1.1   Features

The Toshiba T6600C is one of the most powerful multimedia capable laptop computer's available. Utilizing advanced technology and high-speed components, the T6600C offers excellent display legibility, and IBM PC/AT compatibility. The T6600C system unit consists of the following features:

❏ Microprocessor

The i486DX2-66 microprocessor operates at 66 MHz.

❏ Math co-processor

The microprocessor (i486DX2) incorporates a math co-processor.

❏ Cache memory

Eight (8) KB of cache memory is stored in the i486DX2.
Optionally, a turbo cache module (128 KB) made by Integrated Device Technology (IDT) can be installed in the T6600C. When it is installed, the i486DX2 cache memory is duplicated.

❏ Disk storage

The internal 3.5-inch 510 Megabyte (MB) Hard Disk Drive (HDD) has an average access time of 10 milliseconds. A 3.5-inch Floppy Disk Drive (FDD) supports 2HD floppy disks (1.44 Mbytes) and 2DD floppy disks (720 Kbytes). The T6600C also has a built-in 5.25-inch bay for an optional CD-ROM.

❏ Memory

The T6600C comes standard with 8 MB of CMOS Random Access Memory (RAM). This includes 640 KB of conventional memory and 7,424 KB of extended memory, which can be utilized as a BIOS ROM data copy area, and as expanded memory that is compatible with the Lotus/Intel/Microsoft Expanded Memory Specifications (LIM-EMS).

❏ Display

The high-resolution, Thin Film Transistor (TFT) color Liquid Crystal Display (LCD) displays 640x480 pixels with 260 K colors for both graphics and characters.

The internal display controller supports Video Graphics Adapter (VGA) functions on the internal display device and Super VGA (SVGA) functions on an external CRT. The internal LCD and an external CRT can display simultaneously. The Toshiba proprietary 640x400 mode and AT&T proprietary 640x400 mode are supported at the BIOS level.

❑ Keyboard

The easy-to-use 101/102-key enhanced detachable keyboard with full-size keys and standard spacing is compatible with IBM standard software.

❑ Power supply

The power supply is a universal, auto-sensing power supply which enables worldwide usage of the T6600C as long as a compatible AC plug is available.

❑ Expansion slots

The two Industry Standard Architecture (ISA) bus slots allow for an IBM-compatible full-size card and half-size cards.

❑ Memory card slots

Two optional memory card slots (88-pin) enable you to install the following Toshiba optional memory cards:

4 MB memory card:	PA2004U
8 MB memory card:	PA2005U
16 MB memory card:	PA2010U

❑ Personal Computer Memory Card International Association (PCMCIA) card slot

The optional built-in PCMCIA slot measures 16 mm high.

❑ Parallel port

The Centronics-compatible parallel interface port serves two purposes: the port can be used to connect a Centronics-compatible printer or an external 5.25-inch floppy disk drive.

❑ RS-232-C port

The RS-232-C port is a 9-pin serial interface port.

❑ Mouse port

The 6-pin mouse port on the back supports an IBM PS/2 mouse.

❑ Keyboard port

The 6-pin keyboard port on the back supports an IBM PS/2-compatible keyboard.

❏ RGB port

The 15-pin RGB analog port on the back supports an external CRT.

❏ SCSI port

The T6600C has a Small Computer System Interface (SCSI) port.

❏ Audio ports

The computer has the following standard 3.5-mm diameter miniature stereo jacks for an audio system:

- Headphone (with speaker shut-off switch)
- Line out
- Line in
- Microphone

❏ Special ports

The T6600C has a Feature connector and Z-connector for use with expansion cards.

The T6600C Personal Computer is shown in Figure 1-1, and its system configuration is illustrated in Figure 1-2.
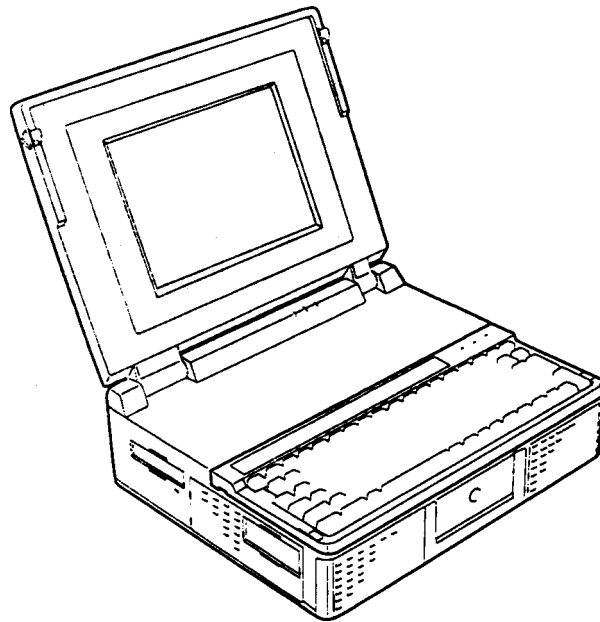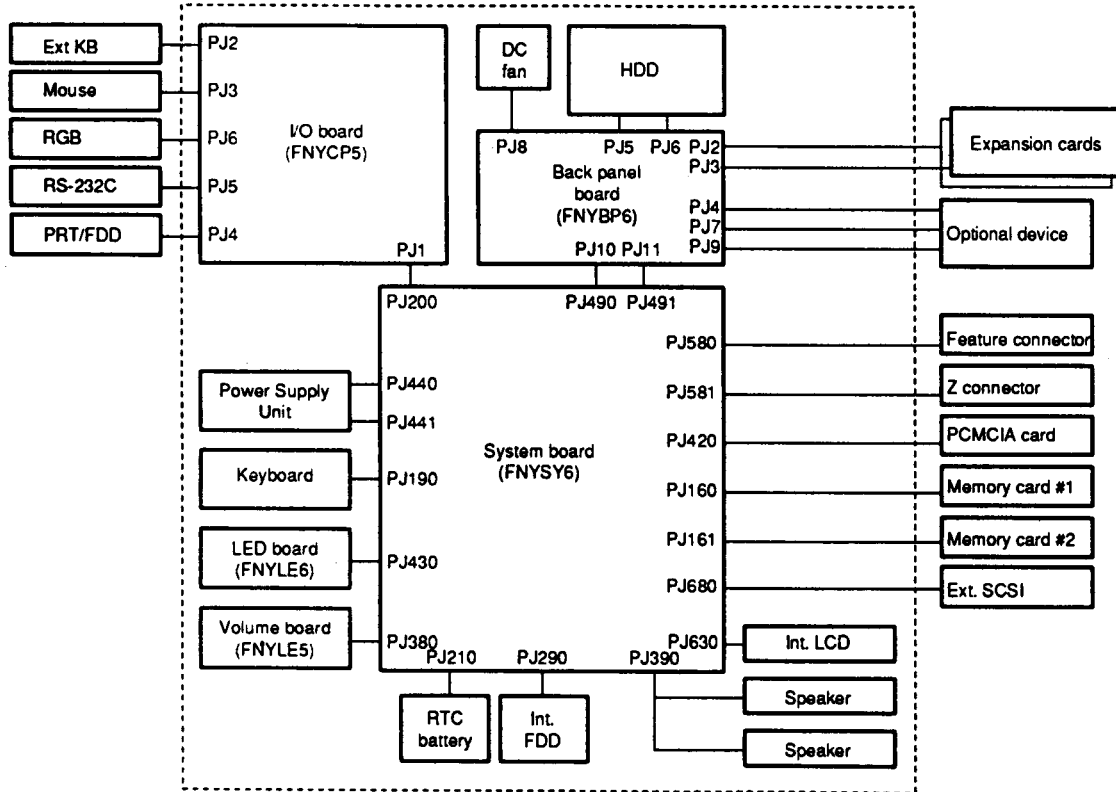

Figure 1-1 T6600C Personal Computer

Figure 1-2 T6600C System Unit Configuration

1.2 System Unit Block Diagram

Figure 1-3 shows a block diagram of the T6600C system unit.

Figure 1-3 T6600C System Board Block Diagram

The block diagram shown in Figure 1-3 is composed of the following major components:

❑ An i486DX2-66 CPU which incorporates a math co-processor and 8 KB cache memory.

❑ The following memory components:

Standard RAM:	8 MB, 32-bit data width (70 ns)
Cache memory:	8 KB (inside CPU), a turbo cache memory module can be installed, duplicating the CPU's cache memory.
System, Video	128 KB (96 KB are used), 8-bit data width
BIOS:	1 Mbit flash ROM. (150 ns)
	This ROM contains Initial Reliability Test (IRT), Basic Input/ Output System (BIOS), and video BIOS.
SCSI BIOS:	32 KB (16 KB are used), 8-bit data width
	EROM is used. (150 ns)
Video RAM:	1 MB, 16-bit data width
	(Eight 256Kx4 bit chips)
Memory card:	4, 8, or 16 MB memory card can be installed.
	32-bit data width.

❑ Super Integration (SI) T9901, which stores the following components:

- Two Direct Memory Access Controllers (DMAC): . 82C37 equivalent
- Two Programmable Interrupt Controllers (PIC): ..... 82C59 equivalent
- One Programmable Interval Timer (PIT): .... 82C54 equivalent
- One Floppy Disk Controller (FDC): .... TC8565 equivalent
- One Serial Input/Output Controller (SIO): .... TC8570 equivalent (The T6600C does not use SIO inside the T9901.)
- One Variable Frequency Oscillator (VFO):.............. TC8568 equivalent
- One I/O Controller
- One Printer Port Controller
- One Speaker Controller

❑ Serial Input/Output Controller (SIO)

One NS16550 chip controls the internal serial port.

❑ Real Time Clock (RTC)

One T9934 chip is used (which has 128 bytes of memory). Fourteen bytes of memory are used for the calendar and clock, and the remaining 114 bytes are used for system configuration data.

❏ Keyboard Controller (KBC)

An M37506E1FP chip and an 8749 chip are used.
The M37506E1FP is a keyboard interface controller which controls the internal keyboard, external keyboard port, and PS/2 mouse port. The 8749 chip is a keyboard scan controller which is mounted inside the detachable keyboard unit.

❏ VGA Display Controller: WD90C31

This controller controls both internal and external VGA-compatible displays and external SVGA-compatible displays with an Analog Digital Converter (DAC). The controller can display data on the internal and external display simultaneously.

❏ SCSI Controller

An AIC6260 chip controls the internal Small Computer System Interface (SCSI) port.

❏ Sound Controller

An AD1848 chip controls the internal sound system.

❏ The Clock Generator receives 14.31818 MHz (X1) and generates the following frequencies:

- 66 MHz for the CPU
- 14.7456 MHz for the COM
- 24 MHz for the FDC and VFO
- 16 MHz is used for KBC (8 MHz)
- 14.31818 MHz for VGA display controller

OSC (X3) generates 32.768 KHz for RTC
OSC (X) generates 24.576 MHz for sound system
OSC (X) generates 16.9344 MHz for sound system

❏ Gate Arrays

System Controller Gate Array

This gate array has the following functions:

- CPU Control
- Turbo Cache Control
- Memory Control
  - DRAM Control
  - Compatible Bus Interface Control
- Bus Controller
  - Compatible Bus Interface Control
  - Compatible Access Control
  - DMAC Control
  - I/O Control

- Address Latch Controller
  - 32-bit to 16-bit Transfer
  - Address Latch
  - DMA Address Generation
  - Refresh Address Generation
- I/O Register
  - Compatible I/O Port
  - Saving the data of the Register (in resume) Control
  - Toshiba Special Register
- Processing Speed Control
- Data Bus Change Controller
- Data Latch

PCMCIA Controller Gate Array

This gate array has the following functions:

- PCMCIA Card Interface control
- HDD and FDD access control by security register
- Communication control between system and KBC
- EEPROM access
- SCSI interrupt control
- External SIO control
- Sound system control
- Display type determine
- DAC digital output on/off control
- Display signal on/off control
- Back light on/off control
- Feature connector and Z-connector connect detection
- External KB select signal control

Display Timing Controller Gate Array

This gate array controls the display timing of the internal display.

1.3   3.5-inch Floppy Disk Drive

The T6600C 3.5-inch Floppy Disk Drive (FDD) is a thin, high-performance reliable drive that supports 720 KB (formatted) 2DD and 1.44 MB (formatted) 2HD 3.5-inch floppy disks.

The T6600C FDD is shown in Figure 1-4, and its specifications are described in Table 1-1.
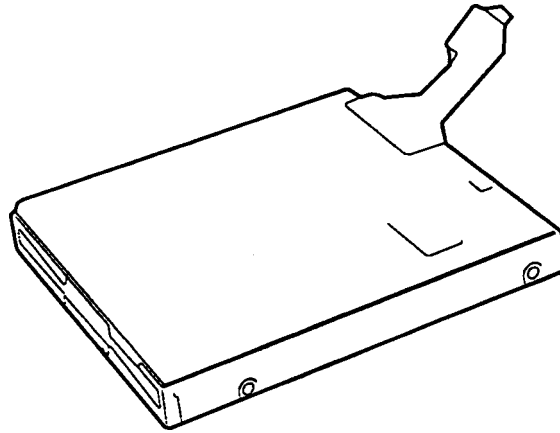
Figure 1-4 3.5-inch FDD

Table 1-1 3.5-inch FDD Specifications

Item	2 MB Mode	1 MB Mode

Storage capacity (KB)
         Unformatted
         Formatted
	2,000
	1,440
		1,000
		720

Number of heads	2	2
Number of cylinders	80	80

Access time (ms)
         Track to track
         Average
         Head settling time
	3
	181
	15
		3
		181
		15

Recording track density (tpi)	135	135
Data transfer rate (Kbps)	500	250
Rotation speed (rpm)	300	300
Recording method	Modified Frequency Modulation (MFM)	

1.4   3.5-inch Hard Disk Drive

The Hard Disk Drive (HDD) is a random access, non-volatile storage device. It has a non-removable 3.5-inch magnetic disk and mini-Winchester type magnetic heads.

The T6600C supports a 510 MB HDD. The disk drive is shown in Figure 1-5, and its specifications are described in Table 1-2.
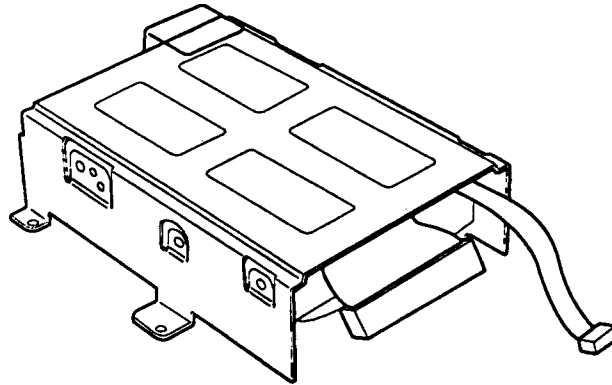
Figure 1-5 3.5-inch HDD

Table 1-2 3.5-inch HDD Specifications

Item	Specification
Model Name	CP30544
Storage capacity (MB) Formatted	510.0
Number of disks	3
Data heads	6
Data surfaces	6
Tracks per surface	2243
Sectors per track	59 (60) to 89 (90)
Bytes per sector	512 to 520
Access time (ms) Track to track Average Maximum	2 10 18
Rotation speed (rpm)	5,400
Data transfer rate (bps) To/from media	3.22 M
Interleave	1:1
Recording method	1-7 RLL

1.5 Keyboard

The 101-key (USA) or 102-key (European) keyboard is mounted on the T6600C's system unit, and is connected to the keyboard controller on the system board through a 19-pin flat cable. The keyboard is shown in Figure 1-6.

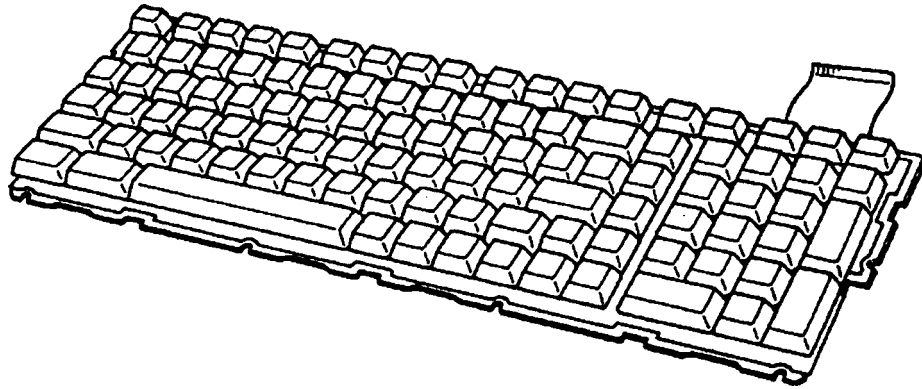See Appendix F for optional keyboard configurations.

Figure 1-6 Keyboard

1.6 Display

The T6600C display is a TFT Color Liquid Crystal Display (LCD) which contains an LCD module, a Fluorescent Lamp (FL), and an FL inverter board.

1.6.1 TFT Color LCD Module

The T6600C TFT color LCD is backlit and supports 640x480 pixels with a High Resolution Graphics Subsystem (HRGS) and 260 K colors for graphics and characters. The HRGS includes the functions of the Video Graphics Array (VGA).

The LCD receives vertical and horizontal synchronizing signals, 9-bit data signals, data enable signals, and shift clock for data transmission. All signals are CMOS-level compatible.

The TFT LCD and FL inverter board are shown in Figure 1-7, and specifications for the LCD are described in Table 1-3.
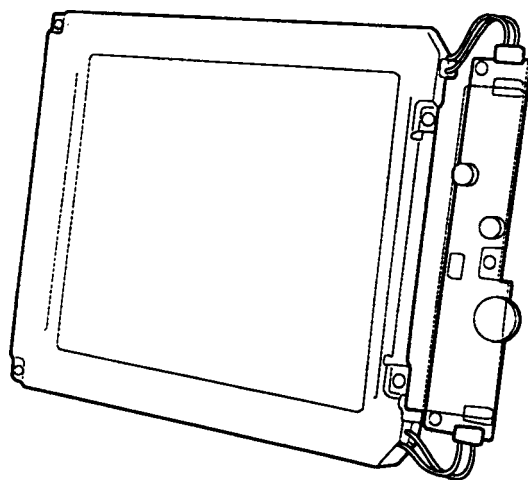
Figure 1-7 TFT Color LCD and FL Inverter Board

Table 1-3 TFT Color LCD Specifications

Item		Specifications
Number of Dots	(dots)	640 x 480
Dot pitch	(mm)	0.33 (W) x 0.33 (H)
Display area	(mm)	211.2 (W) x 158.4 (H)
Contrast		60:1 (minimum)
FL current	(mA)	7.0
FL frequency	(KHz)	20 to 60

1.6.2   Fluorescent Lamp (FL) Inverter Board

The FL inverter board supplies high frequency current to the LCD's Fluorescent Lamp. Specifications for the FL inverter are described in Table 1-4.

Table 1-4 FL Inverter Board Specifications

Item		Specifications
Input	Voltage (VDC)	24
	Power (W)	12.5
Output	Voltage (VAC)	1,100 r.m.s
	Current (mA)	7 mA r.m.s
	Frequency (KHz)	36
	Current limits (mA)	5.0 to 7.0

1.7   Power Supply

The universal auto-sensing power supply can be used worldwide. It supplies +5, –5, +12, +24 and –12 VDC to the system.

The power supply unit is housed in the system unit and supplies regulated power to the:

   1)   System board
   2)   Back panel board
   3)   3.5-inch floppy disk drive (FDD)
   4)   3.5-inch hard disk drive (HDD)
   5)   External keyboard port
   6)   Liquid crystal display (LCD)
   7)   Option slots
   8)   DC fans
   9)   PS/2 mouse port

The power supply unit includes an input line filter, line fuse, cooling fan, power conversion circuitry and connectors.

Input ratings are: 115 VAC, 3.5 A or 230 VAC, 1.7 A.

The power supply unit is shown in Figure 1-8, and the output ratings are specified in Table 1-5.
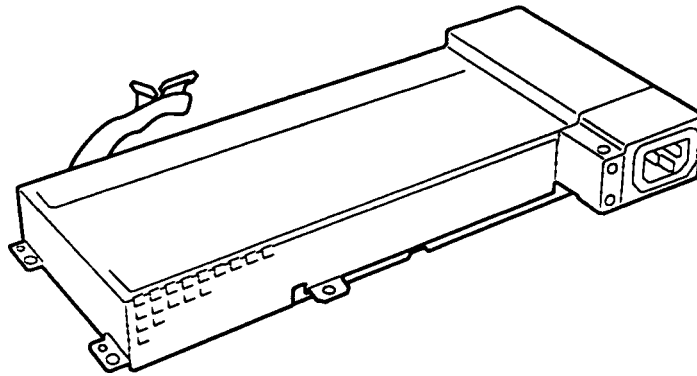
Figure 1-8 Power Supply Unit

Table 1-5 Power Supply Unit Output Rating for the System

*	DC Voltage (V)	Maximum Current (A)
For system	+5	11.8
	+12	2.86
	–5	0.3
	–12	0.31
	+24	0.5

   * For identification of output voltage ratings, refer to Section C.11 in Appendix C.

2.1 Troubleshooting

Chapter 2 describes how to determine if a Field Replaceable Unit (FRU) in the T6600C is causing the computer to malfunction. The FRUs covered are:

1. Power Supply
2. System Board
3. Back Panel Board
4. Floppy Disk Drive
5. Hard Disk Drive
6. Keyboard
7. Display

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

The following tools are necessary for implementing the troubleshooting procedures:

1. A T6600C Diagnostics Disk
2. Two Phillips screwdrivers (3 mm and 2 mm)
3. A Toshiba MS-DOS system disk(s)
4. A 2DD or 2HD formatted work disk for floppy disk drive testing
5. A cleaning kit for floppy disk drive troubleshooting
6. A printer port LED
7. An RS-232-C wraparound connector
8. A printer wraparound connector
9. A multimeter
10. An external 5.25-inch floppy disk drive
11. An external CRT
12. MS-Windows V3.1 system disk
13. MS-Windows Sound system disk
14. Headphone
15. External speaker L, R (including the amplifier)
16. Microphone
17. Sound source (tape recorder, etc.)
18. Audio cable with standard 3.5 mm diameter stereo connector
19. Internal HDD (CP30544 for T6600C)
20. Internal HDD (MK-538FB)
21. External SCSI HDD

2.2 Troubleshooting Flowchart

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

❑ Ask the user if a password is registered, and if it is, ask him or her to enter the password. If the user has forgotten the password, refer to Appendix H for procedures on how to delete it.

❑ Verify with the customer that Toshiba MS-DOS is installed on the hard disk. Non-Toshiba operating systems can cause the computer to malfunction.

❑ Make sure all optional equipment is disconnected from the computer.
After removing all optional devices, if the T6600C is found to be operating properly, then an optional device or a T6600C interface is causing the problem.

Check the following items:

For a memory card, PCMCIA card, turbo cache module, and connected I/O port devices, check the T6600C with the optional device or with a wraparound board for the I/O port using the test program.

If the T6600C works with no errors, the optional device is malfunctioning. If the T6600C does not work or there is an error, the system board is malfunctioning.

For expansion slot cards, check the T6600C with a wraparound board for an expansion slot.

If the T6600C works with no errors, the expansion card is malfunctioning. If the T6600C does not work or there is an error, the back panel board or system board is malfunctioning.

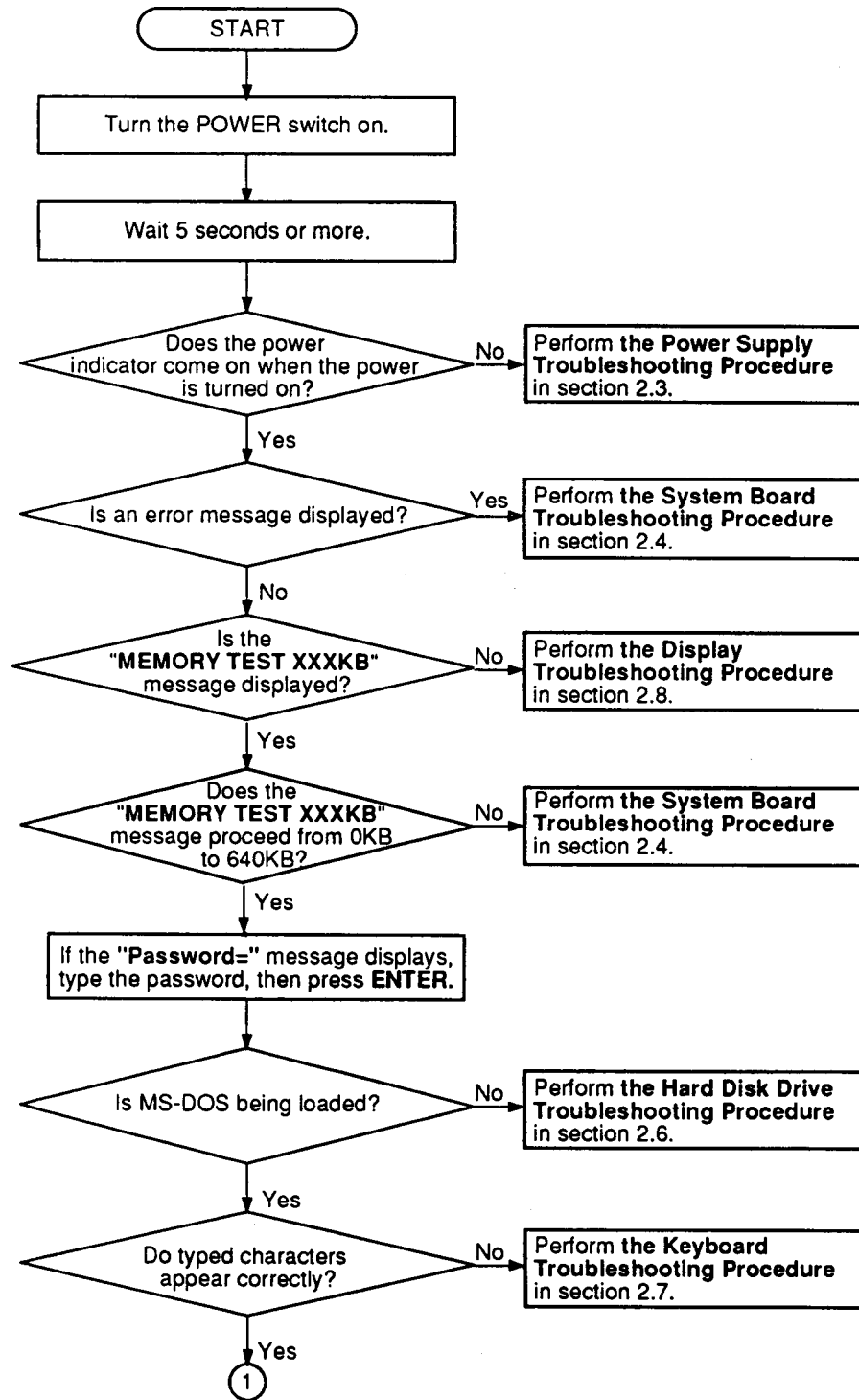❑ Make sure the floppy disk drive is empty.

```
                    ┌─────────────────────┐
                    │       START         │
                    └──────────┬──────────┘
                               │
                    ┌──────────▼──────────┐
                    │ Turn the POWER switch on. │
                    └──────────┬──────────┘
                               │
                    ┌──────────▼──────────┐
                    │ Wait 5 seconds or more. │
                    └──────────┬──────────┘
                               │
```

Does the power indicator come on when the power is turned on? — No → Perform **the Power Supply Troubleshooting Procedure** in section 2.3.

↓ Yes

Is an error message displayed? — Yes → Perform **the System Board Troubleshooting Procedure** in section 2.4.

↓ No

Is the **"MEMORY TEST XXXKB"** message displayed? — No → Perform **the Display Troubleshooting Procedure** in section 2.8.

↓ Yes

Does the **"MEMORY TEST XXXKB"** message proceed from 0KB to 640KB? — No → Perform **the System Board Troubleshooting Procedure** in section 2.4.

↓ Yes

If the **"Password="** message displays, type the password, then press **ENTER**.

↓

Is MS-DOS being loaded? — No → Perform **the Hard Disk Drive Troubleshooting Procedure** in section 2.6.

↓ Yes

Do typed characters appear correctly? — No → Perform **the Keyboard Troubleshooting Procedure** in section 2.7.

↓ Yes

(1)

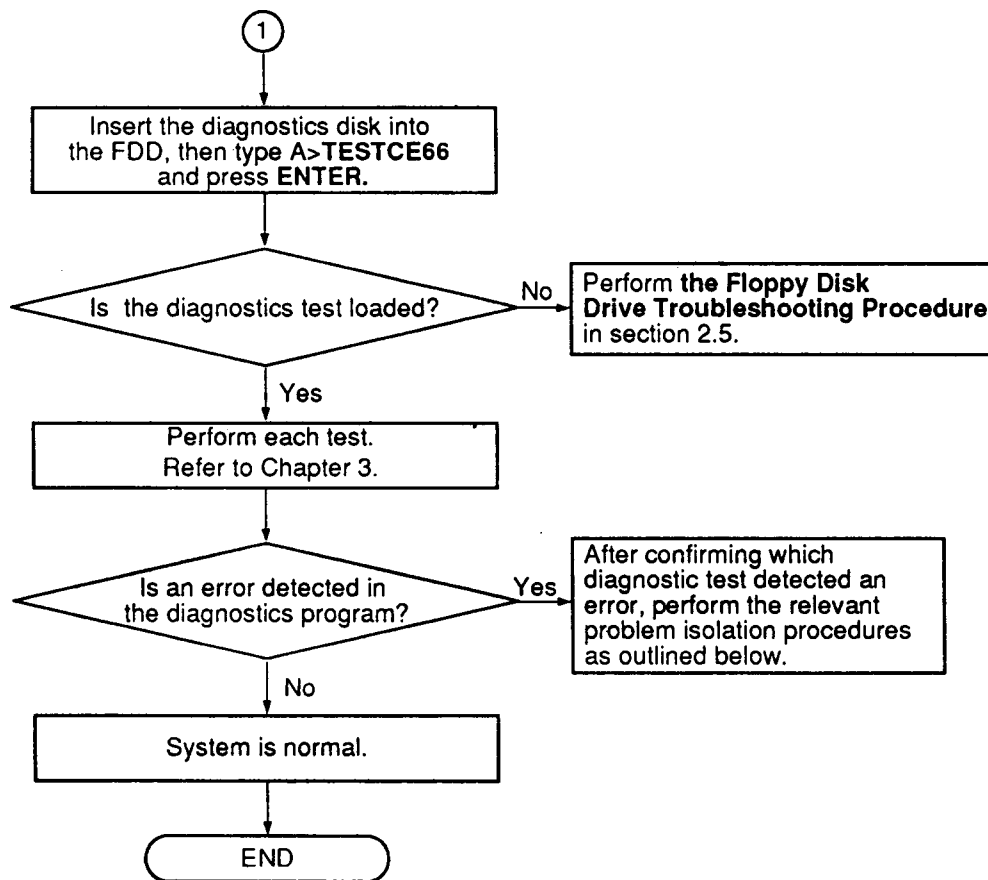*Figure 2-1 Troubleshooting Flowchart (1/2)*

Figure 2-1 Troubleshooting Flowchart (2/2)

If the diagnostics program cannot detect an error, the problem may be intermittent. The Running Test program should be executed several times to isolate the problem.

Check the Log Utilities function to confirm which diagnostic test detected an error(s), then perform the appropriate troubleshooting procedures as follows:

1. If an error is detected on the System Test, Memory Test, Display Test, ASYNC Test, Printer Test, or Real Timer Test, perform the System Board Troubleshooting Procedures in Section 2.4.

2. If an error is detected on the Keyboard Test, perform the Keyboard Troubleshooting Procedures in Section 2.7.

3. If an error is detected on the Floppy Disk Test, perform the Floppy Disk Drive Troubleshooting Procedures in Section 2.5.

4. If an error is detected on the Hard Disk Test, perform the Hard Disk Drive Troubleshooting Procedures in Section 2.6.

2.3   Power Supply Troubleshooting

The T6600C's power supply supplies the power to the components in the T6600C. To determine if the power supply is functioning properly, start with Procedure 1 and continue with the other procedures as instructed. Procedures described in this section are:

Procedure 1:   Power Cord Check

Procedure 2:   Connector Check

Procedure 3:   Output Voltage Check

Procedure 1   Power Cord Check

The T6600C's power cord carries AC voltage to the power supply unit from a wall outlet.

Check 1   Turn off the power, make sure the power cord is firmly plugged into the AC IN socket and into a working wall outlet. If the power cord is connected correctly, go to Check 2.

Check 2   Disconnect the power cord from the T6600C. Use a multimeter to check the output voltage from the wall outlet on the power cord.

If the output voltage is not correct, replace the power cord with a new one. If output voltage is correct, perform Procedure 2.

Procedure 2   Connector Check

The power supply cables should be connected to the system board. These cables may be disconnected or damaged. Open the keyboard cable cover following the steps described in Chapter 4 to check the power supply cable connection to the system board.

Check 1   Remove the keyboard cable cover. Make sure the power supply cables are connected to the system board.
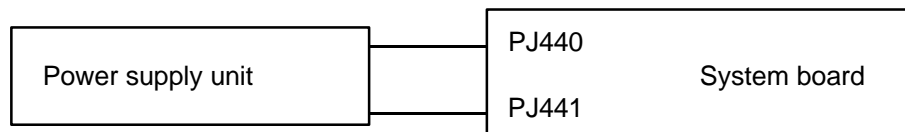
If these cables are disconnected, connect them to the system board. If these cables are damaged, replace the power supply unit.

If these cables are OK, perform Procedure 3.

Procedure 3   Output Voltage Checklist

The power supply supplies five voltages to the system board. Check the output voltage of the power supply unit.

Check 1   Remove the keyboard cable cover, connect the power supply cables to the system board, then connect the AC cord and turn on the power.

Use a multimeter to check the following voltages:

Table 2-1 Output Voltages

Connector	Pin No.	Voltage (V)	
PJ440	1	GND	
	2	-5	(±10%)
	3	GND	
	4	GND	
	5	GND	
	6	GND	
	7	GND	
	8	GND	
	9	GND	
	10	GND	
	11	-12	(±10%)
PJ441	1	+5	(±5%)
	2	+5	(±5%)
	3	+5	(±5%)
	4	+5	(±5%)
	5	+5	(±5%)
	6	+5	(±5%)
	7	+24	(+8V/-4V)
	8	+12	(±5%)
	9	+12	(±5%)
	10	+12	(±5%)

If the output voltages are not correct, replace the power supply unit.

If the output voltages are correct, the system board may be damaged. Go to Section 2.4, System Board Troubleshooting.

2.4 System Board Troubleshooting

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

Procedure 1:   Message Check

Procedure 2:   Printer Port LED Check

Procedure 3:   Diagnostic Test Program Execution Check

Procedure 4:   SCSI Logic Check

Procedure 5:   Sound Logic Check

Procedure 6:   System Board Replacement Check

Procedure 1   Message Check

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

❏ If an error message is shown on the display, perform Check 1.

❏ If there is no error message, go to Procedure 2.

❏ If Toshiba MS-DOS is properly loaded, go to Procedure 3.

Check 1   If one of the following error messages is displayed on the screen, press the **F1** key as the message instructs.

```
(a)    *** Error in CMOS.  Bad configuration type ***
       Check system.  Then press [F1] key ......
(b)    *** Error in CMOS.  Bad battery ***
       Check system.  Then press [F1] key ......
(c)    *** Error in CMOS.  Bad check sum ***
       Check system.  Then press [F1] key ......
(d)    *** Error in CMOS.  Bad memory size ***
       Check system.  Then press [F1] key ......
(e)    *** Error in CMOS.  Bad time function ***
       Check system.  Then press [F1] key ......
```

These errors occur when the system configuration preserved in the RTC memory (CMOS-type memory) is not the same as the actual configuration or when data is lost.

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

Check 2   The IRT checks the system board, and when it detects an error, the system stops or an error message appears. Refer to Table 2-2 for a list of error messages.

❏ If one of the following error messages displays, replace the system board: Error Messages 1 through 23, 26, 30, or 31

❏ If Error Message 24 or 25 displays, go to the Keyboard Troubleshooting Procedures in Section 2.7.

❏ If Error Message 27 or 28 is displayed, go to the HDD Troubleshooting Procedures in Section 2.6.

❏ If Error Message 29 is displayed, go to the FDD Troubleshooting Procedures in Section 2.5.

Table 2-2 IRT Error Messages

No.	Error Message
1	CPU ERROR
2	SYSTEM BIOS CHECK SUM ERROR
3	TIMER CH.2 OUT ERROR
4	PIT ERROR
5	MEMORY REFRESH ERROR
6	FIRST 64KB MEMORY ERROR
7	FIRST 64KB MEMORY PARITY ERROR
8	RTC ERROR
9	RTC UPDATE ERROR
10	CRTC ERROR
11	VRAM ERROR
12	KBC ERROR
13	SYSTEM MEMORY ERROR
14	SYSTEM MEMORY PARITY ERROR
15	EXTENDED MEMORY ERROR
16	EXTENDED MEMORY PARITY ERROR
17	PROTECTED MODE ERROR
18	CPU EXCEPTION ERROR
19	DMA PAGE REGISTER ERROR
20	DMAC #1 ERROR
21	DMAC #2 ERROR
22	PIC #1 ERROR
23	PIC #2 ERROR
24	KEYBOARD ERROR
25	KBC ERROR
26	HDC ERROR
27	HDD #0 ERROR
28	HDD #1 ERROR
29	NO FDD ERROR
30	FDC ERROR
31	TIMER INTERRUPT ERROR

Procedure 2   Printer Port LED Check

The printer port LED displays the IRT status and test status by turning lights on and off as an eight-digit binary value. Figure 2-2 shows the printer port LED.

NOTE: When you perform this check, the external FDD/PRT option in the SETUP program must be set to PRT.
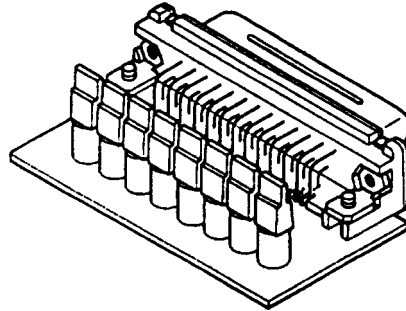

Figure 2-2 Printer Port LED

To use the printer port LED, follow these steps:

1. Turn off the T6600C's power.

2. Plug the printer port LED into the computer's PRT/FDD connector.

3. Hold down the space bar and turn on the T6600C's power.

4. Read the LED status from left to right as you face the back of the computer.

5. Convert the status from binary to hexadecimal notation.

6. If the final LED status is FFh (normal status), go to Procedure 3.

7. If the final LED status matches any of the test status values in Table 2-3, perform Check 1.

NOTE: If an error condition is detected by the IRT test, the printer port LED displays an error code. For example, if the printer port LED displays 02H and halts, it indicates a PIT test error.

Table 2-3 Printer Port LED Boot Mode Error Statuses (1/2)

Error Status	Test Item	Message
01H	CPU test	CPU ERROR
	System ROM check sum test	SYSTEM ROM CHECK SUM ERROR
02H	PIT test	TIMER CH.2 OUT ERROR
		PIT ERROR READ DATA = XXH WRITE DATA = XXH
05H	PIT initialization	—
06H	PIT function test	MEMORY REFRESH ERROR
07H	First 64KB memory test	FIRST 64KB MEMORY ERROR
		FIRST 64KB MEMORY PARITY ERROR
0AH	System memory initialization	—
0CH	Interrupt vector initialization	—
0DH	RTC test	RTC ERROR READ DATA = XXH WRITE DATA = XXH
		RTC UPDATE ERROR
15H	RTC initialization	
16H	PIC initialization	
18H	Display initialization	CRTC ERROR
		VRAM ERROR READ DATA = XXXXXXXXH WRITE DATA = XXXXXXXXH
1FH	KBC test	KBC ERROR
22H	System memory test	SYSTEM MEMORY ERROR
		ADDRESS = XXXXXXXXH READ DATA = XXXXXXXXH WRITE DATA = XXXXXXXXH
		SYSTEM MEMORY PARITY ERROR ADDRESS = XXXX0000H – XXXXFFFFH
25H	Extended memory test	EXTENDED MEMORY ERROR
		ADDRESS = XXXXXXXXH READ DATA = XXXXXXXXH WRITE DATA = XXXXXXXXH
		EXTENDED MEMORY PARITY ERROR ADDRESS = XXXX0000H – XXXXFFFFH
30H		PROTECTED MODE ERROR
31H		CPU EXCEPTION ERROR
33H	DMA page register test	DMA PAGE REGISTER ERROR READ DATA = XXH WRITE DATA = XXH

Table 2-3 Printer Port LED Boot Mode Error Statuses (2/2)

Error Status	Test Item	Message

40H	DMAC test	`DMAC #1 ERROR`
		`READ DATA  = XXXXH`
		`WRITE DATA = XXXXH`
		
		`DMAC #2 ERROR`
		`READ DATA  = XXXXH`
		`WRITE DATA = XXXXH`

41H	DMAC initialization	–

42H	PIC test	`PIC #1 ERROR`
		`READ DATA  = XXH`
		`WRITE DATA = XXH`
		
		`PIC #2 ERROR`
		`READ DATA  = XXH`
		`WRITE DATA = XXH`

4AH	Keyboard test	`KEYBOARD ERROR`
54H	KBC initialization	`KBC ERROR`
55H	Mouse initialization	–
5BH	Password check	

5DH	HDD initialization	`HDC ERROR`
		`HDC #0 ERROR`
		`HDC #1 ERROR`

60H	FDD initialization	`NO FDD ERROR`
		
		`FDD ERROR`

65H	Printer test	–
70H	SIO test	–

80H	Timer initialization	`TIMER INTERRUPT ERROR`
		
		`RTC UPDATE ERROR`

90H	NDP initialization	–
A0H	Expansion I/O ROM	–
A6H	Others H/W initialization	–
FEH	Expansion system ROM	–

FFH	CMOS RAM test	`****Error in CMOS.  Bad battery****`
		`****Error in CMOS.  Bad check sum****`
		`****Error in CMOS.  Bad configuration****`
		`****Error in CMOS.  Bad time function****`
		`Check system.  Then press [F1] key`

Check 1   If any of the following error codes are displayed, replace the system board with a new one.

00h, 02h, 05h, 06h, 07h, 0Ah, 0Ch, 0Dh, 15h, 16h, 18h, 1Fh, 22h, 25h, 30h, 31h, 33h, 40h, 41h, 42h, 54h, 55h, 5Bh, 60h, 65h, 70h, 80h, 90h, A0h, A6h, FEh

Check 2   If Error Code **4Ah** is displayed, go to the Keyboard Troubleshooting procedures in Section 2.7.

Check 3   If Error Code **5Dh** is displayed, go to the HDD Troubleshooting procedures in Section 2.6.

Check 4   If Error Code **60h** is displayed, go to the FDD Troubleshooting procedures in Section 2.5.

Procedure 3   Diagnostic Test Program Execution Check

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

1.   System Test
2.   Memory Test
3.   Printer Test
4.   ASYNC Test

If an error is detected during these tests, replace the system board with a new one.

Procedure 4   SCSI Logic Check

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

Check 1   External SCSI interface check

      Step 1   Make sure the internal SCSI connector is not connected to PJ9 on the back panel board.

      Step 2   Connect the SCSI terminator resister module to the RM 101 and RM 102 sockets on the back panel board.

      Step 3   Make sure the RM 1 and RM 2 sockets are not connected to the system board.

      Step 4   Connect the external SCSI HDD to the external SCSI port (PJ680).

      Step 5   Execute the HDD test of the diagnostic test program. Select 2: HDD2 for the Test drive number.

              If an error is detected during the HDD tests, replace the system board with a new one.

Check 2   Internal SCSI interface check

      Step 1   Make sure the external SCSI port is not connected to PJ680 on the system board.

      Step 2   Connect the internal SCSI HDD to PJ9 on the back panel board and SCSI HDD power cable to PJ6 or PJ7.

      Step 3   Make sure RM 101 and RM 102 are not connected.

      Step 4   Connect the SCSI terminator resister module to RM 1 and RM 2 on the system board.

      Step 5   Execute the HDD test in the diagnostic test program. Select 2:HDD2 for the Test drive number.

              If an error is detected during the HDD tests, replace the system board with a new one.

Procedure 5   Sound Logic Check

Follow these procedures to execute the sound controller test with a sound source, such as a tape recorder. You will need to connect a mouse to execute this test.

Preparation of a Spare HDD

Step 1   Install Toshiba MS-DOS, Windows 3.1, Windows Sound System, and the Logitech Trackman Portable Driver.

Step 2   Open the Windows file "WIN.INI" in a text editor.

Step 3   Edit the following lines under [windows] in the WIN.INI file in the order indicated below:

load=C:\SNDSYS\QRECORD.EXE (about line five of the file)

run=C:\SNDSYS\SOUNDS\POPJAZ30.RMI (about line 90 of the file)

Step 4   Insert the following lines under [sounds] in the WIN.INI file in the order indicated below:

SystemStart=C:\SNDSYS\SOUNDS\WAGNER.WAV,Windows Start

Step 5   Edit the AUTOEXEC.BAT file as follows:

rem c:\DOS\DOSSHELL (change)

WIN (add as the last line)

Preparation for the Test

Step 1   Remove any SCSI devices that may be connected. (Be sure to reinstall them after completing the test.)

Step 2   Install the HDD prepared for conducting the sound system test. (After the test, reinstall the original HDD.)

Step 3   Connect a Logitech Trackman Portable to the connector panel.

Step 4   Connect the following to the connector panel: mike to PJ360, speaker with amplifier to PJ370, and sound source to PJ361.

Test Execution

Remove any floppy disk from the FDD and turn on the power. Follow the steps below to execute the sound controller test:

Step 1   Confirm that Wagner's Wedding March is played when power is turned on.

Step 2   Confirm that pops and jazz are played.

Step 3   While the music is playing, plug a headphone into jack PJ381 and confirm that sound from the speakers is turned off.

Step 4   Before pops and jazz stop automatically, press **Alt + S** to halt sound execution.

Step 5   Put on the headphones.

Step 6   Use the mouse to double click the Quick Recorder icon at the bottom left of the screen to display the Quick Recorder window.

Step 7   Click the red circle in the window and say "test, test" into the mike to record your voice.

Step 8   Click the black square to stop recording.

Step 9   Click the black triangle to check that your voice is played back.

Step 10   Click the black square and select Options.

Step 11   Select Set Recording Level.

Step 12   Select Line-in.

Step 13   Turn on the sound source.

Step 14   Click the Red circle to record the sound source.

Step 15   Click the black square to stop recording.

Step 16   Click the black triangle to check that the sound source is played back.

Step 17   Click the black square.

Step 18   Select Options.

Step 19   Select Set Recording Level.

Step 20   Select microphone.

Step 21   Test is completed. Turn off the power.

Restore the customer's computer to its original state: remove all connectors, boards or memory cards you used for the test and reinstall the original HDD and other devices removed for the test.

If your voice or the sound source is not played back in Steps 9 and 16, replace the system board with a new one.

Procedure 6   System Board Replacement Check

The system board may be damaged. Disassemble the T6600C following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

Check 1   Replace the system board with a new one. Refer to Chapter 4 for instructions on how to remove and replace the unit. If the problem still exists, perform Check 2.

Check 2   Replace the back panel board with a new one. If the problem still exists, perform Check 3.

Check 3   If normal operation is not restored, another FRU is probably defective. The defective unit must be isolated by performing the T6600C Diagnostics Program.

2.5   Floppy Disk Drive Troubleshooting

This section describes how to determine if the T6600C's internal 3.5-inch floppy disk drive is functioning properly. Perform the steps below starting with Procedure 1 and continue with the other procedures as required.

Procedure 1:   FDD Head Cleaning Check

Procedure 2:   External 5.25-inch FDD Check

Procedure 3:   Diagnostic Test Program Check

Procedure 4:   Connector Check and Replacement Check

Procedure 1   FDD Head Cleaning Check

FDD head cleaning is one option available in the Diagnostic Program. A detailed description of the head-cleaning operation is given in Chapter 3, *Tests and Diagnostics.*

After loading Toshiba MS-DOS, run the Diagnostic Program and then clean the FDD heads using the cleaning kit. If the FDD still does not function properly after cleaning, go to Procedure 3.

If the test program cannot be executed on the T6600C, go to Procedure 2.

Procedure 2   External 5.25-inch FDD Check

The floppy disk controller on the computer's system board controls the internal and external FDD. To determine if either the system board or the internal FDD is defective, check the following items:

Check 1   Connect the external 5.25-inch FDD to the PRT/FDD port and make sure it functions properly. If it does, perform Procedure 4. If it doesn't, perform Check 2.

> *NOTE: To use the external 5.25-inch FDD, set the external FDD/PRT option in the SETUP program to FDD A or FDD B.*

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

Procedure 3   Diagnostic Test Program Execution Check

The Floppy Disk Drive Diagnostic Test program is stored on the T6600C Diagnostics Disk. After loading Toshiba MS-DOS, run the diagnostic program. Refer to Chapter 3, *Tests and Diagnostics*, for more information about the diagnostics test procedures.

Floppy disk drive test error codes and their status names are described in Table 2-4. Make sure the floppy disk in the FDD is formatted correctly and that the write protect tab is disabled. If any other errors occur while executing the FDD diagnostics test, go to Procedure 4.
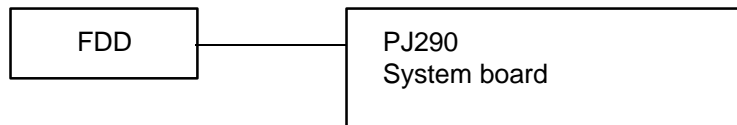
Table 2-4 Floppy Disk Drive Error Codes and Statuses

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

Procedure 4   Connector Check and Replacement Check

The 3.5-inch Floppy Disk Drive is connected to the system board by the FDD cable. This cable may be disconnected from the system board or damaged. Disassemble the T6600C following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

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

```
┌──────────────┐        ┌──────────────────┐
│              │        │  PJ290           │
│   FDD        │────────│  System board    │
│              │        │                  │
└──────────────┘        └──────────────────┘
```

If this cable is disconnected, connect it to the system board and repeat Procedure 3. If the FDD is still not functioning properly, perform Check 2.

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

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

2.6 Hard Disk Drive Troubleshooting

To determine if the hard disk drive is functioning properly, perform the procedures below starting with Procedure 1. Continue with the other procedures as instructed.

> Procedure 1:   Partition Check
>
> Procedure 2:   Message Check
>
> Procedure 3:   Format Check
>
> Procedure 4:   Diagnostic Test Program Execution Check

CAUTION: *The contents of the hard disk will be erased when the HDD troubleshooting procedures are executed. Transfer the contents of the hard disk to a floppy disk(s) using the Toshiba MS-DOS BACKUP command. Refer to the Toshiba MS-DOS Manual for more information about how to perform the BACKUP command.*

Procedure 1   Partition Check

Insert the Toshiba MS-DOS system disk and turn on the computer, then perform the following checks:

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

Check 2   Type **FDISK** and press **Enter**. Choose "Display Partition Information" from the FDISK menu. If Drive C is listed, go to Check 3. If Drive C is not listed, return to the FDISK menu and choose the option to create a DOS partition on Drive C, then recheck the system. If the problem still exists, go to Procedure 2.

Check 3   If Drive C is listed as active in the FDISK menu, go to Check 4. If Drive C is not listed as active, return to the FDISK menu and choose the option to set the active partition for Drive C, then recheck the system. If the problem still exists, go to Procedure 2.

Check 4   Remove the system disk from the FDD and cold boot the computer. If the problem still exists, go to Procedure 2. Otherwise, the HDD is operating normally.

Procedure 2   Message Check

When the T6600C's HDD does not function properly, some of the following error messages may appear on the display. Start with Check 1 below and perform the other checks as instructed.

Check 1   If any of the following messages appear, perform Check 2. If the following messages do not appear, perform Check 4.

Note that the error messages appear on the display for five (5) seconds, then disappear.

```
HDC ERROR
    or
HDD #0 ERROR
    or
HDD #1 ERROR
```

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

```
Insert system disk in drive
Press any key when ready .....
        or
Non-System disk or disk error
Replace and press any key
```

Check 3   Using the Toshiba MS-DOS system disk, install a system program on the hard disk using the SYS command.

If the following message appears on the display, the system program has been transferred to the HDD. Restart the T6600C. If the error message still appears, perform Check 4.

```
System transferred
```

Check 4   The HDD is connected to the system board through the back panel board using an HDD signal cable and an HDD power cable. These cables can become disconnected or damaged. Disassemble the T6600C as described in Chapter 4, *Replacement Procedures*. If the HDD is not connected, connect it to the system board and return to Procedure 1. If the HDD is firmly connected to the system board, perform Procedure 3.
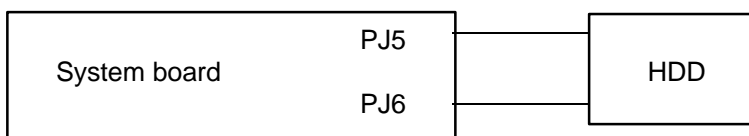
Procedure 3   Format Check

The T6600C's HDD is formatted using the low level format program and the MS-DOS FORMAT program. To format the HDD, start with Check 1 below and perform the other steps as required.

Check 1   Using the Toshiba MS-DOS system disk, partition the hard disk using the FDISK command. Format the hard disk using **FORMAT C:/S/U** to transfer the system program to the HDD. If the following message appears on the display, the HDD is formatted.

      `Format complete`

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

Check 2   Using the T6600C Diagnostics disk, format the HDD with a low level format option. Refer to Chapter 3, *Tests and Diagnostics* for more information about the diagnostics program.

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

      `Format complete`

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

Procedure 4   Diagnostic Test Program Execution Check

The HDD test program is stored in the T6600C Diagnostics Disk. Perform all of the HDD tests in the Hard Disk Drive Test option. Refer to Chapter 3 for more information about the HDD test program.

If an error is detected during the HDD test, an error code and status will be displayed; perform Check 1. The error codes and statuses are described in Table 2-5. If an error code is not generated, the HDD is operating properly.

Table 2-5 Hard Disk Drive Error Codes and Statuses

Code	Status
01h	Bad command
02h	Bad address mark
04h	Record not found
05h	HDC not reset
07h	Drive not initialized
08h	HDC overrun (DRQ)
09h	DMA boundary error
0Ah	Bad sector error
0Bh	Bad track error
10h	ECC error
11h	ECC recover enable
20h	HDC error
40h	Seek error
80h	Time-out error
AAh	Drive not ready
BBh	Undefined error
CCh	Write fault
E0h	Status error
EEh	Access time-out error
FFh	Data compare error

Check 1   Replace the HDD unit with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the HDD is still not functioning properly, perform Check 2.

Check 2   Replace the back panel board with a new one following the instructions in Chapter 4. If the HDD is still not functioning properly, perform Check 3.

Check 3   Replace the system board with a new one following the instructions in Chapter 4.

2.7 Keyboard Troubleshooting

To determine if the T6600C's keyboard is functioning properly, perform the following procedures. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1:   Diagnostic Test Program Execution Check

Procedure 2:   Connector and Replacement Check

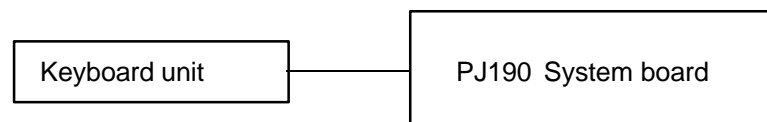### Procedure 1   Diagnostic Test Program Execution Check

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

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

Procedure 2   Connector and Replacement Check

The keyboard is connected to the system board cable. This cable may be disconnected or damaged. Disassemble the T6600C as described in Chapter 4, *Replacement Procedures*, and perform the following checks.

Check 1   Remove the keyboard cable cover. Make sure the keyboard cable is not damaged and is connected to the system board.

```
┌─────────────────────┐        ┌───────────────────────────┐
│   Keyboard unit      │────────│   PJ190  System board     │
└─────────────────────┘        └───────────────────────────┘
```

If this cable is damaged, replace the keyboard unit with a new one. If the cable is disconnected, firmly connect it. Perform Procedure 1 again. If the keyboard is still not functioning properly, perform Check 2.

Check 2   The keyboard controller on the system board may be damaged. Replace the system board with a new one. Refer to Chapter 4 for more information about how to replace the system board.

2.8   Display Troubleshooting

This section describes how to determine if the T6600C's display is functioning properly. Start with Procedure 1 and continue with the other procedures as instructed.

> Procedure 1:   Contrast Control Check
>
> Procedure 2:   External CRT Check
>
> Procedure 3:   Diagnostic Test Program Execution Check
>
> Procedure 4:   Connector Check
>
> Procedure 5:   Replacement Check

Procedure 1   Contrast Control Check

The T6600C display contrast is controlled by the contrast dial, which is located on the right side of the display.

Make sure the contrast dial is adjusted correctly. If the contrast does not change when you turn the contrast dial, perform Procedure 2.

Procedure 2   External CRT Check

Connect the external CRT to the T6600C's external monitor port, then boot the computer. The computer automatically detects the external CRT.

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

If the external CRT appears to have the same problem as the internal LCD, the display controller or connection between the display and system board may be damaged. Go to Procedure 4.

Procedure 3   Diagnostic Test Program Execution Check

The Display Test program is stored on the T6600C Diagnostics Disk. This program checks the display controller on the system board. After loading Toshiba MS-DOS, run the Diagnostics Program. Refer to Chapter 3, *Tests and Diagnostics*, for details.

If an error is detected, go to Procedure 4. If an error is not detected, the display is functioning properly.

Procedure 4   Connector Check

The Display unit has an LCD module, FL unit, Display switch, and FL inverter board. The FL unit and FL inverter board are connected by two cables. The LCD module and system board are connected by a signal cable. The system board and FL inverter board are also connected by a signal cable as shown below. Any of these cables may be disconnected.

Disassemble the display unit and check the following cable connections. Refer to Chapter 4, *Replacement Procedures*, for more information about how to disassemble the computer.
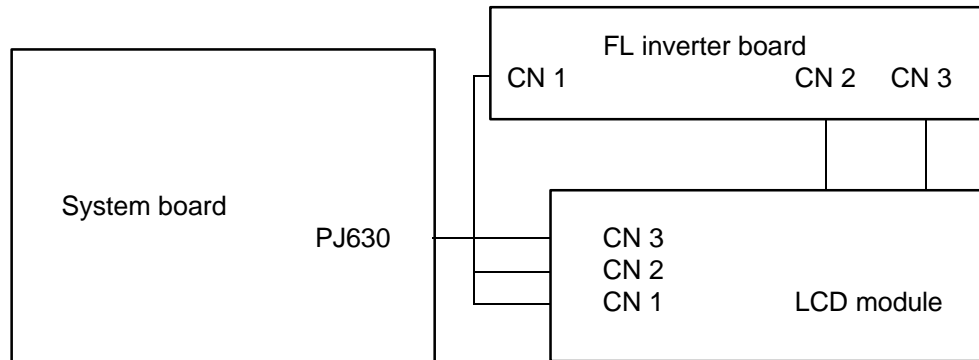

Figure 2-3 T6600C Display Connection

If any of these cables are not connected, firmly reconnect them and repeat Procedures 1 and 2. If the problem still exists, perform Procedure 5.

Procedure 5   Replacement Check

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

❑   If the FL unit does not light, perform Check 1.

❑   If characters are not displayed clearly, perform Check 3.

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

❑   If the FL remains lit when the display is closed, perform Check 4.

Check 1   Replace the FL unit with a new one and test the display again. If the problem still exists, perform Check 2.

Check 2   Replace the FL inverter board with a new one and test the display again. If the problem still exists, perform Check 3.

Check 3   Replace the LCD module with a new one and test the display again. If the problem still exists, perform Check 4.

Check 4   Replace the display switch with a new one and test the display again. If the problem still exists, perform Check 5.

Check 5   Replace the display cable with a new one and test the display again. If the problem still exists, perform Check 6.

Check 6   The system board may be damaged. Replace the system board with a new one and test the display again.

3.1   The Diagnostic Test

This chapter explains how to use the T6600C's Diagnostic Test program (TESTCE66) to test the functions of the T6600C's hardware modules. The Diagnostics Program is stored on the T6600C Diagnostic Disk and consists of 19 programs that are grouped into the Service Program Module (DIAGNOSTICS MENU) and the Test Program Module (DIAGNOSTICS TEST MENU).

The DIAGNOSTICS MENU consists of the following functions.

❑   DIAGNOSTIC TEST

❑   HARD DISK FORMAT

❑   HEAD CLEANING

❑   LOG UTILITIES

❑   RUNNING TEST

❑   FDD UTILITIES

❑   SYSTEM CONFIGURATION

❑   SETUP

The DIAGNOSTIC TEST option contains the following functional tests:

❑ SYSTEM TEST

❑ MEMORY TEST

❑ KEYBOARD TEST

❑ DISPLAY TEST

❑ FLOPPY DISK TEST

❑ PRINTER TEST

❑ ASYNC TEST

❑ HARD DISK TEST

❑ REAL TIMER TEST

❑ NDP TEST

❑ EXPANSION TEST

The following equipment is required to perform some of the T6600C Diagnostic Test programs.

- ❑ The T6600C Diagnostics Disk (all tests)
- ❑ A formatted working disk for the floppy disk drive test (all tests)
- ❑ 3.5-inch 2HD/2DD disk for the internal 3.5-inch FDD
- ❑ 5.25-inch 2D disk for an external 5.25-inch FDD
- ❑ A cleaning kit to clean the floppy disk drive heads (Head Cleaning)
- ❑ A printer wraparound connector (34M741986G01) for the printer wraparound test (Printer test)
- ❑ An RS-232-C wraparound connector (34M741621G01) for the RS-232-C port wraparound test (ASYNC test)
- ❑ An external SVGA display for the SVGA display test
- ❑ An optional memory card for the memory module test
- ❑ A PCMCIA wraparound card for the PCMCIA wraparound test
- ❑ A wraparound board for a 16-bit bus (34P711656G01) for the 32 bus wraparound test
- ❑ An RS-232-C direct cable for the point-to-point test (ASYNC test)
- ❑ An F, Z special connector for the F, Z connector check test
- ❑ A turbo cache memory module for the turbo cache memory test

The sections that follow detail the tests within the Diagnostic Test function of the DIAGNOSTIC MENU. Refer to Sections 3.17 through 3.23 for detailed information on the remaining Service Program Module functions.

3.2   Executing the Diagnostic Test

Toshiba MS-DOS is required to run the T6600C DIAGNOSTICS PROGRAM.

NOTE: You cannot run the diagnostics program on a computer that has loaded an expanded memory manager such as EMM386 or Quarterdeck's QEMM into memory. If you try to run diagnostics with either of these programs loaded, the following message will display on the screen:

```
            Cannot execute in a virtual 8086 mode.
```

There are two ways to run the diagnostics program: 1) by booting from Drive A, or 2) by modifying the CONFIG.SYS file.

Boot from Drive A

1.   Insert a Toshiba operating system diskette into the floppy disk drive (FDD).

2.   Turn on the computer, then proceed to the "Running the Diagnostics Program" section.

Modify the CONFIG.SYS File

1.   Turn on the computer and allow it to boot.

2.   Deactivate the line in the CONFIG.SYS file that loads the device driver for the expanded memory manager by using the DOS batch command "REM." You may also rename the CONFIG.SYS file to keep it from executing upon bootup.

3.   Reboot the computer, then proceed to the "Running the Diagnostics Program" section.

Running the Diagnostics Program

1.   Insert the T6600C Diagnostics disk in the computer's internal floppy disk drive.

2.   At the system prompt, change to Drive A (if necessary), type **TESTCE66**, and press **Enter**.

The following menu appears:

```
TOSHIBA personal computer T6600C 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 T6600C 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 program.*

3. To select the DIAGNOSTIC TEST option from the DIAGNOSTICS MENU, set the highlight bar to **1**, and press **Enter**. The following screen appears:

```
TOSHIBA personal computer T6600C 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
88 - FDD & HDD ERROR RETRY COUNT SET
99 - EXIT TO DIAGNOSTICS MENU

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

Refer to Sections 3.4 through 3.14 for detailed descriptions of each Diagnostic Test (1 through 11). Function 88 sets the floppy disk drive and hard disk drive error retry count, and Function 99 exits the submenus of the Diagnostic Test and returns to the Diagnostic Menu.

4. Select the option you want to execute and press **Enter**. The following message appears:

```
SYSTEM TEST               XXXXXXX  ┌─────────────────────────────┐
                                   │ T6600C DIAGNOSTIC TEST VX.XX │
                                   │ [Ctrl] + [Break]  ; test end │
                                   │ [Ctrl] + [C]       ; key stop│
                                   └─────────────────────────────┘

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

SUB-TEST MENU :

01 - ROM checksum
02 - HW status
03 - ROM Version check
04 - EEPROM ID check
99 - Exit to DIAGNOSTIC TEST MENU

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

5. Select the desired subtest from the menu and press **Enter**. The following messages appear:

```
TEST LOOP    : YES
ERROR STOP   : YES
```

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

Selecting **YES** for *TEST LOOP* sets the test to run continuously until it is halted by the user. Selecting **NO** returns the screen to the main menu after the test is complete.

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

```
ERROR STATUS NAME            [[ HALT OPERATION ]]

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

These three selections have the following functions:

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

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

Selecting **NO** for *ERROR STOP* keeps the test running even if an error is found.

Table 3-1 in Section 3.3 describes the function of each test on the subtest menu; and Table 3-5 in Section 3.15 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 TESTS menu.

Table 3-1 Subtest Names (1/2)

No.	Test Name	Subtest No.	Subtest Item
1	SYSTEM	01	ROM checksum
		02	H/W status
		03	ROM Version check
		04	EEPROM ID check
2	MEMORY	01	RAM constant data
		02	RAM address pattern data
		03	RAM refresh
		04	Protected mode
		05	Memory module
		06	Cache memory
		07	PCMCIA memory
		08	Turbo cache memory
3	KEYBOARD	01	Pressed key display (101)
		02	Pressed key display (102)
		03	Pressed key code display
		04	PS/2 Mouse
4	DISPLAY	01	VRAM write/read
		02	Character attributes
		03	Character set
		04	80*25 Character display
		05	Graphics display (color set 0/1)
		06	640*200 Graphics display
		07	640*400 Graphics display
		08	Display page
		09	"H" pattern display
		10	LED/DAC pallet
		11	TFT color display
		12	F. Z connector check
		13	SVGA mode

Table 3-1 Subtest Names (2/2)

No.	Test Name	Subtest No.	Subtest Item
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	Not used.
		03	Point to point (send)
		04	Point to point (receive)
		05	Not used.
		06	Interrupt test (IRQ 4, 3, 5)
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
9	REAL TIMER	01	Real time
		02	Backup memory
		03	Real time carry
10	NDP	01	NDP test
11	EXPANSION	01	Not used.
		02	Wraparound (F32BUS)
		03	PCMCIA wraparound
		04	SCSI interface check

3.4   System Test

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

Subtest 01   ROM checksum

The ROM checksum tests the system board from address F0000h to FFFFFh (64KB).

Subtest 02   H/W status

This test reads and displays the hardware status as shown below:

```
            76543210
H/W status = 10101100

  Bit7 —                  =
  Bit6 —                  =
  Bit5 — Notch signal  =  2DD
  Bit4 — FDD type      =  2MB
  Bit3 —                  =
  Bit2 — Drive A/B     =  Ext. = A
  Bit1 — External FDD  =  OFF
  Bit0 —                  =
```

Table 3-2 describes the hardware bit status for each bit tested. Pressing **Enter** returns you to the subtest menu.

Table 3-2 Hardware Bit Status

Bit	H/W Status	1	0
7	Reserved	—	—
6	Reserved	—	—
5	Media type	2DD	2HD
4	FDD type	1.6 MB	2 MB
3	Reserved	—	—
2	Drive A/B	Ext. = A	Ext. = B
1	External FDD	ON	OFF
0	Reserved	—	—

Subtest 03   ROM Version check

This subtest checks the version of the following items:

❑ BIOS ROM
❑ SCC version

The subtest compares these items to the reference data stored in the test program.

When the read information is lower than the reference data, the test program displays the following screen image.

```
ROM-BIOS          = V1.00 : OK V1.10
SCC Version       = V1.26 : NG V1.00
```

Reference data

Current data

When the read information is higher, the display is unchanged.

To exit this screen, press the **S** key.

Subtest 04   EEPROM ID check

This subtest checks the EEPROM ID number through the KBC.

3.5   Memory Test

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

Subtest 01   RAM constant data (real mode)

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

The constant data is FFFFh, AAAAh, 5555h, and 0000h.

Subtest 02   RAM address pattern data (real mode)

This subtest writes address pattern data created by the exclusive-ORing (XORing) to the address segment and address offset in conventional memory (0 program end to 640 KB), then reads the new data and compares the results with the original data.

Subtest 03   RAM refresh (real mode)

This subtest writes a 256-byte unit of constant data to conventional memory (0 to 640 KB), then reads the new data and compares the results with the original data.

The constant data is AAAAh and 5555h.

> *NOTE: There is a short delay between write and read operations, depending on the size of the data.*

Subtest 04   Protected mode

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

This subtest writes constant data and address data to extended memory (maximum address 100000h), then reads new data and compares the results with the original data.

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

Subtest 05   Memory module

> *NOTE:* *To execute this subtest, an optional memory card must be installed in the computer.*

This subtest functions the same as Subtest 04, except it is used for testing an optional memory card. Memory module capacities are 2, 4, 8, and 16 MB.

After selecting Subtest 05, the following message appears:

```
Extended memory size (1:2 MB,2:4 MB,3:8 MB,4:16 MB) ?
```

Select the number that corresponds to the memory card installed in the computer.

Subtest 06   Cache memory

To test the cache memory, a pass-through write-read comparison of '5A' data is run repeatedly to the test area ('7000':'Program' size to '7000':=7FFF' (32 KB)) to check the hit-miss ratio (on/off status). One test takes three (3) seconds. The 8 KB cache memory is tested.

Number of miss hit < Number of hit → OK
Number of miss hit ≥ Number of hit → Fail

Subtest 07   PCMCIA Memory

> *NOTE*: *To execute this test, a PCMCIA memory card must be installed in the computer.*

This subtest divides the PCMCIA window (D0000h to DFFFFh) into 64 KB increments. It then executes the subtest by writing constant data to the PCMCIA memory, reads the data, and then compares it with the original data.

Subtest 08   Turbo cache memory

> *NOTE*: *To execute this test, a turbo cache memory module must be installed in the computer.*

After checking the connection of the turbo cache module, this subtest transfers the test program to the test area ('70000':Program size to '70000':77FFF' 32 KB). To test the turbo cache memory, a pass-through write-read comparison of '5A' data is run repeatedly to the test area to check the hit-miss ratio (on/off status). One test takes 3 seconds, and tests the 256 KB turbo cache memory.

Number of miss hit < Number of hit → OK
Number of miss hit ≥ Number of hit → Fail

3.6　Keyboard Test

To execute the Keyboard Test, select **3** from the DIAGNOSTIC TEST menu, press **Enter**, and follow the directions displayed on the screen. The Keyboard Test contains two subtests that test the T6600C's keyboard actions. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01　　　Pressed key display (101)

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

When you execute this subtest, the 101-key keyboard layout is drawn on the display. 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.

Subtest 02　　　Pressed key display (102)

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

When you execute this subtest, the 102-key keyboard layout is drawn on the display. 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.

Subtest 03   Pressed key code display

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

```
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 04   PS/2 mouse

*NOTE: To execute the PS/2 mouse connect check, a PS/2 mouse must be
connected to the computer.*

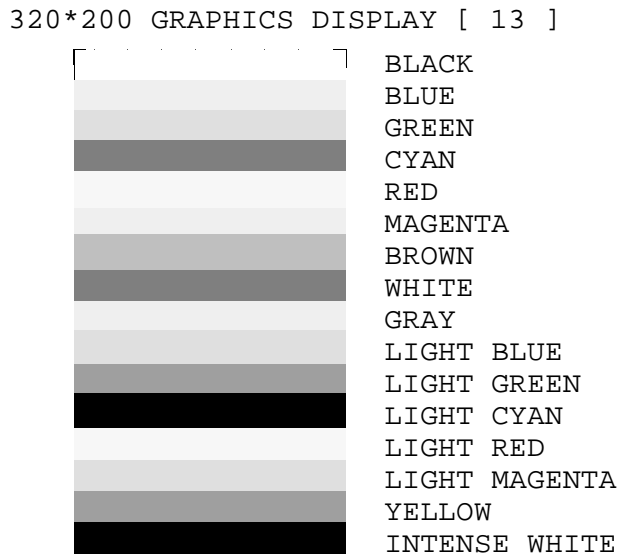This subtest checks whether or not a PS/2 mouse is connected to the
computer.

If this test does not detect an error, it returns to the subtest menu.
If it detects an error, the following message appears:

```
KBC - MOUSE INTERFACE ERROR

                                    [[ HALT OPERATION ]]

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

3.7 Display Test

To execute the Display Test, select **4** from the DIAGNOSTIC TEST menu, press **Enter**, and follow the directions displayed on the screen. The Display Test contains 13 subtests that test the T6600C's display in various modes. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01   VRAM Read/Write

This subtest writes constant data FFFFh, AAAAh, 5555h, 0000h and address data to video RAM (256KB). The data is then read from the video RAM and compared to the original data.

Subtest 02   Character Attributes (modes 1 and 13h)

This subtest displays the following character attribute modes; normal, intensified, reverse, and blinking as shown in the display below. The character attribute modes display the foreground color and intensified color (16 colors or 16-level gray scale) using black, blue, red, magenta, green, cyan, yellow, and white from the color display. The display below appears on the screen when this subtest is executed.

```
CHARACTER ATTRIBUTES

  NEXT LINE SHOWS NORMAL DISPLAY.
     NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN

  NEXT LINE SHOWS INTENSIFIED DISPLAY.
     IIIIIIIIIIIIIIIIIIIIIIIIIIIIIII

  NEXT LINE SHOWS REVERSE DISPLAY.
     RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR

  NEXT LINE SHOWS BLINKING DISPLAY
     BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB


                            00 08 ; BLACK
                            01 09 ; BLUE
                            04 0C ; RED
                            05 0D ; MAGENTA
                            02 0A ; GREEN
                            03 0B ; CYAN
                            06 0E ; YELLOW
                            07 0F ; WHITE


     PRESS [Enter] KEY
```

After pressing **Enter**, 16 colors or 16 gray scales of mode 13h appear in the 320x200 graphics mode as shown below.

```
320*200 GRAPHICS DISPLAY [ 13 ]
```



```
                                    BLACK
                                    BLUE
                                    GREEN
                                    CYAN
                                    RED
                                    MAGENTA
                                    BROWN
                                    WHITE
                                    GRAY
                                    LIGHT BLUE
                                    LIGHT GREEN
                                    LIGHT CYAN
                                    LIGHT RED
                                    LIGHT MAGENTA
                                    YELLOW
                                    INTENSE WHITE
```

```
   PRESS [Enter] KEY
```

Pressing **Enter** toggles between the two tests.

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

Subtest 03   Character Set

In this subtest, the character set (addressed 00h to FFh) is displayed in the 40*25 character mode as shown below.
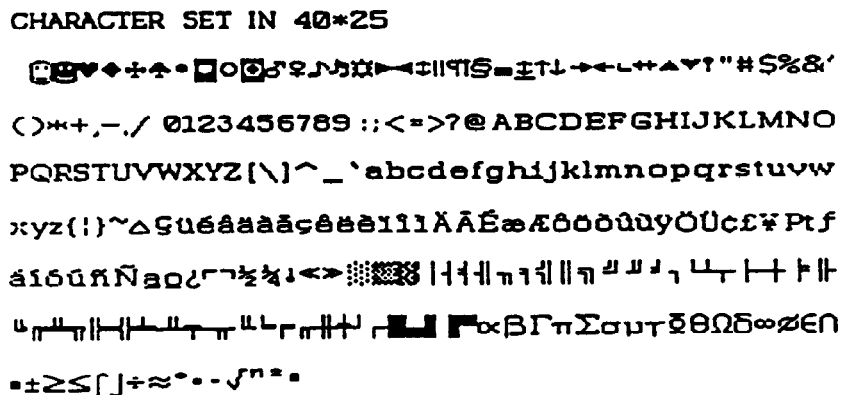

```
   Press [Enter] KEY
```

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

Subtest 04   80x25 Character Display (mode 12)

In this subtest, the character string is displayed shifting one character to the right, line by line in the 80x25 and 80x25 character modes as shown below.

```
80*XX CHARACTER DISPLAY

01234567890123456789012345678901234567890123456789012345678901234567
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklm
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmn
"#$%&'()*+,-./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
-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{
/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|
0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}
123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
23456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~Δ
3456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~ΔÇ
456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~ΔÇü

PRESS [ENTER] KEY
```
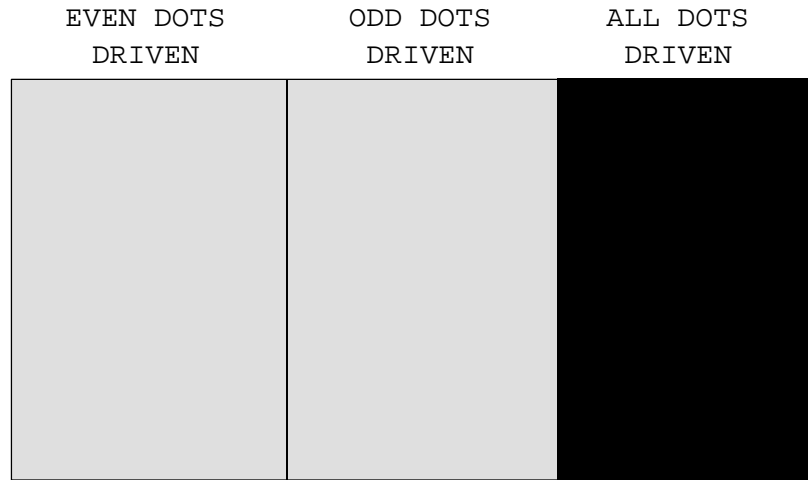
Pressing **Enter** toggles between the two tests. To exit this subtest and return to the DISPLAY TEST menu, press **Ctrl + Break**.

Subtest 05   Character Display (mode 4,D)

This subtest displays two color sets for the color display in 320x200 dot graphics modes 4 and D. One example is shown below:

```
320*200 GRAPHICS DISPLAY
COLOR SET X : [X]

        GREEN         RED        YELLOW
        CYAN        MAGENTA       WHITE
```



```
        PRESS [ENTER] KEY
```

Pressing **Enter** toggles between the two tests. To exit this subtest and return to the DISPLAY TEST menu, press **Ctrl + Break.**

Subtest 06   640x200 Graphics Display (modes 6 and E)

This subtest displays even dots, odd dots, and all dots in the 640x200 dot graphics modes 6 and E as shown below.

```
640*200 GRAPHICS DISPLAY : [X]

            EVEN DOTS          ODD DOTS          ALL DOTS
             DRIVEN            DRIVEN            DRIVEN
```

```
PRESS [Enter] KEY
```

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

Subtest 07   640x400 Graphics Display (modes 10, 74, and 12)

This subtest displays even dots, odd dots, and all dots in the 640x350, 640x400 and 640x480 dot graphics modes 10 and 12 as shown below.

```
640*XXX GRAPHICS DISPLAY

            EVEN DOTS          ODD DOTS          ALL DOTS
             DRIVEN            DRIVEN            DRIVEN
```
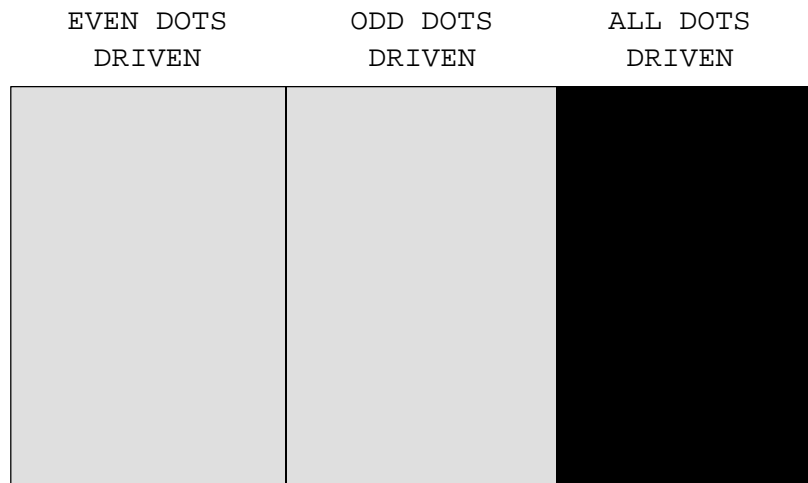
```
PRESS [Enter] KEY
```

Pressing **Enter** changes the size of the displayed image. To exit this subtest and return to the DISPLAY TEST menu, press **Ctrl + Break.**

Subtest 08   Display Page

This subtest confirms that the pages can be changed in order from page 0
through page 7 in 40*25 character mode.

DISPLAY PAGE 0

```
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
O                                       O
O                                       O
O                                       O
O                                       O
O                                       O
O                                       O
O                                       O
O                                       O
O                                       O
O                                       O
O                                       O
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
```

After completion of the test, press **Ctrl + Break** to exit this subtest and return
to the DISPLAY TEST menu.

Subtest 09   H Pattern Display

This subtest displays 2000 H characters on the entire screen, as illustrated
below.

```
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
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HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
```

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

Subtest 10   LED/DAC Pallet

This subtest checks the indicator on the keyboard (Caps Lock, Num Lock, and Scroll Lock) by key operation.

```
[ Speed/CRT/Caps/Num/Scroll LED test ]

(1) Press   [ Caps Lock ]  key !...Caps    (on/off)
(2) Press   [ Num Lock ]   key !...Num     (on/off)
(3) Press   [ Scroll Lock] key !...Scroll  (on/off)

PRESS [Enter] KEY
```

Press **Enter** to display the following messages:

```
[ DAC pallet W-R-CMP test ]  = (about 5 seconds)
[ Processor latch test ]     =
Processor latch test (1:256 times, 2:endless) ?
```

Select either **1** (256 times) or **2** (endless), and press **Enter**.

After pressing **Enter**, the subtest writes '2A' and '15' data to 6 bits of 256x3 (RGB), then reads new data and compares the results with the original data.

Upon completion of the test, the message "OK" displays, then the screen returns to the subtest menu.

Subtest 11   TFT color display

This subtest displays seven screens. The first shows a 64-color band across the screen, the next three screens display 64 gradations (mode '13') of red, green, and blue successively, and the last three display 256 gradations (mode '5F') of red, green, and blue.

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

Subtest 12   F. Z Connector check

This subtest checks the Z-connector and Feature connector using a special connector.

Subtest 13   SVGA mode

This subtest displays seven screens. The first shows many colors at once, the next three display 64 gradations (mode '5D') of red, green, and blue successively, and the last three display 256 gradations (mode '60') of red, green, and blue.

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

3.8 Floppy Disk Test

CAUTION: Before running the floppy disk test, prepare a formatted work disk since the contents of the floppy disk in the FDD will be reased. Remove the Diagnostics Disk and insert the work disk into the FDD.

To execute the Floppy Disk Test, select **5** from the DIAGNOSTIC TEST menu, press **Enter**, and follow the directions displayed on the screen. The Floppy Disk test contains five subtests that test the T6600C's internal floppy disk drive.

The following messages appear after selecting the Floppy Disk Test. Answer each question with an appropriate response to execute the test.

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) ?
    ```

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

    ```
    SYSTEM TEST          XXXXXXX
                                 ┌─────────────────────────────┐
                                 │ T6600C 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     : XXXXX    STATUS       : XXX
    ```

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

    The first digit in the STATUS number indicates the drive being tested, and the last two digits indicate the error status code as explained in Table 3-5 in Section 3.15.

Subtest 01   Sequential Read

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

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

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

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

Subtest 02   Sequential Read/Write

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

Subtest 03   Random Address/Data

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

Subtest 04   Write Specified Address

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

Subtest 05   Read Specified Address

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

3.9 Printer Test

To execute the Printer Test, select **6** from the DIAGNOSTIC TEST menu, press **Enter**, and follow the directions displayed on the screen. The Printer Test contains three subtests that test the output of the printer connected to the T6600C.

> *NOTE: An IBM-compatible printer must be connected to the system to execute this test. Make sure the setup option "External FDD/PRT" is set to "PRT" (Printer).*

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

```
        Channel#1 = XXXXh
        Channel#2 = XXXXh
        Channel#3 = XXXXh
    Select the channel number (1-3) ?
```

The printer I/O port address is specified by the XXXXh number. The T6600C supports three printer channels. Select the printer channel number, and press **Enter** to execute the selected subtest.

Subtest 01   Ripple Pattern

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

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

Subtest 02   Function

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

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

The 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 computer's printer port. The printer wraparound connector (34M741986G01) wiring diagram is described in Appendix G.

This subtest checks the output and bidirectional modes of the data control and status lines through the printer wraparound connector.

3.10 Async Test

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

Subtests 01 through 04 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 will appear at the bottom of the screen when Subtests 01, 03, 04, and 05 are selected:

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

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

Subtest 01   Wraparound (board)

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

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

Subtest 02   Not used.

Subtest 03   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 G.*

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

Subtest 04   Point to point (Receive)

This subtest, used with Subtest 03 described above, receives the data from the send side, then sends the received data.

Subtest 05   Not used.

Subtest 06   Interrupt Test (IRQ 4, 3, 5)

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

3.11 Hard Disk Test

To execute the Hard Disk Test, select **8** from the DIAGNOSTIC TEST menu, press **Enter**, and follow the directions displayed on the screen. The Hard Disk test contains 10 subtests that test the T6600C's hard disk drive functions.

CAUTION: The contents of the hard disk will be erased when Subtest 02, 03, 04, 05, 06, 08, 09, or 10 is executed. Before running the test, transfer the contents of the hard disk to a floppy disk(s). This can be done with the Toshiba MS-DOS BACKUP command.

After the Hard Disk test is completed, execute the Toshiba MS-DOS FDISK command, which will set the partition. Then execute the Toshiba MS-DOS FORMAT command. Refer to the Toshiba MS-DOS manual for details.

---

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 or not the HDD status is displayed on the screen. The HDD status is described in Section 3.16. 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 displays during each subtest.

```
HARD DISK TEST                         XXXXXXX

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

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

The first digit of the STATUS number indicates the drive being tested, and the last two digits indicate the error status code as explained in Table 3-5 in Section 3.15.

Subtest 01   Sequential Read

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

Subtest 02   Address Uniqueness

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

• Forward sequential
• Reverse sequential
• Random

Subtest 03   Random Address/Data

This subtest writes random data to random addresses on the HDD cylinder, head and sector. This data is then read and compared to the original data.

Subtest 04   Cross Talk & Peak Shift

This subtest writes eight types of worst pattern data (shown below) to a cylinder, then reads the data while moving from cylinder to cylinder.

Worst pattern data: B5ADADh, 4A5252h, EB6DB6h, 149249h, 63B63Bh, 9C49C4h, 2DB6DBh, D24924h.

Subtest 05   Write /read/compare (CE)

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

Subtest 06   Write specified address

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

Subtest 07   Read specified address

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

Subtest 08   ECC circuit

This subtest checks the Error Check and Correction (ECC) circuit functions of the specified cylinder and head on the HDD.

Subtest 09   Sequential write

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

Subtest 10   W-R-C specified address

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

3.12 Real Timer Test

To execute the Real Timer Test, select **9** from the DIAGNOSTIC TEST menu, press **Enter**, and follow the directions on the screen. The Real Timer test contains three subtests that test the T6600C's real timer functions. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01   Real Time

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

1. Select Subtest 01; the following message appears:

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

Enter new date:

PRESS [ENTER] KEY TO EXIT TEST
```

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

```
Enter new time :
```

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

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

Subtest 02   Backup Memory

This subtest performs the following backup memory check:

❏ Writes 1-bit of "on" data to addresses 01h through 80h
❏ Writes 1-bit of "off" data to addresses FEh through 7Fh
❏ Writes the data pattern AAh through 55h to the RTC 50-byte memory (address 0Eh to 3Fh)

The subtest then reads and compares this data with the original data.

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

Subtest 03   Real Time Carry

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

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

```
        Current date  : 01-01-1989
        Current time  : 00:00:37
```

Pressing **Enter** displays the following:

```
        Current date : 12-31-1988
        Current time : 23:59:58

  PRESS [Enter] KEY TO EXIT TEST
```

Press **Ctrl + Break** to exit.

3.13 NDP Test

To execute the NDP Test, select **10** from the DIAGNOSTIC TEST menu, press **Enter**, and
follow the directions on the screen. The NDP test contains one subtest that tests the
T6600C's NDP functions. Move the highlight bar to Subtest 01 and press **Enter**.

Subtest 01   NDP test

This test checks the following functions of the co-processor:

❏   Control word

❏   Status word

❏   Bus

❏   Addition

❏   Multiplication

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

3.14 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 four subtests that test the T6600C's expansion functions. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01   Box wraparound (Not used)

Subtest 02   Wraparound (F32BUS)

> *NOTE: To execute this subtest, a wraparound board (34P711656G01) must be installed in the expansion slot.*

The wraparound subtest executes the tests listed in Table 3-3.

Table 3-3 Expansion Test - Wraparound Subtest (F32BUS)

Sub#	Address	Good	Bad	Contents
01	00001	F0	x0	OSC, CLK, ALE, REF signal
02	00002	FA	xx	8259#1 (IRQ7, 6, 5, 4, 3, NMI)
	00002	F8	xx	8259#2 (IRQ14, 12, 11, 10, 9)
03	(ch, #) 0003	nn	xx	DMA#1, Channel #1-3 nn=FF, AA, 55, 00, EE, 99, 44, 00
04	00004	00-FF	xx	Data line
	Caaaa	bb	bb	Address line aaaa=test address, bbbb=read data
06	00006	nn	xx	Memory W/R (nn=FF, AA, 55, 00)
07	00007	08	0x	CNT
08	00008	ff	ss	IO16 (ff<ss) ff=first data, ss=second data
09	00009	nn	xx	MASTER (nn=FF, AA, 55, 00)
10	00010	nn	xx	DMA#2, Channel #5, 6 nn=FF, AA, 55, 00, EE, 99, 44, 00
11	00011	nn	xx	CCMCS2 (nn=FF, AA, 55, 00)
12	00012	—	—	MDSPK (Beep test)
13	00013	00	X0	B8xxxx
		01	xx	B4xxxx
		nn	xx	A17-A23 test (nn=A17-A23)

Subtest 03   PCMCIA wraparound

> *NOTE: To execute this subtest, a PCMCIA wraparound card must be installed in the PCMCIA slot.*

This subtest executes the tests listed in Table 3-4.

Table 3-4 Expansion Test - PCMCIA Wraparound Subtest

Sub#	Address	Good	Bad	Contents
01	00001	nn	xx	Address line
	00001	nn	xx	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 04   SCSI interface

This subtest reads the "0" cylinder on the HDD.

3.15 Error Codes and Error Status Names

Table 3-5 lists the error codes and error status names for the Diagnostic Tests.

Table 3-5 Error Codes and Error Status Names (1/3)

Device Name	Error Code	Error Status Name
(COMMON)	FF	Data Compare Error
SYSTEM	01	ROM Checksum Error
MEMORY	01	Parity Error
	02	Protected Mode Not Changed
	14	Memory Read/Write Error
	DD	Cache Memory Error
KEYBOARD	03	Mouse Interface Error
	04	DCBP Interface Error
FLOPPY DISK	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 Not 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

Table 3-5 Error Codes and Error Status Names (2/3)

Device Name	Error Code	Error Status Name
ASYNC	01	DSR On Time-out
	02	CTS On Time-out
	04	RX-READY Time-out
	08	TX-BUFFER Full Time-out
	10	Parity Error
	20	Framing Error
	40	Overrun Error
	80	Line Status Error
	88	Modem Status Error
	33	No Carrier (Card Modem)
	34	Error (Card Modem)
	36	No Dial Tone (Card Modem)
HARD DISK	01	Bad Command Error
	02	Bad Address Mark Error
	04	Record Not Found
	05	HDC Not Reset Error
	07	Drive Not Initialized
	08	Overrun Error
	09	DMA Boundary Error
	0A	Bad Sector
	0B	Bad Track Error
	10	ECC Error
	11	ECC Recover Enable
	20	HDC Error
	40	Seek Error
	80	Time-out Error
	AA	Drive Not Ready
	BB	Undefined Error
	CC	Write Fault
	E0	Status Error
NDP	01	No CO-PROCESSOR
	02	Control Word Error
	03	Status Word Error
	04	Bus Error
	05	Addition Error
	06	Multiplication Error

Table 3-5 Error Codes and Error Status Names (3/3)

Device Name	Error Code	Error Status Name
EXPANSION	01	Clock Signal Error
	02	8259#1 Interrupt Error
	03	8259#2 Interrupt Error
	04	DMAC (8 bit transfer) Error
	05	DMAC (8 bit) T/C Flat=0 Error
	06	DMAC (8 bit transfer) Last Error
	07	DMAC (8 bit) T/C Flag=1 Error
	08	Data Line (bit 7..0) Error
	09	Address line (A15..0) Error
	0A	Address/Data Line R/W Error
	0B	I/O CH Ready Line Error
	0C	I/O CS16 Line Error
	0D	Power On/Off Line Error
	0E	Master Line Error
	0F	DMAC (16 bit transfer) Error
	10	DMAC (16 bit) T/C Flag=0 Error
	11	DMAC (16 bit transfer) Last Error
	12	DMAC (16 bit) T/C Flag=1 Error
	13	Serial I/O CS Line Error
	14	MEM CS16 Line Error (=0)
	15	MEM CS16 Line Error (=1)
	16	Address Line (A23..17) Error
	17	Protected Mode Not Changed !!!
PCMCIA	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

3.16 Hard Disk Test Detail Status

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

```
HDC status = XXXXXXXX
```

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

The hard disk controller error status is composed of 2 bytes; the first byte displays the contents of the HDC status register in hexadecimal format, and the second byte displays the HDC error register.

The contents of the HDC status register and error register are described in Tables 3-6 and 3-7.

Table 3-6 Hard Disk Controller Status Register Contents

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

Table 3-7 Error Register Contents

Bit	Name	Description
7	BBK1 (Bad block mark)	"0" --- Other "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" --- Other "1" --- There is no ID field in the requested sector.
3	———	Not used
2	ABRT (Abort)	"0" --- Other "1" --- Illegal command error or a drive status error occurred.
1	TK00 (Track 0)	"0" --- The hard disk found Track 0 during a recalibrate command. "1" --- The hard disk could not find Track 0 during a recalibrate command.
0	———	Not used.

3.17 Hard Disk Format

The hard disk format function performs a low-level (physical) format of the hard disk 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

CAUTION: *The contents of the hard disk will be erased when this program is executed. Before executing the function, transfer the contents of the hard disk onto a backup system. This can be done with the Toshiba MS-DOS BACKUP command. See the Toshiba MS-DOS manual for details on using the BACKUP command.*

3.17.1   Function Description

1.   All track FORMAT

This option performs a low-level format of all the tracks on the hard disk as listed in Table 3-8 below.

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

Table 3-8 Hard Disk Formatting Sequence

Model Name	CP30544 (510 MB)
Sector sequences	1
Cylinders	527
Heads	31
Sectors	63
Sector length (bps)	512

2.   Good track FORMAT

This option formats a specified cylinder and track as a good track. If a good track is formatted as a bad track, use this option to change the track to a good track.

3. Bad track FORMAT

This option 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

This option searches the hard disk for bad tracks by reading data to all the tracks on the hard disk. A list of bad tracks is displayed when the program is complete. If an error other than a bad track is detected, the program is automatically terminated.

3.17.2   Operations

```
CAUTION:  The contents of the hard disk will be erased when this program is ex-
ecuted.  Before executing the function, transfer the contents of the hard disk onto a
backup system.  This can be done with the Toshiba MS-DOS BACKUP command.  See
the Toshiba MS-DOS manual for details on using the BACKUP command.
```

Select "TEST 2" and press **Enter** in the DIAGNOSTIC MENU to display the following menu:

```
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

Press [NUMBER] key
```

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 messages display at the bottom of the screen in succession:

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

(a)   Select a drive number and press **Enter**. The following message appears:

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

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

```
Unlock format select (1:no/2:yes)
```

(c)   Select whether the disk has an unlock format.

---

*NOTE: This option appears only when an HDD manufactured by JVC is installed. For JVC HDDs, which are the only disks with unlock formats, you must select **2** (yes). If **1** is selected with a JVC disk, an error will be generated. The system defaults to **1** and this message does not appear when other disks are installed.*

(d)   Bad Track Register

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

(e)   All Track Format

All tracks are formatted as good tracks except those registered as bad tracks in Item (d) above, or those identified as bad tracks in the Track Verification function described in Item (f) below.

(f)   Track Verification

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

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 numbers for the 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 numbers for the 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

This subtest reads the entire disk and displays a list of bad tracks. The test is terminated in case of a bad track check error. To initiate the subtest, enter the drive number at the prompt shown below.

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

Bad tracks are displayed in the format shown below.

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

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

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.

3.18 Head Cleaning

3.18.1   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 function.

3.18.2   Operations

1.   Select Test **4** from the DIAGNOSTIC MENU and press **Enter**. The following messages display:

        DIAGNOSTICS - FLOPPY DISK HEAD CLEANING : VX.XX

        Mount cleaning disk(s) on drive(s).

        Press any key when ready.

2.   Remove the Diagnostics Disk from the FDD, then insert the cleaning disk and press **Enter**.

3.   When the "cleaning start" message appears, the FDD head cleaning has begun.

4.   The display automatically returns to the DIAGNOSTIC MENU when the function is completed.

3.19 Log Utilities

3.19.1   Function Description

This function logs error information generated while a test is in progress and stores the results in RAM. The 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. 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)

3.19.2   Operations

1.   Select **5** and press **Enter** in the DIAGNOSTIC MENU to log error information into RAM or onto a floppy disk. 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. Error information displayed on the screen can be manipulated with the following number keys:

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

3. If an "error retry OK" condition occurs, a capital "R" is placed at the beginning of the error status. However, it is not added to the error count.

3.20 Running Test

3.20.1   Function Description

This function automatically executes the following tests in sequence:

1.   System Test (Subtest 01)
2.   Memory Test (Subtests 01, 02, 04, 06 and 07)
3.   Display Test (Subtests 01 to 08)
4.   FDD Test (Subtest 02)
5.   HDD Test (Subtests 01 and 05)
6.   Real Timer Test (Subtest 02)
7.   Printer Test (Subtest 03)
8.   Async Test (Subtest 01)

The system automatically detects the number of floppy disk drives connected to the T6600C for the FDD test.

3.20.2   Operations

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

1.   Remove the diagnostics disk from the floppy disk drive and insert the work disk.

2.   Select **6** from the Diagnostic Menu and press **Enter**, the following message displays:

```
Printer wraparound test (Y/N) ?
```

Selecting **Y** (Yes) executes the printer wraparound test. A printer wraparound connector must be connected to the **PRT/FDD** port on the back of the T6600C to properly execute this test.

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

```
Serial #A wraparound 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** on the back of the T6600C 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**.

3.21 Floppy Disk Drive Utilities

3.21.1 Function Description

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

1. FORMAT

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

This program formats a 5.25-inch or 3.5-inch floppy disk in one of the following formats:

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

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

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

2. COPY

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

3. DUMP

This program displays the contents of the floppy disk (both the 3.5-inch and the 5.25-inch) and the designated sectors of the hard disk on the display.

3.21.2 Operations

1. Select **7** from the DIAGNOSTIC MENU and press **Enter**. The following menu displays:

```
[ 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 and press **Enter**. The following message displays:

```
Type select (0:2DD-2D,1:2D1-2D,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 is executed:

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

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

         After the floppy disk is formatted, the following message 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 DIAGNOSTIC 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 displays, indicating the program has
       started.

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

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

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

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

(e)   To copy another disk, type **1** and the message from Step (a) displays again.
       Entering **2** returns the test program to the DIAGNOSTIC MENU.

4.   DUMP program

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

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

(b)   Select a format type number. If **2** is selected, the program goes to Step (e).

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

(c)   Select a drive number. The following message displays:

```
Format type select (0:2DD, 1:2D, 2:2HD) ?
```

(d)   Select a media type number. The following message displays:

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

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

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

    Track  number ??
```

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

3.22 System Configuration

3.22.1   Function Description

The System Configuration program contains the following configuration information for the
T6600C:

1. BIOS ROM version
2. SCC version
3. Base memory size
4. Display type
5. Number of floppy disk drives
6. Number of ASYNC ports
7. Number of hard disk drives
8. Number of printer ports
9. Number of Math co-processors
10. Extended Memory Size

3.22.2   Operations

Select **8** from the DIAGNOSTIC MENU and press **Enter** to display the following system
configuration:

```
        SYSTEM CONFIGURATION :

          *  - BIOS ROM VERSION = VX.XX
          *  - SCC VERSION = VX.XX
          *  - 639 KB MEMORY
          *  - COLOR/GRAPH (80 Column)
          *  - 1 FLOPPY DISK DRIVE(S)
          *  - 1 ASYNC ADAPTER
          *  - 1 HARD DISK DRIVE(S)
          *  - 1 PRINTER ADAPTER
          *  - 1 MATH CO-PROCESSOR
          *  - XXXXXKB EXTENDED MEMORY

        Press [Enter] Key
```

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

3.23 SETUP

3.23.1   Function Description

Setup displays the T6600C's current system setup information as listed below.

1.   Memory

    (1)   Total
    (2)   Base
    (3)   Extended
    (4)   Shadow BIOS

2.   Display

    (1)   Display adapter
    (2)   Display device
    (3)   LCD display mode

3.   Hard disk

    (1)   HDD #0 capacity
    (2)   HDD #1 capacity

4.   Power-on password

5.   COM/PRT/FDD

    (1)   Serial port
    (2)   External FDD/PRT
    (3)   Printer port type

6.   Others

    (1)   Processing speed
    (2)   Cache
    (3)   Turbo cache
    (4)   Display auto off
    (5)   Numlock Init. state
    (6)   Keyboard key layout
    (7)   SCSI interrupt level
    (8)   SCSI BIOS/address
    (9)   Sound I/O address
    (10) System speaker

3.23.2   Accessing the SETUP Program

Select **0** from the DIAGNOSTICS MENU and press **Enter** to display the Setup screen.

```
                        T6600C  SETUP            BIOS Ver=*.**
          ──── MEMORY ────                ──── COM/PRT/FDD ────
  Total           = 8192KB      Serial Port       = COM1(IRQ4/3S8H)
  Base            =  640KB       External FDD/PRT  = Printer
  Extended        = 7424KB       Printer Port Type = Output
  Shadow BIOS     =  128KB


          ──── DISPLAY ────                ──────── OTHERS ────────
  Display Adapter   = VGA Compatible   Processing Speed   = High
  Display Device    = LCD              Cache              = Enabled
  LCD Display Mode  = Color            Turbo Cache        = Present
                                       Display Auto Off   = 3.0 min.
                                       Numlock Init. State = On
          ──── HARD  DISK ────          Keyboard Key Layout
  HDD #0 Capacity  = 510MB                  = Standard 101 Key Layout
  HDD #1           = No Drive          SCSI Interrupt Level = IRQ11
                                       SCSI BIOS/Address = 0C8000H-0CFFFFH
          ──── POWER  ON  PASSWORD ────  Sound I/O Address  = 0530H
  Not Registered                       System Speaker     = Enabled


  ↑↓ ← → :   Select items, Space, BkSp : Change values
  Esc: Exit without saving, Home: Set default values, End: Save and reboot
```

The above illustration shows an example of setup options as they may be currently stored in memory. However, this is an example only, your Setup screen may have different values than shown here.

The options, "Display Device" and "LCD Display Mode" differ depending on the option selected for "Display Adapter."

Notice that selecting the type of disk drive is not an option. The T6600C automatically determines what type of internal disk drive is installed. Also, you do not have to run SETUP to use an external 5.25-inch disk drive.

Press **ESC** if the setup options displayed accurately reflect your hardware configuration and no changes are necessary. The screen displays the following message:

            Exit without saving?   (Y/N)

Press **Y**. The system returns to the Diagnostic menu.

3.23.3 Changing SETUP Values

You can change the setup options automatically or manually.

Automatic Reset

1. At the Setup screen, press **Home**. This instructs the program to reset all the options to their factory preset values.

    The program calculates how much base and extended memory your computer has based on whether or not you have an expansion memory card installed.

    The Setup menu displays the new values.

2. Confirm that the new values are correct. To change any option(s), go to the next item, **Manual Reset**.

3. If the new values are correct, press **End** to record the new values in configuration memory.

4. Press **Y** (Yes) upon verification of the new values. The system reboots automatically.

Manual Reset

> *NOTE: The cursor, which is bar-shaped, indicates which option is presently selected.*

1. Use the arrow keys to move the cursor between options. You can also select each option group by pressing the character on the keyboard corresponding to the first character of the heading for each option group. For example, if you press **D**, the cursor moves to the top of the DISPLAY option group.

2. When the cursor highlights the values of an option you want to change, use the **space bar** and **backspace** keys to select the desired value.

3. When you finish making changes, press **End** to record the new values in configuration memory.

4. Setup displays the following message:

    ```
    Save Settings, perform self test and reboot? (Y/N)
    ```

    Review your changes. If you need to make more alterations, press **N** and go back to Step 1 above.

5. If the new values are correct, press **Y**. The new values are recorded into CMOS memory and the system automatically reboots.

3.23.4 SETUP Option Descriptions

The Setup screen is divided into functionally-related groups. This section describes each group and the options within them.

1. Memory

   These options list the computer's memory allocations.

   (a) Total

   Displays the total amount of memory installed and is automatically calculated by the computer.

   (b) Base

   Displays the amount of base (conventional) memory installed and is automatically calculated by the computer. You cannot change this value. However, if you set Hard RAM, this value changes automatically.

   (c) Extended

   Displays the amount of extended memory the T6600C has available. You cannot change this value.

   (d) Shadow BIOS

   The Setup program displays 128 KB of RAM, which is reserved for the Shadow BIOS ROM. This field displays the amount of the extended memory used for the shadow BIOS ROM. You cannot change this value.

2. Display

   These options help you configure the computer's display.

   (a) Display adapter

   This option enables the internal video controller.

VGA compatible	Enables the internal video controller.
Not Used	Disables the internal video controller.

(b)   Display device

This option selects between using the CRT only (CRT mode), or using both the CRT and Color LCD display simultaneously (dual display mode). In either case, if a CRT is connected to the T6600C, the display mode of the Color LCD display is set to either color or monochrome, according to the type of the CRT (color or monochrome). In the dual display mode, the display mode of the Color LCD display agrees with the mode of the CRT. In this case, the border section of the CRT is not displayed on the LCD display.

LCD   Specifies dual display mode. (Default)

CRT   Specifies CRT mode.

(c)   LCD display mode

If there is no CRT attached to the T6600C, this option selects whether the color LCD display uses monochrome mode or color mode. If there is a CRT attached to the T6600C, the display mode of the color LCD display is determined by the type of the CRT (either monochrome or color), and the setting for this option has no effect.

Color   Displays in color mode with a maximum of 512 or 256K colors. (Default)

Monochrome   Displays in the monochrome mode, with some intensity levels of gray for the color LCD display.

3.   Hard Disk

As you change the values for this option using the space and backspace keys, the T6600C Setup displays one of the following lines for HDD#0 and HDD#1.

```
HDD#0 (or #1) Capacity    =   510MB
HDD#0 (or #1)             =   No Drive
```

If the hard disk is installed to the SCSI interface, the program displays its capacity but does not allow you to select the *No Drive* option.

4.   Power On Password

This option allows you to set or reset the power-on and instant passwords.

If no power-on password has been set, the system configuration program displays "Not Registered." To set the power-on password, perform the following steps.

(a)   Press the **Space bar** or **BkSp** key. The following prompt appears.

```
Password =
```

Enter a password of up to sixteen (16) characters. The character string you enter is displayed as a string of asterisks. For example, if you enter a password consisting of four characters, the display shows:

```
Password = ****
```

(b)   When you finish entering the password, press **Enter**. The following message appears allowing you to verify the password.

```
Verify Password =
```

Enter the same character string you just entered and press **Enter**. If the two character strings match, the character string is registered as power-on and instant passwords and the display changes to:

```
Registered
```

If the passwords do not match, the following message appears along with a beep sound indicating you must repeat the last two steps:

```
Entry Error!!
```

Once the power-on password is set, the system configuration program displays "Registered."

To **reset** the power-on password, perform the following steps.

(a)   Press the **Space bar** or **BkSp** key. The following prompt appears:

```
Password =
```

Enter the currently registered password. The character string you enter is displayed as a string of asterisks:

```
Password = ****
```

(b)   When you finish entering the password, press **Enter**. If the character string you entered matches the registered password, the password option is reset and the display changes to:

```
Not registered
```

If the passwords do not match, the following message appears along with a beep sound.

```
Entry Error!!
```

The display then returns to the "Registered" state. Repeat the steps to reset the password.

If you press the **up** or **down arrow** keys while setting or resetting the power-on password, you can quit the process without changing the current setting by pressing the **ESC** key.

NOTE: *Multiple passwords can be set up on the T6600C using the PWSETUP.EXE program found in the C:\DOS directory. However, you cannot delete these passwords using the SETUP screen.*

*For more information on the PWSETUP.EXE program, refer to "Password Security Options" in Chapter 6 of the "**T6600C Series Reference Manual**."*

NOTE: *If the customer has forgotten the password and you cannot start up the computer, contact Toshiba Service at 1-800-999-4273.*

---

5.   COM/PRT/FDD

This Setup option controls communication levels for the serial port, assignments of the FDD/PRT port, and operation of the printer port.

(a)   Serial port

This option sets the COM level–COM1 or COM2–for the serial port.

The serial port interrupt level (IRQ) and I/O port base address for each COM level are shown below:

COM Level	Interrupt Level	I/O Address
COM1	4	3F8h
COM2	3	2F8h
Not used	-	-

You can disable the port by selecting *Not Used*. By doing this you can install an optional card in one of the expansion slots without any conflict with the COM levels of the serial port.

The default setting is:

Serial Port   COM1 (IRQ4/3F8H)

(b)   External FDD/PRT

This option sets the assignment of the FDD/PRT port. Set the option to
Printer to configure the port for a parallel printer. Set the option to *FDD A*
or *FDD B* to use an external 5 1/4" floppy disk drive. Set it to *FDD A* if you
want the external drive to be Drive A, or set it to *FDD B* if you want the
external drive to be Drive B.

The following table is a quick reference to the External FDD/PRT setting.

Option Setting	External Drive ID	Internal Drive ID
Printer	None	A
FDD A	A	B
FDD B	B	A

(c)   Printer port type

This option sets the PRT/FDD connector on the rear panel of the T6600C to
either an output-only or a bi-directional port. The option is valid only when
the PRT/FDD connector is used for the printer, that is, the "External FDD/
PRT" option is set to *Printer*.

The printer port type setting depends on the printer or other parallel
device(s) attached to the PRT/FDD connector.

The options are:

Output   Activates uni-directional operation.

Bi-directional   Activates bi-directional operation.

When a printer is connected to the computer, the port is usually set to
Output.

6.   Others

(a)   Processing speed

This feature changes the CPU processing speed. When *High* is selected, the
CPU runs with the maximum speed that the T6600C can operate, which
might not be fully compatible with the IBM PC/AT bus. If an optional card
or application software does not run with the *High* speed, select *Normal* or
Low so that they may run. Some memory cards in the expansion slot may
require normal speed.

High	Selects the maximum CPU speed.	
Normal	Selects the maximum CPU speed, and is IBM PC/AT bus compatible.	
Low	Sets the CPU clock speed at half the regular speed.	

(b) Cache

This option enables and disables the CPU cache and the Turbo cache, if installed. The *Disabled* option may be required when running some speed-dependent application software.

Enabled	Enables the CPU cache (High speed).
Disabled	Disables the CPU cache (Relatively low speed).

(c) Turbo cache

This option shows whether the Turbo cache hardware is installed. This status is automatically detected by the computer.

(d) Display auto off

This option enables or disables the display automatic power off. When automatic power off is enabled, the duration is set to 30 min.

30 min.	Enables display automatic power off. The internal display is automatically powered off if you do not use the keyboard for 30 minutes.
Disabled	Disables display automatic power off.

(e) Numlock Init. state

This option enables or disables the initial **Num Lock** state.

On	Enables the **Num Lock** when the computer is turned on.
Off	Disables the **Num Lock** when the computer is turned on.

(f) Keyboard key layout

This option selects the keyboard layout.

Standard 101 key layout   Selects the native key layout.

Alternate layout   Changes the **Ctrl**, **Alt**, and **Caps Lock** key layout to a notebook-type computer's key layout.

(g) SCSI BIOS interrupt level

This option selects the SCSI BIOS interrupt level.

IRQ9
IRQ10
IRQ11
Disabled

(h) SCSI BIOS/address

This option selects the starting address of the BIOS for SCSI devices.

0C8000H-0CFFFFH
0D8000H-0DFFFFH
0E0000H-0EFFFFH
Disabled

(i) Sound I/O base address

This option selects the Sound I/O base address.

0530H
0604H
0E80H
Disabled

(j) System speaker

This option enables or disables the system speaker.

Enabled   Enables the system speaker.

Disabled   Disables the system speaker.

4.1 General

This section explains how to disassemble the T6600C 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 must be removed in order to remove others. *Always start by removing the power cord and all external cables connected to the computer,* then follow the order on the chart to determine which FRU must be removed in order to repair the one you think is causing the T6600C to operate improperly.

❏ Power cord

- ❏ Optional PCMCIA Card
- ❏ Optional Memory Card
- ❏ Keyboard Unit
    - ▪ Optional Turbo Cache Memory
    - ▪ Keyboard
- ❏ Back Cover
    - ▪ Optional Expansion Card
- ❏ Bottom Cover
- ❏ HDD
- ❏ 5.25-inch Bay
    - ▪ CD-ROM Drive
- ❏ Back Panel Board
- ❏ DC Fan Unit
- ❏ System Board
    - ▪ Connector Board
    - ▪ RTC Battery
- ❏ FDD
- ❏ Speakers
- ❏ Volume Board
- ❏ Power Supply Unit
- ❏ LED Board

- ❏ Display Mask
- ❏ FL Inverter Board
- ❏ LCD Module
    - ☐ FL Unit
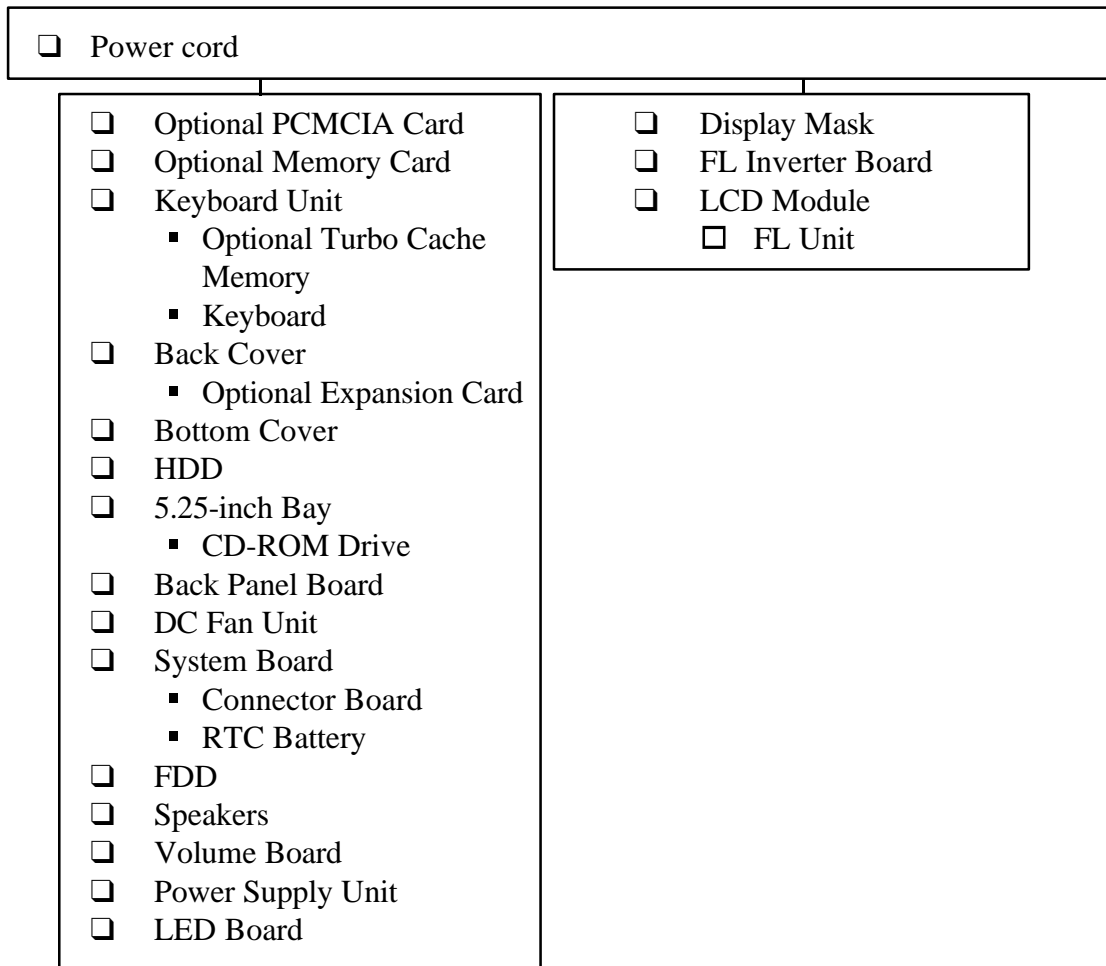
Before You Begin

Look over the procedures in this section before you begin disassembling the T6600C. Familiarize yourself with the disassembly and reassembly steps, then begin each procedure by disconnecting the power cord and all external cables connected to the computer.

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

2. Use only the correct and approved tools.

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

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

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

5. Do not perform any operations that are not necessary, and use only the described procedures for disassembling and installing FRUs in the T6600C.

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

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

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

9. The T6600C contains many sharp edges and corners, so be careful not to injure yourself.

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

Disassembly Procedures

The T6600C has two basic types of cable connectors:

- ❏ Pressure Plate Connectors
- ❏ Normal Pin Connectors

To disconnect a Pressure Plate connector, pull the pressure plate's side tabs straight out (toward the cable) and slide the cable out of the connector. To connect a cable to a Pressure Plate connector, make sure the pressure plate is open by fully extending the side tabs, then slide the cable into the connector. Secure the cable in place by pushing the side tabs of the pressure plate in so the plate is flush with the sides of the connector. *Gently* pull on the cable to make sure it is secure. If you pull out the cable, connect it again making sure the pressure plate's side tabs are fully extended when you insert the cable.

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

Assembly Procedures

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

While assembling the T6600C, remember the following general points:

❑ Take your time, making sure you follow the instructions closely. Most problems arise when you get in a hurry.

❑ 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.

❑ Make sure the correct screws are used to secure all FRUs. Using the wrong screw may either damage the threads or the head of the screw, and may prevent proper seating of an FRU.

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

Tools and Equipment

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

❑ M2 and M3 Phillips screwdrivers to remove and replace screws.

❑ A Jeweler's screwdriver to remove screw covers.

❑ Tweezers to lift out screws that you cannot grasp with your fingers.

❑ An LCD support block composed of antistatic foam.

❑ ESD mats for the floor and the table you are working on.

❑ An ESD wrist strap or heel grounder.

❑ Antistatic carpeting or flooring.

❑ Air ionizers in highly static-sensitive areas.

4.2   Optional PCMCIA Card

Removing an Optional PCMCIA Card

To remove an optional PCMCIA card, follow the steps below and refer to Figures 4-1 through 4-3.

1.   Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2.   Turn the computer so the left side faces you.

3.   Locate the **PCMCIA slot cover** and slide it up to expose the PCMCIA card (Figure 4-1).
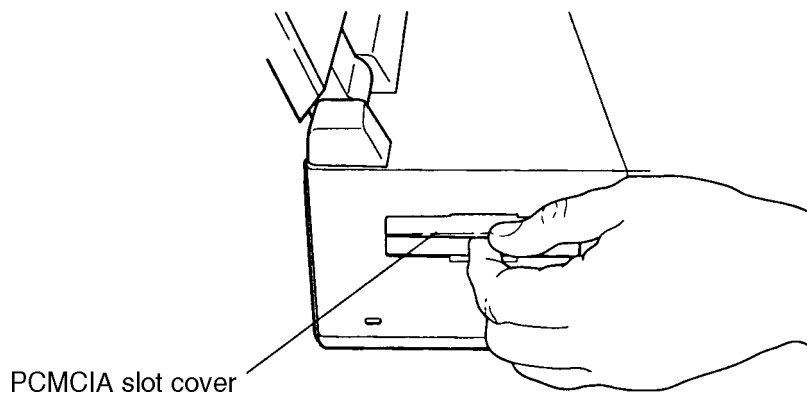
PCMCIA slot cover

Figure 4-1 Opening the PCMCIA Slot Cover

4.   Slide the **release/lock button** downward to recess the **metal tab** (Figure 4-2).

Metal tab

Release/lock button
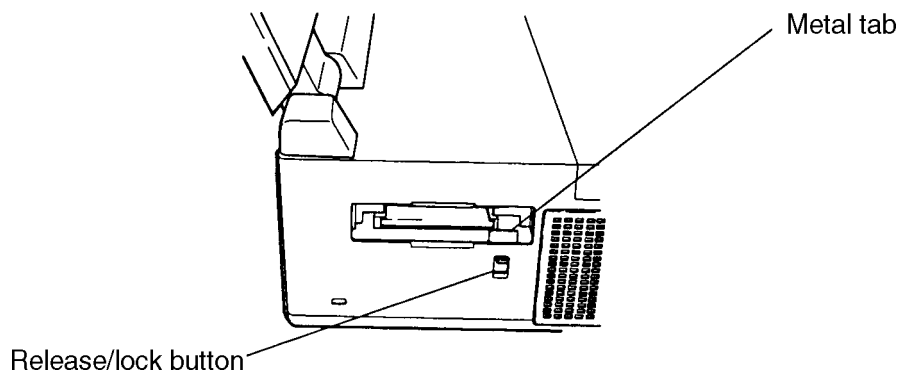
Figure 4-2 The PCMCIA Slot

5. Press the **eject button** to eject the PCMCIA card (Figure 4-3).

Eject button
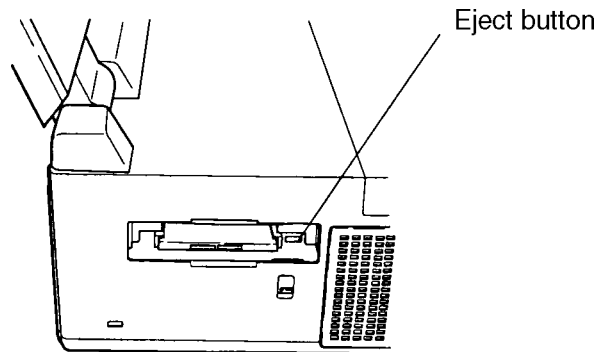
Figure 4-3 Removing the PCMCIA Card

6. Grasp the edges of the card and slide it out of the slot.

Installing an Optional PCMCIA Card

To install an optional PCMCIA card in the T6600C, follow the steps below and refer to Figures 4-1 and 4-2.

1. Slide the **PCMCIA slot cover** up to expose the PCMCIA slot (Figure 4-1).

2. Make sure the **metal tab** is fully recessed by sliding the **release/lock button** all the way down (Figure 4-2).

3. Insert the PCMCIA card into the slot. When the card is almost all the way into the slot, push gently, but firmly, to ensure a firm connection with the computer. Do not force the card into position.

4. To prevent accidental ejection of the PCMCIA card, slide the **release/lock button** upward to expose the **metal tab** (Figure 4-2).

5. Close the **PCMCIA slot cover** (Figure 4-1).

4.3 Optional Memory Card(s)

Removing an Optional Memory Card(s)

The T6600C has two memory expansion slots. To remove an optional memory card from a slot, follow the steps below and refer to Figure 4-4.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Turn the computer so the left side faces you.

3. Remove the optional PCMCIA card as described in Section 4.2.

4. Locate the **memory expansion slot cover** and open it by sliding it down (Figure 4-4).

Memory expansion slot cover
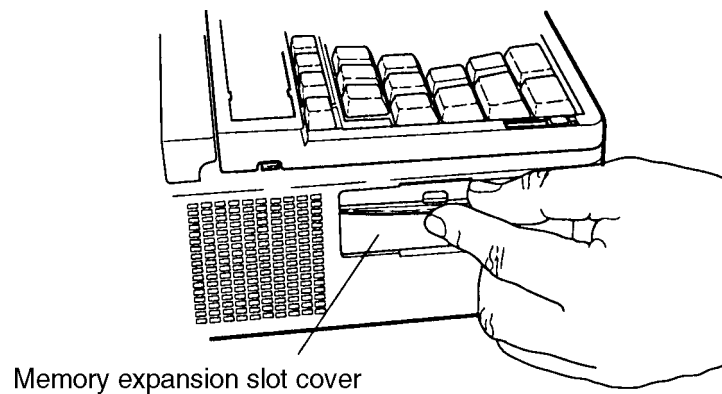
Figure 4-4 Opening the Memory Expansion Slot Cover

5. Grasp the memory card and pull it out. If a second card is in the slot, remove it also.

CAUTION: To avoid damaging the memory card, DO NOT touch its connecting edge (the edge you insert into the computer). Debris or oil in or on the connector may cause memory access problems.

Installing an Optional Memory Card

To install an optional memory card in the T6600C, follow the steps below and refer to Figure 4-4.

1. Turn the memory card so the label faces up and the printed instructions face down.

2. Carefully slide the memory card into one of the memory expansion slots. You may install the memory card in either slot. As you insert the card, guides in the slot lead the card into the socket.

3. When the card is almost all the way in the slot, push firmly, but gently, to ensure a firm connection with the computer. Do not force the card into position.

4. Close the **memory expansion slot cover**.

5. Install the optional PCMCIA card as described in Section 4.2.

6. Connect the power cord and turn on the computer. The computer automatically recognizes the additional memory.

4.4 The Keyboard Unit

Removing the Keyboard Unit

To remove the keyboard unit from the T6600C, follow the steps below and refer to Figures 4-5 and 4-6.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card and memory card(s) as described in Sections 4.2 and 4.3.

3. Open the display panel. Display latches are located on both the right and left sides of the liquid crystal display (LCD) panel.

4. Lift out the **keyboard unit** and place it in front of the computer (Figure 4-5).

5. Remove the **two screw covers**, then remove the **two M3x6 screws** (Figure 4-5).

6. Lift off the **keyboard connector cover** (Figure 4-5).
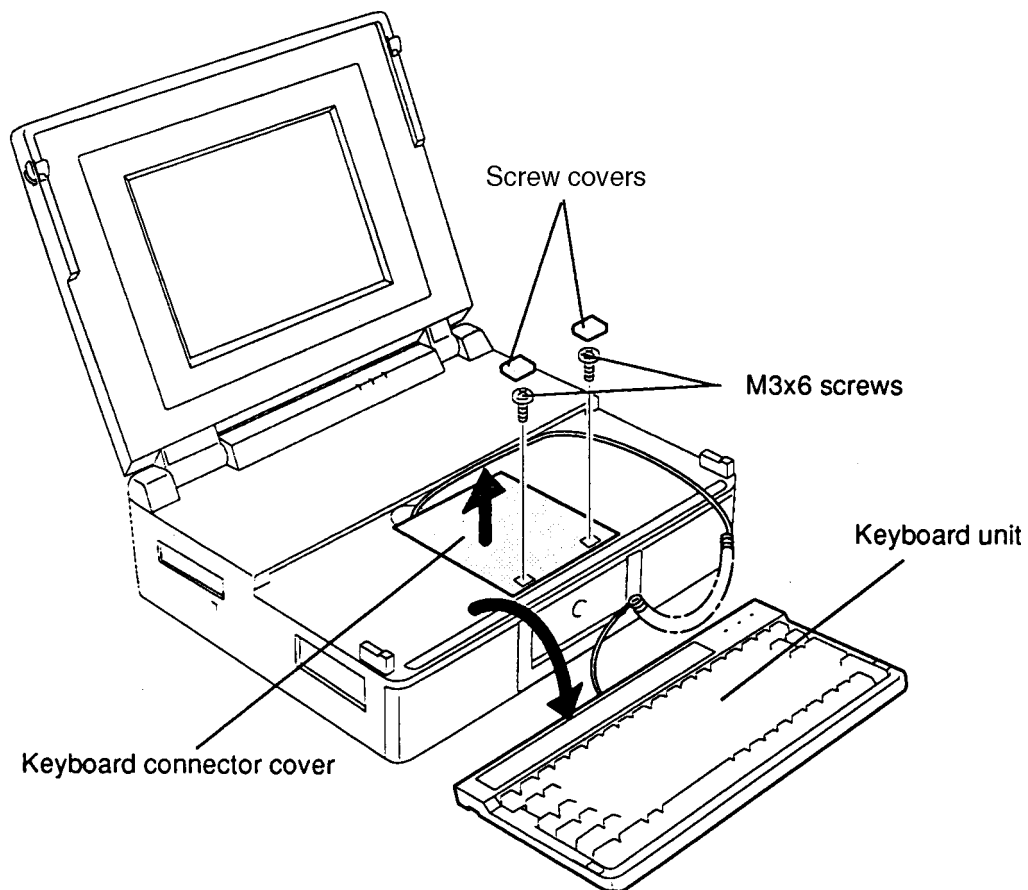
Figure 4-5 Removing the Keyboard Connector Cover

6. Referring to Figure 4-6, locate the **keyboard cable** connection to the system board. Disconnect the **keyboard cable** from **PJ190** on the system board.

7. Remove the **keyboard cable** from the computer.
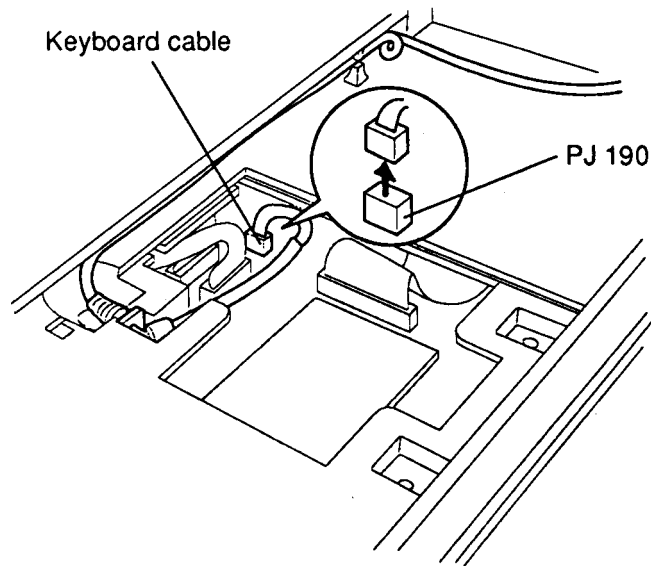
Figure 4-6 Removing the Keyboard Cable

Installing the Keyboard Unit

To install the keyboard unit, follow the steps below and refer to Figures 4-5 and 4-6.

1. Connect the **keyboard cable** to **PJ190** on the system board (Figure 4-6).

2. Route the **keyboard cable** as illustrated in Figure 4-6.

3. Set the **keyboard connector cover** in place and secure it with two **M3x6 silver screws** (Figure 4-5).

4. Press the two **screw covers** into place (Figure 4-5).

5. Place the **keyboard unit** onto the computer.

6. Install the optional memory card(s) and optional PCMCIA card as described in Sections 4.3 and 4.2.

4.5   Optional Turbo Cache Memory Module

To remove an optional turbo cache memory module from the T6600C, follow the steps below and refer to Figure 4-7.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the keyboard connector cover as described in Section 4.4.

3. Remove the turbo cache memory module from the turbo cache memory socket on the system board.

Turbo cache memory module
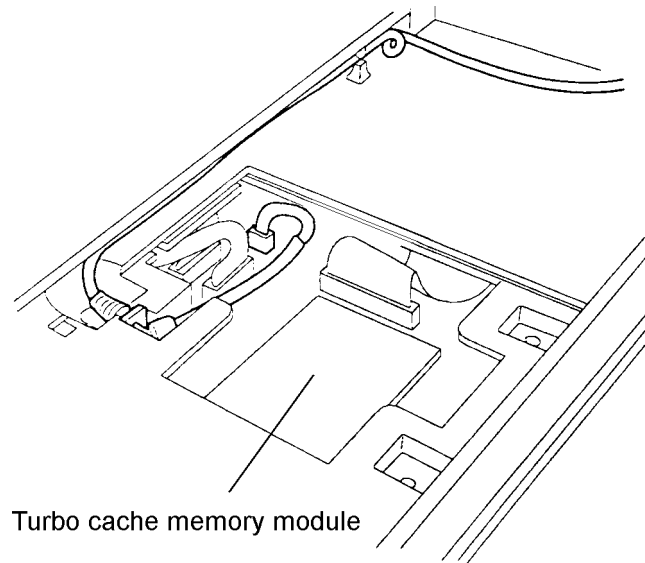
Figure 4-7 Turbo Cache Memory Module

Installing an Optional Turbo Cache Memory Module

To install a turbo cache memory module in the T6600C, follow the steps below and refer to Figure 4-7.

1. Install the memory module into the turbo cache memory socket on the system board.

2. Replace the keyboard connector cover as described in Section 4.4.

4.6   Keyboard

Removing the Keyboard

To remove the keyboard from the keyboard unit, follow the steps below and refer to Figures 4-8 through 4-11.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card, optional memory card(s), keyboard unit, and optional turbo cache memory module as described in Sections 4.2 through 4.5.

3. Turn the keyboard unit over and remove the eight **M2.5x6 silver screws** securing the **bottom cover** (Figure 4-8).
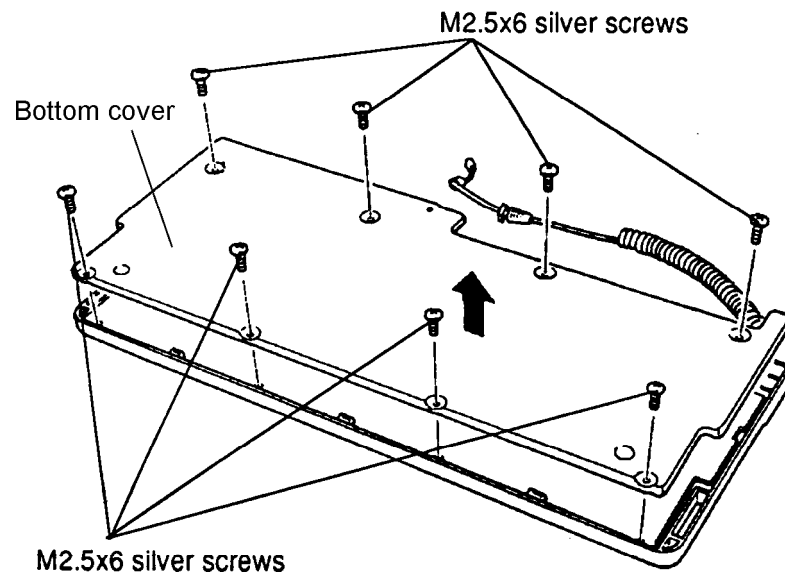
Figure 4-8 Removing the Keyboard

4. Remove the bottom cover from the keyboard assembly.

5.   Locate the **scan controller board** in the upper left corner of the keyboard assembly (next to the **keyboard cable** connection, Figure 4-9).

6.   Remove the **two M2.5x4 screws** securing the **scan controller board** to the keyboard assembly as illustrated in Figure 4-9. Note the **ground cable** secured by one of the **M2.5x4 screws**.
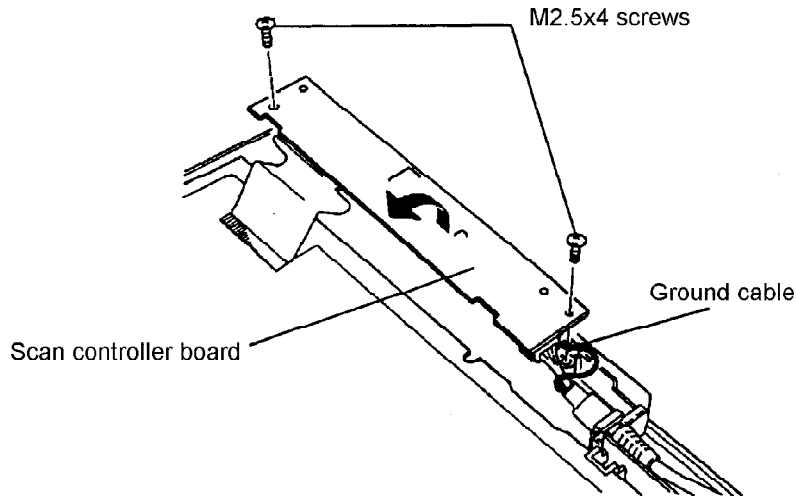
Figure 4-9 Removing the Scan Controller Screws

7.   Gently lift the **scan controller board** and rotate it in the direction of the arrow shown in Figure 4-9.

8.   Disconnect the **keyboard interface cable** from **PJ11** and the **keyboard cable** from **PJ10** on the **scan controller board** as shown in Figure 4-10.

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*NOTE: If you are replacing the **keyboard cable**, it can be removed from the **keyboard assembly** by lifting it out of the cable holder on the assembly.*
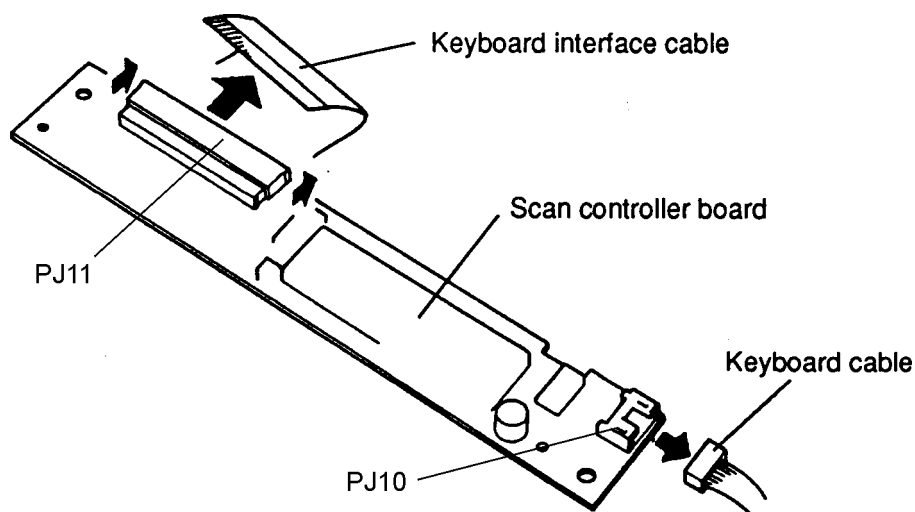
Figure 4-10 Disconnecting the Keyboard Cable and Keyboard Interface Cable

9. Remove the **two M2.5x4 screws** securing the keyboard to the **assembly** and remove the keyboard (Figure 4-11).
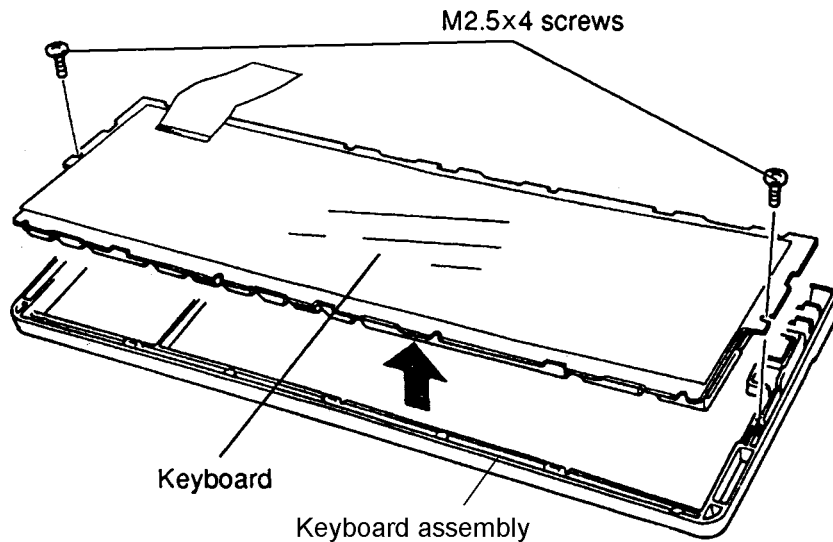
Figure 4-11 Removing the Keyboard from the Keyboard Assembly

Installing the Keyboard

To install the T6600C's keyboard, follow the steps below and refer to Figures 4-8 through 4-11.

1. Place the **keyboard** in the **keyboard assembly** as illustrated in Figure 4-11, and secure it with **two M2.5x4 screws**.

2. Connect the **keyboard interface cable** to **PJ11** on the **scan controller board**, making sure the silver side of the interface cable is facing up when you connect it (Figure 4-10).

3. Connect the **keyboard cable** to **PJ10** on the **scan controller board** (Figure 4-10).

4. Place the **scan controller board** in the keyboard assembly as illustrated in Figure 4-9. Make sure the **keyboard ground cable** is installed under the screw next to the **keyboard cable** connection. Secure the **scan controller board** with two **M2.5x4 screws**.

5. Set the **bottom cover** of the **keyboard assembly** in place, then secure it with eight **M2.5x6 silver screws** (Figure 4-8).

6. Replace the keystrip on the keyboard.

7. Install the optional turbo cache memory module, keyboard unit, optional memory card(s), and optional PCMCIA card as described in Sections 4.5 through 4.2.

4.7 Back Cover

Removing the Back Cover

To remove the T6600C's back cover, follow the steps below and refer to Figure 4-12.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card, optional memory card(s), keyboard unit, and optional turbo cache memory module as described in Sections 4.2 through 4.5.

3. Close the display panel, turn the computer so the back faces you, then turn it upside down.

4. Remove the six **M3x6 silver screws** from the **back cover**.

5. Open the *top* of the **connector panel** and remove the **M3x6 silver screw** located at the top center of the panel.
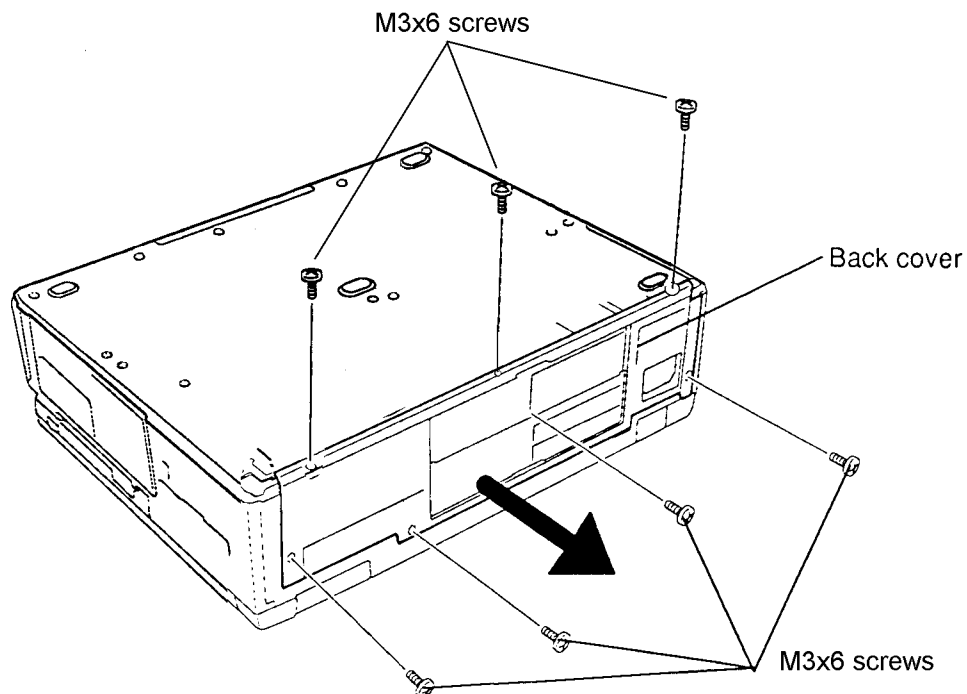
Figure 4-12 Removing the Back Cover

6. Remove the back cover.

Installing the Back Cover

To install the T6600C's back cover, follow the steps below and refer to Figure 4-12.

1. Place the **back cover** on the computer and secure it with seven **M3x6 silver screws**.

2. Install the optional turbo cache memory module, keyboard unit, optional memory card(s), and optional PCMCIA card as described in Sections 4.5 through 4.2.

4.8 Optional Expansion Cards

Removing an Expansion Card

To remove an expansion card from the computer, follow the steps below and refer to Figure 4-13.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card, optional memory card(s), keyboard unit, optional turbo cache memory module, and back cover as described in Sections 4.2 through 4.5 and 4.7.

3. Place the computer right side up with the back facing you.

4. Remove the **M3x6 screw** that secures the **expansion card** to the computer.

NOTE: When removing a Mambo card, proceed to the section titled, "Removing a Mambo Card."

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5. Gently pull the expansion card out of the machine.
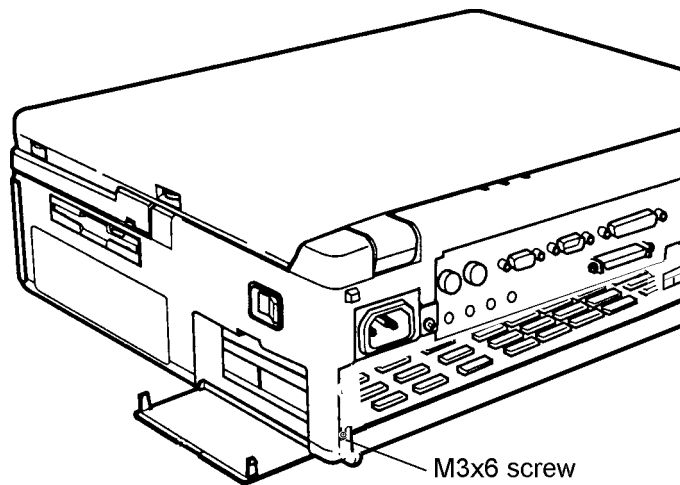
Figure 4-13 Removing an Expansion Card

Removing a Mambo Card (Refer to Figure 4-14.)

1. Gently pull the Mambo card out of the machine about half an inch.

2. Disconnect the **Z connector** and **feature connector cables** from **P305** and **P4** on the card.

3. Carefully pull the card out the rest of the way.

4. Disconnect the **Z connector** and **feature connector cables** from the system board by pulling them towards you.

Installing an Expansion Card

To install an expansion card in the computer, follow the steps below and refer to Figures 4-13 through 4-16.

1. Place the computer right side up with the back facing you.

1a. When installing a Mambo board, connect the **Z connector cable** and **feature connector cable** to PJ581 and PJ580 on the system board. Be sure to align the Z connector cable with the red stripe to the right and the feature connector cable with the red stripe to the left. Note that the connectors on these cables are keyed for proper installation (Figure 4-14).
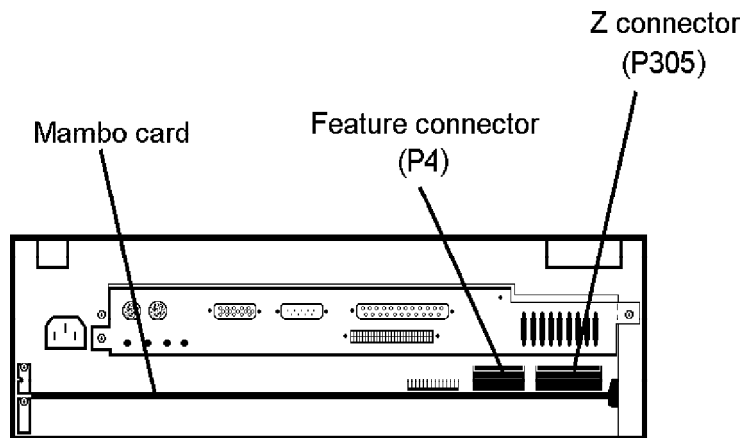
Figure 4-14 Mambo Card Cables and Connectors

2. Fit the right side of the expansion card into a pair of **card guides**. Note that smaller cards do not use the guides (Figure 4-15).
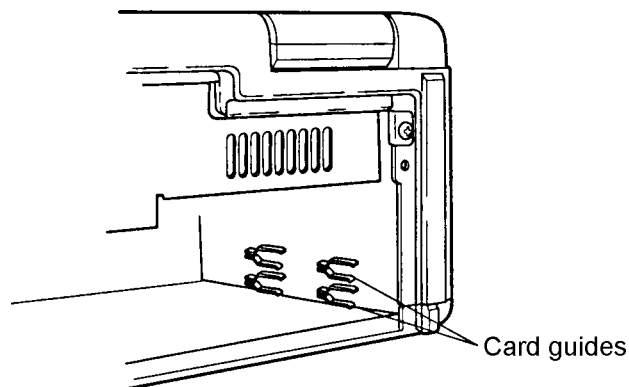
Figure 4-15 Locating the Card Guides

3. Carefully slide the card into the slot using the **expansion slot opening** on the left
    and the card guides on the right to help you align the card (Figure 4-16). If install-
    ing a Mambo card, you may need to bend the connector cables up and out of the
    way to clear some of the components on the board.

3a. Before completely seating a Mambo card, connect the **Z connector** and **feature
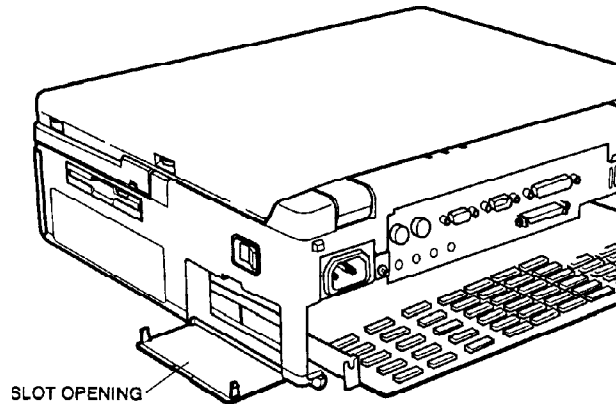   connector cables** to P305 and P4 on the card (Figure 4-14).

SLOT OPENING

Figure 4-16 Inserting an Expansion Card

4. Visually confirm that the connector and socket are aligned and push the card all
    the way into the socket with firm, even pressure.

5. Press firmly on both ends of the card. This ensures that the connector fits securely
    into the expansion socket.

6. Secure the expansion card with an **M3x6 screw** (Figure 4-13).

7. Install the back cover, optional turbo cache memory module, keyboard unit,
    optional memory card(s), and optional PCMCIA card as described in Sections 4.7
    and 4.5 through 4.2.

4.9　Bottom Cover

Removing the Bottom Cover

To remove the T6600C's bottom cover, follow the steps below and refer to Figures 4-17 and 4-18.

1.　Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2.　Remove the optional PCMCIA card, optional memory card(s), keyboard unit, optional turbo cache memory module, back cover, and optional expansion card as described in Sections 4.2 through 4.5, 4.7, and 4.8.

> *NOTE:*　*If you are going to be removing the system board, proceed to Step 3. If you are going to be removing the 5.25-inch bay, HDD, or back panel board, proceed to Step 4.*

3.　Remove the two **power supply cables** from **PJ440** and **PJ441** and the internal **FDD cable** from **PJ290** (Figure 4-17).
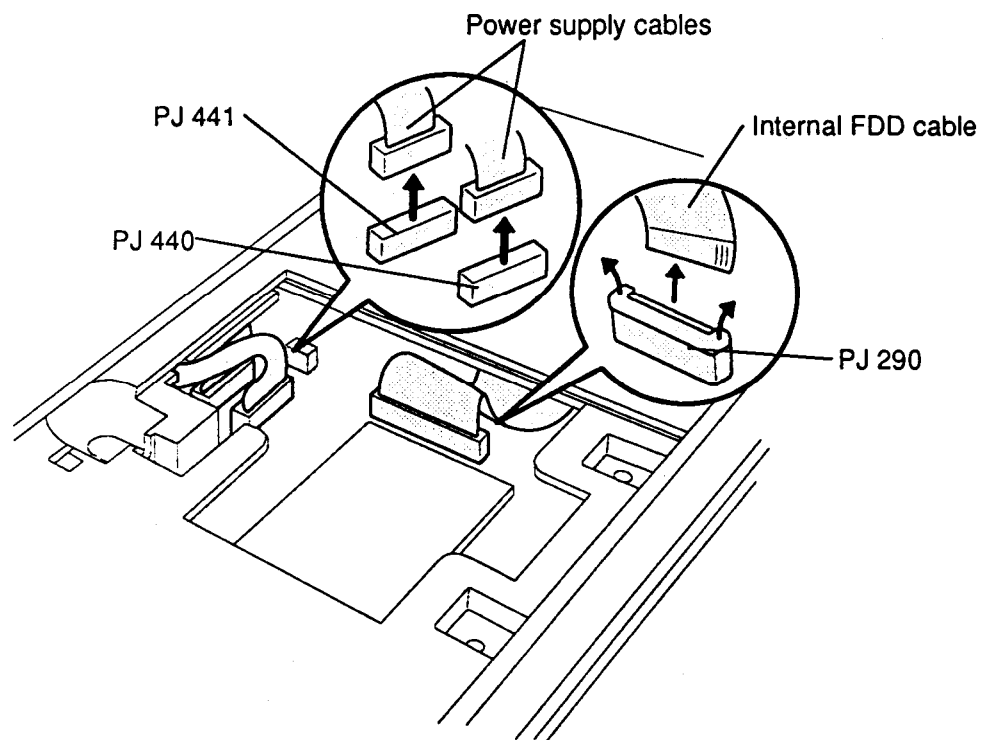

Figure 4-17　Removing the Power Supply and FDD Cables

4.   Turn the computer upside down and lift out the computer's handle.

5.   Remove the fourteen (14) **M3x6 silver screws**, and lift the **bottom cover** off the computer (Figure 4-18).
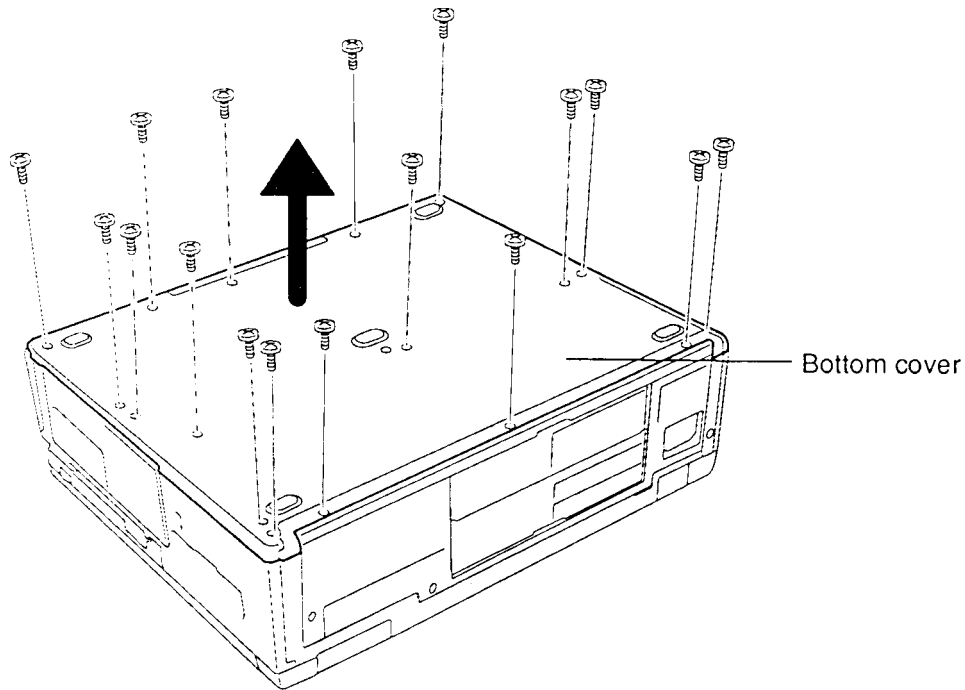
Bottom cover

Figure 4-18 Removing the Bottom Cover

Installing the Bottom Cover

To install the T6600C's bottom cover, follow the steps below and refer to Figures 4-17 and 4-18.

1.   Place the **bottom cover** on the computer and secure it with fourteen (14) **M3x6 silver screws** (Figure 4-18).

2.   If the **power supply cables** and **internal FDD cable** are disconnected, connect them to **PJ440**, **PJ441**, and **PJ290** (Figure 4-17).

3.   Install the optional expansion card, back cover, optional turbo cache memory module, keyboard unit, optional memory card(s), and optional PCMCIA card as described in Sections 4.8, 4.7 and 4.5 through 4.2.

4.10 HDD

Removing the HDD

To remove the T6600C's HDD, follow the steps below and refer to Figures 4-19 and 4-20.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card, optional memory card(s), keyboard unit, optional turbo cache memory module, back cover, optional expansion card, and bottom cover as described in Sections 4.2 through 4.5, and 4.7 through 4.9.

3. Remove the **four M3x6 screws** securing the **HDD unit** (Figure 4-19).

4. Lift up the HDD and disconnect the **HDD signal cable** from **PJ5** and the **HDD power cable** from **PJ6** on the **back panel board** (Figure 4-19).
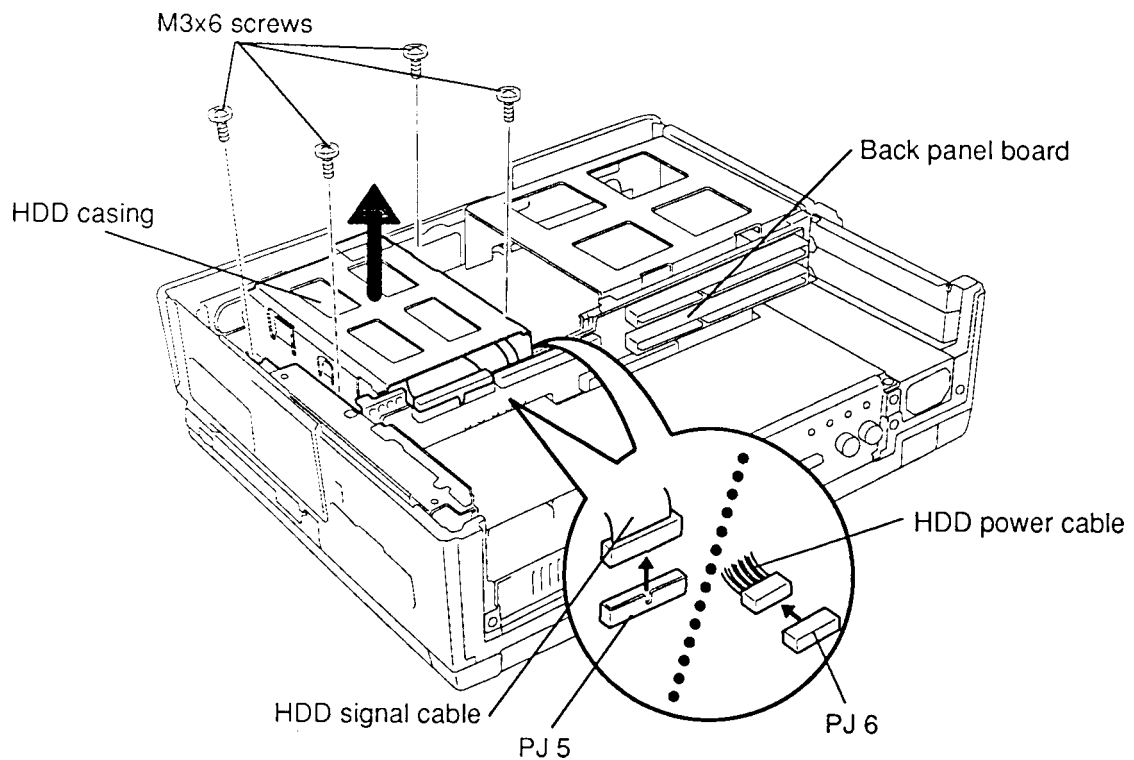

Figure 4-19 Removing the HDD Unit

5. To separate the **HDD** from its casing, remove the **four HDD screws** as illustrated in Figure 4-20.

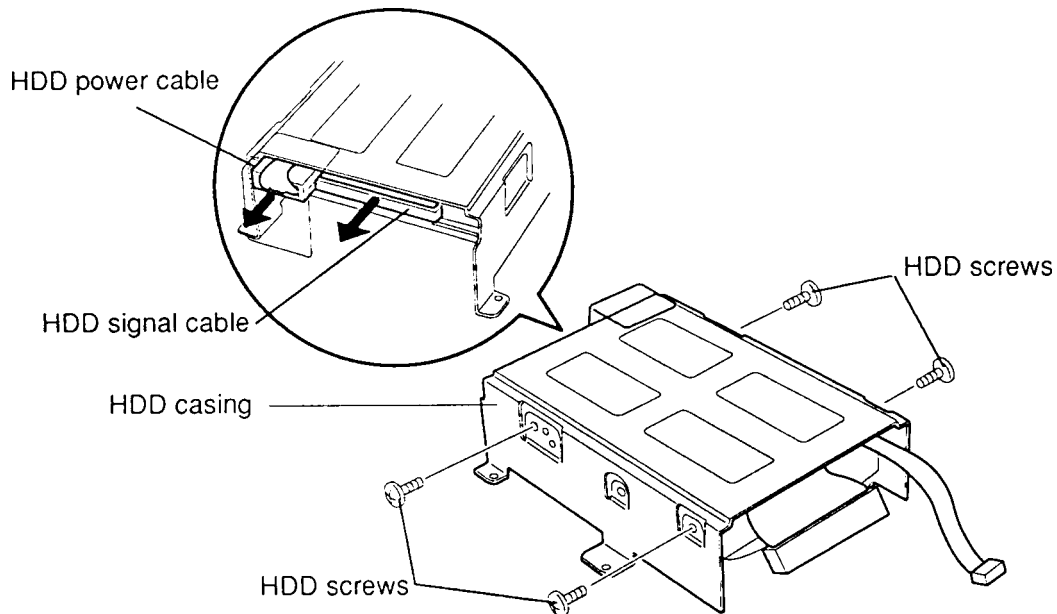6. Disconnect the **HDD signal cable** and **HDD power cable** from the HDD (Figure 4-20).

Figure 4-20 Separating the HDD from its Casing

Installing the HDD

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

1. Connect the **HDD signal cable** and **HDD power cable** to the HDD (Figure 4-20).

2. Rotate the HDD power and signal cables between the HDD and the HDD casing (Figure 4-20).

3. Secure the HDD to the **HDD casing** with **four HDD screws** (Figure 4-20).

4. Connect the **HDD signal cable** to **PJ5** and **HDD power cable** to **PJ6** on the **back panel board** (Figure 4-19).

5. Place the HDD in the computer and secure it with **four M3x6 screws** (Figure 4-19).

6. Install the bottom cover, optional expansion card, back cover, optional turbo cache memory module, keyboard unit, optional memory card(s), and optional PCMCIA card as described in Sections 4.9 through 4.7, and 4.5 through 4.2.

4.11 5.25-inch Bay (T6600C)

Removing the 5.25-inch Bay

To remove the T6600C's 5.25-inch bay, follow the steps below and refer to Figure 4-21.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card, optional memory card(s), keyboard unit, optional turbo cache memory module, back cover, optional expansion card, and bottom cover as described in Sections 4.2 through 4.5, and 4.7 through 4.9.

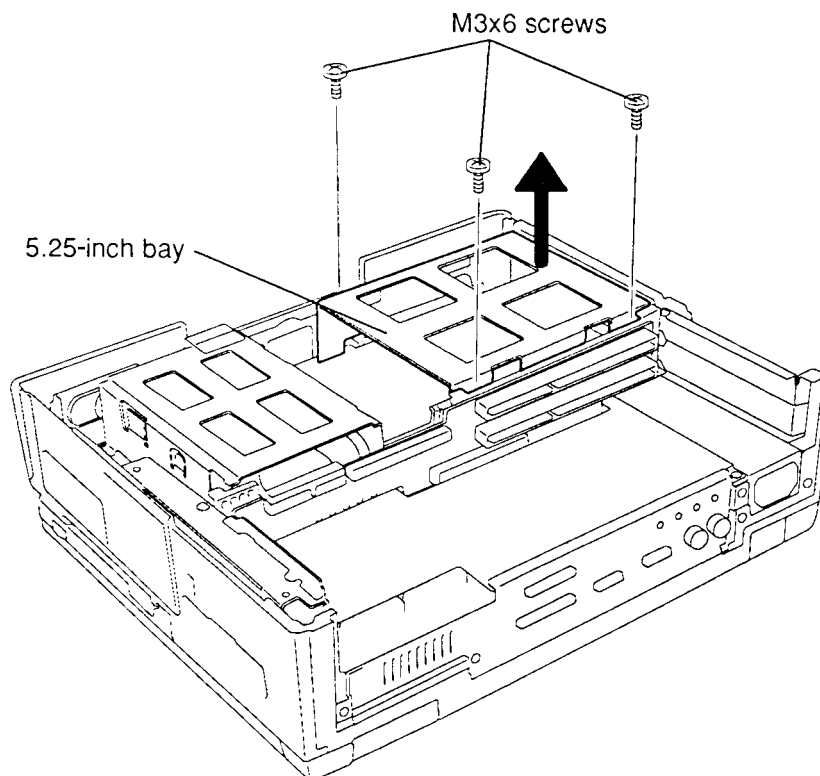3. Remove the **three M3x6 screws** securing the **5.25-inch bay** and lift it out.

Figure 4-21 Removing the 5.25-inch Bay

Installing the 5.25-inch Bay

To install the T6600C's 5.25-inch bay, follow the steps below and refer to Figure 4-21.

1. Set the **5.25-inch bay** in place and secure it with **three M3x6 screws**.

2. Install the bottom cover, optional expansion card, back cover, optional turbo cache memory module, keyboard unit, optional memory card(s), and optional PCMCIA card as described in Sections 4.9 through 4.7, and 4.5 through 4.2.

4.12 CD-ROM Drive (T6600C/CD and T6600C/CDV)

Removing the CD-ROM Drive

To remove the T6600C/CD or T6600C/CDV's CD-ROM drive, follow the steps below and refer to Figures 4-22 and 4-23.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card, optional memory card(s), keyboard unit, optional turbo cache memory module, back cover, optional expansion card, bottom cover, and HDD as described in Sections 4.2 through 4.5 and 4.7 through 4.10.

3. Remove the **three M3x6 screws** securing the **CD-ROM drive** (Figure 4-22).
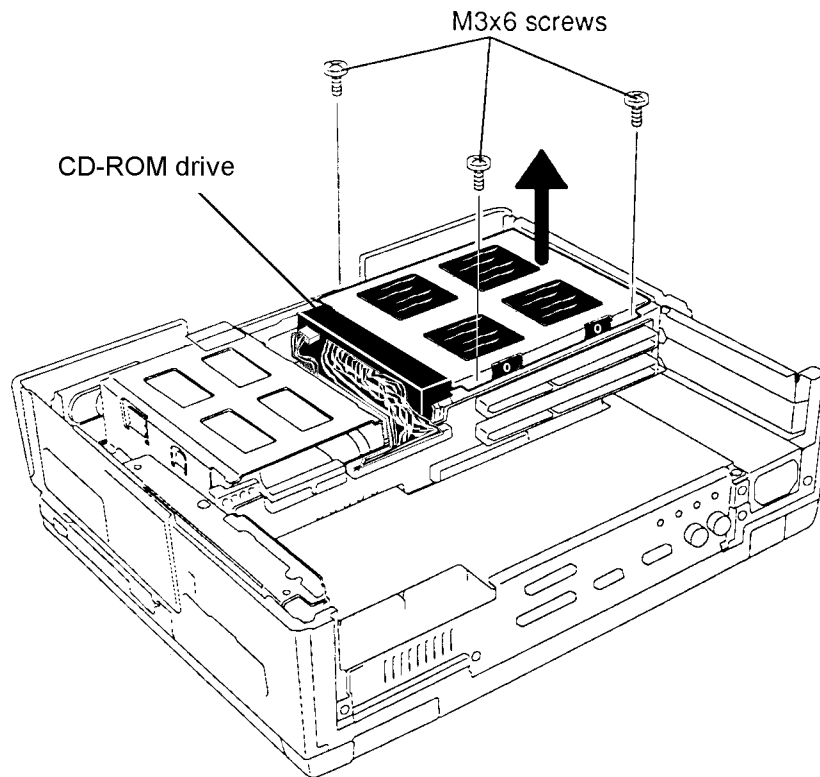
Figure 4-22 Removing the Screws on the CD-ROM Assembly

4. Disconnect the **audio**, **SCSI**, and **power cables** from the drive, then lift the drive out of the bay (Figure 4-23).
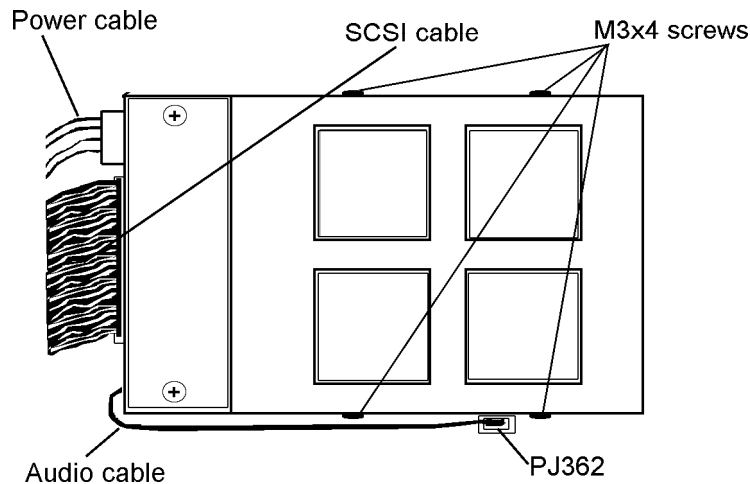

Figure 4-23 Disconnecting Cables from the CD-ROM Drive

5. Disconnect the **audio cable** from **PJ362** on the system board, the **SCSI cable** from PJ9 on the back panel board, and the **power cable** from PJ7 on the back panel board.

6. Remove the **four M3x4 screws** securing the bracket to the CD-ROM drive, then lift off the bracket.

Installing the CD-ROM Drive

To install the T6600C/CD or T6600C/CDV's CD-ROM drive, follow the steps below and refer to Figures 4-22 and 4-23.

1. Secure the CD-ROM bracket to the drive with four M3x4 screws.

2. Connect the audio cable to PJ362 on the system board.

3. Connect the power cable to PJ7 on the back panel board.

4. Connect the SCSI cable to PJ9 on the back panel board.

5. Place the drive in the computer, then connect the **audio**, **SCSI**, and **power cables** to the **CD-ROM drive** (Figure 4-23).

6. Secure the drive with **three M3x6 screws** (Figure 4-22.)

7. Install the HDD, bottom cover, optional expansion card, back cover, optional turbo cache memory module, keyboard unit, optional memory card(s), and optional PCMCIA card as described in Sections 4.10 through 4.7 and 4.5 through 4.2.

4.13 Back Panel Board

Removing the Back Panel Board

To remove the back panel board, follow the steps below and refer to Figures 4-24 and 4-25.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card, optional memory card(s), keyboard unit, optional turbo cache memory module, back cover, optional expansion card, bottom cover, HDD, and 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV) as described in Sections 4.2 through 4.5 and 4.7 through 4.12.

3. Disconnect the **DC fan cable** from **PJ8** on the **back panel board** and remove the **two M3x6 screws** securing the back panel frame (Figure 4-24).

4. Carefully lift out the **back panel board**, disconnecting it from the system board (Figure 4-24).
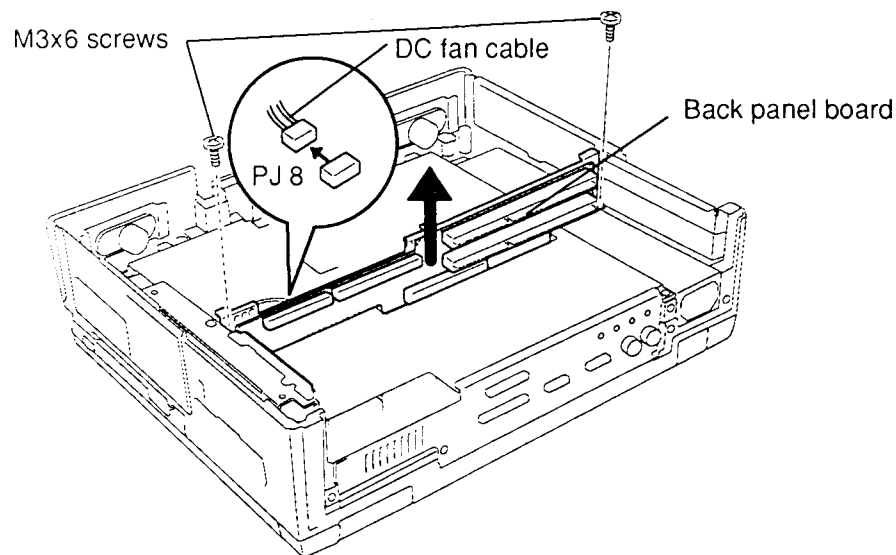
Figure 4-24 Removing the Back Panel Board

5. To separate the **back panel board** from its **frame**, remove the **six M3x6 screws** (Figure 4-25).
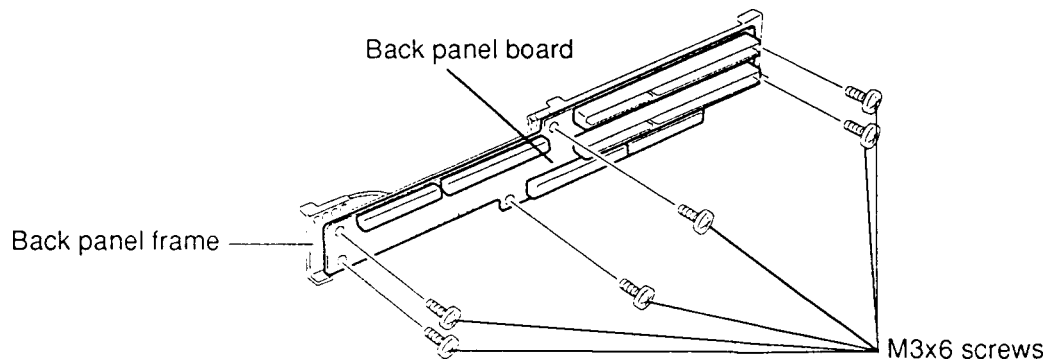
Figure 4-25 Separating the Back Panel Board from its Frame

Installing the Back Panel Board

To install the back panel board, follow the steps below and refer to Figures 4-24 and 4-25.

1. Set the **back panel board** on the **back panel frame** and secure it with **six M3x6 screws** (Figure 4-25).

2. Connect the **back panel board** to the system board at PJ490 and PJ491, then secure the board with **two M3x6 screws** (Figure 4-24).

3. Connect the **DC fan cable** to **PJ8** on the **back panel board** (Figure 4-24).

4. Install the 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV), HDD, bottom cover, optional expansion card, back cover, optional turbo cache memory module, keyboard unit, optional memory card(s), and optional PCMCIA card as described in Sections 4.12 through 4.7 and 4.5 through 4.2.

4.14 DC Fan Unit

Removing the DC Fan Unit

To remove the computer's DC fan unit, follow the steps below and refer to Figure 4-26.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card, optional memory card(s), keyboard unit, optional turbo cache memory module, back cover, optional expansion card, bottom cover, HDD, 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV), and back panel board as described in Sections 4.2 through 4.5 and 4.7 through 4.13.

3. Remove the **two M3x6 screws** securing the **DC fan unit** and lift it out.
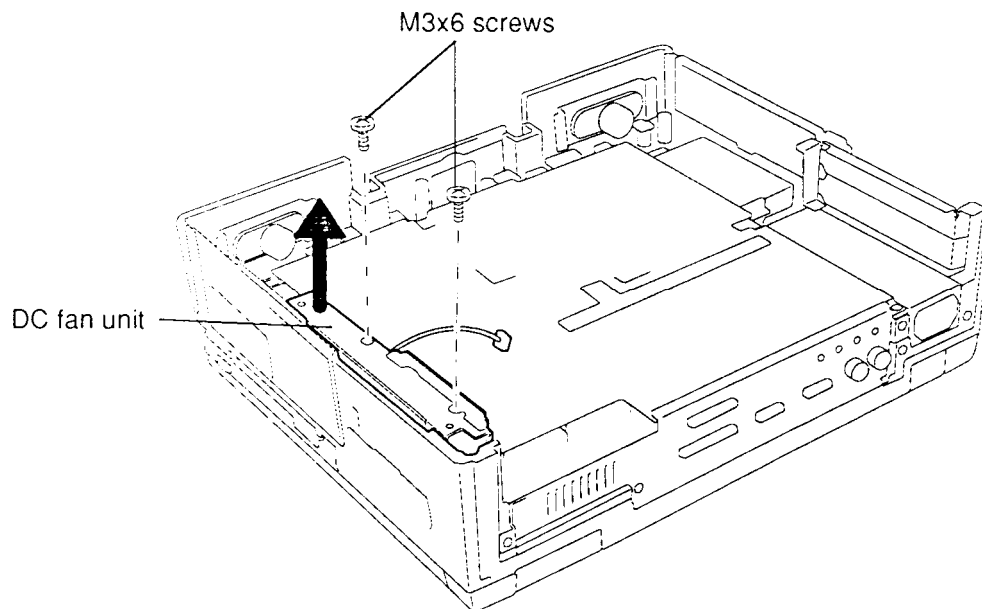
Figure 4-26 Removing the DC Fan Unit

Installing the DC Fan Unit

To install the computer's DC fan unit, follow the steps below and refer to Figure 4-26.

1. Place the **DC fan unit** in the computer, and secure the unit with **two M3x6 screws**.

2. Install the back panel board, 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/ CD and T6600C/CDV), HDD, bottom cover, optional expansion card, back cover, optional turbo cache memory module, keyboard unit, optional memory card(s), and optional PCMCIA card as described in Sections 4.13 through 4.7 and 4.5 through 4.2.

4.15 System Board

Removing the System Board

To remove the computer's system board, follow the steps below and refer to Figures 4-27 through 4-29.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card, optional memory card(s), keyboard unit, optional turbo cache memory module, back cover, optional expansion card, bottom cover, HDD, 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV), back panel board, and DC fan unit as described in Sections 4.2 through 4.5 and 4.7 through 4.14.

3. Remove the **two M3x6 screws** and **two M2.5x6 screws** from the **connector panel board** and take off the board (Figure 4-27).
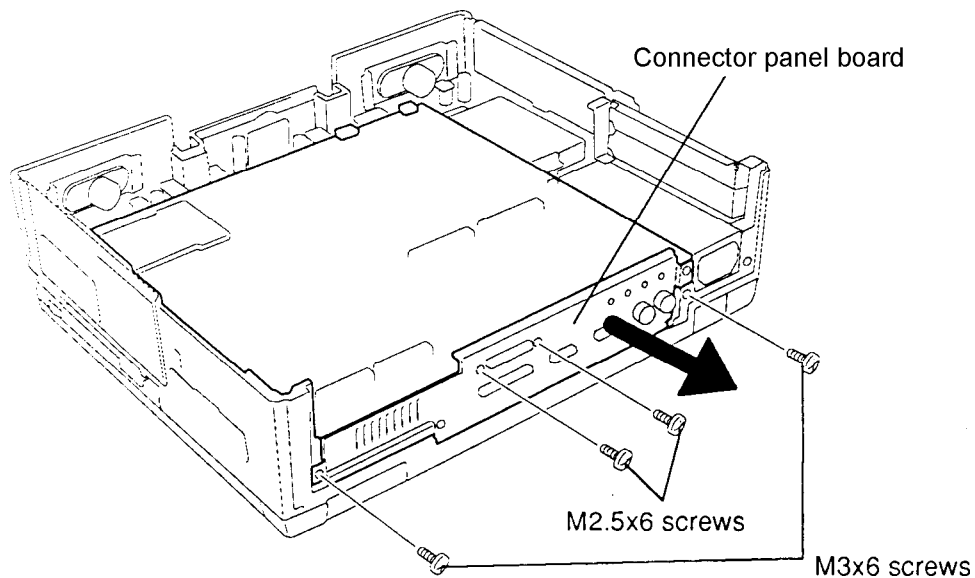
Figure 4-27 Removing the Connector Panel Board

4. Remove the **four M3x6 screws** securing the **system board shield plate** and lift it out (Figure 4-28).
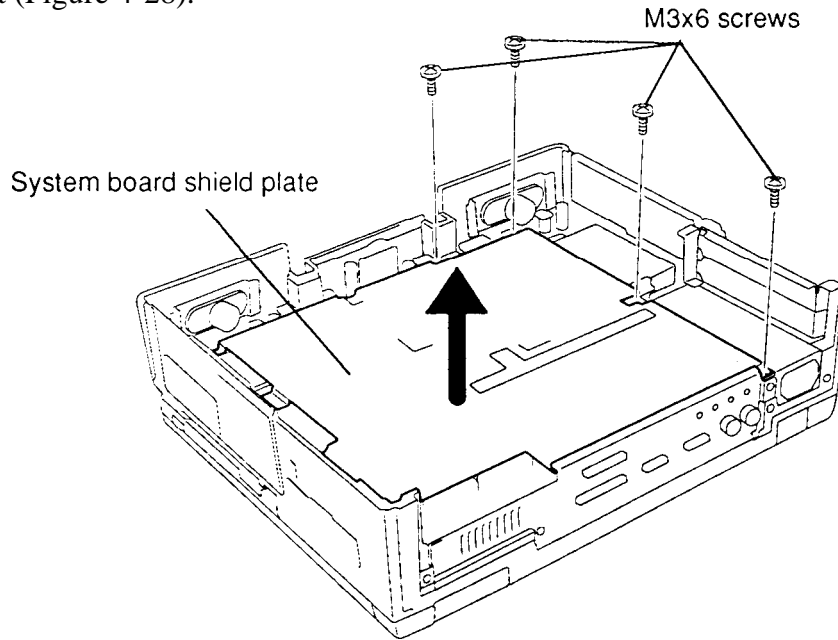
Figure 4-28 Removing the System Board Shield Plate

5. Disconnect the **speaker cable** from **PJ390** and the **volume cable** from **PJ380** (located under the **system board**) (Figure 4-29).

6. Disconnect the **display cable** by releasing the stopper from **PJ630**, then disconnect the pressure plate **LED cabl**e from **PJ430** under the system board.

7. Carefully lift out the system board.
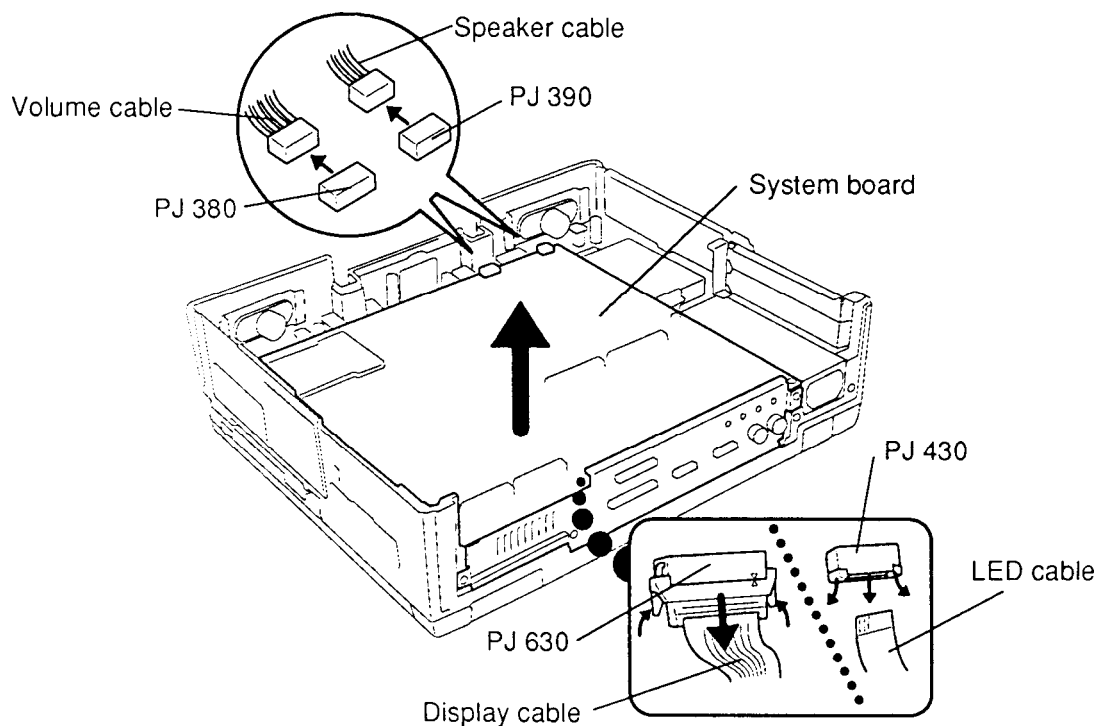
Figure 4-29 Removing the System Board

Installing the System Board

To install the computer's system board, follow the steps below and refer to Figures 4-27 through 4-29.

1. Set the **system board** in place and connect the **display cable** to **PJ630** (located under the system board), then set the stopper on the connector (Figure 4-29).

2. Connect the **LED cable** to **PJ430** (located under the system board) (Figure 4-29).

3. Connect the **speaker cable** to **PJ390** and **volume cable** to **PJ380** (Figure 4-29).

4. Set the **system board shield plate** in place and secure it with **four M3x6 screws** (Figure 4-28).

5. Set the **connector panel board** in place and secure it with **two M3x6 screws** and **two M2.5x6 screws** (Figure 4-27).

6. Install the DC fan unit, back panel board, 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV), HDD, bottom cover, optional expansion card, back cover, optional turbo cache memory module, keyboard unit, optional memory card(s), and optional PCMCIA card as described in Sections 4.14 through 4.7 and 4.5 through 4.2.

4.16 RTC Battery

Removing the RTC Battery

To remove the computer's RTC battery, follow the steps below and refer to Figure 4-30.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card, optional memory card(s), keyboard unit, optional turbo cache memory module, back cover, optional expansion card, bottom cover, HDD, 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV), back panel board, DC fan unit, and system board as described in Sections 4.2 through 4.5 and 4.7 through 4.15.

3. Turn the system board over with the component side up and disconnect the **RTC battery cable** from **PJ210**.

4. The **RTC battery** is held in place with double-sided tape. Pull off the battery to remove it.
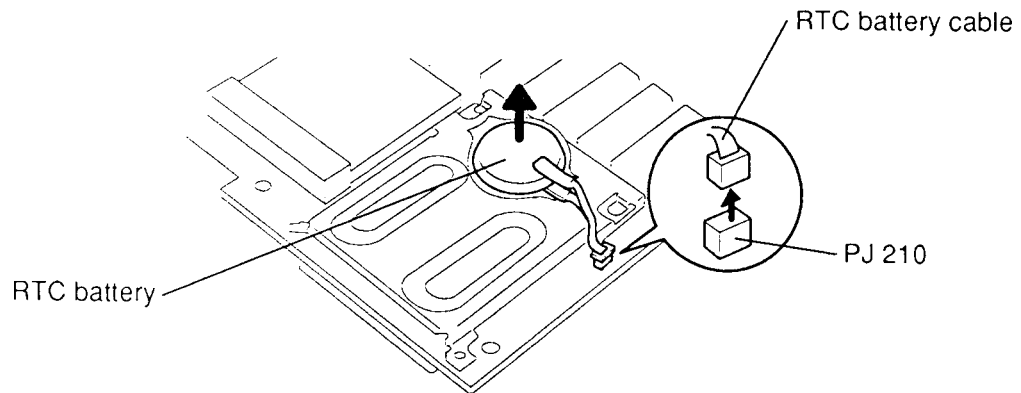
Figure 4-30 Removing the RTC Battery

Installing the RTC Battery

CAUTION: If you replace the RTC battery, be sure to use the same model or an equivalent one recommended by Toshiba. Installation of the wrong battery can cause the battery to explode.

To install the computer's RTC battery, follow the steps below and refer to Figure 4-30.

1.   Apply the double-sided tape to the **RTC battery**, then place the battery on the memory card slot of the system board.

2.   Connect the **RTC battery cable** to **PJ210**.

3.   Install the system board, DC fan unit, back panel board, 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV), HDD, bottom cover, optional expansion card, back cover, optional turbo cache memory module, keyboard unit, optional memory card(s), and optional PCMCIA card as described in Sections 4.15 through 4.7 and 4.5 through 4.2.

4.17 FDD

Removing the FDD

To remove the computer's FDD, follow the steps below and refer to Figures 4-31 and 4-32.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card, optional memory card(s), keyboard unit, optional turbo cache memory module, back cover, optional expansion card, bottom cover, HDD, 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV), back panel board, DC fan unit, and system board as described in Sections 4.2 through 4.5 and 4.7 through 4.15.

3. Remove the **four M3x6 screws** securing the **FDD casing**, then lift out the **FDD** with its **casing** (Figure 4-31).
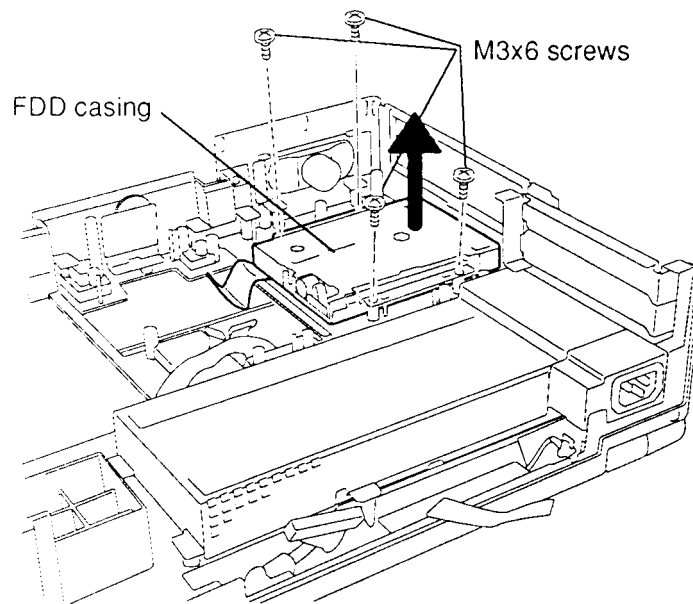
Figure 4-31 Removing the FDD Unit

4. To separate the **FDD** from its **casing**, remove the **four M3x4 screws** (Figure 4-32).
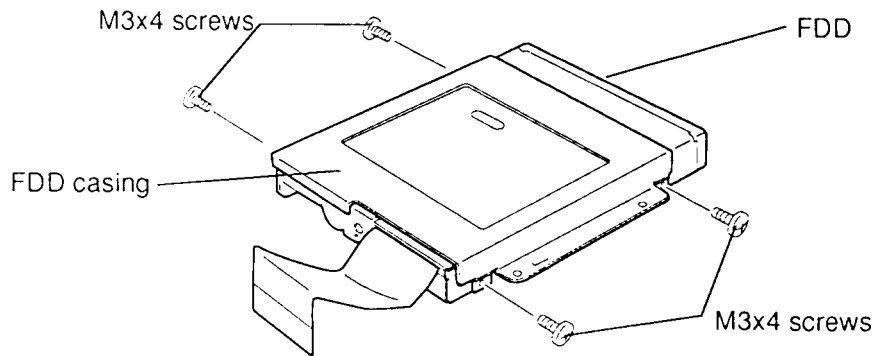
Figure 4-32 Removing the FDD from its Casing

Installing the FDD

To install the computer's FDD, follow the steps below and refer to Figures 4-31 and 4-32.

1. Fit the **FDD** into the **FDD casing** and secure it with **four M3x4 screws**. (Figure 4-32).

2. Place the FDD unit into the system unit and secure it with **four M3x6 screws**. (Figure 4-31)

3. Install the system board, DC fan unit, back panel board, 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV), HDD, bottom cover, optional expansion card, back cover, optional turbo cache memory module, keyboard unit, optional memory card(s), and optional PCMCIA card as described in Sections 4.15 through 4.7 and 4.5 through 4.2.

4.18 Speakers and Volume Board

Removing the Speakers and Volume Board

To remove the speakers and the volume board, follow the steps below and refer to Figure 4-33.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card, optional memory card(s), keyboard unit, optional turbo cache memory module, back cover, optional expansion card, bottom cover, HDD, 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV), back panel board, DC fan unit, and system board as described in Sections 4.2 through 4.5 and 4.7 through 4.15.

3. Remove the **two M3x6 screws** securing **each speaker** and lift out the speakers.

4. Remove the **M3x6 screw** securing the **volume board** and lift out the board.
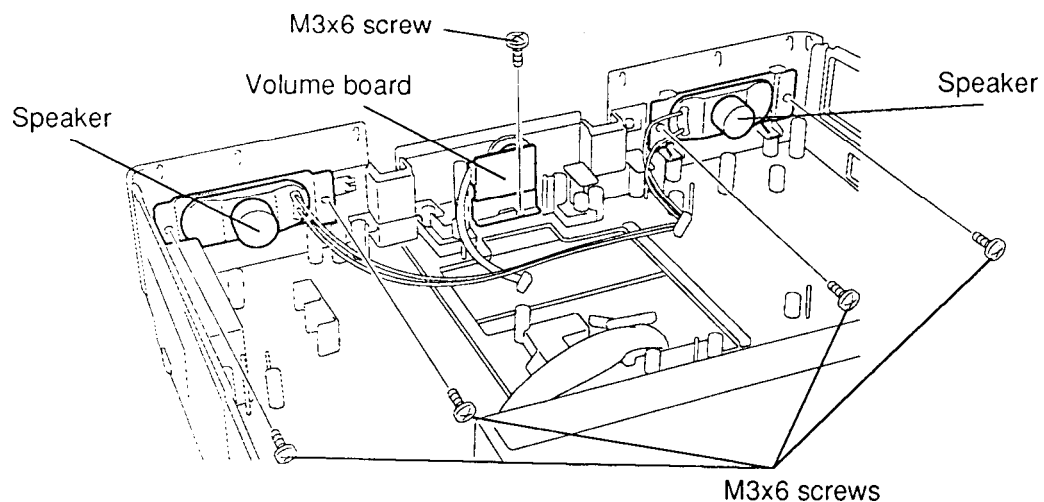
Figure 4-33 Removing the Speakers and the Volume Board

Installing the Speakers and Volume Board

To install the speakers and the volume board, follow the steps below and refer to Figure 4-33.

1. Set the **speakers** into place and secure them with **four M3x6 screws**.

2. Set the **volume board** into place and secure it with **one M3x6 screw**.

3. Install the system board, DC fan unit, back panel board, 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV), HDD, bottom cover, optional expansion card, back cover, optional turbo cache memory module, keyboard unit, optional memory card(s), and optional PCMCIA card as described in Sections 4.15 through 4.7 and 4.5 through 4.2.

4.19 Power Supply Unit

Removing the Power Supply Unit

To remove the power supply unit, follow the steps below and refer to Figure 4-34.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card, optional memory card(s), keyboard unit, optional turbo cache memory module, back cover, optional expansion card, bottom cover, HDD, 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV), back panel board, DC fan unit, and system board as described in Sections 4.2 through 4.5 and 4.7 through 4.15.

3. Remove the **two M3x6 screws** securing the **expansion card support** and lift it out.

4. Remove the **four M3x6 screws** securing the **power supply unit** and lift it out.
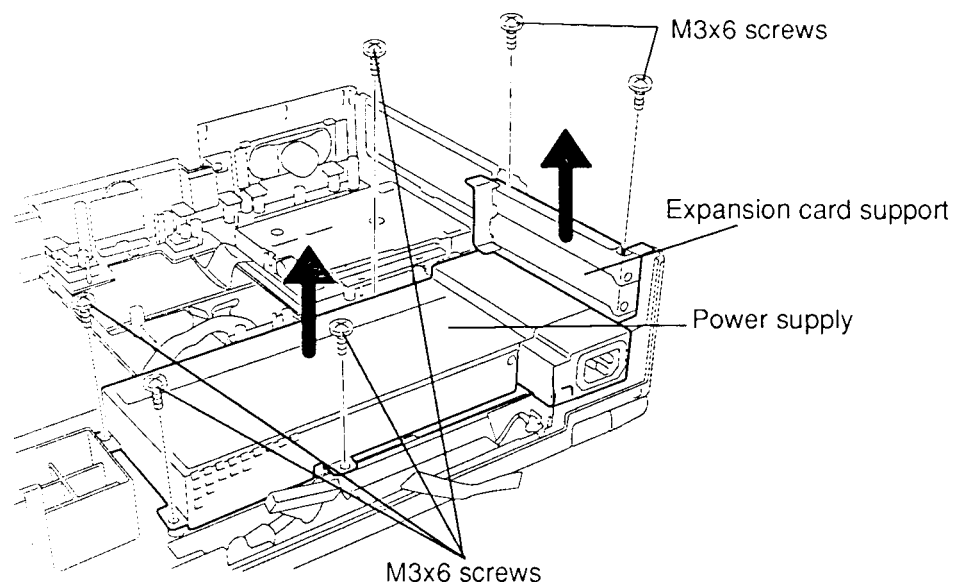
Figure 4-34 Removing the Power Supply Unit

Installing the Power Supply Unit

To install the computer's power supply unit, follow the steps below and refer to Figure 4-34.

1. Set the **power supply unit** in place and secure it with **four M3x6 screws**.

2. Set the **expansion card support** in place and secure it with **two M3x6 screws**.

3. Install the system board, DC fan unit, back panel board, 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV), HDD, bottom cover, optional expansion card, back cover, optional turbo cache memory module, keyboard unit, optional memory card(s), and optional PCMCIA card as described in Sections 4.15 through 4.7 and 4.5 through 4.2.

4.20 LED Board

Removing the LED Board

To remove the computer's LED board, follow the steps below and refer to Figure 4-35.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the optional PCMCIA card, optional memory card(s), keyboard unit, optional turbo cache memory module, back cover, optional expansion card, bottom cover, HDD, 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV), back panel board, DC fan unit, and system board as described in Sections 4.2 through 4.5 and 4.7 through 4.15.

3. Disconnect the **LED cable** from **PJ1** and the **display switch cable** from **PJ2** on the **LED board**.

4. Remove the **two M3x6 screws** securing the **LED board** and lift it out.
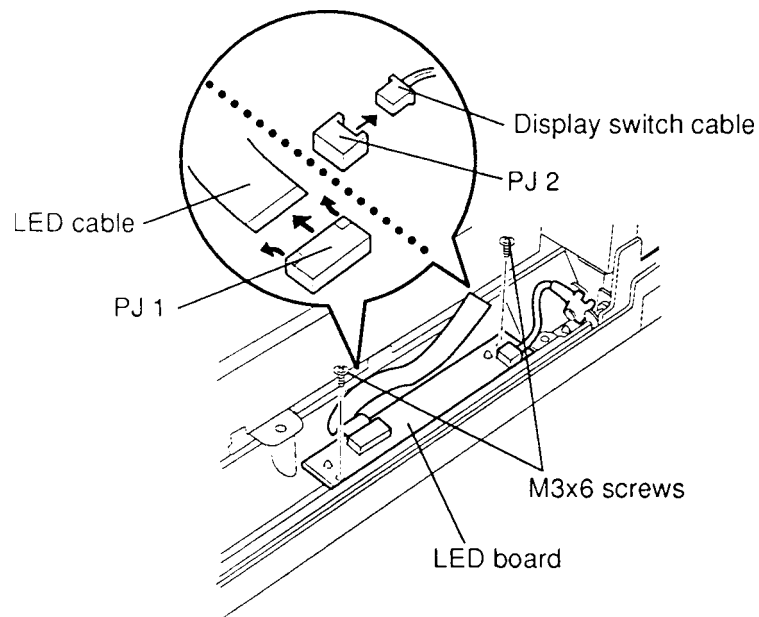
Figure 4-35 Removing the LED Board

Installing the LED Board

To install the computer's LED board, follow the steps below and refer to Figure 4-35.

1. Set the **LED board** in place and secure it with **two M3x6 screws**.

2. Connect the **LED cable** to **PJ1** and the **display switch cable** to **PJ2** on the **LED board**.

3. Install the system board, DC fan unit, back panel board, 5.25-inch bay (T6600C) or CD-ROM drive (T6600C/CD and T6600C/CDV), HDD, bottom cover, optional expansion card, back cover, optional turbo cache memory module, keyboard unit, optional memory card(s), and optional PCMCIA card as described in Sections 4.15 through 4.7 and 4.5 through 4.2.

4.21 Display Mask

Removing the Display Mask

To remove the computer's display mask, follow the steps below and refer to Figure 4-36.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the **four screw covers** from the display hinges and the top corners of the display.

3. Remove the **four M3x6 silver screws** from the display mask.

4. Carefully insert your fingers between the mask and the LCD panel and pry open the latches. Start with the **four latches** across the top of the display mask.

5. Continue unlatching the mask along the **sides** (**four latches** on each side), and at the bottom (**two latches**). There is also a latch at the small support and three latches at the larger support.
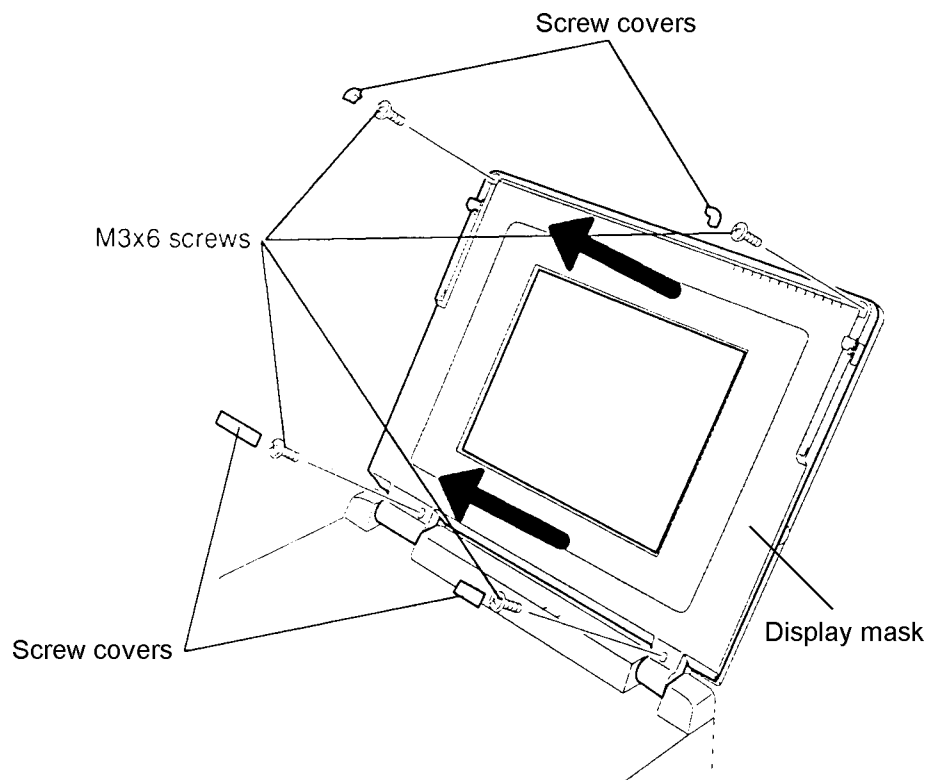
Figure 4-36 Removing the Display Mask

Installing the Display Mask

To install the display mask, follow the steps below and refer to Figure 4-36.

1. Set the **display mask** in place and secure the latches beginning with the four latches in the display supports (three in the larger support, and one in the small support).

2. Continue securing the latches along the bottom of the display (two), the sides (four on each side), and across the top (four).

3. Secure the display mask with **four M3x6 silver screws** at the display hinges and the top corners.

4. Attach the **screw covers** at each display hinge and at the top corners of the display.

4.22 FL Inverter Board

Removing the FL Inverter Board

To remove the computer's FL inverter board, follow the steps below and refer to Figure 4-37.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the display mask as described in Section 4.21.

3. Disconnect the **two FL cable**s from **CN 2** and **CN 3**, and the **display cable** from **CN1** on the **FL inverter board**.

4. Remove the **three M3x6 screws** securing the **FL inverter board**.
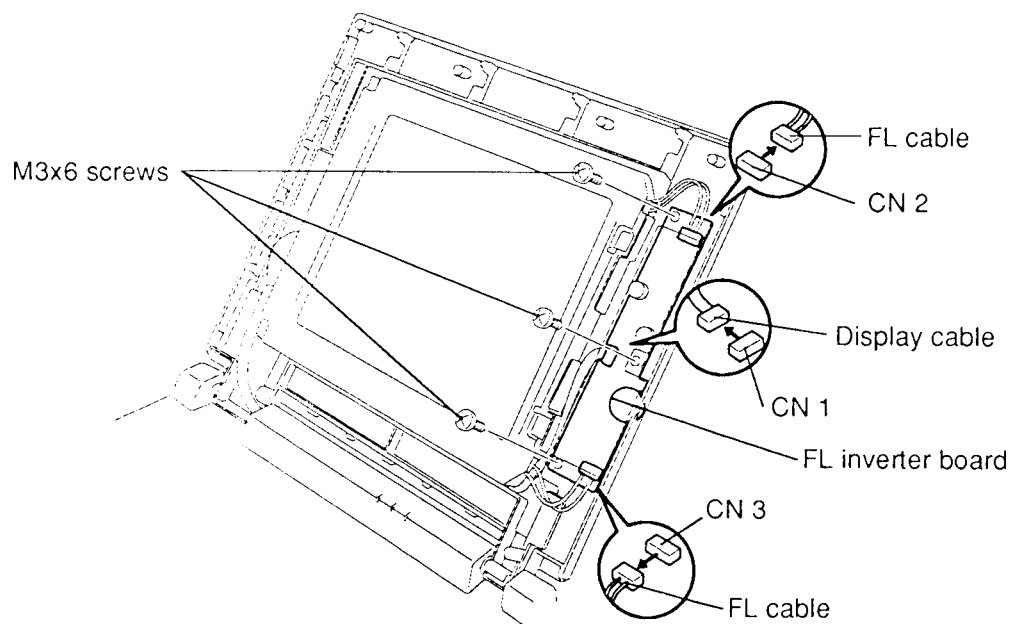
Figure 4-37 Removing the FL Inverter Board

Installing the FL Inverter Board

To install the FL inverter board, follow the steps below and refer to Figure 4-37.

1. Secure the **FL inverter board** with **three M3x6 screws**.

2. Connect the **two FL cables** to **CN 2** and **CN 3**, and the **display cable** to **CN1**.

3. Install the display mask as described in Section 4.21.

4.23 LCD Module

Removing the LCD Module

To remove the computer's LCD module, follow the steps below and refer to Figures 4-38 and 4-39.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the display mask as described in Section 4.21.

3. Disconnect the **two FL cables** from **CN2** and **CN3**, and the **display cable** from **CN1** on the **FL inverter board** (Figure 4-38).

4. Remove the **four M3x6 screws** securing the **LCD module** to the LCD cover (Figure 4-38). Note the **ground cable** secured by the bottom left screw.

5. Carefully rotate the **LCD module** forward (Figure 4-38).
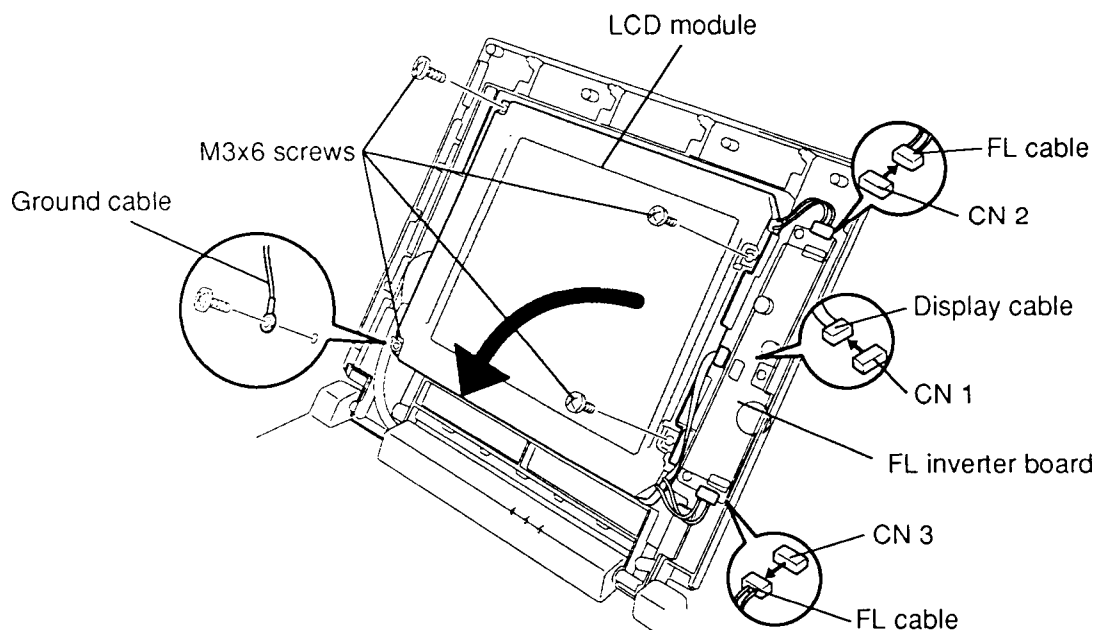
Figure 4-38 Removing the LCD Module

6. Disconnect the **three display cables** from **CN 1**, **CN 2**, and **CN 3** on the **LCD module** (Figure 4-39).
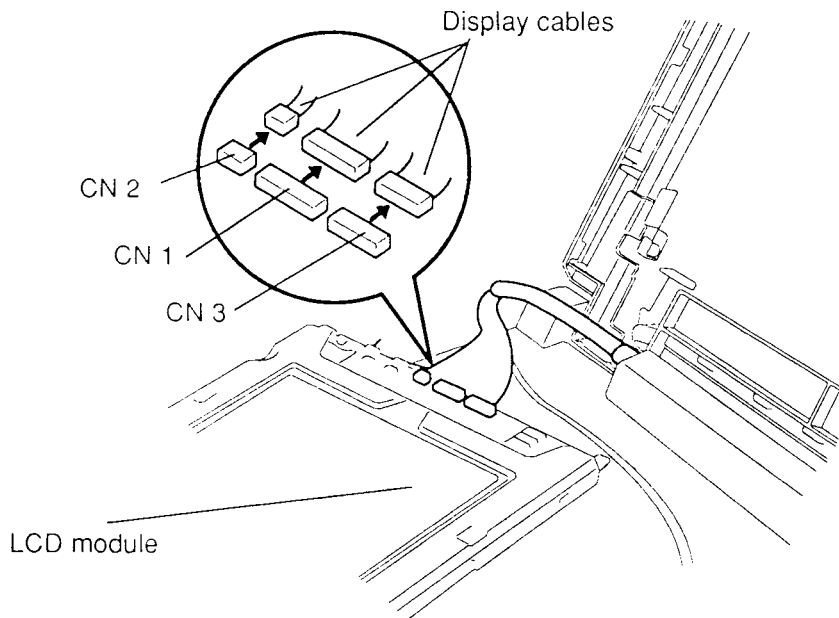
Figure 4-39 Disconnecting the Display Cables

Installing the LCD Module

To install the LCD module, follow the steps below and refer to Figures 4-38 and 4-39.

1. Place the **LCD module** face down on the front of the T6600C and connect the **three display cables** to **CN 1**, **CN 2**, and **CN 3** on the **LCD module** (Figure 4-39).

2. Set the **LCD module** in the LCD cover and secure it with **four M3x6 screws**, making sure to secure the **ground cable** with the bottom left screw (Figure 4-38).

3. Connect the **FL cables** to **CN 2** and **CN 3** and the display cable to **CN 1** on the **FL inverter board**. (Figure 4-38).

4. Install the display mask as described in Section 4.21.

4.24 Fluorescent Lamp Unit

> *CAUTION:* *When removing the FL unit, be careful not to let any dust or other foreign matter enter it.*

Removing the Fluorescent Lamp (FL) Unit

To remove the computer's FL unit, follow the steps below and refer to Figures 4-40 through 4-42.

1. Turn off the power to the computer, then disconnect the power cord and all external cables connected to the computer.

2. Remove the display mask and LCD module as described in Sections 4.21 and 4.23.

3. Lay the **LCD module** face down and use needle-nose pliers to unbend the **three latches** holding the front and back frames together, then lift the unit out of the front frame (Figure 4-40).

4. Remove the **M2x4 silver screw** from the cable side of the **LCD module** (Figure 4-40).
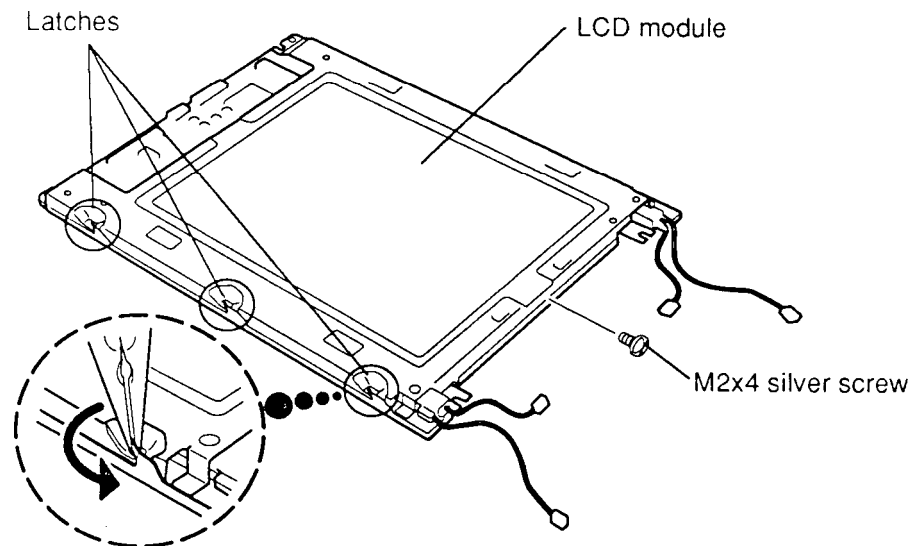
Figure 4-40 Unbending the LCD Module Latches

5.   Remove the **four M2x4 silver screws** securing the **LCD panel** to the FL unit (Figure 4-41).

M2x4 silver screws

LCD module
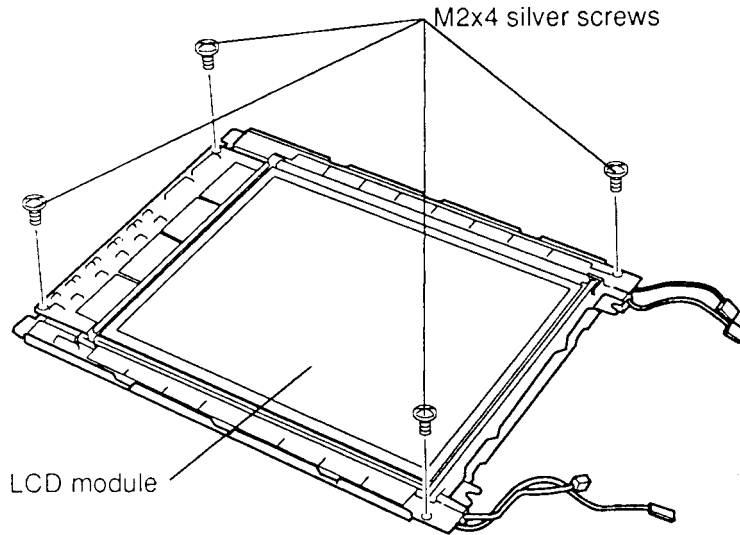
Figure 4-41 Removing the LCD Panel Screws

6.   Gently unsnap the **LCD panel** at the corners from the **FL unit** and lift it off the panel (Figure 4-42).

*CAUTION: Be very careful when you unsnap the display panel. If you use too much force, you might break the panel's **tabs**.*

7.   To separate the **FL unit** from the back frame, remove the **four M2x4 flat silver screws**. (Figure 4-42).

Tabs

LCD panel

M2x4 flat silver screws

M2x4 flat silver screws
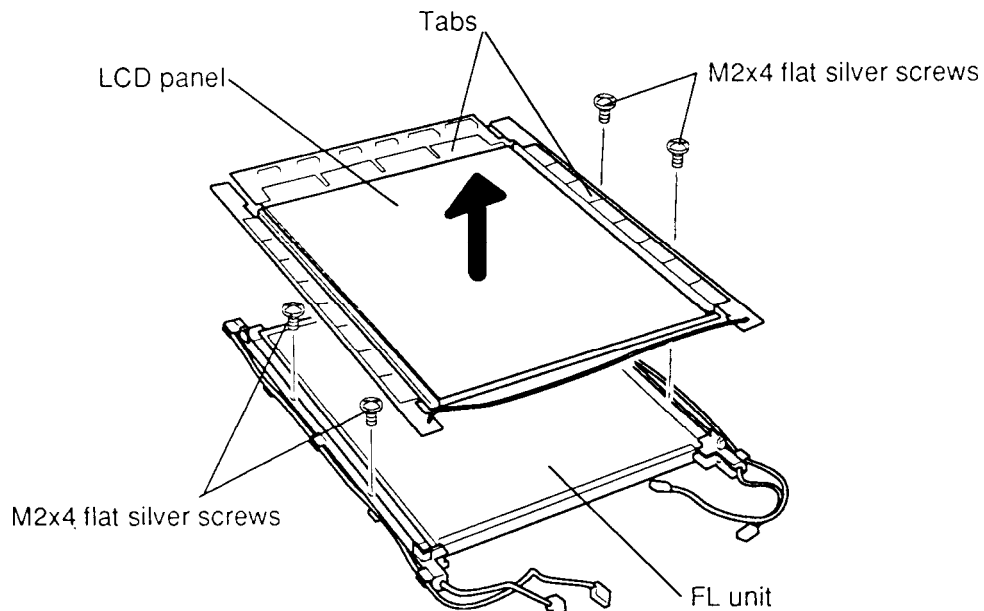
FL unit

Figure 4-42 Removing the FL Unit from the Display Panel

Installing the FL Unit

To install the FL unit, follow the steps below and refer to Figures 4-40 through 4-42.

1. Place the **FL unit** on the back frame and secure them with **four M2x4 flat silver screws** (Figure 4-42).

2. Place the **LCD panel** on the **FL unit** and press on the sides to secure the snaps (Figure 4-42).

> *CAUTION: Be very careful when you snap the display panel together. If you use too much force, you might break the panel's **tabs**.*

3. Secure the **LCD panel** to the **FL unit** with **four silver M2x4 screws** (Figure 4-41).

4. Place the assembly in the front frame and carefully bend the **three latches** back into place (Figure 4-40).

5. Secure the **M2x4 silver screw** to the cable side of the **LCD module** (Figure 4-40).

6. Install the LCD module and display mask as described in Sections 4.23 and 4.21.

Appendix A   Handling the LCD Module

Precautions for Handling the LCD Module

The computer's LCD module can be easily damaged during assembly or disassembly.
Therefore, please observe the following precautions when handling the LCD module.

1. When installing the LCD module in the LCD cover, be sure to seat it so that it is
    properly aligned and maximum visibility of the display is maintained.
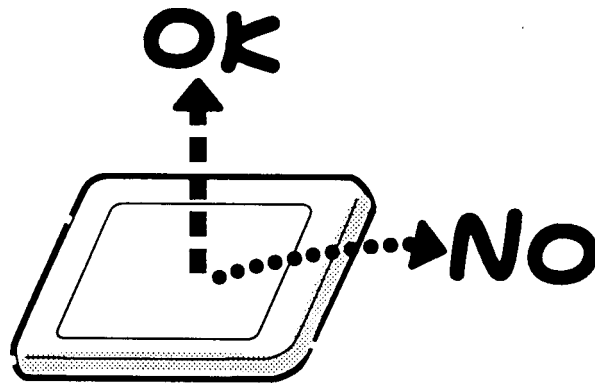
2. Be careful to align the holes at the four corners of the LCD module with the
    corresponding holes in the LCD cover before securing the module with screws. Do
    not force the module into place, because stress can affect its performance.

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

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

    If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.
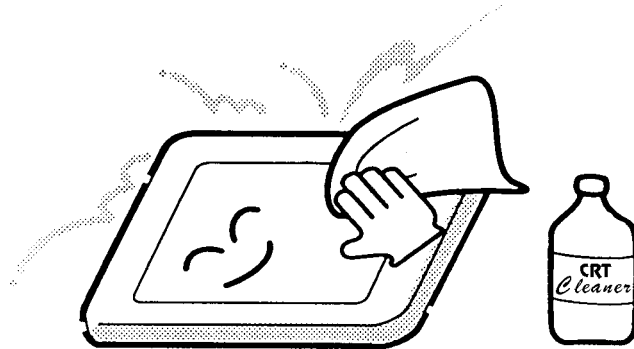
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.
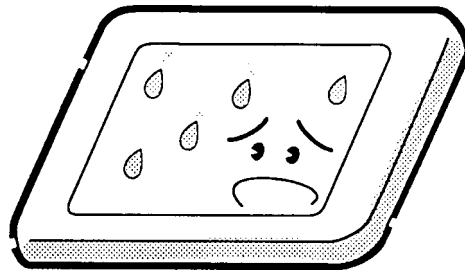
5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.
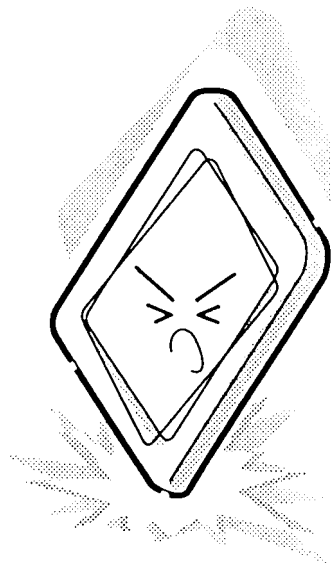
6. CMOS-LSI circuits are used in the module, so guard against damage from electro-static discharge. Be sure to wear a wrist or ankle ground when handling the module.
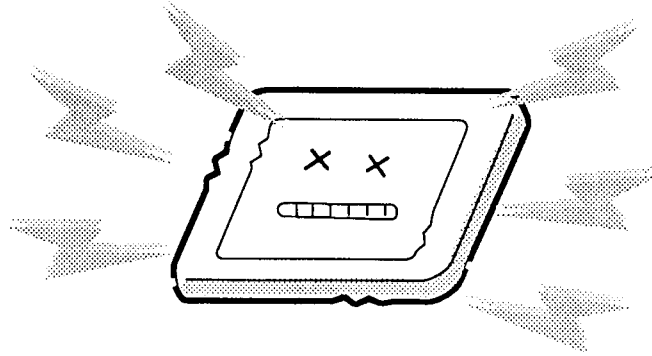
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.
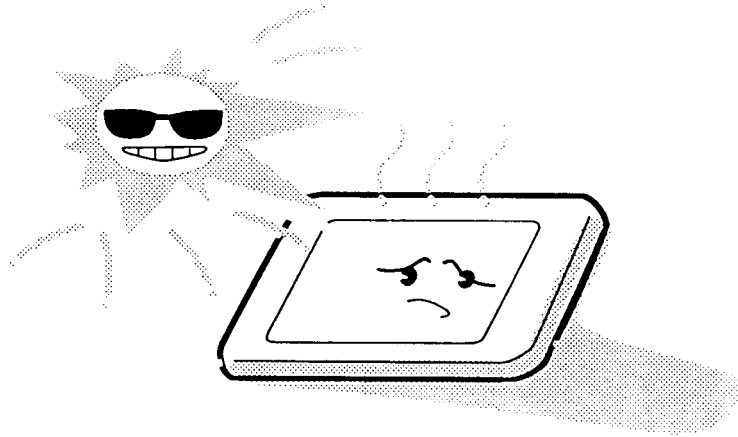
8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.
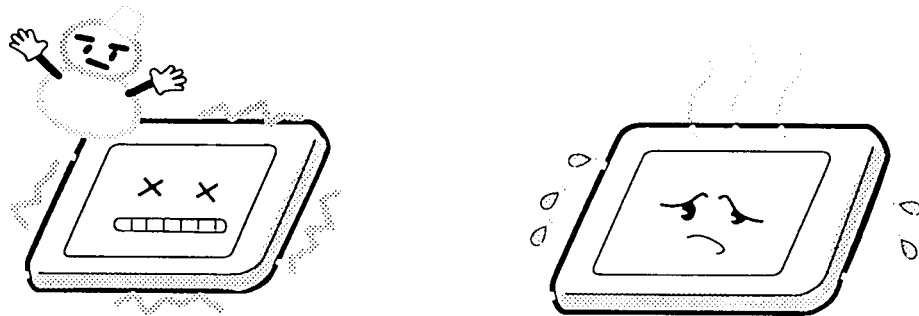
9. Do not disassemble the LCD module. Disassembly can cause malfunctions.
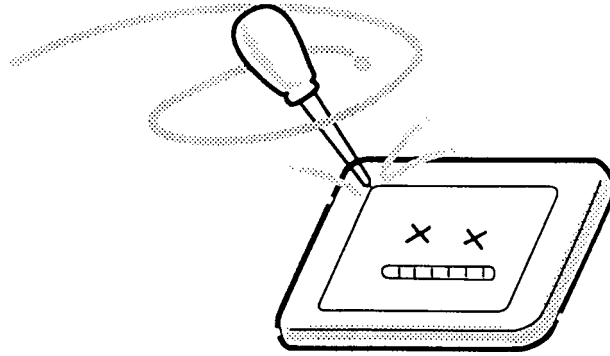
10. If you transport the module, do not use packing material that contains epoxy resin (amine) or silicon glue (alcohol or oxime). These materials can release gas that can damage the panels' polarization.
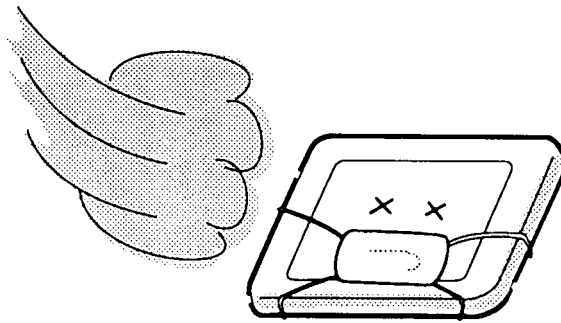
Appendix B   Board Layout

B.1   T6600C System Board (Front)
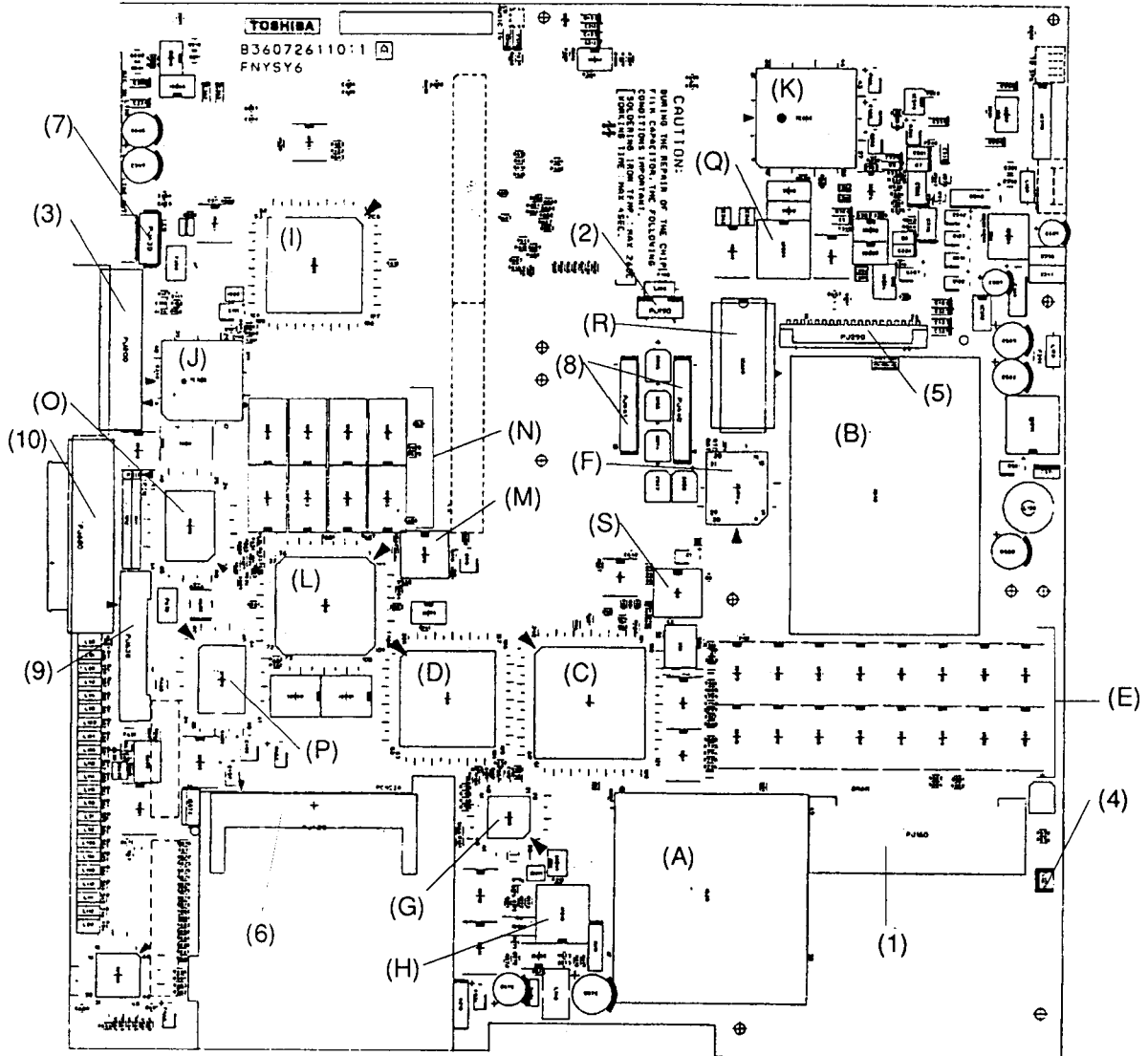
Figure B-1 T6600C System Board (front)
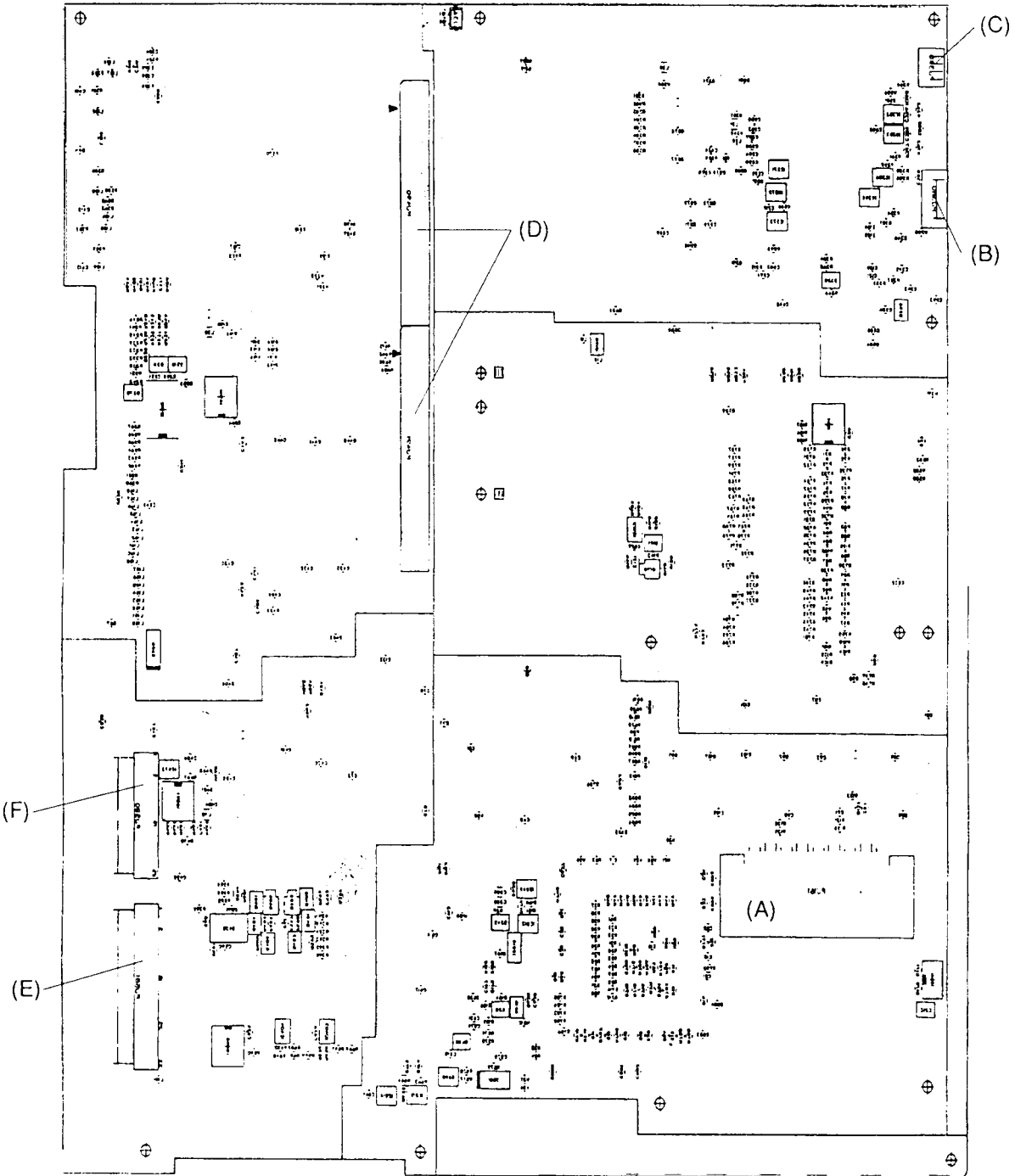
Figure B-2 T6600C System Board (back)

Table B-1 T6600C ICs and Connectors on the System Board (front)

Mark	Number	Name
(A)	IC 20	Central Processing Unit (CPU), 80486DX2
(B)	IC 40	Turbo Cache Memory Socket
(C)	IC 50	System Controller Gate Array
(D)	IC 80	PCMCIA Gate Array
(E)	IC 120 to IC 123	System Memory
	IC 130 to IC 133	System Memory
	IC 140 to IC 143	System Memory
	IC 150 to IC 153	System Memory
(F)	IC 170	System BIOS
(G)	IC 180	Keyboard Controller (KBC)
(H)	IC 210	Real Time Clock (RTC)
(I)	IC 220	Super Integration (SI) T9901
(J)	IC 300	Serial Input Output (SIO)
(K)	IC 340	Sound Controller
(L)	IC 510	Video Controller WD90C31
(M)	IC 520	Clock Generator
(N)	IC 540 to IC 543	Video Memory
	IC 550 to IC 553	Video Memory
(O)	IC 560	Display Timing Controller Gata Array
(P)	IC 570	Digital Analog Converter (DAC)
(Q)	IC 650	SCSI Controller
(R)	IC 660	SCSI BIOS
(S)	IC 10	Clock Generator
(1)	PJ 160	Memory Card Connector
(2)	PJ 190	Internal Keyboard Connector
(3)	PJ 200	Connector Board Interface Connector
(4)	PJ 210	RTC Battery Connector
(5)	PJ 290	Internal FDD Connector
(6)	PJ 420	PCMCIA Connector
(7)	PJ 430	LED Connector
(8)	PJ 440, PJ 441	Power Supply Connector
(9)	PJ 630	Internal LCD Connector
(10)	PJ 680	Internal SCSI Connector

Table B-2 T6600C Connectors on the System Board (back)

Mark	Number	Name
(A)	PJ 161	Memory Card Connector
(B)	PJ 380	Volume Connector
(C)	PJ 390	Speaker Connector
(D)	PJ 490, PJ 491	Back Panel Connector
(E)	PJ 581	Z Connector
(F)	PJ 580	Feature Connector

Appendix C   Pin Assignments

C.1   PJ160, PJ161 Memory Slot A and B Connectors (88-pin)

Table C-1 Memory Slot Connector A Pin Assignments (88-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	—	45	GND	—
02	D00;100	I/O	46	D16;100	I/O
03	D01;100	I/O	47	D17;100	I/O
04	D02;100	I/O	48	D18;100	I/O
05	D03;100	I/O	49	D19;100	I/O
06	D04;100	I/O	50	D20;100	I/O
07	D05;100	I/O	51	D21;100	I/O
08	D06;100	I/O	52	D22;100	I/O
09	VCC	—	53	D23;100	I/O
10	D07;100	I/O	54	(Pulled down)	—
11	VCC	—	55	GND	—
12	GND	—	56	GND	—
13	MA00;111	O	57	MA01;111	O
14	MA02;111	O	58	MA03;111	O
15	VCC	—	59	MA05;111	O
16	MA04;111	O	60	MA07;111	O
17	VCC	—	61	MA09;111	O
18	MA06;111	O	62	GND	—
19	MA08;111	O	63	GND	—
20	MA10;111	O	64	GND	—
21	GND	—	65	RAS1;000	O
22	RAS0;000	O	66	CAS2;011	O
23	CAS0;011	O	67	GND	—
24	CAS1;011	O	68	CAS3;011	O
25	VCC	—	69	RAS3;000	O
26	RAS2;000	O	70	MWE;011	O
27	VCC	—	71	(Pulled up)	—
28	(Pulled up)	—	72	(Not connected)	—
29	(Not connected)	—	73	GND	—
30	(Not connected)	—	74	(Not connected)	—
31	(Not connected)	—	75	(Not connected)	—
32	(Not connected)	—	76	(Not connected)	—
33	(Pulled down)	—	77	(Not connected)	—
34	D08;100	I/O	78	(Not connected)	—
35	VCC	—	79	(Pulled down)	—
36	D09;100	I/O	80	D24;100	I/O
37	VCC	—	81	D25;100	I/O
38	D10;100	I/O	82	D26;100	I/O
39	D11;100	I/O	83	D27;100	I/O
40	D12;100	I/O	84	D28;100	I/O
41	D13;100	I/O	85	D29;100	I/O
42	D14;100	I/O	86	D30;100	I/O
43	D15;100	I/O	87	D31;100	I/O
44	GND	—	88	GND	—

Table C-2 Memory Slot Connector B Pin Assignments (88-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	—	45	GND	—
02	D00;100	I/O	46	D16;100	I/O
03	D01;100	I/O	47	D17;100	I/O
04	D02;100	I/O	48	D18;100	I/O
05	D03;100	I/O	49	D19;100	I/O
06	D04;100	I/O	50	D20;100	I/O
07	D05;100	I/O	51	D21;100	I/O
08	D06;100	I/O	52	D22;100	I/O
09	VCC	—	53	D23;100	I/O
10	D07;100	I/O	54	(Pulled down)	—
11	(Not connected)	—	55	GND	—
12	(Pulled down)	—	56	GND	—
13	MA00;111	O	57	MA01;111	O
14	MA02;111	O	58	MA03;111	O
15	VCC	—	59	MA05;111	O
16	MA04;111	O	60	MA07;111	O
17	(Not connected)	—	61	MA09;111	O
18	MA06;111	O	62	GND	—
19	MA08;111	O	63	GND	—
20	MA10;101	O	64	GND	—
21	GND	—	65	RAS5;000	O
22	RAS4;000	O	66	CAS2;011	O
23	CAS0;011	O	67	GND	—
24	CAS1;011	O	68	CAS3;011	O
25	(Not connected)	—	69	RAS7;000	O
26	RAS6;000	O	70	MWE;011	O
27	VCC	—	71	(Pulled up)	—
28	(Pulled up)	—	72	(Not connected)	—
29	(Not connected)	—	73	GND	—
30	(Not connected)	—	74	(Not connected)	—
31	(Not connected)	—	75	(Not connected)	—
32	(Not connected)	—	76	(Not connected)	—
33	(Pulled down)	—	77	(Not connected)	—
34	D08;100	I/O	78	(Not connected)	—
35	(Not connected)	—	79	(Pulled down)	—
36	D09;100	I/O	80	D24;100	I/O
37	VCC	—	81	D25;100	I/O
38	D10;100	I/O	82	D26;100	I/O
39	D11;100	I/O	83	D27;100	I/O
40	D12;100	I/O	84	D28;100	I/O
41	D13;100	I/O	85	D29;100	I/O
42	D14;100	I/O	86	D30;100	I/O
43	D15;100	I/O	87	D31;100	I/O
44	GND	—	88	GND	—

C.2   PJ190 Internal Keyboard Connectors (5-pin)

Table C-3 Internal Keyboard Connector Pin Assignments (5-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	—	04	GND	—
02	KBFVCC;100	—	05	KBCLK;130	I/O
03	KBDAT;130	I/O			

C.3   PJ200 Connector Board Interface (50-pin)

Table C-4 Connector Board Interface Pin Assignments (50-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	KBVCC	—	26	BUSY;110	I
02	LP;110	O	27	GND	—
03	GND	—	28	SLIN;000	I/O
04	FP;110	O	29	AUTFD;000	O
05	CGREEN;100	O	30	PINIT;000	O
06	CBLUE;100	O	31	GND	—
07	GND	—	32	STROB;000	O
08	CRED;100	O	33	PDB06;100	I/O
09	GND	—	34	PDB07;100	I/O
10	DCD1;111	I	35	GND	—
11	KBVCC	—	36	PDB05;100	O
12	SD1;011	O	37	PDB03;100	O
13	DSR1;111	I	38	PDB04;100	O
14	RD1;011	I	39	PCLR;100	O
15	GND	—	40	PDB02;100	O
16	DTR1;111	O	41	PDB00;100	O
17	RI1;111	I	42	PDB01;100	O
18	CTS1;111	I	43	GND	—
19	GND	—	44	EXKBDT;110	I/O
20	RTS1;111	O	45	KBVCC	—
21	SELCT;100	I	46	EXKBCK;110	I/O
22	ERROR;000	I	47	KBVCC	—
23	GND	—	48	MUSDAT;100	I
24	PE;100	I	49	VCC	—
25	ACK;000	I	50	MUSCLK;100	I

C.4 PJ210 RTC Battery Connector (3-pin)

Table C-5 RTC Connector Pin Assignments (3-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	3V	—	03	GND	—
02	N/C	—			

C.5 PJ4 FDD (Int) Connector (26-pin)

Table C-6 FDD (Int) Connector Pin Assignments (26-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	VCC	—	14	ISTEP;000	O
02	INDEX;000	I	15	GND	—
03	VCC	—	16	IWDAT;000	O
04	IDSL;000	O	17	GND	—
05	VCC	—	18	IWEN;000	O
06	DSKCHG;000	I	19	GND	—
07	VCC	—	20	ITRO;000	I
08	IRDY;000	I	21	GND	—
09	IHMED;000	I	22	IWPR;000	I
10	IMON;000	O	23	GND	—
11	ILOWD;000	O	24	IRDAT;000	I
12	IDIRC;000	O	25	GND	—
13	GND	—	26	ISSEL;000	O

C.6 PJ360, PJ361, PJ362 Audio Input Connectors (3-pin)

Table C-7 PJ360 Mic Connector Pin Assignments (3-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	—	03	(Right)	I
02	(Left)	I			

Table C-8 PJ361 Line Input Connector Pin Assignments (3-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	—	03	(Right)	I
02	(Left)	I			

Table C-9 PJ362 CD-ROM Audio Connector Pin Assignments (3-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	(Right)	—	03	(Left)	I
02	GND				

C.7 PJ370, PJ381, PJ390 Audio Output Connectors

Table C-10 PJ370 Line Out Connector Pin Assignments (3-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	—	03	Right	O
02	Left	O			

Table C-11 PJ381 Headphone Connector Pin Assignments (6-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	—	04	GND	—
02	(Left)	O	05	(PHONE)	I
03	(Right)	O	06	(Not connected)	—

Table C-12 PJ390 Internal Speaker Connector Pin Assignments (4-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	Right A	O	03	Left A	O
02	Right B	O	04	Left B	O

C.8 PJ380 Sound Gain Control

Table C-13 PJ380 Volume Board Connector Pin Assignments (6-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	LVOL;100	I	04	RVOL;100	I
02	LVOL;110	O	05	RVOL;110	O
03	GND	—	06	GND	—

C.9 PJ420 PC Card Slot Connectors (68-pin)

Table C-14 PC Card Slot Connector Pin Assignments (68-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	—	35	GND	—
02	CDAT03;100	I/O	36	CD1;000	I
03	CDAT04;100	I/O	37	CDAT11;100	I/O
04	CDAT05;100	I/O	38	CDAT12;100	I/O
05	CDAT06;100	I/O	39	CDAT13;100	I/O
06	CDAT07;100	I/O	40	CDAT14;100	I/O
07	CE1;000	O	41	CDAT15;100	I/O
08	CADD10;100	O	42	CE2;000	O
09	COE;000	O	43	N/C	—
10	CADD11;100	O	44	CIOR;000	O
11	CADD09;100	O	45	CIOW;000	O
12	CADD08;100	O	46	CADD17;100	O
13	CADD13;100	O	47	CADD18;100	O
14	CADD14;100	O	48	CADD19;100	O
15	CWE;000	O	49	CADD20;100	O
16	CBSY;000	I	50	CADD21;100	O
17	MCVCCA	—	51	MCVCCA	—
18	MCVP1A	—	52	MCVP2A	—
19	CADD16;100	O	53	CADD22;100	O
20	CADD15;100	O	54	CADD23;100	O
21	CADD12;100	O	55	CADD24;100	O
22	CADD07;100	O	56	CADD25;100	O
23	CADD06;100	O	57	N/C	—
24	CADD05;100	O	58	CRESET;100	O
25	CADD04;100	O	59	CWAIT;000	I
26	CADD03;100	O	60	INPACK;000	I
27	CADD02;100	O	61	REG;000	O
28	CADD01;100	O	62	CBVD2;100	I
29	CADD00;100	O	63	CBVD1;100	I
30	CDAT00;100	I/O	64	CDAT08;100	I/O
31	CDAT01;100	I/O	65	CDAT09;100	I/O
32	CDAT02;100	I/O	66	CDAT10;100	I/O
33	CWP;100	I	67	CD2;000	I
34	GND	—	68	GND	—

C.10   PJ430 LED Board Connectors (8-pin)

Table C-15 LED Board Connector Pin Assignments (8-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	POWER;100	O	05	FDDLED;000	O
02	HDDLED;100	O	06	PNLOFF;000	I
03	HDDLED;020	O	07	GND	—
04	(Pulled up)	O	08	N/C	—

C.11   PJ440, PJ441 Power Supply Connectors

Table C-16 PJ440 Power Supply Connector Pin Assignments (11-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	—	07	GND	—
02	M5V	I	08	GND	—
03	GND	—	09	GND	—
04	GND	—	10	GND	—
05	GND	—	11	M12V	I
06	GND	—			

Table C-17 PJ441 Power Supply Connector Pin Assignments (10-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	VCC	I	06	VCC	I
02	VCC	I	07	P24V	I
03	VCC	I	08	P12V	I
04	VCC	I	09	P12V	I
05	VCC	I	10	P12V	I

C.12 PJ490, PJ491 Back Panel Board Connectors (80-pin)

Table C-18 PJ490 Back Panel Board Connector Pin Assignments (80-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	—	41	ENDXFR(Not used)	I
02	RESET;000	O	42	SA13;100	I/O
03	GND	—	43	REFMD;000	I/O
04	INIO16;000	I	44	SA12;100	I/O
05	VCC	—	45	VCC	—
06	INIORDY;100	I	46	$SYSCK;101	O
07	GND	—	47	SA11;100	I/O
08	SD07;100	I/O	48	IRQ7;100	I
09	GND	—	49	GND	—
10	SD06;100	I/O	50	SA10;100	I/O
11	IRQ9;100	I	51	IRQ6;100	I
12	SD05;100	I/O	52	SA09;100	I/O
13	VCC	—	53	VCC	—
14	SD04;100	I/O	54	IRQ5;100	I
15	DRQ2;100	I	55	SA08;100	I/O
16	SD03;100	I/O	56	IRQ4;100	I
17	GND	—	57	GND	—
18	SD02;100	I/O	58	IRQ3;100	I
19	SD01;100	I/O	59	DACK2;000	O
20	SD00;100	I/O	60	TC;100	O
21	VCC	—	61	VCC	—
22	SMEW;000	O	62	BALE;100	O
23	AEN;100	O	63	$14R3M;101	O
24	SMER;000	O	64	SBHE;000	I/O
25	GND	—	65	GND	—
26	SA19;100	I/O	66	LA23;100	I/O
27	IOW;000	I/O	67	IRQ10;100	I
28	SA18;100	I/O	68	LA22;100	I/O
29	VCC	—	69	VCC	—
30	IOR;000	I/O	70	IRQ11;100	I
31	SA17;100	I/O	71	LA21;100	I/O
32	DACK3;000	O	72	IRQ12;100	I
33	GND	—	73	GND	—
34	SA16;100	I/O	74	LA20;100	I/O
35	DRQ3;100	I	75	IRQ15;100	I
36	SA15;100	I/O	76	IRQ14;100	I
37	VCC	—	77	VCC	—
38	DACK1;000	O	78	DACK0;000	O
39	SA14;100	I/O	79	GND	—
40	DRQ1;100	I	80	DRQ0;100	I

Table C-19 PJ491 BP Board Connector Pin Assignments (80-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	—	41	GND	—
02	DACK5;000	O	42	IOCHCK;000	I
03	MEMW;000	I	43	LA19;100	I/O
04	DRQ5;100	I	44	EXME16;000	O
05	VCC	—	45	P12V	—
06	SD08;100	I/O	46	EXIORY;100	O
07	DACK6;000	O	47	SCSIIO;000	I/O
08	SD09;100	I/O	48	SCLED;000	I/O
09	GND	—	49	GND	—
10	DRQ6;100	I	50	SCREQ;000	I/O
11	SD10;100	I/O	51	SCSICD;000	I/O
12	DACK7;000	O	52	SCSEL;000	I/O
13	VCC	—	53	P12V	—
14	SD11;100	I/O	54	SCMSG;000	I/O
15	DRQ7;100	I	55	P12V	—
16	SD12;100	I/O	56	SCRST;000	O
17	GND	—	57	GND	—
18	SD13;100	I/O	58	SCACK;000	I/O
19	MASTER;000	I	59	P12V	—
20	SD14;100	I/O	60	SCBSY;000	I/O
21	VCC	—	61	P12V	—
22	SD15;100	I/O	62	SCATN;000	I/O
23	SA07;100	O	63	P12V	—
24	SA06;100	O	64	SCSIDP;000	I/O
25	GND	—	65	GND	—
26	SA05;100	O	66	SCSID7;000	I/O
27	SA04;100	O	67	P12V	—
28	SA03;100	O	68	SCSID6;000	I/O
29	P12V	—	69	P12V	—
30	SA02;100	O	70	SCSID5;000	I/O
31	SA01;100	O	71	P12V	—
32	SA00;100	O	72	SCSID4;000	I/O
33	MEMR;000	O	73	GND	—
34	HDC0CS;010	O	74	SCSID3;000	I/O
35	HDDLED;000	O	75	M5V	—
36	HDC1CS;010	O	76	SCSID2;000	I/O
37	P12V	—	77	P12V	—
38	EXIO16;000	O	78	SCSID1;000	I/O
39	LA17;100	I/O	79	M12V	—
40	LA16;100	I/O	80	SCSID0;000	I/O

C.13   PJ580, PJ581 Video I/O Connectors

Table C-20 PJ580 Feature Connector Pin Assignments (26-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	FEASEN;000	I	14	PVID6;010	O
02	PVID0;010	O	15	GND	—
03	GND	—	16	PVID7;010	O
04	PVID1;010	O	17	GND	—
05	GND	—	18	PCLK;010	O
06	PVID2;010	O	19	GND	—
07	Not connected	—	20	FR;010	O
08	PVID3;010	O	21	GND	—
09	Not connected	—	22	LP;010	O
10	PVID4;010	O	23	Not connected	—
11	Not connected	—	24	FP;010	O
12	PVID5;010	O	25	Not connected	—
13	Not connected	—	26	GND	—

Table C-21 PJ581 Z-card Connector Pin Assignments (34-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	DACR0;100	I	18	GND	—
02	DACR1;100	I	19	DACB0;100	I
03	GND	—	20	DACB1;100	I
04	DACR2;100	I	21	GND	—
05	DACR3;100	I	22	DACB2;100	I
06	GND	—	23	DACB3;100	I
07	DACR4;100	I	24	GND	—
08	DACR5;100	I	25	DACB4;100	I
09	GND	—	26	DACB5;100	I
10	DACG0;100	I	27	GND	—
11	DACG1;100	I	28	LLP;100	I
12	GND	—	29	LFP;100	I
13	DACG2;100	I	30	GND	—
14	DACG3;100	I	31	GND	—
15	GND	—	32	LFR;100	I
16	DACG4;100	I	33	LPCLK;100	I
17	DACG5;100	I	34	ZENSEN;000	I

C.14   PJ630 LCD Panel Interface Connectors (40-pin)

Table C-22 PJ630 LCD Connector Pin Assignments (40-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	PCLK;050	O	21	DATAG1;120	O
02	GND	—	22	DATAG0;120	O
03	FLTFP;140	O	23	GND	—
04	FLTLP;140	O	24	DATAG2;120	O
05	DATAR4;120	O	25	DATAB1;120	O
06	DATAR3;120	O	26	DATAB0;120	O
07	GND	—	27	DENAB;140	O
08	DATAR5;120	O	28	DATAB2;120	O
09	DATAG4;120	O	29	PNEL0;100	I
10	DATAG3;120	O	30	PNEL1;100	I
11	GND	—	31	GND	—
12	DATAG5;120	O	32	P24V	O
13	DATAB4;120	O	33	LCDVCC	O
14	DATAB3;120	O	34	P24V	O
15	GND	—	35	GND	—
16	DATAB5;120	O	36	GND	—
17	DATAR1;120	O	37	LCDVCC	O
18	DATAR0;120	O	38	FLOFF;100	O
19	GND	—	39	GND	—
20	DATAR2;120	O	40	GND	—

C.15   PJ680 External SCSI Connectors (50-pin)

Table C-23 External SCSI Connector Pin Assignments (50-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	—	26	VCC	O
02	SCSID0;000	I/O	27	GND	—
03	GND	—	28	GND	—
04	SCSID1;000	I/O	29	GND	—
05	GND	—	30	GND	—
06	SCSID2;000	I/O	31	GND	—
07	GND	—	32	SCATN;000	I/O
08	SCSID3;000	I/O	33	GND	—
09	GND	—	34	GND	—
10	SCSID4;000	I/O	35	GND	—
11	GND	—	36	SCBSY;000	I/O
12	SCSID5;000	I/O	37	GND	—
13	GND	—	38	SCACK;000	I/O
14	SDSID6;000	I/O	39	GND	—
15	GND	—	40	SCRST;000	O
16	SCSID7;000	I/O	41	GND	—
17	GND	—	42	SCMSG;000	I/O
18	SCSIDP;000	I/O	43	GND	—
19	GND	—	44	SCSEL;000	I/O
20	GND	—	45	GND	—
21	GND	—	46	SCSICD;000	I/O
22	GND	—	47	GND	—
23	GND	—	48	SCREQ;000	I/O
24	GND	—	49	GND	—
25	N/C	—	50	SCSIIO;000	I/O

Appendix D   USA Display Codes

Table D-1 USA Display Codes

HEXA DECIMAL VALUE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	BLANK (NULL)	►	BLANK SPACE	0	@	P	`	p	Ç	É	á	░	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	β	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	ª	╢	╞	╓	μ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	∙
A	◎	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	∙
B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	Pt	«	╛	╬	▐	∈	■
F	☼	▼	/	?	O	_	o	△	Å	ƒ	»	┐	╧	▀	∩	BLANK FF

Appendix E   Keyboard Scan/Character Codes

Table E-1 KB Code to ASCII Code Conversion Table (1/5)

Cap No.	Keytop	Lower		Upper		Caps Lock				Ctrl		Alt	
						Lower		Upper					
01	~	29	60	29	7E	29	60	29	7E		-		-
	'	29	60	29	7E	29	60	29	7E		-	29	00
02	!	02	31	02	21	02	31	02	21		-	78	00
	1	02	31	02	21	02	31	02	21		-	78	00
03	@	03	32	03	22	03	32	03	22		-	79	00
	2	03	32	03	22	03	32	03	22		-	79	00
04	#	04	33	04	23	04	33	04	23		-	7A	00
	3	04	33	04	23	04	33	04	23		-	7A	00
05	$	05	34	05	24	05	34	05	24		-	7B	00
	4	05	34	05	24	05	34	05	24		-	7B	00
06	%	06	35	06	25	06	35	06	25		-	7C	00
	5	06	35	06	25	06	35	06	25		-	7C	00
07	^	07	36	07	5E	07	36	07	5E	07	1E	7D	00
	6	07	36	07	5E	07	36	07	5E	07	1E	7D	00
08	&	08	37	08	26	08	37	08	26		-	7E	00
	7	08	37	08	26	08	37	08	26		-	7E	00
09	*	09	38	09	2A	09	38	09	2A		-	7F	00
	8	09	38	09	2A	09	38	09	2A			7F	00
10	(	0A	39	0A	28	0A	39	0A	28		-	80	00
	9	0A	39	0A	28	0A	39	0A	28			80	00
11	)	0B	30	0B	29	0B	30	0B	29		-	81	00
	0	0B	30	0B	29	0B	30	0B	29		-	81	00
12	_	0C	2D	0C	5F	0C	2D	0C	5F	0C	1F	82	00
	-	0C	2D	0C	5F	0C	2D	0C	5F	0C	1F	82	00
13	+	0D	3D	0D	2B	0D	3D	0D	2B		-	83	00
	=	0D	3D	0D	2B	0D	3D	0D	2B		-	83	00
15	Back	0E	08	0E	08	0E	08	0E	08	0E	7F		-
	space	0E	08	0E	08	0E	08	0E	08	0E	7F	0E	00
16	Tab	0F	09	0F	00	0F	09	0F	00		-		-
		0E	09	0F	00	0F	09	0F	00	94	00	A5	00
17	Q	10	71	10	51	10	51	10	71	10	11	10	00
		10	71	10	51	10	51	10	71	10	11	10	00
18	W	11	77	11	57	11	57	11	77	11	77	11	00
		11	77	11	57	11	57	11	77	11	17	11	00
19	E	12	65	12	45	12	45	12	65	12	05	12	00
		12	65	12	45	12	45	12	65	12	05	12	00

Cap No.	Keytop	Lower		Upper		Caps Lock				Ctrl		Alt	
						Lower		Upper					
20	R	13	72	13	52	13	52	13	72	13	12	13	00
		13	72	13	52	13	52	13	72	13	12	13	00
21	T	14	74	14	54	14	54	14	74	14	14	14	00
		14	74	14	54	14	54	14	74	14	14	14	00
22	Y	15	79	15	59	15	59	15	79	15	19	15	00
		15	79	15	59	15	59	15	79	15	19	15	00
23	U	16	75	16	55	16	55	16	75	16	15	16	00
		16	75	16	55	16	55	16	75	16	15	16	0
24	I	17	69	17	49	17	49	17	69	17	09	17	00
		17	69	17	49	17	49	17	69	17	09	17	00
25	O	18	6F	18	4F	18	4F	18	6F	18	0F	18	00
		18	6F	18	4F	18	4F	18	6F	18	0F	18	00
26	P	19	70	19	50	19	50	19	70	19	10	19	00
		19	70	19	50	19	50	19	70	19	10	19	00
27	{ [	1A	5B	1A	7B	1A	5B	1A	7B	1A	1B		-
		1A	5B	1A	7B	1A	5B	1A	7B	1A	1B	1A	00
28	}]	1B	5D	1B	7D	1B	5D	1B	7D	1B	1D		-
		1B	5D	1B	7D	1B	5D	1B	7D	1B	1D	1B	00
29	| \	2B	5C	2B	7C	2B	5C	2B	7C	2B	1C		-
		2B	5C	2B	7C	2B	5C	2B	7C	2B	1C	2B	00
30	Caps Lock		-		-		-		-		-		-
			-		-		-		-		-		-
31	A	1E	61	1E	41	1E	41	1E	61	1E	01	1E	00
		1E	61	1E	41	1E	41	1E	61	1E	01	1E	00
32	S	1F	73	1F	53	1F	53	1F	73	1F	13	1F	00
		1F	73	1F	53	1F	53	1F	73	1F	13	1F	00
33	D	20	64	20	44	20	44	20	64	20	04	20	00
		20	64	20	44	20	44	20	64	20	04	20	00
34	F	21	66	21	46	21	46	21	66	21	06	21	00
		21	66	21	46	21	46	21	66	21	06	21	00
35	G	22	67	22	47	22	47	22	67	22	07	22	00
		22	67	22	47	22	47	22	67	22	07	22	00
36	H	23	68	23	48	23	48	23	68	23	08	23	00
		23	68	23	48	23	48	23	68	23	08	23	00
37	J	24	6A	24	4A	24	4A	24	6A	24	0A	24	00
		24	6A	24	4A	24	4A	24	6A	24	0A	24	00
38	K	25	6B	25	4B	25	4B	25	6B	25	0B	25	00
		25	6B	25	4B	25	4B	25	6B	25	0B	25	00
39	L	26	6C	26	4C	26	4C	26	6C	26	0C	26	00
		26	6C	26	4C	26	4C	26	6C	26	0C	26	00
40	: ;	27	3B	27	3A	27	3B	27	3A		-		-
		27	3B	27	3A	27	3B	27	3A		-	27	00

Cap No.	Keytop	Lower		Upper		Caps Lock				Ctrl		Alt	
						Lower		Upper					
41	" '	28 28	27 27	28 28	22 22	28 28	27 27	28 28	22 22	- -		28	- 00
43	Enter	1C 1C	0D 0D	1C 1C	0D 0D	1C 1C	0D 0D	1C 1C	0D 0D	1C 1C	0A 0A	1C	- 00
44	Shift (L)		- -		- -		- -		- -		- -		- -
45	\ |	56 56	5C 5C	56 56	7C 7C	56 56	5C 5C	56 56	7C 7C	- -			- -
46	Z	2C 2C	7A 7A	2C 2C	5A 5A	2C 2C	5A 5A	2C 2C	7A 7A	2C 2C	1A 1A	2C 2C	00 00
47	X	2D 2D	78 78	2D 2D	58 58	2D 2D	58 58	2D 2D	78 78	2D 2D	18 18	2D 2D	00 00
48	C	2E 2E	63 63	2E 2E	43 43	2E 2E	43 43	2E 2E	63 63	2E 2E	03 03	2E 2E	00 00
49	V	2F 2F	76 76	2F 2F	56 56	2F 2F	56 56	2F 2F	76 76	2F 2F	16 16	2F 2F	00 00
50	B	30 30	62 62	30 30	42 42	30 30	42 42	30 30	62 62	30 30	02 02	30 30	00 00
51	N	31 31	6E 6E	31 31	4E 4E	31 31	4E 4E	31 31	6E 6E	31 31	0E 0E	31 31	00 00
52	M	32 32	6D 6D	32 32	4D 4D	32 32	4D 4D	32 32	6D 6D	32 32	0D 0D	32 32	00 00
53	< ,	33 33	2C 2C	33 33	3C 3C	33 33	2C 2C	33 33	3C 3C	- -		33	- 00
54	> .	34 34	2E 2E	34 34	3E 3E	34 34	2E 2E	34 34	3E 3E	- -		34	- 00
55	? /	35 35	2F 2F	35 35	3F 3F	35 35	2F 2F	35 35	3F 3F	- -		35	- 00
57	Shift (R)		- -		- -		- -		- -		- -		- -
58	Ctrl (L)		- -		- -		- -		- -		- -		- -
60	Alt (L)		- -		- -		- -		- -		- -		- -
61	Space	30 39	20 20	39 39	20 20	39 39	20 20	39 39	20 20	39 39	20 20	39 39	20 20
62	Alt Gr		- -		- -		- -		- -		- -		- -
75	Ins	52 52	00 E0	52 52	00 E0	52 52	00 E0	52 52	00 E0	92	- E0	A2	- 00
76	Del	53 53	00 E0	53 53	00 E0	53 53	00 E0	53 53	00 E0	93	- E0	A3	- 00

Cap No.	Keytop	Lower		Upper		Caps Lock				Ctrl		Alt	
						Lower		Upper					
79	←	4B 4B	00 E0	4B 4B	00 E0	4B 4B	00 E0	4B 4B	00 E0	73 73	00 E0	9B	- 00
80	Home	47 47	00 E0	47 47	00 E0	47 47	00 E0	47 47	00 E0	77 77	00 E0	97	- 00
81	End	4F 4F	00 E0	4F 4F	00 E0	4F 4F	00 E0	4F 4F	00 E0	75 75	00 E0	9F	- 00
83	↑	48 48	00 E0	48 48	00 E0	48 48	00 E0	48 48	00 E0	8D	- E0	98	- 00
84	↓	50 50	00 E0	50 50	00 E0	50 50	00 E0	50 50	00 E0	91	- E0	A0	- 00
85	PgUp	49 49	00 E0	49 49	00 E0	49 49	00 E0	49 49	00 E0	84 84	00 E0	99	- 00
86	PgDn	51 51	00 E0	51 51	00 E0	51 51	00 E0	51 51	00 E0	76 76	00 E0	A1	- 00
89	→	4D 4D	00 E0	4D 4D	00 E0	4D 4D	00 E0	4D 4D	00 E0	74 74	00 E0	9D	- 00
110	Esc	01 01	1B 1B	01 01	1B 1B	01 01	1B 1B	01 01	1B 1B	01 01	1B 1B	01	- 00
112	F1	3B 3B	00 00	54 54	00 00	3B 3B	00 00	54 54	00 00	5E 5E	00 00	68 68	00 00
113	F2	3C 3C	00 00	55 55	00 00	3C 3C	00 00	55 55	00 00	5F 5F	00 00	69 69	00 00
114	F3	3D 3D	00 00	56 56	00 00	3D 3D	00 00	56 56	00 00	60 60	00 00	6A 6A	00 00
115	F4	3E 3E	00 00	57 57	00 00	3E 3E	00 00	57 57	00 00	61 61	00 00	6B 6B	00 00
116	F5	3F 3F	00 00	58 58	00 00	3F 3F	00 00	58 58	00 00	62 62	00 00	6C 6C	00 00
117	F6	40 40	00 00	59 59	00 00	40 40	00 00	59 59	00 00	63 63	00 00	6D 6D	00 00
118	F7	41 41	00 00	5A 5A	00 00	41 41	00 00	5A 5A	00 00	64 64	00 00	6E 6E	00 00
119	F8	42 42	00 00	5B 5B	00 00	42 42	00 00	5B 5B	00 00	65 65	00 00	6F 6F	00 00
120	F9	43 43	00 00	5C 5C	00 00	43 43	00 00	5C 5C	00 00	66 66	00 00	70 70	00 00

Cap No.	Keytop	Lower		Upper		Caps Lock				Ctrl		Alt	
						Lower		Upper					
121	F10	44	00	5D	00	44	00	5D	00	67	00	71	00
		44	00	5D	00	44	00	5D	00	67	00	71	00
122	F11	-		-		-		-		-		-	
		85	00	87	00	85	00	87	00	89	00	8B	00
123	F12	-		-		-		-		-		-	
		86	00	88	00	86	00	88	00	8A	00	8C	00
124	PrtSc	-		-		-		-		72	00	-	
		-		-		-		-		72	00	-	
125	Scrl Lock	-		-		-		-		-		-	
		-		-		-		-		-		-	
126	Pause	-		-		-		-		00	00	-	
		-		-		-		-		00	00	-	

Appendix F   Key Layout

F.1   United States (US) Keyboard
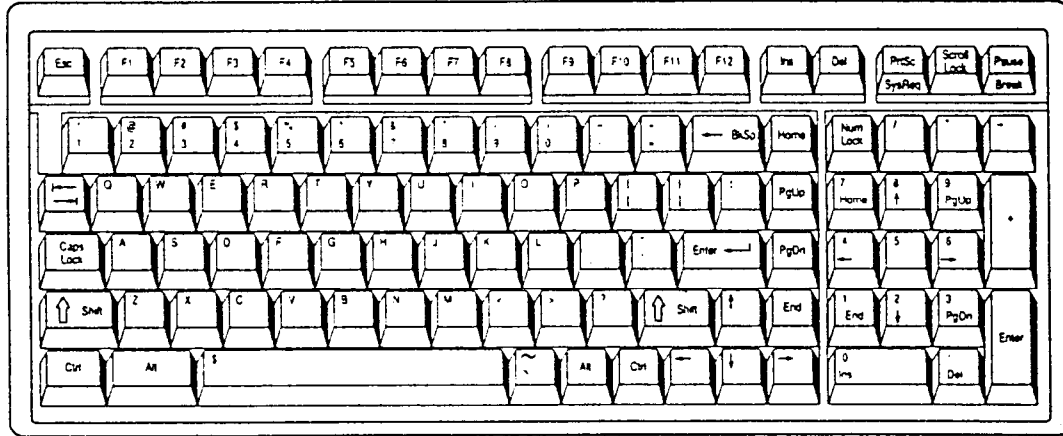

Figure F-1 US Keyboard

F.2   United Kingdom (UK) Keyboard
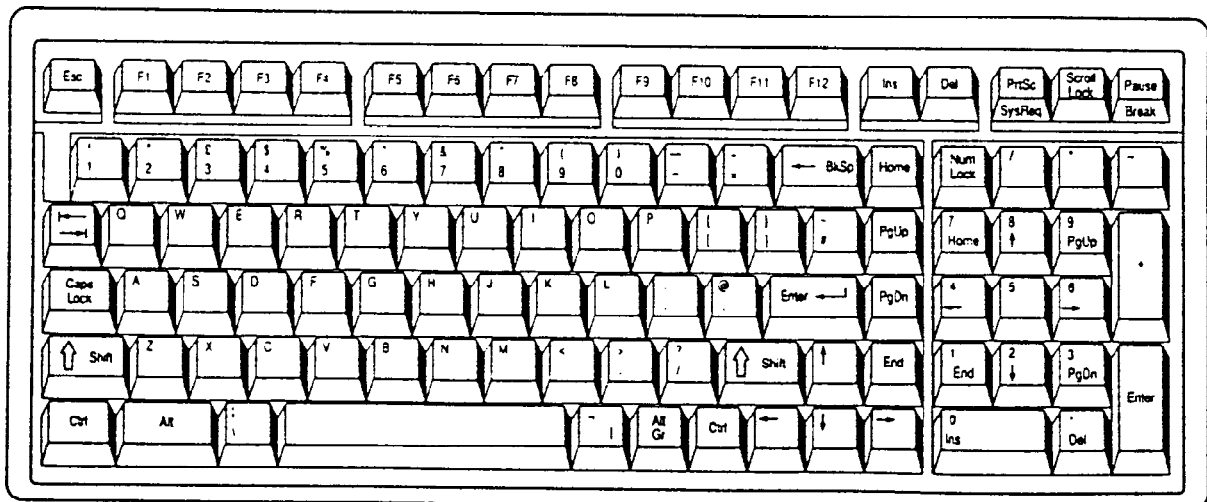

Figure F-2 UK Keyboard

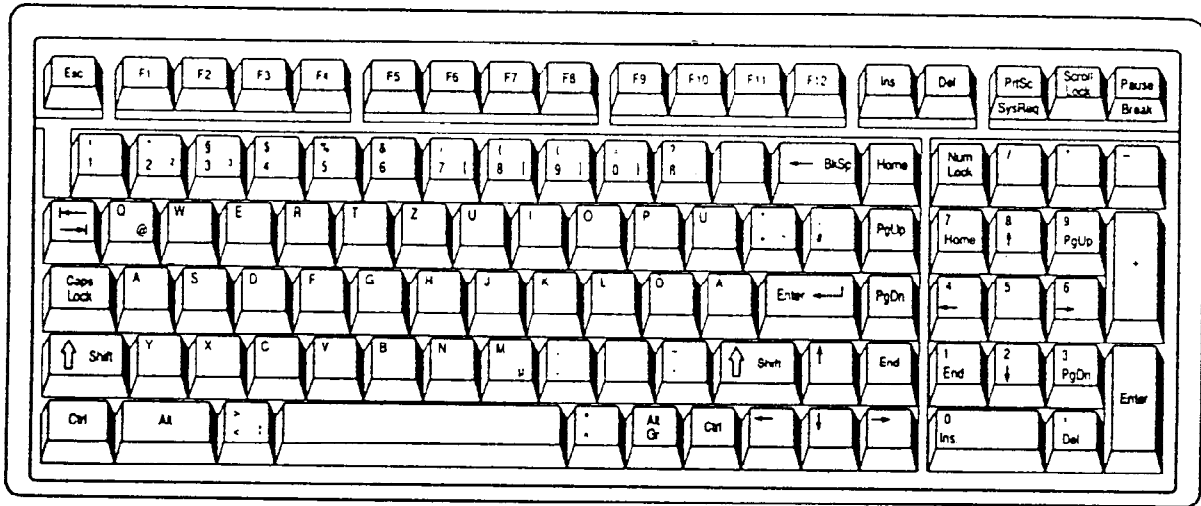## F.3   German (GR) Keyboard

Figure F-3 GR Keyboard

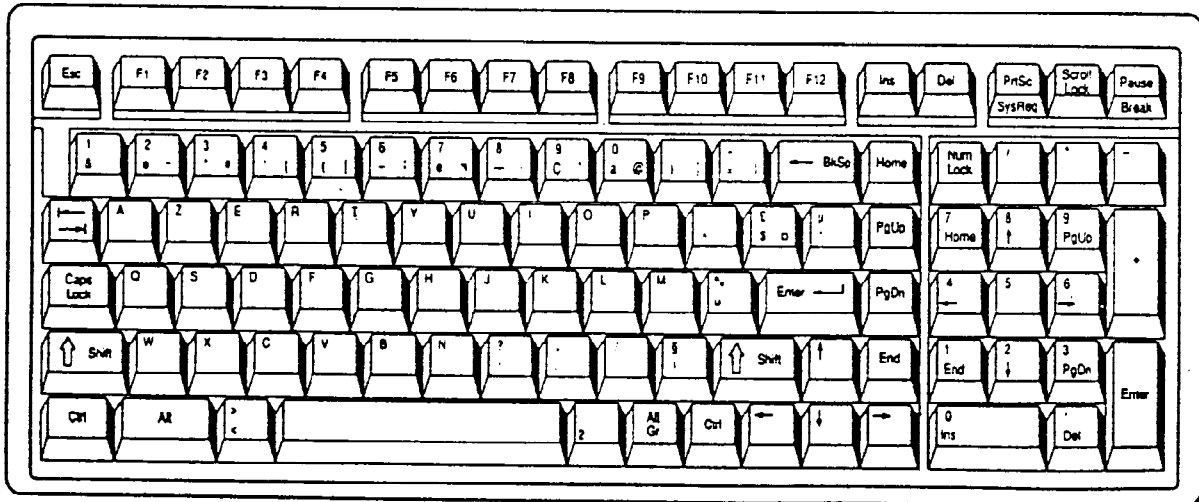## F.4   French (FR) Keyboard

Figure F-4 FR Keyboard

F.5   Spanish (SP) Keyboard
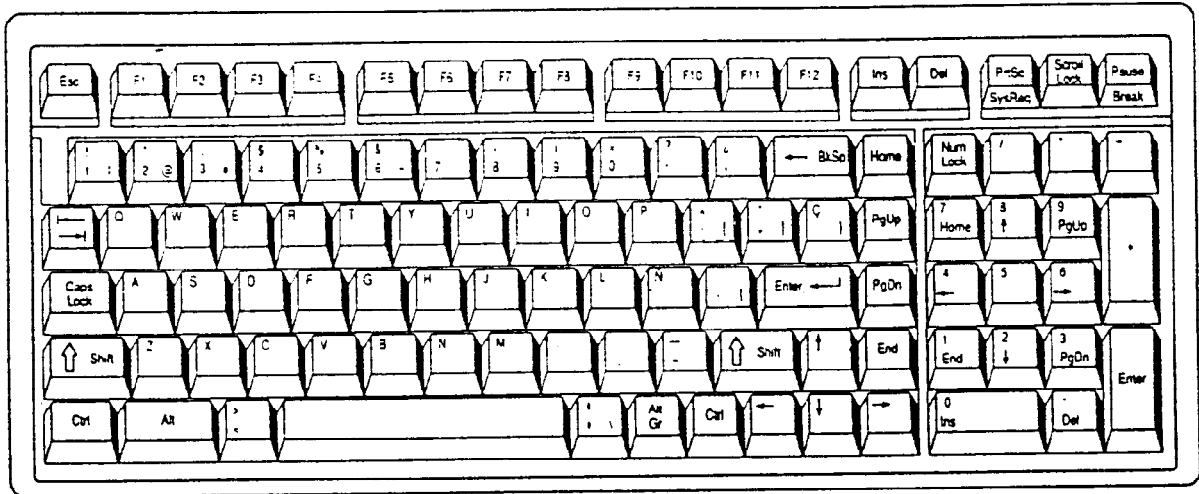

Figure F-5 SP Keyboard
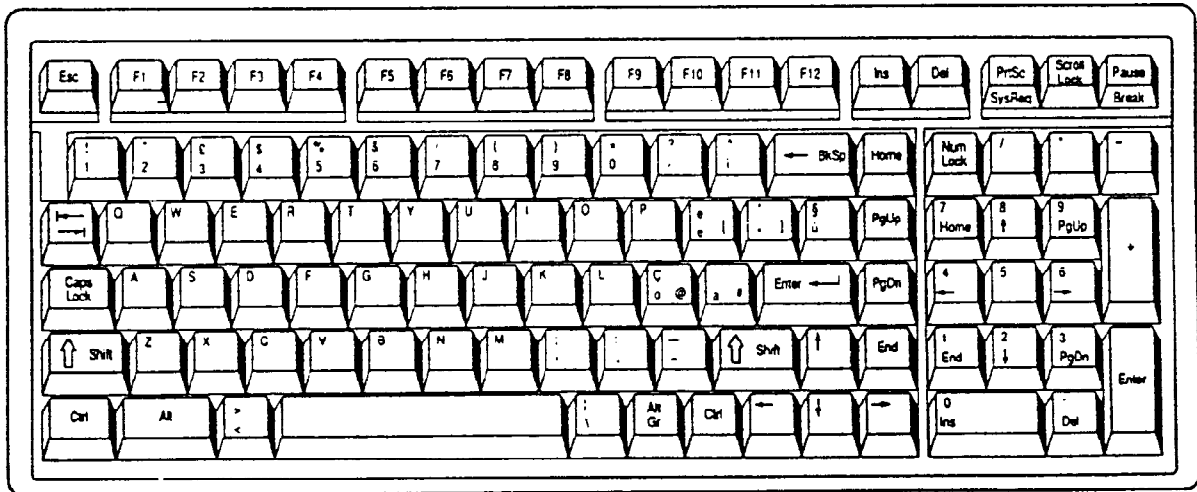
F.6   Italian (IT) Keyboard

Figure F-6 IT Keyboard
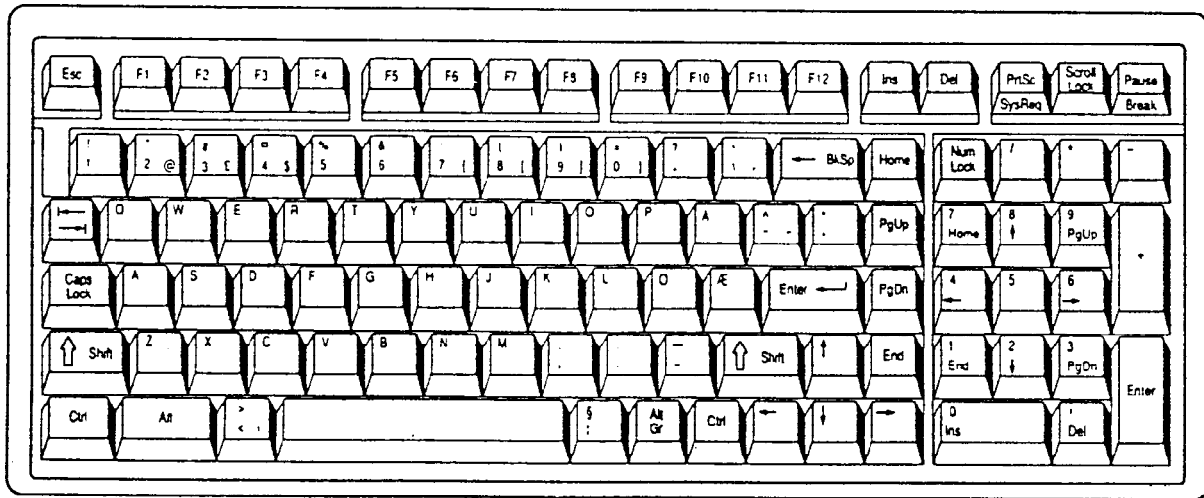
F.7 Scandinavian (SC) Keyboard

Figure F-7 SC Keyboard
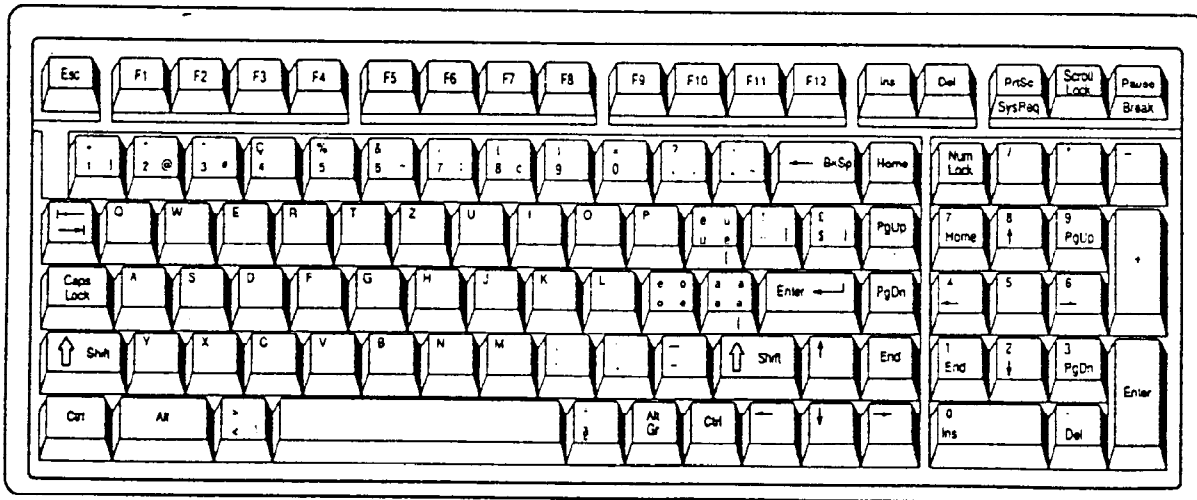
F.8 Swiss-German (SL) Keyboard

Figure F-8 SL Keyboard
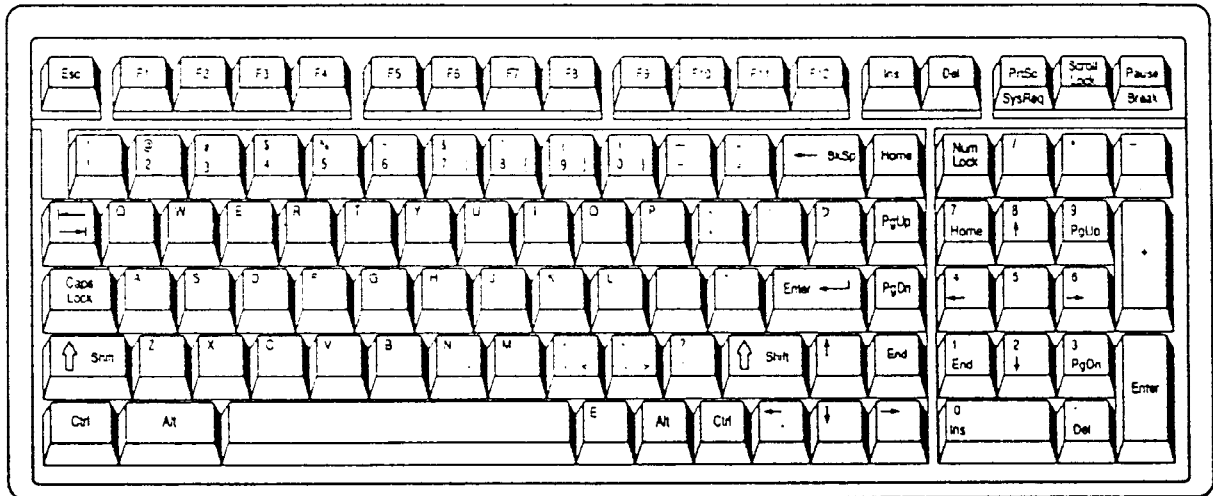
F.9 Canadian (Specialized) Keyboard

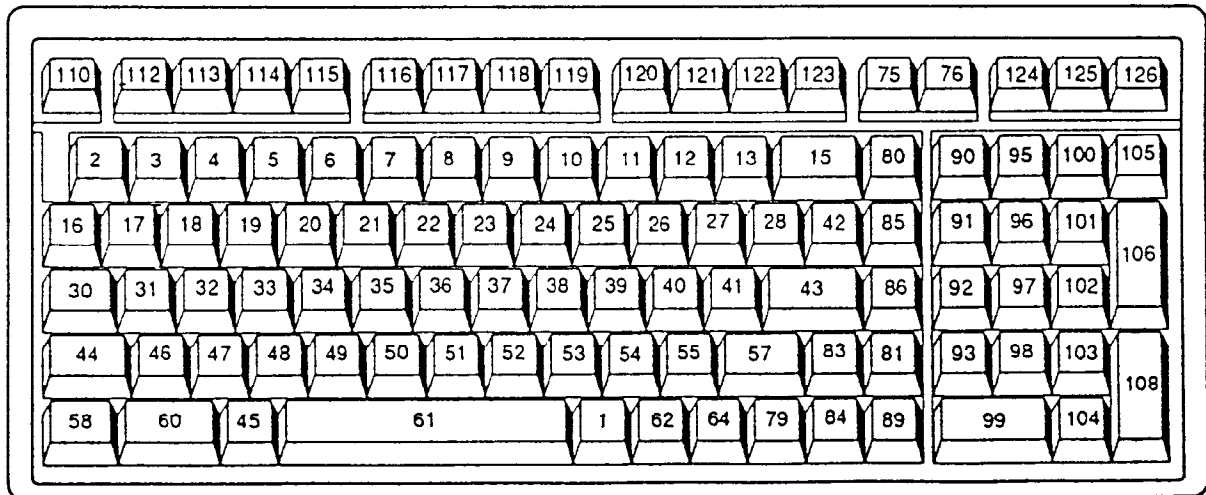*Figure F-9 Canadian Keyboard*

F.10 Keycap Number Keyboard

Figure F-10 Keycap Number Keyboard

Appendix G   Wiring Diagrams
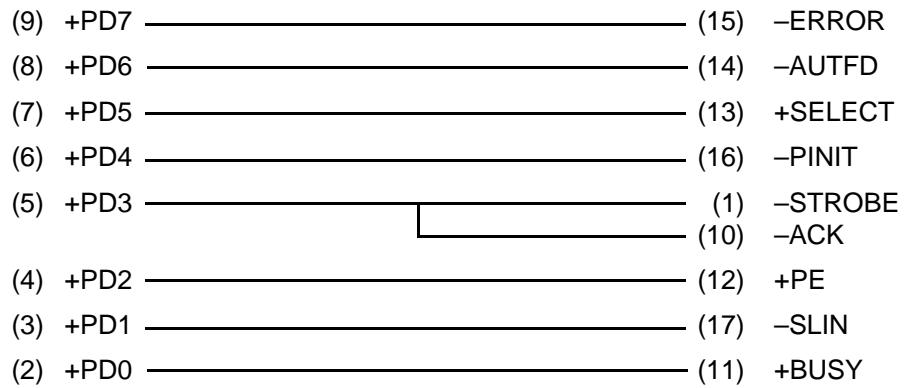
G.1   Printer Wraparound Connector

```
(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 G-1 Printer Wraparound Connecter

G.2   RS-232-C Wraparound Connector

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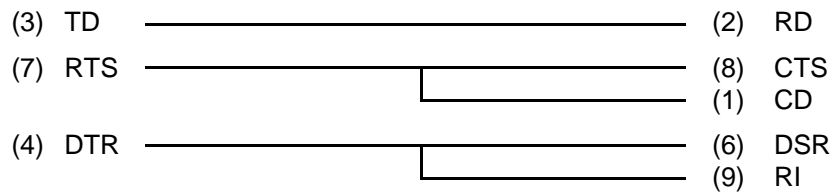
Figure G-2 RS-232-C Wraparound Connecter

G.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  ──────────────┘
```
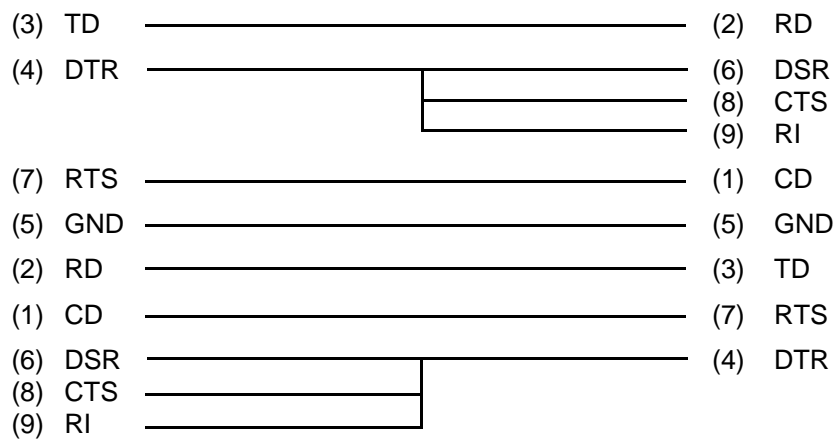
Figure G-3 RS-232-C Direct Cable (9-pin to 9-pin)

G.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  ──────────────────────┐
(8)  CTS  ───────────────────┐  └──────────  (20)  DTR
(9)  RI   ───────────────────┘
```
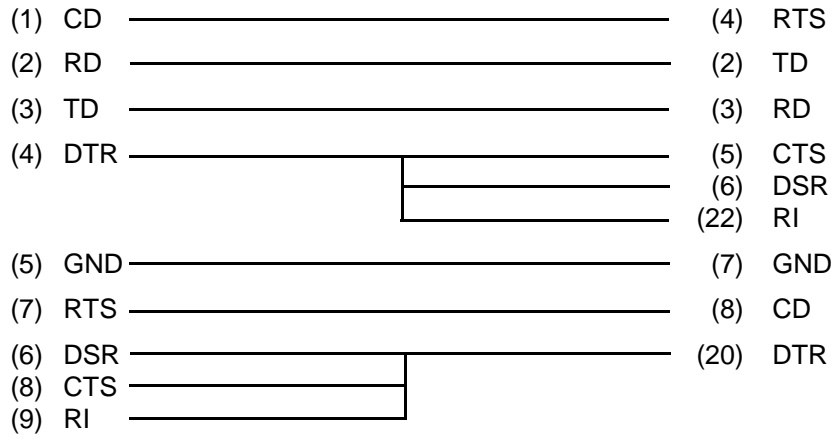
Figure G-4　RS-232-C Direct Cable (9-pin to 25-pin)

Appendix H   Deleting the Password

For security reasons, the Password Deletion Disk will not be distributed to Service Providers. You must obtain the current password from the computer's owner to service the machine.

If the owner forgets the password, contact your Toshiba representative for further action.

Appendix H   Deleting the Password

Appendix I BIOS Rewrite Procedures

This Appendix explains how to rewrite the system BIOS program when updating the BIOS on the T6600C computer.

Tools

To rewrite the BIOS, the following tool is required:

❑ BIOS rewrite disk for the T6600C

Rewriting the BIOS

Follow the procedures below to start the BIOS rewrite program.

1. Turn off the power to the T6600C.

2. Remove the external cable, memory card, and PCMCIA card.

3. Turn on the power while holding down the **F12** key. (Keep holding down the key until the system speaker sounds a beep.)

4. When the BIOS message is displayed, insert the BIOS rewrite disk into the FDD. Press the **Enter** key to start the BIOS rewrite program.

5. When the process is completed, eject the rewrite disk and restart the system.