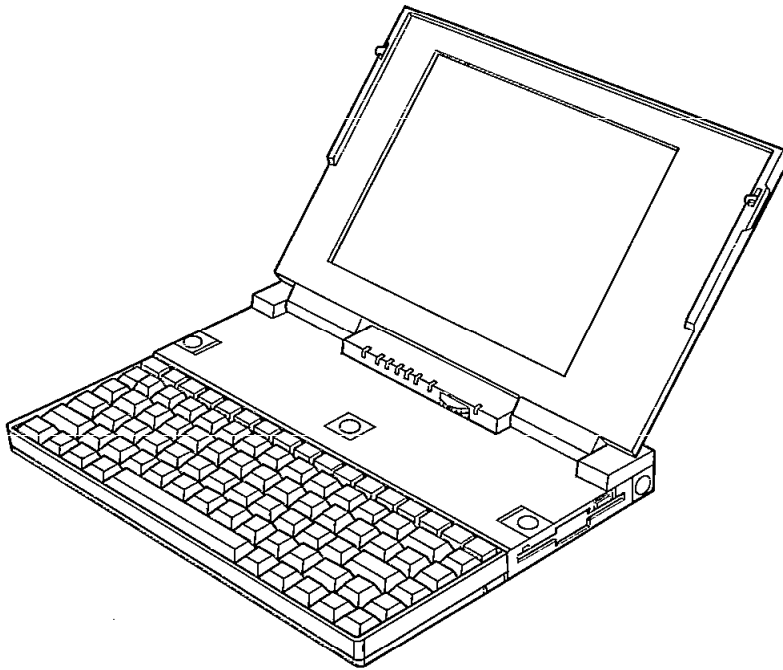


Service Manual

Laptop Computer
CF-1000

This is the Service Manual for the following areas.

- M** ... for U.S.A. and Canada
- E** ... for U.K.
- F** ... for France
- G** ... for F.R. Germany
- IT** ... for Italy
- SP** ... for Spain
- SS** ... for Switzerland
- SW** ... for Sweden



Panasonic®

WARNINGS

For U.K.

- 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.

For U.K.

WARNING

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 three-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 or 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.

VANADIUM LITHIUM BATTERY ⚠

• CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacture.

Dispose of used batteries according to the manufacture's instruction.

VANADIUM LITHIUMBATTERIE ⚠

Vorsicht !

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

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MS-DOS and GW-BASIC are registered trademarks of Microsoft Corporation.

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Safety Precaution

There are special components used in the computer which are important for safety. These parts are shaded on the schematic diagram and indicated by a safety mark Δ on the replacement parts list. It is essential that these critical parts should be replaced with the manufacture's specified parts to prevent shock, fire or other hazards. Do not modify the original design without written permission of the manufacture or this will void the original parts and labor guarantee.

1. System Overview

1.1 General Description

The CF-1000 is based on the Am386SXLV microprocessor and can be run up to 25 MHz.

The disk drives are a 2.5-inch 60 megabytes hard disk and a 3.5-inch 1.44 megabytes floppy disk drive.

It is possible to remove the FDD pack and the optional battery pack can be attached in the space from which the FDD pack was removed.

The system supports up to 12 megabytes of RAM (Total); 4 megabytes are placed on the main logic board and an additional 4 or 8 megabytes can be added using optional RAM card.

Both system BIOS and video BIOS can be in shadow RAM.

The system uses pagemode memory to attain virtual zero-wait-state operation.

Standard ports include two serial (one port is mainly used with a MODEM), one parallel, one external mouse or one external keyboard (IBM-PS/2 style mini DIN size).

The VGA interface is on the main logic board and it supports an analog monitor and a 640 × 480 black and white liquid crystal display.

The AT bus port socket is present for optional docking unit.

1.2 Specifications

Main Unit

PROCESSOR

CPU

Microprocessor Am386SXLV 25/8 MHz

Memory

RAM

4 MB Standard

Up to 12 MB expandable using optional RAM Card

Total RAM	8 MB	12 MB
Type of RAM Card	4 MB RAM Card	8 MB RAM Card

ROM

128 KB FLASH ROM with 32 pins PLCC type including VGA BIOS (not expandable)

Real Time Clock

128 bytes CMOS RAM backed up by Lithium Battery

RTC battery life time: Approx. 5 years

For dedicated MODEM

Internal slot

Storage

HDD

Type

2 1/2"

Capacity

61.08 MB (formatted)

Transfer Rate

16 M bits/sec (to/from media)

Seek Time

Average 16 msec

Display

Type See-through type LCD (black character/white background, reversible) with FL backlight

Resolution 640 × 480 dots
80 characters × 25 lines

Format

Character 80 characters × 25 columns
40 characters × 25 columns

Graphics 640 × 480 dots

Aspect Ratio 1.000 : 1.000

Gray Scale 16 levels (64 levels only for mode 13)

Keyboard

Number of keys 84 keys for U.S. keyboard-layout, 86 keys for others

Special Key**Combination**

Following combinations are supported by ROM-BIOS.

Fn + F1: When the LCD screen mode is bi-level, the screen reverses.

When the LCD screen mode is 16-level, the screen changes in 6 steps.

Fn + Shift + F1: The steps are changed in reverse order from when pressing Fn+F1.

Fn + F2: Changes display device. (LCD/CRT/LCD & CRT simultaneously)

Fn + F3: Changes CPU clock speed. (High/Low)

Fn + F4: Turns the hard disk drive motor down.

Fn + F5: Turns speaker On/Off.

Fn + F6: Backlight brightness control. (High/Middle/Low)

Fn + F7: Turns LCD and backlight Off.

Pressing any key turns them back On.

Fn + F8: Turns serial interface and MODEM Off.

Fn + F9: Battery pack selection.

Fn + F10: Turns system to full standby.

Fn + F11: Turns text expansion On/Off on LCD in text mode.

Fn + F12: Changes Bi-level/Gray shades on LCD in text mode.

Fn + Tenkeypad: Tenkeypad.

Fn + Keypad: Lock tenkeypad.

Fn + PrScr/SysRq: Remaining charge of the battery pack 1 is displayed by the four indicators Caps LK (*Shift LK), Num LK, Scr LK, and Keypad.

Fn + Pause: Remaining charge of the battery pack 2 is displayed by the four indicators Caps LK (*Shift LK), Num LK, Scr LK, and Keypad.

(* for France and Belgium)

I/O: Ports

Parallel Port DB-25 (female)

Serial Port DB-9 (male)

VGA Monitor Port DB-15 (female)

External Mouse/External Keyboard (Mini-DIN 6-pin)

Expansion Bus Port 200-pin (female)

Expansion RAM Connector (50-pin)

MODEM Connector (18-pin)

Connectors**Control**

Power Switch On/Off

LCD Contrast Control

Reset Button

Resume Battery

Type Rechargeable Vanadium Lithium battery

Nominal Voltage 3 Volts

Nominal Capacity 50 mAH (5 hour rating)

Duty Cycle Average 1000 times

Weight 0.008 lbs × 2 (3.7g × 2)

LED Indicators

Batt1/Batt2
Power/Speed

Refer to page 1-6.
Refer to page 1-7.

Caps (Shift)* Lock
Scroll Lock
Num Lock
Key Pad
HDD
FDD

<u>LED Color</u>	<u>On</u>	<u>Off</u>
Green	Caps (Shift)* On	Caps (Shift)* Off
Green	Scroll lock On	Scroll lock Off
Green	Numeric key On	Numeric key Off
Green	Keypad is enabled	Keypad is disabled
Green	HDD is operating	HDD is not operating
Orange	FDD is operating	FDD is not operating

(* For France and Belgium)

Warning Beep

Type
Battery Low Voltage

Speaker
When output voltage of battery becomes low, system begins beeping every 20 seconds during the last 2.5 minutes of battery life.
Then system goes into the suspend/resume mode automatically, when resuming function is enabled.

Resuming Function

- Backup time with fully charged Main battery pack (Ni-MH) and Second battery pack:
Typ. 7 days
Typ. 6 days (with 4 MB RAM Board)
Typ. 5 days (with 8 MB RAM Board)
- Backup time with fully charged Main battery pack (Ni-MH) or Second battery pack:
Typ. 14 days
Typ. 12 days (with 4 MB RAM Board)
Typ. 10 days (with 8 MB RAM Board)
- Backup time with fully charged resume (Vanadium Lithium) battery:
Typ. 30 minutes
Typ. 30 minutes (with 4 MB RAM Board)
Typ. 30 minutes (with 8 MB RAM Board)

Input Voltage

15 V

Current Consumption

1.45 A (Max.)

Temperature**Operating**

41°F to 95°F (5°C to 35°C)

Storage

-4°F to 140°F (-20°C to 60°C)

Humidity**Operating**

Max. 80%

Storage

Max. 80%

Weight

5.1 lbs (2.3 kg)

Dimensions**(W × H × D)**

11.7 × 1.25 × 9.3 inch (297 × 31.8 × 237 mm)

Software**Operating System**

MS-DOS Ver. 5.0

EMS Driver

LIM Ver. 4.0 compatible included in MS-DOS disk

Application Software

QBASIC, SuperStor, Windows Version 3.x

FDD PACK**Floppy Disk**

3 1/2" double sided, high density, double tracked

Recording Capacity

1.44 M/720K bytes

Dimensions**(W × H × D)**

4.0 × 0.63 × 5.38 inch (101.7 × 15.9 × 136.6 mm)

Weight

127 lbs (280 g)

AC Adapter

Primary	100V ~ 240VAC
Secondary	
Voltage	15V DC at 1.33A 13.5V DC at 1.45A
Current Capacity	1.45A (Max.)
Operating Temperature	41°F to 95°F (5°C to 35°C)
Weight	0.72 lbs (0.33 kg)
Dimensions (W × H × D)	3.0 × 1.0 × 5.5 inch (75 × 25.4 × 140 mm)

Battery Pack

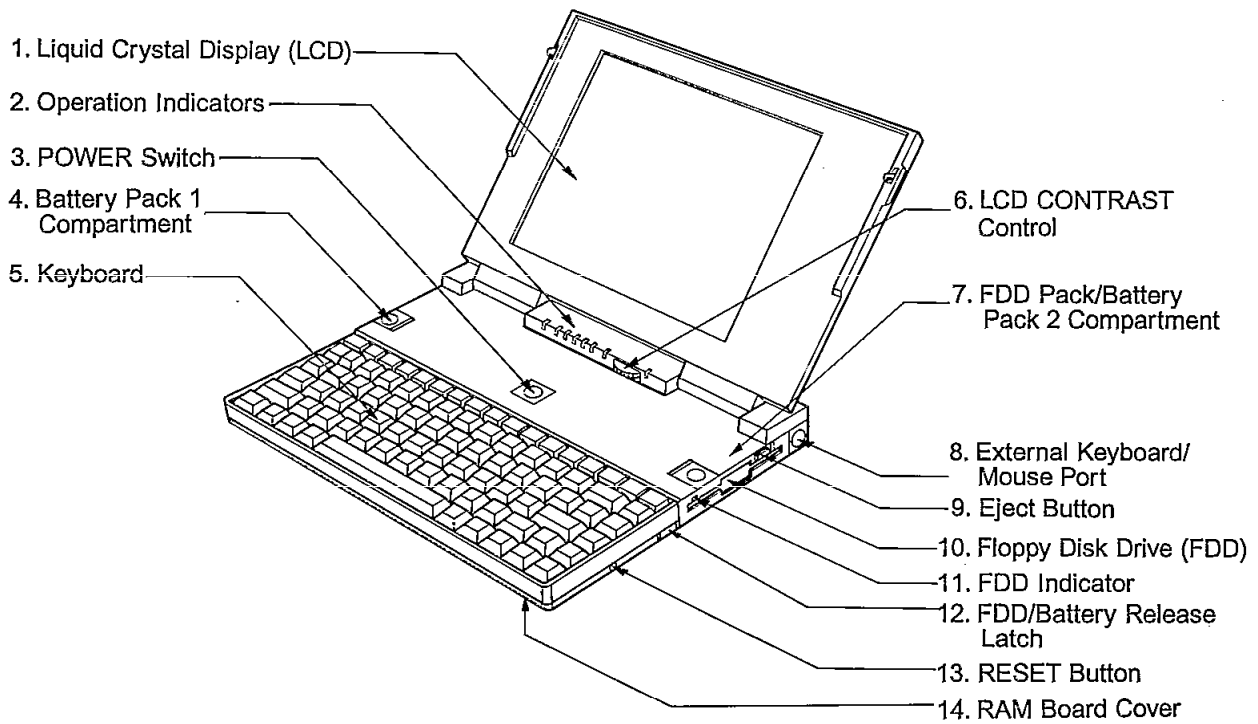
Type	Rechargeable Ni-MH (Nickel-Metal Hydrid) battery
Capacity	1.45AH (5 hour rate) (Ave.), 9.6V (Ave.)
Operating Time	
One Battery Pack	Approx. 1.5 hours (High Performance Mode) Approx. 2.0 hours (Default Mode) Approx. 3.0 hours (Long Life Mode) Up to approximately 5.5 hours (Super Long Life Mode)
Two Battery Packs	Allows each mode to operate for twice the length of time as when using one battery pack.
Charging Time	Approx. 2 hours (Power On: at normal operation) (*Notes) Approx. 75 min (Power Off)
Duty Cycle	Average 500 times
Dimensions (W × H × D)	5.6 × 0.9 × 2.0 inch (143.3 × 21.8 × 51 mm)
Weight	0.63 lbs (0.286 kg)

***Notes**

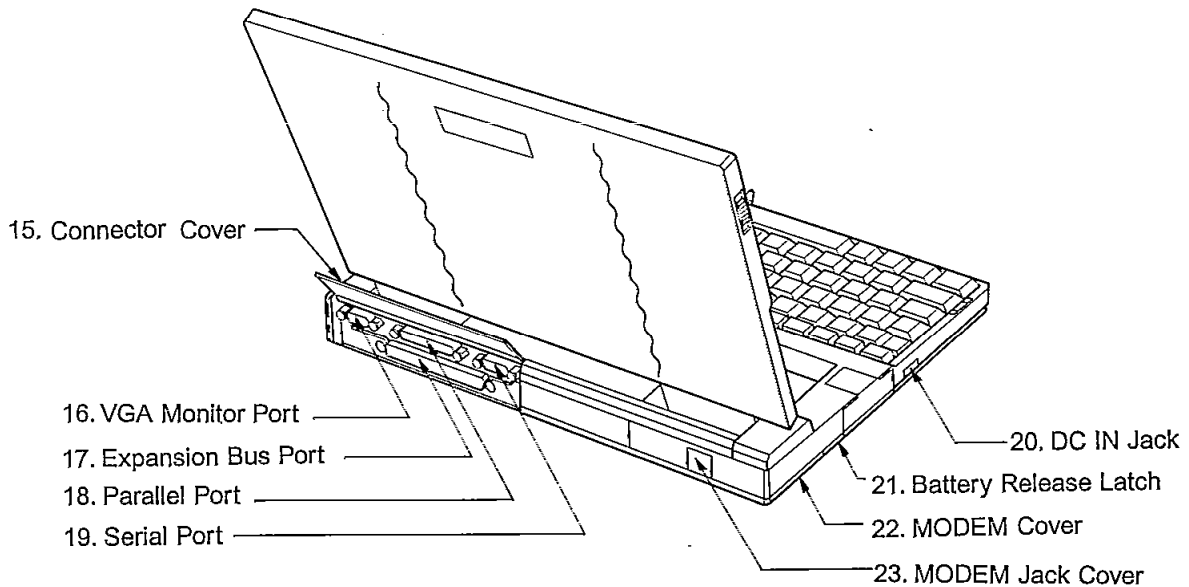
Power consuming condition (such as heavy FDD/HDD access) may cause longer charging time.
Quick charging is done within approx. 41°F to 95°F (5°C to 35°C).
Outside of this range, no charging is done to prevent battery damage.

1.3 Location of Controls and Components

■ Front View



■ Rear View



1. Liquid Crystal Display (LCD)

If you close the display panel while the computer is on, the LCD and its backlight are switched off to prevent heat damage to the LCD. When the display panel is opened again, the LCD and backlight are switched on, and the original screen is displayed. Don't open or close the LCD panel while running communications software (e.g. Lap Link).

2. Operation Indicators**HDD Indicator**

This indicator lights when the computer reads from or writes to the hard disk.

**Cp Lk (Shift Lk*)/Num Lk/
Scr Lk/Key Pad indicators**

Indicate the locked state of each key when illuminated.

(*For France and Belgium)

In addition, the remaining battery charge is displayed based on the illumination of these indicators.

**BATTERY Indicators
(BATT1/BATT2)**

Two indicators display the charging/usage status of the battery pack(s).

When the AC adaptor is connected:

BATTERY Indicator	Battery Pack Status
Lit orange	Charging
Lit green	Fully charged
Blinks orange for 5 seconds following attachment of the AC adaptor.	<ul style="list-style-type: none"> The battery voltage is too low (9V or less). The temperature is outside the range of approximately 41°F to 95°F (5°C to 35°C). Within the allowable temperature range, leaving the AC adaptor connected, continue recharging.
Blinks green for 5 seconds following attachment of the AC adaptor.	The battery pack is not installed.
Blinking red (permanently)	Trouble has occurred in the battery, charging controller, etc.

When the AC adaptor is not connected:

BATTERY Indicator	Battery Pack Status
BATTERY indicator not lit	The AC adaptor is not attached and the computer is not turned on.
Lit green	Fully charged
Lit orange	Not fully charged. (The indicator changes from green to orange when 10% of a fully charged battery is expended.)
Lit red	Low battery power. The battery supply will last approximately 10 minutes after the BATTERY indicator glows red. The beeper sounds every 20 seconds during the last 2.5 minutes. Recharge!*
Blinks green for 5 seconds after turning on the computer.	The battery pack is not installed.
Blinking red (permanently)	Trouble has occurred in the battery, charging controller, etc.

* If recharging is not possible at this time, immediately save any open files on your disk or switch to a spare battery pack. To switch to a spare battery pack, enable the resume function, turn the power off and replace the battery pack.

POWER Indicator

Indicates when the computer is switched on and the CPU speed.

POWER indicator status	CPU Speed
Lit green	Fast (25 MHz)
Lit orange	Slow (8 MHz)

3. **POWER Switch**
4. **Battery Pack 1 Compartment**
5. **Keyboard**
6. **LCD CONTRAST Control**
7. **FDD Pack/Battery Pack 2 Compartment**
8. **External Keyboard/ Mouse Port**
9. **Eject Button**
10. **Floppy Disk Drive**
11. **FDD Indicator**
12. **FDD/Battery Release Latch**
13. **RESET Button**
14. **RAM Board Cover**
15. **Connector Cover**
16. **VGA Monitor Port**
17. **Expansion Bus Port**
18. **Parallel Port**
19. **Serial Port**
20. **DC-IN Jack**
21. **Battery Release Latch**
22. **MODEM Cover**
23. **MODEM Jack Cover**

Press this switch to turn the computer on/off.

It is recommended that battery pack 1 compartment is used if only one battery pack is installed.

The keyboard features IBM 101/102 Keys compatible 84/86 keys and special function keys.

Adjusts the contrast on the LCD.

It is possible to remove this FDD pack. After turning off the power and disconnecting the AC adaptor, if the optional battery pack is attached in the space from which the FDD pack was removed, the computer can be operated using two battery packs.

Note:

The FDD pack should not be removed except when attaching the optional battery pack.

An IBM PS/2 type external keyboard or mouse can be connected to this port. Press this button to remove the floppy disk from the floppy disk drive.

This indicator lights when the computer reads from or writes to the floppy disk. To remove the FDD pack or optional battery pack, pull it out while sliding the FDD/battery release latch.

Use this button when releasing resume function or if there's no other way to restart the computer.

Use a narrow object, such as the tip of a ball-point pen to push the button.

Caution:

Do not use a pencil to push the reset button. Pencil lead can break off inside the computer and damage the computer's circuitry.

Open in order to insert or remove a RAM board.

Open this up to access the back of the computer.

When using an external VGA monitor, connect it to this port with a monitor cable.

Used to connect the optional docking unit, which is used for installing expansion boards.

Used to connect a parallel device such as a printer.

Used to connect a serial device such as a serial mouse or external MODEM.

Connect the DC plug of the supplied AC adaptor.

While sliding the battery release latch, pull out the battery pack.

Remove this cover when installing a MODEM.

Caution:

The hard disk is exposed when the MODEM cover is removed.

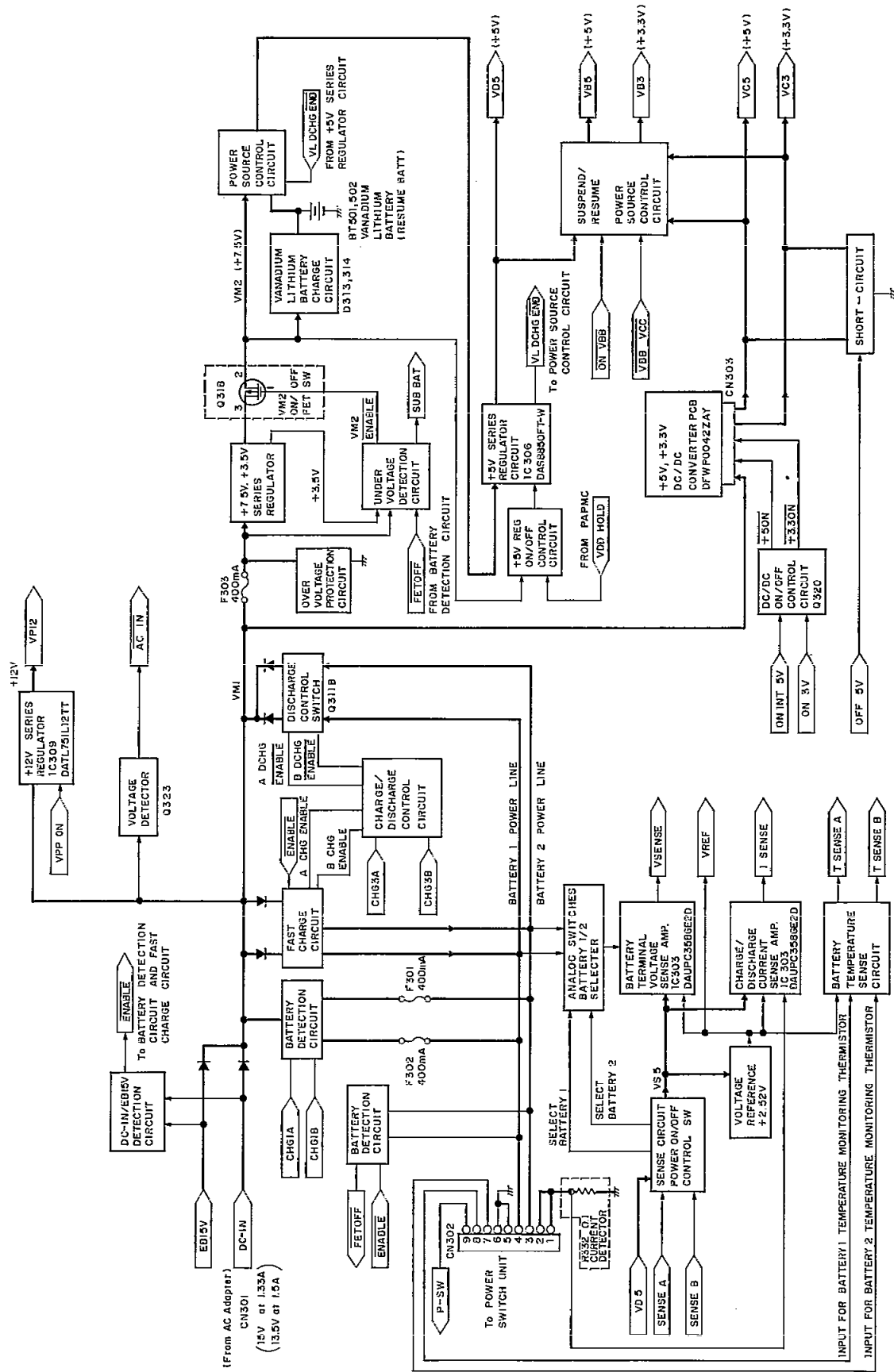
For removal of HDD, refer 4. **Disassembly/Reassembly**.

Remove this cover only when connecting an internal MODEM card to the computer.

1.4 Block Diagrams

● Power Logic Diagram

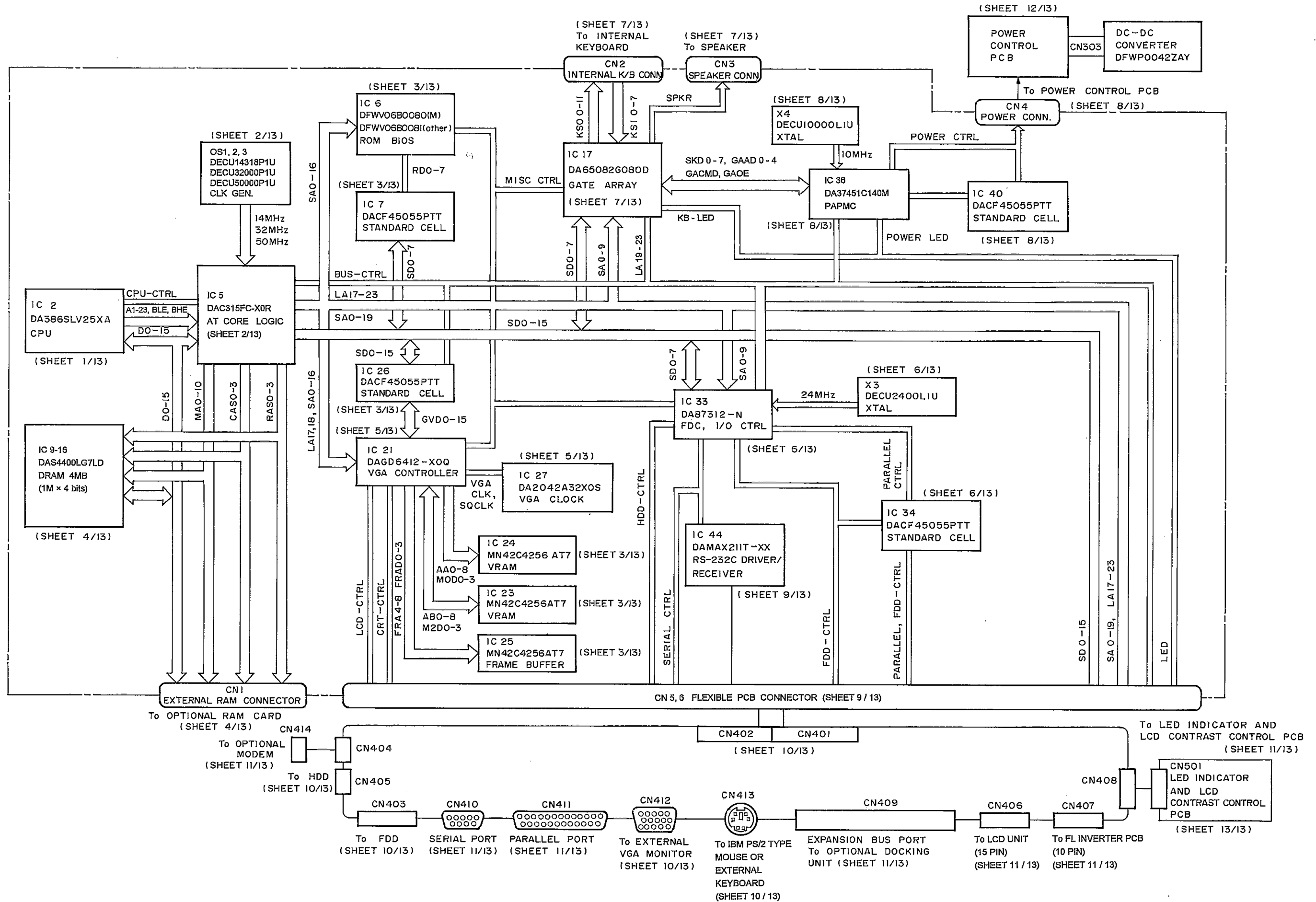
● Power Logic Diagram



Notes:

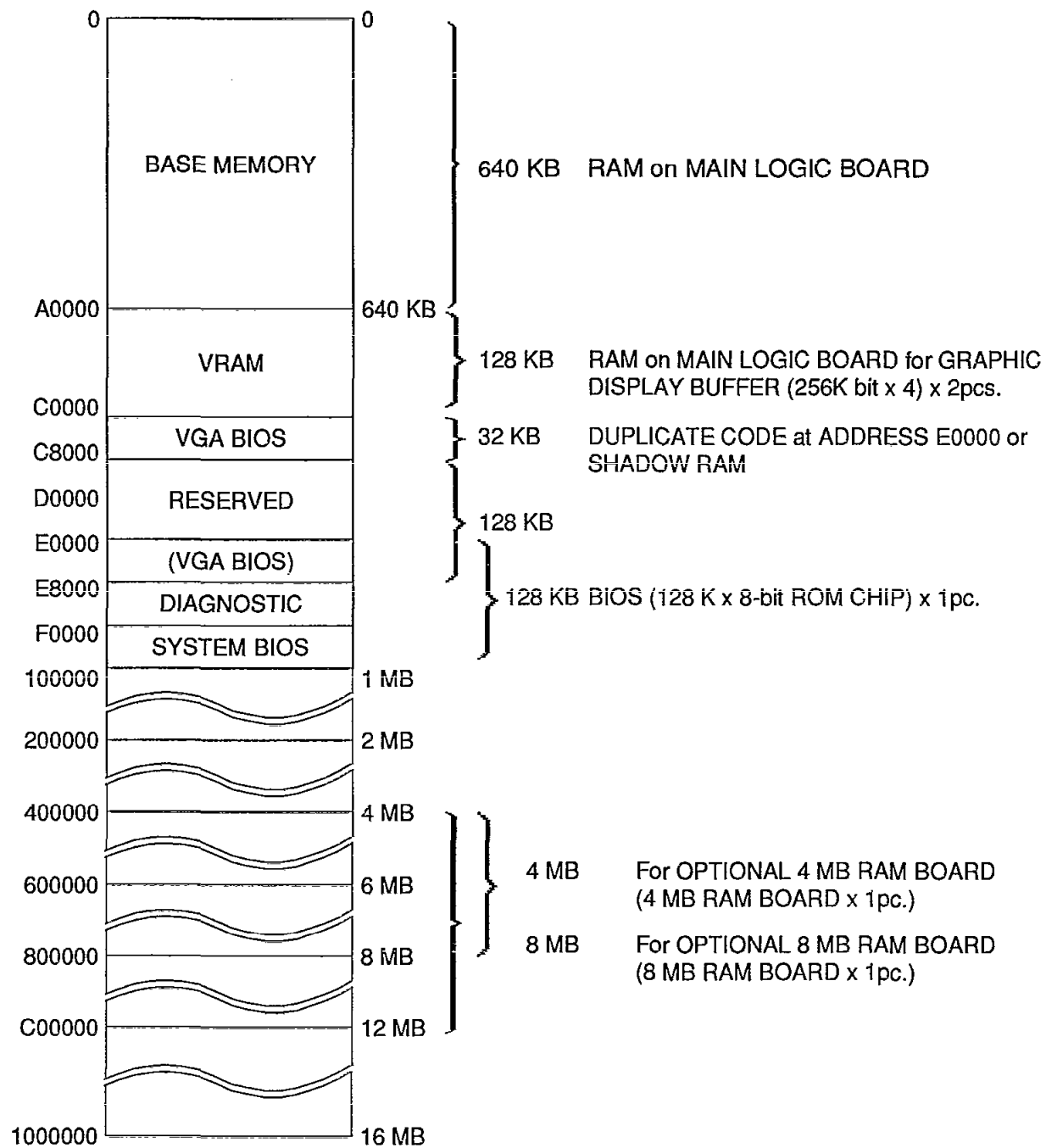
- — Power Lines
- — Control Lines
- Refer to Sheet 12/13 for schematic diagram

● System Logic Diagram



1.5 System Memory Map

The Main Logic Board supports 128 K bytes of ROM area using 1 piece 128 K x 8-bit ROM, and 4 M bytes of RAM area using 8 pieces of 1 M x 4-bit RAM.
The 4 MB of RAM area is expandable up to 12 M bytes using an optional RAM Board in the RAM Slot.



1.6 I/O Address Map

1) System

Address	Function	IC No.
0H	DMA Channel 0 base and current address	IC5
1H	DMA Channel 0 base and word count	IC5
2H	DMA Channel 1 base current address	IC5
3H	DMA Channel 1 base and word count	IC5
4H	DMA Channel 2 base and current address	IC5
5H	DMA Channel 2 base and word count	IC5
6H	DMA Channel 3 base and current address	IC5
7H	DMA Channel 3 base and word count	IC5
8H	Command register, DMA controller 1	IC5
9H	Request Register, DMA controller 1	IC5
0AH	Mask Register, DMA controller 1	IC5
0BH	Mode Register, DMA controller 1	IC5
0CH	Clear byte pointer, DMA controller 1	IC5
0DH	Master Clear, DMA controller 1	IC5
0DH	Temporary Register, DMA controller 1	IC5
0FH	Write all Mask Register Bits, DMA controller 1	IC5
0EH	Clear Mask Register, DMA controller 1	IC5
20H	Initialization Control Word ICW1, Interrupt Controller 1	IC5
21H	Initialization Control Word ICW2, Interrupt Controller 1	IC5
21H	Initialization Control Word ICW3, (Master Device) Interrupt Controller 1	IC5
21H	Initialization Control Word ICW3, (Slave Device) Interrupt Controller 1	IC5
21H	Initialization Control Word ICW4, Interrupt Controller 1	IC5
21H	Operation Control Word OCW1, Interrupt Controller 1	IC5
20H	Operation Control Word OCW2, Interrupt Controller 1	IC5
20H	Operation Control Word OCW3, Interrupt Controller 1	IC5
40H	Timer Counter 1 Channel 0 count	IC5
41H	Timer Counter 1 Channel 1 count	IC5
42H	Timer Counter 1 Channel 2 count	IC5
43H	Timer Counter 1 Command Register	IC5
48H	Timer Counter 2 Channel 0 count	IC5
4AH	Timer Counter 2 Channel 2 count	IC5
4BH	Timer Counter 2 Command Register	IC5
60H	Keyboard Controller data I/O input buffer	IC5
60H	Keyboard Controller data I/O output buffer	IC5
61H	Port 61	IC5
61H	Port 61	IC5
64H	Keyboard Controller Command	IC5
64H	Keyboard Controller Status	IC5
70H	CMOS RAM Address port and NMI Mask	IC5
71H	RTC CMOS RAM data port	IC5
80H	Reserved	IC5
81H	DMA Memory Address Mapper Page Register Channel 2	IC5
82H	DMA Memory Address Mapper Page Register Channel 3	IC5
83H	DMA Memory Address Mapper Page Register Channel 1	IC5
84H	Reserved	IC5
85H	Reserved	IC5
86H	Reserved	IC5
87H	DMA Memory Address Mapper Page Register Channel 0	IC5
88H	Reserved	IC5
89H	DMA Memory Address Mapper Page Register Channel 6	IC5
8AH	DMA Memory Address Mapper Page Register Channel 7	IC5
8BH	DMA Memory Address Mapper Page Register Channel 5	IC5

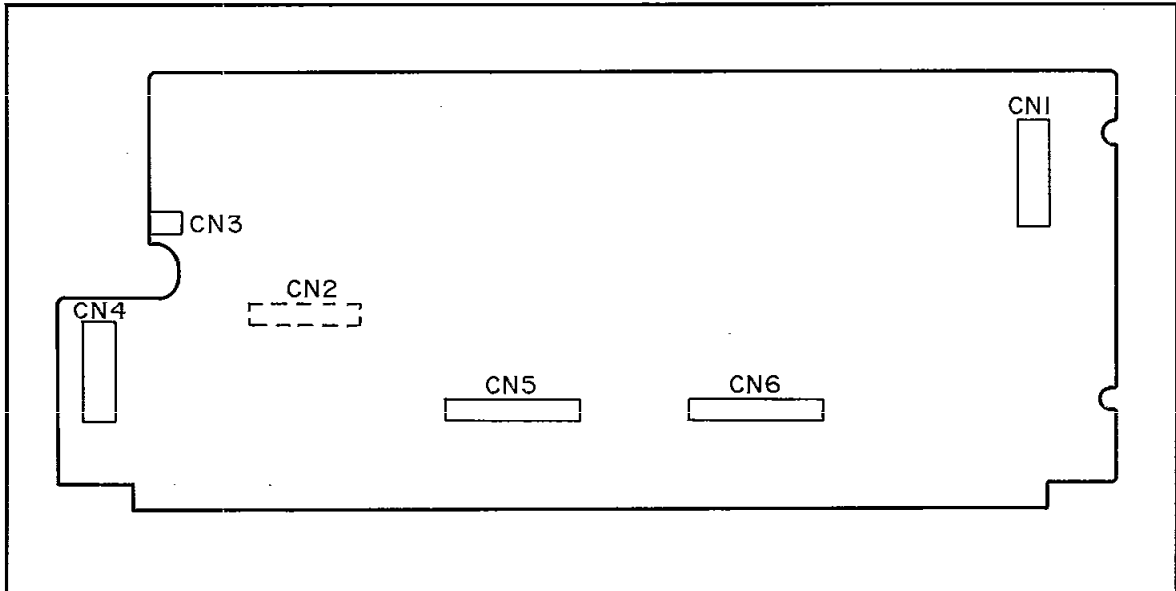
Address	Function	IC No.
8CH	Reserved	IC5
8DH	Reserved	IC5
8EH	Reserved	IC5
8FH	DMA Memory Address Mapper Page Register - Refresh	IC5
92H	Port 92	IC5
0A0H	Initialization Control Word ICW1, Interrupt Controller 2	IC5
0A1H	Initialization Control Word ICW2, Interrupt Controller 2	IC5
0A1H	Initialization Control Word ICW3, (Master Device) Interrupt Controller 2	IC5
0A1H	Initialization Control Word ICW3, (Slave Device) Interrupt Controller 2	IC5
0A1H	Initialization Control Word ICW4, Interrupt Controller 2	IC5
0A1H	Operation Control Word OCW1, Interrupt Controller 2	IC5
0A0H	Operation Control Word OCW2, Interrupt Controller 2	IC5
0A0H	Operation Control Word OCW3, Interrupt Controller 2	IC5
0C0H	DMA Channel 4 base and current address	IC5
0C2H	DMA Channel 4 base and current word count	IC5
0C4H	DMA Channel 5 base and current address	IC5
0C6H	DMA Channel 5 base and current word count	IC5
0C8H	DMA Channel 6 base and current address	IC5
0CAH	DMA Channel 6 base and current word count	IC5
0CCH	DMA Channel 7 base and current address	IC5
0CEH	DMA Channel 7 base and current word count	IC5
0D0H	Command register, DMA controller 2	IC5
0D0H	Status Register, DMA controller 2	IC5
0D2H	Request Register, DMA controller 2	IC5
0D4H	Mask Register, DMA controller 2	IC5
0D6H	Mode Register, DMA controller 2	IC5
0D8H	Clear byte pointer, DMA controller	IC5
0DAH	Master Clear, DMA controller 2	IC5
0DAH	Temporary Register, DMA controller 2	IC5
0DCH	Clear Mask Register, DMA controller 2	IC5
0DEH	Write all Mask Register Bits, DMA controller 2	IC5
0ECH	VL82C315 Configuration Index Register	IC5
0EDH	VL82C315 Configuration Data Port Register	IC5
0EEH	Special Feature Set Fast A20 Gate	IC5
0EFH	Special Feature Set Fast CPU Reset	IC5
0F4H	Slow CPU Register	IC5
0F5H	Fast CPU Register	IC5
0F9H	Special Feature Set Disable	IC5
0FBH	Special Feature Set Enable	IC5

2) Peripherals

Address	Function	IC No.
278H	LPT2 Data Port	IC33
279H	LPT2 Status Port	IC33
27AH	LPT2 Control	IC33
27BH-27FH	Automatic data strobe registers	IC33
2F8H	Serial Controller Port B Receiver Buffer	IC33
2F8H	Serial Controller Port B Transmit holding Buffer	IC33
2F8H	Serial Controller Port B Divisor Latch Least Significant Byte	IC33
2F9H	Serial Controller Port B Divisor Latch Most Significant Byte	IC33

Address	Function	IC No.
2F9H	Serial Controller Port B Interrupt Enable Register	IC33
2FAH	Serial Controller Port B Interrupt ID Register	IC33
2FBH	Serial Controller Port B Line Control Register	IC33
2FCH	Serial Controller Port B MODEM Control Register	IC33
2FDH	Serial Controller Port B Line Status Register	IC33
2FEH	Serial Controller Port B MODEM Status Register	IC33
2FFH	Serial Controller Port B Scratch Register	IC33
378H	LPT1 Data Port	IC33
379H	LPT1 Status	IC33
37AH	LPT1 Control	IC33
37BH-37FH	Automatic data strobe registers	IC33
3B4H	CRTC Index MP	IC21
3B5H	CRTC Data MP	IC21
3BCH	LPT3 Data Port	IC33
3BDH	LPT3 Status	IC33
3BEH	LPT3 Control	IC33
3C0H	Attribute Controller Index	IC21
3C1H	Attribute Controller Data in VGA, Attribute Controller Data in EGA	IC21
3C2H	Miscellaneous Output, Feature	IC21
3C3H	Motherboard Sleep Address	IC21
3C4H	Sequencer	IC21
3C5H	Sequencer	IC21
3C6H	RAMDAC Pixel Mask	IC21
3C7H	RAMDAC Address Register Read Mode, RAMDAC Status Register	IC21
3C8H	RAMDAC Address Register Write Mode	IC21
3C9H	RAMDAC Data	IC21
3CAH	Feature Control	IC21
3CCH	Miscellaneous Output	IC21
3CEH	Graphic Controller and Extensions Index	IC21
3CFH	Graphic Controller and Extensions Data	IC21
3D4H	CRTC Index	IC21
3D5H	CRTC Data	IC21
3DAH	Feature Control, Display Status	IC21
3F0H	Floppy Disk Controller Port Status Register A	IC33
3F1H	Floppy Disk Controller Port Status Register B	IC33
3F2H	Floppy Disk Controller Digital Output Register	IC33
3F4H	Floppy Disk Controller Main Status Register	IC33
3F5H	Floppy Disk Controller Data Register	IC33
3F6H	Fixed Disk Register	IC33
3F7H	Floppy Disk Controller Digital Input Register	IC33
3F7H	Floppy Disk Controller Control Register	IC33
3F7H	Fixed Disk Decode	IC33
3F8H	Serial Controller Port A Receiver Buffer	IC33
3F8H	Serial Controller Port A Transmit holding Buffer	IC33
3F8H	Serial Controller Port A Divisor Latch Least Significant Byte	IC33
3F9H	Serial Controller Port A Divisor Latch Most Significant Byte	IC33
3F9H	Serial Controller Port A Interrupt Enable Register	IC33
3FAH	Serial Controller Port A Interrupt ID Register	IC33
3FBH	Serial Controller Port A Line Control Register	IC33
3FCH	Serial Controller Port A MODEM Control Register	IC33
3FDH	Serial Controller Port A Line Status Register	IC33
3FEH	Serial Controller Port A MODEM Status Register	IC33
3FFH	Serial Controller Port A Scratch Register	IC33
46E8	AT Adapter Sleep Address	IC21

1.7 Pin Configuration



MainPCB

CN1: Optional RAM Card Connector (50-pin)

Pin No.	Signal Name/Description	Direction	Pin No.	Signal Name/Description	Direction
1	VBB (+3V)	—	26	VBB (+3V)	—
2	D0	In/Out	27	D8	In/Out
3	D1	In/Out	28	D9	In/Out
4	D2	In/Out	29	D10	In/Out
5	D3	In/Out	30	D11	In/Out
6	GND	—	31	GND	—
7	D4	In/Out	32	D12	In/Out
8	D5	In/Out	33	D13	In/Out
9	D6	In/Out	34	D14	In/Out
10	D7	In/Out	35	D15	In/Out
11	GND	—	36	GND	—
12	BCAS0#	Out	37	BCAS1#	Out
13	BCAS2#	Out	38	BCAS3#	Out
14	VBB (+3V)	—	39	N.C.	—
15	BRAMW#	Out	40	BRAMW#	Out
16	BRAS0#	Out	41	BRAS1#	Out
17	BRAS2#	Out	42	BRAS3#	Out
18	GND	—	43	GND	—
19	BMA0	Out	44	BMA1	Out
20	BMA2	Out	45	BMA3	Out
21	BMA4	Out	46	BMA5	Out
22	BMA6	Out	47	BMA7	Out
23	BMA8	Out	48	BMA9	Out
24	BMA10	Out	49	RAMOE#	In
25	VBB (+3V)	—	50	VBB (+3V)	—

CN4: Power Control Connector (50-pin to CN304)

Pin No.	Signal Name/Description	Direction	Pin No.	Signal Name/Description	Direction
1	VCC (+5V)	—	26	EB15V	—
2	VCC (+5V)	—	27	EB15V	—
3	VCC (+5V)	—	28	GND	—
4	GND	—	29	VCC (+3V)	—
5	VBB (+3V)	—	30	VCC (+3V)	—
6	VBB (+3V)	—	31	GND	—
7	GND	—	32	ON3V	In
8	VBB (+5V)	—	33	ONINT5V	In
9	VBB (+5V)	—	34	OFF5V	In
10	ONVBB#	Out	35	VBBVCC#	In
11	VDD (+5V)	—	36	CHG3B	In
12	SENSB	Out	37	CHG3A	In
13	GND	—	38	GND	—
14	VPPON	Out	39	VSUB2 (+3.5V)	—
15	ISENSE	In	40	GND	—
16	GND	—	41	GND	—
17	VSENSE	In	42	VREF	Out
18	SENSA	Out	43	CHG1A	In
19	TSENSEA	In	44	CHG1B	In
20	GND	—	45	GND	—
21	P-SW	In	46	ACIN#	In
22	VDD-HOLD	Out	47	TSENSEB	Out
23	VSUB1 (+7V)	—	48	VPP (+12V)	—
24	VFL	—	49	SUBBAT	In
25	VFL	—	50	VM2 (+7.5V)	—

CN2: Internal Keyboard Connector (20-pin)

Pin No.	Signal Name/Description	Direction	Pin No.	Signal Name/Description	Direction
1	KSO11	Out	11	KSI6	In
2	KSO4	Out	12	KSI7	In
3	KSO5	Out	13	KSI1	In
4	KSO6	Out	14	KSO10	Out
5	KSO0	Out	15	KSO7	Out
6	KSI0	In	16	KSO9	Out
7	KSI3	In	17	KSO8	Out
8	KSI2	In	18	KSO3	Out
9	KSI4	In	19	KSO2	Out
10	KSI5	In	20	KSO1	Out

CN3: Speaker Connector (2-pin)

Pin No.	Signal Name/Description	Direction
1	BEEPER	Out
2	GND	—

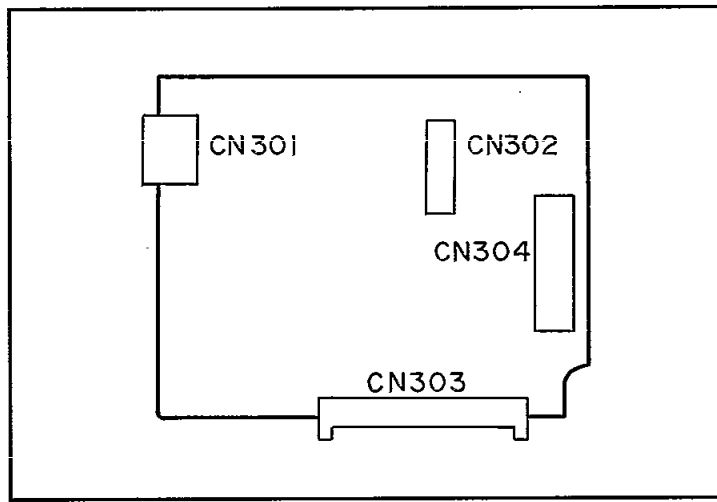
Note: "# " denotes low active.

CN5: To Flexible PCB Connector (120-pin to CN402)

Pin No.	Signal Name/Description	Direction	Pin No.	Signal Name/Description	Direction
1	GND	—	61	GND	—
2	GND	—	62	GND	—
3	M-CTS#	In	63	M-DSR#	In
4	M-DCD#	In	64	DWNMOD	Out
5	M-RI#	In	65	M-SIN	In
6	MODEMSP#	In	66	M-RTS#	Out
7	M-DTR#	In	67	M-SOUT	Out
8	VPP (+12V)	—	68	LCD-CP1	Out
9	LCD-S	Out	69	LCD-VDD (+5V)	—
10	LCD-CP2	Out	70	LCD-DL1	Out
11	LCD-DL0	Out	71	LCD-DL3	Out
12	LCD-DL2	Out	72	LCD-DU1	Out
13	LCD-DU0	Out	73	LCD-DU3	Out
14	LCD-DU2	Out	74	FLON#	Out
15	ON-22V	Out	75	GND	—
16	GND	—	76	VFL	—
17	VEE (-24V)	—	77	VFL	—
18	VLCD	—	78	GND	—
19	GND	—	79	BSA2	Out
20	FLCONT	Out	80	BSA0	Out
21	RTHP	Out	81	HD5LOGIC (+5V)	—
22	BSA1	Out	82	HD5VMT (+5V)	—
23	SYSRST#	Out	83	S-CN1	In
24	HDACTIVE#	In	84	S-CN3	Out
25	S-CN2	In	85	S-CN6	In
26	S-CN4	Out	86	S-CN8	In
27	S-CN7	Out	87	FD5VFIL (+5V)	—
28	S-CN9	In	88	FD5VFIL (+5V)	—
29	RING#	In	89	IN-MO#	Out
30	ONEXT5V	Out	90	1.6M/2M#	Out
31	RTCIRQ#	In	91	BALE	Out
32	IOCHK#	In	92	DRQ7	In
33	RTCWR#	Out	93	DRQ6	In
34	SMEMR#	Out	94	DRQ5	In
35	RTCRD#	Out	95	DRQ0	In
36	SMEMW#	Out	96	IRQ14	In
37	RTCALE	Out	97	IRQ12	In
38	MEMW#	In/Out	98	IRQ10	In
39	WS0#	In	99	DACK2#	Out
40	MEMR#	In/Out	100	IRQ4	In
41	IOCHRDY	In	101	IRQ8	In
42	REFRESH#	In/Out	102	DRQ3	In
43	SYSCLK	Out	103	DRQ1	In
44	LA23	In/Out	104	HCS0#	Out
45	LA17	In/Out	105	ID7	In/Out
46	LA22	In/Out	106	ID4	In/Out
47	LA18	In/Out	107	IRQ9	In
48	LA21	In/Out	108	MASTER#	In
49	LA20	In/Out	109	DACK7#	Out
50	LA19	In/Out	110	DACK6#	Out
51	SA9	In/Out	111	DACK5#	Out
52	SA19	Out	112	DACK0#	Out
53	SA8	In/Out	113	IRQ15	In
54	SA18	Out	114	IRQ11	In
55	SA7	In/Out	115	IRQ3	In
56	SA17	Out	116	IRQ5	In
57	SA6	In/Out	117	DACK3#	Out
58	SA16	In/Out	118	DACK1#	Out
59	SA5	In/Out	119	IRQ7	In
60	SA15	In/Out	120	HCS1#	Out

CN6: To Flexible PCB Connector (120-pin to CN401)

Pin No.	Signal Name/Description	Direction	Pin No.	Signal Name/Description	Direction
1	SA4	In/Out	61	JOR#	In/Out
2	SA14	In/Out	62	LOW#	In/Out
3	SA3	In/Out	63	RSTDRV	In/Out
4	SA13	In/Out	64	AEN	Out
5	SA2	In/Out	65	SD1	In/Out
6	SA12	In/Out	66	SD3	In/Out
7	SA1	In/Out	67	SD5	In/Out
8	SA10	In/Out	68	SD7	In/Out
9	SA0	In/Out	69	SD9	In/Out
10	SA11	In/Out	70	SD11	In/Out
11	LPTD5	In/Out	71	SD13	In/Out
12	LPTD6	In/Out	72	SD15	In/Out
13	LPTD0	In/Out	73	EXTKCLK	In/Out
14	EX-DS#	Out	74	EXTKDATA	In/Out
15	LPTD7	In/Out	75	EXTMCLK	In/Out
16	RDDATA#	In	76	EXTMDATA	In/Out
17	LPTD1	In/Out	77	KB5VFUSE (+5V)	—
18	INDEX#	In	78	SD14	In/Out
19	LPTD4	In/Out	79	SD12	In/Out
20	TRK0#	In	80	SD10	In/Out
21	LPTD2	In/Out	81	SD8	In/Out
22	FDWP#	In	82	SD6	In/Out
23	LPTD3	In/Out	83	SD4	In/Out
24	DSKCHG#	In	84	SD2	In/Out
25	LPTSTRO#	In	85	SD0	In/Out
26	RWC#	Out	86	IOCS16#	In
27	LPTAFD#	Out	87	CRT-BLUE	Out
28	ROMDIS#	In	88	CRT-RED	Out
29	LPTACK#	In/Out	89	CRT-GREEN	Out
30	EX-MO#	Out	90	CRT-VSYNC	Out
31	LPTERR#	In/Out	91	CRT-HSYNC	Out
32	HEAD#	Out	92	MID0	In
33	LPTBUSY	In/Out	93	MID1	In
34	WRDATA#	Out	94	MID2	In
35	LPTINIT#	Out	95	CRT-BGND	Out
36	FDDIR#	Out	96	CRT-RGND	Out
37	FDWE#	Out	97	CRT-GGND	Out
38	LPTPE#	In/Out	98	EXT5V (+5V)	—
39	STEP#	Out	99	EXT5V (+5V)	—
40	LPTSLIN#	Out	100	EXT5V (+5V)	—
41	IN-DS#	Out	101	EXT5V (+5V)	—
42	LPTSLCT	In/Out	102	EXT5V (+5V)	—
43	TC	Out	103	EXT5V (+5V)	—
44	DRQ2	In	104	EXT5V (+5V)	—
45	SBHE#	In/Out	105	EXT5V (+5V)	—
46	MEMCS16#	In	106	DOORSW#	In
47	P-SW	In	107	EXT15V (+15V)	—
48	SUBLDATA	Out	108	EXT15V (+15V)	—
49	SUBLCLK	Out	109	EXT15V (+15V)	—
50	SUBLSYNC	In	110	SETID	Out
51	CAPLED#	Out	111	DOCKING#	In
52	SCRLED#	Out	112	HDDLED#	Out
53	VC3 (+3V)	Out	113	NUMLED#	Out
54	SPDLED	Out	114	PADLED#	Out
55	CHARGEA	Out	115	PWRLED#	Out
56	CHARGE B	Out	116	BATLOWA#	Out
57	VSUB1 (+7V)	—	117	BATLOWB#	Out
58	RTHN	Out	118	VSUB2 (+3.5V)	—
59	GND	—	119	GND	—
60	GND	—	120	GND	—



Power Control PCB

CN301: DC-IN Jack (3-pin)

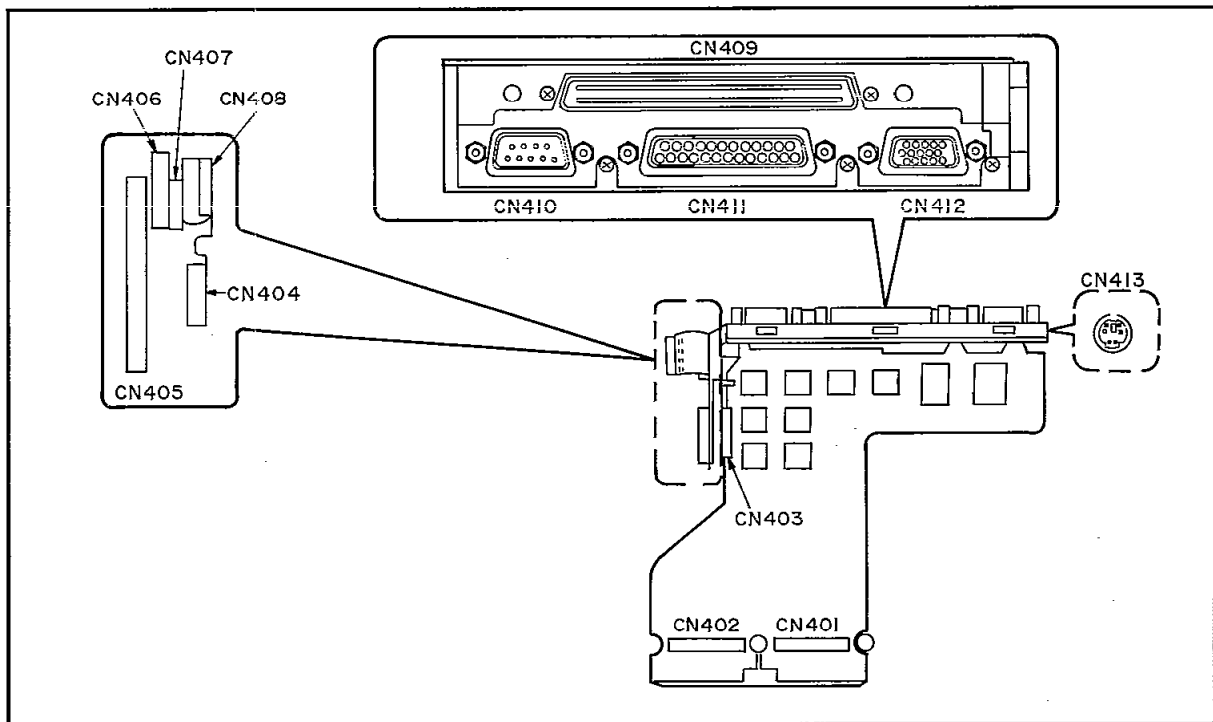
Pin No.	Signal Name/Description	Direction
1	+13.8V	In
2	N.C.	—
3	GND	—

CN302: Power Switch Connector (9-pin)

Pin No.	Signal Name/Description	Direction
1	B-BAT -	—
2	A-BAT -	—
3	B-BAT +	—
4	A-BAT +	—
5	GND	—
6	GND	—
7	B-BAT-TH	In
8	A-BAT-TH	In
9	P-SW	In

CN303: DC-DC Converter Connector (12-pin)

Pin No.	Signal Name/Description	Direction
1	VIN	Out
2	VIN	Out
3	GND	—
4	GND	—
5	+5VON#/OFF	Out
6	+5VON#/OFF	Out
7	+3.3VON#/OFF	Out
8	+3.3VON#/OFF	Out
9	VCC (+3.3V)	—
10	VCC (+3.3V)	—
11	VCC (+5V)	—
12	VCC (+5V)	—



FPC Board

**CN403: FDD Connector
(30-pin)**

Pin No.	Signal Name/ Description	Direction
1	FD5VFIL (+5V)	—
2	INDEX#	In
3	FD5VFIL (+5V)	—
4	IN-DS#	Out
5	FD5VFIL (+5V)	—
6	DISKCHG#	In
7	IN-DS#	Out
8	N.C.	—
9	MEDIA	In
10	IN-MO#	Out
11	RWC#	Out
12	DIR#	Out
13	1.6M/2M	Out
14	STEP	Out
15	GND	—
16	WDATA#	Out
17	GND	—
18	WGATE#	Out
19	GND	—
20	TRK0#	In
21	GND	—
22	WPROTEC#	In
23	GND	—
24	RDATA#	In
25	GND	—
26	HEADSEL#	Out
27	N.C.	—
28	N.C.	—
29	N.C.	—
30	N.C.	—

**CN404: Optional MODEM
Connector (18-pin)**

Pin No.	Signal Name/ Description	Direction
1	CTS	In
2	GND	—
3	DSR	In
4	VCC (+5V)	—
5	RSLD	In
6	SHUTDWN	Out
7	RI	In
8	RXD	In
9	SPKR	In
10	RTS	Out
11	DTR	Out
12	TXD	Out
13	RST	Out
14	GND	—
15	12V (+12V)	—
16	GND	—
17	RING#	In
18	GND	—

CN405: HDD Connector (44-pin)

Pin No.	Signal Name/ Description	Direction	Pin No.	Signal Name/ Description	Direction
1	SYSRST#	Out	23	IOW#	Out
2	GND	—	24	GND	—
3	ID7	In/Out	25	IOR#	Out
4	SD8	In/Out	26	GND	—
5	SD6	In/Out	27	N.C.	—
6	SD9	In/Out	28	N.C.	—
7	SD5	In/Out	29	N.C.	—
8	SD10	In/Out	30	GND	—
9	ID4	In/Out	31	IRQ14	In
10	SD11	In/Out	32	IOCS16#	In
11	SD3	In/Out	33	BSA1	Out
12	SD12	In/Out	34	PDIAG#	In
13	SD2	In/Out	35	BSA0	Out
14	SD13	In/Out	36	BSA2	Out
15	SD1	In/Out	37	HDCS0#	Out
16	SD14	In/Out	38	HDCS1#	Out
17	SD0	In/Out	39	HDACT#	In
18	SD15	In/Out	40	GND	—
19	GND	—	41	HD5VLFIL (+5V)	—
20	N.C.	—	42	HD5VMFIL (+5V)	—
21	N.C.	—	43	GND	—
22	GND	—	44	HD5VLFIL (+5V)	—

**CN406: LCD Connector
(15-pin)**

Pin No.	Signal Name/ Description	Direction
1	LFS	Out
2	LLCLK	Out
3	VDCLK	Out
4	DISP	Out
5	VDD (+5V)	—
6	GND	—
7	VEE (-22V)	—
8	DU0	Out
9	DU1	Out
10	DU2	Out
11	DU3	Out
12	DL0	Out
13	DL1	Out
14	DL2	Out
15	DL3	Out

**CN408: LED Indicator
Connector (22-pin
to CN501)**

Pin No.	Signal Name/ Description	Direction
1	GND	—
2	BRDGBAT1	In
3	BRDGBAT2	In
4	N.C.	—
5	DOORSW#	In
6	ABATLED#	Out
7	ACHGLED#	Out
8	VC3 (+3V)	—
9	HDDLED#	Out
10	CAPLED#	Out
11	NUMLED#	Out
12	SCRLED#	Out
13	PADLED#	Out
14	GND	—
15	SPDLED#	Out
16	PWRLED#	Out
17	THERMISTOR	Out
18	VR-	In
19	BBATLED#	Out
20	BCHGLED#	Out
21	N.C.	—
22	N.C.	—

CN411: Parallel Port (25-pin)

Pin No.	Signal Name/ Description	Direction	For Printer		For External FDD	
			Signal Name/ Description	Direction	Signal Name/ Description	Direction
1	STB#	Out	N.C.	—		
2	PD0	Out	INDEX#	In		
3	PD1	Out	TRK0#	In		
4	PD2	Out	WPRT#	In		
5	PD3	Out	REDT	In		
6	PD4	Out	DRY#/DCG#	In		
7	PD5	Out	N.C.	—		
8	PD6	Out	N.C.	—		
9	PD7	Out	N.C.	—		
10	ACK#	In	DRIVESEL#	Out		
11	BUSY	In	MOTOR ENABLE#	Out		
12	PE	In	WRITE DATA	Out		
13	SLCT	In	WRITE GATE#	Out		
14	AFD#	Out	REDUCED#	Out		
15	ERR#	In	HEAD SEL#	Out		
16	INIT#	Out	DIRECTION#	Out		
17	SLIN#	Out	STEP#	Out		
18	GND	—	GND	—		
19	N.C.	—	N.C.	—		
20	N.C.	—	N.C.	—		
21	N.C.	—	N.C.	—		
22	N.C.	—	N.C.	—		
23	N.C.	—	N.C.	—		
24	GND	—	GND	—		
25	GND	—	GND	—		

**CN407: LCD Connector
(10-pin)**

Pin No.	Signal Name/ Description	Direction
1	DCIN	Out
2	FLON#/OFF	Out
3	FLCONT	Out
4	GND	—
5	LCDON/OFF#	Out
6	VLCD	Out
7	THERMISTOR	Out
8	THERMISTOR	In
9	VEE (-22V)	—
10	GND	—

CN409: Expansion Bus Port (200-pin)

Pin No.	Signal Name/Description	Direction	Pin No.	Signal Name/Description	Direction	Pin No.	Signal Name/Description	Direction	Pin No.	Signal Name/Description	Direction
1	EXT15V (+15V)	—	51	FGREEN	Out	101	DOCKING#	In	151	GND	—
2	EXT15V (+15V)	—	52	FRED	Out	102	SETID1	Out	152	GND	—
3	GND	—	53	FBLUE	Out	103	EXT5VSW	Out	153	SUBLSYNC	In
4	FDTR0#	Out	54	FVSYNC	Out	104	IOCHCK#	In	154	SUBLDATA	Out
5	FTXD0	Out	55	GND	—	105	SMEMR#	Out	155	GND	—
6	FRXD0	In	56	EXT5V (+5V)	—	106	SMEMW#	Out	156	MEMCS16#	In
7	FDCCD0#	In	57	EXT5V (+5V)	—	107	MEMW#	In/Out	157	DRQ2	In
8	GND	—	58	EXT5V (+5V)	—	108	MEMR#	In/Out	158	LPTSLCT	In/Out
9	BALE	Out	59	EXT5V (+5V)	—	109	N.C.	—	159	SLCTIN#	Out
10	DRQ7	In	60	GND	—	110	SYSCLK	Out	160	LPTPE	In/Out
11	DRQ6	In	61	EXTMDATA	In/Out	111	GND	—	161	N.C.	—
12	DRQ5	In	62	FEXTKCLK	In/Out	112	LA17	In/Out	162	LPTINIT#	Out
13	DRQ0	In	63	GND	—	113	LA18	In/Out	163	LPTBUSY	In/Out
14	IRQ14	In	64	SD15	In/Out	114	LA20	In/Out	164	LPTERR#	In/Out
15	IRQ12	In	65	SD13	In/Out	115	GND	—	165	LPTACK#	In/Out
16	IRQ10	In	66	SD11	In/Out	116	SA9	In/Out	166	LPTAFD#	Out
17	DACK2#	Out	67	SD9	In/Out	117	SA8	In/Out	167	LPTSTRO#	Out
18	IRQ4	In	68	SD7	In/Out	118	SA7	In/Out	168	LPTD3	In/Out
19	IRQ6	In	69	SD5	In/Out	119	SA6	In/Out	169	LPTD2	In/Out
20	DRQ3	In	70	SD3	In/Out	120	SA5	In/Out	170	LPTD4	In/Out
21	DRQ1	In	71	SD1	In/Out	121	SA4	In/Out	171	LPTD1	In/Out
22	GND	—	72	GND	—	122	SA3	In/Out	172	LPTD7	In/Out
23	HDCS0#	Out	73	AEN	Out	123	SA2	In/Out	173	LPTD0	In/Out
24	ID7	In/Out	74	PDIAG#	In/Out	124	SA1	In/Out	174	LPTD6	In/Out
25	GND	—	75	FRSTDRV	In/Out	125	SA0	In/Out	175	GND	—
26	ID4	In/Out	76	IOW#	In/Out	126	GND	—	176	SA11	In/Out
27	HDACT#	Out	77	IOR#	In/Out	127	LPTD5	In/Out	177	SA10	In/Out
28	IOCS16#	In	78	HDCS1#	Out	128	GND	—	178	SA12	In/Out
29	GND	—	79	GND	—	129	EX-DS#	Out	179	SA13	In/Out
30	SD0	In/Out	80	IRQ7	In	130	RDATA#	In	180	SA14	In/Out
31	SD2	In/Out	81	DACK1#	Out	131	INDEX#	In	181	SA15	In/Out
32	SD4	In/Out	82	DACK3#	Out	132	TRK0#	In	182	SA16	In/Out
33	SD6	In/Out	83	IRQ5	In	133	WPROTEC#	In	183	SA17	Out
34	SD8	In/Out	84	IRQ3	In	134	DISKCHG#	In	184	SA18	Out
35	SD10	In/Out	85	GND	—	135	HIDENSI#	Out	185	SA19	Out
36	SD12	In/Out	86	IRQ11	In	136	CE2	In	186	GND	—
37	SD14	In/Out	87	IRQ15	In	137	EX-MO#	Out	187	LA19	In/Out
38	GND	—	88	DACK0#	Out	138	HEADSEL#	Out	188	LA21	In/Out
39	FEXTKDTA	In/Out	89	DACK5#	Out	139	WDATA#	Out	189	LA22	In/Out
40	EXTMCLK	In/Out	90	DACK6#	Out	140	DIR#	Out	190	LA23	In/Out
41	GND	—	91	DACK7#	Out	141	WGATE#	Out	191	GND	—
42	EXT5V (+5V)	—	92	MASTER#	In	142	STEP	Out	192	REFRESH#	In/Out
43	EXT5V (+5V)	—	93	IRQ9	In	143	IN-DS#	Out	193	IOCHRDY	In
44	EXT5V (+5V)	—	94	GND	—	144	TC	Out	194	OWS#	In
45	EXT5V (+5V)	—	95	FDSR0#	In	145	SBHE#	In/Out	195	EXTRTCAS	Out
46	GND	—	96	FRTS0#	Out	146	GND	—	196	EXTRTCDS	Out
47	FHSYNC	Out	97	FCTS0#	In	147	POWERSW#	In	197	EXTRTCRW	Out
48	BGND	Out	98	FRI0	In	148	SUBCLK	Out	198	IRQ8	In
49	RGND	Out	99	GND	—	149	SETID1	Out	199	GND	—
50	GGND	Out	100	EXT15V (+15V)	—	150	DOCKING#	In	200	GND	—

CN410: Serial Port (9-pin)

Pin No.	Signal Name/Description	Direction
1	CD	In
2	RD	In
3	TD	Out
4	DTR	Out
5	GND	—
6	DSR	In
7	RTS	Out
8	CTS	In
9	RI	In

CN412: External VGA Monitor Port

Pin No.	Signal Name/Description	Direction
1	RED	Out
2	GREEN	Out
3	BLUE	Out
4	MS2	In
5	N.C.	—
6	RGND	Out
7	GGND	Out
8	BGND	Out
9	N.C.	—
10	N.C.	—
11	MS0	In
12	MS1	In
13	HSYNC	Out
14	VSYNC	Out
15	N.C.	—

CN413: IBM PS/2 type Mouse or External Keyboard Port (6-pin)

Pin No.	Signal Name/Description	Direction
1	EXTMDATA	In/Out
2	N.C.	—
3	GND	—
4	KB5V (+5V)	—
5	EXTMCLK	In/Out
6	N.C.	—

2. Diagnostic Test

2.1 Outline of Diagnostic Test

This diagnostic test program is prepared for the purpose of testing and troubleshooting hardware functions of the computer.

This program is loaded from the disk drive and operates under the management of MS-DOS.

Some test (i.e. MAIN BOARD, RAM, and FLOPPY DISK DRIVE) can be done in ROM-based test program.

Diagnostic Menu (Main Menu)

This is the menu for the testing procedures (the menu is a list of choices available to you). This menu lists the various components of your computer system that are available for testing.

Each item on the menu is described below. The menu you obtain may differ slightly depending on the devices installed in your computer system.

Note: Refer to the items in step 3) **Preparation of 2.4 Diagnostic Test Procedure** on page 2-18 before starting the Diagnostic Test.

If you choose:

(1) 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 testing. Press the [Ctrl] and [Break] keys to stop the testing and return to the DIAGNOSTIC MENU.

(2) TEST AUTOMATICALLY

All the devices will be tested without further input from you. This testing will continue to operate until you press the [Ctrl] and [Break] keys to stop the cycle.

(3) CHANGE MENU

Allows you to add or delete items from the testing menu for the TEST ALL DEVICES or TEST AUTOMATICALLY selection.

(4) EXIT

If you decide that you do not wish to proceed with the diagnostic testing, select this item to reboot.

(5) MAIN BOARD

Tests the Main Board.

(6) xxx KB RANDOM ACCESS MEMORY

Tests the base memory and extended memory. (The number of KB or K-bytes will change depending on the configuration of your system.)

(7) KEYBOARD

Tests the keyboard.

(8) BATTERY

Tests the battery pack.

(9) 1 FLOPPY DISK DRIVE(S)

Tests the floppy disk drive connected to the system.

(10) 1 HARD DISK DRIVE(S)

Tests the hard disk drive connected to the system.

(11) VIDEO

Tests the color/monochrome mode display of LCD. If you have an analog monitor, you can test display.

(12) 1 PARALLEL PORT(S)

Tests the parallel port and external printer connected to the system.

(13) 2 SERIAL PORT(S)

Tests the RS-232C serial port connected to the system.

Making a Selection

There are a number of items shown in the menu that you can choose from.

To select an item from the menu, move the reverse display (the item displayed in reverse video) to the desired item with the <Up-Arrow> key (upward) or <Down-Arrow> key (downward).

At the same time, the number for SELECT MENU at the bottom of the menu will automatically change to match the item.

(You can type the number of the desired option instead of using <Up-Arrow> or <Down-Arrow> key.)

Then press the <Enter> key.

In most cases, you will test the entire system using the first item on the menu (1. TEST ALL DEVICES).

The testing example in this manual will cover the entire testing procedure as contained in the first item.

To run tests on specific devices, see the sections dealing with that test.

If the correct menu has appeared on your screen, proceed to the next step.

Terminating the Diagnostic Tests

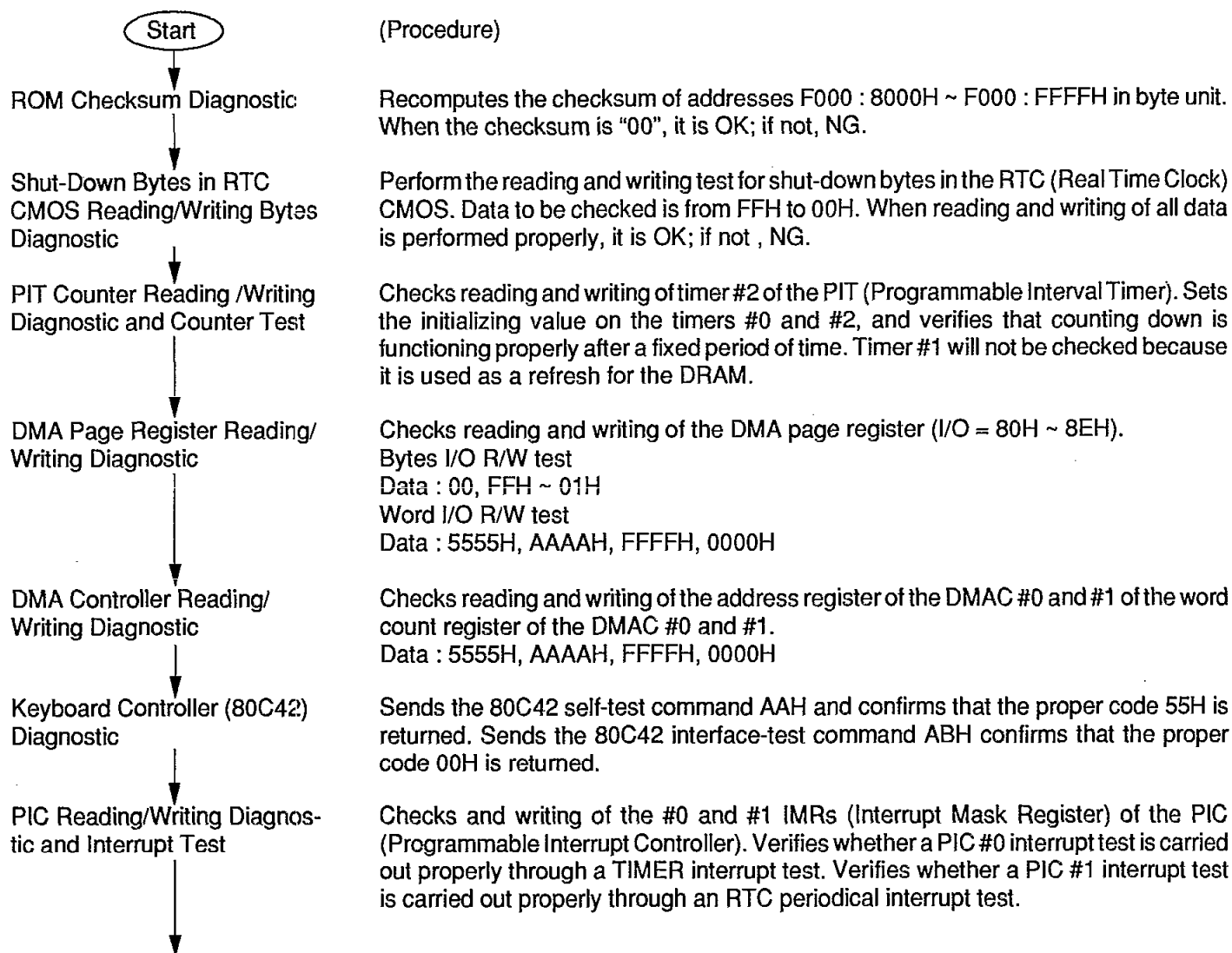
If during the course of testing you wish to stop the procedure, press the [Ctrl] and [Break] keys.

You may need to finish the specific tests being run, (complete the keyboard testing sequence for example) but at the conclusion of the current test, you will return to the menu.

You must press the [Ctrl] and [Break] keys to stop the automatic testing cycle started with item (2) TEST AUTOMATICALLY.

2.2 Diagnostic Description

1. Main Board Test



RTC Diagnostic

Confirms that the timer refreshing bit is properly turned on or off. Confirms that the data concerning the time is within the proper range.

Gate Array Test

Send 0CH data to PAPMC.

This command is to perform PAPMC test and get result PAPMC count 500 msec by internal clock during the test.

And get result from PAPMC and check bit 0 and 1.

bit 0 : 1 GA Write/Read Error

bit 1 : 1 ROM Check Sum Error

END

2. RAM Diagnostic

Start

Data Reading/Writing Diagnostic

Performs the word reading/writing test using data patterns AAAAH, 5555H, FFFFH, and 0000H. This applies to loaded address from 01000H to 9FFFFH.

Address Line Diagnostic

After clearing 64 K bytes, writes FFH only on 8000H and confirms that there is only FFH.

Follows the same procedure as above for the following address:

4000H, 2000H, 1000H, 0800H, 0400H, 0200H, 0100H, 0080H, 0040H, 0020H, 0010H, 0008H, 0004H, 0002H, and 0001H.

Refresh Diagnostic

In order to verify that the refreshing is functioning properly on 1 bank from 10000H, confirms that the data is perfectly stored after waiting for more than 2 seconds

Data Reading/Writing Diagnostic

Checks reading and writing of the 1408 KB RAM (on MAIN LOGIC BOARD) and optional RAM cards under the Extended RAM mode.

END

3. Keyboard Diagnostic

Start

Keyboard Codes Diagnostic

Press any key to recall a scanning code, which is converted to an ASCII code.

Confirms that the ASCII code corresponds to the denotation shown on the top of the pressed key.

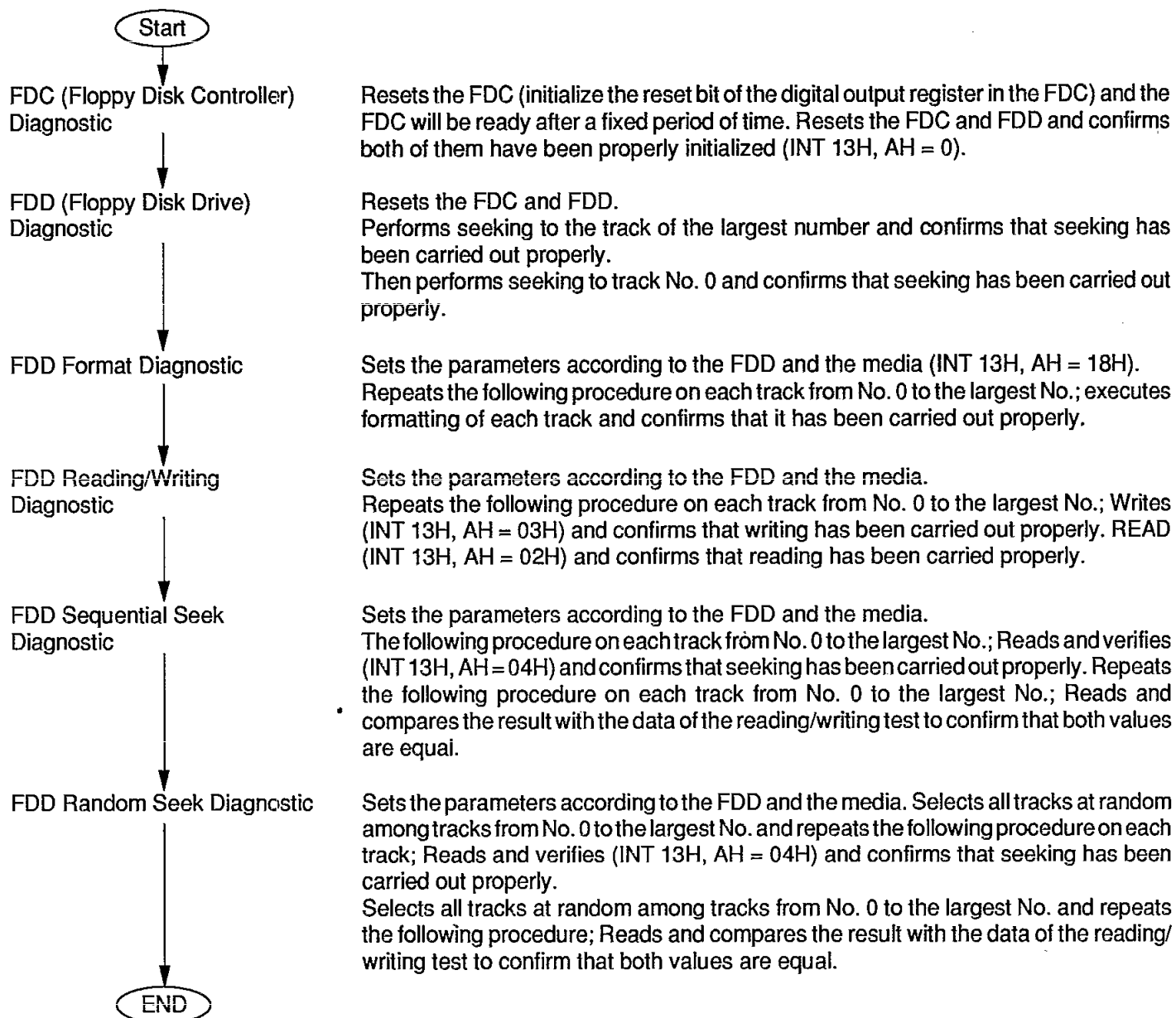
The following international character sets are available; USA, Germany, France, Italy, U.K., Spain, Sweden, Swiss (Gr).

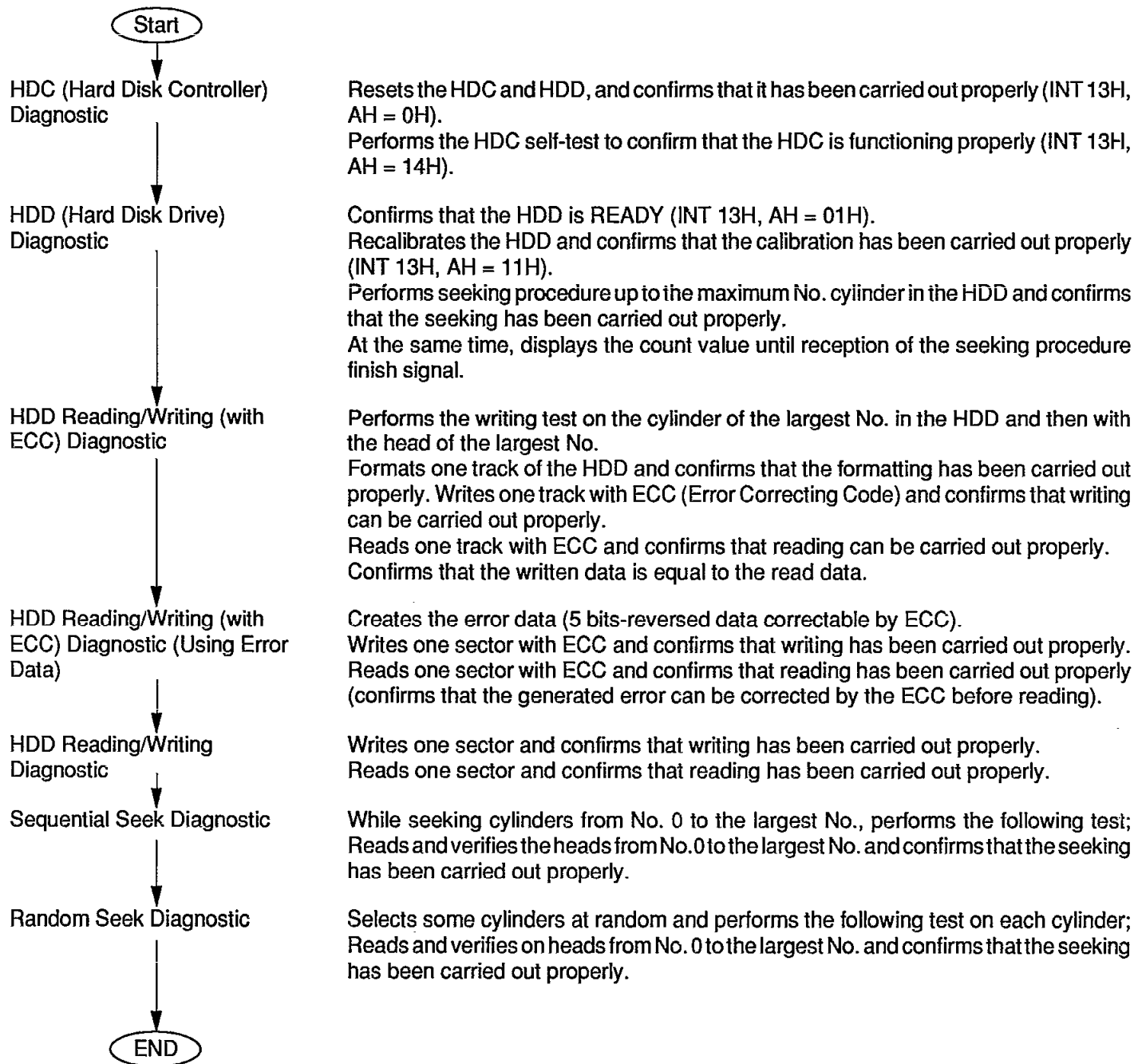
Keyboard Controller

Confirms that commands for the keyboard controller are being accepted properly; that is, interrupt will take place after those commands are accepted and proper codes are returned.

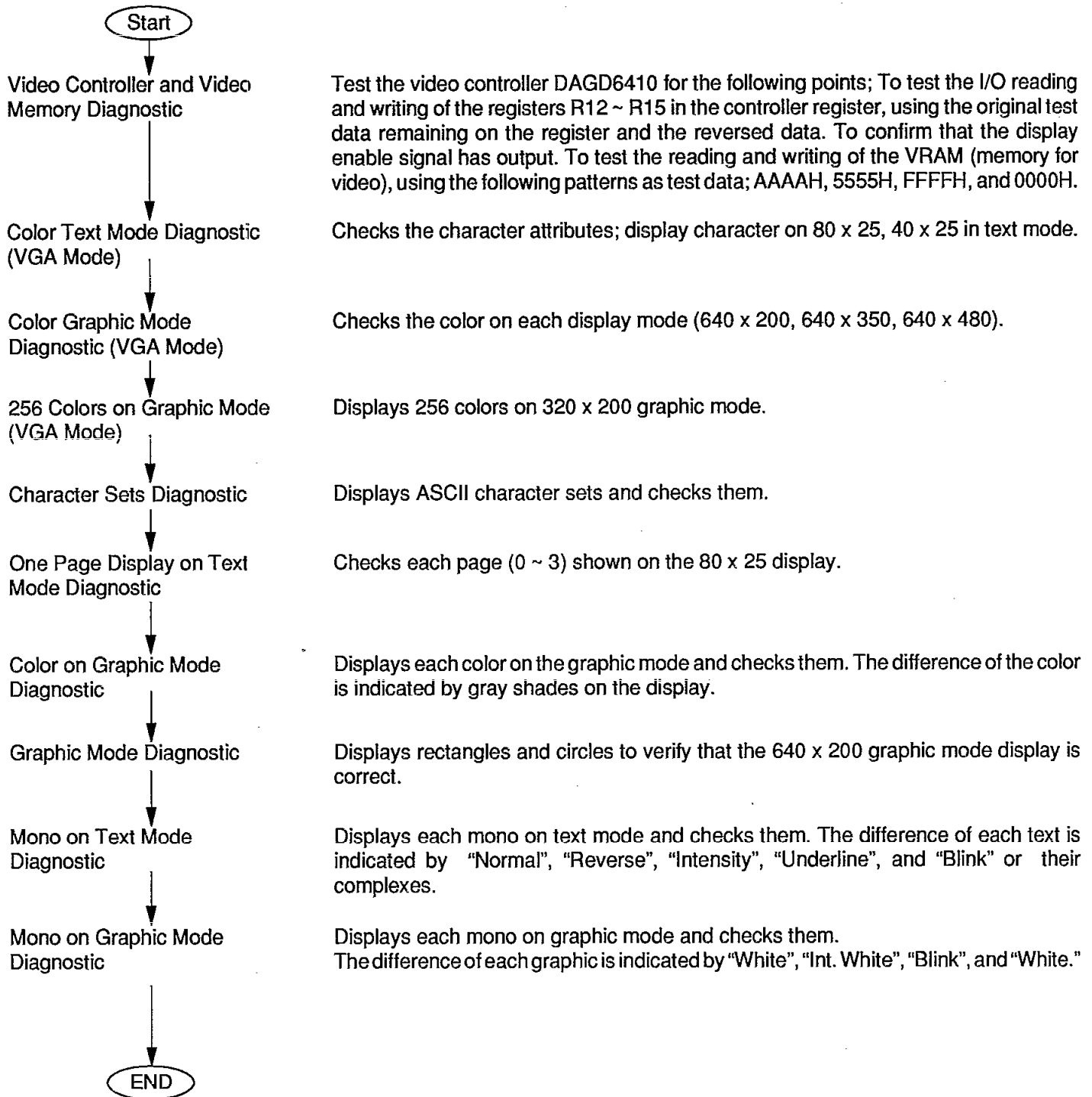
END

4. Floppy Disk Diagnostic

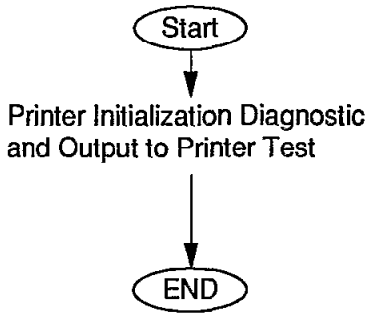


5. **Hard Disk Diagnostic**

6. Video Diagnostic

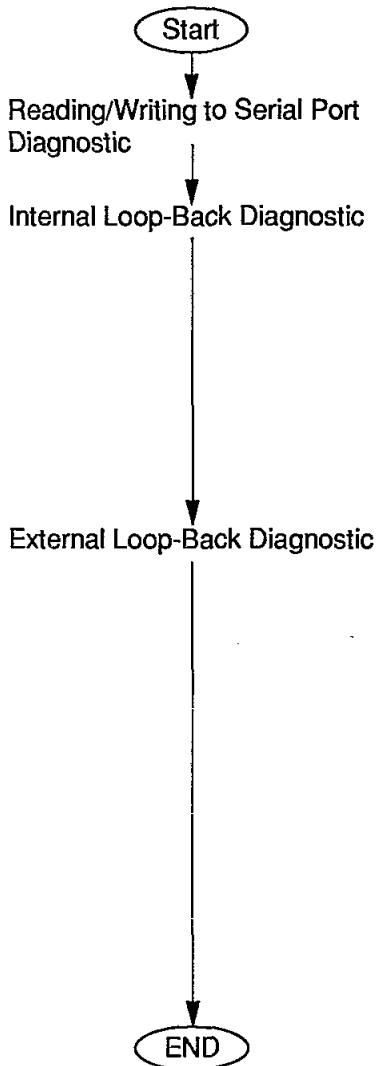


7. Parallel Port Diagnostic



Confirms that the printer I/O ports have been set. Resets printer and confirms that the initialization has been carried out properly. Executes printing and confirms that it has been carried out properly.

8. Serial Port Test



Performs the reading and writing test for the interrupt register and divider register and checks whether the setting is carried out properly.

Internal Loop-Back Diagnostic

Performs the internal loop-back test in the following procedures;

- Sets the transferring rate (9600 bps)
- Sets the transferring system (8 bit, even parity, parity check and 2 stop bit).
- Sets the loop-back mode.
- Transmits the data.
- Ready to receive the data?
- No error generated in the received data?
- Is the received data equal to the transmitted data?

Loops the data that is to be transmitted 256 times and then checks it.

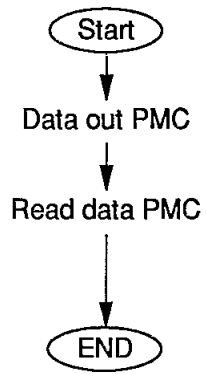
External Loop-Back Diagnostic

Performs the external loop-back test in the following procedures;

- Sets the mode controlling register.
RTS ON (Request To Send)
DTR ON (Data Terminal Ready)
- Confirms that following responses will be returned.
RTS outputs ON signal \Rightarrow RLSD (CD) and CTS receive ON signal
DTR outputs ON signal \Rightarrow DSR and RI receive ON signal

Rewrites the INT CH vector and confirms that interrupts from the next serial port will be adequately generated.

1. Checks that no line status interrupts, frame error, parity error nor overrun error have occurred.
2. Checks whether it is ready for receiving data interrupts and confirms that the transmitted data is equal to the received one.
3. Checks the transmitting interrupts register and transmitting register are empty.

9. **Battery Test**

Send 0C1H and D6H data to PMC to get 1 byte result data from PAPMC and check the result data.

2.3 Error messages

This section describes diagnostic messages:

Power-On Self Test messages and User Diagnostic messages.

Power-On Self Test Messages

Power-On Self Test and boot messages are displayed during the power-on process. There are two types of messages:

- Error messages that indicate a failure with either the hardware, software or firmware.
- Informational messages that provide important information about the power-on and boot processes, such as memory status.

However, sometimes the above messages cannot be reported on the screen.

In such cases, Beep codes are used to identify an error in the Power-On Self Test that occurs when the screen is not available.

Refer to the following lists of error messages, informational messages, and Beep codes.

Resume Function Error Messages in the Power-On Self Test

BIOS should display an error message when resuming has failed in the following three ways.

- Resume failure
When BIOS detects resuming has failed due to an error at failing into suspended. Example: BIOS didn't get the correct SMI.
- Resume memory backup failure
When BIOS detects resuming has failed due to an error at resuming. Example: DRAM checksum is bad.

Error Messages in the Power-On Self Test

Diskette drive 0 seek failure

Drive A has either failed or is missing.

Diskette Subsystem reset failed

FDC (Floppy Disk Controller) has failed.

Diskette read failure...strike F1 to retry boot

Disk is either not formatted or defective.

Gate A20 failure

Protected mode cannot be enabled.

Hard disk controller failure

HDC (Hard Disk Controller) has failed.

Hard disk failure

Hard disk has failed.

Hard disk read failure...strike F1 to retry boot

Hard disk is defective.

Invalid configuration information...please run SETUP program

User should run SETUP1K utility first.

Keyboard clock line failure

Keyboard is defective.

Keyboard data line failure

Keyboard is defective.

Keyboard controller failure

Keyboard controller firmware has failed.

Keyboard stuck key failure

A key(s) is(are) jammed.

Memory address line failure at xxxxxxx, read xxxxxxx expecting xxxxxxx

Circuitry associated with the memory chip has failed.

Memory data line failure at xxxxxxx, read xxxxxxx

One of the memory chips or associated circuitry has failed.

Memory high address line failure at xxxxxxx-xxxxxxx

Circuitry associated with the memory chips has failed.

Memory odd/even failure at xxxxxxx, read xxxxxxx

expecting xxxxxxx

Circuitry associated with the memory chips has failed.

Memory write/read failure at xxxxxxx, read xxxxxxx

expecting xxxxxxx

One of the memory chips or associated circuitry has failed.

No boot device available...strike F1 to retry boot

Either floppy disk drive A, hard disk, or floppy disk itself is defective.

No boot selector on hard disk...strike F1 to retry boot

Drive C is not formatted.

No time tick interrupt

Timer chip has failed.

Not a boot diskette...strike F1 to retry boot

Floppy disk in drive A is not formatted as a bootable disk.

Shutdown failure

Keyboard controller or its associated logic has failed.

Time-of-day clock stopped

CMOS real-time clock chips have failed.

Time chip counter 2 failed

Timer chip counter has failed.

Timer or Interrupt Controller bad

Either timer chip or interrupt controller is defective.

Unexpected interrupt in protected mode

Non-maskable interrupt (NMI) port can't be disabled.

Informational Messages in the Power-On Self Test

MEMORY SIZE = xxxx KB

This amount of memory has been tested successfully.

Decreasing available memory

Memory chips are failing.

Followed by any memory error messages.

Memory test terminated by keystroke

Memory tests stopped by your hitting the <space bar> while the memory tests were running.

Strike the F1 key to continue

An error was found during Power-On Self Test. Attempt to boot the system hitting the F1 key.

Beep Codes

The beep codes that aren't followed by any error messages and are written to Port 80H for fatal system board errors, are listed.

Note: Beep codes on the left column in the list below indicate the pattern of beep code bursts (e.g., 1-1-3 is one beep, followed by another beep, followed by a burst of three beeps.)

none	CPU register test in progress
1-1-3	CMOS write/read failure
1-1-4	ROM BIOS checksum failure
1-2-1	Programmable interval Timer failure
1-2-2	DMA initialization failure
1-2-3	DMA page register write/read failure
1-3-1	RAM refresh verification failure
none	1st 64 K RAM test in progress
1-3-3	1st 64 K RAM chip or data line failure multi-bit
1-3-4	1st 64 K RAM odd/even logic failure
1-4-1	Address line failure 1st 64 K RAM
1-4-2	Parity failure 1st 64 K RAM
2-1-1	Bit 0 1st 64 K RAM failure
2-1-2	Bit 1 1st 64 K RAM failure
2-1-3	Bit 2 1st 64 K RAM failure
2-1-4	Bit 3 1st 64 K RAM failure
2-2-1	Bit 4 1st 64 K RAM failure
2-2-2	Bit 5 1st 64 K RAM failure
2-2-3	Bit 6 1st 64 K RAM failure
2-2-4	Bit 7 1st 64 K RAM failure
2-3-1	Bit 8 1st 64 K RAM failure
2-3-2	Bit 9 1st 64 K RAM failure
2-3-3	Bit A 1st 64 K RAM failure
2-3-4	Bit B 1st 64 K RAM failure
2-4-1	Bit C 1st 64 K RAM failure
2-4-2	Bit D 1st 64 K RAM failure
2-4-3	Bit E 1st 64 K RAM failure
2-4-4	Bit F 1st 64 K RAM failure
3-1-1	Slave DMA register failure
3-1-2	Master DMA register failure
3-1-3	Master interrupt mask register failure
3-1-4	Slave interrupt mask register failure
none	Interrupt vector loading in progress

3-2-4	Keyboard controller test failure
none	CMOS power failure and checksum calculation in progress
none	CMOS config inform validation in progress
3-3-4	Screen memory test failure
3-4-1	Screen initialization failure
3-4-2	Screen retrace test failure
none	Search for video ROM in progress
none	Screen believed operable
none	Screen believed running with video ROM
none	Monochrome monitor believed operable
none	Color monitor (40 column) believed operable
none	Color monitor (80 column) believed operable

Note: No beep code is sounded if a test is aborted while in progress.

User Diagnostic Messages

Various messages or error messages that may appear in User Diagnostic are below.

You may find also a code number in the message. By looking up the code number in the code table, the detailed status of a device can be determined.

Example: In a message of the printer port test like:
PPA Time out error occurred with parallel printer
BIOS status: n1n2
Character: n3n4

A hexadecimal nibble in the message consists of the following 4 bits:
n = D3 D2 D1 D0

For example, if n1 = 5, a hexadecimal 5 is expressed as 0101 in binary codes, then D3 = 0, D2 = 1, D1 = 0, D0 = 1

Also,
n1 = D (1101) then D3 = 1, D2 = 1, D1 = 0, D0 = 1

Look up the number in the code table and clarify the problem.

Main Board Test

- (1) System ROM checksum test
ROM System ROM checksum error
 Checksum: xx
- (2) CMOS RAM shutdown byte r/w test
GRAM Shutdown byte test failed.
 Write data: xxxx Read data: xxxx
- (3) Programmable interrupt timer test
PIT Timer #2 counter r/w failed.
 Write data: xx Read data: xx
PIT Timer count failed.
 High count value expected: 00 current data: xx
- (4) Page register r/w test
PREG Page register r/w test failed. (byte) xx Read data: xx
PREG Page register r/w test failed. (word) xx Read data: xx
- (5) DMA controller register r/w test
DMAC DMA controller register r/w test failed.
 I/O address: xxxx Write data: xxxx Read data: xxxx
- (6) Keyboard controller test
KBCTRL Keyboard controller input buffer full.
KBCTRL Keyboard line always low. (clock)
KBCTRL Keyboard line always high. (clock)
KBCTRL Keyboard line always low. (data)
KBCTRL Keyboard line always high. (data)
KBCTRL Keyboard controller output buffer empty.
KBCTRL Keyboard controller self test failed.
 Return code: xx
- (7) Programmable interrupt controller test
PIC PIC #0 interrupt mask register failed.
 Write data: xx Read data: xx
PIC PIC #1 interrupt mask register failed.
 Write data: xx Read data: xx
PIC PIC #0 handling error
 ISR status: xx
PIC PIC #1 handling error
 ISR status: xx
PIC PIC #0 no interrupt occurred.
PIC PIC #1 no interrupt occurred.
- (8) Realtime clock test
RTC Realtime clock UIP bit always ON.
RTC Realtime clock UIP bit always OFF.
RTC Realtime clock data out of range.
 (Second data: ss)
 (Minute data: mm)
 (Hour data: hh)
 (Date data: dd)
 (Month data: mm)
 (Year data: yyyy)
- (9) GATE Array test
Gate Array write/read Test Error.
PMC ROM check sum Error.

RAM Test

- (1) DRAM read/write test
 DRAM R/W test failed.
 Address: xxxxx Write Data: xxxx Read Data: xxxx
- (2) DRAM refresh test
 DRAM Refresh test failed
 Address: xxxxx Read Data: xx
- (3) DRAM address test
 DRAM Address test failed
 Address: xxxxxx Read Data: xx
- (4) Extended RAM test
 EXTENDED RAM Unsuccessful to enter Protect Mode.
 EXTENDED RAM R/W test failed.
 Address: xxxxx Write Data: xxxx Read Data: xxxx
 EXTENDED RAM Address Line test failed.
 Address Line: xxxxxx, xxxxxx
 EXTENDED RAM Refresh test failed.

Keyboard Test

- (1) Keyboard reset test
 KEY Keyboard failed.
- (2) Keyboard data test
 KEY Key has been hit or broken.
 SCAN CODE: xx

Floppy Disk Drive Test

FDC FDC failed.
 Master status: n1n2
 Floppy Disk Controller (FDC) master status has failed.
 Data bus or FDC chip has failed.
 n1n2 is FDC master status listed below.

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

FDC Init. failed BIOS status: xx
 Floppy Disk Controller (FDC) initialization has failed.
 Data bus or FDC chips have failed.
 xx is BIOS disk error status below.

BIOS disk error status

Status	Meaning
80	Time out
40	Seek out
20	FDC failed
10	CRC error
09	DMA boundary
08	DMA overrun
03	Media change line active
06	No record
04	Write protected
02	No address mark
01	invalid command

FDC Seek failed (max track)
 Seek has failed.
 Floppy Disk Controller (FDC) cable or FDC chip has failed.

FDC Seek failed (0 track)
 Seek has failed.
 Floppy Disk Controller (FDC) cable or FDC chip has failed.

When an error occurs during format, verify, write, and read tests for FDD, it is displayed with the following format and combination of command and error names:

(Format of Error Message)

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

Command Name: Read	Error Name: HDC not found (FFH)
Write	Bad err register (E0H)
Verify	Write fault (CCH)
Format	Undefined error (BBH)
Read long	Drive not ready (AAH)
Write long	Timeout (80H)
Command	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

Serial Port Test

- (1) Register test
- RS232 Serial port failed.
Interrupt ID Write: xx Read: xx
- RS232 Serial port failed.
Divisor Write: xxxx Read: xxxx
- (2) Internal loopback
- RS232 Serial port data loopback failed.
Line & MODEM status: n1n2, n3n4
n1n2n3n4: Refer to the tables of loopback line status and loopback MODEM status below.
- RS232 Serial port data loopback failed.
Xmit: xx Recv: xx
- RS232 Serial port signal loopback failed.
MODEM status: n3n4 Expected: n3'n4'
n3n4: result by test. Refer to the table of MODEM status below
n3'n4': expected status
- (3) External loopback
- RS232 Serial port signal real loopback test failed.
MODEM status: n3n4 Expected: n3'n4'
n3n4: Refer to the table of MODEM status below.
- RS232 Serial port data real loopback test failed.
Line status: n1n2
n1n2: Refer to the table of line status below.
- RS232 Serial port data real loopback test failed.
Xmit: xx Recv: xx
- RS232 Data real loopback transmit failed.
Line status: n1n2
n1n2: Refer to the table of line status below.
- RS232 Data real loopback interrupt request failed.
Line status: n1n2
n1n2: Refer to the table of line status below.
- RS232 Data real loopback receive failed.
Line status: n1n2
n1n2: Refer to the table of line status below.

Loopback line status

Nibble	Bit	Meaning
n1	D3	1: Timing out
	D2	1: Transmit shift register
	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 Port Test

PPA Time out error occurred with parallel printer
 BIOS status: n1n2 Character: xx

PPA I/O error occurred with parallel printer.
 BIOS status: n1n2 Character: xx

PPA Paper end occurred with parallel printer
 BIOS status: n1n2
 Character: xx
 n1n2 is a printer BIOS error status listed below.
 xx is the character sent to the printer.

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

Hard Disk Drive Test

HDC RESET TEST

HDC reset failed.

HDC DIAGNOSTICS TEST

HDC internal diagnostic failed.

HDD SET PARAMETER TEST

HDD set drive parameter failed.

BIOS status: xx HDC status: xx HDC error status: xx

HDD DRIVE READY TEST

HDD drive not ready.

BIOS status: xx HDC status: xx HDC error status: xx

HDD RECALIBRATE TEST

HDD recalibrate failed.

BIOS status: xx HDC status: xx HDC error status: xx

HDD SEEK TEST

HDD seek failed.

BIOS status: xx HDC status: xx HDC error status: xx

HDD SEEK TIME TEST

HDD seek does not complete within some period.

BIOS status: xx HDC status: xx HDC error status: xx

Get parameter error — Can not execute test program!

BIOS status: xx HDC status: xx HDC error status: xx

Note: See the following tables for the status represented by xx, n1n2 and n3n4.

BIOS error status

Status	Meaning
FF	Sense status failed
E0	Bad error 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
0B	Bad track
09	DMA boundary
08	DMA overrun
07	Drive parameter error
05	Reset failed
04	No record
03	Write protected
02	No address mark
01	Invalid command

HDC status

Nibble	Bit	Meaning
n1	D3	1: HDC is busy
	D2	1: HD 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

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

When an error occurs during format, write long, read long, write and read test for HDD, it is displayed with the following format and combination 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 on page 2-13.

Error Name: please refer to the FDD section on page 2-13.

Battery Test

1st Battery abnormal high voltage
 1st Battery charging current overflow
 1st Battery temperature > 100°C (212°F)
 1st Battery temperature < -22°C (-7.6°F) and voltage > 3.3V
 1st Battery Status error

2nd Battery abnormal high voltage
 2nd Battery charging current overflow
 2nd Battery temperature > 100°C (212°F)
 2nd Battery temperature < -22°C (-7.6°F) and voltage > 3.3V
 2nd Battery Status error

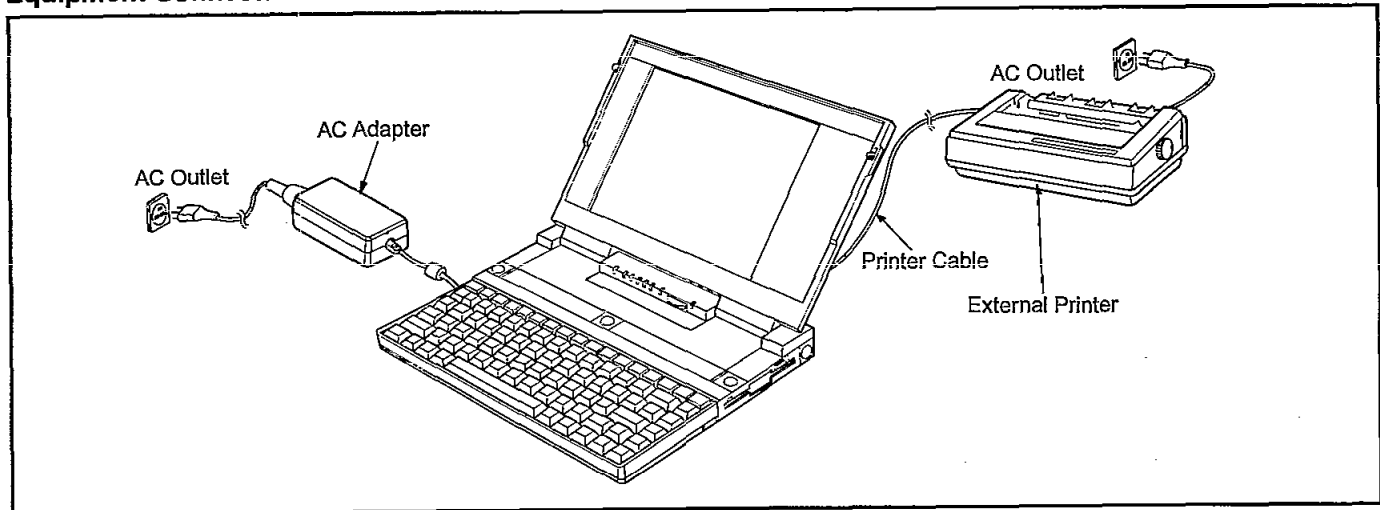
2.4 Diagnostic Test procedure

1) Equipment

Required

(1) Test Laptop Computer	1 unit
(2) AC Adapter	1 pc.
(3) External Printer	1 unit
(4) Loopback Plug (Serial Port Test for RS232C) [P/N: DFWV95C0067]	1 pc.
(5) Loopback Cable (Serial Port Test for MODEM) [P/N: DFWV95C0068]	1 pc.
(6) Installation Disk 1	1 pc.

2) Equipment Connection

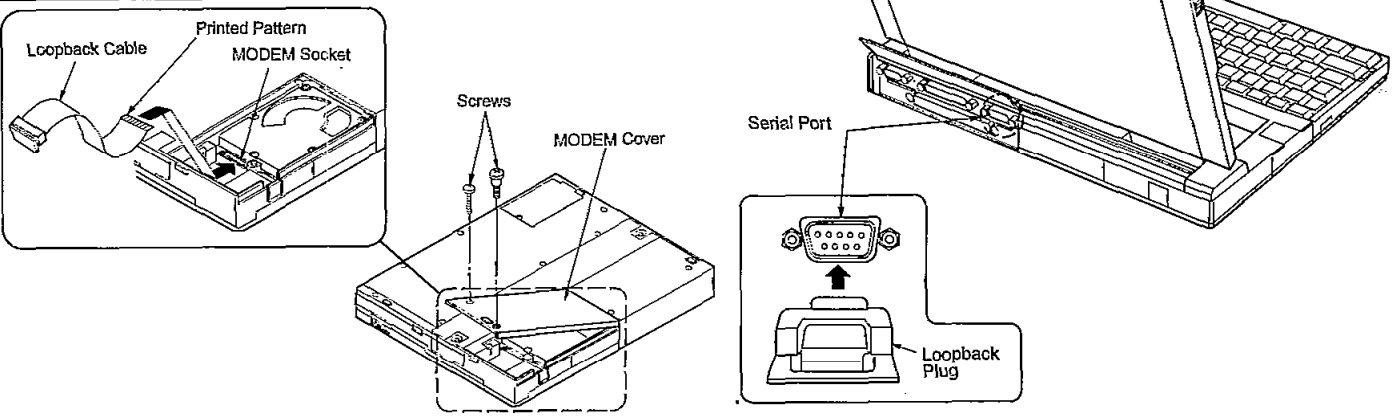


3) Preparation

- (1) Connection should be made as shown in figure above.
- (2) The System Setup should be set to factory setting values by executing the "SETUP1K/F" command. Otherwise messages or items in menu of "4) Test Procedure" on the next page may not be properly displayed on LCD.
- (3) The serial port and MODEM must be enabled in POWER1K program in order to execute the "2 SERIAL PORT" test.
- (4) An error message may appear if the CONFIG.SYS file contains a large number of device driver specifications. Therefore, it is advisable to delete or rename CONFIG.SYS and reboot computer before starting diagnostic test.
- (5) When an optional MODEM is installed, remove it.
- (6) Connect the Loopback Plug and Loopback Cable as shown in figure below.

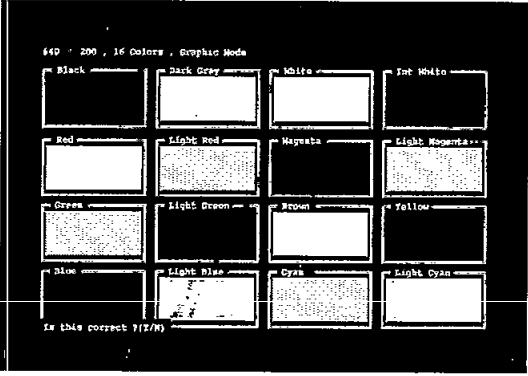
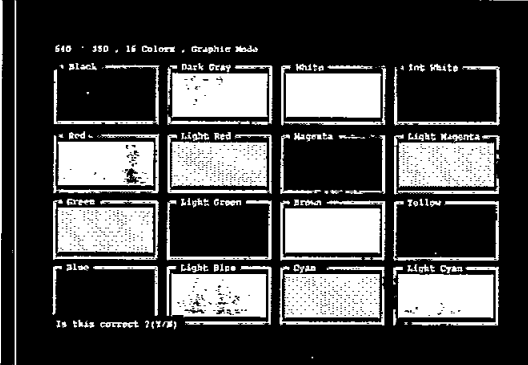
WARNING

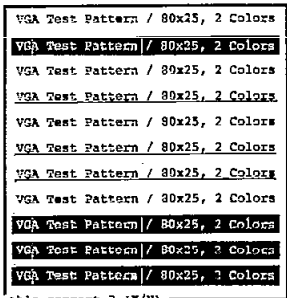
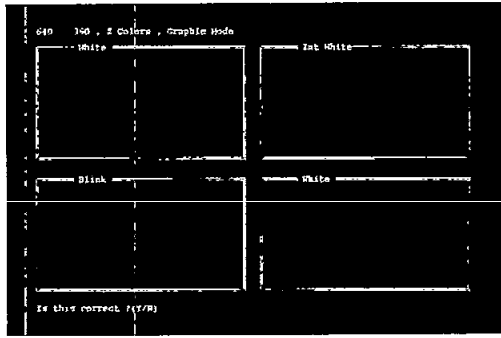
Do not connect or disconnect the Loopback Cable into/from the MODEM socket when the power switch of the computer is ON. Otherwise, the internal fuse could be blown.

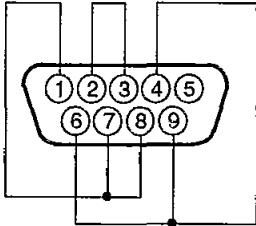


4) Test procedure

Step	Test Procedure	Screen Displays:	Criteria	Remarks
1	Insert Installation Disk 1 into Drive A .			
2	Turn on the main power switch of the computer. Then press the reset button of the computer.	Phoenix View/LC (TM) VGA-Compatible BIOS Version xx Copyright (C) 1984 - 1991 Phoenix Technologies Ltd. All Right Reserved Phoenix 80386 ROM BIOS PLUS Version xxxx Copyright (C) 1985 - 1990 Phoenix Technologies Ltd. All right Reserved 640K Base Memory, xxxx K Extended Strike the F1 key to continue SuperStor Data Compression Driver Version x.xx,xx-xx-xx Copyright (C) AddStor Inc. 1991, 1992, All rights reserved. SuperStor fixed drive C: mounted as drive D: Drive C and D swapped	Note: Press F1 key, when the following message is displayed. "Resume failure Strike the F1 key to continue" Note: When "Enter password:" is displayed, press M S J C K L 4 <Enter> keys. (Refer to the CAUTION described below.)	
3		***** * Your hard disk has been already installed. * * Type INSTALL and press Enter to re-install. * ***** A >	CAUTION: The password described above is the master-password which is prepared for servicing purposes only. Do not use it for other than the above purposes and handle it confidentially. Entering the master-password enables to delete the previous password and disable the system password. However, the master-password will not be registered.	
4	Press D I A G I K keys.	A > DIAG1K _		
5	Press Enter key.	Do you want printed output? (Y/N) _		
6	Press Y (for "Yes") if you want printed output, otherwise press N key.	DIAGNOSTIC MENU (Ver x.xx) 1. TEST ALL DEVICES (DEVICES) 2. TEST AUTOMATICALLY (DEVICES) 3. CHANGE MENU 4. EXIT ■ 5. MAIN BOARD ■ 6. XXXX KB RANDOM ACCESS MEMORY ■ 7. KEYBOARD 8. BATTERY ■ 9. 1 FLOPPY DISK DRIVE(S) ■ 10. 1 HARD DISK DRIVE(S) ■ 11. VIDEO ■ 12. 1 PARALLEL PORT(S) ■ 13. 2 SERIAL PORT(S) SELECT MENU: 1		
7	Press Enter key.	MAIN BOARD TEST ----- BASE RAM TEST CURRENT BASE RAM SIZE = 640KB Base RAM = 640KB Check OK ----- EXTENDED RAM TEST CURRENT EXTENDED RAM SIZE = xxx KB Extended RAM = xxx KB Check OK KEYBOARD RETURN CODE TEST FLOPPY DISK CONTROLLER TEST 1st FLOPPY DISK DRIVE (1.44MFD) TEST ----- HARD DISK CONTROLLER TEST 1st HDD-DRIVE TEST Count value to get SEEK COMPLETE = 0 1st HDD-SEQUENTIAL SEEK TEST Cylinder = xxx 1st HDD-RANDOM SEEK TEST Cylinder = xxx		

Step	Test Procedure	Screen Displays:	Criteria	Remarks																
8		<p style="text-align: center;">40 x 25 , 16 Colors , Text Mode</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>VGA Test Pattern 40 x 25 16 Color</td> <td>VGA Test Pattern 40 x 25 16 Color</td> <td>VGA Test Pattern 40 x 25 16 Color</td> <td>VGA Test Pattern 40 x 25 16 Color</td> </tr> <tr> <td>VGA Test Pattern 40 x 25 16 Color</td> <td>VGA Test Pattern 40 x 25 16 Color</td> <td>VGA Test Pattern 40 x 25 16 Color</td> <td>VGA Test Pattern 40 x 25 16 Color</td> </tr> <tr> <td>VGA Test Pattern 40 x 25 16 Color</td> <td>VGA Test Pattern 40 x 25 16 Color</td> <td>VGA Test Pattern 40 x 25 16 Color</td> <td>VGA Test Pattern 40 x 25 16 Color</td> </tr> <tr> <td>VGA Test Pattern 40 x 25 16 Color</td> <td>VGA Test Pattern 40 x 25 16 Color</td> <td>VGA Test Pattern 40 x 25 16 Color</td> <td>VGA Test Pattern 40 x 25 16 Color</td> </tr> </table> <p style="text-align: center;">Is this correct ? (Y/N)</p>	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color		
VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color																	
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VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color	VGA Test Pattern 40 x 25 16 Color																	
9	Press Y key.	<p style="text-align: center;">30 x 25 , 16 Colors , Text Mode</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>Black VGA Test Pattern 30x25, 16 Colors</td> <td>Dark Gray VGA Test Pattern 30x25, 16 Colors</td> <td>White VGA Test Pattern 30x25, 16 Colors</td> <td>Int White VGA Test Pattern 30x25, 16 Colors</td> </tr> <tr> <td>Red VGA Test Pattern 30x25, 16 Colors</td> <td>Light Red VGA Test Pattern 30x25, 16 Colors</td> <td>Magenta VGA Test Pattern 30x25, 16 Colors</td> <td>Light Magenta VGA Test Pattern 30x25, 16 Colors</td> </tr> <tr> <td>Green VGA Test Pattern 30x25, 16 Colors</td> <td>Light Green VGA Test Pattern 30x25, 16 Colors</td> <td>Brown VGA Test Pattern 30x25, 16 Colors</td> <td>Yellow VGA Test Pattern 30x25, 16 Colors</td> </tr> <tr> <td>Blue VGA Test Pattern 30x25, 16 Colors</td> <td>Light Blue VGA Test Pattern 30x25, 16 Colors</td> <td>Cyan VGA Test Pattern 30x25, 16 Colors</td> <td>Light Cyan VGA Test Pattern 30x25, 16 Colors</td> </tr> </table> <p style="text-align: center;">Is this correct ? (Y/N)</p>	Black VGA Test Pattern 30x25, 16 Colors	Dark Gray VGA Test Pattern 30x25, 16 Colors	White VGA Test Pattern 30x25, 16 Colors	Int White VGA Test Pattern 30x25, 16 Colors	Red VGA Test Pattern 30x25, 16 Colors	Light Red VGA Test Pattern 30x25, 16 Colors	Magenta VGA Test Pattern 30x25, 16 Colors	Light Magenta VGA Test Pattern 30x25, 16 Colors	Green VGA Test Pattern 30x25, 16 Colors	Light Green VGA Test Pattern 30x25, 16 Colors	Brown VGA Test Pattern 30x25, 16 Colors	Yellow VGA Test Pattern 30x25, 16 Colors	Blue VGA Test Pattern 30x25, 16 Colors	Light Blue VGA Test Pattern 30x25, 16 Colors	Cyan VGA Test Pattern 30x25, 16 Colors	Light Cyan VGA Test Pattern 30x25, 16 Colors		
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Blue VGA Test Pattern 30x25, 16 Colors	Light Blue VGA Test Pattern 30x25, 16 Colors	Cyan VGA Test Pattern 30x25, 16 Colors	Light Cyan VGA Test Pattern 30x25, 16 Colors																	
10	Press Y key.																			
11	Press Y key.																			

Step	Test Procedure	Screen Displays:	Criteria	Remarks
22	Press Y key.	<p>80 x 25 , 2 Colors , Text Mode</p>  <p>Normal Reverse Intensity Underline Blink Intensity & Underline Underline & Blink Intensity & Blink Reverse & Intensity Reverse & Blink Reverse & Intensity & Blink</p> <p>Is this correct ? (Y/N)</p>		
23	Press Y key.	 <p>Is this correct ? (Y/N)</p>		
24	Press Y key.	<p>1st serial port test (I/O address 3F8H)</p> <hr/> <p>1st serial port test (I/O address 3F8H) 2nd serial port test (I/O address 2F8H) 2nd serial port test (I/O address 2F8H)</p> <p>Test done!! Hit any key when ready_</p>		
25	Press any key.	<p>DIAGNOSTIC MENU (Ver x.xx)</p> <p>1. TEST ALL DEVICES (DEVICES) 2. TEST AUTOMATICALLY (DEVICES) 3. CHANGE MENU 4. EXIT</p> <ul style="list-style-type: none"> ■ 5. MAIN BOARD ■ 6. XXXX KB RANDOM ACCESS MEMORY ■ 7. KEYBOARD 8. BATTERY ■ 9. 1 FLOPPY DISK DRIVE(S) ■ 10. 1 HARD DISK DRIVE(S) ■ 11. VIDEO 12. 1 PARALLEL PORT(S) ■ 13. 2 SERIAL PORT(S) <p>SELECT MENU: 1</p>		
26	Press 7 key and Enter key.	<p>KEYBOARD</p> <p>1. TEST ALL DEVICES (DEVICES) 2. TEST AUTOMATICALLY (DEVICES) 3. CHANGE MENU 4. EXIT 5. PRESS KEY TEST</p> <ul style="list-style-type: none"> ■ 6. SCAN CODE RETURN TEST <p>SELECT MENU: 1</p>		

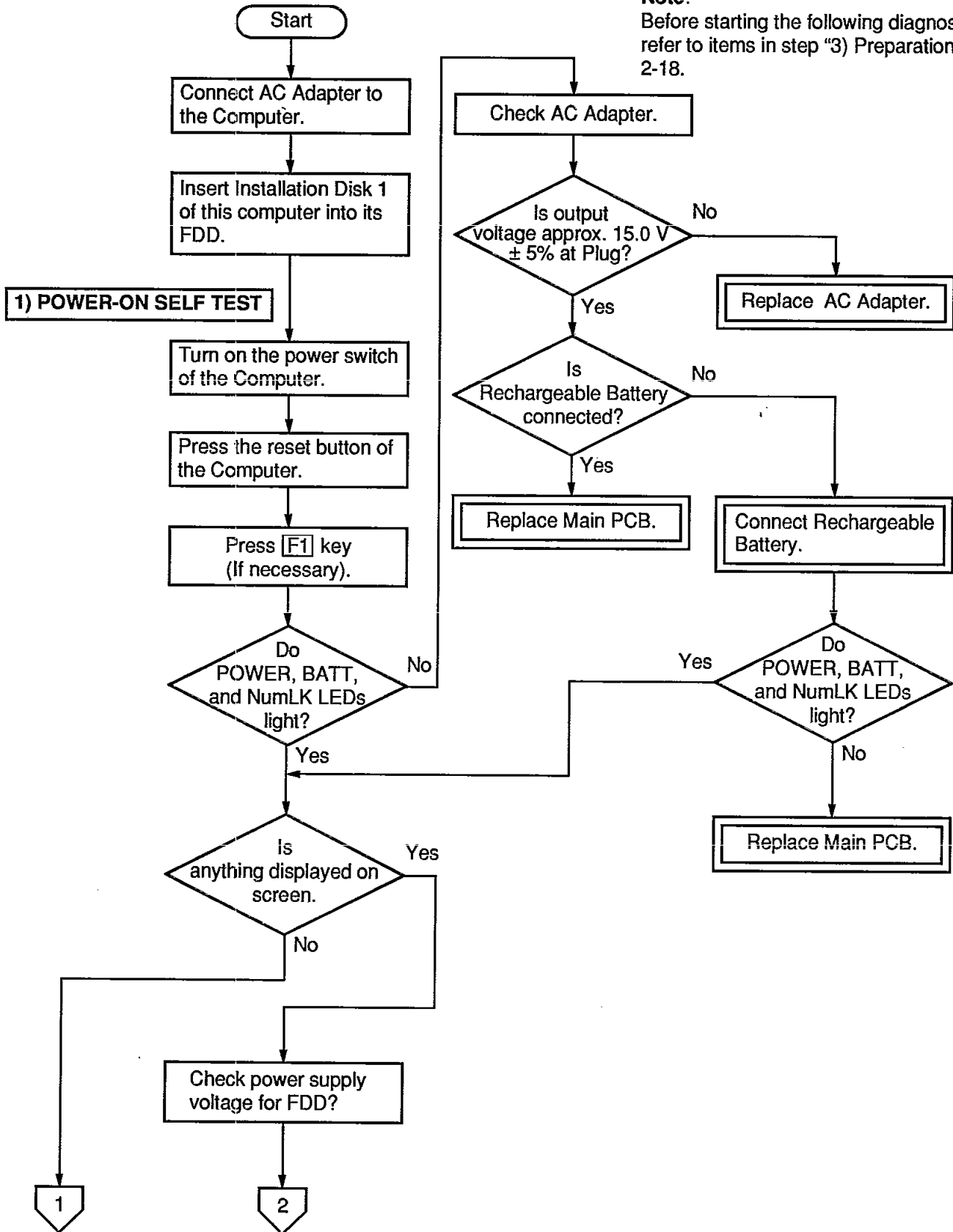
Step	Test Procedure	Screen Displays:	Criteria	Remarks																														
37	Press any key.	DIAGNOSTIC MENU (Ver x.xx) 1. TEST ALL DEVICES (DEVICES) 2. TEST AUTOMATICALLY (DEVICES) 3. CHANGE MENU 4. EXIT ■ 5. MAIN BOARD ■ 6. XXXX KB RANDOM ACCESS MEMORY ■ 7. KEYBOARD ■ 8. BATTERY ■ 9. 1 FLOPPY DISK DRIVE(S) ■ 10. 1 HARD DISK DRIVE(S) ■ 11. VIDEO ■ 12. 1 PARALLEL PORT(S) ■ 13. 2 SERIAL PORT(S) SELECT MENU: 12																																
38	Press 1 3 keys and Enter keys.	2 SERIAL PORT(S) ■ 1. TEST ALL DEVICES (DEVICES) 2. TEST AUTOMATICALLY (DEVICES) 3. CHANGE MENU 4. EXIT ■ 5. 1st SERIAL PORT TEST ■ 6. 2nd SERIAL PORT TEST SELECT MENU: 1																																
39	Press 5 and Enter keys.	1 SERIAL PORT TEST ■ 1. TEST ALL DEVICES (DEVICES) 2. TEST AUTOMATICALLY (DEVICES) 3. CHANGE MENU 4. EXIT ■ 5. RS232C CONTROLLER REGISTER R/W TEST ■ 6. INTERNAL LOOPBACK TEST 7. EXTERNAL LOOPBACK TEST SELECT MENU: 1																																
40	Press 7 and Enter keys.	1st serial port test (I/O address 3F8H) Connect loopback plug Hit any key when ready_	Note: Check to be sure that loopback plug is connected.																															
41	Press any key.	Test done!! Hit any key when ready_	Loopback plug wiring as shown below.																															
42	Press any key.	1 SERIAL PORT TEST 1. TEST ALL DEVICES (DEVICES) 2. TEST AUTOMATICALLY (DEVICES) 3. CHANGE MENU 4. EXIT ■ 5. RS232C CONTROLLER REGISTER R/W TEST ■ 6. INTERNAL LOOPBACK TEST ■ 7. EXTERNAL LOOPBACK TEST SELECT MENU: 7		Note: Refer to the item (3) of (3) Preparation on page 2-18.																														
43	Press 4 and Enter keys.	2 SERIAL PORT(S) 1. TEST ALL DEVICES (DEVICES) 2. TEST AUTOMATICALLY (DEVICES) 3. CHANGE MENU 4. EXIT ■ 5. 1st SERIAL PORT TEST ■ 6. 2nd SERIAL PORT TEST SELECT MENU: 5	Pin Configuration for Serial Port <table border="1"> <thead> <tr> <th>Pin No</th> <th>Signal Name/Description</th> <th>Direction</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CD</td> <td>In</td> </tr> <tr> <td>2</td> <td>RXD</td> <td>In</td> </tr> <tr> <td>3</td> <td>TXD</td> <td>Out</td> </tr> <tr> <td>4</td> <td>DTR</td> <td>Out</td> </tr> <tr> <td>5</td> <td>GND</td> <td>—</td> </tr> <tr> <td>6</td> <td>DSR</td> <td>In</td> </tr> <tr> <td>7</td> <td>RTS</td> <td>Out</td> </tr> <tr> <td>8</td> <td>CTS</td> <td>In</td> </tr> <tr> <td>9</td> <td>RING</td> <td>In</td> </tr> </tbody> </table>	Pin No	Signal Name/Description	Direction	1	CD	In	2	RXD	In	3	TXD	Out	4	DTR	Out	5	GND	—	6	DSR	In	7	RTS	Out	8	CTS	In	9	RING	In	
Pin No	Signal Name/Description	Direction																																
1	CD	In																																
2	RXD	In																																
3	TXD	Out																																
4	DTR	Out																																
5	GND	—																																
6	DSR	In																																
7	RTS	Out																																
8	CTS	In																																
9	RING	In																																

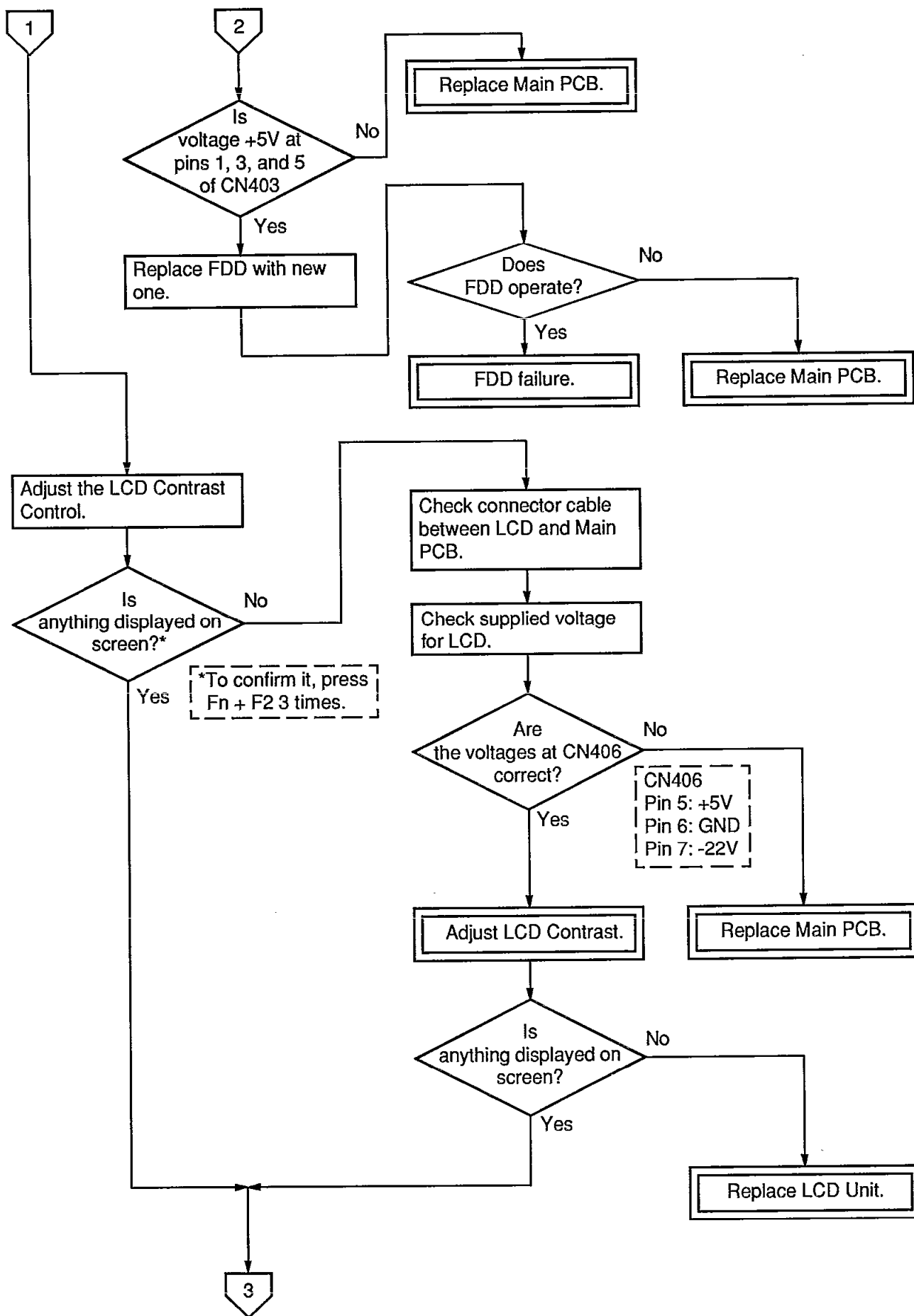
3. Troubleshooting

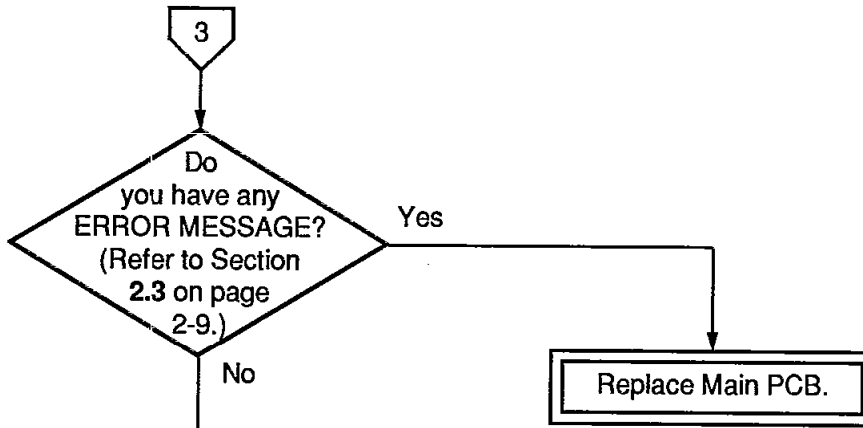
3.1 Troubleshooting (For Block Exchange)

Note:

Before starting the following diagnostic test, refer to items in step "3) Preparation" on page 2-18.







```

    *****
    * Your hard disk has been already installed. *
    * Type INSTALL and press Enter to re-install. *
    *****
    A > _
  
```

2) DIAGNOSTIC TEST

Press **d** **i** **a** **g**
1 **K** **↵** keys.

Note: **↵** key denotes **Enter** key.

Screen displays messages as shown at right

```

    Do you want printed output? (Y/N)_
  
```

Press **Y** or **N** keys.

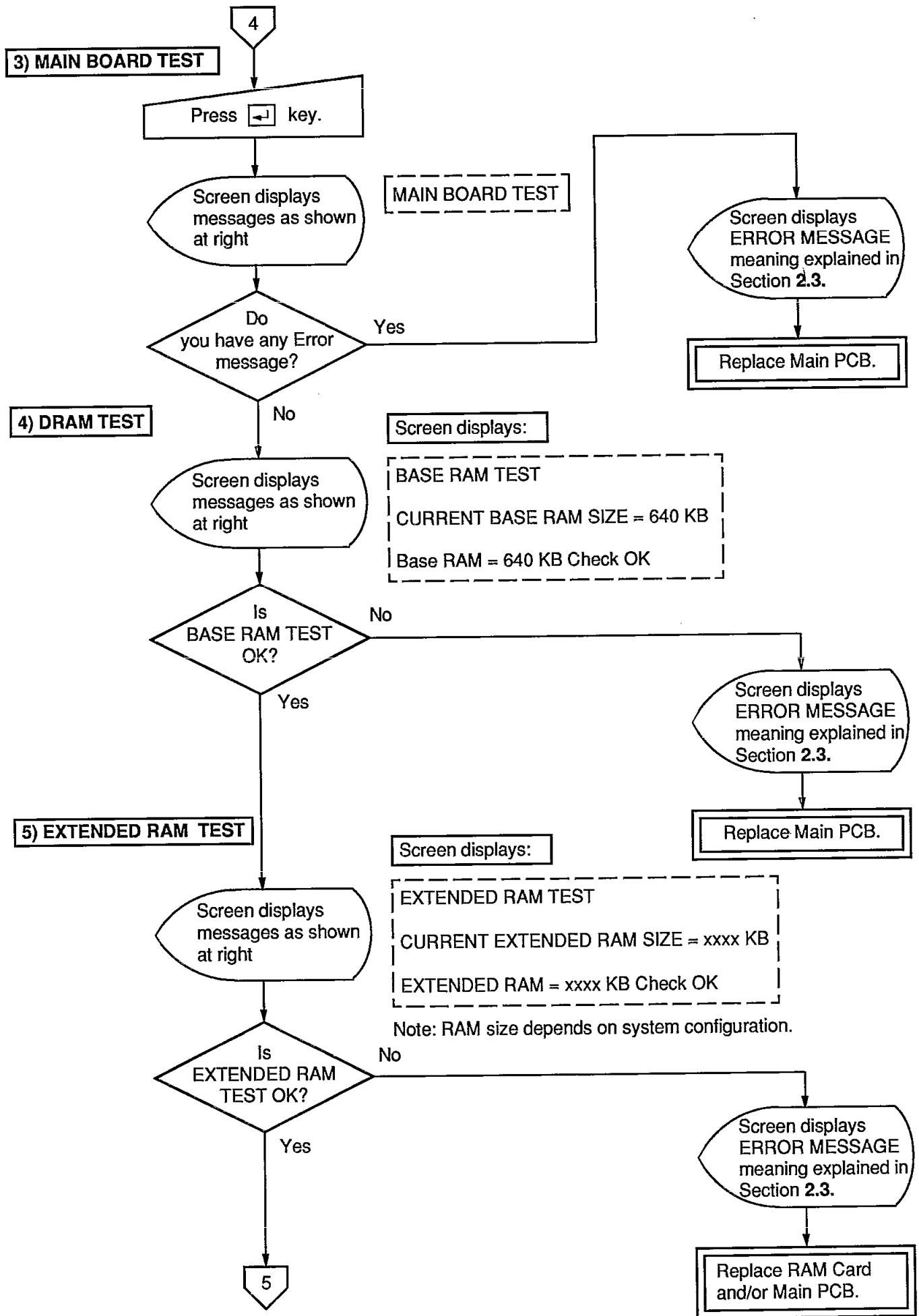
Screen displays messages as shown at right

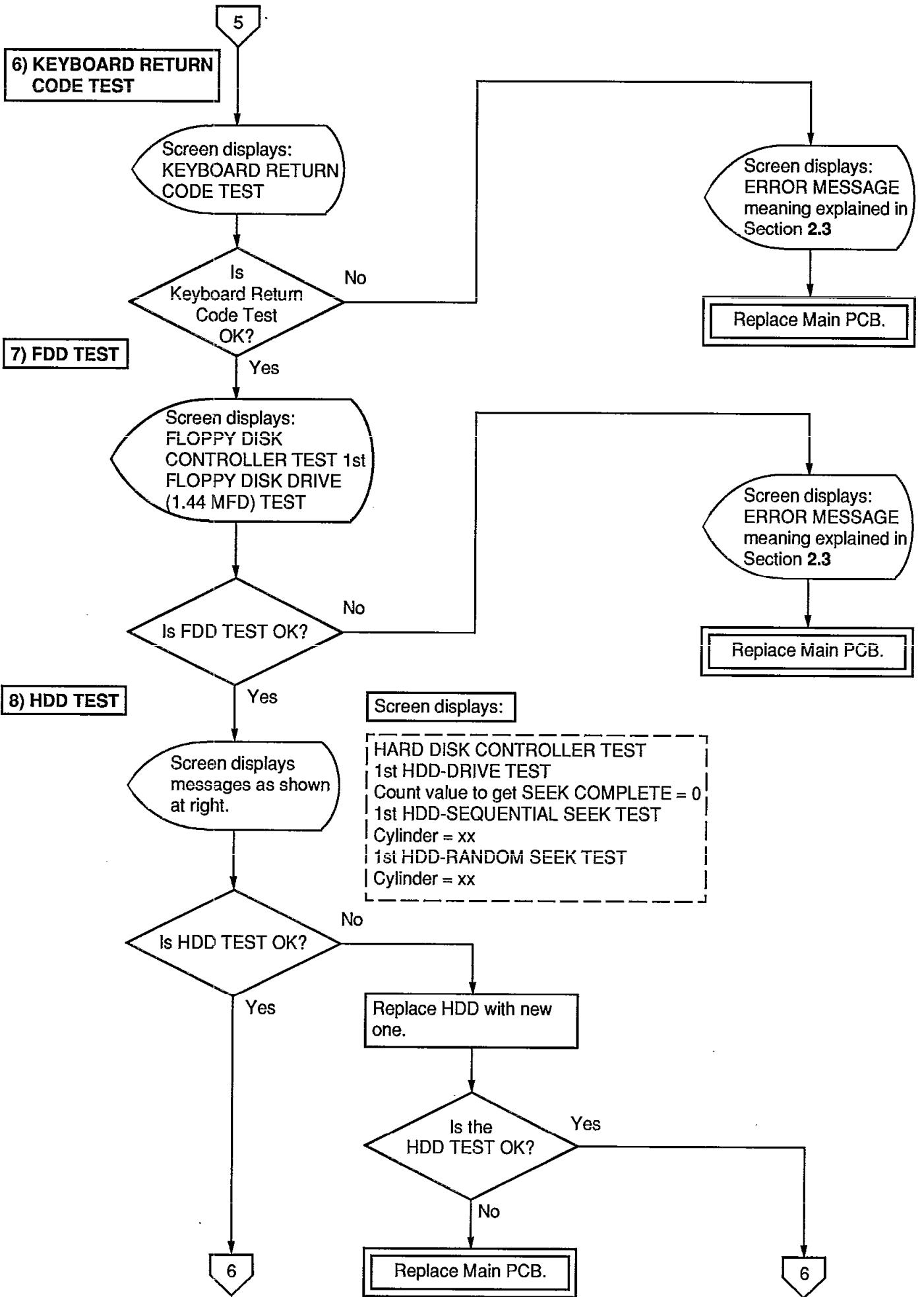
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    DIAGNOSTIC MENU (Ver x.xx)
    1. TEST ALL DEVICES (▣ DEVICES)
    2. TEST AUTOMATICALLY (▣ DEVICES)
    3. CHANGE MENU
    4. EXIT
    5. MAIN BOARD
    6. XXXX KB RANDOM ACCESS MEMORY
    7. KEYBOARD
    8. BATTERY
    9. 1 FLOPPY DISK DRIVE(S)
    10. 1 HARD DISK DRIVE(S)
    11. VIDEO
    12. 1 PARALLEL PORT(S)
    13. 2 SERIAL PORT(S)

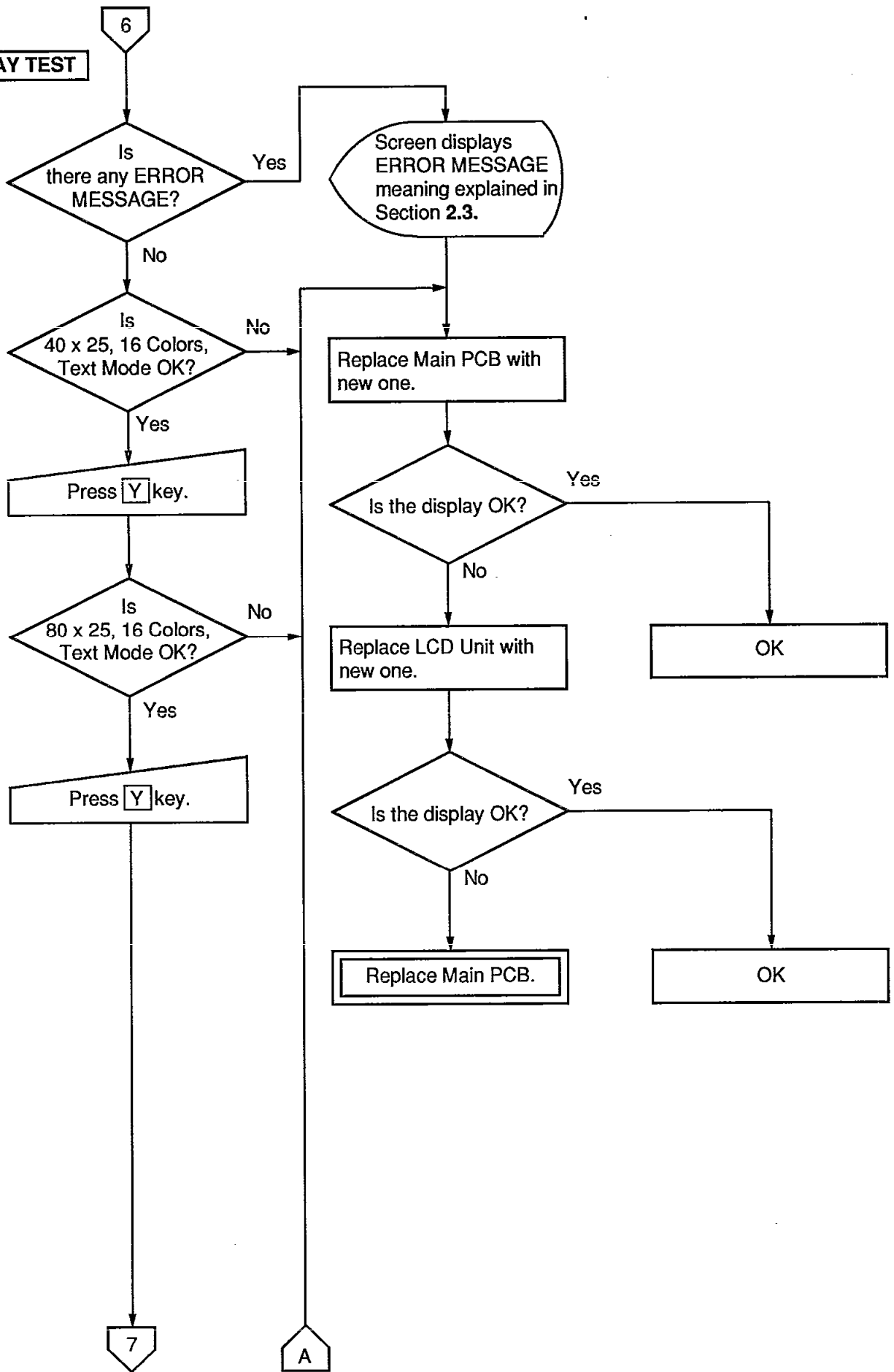
    SELECT MENU: 1
  
```

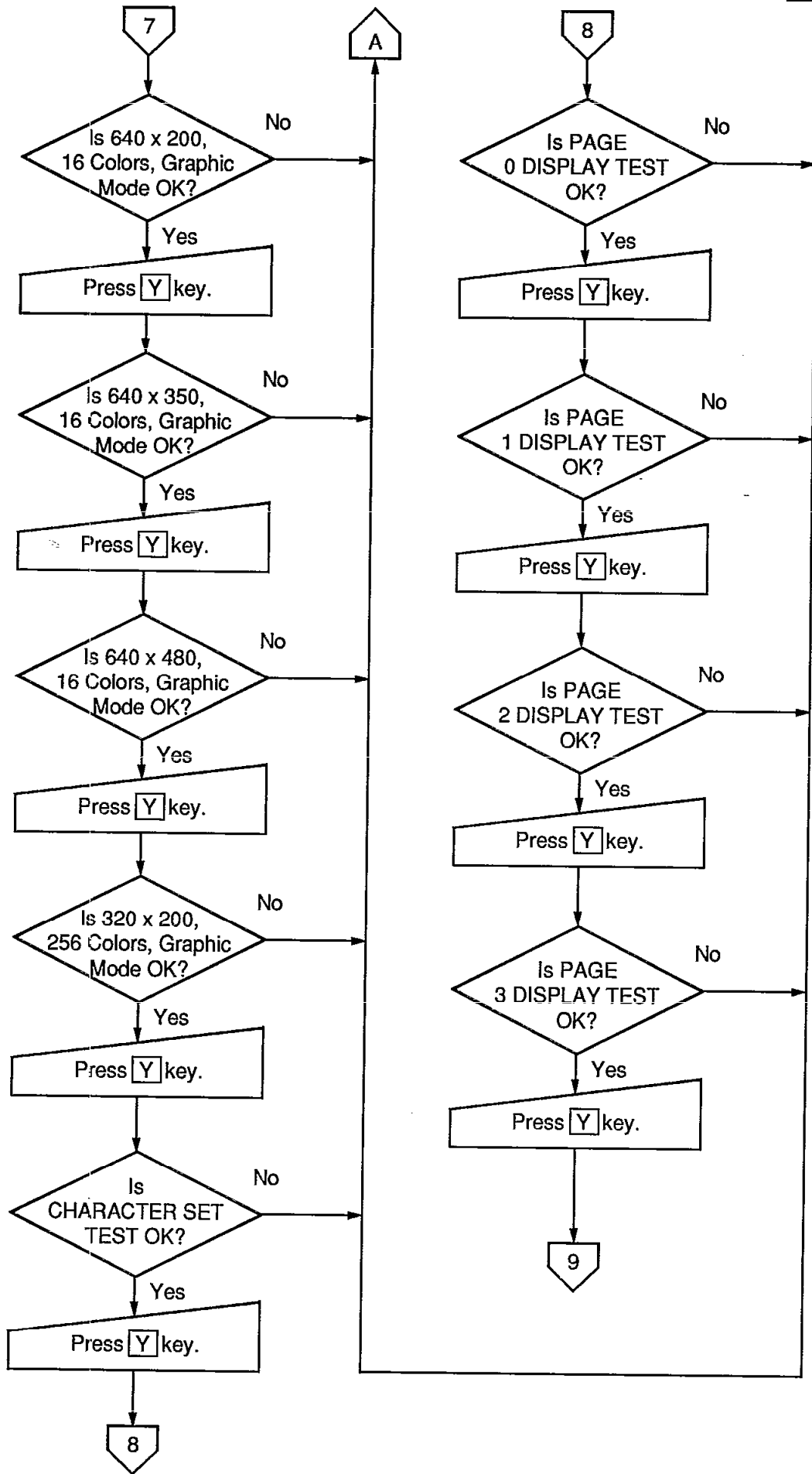


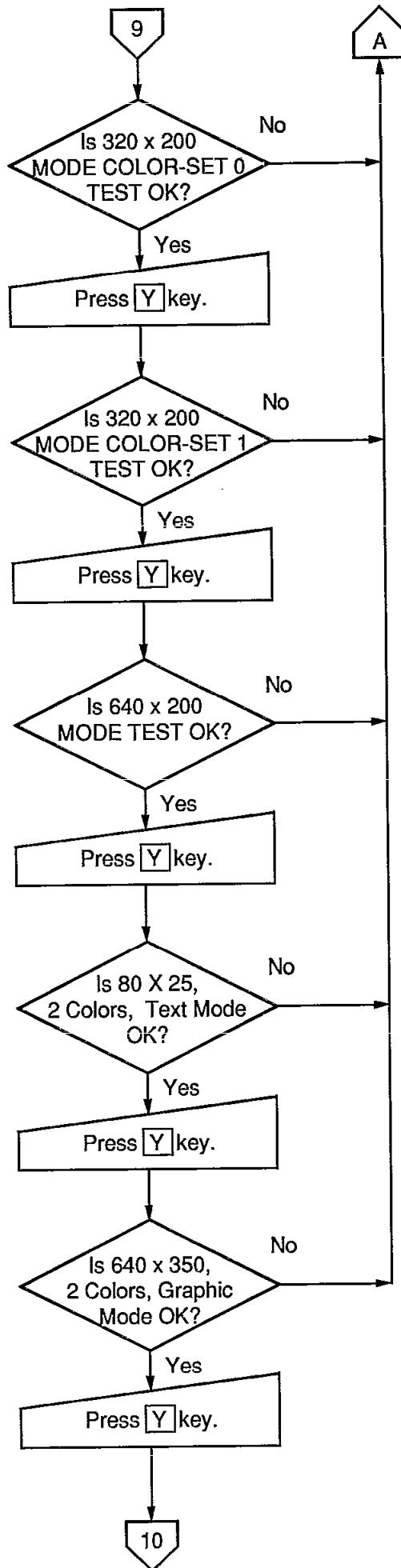


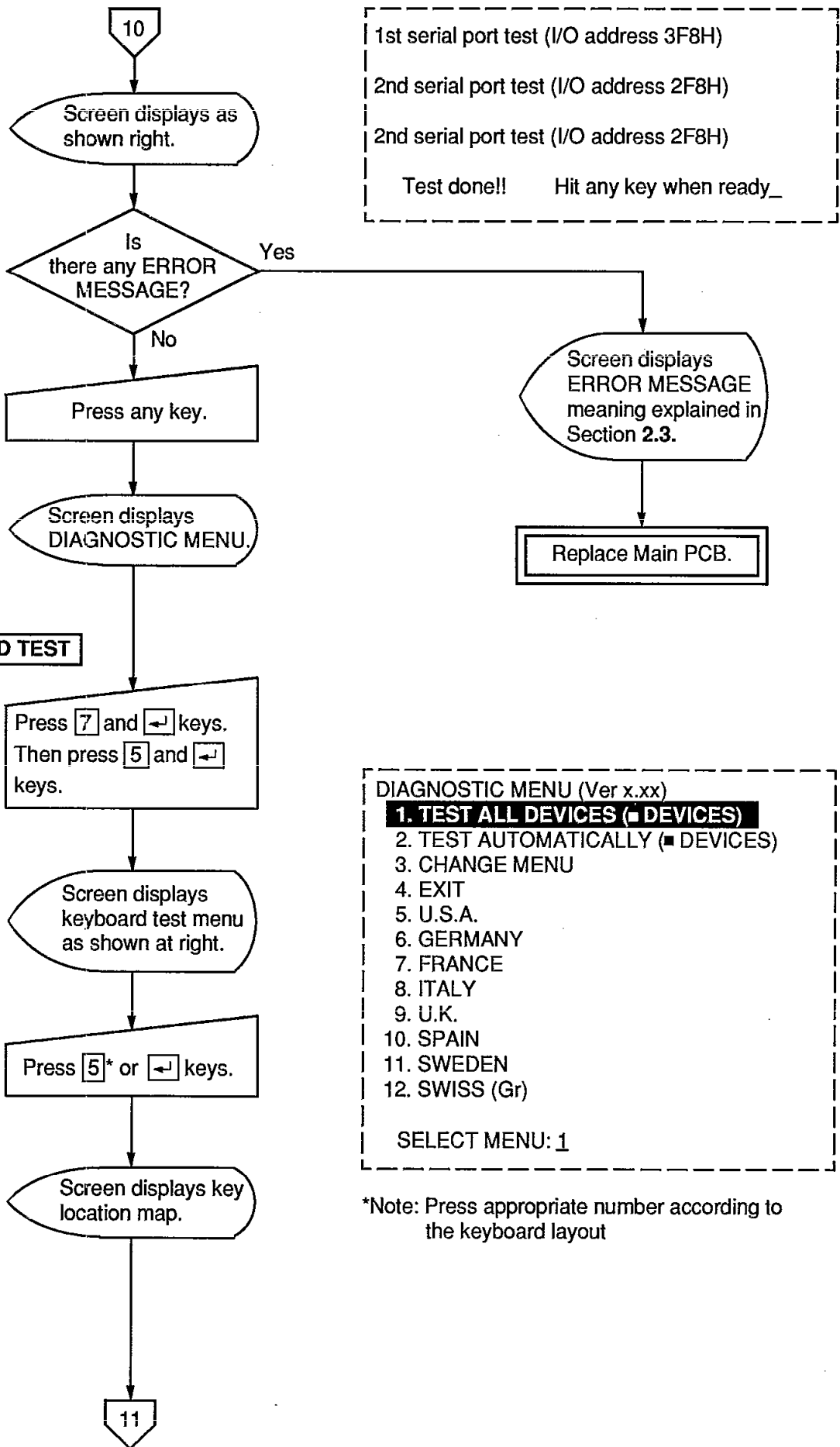


9) LCD DISPLAY TEST







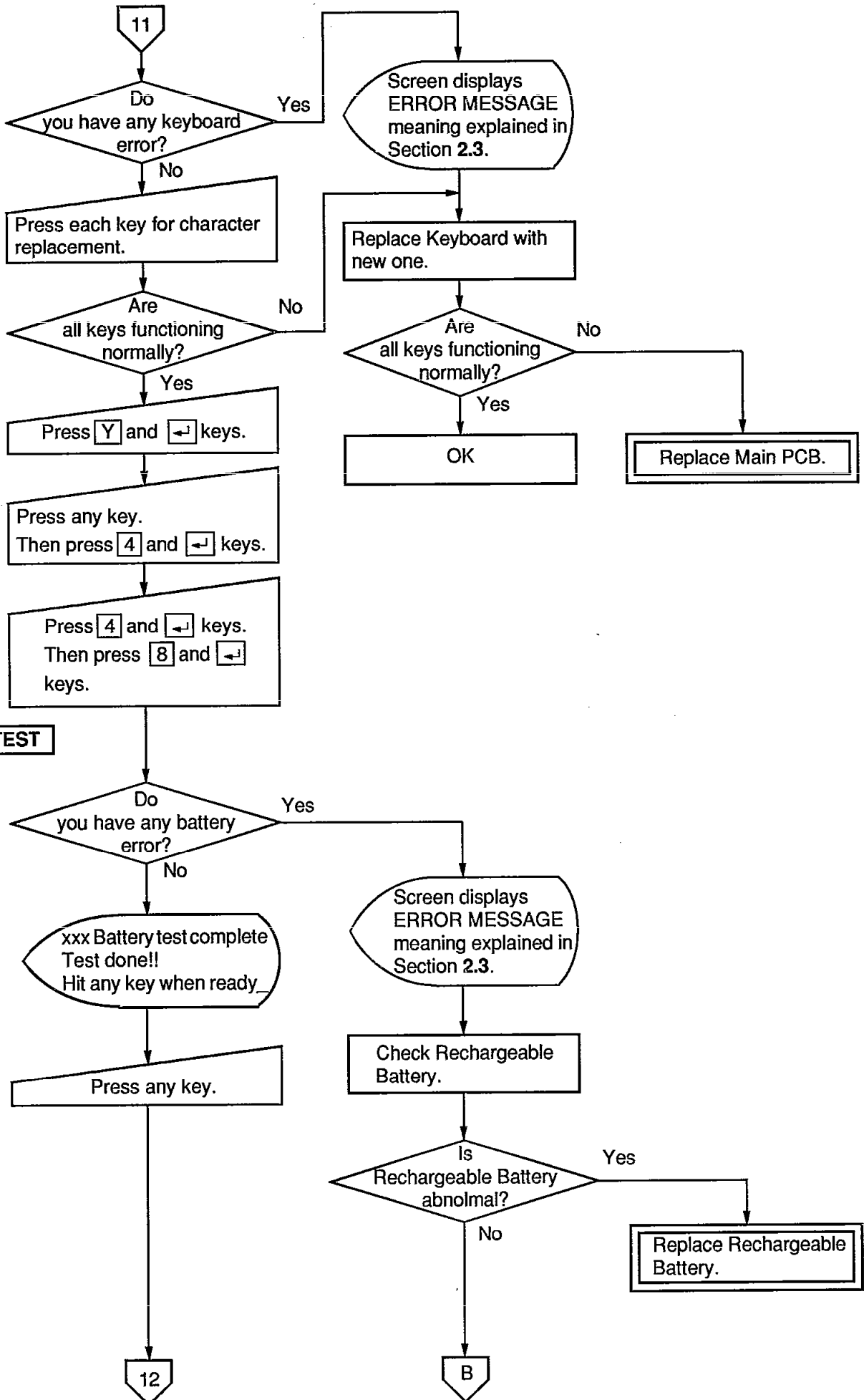


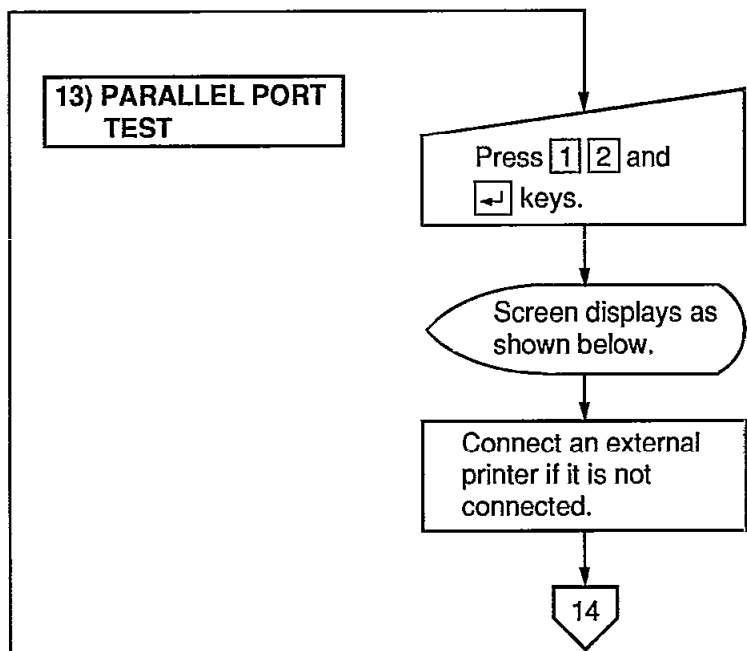
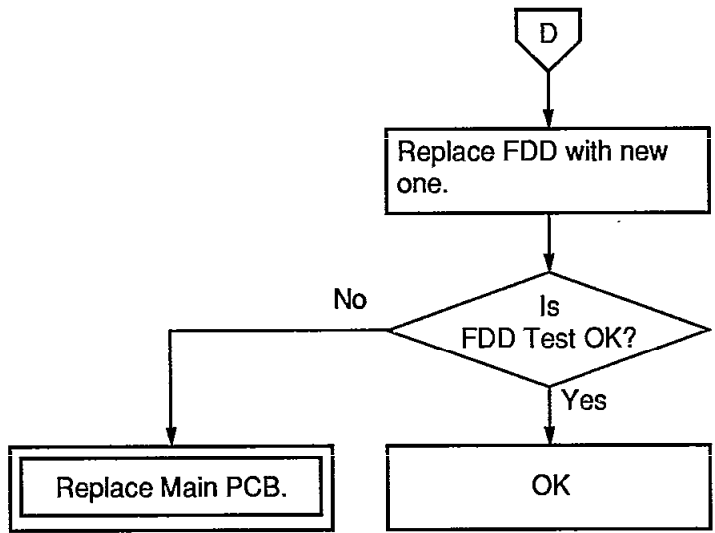
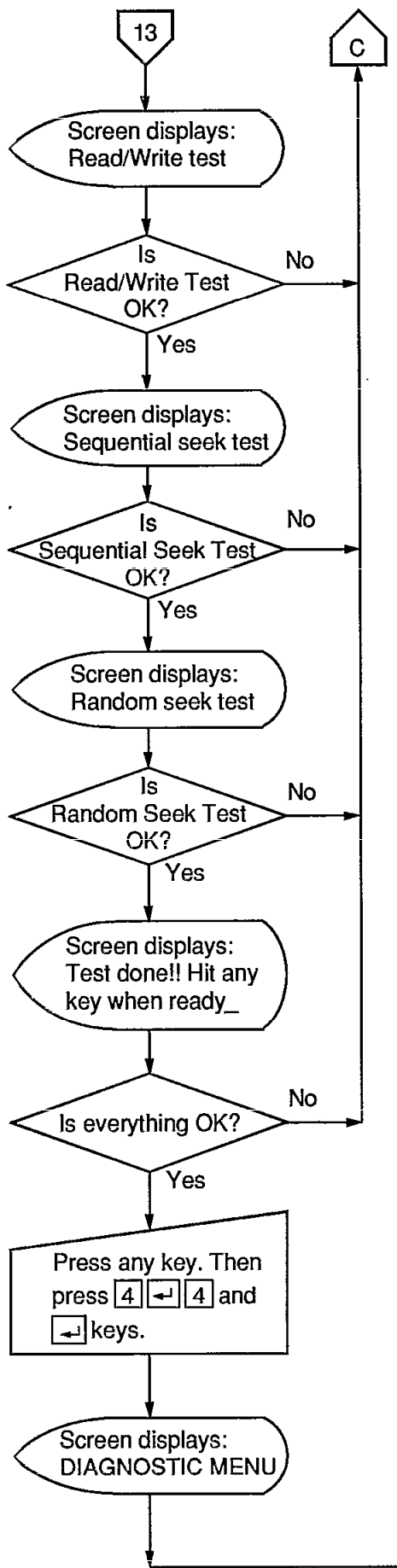
1st serial port test (I/O address 3F8H)
 2nd serial port test (I/O address 2F8H)
 2nd serial port test (I/O address 2F8H)
 Test done!! Hit any key when ready_

10) KEYBOARD TEST

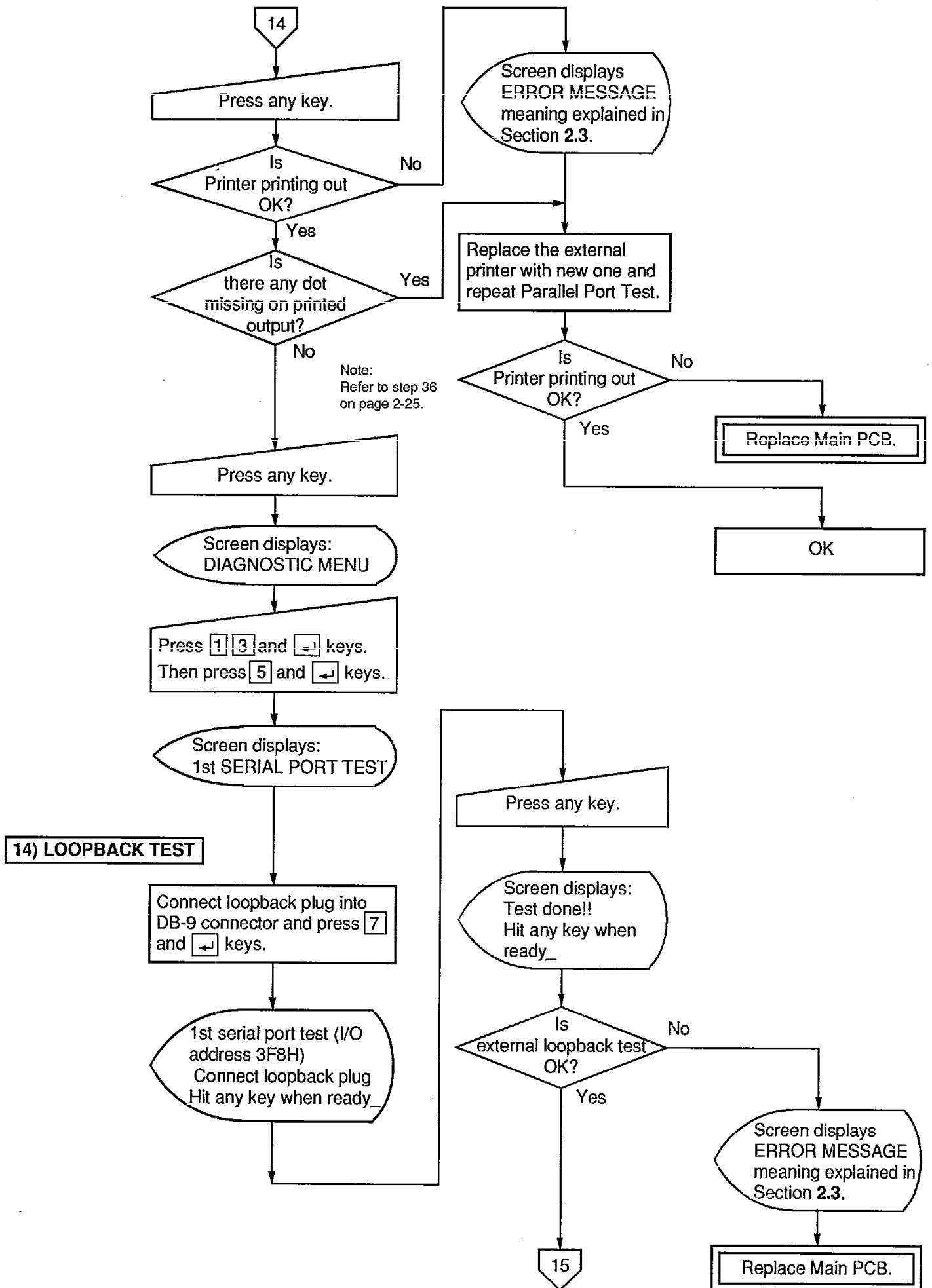
DIAGNOSTIC MENU (Ver x.xx)
1. TEST ALL DEVICES (▣ DEVICES)
 2. TEST AUTOMATICALLY (▣ DEVICES)
 3. CHANGE MENU
 4. EXIT
 5. U.S.A.
 6. GERMANY
 7. FRANCE
 8. ITALY
 9. U.K.
 10. SPAIN
 11. SWEDEN
 12. SWISS (Gr)
 SELECT MENU: 1

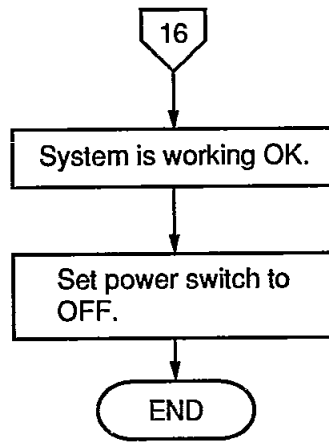
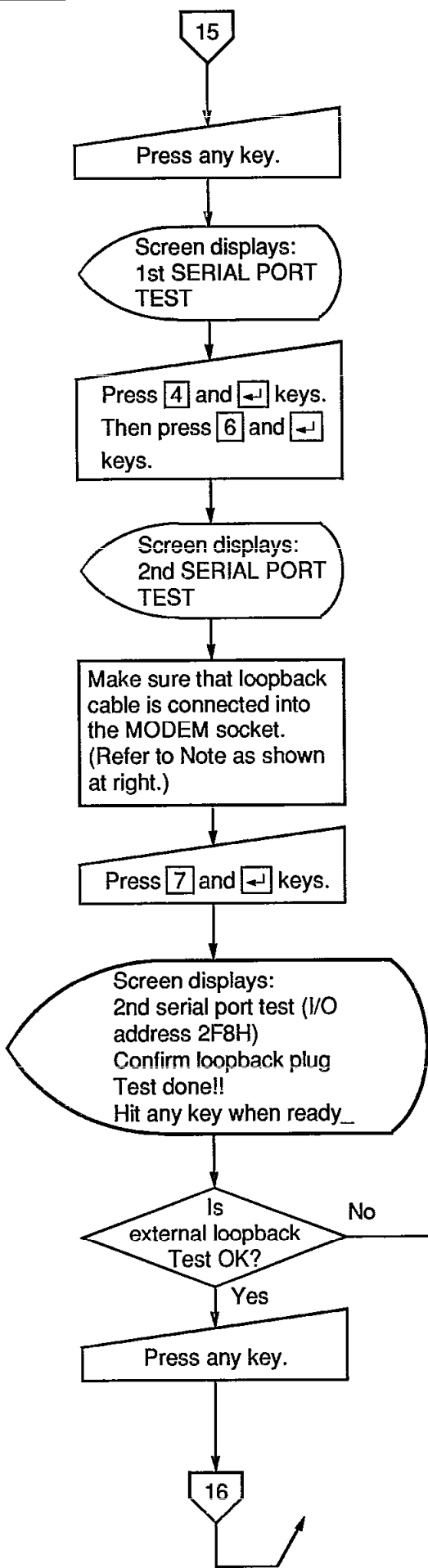
*Note: Press appropriate number according to the keyboard layout





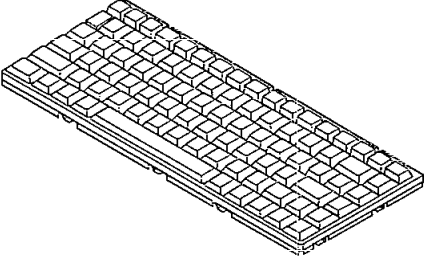
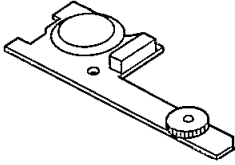
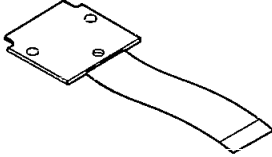
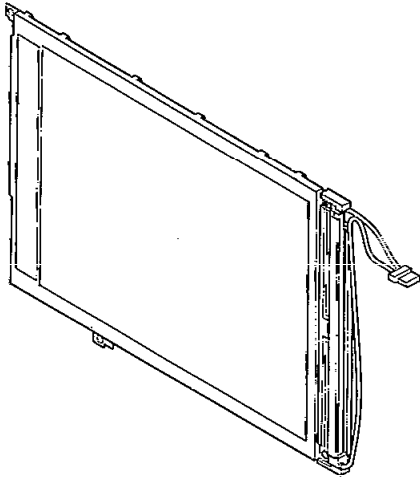
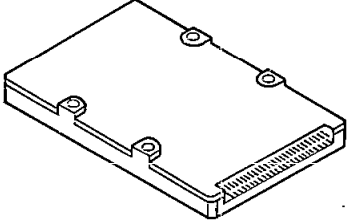
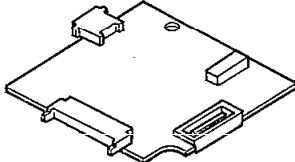
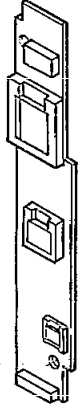
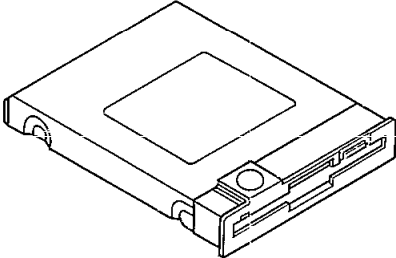
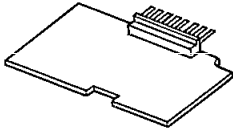
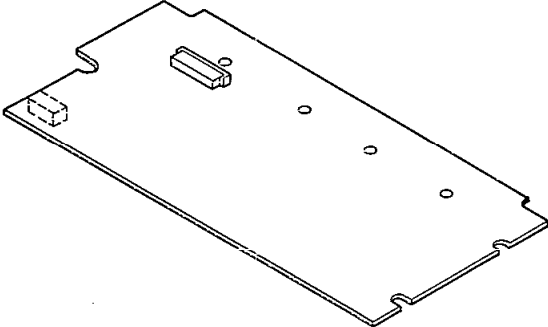
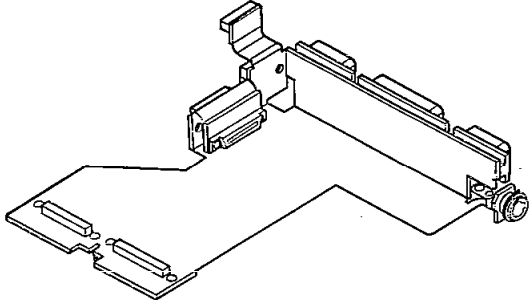
1st Parallel port test (I/O address 378H)
 Connect printer
 Hit any key when ready_





Note:
If loopback cable is not connected yet, refer to "WARNING" in 3) Preparation on page 2-18.

3.2 Appearance of Disassembled Block Unit

<p>Keyboard Ass'y</p> <p>P/N: ESU54TM418BK ... (M) ESU54TM419BA ... (E) ESU54TM419CA ... (F) ESU54TM419AA ... (G) ESU54TM419DA ... (IT) ESU54TM419EA ... (SP) ESU54TM419GA ... (SS) ESU54TM419FA ... (SW)</p> 	<p>LED Indicator/LCD Contrast Control PCB Ass'y</p> <p>P/N: DL3U20548AAA</p>  <p>MODEM Extension PCB Ass'y</p> <p>P/N: DL3UP0550AAA</p> 	<p>LCD Unit</p> <p>P/N: DFADLM64P861</p> 
<p>HDD Unit</p> <p>P/N: DFJH011ZA-S</p> 	<p>Power Control PCB Ass'y</p> <p>P/N: DL3U10548AAA</p> 	<p>FL Inverter PCB</p> <p>P/N: DFWP0041ZAY</p> 
<p>FDD Pack</p> <p>P/N: EME279MCC</p> 	<p>DC-DC Converter PCB</p> <p>P/N: DFWP0042ZAY</p> 	
<p>Main PCB Ass'y</p> <p>P/N: DFVV48C0208 ... (M) DFVV48C0209 ... (E, F, G, IT, SP, SS, SW)</p> 	<p>Flexible PCB Ass'y</p> <p>P/N: DL3UP0549AAA</p> 	

4. Disassembly/Reassembly

Note: Before disassembling, be sure to preform the following procedures.

1. Turn the power switch off.
2. Disconnect the AC adapter and remove battery pack1 as described below.
3. Remove the FDD (Floppy Disk Drive) pack.
4. Remove the optional RAM board and MODEM card if they are installed (Refer to "Removing RAM board" and "Removing MODEM card" described below).
5. Remove battery pack 2 if it is inserted.

Caution: Please follow directions carefully.

Do not interchange screws in any part of the system.

● Removing Battery Pack 1

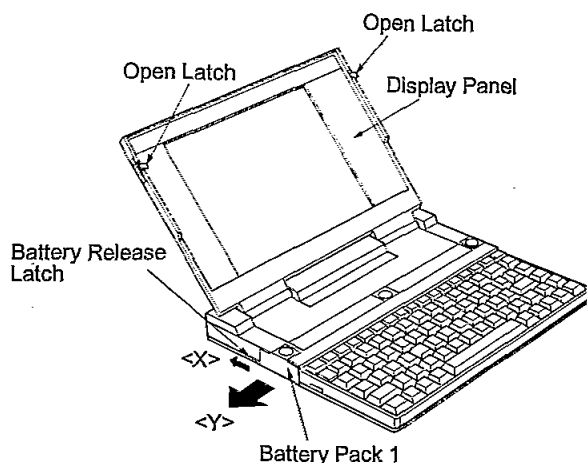


Figure 1

1. Slide the open latches on both side of the computer forward and raise the display panel.
2. While sliding the Battery Release Latch in the direction of the arrow <X>, pull out battery pack 1 in the direction of the arrow <Y> as shown in Figure 1.

● Removing FDD Pack

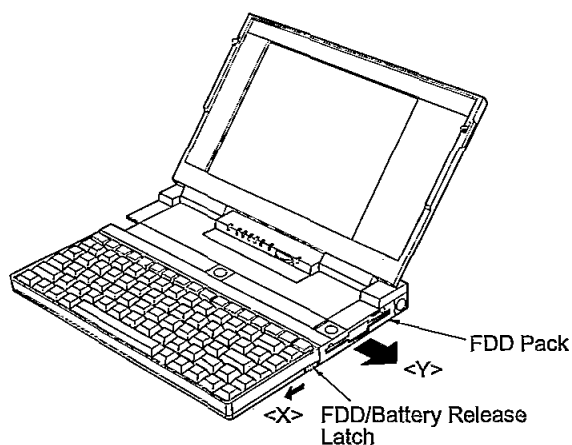


Figure 2

1. While sliding the FDD/Battery Release Latch in the direction of the arrow <X>, pull out the FDD pack in the direction of the arrow <Y> as shown in Figure 2.

Caution:

Be careful of static electricity when handling the FDD pack.
Do not touch the connector of FDD pack.

● Removing RAM Board

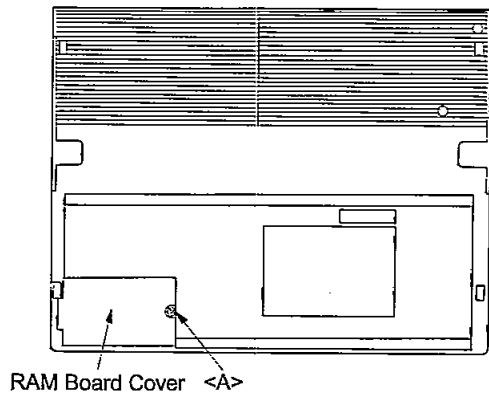


Figure 3

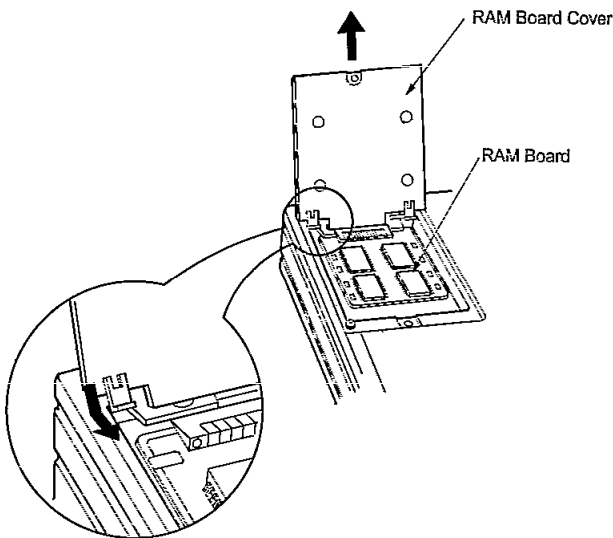


Figure 5

● Removing MODEM Card

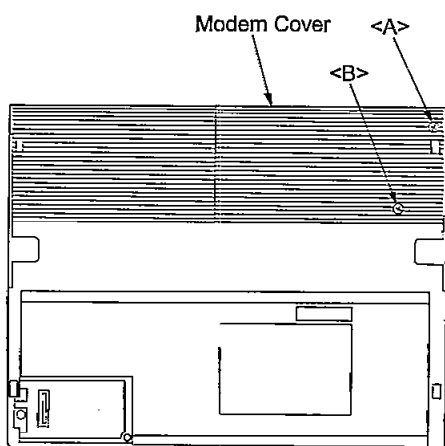


Figure 6

1. Close the display panel and turn the computer over.
2. Remove one screw <A> ($\text{Ø}2 \times 8$ mm). (Refer to Figure 3)
3. Carefully raise the RAM board cover and remove it as shown in Figure 4.

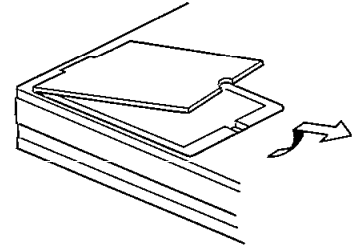


Figure 4

4. With the hooked portion of the removed cover, hook onto the edge of installed RAM board and pull directly upwards. (Refer to Figure 5)

Caution:

Do not use a lever to remove, as this can cause damage to the connector and socket.

1. Remove two screws <A> (Shaft screw) and ($\text{Ø}2 \times 8$ mm). (Refer to Figure 6)
2. Carefully raise the MODEM cover and remove it. (Refer to Figure 6)

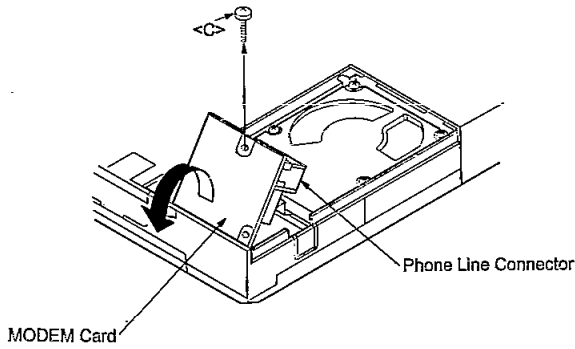


Figure 7

3. Remove the screw on the MODEM and carefully raise the MODEM. (Refer to Figure 7)

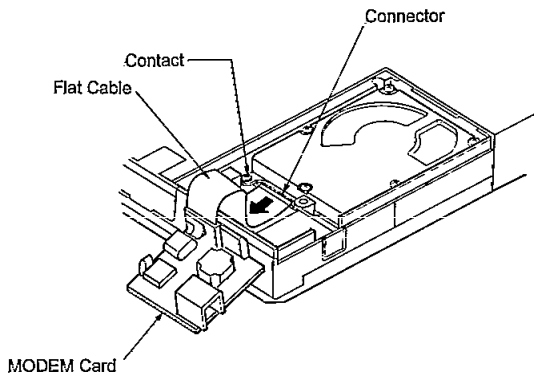


Figure 8

4. Carefully remove the flat cable from the connector. (Refer to Figure 8.)

● Removing Battery Pack 2

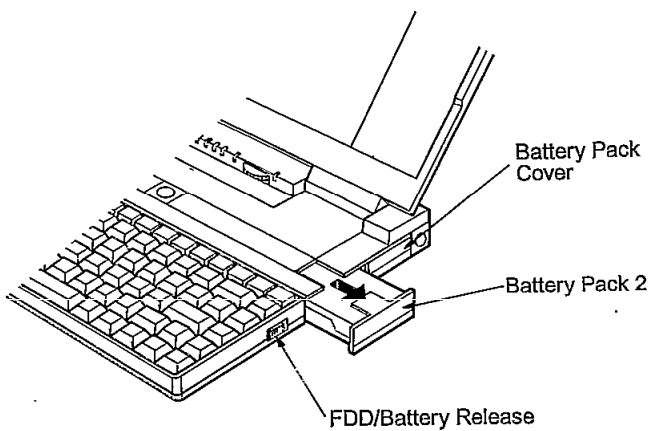


Figure 9

1. Turn the computer over again and open the display panel.
2. While sliding the FDD/Battery Release latch in the direction of the arrow <X>, pull out battery pack 2 in the direction of the arrow <Y>. (Refer to Figure 9)

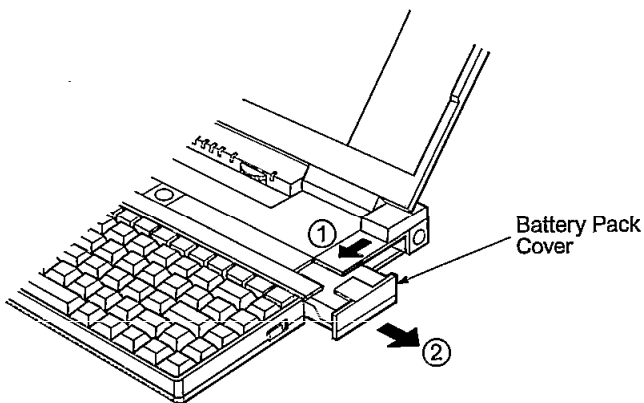


Figure 10

3. Remove the battery pack cover after sliding it toward the front of computer. (Refer to Figure 10)

4.1 HDD (Hard Disk Drive)

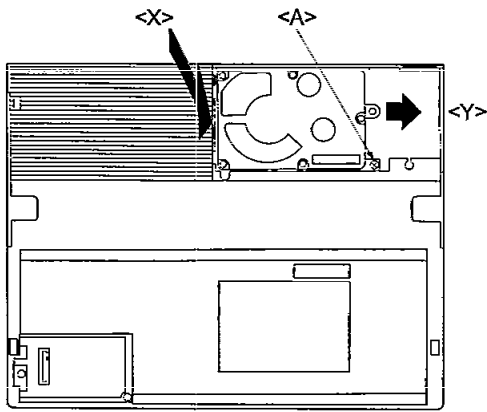


Figure 11

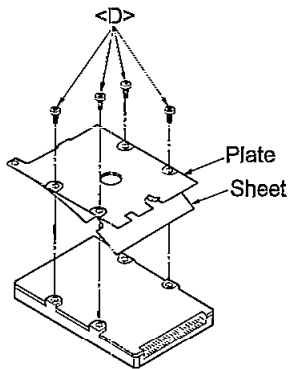


Figure 12

- (1) Close the display panel and turn over the computer.
- (2) Remove one screw <A> ($\text{Ø}2 \times 3 \text{ mm}$).
- (3) Remove HDD by pushing the HDD at the gap <X> in the direction <Y> using a flat head screw driver as shown in Figure 11.

Note:

If the MODEM is installed, remove the MODEM first then remove HDD.

- (6) Remove four screws ($\text{Ø}3 \times 5 \text{ mm}$) then remove the Plate and Sheet as shown in Figure 12.

4.2 Keyboard

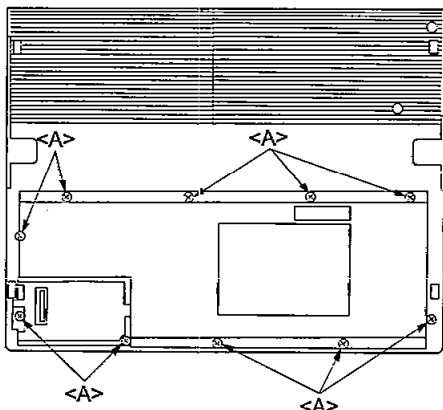


Figure 13

- (1) Remove ten screws <A> ($\text{Ø}2 \times 8 \text{ mm}$).
- (2) Turn over the computer again and open the display panel.

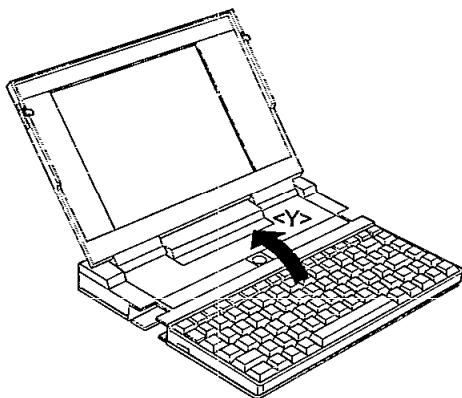


Figure 14

- (3) Raise the keyboard in the direction of arrow <Y> as shown in Figure 14.

- (4) Detach the keyboard flat cable from CN2.

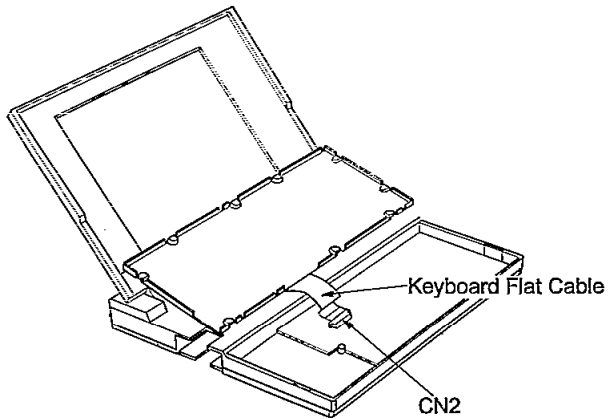


Figure 15

4.3 Main PCB

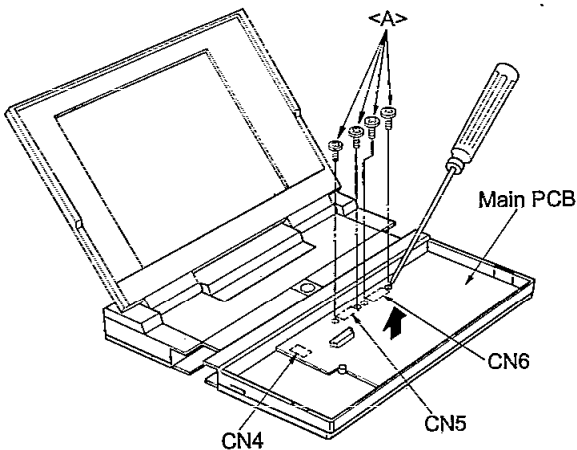


Figure 16A

- (1) After removing the keyboard, remove four screws <A> ($\text{Ø}2 \times 8 \text{ mm}$).
- (2) Detach the Main PCB taking care of the connectors (CN4, CN5, and CN6) as shown in Figures 16A and 16B.

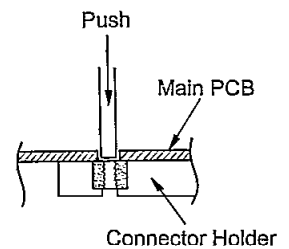


Figure 16B

Note:

When to detach CN5 and CN6, while slightly lifting up the Main PCB, push out the Connector Holder from the screw <A> holes using a flat tip tool ($\text{Ø}2$).

4.4 LED Indicator PCB

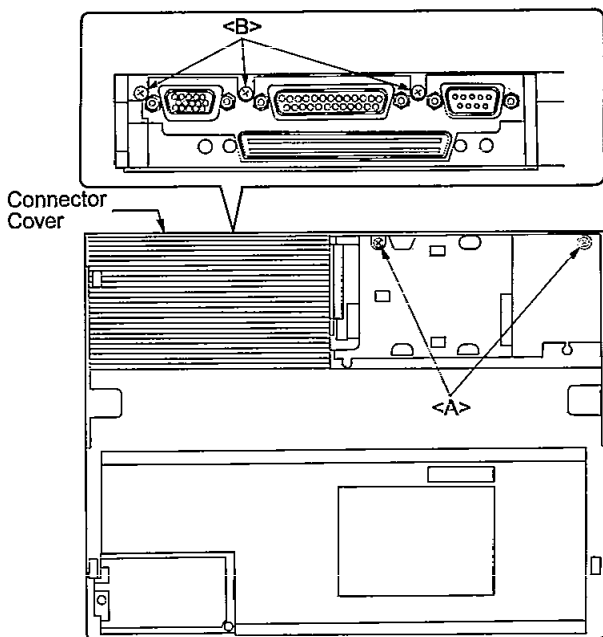


Figure 17

- (1) After removing the HDD, remove two screws <A> ($\text{Ø}2 \times 8 \text{ mm}$).
- (2) Open the connector cover and remove three screws ($\text{Ø}2 \times 3 \text{ mm}$).

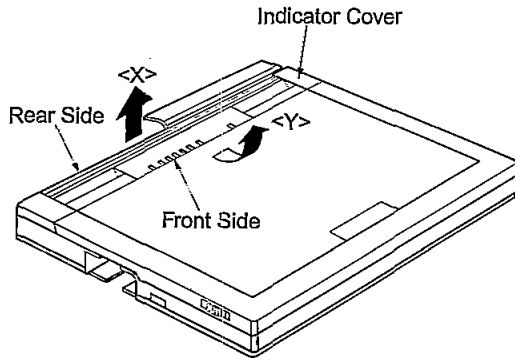


Figure 18

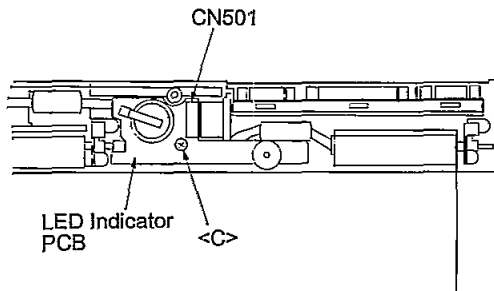


Figure 19

- (3) Turn over the computer again.
- (4) Raise the rear side of indicator cover in the direction of arrow <X>, then raise the front side of indicator cover in the direction of arrow <Y> and remove it as shown in Figure 18.

- (5) Remove one screw <C> ($\text{\O}2 \times 8$ mm) and remove the LED indicator PCB.
- (6) Detach the flat cable from CN501.
- (7) Remove the LED Indicator PCB.

4.5 Display Panel

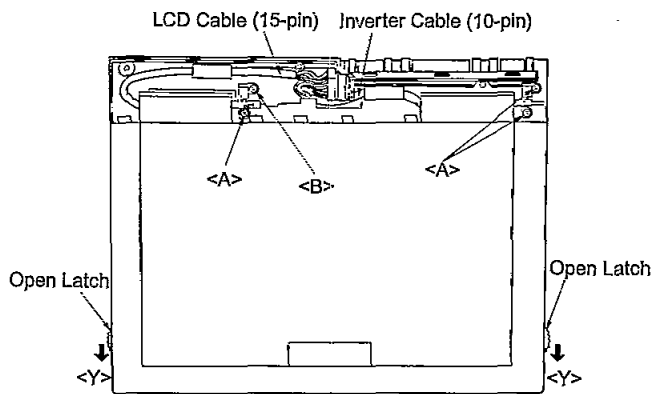


Figure 20

- (1) After removing the LED indicator PCB, detach the Inverter cable (10-pin) from CN407 and the LCD cable (15-pin) from CN406.
- (2) Remove three screws <A> ($\text{\O}2 \times 5$ mm) and one screw ($\text{\O}2 \times 8$ mm).
Note:
When reassembling, please make sure the screw ($\text{\O}2 \times 8$ mm) is in the correct location.
- (3) Slide the open latches on both sides of the computer in the direction of the arrow <Y> and remove the display panel.

4.6 Upper Cabinet, Power Control PCB, DC-DC Converter PCB and Flexible PCB Ass'y.

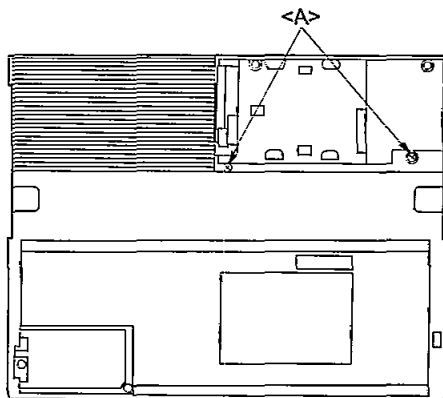


Figure 21

- (1) After removing the HDD, keyboard, main PCB, LED indicator PCB, and display panel, turn over the computer and remove two screws <A> ($\text{\O}2 \times 8$ mm).

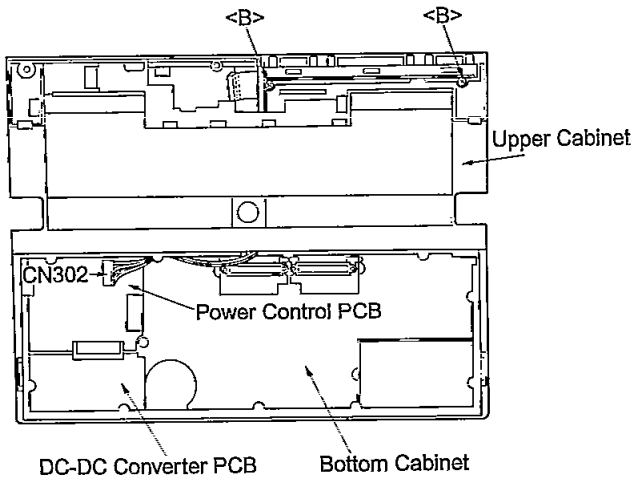


Figure 22

- (2) Turn over the computer again and remove two screws ($\text{Ø}2 \times 8 \text{ mm}$).
- (3) Detach the cable for the power switch from CN302 and raise the upper cabinet.
- (4) Remove the power control PCB and the DC-DC converter PCB.

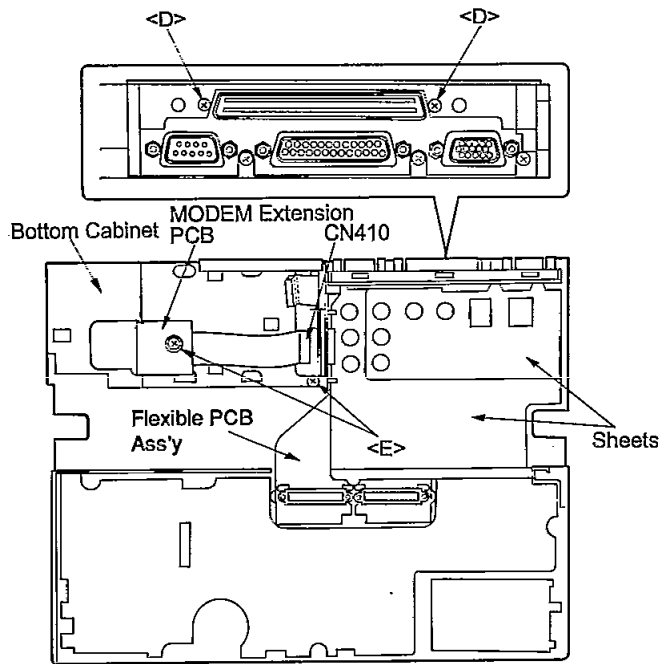


Figure 23

- (5) Remove two sheets, two screws <D> ($\text{Ø}2.6 \times 6 \text{ mm}$), and two screws <E> ($\text{Ø}2 \times 3 \text{ mm}$).
- (6) Remove the Flexible PCB Ass'y.
- (7) Detach the Flat Cable of the MODEM Extension PCB from CN410.
- (8) Remove the MODEM Extension PCB.

4.7 LCD Unit

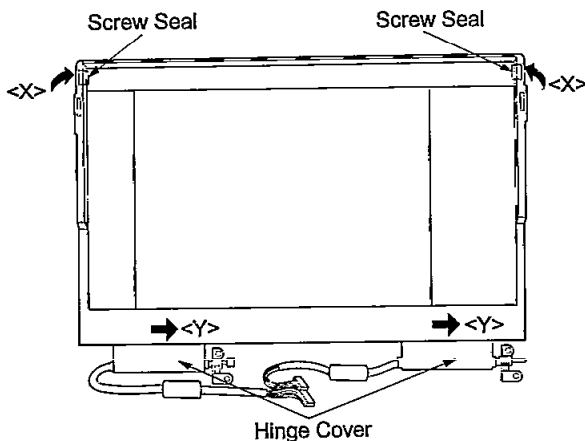


Figure 24

- (1) After removing the display panel, remove two screw seals in the direction of the arrow <X>.
- (2) Slide the hinge covers in the direction of the arrow <Y>, then remove them as shown in Figure 24.

- (3) Remove six screws <A> ($\text{Ø}2 \times 3 \text{ mm}$).

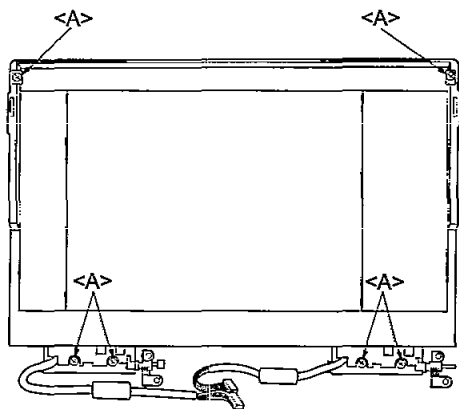


Figure 25

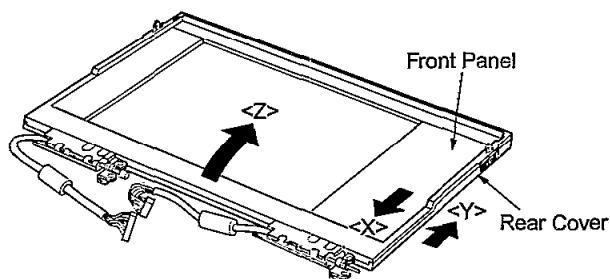


Figure 26

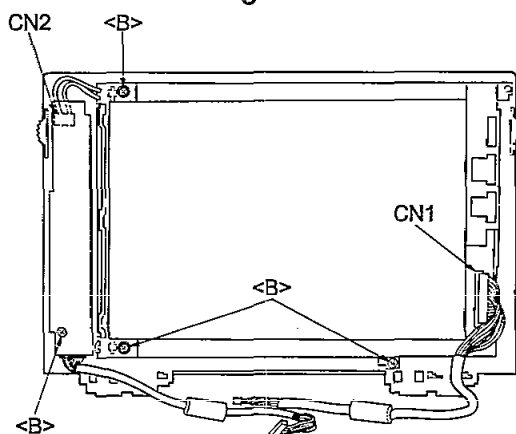


Figure 27

- (4) Sufficiently slide the Front Panel in the direction of the arrow <X> and slide the Rear Cover in the direction of the arrow <Y> alternately as shown in Figure 26.

- (5) Raise the Front of the display panel in the direction of the arrow <Z> and remove it as shown in Figure 26.

- (6) Turn over the Front panel and remove four screws ($\text{Ø}2 \times 3 \text{ mm}$).

- (7) Detach the cables for FL inverter and LCD control from CN2 and CN1.

- (8) Remove the LCD from the Front Panel.

CAUTION:

Be careful when disassembling and servicing since the LCD frame may have sharp edges.

*Reassemble in reverse order.

4.8 Backlight Lamp (Exchange)

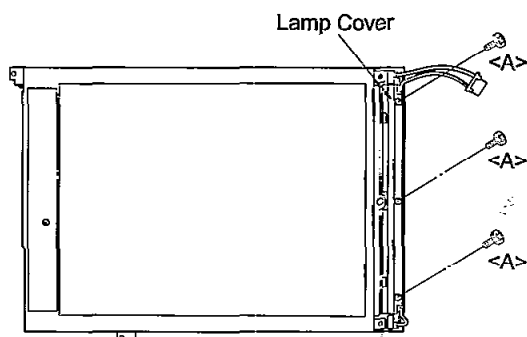


Figure 28

- (1) Remove three screws <A> and remove the Lamp Cover.

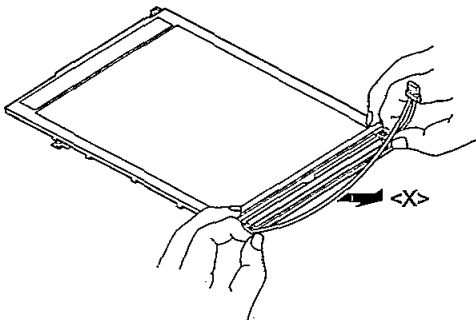


Figure 29

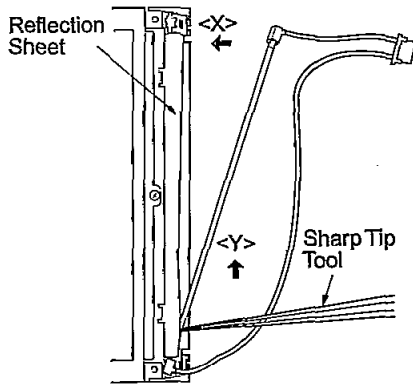


Figure 30

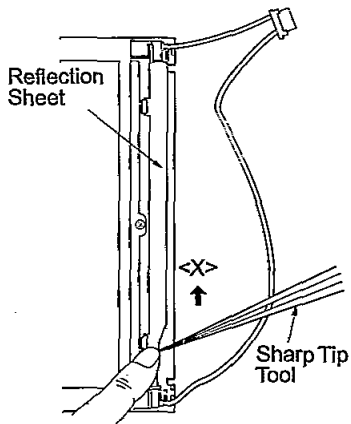


Figure 31

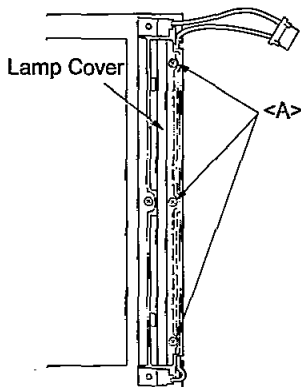


Figure 32

- (2) Remove the Lead Wires from the LCD Frame.
- (3) Remove the Lamp pulling Lead Wires while holding the LCD Frame in the direction arrow <X> as shown in the Figure 29.
- (4) Place the end of the Lamp onto the Frame underneath of the Reflection Sheet using a sharp tip tool.
- (5) While moving the Lamp in the direction <X>, cover the entire Reflection Sheet on the Lamp sliding a sharp tip tool along with the Reflection Sheet.
- (6) Put the Lamp Wires into the LCD Frame firmly.
- (7) Roll the edge of the Reflection Sheet onto the Lamp using a sharp tip tool.
- (8) While holding the rolled edge of the Reflection Sheet, move a sharp tip tool in the arrow direction <X> and roll up the entire Reflection Sheet to the Lamp.
- (9) Gently press the entire rolled Reflection Sheet to the Lamp.
- (10) Attach the Lamp Cover and tighten three screws <A>.
- (11) Tread the Wire to the opening.

5. LCD Contrast Adjustment

5.1 Test Equipment

(1) LCD Contrast Adjustment Disk (P/N: DFWV91C0015)	1 pc.
(2) AC Adapter	1 pc.
(3) Battery Pack 1	1 pc.

(Note: Be sure that Main Battery Pack is fully charged.)

5.2 Adjustment Methods

Note:

The following adjustment should be performed at an environmental temperature of 77°F (25°C).

Preparation:

- Attach the fully charged battery pack.
- Connections should be made as shown in Figure 1.
- Turn the LCD Contrast Control to roughly middle position.

Note:

Three turns a total, so about one and half turns would be a middle position.

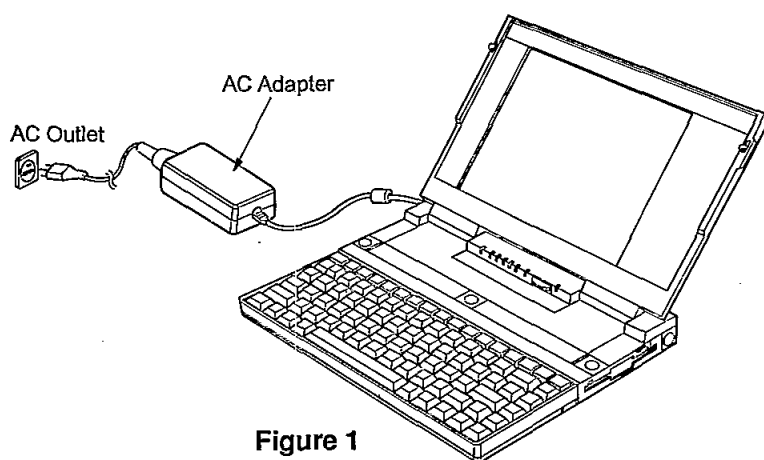


Figure 1

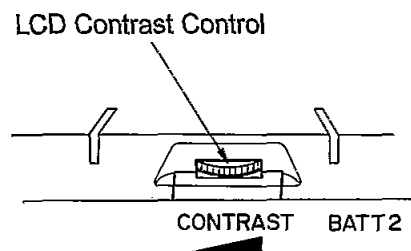


Figure 2

Procedure:

- (1) Insert the LCD contrast adjustment disk to FDD.
- (2) Press the power switch to turn ON the computer and press the reset button.
- (3) Set the backlight brightness into "High".
(Select brightness by using Fn+F6 keys.)
- (4) Confirm that the screen displays test graphic pattern as shown in Figure 3 on next page.
- (5) Carefully adjust the screen contrast by pressing "←" and "→" keys to obtain the best contrast.
- (6) Fully turn the LCD Contrast Control to the left (and right) and check if the test pattern goes off on brighter (and darker) background.
- (7) Press "Space" key.
- (8) Press "Y" key. (Or press "N" key if readjustment is required and repeat from step (5).)
- (9) The LCD screen displays as shown in Figure 4 on next page.
- (10) Press "Y" key. (Or press "N" key if you want exit.)
- (11) The LCD screen displays as shown in Figure 5 on next page.
- (12) LCD contrast adjustment is completed and the computer will be rebooted. Thus, remove the LCD contrast control disk from the FDD.

Note:

If LCD contrast adjustment fails, be sure whether a +12V VP12 is supplied from pin 1 of IC309 (Regulator) or not. The +12V VP12 is output when "Y" is pressed at step (10) in this adjustment.

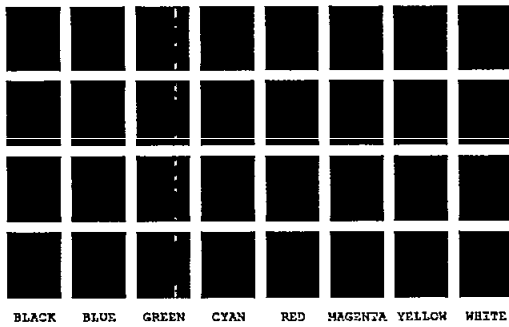


Figure 3

```
A>REM ** write to flash ROM **
A>FLASH100 FLASH1.BIN

Flash ROM Erase and Write.
Continue (Y/N)?
```

Figure 4

Erasing & programming FLASH...please wait

Figure 5

6.How to Identify The BIOS Version

When you need to identify the BIOS version for servicing perform the following procedures :

Note:

The following procedure can be used with CF-1000 (monochrome LCD version).

Procedure:

- 1) Press the power switch to turn ON the computer.
- 2) Type the keys listed in Table 1 with executing "DEBUG.EXE" stored on the DOS directory of drive "C:".
- 3) Read the BIOS version number in the manner described in Table 2.

Table 1

Key Operations	Displayed Messages
D E B U G Enter	C:\ >DEBUG
D Space E 0 0 0 Shift + : D F F 5 Space L 3 Enter	-D E000:DFF5 L3 E000:DFF5 XX XX XX
Q Enter	-Q

Table 2

-D E000:DFF5 L3			
E000:DFF5	XX	XX	XX

BIOS Version No. ↓ ↓ ↓
 XX XX LXX

Example:

Displayed No. 01 00 10
 ↓ ↓ ↓
 BIOS Version No. 1. 00 L10

In this case, BIOS Version No. is "1.00L10".

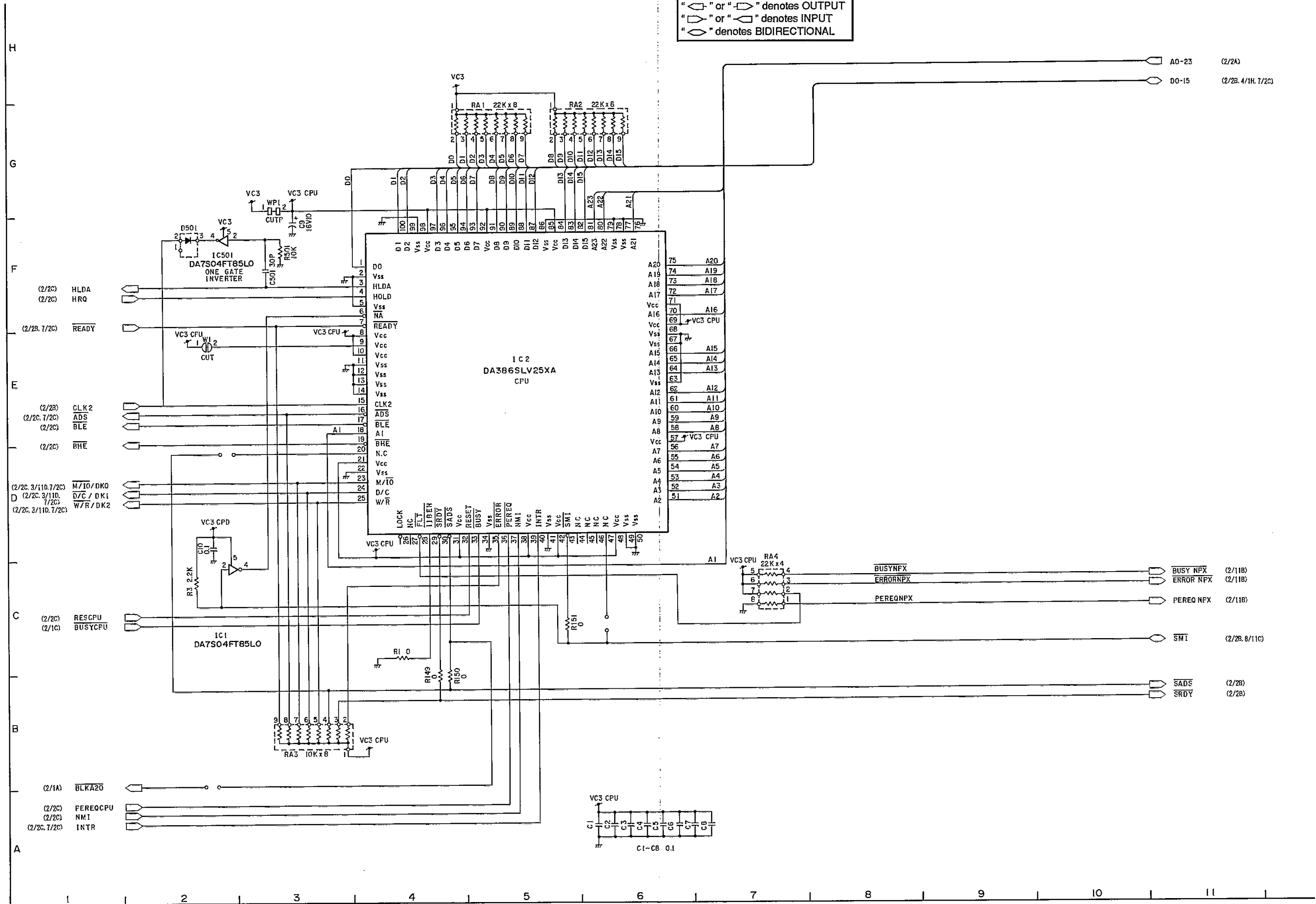
7.2 Schematic Diagrams

(1) Main PCB, CPU Circuit (Sheet No. 1 of 13)

CF-1000

CF-1000

Notes: 3/11E
 Grid Location
 Sheet No.
 "○" or "◻" denotes OUTPUT
 "◻" or "◻" denotes INPUT
 "◻" denotes BIDIRECTIONAL

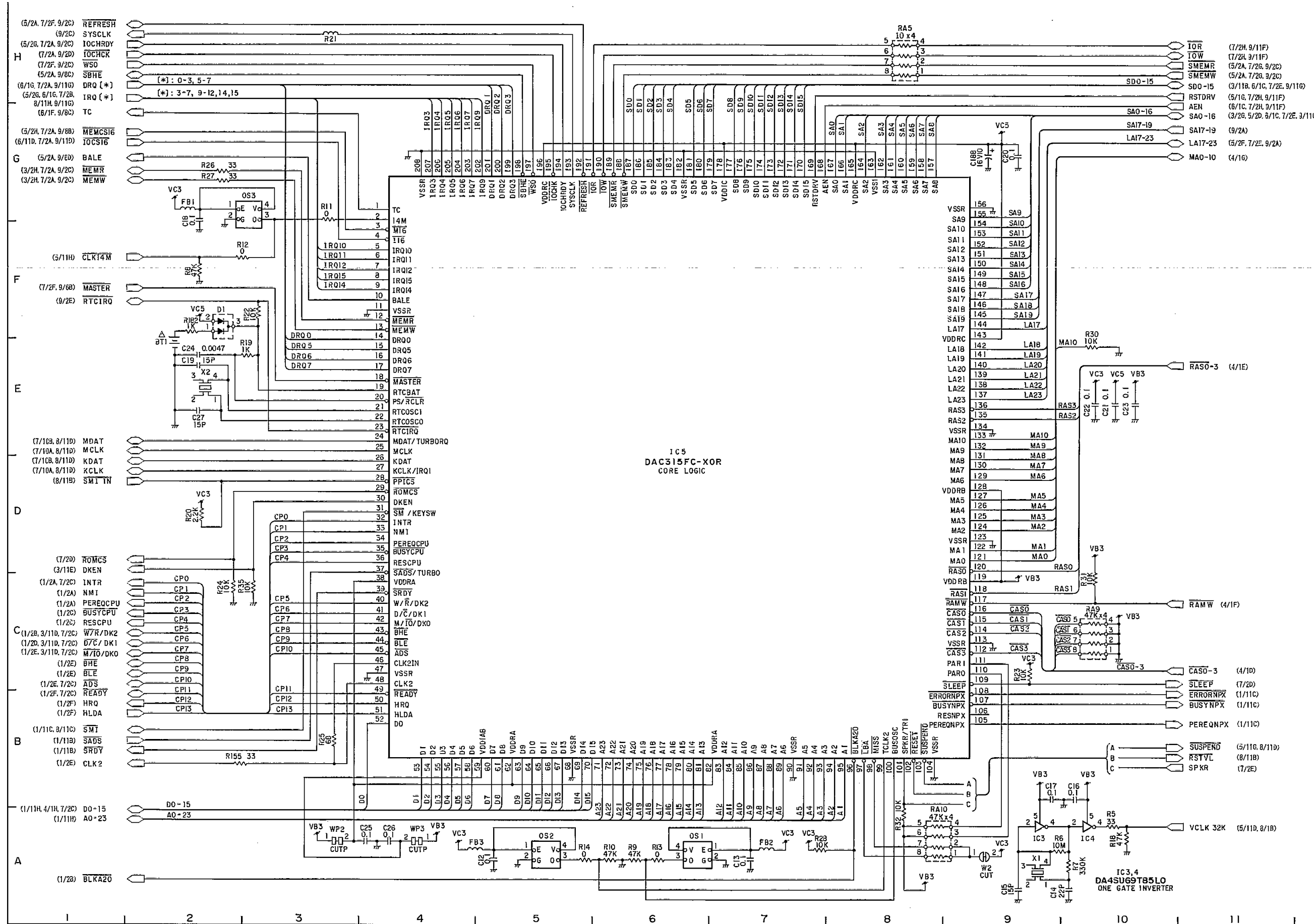


(2) Main PCB, Core Logic and Clock Generator Circuits (Sheet No. 2 of 13)

CF-1000

CF-1000

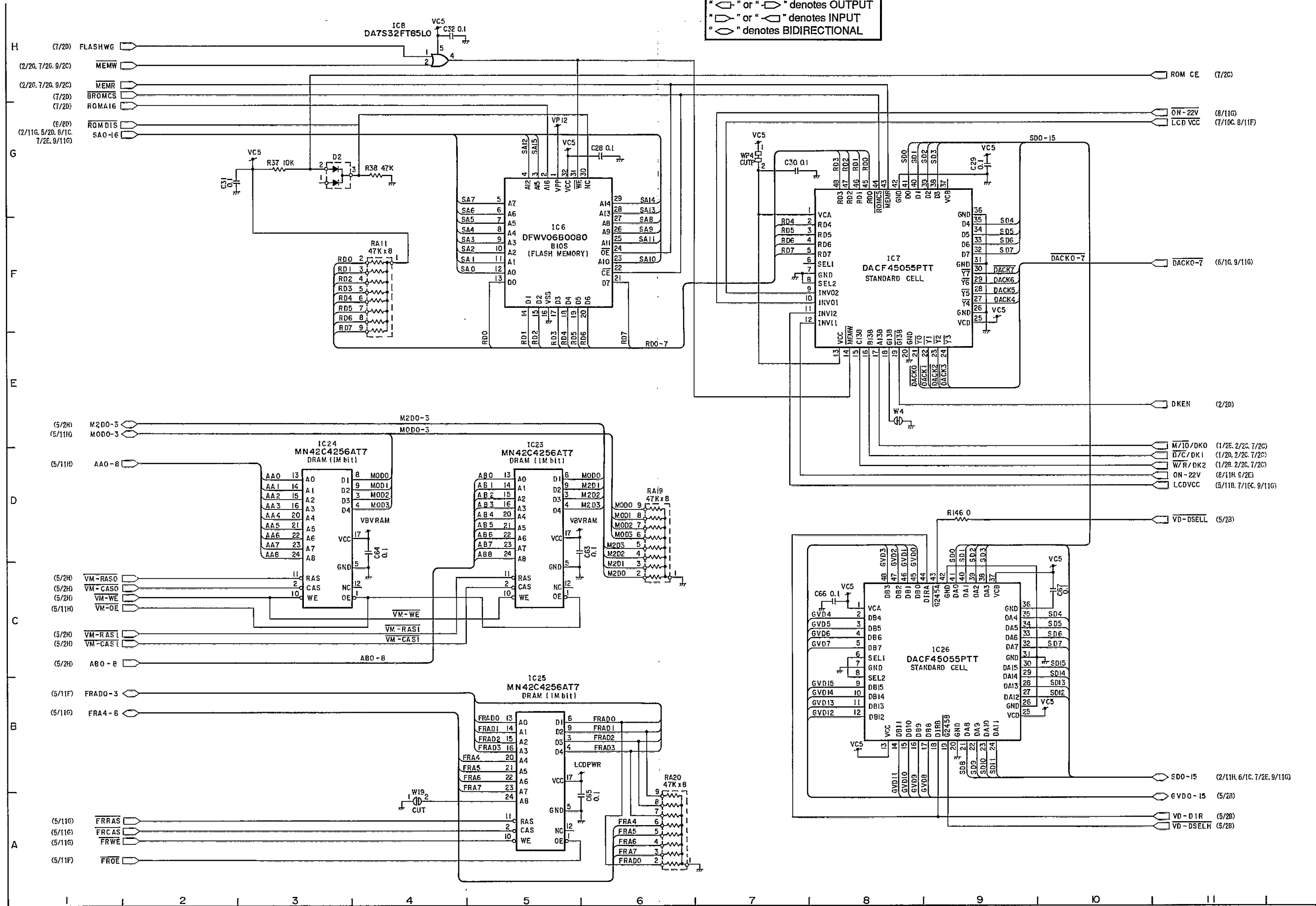
Notes: 3/11E
 Grid Location " " or " " denotes OUTPUT
 Sheet No. " " or " " denotes INPUT
 " " denotes BIDIRECTIONAL



(3) Main PCB, FLASH Memory (BIOS), VRAM and Frame Memory Circuits (Sheet No. 3 of 13)

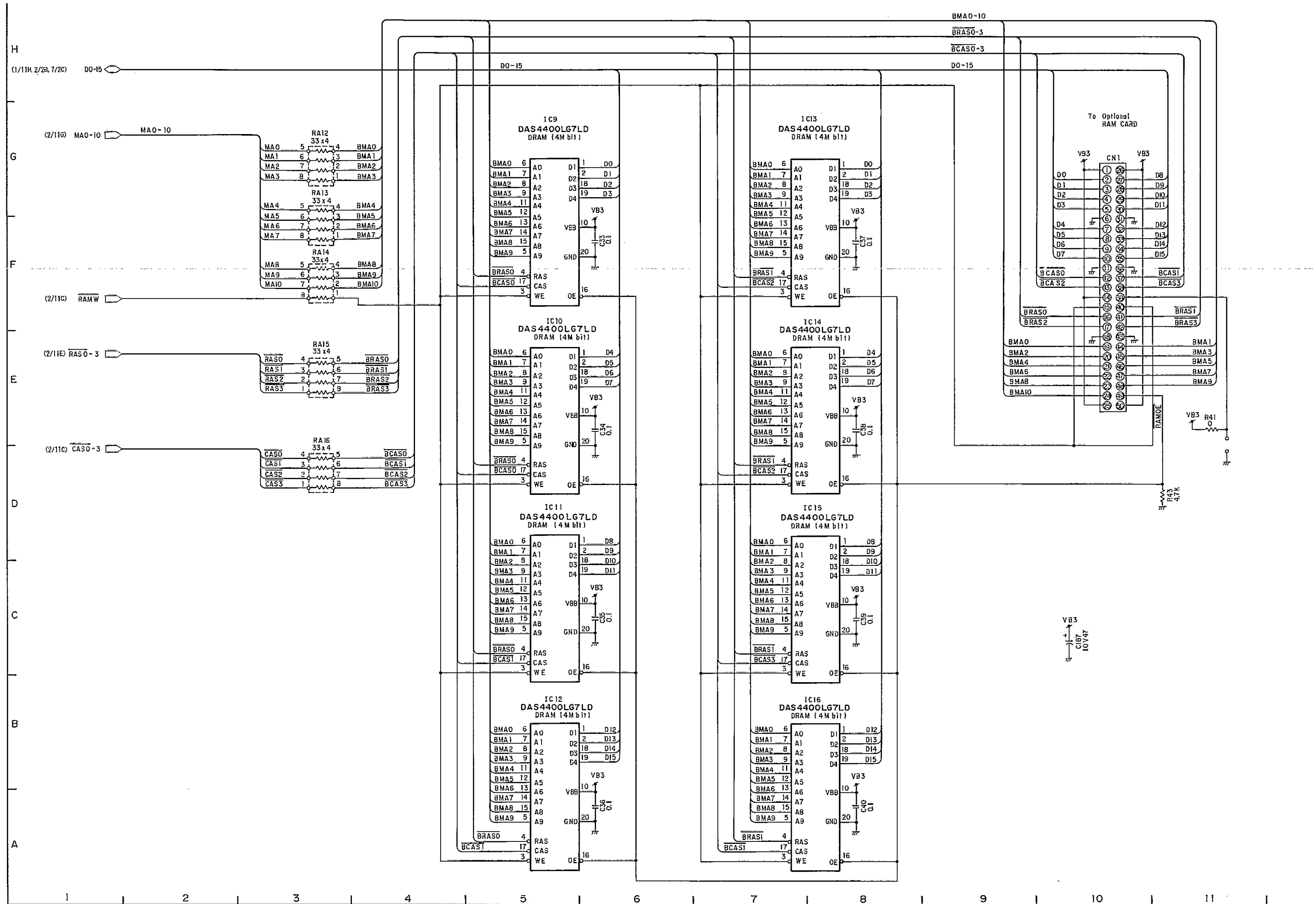
Notes: 3/11E
 → Grid Location
 → Sheet No.

* ⊕ or ⊖ denotes OUTPUT
 ⊕ or ⊖ denotes INPUT
 ⊕ ⊖ denotes BIDIRECTIONAL



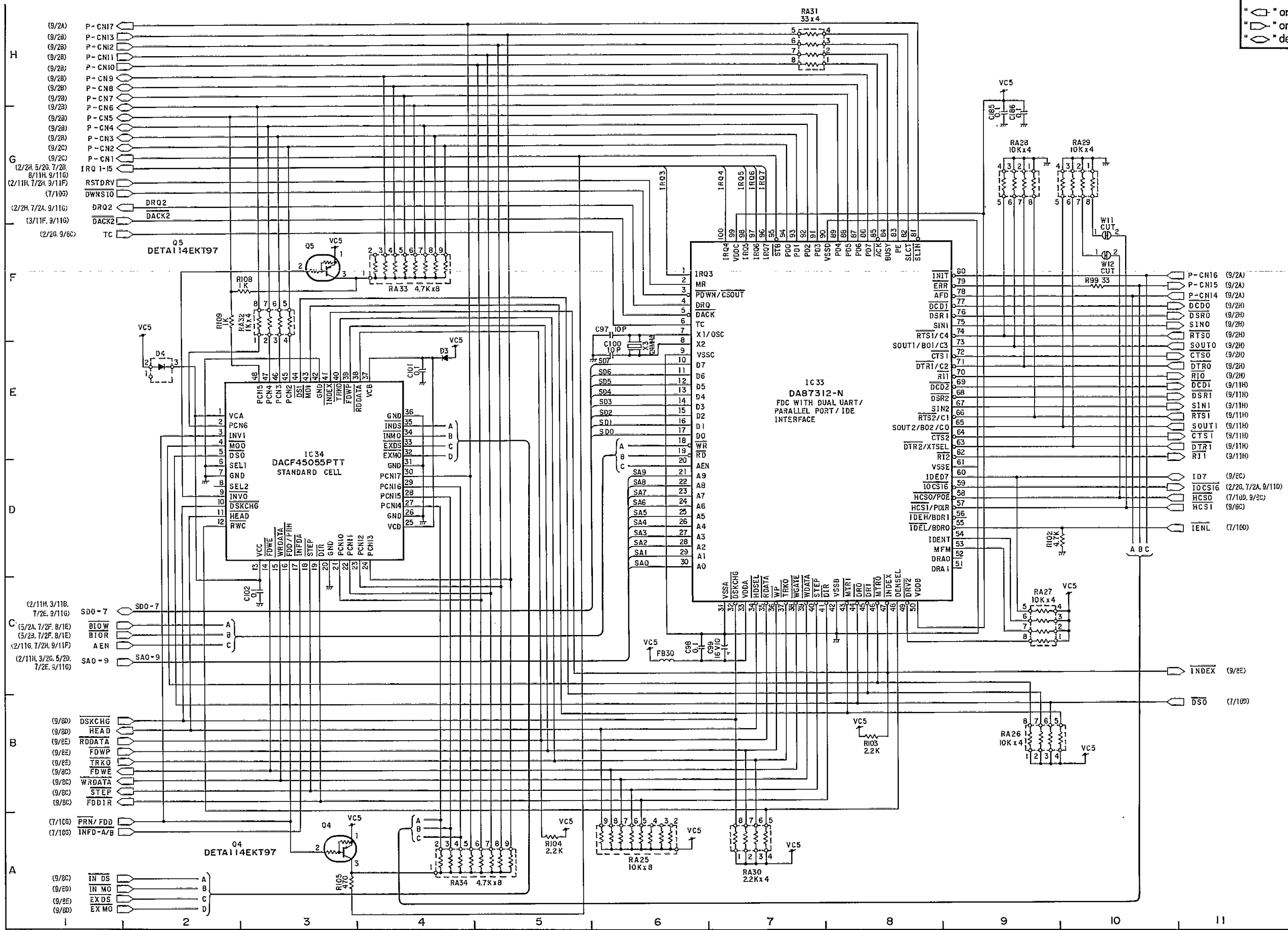
(4) Main PCB, DRAM Circuit (Sheet No. 4 of 13)

Notes: 3/11E
 → Grid Location
 → Sheet No.
 "○" or "◊" denotes OUTPUT
 "◊" or "◊" denotes INPUT
 "◊" denotes BIDIRECTIONAL



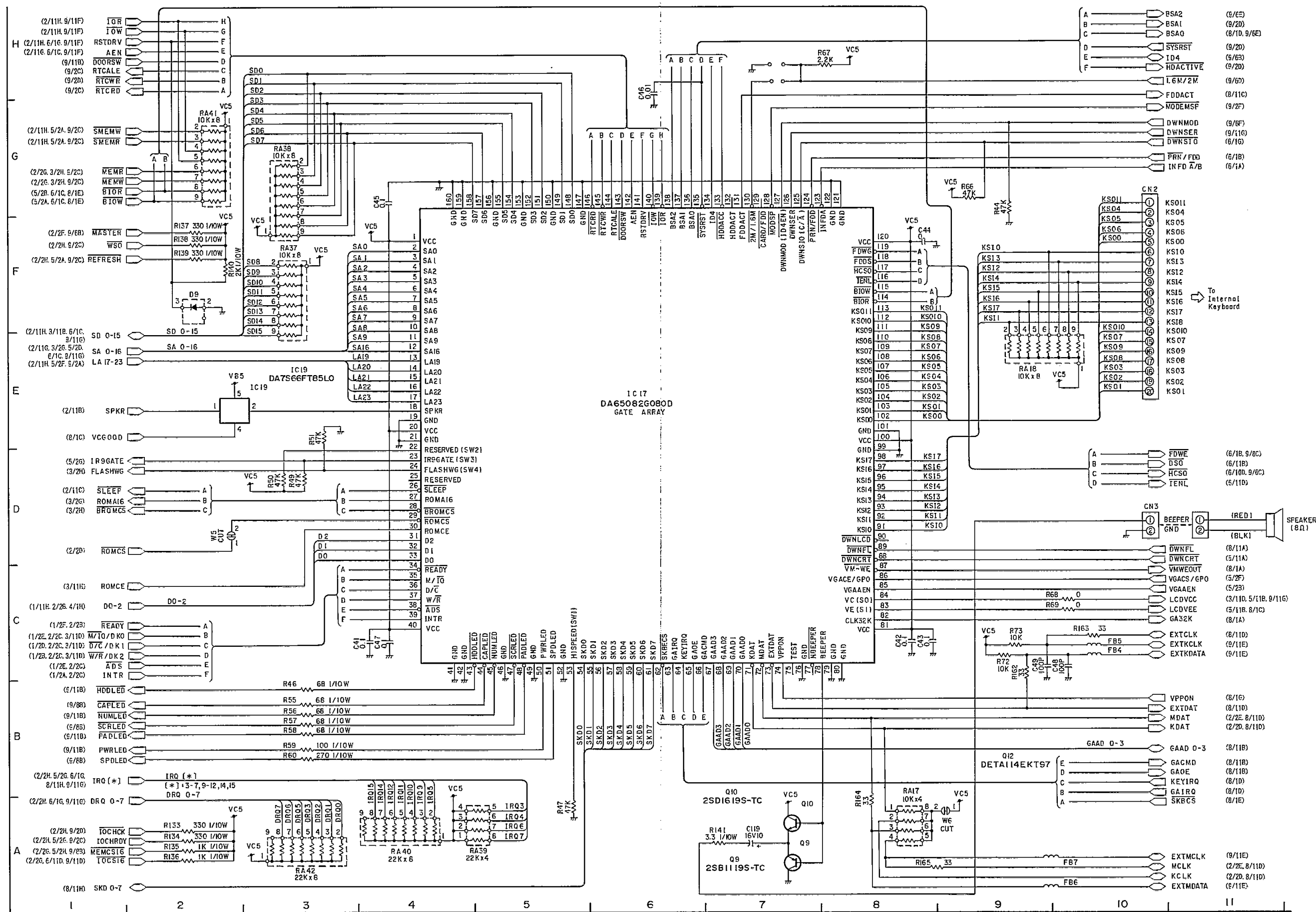
(6) Main PCB, FDC and I/O Control Circuits (Sheet No. 6 of 13)

Notes: 3/11E
 → Grid Location
 → Sheet No.
 "◁" or "▷" denotes OUTPUT
 "◁" or "▷" denotes INPUT
 "◁▷" denotes BIDIRECTIONAL



(7) Main PCB, Gate Array and Speaker Circuits (Sheet No. 7 of 13)

Notes: 3/11E
 Grid Location "◇" or "◇" denotes OUTPUT
 "◇" or "◇" denotes INPUT
 Sheet No. "◇" denotes BIDIRECTIONAL

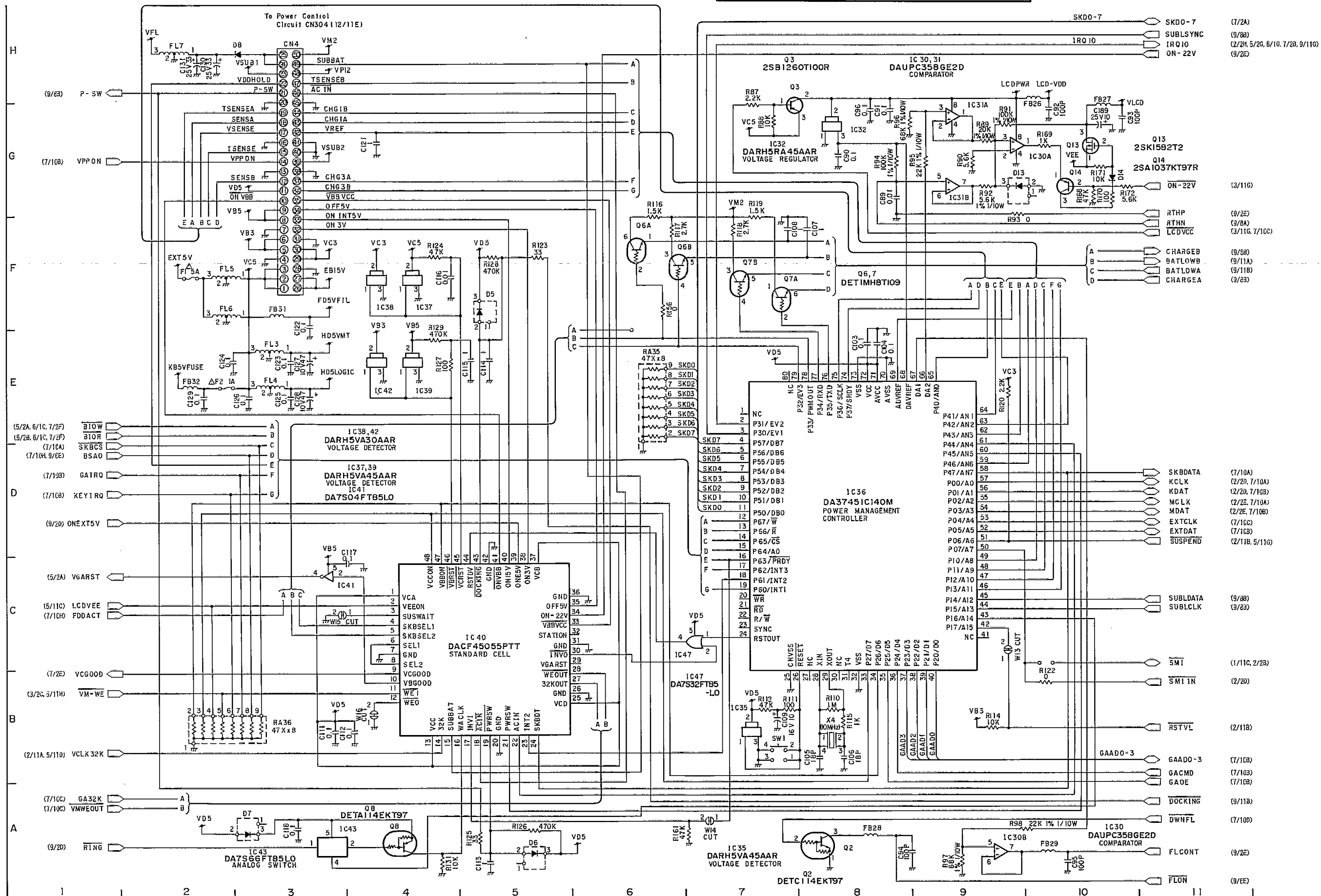


(8) Main PCB, Power Management Controller Circuit (Sheet No. 8 of 13)

CF-1000

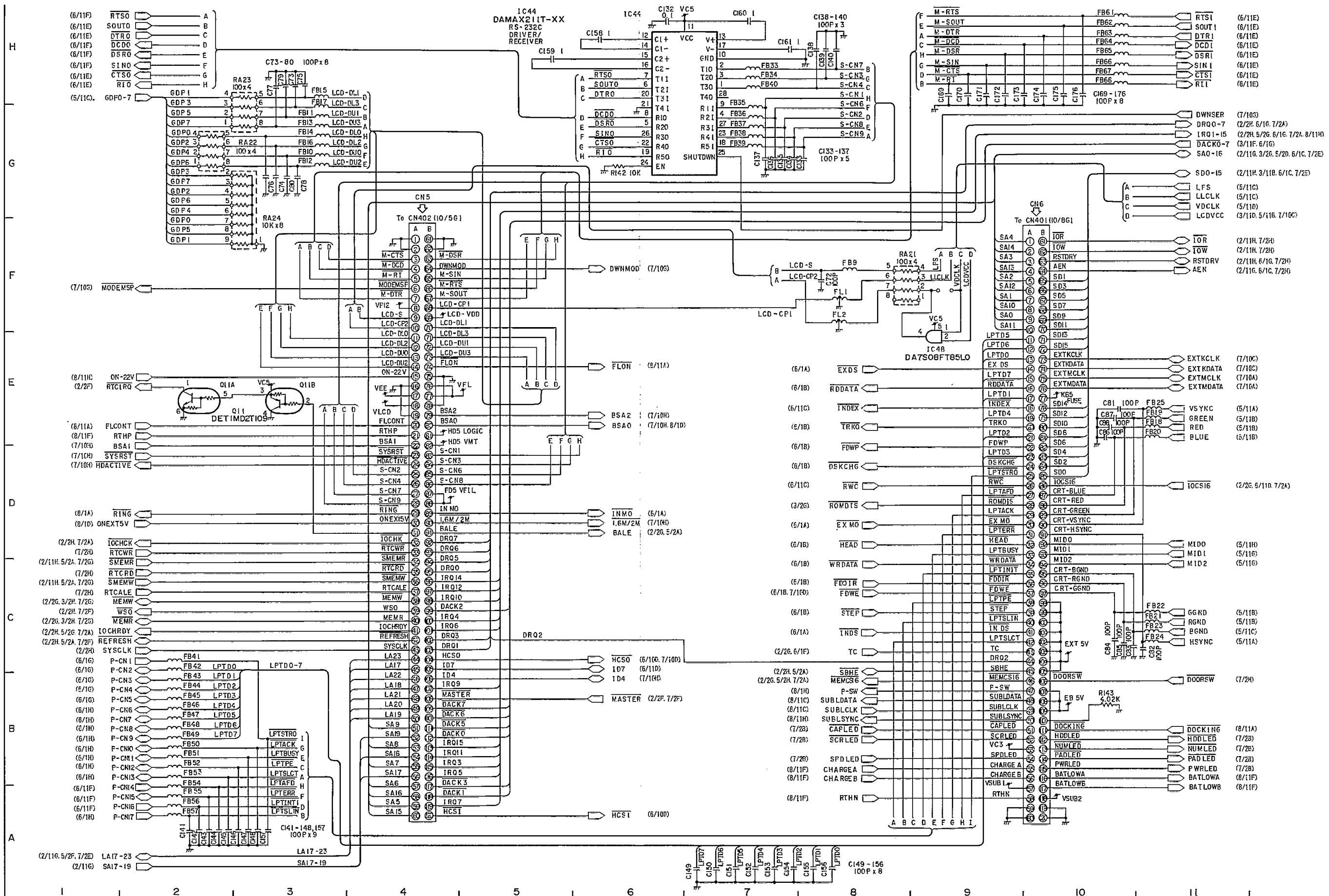
CF-1000

Notes: 3/11E
 " " or " " denotes OUTPUT
 Grid Location " " or " " denotes INPUT
 Sheet No. " " denotes BIDIRECTIONAL

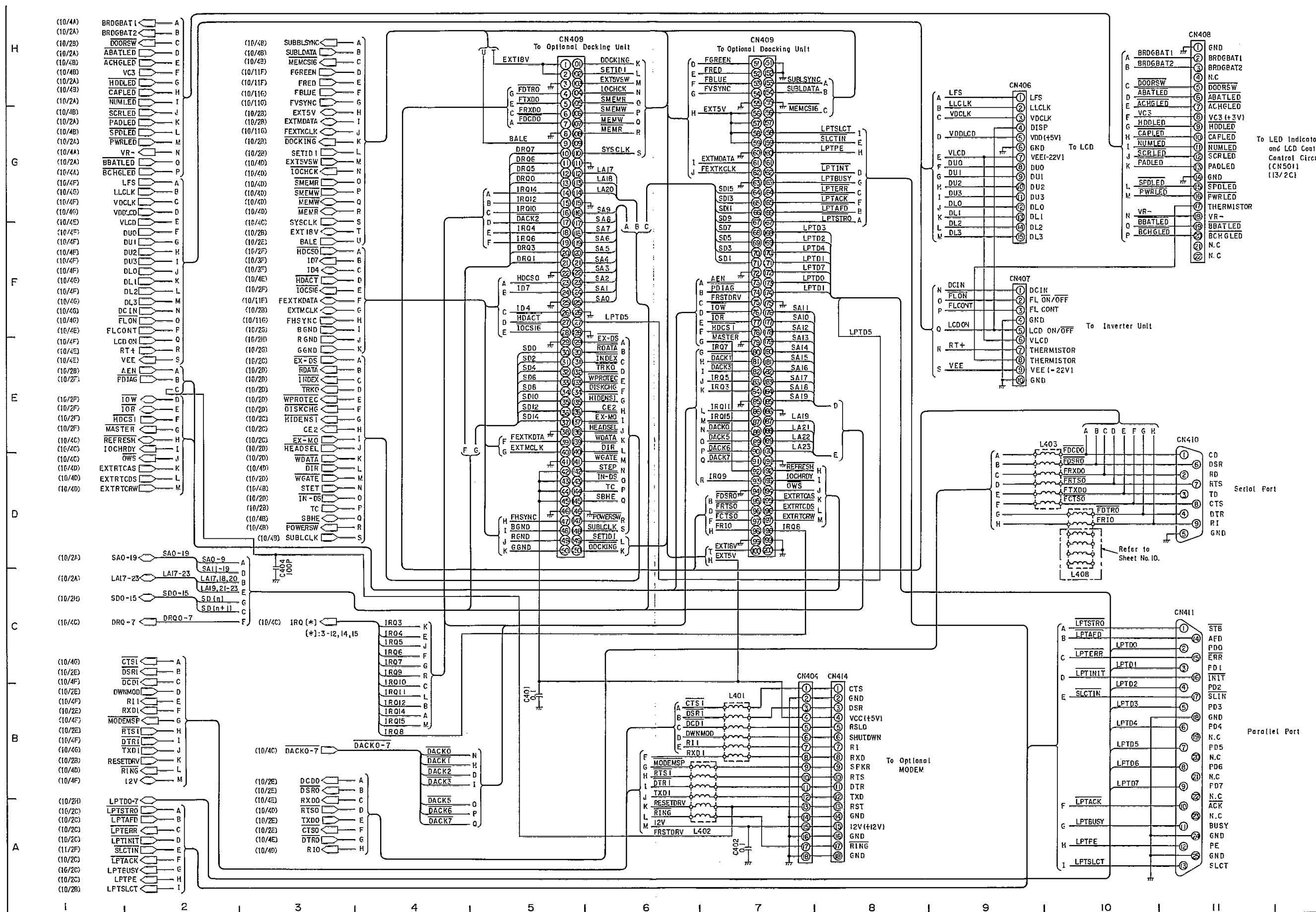


(9) Main PCB, RS-232C Driver/Receiver and Connector Circuits (Sheet No. 9 of 13)

Notes: 3/11E
 Grid Location "◇" or "◇" denotes OUTPUT
 "◇" or "◇" denotes INPUT
 Sheet No. "◇" denotes BIDIRECTIONAL



Notes: 3/11E
 Grid Location "◇" or "◇" denotes OUTPUT
 Sheet No. "◇" or "◇" denotes INPUT
 "◇" denotes BIDIRECTIONAL

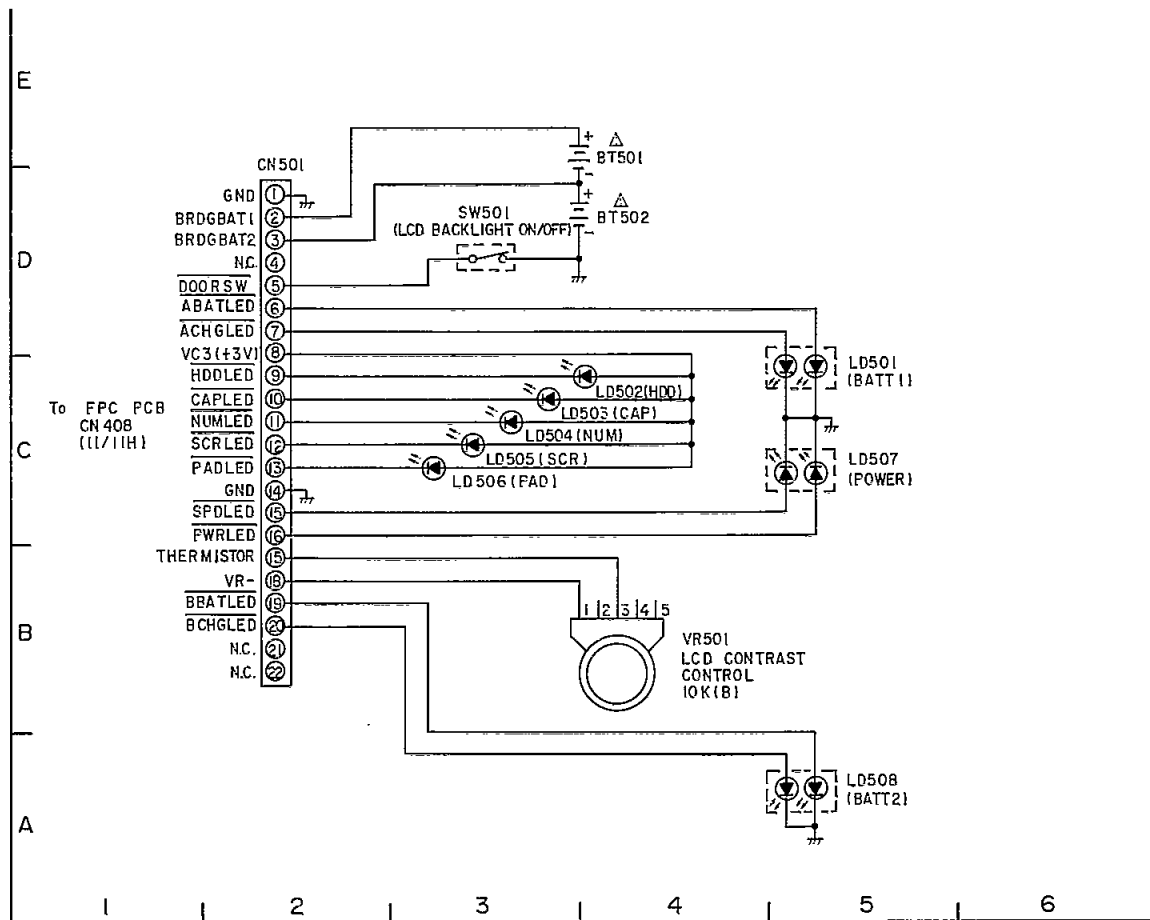


To LED Indicator and LCD Contrast Control Circuit (CN501) (13/2C)

Serial Port

Parallel Port

Notes: 3/11E
 — Grid Location
 — Sheet No.
 "◁" or "▷" denotes OUTPUT
 "◁" or "▷" denotes INPUT
 "◁▷" denotes BIDIRECTIONAL

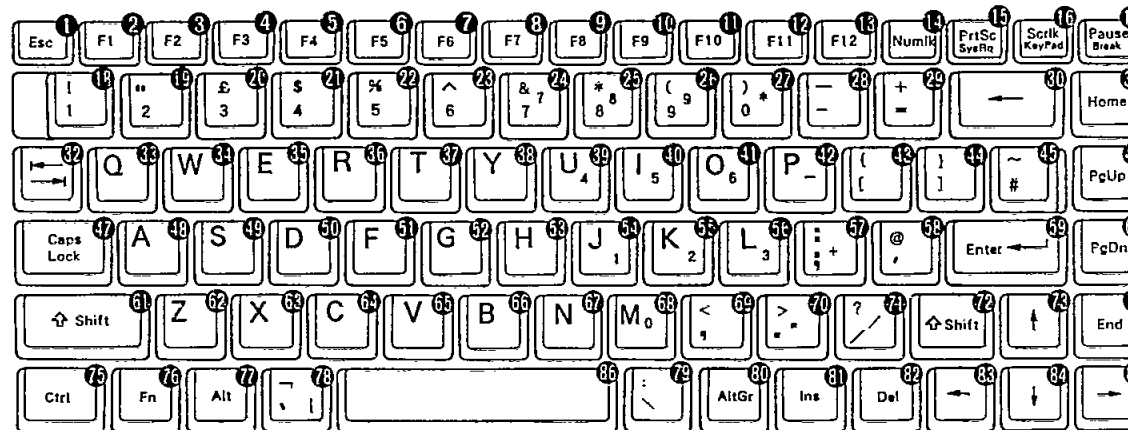


Key Matrix (for U.K.)

To Main PCB, CN2 (Sheet No. 7 of 13) (p.7-16)

	(1)	(2)	(3)	(4)	(5)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	
(6)		F4 5	Esc 1	Ctrl 75	F5 6				F11 12	F10 11	F9 10	F8 9	
(7)	Q 38	W 34	F2 3	| 79	& 4 21			Shift 72	~ # 45	Enter 59	! 40	U 39	% 5 22
(8)	← 32	" 2 19	! 1 18		£ 3 20			Alt Gr 80	] 44	@ 58	O 41	& 7 24	6 23
(9)	↑ 73	A 48	Z 62	Caps Lock 47	E 35	← 83		Del 82	BS 30	P 42	:: 57	J 54	Y 38
(10)	End 74	S 49	X 63	Shift 61	R 36	PgDn 60		Ins 81	+ = 29	{ | 43	L 56	K 55	T 37
(11)	ScrLk 16	B 66	C 64	Alt 77	D 50	↓ 84		PgUp 46	PrtSc 15	_ 28	? / 71	M 68	G 52
(12)	Pause 17	N 67	V 65	| 78	F 51	→ 85		Home 31	NumLk 14	F12 13	> 70	< 69	H 53
(13)		F3 4	F1 2	Fn 76	F6 7			Space 66	) 0 27	(26	* 8 25	F7 8	

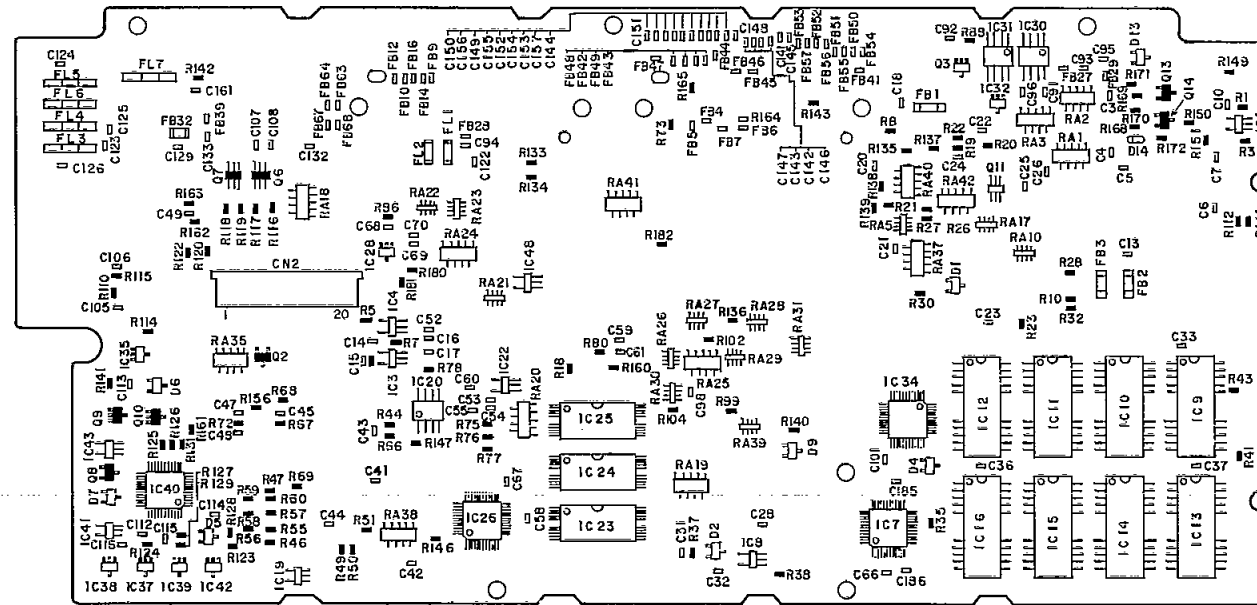
Keyboard Layout (for U.K.)



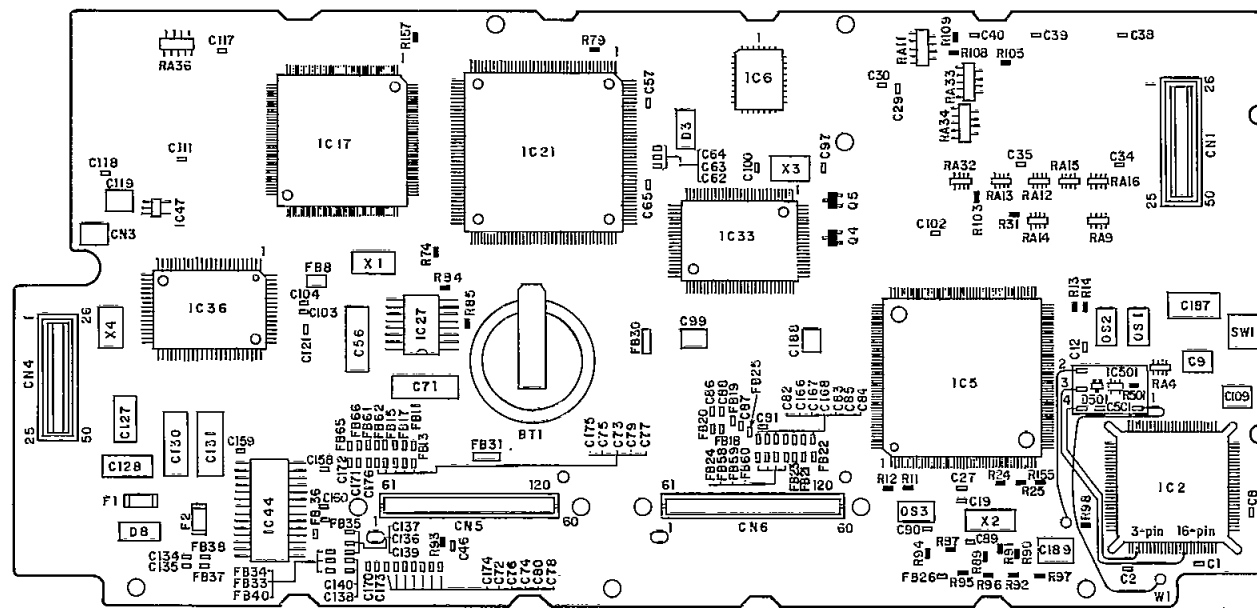
Note: For other keyboards depending on countries, refer to p.7-43 and p.7-44.

7.3 Printed Circuit Board and Parts Locations

Main PCB (Top View)

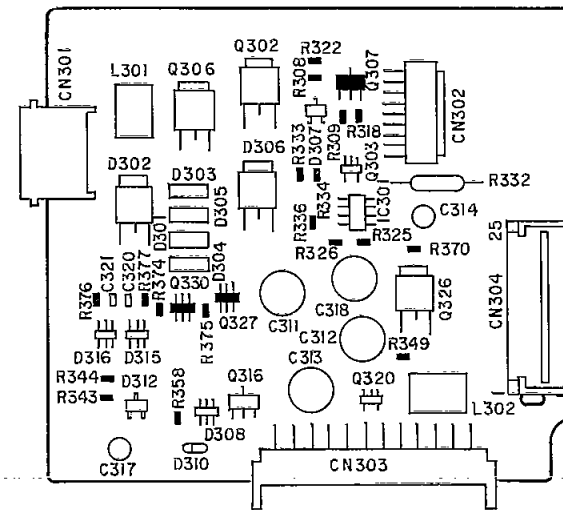


Main PCB (Bottom View)

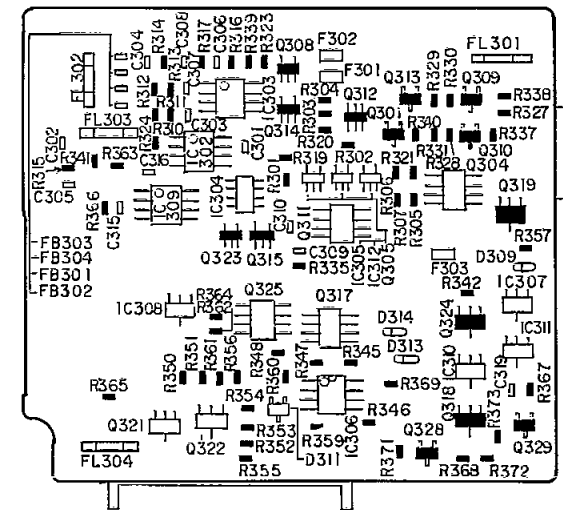


Power Control PCB

(Top View)

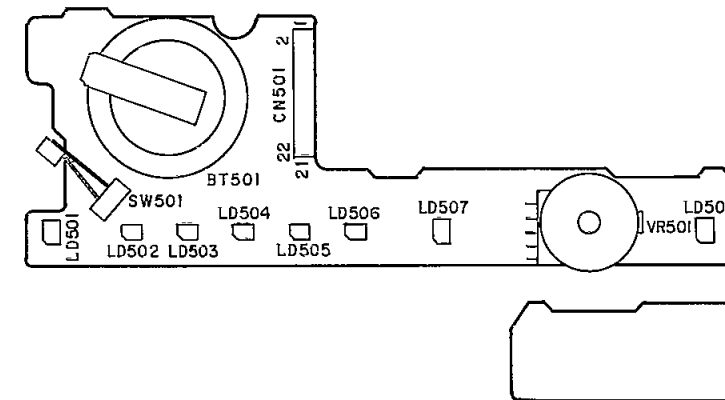


(Bottom View)

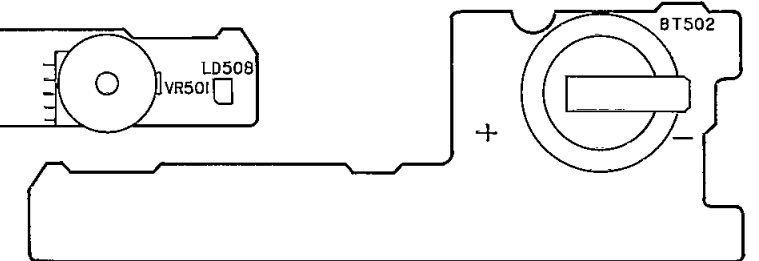


LED Indicator/LCD Contrast Control PCB

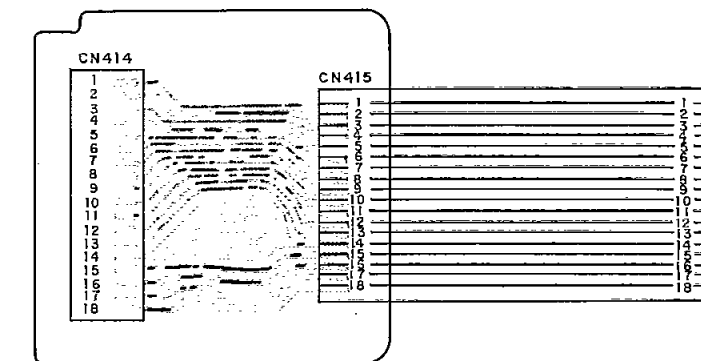
(Top View)



(Bottom View)



MODEM Extension PCB



H
G
F
E
D
C
B
A

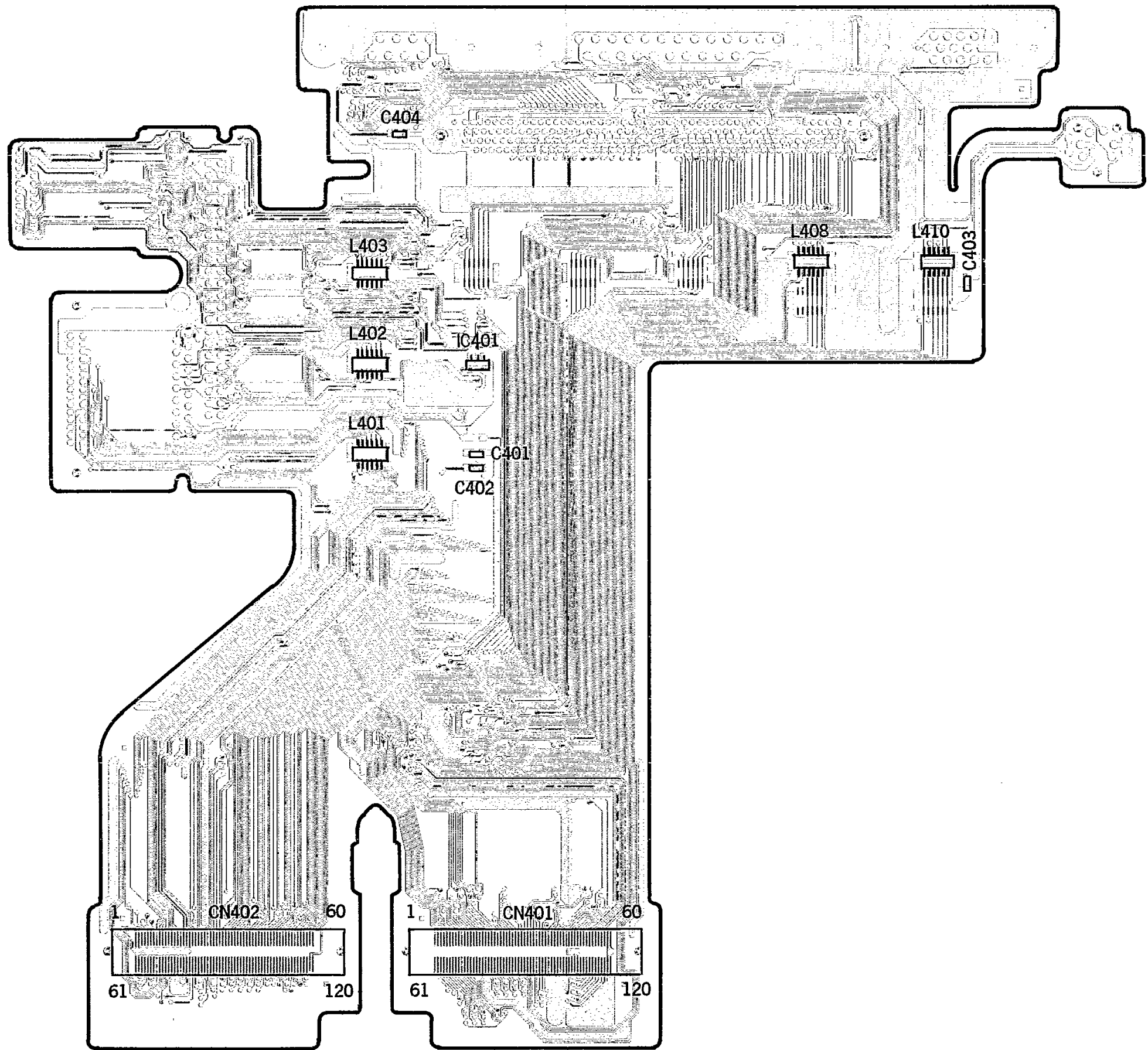
1 2 3 4 5 6 7 8 9 10 11 12

CF-1000

CF-1000

Flexible PCB (Top View)

H
G
F
E
D
C
B
A



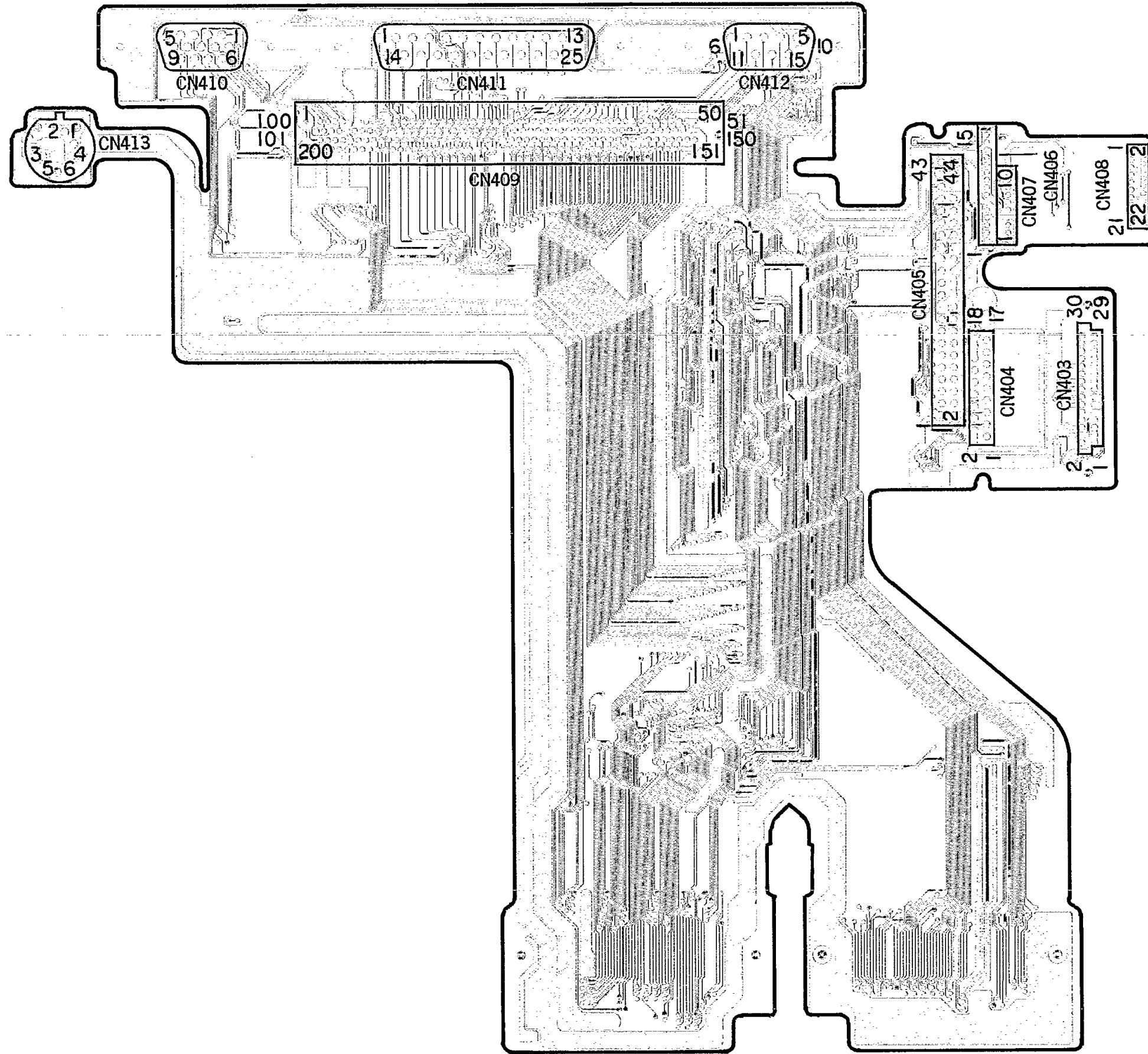
1 2 3 4 5 6 7 8 9 10 11 12 13

CF-1000

CF-1000

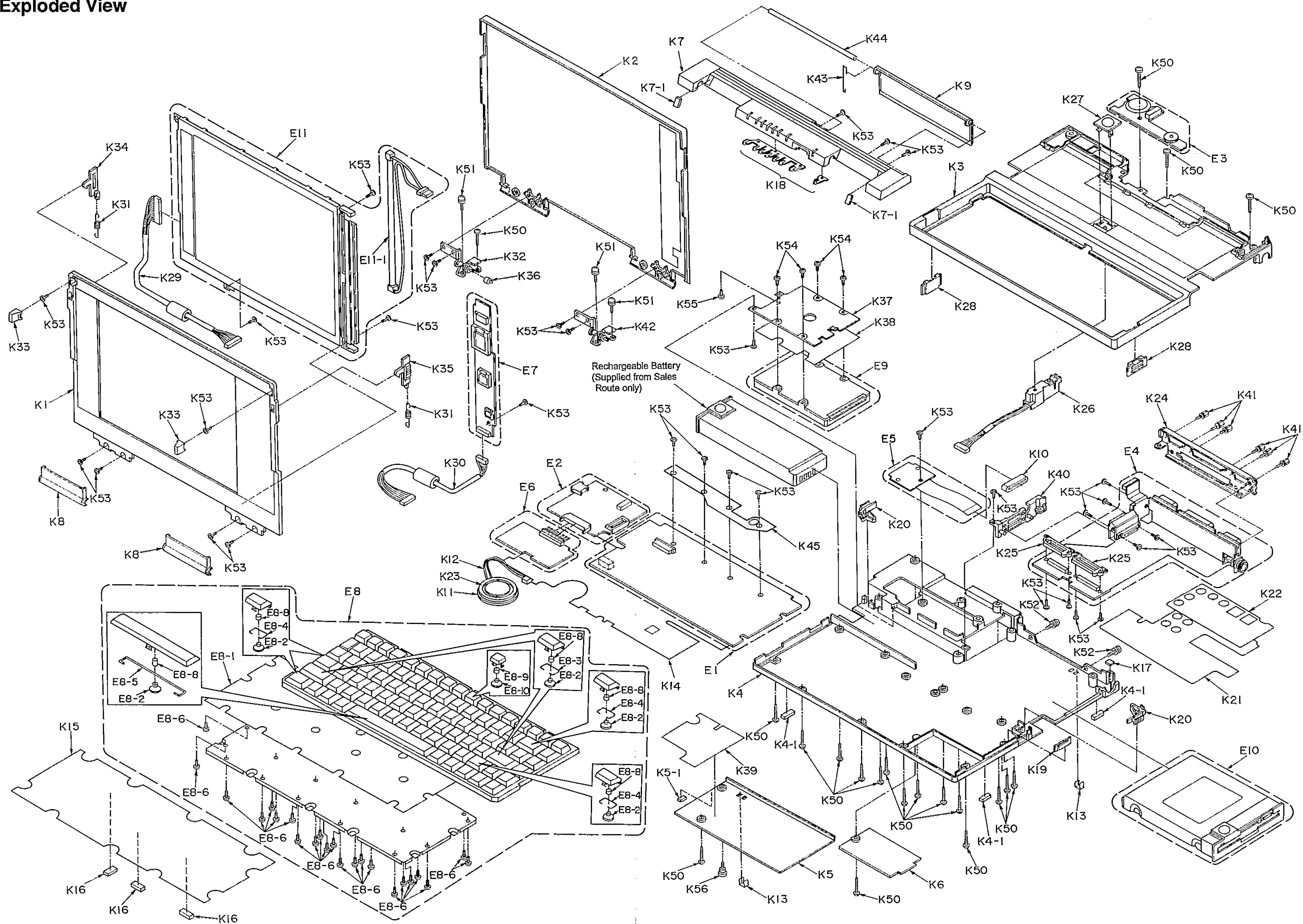
Flexible PCB (Bottom View)

H
G
F
E
D
C
B
A



1 2 3 4 5 6 7 8 9 10 11 12

7.4 Exploded View



7.5 Replacement Parts List (Mechanical, Accessories, Packing, and Electrical)

NOTE: Important safety notice.

Components identified by Δ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

REF. NO. and AREA	PARTS NO.	DESCRIPTION	QTY	
Main Block Units				
E 1 Δ	(M) (E,F,G,IT,SP,SS,SW)	DFWV48C0208 DFWV48C0209	Ass'y, PCB, MAIN RTL RTL	1 1 1
E 2		DL3U10548AAA	Ass'y, PCB, POWER CONTROL RTL	1
E 3		DL3U20548AAA	Ass'y, PCB, LED INDICATOR/LCD CONTRAST CONTROL RTL	1
E 4		DL3UP0549AAA	Ass'y, PCB, FLEXIBLE RTL	1
E 5		DL3UP0550AAA	Ass'y, PCB, MODEM EXTENSION RTL	1
E 6		DFWP0042ZAY	UNIT, PCB, DC-DC CONVERTER	1
E 7 Δ		DFWP0041ZAY	UNIT, PCB, FL INVERTER	1
E 8	(M) (E) (F) (G) (IT) (SP) (SS) (SW)	ESU54TM418BK ESU54TM419BA ESU54TM419CA ESU54TM419AA ESU54TM419DA ESU54TM419EA ESU54TM419GA ESU54TM419FA	Ass'y, KEYBOARD	1 1 1 1 1 1 1 1
E 9 Δ		DFJH011ZB-S	HDD	1
E 10 Δ		EME279MCC	FDD PACK	1
E 11		DFADLM64P861	UNIT, LCD	1
E 11-1		DFAC1001ZAW	BACK LIGHT	1
Mechanical Parts				
K 1		DFWV80C0268	Ass'y, PANEL, LCD FRONT	1
K 2		DFWV84A0096	Ass'y, COVER, LCD REAR	1
K 3 Δ	(M) (E,IT,SP,SS,SW) (F,G)	DFWV80A0140 DFWV80A0141 DFWV80A0142	Ass'y, CABINET, TOP	1 1 1
K 4 Δ	(M) (E,G,F,IT,SP,SS) (SW)	DFWV80C0269 DFWV80C0270 DFWV80C0271	Ass'y, CABINET, BOTTOM	1 1 1
K 4-1		DFKL0013ZA	RUBBER, FOOT	3
K 5		DFWV84F0014	Ass'y, COVER, HDD/MODEM	1
K 5-1		DFKL0013ZA	RUBBER, FOOT	1
K 6		DFKE0246ZB-2	COVER, RAM BOARD	1
K 7		DFWV84F0015	Ass'y, COVER, LED INDICATOR	1
K 7-1		DFKL0013ZA	RUBBER, FOOT	2
K 8		DFGX0109ZA-2	COVER, HINGE	2
K 9		DFKE0245ZA-2	COVER, CONNECTOR, REAR	1
K 10		DDB1Z109-F	FERRITE CORE	1
K 11		EAS2P104B	SPEAKER	1
K 12		DFJS01Z92ZA	CABLE, SPEAKER	1
K 13		DFUS0172ZA	PLATE, EARTH	2
K 14 Δ		DFMX0299ZA	SHEET, INSULATION, MAIN PCB	1
K 15 Δ		DFMX0300ZA	SHEET, INSULATION, KEYBOARD	1
K 16		DFHG959ZA	RUBBER, KEYBOARD	3
K 17		DFHE0059ZA	GASKET	1
K 18		DFGL0028ZA	PANEL, LEADING LIGHT	1
K 19		DFBC0121ZA	BUTTON, SWITCH, RESET	1
K 20		DFBD0057ZA-2	LATCH, RELEASE, BATT/FDD	2
K 21 Δ		DFHR7231ZA	SHEET, FLEXIBLE BOARD	1
K 22 Δ		DFHR7232ZB	SHEET, FILTER	1
K 23		DFHR8115ZA	RUBBER, SPEAKER	1
K 24		DFUA9046ZA	FRAME	1
K 25		DFHR5280ZA	HOLDER, CONNECTOR	2
K 26 Δ		DFJC9914ZA	UNIT, POWER SWITCH/BATTERY TERMINAL	1
K 27		DFBC0120ZA-2	BUTTON, POWER SWITCH	1
K 28		DFHR5272ZA-2	SPACER, LOCK, LCD	2
K 29 Δ		DFJS01Z89ZAV	CABLE, LCD	1
K 30 Δ		DFJS01Z90ZAV	CABLE, INVERTER	1
K 31		DFUW0044ZB	SPRING, LOCK, LCD	2
K 32		DFBH1032ZA	HINGE (LEFT)	1
K 33		DFHG958ZA-2	SEAL, SCREW	2
K 34		DFBD0058ZA-2	LEVER, LOCK, LCD (LEFT)	1
K 35		DFBD0059ZA-2	LEVER, LOCK, LCD (RIGHT)	1
K 36		DFHR4034ZA	CAM	1
K 37		DFMD1069ZA	HOLDER, HDD	1
K 38 Δ		DFMX0301ZA	SHEET, INSULATION, HDD	1
K 39 Δ		DFMX0310ZA	SHEET, INSULATION, MODEM	1

REF. NO.	and AREA	PARTS NO.	DESCRIPTION	Q'TY	
K 40		DFMK0022ZA	HOLDER, CONNECTOR, FLEXIBLE BOARD	1	
K 41		DFHE5035ZA	SCREW, HEXAGONAL	6	
K 42		DFBH1032YA	HINGE (RIGHT)	1	
K 43		DFUW0050ZA	SPRING, COVER, CONNECTOR	1	
K 44		DFDF3075ZA	SHAFT, COVER, CONNECTOR	1	
K 45	△	DFHR7236ZA	SHEET, SPACER	1	
K 50		XSB2+8FZ	SCREW, (2 x 8 mm)	20	
K 51		XYN2+C4	SCREW, (2 x 4 mm)	3	
K 52		XYN26+J6FN	SCREW, (2.6 x 6 mm)	2	
K 53		DFHE5025ZA	SCREW, (2 x 3 mm)	33	
K 54		XYN3+J5	SCREW, (3 x 5 mm)	4	
K 55		XSB3+8FZ	SCREW, (3 x 8 mm)	1	
K 56		DFHE5034ZA	SCREW, SHAFT	1	
Accessories					
A 1	△	(M,E,F,G,IT,SP)	CF-AA158M1	AC ADAPTER	1
		(SS)	CF-AA158M3		1
		(SW)	CF-AA158M2		1
A 2	△	(M)	DFJA0033ZAKK	AC CABLE	1
		(E,F,G,IT,SP,SW)	DFJA0032ZAKK		1
		(E)	DFJA0035ZBKK		1
		(SS)	DFJA18ZAKK		1
A 3		(M,E,IT,SP,SW)	DFJN372ZA	DISK 1, INSTALLATION	1
		(G,SS)	DFJN374ZA		1
		(F)	DFJN376ZA		1
A 4		(M,E,IT,SP,SW)	DFJN373ZA	DISK 2, INSTALLATION	1
		(G,SS)	DFJN375ZA		1
		(F)	DFJN377ZA		1
A 5		(M,E,IT,SP,SW)	DFWV91C0013	DISK SET, WINDOW	1
		(F)	DFWV91C0011		1
		(G,SS)	DFWV91C0014		1
A 6			DFQT9453ZA	SHEET, FUNCTION	1
A 7	△		DFQX2407ZA	GUIDE, WINDOW BASIC	1
A 8	△	(M,E,F,IT,SP,SW)	DFQX2413ZA	GUIDE, USER'S GUIDE	1
		(G,SS)	DFQX2414ZA		1
		(F,SS)	DFQX2415ZA		1
		(IT,SP)	DFQX2422ZA		1
		(SW)	DFQX2421ZA		1
A 9	△		DFQX2416ZA	GUIDE, MS-DOS QUICK REFERENCE GUIDE	1
Packing Materials					
P 1			DFPK0605ZA	CASE, PACKING	1
P 2			DFPN0509ZA	PAD	2
P 3		(M,E,G)	DFPE0162ZA	PAD, MANUAL	1
		(F,IT,SP,SS,SW)			2
P 4			DFPE0163ZA	HOLDER	1
P 5			DFPE0164ZA	PAD, AC ADAPTER	1

REF. NO. and AREA	PARTS NO.	DESCRIPTION	QTY
Main PCB			
E 1- Δ (M) (E,F,G,IT,SP,SS,SW)	DFWV48C0208	Ass'y, PCB, MAIN	RTL 1
	DFWV48C0209		RTL 1
BT 1 Δ	BR2930-1F34	BATTERY, RTC, LITHIUM	1
C 1,2,8,12,29,30,34,35,38-40,57, 62-65,90,102-104,111,117,118	ECUV1C104ZFV	CAPACITOR, CERAMIC, 0.1u	23
C 3-7,10,13,16-18,20-23,25,26,28, 31-33,36,37,41-45,47,52,55,53-61, 66-69,91,96,98,101,112,122-126 129,132,185,186	ECUV1C104ZFV	CAPACITOR, CERAMIC, 0.1u	52
C 9,99,109,119,188	ECEH1CV100F	CAPACITOR, ELECTROLYTIC, 10u, 16V	5
C 14	ECUV1H220JCV	CAPACITOR, CERAMIC, 22P	1
C 15	ECUV1H150JCV	CAPACITOR, CERAMIC, 15P	1
C 19,27	ECUV1H150JCV	CAPACITOR, CERAMIC, 15P	2
C 24	ECUV1H472KVB	CAPACITOR, CERAMIC, 4700P	1
C 46,89	ECUV1H103KBV	CAPACITOR, CERAMIC, 0.01u	2
C 48,49,92-95,133,141-157	ECUV1H101JCV	CAPACITOR, CERAMIC, 100P	24
C 53	ECUV1H511JV	CAPACITOR, CERAMIC, 510P	1
C 54	ECUV1H102JV	CAPACITOR, CERAMIC, 1000P	1
C 56,71	ECEH0JV101F	CAPACITOR, ELECTROLYTIC, 100u, 6.3V	2
C 70,116	ECUV1H103KBV	CAPACITOR, CERAMIC, 0.01u	2
C 72-88,134-140,166-176	ECUV1H101JCV	CAPACITOR, CERAMIC, 100P	35
C 97,100	ECUV1H100DCV	CAPACITOR, CERAMIC, 10P	2
C 105,106	ECUV1H180JCV	CAPACITOR, CERAMIC, 18P	2
C 107,108,113-115,161	DCUG1C105ZFL	CAPACITOR, CERAMIC, 1u	6
C 121,158-160	DCUG1C105ZFL	CAPACITOR, CERAMIC, 1u	4
C 127,128,187	ECEH1AV470F	CAPACITOR, ELECTROLYTIC, 47u, 10V	3
C 130,131	ECEH1EV330F	CAPACITOR, ELECTROLYTIC, 33u, 25V	2
C 189	ECEH1EV100F	CAPACITOR, ELECTROLYTIC, 10u, 25V	1
C 501	ECUV1H300KCV	CAPACITOR, CERAMIC, 30P	1
CN 1,4	DFJS50D53ZA	CONNECTOR, 50-pin	2
CN 2	DFJS20N35ZAF	CONNECTOR, 20-pin, KEYBOARD	1
CN 3	DFJP02C92ZA	CONNECTOR, 2-pin, SPEAKER	1
CN 5,6	DFJP120D50ZA	CONNECTOR, 120-pin	2
D 1,2	DEDRB705DT47	DIODE, SCHOTTKY BARRIER	2
D 3,8	DEDNSQ03A04T	DIODE, SCHOTTKY BARRIER	2
D 4-7,9	DEDRB400DT97	DIODE, SCHOTTKY BARRIER	5
D 13	DEDSB0703CTA	DIODE, SCHOTTKY BARRIER	1
D 14	DEDRLZ110ATE	DIODE, ZENNER	1
D 501	DEDRB400DT97	DIODE, SCHOTTKY BARRIER	1
F 1 Δ	XBADFC5000T	FUSE 5A	1
F 2 Δ	XBADFC1000T	FUSE 1A	1
FB 1-3,32	DDB5Z007-L	FERRITE BEAD	4
FB 4-7,9,10,12,14,16,27-29,39,41-57, 63,64,67,68	DDB5Z012-D	FERRITE BEAD	34
FB 8	ELJPA101KF	CHIP INDUCTOR, 100uH	1
FB 11,13,15,17-26,33-38,40,58-62,65, 66	DDB5Z012-D	FERRITE BEAD	27
FB 30,31	DDB5Z007-L	FERRITE BEAD	2
FL 1,2	DEANFM41R470	FILTER	2
FL 3-7	DEA61R0361TL	FILTER	5
IC 1,41	DA7S04FT85L0	IC, ONE GATE INVERTER	2
IC 2	DA386SLV25XA	IC, CPU	1
IC 3,4	DA4SU69T85L0	IC, ONE GATE INVERTER	2
IC 5	DAC315FC-X0R	IC, CORE LOGIC	1
IC 6 (M) (E,F,G,IT,SP,SS,SW)	DFWV06B0080	IC, FLASH MEMORY, BIOS	1
	DFWV06B0081		1
IC 7,26,34,40	DACF45055PTT	IC, STANDARD CELL	4
IC 8	DA7S32FT85L0	IC, ONE GATE OR	1
IC 9-16	DAS4400LG7LD	IC, 4 M bit DRAM	8
IC 17	DA65082G080D	IC, GATE ARRAY	1
IC 19,22,43	DA7S66FT85L0	IC, ONE GATE ANALOG SWITCH	3
IC 20	DALM334MT-N	IC, CONSTANT CURRENT	1
IC 21	DAGD6412-X0Q	IC, VGA CONTROLLER	1
IC 23-25	MN42C4256AT7	IC, 1 M bit DRAM	3
IC 27	DA2042A32X0S	IC, VGA CLOCK	1
IC 28	DARH5RA33AAR	IC, VOLTAGE REGULATOR (3.3V)	1
IC 30,31	DAUPC358GE2D	IC, COMPARATOR	2
IC 32	DARH5RA45AAR	IC, VOLTAGE REGULATOR (4.5V)	1
IC 33	DA87312-N	IC, FDC WITH DUAL UART/PARALLEL PORT/IDE INTERFACE	1
IC 35,37,39	DARH5VA45AAR	IC, VOLTAGE DETECTOR (4.5V)	3
IC 36	DA37451C140M	IC, POWER MANAGEMENT CONTROLLER	1
IC 38,42	DARH5VA30AAR	IC, VOLTAGE DETECTOR (3.0V)	2
IC 44	DAMAX211T-XX	IC, RS-232C DRIVER/RECEIVER	1
IC 47	DA7S32FT85L0	IC, ONE GATE OR	1

REF. NO. and AREA	PARTS NO.	DESCRIPTION	Q'TY
IC 48	DA7S08FT85L0	IC, ONE GATE AND	1
IC501	DA7S04FT85L0	IC, ONE GATE INVERTER	1
OS 1	DECU32000P1U	CRYSTAL, 32 MHz, 3.3V	1
OS 2	DECU50000P1U	CRYSTAL, 50 MHz, 3.3V	1
OS 3	DECU14318P1U	CRYSTAL, 14.318 MHz, 3.3V	1
Q 2	DETC114EKT97	TRANSISTOR, DIGITAL/SWITCH	1
Q 3	2SB1260T100R	TRANSISTOR, PNP	1
Q 4,5	DETA114EKT97	TRANSISTOR, DIGITAL/SWITCH	2
Q 6,7	DET1MH8T109	TRANSISTOR, ISOLATED MINI-MOLD	2
Q 8	DETA114EKT97	TRANSISTOR, DIGITAL/SWITCH	1
Q 9	2SB1119S-TC	TRANSISTOR, PNP	1
Q 10	2SD1619S-TC	TRANSISTOR, NPN	1
Q 11	DET1MD2T109	TRANSISTOR, ISOLATED MINI-MOLD	1
Q 13	2SK1582T2	TRANSISTOR, Nch FET	1
Q 14	2SA1037KT97R	TRANSISTOR, PNP	1
R 1,41,68,69,122,146,149-151,156,180,181	ERJ3GEYJR00V	JUMPER, CHIP, 0 ohm	12
R 3,20,67,104,120	ERJ3GEYJ222V	RESISTOR, THICK FILM, 2.2K	5
R 5,26,27,99,123,125,162-165	ERJ3GEYJ330V	RESISTOR, THICK FILM, 33	10
R 6	ERJ3GEYK106V	RESISTOR, THICK FILM, 10M	1
R 7	ERJ3GEYJ334V	RESISTOR, THICK FILM, 330K	1
R 8-10,18,38,44,47,49-51,66,80,112,124,161,168	ERJ3GEYJ473V	RESISTOR, THICK FILM, 47K	16
R 11-14,74,84,93,155,157	ERJ3GEYJR00V	JUMPER, CHIP, 0 ohm	9
R 19,115,169,182	ERJ3GEYJ102V	RESISTOR, THICK FILM, 1K	4
R 21	DDB5Z012-D	FERRITE BEAD	1
R 22,23,28,30,32,35,37,72,73,88,114,131,142,160,171	ERJ3GEYJ103V	RESISTOR, THICK FILM, 10K	15
R 24,31	ERJ3GEYJ103V	RESISTOR, THICK FILM, 10K	2
R 25	ERJ3GEYJ680V	RESISTOR, THICK FILM, 68	1
R 43,102	ERJ3GEYJ472V	RESISTOR, THICK FILM, 4.7K	2
R 46,55-58	ERJ6GEYJ680V	RESISTOR, THICK FILM, 68	5
R 59	ERJ6GEYJ101V	RESISTOR, THICK FILM, 100	1
R 60	ERJ6GEYJ271V	RESISTOR, THICK FILM, 270	1
R 75-77	ERJ6ENF1500V	RESISTOR, THICK FILM, 150	3
R 78	ERJ6ENF12R0V	RESISTOR, THICK FILM, 12	1
R 79	ERJ3GEYJ473V	RESISTOR, THICK FILM, 47K	1
R 85	ERJ3GEYJ330V	RESISTOR, THICK FILM, 33	1
R 86	ERJ3GEYJ220V	RESISTOR, THICK FILM, 22	1
R 87,103	ERJ3GEYJ222V	RESISTOR, THICK FILM, 2.2K	2
R 89	ERJ6ENF2002V	RESISTOR, THICK FILM, 20K	1
R 90	ERJ3GEYJ562V	RESISTOR, THICK FILM, 5.6K	1
R 91,94	ERJ6ENF1003V	RESISTOR, THICK FILM, 100K	2
R 92	ERJ6ENF5601V	RESISTOR, THICK FILM, 5.6K	1
R 95,98	ERJ6ENF2202V	RESISTOR, THICK FILM, 22K	2
R 96,97	ERJ6ENF6802V	RESISTOR, THICK FILM, 68K	2
R 105	ERJ3GEYJ471V	RESISTOR, THICK FILM, 470	1
R 108,109	ERJ3GEYJ102V	RESISTOR, THICK FILM, 1K	2
R 110	ERJ3GEYJ105V	RESISTOR, THICK FILM, 1M	1
R 111,127,170	ERJ3GEYJ101V	RESISTOR, THICK FILM, 100	3
R 116,119	ERJ6GEYJ152V	RESISTOR, THICK FILM, 1.5K	2
R 117,118	ERJ6GEYJ272V	RESISTOR, THICK FILM, 2.7K	2
R 126,128,129	ERJ3GEYJ474V	RESISTOR, THICK FILM, 470K	3
R 133,134,137-139	ERJ6GEYJ331V	RESISTOR, THICK FILM, 330	5
R 135,136	ERJ6GEYJ102V	RESISTOR, THICK FILM, 1K	2
R 140	ERJ6GEYJ202V	RESISTOR, THICK FILM, 2K	1
R 141	ERJ6GEYJ3R3V	RESISTOR, THICK FILM, 3.3	1
R 143	ERJ6ENF4021V	RESISTOR, THICK FILM, 4.02K	1
R 172	ERJ3GEYJ562V	RESISTOR, THICK FILM, 5.6	1
R 501	ERJ3GEYJ103V	RESISTOR, THICK FILM, 10K	1
RA 1,2,40,42	DEAE9A223JA	RESISTOR ARRAY, 22K x 8	4
RA 3,18,24,25,37,38,41	DEAE9A103JA	RESISTOR ARRAY, 10K x 8	7
RA 4	EXBV8V223JV	RESISTOR ARRAY, 22K x 4	1
RA 5	EXBV8V100JV	RESISTOR ARRAY, 10 x 4	1
RA 9	EXBV8V473JV	RESISTOR ARRAY, 47K x 4	1
RA 10	DEAB8C473J5	RESISTOR ARRAY, 47K x 4	1
RA 11,36	DEAE9A473JA	RESISTOR ARRAY, 47K x 8	2
RA 12-16	EXBV8V330JV	RESISTOR ARRAY, 33 x 4	5
RA 17,26-29	EXBV8V103JV	RESISTOR ARRAY, 10K x 4	5
RA 19,20,35	DEAE9A473JA	RESISTOR ARRAY, 47K x 8	3
RA 21-23	EXBV8V101JV	RESISTOR ARRAY, 100 x 4	3
RA 30	EXBV8V222JV	RESISTOR ARRAY, 2.2K x 4	1
RA 31	EXBV8V330JV	RESISTOR ARRAY, 33 x 4	1
RA 32	EXBV8V102JV	RESISTOR ARRAY, 1K x 4	1
RA 33,34	DEAE9A472JA	RESISTOR ARRAY, 4.7K x 8	2
RA 39	EXBV8V223JV	RESISTOR ARRAY, 22K x 4	1

REF. NO. and AREA	PARTS NO.	DESCRIPTION	QTY
SW 1	DFSH1A26ZAXR	SWITCH, RESET	1
X 1,2	DECU00032P1D	CRYSTAL, 32.768 KHz	2
X 3	DECU24000L1U	CRYSTAL, 24 MHz	1
X 4	DECU10000L1U	CRYSTAL, 10 MHz	1
Power Control PCB			
E 2 Δ	DL3U10548AAA	Ass'y, PCB, POWER CONTROL	RTL 1
C 301	ECUV1H102JCX	CAPACITOR, CERAMIC, 1000P	1
C 302,303,305,307	ECUV1H103KBG	CAPACITOR, CERAMIC, 0.01u	4
C 304,306,308,316	ECUV1H104ZFX	CAPACITOR, CERAMIC, 0.1u	4
C 309,310,315,319	DCUG1C105ZFL	CAPACITOR, CERAMIC, 1u	4
C 311-313	ECEV0JV101SP	CAPACITOR, ELECTROLYTIC, 100u, 6.3V	3
C 314,317	ECEV1CV100SR	CAPACITOR, ELECTROLYTIC, 10u, 16V	2
C 318	ECEV0GV221SP	CAPACITOR, ELECTROLYTIC, 220u, 4V	1
C 320,321	ECUV1H104ZFX	CAPACITOR, CERAMIC, 0.1u	2
CN301 Δ	DFJJB9Z13ZA	JACK, DC-IN	1
CN302	DFJP09C91ZA	CONNECTOR, 9-pin	1
CN303	DFJS12D57ZA	CONNECTOR, 12-pin	1
CN304	DFJP50D49ZA	CONNECTOR, 50-pin	1
D 301,303,304	DEDSFPB62V	DIODE, SCHOTTKY BARRIER	3
D 302,306	DEDEA6QC04FT	DIODE, SCHOTTKY BARRIER	2
D 305	DED10QS04TR	DIODE, SCHOTTKY BARRIER	1
D 307	DEDAP202KT97	DIODE,	1
D 308,315,316	DEDIMN10T109	DIODE, TRIPLE SWITCHING	3
D 309	DEDRLZ160CTE	DIODE, ZENNER, 16V	1
D 310	DEDHZKL2ALTR	DIODE, ZENNER, 2V	1
D 311	DEDRB420DT97	DIODE, SCHOTTKY BARRIER	1
D 312	DEDDA116T97	DIODE, SWITCHING, SI EPITAXIAL PLANER	1
D 313,314	DEDHZKL4BLTR	DIODE,	2
F 301-303 Δ	DFAHMCPO400T	FUSE, 400mA	3
FB301-304	DDB5Z005-L	FERRITE BEAD	4
FL301-304	DEA61R3472TL	FILTER	4
IC301	DA7W04T12L0	IC, THREE INVERTERS	1
IC302	DANJM431MNTP	IC, VOLTAGE REGURATOR, 2.5V	1
IC303	DAUPC358GE2D	IC, COMPARATOR	1
IC304	DA7W08T12L0	IC, DUAL 2-INPUT AND GATE	1
IC305	DA4S30FT85L0	IC, EXCLUSIVE OR GATE	1
IC306	DAS8850FT-W	IC, VOLTAGE REGURATOR, 5V	1
IC307	DAS81235PG1W	IC, VOLTAGE REGURATOR, 3.5V	1
IC308	DARH5RE33AAR	IC, VOLTAGE REGURATOR, 3.3V	1
IC309	DATL751L12TT	IC, VOLTAGE REGURATOR, 12V	1
IC310	DAS81240PG1W	IC, VOLTAGE REGURATOR, 4V	1
IC311	DAS80740AH1W	IC, VOLTAGE DETECTOR, 4V	1
IC312	DA7S04FT85L0	IC, ONE GATE INVERTER	1
L 301,302	DDB5Z014-D	FERRITE BEAD	2
Q 301	DET1MT1T108	TRANSISTOR, ISOLATED MINI-MOLD, SIGNAL AMP	1
Q 302,306	2SB1181FR7AE	TRANSISTOR, PNP	2
Q 303,320	DETFMG1TA-E	TRANSISTOR, SILICON, EPITAXIAL PLANER DUAL MINI-MOLD	2
Q 304,311,325	DASI9953DYT2	TRANSISTOR, Pch MOS FET	3
Q 305,315,323	DETFMG1TA-E	TRANSISTOR, SILICON, EPITAXIAL PLANER DUAL MINI-MOLD	3
Q 307,316	2SJ238TR	TRANSISTOR, FET	2
Q 308,314	DETFMC1T149	TRANSISTOR, SILICON, EPITAXIAL PLANER DUAL MINI-MOLD	2
Q 309,310,312,313,328	2SK1582T2	TRANSISTOR, FET	5
Q 317	DASI9405DYT2	TRANSISTOR, Pch MOS FET	1
Q 318	2SJ238TR	TRANSISTOR, FET	1
Q 319	2SD1664RTP	TRANSISTOR, NPN	1
Q 321,322	2SK1764TR	TRANSISTOR, FET	2
Q 324	2SB1260T100R	TRANSISTOR, PNP	1
Q 326	2SK974STR	TRANSISTOR, Nch MOS FET	1
Q 327	DET1MD2T109	TRANSISTOR, ISOLATED MINI-MOLD	1
Q 329	2SJ204T2	TRANSISTOR, FET	1
Q 330	DET1MX1TA-E	TRANSISTOR, ISOLATED MINI-MOLD	1
R 301,319,352,355,369,373	ERJ6GEYJ473V	RESISTOR, THICK FILM, 47K	6
R 302,320	ERJ6GEYJ100V	RESISTOR, THICK FILM, 10	2
R 303,304	ERJ6GEYJ472V	RESISTOR, THICK FILM, 4.7K	2
R 305,321,328,329,335,345	ERJ6GEYJ105V	RESISTOR, THICK FILM, 1M	6
R 306,307,327,337,346,347,357,360,362	ERJ6GEYJ102V	RESISTOR, THICK FILM, 1K	10
R 308,309,349	ERJ6GEYJ102V	RESISTOR, THICK FILM, 1K	3
R 310	ERJ6GEYJ189V	RESISTOR, THICK FILM, 18K	1
R 311,317	ERA6EEB202V	RESISTOR, THICK FILM, 2K	2
R 312	ERA6EEB203V	RESISTOR, THICK FILM, 20K	1
R 313	ERA6EEB104V	RESISTOR, THICK FILM, 100K	1
R 314,363,366	ERJ6GEYJ103V	RESISTOR, THICK FILM, 10K	3
R 315,341	ERA6EED752V	RESISTOR, THICK FILM, 7.5K	2
R 316	ERJ6GEYJ161V	RESISTOR, THICK FILM, 160	1

REF. NO. and AREA	PARTS NO.	DESCRIPTION	QTY
R 318	ERJ6GEYJ152V	RESISTOR, THICK FILM, 1.5K	1
R 322,358,370,376,377	ERJ6GEYJ473V	RESISTOR, THICK FILM, 47K	5
R 323,339	ERA6EEB103V	RESISTOR, THICK FILM, 10K	2
R 324	ERA6EEB223V	RESISTOR, THICK FILM, 22K	1
R 325,326	ERJ6GEYJ512V	RESISTOR, THICK FILM, 5.1K	2
R 330,331,338,340,348,359,364,365	ERJ6GEYJ104V	RESISTOR, THICK FILM, 100K	8
R 332	ERX1SJR10P	RESISTOR, FIXED METAL OXIDE FILM, 0.1	1
R 333,334,374,375	ERJ6GEYJ104V	RESISTOR, THICK FILM, 100K	4
R 336	ERJ6GEYJ105V	RESISTOR, THICK FILM, 1M	1
R 342	ERJ6GEYJ200V	RESISTOR, THICK FILM, 20	1
R 343,344	ERJ6GEYJ161V	RESISTOR, THICK FILM, 160	2
R 350,351,356,361	ERJ8GEYJ1R1V	RESISTOR, THICK FILM, 1.1	4
R 353,354,368,372	ERJ6GEYJ101V	RESISTOR, THICK FILM, 100	4
R 367,371	ERJ6GEYJ434V	RESISTOR, THICK FILM, 430K	2

LED Indicator/LCD Contrast Control PCB

E 3 Δ	DL3U20548AAA	Ass'y, PCB, LED INDICATOR/LCD CONTRAST CONTROL	RTL	1
BT501,502 Δ	VL2330-1F34	BATTERY, RESUME, VANADIUM LITHIUM		2
CN501	DFJP22D51ZAF	CONNECTOR, 22-pin		1
LD501,507,508	LN2162C-TR	LED, GREEN/RED		3
LD502-506	LN1361C-TR	LED, GREEN		5
SW501	DFST1A08ZAX	SWITCH, LEAF, LCD ON/OFF		1
VR501	EVUT1AA20B14	VARIABLE RESISTOR, LCD CONTRAST CONTROL		1

Flexible PCB

E 4 Δ	DL3UP0549AAA	Ass'y, PCB, FLEXIBLE	RTL	1
C 401-403	ECUV1H104ZFX	CAPACITOR, CERAMIC, 0.1u		3
C 404	ECUV1H101JCV	CAPACITOR, CERAMIC, 100P		1
CN401,402	DFJS120D54ZA	CONNECTOR, 120-pin		2
CN403	DFJS30D55ZAF	CONNECTOR, 30-pin		1
CN404	DFJS18N37ZAJ	CONNECTOR, 18-pin		1
CN405	DFJS44D59ZAA	CONNECTOR, 44-pin		1
CN406	DFJP15C89ZAJ	CONNECTOR, 15-pin		1
CN407	DFJP10C89ZAJ	CONNECTOR, 10-pin		1
CN408	DFJS22D56ZAF	CONNECTOR, 22-pin		1
CN409	DFJS200D58ZA	CONNECTOR, 200-pin		1
CN410	DFJP09E21YA	CONNECTOR, 9-pin		1
CN411	DFJS25E20ZAA	CONNECTOR, 25-pin		1
CN412	DFJS15E21ZAA	CONNECTOR, 15-pin		1
CN413	DFJS06G25ZBH	CONNECTOR, 6-pin		1
IC401	DA7S04FT85L0	IC, ONE GATE INVERTER		1
L 401-403,408,410	DDB5Z013-L	FERRITE BEAD		5

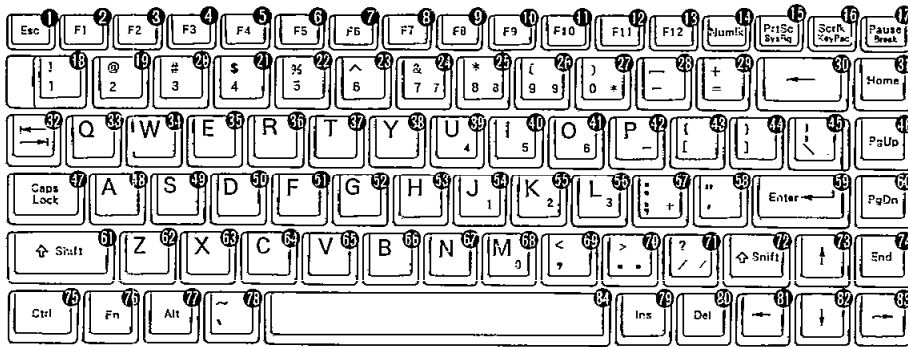
MODEM Extension PCB

E 5 Δ	DL3UP0550AAA	Ass'y, PCB, MODEM EXTENSION	RTL	1
CN414	DFJS18N36ZA	CONNECTOR, 18-pin		1

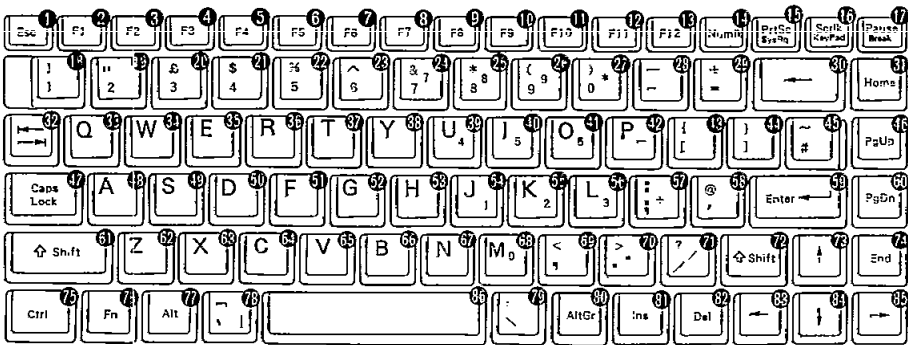
7.6 Keyboard Parts Locations

•Keytop

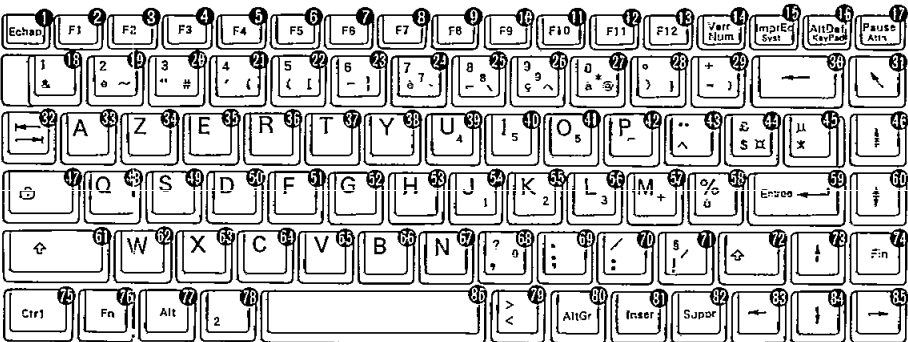
Keytop for U.S.A. and Canada (M)
(84 Keys)



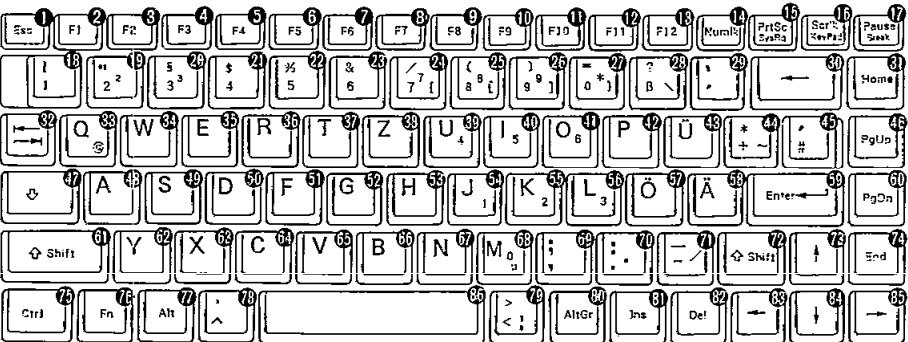
Keytop for English (E)
(86 Keys)



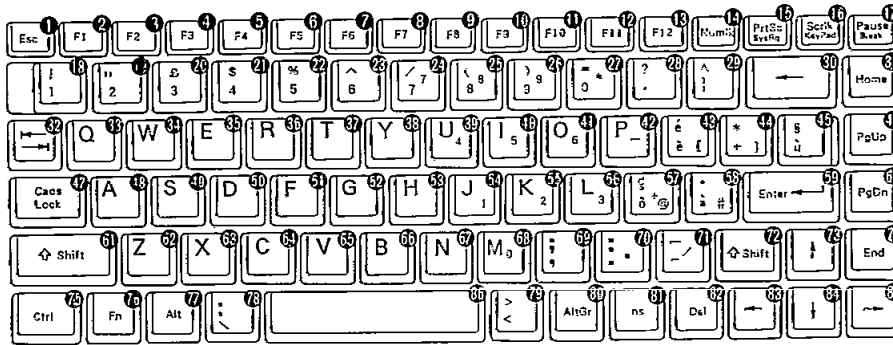
Keytop for French (F)
(86 Keys)



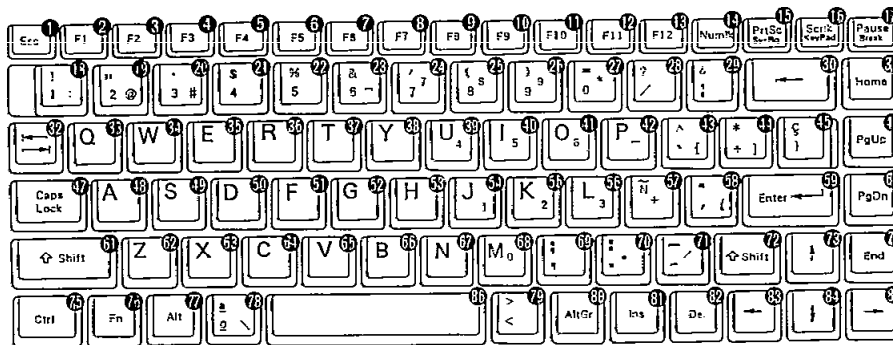
Keytop for German (G)
(86 Keys)



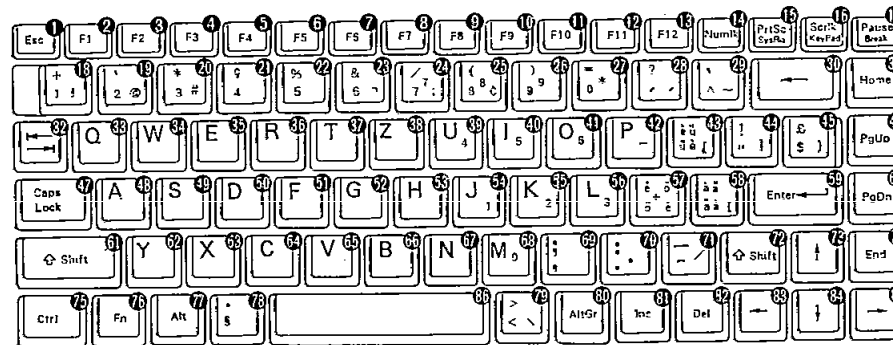
Keypop for Italian (IT)
(86 Keys)



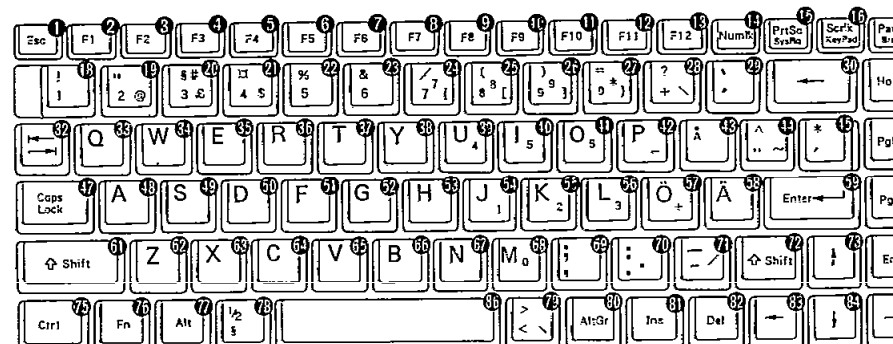
Keypop for Spanish (SP)
(86 Keys)



Keypop for Swiss (SS)
(86 Keys)



Keypop for Swedish (SW)
(86 Keys)



7.7 Replacement Parts List (Keyboard)

• Keyboard for U.S.A. and Canada (M)

REF.	PART NO.	DESCRIPTION	QTY	REF.	PART NO.	DESCRIPTION	QTY
Keyboard for (M)				56	DFWV70C7053	KEYTOP, L	1
E10	ESU54TM418BK	Ass'y. KEYBOARD(M)	1	57	DFWV70C7054	KEYTOP, : ; +	1
1	DFWV70C6998	KEYTOP, Esc	1	58	DFWV70C7055	KEYTOP, " "	1
2	DFWV70C6999	KEYTOP, F1	1	59	DFWV70C7056	KEYTOP, Enter	1
3	DFWV70C7000	KEYTOP, F2	1	60	DFWV70C7057	KEYTOP, PgDn	1
4	DFWV70C7001	KEYTOP, F3	1	61	DFWV70C7058	KEYTOP, Shift(L)	1
5	DFWV70C7002	KEYTOP, F4	1	62	DFWV70C7059	KEYTOP, Z	1
6	DFWV70C7003	KEYTOP, F5	1	63	DFWV70C7060	KEYTOP, X	1
7	DFWV70C7004	KEYTOP, F6	1	64	DFWV70C7061	KEYTOP, C	1
8	DFWV70C7005	KEYTOP, F7	1	65	DFWV70C7062	KEYTOP, V	1
9	DFWV70C7006	KEYTOP, F8	1	66	DFWV70C7063	KEYTOP, B	1
10	DFWV70C7007	KEYTOP, F9	1	67	DFWV70C7064	KEYTOP, N	1
11	DFWV70C7008	KEYTOP, F10	1	68	DFWV70C7065	KEYTOP, M	1
12	DFWV70C7009	KEYTOP, F11	1	69	DFWV70C7066	KEYTOP, < ,	1
13	DFWV70C7010	KEYTOP, F12	1	70	DFWV70C7067	KEYTOP, > .	1
14	DFWV70C7011	KEYTOP, NumLk	1	71	DFWV70C7068	KEYTOP, ? /	1
15	DFWV70C7012	KEYTOP, PrtSc SysRq	1	72	DFWV70C7069	KEYTOP, Shift(R)	1
16	DFWV70C7013	KEYTOP, ScrLk Key Pad	1	73	DFWV70C7070	KEYTOP, ↑	1
17	DFWV70C7014	KEYTOP, Pause Break	1	74	DFWV70C7071	KEYTOP, End	1
18	DFWV70C7015	KEYTOP, ! 1	1	75	DFWV70C7072	KEYTOP, Ctrl	1
19	DFWV70C7016	KEYTOP, @ 2	1	76	DFWV70C7073	KEYTOP, Fn	1
20	DFWV70C7017	KEYTOP, # 3	1	77	DFWV70C7074	KEYTOP, Alt	1
21	DFWV70C7018	KEYTOP, \$ 4	1	78	DFWV70C7075	KEYTOP, ~	1
22	DFWV70C7019	KEYTOP, % 5	1	79	DFWV70C7076	KEYTOP, Ins	1
23	DFWV70C7020	KEYTOP, ^ 6	1	80	DFWV70C7077	KEYTOP, Del	1
24	DFWV70C7021	KEYTOP, & 7	1	81	DFWV70C7078	KEYTOP, ←	1
25	DFWV70C7022	KEYTOP, * 8	1	82	DFWV70C7079	KEYTOP, ↓	1
26	DFWV70C7023	KEYTOP, (9	1	83	DFWV70C7080	KEYTOP, →	1
27	DFWV70C7024	KEYTOP,) 0	1	84	DFWV70C7081	KEYTOP, Space	1
28	DFWV70C7025	KEYTOP, -	1	E10-1	DFWV48C0210	SWITCH, MEMBRANE	1
29	DFWV70C7026	KEYTOP, + =	1	E10-2	DFWV65D0044	SPRING, RUBBER, KEYTOP	67
30	DFWV70C7027	KEYTOP, ←	1	E10-3	DFWV71H0046	ROD, ENTER/SHIFT(L)	1
31	DFWV70C7028	KEYTOP, Home	1	E10-4	DFWV71H0047	ROD, BACK SPACE	3
32	DFWV70C7029	KEYTOP, ⇐	1	E10-5	DFWV71H0048	ROD, SPACE BAR	1
33	DFWV70C7030	KEYTOP, Q	1	E10-6	DFWV50B0016	SCREW, KEYBOARD	23
34	DFWV70C7031	KEYTOP, W	1	E10-7	DFWV71H0049	ROD, Ctrl/CpLk/SHIFT(R)	3
35	DFWV70C7032	KEYTOP, E	1	E10-8	DFWV65C0219	PAD, KEYTOP	67
36	DFWV70C7033	KEYTOP, R	1	E10-9	DFWV65D0046	SPRING, RUBBER, KEYTOP, FUNCTION KEY	17
37	DFWV70C7034	KEYTOP, T	1	E10-10	DFWV65C0220	PAD, KEYTOP, FUNCTION KEY	17
38	DFWV70C7035	KEYTOP, Y	1				
39	DFWV70C7036	KEYTOP, U	1				
40	DFWV70C7037	KEYTOP, I	1				
41	DFWV70C7038	KEYTOP, O	1				
42	DFWV70C7039	KEYTOP, P	1				
43	DFWV70C7040	KEYTOP, [ [	1				
44	DFWV70C7041	KEYTOP,]]	1				
45	DFWV70C7042	KEYTOP, ! \	1				
46	DFWV70C7043	KEYTOP, PgUp	1				
47	DFWV70C7044	KEYTOP, Caps Lock	1				
48	DFWV70C7045	KEYTOP, A	1				
49	DFWV70C7046	KEYTOP, S	1				
50	DFWV70C7047	KEYTOP, D	1				
51	DFWV70C7048	KEYTOP, F	1				
52	DFWV70C7049	KEYTOP, G	1				
53	DFWV70C7050	KEYTOP, H	1				
54	DFWV70C7051	KEYTOP, J	1				
55	DFWV70C7052	KEYTOP, K	1				

● Keyboard for English (E)

REF.	PART NO.	DESCRIPTION	QTY
Keyboard for (E)			
E10	ESU54TM419BA	Ass'y, KEYBOARD(E)	1
1	DFWV70C7083	KEYTOP, Esc	1
2	DFWV70C7084	KEYTOP, F1	1
3	DFWV70C7085	KEYTOP, F2	1
4	DFWV70C7086	KEYTOP, F3	1
5	DFWV70C7087	KEYTOP, F4	1
6	DFWV70C7088	KEYTOP, F5	1
7	DFWV70C7089	KEYTOP, F6	1
8	DFWV70C7090	KEYTOP, F7	1
9	DFWV70C7091	KEYTOP, F8	1
10	DFWV70C7092	KEYTOP, F9	1
11	DFWV70C7093	KEYTOP, F10	1
12	DFWV70C7094	KEYTOP, F11	1
13	DFWV70C7095	KEYTOP, F12	1
14	DFWV70C7096	KEYTOP, NumLk	1
15	DFWV70C7097	KEYTOP, PrtSc SysRq	1
16	DFWV70C7098	KEYTOP, ScrLk Key Pad	1
17	DFWV70C7099	KEYTOP, Pause Break	1
18	DFWV70C7100	KEYTOP, ! 1	1
19	DFWV70C7101	KEYTOP, " 2	1
20	DFWV70C7102	KEYTOP, £ 3	1
21	DFWV70C7103	KEYTOP, \$ 4	1
22	DFWV70C7104	KEYTOP, % 5	1
23	DFWV70C7105	KEYTOP, ^ 6	1
24	DFWV70C7106	KEYTOP, & 7	1
25	DFWV70C7107	KEYTOP, * 8	1
26	DFWV70C7108	KEYTOP, (9	1
27	DFWV70C7109	KEYTOP,) 0	1
28	DFWV70C7110	KEYTOP, -	1
29	DFWV70C7111	KEYTOP, + =	1
30	DFWV70C7112	KEYTOP, ←	1
31	DFWV70C7113	KEYTOP, Home	1
32	DFWV70C7114	KEYTOP, ⇐	1
33	DFWV70C7115	KEYTOP, Q	1
34	DFWV70C7116	KEYTOP, W	1
35	DFWV70C7117	KEYTOP, E	1
36	DFWV70C7118	KEYTOP, R	1
37	DFWV70C7119	KEYTOP, T	1
38	DFWV70C7120	KEYTOP, Y	1
39	DFWV70C7121	KEYTOP, U	1
40	DFWV70C7122	KEYTOP, I	1
41	DFWV70C7123	KEYTOP, O	1
42	DFWV70C7124	KEYTOP, P	1
43	DFWV70C7125	KEYTOP, { [	1
44	DFWV70C7126	KEYTOP, }]	1
45	DFWV70C7127	KEYTOP, ~#	1
46	DFWV70C7128	KEYTOP, PgUp	1
47	DFWV70C7129	KEYTOP, Caps Lock	1
48	DFWV70C7130	KEYTOP, A	1
49	DFWV70C7131	KEYTOP, S	1
50	DFWV70C7132	KEYTOP, D	1
51	DFWV70C7133	KEYTOP, F	1
52	DFWV70C7134	KEYTOP, G	1
53	DFWV70C7135	KEYTOP, H	1
54	DFWV70C7136	KEYTOP, J	1
55	DFWV70C7137	KEYTOP, K	1

REF.	PART NO.	DESCRIPTION	QTY
56	DFWV70C7138	KEYTOP, L	1
57	DFWV70C7139	KEYTOP, : ; +	1
58	DFWV70C7140	KEYTOP, @ ' "	1
59	DFWV70C7141	KEYTOP, Enter	1
60	DFWV70C7142	KEYTOP, PgDn	1
61	DFWV70C7143	KEYTOP, Shift(L)	1
62	DFWV70C7144	KEYTOP, Z	1
63	DFWV70C7145	KEYTOP, X	1
64	DFWV70C7146	KEYTOP, C	1
65	DFWV70C7147	KEYTOP, V	1
66	DFWV70C7148	KEYTOP, B	1
67	DFWV70C7149	KEYTOP, N	1
68	DFWV70C7150	KEYTOP, M	1
69	DFWV70C7151	KEYTOP, < ,	1
70	DFWV70C7152	KEYTOP, > .	1
71	DFWV70C7153	KEYTOP, ? /	1
72	DFWV70C7154	KEYTOP, Shift(R)	1
73	DFWV70C7155	KEYTOP, ↑	1
74	DFWV70C7156	KEYTOP, End	1
75	DFWV70C7157	KEYTOP, Ctrl	1
76	DFWV70C7158	KEYTOP, Fn	1
77	DFWV70C7159	KEYTOP, Alt	1
78	DFWV70C7160	KEYTOP, - ;	1
79	DFWV70C7161	KEYTOP, : \	1
80	DFWV70C7162	KEYTOP, AltGr	1
81	DFWV70C7163	KEYTOP, Ins	1
82	DFWV70C7164	KEYTOP, Del	1
83	DFWV70C7165	KEYTOP, ←	1
84	DFWV70C7166	KEYTOP, ↓	1
85	DFWV70C7167	KEYTOP, →	1
86	DFWV70C7168	KEYTOP, Space	1
E10-1	DFWV48C0210	SWITCH, MEMBRANE	1
E10-2	DFWV65D0044	SPRING, RUBBER, KEYTOP	69
E10-3	DFWV71H0046	ROD, ENTER/SHIFT(L)	1
E10-4	DFWV71H0047	ROD, BACK SPACE	3
E10-5	DFWV71H0048	ROD, SPACE BAR	1
E10-6	DFWV50B0016	SCREW, KEYBOARD	23
E10-7	DFWV71H0049	ROD, Ctrl/Cplk/SHIFT(R)	3
E10-8	DFWV65C0219	PAD, KEYTOP	69
E10-9	DFWV65D0046	SPRING, RUBBER, KEYTOP, FUNCTION KEY	17
E10-10	DFWV65C0220	PAD, KEYTOP, FUNCTION KEY	17

• Keyboard for French (F)

REF.	PART NO.	DESCRIPTION	QTY
Keyboard for (F)			
E10	BSU54TM419CA	Ass'y, KEYBOARD(F)	1
1	DFWV70C7170	KEYTOP, Echap	1
2	DFWV70C7171	KEYTOP, F1	1
3	DFWV70C7172	KEYTOP, F2	1
4	DFWV70C7173	KEYTOP, F3	1
5	DFWV70C7174	KEYTOP, F4	1
6	DFWV70C7175	KEYTOP, F5	1
7	DFWV70C7176	KEYTOP, F6	1
8	DFWV70C7177	KEYTOP, F7	1
9	DFWV70C7178	KEYTOP, F8	1
10	DFWV70C7179	KEYTOP, F9	1
11	DFWV70C7180	KEYTOP, F10	1
12	DFWV70C7181	KEYTOP, F11	1
13	DFWV70C7182	KEYTOP, F12	1
14	DFWV70C7183	KEYTOP, VerrNum	1
15	DFWV70C7184	KEYTOP, Impr Ecr Syst	1
16	DFWV70C7185	KEYTOP, Art Def Keypad	1
17	DFWV70C7186	KEYTOP, Pause Attn	1
18	DFWV70C7187	KEYTOP, & 1	1
19	DFWV70C7188	KEYTOP, e 2	1
20	DFWV70C7189	KEYTOP, " 3	1
21	DFWV70C7190	KEYTOP, ' 4	1
22	DFWV70C7191	KEYTOP, (5	1
23	DFWV70C7192	KEYTOP, - 6	1
24	DFWV70C7193	KEYTOP, è 7	1
25	DFWV70C7194	KEYTOP, - 8	1
26	DFWV70C7195	KEYTOP, ç 9	1
27	DFWV70C7196	KEYTOP, à 0	1
28	DFWV70C7197	KEYTOP,) 。	1
29	DFWV70C7198	KEYTOP, + =	1
30	DFWV70C7199	KEYTOP, ←	1
31	DFWV70C7200	KEYTOP, ↖	1
32	DFWV70C7201	KEYTOP, ⇐	1
33	DFWV70C7202	KEYTOP, A	1
34	DFWV70C7203	KEYTOP, Z	1
35	DFWV70C7204	KEYTOP, E	1
36	DFWV70C7205	KEYTOP, R	1
37	DFWV70C7206	KEYTOP, T	1
38	DFWV70C7207	KEYTOP, Y	1
39	DFWV70C7208	KEYTOP, U	1
40	DFWV70C7209	KEYTOP, I	1
41	DFWV70C7210	KEYTOP, O	1
42	DFWV70C7211	KEYTOP, P	1
43	DFWV70C7212	KEYTOP, -	1
44	DFWV70C7213	KEYTOP, £\$	1
45	DFWV70C7214	KEYTOP, u *	1
46	DFWV70C7215	KEYTOP, ‡	1
47	DFWV70C7216	KEYTOP, Ⓢ	1
48	DFWV70C7217	KEYTOP, Q	1
49	DFWV70C7218	KEYTOP, S	1
50	DFWV70C7219	KEYTOP, D	1
51	DFWV70C7220	KEYTOP, F	1
52	DFWV70C7221	KEYTOP, G	1
53	DFWV70C7222	KEYTOP, H	1
54	DFWV70C7223	KEYTOP, J	1
55	DFWV70C7224	KEYTOP, K	1

REF.	PART NO.	DESCRIPTION	QTY
56	DFWV70C7225	KEYTOP, L	1
57	DFWV70C7226	KEYTOP, M	1
58	DFWV70C7227	KEYTOP, % ù	1
59	DFWV70C7228	KEYTOP, Entrée	1
60	DFWV70C7229	KEYTOP, ‡	1
61	DFWV70C7230	KEYTOP, ⏏(L)	1
62	DFWV70C7231	KEYTOP, W	1
63	DFWV70C7232	KEYTOP, X	1
64	DFWV70C7233	KEYTOP, C	1
65	DFWV70C7234	KEYTOP, V	1
66	DFWV70C7235	KEYTOP, B	1
67	DFWV70C7236	KEYTOP, N	1
68	DFWV70C7237	KEYTOP, ?	1
69	DFWV70C7238	KEYTOP, . ;	1
70	DFWV70C7239	KEYTOP, / :	1
71	DFWV70C7240	KEYTOP, \$!	1
72	DFWV70C7241	KEYTOP, ⏏(R)	1
73	DFWV70C7242	KEYTOP, ↑	1
74	DFWV70C7243	KEYTOP, Fin	1
75	DFWV70C7244	KEYTOP, Ctrl	1
76	DFWV70C7245	KEYTOP, Fn	1
77	DFWV70C7246	KEYTOP, Alt	1
78	DFWV70C7247	KEYTOP, 2	1
79	DFWV70C7248	KEYTOP, < >	1
80	DFWV70C7249	KEYTOP, AltGr	1
81	DFWV70C7250	KEYTOP, Inser	1
82	DFWV70C7251	KEYTOP, Suppr	1
83	DFWV70C7252	KEYTOP, ←	1
84	DFWV70C7253	KEYTOP, ↓	1
85	DFWV70C7254	KEYTOP, →	1
86	DFWV70C7255	KEYTOP, Space	1
E10-1	DFWV48C0210	SWITCH, MEMBRANE	1
E10-2	DFWV65D0044	SPRING, RUBBER, KEYTOP	69
E10-3	DFWV71H0046	ROD, ENTER/SHIFT(L)	1
E10-4	DFWV71H0047	ROD, BACK SPACE	3
E10-5	DFWV71H0048	ROD, SPACE BAR	1
E10-6	DFWV50B0016	SCREW, KEYBOARD	23
E10-7	DFWV71H0049	ROD, Ctrl/CpLk/SHIFT(R)	3
E10-8	DFWV65C0219	PAD, KEYTOP	69
E10-9	DFWV65D0046	SPRING, RUBBER, KEYTOP, FUNCTION KEY	17
E10-10	DFWV65C0220	PAD, KEYTOP, FUNCTION KEY	17

• Keyboard for German (G)

REF.	PART NO.	DESCRIPTION	QTY
Keyboard for (G)			
E10	ESU54TM419AA	Ass'y, KEYBOARD(G)	1
1	DFWV70C7257	KEYTOP, Esc	1
2	DFWV70C7258	KEYTOP, F1	1
3	DFWV70C7259	KEYTOP, F2	1
4	DFWV70C7260	KEYTOP, F3	1
5	DFWV70C7261	KEYTOP, F4	1
6	DFWV70C7262	KEYTOP, F5	1
7	DFWV70C7263	KEYTOP, F6	1
8	DFWV70C7264	KEYTOP, F7	1
9	DFWV70C7265	KEYTOP, F8	1
10	DFWV70C7266	KEYTOP, F9	1
11	DFWV70C7267	KEYTOP, F10	1
12	DFWV70C7268	KEYTOP, F11	1
13	DFWV70C7269	KEYTOP, F12	1
14	DFWV70C7270	KEYTOP, NumLk	1
15	DFWV70C7271	KEYTOP, PrtSc SysRq	1
16	DFWV70C7272	KEYTOP, ScrLk Key Pad	1
17	DFWV70C7273	KEYTOP, Pause Break	1
18	DFWV70C7274	KEYTOP, ! 1	1
19	DFWV70C7275	KEYTOP, " 2	1
20	DFWV70C7276	KEYTOP, § 3	1
21	DFWV70C7277	KEYTOP, \$ 4	1
22	DFWV70C7278	KEYTOP, % 5	1
23	DFWV70C7279	KEYTOP, & 6	1
24	DFWV70C7280	KEYTOP, / 7	1
25	DFWV70C7281	KEYTOP, (8	1
26	DFWV70C7282	KEYTOP,) 9	1
27	DFWV70C7283	KEYTOP, = 0	1
28	DFWV70C7284	KEYTOP, ? β	1
29	DFWV70C7285	KEYTOP, ~	1
30	DFWV70C7286	KEYTOP, ←	1
31	DFWV70C7287	KEYTOP, Home	1
32	DFWV70C7288	KEYTOP, ⇐	1
33	DFWV70C7289	KEYTOP, Q @	1
34	DFWV70C7290	KEYTOP, W	1
35	DFWV70C7291	KEYTOP, E	1
36	DFWV70C7292	KEYTOP, R	1
37	DFWV70C7293	KEYTOP, T	1
38	DFWV70C7294	KEYTOP, Z	1
39	DFWV70C7295	KEYTOP, U	1
40	DFWV70C7296	KEYTOP, I	1
41	DFWV70C7297	KEYTOP, O	1
42	DFWV70C7298	KEYTOP, P	1
43	DFWV70C7299	KEYTOP, Ü	1
44	DFWV70C7300	KEYTOP, * +	1
45	DFWV70C7301	KEYTOP, ' #	1
46	DFWV70C7302	KEYTOP, PgUp	1
47	DFWV70C7303	KEYTOP, ⇩	1
48	DFWV70C7304	KEYTOP, A	1
49	DFWV70C7305	KEYTOP, S	1
50	DFWV70C7306	KEYTOP, D	1
51	DFWV70C7307	KEYTOP, F	1
52	DFWV70C7308	KEYTOP, G	1
53	DFWV70C7309	KEYTOP, H	1
54	DFWV70C7310	KEYTOP, J	1
55	DFWV70C7311	KEYTOP, K	1

REF.	PART NO.	DESCRIPTION	QTY
56	DFWV70C7312	KEYTOP, L	1
57	DFWV70C7313	KEYTOP, Ö	1
58	DFWV70C7314	KEYTOP, Ä	1
59	DFWV70C7315	KEYTOP, Enter	1
60	DFWV70C7316	KEYTOP, PgDn	1
61	DFWV70C7317	KEYTOP, Shift(L)	1
62	DFWV70C7318	KEYTOP, Y	1
63	DFWV70C7319	KEYTOP, X	1
64	DFWV70C7320	KEYTOP, C	1
65	DFWV70C7321	KEYTOP, V	1
66	DFWV70C7322	KEYTOP, B	1
67	DFWV70C7323	KEYTOP, N	1
68	DFWV70C7324	KEYTOP, M	1
69	DFWV70C7325	KEYTOP, ; ,	1
70	DFWV70C7326	KEYTOP, : .	1
71	DFWV70C7327	KEYTOP, -	1
72	DFWV70C7328	KEYTOP, Shift(R)	1
73	DFWV70C7329	KEYTOP, ↑	1
74	DFWV70C7330	KEYTOP, End	1
75	DFWV70C7331	KEYTOP, Ctrl	1
76	DFWV70C7332	KEYTOP, Fn	1
77	DFWV70C7333	KEYTOP, Alt	1
78	DFWV70C7334	KEYTOP, ° ^	1
79	DFWV70C7335	KEYTOP, > <	1
80	DFWV70C7336	KEYTOP, AltGr	1
81	DFWV70C7337	KEYTOP, Ins	1
82	DFWV70C7338	KEYTOP, Del	1
83	DFWV70C7339	KEYTOP, ←	1
84	DFWV70C7340	KEYTOP, ↓	1
85	DFWV70C7341	KEYTOP, →	1
86	DFWV70C7342	KEYTOP, Space	1
E10-1	DFWV48C0210	SWITCH, MEMBRANE	1
E10-2	DFWV65D0044	SPRING, RUBBER, KEYTOP	69
E10-3	DFWV71H0046	ROD, ENTER/SHIFT(L)	1
E10-4	DFWV71H0047	ROD, BACK SPACE	3
E10-5	DFWV71H0048	ROD, SPACE BAR	1
E10-6	DFWV50B0016	SCREW, KEYBOARD	23
E10-7	DFWV71H0049	ROD, Ctrl/CpLk/SHIFT(R)	3
E10-8	DFWV65C0219	PAD, KEYTOP	69
E10-9	DFWV65D0046	SPRING, RUBBER, KEYTOP, FUNCTION KEY	17
E10-10	DFWV65C0220	PAD, KEYTOP, FUNCTION KEY	17

● Keyboard for Italian (IT)

REF.	PART NO.	DESCRIPTION	QTY
Keyboard for (IT)			
E10	ESU54TM419DA	Ass' y. KEYBOARD(IT)	1
1	DFWV70C7777	KEYTOP, Esc	1
2	DFWV70C7778	KEYTOP, F1	1
3	DFWV70C7779	KEYTOP, F2	1
4	DFWV70C7780	KEYTOP, F3	1
5	DFWV70C7781	KEYTOP, F4	1
6	DFWV70C7782	KEYTOP, F5	1
7	DFWV70C7783	KEYTOP, F6	1
8	DFWV70C7784	KEYTOP, F7	1
9	DFWV70C7785	KEYTOP, F8	1
10	DFWV70C7786	KEYTOP, F9	1
11	DFWV70C7787	KEYTOP, F10	1
12	DFWV70C7788	KEYTOP, F11	1
13	DFWV70C7789	KEYTOP, F12	1
14	DFWV70C7790	KEYTOP, Numlk	1
15	DFWV70C7791	KEYTOP, PrtSc SysRg	1
16	DFWV70C7792	KEYTOP, ScrIk Keypad	1
17	DFWV70C7793	KEYTOP, Pause Break	1
18	DFWV70C7794	KEYTOP, ! 1	1
19	DFWV70C7795	KEYTOP, " 2	1
20	DFWV70C7796	KEYTOP, £ 3	1
21	DFWV70C7797	KEYTOP, \$ 4	1
22	DFWV70C7798	KEYTOP, % 5	1
23	DFWV70C7799	KEYTOP, & 6	1
24	DFWV70C7800	KEYTOP, / 7	1
25	DFWV70C7801	KEYTOP, (8	1
26	DFWV70C7802	KEYTOP,) 9	1
27	DFWV70C7803	KEYTOP, = 0	1
28	DFWV70C7804	KEYTOP, ? ' 1	1
29	DFWV70C7805	KEYTOP, ^ i	1
30	DFWV70C7806	KEYTOP, ←	1
31	DFWV70C7807	KEYTOP, Home	1
32	DFWV70C7808	KEYTOP, ⇐	1
33	DFWV70C7809	KEYTOP, Q	1
34	DFWV70C7810	KEYTOP, W	1
35	DFWV70C7811	KEYTOP, E	1
36	DFWV70C7812	KEYTOP, R	1
37	DFWV70C7813	KEYTOP, T	1
38	DFWV70C7814	KEYTOP, Y	1
39	DFWV70C7815	KEYTOP, U	1
40	DFWV70C7816	KEYTOP, I	1
41	DFWV70C7817	KEYTOP, O	1
42	DFWV70C7818	KEYTOP, P	1
43	DFWV70C7819	KEYTOP, é è	1
44	DFWV70C7820	KEYTOP, * +	1
45	DFWV70C7821	KEYTOP, § ù	1
46	DFWV70C7822	KEYTOP, Pgup	1
47	DFWV70C7823	KEYTOP, Capslock	1
48	DFWV70C7824	KEYTOP, A	1
49	DFWV70C7825	KEYTOP, S	1
50	DFWV70C7826	KEYTOP, D	1
51	DFWV70C7827	KEYTOP, F	1
52	DFWV70C7828	KEYTOP, G	1
53	DFWV70C7829	KEYTOP, H	1
54	DFWV70C7830	KEYTOP, J	1
55	DFWV70C7831	KEYTOP, K	1

REF.	PART NO.	DESCRIPTION	QTY
56	DFWV70C7832	KEYTOP, L	1
57	DFWV70C7833	KEYTOP, ç ò	1
58	DFWV70C7834	KEYTOP, ò à	1
59	DFWV70C7835	KEYTOP, Enter	1
60	DFWV70C7836	KEYTOP, PgDn	1
61	DFWV70C7837	KEYTOP, Shift (L)	1
62	DFWV70C7838	KEYTOP, Z	1
63	DFWV70C7839	KEYTOP, X	1
64	DFWV70C7840	KEYTOP, C	1
65	DFWV70C7841	KEYTOP, V	1
66	DFWV70C7842	KEYTOP, B	1
67	DFWV70C7843	KEYTOP, N	1
68	DFWV70C7844	KEYTOP, M	1
69	DFWV70C7845	KEYTOP, ; ,	1
70	DFWV70C7846	KEYTOP, : ·	1
71	DFWV70C7847	KEYTOP, -	1
72	DFWV70C7848	KEYTOP, Shift (R)	1
73	DFWV70C7849	KEYTOP, ↑	1
74	DFWV70C7850	KEYTOP, End	1
75	DFWV70C7851	KEYTOP, Ctrl	1
76	DFWV70C7852	KEYTOP, Fn	1
77	DFWV70C7853	KEYTOP, Alt	1
78	DFWV70C7854	KEYTOP, ; \	1
79	DFWV70C7855	KEYTOP, > <	1
80	DFWV70C7856	KEYTOP, AltGr	1
81	DFWV70C7857	KEYTOP, Ins	1
82	DFWV70C7858	KEYTOP, Del	1
83	DFWV70C7859	KEYTOP, ←	1
84	DFWV70C7860	KEYTOP, ↓	1
85	DFWV70C7861	KEYTOP, →	1
86	DFWV70C7862	KEYTOP, Space	1
E10-1	DFWV48C0210	SWITCH, MEMBRANE	1
E10-2	DFWV65D0044	SPRING, RUBBER, KEYTOP	69
E10-3	DFWV71H0046	ROD, ENTER/SHIFT(L)	1
E10-4	DFWV71H0047	ROD, BACK SPACE	3
E10-5	DFWV71H0048	ROD, SPACE BAR	1
E10-6	DFWV50B0016	SCREW, KEYBOARD	23
E10-7	DFWV71H0049	ROD, Ctrl/CpLk/SHIFT(R)	3
E10-8	DFWV65C0219	PAD, KEYTOP	69
E10-9	DFWV65D0046	SPRING, RUBBER, KEYTOP, FUNCTIONKEY	17
E10-10	DFWV65C0220	PAD, KEYTOP, FUNCTIONKEY	17

• Keyboard for Spanish (SP)

REF.	PART NO.	DESCRIPTION	QTY
Keyboard for (SP)			
E10	ESU54TM419EA	Ass'y, KEYBOARD(SP)	1
1	DFWV70C7603	KEYTOP, Esc	1
2	DFWV70C7604	KEYTOP, F1	1
3	DFWV70C7605	KEYTOP, F2	1
4	DFWV70C7606	KEYTOP, F3	1
5	DFWV70C7607	KEYTOP, F4	1
6	DFWV70C7608	KEYTOP, F5	1
7	DFWV70C7609	KEYTOP, F6	1
8	DFWV70C7610	KEYTOP, F7	1
9	DFWV70C7611	KEYTOP, F8	1
10	DFWV70C7612	KEYTOP, F9	1
11	DFWV70C7613	KEYTOP, F10	1
12	DFWV70C7614	KEYTOP, F11	1
13	DFWV70C7615	KEYTOP, F12	1
14	DFWV70C7616	KEYTOP, NumLk	1
15	DFWV70C7617	KEYTOP, PrtSc SysRq	1
16	DFWV70C7618	KEYTOP, ScrLk Key Pad	1
17	DFWV70C7619	KEYTOP, Pause Break	1
18	DFWV70C7620	KEYTOP, ! 1	1
19	DFWV70C7621	KEYTOP, " 2	1
20	DFWV70C7622	KEYTOP, . 3	1
21	DFWV70C7623	KEYTOP, \$ 4	1
22	DFWV70C7624	KEYTOP, % 5	1
23	DFWV70C7625	KEYTOP, & 6	1
24	DFWV70C7626	KEYTOP, / 7	1
25	DFWV70C7627	KEYTOP, (8	1
26	DFWV70C7628	KEYTOP,) 9	1
27	DFWV70C7629	KEYTOP, = 0	1
28	DFWV70C7630	KEYTOP, ? '	1
29	DFWV70C7631	KEYTOP, & i	1
30	DFWV70C7632	KEYTOP, ←	1
31	DFWV70C7633	KEYTOP, Home	1
32	DFWV70C7634	KEYTOP, ⇐	1
33	DFWV70C7635	KEYTOP, Q	1
34	DFWV70C7636	KEYTOP, W	1
35	DFWV70C7637	KEYTOP, E	1
36	DFWV70C7638	KEYTOP, R	1
37	DFWV70C7639	KEYTOP, T	1
38	DFWV70C7640	KEYTOP, Y	1
39	DFWV70C7641	KEYTOP, U	1
40	DFWV70C7642	KEYTOP, I	1
41	DFWV70C7643	KEYTOP, O	1
42	DFWV70C7644	KEYTOP, P	1
43	DFWV70C7645	KEYTOP, ^ `	1
44	DFWV70C7646	KEYTOP, * +	1
45	DFWV70C7647	KEYTOP, { }	1
46	DFWV70C7648	KEYTOP, PgUp	1
47	DFWV70C7649	KEYTOP, Caps Lock	1
48	DFWV70C7650	KEYTOP, A	1
49	DFWV70C7651	KEYTOP, S	1
50	DFWV70C7652	KEYTOP, D	1
51	DFWV70C7653	KEYTOP, F	1
52	DFWV70C7654	KEYTOP, G	1
53	DFWV70C7655	KEYTOP, H	1
54	DFWV70C7656	KEYTOP, J	1
55	DFWV70C7657	KEYTOP, K	1

REF.	PART NO.	DESCRIPTION	QTY
56	DFWV70C7658	KEYTOP, L	1
57	DFWV70C7659	KEYTOP, Ñ	1
58	DFWV70C7660	KEYTOP, - '	1
59	DFWV70C7661	KEYTOP, Enter	1
60	DFWV70C7662	KEYTOP, PgDn	1
61	DFWV70C7663	KEYTOP, Shift(L)	1
62	DFWV70C7664	KEYTOP, Z	1
63	DFWV70C7665	KEYTOP, X	1
64	DFWV70C7666	KEYTOP, C	1
65	DFWV70C7667	KEYTOP, V	1
66	DFWV70C7668	KEYTOP, B	1
67	DFWV70C7669	KEYTOP, N	1
68	DFWV70C7670	KEYTOP, M	1
69	DFWV70C7671	KEYTOP, ; ,	1
70	DFWV70C7672	KEYTOP, : .	1
71	DFWV70C7673	KEYTOP, ~ -	1
72	DFWV70C7674	KEYTOP, Shift(R)	1
73	DFWV70C7675	KEYTOP, ↑	1
74	DFWV70C7676	KEYTOP, End	1
75	DFWV70C7677	KEYTOP, Ctrl	1
76	DFWV70C7678	KEYTOP, Fn	1
77	DFWV70C7679	KEYTOP, Alt	1
78	DFWV70C7680	KEYTOP, a o	1
79	DFWV70C7681	KEYTOP, > <	1
80	DFWV70C7682	KEYTOP, AltGr	1
81	DFWV70C7683	KEYTOP, Ins	1
82	DFWV70C7684	KEYTOP, Del	1
83	DFWV70C7685	KEYTOP, ←	1
84	DFWV70C7686	KEYTOP, ↓	1
85	DFWV70C7687	KEYTOP, →	1
86	DFWV70C7688	KEYTOP, Space	1
E10-1	DFWV48C0210	SWITCH, MEMBRANE	1
E10-2	DFWV65D0044	SPRING, RUBBER, KEYTOP	69
E10-3	DFWV71H0046	ROD, ENTER/SHIFT(L)	1
E10-4	DFWV71H0047	ROD, BACK SPACE	3
E10-5	DFWV71H0048	ROD, SPACE BAR	1
E10-6	DFWV50B0016	SCREW, KEYBOARD	23
E10-7	DFWV71H0049	ROD, Ctrl/CpLk/SHIFT(R)	3
E10-8	DFWV65C0219	PAD, KEYTOP	69
E10-9	DFWV65D0046	SPRING, RUBBER, KEYTOP, FUNCTIONKEY	17
E10-10	DFWV65C0220	PAD, KEYTOP, FUNCTIONKEY	17

• Keyboard for Swiss (SS)

REF.	PART NO.	DESCRIPTION	QTY
Keyboard for (SS)			
E10	ESU54TM419GA	Ass'y, KEYBOARD(SS)	1
1	DFWV70C7690	KEYTOP, Esc	1
2	DFWV70C7691	KEYTOP, F1	1
3	DFWV70C7692	KEYTOP, F2	1
4	DFWV70C7693	KEYTOP, F3	1
5	DFWV70C7694	KEYTOP, F4	1
6	DFWV70C7695	KEYTOP, F5	1
7	DFWV70C7696	KEYTOP, F6	1
8	DFWV70C7697	KEYTOP, F7	1
9	DFWV70C7698	KEYTOP, F8	1
10	DFWV70C7699	KEYTOP, F9	1
11	DFWV70C7700	KEYTOP, F10	1
12	DFWV70C7701	KEYTOP, F11	1
13	DFWV70C7702	KEYTOP, F12	1
14	DFWV70C7703	KEYTOP, NumLk	1
15	DFWV70C7704	KEYTOP, PrtSc SysRg	1
16	DFWV70C7705	KEYTOP, ScrLk Keypad	1
17	DFWV70C7706	KEYTOP, Pause Break	1
18	DFWV70C7707	KEYTOP, + 1	1
19	DFWV70C7708	KEYTOP, " 2	1
20	DFWV70C7709	KEYTOP, * 3	1
21	DFWV70C7710	KEYTOP, & 4	1
22	DFWV70C7711	KEYTOP, % 5	1
23	DFWV70C7712	KEYTOP, & 6	1
24	DFWV70C7713	KEYTOP, / 7	1
25	DFWV70C7714	KEYTOP, (8	1
26	DFWV70C7715	KEYTOP,) 9	1
27	DFWV70C7716	KEYTOP, = 0	1
28	DFWV70C7717	KEYTOP, ? ' ^	1
29	DFWV70C7718	KEYTOP, ` ~	1
30	DFWV70C7719	KEYTOP, ←	1
31	DFWV70C7720	KEYTOP, Home	1
32	DFWV70C7721	KEYTOP, ⇐	1
33	DFWV70C7722	KEYTOP, Q	1
34	DFWV70C7723	KEYTOP, W	1
35	DFWV70C7724	KEYTOP, E	1
36	DFWV70C7725	KEYTOP, R	1
37	DFWV70C7726	KEYTOP, T	1
38	DFWV70C7727	KEYTOP, Z	1
39	DFWV70C7728	KEYTOP, U	1
40	DFWV70C7729	KEYTOP, I	1
41	DFWV70C7730	KEYTOP, O	1
42	DFWV70C7731	KEYTOP, P	1
43	DFWV70C7732	KEYTOP, è ü	1
44	DFWV70C7733	KEYTOP, ! "	1
45	DFWV70C7734	KEYTOP, £ \$	1
46	DFWV70C7735	KEYTOP, Pgup	1
47	DFWV70C7736	KEYTOP, Capslock	1
48	DFWV70C7737	KEYTOP, A	1
49	DFWV70C7738	KEYTOP, S	1
50	DFWV70C7739	KEYTOP, D	1
51	DFWV70C7740	KEYTOP, F	1
52	DFWV70C7741	KEYTOP, G	1
53	DFWV70C7742	KEYTOP, H	1
54	DFWV70C7743	KEYTOP, J	1
55	DFWV70C7744	KEYTOP, K	1

REF.	PART NO.	DESCRIPTION	QTY
56	DFWV70C7745	KEYTOP, L	1
57	DFWV70C7746	KEYTOP, é ö	1
58	DFWV70C7747	KEYTOP, à ä	1
59	DFWV70C7748	KEYTOP, Enter	1
60	DFWV70C7749	KEYTOP, PgDn	1
61	DFWV70C7750	KEYTOP, Shift (L)	1
62	DFWV70C7751	KEYTOP, Y	1
63	DFWV70C7752	KEYTOP, X	1
64	DFWV70C7753	KEYTOP, C	1
65	DFWV70C7754	KEYTOP, V	1
66	DFWV70C7755	KEYTOP, B	1
67	DFWV70C7756	KEYTOP, N	1
68	DFWV70C7757	KEYTOP, M	1
69	DFWV70C7758	KEYTOP, ; ,	1
70	DFWV70C7759	KEYTOP, : ·	1
71	DFWV70C7760	KEYTOP, -	1
72	DFWV70C7761	KEYTOP, Shift (R)	1
73	DFWV70C7762	KEYTOP, ↑	1
74	DFWV70C7763	KEYTOP, End	1
75	DFWV70C7764	KEYTOP, Ctrl	1
76	DFWV70C7765	KEYTOP, Fn	1
77	DFWV70C7766	KEYTOP, Alt	1
78	DFWV70C7767	KEYTOP, . \$	1
79	DFWV70C7768	KEYTOP, > <	1
80	DFWV70C7769	KEYTOP, AltGr	1
81	DFWV70C7770	KEYTOP, Ins	1
82	DFWV70C7771	KEYTOP, Del	1
83	DFWV70C7772	KEYTOP, ←	1
84	DFWV70C7773	KEYTOP, ↓	1
85	DFWV70C7774	KEYTOP, →	1
86	DFWV70C7775	KEYTOP, Space	1
E10-1	DFWV48C0210	SWITCH, MEMBRANE	1
E10-2	DFWV65D0044	SPRING, RUBBER, KEYTOP	69
E10-3	DFWV71H0046	ROD, ENTER/SHIFT(L)	1
E10-4	DFWV71H0047	ROD, BACK SPACE	3
E10-5	DFWV71H0048	ROD, SPACE BAR	1
E10-6	DFWV50B0016	SCREW, KEYBOARD	23
E10-7	DFWV71H0049	ROD, Ctrl/CpLk/SHIFT(R)	3
E10-8	DFWV65C0219	PAD, KEYTOP	69
E10-9	DFWV65D0046	SPRING, RUBBER, KEYTOP, FUNCTIONKEY	17
E10-10	DFWV65C0220	PAD, KEYTOP, FUNCTIONKEY	17

• Keyboard for Swedish (SW)

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REF.	PART NO.	DESCRIPTION	QTY
Keyboard for (SW)			
E10	ESU54TM419FA	Ass'y, KEYBOARD(SW)	1
1	DFWV70C7516	KEYTOP, Esc	1
2	DFWV70C7517	KEYTOP, F1	1
3	DFWV70C7518	KEYTOP, F2	1
4	DFWV70C7519	KEYTOP, F3	1
5	DFWV70C7520	KEYTOP, F4	1
6	DFWV70C7521	KEYTOP, F5	1
7	DFWV70C7522	KEYTOP, F6	1
8	DFWV70C7523	KEYTOP, F7	1
9	DFWV70C7524	KEYTOP, F8	1
10	DFWV70C7525	KEYTOP, F9	1
11	DFWV70C7526	KEYTOP, F10	1
12	DFWV70C7527	KEYTOP, F11	1
13	DFWV70C7528	KEYTOP, F12	1
14	DFWV70C7529	KEYTOP, NumLk	1
15	DFWV70C7530	KEYTOP, PrtSc SysRq	1
16	DFWV70C7531	KEYTOP, ScrLk Key Pad	1
17	DFWV70C7532	KEYTOP, Pause Break	1
18	DFWV70C7533	KEYTOP, ! 1	1
19	DFWV70C7534	KEYTOP, " 2	1
20	DFWV70C7535	KEYTOP, # 3	1
21	DFWV70C7536	KEYTOP, \$ 4	1
22	DFWV70C7537	KEYTOP, % 5	1
23	DFWV70C7538	KEYTOP, & 6	1
24	DFWV70C7539	KEYTOP, / 7	1
25	DFWV70C7540	KEYTOP, (8	1
26	DFWV70C7541	KEYTOP,) 9	1
27	DFWV70C7542	KEYTOP, = 0	1
28	DFWV70C7543	KEYTOP, ? +	1
29	DFWV70C7544	KEYTOP, ' `	1
30	DFWV70C7545	KEYTOP, ←	1
31	DFWV70C7546	KEYTOP, Home	1
32	DFWV70C7547	KEYTOP, ⇐	1
33	DFWV70C7548	KEYTOP, Q	1
34	DFWV70C7549	KEYTOP, W	1
35	DFWV70C7550	KEYTOP, E	1
36	DFWV70C7551	KEYTOP, R	1
37	DFWV70C7552	KEYTOP, T	1
38	DFWV70C7553	KEYTOP, Y	1
39	DFWV70C7554	KEYTOP, U	1
40	DFWV70C7555	KEYTOP, I	1
41	DFWV70C7556	KEYTOP, O	1
42	DFWV70C7557	KEYTOP, P	1
43	DFWV70C7558	KEYTOP, Å	1
44	DFWV70C7559	KEYTOP, ^ ..	1
45	DFWV70C7560	KEYTOP, * '	1
46	DFWV70C7561	KEYTOP, PgUp	1
47	DFWV70C7562	KEYTOP, Caps Lock	1
48	DFWV70C7563	KEYTOP, A	1
49	DFWV70C7564	KEYTOP, S	1
50	DFWV70C7565	KEYTOP, D	1
51	DFWV70C7566	KEYTOP, F	1
52	DFWV70C7567	KEYTOP, G	1
53	DFWV70C7568	KEYTOP, H	1
54	DFWV70C7569	KEYTOP, J	1
55	DFWV70C7570	KEYTOP, K	1

REF.	PART NO.	DESCRIPTION	QTY
56	DFWV70C7571	KEYTOP, L	1
57	DFWV70C7572	KEYTOP, Ö	1
58	DFWV70C7573	KEYTOP, Ä	1
59	DFWV70C7574	KEYTOP, Enter	1
60	DFWV70C7575	KEYTOP, PgDn	1
61	DFWV70C7576	KEYTOP, Shift(L)	1
62	DFWV70C7577	KEYTOP, Z	1
63	DFWV70C7578	KEYTOP, X	1
64	DFWV70C7579	KEYTOP, C	1
65	DFWV70C7580	KEYTOP, V	1
66	DFWV70C7581	KEYTOP, B	1
67	DFWV70C7582	KEYTOP, N	1
68	DFWV70C7583	KEYTOP, M	1
69	DFWV70C7584	KEYTOP, ; ,	1
70	DFWV70C7585	KEYTOP, : ;	1
71	DFWV70C7586	KEYTOP, ' -	1
72	DFWV70C7587	KEYTOP, Shift(R)	1
73	DFWV70C7588	KEYTOP, ↑	1
74	DFWV70C7589	KEYTOP, End	1
75	DFWV70C7590	KEYTOP, Ctrl	1
76	DFWV70C7591	KEYTOP, Fn	1
77	DFWV70C7592	KEYTOP, Alt	1
78	DFWV70C7593	KEYTOP, 1/2 \$	1
79	DFWV70C7594	KEYTOP, > <	1
80	DFWV70C7595	KEYTOP, AltGr	1
81	DFWV70C7596	KEYTOP, Ins	1
82	DFWV70C7597	KEYTOP, Del	1
83	DFWV70C7598	KEYTOP, ←	1
84	DFWV70C7599	KEYTOP, ↓	1
85	DFWV70C7600	KEYTOP, →	1
86	DFWV70C7601	KEYTOP, Space	1
E10-1	DFWV48C0210	SWITCH, MEMBRANE	1
E10-2	DFWV65D0044	SPRING, RUBBER, KEYTOP	69
E10-3	DFWV71H0046	ROD, ENTER/SHIFT(L)	1
E10-4	DFWV71H0047	ROD, BACK SPACE	3
E10-5	DFWV71H0048	ROD, SPACE BAR	1
E10-6	DFWV50B0016	SCREW, KEYBOARD	23
E10-7	DFWV71H0049	ROD, Ctrl/CpLk/SHIFT(R)	3
E10-8	DFWV65C0219	PAD, KEYTOP	69
E10-9	DFWV65D0046	SPRING, RUBBER, KEYTOP, FUNCTION KEY	17
E10-10	DFWV65C0220	PAD, KEYTOP, FUNCTION KEY	17