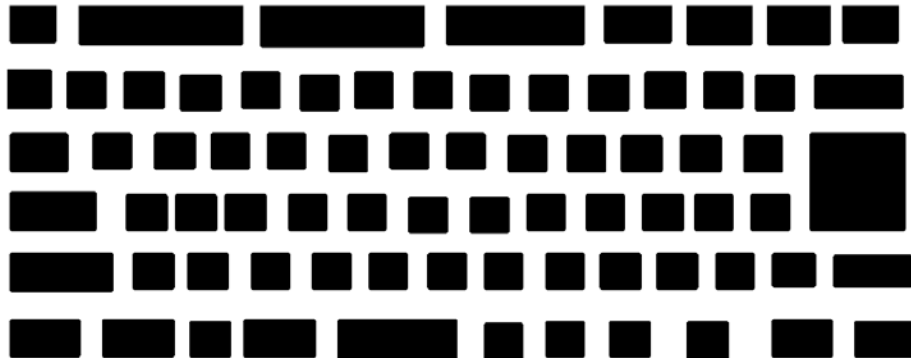
Select the subtest number you want to test and press **Enter**.

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

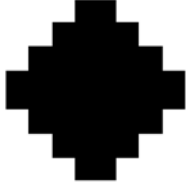
This subtest checks the functions of the touch pad as shown below.


- 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 >>

```

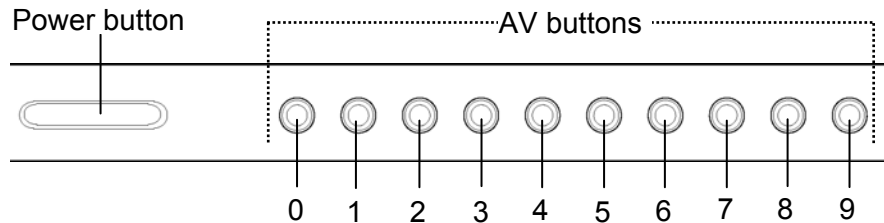
Subtest 03 GP Button

This subtest checks if the AV buttons (10 buttons) work properly.

The following message appears in the display.

```
Press button [0]
```

Press first AV button from the left (the nearest AV button to power button). The name of AV buttons in the message is described as number (0-9) from the left side. (Refer to the following picture.)



Press the indicated AV button [0], then following message will appear in the display.

```
Press button [1]
```

As the same way, press the indicated AV button and carry on the AV button test.

If wrong key is pressed, following message will appear in the display.

```
Press any key !
```

Pressing any key, indication of pressing AV button will appear in the display again. Unless the right AV button is pressed, this operation is repeated.

After checking all AV buttons, return to the ONLY ONE TEST menu automatically.

Subtest 04 Kill Switch

This subtest checks if the Wireless communication switch works properly.

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

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

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

```
KILL SWITCH ON !!
```

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

```
KILL SWITCH OFF !!
```

After Sliding the switch to OFF position, return to the ONLY ONE TEST menu automatically.

Subtest 05 USB

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

This subtest checks if USB port works properly.

The following menu appears in the display.

```
#####
##### ONLY ONE TEST Menu (XXXXXXXX) #####
#####
*
* 0 ..... Port 0 *
* 1 ..... Port 1 *
* 2 ..... Port 2 *
* 3 ..... Port 3 *
* 9 ..... EXIT *
*
*****
.... Press test number[0-3, 9] ?
```

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

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

OK message appears in the display if the test ends without a defective.

NG message appears in the display if a defective is found during the test. Confirm the connection of cable, then execute the test again.

Press **9** and return to ONLY ONE TEST menu.

Subtest 06 Touch Pad (Scroll Button)

This subtest checks if the scroll button of touch pad works properly.

The following message appears in the display.

```
***** Scroll button TEST (VX.XX) *****
```

```
Press Scroll button
```

```
Up    Button OFF  
Down  Button OFF
```

```
Press [ESC] key to EXIT
```

Check the message changes OFF<->ON while pressing UP or DOWN button of scroll button.

Press **ESC** and return to ONLY ONE TESST menu.

Subtest 07 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]
```

Confirm each LED lights properly.

- (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)

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

Check [PowerSW-LED]= Green

Check if the Power Switch LED lights in the following order.
(Green -> Orange -> Blue -> OFF)

Press any key and following message appears in the display.

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

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

Press **Enter** and return to the ONLY ONE TEST menu.

Subtest 08 Remocon (Sound, onsei/onta)

This subtest checks if AUDIO button of attached remote controller works properly.

The following message appears in the display.

Press [AUDIO] button !

Press AUDIO button of the remote controller and return to the ONLY ONE TEST menu.

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.

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 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 (yes)** and **Enter**. To cancel the test, press **N (no)** and **Enter**. If you execute the selectable test, follow the indication message in the display.
3. After setting the selectable test, the 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. The option 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 information.

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	= XXXXXXXX

NOTE: Only when a 2nd HDD is installed, [Drive #2] message appears in the display.

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 total version
6. PS Microprocessor version
7. SVP parameter version [Panel/Manufacture code/Product code]
8. Micro code 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 = XXXXXKB
* - Chip set           = XXXXXX                      VRAM = XXXXMB
* - BIOS ROM Version   = VX.XX      1st ID = XXH, 2nd ID = XXH
* - BOOT ROM Version   = VX.XX
* - EC Total Version   = VX.XX
* - PS Micon Version   = VX.XX
* - SVP Par. Version   = VX.XX      (Panel=XXXXXXXXXX, Manu=XXXX, Prod=XXXX)
* - Micro code Revision = VX.XX      (Processor=XXXh)
* - Total Memory Size  = XXXXXXMB (Conventional Memory = XXXKB)
* - Battery Code       = XXXXXXXXXXXXX
* - HWSC               = XXXXXXXX
* - FSB                = XXXXXMHz (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 = XXXXX, (XXXXX GB) [XXXXXXXXXXXXXXXXXXXX]
                          #2 Sectors = XXXXX, (XXXXX GB) [XXXXXXXXXXXXXXXXXXXX]
* - ODD                   = XXXX XXXXXXXX XXXXXXXX [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 = XXXXXXXXXXXX
*****
*****
*
*   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 = XXXXXXXXXXXX
*****
*****
*
*   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 Calexico 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 Calexico 11b/g Card

This subtest checks SKU information, MAC address, connection and communication of wireless LAN antenna of Calexico 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 = XXXXXXXXXXXX
*
*****
*
*      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 = XXXXXXXXXXXX
*
*****
*
*      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.

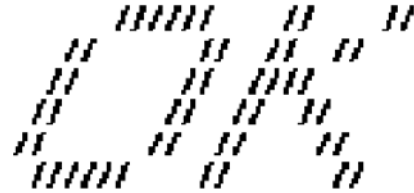
The following message will appear:

```
[LAN transmit & receive test !]
                                COMPLETED Repeat count = 00000
                                Error count  = 00000

LOOPBACK TEST

100Mbps Auto-negotiation TxRx Test
Destination Address      = xxxxxxxxxxxxxx
Source Address          = xxxxxxxxxxxxxx

** 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.

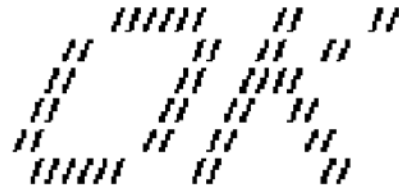
Subtest02 (GbE)

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.

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.
-----
+-----+
|           |   BD_ADDR of the DUT = XXXXXXXXXXXXX [h]
+-----+

  CCCC   OOO   M   M P P P P P L   EEEEE TTTTTT EEEEE D D D D
C   C O   O M M   M 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 P P P P P L   EEEEE T   EEEEE 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   L L L L L L EEEEE T   EEEEE D D D D

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  P P P P P P  L      EEEEEEE TTTTTTTT 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  P P P P P P  L      EEEEEEE T    EEEEEEE
I   N     N N 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          L L L L L L L 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.

3.30 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**.

3.30.1 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>NOTE: <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.

3.30.2 Sound (Legacy) test

To execute the Sound (Legacy) test, select **2** and press **Enter**.

CAUTION: *Sound (Legacy) test is not supported in this model.*

3.30.3 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       : XXXXXXX    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
          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    : XXXXXXXX   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 = XXXXXXXXX
  
```

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.

3.30.4 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.

3.31 SETUP

3.31.1 Function Description

This program displays the current system setup information as listed below:

1. Memory
2. System Date/Time
3. Battery
4. Password
5. Boot Priority
 - (a) Boot Priority
 - (b) HDD Priority
 - (c) Network Boot Protocol
6. Others
 - (a) CPU Cache
 - (b) Level 2 Cache
 - (c) Dynamic CPU Frequency Mode
 - (d) Auto Power On
 - (e) Start Up Logo
 - (f) Sound Logo
 - (g) Power Button Lamp
7. Configuration
8. Drives I/O
 - (a) Built-in HDD
 - (b) CD-ROM
9. PCI Bus
10. Display
 - (a) Power On Display
 - (b) LCD Display Stretch
 - (c) TV Type
11. Peripheral
 - (a) Internal Pointing Device
 - (b) Hard Disk Mode
12. LEGACY EMULATION
 - (a) USB KB/Mouse Legacy Emulation
 - (b) USB-FDD Legacy Emulation
13. PCI LAN

3.31.2 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 Priorit = HDD → FDD → CD-ROM → LAN HDD Priority = Built in HDD1 → Built in HDD2 Network Boot Protocol = PXE</p>
<p style="text-align: center;">SYSTEM DATE/TIME</p> <p>Date(MM-DD-YY) = XX-XX-XXXX Time(HH:MM:SS) = XX:XX:XX</p>	<p style="text-align: center;">OTHERS</p> <p>CPU Cache = Enabled Level 2 Cache = Enabled Dynamic CPU Frequency Mode = Dynamically Switchable Auto Power On = Disabled Start UP Logo = Animation Sound Logo = Enabled Power Button Lamp = Mode 1</p>
<p style="text-align: center;">BATTERY</p> <p>Battery Save Mode = Full Power</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 LCD Display Stretch = Enabled TV Type = NTSC (JAPAN)</p>
<p style="text-align: center;">DRIVERS I/O</p> <p>Built-in HDD = Primary IDE (1F0H/IRQ14) CD-ROM = Secondary IDE (170H/IRQ15)</p>	<p style="text-align: center;">PERIPHERAL</p> <p>Internal Pointing Device = Enabled Hard Disk Mode = Enhanced IDE (Normal)</p>
<p style="text-align: center;">PCI BUS</p> <p>PCI BUS = IRQ10, IRQ11</p>	<p style="text-align: center;">LEGACY EMULATION</p> <p>USB KB/Mouse Legacy Emulation = Enabled USB-FDD Legacy Emulation = Enabled</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

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 13 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.
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.
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 1.50/1.60/1.70/1.80/2.00/2.10GHz(Pentium-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.

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.

LCD Brightness

Use this option to set the level of LCD brightness.

Super-Bright Full brightness for maximum visibility.

Bright Full brightness for high visibility.

Semi-Bright Less than full brightness for saving power.

Cooling Method

Maximum Performance If the CPU becomes too hot, the fan turns on automatically in a high speed to cool down the CPU.

Performance If the CPU becomes too hot, the fan turns on automatically. When the CPU temperature falls to a normal range, the fan turns off.

Battery optimized 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**).

Registered The user password has been registered.

Not registered 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.

(b) HDD Boot Priority

Use this option to set the booting priority from HDD.

Built in HDD1→Built in HDD2 (Default)

: Searching boot-command from Built in HDD1

Built in HDD2→Built in HDD1

: Searching boot-command from Built in HDD2

NOTE: *When 2nd HDD is not installed, this option does not appear in the menu.*

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) CPU Cache

Use this option to enable or disable the CPU cache.

Enabled Enables the CPU cache. (Default)

Disabled Disables the CPU cache.

(b) 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.

(c) 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)

Always High

Disables Pentium-M processor featuring Intel SpeedStep technology and always runs the processor at its maximum speed.

Always Low

Disables Pentium-M processor featuring Intel SpeedStep technology and always runs the processor at its default speed.

(d) 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

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.

- 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.

(e) Start Up Logo

This option enables or disables an animation logo function.

Animation Enables the animation logo function. (Default)

Picture Disables the animation logo function

(f) Sound Logo

This option enables or disables sound logo function.

Enabled Enables the sound logo function. (Default)

Disabled Disables the sound logo function

(g) Power Button Lamp

This option sets the power button lamp.

Off Always off.

Mode 1 Sets to Mode 1. (Default)
Glow blue (Power ON) / Glow yellow (Standby) / Glow orange (Power OFF/Hibernation)

Mode 2 Sets to Mode 2.
Glow blue (Power ON) / Alternately flashes green and orange (Standby) / Alternately flashes green and blue (Power OFF/Hibernation)

Mode 3 Sets to Mode 3.
Changes in order of green, orange and blue (Power ON) / Glow yellow (Standby) / Glow orange (Power OFF /Hibernation)

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". And after the test end, select "Setup by OS".

8. 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.

Built-in HDD	This cannot be changed.
CD-ROM	This cannot be changed. This is not displayed when a drive is not built-in.

9. 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

10. 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.

NOTE: When starting the computer in Standby or Hibernation, the last configuration is remembered. 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 and TV display.

You cannot select TV display in HW Setup. To display on a TV screen, use **Fn+F5**.

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 (S-Video) TV in Europe and China system

525p (480p,D2) High Definition Television with 480 progressive scan

750p (720p,D4) High Definition Television with 720 progressive scan

1125i (1080i,D3) High Definition Television with 1080 interlace

525i (480i,D1) High Definition Television with 480 interlace

PAL (SCART) TV in Europe system

11. 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) 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.*

12. 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

13. 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.

Chapter 4

Replacement Procedures

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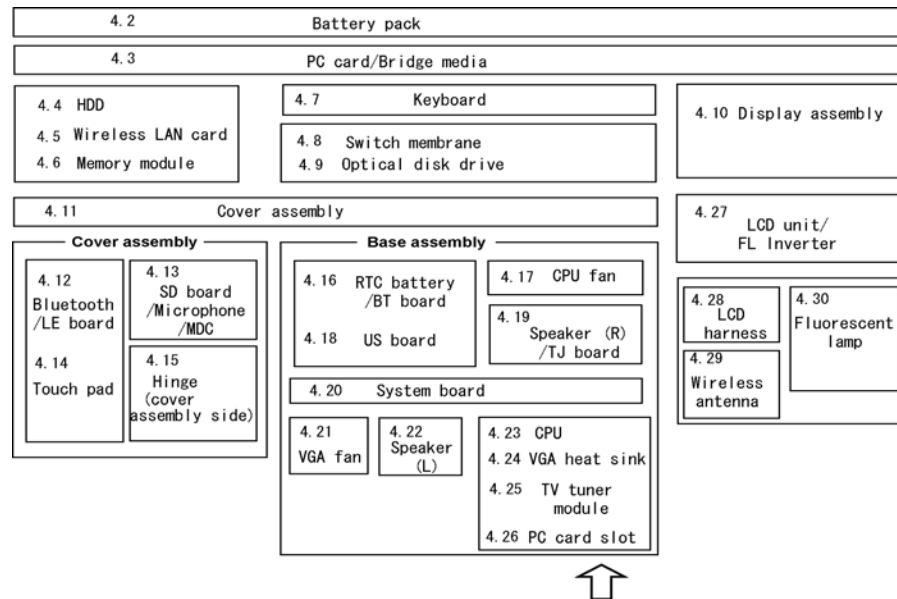
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4.1 Overview

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

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

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

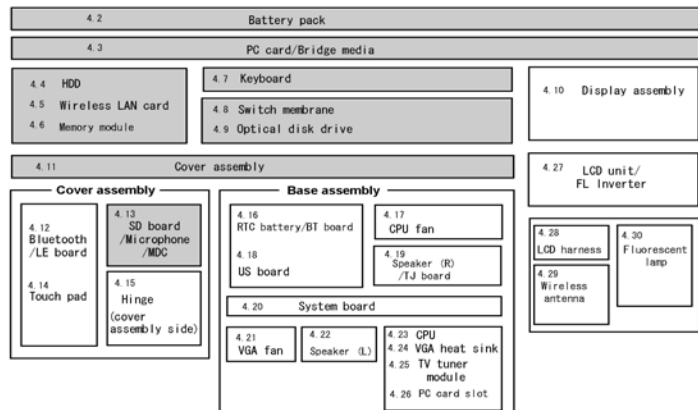


- Chart Notation

The chart shows the case for the following example:

- Removing a MDC

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



Safety Precautions

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

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

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

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

Before You Begin

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

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

Disassembly Procedure

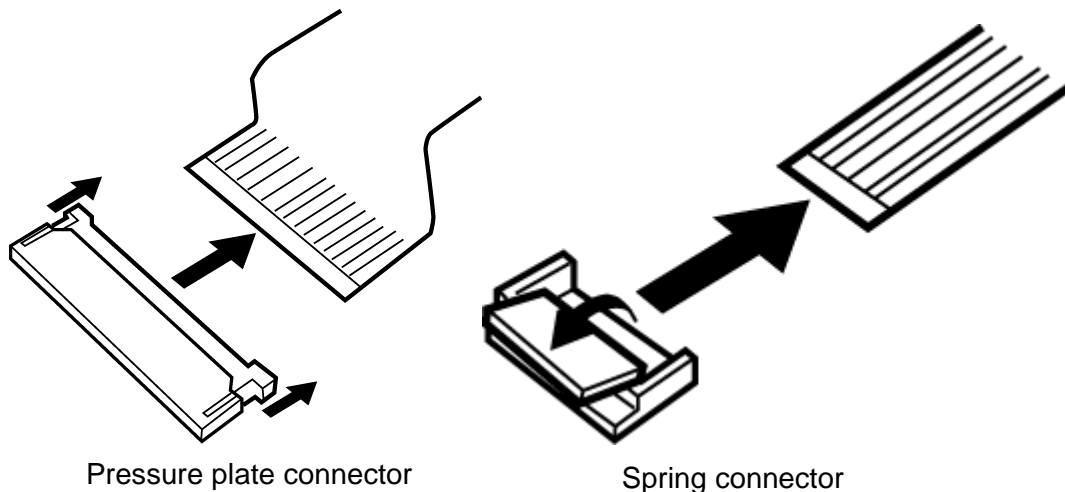
Three main types of cable connector are used.

- Pressure plate connector
- Spring connector
- Normal pin connector

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

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

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



Assembly Procedure

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

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

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

After installing FRUs, check that the computer operates correctly.

Tools and Equipment

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

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

Screw Tightening Torque

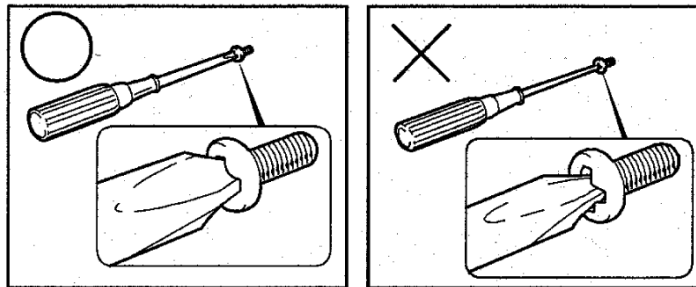
Use the following torque when tightening screws.

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

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

- M2 (2mm) 0.167 N·m (1.7 kgf·cm)
- M2.5 (2.5mm) 0.294 N·m (3.0 kgf·cm)
- M3.0 (3mm) 0.549 N·m (5.6 kgf·cm)

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



Grip Color

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

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



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

Screw Notation

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

Format:

Screw shape + Screw length (mm)

Screw shape

B: Bind screw

F: Thin head screw

S: Super thin head screw

T: Tapping screw

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

Example: B6 ... 6mm bind screw

4.2 Battery pack

Removing the battery pack

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

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

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all external devices from the computer.
3. Turn the computer upside down.
4. Release the **battery lock**.
5. Slide the **battery latch** to the arrow direction and pull up the **battery**.
6. Release the **hook** of the battery cover and remove the **battery pack** from the **battery cover**.

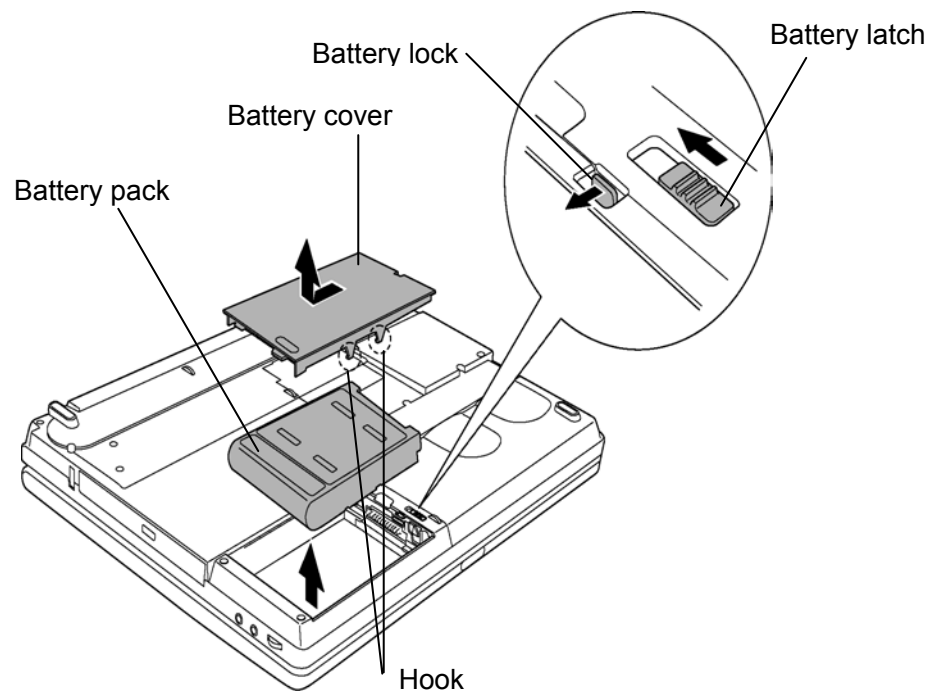


Figure 4-1 Removing the battery pack

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

Installing the battery pack

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

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

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

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all external devices from the computer.
3. Attach the **battery cover** to the **battery pack**.
4. Place the **battery pack** into the slot from the other side of the connector and insert it carefully.
5. Slide the **battery lock** to the lock position.

4.3 PC card/Bridge media

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 a PC card in accordance with any instructions in a PC card manual or the manuals of the computer system you are using.

1. Push the **eject button**. It will pop out when you release it. Then press the eject button once more to eject a PC card.
2. Grasp a **PC card** and remove it.

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

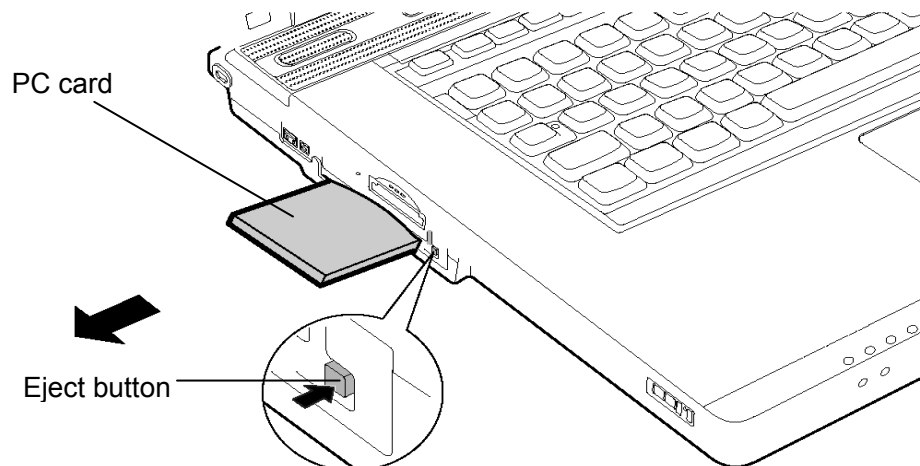


Figure 4-2 Removing a PC card

Installing a PC card

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

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

4.3.2 Bridge media (SD Card / Memory Stick / xDPicture Card)

Removing a Bridge media

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

CAUTION: Insert or remove a Bridge Media in accordance with any instructions in the each Bridge Media manual or the manuals of the computer system you are using.

1. Push a **Bridge media**. It will pop out partly when you release, so pull out the card.

(As an instance, SD card is described in the figure 4-3.)

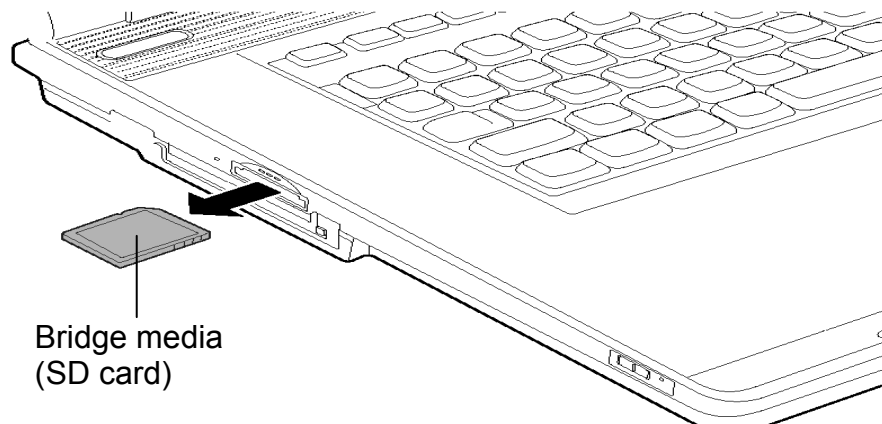


Figure 4-3 Removing a bridge media

Installing a Bridge media

The following describes the procedure for inserting a Bridge Media (See Figure 4-3).

1. Insert a **Bridge Media** and press it until it is securely connected.

4.4 HDD

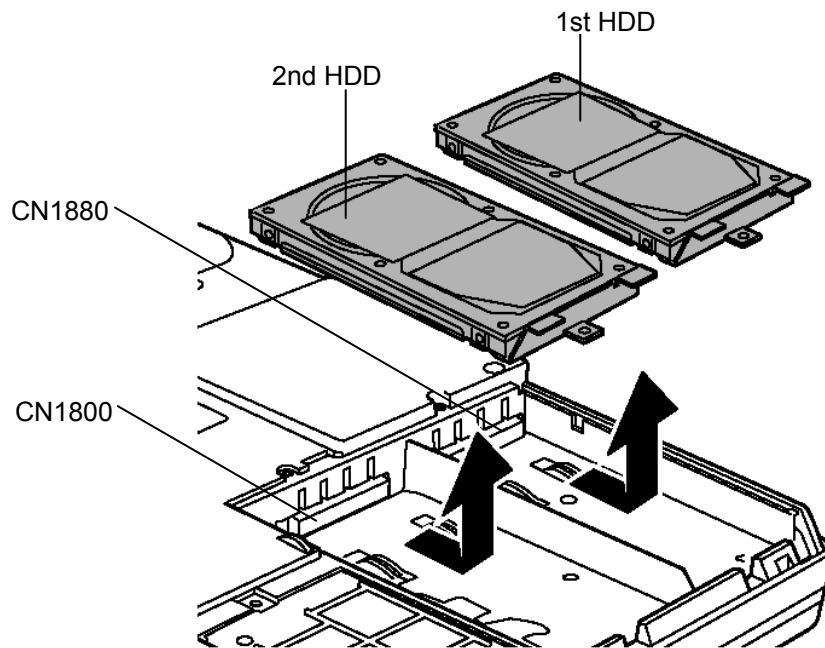
Removing a HDD

The following describes the procedure for removing a HDD (See Figure 4-4 to 4-6).

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

1. Turn the computer upside down.
2. Remove the following screws securing a HDD slot cover and remove a **HDD slot cover**.
 - M2.5×4.0B FLAT BIND screw x3
3. Remove the following screws securing the **1st HDD assembly**.
 - M2.5×6.0B FLAT BIND screw x 1
4. Disconnect the **1st HDD assembly** from the connector on the system board **CN1880**.

CAUTION: When a 2nd HDD is installed, they are installed in the position as the following figure.



5. (If a 2nd HDD is installed) Remove the following **screw** securing the **2nd HDD assembly**.
 - M2.5×6.0B FLAT BIND screw x 1
6. Disconnect the **2nd HDD assembly** from the connector **CN1800** on the system board.

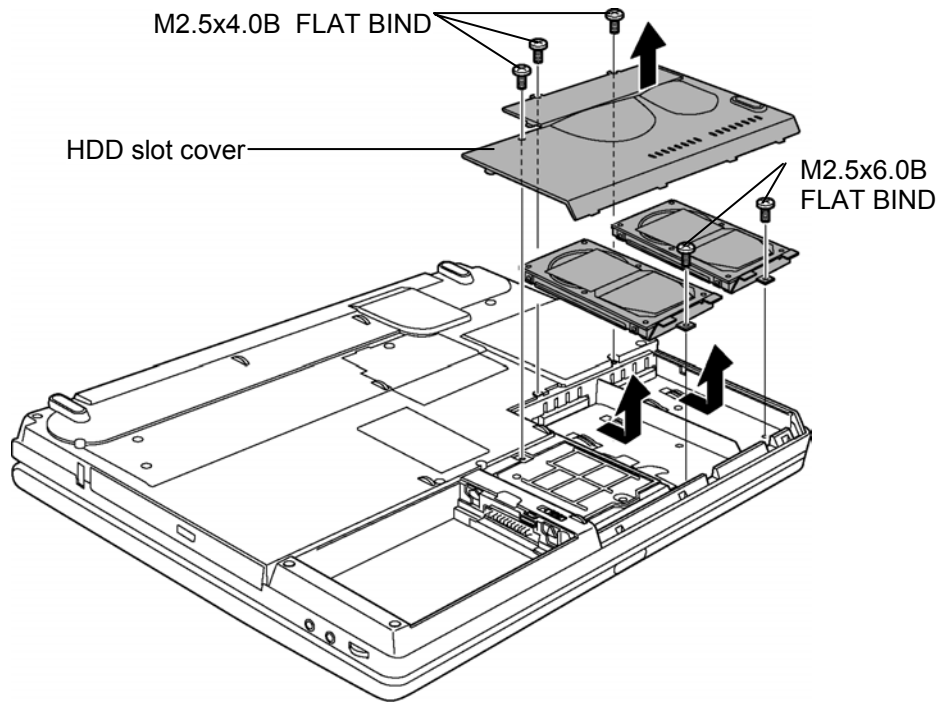


Figure 4-4 Removing the HDD assembly

7. Remove the **short pin** from the connector pin of the 2nd HDD.

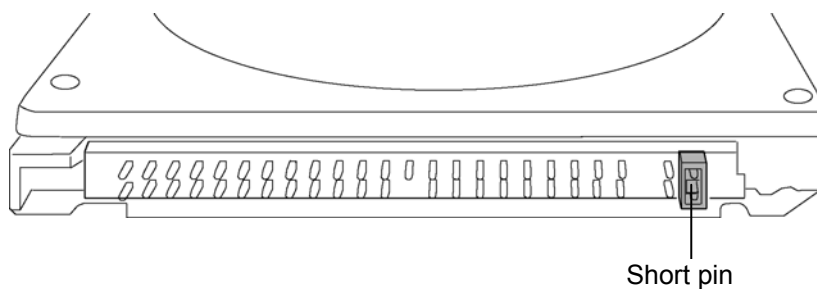


Figure 4-5 Removing the short pin

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

- M3.0×4.0Z FLAT BIND screw x4

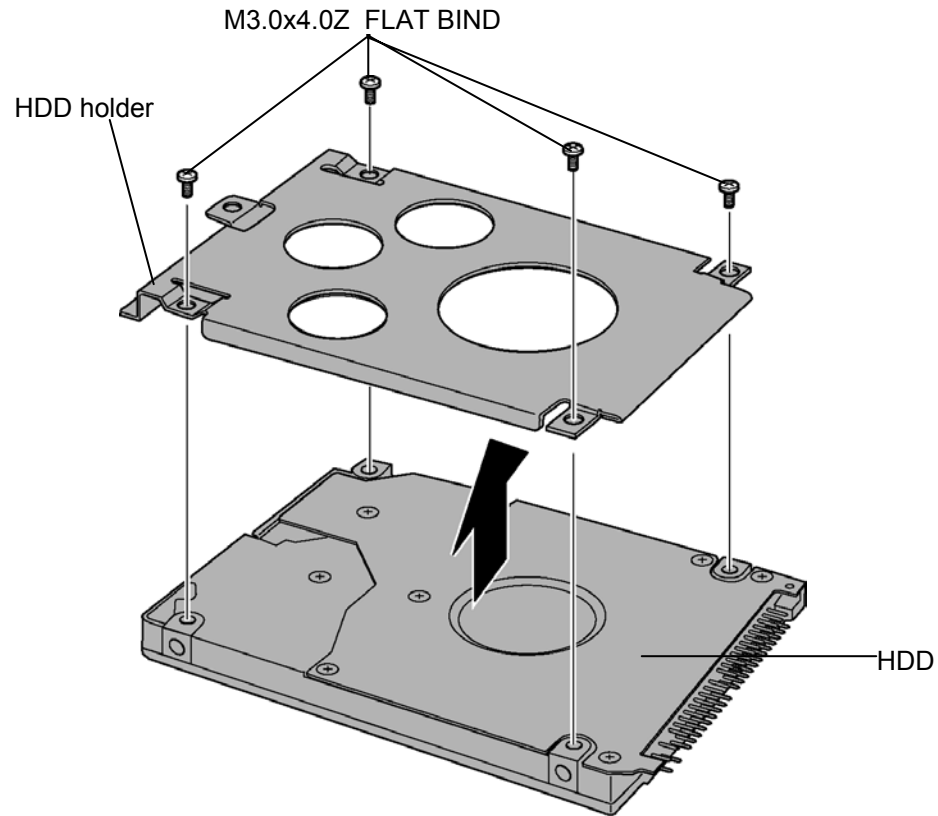


Figure 4-6 Removing a HDD

Installing a HDD

The following describes the procedure for installing a HDD (See Figure 4-4 to 4-6).

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

- M3.0×4.0Z FLAT BIND screw x4

NOTE: Although they are 3mm head screws, screw torque must be set in 0.294 N·m (3.0Kgf·cm) for four screws securing the HDD holder.

2. (If a 2nd HDD is installed) Attach a **short pin** to the connector pin of the 2nd HDD assembly.

3. Insert the **2nd HDD assembly** into the HDD slot from the screw hole side first and connect it carefully to the **PJ1800** on the system board.

4. Secure the **2nd HDD assembly** with the following **screw**.

- M2.5×6.0B FLAT BIND screw x1

5. Insert the **1st HDD assembly** into the HDD slot from the screw hole side first and connect it carefully to the **PJ1880** on the system board.

6. Secure the **1st HDD assembly** with the following **screw**.

- M2.5×6.0B FLAT BIND screw x1

7. Install the **HDD slot cover** and secure it with the following **screws**.

- M2.5×4.0B FLAT BIND screw x 3

4.5 Wireless LAN card

Removing a Wireless LAN card

The following describes the procedure for removing a Wireless LAN card (See Figure 4-7).

1. Remove the following **screw** securing **wireless LAN card cover** and remove it.
 - B2.0 x 4.0Z BIND screw x1
 - or
 - B2.0 x 4.0B LH STICK x1
2. Disconnect the **wireless LAN antenna cable Main** (white cable) and **AUX** (black cable) from the connectors on a wireless LAN card.
3. Open the left and right latches holding a wireless LAN card and remove a **wireless LAN card** from the **connector CN2200** on the system board.

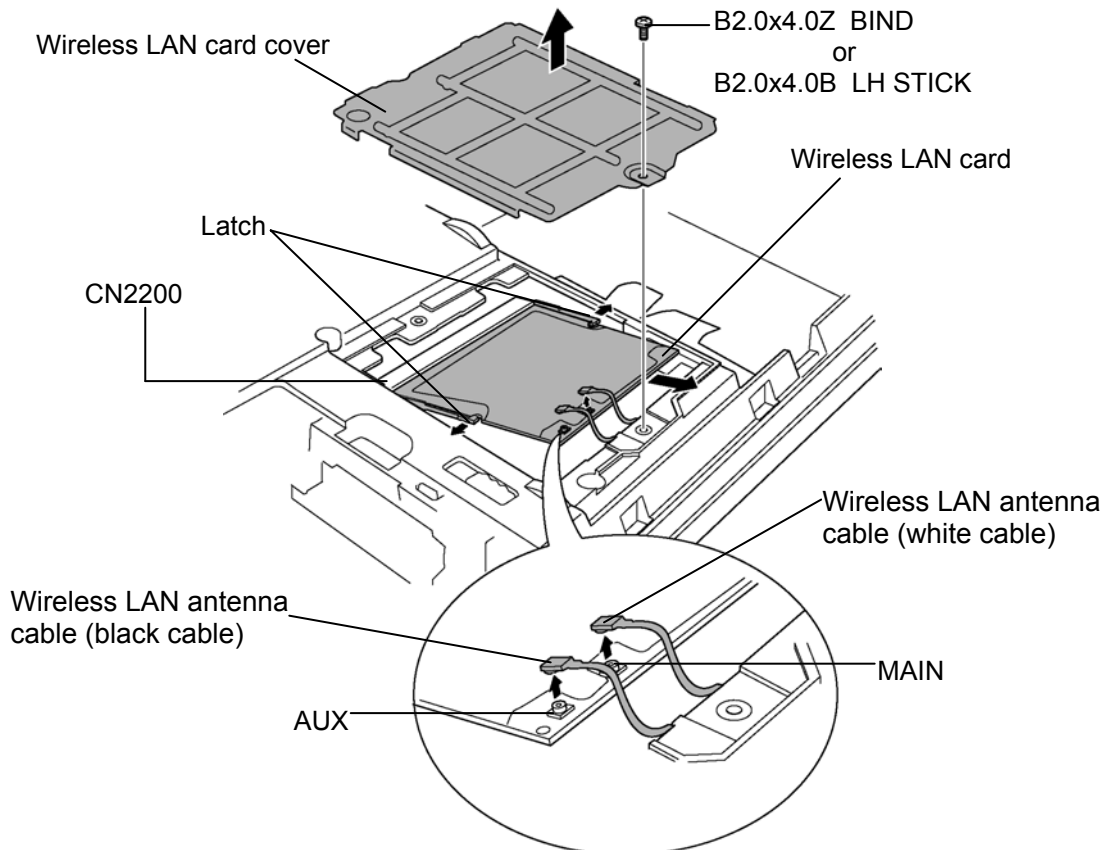


Figure 4-7 Removing a wireless LAN card

Installing a Wireless LAN card

The following describes the procedure for installing a Wireless LAN card (See Figure 4-7).

1. Insert a **wireless LAN card** terminals slantwise into the connector **CN2200** on the computer and press a wireless LAN card until it is securely in place.
2. Connect the **wireless LAN antenna cables** (black and white) to the terminals on a wireless LAN card.
3. Install the **wireless LAN card cover** and secure it with the following **screw**.

- B2.0 x 4.0Z BIND screw x1

or

- B2.0 x 4.0B LH STICK x1

4.6 Memory module

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

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

Never press hard or bend a memory module.

Removing a memory module

To remove a memory module, confirm that the computer is in boot mode. Then perform the following procedure (See Figure 4-8).

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

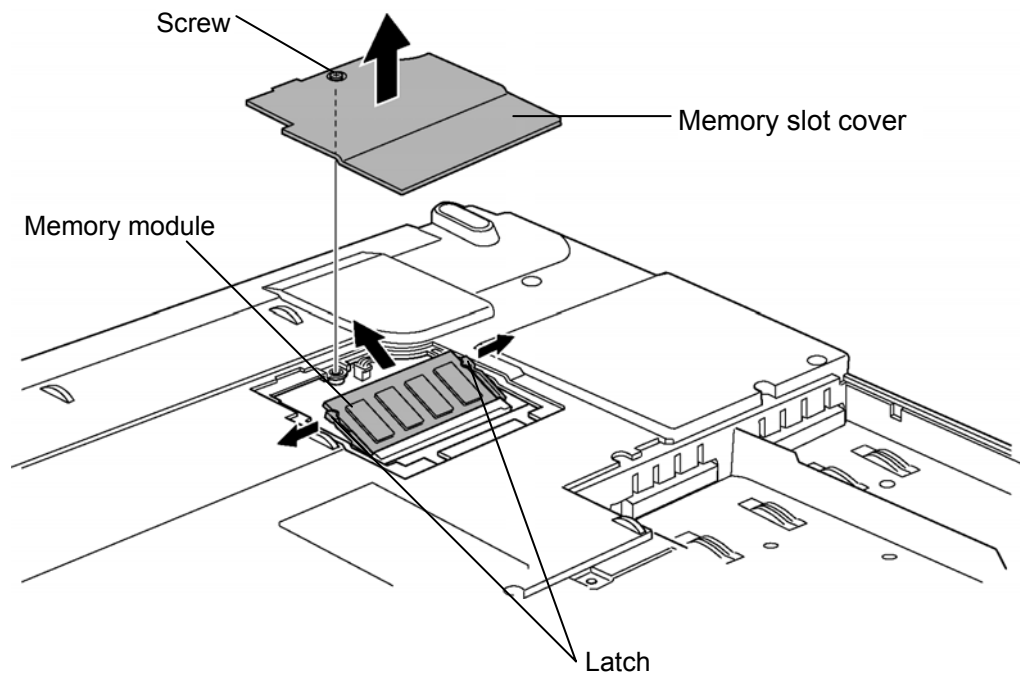


Figure 4-8 Removing a memory module

Installing a memory module

To install a memory module, confirm that the computer is in boot mode. Then perform the following procedure (See Figure 4-8).

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

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

Never press hard or bend a memory module.

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

4.7 Keyboard

Removing the keyboard

The following describes the procedure for removing the keyboard (See Figure 4-9 to 4-11).

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

1. Open the display.
2. Insert your finger into the slot between the keyboard brace and the computer. Then, lift up the **keyboard brace** to unlatch and remove it.
3. Remove the following **screw** securing the speaker cover assembly
 - M2.5×4.0B FLAT BIND screw x1
4. Slide the **speaker cover assembly** to the arrow direction and pull up to remove.

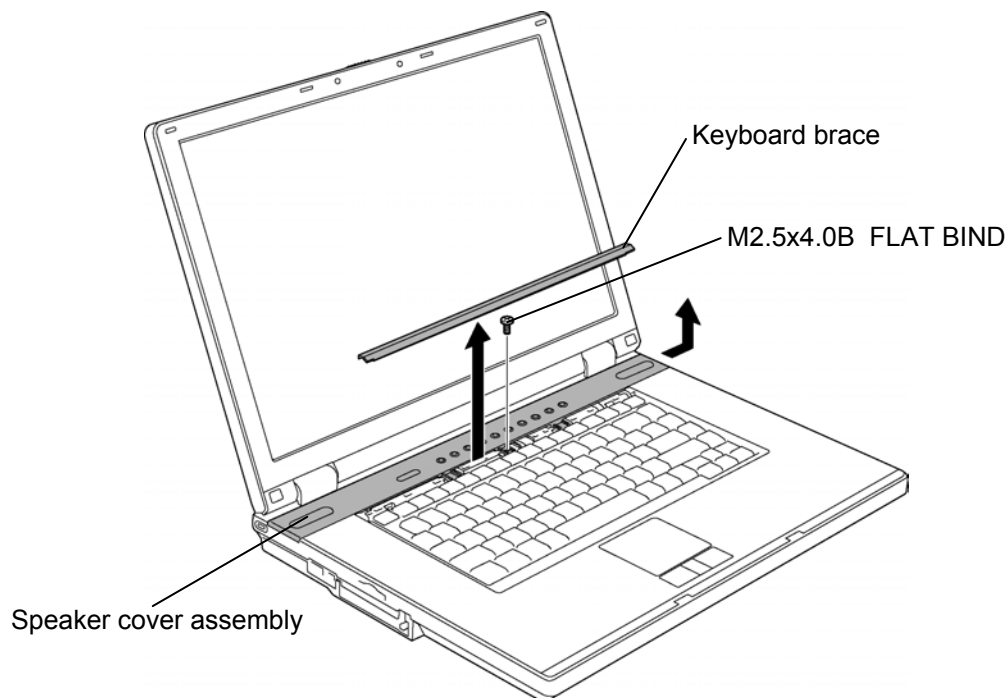


Figure 4-9 Removing the speaker cover assembly

5. Remove the following **screws** securing the **keyboard**.

- M2.5×2.8B FLAT BIND screw x2

6. Lift the upper side of the **keyboard** and turn it face down on the palm rest.

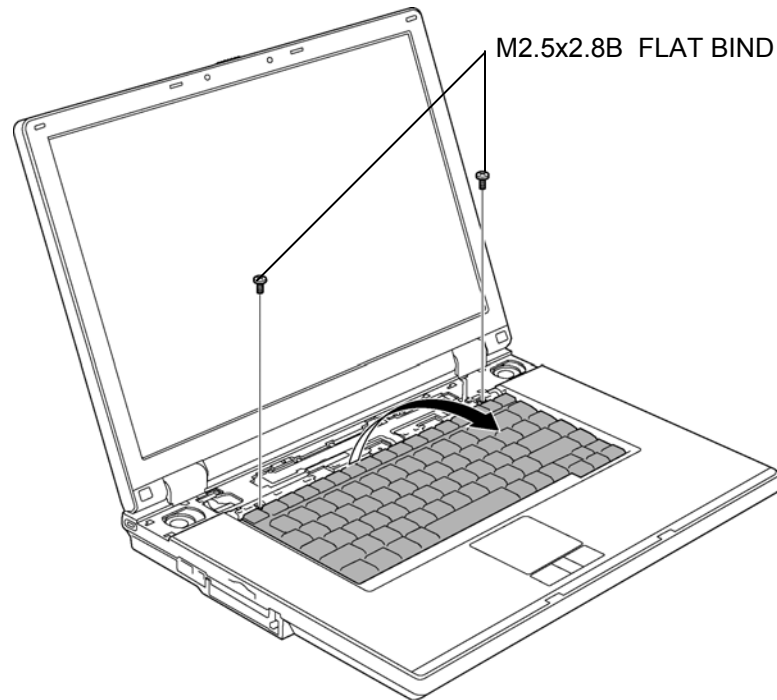


Figure 4-10 Removing the keyboard

7. Remove the following **screws** securing the keyboard support plate and remove the **keyboard support plate**.
 - M2.5×8.0B FLAT BIND screw x2
8. Disconnect the **keyboard flexible cable** from the connector **CN3200** on the system board.
9. Remove the **keyboard**.

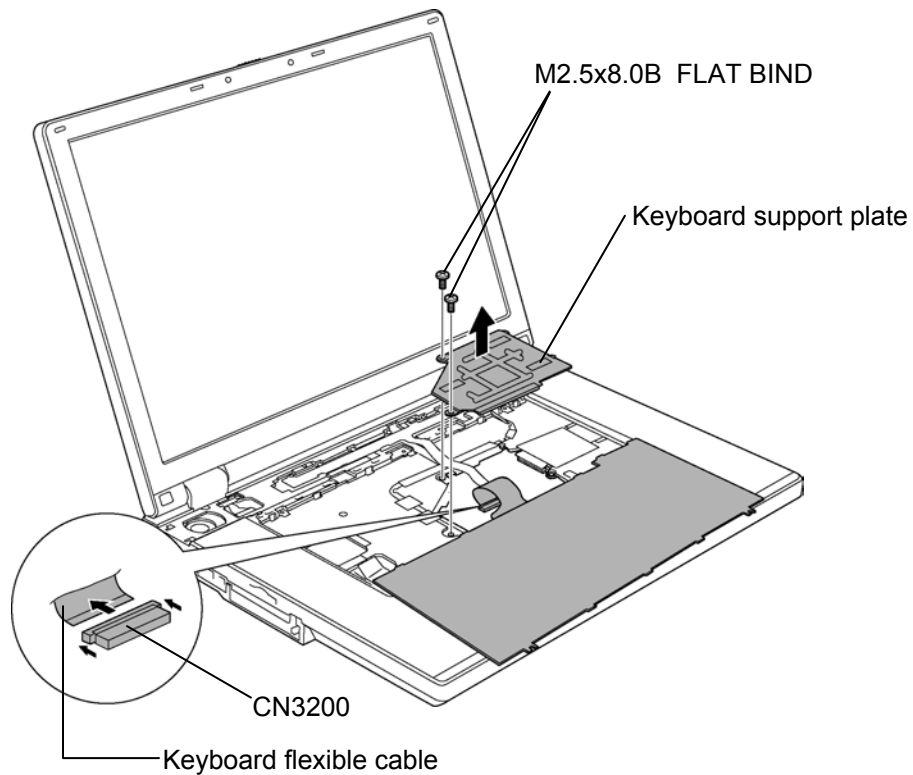


Figure 4-11 Removing the keyboard support plate

Installing the keyboard

The following describes the procedure for installing the keyboard (See Figure 4-9 to 4-11).

1. Turn the **keyboard** upside down and place it on the palm rest as its face down.
Connect the **keyboard flexible cable** to the connector **CN3200** on the system board.
2. Install the **keyboard support plate** and secure it with the following **screws**.
 - M2.5×8.0B FLAT BIND screw x2
3. Turn the **keyboard** face up and put it on the computer. Make sure that there is no space between the keyboard and the computer.
4. Secure the keyboard with the following **screws**.
 - M2.5×2.8B FLAT BIND screw x2
5. Slide and set the **speaker cover assembly** and secure it with the following **screw**.
 - M2.5×4.0B FLAT BIND screw x1
6. Install the **keyboard brace** by pressing it from the topside.

4.8 Switch membrane

Removing the switch membrane

The following describes the procedure for removing the switch membrane (See Figure 4-12).

1. Turning up the **insulator**, disconnect the switch membrane from the connector **CN9650** on the system board.
2. Remove the following **screw** securing the switch membrane.
 - M2.5×2.8B FLAT BIND screw x1
3. Slide the **switch membrane** to the arrow direction and remove it.

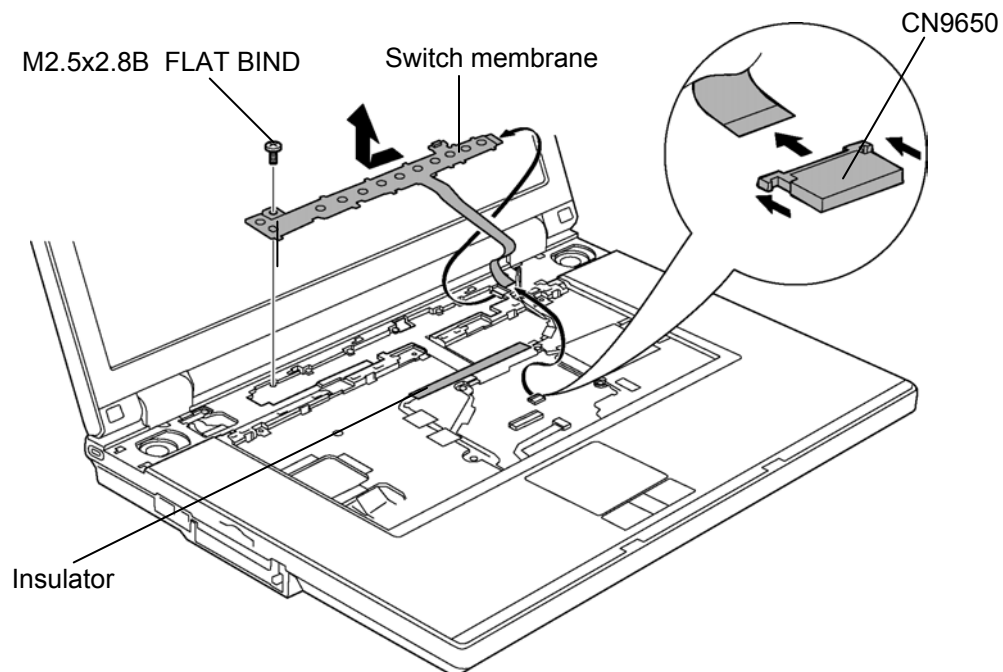


Figure 4-12 Removing the switch membrane

Installing the switch membrane

The following describes the procedure for installing the switch membrane (See Figure 4-12).

1. Slide and set the **switch membrane** in the computer.
2. Turning up the **insulator**, connect the switch membrane to the connector **CN9650** on the system board.
3. Secure the switch membrane with the following **screw**.
 - M2.5×2.8B FLAT BIND screw x1

4.9 Optical disk drive

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

Removing an optical disk drive

The following describes the procedure for removing an optical disk drive (See Figure 4-13 and 4-14).

1. Turn over the computer and remove the following **screws** securing an optical disk drive.
 - M2.5×4.0B FLAT BIND screw x2
2. Inserting a blunt-edged tool from the **slot**, disconnect an **optical disk drive** toward the arrow direction from the connector **CN1810** on the system board.

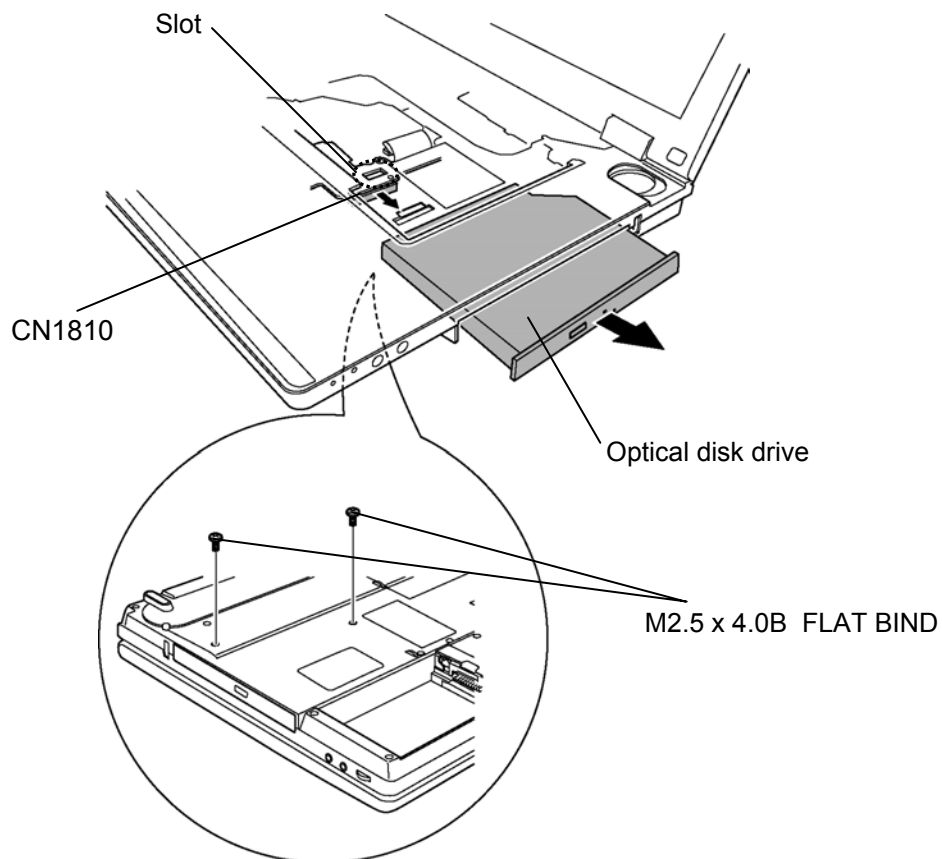


Figure 4-13 Removing an optical disk drive

3. Remove the following **screws** securing the **side bracket** and remove it from an optical disk drive.

- M2.0×3.0C SUPER THIN HEAD screw x2
- M2.0×3.2B Stepping screw x1

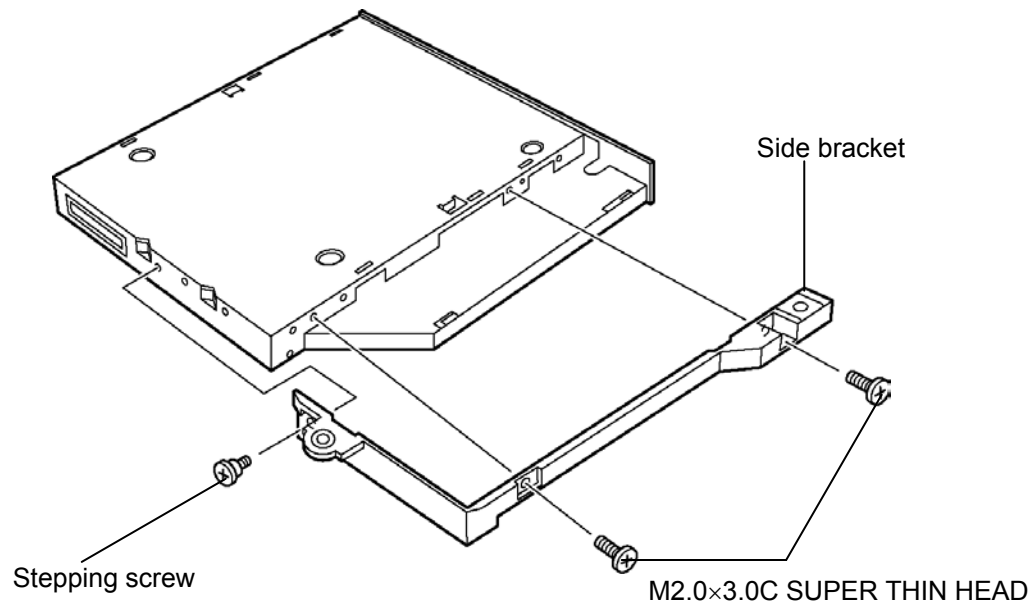


Figure 4-14 Disassembling the side bracket

Installing an optical disk drive

The following describes the procedure for installing an optical disk drive (See Figure 4-13 and 4-14).

1. Attach the **side bracket** to an optical disk drive and secure it with the following **screws**.
 - M2.0×3.0C SUPER THIN HEAD screw x2
 - M2.0×3.2B Stepping screw x1
2. Insert an optical disk drive assembly into the slot and connect it to the connector **CN1810** on the system board.
3. Turn over the computer and secure **an optical disk drive** with the following **screws**.
 - M2.5×4.0B FLAT BIND screw x2

4.10 Display assembly

Removing the display assembly

The following describes the procedure for removing the display assembly (See Figure 4-15 to 4-20).

1. Close the display and turn the computer upside down.
2. Remove the following **screws** from the bottom of the computer.
 - M2.5×8.0B FLAT BIND screw (Locktight) x2

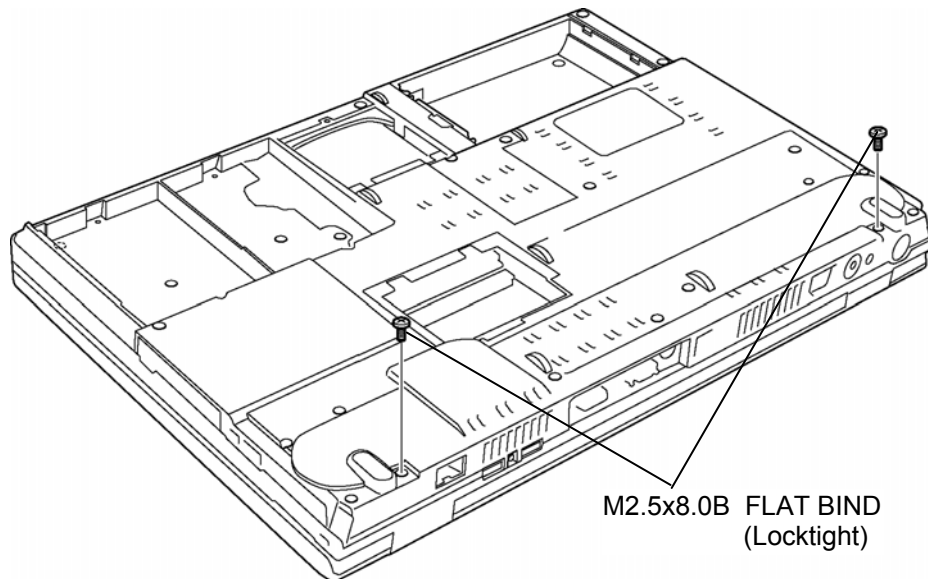


Figure 4-15 Removing the screws (securing display assembly)

3. Peeling off the **insulator**, pull out the **wireless LAN antenna cables** from the guide.
4. Pull out the **bluetooth antenna cable** from the bluetooth.
5. Pull out the **bluetooth antenna cable** from the **guide**.

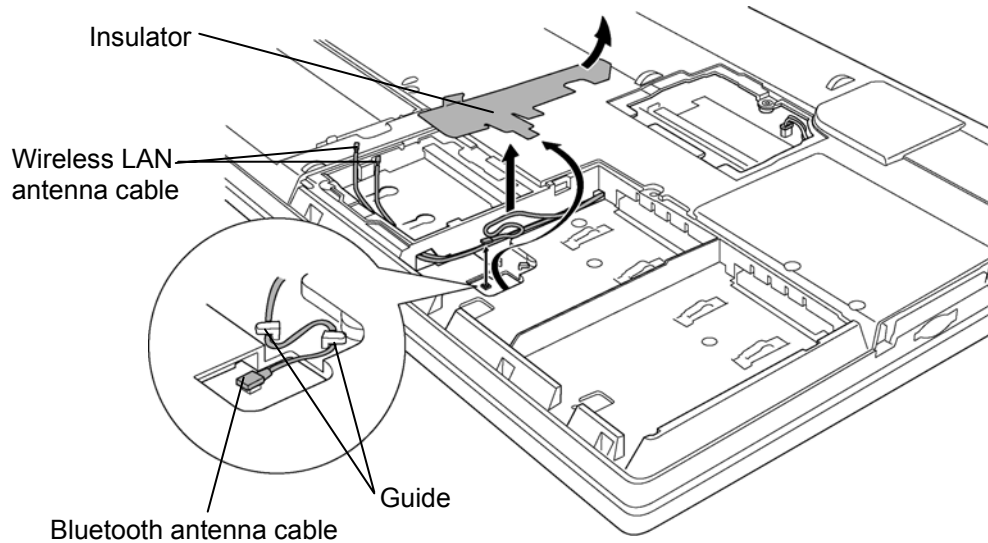


Figure 4-16 Removing the cables (back)

6. Turning over the computer and opening the display, peel off the **insulators** and pull out the wireless antenna cables from the slot.

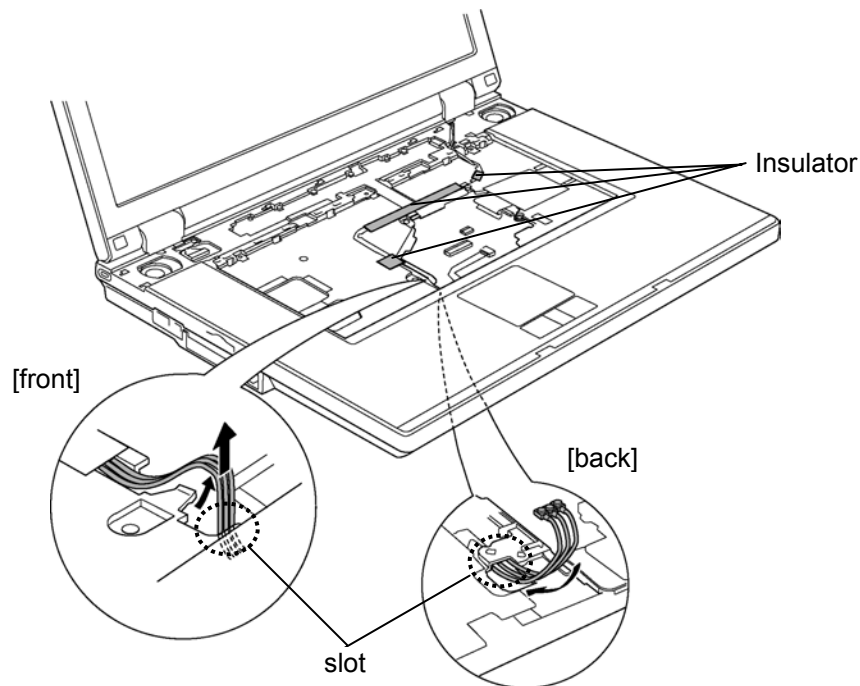


Figure 4-17 Pulling out the wireless antenna cables

7. Peel off the **mask seals** from the display mask and remove the following **screws** securing the display mask.

- M2.5×6.0B FLAT BIND screw x2

8. Releasing latches of hinge caps, remove the hinge caps from both sides.

9. Remove the following **screws** securing the hinge.

- M2.5×8.0B FLAT BIND screw (Locktight) x2

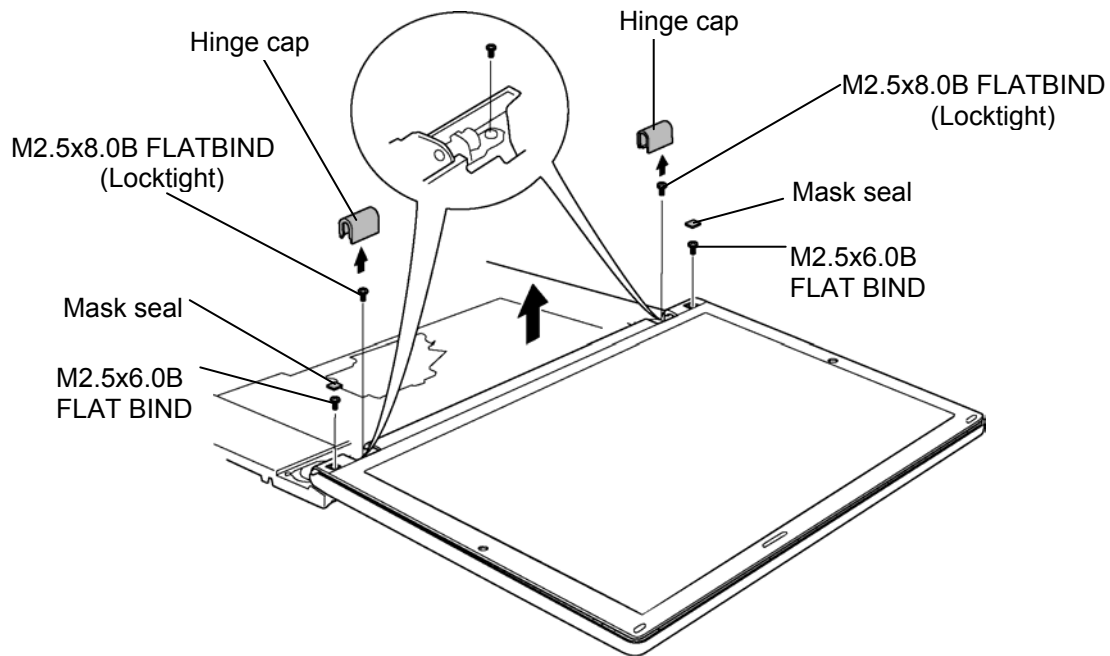


Figure 4-18 Removing the hinge caps

10. Remove the following **screws** securing the LCD harness holder.

- M2.5×2.8B FLAT BIND screw x1

11. Remove the **LCD harness holder**.

12. Remove the **LCD harness** from the connector **CN5600** on the system board.

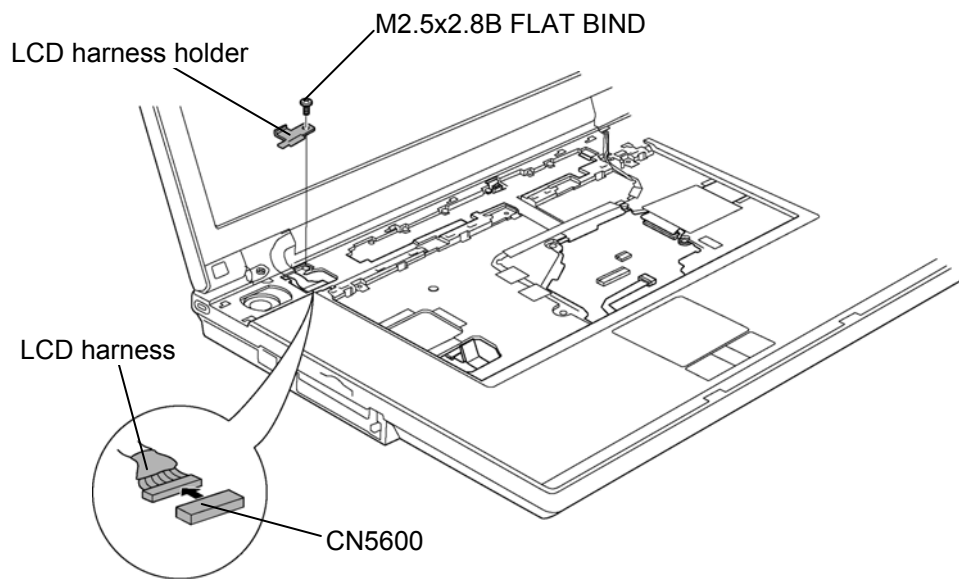


Figure 4-19 Removing the LCD harness

13. Pulling out the **pole of hinge** from the **hole** of base assembly, remove the **display assembly** from the base assembly.

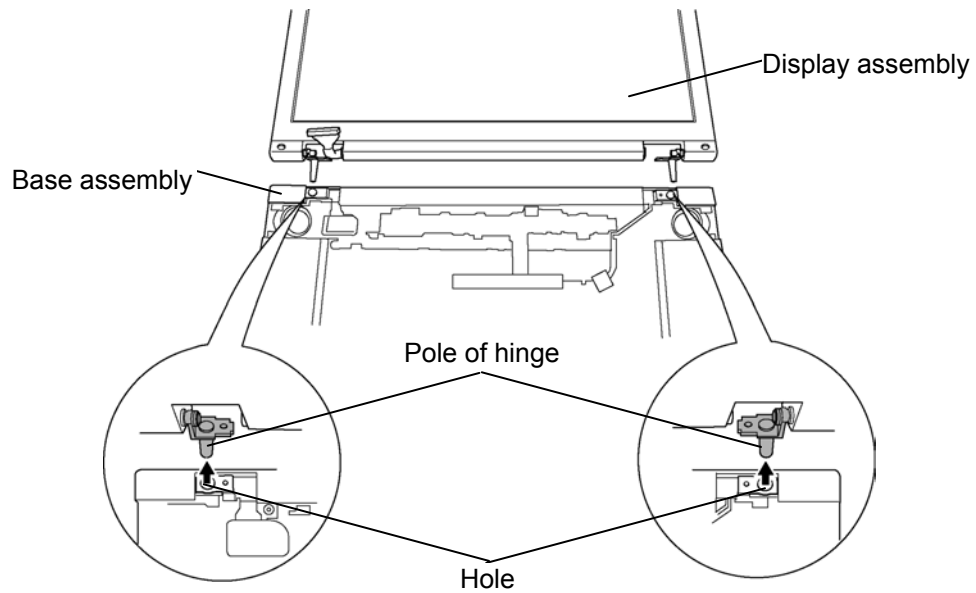


Figure 4-20 Removing the display assembly

Installing the display assembly

The following describes the procedure for installing the display assembly (See Figure 4-15 to 4-20).

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

- M2.5×8.0B FLAT BIND screw x2
(Locktight)

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

3. Connect the **LCD harness** to the connector **CN5600** on the system board.
4. Install the **LCD harness holder** and secure it with the following **screw**.
 - M2.5×2.8B FLAT BIND screw x1
5. Install the both sides of **hinge caps**.
6. Secure the **display mask** with the following **screws** and stick the **mask seal** on them.
 - M2.5×6.0B FLAT BIND screw x2
7. Arrange the wireless antenna cables along the guide (front) and secure them with **insulators**.
8. Pass the cables to the back of computer through the **slot**.
9. Turn over the computer and arrange the **bluetooth antenna cable** along the guide.
10. Connect the **bluetooth antenna cable** to the connector on the bluetooth.
11. Arrange the **wireless LAN antenna cables** along the guide and stick the **insulator**.
12. Secure the display assembly from the back of computer with the following **screws**.

- M2.5×8.0B FLAT BIND screw x2
(Locktight)

4.11 Cover assembly

Removing the cover assembly

The following describes the procedure for removing the cover assembly (See Figure 4-21 to 4-24).

1. Turn over the computer.
2. Remove the following **screws** securing the cover assembly from the back and bottom of computer.
 - M2.5×4.0B FLAT BIND screw x3 ("4" in the figure)
 - M2.5×6.0B FLAT BIND screw x3 ("6" in the figure)
 - M2.5×8.0B FLAT BIND screw x4 ("8" in the figure)
 - M2.5×16.0B FLAT BIND screw x10 ("16" in the figure)

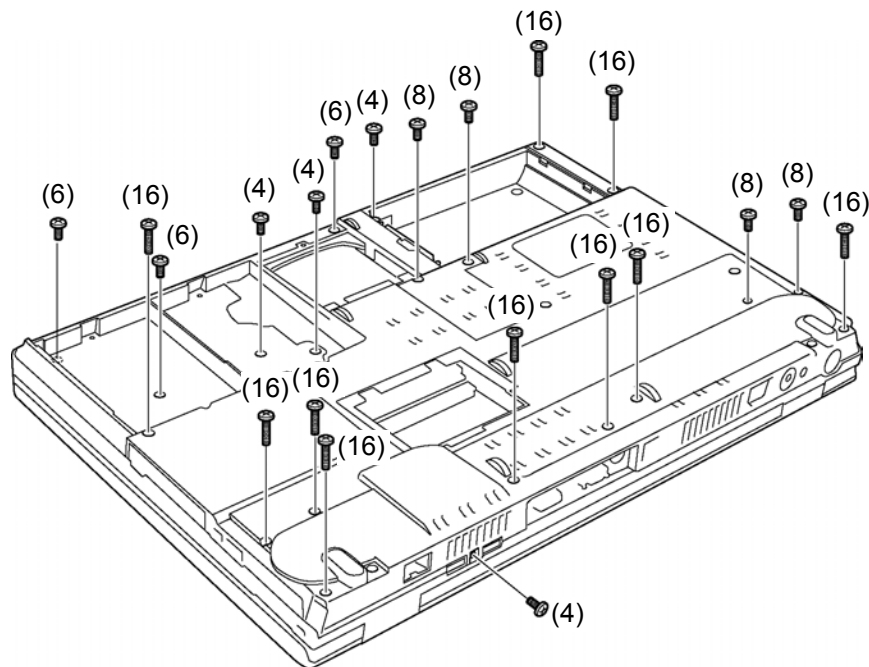


Figure 4-21 Removing the screws (back)

3. Disconnect the **VGA fan cable** from the connector **CN8780** in the memory slot.

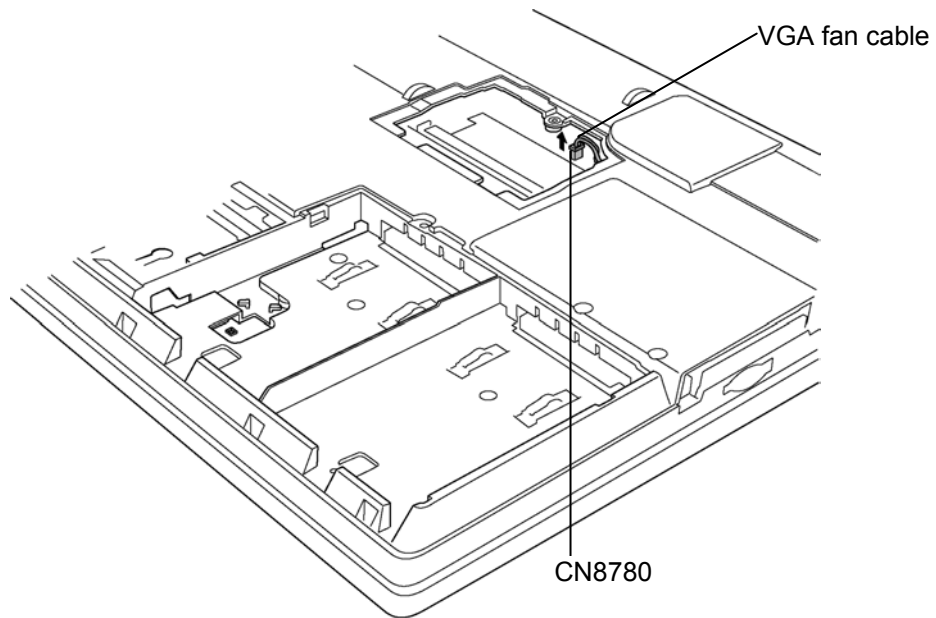


Figure 4-22 Disconnecting the VGA fan cable

4. Turning over the computer, remove the following **screws** securing the cover assembly.
 - M2.5×8.0B FLAT BIND screw x3
5. Disconnect the **SD board flat cable** from the connector **CN9500** on the system board.
6. Disconnect the **touch pad flat cable** from the connector **CN3201** on the system board.
7. Turning up the **insulator**, disconnect the **LE board flat cable** from the connector **CN9660** on the system board
8. Disconnect the **MDC harness** from the connector **CN3021** on the system board

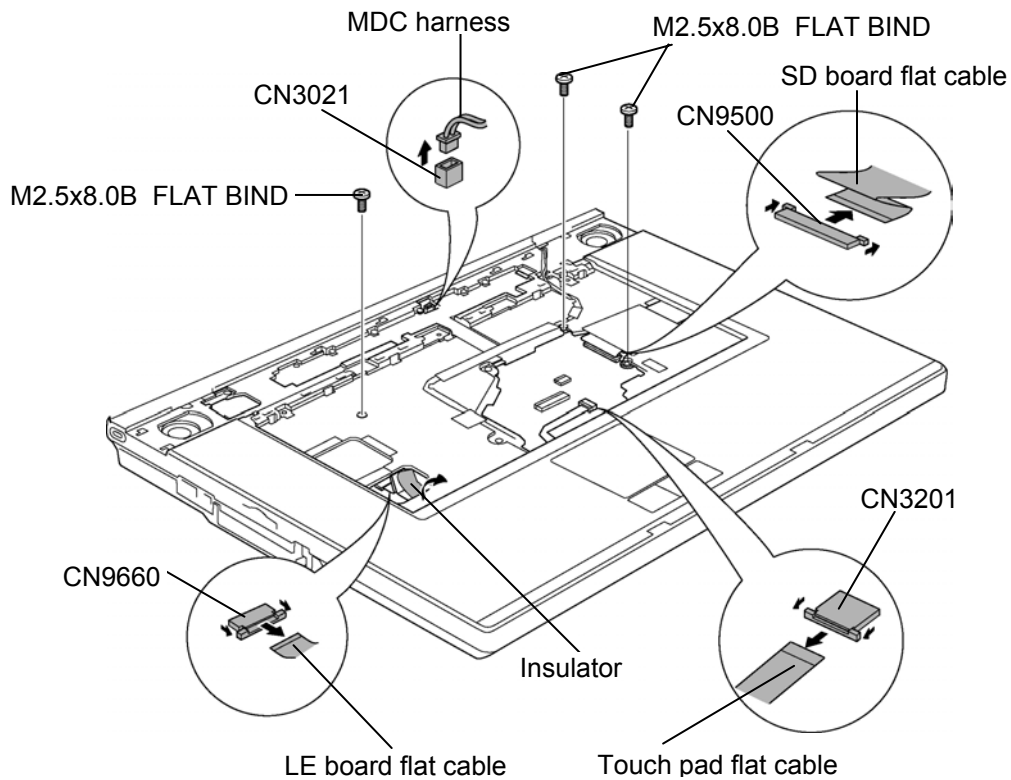


Figure 4-23 Removing the screws & cables (front)

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

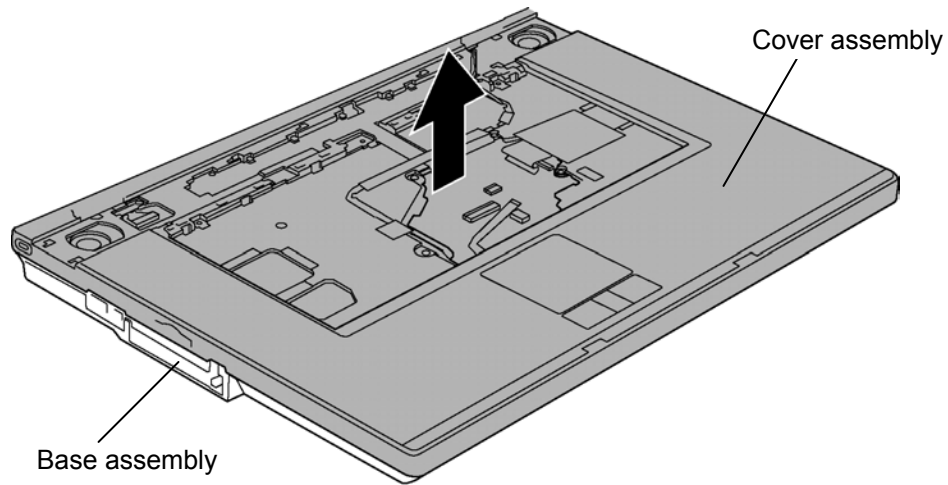


Figure 4-24 Removing the cover assembly

Installing the cover assembly

The following describes the procedure for installing the cover assembly (See Figure 4-21 to 4-24).

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

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

2. Connect the **MDC harness** to the connector **CN3021** on the system board.
3. Turning up the **insulator**, connect the **LE board flat cable** to the connector **CN9660** on the system board.
4. Connect the **touch pad flat cable** to the connector **CN3201** on the system board.
5. Connect the **SD board flat cable** to the connector **CN9500** on the system board.
6. Secure the cover assembly with the following **screws**.
 - M2.5×8.0B FLAT BIND screw x3
7. Turning over the computer, connect the **VGA fan cable** to the connector **CN8780** in memory slot.
8. Secure the cover assembly with the following **screws** from the back and bottom of computer.
 - M2.5×4.0B FLAT BIND screw x3 ("4" in the figure)
 - M2.5×6.0B FLAT BIND screw x3 ("6" in the figure)
 - M2.5×8.0B FLAT BIND screw x4 ("8" in the figure)
 - M2.5×16.0B FLAT BIND screw x10 ("16" in the figure)

4.12 Bluetooth / LE board

4.12.1 Bluetooth

Removing a Bluetooth

The following describes the procedure for removing a bluetooth (See Figure 4-25).

1. Remove the following **screw** securing a bluetooth module.
 - M2.0×4.0Z BIND screw x1
2. Disconnect the **bluetooth flat cable** from a bluetooth module.
3. Remove a **bluetooth module** from the cover assembly.

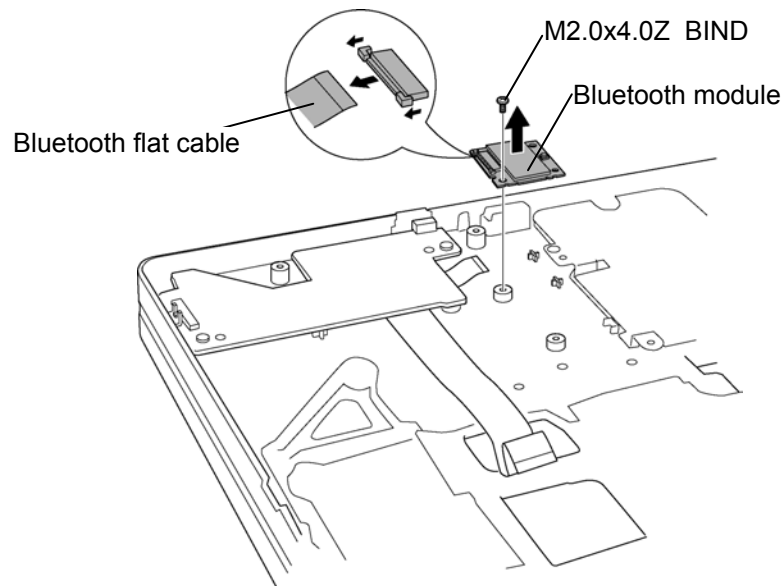


Figure 4-25 Removing a bluetooth module

Installing a Bluetooth

The following describes the procedure for installing a bluetooth (See Figure 4-25).

1. Connect the **bluetooth flat cable** to the connector on a bluetooth module.
2. Install a **bluetooth module** to the cover assembly and secure it with the following **screw**.

- M2.0×4.0Z BIND screw x1

4.12.2 LE board

Removing the LE board

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

1. Remove the following **screws** securing the LE board and remove the LE board from the cover assembly.
 - M2.5×4.0B FLAT BIND screw x2
2. Disconnect the **LE board flat cable** from the connector **CN9670** on the LE board.
3. Disconnect the **bluetooth flat cable** from the connector **CN4400** on the LE board.

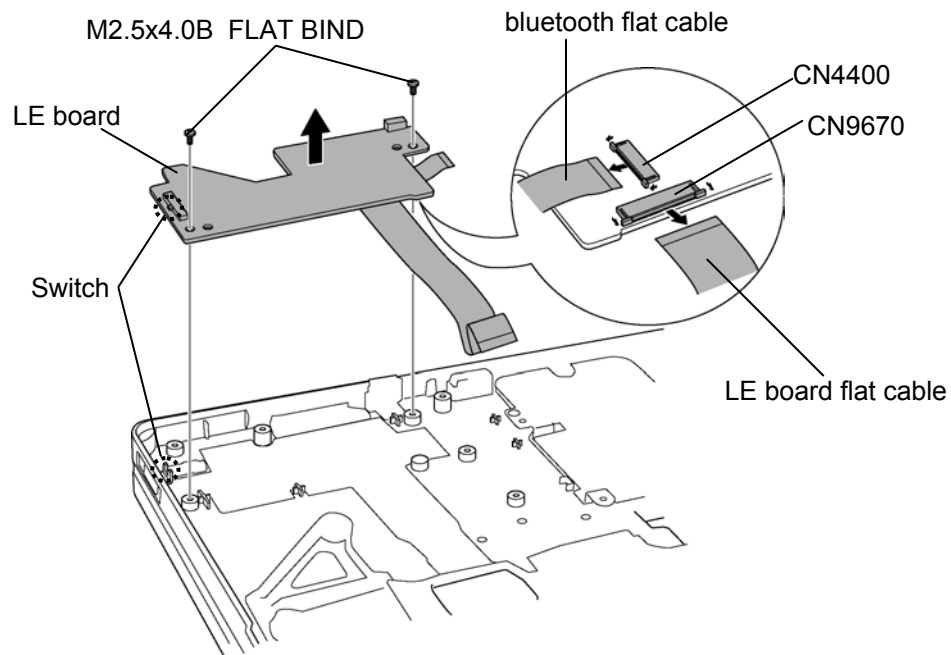


Figure 4-26 Removing the LE board

Installing the LE board

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

1. Connect the **bluetooth flat cable** to the connector **CN4400** on the LE board.
2. Connect the **LE board flat cable** to the connector **CN9670** on the LE board.
3. Fitting the **wireless communication switch** to the lever, install the **LE board** to the cover assembly and secure it with the following **screws**.

- M2.5×4.0B FLAT BIND screw x2

4.13 SD board / Microphone / MDC

4.13.1 SD board

Removing the SD board

The following describes the procedure for removing the SD board (See Figure 4-27 and 4-28).

1. Turn up the **insulator** and peel off the **glass tape** covering the MDC harness.
2. Pull out the **MDC harness** and its **core** from the guide of cover assembly.
3. Remove the following **screws** securing the MDC cover plate and remove the **MDC cover plate**.

- M2.5×6.0B SUPER THIN HEAD screw x3

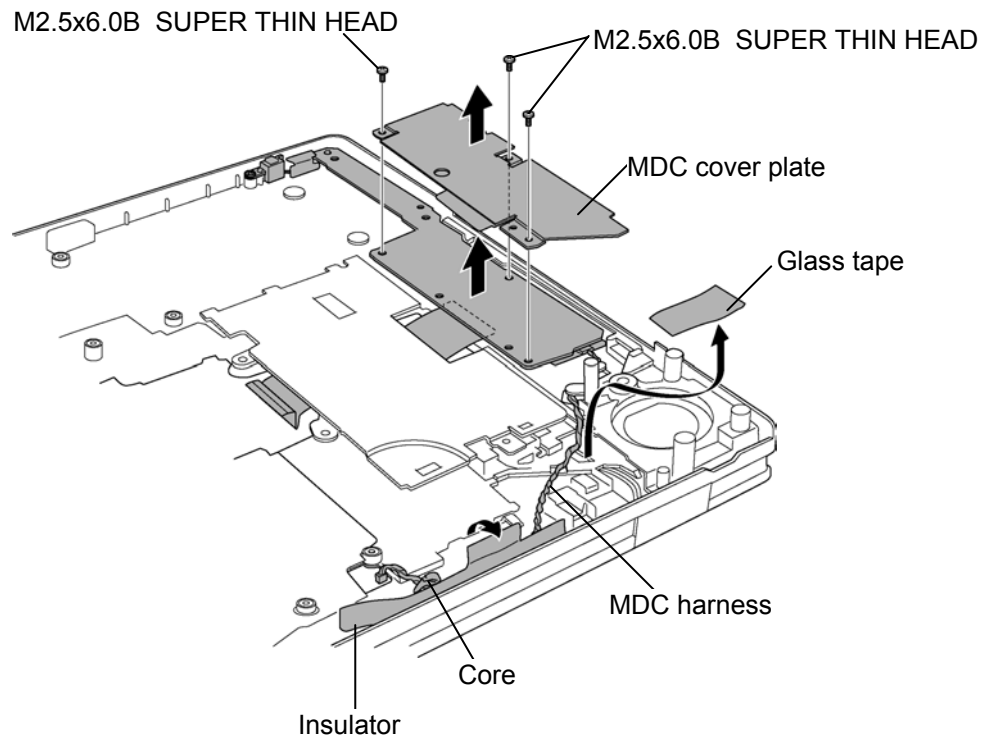


Figure 4-27 Removing the MDC cover plate

4. Remove the following **screws** securing the mic assembly and peel off the **insulator** fixing the SD board.
 - M2.0×4.0Z BIND screw x1
5. Pulling out the **SD board flat cable** from the **slot** of cover assembly, remove the **SD board** from the cover assembly with the mic assembly connected.
6. Turning over the SD board, disconnect the **SD board flat cable** from the connector **CN9510** on the system board.

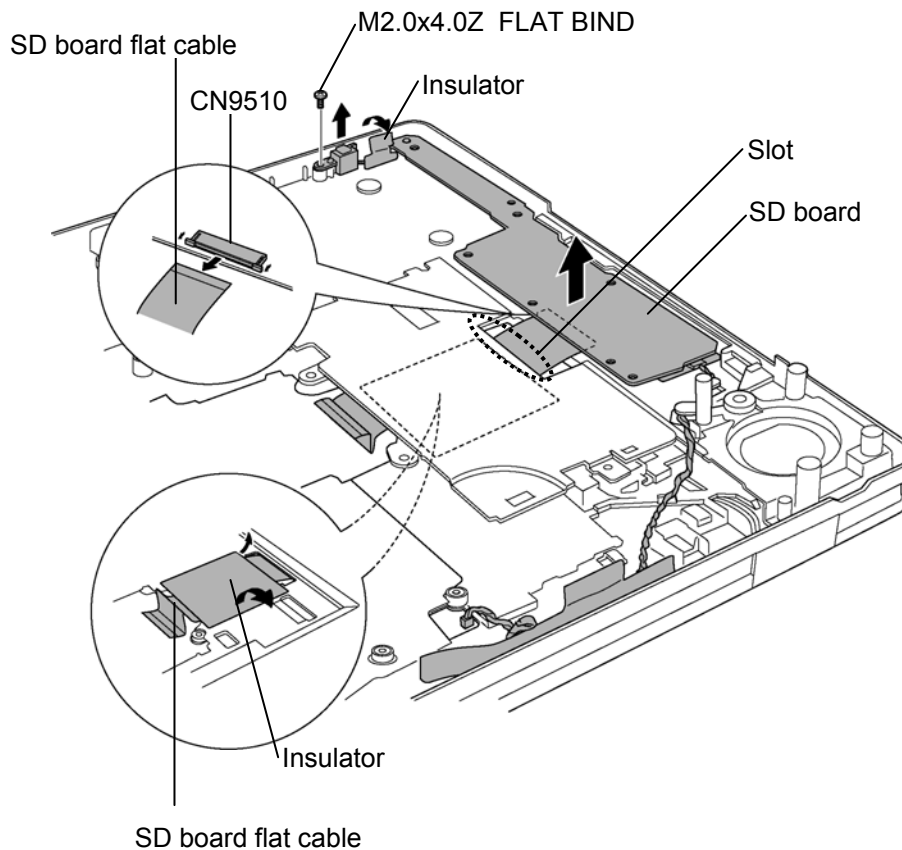


Figure 4-28 Removing the SD board

Installing the SD board

The following describes the procedure for installing the SD board (See Figure 4-27 and 4-28).

1. Connect the **SD board flat cable** to the connector **CN9510** on the SD board.
2. Passing through the SD board flat cable to the **slot** of the cover assembly, fix it with the **insulator** in the front side.
3. Arrange the **MDC harness** along the guide of the cover assembly and fix it with **glass tape**.
4. Fix the **MDC harness** and its **core** with the **insulator**.
5. Install the **MDC cover plate** and secure it with the following **screws**.
 - M2.5×6.0B SUPER THIN HEAD screw x3
6. Install the **mic assembly** to the slot and secure it with the following **screw**.
 - M2.0×4.0Z BIND screw x1
7. Cover and fix the mic cable with the **insulator**.

4.13.2 Microphone

Removing the microphone

The following describes the procedure for removing the microphone (See Figure 4-29).

1. Disconnect the **mic cable** from the connector **CN6000** on the SD board.
2. Pull out the microphone from the mic hold guide.

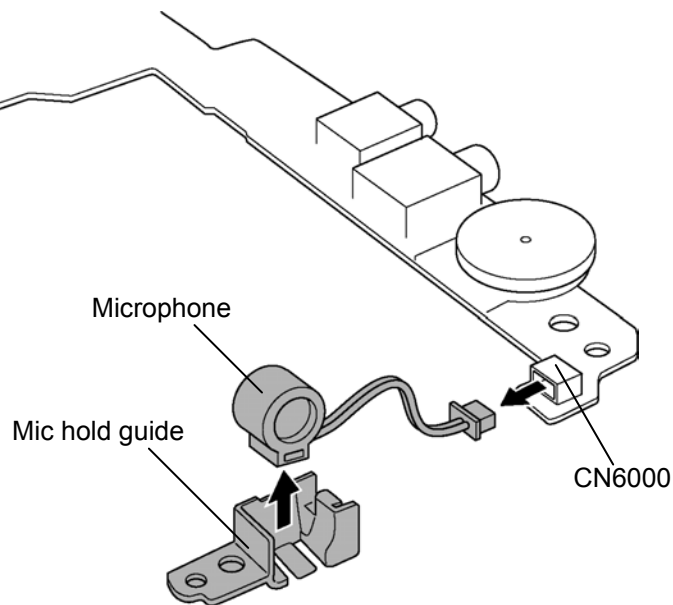


Figure 4-29 Removing the microphone

Installing the microphone

The following describes the procedure for installing the microphone (See Figure 4-29).

1. Install the **microphone** to the **mic hold guide**.
2. Connect the **mic cable** to the connector **CN6000** on the SD board.

4.13.3 MDC

Removing a MDC

The following describes the procedure for removing a MDC (See Figure 4-30).

1. Remove the following **screws** securing a MDC.
 - M2.0×4.0Z BIND screw x2
2. Pull up straight and remove a **MDC** from the connector **CN3000** on the SD board.
3. Disconnect the **MDC harness** from a MDC.

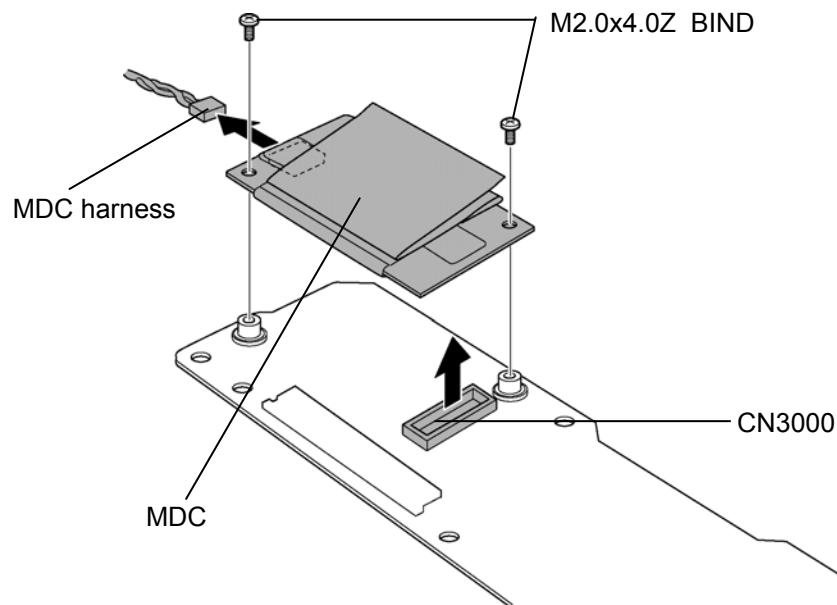


Figure 4-30 Removing a MDC

Installing a MDC

The following describes the procedure for installing a MDC (See Figure 4-30).

1. Connect the **MDC harness** to the connector on the MDC.
2. Connect and install a **MDC** to the connector **CN3000** on the SD board.
3. Secure a MDC with the following **screws**.
 - M2.0×4.0Z BIND screw x2

4.14 Touch pad

Removing the touch pad

The following describes the procedure for removing the touch pad (See Figure 4-31).

1. Peel off the **glass tape** and disconnect the **touch pad flat cable** from the connector on the touch pad.
2. Remove the following **screws** securing the touch pad plate.
 - M2.5×3.0B SUPER THIN HEAD screw x3
3. Turning up the **insulator**, remove the **touch pad plate**.
4. Remove the following **screws** securing the touch pad.
 - M2.5×3.0B SUPER THIN HEAD screw x2
5. Peel off and remove the **touch pad** from the cover assembly.

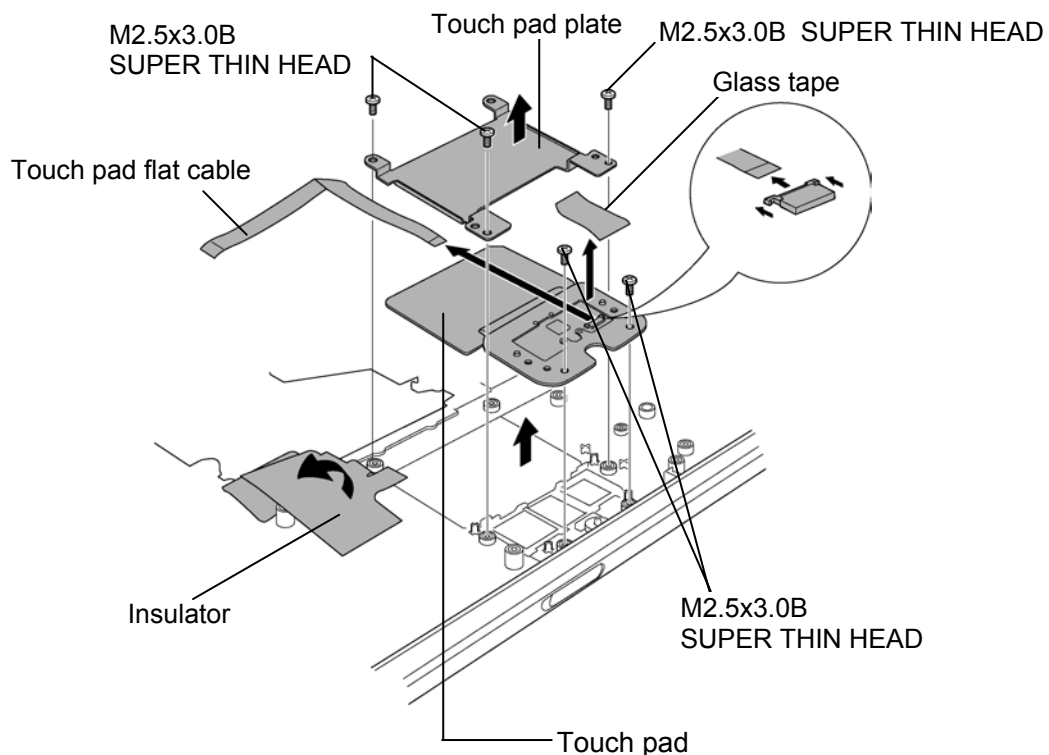


Figure 4-31 Removing the touch pad

Installing the touch pad

The following describes the procedure for installing the touch pad (See Figure 4-31).

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

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

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

2. Stick and install the **touch pad** on the cover assembly.
3. Secure the touch pad with the following **screws**.
 - M2.5×3.0B SUPER THIN HEAD screw x2
4. Install the **touch pad plate** and secure it with the following **screws**.
 - M2.5×3.0B SUPER THIN HEAD screw x3
5. Stick the **insulator** on the touch pad plate.
6. Connect the **touch pad flat cable** to the connector on the touch pad and stick the **glass tape** on the connector.

4.15 Hinge (cover assembly side)

Removing the Hinge

The following describes the procedure for removing hinge (See Figure 4-32).

1. Remove the following **screws** securing the **hinges** (cover assembly side).
 - M2.5×6.0 PSP TIGHT screw x2
2. Turn up the **insulator** on the left hinge and remove the **hinges** from the cover assembly.

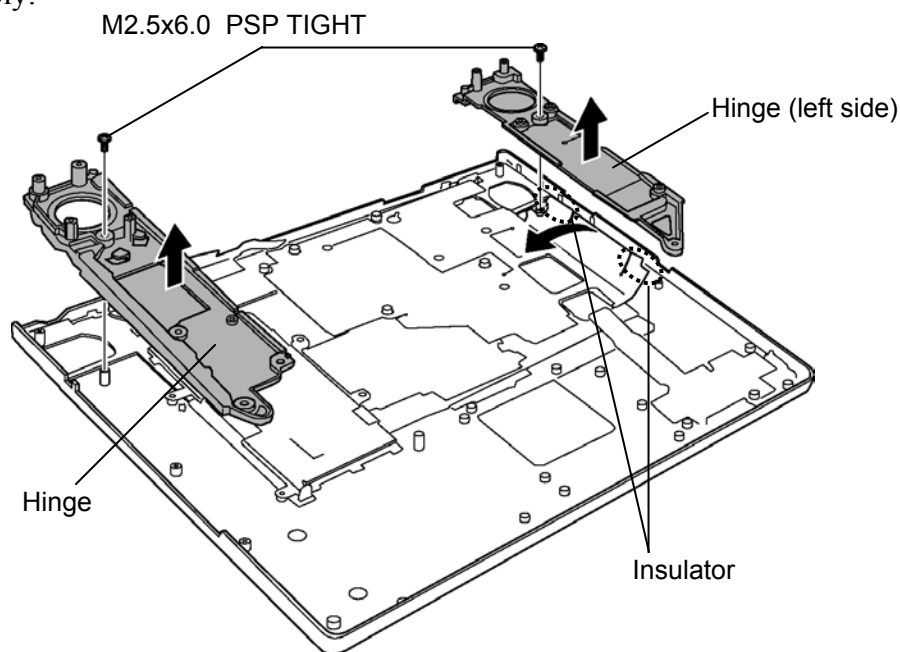


Figure 4-32 Removing the hinge (cover assembly side)

Installing the Hinge

The following describes the procedure for installing the hinge (See Figure 4-32).

1. Install the **hinges** to the cover assembly and secure them with the following **screws**.
 - M2.5×6.0 PSP TIGHT screw x2
2. Stick the **insulator** on the **left hinge**.

4.16 RTC battery / BT board

4.16.1 RTC battery

Removing the RTC battery

The following describes the procedure for removing the RTC battery (See Figure 4-33).

1. Peel off the **glass tape** and pull out the **RTC battery** from the battery connector cover.
2. Disconnect the **RTC battery cable** from the connector **CN9990** on the system board.

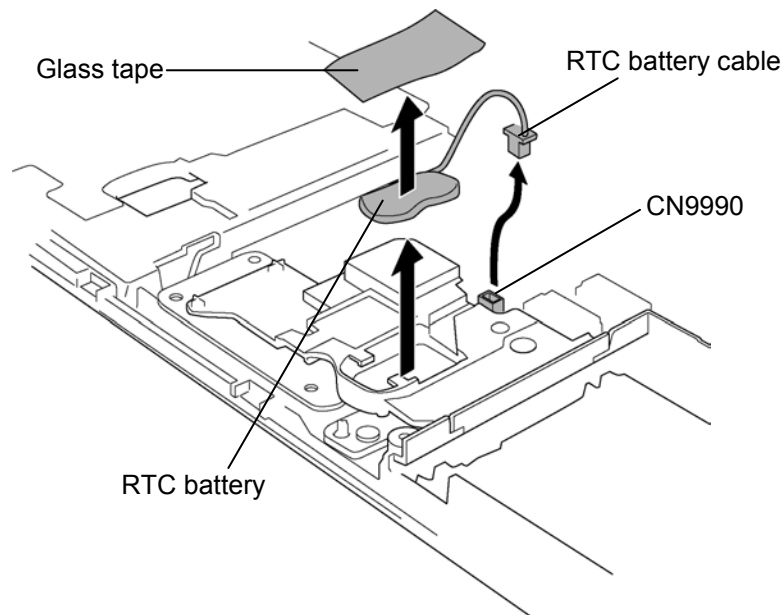


Figure 4-33 Removing the RTC battery

Installing the RTC battery

The following describes the procedure for installing the RTC battery (See Figure 4-33).

1. Connect the **RTC battery cable** to the connector **CN9990** on the system board.
2. Install the **RTC battery** to the battery connector cover and fix it with the **glass tape**.

4.16.2 BT board

Removing the BT board

The following describes the procedure for removing the BT board (See Figure 4-34).

1. Remove the following **screw** securing the battery connector cover and remove the **battery connector cover**.
 - M2.5×6.0B FLAT BIND screw x1
2. Disconnect the **BT board flat cable** from the connector **CN9691** on the BT board and from the connector **CN8021** on the system board.
3. Remove the following **screw** securing the BT board.
 - M2.5×6.0B FLAT BIND screw x1
4. Disconnect the **battery harness** from the connector **CN9690** on the BT board and from the connector **CN8020** on the system board.

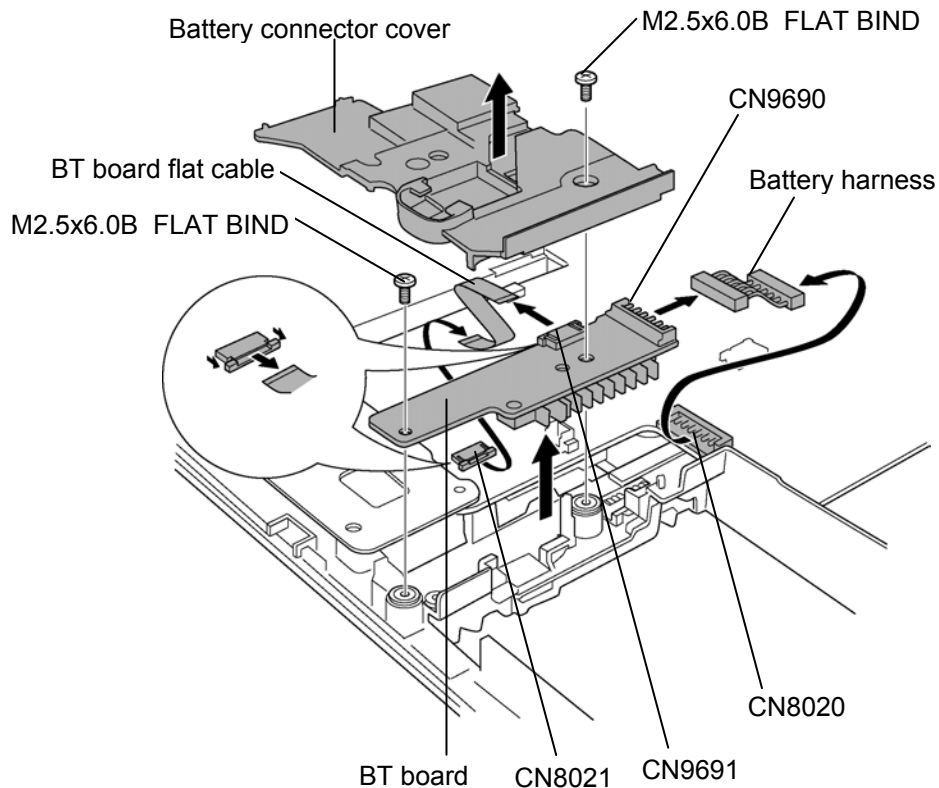


Figure 4-34 Removing the BT board

Installing the BT board

The following describes the procedure for installing the BT board (See Figure 4-34).

1. Connect the **battery harness** to the connector **CN9690** on the BT board and to the connector **CN8020** on the system board.
2. Install the **BT board** and secure it with the following **screw**.
 - M2.5×6.0B FLAT BIND screw x1
3. Connect the **BT board flat cable** to the connector **CN9691** on the BT board and to the connector **CN8021** on the system board.
4. Install the **battery connector cover** and secure it with the following **screw**.
 - M2.5×6.0B FLAT BIND screw x1

4.17 CPU fan

Removing the CPU fan

The following describes the procedure for removing the CPU fan (See Figure 4-35).

1. Disconnect the **CPU fan cable** from the connector **CN8770** on the system board.
2. Remove the following **screws** securing the CPU fan and remove the **CPU fan**.

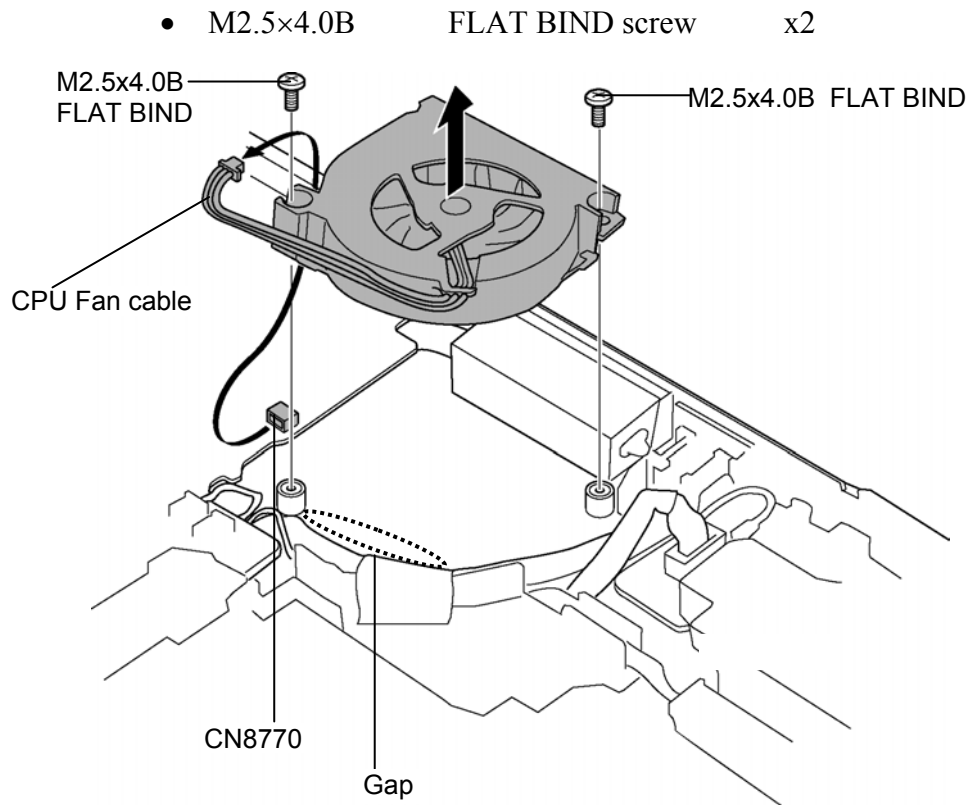


Figure 4-35 Removing the CPU fan

Installing the CPU fan

The following describes the procedure for installing the CPU Fan (See Figure 4-35).

1. Install the **CPU fan** and secure it with the following **screws**.
 - M2.5×4.0B FLAT BIND screw x2
2. Arranging the CPU fan cable through the gap between the fan and harness holder, connect the **CPU fan cable** to the connector **CN8770** on the system board.

4.18 US board

Removing the US board

The following describes the procedure for removing the US board (See Figure 4-36).

1. Disconnect the **USB harness** from the connector **CN4621** on the US board.
2. Remove the following **screw** securing the US board and remove the **US board**.

- M2.5×4.0B FLAT BIND screw x1

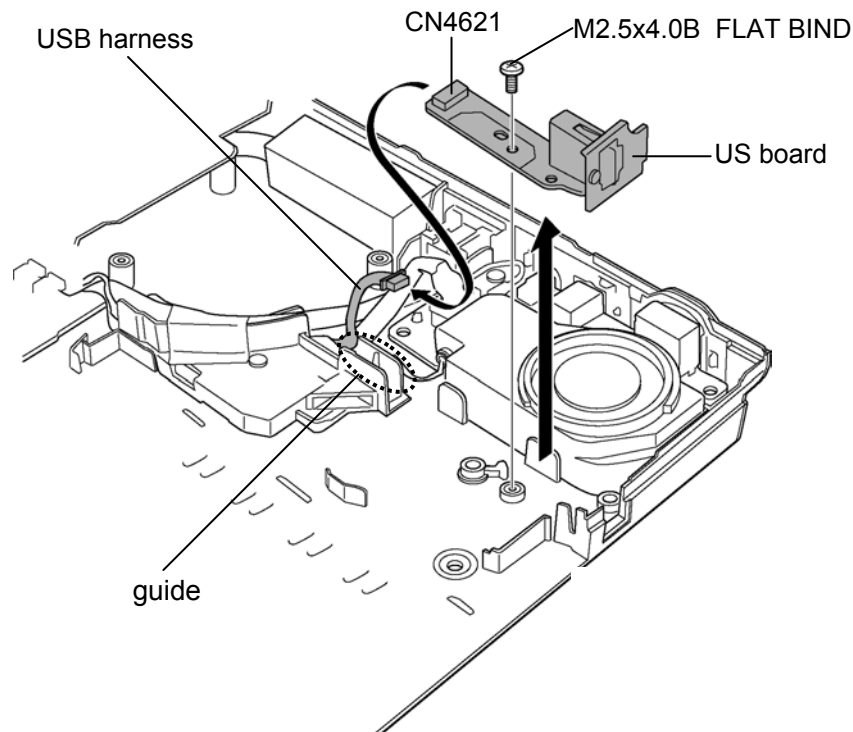


Figure 4-36 Removing the US board

Installing the US board

The following describes the procedure for installing the US board (See Figure 4-36).

1. Install the **US board** and secure it with the following **screw**.

- M2.5×4.0B FLAT BIND screw x1

2. Arranging the USB harness along the **guide**, connect the **USB harness** to the connector **CN4621** on the US board.

4.19 Speaker (R) / TJ board

4.19.1 Speaker (R)

Removing the speaker (R)

The following describes the procedure for removing the speaker (R) (See Figure 4-37 and 4-38).

1. Peeling off the **glass tape** from the harness holder.
2. Pull out the **DC-IN jack** from the slot and pull out the **DC-IN cable** from the guide of harness holder.
3. Remove the following **screw** securing the harness holder and remove the **harness holder**.

- M2.5×4.0B FLAT BIND screw x1

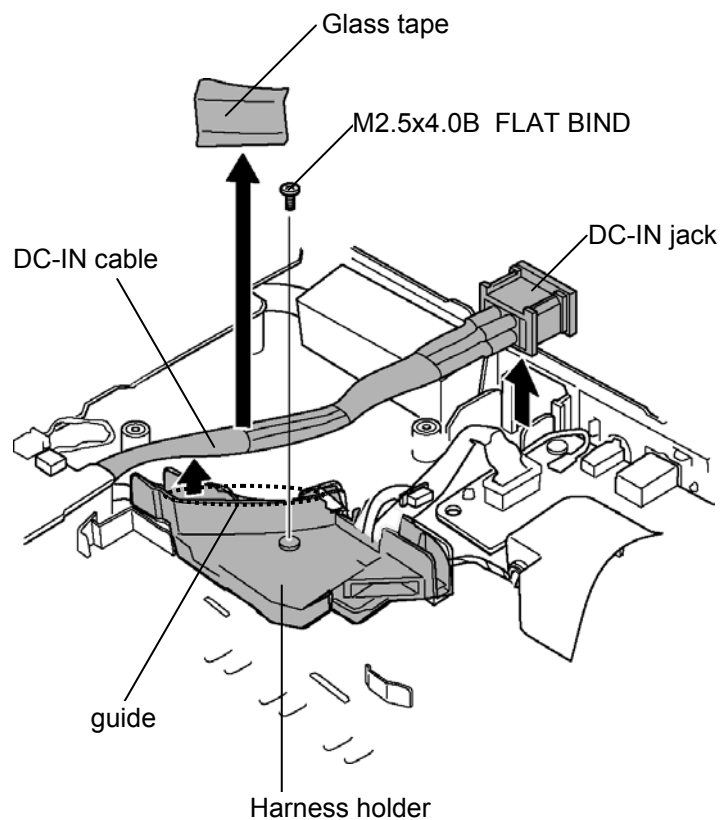


Figure 4-37 Removing the harness holder

4. Pull out the **USB harness** from the guide of base assembly.
5. Disconnect the **TJ board cable** from the connector **CN9614** on the TJ board and pull it out from the guide of base assembly.
6. Disconnect the **speaker (R) cable** from the connector **CN6003** on the system board and pull it out from the guide.
7. Pull up the **speaker (R)** straight and remove it.

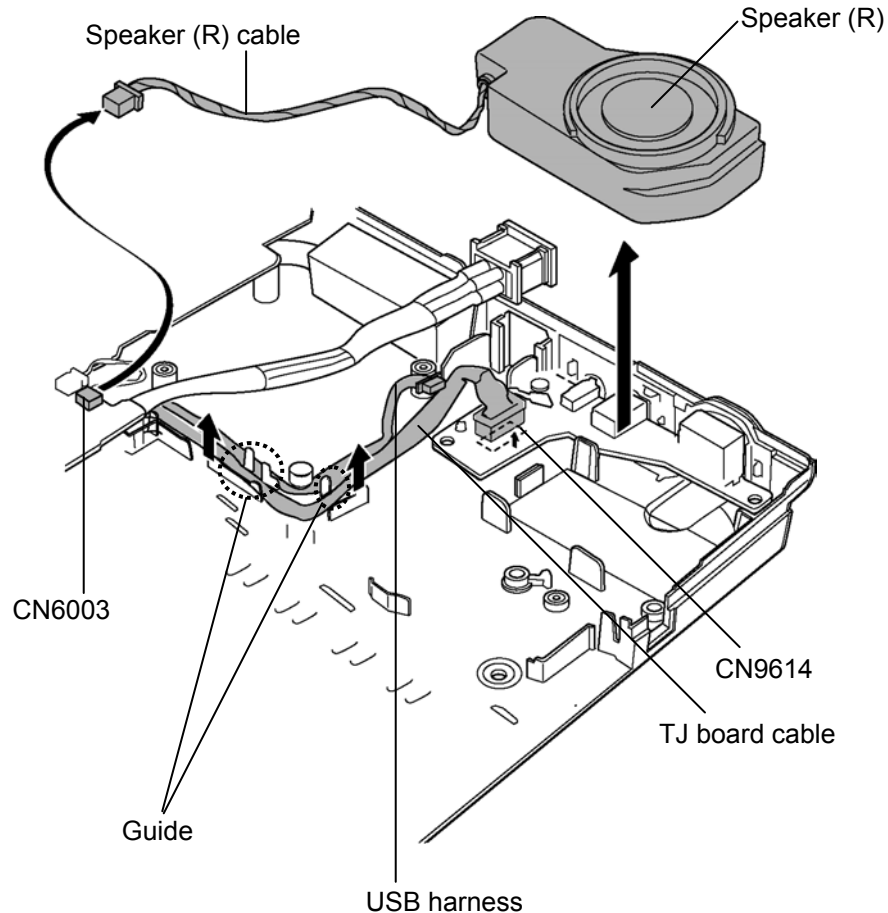


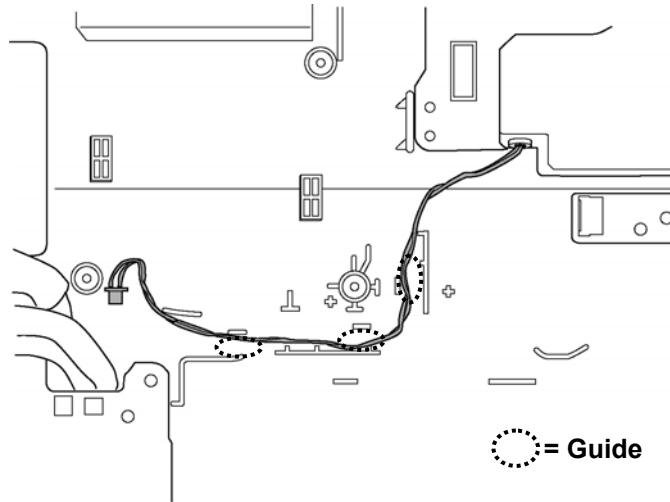
Figure 4-38 Removing the speaker (R)

Installing the speaker (R)

The following describes the procedure for installing the speaker (R) (See Figure 4-37 to 4-39).

1. Install the **speaker (R)** to the slot of base assembly.
2. Arrange the **speaker (R) cable** along the guide and connect it to the connector **CN6003** on the system board.

NOTE: Be sure to arrange the speaker (R) cable in the following guide.



3. Arranging the **TJ board cable** along the guide, connect it to the connector **CN9614** on the TJ board.
4. Arrange the **USB harness** along the guide.

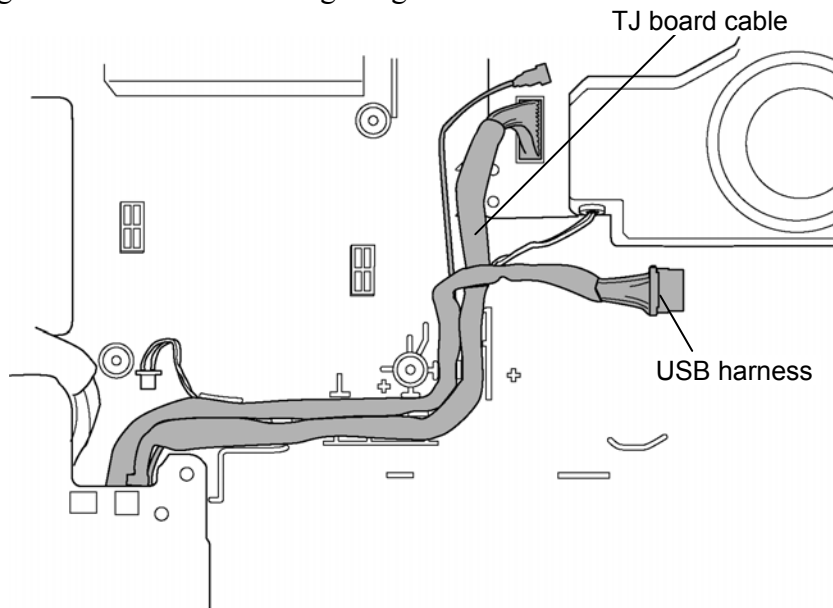


Figure 4-39 Cable arrangement in guide

5. Install the **harness holder** and secure it with the following screw.
 - M2.5×4.0B FLAT BIND screw x1

NOTE: When installing the harness holder, be careful not to catch cables.

6. Arrange the **DC-IN cable** along the guide of harness holder and install the **DC-IN jack** in the slot of base assembly.
7. Fix the DC-IN cable with the **glass tape**.

4.19.2 TJ board

Removing the TJ board

The following describes the procedure for removing the TJ board (See Figure 4-40).

1. Disconnect the **TV antenna cable** from the connector **CN9611** on the TJ board and pull it out from the guide of base assembly.
2. Remove the following **screws** securing TJ board and remove the **TJ board**.

- M2.5×4.0B FLAT BIND screw x2

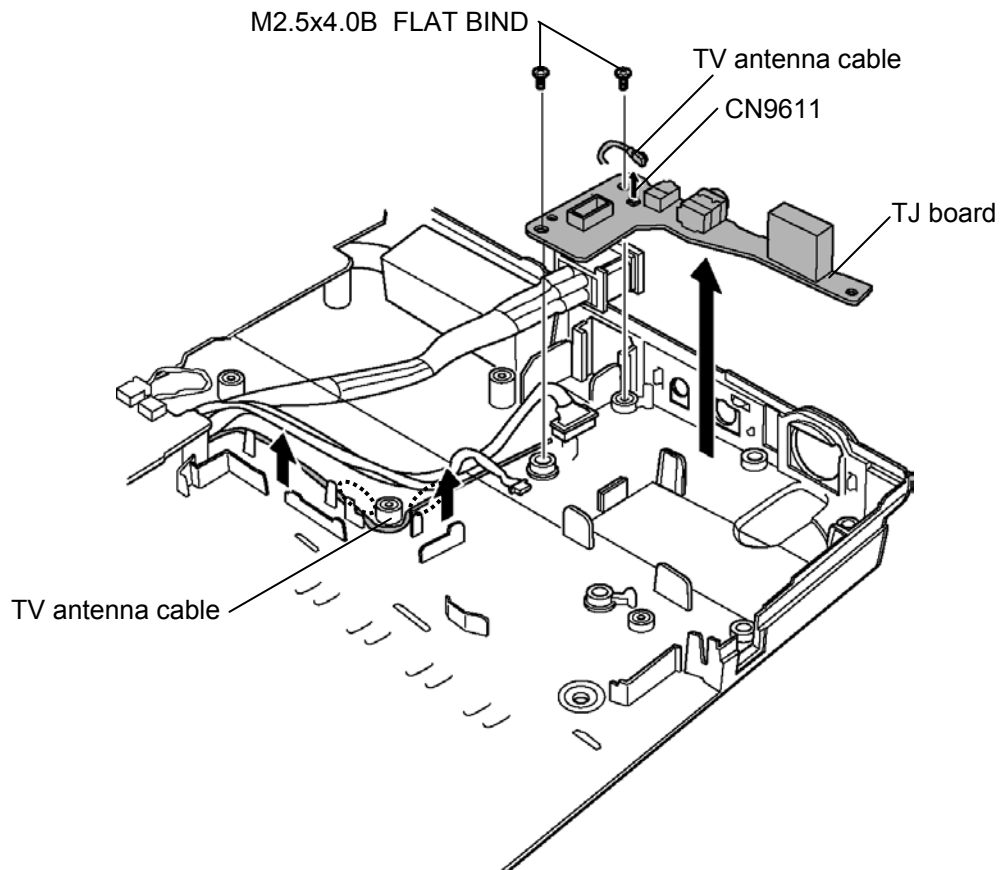
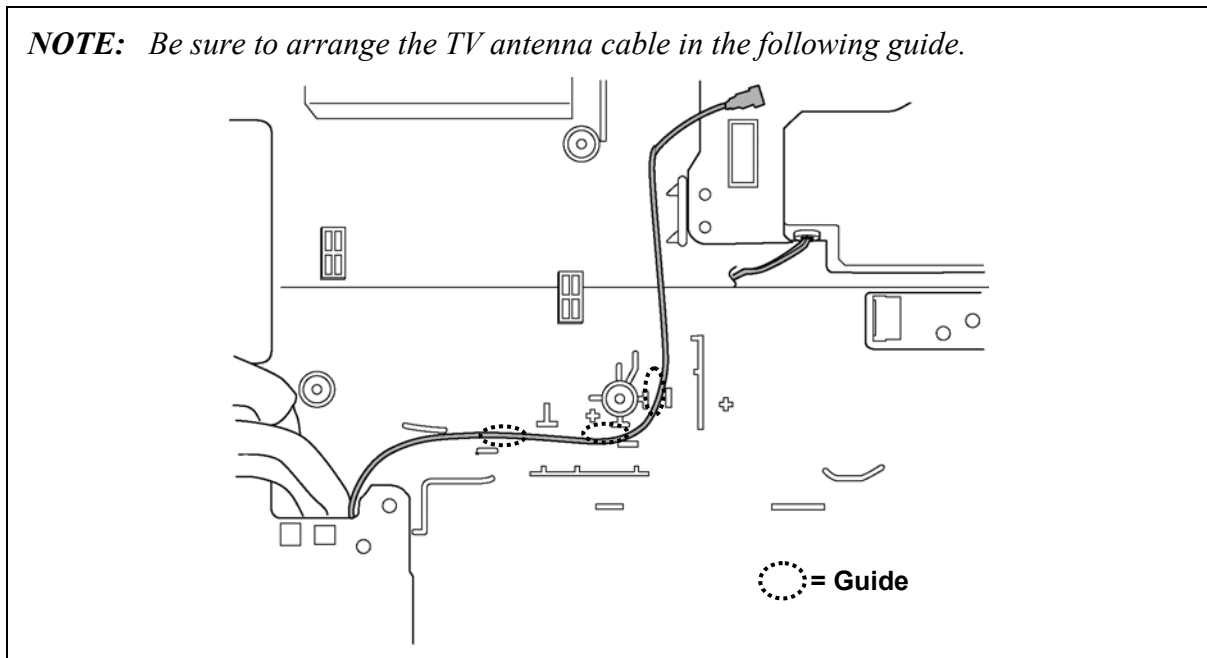


Figure 4-40 Removing the TJ board

Installing the TJ board

The following describes the procedure for installing the TJ board (See Figure 4-40).

1. Install the **TJ board** and secure it with the following **screws**.
 - M2.5×4.0B FLAT BIND screw x2
2. Arranging the **TV antenna cable** along the guide, connect it to the connector **CN9611** on the TJ board.



4.20 System board

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

2. If replacing with a new system board, execute the subtest01 Initial configuration in section 3.3 “Setting of the hardware configuration”. Also update with the latest BIOS as described in Appendix G “BIOS Rewrite Procedures” and with the latest EC/KBC as described in Appendix H “EC/KBC Rewrite Procedures”.

Removing the system board

The following describes the procedure for removing the system board (See Figure 4-41).

1. Disconnect the **speaker (L) cable** from the connector **CN6002** on the system board.
2. Turning up the **insulator** (covering on 1 screw), remove the following **screws** securing the system board and remove the **system board**.

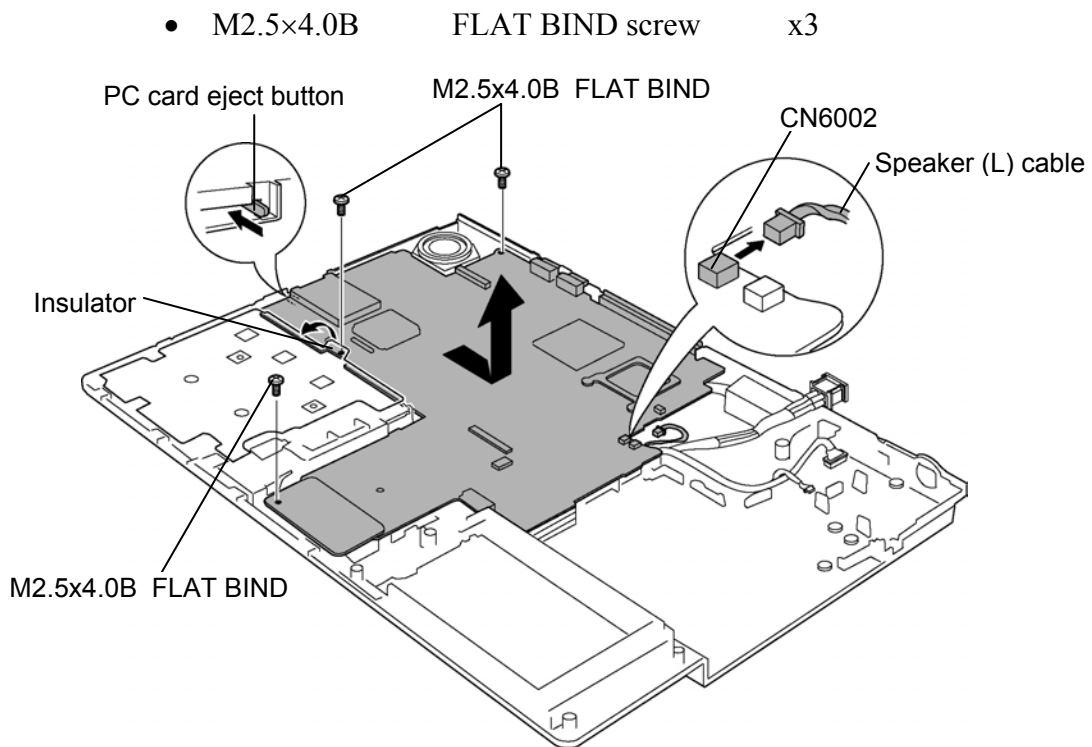


Figure 4-41 Removing the system board

Installing the system board

The following describes the procedure for installing the system board (See Figure 4-41).

1. Fitting the **PC card eject button**, install the **system board** to the base assembly from the PC card side first.
2. Turning up the **insulator** (covering on 1 screw hole), secure the system board with the following **screws**.

- M2.5×4.0B FLAT BIND screw x3

3. Connect the **speaker (L) cable** to the connector **CN6002** on the system board.

4.21 VGA fan

Removing the VGA fan

The following describes the procedure for removing the VGA fan (See Figure 4-42).

1. Remove the following **screws** securing the VGA fan.

- M2.5×4.0B FLAT BIND screw x2

2. Remove the **VGA fan**.

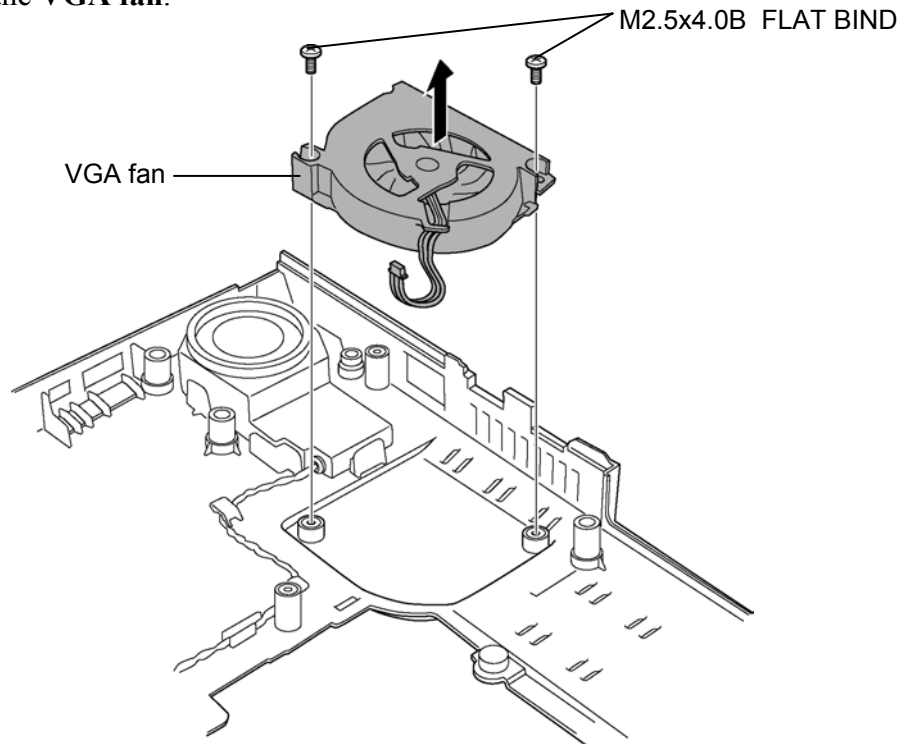


Figure 4-42 Removing the VGA fan

Installing the VGA fan

The following describes the procedure for installing the VGA fan (See Figure 4-42).

1. Install the **VGA fan** to the base assembly.

2. Secure the VGA fan with the following **screws**.

- M2.5×4.0B FLAT BIND screw x2

4.22 Speaker (L)

Removing the speaker (L)

The following describes the procedure for removing the speaker (L) (See Figure 4-43).

1. Peeling off the **glass tape**, pull out the **speaker (L) cable** from the guide of base assembly.
2. Pull up the **speaker (L)** straight and remove it from the slot.

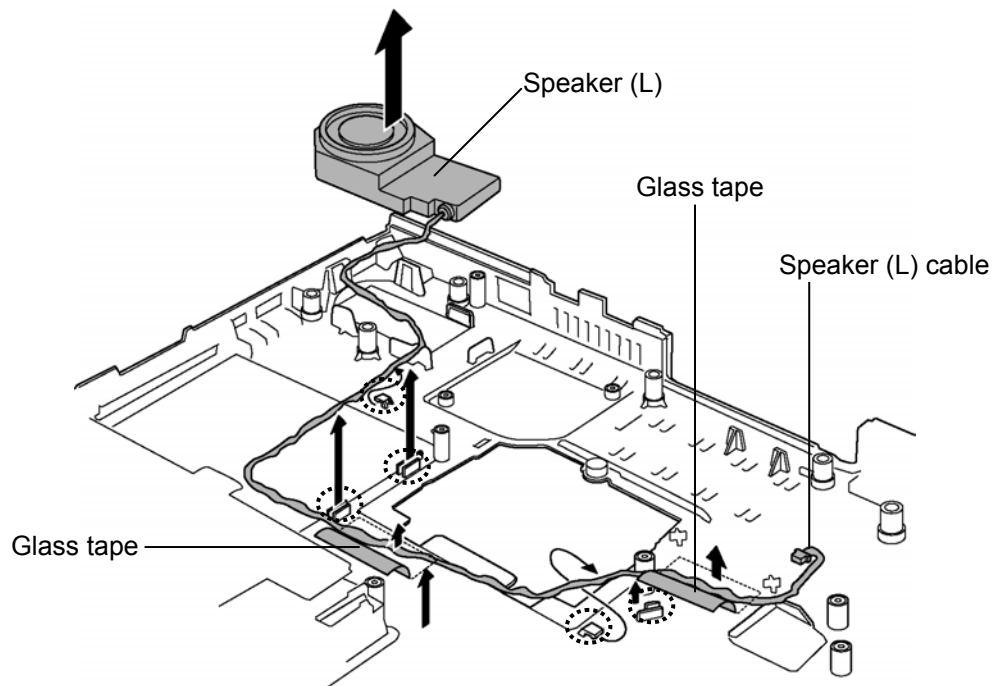


Figure 4-43 Removing the speaker (L)

Installing the speaker (L)

The following describes the procedure for installing the speaker (L) (See Figure 4-43).

1. Install the **speaker (L)** to the slot of base assembly.
2. Arrange the **speaker (L) cable** along the guide and fix it with **glass tape**.

4.23 CPU

Removing the CPU

The following describes the procedure for removing the CPU (See Figure 4-44 and 4-45).

1. Remove the following **screws** securing the heat sink holder.

- M2.0×4.0Z BIND screw x3

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

2. Remove the **heat sink holder** and **CPU heat sink**.

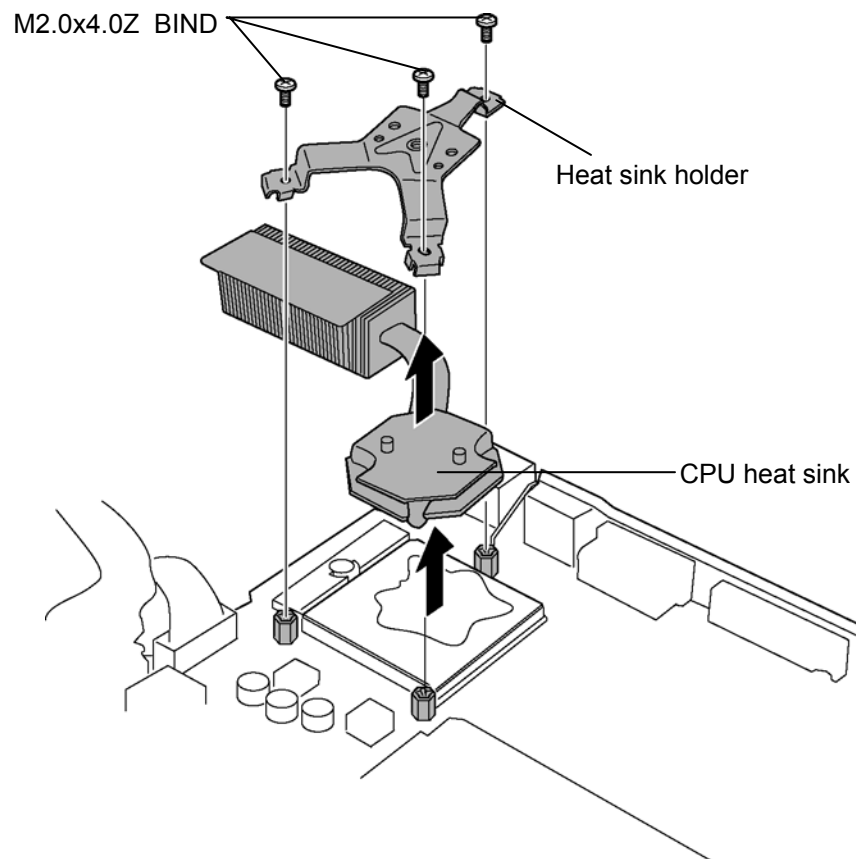


Figure 4-44 Removing the CPU heat sink

3. Unlock the **CPU** by rotating the **cam** on the CPU socket 180 degrees to the counterclockwise with a flat-blade screwdriver.
4. Remove the **CPU**.

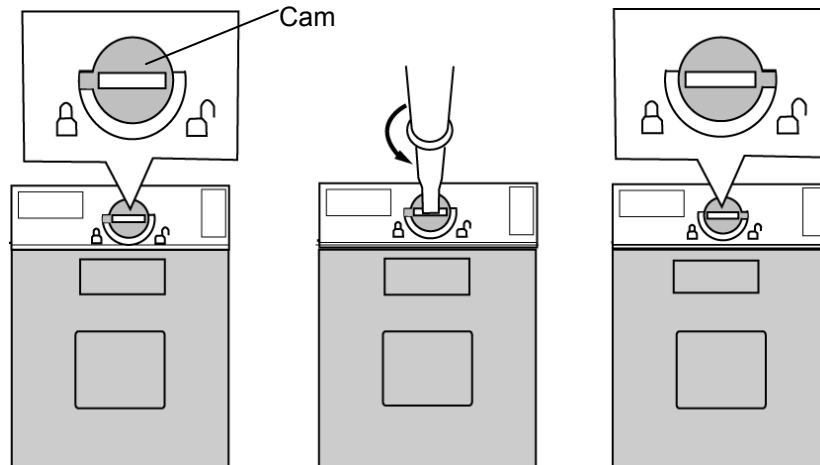


Figure 4-45 Removing the CPU

Installing the CPU

The following describes the procedure for installing the CPU (See Figure 4-44 to 4-46).

1. Check that the mark of cam is in the unlocking position.
2. Attach the **CPU** to the correct position in the **CPU socket**.
3. Fix the **CPU** by rotating the cam 180 degrees to the clockwise with a flat-blade screwdriver.
4. If there is already silicon grease on the CPU, clean it with a cloth.
Using a special applicator, apply silicon grease so that the CPU chip on the CPU is completely covered.

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

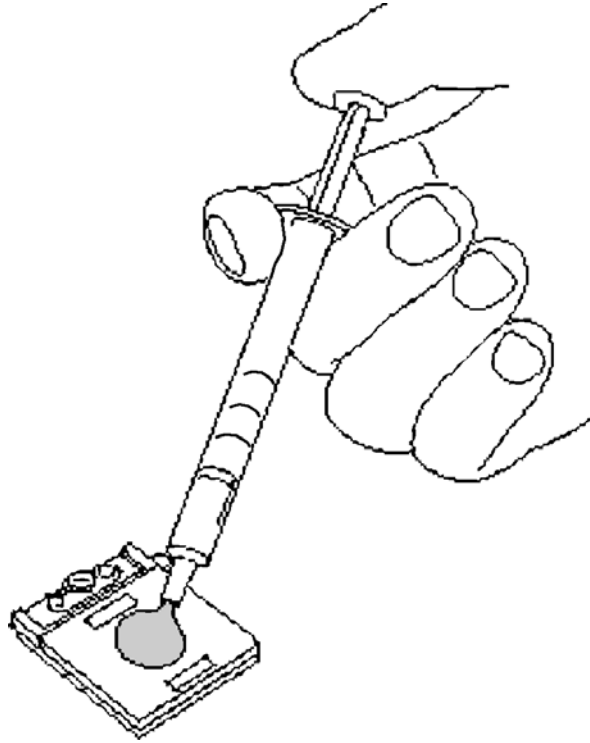


Figure 4-46 Applying silicon grease

5. Install the **CPU heat sink** and **heat sink holder** and secure them with the following screws.
 - M2.0×4.0Z BIND screw x3

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

4.24 VGA heat sink

Removing the VGA heat sink

The following describes the procedure for removing the VGA heat sink (See Figure 4-47).

1. Remove the following **screws** securing the VGA heat sink.
 - M2.0×3.0C SUPER THIN HEAD screw x3
2. Pull up the **VGA heat sink** straight and remove it.

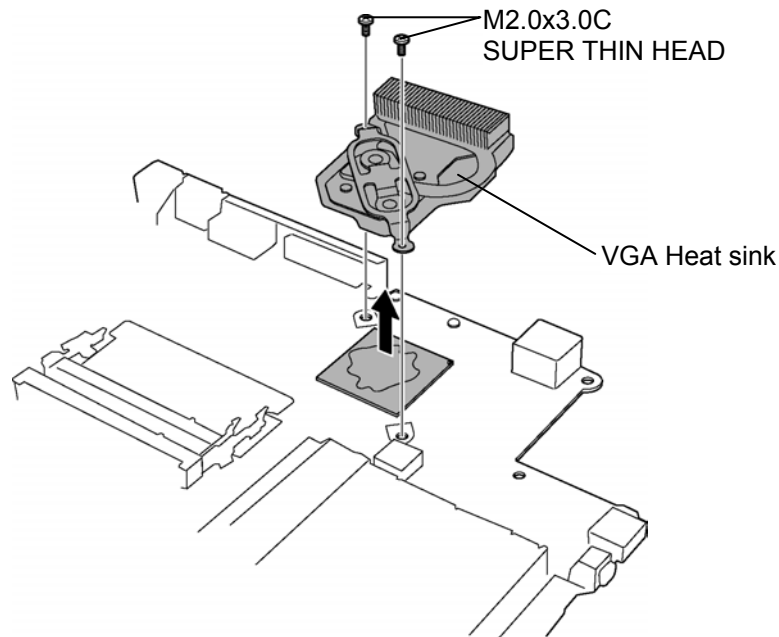


Figure 4-47 Removing the VGA heat sink

Installing the VGA heat sink

The following describes the procedure for installing the VGA heat sink (See Figure 4-47).

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

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

2. Secure the VGA heat sink with the following **screws**.
 - M2.0×3.0C SUPER THIN HEAD screw x3

4.25 TV tuner module

Removing the TV tuner module

The following describes the procedure for removing the TV tuner module (See Figure 4-48 and 4-49).

1. Disconnect the **USB harness** from the connector **CN4613** on the system board and pull it out from the harness guide.
2. Disconnect the **TJ board cable** from the connector **CN5660** on the system board and pull it out from the harness guide.
3. Disconnect the **TV tuner harness** from the connector **CN5661** on the system board and pull it out from the harness guide.
4. Remove the following **screws** securing the harness guide and TV tuner module.
 - M2.0×6.0Z BIND screw x2
5. Remove the **harness guide**.

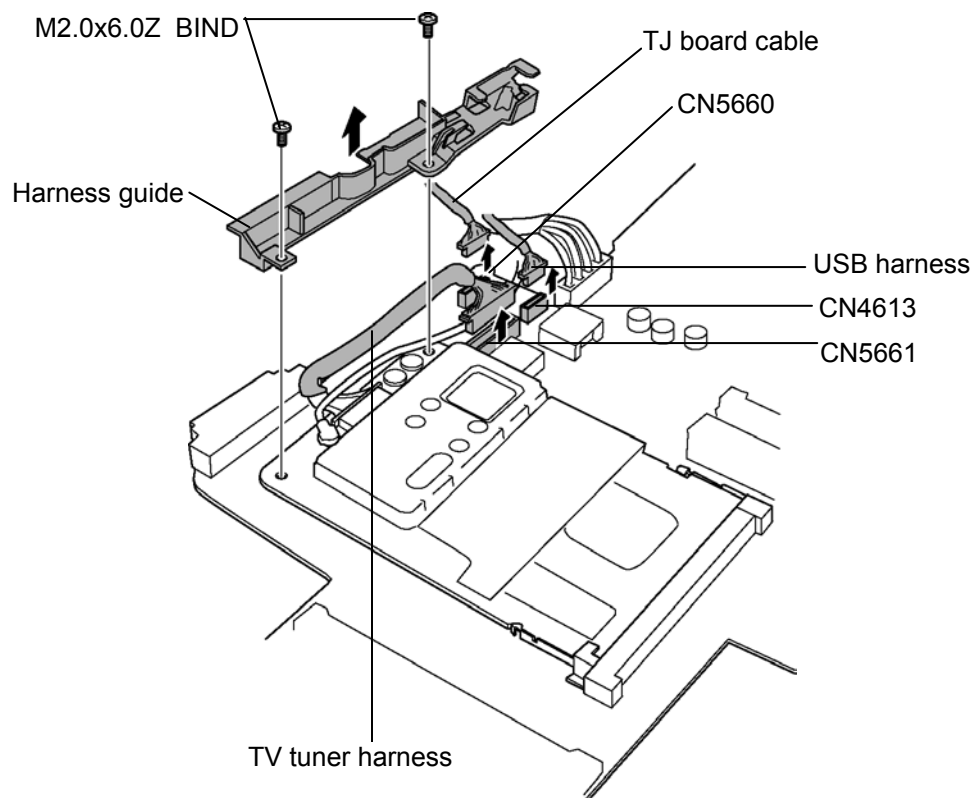


Figure 4-48 Removing the harnesses guide

6. Disconnect the **TV antenna cable** from the connector on the TV tuner module.
7. Disconnect the **TV tuner harness** from the connector on the TV tuner module.
8. Open the left and right latches holding the TV tuner module and remove the **TV tuner module** from the connector **CN2220** on the system board.

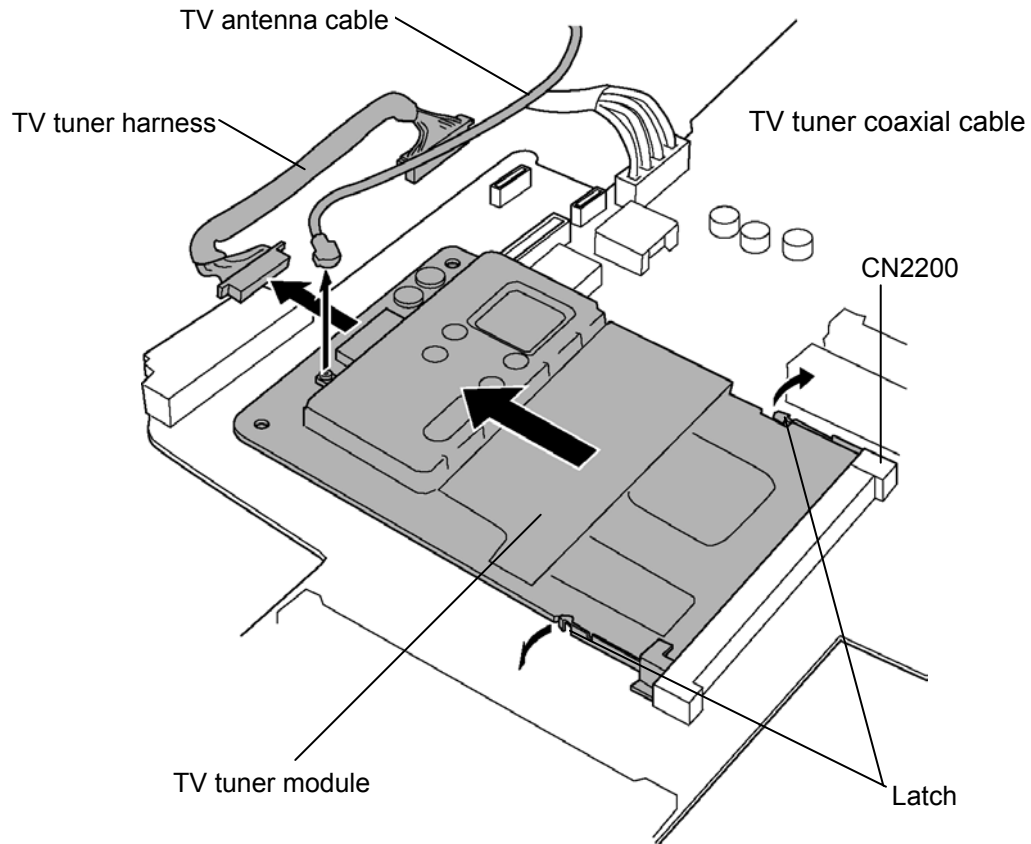


Figure 4-49 Removing the TV tuner module

Installing the TV tuner module

The following describes the procedure for installing the TV tuner module (See Figure 4-48 to 4-50).

1. Insert the **TV tuner module** terminals slantwise into the connector **CN2220** on the system board.
2. Connect the **TV tuner harness** to the connector on the TV tuner module.
3. Connect the **TV antenna cable** to the connector on the TV tuner module.
4. Install the **harness guide** and secure it with the following screws.
 - M2.0×6.0Z BIND screw x2
5. Arrange the **TV antenna cable** along the harness guide.
6. Arrange the **TV tuner harness** along the guide and connect it to the connector **CN5661** on the system board.
7. Arrange the **TJ board cable** along the harness guide and connect it to the connector **CN5660** on the system board.
8. Connect the **USB harness** to the connector **CN4613** on the system board and arrange the cable along the harness guide.

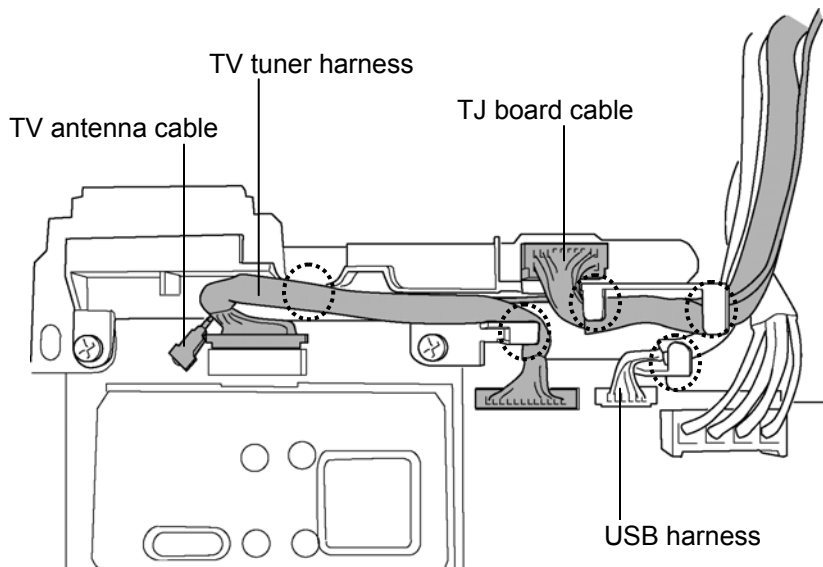


Figure 4-50 Arranging cables on the harness guide

4.26 PC card slot

Removing the PC card slot

The following describes the procedure for removing the PC card slot (See Figure 4-51).

1. Remove the following **screws** securing the PC card slot.
 - M2.0×8.0Z BIND screw x2
 - M2.0×3.0Z SUPER THIN HEAD screw x2
2. Pull up the **PC card slot** straight and remove it from the connector **CN2100** on the system board.

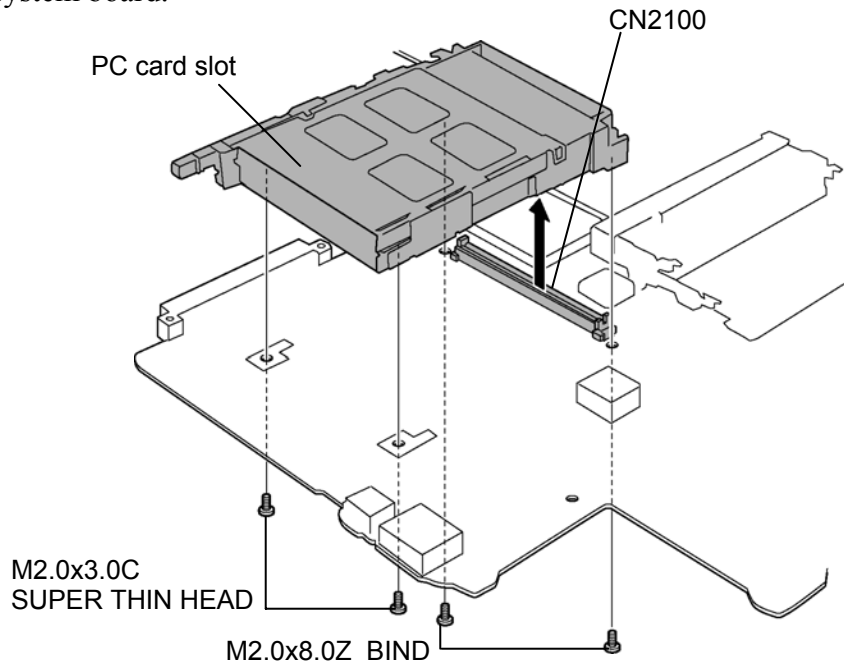


Figure 4-51 Removing the PC card slot

Installing the PC card slot

The following describes the procedure for installing the PC card slot (See Figure 4-51).

1. Insert the terminal of the PC card slot to the connector **CN2100** on the system board.
2. Secure the **PC card slot** with the following **screws**.
 - M2.0×8.0Z BIND screw x2
 - M2.0×3.0Z SUPER THIN HEAD screw x2

4.27 LCD unit / FL inverter

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

Removing the LCD unit / FL inverter

The following describes the procedure for removing the LCD unit and FL inverter (See Figure 4-52 to 4-55).

1. Insert your finger between the edge of the display mask and the **LCD**, and remove the **display mask** while releasing the latches of display mask.

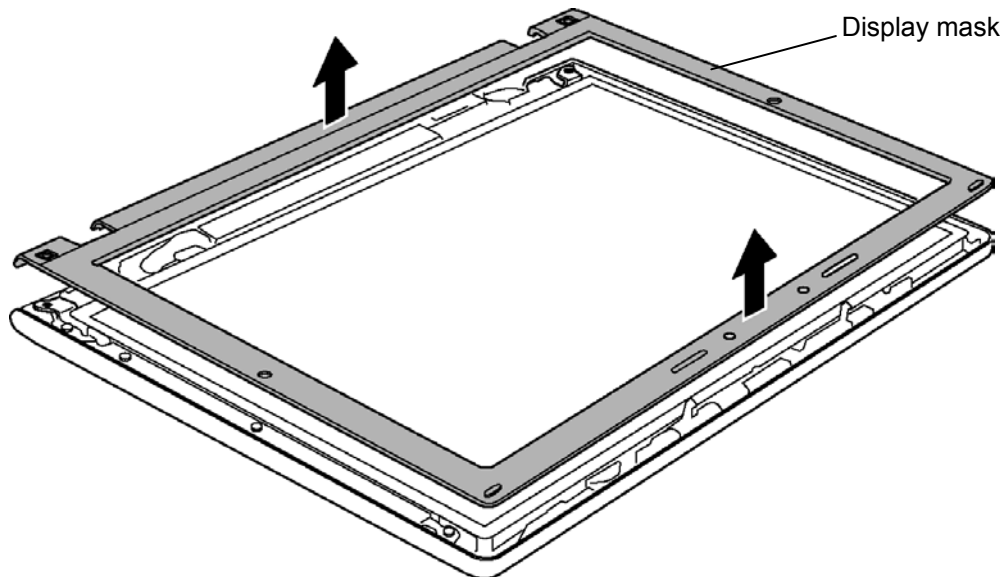


Figure 4-52 Removing the display mask

2. Remove the following **screw** securing the FL inverter.
 - M2.0x5.0C SUPER THIN HEAD screw x1
3. Pull out one **insulator** and peel off the other one adhered to the FL inverter.
4. Disconnect the **LCD harnesses** from the connectors **CN1** and **CN2** on the FL inverter.
5. Disconnect the **HV harnesses** from the connectors **CN3** and **CN4** on the FL inverter.
6. Remove the **FL inverter** while peeling off the **double-sided tape**.

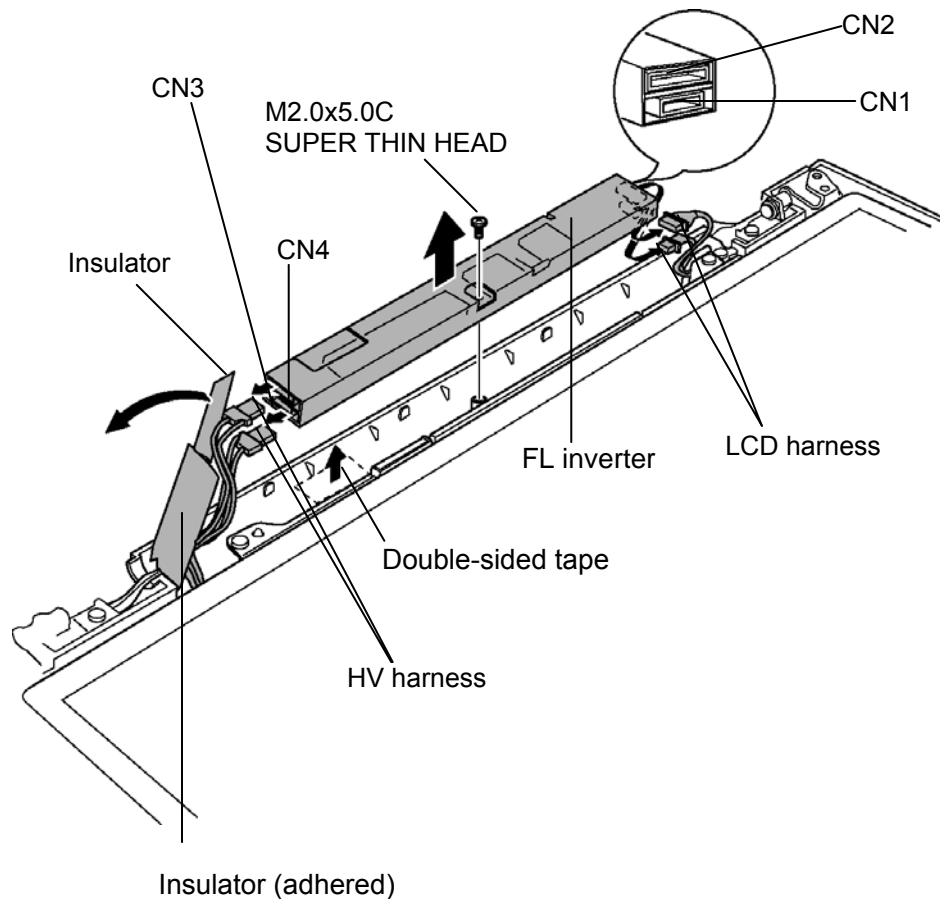


Figure 4-53 Removing the FL inverter

7. Remove the following **screws** securing the LCD unit.
 - M2.0x5.0C SUPER THIN HEAD screw x6
8. With the bottom edge of the LCD unit on the display cover, lift only the top edge of the LCD unit. After peeling off the **copper tape**, disconnect the LCD harness from the connector on the back of the LCD.
9. Remove the **LCD unit**.

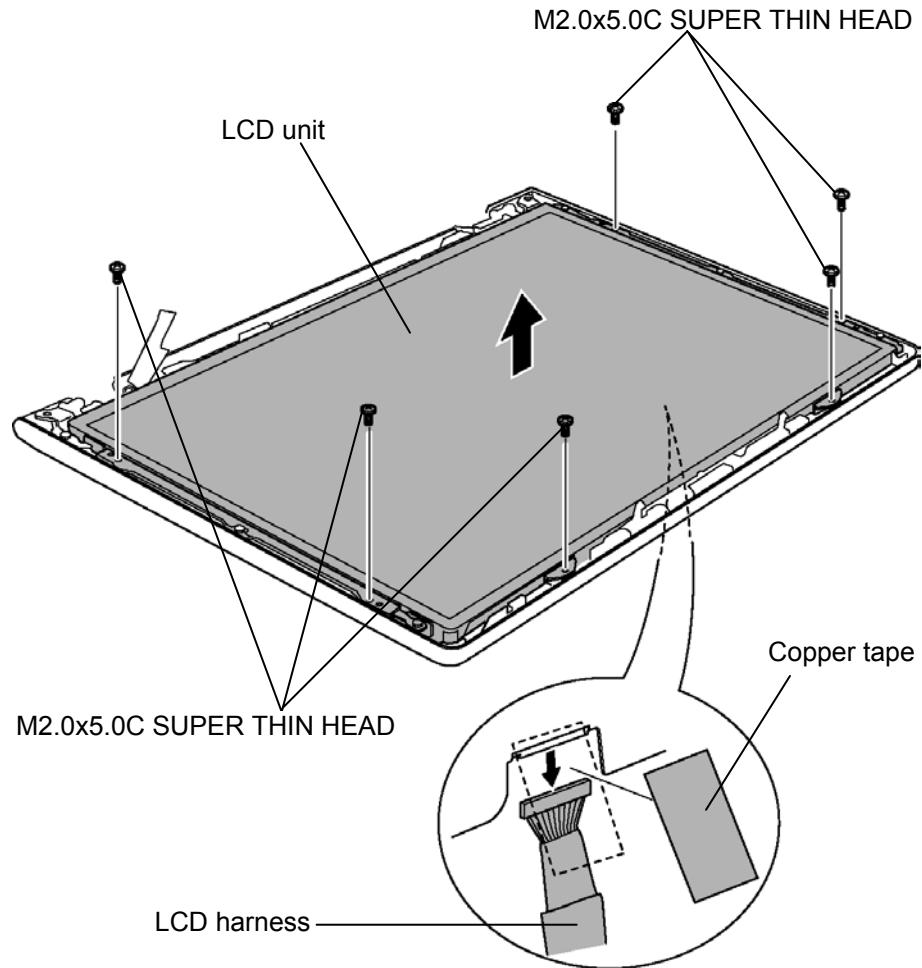


Figure 4-54 Removing the LCD unit

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

- M2.0x3.0C SUPER THIN HEAD screw x6

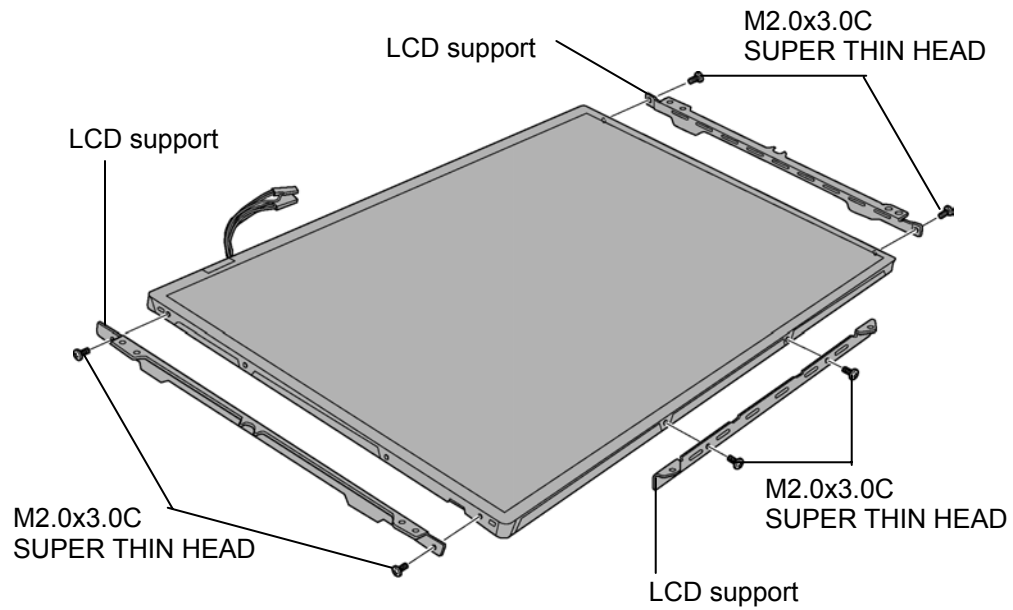


Figure 4-55 Removing the LCD supports

Installing the LCD unit/FL Inverter

The following describes the procedure for installing the LCD unit and FL inverter (See Figure 4-52 to 4-55).

1. Install the LCD supports (LCD unit side) to the LCD and secure them with the following **screws**.
 - M2.0×3.0C SUPER THIN HEAD screw x6
2. Stand the **LCD unit** on the display cover and connect the **LCD harness** to the connector on the back of LCD.
3. Stick the **copper tape** on the connector of LCD harness.
4. Secure the LCD unit with the following **screws**.
 - M2.0×5.0C SUPER THIN HEAD screw x6
5. Connect **LCD harnesses** to the connector **CN1** and **CN2** of the FL inverter.

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

6. Connect **HV harnesses** to the connector **CN3** and **CN4** of the FL inverter.
7. Insert one **insulator** under the LCD unit with the HV harnesses folded and stick the other one to the FL inverter.
8. Install the **FL inverter** while sticking the **double-sided tape** and secure it with the following **screw**.
 - M2.0×5.0C SUPER THIN HEAD screw x1
9. Install the **display mask** while fitting the latches.

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

4.28 LCD harness

Removing the LCD harness

The following describes the procedure for removing LCD harness (See Figure 4-56).

1. Remove the **LCD cushion** from the LCD support.
2. Remove the following **screws** securing the LCD support (display cover side) and remove the **LCD support**.
 - M2.5×6.0 PSP TIGHT screw x2
3. Remove the following **screw** securing the LCD harness holder (display cover side) and remove the **LCD harness holder**.

- M2.5×4.0B FLAT BIND screw x1

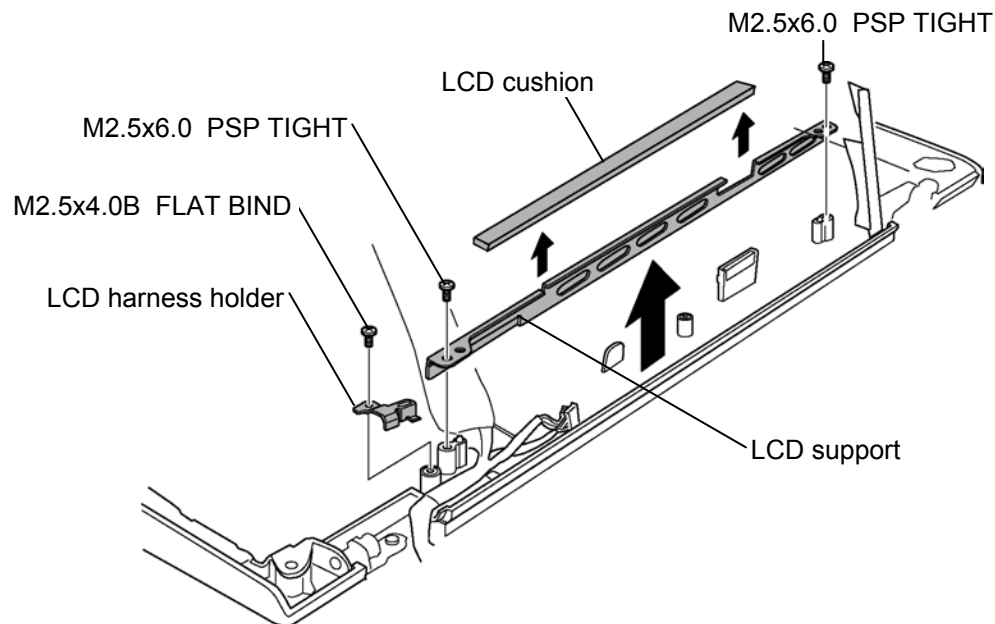


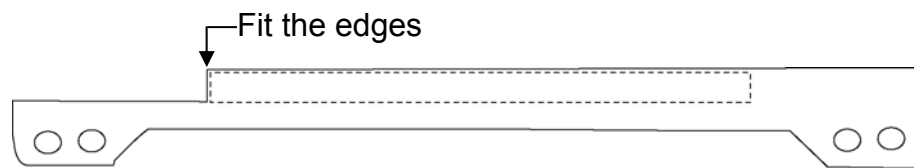
Figure 4-56 Removing the LCD harness holder (display cover side)

Installing the LCD harness

The following describes the procedure for installing the LCD harness (See Figure 4-56).

1. Arrange the **LCD harness** along the guide.
2. Install the **LCD harness holder (display cover side)** and secure it with the following **screw**.
 - M2.5×4.0B FLAT BIND screw x1
3. Install the **LCD support** (display cover side) and secure it with the following **screws**.
 - M2.5×6.0 PSP TIGHT screw x2
4. Install the **LCD cushion** on the LCD support.

NOTE: When installing the LCD cushion, make sure that the edge of LCD cushion is fit on the edge of LCD support.



4.29 Wireless antennas

Removing the wireless antennas

The following describes the procedure for removing the wireless antennas (See Figure 4-57 and 4-58).

1. Remove the following **screws** securing the **hinge** (display cover side).

- M2.5x6.0 PSP TIGHT screw x6

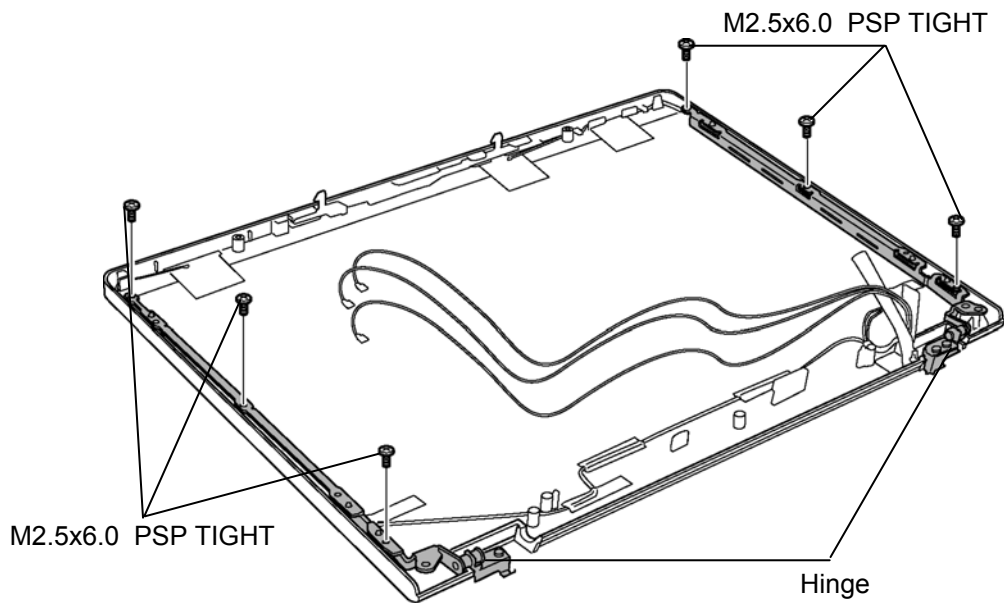


Figure 4-57 Removing the hinge (display cover side)

2. Peel off the **acetate tape** fixing the wireless antenna cables.
3. Pull out the wireless antenna cables from the guide and peel off the wireless LAN antennas and bluetooth antenna from the display cover.

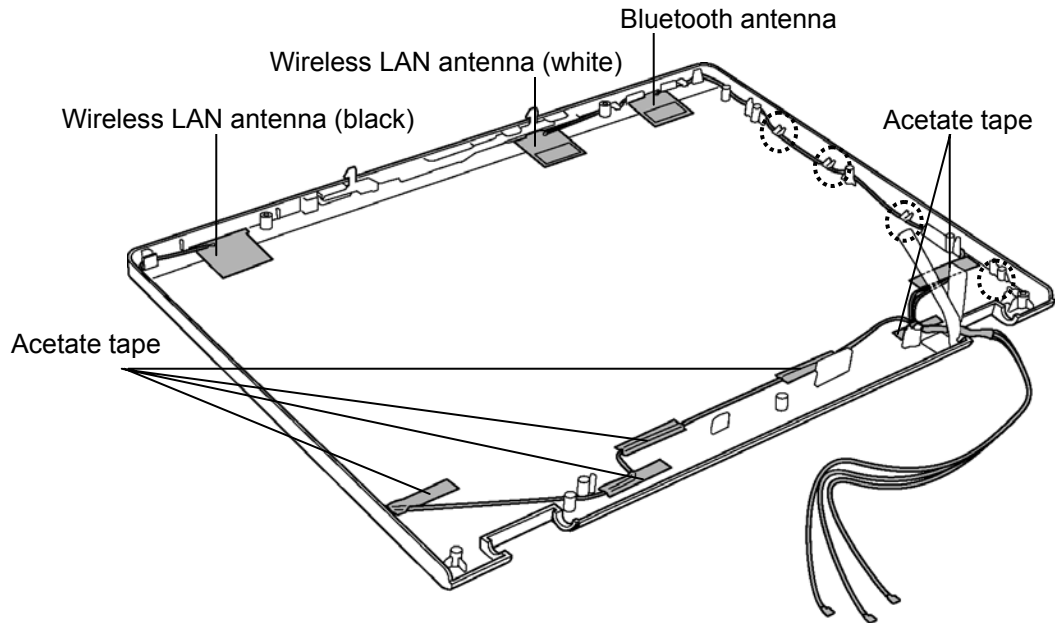
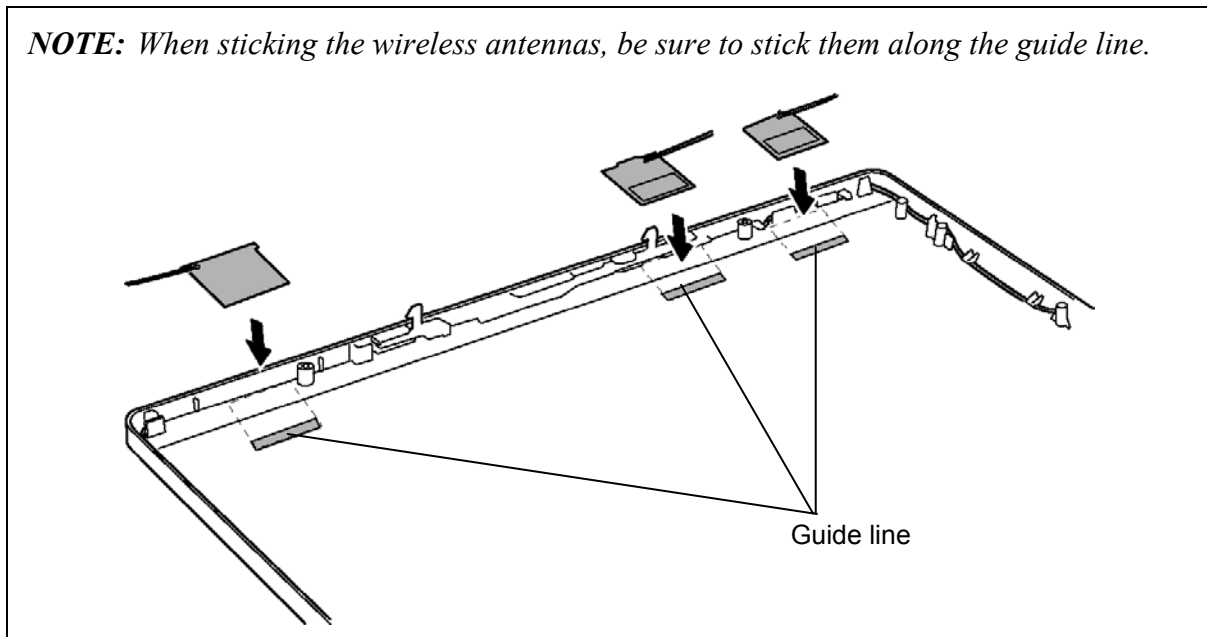


Figure 4-58 Removing the wireless antennas

Installing the wireless antennas

The following describes the procedure for installing the wireless antennas (See Figure 4-57 and 4-58).

1. Stick the wireless LAN antennas and bluetooth antenna on the display cover.



2. Arrange the **wireless LAN antenna cables** and **bluetooth antenna cable** along the guide of display cover, and secure them with **acetate tapes**.
3. Install the **hinge** (display cover side) to the display cover and secure them with the following **screws**.

- M2.5×6.0 PSP TIGHT screw x6

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USB board

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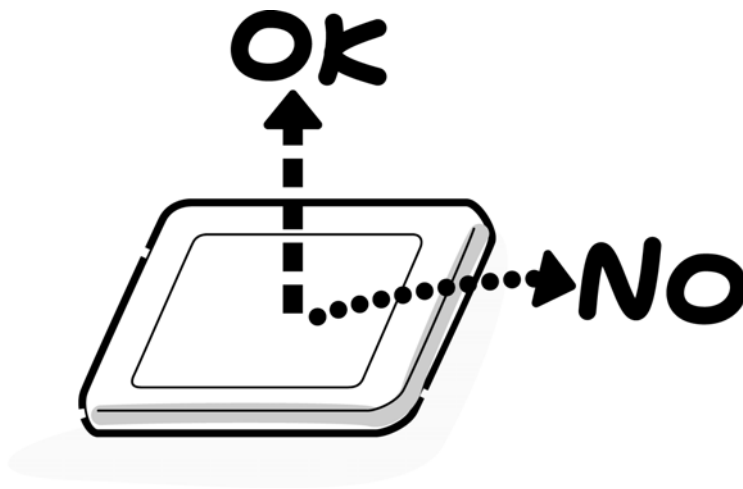
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Appendix A Handling the LCD Module

Precautions for handling the LCD module

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

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



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

Also, the panel's polarized surface is easily scarred, so be careful when handling it.



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

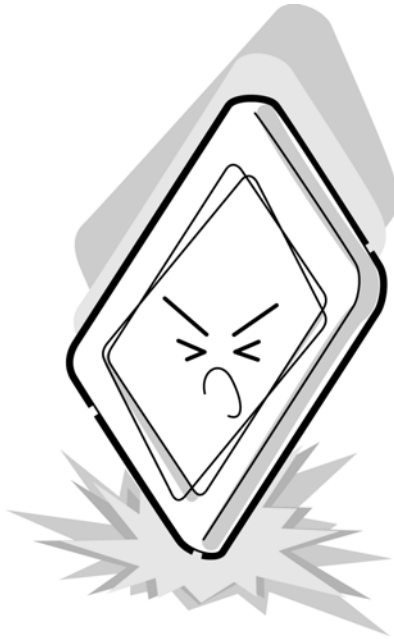
If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.



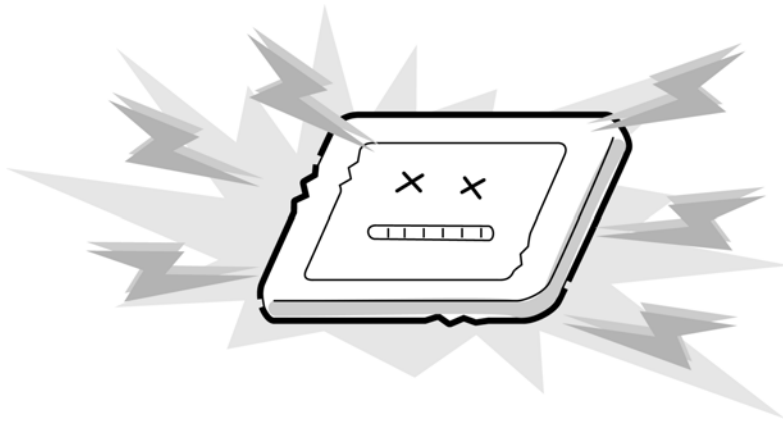
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.



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



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



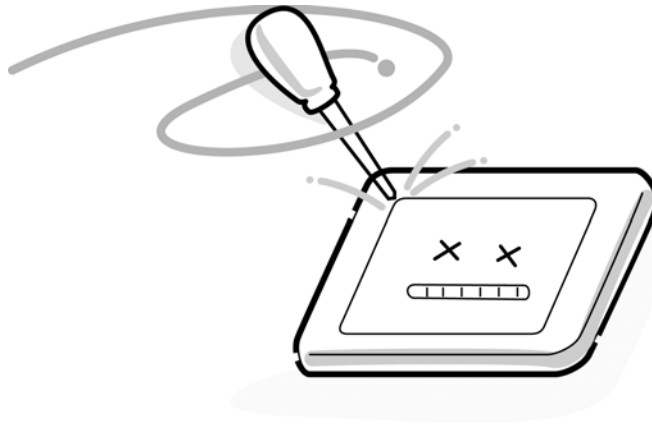
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.



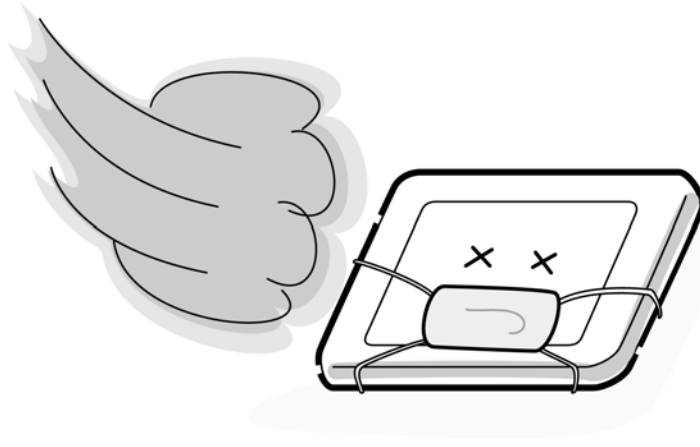
8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



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



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



Appendix B Board Layout

B.1 System Board Front View

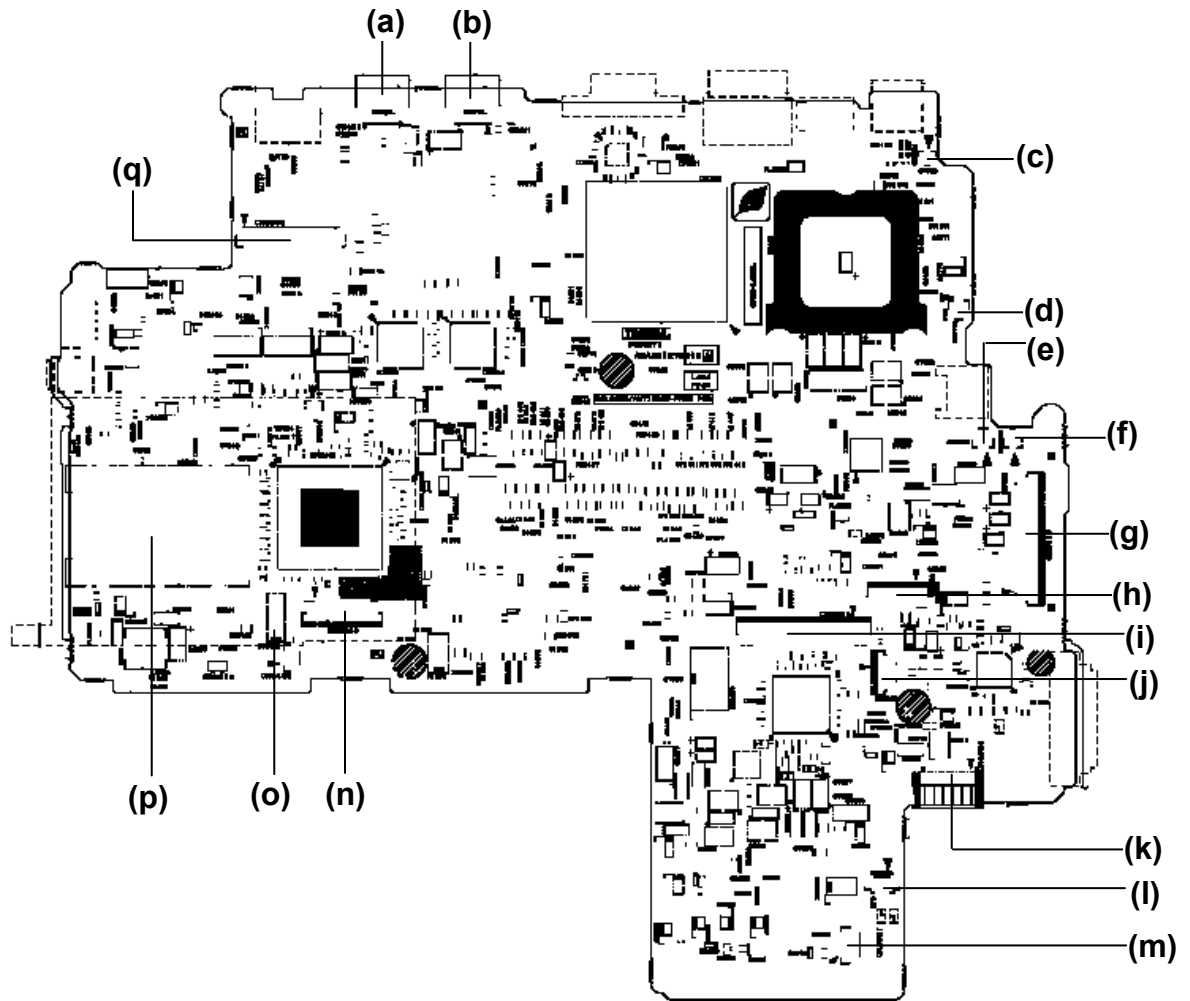


Figure B-1 System board layout (front)

Table B-1 System board ICs and connectors (front)

Mark	Number	Name
(a)	CN4610	USB Port 2
(b)	CN4611	USB Port 1
(c)	CN3021	MDC cable connector
(d)	CN8770	CPU Fan connector
(e)	CN6002	Speaker (L) connector
(f)	CN6003	Speaker (R) connector
(g)	CN9500	SD board I/F connector
(h)	CN9650	Switch membrane I/F connector
(i)	CN3200	Keyboard I/F connector
(j)	CN3201	Touch pad I/F connector
(k)	CN8020	BT board I/F connector (Power)
(l)	CN9990	RTC battery connector
(m)	CN8021	BT board I/F connector (Signal)
(n)	CN9660	LE board I/F connector
(o)	CN3400	Debug port
(p)	IS2101	Bridge Media slot
(q)	CN5600	LCD I/F connector

B.2 System Board Back View

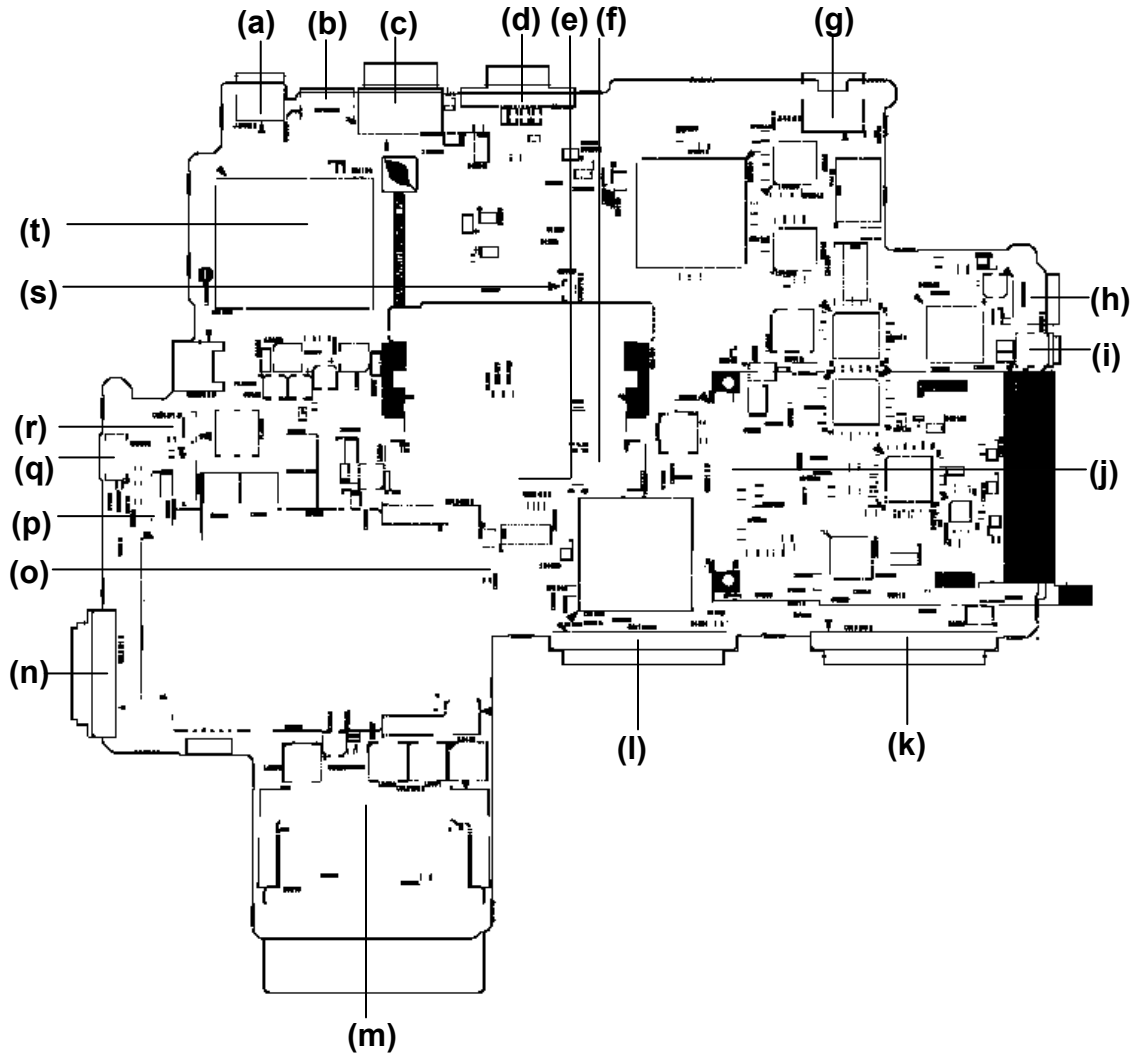


Figure B-2 System board layout (Back)

Table B-2 System board ICs and connectors (back)

Mark	Number	Name
(a)	J3021	Modem connector
(b)	CN5501	S-VIDEO OUT connector
(c)	CN5502	D-VIDEO connector
(d)	CN5080	CRT I/F connector
(e)	CN1400	Memory 1 connector
(f)	CN1401	Memory 2 connector
(g)	J4100	LAN I/F connector
(h)	CN4612	USB Port 3
(i)	CN4200	IEEE1394 connector
(j)	CN2100	PC Card connector
(k)	CN1880	1st HDD connector
(l)	CN1800	2nd HDD connector
(m)	CN2200	Wireless LAN Card connector
(n)	CN1810	ODD I/F connector
(o)	CN2220	TV tuner I/F connector
(p)	CN5661	TV tuner harness connector
(q)	CN5660	TJ board I/F connector
(r)	CN4613	US board I/F connector
(s)	CN8780	VGA Fan connector
(t)	IS1050	CPU

B.3 BT board

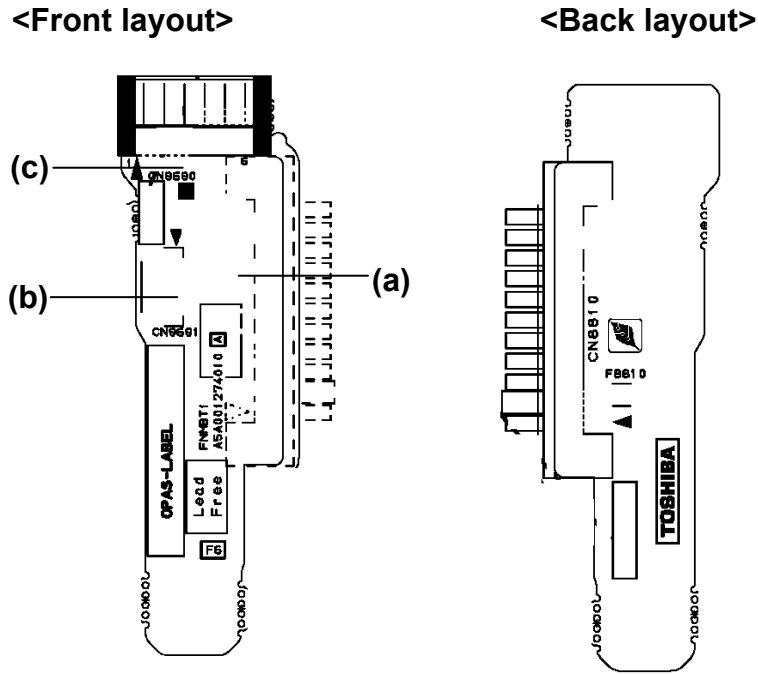


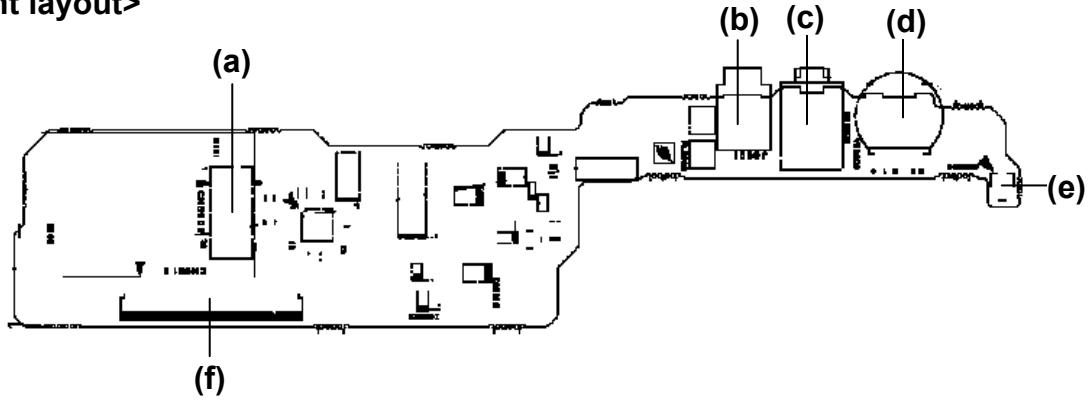
Figure B-3 BT board layout

Table B-3 BT board connectors

Mark	Number	Name
(a)	CN8810	Battery I/F connector
(b)	CN9691	System board I/F connector (Signal)
(c)	CN9690	System board I/F connector (Power)

B.4 SD board

<Front layout>



<Back layout>

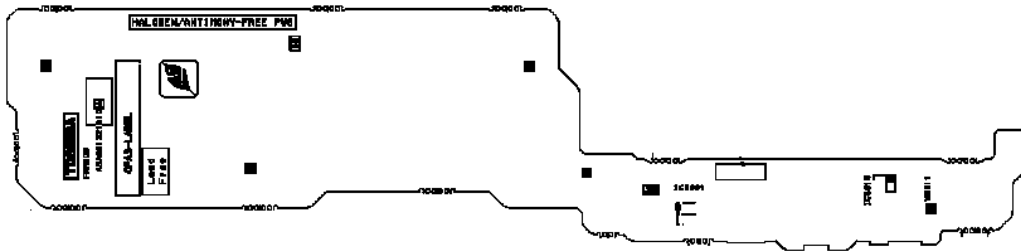


Figure B-4 SD board layout

Table B-4 SD board connectors

Mark	Number	Name
(a)	CN3000	MDC I/F connector
(b)	J6001	External Microphone connector
(c)	DS6000	Headphone/SPDIF connector
(d)	VR6000	Volume
(e)	CN6000	Internal Microphone
(f)	CN9510	System board I/F connector

B.5 US board

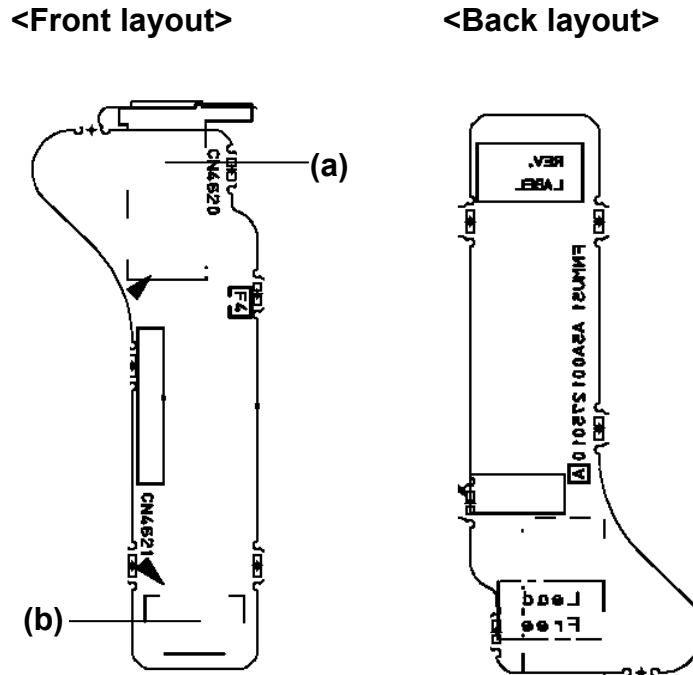


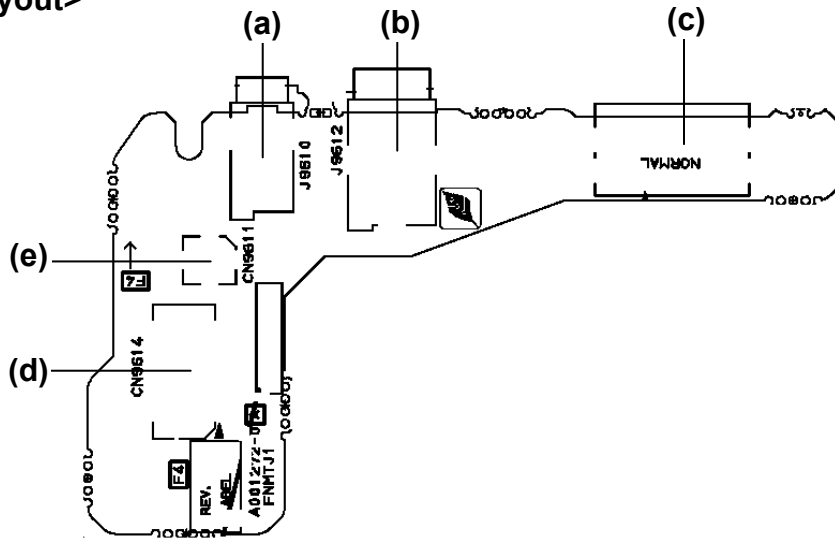
Figure B-5 US board layout

Table B-5 US board connectors

Mark	Number	Name
(a)	CN4620	USB Port 0
(b)	CN4621	System board I/F connector

B.6 TJ board

<Front layout>



<Back layout>

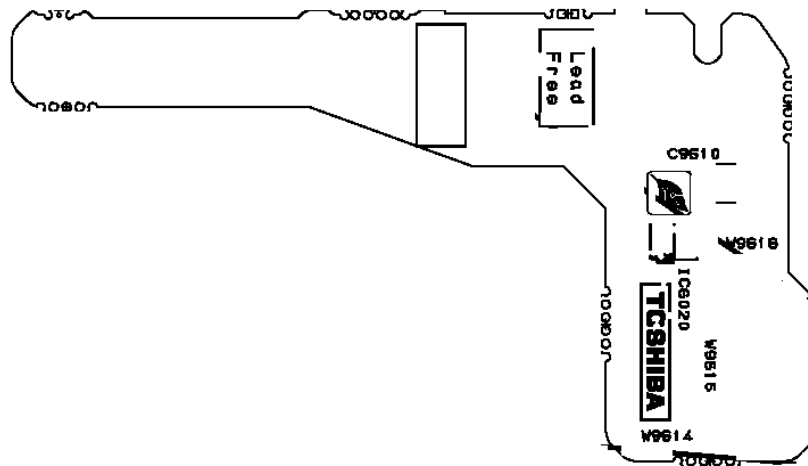


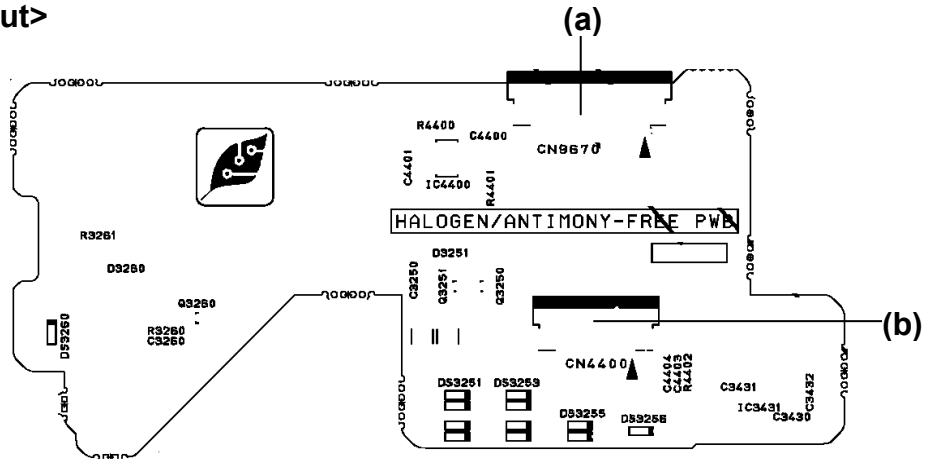
Figure B-6 TJ board layout

Table B-6 TJ board connectors

Mark	Number	Name
(a)	J9610	TV antenna connector
(b)	J9612	Monitor-IN connector
(c)	CN9613	S-VIDEO IN connector
(d)	CN9614	System board I/F connector
(e)	CN9611	TV tuner coaxial cable connector

B.7 LE board

<Front layout>



<Back layout>

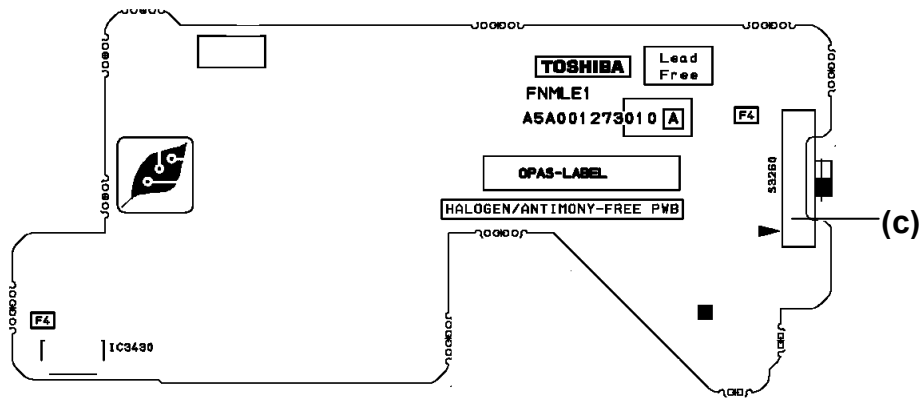


Figure B-7 LE board layout

Table B-7 LE board connectors

Mark	Number	Name
(a)	CN9670	System board I/F connector
(b)	CN4400	Bluetooth I/F connector
(c)	S3260	Wireless communication switch

Appendix C Pin Assignment

System Board (FNMSY*)

C.1 CN1400 Memory Connector 0 (200-PIN)

Table C-1 Memory connector 0 (200-PIN) (1/3)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	MR1R25-B1V	-	2	MRVREF-B1V	-
3	GND	-	4	GND	-
5	SDQ04-B2P	I/O	6	SDQ01-B2P	I/O
7	SDQ00-B2P	I/O	8	SDQ03-B2P	I/O
9	2R5-B2V	-	10	2R5-B2V	-
11	SDQS0-B2P	I/O	12	GND	-
13	SDQ06-B2P	I/O	14	SDQ02-B2P	I/O
15	GND	-	16	GND	-
17	SDQ05-B2P	I/O	18	SDQ07-B2P	I/O
19	SDQ13-B2P	I/O	20	SDQ14-B2P	I/O
21	2R5-B2V	-	22	2R5-B2V	-
23	SDQ08-B2P	I/O	24	SDQ15-B2P	I/O
25	SDQS1-B2P	I/O	26	GND	-
27	GND	-	28	GND	-
29	SDQ09-B2P	I/O	30	SDQ11-B2P	I/O
31	SDQ12-B2P	I/O	32	SDQ10-B2P	I/O
33	2R5-B2V	-	34	2R5-B2V	-
35	SCK0-B2P	I	36	2R5-B2V	-
37	SCK0-B2N	I	38	GND	-
39	GND	-	40	GND	-
41	SDQ22-B2P	I/O	42	SDQ16-B2P	I/O
43	SDQ18-B2P	I/O	44	SDQ20-B2P	I/O
45	2R5-B2V	-	46	2R5-B2V	-
47	SDQS2-B2P	I/O	48	GND	-
49	SDQ23-B2P	I/O	50	SDQ17-B2P	I/O
51	GND	-	52	GND	-
53	SDQ19-B2P	I/O	54	SDQ21-B2P	I/O
55	SDQ27-B2P	I/O	56	SDQ24-B2P	I/O
57	2R5-B2V	-	58	2R5-B2V	-

Table C-1 Memory connector 0 (200-PIN) (2/3)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
59	SDQ26-B2P	I/O	60	SDQ25-B2P	I/O
61	SDQS3-B2P	I/O	62	GND	-
63	GND	-	64	GND	-
65	SDQ30-B2P	I/O	66	SDQ29-B2P	I/O
67	SDQ31-B2P	I/O	68	SDQ28-B2P	I/O
69	2R5-B2V	-	70	2R5-B2V	-
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	-
83	SCB6A-B2P	I/O	84	SCB7A-B2P	I/O
85	N.C	-	86	N.C	-
87	GND	-	88	GND	-
89	2R5-B2V	-	90	GND	-
91	GND	-	92	2R5-B2V	-
93	2R5-B2V	-	94	2R5-B2V	-
95	SCKE1-B2P	I	96	SCKEO-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	-	114	2R5-B2V	-
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	SDQ38-B2P	I/O	128	SDQ36-B2P	I/O
129	SDQ34-B2P	I/O	130	SDQ37-B2P	I/O

Table C-1 Memory connector 0 (200-PIN) (3/3)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
131	2R5-B2V	-	132	2R5-B2V	-
133	SDQS4-B2P	I/O	134	GND	-
135	SDQ39-B2P	I/O	136	SDQ33-B2P	I/O
137	GND	-	138	GND	-
139	SDQ35-B2P	I/O	140	SDQ32-B2P	I/O
141	SDQ45-B2P	I/O	142	SDQ46-B2P	I/O
143	2R5-B2V	-	144	2R5-B2V	-
145	SDQ44-B2P	I/O	146	SDQ42-B2P	I/O
147	SDQS5-B2P	I/O	148	GND	-
149	GND	-	150	GND	-
151	SDQ41-B2P	I/O	152	SDQ43-B2P	I/O
153	SDQ40-B2P	I/O	154	SDQ47-B2P	I/O
155	2R5-B2V	-	156	2R5-B2V	-
157	2R5-B2V	-	158	SCK1-B2N	I
159	GND	-	160	SCK1-B2P	I
161	GND	-	162	GND	-
163	SDQ48-B2P	I/O	164	SDQ51-B2P	I/O
165	SDQ53-B2P	I/O	166	SDQ52-B2P	I/O
167	2R5-B2V	-	168	2R5-B2V	-
169	SDQS6-B2P	I/O	170	GND	-
171	SDQ49-B2P	I/O	172	SDQ55-B2P	I/O
173	GND	-	174	GND	-
175	SDQ54-B2P	I/O	176	SDQ50-B2P	I/O
177	SDQ60-B2P	I/O	178	SDQ62-B2P	I/O
179	2R5-B2V	-	180	2R5-B2V	-
181	SDQ56-B2P	I/O	182	SDQ63-B2P	I/O
183	SDQS7-B2P	I/O	184	GND	-
185	GND	-	186	GND	-
187	SDQ57-B2P	I/O	188	SDQ59-B2P	I/O
189	SDQ61-B2P	I/O	190	SDQ58-B2P	I/O
191	2R5-B2V	-	192	2R5-B2V	-
193	SMBDAT-P3P	I/O	194	GND	-
195	SMBCLK-P3P	I/O	196	GND	-
197	P3V	-	198	GND	-
199	N.C	-	200	N.C	-

C.2 CN1401 Memory connector 1 (200-PIN)

Table C-2 Memory connector 1 (200-PIN) (1/3)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	MRVREF-B1V	-	2	MRVREF-B1V	-
3	GND	-	4	GND	-
5	SDQ04-B2P	I/O	6	SDQ01-B2P	I/O
7	SDQ00-B2P	I/O	8	SDQ03-B2P	I/O
9	2R5-B2V	-	10	2R5-B2V	-
11	SDQS0-B2P	I/O	12	GND	-
13	SDQ06-B2P	I/O	14	SDQ02-B2P	I/O
15	GND	-	16	GND	-
17	SDQ05-B2P	I/O	18	SDQ07-B2P	I/O
19	SDQ13-B2P	I/O	20	SDQ14-B2P	I/O
21	2R5-B2V	-	22	2R5-B2V	-
23	SDQ08-B2P	I/O	24	SDQ15-B2P	I/O
25	SDQS1-B2P	I/O	26	GND	-
27	GND	-	28	GND	-
29	SDQ09-B2P	I/O	30	SDQ11-B2P	I/O
31	SDQ12-B2P	I/O	32	SDQ10-B2P	I/O
33	2R5-B2V	-	34	2R5-B2V	-
35	SCK3-B2P	I	36	2R5-B2V	-
37	SCK3-B2N	I	38	GND	-
39	GND	-	40	GND	-
41	SDQ22-B2P	I/O	42	SDQ16-B2P	I/O
43	SDQ18-B2P	I/O	44	SDQ20-B2P	I/O
45	2R5-B2V	-	46	2R5-B2V	-
47	SDQS2-B2P	I/O	48	GND	-
49	SDQ23-B2P	I/O	50	SDQ17-B2P	I/O
51	GND	-	52	GND	-
53	SDQ19-B2P	I/O	54	SDQ21-B2P	I/O
55	SDQ27-B2P	I/O	56	SDQ24-B2P	I/O
57	2R5-B2V	-	58	2R5-B2V	-
59	SDQ26-B2P	I/O	60	SDQ25-B2P	I/O
61	SDQS3-B2P	I/O	62	GND	-

Table C-2 Memory connector 1 (200-PIN) (2/3)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
63	GND	-	64	GND	-
65	SDQ30-B2P	I/O	66	SDQ29-B2P	I/O
67	SDQ31-B2P	I/O	68	SDQ28-B2P	I/O
69	2R5-B2V	-	70	2R5-B2V	-
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	-	82	2R5-B2V	-
83	SCB6B-B2P	I/O	84	SCB7B-B2P	I/O
85	N.C	-	86	N.C	-
87	GND	-	88	GND	-
89	2R5-B2V	-	90	GND	-
91	GND	-	92	2R5-B2V	-
93	2R5-B2V	-	94	2R5-B2V	-
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	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	-	114	2R5-B2V	-
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	SDQ38-B2P	I/O	128	SDQ36-B2P	I/O
129	SDQ34-B2P	I/O	130	SDQ37-B2P	I/O
131	2R5-B2V	-	132	2R5-B2V	-
133	SDQS4-B2P	I/O	134	GND	-

Table C-2 Memory connector 1 (200-PIN) (3/3)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
135	SDQ39-B2P	I/O	136	SDQ33-B2P	I/O
137	GND	-	138	GND	-
139	SDQ35-B2P	I/O	140	SDQ32-B2P	I/O
141	SDQ45-B2P	I/O	142	SDQ46-B2P	I/O
143	2R5-B2V	-	144	2R5-B2V	-
145	SDQ44-B2P	I/O	146	SDQ42-B2P	I/O
147	SDQS5-B2P	I/O	148	GND	-
149	GND	-	150	GND	-
151	SDQ41-B2P	I/O	152	SDQ43-B2P	I/O
153	SDQ40-B2P	I/O	154	SDQ47-B2P	I/O
155	2R5-B2V	-	156	2R5-B2V	-
157	2R5-B2V	-	158	SCK4-B2N	I
159	GND	-	160	SCK4-B2P	I
161	GND	-	162	GND	-
163	SDQ48-B2P	I/O	164	SDQ51-B2P	I/O
165	SDQ53-B2P	I/O	166	SDQ52-B2P	I/O
167	2R5-B2V	-	168	2R5-B2V	-
169	SDQS6-B2P	I/O	170	GND	-
171	SDQ49-B2P	I/O	172	SDQ55-B2P	I/O
173	GND	-	174	GND	-
175	SDQ54-B2P	I/O	176	SDQ50-B2P	I/O
177	SDQ60-B2P	I/O	178	SDQ62-B2P	I/O
179	2R5-B2V	-	180	2R5-B2V	-
181	SDQ56-B2P	I/O	182	SDQ63-B2P	I/O
183	SDQS7-B2P	I/O	184	GND	-
185	GND	-	186	GND	-
187	SDQ57-B2P	I/O	188	SDQ59-B2P	I/O
189	SDQ61-B2P	I/O	190	SDQ58-B2P	I/O
191	2R5-B2V	-	192	2R5-B2V	-
193	SMBDAT-P3P	I/O	194	P3V	-
195	SMBCLK-P3P	I/O	196	GND	-
197	P3V	-	198	GND	-
199	N.C	-	200	N.C	-

C.3 CN1880 1st HDD I/F connector (44-PIN)*Table C-3 1st HDD I/F connector (44-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	IDRSTM-P5N	I/O	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	I	22	GND	-
23	PDIOW-P3N	I	24	GND	-
25	PDIOR-P3N	I	26	GND	-
27	PIORDY-P3P	I	28	GND	-
29	PDDACK-P3N	I	30	GND	-
31	IRQ14-P3P	I	32	N.C	-
33	PDA1-P3P	I	34	PPDIAG-P3N	O
35	PDA0-P3P	I	36	PDA2-P3P	O
37	PDCS1-P3N	I	38	PDCS3-P3N	O
39	PDASP-P5N	I	40	GND	-
41	P5V	-	42	P5V (Reserved)	-
43	GND	-	44	N.C	-

C.4 CN1800 2nd HDD I/F connector (44-PIN)*Table C-4 2nd HDD I/F connector (44-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	IDRSTA-P5N	I/O	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	I	22	GND	-
23	PDIOW-P3N	I	24	GND	-
25	PDIOR-P3N	I	26	GND	-
27	PIORDY-P3P	I	28	N.C	-
29	PDDACK-P3N	I	30	GND	-
31	IRQ14-P3P	I	32	N.C	-
33	PDA1-P3P	I	34	PPDIAG-P3N	O
35	PDA0-P3P	I	36	PDA2-P3P	O
37	PDCS1-P3N	I	38	PDCS3-P3N	O
39	PDASP-P5N	I	40	GND	-
41	P5V	-	42	P5V (Reserve)	-
43	GND	-	44	N.C	-

C.5 CN1810 ODD I/F connector (50-PIN)*Table C-5 ODD I/F connector (50-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	CDAUDL-PXP	O	2	CDAUDR-PXP	O
3	CD-GND	I	4	N.C	-
5	IDRSTB-P5N	O	6	SDD08-P3P	I/O
7	SDD07-P3P	I/O	8	SDD09-P3P	I/O
9	SDD06-P3P	I/O	10	SDD10-P3P	I/O
11	SDD05-P3P	I/O	12	SDD11-P3P	I/O
13	SDD04-P3P	I/O	14	SDD12-P3P	I/O
15	SDD03-P3P	I/O	16	SDD13-P3P	I/O
17	SDD02-P3P	I/O	18	SDD14-P3P	I/O
19	SDD01-P3P	I/O	20	SDD15-P3P	I/O
21	SDD00-P3P	I/O	22	SDDREQ-P3P	I
23	GND	-	24	SDIOR-P3N	O
25	SDIOW-P3N	O	26	GND	-
27	SIORDY-P3P	I	28	SDDACK-P3N	O
29	IRQ15-P3P	I	30	N.C	-
31	SDA1-P3P	O	32	N.C	O
33	SDA0-P3P	O	34	SDA2-P3P	O
35	SDCS1-P3N	O	36	SDCS3-P3N	O
37	N.C	-	38	P5V	-
39	P5V	-	40	P5V	-
41	P5V	-	42	P5V	-
43	GND	-	44	GND	-
45	GND	-	46	N.C	-
47	N.C	-	48	GND	-
49	N.C	-	50	N.C	-

C.6 CN2100 PC card I/F connector (150-PIN)

Table C-6 PC card I/F connector (150-PIN) (1/3)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	-	2	GND	-
3	N.C (CPUD-)	-	4	N.C (USB+)	-
5	GND	-	6	N.C (CPUSB#)	-
7	N.C (Reserve)	-	8	N.C (Reserve)	-
9	GND	-	10	N.C (Reserve)	-
11	N.C (SMBCLK)	-	12	N.C (SMBDAT)	-
13	N.C (CRD1R5-P1V)	-	14	N.C (CRD1R5-P1V)	-
15	N.C (CRD1R5-P1V)	-	16	N.C (PEWAKE#)	-
17	GND	-	18	N.C (CRD-E3V)	-
19	N.C (CRD-E3V)	-	20	N.C (CRDRST#)	-
21	N.C (CRD-P3V)	-	22	N.C (CRD-P3V)	-
23	N.C (CRD-P3V)	-	24	N.C (CRD-P3V)	-
25	GND	-	26	N.C (CRDCRQ#)	-
27	N.C (CPPE#)	-	28	GND	-
29	GND	-	30	GND	-
31	N.C (XPECRD-)	-	32	N.C (XPECRD+)	-
33	GND	-	34	N.C (PERCRD-)	-
35	N.C (PERCRD+)	-	36	GND	-
37	GND	-	38	GND	-
39	GND	-	40	GND	-
41	N.C (PETCRD-)	-	42	N.C (PETCRD+)	-
43	GND	-	44	N.C	-
45	N.C	-	46	N.C	-
47	N.C	-	48	N.C	-
49	N.C	-	50	N.C	-
51	GND	-	52	N.C	-
53	N.C	-	54	N.C	-
55	N.C	-	56	N.C	-
57	N.C	-	58	N.C	-
59	GND	-	60	N.C	-

Table C-6 PC card I/F connector (150-PIN) (2/3)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
61	N.C	-	62	N.C	-
63	N.C	-	64	N.C	-
65	N.C	-	66	N.C	-
67	GND	-	68	N.C	-
69	N.C	-	70	N.C	-
71	N.C	-	72	N.C	-
73	N.C	-	74	GND	-
75	N.C	-			
76	GND	-	77	GND	-
78	ACCD1-E3N	I/O	79	ACAD00-EYP	I/O
80	ACAD02-EYP	I/O	81	ACAD01-EYP	I/O
82	ACAD04-EYP	I/O	83	ACAD03-EYP	I/O
84	GND	-	85	ACAD06-EYP	I/O
86	ACAD05-EYP	I/O	87	ACD14-EYP	I/O
88	ACAD07-EYP	I/O	89	ACAD08-EYP	I/O
90	ACCBE0-EYN	I/O	91	ACAD10-EYP	I/O
92	GND	-	93	ACAD09-EYP	I/O
94	ACVS1-E3P	I/O	95	ACAD11-EYP	I/O
96	ACAD13-EYP	I/O	97	ACAD12-EYP	I/O
98	ACAD15-EYP	I/O	99	ACAD14-EYP	I/O
100	GND	-	101	ACAD16-EYP	I/O
102	ACCBE1-EYN	I/O	103	ACA18-EYP	I/O
104	ACPAR-EYP	I/O	105	ACLOCK-EYN	I/O
106	ACPERR-EYN	I/O	107	ACSTOP-EYN	I/O
108	GND	-	109	ACGNT-EYN	-
110	ACDEVS-EYN	I/O	111	ACINT-EYN	I/O
112	MCVCCA-EYV	I/O	113	GND	-
114	MCVPPA-EYV	I/O	115	ACCLK-EYP	I/O
116	ACTRDY-EYN	I/O	117	ACIRDY-EYN	I/O
118	GND	-	119	ACFRAM-EYN	I/O
120	ACCBE2-EYN	I/O	121	ACAD17-EYP	I/O
122	ACAD18-EYP	I/O	123	ACAD19-EYP	I/O
124	ACAD20-EYP	I/O	125	ACVS2-E3P	I/O
126	GND	-	127	ACAD21-EYP	I/O

Table C-6 PC card I/F connector (150-PIN) (3/3)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
128	ACRST-EYN	I/O	129	ACAD22-EYP	I/O
130	ACSERR-EYN	I/O	131	ACAD23-EYP	I/O
132	ACREQ-EYN	I/O	133	ACAD24-EYP	I/O
134	GND	-	135	ACCBE3-EYN	I/O
136	ACAD25-EYP	I/O	137	ACAUDI-EYP	I/O
138	ACAD26-EYP	I	139	ACSTSC-EYP	I/O
140	ACAD27-EYP	I/O	141	ACAD28-EYP	I/O
142	GND	-	143	ACAD29-EYP	I/O
144	ACAD30-EYP	I/O	145	ACD02-EYP	I/O
146	ACAD31-EYP	I/O	147	ACCLKR-EYN	I/O
148	ACCD2-E3N	I/O	149	GND	-
150	GND	-			

C.7 CN3200 Keyboard I/F connector (34-PIN)*Table C-7 Keyboard I/F connector (34-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	NUMLED-P5N	I/O	2	ARWLED-P5N	I/O
3	CAPLED-P5N	I/O	4	P5V	-
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	-	30	N.C	-
31	N.C	-	32	N.C	-
33	N.C	-	34	P5V	-

C.8 CN3201 PAD I/F connector (4-PIN)*Table C-8 Pad I/F connector (4-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	-	2	IPDCLK-P5P	I/O
3	IPDDAT-P5P	I/O	4	P5V	-

C.9 CN9990 RTC battery connector (3-PIN)*Table C-9 RTC battery connector (3-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	R3V	O	2	N.C	-
3	GND	-			

C.10 CN8770 CPU FAN connector (3-PIN)*Table C-10 CPU FAN connector (3-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	FAN VCC	-	2	GND	-
3	FANG-P3P	I			

C.11 CN8780 VGA FAN connector (3-PIN)*Table C-11 VGA FAN connector (3-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	FAN VCC	-	2	GND	-
3	FANG-P3P	I			

C.12 CN4610 USB I/F connector Port2 (4-PIN)*Table C-12 USB I/F connector Port2 (3-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	USB1PS-E5V	I	2	USBP2-S3N	I/O
3	USBP2-S3P	I/O	4	GND	-

C.13 CN4611 USB I/F connector Port 4 (4-PIN)*Table C-13 USB I/F connector Port4 (4-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	USB1PS-E5V	I	2	USBP4-S3N	I/O
3	USBP4-S3P	I/O	4	GND	-

C.14 CN4612 USB I/F connector Port 0 (4-PIN)*Table C-14 USB I/F connector Port0 (4-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	USB0PS-E5V	I	2	USBP0-S3N	I/O
3	USBP0-S3P	I/O	4	GND	-

C.15 W8800 DC IN connector (4-PIN)*Table C-15 DC IN connector (4-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	PVL POWER	I	2	PVL POWER	I
3	GND	-	4	GND	-

C.16 IS2101 MEDIA BRIDGE I/F connector (42-PIN)

Table C-16 MEDIA BRIDGE I/F connector (42-PIN)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	MSDAT2-E3P	I/O	2	MSDAT3-E3P	I/O
3	MSBS-E3P	I/O	4	GND	-
5	GND	-	6	FM-E3V	-
7	MSCLK-E3P	I/O	8	MSDAT3-E3P	I/O
9	MSCD-E3N	O	10	MSDAT2-E3P	I/O
11	MSSDIO-E3P	I/O	12	MSDAT1-E3P	I/O
13	MSBS-E3P	I/O	14	GND	-
15	FM-E3V	-	16	MSCLK-E3P	I/O
17	GND	-	18	MSSDIO-E3P	I/O
19	MSDAT1-E3P	I/O	20	FM-E3V	-
21	SDAT3-E3P	I/O	22	SDAT2-E3P	I/O
23	SDAT1-E3P	I/O	24	SDAT0-E3P	I/O
25	MSDAT3-E3P	I/O	26	MSDAT2-E3P	I/O
27	MSDAT1-E3P	I/O	28	MSSDIO-E3P	I/O
29	GND	-	30	MSCLK-E3P	I/O
31	XDWE-E3N	I	32	SDCMD-E3P	I/O
33	SMCLE-E3P	I/O	34	XDCE-E3N	I
35	XDRE-E3N	I	36	SMRDY-E3P	I
37	SMCD-E3N	I	38	GND	-
39	GND	-	40	SDCD-E3N	O
41	GND	-	42	SDWP-E3P	O

C.17 CN2200 Wireless LAN card I/F connector (124-PIN)

Table C-17 Wireless LAN card 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-S5N	I	14	N.C.	-
15	GND	-	16	N.C.	-
17	PIRQD-P3N	I	18	P5V	-
19	P3V	-	20	PIRQA-P3N	O
21	N.C.	-	22	N.C.	-
23	GND	-	24	E3V	-
25	X33MPC-P3P	I	26	PCIRS1-S3N	O
27	GND	-	28	P3V	-
29	PREQ2-P3N	I	30	PGNT2-P3N	O
31	P3V	-	32	GND	-
33	AD31-P3P	I/O	34	PME-S3N	O
35	AD29-P3P	I/O	36	WCHCLK-P3P	O
37	GND	-	38	AD30-P3P	I/O
39	AD27-P3P	I/O	40	P3V	-
41	AD25-P3P	I/O	42	AD28-P3P	I/O
43	WCHDAT-P3P	O	44	AD26-P3P	I/O
45	CBE3-P3N	I/O	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	I/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	-

Table C-17 Wireless LAN card connector (124-PIN) (2/2)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
63	P3V	-	64	FRAME-P3N	I/O
65	CLKRUN-P3N	I/O	66	TRDY-P3N	I/O
67	SERR-P3N	I	68	STOP-P3N	I/O
69	GND	-	70	P3V	-
71	PERR-P3N	I/O	72	DEVSEL-P3N	I/O
73	CBE1-P3N	I/O	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	I/O
87	AD07-P3P	I/O	88	P3V	-
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	-	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	-

C.18 CN2220 WW Tuner I/F connector (124-PIN)

Table C-18 WW Tuner 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	GND	-	10	GND	-
11	N.C.	-	12	N.C.	-
13	N.C.	-	14	N.C.	-
15	GND	-	16	N.C.	-
17	N.C.	-	18	T-P5V	-
19	P3V	-	20	PIRQD-P3N	O
21	N.C.	-	22	N.C.	-
23	GND	-	24	N.C.	-
25	X33MPT-P3P	I	26	PCIRS1-S3N	O
27	GND	-	28	T-P3V	-
29	PREQ1-P3N	I	30	PGNT1-P3N	O
31	T-P3V	-	32	GND	-
33	AD31-P3P	I/O	34	N.C.	-
35	AD29-P3P	I/O	36	N.C.	-
37	GND	-	38	AD30-P3P	I/O
39	AD27-P3P	I/O	40	T-P3V	-
41	AD25-P3P	I/O	42	AD28-P3P	I/O
43	N.C.	-	44	AD26-P3P	I/O
45	CBE3-P3N	I/O	46	AD24-P3P	I/O
47	AD23-P3P	I/O	48	AD25-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	I/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	-

Table C-18 WW Tuner I/F connector (124-PIN) (2/2)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
63	T-P3V	-	64	FRAME-P3N	I/O
65	CLKRUN-P3N	-	66	TRDY-P3N	I/O
67	SERR-P3N	I	68	STOP-P3N	I/O
69	GND	-	70	T-P3V	-
71	PERR-P3N	I/O	72	DEVSEL-P3N	I/O
73	CBE1-P3N	I/O	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	I/O
87	AD07-P3P	I/O	88	T-P3V	-
89	T-P3V	-	90	AD06-P3P	I/O
91	AD05-P3P	I/O	92	AD04-P3P	I/O
93	T-P5V	-	94	AD02-P3P	I/O
95	AD03-P3P	I/O	96	AD00-P3P	I/O
97	T-P5V	-	98	T-P5V	-
99	AD01-P3P	I/O	100	N.C.	-
101	GND	-	102	GND	-
103	N.C.	-	104	N.C.	-
105	N.C.	-	106	N.C.	-
107	N.C.	-	108	N.C.	-
109	N.C.	-	110	N.C.	-
111	N.C.	-	112	GND	-
113	GND	-	114	GND	-
115	N.C.	-	116	GND	-
117	GND	-	118	GND	-
119	GND	-	120	GND	-
121	N.C.	-	122	N.C.	-
123	T-P5V	-	124	N.C.	-

C.19 J4100 Network I/F connector (12-PIN)*Table C-19 Network I/F connector (12-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	TDP-P3P	I	2	TDN-P3N	I
3	RDP-P3P	I	4	GND	-
5	GND	-	6	RDN-P3N	I/O
7	GND	-	8	GND	-
9	P3V	-	10	LNK-P3N	I/O
11	P3V	-	12	ACT-P3N	I/O

C.20 CN4200 1394 I/F connector (4-PIN)*Table C-20 1394 I/F 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.21 CN5600 LCD I/F connector (41-PIN)*Table C-21 LCD I/F connector (41-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	LTXCK0-P3N	I/O	2	LTXCK0-P3P	I/O
3	GND	-	4	LTXDT0-P3N	I/O
5	LTXDT0-P3P	I/O	6	LTXDT1-P3N	I/O
7	LTXDT1-P3P	I/O	8	LTXDT2-P3N	I/O
9	LTXDT2-P3P	I/O	10	GND	-
11	LTXCK1-P3N	I/O	12	LTXCK0-P3P	I/O
13	GND	-	14	LTXDT4-P3N	I/O
15	LTXDT4-P3P	I/O	16	LTXDT5-P3N	I/O
17	LTXDT5-P3P	I/O	18	LTXDT6-P3N	I/O
19	LTXDT6-P3P	I/O	20	GND	-
21	GND	-	22	NV3SCL-P3P	I/O
23	P3V	-	24	PNL-P3V	O
25	PNL-P3V	O	26	NV3SDA-P3P	I/O
27	GND	-	28	GND	-
29	GND	-	30	GND	-
31	GND	-	32	FL-GND	-
33	BRT0-P5P	I/O	34	BRT1-P5P	I/O
35	BRT2DA-S3P	I/O	36	FL-P5V	O
37	FL-P5V	O	38	FL-P5V	O
39	FL-P5V	O	40	FL-P5V	O
41	FL-P5V	O			

C.22 CN5080 CRT I/F connector (15-PIN)*Table C-22 CRT I/F connector (15-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	CRTRED-PXP	I	2	CRTGRN-PXP	I
3	CRTBLU-PXP	I	4	N.C	-
5	GND	-	6	GND	-
7	GND	-	8	GND	-
9	DDC-P5V	-	10	GND	-
11	N.C	-	12	NVDSDA-P5P	I/O
13	(AHSYNC-P3P)	I/O	14	(AVSYNC-P3P)	I/O
15	NVDSCL-P5P	I/O			

C.23 CN5501 S-video I/F connector (4-PIN)*Table C-23 S-Video I/F connector (4-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	-	2	GND	-
3	(TADACC-PXP)	O	4	(TVDACB-PXP)	O

C.24 CN5502 D-video I/F connector (14-PIN)*Table C-24 D-Video I/F connector (14-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	HDTVY-PXP	I	2	GND	-
3	HDTV PB-PXP	I	4	GND	-
5	HDTV PR-PXP	I	6	GND	-
7	LINOTL-PXP	I	8	(LINE1)	O
9	(LINE2)	O	10	LINOTR-PXP	I
11	(LINE3)	O	12	GND	-
13	LINOT-GND	O	14	(Plug)	O

C.25 CN5800 SVP Host I/F connector (2-PIN)*Table C-25 SVP Host I/F connector (2-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	SVSCL-P3P	I/O	2	SVSDA-P3P	I/O

C.26 CN9650 SWITCH I/F connector (20-PIN)*Table C-26 SWITCH I/F connector (20-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	N.C	-	2	PNLOFF-S3N	I
3	KBRT07-S3N	I	4	KBRT06-S3N	I
5	KBRT05-S3N	I	6	KBRT04-S3N	I
7	KBRT03-S3N	I	8	KBSC16-S3N	I
9	KBRT02-S3N	I	10	KBRT01-S3N	I
11	KBRT00-S3N	I	12	GND	-
13	GND	-	14	CDBTN-S3N	I
15	TVBTN-S3N	I	16	PWRSW-S3N	I
17	PBLEDG-S3P	I	18	PBLEDB-S3P	I
19	M5V	I	20	PBLEDO-S3P	I

C.27 CN6002 Speaker (Left) connector (3-PIN)*Table C-27 Speaker (Left) connector (3-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	SPOTL-PXN	O	2	N.C.	-
3	SPOTL-PXN	O			

C.28 CN6003 Speaker (Right) connector (2-PIN)*Table C-28 Speaker (Right) connector (2-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	SPOTR-PXN	O	2	SPOTR-PXP	I/O

C.29 CN3400 Debug port (4-PIN)*Table C-29 Debug port connector (4-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	P3V	-	2	DBG RX-E3P	O
3	(TXD1)	I	4	GND	-

C.30 CN9500 Sound board I/F connector (57-PIN)

Table C-30 Sound board I/F connector (57-PIN)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	CDAUDL-PXP	I	2	CD-GND	I
3	CDAUDR-PXP	I	4	LINOTR-PXP	I
5	LINOT-GND	I	6	LINOTL-PXP	I
7	GND	-	8	X97BBC1-P3P	I/O
9	GND	-	10	VOLBYP-P3N	I/O
11	SPKON-P3N	I/O	12	E3V	-
13	E3V	-	14	M97IN2-E3P	I/O
15	M97IN1-P3P	I/O	16	GND	-
17	M97RS1-S3N	I/O	18	M97RS1-S3N	I/O
19	GND	-	20	M97OT2-P3P	I/O
21	M97OT1-P3P	I/O	22	GND	-
23	M97SY2-P3P	I/O	24	M97SY1-P3P	I/O
25	GND	-	26	X14SND-P3P	I/O
27	GND	-	28	SNDMUT-S3N	I/O
29	P3V	-	30	P3V	-
31	AMPSD-S3N	I/O	32	SND-P5V	-
33	SND-P5V	-	34	SND-P5V	-
35	SND-P5V	-	36	SND-P5V	-
37	PCBEEP-E3P	I/O	38	ATBEEP-P3P	I/O
39	SND-GND	-	40	SND-GND	I
41	SND-GND	-	42	SND-GND	I
43	SND-GND	-	44	FMTRDR-PXP	I/O
45	VREF1-P2V		46	FMTRDL-PXP	I/O
47	LINR-PXP	I/O	48	LIN-GND	I/O
49	LINL-PXP	I/O	50	SPOTL-PXP	I/O
51	SPOTL-PXP	I/O	52	SPOTL-PXN	I/O
53	SPOTL-PXN	I/O	54	SPOTR-PXP	I/O
55	SPOTR-PXP	I/O	56	SPOTR-PXN	I/O
57	SPOTR-PXN	I/O			

C.31 CN5660 TJ board I/F connector (20-PIN)*Table C-31 TJ board I/F connector (20-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	LINR-PXP	I/O	2	FMTRDR-PXP	I/O
3	LIN-GND	I/O	4	VREF1-P2V	I/O
5	LINL-PXP	I/O	6	FMTRDL-PXP	I/O
7	GND	-	8	GND	-
9	COMPIN-PXP	I/O	10	LUMAIN-PXP	I/O
11	GND	-	12	GND	-
13	SVSCL-P3P	I/O	14	CROMIN-PXP	I/O
15	SVSDA-P3P	I/O	16	GND	-
17	FMTSTO-P3P	I/O	18	SUSCLK-S3P	I/O
19	SND-P5V	I	20	FMT-P3V	I

C.32 CN8020 BT board (Power) I/F connector (6-PIN)*Table C-32 BT board (Power) I/F connector (6-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	-	2	GND	-
3	GND	-	4	(Q8811)	I/O
5	(Q8811)	I/O	6	(Q8811)	I/O

C.33 CN8021 BT board (Signal) I/F connector (8-PIN)*Table C-33 BT board (Signal) I/F connector (8-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	BTMP1 (Therm+)	-	2	DCHG	I/O
3	M5V (VDD)	-	4	PSCL-S5P (MBCLK)	-
5	PSDA-S5P (MBDAT)	I/O	6	GND (VSS)	-
7	DBT10V-S5N (OV)	-	8	GND (1 st /2 nd)	I/O

C.34 CN4613 US board I/F connector (6-PIN)*Table C-34 US board I/F connector (6-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	USB0PS-E5V	I	2	USB0PS-E5V	I
3	USBP3-S3N	I/O	4	USBP3-S3P	I/O
5	GND	-	6	GND	-

C.35 CN9660 LE board I/F connector (30-PIN)*Table C-35 LE board I/F connector (30-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	-	2	DCINOR-S5N	I
3	DCINGR-S5N	I	4	GND	-
5	PWLEOR-S3P	I	6	PWLEGR-S3P	I
7	M5V	-	8	M5V	-
9	BAT1OR-S5N	I	10	BAT1GR-S5N	I
11	GND	-	12	PDASP-P5N	I
13	P5V	-	14	BTMDL-P3N	I
15	GND	-	16	BTLED-S5P	I
17	S3V	-	18	BTSWON-S3P	I
19	RCIRRX-S3P	I	20	GND	-
21	USBP5-S3P	I	22	USBP5-S3N	-
23	P5V	-	24	P5V	-
25	N.C	-	26	BTRST-S3N	I
27	GND	-	28	WCHCLK-P3P	I
29	WCHDAT-P3P	I	30	GND	-

Sound board (FNMSD*)**C.36 CN3000 MDC I/F connector (30-PIN)***Table C-36 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	-
17	E3V	-	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.37 J6001 External microphone I/F connector (6-PIN)*Table C-37 External microphone I/F connector (6-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	A-GND	-	2	(MICIN-PXP)	O
3	(BIAS)	O	4	N.C.	-
5	N.C.	-	6	(VREF1-P2V)	I

C.38 CN6000 Internal microphone connector (2-PIN)*Table C-38 Internal microphone I/F connector (6-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	(VREF1-P2V)	I/O	2	A-GND	-

C.39 DS6000 Headphone/SPDIF connector (10-PIN)*Table C-39 Headphone/SPDIF connector (10-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	SPKEN-P4P	O	2	HEADL-PXP	O
3	HEADR-PXP	O	4	A-GND	-
5	SPDJIN-P3N	O	6	N.C	-
7	DOUT-P3P	O	8	SPD3V-P3V	O
9	GND	-	10	N.C	-

C.40 CN9510 System board I/F connector (57-PIN)

Table C-40 System board I/F connector (57-PIN)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	SPOTR-PXN	I/O	2	SPOTR-PXN	I/O
3	SPOTR-PXP	I/O	4	SPOTR-PXP	I/O
5	SPOTL-PXN	I/O	6	SPOTL-PXN	I/O
7	SPOTL-PXP	I/O	8	SPOTL-PXP	I/O
9	LINL-PXP	I/O	10	A-GND	-
11	LINR-PXP	I/O	12	FMRDL-PXP	I/O
13	VREF1-P2V	O	14	FMRDR-PXP	I/O
15	SND-GND	-	16	SND-GND	-
17	SND-GND	-	18	SND-GND	-
19	SND-GND	-	20	ATBEEP-P3P	I/O
21	PCBEEP-E3P	I/O	22	SND-P5V	-
23	SND-P5V	-	24	SND-P5V	-
25	SND-P5V	-	26	SND-P5V	-
27	AMPSD-S3N	-	28	P3V	-
29	P3V	-	30	SNDMUT-S3N	O
31	GND	I	32	X14SND-P3P	I/O
33	GND	-	34	M97SY1-P3P	I/O
35	M97SY2-P3P	I/O	36	GND	-
37	M97OT1-P3P	I/O	38	M97OT2-P3P	I/O
39	GND	I/O	40	M97RS1-S3N	I/O
41	M97RS2-S3N	I/O	42	GND	-
43	M97IN1-P3P	I	44	M97IN2-E3P	I
45	E3V	-	46	E3V	-
47	SPKON-P3N	I/O	48	VOLBYP-P3N	I/O
49	GND	-	50	X97BC1-P3P	I/O
51	GND	-	52	LINOTL-PXP	O
53	A-GND	-	54	LINOTR-PXP	O
55	CDAUDR-PXP	I	56	CD-GND	-
57	CDAUDL-PXP	-			

LED board (FNMLE*)

C.41 CN4400 Bluetooth I/F connector (20-PIN)

Table C-41 Bluetooth I/F connector (20-PIN)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	-	2	N.C.	-
3	BTMDL-P3N	O	4	N.C.	-
5	N.C.	-	6	N.C.	-
7	N.C.	-	8	BTRST-S3N	I
9	N.C.	-	10	N.C.	-
11	GND	-	12	N.C.	-
13	GND	-	14	WCHCLK-P3P	I
15	N.C.	-	16	USBP5-S3P	I/O
17	USBP5-S3N	I/O	18	WCHDAT-P3P	I
19	N.C.	-	20	BT-P3V	I

C.42 CN9670 System board I/F connector (30-PIN)*Table C-42 System board I/F connector (30-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	GND	-	2	WCHDAT-P3P	O
3	WCHCLK-P3P	O	4	GND	-
5	BTRST-S3N	I/O	6	N.C.	-
7	P5V	-	8	P5V	-
9	USBP5-S3N	I/O	10	USBP5-S3P	I/O
11	GND	-	12	ACIRRX-S3P	I
13	BTSWON-S3P	I	14	S3V	-
15	BTLED-S5P	I	16	GND	-
17	BTMDL-P3N	I	18	PDASP-P5V	I/O
19	PDASP-P5N	I/O	20	GND	I/O
21	BAT1GR-S5N	I/O	22	BAT1OR-S5N	I/O
23	M5V	-	24	M5V	-
25	PWLEGR-S3P	I	26	PWLEOR-S3P	I
27	GND	-	28	DCINGR-S5N	I
29	DCINOR-S5N	I	30	GND	-

TV jack board (FNMTJ*)

C.43 J9610 TV antenna connector (4-PIN)

Table C-43 TV antenna connector (4-PIN)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	(PJ9611-3)	I/O	2	(PJ9611-1)	I/O
3	(PJ9611-2)	I/O	4	(PJ9611-4)	I/O

C.44 CN9611 Coaxial connector (4-PIN)

Table C-44 Coaxial connector (4-PIN)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	(PJ9610-2)	I/O	2	(PJ9610-3)	I/O
3	(PJ9610-1)	I/O	4	(PJ9610-4)	I/O

C.45 J9612 Monitor-IN I/F connector (5-PIN)

Table C-45 Monitor-IN I/F connector (5-PIN)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	(LINR-PXP)	I	2	TV-GND	-
3	COMPIN-PXP	I	4	(LINL-PXP)	I
5	TV-GND	-			

C.46 CN9613 S-Video IN I/F connector (4-PIN)

Table C-46 S-Video IN I/F connector (4-PIN)

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	TV-GND	-	2	TV-GND	-
3	LUMAIN-PXP	I	4	CROMINXP	I

C.47 CN9614 System board I/F connector (20-PIN)*Table C-47 System board I/F connector (20-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	LINR-PXP		2	TV-GND (FMTRDR-PXP)	-
3	TV-GND	-	4	VREF1-P2V	
5	LINL-PXP		6	TV-GND (FMTRDL-PXP)	-
7	TV-GND (COMPIN-PXP)	-	8	TV-GND (LUMAIN-PXP)	-
9	COMPIN-PXP		10	LUMAIN-PXP	
11	TV-GND	-	12	TV-GND (CROMIN-PXP)	-
13	N.C. (SVSCL-P3P)	-	14	CROMIN-PXP	
15	N.C. (SVSDA-P3P)	-	16	TV-GND	-
17	TV-GND	-	18	N.C. (SUSCLK-S3P)	-
19	SND-P5V		20	N.C. (FMT-P3V)	-

USB board (FNMUS*)**C.48 CN4620 USB I/F connector (4-PIN)***Table C-48 USB I/F connector (4-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	USBPSC-E5V	I/O	2	USBPC-S3N	I/O
3	USBPC-S3P	I/O	4	GND	-

C.49 CN4621 System board I/F connector (6-PIN)*Table C-49 System board I/F connector (6-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	USBPSC-E5V	I/O	2	USBPSC-E5V	I/O
3	USBPC-S3N	I/O	4	USBPC-S3P	I/O
5	GND	-	6	GND	-

Battery board (FNMBT*)**C.50 CN8810 Battery I/F connector (10-PIN)***Table C-50 Battery I/F connector (10-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	PVBL1-BAT	I/O	2	BTMP1	I/O
3	BATDCHG1	I/O	4	M5V	-
5	PSCL-S5P	I/O	6	PSDA-S5P	I/O
7	(VSS)	I/O	8	DVT10V-S5N	I/O
9	BATVSS1	I/O	10	BATGND1	I/O

C.51 CN9690 System board (Power) I/F connector (6-PIN)*Table C-51 System board (Power) I/F connector (6-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	PVBL1-BAT	I/O	2	PVBL1-BAT	I/O
3	PVBL1-BAT	I/O	4	BATGND1	I/O
5	BATGND1	I/O	6	BATGND1	I/O

C.52 CN9691 System board (Signal) I/F connector (8-PIN)*Table C-52 System board (Signal) I/F connector (8-PIN)*

PIN No.	Signal name	I/O	PIN No.	Signal name	I/O
1	BATVSS1	-	2	DVT10V-S5N	
3	BATVSS1	-	4	PSDA-S5P	I/O
5	PSCL-S5P	I/O	6	M5V	-
7	BATDCHG1	I/O	8	BTMP1	I/O

Appendix D Display Codes

D.1 Display Codes

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

Cap No.	Keytop	Code set 1		Code set 2		Note	
		Make	Break	Make	Break		
01	‘ ~	29	A9	0E	F0	0E	
02	1 !	02	82	16	F0	16	
03	2 @	03	83	1E	F0	1E	
04	3 #	04	84	26	F0	26	
05	4 \$	05	85	25	F0	25	
06	5 %	06	86	2E	F0	2E	
07	6 ^	07	87	36	F0	36	
08	7 &	08	88	3D	F0	3D	*2
09	8 *	09	89	3E	F0	3E	*2
10	9 (0A	8A	46	F0	46	*2
11	0)	0B	8B	45	F0	45	
12	- _	0C	8C	4E	F0	4E	
13	= +	0D	8D	55	F0	55	
15	BkSp	0E	8E	66	F0	66	
16	Tab	0F	8F	0D	F0	0D	
17	Q	10	90	15	F0	15	
18	W	11	91	1D	F0	1D	
19	E	12	92	24	F0	24	
20	R	13	93	2D	F0	2D	
21	T	14	94	2C	F0	2C	
22	Y	15	95	35	F0	35	
23	U	16	96	3C	F0	3C	*2
24	I	17	97	43	F0	43	*2
25	O	13	98	44	F0	44	*2
26	P	19	99	4D	F0	4D	*2
27	[{	1A	9A	54	F0	54	
28] }	1B	9B	5B	F0	5B	

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

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

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

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

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

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

Notes:

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

Table D-2 Scan codes with left Shift key

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

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

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

Table D-3 Scan codes in Numlock mode

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

Table D-4 Scan codes with Fn key

Cap No.	Keytop	Code set 1		Code set 2	
		Make	Break	Make	Break
43	ENT	E0 1C	E0 9C	E0 5A	E0 F0 5A
58	CTRL	E0 1D	E0 9D	E0 14	E0 F0 14
60	LALT	E0 38	E0 B8	E0 11	E0 F0 11
121	ARROW	45	C5	77	F0 77
122	NUMERIC	45	C5	77	F0 77
123	Scrl	46	C5	7E	F0 7E

Table D-5 Scan codes in overlay mode

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

Table D-6 No.124 key scan code

Key top	Shift	Code set 1				Code set 2			
		Make		Break		Make		Break	
Prt Sc	Common	E0 2A	E0 37	E0 B7	E0 AA	E0 12	E0 7C	E0 F0	7C E0 F0 12
	Ctrl +	E0 37		E0 B7		E0 7C		E0 F0	7C
	Shift +	E0 37		E0 B7		E0 7C		E0 F0	7C
	Alt +		54	D4		84		F0	B4

Table D-7 No.126 key scan code

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

*: This key generates only make codes.

Appendix E Key Layout

E.1 United States (US) Keyboard

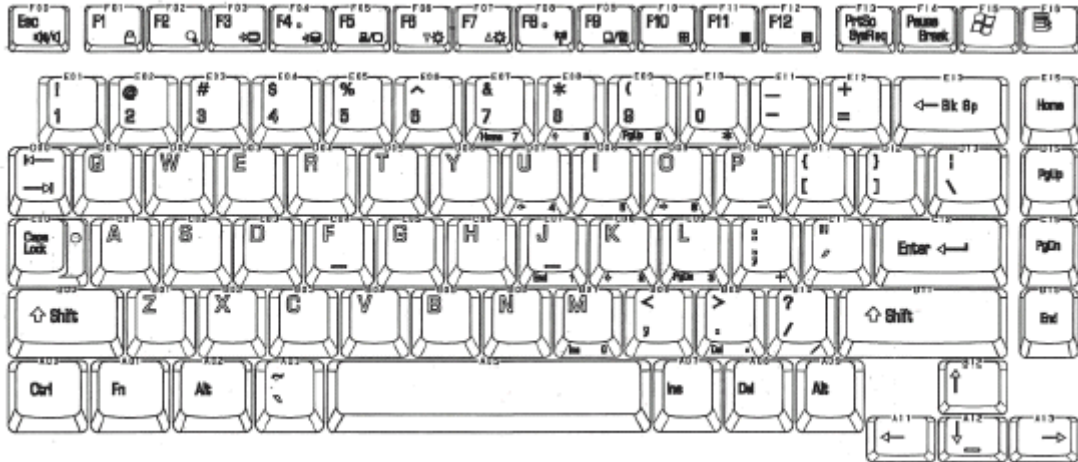


Figure E-1 US Keyboard layout

E.2 United Kingdom (UK) Keyboard

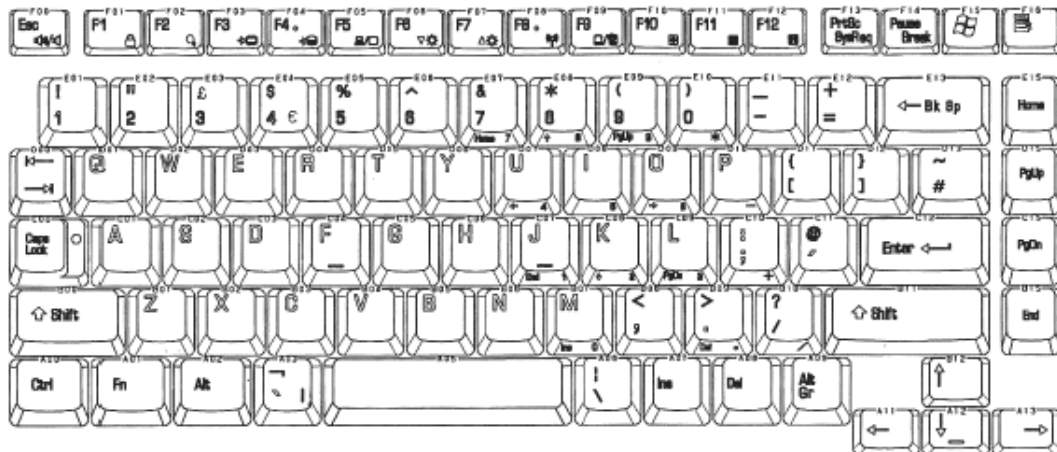


Figure E-2 UK Keyboard layout

Appendix F Wiring Diagrams

F.1 RGB Monitor ID Wraparound connector

(1) RED	_____	RED	(1)
(2) GREEN	_____	GREEN	(2)
(3) BLUE	_____	BLUE	(3)
(4) NC	_____	NC	(4)
(5) GND	_____	GND	(5)
(6) GND	_____	GND	(6)
(7) GND	_____	GND	(7)
(8) GND	_____	GND	(8)
(9) 5V	_____	5V	(9)
(10) GND	_____	GND	(10)
(11) NC	_____	NC	(11)
(12) SDA	_____	SDA	(12)
(13) HSYNC	_____	HSYNC	(13)
(14) VSYNC	_____	VSYNC	(14)
(15) SDL	_____	SCL	(15)

Figure F-1 RGB Monitor ID Wraparound connector (15PIN to 15PIN)

F.2 LAN Loopback Connector

(1) BIBAP (TX+)	_____	(3) BIDBP (RX+)
(2) BIDAN (TX-)	_____	(4) BIDBN (RX-)

Figure F-2 LAN loopback connector

Appendix G BIOS Rewrite Procedures

This Appendix explains how to rewrite the system BIOS program when you update the system BIOS.

Tools

To rewrite the BIOS, you need the following tool:

- ❑ BIOS/EC/KBC rewriting disk

Rewriting the BIOS

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cables and cards.
4. Connect an external FDD and insert the BIOS rewriting disk into the external FDD.
5. Turn on the power while holding down the tilde character key.

For example



(US Keyboard)



(UK Keyboard)

(Keep holding down the key.)

6. The BIOS rewriting starts.
7. When the process is completed, it beeps and the system automatically reboots.

NOTE:

1. Connect the AC adaptor to the computer when you rewrite the BIOS.
2. Do not turn off the power while you are rewriting the BIOS.
If the rewrite fails, it might be impossible to start up the computer.
3. If you fail to rewrite BIOS, then when you next turn on the power, a message may be displayed that the contents of the BIOS have been erased.
In this case, insert the BIOS rewriting disk, and the BIOS will be rewritten.

Appendix H EC/KBC Rewrite Procedures

This Appendix explains how to rewrite the EC/KBC system program when you update the EC/KBC system.

It is necessary to rewrite the EC/KBC system program when the following changes are made.

- Replacing of system board
- Replacing of LCD

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. Connect the AC adaptor 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 contents of the EC/KBC have been erased. In this case, insert the EC/KBC rewriting disk, and the EC/KBC will be rewritten.
 5. Normally it takes about 30 seconds to rewrite the EC/KBC. It may take 3 minutes (maximum), depending 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 cables and cards.

4. Connect an external FDD and insert the EC/KBC rewriting disk into the external FDD.
5. Turn on the power while holding down the Tab key. (Keep holding down the key until a message appears on the screen.) The EC/KBC rewriting starts.
6. When the EC/KBC rewrite is completed, the system is automatically turned off.

Appendix I Reliability

The following table shows MTBF (Mean Time Between Failures) in maximum configuration.

Table I-1 MTBF

Component	Time (hours)
System	6678.69

