TOSHIBA TECRA 9100 SERIES MAINTENANCE MANUAL

Toshiba Personal Computer

TECRA 9100 Series

Maintenance Manual

TOSHIBA CORPORATION

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Toshiba Personal Computer TECRA 9100 Series Maintenance Manual

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Disclaimer

The information presented in this manual has been reviewed and validated for accuracy. The included set of instructions and descriptions are accurate for the DynaBook V1, V2 Series at the time of this manual's production. However, succeeding computers and manuals are subject to change without notice. Therefore, Toshiba assumes no liability for damages incurred directly or indirectly from errors, omissions, or discrepancies between any succeeding product and this manual.

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Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer DynaBook V1, V2 Series, referred to as V1, V2 Series in this manual.

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

SAFETY PRECAUTIONS

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

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

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

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

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

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

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

The manual is divided into the following parts:

Chapter 1	Hardware Overview describes the DynaBook V1, V2 Series system unit and each FRU.
Chapter 2	Troubleshooting Procedures explains how to diagnose and resolve FRU problems.
Chapter 3	Test and Diagnostics describes how to perform test and diagnostic operations for maintenance service.
Chapter 4	Replacement Procedures describes the removal and replacement of the FRUs.
Appendices	The appendices describe the following:

- ❑ Handling the LCD module
- ❑ Board layout
- ❑ Pin assignments
- ❑ Keyboard scan/character codes
- ❑ Key layout
- ❑ Wiring diagrams
- ❑ BIOS Rewrite Procedures
- ❑ Reliability

Conventions

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

Acronyms

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

Read Only Memory (ROM)

Keys

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

Key operation

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

User input

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

DISKCOPY A: B:

The display

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

```
Format complete
System transferred
```

Table of Contents

Chapter 3 Tests and Diagnostics

Chapter 4 Replacement Procedures

Appendices

Chapter 1

Hardware Overview

Chapter 1 Contents

Figures

Tables

1.1 Features

The Toshiba TECRA 9100 Personal Computer uses extensive Large Scale Integration (LSI), and Complementary Metal-Oxide Semiconductor (CMOS) technology extensively to provide compact size, minimum weight, low power usage and high reliability. This computer incorporates the following features and benefits: The product configuration is BTO/CTO-compatible so that a system can be designed to suit a specific purpose.

- Microprocessor

  The 9100 Series computer is equipped with an Intel Mobile Pentium 4 Processor, which incorporates a math co-processor, a 20KB L1 cache memory and a 512KB L2 cache memory. The processor runs with one of the following speeds:

  - Intel Mobile Pentium 4 Processor 1.70GHz (1.30V) / 1.20GHz (1.20V)
  - Intel Mobile Pentium 4 Processor 1.60GHz (1.30V) / 1.20GHz (1.20V)

  This processor operates at 1.30V-1.20V and 133MHz bus clock. A 12KB level-1 cache memory and a 512KB level-2 cache memory are built in.

- Chipset

  The 9100 Series is equipped with Brookdale-M MCH-M (Graphics and Memory Controller Hub), Brookdale-M ICH3-M (I/O Controller Hub3) and YEBISU3S.

- Video Controller

  - VGAC S3 Super Savage/IXC 86C584 (Tristar 64C)
  - 3.3 volt operation
  - Connected to AGP4X bus

  Video RAM, VRAM 16MB is integrated in the VGAC.

- Memory

  Two expansion memory slots are provided to accommodate 2.5V drive PC2100 DDR-SDRAM memory units with a total capacity of 1024 MB maximum.

  The following three memory modules are available.

  - 128 MB (8M×16bit, 3.3V,SDRAM 8P) or (16M×16bit, 3.3V,SDRAM 4P)
  - 256 MB (16M×16bit, 3.3V,SDRAM 8P)
  - 512 MB (32M×16bit, 3.3V,SDRAM 8P) or (16M×16bit, 3.3V,SDRAM 16P)

- ❑ Built-in HDD

  The computer has a 2.5-inch HDD. The following four capacities are available.

  - 15 GB (9.5 mm thick)
  - 20 GB (9.5 mm thick)
  - 30 GB (9.5 mm thick)
  - 40 GB (9.5 mm thick)

- ❑ FDD

  A 3.5-inch FDD accommodates 2HD (1.44MB) or 2DD (720KB) disks.
  The FDD is connected to an external USB port.

- ❑ Slim Select Bay

  A CD-ROM, DVD-ROM, CD-R/RW or COMBO drive, 2nd HDD or 2nd Battery can be installed in the Slim Select Bay. In addition, a second HDD may be purchased as an option for use in the system.

- ❑ CD-ROM Drive

  A full-size, maximum 24-speed 640MB CD-ROM drive, contains an AT Attachment Packet Interface (ATAPI) controller, and supports the following formats: CD-DA, CD-ROM, Photo-CD (Multi-session), and CD-Extra (CD Plus).

- ❑ CD-R/RW Drive

  A full-size, maximum 24-speed CD-ROM drive, maximum 8-speed CD-R writing and maximum 8-speed CD-RW writing, maximum 14-speed CD-RW reading, maximum 24-speed CD-ROM/CD-RW reading, contains an AT Attachment Packet Interface (ATAPI) controller, and supports the following formats: CD-DA, CD-ROM, CD-R, CD-RW, Photo-CD (Multi-session), and CD-Extra (CD Plus).

- ❑ DVD-ROM Drive

  A full-size and runs either 12cm (4.72-inch) or 8cm (3.15-inch) DVD/CDs without an adaptor. It plays DVDs at a maximum 8-speed and reads CDs at maximum 24-speed.

- ❑ Multi Drive

  This drive is a combination DVD-ROM and CD-R/RW Drive. It is full-size and runs either 12cm (4.72-inch) or 8cm (3.15-inch) DVD/CDs without an adaptor. It plays DVDs at a maximum 8-speed, writes CD-R at maximum 8-speed CD-R, writes CD-RW at maximum 4-speed, and reads CDs at maximum 24-speed

- Display

  The display comes in the following three types:
  • 14.1" XGA-TFT color display, resolution 1024×768, 16M colors
  • 14.1" SXGA+-TFT color display, resolution 1400×1050, 16M colors

  In addition, a video controller and an 16MB VRAM enables an external monitor to display 16M colors at a resolution of 1024×768 pixels or 256 colors at a resolution of 1400×1050 pixels.

- Keyboard

  An-easy-to-use 85/86-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® 2000/XP. It supports software that uses a 101- or 102-key enhanced keyboard.

- Batteries

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

- Universal Serial Bus (USB)

  Two USB ports are provided. They enable daisy-chain connection of up to 127 USB-equipped devices and 12Mbps (full speed) or 1.5Mbps (low speed) serial data transfer. They are designed for easy configuration by a PnP operating system and provide hot insertion/ejection capability.

- IEEE 1394 port

  The computer comes with one IEEE 1394 port. It allows for the connection of up to 63 devices and provides 100, 200 and 400Mbits/sec transfer rates. It supports hot insertion/ejection capability so there is no need to restart the computer when the user attaches a new peripheral.

- Serial port

  A standard, 9-pin, serial port enables connection of such serial devices as a serial printer, mouse or modem. A Universal Asynchronous Receiver/Transmitter (UART) is 16550A equivalent.

- External monitor port

  The port enables connection of an external monitor, which is recognized automatically by Video Electronics Standards Association (VESA) Display Data Channel (DDC) 2B compatible functions.

- PS/2™ mouse/keyboard port

  Either a PS/2 compatible keyboard or a PS/2 compatible mouse can be connected to the port.

- PC card slot

  A PC card slot (PCMCIA) accommodates two 5mm cards (Type II) or one 10.5mm (Type III) card. These slots support 16-bit PC cards and Card Bus (By help from Windows® 98/2000) PC cards (32-bit).

- SD Card

  An SD Card Slot can accommodate Secure Digital flash memory cards with capacities of 8MB, 16MB, 32MB, 64MB and 128MB. SD cards let you easily transfer data from devices, such as digital cameras and Personal Digital Assistants, that use SD Card flash-memory.

- Docking interface port

  A 242-pin, docking interface port enables connection of an optional Port Replicator 2001. It provides additional features as follows:

  - RJ-45 LAN jack, RT11 Modem jack
  - External monitor port
  - Parallel port and Serial port
  - PS/2 Mouse port and Keyboard port
  - DC IN socket
  - Security lock slot
  - Audio line-in, line out jack
  - Two USB ports and an IEEE 1394 port
  - DVI port

- AccuPoint II

  A pointing device, the AccuPoint II, located in the center of the keyboard and control buttons at the base of the keyboard enables control of the on-screen pointer and scrolling of the windows without requiring desk space for a mouse.

- Infrared port

  The infrared port is compatible with Fast InfraRed (FIR) standards enabling cableless 4 Mbps, 1.15 Mbps, 115.2 kbps, 57.6 kbps, 38.4 kbps, 19.2 kbps or 9.6 kbps data transfer with Infrared Data Association (IrDA) 1.1 compatible external devices.

- Sound system

  In addition, this sound system is equipped with the following:

  - PC/PCI and Serialized IRQ
  - AC-3 and I^2C Serial Input (ZV-port)
  - SPDIF and AC-2 I/F (AC-Link 2.0)
  - Stereo speakers
  - Built-in Microphone (Mono)
  - Volume control knob
  - Stereo Headphone jack
  - External microphone jack

- Video-out jack

  The RCA video jack enables to transfer NTSC or PAL data to external devices.

- Internal modem (BTO)

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

  The internal modem provides capability for data and fax communication and supports ITU-TV.90. For data reception it operates at 56,000bps and for data transmission it operates at 33,600bps. For fax transmission it operates at 14,400bps. It is also equipped with Speakerphone and TAM (Telephony Answering Machine) function. The speed of data transfer and fax depends on analog telephone line conditions. It has an RJ11 modem jack for connecting to a telephone line.

- Internal LAN

  The computer is equipped with LAN circuits that support Ethernet LAN (10 megabits per second, 10BASE-T) and Fast Ethernet LAN (100 mega bits per second, 100 BASE-Tx). It also supports Wakeup on LAN (WOL) and Magic Packet.

- Bluetooth (BTO)

  The computer is equipped with Bluetooth communications standards enable wireless connection to compatible devices, including an optical Internet adaptor.

- ❑ Mini PCI Card slot (1 slot, BTO)

  In some models built to order (BTO), a Mini PCI Card with wireless LAN functions is available.

  • Wireless LAN The Mini PCI Card for wireless LAN is compatible with other LAN systems based on Direct Sequence Spread Spectrum radio technology that complies with the IEEE 802.11 Standard (Revision B). It supports data transfer up to 11 Mbit/s. It has Frequency Channel Selection (2.4GHz) and allows roaming over multiple channels.

The front of the computer is shown in figure 1-1.

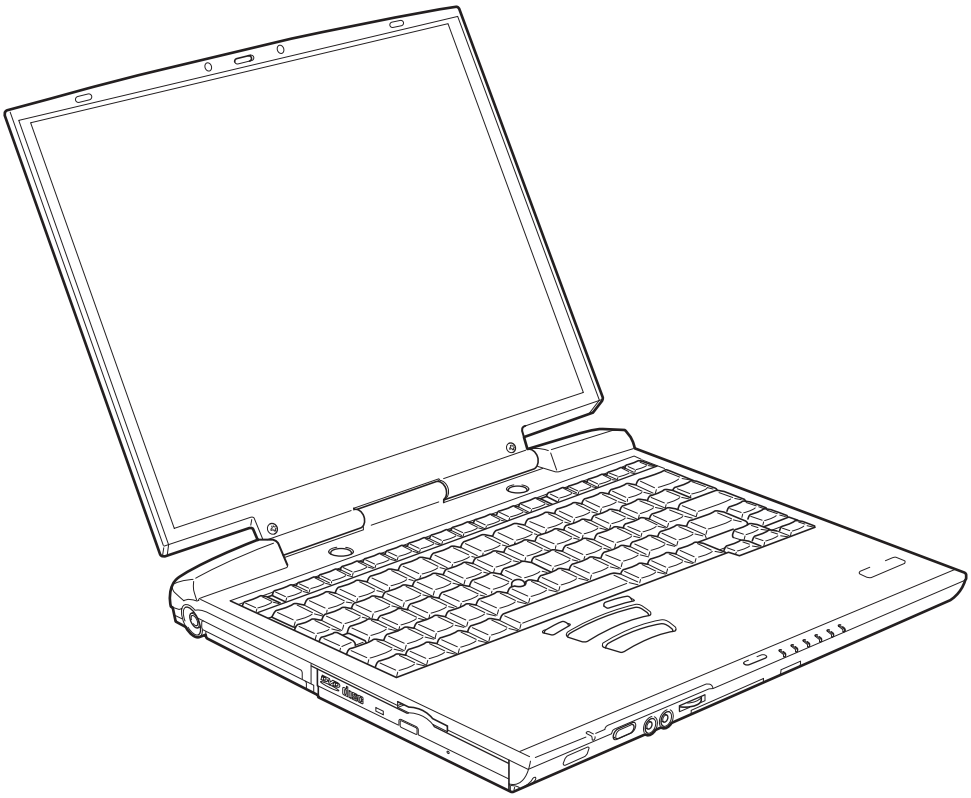


Figure 1-1 Front of the computer

The system unit configuration is shown in figure 1-2.

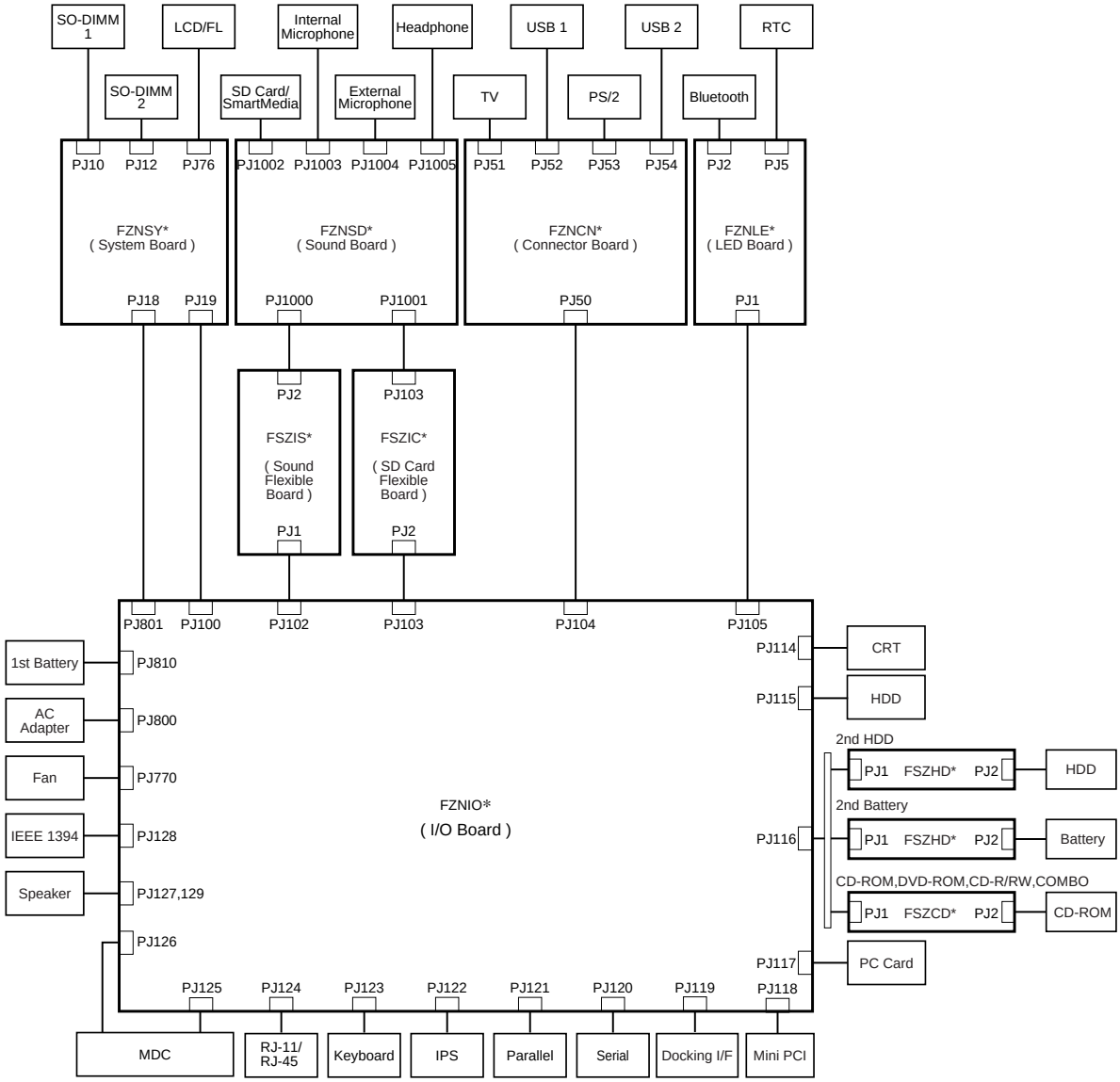


Figure 1-2 System unit configuration

1.2 System Unit Block Diagram

Figure 1-3 is a block diagram of the system unit.

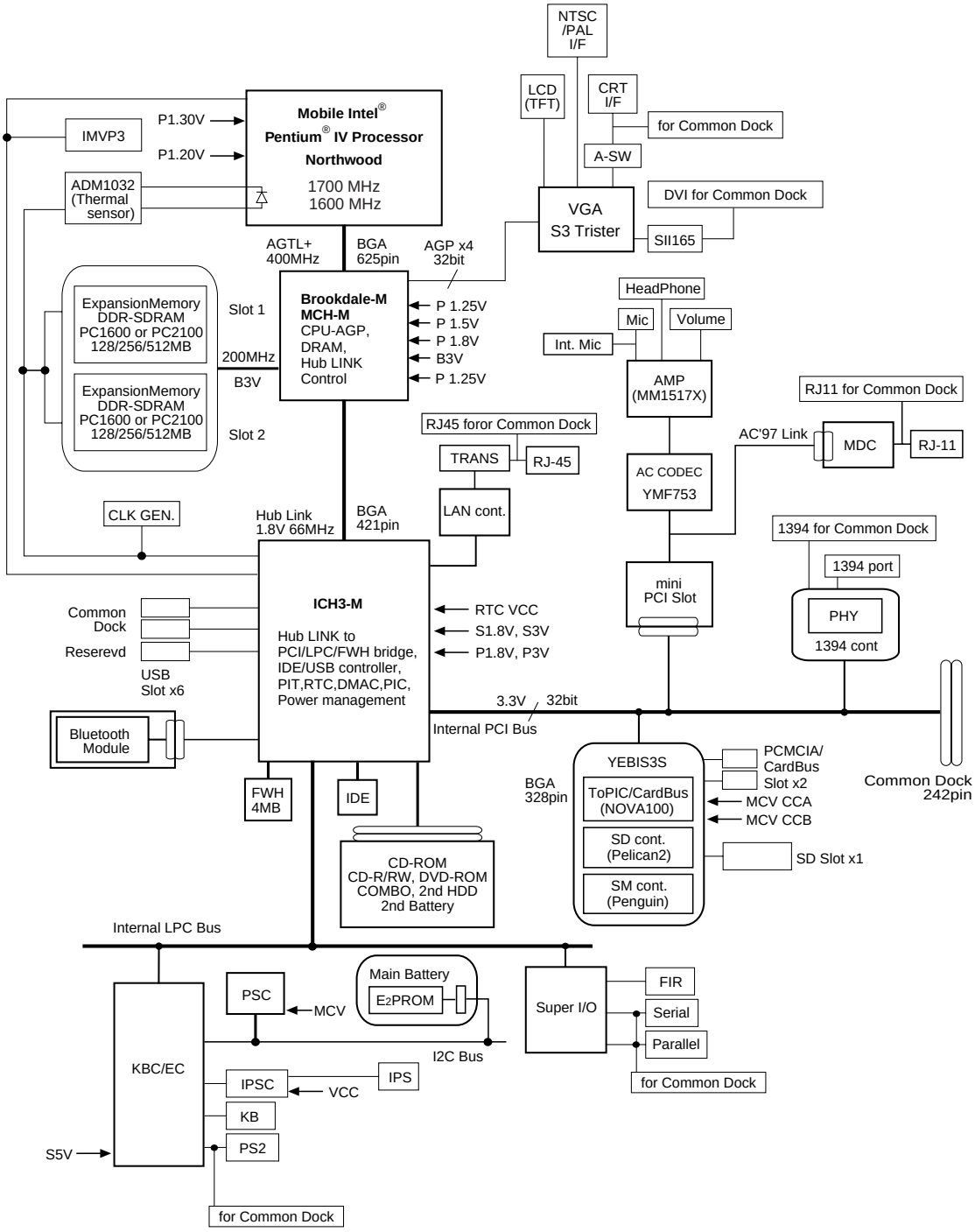


Figure 1-3 System unit block diagram

The system unit is composed of the following major components:

- ❑ Processor

    - Intel Mobile Pentium 4 Processor 1.70GHz
        - Processor core speed: 1.70GHz (Performance Mode at 1.30V) and 1.20GHz (Battery Optimized Mode at 1.20V)
        - Processor bus speed: 400MHz
        - Integrated L1 cache memory: 12KB instruction cache and 8KB write-back data cache, 4-way set associative
        - Integrated L2 cache memory: 512KB ECC protected cache data array, 8-way set associative
        - Integrated NDP

    - Intel Mobile Pentium 4 Processor 1.60GHz
        - Processor core speed: 1.60GHz (Performance Mode at 1.30V) and 1.20GHz (Battery Optimized Mode at 1.20V)
        - Processor bus speed: 400MHz
        - Integrated L1 cache memory: 12KB instruction cache and 8KB write-back data cache, 4-way set associative
        - Integrated L2 cache memory: 512KB ECC protected cache data array, 8-way set associative
        - Integrated NDP

- ❑ Memory

    Two BTO/CTO-compatible expansion memory slots are provided. Expansion up to 1024 MB is available.

    - DDR-SDRAM (Double Data Rate - Synchronous DRAM @133MHz)
    - 128 MB/256/512 MB selectable
        - 128 MB (128Mbit 8M×16bit, 8P) or (16M×16bit, 4P)
        - 256 MB (256Mbit 16M×16bit, 8P)
        - 512 MB (512Mbit 32M×16bit, 8P) or (256Mbit 16M×16bit, 16P)
    - 200 pin, SO Dual In-line Memory Modules. (SO-DIMM)
    - 2.5 volt operation
    - No parity bit
    - Data transfer is 64-bit width

- Brookdale-M Graphics and Memory Controller Hub (MCH3-M)

  - One Intel 82845MP is used.
  - Features:
    - Processor/Host Bus Support
    - Integrated SDRAM Controller
    - Accelerated Graphics Port (AGP R2.0) Interface Multiplexed with Internal Graphics
    - Hub Link Interface

- I/O Controller Hub 3 (ICH3-M)

  - One Intel 82801LAM is used.
  - This gate array has the following features:
    - Enhanced DMA featuring Mobile PC/PCI
    - Serial Interrupt Controller
    - Interrupt Controller
    - Power Management Logic
    - Suspend/Resume Logic
    - Low Pin count (LPC) Bus Controller (EC/KBC, Super I/O)
    - Firmware Hub (FWH) I/F supports BIOS
    - BusMasterIDE/UltraDMA100/66/33
    - Real-Time Clock
    - Stop Clock
    - PCI Clock stop
    - ACPI
    - AC'97 I/F
    - USB Controller (UHCI)

- PC Card Controller Gate Array

  - One YEBISU3S gate array is used.
  - This gate array has the following functions and components.
    - PCI interface (PCI Revision2.2)
    - Chipset interface
      Intel serial interrupt
    - CardBus/PC Card controller (Yenta Version2.2)
      Parallel power supply control (Toshiba style) and serial power supply control (Texas Instruments style)
    - SD memory card controller (SDHC Ver.01)
    - SDIO card controller (Ver.1.0)
    - Smart Card interface
    - SIO controller

- Docking station interface
  Q switch control, reset control
- External device interface
- FDD/IDE hot plugging and removal control
- Slim Select Bay interface

❑ Firmware Hub (FWH)

- One Intel 82802AB8 is used.
- This gate array has the following features:
  - Intel platform compatibility
  - Firmware hub hardware interface mode
  - Industry-standard packages
  - Two configurable interfaces
  - 4Mbits of flash memory for platform code/data nonvolatile storage
  - Address/Address-Multiplexed (A/A Mux) interface/mode
  - Case temperature operating range
  - Vcc: 3.3V ± 0.3V
  - Vpp: 3.3V and 12V for fast programming (80 hours maximum)
- 4Mbits of flash memory are used as shown below:
  - 64KB are used for VGA-BIOS.
  - 192KB are used for system BIOS.
  - 8KB are used for plug and play data area.
  - 8KB are used for password security.
  - 16KB are used for boot strap.
  - 64KB are used for ACPI P code.
  - 64KB are used for LOGO.
  - 64KB are reserved for LAN BIOS.
  - 32KB are reserved.

❑ Display Controller

One S3 Tristar 64C86C584 chip is used. The video controller incorporates, graphics accelerator, video accelerator.

- 1.85 volt (core)/3.3 volt (interface) operation.
- Connected to AGP bus
- 3D accelerator function.
- Video RAM, VRAM 16MB is integrated in the VGAC

❑ Sound Controller

- One Yamaha YMF753 chip is used.
- SW sound

❑ EC/KBC (Embedded Controller/Keyboard Controller)

- One Mitsubishi M306K7F8LRLPC micon chip functions as both EC and KBC.
- EC
  This controller controls the following functions:
  - Power supply sequence
  - Thermal conditions
  - LEDs
  - Beep
  - Device ON/OFF
  - Fan speed
  - Universal I/O port
  - Docker Docking Sequence
  - Battery capacity check
  - Forced reset
  - Flash rewriting
  - EC interface
  - I^2C communication
  - EC access
  - Slim Select Bay Control

- KBC
  This controller has the following functions:
  - Scan controller to check status of keyboard matrix
  - Interface controller between the keyboard scan controller and the system
  - Control of switching and simultaneous operation of the accupoint/external PS/2 mouse and of the internal keyboard/external PS/2 keyboard

- ❑ AccuPoint II Controller (IPSC)
    - One 3DA3DT336B chip is used.
    - This controller provides simultaneous control of both the AccuPoint II and a PS/2 mouse.

- ❑ PSC (Power Supply Controller)
    - One TMP87PM48U chip is used.
    - This controller controls the power sources.

- ❑ RS232 Driver
    - One MAXIM3243 chip is used.
    - This driver converts signals for interface with external equipment.

- ❑ E^2 PROM
    - One BR93LC46F-WE2 is used for LAN MAC address.
    - One M24C02 equivalent (128 words x 16-bit, I^2C-Interface) is used for 1394 ID.

- ❑ Clock Generator
    - One ICS950805BGT is used.
    - This device generates the system clock.

- ❑ Modem Controller
    - One built-in modem card with Xircom Lucent SCORPIO+CSP1037B is used.
    - This controller has the following functions:
        - Digital line protection support
        - Ring wake up support
        - AC97 interface
        - The following communication codes are supported
          Data:
          V.90 (56K bps) data communication control
          V.34 (33.6 K~2400)
          V.32 bis (14.4K, 12K, 9600)
          V.22 bis (2400, 1200)
          V.22 (1200)
          V.23 (1200, 600, 75)
          V.21 (300)
          Fax:
          V.17 (14.4K, 12K, 9600, 7200)
          V.29 (9600, 7200, 4800)
          V.27 ter (4800, 2400)
          V.21 ch2 (300)

- Internal LAN Controller

  - One MAC incorporated with ICH3-M and PHY (Kinnereth 82562ET) are used for the internal chip, and are connected with RJ11/RJ45 combo connector.
  - This controller has the following functions:
    Full Duplex support at 10 Mbps/100 Mbps
    - WOL support
    - Magic Packet Support

- Wireless LAN

  - One Mini PCI card for LAN with TI card bus controller, TI 1410 is used.

- Super I/O

  - One LPC 47N227 chip is used.
  - This gate array has the following features:
    - Floppy Disk Controller
    - Serial Port Controller
    - Infrared Communications Controller
    - Parallel Port Controller

1.3 3.5-inch Floppy Disk Drive (USB External)

The 3.5-inch FDD is a thin, high-performance reliable drive that supports 720KB (formatted) 2DD and 1.44MB (formatted) 2HD disks.

The FDD is shown in figure 1-4. The specifications for the FDD are listed in Table 1-1.

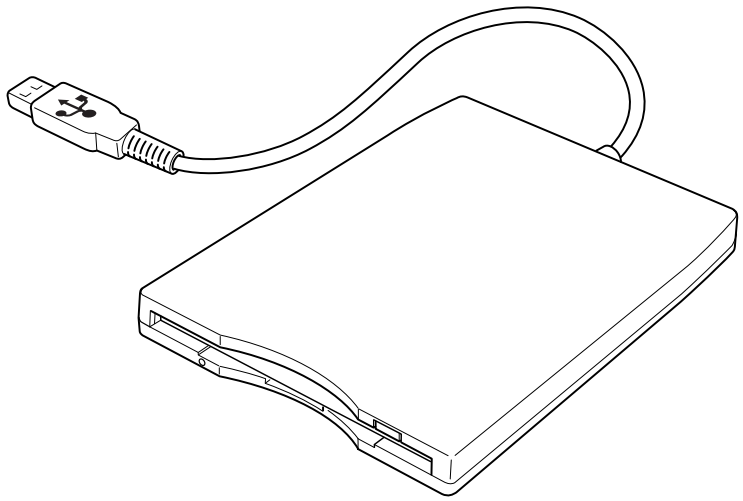


Figure 1-4 3.5-inch FDD (USB External)

Table 1-1 3.5-inch FDD specifications

Items	2MB mode	1MB mode
Storage Capacity (KB) Unformatted Formatted	 2,000 1,440	 1,000 720
Number of heads	2	2
Number of cylinders	80	80
Recording method	Modified Frequency Modulation (MFM)	

1.4 2.5-inch Hard Disk Drive

The removable HDD is a random access non-volatile storage device. It has a non-removable 2.5-inch magnetic disk and mini-Winchester type magnetic heads.
The computer supports a 15 GB, 20GB, 30GB and 40 GB HDD
The HDD is shown in figure 1-5. Specifications are listed in Table 1-2.

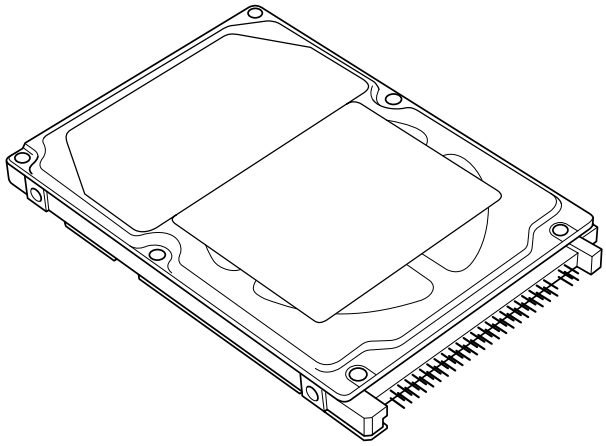


Figure 1-5 2.5-inch HDD

Table 1-2 2.5-inch HDD specifications

Items	IBM ZA2397P15 (15GB)	Toshiba HDD2168B IBM IC25N020ATCS04 (20GB)	Toshiba HDD2169B IBM IC25N030ATCS04 (30GB)	TOSHIBA HDD2171B (40GB)
Formatted Capacity (Billion bytes)	15.0968	20.003	30.005	40.007
User Data Sectors	19,640,880	39,070,080	58,605,120	78,140,160
Bytes per Sector	512	512	512	512
Rotation Speed (rpm)	4,200	4,200	4,200	4,200

1.5 CD-ROM Drive

The CD-ROM drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CDs. They provide high-performance, twenty-four-speed plays on a maximum (reads 3,600 KB per second).

The CD-ROM drive is shown in figure 1-6. Specifications are listed in Table 1-3.

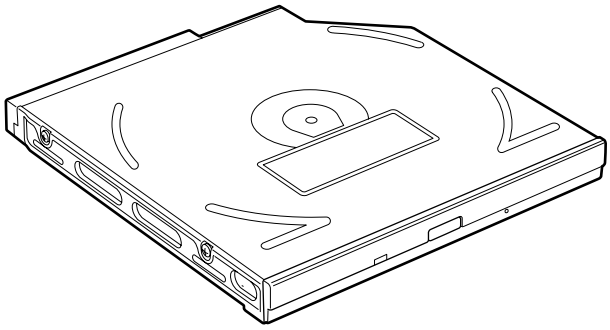


Figure 1-6 CD-ROM drive

Table 1-3 CD-ROM drive specifications

Item	TEAC specifications (CD-224E-BA) 24 x mode (Max.)
ATAPI Burst (Mbytes/s)	33.3 (U-DMA Transfer mode 2)
Access time (ms) Average Random Access Average Full Stroke Access	 115 (Typ.) 250 (Typ.)
Rotation speed (rpm)	5,136
Data Buffer Capacity (Kbytes)	128
Supported Format	CD-DA, CD-ROM, CD-R, CD-ROM XA, CD-I FMV, Video-CD, CD-RW, PhotoCD (Multi-cession), CD-Extra (CD Plus), CD-G

1.6 DVD-ROM Drive

Toshiba SD-C2502, TEAC DV-28E-B35, the DVD-ROM drive accommodates either 12cm (4.72-inch) or 8cm (3.15-inch) DVDs. It provides maximum 8-speed play: reads10,820KB per second on a maximum DVD-ROM mode play and 3,600KB per second on a maximum CD-ROM mode play.

The DVD-ROM drive is shown in figure 1-7. Specifications for the DVD-ROM drive are described in table 1-4.

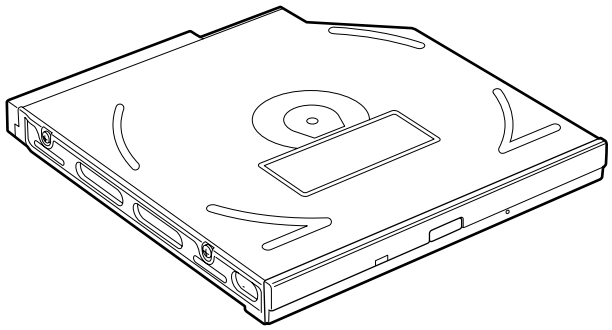


Figure 1-7 DVD-ROM drive

Table 1-4 Hitachi DVD-ROM drive specifications

Item	HITACHI GDR-8081N	
	DVD-ROM mode	CD-ROM mode
ATAPI Burst (Mbytes/s)	33.3 (U-DMA Transfer mode 2)	
Access time (ms) Average Random Access Average Full Stroke Access	 100 (Typ.) 160 (Typ.)	 95 (Typ.) 160 (Typ.)
Rotation speed (rpm)	4,670 Max	5,100Max
Data Buffer Capacity (Kbytes)	512	
Supported Format	DVD-ROM, DVD-R (Read) CD-DA, CD+(E)G, CD-MIDI, CD-TEXT CD-ROM, CD-ROM XA, CD-I CD-I Bridge (Photo-CD, Video-CD) Multisession CD (Photo-CD, CD-EXTRA, CD-R, CD-RW) CD-R (Read), CD-RW (Read)	

Table 1-4 TEAC DVD-ROM drive specifications

Item	DVD-ROM mode	CD-ROM mode
ATAPI Burst (Mbytes/s)	33.3 (U-DMA Transfer mode 2)	
Access time (ms) Average Random Access	110 (Typ.)	85 (Typ.)
Rotation speed (rpm)	4,594 Max	5,136Max
Data Buffer Capacity (Kbytes)	256	
Supported Format	DVD-ROM, DVD-R (Read) CD-DA, CD+(E)G, CD-MIDI, CD-TEXT CD-ROM, CD-ROM XA, CD-I CD-I Bridge (Photo-CD, Video-CD) Multisession CD (Photo-CD, CD-EXTRA, CD-R, CD-RW) CD-R (Read), CD-RW (Read)	

1.7 CD-R/RW Drive

Matsushita UJDA340TBI-Z, TEAC CD-W28E-035the full-size CD-R/RW drive module can record data to rewritable CDs as well as run either 12cm (4.72") or 8cm (3.15") CDs without using an adaptor.

The CD-R/RW drive is shown in figure 1-8. Specifications are listed in Table 1-5.

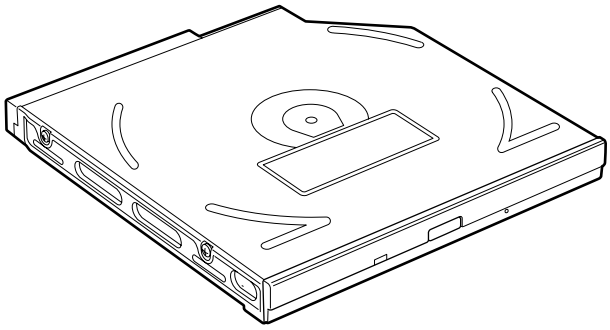


Figure 1-8 CD-R/RW drive

Table 1-5 CD-R/RW drive specifications

Item	Matsushita UJDA340	TEAC CD-W28E-035
ATAPI Burst (Mbytes/s)	16.6 (Ultra DMA mode 2)	
Access time (ms)	150 (max 24, Typ.)	110(max 24, Typ.)
Speed	Read: CD-ROM, CD-R (max 24) CD-RW (max 14) Write: CD-R (max 4) CD-RW (max 8)	
Cache (Mbytes)	2	
Supported Format	Video CD, Photo CD, CD-ROM, CD-ROM XA, CD-EXTRA, CD-R, CD-Rewritable, CD-DA, CD-Text	

1.8 COMBO Drive

Matsushita VJDA720 TOSHIBA SD-R2102, the CD-RW/DVD-ROM drive is capable of driving either 12cm (4.72-inch) or 8cm (3.15-inch) DVD and CD without using an adaptor. This drive provides maximum 6-speed play on a DVD-ROM mode play, 24-speed play on a CD-ROM mode play and 4-speed record on a CD-R/CD-RW write mode.

The COMBO drive is shown in figure 1-7. Specifications are listed in Table 1-6.

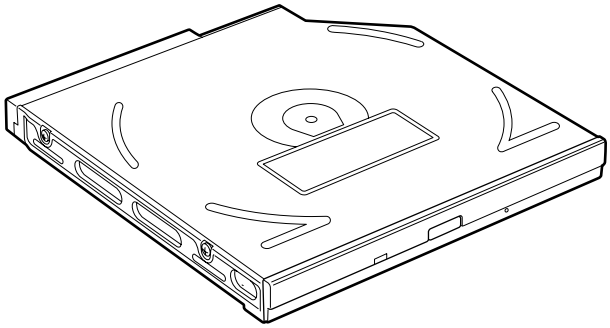


Figure 1-9 COMBO drive

Table 1-6 COMBO drive specifications

Item	Matsushita UJDA720 or TOSHIBA SD-R2102		
	DVD-ROM mode	**CD-ROM mode**	**CD-R/CD-RW (Write)**
ATAPI Burst (Mbytes/s)	33.3 (Ultra DMA mode 2) 16.7 (PIO Mode 4, Multi word DMA mode 2)		
Access time (ms) Average Full Stroke Access	180	130	-
Data Buffer Capacity (Mbytes)	2		
Supported Format	DVD: DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R (read) CD: CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video-CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW		CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video-CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio)

1.9 Power Supply

The power supply supplies many different voltages to the system board and performs the following functions:

1. Checks power input to determine:
    - Whether the AC adaptor is connected to the computer
    - Whether the battery pack is installed and supplying power

2. Checks power supply's internal controls:
    - Battery pack charging: start, stop and voltage supplied to the battery pack
    - Power supply system: Power supplied from a DC power source (AC adaptor)
    - Faulty power supply: Executes forced shutdown if needed
    - Logic: Power supply to various circuits
    - Charging current to PWM control IC for battery pack charging

3. Controls the following aspects of the logic system
    - Power supply to gate arrays
    - Power on/off

4. Indicates the following:
    - DC IN (sets LED to orange or green)
    - Battery icon (sets LED to orange or green)
    - Faulty power supply by low battery

5. Interface for the following:
    - BIOS via EC/KBC
    - Function mode of power supply

6. Detects the following:
    - Input voltage to logic system
    - Input voltage, overvoltage and input/output to battery pack
    - Battery pack's internal temperature
    - Input voltage to DC power supply (output from AC adaptor)

The power supply output rating is specified in Table 1-7.

Table 1-7 Power supply output rating

Device	Name	DC Voltage (V)	Power supplied Yes/No		
			Power off Suspend	Power off Boot mode	No battery *1)
CPU	PPV	1.0 to 1.3	No	No	No
CPU, Pull-ups	P0V	1.3	No	No	No
ICH3-M	P1V	1.8	No	No	No
MCH-M, ICH3-M	E1V	1.8	Yes	No	No
ICH3-M (Always)	S1V	1.8	Yes	No	No
Clock Generator, PWRGOOD	P3V	3.3	No	No	No
Tristar, MCH-M	AGP I/O	1.5 or 3.3	Yes	No	No
Tristar	BGV	1.85	Yes	No	No
MCH-M, YEBISU3S-GA, Tristar, PC Card Slot(s), miniPCI	B3V	3.3	Yes	No	No
YEBISU3S-GA, PC Card Slot(s)	B5V	5	Yes	No	No
Clock Generator, ICH3-M, YMF753, miniPCI	P3V	3.3	No	No	No
IPSC, LED's, LCD Panel, miniPCI, HDD, Flash ROM, Slim Select Bay *2)	P5V	5	No	No	No
Pull-ups	B15V	15	Yes	No	No
ICH3-M (Always)	S3V	3	Yes	Yes	No
EC/KBC	S5V	5	Yes	Yes	No
PSC	MCV	5	Yes	Yes	No
ICH3-M (RTC)	R3V	3.3	Yes	Yes	Yes

*1) Both Main battery and Sub Battery are empty, and only RTC Battery is charged.

*2) CD-ROM or DVD-ROM drive Unit is attached.

1.10 Batteries

The computer has three types of batteries as follows:

- Main battery pack
- RTC battery
- Secondary battery pack (Optional Slim Select Bay Module)

The battery specifications are listed in Table 1-8.

Table 1-8 Battery specifications

Battery name	Material	Output voltage	Capacity
Main battery	Lithium-Ion	10.8 V	3,600 mAh
RTC battery	Lithium-Ion	3.0 V	17 mAh
Secondary battery pack	Lithium-Ion	10.8 V	3,000 mAh

1.10.1 Main Battery

The removable main battery pack is the computer's main power source when the AC adaptor is not attached. The main battery maintain the state of the computer when the computer enters in resume mode.

1.10.2 Battery Charging Control

Battery charging is controlled by a power supply microprocessor. The microprocessor controls whether the charge is on or off and detects a full charge when the AC adaptor and battery are attached to the computer. The system charges the battery using quick charge.

Quick Battery Charge

When the AC adaptor is attached, there are two types of quick charge: quick charges 1 when the system is powered off and quick charge 2 when the system is powered on.

Table 1-9 Time required for quick charges

Status	Computer only Charging time	Port Replicator 2001
Quick charge 1 (power off)	2.5 hours	2.5 hours
Quick charge 2 (power on)	3.0 to 8.0 hours or longer	

NOTE: *The time required for quick charge 2 is affected by the amount of power the system is consuming. Use of the fluorescent lamp and frequent disk access diverts power and lengthens the charge time.*

If any of the following occurs, the battery quick charge process stops.

1. The battery becomes fully charged.
2. The AC adaptor or battery is removed.
3. The battery or output voltage is abnormal.

- ❑ Detection of full charge

A full charge is detected only when the battery is charging at quick charge. A full charge is detected under any of the following conditions:

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

1.10.3 RTC battery

The RTC battery provides power to keep the current date, time and other setup information in memory while the computer is turned off. Table 1-10 lists the charging time and data preservation period of the RTC battery.

Table 1-10 RTC battery charging/data preservation time

Status	Time
Charging Time (power on)	50 hours
Data preservation period (full charge)	1 month

Chapter 2

Troubleshooting Procedures

Chapter 2 Contents

Figures

Tables

2.1 Troubleshooting

Chapter 2 describes how to determine if a Field Replaceable Unit (FRU) in the computer is causing the computer to malfunction. The FRUs covered are:

1. System Board
2. Floppy Disk Drive
3. Hard Disk Drive
4. Keyboard
5. Display
6. CD-R/RW Drive
7. COMBO Drive
8. Modem
9. LAN
10. Bluetooth
11. Wireless LAN
12. Sound components

The Diagnostics Disk operations are described in Chapter 3. Detailed *Replacement Procedures* are given in Chapter 4, *Replacement Procedures*.
The following tools are necessary for implementing the troubleshooting procedures:

1. Diagnostics Disk
2. Phillips screwdriver (2 mm)
3. LH-STIX screwdriver
4. Toshiba MS-DOS system disk(s)
   (You must install the following onto the disk: SYS.COM, FORMAT.COM, FDISK.COM and FDISK.EXE)
5. 2DD or 2HD formatted work disk for floppy disk drive testing
6. Cleaning kit for floppy disk drive troubleshooting
7. Serial port wraparound connector
8. PC card wraparound card
9. Multimeter
10. External USB FDD
11. External USB keyboard and Mouse
12. Headphone
13. Microphone
14. USB test module and USB cable
15. TOSHIBA CD-ROM TEST DISK (ZA1217P01/P000204190)
16. DVD-ROM TSD-1 (TOSHIBA EMI DVD Test Media)
17. Music CD
18. CD-RW Media (blank)
19. RJ11 connector checker
20. S/PDIF Speaker
21. Advanced Port Replicator
22. Personal computer that can communicate by wireless LAN for wireless LAN troubleshooting
23. Personal computer that can communicate by Bluetooth for Bluetooth troubleshooting
24. Antenna test cable

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 the user if a password is registered and, if it is, ask him or her to enter the password. If the user has forgotten the system password, perform the following procedure at the appropriate step in the flowchart in figure 2-1:

  Connect the printer port in the Port Replicator, hold down the "P" key and turn the POWER switch on. The computer will override the password function by erasing the current password.

- Verify with the customer that Microsoft 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.

- Make sure the External USB floppy disk drive is empty.

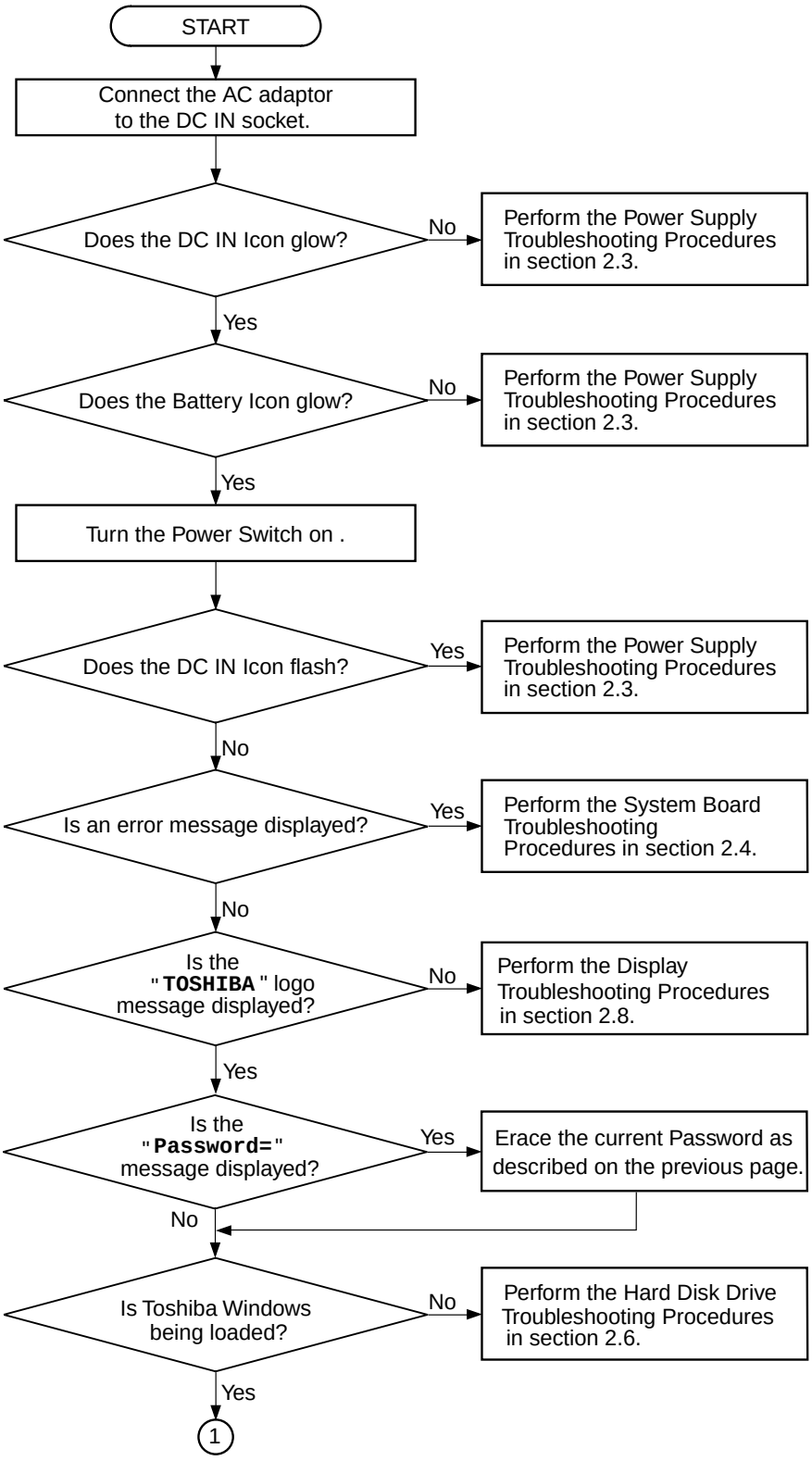


Figure 2-1 Troubleshooting flowchart (1/2)

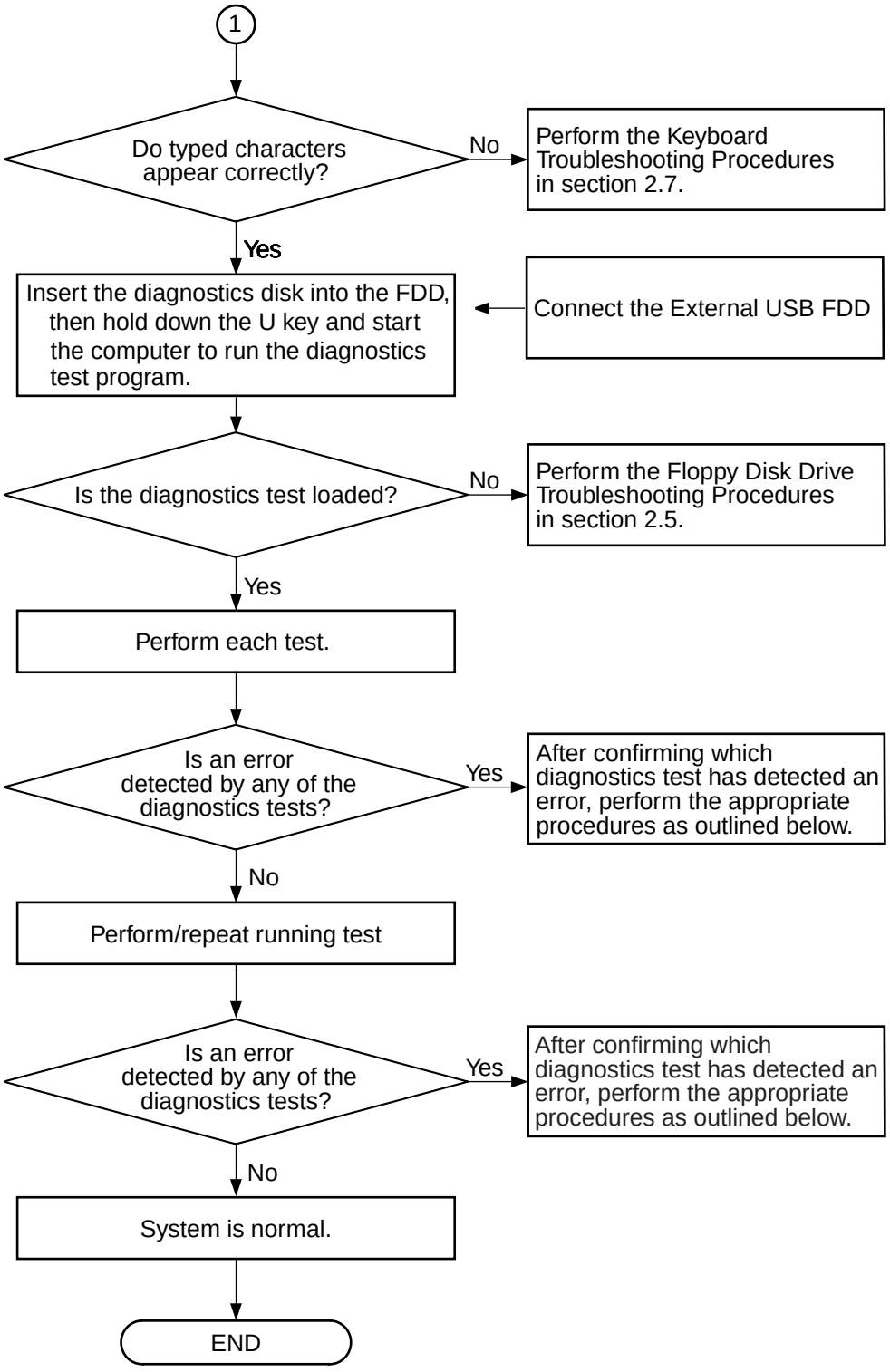


Figure 2-1 Troubleshooting flowchart (2/2)

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

1. If an error is detected on the system test, memory test, real timer test, perform the System Board and Processor Module Troubleshooting Procedures in Section 2.4.

2. If an error is detected on the floppy disk test, perform the 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 detected on the keyboard test, perform the Keyboard Troubleshooting Procedures in Section 2.7.

5. If an error is detected on the display test, perform the Display Troubleshooting Procedures in Section 2.8.

6. If an error is detected on the CD-RW test, perform the CD-R/RW Drive Troubleshooting Procedures in Section 2.9.

7. If an error is detected on the CD-ROM/DVD-ROM test, perform the CD-ROM/DVD-ROM/COMBO 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 Bluetooth test, perform the Bluetooth Troubleshooting Procedures in Section 2.13.

11. If an error is detected on the Wireless LAN test, perform the Wireless LAN Troubleshooting Procedures in Section 2.14.

12. If an error is detected on the sound test, perform the Sound Troubleshooting Procedures in Section 2.15.

2.3 Power Supply Troubleshooting

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

Procedure 1: Icons in the Sub LCD Check

Procedure 2: Error Code Check

Procedure 3: Connection Check

Procedure 4: Charge Check

Procedure 5: Replacement Check

Procedure 1 Icons in the LCD Check

The following Icons in the LCD indicate the power supply status:

- Battery icon
- DC IN icon

The power supply controller displays the power supply status through the Battery icon and the DC IN icon in the LCD as listed in the tables below. To check the power supply status, install a battery pack and connect an AC adaptor.

Table 2-1 Battery Icon

Battery Icon	Power supply status
Lights Outline of the Battery	Main Battery is installed
Flashes / Lights	Charge / Full charge
Doesn't light	Main Battery is NOT installed

Table 2-2 DC IN Icon

DC IN icon	Power supply status
Lights	DC power is being supplied from the AC adaptor.
Doesn't light	Any condition other than those above.

Procedure 2 Error Code Check

If the power supply microprocessor detects a malfunction, it indicates the error code as shown below.

The error code begins with the least significant digit.

Error code

Error code	Where Error occurs	
1*h	Adaptor (AC Adaptor, DS)	AC Adaptor is not connected. Error code begins with : 0x10 Error code ends with : 0x1F
2*h	The 1st battery	The 1st Battery is not connected. Error code begins with : 0x20 Error code ends with : 0x2F
3*h	The 2nd Battery	The 2nd Battery is not connected. Error code begins with : 0x30 Error code ends with : 0x3F
4*h	S3V output	Operating Power ON Error code begins with : 0x40 Error code ends with : 0xDF
5*h	C5V output	
6*h	C3V output	
7*h	PPV output	
8*h	PGV output	
9*h	1R5-E1V output	
A*h	1R8-E1V output	
B*h	BVGAV output	
C*h	1R25-E1V output	
D*h	2R5-E2V output	
E*h		
F*h		

Check 1 Compare the patterns in the hexadecimal error code to the tables below.

- ❑ DC IN

Error code	Meaning
10h	AC Adaptor output voltage is over 16.5V.
11h	Enhanced Port Replicator output voltage is over 16.5V.
12h	Current from the DC power supply is over the limit (6.05A).
13h	Current from the DC power supply is over the limit (0.5A) when there is no load.
14h	Current sensing IC is not normal.

- ❑ 1st Battery

Error code	Meaning
20h	Main battery voltage is over 13.46V. (Not supported)
21h	Main battery charge current is over 6.05A.
22h	Main battery discharge current over 0.5A.
23h	Main battery charge current is over 3.5A.
24h	Current sensing IC is not normal.
25h	Main battery charge current is over 0.3A when there is no charging.

- ❑ 2nd Battery

Error code	Meaning
30h	Secondary battery voltage is over 13.46V. (Not Supported)
31h	Secondary battery charge current is over 6.05A.
32h	Main battery discharge current over 0.5A.
33h	Secondary battery charge current is over 3.5A.
34h	Current sensing IC is not normal.
35h	Secondary battery charge current is over 0.3A when there is no charging.

- S3V output

Error code	Meaning
40h	S3V voltage is under or equal to 3.14V. (On/Off)
45h	S3V voltage is under or equal to 3.14V. (Staring)

- C5V output

Error code	Meaning
50h	C5V voltage is over 6.00V.
51h	C5V voltage is under or equal to 4.50V when the computer is powered on.
52h	C5V voltage is under or equal to 4.50V when the computer is booting up.
53h	C5V voltage is abnormal when the computer is suspended.
54h	C5V voltage is abnormal when the computer shuts down.
55h	C5V voltage is less than 4.50V when the computer is starting.

- C3V output

Error code	Meaning
60h	C3V voltage is over 3.96V.
61h	C3V voltage is under or equal to 2.81V when the computer is powered on.
62h	C3V voltage is under or equal to 2.81V when the computer is booting up.
63h	C3V voltage is abnormal when the computer is suspended.
64h	C3V voltage is abnormal when the computer shuts down.
65h	C3V voltage is less than 2.81V when the computer is starting.

- PPV output

Error code	Meaning
70h	PPV voltage is over 1.56V.
71h	PPV voltage is under or equal to 0.68V when the computer is powered on.
72h	PPV voltage is under or equal to 0.68V when the computer is booting up.
73h	PPV voltage is over or equal to 0.68V when the computer is powered off.

- BGV output

Error code	Meaning
80h	BGV voltage is over 2.28V.
81h	BGV voltage is under or equal to 1.53V when the computer is powered on.
82h	BGV voltage is under or equal to 1.53V when the computer is booting up.
83h	BGV voltage is over or equal to 1.53V when the computer is powered off.
84h	BGV voltage is abnormal when the computer is suspended or over 1.53V when the computer is suspended. Also, BGV voltage is more than 1.53V when the power off.

- 1R5-E1V output

Error code	Meaning
90h	1R5-E1V voltage is more than 1.80V when the computer is powered on or off.
91h	1R5-E1V voltage is not more than 1.275V when the computer is powered on.
92h	1R5-E1V voltage is not more than 1.275V when the computer is booting up.
93h	1R5-E1V voltage is not less than 1.275V when the computer is powered off.
94h	1R5-E1V voltage is not more than 1.275V when the computer is suspended.

- 1R8-E1V output

Error code	Meaning
A0h	1R8-E1V voltage is more than 2.16V when the computer is powered on or off.
A1h	1R8-E1V voltage is not more than 1.53V when the computer is powered on.
A2h	1R8-E1V voltage is not more than 1.53V when the computer is booting up.
A3h	1R8-E1V voltage is not less than 1.53V when the computer is powered off.
A4h	1R8-E1V voltage is not more than 1.53V when the computer is suspended.

- BGV output

Error code	Meaning
B0h	BGV voltage is over 2.28V.
B1h	BGV voltage is under or equal to 1.53V when the computer is powered on.
B2h	BGV voltage is under or equal to 1.53V when the computer is booting up.
B3h	BGV voltage is over or equal to 1.53V when the computer is powered off.
B4h	BGV voltage is abnormal when the computer is suspended or over 1.53V when the computer is suspended. Also, BGV voltage is more than 1.53V when the power off.

- 1R25-E1V output

Error code	Meaning
C0h	1R25-E1V voltage is more than 1.50V when the computer is powered on or off.
C1h	1R25-E1V voltage is not more than 1.063V when the computer is powered on.
C2h	1R25-E1V voltage is not more than 1.063V when the computer is booting up.
C3h	1R25-E1V voltage is not less than 1.063V when the computer is powered off.
C4h	1R25-E1V voltage is not more than 1.063V when the computer is suspended.

- 2R5-E1V output

Error code	Meaning
D0h	2R5-E1V voltage is more than 3.00V when the computer is powered on or off.
D1h	2R5-E1V voltage is not more than 2.125V when the computer is powered on.
D2h	2R5-E1V voltage is not more than 2.125V when the computer is booting up.
D3h	2R5-E1V voltage is not less than 2.125V when the computer is powered off.
D4h	2R5-E1V voltage is not more than 2.125V when the computer is suspended.

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

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

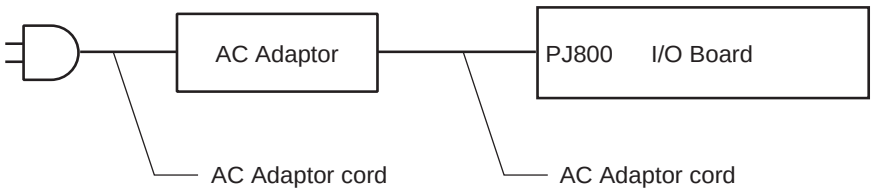
Check 3 In the case of error code 2Xh:

- ❑ Make sure the battery pack is correctly installed in the computer. If the battery pack is correctly installed, go to the following step:
- ❑ Replace the battery pack with a new one. If the error still exists, go to Procedure 5.

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

Procedure 3 Connection Check

The power supply wiring diagram is shown below:



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

Check 1 Disconnect the AC power cord from the wall outlet. Check the power cable for breaks. If the power cord is damaged, connect a new AC power cord. If there is no damage, go to Check 2.

Check 2 Make sure the AC adaptor cord and AC power cord are firmly plugged into the PJ800 DC IN 15 V socket and AC adaptor inlet/wall outlet, respectively. If these cables are connected correctly, go to Check 3.

Check 3 Make sure the DC IN input port where an AC adaptor's DC output plug is connected is firmly secured to the system board.

- If the DC IN input port is loose, go to Procedure 5.
- If it is not loose, go to Check 4.

Check 4 Use a multimeter to make sure the AC adaptor output voltage is close to 15 V. If the output is several percent lower than 15 V, go to Check 5. If the output is close to 15 V, go to Check 6.

Check 5 Connect a new AC adaptor or AC power cord.

- If the DC IN icon does not light, go to Procedure 5.
- If the battery icon does not light, go to Check 6.

Check 6 Make sure the battery pack is installed in the computer correctly. If the battery is properly installed and the battery icon still does not light, go to Procedure 4.

Procedure 4 Charge Check

The power supply may not charge the battery pack. Perform the following procedures:

1. Reinstall the battery pack.
2. Attach the AC adaptor and turn on the power. If you cannot turn on the power, go to Procedure 5.
3. Run the Diagnostic test, go to System test and execute subtest 06 (Quick charge) described in Chapter 3.
4. When charge is complete, the diagnostics test displays the result code. Check the result code against the table below and perform any necessary check.

Result code	Contents	Check items
0	The battery is charging normally.	Normal
1	The battery is fully charged.	Normal
2	The AC adaptor is not attached.	Check 1
3	The AC adaptor's output voltage is not normal.	Check 1
4	The battery is not installed.	Check 2
5	The battery's output voltage is not normal.	Check 3
6	The battery's temperature is not normal.	Check 4
7	A bad battery is installed.	Check 2
8	Any other problems.	Check 5

Check 1 Make sure the AC adaptor and AC power cord are firmly plugged into the DC IN socket and the wall outlet. If these cables are connected correctly, replace the AC adaptor (and/or AC power cord, if necessary).

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

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

Check 4 The battery's temperature is too hot or cold. Return the temperature to a normal operating condition. If the battery pack still is not charged, go to Check 5.

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

Procedure 5 Replacement Check

The system board processor module may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*. Check the connection between the AC adaptor and system board and connection. After checking the connections, perform the following Check 1:

Check 1 Replace the AC adaptor with a new one. If the AC adaptor is still not functioning properly, perform Check 2.

Check 2 Use a multimeter to make sure that the F800, F810 and F820 fuse are not blown. If fuses are not blown, go to Check 3.

Check 3 Replace the system board with a new one following the steps described in Chapter 4, *Replacement Procedures*.

2.4 System Board Troubleshooting

This section describes how to determine if the system board and CPU are defective or not functioning properly. 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: Printer Port LED Check on Resume Mode

Procedure 3: Diagnostic Test Program Execution Check

Procedure 4: Replacement Check

Procedure 1 Message Check

When the power is turned on, the system performs the Initial Reliability Test (IRT) installed in the BIOS ROM. The IRT tests each IC on the system board and initializes it.

- ❑ If an error message is shown on the display, perform Check 1.
- ❑ If there is no error message, go to Procedure 2.
- ❑ If Toshiba MS-DOS or Windows Me is properly loaded, go to Procedure 3.

Check 1 If one of the following error messages displays 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, returns all system settings to their default values. Then the system reboots.

If error message (b) appears often when the power is turned on, replace the RTC battery. If any other error message displays, 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 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) displays, go to Procedure 5.

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

If error message (19) or (20) displays, go to the HDD Troubleshooting Procedures in Section 2.6.

If error message (21) displays, go to the CD-R/RW Drive Troubleshooting Procedures in Section 2.9 or the COMBO Drive Troubleshooting Procedures in Section 2.10

If error message (22) or (23) displays, go to the FDD Troubleshooting Procedures in Section 2.5.

(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) IDE #0 ERROR
(21) IDE #1 ERROR
(22) NO FDD ERROR
(23) FDC ERROR
(24) TIMER INTERRUPT ERROR
(25) RTC UPDATE ERROR

Procedure 2 Printer Port LED Check on Boot Mode

The printer port LED displays the IRT (Initial Reliability Test) status and test status by turning lights on and off as an eight-digit binary value for boot mode. Figure 2-2 shows the printer port LED.

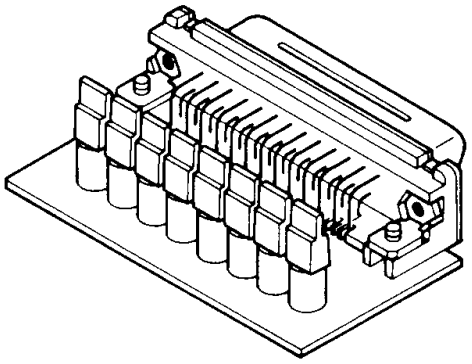


Figure 2-2 Printer port LED

To use the printer port LED follow the steps below:

1. Plug the printer port LED into the parallel port of the Advanced Port Replicator 2001.
2. Read the LED status from left to right as you are facing the back of the computer.
3. Convert the status from binary to hexadecimal notation.
4. If the final LED status is FFh (normal status), go to Procedure 4.
5. If the final LED status matches any of the test status values in Table 2-3, perform Check 1.

***NOTE**: If an error condition is detected by the IRT test, the printer port LED displays an error code after the IRT test ends. For example, when the printer port LED displays B2 and halts, the IRT test has already completed the KBC initialization. In this instance, the IRT indicates an error has been detected during the BIOS rewrite.*

Table 2-3 Printer port LED boot mode status (1/6)

LED Status	Test item	Message
FFh	Start	Register initialization for boot block
B0h	Flash ROM check	PIT ch.0 initialization
		BIOS rewrite flag initialization
		Transition to protected mode
		Boot block checksum
		Checksum check except boot block
B1h	EC/KBC rewrite check	KBC initialization
B2h	BIOS rewrite	BIOS rewrite request check
B3h	System BIOS rewrite transition to IRT	System BIOS rewrite transition to IRT
	Rewriting BIOS	Initializing Power Management I/O space
		Enabling BIOS writing
		Serial interrupt control
		Disabling BIOS write protection
		Enabling SMBus I/O space
		Enabling SMBus access
		PIT channel 1 initialization
		PIT, DMAC, PIC initialization
		DRAM configuration
		Cache bus, L2 initialization, configuration
		Enabling L1 cache
		Memory clear
		Protecting flash ROM area cache
		Disabling cache
		Special register, Intel chip set initialization
B5h	Display initialization for Boot Block	Storing key scan code
		Setting up TASK_1ms_TSC
		Display initialization
B6h	Sound control initialization	Sound controller initialization (for beep)
		Message display
		Key input
		Reading CHGBIOSA.EXE
00h	IRT Check system	PIT ch.1 initialization
01h	Memory check	DRAM type and size check
	SM-RAM stack area test	SM-RAM stack area test

Table 2-3 Printer port LED boot mode status (2/6)

LED Status	Test item	Message
02h	CMOS check and initialization	Configuring cache memory
		Enable L1 cache
		CMOS access test
		CMOS battery level check
		CMOS checksum
		CMOS data initialization (1)
		Set IRT status
		DRAM size storing in CMOS
03h	Resume branch	Resume branch check
		SM-RAM checksum
		SMI control flag clear
		System BIOS RAM area checksum
		System BIOS ROM to RAM copy
1FH		Wake Up check
		SMRAM base rewrite
20h		PnP RAM checksum
		PIT test and initialization
06h	Grant SMI	CPU check measure
		Enabling SMI except for auto-off function
		Set clock generator
		Set CPU clock to high
		Check model specific info
		PIC register restore
		KBC initialization
07h	Resume process	Resume process to resume main
		Resume error process
	System BIOS ROM/RAM copy	AGP bridge initialization
04h	SMRAM initialization	SMRAM initialization
		Wake Up check
		SMRAM base rewrite and BIOS CPU state map store
		Initializing SMRAM
05h	Initializing a PIT and a CPU	Initializing the channel 0 of a PIT
		Initializing the channel 2 of a PIT
		Testing the channel 1 of a PIT

Table 2-3 Printer port LED boot mode status (3/6)

LED Status	Test item	Message
05h	Initializing a PIT and a CPU	Testing the channel 2 of a PIT
		Measuring the clock speed of a CPU
		Enabling SMIs except auto-off feature
		Handling events from an EC
		Performing timeshared process for time measurement of IRT
		Updating microcodes
		Enabling or disabling the function of processor serial number ID
		Checking whether Geyserville is supported
		Switching CPU clock speed to high
06h	Read EC version	Read EC version
		CMOS default setup check
		ACPI table initialization
		KBC initialization
	VGA initialization Sound initialization Modem initialization Get multi-box status	VGA display off and reset control
		Sound controller initialization
		Modem reset power down release process
		Get multi-box status
	PCI initialization	PCI initialization
		PCI test
		Check if self test is required
		Password initialization
07h	PCI initialization	PCI bus initialization (DS bus connect)
		Wait for LAN controller reset completion
		Wake Up check
08h	CMOS data initialization	CMOS data initialization (2)
		PnP initialization
	SET UP	Set SETUP item
		Running a task waiting for the end of INIT_PCI
		Waiting for the end of multiple box states check
		Set processing speed
		System speaker volume control (Beep)
		H/W configuration from PnP resource

Table 2-3 Printer port LED boot mode status (4/6)

LED Status	Test item	Message
09h	Serial interrupt control	Serial interrupt control
	Initializing PnP hardwares	Initializing PC Card Slots
	Configuration	Initializing SIO
		Initializing FIR
		Creating a work area for auto configuration
		Configuration
		Storing the results of VGA configuration
	HDD initialization	PCI device open and vender ID rewrite
	FDD initialization	PCI automatic configuration
0Ah		Set printer port
		HDD initialization
		SD initialization
		HC initialization and USB device Recognition/Initialization
		IRQ routing table update
	Output code generation	Output code generation
0Bh	First 64KB memory check	First 64KB memory check
0Ch	Initializing interrupt vectors	Initializing interrupt vectors
0Dh	NDP initialization	NDP initialization
0Eh	Setting up system	Storing CMOS error information in SMRAM
		Initializing timer
		Initializing a buffer for power saving
		Initializing an EC, and reading battery information
		Updating system BIOS (model name, and EDID of the LCD)
0Fh	Initializing the display	Initializing VGA BIOS
10h	Display logo	Display logo
11h	Checking system memory	Checking system memory
12h	Extension memory check	Extension memory check
13h	Initializing system memory	Initializing system memory
15h	Checking DMA pages	Checking DMA pages
16h	DMAC check	DMAC check
17h	DMAC initialization	DMAC initialization (Boot)

Table 2-3 Printer port LED boot mode status (5/6)

LED Status	Test item	Message
18h	Printer check	Printer check
19h	SIO check	SIO check
		Wait for SIO initialization process completion
1Ah	Checking password	Waiting for the end of the HDD initialization
		Checking key-in pressed during the IRT
		Loading BM
		Prioritizing ATA
		Initializing BM
		Entering password
		Canceling BM
1Bh	Checking EX I/O ROM	Checking extension I/O ROM
82h	HDD initialization	Wait for HDD initialization process completion
83h		IRT key input check
		ATA priority initialization
		Password input
		Wait for KBC / Mouse initialization completion
C0h	PnP configuration	PCI IRQ configuration
1Bh	Extension I/O ROM check	Extension I/O ROM check
1Ch	Final setting up prior to boot-up	Storing the value of 40;00
		Setting up the address of font data for resuming
		Setting up the parameters for character repeat on a USB keyboard
		Getting keys pressed during the IRT
		Storing shadow RAM size
		Updating system resources information prior to boot-up
		Renewing memory mapping data for INT15h E820h
		Updating a table for DMI
		Copying an ACPI table to the top of an expansion
		Waiting for the end of writing PSC version on BIOS
		Waiting for the end of serial port initialization
		Canceling NMI mask
		Examining the checksum of TIT
		Clearing IRT running flag for runtime
		Update checksum for runtime
		Branching to hibernation
		Initializing Bluetooth
		Checking whether a CPU, an HDD or other component have been upgraded

Table 2-3 Printer port LED boot mode status (6/6)

LED Status	Test item	Message
1Ch		Setting up battery safe mode
		Setting up date
		Waiting for the end of AC-Link initialization
		Waiting for the end of Bluetooth initialization
		Updating DMI Wakeup factor and SM-BIOS structure table
		Closing configuration space of PCI devices
		Cache control
		Updating parameter block A
		Setting up the clock speed of the CPU to the appointed value by the Setup
		Waiting for the motor off of a disabled HDD
		Concluding FDD information
		Clearing power button status
		Enabling the power button
FFh	End	

Check 1 If the following error codes are displayed, go to Procedure 5.

B0h, B1h, B2h, B3h, B4h, B5h, B6h, 00h, 01h, 02h, 03h, 04h, 05h, 06h, 07h, 08h, 09h, 0Ah, 0Bh, 0Ch, 0Dh, 0Eh, 0Fh, 10h, 11h, 12h, 13h, 14h, 15h, 16h, 17h, 18h, 19h, 1Bh, 1Ch, 1Dh, 1Eh

Check 2 If error code 81h or 82h is displayed, go to Section 2.5 FDD Troubleshooting and Section 2.6 HDD Troubleshooting.

Procedure 3 Diagnostic Test Program Execution Check

Execute the following tests from the Diagnostic Test Menu. Refer to Chapter 3, *Tests and Diagnostics,* 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. Hard Disk test
7. Real Timer test
8. NDP test
9. Expansion test
10. Sound/LAN/Modem test
11. CD-ROM/DVD-ROM test
12. Bluetooth test
13. Wireless LAN test

If an error is detected during these tests, go to Procedure 3.

Procedure 4 Replacement Check

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

Check 1 Visually check for the following:

a) Cracked or broken connector housing

b) Damaged connector pins

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

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

2.5 FDD Troubleshooting

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

Procedure 1: FDD Head Cleaning Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Replacement Check

Procedure 1 FDD Head Cleaning Check

FDD head cleaning operation details are given in Chapter 3, *Tests and Diagnostics*.

Insert the Diagnostics Disk in the computer's floppy disk drive, turn on the computer and run the test. Clean the FDD heads using the cleaning kit. If the FDD still does not function properly after cleaning, go to Procedure 2.

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

Procedure 2 Diagnostic Test Program Execution Check

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

Floppy disk drive test error codes and their status names are listed in Table 2-3. Make sure the floppy disk is formatted correctly and that the write protect tab is disabled. If any other errors occur while executing the FDD diagnostics test, go to Check 1.

Table 2-4 FDD error code and status

Code	Status
01h	Bad command
02h	Address mark not found
03h	Write protected
04h	Record not found
06h	Media removed on dual attach card
08h	DMA overrun error
09h	DMA boundary error
10h	CRC error
20h	FDC error
40h	Seek error
60h	No FDD
80h	Time out error (Not ready)
EEh	Write buffer error
FFh	Data compare error

Check 1 If the following message displays, disable the write protect tab on the floppy disk. If any other message appears, perform Check 2.

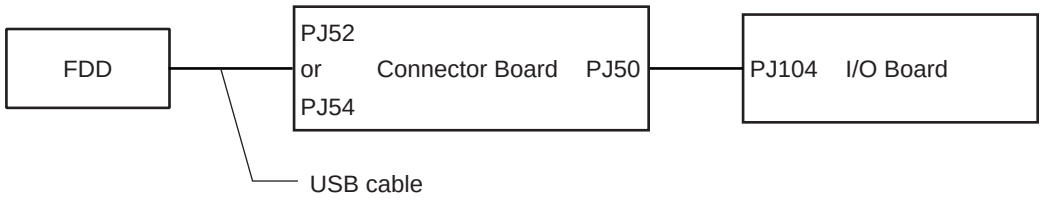
```
Write protected
```

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

Procedure 3 Connector Check and Replacement Check

The 3.5inch FDD is connected to the System Board.

Check 1 Make sure the USB cable is securely connected to the FDD.



Also, check the cables between connector board, I/O board and system board.

- Whether cables are disconnected
- Whether connectors are squarely connected
- Whether connectors are firmly connected
- Whether if connectors are defective
- If any of the connections are loose, reconnect firmly and repeat Procedure 2.
- If any connector is damaged, replace it with a new one and repeat Procedure 2.
- If there is still an error, go to Check 2.

Check 2 The FDD cable may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the FDD is still not functioning properly, perform Check 3.

Check 3 Replace the System board with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.6 HDD Troubleshooting

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

Procedure 1: Message Check

Procedure 2: Partition 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 you execute the HDD troubleshooting procedures. Transfer the contents of the hard disk to floppy disks or other storage media.*

Procedure 1 Message Check

When the computer's HDD does not function properly, some of the following error messages may appear on the display. Start with Check 1 below and perform the other checks as instructed.

Check 1 If any of the following messages appear, go to Procedure 5. If the following messages do not appear, perform Check 2.

```
HDC ERROR (After 5 seconds this message will disappear.)
```

or

```
IDE #0 ERROR (After 5 seconds this message will disappear.)
```

or

```
IDE #1 ERROR (After 5 seconds this message will disappear.)
```

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

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

or

```
Non-System disk or disk error
Replace and press any key
```

Check 3 See whether the Hard Disk option is set to Not used. If it is set to Not used, choose another setting and restart the computer. If the problem still exists, go to Procedure 2.

Procedure 2 Partition Check

Insert the Toshiba MS-DOS system disk and restart the computer with U key holding down. Perform the following checks:

Check 1 Type **C:** and press **Enter**. If you cannot change to drive C, go to Check 2. If you can change to drive C, go to Check 3.

Check 2 Type **FDISK** and press **Enter**. Choose Display Partition Information from the FDISK menu. If drive C is listed, go to Check 3. If drive C is not listed, return to the FDISK menu and choose the option to create a DOS partition on drive C. Restart the computer from the Toshiba MS-DOS system disk. If the problem still exists, go to Procedure 3.

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. Restart the computer and then go to Procedure 3.

Check 4 Remove the FD and restart the computer. If the problem still exists, go to Procedure 3.

Check 5 Using the **SYS** command on the Toshiba MS-DOS system disk, install system files on the HDD.

If the following message appears on the display, the system files have been transferred to the HDD. Restart the computer. If the problem still exists, go to Procedure 3.

```
System transferred
```

***NOTE**: If the computer is running Windows 2000, OSR2 or higher and the hard disk has more than 512 MB capacity, the FDISK program will ask if you need support for a partition larger than 2GB. Select Y for large partition support; however, be sure to read the precaution regarding access by other operating systems.*

Procedure 3 Format Check

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

Check 1 Format the HDD and transfer system files using **FORMAT C:/S/U**. If the following message appears on the display, the HDD is formatted.

```
Format complete
```

If an error message appears on the display, refer to the Toshiba MS-DOS Manual for more information and perform Check 2.

Check 2 Using the Diagnostics Disk, format the HDD with a low level format option. Refer to Chapter 3, *Tests and Diagnostics* for more information about the diagnostic program.

If the following message appears on the display, the HDD low level format is complete. Partition and format the HDD using the MS-DOS FORMAT command.

```
Format complete
```

If you cannot format the 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. Replace the HDD with a new one following the instructions in Chapter 4, *Replacement Procedures*. The error codes and statuses are listed in Table 2-4. If an error code is not generated and the problem still exists, go to Procedure 5.

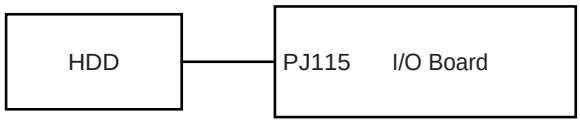
Table 2-5 Hard disk drive error code and status

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

Procedure 5 Connector Check and Replacement Check

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

Check 1 Make sure the HDD is firmly connected to the I/O board.



If any of the connections are loose, reconnect firmly and repeat Procedure 1. If there is still an error, go to Check 2.

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

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

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

2.7 Keyboard and PAD I/F Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

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

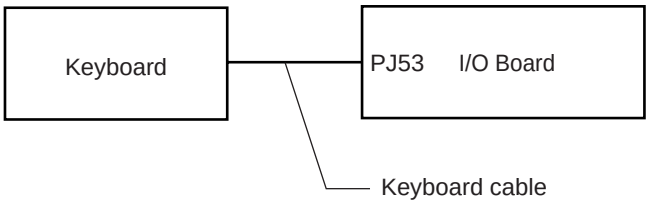
If an error occurs, go to Procedure 2. If an error does not occur, the keyboard is functioning properly.

Procedure 2 Connector and Replacement Check

The keyboard, PAD I/F and PAD Switch may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

1. If the keyboard malfunctions, start with Check 1.
2. If the PAD I/F malfunctions, start with Check 3.
3. If the PAD Switch malfunctions, start with Check 5.

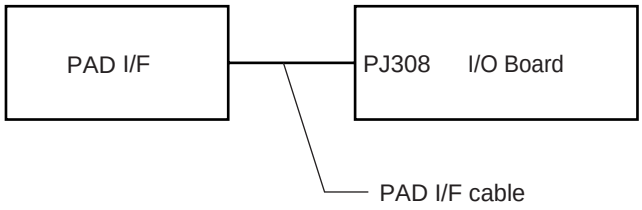
Check 1 Make sure the keyboard cable is securely connected to the I/O board.



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

Check 2 The keyboard or its cable may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 7.

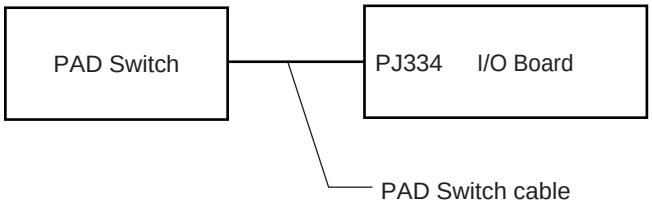
Check 3 Make sure the PAD interface cable is firmly connected to the system board.



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

Check 4 The PAD interface or its cable may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 7.

Check 5 Make sure the PAD Switch cable is firmly connected to the I/O board.



If the connection is loose, reconnect firmly and repeat Procedure 1. If there is still an error, go to Check 6.

Check 6 The PAD Switch may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If there is still an error, go to Check 7.

Check 7 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.8 Display Troubleshooting

This section describes how to determine if the computer's display is functioning properly. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector and Cable Check

Procedure 3: Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

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

Procedure 2 Connector and Cable Check

The LCD Module is connected to the system board by an LCD/FL cable. The FL inverter board is also connected to the system board by an LCD/FL cable. The connectors may be disconnected from the system board or may be damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*.

If the connection is loose, reconnect firmly and restart the computer. If there is still an error, go to Procedure 3.

Procedure 3 Replacement Check

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

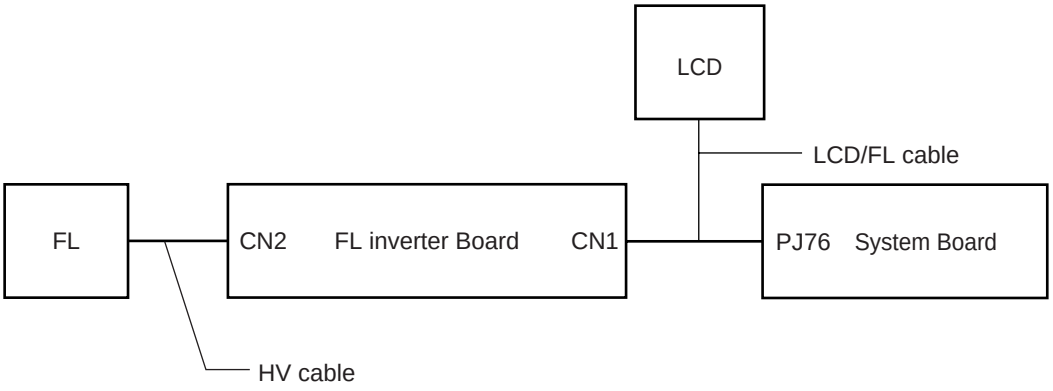
If the FL does not light, perform Check 1.

If characters or graphics are not displayed clearly, perform Check 1.

If some screen functions do not operate properly, perform Check 3.

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

Check 1 Replace the FL with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still exists, perform Check2.



Check 2 Replace the FL with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still exists, perform Check 3.

Check 3 Replace the LCD module with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still exists, perform Check 4.

Check 4 Replace the display cable (FL cable and LCD cable) with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still exists, perform Check 5.

Check 5 The display controller on the system board may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.9 CD-R/RW Drive Troubleshooting

This section describes how to determine if the computer's internal CD-R/RW drive is functioning properly. Perform the steps below starting with Procedure 1 and continue with the other procedures as required.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

The CD-ROM/DVD-ROM test program is stored in the Diagnostics Disk.

For the CD-R/RW test, prepare a test CD-RW.

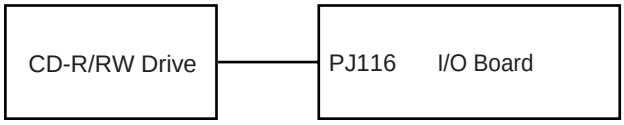
Then insert the Diagnostics Disk in the computer's floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics*, for more information about the diagnostics test procedures.

If any errors occur while executing the CD-ROM/DVD-ROM test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The CD-R/RW drive is connected to the system board. The connectors may be disconnected from the system board or may be damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

Check 1 Make sure the CD-R/RW drive is firmly connected to the I/O board.



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

Check 2 The CD-R/RW drive may be defective or damaged. Replace the drive with a new one. If there is still an error, go to Check 3.

Check 3 Replace the system board with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 4.

2.10 COMBO Drive Troubleshooting

This section describes how to determine if the CD-ROM/DVD-ROM/COMBO drive in the Slim Select Bay is functioning properly. Perform the steps below starting with Procedure 1 and continue with the other procedures as required.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

The CD-ROM/DVD-ROM test program is stored in the Diagnostics Disk.

For the test, prepare a test DVD-ROM and CD-RW Media (branch).

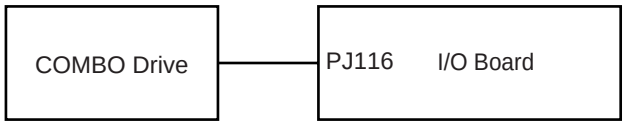
Then insert the Diagnostics Disk in the computer's floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics,* for more information about the diagnostics test procedures.

If any errors occur while executing the CD-ROM/DVD-ROM test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

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

Check 1 Make sure the COMBO drive is firmly connected to the I/O board.



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

Check 2 The COMBO drive may be defective or damaged. Replace the drive with a new one. If there is still an error, go to Check 3.

Check 3 Replace the system board with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 4.

2.11 Modem Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

The Sound/LAN/Modem test program is stored in the Diagnostics Disk.

For the test, prepare a test Sound/LAN/Modem.

Then insert the Diagnostics Disk in the computer’s floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics,* for more information about the diagnostics test procedures.

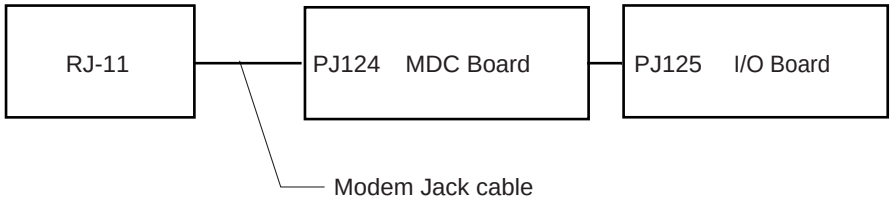
If any errors occur while executing the Sound/LAN/Modem test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The Modem is installed as a modem daughter card (MDC). If the modem malfunctions, there may be a bad connection between the MDC and the system board. Or the MDC, I/O board or their connectors might be damaged.

Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

Check 1 Make sure the MDC cable is firmly connected to PJ125 on the I/O board and make sure the MDC is firmly connected to PJ126 on the I/O board.



If a connector is disconnected, connect it firmly and repeat Procedure 1. If the Modem is still not functioning properly, perform Check 2.

Check 2 The MDC may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the modem is still not functioning properly, perform Check 3.

Check 3 The system board may be defective or damaged. Replace the System Board with a new one following the steps in Chapter 4, *Replacement Procedures.*

2.12 LAN Troubleshooting

This section describes how to determine if the computer's LAN is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

The Sound/LAN/Modem test program is stored in the Diagnostics Disk.

For the test, prepare a test Sound/LAN/Modem.

Then insert the Diagnostics Disk in the computer's floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics,* for more information about the diagnostics test procedures.

If any errors occur while executing the Sound/LAN/Modem test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

An RJ45 jack with LAN cable is connected to the System Board. If the LAN malfunctions, the System Board might be damaged.

Disassemble the computer following the steps described in Chapter 4, Replacement Procedures.

2.13 Bluetooth Troubleshooting

This section describes how to determine if the computer's Bluetooth is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antennas' Connection Check

Procedure 3: Antenna Check

Procedure 4: Replacement Check

Procedure 1 Transmitting-Receiving Check

Make sure the wireless switch on the left side of the computer is turned ON. If it is not, slide the switch toward the back of the computer to turn it on.

Check 1 Execute test program **IMCSPC70.EXE** to check the BD_ADDR of the Bluetooth. Perform the test following the instructions described in Chapter 3, *Bluetooth Test Program (IMCSPC70.EXE)*.

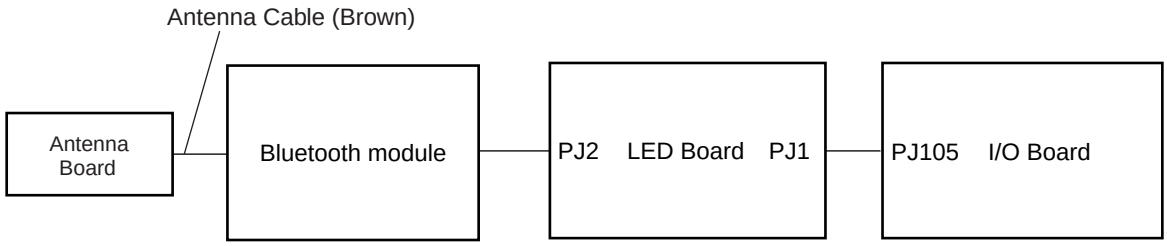
If the computer passes the test, the function is correctly working. If the computer does not pass the test, the Bluetooth board may be disconnected or damaged. Make sure the connector on the Bluetooth board is firmly connected to PJ325 on the I/O board. And perform the test program **IMCSPC70.EXE** again.
If the computer still does not pass the test, go to check 3.

Check 2 Execute test program **IMCSPC50.EXE** to check the transmitting-receiving function of the Bluetooth. You will need a second computer that can communicate by the Bluetooth. Perform the test following the instructions described in Chapter 3, *Bluetooth Test Program (IMCSPC50.EXE)*.
If the computer passes *the* test, the function is correctly working.
If the computer does not pass the test, go to check 3.

Check 3 The Bluetooth board may be defective or damaged. Replace it with a new one. And perform the test program again.
If the computer still does not pass the test, go to Procedure 2.

Procedure 2 Antennas' Connection Check

The Bluetooth function wiring diagram is shown below:



Any of the connections may be disconnected. 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 Bluetooth module is still not functioning properly, perform Check 2.

Check 2 Make sure the Bluetooth module is firmly connected to PJ2 on the LED board.

If the connector is disconnected, connect it firmly and perform Procedure 1. If the Bluetooth module is still not functioning properly, perform Check 3.

Check 3 Make sure the Bluetooth antenna cable (brown) is firmly connected to the Bluetooth module.

If the Bluetooth antenna cable is disconnected, connect it firmly and perform Procedure 1. If the Bluetooth function is still not functioning properly, perform Check 4.

Check 4 Make sure the LED board is firmly connected to connector PJ105 on the I/O board, PJ1 on the LED board. Refer to Chapter 4, *Replacement Procedures*, for detailed steps of disassembling.

In any connections are disconnected, connect them firmly and perform Procedure 1. If the Bluetooth is still not functioning properly, go to Procedure 3.

Procedure 3 Antenna Check

Check 1 Use an antenna test cable to check the antennas' connection. Follow the steps below:

1. Remove the Bluetooth slot cover and lift it off. Refer to Chapter 4, *Replacement Procedures*, for detailed steps of disassembling.
2. Disconnect the Bluetooth antenna cable connected to the Bluetooth module.
3. Connect the end of the antenna test cable to the multimeter.
4. Connect the Bluetooth antenna cable to the antenna test cable. One clip is connected to the end of the Bluetooth antenna cable. The other is connected to the opposite side of the Bluetooth antenna cable.
5. Determine the resistance. The cable passes the test when the resistance is less than 5Ω. If it is more than 5Ω, the Bluetooth antenna cable fails the test.

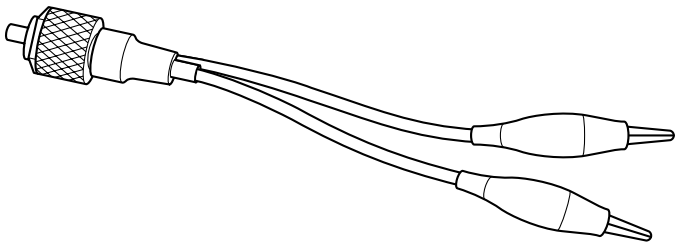


Figure 2-3 Antenna Test cable

NOTE:	*1.*	*The resistances determined with the steps above may not be stable with other machines because of "cable loss," which varies according to the length of the cable. The impedance of the antenna itself is about 0.5-0.8Ω.*
	2.	*The above steps cannot accurately determine the impedance of the antenna. Use an LC meter for a precise measure of impedance.*

If the Bluetooth antenna cable pass the test, connect it to the Bluetooth module and cover the slot, then perform Procedure 1.

If the Bluetooth antenna cable does not pass the test, go to Procedure 4.

Procedure 4 Replacement Check

Check 1 The Bluetooth module may be defective or damaged. Replace the Bluetooth module with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Bluetooth is still not functioning properly, perform Check 2.

Check 2 The I/O board may be defective or damaged. Replace the I/O board with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.14 Wireless LAN Troubleshooting

This section describes how to determine if the computer's Wireless LAN is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antennas' Connection Check

Procedure 3: Antennas' Capability Check

Procedure 4: Replacement Check

Procedure 1 Transmitting-Receiving Check

Make sure the wireless switch on the left side of the computer is turned ON. If it is not, slide the switch toward the back of the computer to turn it on.

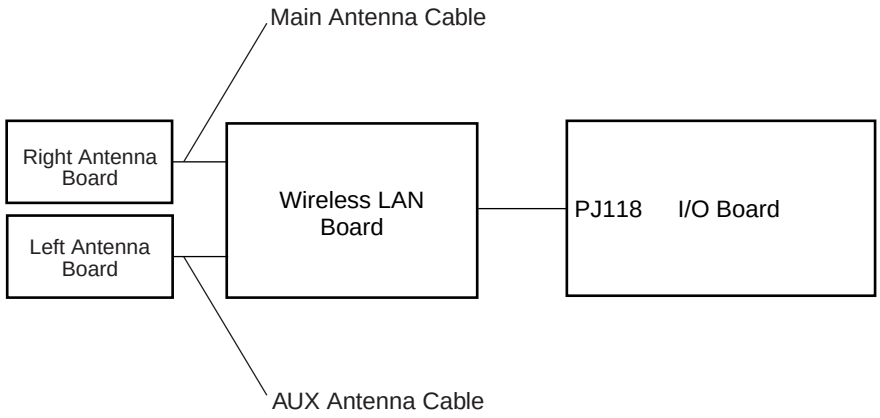
Check 1 Execute test program CERT201T.EXE to check the transmitting-receiving function of the wireless LAN. You will need a second computer that can communicate by the wireless LAN. Perform the test following the instructions described in Section 3.27, *Wireless LAN Test Program (CERT201T.EXE)*.

If the computer passes the test, the function is correctly working.

If the computer does not pass the test, perform Procedure 2.

Procedure 2 Antennas' Connection Check

The wireless LAN function wiring diagram is shown below:



Any of the connections may be disconnected. Disassemble the computer following the steps described in Chapter 4, *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 Bluetooth module is still not functioning properly, perform Check 2.

Check 2 Make sure the wireless LAN board is firmly connected to PJ116 on the I/O board.

If the connector is disconnected, connect it firmly and perform Procedure 1. If the wireless LAN board is still not functioning properly, perform Check 3.

Check 3 Make sure the wireless LAN antenna cables (black and white) are firmly connected to the wireless LAN board.

If the wireless LAN antenna cables are disconnected, connect them firmly and perform Procedure 1. If the wireless LAN function is still not functioning properly, go to Procedure 3.

Procedure 3 Antenna Check

Check 1 Use an antenna test cable to check the antennas' connection. Follow the steps below:

1. Remove the wireless LAN slot cover and lift it off. Refer to Chapter 4, *Replacement Procedures*, for detailed steps of disassembling.
2. Disconnect the wireless LAN antenna cables connected to the wireless LAN board.
3. Connect the end of the antenna test cable to the multimeter.
4. Connect the Main antenna cable to the antenna test cable. One clip is connected to the end of the antenna cable. The other is connected to the opposite side of the antenna cable.
5. Determine the resistance. The cable passes the test when the resistance is less than 5Ω. If it is more than 5Ω, the Bluetooth antenna cable fails the test.
6. Change the antenna cable. Perform from step 3 to check the black antenna cable.

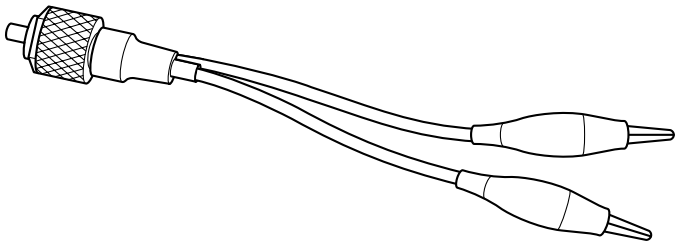


Figure 2-4 Antenna Test cable

NOTE:	*1.*	*The resistances determined with the steps above may not be stable with other machines because of "cable loss," which varies according to the length of the cable. The impedance of the antenna itself is about 0.5-0.8Ω.*
	2.	*The above steps cannot accurately determine the impedance of the antenna. Use an LC meter for a precise measure of impedance.*

If the wireless LAN antenna cables pass the test, connect them to the wireless LAN board and cover the slot, then perform Procedure 1.

If the wireless LAN antenna cables do not pass the test, replace the wireless LAN antenna cables with new ones following the steps in Chapter 4, *Replacement Procedures*. If the wireless LAN is still not functioning properly, go to Procedure 4.

Procedure 4 Replacement Check

The wireless LAN board, wireless communication switch board, I/O board and system board are connected to the circuits. Any of these components may be damaged. Refer to Chapter 4, *Replacement Procedures,* for instructions on how to disassemble the computer and then perform the following checks:

Check 1 Replace the wireless communication board with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still exists, perform Check2.

Check 2 The wireless LAN board may be defective or damaged. Replace the system board with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check3.

Check 3 Replace the I/O board with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still exists, perform Check 4

Check 4 Replace the system board with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again.

2.15 Sound Troubleshooting

This section describes how to determine if the computer's sound functions are functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check

Procedure 3: Replacement Check

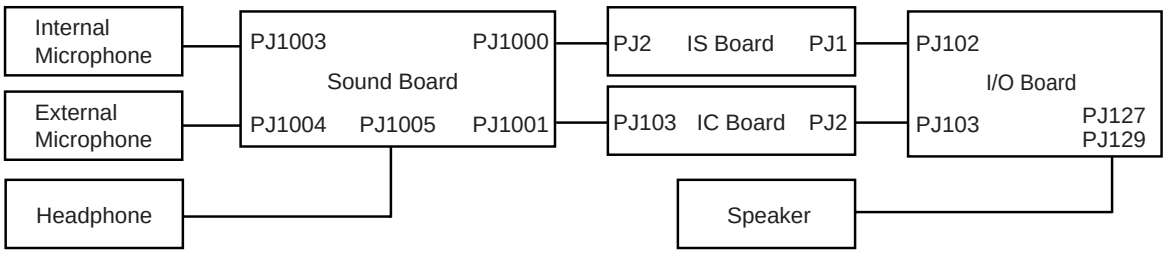
Procedure 1 Diagnostic Test Program Execution Check

The Sound/LAN/Modem test program is stored on the computer’s diagnostic disk. Insert the Diagnostics disk in the computer's floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics*, for details.

If an error is detected, go to Procedure 2.

Procedure 2 Connector Check

The sound function wiring diagram is shown below:



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

If the stereo speakers do not work correctly, perform Check 1.

If headphones do not work correctly, perform Check 2.

If sound recording does not work correctly, perform Check 3.

Check 1 If the stereo speakers do not work properly, the speaker cables may be disconnected. Make sure the speaker cables are firmly connected to PJ127 on the I/O board. If the stereo speakers are still not functioning properly, go to Procedure 3.

Check 2 If headphones do not work properly, the sound board may be disconnected or damaged. Make sure connector PJ1000 and 1001 on the sound board is firmly connected to the I/O board. If the sound function still does not work properly, replace it with a new one. Go to Procedure 3.

Check 3 If the sound recording function does not work properly, the Internal microphone cable may be disconnected. Make sure the microphone cable is firmly connected to PJ1003 on the sound board. If recording is still not functioning properly, go to Procedure 3.

Procedure 3 Replacement Check

Check 1 If the stereo speakers do not sound properly, they may be defective or damaged. Replace them with new ones. If the stereo speakers still do not work properly, go to Check 5.

Check 2 If headphones don't sound properly, the headphone jack may be defective or damaged. Replace the sound board with a new one. If the sound function still does not work properly, go to Check 5.

Check 3 If the sound function does not work properly, the microphone cable may be defective or damaged. Replace it a new one. If the sound function still does not work properly, go to Check 4.

Check 4 The I/O board may be defective or damaged. Replace it with a new one.

Chapter 3
Tests and Diagnostics

Chapter 3 Contents

Figures

Tables

3.1 The Diagnostic Test

This chapter explains how to use the Diagnostic Test program to test the functions of the computer's hardware modules. The Diagnostic Test Program is stored on the Diagnostic Disk. The Diagnostic Test program consists of eight programs that are grouped into the Service Program Module (DIAGNOSTIC TEST MENU).

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

1. *Check all cables for loose connections.*
2. *Exit any application you may be using and close Windows.*
3. *Do not turn on the computer in Windows 2000/XP before you insert the Diagnostics disk in the floppy disk drive. The computer system will hang up. If you insert the Diagnostic disk while the computer is running, shut down the computer, and reboot from the Diagnostics disk.*

The DIAGNOSTIC MENU consists of the following eight functions.

- ❑ DIAGNOSTIC TEST
- ❑ HEAD CLEANING
- ❑ LOG UTILITIES
- ❑ RUNNING TEST
- ❑ FDD UTILITIES
- ❑ SYSTEM CONFIGURATION
- ❑ EXIT TO MS-DOS
- ❑ SETUP

The DIAGNOSTIC TEST MENU contains the following fourteen 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 TEST
- ❑ LAN TEST

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

- ❑ The Diagnostics Disk (all tests)
- ❑ A formatted working disk for the floppy disk drive test
- ❑ An external FDD attachment
- ❑ A cleaning kit to clean the floppy disk drive heads (Head Cleaning)
- ❑ A cleaning kit to clean the DVD-ROM drive heads (Head Cleaning)
- ❑ A PC card wraparound connector for the I/O card test (Expansion test) (Rev.B or higher)
- ❑ Port Replicator 2001
- ❑ A printer wraparound connector for the printer wraparound test (Printer test)
- ❑ A CD test media (TOSHIBA CD-ROM TEST DISK (ZA1217P01/P000204190) and music CD) (CD-ROM test)
- ❑ A DVD test media (Toshiba-EMI DVD-ROM TEST DISK TSD-1)
- ❑ External CRT (Display test)
- ❑ PS/2 or compatible keyboard (Keyboard test)
- ❑ PS/2 or compatible mouse (Keyboard test)
- ❑ Serial port wraparound connector (ASYNC test)
- ❑ Headphone (Sound test)
- ❑ CD-ROM drive (CD-ROM test)
- ❑ A microphone
- ❑ A modular cable and RJ11 connector checker
- ❑ A modular cable and RJ11 connector checker (LED)
- ❑ USB test module and USB cable
- ❑ LAN wraparound connector
- ❑ Music CD (CD-ROM/DVD-ROM test)

The following sections detail the tests within the Diagnostic Test function of the DIAGNOSTIC TEST MENU. Refer to Sections 3.20 through 3.25 for detailed information on the remaining Service Program Module functions.

3.2 Executing the Diagnostic Test

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

1. Insert the Diagnostics disk in the floppy disk drive and turn on the computer. (The Diagnostics Disk contains the MS-DOS boot files.)

> ***NOTE**: To execute the CD-ROM or DVD-ROM test, make sure the CD-ROM and CD-ROM drive or DVD-ROM and DVD-ROM drive is installed in the computer and the external FDD is attached to the USB port.*

The following menu will appear:

```
TOSHIBA Personal Computer  xxxxxxx DIAGNOSTICS
Version X.XX (C) Copyright TOSHIBA Corp. XXXX

DIAGNOSTICS MENU :

  1 - DIAGNOSTIC TEST
  2 - HARD DISK FORMAT
  3 -
  4 - HEAD CLEANING
  5 - LOG UTILITIES
  6 - RUNNNING TEST
  7 - FDD UTILITIES
  8 - SYSTEM CONFIGURATION
  9 - EXIT TO MS-DOS
  0 - SETUP


                                    ↑↓→← : 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, or press **Ctrl** + **C** to stop the test program.*

2. To execute the DIAGNOSTIC TEST MENU from the DIAGNOSTICS MENU, set the highlight bar to **1**, and press **Enter**. The following DIAGNOSTIC TEST MENU will appear:

```
TOSHIBA Personal Computer  xxxxxxx DIAGNOSTICS
Version X.XX (C) Copyright TOSHIBA Corp. XXXX

DIAGNOSTICS MENU :

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

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

Refer to sections 3.4 through 3.17 for detailed descriptions of each Diagnostic Tests 1 through 14. Function 88 sets the floppy disk drive and hard disk drive error retry count. Function 99 exits the submenus of the Diagnostic Test and returns to the Diagnostic Menu.

3. Select the option you want to execute and press **Enter**. The following message will appear:

```
SYSTEM TEST    XXXXXXX          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 – ROM checksum
02 –
03 –
04 – Fan ON/OFF
05 – Geyserville
06 – Quick charge
07 – DMI read
08 – DMI write
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.*

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

```
TEST LOOP : YES/NO
```

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

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

5. The following message will appear:

   ```
   ERROR STOP : YES/NO
   ```

   Then, use the left or right arrow keys to move the cursor to the desired option and press **Enter**.

   Selecting **YES** 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.

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

   Table 3-1 in section 3.3 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.

3.3 Subtest Names

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

Table 3-1 Subtest names (1/2)

No.	Test Name	Subtest No.	Subtest Name
1	SYSTEM	01	ROM checksum
		04	Fan ON/OFF
		05	Geyserville
		06	Quick charge
		07	DMI read
		08	DMI write
2	MEMORY	01	Conventional memory
		02	Protect mode
		04	Cache memory
		05	L2 cache memory
		06	Stress
3	KEYBOARD	01	Pressed key display
		02	Pressed key code display
		03	PS/2 Mouse connect check
		04	Pointing Stick
		05	USB test
		07	In Touch Key
4	DISPLAY	01	VRAM read/write for VGA
		02	Gradation for VGA
		03	Gradation for LCD
		04	Gradation & Mode test for VGA
		05	All dot on/off for LCD
		06	“H” pattern display
		07	LCD Brightness
5	FLOPPY DISK	01	Sequential read
		02	Sequential read/write
		03	Random address/data
		04	Write specified address
		05	Read specified address

Table 3-1 Subtest names (2/2)

No.	Test Name	Subtest No.	Subtest Name
6	PRINTER	01	Ripple pattern
		02	Function
		03	Wrap around
7	ASYNC	01	Wrap around (board)
		02	Point to point (send)
		03	Point to point (receive)
		04	Interrupt test
		06	FIR/SIR point to point (send)
		07	FIR/SIR point to point (receive)
8	HARD DISK	01	Sequential read
		02	Address uniqueness
		03	Random address/data
		04	Cross talk & peak shift
		06	Write specified address
		07	Read specified address
		09	Sequential write
		10	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	I/O card test (PCMCIA)
		03	RGB monitor ID
13	CD-ROM/DVD-ROM	01	Sequential read
		02	Read specified address
		03	Random address/data
		04	Playback music
		05	RW 1Point W/R/C
14	LAN	01	LAN MAC address Display

3.4 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 on the System Board.

Subtest 04 Fan On/Off

This subtest checks fan operation using the on/off command.

```
*** Fan ON *** : Press [Enter] key?
```

When you press **Enter**, the fan should spin.

```
*** Fan OFF *** : Press [Enter] key?
```

When you press **Enter**, the fan should stop.

Subtest 05 Geyserville

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

Subtest 06 Charge

Displays charge status.

Subtest 07 DMI read

Reads the factory setting for the serial and DMI numbers.

```
Model Name          :  XXXXXX
Version Number      :  XXXXXX-XXXXX
Serial Number       :  XXXXXX
Model Number        :  XXXXXX
PCN/BND Number      :  XXXXXX
UUID Number         :  XXXXXX
```

Subtest 08 DMI write

Write to memory the factory setting for serial and DMI numbers, input from the keyboard.

3.5 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 to extended memory (maximum address 100000h) then reads the new data and compares the result with the original data.

The constant data is FFh, AAh, 55h, and 00h.

Subtest 04 Cache Memory

To test the cache memory, a pass-through write-read comparison of '5A' 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 L2 Cache Memory

To test the L2 cache memory, a similar test to that for the cache memory is performed.

Subtest 06 Stress

The conventional memory is provided with a write/read buffer (size 1b30 h) and creates write data in the write buffer. Subsequent to 1 MB, the data is written in the write buffer and is read into the read buffer, followed by a data comparison up to the maximum memory size.

Subtest 07 SPD Memory

This subtest displays the items indicated below for the Serial Presence Detest (SPD) memory installed in each of the A and B slots.

Fundamental memory type
Voltage interface standard of this assembly
System frequency
Total memory

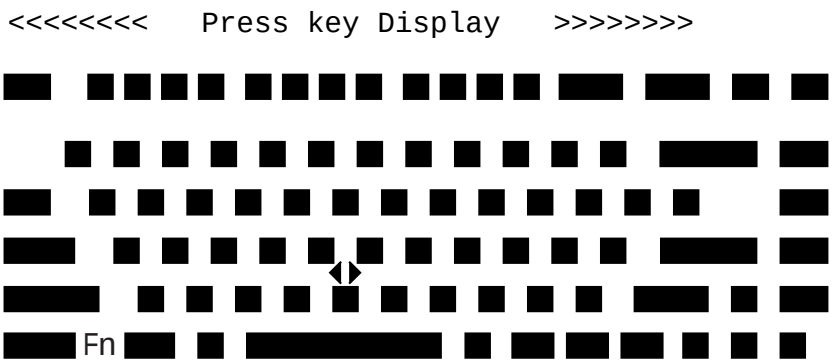
3.6 Keyboard Test

To execute the Keyboard Test, select **3** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. The Keyboard test contains four subtests that test the computer's keyboard, PS/2 mouse, and AccuPoint actions. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Pressed Key Display (82/84)

> ***NOTE:*** *The* ***Num Lock*** *and the* ***Overlay*** *mode must be off to execute this subtest.*

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 that was pressed. Holding a key down enables the auto-repeat function which causes the key's display character to blink.



If TEST OK, Press **Del Enter** Key.

Subtest 02 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**, **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  Caps Lock  Num Lock  Scroll Lock
Alt  Ctrl  Left Shift  Right Shift

PRESS [Enter] KEY
```

Subtest 03 PS/2 Mouse Connect Check

> ***NOTE**: To execute the PS/2 mouse connect check, a PS/2 mouse must be connected to the computer before the power is turned on.*

This subtest checks whether a PS/2 mouse is connected or not.

If this test does not detect an error, it returns to the subtest menu.

If this test detects an error, the following message appears:

```
DATA COMPARE ERROR

                                    [[ HALT OPERATION ]]

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

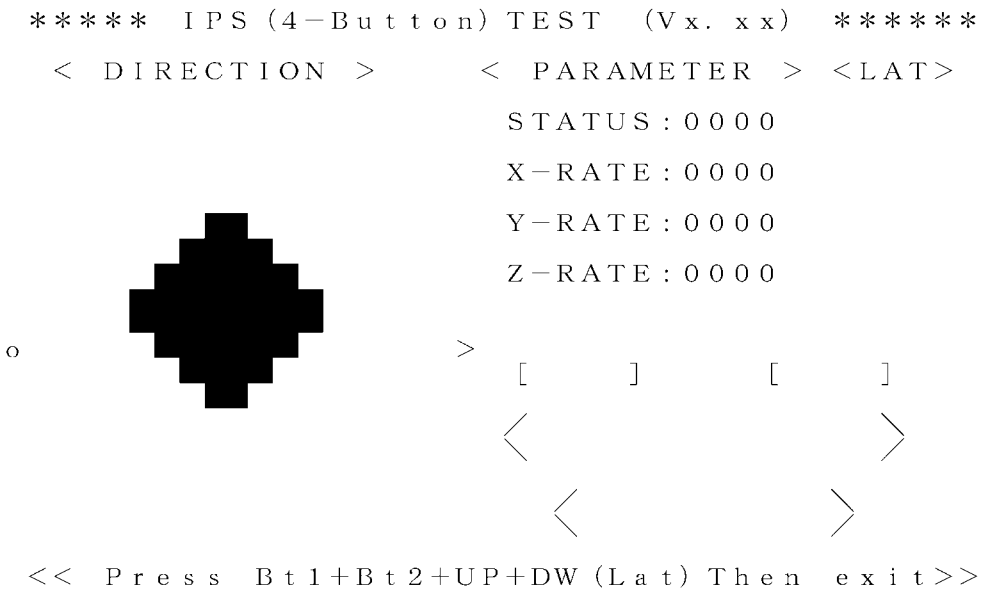
Subtest 04 Pointing Stick

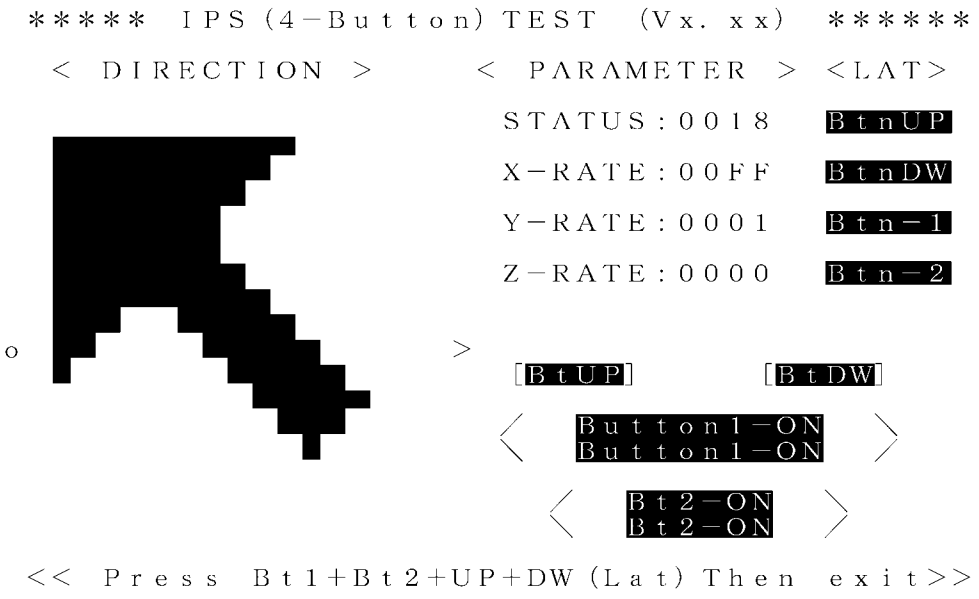
> ***NOTE**: The computer has two scroll buttons in addition to two conventional buttons. If you connect a conventional PS/2 mouse to the computer, subtest 04 may not be tested correctly. Use such a mouse that has scroll function.*

This subtest checks the functions of the pointing stick as shown below.

A) IPS stick pressure sensing direction and parameter.
B) IPS switch function check.

This test reports the pointing stick motion response from the IPS and IPS switch. When the stick is pressed towards the upper left, the <DIRECTION> display changes according to the following illustration. If an IPS switch is pressed, the <LAT> displays appear on the right side one by one. The parameters appear on the center of the display. If four IPS switches are pressed at the same time, the subtest menu displays.





Subtest 05 USB

This subtest checks USB. The USB TEST Module (ZD0003P01) and USB Cable (ZD0003P02) must be connected to the computer.

If the test is completed successfully, OK is displayed. If nothing is displayed, there may be a problem with the USB port. Check the wraparound connection and repeat the test.

3.7 Display Test

To execute the Display Test, select **4** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. The Display test contains six subtests that test the display in various modes. Move the highlight bar to the subtest you want to execute and press **Enter**.

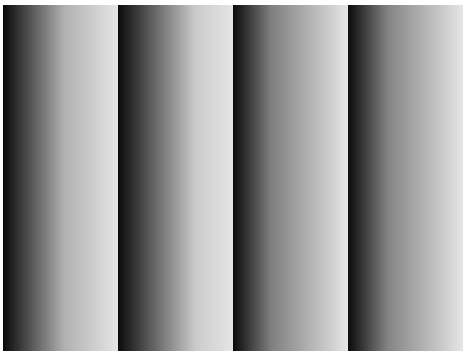
> ***NOTE**: To execute the Display test, connect an EDID (Extended Display Identification Data) display. Do not connect an RGB wraparound connector. In the simultaneous display mode, the result of the test shows "Data Compare Error".*

Subtest 01 VRAM Read/Write

This subtest writes constant data AAh and 55h and address data to video RAM 8MB. This data is then read from the video RAM 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 **Ctrl + Break**.

Subtest 03 Gradation for LCD

This subtest displays several horizontal bands of multiple color, followed by red, green and blue bars. Each bar displays black on the top and the brightest color at the bottom.

Then, this subtest displays full screen of eight colors: red, semi-red, green, semi-green, blue, semi-blue, white, and semi-white.

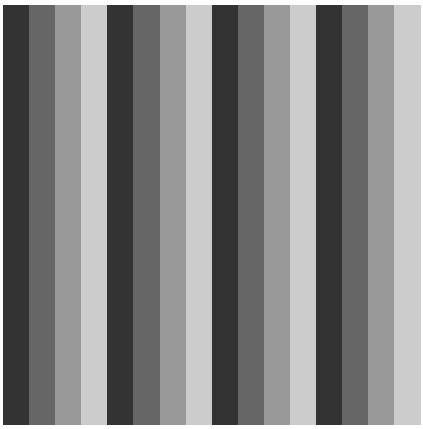
Each color displays for three seconds.

Subtest 04 Gradation & Mode test for VGA

This subtest displays gradations for each mode. Execute the test, then press **Enter** to change the mode.

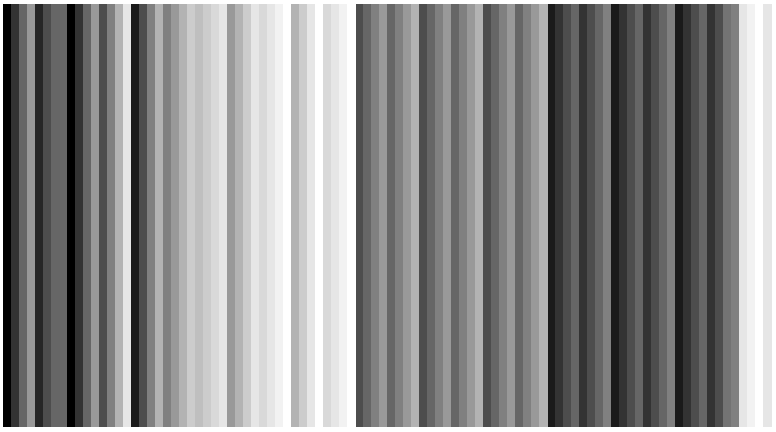
Resolution	Mode
1400 x 1050	12, 13, 3, 111, 112, 114, 115, 117(XGA), 118, 13c, 13b

The display below appears on the screen when this subtest is executed. Pressing **Enter** changes the size of the displayed image.



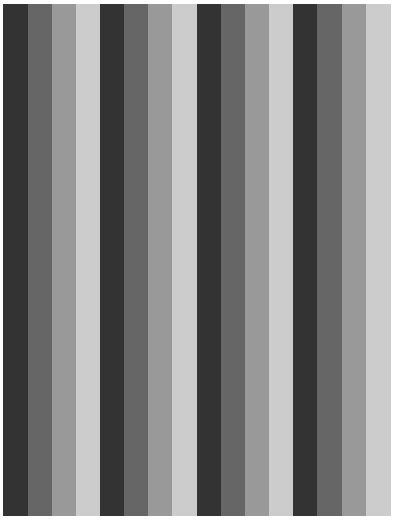
[Mode 12]

Pressing **Enter** changes the size of the displayed image.



[Mode 13]

Pressing **Enter** changes the size of the displayed image.



[Mode 3]

Pressing **Enter** changes the size of the displayed image in the following order:

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 111 640*480 64K]

To exit this subtest and return to the DISPLAY TEST menu, press **[Ctrl] + [Break].**

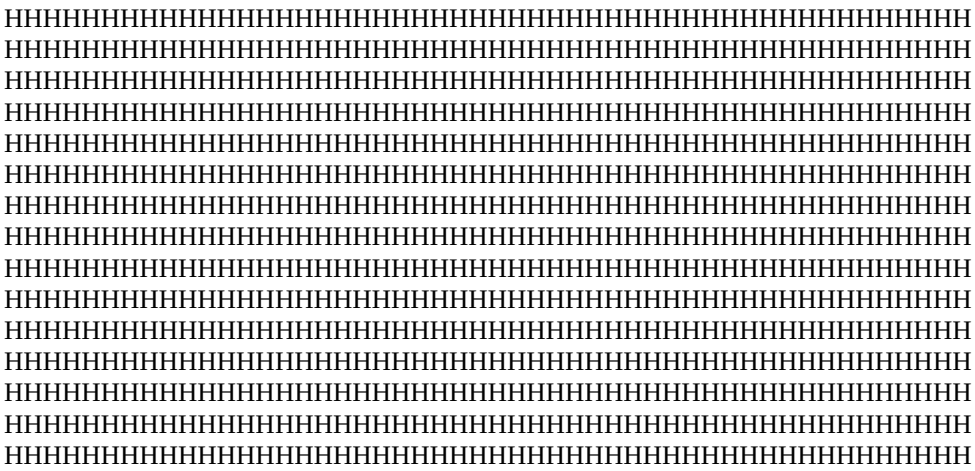
Subtest 05 All Dot On /Off for LCD

This subtest displays an all-white screen (all dots on) for three seconds then an all-black screen (all dots off) for three seconds.

To exit this subtest and return to the DISPLAY TEST menu, press **[Ctrl] + [Break].**

Subtest 06 "H" Pattern Display

This subtest displays a full screen of "H" patterns.



To exit this subtest and return to the DISPLAY TEST menu, **[Ctrl] + [Break].**

> ***NOTE****: The last row may not be completely filled. This condition does not indicate on error.*

Subtest 07 LCD Brightness

The LCD brightness changes in the following order:

Super-Bright —> Bright —> Semi-Bright —> Bright —> Super-Bright

3.8 Floppy Disk Test

> ***NOTE**: 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. The Floppy Disk test contains five subtests that test the FDD. 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. Select the test drive number to be tested.

Test drive number	FDD #1
	FDD #2
	FDD #1 & #2

2. Select the media type to be tested.

Media in drive#1 mode	2DD
	2D
	2D-2HD/2DD
	2HD
Media in drive #2 mode	2DD
	2D
	2D-2HD/2DD
	2HD

3. Select the 2HD media mode to be tested (in the case that 2HD was selected at 2. above.)

2HD Media mode	1.44MB
	1.20MB (Not use except Japan.)

4. Select the test start track to be tested

Test start track	00 to 79

The floppy disk test menu will appear after you select. 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     XXXXXXX
```

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

Subtest 01 Sequential Read

This subtest performs a Cyclic Redundancy Check (CRC) that continuously reads all the tracks on a floppy disk. The following tracks are read according to the media type in the floppy disk drive:

Double-sided, double-density (2D): Tracks 0 to 39.

Double-sided, double-density, double-track (2DD) and double-sided, high-density, double-track (2HD): Tracks 0 to 79.

The start track is specified when the FDD test is started from the Diagnostic Test Menu. Refer to Step 3 at the beginning of this section to set the start track.

Subtest 02 Sequential Read/Write

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

Subtest 04 Write Specified Address

This subtest writes specified data to a specified track, head, and address.

Subtest 05 Read Specified Address

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

3.9 Printer Test

To execute the Printer Test, select **6** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. The Printer Test contains three subtests that test the output of the printer connected to the computer. 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**: A Port Replicator and an IBM compatible printer must be connected to the system to execute this test.*

The following message will appear when the printer test is selected:

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

Subtest 02 Function

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

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

This subtest prints the various print types shown below:

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

Subtest 03 Wraparound

> ***NOTE****: To execute this subtest, a printer wraparound connector must be connected to the printer port in the Port Replicatort. The printer wraparound connector (34M741986G01) wiring diagram is described in Appendix F.*

This subtest checks the output and bi-directional modes of the data control and status lines through the parallel port wraparound connector.

3.10 Async Test

To execute the Async Test, select **7** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions displayed on the screen. The async test contains seven subtests that test the asynchronous communication functions. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtests 01 through 07 require the following data format:

Method:	Asynchronous
Speed:	9600BPS (Subtests 01 to 04)
	38400BPS (Subtests 06, 07)
Data:	8 bits and one parity bit (EVEN)
Data pattern:	20h to 7Eh

The following message will appear at the bottom of the screen when subtests 01, 02, and 03, are selected:

```
Channel#1 = XXXXh
Channel#2 = XXXXh
Channel#3 = XXXXh
Select the Channel number (1/2/3)
```

The serial I/O port address is specified by the XXXXh number. Select the serial port channel number and press **Enter** to start the subtest.

Subtest 01 Wraparound (board)

> ***NOTE****: To execute this subtest an RS-232C wraparound connector (34M741621G01) must be connected to the RS-232C port. The RS-232C wraparound connector wiring diagram is described in Appendix F.*

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

Subtest 02 Point to Point (send)

> ***NOTE****: To execute this subtest, two machines must be connected with an RS-232C direct cable. One machine should be set as "send"(subtest 02) and the other set as "receive" (subtest 03). The wiring diagram for the RS-232C direct cable is described in Appendix F.*

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

Subtest 03 Point to Point (receive)

This subtest is used with subtest 02 described above. This subtest receives the data from the send side, then sends the received data.

Subtest 04 Interrupt Test

This subtest checks the Interrupt Request Level of IRQ 4, 3 and 5 from the send side.

Subtest 06 FIR/SIR Point to Point (send)

> ***NOTE:*** *To execute subtests 06 and 07, 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 07 FIR/SIR Point to Point (receive)

This subtest is used with subtest 06 described above. This subtest receives the data from the send side, then sends the received data through the FIR/SIR port.

3.11 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. The hard disk test contains ten subtests that test the hard disk drive functions.

> ***NOTE:*** *The contents of the hard disk will be erased when subtest 02, 03, 04, 05, 06, 08, 09, or 10 is executed. Before running the test, the customer should transfer the contents of the hard disk to floppy 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.*

After selecting the hard disk test from the DIAGNOSTIC TEST MENU, answer each of the questions that appear successively with an appropriate response to execute the test.

1. Select the hard disk drive number to be tested.

Test drive number	#1
	#2
	#1&#2

2. This message is used to select the retry operation when the hard disk controller detects an error. Select **yes** or **no**.

HDC F/W error retry	yes
	no

3. This message is used to select the error dump operation when a data compare error is detected. Select **yes** or **no**.

Data compare error dump	yes
	no

4. This message is used to select whether or not the HDD status is displayed on the screen. The HDD status is described in section 3.19. Select **yes** or **no**.

Detail status display	yes
	no

5. 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      XXXXXXX

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

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

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

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:

- Forward sequential
- Reverse sequential
- Random

Subtest 03 Random Address/Data

This subtest writes random data to random addresses on the HDD cylinder, head and sector. 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.

Worst pattern data	Cylinder
'B5ADAD'	0 cylinder
'4A5252'	1 cylinder
'EB6DB6'	2 cylinder
'149249'	3 cylinder
'63B63B'	4 cylinder
'9C49C4'	5 cylinder
'2DB6DB'	6 cylinder
'D24924'	7 cylinder

Subtest 05 Write/Read/Compare (CE)

This subtest writes B5ADADh worst pattern data to the CE cylinder on the HDD, then reads the data from the CE cylinder and compares it with the original data.

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 09 Sequential Write

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

Subtest 10 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.

3.12 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. The real timer test contains three subtests that test the computer's real timer functions. 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 message 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**. The following prompt will appear:

```
Enter new time :
```

3. If the current time is not correct, input the correct time in 24-hour format.

Pressing **Enter** toggles between the time and the date. To exit, press **Ctrl + Break**.

Subtest 02 Backup Memory

This subtest performs the following backup memory check:

Writes 1-bit of "on" data to address 01h through 80h

Writes 1-bit of "off" data to address 0Eh through 80h

Writes the data pattern AAh and 55h to the RTC 114-byte memory (address 0Eh to 7Fh)

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

To exit, press **Ctrl + Break**.

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
```

Pressing **Enter** returns to the original screen

Press **Ctrl + Break** to exit.

3.13 NDP Test

To execute the NDP test, select **10** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen. The NDP test contains one subtest that tests the computer's NDP functions.

Subtest 01 NDP

This test checks the following functions of NDP:

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

Press **Ctrl + Break** to exit.

3.14 Expansion Test

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

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

Subtest 01 PCMCIA Wraparound

This test 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 number01 The following message will apper:Test slot number select (1:slot, 2:slot, 0:slot0&1)?*

NOTE *: Subtests 02, 04 and 05 are for Advanced Port Replicator 2001. For procedures on those subtests, refer to the Advanced Port Replicator 2001 maintenance manual.*

Subtest 02 DS bus wraparound

Conduct this test by PCI configuration register read/write.

Subtest 03 RGB monitor ID

Use an RGB monitor ID wraparound board for this test, specifically the index type general board (Port/Index:Data)=(E4/E5:F1h).

First, write 0FFh data on this board, and verify that the read data is xFh. Then, write the following data, read the data from the same board, and compare the data.

Write data	Data for comparison
FEh	xAh
FDh	x5h
FBh	xAh
F7h	x5h

3.15 CD-ROM/DVD-ROM Test

To execute the CD-ROM/DVD test, select **13** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen. The CD-ROM/DVD test contains six subtests that test the computer's CD-ROM functions.

> ***NOTE**: First make sure the CD-ROM driver (CDRNEW.COM) is installed and insert the test media CD (TOSHIBA CD-ROM TEST DISK (ZA1217P01/P000204190)). For the DVD-ROM test, insert the media CD (Toshiba-EMI TEST DISK TSD-1).*

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 Playback Music (CD only)

> ***NOTE**: The TOSHIBA CD-ROM TEST DISK (ZA1217P01/P000204190) and the Toshiba-EMI DVD-ROM TEST DISK TSD-1 cannot be used for Subtest 04. For this test, use an ordinary music CD.*

This subtest reads track data from a specified track and plays the sound.

Subtest 07 RW 1Point W/R/C

This subtest is IDE busmaster test.

3.16 LAN Test

To execute the LAN test, select **14** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen.

Subtest 01 MAC address Display

This subtest displays the MAC address of the LAN.

3.17 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	ROM Checksum Error
Memory	01 02 14 DD DE DF	Parity Error Protected Mode Not Changed Memory Read/Write Error Cache Memory Error 2nd Cache Error TAG-RAM Error
FDD	01 02 03 04 06 08 09 10 20 40 60 80 EE	Bad Command Address Mark Not Found Write Protected Record Not Found Media Removed DMA Overrun Error DMA Boundary Error CRC Error FDC Error Seek Error FDD Not Drive Error Time Out Error Write Buffer Error
Printer	01 08 10 20 40 80	Time Out Fault Select Line Out Of Paper Power Off Busy Line

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

Device name	Error code	Error status name
ASYNC	01	DSR On Time Out
	02	CTS On Time Out
	04	RX-READY Time Out
	08	TX-BUFFER Full Time Out
	10	Parity Error
	20	Framing Error
	40	Overrun Error
	50	Underrun error
	60	Timer time out error
	70	CRC error
	80	Line Status Error
	88	Modem Status Error
HDD	01	Bad Command Error
	02	Address Mark Not Found
	04	Record Not Found
	05	HDC Not Reset Error
	07	Drive Not Initialized
	08	HDC Overrun (DRQ)
	09	DMA Boundary Error
	0A	Bad Sector
	0B	Bad Track Error
	10	ECC Error
	11	ECC Recover Enable
	20	HDC Error
	40	Seek Error
	80	Time Out Error
	AA	Drive Not Ready
	BB	Undefined Error
	CC	Write Fault
	E0	Status Error
	EE	Access Time Out Error
	DA	No HDD
NDP	01	No Co-Processor
	02	Control Word Error
	03	Status Word Error
	04	Bus Error
	05	Addition Error
	06	Multiply Error

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

Device name	Error code	Error status name
Expansion	C1	Address Line Error
	C2	REG# Line Error
	C3	CE#1 Line Error
	C4	CE#2 Line Error
	C5	DATA Line Error
	C6	WAIT Line Error
	C7	BSY# Line Error
	C8	BVD1 Line Error
	CD	No PCMCIA
	CE	Card Type Error
CD/DVD-ROM	01	Bad Command
	02	Illegal Length
	03	Unit Attention
	04	Media Change Request
	05	Media Detected
	06	Additional Sense
	09	Boundary Error
	11	Corrected Data Error
	20	Drive Not Ready
	40	Seek Error
	80	Time Out
	90	Reset Error
	BO	Address Error
Keyboard	01	Mouse Interface Error
	02	IPS Interface Error
	03	Interface Error
	04	Retransmit Error
	05	Mouse Handler Not Support
	06	PS/2 Mouse & IPS Not Support

3.18 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	DRDY (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	CORR (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	BBK1 (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	IDNF (Identification)	"0" … Not used "1" … There was no ID field in the requested sector.
3	——	Not used
2	ABRT (Abort)	"0" … Not used "1" … Illegal command error or a drive status error occurred.
1	TK00 (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.

3.19 Head Cleaning

3.19.1 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.

3.19.2 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.

3.20 Log Utilities

3.20.1 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. If the power switch is turned off, the error information will be lost. The error information is displayed in the following order:

1. Error count (CNT)
2. Test name (TS-NAME)
3. Subtest number (TS-NAME)
4. Pass count (PASS)
5. Error status (STS)
6. FDD/HDD or memory address (ADDR)
7. Write data (WD)
8. Read data (RD)
9. HDC status (HSTS)
10. Error status name (ERROR STATUS NAME)

3.20.2 Operations

Selecting **5** and pressing **Enter** in the DIAGNOSTIC MENU, logs error information into RAM or onto a floppy disk. The error information is displayed in the following format:

```
     XXXXX ERRORS
CNT  TS-NO   PASS STS  ADDR    WD RD HSTS [ERROR STATUS NAME]

001  FDD 02  0000 103  00001   00 00 0000 FDD-WRITE PROTECTED
001  FDD 01  0000 180  00001   00 00 0000 FDD-TIME OUT ERROR
 |    |  |    |    |     |     |  |   |         |
 |    |  |    |    |   Address |  |   |         |
 |    |  |    |  Error status  |  | HDC status  |
 |    |  |  Pass count         | Read data      |
 |    | Subtest number         |          Error status name
 |   Test name               Write data
 |
 Error count


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

2. The error information displayed on the screen can be manipulated by the following number keys:

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

3. In the case of “error retry OK,” a capital “R” will be placed at the beginning of the error status. However, it is not added to the error count.

3.21 Running Test

3.21.1 Function Description

This function automatically executes the following tests in sequence:

1. System test (subtest 01)
2. Memory test (subtests 01, 02, 04, and 06)
3. Display test (subtest 01)
4. FDD test (subtest 02)
5. HDD test (subtests 01 and 05)
6. Real timer test (subtest 02)
7. Printer test (subtest 03) if selected
8. Async test (subtest 01) if selected

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

3.21.2 Operations

***NOTE**: Do not forget to load a work disk in the FDD. If a work disk is not loaded, an error will be generated during the FDD testing.*

1. Remove the diagnostics disk from the floppy disk drive and insert the work disk.
2. Select **6** from the Diagnostic Menu and press **Enter,** the following message displays:

   ```
   Printer wrap around test (Y/N) ?
   ```

   Selecting **Y (yes)** executes the printer wraparound test. A printer wraparound connector must be connected to the parallel port of the computer to properly execute this test.

3. Select **Y** or **N** and press **Enter**. The following message will appear:

   ```
   Serial #A wrap around test (Y/N) ?
   ```

   Selecting **Y (yes)** executes the ASYNC wraparound test. An RS-232-C wraparound connector must be connected to the serial port of the computer to properly execute this test.

4. Select **Yes** or **No** and press **Enter**. The following message will be appear :

```
FDD test (R:read/W:read-write) ?
```

5. Select **Yes** or **No** and press **Enter**. The following message will appear :

```
Mount the work disk(s) on the drive(s),
then press [Enter] key.
[Warning : The contents of the disk(s),
will be destroyed.]
```

6. This program is executed continuously. To terminate the program, press **Ctrl + Break.**

3.22 Floppy Disk Drive Utilities

3.22.1 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 5.25-inch or 3.5-inch floppy disk in the following formats:

(a) 2D: Double-sided, double-density, 48/67.5 TPI, MFM mode, 512 bytes, 9 sectors/track.

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

(c) 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

This program reads the hard disk ID and displays the hard disk ID, serial number and other hard disk information.

3.22.2 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) Remove the source disk from the FDD, insert a formatted work disk and press any key. The [[track, head = XXX X]] message will appear and start copying to the target disk. When the amount of data is too large to be copied in one operation, the message from step (b) displays again. After the floppy disk has been copied, the following message will appear:

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

   (e) To copy another disk, type **1** and the message from step (a) displays 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 format type number. If `2:HDD` is selected, the display will go to step (e).

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

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

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

   (d) Select a media type number and the following message will appear:

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

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

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

   Track number ??
   ```

   (f) Set the track number you want to dump. The system will access the disk and dump a list.

5. HDD ID program

   Selecting HDD ID displays the following HDD ID configuration:

```
[HDD ID Read (VX.XX)] [Drive #X]
   ID code (h)              =  XXXX
   No. of Cylinders         =  XXXX XXXX
   Removable Cylinders      =  XXXX  XXXX
   No. of Heads             =  XXXX XXXX
   Unformat Bytes/Track     =  XXXX XXXX
   Unformat Bytes/Sector    =  XXXX XXXX
   Sectors/Track            =  XXXX XXXX
   Gap Length               =  XXXX XXXX
   Sync. Bytes              =  XXXX XXXX
   Reserved (h)             = XXXX
   Serial No.               =  YYY...
   Controller Type (h)      =  XXXX
   Sector Buffers           =  XXXX XXXX
   ECC Bytes                =  XXXX XXXX
   Firmware Rev.            =  YYYYYY..
   Model No.                =  YYYY...
   Reserved (h)             =  XXXX
   Double Word Capability   =  XXXX XXXX

   Press [Enter] key
```

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

3.23 System Configuration

3.23.1 Function Description

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

1. Processor Type
2. VGA Controller
3. MS-DOS Version
4. BIOS ROM version (1st ID, 2nd ID)
5. Boot ROM version
6. KBC version
7. PS Microprocessor Version
8. Total Memory Size
9. Battery code
10. Sound System
11. The number of printer ports
12. The number of ASYNC ports
13. The number of math co-processors
14. PCMCIA Slot
15. Modem/LAN Type
16. The number of floppy disk drives
17. The number of hard disk drives
18. Selective Bay Unit
19. Date/Time

3.23.2 Operations

Selecting **8** from the DIAGNOSTIC MENU and pressing **Enter** displays the following system configuration:

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

* - Processor Type(Step) = XXXX
**- VGA Controller       = XXXX
* - MS-DOS Version       = VX.XX
* - BIOS ROM Version     = VX.XX 1st ID = XXH, 2nd ID = XXH
* - BOOT ROM Version     = VX.XX
* - KBC Version          = VX.XX
* - PS Micom Version     = VX.XX   ( EC Version = VX.XX )
* - Total Memory Size    = XXXXXMB ( Conventional Memory = XXXXX KB )
* - Battery Code         = XXXXXMB
**- Sound System         = XXXXX
* - X Printer Adapter           LPT1  = XXXX  LPT2 = XXXX  LPT3 = XXXX
* - X ASYNC Adapter             COM1  = XXXX  COM2 = XXXX  COM3 = XXXX
* -
* - X Math Co-Processor
* - X PCMCIA Slot
* - X Modem / LAN     =    XX

* - X Floppy Disk Drive(s)   Track = XXXXX               Sector = XX
* - X Hard Disk Drive(s)    #1 Sectors   = XXXXX (XXXXXMB)
                            #2 Sectors   = XXXXX (XXXXXMB)

* - Selective Bay Unit =  XXXX

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

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

3.24 SETUP

3.24.1 Function Description

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

1. Memory
   (a) Total
2. Password (Not Registered)
3. Battery
   (a) Battery Save Mode
4. Peripheral
   (a) Pointing Devices
   (b) Ext Keyboard "Fn" (Ext. Keyboard)
   (c) Parallel Port Mode
   (d) Hard Disk Mode
5. Display
   (a) Power On Display
   (b) LCD Display Stretch
6. Boot Priority
   (a) Boot Priority
   (b) HDD Priority
   (c) Power On Boot Select
7. Others
   (a) Power-up Mode
   (b) CPU Cache
   (c) Level 2 Cache
   (d) Processor Serial Number
   (e) Dynamic CPU Frequency Mode
   (f) Auto Power On
8. Configuration
   (a) Device Config.
9. I/O Ports
   (a) Serial
   (b) Parallel
10. PCI Bus

11. USB Legacy Emulation

    (a) USB keyboard/Mouse Legacy Emulation
    (b) USB-FDD Legacy Emulation

12. PC Card

    (a) Controller Mode

13. Drives I/O

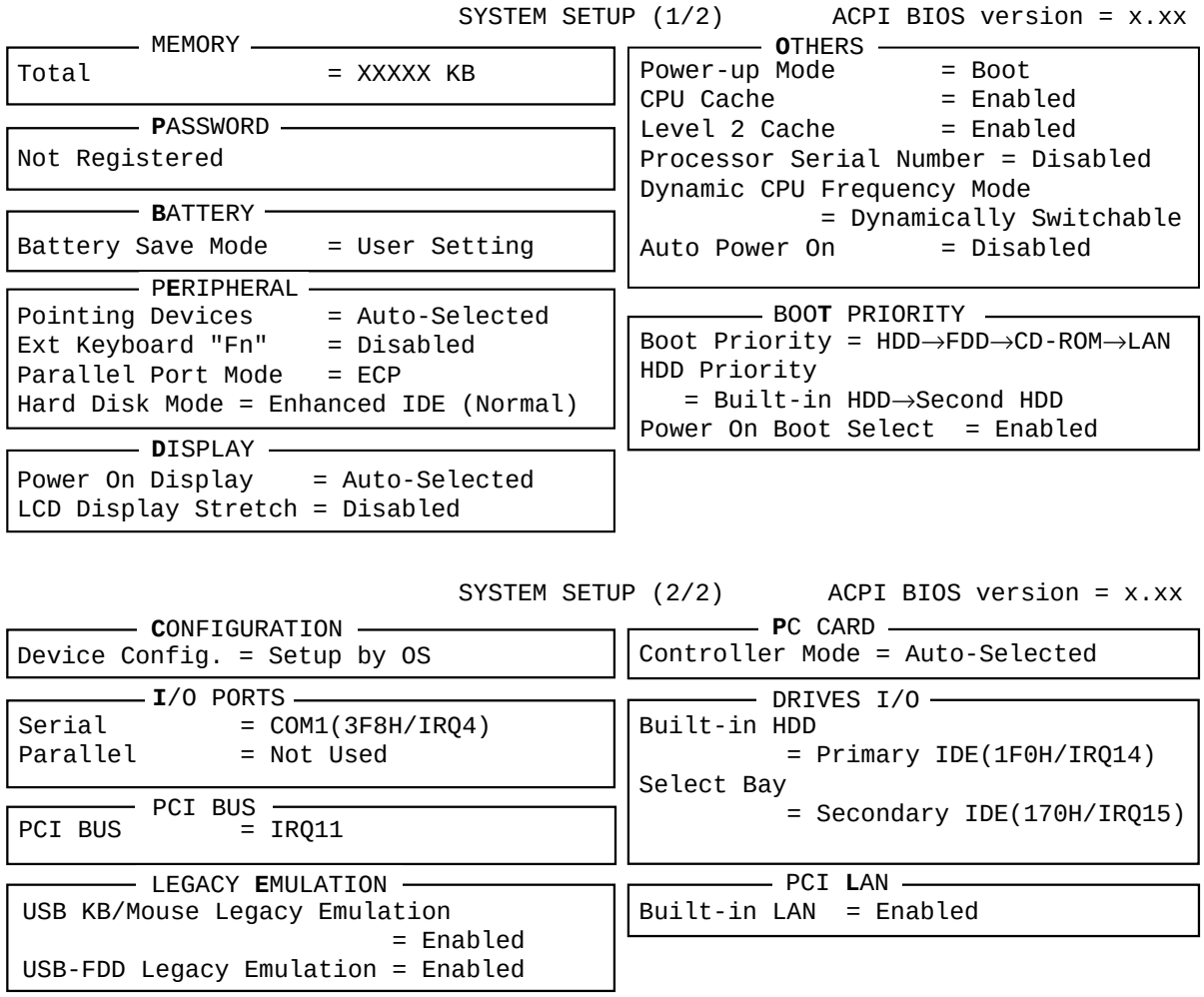
    (a) Built-in HDD
    (b) CD-ROM

14. PCI LAN

    (a) Built-in LAN

3.24.2 Accessing the SETUP Program

Selecting **0** from the DIAGNOSTICS MENU and pressing **Enter** displays the TSETUP screen. The TSETUP screen is divided into two pages: SYSTEM SETUP (1/2) and SYSTEM SETUP (2/2).



NOTE:

1. Panel Power On/Off item appears only when the Power-up Mode is in Resume mode.

2. Processor Serial Number item does not appear in the following case:

(1) A supervisor password and user password are registered.

(2) USER PASSWORD MODE = Unable to show Processor Serial Number item, and

(3) A user password is used to log onto the computer.

3. The USB FDD Legacy Emulation item appears under the LEGACY EMULATION item only when Floppy Disk I/O is set to Disabled.

4. The LCD Display Stretch item appears under the Display item only when the LCD screen resolution is XGA (1024×768 LCD).

Moving Within the SETUP Menu and Changing Values

1. Press ← and → to move between the two columns. Press **PgDn** and **PgUp** to move between the two pages. Press ↑ and ↓ to move between items in a column.
2. Press either the **space bar** or **BkSp** to change the value.

Accepting Changes and Exiting the SETUP Window

1. Press **End** to accept the changes you made.

   The following message is displayed:

   ```
   Are you sure? (Y/N)
   The change 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 toward User.*

The Factory Preset Configuration

When you access SETUP, the current configuration is displayed.

1. To show the factory preset configuration, press **Home**.
2. Press **End** and then press **Y** to accept the factory preset settings.

> ***NOTE:*** *When you execute the default setting, the following settings are not changed:*
> *HDD Mode*
> *Password*
> *Write Policy in the CPU Cache*

SETUP Options

The SETUP screen is divided into functionally related groups. This section describes each group and its options.

1. Memory

   This group of options displays the computer's memory.

   (a) Total

   This field displays the total amount of memory installed and is automatically calculated by the computer. You cannot change this value.

2. Password

   This option allows you to set or reset the user password for power on.

   Not Registered Change or remove the password. (Default)

   For details on setting the user password refer to the User's Manual.

3. Battery

   This option is used to select **the** battery setting.

   (a) Battery Save Options

   The following set of options can be selected in the submenu.

   Processing Speed

   This feature changes the CPU processing speed.

   High CPU operates at high speed. (Default)

   Low CPU operates at low speed.

   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 for the set period of time.

Disabled Disables display automatic power off.

xx Min. Automatically turns off 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 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

If the CPU becomes too hot, the fan turns on or the processing speed is lowered automatically. When the CPU temperature falls to a normal range, the fan turns off.

Maximum performance Turns on fan first, then if necessary lowers CPU processing speed.

Performance Uses a combination of fan and lowering the CPU processing speed.

Battery optimized Lowers the CPU processing speed first, then if necessary turns on the fan.

4. Peripheral

   Use this option to select the hard disk mode.

   (a) Pointing Devices

   This option enables or disables the AccuPoint II.

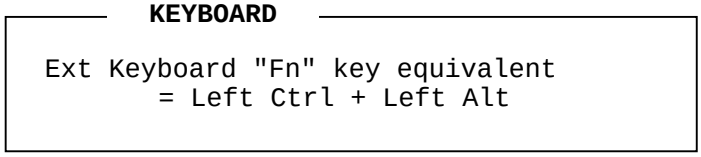
   Auto-Selected If a PS/2 mouse is connected to the computer when you turn on the power, the PS/2 mouse is enabled and the AccuPoint II is disabled. Otherwise, the AccuPoint II is enabled. (Default)

   Simultaneous Enables both the AccuPoint and PS/2 mouse with using a Port Replicator.

   (b) Ext Keyboard "Fn"

   Use this option to set the Fn key equivalent when you are using an external keyboard. Selecting this option displays the following subwindow.

   Enabled Enables the feature.



   Use this option to set a key combination on an external keyboard to emulate the **Fn** key on the computer's internal keyboard. Setting an **Fn** key equivalent will enable you to use “Hotkeys” by pressing the set combination in place of the **Fn** key. The following items can be selected for this option:

   Left Ctrl + Left Alt*
   Right Ctrl + Right Alt*
   Left Alt + Left Shift
   Right Alt + Right Shift
   Left Alt + Caps Lock

   ***If these selections are made, you cannot warm boot the system by pressing **Ctrl + Alt + Del**.

   Disabled Disables the feature. (Default)

(c) Parallel Port Mode

The options in this tab are ECP and Standard Bi-directional.

ECP Sets the port mode to Extended Capabilities Port (ECP). For most printers, the port should be set to ECP. (Default)

Std. Bi-Direct.
This setting should be used with some other parallel devices.

(d) Hard Disk Mode

Use this item to select the hard disk mode.

Enhanced IDE (Normal) Select this mode when using an operating system that supports Enhanced IDE. (Default)

Standard IDE Select this mode when using an operating system that does not support Enhanced IDE.

> ***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.*

5. 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)
Simultaneous	Selects both the internal LCD and the external monitor for simultaneous display.

***NOTE**: When starting the computer in Resume mode, the last configuration is remembered. If data does not appear on the display you are using after starting in Resume mode, pressing **Fn+F5**.*

*Pressing **Fn+F5** changes the display setting in the order of internal LCD to simultaneous to external monitor.*

(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.

6. Boot Priority

This tab set the priority for booting the computer and the priority for the built-in HDD or optional secondary HDD.

(a) Boot Priority Options

HDD→FDD→CD-ROM→LAN:	The computer looks for bootable files first on the HDD, then on the FDD and finally on the CD-ROM. (Default)
FDD→HDD→CD-ROM→LAN:	The computer looks for bootable files first on the FDD, then on the HDD and finally on the CD-ROM.
HDD→CD-ROM→LAN→FDD:	The computer looks for bootable files first on the HDD, then on the CD-ROM and finally on the HDD.
FDD→CD-ROM→LAN→HDD:	The computer looks for bootable files first on the FDD, then on the CD-ROM and finally on the HDD.
HDD→CD-ROM→LAN→FDD:	The computer looks for bootable files first on the HDD, then on the CD-ROM and finally on the HDD.
CD-ROM→LAN→HDD→FDD:	The computer looks for bootable files first on the CD-ROM, then on the HDD and finally on the FDD.
CD-ROM→LAN→FDD→HDD:	The computer looks for bootable files first on the CD-ROM, then on the FDD and finally on the HDD.

***NOTE**: CD-ROM is displayed even if a DVD-ROM drive is installed.*

(b) HDD Priority Options

Built-in HDD→Second HDD

When HDD occurs in the boot priority order, the computer looks for bootable files first on the built-in HDD and then on the optional secondary HDD. (Default)

Second HDD→ Built-in HDD

When HDD occurs in the boot priority order, the computer looks for bootable files first on the optional secondary HDD and then on the built-in HDD.

***NOTE**: The above settings are displayed even if the secondary HDD is not installed in the Selectable Bay. However, in this case the secondary HDD settings will not be effective.*

(c) Power On Boot Select Options

You can override the settings, manually select and enable a boot device by pressing one of the following keys while the computer is booting:

D Default SYSTEM SETUP Device.
U Selects the USB FDD.
1 Selects the computer's built-in HDD.
2 Selects the Slim Select Bay's secondary HDD.
C Selects CD-ROM, DVD-ROM or Multi Drive
N Selects the Network.
P Selects the PC card HDD.

NOTES: *1. PC card HDD boot is supported only by slot 0 on the computer. Support is guaranteed only for Toshiba PC card HDDs.*

2.When you assign a PC card HDD top priority, "PC" is not displayed. However, the PC card HDD takes the position of HDD in the Boot Priority Options list above.

These procedures do not affect the settings.

To hold pressing **F12 (or F2)** key displays Boot Select Menu.

You cannot disable these devices while the computer is booting.

7. Others

   Whether or not you need to configure the computer with these options depends primarily on the kind of software or peripherals you use.

   (a) Power-up Modes

   Use this option to choose between resume and boot mode. This option can also be set by hotkeys.

Boot	Turns on boot mode. (Default)
Resume	Turns on resume mode.

   (b) CPU Cache

   Use this option to enable or disable the CPU cache.

Enabled	Enables the CPU cache. (Default)
Disabled	Disables the CPU cache.

   When enabled is selected, a subwindow similar to the one below is displayed to select the cache write policy. The options for this setting are **Write-back** (default) and **Write-through** for CPU cache.

```
                OPTION
Write policy      =  Write-back
```

   Write-back policy provides better system performance, because main memory is accessed only when necessary to update the cache contents with changes in main memory. Write-through policy accesses main memory every time data is handled by the processor.

   (c) Level 2 Cache

   Use this option to enable or disable the level 2 cache.

Enabled	Enables the level 2 cache. (Default)
Disabled	Disables the level 2 cache.

(d) Processor Serial Number

Use this option to enable or disable the ability of a remote location to read the processor serial number only for the Pentium III.

Enabled Enables the remote location.

Disabled Disables the remote location (Default).

(e) Dynamic CPU Frequency Mode

Use this option to choose from the following settings:

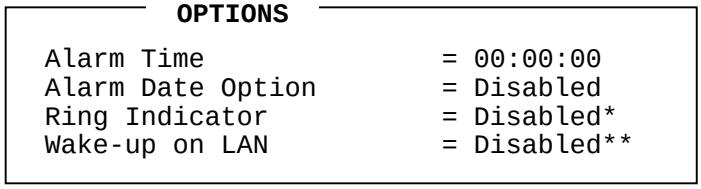
Dynamically Switchable Enables Mobile Pentium® III processor featuring Intel® SpeedStep™ technology

Always High Disables Mobile Pentium® III processor featuring Intel® SpeedStep™ technology and always runs the processor at its maximum speed.

Always Low Disables Mobile Pentium® III processor featuring Intel® SpeedStep™ technology and always runs the processor at its default speed.

(f) Auto Power On

Use this option to set a time and date for automatic power on and enable or disable the ring indicator feature. **Ring Indicator** displays only when the computer is in Resume mode and the **Alarm Date Option** displays when **Alarm Time** is enabled.



***** only for Modem Model ******only for LAN Model

Alarm Time is set in the sequence of hours and minutes. Seconds cannot be changed. **Alarm Date Option** is set in the sequence of month and day. If Alarm Date is set to Disabled, the computer will be powered on at the same time every day. Press ↓ to move the cursor to the right and ↑ to move the cursor to the left when you set the date and time.

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 Resume 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.*

8. Configuration

   This field displays the configuration method.

   The devices are initialized when the PNP OS loads.

   Setup by OS First, devices necessary for loading the OS will be initialized. After the PNP OS loads, other devices will be initialized by the OS. In this case, setup of PC Cards will be fixed to "Auto-Selected," and cannot be changed. (Default)

   All Devices All devices will be initialized.

   If you are using an OS that does not have PNP capacity, select "All Devices."

   The Display shows the following message:

   Device Config. = All Devices

9. I/O ports

   This option controls settings for the serial and parallel ports and the sound system. It also controls the setting for the joystick on the optional Desk Station.

   > ***NOTE:*** *Do not assign the same interrupt request level and I/O address to the serial port and PC card.*

   (a) Serial

   Use this option to set the COM level for the serial port. The serial port interrupt request level (IRQ) and I/O port base address for each COM level is shown below:

COM level	Interrupt level	I/O address	
COM1	4	3F8H	(Serial port default)
COM2	3	2F8H	
COM3	4	3E8H	
COM3	5	3E8H	
COM3	7	3E8H	
COM4	3	2E8H	
COM4	5	2E8H	
COM4	7	2E8H	
Not Used	Disables port		

(b) Parallel

This option sets the interrupt request level (IRQ) and I/O port base address for the parallel port. When the Printer Port Mode is set to **Std. Bi-direct**, the options are:

LPT setting	Interrupt level	I/O address
LPT 1	7	378H
LPT 2	5	278H
LPT 3	7	3BCH
Not Used	Disables port	

When the Printer Port Mode (see settings below) is set to **ECP**, the DMA channel can also be set to **1**, **2** or **3**. The default is 3.

LPT setting	Interrupt level	I/O address	DMA channel
LPT 1	7	378H	3 (Parallel port default)
LPT 2	5	278H	3
LPT 3	7	3BCH	3
Not Used	Disables the port		
Others	Others settings made automatically by plug-and-play operating systems		

When you select one of the above options, except for **Not Used**, a subwindow similar to the one below appears to let you set the DMA. The options for this setting are Channel 1and Channel 3 (Default).

```
OPTIONS
DMA          = Channel 3 (Default)
```

For most printers, the port should be set to **ECP**. With some other parallel devices, the setting should be **Std. Bi-Direct**.

10. PCI Bus

    This item displays the interrupt level for the Card Bus in the computer and the PCI bus in the Desk Station. It is for information only and cannot be changed.

11. USB Legacy Emulation.

    (a) USB keyboard/Mouse Legacy Emulation.

    Use this option to enable or disable USB KB/Mouse Legacy Emulation. If your operating system does not support USB, you can still use a USB mouse and keyboard by setting the **USB KB/Mouse Legacy Emulation** item to **Enabled**.

    Enabled USB Legacy Support can be used. (Default)

    Disabled USB Legacy Support cannot be used.

    (b) USB-FDD Legacy Emulation.

    Use this option to enable or disable USB-FDD Legacy Emulation.

    Enabled USB Legacy Support can be used. (Default)

    Disabled USB Legacy Support cannot be used.

    Initial setting of the computer does not display this item. It appears only when Floppy Disk I/O is set to Disabled.

    To use a USB-FDD, set the Floppy Disk item under FLOPPY DISK I/O to Disabled, then select Enabled in this item, USB-FDD Legacy Emulation.

    If you select Disabled, the USB-FDD cannot be used.

12. PC Card

    This option lets you set the PC Card Controller mode.

    Auto-Selected Use this setting for all PC Card if you are using Windows 95/98, Windows NT 4 or higher. (Default)

13. Drives I/O

This option controls the setting for the hard disk drives and/or CD-ROM drive, installed in the built-in HDD slot, Selectable Bay, and/or Expansion Station.

(a) Setting for Hard Disk Drive (`Built-in HDD`)

Primary IDE (1F0H/IRQ14) The built-in HDD is ready for use.

No Drive The built-in HDD is not installed.

(b) Setting for Hard Disk Drive (`Int Selectable Bay`)

Secondary IDE (170H/IRQ15) Computer Selectable Bay HDD.

When an ATA card is installed in IN13h, the sub window below is displayed.

```
DRIVES I/O
Built-in HDD        = Primary IDE (1F0H/IRQ14)
Int Selectable Bay  = Secondary IDE (170H/IRQ15)
```

(c) Setting for CD-ROM/DVD-ROM Drive (Int Selectable Bay)

Secondary IDE (170H/IRQ15) Computer Selectable Bay DVD-ROM.

(d) When an ATA card is installed in IN13h, the sub window below is displayed.

```
DRIVES I/O
Built-in HDD        = Primary IDE (1F0H/IRQ14)
Int Selectable Bay  = Secondary IDE (170H/IRQ15)
ATA Card            = Others (190H/IRQ)
```

14. PCI LAN

(a) Built-in LAN

Enabled Enable Built-in LAN functions. (Default)

Disabled Disable Built-in LAN functions.

3.25 Modem Test Program

To execute the Modem Test, select **14** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen. The Modem Test contains three Subtests that test the modem functions Modem/LAN functions and IEEE1394 functions.

Subtest 01 MODEM

This test contains the following tests.

1) Scorpio Modem Initialize

   Detects the modem.

2) Digital Loop back Test

   Initializes the DSP.

Subtest 03 LAN LOOP BACK

This Subtest performs an external loop back test to check the cable connection the RJ-45 jack.

***NOTE**: You will need the LAN wraparound connector for this Subtest.*

Subtest 04 IEEE1394

This Subtest performs a controller internal loopback test to check the IEEE 1394 interface.

3.26 IEEE1394 Test Program

This section describes how to perform the IEEE1394 test with the test program.

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

(a) Insert the Diagnostics disk in the floppy disk drive and turn on the computer. (The Diagnostics Disk contains the MS-DOS boot files.)

The following menu shown in figure 3-1 will appear:

```
*****************************************************************
*     ---------------------------------------------------       *
*        IEEE1394 [TSB12LV28] test menu  ( For Repair ) V1.00     *
*     ---------------------------------------------------       *
*                                                               *
*     ============   Select test NO. and [Enter]  ============   *
*                                                               *
*          1 : ... IEEE1394 test                                *
*          2 : ... Responder tool                               *
*          3 : ... ID Check                                     *
*                                                               *
*****************************************************************
Select [ 1 - 3 ] ?
```

Figure 3-1

(b) To execute the TEST, select the option number you want to execute and press **Enter**.

IEEE1394 test

This program checks the data transporting between responder machine and target machine.

Note:	*Use another computer that can communicate by IEEE1394 (i.Link) cable as a reference machine to perform this test.*

Responder tool

This program initializes the machine responder.

ID Check

This program checks the GUID.

3.27 Wireless LAN Test Program

This section describes how to perform the wireless LAN transmitting-receiving test with the test program.

> ***Note:*** *Use another computer that can communicate by the wireless LAN as a reference machine to perform this test.*

To start the Wireless LAN test program, follow the steps below:

Insert a floppy disk containing the test program into the target machine and turn on the target machine. The Wireless LAN test menu will appear.

```
    ##############################################################################
    #####    TECRA9100   Wireless LAN sub system repair test   VX.XX    ########
    ##############################################################################
    *                                                                            *
    *      1 .............  Transmit & Receive test [Responder]                  *
    *      2 .............  MAC Address test [Mini-PCI Wireless LAN]             *
    *      3 .............  Wireless LAN (WEP64/128) test                        *
    *                                                                            *
    *      0 .............  Transmit & Receive test [Initiator]                  *
    *                                                                            *
    ******************************************************************************
    *
  .... Press test number[1-3,0] ?
```

Press 1, 2 or 3 key to perform the corresponding sub test. To quit the Wireless LAN test program, eject the floppy disk and turn the computer off while the menu above is displayed.

1. Transmit & Receive test

   This sub test checks transmit and receive functions.

Transmit test

Press **1** to select the test and press **Enter** in the target machine as a responder. The following message will appear:

```
  ###############################################################################
  ########        Wireless LAN sub system repair test   VX.XX         ########
  ###############################################################################
  *                                                                             *
  *      1 ............  Transmit & Receive test [Responder]                    *
  *      2 ............  MAC Address test [Mini-PCI Wireless LAN]               *
  *      3 ............  Wireless LAN (WEP64/128) test                          *
  *                                                                             *
  *      0 ............  Transmit & Receive test [Initiator]                    *
  *                                                                             *
  *******************************************************************************
  *
.... Press test number[1-3,0] ?1
======== RESPONDER SET ==========
ORiWL.EXE  Rev.03      Copyright (C) Toshiba Corporation, 2000, 2001
Initializing...

[[[ Responder Mode ]]]
MAC adress : XXXXXXXXXXXX
Ad-hoc mode
  SS ID : PHN Test
  Channel : 10
  Tx ratio : 2 Mbps
```

To prepare the tester machine for the Wireless LAN test program, insert a floppy disk containing the test program into the tester machine and turn on the tester machine. The Wireless LAN test menu will appear.

Press **0** to select the test and press **Enter** in the initiator machine. The following message will appear:

```
  ###############################################################################
  ########        Wireless LAN sub system repair test   VX.XX         ########
  ###############################################################################
  *                                                                             *
  *      1 ............  Transmit & Receive test [Responder]                    *
  *      2 ............  MAC Address test [Mini-PCI Wireless LAN]               *
  *      3 ............  Wireless LAN (WEP64/128) test                          *
  *                                                                             *
  *      0 ............  Transmit & Receive test [Initiator]                    *
  *                                                                             *
  *******************************************************************************
  *
.... Press test number[1-3,0] ?0
======== RESPONDER SET ==========
ORiWL.EXE  Rev.03      Copyright (C) Toshiba Corporation, 2000, 2001
Initializing...

[[[ Trnsmit-Receive Test ]]]
MAC adress : XXXXXXXXXXXX
Ad-hoc mode
  SS ID : PHN Test
  Channel : 10
  Tx ratio : 2 Mbps
_ PASS : 134  ERROR : 0
```

When the machine has passed the test, “OK” message will appear in the test machine.

Then press **Enter** in the target machine; the “OK” message will appear also in the target machine.

Press **Enter** to return to the main menu.

Receive test

In receive test reverse the procedures of the transmit test. To prepare the tester machine for the Wireless LAN test program, insert a floppy disk containing the test program into the tester machine and turn on the tester machine. The Wireless LAN test menu will appear.

Press **1** to select the test and press **Enter**. The following message will appear:

```
  ##############################################################################
  ########       Wireless LAN sub system repair test   VX.XX         ########
  ##############################################################################
  *                                                                            *
  *      1 ............  Transmit & Receive test [Responder]                   *
  *      2 ............  MAC Address test [Mini-PCI Wireless LAN]              *
  *      3 ............  Wireless LAN (WEP64/128) test                         *
  *                                                                            *
  *      0 ............  Transmit & Receive test [Initiator]                   *
  *                                                                            *
  ******************************************************************************
  *
.... Press test number[1-3,0] ?1
======== RESPONDER SET ==========
ORiWL.EXE  Rev.03      Copyright (C) Toshiba Corporation, 2000, 2001
Initializing...

[[[ Responder Mode ]]]
MAC adress : XXXXXXXXXXXX
Ad-hoc mode
  SS ID : PHN Test
  Channel : 10
  Tx ratio : 2 Mbps
```

Press **0** to select the test and press **Enter** in the target machine. The following message will appear:

```
  ##############################################################################
  ########        Wireless LAN sub system repair test   VX.XX         ########
  ##############################################################################
  *                                                                            *
  *      1 .............  Transmit & Receive test [Responder]                  *
  *      2 .............  MAC Address test [Mini-PCI Wireless LAN]             *
  *      3 .............  Wireless LAN (WEP64/128) test                        *
  *                                                                            *
  *      0 .............  Transmit & Receive test [Initiator]                  *
  *                                                                            *
  ******************************************************************************
  *
.... Press test number[1-3,0] ?0
======== RESPONDER SET ==========
ORiWL.EXE  Rev.03      Copyright (C) Toshiba Corporation, 2000, 2001
Initializing...

[[[ Trnsmit-Receive Test ]]]
MAC adress : XXXXXXXXXXXX
Ad-hoc mode
  SS ID : PHN Test
  Channel : 10
  Tx ratio : 2 Mbps
_ PASS : 134  ERROR : 0
```

When the machine has passed the test, “OK” message will appear in the target machine.

Then press **Enter** in the test machine; the “OK” message will appear also in the test machine.

Press **Enter** to return to the main menu.

2. MAC Address test

This sub test reads MAC Address. If there is no problem, the “OK” message will appear.

3. Wireless LAN (WEP64/WEP128) test

This sub test reads the WEP of the Wireless LAN Card, installed in the machine.
A message similar to the following will appear:

```
****** This CARD is WEP128 ******
Press any key to continue . . .
```

3.28 Bluetooth Test Program

This section describes how to perform the Bluetooth test program to check if the Bluetooth functions of computer are working properly. To start the Bluetooth test program, follow the steps below:

> ***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                                         *
  *                                                                            *
  *      2 .............  communication test ( DUT mode )                       *
  *                                                                            *
  *      T .............  communication test ( TEST mode )                      *
  *                                                                            *
  ******************************************************************************
  *
.... Press test number[1-2,T] ?
```

Press 1 or 2 key to perform the corresponding sub test. To quit the Bluetooth test program, eject the floppy disk and turn the computer off while the menu above is displayed.

1. 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 shown.

```
--------------------------------------------------------------------------------
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA Co.
--------------------------------------------------------------------------------

                        My BD_ADDR = 00037A02168D [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       AAAAAAA       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 shown.

```
--------------------------------------------------------------------------------
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA Co.
--------------------------------------------------------------------------------

                        My BD_ADDR = 00037A02168B [h]


                        FFFFFF     A      III   L
                        F         A A      I    L
                        F        A   A     I    L
                        FFFFFF  A     A    I    L
                        F       AAAAAAA    I    L
                        F       A     A    I    L
                        F       A     A   III   LLLLLLL
```

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 3-5 Error code (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: Uset 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.

Table 3-5 Error code (2/2)

Error code	Meaning
0x20	Unsupported LMP Parameter Value.
0x21	Role Change Not Allowed.
0x22	LMP Response Timeout.
0x23	LMP Error Transaction Collosion.
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.

2. Communication test

This subtest checks the Bluetooth communication functions. Preparing the tester machine for the Bluetooth test program. Insert a floppy disk containing the test program into the tester machine and turn on the tester machine. The Bluetooth test menu will appear:

Press **2** to select the test and press **Enter** in the target machine. The following message will appear:

When the test begins, the machine displays **BD_ADDR of the DUT**. The progress bar stops when the test is completed. The following message is shown.

```
--------------------------------------------------------------------------------
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX  Copyright (C) by TOSHIBA Co.
--------------------------------------------------------------------------------
+----------------------+
|          DUT         |   BD_ADDR of the DUT = XXXXXXXXXXXX [h]
+----------------------+



     Ready>>>>>>>>>>>>>>>>>>>>>>        <- Progress Bar



                                    [ESC] : Stop
```

When the Bluetooth test menu is displayed, press **T** to select the test and press **Enter** in the test machine. The following message will appear:

```
--------------------------------------------------------------------------------
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX  Copyright (C) by TOSHIBA Co.
--------------------------------------------------------------------------------
+------------------+
|                  |
|      Tester      |
|                  |
+------------------+









                              [ESC]:Finish Tester  [SPACE]:Start
                              Is DUT ready?
```

Then press **Space** to start the Bluetooth communication test.

When the machine has passed the test, it displays **BD_ADDR of the DUT**. If the connection with the tester is completed, the progress bar stops. The following message is shown.

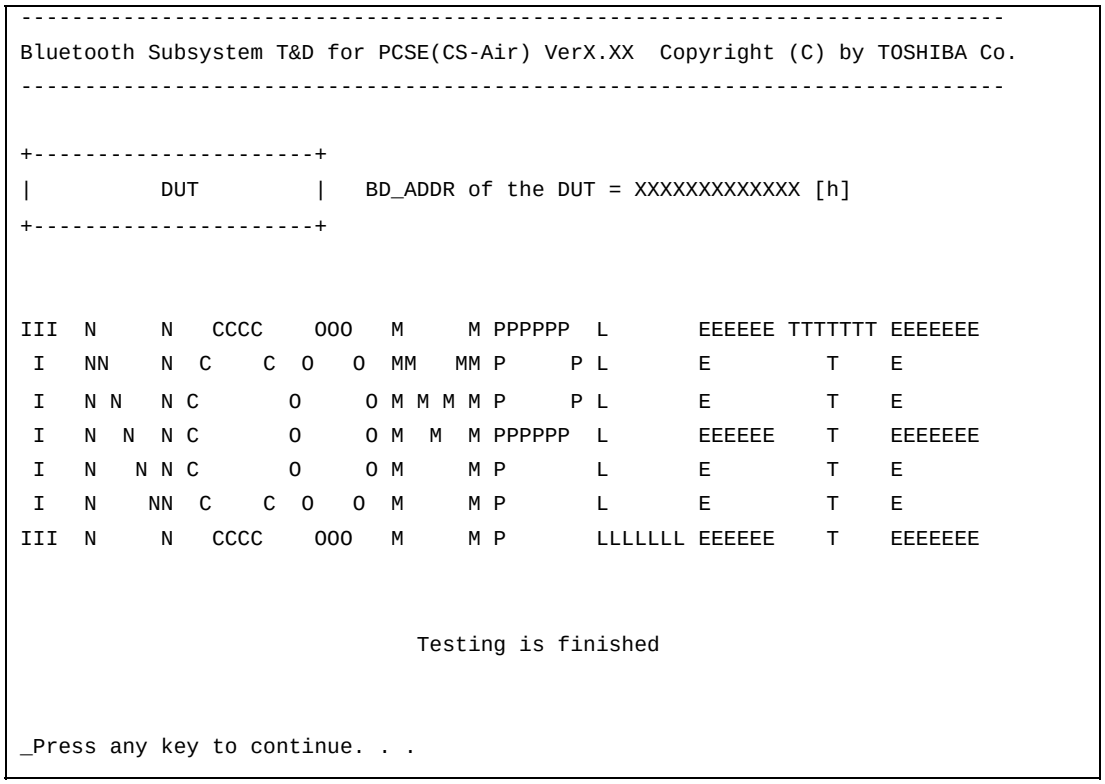
```
--------------------------------------------------------------------------------
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX  Copyright (C) by TOSHIBA Co.
--------------------------------------------------------------------------------
+----------------------+
|          DUT         |   BD_ADDR of the DUT = XXXXXXXXXXXX [h]
+----------------------+

     CCCC    OOO   M     M PPPPPP  L       EEEEEE TTTTTTT EEEEEEE DDDDD
    C    C  O   O  MM   MM P     P L       E         T    E       D    D
   C       O     O M M M M P     P L       E         T    E       D     D
   C       O     O M  M  M PPPPPP  L       EEEEEE    T    EEEEEEE D     D
   C       O     O M     M P       L       E         T    E       D     D
    C    C  O   O  M     M P       L       E         T    E       D    D
     CCCC    OOO   M     M P       LLLLLLL EEEEEE    T    EEEEEEE DDDDD


                              Testing is finished

A>_
```

If the target machine has any problem, the following message shown ”INCOMPLETE” is displayed with the **Error CODE**.



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 (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: Uset 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.

Table 3-6 Error code (2/2)

Error code	Meaning
0x20	Unsupported LMP Parameter Value.
0x21	Role Change Not Allowed.
0x22	LMP Response Timeout.
0x23	LMP Error Transaction Collosion.
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 Sound Test Program

This section describes how to perform the sound test program to check if the sound functions of the computer are working properly.

NOTE:	*You need the sound test disk, an external microphone and headphones to perform this test. You must install the sound test program onto the hard disk to conduct the sound test.*

WARNING:	*The system is capable of producing high volume sound, so when you use the headphones be careful to set the volume low and adjust it as necessary. Using the headphones at full volume could damage your ears.*

To start the sound test program, follow these steps:

Make sure the write protect tab on the sound test disk is disabled. Insert the sound test disk in the floppy disk drive and turn on the computer. The following SOUND TEST menu will appear:

```
*****************************************************************
*     ----------------------------------------------------      *
*        TECRA9100  DIAGNOSTICS PROGRAM ( SOUND TEST )          *
*     ============   Select test NO. and [Enter]  ============   *
*                                                               *
*          1 : ... Microphoned recording & play                 *
*                                                               *
*          2 : ... DoReMi                                       *
*                                                               *
*          3 : ... Line in/out                                  *
*                                                               *
*          4 : ... SPDIF                                        *
*                                                               *
*****************************************************************
Select[ 1 - 4 ] ? _
```

Press **1**, **2**, **3** or **4** key to perform the corresponding sub test.

To quit the sound test program, eject the floppy disk and turn the computer off while the menu above is displayed.

Subtest 01 Microphoned recording & play

Use this Subtest to check the functions of the CODEC A/D and D/A converter. Both the microphone terminals and headphone terminals can be checked at the same time.

Before executing this Subtest, connect an external microphone to the computer. If necessary, connect headphones to the computer to check whether the headphones jack of the computer is working correctly.

To execute this Subtest, press **1** key then press **Enter** key when the SOUND TEST menu is displayed. The following message appears:

```
AC-XG CODEC test program ver x.xx
Copyright (c) YAMAHA Corporation xxxx-xxxx. All rights
reserved.

  Recording & Playback Test [MIC1 >> LINE]
   Hit any key to start Recording.
```

Press any key to start recording for three seconds. After recording is completed, the computer immediately plays back the recorded sound. Then the following message appears:

```
  Did you hear the correct sound ?  ( Y / N )
```

Press **Y** or **N** key and any one key to return the SOUND TEST menu.

Subtest 02 DoReMi

This subtest is executed by loading Playwave. In this subtest, the control of the sound volume can be also tested.

Connect headphones and make sure you can hear the musical scale:
do, re, mi, fa, so, la, si, do from the right and left headphone.

Subtest 03 Line in/out

When the **Sound (Line in/out)** test menu is displayed, press **3** to select the test and press **Enter**. When you press **Enter**, the system records the sound from the sound generating device connected to connector on the sound board. After the recording is complete, press **Enter** to play the recorded sound through the internal speaker.

If the sound is played properly, press **Y**.

Subtest 04 SPDIF

Connect an S/PDIF compatible external speaker to DS1100 on the sound board.
Press **4** and press **Enter** to select the Sound (S/PDIF) test.
When you press **Enter**, the recorded sound is played through the S/PDIF compatible speaker.

If the sound is played properly, press **Y**.

Chapter 4

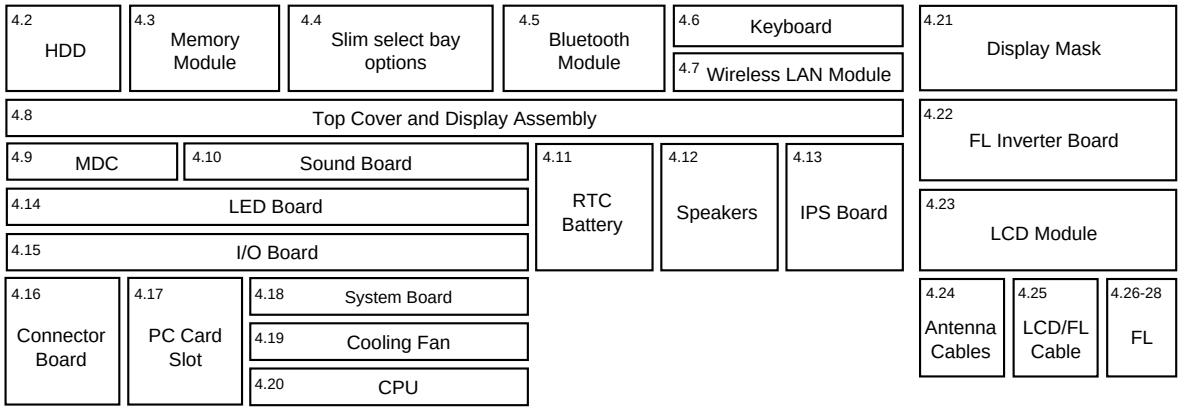
Replacement Procedures

Chapter 4 Contents

Figures

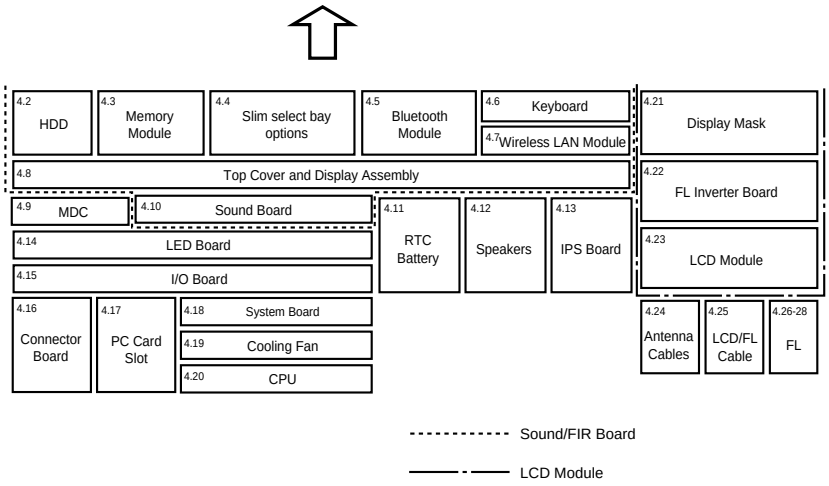
4.1 General

This section explains how to disassemble the computer and replace Field Replaceable Units (FRUs). It may not be necessary to remove all the FRUs in order to replace one. The chart below is a guide to which FRUs need to be removed in order to remove others. Always start by removing the battery pack, next, optional items such as the optional PC card, optional mini PCI card and optional memory module, then follow the line on the chart to determine which FRU you must remove next in order to repair the one you think is causing the computer to operate improperly. Refer to the example at the bottom of the page.



How to See the Chart

Two examples of referring to the chart are shown below.



•Removing the Sound Board.

First, the top cover with display assembly must be removed. It can be seen from the chart that the HDD, Wireless LAN, Slim Select Bay options, and keyboard above the top cover with display assembly must be removed before removing the top cover with display assembly.

•Removing the LCD Module

The FL inverter board and display mask above the LCD module must be removed in advance.

Safety Precautions

Before you begin disassembly, read the following safety precautions and observe them carefully as you work.

DANGER:

1. *Always use the genuine battery that is authorized by Toshiba or compatible with the unit. Since other battery packs have different specifications, they may be incompatible with the unit, and may burst or explode.*
   Never heat or disassemble the battery pack, as that could cause leakage of alkaline solution. Never throw the battery pack into a fire, as that could cause the battery pack to explode.
2. *The power supply, FL inverter and other components carry high voltages. If you need to turn on the power of a partially disassembled computer to check its operation, be very careful not to touch connectors or components, in order to avoid the risk of electric shock.*
   Also, do not disassemble individual components in first-level maintenance.

WARNING:

1. *Turn off the power and disconnect the AC adaptor from the power source, to avoid exposure to electric shock.*
2. *Batteries in the computer retain an electrical charge, so there is danger of electrical shock even when the computer is disconnected from an AC power source. Remove any metal jewelry or accessories such as necklaces, bracelets or rings, in order to reduce the risk of electric shock. Never work with wet or damp hands.*
3. *Be careful of edges and corners as these may cut.*

CAUTION:

1. *When you change a component, be sure the replacement component meets the required specifications. Never use foreign parts, to avoid any risk of damage to the computer.*
2. *To avoid any risk of short-circuit, fire or other internal damage, never allow any metal objects such as screws or paper clips to fall into the unit. Be sure to replace screws with the same size as those removed. Make sure all screws are securely fastened. Loose screws can cause short circuits, resulting in heat, smoke or fire.*
3. *Before lifting out an FRU or other component, make sure all cables to the component have been disconnected, in order to reduce the risk of accidental electric shock.*
4. *If you use AC power, be sure to use the cable that came with the computer or one recommended by Toshiba.*
5. *Make sure that all replacement components meet the specifications for the computer and that all cables and connectors are securely fastened, in order to avoid the risk of electric shock.*
6. *Some parts inside the computer, such as the CPU and cooling module, become very hot during operation. Conduct repair work after they have cooled. Be careful around the CPU and cooling module to avoid burns.*

Before You Begin

Look over the procedures in this section before you begin disassembling the computer. Familiarize yourself with the disassembly and reassembly steps. Begin each procedure by removing the AC adapter and the battery pack as instructed in this section:

1. Do not disassemble the computer unless it is operating abnormally.

2. Use only the correct and approved tools.

3. Make sure the working environment is free from the following elements whether you are using or storing the computer.

   - ❑ Dust and contaminates
   - ❑ Static electricity
   - ❑ Extreme heat, cold and humidity

4. Make sure the FRU you are replacing is causing the abnormal operation by performing the necessary diagnostics tests described in this manual.

5. Do not perform any operations that are not necessary and use only the described procedures for disassembling and installing FRUs in the computer.

6. After removing parts from the computer, place them in a safe place away from the computer so they will not be damaged and will not interfere with your work.

7. You will remove and replace many screws when you disassemble the computer. When you remove screws, make sure they are placed in a safe place and identified with the correct parts.

8. When assembling the computer make sure you use the correct screws to secure the various pieces in place. Screw sizes are listed in their corresponding figures.

9. The computer contains many sharp edges and corners, so be careful not to injure yourself.

10. After you have replaced an FRU, make sure the computer is functioning properly by performing the appropriate test on the FRU you have fixed or replaced.

Disassembly Procedures

The computer has two basic types of cable connectors:

- Pressure Plate Connectors
- Normal Pin Connectors

To disconnect a Pressure Plate connector, lift up the tabs on either side of the connector's plastic pressure plate and slide the cable out of the connector. To connect the cable to a Pressure Plate connector, make sure the pressure plate is fully lifted and slide the cable into the connector. Secure the cable in place by pushing the sides of the pressure plate down so the plate is flush with the sides of the connector. Gently pull on the cable to make sure the cable is secure. If you pull out the connector, connect it again making sure the connector's pressure plate is fully lifted when you insert the cable.

Standard pin connectors are used with all other cables. These connectors can be connected and disconnected by simply pulling them apart or pushing them together.

Assembly Procedures

After you have disassembled the computer and fixed or repaired the problem that was causing the computer to operate abnormally, you will need to reassemble the computer.

Install all the removed FRUs following the steps described in the corresponding sections in this chapter.

While assembling the computer, remember the following general points:

- Take your time, making sure you follow the instructions closely. Most problems arise when you get in a hurry assembling the computer.
- Make sure all cables and connectors are securely fastened.
- Before securing the FRU or other parts, make sure that screws or the FRU will pinch no cables.
- Check that all latches are closed securely in place.
- Make sure all the correct screws are used to secure all FRUs. Using the wrong screw can either damage the threads on the screw or the head of the screw and may prevent proper seating of an FRU.

After installing an FRU in the computer, confirm that the FRU and the computer are functioning properly.

Tools and Equipment

The use of Electrostatic Discharge (ESD) equipment is very important for your safety and the safety of those around you. Proper use of these devices will increase the success rate of your repairs and lower the cost for damaged or destroyed parts. The following equipment is necessary to disassemble and reassemble the computer:

- ❑ One M2 point size 0 Phillips screwdriver to remove and replace screws.
- ❑ One 4 mm flat-blade screwdriver.
- ❑ Tweezers, to lift out screws that you cannot grasp with your fingers.
- ❑ ESD mats for the floor and the table you are working on.
- ❑ An ESD wrist strap or heel grounder.
- ❑ Anti-static carpeting or flooring.
- ❑ Air ionizers in highly static sensitive areas.
- ❑ Plastic card of the size of credit card.
- ❑ Antenna coaxial cable disconnector

Screw Tightening Torque

When you fasten screws, be sure to follow the torque list below.

CAUTION: *Overtightening can damage components and screws; undertightening can result in electrical shorts or other damage if screws or components come loose.*

NOTE: *Toshiba recommends that you use an electric screw driver for quick and easy operations.*

- ❑ M2 0.17 N·m (1.7 kgf·cm)
- ❑ M2.5 0.30 N·m (3.0 kgf·cm)
- ❑ M3 0.57 N·m (5.6 kgf·cm)
- ❑ M2.5×4 PSP TITE 0.204 N·m (2.0 kgf·cm)
- ❑ M2.5×6 GIZA TITE 0.30 N·m (3.0 kgf·cm)
- ❑ LCD (internal use)
  DTI 14.1 inch 0.153 N·m (1.5 kgf·cm)
  Sharp 0.092 N·m (0.9 kgf·cm)

NOTE: *The computer contains several flat-head screws. These screws have less contact area with the screwdriver, so be careful to press firmly enough to prevent the screwdriver from slipping out and damaging the screw head.*

Color of Screw Shaft

To avoid mistakes on the screw length, screw shafts are colored as follows:

- ❑ Even number length screw: brown
- ❑ Odd number length screw: white
- ❑ Special length screw: blue
  Screws whose lengths are indicated to one or more decimal places such as 2.5 mm or 2.8 mm.

Marking of Screws on the Computer Body

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.

Kind of screws	Symbol
❑ Bind screw	B
❑ Flat-head screw	F
❑ Super flat-head screw	S
❑ Tapping screw	T
❑ Other screws (Unique screws, stud, etc.)	U

Examples:

- ❑ 6 mm bind screw B6
- ❑ 12 mm bind screw B12
- ❑ 5 mm stud U5
  (Indicates the screwed length in round number regardless the length of the stud.)

Removing the Battery Pack

To remove the battery pack, follow the steps below and refer to figures 4-1and 4-2.

> ***CAUTION:*** *When handling battery packs, be careful not to short circuit the terminals. Also do not drop, hit or otherwise apply impact; do not scratch or break the casing and do not twist or bend the battery pack.*

1. Turn the computer upside down with the front facing you.
2. Slide the **battery lock** in the direction of the arrow.

> ***NOTE:*** *For environmental reasons, do not throw away a spent battery pack. Please follow local ordinances or regulations for its disposal.*

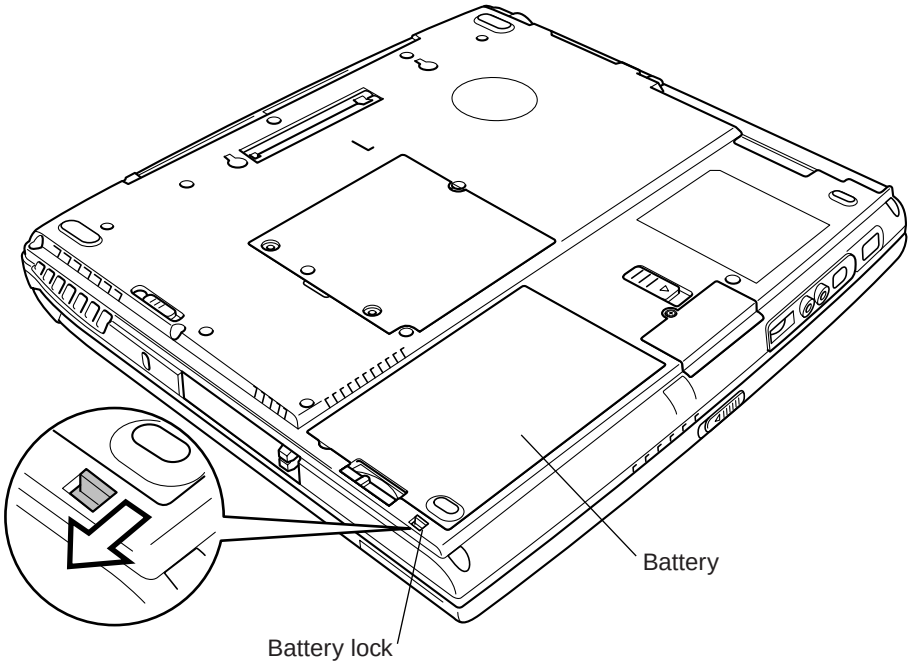


Figure 4-1 Removing the battery pack

4. Slide the **Latch** in the direction of the arrow.
5. Grasp and pull the **battery pack** forward and lift it out.
6. Remove the **battery**.

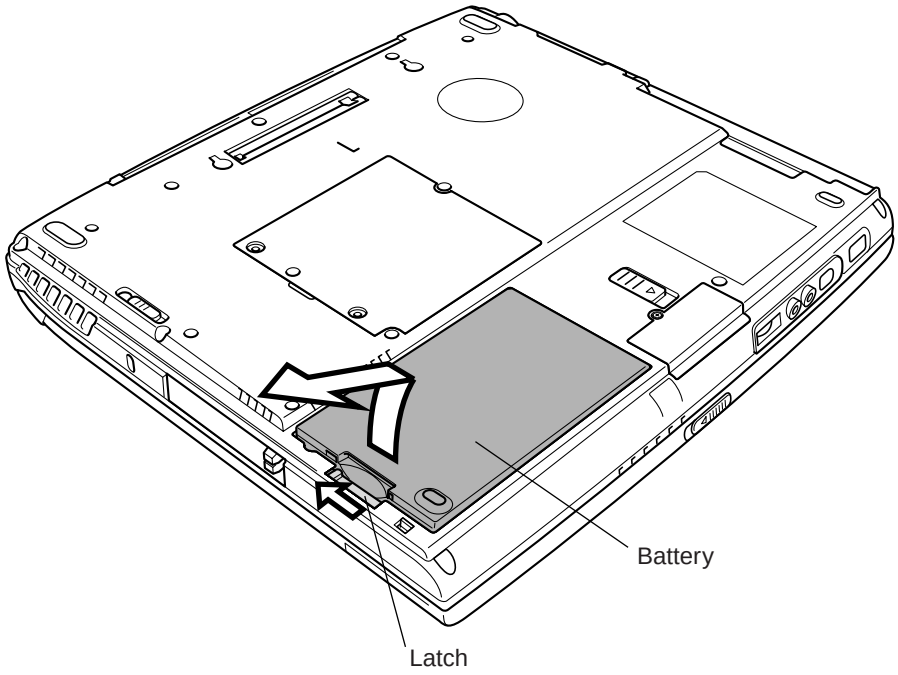


Figure 4-2 Removing the battery pack

Installing the Battery Pack

To install the battery pack, follow the steps below and refer to figures 4-1 and 4-2.

CAUTION: *The battery pack is a lithium ion battery which can explode if not properly replaced, used, handled or disposed of. Dispose of the battery as required by local ordinances or regulations. Use only batteries recommended by Toshiba as replacements.*

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

1. Seat a new or recharged **battery pack**.
2. Carefully push the **battery pack** toward the connectors.
3. Slide the **battery lock** to the right to secure the **battery pack**.

Removing the Optional PC Card

To remove the PC Card (option), make sure the computer is in boot mode, then follow the steps below and refer to figure 4-3.

> ***CAUTION:*** *Before you remove a PC Card, refer to the card's documentation and to your operating system documentation for proper procedures and precautions.*

1. When the security lock for the **PC card** is set, turn the computer upside down, remove **one silver M2.5×4 screw**, slide the latch to the left to release the lock and secure the **M2.5×4 screw**.
2. Turn the computer right side up.
3. Press the eject button for the **PC card** you want to remove to extend the button.
4. Press the extended eject button to pop the **PC card** out slightly.
5. Grasp the PC Card and pull it out.

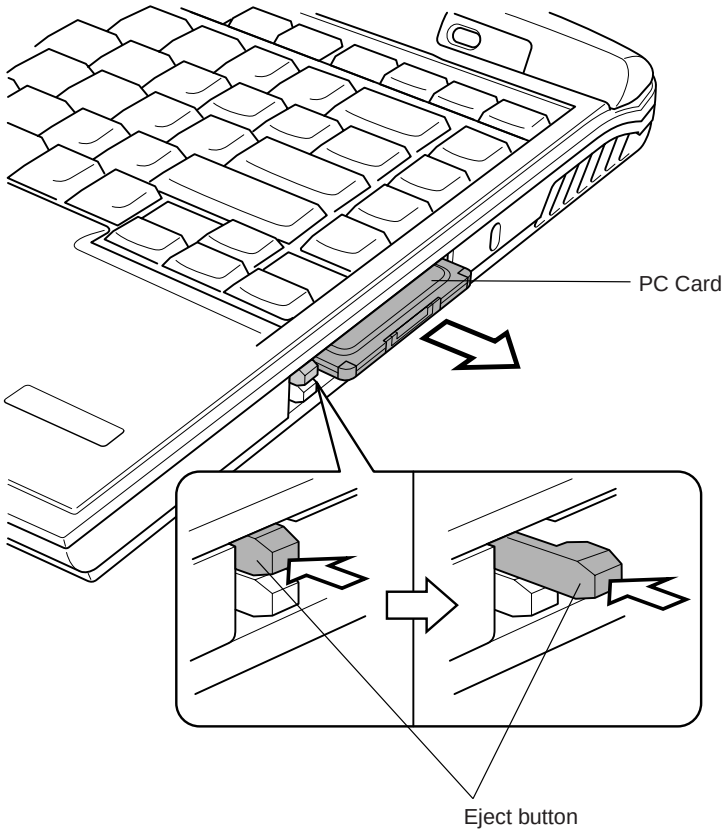


Figure 4-3 Removing a PC Card

Installing the Optional PC Card

To install the PC card (option), follow the steps below and refer to figure 4-3.

1. Insert a **PC card** and push it carefully to ensure a firm connection.
2. Push the eject button.
3. To set the security lock, turn the computer upside down, remove **one M2.5×4 silver screw**, slide the lock to the right and secure the **M2.5×4 silver screw**.

Removing the Optional SD Card

To remove the SD Card (option), make sure the computer is in boot mode, then follow the steps below and refer to figure 4-4.

> ***CAUTION:*** *Before you remove an SD Card, refer to the card's documentation and to your operating system documentation for proper procedures and precautions.*

1. Turn the computer right side up.
2. Push the **SD card** in and release it to pop the card out slightly.
3. Grasp the **SD card** and pull it out.

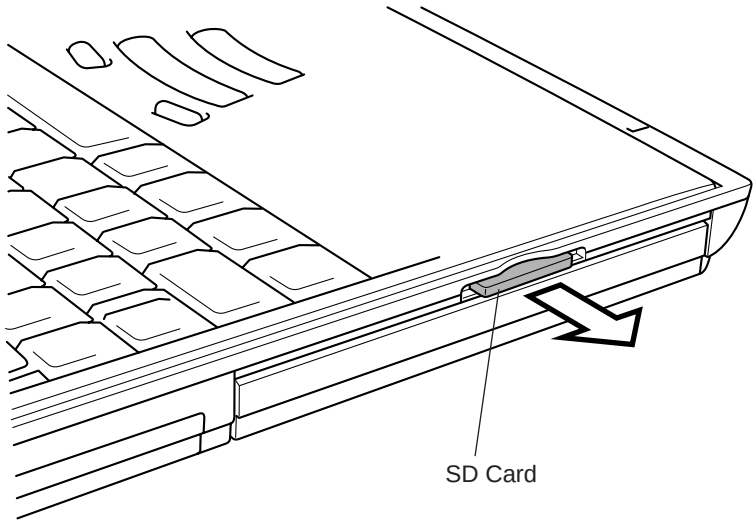


Figure 4-4 Removing a SD Card

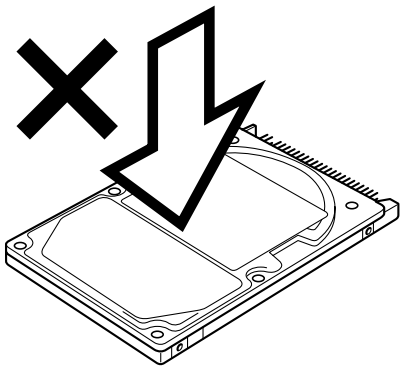
Installing the Optional SD Card

To install the SD Card (option), follow the steps below and refer to figure 4-4.

1. Insert an **SD Card**.
2. Push it carefully to ensure a firm connection.

4.2 HDD

***CAUTION**: When handling the HDD, do not press the top surface as shown by the arrow. Hold it by the sides.*



Removing the HDD

To remove the HDD, follow the steps below and refer to figures 4-5 to 4-8.

1. Turn the computer upside down.
2. Remove **one M2.5×6 silver flat-head screw** securing the HDD cover.
3. Remove the **cover** by sliding it in the direction of the arrow.

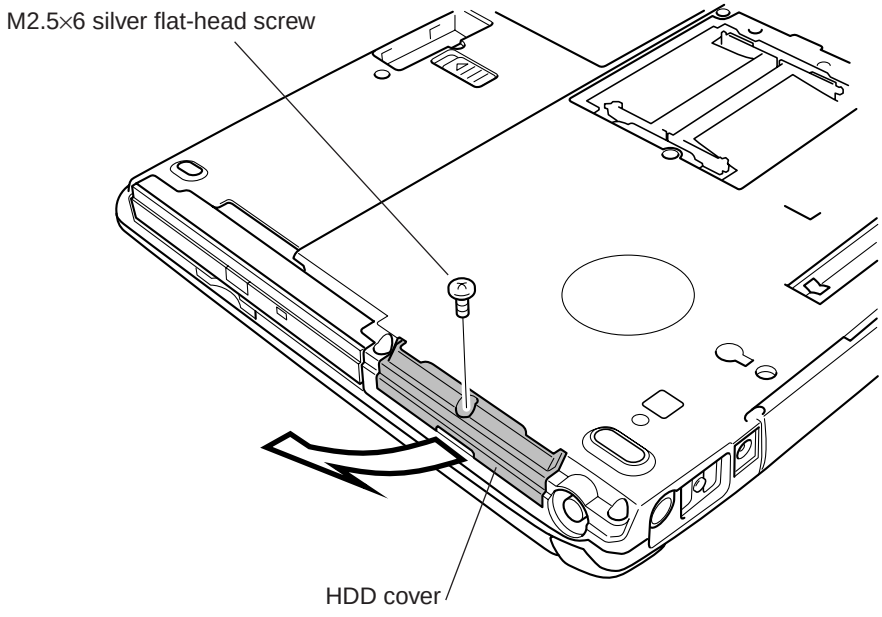


Figure 4-5 Removing the HDD cover

4. Pull the white **plastic tab** to remove the **HDD**. Be careful not to damage the connector.

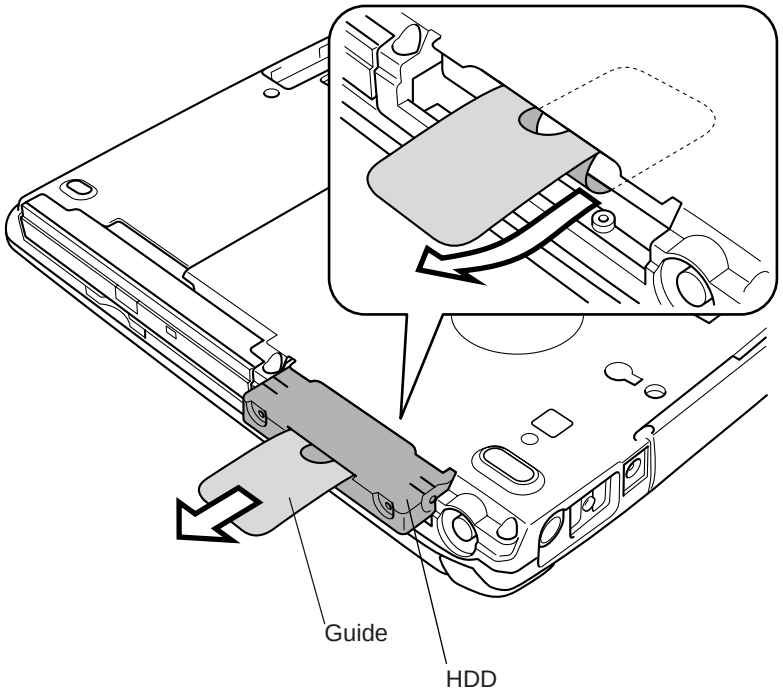


Figure 4-6 Removing the HDD pack

NOTE: *The following steps describe how to disassemble the HDD pack; however, do not disassemble if the HDD is working properly.*

5. Turn over the **HDD** bracket.

5. Place the **HDD** pack on a flat surface, and remove **four M3×4 flat-head screws**.
6. Remove the **HDD bracket**.

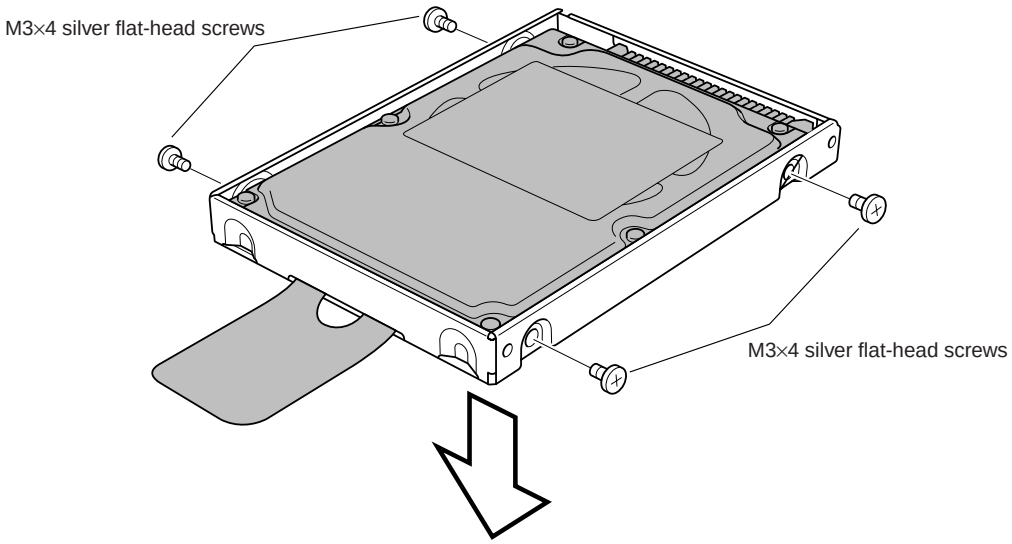


Figure 4-7 Removing screws and HDD bracket

7. Remove the connector.

> ***CAUTION:*** *Do not apply pressure to the top or bottom of the HDD.*

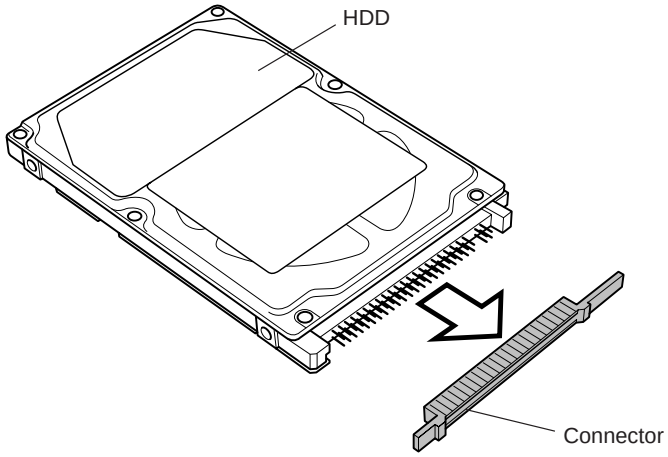


Figure 4-8 Removing the connector

Installing the HDD

To install the HDD, follow the steps below and refer to figures 4-5 to 4-8.

> ***CAUTION:*** *Don't hold the HDD by its top and bottom flat surfaces. It may damage the HDD.*

1. Connect the connector.
2. Seat the **HDD** in the bracket.
3. Secure **four M3×4 flat-head screws**.

> ***CAUTION:*** *Do not apply pressure to the middle of the HDD pack. It may damage the HDD bracket. Hold the HDD by its corners.*

4. Hold the **HDD pack** by its corners and insert it into the computer. Press to ensure a firm connection.
5. Insert the white **plastic tab** into the gap between the computer top cover and the **HDD**, and seat the **cover**.
6. Secure the **HDD cover** with **one M2.5×4 silver flat-head screw**.

4.3 Memory Modules (Option)

Removing the Memory Module (Option)

To remove the memory module (option) make sure the computer is in boot mode and powered off, follow the steps below and refer to figures 4-9 and 4-10.

CAUTION: *Do not try to remove a memory module with the computer turned on. You can damage the computer and the memory.*

1. Turn the computer upside down.
2. Remove **two M2.5×3 silver flat-head screws**.
3. Lift off the **memory slot cover**.

CAUTION: *Do not touch the connectors on the memory module(s) or on the computer. Debris on the connectors may cause memory access problems.*

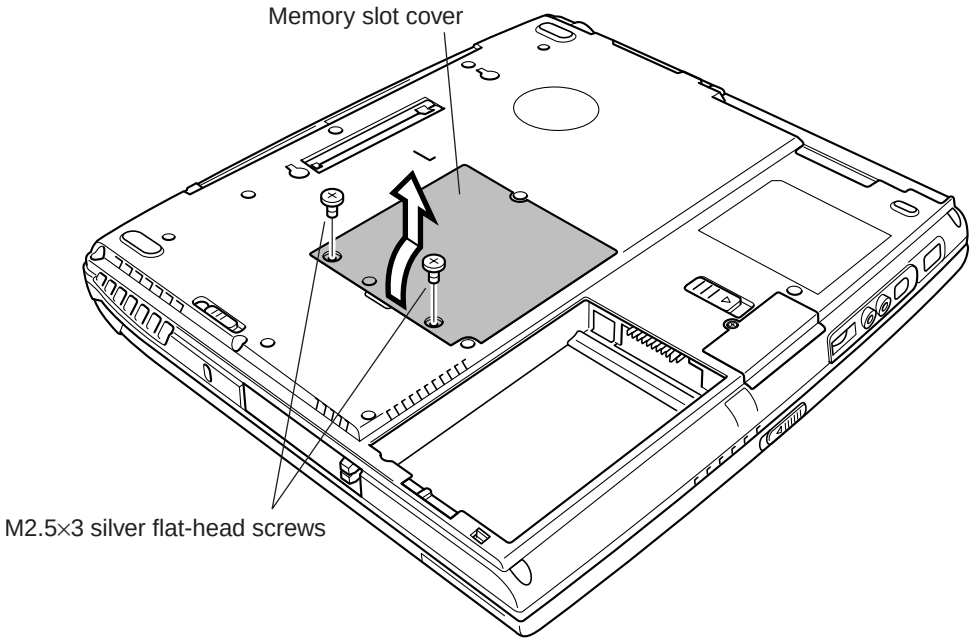


Figure 4-9 Removing the memory slot cover

Gently press out on **two latches**. One end of the **expansion memory module** will pop up.

4. Grasp the expansion **memory module** and pull it out.

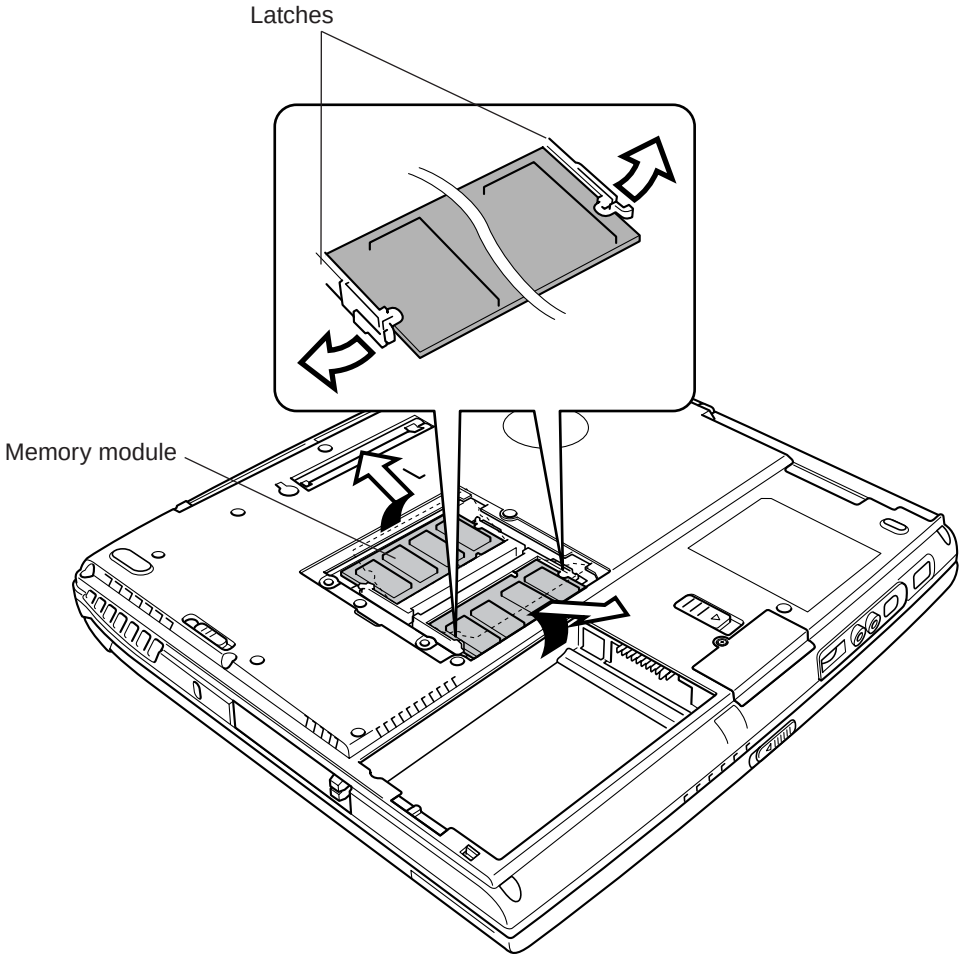


Figure 4-10 Removing the memory modules

Installing a Memory Module

To install a memory module (option), make sure that the computer is in boot mode and powered off, follow the steps below and refer to figures 4-9 and 4-10.

> ***CAUTION:*** *Do not touch the connectors on the memory module or on the computer. Debris on the connectors may cause memory access problems.*

1. Fit the **expansion memory module**'s connectors into the computer's connectors and press carefully to ensure firm contact.

2. Gently, push the **expansion memory module** down until **latches** on either side engage the **expansion memory module** to hold it in place.

3. Align two tabs on the edge of the **expansion memory slot cover** with two notches on the memory slot, and seat the **expansion memory slot cover**.

4. Secure the **expansion memory slot cover** with **two M2.5×3 silver screws**.

> ***CAUTION:*** *Do not install a memory module in slot B only. Use slot A prior to slot B. Otherwise, the computer or the memory may be damaged.*

4.4 Slim Select Bay Module

Removing the Slim Select Bay Module

NOTE: *Removal of the Slim Select Bay module is the same for all modules. For instructions on disassembling each component, refer to the relevant section in this chapter.*

To remove the slim select bay options, follow the steps below and refer to figure 4-11.

1. Turn the computer upside down.
2. Slide the release lever in the direction of the arrow, and pull out **the slim select bay module**.

CAUTION: *The Slim Select Bay module can become hot with use. Be careful when removing the module.*

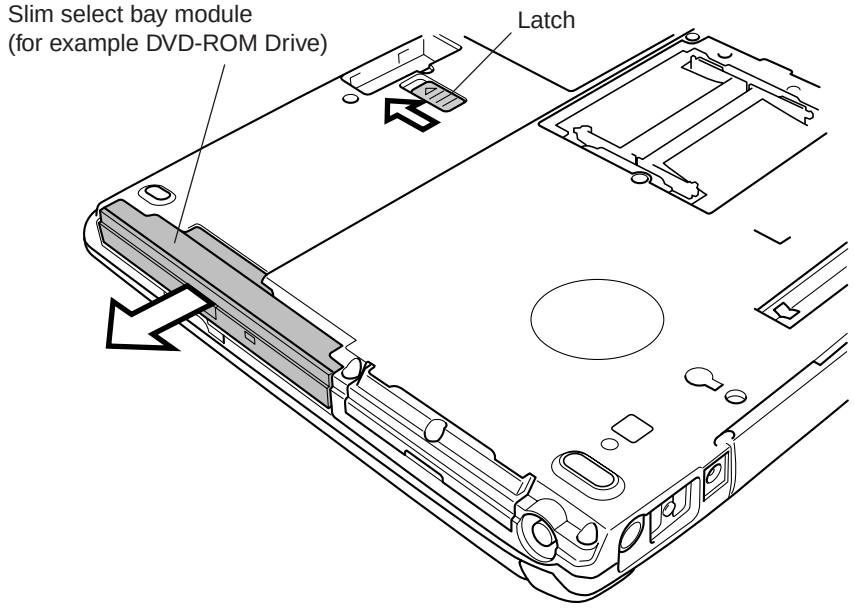


Figure 4-11 Removing a Slim Select Bay Module

Installing the Slim Select Bay Module

Install the slim select module as described below and refer to figure 4-11.

1. Insert a module in the **slim select bay**.
2. Push it in till it clicks.

4.5 Bluetooth Board

Removing the Bluetooth Board

To remove the Bluetooth board (option), make sure the computer is in boot mode and powered off, follow the steps below and refer to figures 4-12 and 4-13.

> ***CAUTION:*** *Do not try to remove the Bluetooth board with the computer turned on. You can damage the computer and the Bluetooth board.*

1. Turn the computer upside down.
2. Remove **one M2×4 flat-head screw**.
3. Remove the **Bluetooth board cover**.

> ***CAUTION:*** *Do not touch the connectors on the Bluetooth board or on the computer. Debris on the connectors may cause Bluetooth board access problems.*

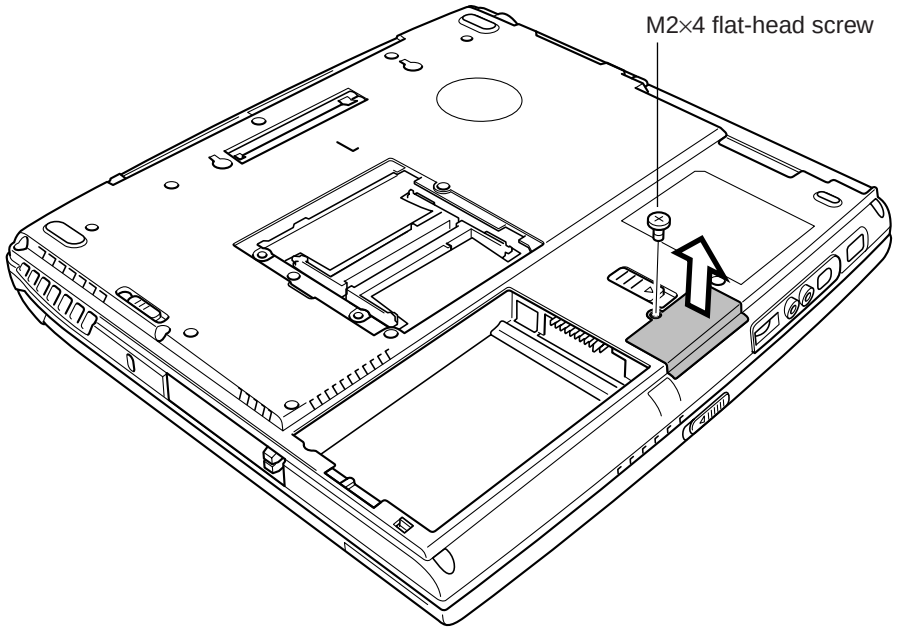


Figure 4-12 Removing the Bluetooth board cover

4. Disconnect the **Bluetooth antenna cable (brown)** from the **Bluetooth board** using an **antenna coaxial cable disconnector**.

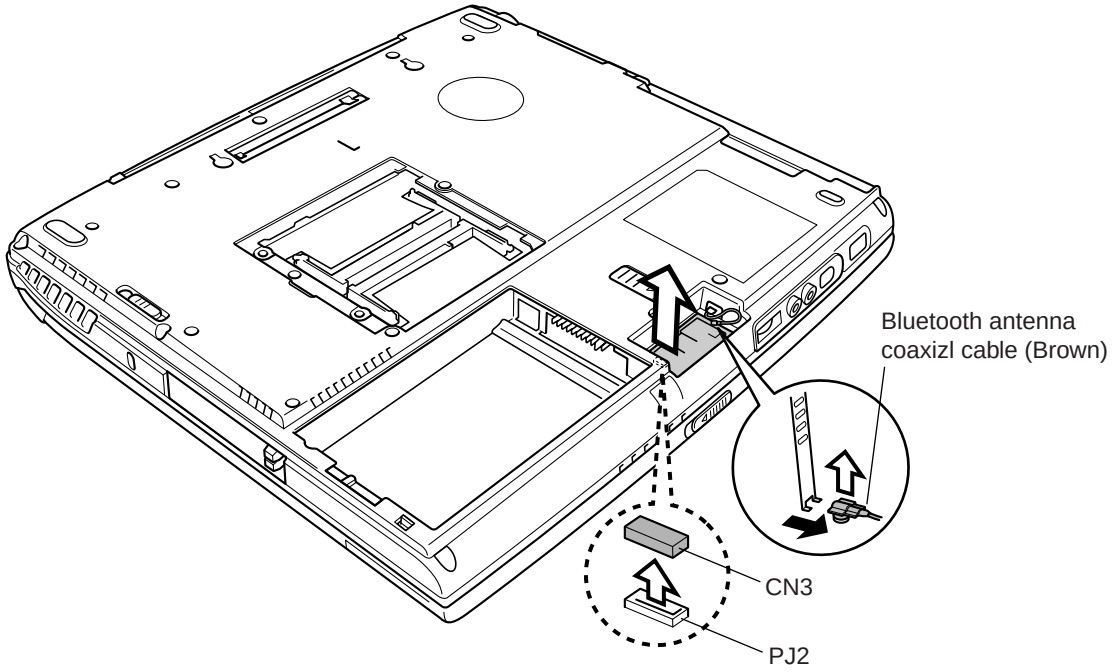


Figure 4-13 Disconnecting the Bluetooth antenna cable

Installing the Bluetooth Board

To install the Bluetooth board (option), make sure that the computer is in boot mode and powered off, follow the steps below and refer to figures 4-12 and 4-13.

> ***CAUTION:*** *Be sure to turn the computer off in boot mode before removing the Bluetooth board. Otherwise, the computer or the Bluetooth board may be damaged.*

1. Set the **Bluetooth board** onto the connector.
2. Gently push the **Bluetooth board** down until latches on both sides engage the **Bluetooth board**.
3. Connect the **Bluetooth antenna coaxial cable (Brown)** to the connector on **Bluetooth board**.
4. Place the **Bluetooth board cover** back on.
5. Fasten the cover with **one M2×4 flat-head screw**.

> *CAUTION: Be careful not to damage or pinch the Bluetooth antenna cable when you seat the cover.*

4.6 Keyboard

Removing the Keyboard

To remove the keyboard, follow the steps below and refer to figures 4-14 to 4-17.

1. Turn the computer upside down.
2. Remove **one M2×11 silver flat-head screw**.

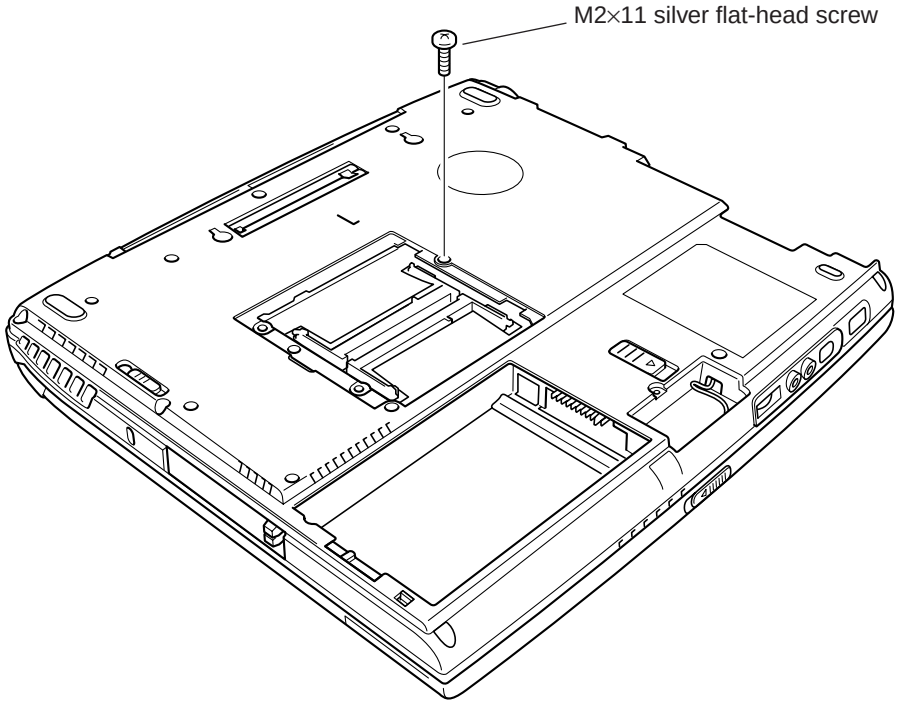


Figure 4-14 Remove one screw securing the keyboard

3. Turn the computer right side up.
4. Open the display panel.

5. Insert your fingernails into **notches** in the keyboard holder and the computer, and pry up the **keyboard holder** to unlatch it at eleven points and remove it.

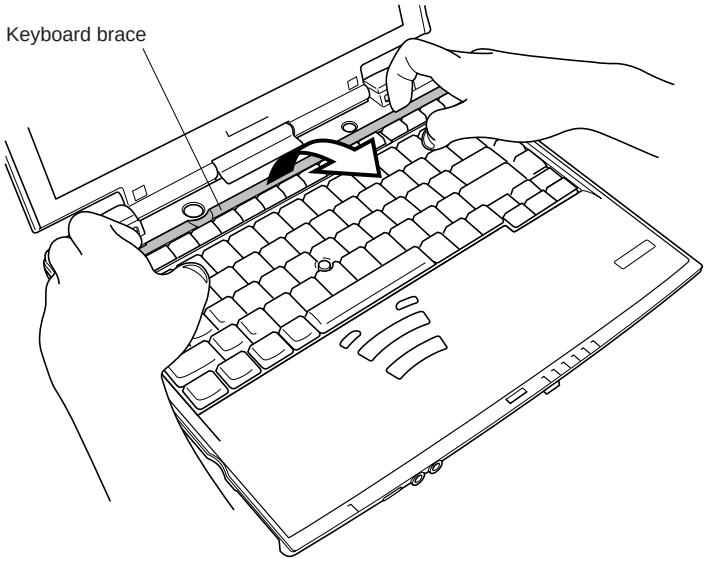


Figure 4-15 Removing the keyboard holder

6. Remove **two M2.5×3 black flat-head screws**.
7. Rotate out the **keyboard** and lay it on top of the palm rest.

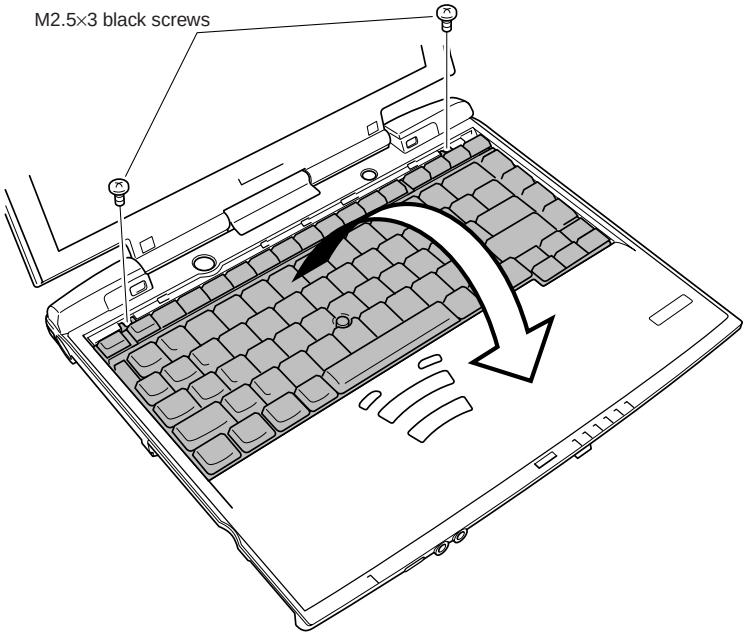


Figure 4-16 Removing two screws

8. Disconnect the **keyboard cable** from **PJ123** on the **system board**, and remove the **keyboard**.

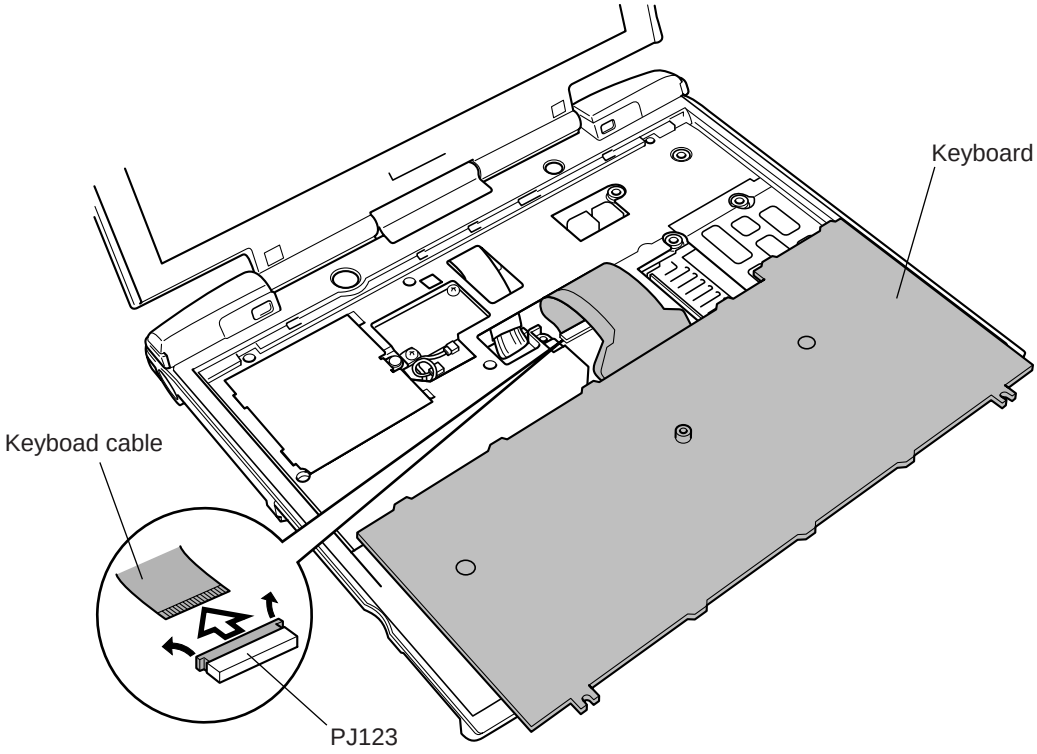


Figure 4-17 Removing the keyboard

Installing the Keyboard

To install the keyboard, follow the steps below and refer to figures 4-14 to 4-17.

1. Connect the **keyboard cable** to **PJ123** on the **system board**.
2. Align the latches on the front of the **keyboard** with the notches in the top cover.
3. Seat the **keyboard** and secure it with **two M2.5×3 black flat-head screws**.
4. Seat the keyboard **holder** and press to secure **notches**.
5. Turn the computer upside down.
6. Secure the **keyboard** with **one M2×11 silver flat-head screw**.

4.7 Wireless LAN Card

Removing the Wireless LAN Card

To remove the wireless LAN card (option), make sure the computer is in boot mode and powered off, follow the steps below and refer to figures 4-18 and 4-19.

> ***CAUTION:*** *Do not try to remove the wireless LAN Card with the computer turned on. You can damage the computer and the wireless LAN Card.*

1. Remove **one M2×4 flat-head screw**.
2. Remove the **wireless LAN card slot cover**.

> ***CAUTION:*** *Do not touch the connectors on the wireless LAN Card module on the computer. Debris on the connectors may cause wireless LAN Card access problems.*

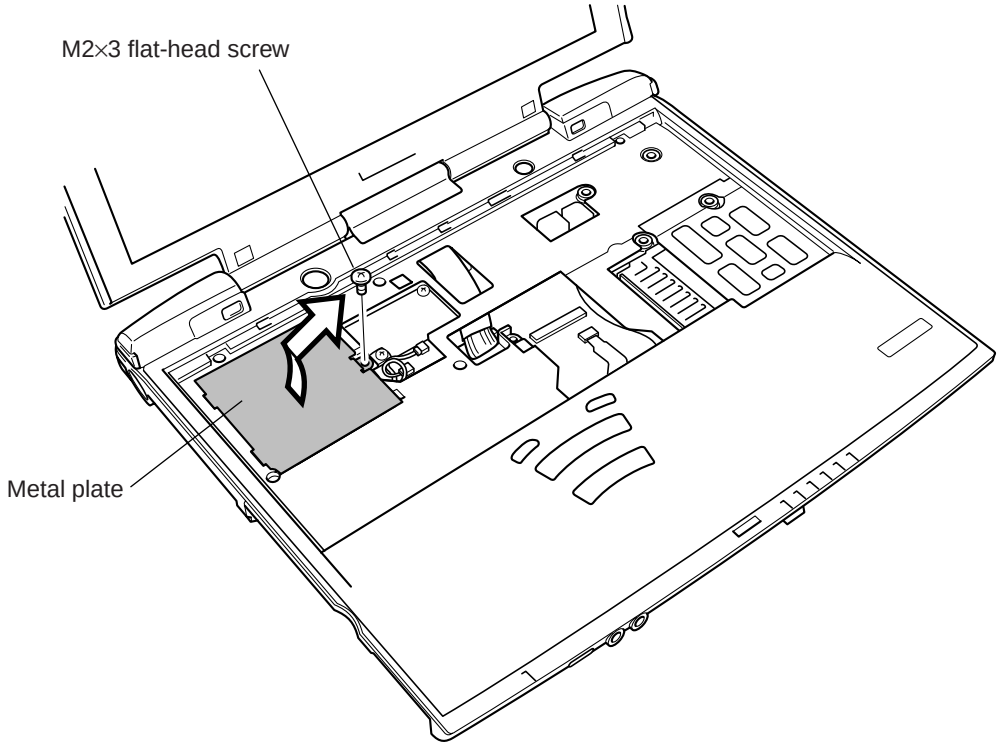


Figure 4-18 Removing the wireless LAN card slot cover

3. Disconnect the **wireless LAN antenna cables (black and white)** from the **wireless LAN card** using **an antenna coaxial cable disconnector**.

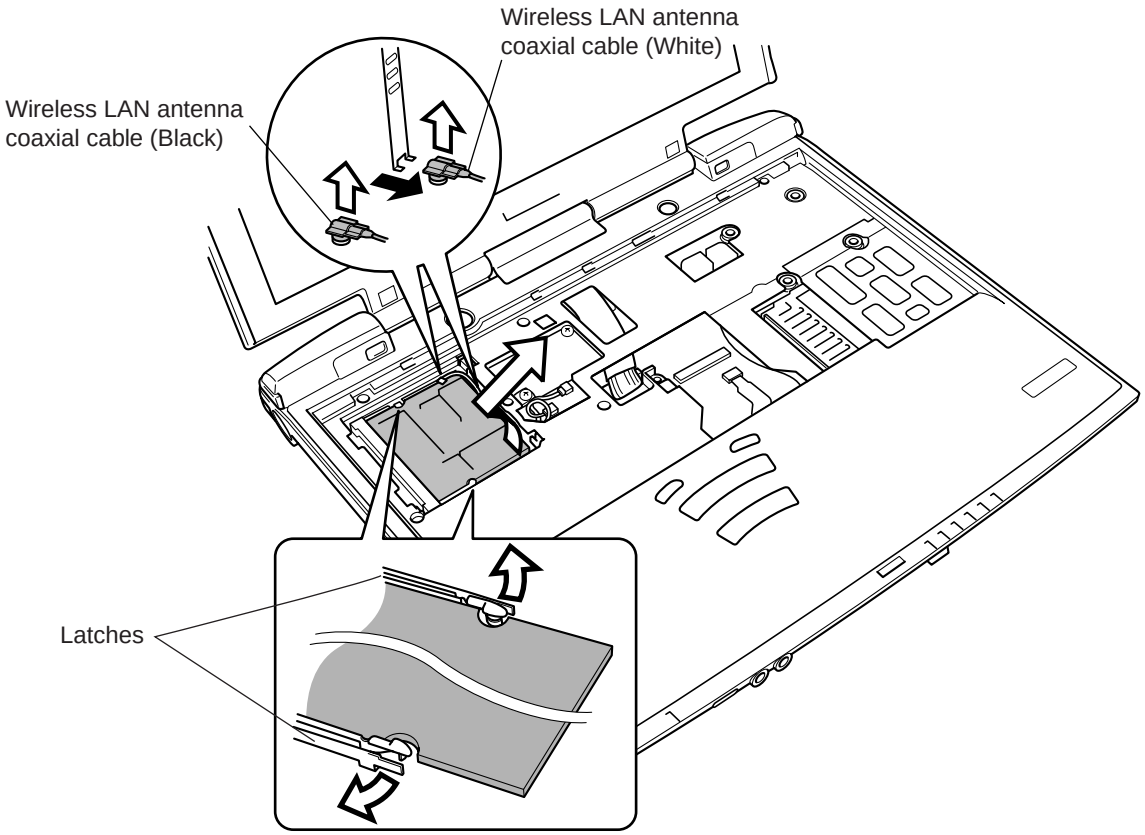


Figure 4-19 Disconnecting the antenna coaxial cable

4. Push the **wireless LAN card lock latches** outward to release the **wireless LAN card**. It will pop up to about a 45 degrees angle.

5. Pull out the **wireless LAN card**. Be careful not to damage the connector.

Installing the Wireless LAN Card

To install the wireless LAN card (option), make sure that the computer is in boot mode and powered off, follow the steps below and refer to figures 4-18 and 4-19.

CAUTION: *Be sure to switch the computer off before removing the* ***wireless LAN card****. Otherwise, the computer or the* ***wireless LAN card*** *may be damaged.*

1. Insert the **wireless LAN card** into the connector at an angle of 45 degrees.
2. Gently push the **wireless LAN card** down until latches on both sides engage the **wireless LAN card** to hold it in place.
3. Connect the **wireless LAN antennas (black and white) cables** to the connectors on the **wireless LAN card**.

CAUTION: *Be careful not to damage or pinch the wireless LAN cables when you seat the slot cover.*

4. Place the **wireless LAN card slot cover** back on.
5. Secure the cover with **one M2×4 flat-head screw**.

CAUTION: *There are two MAC address barcode labels in the package containing the new Wireless LAN Card. Apply one label to the bottom of the computer and one to the box the computer was shipped in. Before you apply the new labels, remove the old ones from the computer and the box. The computer may have MAC address barcode labels for both wired and wireless LANs. Be sure to replace the correct label.*

4.8 Top Cover with Display Assembly

Removing the Top Cover with Display Assembly

To remove the top cover with display assembly, follow the steps below and refer to figures 4-20 to 4-23.

1. Turn the computer upside down, and remove the following **12 screws**:
   - One M2.5×8 black flat-head screw
   - Six M2.5×16 screws
   - Four M2×12 black flat-head screws
   - One M2.5×4 screw

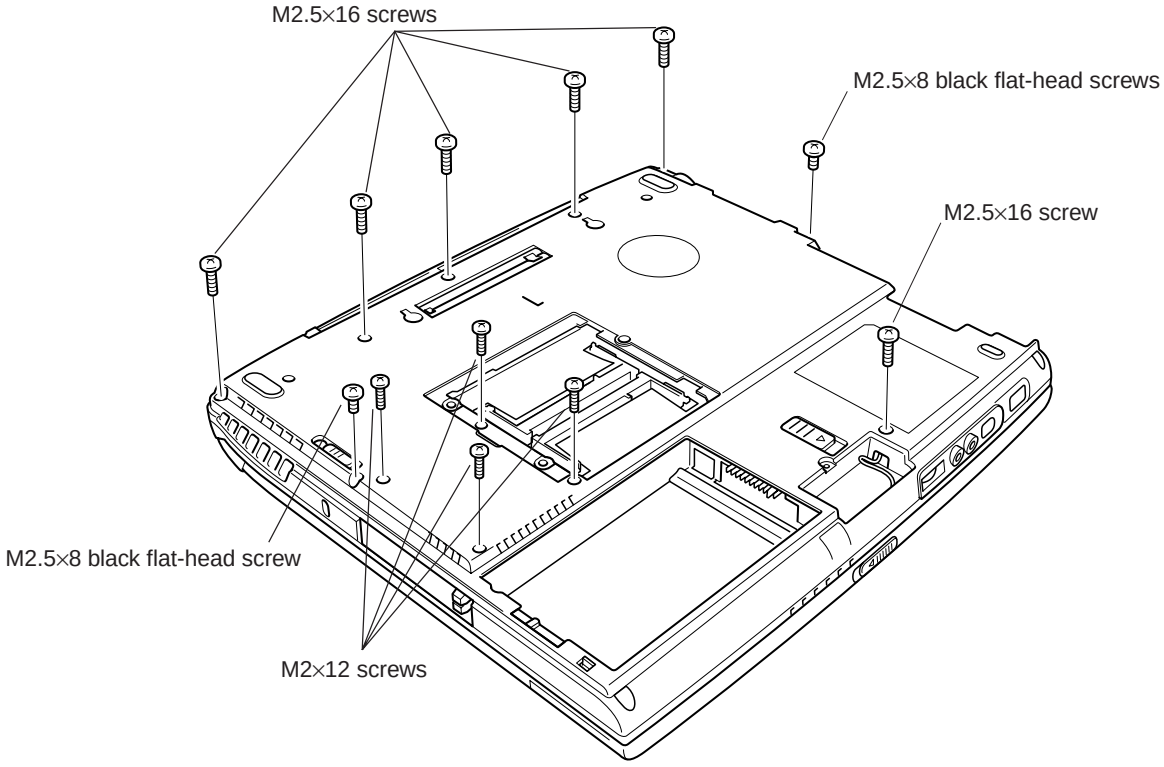


Figure 4-20 Removing 12 screws from the bottom of the computer

2. Remove the following **five screws**:
   - Two M2.5×8 black screws
   - Two M2.5×3 silver flat-head screws
   - One M2.5×4 black flat-head screw

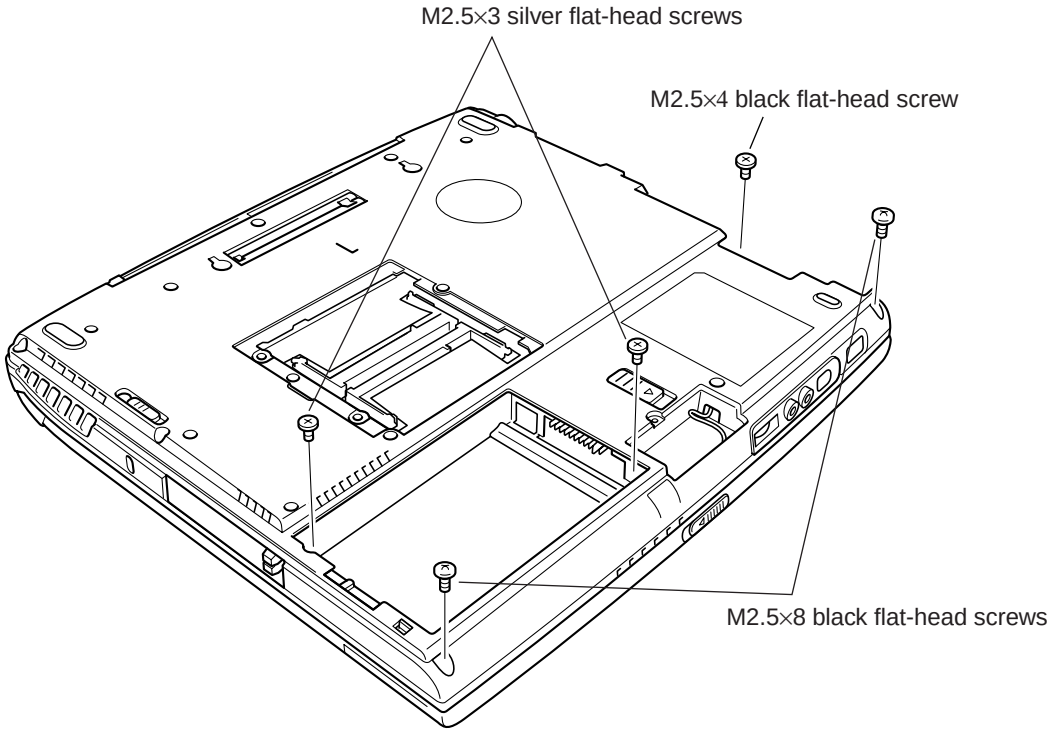


Figure 4-21 Removing five screws from the bottom of the computer

2. Turn the computer right side up, open the display panel and disconnect the **IPS cable** from **PJ122**, the **FL/LCD cable** from **PJ76** and the **speaker cables** from **PJ127** and **PJ129** on the **I/O board**.

3. Remove **two M2.5×8 screws**.

4. Remove **one M2.5×13 black screw**.

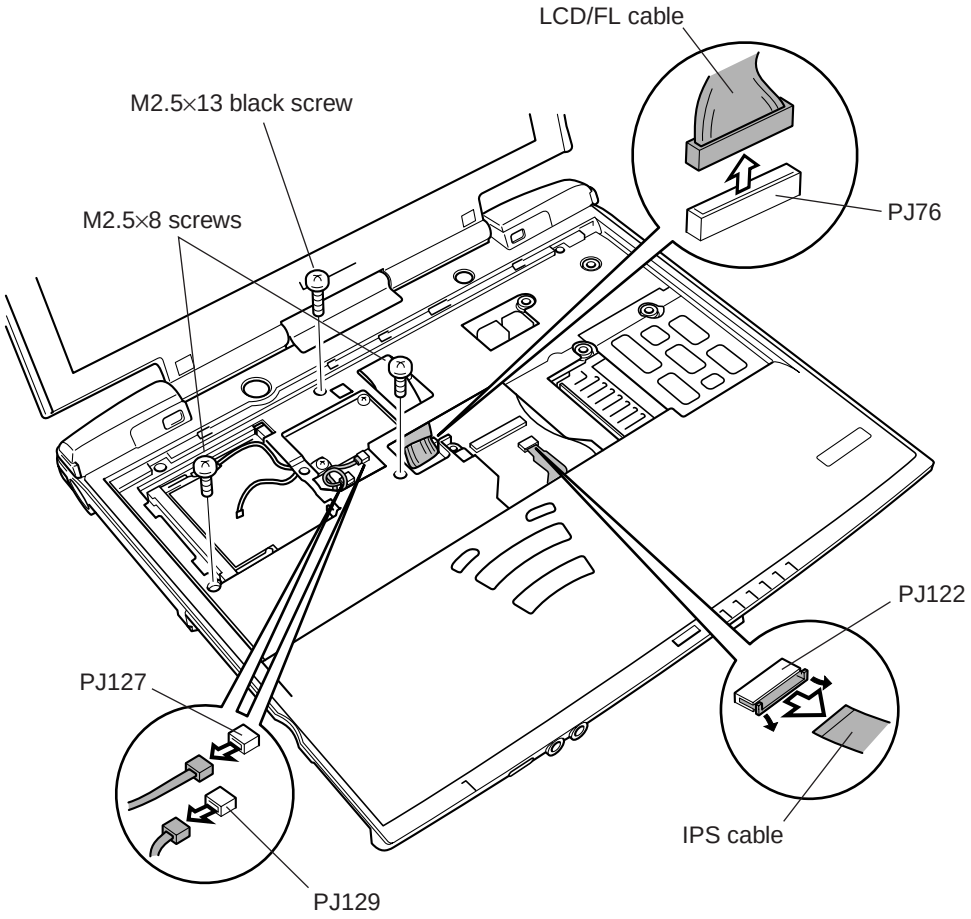


Figure 4-22 Disconnecting the cables

5. Remove the **top cover with display assembly** starting from the front. Be careful not to damage the **Bluetooth antenna coaxial cable**.

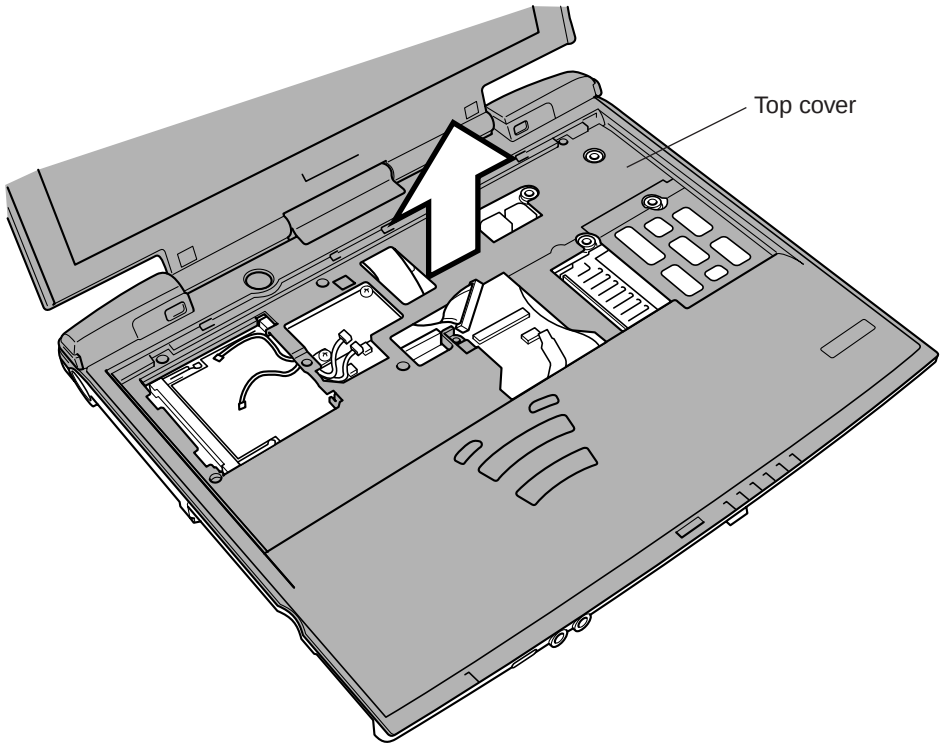


Figure 4-23 Removing the top cover

Installing the Top Cover with Display Assembly

To install the top cover with display assembly, follow the steps below and refer to figures 4-20 to 4-23.

1. Be careful to route the **Bluetooth antenna coaxial cable** and **wireless LAN antenna coaxial cables** so that the **top cover with display assembly** will not pinch them.
2. Seat the top cover.
3. Press along the edges of the **top cover with display assembly** to secure latches.
4. Connect the **LCD/FL cable** to **PJ76** and route the **Bluetooth antenna coaxial cable**.
5. Connect the **IPS Switch cable** to **PJ122**.
6. Connect the **speaker cables** to **PJ127** and **PJ129**.
7. Secure the following **five screws**:
   - Two M2.5×8 black screws
   - Two M2.5×3 silver flat-head screws
   - One M2.5×4 black flat-head screw
8. Turn the computer upside down and secure the following **12 screws**:
   - One M2.5×8 black flat-head screws
   - Six M2.5×16 screws
   - Four M2×12 black flat-head screws
   - One M2.5×4 screw

4.9 Modem Daughter Card

Removing the Modem Daughter Card

To remove the **modem daughter card**, follow the steps below and refer to figure 4-24.

1. Remove the **tape** securing the **modem cable**.
2. Remove **two M2×4 screws** securing the **modem daughter card**.
3. Disconnect the cable from **PJ126** on the **I/O board**.
4. Carefully lift up the **modem daughter card** to disconnect it from **PJ125** on the **I/O board**.

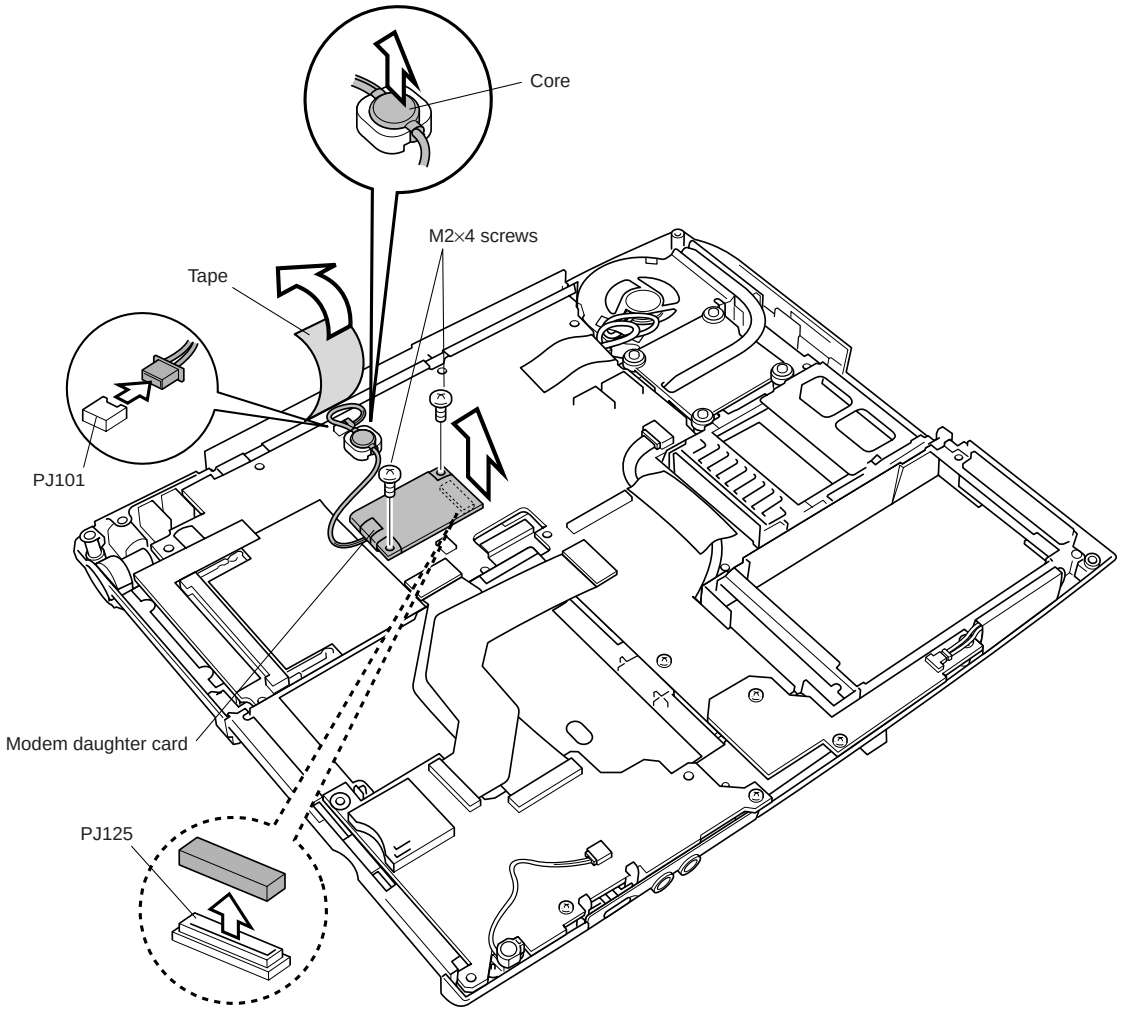


Figure 4-24 Removing the modem daughter card

Installing the Modem Daughter Card

To install the modem daughter card, follow the steps below and refer to figure 4-24.

1. Seat the **modem daughter card** and press carefully on the right end of the card to connect it to **PJ125** on the **I/O board**. Be careful not to damage the card or connector.

2. Secure the **modem daughter card** with **two M2×4 screws**.

3. Connect the cable to **PJ126** on the **I/O board**.

4. Secure the **modem cable** with the **tape**.

4.10 Sound/FIR Board

Removing the Sound/FIR Board

To remove the **sound/FIR board**, follow the steps below and refer to figures 4-25 and 4-26.

1. Disconnect the **sound cables** from **PJ102** and **PJ103** on the **I/O board**.
2. Remove **two M2.5×4 screws** securing the **sound/FIR board**.
3. Lift up the **sound/FIR board**.

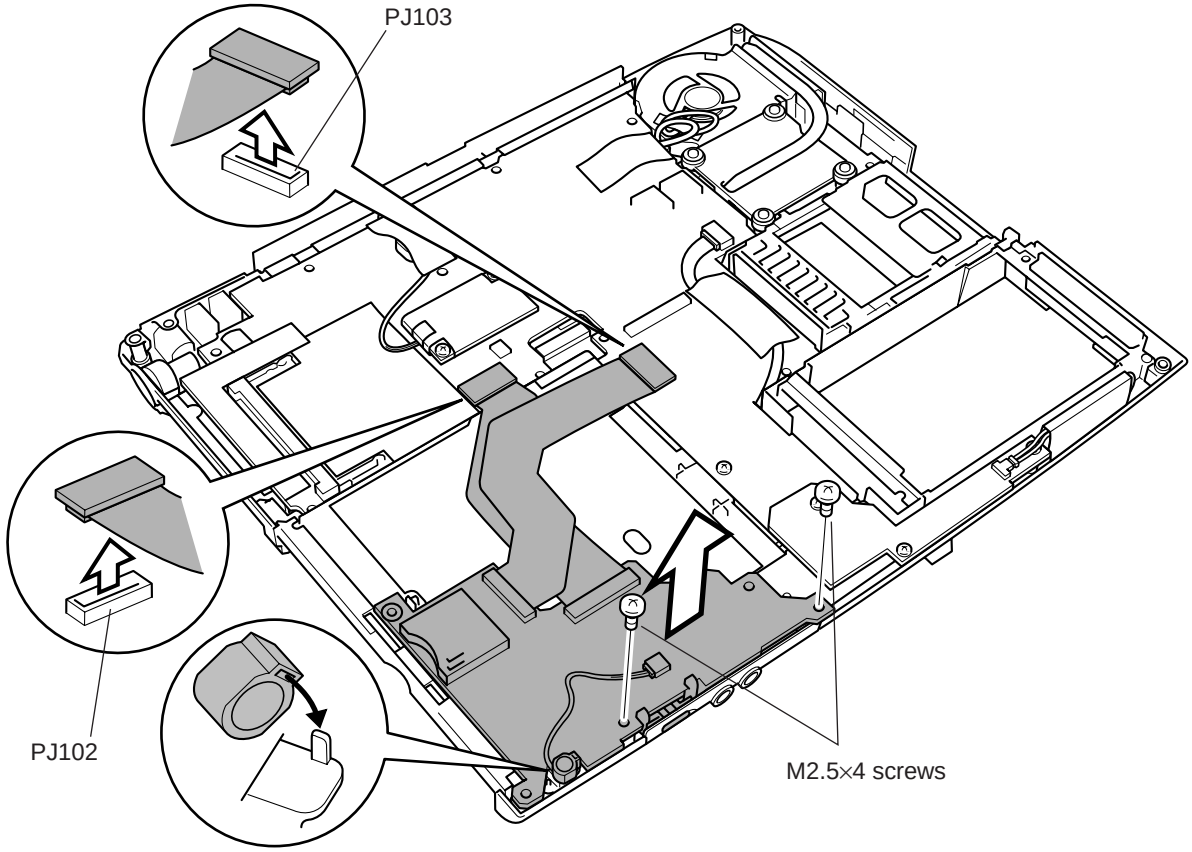


Figure 4-25 Removing the sound/FIR board

4. Disconnect the **sound cables** from **PJ1000** and **J1001** on the **sound/FIR board**.
5. Disconnect the internal **microphone cable** from **PJ1003** on the **sound/FIR board**.

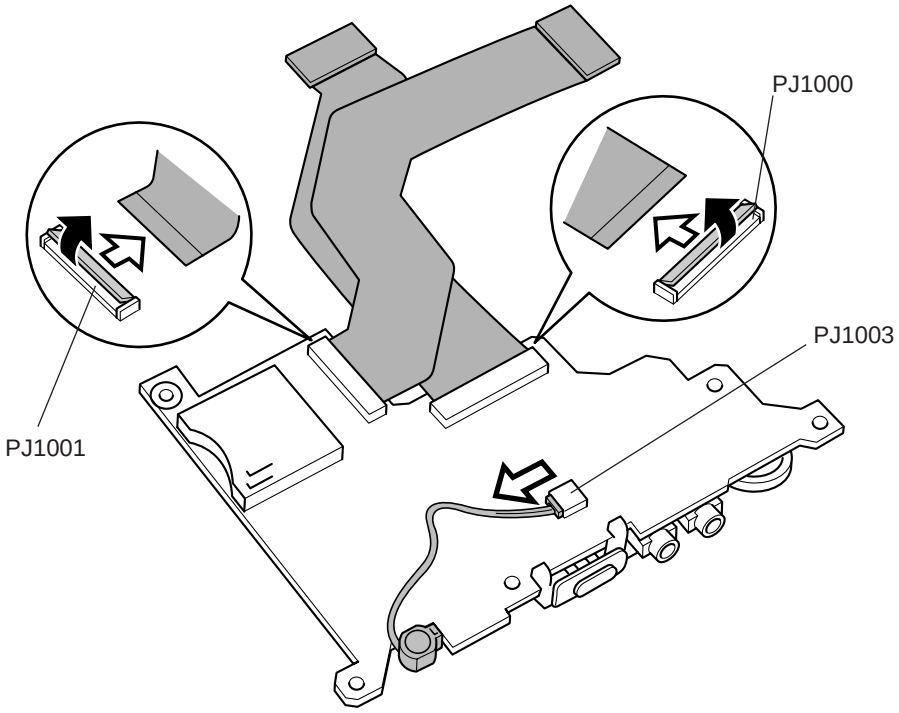


Figure 4-26 Disconnecting the sound cables and microphone cable

Installing the Sound/FIR Board

To install the **sound/FIR board**, follow the steps below and refer to figures 4-25 and 4-26.

1. Connect the **microphone cable** to **PJ1003** on the **sound/FIR board**.
2. Connect the **sound cable** to **PJ1000** and **PJ1001** on the **sound/FIR board**. Make sure **PJ1000** and **PJ1001** are firmly connected.
3. Set the **sound/FIR board**, making sure that the **microphone** is in position.
4. Secure the **sound/FIR board** with **two M2.5×4 screws**.

4.11 RTC Battery

WARNING: *When it is necessary to replace the RTC battery, be sure to use genuine batteries or replacement batteries authorized by Toshiba. Installing the wrong battery could cause a battery explosion or other damage.*

If the RTC battery is found abnormal, it must not be installed. Replace it with a new battery, and dispose of the old one according to the local regulations.

Check for any of the following signs of damage:

1) Electrolyte leakage

- *Corrosion (greenish color) on the battery connector or cable*
- *Corrosion on the computer's battery connector*
- *White powder on any part of the battery*
- *White powder in the battery tray*
- *Clear liquid on the battery*
- *Clear liquid in the battery tray*
- *Clear liquid on any board near the battery*

2) Damage to the connection cable

3) Damage to the connector housing

If any powder or liquid is found in or around the battery tray, clean it. Be very careful not to let any leaked material contact your eyes or mouth. Do not inhale fumes from leaked material.

If leaked material contacts your skin, eyes or mouth, wash the affected area thoroughly with clean water.

Removing the RTC Battery

To remove the RTC battery, follow the steps below and refer to figure 4-27.

1. Disconnect the **RTC battery cable** from **PJ5** on the **I/O board**.
2. Lift up the **insulator** covering the **RTC battery**.
3. Lift out the **RTC battery**.

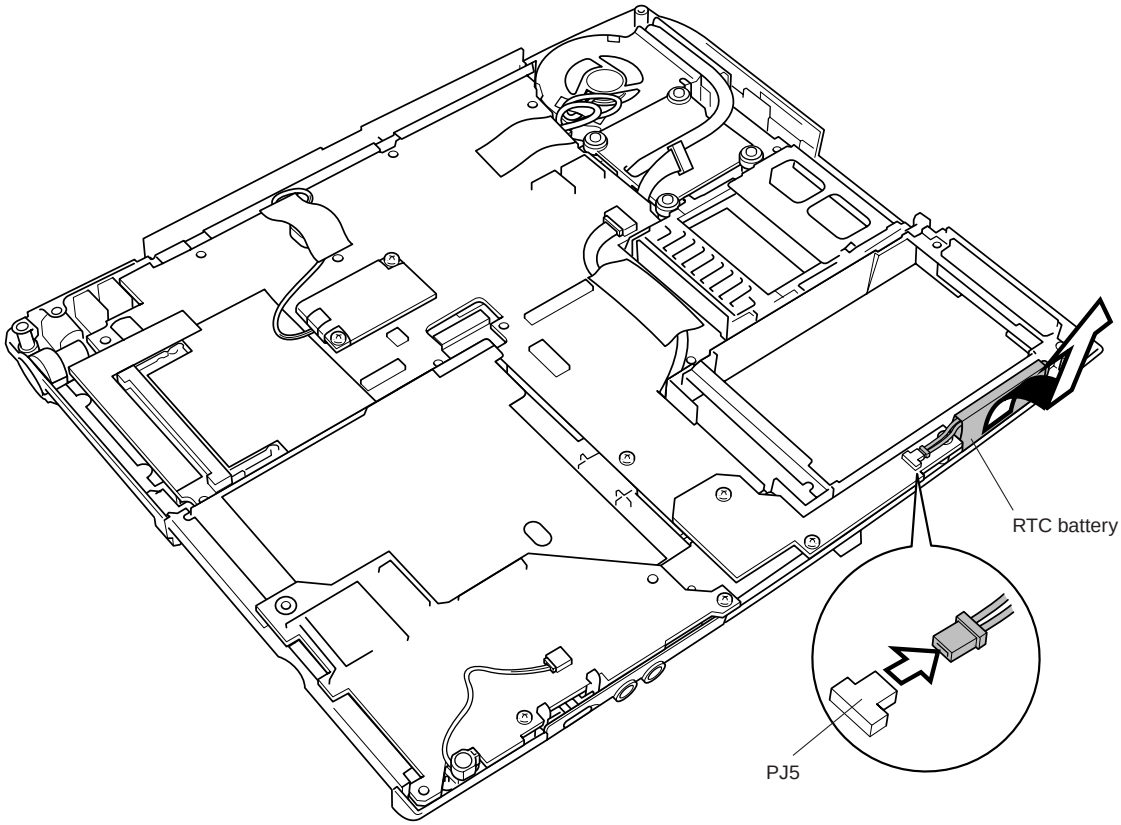


Figure 4-27 Removing the RTC battery

Installing the RTC Battery

To install the RTC battery, follow the steps below and refer to figure 4-27.

1. Lift up the **insulator** and seat the **RTC battery**.
2. Lay the **insulator** in place.
3. Connect the **RTC battery cable** to **PJ5** on the **LED board**.

4.12 Speakers

Removing the Speakers

To remove the speakers, follow the steps below and refer to figures 4-28 to 4-31.

1. Lay the **top cover and display assembly** upside down.
2. Remove **two M2.5×6 screws** securing the **metal plate**.

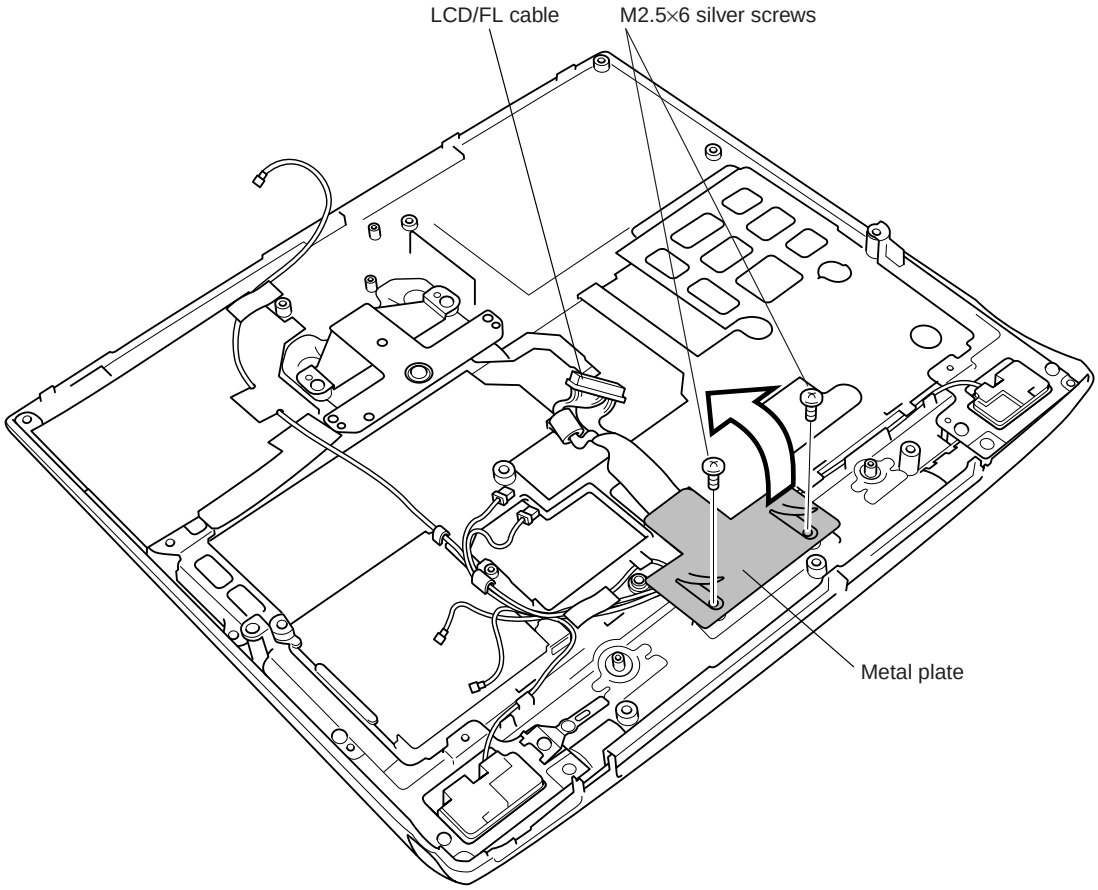


Figure 4-28 Removing two screws securing the metal plate

3. Remove the **tape** securing the **speaker cables**.
4. Thread the **LCD/FL cable** through the bridge.

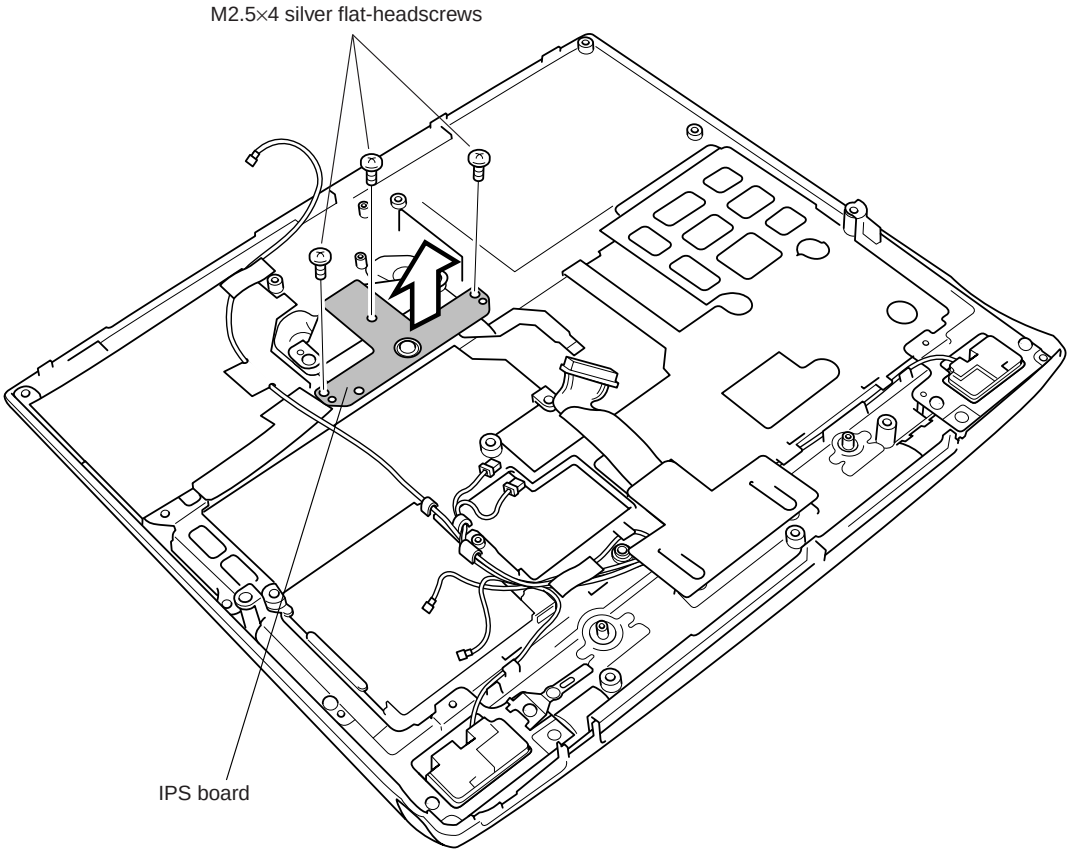


Figure 4-29 Removing the tape and thread the LCD/FL cable

5. Free the **speaker cables** from their **guides** and lift out the **speakers**.
6. Remove **four M2.5×6 screws** securing the **speakers**.

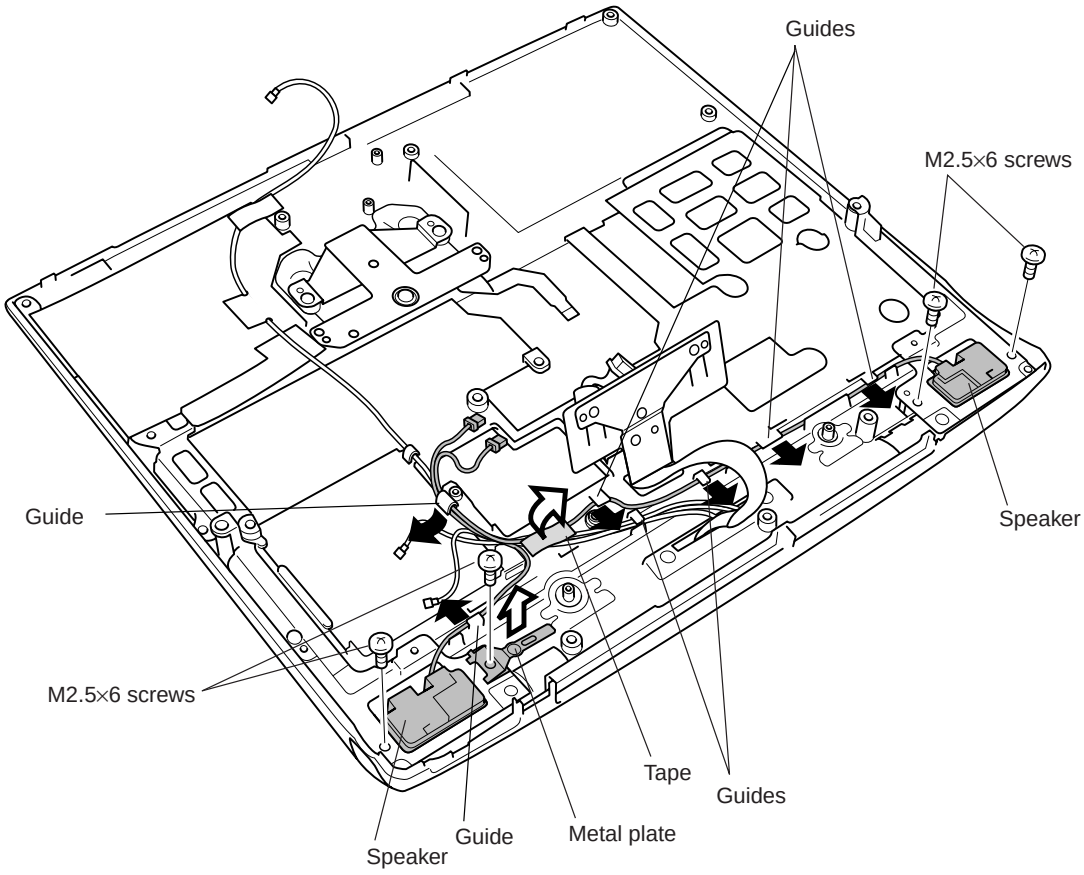


Figure 4-30 Remove the screws securing the speakers and free the speaker cables

7. Remove the **speakers**.

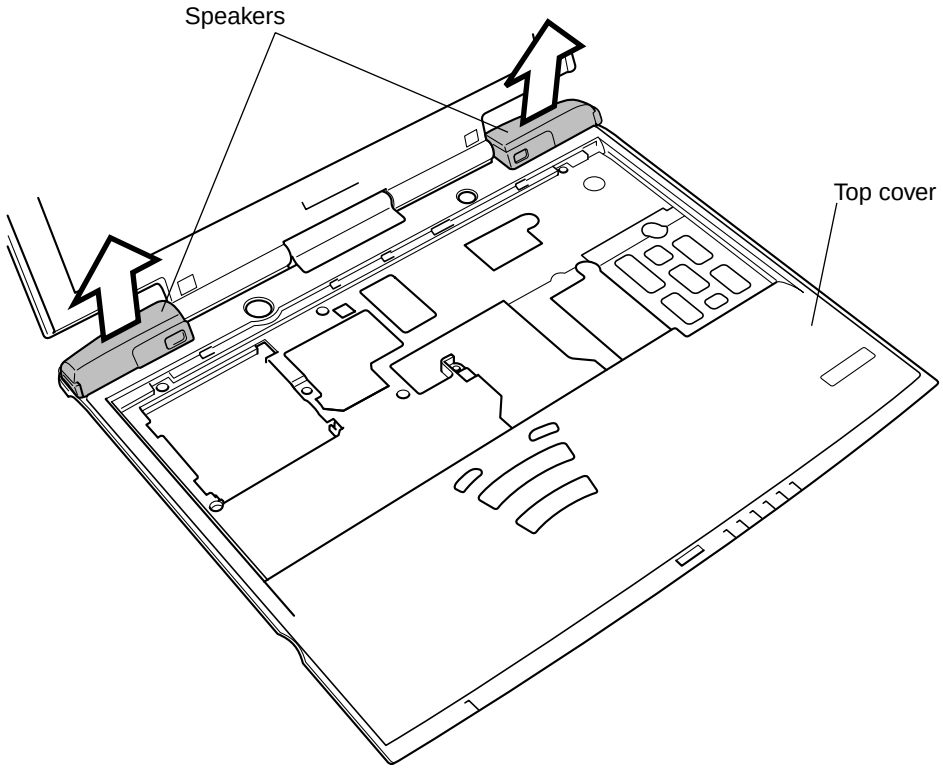


Figure 4-31 Remove the speakers

Installing the Speakers

To install the speakers, follow the steps below and refer to figures 4-28 to 4-31.

1. Seat **each speaker**.
2. Secure the **speakers** with **four M2.5×6 screws**.
3. Route the **speaker cables** through **guides**.
4. Secure the **speaker cables** with **tape**.
5. Secure the **metal brace** with **two M2.5×6 screws**.

4.13 IPS Board

Removing the IPS Board

To remove the IPS Board, follow the steps below and refer to figure 4-32.

1. Lay the **top cover and display assembly** upside down.
2. Remove **three M2.5×4 silver flat-head screws** securing the **IPS Board**.
3. Remove the **IPS board**.

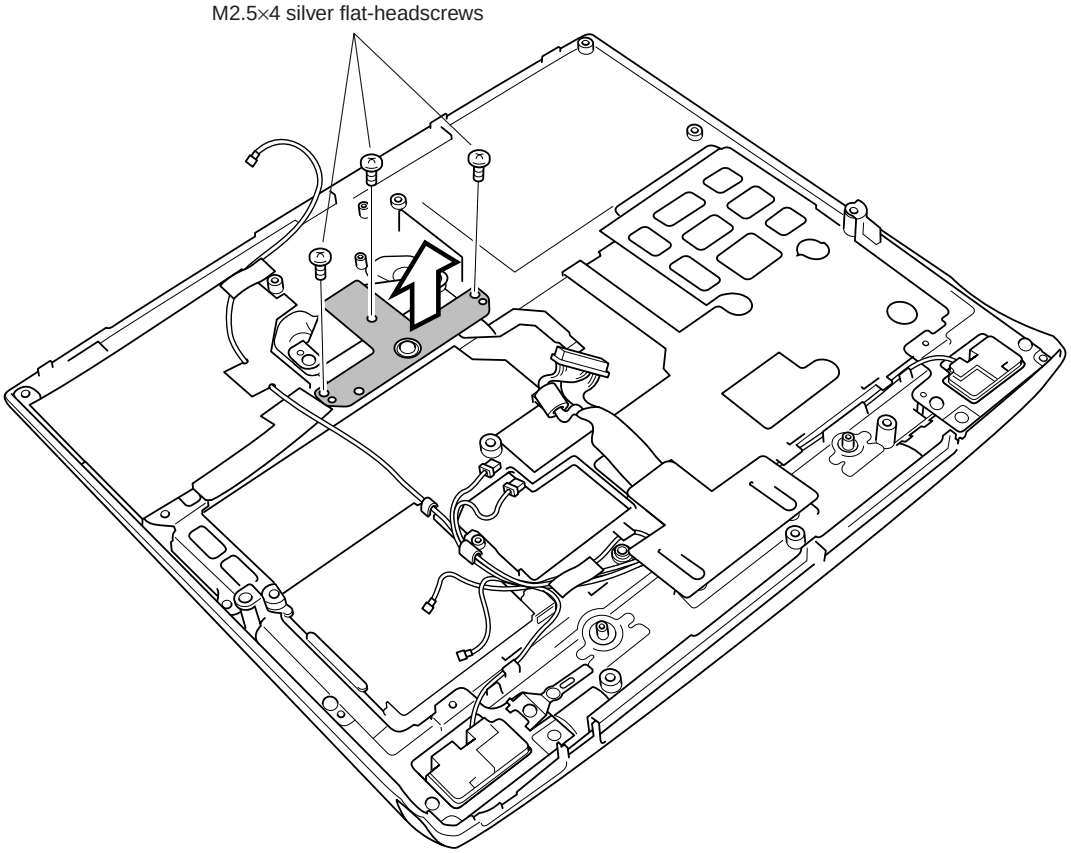


Figure 4-32 Removing the IPS board

Installing the IPS Board

To install the IPS board, follow the steps below and refer to figure 4-32.

1. Seat the **IPS board**.
2. Secure the **IPS board** with **three M2.5×4 screws**.

4.14 LED Board

Removing the LED Board

To remove the LED board, follow the steps below and refer to figure 4-33.

1. Remove **two M2×4 screws** and **one M2×8 screw** securing the **LED board**.
2. Carefully lift up the **LED board** to disconnect it from **PJ105** on the I/O board.

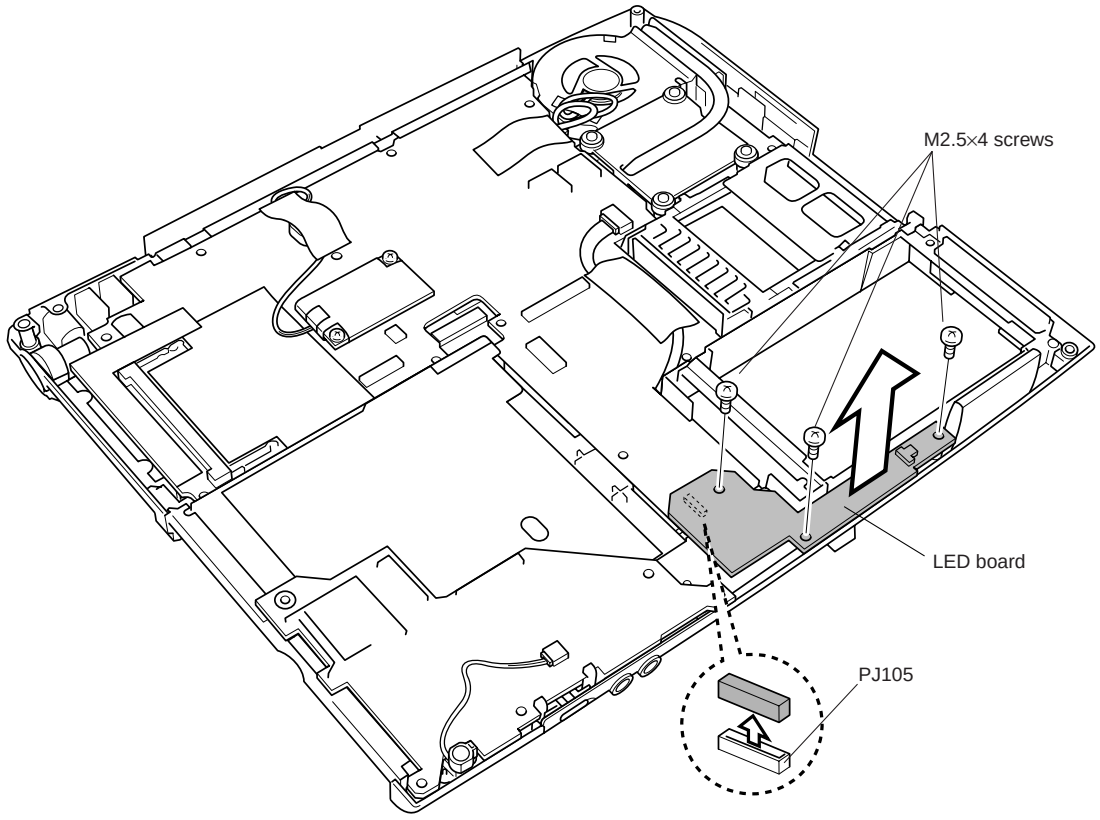


Figure 4-33 Removing the LED board

Installing the LED Board

To install the LED board, follow the steps below and refer to figure 4-33.

1. Seat the **LED board** and press carefully on the left end of the board to connect it to **PJ105** on the I/O board. Be careful not to damage the card or connector.

2. Secure the **LED board** with **two M2×4 screws**.

4.15 I/O Board

Removing the I/O Board

To remove the I/O board, follow the steps below and refer to figure 4-34.

1. Remove the **tape** securing the **fan cable**.
2. Disconnect the **fan cable** from **PJ770** on the **I/O board**.
3. Disconnect the **Battery cable** from **PJ801** on the **I/O board**.
4. Remove **two M2.5×4 screws** securing the **I/O board** to the **system board**.
5. Lift up the **I/O board** in the direction of the arrow to disconnect from **PJ100** on the **system board**.

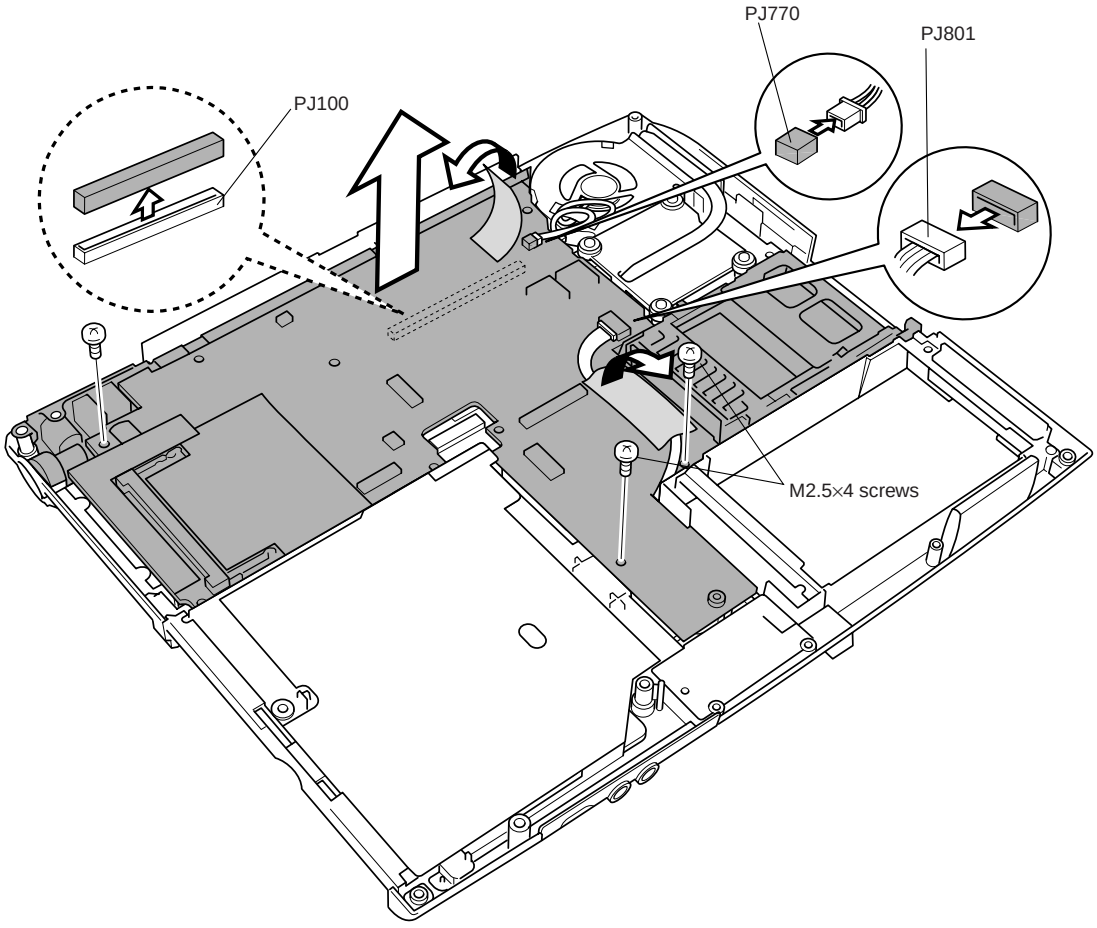


Figure 4-34 Removing the I/O board

Installing the I/O board

To install the I/O board, follow the steps below and refer to figure 4-34.

1. Seat the **I/O board** on the **system board** and press to connect to **PJ100** on the **system board**.

CAUTION: *Make sure you connect the boards securely. A loose connection could damage the boards. Also, if the connectors are not fully seated the boards could be bent and damaged when you secure them with screws.*

2. Connect the **fan cable** to **PJ770** on the **I/O board**.
3. Secure the **fan cable** with the **tape**.
4. Connect the **battery cable** to **PJ801** on the **I/O board**.
5. Secure the **I/O board** to the **system board** with the **two M2.5×4 screws**.

CAUTION: *There are two MAC address barcode labels in the package containing the new I/O board. Apply one label to the bottom of the computer and one to the box the computer was shipped in. Before you apply the new labels, remove the old ones from the computer and the box. The computer may have MAC address barcode labels for both wired and wireless LANs. Be sure to replace the correct label.*

4.16 Connector Board

Removing the Connector Board

To remove the **connector board**, follow the steps below and refer to figures 4-35 and 4-36.

1. Remove **one M2.5×4 flat-head screw** securing the **connector board**.
2. Lift up **connector board** in the direction of the arrow, to disconnect it from **PJ104** on the **I/O board**.

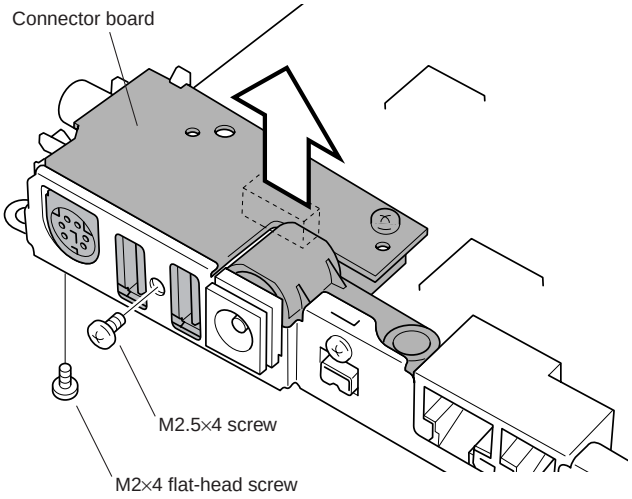


Figure 4-35 Removing the connector board

3. Remove **one M2.5×4 flat-head screw** securing the **connector board**.
4. Unfasten the **plastic brace** and lift up the **connector board**.

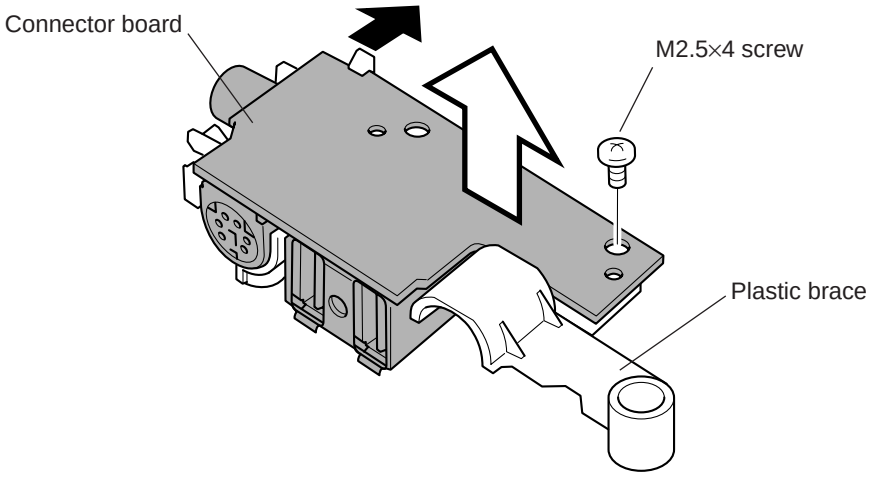


Figure 4-36 Removing the connector board

Installing the Connector Board

To install the **connector board**, follow the steps below and refer to figures 4-35 and 4-36.

1. Fasten the **connector board** to the **plastic brace**.
2. Place the **connector board** in position and connect **PJ60** to **PJ104** on the **I/O board**.
3. Secure the **connector board** with **one M2.5×4 screw**.

4.17 PC Card Slot

Removing the PC card slot

To remove the PC card slot, follow the steps below and refer to figure 4-37.

1. Lay the **I/O board** right side up.
2. Push **two latches** to disconnect and remove the **PC card slot**.

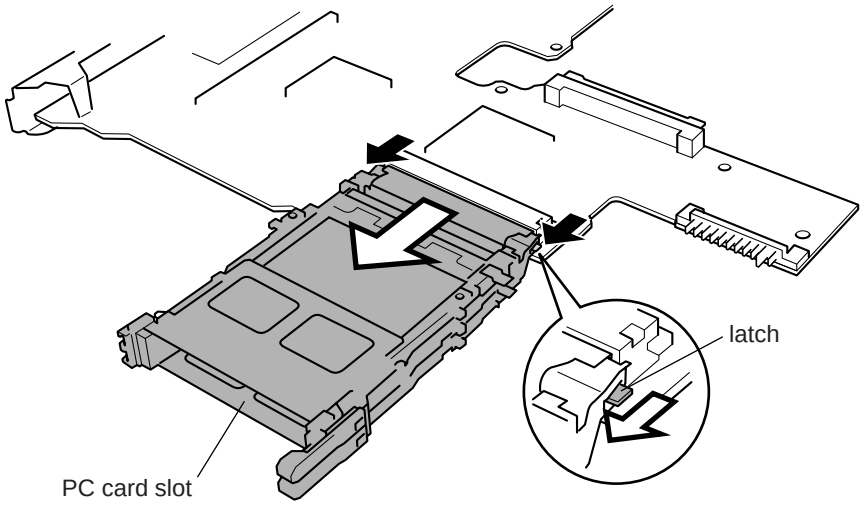


Figure 4-37 Removing the PC card slot

Installing the PC card slot

To install the PC card slot, follow the steps below and refer to figure 4-37.

1. Seat the **PC card slot**.
2. Press to secure **two latches**. Make sure the connection is secure.

CAUTION: *If you do not seat the PC card slot completely, you might not be able to connect the system board properly. Make sure the plastic part of the PC card slot is flush with the connector.*

4.18 System Board

Removing the System Board

To remove the system board, follow the steps below and refer to figure 4-38.

1. Remove **four M2.5×4 screws** securing the **system board**.
2. Lift out the **system board**.

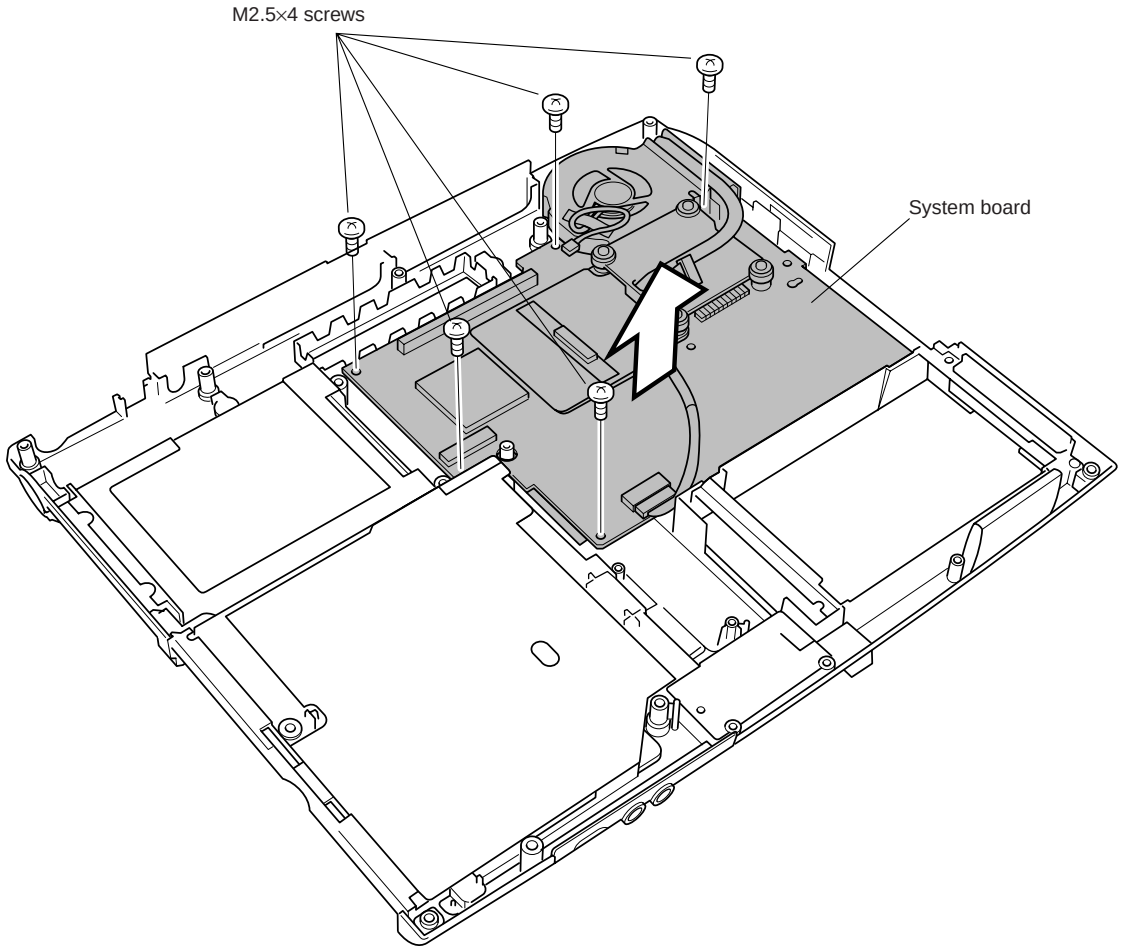


Figure 4-38 Removing the system board

Installing the System Board

To install the system board, follow the steps below and refer to figure 4-38.

1. Seat the **system board**.
2. Secure the **system board** to the **I/O board** with four **M2.5×4 screws**.

4.19 Cooling Fan

Removing the Cooling Fan

To remove the cooling fan, follow the steps below and refer to figures 4-39 and 4-40.

> ***CAUTION:*** *The cooling fan can become very hot during operation. Conduct repair work after the fan has cooled. Do not touch or apply impact to the cooling fan.*

1. Disconnect the **battery cable** from **PJ202** on the **system board**.
2. Remove **four M2×10 screws** securing the **cooling fan**.
3. Remove the **cooling fan**.

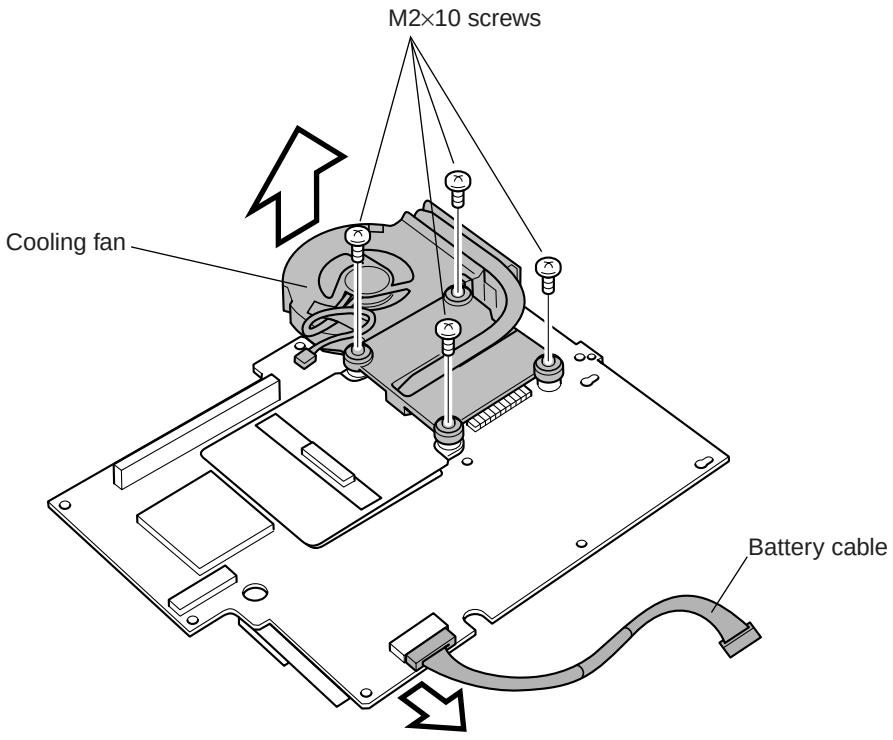


Figure 4-39 Removing the cooling fan

4. Remove the **heat sink**.

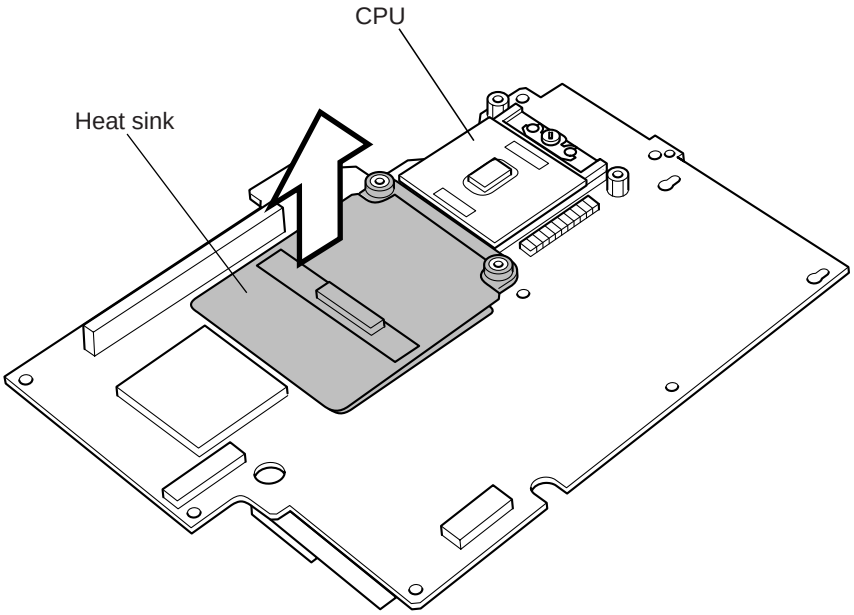


Figure 4-40 Removing the heat sink

Installing the Cooling Fan

To install the **cooling fan**, follow the steps below and refer to figure 4-39 and figure 4-40.

> ***CAUTION:*** *When you remove the cooling fan, wipe the grease off of the bottom of the heat sink and top of the CPU. Apply new grease.*

1. Apply **new grease** on the top of the **chip** covered by the **heat sink** on the **system board**.
2. Seat the **heat sink**.
3. Apply **new grease** on the top of the **CPU**.
4. Seat the **cooling fan**.
5. Secure the **cooling fan** with **four M2×10 screws**.
6. Secure the **fan cable** with the **tape**.
7. Connect the **battery cable** to **PJ202** on the **system board**.

4.20 CPU

Removing the CPU

To remove the CPU, follow the steps below and refer to figures 4-41 and 4-42.

CAUTION: *When you remove the CPU, wipe the grease off of the bottom of the heat sink, bottom of the cooling fan and top of the CPU. Apply new grease.*

1. Turn the **cam** to the unlock position with a flat-blade screwdriver to unlock the **CPU**.

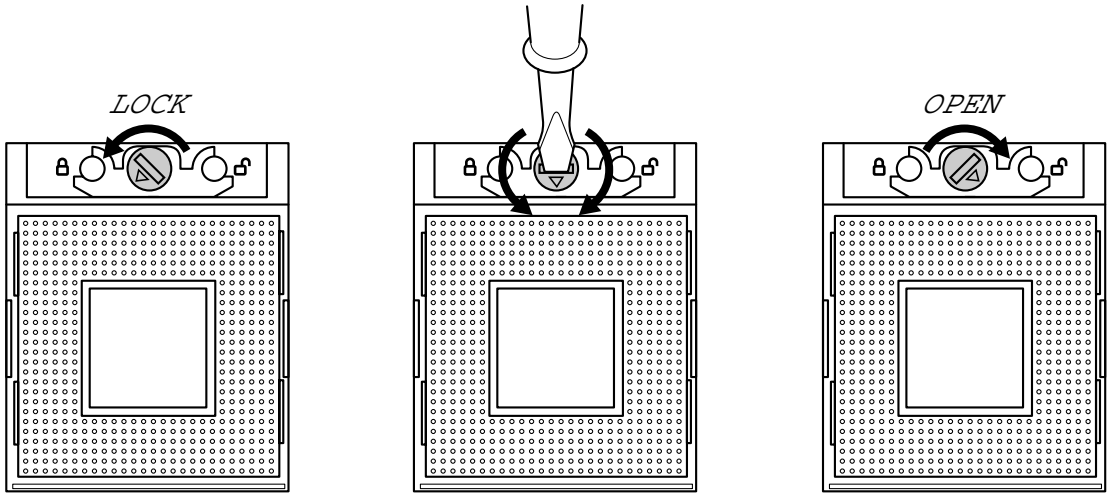


Figure 4-41 Unlock the CPU

2. Lift out the **CPU**.

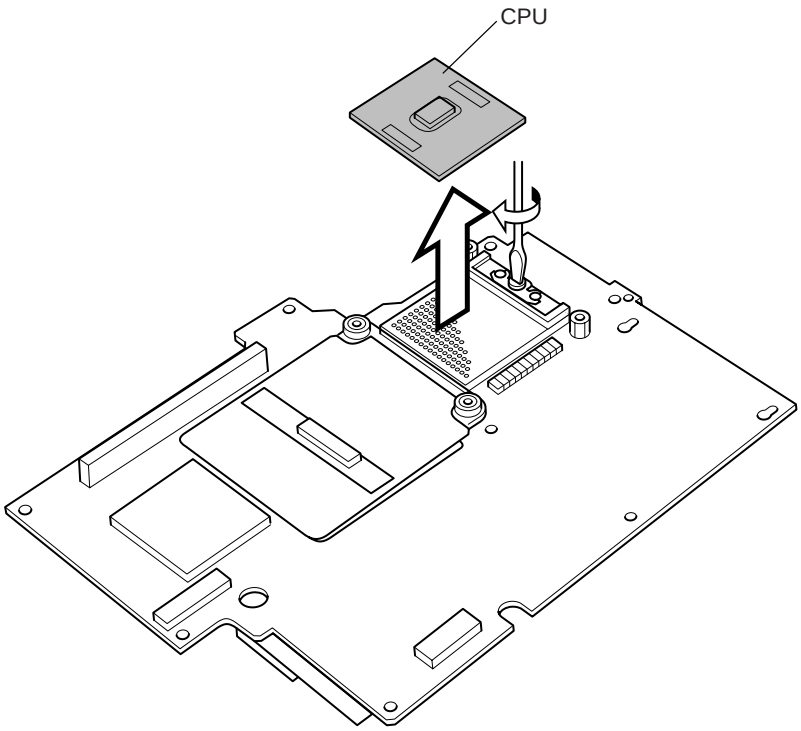


Figure 4-42 Removing the CPU

Installing the CPU

To install the CPU, follow the steps below and refer to figures 4-41 to 4-43.

1. Make sure the **cam** is in the open position.
2. Seat the **CPU** in the **CPU socket**. Make sure the alignment is exact to avoid damaging pins on the **CPU**.
3. Press the interposer gently with your fingers and turn the **cam** on the **CPU socket** to the lock position with a flat-blade screwdriver to secure the **CPU**.
4. Apply new grease on the **CPU** as shown in figure 4-43.
5. Apply **new grease** on the top of the **chip** covered by the **heat sink** on the **system board**.

CAUTION: *When you install the CPU, apply new grease on the top of the chip covered by the heat sink on the system board and on the top of the CPU.*

Figure 4-43 Apply new grease

4.21 Display Mask

Removing the Display Mask

To remove the display mask, follow the steps below and refer to figures 4-44 and 4-45:

1. Remove **two mask seals** at the bottom corners of the display assembly.
2. Remove **two M2.5×6 flat-head screws**.

> ***NOTE:*** *Support the display with your hand when you remove the screws.*

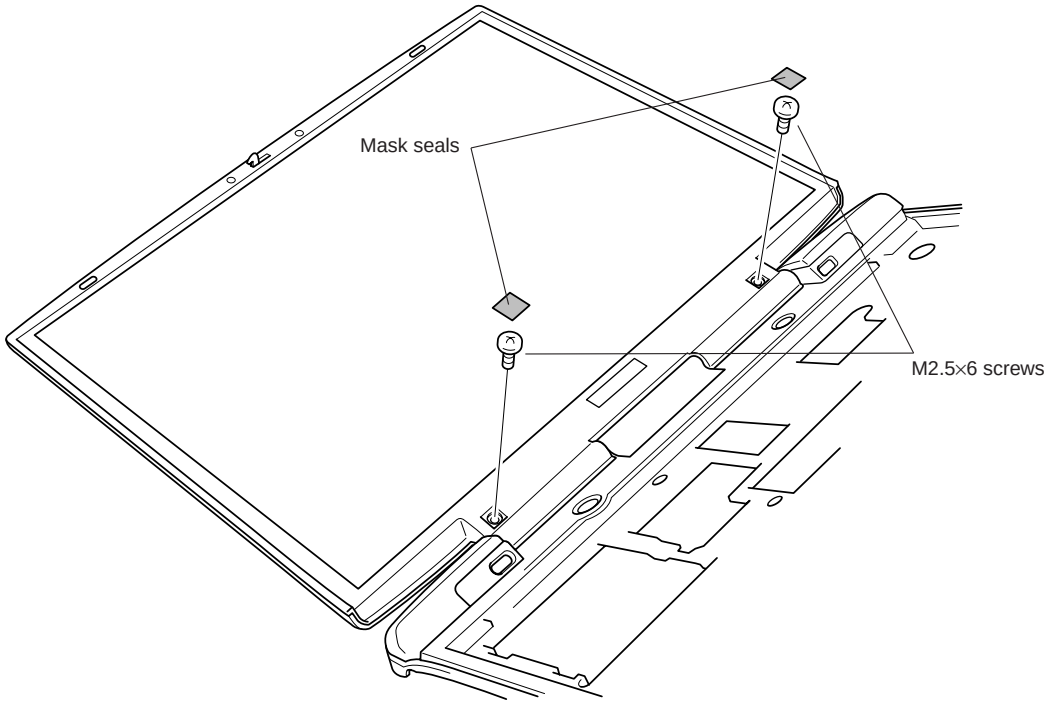


Figure 4-44 Removing the screws on the display mask

3. Release the **21 latches** on the display mask in the following order:
   - Five bottom latches
   - Five latches each on right and left side
   - Six top latches.

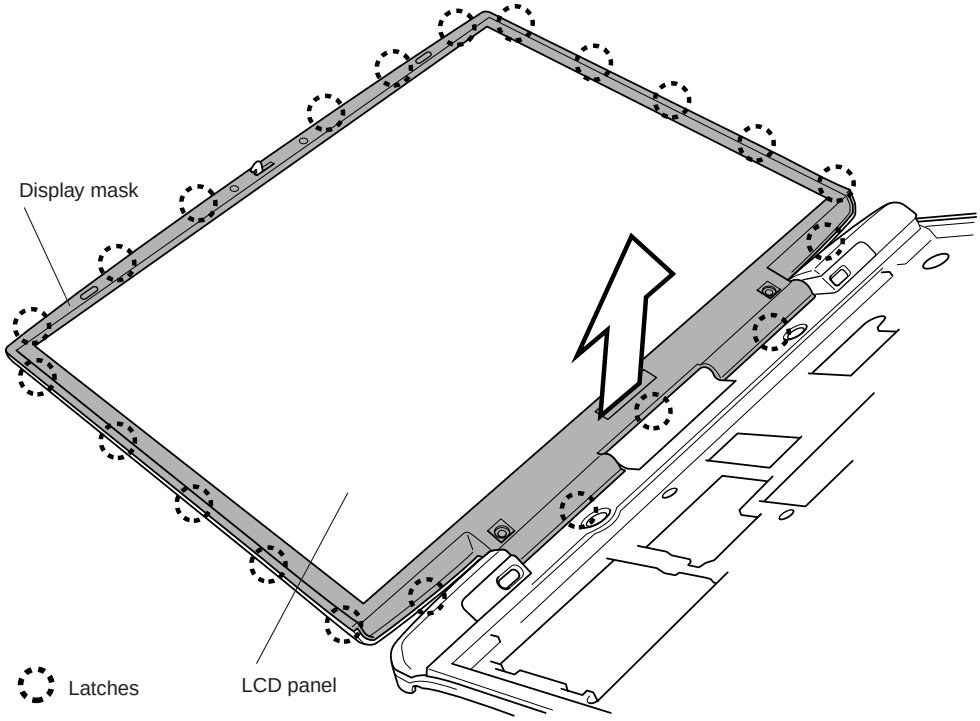


Figure 4-45 Removing the display mask

Installing the Display Mask

To install the display mask, follow the steps below and refer to figures 4-44 and 4-45.

1. Place the **display mask** in position, and fasten the **21 latches** in the following order:
   - Five bottom latches
   - Five latches each on right and left side
   - Six top latches.

2. Secure the **display mask** with **two M2.5×6 flat-head screws**.

   > ***NOTE:*** *Hold the display by the back with your hand while tightening the screws.*

3. Set **two mask seals** back on the screws.

4.22 FL Inverter Board

Removing the FL Inverter Board

To remove the FL inverter board, follow the steps below and refer to figure 4-46:

1. Remove **one M2×4 screw** securing **FL inverter board**.
2. Lift the **FL inverter board** and disconnect the **FL cable** from **CN1** on the **FL inverter board**.
3. Disconnect the **HV cable** from **CN2** on the **FL inverter board**.
4. Remove the **FL inverter board**.

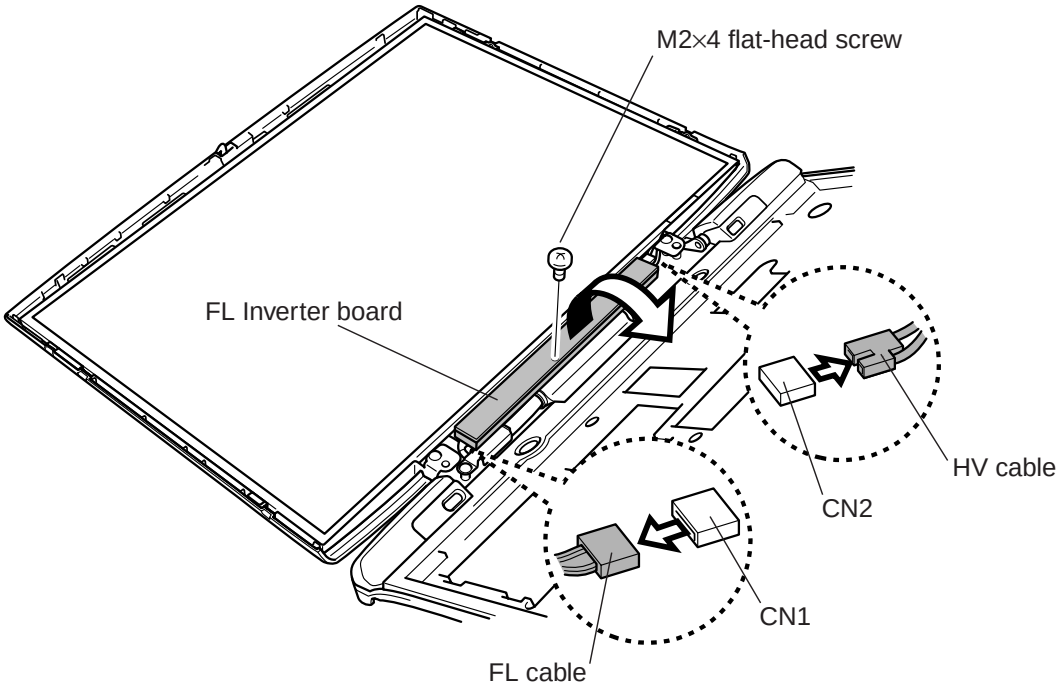


Figure 4-46 Removing one screw from FL inverter board

Installing the FL Inverter Board

To install the FL inverter board, follow the steps below and refer to figure 4-46.

1. Connect the **FL inverter cable** to **CN1** and the **HV cable** to **CN2**.
2. Seat the **FL inverter board**.
3. Secure the **FL inverter board** with **one M2×4 screw**.

4.23 LCD Module

NOTE: *Be careful not to apply pressure to the ICs along the edge of LCD module. The ICs are easily damaged.*

NOTE: *For environmental reasons, do not throw away a malfunctioning LCD module (or FL). Please follow local ordinances or regulations for its disposal.*

Removing the LCD Module

To remove the LCD Module, follow the steps below and refer to figures 4-47 to 4-49:

1. Remove **four masking seals** that cover the **screws**.
2. Remove **four M2×4 screws** that fasten **the LCD module**.

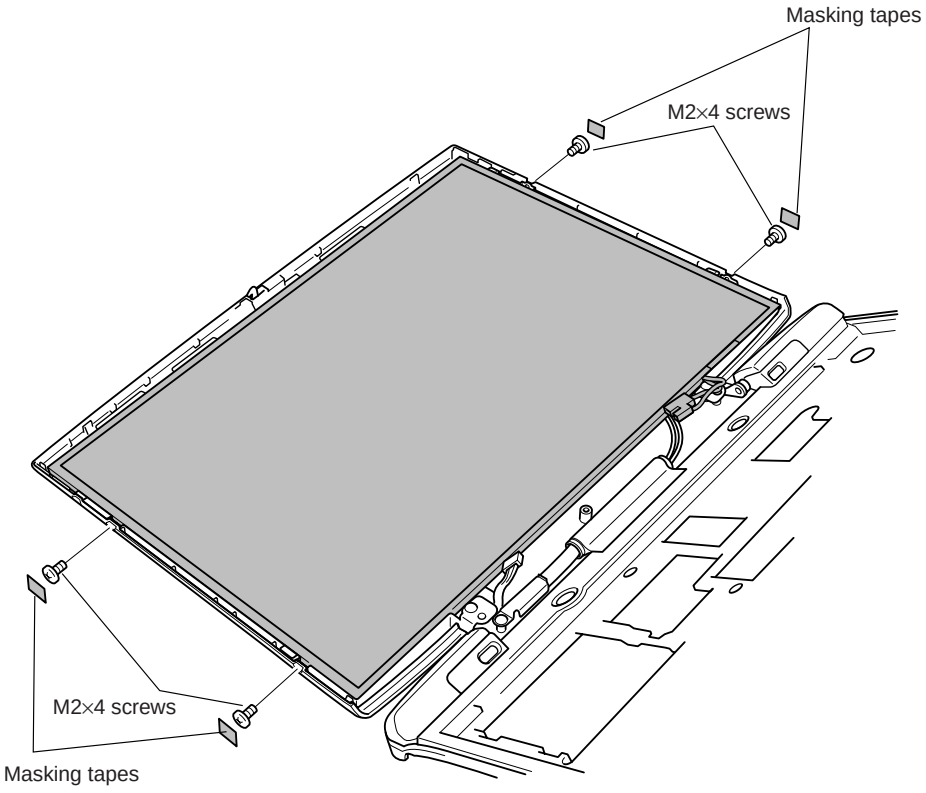


Figure 4-47 Removing four screws that secure the LCD module

3. Carefully rotate out the top of the **LCD module** to access the **LCD/FL cable**.
4. Remove the **tape** securing **the LCD/FL cable**.
5. Disconnect the **LCD/FL cable**.
6. Remove **the LCD module**.

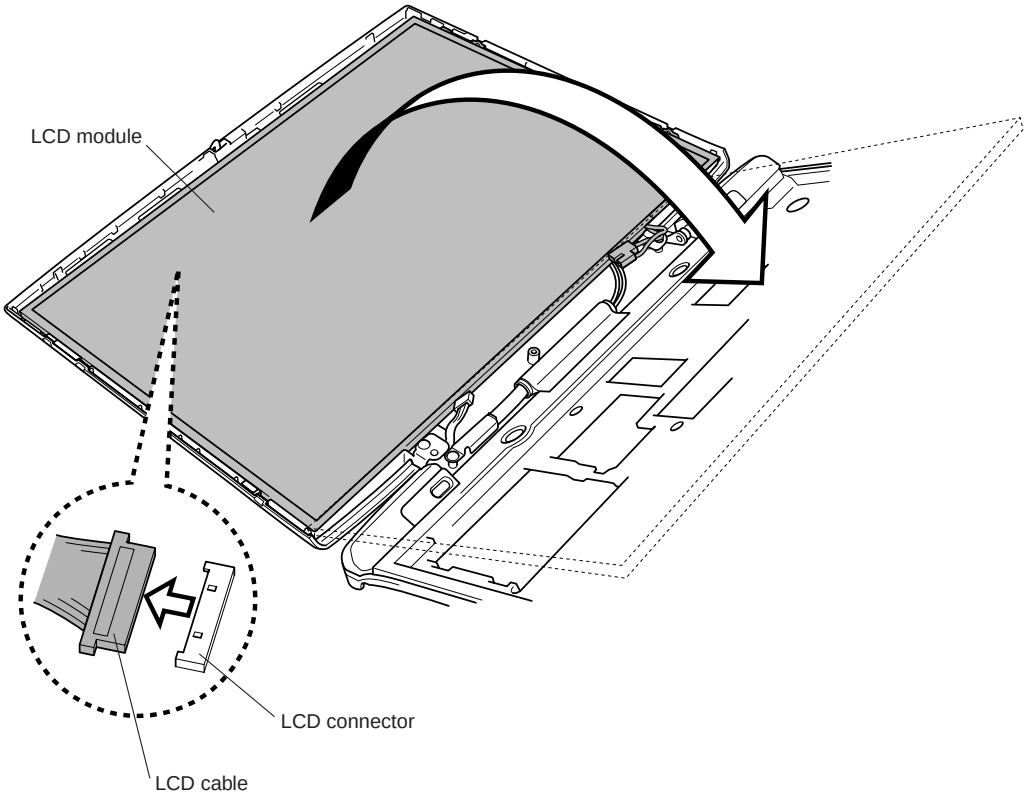


Figure 4-48 Removing the LCD module

7. Remove **four silver flat-head M2×3 screws** securing the **metal brace**.

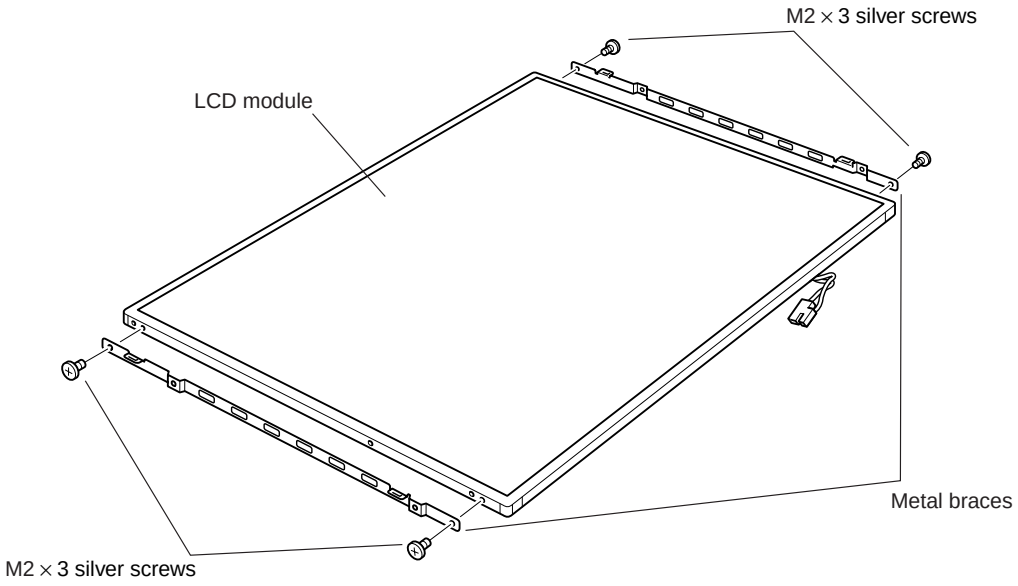


Figure 4-49 Removing the metal brace

Installing the LCD Module

To install the **LCD module**, follow the steps below and refer to figures 4-47 to 4-49.

1. Seat **two metal braces** and **secure each** with **two silver flat-head M2×3 screws**.
2. Connect the **LCD/FL cable** to **the LCD module**.
3. Secure the **LCD/FL cable** with the **tape**.
4. Seat the **LCD module** and secure it with **four M2×5 screws**.

CAUTION: *Make sure the cables lie inside the guide. Be careful not to damage or pinch any cables when you seat the LCD module.*

4.24 Antenna Coaxial Cables

Removing the Antenna Coaxial Cables

To remove the antenna coaxial cables, follow the steps below and refer to figures 4-50 to 4-55.

NOTE: *When you open or close the top cover, hold it by the sides close to the hinges to prevent damage.*

1. Remove **two silver M2.5×6 screws** securing the **metal plate**.

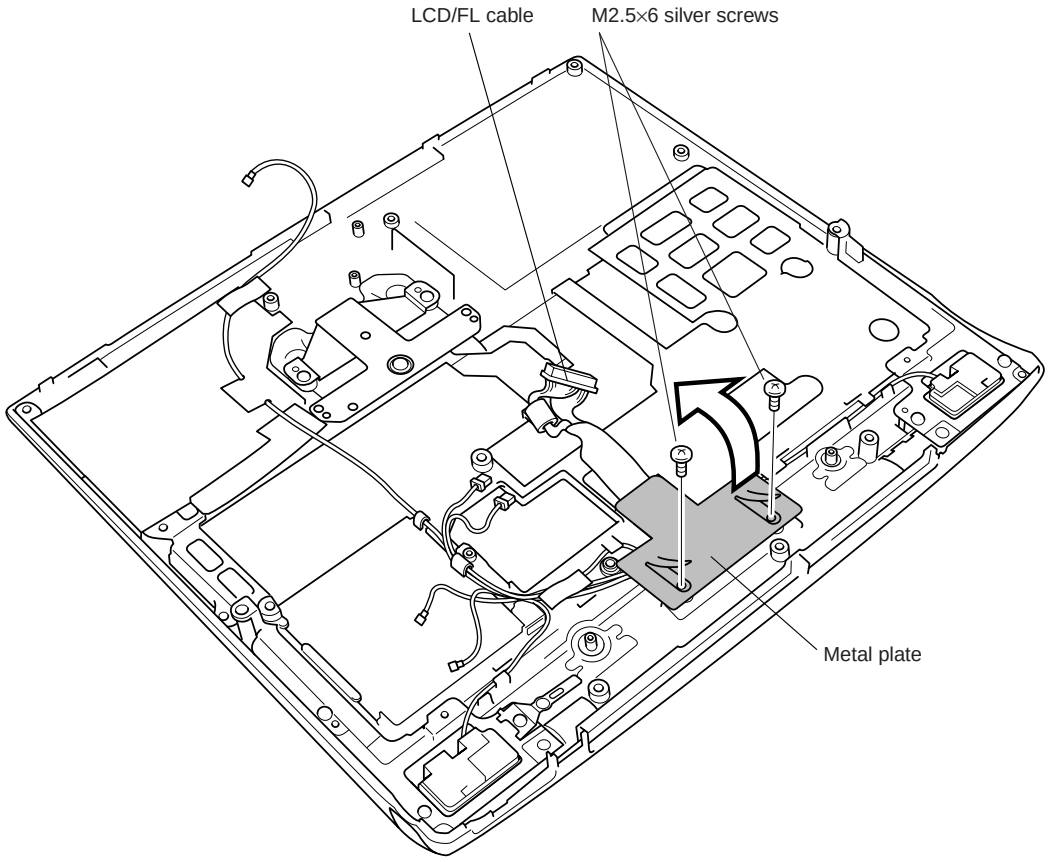


Figure 4-50 Remove two silver screws securing the metal brace

2. Remove the **tape** securing the **Bluetooth antenna coaxial cable**.
3. Remove the **tape** securing the **Bluetooth antenna coaxial cable** and the **wireless LAN antenna coaxial cables**.
4. Pull the **LCD/FL cable** partially through the bridge to provide access to the **Bluetooth antenna coaxial cable** and the **wireless LAN antenna coaxial cables**.

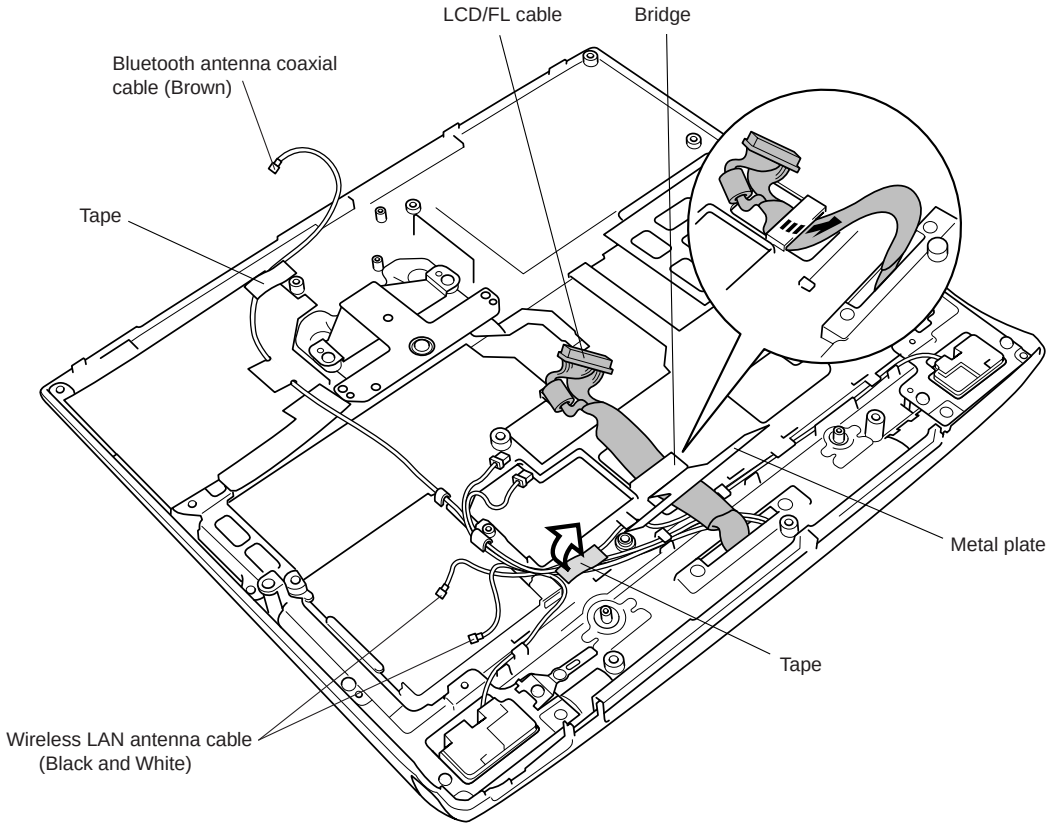


Figure 4-51 Remove tape securing the antenna coaxial cables

5. Free the all **antenna coaxial cables** from the **hooks**.

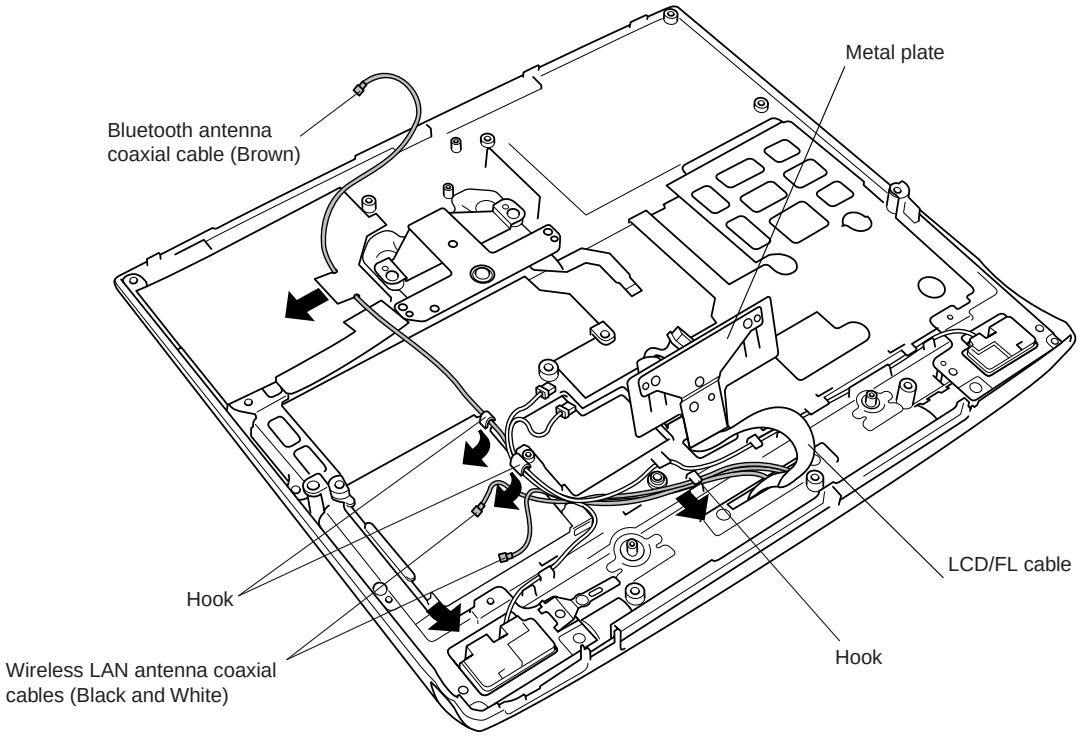


Figure 4-52 Free the antenna coaxial cables

6. Remove one **M2.5×4 screw** securing the **metal brace**.
7. Lift up the **plastic brace** and lay it upside down.
8. Remove **one M2.5×4 silver screw** securing the **plastic brace**.
9. Slip tweezers into the side of the **plastic brace** and pry to release **two latches** and remove the **top part of the plastic brace**.

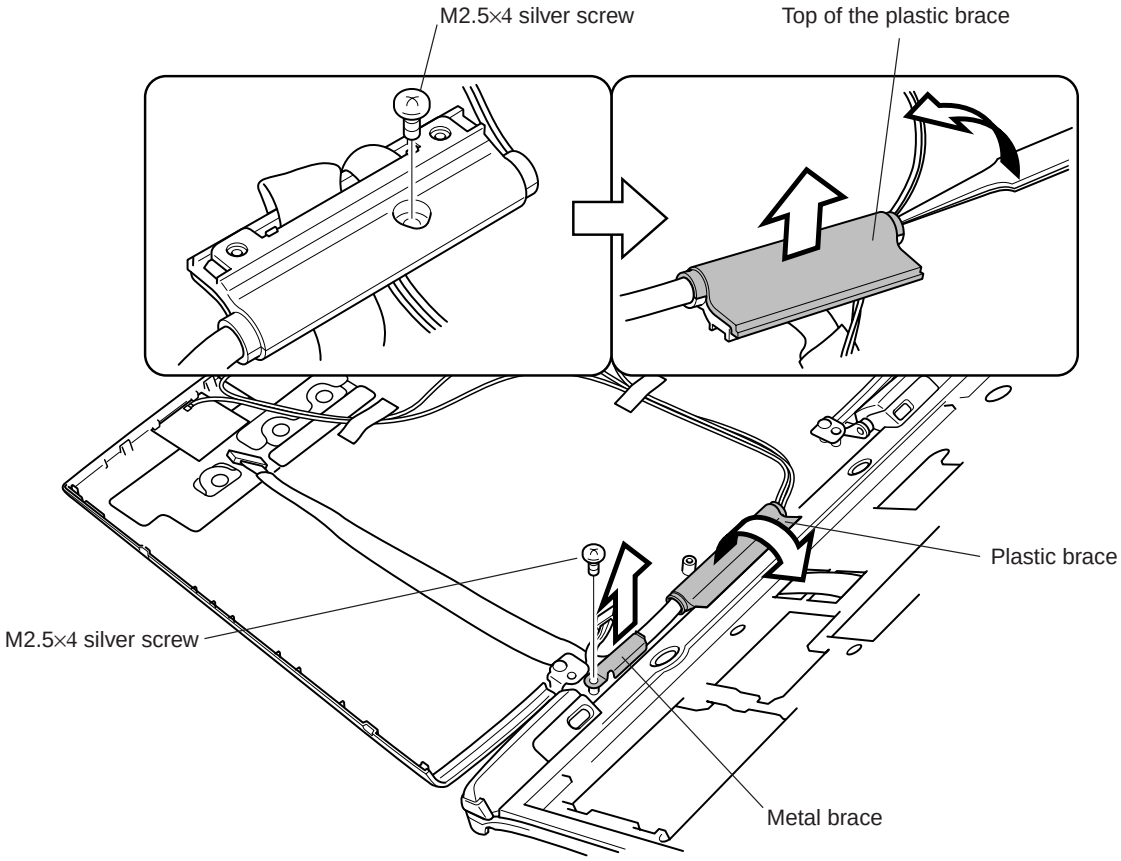


Figure 4-53 Removing the metal brace and plastic brace

10. Remove the **tapes** securing the **antenna coaxial cables**.

11. Remove the **antenna coaxial cables**.

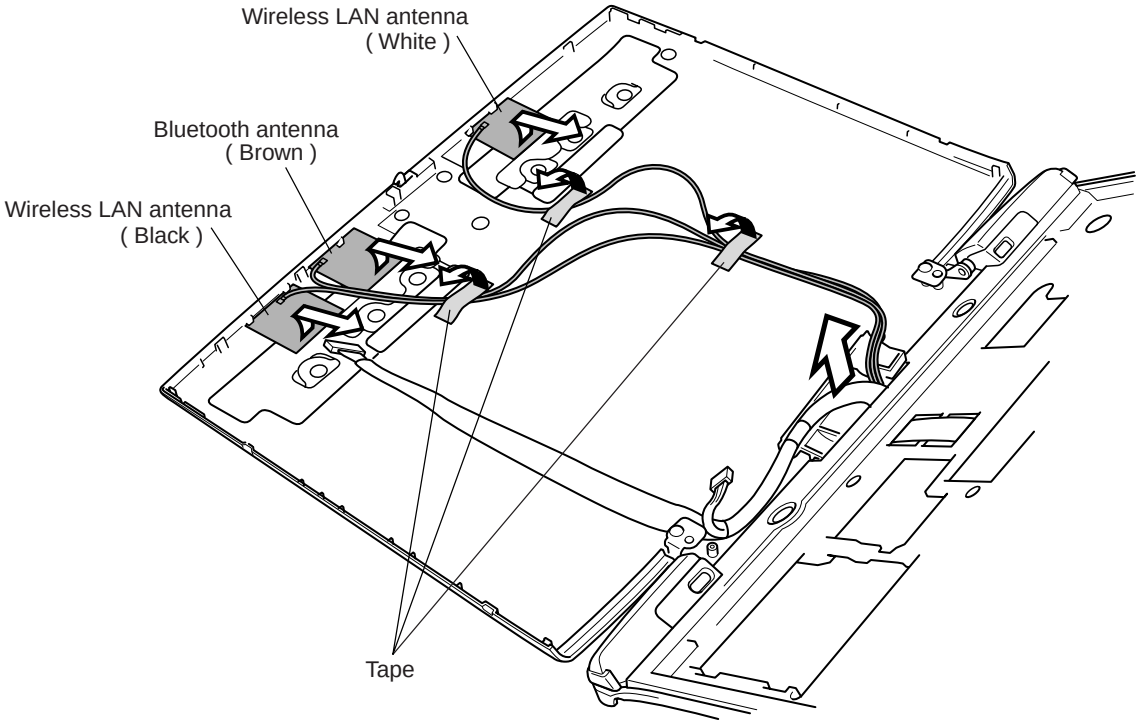


Figure 4-54 Removing the antenna coaxial cables

Installing the Antenna Coaxial Cables

To install the antenna coaxial cables, follow the steps below and refer to figures 4-51 to 4-54.

1. Seat the **antenna sheets** and route the **antenna coaxial cables**.
2. Secure the **antenna coaxial cables** with **tapes**.
3. Thread the **antenna coaxial cables** through the **plastic brace** and secure it with **one M2.5×4 silver screw**.
4. Route the **wireless LAN antenna coaxial cables** through the **hooks** and secure them with **tape**.
5. Route the **Bluetooth antenna coaxial cable** through the **hooks** and secure it with **tape**.
6. Pull the **LCD/FL cable** through the bridge.
7. Secure the **metal plate** with **two silver M2.5×6 screws**.

4.25 LCD/FL Cable

Removing the LCD/FL Cable

To remove the LCD/FL cable and antenna coaxial cable, follow the steps below and refer to figures 4-55 to 4-58.

> ***NOTE:*** *When you open or close the top cover, hold it by the sides close to the hinges to prevent damage.*

1. Remove **two silver M2.5×6 screws** securing the **metal plate**.

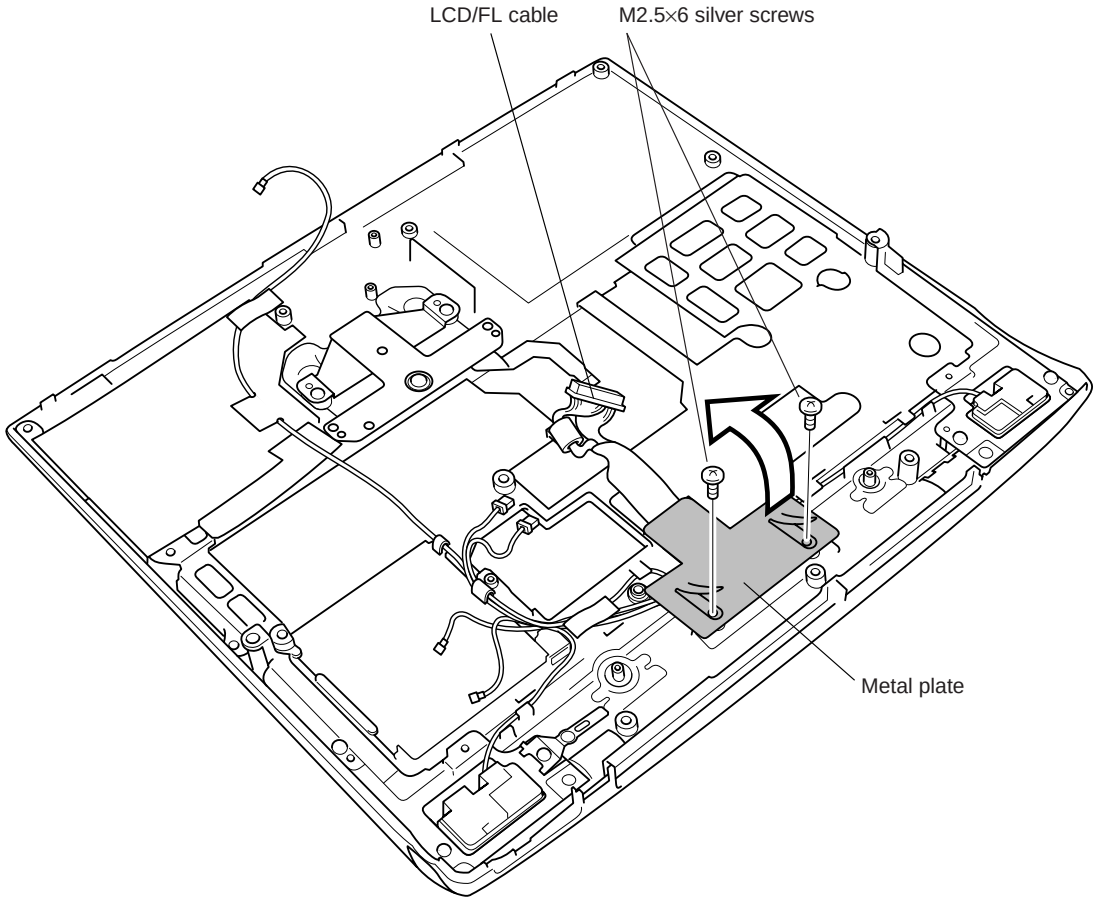


Figure 4-55 Remove two silver screws securing the metal brace

2. Pull the **LCD/FL cable** partially through the bridge.

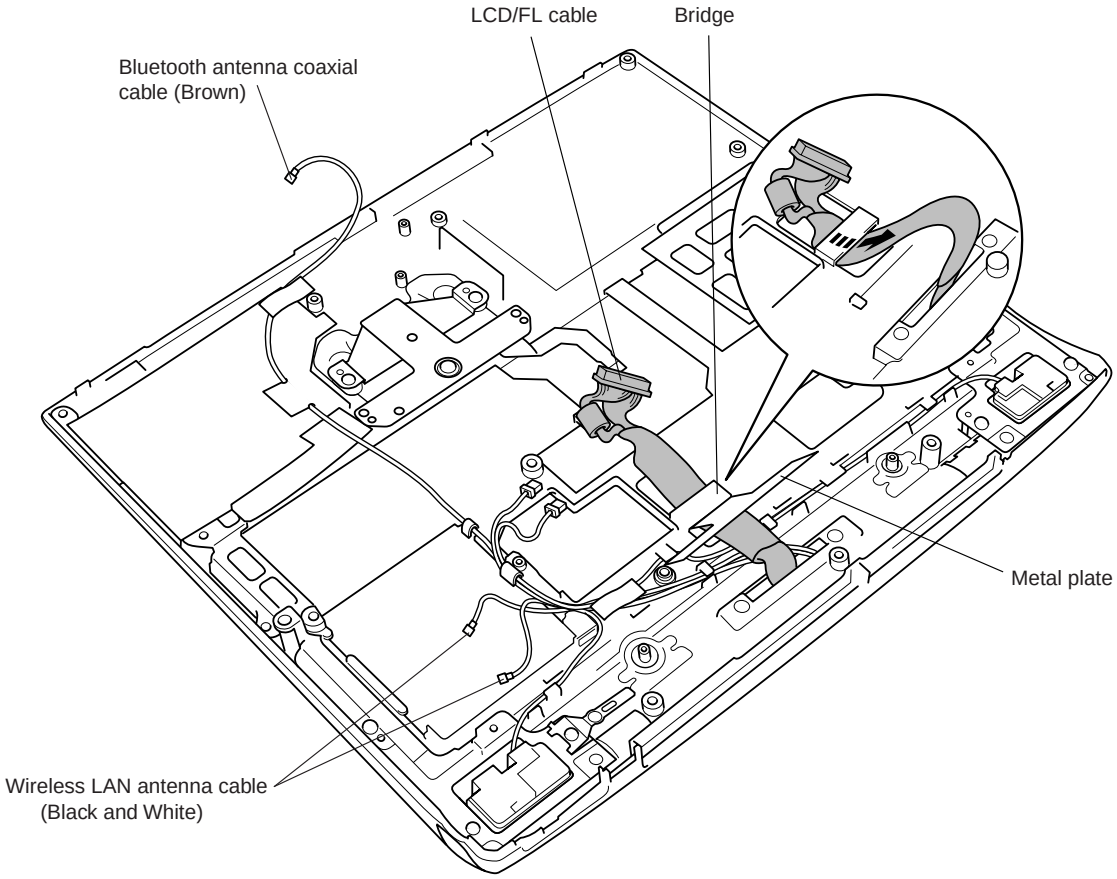


Figure 4-56 Pull the LCD/FL cable through the bridge

3. Remove one **M2.5×4 screw** securing the **metal brace**.
4. Lift up the **plastic brace** and lay it upside down.
5. Remove **one M2.5×4 silver screw** securing the **plastic brace**.
6. Slip tweezers into the side of the **plastic brace** and pry to release **two latches** and remove the **top part of the plastic brace**.

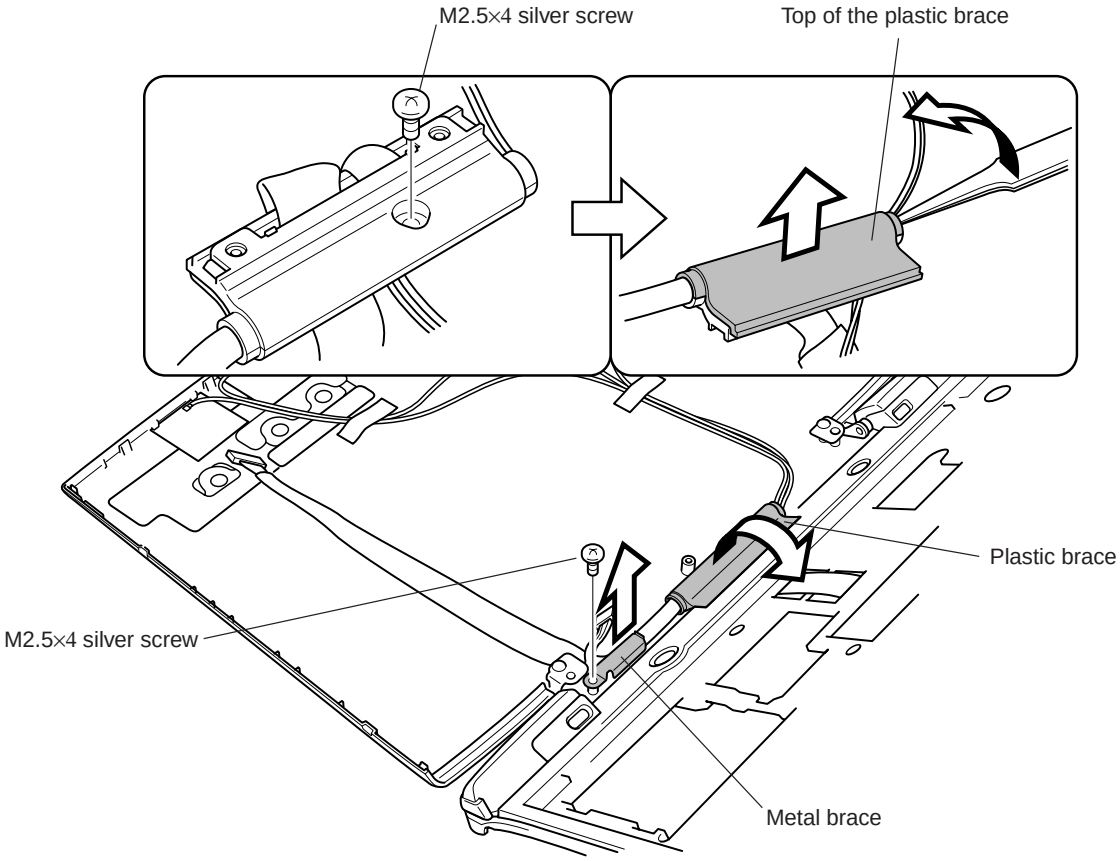


Figure 4-57 Removing the plastic brace

7. Remove the **LCD/FL cable**.

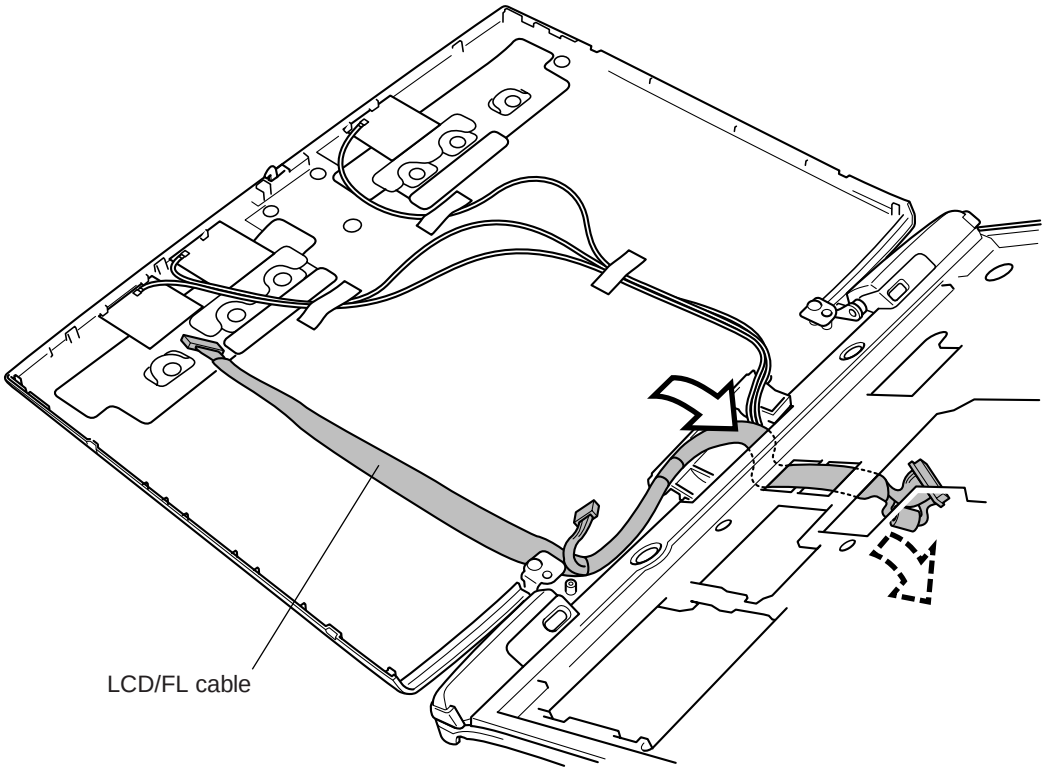


Figure 4-58 Removing the LCD/FL cable

Installing the LCD/FL Cable

To install the LCD/FL cable, follow the steps below and refer to figures 4-55 to 4-58.

1. Pull the **LCD/FL cable** through the bridge and the **plastic brace**.
2. Route the **wireless LAN antenna coaxial cables** and the **Bluetooth antenna coaxial cable** through the **plastic brace**.
3. Set the **top part of the plastic brace**.
4. Secure the **plastic brace** with **one silver M2.5×4 screw**.
5. Seat the **plastic brace**.
6. Pull the **LCD/FL cable** through the bridge.
7. Secure the **metal plate** with **two silver M2.5×6 screws**.

4.26 TFT FL (Model 14.1 Toshiba)

Removing the TFT FL (Model 14.1 Toshiba)

To remove the TFT FL (Model 14.1 Toshiba), follow the steps below and refer to figures 4-59 to 4-63.

1. Carefully, turn the LCD module upside down on the flat surface of the table. To avoid damaging the surface of the LCD module, lay it on a protective, dust-free sheet such as a soft, clean cloth.
2. Remove one strip of insulation tape "1" securing the FL cable, two strips of insulation tape "2".
3. Remove one strip of insulation tape "3" securing the X-PCB insulation sheet and one strips of insulation tape "4" securing Y-PCB insulation sheet.
4. Lift up the X-PCB insulation sheet and the Y-PCB insulation sheet. Be careful to lift up only the part that covers the back of the LCD module. Hold down the frame as you lift the insulation sheets. (Do not lift up the part of the sheet on the side of the frame. X and Y-PCB insulation sheets will be reused.)

***CAUTION**: Do not damage the X-PCB, Y-PCB and FPC.*

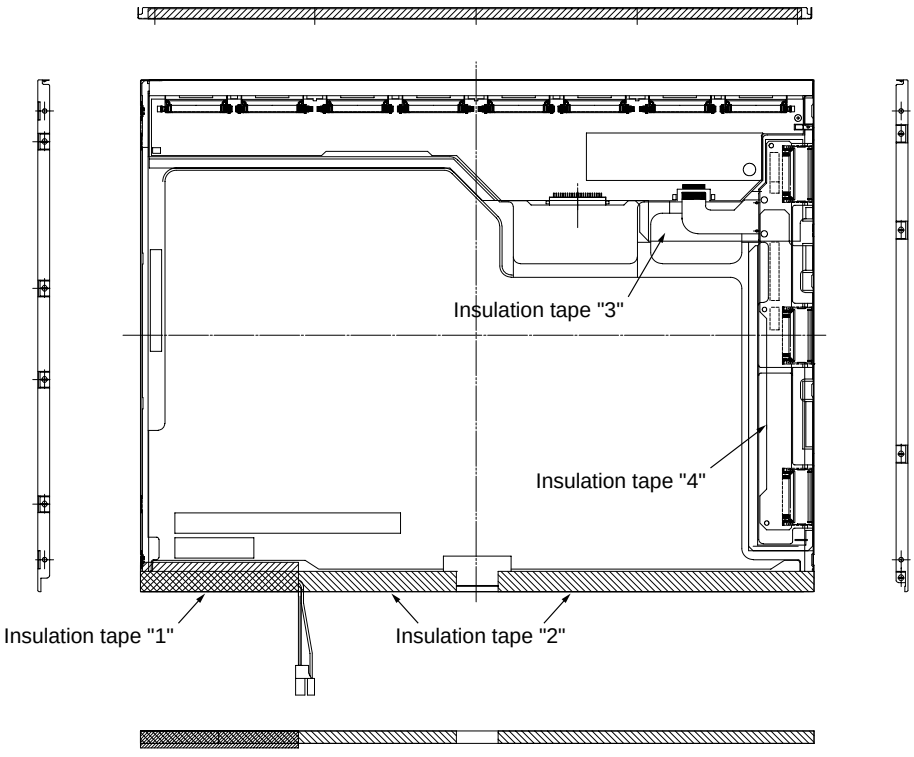


Figure 4-59 Removing the insulation tape and sheet

5. Fold out the X and Y-PCB insulation sheets as illustrated below. Don't lift up them from the side of the frame.
6. Remove the screws from the left side, top side and right side of the frame in the order illustrated below.
7. Remove the FPC from the connector.
8. Unfold the bent part on the frame.

***NOTE**: Use a No. 0 Phillips screwdriver to remove the screws. Do not damage the Y-PCB when you pull the FPC out of the hook on the frame.*

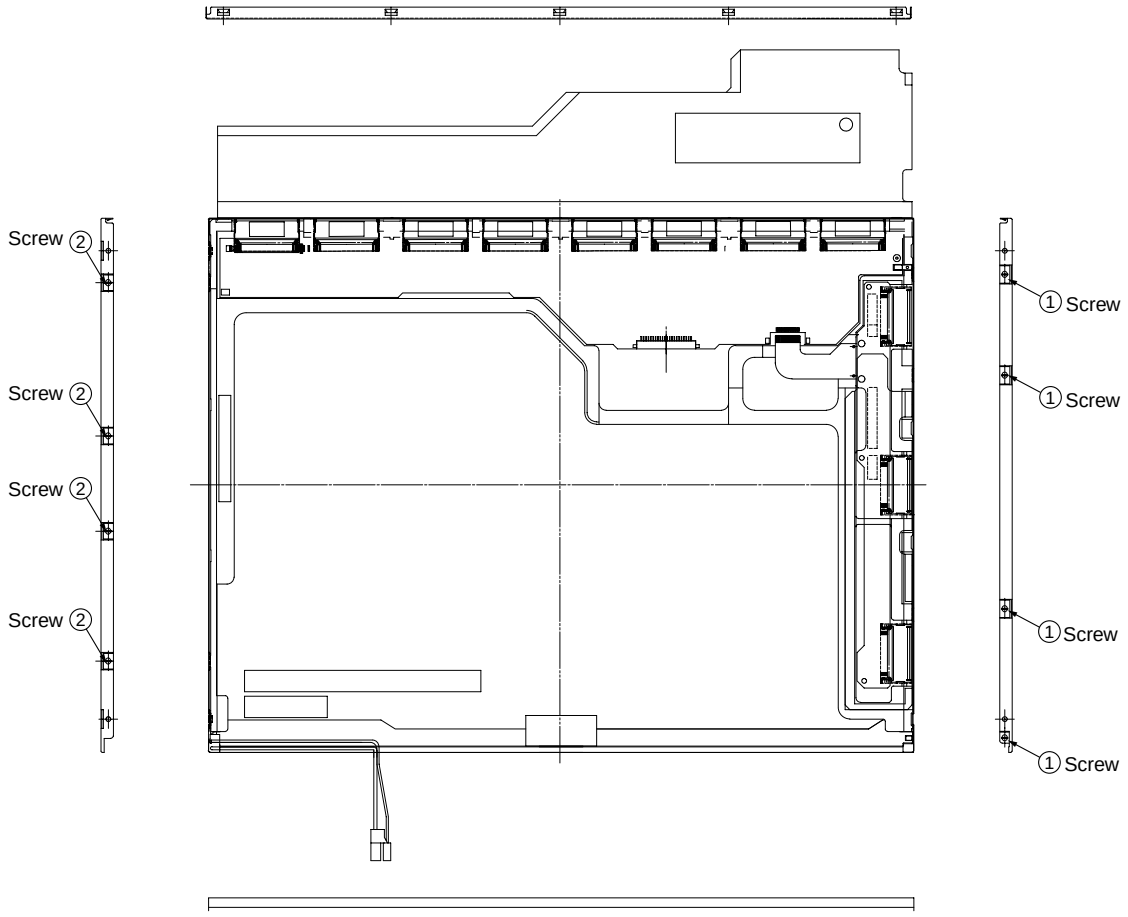


Figure 4-60 Folding out the insulation sheets and removing the screws and FPC

9. Turn the LCD module right side up.

10. Remove the frame with the X and Y-insulation sheets.

> ***NOTE**: Do not damage the X-TAB with the bent parts on the top side of the frame when you remove the frame.*

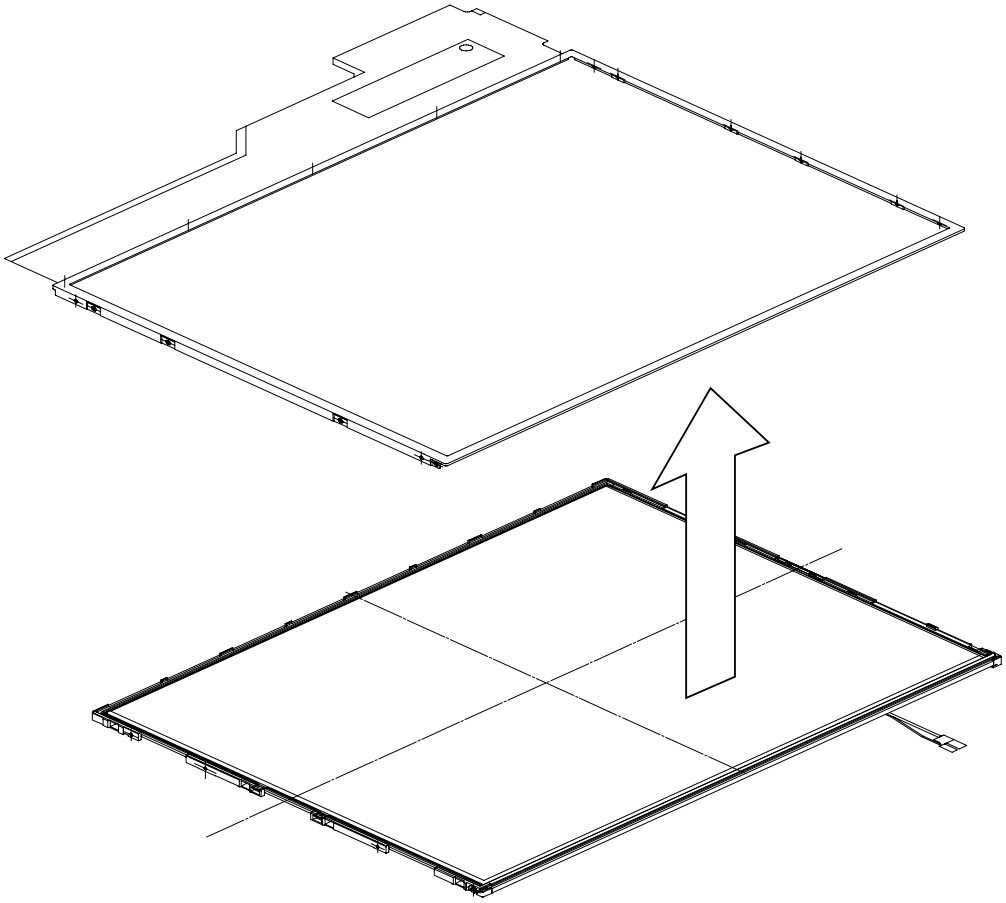


Figure 4-61 Removing the frame

11. Fold out the Y-PCB and X-PCB in the order illustrated below.

***NOTE**: Do not damage the X-PCB and Y-PCB.*

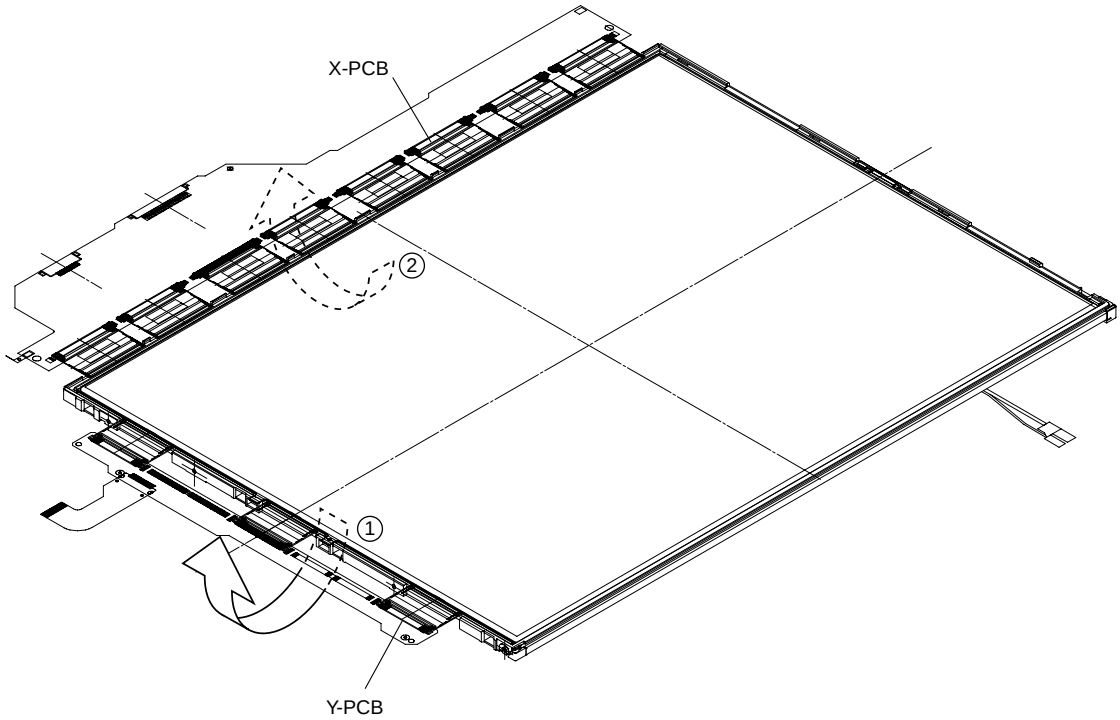


Figure 4-62 Folding out the Y-PCB and X-PCB

12. Separate the PCB-ASSY cell from the backlight unit. (1)
13. Remove entirely the remaining tape on the back of the cell and on the frame. (2)
14. Apply one strip of double-faced tape to the frame. (3)

> ***NOTE**: The top side of the cell (2) is attached to the frame with double-faced tape, so be careful when you remove the cell.*
>
> *Do not lift up the opaque tape on the top side of the cell.*
>
> *Do not apply double-faced tape to the surface of the FL.*

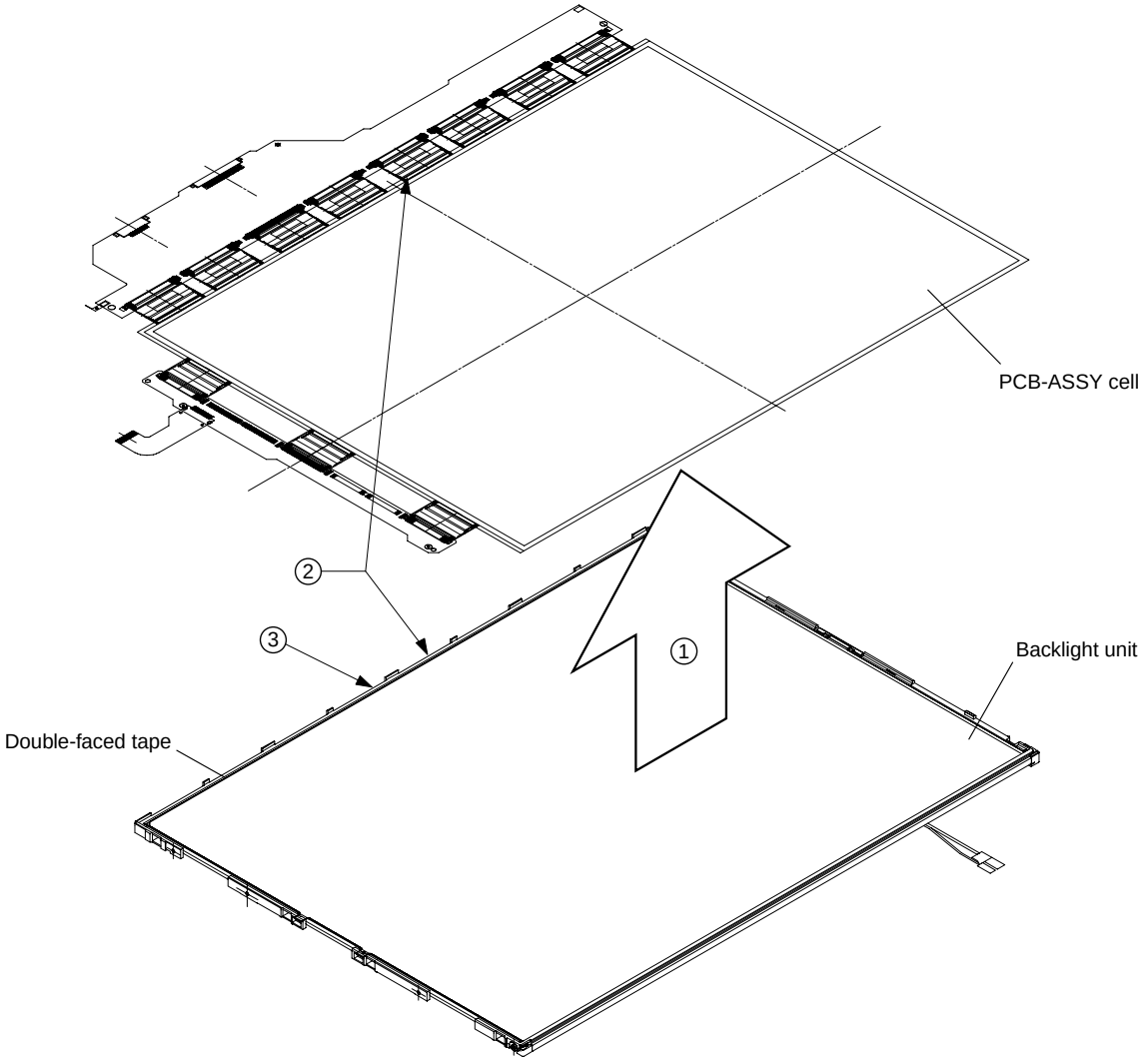


Figure 4-63 Separating the PCB-ASSY cell

15. Remove the upper two lens sheets taking care not to damage or contaminate them with the tape or frame. The upper two lens sheets have two tabs on the left side and one tab on the right side.

16. Remove the lower two lens sheets. Do not remove the sheet-fixing tape on the frame.

17. Remove the light guide and reflective sheet from the hooks on both the ends of the edge of the frame taking care not to damage or contaminate them.

18. Remove the low-voltage FL cable from the frame taking care not to pull the lamp element.

19. Remove the double-faced tape from the center of the reflector taking care not to break the plastic frame.

20. Remove the U-shaped hook of the high-voltage side of the reflector from the frame.

Installing the TFT FL (Model 14.1 Toshiba)

To install the TFT FL (Model 14.1 Toshiba), follow the steps below and refer to figures 4-64 to 4-69.

1. Install the U-shaped hook of the high-voltage side of the reflector into the frame.
2. Apply one strip of double-faced tape to the center of the reflector.
3. Fit the low-voltage FL cable into the frame.
4. Install the reflective sheet and the light guide.
5. Install four lens sheets.
6. Check the module as shown below.

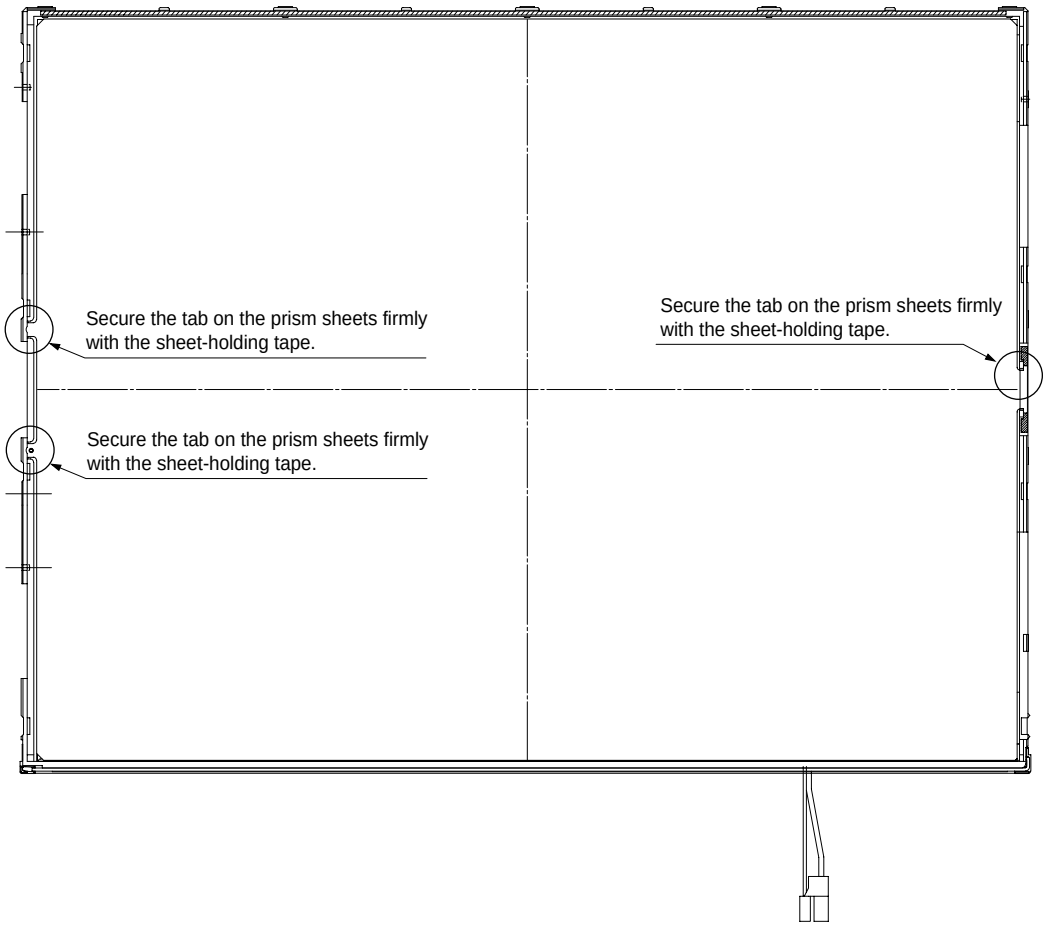


Figure 4-64 Checking the module

7. Remove the liner from the double-faced tape on the top side of the frame of the backlight unit.

8. Make sure there is no dust, foreign matter or damage on the backlight or back side of the cell, then install the PCB-ASSY cell onto the backlight unit.

***NOTE**: Align the bottom left corner as illustrated below.*

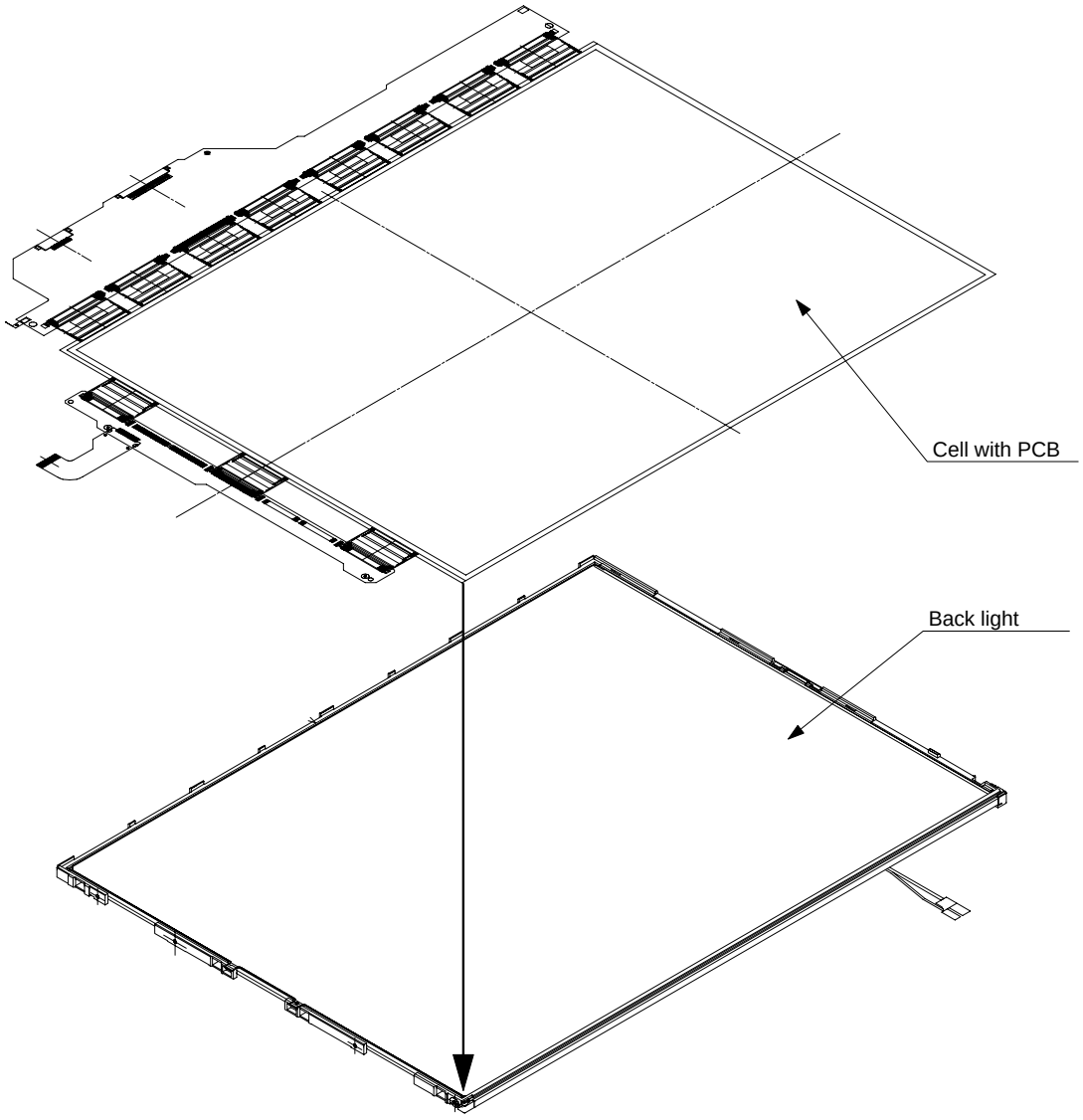


Figure 4-65 Installing the PCB-ASSY cell

9. Fold the X-PCB and Y-PCB onto the back of the backlight unit in the order illustrated below.

10. Insert the FPC into the hook on the frame.

11. Connect the FPC to the connector and secure it with the latch of the connector.

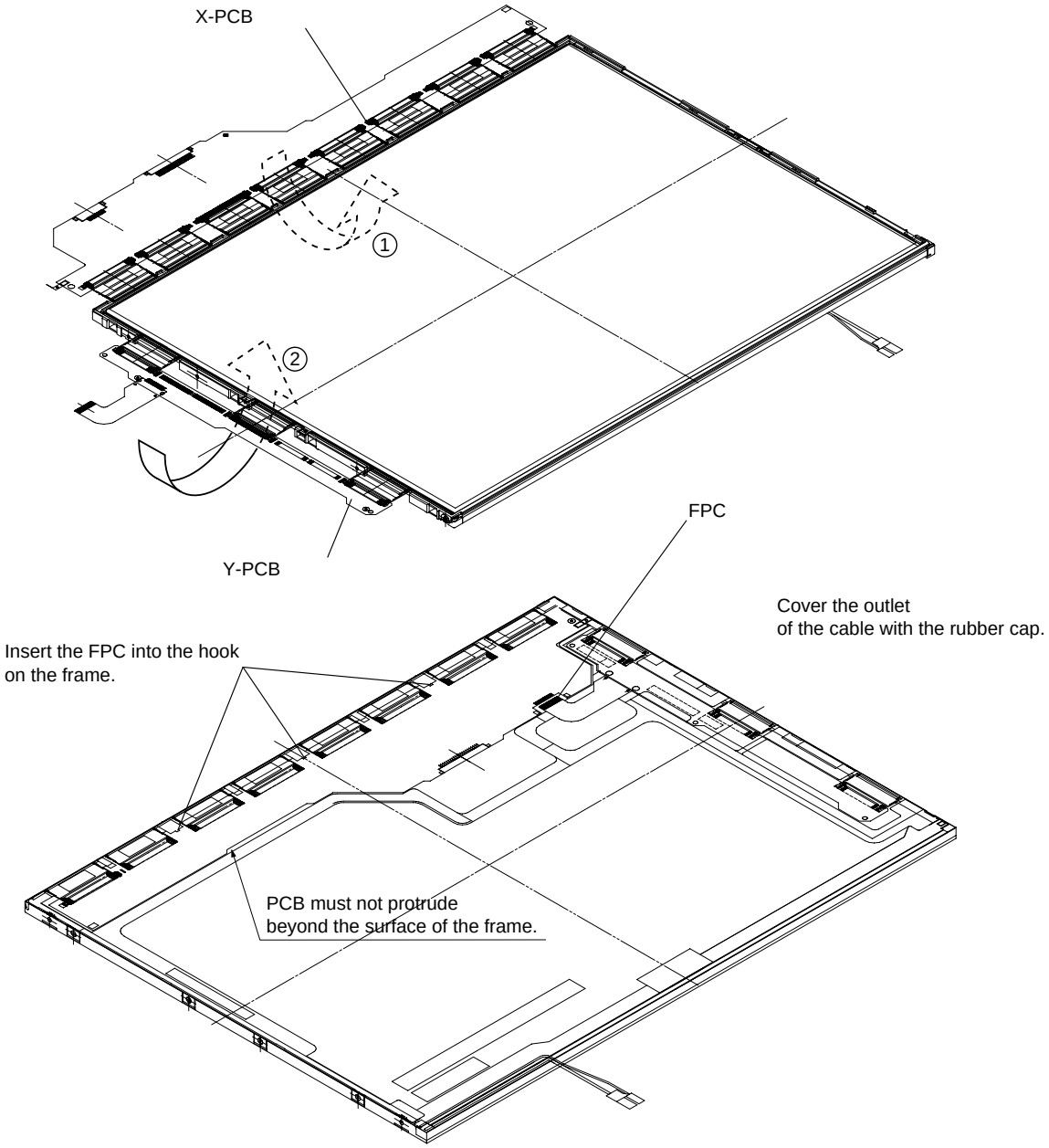


Figure 4-66 Folding the X-PCB and Y-PCB

12. Install the frame.

> ***NOTE**: Make sure that the GND-CU of the Y-PCB is inside the frame and that the lamp reflector at the lower left side is inside the frame.*

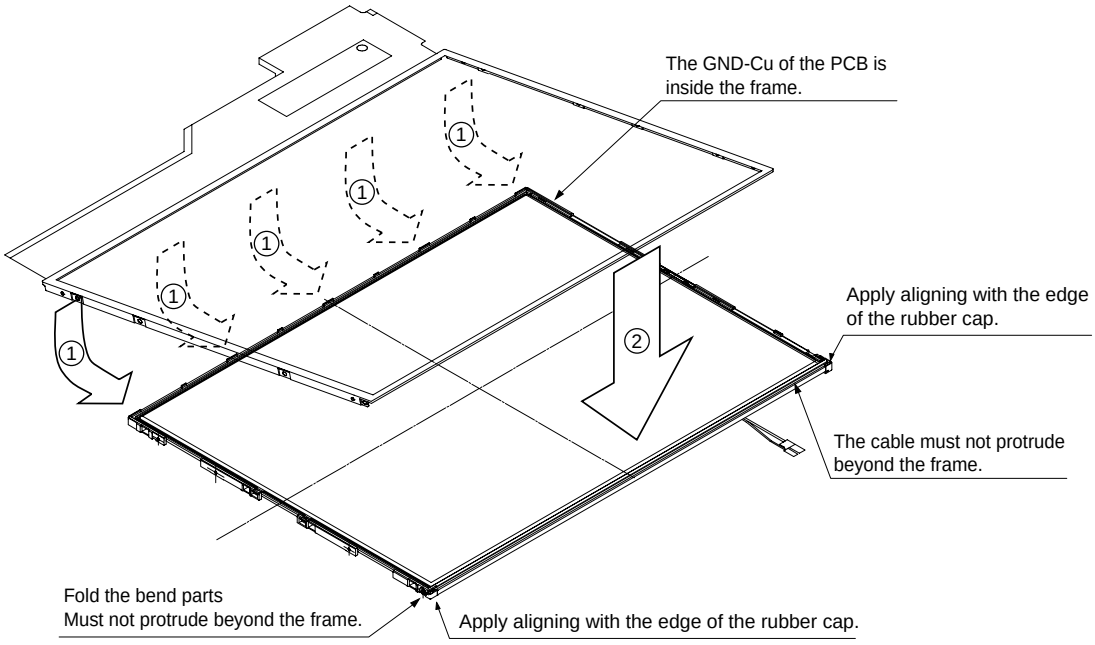


Figure 4-67 Installing the frame

13. Fold two bend parts on the top side of the frame.

14. Secure the left side of the frame with four screws. (1) – (4)

15. Secure the right side of the frame with two screws. (5) – (8)

***NOTE**: Tighten all (eight) screws to a torque of 147mN·m (1.5kgf·cm). Use a No. 0 Phillips screwdriver to tighten the screws.*

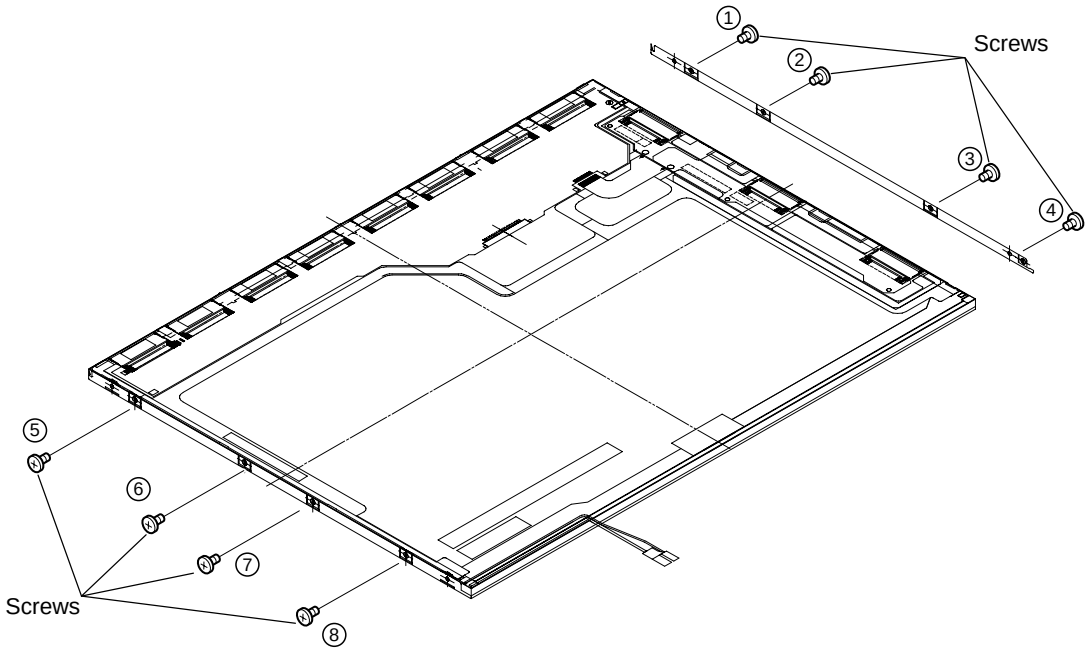


Figure 4-68 Securing the screws

16. Apply the X insulation sheet (1) and the Y insulation sheet. (2)
17. Apply one strip of insulation tape "1" to the center of the left side. (3)
18. Apply one strip of insulation tape "1" to the center of the bottom side (FL side). (4)
19. Apply two strips of insulation tape "2" to the bottom side (FL side). (5)
20. Apply one strip of insulation tape "3" to secure the FL. (6)

***NOTE**: Do not damage the X-PCB, Y-PCB when you apply the tape or sheet.*

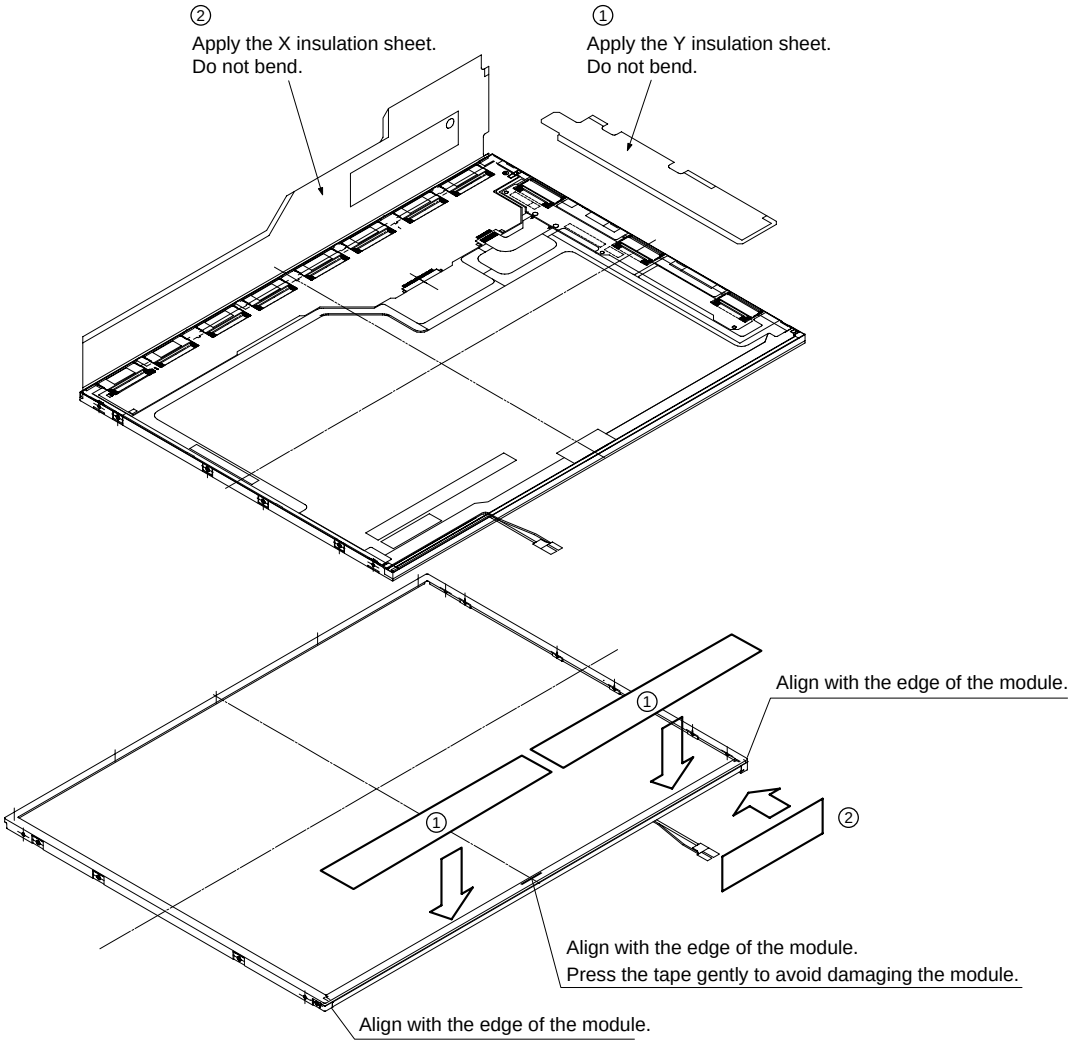


Figure 4-69 Applying the insulation sheets and tapes

4.27 TFT FL (Model 14.1 SHARP LQ141X1LH63)

> ***CAUTION**: When you replace the fluorescent lamp, wear finger covers or gloves to avoid contaminating or damaging the LCD panel. Be careful not to let dust or other foreign matter into the module.*

Removing the TFT FL (Model 14.1 SHARP LQ141X1LH63)

To remove the TFT FL (Model 14.1 SHARP LQ141X1LH63), follow the steps below and refer to figures 4-70 to 4-84.

1. Turn the LCD module upside down.

2. Remove **protective cover-S**, **protective cover-G**, **aluminum tape** and **tape securing the wire** applied to the back of the LCD module. Be careful not to damage the TCP or ICs. (Dispose of the protective covers and tape you removed.)

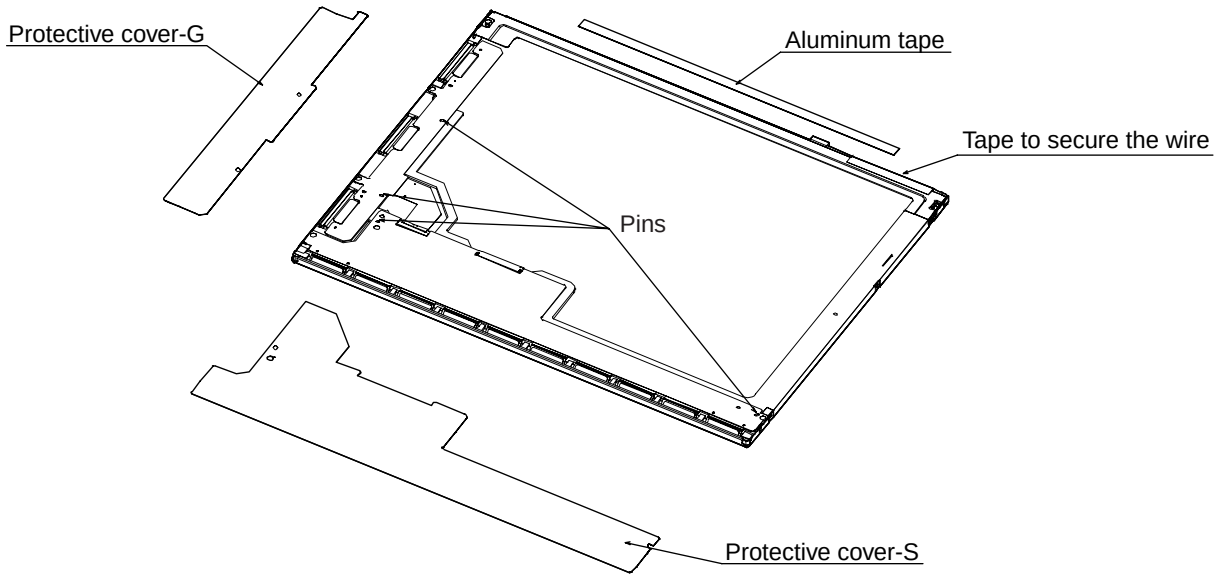


Figure 4-70 Removing the covers and tape

3. Remove **four screws** from the side of the LCD module.

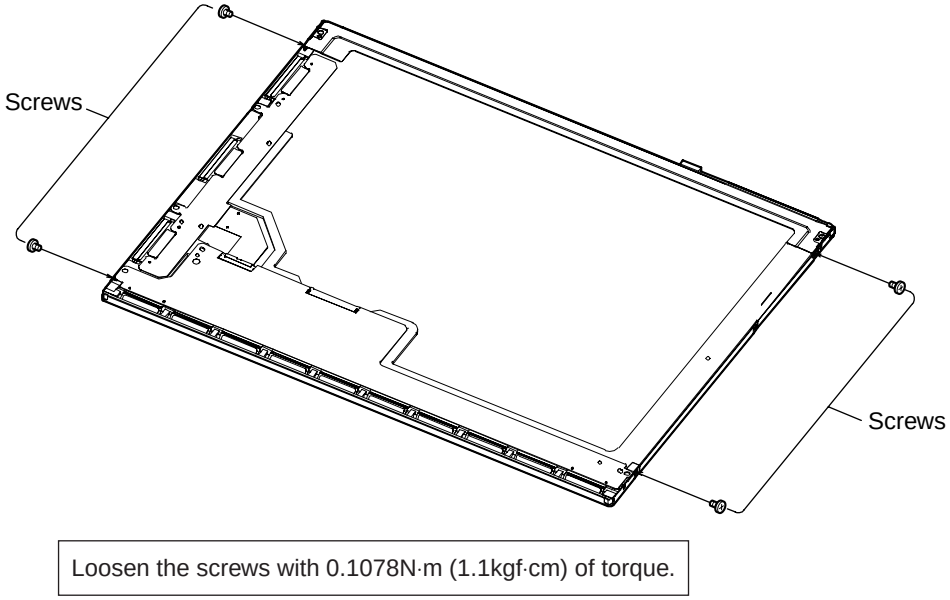


Figure 4-71 Removing the screws

4. Turn the LCD module right side up.
5. Release **two latches** on the lamp side of the top frame.

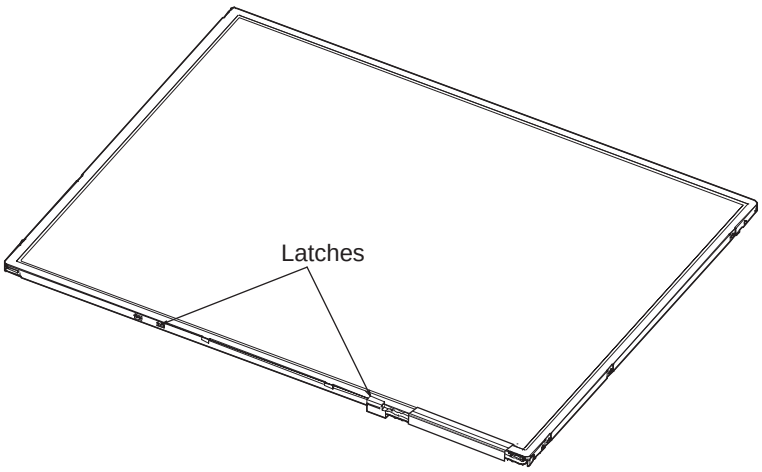


Figure 4-72 Removing the top latches

6. Rotate the top frame from the lamp side, then release the U-shaped side of the top frame to remove the **top frame**.

7. Remove **tape** securing the ground wire.

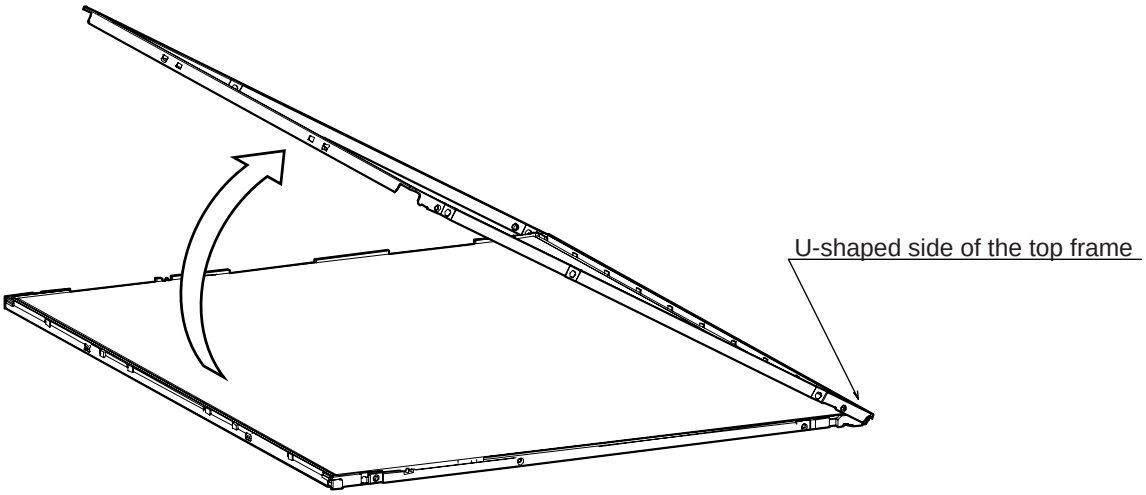
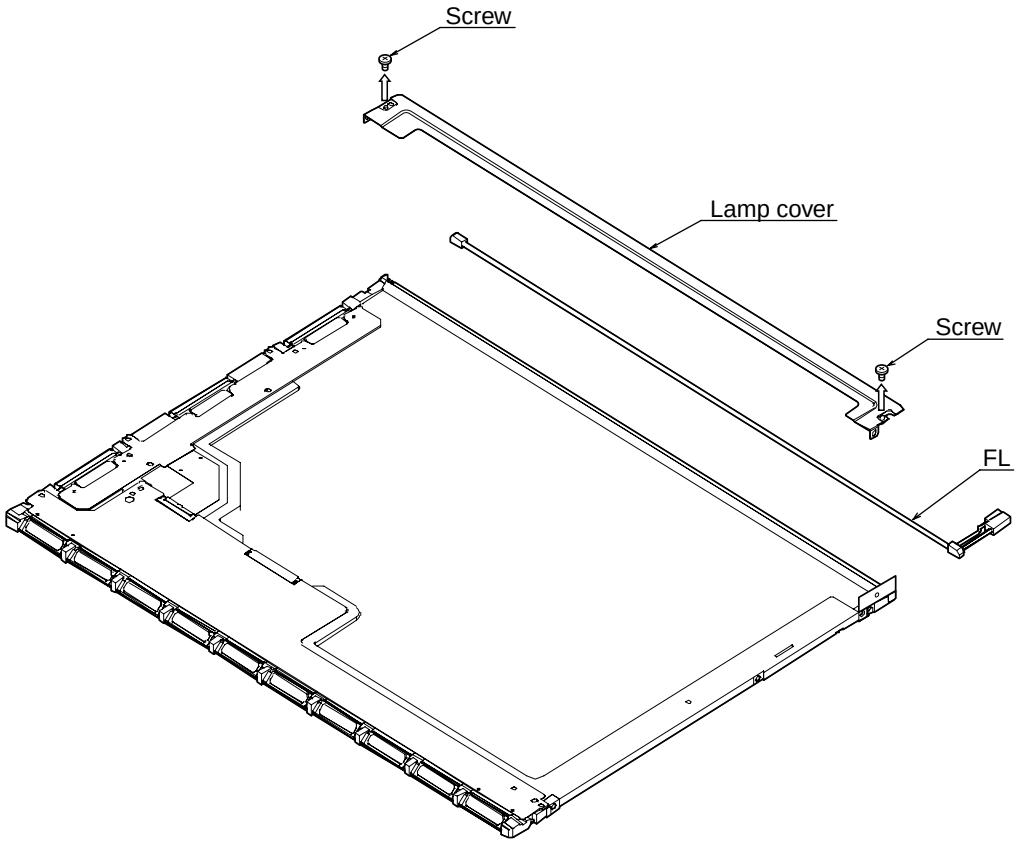


Figure 4-73 Removing the top frame

8. Turn the LCD module upside down.
9. Remove **two screws** securing the **lamp cover**.
10. Remove the **lamp cover**.
11. Gently remove the **FL** taking care not to damage it.



Loosen the screws with 0.1078N·m (1.1kgf·cm) of torque.

Figure 4-74 Removing the lamp cover and the FL

Installing the TFT FL (Model 14.1 SHARP LQ141X1LH63)

To install the TFT FL (Model 14.1 SHARP LQ141X1LH63), follow the steps below and refer to figures 4-75 to 4-79.

1. Install a new **FL**.
2. Seat the **lamp cover** on the LCD module aligning the holes on the lamp cover with the pins on the LCD module. Let the P-chassis be outside by the outlet of the wire.
3. Fold the **shield tape** down.
4. Secure the **lamp cover** with **two screws**.

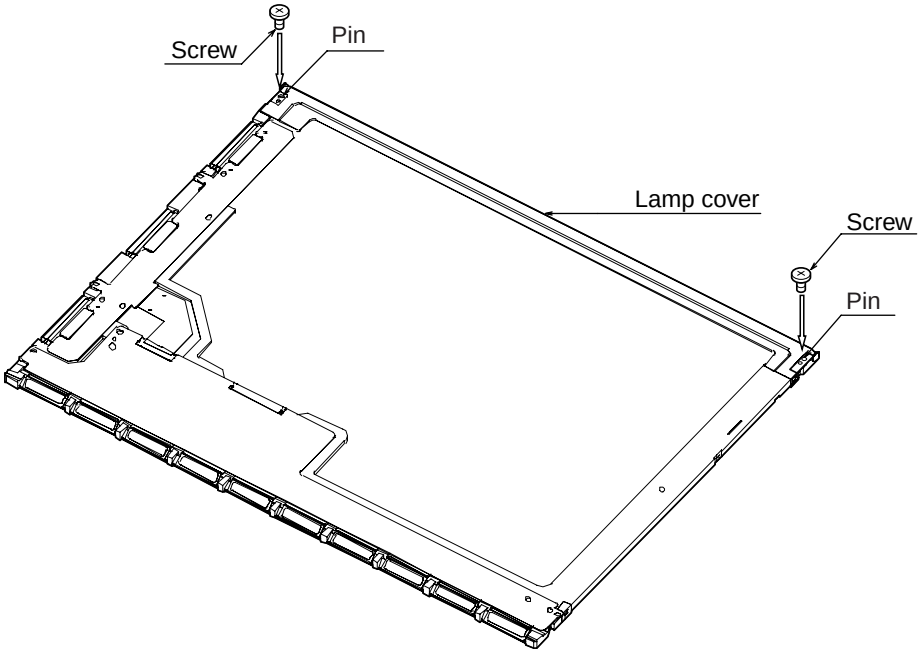


Figure 4-75 Installing the lamp cover

5. Secure the **ground wire** with **one strip of tape**.
6. Make sure the LCD panel fits into the panel guide ribs.
7. Hook the U-shaped side of the top frame to the P-chassis, then lay the top frame on the LCD module.
8. Secure the **top frame** with **two latches** on the lamp side.

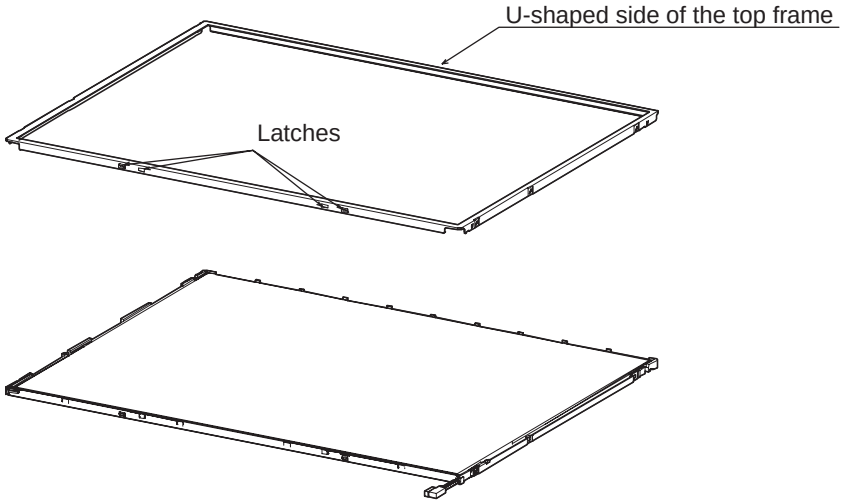


Figure 4-76 Installing the top frame

9. Secure **five screws** on the side of the top frame. Make sure two latches on the lamp side of the top frame secure the top frame firmly.

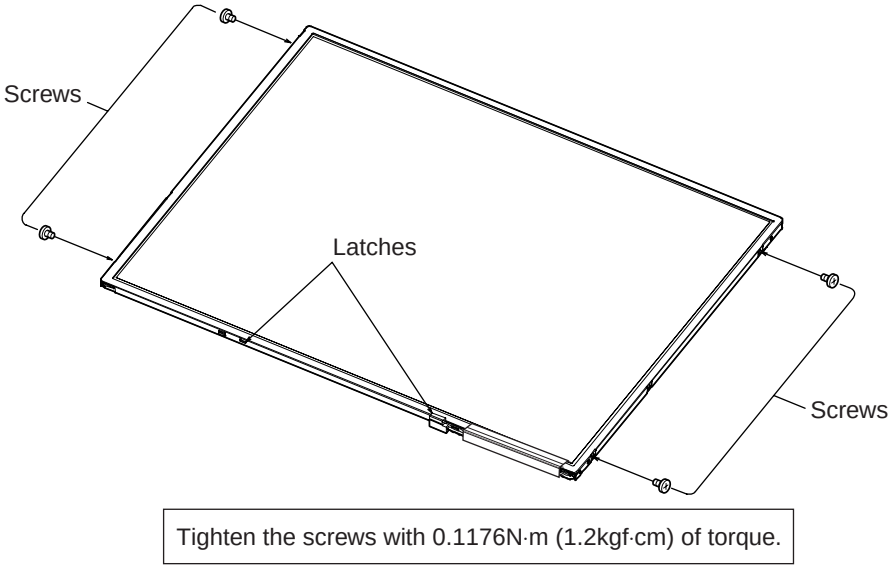


Figure 4-77 Securing the screws

10. Apply a new **protective cover-S** aligning the holes on it with the pins on the LCD module. Then fold it down along the side of the top frame.

11. Apply a new **protective cover-G** aligning the holes on it with the pins on the LCD module. Then fold it down along the side of the top frame.

12. Apply new **aluminum tape** aligning its length with a line on the lamp cover on the back of the LCD module and align one end with the edge of the lamp cover.

13. Secure the wire with tape. Align the length of the tape with a line on the lamp cover on the back of the LCD module and align one end with the edge of the frame so that the tape covers a screw.

14. Apply tape aligning one of its corners with a corner of the rectangular hole on the back of the LCD module.

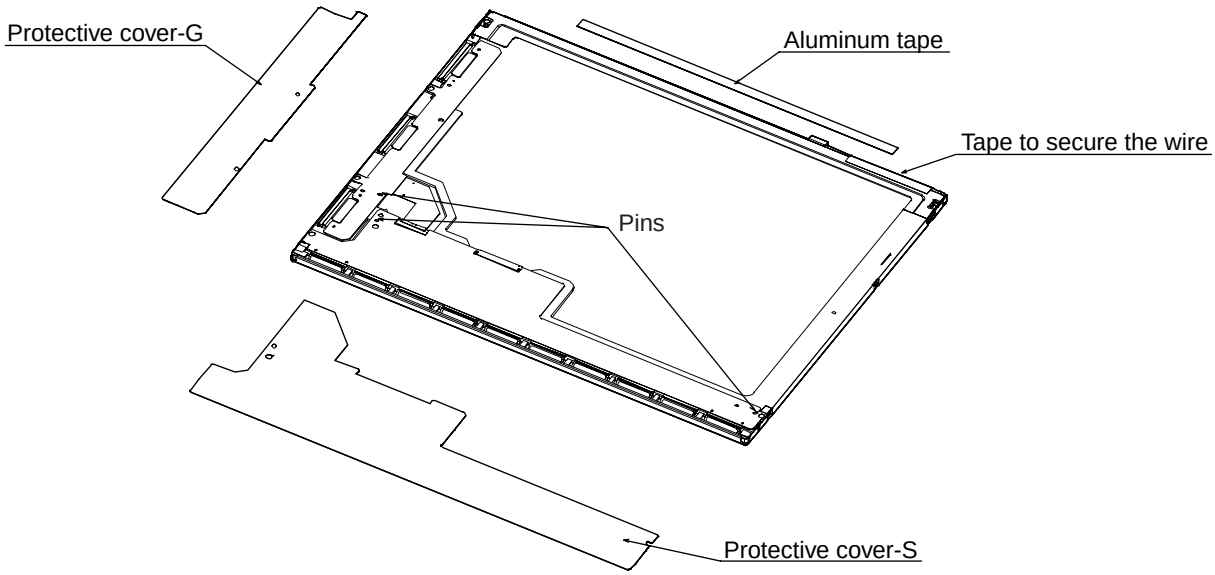


Figure 4-78 Applying the covers and tapes

15. Check as shown below after assembling.

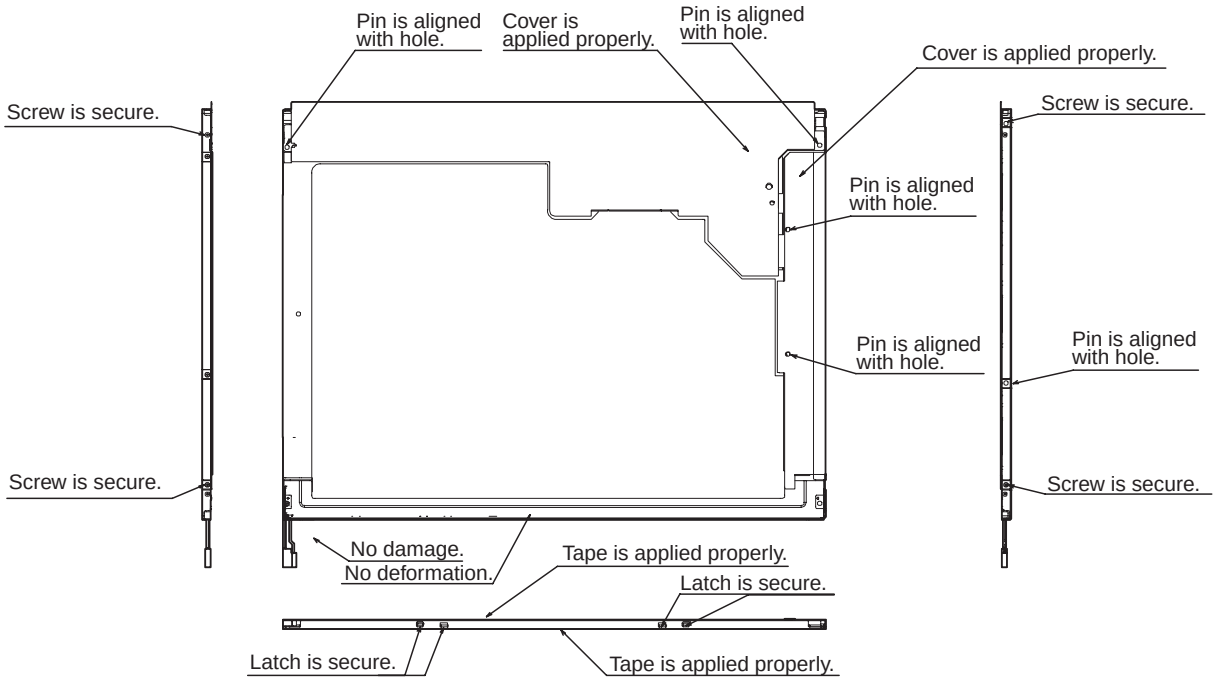


Figure 4-79 Checking the LCD module

4.28 TFT FL (Model 14.1 SHARP LQ141F1LH23)

> ***CAUTION**: When you replace the fluorescent lamp, wear finger covers or gloves to avoid contaminating or damaging the LCD panel. Be careful not to let dust or other foreign matter into the module.*

Removing the TFT FL (Model 14.1 SHARP LQ141F1LH23)

To remove the TFT FL (Model 14.1 SHARP LQ141X1LH23), follow the steps below and refer to figures 4-80 to 4-84.

1. Turn the LCD module upside down.

2. Remove **protective cover-S**, **protective cover-G**, **aluminum tape** and **tape securing the wire** applied to the back of the LCD module. Be careful not to damage the TCP or ICs. (Dispose of the protective covers and tape you removed.)

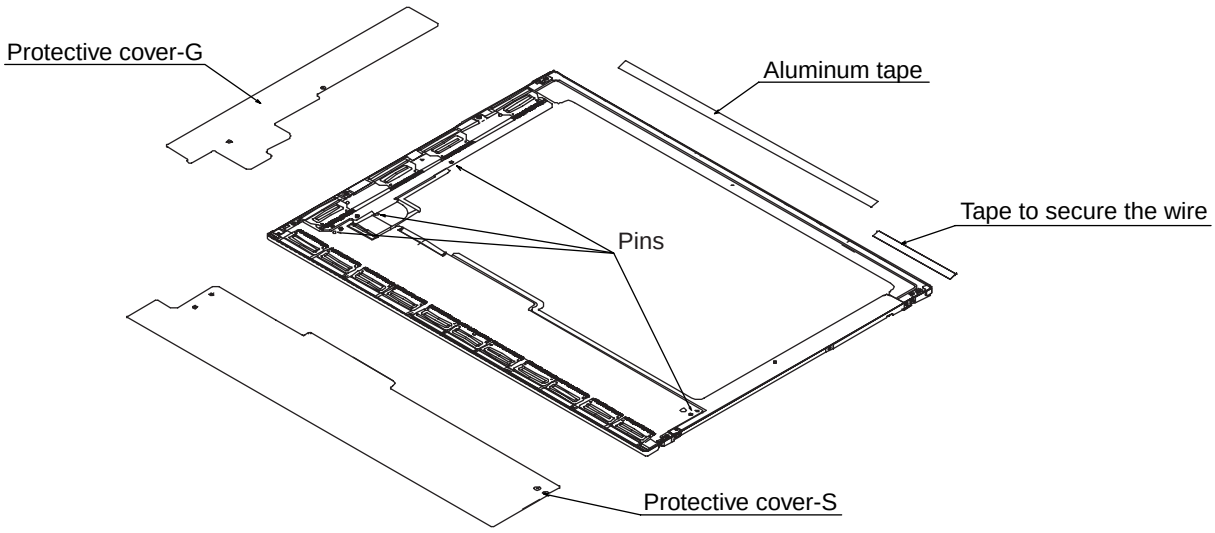


Figure 4-80 Removing the covers and tape

3. Remove **four screws** from the side of the LCD module.

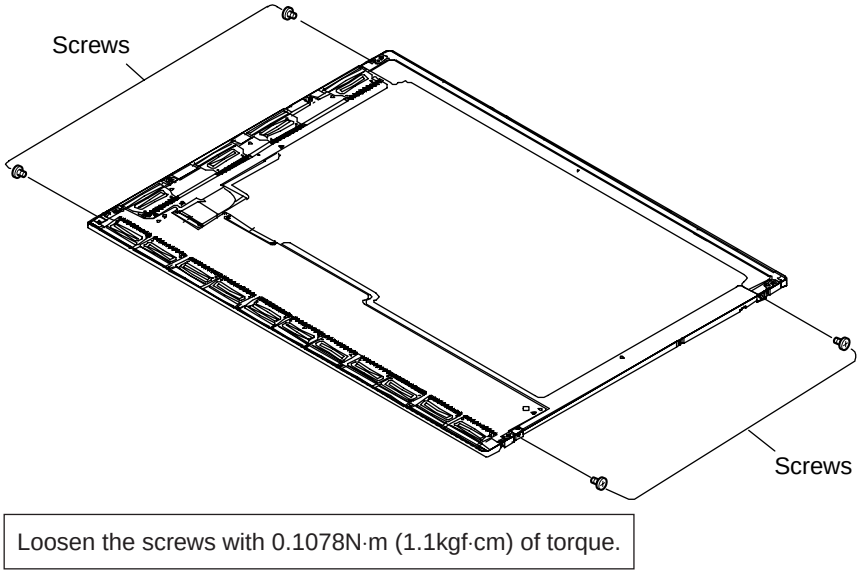


Figure 4-81 Removing the screws

4. Turn the LCD module right side up.
5. Release **two latches** on the lamp side of the top frame.

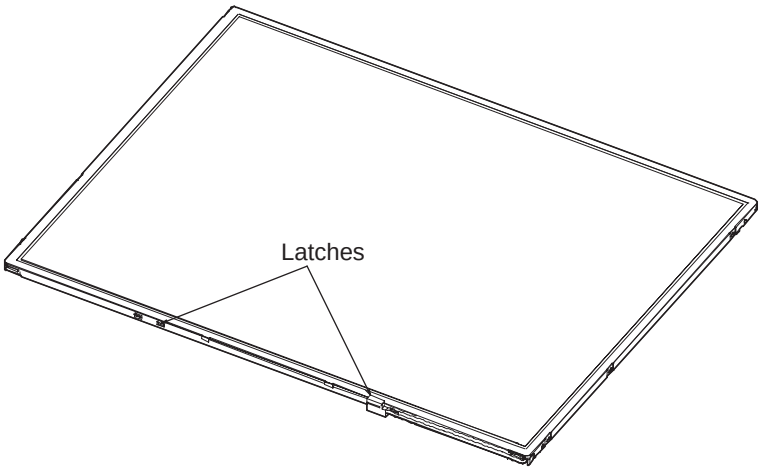


Figure 4-82 Removing the top latches

6. Rotate the top frame from the lamp side, then release the U-shaped side of the top frame to remove the **top frame**.

7. Remove **tape** securing the ground wire.

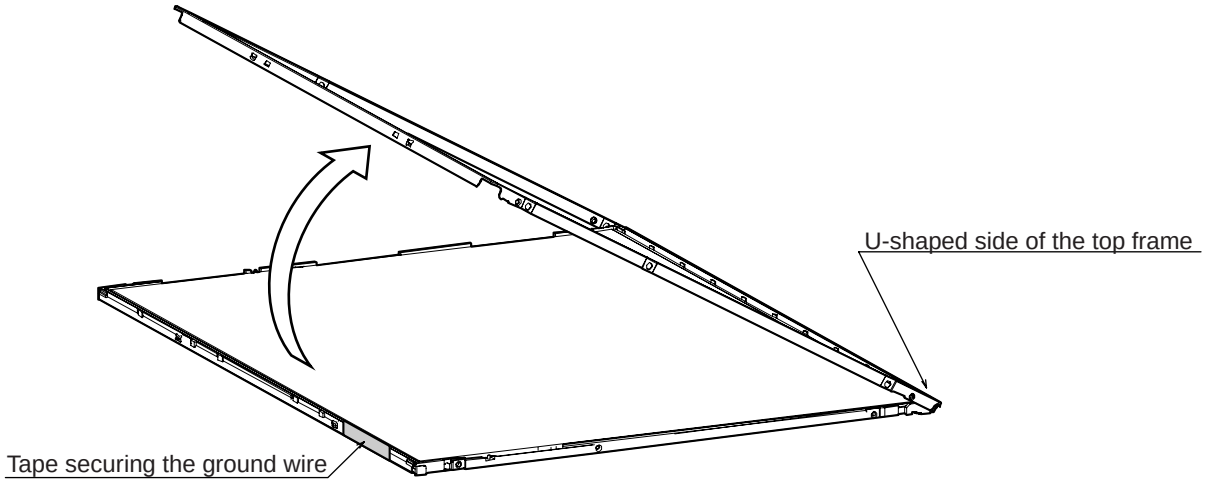
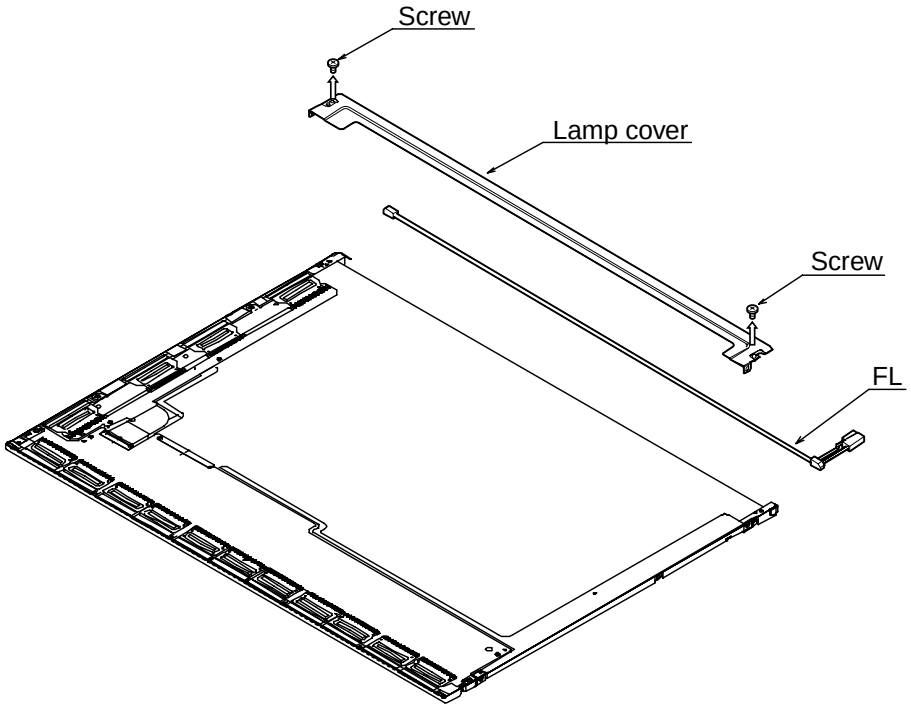


Figure 4-83 Removing the top frame

8. Turn the LCD module upside down.
9. Remove **two screws** securing the lamp cover.
10. Remove the **lamp cover**.
11. Gently remove the **FL** taking care not to damage it.



Loosen the screws with 0.1078N·m (1.1kgf·cm) of torque.

Figure 4-84 Removing the lamp cover and the FL

Installing the TFT FL (Model 14.1 SHARP LQ141F1LH23)

To install the TFT FL (Model 14.1 SHARP LQ141F1LH23), follow the steps below and refer to figures 4-85 to 4-89.

1. Install a new **FL**.
2. Seat the **lamp cover** on the LCD module aligning the holes on the lamp cover with the pins on the LCD module. Let the P-chassis be outside by the outlet of the wire.
3. Fold the **shield tape** down.
4. Secure the **lamp cover** with **two screws**.

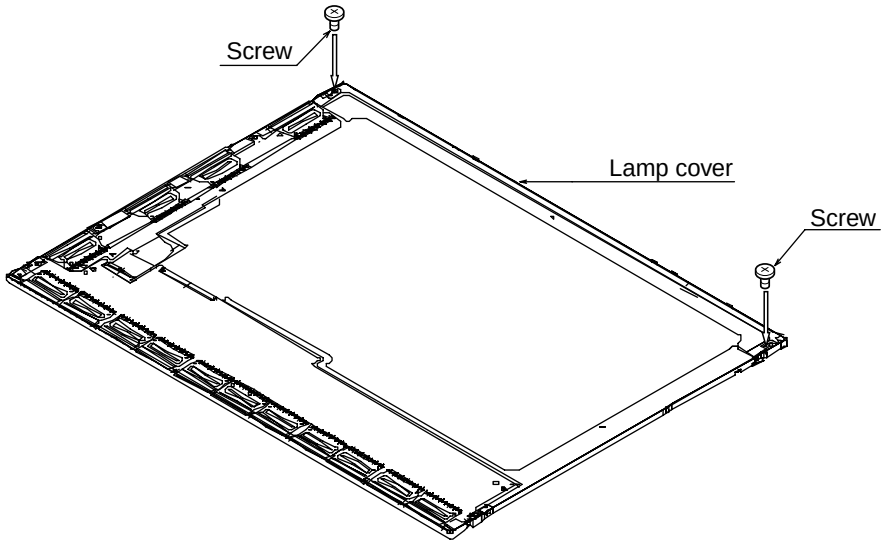


Figure 4-85 Installing the lamp cover

5. Secure the **ground wire** with **one strip of tape**.
6. Make sure the LCD panel fits into the panel guide ribs.
7. Hook the U-shaped side of the top frame to the P-chassis, then lay the top frame on the LCD module.
8. Secure the **top frame** with **two latches** on the lamp side.

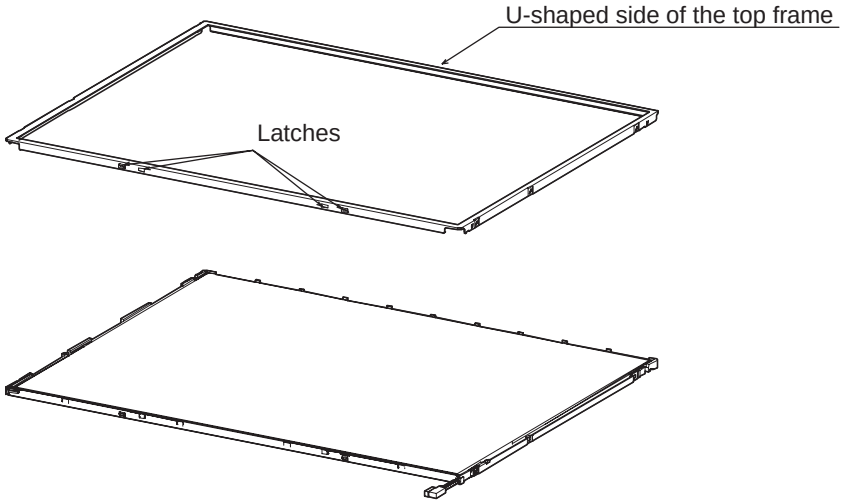


Figure 4-86 Installing the top frame

9. Secure **five screws** on the side of the top frame. Make sure two latches on the lamp side of the top frame secure the top frame firmly.

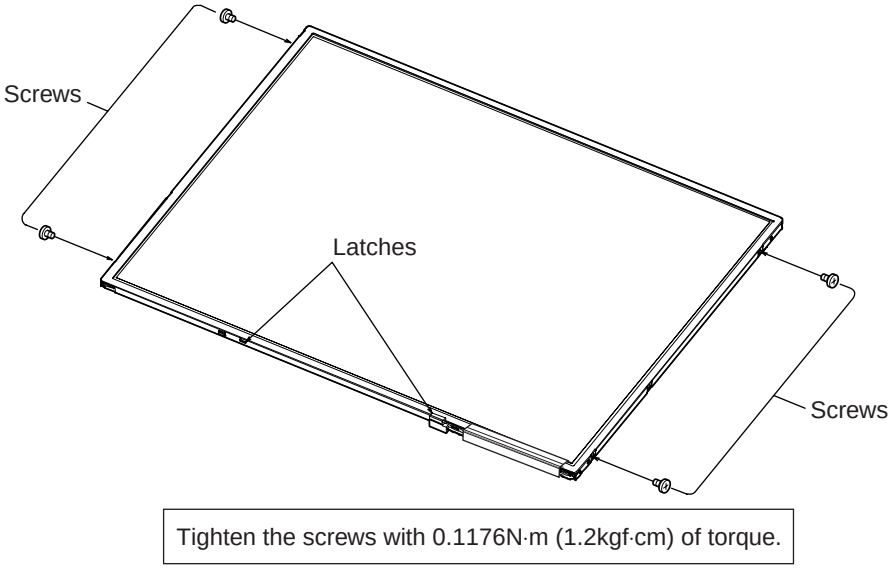


Figure 4-87 Securing the screws

10. Apply a new **protective cover-S** aligning the holes on it with the pins on the LCD module. Then fold it down along the side of the top frame.

11. Apply a new **protective cover-G** aligning the holes on it with the pins on the LCD module. Then fold it down along the side of the top frame.

12. Apply new **aluminum tape** aligning its length with a line on the lamp cover on the back of the LCD module and align one end with the edge of the lamp cover.

13. Secure the wire with tape. Align the length of the tape with a line on the lamp cover on the back of the LCD module and align one end with the edge of the frame so that the tape covers a screw.

14. Apply tape aligning one of its corners with a corner of the rectangular hole on the back of the LCD module.

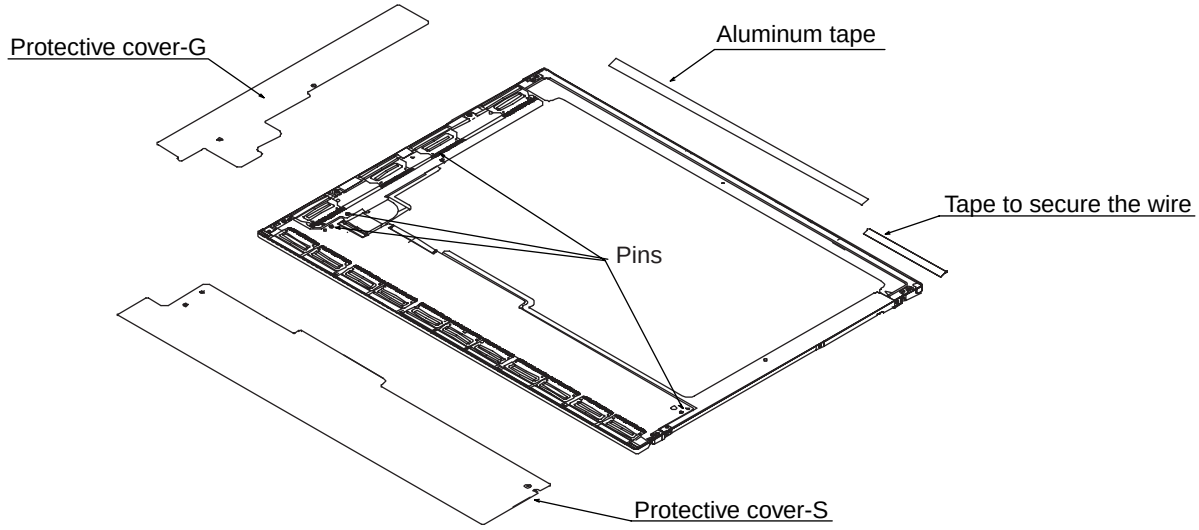


Figure 4-88 Applying the covers and tapes

15. Check as shown below after assembling.

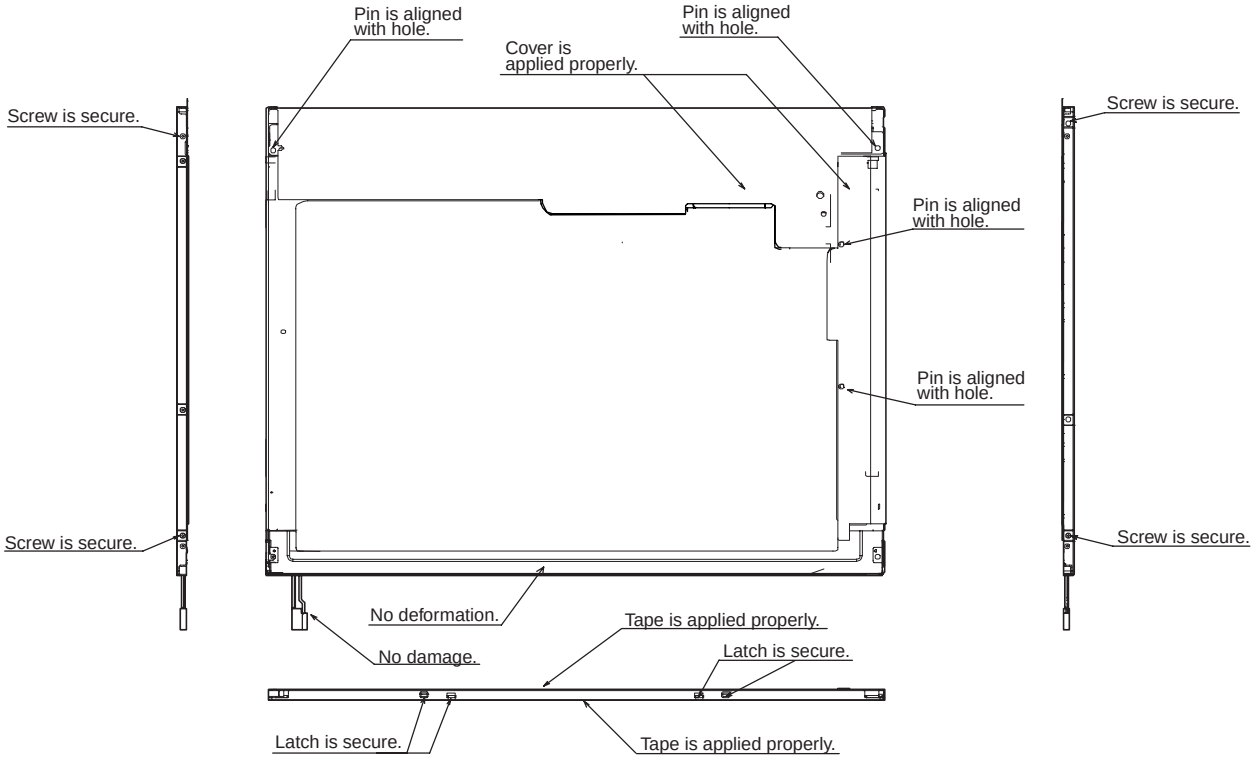


Figure 4-89 Checking the LCD module

Appendices

Appendix Contents

Figures

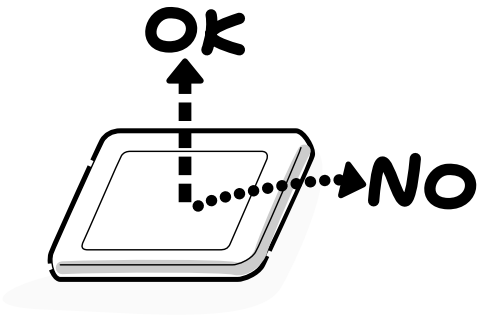
Tables

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. For 14.4 inch LCD module, be careful to align the four holes at the right side and left side of the LCD module with the corresponding holes in the LCD cover before securing the module with four screws.
   Do not force the module into place, because stress can affect its performance.

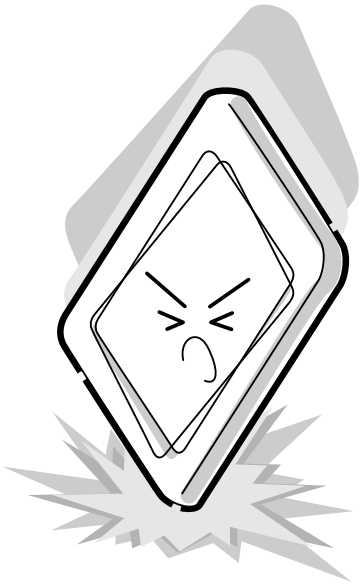
   Also, the panel's polarized surface is easily scarred, so be carefully when handling it.

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

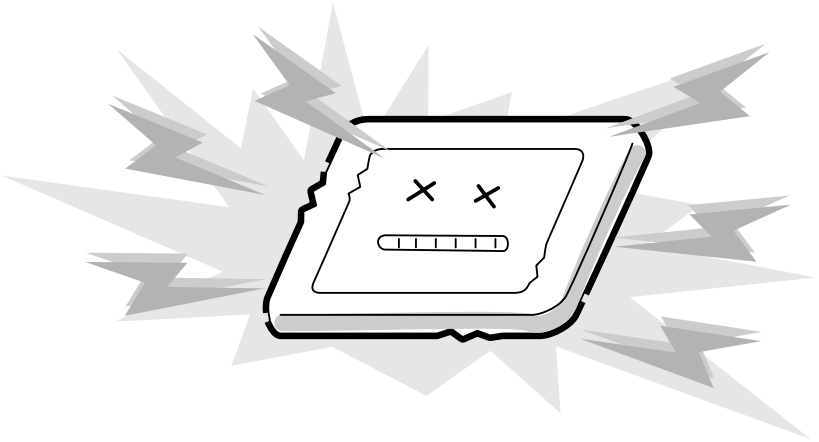
   If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.

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

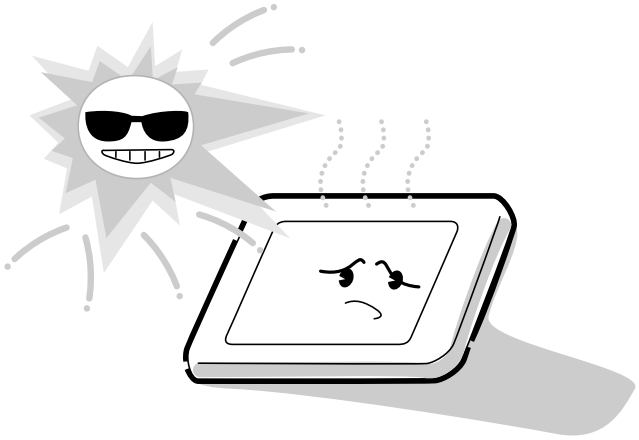
5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



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

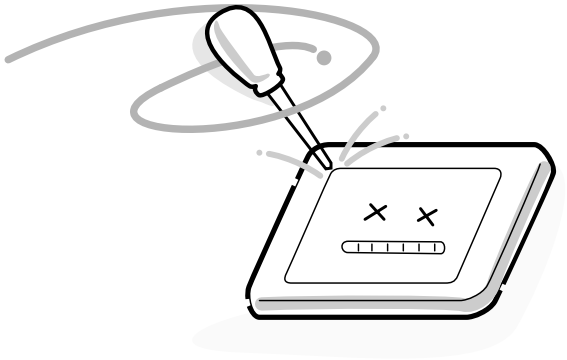


7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.

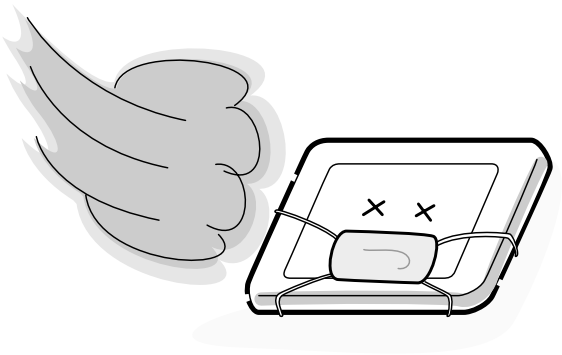


8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.

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



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



Appendix B Board Layout

B.1 System Board (FZNSY*) Front View

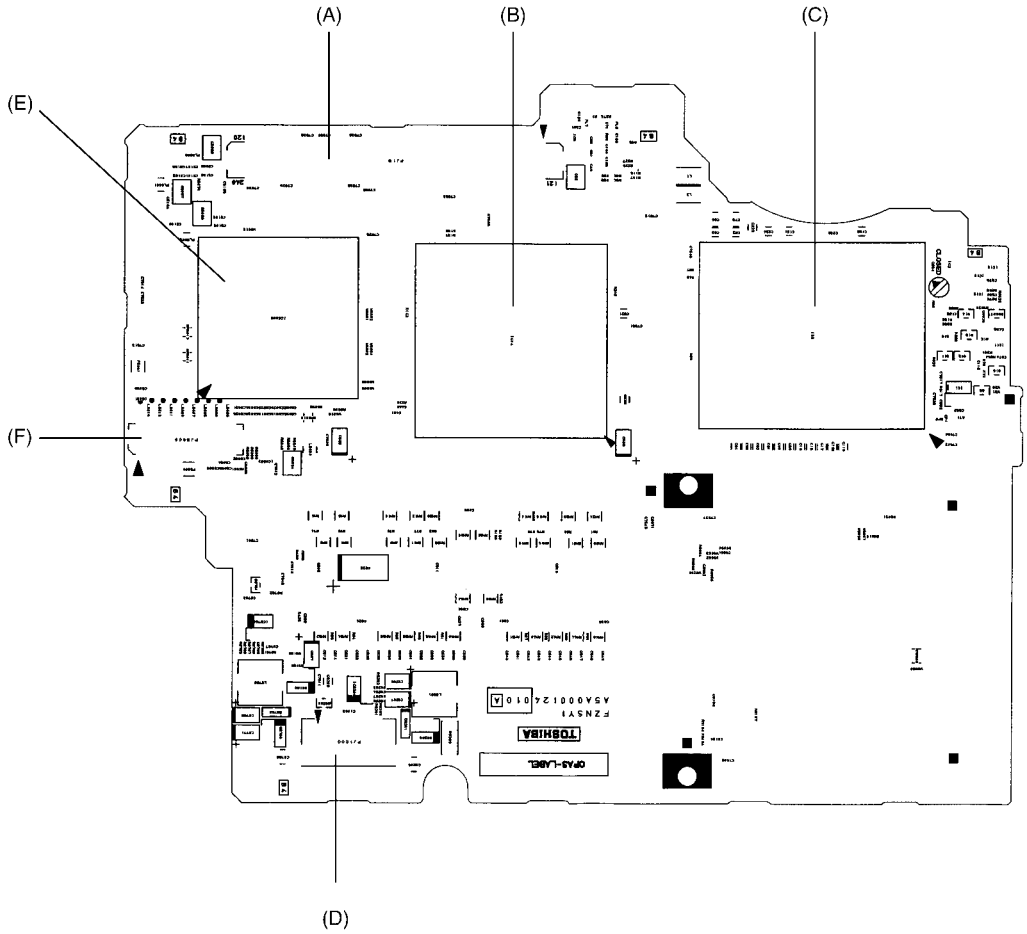


Figure B-1 System board (FZNSY) layout (front)*

B.2 System Board (FZNSY*) Back View

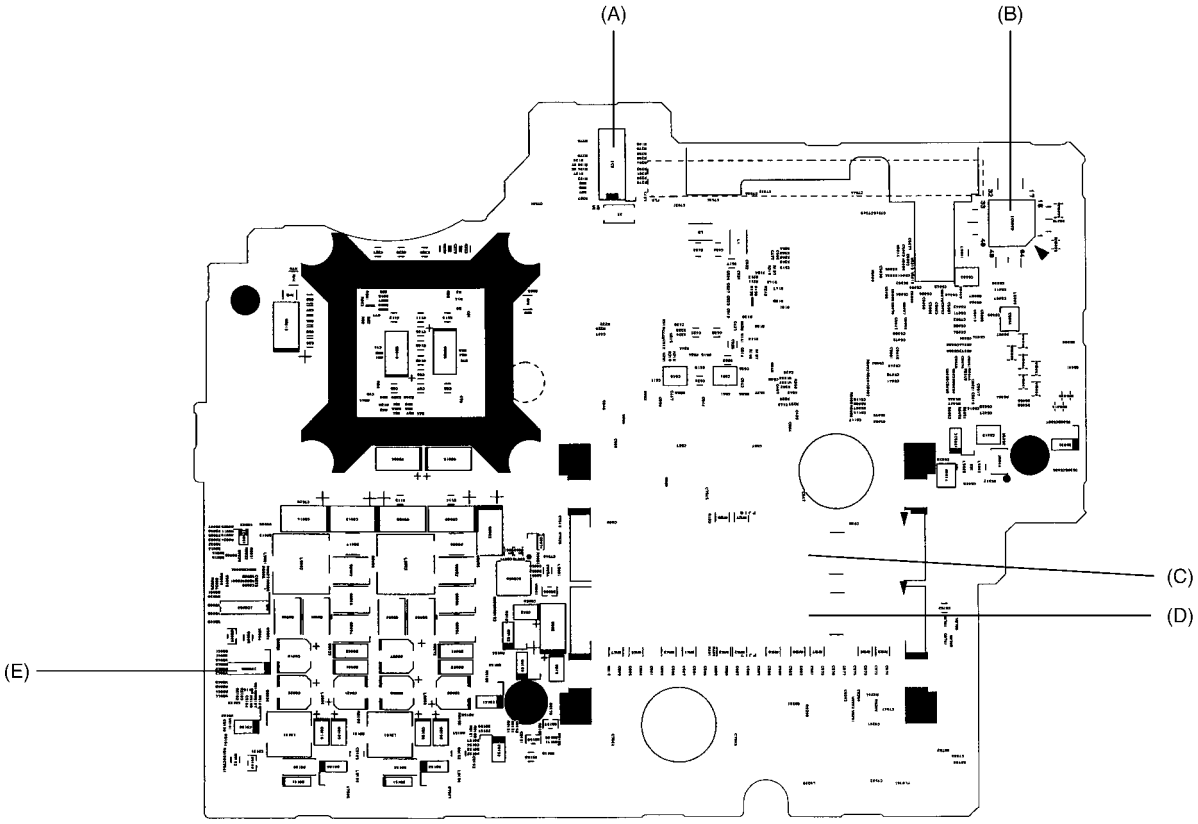


Figure B-2 System board (FZNSY) layout (back)*

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

Mark	Number	Name
(A)	PJ19	FZNIO* I/F
(B)	IC14	GMCH3-M
(C)	IS3	CPU
(D)	PJ18	FZNIO* I/F
(E)	IC5000	VGA Super Savage/IXC
(F)	PJ5000	LCD I/F

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

Mark	Number	Name
(A)	IC9	CK-TITAN
(B)	IC5003	SiI 168
(C)	PJ10	SO-DIMM (1)
(D)	PJ12	SO-DIMM (2)
(E)	IC4	MAX1718

B.3 I/O Board (FZNIO*) Front View

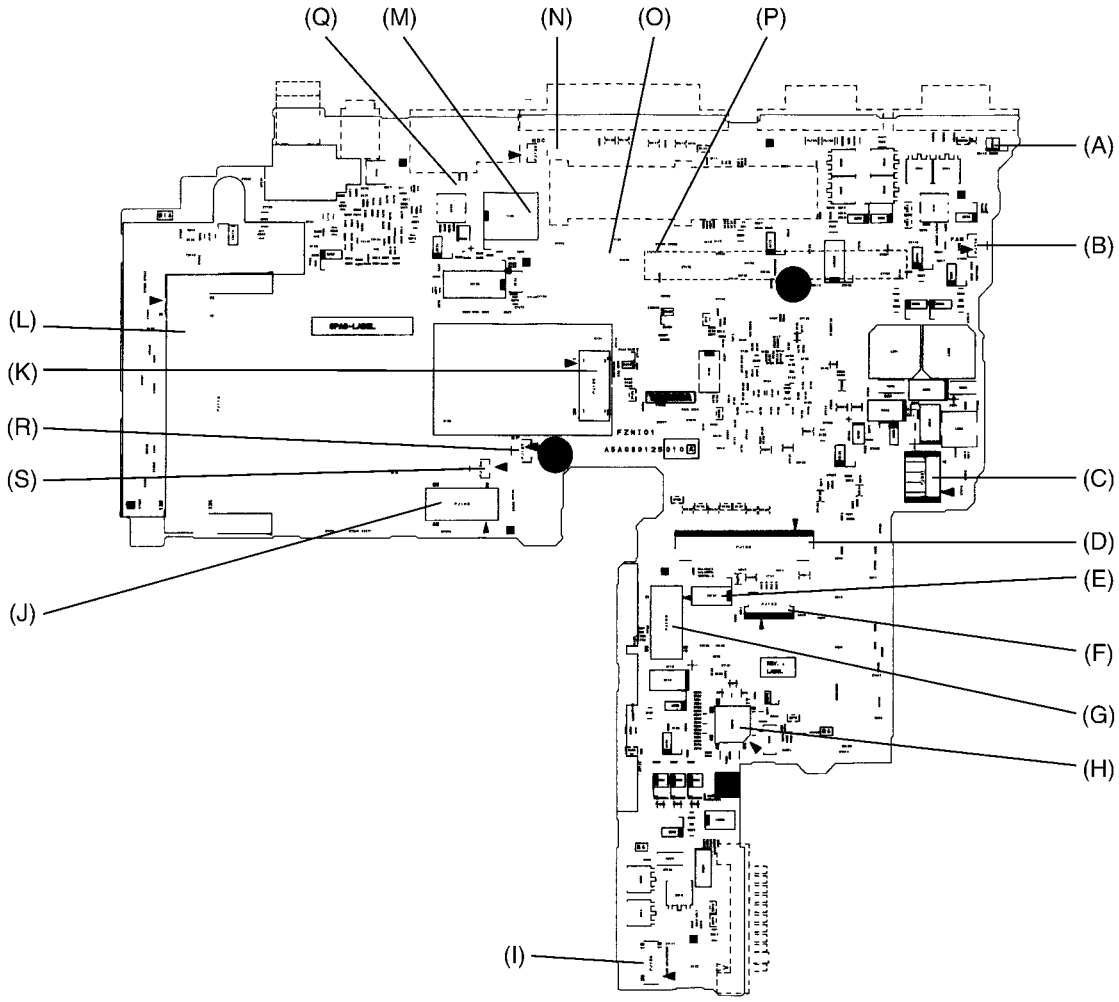


Figure B-3 I/O board (FZNIO) layout (front)*

Table B-3 I/O board (FZNIO) ICs and connectors (front)*

Mark	Number	Name
(A)	IC100	SW L3306
(B)	PJ770	FAN VCC
(C)	PJ801	DC-IN
(D)	PJ123	KB I/F
(E)	IC134	
(F)	PJ122	IPSC
(G)	PJ103	FZNSD* I/F
(H)	IC972	PSC
(I)	PJ105	FZNLE* I/F
(J)	PJ102	FZNLE* I/F
(K)	PJ125	MDC Connector
(L)	PJ118	Mini PCI I/F
(M)	T100	H1195
(N)	PJ126	
(O)	IC122	Q-SW
(P)	IC123	Q-SW
(Q)	PJ126	MDC I/F
(R)	PJ127	Speaker connector
(S)	PJ129	Speaker connector

B.4 I/O Board (FZNIO*) Back View

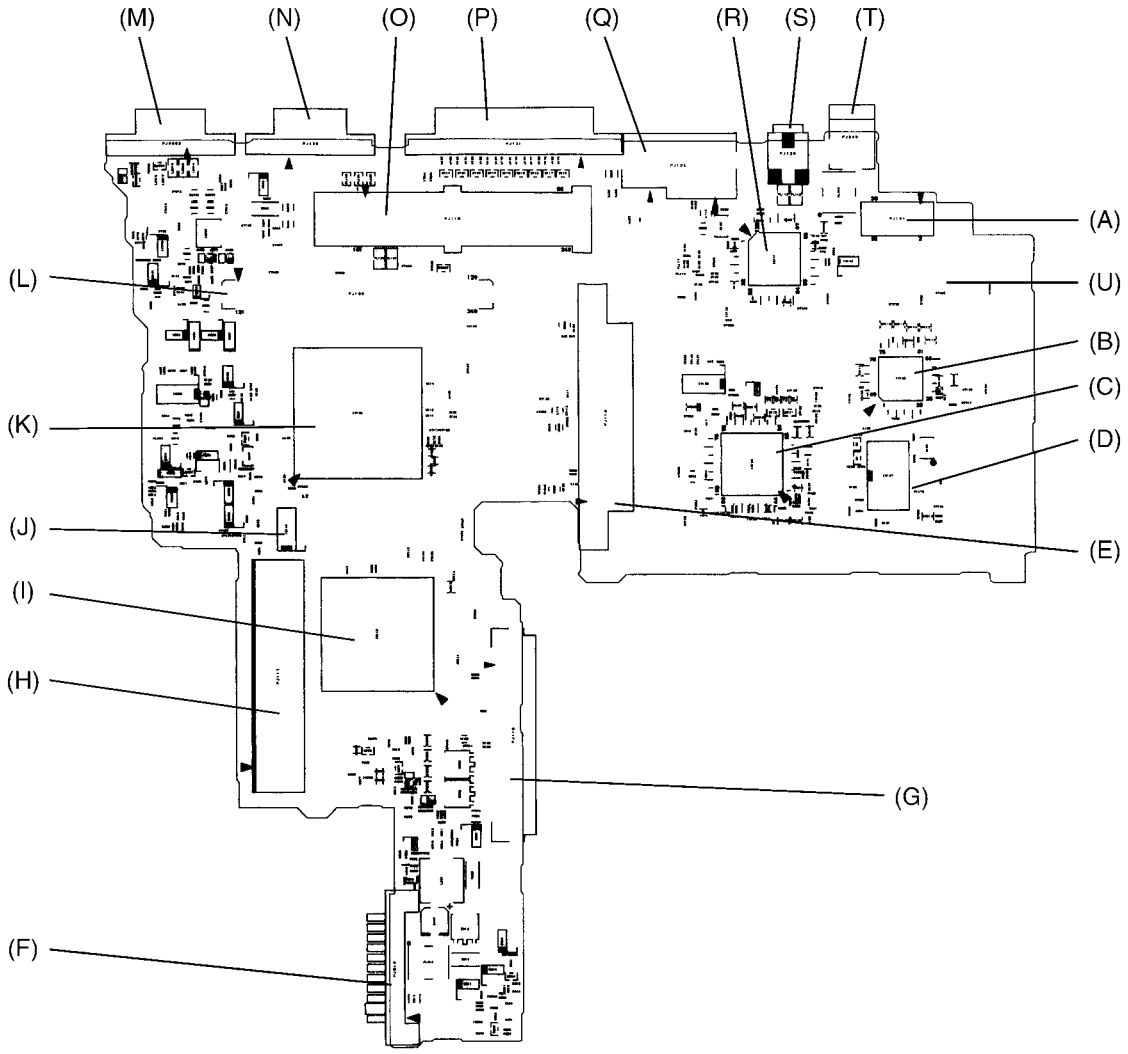


Figure B-4 I/O board (FZNIO) layout (back)*

Table B-4 I/O board (FZNIO) connectors (back)*

Mark	Number	Name
(A)	PJ104	FZNCN* I/F
(B)	IC129	Super I/O
(C)	IC125	EC/KBC
(D)	IC107	FWH
(E)	PJ115	HDD I/F
(F)	PJ810	1st Battery
(G)	PJ116	Slim Select Bay interface
(H)	PJ117	PC Card I/F
(I)	IC112	YEBIS3S
(J)	IC118	PC Card I/F
(K)	IC103	ICH3-M
(L)	PJ100	FZNSY* I/F
(M)	PJ5002	CRT I/F
(N)	PJ120	Serial I/F
(O)	PJ119	Docking I/F
(P)	PJ121	Parallel I/F
(Q)	PJ124	LAN/MODEM I/F
(R)	IC141	1394 PHY/LINK
(S)	PJ128	1394 I/F
(T)	PJ800	DC-IN
(U)	IC142	1394 EEPROM

B.5 Sound Board (FZNSD*) Front View

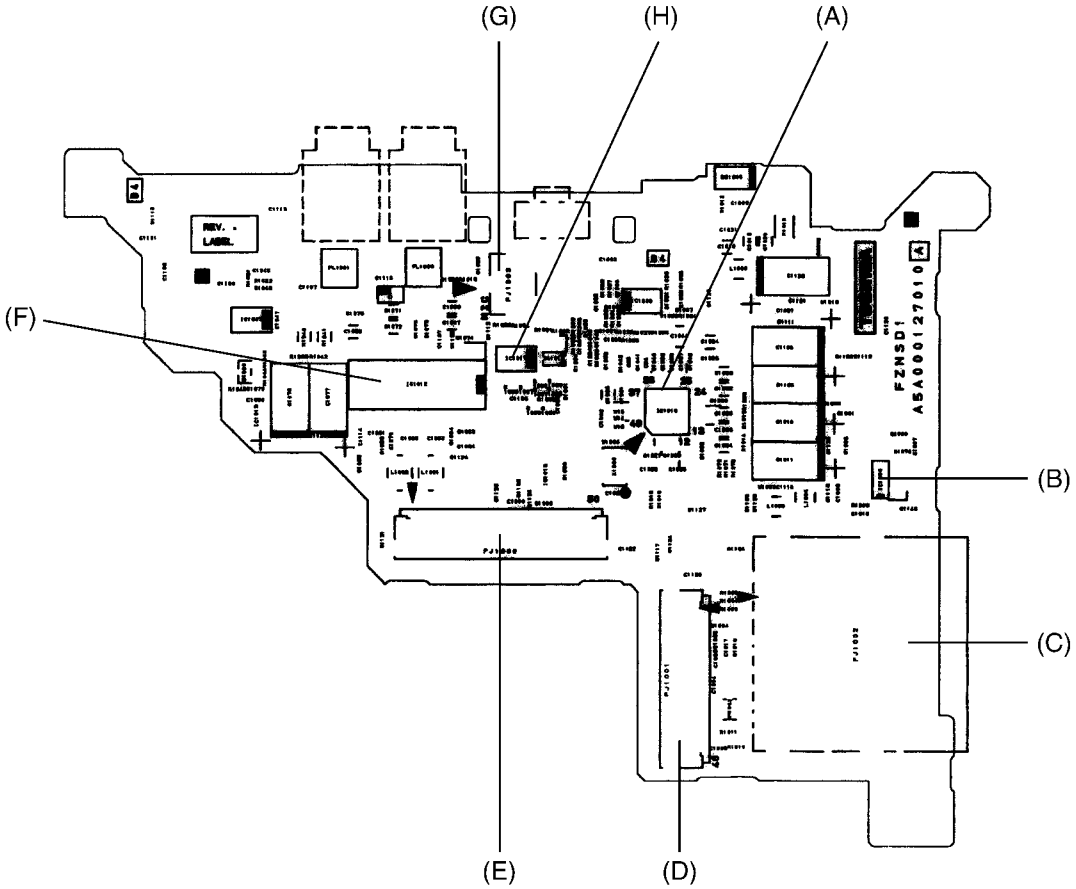


Figure B-5 Sound board (FZNSD) layout (front)*

Table B-5 Sound board (FZNSD) ICs and connectors (front)*

Mark	Number	Name
(A)	IC1004	YMF753-S
(B)	IC1000	SD/SM POWER
(C)	PJ1002	SD I/F
(D)	PJ1001	FNZIC I/F
(E)	PJ1000	FNZIC I/F
(F)	IC1012	AMP MM1517X
(G)	PJ1003	Internal Microphone

B.6 Sound Board (FZNSD*) Back View

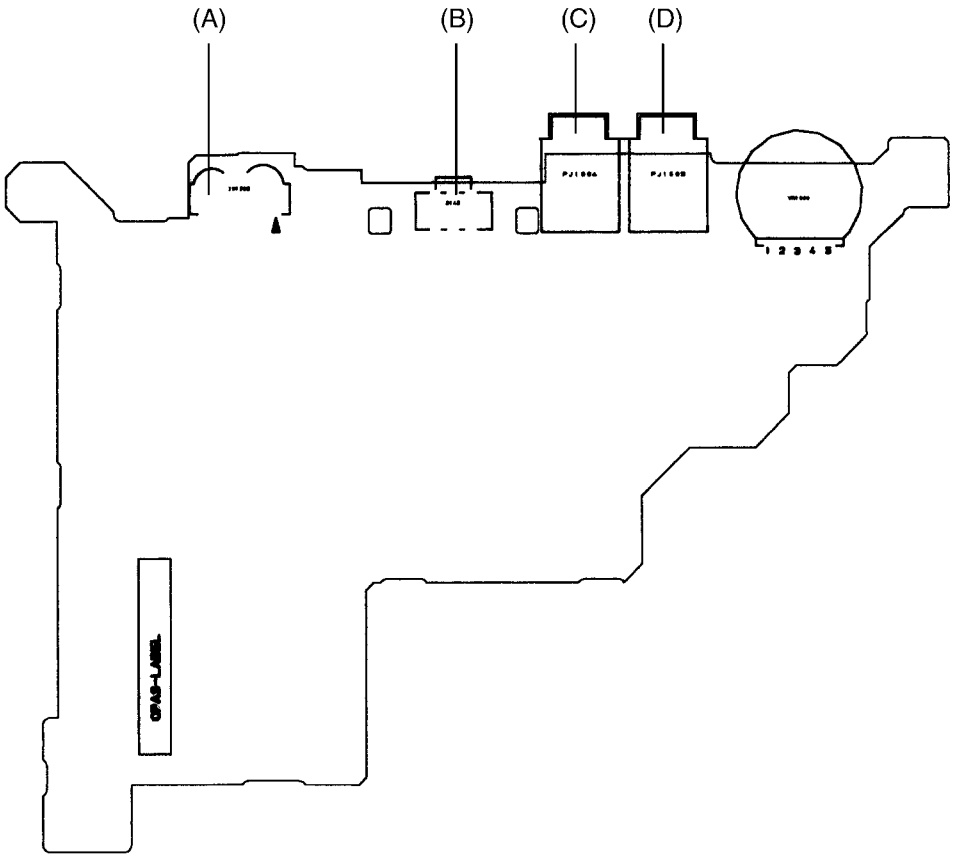


Figure B-6 Sound board (FZNSD) layout (back)*

Table B-6 Sound board (FZSD) connectors (back)*

Mark	Number	Name
(A)	IC1003	FIR I/F
(B)	S1000	MM1517X
(C)	PJ1004	Microphone Connector
(D)	PJ1005	Headphone Connector

B.7 Connector Board (FZCN*) Front View

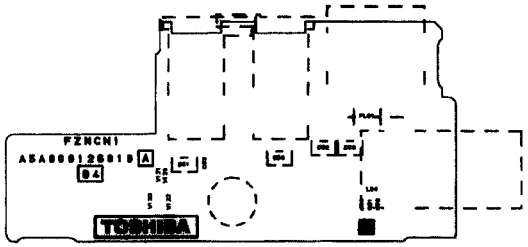


Figure B-7 Connector board (FZCN) layout (front)*

B.8 Connector Board (FZNCN*) Back View

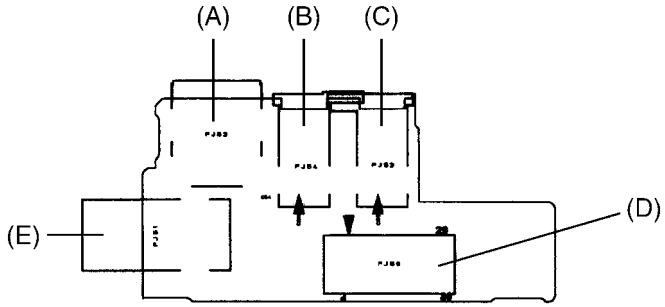


Figure B-8 Connector board (FZNCN) layout (back)*

Table B-7 Connector board (FZNCN) connector (back)*

Mark	Number	Name
(A)	PJ53	PS/2 MOUSE/KB
(B)	PJ54	USB I/F PORT1
(C)	PJ52	USB I/F PORT0
(D)	PJ50	FZNIO1 I/F
(E)	PJ51	TV I/F

B.9 LED Board (FZNLE*) Front View

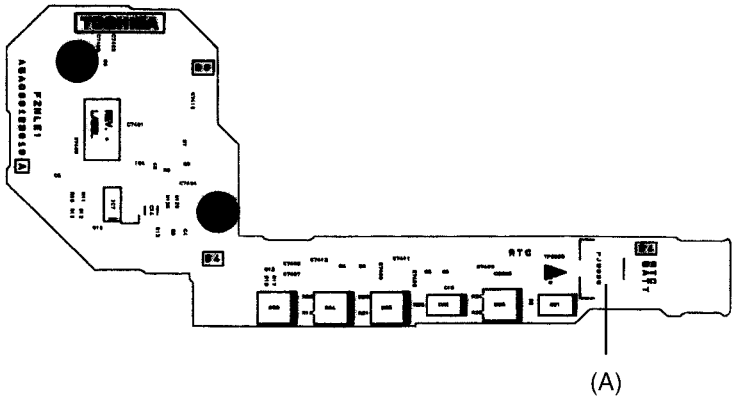


Figure B-9 LED board (FZNLE) layout (front)*

B.10 LED Board (FZNLE*) Back View

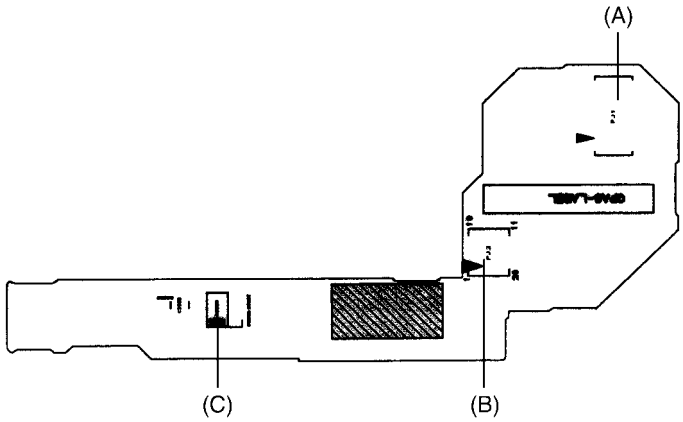


Figure B-10 LED board (FZNLE) layout (back)*

Table B-8 LED board (FSZLE) connector (front)*

Mark	Number	Name
(A)	PJ5	RTC Battery Connector

Table B-9 LED board (FSZLE) connector (back)*

Mark	Number	Name
(A)	PJ1	FNZIO* I/F
(B)	PJ2	Bluetooth I/F
(C)	IC9999	RTCVCC

Appendix C Pin Assignments

I/O Board (FZNIO*)

C.1 PJ100 FZNSY* interface connector (240pin)

TableC-1 FZNSY interface connector (240pin) (1/4)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	P3V	-	2	P3V	-
3	P3V	-	4	PCISTP-P3N	-
5	CPUSTP-P3N	O	6	GND	O
7	CGENPD-P3N	O	8	GND	-
9	X33MPC-P3P	I	10	GND	-
11	X33IE3-P3P	I	12	GND	-
13	X33MCC-P3P	I	14	GND	-
15	X33ICH-P3P	I	16	GND	-
17	NC	-	18	GND	-
19	NC	-	20	GND	-
21	GND	-	22	GND	-
23	B3V	-	24	B3V	-
25	B3V	-	26	GND	-
27	B3V	-	28	B3V	-
29	B3V	-	30	B3V	-
31	B3V	-	32	PCIRST-S3N	O
33	STPCLK-PPN	O	34	A20M-PPN	O
35	NMI-PPP	O	36	GND	-
37	INIT-PPN	O	38	CPUPER-PPN	O
39	SMI-PPN	O	40	INTR-PPP	O
41	MUXDSL-E5P	O	42	STPAGP-B3N	O
43	GND	-	44	GND	-
45	HI00-P1P	I/O	46	GND	-
47	GND	-	48	HI02-P1P	I/O
49	GND	-	50	HI04-P1P	I/O
51	GND	-	52	HI06-P1P	I/O
53	GND	-	54	HI08-P1P	I/O
55	GND	-	56	GND	-
57	HI10-P1P	I/O	58	GND	-
59	GND	-	60	BLUE-PXP	I
61	GND (VGAGND)	-	62	LGREN-PXP	I

TableC-1 FZNSY interface connector (240pin) (2/4)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
63	GND (VGAGND)	-	64	RED-PXP	I
65	GND	-	66	GND (VGAGND)	-
67	HSYNC-BXP	I	68	OVSYNC-PXP	I
69	GND (VGAGND)	-	70	DBLUE-PXP	I
71	GND (VGAGND)	-	72	DLGRN-PXP	I
73	GND (VGAGND)	-	74	DRED-PXP	I
75	GND	-	76	1R8-P1V	-
77	1R8-P1V	-	78	GND	-
79	DPCONF-S5P	O	80	EVON-S5P	O
81	EVON-S5N	O	82	VIDPGD-P3P	O
83	GND	-	84	B5V	-
85	GND	-	86	E5V	-
87	E5V	-	88	E5V	-
89	GND	-	90	AINMUX05	I
91	PSCMUX-S5P	O	92	FLTEN-S3N	O
93	FLON-S3N	O	94	GND	-
95	GND	-	96	PDNVGA-B3P	O
97	DVSGPD-P3N	O	98	E3V	-
99	DDCSCL-P3P	I/O	100	DDCSDA-P3P	I/O
101	GND	-	102	GND	-
103	PVONCP-EBP	O	104	BVONCP-EBP	O
105	GND	-	106	GND	-
107	DVTX2P-P3P	I	108	DVITX2M-P3N	I
109	GND	-	110	DVITX1P-P3P	I
111	DVTX1M-P3N	I	112	GND	-
113	DVTX0P-P3P	I	114	DVITX0M-P3N	-
115	GND	-	116	GND	-
117	DVTXCP-P3P	I	118	DVITXCM-P3N	I
119	GND	-	120	GND	-
121	P3V	-	122	P3V	-
123	P3V	-	124	PCNFPV-S3N	O
125	DBR-B3N	I	126	GND	-
127	CPWRGD-PPP	O	128	GND	-
129	X66ICH-P3P	I	130	GND	-
131	X33SIO-P3P3	I	132	GND	-
133	X33KBC-P3P	I	134	GND	-
135	X33FWH-P3P	I	136	GND	-
137	X48ICH-P3P	I	138	GND	-

TableC-1 FZNSY interface connector (240pin) (3/4)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
139	NC	-	140	GND	-
141	X14ICH-P3P	I	142	GND	-
143	B3V	-	144	B3V	-
145	B3V	-	146	GND	-
147	B3V	-	148	B3V	-
149	B3V	-	150	B3V	-
151	B3V	-	152	2R5-E2V	-
153	PPV	-	154	PPV	-
155	BGV	-	156	GND	-
157	DPSLP-P3P	O	158	MUXHI-P3P	O
159	AGPBSY-P3N	I	160	GND	-
161	INT7-P3N	I	162	GND	-
163	GND	-	164	HISTB-P1P	I/O
165	HISTB-P1N	I/O	166	GND	-
167	HI01-P1P	I/O	168	GND	-
169	HI03-P1P	I/O	170	GND	-
171	HI05-P1P	I/O	172	GND	-
173	HI07-P1P	I/O	174	GND	-
175	HI09-P1P	I/O	176	GND	-
177	HIRFNS-PXP	-	178	GND	-
179	HIRFSN-PXP	-	180	GND	-
181	GND	-	182	SMBCLK-P3P	I/O
183	SMBDAT-P3P	I/O	184	SLP-PPN	O
185	GND	-	186	DPSLP-PPN	O
187	GND	-	188	GND	-
189	PQV	-	190	PQV	-
191	GND	-	192	GND	-
193	ICHPCG-P3P	I	194	ICHPGD-P3P	I
195	GND	-	196	M5V	-
197	GND	-	198	15-E8V	-
199	GND	-	200	PVON-S5P	O
201	PVON-R3N	O	202	FERR-P3N	I
203	BVON-S5P	O	204	THRM-P3N	I
205	GND	-	206	FANRQ-P3N	I
207	CPUHOT-S5N	I	208	RSTVGA-B3N	O
209	ONCPU-E3P	O	210	GND	-
211	BRT2DA-P5P	O	212	BRT1-P5P	O
213	BRT0-P5P	O	214	PNL2-P3P	I

TableC-1 FZNSY interface connector (240pin) (4/4)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
215	GND	-	216	PNL1-P3P	I
217	PNL0-P3P	I	218	PROHOT-P3N	O
219	GND	-	220	P5V	-
221	P5V	-	222	P5V	-
223	P5V	-	224	P5V	-
225	GND	-	226	GND	-
227	AV ; 100	I	228	GND	-
229	GND	-	230	GND	-
231	GND	-	232	GND	-
233	GND	-	234	GND	-
235	GND	-	236	GND	-
237	GND	-	238	GND	-
239	GND	-	240	GND	-

C.2 PJ102 FSZIS* interface connector (1) (50pin)

TableC-2 FSZIS interface connector (1) (50pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	SPOTR-PXP	I	4	SPOTL-PXN	I
5	SPOTR-PXN	I	6	SPOTL-PXP	I
7	GND	-	8	GND	-
9	DOUTL-PXN	I	10	DOUTL-PXN	I
11	DOUTR-PXP	I	12	DOUTR-PXP	I
13	GND	-	14	DINR-PXN	O
15	DINL-PXN	O	16	DINL-PXN	O
17	DINR-PXP	O	18	GND	-
19	GND	-	20	PHONE-BXP	O
21	GND	-	22	PHONE-BXN	O
23	AMPSD-P3N	O	24	GND	-
25	GND	-	26	CAUDIO-P3P	O
27	ATBEEP-P3P	O	28	GND	-
29	SNDMUT-P3N	O	30	BTSWON-S3P	I
31	GND	O	32	P3V	-
33	S3V	-	34	P3V	-
35	IRRX-P3N	I	36	P3V	-
37	IRTX-P3P	O	38	IRMODE-P3P	O
39	GND	-	40	NC	O
41	X97BC3-P3P	I	42	GND	-
43	GND	-	44	M97RST-S3N	O
45	X97BC1-P3P	I	46	M97SD0-P3P	O
47	M97DI1-B3P	I	48	M97SYC-P3P	O
49	GND	-	50	GND	-

C.3 PJ103 FSZIC* interface connector (2) (50pin)

TableC-3 FSZIC interface connector (2) (50pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	SDWP-B3P	I	2	GND	-
3	SDCD-B3N	I	4	GND	-
5	SDAT1-B3P	I/O	6	GND	-
7	SDAT0-B3P	I/O	8	GND	-
9	GND	-	10	GND	-
11	SDCLK-B3P	O	12	GND	-
13	SDCMD-B3P	I/O	14	GND	-
15	SDAT3-B3P	I/O	16	GND	-
17	SDAT2-B3P	I/O	18	GND	-
19	GND	-	20	GND	-
21	SDPWR-B3P	O	22	GND	-
23	SDLED-B3P	O	24	GND	-
25	B3V	-	26	GND	-
27	B3V	-	28	GND	-
29	SND-P5V	-	30	SND-P5V	-
31	SND-P5V	-	32	SND-P5V	-
33	SND-P5V	-	34	NC	-
35	SND-P5V	-	36	(CD1-GND)	-
37	SND-P5V	-	38	(CD1-GND)	-
39	NC	-	40	(CD1-GND)	-
41	SND-GND	-	42	(CD1-GND)	-
43	SND-GND	-	44	(CD1-GND)	-
45	SND-GND	-	46	CDAUDL-PXP	O
47	SND-GND	-	48	CDAUDR-PXP	O
49	SND-GND	-	50	(CD-GND)	-

C.4 PJ104 FZNCN* interface connector (30pin)

TableC-4 FZNCN interface connector (30pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	GND	-	4	AV ; 100	O
5	GND	-	6	GND	-
7	GND	-	8	GND	-
9	NC	-	10	MOUSCK-P5P	I/O
11	P5V	-	12	MOUSDT-P5P	I/O
13	P5V	-	14	GND	-
15	P5V	-	16	EXKBCK-P5P	I/O
17	NC	-	18	EXKBDT-P5P	I/O
19	GND	-	20	GND	-
21	USBP0-E3N	I/O	22	USBP1-E3N	I/O
23	USBIPS-E5V	-	24	USBIPS-E5V	-
25	USBIPS-E5V	-	26	USBIPS-E5V	-
27	NC	I/O	28	USBP1-E3P	I/O
29	GND	-	30	GND	-

C.5 PJ105 FZNLE* interface connector (30pin)

TableC-5 FZNLE interface connector (30pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	PMEBT-S3N	I
3	BTRST-S3P	O	4	E5V	-
5	E5V	-	6	USBP4-E3N	I/O
7	GND	-	8	HDDLED-P5P	O
9	CDRLED-P5P	O	10	BTLED-S3P	O
11	M5V	-	12	P5V	-
13	R3V	-	14	NC	-
15	GND	-	16	GND	-
17	BAT2GR-S5N	O	18	BAT2OR-S5N	O
19	BAT1GR-S5N	O	20	BAT1OR-S5N	O
21	PWLEGR-S3P	O	22	PWLEOR-S3P	O
23	DCINGR-S5N	O	24	DCINOR-S5N	O
25	BTMDL-P3N	I	26	USBP4-E3P	I/O
27	NC	-	28	BTIFOF-S3N	O
29	BTPON-S3P	O	30	GND	-

C.6 PJ5002 CRT interface connector (15pin)

TableC-6 CRT interface connector (15pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	RED-PXP	O	2	LGREN-PXP	O
3	BLUE-PXP	O	4	NC	-
5	GND	-	6	GND	-
7	GND	-	8	GND	-
9	P5V	-	10	GND	-
11	NC	-	12	DDCSDA ; 100	I/O
13	HSYNC ; 100	O	14	ODSYNC ; 100	O
15	DDCSCL ; 100	I/O			

C.7 PJ115 HDD interface connector (44pin)

TableC-7 HDD interface connector (44pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	NC	-	2	GND	-
3	P5V	-	4	P5V	-
5	GND	-	6	HDDLED-P5N	I
7	PDCS3-P5N	O	8	PDCS1-P5N	O
9	PDA2-P5P	O	10	PDA0-P5P	O
11	NC	-	12	PDA1-P5P	O
13	NC	-	14	IRQ14-P3P	I
15	GND	-	16	PDDACK-P5N	O
17	NC	-	18	PIORDY-P5P	I
19	GND	-	20	PDIOR-P5N	O
21	GND	-	22	PDIOW-P5N	O
23	GND	-	24	PDDREQ-P5P	I
25	NC	-	26	GND	-
27	PDD15-P5P	I/O	28	PDD00-P5P	I/O
29	PDD14-P5P	I/O	30	PDD01-P5P	I/O
31	PDD13-P5P	I/O	32	PDD02-P5P	I/O
33	PDD12-P5P	I/O	34	PDD03-P5P	I/O
35	PDD11-P5P	I/O	36	PDD04-P5P	I/O
37	PDD10-P5P	I/O	38	PDD05-P5P	I/O
39	PDD09-P5P	I/O	40	PDD06-P5P	I/O
41	PDD08-P5P	I/O	42	PDD07-P5P	I/O
43	GND	-	44	IDRSTA-P5N	O

C.8 PJ116 Slim Select Bay interface connector (72pin)

TableC-8 Slim Select Bay interface connector (72pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	CDAUDR-PXP	I	4	CDAUDL-PXP	I
5	GND	-	6	CD1-GND	-
7	IDRSTB-P5N	O	8	GND	-
9	GND	-	10	SDD07-P5P	I/O
11	SDD08-P5P	I/O	12	SDD06-P5P	I/O
13	SDD09-P5P	I/O	14	SDD05-P5P	I/O
15	SDD10-P5P	I/O	16	GND	-
17	GND	-	18	SDD04-P5P	I/O
19	SDD11-P5P	I/O	20	SDD03-P5P	I/O
21	SDD12-P5P	I/O	22	SDD02-P5P	I/O
23	SDD13-P5P	I/O	24	SB-P5V	-
25	SB-P5V	-	26	SDD01-P5P	I/O
27	SDD14-P5P	I/O	28	SDD00-P5P	I/O
29	SDD15-P5P	I/O	30	GND	-
31	GND	-	32	SDDREQ-P3P	I
33	GND	-	34	SDIOW-P3N	O
35	GND	-	36	SDIOR-P3N	O
37	GND	-	38	SIORDY-P5P	I
39	NC	-	40	SDDACK-P3N	O
41	GND	-	42	IRQ15-P3P	I
43	NC	-	44	SDA1-P3P	O
45	SB-P5V	-	46	SB-P5V	-
47	SB-P5V	-	48	SDA0-P3P	O
49	SDA2-P3P	O	50	SDCS1-P3N	O
51	SDCS3-P3N	O	52	CDRLED-P5N	I
53	GND	-	54	MBSTS2-S3P	I
55	MBSTS1-S3P	I	56	MBSTS0-S3P	I
57	GND	-	58	DBT20V-S5N	I
59	PSDA-S5P	I/O	60	BT2VD	-
61	PSCL-S5P	I/O	62	BTMP2-SXP	I
63	CDCHG2-S5P	-	64	GND	-
65	GND	-	66	NC	-
67	GND	-	68	NC	-
69	GND	-	70	GND	-
71	GND (PGBT2)	-	72	PVBT2	-

C.9 PJ117 PC Card slot connector (152pin)

TableC-9 PC Card slot connector (152pin) (1/2)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
A01	GND	-	A39	ACAD06-BYP	I/O
A02	ACAD00-BYP	I/O	A40	ACD14-BYP	I/O
A03	ACAD01-BYP	I/O	A41	ACAD08-BYP	I/O
A04	ACAD03-BYP	I/O	A42	ACAD10-BYP	I/O
A05	ACAD05-BYP	I/O	A43	ACVS1-B3P	I/O
A06	ACAD07-BYP	I/O	A44	ACAD13-BYP	I/O
A07	ACCBE0-BYN	I/O	A45	ACAD15-BYP	I/O
A08	ACAD09-BYP	I/O	A46	ACAD16-BYP	I/O
A09	ACAD11-BYP	I/O	A47	ACA18-BYP	I/O
A10	ACAD12-BYP	I/O	A48	ACLOCK-BYN	I/O
A11	ACAD14-BYP	I/O	A49	ACSTOP-BYN	I/O
A12	ACCBE1-BYN	I/O	A50	ACDEVS-BYN	I/O
A13	ACPAR-BYP	I/O	A51	MCVCCA-BYV	-
A14	ACPERR-BYN	I/O	A52	MCVPPA-BYV	-
A15	ACGNT-BYN	O	A53	ACTRDY-BYN	I/O
A16	ACINT-BYN	I	A54	ACFRAM-BYN	I/O
A17	MCVCCA-BYV	-	A55	ACAD17-BYP	I/O
A18	MCVPPA-BYV	-	A56	ACAD19-BYP	I/O
A19	ACCLK-BYP	I/O	A57	ACVS2-B3P	I/O
A20	ACIRDY-BYN	I/O	A58	ACRST-BYN	I/O
A21	ACCBE2-BYN	I/O	A59	ACSERR-BYN	I/O
A22	ACAD18-BYP	I/O	A60	ACREQ-BYN	I
A23	ACAD20-BYP	I/O	A61	ACCBE3-BYN	I/O
A24	ACAD21-BYP	I/O	A62	ACAUDI-BYP	I
A25	ACAD22-BYP	I/O	A63	ACSTSC-BYP	I
A26	ACAD23-BYP	I/O	A64	ACAD28 -BYP	I/O
A27	ACAD24 -BYP	I/O	A65	ACAD30-BYP	I/O
A28	ACAD25-BYP	I/O	A66	ACAD31-BYP	I/O
A29	ACAD26-BYP	I/O	A67	ACCD2-B3N	I
A30	ACAD27-BYP	I/O	A68	GND	-
A31	ACAD29-BYP	I/O	A69	GND	-
A32	ACD02-BYP	I/O	A70	GND	-
A33	ACCLKR-BYN	I/O	A71	GND	-
A34	GND	-	A72	GND	-
A35	GND	-	A73	GND	-
A36	ACCD1-B3N	I	A74	GND	-
A37	ACAD02-BYP	I/O	A75	GND	-
A38	ACAD04-BYP	I/O	A76	GND	-

TableC-9 PC Card slot connector (152pin) (2/2)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
B01	GND	-	B39	BCAD06-BYP	I/O
B02	BCAD00-BYP	I/O	B40	BCD14-BYP	I/O
B03	BCAD01-BYP	I/O	B41	BCAD08-BYP	I/O
B04	BCAD03-BYP	I/O	B42	BCAD10-BYP	I/O
B05	BCAD05-BYP	I/O	B43	BCVS1-B3P	I/O
B06	BCAD07-BYP	I/O	B44	BCAD13-BYP	I/O
B07	BCCBE0-BYN	I/O	B45	BCAD15-BYP	I/O
B08	BCAD09-BYP	I/O	B46	BCAD16-BYP	I/O
B09	BCAD11-BYP	I/O	B47	BCA18-BYP	I/O
B10	BCAD12-BYP	I/O	B48	BCLOCK-BYN	I/O
B11	BCAD14-BYP	I/O	B49	BCSTOP-BYN	I/O
B12	BCCBE1-BYN	I/O	B50	BCDEVS-BYN	I/O
B13	BCPAR-BYP	I/O	B51	MCVCCB-BYV	-
B14	BCPERR-BYN	I/O	B52	MCVPPB-BYV	-
B15	BCGNT-BYN	O	B53	BCTRDY-BYN	I/O
B16	BCINT-BYN	-	B54	BCFRAM-BYN	I/O
B17	MCVCCB-BYV	-	B55	BCAD17-BYP	I/O
B18	MCVPPB-BYV	I/O	B56	BCAD19-BYP	I/O
B19	BCCLK-BYP	I/O	B57	BCVS2-B3P	I/O
B20	BCIRDY-BYN	I/O	B58	BCRST-BYN	I/O
B21	BCCBE2-BYN	I/O	B59	BCSERR-BYN	I/O
B22	BCAD18-BYP	I/O	B60	BCREQ-BYN	I
B23	BCAD20-BYP	I/O	B61	BCCBE3-BYN	I/O
B24	BCAD21-BYP	I/O	B62	BCAUDI-BYP	I
B25	BCAD22-BYP	I/O	B63	BCSTSC-BYP	I
B26	BCAD23-BYP	I/O	B64	BCAD28 -BYP	I/O
B27	BCAD24 -BYP	I/O	B65	BCAD30-BYP	I/O
B28	BCAD25-BYP	I/O	B66	BCAD31-BYP	I/O
B29	BCAD26-BYP	I/O	B67	BCCD2-B3N	I
B30	BCAD27-BYP	I/O	B68	GND	-
B31	BCAD29-BYP	I/O	B69	GND	-
B32	BCD02-BYP	I/O	B70	GND	-
B33	BCCLKR-BYN	I/O	B71	GND	-
B34	GND	-	B72	GND	-
B35	GND	-	B73	GND	-
B36	BCCD1-B3N	I	B74	GND	-
B37	BCAD02-BYP	I/O	B75	GND	-
B38	BCAD04-BYP	I/O	B76	GND	-

C.10 PJ118 Mini PCI Card slot connector (124pin)

TableC-10 Mini PCI Card slot connector (124pin) (1/2)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	NC	-	2	NC	-
3	NC	-	4	NC	-
5	NC	-	6	NC	-
7	NC	-	8	NC	-
9	NC	-	10	NC	-
11	NC(LED1-GRNP)	-	12	NC(LED2-YELP)	-
13	WLON-S3N	O	14	NC(LED2-YELN)	-
15	GND	-	16	NC	-
17	INT7-P3N	I	18	P5V	-
19	P3V	-	20	INT8-P3N	I
21	NC	-	22	NC	-
23	GND	-	24	B3V	-
25	X33MPC-P3P	O	26	PCIRST-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	-
35	AD29-P3P	I/O	36	NC	-
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	NC	-	44	AD26-P3P	I/O
45	CBE3-P3N	I/O	46	AD24-P3P	I/O
47	AD23-P3P	I/O	48	AD26-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

TableC-10 Mini PCI Card slot connector (124pin) (2/2)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
61	IRDY-P3N	I/O	62	GND	-
63	P3V	-	64	FRAME-P3N	I/O
65	CLKRUN-P3N	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	NC	-	94	AD02-P3P	I/O
95	AD03-P3P	I/O	96	AD00-P3P	I/O
97	P5V	-	98	NC	-
99	AD01-P3P	I/O	100	NC	-
101	GND	-	102	GND	-
103	M97SYC-P3P	O	104	GND	-
105	M97DI0-E3P	I	106	NC	-
107	X97BC2-P3P	O	108	NC	-
109	MDC-B3V	-	110	AC-RESET	O
111	NC	-	112	NC	-
113	GND	-	114	GND	-
115	NC(SYS_AUDIO_O0T)	-	116	SYS_AUDIO_IN	I
117	GND	-	118	GND	-
119	GND	-	120	GND	-
121	NC	-	122	NC	-
123	P5V	-	124	B3V	-

C.11 PJ119 Docking interface connector (242pin)

TableC-11 Docking interface connector (242pin) (1/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	DCOUT	-	2	DCOUT	-
3	DOCDT1-S3N	I	4	IF-P5V	-
5	MOUSCK-P5P	I/O	6	EXKBCK-P5P	I/O
7	GND	-	8	PHYRST-E3N	O
9	DPCONF-S5P	I	10	GND	-
11	GND	-	12	DDCSCL-P3P	I/O
13	DRED-PXP	O	14	DLGRN-PXP	O
15	DBLUE-PXP	I/O	16	OVSYNC-PXP	O
17	DDCSCL-P3P	I/O	18	NC	-
19	GND	-	20	NC	-
21	NC	-	22	DVITX2-P3P	O
23	DVITX2-P3N	O	24	DVITX1-P3P	O
25	DVITX1-P3N	O	26	DVITX0-P3P	O
27	DVITX0-P3N	O	28	GND	-
29	GND	-	30	DVITXC-P3P	O
31	DVITXC-P3N	O	32	DVIDET-S3N	I
33	NC	-	34	NC	-
35	NC	-	36	NC	-
37	GND	-	38	NC	-
39	NC	-	40	NC	-
41	GND	-	42	NC	-
43	NC	-	44	NC	-
45	GND	-	46	NC	-
47	NC	-	48	NC	-
49	GND	-	50	NC	-
51	NC	-	52	NC	-
53	GND	-	54	NC	-
55	NC	-	56	NC	-
57	Not Mount	-	58	Not Mount	-
59	MDMRG-B3P	I/O	60	MDMTP-B3P	I/O
61	DCOUT	-	62	DCOUT	-
63	EJCTRQ-S3N	I/O	64	IF-P5V	-
65	MOUSDT-P5P	I/O	66	EXKBDT-P5P	I/O
67	GND	-	68	DNVSON-S3P	O
69	DILSON-E3P	O	70	NVPCNF-S3P	I
71	GND	-	72	DDCSDA –E3P	I/O
73	GND (VGAGND)	-	74	GND (VGAGND)	-
75	GND (VGAGND)	-	76	DDCSDA-E3P	O
77	DVISDA-P3P	I/O	78	NC	-

TableC-11 Docking interface connector (242pin) (2/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
79	GND	-	80	NC	-
81	NC	-	82	NC	I/O
83	NC	-	84	NC	I/O
85	NC	-	86	NC	-
87	NC	-	88	GND	-
89	GND	-	90	NC	-
91	NC	-	92	NC	-
93	DVSGPD-P3N	O	94	NC	-
95	DCADIO-S3P	I/O	96	DSMI-B3P	I
97	GND	-	98	DCKRUN-P3N	I/O
99	PME-S3P	I	100	DAD01-P3P	I/O
101	GND	-	102	DAD03-P3P	I/O
103	DAD05-P3P	I/O	104	DAD07-P3P	I/O
105	GND	-	106	DAD08-P3P	I/O
107	DAD10-P3P	I/O	108	DAD12-P3P	I/O
109	GND	-	110	DAD14-P3P	I/O
111	DCBE1-P3N	I/O	112	DPAR-P3P	I/O
113	GND	-	114	NC	-
115	NC	-	116	NC	-
117	Not Mount	-	118	Not Mount	-
119	Not Mount	-	120	Not Mount	-
121	DCOUT	-	122	DCOUT	-
123	DSSCL-S5P	I/O	124	IF-P5V	-
125	S5V	-	126	DTPA-B3P	I/O
127	GND	-	128	DTPB-B3P	I/O
129	USBON2-S3P	O	130	USBOC2-E3N	O
131	GND	-	132	USBON3-S3P	O
133	USBOC3-E3N	O	134	SNDMUT-P3N	O
135	NC	-	136	DOUTL-PXP	O
137	DINL-PXP	-	138	DINR-PXN	I
139	GND	-	140	PWRSW-S3N	I
141	DCD-PYP	I	142	DSR-PYP	I
143	TXD-PYN	O	144	RING-BYP	I
145	PE-P5P	I	146	PDB07-P5P	I/O
147	PDB06-P5P	I/O	148	GND	-
149	GND	-	150	PDB04-P5P	I/O
151	PDB01-P5P	I/O	152	PDB02-P5P	I/O
153	PDB00-P5P	I/O	154	STROB-P5N	O
155	NC	-	156	NC	-
157	GND	-	158	NC	-
159	NC	-	160	NC	-

TableC-11 Docking interface connector (242pin) (3/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
161	GND	-	162	NC	-
163	NC	-	164	NC	-
165	GND	-	166	NC	-
167	NC	-	168	NC	-
169	GND	-	170	NC	-
171	NC	-	172	NC	-
173	GND	-	174	NC	-
175	LAN-E3V	-	176	VOID	-
177	VOID	-	178	TERMPL-GND	-
179	TXP-EXP	O	180	TXN-EXN	O
181	DCOUT	-	182	DCOUT	-
183	DSSDA-S5P	I/O	184	IF-P5V	-
185	NC	-	186	DTPA-B3N	I/O
187	GND	-	188	DTPB-B3N	I/O
189	USBD2-E3P	I/O	190	USBD2-E3N	I/O
191	GND	-	192	USBD3-E3P	I/O
193	USBD3-E3N	I/O	194	DOUTR-PXP	O
195	DOUTR-PXN	O	196	DOUTL-PXN	O
197	DINL-PXN	I	198	DINR-PXP	I
199	GND	-	200	RXD-PYN	I
201	RTS-PYP	O	202	CTS-PYP	I
203	DTR-PYP	O	204	SELCT-P5P	I
205	BUSY-P5P	I	206	ACK-P5N	I
207	PDB05-P5P	I/O	208	GND	-
209	GND	-	210	PDB03-P5P	I/O
211	SLIN-P5N	I/O	212	PINIT-P5N	O
213	ERROR-P5N	I	214	AUTFD-P5N	O
215	NC	-	216	NC	-
217	GND	-	218	NC	-
219	NC	-	220	NC	-
221	GND	-	222	NC	-
223	NC	-	224	NC	-
225	GND	-	226	NC	-
227	NC	-	228	NC	-
229	GND	-	230	NC	-
231	NC	-	232	NC	-
233	GND	-	234	ACT-E3N	I
235	LNK-E3N	I	236	DOCDT2-S3N	I
237	VOID	-	238	VOID	-
239	RXP-EXP	I	240	RXN-EXN	I
A1	DSKDC	-	A2	GND	-

C.12 PJ120 Serial interface connector (9pin)

TableC-12 Serial interface connector (9pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	DCD1 ; 110	I	2	RD1 ; 010	I
3	SD1 ; 010	O	4	DTR1 ; 110	O
5	GND	-	6	DSR1 ; 110	I
7	RTS1 ; 110	O	8	CTS1 ; 110	I
9	RT1 ; 110	I			

C.13 PJ121 Parallel interface (25pin)

TableC-13 Parallel interface (25pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	STRDB-P5N	O	2	PDB00-P5P	I/O
3	PDB01-P5P	I/O	4	PDB02-P5P	I/O
5	PDB03-P5P	I/O	6	PDB04-P5P	I/O
7	PDB05-P5P	I/O	8	PDB06-P5P	I/O
9	PDB07-P5P	I/O	10	ACK-P5N	I
11	BUSY-P5P	I	12	PE-P5N	I
13	SELCT-P5P	I	14	AUTFD-P5N	O
15	ERROR-P5N	I	16	PINIT-P5N	O
17	SLIN-P5N	O	18	GND	-
19	GND	-	20	GND	-
21	GND	-	22	GND	-
23	GND	-	24	GND	-
25	GND	-			

C.14 PJ122 IPSC connector (5pin)

TableC-14 IPSC connector (5pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	SWM	I	2	GND	-
3	SWL	I	4	SWR	I
5	MOD3	I			

C.15 PJ123 Keyboard interface connector (34pin)

TableC-15 Keyboard interface connector (34pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	NUMLED-P5N	O	2	ARWLED-P5N	O
3	CAPLED-P5N	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-S3P	I
13	KBSC07-S3N	O	14	KBSC08-S3N	O
15	KBSC09-S3N	O	16	KBRT01-S3P	I
17	KBRT02-S3P	I	18	KBRT03-S3P	I
19	KBSC10-S3N	O	20	KBSC11-S3N	O
21	KBRT04 -S3P	I	22	KBRT05-S3P	I
23	KBSC12-S3N	O	24	KBSC13-S3N	O
25	KBRT06-S3P	I	26	KBRT07-S3P	I
27	KBSC14-S3N	O	28	KBSC15-S3N	O
29	NC	-	30	IPSP5V (P5V)	-
31	IPSX-PXP	I	32	IPSGND (GND)	-
33	IPSY-PXP	I	34	NC	-

C.16 PJ124 LAN/Modem interface connector (14pin)

TableC-16 Network interface connector (14pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
A1	TX+	O	A2	TX-	O
A3	RX+	I	A4	GND	-
A5	GND	-	A6	RX-	I
A7	GND	-	A8	GND	-
A9	ACT-E3N	O	A10	LAN-E3V	-
A11	LNK-E3N	O	A12	LAN-E3V	-
B1	MDMTIP-B3P	I/O	B2	MDMRNG-B3P	I/O

C.17 PJ125 MDC interface connector (30pin)

TableC-17 MDC interface connector (30pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	NC (MONO OUT/PC)	-	2	GND	-
3	GND	-	4	PHONE-BXN	I
5	NC (AUXA RIGHT)	-	6	NC	-
7	NC (AUXA LEFT)	-	8	GND	-
9	NC (CD GND)	-	10	5V main	-
11	NC (CD RIGHT)	-	12	NC	-
13	NC (CD LEFT)	-	14	NC	-
15	GND	-	16	MDC-B3V	-
17	3.3 VAUX	-	18	5VD	-
19	GND	-	20	GND	-
21	3.3V main	-	22	SYNC	O
23	M97SDO-P3P	O	24	NC (SDATA INB)	-
25	M97RST-S3N	O	26	M97DI1-E3P	I
27	GND	-	28	GND	-
29	GND	-	30	X97BC1-P3P	O

C.18 PJ126 MDC interface connector (2pin)

TableC-18 MDC interface connector (2pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	MDMTIP-B3P	I/O	2	MDMRG-B3P	I/O

C.19 PJ127 Right Speaker connector (3pin)

TableC-19 Right Speaker connector (3pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	SPOTR-PXP	I/O	2	SPOTR-PXN	I/O
3	NC				

C.20 PJ129 Left Speaker connector (2pin)

TableC-20 Left Speaker connector (2pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	SPOTL-PXP	I/O	2	SPOTL-PXN	I/O

C.21 PJ128 1394 interface connector (4pin)

TableC-21 1394 interface connector (4pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	TPB0-E3N	I/O	2	TPB0-E3N	I/O
3	TPA0-E3N	I/O	4	TPA0-E3N	I/O

C.22 PJ800 DC-IN connector (CN3) (3pin)

TableC-22 DC-IN connector(CN3) (3pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	DCIN	-	2	P3V	-
3	GND	-			

C.23 PJ801 PVT interface connector (3A/PIN) (4pin)

TableC-23 DC-IN connector (3A/PIN) (4pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	PVT-EFV	-	4	PVT-EFV	-

C.24 PJ810 1st Battery interface connector (10pin)

TableC-24 PAD interface connector (10pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	+	-	2	BTMP1	I
3	DCHG	-	4	M5V	-
5	PSCL-S5P	I/O	6	PSDA-S5P	I/O
7	GND	-	8	DBT10V-S5N	I
9	GND	-	10	-	-

C.25 PJ770 Fan VCC connector (3pin)

TableC-25 Fan interface connector (3pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	P5V	-	2	GND	-
3	FANG-P3P	I			

System Board (FZNSY*)

C.26 PJ19 FZNIO* interface connector (240pin)

TableC-26 FZNIO interface connector (240pin) (1/4)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	P3V	-	2	P3V	-
3	P3V	-	4	PCISTP-P3N	I
5	CPUSTP-P3N	I	6	GND	-
7	CGENPD-P3N	I	8	GND	-
9	X33MPC-P3P	O	10	GND	-
11	X33IE3-P3P	O	12	GND	-
13	X33MCC-P3P	O	14	GND	-
15	X33ICH-P3P	O	16	GND	-
17	NC	-	18	GND	-
19	NC	-	20	GND	-
21	GND	-	22	GND	-
23	B3V	-	24	B3V	-
25	B3V	-	26	GND	-
27	B3V	-	28	B3V	-
29	B3V	-	30	B3V	-
31	B3V	-	32	PCIRST-S3N	I
33	STPCLK-PN	I	34	A20M-PN	I
35	NMI-PP	I	36	GND	-
37	HINT-PN	I	38	CPUPER-PPN	I
39	SMI-PN	I	40	INTR-PP	I
41	MUXDSL-P3P	I	42	STPAGP-B3N	I
43	GND	-	44	GND	-
45	HI00-P1P	I/O	46	GND	-
47	GND	-	48	HI02-P1P	I/O
49	GND	-	50	HI04-P1P	I/O
51	GND	-	52	HI06-P1P	I/O
53	GND	-	54	HI08-P1P	I/O
55	GND	-	56	GND	-
57	HI10-P1P	O	58	GND	-
59	GND	-	60	BLUE-PXP	O
61	GND (VGAGND)	-	62	LGREN-PXP	O
63	GND (VGAGND)	-	64	RED-PXP	O
65	GND	-	66	GND (VGAGND)	-
67	HSYNC-BXP	O	68	OVSYNC-BXP	O

TableC-26 FZNIO interface connector (240pin) (2/4)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
69	GND (VGAGND)	-	70	DBLUE-PXP	O
71	GND (VGAGND)	-	72	DLGRN-PXP	O
73	GND (VGAGND)	-	74	DRED-PXP	O
75	GND	-	76	1R8-P1V	-
77	1R8-P1V	-	78	GND	-
79	DPCONF-S5P	I	80	EVON-S5P	I
81	EVON-S5N	I	82	VIDPGD-P3P	I
83	GND	-	84	B5V	-
85	GND	-	86	E5V	-
87	E5V	-	88	E5V	-
89	GND	-	90	AINMUX05	O
91	PSCMUX-S5P	I	92	FLTEN-S3N	I
93	FLON-S3N	I	94	GND	-
95	GND	-	96	PDNVGA-B3P	I
97	DVSGPD-P3N	I	98	E3V	-
99	DDCSCL-P3P	I/O	100	DDCSDA-P3P	I/O
101	GND	-	102	GND	-
103	PVONCP-EBP	I	104	BVONCP-EBP	I
105	GND	-	106	GND	-
107	DVTX2P-P3P	O	108	DVTX2M-P3N	O
109	GND	-	110	DVTX1P-P3P	O
111	DVTX1M-P3N	O	112	GND	-
113	DVTX0P-P3P	O	114	DVTX0M-P3N	O
115	GND	-	116	GND	-
117	DVTXCP-P3P	O	118	DVTXCM-P3N	O
119	GND	-	120	GND	-
121	P3V	-	122	P3V	-
123	P3V	-	124	PCNFPV-S3N	I
125	DBR-B3N	O	126	GND	-
127	CPWGD-PPP	I	128	GND	-
129	X66ICH-P3P	O	130	GND	-
131	X33SIO-P3P	O	132	GND	-
133	X33KBC-P3P	O	134	GND	-
135	X33FWH-P3P	O	136	GND	-
137	X48ICH-P3P	O	138	GND	-
139	X48MCC-P3P	O	140	GND	-
141	X14ICH-P3P	O	142	GND	-

TableC-26 FZNIO interface connector (240pin) (3/4)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
143	B3V	-	144	B3V	-
145	B3V	-	146	GND	-
147	B3V	-	148	B3V	
149	B3V	-	150	B3V	-
151	B3V	-	152	2R5-E3V	-
153	PPV	-	154	PPV	-
155	BGV	-	156	GND	-
157	DPSLP-P3P	I	158	GND	-
159	INT5-P3N	O	160	GND	-
161	INIT7-P3N	O	162	GND	-
163	GND	-	164	HLSTB-P1P	I/O
165	HISTB-P1N	I/O	166	HL03-P1P	-
167	HI01-P1P	I/O	168	GND	-
169	HI03-P1P	I/O	170	GND	-
171	HI05-P1P	I/O	172	GND	-
173	HI07-P1P	I/O	174	GND	-
175	HI09-P1P	I/O	176	GND	-
177	HIRFNS-PXP	-	178	GND	-
179	HIRFSN-PXP	-	180	GND	-
181	GND	-	182	SMBCLK-P3P	I/O
183	SMBDAT-P3P	I/O	184	SLP-PPN	I
185	GND	-	186	DPSLP-PPN	I
187	GND	-	188	GND	-
189	1R2-P1V	-	190	1R2-P1V	-
191	GND	-	192	GND	-
193	IGNNE-PPN	I	194	ICHPGD-P3P	O
195	GND	-	196	M5V	-
197	GND	-	198	15-E8V	-
199	GND	-	200	PVON-S5P	O
201	PVON-R3N	I	202	FERR-P3N	O
203	BVON-R3N	I	204	THRM-P3N	O
205	GND	-	206	FANRQ-P3N	O
207	CPUHOT-S5N	O	208	RSTVGA-B3N	I
209	ONCPU-E3P	I	210	GND	-
211	BRT2DA-P5P	I	212	BRT1-P5P	I
213	BRT0-P5P	I	214	PNL2-P3P	O
215	GND	-	216	PNL1-P3P	O

TableC-26 FZNIO interface connector (240pin) (4/4)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
217	PNL0-P3P	O	218	TUALTN-P3P	I
219	GND	-	220	P5V	-
221	P5V	-	222	P5V	-
223	P5V	-	224	P5V	-
225	GND	-	226	GND	-
227	AV ; 100	O	228	GND	-
229	GND	-	230	GND	-
231	GND	-	232	GND	-
233	GND	-	234	GND	-
235	GND	-	236	GND	-
237	GND	-	238	GND	-
239	GND	-	240	GND	-

C.27 PJ1000 PVT interface connector (4pin)

TableC-27 PVT interface connector (4pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	PVT-EFV	-	2	PVT-EFV	-
3	GND	-	4	GND	-

C.28 PJ16 Extended Memory SO-DIMM (1) connector (200pin)

TableC-28 Extended Memory SO-DIMM (1) connector (200pin) (1/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	1R25VR-B1V	-	2	1R25VR-B1V	-
3	GND	-	4	GND	-
5	SDQ00R-B2P	I/O	6	SDQ06R-B2P	I/O
7	SDQ05R-B2P	I/O	8	SDQ03R-B2P	I/O
9	2R5-B2V	-	10	2R5-B2V	-
11	SDQS0R-B2P	I/O	12	GND	-
13	SDQ01R-B2P	I/O	14	SDQ02R-B2P	I/O
15	GND	-	16	GND	-
17	SDQ04R-B2P	I/O	18	SDQ07R-B2P	I/O
19	SDQ13R-B2P	I/O	20	SDQ14R-B2P	I/O
21	2R5-B2V	-	22	2R5-B2V	-
23	SDQ08R-B2P	I/O	24	SDQ15R-B2P	I/O
25	SDQS1R-B2P	I/O	26	GND	-
27	GND	-	28	GND	-
29	SDQ12R-B2P	I/O	30	SDQ11R-B2P	I/O
31	SDQ09R-B2P	I/O	32	SDQ10R-B2P	I/O
33	2R5-B2V	-	34	2R5-B2V	-
35	SCK1-B2P	I/O	36	2R5-B2V	-
37	SCK1-B2N	I/O	38	GND	-
39	GND	-	40	GND	-
41	SDQ22R-B2P	I/O	42	SDQ16R-B2P	I/O
43	SDQ18R-B2P	I/O	44	SDQ20R-B2P	I/O
45	2R5-B2V	-	46	2R5-B2V	-
47	SDQS2R-B2P	I/O	48	GND	-
49	SDQ23R-B2P	I/O	50	SDQ17R-B2P	I/O
51	GND	-	52	GND	-
53	SDQ19R-B2P	I/O	54	SDQ21R-B2P	I/O
55	SDQ27R-B2P	I/O	56	SDQ24R-B2P	I/O
57	2R5-B2V	-	58	2R5-B2V	-
59	SDQ26R-B2P	I/O	60	SDQ25R-B2P	I/O
61	SDQS3R-B2P	I/O	62	GND	-
63	GND	-	64	GND	-
65	SDQ31R-B2P	I/O	66	SDQ29R-B2P	I/O
67	SDQ30R-B2P	I/O	68	SDQ28R-B2P	I/O
69	2R5-B2V	-	70	2R5-B2V	-
71	SCB4R-B2P	I/O	72	SCB6R-B2P	I/O
73	SCB5R-B2P	I/O	74	SCB6R-B2P	I/O
75	GND	-	76	GND	-
77	SDQS8R-B2P	I/O	78	GND	-

TableC-28 Extended Memory SO-DIMM (1) connector (200pin) (2/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
79	SCB0R-B2P	I/O	80	SCB3R-B2P	I/O
81	2R5-B2V	-	82	2R5-B2V	-
83	SCB1R-B2P	I/O	84	SCB7R-B2P	I/O
85	NC	-	86	NC	-
87	GND	-	88	GND	-
89	SCK0-B2P	I	90	GND	-
91	SCK0-B2N	I	92	2R5-B2V	-
93	2R5-B2V	-	94	2R5-B2V	-
95	SCKE1-B2P	I	96	SCK0-B2P	I
97	NC	-	98	NC	-
99	SMA12R-B2P	I	100	SMA11R-B2P	I
101	SMA09R-B2P	I	102	SMA08R-B2P	I
103	GND	-	104	GND	-
105	SMA07R-B2P	I	106	SMA06R-B2P	I
107	SMA05R-B2P	I	108	SMA04R-B2P	I
109	SMA03R-B2P	I	110	SMA02R-B2P	I
111	SMA01R-B2P	I	112	SMA00R-B2P	I
113	2R5-B2V	-	114	2R5-B2V	-
115	SMA10R-B2P	I	116	SBS1R-B2P	I
117	SBS0R-B2P	I	118	SRASR-B2P	I
119	SWER-B2N	I	120	SCASR-B2N	I
121	SCS0-B2N	I	122	SCSN1-B2N	I
123	NC	-	124	NC	-
125	GND	-	126	GND	-
127	SDQ38R-B2P	I/O	128	SDQ36R-B2P	I/O
129	SDQ34R-B2P	I/O	130	SDQ36R-B2P	I/O
131	2R5-B2V	-	132	2R5-B2V	-
133	SDQS4R-B2P	I/O	134	GND	-
135	SDQ39R-B2P	I/O	136	SDQ33R-B2P	I/O
137	GND	-	138	GND	-
139	SDQ35R-B2P	I/O	140	SDQ37R-B2P	I/O
141	SDQ40R-B2P	I/O	142	SDQ42R-B2P	I/O
143	2R5-B2V	-	144	2R5-B2V	-
145	SDQ44R-B2P	I/O	146	SDQ43R-B2P	I/O
147	SDQS5R-B2P	I/O	148	GND	-
149	GND	-	150	GND	-
151	SDQ41R-B2P	I/O	152	SDQ47R-B2P	I/O
153	SDQ41R-B2P	I/O	154	SDQ45R-B2P	I/O
155	2R5-B2V	-	156	2R5-B2V	-
157	2R5-B2V	-	158	SCK2-B2N	I

TableC-28 Extended Memory SO-DIMM (1) connector (200pin) (3/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
159	GND	-	160	SCK2-B2P	I/O
161	GND	-	162	GND	-
163	SDQ48R-B2P	I/O	164	SDQ54R-B2P	I/O
165	SDQ49R-B2P	I/O	166	SDQ55R-B2P	I/O
167	2R5-B2V	-	168	2R5-B2V	-
169	SDQS6R-B2P	I/O	170	GND	-
171	SDQ53R-B2P	I/O	172	SDQ51R-B2P	I/O
173	GND	-	174	GND	-
175	SDQ52R-B2P	I/O	176	SDQ50R-B2P	I/O
177	SDQ61R-B2P	I/O	178	SDQ62R-B2P	I/O
179	2R5-B2V	-	180	2R5-B2V	-
181	SDQ60R-B2P	I/O	182	SDQ63R-B2P	I/O
183	SDQS7R-B2P	I/O	184	GND	-
185	GND	-	186	GND	-
187	SDQ56R-B2P	I/O	188	SDQ59R-B2P	I/O
189	SDQ57R-B2P	I/O	190	SDQ58R-B2P	I/O
191	2R5-B2V	-	192	2R5-B2V	-
193	SMBDAT-P3P	I/O	194	GND	-
195	SMBCLK-P3P	I	196	GND	-
197	P3V	-	198	GND	-
199	NC	-	200	NC	-

C.29 PJ17 Extended Memory SO-DIMM (2) connector (200pin)

TableC-29 Extended Memory SO-DIMM (2) connector (200pin) (1/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	1R25VR-B1V	-	2	1R25VR-B1V	-
3	GND	-	4	GND	-
5	SDQ00R-B2P	I/O	6	SDQ06R-B2P	I/O
7	SDQ05R-B2P	I/O	8	SDQ03R-B2P	I/O
9	2R5-B2V	-	10	2R5-B2V	-
11	SDQS0R-B2P	I/O	12	GND	-
13	SDQ01R-B2P	I/O	14	SDQ02R-B2P	I/O
15	GND	-	16	GND	-
17	SDQ04R-B2P	I/O	18	SDQ07R-B2P	I/O
19	SDQ13R-B2P	I/O	20	SDQ14R-B2P	I/O
21	2R5-B2V	-	22	2R5-B2V	-
23	SDQ08R-B2P	I/O	24	SDQ15R-B2P	I/O
25	SDQS1R-B2P	I/O	26	GND	-
27	GND	-	28	GND	-
29	SDQ12R-B2P	I/O	30	SDQ11R-B2P	I/O
31	SDQ09R-B2P	I/O	32	SDQ10R-B2P	I/O
33	2R5-B2V	-	34	2R5-B2V	-
35	SCK1-B2P	I	36	2R5-B2V	-
37	SCK1-B2N	I	38	GND	-
39	GND	-	40	GND	-
41	SDQ22R-B2P	I/O	42	SDQ16R-B2P	I/O
43	SDQ18R-B2P	I/O	44	SDQ20R-B2P	I/O
45	2R5-B2V	-	46	2R5-B2V	-
47	SDQS2R-B2P	I/O	48	GND	-
49	SDQ23R-B2P	I/O	50	SDQ17R-B2P	I/O
51	GND	-	52	GND	-
53	SDQ19R-B2P	I/O	54	SDQ21R-B2P	I/O
55	SDQ27R-B2P	I/O	56	SDQ24R-B2P	I/O
57	2R5-B2V	-	58	2R5-B2V	-
59	SDQ26R-B2P	I/O	60	SDQ25R-B2P	I/O
61	SDQS3R-B2P	I/O	62	GND	-
63	GND	-	64	GND	-
65	SDQ31R-B2P	I/O	66	SDQ29R-B2P	I/O
67	SDQ30R-B2P	I/O	68	SDQ28R-B2P	I/O
69	2R5-B2V	-	70	2R5-B2V	-
71	SCB4R-B2P	I/O	72	SCB6R-B2P	I/O
73	SCB5R-B2P	I/O	74	SCB6R-B2P	I/O
75	GND	-	76	GND	-
77	SDQS8R-B2P	I/O	78	GND	-

TableC-29 Extended Memory SO-DIMM (2) connector (200pin) (2/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
79	SCB0R-B2P	I/O	80	SCB3R-B2P	I/O
81	2R5-B2V	-	82	2R5-B2V	-
83	SCB1R-B2P	I/O	84	SCB7R-B2P	I/O
85	NC	-	86	NC	-
87	GND	-	88	GND	-
89	SCK0-B2P	I	90	GND	-
91	SCK0-B2N	I	92	2R5-B2V	-
93	2R5-B2V	-	94	2R5-B2V	-
95	SCKE1-B2P	I	96	SCK0-B2P	I
97	NC	-	98	NC	-
99	SMA12R-B2P	I/O	100	SMA11R-B2P	I
101	SMA09R-B2P	I/O	102	SMA08R-B2P	I
103	GND	-	104	GND	-
105	SMA07R-B2P	I	106	SMA06R-B2P	I
107	SMA05R-B2P	I	108	SMA04R-B2P	I
109	SMA03R-B2P	I	110	SMA02R-B2P	I
111	SMA01R-B2P	I	112	SMA00R-B2P	I
113	2R5-B2V	-	114	2R5-B2V	-
115	SMA10R-B2P	I	116	SBS1R-B2P	I
117	SBS0R-B2P	I	118	SRASR-B2P	I
119	SWER-B2N	I	120	SCASR-B2N	I
121	SCS0-B2N	I	122	SCSN1-B2N	I
123	NC	-	124	NC	-
125	GND	-	126	GND	-
127	SDQ38R-B2P	I/O	128	SDQ36R-B2P	I/O
129	SDQ34R-B2P	I/O	130	SDQ36R-B2P	I/O
131	2R5-B2V	-	132	2R5-B2V	-
133	SDQS4R-B2P	I/O	134	GND	-
135	SDQ39R-B2P	I/O	136	SDQ33R-B2P	I/O
137	GND	-	138	GND	-
139	SDQ35R-B2P	I/O	140	SDQ37R-B2P	I/O
141	SDQ40R-B2P	I/O	142	SDQ42R-B2P	I/O
143	2R5-B2V	-	144	2R5-B2V	-
145	SDQ44R-B2P	I/O	146	SDQ43R-B2P	I/O
147	SDQS5R-B2P	I/O	148	GND	-
149	GND	-	150	GND	-
151	SDQ41R-B2P	I/O	152	SDQ47R-B2P	I/O
153	SDQ41R-B2P	I/O	154	SDQ45R-B2P	I/O
155	2R5-B2V	-	156	2R5-B2V	-
157	2R5-B2V	-	158	SCK2-B2N	I

TableC-29 Extended Memory SO-DIMM (2) connector (200pin) (3/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
159	GND	-	160	SCK2-B2P	I
161	GND	-	162	GND	-
163	SDQ48R-B2P	I/O	164	SDQ54R-B2P	I/O
165	SDQ49R-B2P	I/O	166	SDQ55R-B2P	I/O
167	2R5-B2V	-	168	2R5-B2V	-
169	SDQS6R-B2P	I/O	170	GND	-
171	SDQ53R-B2P	I/O	172	SDQ51R-B2P	I/O
173	GND	-	174	GND	-
175	SDQ52R-B2P	I/O	176	SDQ50R-B2P	I/O
177	SDQ61R-B2P	I/O	178	SDQ62R-B2P	I/O
179	2R5-B2V	-	180	2R5-B2V	-
181	SDQ60R-B2P	I/O	182	SDQ63R-B2P	I/O
183	SDQS7R-B2P	I/O	184	GND	-
185	GND	-	186	GND	-
187	SDQ56R-B2P	I/O	188	SDQ59R-B2P	I/O
189	SDQ57R-B2P	I/O	190	SDQ58R-B2P	I/O
191	2R5-B2V	-	192	2R5-B2V	-
193	SMBDAT-P3P	I/O	194	P3V	-
195	SMBCLK-P3P	I	196	GND	-
197	P3V	-	198	GND	-
199	NC	-	200	NC	-

C.30 PJ5000 LCD interface connector (40pin)

TableC-30 LCD interface connector (40pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	P3V	-
3	GND	-	4	P3V	-
5	GND	-	6	ETX21M ; 001	O
7	GND	-	8	ETX21P ; 101	O
9	PNL2-P3P	I	10	ECLK2M ; 001	O
11	PNL1-P3P	I	12	ECLK2P ; 101	O
13	PNL0-P3P	I	14	ETX22M ; 001	O
15	GND	-	16	ETX22P ; 101	O
17	GND	-	18	ETX20M ; 011	O
19	GND	-	20	ETX20P ;101	O
21	GND	-	22	GND	-
23	GND	-	24	OTX12M ; 001	O
25	P5V	-	26	OTX12P ; 101	O
27	P5V	-	28	OCLK1M ; 001	O
29	P5V	-	30	OCLK1P ; 101	O
31	GND	-	32	OTX10M ; 001	O
33	GND	-	34	OTX10P ; 101	O
35	BRT2-P5P	O	36	OTX11M ; 001	O
37	BRT1-P5P	O	38	OTX11P ; 101	O
39	BRT0-P5P	O	40	GND	-

Sound Board (FSZSD*)

C.31 PJ1000 FSZIS* interface connector (50pin)

TableC-31 FSZIS interface connector (50pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	SPOTR-PXP	O	4	SPOTR-PXN	O
5	SPOTL-PXN	O	6	SPOTL-PXP	O
7	GND	-	8	DOUTL-PXN	O
9	DOUTL-PXP	O	10	DOUTR-PXN	O
11	DOUTR-PXP	O	12	GND	-
13	DINTL-PXN	I	14	DINL-PXP	I
15	DINR-PXN	I	16	DINR-PXP	I
17	GND	-	18	PHONE-BXP	I
19	PHONE-BXN	I	20	GND	-
21	GND	-	22	AMPSD-P3N	I
23	FIR-GND	-	24	ATBEEP-P3P	I
25	SNDMUT-P3N	I	26	FIR-GND	-
27	CAUDIO-P3P	I	28	GND	-
29	FIR-GND	-	30	BTSWON-S3P	O
31	S3V	-	32	P3V	-
33	P3V	-	34	P3V	-
35	P3V	-	36	IRRX-P3N	O
37	IRTX-P3P	I	38	IRMODE-P3P	I
39	NC	-	40	GND	-
41	GND	-	42	X97BC3-P3P	O
43	GND	O	44	X97BC1-P3P	O
45	M97DI0-B3P	O	46	M97RST-S3N	I
47	M97SDO-P3P	I	48	M97SYC-P3P	I
49	GND	-	50	GND	-

C.32 PJ1001 FSZIC* interface connector (40pin)

TableC-32 FSZIC interface connector (40pin) (1/2)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	CD-GND	-	2	CDAUDR-PXP	I
3	CDAUDL-PXP	I	4	CD-GND	-
5	(AGND)	-	6	(A-GND)	-
7	(AGND)	-	8	(A-GND)	-
9	SNDGND	-	10	SNDGND	-
11	SNDGND	-	12	SNDGND	-
13	SNDGND	-	14	NC	-
15	SND-P5V	-	16	SND-P5V	-
17	SND-P5V	-	18	SND-P5V	-
19	SND-P5V	-	20	B3V	-
21	B3V	-	22	NC	-
23	GND	-	24	GND	-
25	SDLED-B3P	I	26	SDPWR-B3P	I
27	GND	-	28	SDAT2-B3P	I/O
29	SDAT3-B3P	I/O	30	SDCMD-B3P	I/O
31	GND	-	32	SDCLK-B3P	I
33	GND	-	34	SDAT0-B3P	I/O
35	SDAT1-B3P	I/O	36	GND	-
37	SDCD-B3N	O	38	SDWP-B3P	O
39	GND	-	40	GND	-

C.33 PJ1002 SD interface connector (12pin)

TableC-33 SD interface connector (12pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	SDAT3-B3P	I/O	2	SDCMD-B3P	I/O
3	GND	-	4	SD-B3V	-
5	SDCLK-B3P	I	6	GND	-
7	SDAT0-B3P	I/O	8	SDAT1-B3P	I/O
9	SDAT2-B3P	I/O	10	SDCD-B3N	O
11	SDWP-B3P	O	12	GND	-

C.34 PJ1003 Internal Microphone connector (2pin)

TableC-34 Internal Microphone connector (2pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	MMREFV-P2V	I	2	A-GND	-

C.35 PJ1004 External Microphone connector (6pin)

TableC-35 External Microphone connector (6pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	A-GND	-	2	MICIN-PXP	I
3	MMREFV-P2V	-	4	NC	-
5	NC	-	6	MICIN-PXP	I

C.36 PJ1005 Headphone connector (6pin)

TableC-36 Headphone connector (6pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	A-GND	-	2	HEADL-PXP	O
3	HEADR-PXP	O	4	GND	-
5	SPKEN-P5P	I	6	NC	-

Connector Board (FZNCN*)

C.37 PJ50 FSZIO* interface connector (30pin)

TableC-37 FSZIO interface connector (30pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	GND	-	4	AV ; 100	I
5	GND	-	6	GND	-
7	GND	-	8	GND	-
9	NC	-	10	MOUSCK-P5P	I/O
11	P5V	-	12	MOUSDT-P5P	I/O
13	P5V	-	14	GND	-
15	P5V	-	16	EXKBCK-P5P	I/O
17	NC	-	18	EXKBDT-P5P	I/O
19	GND	-	20	GND	-
21	USBP0-E3N	I/O	22	USBP1-E3N	I/O
23	USBIPS-E5V	-	24	USBIPS-E5V	-
25	USBIPS-E5V	-	26	USBIPS-E5V	-
27	USBP0-E3P	I/O	28	USBP1-E3P	I/O
29	GND	-	30	GND	-

C.38 PJ51 TV interface connector (3pin)

TableC-38 TV interface connector (3pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	AV ; 100	O
3	GND	-			

C.39 PJ52 USB interface connector PORT0 (4pin)

TableC-39 USB interface connector PORT0 (4pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	USBIPS-E5V	-	2	USBP0-E3N	I/O
3	USBP0-E3P	I/O	4	GND	-

C.40 PJ54 USB interface connector PORT1 (4pin)

TableC-40 USB interface connector PORT1 (4pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	USBIPS-E5V	-	2	USBP1-E3N	I/O
3	USBP1-E3P	I/O	4	GND	-

C.41 PJ53 PS/2 interface connector (6pin)

TableC-41 PS/2 interface connector (6pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	MOUSDT-P5P	I/O	2	EXKBDT-P5P	I/O
3	GND	-	4	P5V	-
5	MOUSCK-P5P	I/O	6	EXKBCK-P5P	I/O

LED Board (FZNLEO*)

C.42 PJ1 FSZIO* interface connector (30pin)

TableC-42 FSZIO interface connector (30pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	PMEBT-S3NC	O
3	BTRST-S3P	I	4	E5V	-
5	E5V	-	6	USBP4-E3N	I/O
7	GND	-	8	HDDLED-P5P	I
9	CDRLED-P5P	I	10	BTLED-S3P	I
11	M5V	-	12	P5V	-
13	R3V	-	14	NC	-
15	GND	-	16	GND	-
17	BAT2GR-S5N	I	18	BAT20R-S5N	I
19	BAT1GR-S5N	I	20	BAT1OR-S5N	I
21	PWLEGR-S3P	I	22	PWLEOR-S3P	I
23	DCINGR-S5N	I	24	DCINOR-S5N	I
25	BTMDL-P3N	O	26	USBP4-E3P	I/O
27	NC	-	28	BTIFIOF-S3N	I
29	BTPON-S3P	I	30	GND	-

C.43 PJ2 Bluetooth interface connector (20pin)

TableC-43 Bluetooth interface connector (20pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	NC	-
3	BTMDL-P3N	-	4	NC	-
5	NC	-	6	NC	-
7	NC	-	8	BTRST-S3P	O
9	PMEBT-S3N	I	10	NC	-
11	GND	-	12	NC	-
13	BTIFOF-S3N	O	14	NC	-
15	NC	-	16	USBP4-E3P	I/O
17	USBP4-E3N	I/O	18	NC	-
19	NC	-	20	BT-E3V	-

C.44 PJ9999 RTCVCC connector (2pin)

TableC-44 RTCVCC connector (2pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	ZS-PWCHKF	-	2	GND	-

Sound Flexible Board (FSZIS*)

C.45 PJ1 FSZIO* interface connector (50pin)

TableC-45 FSZIO interface connector (50pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	SPOTR-PXP	O	4	SPOTL-PXN	O
5	SPOTR-PXN	O	6	SPOTL-PXP	O
7	GND	-	8	GND	-
9	DOUTL-PXN	O	10	DOUTR-PXN	O
11	DOUTL-PXP	O	12	DOUTR-PXP	O
13	GND	-	14	DINL-PXN	I
15	DINR-PXN	I	16	DINL-PXP	I
17	DINR-PXP	I	18	GND	-
19	GND	-	20	PHONE-BXP	I
21	GND	-	22	PHONE-BXN	I
23	AMPSD-P3N	I	24	GND	-
25	ALARM-P3P	I	26	CAUDIO-P3P	I
27	ATBEEP-P3P	I	28	SPKVOL-S3P	I
29	SNDMUT-P3N	I	30	BTSWON-S3P	O
31	DCADIO-S3P	I	32	P3V	-
33	S3V	-	34	P3V	-
35	IRRX-P3P	O	36	P3V	-
37	IRTX-P3P	I	38	IRMODE-P3P	I
39	GND	-	40	MDMSPK-P3P	I
41	X97BC3-P3P	O	42	GND	-
43	X97BC2-P3P	O	44	M97RST-P3N	I
45	X97BC1-P3P	O	46	M97SDO-P3P	I
47	M97DI1-B3P	O	48	M97SYC-P3P	I
49	GND	-	50	GND	-

C.46 PJ2 FSZSD* interface connector (50pin)

TableC-46 FSZSD interface connector (50pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	SPOTR-PXP	I	4	SPOTR-PXN	I
5	SPOTL-PXN	I	6	SPOTL-PXP	I
7	GND	-	8	DOUTL-PXN	I
9	DOUTL-PXP	I	10	DOUTR-PXN	I
11	DOUTR-PXP	I	12	GND	-
13	DINL-PXN	O	14	DINL-PXP	O
15	DINR-PXN	O	16	DINR-PXP	O
17	GND	-	18	PHONE-BXP	O
19	PHONE-BXN	O	20	GND	-
21	GND	-	22	AMPSD-P3N	O
23	ALARM-P3P	O	24	ATBEEP-P3P	O
25	SNDMUT-P3N	O	26	DCADIO-S3P	O
27	CAUDIO-P3P	O	28	GND	-
29	SPKVOL-S3P	O	30	BTSWON-S3P	I
31	S3V	-	32	P3V	-
33	P3V	-	34	P3V	-
35	P3V	-	36	IRRX-P3P	I
37	IRTX-P3P	O	38	IRMODE-P3P	O
39	MDMSPK-P3P	O	40	GND	-
41	GND	-	42	X97BC3-P3P	I
43	X97BC2-P3P	I	44	X97BC1-P3P	I
45	M97DI1-B3P	I	46	M97RST-P3N	O
47	M97SDO-P3P	O	48	M97SYC-P3P	O
49	GND	-	50	GND	-

SD Card Flexible Board (FSZIC*)

C.47 PJ2 FSZIO* interface connector (50pin)

TableC-47 FSZIO interface connector (50pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	SDWP-B3P	O	2	GND	-
3	SDCD-B3N	O	4	GND	-
5	SDAT1-B3P	I/O	6	GND	-
7	SDAT0-B3P	I/O	8	GND	-
9	GND	-	10	GND	-
11	SDCLK-B3P	I	12	GND	-
13	SDCMD-B3P	I/O	14	GND	-
15	SDAT3-B3P	I/O	16	GND	-
17	SDAT2-B3P	I/O	18	GND	-
19	GND	-	20	GND	-
21	SDPWR-B3P	I	22	GND	-
23	SDLED-B3P	I	24	GND	-
25	B3V	-	26	GND	-
27	B3V	-	28	GND	-
29	SND-P5V	-	30	SND-P5V	-
31	SND-P5V	-	32	SND-P5V	-
33	SND-P5V	-	34	NC	-
35	SND-P5V	-	36	CD2-GND	-
37	SND-P5V	-	38	CD2-GND	-
39	NC	-	40	CD2-GND	-
41	SNDGND	-	42	CD2-GND	-
43	SNDGND	-	44	CD-GND	-
45	SNDGND	-	46	CDAUDL-PXP	I
47	SNDGND	-	48	CDAUDR-PXP	I
49	SNDGND	-	50	CD-GND	-

C.48 PJ103 FSZSD* interface connector (40pin)

TableC-48 FSZSD interface connector (40pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	CD-GND	-	2	CDAUDR-PXP	O
3	CDAUDL-PXP	O	4	CD-GND	-
5	CD2-GND	-	6	CD2-GND	-
7	CD2-GND	-	8	CD2-GND	-
9	SNDGND	-	10	SNDGND	-
11	SNDGND	-	12	SNDGND	-
13	SNDGND	-	14	NC	-
15	SND-P5V	-	16	SND-P5V	-
17	SND-P5V	-	18	SND-P5V	-
19	SND-P5V	-	20	B3V	-
21	B3V	-	22	NC	-
23	GND	-	24	GND	-
25	SDLED-B3P	O	26	SDPWR-B3P	O
27	GND	-	28	SDAT2-B3P	I/O
29	SDAT3-B3P	I/O	30	SDCMO-B3P	I/O
31	GND	-	32	SDCLK-B3P	O
33	GND	-	34	SDAT0-B3P	I/O
35	SDAT1-B3P	I/O	36	GND	-
37	SDCD-B3N	I	38	SDWP-B3P	I
39	GND	-	40	GND	-

FSZHD0/1/2 Board

C.49 PJ1 System interface connector (74pin)

TableC-49 System interface connector (74pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	NC	-	4	GND	-
5	NC	-	6	GND	-
7	GND	-	8	NC	-
9	NC	-	10	NC	-
11	NC	-	12	NC	-
13	NC	-	14	GND	-
15	GND	-	16	GND	-
17	NC	-	18	GND	-
19	CDRLED-E5N	O	20	SDCS3-P3N	I
21	SDCS1-P3N	I	22	SDA2-P3P	I
23	SDA0-P3P	I	24	SB-E5V	-
25	SB-E5V	-	26	SB-E5V	-
27	SDA1-P3P	I	28	IOCS16-P5N	O
29	IRQ15-P3P	O	30	GND	-
31	SDDACK-P3N	I	32	NC	-
33	SIORDY-P5P	O	34	GND	-
35	SDIOR-P3N	I	36	GND	-
37	SDIOW-P3N	I	38	GND	-
39	SDDREQ-P3P	O	40	GND	-
41	GND	-	42	SDD15-P5P	I/O
43	SDD00-P5P	I/O	44	SDD14-P5P	I/O
45	SDD01-P5P	I/O	46	SB-E5V	-
47	SB-E5V	-	48	SDD13-P5P	I/O
49	SDD02-P5P	I/O	50	SDD12-P5P	I/O
51	SDD03-P5P	I/O	52	SDD11-P5P	I/O
53	SDD04-P5P	I/O	54	GND	-
55	GND	-	56	SDD10-P5P	I/O
57	SDD05-P5P	I/O	58	SDD09-P5P	I//O
59	SDD06-P5P	I/O	60	SDD08-P5P	I/O
61	SDD07-P5P	I/O	62	GND	-
63	GND	-	64	IDRSTB-E5N	I
65	(CD-GND)	-	66	GND	-
67	(CDAUDL-PXP)	-	68	(CDAUDR-PXP)	-
69	GND	-	70	GND	-
71	NC	-	72	NC	-
73	NC	-	74	NC	-

C.50 PJ2 HDD interface connector (44pin)

TableC-50 HDD interface connector (44pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	IDRSTB-E5N	O
3	SDD08-P5P	I/O	4	SDD07-P5P	I/O
5	SDD09-P5P	I/O	6	SDD06-P5P	I/O
7	SDD10-P5P	I/O	8	SDD05-P5P	I/O
9	SDD11-P5P	I/O	10	SDD04-P5P	I/O
11	SDD12-P5P	I/O	12	SDD03-P5P	I/O
13	SDD13-P5P	I/O	14	SDD02-P5P	I/O
15	SDD14-P5P	I/O	16	SDD01-P5P	I/O
17	SDD15-P5P	I/O	18	SDD00-P5P	I/O
19	NC	-	20	GND	-
21	GND	-	22	SDDREQ-P3P	I
23	GND	-	24	SDIOW-P3N	O
25	GND	-	26	SDIOR-P3N	O
27	NC	-	28	SIORDY-P5P	I
29	GND	-	30	SDDACK-P3N	O
31	IOCS16-P5N	I	32	IRQ15-P3P	I
33	NC	-	34	SDA1-P3P	O
35	SDA2-P3P	O	36	SDA0-P3P	O
37	SDCS3-P3N	O	38	SDCS1-P3N	O
39	GND	-	40	CDRLED-E5N	I
41	SB-E5V	-	42	SB-E5V	-
43	NC	-	44	GND	-

FSZCD0/1/2 Board

C.51 PJ1 System interface connector (74pin)

TableC-51 System interface connector (74pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	NC	-	4	GND	-
5	NC	-	6	GND	-
7	GND	-	8	NC	-
9	NC	-	10	NC	-
11	NC	-	12	NC	-
13	NC	-	14	GND	-
15	GND	-	16	NC	-
17	NC	-	18	GND	-
19	CDRLED-E5N	O	20	SDCS3-P3N	I
21	SDCS1-P3N	I	22	SDA2-P3P	I
23	SDA0-P3P	I	24	SB-E5V	-
25	SB-E5V	-	26	SB-E5V	-
27	SDA1-P3P	I	28	IOCS16-P5N	O
29	IRQ15-P3P	O	30	GND	-
31	SDDACK-P3N	I	32	NC	-
33	SIORDY-P5P	O	34	GND	-
35	SDIOR-P3N	I	36	GND	-
37	SDIOW-P3N	I	38	GND	-
39	SDDREQ-P3P	O	40	GND	-
41	GND	-	42	SDD15-P5P	I/O
43	SDD00-P5P	I/O	44	SDD14-P5P	I/O
45	SDD01-P5P	I/O	46	SB-E5V	-
47	SB-E5V	-	48	SDD13-P5P	I/O
49	SDD02-P5P	I/O	50	SDD12-P5P	I/O
51	SDD03-P5P	I/O	52	SDD11-P5P	I/O
53	SDD04-P5P	I/O	54	GND	-
55	GND	-	56	SDD10-P5P	I/O
57	SDD05-P5P	I/O	58	SDD09-P5P	I/O
59	SDD06-P5P	I/O	60	SDD08-P5P	I/O
61	SDD07-P5P	I/O	62	GND	-
63	GND	-	64	IDRSTB-E5N	I
65	A-GND	-	66	GND	-
67	CDAUDL-PXP	O	68	CDAUDR-PXP	O
69	GND	-	70	GND	-
71	NC	-	72	NC	-
73	NC	-	74	NC	-

C.52 PJ2 CD/DVD interface connector (50pin)

TableC-52 CD/DVD interface connector (50pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	CDAUDL-PXP	I	2	CDAUDR-PXP	I
3	A-GND	-	4	NC	-
5	IDRSTB-E5N	O	6	SDD08-P5P	I/O
7	SDD07-P5P	I/O	8	SDD09-P5P	I/O
9	SDD06-P5P	I/O	10	SDD10-P5P	I/O
11	SDD05-P5P	I/O	12	SDD11-P5P	I/O
13	SDD04-P5P	I/O	14	SDD12-P5P	I/O
15	SDD03-P5P	I/O	16	SDD13-P5P	I/O
17	SDD02-P5P	I/O	18	SDD14-P5P	I/O
19	SDD01-P5P	I/O	20	SDD15-P5P	I/O
21	SDD00-P5P	I/O	22	SDDREQ-P3P	I
23	GND	-	24	SDIOR-P3N	O
25	SDIOW-P3N	O	26	GND	-
27	SIORDY-P5P	I	28	SDDACK-P3N	O
29	IRQ15-P3P	I	30	IOCS16-P3N	I
31	SDA1-P3P	O	32	NC	-
33	SDA0-P3P	O	34	SDA2-P3P	O
35	SDCS1-P3N	O	36	SDCS3-P3N	O
37	CDRLED-E5N	I	38	SB-E5V	-
39	SB-E5V	-	40	SB-E5V	-
41	SB-E5V	-	42	SB-E5V	-
43	GND	-	44	GND	-
45	GND	-	46	GND	-
47	NC	-	48	GND	-
49	NC	-	50	NC	-

FSZBA* Board

C.53 PJ1 System interface connector (74pin)

TableC-53 System interface connector (74pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	NC	-	4	GND	-
5	NC	-	6	GND	-
7	GND	-	8	CDCHG2-S5P	
9	BTMP2-SXP	O	10	SCL-S5P	I/O
11	BT2VD	-	12	SDA-S5P	I/O
13	DBT20V-S5N	O	14	GND	-
15	NC	-	16	NC	-
17	NC	-	18	GND	-
19	NC	-	20	NC	-
21	NC	-	22	NC	-
23	NC	-	24	NC	-
25	NC	-	26	NC	-
27	NC	-	28	NC	-
29	NC	-	30	GND	-
31	NC	-	32	NC	-
33	NC	-	34	GND	-
35	NC	-	36	GND	-
37	NC	-	38	GND	-
39	NC	-	40	GND	-
41	GND	-	42	NC	-
43	NC	-	44	NC	-
45	NC	-	46	NC	-
47	NC	-	48	NC	-
49	NC		50	NC	-
51	NC	-	52	NC	-
53	NC	-	54	GND	-
55	GND	-	56	NC	-
57	NC	-	58	NC	-
59	NC	-	60	NC	-
61	NC	-	62	GND	-
63	GND	-	64	NC	-
65	(CD-GND)	-	66	GND	-
67	(CDAUDL-PXP)	-	68	(CDAUDR-PXP)	-
69	GND	-	70	GND	-
71	PVBT2-DFP	-	72	PVBT2-DEP	-
73	PVBT2-DFN	-	74	PVBT2-DFN	-

C.54 PJ2 Battery connector interface connector (10pin)

TableC-54 Battery interface connector (10pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	PVBT2-DFP	-	2	BTMP2-SXP	I
3	CDCHG2-S5P	I	4	BT2VD	-
5	SCL-S5P	I/O	6	SDA-S5P	I/O
7	GND	-	8	DBT20V-S5N	I
9	VDD	-	10	PVBT2-DFN	-

Appendix D Keyboard Scan/Character Codes

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

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
01	‘ ~	29	A9	0E	F0	0E	
02	1 !	02	82	16	F0	16	
03	2 @	03	83	1E	F0	1E	
04	3 #	04	84	26	F0	26	
05	4 $	05	85	25	F0	25	
06	5 %	06	86	2E	F0	2E	
07	6 ^	07	87	36	F0	36	
08	7 &	08	88	3D	F0	3D	*2
09	8 *	09	89	3E	F0	3E	*2
10	9 (	0A	8A	46	F0	46	*2
11	0)	0B	8B	45	F0	45	
12	- _	0C	8C	4E	F0	4E	
13	= +	0D	8D	55	F0	55	
15	BkSp	0E	8E	66	F0	66	
16	Tab	0F	8F	0D	F0	0D	
17	Q	10	90	15	F0	15	
18	W	11	91	1D	F0	1D	
19	E	12	92	24	F0	24	
20	R	13	93	2D	F0	2D	
21	T	14	94	2C	F0	2C	
22	Y	15	95	35	F0	35	
23	U	16	96	3C	F0	3C	*2
24	I	17	97	43	F0	43	*2
25	O	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

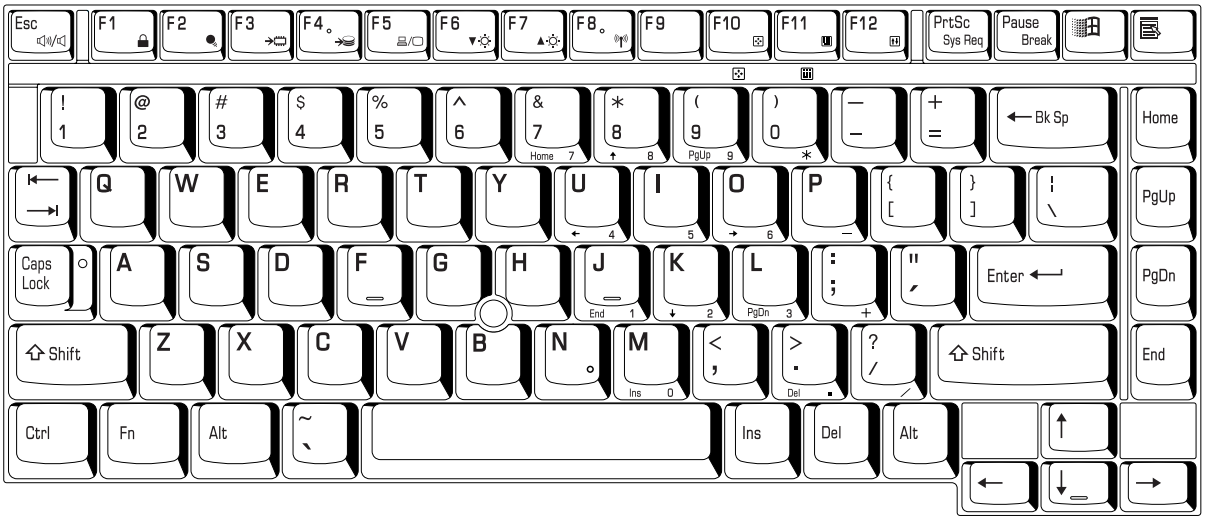


Figure E-1 US keyboard

E.2 United Kingdom (UK) Keyboard

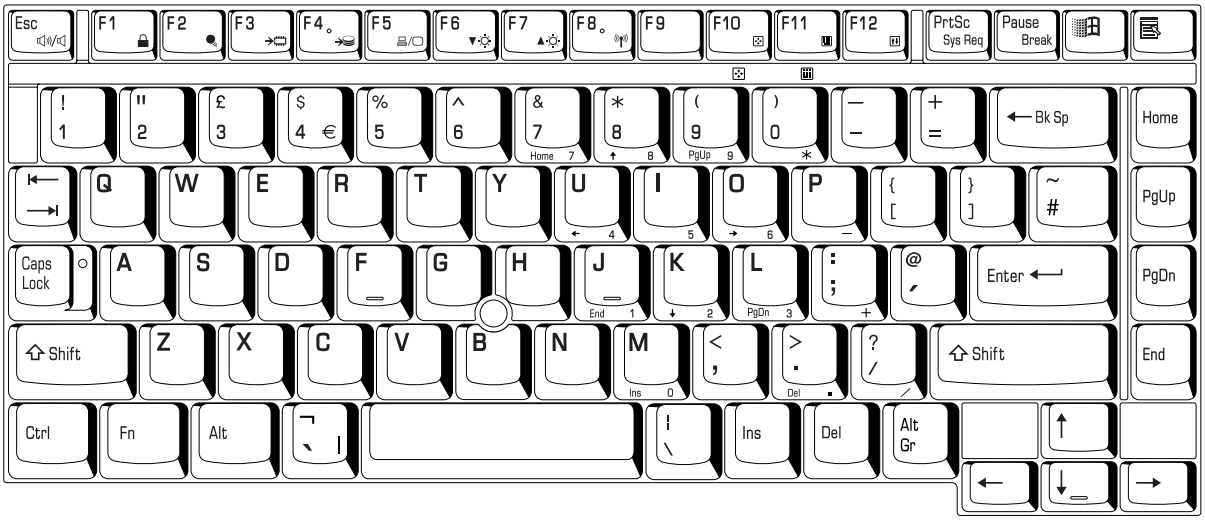


Figure E-2 UK keyboard

E.3 German (GR) Keyboard

Figure E-3 GR keyboard

E.4 French (FR) Keyboard

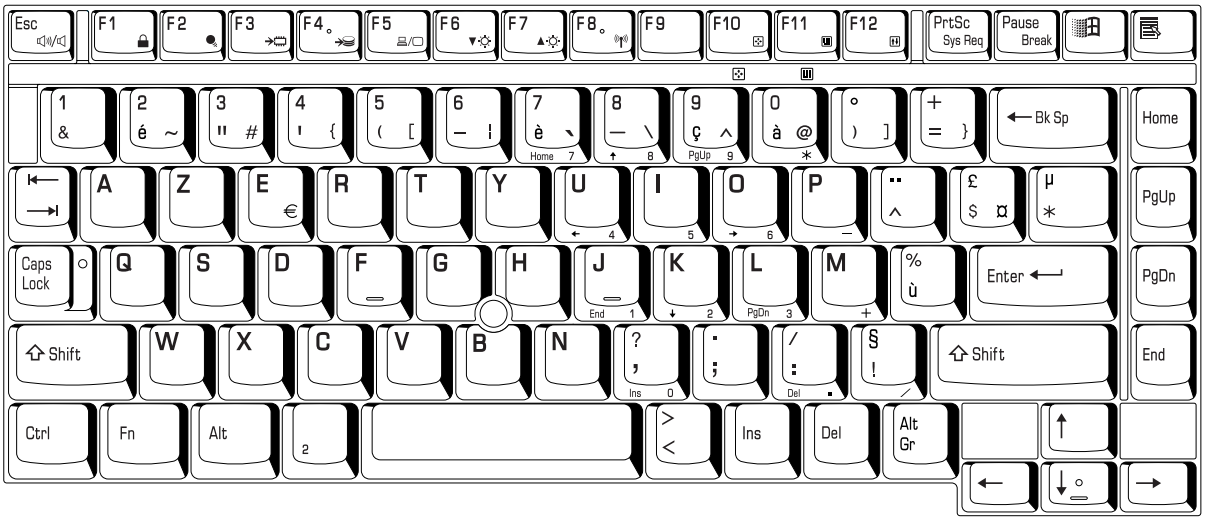


Figure E-4 FR keyboard

E.5 Spanish (SP) Keyboard

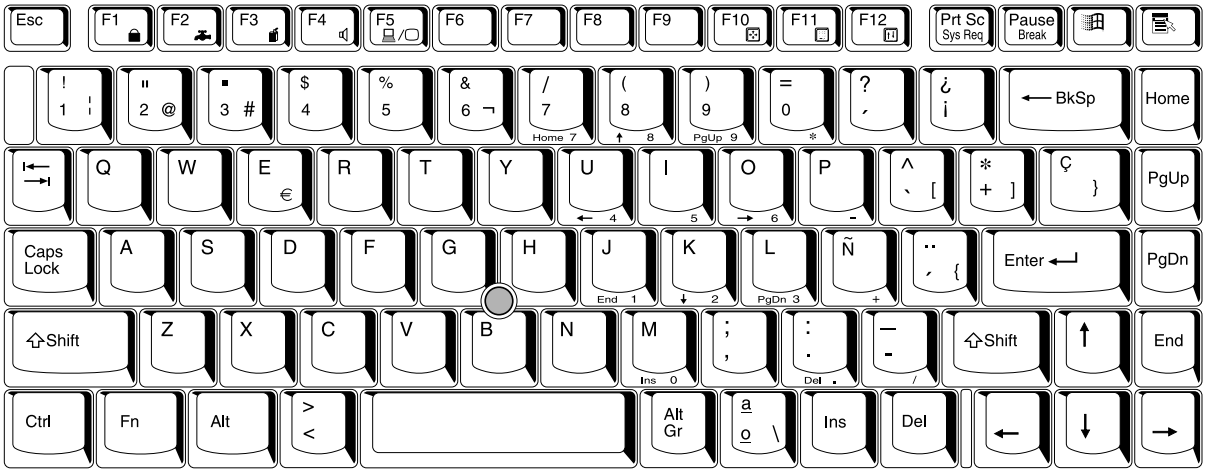


Figure E-5 SP keyboard

E.6 Italian (IT) Keyboard

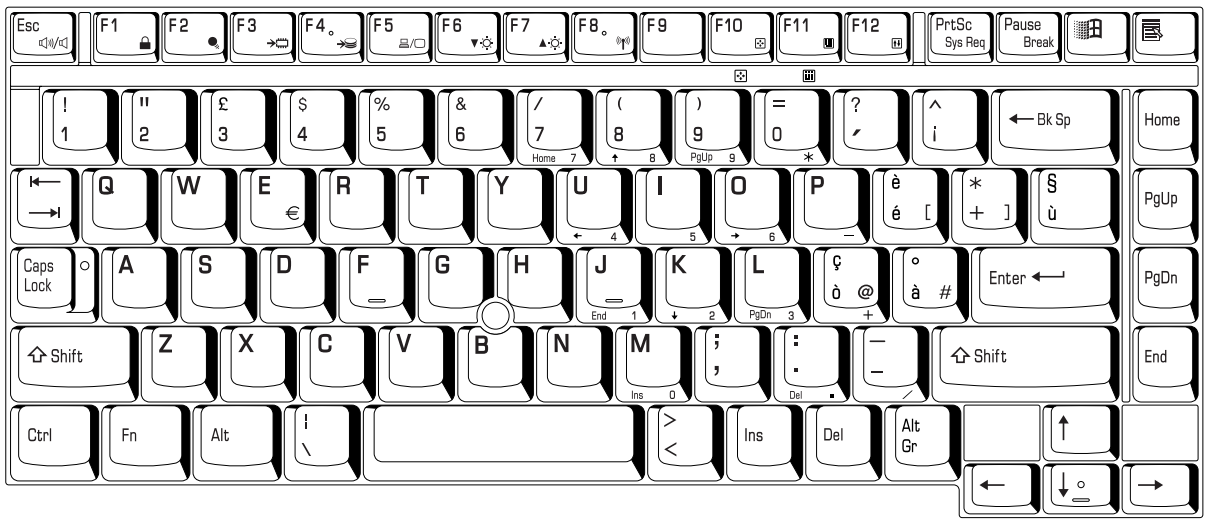


Figure E-6 IT keyboard

E.7 Scandinavian (SC) Keyboard

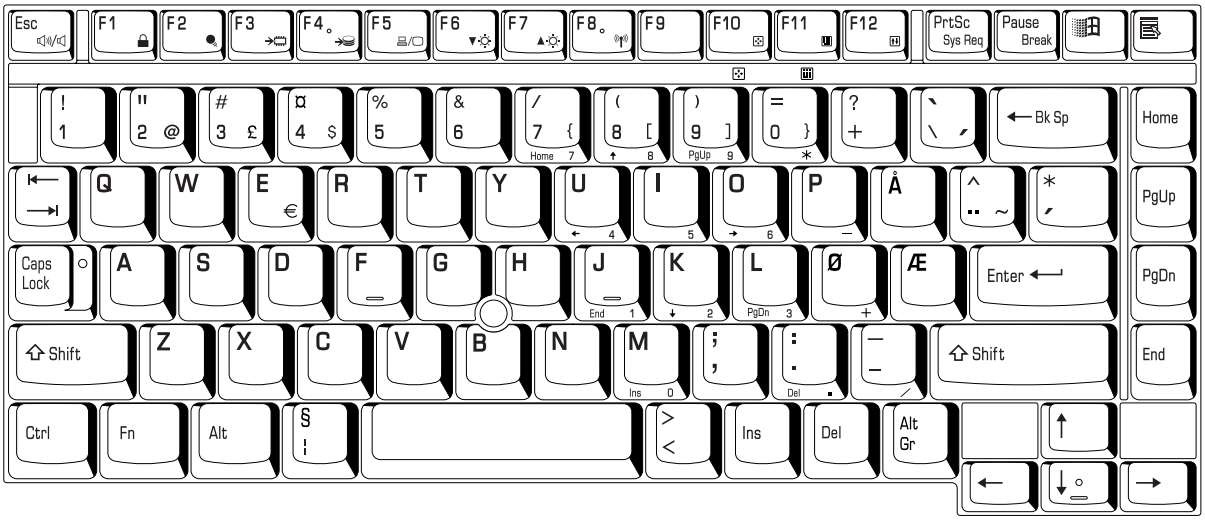


Figure E-7 SC keyboard

E.8 Swiss-German (SL) Keyboard

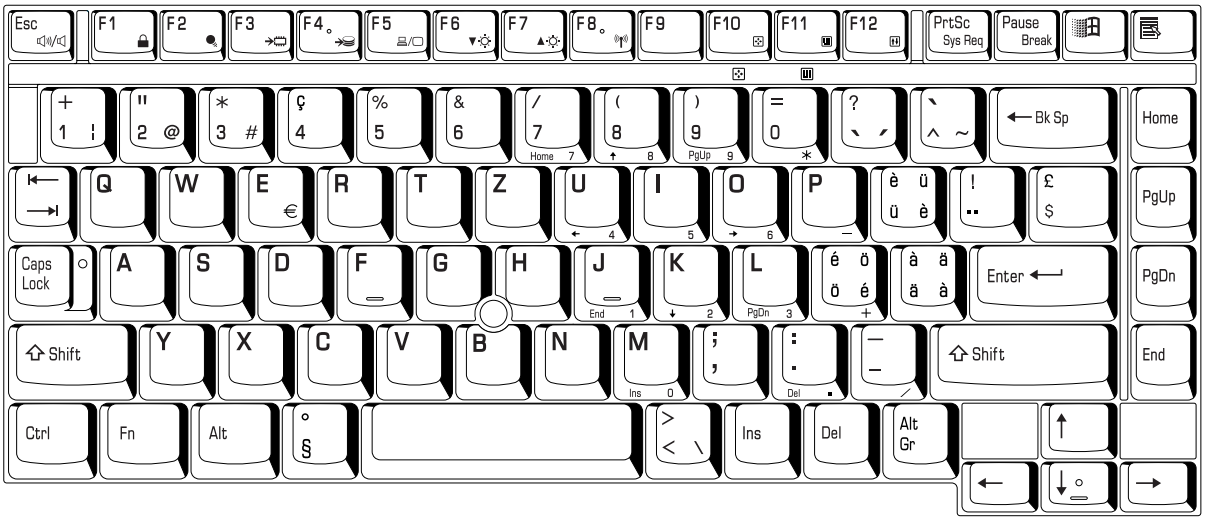


Figure E-8 SL keyboard

E.9 Canadian (CS) Keyboard

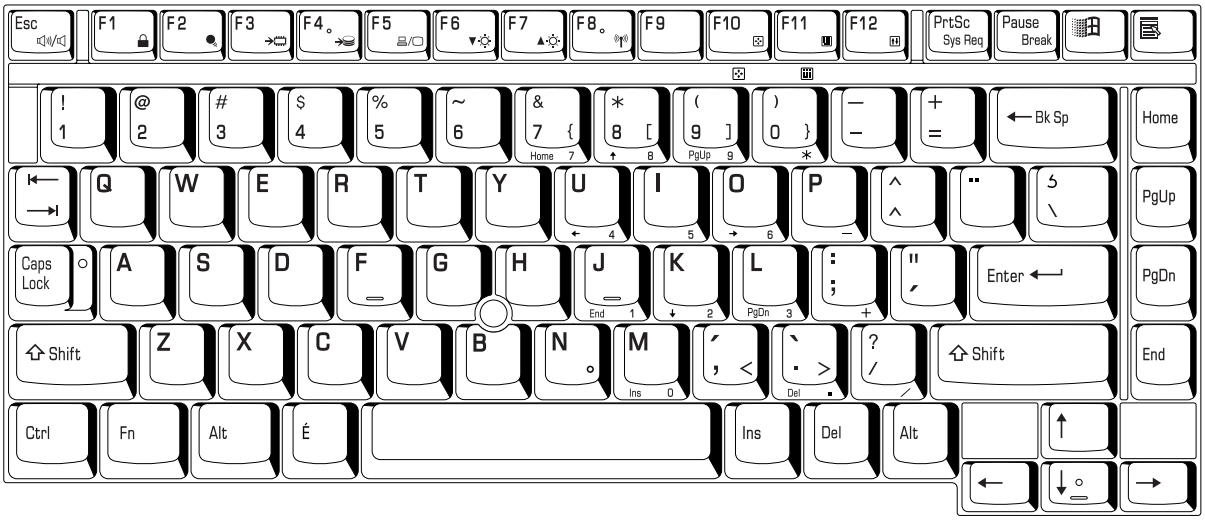


Figure E-9 CS keyboard

Appendix F Wiring Diagrams

F.1 Parallel Port Wraparound Connector

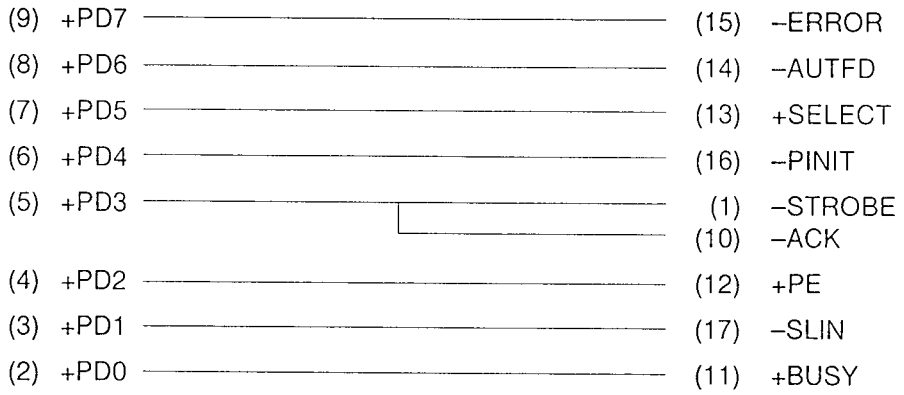


Figure F-1 Parallel port wraparound connector

F.2 Serial Port Wraparound Connector

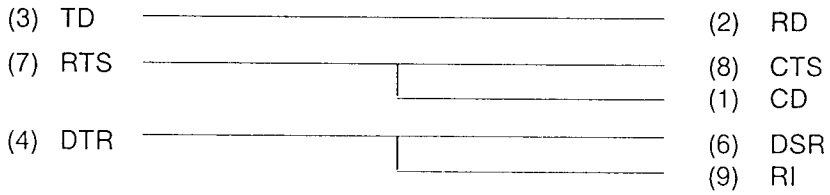


Figure F-2 Serial port wraparound connector

F.3 Serial Port Direct Cable (9-Pin to 9-Pin)

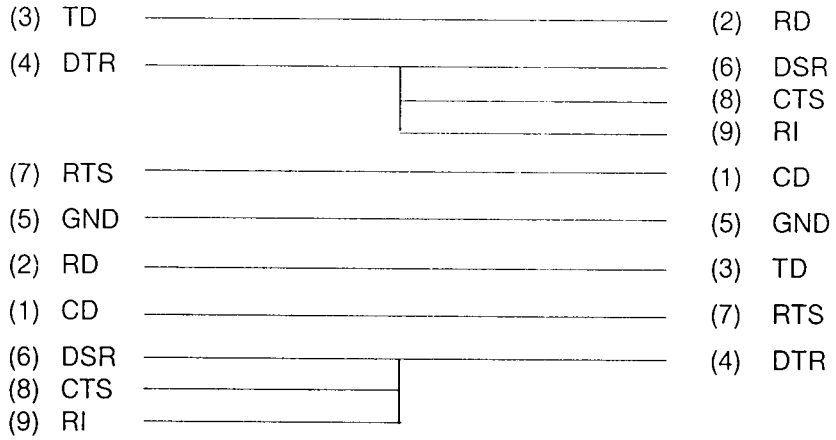


Figure F-3 Serial port direct cable (9-pin to 9-pin)

F.4 Serial Port Direct Cable (9-Pin to 25-Pin)

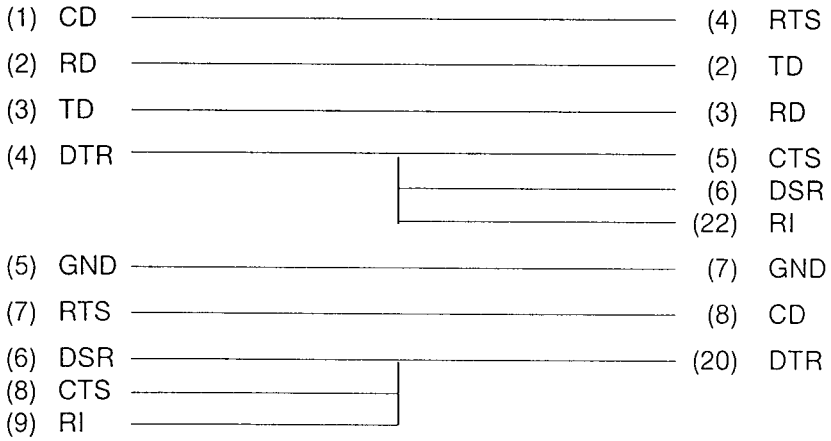


Figure F-4 Serial port direct cable (9-pin to 25-pin)

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 for the computer that has renewed BIOS data.

Rewriting the BIOS

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cable and PC card.
4. Connect an external FDD and insert the BIOS/EC/KBC rewriting disk into either the external FDD.
5. Turn on the power while holding down the No. 01 key.

For example

 (US Keyboard)

 (UK Keyboard)

(Keep holding down the key until a message appears on the screen.)
The BIOS rewriting starts.

6. When the process is completed, eject the BIOS/EC/KBC rewriting disk and the system is automatically reset.

Appendix H EC/KBC Rewrite Procedures

This Appendix explains how to rewrite the EC/KBC system program when you update the EC/KBC system.

Tools

To rewrite the EC/KBC, you need the following tool:

- ❑ BIOS/EC/KBC rewriting disk for the computer

Rewriting the EC/KBC

NOTE:

1. *Rewrite the EC/KBS 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 has been erased. In this case, insert the BIOS/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 cable and PC Card.
4. Connect an external FDD and insert the BIOS/EC/KBC rewriting disk into either the external or built-in 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 BIOS/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) for each component.

Table I-1 MTBF

Component	Time (hours)
LCD	50,000H
Keyboard	40,000H
HDD	300,000H
USB FDD	30,000H
DVD-ROM drive	60,000H
CD-ROM drive	60,000H
AC adaptor	50,000H

Appendix J Connection for Check

The following figure shows the connection for checking the circuit.

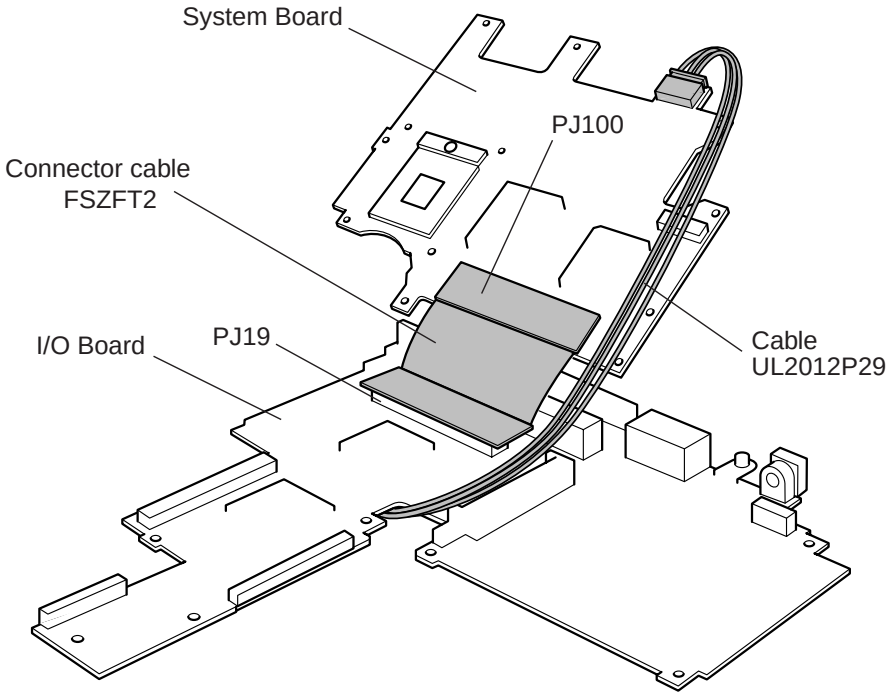


Figure J-1 Connection for the I/O Board and System Board

1. Connect cable **UL2012P29** to the **system board**.
2. Lay the **system board** right side up.
3. Firmly connect one end of **FSZFT2** to **PJ19** on the **I/O board**.
4. Firmly connect the other end of the **FSZFT2** to **PJ100** on the **system board**.

CAUTION: *Make sure you connect the boards securely. A loose connection could damage the boards. Also, if the connectors are not fully seated the boards could be bent and damaged.*

CAUTION: *Don not lay the system board flat. Make sure it leans against a stand when you check the connection.*