1.1   Features

The Toshiba Desk Station V+ gives your Toshiba Personal Computer the expansion capabilities of a desktop computer. The Desk Station V+ connects with any Toshiba Personal Computer that has a 240-pin docking interface (except the 700CS/CT). This interface is designed for easy, one-step connection. The Desk Station V+'s features, functions, and capabilities include:

❑ Plug and Play

Supports plug and play technology. Under a plug and play OS, it ensures automatic device configuration and hot/warm docking (also undocking) with the computer.

❑ PCI/ISA Bus Expansion Slot

Two full-size Peripheral Component Interconnect, Industry Standard Architecture (PCI/ISA) bus slots and one half-size PCI bus slot.

❑   Selectable Bay

The selectable bay provides for connection of either a Floppy Disk Drive (FDD) or a CD-ROM module.

An FDD supports 3.5-inch 2HD (1.44 MB) disks and 2DD (720 KB) disks. A full-size, six-speed CD-ROM drive contains an ATAPI (AT Attachment Packet Interface) Controller.

❑ PC Card Slot

Two PC card (PCMCIA) slots, each of which can accommodate one Type III (10.5 mm) card. The slots are ready for CardBus, which is equivalent to PCI bus performance.

❑ SCSI Expansion

An on-board Small Computer System Interface (SCSI) controller. It enables connections of SCSI-2 peripherals. In synchronous mode, it supports a maximum data transfer rate of 10 MB.

❑ Drive Bay

One industry-standard 5.25-inch drive bay. A SCSI drive or an enhanced IDE drive can be installed in it.

❏ Audio Expansion

Stereo speakers and the following jacks to connect external audio devices: stereo headphone, stereo microphone, audio line-in, and audio line-out.

❏ Joystick Port

Used to connect a joystick or MIDI device. The signals pass through the Desk Station V+.

❏ External Monitor Port

Used to connect an analog interface display. The signals pass through the Desk Station V+.

❏ Mouse Port

Used to connect a PS/2 compatible pointing device. The signals pass through the Desk Station V+.

❏ Keyboard Port

Used to connect a PS/2 keyboard. The signals pass through the Desk Station V+.

❏ Parallel Port

Used to connect a Centronics compatible printer or other parallel device. The port supports Extended Capabilities Port (ECP) conforming to IEEE·1284. The signals pass through the Desk Station V+.

❏ Serial Port

Used to connect serial devices, such as a serial printer, serial mouse, or external modem. The signals pass through the Desk Station V+.

❏ SCSI Port

Provides a 50-pin, high-density SCSI port. It supports up to seven (or six if one is installed in the drive bay) external SCSI peripherals by daisy chain connection.

❏ Security Lock Key

Provides a security lock key to protect the computer and installed devices. It disables docking/undocking of the computer and prevents opening of the expansion slot and the drive bay.

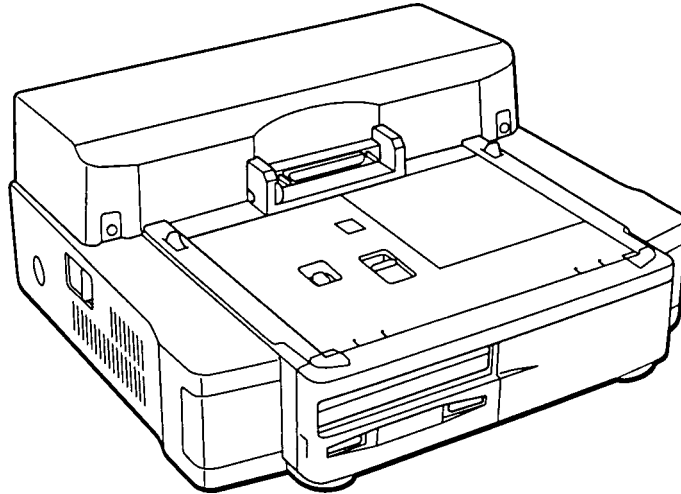The Desk Station V+ is shown in Figure 1-1.

Figure 1-1 Desk Station V+

The Desk Station V+ configuration is shown in Figure 1-2.
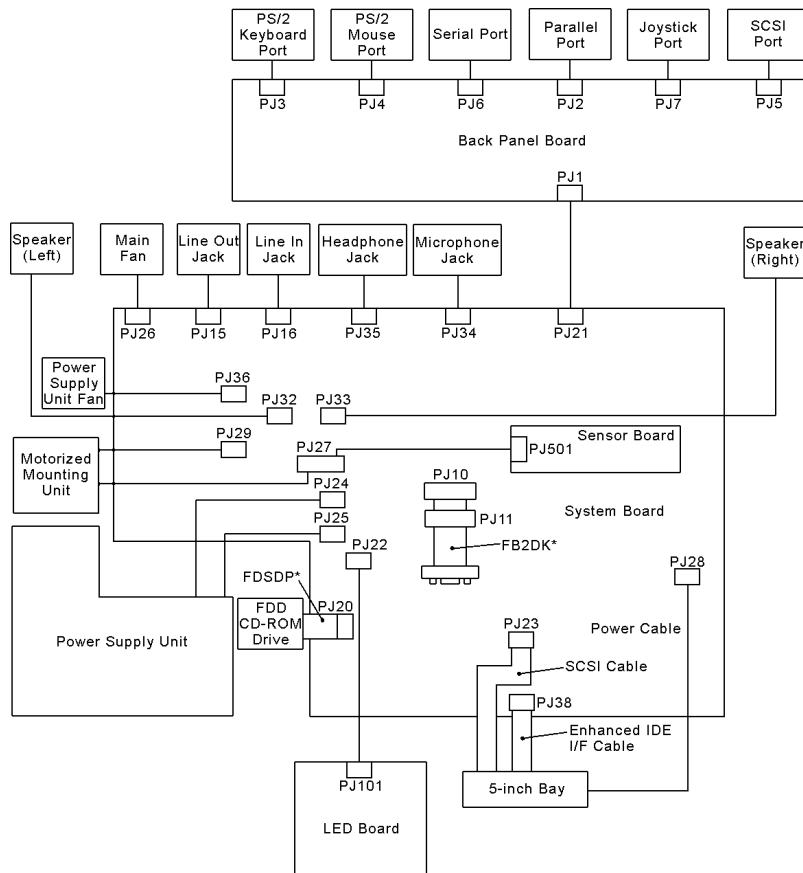

Figure 1-2 Desk Station V+ system unit configuration

1.2 System Unit Block Diagram

The block diagrams of the Desk Station V+ and Toshiba 710/720 Personal Computer are shown in Figures 1-3 and 1-4. They show how the Desk Station V+ is configured and how it works when the computer is attached.
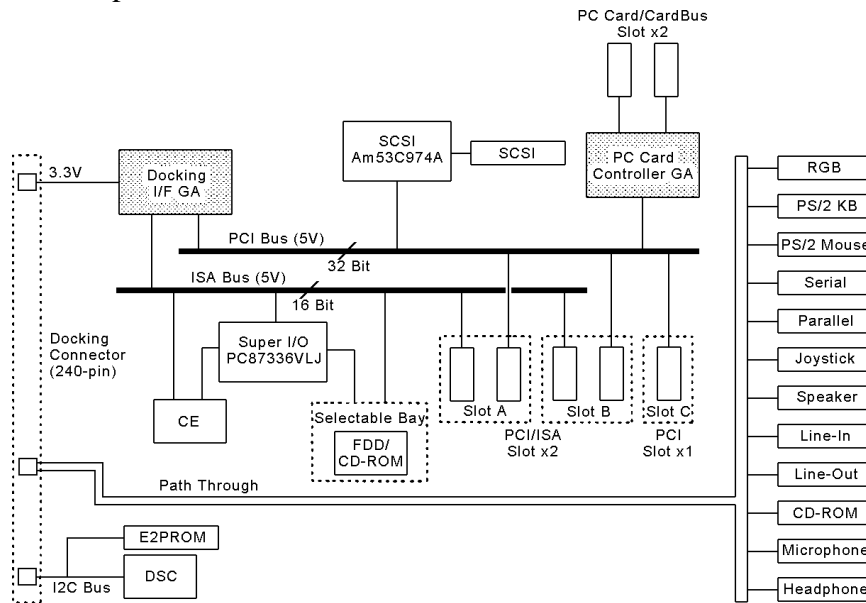
Figure 1-3 Desk Station V+ block diagram
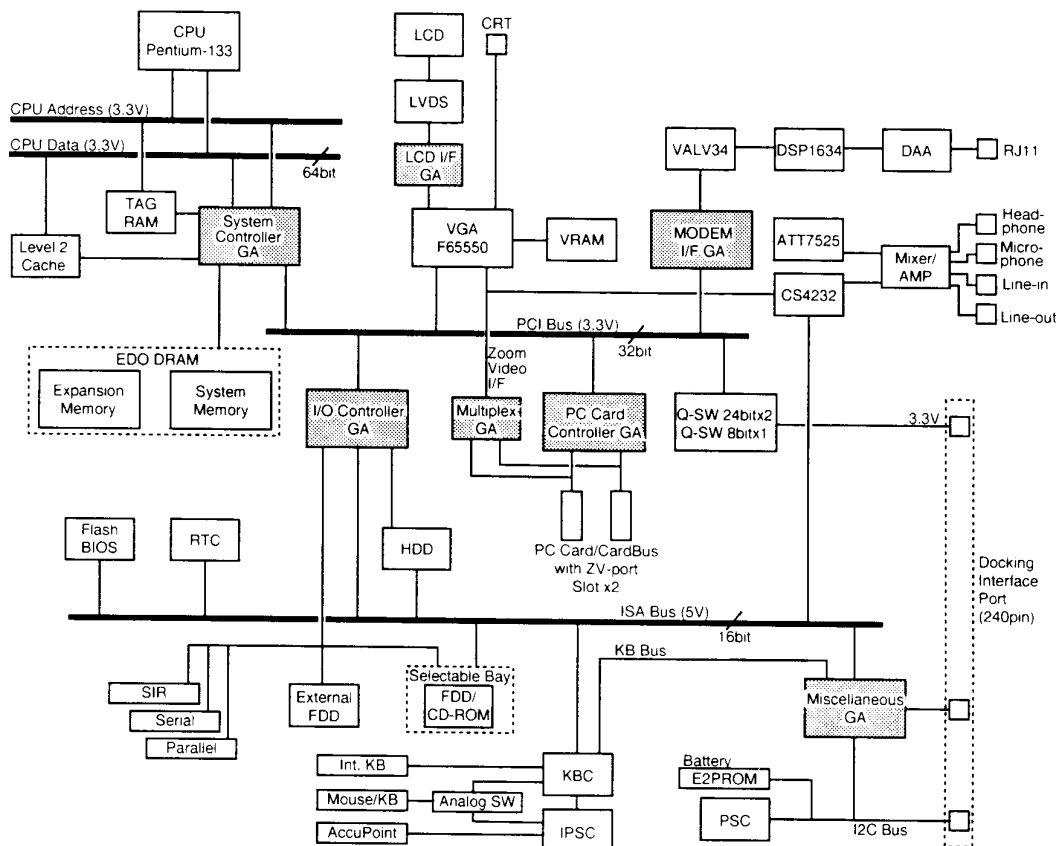
Figure 1-4 710/720 computer block diagram

The system board's major components:

❏ Docking Interface Gate Array

This gate array has the following functions:
- Docking interface
- PCI-PCI bus bridge
- PCI-ISA bus bridge
- High speed ISA bus control

❏ PC Card Controller Gate Array

This gate array has the following functions:
- PC card control

❏ Super I/O

National Semiconductor PC87336VLJ has the following functions:
- Two UARTs   16550A equivalent (Not used)
- One FDC   μPD765A equivalent
- One parallel port control (Not used)

❏ SCSI Controller

Advanced Micro Devices (AMD) Am53C974A is used.
This Fast SCSI-2 controller supports PCI bus mastering data transfer.

1.3 Power Supply

1.3.1 AC Input

Voltage	100 to 115 V 220 to 240 V
Frequency	50/60 Hz

1.3.2 DC Output

Table 1-1 Power supply DC output

Name	Voltage (V)	Ripple (mV)	Ampere (mA)	Use
VCC	+5.0 ±5%	50	7,200	GA, PCI slot, ISA slot, SCSI bay, selectable bay, PC card
P3V	+3.3 ±5%	30	7,100	GA, PCI slot, PC card
P12V	+12.0 ±5%	120	1,800	PCI slot, ISA slot, PC card
M12V	-12.0 ±10%	240	300	PCI slot, ISA slot
M5V	-5.0 ±10%	100	300	ISA slot
DSV	+5.0 ±5%	50	50	DSC
FP12V	+12.0 ±10%	240	50	LED, fan, undock motor
P15V	+15.0 ±5%	150	2,700	Computer

NOTE: *When an AC cord is connected to the Desk Station V+, the power supply unit always supplies DSV, FP12V, and P15V even when the system power is off.*

2.1 Troubleshooting

This chapter describes how to determine if a Field Replaceable Unit (FRU) in the Desk Station V+ is not functioning properly. The FRU's covered are:

1. Power supply unit
2. System board
3. Sensor board
4. Back panel board
5. LED board
6. Selectable bay cable
7. Interface cable

Diagnostics Disk operations are described in Chapter 3 and detailed replacement procedures are given in Chapter 4.

You will need the following tools to perform the Desk Station V+ troubleshooting steps:

1. Diagnostics Disk
2. Phillips screwdriver (M3)
3. Toshiba MS-DOS system disks
   (You must install the following onto the disk: SYS.COM, FORMAT.COM, FDISK.COM and FDISK.EXE)
4. 2DD or 2HD formatted work disk for floppy disk drive testing
5. Cleaning kit for floppy disk drive troubleshooting
6. Serial wraparound connector
7. Printer wraparound connector
8. Multimeter
9. External monitor
10. PS/2 or compatible keyboard
11. PS/2 or compatible mouse
12. Serial port wraparound connector
13. PC card wraparound card
14. Multimedia sound system with line-in and line-out ports
15. Headphone
16. CD-ROM drive
17. BEX test CD-ROM (audio-combined) TCDR-702
18. Music CD
19. PCI bus wraparound board
20. ISA bus wraparound board
21. Computer system that can be connected to the Desk Station V+

2.2 Troubleshooting Flowchart

Use the flowchart in Figure 2-1 as a guide to determine which FRU testing procedures to execute. Before performing the flowchart steps, perform the following steps:

1.   Remove all optional equipment from the Desk Station V+.

2.   Connect a personal computer to the Desk Station V+.

> *NOTE: Refer to the Desk Station V+ User's Manual for instructions on how to connect the computer to the Desk Station V+.*

3.   Connect the following on the Desk Station V+:

❑ PCI bus wraparound board connector to the PCI bus port
❑ ISA bus wraparound board connector to the ISA bus port
❑ Printer wraparound connector to the printer port
❑ External monitor port to the external monitor
❑ PS/2 keyboard connector to the PS/2 or compatible keyboard
❑ PS/2 mouse to the PS/2 or compatible mouse port
❑ PC card wraparound board to the PC card slot
❑ External speaker to the line-out port
❑ External microphone to the line-in port
❑ Serial wraparound connector to the serial port

```
                        ┌──────────────┐
                        │    START     │
                        └──────┬───────┘
                               │
              ┌────────────────┴────────────────┐
              │  Connect the AC Cord to          │
              │  the Desk Station V+.            │
              └────────────────┬────────────────┘
                               │
                          ╱────┴────╲                          ┌─────────────────────────┐
                      ╱                ╲         No            │ Perform the Fan         │
                    ╱   Does the Main Fan ╲ ─────────────────▶ │ Troubleshooting procedures│
                    ╲   turn correctly?   ╱                    │ in Section 2.5.          │
                      ╲                ╱                       └─────────────────────────┘
                          ╲────┬────╱
                               │ Yes
                          ╱────┴────╲                          ┌─────────────────────────┐
                      ╱   Does the     ╲       No              │ Perform the LED Board    │
                    ╱ Desk Station V+ Power╲ ───────────────▶  │ Troubleshooting procedures│
                    ╲ Icon light orange?  ╱                    │ in Section 2.3.          │
                      ╲                ╱                       └─────────────────────────┘
                          ╲────┬────╱
                               │ Yes
              ┌────────────────┴────────────────┐
              │  Connect the computer            │
              │  to the Desk Station V+.        │
              └────────────────┬────────────────┘
                               │
                          ╱────┴────╲                          ┌─────────────────────────┐
                      ╱   Does the     ╲       Yes             │ Perform the System Board │
                    ╱ Desk Station V+ Docking╲ ─────────────▶  │ and Motorized Mounting   │
                    ╲ Icon light orange?  ╱                    │ Unit Troubleshooting     │
                      ╲                ╱                       │ procedures in Section 2.6.│
                          ╲────┬────╱                          └─────────────────────────┘
                               │ No
                          ╱────┴────╲                          ┌─────────────────────────┐
                      ╱   Does the     ╲       No              │ Perform the System Board │
                    ╱ Desk Station V+ Docking╲ ──────────────▶ │ and Motorized Mounting   │
                    ╲ Icon light green?  ╱                     │ Unit Troubleshooting     │
                      ╲                ╱                       │ procedures in Section 2.6.│
                          ╲────┬────╱                          └─────────────────────────┘
                               │ Yes
              ┌────────────────┴────────────────┐
              │  Turn the computer or            │
              │  Desk Station V+ on.            │
              └────────────────┬────────────────┘
                               │                               ┌─────────────────────────┐
                          ╱────┴────╲                          │ Check the connection     │
                      ╱   Does the     ╲       No              │ between the computer and │
                    ╱ Desk Station V+ Power╲ ────────────────▶ │ Desk Station V+. Perform │
                    ╲ Icon light green?  ╱                     │ the Power Supply Unit    │
                      ╲                ╱                        │ Troubleshooting procedures│
                          ╲────┬────╱                          │ in Section 2.4 if the problem│
                               │ Yes                           │ still occurs.            │
                          ╱────┴────╲                          └─────────────────────────┘
                      ╱                ╲       No              ┌─────────────────────────┐
                    ╱ Does the Power Supply ╲ ───────────────▶ │ Perform the Fan         │
                    ╲ Unit Fan turn correctly?╱                │ Troubleshooting procedures│
                      ╲                ╱                       │ in Section 2.5.          │
                          ╲────┬────╱                          └─────────────────────────┘
                               │ Yes
              ┌────────────────┴────────────────┐
              │  Run the Desk Station V+         │
              │  Diagnostics Program.           │
              └────────────────┬────────────────┘
                               │
                          ╱────┴────╲                          ┌─────────────────────────┐
                      ╱                ╲       Yes             │ Perform the Diagnostic Test│
                    ╱ Is an error detected? ╲ ───────────────▶ │ Program Troubleshooting  │
                    ╲                    ╱                     │ procedures in Section 2.7.│
                      ╲                ╱                       └─────────────────────────┘
                          ╲────┬────╱
                               │ No
                        ┌──────┴───────┐
                        │     END      │
                        └──────────────┘
```
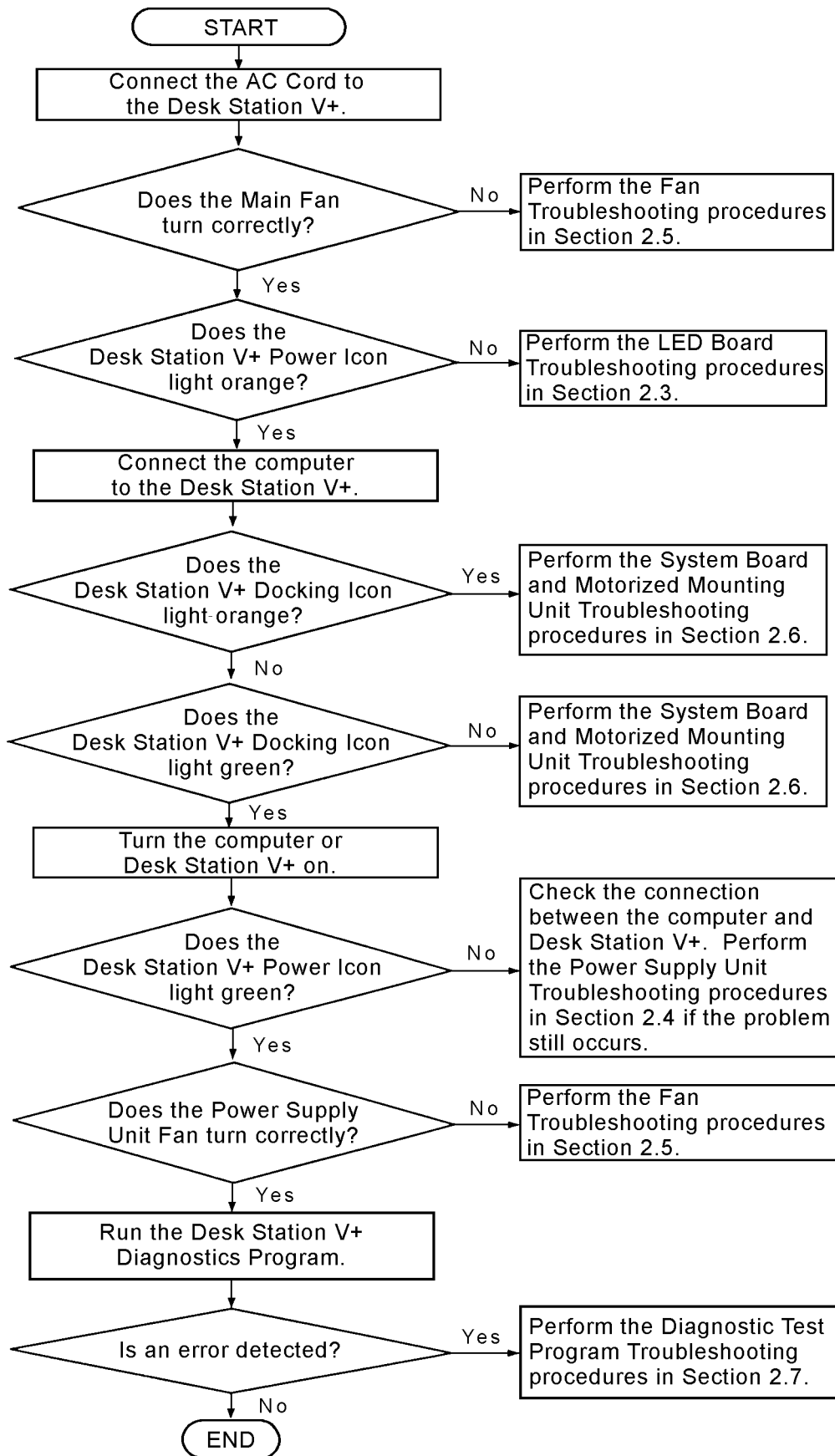
Figure 2-1 Troubleshooting flowchart
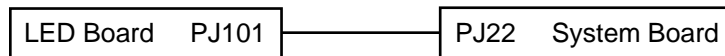
2.3 LED Board Troubleshooting

This section describes how to determine if the LED board is defective. Perform Procedure 1 as necessary. The procedure described in this section is:

Procedure 1:   Connector Check

Procedure 1   Connector Check

The LED board is connected to the system board by a cable. This cable may be disconnected. Check the connection. Disassembly procedures are described in Chapter 4, *Replacement Procedures*.

Check 1   Make sure the LED cable is properly connected to the system board as shown below:

```
┌─────────────────────┐          ┌──────────────────────┐
│ LED Board    PJ101  ├──────────┤ PJ22    System Board │
└─────────────────────┘          └──────────────────────┘
```

Restart the system. If the problem still occurs, perform Check 2.

Check 2   The LED board may be damaged. Replace it with a new one. Restart the system. If the problem still occurs, perform Check 3.

Check 3   The system board may be damaged. Replace it with a new one. Restart the system.

2.4   Power Supply Unit Troubleshooting

This section describes how to determine if the power supply unit is defective. Start with Procedure 1 and continue with the other procedures as instructed. The procedures described in this section are:

Procedure 1:   AC Cord Check

Procedure 2:   Power Supply Connector Check

Procedure 3:   Power Supply Output Voltage Check

Procedure 4:   Power Supply Unit Replacement Check

Procedure 1   AC Cord Check

Power is supplied to the Desk Station V+ from a wall outlet through the AC cord.

Check 1   Make sure the AC cord is firmly plugged into the AC IN socket on the back of the Desk Station V+.

Check 2   Unplug the AC cord from the Desk Station V+. Check the AC cord output voltage with a multimeter.

If output voltage is normal, perform Procedure 2.

If output voltage is abnormal, perform Check 3.

Check 3   Replace the AC cord with a new one. Perform Check 2 again. If the problem still exists, perform Procedure 2.

Procedure 2   Power Supply Connector Check

The Desk Station V+ power supply provides voltage to the system board through the power supply cables.

Check 1   Make sure the two power supply cables are properly connected to the system board as shown below:

```
┌──────────┐         ┌──────────────────┐
│  Power   │─────────│ PJ24             │
│  Supply  │         │      System Board│
│   Unit   │─────────│ PJ25             │
└──────────┘         └──────────────────┘
```
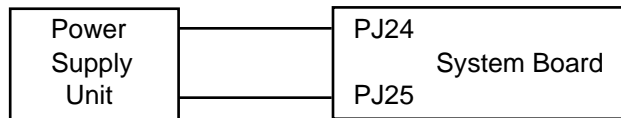
Restart the system. If the problem still exists, perform Check 2.

Check 2   The four power supply cables may be damaged. Perform Procedure 3.

Procedure 3   Power Supply Output Voltage Check

Table 2-1 shows the Desk Station V+ power supply output voltage specifications:

Table 2-1 Power supply output voltage specifications

Board name	PJ number	Pin number	Signal name
System board	PJ24	1	DOCPWN
		2	DOCPWN
		3	GND
		4	P12V
		5	FP12V
		6	NC
		7	DSVCC
		8	GND
		9	GND
		10	P3V
		11	P3V
	PJ25	1	DSG
		2	P15V
		3	GND
		4	M5V
		5	M12V
		6	GND
		7	GND
		8	VCC
		9	VCC
		10	PCONF

Check 1   Check the output voltage of each cable.

> *NOTE*: *To check the output voltage, a computer must be connected to the Desk Station V+ and the computer and the Desk Station V+ must be turned on.*

If the output voltage is normal, another unit may be damaged.

If the output voltage is abnormal, perform Procedure 4.

Procedure 4   Power Supply Unit Replacement Check

The power supply unit may be damaged. Replace the power supply unit following the procedures described in Chapter 4, *Replacement Procedures*.

If the problem still remains, the system board may be damaged. Perform the system board and motorized mounting unit troubleshooting procedures in Section 2.6.

2.5　Fan Troubleshooting

This section describes how to determine if the fans are defective. Start with Procedure 1 and continue with the other procedure as instructed. The procedures described in this section are:

> Procedure 1:　　Connector Check
>
> Procedure 2:　　Circuit Check

NOTE: To operate the power fan, a computer must be connected to the Desk Station V+, and the computer and Desk Station V+ must be turned on.

Procedure 1　　Connector Check

The main fan and the power supply unit fan are connected to the system board by cables. The cables may be disconnected. Open the top cover of the Desk Station V+ to check these connections. Disassembly procedures are described in Chapter 4, *Replacement Procedures*.

Check 1　　Make sure the fan cables are properly connected to the system board as shown below:

```
┌──────────────┐            ┌─────────────────────┐
│   Main Fan    │────────────│ PJ26                │
└──────────────┘            │        System Board │
┌──────────────┐            │ PJ36                │
│ Power Supply │────────────│                     │
│   Unit Fan    │            └─────────────────────┘
└──────────────┘
```
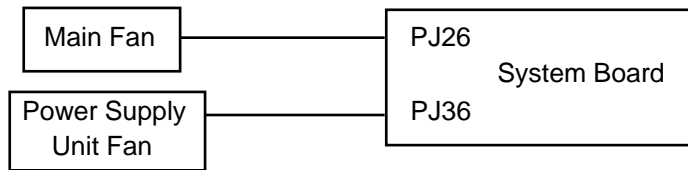
If a cable is disconnected, connect it. Restart the system. If the problem still occurs, perform Check 2.

Check 2　　The main fan or power supply unit fan may be damaged. Replace the main fan with a new one and restart the system.

If the problem still exists, the power supply unit fan may be damaged. Replace it with a new one and restart the system.

If the problem still occurs, perform Procedure 2.

Procedure 2　　Circuit Check

There may be problems with the circuit connecting the power supply. Perform the power supply unit troubleshooting procedures described in Section 2.4.

2.6 System Board and Motorized Mounting Unit Troubleshooting

This section describes how to determine if the system board or the motorized mounting unit is defective. Start with Procedure 1 and continue with other steps as instructed. The procedures described in this section are:

Procedure 1: Connections Between the Computer and the Desk Station V+ Check

Procedure 2: Connector and Replacement Check

Procedure 1 Connections Between the Computer and the Desk Station V+ Check

If the eject icon is flashing orange, the computer is not connected to the Desk Station V+. Go to Check 1.

Check 1 The Desk Station V+ is connected to the computer through the docking I/F connector. Check this connector, and connect the computer if it is not properly connected. Restart the system.

If the system still does not function properly, perform Procedure 2.

Procedure 2 Connector and Replacement Check

The interface unit is connected to the system board by a socket. This socket may be disconnected from the system board. Check this connection. Disassembly procedures are described in Chapter 4, *Replacement Procedures*.

Check 1 Make sure the motorized mounting unit is properly connected to the system board as shown below:

```
┌──────────────────────────┐        ┌────────────────────────┐
│ Sensor Board      PJ501  │────┐    │ PJ27                   │
└──────────────────────────┘    ├────┤           System Board │
┌──────────────────────────┐    │    │ PJ29                   │
│ Motorized Mounting Unit  │────┘    └────────────────────────┘
└──────────────────────────┘
```
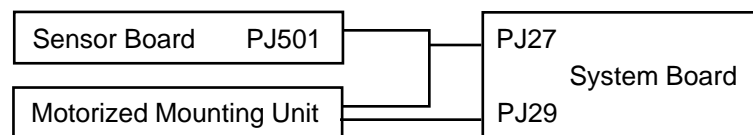
Restart the system. If the problem still occurs, perform Check 2.

Check 2 The motorized mounting unit or system board may be damaged. Replace the motorized mounting unit with a new one. Restart the system.

If the problem still exists, the system board may be damaged. Replace it with a new system board.

2.7   Diagnostic Test Program Troubleshooting

This section describes how to determine which part is defective when an error is detected on one of the items in the Diagnostic Test Program. Diagnostic Test Program operation is described in Chapter 3.

If an error is detected in any of the following tests, perform the appropriate procedure.

Procedure 1:	Printer Test Check
Procedure 2:	Serial Port Check (Async Test)
Procedure 3:	Expansion Test Check
Procedure 4:	Floppy Disk Test Check
Procedure 5:	Keyboard/Mouse Test Check
Procedure 6:	CD-ROM Test Check
Procedure 7:	Display Test Check
Procedure 8:	Enhanced IDE Drive Test Check

Procedure 1   Printer Test Check

Perform this procedure when an error is detected on Subtests 01 (Ripple pattern), 02 (Function), and 03 (Wraparound) of the Printer Test. Disassembly procedures are described in Chapter 4, *Replacement Procedures*.

Check 1   Make sure the printer and wraparound connectors are properly connected to the Desk Station V+. If the error still occurs, perform Check 2.

Check 2   The back panel board may be damaged. Replace it with a new one. If the error still occurs, perform Check 3.

Check 3   The system board may be damaged. Replace the system board with a new one. If the error still occurs, perform Check 4.

Check 4   The interface cable may be damaged. Replace it with a new one.

Procedure 2 Serial Port Check

Perform this procedure when an error is detected on Subtest 01 (Serial Port Wraparound) of the Async Test. Disassembly procedures are described in Chapter 4, *Replacement Procedures*.

Check 1   Make sure the RS-232-C wraparound connector is properly connected to the Desk Station V+. If the error still occurs, perform Check 2.

Check 2   Check that the computer's Setup Program is set correctly. Perform the test program again. If the error still occurs, perform Check 3.

Check 3   The back panel board may be damaged. Replace it with a new one. If the error still occurs, perform Check 4.

Check 4   The system board may be damaged. Replace the system board with a new one. If the error still occurs, perform Check 5.

Check 5   The interface cable may be damaged. Replace it with a new one.

Procedure 3 Expansion Test Check

Perform this procedure when an error is detected during the Expansion Test.

Check 1   Make sure the wraparound board is properly connected to the Desk Station V+. If the error still occurs, perform Check 2.

Check 2   Make sure the interface cable is properly connected. If the error still occurs, perform Check 3.

Check 3   The back panel board may be damaged. Replace it with a new one. If the error still occurs, perform Check 4.

Check 4   The system board may be damaged. Replace it with a new one. If the error still occurs, perform Check 5.

Check 5   The interface cable may be damaged. Replace it with a new one.
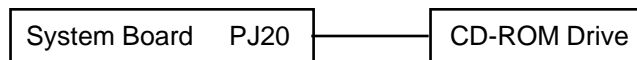
Procedure 4 Floppy Disk Test Check

Perform this procedure when an error is detected during the Floppy Disk Test. There are two sets of procedures, based on whether the FDD is connected to the selectable bay port or the selectable bay. Disassembly procedures are described in Chapter 4, *Replacement Procedures*.

When the FDD is connected to the **selectable bay port**, perform the following procedures:

Check 1   Make sure the FDD cable is properly connected to the FDD and Desk Station V+ selectable bay port. If the error still occurs, perform Check 2.

Check 2   Make sure you turn on the Desk Station V+ after you turn on the FDD. If the error still occurs, perform Check 3.

Check 3   The system board may be damaged. Replace the system board with a new one. If the error still occurs, perform Check 4.

Check 4   The selectable bay cable may be damaged. Replace it with a new one.

When the FDD is connected to the **selectable bay**, perform the following procedures:

Check 1   Make sure the selectable bay cable is properly connected between the FDD and the system board (PJ20) as shown below. If the error still occurs, perform Check 2.
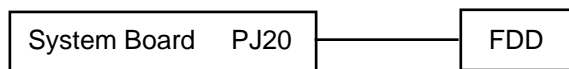
```
+---------------------------+        +-------+
| System Board    PJ20      |--------| FDD   |
+---------------------------+        +-------+
```

Check 2   The system board may be damaged. Replace it with a new one. If the error still occurs, perform Check 3.

Check 3   The FDD may be defective. Replace it with a new one.

Procedure 5   Keyboard/Mouse Test Check

Perform this procedure when an error is detected during the Keyboard (Mouse) Test. Disassembly procedures are described in Chapter 4, *Replacement Procedures.*

Check 1   Verify that the external keyboard cable or PS/2 mouse cable is properly connected to the Desk Station V+. If the error still occurs, perform Check 2.

Check 2   Make sure you turn on the Desk Station V+ after you connect the external keyboard or PS/2 mouse. If the error still occurs, perform Check 3.

Check 3   The back panel board may be damaged. Replace it with a new one. If the error still occurs, perform Check 4.

Check 4   The system board may be damaged. Replace it with a new one. If the error still occurs, perform Check 5.

Check 5   The interface cable may be damaged. Replace it with a new one. If the error still occurs, the 3.5-inch FDD may be defective.

Procedure 6   CD-ROM Test Check

Perform this procedure when an error is detected during the CD-ROM Test. There are two sets of procedures, based on whether the CD-ROM drive is connected to the selectable bay port or the selectable bay. Disassembly procedures are described in Chapter 4, *Replacement Procedures*.

When the CD-ROM drive is connected to the **selectable bay port**, perform the following procedures:

Check 1   Make sure the selectable bay cable is properly connected to the CD-ROM drive and Desk Station V+ selectable bay. If the error still occurs, perform Check 2.

Check 2   Make sure you turn on the Desk Station V+ after you turn on the CD-ROM drive. If the error still occurs, perform Check 3.

Check 3   The system board may be damaged. Replace the system board with a new one. If the error still occurs, perform Check 4.

Check 4   The selectable bay cable may be damaged. Replace it with a new one.

When the CD-ROM drive is connected to the **selectable bay**, perform the following procedures:

Check 1   Make sure the selectable bay is properly connected between the CD-ROM drive and the system board (PJ20) as shown below. If the error still occurs, perform Check 2.

```
┌────────────────────────┐         ┌──────────────────┐
│ System Board    PJ20   ├─────────┤  CD-ROM Drive    │
└────────────────────────┘         └──────────────────┘
```

Check 2   The system board may be damaged. Replace it with a new one. If the error still occurs, perform Check 3.

Check 3   The CD-ROM drive may be defective. Replace it with a new one.

Procedure 7   Display Test Check

Perform this procedure when an error is detected during the Display Test. Disassembly procedures are described in Chapter 4, *Replacement Procedures*.

When the external monitor is connected to the display port, perform the following procedures:

Check 1   Make sure the external monitor cable is properly connected to the Desk Station V+ display port. If the error still occurs, perform Check 2.

Check 2   Make sure you turn on the Desk Station V+ after you turn on the external monitor. If the error still occurs, perform Check 3.

Check 3   The back panel board may be damaged. Replace it with a new one. If the error still occurs, perform Check 4.

Check 4   The system board may be damaged. Replace it with a new one.

Procedure 8   Enhanced IDE Drive Test Check

Perform this procedure when an error is detected during the Enhanced IDE Drive Test. Disassembly procedures are described in Chapter 4, *Replacement Procedures*.

When the enhanced IDE drive is connected to the enhanced IDE port, perform the following procedures:

Check 1   Make sure the enhanced IDE cable is properly connected to the Desk Station V+ enhanced IDE port. If the error still occurs, perform Check 2.

Check 2   Make sure an IDE hard disk drive is installed in the computer. If an HDD is installed in the computer, remove the selectable bay module (HDD, CD-ROM, or FDD) and execute the test. If the error still occurs, perform Check 3.

Check 3   The system board may be damaged. Replace the system board with a new one.

3.1 The Diagnostic Test

> **NOTE**: *Use only the Desk Station V+ Diagnostic Test Program. Do not use the Diagnostic Programs for the 710CDT/720CDT or Enhanced Port Replicator II.*

This chapter explains how to use the Diagnostic Test Program to test the functions of the Desk Station V+'s hardware modules. The Diagnostics Program is stored on the Diagnostics Disk and consists of eight programs grouped into the Service Program Module (Diagnostics Menu) and 13 tests in the Test Program Module (Diagnostic Test Menu).

> **NOTE**: *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.*

The Diagnostics Menu consists of the following functions:

- ❏ DIAGNOSTIC TEST
- ❏ HARD DISK FORMAT
- ❏ HEAD CLEANING
- ❏ LOG UTILITIES
- ❏ RUNNING TEST
- ❏ FDD UTILITIES
- ❏ SYSTEM CONFIGURATION
- ❏ EXIT TO MS-DOS
- ❏ SETUP

Of the 13 functional tests in the Diagnostic Test Menu, 10 (*) programs are used for the Desk Station V+ test. Functional tests not marked by an asterisk are not used for the Desk Station V+.

- ❏ 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*
- ❏ SOUND TEST*
- ❏ CD-ROM TEST*

The service programs are the remaining Diagnostic Menu functions (hard disk format, etc.).

You will need the following equipment to perform some of the Diagnostic Test Programs.

❏ Diagnostics Disk (All tests)
❏ Formatted working disk (All tests)
❏ 3.5-inch 2HD/2DD disk for 3.5-inch FDD in the selectable bay (All tests)
❏ Cleaning kit to clean the floppy disk drive heads (Head Cleaning)
❏ PC card wraparound card (Expansion Test)
❏ Printer wraparound connector (Printer Test)
❏ Serial wraparound connector (Async Test)
❏ CD test media: BEX Test CD-ROM Audio-Combined TCDR-702 and music CD (CD-ROM Test)
❏ External (SVGA) monitor (All tests)
❏ External monitor ID wraparound cable (Expansion Test)
❏ PS/2 or compatible keyboard (All tests)
❏ PS/2 or compatible mouse (Keyboard Test)
❏ Multimedia sound system with line-in and line-out ports (Sound Test)
❏ Headphone (Sound Test)
❏ CD-ROM drive (CD-ROM Test)
❏ Computer system that can be connected to the Desk Station V+ (All tests)
❏ IDE HDD for the 5-inch Bay (Expansion Test)
❏ SCSI wraparound board (Expansion Test)
❏ PCI wraparound board (Expansion Test)
❏ ISA wraparound board (Expansion Test)
❏ Joystick wraparound board (Expansion Test)
❏ Speaker with amplifier (Sound Test)
❏ Joint cable for joystick port (Expansion Test)
❏ Stereo mini jack cable (Sound Test)
❏ Microphone (Sound Test)

The following sections detail the tests within the Diagnostic Test function of the Diagnostic Test Menu. For detailed information about the Diagnostic Test functions, see Sections 3.2 through 3.15. Refer to Sections 3.16 through 3.21 for detailed information on the service program functions. For an explanation of other functions, refer to the *710CDT/720CDT Maintenance Manual*.

3.2 Executing the Diagnostic Test

Running the Diagnostics Program requires Toshiba MS-DOS. To start the Diagnostics Program, follow these steps:

1. Set the computer on the Desk Station V+.

2. Insert the Diagnostics Disk in the computer's floppy disk drive and turn on the Desk Station V+ and the computer.

> *NOTE*: *If you intend to run the Floppy Disk Test, install the FDD in the Desk Station V+ selectable bay. If you intend to run the CD-ROM Test, install the optional CD-ROM drive in the Desk Station V+ selectable bay.*

The following menu appears:

```
TOSHIBA Personal Computer xxx DIAGNOSTICS
Version X.XX (C) Copyright TOSHIBA Corp. 19XX

DIAGNOSTICS MENU :

   1 - DIAGNOSTIC TEST
   2 - HARD DISK FORMAT
   3 -
   4 - HEAD CLEANING
   5 - LOG UTILITIES
   6 - RUNNING 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.*

3. To execute the Diagnostic Test Menu from the Diagnostics Menu, set the high-light bar to **1** and press **Enter**. The Diagnostic Test Menu appears:

```
TOSHIBA Personal Computer xxx DIAGNOSTICS
Version X.XX (C) Copyright TOSHIBA Corp. 19XX
DIAGNOSTIC TEST MENU :
 1 - SYSTEM TEST
 2 - MEMORY TEST
 3 - KEYBOARD TEST
 4 - DISPLAY TEST
 5 - FLOPPY DISK TEST
 6 - PRINTER TEST
 7 - ASYNC TEST
 8 - HARD DISK TEST
 9 - REAL TIMER TEST
10 - NDP TEST
11 - EXPANSION TEST
12 - SOUND TEST
13 - CD-ROM 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 3.12 for detailed descriptions of Diagnostic Tests 1 through 13. 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 Diagnostics Menu.

4. Select the option you want to execute and press **Enter**. For example, if you select 11 - EXPANSION TEST, the following message appears:

```
 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 -     PCMCIA wraparound
    02 -     DS bus wraparound
    03 -     RGB monitor ID
    04 -     Joystick
    05 -     Joystick wraparound
    06 -     ISA bus wraparound
    07 -     PCI bus wraparound
    08 -     SCSI bus wraparound
    99 -     EXIT TO DIAGNOSTICS MENU
                           ↑↓→←  :  Select items
                           Enter :  Specify
                           Esc   :  Exit
```

> *NOTE*: *The menu your computer displays may differ slightly from the one shown above.*

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

```
TEST LOOP   :   YES
```

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 Diagnostic Test Menu after the test is complete.

6.   The following message appears:

```
ERROR STOP  :  YES
```

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 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.

7.   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 3.14 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 Diagnostic Test Menu subtest names (1/2)

No.	Test name	Subtest no.	Subtest item
1	SYSTEM	06	Serial ID check
		07	DSC version
		08	Key position check
3	KEYBOARD	01	Pressed key display
		02	Pressed key code display
		03	PS/2 mouse connect check
		04	Pointing stick
4	DISPLAY	11	Color display
5	FLOPPY DISK	01	Sequential read
		02	Sequential read/write
		03	Random address/data
		04	Write specified address
		05	Read specified address
6	PRINTER	01	Ripple pattern
		02	Function
		03	Wraparound
7	ASYNC	01	Wraparound (board)
		02	Point to point (send)
		03	Point to point (receive)
8	HARD DISK	01	Sequential read
		02	Address uniqueness
		03	Random address/data
		04	Cross talk & peak shift
		05	Write/read/compare (CE)
		06	Write specified address
		07	Read specified address
		08	ECC circuit
		09	Sequential write
		10	W-R-C specified address

Table 3-1 Diagnostic Test Menu subtest names (2/2)

No.	Test name	Subtest no.	Subtest item
11	EXPANSION	01	PCMCIA wraparound (EXT)
		02	DS bus wraparound
		03	RGB monitor ID
		04	Joystick
		05	Joystick wraparound
		06	ISA bus wraparound
		07	PCI bus wraparound
		08	SCSI bus wraparound
12	SOUND	01	CODEC (REC/PLAY)
		02	FM-synthesizer
		03	SIN wave playback
		04	CODEC (line in/out)
13	CD-ROM	01	Sequential read
		02	Read specified address
		03	Random address/data
		04	Playback music
		05	5 1/2-inch Bay Sound Test

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**.

Subtests 01 to 05   Not used

Subtest 06   Serial ID Check

Checks the Desk Station V+ serial ID, which is stored in EEPROM. If the ID is not found, this test generates a four-byte random number plus one checksum byte. It writes the four-byte number to EEPROM address 88h-8Bh and the one checksum byte to 8Fh.

Subtest 07   DSC Version

Checks the DSC version.

Subtest 08   Key Position Check

Checks the position of the Desk Station V+ key. To execute the test, insert the key, turn it to the NORMAL position, and press **Enter**. Turn the key again and a message should indicate its current position.

3.5 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 actions. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01   Pressed Key Display

> *NOTES*:
> 1. *To execute Subtest 01 or 02, a PS/2 keyboard must be connected to the Desk Station V+.*
> 2. ***Num Lock*** *and* ***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 an "*" character. Holding a key down enables the auto-repeat function, which causes the key's display character to blink.

```
      [[[   Press Key Display   ]]]
```
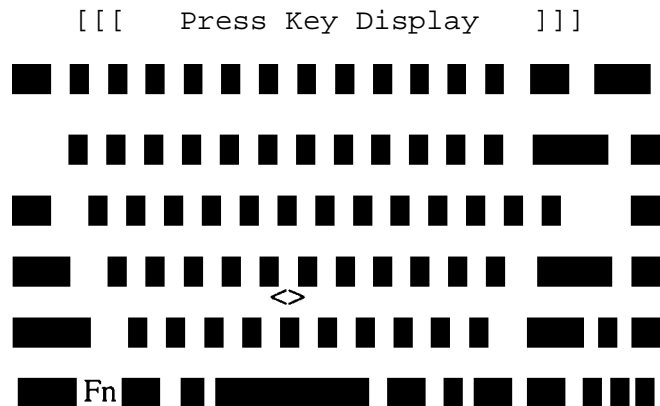
```
          If test OK, Press [Del] [Enter] Key
```

Subtest 02   Pressed Keycode Display

> ***NOTE****: To execute this subtest, a PS/2 keyboard must be connected to the Desk Station V+.*

When a key is pressed, the scan code, character code, and keytop name display on the screen in the format shown below. The **Ins**, **Caps Lock**, **Num Lock**, **Scroll Lock**, **Alt**, **Ctrl**, **Left Shift**, and **Right Shift** keys display in reverse screen mode when pressed.

```
KEYBOARD TEST  IN PROGRESS  302000

            Scan code      =
            Character code =
            Keytop         =

Ins Lock Caps Lock  Num Lock   Scroll Lock
Alt      Ctrl       Left Shift Right Shift

PRESS [Enter] KEY
```

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 Desk Station V+.*

Checks whether a PS/2 mouse is connected.

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

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

```
KBD - MOUSE INTERFACE ERROR

                               [[ HALT OPERATION ]]

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

Subtest 04   Pointing Stick

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 by displaying the location parameters. When the stick is pressed towards the upper left, the <POINTING> display changes according to the following illustration. If an IPS switch is pressed, the <BUTTON> display alternates between black and white. Also, the parameters appear on the right side of the display. If two IPS switches are pressed at the same time, the subtest menu displays.

```
*****   IPS TEST PROGRAM (V1.00)   *****

      < POINTING >          < PARAMETER >
                              STATUS:0008h
                              X-RATE:0000h
                              Y-RATE:0000h


                              < BUTTON >

                            (1)        (2)



      << PRESS BUTTON1 + BUTTON2 THEN END >>
```

There are eight directions of arrow marks as shown below.

When a button is pressed, the display alternates as shown below.

3.6   Display Test

> *NOTE*: *To execute the Display Test, an external monitor must be connected to the Desk Station V+ external monitor port.*

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 one subtest (Subtest 11) that tests the computer's display. To execute Subtest 11, move the highlight bar to the subtest and press **Enter**.

Subtests 01 to 10   Not used

Subtest 11   Color Display

Sets the video mode to "13," displays color code (0 to 63) at the same time, and then displays seven screens. The first screen shows many colors at once; the next three display 64 shades of red, green, and blue successively; and the last three display 64 shades of red, green, and blue. Also, it sets the video mode "5F" and displays 256 colors.

Press **Enter** to change the display. Press **Ctrl** + **Break** to exit.

3.7 Floppy Disk Test

> *NOTES:*
> 1. *To execute Floppy Disk Test, an FDD must be connected to the Desk Station V+ selectable bay.*
> 2. *Before running the Floppy Disk Test, prepare a formatted work disk. Remove the Diagnostics Disk and insert a 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 on the screen. The Floppy Disk Test contains five subtests that test the FDD connected to the Desk Station V+ selectable bay. The following messages appear after selecting the Floppy Disk Test from the Diagnostic Test Menu. To execute the test, answer each question with an appropriate response.

1. Select the test drive number of the floppy disk drive to be tested and press **Enter**.

    ```
    Test drive number select (1:FDD#1,2:FDD#2,0:FDD1&2) ?
    ```

2. Select the media type of the floppy disk in the test drive to be tested and press **Enter**.

    ```
    Media in drive #X mode (0:2DD,1:2D,2:2D-2HD/2DD,3:2HD) ?
    ```

    If you select media type 3 (2HD), select the 2HD media mode of the floppy disk in the test drive to be tested and press **Enter**.

    ```
    2HD Media mode (1:1.20MB,2:1.44MB) ?
    ```

3. Select the track you want the test to start on and press **Enter**. Simply pressing **Enter** sets the start track to zero.

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

4. The Floppy Disk Test Menu appears after you select the start track number. Select the number of the subtest you want to execute and press **Enter**. The following message appears during the Floppy Disk Test.

    ```
    FLOPPY DISK        XXXXXXX
                                xxxx DIAGNOSTIC TEST VX.XX
                                [Ctrl]+[Break]  ; test end
                                [Ctrl]+[C]      ; key stop
    ```

Subtest 01   Sequential Read

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 Floppy Disk 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

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

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

Writes specified data to a specified track, head, and address.

Subtest 05   Read Specified Address

Reads data from a specified track, head, and address.

3.8 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.

> *NOTE*: *An IBM compatible printer must be connected to the Desk Station V+ to execute this test.*

The following message appears 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

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 Desk Station V+ printer port. The printer wraparound connector (34M741986G01) wiring diagram is described in Appendix B.

Checks the output and bidirectional modes of the data control and status lines through the printer wraparound connector.

3.9 Async Test

To execute the Async Test, select **7** from the Diagnostic Test Menu, press **Enter**, and follow the directions on the screen. The Async Test contains three subtests (Subtests 01 through 03) that test the asynchronous communication functions. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtests 01 through 03 require the following data format:

    Method: Asynchronous
    Speed: 9600BPS
    Data: 8 bits and one parity bit (EVEN)
    Data pattern: 20h to 7Eh

The following message appears at the bottom of the screen when a subtest is 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. Press **Enter** to start the subtest.

Subtest 01   Wraparound (Board)

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

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-232-C direct cable. One machine should be set as "send" (Subtest 03) and the other set as "receive" (Subtest 04). The wiring diagram for the RS-232-C direct cable is described in Appendix B.*

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)

Used with Subtest 03 described above. Receives the data from the send side, then sends the received data.

Subtests 04 to 07   Not used

3.10 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 drive 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 drive to floppy disk. If the customer has not or cannot perform the backup, create backup disks as described below.

1. *If MS-DOS 6.22/Windows for Workgroups was selected, use the Master Diskette Creator (MDC) utility in the Toshiba Utility folder to back up the preinstalled software. After backing up the preinstalled software, use the BACKUP command in the Toshiba Companion Utility to back up the entire disk, including the user's files.*
2. *If Windows 95 was selected, 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 preinstalled 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 appropriate instructions for each operating system.

The following messages appear after selecting the Hard Disk Test from the Diagnostic Test Menu. To execute the test, answer each of the following questions with an appropriate response:

1. When you select the Hard Disk Test from the Diagnostic Test Menu, the following message appears:

   ```
   Test drive number select (1:HDD#1,2:HDD#2,0:HDD1&2) ?
   ```

2. Select the hard disk drive number to be tested and press **Enter**. The following message appears:

   ```
   HDC F/W error retry  (1:yes,2:no) ?
   ```

3. This message is used to select the retry operation when the hard disk controller detects an error.   Select **1** or **2** and press **Enter**. The following message appears:

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

4. This message is used to select the error dump operation when a data compare error is detected. Select **1** or **2** and press **Enter**. The following message appears:

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

5. This message is used to select whether the HDD status displays on the screen. The HDD status is described in Section 3.15. Select **1** or **2** and press **Enter**.

6. The Hard Disk Test message appears after you respond to the Detail Status prompt. Select the number of the subtest you want to execute and press **Enter**. The following message appears 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; the last two digits indicate the error status code as explained in Table 3-2.

Subtest 01   Sequential Read

Reads all HDD tracks sequentially, 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

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

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

Writes eight types of worst pattern data (shown 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)

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

Writes specified data to a specified cylinder and head on the HDD.

Subtest 07   Read Specified Address

Reads data which has been written to a specified cylinder and head on the
HDD.

Subtest 08   ECC Circuit

Checks the Error Check and Correction (ECC) circuit functions of the speci-
fied cylinder and head on the HDD.

Subtest 09   Sequential Write

Writes specified 2-byte data to all of the cylinders on the HDD.

Subtest 10   W-R-C Specified Address

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

3.11 Expansion Test

To execute the Expansion Test, select **11** from the Diagnostic Test Menu, press **Enter**, and follow the directions on the screen. The Expansion Test contains eight subtests that test the asynchronous communication functions. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01   PCMCIA Wraparound (EXT)

> *NOTE: To execute this subtest, the PC card wraparound card is re-quired.*

Checks the following signal lines of the Desk Station V+ PC card slot:

❑ Address line

❑ REG#, CE#1, CE#2 line

❑ Data line

❑ Speaker line

❑ Wait line

❑ BSY#, BVD1 line

Executes 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

Subtest 02   DS Bus Wraparound

Connect the board to be tested to the PCI configuration register and execute all BIOS function calls. Bit shift executes on test data AAAAAAAh, 55555555h, and 00000001h to 40000000h.

Subtest 03   RGB Monitor ID

> *NOTE: When you execute Subtest 3, set the LOOP to NO and ERROR STOP to YES. After executing Subtest 3, turn off or reboot the computer; otherwise the computer will hang up.*

Use an RGB monitor ID wraparound port (UL0232P05). Connect the board to be tested to the general index port (Port/Index:Data) = (E4/E5:F1h).

The first 0FFh data is written to this port; then it is read and compared to the original data. The following shows the write data and compare data.

Write	Compare
FEh	xAh
FDh	x5h
FBh	xAh
F7h	x5h

Subtest 04   Joystick

To execute this subtest, a joystick is required. For minimum sampling data, turn the stick to the upper left and press the A or B button. For maximum sampling data, turn the stick to the lower right and press the A or B button (it must be a different button than the one used for minimum sampling data). If two sampling data are the same, an error occurs.

Subtest 05   Joystick Wraparound Test

Use the joystick wraparound connector (FWTJSO) (B36074081010) and the joint cable for the joystick port. Control is from the printer port to the joystick port.

Press the joystick buttons (A and B) to check their operation. Move the joystick to check the X and Y axes.

Subtest 06   ISA Bus Wraparound

Checks the following items:

❏ OSC/SYSCB/ALE,REFM signal

❏ Interrupt test

❏ DMA test

❏ Data line test

❏ Address line test

❏ CNT test

❏ IO16 test

❏ Master test

❏ DMA #2 test

❏ Power line (-12, +12, -5V)

❏ A17-23 test

Subtest 07   PCI Bus Wraparound

Checks the following items:

❏ Vendor ID verification

❏   Register write

❏   Memory write/read

❏   Master test

❏   Interrupt test

Subtest 08   SCSI Bus Wraparound

> *NOTE: Before you execute Subtest 8, load the PSCSIDRV and SCSIAUI files.*

The SCSI connector is a 50-pin connector and an 18-pin interface that is used to test for shorts and broken or disconnected wires. If an error is found, the signal name below displays on the screen.

Data line	Control line	Signal name
(DB0)	Attention	ATN
(DB1)	Busy	BSY
(DB2)	Acknowledge	ACK
(DB3)	Reset	RST
(DB4)	Message	MSG
(DB5)	Select	SEL
(DB6)	Command/Data	C/D
(DB7)	Request	REQ
(DBP)	Input/Output	I/O

3.12 Sound Test

To execute the Sound Test, select **12** from the Diagnostic Test Menu, press **Enter**, and follow the directions on the screen. The Sound Test contains four subtests that test the computer's sound functions.

> *NOTE*: *To execute this subtest, an external microphone and external headphone (or internal speaker) are required.*
>
> *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.*

Subtest 01   CODEC (REC/PLAY)

Tests the functions of the CODEC (AD1848) A/D, D/A converter. At the same time, tests the microphone terminals and headphone terminals. When you execute this subtest, the following message displays.

```
[Quick REC & PLAY for AD1848]
Press any key to *** REC ***
```

After pressing any key, start recording and immediately play the sound. (It takes three seconds.)

Subtest 02   FM Synthesizer

Tests the OPL# (YMF262) functions. Connect the headphone and check the scale on the right and left sides. Check the sound adjustment volume.

Subtest 03   SIN Wave Playback

Expands the sine wave data table to 64 KB and creates sine wave data. The play data is transferred between DMA and CODEC, and plays the sound. (It is a long beep.) Also, using the oscilloscope, observe the sine waveform.

Subtest 04   CODEC Line In/Out

> *NOTE*: *The Desk Station V+ must be connected to conduct the line-out*
> *test.*

Load the file ESS688L.COM. Connect a sound source such as a CD player or
stereo to the line-in port. Next, connect an output device such as an amplifier
for the internal speaker or a radio/cassette player to the line-out port.

After making the connections, a dialogue box displays. Press **Enter** to play a
recorded sound. About three seconds after the recorded sound plays, the
dialogue box displays again.

3.13 CD-ROM Test

> *NOTE: To execute the CD-ROM Test, an optional CD-ROM drive must be connected to the Desk Station V+ selectable bay*

First, make sure the CD-ROM driver (CDROMDRV.COM) is installed; then insert the test media CD (BEX Test CD-ROM (Audio-Combined) TCDR-702). To execute the CD-ROM Test, select **13** from the Diagnostic Test Menu, press **Enter**, and follow the directions on the screen. The CD-ROM Test contains five subtest that test the CD-ROM functions of the CD-ROM drive connected to the Desk Station V+ selectable bay.

Subtest 01   Sequential Read

Sequentially reads one block unit (512 bytes) of all logical addresses.

Subtest 02   Random Address/Data

Reads one-block data and multi-block data from random addresses 200 times.

Subtest 03   Read Specified Address

Reads one-block of data from the specified address.

Subtest 04   Playback Music

> *NOTE: The BEX Test CD-ROM (Audio-Combined) TCDR-702 cannot be used for Subtest 04. For this test, use an ordinary music CD.*

Reads track data from a specified track and plays the sound.

Subtest 05   5 1/2-Inch Bay Sound Test

Connect a sound connector to the 5 1/2-inch bay, sound test tools (UL0245P02 and UL0232P03) to a sound connector, and a sound reproduction tool such as a CD player to the sound test tools. Tests that the CD player sounds are reproduced through the Desk Station V+ speakers.

3.14 Diagnostic Test Error Codes and Status Names

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

Table 3-2 Diagnostic Test error codes and status names (1/2)

Device name	Error code	Error status name
(Common)	FF	Data Compare Error
System	02	Location ID Error
	03	Serial ID Write Error
	04	Version Check Error
	05	Key Sensor Error
Keyboard	01	Mouse Interface Error
	02	IPS Interface Error
	03	Interface Error
	04	Retransmit Error
	05	Mouse Handler Not Supported
	06	PS/2 Mouse & IPS Not Connected
FDD	01	Bad Command
	02	Address Mark Not Found
	03	Write Protected
	04	Record Not Found
	06	Media Removed
	08	DMA Overrun Error
	09	DMA Boundary Error
	10	CRC Error
	20	FDC Error
	40	Seek Error
	60	FDD Drive Error
	80	Time Out Error
	EE	Write Buffer Error
Printer	01	Time Out
	08	Fault
	10	Select Line
	20	Out Of Paper
	40	Power Off
	80	Busy Line
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
	80	Line Status Error
	88	Modem Status Error

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

Device name	Error code	Error status name
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 Recovery Enabled
	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
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
CD-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
	B0	Address Error

3.15 Hard Disk Test Detail Status

When an error occurs in the Hard Disk Test, the following message displays:

```
HDC status = XXXXXXXX
```

Detailed information about the Hard Disk Test error displays on the screen by an eight-digit number. The first four digits represent the hard disk controller (HDC) error status number; 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; 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 to accept any command.
5	DWF (Drive write fault)	"0" --- DWF error is not detected. "1" --- Write fault condition occurs.
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 some error.

Table 3-4 Hard disk controller 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 occurs.
1	TK00 (Track 0)	"0" --- The hard disk has found track 0 during a recalibrate command. "1" --- The hard disk could not find track 0 during a recalibrate command.
0	——	Not used.

3.16 Hard Disk Format

This command executes hard disk drive formatting. There are two types of hard disk drive formatting:

- ❏ Low-level (physical) formatting
- ❏ MS-DOS (logical) formatting

This hard disk format function performs a low-level format of the hard disk drive and executes the following hard disk formats and check:

1. All track FORMAT
2. Good track FORMAT
3. Bad track FORMAT
4. Bad track CHECK

NOTE: *The contents of the hard disk drive will be erased when this program is executed. Before executing this function, the customer should transfer the contents of the hard disk drive to floppy disk. If the customer has not or cannot perform the backup, create backup disks as described below.*
1. *If MS-DOS 6.22/Windows for Workgroups was selected, use the Master Diskette Creator (MDC) utility in the Toshiba Utility folder to back up the preinstalled software. After backing up the preinstalled software, use the BACKUP command in the Toshiba Companion Utility to back up the entire disk, including the user's files.*
2. *If Windows 95 was selected, 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 preinstalled 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 appropriate instructions for each operating system.

3.16.1   Function Description

1.   All Track FORMAT

Performs a low-level format of all the tracks on the hard disk drive as shown in
Table 3-5.

> *NOTE: Before executing this option, check for bad tracks using the Bad
> Track CHECK option or display a list of bad tracks on the HDD.*

Table 3-5 Hard disk drive formatting sequence

Item	MK2720FC
Storage capacity formatted (bytes)	1,216,954,368
Cylinder	2,358
Heads	16
Sectors	63
Bytes per sector	512
Rotation speed (rpm)	4,200
Recording method	8 - 9 RLL

2.   Good Track FORMAT

Formats a specified cylinder and track as a good track. If a good track is format-
ted as a bad track, use this option to change the track to a good track.

3.   Bad Track FORMAT

Formats a specified cylinder and track as a bad track. If a bad track is detected,
use this option to label it as a bad track.

4.   Bad Track CHECK

Searches the hard disk drive for bad tracks by reading data to all the tracks on the
hard disk drive. A list of bad tracks displays when the program is complete. If an
error other than a bad track is detected, the program automatically terminates.

3.16.2 Operations

> *NOTE: After the HDD has been formatted, execute the Toshiba MS-DOS FDISK command to partition the HDD. Next, execute the Toshiba MS-DOS FORMAT command. Refer to the Toshiba MS-DOS manual for more information about using these commands.*

Selecting Test 2 from the Diagnostics Menu and pressing **Enter**, displays the following messages:

```
DIAGNOSTICS - HARD DISK FORMAT : VX.XX

   1 - All track FORMAT
   2 - Good track FORMAT
   3 - Bad track FORMAT
   4 - Bad track CHECK
   9 - Go to TEST MENU

 ↑↓→← : Select items, Enter: Finish, Esc: Exit
```

1. All Track FORMAT

   Pressing 1 selects All track FORMAT, which lets you format the entire disk.

   ```
   [All track FORMAT]

   Drive :    #1 = HDD   #2 = Non
   Cylinder  :    XXXX
   Head  :    XX
   Sector    :    XX

   <<< Model name = >>>
   ```

   The following selections also appear at the bottom of the screen in succession:

   (a) Drive Number

   ```
       Drive number select (1:#1,2:#2) ?
   ```

   Select a drive number and press **Enter**.

   (b) Interleave Number

   ```
       Interleave number (1/1 ~ 8) ?
   ```

   Select an interleave number (1 - 8) and press **Enter**. Pressing only **Enter** selects 1.

(c)   Bad Track Register

Next, the Bad Track Register prompt appears as shown below. Enter the cylinder and head numbers of bad tracks and press **Enter**. Note that if there are no bad tracks, pressing **Enter** alone is the same as executing All Track Format described in Item (d) below.

```
    [ WARNING : Current DISK data will be
                 completely destroyed ]

    Press Bad cylinder number (dddd)] key ?
    Press Bad head number (dd)] key ?
```

Enter the cylinder and head number in the format above in decimal notation. Repeat for each bad track you want to format.

After entering the bad tracks, press **Enter** to execute the format.

(d)   All Track Format

All tracks are formatted as good tracks except those registered as bad tracks in Item (c) above or those identified as bad tracks in track verification described in Item (e) below.

(e)   Track Verification

A check is made of all tracks. If an ECC error, ECC-correctable-data error, or record-not-found error is detected at a track, that track is automatically formatted as a bad track.

2.   Good Track FORMAT

If a good track has been erroneously formatted as a bad track, you can use this subtest to reformat the track as a good track. To format a track as a good track, enter the number for drive, interleave, cylinder, and head as indicated in the screen prompt shown below.

```
    Drive number select (1:#1, 2:#2) ?
    Interleave number (1 / 1 - 8) ?
        Press [Cylinder number (dddd)] ?
        Press [Head number (dd)] ?
```

Press **Enter** to return to the Hard Disk Format Menu.

3. Bad Track FORMAT

   To format a track as a bad track, enter the number for drive, interleave, cylinder, and head as indicated in the screen prompt shown below.

   ```
   Drive number select (1:#1, 2:#2) ?
   Interleave number (1 / 1 - 8) ?
       Press [Cylinder number (dddd)] ?
       Press [Head number (dd)] ?
   ```

   Press **Enter** to return to the Hard Disk Format Menu.

4. Bad Track CHECK

   Reads the entire disk and displays a list of bad tracks. If a bad track check error occurs, the test is terminated. To initiate the subtest, enter the drive number at the prompt shown below.

   ```
   Drive number select (1:#1, 2:#2) ?
   ```

   Bad tracks display in the format shown below.

   ```
   [[cylinder, head = 0123 03]]
   ```

   Press **Enter** to return to the Hard Disk Format Menu.

3.17 Head Cleaning

3.17.1   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.

3.17.2   Operations

1. Selecting Test **4** from the Diagnostics 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, 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 Diagnostics Menu when the program is completed.

3.18 Log Utilities

3.18.1   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 displays 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)

3.18.2   Operations

1.   Selecting **5** from the Diagnostics Menu and pressing **Enter**, logs error information into RAM or onto a floppy disk. The error information displays in the following format:

```
    XXXXX ERRORS
CNT TS-NAME PASS STS ADDR    WD RD HSTS [STATUS NAME]

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

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

2.   The error information that displays 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 Diagnostics 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.

3.19 Running Test

3.19.1   Function Description

This function automatically executes the following tests in sequence:

1.   Display Test (Subtest 11)
2.   Floppy Disk Test (Subtest 02)
3.   Hard Drive Test (Subtest 05)
4.   Sound Test (Subtest 02)
5.   Expansion Test (Subtests 02, 03, and 05)

The system automatically detects the number of floppy disk drives connected to the computer for the Floppy Disk Test.

3.19.2   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 FDD testing.

1.   Remove the Diagnostics Disk from the floppy disk drive and insert the work disk.

2.   Select **6** from the Diagnostics 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 appears:

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

Selecting **Y (yes)** executes the Async Wraparound Test. An RS-232-C wrap-around 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 appears :

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

5.   This program executes continuously. To terminate the program, press **Ctrl** +
Break.

3.20 Floppy Disk Drive Utilities

3.20.1   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.*

Format a 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

Copies data from a source floppy disk to a target floppy disk.

3.   DUMP

Displays the contents of the floppy disk and the designated sectors of the hard disk drive on the display.

3.20.2   Operations

1.   Selecting **7** from the Diagnostics Menu and pressing **Enter** displays the following message:

```
[ FDD UTILITIES ]

    1 - FORMAT
    2 - COPY
    3 - DUMP
    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-2DD,1:2D-2D,2:2D-2HD,3:2HD-2HD) ?
```

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

```
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 displays when the FDD format executes:

```
[ 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 appears:

```
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 Diagnostics Menu.

3.   COPY Program

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

```
FLOPPY DISK FORMAT & COPY : VX.XX
Type select (0:2DD-2DD,1:2D-2D,2:2D-2HD,3:2HD-2HD) ?
```

(b) Selecting a media/drive type number displays 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 appears, 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 appears and the data starts 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 appears:

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

(e) To copy another disk, type **1** and the message from Step 1 displays again. Entering **2** returns the test program to the Diagnostics 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 **C or D** is selected, the display goes to Step (e).

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

(c) Select a drive number and the following message displays:

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

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

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

(e)   Insert a source disk and press any key. The following message appears:

```
—— Max. address ——
[Track ] = 0079
[ Head ] = 01
[Sector] = 09

Track number ??
```

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

3.21 System Configuration

3.21.1   Function Description

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

1. BIOS ROM version
2. Boot ROM version
3. KBC version
4. PS microprocessor version
5. Base memory size
6. Number of floppy disk drives
7. Number of async ports
8. Number of hard disk drive drives
9. Number of printer ports
10. Extended Memory Size
11. Number of math co-processors

3.21.2   Operations

Selecting **8** from the Diagnostics Menu and pressing **Enter** displays the following system configuration:

```
SYSTEM CONFIGURATION :

   * - BIOS ROM VERSION = VX.XX
   * - BOOT ROM VERSION = VX.XX
   * - KBC VERSION      = VX.XX
   * - PS MICOM VERSION = VX.XX
   * - 639KB MEMORY
   * - 1 FLOPPY DISK DRIVE(S)
   * - 1 ASYNC ADAPTER
   * - 1 HARD DISK DRIVE(S)
   * - 1 PRINTER ADAPTER
   * - XXXMB + XXXXKB EXTENDED MEMORY
   * - 1 MATH CO-PROCESSOR

Press [Enter] Key
```

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

4.1   General

This section explains how to disassemble the Desk Station V+ 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. Follow the chart to determine which FRU you must remove next in order to repair the one you think is causing the Desk Station V+ to operate improperly.

❑ Cover
❑ Key Unit
❑ Fan
❑ Rear Panel
❑ Motorized Mounting Unit
❑ Interface Cable
❑ Sensor Board
❑ 5-Inch Expansion Bay
❑ Selectable Bay
❑ Speaker
❑ LED Board
❑ Separator Frame
❑ Middle Frame
❑ Power Supply Unit
❑ System Board

Safety Precautions

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

> *DANGER:*
> 1. *The power supply and other components carry high voltages. To avoid the risk of electric shock when you need to turn on the power of a partially disassembled Desk Station V+ to check its operation, be very careful not to touch connectors or components. Also, do not disassemble individual components during first-level maintenance.*

> *WARNING:*
> **To avoid the risk of electric shock or other injury:**
> 1. *Always turn the power off and disconnect the AC power cord from the power source.*
> 2. *Remove any metal jewelry or accessories such as necklaces, bracelets, or rings. Batteries in the computer retain electrical charge, so there is danger of electrical shock even when the computer is disconnected from an AC power source.*
> 3. *Never work with wet or damp hands.*
> 4. *The Desk Station V+ contains many sharp edges and corners, so be careful not to injure yourself.*
> 5. *Make sure that all replacement components meet the specifications for the Desk Station V+ and that all cables and connectors are securely fastened.*

> *CAUTION:*
> **To avoid damage to the Desk Station V+:**
> 1. *When you change a component, be sure the replacement component meets the required specifications. Never use foreign parts.*
> 2. *Be sure metal objects such as screws or paper clips do not fall into the unit. They can cause short-circuit, fire, or other internal damage.*
> 3. *When assembling the Desk Station V+, make sure you use the correct screws to secure the various pieces place. Screw sizes are listed in the corresponding figures. Make sure all screws are securely fastened. Loose screws can cause short circuits, resulting in heat, smoke, or fire.*
> 4. *Before removing an FRU or other component, make sure all cables to the component have been disconnected.*
> 5. *If you use AC power, be sure to use the cable that came with the Desk Station V+ or one recommended by Toshiba.*

Before You Begin

Look over the procedures in this section before you begin disassembling the Desk Station V+. Familiarize yourself with the disassembly and reassembly steps. Begin each procedure by removing the AC power cord:

1. Do not disassemble the Desk Station V+ 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 Desk Station V+:

    ❑   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 Desk Station V+.

6. After removing parts from the Desk Station V+, place them in a safe place away from the Desk Station V+ 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 Desk Station V+. Make sure screws are placed in a safe place and identified with the correct parts.

8. When assembling the Desk Station V+, make sure you use the correct screws to secure the various pieces in place. Screw sizes are listed in the corresponding figures.

9. The Desk Station V+ contains many sharp edges and corners, so be careful not to injure yourself.

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

Disassembly Procedures

The Desk Station V+ 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 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 the connector out, 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 Desk Station V+ and fixed or repaired the problem that was causing the Desk Station V+ to operate abnormally, you will need to reassemble the Desk Station V+.

While assembling the Desk Station V+, remember the following general points:

❑   Take your time, making sure you follow the instructions closely. Most problems arise when you hurry to assemble the Desk Station V+.

❑   Make sure all cables and connectors are securely fastened.

❑   Before securing the FRU or other parts, make sure that no cables will be pinched by screws or the FRU.

❑   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 damage the threads or the head of the screw and may prevent proper seating of an FRU.

After installing an FRU in the Desk Station V+, confirm that the FRU and the Desk Station V+ 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 Desk Station V+:

❑ One M3 Phillips screwdriver to remove and replace screws.

❑ One box wrench to remove and replace a bolt.

❑ 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.

Screw Tightening Torque

When you fasten screws, be sure to follow the torque list below. Overtightening can damage components and screws; under tightening can result in electrical shorts or other damage if screws or components loosen.

❑ M3   5.0 kgfcm

4.2 Interface Cover, Front Cover, and Top Cover

Removing the Interface Cover, Front Cover, and Top Cover

To remove the interface cover, front cover, and top cover, follow the steps below and refer to Figures 4-1 through 4-5.

1. Disconnect the computer, power cord, and all external cables connected to the Desk Station V+.

2. Remove all optional PC cards and expansion boards from the Desk Station V+.

3. Push **two latches** (marked "PUSH") on the **interface cover**, raise the cover about 45 degrees, and remove it.

4. Push **two latches** (marked "PUSH") on the **front cover** to release the latches. Pull the top of the cover away from the main unit and lower the cover to free it from three latches at the bottom. Remove the front cover.
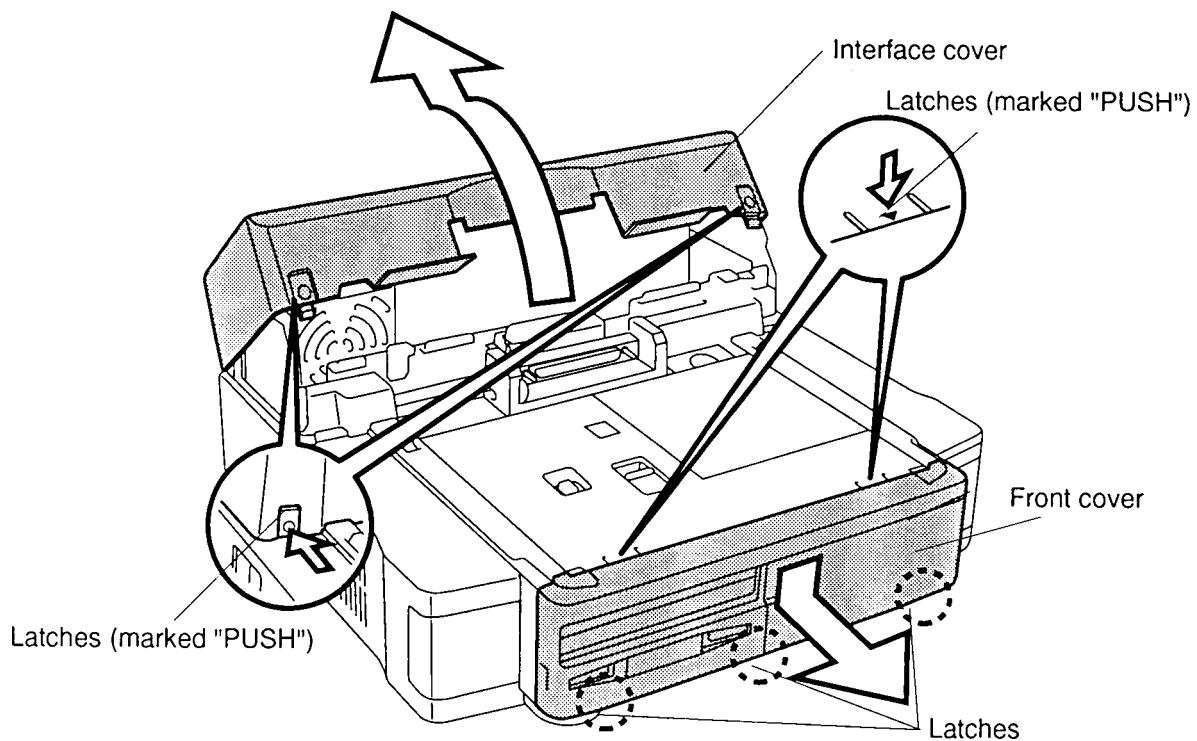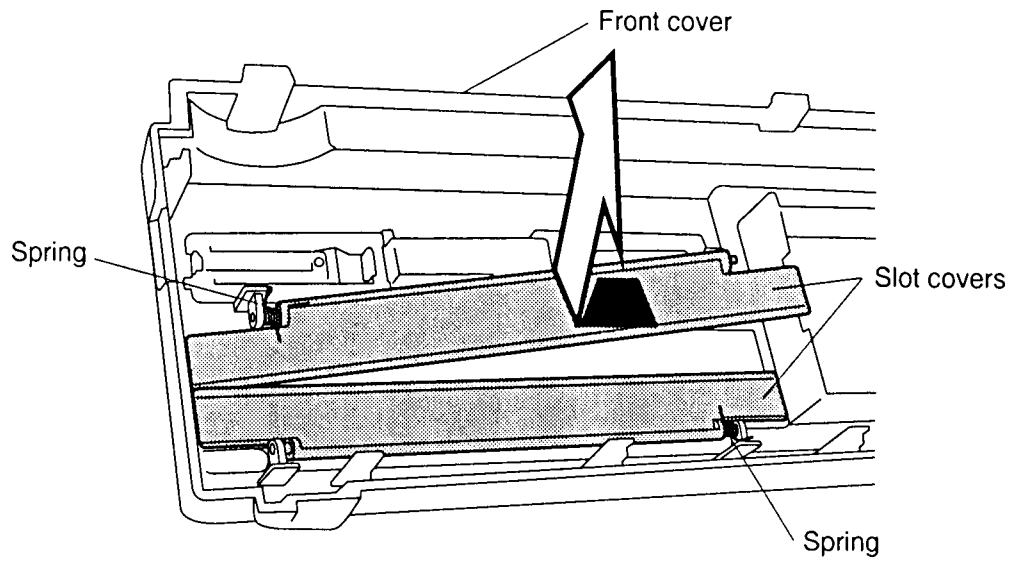

Figure 4-1 Removing the interface cover and front cover
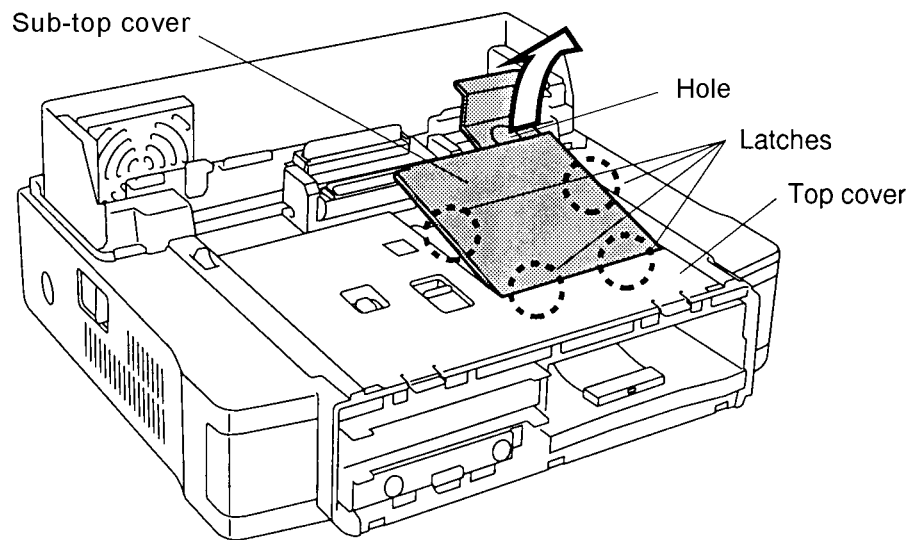
5. To remove the **slot covers** from the **front cover**, push the covers toward the springs and lift up.

Figure 4-2 Removing the slot covers

> **NOTE**: *The springs will come off with the covers. Be careful not to lose the springs.*

6. Put your finger into the hole in the **sub-top cover** and lift up to remove it from the **top cover**.

Figure 4-3 Removing the sub-top cover

7. Remove the **seal** concealing one screw and remove **one M3x6 screw**. Then remove the remaining **two M3x6 screws** securing the **top cover**.

8. Release the latches along the sides and lift off the top cover.
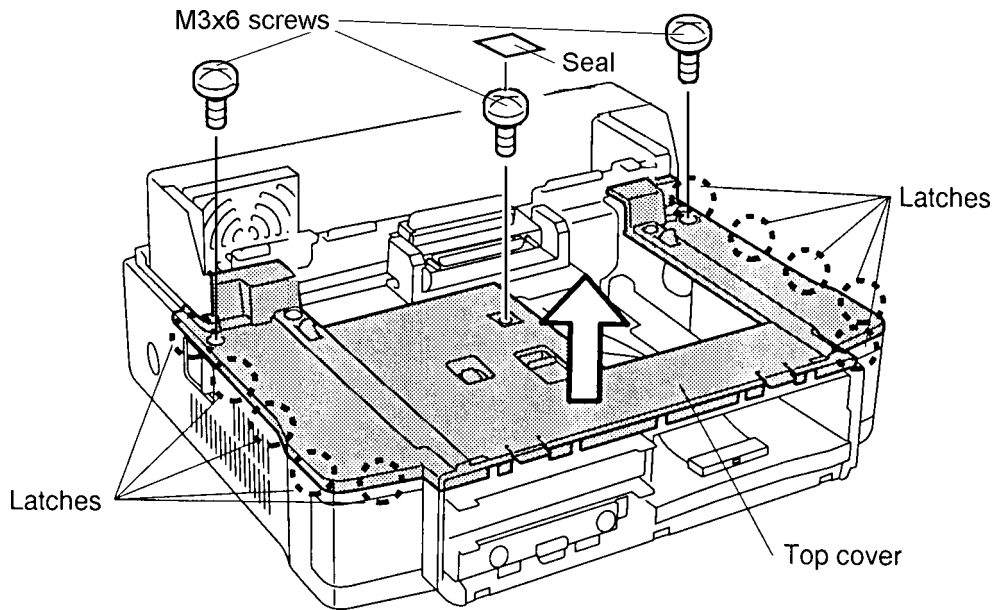
Figure 4-4 Removing the top cover

9. Remove **four M3x6 screws** securing the **fastening clasps**. Remove the **fastening clasps** from the **top cover** and the **springs** from the **fastening clasps**.
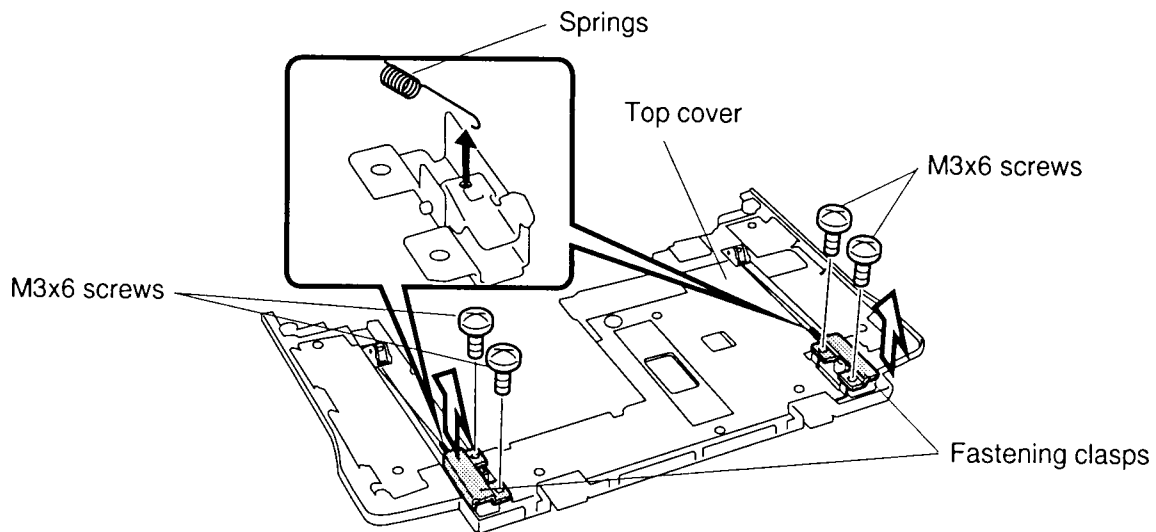
Figure 4-5 Removing the clasp

Installing the Interface Cover, Front Cover, and Top Cover

To install the interface cover, front cover, and top cover, follow the steps below and refer to Figures 4-1 through 4-5.

1. Hook the **springs** onto the **fastening clasps** and secure the **fastening clasps** with **four M3x6 screws**. Be sure the springs work by pressing the levers that release the top cover locks.

2. Place the **top cover** in the proper position. Secure the front left latch first, secure the right front latch, and press toward the back and down at the same time to secure the remaining latches. Do not press straight down; it can damage the latches. Secure the top cover with **three M3x6 screws**.

3. Set the **sub-top cover** on the **top cover**.

4. Set the **slot covers** with the **springs** on the **front cover**.

5. Set the **three latches** into their corresponding holes and press the **front cover** into place to secure the **two latches** marked "PUSH."

6. Set the **interface cover** in place and press down to secure the two latches marked "PUSH."

4.3   Back Cover and Side Covers

Removing the Back Cover and Side Covers

To remove the back cover and side covers, follow the steps below and refer to Figures 4-6 and 4-7.

1. Disconnect the computer, power cord, and all external cables connected to the Desk Station V+.

2. Remove all optional PC cards and expansion boards from the Desk Station V+.

3. Remove the interface cover, front cover, and top cover as described in Section 4.2.

4. Remove **two M3x6 screws** securing the **back cover**. Pull at the latches to free them and remove the cover.
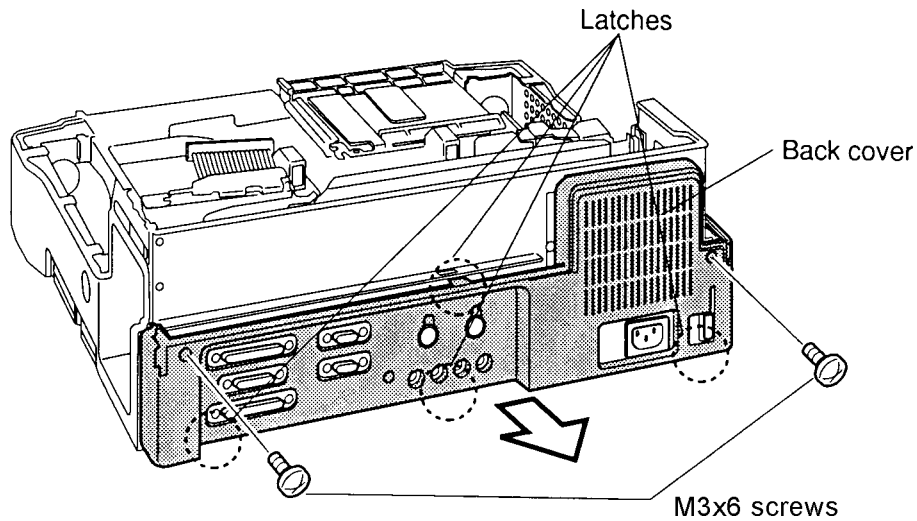
Figure 4-6 Removing the back cover

5. Pull at the latches to free them and remove the **side covers**.
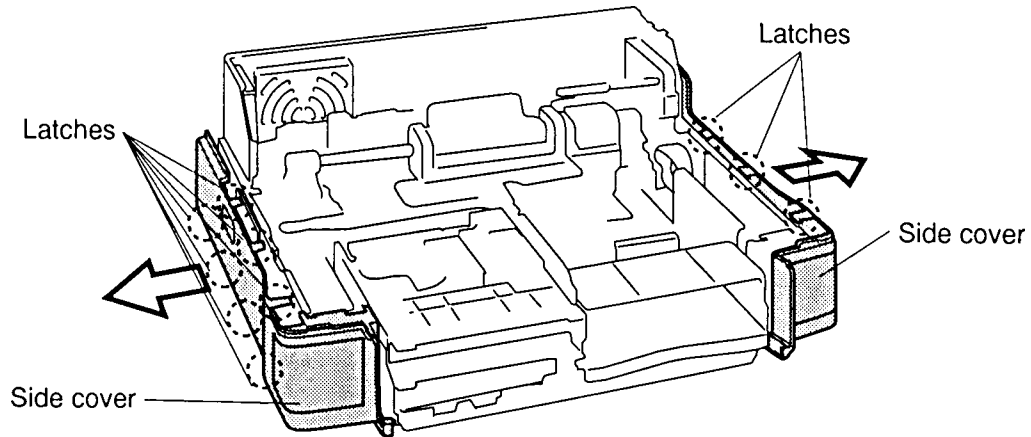
Figure 4-7 Removing the side covers

Installing the Back Cover and Side Covers

To install the back cover and side covers, follow the steps below and refer to Figures 4-6 and 4-7.

1. Set the **side covers** in place (use the two guide pins on each side cover), press to secure the lower latches, then push up to secure the top latches.

2. Set the **back cover** in place and press to secure the latches. Secure the back cover with **two M3x6 screws**.

3. Install the interface cover, front cover, and top cover as described in Section 4.2.

4.4 Key Unit, Fan, and Rear Panel

Removing the Key Unit, Fan, and Rear Panel

To remove the key unit, fan, and rear panel, follow the steps below and refer to Figures 4-8 through 4-10.

1. Disconnect the computer, power cord, and all external cables connected to the Desk Station V+.

2. Remove all optional PC cards and expansion boards from the Desk Station V+.

3. Remove the interface cover, front cover, top cover, back cover, and side covers as described in Sections 4.2 and 4.3.

4. Remove **two M3x6 screws** securing the **key unit** and remove it.

> *NOTE: When you remove the key unit, pull it out from the inside of the Desk Station V+.*
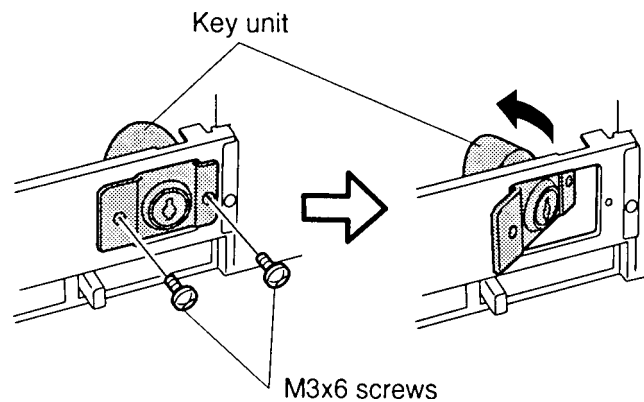
Figure 4-8 Removing the key unit

5. Disconnect the **fan cable** from **PJ26** on the **system board**. Remove the **tape** securing the cable.

6. Remove **two M3x6 screws** securing the **fan** and remove it.
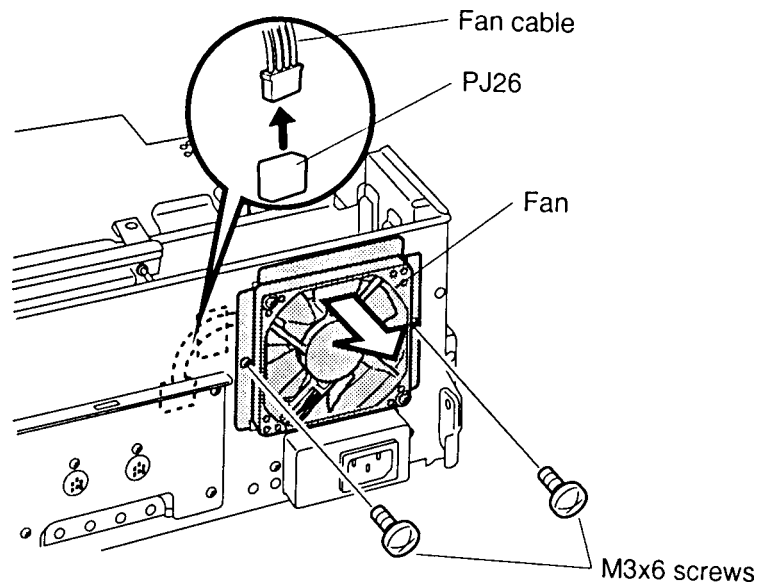
Figure 4-9 Removing the fan

7. Remove **four M3x6 screws** securing the **rear panel**.

8. Pull up on the **rear panel** to disconnect it from **PJ21** on the **system board** and lift off the panel.
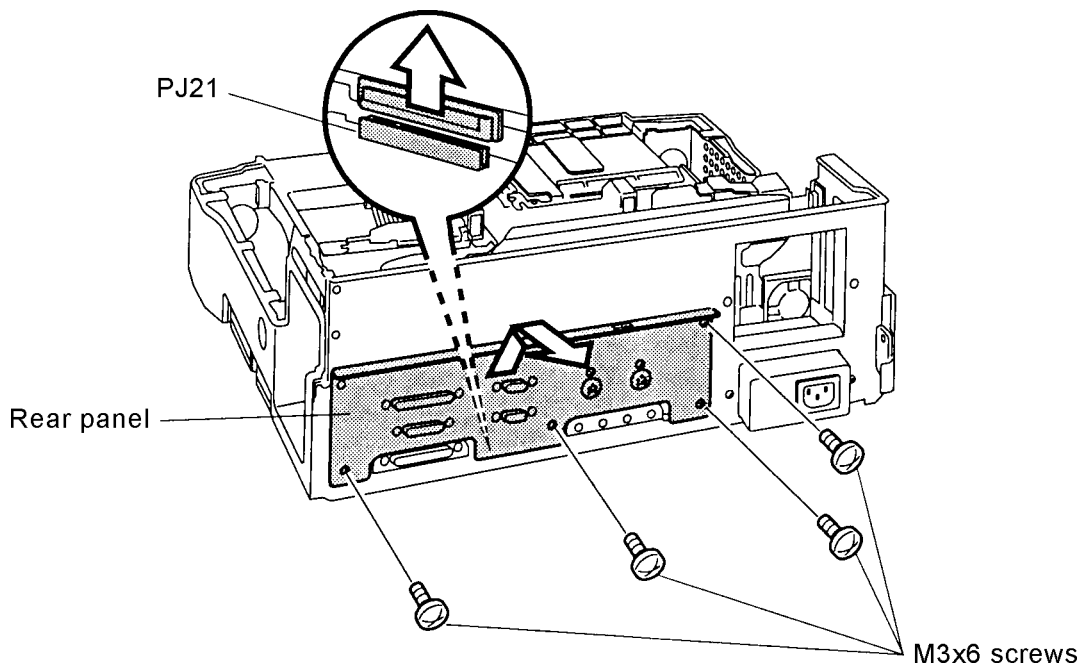
Figure 4-10 Removing the rear panel

Installing the Key Unit, Fan, and Rear Panel

To install the key unit, fan and rear panel, follow the steps below and refer to Figures 4-8 through 4-10.

1. Connect the **rear panel** to **PJ21** on the **system board**.

2. Secure the **rear panel** with **four M3x6 screws**.

3. Secure the **fan** with **two M3x6 screws**.

4. Connect the **fan cable** to **PJ26** on the **system board**. Secure the fan cable against the rear panel with **tape**.

5. Secure the **key unit** with **two M3x6 screws**.

   > *NOTE*: *Seat the key unit from the inside of the Desk Station V+.*

6. Install the back cover, side covers, interface cover, front cover, and top cover as described in Sections 4.3 and 4.2.

4.5   Motorized Mounting Unit

Removing the Motorized Mounting Unit

To remove the motorized mounting unit, follow the steps below and refer to Figures 4-11 through 4-13.

1.   Disconnect the computer, power cord, and all external cables connected to the Desk Station V+.

2.   Remove all optional PC cards and expansion boards from the Desk Station V+.

3.   Remove the interface cover, front cover, top cover, back cover, side covers, key unit, fan, and rear panel as described in Sections 4.2, 4.3, and 4.4.

4.   Remove **two M3x6 screws** securing the **interface cable** and lay the **interface cable** and **interface cable cover** (a metal frame behind the interface cable) back on the middle frame, so the cable doesn't get in the way.

5.   Reach behind the middle frame, press the lower latches together, and push them through the holes in the middle frame. Lift out the **sensor cover**.
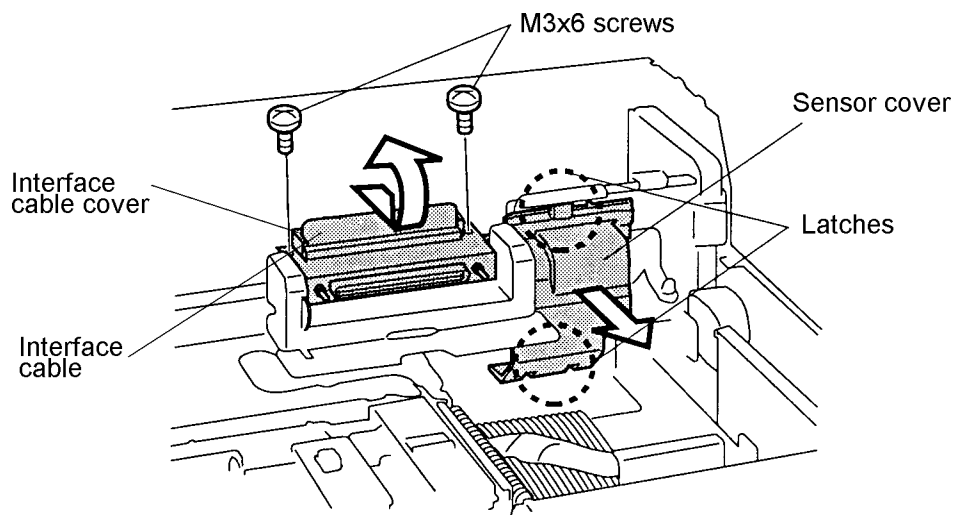
Figure 4-11 Removing the screws and sensor cover

6. Remove **three M3x6 screws** securing the **motorized mounting unit** and remove the **spring** from the **separator frame**.
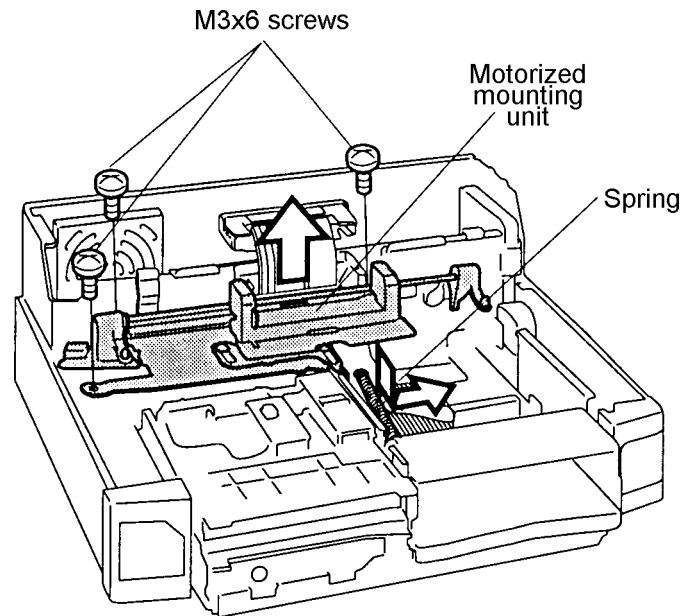
Figure 4-12 Removing the screws and spring

7. Carefully lift up the **motorized mounting unit** and disconnect the **motorized mounting unit cable** (left side) from **PJ24** on the **system board** and also from the **motorized mounting unit**.

> *NOTE*: *The motorized mounting unit cable has connectors in both the right and left sides.*

8. Disconnect the **motor cable** from **PJ29** on the **system board**.
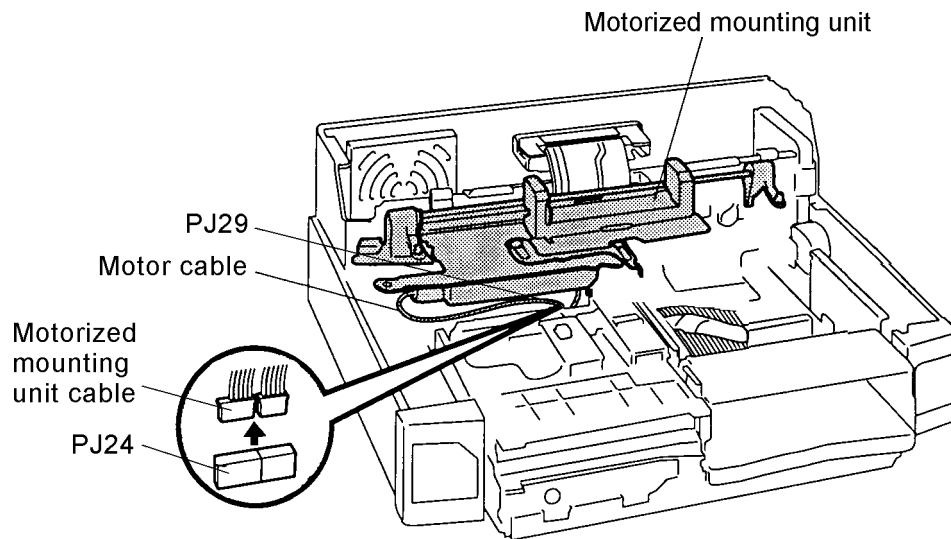
Figure 4-13 Removing the motorized mounting unit

Installing the Motorized Mounting Unit

To install the motorized mounting unit, follow the steps below and refer to Figures 4-11 through 4-13.

1. Connect the **motor cable** to **PJ29** on the **system board**.

2. Connect the **motorized mounting unit cable** (left side) to **PJ24** on the **system board** and to the **motorized mounting unit**. Be careful that the cable is not pinched under the unit.

3. Seat the **motorized mounting unit** and secure it with **three M3x6 screws** and set the **spring** onto the **separator frame**.

4. Seat the **sensor cover** (bottom first).

5. Secure the **interface cable** and **interface cable cover** with **two M3x6 screws**. Be sure to press the interface cable down before seating the interface cable cover.

6. Install the rear panel, fan, key unit, back cover, side covers, interface cover, front cover, and top cover as described in Sections 4.4, 4.3, and 4.2.

> *NOTE: Silicone grease is on the moving parts. Do not touch; otherwise grease may be transferred to other parts of the unit.*

4.6   Interface Cable and Sensor Board

Removing the Interface Cable and Sensor Board

To remove the interface cable and sensor board, follow the steps below and refer to Figures 4-14 and 4-15.

1.   Disconnect the computer, power cord, and all external cables connected to the Desk Station V+.

2.   Remove all optional PC cards and expansion boards from the Desk Station V+.

3.   Remove the interface cover, front cover, top cover, back cover, side covers, key unit, fan, rear panel and motorized mounting unit as described in Sections 4.2 through 4.5.

4.   Disconnect the **motorized mounting unit cable** (right side) from **PJ50** on the **sensor board**.

5.   Remove **one M3x4 screw** (with **washer**) securing the **system cable plate** and remove the **system cable plate**. Note that the cable plate slides under the separator frame.

6.   Disconnect the **interface cable** from **PJ10** and **PJ11** on the **system board** and remove the **interface cable**.
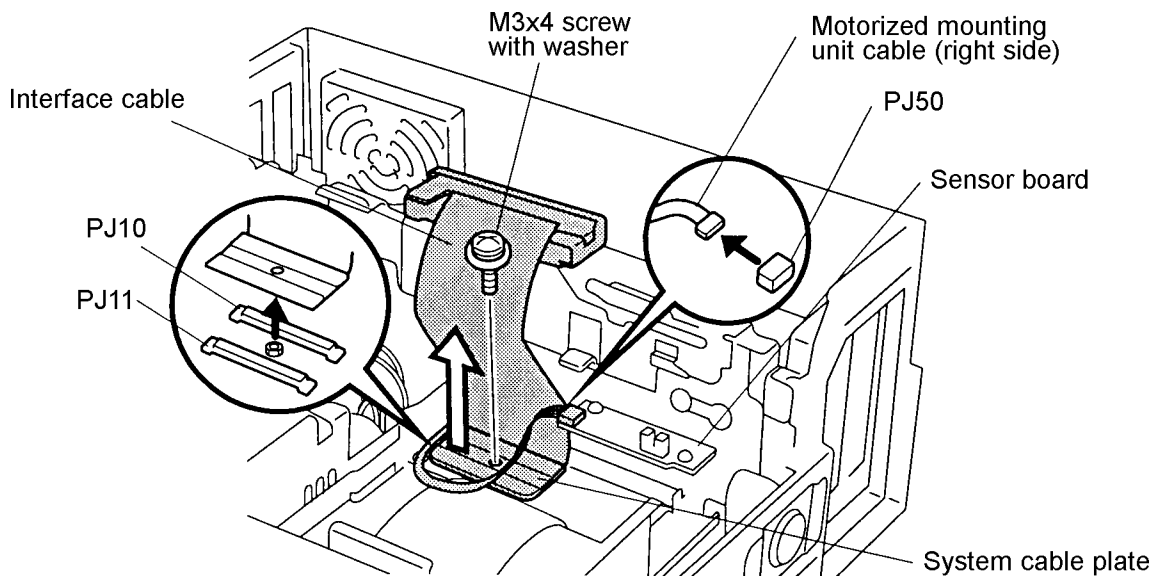
Figure 4-14 Removing the system cable plate and interface cable

7.   Remove **two M3x6 screws** securing the **sensor board** and lift it out of the **middle frame**.
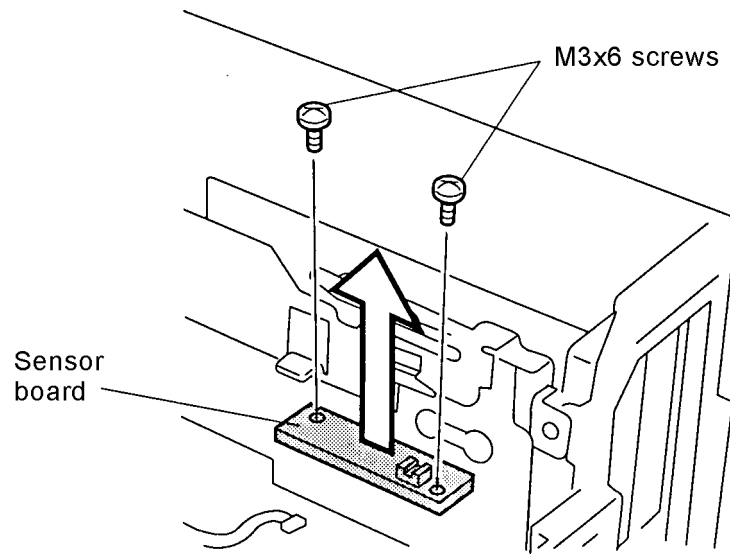
Figure 4-15 Removing the sensor board

Installing the Interface Cable and Sensor Board

To install the interface cable and sensor board, follow the steps below and refer to Figures 4-14 and 4-15.

1. Seat the **sensor board** onto the **middle frame**.

2. Secure the **sensor board** with **two M3x6 screws**.

3. Connect the **interface cable** to **PJ10** (first) and **PJ11** (second) on the **system board**. Be sure both connectors are firmly joined. If you are replacing the cable, refer to the old one to duplicate how it is bent.

   > *NOTE: After you connect the interface cable, lay the cable back on the middle frame so it doesn't get in the way.*

4. Set the **system cable plate** onto the **interface cable** and secure the **system cable plate** with **one M3x4 screw** (with **washer**).

   > *NOTE: The left side of the system cable plate slips under the separator frame.*

5. Connect the **motorized mounting unit cable** (right side) to **PJ50** on the **system board**.

   > *NOTE: The motorized mounting unit cable has connectors on both the right and left sides.*

6. Install the motorized mounting unit, rear panel, fan, key unit, back cover, side covers, interface cover, front cover, and top cover as described in Sections 4.5 back through 4.2.

4.7   5-Inch Expansion Bay

Removing the 5-Inch Expansion Bay

To remove the 5-inch expansion bay, follow the steps below and refer to Figures 4-16 through 4-18.

1.   Disconnect the computer, power cord, and all external cables connected to the Desk Station V+.

2.   Remove all optional PC cards and expansion boards from the Desk Station V+.

3.   Remove the interface cover, front cover, top cover, back cover, side covers, key unit, fan, rear panel, motorized mounting unit, interface cable, and sensor board as described in Sections 4.2 through 4.6.

4.   Remove **tape** securing the **flat cable** and **power cable**, then remove **one M3x6 screw** securing the **5-inch expansion bay lower frame**.

5.   Slide the **5-inch expansion bay lower frame** forward to remove it.
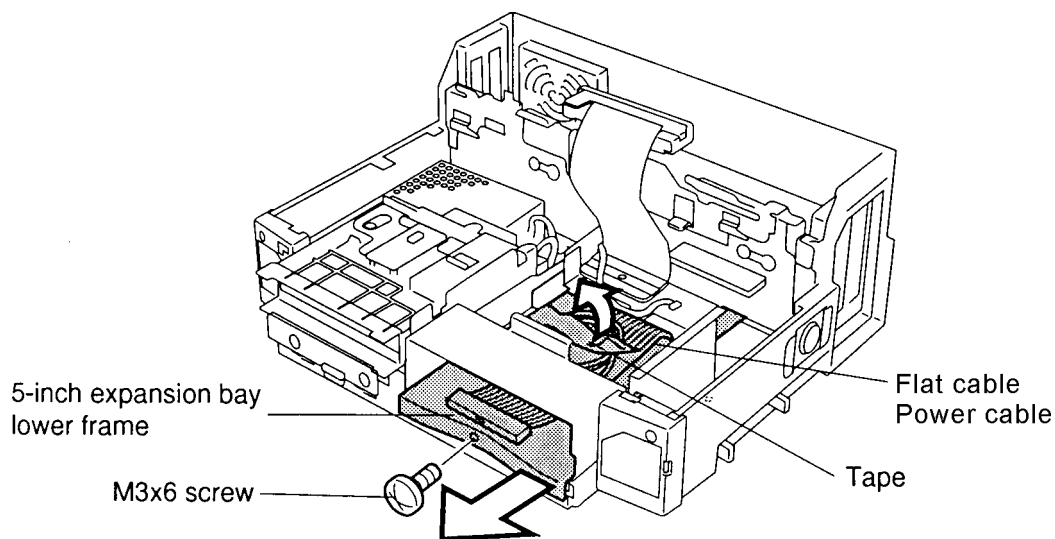
Figure 4-16 Removing the 5-inch expansion bay lower frame

6. Remove **four M3x6 screws** securing the **5-inch expansion bay upper frame**.

7. Slide the **5-inch expansion bay upper frame** forward to remove it.
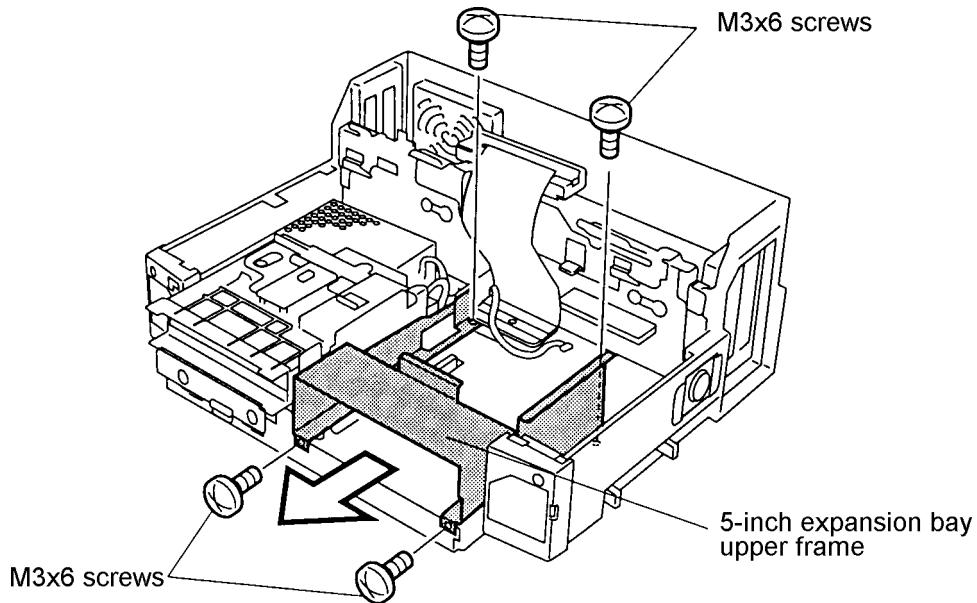
Figure 4-17 Removing the 5-inch expansion bay upper frame

8. Disconnect the **flat cable** from **PJ23** on the **system board** and the **power cable** from **PJ28** on the **system board**. If the **SCSI cable** is connected, remove it from **PJ38** on the **system board**.
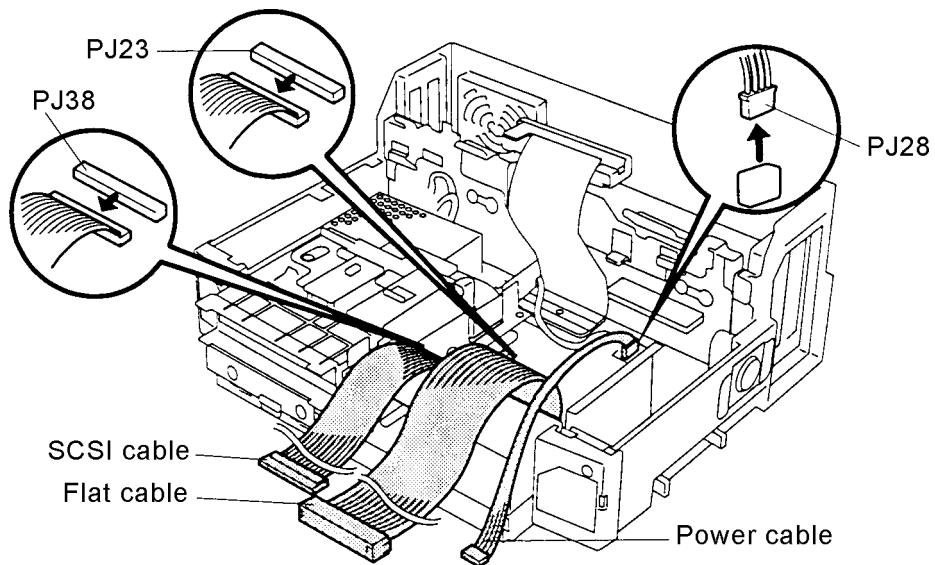
Figure 4-18 Disconnecting the flat cable, power cable, and SCSI cable

Installing the 5-Inch Expansion Bay

To install the 5-inch expansion bay, follow the steps below and refer to Figures 4-16 through 4-18.

1. If a **SCSI cable** was removed, connect it to **PJ38** on the **system board**. Be sure no pressure is applied to the selectable bay cable.

2. Connect the **flat cable** to **PJ23** on the **system board**. Be sure no pressure is applied to the selectable bay cable.

3. Set the **5-inch expansion bay upper frame** in place and slide it back to fully seat it.

4. Secure the **5-inch expansion bay upper frame** with **four M3x6 screws**.

5. Set the **5-inch expansion bay lower frame** in place and slide it back to fully seat it.

6. Secure the **5-inch expansion bay lower frame** with **one M3x6 screw** and secure the **flat cable** with **tape**.

7. Connect the **power cable** to **PJ28** on the **system board** and secure the **power cable** and **flat cable** with **tape**.

8. Install the interface cable, sensor board, motorized mounting unit, rear panel, fan, key unit, back cover, side covers, interface cover, front cover, and top cover as described in Sections 4.6 back through 4.2.

4.8   Selectable Bay

Removing the Selectable Bay

To remove the selectable bay, follow the steps below and refer to Figures 4-19 and 4-20.

1.   Disconnect the computer, power cord, and all external cables connected to the Desk Station V+.

2.   Remove all optional PC cards and expansion boards from the Desk Station V+.

3.   Remove the interface cover, front cover, top cover, back cover, side covers, key unit, fan, rear panel, motorized mounting unit, interface cable, sensor board, and 5-inch expansion bay as described in Sections 4.2 back through 4.7.

4.   Disconnect the **selectable bay cable** from **PJ20** on the **system board**. Remove the **tape**.

5.   Remove **two M3x6 screws** securing the **selectable bay,** then push it slightly to the left and lift it up.
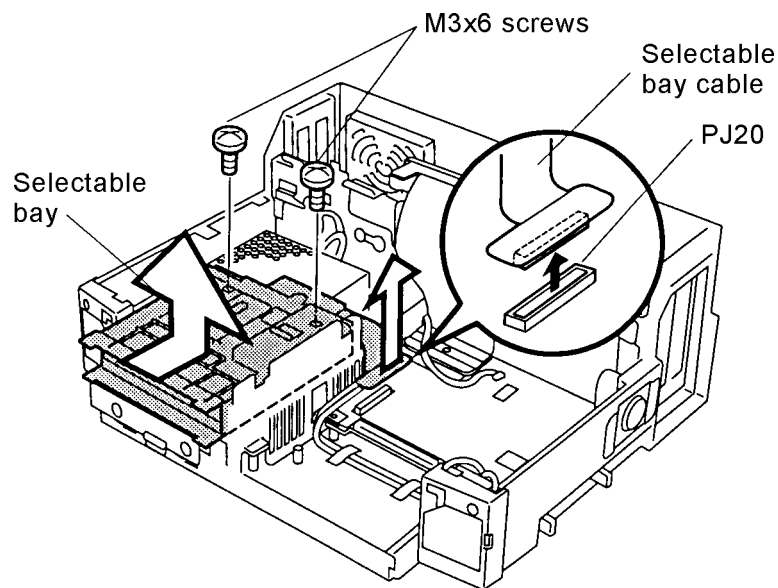
Figure 4-19 Removing the selectable bay

6. Use a small object to release the **four latches** on the **selectable bay**, open the **selectable bay**, and remove the **selectable bay cable**.
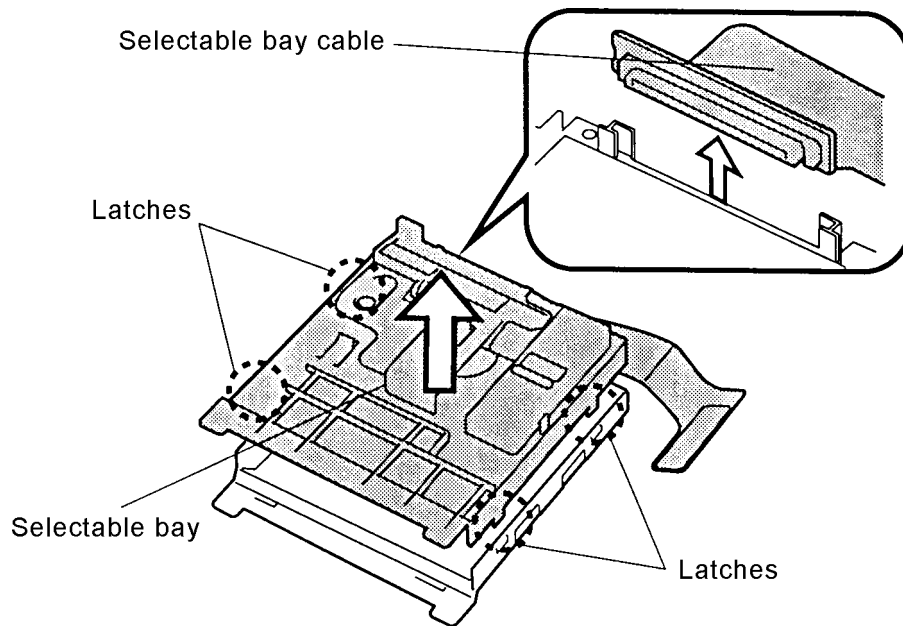
Figure 4-20 Opening the selectable bay

Installing the Selectable Bay

To install the selectable bay, follow the steps below and refer to Figures 4-19 and 4-20.

1. Seat the **selectable bay** in place right side first and slide it back to fully seat it.

   NOTE: When you seat the selectable bay, gently push it to the right.

2. Connect the **selectable bay cable** to **PJ20** on the **system board** and secure with **tape**. If you are replacing the cable, refer to the old cable to duplicate how it is bent.

3. Secure the **selectable bay** with **two M3x6 screws**.

4. Install the 5-inch expansion bay, interface cable, sensor board, motorized mounting unit, rear panel, fan, key unit, back cover, side covers, interface cover, front cover, and top cover as described in Sections 4.7 back through 4.2.

4.9   Speakers and LED Board

Removing the Speakers and LED Board

To remove the speakers and LED board, follow the steps below and refer to Figures 4-21 and 4-22.

1.   Disconnect the computer, power cord, and all external cables connected to the Desk Station V+.

2.   Remove all optional PC cards and expansion boards from the Desk Station V+.

3.   Remove the interface cover, front cover, top cover, back cover, side covers, key unit, fan, rear panel, motorized mounting unit, interface cable, sensor board, 5-inch expansion bay, and selectable bay as described in Sections 4.2 through 4.8.

4.   Disconnect the **two speaker cables** from **PJ32** (left speaker) and **PJ33** (right speaker) on the **system board** and remove two pieces of **tape**. Be sure to note how the cables are threaded.

5.   Remove **two M3x6 screws** securing the **two speakers** and remove the **left speaker**.
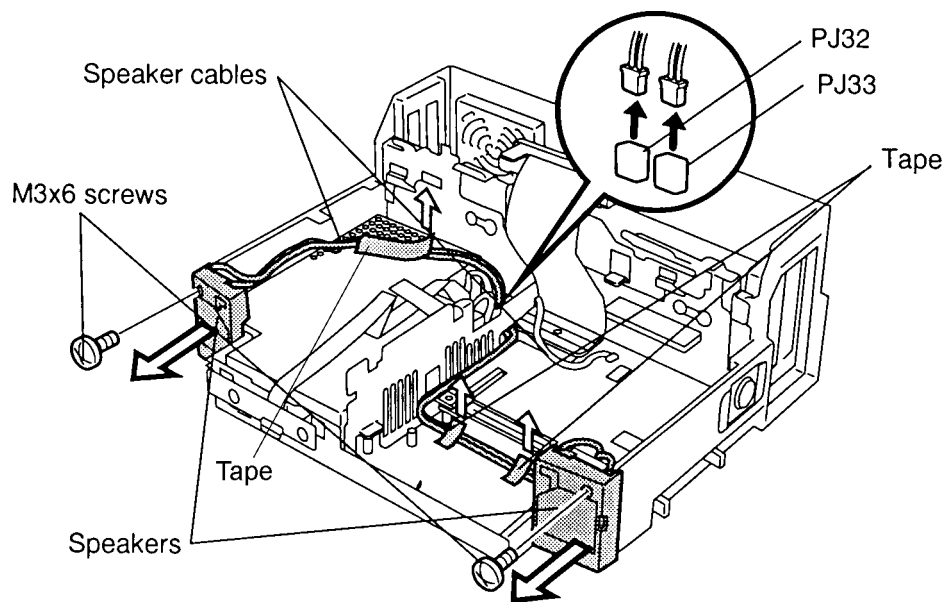
Figure 4-21 Removing the speakers

6.   Disconnect the **LED cable** from **PJ22** on the **system board** and remove the **tape**.

7.   Remove **two M3x6 screws** securing the **LED board** and remove it.

8.   Disconnect the **LED cable** from **PJ101** on the **LED board**.
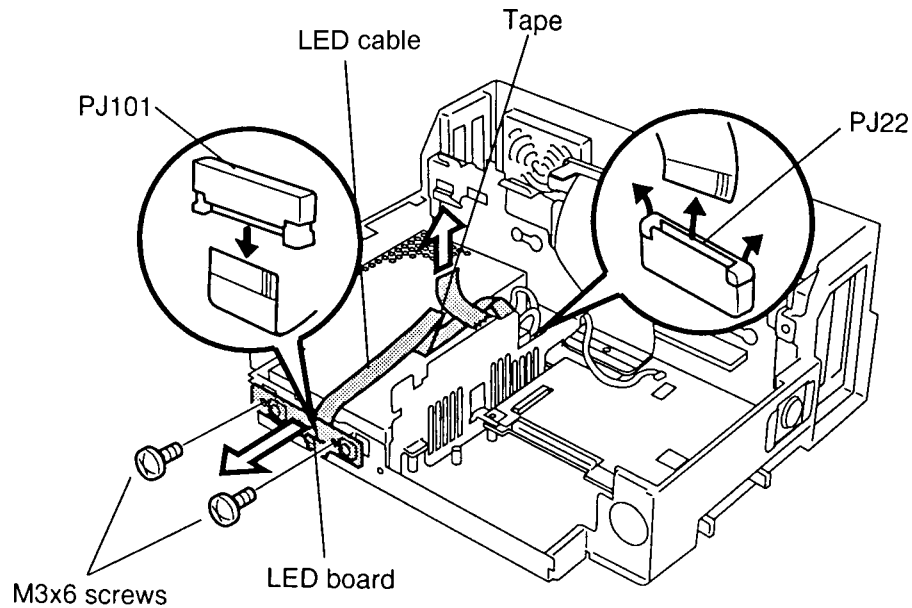
Figure 4-22 Removing the LED board

Installing the Speakers and LED Board

To install the speakers and LED board, follow the steps below and refer to Figures 4-21 and 4-22.

1. Connect the **LED cable** to **PJ101** on the **LED board**. Be sure not to place the cable over the screw holes used to secure the selectable bay.

2. Secure the **LED board** with **two M3x6 screws**.

3. Connect the **LED cable** to **PJ22** on the **system board** and secure the **LED cable** with **tape**. If you are installing a new cable, refer to the old one to duplicate the bends. If the new cable is a tight fit, use a plastic ruler to align the cable, then insert it straight into the connector.

4. Set the **speakers** and secure them with **two M3x6 screws**.

5. Connect the **left speaker cable** to **PJ32** on the **system board** and secure with two pieces of **tape**. Be sure to rethread the cable as you found it; it will need to be in place before the separator frame is installed.

6. Install the selectable bay, 5-inch expansion bay, interface cable, sensor board, motorized mounting unit, rear panel, fan, key unit, back cover, side covers, interface cover, front cover, and top cover as described in Sections 4.8 back through 4.2.

4.10 Separator Frame and Middle Frame

Removing the Separator Frame and Middle Frame

To remove the separator frame and middle frame, follow the steps below and refer to Figures 4-23 through 4-25.

1. Disconnect the computer, power cord, and all external cables connected to the Desk Station V+.

2. Remove all optional PC cards and expansion boards from the Desk Station V+.

3. Remove the interface cover, front cover, top cover, back cover, side covers, key unit, fan, rear panel, motorized mounting unit, interface cable, sensor board, 5-inch expansion bay, selectable bay, speakers, and LED board as described in Sections 4.2 through 4.9.

4. Remove **three M3x6 screws** securing the **separator frame** and remove it.
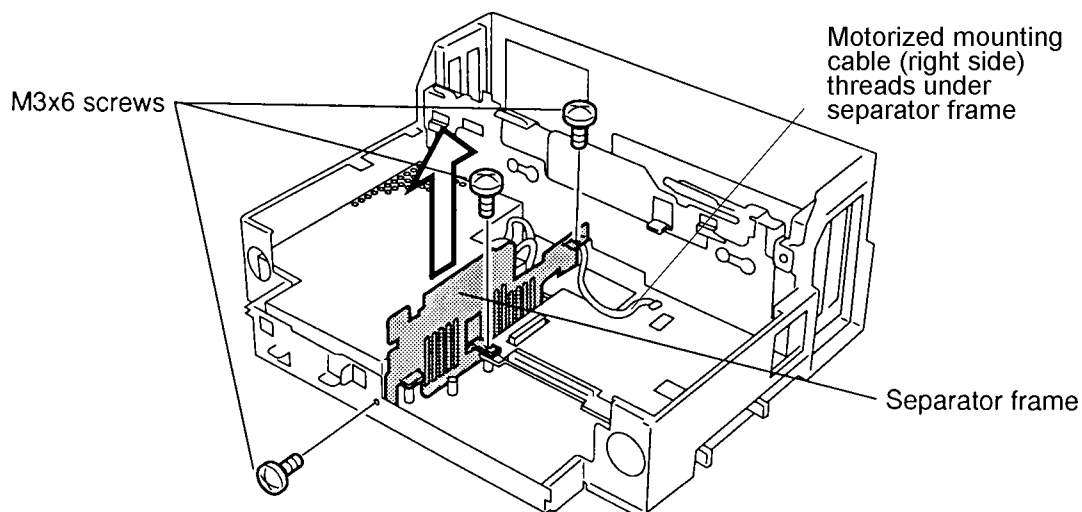
Figure 4-23 Removing the separator frame

5. Disconnect the **motorized mounting unit cable** (right side) from **PJ27** on the **system board**. Be sure to note how the cable is threaded and that it is placed under the separator frame.

6. Disconnect the **right speaker cable** from **PJ33** on the **system board** and remove the **tape**. Remove the right speaker with its cable. Be sure to note how the cable is threaded and that it is placed under the separator frame.

7. Disconnect the **middle frame fan cable** from **PJ36** on the **system board**. Note that the cable is threaded under the middle frame.

8. Remove **three M3x6 screws** securing the **middle frame** and remove it.
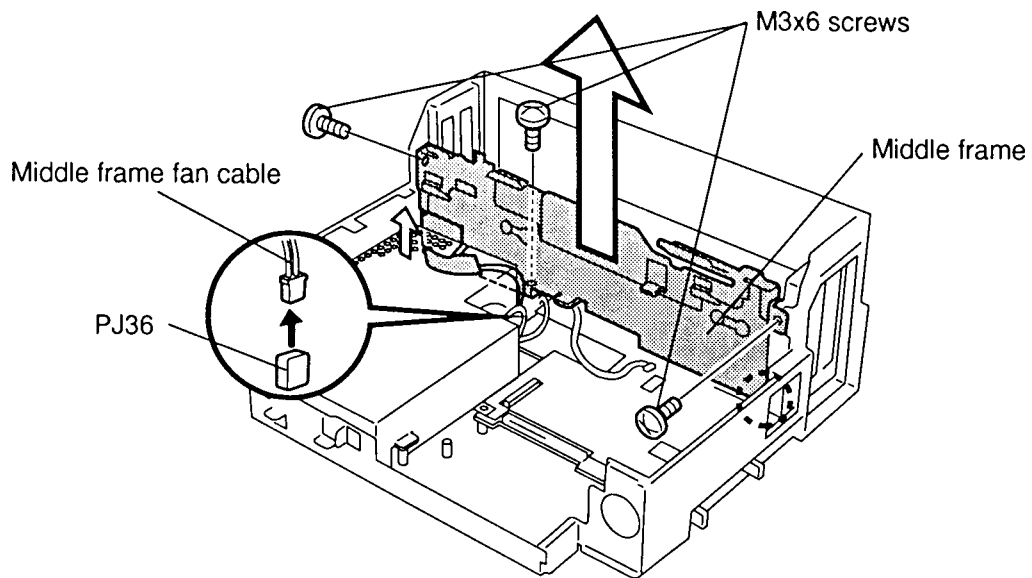
Figure 4-24 Removing the middle frame

9. Remove **two M3x6 screws** securing the **middle frame fan**.

10. Slide the **middle frame fan** to the left and remove it.
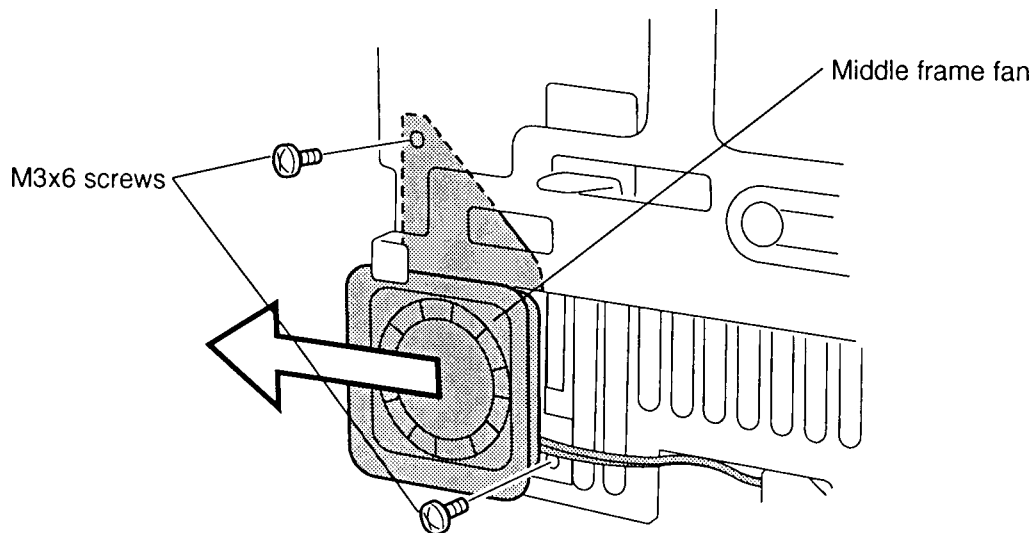
Figure 4-25 Removing the middle frame fan

Installing the Separator Frame and Middle Frame

To install the separator frame and middle frame, follow the steps below and refer to Figures 4-23 through 4-25.

1. Set the **middle frame fan** in place and slide it to the right to seat it. Secure it with **two M3x6 screws**.

2. Seat the **middle frame** and secure it with **three M3x6 screws**. Be sure the plastic protector on the back is flush against the frame. The middle frame fan cable should be in place (under the frame); be sure it will not be pinched.

3. Connect the **middle frame fan cable** to **PJ36** on the **system board**.

4. Connect the **right speaker cable** to **PJ33** on the **system board**. Rethread the cable as you found it; it must be threaded under, not over, the separator frame. Secure the **right speaker cable** with two pieces of **tape**.

5. Connect the **motorized mounting unit cable** (right side--larger connector) to **PJ27** on the **system board**. Be sure to rethread the cable as you found it; it must be threaded under, not over, the separator frame.

6. Seat the **separator frame** and secure it with **three M3x6 screws**.

7. Install the speakers, LED board, selectable bay, 5-inch expansion bay, interface cable, sensor board, motorized mounting unit, key unit, fan, rear panel, back cover, side covers, interface cover, front cover and top cover as described in Sections 4.9 back through 4.2.

4.11 Power Supply Unit

Removing the Power Supply Unit

To remove the power supply unit, follow the steps below and refer to Figures 4-26 through 4-28.

1. Disconnect the computer, power cord, and all external cables connected to the Desk Station V+.

2. Remove all optional PC cards and expansion boards from the Desk Station V+.

3. Remove the interface cover, front cover, top cover, back cover, side covers, key unit, fan, rear panel, motorized mounting unit, interface cable, sensor board, 5-inch expansion bay, selectable bay, speakers, LED board, separator frame, and middle frame as described in Sections 4.2 through 4.10.

4. Remove **three M3x15 screws** securing the **power supply unit**.

5. Remove **two M3x6 screws** securing the **AC cord cover** and remove it.
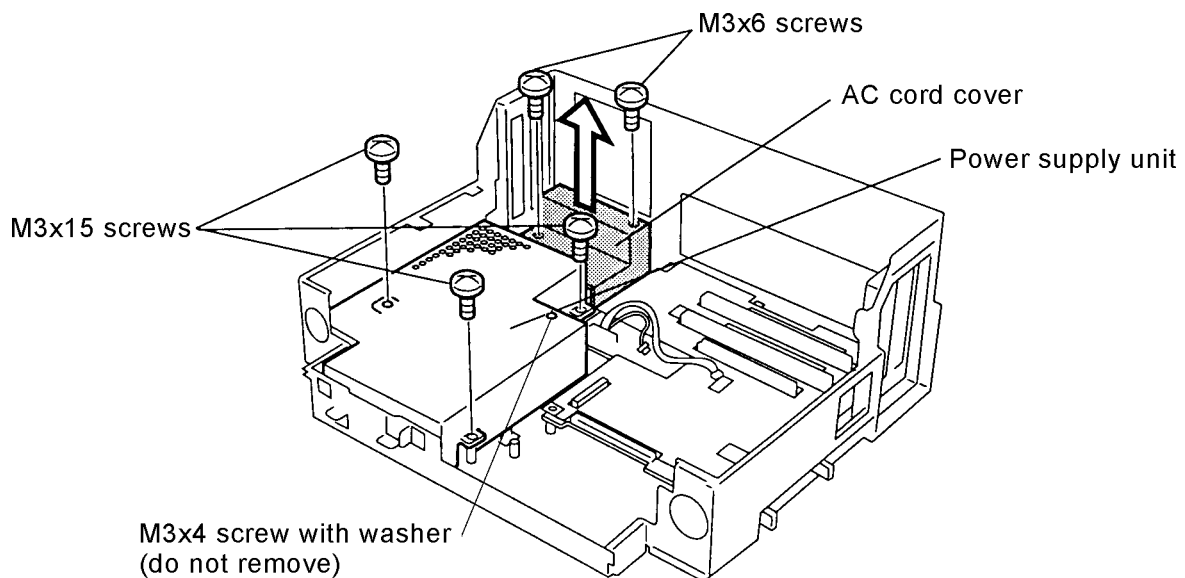
Figure 4-26 Removing the screws and AC cord cover

6. Remove **two M3x6 screws** securing the **AC cord connector**.
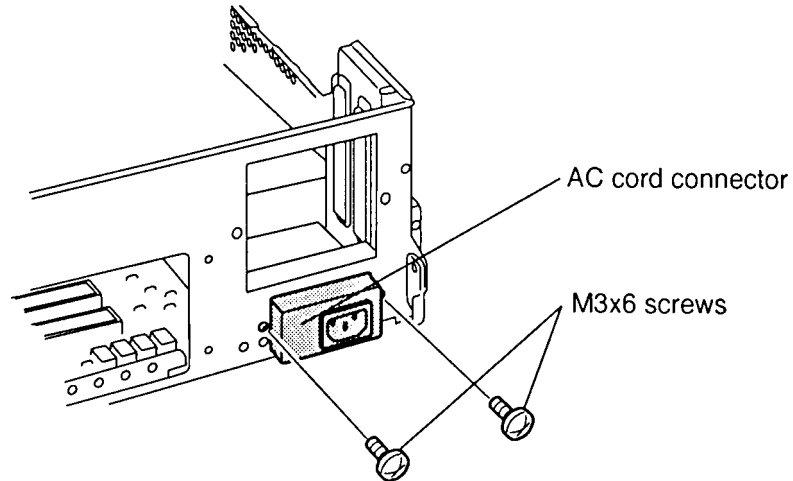
Figure 4-27 Removing the screws

7. Disconnect the **power supply cables** from **PJ24** and **PJ25** on the **system board** and lift out the **power supply unit**.

NOTE: *If you are replacing the power supply unit, remove the plastic spacer on the old power supply unit for use with the new power supply unit.*
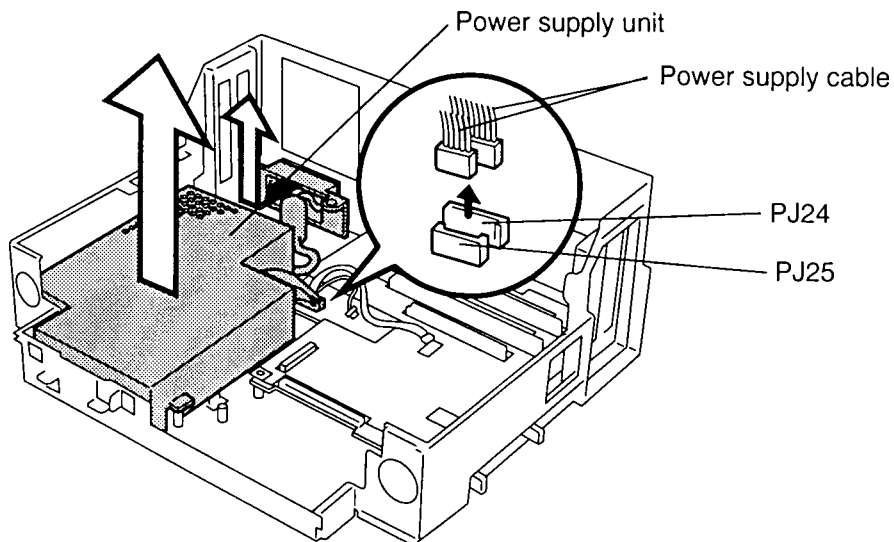
Figure 4-28 Removing the power supply unit

Installing the Power Supply Unit

To install the power supply unit, follow the steps below and refer to Figures 4-26 through 4-28.

1. Seat the **power supply unit** on the **system board**. Connect the **power supply cables** to **PJ24** and **PJ25** on the **system board**.

> *NOTE: When you seat the power supply unit, gently push it forward and then push it to the right.*

2. Secure the **AC cord connector** with **two M3x6 screws**.

3. Seat the **AC cord cover** and secure it with **two M3x6 screws**.

4. Secure the **power supply unit** with **three M3x15 screws**.

5. Install the separator frame, middle frame, speakers, LED board, selectable bay, 5-inch expansion bay, interface cable, sensor board, motorized mounting unit, key unit, fan, rear panel, back cover, side covers, interface cover, front cover, and top cover as described in Sections 4.10 back through 4.2.

4.12 System Board

Removing the System Board

To remove the system board, follow the steps below and refer to Figure 4-29.

1. Disconnect the computer, power cord, and all external cables connected to the Desk Station V+.

2. Remove all optional PC cards and expansion boards from the Desk Station V+.

3. Remove the interface cover, front cover, top cover, back cover, side covers, key unit, fan, rear panel, motorized mounting unit, interface cable, sensor board, 5-inch expansion bay, selectable bay, speakers, LED board, separator frame, middle frame, and power supply unit as described in Sections 4.2 through 4.11.

4. Remove **nine M3x6 screws** and **one bolt** securing the **system board**.

5. Lift out the **system board**.

> *NOTE: Slide the system board to the left and then lift it up to release it from the eject buttons of the PC card slot.*
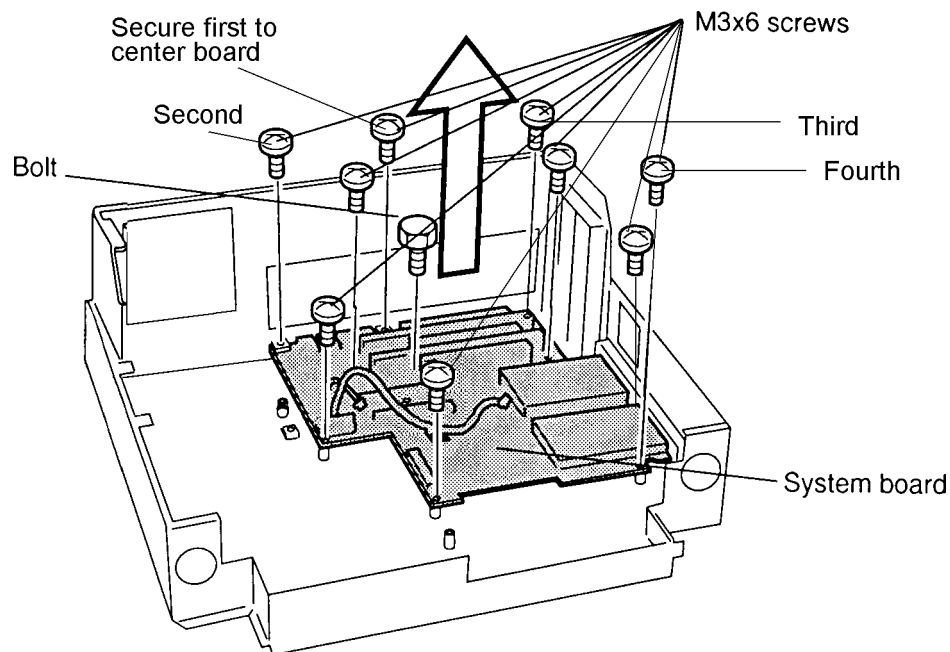
Figure 4-29 Removing the system board

Installing the System Board

To install the system board, follow the steps below and refer to Figure 4-29.

1. Seat the **system board** and secure it with **nine M3x6 screws** and **one bolt** in the order shown (first through fourth).

    > *NOTE*: *When you seat the system board, gently push it back.*

2. Install the power supply unit, separator frame, middle frame, speakers, LED board, selectable bay, 5-inch expansion bay, interface cable, sensor board, motorized mounting unit, key unit, fan, rear panel, back cover, side covers, interface cover, front cover, and top cover as described in Sections 4.11 back through 4.2.

Appendix A   Board Layouts

A.1   System Board Front View
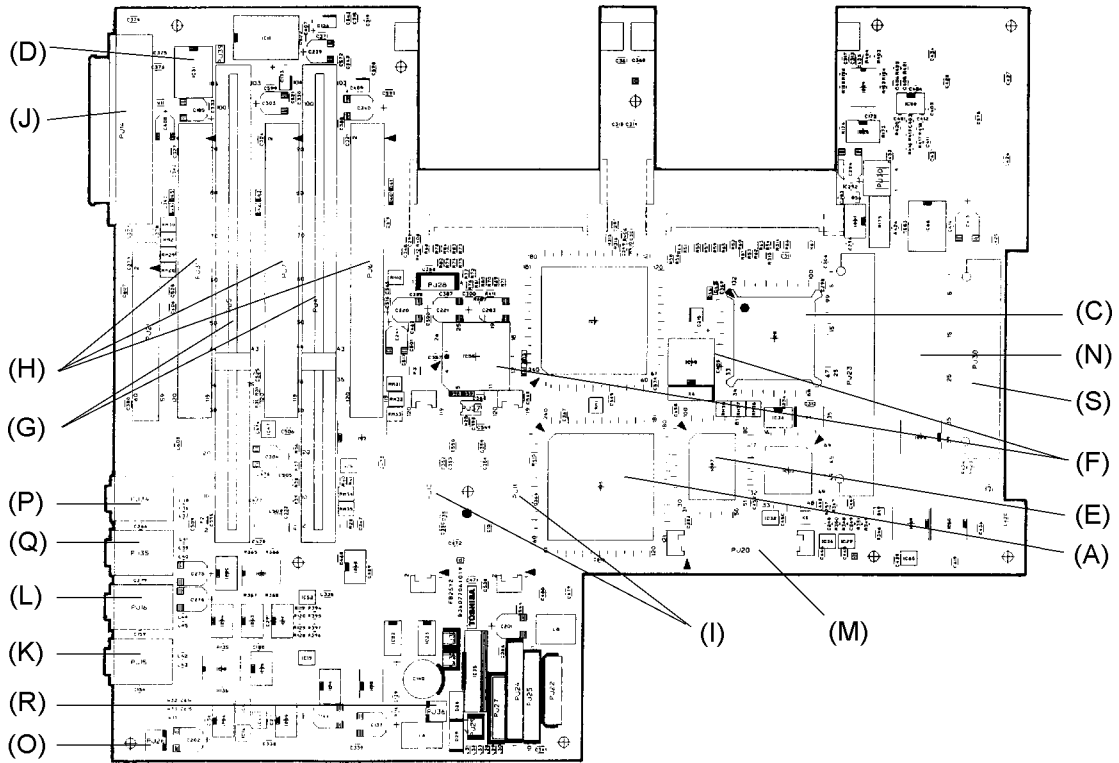
Figure A-1 System board (front)

A.2   System Board Back View

(A)
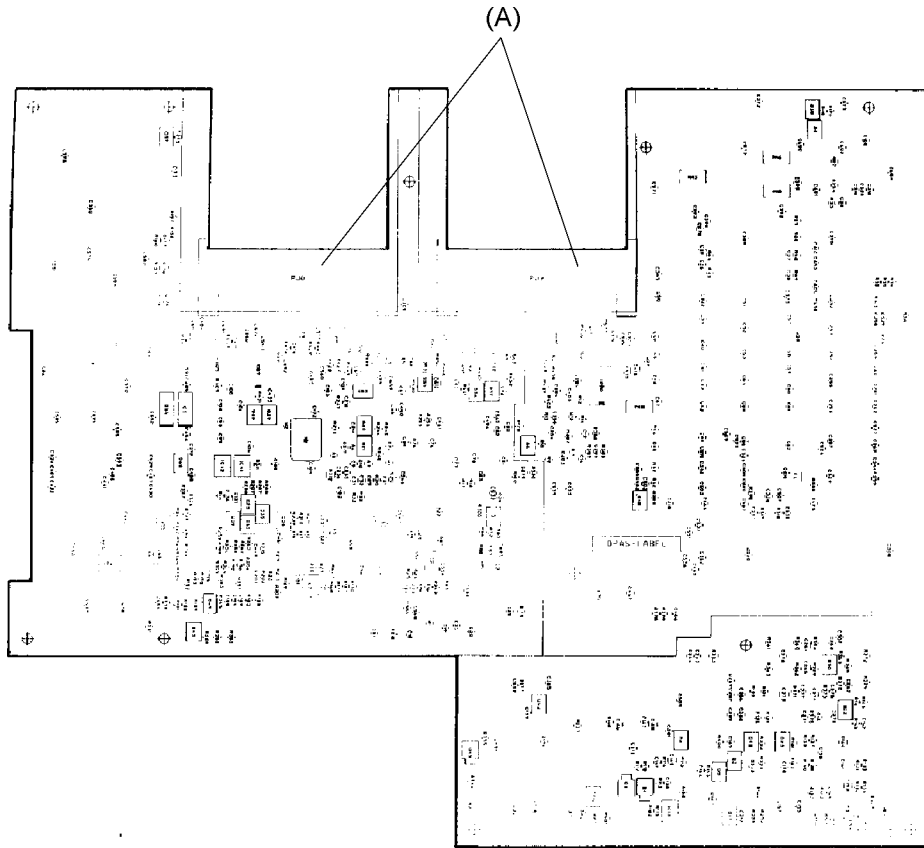
Figure A-2 System board (back)

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

Mark	Number	Name
(A)	IC3	Docking I/F Connector GA
(B)	IC6	PC Card Controller GA
(C)	IC8	SCSI Controller
(D)	IC31	External SCSI Controller
(E)	IC27	Super I/O Controller GA
(F)	IC40,55	Clocks Controller
(G)	PJ4,5	ISA Connector
(H)	PJ6,7,31	PCI Connector
(I)	PJ10,11	System I/F Connector
(J)	PJ14	External SCSI Connector
(K)	PJ15	Line Out Connector
(L)	PJ16	Line In Connector
(M)	PJ20	FDD CD-ROM Pack I/F Connector
(N)	PJ23	Internal SCSI Connector
(O)	PJ26	Main Fan Connector
(P)	PJ34	Microphone Connector
(Q)	PJ35	Headphone Connector
(R)	PJ36	Power Supply Fan Connector
(S)	PJ38	Enhanced IDE Connector

Table A-2 System board IC and connector (back)

Mark	Number	Name
(A)	PJ8,9	PC Card I/F Connector

Appendix B   Wiring Diagrams

B.1   Printer Wraparound Connector

```
(9)  +PD7 ──────────────────────────── (15)  –ERROR
(8)  +PD6 ──────────────────────────── (14)  –AUTFD
(7)  +PD5 ──────────────────────────── (13)  +SELECT
(6)  +PD4 ──────────────────────────── (16)  –PINIT
(5)  +PD3 ──────────────┐               (1)  –STROBE
                        └────────────  (10)  –ACK
(4)  +PD2 ──────────────────────────── (12)  +PE
(3)  +PD1 ──────────────────────────── (17)  –SLIN
(2)  +PD0 ──────────────────────────── (11)  +BUSY
```
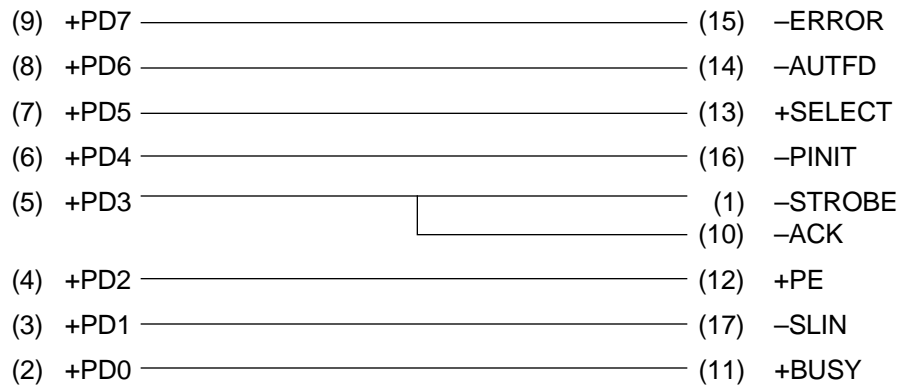
Figure B-1 Printer wraparound connector

B.2   RS-232-C Wraparound Connector

```
(3)  TD  ──────────────────────────── (2)  RD
(7)  RTS ────────────────┐             (8)  CTS
                         └──────────── (1)  CD
(4)  DTR ────────────────┐             (6)  DSR
                         └──────────── (9)  RI
```
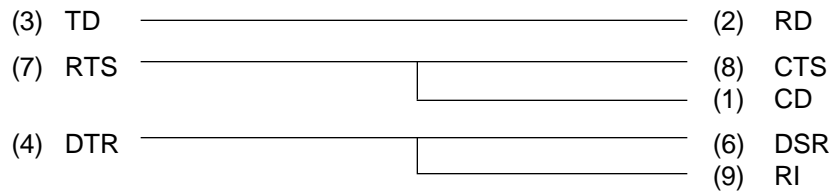
Figure B-2 RS-232-C wraparound connector

B.3   RS-232-C Direct Cable (9-Pin to 9-Pin)

```
(3)  TD  ──────────────────────────── (2)  RD
(4)  DTR ────────────────┐             (6)  DSR
                         ├──────────── (8)  CTS
                         └──────────── (9)  RI
(7)  RTS ──────────────────────────── (1)  CD
(5)  GND ──────────────────────────── (5)  GND
(2)  RD  ──────────────────────────── (3)  TD
(1)  CD  ──────────────────────────── (7)  RTS
(6)  DSR ────────────────┐             (4)  DTR
(8)  CTS ────────────────┤
(9)  RI  ────────────────┘
```
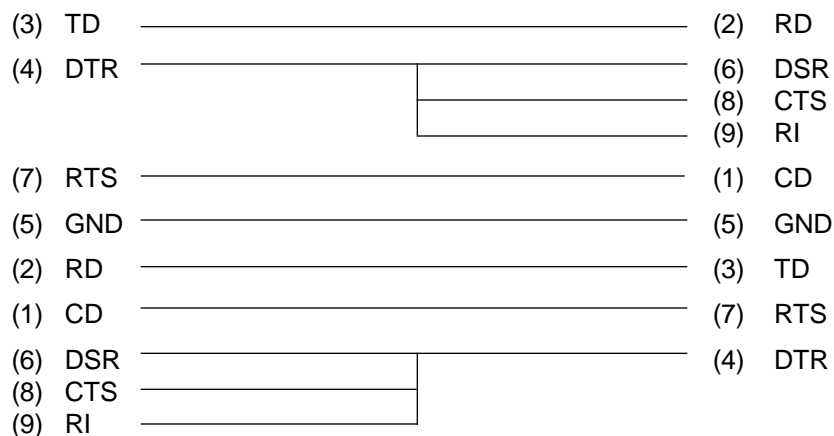
Figure B-3 RS-232-C direct cable (9-pin to 9-pin)

B.4   RS-232-C Direct Cable (9-Pin to 25-Pin)

```
(1)  CD   ─────────────────────────────   (4)   RTS
(2)  RD   ─────────────────────────────   (2)   TD
(3)  TD   ─────────────────────────────   (3)   RD
(4)  DTR  ──────────────────┐             (5)   CTS
                            ├──────────── (6)   DSR
                            └──────────── (22)  RI
(5)  GND  ─────────────────────────────   (7)   GND
(7)  RTS  ─────────────────────────────   (8)   CD
(6)  DSR  ──────────────┐                 (20)  DTR
(8)  CTS  ──────────────┤
(9)  RI   ──────────────┘
```
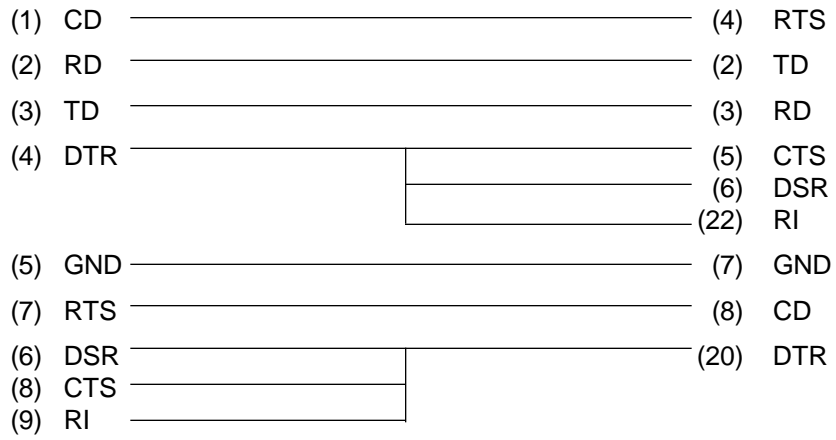
Figure B-4 RS-232-C direct cable (9-pin to 25-pin)

Appendix C   Pin Assignments

C.1   PJ4 ISA Slot (A) Connector (104-pin)

Table C-1 ISA slot (A) connector pin assignments (104-pin) (1/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	ISD15;100	I/O	02	GND	-
03	ISD14;100	I/O	04	MASTER;000	I
05	ISD13;100	I/O	06	VCC	-
07	ISD12;100	I/O	08	IDRQ7;100	I
09	ISD11;100	I/O	10	IDACK7;000	O
11	ISD10;100	I/O	12	IDRQ6;100	I
13	ISD09;100	I/O	14	IDACK6;000	O
15	ISD08;100	I/O	16	IDRQ5;100	I
17	IMEMW;000	I/O	18	IDACK5;000	O
19	IMEWR;000	I/O	20	IDRQ0;100	I
21	ILA17;100	I/O	22	IDACK0;000	O
23	ILA18;100	I/O	24	IIRQ14;100	I
25	ILA19;100	I/O	26	IIRQ15;100	I
27	ILA20;100	I/O	28	IIRQ12;100	I
29	ILA21;100	I/O	30	IIRQ11;100	I
31	ILA22;100	I/O	32	IIRQ10;100	I
33	ILA23;100	I/O	34	IOCS16;000	I
35	ISBHE;000	I/O	36	MECS16;000	I
37	NC	-	38	NC	-
39	NC	-	40	NC	-
41	NC	-	42	NC	-
43	ISA00;100	I/O	44	GND	-
45	ISA01;100	I/O	46	$14R3M;120	I
47	ISA02;100	I/O	48	VCC	-
49	ISA03;100	I/O	50	IBALE;100	O
51	ISA04;100	I/O	52	ITC;100	O
53	ISA05;100	I/O	54	IDACK2;000	O
55	ISA06;100	I/O	56	IIRQ3;100	I
57	ISA07;100	I/O	58	IIRQ4;100	I
59	ISA08;100	I/O	60	IIRQ5;100	I
61	ISA09;100	I/O	62	IIRQ6;100	I
63	ISA10;100	I/O	64	IIRQ7;100	I
65	ISA11;100	I/O	66	ISCLK$;100	O

Table C-1 ISA slot (A) connector pin assignments (104-pin) (2/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
67	ISA12;100	I/O	68	IRFRSH;000	I/O
69	ISA13;100	I/O	70	IDRQ1;100	I
71	ISA14;100	I/O	72	IDACK1;000	O
73	ISA15;100	I/O	74	IDRQ3;100	I
75	ISA16;100	I/O	76	IDACK3;000	O
77	ISA17;100	O	78	IIOR;000	I/O
79	ISA18;100	O	80	IIOW;000	I/O
81	ISA19;100	O	82	ISMEMR;000	O
83	IAEN;100	O	84	ISMEMW;000	O
85	IIOCRY;100	I	86	GND	-
87	ISD00;100	I/O	88	P12V	-
89	ISD01;100	I/O	90	IOWAIT;000	I
91	ISD02;100	I/O	92	M12V	-
93	ISD03;100	I/O	94	IDRQ2;100	I
95	ISD04;100	I/O	96	M5V	-
97	ISD05;100	I/O	98	IIRQ9;100	I
99	ISD06;100	I/O	100	VCC	-
101	ISD07;100	I/O	102	IRESET;100	O
103	IIOCHK;000	I	104	GND	-

C.2 PJ5 ISA Slot (B) Connector (104-pin)

Table C-2 ISA slot (B) connector pin assignments (104-pin) (1/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	ISD15;100	I/O	02	GND	-
03	ISD14;100	I/O	04	MASTER;000	I
05	ISD13;100	I/O	06	VCC	-
07	ISD12;100	I/O	08	IDRQ7;100	I
09	ISD11;100	I/O	10	IDACK7;000	O
11	ISD10;100	I/O	12	IDRQ6	I
13	ISD09;100	I/O	14	IDACK6;000	O
15	ISD08;100	I/O	16	IDRQ5;100	I
17	IMEMW;000	I/O	18	IDACK5;000	O
19	IMEWR;000	I/O	20	IDRQ0;100	I
21	ILA17;100	I/O	22	IDACK0;000	O
23	ILA18;100	I/O	24	IIRQ14;100	I
25	ILA19;100	I/O	26	IIRQ15;100	I
27	ILA20;100	I/O	28	IIRQ12;100	I
29	ILA21;100	I/O	30	IIRQ11;100	I
31	ILA22;100	I/O	32	IIRQ10;100	I
33	ILA23;100	I/O	34	IOCS16;100	I
35	ISBHE;000	I/O	36	MECS16;000	I
37	NC	-	38	NC	-
39	NC	-	40	NC	-
41	NC	-	42	NC	-
43	ISA00;100	I/O	44	GND	-
45	ISA01;100	I/O	46	$14R3M;130	I
47	ISA02;100	I/O	48	VCC	-
49	ISA03;100	I/O	50	IBALE;100	O
51	ISA04;100	I/O	52	ITC;100	O
53	ISA05;100	I/O	54	IDACK2;000	O
55	ISA06;100	I/O	56	IIRQ3;100	I
57	ISA07;100	I/O	58	IIRQ4;100	I
59	ISA08;100	I/O	60	IIRQ5;100	I
61	ISA09;100	I/O	62	IIRQ6;100	I
63	ISA10;100	I/O	64	IIRQ7;100	I
65	ISA11;100	I/O	66	ISCLK$;100	O

Table C-2 ISA slot (B) connector pin assignments (104-pin) (2/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
67	ISA12;100	I/O	68	IRFRSH;000	I/O
69	ISA13;100	I/O	70	IDRQ1;100	I
71	ISA14;100	I/O	72	IDACK1;000	O
73	ISA15;100	I/O	74	IDRQ3;100	I
75	ISA16;100	I/O	76	IDACK3;000	O
77	ISA17;100	O	78	IIOR;000	I/O
79	ISA18;100	O	80	IIOW;000	I/O
81	ISA19;100	O	82	ISMEMR;000	O
83	IAEN;100	O	84	ISMEMW;000	O
85	IIOCRY;100	I	86	GND	-
87	ISD00;100	I/O	88	P12V	-
89	ISD01;100	I/O	90	IOWAIT;000	I
91	ISD02;100	I/O	92	M12V	-
93	ISD03;100	I/O	94	IDRQ2;100	I
95	ISD04;100	I/O	96	M5V	-
97	ISD05;100	I/O	98	IIRQ9;100	I
99	ISD06;100	I/O	100	VCC	-
101	ISD07;100	I/O	102	IRESET;100	O
103	IIOCHK;000	I	104	GND	-

C.3 PJ6 PCI Slot (A) Connector (120-pin)

Table C-3 PCI slot (A) connector pin assignments (120-pin) (1/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	PIAVCC	-	02	M12V	-
03	P12V	-	04	GND	-
05	PIAVCC	-	06	GND	-
07	PIAVCC	-	08	NC	-
09	PIAVCC	-	10	PIAVCC	-
11	PINTC;000	I	12	PIAVCC	-
13	PINTA;000	I	14	PINTD;000	O
15	PIAVCC	-	16	PINTB;000	O
17	NC	-	18	PSNTOA;000	I
19	PIAVCC	-	20	NC	-
21	NC	-	22	PSNT1A;000	I
23	GND	-	24	GND	-
25	GND	-	26	GND	-
27	NC	-	28	NC	-
29	PRST;000	O	30	GND	-
31	PIAVCC	-	32	$PCLK2;100	O
33	PGNTD;000	O	34	GND	-
35	GND	-	36	PREQD;000	I
37	NC	-	38	PIAVCC	-
39	PAD30;100	I/O	40	PAD31;100	I/O
41	PIA3V	-	42	PAD29;100	I/O
43	PAD28;100	I/O	44	GND	-
45	PAD26;100	I/O	46	PAD27;100	I/O
47	GND	-	48	PAD25;100	I/O
49	PAD24;100	I/O	50	PIA3V	-
51	IDSELD;100	O	52	PCBE3;000	I/O
53	PIA3V	-	54	PAD23;100	I/O
55	PAD22;100	I/O	56	GND	-
57	PAD20;100	I/O	58	PAD21;100	I/O
59	GND	-	60	PAD19;100	I/O
61	PAD18;100	I/O	62	PIA3V	-
63	PAD16;100	I/O	64	PAD17;100	I/O
65	PIA3V	-	66	PCBE2;000	I/O

Table C-3 PCI slot (A) connector pin assignments (120-pin) (2/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
67	PFRAME;000	I/O	68	GND	-
69	GND	-	70	PIRDY;000	I/O
71	PTRDY;000	I/O	72	PIA3V	-
73	GND	-	74	PDVSEL;000	I/O
75	PSTOP;000	I/O	76	GND	-
77	PIA3V	-	78	PLOCK;000	I/O
79	SDONE;100	I/O	80	PPERR;000	I/O
81	SBO;000	I/O	82	PIA3V	-
83	GND	-	84	PSERR;000	I/O
85	PPAR;100	I/O	86	PIA3V	-
87	PAD15;100	I/O	88	PCBE1;000	I/O
89	PIA3V	-	90	PAD14;100	I/O
91	PAD13;100	I/O	92	GND	-
93	PAD11;100	I/O	94	PAD12;100	I/O
95	GND	-	96	PAD10;100	I/O
97	PAD09;100	I/O	98	GND	-
99	PCBE0;000	I/O	100	PAD08;100	I/O
101	PIA3V	-	102	PAD07;100	I/O
103	PAD06;100	I/O	104	PIA3V	-
105	PAD04;100	I/O	106	PAD05;100	I/O
107	GND	-	108	PAD03;100	I/O
109	PAD02;100	I/O	110	GND	-
111	PAD00;100	I/O	112	PAD01;100	I/O
113	PIAVCC	-	114	PIAVCC	-
115	REQ64;000	I/O	116	ACK64;000	I/O
117	PIAVCC	-	118	PIAVCC	-
119	PIAVCC	-	120	PIAVCC	-

C.4   PJ7 PCI Slot (B) Connector (120-pin)

Table C-4 PCI slot (B) connector pin assignments (120-pin) (1/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	PIBVCC	-	02	M12V	-
03	P12V	-	04	GND	-
05	PIBVCC	-	06	GND	-
07	PIBVCC	-	08	NC	-
09	PIBVCC	-	10	PIBVCC	-
11	PINTD;000	I	12	PIBVCC	-
13	PINTB;000	I	14	PINTC;000	O
15	PIBVCC	-	16	PINTA;000	O
17	NC	-	18	PSNTOB;000	I
19	PIBVCC	-	20	NC	-
21	NC	-	22	PSNT1B;000	I
23	GND	-	24	GND	-
25	GND	-	26	GND	-
27	NC	-	28	NC	-
29	PRST;000	O	30	GND	-
31	PIBVCC	-	32	$PCLK3;100	O
33	PGNTE;000	O	34	GND	-
35	GND	-	36	PREQE;000	I
37	NC	-	38	PIBVCC	-
39	PAD30;100	I/O	40	PAD31;100	I/O
41	PIB3V	-	42	PAD29;100	I/O
43	PAD28;100	I/O	44	GND	-
45	PAD26;100	I/O	46	PAD27;100	I/O
47	GND	-	48	PAD25;100	I/O
49	PAD24;100	I/O	50	PIB3V	-
51	IDSELE;100	O	52	PCBE3;000	I/O
53	PIBVCC	-	54	PAD23;100	I/O
55	PAD22;100	I/O	56	GND	-
57	PAD20;100	I/O	58	PAD21;100	I/O
59	GND	-	60	PAD19;100	I/O
61	PAD18;100	I/O	62	PIB3V	-
63	PAD16;100	I/O	64	PAD17;100	I/O
65	PIB3V	-	66	PCBE2;000	I/O

Table C-4 PCI slot (B) connector pin assignments (120-pin) (2/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
67	PFRAME;000	I/O	68	GND	-
69	GND	-	70	PIRDY;000	I/O
71	PTRDY;000	I/O	72	PIB3V	-
73	GND	-	74	PDVSEL;000	I/O
75	PSTOP;000	I/O	76	GND	-
77	PIB3V	-	78	PLOCK;000	I/O
79	SDONE;100	I/O	80	PPERR;000	I/O
81	SBO;000	I/O	82	PIB3V	-
83	GND	-	84	PSERR;000	I/O
85	PPAR;100	I/O	86	PIB3V	-
87	PAD15;100	I/O	88	PCBE1;000	I/O
89	PIB3V	-	90	PAD14;100	I/O
91	PAD13;100	I/O	92	GND	-
93	PAD11;100	I/O	94	PAD12;100	I/O
95	GND	-	96	PAD10;100	I/O
97	PAD09;100	I/O	98	GND	-
99	PCBE0;000	I/O	100	PAD08;100	I/O
101	PIB3V	-	102	PAD07;100	I/O
103	PAD06;100	I/O	104	PIB3V	-
105	PAD04;100	I/O	106	PAD05;100	I/O
107	GND	-	108	PAD03;100	I/O
109	PAD02;100	I/O	110	GND	-
111	PAD00;100	I/O	112	PAD01;100	I/O
113	PIBVCC	-	114	PIBVCC	-
115	REQ64;001	I/O	116	ACK64;000	I/O
117	PIBVCC	-	118	PIBVCC	-
119	PIBVCC	-	120	PIBVCC	-

C.5 PJ31 PCI Slot (C) Connector (120-pin)

Table C-5 PCI slot (C) connector pin assignments (120-pin) (1/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	PIBVCC	-	02	M12V	-
03	P12V	-	04	GND	-
05	PIBVCC	-	06	GND	-
07	PIBVCC	-	08	NC	-
09	PIBVCC	-	10	PIBVCC	-
11	PINTB;000	I	12	PIBVCC	-
13	PINTD;000	I	14	PINTA;000	O
15	PIBVCC	-	16	PINTC;000	O
17	NC	-	18	NC	-
19	PIBVCC	-	20	NC	-
21	NC	-	22	NC	-
23	GND	-	24	GND	-
25	GND	-	26	GND	-
27	NC	-	28	NC	-
29	PRST;000	O	30	GND	-
31	PIBVCC	-	32	$PCLK4;100	O
33	PGNTB;000	O	34	GND	-
35	GND	-	36	PREQB;000	I
37	NC	-	38	PIBVCC	-
39	PAD30;100	I/O	40	PAD31;100	I/O
41	PIB3V	-	42	PAD29;100	I/O
43	PAD28;100	I/O	44	GND	-
45	PAD26;100	I/O	46	PAD27;100	I/O
47	GND	-	48	PAD25;100	I/O
49	PAD24;100	I/O	50	PIB3V	-
51	IDSELC;100	O	52	PCBE3;000	I/O
53	PIBVCC	-	54	PAD23;100	I/O
55	PAD22;100	I/O	56	GND	-
57	PAD20;100	I/O	58	PAD21;100	I/O
59	GND	-	60	PAD19;100	I/O
61	PAD18;100	I/O	62	PIB3V	-
63	PAD16;100	I/O	64	PAD17;100	I/O
65	PIB3V	-	66	PCBE2;000	I/O

Table C-5 PCI slot (C) connector pin assignments (120-pin) (2/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
67	PFRAME;000	I/O	68	GND	-
69	GND	-	70	PIRDY;000	I/O
71	PTRDY;000	I/O	72	PIB3V	-
73	GND	-	74	PDVSEL;000	I/O
75	PSTOP;000	I/O	76	GND	-
77	PIB3V	-	78	PLOCK;000	I/O
79	SDONE;100	I/O	80	PPERR;000	I/O
81	SBO;000	I/O	82	PIB3V	-
83	GND	-	84	PSERR;000	I/O
85	PPAR;100	I/O	86	PIB3V	-
87	PAD15;100	I/O	88	PCBE1;000	I/O
89	PIB3V	-	90	PAD14;100	I/O
91	PAD13;100	I/O	92	GND	-
93	PAD11	I/O	94	PAD12;100	I/O
95	GND	-	96	PAD10;100	I/O
97	PAD09;100	I/O	98	GND	-
99	PCBE0;000	I/O	100	PAD08;100	I/O
101	PIB3V	-	102	PAD07;100	I/O
103	PAD06;100	I/O	104	PIB3V	-
105	PAD04;100	I/O	106	PAD05;100	I/O
107	GND	-	108	PAD03;100	I/O
109	PAD02;100	I/O	110	GND	-
111	PAD00;100	I/O	112	PAD01;100	I/O
113	PIBVCC	-	114	PIBVCC	-
115	REQ64;000	I/O	116	ACK64;000	I/O
117	PIBVCC	-	118	PIBVCC	-
119	PIBVCC	-	120	PIBVCC	-

C.6 PJ8 PC Card/CardBus Connector (85-pin)

Table C-6 PC card/CardBus connector pin assignments (85-pin) (1/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	GND	-	02	AD03;100	I/O
03	AD04;100	I/O	04	AD05;100	I/O
05	AD06;100	I/O	06	AD07;100	I/O
07	ACE1;000	O	08	AA10;100	O
09	AOE;000	O	10	AA11;100	O
11	AA09;100	O	12	AA08;100	O
13	AA13;100	O	14	AA14;100	O
15	AWE;000	O	16	AIREQ;000	I
17	MCVCCA	-	18	MCVP1A	-
19	AA16;100	O	20	AA15;100	O
21	AA12;100	O	22	AA07;100	O
23	AA06;100	O	24	AA05;100	O
25	AA04;100	O	26	AA03;100	O
27	AA02;100	O	28	AA01;100	O
29	AA00;100	O	30	AD00;100	I/O
31	AD01;100	I/O	32	AD02;100	I/O
33	AIIS16;000	I	34	GND	-
35	GND	-	36	ACD1;000	I
37	AD11;100	I/O	38	AD12;100	I/O
39	AD13;100	I/O	40	AD14;100	I/O
41	AD15;100	I/O	42	ACE2;000	O
43	AVS1;100	I/O	44	AIORD;000	I/O
45	AIOWR;000	I/O	46	AA17;100	O
47	AA18;100	O	48	AA19;100	O
49	AA20;100	O	50	AA21;100	O
51	MCVCCA	-	52	MCVP1A	-
53	AA22;100	O	54	AA23;100	O
55	AA24;100	O	56	AA25;100	O
57	AVS2;100	I	58	ARESET;100	O
59	AWAIT;000	I	60	AINPCK;000	I
61	AREG;000	O	62	ASPKR;000	I
63	ATSCHG;000	I	64	AD08;100	I/O
65	AD09;100	I/O	66	AD10;100	I/O

Table C-6 PC card/CardBus connector pin assignments (85-pin) (2/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
67	ACD2;000	I	68	GND	-
69	GND	-	70	GND	-
71	GND	-	72	GND	-
73	GND	-	74	GND	-
75	GND	-	76	GND	-
77	GND	-	78	GND	-
79	GND	-	80	GND	-
81	GND	-	82	GND	-
83	GND	-	84	GND	-
85	GND	-			

C.7 PJ9 PC Card/CardBus Connector (85-pin)

Table C-7 PC card/CardBus connector pin assignments (85-pin) (1/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	GND	-	02	BD03;100	I/O
03	BD04;100	I/O	04	BD05;100	I/O
05	BD06;100	I/O	06	BD07;100	I/O
07	BCE1;000	O	08	BA10;100	O
09	BOE;000	O	10	BA11;100	O
11	BA09;100	O	12	BA08;100	O
13	BA13;100	O	14	BA14;100	O
15	BWE;000	O	16	BIREQ;000	I
17	MCVCCB	-	18	MCVP1B	-
19	BA16;100	O	20	BA15;100	O
21	BA12;100	O	22	BA07;100	O
23	BA06;100	O	24	BA05;100	O
25	BA04;100	O	26	BA03;100	O
27	BA02;100	O	28	BA01;100	O
29	BA00;100	O	30	BD00;100	I/O
31	BD01;100	I/O	32	BD02;100	I/O
33	BIIS16;000	I	34	GND	-
35	GND	-	36	BCD1;000	I
37	BD11;100	I/O	38	BD12;100	I/O
39	BD13;100	I/O	40	BD14;100	I/O
41	BD15;100	I/O	42	BCE2;000	O
43	BVS1;100	I/O	44	BIORD;000	I/O
45	BIOWR;000	I/O	46	BA17;100	O
47	BA18;100	O	48	BA19;100	O
49	BA20;100	O	50	BA21;100	O
51	MCVCCB	-	52	MCVP1B	-
53	BA22;100	O	54	BA23;100	O
55	BA24;100	O	56	BA25;100	O
57	BVS2;100	I	58	BRESET;100	O
59	BWAIT;000	I	60	BINPCK;000	I
61	BREG;000	I	62	BSPKR;000	I
63	BTSCHG;000	I	64	BD08;100	I/O
65	BD09;100	I/O	66	BD10;100	I/O

Table C-7 PC card/CardBus connector pin assignments (85-pin) (2/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
67	BCD2;000	I	68	GND	-
69	GND	-	70	GND	-
71	GND	-	72	GND	-
73	GND	-	74	GND	-
75	GND	-	76	GND	-
77	GND	-	78	GND	-
79	GND	-	80	GND	-
81	GND	-	82	GND	-
83	GND	-	84	GND	-
85	GND	-			

C.8   PJ10 System I/F (1) Connector (120-pin)

Table C-8 System I/F (1) connector pin assignments (120-pin) (1/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	GND	-	02	PDB02;100	I/O
03	GND	-	04	PDB06;100	I/O
05	GND	-	06	PCONF;100	I/O
07	GND	-	08	MCV	-
09	GND	-	10	DAD07;100	I/O
11	PDB07;100	I/O	12	DAD08;100	I/O
13	SLIN;000	O	14	DAD31;100	I/O
15	PDB01;100	I/O	16	DAD06;100	I/O
17	AUTFD;000	I	18	DAD05;100	I/O
19	PE;100	O	20	DAD30;100	I/O
21	DAD15;100	I/O	22	DAD03;100	I/O
23	NC	-	24	DAD04;100	I/O
25	DGND	-	26	DAD29;100	I/O
27	DGND	-	28	DAD02;100	I/O
29	DGND	-	30	DAD01;100	I/O
31	DGND	-	32	DAD00;100	I/O
33	NC	-	34	DAD28;100	I/O
35	P15V	-	36	DRST;000	I
37	P15V	-	38	DAD27;100	I/O
39	P15V	-	40	DREFRH;000	I/O
41	P15V	-	42	DAD26;100	I/O
43	GND	-	44	DFRAME;000	I/O
45	GND	-	46	DAD25;100	I/O
47	GND	-	48	DLOCK;000	I/O
49	GND	-	50	DPERR	I/O
51	GND	-	52	DAD24;100	I/O
53	GND	-	54	DAD12;100	I/O
55	GND	-	56	DSTOP;000	I/O
57	GND	-	58	DAD23;100	I/O
59	GND	-	60	DTRDY;000	I/O
61	GND	-	62	DAD22;100	I/O
63	GND	-	64	DCBE2;000	I/O
65	GND	-	66	DAD11;100	I/O

Table C-8 System I/F (1) connector pin assignments (120-pin) (2/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
67	GND	-	68	DAD21;100	I/O
69	GND	-	70	DIRQCK;100	I/O
71	GND	-	72	DCBE0;000	I/O
73	GND	-	74	DAD20;100	I/O
75	NC	-	76	DIOCHK;000	I/O
77	IFVCC	-	78	DAD19;100	I/O
79	IFVCC	-	80	DSERR;000	I/O
81	NC	-	82	DAD09;100	I/O
83	GND	-	84	DAD18;100	I/O
85	GND	-	86	RTS;100	I
87	GND	-	88	SD1;100	I
89	GND	-	90	SNDMUT;000	I/O
91	GND	-	92	DSCREQ;000	I/O
93	GND	-	94	SIRRXD;000	I/O
95	GND	-	96	DSCGNT;000	I/O
97	GND	-	98	SIRTXD;100	I/O
99	GND	-	100	DTR;100	I
101	GND	-	102	HSYNC;100	I
103	GND	-	104	MNTIDO;100	I/O
105	GND	-	106	OVSYNC;100	I
107	GND	-	108	MNTID1;100	I/O
109	LINEIL;100	O	110	RED;100	I
111	CDL;100	O	112	MNTDID2;100	I/O
113	DSKCHG;000	O	143	LGREN;100	I
115	JOYDT1;100	I/O	116	MNTID3;100	I/O
117	JOYDT3;100	I/O	118	BLUE;100	I
119	LINEOL;100	I	120	GND	-

C.9 PJ11 System I/F (2) Connector (120-pin)

Table C-9 System I/F (2) connector pin assignments (120-pin) (1/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	SELECT;100	I	02	GND	-
03	GND	-	04	GND	-
05	PDB05;100	I/O	06	GND	-
07	PINIT;000	I	08	GND	-
09	ERROR;000	O	10	GND	-
11	PDB00;100	I/O	12	BUSY;100	O
13	STROB;000	I	14	PDB03;100	I/O
15	DOCPWN;100	I	16	PDB04;100	I/O
17	DAD16;100	I/O	18	ACK;000	O
19	DDEVSL;000	I/O	20	DAD17;100	I/O
21	DPAR;100	I/O	22	DAD14;100	I/O
23	DAD13;100	I/O	24	NC	-
25	DIRDY;000	I/O	26	DGND	-
27	DCBE3;000	I/O	28	DGND	-
29	DCBE1;000	I/O	30	DGND	-
31	DAD10;100	I/O	32	DGND	-
33	DIRQO;000	O	34	DNC	-
35	DINTD;000	I/O	36	P15V	-
37	DINTC;000	I/O	38	P15V	-
39	$DSCLK;100	I/O	40	P15V	-
41	DINTB;000	I/O	42	P15V	-
43	DGNT;000	I/O	44	NC	-
45	DREQ;000	I/O	46	GND	-
47	DINTA;000	I/O	48	GND	-
49	RI1;100	O	50	GND	-
51	DPREQ;000	I/O	52	GND	-
53	DCD1;100	O	54	GND	-
55	DPGNT;000	I/O	56	GND	-
57	DSR1;100	O	58	GND	-
59	EXKBCK;100	I/O	60	GND	-
61	SCL;100	I/O	62	GND	-
63	MIDIN;100	O	64	GND	-
65	RD1;000	O	66	GND	-

Table C-9 System I/F (2) connector pin assignments (120-pin) (2/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
67	EXKBDT;100	I/O	68	GND	-
69	MIDOUT;100	I	70	GND	-
71	SDA;100	I/O	72	GND	-
73	DOCRI;100	O	74	GND	-
75	MOUSCK;100	I/O	76	NC	-
77	DOCKEN;000	I	78	IFVCC	-
79	CTS1;100	O	80	IFVCC	-
81	MOUSDT;100	I/O	82	NC	
83	SPKDIS;100	O	84	GND	-
85	PCM2SP;100	O	86	GND	-
87	MICDIS;100	O	88	GND	-
89	LINEIL;000	O	90	GND	-
91	LINEIR;100	O	92	GND	-
93	LINEIR;000	O	94	GND	-
95	DCPCLR;100	I	96	GND	-
97	DOCSMI;100	O	98	GND	-
99	CDR;100	O	100	GND	-
101	NC	-	102	GND	-
103	MICR;000	O	104	GND	-
105	JOYDTO;100	I/O	106	GND	-
107	MICL;000	O	108	GND	-
109	JOYDT2;100	I/O	110	CDR;000	O
111	LINEOL;000	I	112	CDL;100	O
113	JOYDT5;100	I/O	114	MICR;100	O
115	JOYDT4;100	I/O	116	LINEOR;100	I
117	JOYDT7;100	I/O	118	LINEOR;000	I
119	JOYDT6;100	I/O	120	MICL;100	O

C.10 PJ14 External SCSI I/F Connector (50-pin)

Table C-10 External SCSI I/F connector pin assignments (50-pin)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	GND	-	02	SCD0;000	I/O
03	GND	-	04	SCD1;000	I/O
05	GND	-	06	SCD2;000	I/O
07	GND	-	08	SCD3;000	I/O
09	GND	-	10	SCD4;000	I/O
11	GND	-	12	SCD5;000	I/O
13	GND	-	14	SCD6;000	I/O
15	GND	-	16	SCD7;000	I/O
17	GND	-	18	SCDP;000	I/O
19	GND	-	20	GND	-
21	GND	-	22	GND	-
23	GND	-	24	GND	-
25	NC	-	26	TRMPWR	-
27	GND	-	28	GND	-
29	GND	-	30	GND	-
31	GND	-	32	SCATN;000	O
33	GND	-	34	GND	-
35	GND	-	36	SCBSY;000	I/O
37	GND	-	38	SCACK;000	O
39	GND	-	40	SCRST;000	I/O
41	GND	-	42	SCMSG;000	I
43	GND	-	44	SCSEL;000	I/O
45	GND	-	46	SCCD;000	I
47	GND	-	48	SCREQ;000	I
49	GND	-	50	SCIO;000	I

C.11 PJ23 Internal SCSI I/F Connector (50-pin)

Table C-11 Internal SCSI I/F connector pin assignments (50-pin)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	GND	-	02	SCD0;000	I/O
03	GND	-	04	SCD1;000	I/O
05	GND	-	06	SCD2;000	I/O
07	GND	-	08	SCD3;000	I/O
09	GND	-	10	SCD4;000	I/O
11	GND	-	12	SCD5;000	I/O
13	GND	-	14	SCD6;000	I/O
15	GND	-	16	SCD7;000	I/O
17	GND	-	18	SCDP;000	I/O
19	GND	-	20	GND	-
21	GND	-	22	GND	-
23	GND	-	24	GND	-
25	NC	-	26	GND	-
27	GND	-	28	GND	-
29	GND	-	30	GND	-
31	GND	-	32	SCATN;000	O
33	GND	-	34	GND	-
35	GND	-	36	SCBSY;000	I/O
37	GND	-	38	SCACK;000	O
39	GND	-	40	SCRST;000	I/O
41	GND	-	42	SCMSG;000	I
43	GND	-	44	SCSEL;000	I/O
45	GND	-	46	SCCD;000	I
47	GND	-	48	SCREQ;000	I
49	GND	-	50	SCIO;000	I

C.12 PJ15 Line Out Connector (6-pin)

Table C-12 Line out connector pin assignments (6-pin)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	GND	-	02	LINEOL;000	O
03	LINEOR;000	O	04	NC	-
05	GND	-	06	NC	-

C.13 PJ32 Speaker (1) Connector (2-pin)

Table C-13 Speaker (1) connector pin assignments (2-pin)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	SPKOL;100	O	02	SPKOL;000	O

C.14 PJ33 Speaker (2) Connector (2-pin)

Table C-14 Speaker (2) connector pin assignments (2-pin)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	SPKOR;100	O	02	SPKOR;000	O

C.15 PJ35 Headphone Connector (6-pin)

Table C-15 Headphone connector pin assignments (6-pin)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	GND	-	02	LINEL;100	O
03	LINER;100	O	04	NC	-
05	GND	-	06	SPKDIS;000	I

C.16 PJ34 Microphone Connector (6-pin)

Table C-16 Microphone connector pin assignments (6-pin)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	GND	-	02	MICL;000	I
03	MICR;000	I	04	NC	-
05	MICDIS;100	I	06	GND	-

C.17 PJ16 Line in Connector (6-pin)

Table C-12 Line in connector pin assignments (6-pin)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	GND	-	02	LINEIL;000	I
03	LINEIR;000	I	04	NC	-
05	NC	-	06	NC	I

C.18   PJ20 FDD/CD-ROM Pack I/F Connector (80-pin)

Table C-18   FDD/CD-ROM pack I/F connector pin assignments (80-pin) (1/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	VCC	-	02	VCC	-
03	VCC	-	04	VCC	-
05	GND	-	06	VCC	-
07	INCDL;100	I	08	GND	-
09	INCDR;100	I	10	ISD07;100	I/O
11	GND	-	12	GND	-
13	ISA02;100	I/O	14	ISD08;100	I/O
15	ISA00;100	I/O	16	GND	-
17	CDRCS0;000	O	18	TRK0;000	I
19	WDATA;000	O	20	GND	-
21	IFSL;000	O	22	HDSEL;000	O
23	ISA01;100	I/O	24	GND	-
25	GND	-	26	IRESET;000	O
27	IOCS16;000	I	28	GND	-
29	CDRCS1;000	O	30	ISD09;100	I/O
31	CDRIRQ;100	I	32	GND	-
33	GND	-	34	ISD06;100	I/O
35	CDDACK;000	O	36	GND	-
37	INDEX;000	I	38	WGATE;000	O
39	RDATA;000	I	40	GND	-
41	GND	-	42	ISD10;100	I/O
43	HIORDY;100	I	44	GND	-
45	DSKCHG;000	I	46	ISD05;100	I/O
47	IIOR;000	I/O	48	GND	-
49	GND	-	50	ISD11;100	I/O
51	IIOW;000	I/O	52	GND	-
53	MBSTS0;100	I	54	ISD04;100	I/O
55	CDDRQ;100	I	56	GND	-
57	NC	-	58	STEP;000	O
59	CDRLED;000	I	60	GND	-
61	IFMO;000	O	62	ISD12;100	I/O
63	MBSTS1;100	I	64	GND	-
65	ISD00;100	I/O	66	ISD03;100	I/O

Table C-18 FDD/CD-ROM pack I/F connector pin assignments (80-pin) (2/2)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
67	GND	-	68	GND	-
69	ISD15;100	I/O	70	ISD13;100	I/O
71	WP;000	I	72	GND	-
73	ISD01;100	I/O	74	ISD02;100	I/O
75	DENSEL;100	O	76	GND	-
77	ISD14;100	I/O	78	DIR;000	O
79	NC	-	80	NC	-

C.19 PJ26 Main Fan Connector (2-pin)

Table C-19 Main fan connector pin assignments (2-pin)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	FP12V	-	02	FANON;100	I

C.20 PJ36 Power Supply Unit Fan Connector (2-pin)

Table C-20 Power supply unit fan connector pin assignments (2-pin)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	SF12V	-	02	GND	-

C.21 PJ38 Enhanced IDE Connector (40-pin)

Table C-21 Enhanced IDE connector pin assignments (40-pin)

Pin no.	Signal name	I/O	Pin no.	Signal name	I/O
01	IRESET;100	I/O	02	GND	-
03	ISD07;100	I/O	04	ISD08;100	I/O
05	ISD06;100	I/O	06	ISD09;100	I/O
07	ISD05;100	I/O	08	ISD10;100	I/O
09	ISD04;100	I/O	10	ISD11;100	I/O
11	ISD03;100	I/O	12	ISD12;100	I/O
13	ISD02;100	I/O	14	ISD13;100	I/O
15	ISD01;100	I/O	16	ISD14;100	I/O
17	ISD00;100	I/O	18	ISD15;100	I/O
19	GND	-	20	NC	-
21	CDRDQ;100	I/O	22	GND	-
23	IIOW;000	O	24	GND	-
25	IIOR;000	O	26	GND	-
27	HIORDY;100	I/O	28	VCC	-
29	CDDACK;000	I/O	30	GND	-
31	CDRIRQ;100	I/O	32	IOCS16;000	I/O
33	ISA01;100	I/O	34	NC	-
35	ISA00;100	I/O	36	ISA02;100	I/O
37	CDRCS0;000	I/O	38	CDRCS1;000	I/O
39	IDELED;000	I/O	40	GND	-