



Maintenance Manual

PORTEGE X40L-K Series

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Preface

This maintenance manual describes how to perform hardware service maintenance for the computer.

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

Safety Icons

Safety icons are used in this manual to bring important information to your attention. Each type of message is identified as shown below.



Indicates a potentially hazardous situation, which could result in death or serious injury, if you do not follow instructions.



A caution informs you that improper use of equipment or failure to follow instructions may cause data loss, equipment damage, or may result in minor or moderate injury.



Please read. A note is a hint or advice that helps you make best use of your equipment.

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

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

The manual is divided into the following parts:

Chapter 1

Hardware Overview describes the system unit and each FRU.

Chapter 2

Troubleshooting Procedures explains how to diagnose and resolve FRU problems.

Chapter 3

Test and Diagnostics describes how to perform test and diagnostic operations for maintenance service.

Chapter 4

Replacement Procedures describes the removal and replacement of the FRUs.

Appendices

The appendices describe the following:

- Handling the LCD module
- Board layout
- Keyboard scan/character codes
- Key layout
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- EC/KBC rewrite procedures
- Reliability

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Chapter 1

Hardware Overview

1.1 Features and System Unit Block Diagram

Dynabook Personal Computer uses extensive Large Scale Integration (LSI), and Complementary Metal-Oxide Semiconductor (CMOS) technology extensively to provide compact size, minimum weight, low power usage and high reliability. This computer incorporates the following features/major components.

There are some models and options. Refer to the Parts List for the configuration of each model and options.

The system unit configuration is shown below:

Figure 1-1 System unit configurations

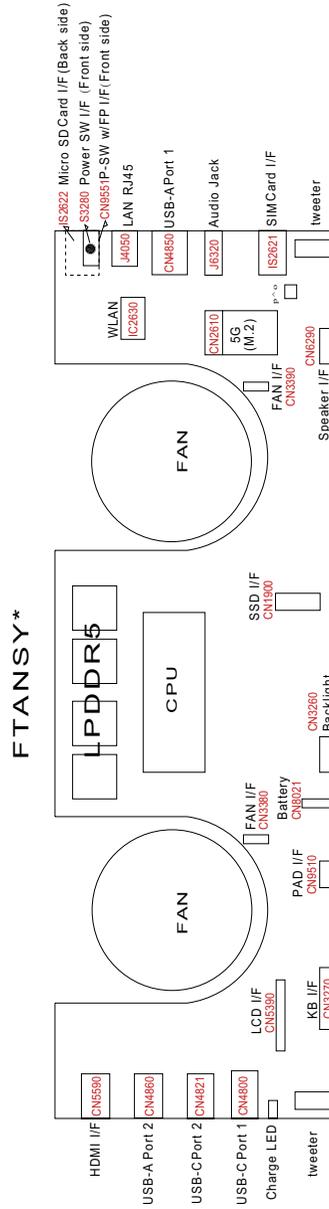
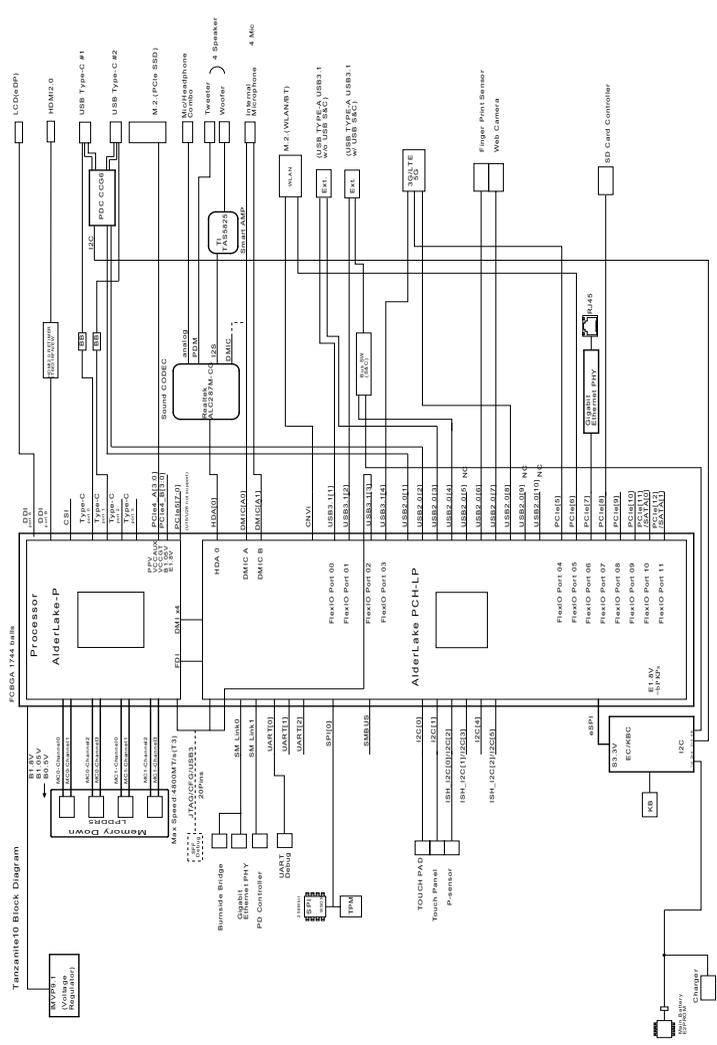


Figure 1-2 is a block diagram of the system unit.
 Figure 1-2 System unit block diagram



■ Microprocessor

The computer is equipped with an Intel® Processor.
 The PC is equipped with one of the following speeds:

Core Frequency	L3 Cache Size	Turbo	Number of cores/number of threads
i7-1280P 28W 6+8 vPro	24MB	4.8GHz	14/20
i7-1270P 28W 4+8 vPro	18MB	4.8GHz	8/16
i7-1260P 28W 4+8	18MB	4.7GHz	8/16
i5-1250P 28W 4+8 vPro	12MB	4.4GHz	8/16
i5-1240P 28W 4+8	12MB	4.4GHz	8/16

■ Memory

LPDDR5 on-board memory (8GB or 16GB, 32GB).

■ VGA Controller

The PC comes in with the following type:

- The internal graphics controller in Intel Processor (Core i*) is used.

■ SSD

The computer supports M.2 SSD. The following capacities are available.

- 256GB (PCIe I/F)
- 512GB (PCIe I/F)
- 1TB (PCIe I/F)

■ Display

The PC comes in with following type:

- 14" 16:10 FHD-TFT Anti-Glare type LCD 1920 X 1200

■ Keyboard

The computer's keyboard layouts are compatible with a 104/105-key enhanced keyboard - by pressing some keys in combination, all of the 104/105-key enhanced keyboard functions can be performed on the computer.

The number of keys available on your keyboard will depend on which country/region your computer is configured for, with keyboards being available for numerous languages.

In use there are different types of keys, specifically typewriter keys, function keys, hot keys, and Windows special keys.

■ Touch Pad

The Touch Pad located in the palm rest is used to control the movement of the on-screen pointer.

■ Battery

The computer has a rechargeable Lithium-Ion main battery pack. A part of this battery pack is used for RTC battery function.

■ Thunderbolt™ 4/USB Type-C™ port

Two Thunderbolt™ 4/USB Type-C™ ports, which support Thunderbolt™ 4 and USB 3.2 Gen2, are provided on your computer.

■ Universal Serial Bus (USB 3.2 Gen1) port

Two type-A Universal Serial Bus ports, which comply to the USB 3.2 standard, are provided on your computer. The USB 3.2 port is compliant with USB 3.2 Gen1 standard and backward compatible with USB 2.0 devices.

- HDMI out port

HDMI out port can connect with Type A connector HDMI cable.

- Memory media slot

This slot lets you insert a micro SD™/SDHC™/SDXC™ memory card.

- Sound system

The sound system is equipped with the following features:

- Stereo speakers: No-brand
- Built-in microphone (Webcam, provided with some models)
- Headphone/Microphone jack
- Corresponding to Cortana Premium Voice recognition rate
- Wireless LAN/Bluetooth, Wireless WAN

As a wireless module, Intel802.11ax supporting also bluetooth function is mounted.

Some models also support 3G/LTE function as wireless WAN function.

- Web Camera

Web Camera is a device that allows you to record video or take photographs with your computer. You can use it for video chatting or video conferences using a communication tool such as Windows Live Messenger. The Web Camera equipped on some models can support face recognition feature for Windows Hello.

- Sensors and others

- Finger print sensor: Integrated with Power button (BTO)
- EC/KBC (Embedded Controller/Keyboard Controller): SMSC ME C1632

1.2 SSD

1.2.1 M.2 SSD

The computer supports a 256GB, 512GB or 1TB SSD.

The SSD specifications are listed in below.

Table 1-1 M.2 SSD specifications (Phison)

Items	Specifications	
	G8BC000CJ251	G8BC000CJ511
Width (mm)	22.00 ± 0.15	22.00 ± 0.15
Height (mm)	1.35 Max	1.35 Max

Items	Specifications	
Depth (mm)	80.0 ± 0.15	80.0 ± 0.15
Weight (g)	6.9 Max	6.9 Max
Storage size (formatted)	256GB	512GB
	G8BC000CX250	G8BC000CX510
Width (mm)	22.00 ± 0.15	22.00 ± 0.15
Height (mm)	2.15 Max	2.15 Max
Depth (mm)	80.0 ± 0.15	80.0 ± 0.15
Storage size (formatted)	256GB	512GB

Table 1-2 M.2 SSD specifications (Samsung)

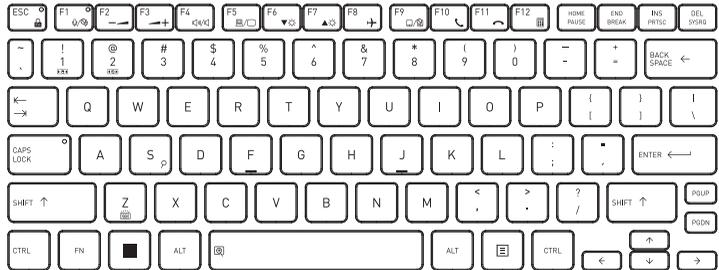
Items	Specifications	
	G8BC000CT250	G8BC000CL510
Width (mm)	22.00 ± 0.15	22.00 ± 0.15
Height (mm)	2.38 Max	2.38 Max
Depth (mm)	80.0 ± 0.15	80.0 ± 0.15
Weight (g)	6.0 Max	6.0 Max
Storage size (formatted)	256GB	512GB
	G8BC000CS510	G8BC000CS1A0
Width (mm)	22.00 ± 0.15	22.00 ± 0.15
Height (mm)	2.38 Max	2.38 Max
Depth (mm)	80.0 ± 0.15	80.0 ± 0.15
Weight (g)	9.0 Max	9.0 Max
Storage size (formatted)	512GB	1TB

1.3 Keyboard

The computer's keyboard layouts are compatible with a 104/105-key enhanced keyboard - by pressing some keys in combination, all of the 104/105-key enhanced keyboard functions can be performed on the computer.

Figure 1-3 is a view of the keyboard. See Appendix E about the layout of the keyboard.

Figure 1-3 Keyboard



1.4 Display

The display consists of 14-inch FHD LCD module.

1.4.1 LCD Module

The LCD module used for the TFT color display uses a backlight as the light source and can display a maximum of 16M colors with 14-inch FHD (1920x1200) resolutions.

Figure 1-4 shows a view of the LCD module and Table 1-3 lists the specifications.

Figure 1-4 LCD module

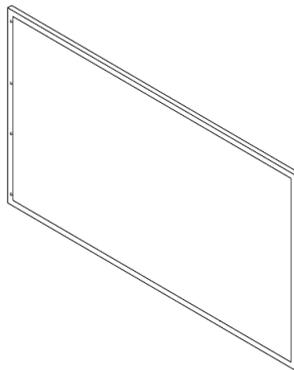


Table 1-3 LCD module specifications

Item	G33C000AX110
Number of Dots	1920(W) × 1200(H)
Dot pitch (mm)	0.157(H)×0.157(V)
Active area (mm)	301.59(W) × 188.49(H)
Outline (mm)	306.59 x 205w/PWB(H) x 2.1 max(D)

1.5 Power Supply

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

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

The power supply output rating is specified in below.

Figure 1-5 Power supply output rating

ACPI state		S0	S0x	S4		S5		G3	使用先
M state		M0	M0x	M3	Moff	M3	Moff		
電圧	Sig. Name								
P	0.1.8V 可変	PPV	O/x (*)	x	x	x	x	x	Processor (VCCCORE)
	0.1.8V 可変	VCCAUX-PPV	O/x (*)	O/x (*)	x	x	x	x	Processor (VCCNAUX)
	0.1.8V 可変	HGD-PGV	O/x (*)	x	x	x	x	x	Processor (VCCGT)
	1.8	BND1R8-P1V	O	O	x	x	x	x	Audio CODEC
	3.3	P3V	O	O	x	x	x	x	PCIe SSD, Camera, Click Pad, HDMI
		SDCD-P3V	O	O	x	x	x	x	SD Card Cont. (Bayhub1C2210)
		FMC-P3V	O	O	x	x	x	x	SD Card Cont. (Realtek1C2200)
		PNL-P3V	O	O	x	x	x	x	LCD Panel
	5.0	P5V	O	O	x	x	x	x	KB, FAN, Audio
		SMCD-P5V	O	O	x	x	x	x	Smart card
		HDMI-P5V	O	O	x	x	x	x	HDMI
		KBKBLT-P5V	O	O	x	x	x	x	KB Backlight
	10V	AMP-PAV	O	O	x	x	x	x	SMT AMP
	B	1.05S 可変	1R0S-E1V	O	O	x	x	x	x
0.5 可変		0RS-B0V	O	O	x	x	x	x	LPDDR5 On-board(VDD0)
1.7-1.95v 可変		1R8-B1V	O	O	x	x	x	x	LPDDR5 On-board(VDD1)
E	1.05	1R0SP0C-E1V	O	O	x	x	x	x	PCH (VCC1P0S_PROC)
	1.05	V1P0SE-EYV	O	O	x	x	x	x	PCH
	0.78V	WNEXT-EYV	O	O	x	x	x	x	PCH
	1.8	1R8-E1V	O	O	x	x	O/x (*)	O/x (*)	PCH(VCCA_CLKLDO_1P8,VCCPRIM_1P8), EC/KB, HDMI2.0
	3.3	E3V	O	O	x	x	O/x (*)	O/x (*)	PCH(VCCPRIM_3p3,VCCPDSW_3P3,VCCST0_VP0,SPI_RGM,BBR_SPI,TPM,VLAN_S0)
		LAN-E3V	O	O	x	x	O/x (*)	O/x (*)	LAN
		WWAN-E3V	O	O	x	x	x	x	5G
	5.0	E5V	O	O	x	x	O/x (*)	O/x (*)	HDMI, Type-C VBUS, F_PD01
		US3PS1-E5V	O	O	x	x	x	x	USB Type-A Port#1 (S&C)
		US3PS2-E5V	O	O	x	x	x	x	USB Type-A Port#2
S	3.3	S3V	O	O	O	O	O	O	EC/NC, Thermal Sensor, LID Sensor, PD Controller, EC Debug port
	5	MSV	O	O	O	O	O	O	LEDs
	2.5,4.7	R3V	O	O	O	O	O	O	PCNVCCRTC

ブルアップ電源、フィルタ、電流測定用抵抗通過の電源、チップセットが生成する電源、およびサブシステム回路部でクローズするものを除く

(*) x : Package C9,C10 State

(2) x : マネリ省電力機能動作時

(3) O : Wake up enable

(4) O/x : O : Premium power map, X:Volume power map

1.6 Batteries

The computer has one battery as follows:

■ Main battery pack

The battery specifications are listed in below.

Table 1-4 Battery specifications

Battery name	Parts Code	Material	Output voltage	Capacity
Main battery	G71C000MT110	Lithium-Ion	15.4 V	65Wh, 4 cell
	G71C000MV110	Lithium-Ion	TBD	65Wh, 4 cell

1.6.1 Main Battery

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

1.6.2 Battery Charging Control

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

Battery Charge

When the AC adaptor is attached, there are two types of charge: When the system is powered off and when the system is powered on. [Table 1-5](#) lists the charging time required for charges.

Table 1-5 Time required for charges

Battery type	Power off	Power on
Battery (65Wh, 4 cell)	about 3.5 hours	about 3.5 to 10.0 hours



The time required when the system is powered on is affected by the amount of power the system is consuming. Use of the fluorescent lamp and frequent disk access diverts power and lengthens the charge time.

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

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

Data preservation time

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

Table 1-6 Data preservation time

Battery type	Sleep Mode	Shut Down Mode
Battery (65Wh, 4 cell)	about 13 to 8days	about 60 days

1.7 AC adaptor

The AC adaptor is also used to charge the battery. At the charging, connect it to Thunderbolt 4/USB Type-C connector on the PC or to the USB Type-C adapter. It corresponds to USB-PD.

Table 1-7 AC adaptor specifications

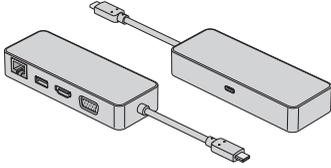
Parameter	Specification	
	USB-C straight	
	G71C000LR310 (2-pin)	G71C000LS310 (3-pin)
Power	65W	
Input voltage	100V/240V	
Input frequency	50Hz to 60Hz	
Input current	1.5 A (100V-240V)	
Output voltage	5 ~ 20 V	
Output current	3 A (Peak 3.25 A)	

1.8 USB Type-C Adapter

To expansion the PC functions, some USB Type-C adapters are prepared.

Table 1-8 lists the USB Type-C adapter specifications.

Table 1-8 USB Type-C adapter specifications

Item	Specifications
Maker	Goodway
Appearance	
Specifications	USB-C to HDMI/VGA Travel Adapter
Parts code	G83C000L2110
Functions	USB 3.0 port/HDMI out port/RGB monitor port/LAN jack/USB Type-C port (Power Delivery Charging)

Chapter 2

Troubleshooting Procedures

2.1 Troubleshooting

This chapter 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 here are as follows:

1. Power supply
2. System Board
3. USB
4. M.2 SSD
5. Keyboard
6. Touch Pad (Click Pad)
7. Display
8. LAN
9. Wireless LAN + Bluetooth
10. Sound
11. Memory media (SD Card) slot
12. Fingerprint sensor
13. Web camera
14. HDMI
15. USB Type-C adapter

* Please note that some units are installed only on some models.

The Test Program operations are described in Chapter 3, [Tests and Diagnostics](#). Detailed [Replacement Procedures](#) are described in Chapter 4.



Before exchanging a system board, write down the DMI information on TOP Menu. Register this DMI information after exchanging a system board by performing “DMI Entry utility” in the test program. For details, refer to [3.3 Entry of the DMI information](#).

Also update with the latest EC/KBC as described in Appendix H “EC/KBC Rewrite Procedures”.

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

2.2 Troubleshooting Flowchart

Use the flowchart in [Figure 2-1](#) and [Figure 2-2](#) 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 has been registered and, if so, ask him or her to enter the password.
- Verify with the customer that Windows is installed on the hard disk. Non-Windows operating systems can cause the computer to malfunction.
- Make sure all optional equipment is removed from the computer.
- If the USB Type-C adapter is bundled with the tested computer, connect the AC adapter via the Type-C adapter.

Figure 2-1 Troubleshooting flowchart (1/2)

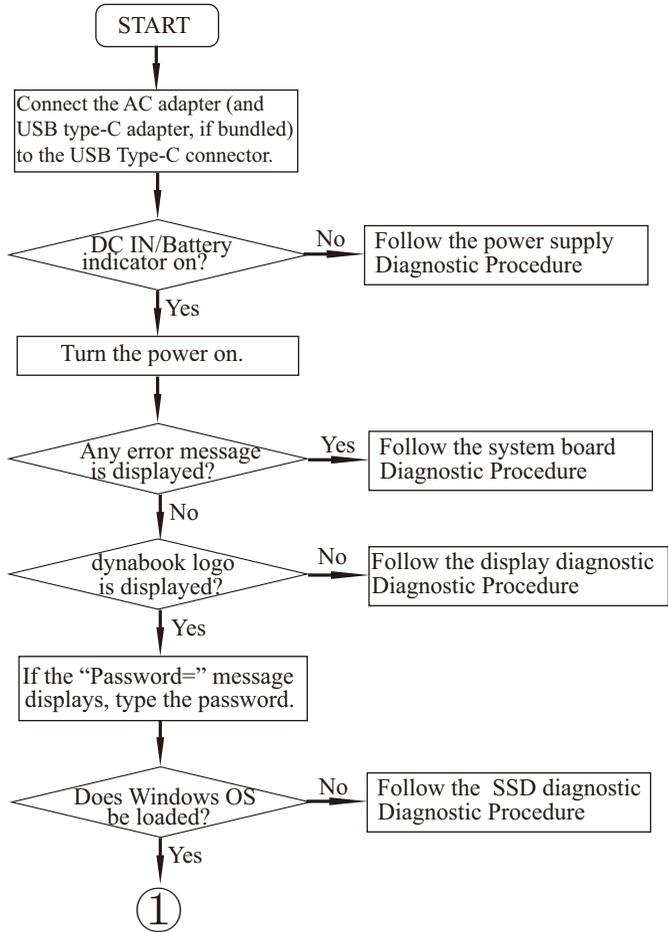
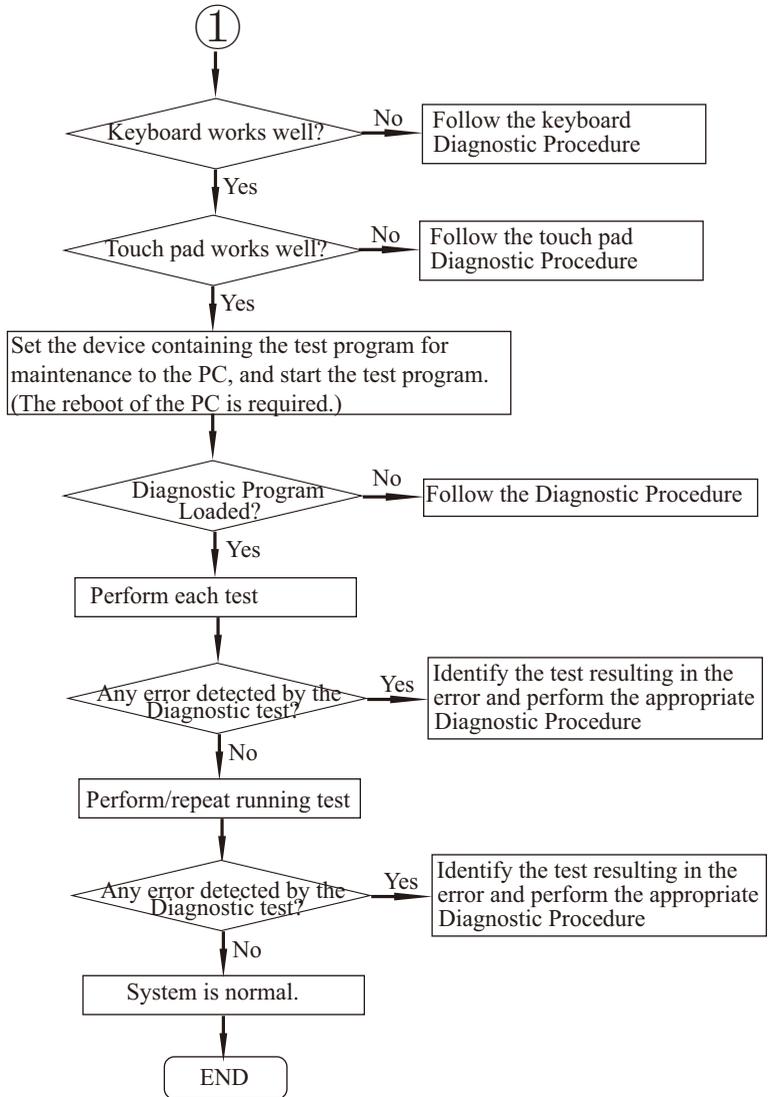


Figure 2-2 Troubleshooting flowchart (2/2)



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), and then perform the appropriate troubleshooting procedures as follows:

1. If an error is detected on the power supply, perform the power supply Troubleshooting Procedures in [2.3 Power Supply Troubleshooting](#).
2. If an error is detected by an error message or a Memory test, perform the System Board Troubleshooting Procedures in [2.4 System Board Troubleshooting](#).
3. If an error is detected on the USB, perform the USB Troubleshooting Procedures in [2.5 USB Troubleshooting](#).
4. If an error is detected on SSD test, perform the SSD Troubleshooting Procedures in [2.6 SSD Troubleshooting](#).
5. If an error is detected on the Keyboard test, perform the Keyboard Troubleshooting Procedures in [2.7 Keyboard Troubleshooting](#).
6. If an error is detected on the Touch Pad test, perform the touch pad Troubleshooting Procedures in [2.8 Touch Pad \(Click Pad\) Troubleshooting](#).
7. If an error is detected on the LCD Panel test, perform the Display Troubleshooting Procedures in [2.9 Display Troubleshooting](#).
8. If an error is detected on the LAN test, perform the LAN Troubleshooting Procedures in [2.10 LAN Troubleshooting](#).
9. If an error is detected on the Wireless LAN + Bluetooth test, perform the Wireless LAN + Bluetooth Troubleshooting Procedures in [2.11 Wireless LAN + Bluetooth Troubleshooting](#).
10. If an error is detected on the sound, perform the Sound Troubleshooting Procedures in [2.12 Sound Troubleshooting](#).
11. If an error is detected on the Memory media (SD Card) Slot, perform the Memory media (SD Card) Slot troubleshooting Procedures in [2.13 Memory media \(SD Card\) Slot Troubleshooting](#).
12. If an error is detected on the Fingerprint sensor, perform the Fingerprint sensor Troubleshooting Procedures in [2.14 Fingerprint sensor Troubleshooting](#).
13. If an error is detected on the Web camera, perform the Web camera Troubleshooting Procedures in [2.15 Web camera Troubleshooting](#).
14. If an error is detected on the HDMI port, perform the HDMI Port Troubleshooting Procedures in [2.16 HDMI Port Troubleshooting](#).
15. If a malfunction is detected on the USB Type-C adapter, perform the USB Type-C adapter Troubleshooting Procedures in [2.17 USB Type-C adapter Troubleshooting](#).

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:

[2.3.1 Procedure 1 Power Status Check](#)

[2.3.2 Procedure 2 Error Code Check](#)

[2.3.3 Procedure 3 Connection Check](#)

[2.3.4 Procedure 4 Charging Check](#)

[2.3.5 Procedure 5 Replacement Check](#)

2.3.1 Procedure 1 Power Status Check

The following icons indicate the power supply status:

- DC IN/Battery indicator
- Power indicator

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

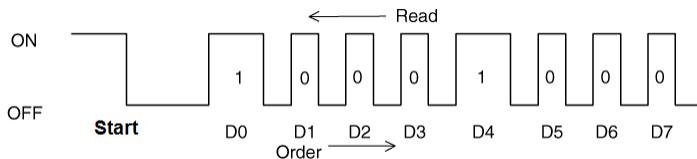
Table 2-1 DC IN/Battery indicator

DC IN/Battery indicator	Power supply status
Amber	Indicates the AC adaptor is connected and the battery is charging.
White	Indicates the AC adaptor is connected and the battery is fully charged.
Flashing Amber	The battery charge is low. The AC adaptor must be connected in order to recharge the battery.
Flashing White	Indicates a problem with the computer.
Doesn't light	Any condition other than those above.

Table 2-2 Power indicator

Power indicator	Power supply status
White	Indicates power is being supplied to the computer and the computer is turned on.
Doesn't light	Any condition other than those above.

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



Check 1 Convert the DC IN/battery indicator blink pattern into the hexadecimal error code and compare it to the figure below.

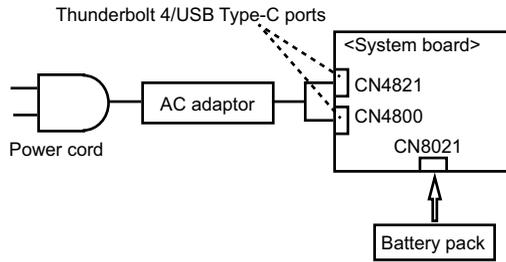
Figure 2-3 Error code

Abnormal definition	Error code	Conditions
AC adapter [0A] offset value abnormal	10h	$51.59\text{mv} \leq \text{A/D value} - \text{default value} $
AC adapter power supply over rating	11h	AC exist and AC adapter output current over DCIN upper limit
AC adapter current over upper limit	12h	AC exist & all power supply off(no wakeup factor) & charge stop&AC adapter output current over 0.5A
AC adapter voltage over upper limit in PC side	13h	During power on status, system voltage over PC side AC adapter upper limit
AC adapter voltage over upper limit in dock side	14h	During power on status, system voltage over dock side AC adapter upper limit
E power output error during power on process	20h	During power on process, PCNFEV signal still de-assertion timeout more than 1s after EVON signal assertion.
E power output error during power on status	21h	During power on status, PCNFEV signal change to deassertion.
E power output error during power off status (output inactive)	22h	During power off (PS3/PS4 with wakeup factor) status, PCNFEV signal change to deassertion.
E power output error during power off status (output active)	23h	During power off (S5) status, PCNFEV signal change to assertion.
B power output error during power on process	30h	During power on process, PCNFBV signal timeout more than 1s after EVON signal assertion.
B power output error during power on status	31h	During power on status, PCNFBV signal change to deassertion.
B power output error during power off status (output inactive)	32h	During power off (PS3) status, PCNFBV signal change to deassertion.
B power output error during power off status (output active)	33h	During power off (S5) status, PCNFBV signal change to assertion.

2.3.3 Procedure 3 Connection Check

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

Figure 2-4 Connection Check



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

- Check 1 Make sure the AC adaptor and the AC power cord are connected firmly each other and to the outlet and computer. If these cables are connected firmly, go to Check 2.
- Check 2 Replace the AC adaptor and the AC power cord with new ones.
- 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 or flashes white, go to Procedure 4.

2.3.4 Procedure 4 Charging Check

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

- Check 1 The battery pack may be completely discharged. Wait a few minutes to charge the battery pack while connecting the battery pack and the AC adaptor. If the battery pack is still not charged, go to Check 2.
- Check 2 The battery's temperature is too high or low. Leave the battery for a while to adjust it in the right temperature. If the battery pack is still not charged, go to Procedure 5.

2.3.5 Procedure 5 Replacement Check

The power is supplied to the system board by the AC adaptor or the battery pack. If one of them was damaged, perform the following Checks.

To disassemble the computer, follow the steps described in Chapter 4, [Replacement Procedures](#).

When AC adaptor is connected:

- Check 1 AC adaptor may be faulty. Replace the AC adaptor with a new one. If the problem still occurs, perform Check 2.
- Check 2 System board may be faulty. Replace the system board with a new one.

When AC adaptor is not connected (while powered by the battery pack):

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

2.4 System Board Troubleshooting

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

[2.4.1 Procedure 1 Message Check](#)

[2.4.2 Procedure 2 Diagnostic Test Program Execution Check](#)

[2.4.3 Procedure 3 Replacement Check](#)

2.4.1 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.

Check 1

If one of the following error messages is displayed on the screen, press a key or button specified by the message.

If you press the key or button, the SETUP screen will appear. Set the correct date and time. If the following error message appears often at power-on, replace the battery pack or RTC battery (if RTC battery is installed).

If any other error message other than below is displayed, perform Check 2.

- (a)**** Date and Time reset to default ****
Press [F2] key to set Date and Time.
- (b)**** Date and Time reset to default ****
Press Windows button to set the Date/Time in OS.
- (c)**** Date and Time reset to default ****
Press ENTER to set Date and Time.

Check 2

If the following error message is displayed on the screen, perform Check 3. If any other error message is displayed, perform Procedure 3.

Insert system disk in drive.

Press any key when ready....

Please check if the Boot Mode is correct in the BIOS settings.

The BIOS settings menu is launched by pressing the [F2] key after you reboot.

Check 3

A device without any system information is installed and it may be designated as the boot device. Remove the device, press any key and reboot the computer. At the reboot, press **F2** to display the BIOS setup screen. Set the correct boot device and repeat Procedure 1. If any error occurs or any device is not installed, go to Procedure 2.

2.4.2 Procedure 2 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 Diagnostics* for more information on how to perform these tests.

Table 2-3 Main Test Menu

Test No	Test Name	Sub Test No	Sub Test Name
1	MEMORY	1	Main Memory Test
		2	V-RAM Memory Test
2	HDD/SSD Test	1	Sequential Read Test
		2	Partial Read Test
		3	Address Jump Test
		4	Address Uniqueness Test
		5	Specify Address Test
3	Keyboard Test	1	Key-code Test
		2	Touch Pad Test
4	LCD Panel Test	1	LCD Panel Test
		2	All dot on/off for LCD
		3	H - pattern display
		4	LCD brightness
5	Battery Charge Test		
6	Fan Test		
7	Acceleration Sensor Test		
8	EXIT to TOP Menu		

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

2.4.3 Procedure 3 Replacement Check

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

2.5 USB Troubleshooting

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

[2.5.1 Procedure 1 The test program reading check for maintenance by a USB unit](#)

[2.5.2 Procedure 2 Connector Check and Replacement Check](#)

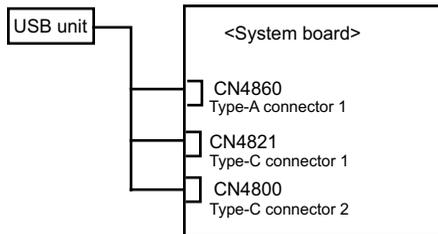
2.5.1 Procedure 1 The test program reading check for maintenance by a USB unit

USB connector and the test program for maintenance is read. If the test program cannot be executed on the computer, go to Procedure 2.

2.5.2 Procedure 2 Connector Check and Replacement Check

USB unit is connected to USB port System board. The connection of the cable and board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4, [Replacement Procedures](#) and perform the following checks.

Figure 2-5 Connection Check



Check 1

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



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

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

Check 2

Connect USB unit to other USB port and check if it works properly. If it does not work properly, perform Check 3

Check 3

USB unit may be faulty. Replace it with a new one. If the problem still occurs, perform Check 4

Check 4

System board may be faulty. Replace it with a new one following the steps in Chapter 4, [Replacement Procedures](#).

2.6 SSD Troubleshooting

To check if the M.2 SSD is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check



The contents of the SSD will be erased when the SSD troubleshooting procedures are executed. Save the required contents of the SSD to other storage drive in advance. For the backup, refer to the User's Manual.

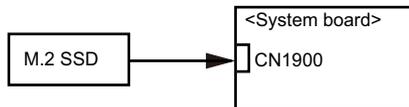
2.6.1 Procedure 1 Diagnostic Test Program Execution Check

The SSD test program is stored in the Diagnostic Test Program. Perform all of the SSD tests in the SSD Test. Refer to Chapter 3, [Tests and Diagnostics](#), for more information about the SSD test program.

2.6.2 Procedure 2 Connector Check and Replacement Check

The SSD may be disconnected, or the SSD or system board may be damaged. Disassemble the computer following the steps described in Chapter 4, [Replacement Procedures](#) and perform the following checks:

1. Check 1 Make sure the M.2 SSD is firmly connected to CN1900 on the system board.



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

2. Check 2 The M.2 SSD may be damaged. Replace it with a new one following the instructions in Chapter 4, [Replacement Procedures](#) and check the operation. If the problem still exists, perform Check 3.
3. Check 3 System board may be faulty. Replace it with a new one following the instructions in Chapter 4, [Replacement Procedures](#)

2.7 Keyboard Troubleshooting

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

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

2.7.1 Procedure 1 Diagnostic Test Program Execution Check

Execute the Keyboard Test, pressed key display test and Touch Pad test in the Diagnostic Program. Refer to Chapter 3, [Tests and Diagnostics](#), for more information on how to perform the test program.

Press Fn+Z key after starting Windows. By repeating the key operation twice, it checks that keyboard illuminations light up or put out the light.

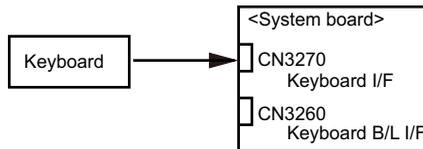
If an error occurs, go to Procedure 2. If an error does not occur, keyboard is functioning properly.

2.7.2 Procedure 2 Connector Check and Replacement Check

The connection of cable and board may be disconnected or faulty. Disassemble the computer following the steps described in Chapter 4, [Replacement Procedures](#), and perform the following checks:

Check 1

Make sure keyboard cable is firmly connected to CN3270 and CN3260 on the system board.



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

Check 2

System board may be faulty. Replace it with a new one following the instructions in Chapter 4, [Replacement Procedures](#). If the problem still occurs, perform Check 3.



Exchange the system board first as the INSU KB attached to KB and the used KB is impossible to reuse.

Check 3

Keyboard may be faulty. Replace it with a new one following the instructions in Chapter 4, [Replacement Procedures](#).

2.8 Touch Pad (Click Pad) Troubleshooting

To check if the computer's Touch Pad (Click Pad) is malfunctioning or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check

Procedure 3: Replacement Check

2.8.1 Procedure 1 Diagnostic Test Program Execution Check

Execute the Keyboard test, pressed key display test and Touch pad test in the Diagnostic Program. Refer to Chapter 3, [Tests and Diagnostics](#), for more information on how to perform the test program.

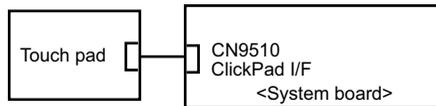
If an error occurs, go to Procedure 2. If an error does not occur, touch pad is functioning properly.

2.8.2 Procedure 2 Connector Check

The connection of the Touch Pad (Click Pad) and board may be defective. Otherwise, they may be faulty. Disassemble the computer following the steps described in Chapter 4, [Replacement Procedures](#), and perform the following checks:

Check 1

Make sure the cable are firmly connected to the system board.



If the connection is loose, reconnect firmly and repeat Procedure 1. If the problem still occurs, go to Procedure 3.

2.8.3 Procedure 3 Replacement Check

- If Touch Pad (Click pad) does not work properly, perform check 1.

Check 1

Touch Pad (Click Pad) or the cable(s) may be faulty. Replace them with new ones following the instructions in Chapter 4, [Replacement Procedures](#). If the problem still occurs, go to Check 2.

Check 2

System board may be faulty. Replace it with a new one following the instructions in Chapter 4, [Replacement Procedures](#).

2.9 Display Troubleshooting

This section describes how to determine if the computer's display is functioning properly.

To check the touch function, start with Procedure 1. To check the display function, start with Procedure 2.

Procedure 1: Check on Windows OS

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Replacement Check

2.9.1 Procedure 1 Check on Windows OS

This procedure checks if the touch screen (provide with some models) is working properly by using the function of Windows.

Check 1

Make sure the mouse cursor is following your finger when you move your finger 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 the display with the finger. If it does not work properly, go to Procedure 2.

2.9.2 Procedure 2 Diagnostic Test Program Execution Check

Execute the Display Test, pressed LCD panel test in the Diagnostic Program. See Chapter 3, [Tests and Diagnostics](#) for information on how to perform the test.

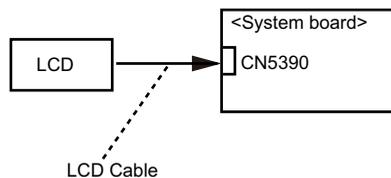
If an error is detected in the test, go to Procedure 3. If no error is detected, the display itself is normal.

2.9.3 Procedure 3 Connector Check and Replacement Check

The connection among LCD and board may be disconnected or faulty. Disassemble the computer following the steps described in Chapter 4, [Replacement Procedures](#), and perform the following checks:

Check 1

Make sure the LCD cable is securely connected to CN5390 on the system board.



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

Check 2

The LCD cable may be damaged. Replace it with a new one following the instructions in Chapter 4, [Replacement Procedures](#) and test the display again. If the problem still exists, perform Check 3.

Check 3

The LCD module may be damaged. Replace it with a new one following the instructions in Chapter 4, [Replacement Procedures](#) and test the display again. If the problem still exists, perform Check 4

Check 4

The display controller on the system board may be damaged. Replace the system board with a new one following the instructions in Chapter 4, [Replacement Procedures](#).

2.10 LAN Troubleshooting

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

Procedure 1: Check on Windows OS

Procedure 2: Connector Check and Replacement Check

2.10.1 Procedure 1 Check on Windows OS

This procedure checks if the LAN function is working properly by using the function of Windows.

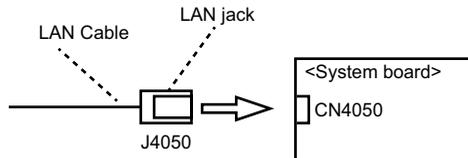
If any error is detected by the test, go to Procedure2.

2.10.2 Procedure 2 Connector Check and Replacement Check

LAN cable is connected to system board. If LAN malfunctions, the connection of the cable and board may be defective. Otherwise, they may be faulty.

Check 1

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



Check 2

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

Check 3

LAN jack may be faulty. Replace it with a new one following the instruction in Chapter 4, [Replacement Procedures](#). If the problem still occurs, perform Check 4.

Check 4

System board may be faulty. Replace it with a new one following the instruction in Chapter 4, [Replacement Procedures](#).

2.11 Wireless LAN + Bluetooth Troubleshooting

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

Procedure 1: Module/Antennas' Check

Procedure 2: Connection Check

Procedure 3: Replacement Check

2.11.1 Procedure 1 Module/Antennas' Check

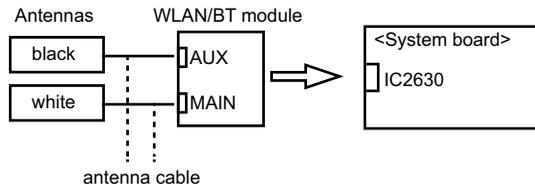
Check 1

This procedure checks if the Wireless LAN and Bluetooth is working properly by using the function of Windows. Refer to Chapter 3, [Tests and Diagnostics](#) for more information.

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

2.11.2 Procedure 2 Connection Check

The wireless LAN/Bluetooth module's wiring diagram is shown below:



Any of the connections may be defective. Disassemble the computer following the steps described in Chapter 4, [Replacement Procedures](#), and perform the following checks:

Check 1

Make sure that antenna cables for wireless function (black and white) are firmly connected to the connectors on the module. If the cables are not connected properly, connect them firmly and perform Procedure 1. If the problem still occurs, go to the Procedure 3.

2.11.3 Procedure 3 Replacement Check

Wireless LAN/Bluetooth module, antenna for wireless function or system board may be faulty. Refer to Chapter 4, [Replacement Procedures](#), for instructions on how to disassemble the computer and then perform the following checks:

Check 1

Wireless LAN/Bluetooth Combo module may be faulty. Replace System board with new one following the instructions in Chapter 4, [Replacement Procedures](#). If the problem still occurs, perform Check 2.

Check 2

The antennas for wireless function may be faulty. Replace them with new ones following the instructions in Chapter 4, [Replacement Procedures](#). If the problem still occurs, perform Check 3.

2.12 Sound Troubleshooting

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

Procedure 1: Check on Windows OS

Procedure 2: Connector Check

Procedure 3: Replacement Check

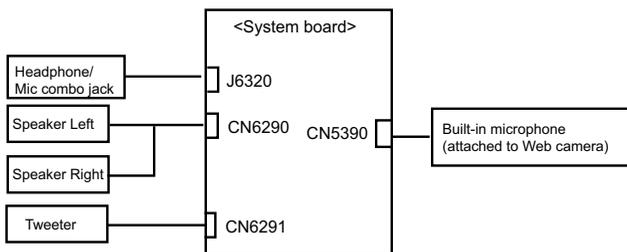
2.12.1 Procedure 1 Check on Windows OS

This procedure checks if the Sound is working properly by using the function of Windows.

If any error is detected, go to Procedure 2.

2.12.2 Procedure 2 Connector Check

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



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

If the problem still occurs, go to Procedure 3.

2.12.3 Procedure 3 Replacement Check

- If headphone (HP/Mic Combo Jack in) does not work properly, perform Check 1.
- If external microphone does not work properly, perform check 2.
- If built-in microphone (Web camera) does not work properly, perform check 3.
- If Speaker Right/Left does not work properly, perform check 4.
- If Tweeter does not work properly, perform check 5.

Check 1

Headphone (HP/Mic Combo Jack in) may be faulty. Replace it with a new one following the steps in Chapter 4, [Replacement Procedures](#). If the problem still occurs, perform Check 6.

Check 2

External microphone (HP/Mic Combo Jack in) may be faulty. Replace it with a new one following the steps in Chapter 4, [Replacement Procedures](#). If the problem still occurs, perform Check 6.

Check 3

Built-in microphone (Web camera) may be faulty. Replace it with a new one following the steps in Chapter 4, [Replacement Procedures](#). If the problem still occurs, perform Check 6.

Check 4

Speaker Right/Left or harness may be faulty. Replace it with a new one following the steps in Chapter 4, [Replacement Procedures](#). If the problem still occurs, perform Check 6.

Check 5

Tweeter or harness may be faulty. Replace it with a new one following the steps in Chapter 4, [Replacement Procedures](#). If the problem still occurs, perform Check 6.

Check 6

System board may be faulty. Replace it with a new one following the instructions in Chapter 4, [Replacement Procedures](#).

2.13 Memory media (SD Card) Slot Troubleshooting

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

Procedure 1: Check on Windows OS

Procedure 2: Connector Check and Replacement Check

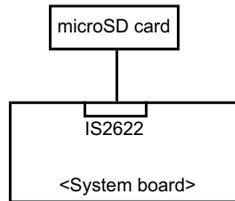
2.13.1 Procedure 1 Check on Windows OS

Insert a microSD Card into the slot. Check if the installed Windows recognizes automatically the microSD Card and the data in the microSD Card can be read.

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

2.13.2 Procedure 2 Connector Check and Replacement Check

The Memory media (microSD Card) connection is shown in the following figure.



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

If the problem still occurs, go to Check 1.

Check 1

Memory media (microSD Card) may be disconnected. Make sure the Memory media is firmly inserted to IS2622. If not, insert it firmly. If the it is still not functioning properly, perform Check 2.

Check 2

Memory media (microSD Card) may be faulty. Replace it with a new one following the step in Chapter 4 [Replacement Procedures](#). If the problem continues, perform Check 3.

Check 3

System board may be faulty. Replace it with a new one following the step in Chapter 4 [Replacement Procedures](#).

2.14 Fingerprint sensor Troubleshooting



To delete the account for confirming the fingerprint operation, it is necessary to log on by the account with the management authority. If the sign-in password has been set, ask the password to the user beforehand.

To check if the Fingerprint sensor works correctly or not, follow the troubleshooting procedures below as instructed.

When failed in Procedure 1 to Procedure 3, execute Procedure 4.

Procedure 1: Setting Windows sign-in password

Procedure 2: Registration of PIN and fingerprint

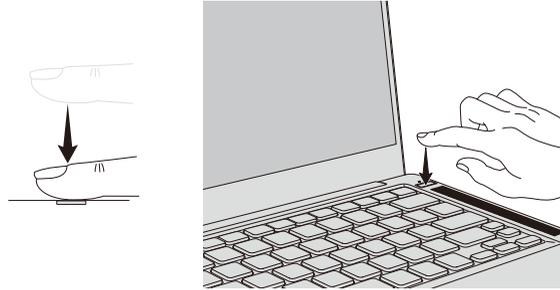
Procedure 3: Authentication of fingerprint

Procedure 4: Connector Check and Replacement Check

Scan your finger shown below:

Straight your finger and touch the center of the fingerprint sensor lightly and lift your finger.

Figure 2-6 Scan the finger



2.14.1 Procedure 1 Setting Windows sign-in password

To use the fingerprint functions, registration of your fingers on “Windows Hello” after setting the Windows sign-in password and PIN.

2.14.2 Procedure 2 Registration of PIN and fingerprint

1. Sign-in to a user account where you want to register the fingerprint information.
2. Click [Start] button.
3. Click [Settings].
4. Click [Accounts] -> [Sign-in options].
5. Click [Add] of [Windows Hello PIN].
The message to confirm the account's password will appear.
6. Input the Windows password to [Password] and click [OK] button.
The display to set PIN will appear.
7. Input numbers you want to set to [New PIN].
Set four or more numbers as the PIN.
8. Input the PIN number you set to [PIN confirmation] and click [OK].
9. Then click [Setup] of [Windows Hello Fingerprint] in [Sign-in options].
[Windows Hello Setup] screen will appear.
10. Click [Start].
The screen with a message for checking the user will appear.
11. Input PIN number to [PIN].
The screen requesting to swipe on the fingerprint sensor will appear.
12. Touch your finger on the fingerprint sensor and lift it.
Repeat it until setup is complete. (The message to show the completion will appear.)

13. When the message to show the registration completion appears, click [Close].
To register another finger, click [Add another finger] and repeat steps from the step 12.

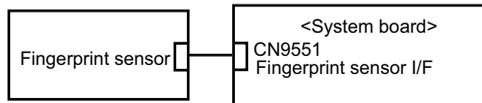
2.14.3 Procedure 3 Authentication of fingerprint

1. Turn on the computer to start up Windows.
2. Touch your registered finger on the fingerprint sensor and lift it.
When your fingerprint is authenticated, you can sign-in Windows.

If you fail this authentication continually five times, you can not use the fingerprint authentication. In that case, type the password to sign in to Windows. If you want to type the password on the finger print authentication screen, press **BACKSPACE**.

2.14.4 Procedure 4 Connector Check and Replacement Check

The fingerprint sensor is connected as follows.



Disassemble the computer following the steps described in Chapter 4, [Replacement Procedures](#), and perform the following checks:

Check 1

The connection between Fingerprint sensor and System board may be loose. Make sure the cables are firmly connected to system board. If the problem still occurs, go to Check 2.

Check 2

The Fingerprint sensor may be faulty. Replace it with a new one. If the problem still occurs, perform Check 3.

Check 3

System board may be faulty. Replace it with a new one following the step in Chapter 4, [Replacement Procedures](#).

2.15 Web camera Troubleshooting

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

Procedure 1: Check on Windows OS

Procedure 2: Connector Check and Replacement Check

2.15.1 Procedure 1 Check on Windows OS

Use the application software which is originally installed in the computer to check if the web camera can record/replay still images and moving images (including sound) without problems.

Click **Start** -> **Camera** to open the Camera app.

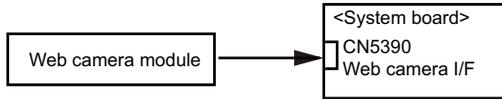
If any troubles occur on recording/replaying of still or moving images, perform Procedure 2.

2.15.2 Procedure 2 Connector Check and Replacement Check

If Web camera malfunctions, there may be a bad connection between web camera and system board, or either of these two components might be faulty. Disassemble the computer following the steps described in Chapter 4 and perform the following checks.

Check 1

Make sure the Web camera harness and FPC are firmly connected to the system board and the Web camera module. Then perform Procedure 1 again. If the problem still occurs, perform Check 2.



Check 2

Web camera module or the harness/FPC may be faulty. Replace it with a new one following the steps in Chapter 4, [Replacement Procedures](#). If the problem still occurs, perform Check 3.

Check 3

System board may be faulty. Replace it with a new one following the step in Chapter 4, [Replacement Procedures](#).

2.16 HDMI Port Troubleshooting

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

Procedure 1: Check on HDMI port

Procedure 2: Connector Check and Replacement Check

2.16.1 Procedure 1 Check on HDMI TV

HDMI (High-Definition Multimedia Interface) port digitally transfers both video and audio data without reducing the quality. HDMI-compatible external display devices including televisions can be connected via the HDMI port.

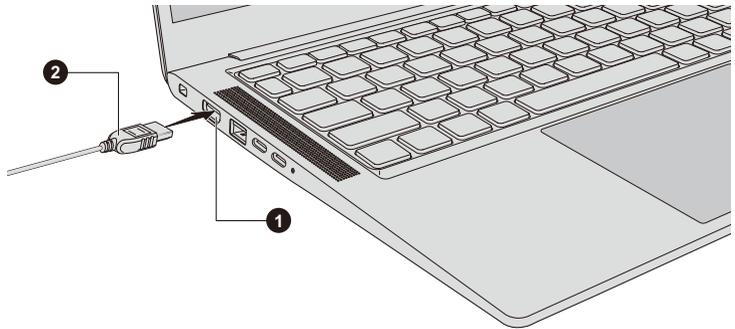
To connect an HDMI-compatible display device, follow the steps as detailed below:



As the port operation of all HDMI (High-Definition Multimedia Interface) monitors have not been confirmed, some HDMI monitors may not function properly.

1. Plug one end of the HDMI cable into the HDMI in port of the HDMI display device.
2. Plug the other end of the HDMI cable into the HDMI out port on your computer.
3. Turn the HDMI display device's power on.

Figure 2-7 Connecting the HDMI out port



1. HDMI out port

2. HDMI cable

2.16.2 Procedure 2 Connector Check and Replacement Check

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

Check 1

Make sure HDMI TV is firmly connected to the HDMI out port on the system board. If the problem still occurs, perform Check 2.

Check 2

It checks whether there are any abnormalities in a setup of HDMI TV, and returns to Procedure 1. In addition, an HDMI setup of television should check "the instructions manual of attachment on HDMI TV." If the problem still exists, perform Check 3.

Check 3

HDMI cable may be damaged. Replace it with a new one. If the problem still exists, perform Check 4.

Check 4

HDMI TV may be damaged. Replace it with a new one and check the operation. If the problem still exists, perform Check 5.

Check 5

System board may be damaged. Replace it with a new one following the instructions in Chapter 4, [Replacement Procedures](#).

2.17 USB Type-C adapter Troubleshooting

The USB Type-C™ adapter provides you with a USB Type-C™ port which enables you to connect the AC adaptor when you want to charge the battery or operate from AC power.

■ RGB port

To check if each function of USB Type-C adapter work properly or not, follow the steps below.

2.17.1 RGB port

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

Procedure 1: Check on external display

Procedure 2: Connector Check and Replacement Check

Procedure 1 Check on external display

Connect an external display to the RGB port on the USB Type-C adapter. If the RGB port works, a desktop screen of Windows will appear on the external display.

Connecting to the computer

1. Connect the USB Type-C adapter to the Thunderbolt 3/USB type-C connector on the computer.
2. Plug one end of the cable into the RGB port of the external display.
3. Turn on the power of the external display.
4. Plug the other end of the cable into the RGB port on the USB Type-C adapter.

Switching the image output from computer's screen to the external display

When you press **FN + F5**, the screen for selecting the device to show image will appear. Select [Second screen only]. Then check if the desktop image is shown on the external display. If any problem occurs on sound and image output, perform Procedure 2.

Procedure 2 Connector Check and Replacement Check

Check 1

Make sure the external display is connected to RGB port with the cable. If the connection is loose, reconnect it firmly and repeat Procedure 1. If there is still an error, go to Check 2.

Check 2

Check the setup condition of the external display and returns to Procedure 1. As for the setting of the external display, refer to the instructions manual for the external display. If the problem still exists, perform Check 3.

Check 3

The external display may be damaged. Replace it with a new one and repeat Procedure 1. If the problem still exists, perform Check 4.

Check 4

USB Type-C adapter may be damaged. Replace it with a new one. If the problem still exists, check the PC condition.

Chapter 3

Tests and Diagnostics

3.1 Test program for maintenance

The test program for maintenance consists of the following items:

- Check and update of ME FW information
- Check of hardware information
- Check and update of BIOS information
- Check and update of EC/KBC information
- Diagnostic test programs

After performing the Diagnostic test programs, setting to “Battery Off mode” state is needed.

3.1.1 Check and update of ME FW information

The ME FW version is checked and if the update is needed, the message is displayed.

3.1.2 Check of hardware information

The information about hardware, such as HDD/SSD, memory and DMI, is displayed.

If no DMI information is registered, the message to request the DMI information registration is displayed.

3.1.3 Check and update of BIOS information

The BIOS version is checked and if it is not the latest one, the message to confirm if update is needed or not.

3.1.4 Check and update of EC/KBC information

The EC/KBC version is checked and if it is not the latest one, the message to confirm if update is needed or not.

3.1.5 Diagnostic test programs

There are programs to write the HW information and to check the function of HW components in the diagnostic test.

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

- The diagnostic program for maintenance (USB Memory),
- A Headphones and microphone (Sound test)
- The calibration tool for sensor (USB memory, depending on the model to be tested)

3.1.6 Setting of Battery Off mode

Before returning to user, set the "Battery Off mode" to the PC.

Select [Advanced]-> [System Configuration] in the BIOS setup screen. You can see [Battery Disconnect] item. Connect the AC adaptor and execute it to set the "Battery Off mode" state.

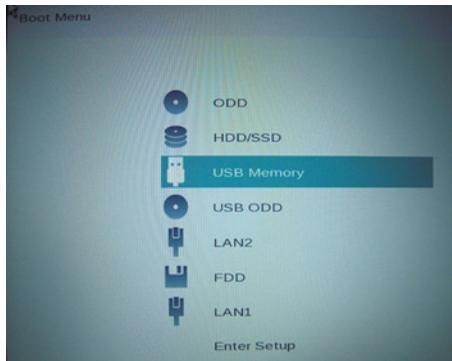
3.2 How to execute the test program

To start the test program for the maintenance, follow these steps below:

Step 1: Insert the USB memory which includes the test program into the USB connector.

Step 2: Turn on the computer while pressing F12 of the keyboard.

Step 3: Chose USB device on the selection screen, and press Enter of the keyboard.



Step 4: Then this program executes the followings automatically.

Procedure 1: Check and update of ME FW information

The ME FW version is checked and if the update is needed, the following message is displayed.

Do you want to update ME-FW (AMT) ? (Y) ?

When the message above is displayed, press **Y**. The ME FW will be updated and the computer will restart. Then repeat from Step 2.

Procedure 2: Check of hardware information

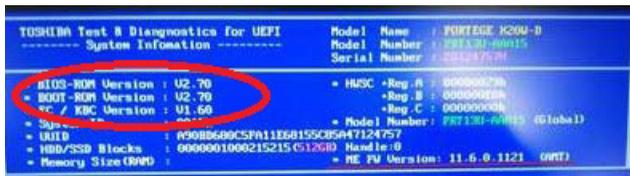
The program checks and displays the hardware information such as HDD and SSD of the computer.

When a system board is exchanged and DMI information is not written in, the DMI information can be registered with this program.

Refer to [3.3 Entry of the DMI information](#) for details.

Procedure 3: Check and update of BIOS information

The BIOS version is checked and if it is not the latest one, the message to confirm if update is needed or not. The current version is displayed at upper part of the display.



Does it update BIOS (Vx.xx->Vx.xx)? (Y or N), or press [Enter] (Selection=Y)?

When the message above appears, pressing **ENTER** will start BIOS update.

Then, since the computer reboots automatically, repeat from Step 2.

If BIOS update is not needed, press **N**.

Procedure 4: Check and update of EC/KBC information

The EC/KBC version is checked and if it is not the latest one, the message to confirm if update is needed or not. The current version is displayed at upper part of the display.

Does it update EC/KBC (Vx.xx->Vx.xx)? (Y or N), or press [Enter] (Selection=Y)?

When the message above appears, pressing **ENTER** will start EC/KBC update.

Then, since the computer reboots automatically, repeat from Step 2.

If BIOS update is not needed, press **N**.



1. Connect the AC adaptor and the charged battery to the computer when you update the BIOS, EC/KBC or ME FW.
2. Do not turn off the power while you are updating the BIOS or EC/KBC. If the update fails, it might be impossible to start up the computer.
3. If the update rewrite fails, when you next turn on the power, a message may be displayed that the contents of the BIOS or EC/KBC have been erased. In that case, turn on the power again and perform Procedure 2 or 3.

The following message will appear. If the PCB exchange or DMI information rewrite has been done, press **Y**. Otherwise, press **N**.

Change PCB ? or After Update DMI ? (y/n)

Pressing **Y** will show the following message. If the **A** key of the PC has the "Application key" sub icon, press **Y**. It will set the HWSC additionally. Otherwise, press **N**.

Does [A] key have "Application key" sub icon?
(y/n)

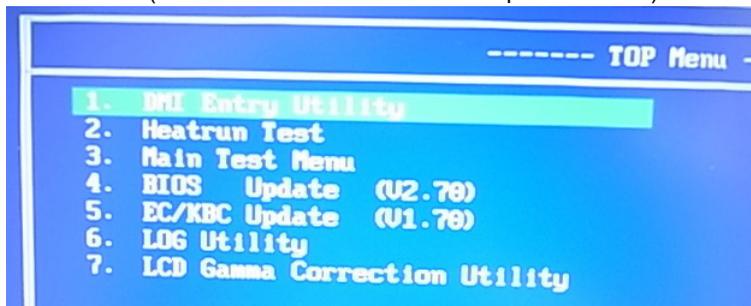
(Sample of **A** key with "Application key" sub icon)



← "Application key" icon

After that, the following test program menu (Top Menu) is displayed.

(The menu below shows an example of screen.)



Select Menu ([NUM] or [↑][↓] -> [Enter])

To start the DMI Entry Utility, press **1** and **Enter**.

To start the Heatrun Test, press **2** and **Enter**.

To start the Main Test Menu, press **3** and **Enter**.

To start the LCD Gamma Correction Utility, press **7** and **Enter**.



Before starting the diagnostics, be sure to follow these steps:

1. Check all cables are connected firmly.
2. Exit any application and close Windows.

3.3 Entry of the DMI information

To execute the DMI Entry Utility, select **1** from the test program menu (Top Menu), press **Enter**.



When replacing the system board, be sure to execute the following procedures.

Before replacing the system board, make a note of DMI information of the current PCB. The information can be confirmed by the “System Information” screen displayed after start of test program.

After replacing the system board, execute “DMI entry utility” to register the DMI information to the new system board according to the note.

The following message will appear. Press **Y**.

**** Warning : Update DMI really? (y/n) ****

The PC will restart. Press **F12** and select the USB memory as the boot device. Then the following screen will appear.

DMI Setting for Maintenance V.0.9.3.0

dynabook F82/E

Model Name:

Version Number:

Serial Number:

Family:

PCB Product Name:

Model Number:

PCB/UID Number:

Information

UID Number: 30A2A3B053D611E6014E C0374F121732

SKU Number: PH11DN

Type3 Serial: 7G121732H

PCB Serial: C042621410G/E100

Input the information one by one. (If you have not replaced the system board, the DMI information should not be changed.)

- Model Name (e.g. PORTEGE Z830)
- Version Number (e.g. XF82BFGCTL7AA21)
- Serial number (e.g. 7G121732H)
- Model Number (e.g. PRT10N-AAAA2)
- PCN/BND Number (e.g. PCN3384T0Z01FA1F/XXX)

The meaning of buttons at the bottom is as follows:

- Load DMI : reads out the current DMI information and display it.
- Write DMI : writes the DMI information input to this screen when pressed.
- Cancel : ends this program.

When Write DMI button is pressed, the message will appear. Select WRITE button and then OK button.

To finish this utility, press Cancel button. The PC will restart. Press **F12** and select the USB memory as the boot device. Then this program will return to the test program screen.

3.4 Heatrun Test

The Heatrun test is an automatic test program that executes the following tests successively.

1. Main Memory test
2. V-RAM Memory test
3. Sequential Read Test

To execute this test, select **2** from the test program menu (Top Menu), and press **Enter**.

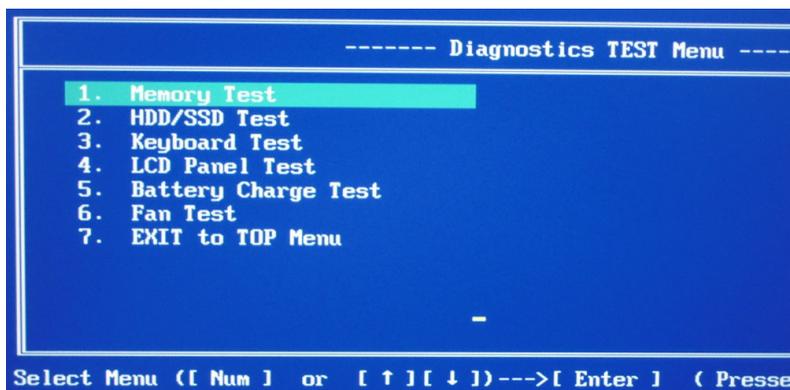
Explanation of each test:

1. Main Memory test
Refer to Subtest 1 of 3.6 Memory Test
2. V-RAM Memory test
This test sets the display mode to the maximum resolution. Then it writes/reads the test data to/from the VRAM area, and compares them. This test checks the VRAM area in order with the following 4 test data: FFFFFFFFh, AAAAAAAAh, 55555555h, 00000000h.
3. Sequential Read Test
Refer to Subtest 1 of 3.7 Hard disk/SSD Test

To terminate the program, press **[SHIFT] + [Q]**.

3.5 Main Test Menu

To display the Main Test Menu, select **3** from the test program menu (Top Menu) and press **Enter**. (The menu below shows an example of screen.)



If you want to stop the test program under running temporarily, press **SHIFT + Q**.

After the stop, pressing **C** continues the test and pressing **E** ends the test.

To return to the Top menu, move the cursor to **EXIT to TOP Menu** on the screen above and press **ENTER**.

Others are the diagnostic tests. Move the cursor on the test item you want to execute and press **ENTER**.

The following table shows the subtests names of each test.

TEST NO.	TEST NAME	SUBTEST No.	SUBTEST NAME
1	MEMORY	1	Main Memory Test
2	HDD/SSD Test	1	Sequential Read Test
		2	Partial Read Test
		3	Address Jump Test
		4	Address Uniqueness Test
		5	Specify Address Test
3	Keyboard Test	1	Key-code Test
		2	Touch Pad Test
4	LCD Panel Test	1	LCD Panel Test
		2	All dot on/off for LCD
		3	H - pattern display
		4	LCD brightness
5	Battery Charge Test	-	-

TEST NO.	TEST NAME	SUBTEST No.	SUBTEST NAME
6	Fan Test	-	-
8	EXIT to TOP Menu		

After a subtest is selected, the following message may appear.

```

1. Go to Test
2. Test Loop : YES
3. Error Stop : YES

```

The meaning of each item is as follows:

■ Test Loop

Select No: After testing, the program returns to the screen to select Error Stop and Test Loop item selection.

Select Yes: After testing, the pass count is increased by one, and the test is performed again from the test top. Repeat the test until **SHIFT + Q** is entered.

The setting of Yes/No can be changed by pressing **ENTER**.

■ Error Stop

Select Yes: if any error occurs during the test, the test is suspended and key input is required.

Enter **C**Restarts the test execution

Enter **E**.....Ends the test. The program returns to the screen to select Error Stop and Test Loop item selection.

Select No: though any error occurs during the test, the test is continued.

The setting of Yes/No can be changed by pressing **ENTER**.

■ Go to Test

The subtest is started in the conditions selected above by entering **ENTER**.

For more information about the tests in the Main Test Menu and other tests, refer to Section 3.6 or later.

3.6 Memory Test

To execute the Memory Test, select **1** from the DIAGNOSTIC TEST Menu (Main Test Menu), press **Enter** and follow the directions on the screen. (Move the highlight bar to the subtest you want to execute and press **Enter**.)

Subtest 1 [Main memory Test]

This test writes/reads the test data to/from the main memory, and compares them.

The test procedure is as follows:

- (1) This test gets the memory map table.
- (2) It seeks empty area more than 1MB.
- (3) To the whole empty area, it writes the test data and reads out them to compare the test data and read data.
- (4) Up to the maximum address of the mounted memory, it repeats to seek the empty area, to write the test data, to read out the data and to compare the test data and read data.
- (5) It repeats the process from (1) to (4) above with the 4 test data.

The test patterns are 4-byte data: 00000000h, 55555555h, AAAAAAAAAAh and FFFFFFFFh. If empty area less than 3-byte length is found, the test data is not written.

If the empty memory is 64MB or less, this test is not executed. In the case that this test is never executed because of the memory size shortage, this test displays the message "Data Not Found "and writes the information to the text file

(errorlog.txt) as an error log.

If the test data and read data is not the same at comparing, this test displays the message "Data Compare error "and writes the information to the text file (errorlog.txt) as an error log.

As for the details of the error log, refer to 3.12 Log utility.

3.7 Hard Disk (&SSD) Test

To execute the Hard Disk Test, select **2** from the DIAGNOSTIC TEST MENU (Main Test Menu), press **Enter** and follow the directions on the screen. (Move the highlight bar to the subtest you want to execute and press **Enter**.)

Subtest 1 [Sequential Read Test]

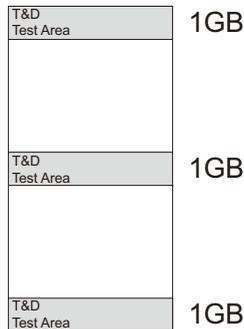
This test reads out the whole data from the address of LBA 0 to the last. The data is read by 64-LBA unit.

If any errors occur, this test displays the message "HDD Read error "and writes the information to the text file (errorlog.txt) as an error log.

Subtest 2 [Partial Read Test]

This test reads the data from the top and middle of the HDD area by 1GB. It reads also from 1GB area before of the last address to the last.

If any errors occur, this test displays the message "HDD Read error "and writes the information to the text file (errorlog.txt) as an error log.



Subtest 3 [Address Jump Test]

This test writes the test data (AAAAAAAh) to

1. LBA 63 (by 512-byte)
2. LBA 22 (=63 - 41) (by 512-byte)
3. LBA 86 (=22 + 64) (by 512-byte)
4. LBA 45 (=86 - 41) (by 512-byte)

At Step 1, this test starts from the LBA 63 and writes the test data by 512-byte.

At Step 2, it writes the 512-byte data to the LBA decreased by 41 LBAs from the LBA designated at the previous step.

At Step 3, it writes the 512-byte data to the LBA increased by 64 LBAs from the LBA designated at the previous step.

At Step 4, it writes the 512-byte data to the LBA decreased by 41 LBAs from the LBA designated at the previous step.

By repeating the decrease and increase of the LBA's address, this test continues to write the test data up to the last address. After that, it reads out the data from the same LBAs to compare.

If there are no 64 LBAs at last, this test is not executed for the last address.

If any errors occur, this test displays the message "HDD Write error" and writes the information to the text file (errorlog.txt) as an error log.

Subtest 4 [Address Uniqueness Test]

This test writes the number of passes (UNIT32) (default is 0) per LBA and the LBA number (UNIT32). To the rest of a LBA (calculated as "LBA size - (UNIT32)*2"), it writes "0".

This test writes the test data up to the last address. Then it reads out the data to compare. The number of passes will be 0 (default value) unless comparing of the whole data is completed. At the beginning of the test in the second round, the number would become 1 (when Test Loop Yes is selected. When Test Loop No is selected, the number will not be changed. In that case, the number remains 0 at the end of the test.) If the test data and read data is not the same, this test displays a message of "Data Compare error" and writes the information to the text file (errorlog.txt) as an error log.

(1 LBA (512-byte))

Number of Passes (UINT32)	LBA No. (UINT32)	0 0 0 0 0 0
---------------------------	------------------	-----------------------

Subtest 5 [Specify Address Test]

First, specifying of the address of the start LBA, the data length and test data for writing (Dword) is needed for this test. Then this test writes the specified test data to the specified address and read them to compare.

If any errors occur at comparing, this test displays the message "Compare error" and writes the information to the text file (errorlog.txt) as an error log.

As for the details of the error log, refer to 3.12 Log utility.

3.8 Keyboard Test

To execute the Keyboard Test, select **3** from the DIAGNOSTIC TEST Menu (Main Test Menu), press **Enter** and follow the directions on the screen. (Move the highlight bar to the subtest you want to execute and press **Enter**.)

Subtest 1 [key-code Test]

This test displays the key code and scan code of a pressed key. To back to the main menu screen, press **Del + Enter**.

(Displayed information)

(Presses Key Code : xx)

(Presses Scan Code : xx)

Subtest 2 [Touch Pad Test]

This test gets the information of moving amount of the touch pad, both for direction X and Y, and pressing (ON)/releasing (OFF) information of the button A (left click button) and B (right click button), and displays the information in real time. To back to the main menu screen, press the button A and B.

(Displayed information)

[X: xxxx] [Y: xxxx] [Button A : x] [Button B : x]

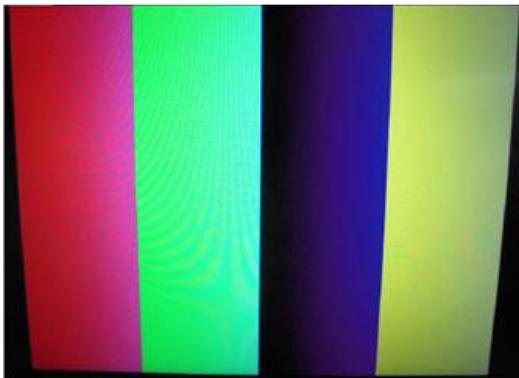
3.9 LCD Panel Test

To execute the LCD Panel Test, select **4** from the DIAGNOSTIC TEST Menu (Main Test Menu), press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 1 [LCD Panel Test]

This test displays the following 4 colors, Red, Green, Blue and Yellow, from the left side of the display to right side, from the black to the maximum brightness. To back to the main menu screen, press **ENTER**.

(Screen sample)



Subtest 2 [All dot on/off for LCD]

This test displays the white screen for 5 sec. and then the black screen for 5 sec. After that, this test backs to the main menu screen automatically.

Subtest 3 [H - pattern display]

This test displays the letter "H" on the whole screen. To back to the main menu screen, press **ENTER**.

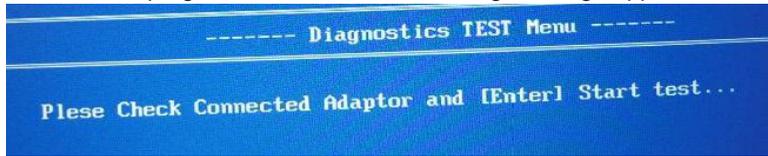
Subtest 4 [LCD brightness]

This test displays the white screen and changes the LCD brightness to the maximum, middle and low setting in order with 5-sec intervals. After that this test backs to the main menu screen automatically.

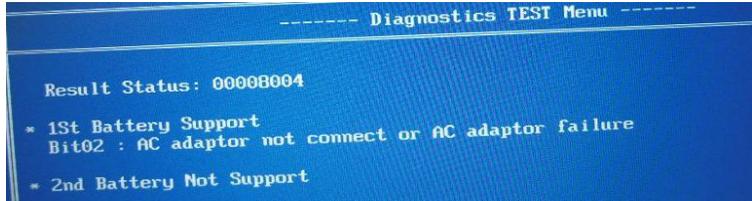
3.10 Battery Charge Test

To execute the Battery Charge Test, select **5** from the DIAGNOSTIC TEST Menu (Main Test Menu), press **Enter** and follow the directions on the screen.

When this test program is selected, the following message appears.



The test starts by pressing **ENTER**. The test gets the charging status of the mounted battery pack and displays the message.



To back to the main menu screen, press **ENTER**.

3.11 Fan Test

To execute the FAN Test, select **6** from the test program menu (Top Menu), press **Enter** and follow the directions on the screen.

This subtest checks if FAN works properly.

```
FAN Low-speed ... Target Low: XXXX Rpm Result
Low: XXXX Rpm OK/NG
```

```
FAN High-speed... Target High: XXXX Rpm Result
High: XXXX Rpm OK/NG
```

OK appears in the display if the test ends without an error.

NG appears in the display if an error is found during the test.

To back to the main menu screen, press **ENTER**.

3.12 Log Utility

This function logs error information generated while a test is in progress and stores the results in USB memory.
(file name: errorlog.txt)

1. Each test description

To execute the Log Utility, select **LOG Utility** from the test program menu (Top Menu), and press **ENTER**. The following screen will appear.

Display examples

T-Name	Pass	Sts	Address	Write	Read
HDD_001	12345678	1234	1234567812345678	00000000	55555555
RAM_001	12345678	1234	1000007812345678	00000000	55555555

- T-NAME..... Test name

(Test name example)

RAM_01.....Main Memory Test
 HDD_01.....Sequential Read Test
 HDD_02.....Partial Read Test
 HDD_03.....Address Jump Test
 HDD_04.....Address uniqueness Test
 HDD_05.....Specify Address Test
 BAT_01.....Battery Charge Test

- Pass..... Pass count which the error occurred
- Sts..... . Status

(Value)

00FF..... Data compare error (Memory Test/HDD Test)
 00E0.....Data Not Found (Memory Test)
 0002..... Protocol error (Memory Test/HDD Test)

- Address... Address (Memory Test/HDD Test...Sector No.)
- Write..... . Write value (Memory Test/HDD Test)
- Read..... . Read value (Memory Test/HDD Test/ Battery Charge Test)

To clear the log information, press **C**. To back to the main menu screen, press **ENTER**.

3.13 LCD Gamma correction

To execute the LCD Gamma Correction Utility, select **7** from the test program menu (Top Menu), press **Enter** and follow the directions on the screen.

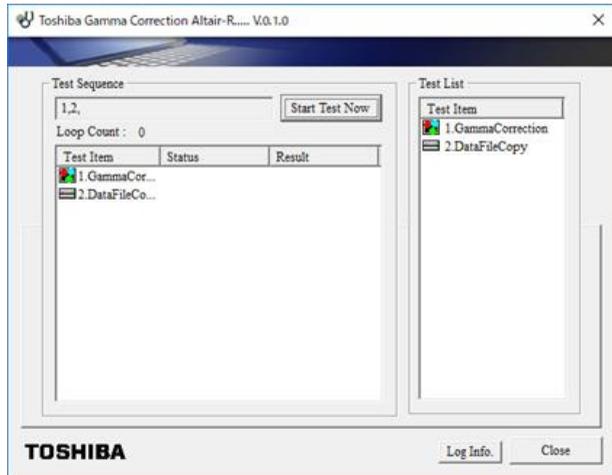


After replacing the system board, be sure to execute this program.

The following message will appear. Press **Y**.

```
* Restart system and Start utility *
*           Are you sure? (y/n)           *
```

The PC will restart. Press **F12** and select the USB memory as the boot device. Then the following screen will appear and the correction is done automatically.



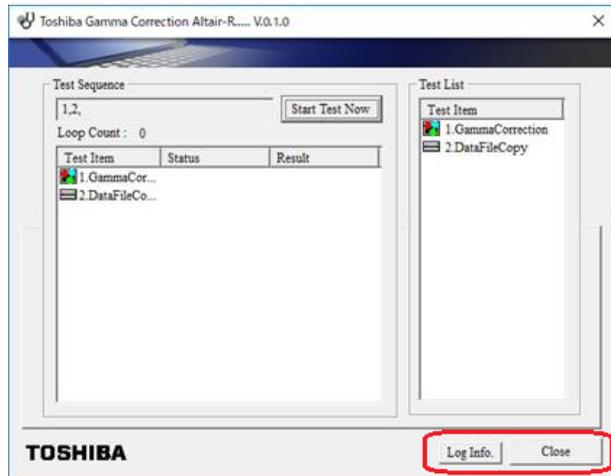
If this program ends successfully, "PASS" is displayed.



If any errors occurred, "FAIL" will be displayed.



Select "Close" button at the lower left to back to the start screen.



Any errors occurred during this program will be registered in the log. To check the content, select “LogInfo.” button.

When “Close” button is selected, the PC will restart. Press **F12** and select the USB memory as the boot device. Then this program will return to the original test program screen.

3.14 Wireless Module Test

Since there is no test program to check the wireless function, check if the wireless module and antenna are working without problem on Windows.

3.14.1 Check of the wireless module

Turn on the wireless communication function and check the module name via the application, PC system information. On this model, a combo module which has both wireless LAN and Bluetooth function is mounted.

<How to display PC system information screen>

- 1) Click Start button.
- 2) Click [dynabook PC Information].
Check the content of “Netwrok”.

dynabook PC Information Ver. 6.0.12.0

Basic PC information is displayed below. Save

Model Name	PORTEGE X30-E
Part Number	PT284L-AAA12
Serial Number	XH047457H
OS Version	Microsoft Windows 10 Pro 10.0.18362
BIOS Version	Version 0.30
CPU	Intel(R) Core(TM) i5-8350U CPU @ 1.70GHz
Physical Memory	8192MB RAM
Hard Disk Capacity	242,544,013,312 [Byte] 225.887 [GB]
Hard Disk Free Space	211,762,716,672 [Byte] 197.219 [GB]
Capacity	
Video	Intel(R) UHD Graphics 620 Version=25.20.100.6576
Screen Resolution	1920 x 1080 Pixels
Color Quality	True Color (32 Bit)
Sound	Realtek High Definition Audio Version=6.0.1.8619
	Intel(R) Display Audio Version=10.26.0.6
Network	Intel(R) Dual Band Wireless-AC 8265 Version=20.70.9.1 MAC Address=CC:27:11:7A:8F:12
Modem	None

If "Wireless**" appears in the screen, it means the wireless module has been recognized.

3.14.2 Check of the antenna connection

Confirm that the icon for wireless LAN appears at the lower right of the screen under the circumstances the wireless communication function is available.



Click the icon. If the computer can find any AP (Access Point), the network names like below will appear. It shows the antenna cables are surely connected to the wireless module.



If the antenna cables are not connected to the wireless module or no available AP is found, the following icon will appear.



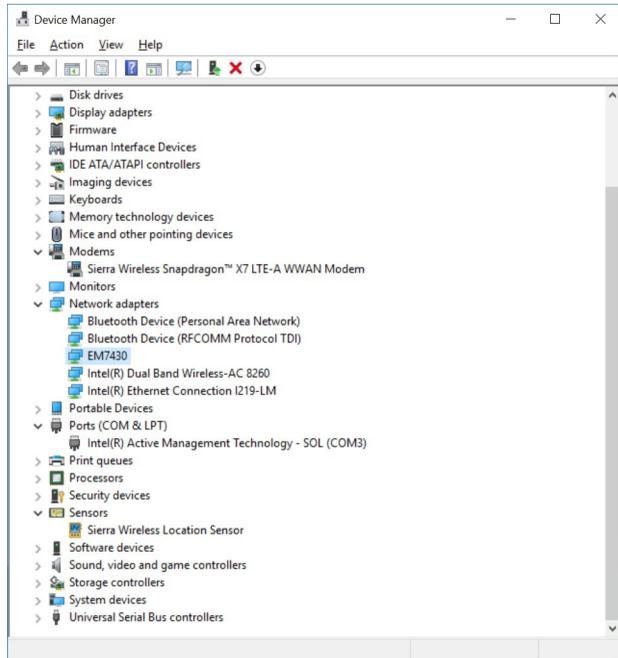
In the case of no-antenna connection

If AP should be ready but no AP point appears, any problem might occur on the wireless module or on the antenna connection.

3.15 3G/LTE Test

Check if the 3G/LTE module is recognized by the PC on Windows.

Start the device manager. If "EM*****" is shown under "Network adapters", the module is recognized.



(Sample of a module name)

3.16 Sound Test

Since there is no sound test in the test program for maintenance, check the functions related to sound on Windows with music data, etc.

3.17 SETUP

3.17.1 Function Description

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

Main menu

- System Time (System time)
- System Date (System time)
- CPU Type
- CPU Speed
- HDD/SSD
- Total Memory Size
- System BIOS Version
- EC Version
- Language

Security menu

- BIOS Password
 - User
 - Supervisor
- HDD/SSD Password
 - Mode
- Secure Boot
- Clear Secure Boot keys (*1)
- Clear Fingerprint data (*1)
- Clear System data (*1)
- TPM
- Clear TPM Owner
- Hide TPM
- BIOS Access Rights (*1)
- Boot Menu (*1)
- USB Provisioning of AMT (*1)
- Device Access Control/Device Boot Control (*1)

*1 : This item is shown only when a supervisor password is set.

Power Management menu

- Wak on Keyboard
- Critical Battery Wake-up
- Panel Open – Power On
- Power on by AC
- Intel Turbo Boost Technology
- Intel Display Power Management
- SATA interface setting
- Keyboard Backlight Control Mode
- Backlight Lighting Time

Advanced menu

- Virtualization Technology
- SW Guard Extensions (SGX)
- Select Owner EPOCH input type
- Beep Sound
- Sleep and charge
- USB Power in Off State
- USB Legacy Emulation
- Wireless LAN Configuration
 - Wi-Fi Configuration
 - TIs Auth Configuration
- System Configuration
 - Wireless LAN
 - Bluetooth
 - Web Camera
 - SD Host Controller
 - Fingerprint Sensor
 - Internal Thunderbolt Controller
 - Microphone
 - Memory Performance Mode
 - LAN Boot Selection
 - MAC Address Pass Through
 - Power On Display
 - Boot Up NumLock Status
 - Function Keys Mode (without pressing Fn first)
 - Large aperture graphics adapters
- Thunderbolt Configuration
 - Devices under Thunderbolt
 - Native Thunderbolt Support
- Evaluation
 - Advanced
 - Chipset
 - Main
 - Security
 - Boot
 - Save & Exit

Boot menu

- Boot Option #1
- Boot Option #2
- Boot Option #3
- Boot Option #4
- Priority for devices

Exit menu

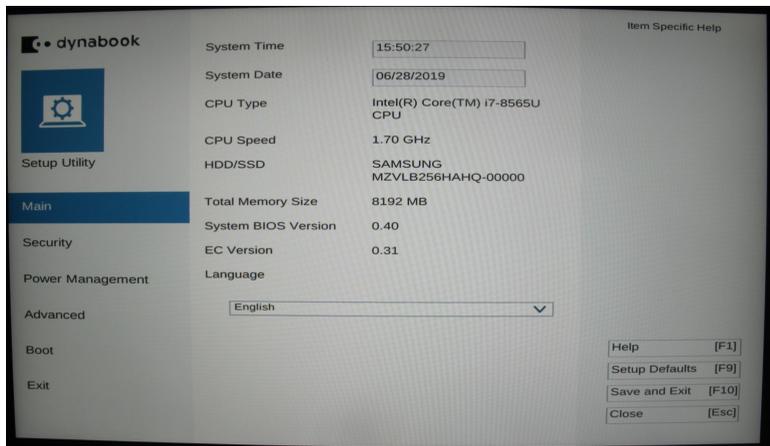
- Exit Saving Changes
- Exit Discarding Changes
- Load Setup Defaults
- Save Changes and Power off

3.17.2 Accessing the SETUP Program

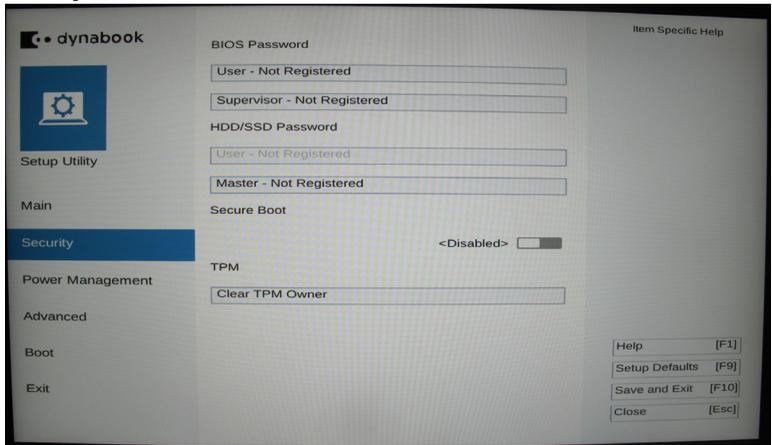
Turn on the power SW.

Then press **F2** key of the keyboard. The following display appears.

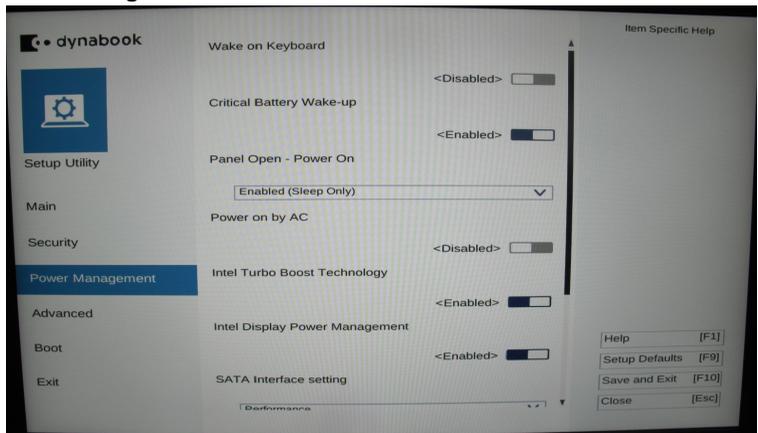
Main menu screen



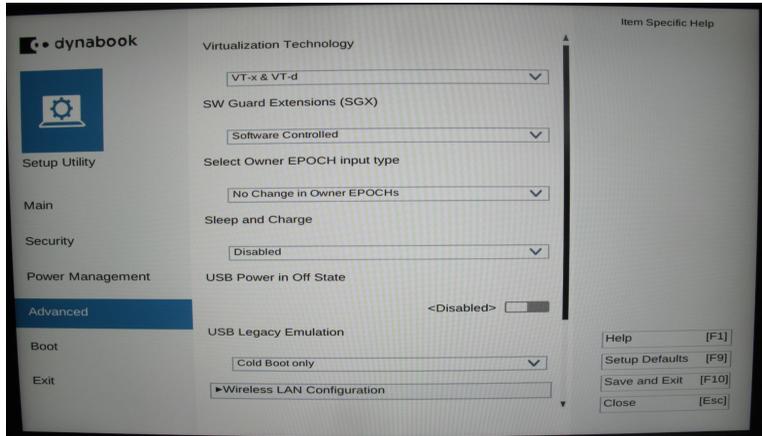
Security menu screen



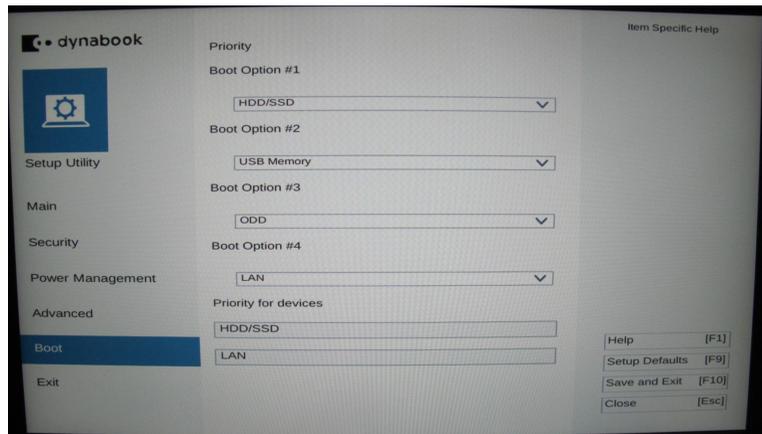
Power Management menu screen



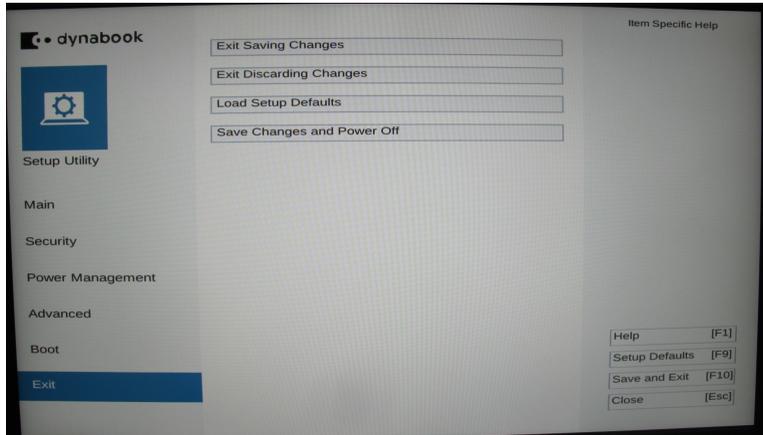
Advanced menu screen



Boot menu screen



Exit menu screen



Moving Within the SETUP Menu and Changing Values

1. Press ← and → to move between the two columns. Press ↑ and ↓ to move between items in a column.
2. Press the **[Enter]** Key to change the value.

Accepting Changes and Exiting the SETUP Window

1. Press **[F10]** key to accept the changes you made.
2. To make other changes, press **N**. Repeat the steps above.
3. To accept the changes, press **Y**.



You can press **ESC** to quit at any time without saving changes. **SETUP** asks you to confirm that you do not want to save your changes. When **SETUP** is displayed at the next time, the current configuration appears.

The Factory Preset Configuration

When you access **SETUP**, the current configuration is displayed.

1. To load the factory preset configuration, press **[F9]** key.
2. To accept the default settings, press **[Y]** key.

How to change setup Options

Since a help is displayed on the right-hand side of each menu screen, refer to it before change.

Chapter 4

Replacement Procedures

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

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

Table 4-1 the case for the following example

4.10 Cover Assembly and Base Assembly	
Cover	4.21 LCD Assembly
4.20 Wireless LAN card 4.19 Keyboard 4.18 Power button & Fingerprint sensor 4.17 Speaker 4.16 Click pad 4.15 System board 4.14 Fin 4.13 Fan 4.12 SSD 4.11 Battery pack	4.22 Camera module

Please prepare required parts in advance, when replacing the relevant items.

4.1 Safety Precautions

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



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



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



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

4.2 Before You Begin

Take note of the following points before starting work. Always remove the AC adaptor and battery pack before commencing any of the procedures. The procedure for removing the battery pack is described in [4.11 Battery pack](#).

1. Do not disassemble the computer unless it is operating abnormally.
2. Use the recommended tools.
3. Ensure that the environment for working on and storing parts does not contain any of the following.
 - Dust or dirt
 - Static electricity
 - Extremely hot, cold, or humid conditions
4. Perform the diagnostic tests described in Chapter 2 to identify the FRU that has probably caused the system failure.
5. Do not perform any unnecessary work. Always work in accordance with the disassembly and re-assembly procedures in this manual.
6. Keep parts removed from the computer in a safe place away from the computer where they will not be damaged or interfere with your work.
7. Disassembling requires the removal of a large number of screws. Keep removed screws in a safe place such that you can determine which screws belong to which part.
8. When re-assembling, ensure that you use the correct screws and fit parts in the correct position. Screw sizes are noted in the text and figures.

9. As all parts have sharp edges and corners, take care not to cut yourself.
10. After replacing an FRU, check that the computer and replaced part operate correctly.

4.3 Disassembly Procedure

Four main types of cable connector are used.

- Pressure plate connector
- Spring connector
- Back flip connector
- Normal pin connector

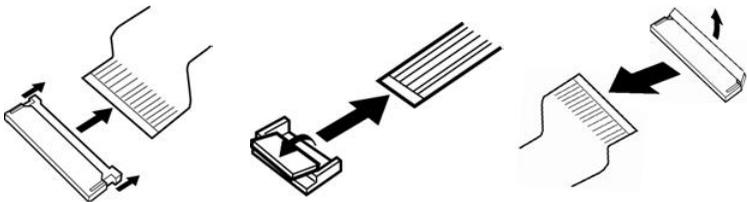
For pressure plate connectors, slide the pressure plate holding tags on both sides of the plastic pressure plate on the connector and pull the cable out from the connector. When reconnecting the cable to the pressure plate connector, slide the pressure plate holding tags on both sides of the plastic pressure plate on the connector and insert the cable into the connector. Push both tags of the pressure plate such that the cable is fixed in the correct position. Pull the cable to ensure that it is securely connected.

For spring connectors, lift up the stopper frees the cable and allow it to be pulled out. To reconnect, hold the stopper in the up position and insert the cable, then lower the stopper to secure the cable. Pull the cable to ensure that it is securely connected.

For back flip connectors, lift up the flip plate frees the cable and allow it to be pulled out. To reconnect, hold the flip plate in the up position and insert the cable, then lower the flip plate to secure the cable. Pull the cable to ensure that it is securely connected.

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

Figure 4-1 Pressure plate connector/Spring connector/Back flip connector



4.4 Assembly Procedures

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

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

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

After installing FRUs, check that the computer operates correctly.

4.5 Tools and Equipment

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

- One Philips screwdriver with type 0 bit (for S-THIN HEAD screws)
- One Philips screwdriver with type 1 bit (for screws other than above)
- One flat-blade screwdriver (for removing the CPU)
- Tweezers (for lifting screws)
- ESD mats (lay on work table or floor)
- An ESD wrist strap and heel grounder
- Anti-static carpet or flooring
- Air-ionizers in highly static sensitive areas
- Antenna coaxial cable disconnecter
- Special syringe (for applying grease)

4.6 Screw Tightening Torque

When you fasten screws, be sure to follow the torque list below.



Overtightening can damage components and screws; undertightening can result in electrical shorts or other damage if screws or components come loose.

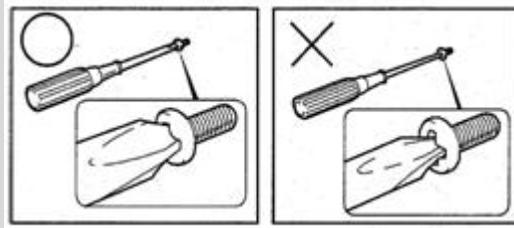


Dynabook recommends that you use an electric screw driver for quick and easy operations.

- M2 (2mm) 0.167 N•m (1.7 kgf cm)
- M2.5 (2.5mm) 0.294 N•m (3.0 kgf cm)



To prevent damage to THIN HEAD screws, use type 0 bit philips screwdriver. Press along the axis of the screwdriver while turning the screw. This is because the contact area between the screw and driver is less than for a pan head screw (standard pan-shaped screw head).



4.7 Grip Color

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

[Normal grip]

- Normal length screws: Blue
- Special length screws: Green
- Tight grip screw: Yellow

“Special length screw” means screws whose length is indicated in an integral number to the first decimal places such as 2.5 mm, 2.6 mm and so on.



4.8 Screw Notation

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

Screw type + Screw length (mm)

Screw shape

B: Bind screw

F: Flat head screw

S: Super thin head screw

T: Tapping screw

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

Example: B6 ... 6mm BIND screw

Screw color/material

B: Black/Nickel

C: Silver/Non-Hexavalent Chromate

U: Other screws (Unique screws: such as stud, etc.)

4.9 Memory media



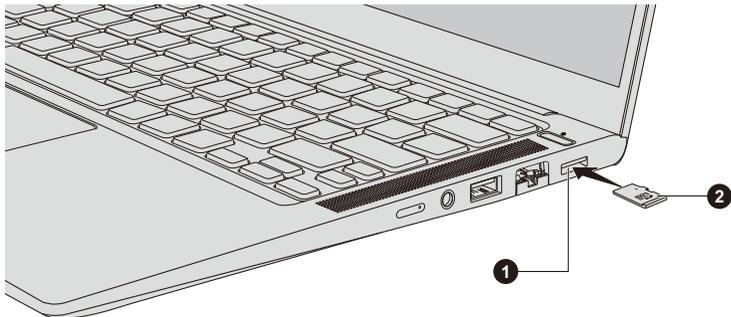
Insert or remove a Memory media in accordance with any instructions in each Memory Media manual or the manuals of the computer system you are using.

4.9.1 Installing the Memory media

To insert memory media, follow the steps as detailed below.

1. Turn the memory media so that the contacts (metal areas) face down.
2. Insert the memory media into the memory media slot on your computer.
3. Press the memory media gently until it clicks into place.

Figure 4-2 Inserting memory media



1. Memory media slot

2. Memory media

4.9.2 Removing the Memory media

To remove memory media, follow the steps as detailed below.

1. Open the **Safely Remove Hardware and Eject Media** icon on the Windows Taskbar.
2. Select **memory media**.
3. Push the memory media until you hear a click to partially release it.
4. Grasp the media and remove it.

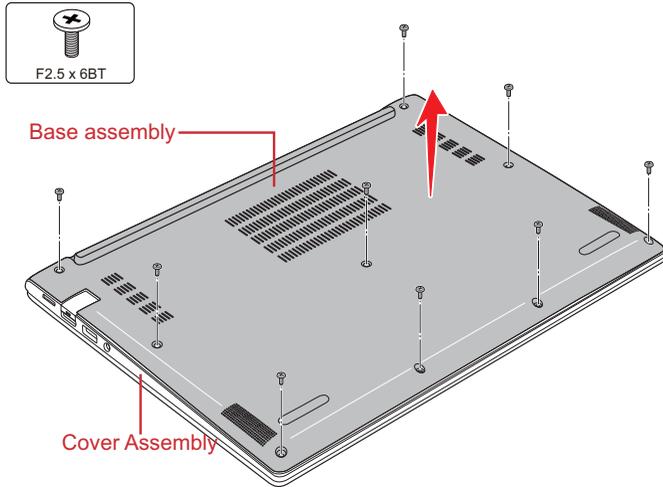
4.10 Cover Assembly and Base Assembly

4.10.1 Removing the Cover Assembly and Base Assembly

To remove the Base Assembly, follow the steps below.

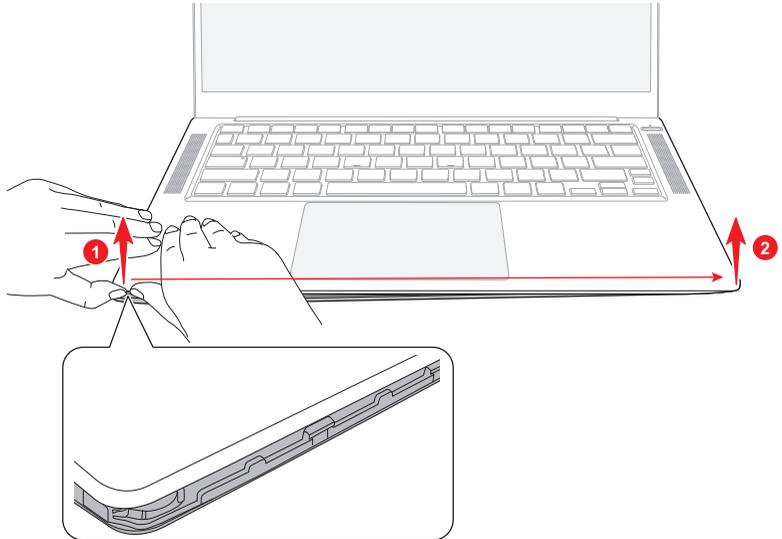
1. Close the display panel and turn the computer face down.
2. Remove the following screws securing the Cover Assembly and the Base Assembly.

Figure 4-3 Removing the Base Assembly (1)



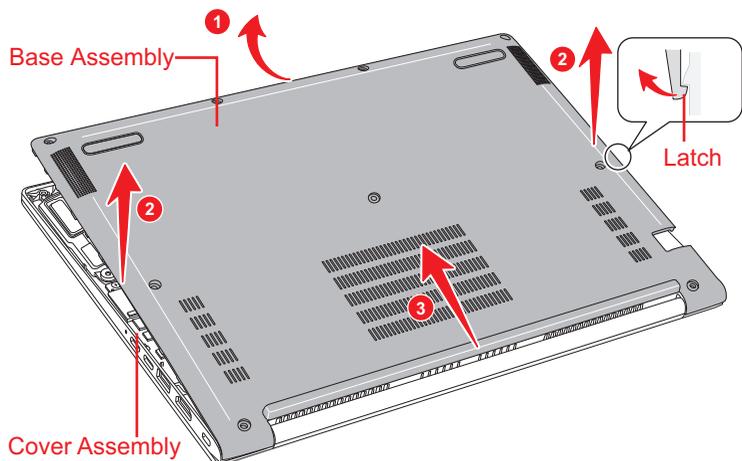
3. Turn the computer over and open the display panel, release the latches from the lower left of the computer as shown in the figure below.

Figure 4-4 Removing the Base Assembly (2)



4. Turn the computer again and separate the Base Assembly and Cover Assembly as shown in the figure below.

Figure 4-5 Removing the Base Assembly (3)



4.10.2 Installing the Base Assembly

To install the Base Assembly, follow the steps below.

1. Set the Cover Assembly on the Base Assembly while securing the latch.
2. Secure the Cover Assembly and Base Assembly with the screws.



Do not reuse the removed screws. Be sure to use new screws.

3. Turn the computer, and open the display.

4.11 Battery pack

4.11.1 Removing the Battery pack

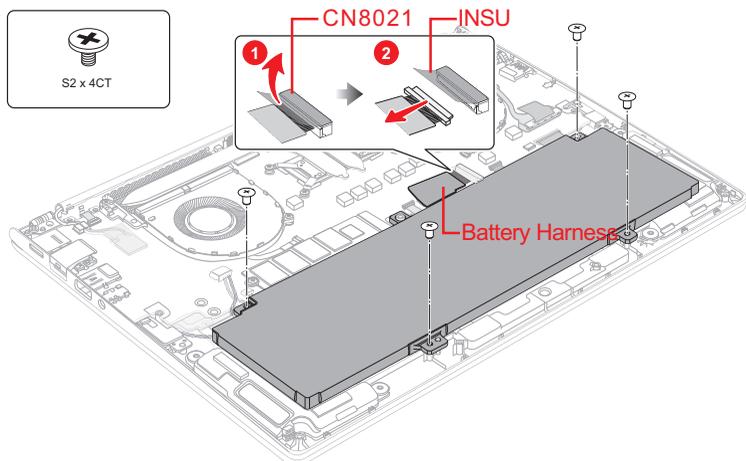
To remove the battery pack, follow the steps below.



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

1. Disconnect the **BATTERY HARNESS** from the connector **CN8021** on the System board.
2. Remove the following screws and the battery pack.

Figure 4-6 Releasing the battery pack



Dispose of the used/removed battery pack in accordance with the laws and ordinances of your local authority.

4.11.2 Installing the Battery pack

To install the battery pack, follow the steps below.



The lithium ion battery pack may explode if not fitted, operated, handled, or disposed correctly. Dispose always the used battery pack in accordance with the laws and ordinances of your local authority.

Use only the batteries approved by Dynabook.



Check the battery's terminals visually. If they are dirty, wipe them clean with a dry cloth.

1. Set the battery pack to the COVER ASSY and secure it with the screws.
2. Connect the **BATTERY HARNESS** to the connector **CN8021** on the System board.
3. Stick a new **INSU** on the connector.

4.12 SSD

4.12.1 Removing the SSD

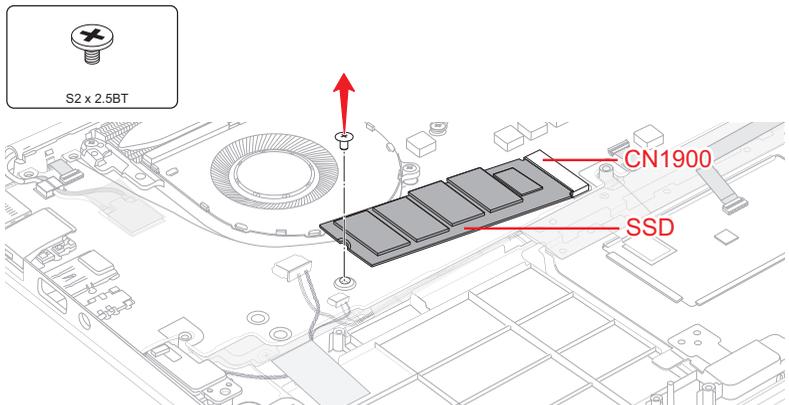
To remove the SSD, follow the steps below .



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

1. Remove the the following screw and disconnect the **SSD** from the connector **CN1900** on the System board.

Figure 4-7 Removing the SSD



4.12.2 Installing the SSD

To install the SSD, follow the steps below.



To avoid damage, always hold the SSD only by its sides.

To prevent the SSD from being distorted when installing the SSD pack into the computer, do not press the center of the SSD pack. Always hold the SSD pack by its sides.

1. Insert the **SSD** to the connector **CN1900** on the **System Board**.
2. Push down the **SSD** and secure it with the screw.

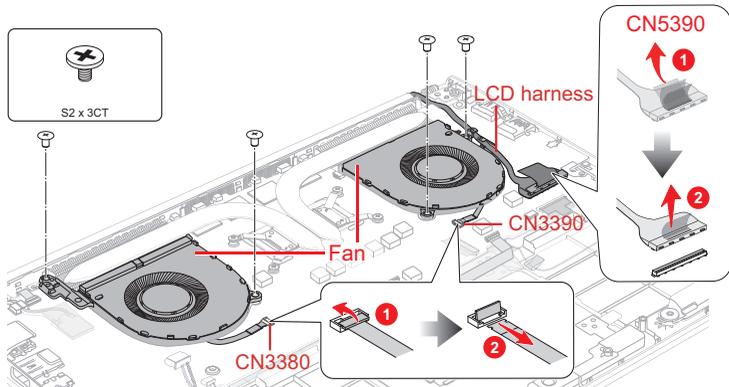
4.13 Fan

4.13.1 Removing the Fan

To remove the Fan, follow the steps below.

1. Disconnect the **LCD harness** from the connector **CN5390** on the **System Board**.
2. Disconnect the **Fan harness** from the connector **CN3380** and **CN3390** on the **System Board**.
3. Remove the following screws and the **Fan** from the Cover Assembly.

Figure 4-8 Removing the Fan

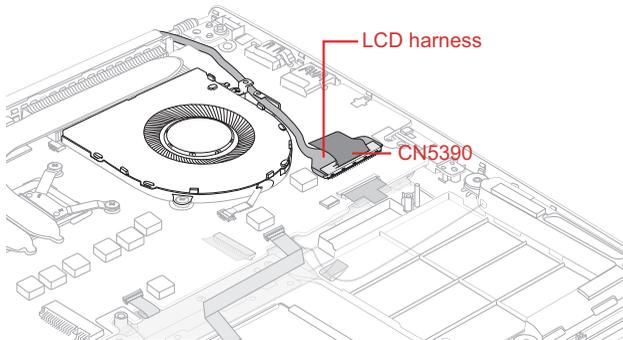


4.13.2 Installing the Fan

To install the Fan, follow the steps below.

1. Set the **Fan** in place on the Cover Assembly and secure it with the screws.
2. Connect the **Fan harness** to the connector **CN3380** and **CN3390** on the **System Board**.
3. Arrange the **LCD harness** in place, and connect the harness to the connector.

Figure 4-9 Installing the Fan



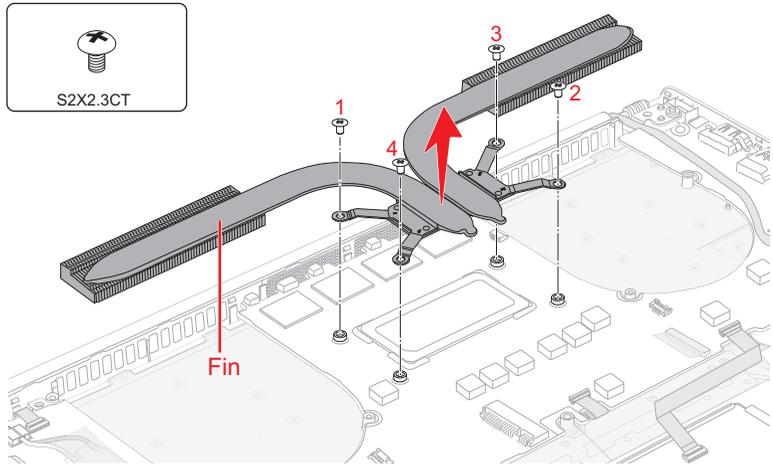
4.14 Fin

4.14.1 Removing the Fin

To remove the Fin, follow the steps below.

1. Remove the following screws and then the **Fin**.

Figure 4-10 Removing the Fin



4.14.2 Installing the Fin

To install the Fin, follow the steps below.

1. Set the **Fin** in place and secure it with the screws.

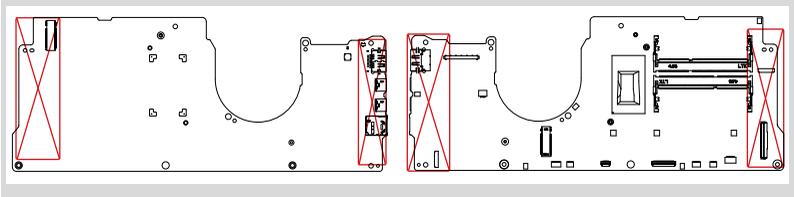


When installing the Fin, be sure to install the screws in the order of the number marked on the Fin.

4.15 System board



1. If replacing with a new system board, update the DMI information as described in Chapter 3, [Tests and Diagnostics](#). Also update with the latest BIOS and EC/KBC as described in Appendix G, [BIOS Rewrite Procedures](#), and Appendix H, [EC/KBC Rewrite Procedures](#).
2. When replacing the system board with a new one, the ProductKey (MBR-DPK) must be written on the system board.
3. When removing/installing the system board, do not handle with the handling prohibition area.

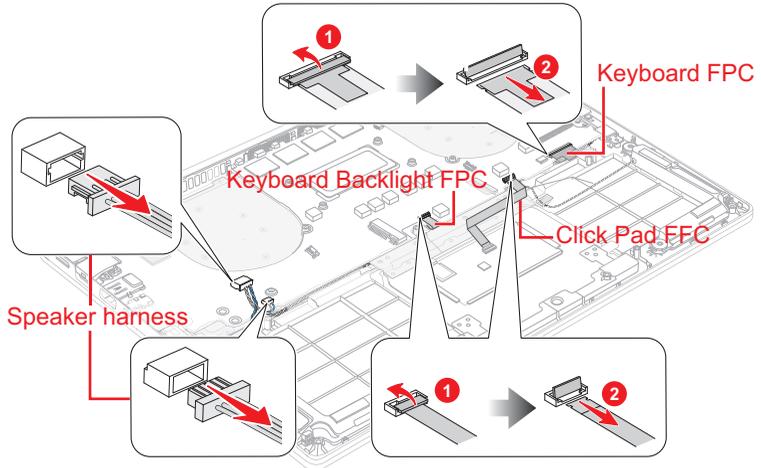


4.15.1 Removing the System board

To remove the system board, follow the steps below.

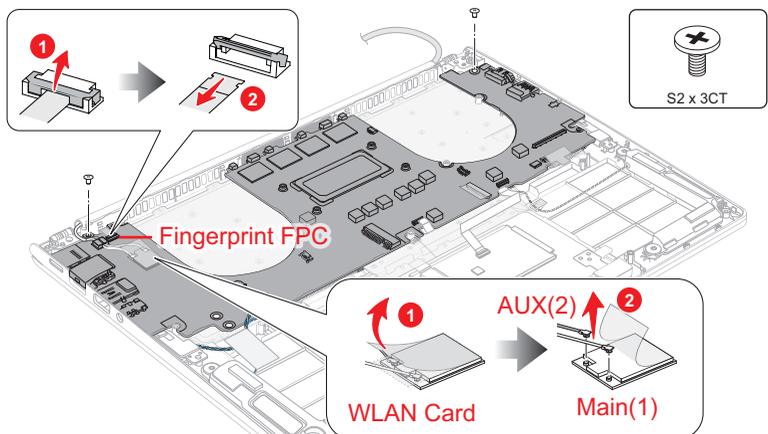
1. Disconnect the **Keyboard FPC**, **Click Pad FFC**, **Keyboard Backlight FPC**, **Speaker harness** from the **System Board**.

Figure 4-11 Removing the system board (1)



2. Disconnect the **Fingerprint FPC** from the connector **CN9551** on the **System Board**.
3. Disconnect the **Wireless LAN antenna** cable from the connector on the Wireless LAN card (black cable from “AUX” or “2” and white cable from “Main” or “1”).
4. Remove the following the screws. Carefully lift up the system board.

Figure 4-12 Removing the system board (2)



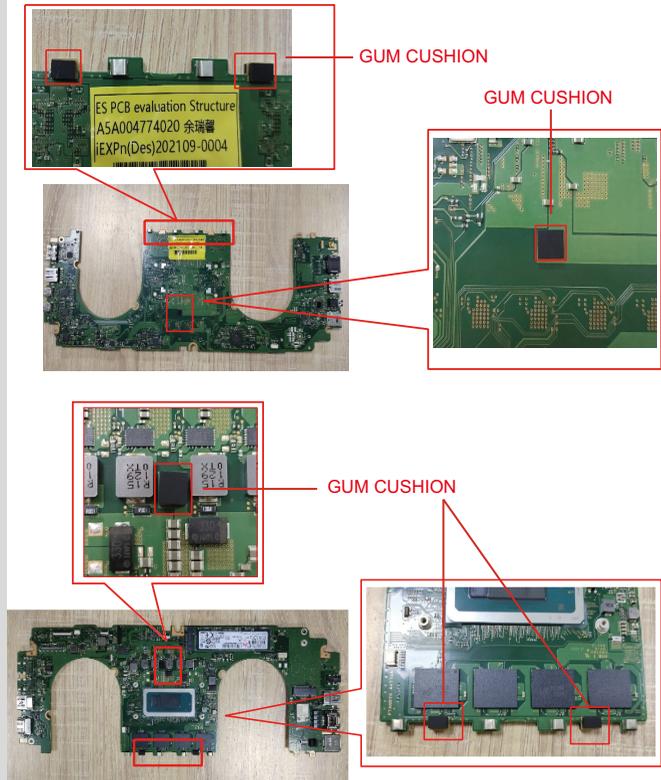
4.15.2 Installing the System board

To install the system board, follow the steps below.

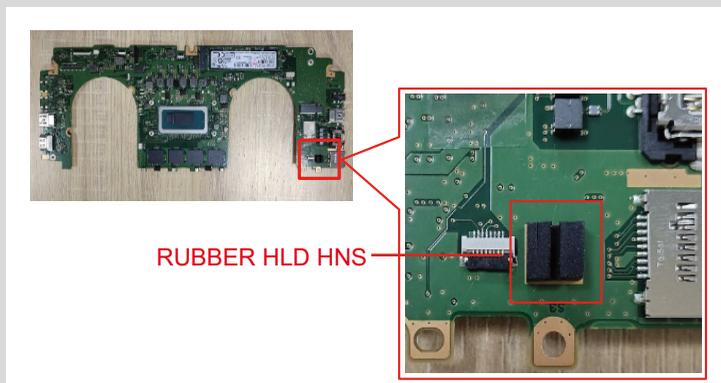
1. Set the system board in place.
2. Secure the system board with the screws.
3. Connect the **Keyboard FPC, Click Pad FFC, Keyboard Backlight FPC, Speaker harness, Fingerprint FPC** to the **System Board**.
4. Connect the **Wireless LAN antenna cable** to the connectors on the Wireless LAN card (black cable from "**AUX**" or "**2**" and white cable from "**Main**" or "**1**").



When replacing the system board with a new one, stick six pieces of **GUM CHUSION** on the system board in place.



When replacing the system board with a new one, stick a **RUBBER HLD HNS** on the system board in place.



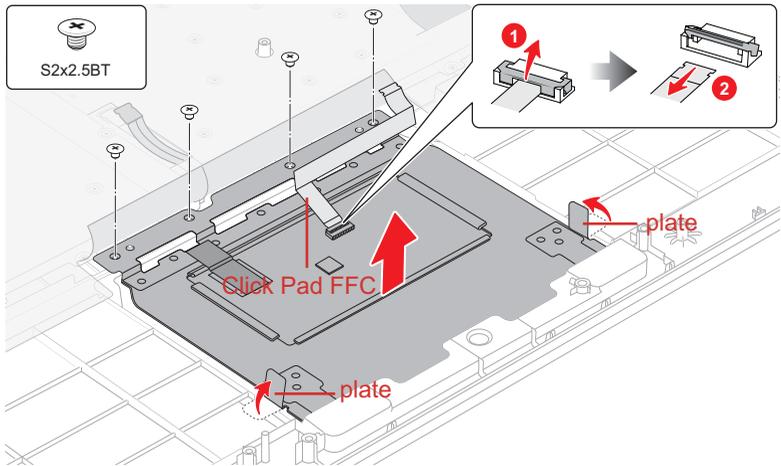
4.16 Click pad

4.16.1 Removing the Click pad

To remove the click pad, follow the steps below.

1. Disconnect the **Click Pad FFC** from the connector on the Click Pad.
2. Remove the following screws, and then lift the **plate** shown in the following figure to remove the Click pad.

Figure 4-13 Removing the Click pad (1)



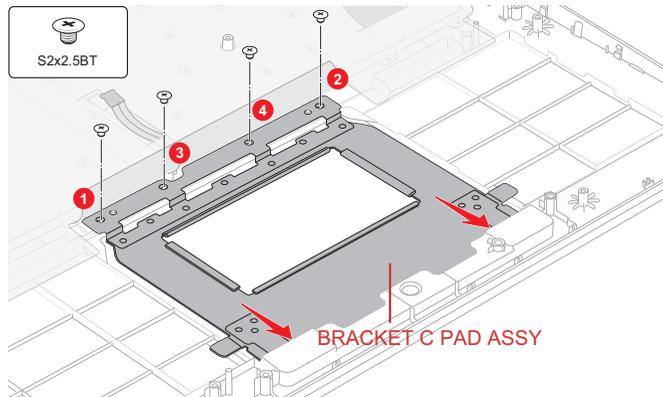
4.16.2 Installing the Click pad



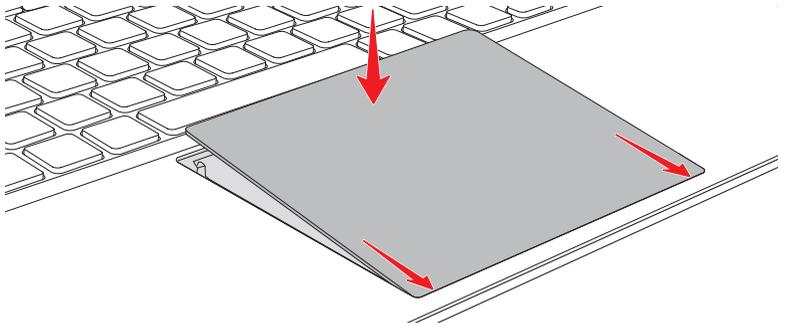
Do not reuse the removed Click pad. Be sure to use new one.

To install the Click pad, follow the steps below.

1. Stick the **CAPD MYLAR** to the new Click pad.
2. Set the **BRACKET C PAD ASSY** to the Cover Assembly and secure it with the screws.

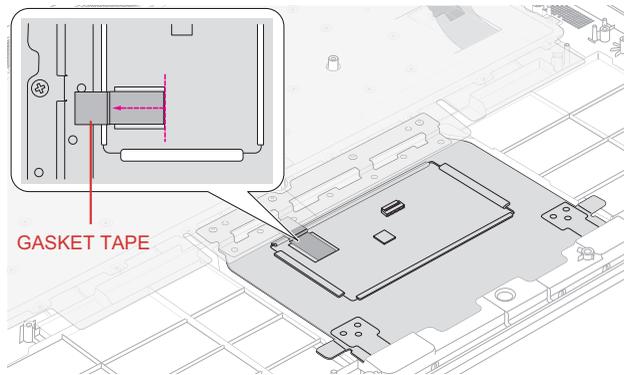
Figure 4-14 Installing the Click pad (1)

3. Stick a new Click pad to the Cover Assembly.

Figure 4-15 Installing the Click pad (2)

4. Stick a new **GASKET TAPE** to the Click pad.

Figure 4-16 Installing the Click pad (3)



5. Connect the **Click Pad FFC** to the connector on the Click Pad and the connector **CN9510** on the **System Board**.

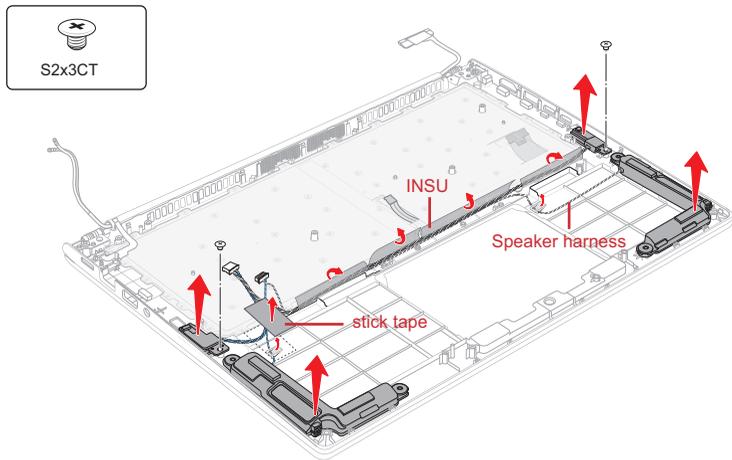
4.17 Speaker

4.17.1 Removing the Speaker

To remove the Speaker, follow the steps below.

1. Disconnect the **Speaker harness** from the connector **CN6290** and **CN6291** on the system board.
2. Open the **INSU** and **stick tape**. Release the **Speaker harness** from the guides.
3. Remove the the following screws and the Speaker from the slot on the Cover Assembly.

Figure 4-17 Removing the Speaker



4.17.2 Installing the Speaker

To install the Speaker, follow the steps below.

1. Set the speakers to the slots of the Cover Assembly and secure it with the screws.
2. Arrange the **Speaker harness** under the guides and fix it with the new **INSU** and **stick tape**.
3. Connect the Speaker harness to the connector **CN6290** and **CN6291** on the system board.

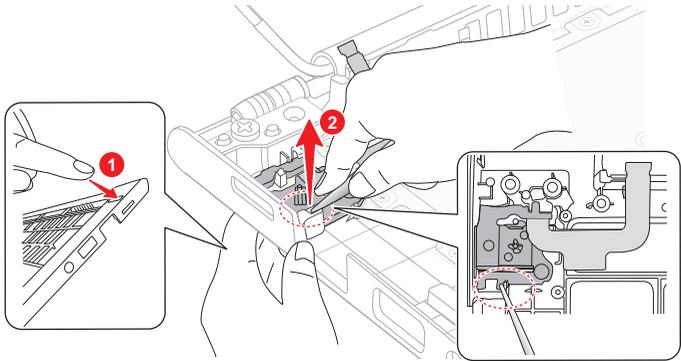
4.18 Power button & Fingerprint sensor

4.18.1 Removing the Power button & Fingerprint sensor

To remove the Power button & Fingerprint sensor, follow the steps below.

1. Remove the Power button & Fingerprint sensor from the Cover Assembly as shown in below figure.

Figure 4-18 Removing the Power button & Fingerprint sensor



4.18.2 Installing the Power button & Fingerprint sensor

To install the Power button & Fingerprint sensor, follow the steps below.

1. Align the module with guide pins on the Cover Assembly and set the Power button in place.

Figure 4-19 Installing the Power button (1)

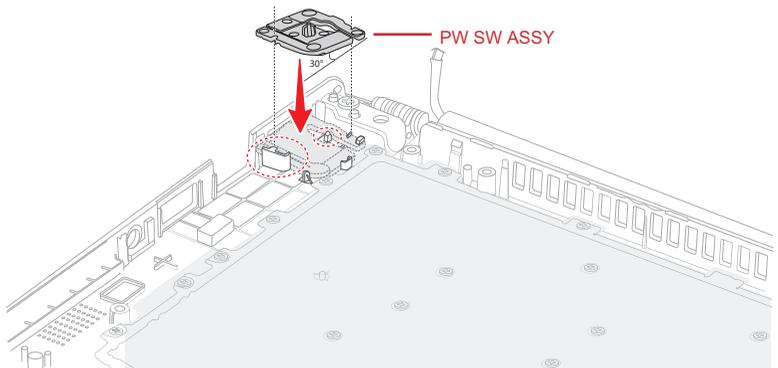
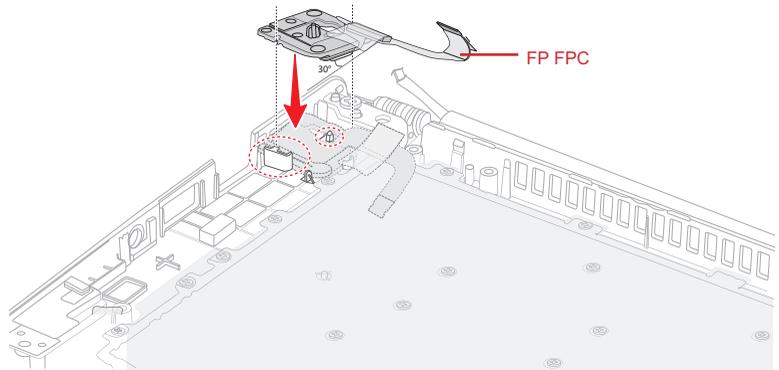
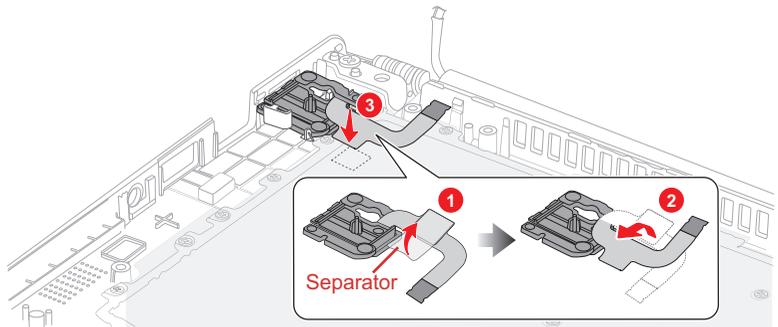


Figure 4-20 Installing the Power button & Fingerprint sensor (2)

2. **(For Fingerprint model)** Peel off the separator on the FP FPC and then stick to the INSU KB.

Figure 4-21 Installing the Power button & Fingerprint sensor (3)

4.19 Keyboard

4.19.1 Removing the Keyboard

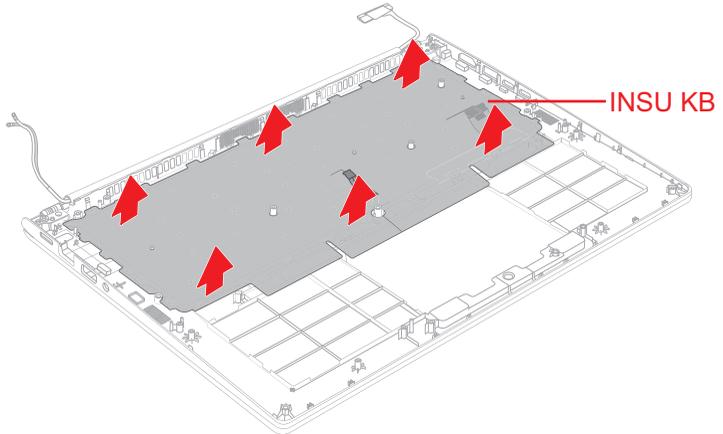
To remove the keyboard, follow the steps below.



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

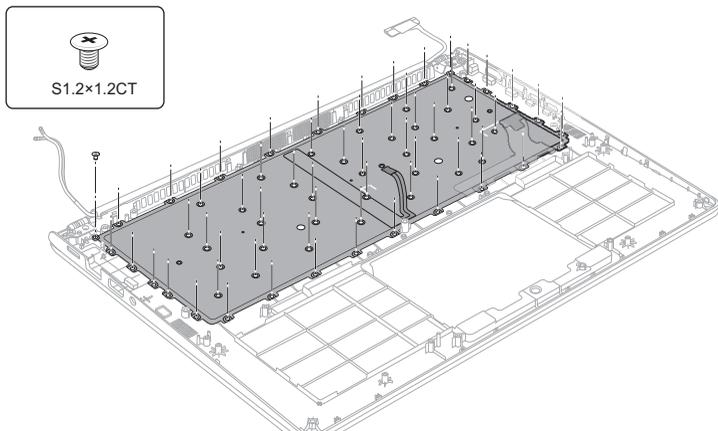
1. Peel off the INSU KB.

Figure 4-22 Removing the keyboard (1)



2. Remove the following screws and then keyboard.

Figure 4-23 Removing the keyboard (2)

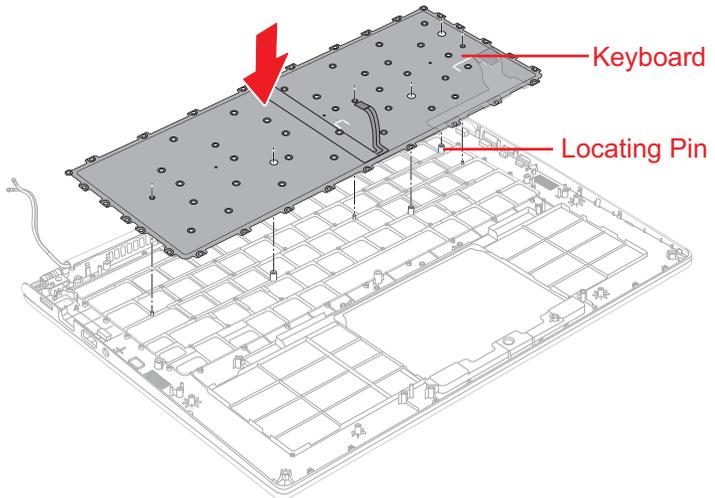


4.19.2 Installing the Keyboard

To install the keyboard, follow the steps below.

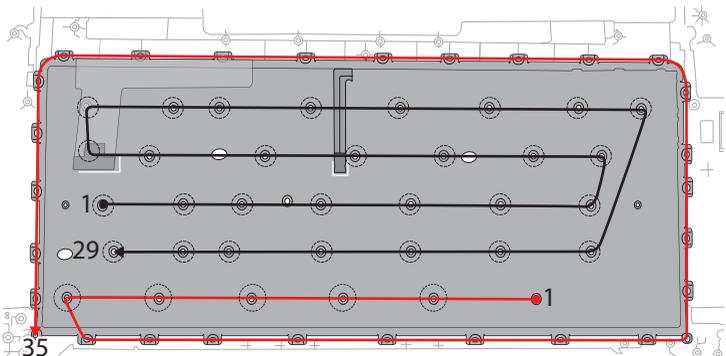
1. Align the **locating pins** and set the keyboard to the Cover Assembly in place.

Figure 4-24 Installing the keyboard (1)



2. Secure keyboard with the following screws. Be sure to secure the screws follow the arrow order on below figure.

Figure 4-25 Installing the keyboard (2)



3. Stick a new **INSU KB** to the Cover Assembly in place. Make sure the whole INSU KB is flatly stuck including the four corners.

4.20 Wireless LAN card

4.20.1 Removing/Installing the Wireless LAN card

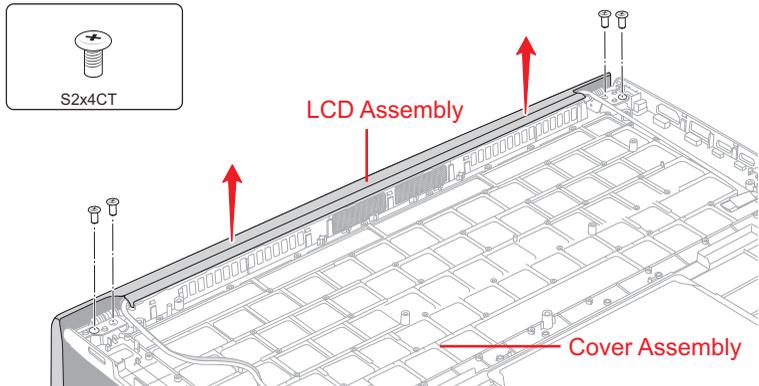
The Wireless LAN card cannot be removed, please replace it with a new System Board.

4.20.2 Removing the W-LAN antenna

To remove the wireless antenna, follow the steps below.

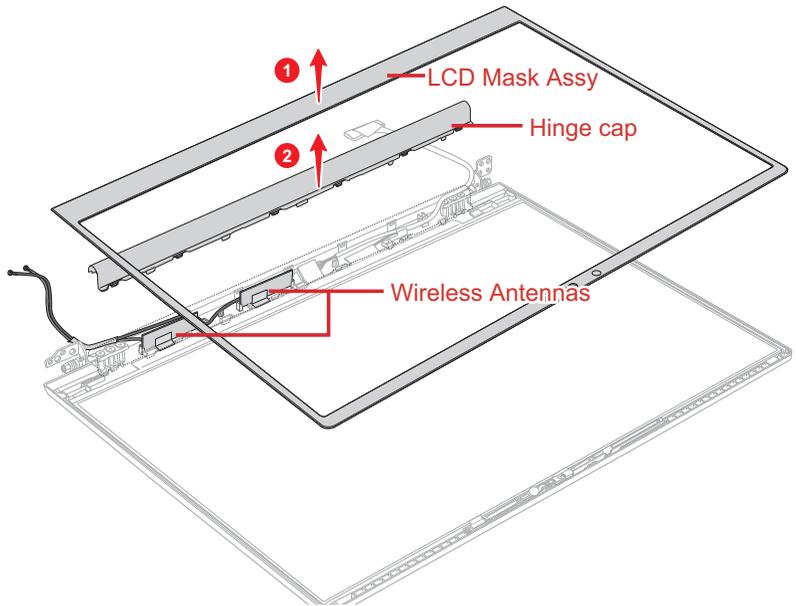
1. Release the following **screws** and separate the LCD Assembly and Cover Assembly.

Figure 4-26 Removing the W-LAN ANTENNA (1)



2. Remove the **LCD mask** from the LCD Cover Assembly and then Remove **hinge cap**.
3. Peel off the wireless LAN antennas from the LCD cover.

Figure 4-27 Removing the W-LAN antenna (2)

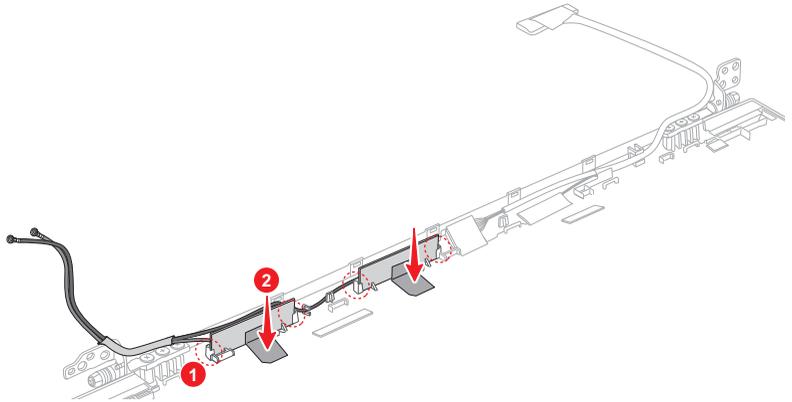


4.20.3 Installing the W-LAN antenna

To install the W-LAN antenna, follow the steps below.

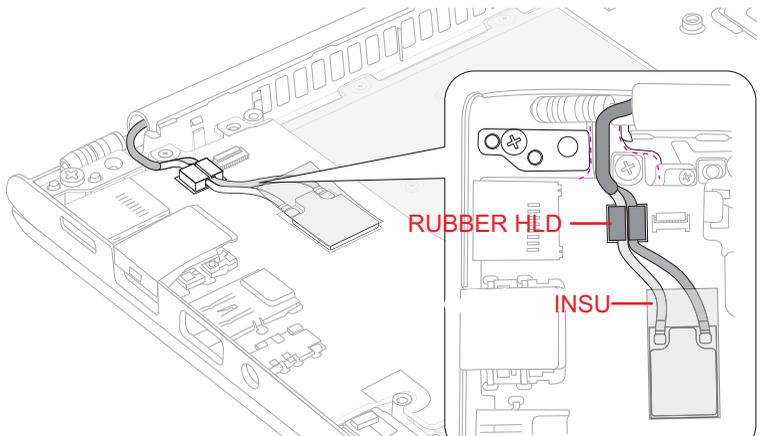
1. Stick new **Wireless antennas** in place.
2. Arrange the **Wireless antenna cables** in place as shown in below figure.

Figure 4-28 Installing the W-LAN antenna (1)



3. Set the **hinge cap** while engaging the latches.
4. Peel off the **separator** on the LCD mask and then set the LCD mask on the LCD cover.
5. Arrange the Wireless antenna cables in place and secure it with **RUBBER HLD.**
6. Stick a new **INSU** on the wireless LAN card.

Figure 4-29 Installing the W-LAN antenna(2)



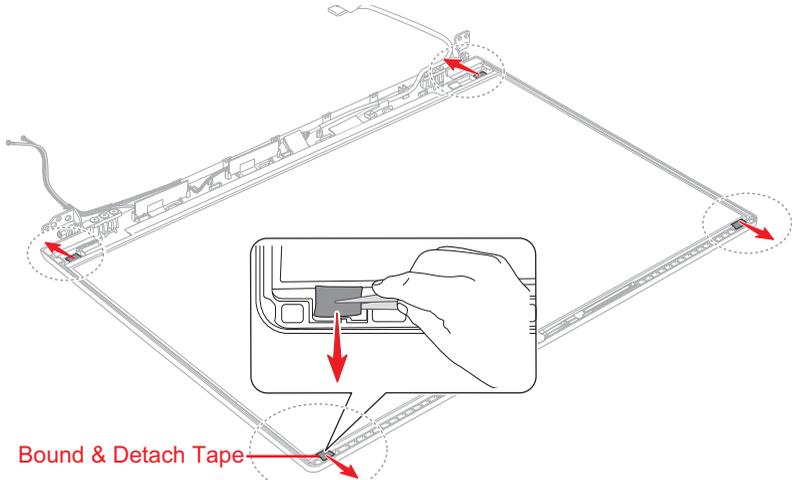
4.21 LCD Assembly

4.21.1 Removing the LCD unit

To remove the LCD unit, follow the steps below.

1. Grasp the bound & detach tapes and pull out the tapes slowly and parallelly from the LCD cover.

Figure 4-30 Removing the LCD unit (1)



2. Take out the LCD unit.
Be careful that the LCD harness is connected to the connector on the back of the LCD unit.
3. Peel the pull tape and disconnect the LCD harness from the connector on the LCD unit.

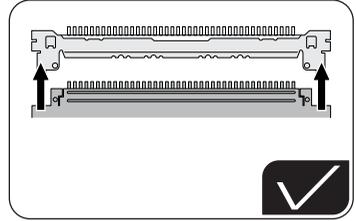
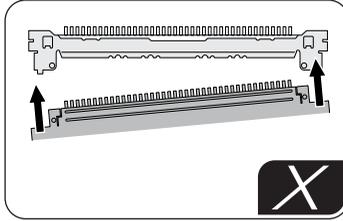
4.21.2 Installing the LCD unit

To install the LCD unit, follow the steps below.

1. Connect the LCD harness to the connector on the LCD unit and secure it with the pull tape and glass tape.

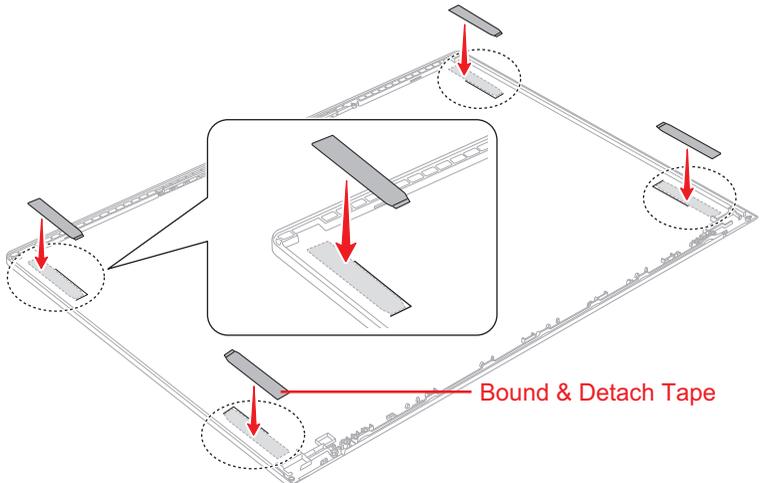


When connect the LCD harness, make sure to connect the right and left side at the same time as shown in the figure below.



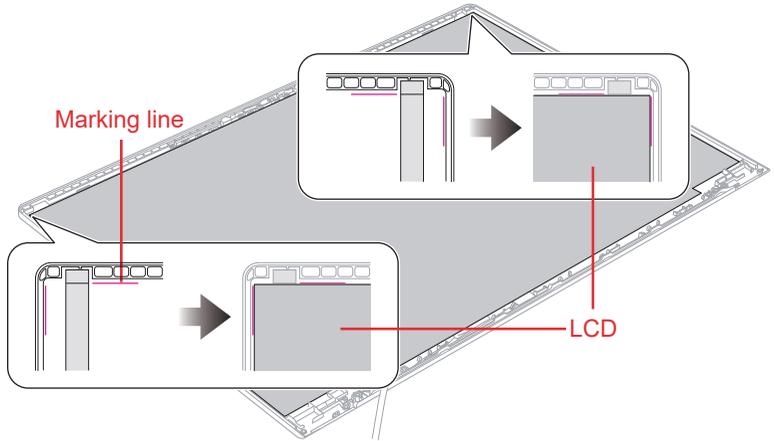
- Remove the **Mylar** from the LCD cover first and then stick 4 pieces of bound & detach tapes referring to the **marking line** on the LCD cover.

Figure 4-31 Installing the LCD unit (1)



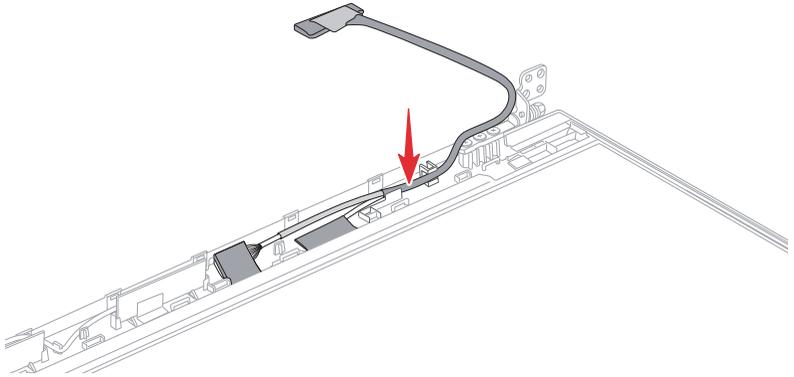
- Peel off the separators on the bound & detach tapes and then align the **marking line** on the LCD cover to set the LCD in place.

Figure 4-32 Installing the LCD unit (2)



4. Arrange the LCD harness under the guides of the LCD cover.

Figure 4-33 Installing the LCD unit (3)



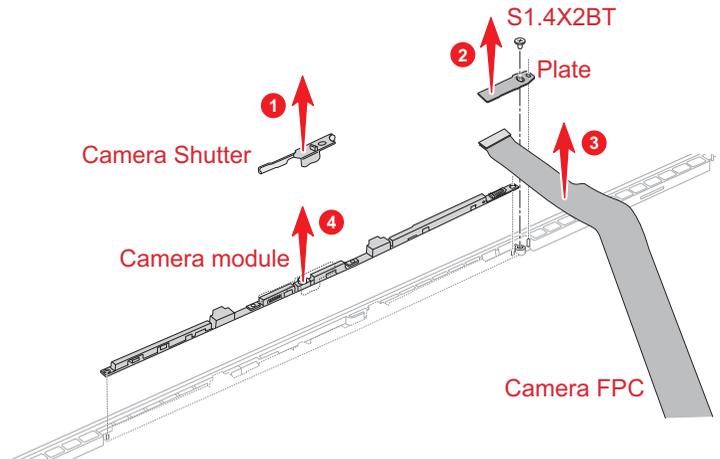
4.22 Camera module

4.22.1 Removing the Camera module

To remove the camera module, follow the steps below.

1. Remove the **Camera Shutter, screw and plate**.
2. Disconnect the **FPC** from the connector on the camera module.
3. Peel off the **camera module** from the slot of the LCD cover.

Figure 4-34 Removing the camera module (1)



Do not reuse the removed camera module. Be sure to use new camera module.

4.22.2 Installing the Camera module

To install the camera module, follow the steps below.

1. Connect the **Camera FPC** to the connector on the camera module.
2. Peel off a protection sheet from a new camera module and stick the new **camera module** to the LCD cover.
3. Set the **Plate** in place and secure it with the screw.
4. Set the **Camera Shutter** in place.

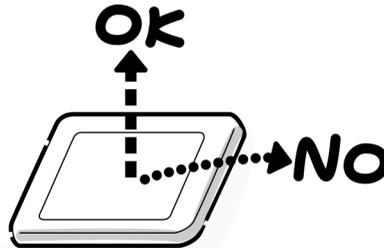
Appendix A

Handling the LCD Module

A.1 Precautions for handling the LCD module

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

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



2. Be careful to align the holes at the four corners of the LCD module with the corresponding holes in the LCD cover before securing the module with screws. Do not force the module into place, because stress can affect its performance. Also, the panel's polarized surface is easily scarred, so be careful when handling it.



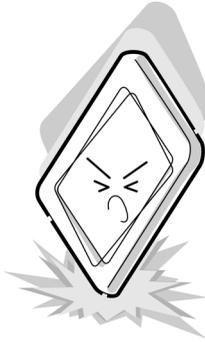
3. If the panel's surface gets dirty, wipe it with cotton or a soft cloth. If it is still dirty, try breathing on the surface to create a light condensate and wipe it again. If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.



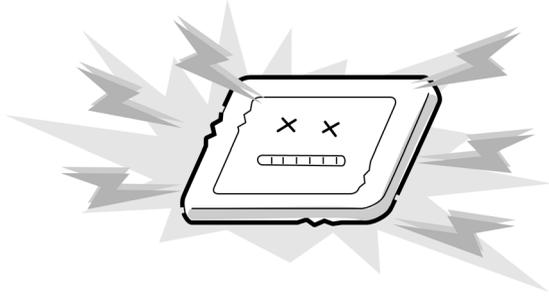
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.



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



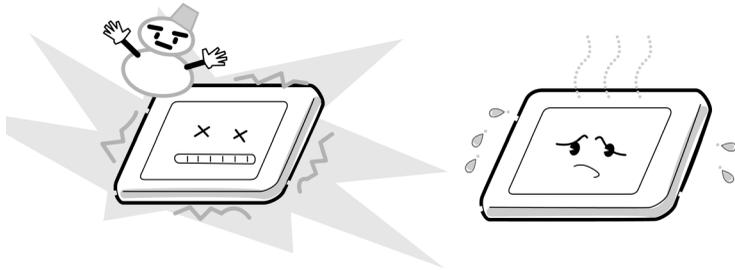
6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle ground when handling the module.



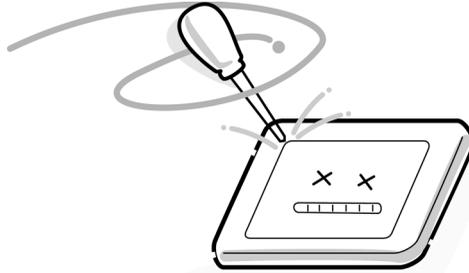
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.



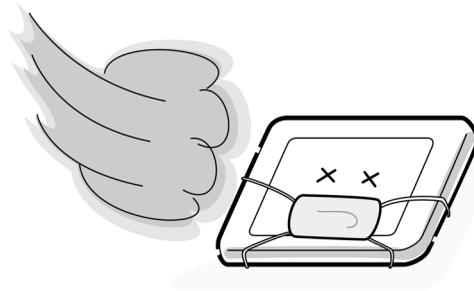
8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



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



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



Appendix B

Board Layout

B.1 System Board (FTANSY*) Front View

Figure B-1 System Board (FTANSY*) layout (front)

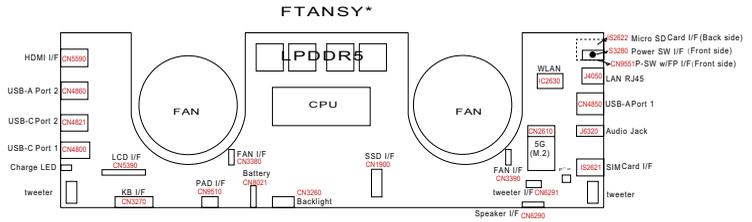


Table B-1 System Board (FTANSY*) connectors (front)

Number	Name
CN5590	HDMI I/F connector
CN4860	USB 3.0 Type-A I/F connector
CN4821	USB Type-C I/F connector
CN4800	USB Type-C I/F connector
CN5390	LCD I/F connector
CN3270	Keyboard I/F connector
CN9510	Click pad (touch pad) I/F connector
CN3380	FAN I/F connector
CN3260	Keyboard Backlight interface connector
CN8021	Battery I/F connector
CN1900	SSD interface connector
CN3390	FAN I/F connector
CN6291	Tweeter I/F connector
CN6290	Speaker I/F connector
CN2610	5G I/F connector
CN9551	Fingerprint sensor I/F connector
IS2622	Micro SD I/F connector
J4050	LAN interface connector
CN4850	USB 3.0 Type-A I/F connector
J6320	HeadPhone/Mic jack
IS2621	Nano SIM card I/F connector

Appendix C

Keyboard Scan/Character Codes

C.1 Scan Codes

Table C-1 Scan codes (set 1 and set 2)

Cap No.	Keytop	Code set 1		Code set 2		Note
		Make	Break	Make	Break	
01	' ~	29	A9	0E	F0 0E	
02	1 !	02	82	16	F0 16	
03	2 @	03	83	1E	F0 1E	
04	3 #	04	84	26	F0 26	
05	4 \$	05	85	25	F0 25	
06	5 %	06	86	2E	F0 2E	
07	6 ^	07	87	36	F0 36	
08	7 &	08	88	3D	F0 3D	*2
09	8 *	09	89	3E	F0 3E	*2
10	9 (0A	8A	46	F0 46	*2
11	0)	0B	8B	45	F0 45	
12	- _	0C	8C	4E	F0 4E	
13	= +	0D	8D	55	F0 55	

Cap No.	Keytop	Code set 1		Code set 2		Note
		Make	Break	Make	Break	
15	BkSp	0E	8E	66	F0 66	
16	Tab	0F	8F	0D	F0 0D	
17	Q	10	90	15	F0 15	
18	W	11	91	1D	F0 1D	
19	E	12	92	24	F0 24	
20	R	13	93	2D	F0 2D	
21	T	14	94	2C	F0 2C	
22	Y	15	95	35	F0 35	
23	U	16	96	3C	F0 3C	*2
24	I	17	97	43	F0 43	*2
25	O	13	98	44	F0 44	*2
26	P	19	99	4D	F0 4D	*2
27	[{	1A	9A	54	F0 54	
28] }	1B	9B	5B	F0 5B	
29	\	2B	AB	5D	F0 5D	*5
30	Caps Lock	3A	BA	58	F0 58	
31	A	1E	9E	1C	F0 1C	
32	S	1F	9F	1B	F0 1B	
33	D	20	A0	23	F0 23	
34	F	21	A1	2B	F0 2B	
35	G	22	A2	34	F0 34	
36	H	23	A3	33	F0 33	
37	J	24	A4	3B	F0 3B	*2
38	K	25	A5	42	F0 42	*2
39	L	26	A6	4B	F0 4B	*2
40	; :	27	A7	4C	F0 4C	*2
41	' "	28	A8	52	F0 52	
43	Enter	1C	9C	5A	F0 5A	*3
44	Shift (L)	2A	AA	12	F0 12	
45	No.102 key	56	D6	61	F0 61	

Cap No.	Keytop	Code set 1		Code set 2		Note
		Make	Break	Make	Break	
46	Z	2C	AC	1A	F0 1A	
47	X	2D	AD	22	F0 22	
48	C	2E	AE	21	F0 21	
49	V	2F	AF	2A	F0 2A	
50	B	30	B0	32	F0 32	
51	N	31	B1	31	F0 31	
52	M	32	B2	3A	F0 3A	*2
53	, <	33	B3	41	F0 41	*2
54	. >	34	B4	49	F0 49	*2
55	/ ?	35	B5	4A	F0 4A	*2
57	Shift (R)	36	B6	59	F0 59	
58	Ctrl	1D	9D	14	F0 14	*3
60	Alt (L)	38	B8	11	F0 11	*3
61	Space	39	B9	29	F0 29	
62	ALT (R)	E0 38	E0 B8	E0 11	E0 F0 11	
75	Ins	E0 52	E0 D2	E0 70	E0 F0 70	*1
76	Del	E0 53	E0 D3	E0 71	E0 F0 71	*1
79	←	E0 4B	E0 CB	E0 6B	E0 F0 6B	*1
80	Home	E0 47	E0 C7	E0 6C	E0 F0 6C	*1
81	End	E0 4F	E0 CF	E0 69	E0 F0 69	*1
83	↑	E0 48	E0 C8	E0 75	E0 F0 75	*1
84	↓	E0 50	E0 D0	E0 72	E0 F0 72	*1
85	PgUp	E0 49	E0 C9	E0 7D	E0 F0 7D	*1
86	PgDn	E0 51	E0 D1	E0 7A	E0 F0 7A	*1
89	→	E0 4D	E0 CD	E0 74	E0 F0 74	*1

Cap No.	Keytop	Code set 1		Code set 2		Note
		Make	Break	Make	Break	
110	Esc	01	81	76	F0 76	
112	F1	3B	BB	05	F0 05	
113	F2	3C	BC	06	F0 06	
114	F3	3D	BD	04	F0 04	
115	F4	3E	BE	0C	F0 0C	
116	F5	3F	BF	03	F0 03	
117	F6	40	C0	0B	F0 0B	
118	F7	41	C1	83	F0 83	
119	F8	42	C2	0A	F0 0A	
120	F9	43	C3	01	F0 01	
121	F10	44	C4	09	F0 09	*3
122	F11	57	D7	78	F0 78	*3
123	F12	58	D8	07	F0 07	*3
124	PrintSc	*6	*6	*6	*6	*6
126	Pause	*7	*7	*7	*7	*7
202	Fn	—	—	—	—	*4
203	Win	E0 5B	E0 DB	E0 1F	E0 F0 1F	
204	App	E0 5D	E0 DD	E0 2F	E0 F0 2F	

Notes:

1. Scan codes differ by mode.
2. Scan codes differ by overlay function.
3. Combined with the Fn key makes different codes.
4. Fn key does not generate a code by itself.
5. This key corresponds to key No. 42 in a 102-key model.
6. Refer to [Table C-6](#), No. 124 key scan code.
7. Refer to [Table C-7](#), No. 126 key scan code.

Table C-2 Scan codes with left Shift key

Cap No.	Keytop	Code set 1		Code set 2	
		Make	Break	Make	Break
55	/	E0 AA E0 35	E0 B5 E0 2A	E0 F0 12 E0 4A	E0 F0 4A E0 12
75	INS	E0 AA E0 52	E0 D2 E0 2A	E0 F0 12 E0 70	E0 F0 70 E0 12
76	DEL	E0 AA E0 53	E0 D3 E0 2A	E0 F0 12 E0 71	E0 F0 71 E0 12
79	←	E0 AA E0 4B	E0 CB E0 2A	E0 F0 12 E0 6B	E0 F0 6B E0 12
80	Home	E0 AA E0 47	E0 C7 E0 2A	E0 F0 12 E0 6C	E0 F0 6C E0 12
81	End	E0 AA E0 4F	E0 CF E0 2A	E0 F0 12 E0 69	E0 F0 69 E0 12
83	↑	E0 AA E0 48	E0 C8 E0 2A	E0 F0 12 E0 75	E0 F0 75 E0 12
84	↓	E0 AA E0 50	E0 D0 E0 2A	E0 F0 12 E0 72	E0 F0 72 E0 12
85	PgUp	E0 AA E0 49	E0 C9 E0 2A	E0 F0 12 E0 7D	E0 F0 7D E0 12
86	PgDn	E0 AA E0 51	E0 D1 E0 2A	E0 F0 12 E0 7A	E0 F0 7A E0 12
89	→	E0 AA E0 4D	E0 CD E0 2A	E0 F0 12 E0 74	E0 F0 74 E0 12
203	Win	E0 AA E0 5B	E0 DB E0 2A	E0 F0 12 E0 1F	E0 F0 1F E0 12
204	App	E0 AA E0 5D	E0 DD E0 2A	E0 F0 12 E0 2F	E0 F0 2F E0 12

Note : The table above shows scan codes with the left **SHIFT** key. In combination with the right **SHIFT** key, scan codes are changed as listed below:

	With left Shift	With right Shift
Set 1	E0 AA	E0 B6
	E0 2A	E0 36
Set 2	E0 F0 12	E0 F0 59
	E0 12	E0 59

Table C-3 Scan codes in Numlock mode

Cap No.	Key op	Code set 1		Code set 2	
		Make	Break	Make	Break
75	INS	E0 2A E0 52	E0 D2 E0 AA	E0 12 E0 70	E0 F0 70 E0 F0 12
76	DEL	E0 2A E0 53	E0 D3 E0 AA	E0 12 E0 71	E0 F0 71 E0 F0 12
79	←	E0 2A E0 4B	E0 CB E0 AA	E0 12 E0 6B	E0 F0 6B E0 F0 12
80	Home	E0 2A E0 47	E0 C7 E0 AA	E0 12 E0 6C	E0 F0 6C E0 F0 12
81	End	E0 2A E0 4F	E0 CF E0 AA	E0 12 E0 69	E0 F0 69 E0 F0 12
83	↑	E0 2A E0 48	E0 C8 E0 AA	E0 12 E0 75	E0 F0 75 E0 F0 12
84	↓	E0 2A E0 50	E0 D0 E0 AA	E0 12 E0 72	E0 F0 72 E0 F0 12
85	PgUp	E0 2A E0 49	E0 C9 E0 AA	E0 12 E0 7D	E0 F0 7D E0 F0 12
86	PgDn	E0 2A E0 51	E0 D1 E0 AA	E0 12 E0 7A	E0 F0 7A E0 F0 12
89	→	E0 2A E0 4D	E0 CD E0 AA	E0 12 E0 74	E0 F0 74 E0 F0 12
203	Win	E0 2A E0 5B	E0 DB E0 AA	E0 12 E0 1F	E0 F0 1F E0 F0 12
204	App	E0 2A E0 5D	E0 DD E0 AA	E0 12 E0 2F	E0 F0 2F E0 F0 12

Table C-4 Scan codes with Fn key

Cap No.	Keytop	Code set 1		Code set 2	
		Make	Break	Make	Break
43	ENT	E0 1C	E0 9C	E0 5A	E0 F0 5A
58	CTRL	E0 1D	E0 9D	E0 14	E0 F0 14
60	LALT	E0 38	E0 B8	E0 11	E0 F0 11
121	ARROW	45	C5	77	F0 77
122	NUMERIC	45	C5	77	F0 77
123	Scrl	46	C5	7E	F0 7E

Table C-5 Scan codes in overlay mode

Cap No.	Keytop	Code set 1		Code set 2	
		Make	Break	Make	Break
09	8 (8)	48	C8	75	F0 75
10	9 (9)	49	C9	7D	F0 7D
11	0 (*)	37	B7	7C	F0 7C
23	U (4)	4B	CB	6B	F0 6B
24	I (5)	4C	CC	73	F0 73
25	O (6)	4D	CD	74	F0 74
26	P (-)	4A	CA	7B	F0 7B
37	J (1)	4F	CF	69	F0 69
38	K (2)	50	D0	72	F0 72
39	L (3)	51	D1	7A	F0 7A
40	; (+)	4E	CE	79	F0 79
52	M (0)	52	D2	70	F0 70
54	. (.)	53	D3	71	F0 71
55	/ (/)	E0 35	E0 B5	40 4A	E0 F0 4A

Table C-6 No.124 key scan code

Key top	Shift	Code set 1				Code set 2			
		Make		Break		Make		Break	
Prt Sc	Common	E0 2A	E0 37	E0 B7	E0 AA	E0 12	E0 7C	E0 F0 7C	E0 F0 12
	Ctrl +	E0 37		E0 B7		E0 7C		E0 F0 7C	
	Shift +	E0 37		E0 B7		E0 7C		E0 F0 7C	
	Alt +		54	D4		84		F0 B4	

Table C-7 No.126 key scan code

Keytop	Shift	Code set 1				Code set 2			
		Make				Make			
Pause	Common*	E1 1D	45 E1	9D C5		E1 14	77 E1	F0 14	F0 77
	Ctrl*	E0 46	E0 C6			E0 7E	E0 F0	7E	

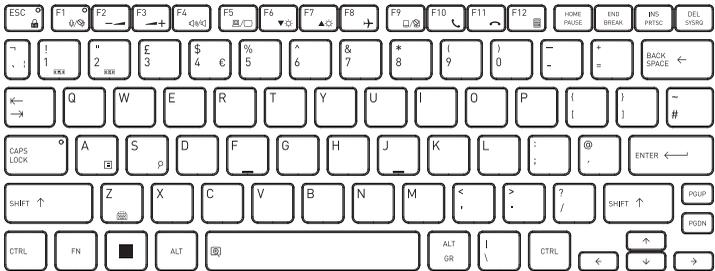
*: This key generates only make codes.

Appendix D

Key Layout

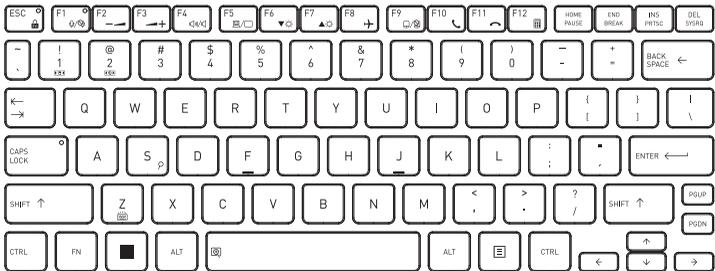
D.1 United Kingdom (UK) Keyboard

Figure D-1 UK keyboard



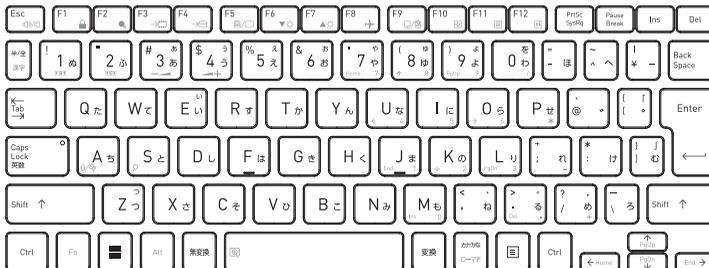
D.2 United States (US) Keyboard

Figure D-2 US keyboard



D.3 Japan (JP) Keyboard

Figure D-3 JP keyboard

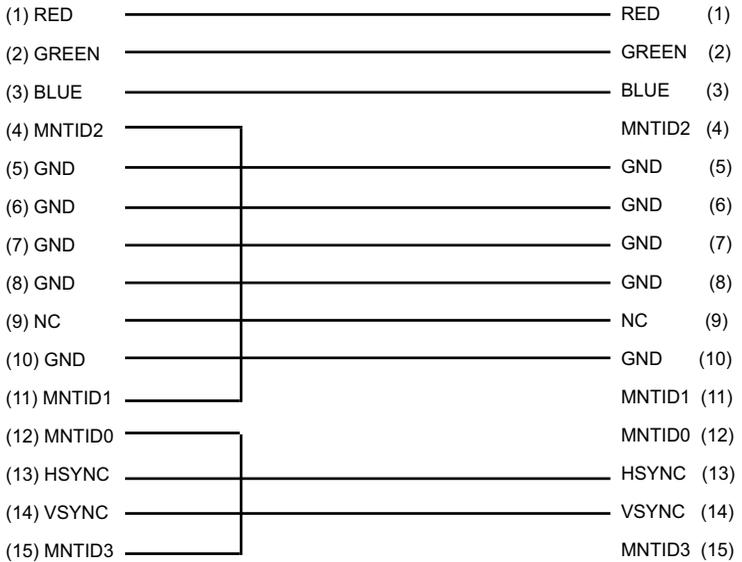


Appendix E

Wiring diagrams

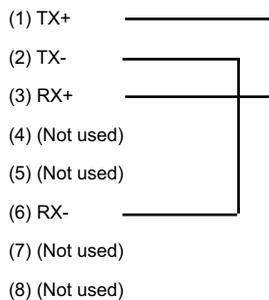
E.1 RGB Monitor Loopback Connector

Figure E-1 RGB Monitor Loopback Connector



E.2 LAN Loopback Connector

Figure E-2 LAN Loopback Connector



Appendix F

BIOS Rewrite Procedures

This Appendix explains how to rewrite the system BIOS program when you update the system BIOS.

F.1 Tools

To rewrite the BIOS, you need the following tool:

- BIOS/EC/KBC rewriting disk

F.2 Rewriting the BIOS

1. Turn off the power to the computer.
2. Remove the external cables and cards.
3. Set the USB Flash Memory containing BIOS rewriting data.
4. Turn on the power while holding down the tilde character key or 半 / 全 key Until LED blinks

For example

(US Keyboard)



(UK Keyboard)



(JP Keyboard)



(Keep holding down the key.)

5. The BIOS rewriting starts.
6. When the process is completed, the system automatically reboots.



1. Connect the AC adaptor and the charged battery to the computer when you rewrite the BIOS.
2. Do not turn off the power while you are rewriting the BIOS.
3. If the rewrite fails, it might be impossible to start up the computer.
4. If you fail to rewrite BIOS, then when you next turn on the power, a message may be displayed that the contents of the BIOS have been erased. In this case, insert the BIOS rewriting disk and the BIOS will be rewritten.

Appendix G

EC/KBC Rewrite Procedures

It is necessary to rewrite the EC/KBC system program when the following changes are made.

1. Replacing of system board
2. Replacing of LCD

The EC/KBC can't be updated solely. It will be updated simultaneously during the BIOS update.

As for the BIOS update, refer to Appendix G.

Appendix H

Reliability

The following table shows MTBF (Mean Time Between Failures) in maximum configuration.

Table H-1 MTBF

Time (hours)
9026