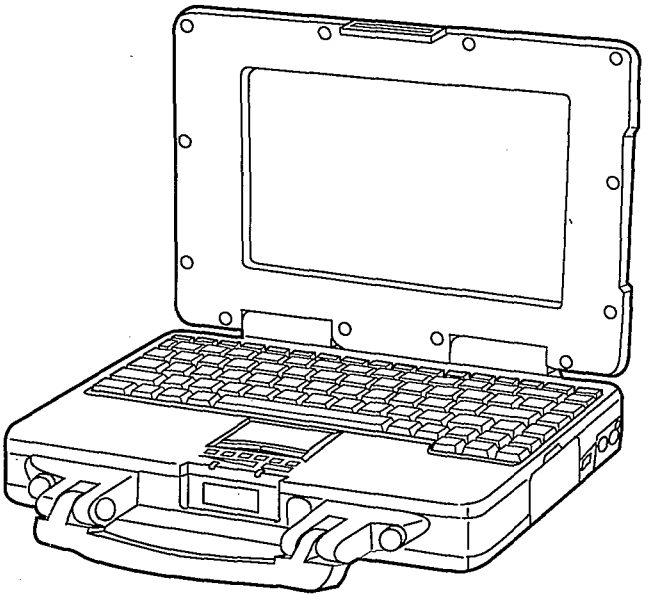
ORDER NO. CPD9609026C0
G22

Service Manual

Notebook Computer

CF-25



This is the Service Manual for the following areas.

M ... for U.S.A. and Canada
E ... for U.K.
G ... for Germany

Model Number Reference

The models in the CF-25 series are numbered in accordance with the types of the CPU, LCD and HDD etc. featured by the product.

Model No.CF-25 □ □ □ □ **AA** □

CPU type
- C: for Pentium™Processor /100MHz
- E: for Pentium™Processor /133MHz

LCD type
- G: for 10.4" TFT Color /800 X 600 pixels

HDD type
- 8: for 840MB
- C: for 1.35GB

RAM size
- 2: for 8MB

Area
- M: for U.S.A. and Canada
- E: for U.K.
- G: for Germany

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic®

For U.K.

WARNINGS

- Disconnect the mains plug from the supply socket when not in use.
- This equipment is not designed for connection to an IT power system.
- Care must be taken to ensure that the integrity of the PELV (Protective Extra Low Voltage) system is maintained when interface to other parts of equipment takes place.

This apparatus must be earthed for your safety.

To ensure safe operation three pin-plug (not for U.K.) must be inserted only into a standard tree-pin power point which is effectively earthed through the normal household wiring.
Ensure the main outlet socket is easily accessible to enable the user to isolate the apparatus from the main supply by withdrawing the main plug.
Extension cords used with the equipment must be three core and be correctly wired to provide connection to earth. Wrongly wired extension cords are major cause of fatalities.
The fact that the equipment operates satisfactorily does not imply that the power point is earthed and that the installation is completely safe.
For your safety, if any doubt about the effective earthing of the power point, consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Green-and-Yellow: Earth
Blue: Neutral
Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured marking identifying the terminals in your plug, produced as follows: The wire which is coloured GREEN-and-YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol or coloured GREEN of GREEN-and-YELLOW.
The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.
The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

LITHIUM BATTERY ⚠

- **CAUTION**
  Danger of explosion if battery is incorrectly replaced.
  Replace only with the same or equivalent type recommended by the equipment manufacture.
  Discard used batteries according to the manufacturer's instructions.

LITHIUMBATTERIE ⚠

Vorsicht!
Explosionsgefahr bei unsachgemäßem Austausch der Batterie. Ersatz nur durch denselben order einen vom Hersteller empfohlenen ähnlichen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

PILE AU LITHIUM ⚠

ATTENTION: IL Y A DANGER D'EXPLOSION S' IL Y A REMPLACEMENT INCORRECT DE LA PILE. REMPLACER UNIQUEMENT AVEC UNE PILE DU MÈME TYPE OU D'UN TYPE RECOMMANDÉ PAR LE CONSTRUCTEUR. METTRE AU RÉBUT LES PILES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS DU FABRICANT.

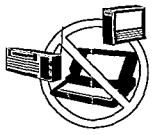
Precautions

■ Usage

Keep away from Heat and Cold
Do not store or use the computer in locations exposed to heat, direct sunlight, or extreme cold.
Avoid moving the computer between locations with large temperature differences.
Operation: 5 °C to 35 °C (41 °F to 95 °F)
Storage: -20 °C to 60 °C (-4 °F to 140 °F)

Avoid Humidity Liquids and Dust
Do not store or use the computer in locations exposed to high humidity, liquids (including rain) or dust.

Prevent Shock
Do not subject the computer to severe vibrations or impact. Do not place the computer inside a car truck.



Avoid Radio Frequency Interference
Do not place the computer near a television or radio receiver.

■ Handling

Keep Magnets Away
Keep the computer away from magnetic fields.

Avoid Stacking
Do not place heavy objects on top of the computer.

Keep Small Object Away
Do not insert paper clips or other small objects into the computer.

Do Not Disassemble the Computer
Do not attempt to disassemble your compuer.

LCD Panel
- The LCD panel should not be exposed to direct sunlight or ultraviolet light.
- Do not apply excessive downward force on the display when it is completely opened, especially when plugs and/or cables are connected to the rear of the computer.

Carrying
- Do not carry the computer without first turning off the power.
- Do not hold the computer by the LCD panel if the computer is open.
- Do not move the computer while a floppy disk is inserted.

■ Maintenance

Surface of the LCD Panel
- Soak a piece of gauze or soft cloth sufficiently in isopropyl alcohol only, and wipe the panel gently. Using excessive force may scratch the panel. Avoid wiping with a dry cloth, since this can damage the surface of the polarizing plate. Also, be sure not to use water and perfumes, as these liquids can dissolve the coloration of the polarizing plate.

Areas other than the Display
- Gently wipe other areas using a soft cloth pre-soaked in water or a neutral cleaner and wrung out thoroughly. Do not use solvents like benzine and thinner, nor chemical cloths.

■ Handling the AC Adapter

- Do not twist or pull the AC power cord forcefully. Doing so may damage the connections.
- Use only the specified AC adaptor (Factory Control Number: CF-AA1526) with your computer. Using an AC adapter other than the one supplied might damage the battery and/or the computer.
- When the DC plug is not connected to the computer, disconnect the AC cord from your AC wall outlet as well. If the cord is kept connected, a very low level of power equivalent to approximately 1.5 watts will be consumed.

■ Against Computer Viruses

- Anti-virus software is not supplied. However, you should obtain such software if you plan to transfer files actively or to use the Internet.

■ Cables

- Generally speaking, cables or wiring to/from your computer should not exceed 3 m (118.11 inches).

◆CAUTION◆
However this comuter is designed to prepare for shock, liquid and dust, please read the above precautions carefully on how to handle your computer.

CONTENTS

1. Specifications

Model No.	CF-25EGC2AAM / CF-25EGC2AAE*1	CF-25 CG82AAM / CF-25 CG82AAE
CPU	Pentium® Processor (133 MHz, 2.9 V)	Pentium® Processor (100 MHz, 2.9 V)
LCD	10.4" Non Glare Active Matrix (TFT) 800 X 600	
VRAM	1 MB	
Memory	8 MB (Expandable to 40 MB)	
Floppy Disk Drive	1.44 MB (Double-sided, High-density, Double track) 720 KB (Double-sided, Double-density, Double track)	
Hard Disk Drive*2	1.35 GB*3 (16 msec / Enhanced IDE)	840 MB*4 (16 msec / Enhanced IDE)
Sound	16 bits 44.1 KHz	
Speaker	Mono Speaker (built in)	
Keyboard	Windows 95 Keyboard (for U.S.A.: 87keys, for U.K.: 89keys)	
Pointing Device	Touch Pad	
Indicator	LED X 8 (Battery, Power, CapsLK, NumLK, ScrLK, Key Pad, MP, HD)	
Slots	PC (PCMCIA) Card Slots: 3 Slots for Type I or II / 1 Slot for Type III (supports CardBus, ZV Port (bottom slot)), Expansion RAM Slot, Multimedia Pocket Slot Output current limit: 3.3 V: 400 mA, 5 V: 400 mA, 12 V: 120 mA	
Ports	Parallel Port: Dsub 25-pin female Serial Port: Dsub 9-pin male Ext. Display Port: Mini Dsub 15-pin female Ext. Mouse / Keyboard Port: Mini DIN 6-pin female Expansion Bus Port: Dedicated 80-pin female Headphone Connector: Stereo output (Miniature jack, 3.5 DIA) Impedance 32 Ω Output power 4 mW (impedance 32 Ω) X 2 DC-IN Connector: Mini jack Infrared Communication Port: IrDA compliant Speed: 115200 bit/sec	
Battery	Battery Pack: Ni-MH (Nickel Metal Hybride) rechargeable battery pack, 9.6 V, 3200 mAh Operating Time: 1.5-2.5 hours (Depending on the conditions) Charging Time : Power on : approx. 4 hours*5 Power off : approx. 2 hours*5 Clock Battery: Coin type lithium battery, 3.0 V, Operating Time: approx. 10 years	
Power Saving	Suspend (hibernation) function, Standby function	
Software	Operating Environment: Microsoft® Windows® 95 (pre-installed) Utility Programs: Setup, Diagnostics, CardWorks™, TranXit™,	
AC Adapter	AC100 V-240 V 50 / 60 Hz Auto Sensing / Switching DC 15 V, 2.6 A	
Security	Password function (Supervisor Password, User Password, Coffee break Password)	
Physical Dimensions (Width X Height X Depth)	299 mm (11.8") X 59 mm (2.4") X 237 mm (9.3") (Not including protrusions)	
Weight	3.2 kg (7.1 lbs) + handle 0.2 kg (4.6 lbs)	
Environment (Temperature/ Humidity range)	Operating: 5°C to 35°C (41°F to 95°F) / 30% to 80% RH (no condensation) Storage: -20°C to 60°C (-4°F to 140°F) / 30% to 90% RH (no condensation)	

*1 M = U.S.A. model, E = U.K. model, G = Germany model *2 The hard disk drive contains a partition (approx. 90 MB) for system use. *3 1 GB = 10^9 bytes *4 1 MB = 10^6 bytes *5 These values serve only as guidelines.

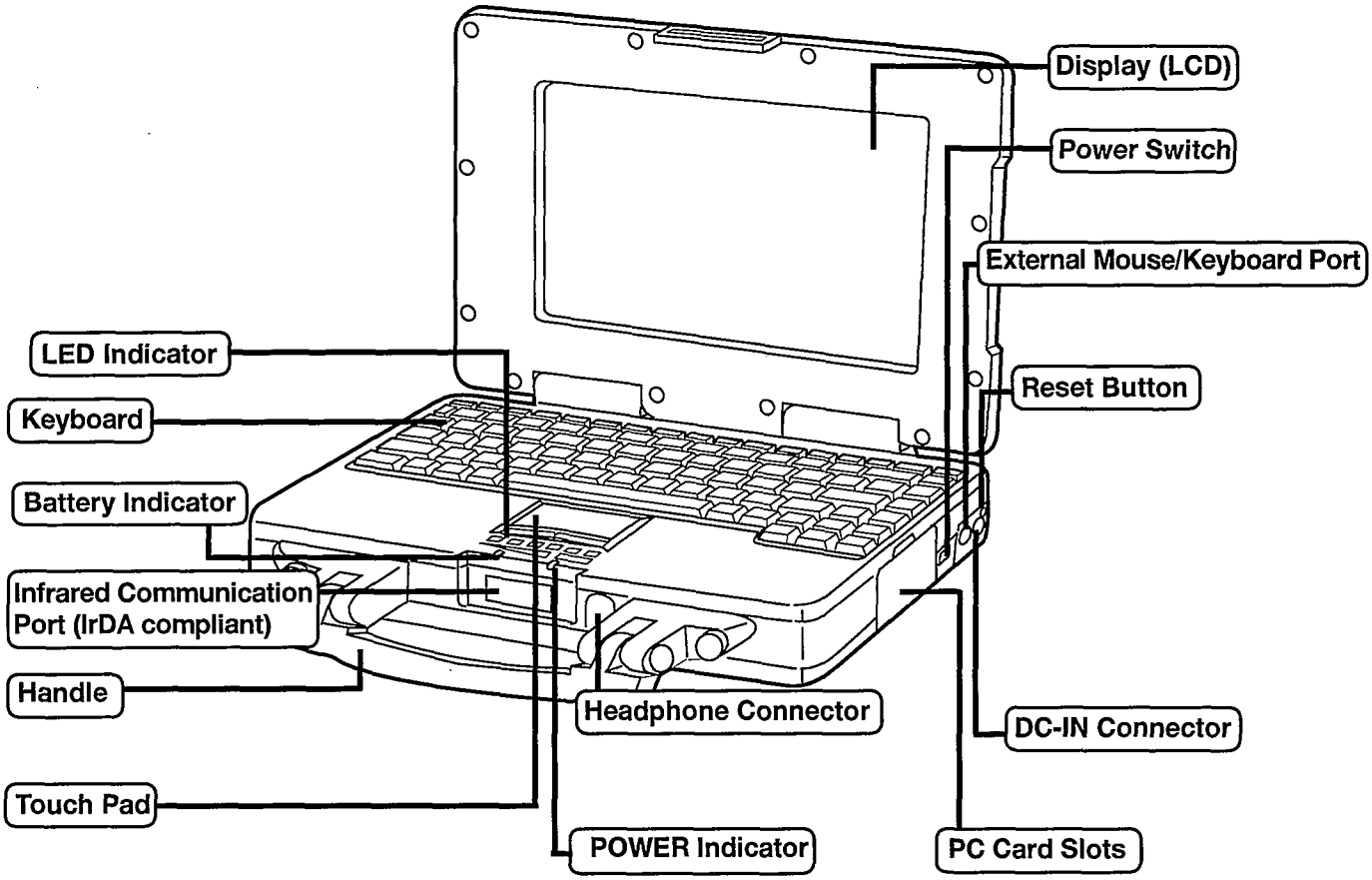
LCD External Display

LCD	Resolution (Pixels)	Color	Refresh Rate (Hz)	
			CRT (Max.)	LCD/SIM (Max.)
800 X 600	640 x 480	256	85	60
	640 x 480	High Color	85	60
	640 x 480	True Color*	85	60
	800 x 600	256	85	60
	800 x 600	High Color	85	60
	1024 x 768	256	85	60

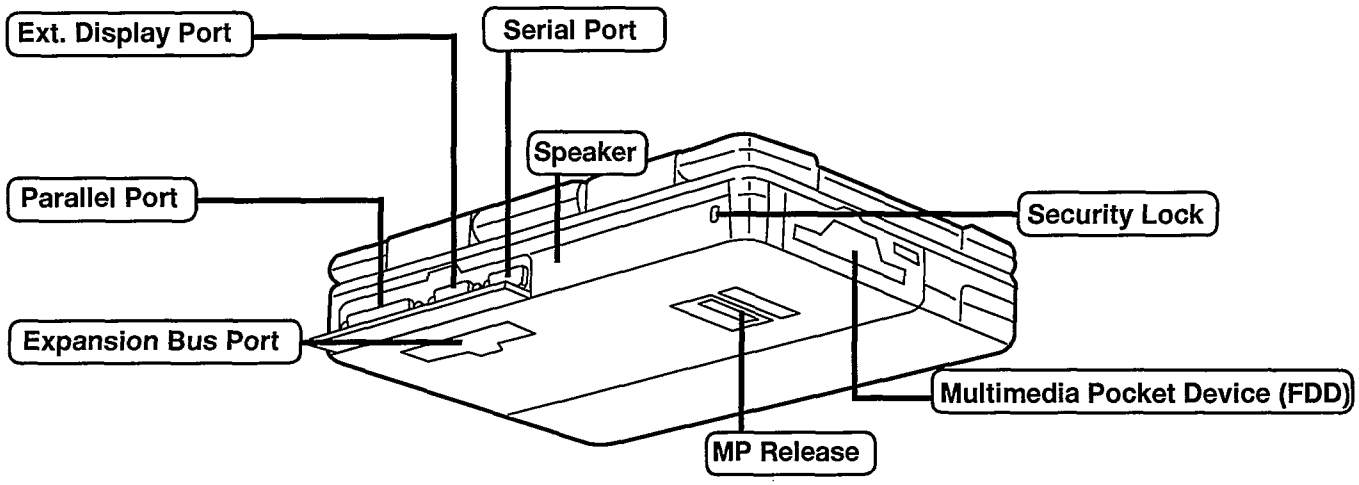
* LCD supports only 262144 (256K) colors.

2. Location of Controls

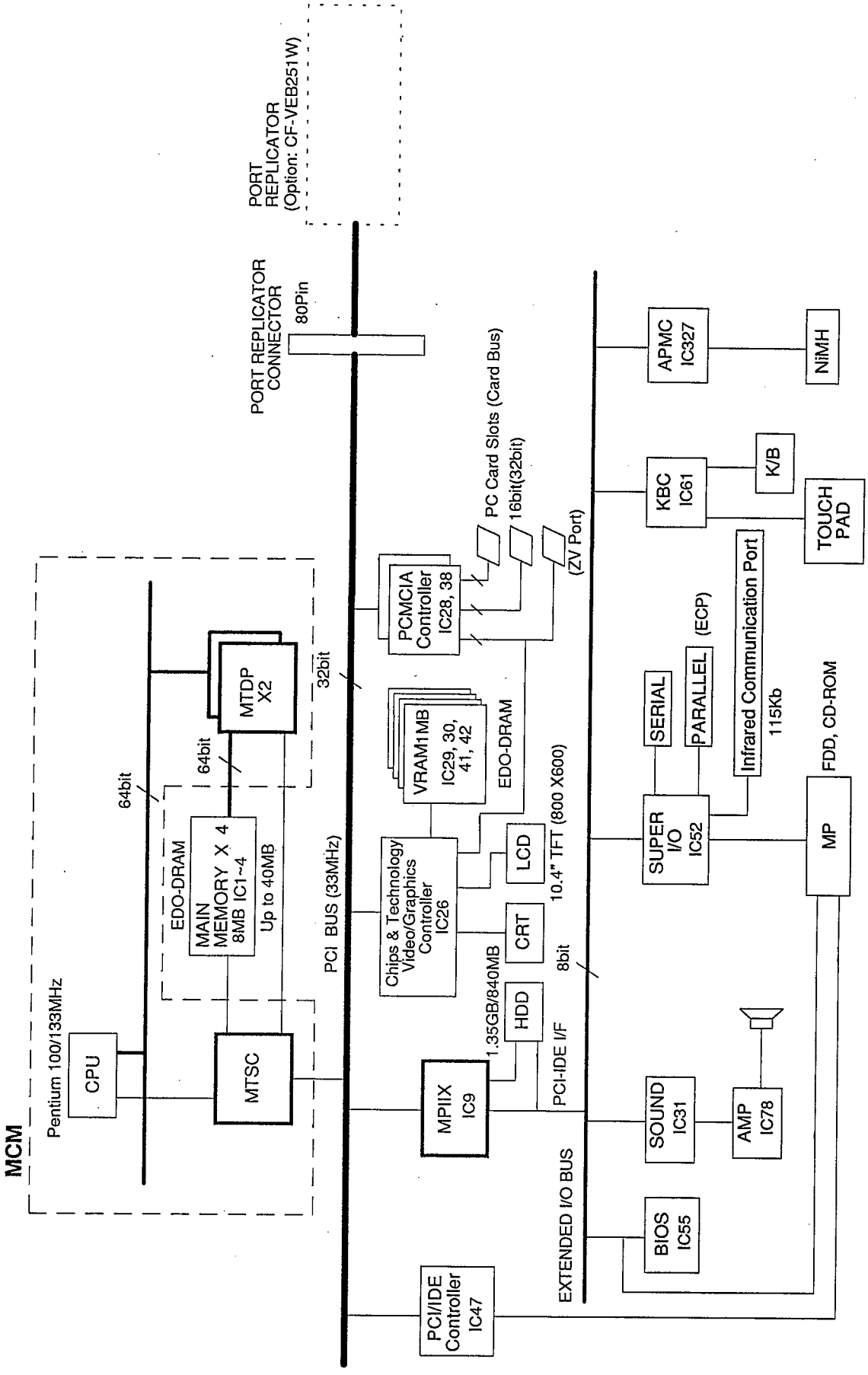
Front



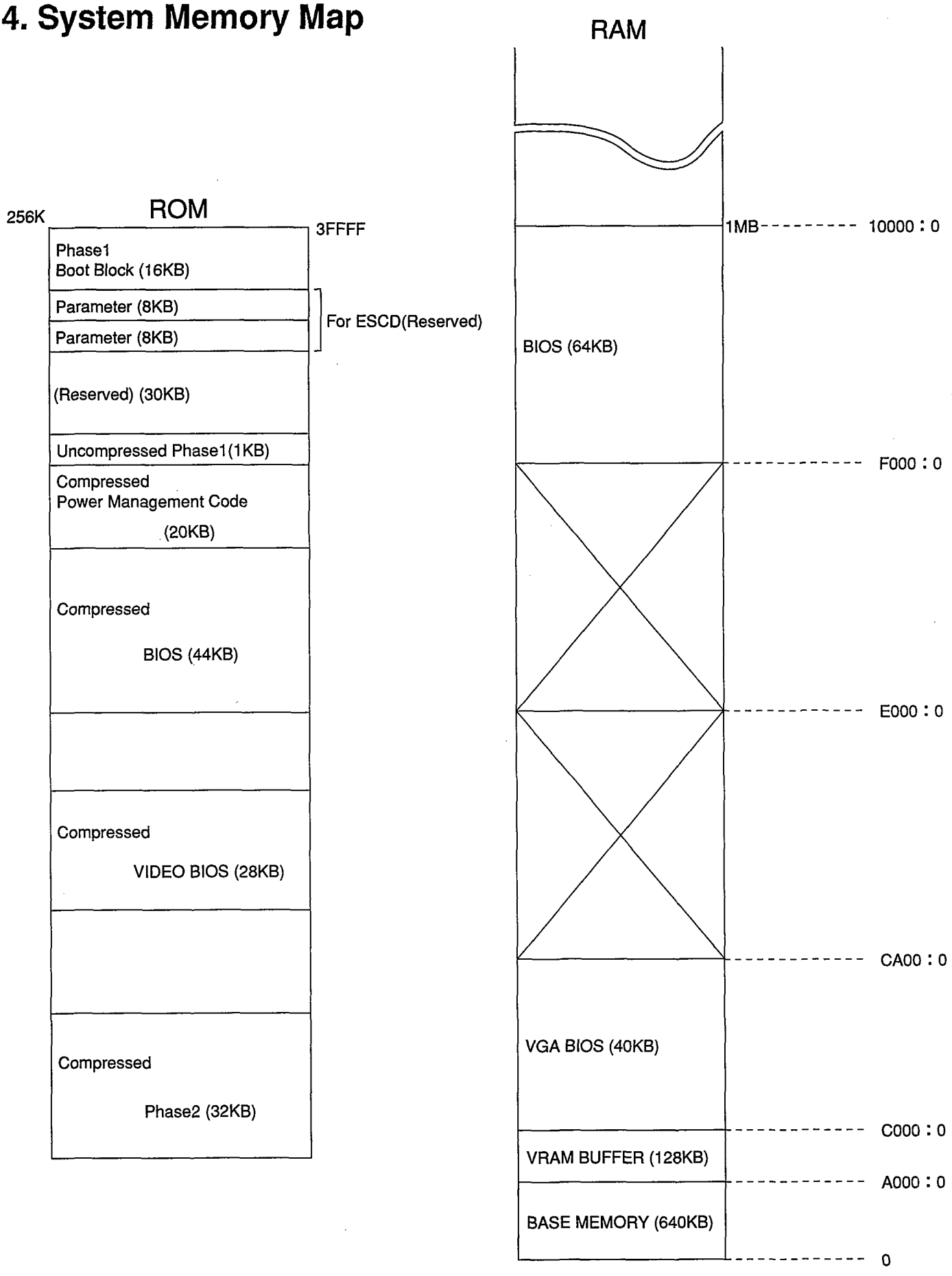
Back and Bottom



3. Block Diagram



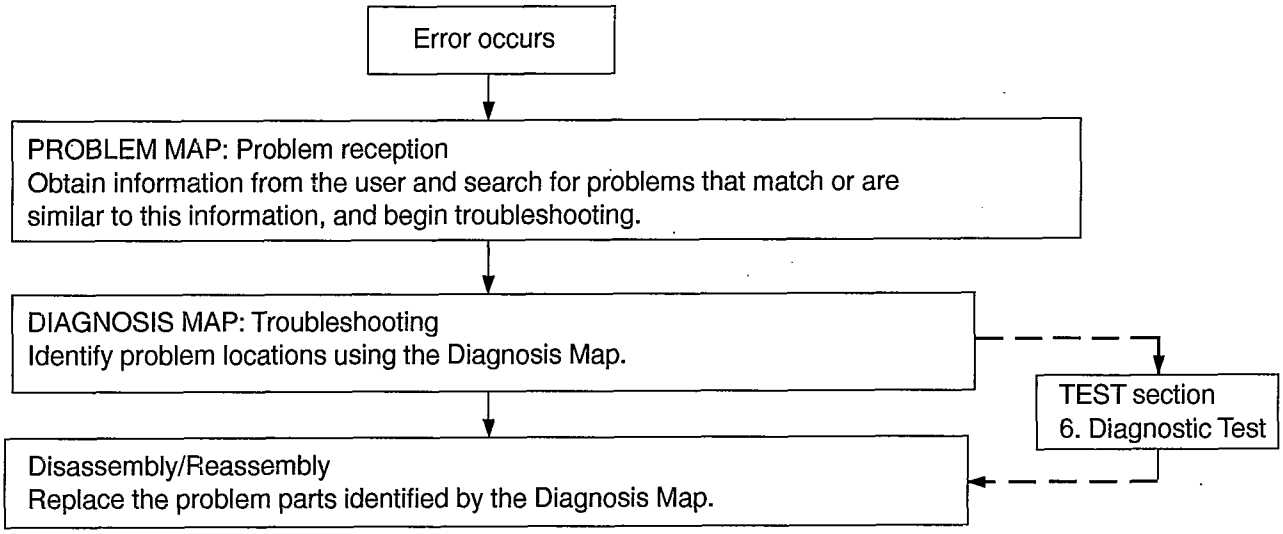
4. System Memory Map



5. Diagnosis Procedure

5.1 Outline of Diagnosis Procedure

If an error message is received from the unit, verify the location of the error in the Problem Map, and select the Diagnosis Map where the cause appears to be located.
Separate the problem locations in the Diagnosis Map, and replace the problem parts identified with the Diagnosis Map.

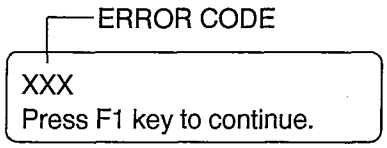


5.2 PROBLEM MAP

■ POST (Power on self test) ERROR

1) Startup Error Codes (Refer to pages 5-4~5-6).

During POST (power on self test) following error codes may be displayed.
They are also displayed if a hardware failure occurs.

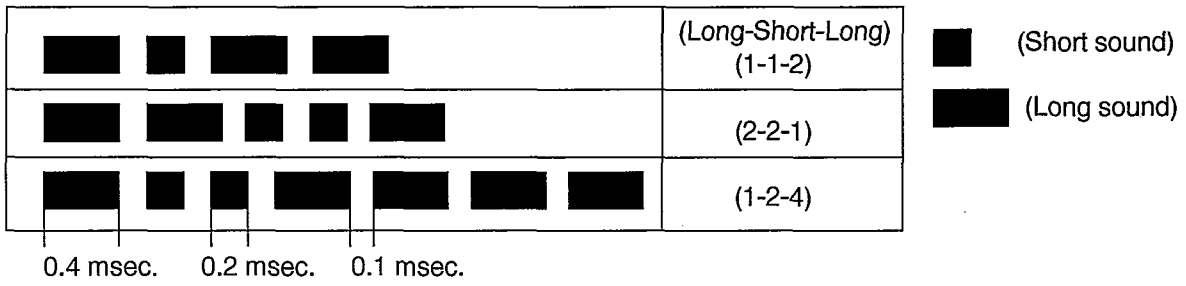


Press [F1] and one of these messages follows.

Code		Code	
062	Boot failure–default configuration used	301	Keyboard Error
101	System Board Failure	303	Keyboard Error
102	System Board Failure	604	Diskette Drive Error
106	System Board Failure	605	Diskette Drive Error
114	Adapter ROM Error	1780	Hard Disk Error
151	System Board Failure	1800	PCI Error
161	Bad CMOS Battery	1801	PCI Error
162	Configuration Change Has Occurred	1802	PCI Error
162	Configuration Error	1803	PCI Error
163	Data and Time Incorrect	1804	PCI Error
173	Configuration Change Has Occurred	1805	PCI Error
177	The security passwords have been corrupted	8601	Pointing Device Error
201	Memory Size Error	I9990301	
		I9990305	

2) Beep Error Codes (Refer to Page 5-6).

Three examples of beep sounds are shown below.
Length of bar shows sound duration.



■ MAIN UNIT PROBLEM

Problem	Symptom	Ref.Page
Power problem	No power is sent to the unit.	5-7
	Power cuts off during operation.	5-7
	Power cannot be turned off during operation.	5-7
System hangs	Unit does not start up when power is turned on.	5-7
	Unit hangs during operation.	5-7
Boot problem	When a device is selected for "Boot Up Drive", the system boots from a different device.	5-7
Date or Clock problem	Date or Time cannot be input.	5-7
	Date and Time does not change properly.	5-7
	Date and Time are not displayed.	5-7
Memory problem	Memory count is too large or too small.	5-7
Speaker problem	No Sound	5-8
	Volume does not work.	5-8
Battery pack problem	Battery pack will not charge.	5-8
	Battery pack overheats.	5-8

■ LCD PROBLEM

Problem	Symptom	Ref.Page
LCD does not display	No picture appears on the screen.	5-8
LCD display problem	Display is too dark or too bright.	5-8
	Display becomes vertical line or horizontal line.	5-8
	Some of the blocks on the screen do not display properly.	5-8
	A striped pattern is displayed.	5-8
	Lines and dots are omitted from the display.	5-8
	Dots appear.	5-8
	Display quality poor.(Fuzzy or slanted, etc.)	5-8
	Backlight does not turn on.	5-8
LCD display function problem	Character appearance is abnormal.	5-8
	Graphics are not displayed, although other characters do appear.	5-8
	Graphics pattern does not display properly.	5-8

KEYBOARD, MOUSE or TOUCH PAD PROBLEM

Problem	Symptom	Ref.Page
Keyboard problem	Key top cannot be pressed.	5-9
	Key top does not spring back after pressing.	5-9
	Unit will not accept inputs from any key.	5-9
	Input character is displayed as garbage.	5-9
Mouse problem	Inputs from the mouse are not accepted properly.	5-9
TOUCH PAD problem	Inputs from the TOUCH PAD are not accepted properly.	5-9

FDD PROBLEM

Problem	Symptom	Ref.Page
FDD problem	FDD indicator is not displayed.	5-9
	Cannot insert floppy disk.	5-9
	Cannot remove floppy disk.	5-9
	Does not boot from FDD.	5-9
	Cannot read from floppy disk.	5-10
	Cannot write to floppy disk.	5-10
	Floppy disk is scratched or otherwise damaged.	5-10
	Content of floppy disk is destroyed.	5-10
	Damage to contents written to floppy disk.	5-10
	Damage to contents read from floppy disk.	5-10
	Abnormal sound.	5-10
	Diagnostic Test reports problem in FDC.	5-10

HDD PROBLEM

Problem	Description	Ref.Page
HDD problem	Does not boot from HDD.	5-10
	Cannot read from HDD.	5-10
	Cannot write to HDD.	5-10
	Damage to data written to HDD.	5-11
	Damage to data read from HDD.	5-11
	HDD contents are destroyed.	5-11
	Diagnostic Test reports problem in HDC or HDD.	5-11
	HDD indicator is not displayed.	5-11
	Abnormal sound.	5-11

SERIAL COMMUNICATION PROBLEM

Problem	Symptom	Ref.Page
Transmission problem	Data cannot be sent or received.	5-11
	Unit will not communicate with another computer when connected directly.	5-11
	Unit will not communicate with modem.	5-11
	Diagnostic Test reports problem in serial port.	5-11

INFRARED COMMUNICATION PORT PROBLEM

Problem	Symptom	Ref.Page
Transmission problem	Data cannot be sent or received.	5-12

■ PRINTING PROBLEM

Problem	Symptom	Ref.Page
Printing problem	Data does not print.	5-12
	Data prints out incorrectly.	5-12
	The unit hangs after outputting data to the printer.	5-12
	Print area is out of line.	5-12
	Data is printed all on one line.(Carriage return does not work.)	5-12

■ PC CARD PROBLEM

Problem	Symptom	Ref.Page
PC CARD problem	Cannot insert PC CARD.	5-12
	Cannot remove PC CARD.	5-12
	PC CARD does not work properly.	5-12

5.3 Diagnosis Map

■ Startup Error Code

No.	Error Code	Description	Troubleshooting procedure No.	Troubleshooting procedure	Result	Source of problem	Ref.Page
1	062	Default configuration in use	1-1	Check configuration.	——	Configuration	——
2	101	Interrupt controller failure	2-1	——	——	Main P.C.B.	7-5
3	102	External ROM checksum error	3-1	——	——	Docking unit or Bus connectors or Expansion card	——
4	106	Diskette controller failure	4-1	——	——	Main P.C.B.	7-5
5	114	Adapter ROM checksum error	5-1	Does the system return to normal if the expansion card is removed?	YES	Go to No. 5-2	——
					NO	Main P.C.B. or Bus connectors or CPU Module	7-5, 7-6
			5-2	Replace the expansion card. Does operation return to normal?	YES	Expansion card	——
					NO	Main P.C.B.	7-5
6	151	Real Time Clock failure	6-1	——	——	Main P.C.B.	7-5
7	161	Dead RTC Battery	7-1	Does resetting through SETUP correct the problem?	YES	Error during SETUP	——
					NO	Main P.C.B.	7-5
8	162	Configuration error	8-1	Check configuration.	——	Configuration	——
9	162	CMOS Checksum error	9-1	Were the correct settings selected during SETUP?	YES	Go to No. 9-2	——
					NO	Go to No. 9-4	——
			9-2	Replace the FDD. Does operation return to normal?	YES	FDD	7-2,7-8
					NO	Go to No. 9-3	——
			9-3	Replace the HDD. Does operation return to normal?	YES	HDD	7-2
					NO	Go to No. 9-4	——
			9-4	Does resetting through SETUP correct the problem?	YES	Error during SETUP	——
					NO	Main P.C.B.	7-5
10	163	Real time Clock is not updating	10-1	Does resetting the date/time in SETUP correct the problem?	YES	Error during SETUP	——
					NO	Main P.C.B.	7-5
11	173	ROM configuration changed	11-1	——	——	(Flash ROM BIOS is updated)	——

No.	Error Code	Description	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Ref.Page
12	177	Password is corrupted. (CMOS RAM is broken)	12-1	Does resetting through SETUP correct the problem?	YES	Error during SETUP	———
					NO	Main P.C.B.	7-5
13	201	Memory size/data error	13-1	Replace the expansion RAM card. Does operation return to normal? (Go to "NO" if not connected.)	YES	Expansion RAM card	7-3
					NO	Main P.C.B. or CPU Module	7-5, 7-6
14	301	Keyboard failure	14-1	Is the keyboard properly connected?	YES	Go to No. 15-1.	———
					NO	Keyboard was not connected properly	7-4, 7-7
15	303	Keyboard controller failure	15-1	Replace the keyboard. Does operation return to normal?	YES	Keyboard	7-7
					NO	Main P.C.B. or Keyboard Connector P.C.B.	7-5, 7-7
16	604	Diskette drive 0 failure	16-1	Is the FDD properly connected?	YES	Go to No. 16-2	———
					NO	FDD was not connected properly	7-2, 7-8
			16-2	Replace the FDD Pack. Does operation return to normal?	YES	FDD or FDD FPC	7-2, 7-8
					NO	Main P.C.B. or LCD FPC	7-5, 7-9
17	605	Diskette unlocked problem	17-1	Is the FDD properly connected?	YES	Go to No. 17-2	———
					NO	FDD was not connected properly	7-2, 7-8
			17-2	Replace the FDD Pack. Does operation return to normal?	YES	FDD or FDD FPC	7-2, 7-8
					NO	Main P.C.B.	7-5
18	1780	Fixed disk 0 failure	18-1	Replace the HDD Pack. Does operation return to normal?	YES	HDD or HDD FPC	7-2
					NO	Main P.C.B.	7-5
19	1800	No more IRQ available	19-1	Check configuration.	—	———	———
20	1801	No more room for option ROM	20-1	The expansion card cannot be used.	—	———	———
21	1802	No more I/O space available	21-1	———	—	Docking unit or Bus connectors or Expansion card	———
22	1803	No more memory (above 1MB) available	22-1	———	—	Docking unit or Bus connectors or Expansion card	———
23	1804	No more memory (below 1MB) available	23-1	The expansion card cannot be used.	—	———	———
24	1805	Checksum error or 0 size opt. ROM	24-1	———	—	Docking unit or Bus connectors or Expansion card	———
25	8601	Pointing device failure	25-1	Replace the mouse. Does operation return to normal?	YES	Mouse	———
					NO	Go to No. 25-2	———
			25-2	Replace the keyboard. Does operation return to normal?	YES	Keyboard	7-7
					NO	Go to No. 25-3	———
			25-3	Replace the TOUCH PAD. Does operation return to normal?	YES	TOUCH PAD	7-7
					NO	Main P.C.B. or Keyboard Connector P.C.B.	7-5, 7-7

No.	Error Code	Description	Troubleshooting procedures No.		Result	Source of problem	Ref.Page
26	I999 0301	Hard disk failure	26-1	Does executing FDISK correct the problem?	YES	Format data destroyed	———
					NO	Go to No. 26-2	———
			26-2	Replace the HDD Pack. Does operation return to normal?	YES	HDD or HDD FPC	7-2
					NO	Main P.C.B	7-5
27	I999 0305	An operating system could not be found	27-1	Does executing FDISK correct the problem?	YES	Format data destroyed.	———
					NO	Go to No. 27-2	———
			27-2	Replace the HDD Pack. Does operation return to normal?	YES	HDD or HDD FPC	7-2
					NO	Main P.C.B.	7-5

■ Beep Error Code

No.	Beep Sound	Description	Source of problem	Ref.Page
1	1-1-2	CPU register test failure	CPU Module	7-6
2	1-1-3	CMOS write/read test failure	Main P.C.B.	7-5
3	1-1-4	BIOS ROM checksum failure	Main P.C.B.	7-5
4	1-2-1	Programmable Interval Timer test failure	Main P.C.B.	7-5
5	1-2-2	DMA initialization test in progress or failure	Main P.C.B.	7-5
6	1-2-3	DMA page register write/read test in progress or failure	Main P.C.B.	7-5
7	1-2-4	RAM refresh verification failure	CPU Module	7-6
8	1-3-1	1st 64K RAM test failure	Main P.C.B. or CPU Module	7-5, 7-6
9	1-3-3	Slave DMA register test in progress or failure	Main P.C.B.	7-5
10	1-3-4	Master DMA register test in progress or failure	Main P.C.B.	7-5
11	1-4-1	Master interrupt mask register test failure	Main P.C.B.	7-5
12	1-4-2	Slave interrupt mask register test failure	Main P.C.B.	7-5
13	1-4-3	Interrupt vector loading failure	Main P.C.B.	7-5
14	1-4-4	Keyboard controller test failure	Main P.C.B.	7-5
15	2-1-3	Screen initialization in progress	Main P.C.B.	7-5
16	2-1-4	Screen memory test in progress	Main P.C.B.	7-5
17	2-2-1	Screen retrace tests in progress	Main P.C.B.	7-5
18	2-2-2	Search for video ROM in progress	Main P.C.B.	7-5
19	2-2-4	Timer tick interrupt test in progress or failure	Main P.C.B.	7-5
20	2-3-1	Interval timer channel 2 test in progress or failure	Main P.C.B.	7-5
21	2-3-2	RAM test in progress or failure above address 0FFFFH	Main P.C.B. or CPU Module	7-5, 7-6
22	2-3-3	Time-of-Day clock test failure	Main P.C.B.	7-5
23	2-3-4	Serial port test test in progress or failure	Main P.C.B.	7-5
24	2-4-1	Parallel port test test in progress or failure	Main P.C.B.	7-5
25	2-4-2	Math Coprocessor test in progress or failure	Main P.C.B. or CPU Module	7-5, 7-6

MAIN UNIT DIAGNOSIS (1/2)

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.		Result	Source of problem	Ref.Page
1	No power is sent to the unit. (when using AC)	1-1	Is electricity being input properly.	YES	Go to No. 1-2	———
				NO	Power input line	———
		1-2	Replace the AC adapter. Does operation return to normal?	YES	AC adapter	———
				NO	Main P.C.B.	7-5
	No power is sent to the unit. (When using the Battery Pack)	1-3	Is the Battery Pack charged?	YES	Go to No. 1-4	———
				NO	Connect the AC adapter and charge	———
		1-4	Replace the Battery Pack. Does operation return to normal?	YES	Battery Pack	7-2
				NO	Main P.C.B.	7-5
2	Power cuts off during operation. (When using AC)	2-1	Replace the AC adapter. Does operation return to normal?	YES	AC adapter	———
				NO	Main P.C.B.	7-5
	Power cuts off during operation. (When using the Battery Pack)	2-2	Is the Battery Pack charged?	YES	Go to No. 2-4	———
				NO	Connect the AC adapter and charge	———
		2-3	Replace the Battery Pack. Does operation return to normal.	YES	Battery Pack	7-2
				NO	Main P.C.B.	7-5
3	Power cannot be turned off during operation.	3-1	Replace the Main P.C.B.	—	Main P.C.B.	7-5

MAIN UNIT DIAGNOSIS (2/2)

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.		Result	Source of problem	Ref.Page
1	Unit does not start up when power is turned on. Unit hangs during operation.	1-1	Does operation return to normal when the unit is reset?	YES	Temporary timing error	———
				NO	Go to No. 1-2	———
		1-2	Is there a problem in the boot-up software?	YES	Software.	———
				NO	Go to No. 1-3	———
		1-3	Replace the CPU P.C.B.. Does operation return to normal?	YES	CPU Module	7-6
				NO	Main P.C.B.	7-5
2	When a device is selected for "Boot Up Drive", the system boots from a different device.	2-1	Are there system files in the device selected?	YES	Go to No. 2-2	———
				NO	Improper setting	———
		2-2	Does the unit operate normally after replacing the problem device.	YES	Device for which the problem occurred	———
				NO	Main P.C.B.	7-5
3	Date or Time cannot be input. Date and Time does not change properly. Date and Time are not displayed.	3-1	Replace the Main P.C.B.. Does operation return to normal?	—	Main P.C.B.	7-5
4	Memory count is too large or too small.	4-1	Replace the Main P.C.B..	—	Main P.C.B.	7-5

No.	Symbol	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Ref.Page
5	No Sound Volume does not work.	5-1	Check software setting.	YES	Software setting	———
				NO	Go to No. 5-2.	———
		5-2	Replace the Speakers. Does operation return to normal?	YES	Speaker	7-6
				NO	Main P.C.B.	———
6	Battery pack will not charge. Battery pack overheats.	6-1	Replace the Battery Pack. Does operation return to normal?	YES	Battery Pack	7-2
				NO	Main P.C.B.	7-5

■ LCD DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symbol	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Ref.Page
1	No picture appears on the screen.	1-1	Does the LCD display properly after brightness level is adjusted?	YES	Brightness adjustment	———
				NO	Go to No. 1-2	———
		1-2	Replace the LCD or LCD FPC. Does operation return to normal?	YES	LCD or LCD FPC	7-9
				NO	Main P.C.B.	7-5
2	Display is too dark or too bright.	2-1	Does the LCD display properly after brightness level is adjusted?	YES	Brightness adjustment	———
				NO	Go to No. 2-2	———
		2-2	Replace the LCD or LCD FPC. Does operation return to normal?	YES	LCD or LCD FPC	7-9
				NO	Main P.C.B.	7-5
3	Display becomes vertical or horizontal line.	3-1	Replace the LCD. Does operation return to normal?	YES	LCD	7-9
				NO	Go to No. 3-2	———
	Some of the blocks on the screen do not display properly. A striped pattern is displayed. Lines and dots are omitted from the display. Dots appear. Display quality poor. (Fuzzy or slanted, etc.)	3-2	Replace the Main P.C.B.. Does operation return to normal?	YES	Main P.C.B.	7-5
				NO	LCD FPC	7-9
4	Backlight does not turn on.	4-1	Replace the backlight. Does operation return to normal?	YES	Backlight	7-10
				NO	Go to No. 4-2	———
		4-2	Replace the Inverter P.C.B.. Does operation return to normal?	YES	Inverter P.C.B.	7-9
				NO	Go to No. 4-3	———
		4-3	Replace the LCD FPC. Does operation return to normal?	YES	LCD FPC	7-9
				NO	Main P.C.B.	7-5
5	Character appearance is abnormal.	5-1	Replace the LCD. Does operation return to normal?	YES	LCD	7-9
				NO	Go to No. 5-2	———
	Graphics are not displayed, although other characters do appear. Graphics pattern does not display properly.	5-2	Replace the Main P.C.B.. Does operation return to normal?	YES	Main P.C.B.	7-5
				NO	LCD FPC	7-9

■ KEYBOARD, MOUSE or TOUCH PAD DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.		Result	Source of problem	Ref.Page
1	Key top cannot be pressed. Key top does not spring back after pressing.	1-1	Keyboard is broken.	——	Keyboard	7-7
2	Unit will not accept inputs from any key.	2-1	Is the keyboard connector properly connected?	YES	Go to No. 2-2	———
				NO	Keyboard connection	7-4, 7-7
		2-2	Replace the keyboard and see if inputting from the keyboard functions normally?	YES	Keyboard	7-7
				NO	Go to No. 2-3	———
		2-3	Replace the Main P.C.B. and see if inputting from the keyboard functions normally.	YES	Main P.C.B.	7-5
				NO	LCD FPC	7-9
3	Input character is displayed as garbage.	3-1	Is the keyboard setting in the operating system correct?	YES	Go to No. 3-2	———
				NO	Software setting	———
		3-2	Replace the keyboard and see if inputting from the keyboard functions normally.	YES	Keyboard	7-7
				NO	Go to No. 3-3	———
		3-3	Replace the Keyboard connector P.C.B. and see if inputting from the keyboard functions normally.	YES	Keyboard connector P.C.B.	7-7
				NO	Main P.C.B.	7-5
4	Inputs from the mouse are not accepted properly.	4-1	Is the mouse properly connected?	YES	Go to No. 5-2	———
				NO	Mouse connection	———
		4-2	Replace the mouse. Does operation return to normal?	YES	Mouse	———
				NO	Main P.C.B.	7-5
5	Inputs from the TOUCH PAD are not accepted properly.	5-1	Is the TOUCH PAD unit properly connected?	YES	TOUCH PAD connection	7-7
				NO	Go to No. 6-2	———
		5-2	Replace the TOUCH PAD or TOUCH PAD FPC. Does operation return to normal?	YES	TOUCH PAD or TOUCH PAD FPC	7-7
				NO	Main P.C.B.	7-5

■ FDD DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.		Result	Source of problem	Ref.Page
1	FDD indicator is not displayed.	1-1	Replace the FDD or FDD FPC. Does operation return to normal?	YES	FDD or FDD FPC	7-2, 7-8
				NO	Main P.C.B.	7-5
2	Cannot insert floppy disk. Cannot remove floppy disk.	2-1	Is the floppy disk warped or bent, or labels interfering?	YES	Floppy disk	———
				NO	FDD	7-2, 7-8
3	Does not boot from FDD.	3-1	Are there system files on the media?	YES	Main P.C.B.	7-5
				NO	Software	———

No.	Symptom	Troubleshooting procedures No.		Result	Source of problem	Ref.Page
4	Cannot read from floppy disk. Cannot write to floppy disk.	4-1	Is the floppy disk format correct for the operating system currently being used?	YES	Go to No. 4-2	———
				NO	Floppy disk format	———
		4-2	Does this occur for a specific floppy disk?	YES	Floppy disk	———
				NO	Go to No. 4-3	———
		4-3	Try cleaning the disk heads. Does this fix the problem?	YES	Heads were dirty	———
				NO	Go to No. 4-4	———
		4-4	Replace the FDD. Does operation return to normal?	YES	FDD	7-2, 7-8
				NO	Main P.C.B.	7-5
5	Floppy disk is scratched or otherwise damaged.	5-1	Try cleaning the disk heads. Does this fix the problem?	YES	Heads were dirty	———
				NO	FDD	7-2, 7-8
6	Content of floppy disk is destroyed.	6-1	Was the eject button pressed while the system was accessing the disk?	YES	Operating mistake	———
				NO	Go to No. 6-2	———
		6-2	Replace the FDD. Does operation return to normal?	YES	FDD	7-2, 7-8
				NO	Main P.C.B.	7-5
7	Damage to contents written to floppy disk. Damage to contents read from floppy disk.	7-1	Does this occur for a specific floppy disk?	YES	Floppy disk	———
				NO	Go to No. 7-2	———
		7-2	Replace the FDD. Does operation return to normal?	YES	FDD	7-2, 7-8
				NO	Main P.C.B.	7-5
8	Abnormal sound	8-1	Does it sound like the head is moving?	YES	Normal	———
				NO	FDD	7-2, 7-8
9	Diagnostic Test reports problem in FDC.	9-1	Replace the FDD. Does operation return to normal?	YES	FDD	7-2, 7-8
				NO	Main P.C.B.	7-5

■ HDD DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.		Result	Source of problem	Ref.Page
1	Does not boot from HDD.	1-1	Has the HDD been partitioned?	YES	Go to No. 1-2	———
				NO	Improper setting	———
		1-2	Are there system files on the HDD?	YES	Go to No. 1-3	———
				NO	Software on the HDD	———
		1-3	Replace the HDD or HDD FPC. Does operation return to normal?	YES	HDD or HDD FPC	7-2
				NO	Main P.C.B.	7-5
2	Cannot read from HDD.	2-1	Has the HDD been formatted?	YES	Go to No. 2-2	———
				NO	HDD format	———
	Cannot write to HDD.	2-2	Replace the HDD or HDD FPC. Does operation return to normal?	YES	HDD or HDD FPC	7-2
				NO	Main P.C.B.	7-5

No.	Symptom	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Ref.Page
3	Damage to data written to HDD. Damage to data read from HDD. HDD contents are destroyed	3-1	Replace the HDD. Does operation return to normal?	YES	HDD	7-2
				NO	Main P.C.B.	7-5
4	Diagnostic Test reports problem in HDC or HDD.	4-1	Replace the HDD.	——	HDD	7-2
5	HDD indicator is not displayed.	5-1	Replace the HDD or HDD FPC. Does operation return to normal?	YES	HDD or HDD FPC	7-2
				NO	Main P.C.B.	7-5
6	Abnormal sound	6-1	Replace the HDD.	——	HDD	7-2

■ SERIAL COMMUNICATION DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting Procedures No.	Troubleshooting Procedures	Result	Source of problem	Ref.Page
1	Data cannot be sent or received.	1-1	Is the COM port properly set?	YES	Go to No. 1-2	——
				NO	Improper setting	——
		1-2	Is the same transmission protocol set for both the sending and receiving units?	YES	Go to No. 1-3	——
				NO	Improper setting	——
		1-3	Does the RS-232C on the Main P.C.B. operate normally under a loopback test?	YES	Check the interface with the other computer	——
				NO	Main P.C.B.	7-5
2	Unit will not communicate with another computer when connected directly.	2-1	Is the connection cable a dedicated cross-patched cable?	YES	Go to No. 2-2	——
				NO	Connection cable	——
		2-2	Is the same transmission protocol set for both the sending and receiving units?	YES	Go to No. 2-3	——
				NO	Improper setting	——
		2-3	Does the RS-232C on the Main P.C.B. operate normally under a reverse test?	YES	Check the interface with the other computer	——
				NO	Main P.C.B.	7-5
3	Unit will not communicate with modem.	3-1	Is the COM port properly set?	YES	Go to No. 3-2	——
				NO	Improper setting	——
		3-2	Is the transmission protocol correct?	YES	Go to No. 3-3	——
				NO	Improper setting	——
		3-3	Does the modem operate normally under a local analog loopback test?	YES	Line	——
				NO	Go to No. 3-4	——
		3-4	Does the RS-232C on the main board operate normally under a loopback test?	YES	Modem	——
				NO	Main P.C.B.	7-5
4	Diagnostic Test reports problem in serial port.	4-1	Is the loop back device properly attached to the connector (for an external loop back)?.	YES	Main P.C.B.	7-5
				NO	Improper setting	——

■ INFRARED COMMUNICATION PORT DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.		Result	Source of problem	Ref.Page
1	Data cannot be sent or received.	1-1	Is the Infrared Communication Port enabled in Setup?	YES	Go to No. 1-2.	———
				NO	Improper setting.	———
		1-2	Is the same transmission protocol set for both the sending and receiving units?	YES	Go to No. 1-3.	———
				NO	Improper setting.	———
		1-3	Does Diagnostic Test report problem?	——	Main P.C.B.	7-5

PRINTING DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.		Result	Source of problem	Ref.Page
1	Data does not print from the printer.	1-1	Does the printer pass its self-printing test?	YES	Main P.C.B.	7-5
				NO	Printer	———
2	Data prints out incorrectly.	2-1	Does the printer pass its self-printing test?	YES	Go to No. 2-2	———
				NO	Printer	———
		2-2	Is the Parallel Port (Data Direction) setting correct?	YES	Main P.C.B.	7-5
				NO	Improper setting	———
3	The unit hangs after outputting data from the printer.	3-1	Replace the Main P.C.B.. Does operation return to normal?	YES	Main P.C.B.	7-5
				NO	Printer	———
4	Print area is out of line.	4-1	Does the printer pass its self-printing test?	YES	Main P.C.B.	7-5
				NO	Printer	———
5	Data is printed all on one line.	5-1	Does the printer pass its self-printing test?	YES	Main P.C.B.	7-5
	(Carriage return does not work.)			NO	Printer	———

■ PC CARD DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.		Result	Source of problem	Ref.Page
1	Cannot insert PC CARD. Cannot remove PC CARD.	1-1	Is the PC CARD deformed?	YES	PC CARD	7-3
				NO	PC CARD Slot	7-5
2	PC CARD does not work properly.	2-1	Is a correct driver used?	YES	Go to No. 2-2.	———
				NO	Driver software	———
		2-2	Is there a conflict in configuration? (I/O Address, IRQ)	YES	Configuration	———
				NO	Go to No. 2-3.	———
		2-3	Does Diagnostic Test report problem in PC CARD controller?	YES	Main P.C.B.	7-5
				NO	PC CARD	7-3

6. Diagnostic Test

6.1 Outline of Diagnostic Test

Diagnostic Menu (Main Menu)

This menu lists the available choices of the diagnostic program and the various components of your computer system that can be tested using the diagnostic program. Each menu item is described below. The menu you obtain may differ slightly depending on the devices installed in your computer system.

- **Main test items**

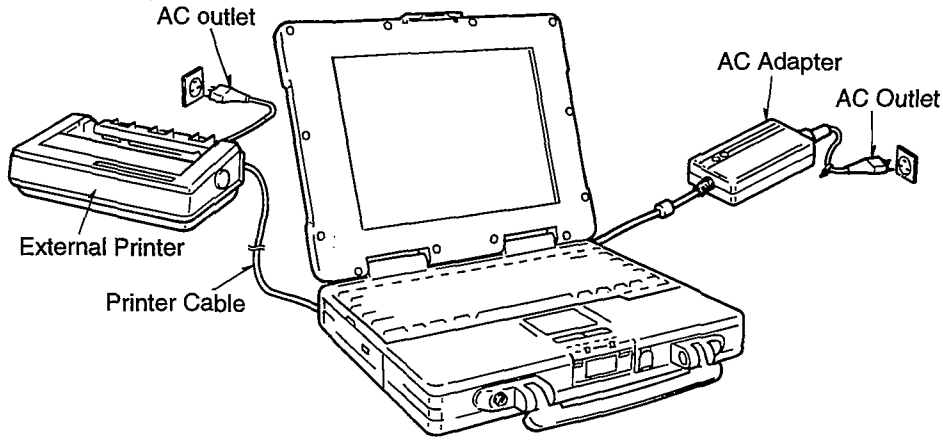
TEST ALL DEVICES	Each device is checked in sequence. Notice that this item is automatically programmed as the default choice. Press the [Enter] key to begin the test.
TEST AUTOMATICALLY	All the devices will be tested repeatedly without further input from user.
CHANGE MENU	Allows user to add or delete items from the testing menu for the TEST ALL DEVICES or TEST AUTOMATICALLY selection.
EXIT	If you decide that you do not wish to proceed with the diagnostic testing, select this item to reboot.
MAIN BOARD	Tests the main board.
***KB RANDOM ACCESS MEMORY	Tests the base memory and extended memory. (The number of KB will change depending on the configuration of your system.)
KEYBOARD	Tests the keyboard.
TOUCH PAD/MOUSE	Tests the touch pad and external mouse.
BATTERY PACK	Tests the battery pack.
VIDEO	Tests the LCD, external display and video controller.
1 HARD DISK DRIVE(S)	Tests the hard disk drive connected to the system.
1 FLOPPY DISK DRIVE(S)	Tests the floppy disk drive connected to the system. Prepare a 3.5" 2DD floppy disk and 3.5" 2HD floppy disk. This test will erase the data on the floppy disk.
1 PARALLEL PORT(S)	Tests the parallel port and external printer connected to the system. Prepare a printer and loopback plug for the parallel port.
1 SERIAL PORT(S)	Tests the RS-232C serial port connected to the system. Prepare a loopback plug for the serial port.
SOUND	Tests the FM sound source and the sound generator register.
PC CARD CONTROLLER	Tests the PC card controller.
INFRARED COMMUNICATION PORT	Tests the infrared communication port.

6.2 Diagnostic Test Procedure

■ 1. Equipment

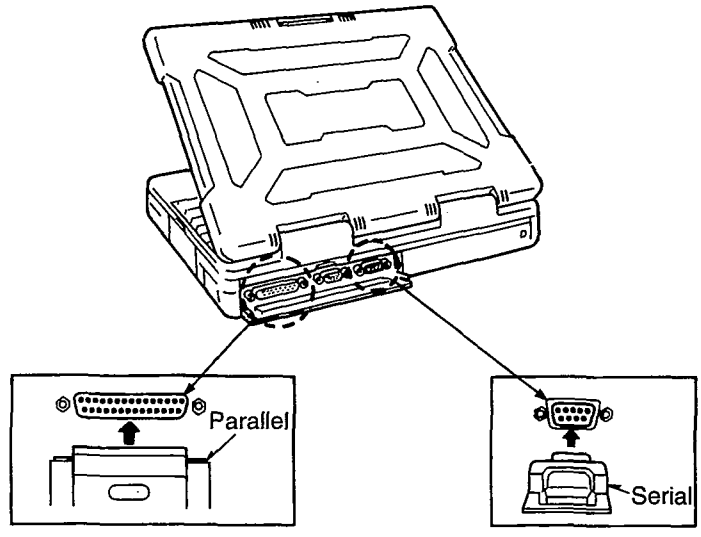
(1) Test Computer..... 1 unit
(2) AC Adapter..... 1 pc.
(3) External Printer..... 1 unit
(4) Loopback Plug (Parallel Port Test) [P/N: DFWV95C0081].....1 pc.
(5) Loopback Plug (Serial Port Test for RS232C) [P/N: DFWV95C0067].....1 pc.
(6) Firstaid FD..... 1 pc.

■ 2. Equipment Connection



■ 3. Preparation

(1) Connect the computer as shown in the figure above.
(2) The System Setup should be set to the factory setting values by executing the "SETUP25 /F" command. If not, the messages and items of the diagnostic test may not be displayed properly on the LCD.
(3) The serial port must be enabled in the SETUP25 program in order to execute the "1st SERIAL PORT" test.
(4) Connect the serial loopback plug as shown in the figure below.
(5) In order to test the parallel port with Loopback Plug, disconnect the printer cable and connect the parallel loopback plug **with Power OFF** as shown in figure below.



■4. NOTICE

When "Enter password" is displayed, use "Password Skipping Plug" in order to skip the user password.

1) Connect the D-SUB-25 plug to the parallel port.
2) Connect the PS/2 plug to the mouse port.
3) Power on the CF-25
4) Confirm that the system boots-up without asking a password.
5) Execute "SETUP25/ISF" to reset all setup information.
6) Disconnect plugs

The wiring of the plug is described below.

Connect pins 2- 5- 6- 8- 13-15-25.	Connect pins 3-4-7-9-10-12 to VC5(Pin4) for PS/2 mouse plug.
Connect pins 11-24.	Connect pins 22-23 to Shield GND for PS/2 mouse cable.

CAUTION

The plug described above must be used for servicing purpose only.
Do not use it for other than the above purpose and ensure that it remains confidential.
Using the plug enables the user to skip the previous password and disable the password.

■5. Test Procedure

Insert the "Firstaid FD" into the floppy disk drive and restart the computer.

⬇

```
1 Boot
2 Restore HDD to Factory defaut
```

Press (1) and (Enter) keys.

⬇

```
A: \ WINDOWS \ COMMAND>
```

Input the following;

Press (D)(I)(A)(G)(2)(5) and (Enter) keys.

```
DIAGNOSTIC MENU (V*.*L**)
      1. TEST ALL DEVICES      (□ DEVICES)
      2. TEST AUTOMATICALLY (■DEVICES)
      3. CHANGE MENU
      4. EXIT
   ■  5. MAIN BOARD
   ■  6. xxxxxKB RANDOM ACCESS MEMORY
   ■  7. KEYBOARD
      8. TOUCH PAD / MOUSE
      9. BATTERY PACK
   ■ 10. VIDEO
   ■ 11. 1 HARD DISK DRIVE(S)
   ■ 12. 1 FLOPPY DISK DRIVE(S)
     13. 1 PARALLEL PORT(S)
   ■ 14. 1 SERIAL PORT(S)
     15. SOUND
   ■ 16. PCCARD CONTROLLER
   ■ 17. INFRARED COMMUNICATION PORT

SELECT MENU : _
```

(Fig, 1)

Select test item, Press number and Enter keys.

1) MAIN BOARD TEST

Fig.1 displayed.
Press (5) and (Enter) keys.

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message].

2) xxxxxKB RANDOM ACCESS MEMORY TEST

Fig.1 displayed.
Press (6) and (Enter) Keys.

● Display

```
BASE RAM TEST
   CURRENT BASE RAM SIZE = 640KB
   640KB  OK
EXTENDED RAM TEST
  CURRENT EXTENDED RAM SIZE = xxxxxKB
  xxxxxKB  OK
```

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message].

3) KEYBOARD TEST

Fig.1 displayed.
Press (7) and (Enter) keys. Fig.2 displayed.

● Display

```
   1. TEST ALL DEVICES      (□DEVICES)
   2. TEST AUTOMATICALLY  (■DEVICES)
   3. CHANGE MENU
   4. EXIT
   5. PRESS KEY TEST
  ■6. SCAN CODE RETURN TEST
SELECT MENU : _
```

(Fig.2)

For 5. PRESS KEY TEST. (Fig.2)
Press (5) and (Enter) Keys. Fig.3 displayed.

● Display

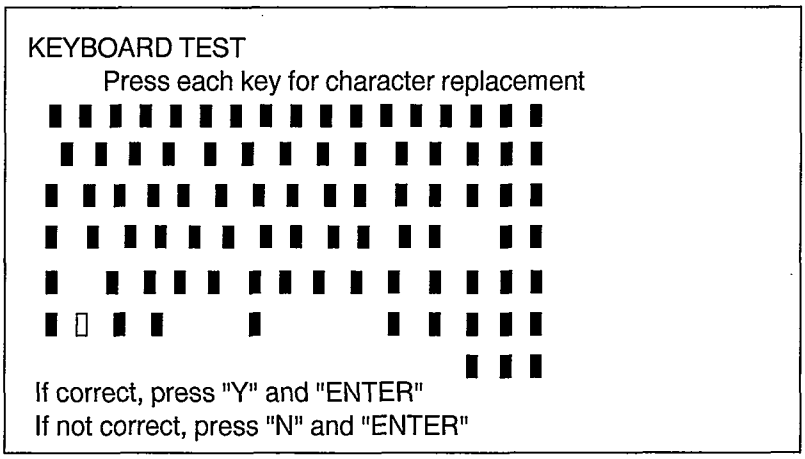
```
PRESS KEY TEST
        1. TEST ALL DEVICES      (□ DEVICES)
        2. TEST AUTOMATICALLY  (■ DEVICES)
        3. CHANGE MENU
        4. EXIT
        5. U.S.A.
        6. U.K.
        7. SWEDEN
        8. JAPAN
        9. GERMANY
       10. FRANCE
       11. ITALY
       12. SPAIN
       13. SWISS  (Gr)
     SELECT MENU : _
```

(Fig.3)

For 5. U.S.A.. (Fig.3)

Press (5) * and (Enter) keys. *Note: Press appropriate number according to the keyboard layout.

● Display



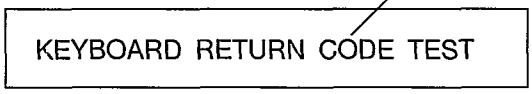
(Normal Message): Keyboard is OK Hit any key when ready._

When an error message is displayed, refer to [6.3 Error Message].

For 6. SCAN CODE RETURN TEST. (Fig.2)

Press (6) and (Enter) keys.

● Display



Immediately after this message is displayed, press the key of the test you would like to perform.
(The routine will terminate if no entry is pressed.)

Press any key.

(Normal message) : KEY Key has been hit or broken (F10)
SCAN code : xx

Test done ! ! Hit any key when ready._

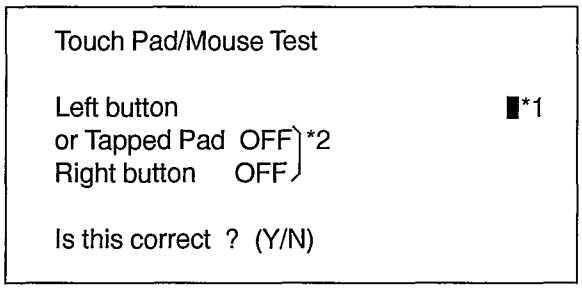
When an error message is displayed, refer to [6.3 Error Massage].

4) TOUCH PAD

Fig.1 displayed.

Press (8) and (Enter) keys.

● Display



*1 The cursor moves over the screen according to the movement of your finger tip over the work surface.

*2 Clicking the button or quickly tapping the pad twice quickly switches the display to "ON".

5) BATTERY PACK TEST

Fig.1 displayed.
Press (9) and (Enter) keys.

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message].

6) VIDEO TEST

Fig.1 displayed.
Press (10) and (Enter) keys. Fig.4 displayed.

● Display

```
 1. TEST ALL DEVICES      (□DEVICES)
 2. TEST AUTOMATICALLY    (■DEVICES)
 3. CHANGE MENU
 4. EXIT
■5. VGA COLOR MODE TEST   ┐ *Use these tests to look at the screen
■6. VGA MONO MODE TEST    │  and verify that the LCD screen is
■7. S-VGA COLOR MODE TEST ┘  displaying properly.

SELECT MENU : _
```

(Fig.4)

For 5. VGA COLOR MODE TEST. (Fig.4)
Press (5) and (Enter) keys. Fig.5 displayed.

● Display

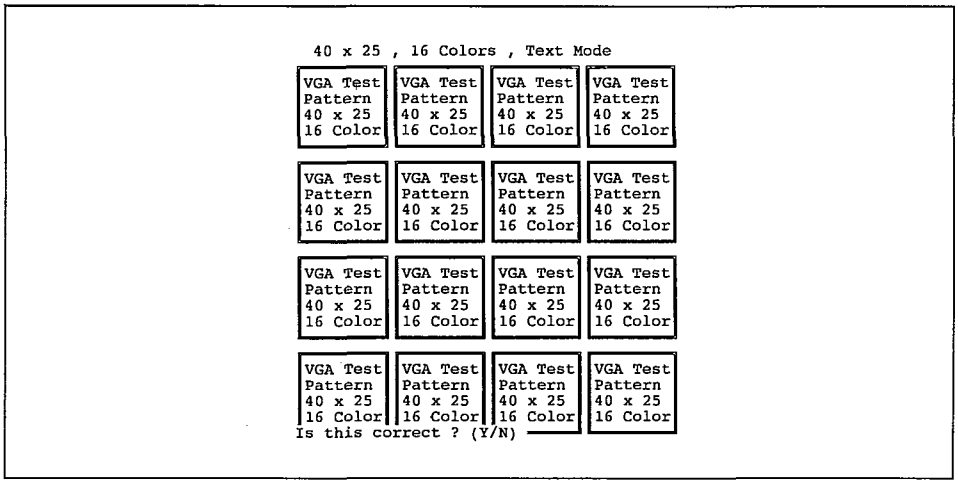
```
   1. TEST ALL DEVICES      (□DEVICES)
   2. TEST AUTOMATICALLY    (■ DEVICES)
   3. CHANGE MENU
   4. EXIT
■  5. COLOR 40x25 TEXT MODE TEST
■  6. COLOR 80x25 TEXT MODE TEST
■  7. COLOR 640x200 GRAPHIC MODE TEST
■  8. COLOR 640x350 GRAPHIC MODE TEST
■  9. COLOR 640x480 GRAPHIC MODE TEST
■ 10. COLOR 320x200 256 COLOR TEST
■ 11. ASCII CODE PRINT
■ 12. PAGE CHANGE
■ 13. COLOR CHANGE GRAPHICS MODE
■ 14. CIRCLE & SQUARE PRINT

  SELECT MENU : _
```

(Fig.5)

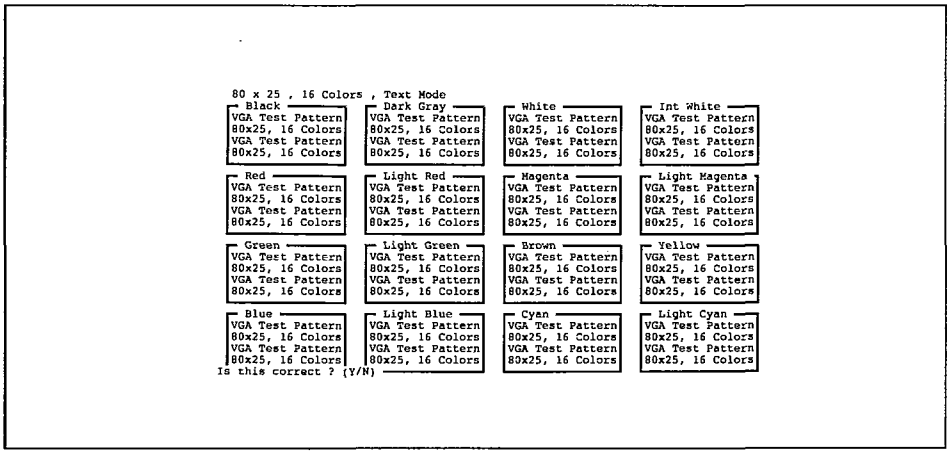
For 5. COLOR 40x25 TEXT MODE TEST. (Fig.5)
Press (5) and (Enter) keys.

● Display



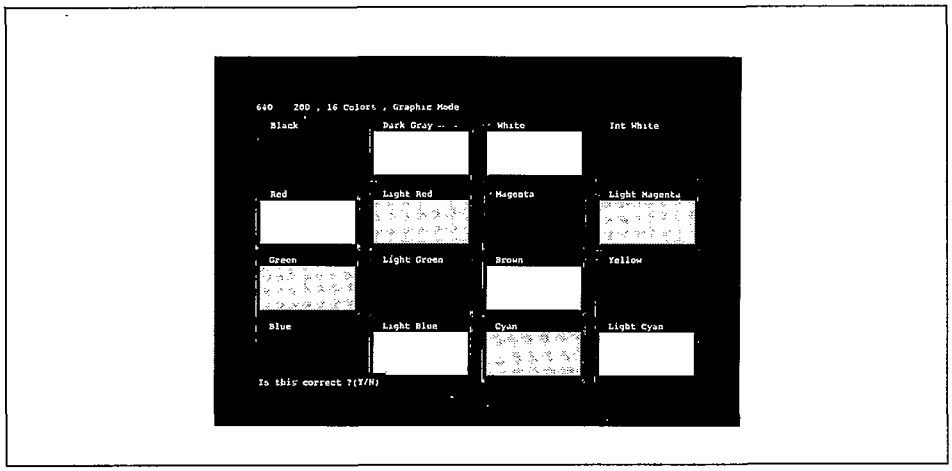
For 6. COLOR 80x25 TEXT MODE TEST. (Fig.5)
Press (6) and (Enter) keys.

● Display



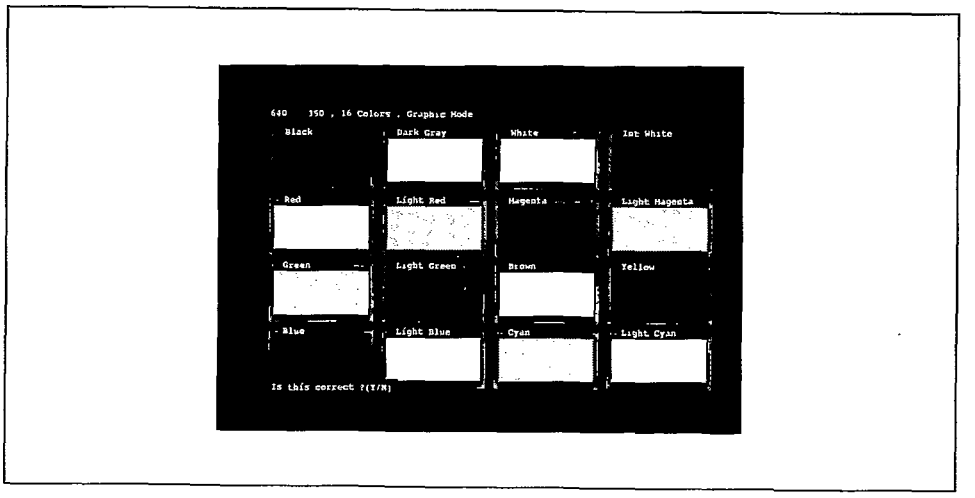
For 7. COLOR 640x200 GRAPHIC MODE TEST. (Fig.5)
Press (7) and (Enter) keys.

● Display



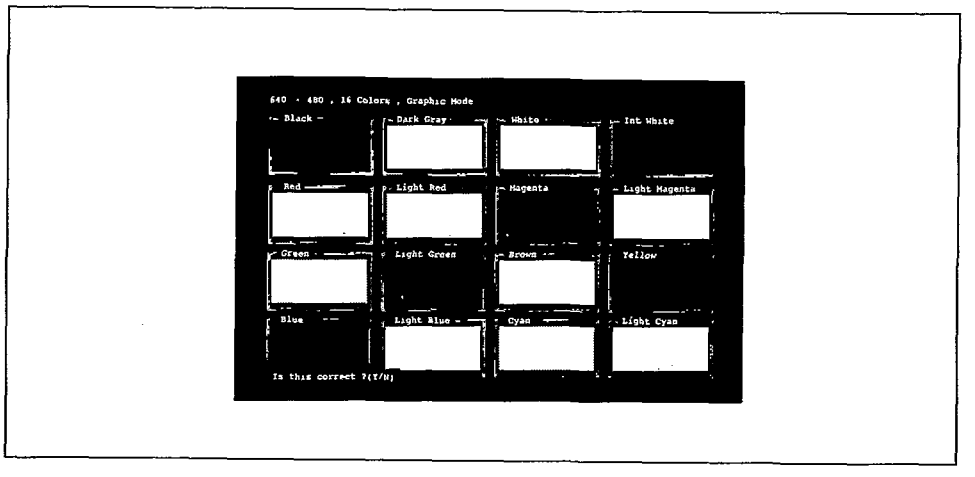
For 8. COLOR 640x350 GRAPHIC MODE TEST. (Fig.5)
Press (8) and (Enter) keys.

● Display



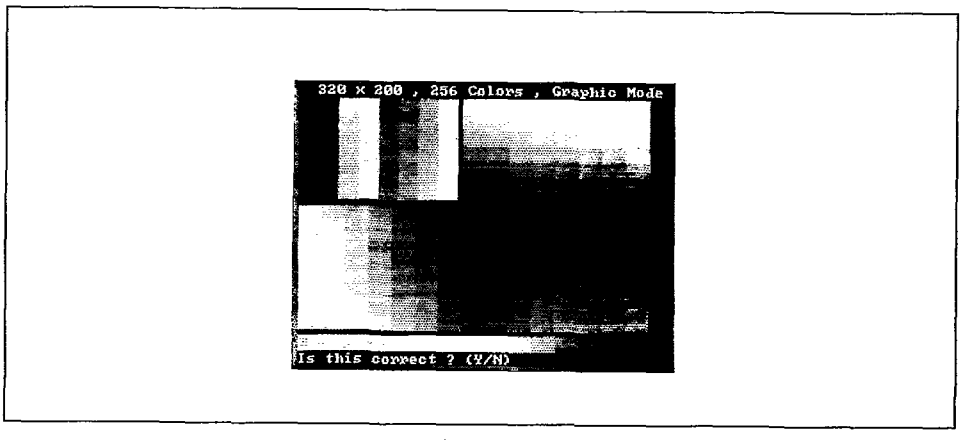
For 9. COLOR 640x480 GRAPHIC MODE TEST. (Fig.5)
Press (9) and (Enter) keys.

● Display



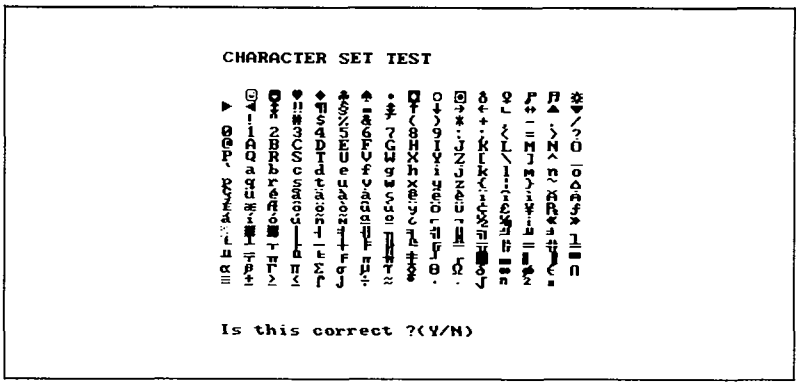
For 10. COLOR 320x200 256 COLOR TEST. (Fig.5)
Press (10) and (Enter) keys.

● Display



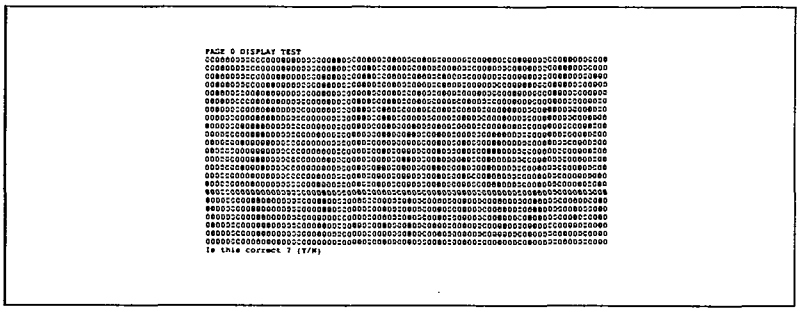
For 11. ASCII CODE PRINT. (Fig.5)
Press (11) and (Enter) keys.

● Display



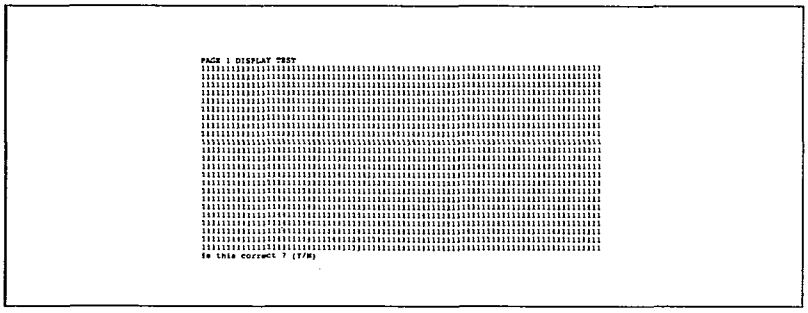
For 12. PAGE CHANGE. (Fig.5)
Press (12) and (Enter) keys.

● Display



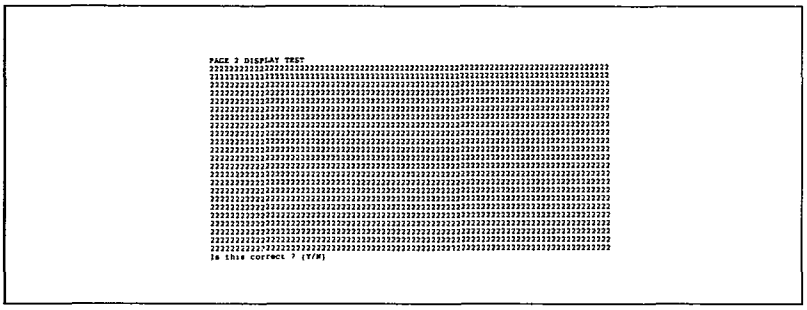
Press (Y) key.

● Display



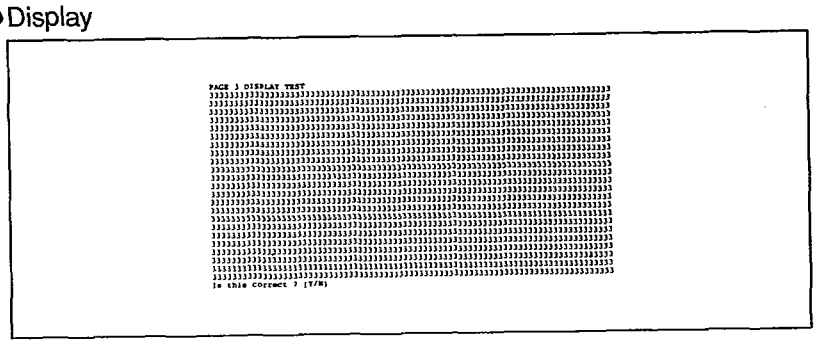
Press (Y) key.

● Display



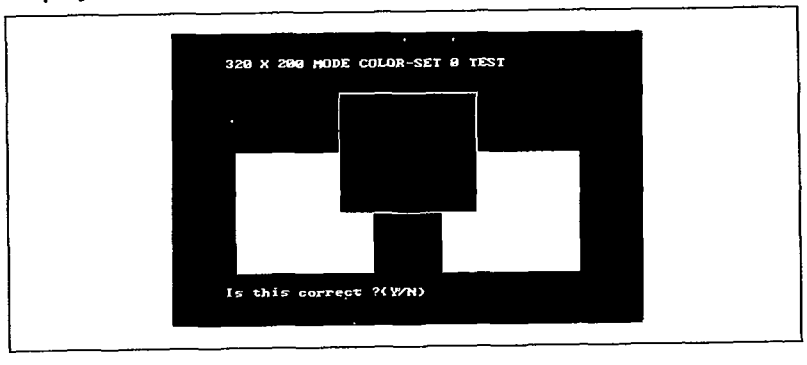
Press (Y) key.

● Display



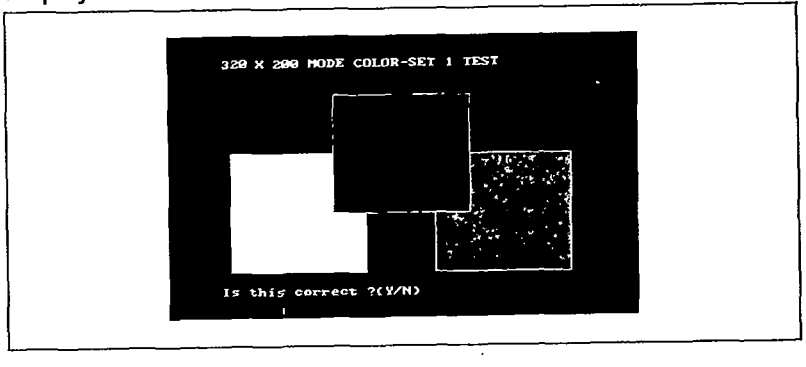
For 13. COLOR CHANGE GRAPHICS MODE. (Fig.5)
Press (13) and (Enter) keys.

● Display



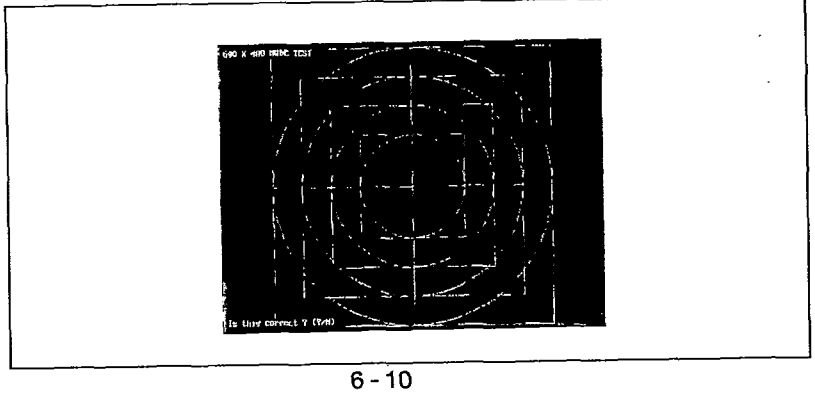
Press (Y) key.

● Display



For 14. CIRCLE & SQUARE PRINT. (Fig.5)
Press (14) and (Enter) keys.

● Display



For 6. VGA MONO MODE TEST. (Fig.4)
Press (6) and (Enter) keys. Fig.6 displayed.

● Display

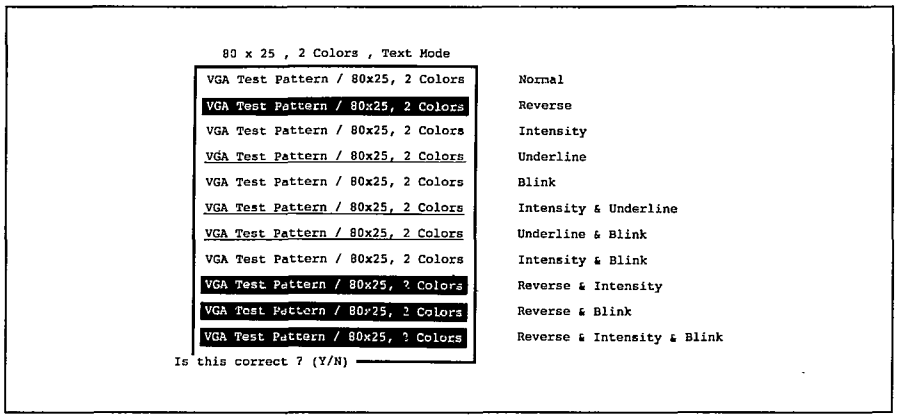
```
1. TEST ALL DEVICES        (□ DEVICES)
2. TEST AUTOMATICALLY      (■ DEVICES)
3. CHANGE MENU
4. EXIT
■ 5. MONO 80 x 25 TEXT MODE TEST
■ 6. MONO 640 x 350 GRAPHIC MODE TEST

SELECT MENU : _
```

(Fig.6)

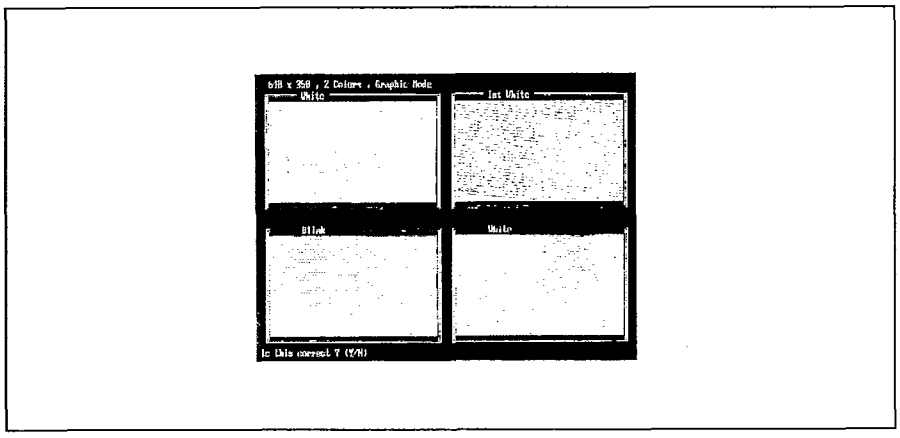
For 5. MONO 80 x 25 TEXT MODE TEST. (Fig.6)
Press (5) and (Enter) keys.

● Display



For 6. MONO 640 x 350 GRAPHIC MODE TEST. (Fig.6)
Press (6) and (Enter) keys.

● Display



For 7. S-VGA COLOR MODE TEST. (Fig.4)
Press (7) and (Enter) keys. Fig.7 displayed.

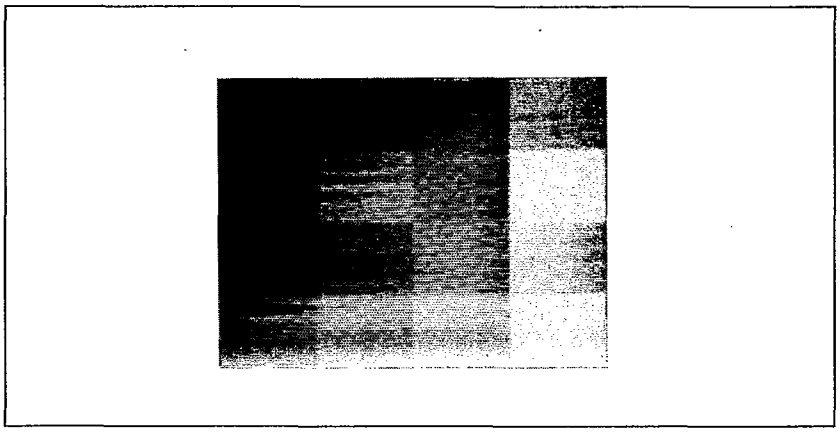
● Display

```
  1. TEST ALL DEVICES        (□ DEVICES)
  2. TEST AUTOMATICALLY      (■ DEVICES)
  3. CHANGE MENU
  4. EXIT
■ 5. 800 x 600     16 COLOR TEST
■ 6. 1024 x 768    16 COLOR TEST
■ 7. 640 x 480    256 COLOR TEST
■ 8. 800 x 600    256 COLOR TEST
■ 9. 1024 x 768   256 COLOR TEST
■ 10. 640 x 480    64k COLOR TEST
■ 11. 800 x 600    64k COLOR TEST
■ 12. 640 x 480   16M COLOR TEST
 SELECT MENU : _
```

(Fig.7)

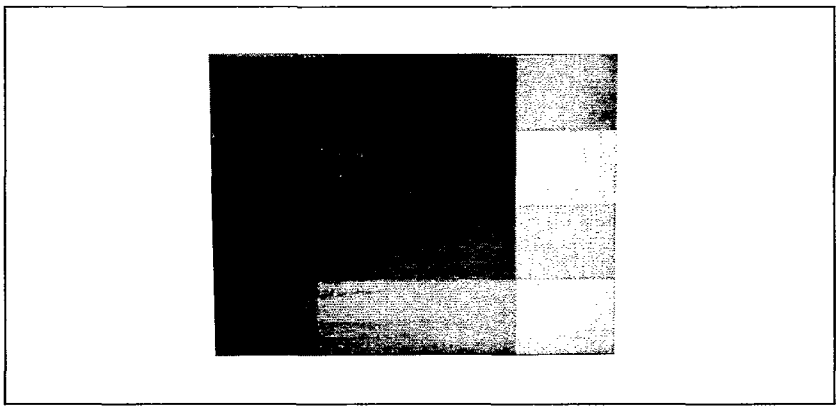
For 5. 800 x 600 16 COLOR TEST. (Fig.7)
Press (5) and (Enter) keys.

● Display



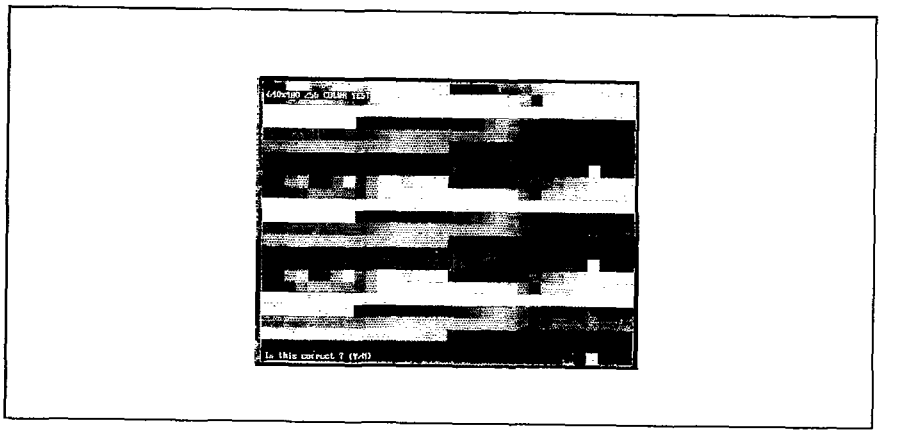
For 6. 1024 x 768 16 COLOR TEST. (Fig.7)
Press (6) and (Enter) keys.

● Display



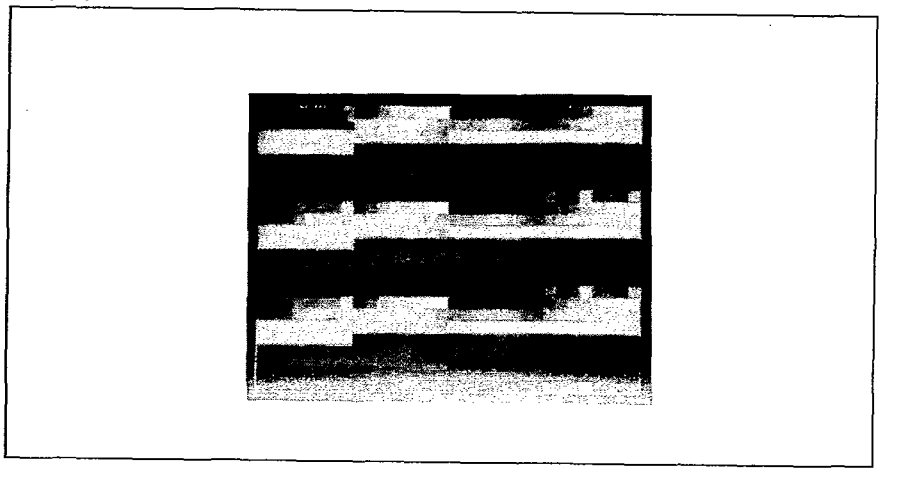
For 7. 640 x 480 256 COLOR TEST. (Fig.7)
Press (7) and (Enter) keys.

● Display



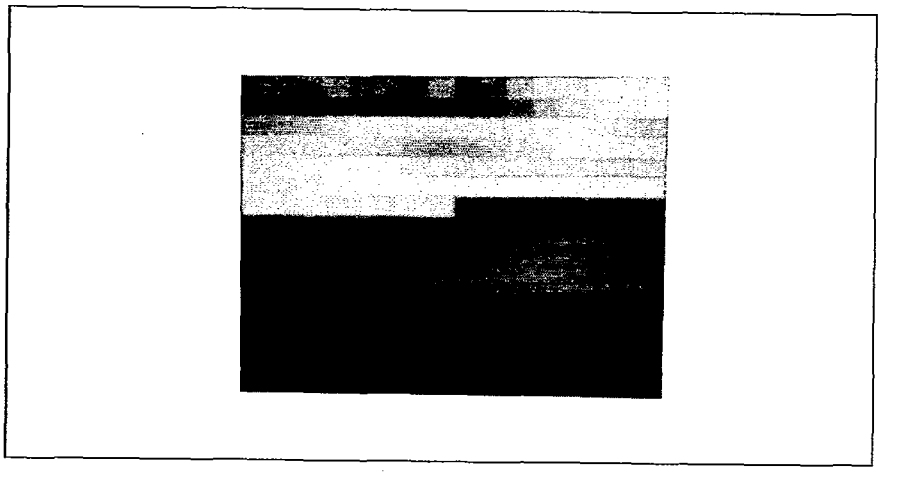
For 8. 800 x 600 256 COLOR TEST. (Fig.7)
Press (8) and (Enter) keys.

● Display



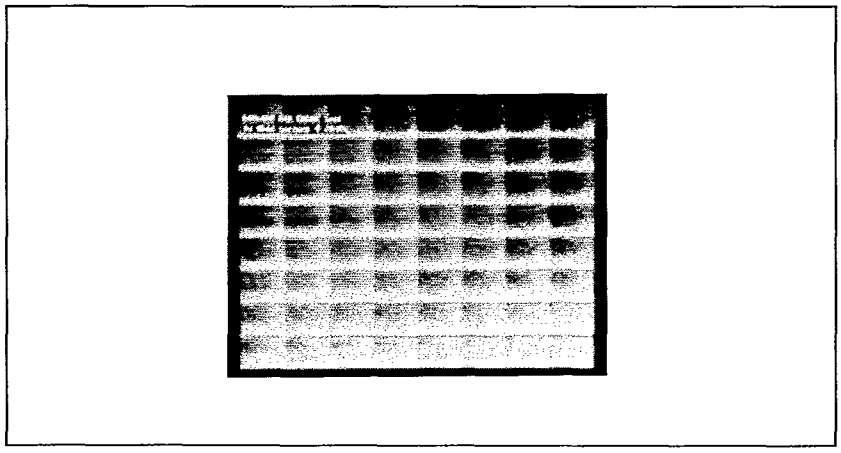
For 9. 1024 x 768 256 COLOR TEST. (Fig.7)
Press (9) and (Enter) keys.

● Display



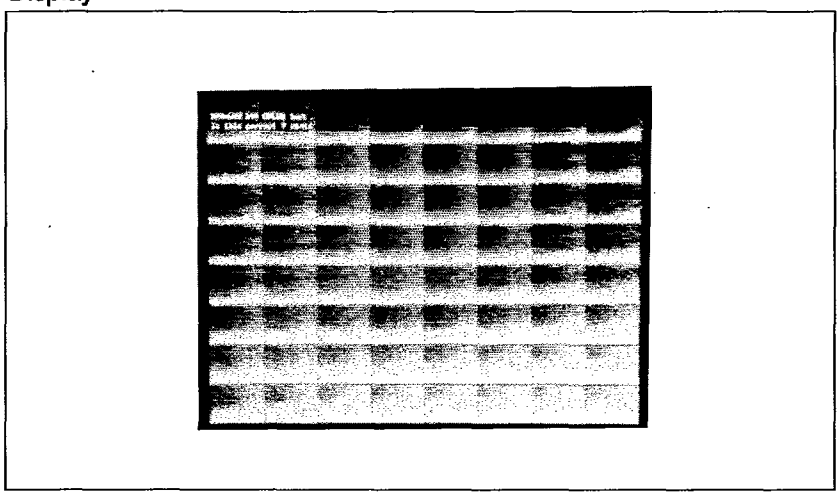
For 10. 640 x 480 64K COLOR TEST. (Fig.7)
Press (10) and (Enter) keys.

● Display



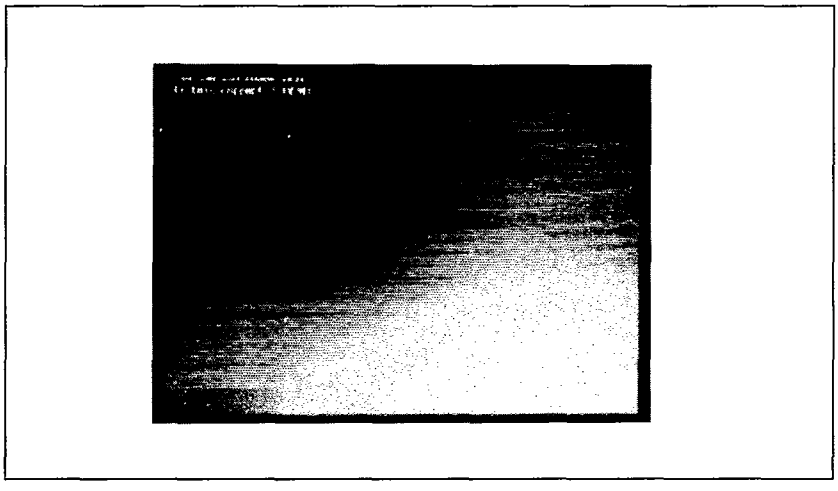
For 11. 800 x 600 64K COLOR TEST. (Fig.7)
Press (11) and (Enter) keys.

● Display



For 12. 640 x 480 16M COLOR TEST. (Fig.7)
Press (12) and (Enter) keys.

● Display



7) 1 HARD DISK DRIVE(S) TEST

Fig.1 displayed.
Press (11) and (Enter) keys. Fig.8 displayed.

● Display

```
1st HARD DISK DRIVE(S)
      1. TEST ALL DEVICES       (□DEVICES)
      2. TEST AUTOMATICALLY     (■DEVICES)
      3. CHANGE MENU
      4. EXIT
   ■ 5. HARD DISK CONTROLLER TEST
   ■ 6. 1st HARD DISK DRIVE TEST

    SELECT : _
```

(Fig.8)

For 5. HARD DISK CONTROLLER TEST. (Fig.8)
Press (5) and (Enter) keys.

● Display

```
HARD DISK CONTROLLER TEST
```

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message].

For 6. 1st HARD DISK DRIVE TEST. (Fig.8)
Press (6) and (Enter) keys. Fig.9 displayed.

● Display

```
      1. TEST ALL DEVICES       (□DEVICES)
      2. TEST AUTOMATICALLY     (■DEVICES)
      3. CHANGE MENU
      4. EXIT
   ■ 5. HDD-DRIVE TEST
      6. HDD-READ/WRITE TEST
   ■ 7. HDD-SEQUENTIAL SEEK TEST
   ■ 8. HDD-RANDOM SEEK TEST

SELECT : _
```

(Fig.9)

For 5. HDD-DRIVE TEST. (Fig.9)
Press (5) and (Enter) keys.

● Display

```
1st HDD-DRIVE TEST
Count value to get SEEK COMPLETE = 0
```

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message]

For 6. HDD-READ/WRITE TEST. (Fig.9)
Press (6) and (Enter) keys.

● Display

```
xxxxxxxxxxxxxxxxxxxxx Warning !!! xxxxxxxxxxxxxxxxxxxx
      Reserved cylinder for DIAGNOSTICS will lose its data.
      Reserved cylinder number = ***
xxxxxxxxxxxxxxxxxxxxx Warning !!! xxxxxxxxxxxxxxxxxxxx

Do you want to continue ? (Y/N)
```

Press (Y) key.

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message].

For 7. HDD-SEQUENTIAL SEEK TEST. (Fig.9)
Press (7) and (Enter) keys.

● Display

```
1st HDD-SEQUENTIAL SEEK TEST

Cylinder = xxx
```

The numbers indicated by xxx will vary depending on the type of HDD.

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message].

For 8. HDD-RANDOM SEEK TEST. (Fig.9)
Press (8) and (Enter) keys.

● Display

```
1st HDD-RANDOM SEEK TEST

Cylinder = xxx
```

The numbers indicated by xxx will vary depending on the type of HDD.

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message].

8) 1FLOPPY DISK DRIVE(S) TEST

Fig.1 displayed.
Press (12) and (Enter) keys. Fig.10 displayed.

● Display

```
1st FLOPPY DISK DRIVE(S)
      1. TEST ALL DEVICES        (■DEVICES)
      2. TEST AUTOMATICALLY      (□DEVICES)
      3. CHANGE MENU
      4. EXIT
   ■  5. FLOPPY DISK CONTROLLER TEST
   ■  6. 1st FLOPPY DISK  DRIVE TEST

   SELECT : _
```

(Fig.10)

For 5. FLOPPY DISK CONTROLLER TEST. (Fig.10)
Press (5) and (Enter) keys.

● Display

```
      FLOPPY DISK CONTROLLER TEST
```

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message].

For 6. 1st FLOPPY DISK DRIVE TEST. (Fig.10)
Press (6) and (Enter) keys. Fig.11 displayed.

● Display

```
   1. TEST ALL DEVICES        (□DEVICES)
   2. TEST AUTOMATICALLY      (■DEVICES)
   3. CHANGE MENU
   4. EXIT
■  5. 1.44M - FDD TEST
   6. 2DD - MEDIA IN 1.44 - FDD TEST
   7. 2HD - MEDIA (1440KB) IN 1.44 - FDD TEST
   8. 2HD - MEDIA (1230KB) IN 1.44 - FDD TEST
   9. 2HD - MEDIA (1200KB) IN 1.44 - FDD TEST

SELECT MENU : _
```

(Fig.11)

For 5. 1.44M - FDD TEST. (Fig.11)
Press (5) and (Enter) keys.

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message].

For 6. 2DD - MEDIA IN 1.44 - FDD TEST. (Fig.11)
Press (6) and (Enter) keys.
NOTE) At this time insert a formattable floppy disk into the FDD.
(All data on the floppy disk will be erased.)

● Display

```
xxxxxxxxxxxxxxxxxxxxx Warning ! ! ! xxxxxxxxxxxxxxxxxxxx
      CONTENTS OF DISK WILL BE DESTROYED
xxxxxxxxxxxxxxxxxxxxx Warning ! ! ! xxxxxxxxxxxxxxxxxxxx

Insert scratch 2DD disk into 1st drive
Hit any key when ready.<---------- Press a key to begin formatting.

Formatting.....

Read/Write test
Sequential seek test
Random  seek test
```

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Messages].

*Use the same procedure for 7,8,9. 2HD-MEDIA (1440MB,1230MB,1200MB) IN 1.44 - FDD TEST.

9) 1 PARALLEL PORT(S) TEST.

Fig.1 displayed.
Press (13) and (Enter) keys. Fig.12 displayed.

● Display

```
  1. TEST ALL DEVICES      (□DEVICES)
  2. TEST AUTOMATICALLY    (■DEVICES)
  3. CHANGE MENU
  4. EXIT
  5. PRINT OUT TEST
  6. EXTERNAL LOOPBACK TEST
SELECT : _
```

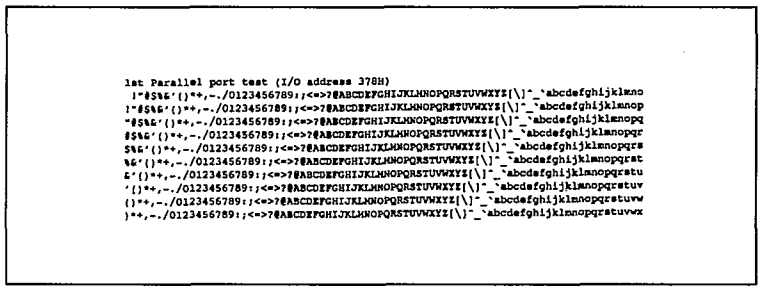
(Fig.12)

For 5. PRINT OUT TEST. (Fig.12)
Press (5) and (Enter) keys.

● Display

```
1st Parallel port test (I/O address  xxxH)
Connect printer
Hit any key when ready._
```

(Normal Message): Sample characters will be printed to the printer.



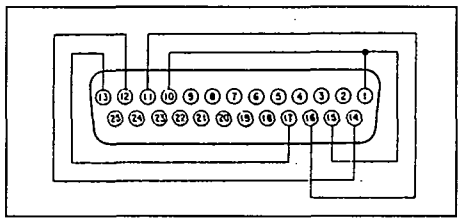
When an error message is displayed, refer to [6.3 Error Message].

For 6. EXTERNAL LOOPBACK TEST.
Press (6) and (Enter) keys.

Loopback Plug Wiring Information

- Display

```
Connect loopback plug
Hit any key when ready._
```



"Connect loopback plug" will be displayed.
Connect the loopback plug to the parallel port.

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message].

10) 1 SERIAL PORT(S)

Fig.1 displayed.
Press (14) and (Enter) keys. Fig.13 displayed.

- Display

```
  1. TEST ALL DEVICES
  2. TEST AUTOMATICALLY
  3. CHANGE MENU
  4. EXIT
■ 5. RS232C CONTROLLER REGISTER R/W TEST
■ 6. INTERNAL LOOPBACK TEST
  7. EXTERNAL LOOPBACK TEST

SELECT MENU : _
```

(Fig.13)

For 5. RS232C CONTROLLER REGISTER R/W TEST. (Fig.13)
Press (5) and (Enter) keys.

● Display

1st serial port test (I/O address xxxH)

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message].

For 6. INTERNAL LOOPBACK TEST. (Fig.13)
Press (6) and (Enter) keys.

● Display

Connect the loopback plug to the serial port.

1st serial port test (I/O address xxxH)

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message].

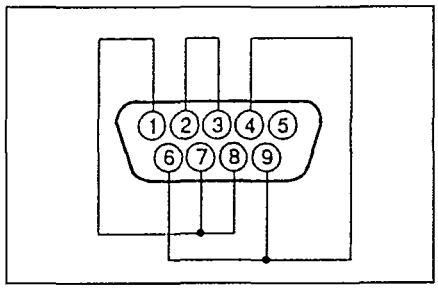
For 7. EXTERNAL LOOPBACK TEST. (Fig.13)
Press (7) and (Enter) keys.

● Display

1st serial port test (I/O address xxxH)
Connect loopback plug. ⟵ Connect the loopback plug to the serial port.
Hit any key when ready

(Normal Message): Test done ! ! Hit any key when ready
When an error message is displayed, refer to [6.3 Error Message].

Loopback Plug Wiring Information



11) SOUND TEST

Fig.1 displayed.
Press (15) and (Enter) keys. Fig.14 displayed.

● Display

```
1. TEST ALL DEVICES      (□DEVICES)
2. TEST AUTOMATICALLY    (■DEVICES)
3. CHANGE MENU
4. EXIT
5. FM PLAY TEST
6. SOUND REGISTER TEST
SELECT MENU : _
```

(Fig.14)

For 5. FM PLAY TEST. (Fig.14)
Press (5) and (Enter) keys.

Make sure the sound is coming up.

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message].

For 6. SOUND REGISTER TEST. (Fig.14)
Press (6) and (Enter) keys.

● Display

```
SOUND REGISTER (22xH) R/W OK.
```

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [6.3 Error Message].

12) PC CARD CONTROLLER TEST.

Fig.1 displayed.
Press (16) and (Enter) keys.

(Normal Message): Test done ! ! Hit any key when ready._
when an error message is displayed, refer to [6.3 Error Message].

13) INFRARED COMMUNICATION PORT TEST.

Fig.1 desplayed.
Press (17) and (Enter) keys

● Display

```
CONTROLLER REGISTER R/W TEST
Infrared port (I/O address xxxH)
```

(Normal Message): Test done ! ! Hit any key when ready.
When an error message is displayed, refer to [6.3 Error Message].

6.3 Error Message

Test Item	Error Message		Source of Problem	Ref.Page
Main P.C.B. Test				
CMOS RAM shutdown byte r/w test	CRAM	Shutdown byte test failed. (F10) Write data: xxxx Read: xxxx	Main P.C.B.	7-5
Programmable interrupt timer test	PIT	Timer #2 counter r/w failed. (F10) Write data: xx Read: xx	Main P.C.B.	7-5
	PIT	Timer count failed. (F10) High count value expected: 00 current data: xx		
Page register r/w test	PREG	Page register r/w test failed. (byte) (F10) Write data = xx Read data = xx	Main P.C.B.	7-5
	PREG	Page register r/w test failed. (word) (F10) Write data = xx Read data = xx		
DMA controller register r/w test	DMAC	DMA controller register r/w test failed. (F10) I/O address: xxxx Write data: xxxx Read data: xxxx	Main P.C.B.	7-5
Keyboard controller test	KBCTRL	Keyboard controller input buffer full. (F10)	Main P.C.B.	7-5
	KBCTRL	Keyboard line always low. (clock) (F10)		
	KBCTRL	Keyboard line always high. (clock) (F10)		
	KBCTRL	Keyboard line always low. (data) (F10)		
	KBCTRL	Keyboard line always high. (data) (F10)		
	KBCTRL	Keyboard controller output buffer empty. (F10)		
	KBCTRL	Keyboard controller self test failed. (F10) Return code: xx		
Programmable interrupt controller test	PIC	PIC #0 interrupt mask register failed. (F10) Write data: xx Read data: xx	Main P.C.B.	7-5
	PIC	PIC #1 interrupt mask register failed. (F10) Write data: xx Read data: xx		
	PIC	PIC #0 handling error (F10) ISR status: xx		
	PIC	PIC #1 handling error (F10) ISR status: xx		
	PIC	PIC #0 no interrupt occurred. (F10)		
	PIC	PIC #1 no interrupt occurred. (F10)		
Real-time clock test	RTC	Real-time clock UIP bit always ON. (F10)	Main P.C.B.	7-5
	RTC	Real-time clock UIP bit always OFF. (F10)		
	RTC	Real-time clock data out of range. (F10) (Second data: ss) (Minute data: mm) (Hour data: hh) (Data data: dd) (Month data: mm) (Year data: yyyy)		
RAM Test				
DRAM r/w test	DRAM	DRAM R/W test failed. (F11) Address xxxxxxxxH Write data = xxH Read data =xxH	Main P.C.B.	7-5
DRAM refresh test	DRAM	DRAM Refresh test failed. (F11) Address xxxxxxxxH Write data = xxH Read data = xxH	Main P.C.B.	7-5
DRAM address line test	DRAM	DRAM Address Line test failed. (F11) The data written into address xxxxxxxxH can be read from address yyyyyyyyH	Main P.C.B.	7-5
Protect test		[xx] Protected mode error. (F11)	Main P.C.B.	7-5

Test Item	Error Message		Source of Problem	Ref.Page
Keyboard Test				
Keyboard reset test	KEY	Keyboard failed. (F40)	Main P.C.B.	7-5
Keyboard data test	KEY	Keyboard has been hit or broken. (F10) SCAN code : xx	Main P.C.B.	7-5
Floppy Disk Drive Test				
Floppy disk controller test		FDC failed. (F10) Master status: n1n2 Floppy Disk Controller (FDC) master status has failed. Data bus or FDC chip has failed. (n1n2 is FDC master status listed on page 6-25.)	Main P.C.B.	7-5
Floppy disk controller test		Init. failed. (F10) BIOS status : xx Floppy Disk Controller (FDC) initialization has failed. Data bus or FDC chips have failed. (xx is BIOS disk error status listed on page 6-25.)	Main P.C.B.	7-5
Floppy disk drive test		Seek failed (max. track) (F30) Seek has failed. Floppy Disk Controller (FDC) cable or FDC chip has failed.	FDD	7-2, 7-8
Floppy disk drive test		Seek failed (0 track) (F30) Seek has failed. Floppy Disk Controller (FDC) cable or FDC chip has failed.	FDD	7-2, 7-8
Floppy disk controller test		Cannot change spindle speed of FDD motor (F10)	Main P.C.B.	7-5
Hard Disk Drive Test				
HDC reset test		HDC reset failed. (F31)	HDD	7-2
HDC diagnostics test		HDC internal diagnostic failed. (F31)	HDD	7-2
HDD set parameter test		HDD set drive parameter failed. (F31) BIOS status: xx HDC status: xx HDC error status: xx	HDD	7-2
HDD drive ready test		HDD drive not ready. (F31) BIOS status: xx HDC status: xx HDC error status: xx	HDD	7-2
HDD recalibrate test		HDD recalibrate failed. (F31) BIOS status: xx HDC status: xx HDC error status: xx	HDD	7-2
HDD seek test		HDD seek failed. (F31) BIOS status: xx HDC status: xx HDC error status: xx	HDD	7-2
HDD seek time test		HDD seek does not complete within some period. (F31) BIOS status: xx HDC status: xx HDC error status: xx	HDD	7-2
Serial Port Test				
Register test	RS232	Serial port failed. (F71) Interrupt ID Write: xx Read: xx	Main P.C.B.	7-5
	RS232	Serial port failed. (F71) Divisor Write: xxxx Read: xxxx		
Internal loopback test	RS232	Serial port data loopback failed. (F71) Line & modem status: n1n2,n3n4 (Refer to the tables of loopback line status and loopback modem status on page 6-25.)	Main P.C.B.	7-5
	RS232	Serial port data loopback failed. (F71) Xmit: xx Recv: xx		
	RS232	Serial port signal loopback failed. (F71) Modem status: n3n4 Expected: n3'n4' (n3n4: result by test. Refer to the table of modem status on page 6-25. n3'n4': expected status.)		

Test Item	Error Message	Source of Problem	Ref.Page
External loopback test	RS232 Serial port signal real loopback test failed. (F71) Modem status: n3n4 Expected: n3'n4' (n3n4: Refer to the table of line status on page 6-25.) RS232 Serial port data real loopback test failed. (F71) Line status : n1n2 (n1n2: Refer to the table of line status on page 6-25.) RS232 Serial port data real loopback test failed. (F71) Xmit: xx Recv: xx RS232 Data real loopback transmit failed. (F71) Line status: n1n2 (n1n2: Refer to the table of line status on page 6-25.) RS232 Data real loopback interrupt request failed. (F71) Line status: n1n2 (n1n2: Refer to the table of line status on page 6-25.) RS232 Data real loopback receive failed. (F71) Line status: n1n2 (n1n2: Refer to the table of line status on page 6-25.)	Main P.C.B.	7-5
Parallel Port Test			
Printer Out Test	PPA Time -out error occurred with parallel printer. (F72) BIOS status: n1n2 Character: xx PPA I/O error occurred with parallel printer. (F72) BIOS status: n1n2 Character: xx PPA Paper end occurred with parallel printer. (F72) BIOS status: n1n2 Character: xx (n1n2 is a printer BIOS error status listed on page 6-26. xx is the character sent to the printer.)	Main P.C.B.	7-5
External Loopback test	PPA Parallel port interrupt request failed. (F72) PPA Parallel port signal real loopback test failed. (F72) Status: xx Expected: xx	Main P.C.B.	7-5
Infrared Communication Port Test			
Controller register r/w test	Infrared port failed. (F80)	Main P.C.B.	7-5
PC CARD Controller Test			
	PC CARD Controller is invalid. (F10)	Main P.C.B.	7-5
Sound Test			
Sound register test	*SOUND REGISTER R/W ERROR! !*	*Main P.C.B.*	7-5
Battery Test			
	Battery : Overcharged (F10) Battery : Overdischarged (F10) Battery : Cell balance error (F10) Battery : Switching error (F10) Battery : Temperature is out of range (F10) Battery : Exceed maximum charging amount (F10) Battery : Exceed maximum charging time (F10) Battery : Serial communication error (F10) Battery : Charging current does not decrease (F10) Battery : No response from battery (F10) Battery : Charging current error (F10) Battery : Abnormal high voltage (F10) Battery : Abnormal temperature (F10) Battery : Low voltage after 60 minutes charged (F10) Battery : No battery but voltage is deleted (F10) Battery : Exceed maximum charging amount (F10) Battery : Abnormal charging current (F10) Battery : Abnormal CPU temperature (F10)	Main P.C.B. or Battery Pack	7-5, 7-2

● FDC master status

Nibble	Bit	Meaning
n1	D3	1: FDC data register is ready to receive and transmit data
	D2	1: Transmit data from FDC to processor
	D1	1: Transmit in non-DMA mode
	D0	1: FDC is busy
n2	D3	
	D2	
	D1	1: Seek in drive B
	D0	1: Seek in drive A

● BIOS disk error status

Status	Meaning
80	Time out
40	Seek out
20	FDC failed
10	CRC error
0C	Bad media type
09	DMA boundary
08	DMA overrun
06	Diskette removed
04	Sector not found
03	Write protected
02	No address mark
01	Invalid command

● BIOS error status

Status	Meaning
FF	Sense status failed
E0	Error status register
CC	Write fault
BB	Undefined error
AA	Drive not ready
80	Time out
40	Seek error
20	Controller failed
11	ECC corrected data error
10	Bad CRC or ECC
0F	DMA arbitration level out of range
0E	Control data address mark detected
0D	Invalid number of sectors on format
0B	Bad cylinder
0A	Bad sector
09	DMA boundary
08	DMA overrun
07	Drive parameter error
05	Reset failed
04	Sector not found
02	No address mark
01	Invalid command

● HDC error status

Nibble	Bit	Meaning
n3	D3	1: Back block
	D2	1: Non-correctable ECC error
	D1	1:
	D0	1: Selector not found
n4	D3	1:
	D2	1: HD not ready
	D1	1: No track 00 signal
	D0	1: No address mark

● HDC status

Nibble	Bit	Meaning
n1	D3	1: HDC is busy
	D2	1: HDC is ready
	D1	1: Write fault signal from HD
	D0	1: Seek is completed
n2	D3	1: HDC requests to transmit data
	D2	1: ECC corrected data
	D1	1: Index pulse signal
	D0	1: Error found in executed instructions

● Loopback line status

Nibble	Bit	Meaning
n1	D3	1: Timing out
	D2	1: Transmit shift register (is) empty
	D1	1: Transmit-holding register (is) empty
	D0	1: Break detect
n2	D3	1: Framing error
	D2	1: Parity error
	D1	1: Overrun error
	D0	1: Data ready

● Loopback modem status

Nibble	Bit	Meaning
n3	D3	1: Carrier detect (CD)
	D2	1: Ring indicator (RING)
	D1	1: Data set ready (DSR)
	D0	1: Clear to send (CTS)
n4	D3	
	D2	
	D1	
	D0	

• Printer BIOS error status

Nibble	Bit	Meaning
n1	D3	0: Busy
	D2	1: Acknowledge
	D1	1: Paper end
	D0	1: Printer is selected
n2	D3	1: I/O error
	D0	1: Time-out

- When an error occurs during format, verify, write and read tests for FDD, an error message is displayed in the following format of the command and error names:

(Format of Error Message)

[Command Name] failed: [Error Name] Cylinder = xx Head = xx Sector = xx

Command Name: Read
Write
Verify
Format
Read long
Write long
Command

Error Name: HDC not found (FFH)
Bad err register (E0H)
Write fault (CCH)
Undefined error (BBH)
Drive not ready (AAH)
Time-out (80H)
Seek error (40H)
FDC or HDC error (20H)
Data corrected (11H)
CRC or ECC error (10H)
Bad track (0BH)
Bad sector mark (0AH)
64 K boundary (09H)
DMA overrun (08H)
Parameter error (07H)
Reset error (05H)
No record (04H)
Write protected (03H)
No address mark (02H)
Invalid command (01H)

When there is a difference between write data and read data, the following error message is displayed:

Compare error Cylinder = xx Head = xx Sector = xx

- When an error occurs during format, write long, read long, write and read tests for HDD, an error message is displayed in the following format of command and error names:

(Format of Error Message)

[Command Name] failed: [Error Name] Cylinder = xx Head = xx Sector = xx

Command Name: Please refer to the FDD section above.
Error Name: Please refer to the FDD section above.

7. Disassembly/Reassembly

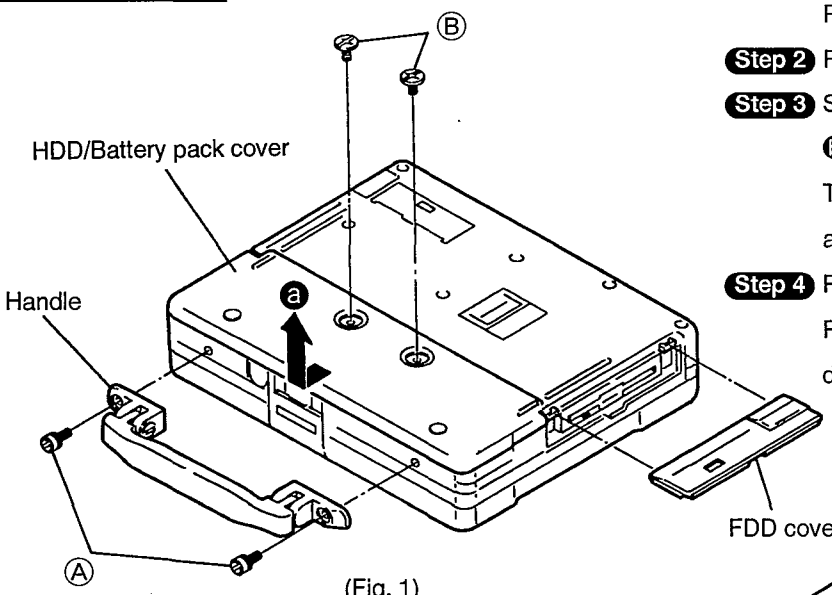
Note: Befor disassembling, be sure to perform the following procedures.

1. Make sure the "Suspend/Resume" or "Hibernation" feature is disabled.
2. Turn the power switch OFF and unplug the unit.
3. Disconnect the AC adapter and remove Battery Pack as described at Ref. No.1.
4. Remove the FDD pack or other devices from Multimedia Pocket. (Ref. No.1)
5. Remove the optional PC card and RAM card, if they are installed (Ref. No.2 and 3)

Caution: 1. Please follow directions carefully.
2. Be carefull of static electricity.
3. Do not interchange screws in any part of the system.

● Contents

Ref. No. 1	Removing HDD (Hard Disk Dirve), FDD (Floppy Disk Drive) Pack and Battery Pack
Procedure Ref. 1	



(Fig. 1)

Ⓐ	K113
	ϕ5×12mm (Black)

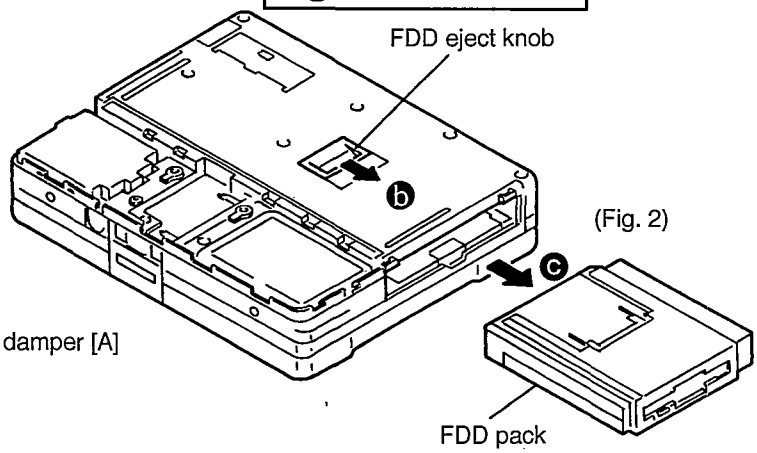
Ⓑ	K112
	ϕ3×8mm (Black)

Step 1 Remove the two screws Ⓐ. (Fig. 1)
Remove the Handle. (Fig. 1)

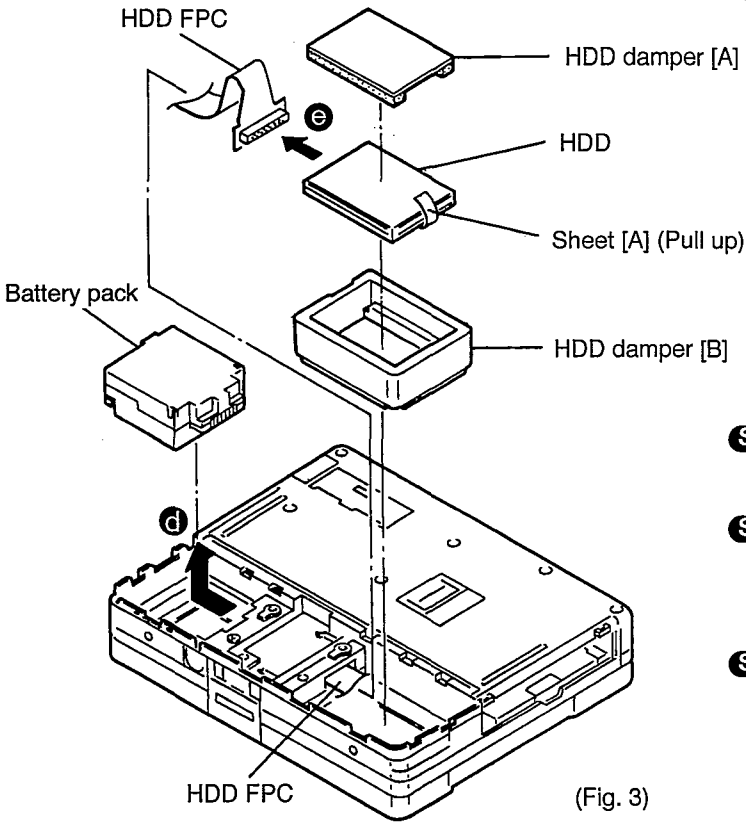
Step 2 Remove the FDD cover. (Fig. 1)

Step 3 Slide the FDD eject knob in the direction of arrow ⓑ. (Fig. 2)
The FDD pack will slide out in the direction of arrow ⓒ. (Fig. 2)

Step 4 Remove the two screws Ⓑ. (Fig. 1)
Remove the HDD/Battery pack cover in the direction of arrow ⓐ. (Fig. 1)



(Fig. 2)



(Fig. 3)

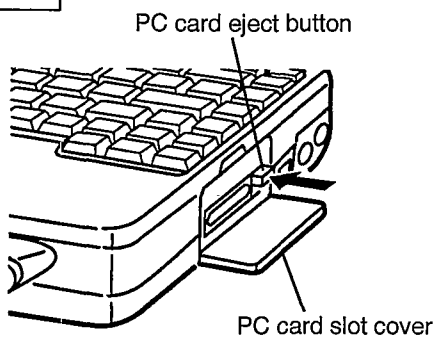
Step 5 Remove the Battery pack in the direction of the arrow ⓓ. (Fig. 3)

Step 6 Remove the HDD damper [A]. (Fig. 3)
Remove the HDD by pulling the sheet [A] up. (Fig. 3)

Step 7 Remove the HDD FPC in the direction of arrow ⓔ. (Fig. 3)

Ref. No. 2 Removing PC CARD (if installed)

Procedure
Ref. 2

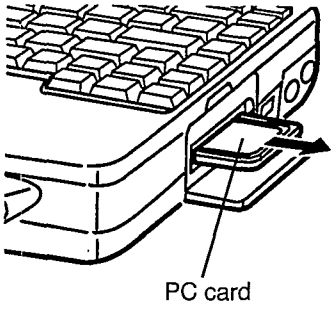


(Fig. 4)

Step 1 Open the PC card slot cover. (Fig. 4)

Step 2 Push the PC card eject button to displace the card. (Fig. 4)

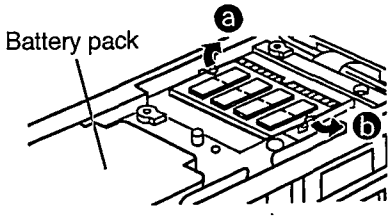
Step 3 Remove the card by pulling it out. (Fig. 5)



(Fig. 5)

Ref. No. 3 Removing RAM CARD (if installed)

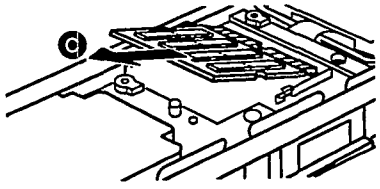
Procedure
Ref. 1 (step 4) ➡ 3



(Fig. 6)

Step 1 Remove the HDD/Battery pack cover.
Ref. No. 1 (step 4)

Step 2 Pulls the hooks on both sides in the direction of arrows ⓐ and ⓑ. (Fig. 6)



(Fig. 7)

Step 3 Gently remove the RAM card from the slot in the direction of arrow ⓒ. (Fig. 7)

Ref. No. 4 — Removing Upper Cabinet Unit, Display Unit and Intermediate Cabinet Unit

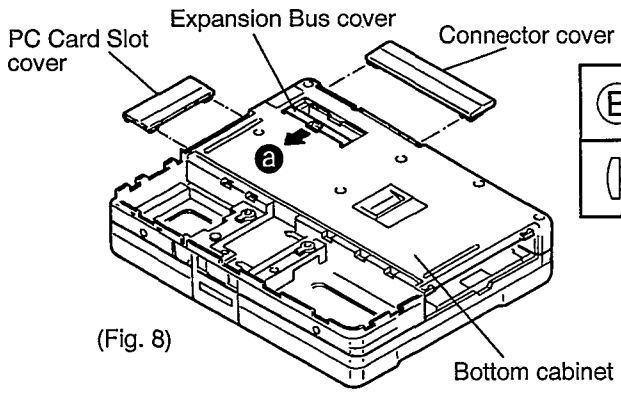
Procedure
Ref. 1 ➡ 4

Step 1 Remove the PC Card Slot cover. (Fig. 8)

Step 2 Remove the Connector cover. (Fig. 8)

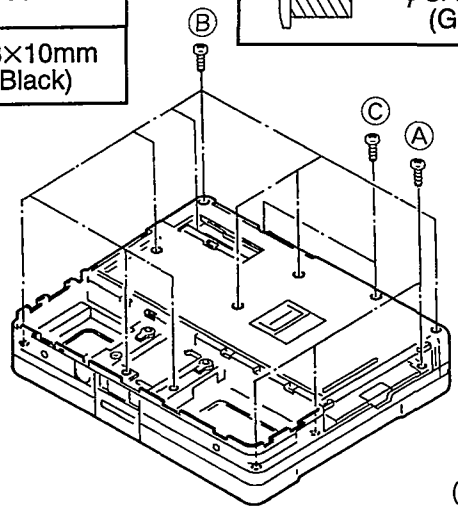
Step 3 Slide the Expansion Bus cover in the direction of arrow ⓐ. (Fig. 8)

Ⓒ	K109	ϕ3×20mm (Black)

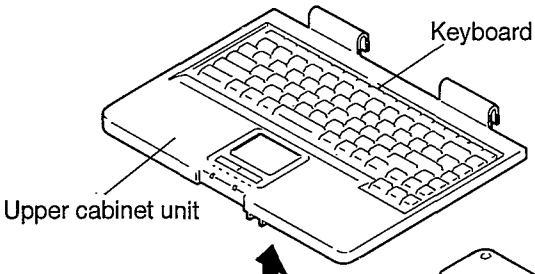


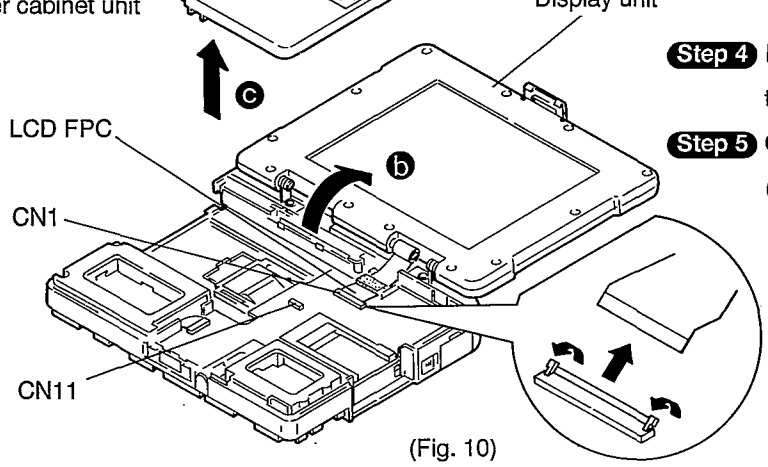
(Fig. 8)

Ⓑ	K100	ϕ3×10mm (Black)
Ⓐ	K108	ϕ3×8mm (Gold)



(Fig. 9)





(Fig. 10)

Step 4 Remove the three screws Ⓐ, nine screws Ⓑ and two screws Ⓒ. (Fig. 9)

Step 5 Open the display unit in the direction of arrow ⓑ. (Fig. 10)

Step 6 Remove the Upper cabinet unit in the direction of arrow ⓒ. (Fig. 10)

Notes When Assembling

Make sure keyboard connector P.C.B. is connected with Main P.C.B. (CN11).

Step 7 Disconnect the LCD FPC from CN1. (Fig. 10)

Step 8 Remove the two screws Ⓓ.

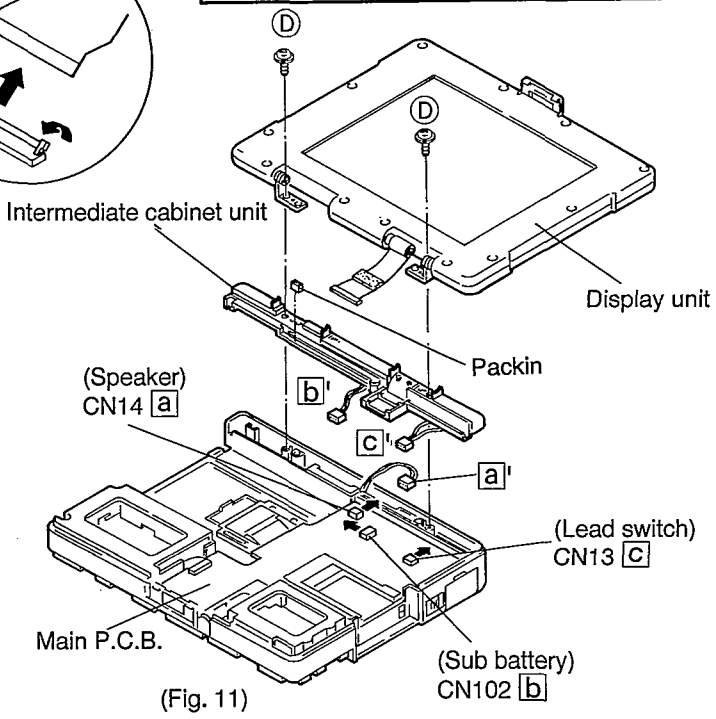
Remove the Display unit. (Fig. 11)

Step 9 Disconnect the three cables from CN102, CN13 and CN14. (Fig. 11)

(a—a', b—b', c—c')

Step 10 Remove the Intermediate cabinet unit. (Fig. 11)

Ⓓ	K107	ϕ3×10mm (Gold)



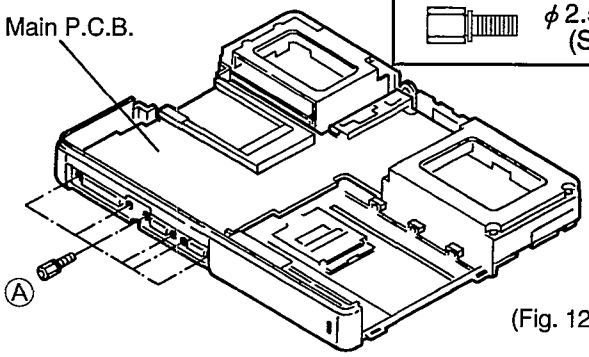
(Fig. 11)

Ref. No. 5 Removing Main P.C.B.

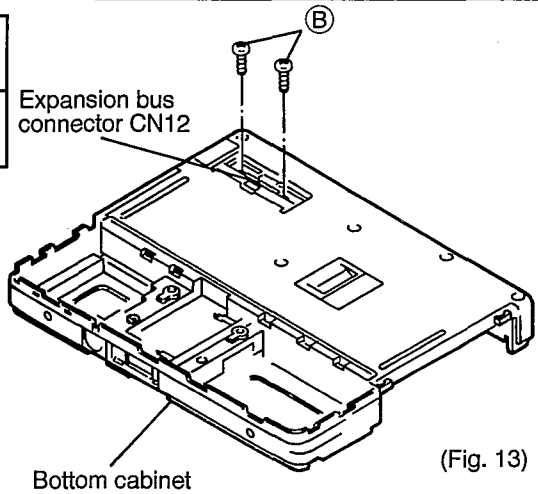
Procedure
Ref. 1 ➡ 4 ➡ 5

Ⓑ	K110	ϕ2×5mm (Gold)

Ⓐ	K111	ϕ2.5×7.8mm (Silver)



(Fig. 12)



(Fig. 13)

Step 1 Remove the six screws Ⓐ. (Fig. 12)

Step 2 Remove the two screws Ⓑ. (Fig. 13)

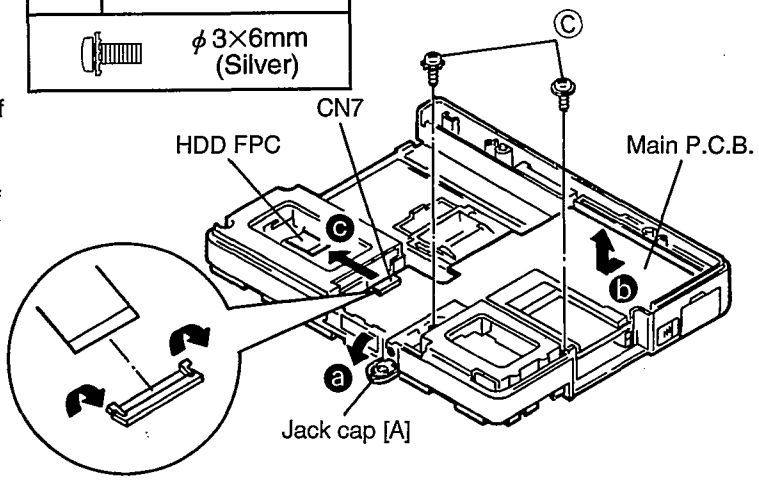
Step 3 Remove the two screws Ⓒ. (Fig. 14)

Step 4 Remove the Jack cap [A] in the direction of arrow ⓐ. (Fig. 14)

Step 5 Remove the Main P.C.B. in the direction of arrow ⓑ. (Fig. 14)

Step 6 Disconnect the HDD FPC from CN7 in the direction of arrow ⓒ. (Fig. 14)

Ⓒ	K104	ϕ3×6mm (Silver)

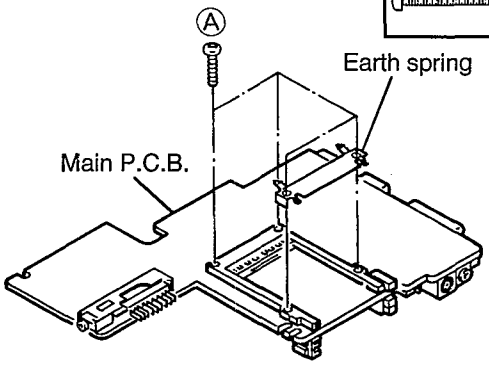


(Fig. 14)

Ref. No. 6 Removing PC CARD SLOT

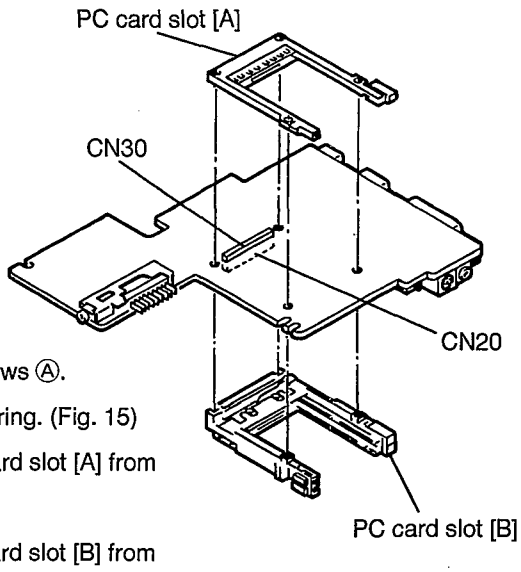
Procedure
Ref. 1 ➡ 4 ➡ 5 ➡ 6

Ⓐ	K114	ϕ2×20mm (Gold)



(Fig. 15)

(Fig. 16)



Step 1 Remove the four screws Ⓐ. Remove the Earth spring. (Fig. 15)

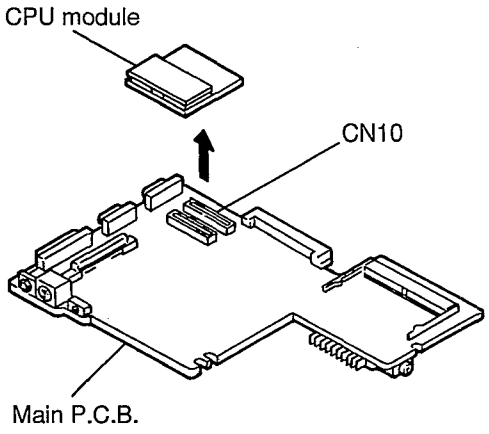
Step 2 Disconnect the PC card slot [A] from CN30. (Fig. 16)

Step 3 Disconnect the PC card slot [B] from CN20. (Fig. 16)

Ref. No. 7 Removing CPU Module

Procedure
Ref. 1 ➡ 4 ➡ 5 ➡ 7

Step 1 Remove the CPU module from CN10. (Fig. 17)



(Fig. 17)

Ref. No. 8 Removing Bottom Cabinet and Speaker

Procedure
Ref. 1 ➡ 4 ➡ 5 ➡ 8

Ⓐ	K103	ϕ2×4mm (Gold)

ⒷⒷ′	K105	ϕ2.6×3.5mm (Silver)

Step 1 Remove the four screws Ⓐ.
(a—a′, b—b′, c—c′, d—d′)
Remove the FDD eject knob. (Fig. 18)

Step 2 Remove the Spring [A] from Hook and e′.
(Fig. 18)
(e—e′)

Step 3 Remove the two screws Ⓑ.
Remove the CPU radiation plate [A], [B]. (Fig. 18)

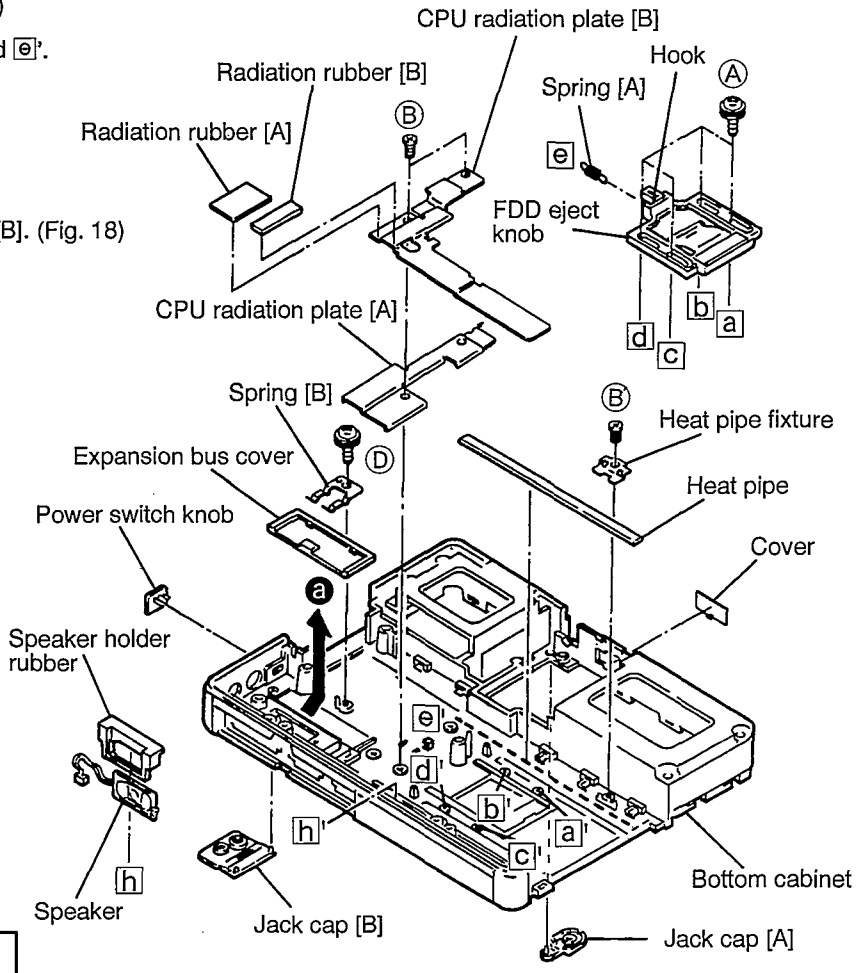
Step 4 Remove the screw Ⓑ′.
Remove the Heat pipe fixture.
Remove the Heat pipe. (Fig. 18)

Step 5 Remove the screw Ⓓ.
Remove the Spring [B].
Remove the Expansion bus cover in the direction of arrow ⓐ.
(Fig. 18)

Step 6 Remove the Jack cap [A], [B], Cover and Power switch knob.
(Fig. 18)

Step 7 Remove the speaker holder rubber and Speaker from h′
(h—h′). (Fig. 18)

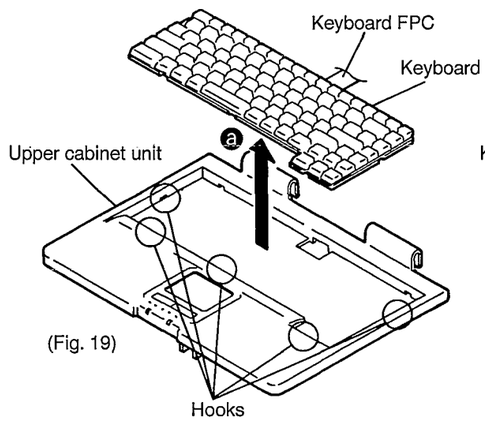
Ⓓ	K104	ϕ3×6mm (Silver)



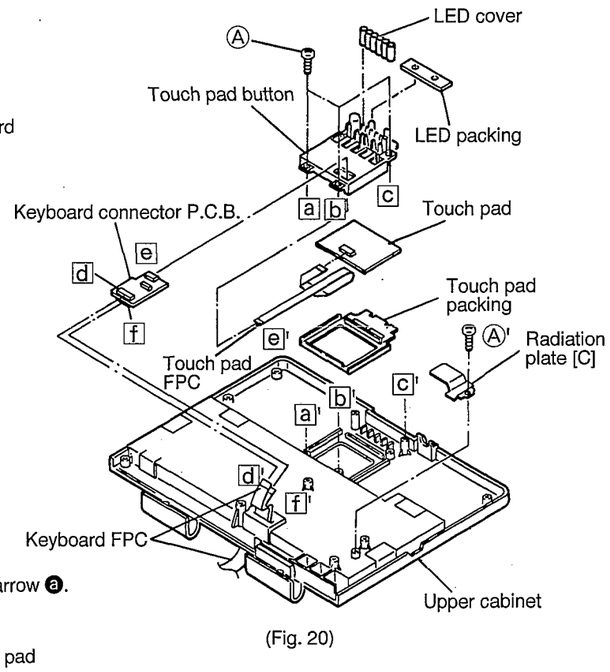
(Fig. 18)

Ref. No. 9 — Removing Keyboard, Keyboard Connector P.C.B. and Touch Pad

Procedure
Ref. 1 ➡ 4 ➡ 9



(Fig. 19)



(Fig. 20)

Step 1 Release the five hooks.
Remove the Keyboard in the direction of arrow ❶.
(Fig. 19)

Step 2 Disconnect the Keyboard FPC and Touch pad FPC from Keyboard connector P.C.B. (Fig. 20)
(d—d', e—e', f—f')

Step 3 Remove the three screws Ⓐ. (Fig. 20)
(a—a', b—b', c—c')

Step 4 Remove the Touch pad button.
Remove the Touch Pad. (Fig. 20)

ⒶⒶ'	K106
	ϕ3×6mm (Black)

Ref. No. 10 — Removing Sub Battery and Lead Switch

Procedure
Ref. 1 ➡ 4 ➡ 10

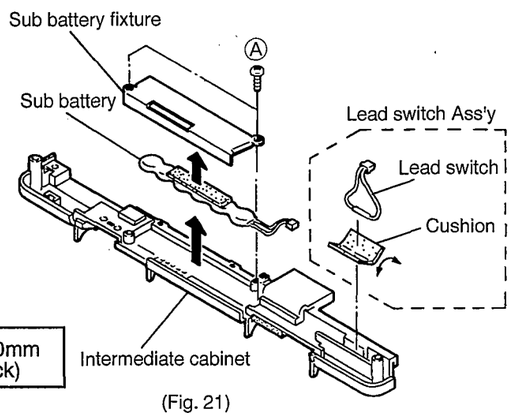
Step 1 Remove the two screws Ⓐ. (Fig. 21)

Step 2 Remove the Sub battery fixture.
Remove the Sub battery. (Fig. 21)

Step 3 Remove the Lead switch Ass'y.

Step 4 Open the Cushion.
Remove the Lead switch. (Fig. 21)

Ⓐ	K100	ϕ3×10mm (Black)



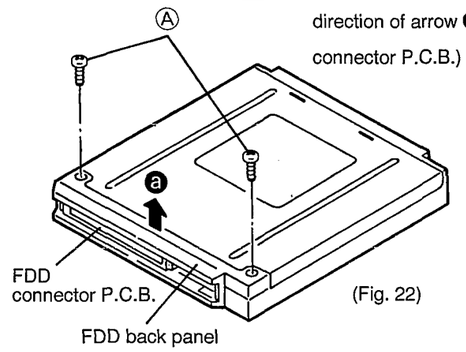
(Fig. 21)

Ref. No. 11 — Removing FDD (Floppy Disk Drive)

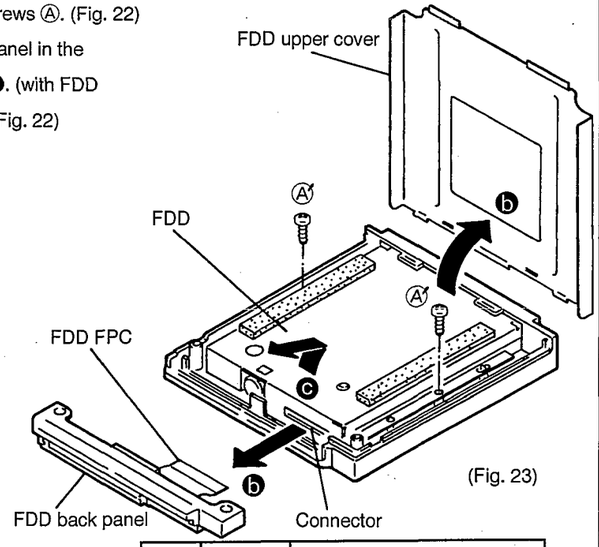
Procedure
Ref. 1 ➡ 11

Step 1 Remove the two screws Ⓐ. (Fig. 22)

Step 2 Lift the FDD back panel in the direction of arrow ❶. (with FDD connector P.C.B.) (Fig. 22)



(Fig. 22)



(Fig. 23)

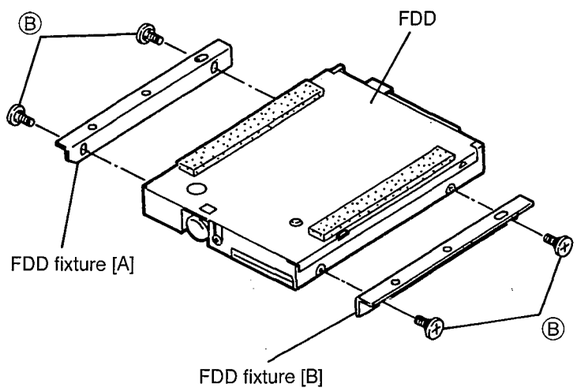
ⒶⒶ'	E12-10	ϕ2.6×8mm (Black)

Step 3 Remove the FDD upper cover in the direction of arrow ❷. (Fig. 23)

Step 4 Remove the two screws Ⓐ'. (Fig. 23)

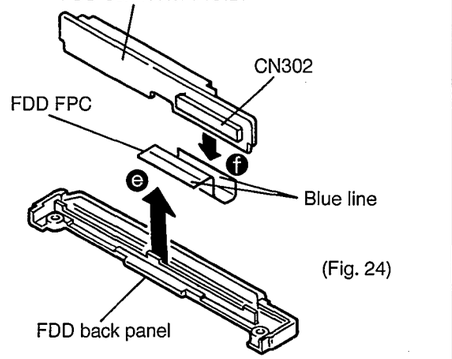
Step 5 Remove the FDD in the direction of arrow ❸. (Fig. 23)

Step 6 Disconnect the FDD FPC from Connector in the direction of arrow ❷.
(Fig. 23)



(Fig. 25)

Ⓑ	E12-11	
		ϕ2×3.5mm (Silver)



(Fig. 24)

Step 7 Remove the FDD connector P.C.B. from FDD back panel in the direction of arrow ❹. (Fig. 24)

Step 8 Disconnect the FDD FPC from CN302 in the direction of arrow ❺. (Fig. 24)

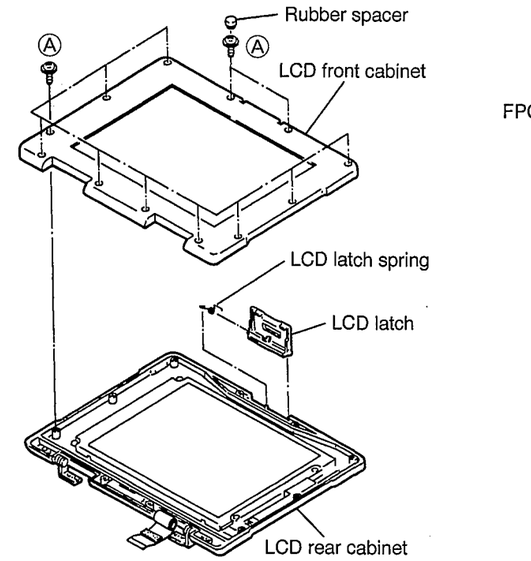
Step 9 Remote the four screws Ⓑ. (Fig. 25)
Remove the FDD fixture [A], [B]. (Fig. 25)

Ref. No. 12 Removing LCD Unit and LCD FPC

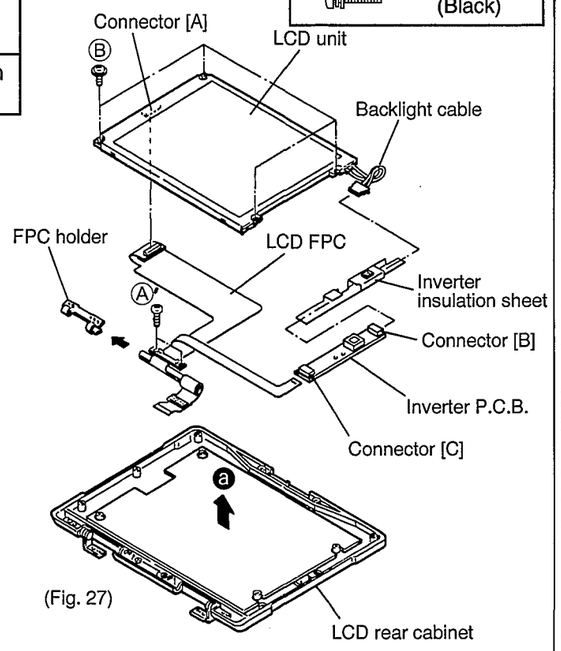
Procedure
Ref. 1 ➡ 4 ➡ 12

Ⓑ Ⓑ'	K101
	ϕ2.6×8mm (Silver)

Ⓐ Ⓐ'	K102
	ϕ2.6×8mm (Black)



(Fig. 26)



(Fig. 27)

Step 1 Remove the two Rubber spacers and twelve screws Ⓐ.
Remove the LCD front cabinet. (Fig. 26)

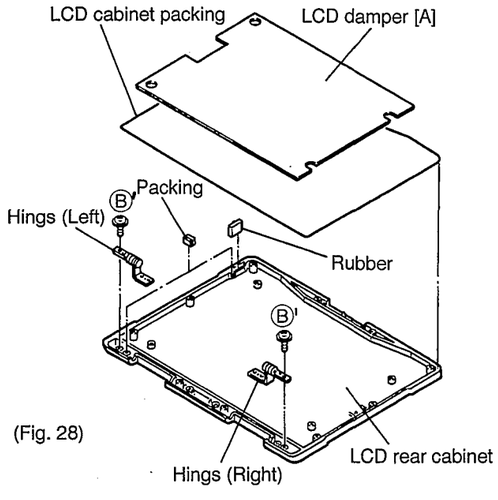
Step 2 Remove the LCD latch and LCD latch spring. (Fig. 26)

Step 3 Remove the four screws Ⓑ.
Remove the two screws Ⓐ'.
Lift the LCD unit in the direction of arrow ⓐ
Disconnect the LCD FPC from Connector [A]. (Fig. 27)

Step 4 Disconnect the Backlight cable and LCD FPC from Connector [B] and [C].
Remove the Inverter insulation sheet. (Fig. 27)

Step 5 Remove the two screws Ⓑ'.
Remove the Hinges (left), (Right). (Fig. 28)

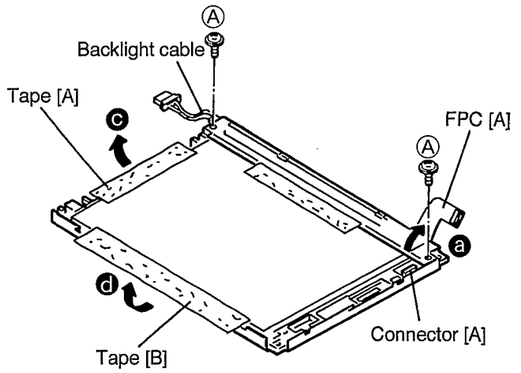
Step 6 Remove the LCD damper [A], LCD cabinet packing, Rubber and Packings. (Fig. 28)



(Fig. 28)

Ref. No. 13 Removing Backlight Lamp

Procedure
Ref. 1 ➡ 4 ➡ 12 ➡ 13

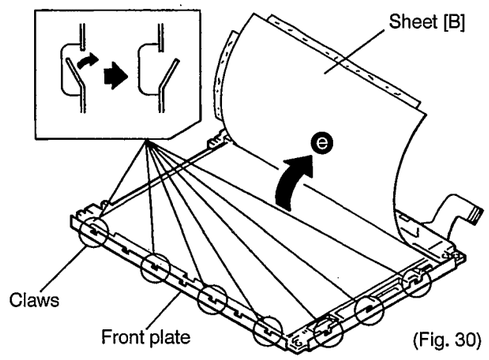


(Fig. 29)

Step 1 Remove the two screws Ⓐ.
Disconnected the FPC [A] from Connector [A] in the direction of arrow ⓐ. (Fig. 29)

Step 2 Remove the tape [A], [B] in the direction of arrow ⓒ, ⓓ. (Fig. 29)

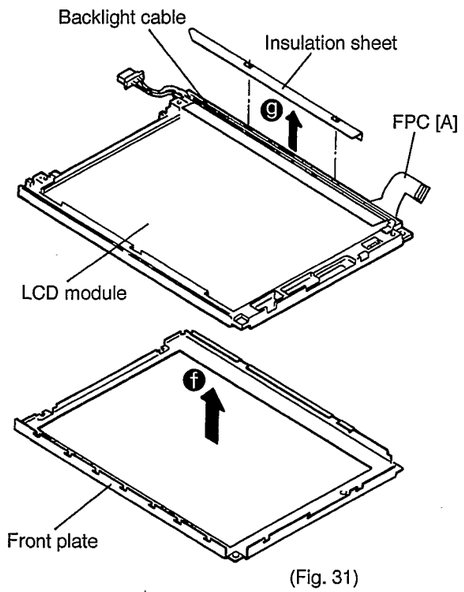
Step 3 Open the Sheet [B] in the direction of arrow ⓔ.
Bend the claws at the seven locations with a plier toward outer side. (Fig. 30)



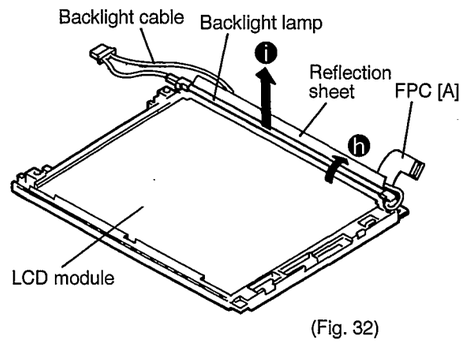
(Fig. 30)

Step 4 Remove the LCD module in the direction of arrow ⓕ.
Remove the Sheet [B] and Insulation sheet. (Fig. 31)

Step 5 Remove the Backlight cable in the direction of arrow ⓖ. (Fig. 31)



(Fig. 31)

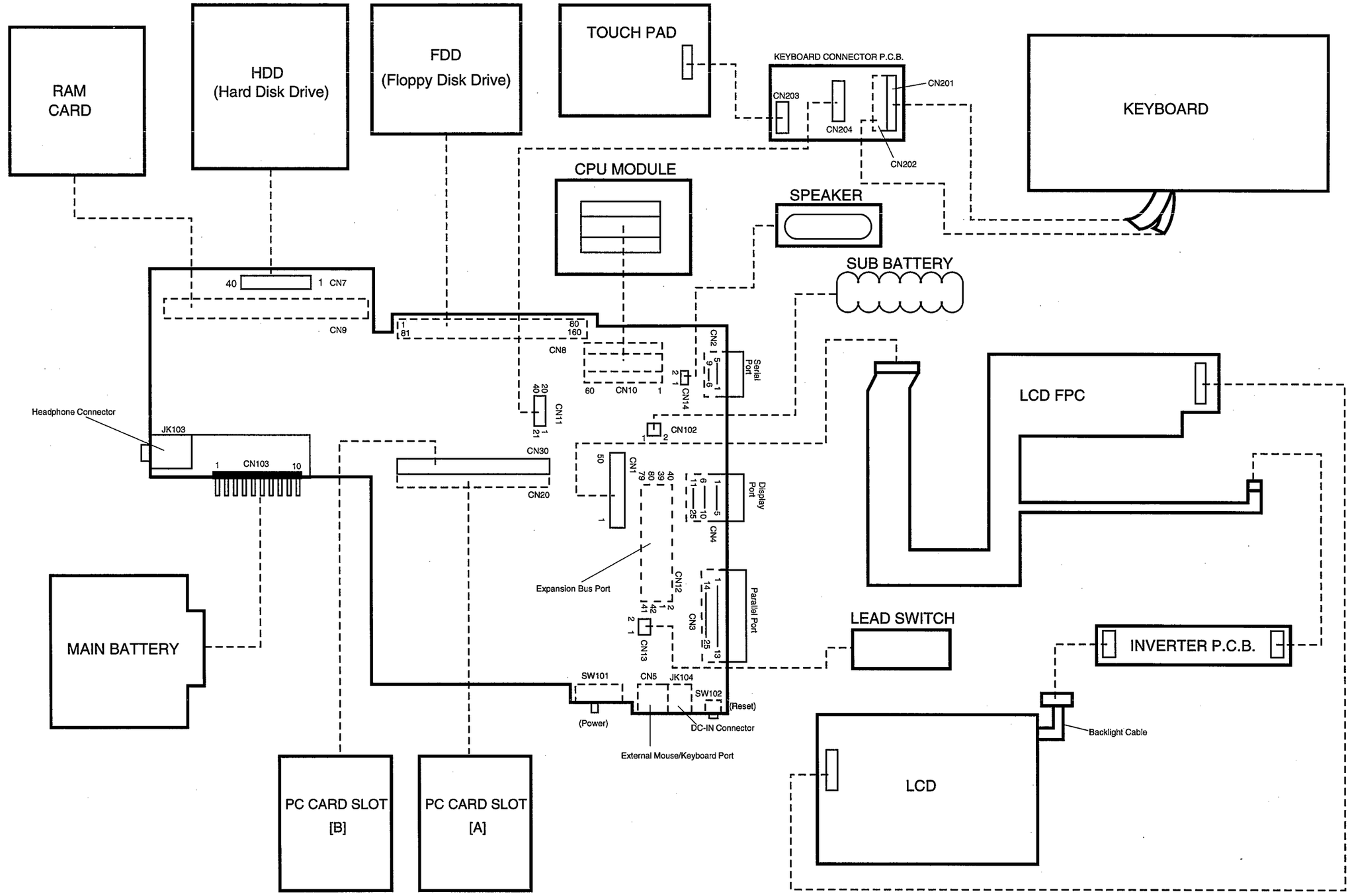


(Fig. 32)

Step 6 Open the Reflection Sheet in the direction ⓗ. (Fig. 32)

Step 7 Remove the Backlight lamp in the direction of arrow ⓘ. (Fig. 32)

8. Wiring Connection Diagram



9. I/O address map

1) System

Address	Function	IC No.
0H	DMA Channel 0 base and current address	IC9
1H	DMA Channel 0 base and word count	IC9
2H	DMA Channel 1 base and current address	IC9
3H	DMA Channel 1 base and word count	IC9
4H	DMA Channel 2 base and current address	IC9
5H	DMA Channel 2 base and word count	IC9
6H	DMA Channel 3 base and current address	IC9
7H	DMA Channel 3 base and word count	IC9
8H	Command Register, DMA Controller 1	IC9
9H	Request Register, DMA Controller 1	IC9
0AH	Mask Register, DMA Controller 1	IC9
0BH	Mode Register, DMA Controller 1	IC9
0CH	Clear byte pointer, DMA Controller 1	IC9
0DH	Master Clear, DMA Controller 1	IC9
0DH	Temporary Register, DMA Controller 1	IC9
0FH	Write all Mask Register Bits, DMA Controller 1	IC9
0EH	Clear Mask Register, DMA Controller 1	IC9
20H	Initialization Control Word ICW1, Interrupt Controller 1	IC9
21H	Initialization Control Word ICW2, Interrupt Controller 1	IC9
21H	Initialization Control Word ICW3, (Master Device) Interrupt Controller 1	IC9
21H	Initialization Control Word ICW3, (Slave Device) Interrupt Controller 1	IC9
21H	Initialization Control Word ICW4, Interrupt Controller 1	IC9
21H	Operation Control Word OCW1, Interrupt Controller 1	IC9
20H	Operation Control Word OCW2, Interrupt Controller 1	IC9
20H	Operation Control Word OCW3, Interrupt Controller 1	IC9
24H	AT Core Logic Index Register	IC9
26H	AT Core Logic Data Register	IC9
40H	Timer Counter 1 Channel 0 count	IC9
41H	Timer Counter 1 Channel 1 count	IC9
42H	Timer Counter 1 Channel 2 count	IC9
43H	Timer Counter 1 Command Register	IC9
48H	Timer Counter 2 Channel 0 count	IC9
4AH	Timer Counter 2 Channel 2 count	IC9
4BH	Timer Counter 2 Command Register	IC9
60H	Keyboard Controller data I/O input buffer	IC9
60H	Keyboard Controller data I/O output buffer	IC9
61H	Port 61	IC9
64H	Keyboard Controller Command	IC9
64H	Keyboard Controller Status	IC9
70H	CMOS RAM Address port and NMI Mask	IC9
71H	RTC CMOS RAM data port	IC9
80H	Reserved	IC9
81H	DMA Memory Address Mapper Page Register Channel 2	IC9
82H	DMA Memory Address Mapper Page Register Channel 3	IC9
83H	DMA Memory Address Mapper Page Register Channel 1	IC9
84H	Reserved	IC9
85H	Reserved	IC9
86H	Reserved	IC9
87H	DMA Memory Address Mapper Page Register Channel 0	IC9
88H	Reserved	IC9

Continued

Address	Function	IC No.
89H	DMA Memory Address Mapper Page Register Channel 6	IC9
8AH	DMA Memory Address Mapper Page Register Channel 7	IC9
8BH	DMA Memory Address Mapper Page Register Channel 5	IC3
8CH	Reserved	IC9
8DH	Reserved	IC9
8EH	Reserved	IC9
8FH	DMA Memory Address Mapper Page Register - Refresh	IC9
92H	Port 92	IC9
0A0H	Initialization Control Word ICW1, Interrupt Controller 2	IC9
0A1H	Initialization Control Word ICW2, Interrupt Controller 2	IC9
0A1H	Initialization Control Word ICW3, (Master Device) Interrupt Controller 2	IC9
0A1H	Initialization Control Word ICW3, (Slave Device) Interrupt Controller 2	IC9
0A1H	Initialization Control Word ICW4, Interrupt Controller 2	IC9
0A1H	Operation Control Word OCW1, Interrupt Controller 2	IC9
0A0H	Operation Control Word OCW2, Interrupt Controller 2	IC9
0A0H	Operation Control Word OCW3, Interrupt Controller 2	IC9
0B0H	Power Management Register	IC9
0B2H	Power Management Register	IC9
0C0H	DMA Channel 4 base and current address	IC9
0C2H	DMA Channel 4 base and current word count	IC9
0C4H	DMA Channel 5 base and current address	IC9
0C6H	DMA Channel 5 base and current word count	IC9
0C8H	DMA Channel 6 base and current address	IC9
0CAH	DMA Channel 6 base and current word count	IC9
0CCH	DMA Channel 7 base and current address	IC9
0CEH	DMA Channel 7 base and current word count	IC9
0D0H	Command Register, DMA Controller 2	IC9
0D0H	Status Register, DMA Controller 2	IC9
0D2H	Request Register, DMA Controller 2	IC9
0D4H	Mask Register, DMA Controller 2	IC9
0D6H	Mode Register, DMA Controller 2	IC9
0D8H	Clear byte pointer, DMA Controller	IC9
0DAH	Master Clear, DMA Controller 2	IC9
0DAH	Temporary Register, DMA Controller 2	IC9
0DCH	Clear Mask Register, DMA Controller 2	IC9
0DEH	Write all Mask Register Bits, DMA Controller 2	IC9
0194H	APMC Index Register	IC327
0195H	APMC Data Register	IC327
0196H	G/A Index Register	IC56
0197H	G/A Data Register	IC56

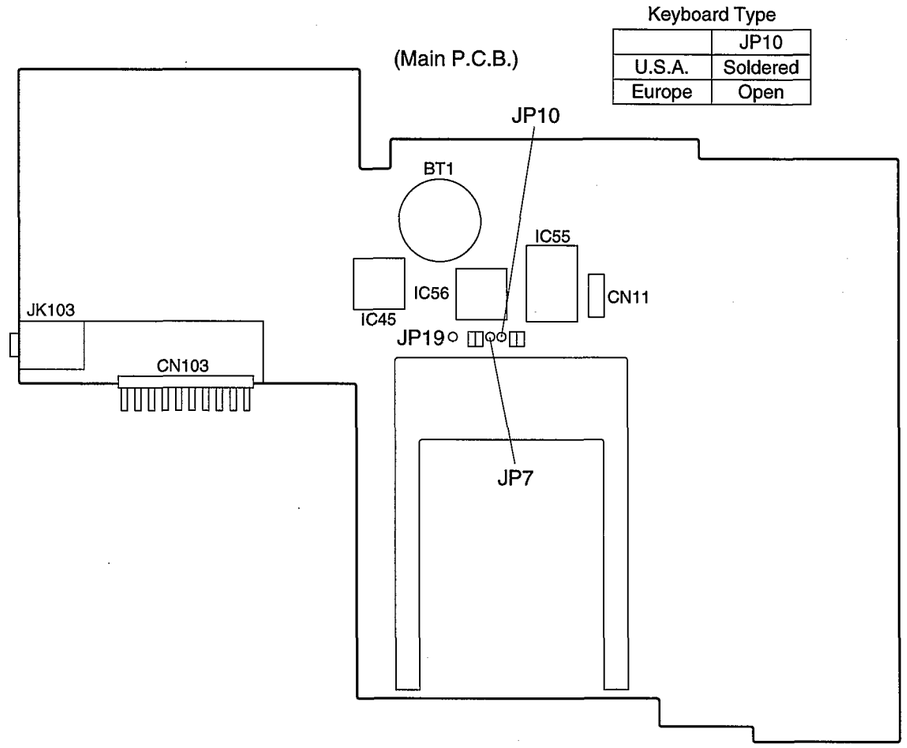
2) Peripherals

Address	Function	IC No.
220H–22FH or 230H–23FH or 240H–24FH or 250H–25FH	Sound Chip	IC31
278H–27AM	LPT3	IC52

Continued

Address	Function	IC No.
2E8H–2EFH	Serial Port 4	IC52
2F8H–2FFH	Serial Port 2 or IrDA	IC52
378H–37AH	LPT2	IC52
388H–38BH	Sound Chip	IC31
398H	Super I/O Index Register	IC52
399H	Super I/O Data Register	IC52
3B4H	CRTC Index MP	IC26
3B5H	CRTC Data MP	IC26
3BCH–3BEH	LPT1	IC52
3C1H	Attribute Controller Data in VGA, Attribute Controller Data in EGA	IC26
3C2H	Miscellaneous Output, Feature	IC26
3C3H	Motherboard Sleep Address	IC26
3C4H	Sequencer	IC26
3C5H	Sequencer	IC26
3C6H	RAMDAC Pixel Mask	IC26
3C7H	RAMDAC Address Register Read Mode, RAMDAC Status Register	IC26
3C8H	RAMDAC Address Register Write Mode	IC26
3C9H	RAMDAC Data	IC26
3CAH	Feature Control	IC26
3CCH	Miscellaneous Output	IC26
3CEH	Graphic Controller and Extensions Index	IC26
3CFH	Graphic Controller and Extensions Data	IC26
3D4H	CRTC Index	IC26
3D5H	CRTC Data	IC26
3DAH	Feature Control, Display Status	IC26
3E0H	PCMCIA Index Register	IC38
3E1H	PCMCIA Data Register	IC38
3E2H	PCMCIA Index Register for the third slot	IC28
3E3H	PCMCIA Data Register for the third slot	IC28
3E8H	Serial Controller Port 3 Receiver Buffer	IC52
3E8H–3FFH	Serial Port 3	IC52
3F2H	Floppy Disk Controller Digital Output Register	IC52
3F4H	Floppy Disk Controller Main Status Register	IC52
3F5H	Floppy Disk Controller Data Register	IC52
3F6H	Fixed Disk Register	IC52
3F7H	Floppy Disk Controller Digital Input Register	IC52
3F7H	Floppy Disk Controller Control Register	IC52
3F7H	Fixed Disk Decode	IC52
3F8H–3FFH	Serial Port 1	IC52
678H–67FH	LPT3	IC52
778H–77FH	LPT2	IC52

10. Jumper Setting for LCD and keyboard type



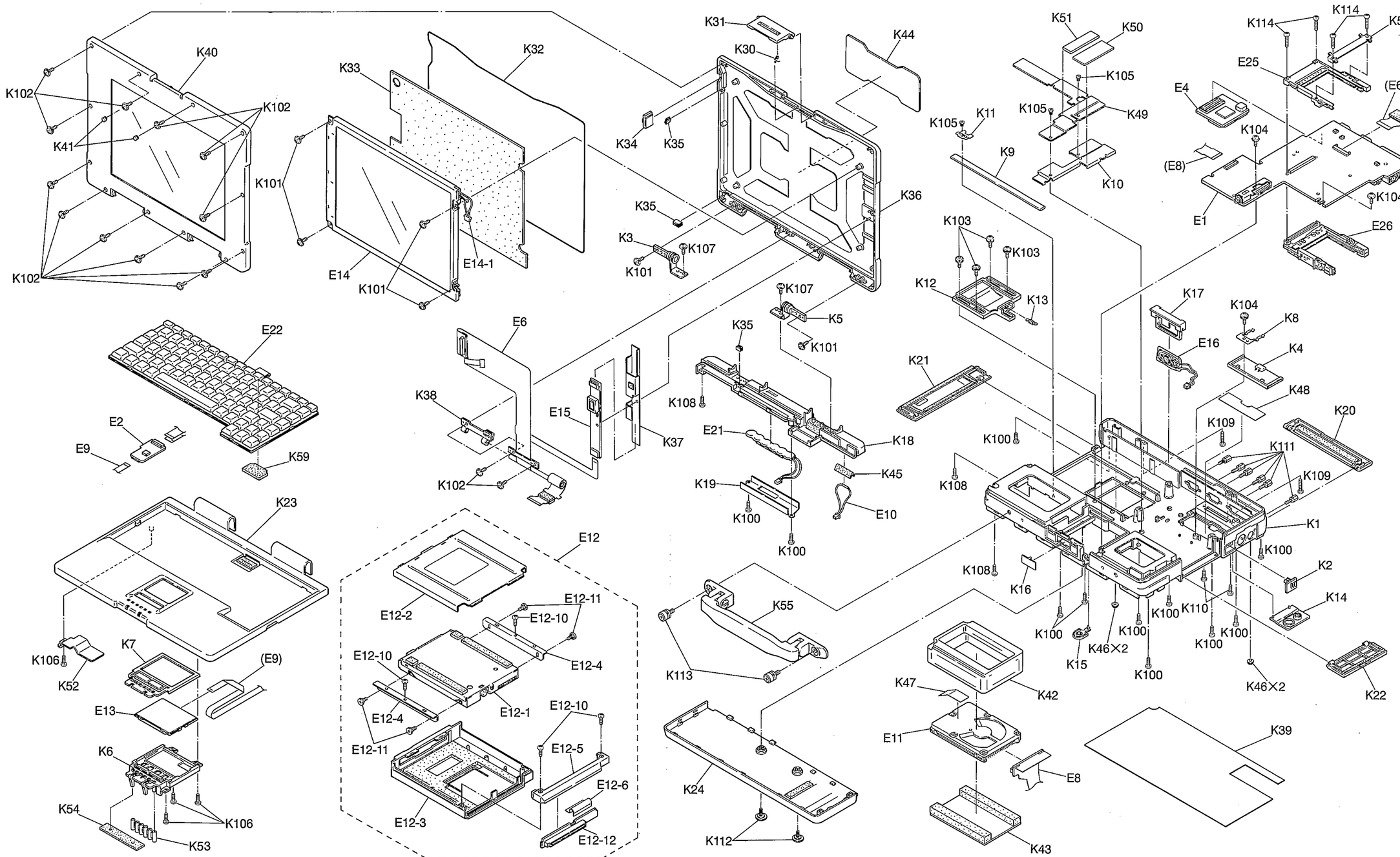
Keyboard Type

	JP10
U.S.A.	Soldered
Europe	Open

11.Quick Reference for Screws

REF.NO.	PART NO.	ACTUAL SIZE	REF.NO.	PART NO.	ACTUAL SIZE
K100	XTB3+10GFZ	φ3×10mm (Black)	K107	XYN3+J8	φ3×8mm (Gold)
K101	XYN26+F8FN	φ2.6×8mm (Silver)	K108	XTB3+8G	φ3×8mm (Gold)
K102	DFHE5064ZA	φ2.6×8mm (Black)	K109	XTB3+20GFZ	φ3×20mm (Black)
K103	XYN2+F4	φ2×4mm (Gold)	K110	XSN2+5	φ2×5mm (Gold)
K104	XYN3+E6FN	φ3×6mm (Silver)	K111	DFHE5058ZA	φ2.5×7.8mm (Silver)
K105	DFHE5023ZA	φ2.6×3.5mm (Silver)	K112	DFHK0001ZA	φ3×8mm (Black)
K106	XTB3+6GFZ	φ3×6mm (Black)			
E12-10	XTB26+8GFZ	φ2.6×8mm (Black)	K113	DFHE5068ZA	φ5×12mm (Black)
E12-11	DFHE5059ZA	φ2×3.5mm (Silver)	K114	XSN2+20	φ2×20mm (Gold)

12. Exploded View



12 - 1

12 - 2

13. Replacement Parts List

Notes: Important safety notice.
Components identified by ⚠ have special characteristics important for safety.
When replacing any of these component, use only manufacturer's special parts.

REF.NO. and AREA		PART NO.	DESCRIPTION		Q'TY
Main Block Units					
E1	⚠	DL3U10847AAA	PCB, MAIN	RTL	1
E2		DL3UP0881AAA	PCB, KEYBOARD CONNECTOR	RTL	1
E4		DLWP0069A02A	MODULE, CPU (CF-25C******)		1
E4		DLWP0070A02A	MODULE, CPU (CF-25E******)		1
E6		DFWV48C0357	ASS'Y, FPC, LCD		1
E8		DLUP0110A01A	FPC, HDD		1
E9		DFJE9046ZA	FPC, TOUCH PAD		1
E10		DFSE9007YA	ASS'Y LEAD SWITCH		1
E11	⚠	DFJH058ZA-S	HDD, 1.35GB (CF-25**C****)		1
E11	⚠	DFJH059ZA-S	HDD, 840MB (CF-25**8****)		1
E12	⚠	DFWV44K0027	ASS'Y, FDD		1
E12-1	⚠	EME279MG	FDD		1
E12-2		DFMD7339ZA	COVER, UPPER, FDD		1
E12-3		DFGX0178ZA-0	CABINET, FDD		1
E12-4		DFMD7340ZA	FIXTURE, FDD [A], [B]		2
E12-5		DFGX0179ZB-0	FDD BACK PANEL		1
E12-6		DFJE26A024BB	FPC, FDD		1
E12-10		XTB26+8GFZ	SCREW, FDD		4
E12-11		DFHE5059ZA	SCREW, FDD		4
E12-12		DL3U30847AAA	PCB, FDD CONNECTOR	RTL	1
E13		DFJL0023ZB	TOUCH PAD		1
E14		EDTCB09QAF-Y	UNIT, LCD		1
E14-1		DFAC0023ZAW	BACKLIGHT		1
E15	⚠	DFWP0065ZAV	PCB, INVERTER		1
E16		DFAS40D01ZAN	UNIT, SPEAKER		1
E21		DFBA6/V70HS	SUB BATTERY (With Sponge)		1
E22	(M)	DFSX1A57ZATS	KEYBOARD		1
E22	(E)	DFSX1A58ZATS	KEYBOARD		1
E22	(G)	DFSX1A59ZATS	KEYBOARD		1
E25		DFJP094ZA136	PC CARD SLOT [A]		1
E26		DFJP095ZA068	PC CARD SLOT [B]		1
Accessories					
A1	(M,E)	DFQX2517ZB	MANUAL, USER'S GUIDE		1
A1	(G)	DFQX2518ZA	MANUAL, USER'S GUIDE		1
A2	⚠ (E)	DFJA0042ZAKK	AC CABLE		1
A2	⚠ (G)	DFJA0044ZAKK	AC CABLE		1
A2	⚠ (M)	DFJA0047ZAKK	AC CABLE		1
A3	(M,E)	DFJN0630ZAE	BACK UP FD		1
A3	(G)	DFJN0631ZAE	BACK UP FD		1
Packing Materrial					
P1		DFPK0832ZA	CASE, PACKING		1
P2		DFPN0624ZA	CUSHION		2
Mechanical Parts					
K1		DFKF0159ZA-0	CABINET, BOTTOM		1
K2		DFBD0085ZA-0	KNOB, POWER SWITCH		1
K3		DFBH1060ZA	HING (L)		1
K4		DFKE0361ZA-0	COVER, EXPANSION BUS		1
K5		DFBH1061ZA	HING (R)		1
K6		DFBC0174ZA-0	BUTTON, TOUCH PAD		1

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REF.NO. and AREA	PART.NO.	DESCRIPTION	Q'TY
Mechanical Parts			
K7	DFHG1030ZA	PACKING, TOUCH PAD	1
K8	DFUS0224ZB	SPRING [B]	1
K9	DFMY0100ZA	HEAT PIPE	1
K10	DFMY0104ZA	PLATE, RADIATION CPU [A]	1
K11	DFMD7343ZA	FIXTURE, HEAT PIPE	1
K12	DFHR5367ZA	FDD EJECT KNOB	1
K13	DFUW0064ZA	SPRING [A]	1
K14	DFGX0176ZA-0	JACK CAP [B]	1
K15	DFGX0177ZB-0	JACK CAP [A]	1
K16	DFGL0058ZA	COVER	1
K17	DFHG1031ZA	RUBBER, HOLDER, SPEAKER	1
K18	DFKE8084ZA-0	ASS'Y, INTERMEDIATE CABINET	1
K19	DFMD7314ZA	FIXTURE, SUB BATTREY	1
K20	DFWV84F0042	ASS'Y, COVER, CONNECTOR	1
K21	DFKE8088YA-0	ASS'Y, COVER, FDD	1
K22	DFWV84F0044	ASS'Y, COVER, PC CARD SLOT	1
K23	DFKM8105ZA-0	ASS'Y, UPPER CABINET	1
K24	DFWV84F0045	ASS'Y, COVER, HDD/MAIN BATTERY	1
K30	DFUW0063ZA	SPRING, LCD LATCH	1
K31	DFBS0034ZA-0	LCD LATCH	1
K32	DFHR5365ZA	PACKING, LCD CABINET	1
K33	DFHG1026ZA	DAMPER, LCD [A]	1
K34	DFHG1043ZA-0	RUBBER	1
K35	DFHG1028ZA	PACKING	3
K36	DFKM0214ZA-0	CABINET, LCD, REAR	1
K37	DFMX0450ZA	SHEET, INSULATION, INVERTER	1
K38	DFHR5363ZA	HOLDER, FPC	1
K39 ⚠	DFGT0610ZA	RATING LABEL	1
K40	DFWV80A0195	ASS'Y, CABINET, LCD FRONT	1
K41	DFHG1012ZA-0	SPACER, RUBBER	2
K42	DFHG1045ZA	DAMPER, HDD [B]	1
K43	DFHR8251ZA	DAMPER, HDD [A]	1
K44	DFGB0056ZA-0	LOGO BADGE	1
K45	DFHR8244ZA	CUSHION, READ SWITCH	1
K46	DFHG310YA-0	RUBBER, FOOT	4
K47	DFHR7379ZA	SHEET [A], HDD	1
K48	DFHR7380ZA	SHEET, COVER, EXPANSION BUS	1
K49	DFMY0106ZA	PLATE, RADIATION CPU [B]	1
K50	DFMY0099ZA	RUBBER, RADIATION [A]	1
K51	DFMY0107ZA	RUBBER, RADIATION [B]	1
K52	DFMY0105ZA	PLATE, RADIATION [C]	1
K53	DFHG1048ZA	COVER, LED	1
K54	DFHR7382ZA	PACKING, LED	1
K55	DFKH1003ZA-0	HANDLE	1
K58	DFUS0225ZA	EARTH SPRING	1
K59	DFHR8247ZA	SHEET, KEYBOARD, FPC	1
K100	XTB3+10GFZ	SCREW	11
K101	XYN26+F8FN	SCREW	6
K102	DFHE5064ZA	SCREW	14
K103	XYN2+F4	SCREW	4
K104	XYN3+E6FN	SCREW	3
K105	DFHE5023ZA	SCREW	3
K106	XTB3+6GFZ	SCREW	4
K107	XYN3+J10	SCREW	2
K108	XTB3+8G	SCREW	3
K109	XTB3+20GFZ	SCREW	2
K110	XSN2+5	SCREW	2
K111	DFHE5058ZA	SCREW	6
K112	DFHK0001YA	SCREW	2
K113	DFHE5068ZA	SCREW	2
K114	XSN2+20	SCREW	4

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