
Chapter 2

Troubleshooting Procedures

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2.1 Troubleshooting

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

The FRUs covered are:

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

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

The following tools are necessary for implementing the Diagnostics procedures:

1. Diagnostics Disk (Test program for maintenance)
2. Phillips screwdrivers

NOTE: Be sure to use the PH point size “0” screwdriver complying with the ISO/DIS 8764-1:1996. Use, however, the PH point size “1” screwdriver for screws fixing the expansion memory slot cover and the keyboard.

3. Screwdriver for LH sticks
4. Toshiba MS-DOS system FD
5. Work disk (for FDD testing)
6. Cleaning disk kit (for FDD head cleaning)
7. A set of tools for debug port test (test cable, test board, RS-232C cross cable, display, D port FD)
8. PC with a serial port (for displaying debug port test result)
9. Wraparound connector for PC card
10. Tester
11. External CRT
12. External USB Keyboard
13. External USB mouse
14. Headphone
15. Microphone
16. RJ-11 connector checker LED
17. LAN wraparound connector
18. PC (for infrared communication test and wireless LAN test)

2.2 Troubleshooting Flowchart

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

- Make sure that Toshiba Windows[®] XP Tablet PC Edition is installed on the hard disk. Non-Toshiba operating systems can cause the computer malfunction.
- Make sure all optional equipment is removed from the computer.
- Make sure the USB FDD is empty.

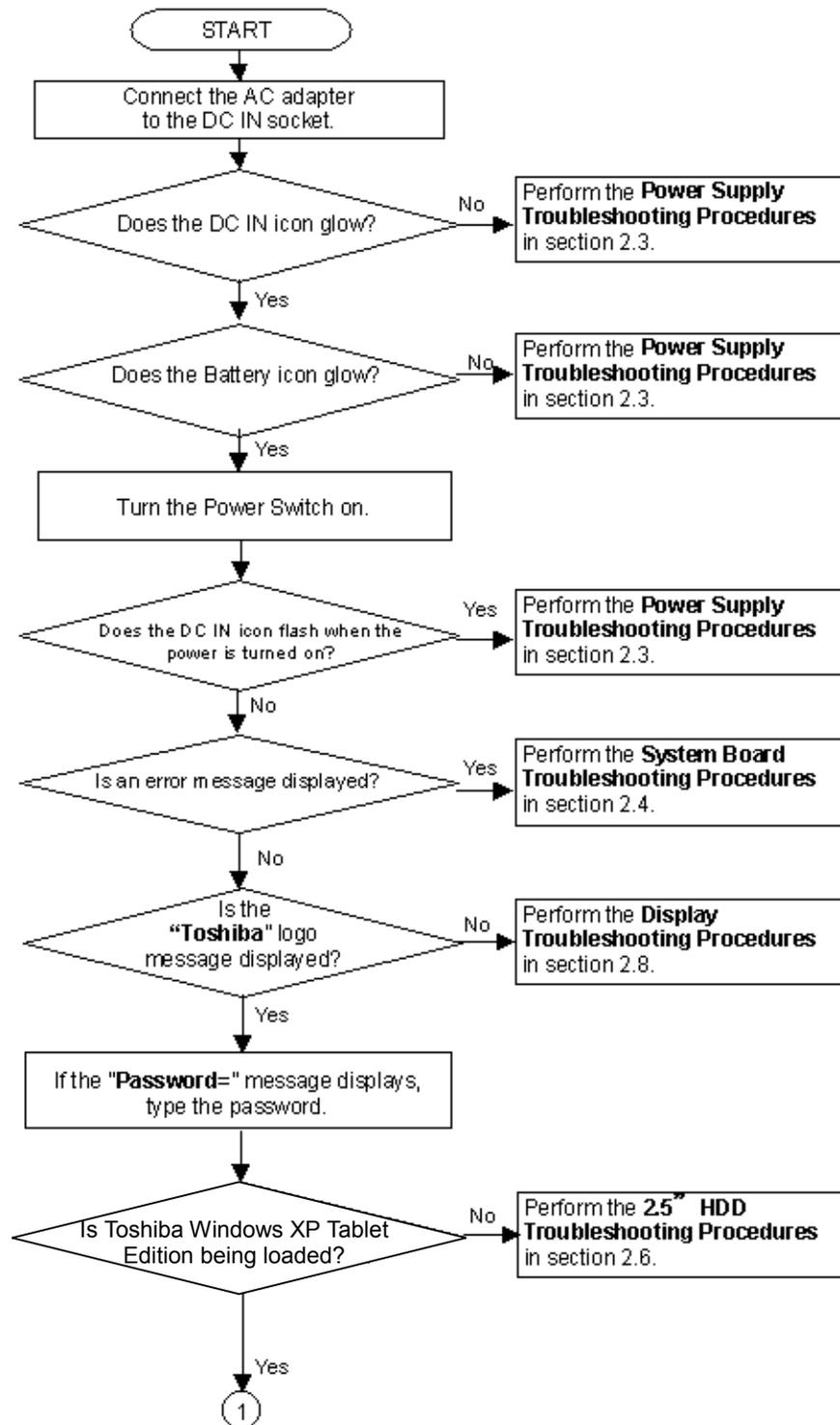


Figure 2-1 Troubleshooting flowchart (1/2)

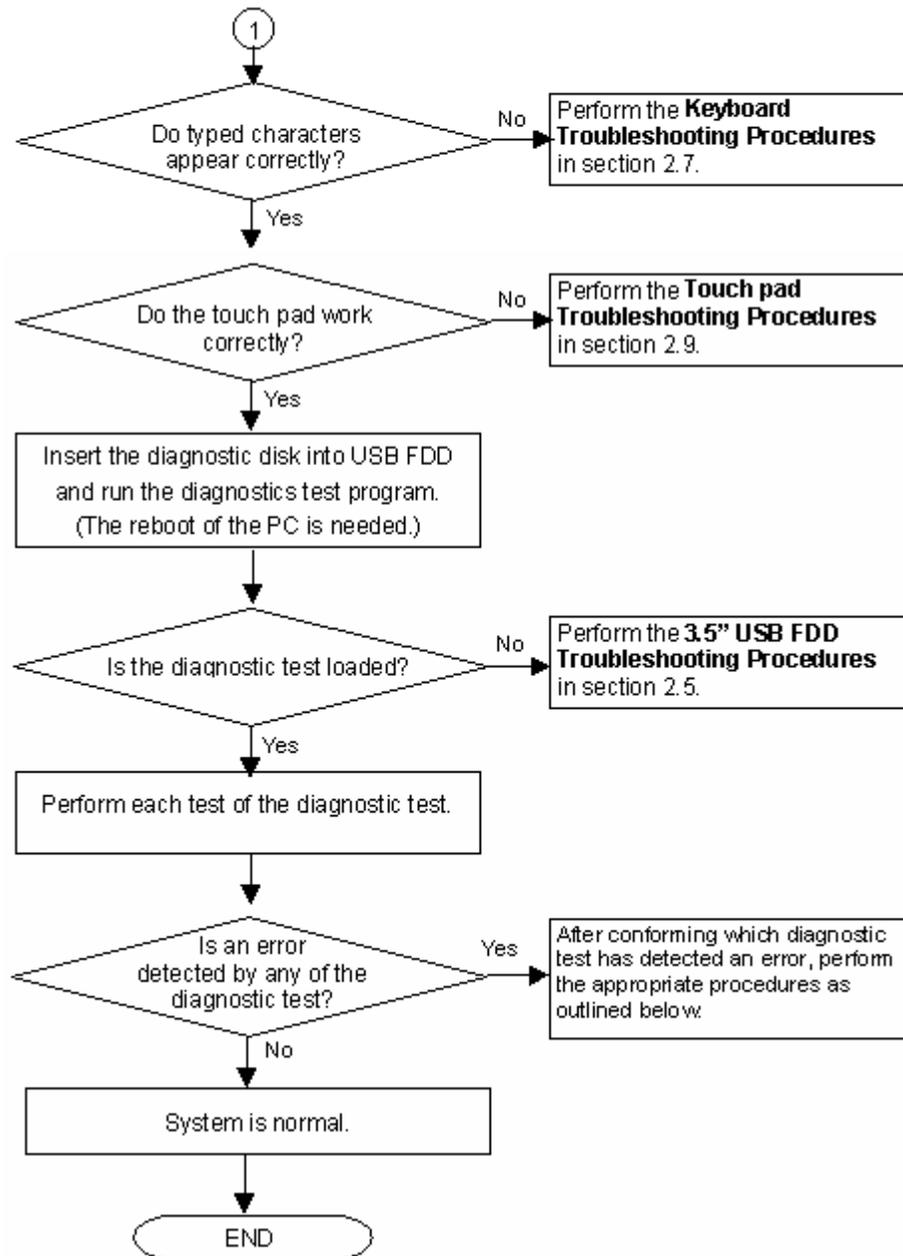


Figure 2-1 Troubleshooting flowchart (2/2)

If the diagnostics program cannot detect an error, the problem may be intermittent. The 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, ASYNC test, Real timer test, NDP test or expansion test, perform the System Board Troubleshooting Procedures in Section 2.4.
2. If an error is detected on the Keyboard test, perform the Keyboard Troubleshooting Procedures in Section 2.7.
3. If an error is detected on the Display test, perform the Display Troubleshooting Procedures in Section 2.8.
4. If an error is detected on the Floppy disk test, perform the USB FDD Troubleshooting Procedures in Section 2.5.
5. If an error is detected on the Hard disk test, perform the HDD Troubleshooting Procedures in Section 2.6.
6. If an error is detected on the modem test, perform the Modem Troubleshooting Procedures in Section 2.10.
7. If an error is detected on the LAN test, perform the LAN Troubleshooting Procedures in Section 2.11.
8. If an error is detected on the sound test, perform the Sound Troubleshooting Procedures in Section 2.12.
9. If an error is detected on the wireless LAN test, perform the Wireless LAN Troubleshooting Procedures in Section 2.15.

2.3 Power Supply Troubleshooting

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

- Procedure 1: Power Supply Icon Check
- Procedure 2: Error Code Check
- Procedure 3: Connection Check
- Procedure 4: Quick Charge Check
- Procedure 5: Replacement Check

Procedure 1 Power Supply Icon Check

The following two icons indicate the power supply status:

- Battery icon
- DC IN icon

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

Table 2-1 Battery icon

Battery icon	Power supply status
Lights orange	Battery is charged and the external DC is input. It has no relation with ON/OFF of the system power.
Lights green	Battery is fully charged and the external DC is input. It has no relation with ON/OFF of the system power.
Blinks orange (even intervals)	The battery level is low while the system power is ON.
Flashes orange	The battery level is low and the power switch is pressed on in the battery driving.
Doesn't light	Any condition other than those above.

Table 2-2 DC IN icon

DC IN icon	Power supply status
Lights green	DC power is being supplied from the AC adapter.
Blinks orange	Power supply malfunction ^{*1}
Doesn't light	Any condition other than those above.

*1 When the power supply controller detects a malfunction, the DC IN icon blinks orange. It shows an error code.

When icons are blinking, perform the following procedure.

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

If icons are still blinking after the operation above, check the followings:

- Check 1 If the DC IN icon blinks orange, go to Procedure 2.
- Check 2 If the DC IN icon does not light, go to Procedure 3.
- Check 3 If the battery icon does not light orange or green, go to Procedure 4.

<p>CAUTION: Use a recommended AC adapter (G71C0002S310).</p>

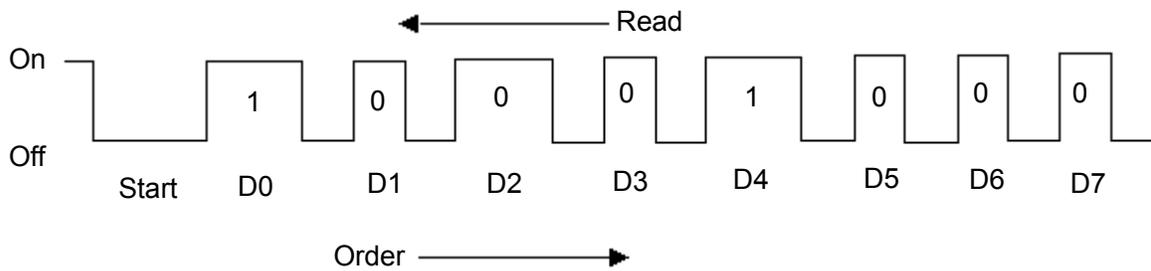
Procedure 2 Error Code Check

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

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

The error code begins with LSB (Least Significant bit)

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



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

- DC power supply (AC adapter)

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

Main Battery

Error code	Meaning
20h	Overvoltage is detected. (This is not supported.)
21h	Main battery charge current is over 7.00A.
22h	Main battery discharge current is over 0.5A when there is no load.
23h	Main battery charge current is over 3.1A when AC adapter is not connected.
24h	Abnormal current has been sensed 0[A].
25h	Main battery charge current is over 0.3A.

Second Battery

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

S3V output (P60)

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

❑ 1R5-C1V output (P61)

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

❑ 1R8-C1V output (P62)

Error code	Meaning
60h	1R8-C1V voltage is over 2.16V when the computer is powered on/off.
61h	1R8-C1V voltage is 1.53V or less when the computer is powered on.
62h	1R8-C1V voltage is 1.53V or less when the computer is booting up.
63h	1R8-C1V voltage is 1.53V or less when the computer is suspended.
64h	1R8-C1V voltage is abnormal during shutdown (CV support)
65h	1R8-C1V voltage is 1.53V or less when the computer is booting up. (CV support)

❑ PPV output (P63 : MUX_CH0)

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

❑ PGV output (P64 : MUX_CH0)

Error code	Meaning
80h	PGV voltage is over 1.62V when the computer is powered on/off.
81h	PGV voltage is 0.68V or less when the computer is powered on.
82h	PGV voltage is 0.68V or less when the computer is booting up.
83h	PGV voltage is 0.68V or more when the computer is powered off.
84h	PGV voltage is 0.68V or less when the computer is suspended.

❑ E5V output (P65 : MUX_CH0)

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

❑ E3V output (P66 : MUX_CH0)

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

❑ 1R2-P1V output (P63 : MUX_CH1)

Error code	Meaning
B0h	1R2-P1V voltage is over 1.44V when the computer is powered on.
B1h	1R2-P1V voltage is 1.02V or less when the computer is powered on.
B2h	1R2-P1V voltage is 1.02V or less when the computer is booting up.
B3h	1R2-P1V voltage is 1.02V or more when the computer is powered off.

- 2R5-P2V output (P64 : MUX_CH1)

Error code	Meaning
C0h	2R5-P2V voltage is over 3.00V when the computer is powered on.
C1h	2R5-P2V voltage is 2.125V or less when the computer is powered on.
C2h	2R5-P2V voltage is 2.125V or less when the computer is booting up.
C3h	2R5-P2V voltage is 2.125V or more when the computer is powered off.
C4h	2R5-P2V voltage is 2.125V or less while the computer is suspended.

- 1R25-P1V output (P65 : MUX_CH1)

Error code	Meaning
D0h	1R25-P1V voltage is over 1.50V when the computer is powered on.
D1h	1R25-P1V voltage is 1.063V or less when the computer is powered on.
D2h	1R25-P1V voltage is 1.063V or less when the computer is booting up.
D3h	1R25-P1V voltage is 1.063V or more when the computer is powered off.
D4h	1R25-P1V voltage is 1.063V or less while the computer is suspended.

- 2R5-B2V output (P66 : MUX_CH1)

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

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

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

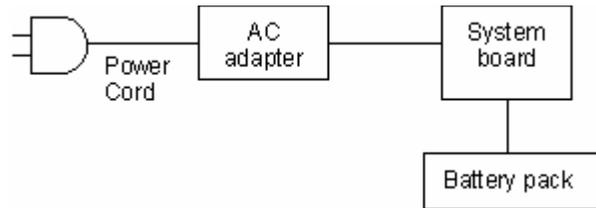
Check 3 In the case of error code 21h:

- Go to Procedure 3.

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

Procedure 3 Connection Check

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



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

- Check 1 Make sure the AC adapter and the AC power cord are firmly plugged into the DC IN 15 V socket and wall outlet. If these cables are connected correctly, go to Check 2.
- Check 2 Replace the AC adapter and the AC power cord with new ones.
- If the DC IN icon does not light, go to Procedure 5.
 - If the battery icon does not light, go to Check 3.
- Check 3 Make sure the battery pack is installed in the computer correctly. If the battery is properly installed and the battery icon still does not light, go to Procedure 4.

Procedure 4 Quick Charge Check

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

- Check 1 Make sure the AC adapter is firmly plugged into the DC IN socket.
- Check 2 Make sure the battery pack is properly installed. If the battery is properly installed, go to Check 3.
- Check 3 The battery pack may be completely discharged. Wait a few minutes to charge the battery pack while connecting the battery pack and the AC adapter. If the battery pack is still not charged, go to Check 4.
- Check 4 The battery's temperature is too high or low. Return the temperature to normal operating condition. If the battery pack is still not charged, go to Check 5.
- Check 5 Replace the battery pack with a new one. If the battery pack is still not charged, go to Procedure 5.

Procedure 5 Replacement Check

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

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

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

Check 2 Replace the system board with a new one.

2.4 System Board Troubleshooting

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

Procedure 1: Message Check

Procedure 2: Debug port (D port) Check on Boot Mode

Procedure 3: Diagnostic Test Program Execution Check

Procedure 4: Replacement Check

Procedure 1 Message Check

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

- If an error message is shown on the display, perform Check 1.
- If there is no error message, go to Procedure 2.
- If MS-DOS or Windows XP Tablet PC Edition is properly loaded, go to Procedure 4.

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

If you press the **F1** key as the message instructs, the **SETUP** screen appears to set the system configuration. If any other error message is displayed, perform Check 2.

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

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

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

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

If any other error message is displayed, perform Check 3.

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

If one of the following error messages (1) through (17), (24) or (25) is displayed, go to Procedure 5.

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

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

If error message (22) or (23) is displayed, go to the 3.5" USB FDD Troubleshooting Procedures in Section 2.5.

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

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

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

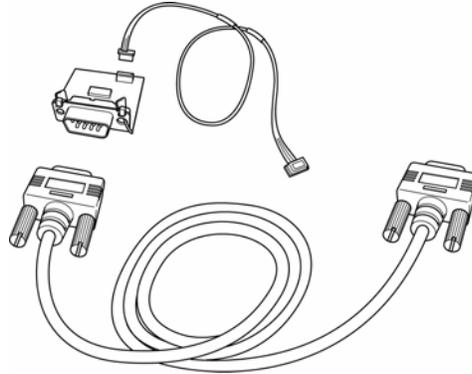
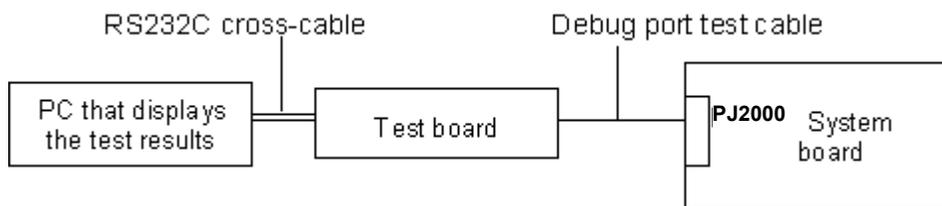


Figure 2-2 A tool set for debug port test

The test procedures are follows;

1. Connect the debug test cable to the connector PJ2000 of the system board. For disassembling to connect the test cable, refer to Chapter 4.
2. Connect the debug port test cable and RS-232C cross-cable to the test board.
3. Connect the RS-232C cross-cable to the PC that displays the results.



4. Boot the computer in MS-DOS mode.

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

<u>F100</u>	<u>: 000.000382</u>	<u>IRT_CHK_INMSYSI_START</u>
D port status	Time (second) to process	Contents of process

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

Table 2-3 D port status (1/7)

D port status	Details	Remarks
F000h	Clearing software reset bit	
	Enabling address line A20	
	Initializing special registers and M1535	
	Initializing the CH0 of a PIT (for HOLD_ON)	
	Initializing flag for BIOS rewriting factor	
	CHECK SUM CHECK (FEFC0000h to FEFF7FFFh)	
	Shifting to protected mode	
	Examining the checksum of Boot Block	HALT when checksum is not correct.
	Examining the checksum of data except Boot Block	
F001h	Checking if EC/KBC firmware is to be rewritten	Shifting to BIOS rewriting process if BIOS rewriting request exists
	Executing KBC initializing sequence	
	Sending KBC enable command	
	Checking F12 key-in	
F002h	Initializing security controller	
F003h to F005h	Checking whether BIOS rewrite is requested	Checksum error except Boot Block or rewriting request by F12key-in
F006H	Checking BIOS signature	
F007h	Shifting process to System BIOS IRT side	For BIOS rewriting process
	BIOS rewriting process	
	Initializing unique HW for this model	
	Initializing GPIO I/O space	
	Enabling BIOS writing	
	Serial interrupt control	
	Canceling BIOS write protection	
	Enabling SMBus I/O space	
	Enabling SMBus access	
	Configuring DRAM	
	Enabling L1 cache memory	
	Clearing memory	
F008h	Changing ROM BIOS to RAM BIOS	
F009h	Storing key scan codes	
	Setting up TASK_1ms_TSC	
	Displaying message on navipanel (EC/KBC UPDATE, BIOS UPDATE/DAMAGED)	

Table 2-3 D port status (2/7)

D port status	Details	Remarks
F009h	Key inputting	
	Loading CHGBIOSA.EXE and CHGFIRMA.EXE	
	Resetting FDC	
	Setting parameter for 2HD (1.44MB) and transmission rate	
	Reading the first sector	When it is sector for 2HD, media type is determined.
	Setting parameter for 2DD (720KB)and transmission rate	
	Searching CHGBIOSA.EXE in the root directory	
	Calculating start head and sector of directory	
	Reading contents of root directory by one sector	
	Searching entry of "CHGBIOSA.EXE"/ "CHGFIRMA.EXE" in the sector	
	Reading EXE header of "CHGBIOSA.EXE"/ "CHGFIRMA.EXE"	If error occurs, process goes to key input.
	Executing CHGBIOSA.EXE and CHGFIRMA.EXE	
	F100h	Disabling cache
Initializing special registers		
Initializing Ch1 of a PIT (Refresh interval ->30 micro seconds)		
F101h	Checking size and type of DRAM (on Cold Booting)	
	Checking DRAM size	HALT when DRAM size is 0.
	Testing stack area of SMRAM	HALT when it can be used as stack area.

Table 2-3 D port status (3/7)

D port status	Details	Remarks
F102h	Configuring cache memory	
	Enabling L1 cache memory	
	Testing CMOS for access (on Cold Booting)	
	Checking remaining of CMOS backup battery	
	Examining checksum of CMOS	
	Initializing data in CMOS (1)	
	Setting up IRT status (Set "1" for Boot status and IRT busy flag bit. Set "0" for other bits.)	
	Storing size of DRAM	
F103h	Checking for branch of resuming (only on Cold Boot)	No resume 1. when CMOS error occurs. 2. when Resume Status Code is not set.
	Checking resume error	
	ICH4-M Power Failure	Resume error 7Ah
	Examining the checksum of SMRAM	Resume error 73h
	Checking whether the memory configuration have been changed	Resume error 73h
	Examining the checksum of system BIOS RAM area	Resume error 79h
	Shifting to resuming process (RESUME_MAIN)	
	Resume error process	
	Disabling all SMIs	
	Clearing resuming status	
	Returning to ROM	
	Setting up area from C0000h to EFFFFh for PCI (disabling DRAM)	
	Setting a request for resuming error	
	Copying system BIOS from ROM to RAM	HALT when error occurs.

Table 2-3 D port status (4/7)

D port status	Details	Remarks
F104h	Initializing SMRAM	
	Checking factor of WakeUp	
	Rewriting SMRAM base and storing CPU state map for BIOS	
	Enabling SMI by ASMI	
F106h	Initializing devices which need initialization before initializing PCI bus	
	Testing (only on COLD booting) and Initializing PIT	
	Setting test pattern to channel 0 of PIT#0	
	Checking whether the test pattern can be read	
	Initializing PIT channel 0 (Interval of timer interrupt -> 55ms)	
	Initializing PIT channel 2 (frequency for sound generator -> 664Hz)	
	Testing PIT channel 1 (checks whether the refresh signal operates correctly in refresh interval of 30 micro seconds)	HALT when time out occurs.
	Testing PIT channel 2 (checks whether the speaker gate operates correctly)	
	Measuring CPU clock	
	Enabling SMIs except auto-off function	
	Control of battery discharging current	
	Performing timeshared process for time measurement of IRT	
	Initializing CPU	
	Updating P6 micro-code	
	Enabling or disabling function of processor serial number ID	
	Checking whether Geyserville is supported	
	Switching CPU clock speed to high	
Setting Graphics Aperture Size		

Table 2-3 D port status (5/7)

D port status	Details	Remarks
F107h	Storing memory size of ROM in buffer	
	Reading EC version	
	Updating the type of flash ROM	
	Determining the destination based on DMI data	
	Checking default setting of CMOS	Set to default value to CMOS if Bad Battery or Bad Checksum (ROM, CMOS) exists.
	Initializing ACPI table (for optional ROM)	
	Storing results of VGA configuration	
F108h	Generating task waiting for completion of PCI_CONFIGURATION	
	Initializing H/W needed after PCI configuration	
	Enabling/Disabling IEEE1394	
	Generating output codes	
F10Ch	FIRST_64KB_CHECK (Checking first 64KB of memory)	
F10Dh	INIT_INT_VECTOR (Initializing interrupt vectors)	
F10Eh	INT_NDP (Initializing NDP)	
F10Fh	INIT_SYSTEM (Initializing system)	
	Storing CMOS error information in IRT_ERR_STS_BUF	
	Initializing timer	
	Initializing buffer for power saving	
	Initializing an EC, and reading battery information	
	Updating system BIOS (model name, and EDID of the LCD)	
F110h	INIT_DISPLAY (Waiting for completion of initializing VGA chip and pre-processing for initializing VGA BIOS)	
F111h	Initializing VGA BIOS	
F112h	Post-processing for Initializing VGA BIOS	
F113h	DISP_LOGO (Displaying logo)	
F114h	SYS_MEM_CHECK (Checking conventional memory)	

Table 2-3 D port status (6/7)

D port status	Details	Remarks
F115h	EXT_MEM_CHECK (Checking exception in protect mode)	
F116h	CHK_DMA_PAGE (Checking DMA Page Register)	
F117h	CHECK_DMA (Checking DMAC)	
F11Ah	INT_DMACH (Initializing DMAC)	
F11Bh	BOOT_PASSWORD (Checking password)	
	Waiting for end of divided FDD initialization (INT_FDD) process	
	Waiting for the end of HDD initialization	
	Checking key input pressed during IRT	Waiting for completion of KBC initializing
	Initializing ATA prioritizing	
F11Eh	EX_IO_ROM_CHECK (Checking optional I/O ROM)	
F11Fh	PRE_BOOT_SETUP	
	Storing value of 40:00 (for saving/restoring SIO)	
	Setting up address of font data for resume password	
	Setting up parameters for character repeat on USB keyboard	
	Getting keys pressed during IRT	
	Storing T_SHADOW_RAM_SIZE (shadow RAM size)	
	Updating system resources information prior to boot-up	
	Rewriting memory mapping data for INT15h E820h function	
	Updating table for DMI	
	Copying ACPI table to top of expansion memory	
	Waiting for completion of writing PSC version on BIOS	
	Waiting for completion of setting for clock generator	If error occurs, process stops with D port = 1Eh.

Table 2-3 D port status (7/7)

D port status	Details	Remarks
(F11Fh)	Canceling NMI mask	
	Calculating checksum of TIT	
	Clearing IRT running flag for runtime	
	Update checksum for runtime	
	Checking whether CPU, HDD or other components have been upgraded	
	Disabling PC Card not being used	
	Initializing HW prior to BOOT, Waiting for completion of initializing	
	Setting up battery save mode	
	Setting up date	
	Waiting for completion of AC-Link initialization	
	Updating DMI Wakeup factor and SM-BIOS structure table	
	Closing configuration space of PCI devices	
	Cache control	
	Processing related to CPU	
	Updating parameter block A	
	Setting up CPU clock speed to designated value by Setup	
	Waiting for motor off of disabled HDD	
	Post processing of PRE_BOOT_SETUP	
	Clearing power button status (PWRBTN)	
	Enabling power button	
F121h	Checking request for starting SETUP (by pressing ESC key or CMOS error)	SETUP starts if any request exists.
FFFFh		

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

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

D port error status is as follows:

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

Procedure 3 Diagnostic Test Program Execution Check

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

1. System test
2. Memory test
3. Keyboard test
4. Display test
5. USB Floppy Disk test
6. ASYNC test
7. Hard Disk test
8. Real Timer test
9. NDP test
10. Expansion test
11. Wireless LAN test
12. Bluetooth test
13. Sound/LAN/Modem test

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

Procedure 4 Replacement Check

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

Check 1 Visually check for the following:

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

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

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

2.5 USB 3.5" FDD Troubleshooting

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

Procedure 1: FDD Head Cleaning Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Replacement Check

Procedure 1 FDD Head Cleaning Check

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

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

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

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

Procedure 2 Diagnostic Test Program Execution Check

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

Make sure the floppy disk is formatted correctly and that the write protect tab is disabled. Floppy disk drive test error codes and their status names are listed in Table 2-4. If any other errors occur while executing the FDD diagnostics test, go to Check 1.

Table 2-4 FDD error code and status

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

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

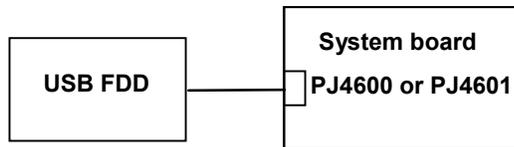
Write protected

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

Procedure 3 Connector Check and Replacement Check

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

- Check 1 Make sure the USB FDD cable is firmly connected to the PJ4600 or PJ4601 of the system board.



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

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

2.6 2.5" HDD Troubleshooting

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

Procedure 1: Partition Check

Procedure 2: Message Check

Procedure 3: Format Check

Procedure 4: Diagnostic Test Program Execution Check

Procedure 5: Connector Check and Replacement Check

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

Procedure 1 Partition Check

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

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

Procedure 2 Message Check

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

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

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

HDC ERROR

or

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

Check 2 If either of the following messages appears, go to Check 3. If the following messages do not appear, perform Check 5.

Insert system disk in drive
Press any key when ready

or

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

Check 3 Check SETUP to see whether the Hard Disk option is set to Not used. If it is set to Not used, choose another setting and return to Check 1. If it is not set to Not used, go to Check 4.

Check 4 Using the SYS command of the MS-DOS, transfer the system to the 2.5" HDD. If the system is not transferred, go to Procedure 3. Refer to the MS-DOS Manual for detailed operation.

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

System Transferred

If an error message appears on the display, perform Check 5.

Check 5 The 2.5" HDD and the connector of the system board may be disconnected (Refer to the steps described in Chapter 4, *Replacement Procedures* for disassembling.). Insert the connectors firmly. If they are firmly connected, go to Procedure 3.

Procedure 3 Format Check

The computer's 2.5" HDD is formatted using the MS-DOS FORMAT program or the physical format program of the test program. To format the 2.5" HDD, start with Check 1 below and perform the other steps as required.

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

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

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

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

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

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

Procedure 4 Diagnostic Test Program Execution Check

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

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

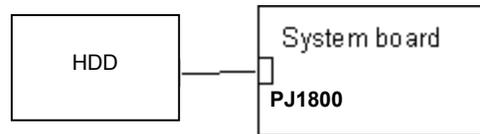
Table 2-5 2.5" HDD error code and status

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

Procedure 5 Connector Check and Replacement Check

The HDD is connected to the connector PJ1800 of the system board. The connecting portion may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks to check the connecting portion:

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



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

Check 2 The 2.5" HDD may be damaged. Replace it with a new one and check the operation. If the problem still exists, perform Check 3.

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

2.7 Keyboard Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

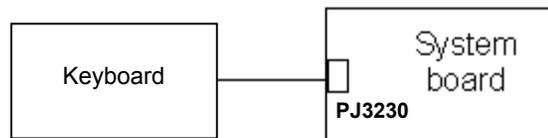
Execute the Keyboard Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

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

Procedure 2 Connector Check and Replacement Check

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

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



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

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

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

2.8 Display Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector and Cable Check

Procedure 3: Fuse Conduction Check

Procedure 4: Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

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

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

Procedure 2 Connector and Cable Check

The LCD module is connected to the system board through the LCD harness. The cable may be disconnected from each board or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*. If the connection is loose, reconnect firmly and repeat Procedure 2. If there is still an error, go to Procedure 3.

Procedure 3 Fuse Conduction check

Some fuses may be blown. To test the conduction of the fuse F2, F5000 and F5001 near the LCD I/F connector (PJ5205, PJ5206), disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*. If either fuse is blown, replace the system board repeat Procedure 3. If there is still an error, go to Procedure 4.

Procedure 4 Replacement Check

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

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

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

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

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

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

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

Check 6 The display controller of the system board may be damaged. Replace the system board with a new one.

2.9 Touch Pad Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 3: Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

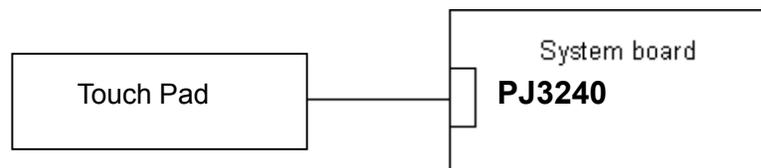
Execute the keyboard test program, or maintenance test program, because the pointing device (touch pad) test program is a component of the keyboard test program. For the operating procedure, see Chapter 3.

If any error is detected, perform Procedure 2. The pointing device is operating normally if no error is detected.

Procedure 2 Connector Check and Replacement Check

The touch pad is connected to the system board (PJ3240) with a flexible cable. This cable may have come off the connector or the connector may have come off the system board.

Disassemble the computer and check the cable connections. See Chapter 4 for the disassembly procedure. If the connector has come off, connect firmly and make sure the operation. If there is still an error, go to Procedure 3.



Procedure 3 Replacement Check

The touch pad may be damaged. Replace the touch pad.

2.10 Modem Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

Execute the Modem test program available as part of the maintenance test program. This program checks the modem. See Chapter 3 for information on how to perform the test.

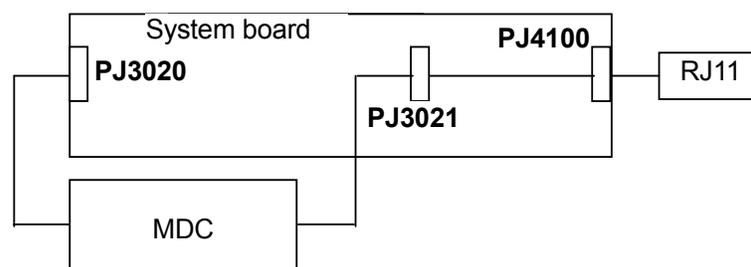
If any error is detected by the test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

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

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

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



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

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

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

2.11 LAN Troubleshooting

To check if the computer's LAN is defective or malfunctioning, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

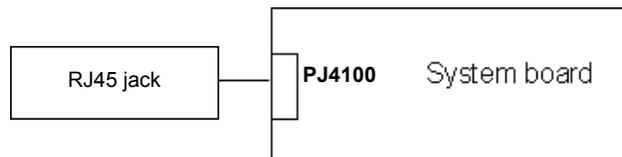
To check the LAN function, execute the Sound/LAN/modem test program subtest 04 (LAN test). See Chapter 3 for information on how to perform the test.

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

Procedure 2 Connector Check and Replacement Check

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

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



2.12 Sound Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check

Procedure 3: Replacement Check

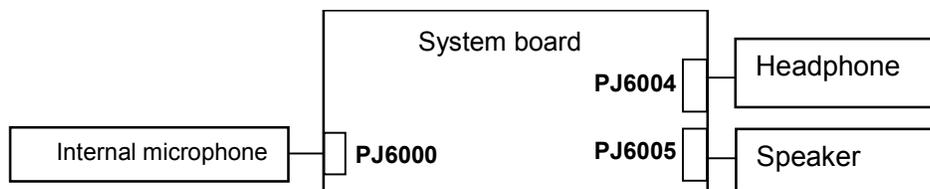
Procedure 1 Diagnostic Test Program Execution Check

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

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

Procedure 2 Connector Check

The speaker, internal microphones and headphone are connected to the system board shown in the following figure.



Check 1 Make sure the headphone cable is firmly inserted to the headphone jack (PJ6004 on the system board). If there is still an error, perform Check 2.

Check 2 The speaker cable may be disconnected. . Disassemble the computer following the steps described in Chapter 4 and make sure the speaker cable is connected to the PJ6005 of the system board. If there is still an error, perform Check 3.

Check 3 The internal microphone cables may be disconnected. . Disassemble the computer following the steps described in Chapter 4 and make sure the internal microphone cables are connected to the PJ6000 of the system board. If there is still an error, perform Procedure 3.

Procedure 3 Replacement Check

- Check 1 If any of the speaker and internal microphones is not working properly, the part may be faulty. Replace it with a new one following the step in Chapter 4. If there is still an error, go to Check 2.
- Check 2 The system board may be faulty. Replace it with a new one following the step in Chapter 4. If there is still an error, perform Check 3.
- Check 3 The headphone may be faulty. Replace it with a new one.

2.13 SD Card Slot Troubleshooting

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

Procedure 1: Check on Windows XP Tablet PC Edition

Procedure 2: Connector/Replacement Check

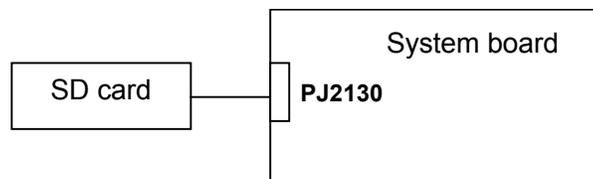
Procedure 1 Check on Windows XP Tablet PC Edition

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

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

Procedure 2 Connector/Replacement Check

The SD card is connected to the connector PJ2130 of the connector board.



- Check 1 The SD card and the system board may be disconnected. Make sure the SD card is firmly inserted to the PJ2130 of the system board. If the SD card is still not functioning properly, perform Check 2.
- Check 2 The SD card may be faulty. Replace it with a new one following the step in Chapter 4. If the problem continues, perform Check 3.
- Check 3 The system board may be faulty. Replace it with a new one following the step in Chapter 4.

2.14 Tablet Pen Troubleshooting

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

CAUTION: Use the supplied Tablet Pen in this test.

Procedure 1: Check on Windows XP Tablet PC Edition

Procedure 2: Replacement Check

Procedure 3: Connector/Replacement Check

Procedure 1 Check on Windows XP Tablet PC Edition

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

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

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

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

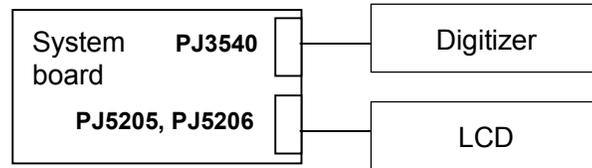
Procedure 2 Replacement Check

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

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

Procedure 3 Connector/Replacement Check

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



- Check 1 The Digitizer might not be connected. Make sure the Digitizer is connected to the PJ3540 on the system board. If there is still an error, go to Check 2.
- Check 2 The LCD might not be connected. Make sure the LCD is connected to the PJ5205 and PJ5206 on the system board. If there is still an error, go to Check 3.
- Check 3 The Digitizer, the LCD or the system board might be defective. Replace it with a new one following the steps in Chapter 4. Then check the tablet pen is working properly.

2.15 Wireless LAN Troubleshooting

To check if the Wireless LAN is good or no good, follow the troubleshooting procedures below as instructed.

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antennas' Connection Check

Procedure 3: Antenna Check

Procedure 4: Replacement Check

Procedure 1 Transmitting-Receiving Check

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

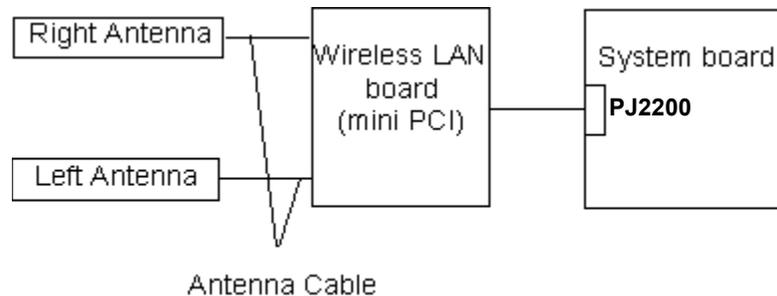
Check 1 Execute test program for the wireless LAN function to check the transmitting-receiving function of the wireless LAN. You will need a second computer that can communicate by the wireless LAN.

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

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

Procedure 2 Antennas' Connection Check

The wireless LAN function wiring diagram is shown below:



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

Check 1 The wireless LAN board and the system board may be disconnected. Make sure the wireless LAN board is firmly connected to the PJ2200 of the system board.

If the connector is disconnected, connect firmly and return to Procedure 1. If there is still an error, go to Check 2.

Check 2 Make sure the wireless LAN antennas (black and white) are firmly connected to the Wireless board. If the antennas are disconnected, connect firmly then return to Procedure 1. If there is still an error, perform Procedure 3.

Procedure 3 Antenna Check

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

Any of the connections may be disconnected. Disassemble the computer following the steps described in Chapter 4, perform the following checks

1. Disassemble the computer and disconnect the wireless LAN antennas (white and black) from the wireless LAN board. Refer to Chapter 4, *Replacement Procedures*, for detailed steps of disassembling
2. Connect the tester set up for impedance measurement to the antenna jig. Measure the white antenna's resistance
3. Determine the resistance. The antenna passes the test when the resistance is 5Ω or less. If it is more than 5Ω , the antenna is faulty.
4. Measure the black antenna's resistance. Check if there is faulty.

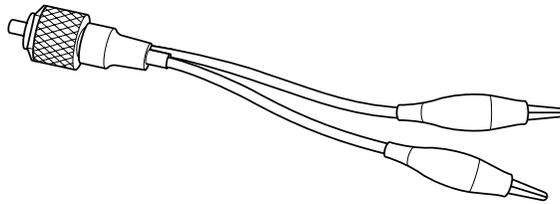


Figure 2-3 Antenna Test jig

Measurement Value	Pass/fail	Comment
5Ω or less	Pass	Include cable loss
More than 5Ω	Fail	The digital tester shows 0L ,etc. if there is a broken wire.

NOTE:

1. The resistances determined with the steps above may not be stable according to the length of the antenna. The impedance of the antenna itself is about 0.5 to 0.8 ohm.
2. The above steps cannot accurately determine the impedance of the antenna. Use an LC meter for a precise measure of impedance.

If each wireless antenna passes the above test, return the Wireless LAN module back, then perform Procedure 1.

If the wireless LAN has still an error, go to Procedure 4.

Procedure 4 Replacement Check

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

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

2.16 Bluetooth Troubleshooting

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

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antennas' Connection Check

Procedure 3: Antenna Check

Procedure 4: Replacement Check

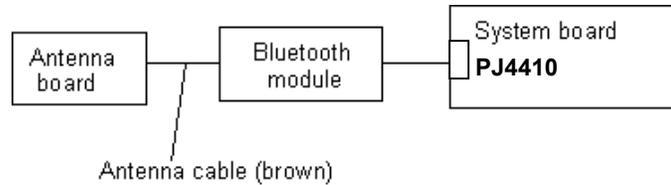
Procedure 1 Transmitting-Receiving Check

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

- Check 1 Execute test program IMCSPC73.EXE to check the BD_ADDR of the Bluetooth. Perform the test following the instructions described in Chapter 3, Bluetooth Test Program (IMCSPC73.EXE).
If the computer passes the test, the function is correctly working. If the computer does not pass the test, the Bluetooth board may be disconnected or damaged. Make sure the connector on the Bluetooth board is firmly connected to PJ4900 on the system board. And perform the test program IMCSPC73.EXE again.
If the computer still does not pass the test, go to check 2.
- Check 2 Execute test program IMCSPC53.EXE to check the transmitting-receiving function of the Bluetooth. You will need a second computer that can communicate by the Bluetooth. Perform the test following the instructions described in Chapter 3, Bluetooth Test Program (IMCSPC53.EXE).
If the computer passes the test, the function is correctly working.
If the computer does not pass the test, go to check 3.
- Check 3 The Bluetooth board may be defective or damaged. Replace it with a new one. And perform the test program again.
If the computer still does not pass the test, go to Procedure 2.

Procedure 2 Antennas' Connection Check

The Bluetooth function wiring diagram is shown below:



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

Check 1 Make sure the wireless communication switch is “On”.

If the switch is “Off”, turn it “On”. If the Bluetooth module is still not functioning properly, perform Check 2.

Check 2 Make sure the Bluetooth module is firmly connected to PJ4410 on the system board.

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

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

If the Bluetooth antenna cable is disconnected, connect it firmly and perform Procedure 1. If the Bluetooth function is still not functioning properly, go to Procedure 3.

Procedure 3 Antenna Check

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

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

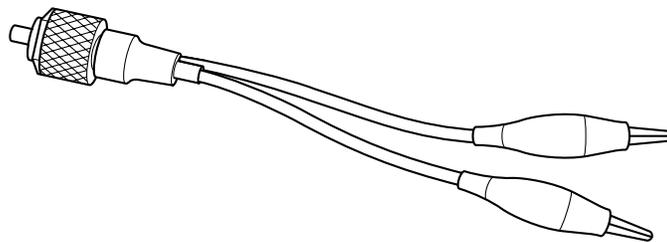


Figure 2-4 Antenna Test cable

NOTE:

1. The resistances determined with the steps above may not be stable according to the length of the antenna. The impedance of the antenna itself is about 0.5 to 0.8 ohm.
2. The above steps cannot accurately determine the impedance of the antenna. Use an LC meter for a precise measure of impedance.

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

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

Procedure 4 Replacement Check

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

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

