ORDER NO. CPD9010459C0
G3

Service Manual

Laptop Computer

CF-270

This is the Service Manual for the following areas.

M ... For U.S.A.

C ... For Canada.

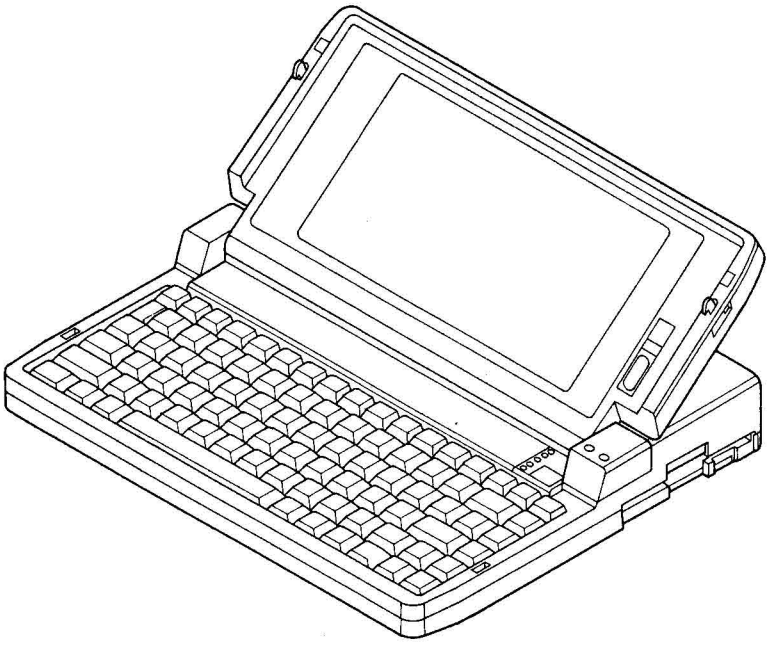
• For Europe

E .....for U.K.

F .....for France.

G .....for F.R.Germany.

Business Partner™ Notebook Computer



Panasonic®

WARNINGS

For UK

- 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 interfacing to other parts of equipment takes place.

This equipment is produced to BS800/1983.

For the Netherlands

VOLDOET AAN EEC RIGHTLJN 82/499 E.E.C.

For UK

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 mains outlet socket is easily accessible to enable the user to isolate the apparatus from the mains supply by withdrawing the mains plug.
Extension cords used with the equipment must be three-core and be correctly wired to provide connection to earth.
Wrongly wired extension cords are major cause of fatalities.
The fact that the equipment operates satisfactorily does not imply that the power point is earthed and that the installation is completely safe.
For your safety, if any doubt about the effective earthing of the power point, consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:
Green-and-Yellow: Earth
Blue: Neutral
Brown: Live

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

LITHIUM BATTERY ⚠

Due to the risk for explosion it might only be exchanged with a same battery of the same manufacture and type.

Contents

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 ⚠ on the replacement parts list. It is essential that these critical parts should be replaced with the manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without written permission of the manufacturer or this will void the original parts and labor guarantee.

1. System Overview

1.1 General Description

The CF-270 is based on the 80C286 microprocessor and can run up to 16MHz.
An 80C287 math co-processor socket is present as well.
The system supports up to 5 megabytes RAM (Total); 1 megabyte is placed on the main logic board, and an additional 4 megabytes can be added using four SIMMs (Single In-line Memory Module).
Both system BIOS and video BIOS can be in shadow RAM.
Without processor RAM cache, the system uses pagemode memory and/or interleaved 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 keyboard (IBM-PS/2 style mini DIN size).
The disk drives are a 2.5-inch 20 megabytes hard disk and a 3.5-inch 1.44 megabytes floppy disk drive.
The VGA interface is on the main logic board and it supports analog/digital monitor and a 640×400 black and white Liquid Crystal Display.

1.2 Specifications

Main Unit

PROCESSOR

CPU	Microprocessor 80C286, 16MHz Co-processor (Option) 80C287A, 12MHz

Memory

RAM	640KB Up to 5MB expandable using four optional 1MB RAM Cards
ROM	128KB

Storage

	3 1/2″ Floppy Disk Drive (FDD) (1.44M/720K bytes double-sided, high density, double track) 2 1/2″ Hard Disk Drive (HDD) (20M bytes, 23ms seek time)

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 columns×25 lines 40 columns×25 lines
Graphics	640×480 dots (16 grayscale)

Keyboard	
Number of keys	84 keys for (M) and (C), 85 keys for (E), (F) and (G)
Key Top	U.S. Keyboard-Layout for (M) and (C) U.K. Keyboard-Layout for (E) French Keyboard-Layout for (F) German Keyboard-Layout for (G) External Keyboard
I/O	Parallel Port DB-25 (female) Serial Port DB-9 (male) VGA Monitor Port DB-15 (female)
Control	Power Switch ON/OFF Contrast Backlight Intensity (High/Middle/Low) Reset Button
Software	MS-DOS V 4.01 GW-BASIC V 3.20
Input Voltage	16V
Current Consumption	1.25A (MAX.)
Temperature	
Operating	41°F~95°F (5°C~35°C)
Storage	−4°F~140°F (−20°C~60°C)
Weight	6.9lbs (3.14kg) (Including Battery Pack)
Dimensions	12 3/16″ × 1 11/16″ × 10″
(W × H × D)	(310 × 44 × 254mm)

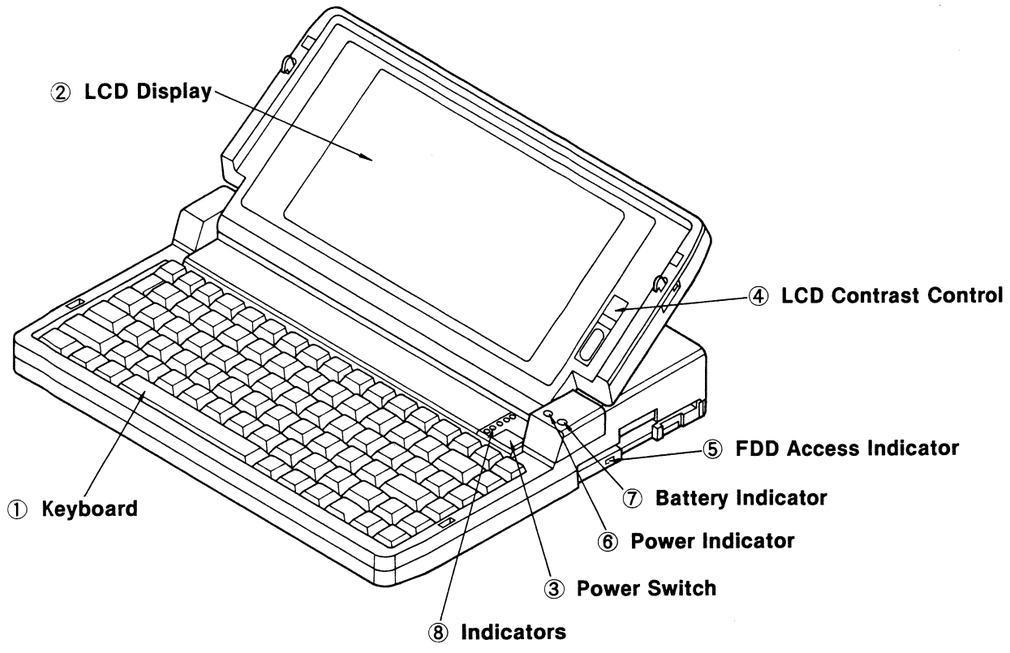
AC Adaptor

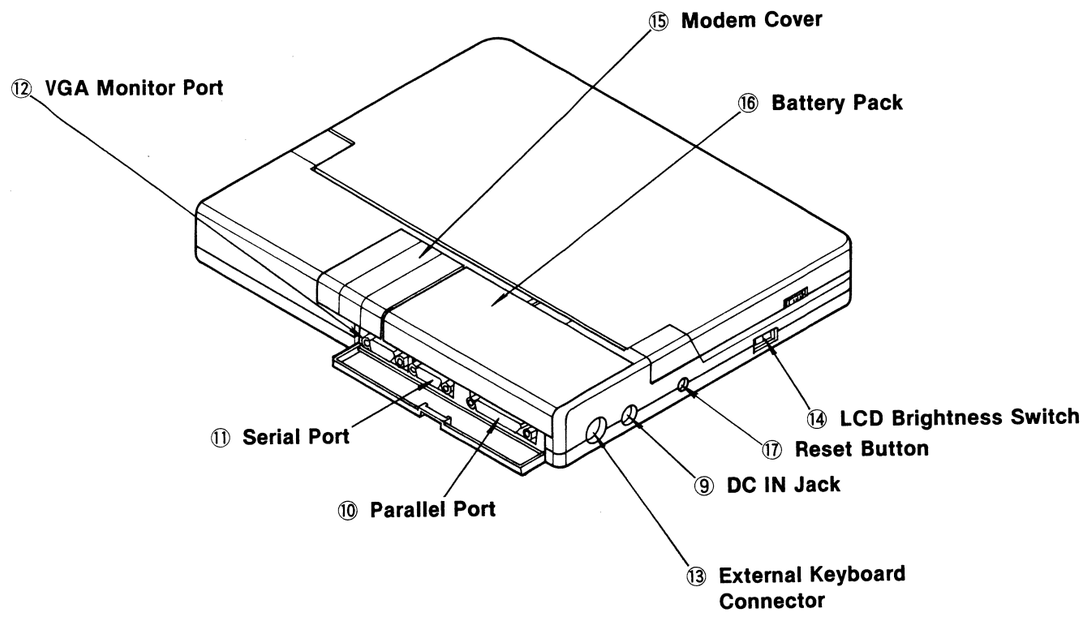
Primary	105V~135VAC for (M) and (C) 110V~240VAC for (E), (F) and (G)
Secondary	
Voltage	16V at 1.25A
Current Capacity	1.25A (MAX.)
Operating Temperature	36°F~104°F (0°C~40°C)
Weight	0.57lbs (0.26kg) for (M) and (C), 0.45kg, for (E), (F) and (G)
Dimensions	2 11/32″ × 1 13/32″ × 3 13/16″ (60 × 36 × 97mm) for (M) and (C)
(W × H × D)	70 × 43 × 135mm for (E), (F) and (G)

Battery Pack

Capacity	1.4AH (5 Hours rate) (AVE.) 12V (AVE.)
Charging Time	Approx. 4 Hours (Power ON: at normal operation) 2 Hours (Power OFF)
Duty Cycle	Approx. 400 times
Dimensions	5 5/8″ × 25/32″ × 2 13/16″ (143 × 19.5 × 71mm)
Weight	0.82lbs (370g)

1.3 Location of Controls and Components





① Keyboard
The Keyboard features 84/85 typewriter keys and special function keys.

② LCD Display
This display has 25 lines that allow 80 characters on each line.

③ Power Switch
Push this switch to turn the power ON or OFF.

④ LCD Contrast Control
This control adjusts the contrast of the LCD display relative to the viewing angle.

⑤ FDD Access Indicator
This sunset orange LED lights when the FDD is accessed.

⑥ Power Indicator
This green LED lights when the power switch is ON.
This indicator reflects the following CPU speed as well:
Lit orange: Slow (8MHz)
Lit green: Fast (16MHz)

⑦ Battery Indicator
The battery indicator reflects the following four statuses:

BATTERY indicator status	Battery pack status
BATTERY indicator not lit	The computer is being powered from the battery pack.
Lit orange	Charging
Lit green	Fully charged
Lit red	Low battery pack power. The battery supply will only last approximately 10 minutes after the BATTERY indicator glows red. Beeper warns for approximately last 2 minutes.
Blinking orange	The computer is being powered from the AC adaptor and the battery pack is not attached.

⑧ Indicators
These indicators consist of HDD, CapsLK, ScrLK (or Shift Lock) and Key Pad.

⑨ DC IN Jack
Connect the appropriate end of the AC adaptor.

⑩ Parallel Port
For hard copy printouts of information, attach a parallel printer to this port by using a printer cable.

⑪ Serial Port
Attach a DB-9 cable to this port when you need to receive or transmit serial information.

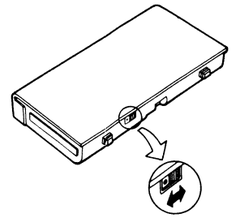
⑫ VGA Monitor Port
To use external VGA monitor, attach a DB-15 cable to this port.

⑬ External Keyboard Connector
Useful external keyboard (IBM PS/2 style) is able to attach to this connector.

⑭ LCD Brightness Switch
Slide this switch to adjust the LCD backlight brightness.

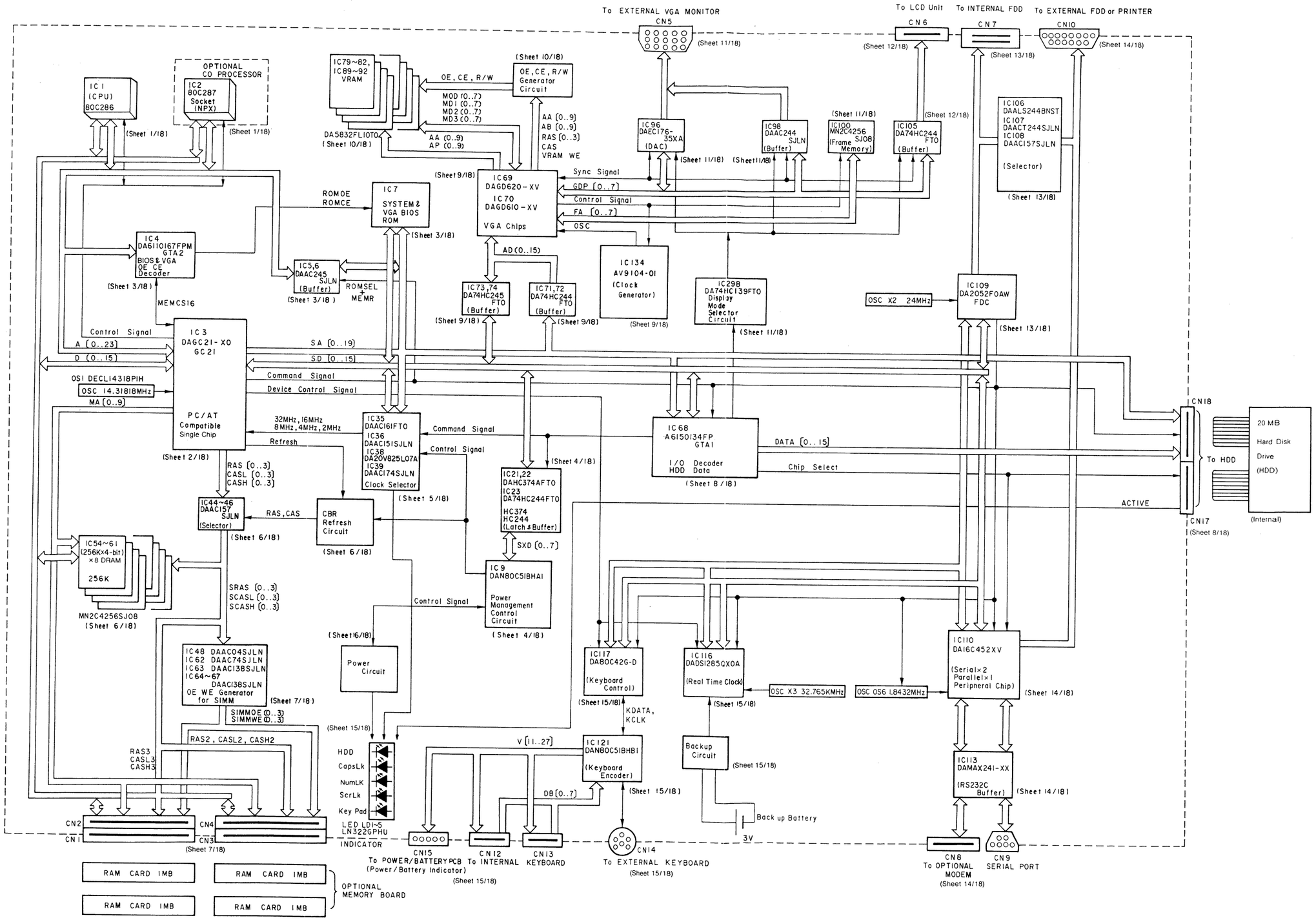
⑮ Modem Cover
Modem cover covers the optional modem receptacle.

⑯ Battery Pack
Included rechargeable battery pack for AC wall outlet free operations.
Note: There is a switch on the side of the battery pack. It is not related to any special function, but is simply intended to serve as a reminder of whether battey has been charged or not.



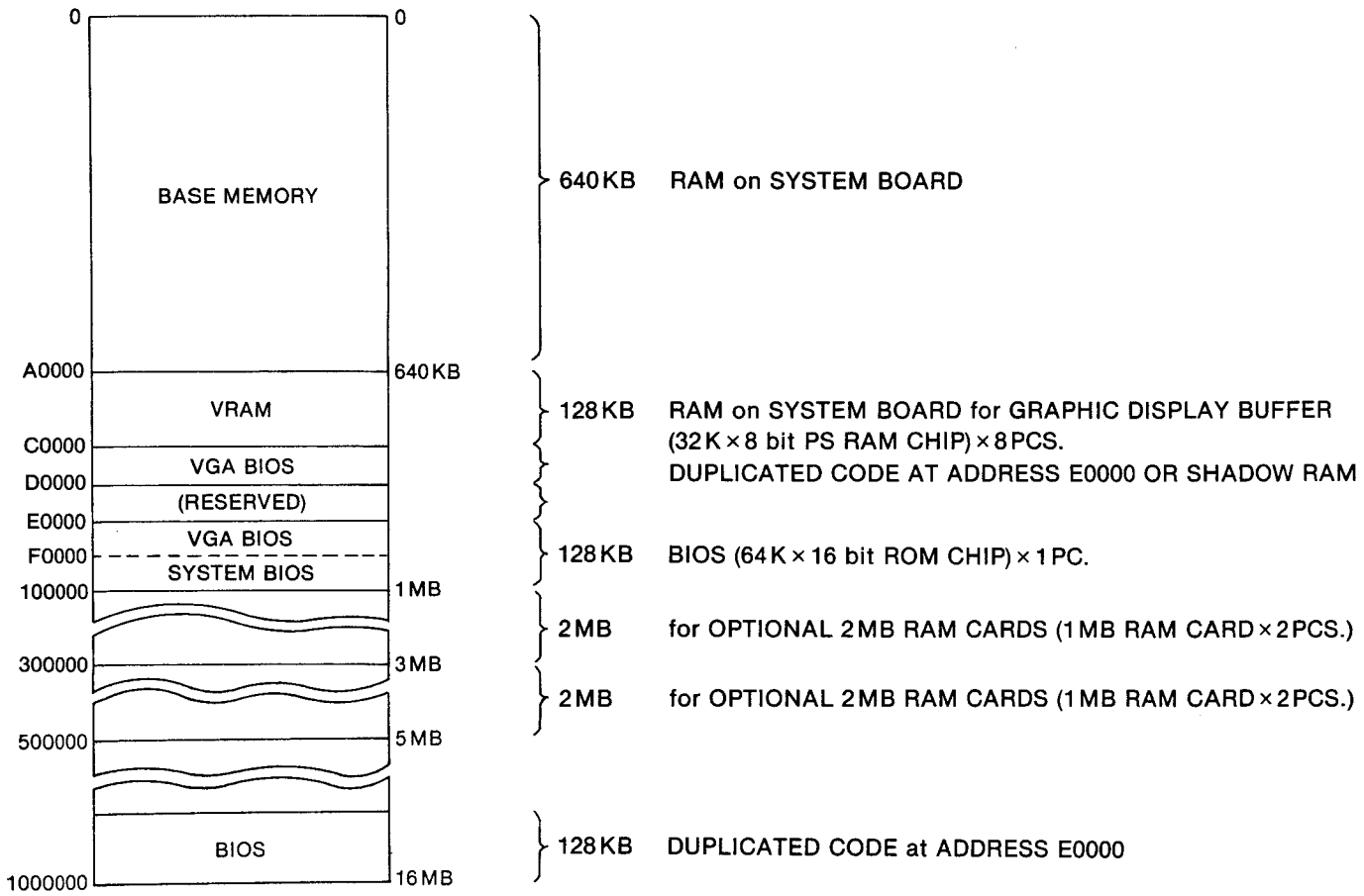
⑰ Reset Button
Pushing this button resets entire system of this computer.

1.4 Block Diagram



1.5 System Memory Map

The Main PCB supports 128K bytes of ROM area using 1 piece of 64K×16 bit ROM, and 1M byte of RAM area using 8 pieces of 256K×4 bit RAM.
The 640K bytes of RAM area is expandable up to 5M bytes using four optional RAM Cards in the RAM Slots.



1.6 I/O Address Map

1) System

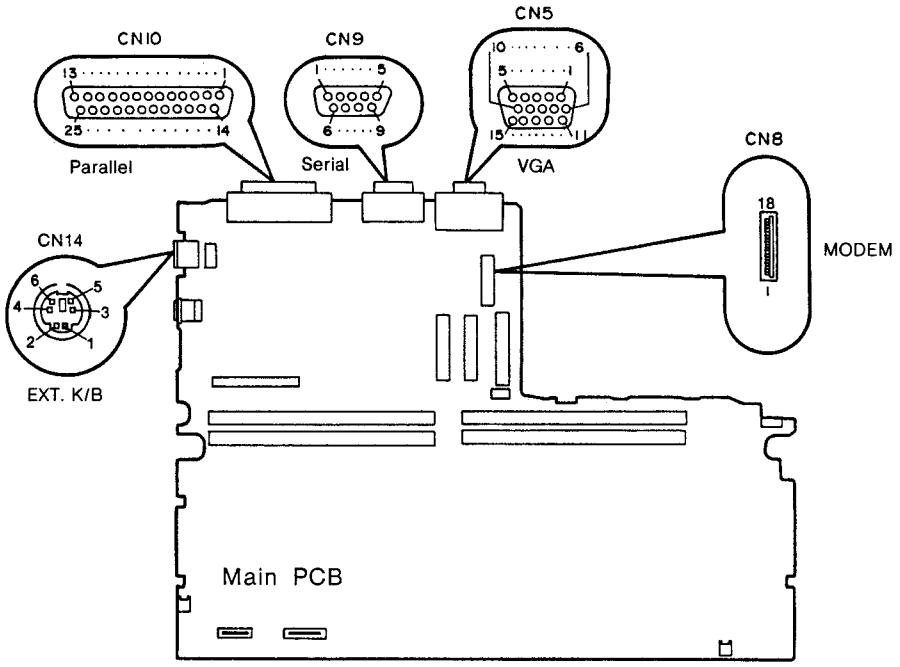
Address	Function	IC No.
000–01F	DMA controller 1 (slave)	IC3
020, 012	Interrupt controller 1 (master)	IC3
024, 028	Configuration register	IC3
040–043	Timer/Counter	IC3
060, 064	Keyboard controller	IC117
061	Port B register (PPI)	IC3
070, 071	Real-time clock	IC116
	NMI Mask bit	IC3
080-09F	DMA Memory Mapper (page register)	IC3
0A0–0A1	Interrupt controller 2 (slave)	IC3
0C0–0CF	DMA controller 2 (master)	IC3
800000F0–800000FF	Numeric Coprocessor	IC2 (Option)

At power on time, the NMI into 80C286 is masked off. The Mask bit can be set and reset by the system software.
Mask off (enable NMI): Write 0H to I/O address 70H
Mask on (disable NMI): Write 80H to I/O address 70H

2) Peripherals

Address	Function	IC No.
278–27F	Parallel printer port 2	IC110
2F8–2FF	Serial Port (IRQ3) [Modem port]	IC110
378–37F	Parallel printer port 1 (IRQ7)	IC110
3B0–3DF	Video Graphics Array	IC69
3F0–3F7	Diskette controller (IRQ6)	IC109
1F0–1F7	Hard Disk (16 bit) (IRQ14)	IC68
3F8–3FF	Serial port (IRQ4)	IC110

1.7 Pin Configurations



CN5 VGA Monitor Port (15-pin)

Pin No.	Signal Name/ Description	Direction
1	RED	Out
2	GREEN	Out
3	BLUE	Out
4	MS2	In
5	GND	—
6	GND	—
7	GND	—
8	GND	—
9	N.C.	—
10	GND	—
11	MS0	In
12	MS1	In
13	HSYNC	Out
14	VSYNC	Out
15	Not Used	—

CN8 MODEM Connector (18-pin)

Pin No.	Signal Name/ Description	Direction
1	$\overline{\text{CTS1}}$	In
2	GND	—
3	DSR1	In
4	+5V (VCC)	Out
5	$\overline{\text{RLSD1}}$	In
6	DDP6	Out
7	RI1	In
8	SIN1	In
9	$\overline{\text{MODEMSP}}$	In
10	$\overline{\text{RTS1}}$	Out
11	$\overline{\text{DTR1}}$	Out
12	SOUT1	Out
13	XRESET	Out
14	GND	—
15	N.C.	—
16	GND	—
17	N.C.	—
18	GND	—

CN10 Parallel/External FDD Port (25-pin)

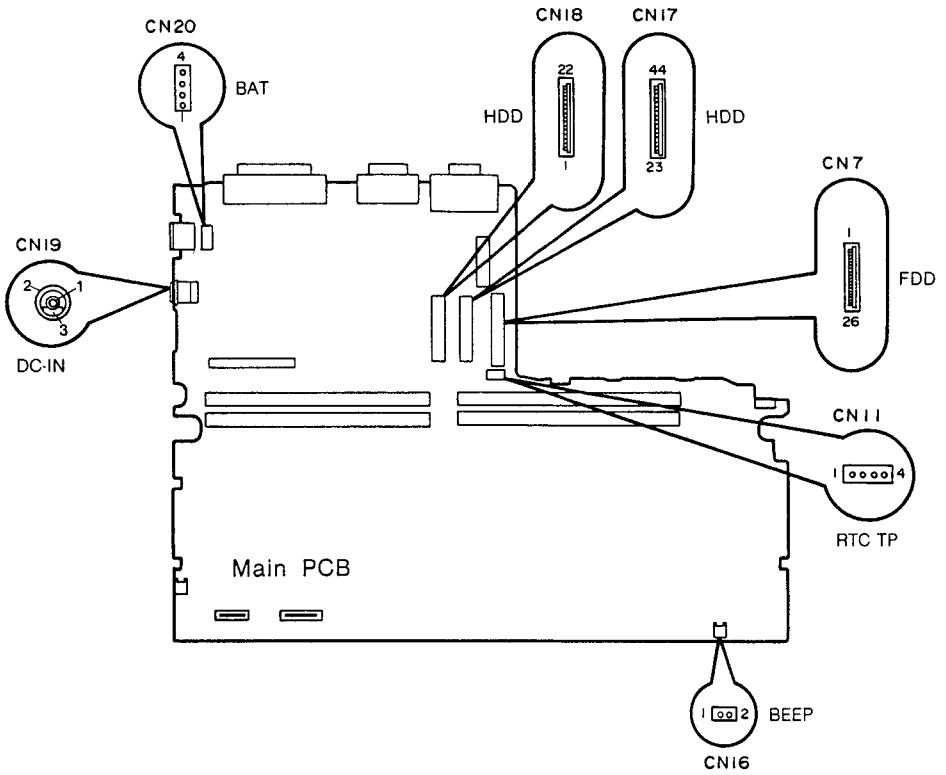
	For Printer		For External FDD	
Pin No.	Signal Name/ Description	Direction	Signal Name/ Description	Direction
1	$\overline{\text{STB}}$	Out	Not Used	—
2	PD0	Out	$\overline{\text{INDEX}}$	In
3	PD1	Out	$\overline{\text{TRK0}}$	In
4	PD2	Out	$\overline{\text{WPRT}}$	In
5	PD3	Out	$\overline{\text{REDT}}$	In
6	PD4	Out	$\overline{\text{DRY/DCG}}$	In
7	PD5	Out	Not Used	—
8	PD6	Out	Not Used	—
9	PD7	Out	Not Used	—
10	$\overline{\text{ACK}}$	In	$\overline{\text{DRIVESEL}}$	Out
11	BUSY	In	$\overline{\text{MOTOR ENABLE}}$	Out
12	PE	In	$\overline{\text{WRITE DATA}}$	Out
13	$\overline{\text{SLCT}}$	In	$\overline{\text{WRITE GATE}}$	Out
14	$\overline{\text{AFD}}$	Out	$\overline{\text{REDUCED}}$	Out
15	$\overline{\text{ERR}}$	In	$\overline{\text{HEAD SEL}}$	Out
16	$\overline{\text{INIT}}$	Out	$\overline{\text{DIRECTION}}$	Out
17	$\overline{\text{SLIN}}$	Out	$\overline{\text{STEP}}$	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	—

CN9 Serial Port (9-pin)

Pin No.	Signal Name/ Description	Direction
1	CD	In
2	RXD1	In
3	$\overline{\text{TXD1}}$	Out
4	$\overline{\text{DTR1}}$	Out
5	GND	—
6	$\overline{\text{DSR1}}$	In
7	$\overline{\text{RTS1}}$	Out
8	$\overline{\text{CTS1}}$	In
9	RING1	In

CN14 External Keyboard Connector (6-pin)

Pin No.	Signal Name/ Description	Direction
1	$\overline{\text{INT1}}$	In
2	N.C.	—
3	GND	—
4	+5V (VCC)	Out
5	$\overline{\text{INT0}}$	In
6	N.C.	—



CN7 FDD Connector (26-pin)

Pin No.	Signal Name/ Description	Direction
1	+5V (VCC)	Out
2	INDEX	In
3	+5V (VCC)	Out
4	DRIVESELECT	Out
5	+5V (VCC)	Out
6	DISKCHANGE	In
7	+5V (VCC)	Out
8	N.C.	—
9	N.C.	—
10	MOTORON	Out
11	MODESELECT	Out
12	DIRECTION	Out
13	GND	—
14	STEP	Out
15	GND	—
16	WRITEDATA	Out
17	GND	—
18	WRITEGATE	Out
19	GND	—
20	TRACK00	In
21	GND	—
22	WRITEPROTECT	In
23	GND	—
24	READDATA	In
25	GND	—
26	SIDESELECT	Out

CN17 HDD Connector (22-pin)

Pin No.	Signal Name/ Description	Direction
23	IOW	Out
24	GND	—
25	IOR	Out
26	GND	—
27	N.C.	—
28	N.C.	—
29	N.C.	—
30	GND	—
31	IRQ14	In
32	IOCS16	In
33	A1	Out
34	N.C.	—
35	A0	Out
36	A2	Out
37	HDCCS0	Out
38	HDCCS1	Out
39	ACTIVE	In
40	GND	—
41	+5V (LOGIC)	Out
42	+5V (MOTOR)	Out
43	GND	—
44	AT/XT	Out

CN18 HDD Connector (22-pin)

Pin No.	Signal Name/ Description	Direction
1	RESET	Out
2	GND	—
3	DATA 7	In/Out
4	DATA 8	In/Out
5	DATA 6	In/Out
6	DATA 9	In/Out
7	DATA 5	In/Out
8	DATA 10	In/Out
9	DATA 4	In/Out
10	DATA 11	In/Out
11	DATA 3	In/Out
12	DATA 12	In/Out
13	DATA 2	In/Out
14	DATA 13	In/Out
15	DATA 1	In/Out
16	DATA 14	In/Out
17	DATA 0	In/Out
18	DATA 15	In/Out
19	GND	—
20	N.C.	—
21	N.C.	—
22	GND	—

CN16 BEEP (2-pin)

Pin No.	Signal Name/ Description	Direction
1	P1	Out
2	P2	Out

CN11 RTCTP (4-pin)

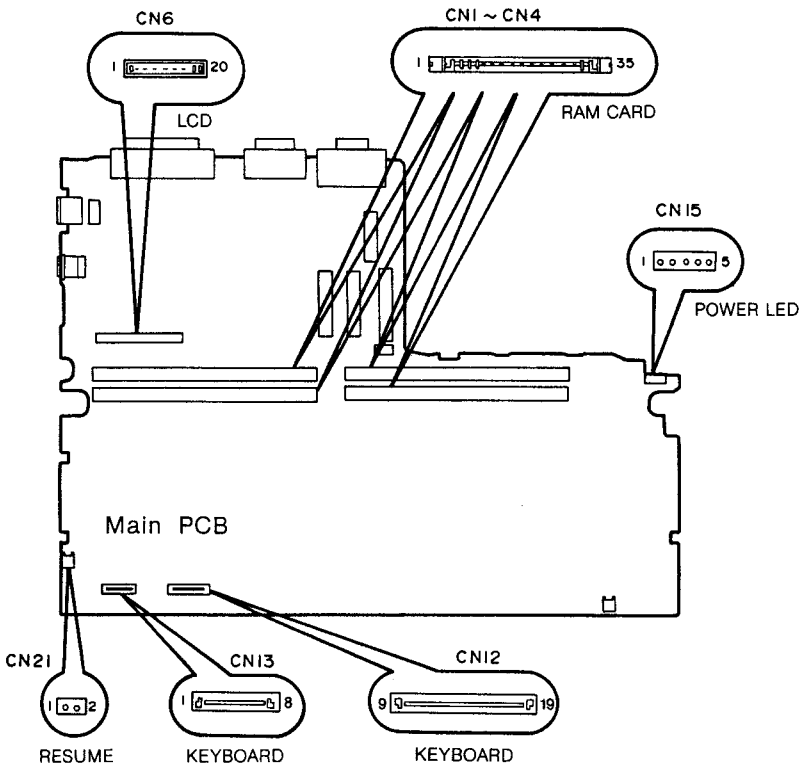
Pin No.	Signal Name/ Description	Direction
1	+3V (P1)	Out
2	VBAT	Out
3	SQW	Out
4	GND	—

CN19 DC-IN (3-pin)

Pin No.	Signal Name/ Description	Direction
1	+16V	In
2	GND	—
3	GND	—

CN20 BAT (4-pin)

Pin No.	Signal Name/ Description	Direction
1	VSENSE	In
2	GND	—
3	TSENSE	In
4	ISENSE	In



CN1-4 RAM CARD Connector (35-pin)

Pin No.	Signal Name/ Description	Direction
1	GND	—
2	$\overline{CAS0}$	Out
3	D0	In/Out
4	A0	Out
5	A1	Out
6	D1	In/Out
7	A2	Out
8	$\overline{OE0}$	Out
9	$\overline{WE0}$	Out
10	+5V (VDD)	Out
11	$\overline{CAS1}$	Out
12	D2	In/Out
13	A3	Out
14	A4	Out
15	D3	In/Out
16	A5	Out
17	$\overline{OE1}$	Out
18	$\overline{WE1}$	Out
19	GND	—
20	$\overline{CAS2}$	Out
21	D4	In/Out
22	$\overline{RAS}$	Out
23	A6	Out
24	D5	In/Out
25	A7	Out
26	$\overline{OE2}$	Out
27	$\overline{WE2}$	Out
28	+5V (VDD)	Out
29	$\overline{CAS3}$	Out
30	D6	In/Out
31	A8	Out
32	D7	In/Out
33	$\overline{OE3}$	Out
34	$\overline{WE3}$	Out
35	GND	—

CN6 LCD Connector (20-pin)

Pin No.	Signal Name/ Description	Direction
1	S	Out
2	CP1	Out
3	CP2	Out
4	+5V (VDD)	Out
5	GND	—
6	−22V (VEE)	Out
7	DU0	Out
8	DU1	Out
9	DU2	Out
10	DU3	Out
11	DL0	Out
12	DL1	Out
13	DL2	Out
14	DL3	Out
15	VFL	Out
16	FL CONT	Out
17	FL VAR	Out
18	FL VSS	—
19	CON LCD	In
20	CONVR	Out

CN12 Keyboard Connector (11-pin)

Pin No.	Signal Name/ Description	Direction
9	P1, 4	In
10	P1, 5	In
11	P1, 6	In
12	P2, 0	In
13	P2, 1	In
14	P2, 2	In
15	P2, 3	In
16	P2, 4	In
17	P2, 5	In
18	P2, 6	In
19	P2, 7	In

CN13 Keyboard Connector (8-pin)

Pin No.	Signal Name/ Description	Direction
1	P0, 0	Out
2	P0, 1	Out
3	P0, 2	Out
4	P0, 3	Out
5	P0, 4	Out
6	P0, 5	Out
7	P0, 6	Out
8	P0, 7	Out

CN15 POWER LED Connector (5-pin)

Pin No.	Signal Name/ Description	Direction
1	POWER	Out
2	SPEED	Out
3	BATLOW	Out
4	CHARGE	Out
5	GND	—

CN21 RESUME (2-pin)

Pin No.	Signal Name/ Description	Direction
1	P1 (7.2V)	In
2	GND	—

2. Diagnostic Test

2.1 Outline of Diagnostic Test

This diagnostics test program is prepared for the purpose of testing and troubleshooting hardware functions of the computer.
This program is ROM based but can also be loaded from the disk drive and operates under the management of MS-DOS (Disk Operating System).

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 items of **3) Preparation** of **2.3 Diagnostic Test Procedures** on page 2−8 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 you do not wish to proceed with the diagnostic testing, select this item to reboot.

(5) MAIN BOARD

Tests the Main Board.

(6) 640KB BASE RANDOM ACCESS MEMORY

Tests the base memory.

(7) xxxKB EXTENDED RANDOM ACCESS MEMORY (OPTION)

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

(8) KEYBOARD

Tests the keyboard and keyboard controller.

(9) 1 FLOPPY DISK DRIVE

Tests the floppy disk drive connected to the system.

(10) 1 HARD DISK DRIVE

Tests the hard disk drive connected to the system.

(11) VIDEO

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

(12) 1 PRINTER PORT

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

(13) 2 SERIAL PORT

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

(14) SETUP

Sets up the system configuration of computer.

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 be automatically changed to match the item.
(You can type the number of the desired option instead of using the <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). Then 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 procedure.

If the screen does not display the menu, or the menu does not match your system configuration, write down procedure, any error messages displayed, and call your dealer for service.

Terminating the Diagnostic Tests

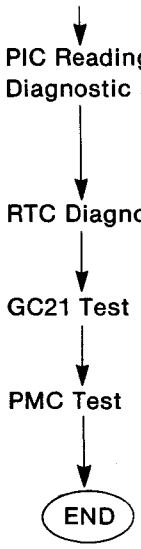
If during the course or the testing you wish to stop the procedure, press the [Ctrl] and [Break] keys.
You may need to finish the specific tests being run (complete the keyboard testing sequence, for example) but at the conclusion of the current test, you will return to the menu.

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

2.2 Diagnostics Description

1. Main Board Test

Start	(Procedure)
ROM Check Sum Diagnostic	Recompute the check sum of addresses F000: 8000H~F000: FFFFH in byte unit. When the check sum is "00", it is OK; if not, NG.
Shut-Down Bytes in RTC CMOS Reading/Writing Bytes Diagnostic	Perform the reading and writing test for shut-down bytes in the RTC (Real Time Clock) CMOS. Data to be checked are from FFH to 00H. When reading and writing of all data is performed properly, it is OK; if not, NG.
PIT Counter Reading/Writing Diagnostic and Counter Test	Check reading and writing of the time #2 of the PIT (Programmable Interval Timer). Set the initializing value on the timers #0 and #2, and verify that counting down is functioning properly after a fixed period of time has elapsed (software loop 8MHz). The timer #1 will not be checked because of using it as a refresh for the DRAM.
DMA Page Register Reading/Writing Diagnostic	Check reading and writing of the DMA page register (I/O=80H~8EH). Bytes I/O R/W test Data: 00, FFH Word I/O R/W test Data: 5555H, AAAAH, FFFFH, 0000H
DMA Controller Reading/Writing Diagnostic	Check reading and writing of the address register of the DMAC #0 and #1 of the word count register of the DMAC #0 and #1. Data: 5555H, AAAAH, FFFFH, 0000H
Keyboard Controller (80C42) Diagnostic	Send the 80C42 self-test command AAH and confirm that the proper code 55H is returned. Send the 80C42 interface-test command ABH and confirm that the proper code 00H is returned.



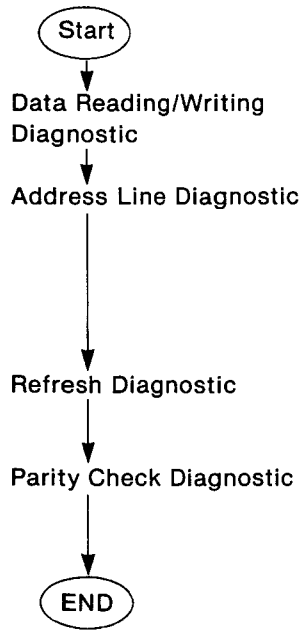
Check reading and writing of the #0 and #1 IMRs (Interrupt Mask Register) of the PIC (Programmable Interrupt Controller). Verifies whether a PIC #0 interrupt test is carried out properly through a TIMER interrupt test. Verifies whether a PIC #1 interrupt test is carried out properly through an RTC periodical interrupt test.

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

Check fast reset, fast A20 ON/OFF and memory mapping functions of GC21 chip set.

Check CPU speed control function of PMC (Power Management Controller) and perform PMC interrupt test.

2. RAM Diagnostic



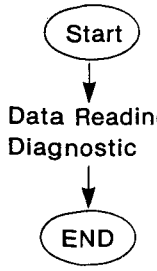
Perform the word reading/writing test using data patterns AAAAH, 5555H, FFFFH and 0000H. This applies to loaded addresses from 01000H to 9FFFFH.

After clearing 64K bytes, write FFH only on 8000H and confirm that there is only FFH.
Follows the same procedure as above for the following addresses:
4000H, 2000H, 1000H, 0800H, 0400H, 0200H, 0100H, 0080H, 0040H, 0020H, 0010H, 0008H, 0004H, 0002H and 0001H.

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

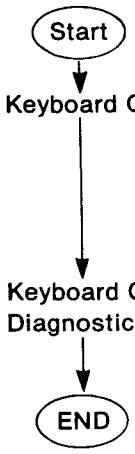
Check whether there is any parity error or not for the banks from 512KB to 640KB. Clear data 0, 0101H, 0303H, FEFEH and FFFFH, and confirm whether there is any parity error or not.

3. Extended RAM Diagnostic



Check reading and writing of the 384KB RAM (MAIN PCB) and optional RAM cards under the Extended RAM mode.

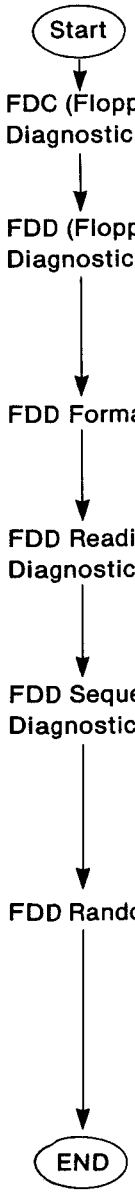
4. Keyboard Diagnostic



Press any key to recall a scanning code, which is converted to an ASCII code. Confirm 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, Switzerland (Gr).

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

5. Floppy Disk Diagnostic



Reset the FDC (initialize the reset bit of the digital output register in the FDC) and the FDC will be ready after a fixed period of time has elapsed. Reset the FDC and FDD and confirm both of them have been properly initialized (INT 13H, AH=0)

Reset the FDC and FDD.
Perform seeking to the track of the largest number and confirm that seeking has been carried out properly.
Then perform seeking to the track No. 0 and confirm that seeking has been carried out properly.

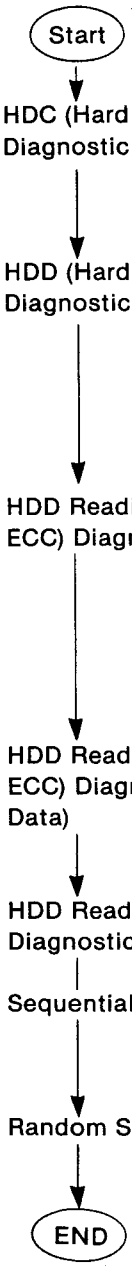
Set the parameters according to the FDD and the media (INT 13H, AH=17H).
Repeat the following procedure on each track from No. 0 to the largest No.; execute formatting of each track and confirm that it has been carried out properly.

Set the parameters according to the FDD and the media.
Repeat the following procedure on each track from No. 0 to the largest No.; WRITE (INT 13H, AH=03H) and confirm that writing has been carried out properly. READ (INT 13H, AH=02H) and confirm that reading has been carried out properly.

Set the parameters according to the FDD and the media.
The following procedure on each track from No. 0 to the largest NO.; READ and VERIFY (INT 13H, AH=04H) and confirm that seeking has been carried out properly. Repeat the following procedure on each track from No. 0 to the largest No.; READ and compare the result with the data of the reading/writing test to confirm that both values are equal.

Set the parameters according to the FDD and the media. Select all tracks at random among tracks from No. 0 to the largest No. and repeat the following procedure on each track; READ and VERIFY (INT 13H, AH=04H) and confirm that seeking has been carried out properly.
Select all tracks at random among tracks from No. 0 to the largest No. and repeat the following procedure; READ and compare the result with the data of the reading/writing test to confirm that both values are equal.

6. Hard Disk Diagnostic



Reset the HDC and HDD, and confirm that it has been carried out properly (INT 13H, AH=0H).
Perform the HDC self-test to confirm that the HDC is functioning properly (INT 13H, AH=14H).

Confirm that the HDD is READY (INT 13H, AH=01H).
Recalibrate the HDD and confirm that the calibration has been carried out properly (INT 13H, AH=11H).
Perform seeking procedure up to the maximum No. cylinder in the HDD and confirm that the seeking has been carried out properly.
At the same time, display the count value until reception of the seeking procedure finish signal.

Perform the writing test on the cylinder of the largest No. in the HDD and then with the head of the largest No.
Format one track of the HDD and confirm that the formatting has been carried out properly. WRITE one track with ECC (Error Correcting Code) and confirm that writing can be carried out properly.
READ one track with ECC and confirm that reading can be carried out properly. Confirm that the written data is equal to the read one.

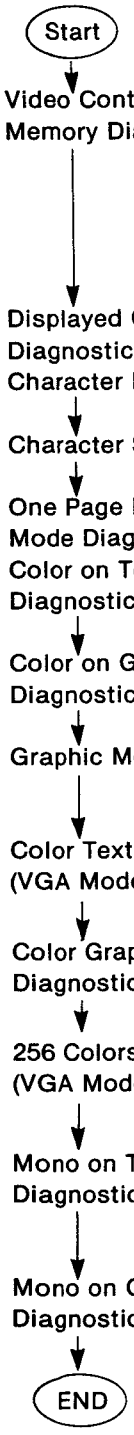
Create the error data (5 bits-reversed data correctable by ECC).
WRITE one sector with ECC and confirm that writing has been carried out properly.
READ one sector with ECC and confirm that reading has been carried out properly (confirm that the generated errors can be corrected by the ECC before reading).

WRITE one sector and confirm that writing has been carried out properly.
READ one sector and confirm that reading has been carried out properly.

While seeking cylinders from No. 0 to the largest No., perform the following test; READ and VERIFY the heads from No. 0 to the largest No. and confirm that the seeking has been carried out properly.

Select some cylinders at random and perform the following test on each cylinder; READ and VERIFY on heads from No. 0 to the largest No. and confirm that the seeking has been carried out properly.

7. Video Diagnostic



Test the video controllers DAGD610/620 for the following points; To test the I/O reading and writing of the registers R12~R15 in the controller register, using the original test data remaining on the register and the reversed data. To confirm that the display enable signal has output. To test the reading and writing of the VRAM (memory for video), using the following patterns as test data; AAAAH, 5555H, FFFFH and 0000H.

Check the character attributes; normal, intensified, reversed and blinking attributes.

Display characters on each text mode and check them.

Display ASCII character sets and check them.

Check each page (0~3) shown on the 80 × 25 display.

Display each color on the text mode and check them. The difference of each color is indicated by gray shades on the display.

Display each color on the graphic mode and check them. The difference of the color is indicated by gray shades on the display.

Display rectangeles and circles to verify that the 640 × 200 graphic mode display is correct.

Check the character attributes; display character on 80 × 25, 40 × 25 in text mode.

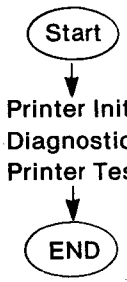
Check the color on each display mode (640 × 200, 640 × 350, 640 × 480).

Display 256 colors on 320 × 200 graphic mode.

Display each mono on text mode and check them. The difference of each text is indicated by "Normal", "Reverse", "Intensity", "Underline" and "Blink" or their complexes.

Display each mono on graphic mode and check them.
The difference of each graphic is indicated by "White", "Int. White", "Blink" and "White".

8. Parallel Port Diagnostic



Confirm that the printer I/O ports have been set. Reset printer and confirm that the initialization has been carried out properly. Execute printing and confirm that it has been carried out properly.

9. Serial Port Test

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

Perform the internal loop back test in the following procedures;

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

Loop the data that is to be transmitted 256 times and then check it.

Perform the external loop back test in the following procedures;

- Set the mode controlling register.
  RTS ON (request to send)
  DTR ON (data terminal ready)
- Condirm that the following responses will be returned.
  RTS (request to send) RLSD and CTS signals
  DTR (data terminal ready) DSR and RI signals

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

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

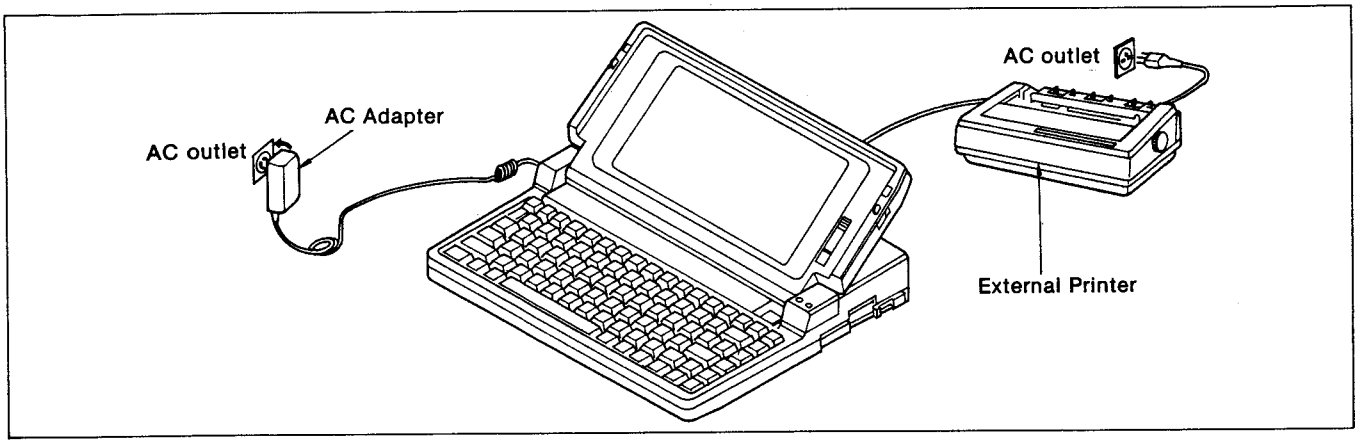
2.3 Diagnostic Test Procedure

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

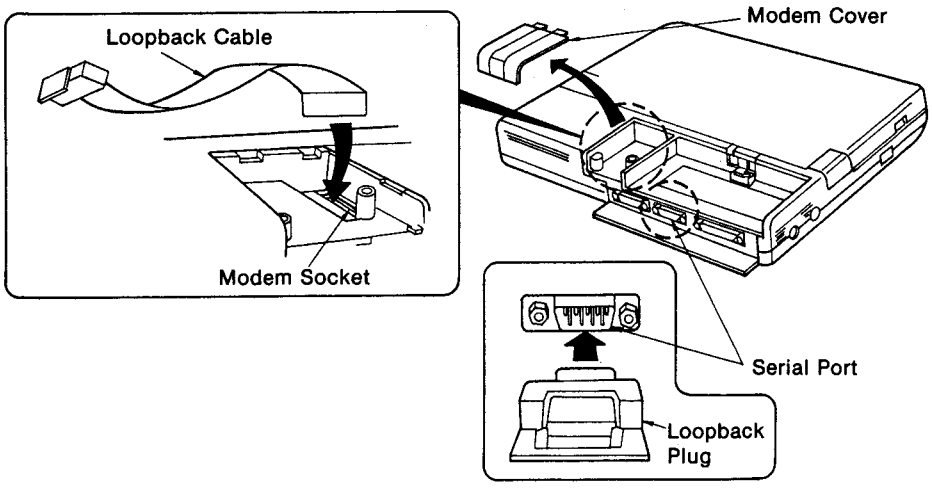


3) Preparation

(1) Connections should be made as shown in Figure above.
(2) The System Setup Settings should be set to factory setting values by executing "SETUP270/F" command. Otherwise message or item on menu in "4) Test Procedure" may not be properly displayed on LCD.
(3) If optional modem is installed, remove it.
(4) Connect the Loopback Cable and Loopback Connector as shown in Figure below.

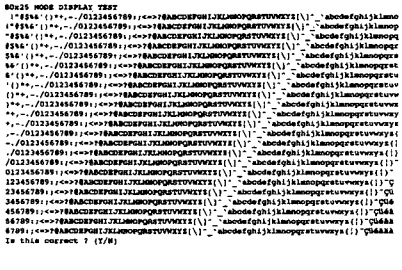
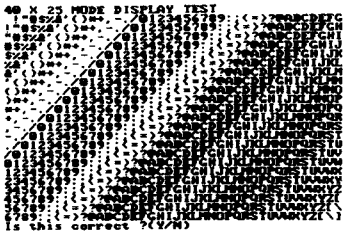
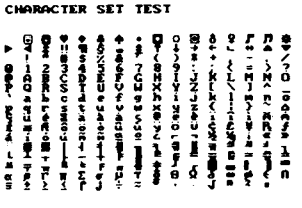
WARNING

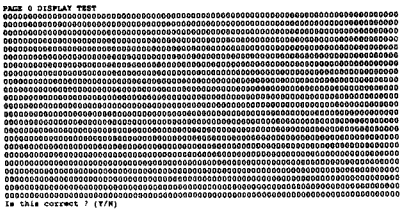
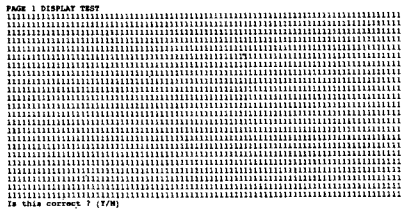
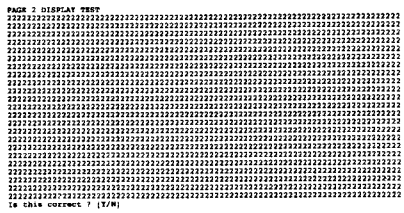
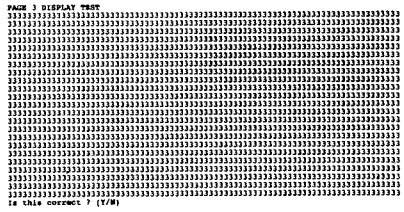
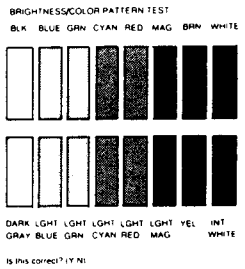
Do not to connect or disconnect the Loopback Cable into/from Modem socket when the power switch of the computer is turned ON. Otherwise the internal fuse could be blown.

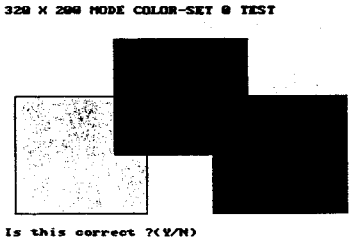
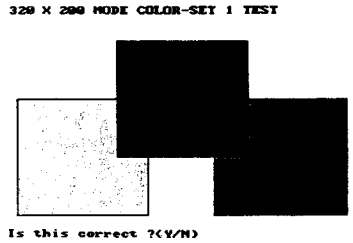
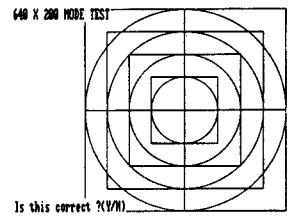
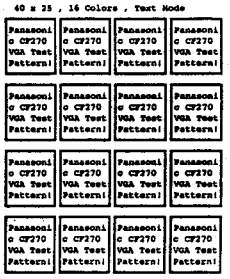
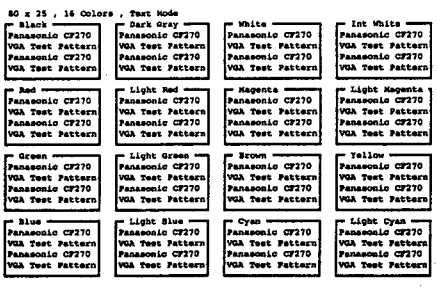


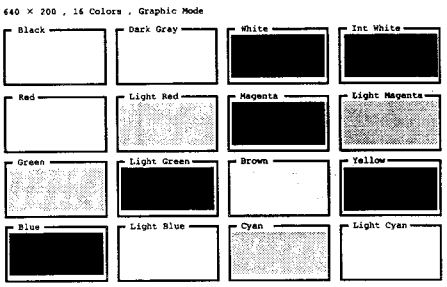
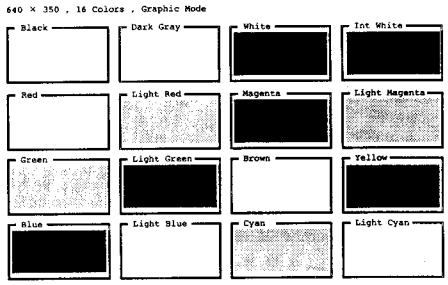
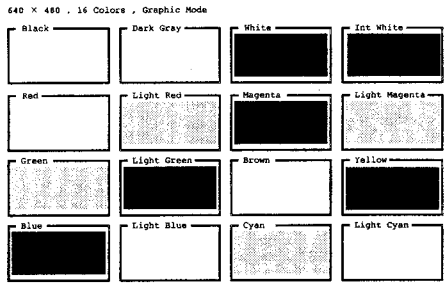
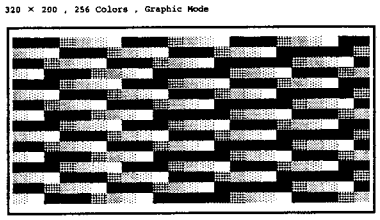
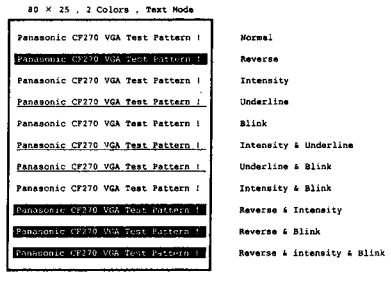
4) Test Procedure

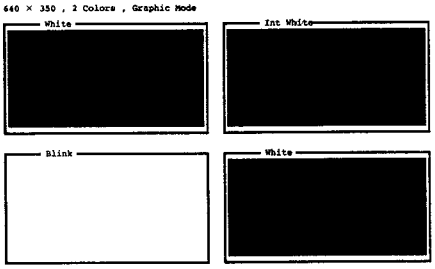
Step	Test Procedure	Screen Displays:	Criteria	Remarks
1	Insert the Installation Disk 1 into Drive [A].			
2	Turn on the main power switch of the computer.	Phoenix Advanced Video BIOS Version x.xx xx Copyright (C) 1984−1989 Phoenix Technologies Ltd. All Rights Reserved Phoenix 80286 ROM BIOS PLUS Version x.xx.xx Copyright (C) 1985-1990 Phoenix Technologies Ltd. All Rights Reserved Memory Size=xxxxx KB ********** *Your hard disk has been already installed. * *Type INSTALL and press Enter to re-install. * ********** A>		
3	Press [D][I][A][G][2][7][0] keys.	A>diag270_		
4	Press [Enter] key.	Do you want printed output? (Y/N) _		
5	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. 640 KB BASE RANDOM ACCESS MEMORY • 7. xxxx KB EXTENDED RANDOM ACCESS MEMORY • 8. KEYBOARD • 9. 1 FLOPPY DISK DRIVE • 10. 1 HARD DISK DRIVE • 11. VIDEO 12. 1 PRINTER PORT • 13. 2 SERIAL PORT 14. SETUP SELECT MENU: 1_		
6	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		

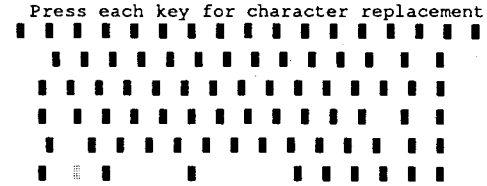
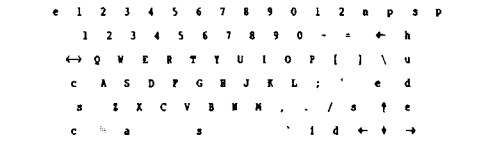
Step	Test Procedure	Screen Displays:	Criteria	Remarks
6A		1st HDD–SEQUENTIAL SEEK TEST Cylinder=613 1st HDD–RANDOM SEEK TEST Cylinder=422 ATTRIBUTES TEST THIS LINE IS NORMAL VIDEO THIS LINE IS HIGH INTENSITY VIDEO [THIS LINE IS REVERCE VIDEO] THIS LINE IS BLINKING Is this correct? (Y/N) _		
7	Press [Y] key.			
8	Press [Y] key.			
9	Press [Y] key.			

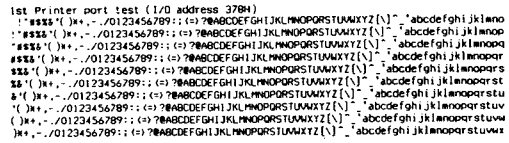
Step	Test Procedure	Screen Displays:	Criteria	Remarks
10	Press [Y] key.			
11	Press [Y] key.			
12	Press [Y] key.			
13	Press [Y] key.			
14	Press [Y] key.			

Step	Test Procedure	Screen Displays:	Criteria	Remarks
15	Press [Y] key.			
16	Press [Y] key.			
17	Press [Y] key.			
18	Press [Y] key.			
19	Press any key.			

Step	Test Procedure	Screen Displays:	Criteria	Remarks
20	Press any key.			
21	Press any key.			
22	Press any key.			
23	Press any key.			
24	Press any key.			

Step	Test Procedure	Screen Displays:	Criteria	Remarks
25	Press any key.			
26	Press any key.	1st serial port test (I/O address 3F8H) 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 _		
27	Press any key.	DIAGNOSTIC MENU (Ver. 0.04) 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • 5. MAIN BOARD • 6. 640 KB BASE RANDOM ACCESS MEMORY • 7. xxxx KB EXTENDED RANDOM ACCESS MEMORY • 8. KEYBOARD • 9. 1 FLOPPY DISK DRIVE • 10. 1 HARD DISK DRIVE • 11. VIDEO 12. 1 PRINTER PORT • 13. 2 SERIAL PORT 14. SETUP SELECT MENU: 1_		
28	Press [8] and [Enter] keys.	KEYBOARD 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT 5. PRESS KEY TEST • 6. SCAN CODE RETURN TEST SELECT MENU: 1_		
29	Press [5] and [Enter] keys.	PRESS KEY TEST 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_		

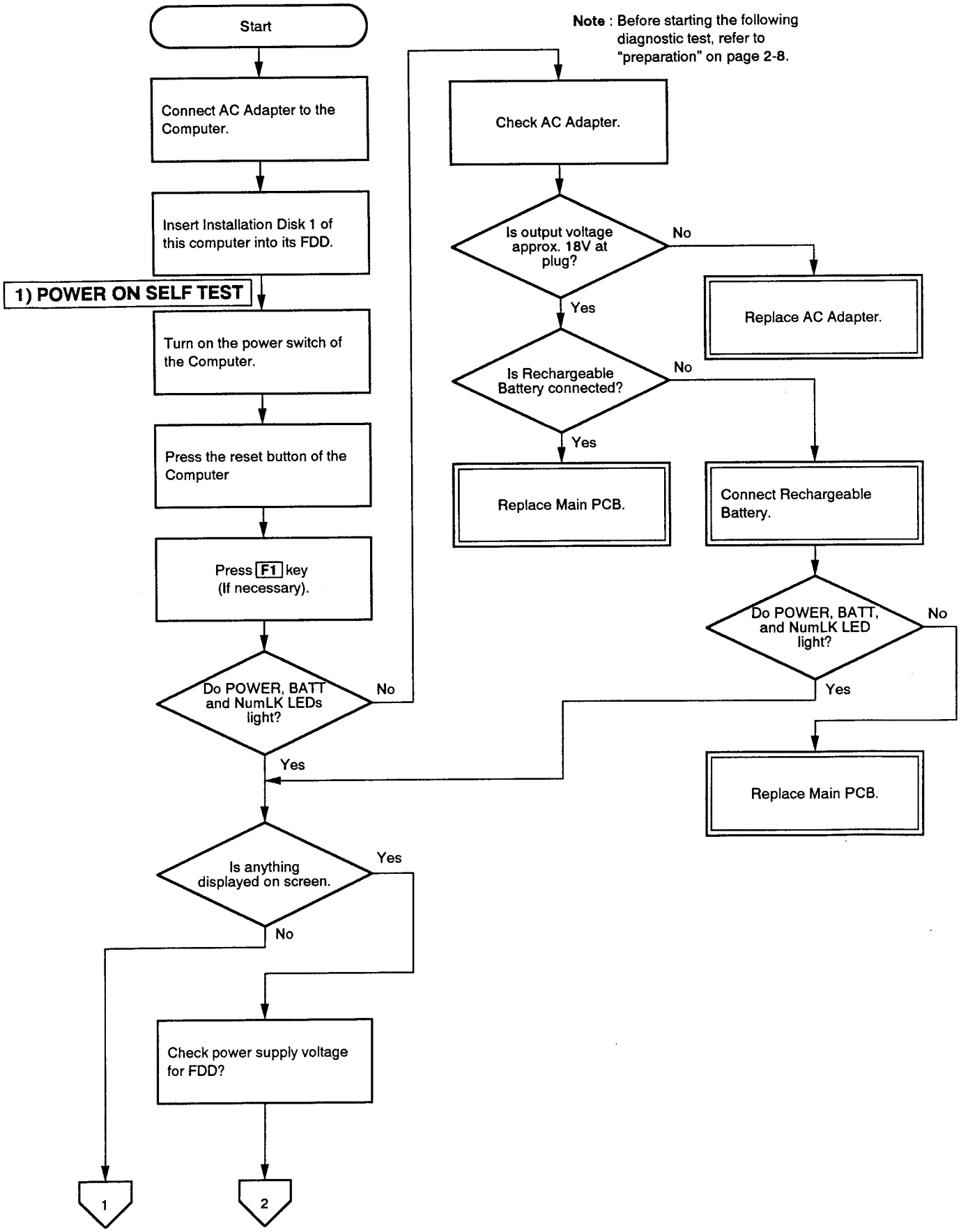
Step	Test Procedure	Screen Displays:	Criteria	Remarks
30	Press [5] and [Enter] keys.	KEYBOARD TEST Press each key for character replacement  If correct, press "Y" and "ENTER" If not correct, press "N" and "ENTER"		
31	Press all keys for keyboard test. Press [Y] and [Enter] keys.	KEYBOARD TEST Press each key for character replacement  If correct, press "Y" and "ENTER" If not correct, press "N" and "ENTER"		
32	Press any key.	PRESS KEY TEST 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: 5__		
33	Press [4] and [Enter] keys. Press [4] and [Enter] keys again.	DIAGNOSTIC MENU (Ver. x.xx) 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • 5. MAIN BOARD • 6. 640 KB BASE RANDOM ACCESS MEMORY • 7. xxxx KB EXTENDED RANDOM ACCESS MEMORY • 8. KEYBOARD • 9. 1 FLOPPY DISK DRIVE • 10. 1 HARD DISK DRIVE • 11. VIDEO 12. 1 PRINTER PORT • 13. 2 SERIAL PORT 14. SETUP SELECT MENU: 8__		

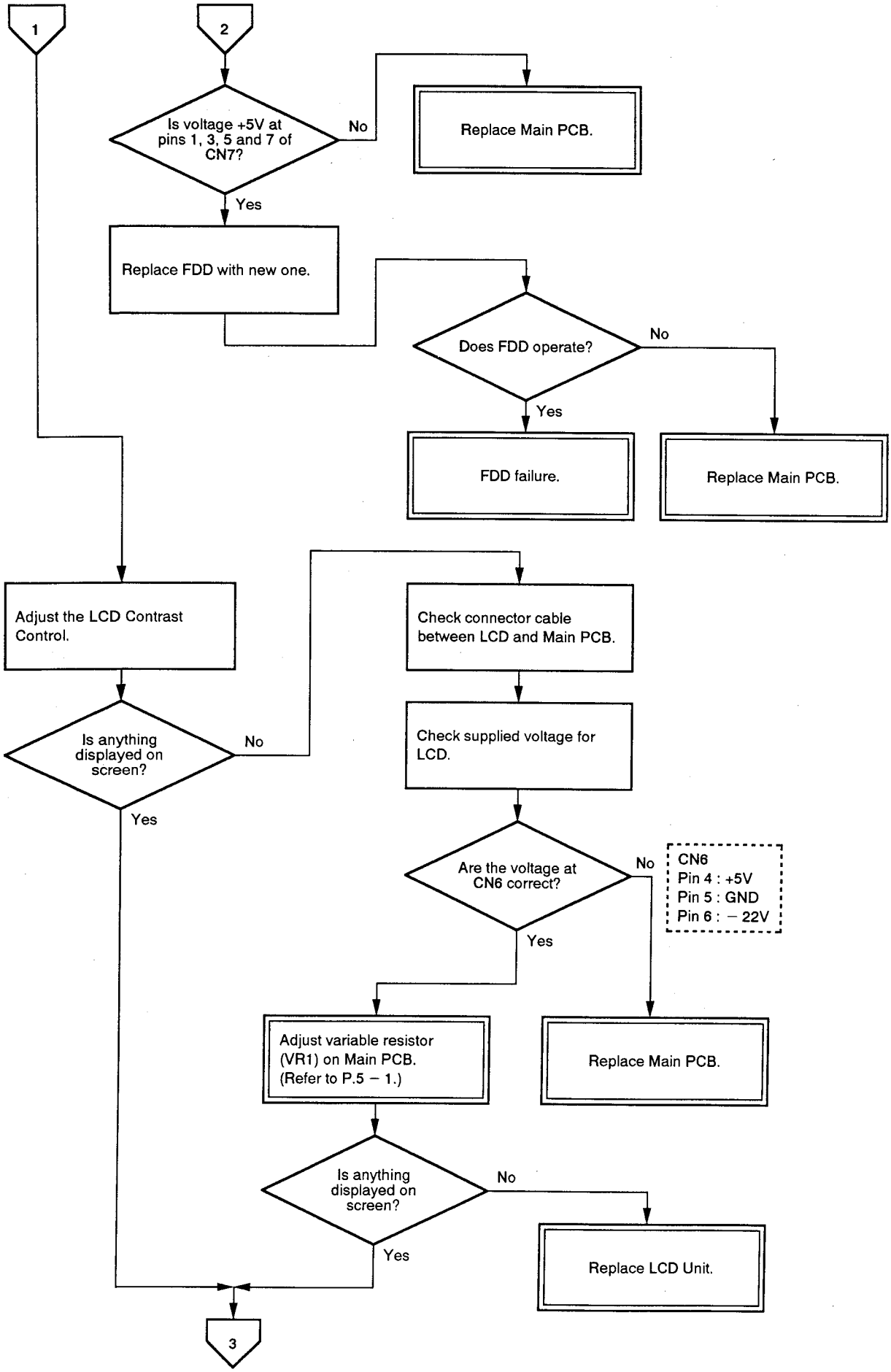
Step	Test Procedure	Screen Displays:	Criteria	Remarks
34	Press [1] [2] keys and [Enter] key.	1st Printer port test (I/O address 378H) Connect printer Hit any key when ready _		
35	Press any key.	Test done!! Hit any key when ready_ Printing Sample 		
36	Press any key.	DIAGNOSTIC MENU (Ver. x.xx) 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • 5. MAIN BOARD • 6. 640 KB BASE RANDOM ACCESS MEMORY • 7. xxxx KB EXTENDED RANDOM ACCESS MEMORY • 8. KEYBOARD • 9. 1 FLOPPY DISK DRIVE • 10. 1 HARD DISK DRIVE • 11. VIDEO 12. 1 PRINTER PORT • 13. 2 SERIAL PORT 14. SETUP SELECT MENU: 11_		
37	Press [1] [3] keys and [Enter] key.	2 SERIAL PORT 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_		
38	Press [5] and [Enter] keys.	1st 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_	Note: Make sure that loopback plug is connected. If it is not connected, refer to item (4) of 3) Preparation on P. 2-8.	
39	Press [7] and [Enter] keys.	1st serial port test (I/O address 3F8H) Connect loopback plug Hit any key when ready _		
40	Press any key.	Test done!! Hit any key when ready _		

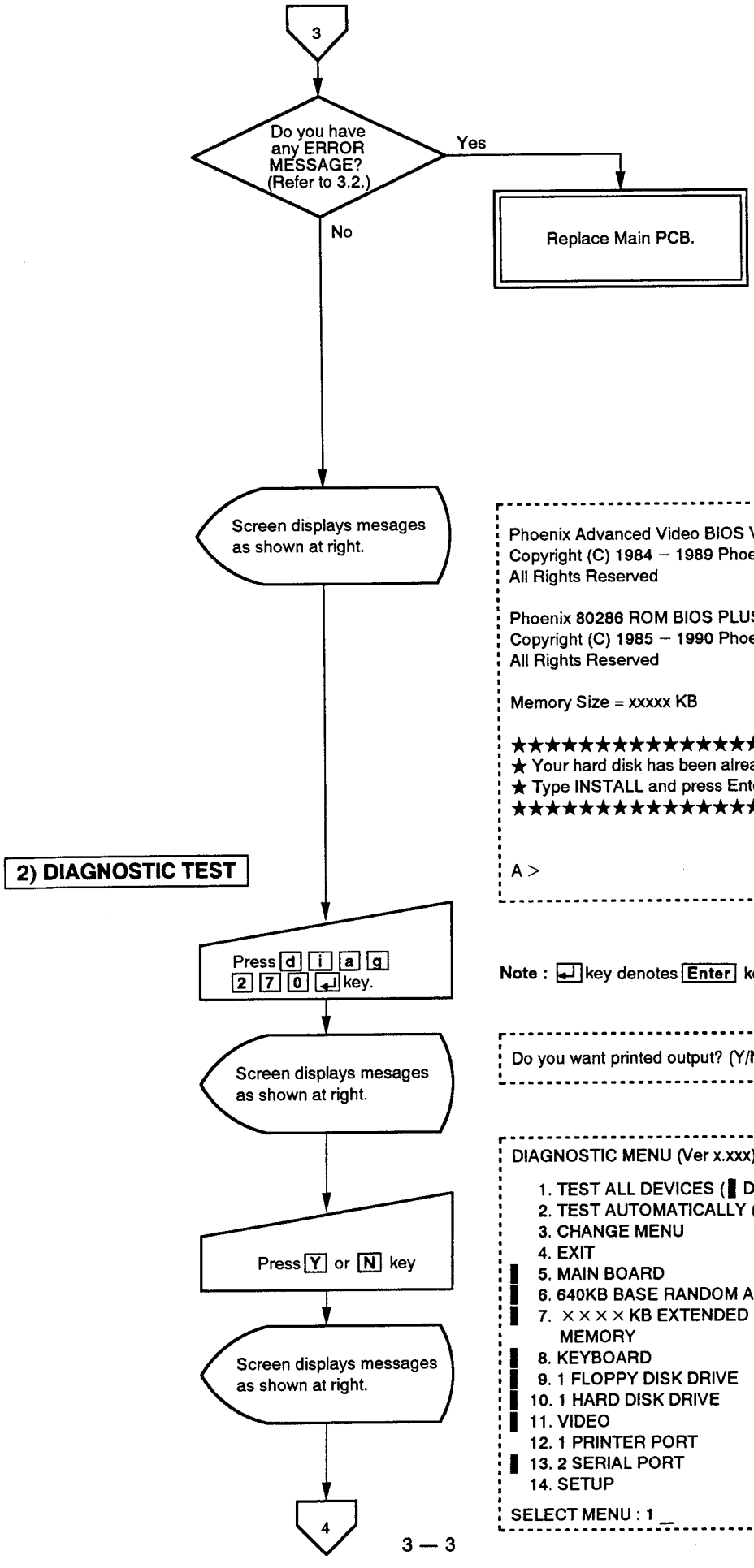
Step	Test Procedure	Screen Displays:	Criteria	Remarks
41	Press [4] and [Enter] keys.	2 SERIAL PORT 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • [5. 1st SERIAL PORT TEST] • 6. 2nd SERIAL PORT TEST SELECT MENU: 5_		
42	Press [6] and [Enter] keys.	2nd SERIAL 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_	Note: Make sure that loopback cable is connected into MODEM socket. If it is not connected, refer to item (4) of 3) Preparation on page 2-8.	
43	Press [7] and [Enter] keys.	2nd serial port test (I/O address 2F8H) Confirm loopback plug. Test done!! Hit any key when ready _		
44	Press any key. Press [4] and [Enter] keys. Press [4] and [Enter] keys again.	DIAGNOSTIC MENU (Ver. x.xx) 1. TEST ALL DEVICES (• DEVICES) 2. TEST AUTOMATICALLY (• DEVICES) 3. CHANGE MENU 4. EXIT • 5. MAIN BOARD • 6. 640 KB BASE RANDOM ACCESS MEMORY • 7. xxxx KB EXTENDED RANDOM ACCESS MEMORY • 8. KEYBOARD • 9. 1 FLOPPY DISK DRIVE • 10. 1 HARD DISK DRIVE • 11. VIDEO 12. 1 PRINTER PORT • [13. 2 SERIAL PORT] 14. SETUP SELECT MENU: 13_		
45	Press [1] [4] keys and [Enter] keys. If you do not need to do that, just finish the DIAGNOSTICS.	********** System Configuration Setup Utility ********** A = Current Time --xx:xx:xx B = Current Date --xx-xx-xxxx C = Display (Internal/External) --Internal LCD D = LCD Video Mode --Color E = LCD Background Mode --Normal F = Serial Port Assignment --COM1: Serial, COM2: Modem G = Speaker --Enable H = CPU Speed --Fast (16MHz) I = Memory --Expanded (EMS) Memory J = Parallel Port --Uni-directional ********** MAIN MENU ********** >> Select 'A' through 'J' to change the item >> SPACE key to go through all the items [F2=Save & Exit] [F3=Quit] [F10=Factory Settings] Note: If you need to change setup, select the desired parameter according to the setup menu. When a change has been made in this function, please save these changes by pressing the [F2] key. After the changes have been made and the DIAGNOSTIC menu returns, you must press item 4 to exit and reboot the system in order to see the changes that have been made. Once the unit has rebooted you can then enter the DIAGNOSTICS again.		

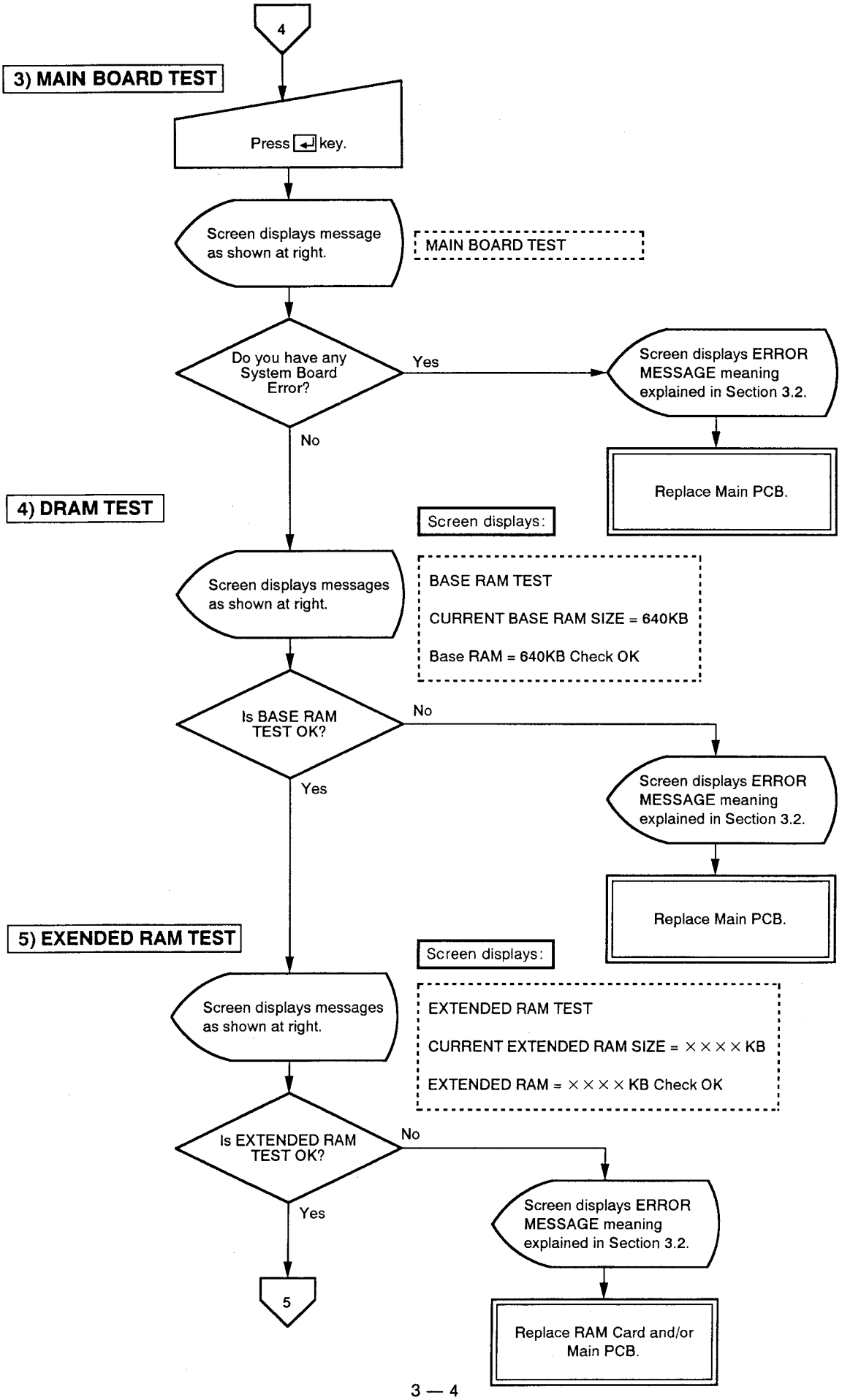
3. Troubleshooting

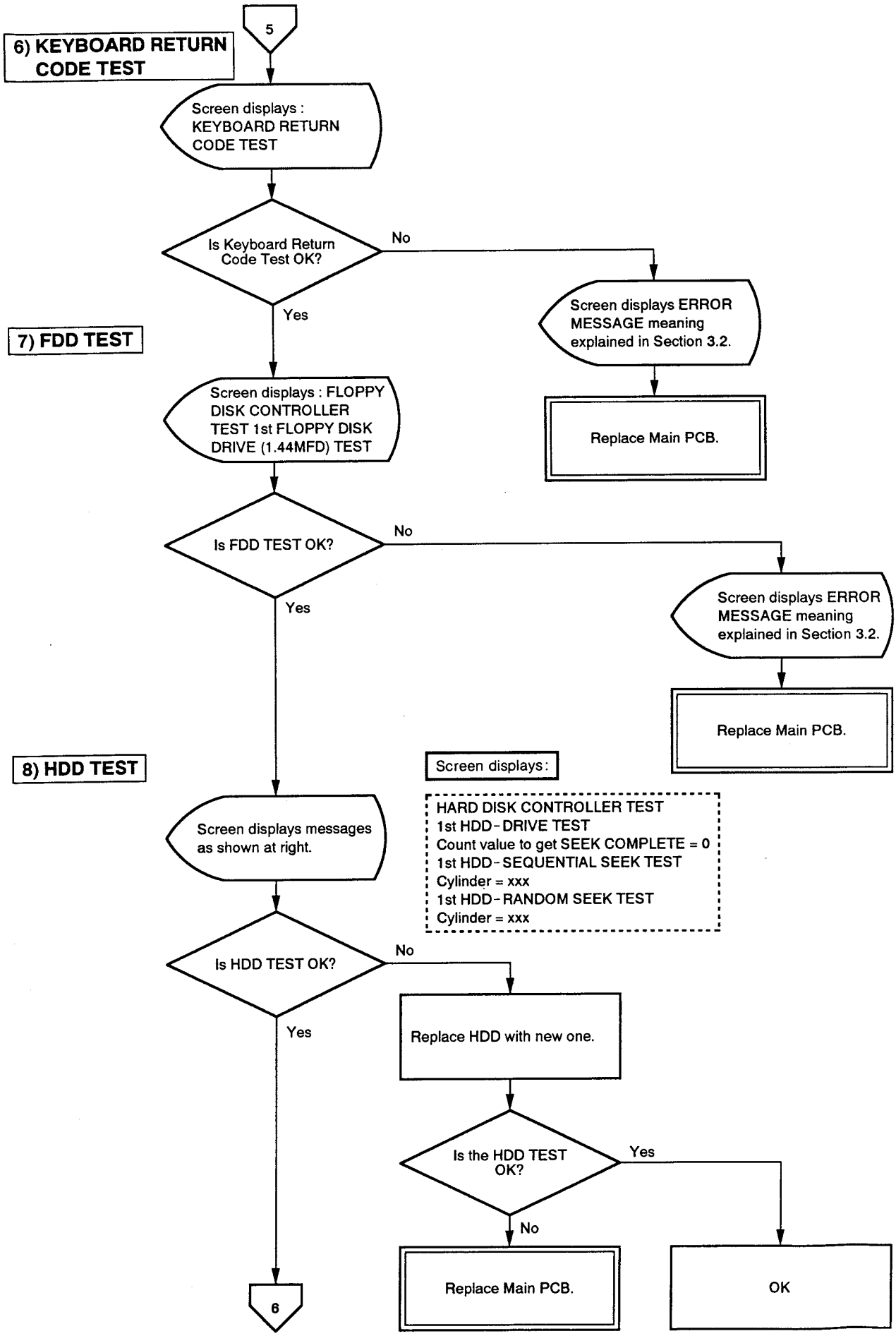
3.1 Troubleshooting (For Block Exchange)



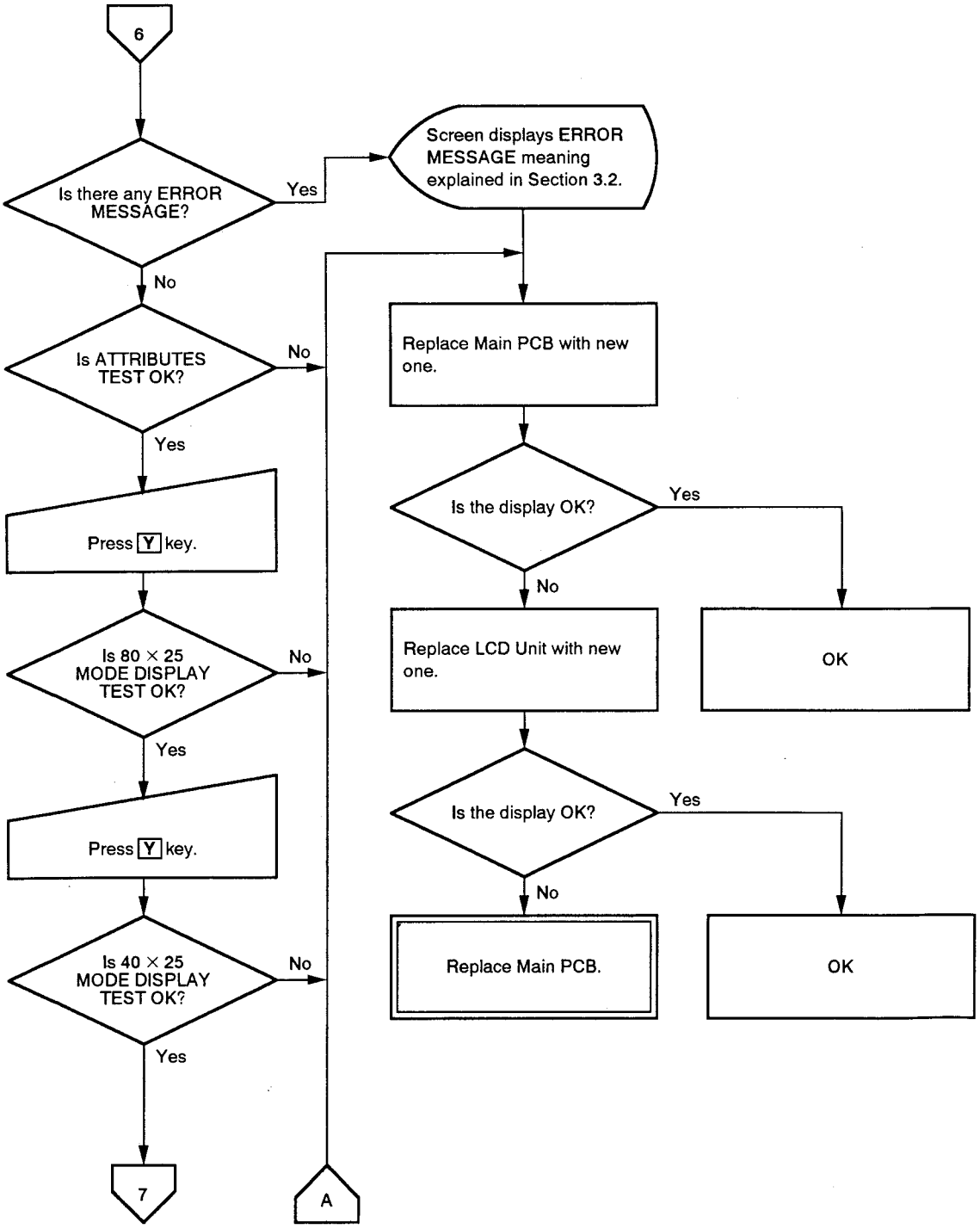

1
2
Is voltage +5V at pins 1, 3, 5 and 7 of CN7?
No
Replace Main PCB.
Yes
Replace FDD with new one.
Does FDD operate?
No
Yes
FDD failure.
Replace Main PCB.
Adjust the LCD Contrast Control.
Check connector cable between LCD and Main PCB.
Is anything displayed on screen?
No
Check supplied voltage for LCD.
Yes
Are the voltage at CN6 correct?
No
CN6
Pin 4 : +5V
Pin 5 : GND
Pin 6 : − 22V
Yes
Adjust variable resistor (VR1) on Main PCB. (Refer to P.5 − 1.)
Replace Main PCB.
Is anything displayed on screen?
No
Yes
Replace LCD Unit.
3

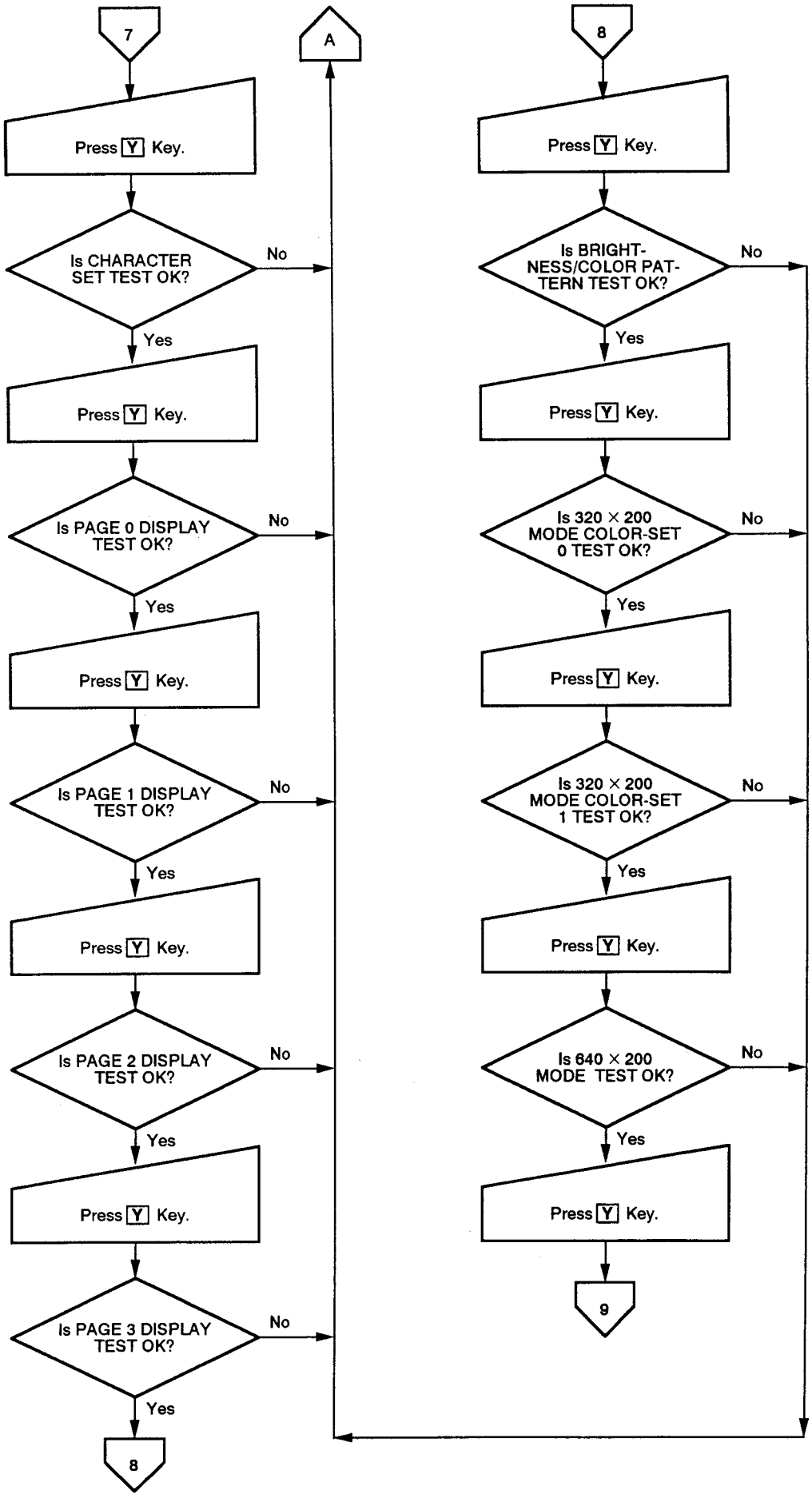

3
Do you have any ERROR MESSAGE? (Refer to 3.2.)
Yes
No
Replace Main PCB.
Screen displays mesages as shown at right.
Phoenix Advanced Video BIOS Version x.xx xx
Copyright (C) 1984 – 1989 Phoenix Technologies Ltd.
All Rights Reserved
Phoenix 80286 ROM BIOS PLUS Version x.xx.xx
Copyright (C) 1985 – 1990 Phoenix Technologies Ltd.
All Rights Reserved
Memory Size = xxxxx KB
★★★★★★★★★★★★★★★★★★★★★★
★ Your hard disk has been already installed. ★
★ Type INSTALL and press Enter to re-install. ★
★★★★★★★★★★★★★★★★★★★★★★
A >
2) DIAGNOSTIC TEST
Press d i a g 2 7 0 ↵ key.
Note : ↵ key denotes Enter key.
Screen displays mesages as shown at right.
Do you want printed output? (Y/N) _
Press Y or N key
Screen displays messages as shown at right.
DIAGNOSTIC MENU (Ver x.xxx)
1. TEST ALL DEVICES (DEVICES)
2. TEST AUTOMATICALLY (DEVICES)
3. CHANGE MENU
4. EXIT
5. MAIN BOARD
6. 640KB BASE RANDOM ACCESS MEMORY
7. ××××KB EXTENDED RANDOM ACCESS MEMORY
8. KEYBOARD
9. 1 FLOPPY DISK DRIVE
10. 1 HARD DISK DRIVE
11. VIDEO
12. 1 PRINTER PORT
13. 2 SERIAL PORT
14. SETUP
SELECT MENU : 1 _
4

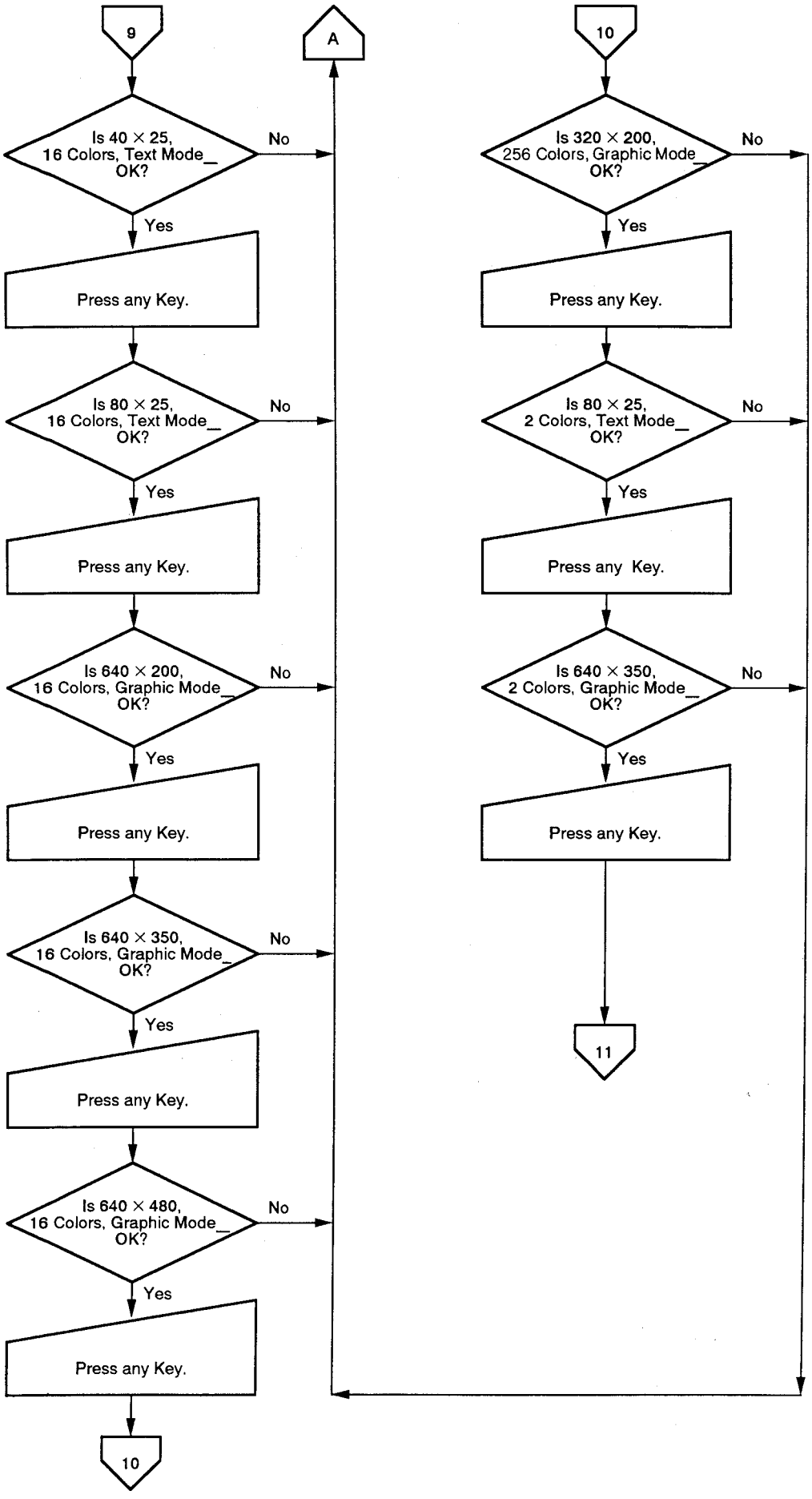

4
3) MAIN BOARD TEST
Press ↵ key.
Screen displays message as shown at right.
MAIN BOARD TEST
Do you have any System Board Error?
Yes
Screen displays ERROR MESSAGE meaning explained in Section 3.2.
Replace Main PCB.
No
4) DRAM TEST
Screen displays:
Screen displays messages as shown at right.
BASE RAM TEST
CURRENT BASE RAM SIZE = 640KB
Base RAM = 640KB Check OK
Is BASE RAM TEST OK?
No
Screen displays ERROR MESSAGE meaning explained in Section 3.2.
Replace Main PCB.
Yes
5) EXENDED RAM TEST
Screen displays:
Screen displays messages as shown at right.
EXTENDED RAM TEST
CURRENT EXTENDED RAM SIZE = ××××KB
EXTENDED RAM = ××××KB Check OK
Is EXTENDED RAM TEST OK?
No
Screen displays ERROR MESSAGE meaning explained in Section 3.2.
Replace RAM Card and/or Main PCB.
Yes
5

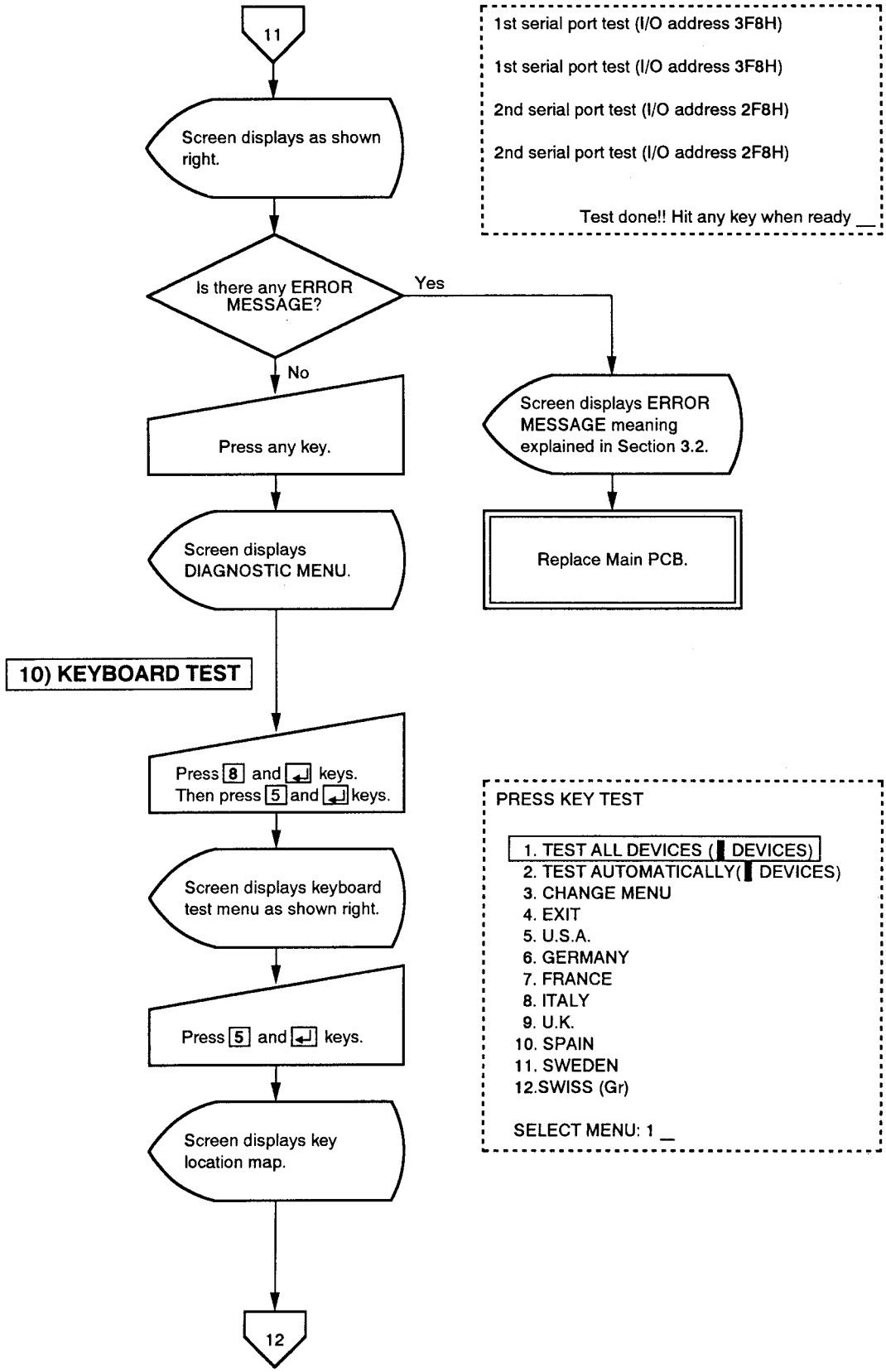

5
6) KEYBOARD RETURN CODE TEST
Screen displays : KEYBOARD RETURN CODE TEST
Is Keyboard Return Code Test OK?
No
Yes
Screen displays ERROR MESSAGE meaning explained in Section 3.2.
Replace Main PCB.
7) FDD TEST
Screen displays : FLOPPY DISK CONTROLLER TEST 1st FLOPPY DISK DRIVE (1.44MFD) TEST
Is FDD TEST OK?
No
Yes
Screen displays ERROR MESSAGE meaning explained in Section 3.2.
Replace Main PCB.
8) HDD TEST
Screen displays messages as shown at right.
Screen displays:
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
Is HDD TEST OK?
No
Yes
Replace HDD with new one.
Is the HDD TEST OK?
Yes
No
Replace Main PCB.
OK
6

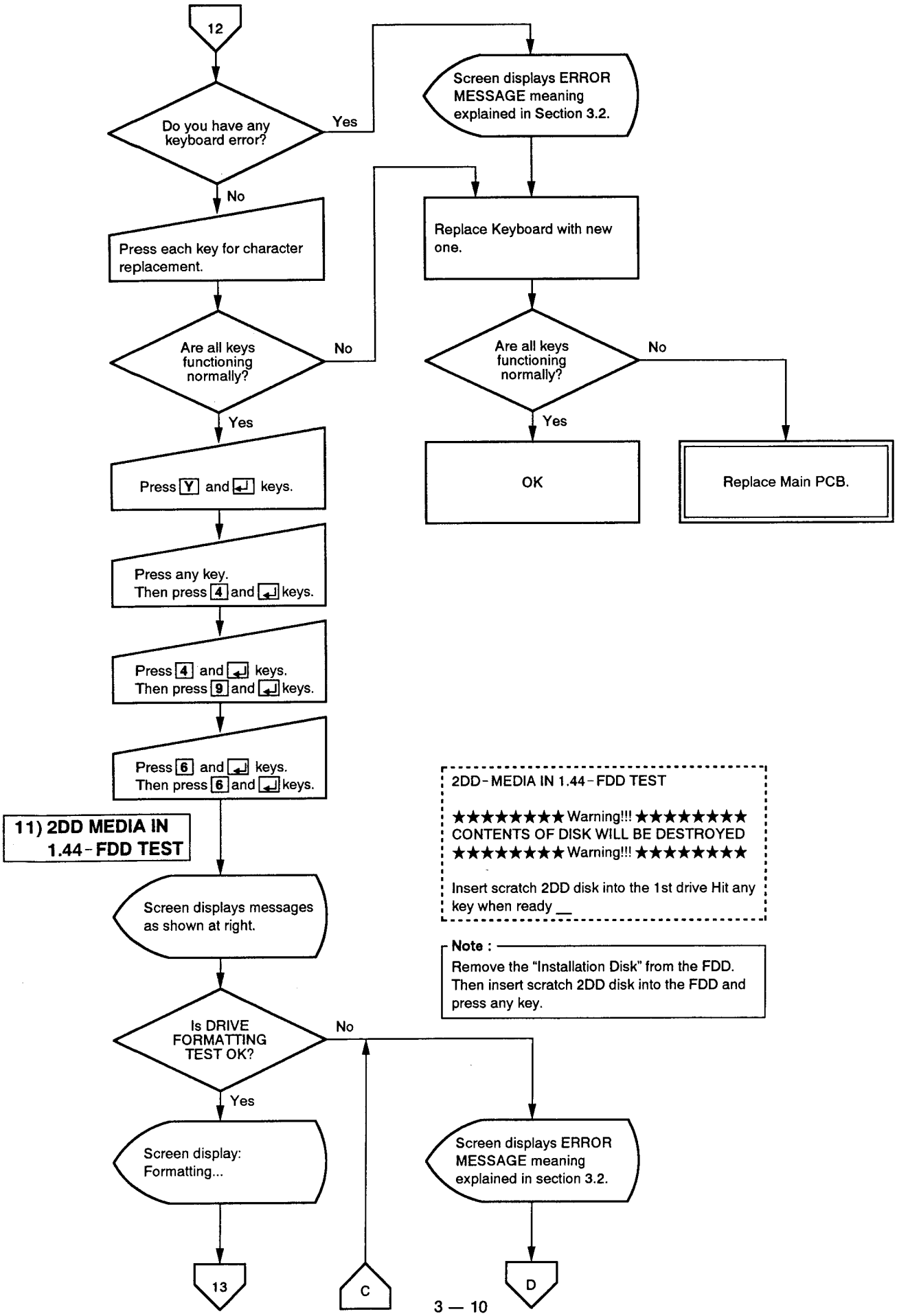
9) LCD DISPLAY TEST

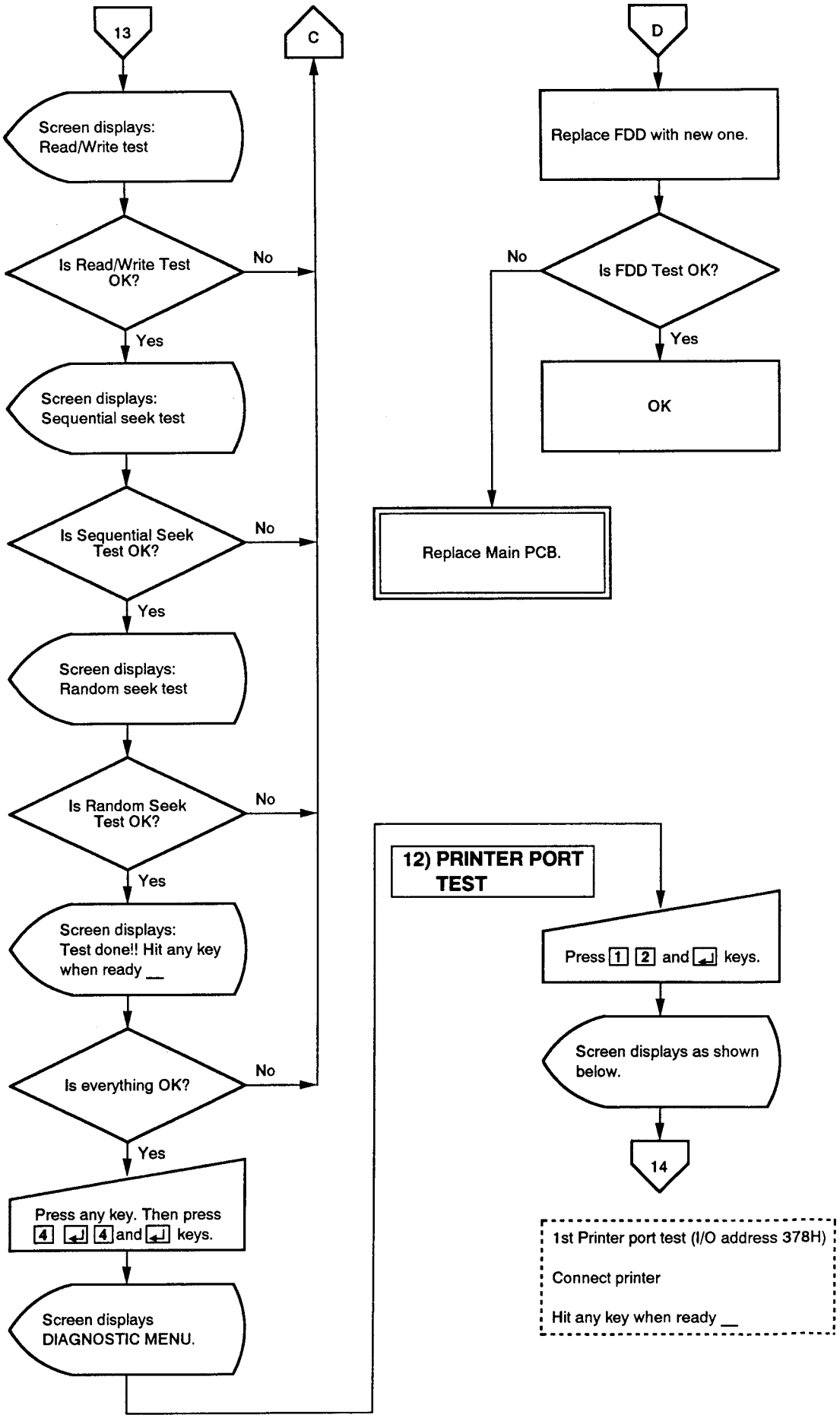


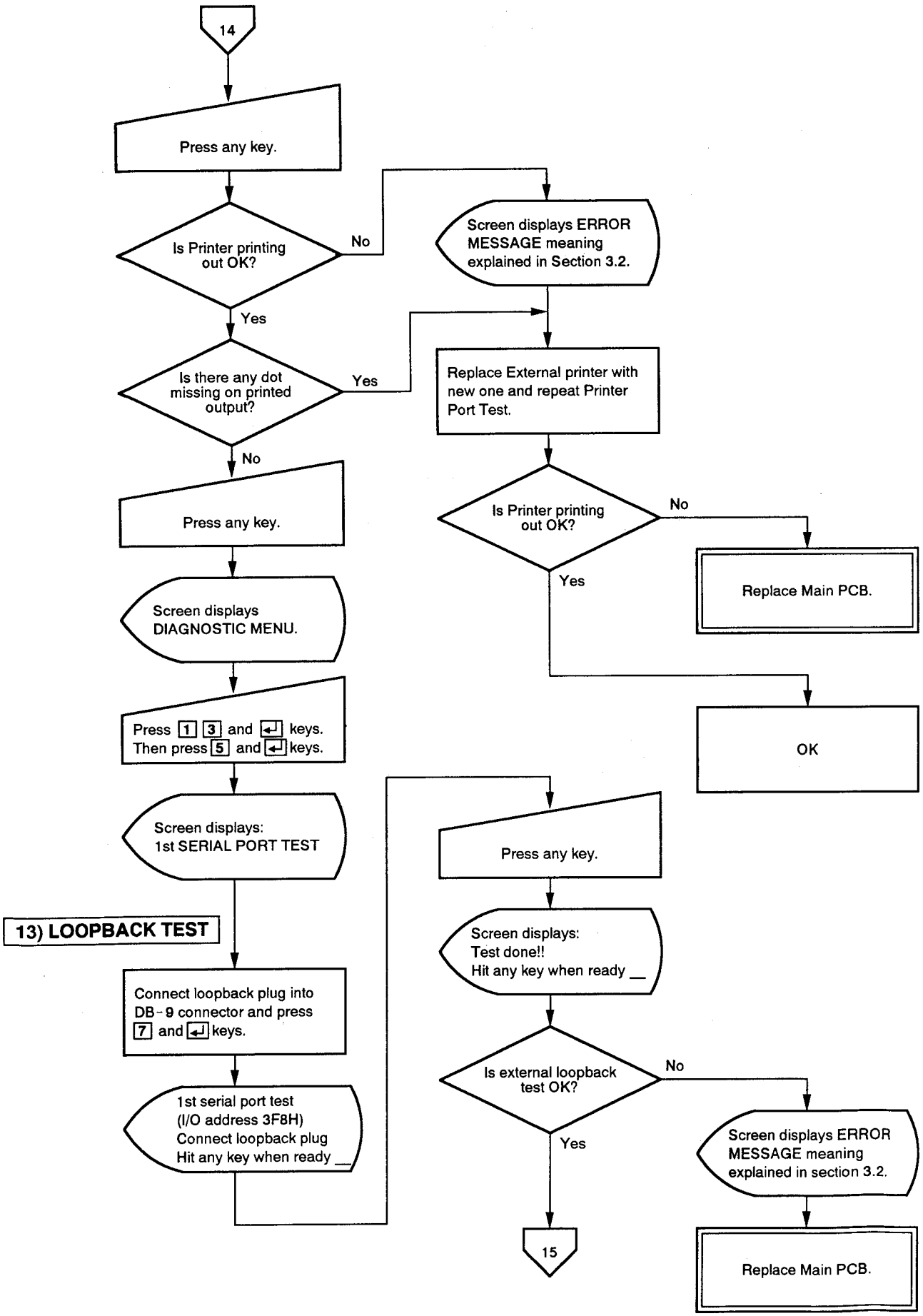

7
A
Press Y Key.
Is CHARACTER SET TEST OK?
No
Yes
Press Y Key.
Is PAGE 0 DISPLAY TEST OK?
No
Yes
Press Y Key.
Is PAGE 1 DISPLAY TEST OK?
No
Yes
Press Y Key.
Is PAGE 2 DISPLAY TEST OK?
No
Yes
Press Y Key.
Is PAGE 3 DISPLAY TEST OK?
No
Yes
8
8
Press Y Key.
Is BRIGHT-NESS/COLOR PAT-TERN TEST OK?
No
Yes
Press Y Key.
Is 320 × 200 MODE COLOR-SET 0 TEST OK?
No
Yes
Press Y Key.
Is 320 × 200 MODE COLOR-SET 1 TEST OK?
No
Yes
Press Y Key.
Is 640 × 200 MODE TEST OK?
No
Yes
Press Y Key.
9

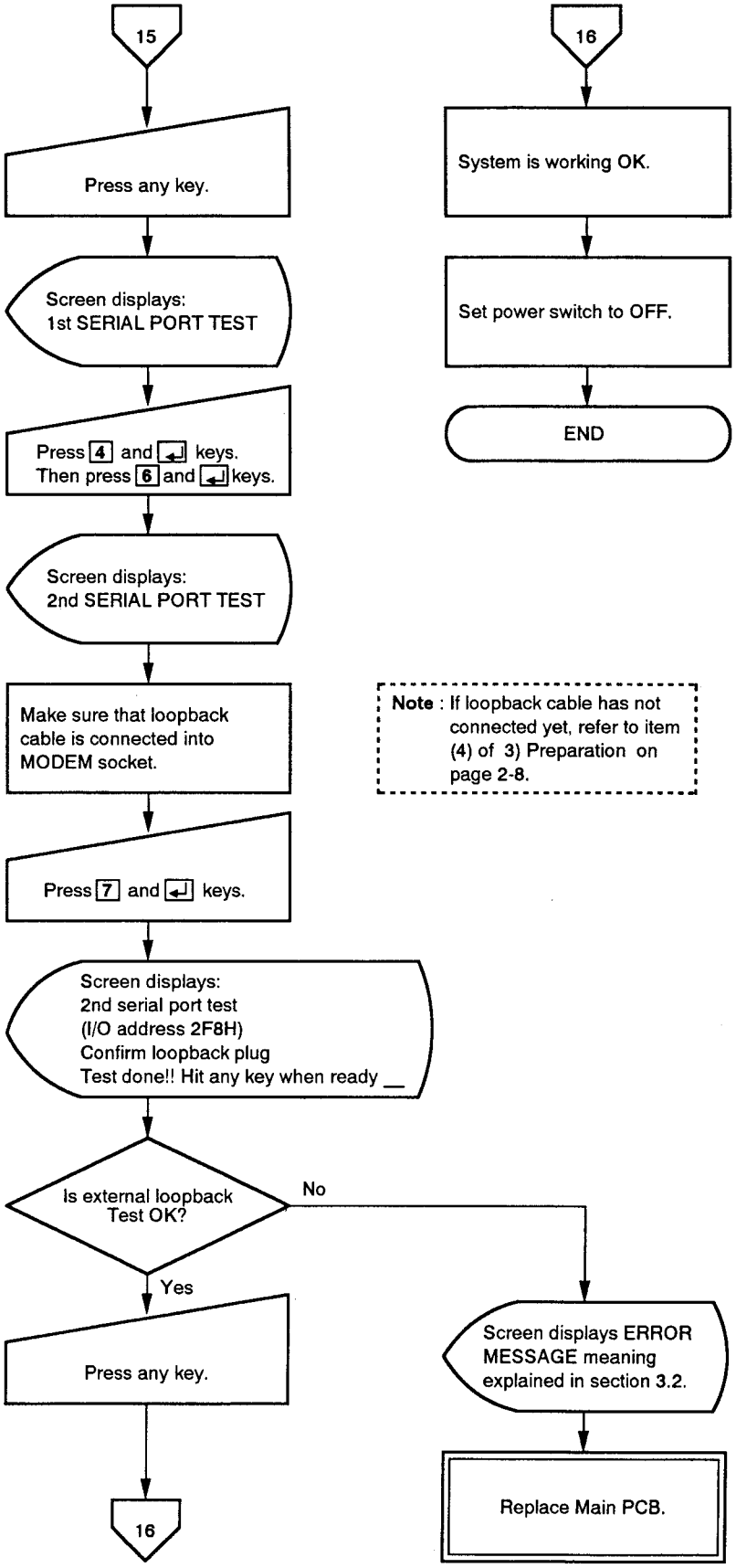

9
A
10
Is 40 × 25,
16 Colors, Text Mode_
OK?
No
Yes
Press any Key.
Is 80 × 25,
16 Colors, Text Mode_
OK?
No
Yes
Press any Key.
Is 640 × 200,
16 Colors, Graphic Mode_
OK?
No
Yes
Press any Key.
Is 640 × 350,
16 Colors, Graphic Mode_
OK?
No
Yes
Press any Key.
Is 640 × 480,
16 Colors, Graphic Mode_
OK?
No
Yes
Press any Key.
10
Is 320 × 200,
256 Colors, Graphic Mode_
OK?
No
Yes
Press any Key.
Is 80 × 25,
2 Colors, Text Mode_
OK?
No
Yes
Press any Key.
Is 640 × 350,
2 Colors, Graphic Mode_
OK?
No
Yes
Press any Key.
11


11
Screen displays as shown right.
1st serial port test (I/O address 3F8H)
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 __
Is there any ERROR MESSAGE?
Yes
No
Press any key.
Screen displays ERROR MESSAGE meaning explained in Section 3.2.
Screen displays DIAGNOSTIC MENU.
Replace Main PCB.
10) KEYBOARD TEST
Press 8 and ↵ keys. Then press 5 and ↵ keys.
PRESS KEY TEST
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 _
Screen displays keyboard test menu as shown right.
Press 5 and ↵ keys.
Screen displays key location map.
12


12
Do you have any keyboard error?
Yes
Screen displays ERROR MESSAGE meaning explained in Section 3.2.
No
Press each key for character replacement.
Replace Keyboard with new one.
Are all keys functioning normally?
No
Are all keys functioning normally?
No
Yes
Yes
Press Y and ↵ keys.
OK
Replace Main PCB.
Press any key.
Then press 4 and ↵ keys.
Press 4 and ↵ keys.
Then press 9 and ↵ keys.
Press 6 and ↵ keys.
Then press 6 and ↵ keys.
11) 2DD MEDIA IN 1.44-FDD TEST
2DD-MEDIA IN 1.44-FDD TEST
★★★★★★★★ Warning!!! ★★★★★★★★
CONTENTS OF DISK WILL BE DESTROYED
★★★★★★★★ Warning!!! ★★★★★★★★
Insert scratch 2DD disk into the 1st drive Hit any key when ready _
Screen displays messages as shown at right.
Note :
Remove the "Installation Disk" from the FDD. Then insert scratch 2DD disk into the FDD and press any key.
Is DRIVE FORMATTING TEST OK?
No
Yes
Screen display: Formatting...
Screen displays ERROR MESSAGE meaning explained in section 3.2.
13
C
D


13
C
Screen displays:
Read/Write test
Is Read/Write Test
OK?
No
Yes
Screen displays:
Sequential seek test
Is Sequential Seek
Test OK?
No
Yes
Screen displays:
Random seek test
Is Random Seek
Test OK?
No
Yes
Screen displays:
Test done!! Hit any key
when ready __
Is everything OK?
No
Yes
Press any key. Then press
4 ↵ 4 and ↵ keys.
Screen displays
DIAGNOSTIC MENU.
D
Replace FDD with new one.
No
Is FDD Test OK?
Yes
OK
Replace Main PCB.
12) PRINTER PORT
TEST
Press 1 2 and ↵ keys.
Screen displays as shown
below.
14
1st Printer port test (I/O address 378H)
Connect printer
Hit any key when ready __


14
Press any key.
Is Printer printing out OK?
No
Screen displays ERROR MESSAGE meaning explained in Section 3.2.
Yes
Is there any dot missing on printed output?
Yes
Replace External printer with new one and repeat Printer Port Test.
No
Press any key.
Is Printer printing out OK?
No
Replace Main PCB.
Yes
Screen displays DIAGNOSTIC MENU.
OK
Press 1 3 and ↵ keys. Then press 5 and ↵ keys.
Screen displays: 1st SERIAL PORT TEST
Press any key.
13) LOOPBACK TEST
Screen displays: Test done!! Hit any key when ready __
Connect loopback plug into DB-9 connector and press 7 and ↵ keys.
Is external loopback test OK?
No
1st serial port test (I/O address 3F8H) Connect loopback plug Hit any key when ready __
Yes
Screen displays ERROR MESSAGE meaning explained in section 3.2.
15
Replace Main PCB.


15
Press any key.
Screen displays:
1st SERIAL PORT TEST
Press 4 and ↵ keys.
Then press 6 and ↵ keys.
Screen displays:
2nd SERIAL PORT TEST
Make sure that loopback cable is connected into MODEM socket.
Press 7 and ↵ keys.
Screen displays:
2nd serial port test
(I/O address 2F8H)
Confirm loopback plug
Test done!! Hit any key when ready __
Is external loopback Test OK?
No
Yes
Press any key.
16
Screen displays ERROR MESSAGE meaning explained in section 3.2.
Replace Main PCB.
16
System is working OK.
Set power switch to OFF.
END
Note : If loopback cable has not connected yet, refer to item (4) of 3) Preparation on page 2-8.

3.2 Error messages

This section describes diagnostic messages:

Power on diagnostic messages and user diagnostic messages.

Power On Diagnostic Test Messages

Power on diagnostic 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 case, Beep codes are used to identify an error in the power on diagnostic test that occurs when the screen is not available.

Befer to the following lists about the Error messages, informational messages, and Beep codes.

Error messages in the Power on diagnostic test

Diskette Seek to track 0 failed
: Drive A has either failed or is missing.

Diskette drive 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 SETUP270 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 stuckkey failure
: A key(s) is(are) jammed.

Memory address line failure at xxxxxxx, read xxxxxxx expecting xxxxxxx
: Circuitry associated with the memory chips 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
: 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 has 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 diagnostics 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 tests terminated by keystroke
: Memory tests stopped by your hitting the <spacebar> while the memory tests were running.

Strike the F1 key to continue
: An error was found during Power on diagnostic 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 64K RAM test in progress
1-3-3 1st 64K RAM chip or data line failure multi-bit
1-3-4 1st 64K RAM odd/even logic failure
1-4-1 Address line failure 1st 64K RAM
1-4-2 Parity failure 1st 64K RAM
2-1-1 Bit 0 1st 64K RAM failure
2-1-2 Bit 1 1st 64K RAM failure
2-1-3 Bit 2 1st 64K RAM failure
2-1-4 Bit 3 1st 64K RAM failure
2-2-1 Bit 4 1st 64K RAM failure
2-2-2 Bit 5 1st 64K RAM failure
2-2-3 Bit 6 1st 64K RAM failure
2-2-4 Bit 7 1st 64K RAM failure
2-3-1 Bit 8 1st 64K RAM failure
2-3-2 Bit 9 1st 64K RAM failure
2-3-3 Bit A 1st 64K RAM failure
2-3-4 Bit B 1st 64K RAM failure
2-4-1 Bit C 1st 64K RAM failure
2-4-2 Bit D 1st 64K RAM failure
2-4-3 Bit E 1st 64K RAM failure
2-4-4 Bit F 1st 64K 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
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.
The contents of Port 80H can be read to identify the area of failure.

User Diagnostic Messages

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

You may find also the 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 4 bits follow:
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
CRAM Shutdown byte test failed
Write data: xxxx Read
data: xxxx CMOS RAM has failed.

(3) Programmable interrupt timer test
PIT Timer #2 counter r/w failed.
PIT Timer count failed.
High count value expected:
00 current date: dd

(4) Page register r/w test
PREG Page register r/w test failed. (byte)
Write data: xx
Read data: xx
Page register has failed.
PREG Page register r/w test failed. (word)
Write data: xx
Read data: xx
Page register has failed.

(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
Register of Direct Memory
Access Controller has failed.

(6) Keyboard controller test
KBCTRL Keyboard controller input buffer full.
Input buffer of Keyboard Controller is full.
KBCTRL Keyboard line always low. (clock)
KBCTRL Keyboard line always high. (clock)
KBCTRL Keyboard line always low. (date)
KBCTRL Keyboard controller output buffer empty.
KBCTRL Keyboard controller self test failed.
Return code: xx
KBCTRL Keyboard data line always low.

(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
PIC PIC #1 no interrupt occurred.

(8) Internal counter test
INTCNT Internal counter not cleared.
INTCNT Internal counter count failed.
INTCNT Internal counter count too slow.
INTCNT Internal counter count too fast.

(9) Realtime clock test

RTC Real time 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)
(Day of week: www)
(Month data: mm)
(Year data: yyyy)

RAM Test

(1) DRAM read/write test

DRAM R/W test failed.
Address: xxxxxx
Write Data: xxxx
Read Data: xxxx
Dynamic RAM data test has failed.

(2) DRAM Parity test

DRAM Parity error occurred
Address: xxxxxx
Parity check has failed.

(3) DRAM refresh test

DRAM Refresh test failed
Address: xxxxxx
Read Data: xx
Dynamic RAM address test has failed.

(4) DRAM address test

DRAM Address test failed
Address: xxxxxx
Read data: xx
Dynamic RAM address test has failed.

GC21 Test

Fast Reset Test
Fast Reset failed.

A20 Control Test
A20 Gate open failed
A20 Gate close failed

CR Index R/W Test
CR0 Index select
failed: CR0=xx xx
CR1 Index select
failed: CR1=xx xx
CR2 Index select
failed: CR2=xx xx
CR3 Index select
failed: CR3=xx xx
CR4 Index select
failed: CR4=xx xx
CR5 Index select
failed: CR5=xx xx

CR Validity Test
CR1 Invalid, CR1=xx
CR3 Invalid, CR3=xx
CR4 Invalid, CR4=xx
CR5 Invalid, CR5=xx

384 Control Test
384 Enable failed
384 Disable failed

EMS Test Context 0
Mapping error at xxxx xxxxxx

EMS Test Context 1
Mapping error at xxxx xxxxxx

EMS Protect Test
EMS Protect failed

MAR Auto inc Test
Auto increment failed.
MAR xxxx

EMS Disable Test
EMS Disable failed.

Shadow Enable Test
Shadow (ExxxxH) Enable failed.
Shadow (FxxxxH) Enable failed.

PMC Test
CPU SPEED (xx MHz) TOO SLOW
CPU SPEED (xx MHz) TOO FAST
(xx=8, 16)
PMC Interrupt failer-TIMER
PMC Interrupt failer-VRAM ACCESS

Keyboard Test

(1) Keyboard rest test

KEY keyboard failed

(2) Keyboard data test

KEY Key has been hit or broken SCAN CODE: xx

Video Test

(1) Video register test

VIDEO VIDEO register failed.
VIDEO register has failed.

(2) Video display timing signal test

VIDEO Display timing signal failed.
Status has failed.
Horizontal Sync. signal is not detected at address 3DAH.

(3) Video RAM test

VIDEO VRAM failed.
Address: xxxx:xxxx
Write: xxxx
Read: xxxx
VRAM data test has failed.
Data bus or chip has failed.

VIDEO VRAM Address Bus failed.
Address: xxxx:xxxx
VRAM address test has failed.
Address bus or VRAM chip has failed.

Floppy disk drive Test

FDC FDC failed.
Master status: n1n2
Floppy Disk Controller (FDC) master status has failed.
Data bus or FDC chips 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 has 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

FDD seek failed (max track)
Seek has failed.
Floppy Disk controller (FDC) cable or FDC chip has failed.

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

Serial port Test

(1) Resister test

RS232 Serial port failed.
Interrupt ID Write: xx
Read: xx
Serial port controller could not be found.

RS232 Serial port failed.
Divisor Write: xxxx
Read: xxxx
Divisor register has failed.

(2) Internal loopback

RS232 Serial port data loopback failed.
Line & Modem status: n1n2, n3n4
Loopback status has failed.
n1n2n3n4:Refer to the following table.

Loopback line status

nibble	bit	meaning
n1	D3	1: Timing out
	D2	1: Transmit shift register is empty
	D1	1: Transmit holding register is empty
	D0	1: Break defect
n2	D3	1: Framming error
	D2	1: Parity error
	D1	1: Overrun error
	D0	1: Data ready

Loopback modem status

n1	D3	1: Carrier defect
	D2	1: Ring indicator
	D1	1: Data set ready
	D0	1: Clear to send
n2	D3	1: Delta carrier defect
	D2	1: Trailing edge ring indicator
	D1	1: Delta data set ready
	D0	1: Delta clear to send

RS232 Serial port data loopback failed.
Xmit: xx Recv: xx
Loopback data test has failed.

RS232 Serial port signal loopback failed.
Loopback status has failed.
n2n4: expected status
n1n2: result by test. Refer to the following table.

Loopback modem status

n3	D3 1: Carrier detect D2 1: Ring indicator D1 1: Data set ready D0 1: Clear to send
n4	D3 1: Delta carrier defect D2 1: Trailing edge ring indicator D1 1: Delta data set ready D0 1: Delta clear to send

(3) External loopback

RS232 Serial port signal real loopback test failed.
Modem status: n1n2
Expected: n3n4
Loopback status has failed.
n1n2: Refer to the previous table.

RS232 Serial port data real loopback test failed.
Line status: n1n2
n1n2: Refer to the table 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 below.

RS232 Data real loopback interrupt request failed.
Line status: n1n2
n1n2: Refer to the table below.

RS232 Data real loopback receive failed.
Line status: n1n2
n1n2: Refer to the table 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 defect
n2	D3	1: Framming error
	D2	1: Parity error
	D1	1: Overrun error
	D0	1: Data ready

Printer port Test

PPA Time out error occurred with parallel printer

PPA I/O error occurred with parallel printer.

PPA Paper end occurred with parallel printer
BIOS status: n1n2
Character: n3n4
n1n2 is a printer BIOS error status listed below.
n3n4 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.
- HDD DRIVE READY TEST
  HDD drive not ready.
  BIOS status: xx HDC status: xx
  HDC error status:
- HDD RECALIBRATE TEST
  HDD recalibrate failed.
  BIOS status: xx HDC status: xx
  HDC error status:
- HDD SEEK REST
  HDD seek failed.
  BIOS status: xx HDC status: xx
  HDC error status:
- HDD SEEK TIME TEST
  HDD seek does not complete within some period.
  BIOS status: xx HDC status: xx
  HDC error status:

Get parameter error--Can not execute test program!

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

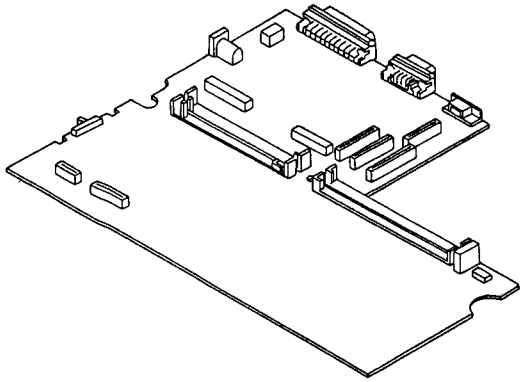
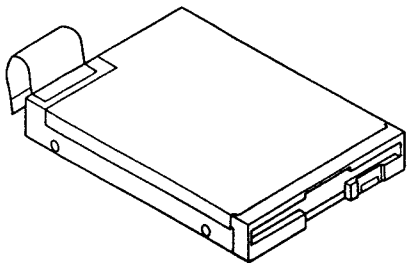
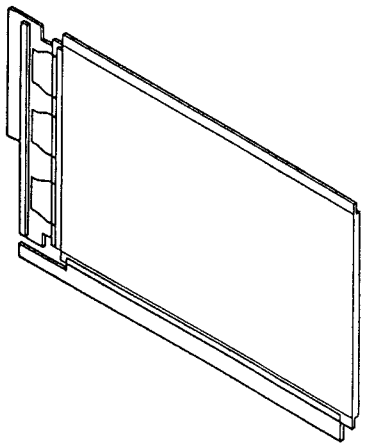
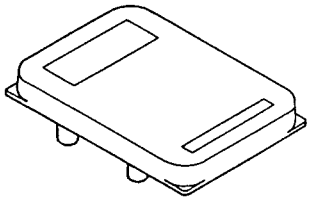
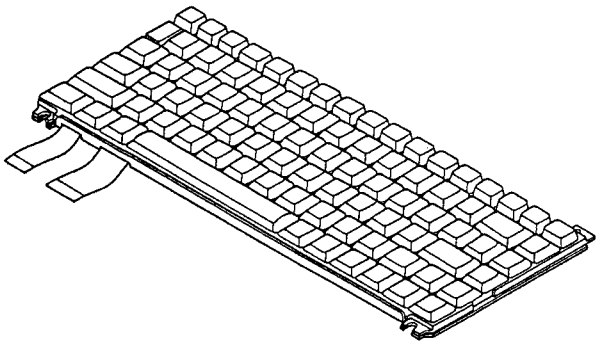
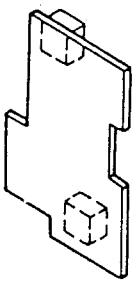
HDC status

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: Errors found in executed instructions

HDC error status

nibble	bit	meaning
n1	D3	1: Back block
	D2	1: Non-correctable ECC error
	D1	–
	D0	1: Selector not found
n2	D3	–
	D2	1: HD not ready
	D1	1: No track 00 signal
	D0	1: No address mark

3.3 Appearance of Disassembled Block Unit

<table>
<tr><th>Main PCB</th><th>Floppy Disk Drive (P/N: EME263MGP)</th></tr>
<tr><td>P/N: DL3K10393BA for (M)
DL3U10393CA for (C)
DL3U10393EA for (E), (F) and (G)
 
(Please read the *Note described below.)</td><td>  </td></tr>
<tr><th>LCD Unit (P/N: DFWVD8A008)</th><th>Hard Disk Drive (P/N: DFWV44K0003)</th></tr>
<tr><td>  </td><td> 
Note:
The hard disk drive will be supplied without the HDD shield case. (Refer to page 4-7.)</td></tr>
<tr><th>Keyboard Ass'y</th><th>FL Inverter PCB (P/N: DL3U10401AA)</th></tr>
<tr><td>P/N: DFWV43H053Z for (M) and (C)
DFWV43H065Z for (E)
DFWV43H066Z for (F)
DFWV43H067Z for (G)
  </td><td>  </td></tr>
</table>

* Note: Metal connector frame is not attached to Main Board.

4. Disassembly/Reassembly

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

1. Turn the power switch off.
2. Disconnect the AC adapter.
3. Remove the floppy disk if it is inserted in the floppy disk drive.
4. Remove the optional modem and RAM cards if they are installed.

Caution: Please follow directions carefully.
Do not interchange screws in any part of the system.

4.1 Top case

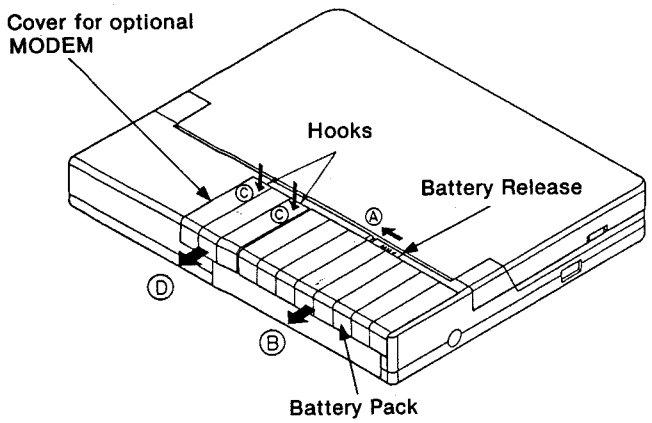


Figure 1

(1) Slide the spring-loaded battery release in the direction of arrow Ⓐ and then pull the battery pack in the direction of arrow Ⓑ.

(2) Push the hooks of the cover for optional MODEM in the direction of arrows Ⓒ and then remove the cover for optional MODEM in the direction of arrow Ⓓ.

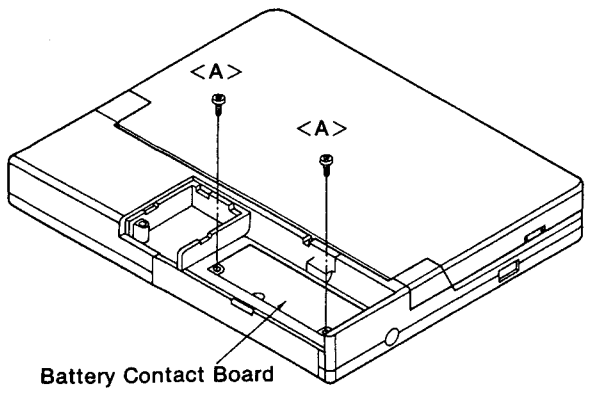


Figure 2

(3) Remove two screws <A> (3φ×5mm) on the battery contact board as shown in Figure 2.

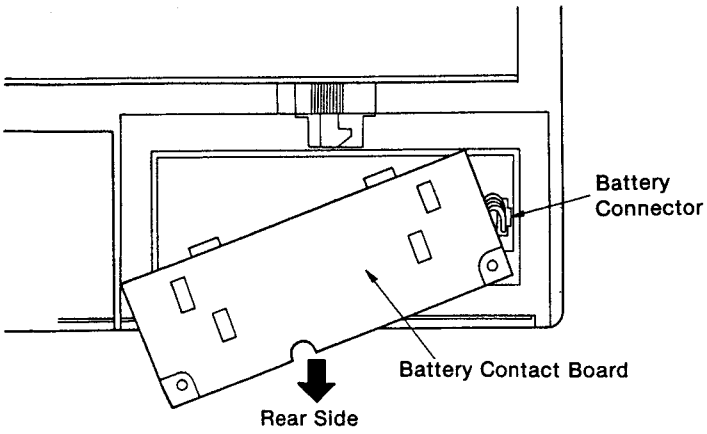


Figure 3

(4) Gently lift up the battery contact board and disconnect the battery connector as shown in Figure 3.

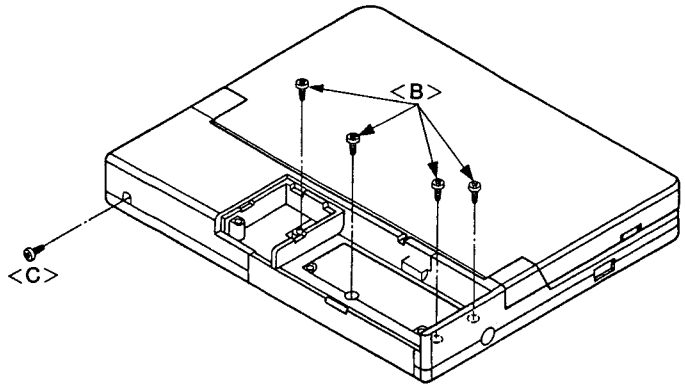


Figure 4

(5) Remove four screws <B> (3φ×8mm) as shown in Figure 4.

(6) Remove one screw <C> (3φ×5mm) as shown in Figure 4.

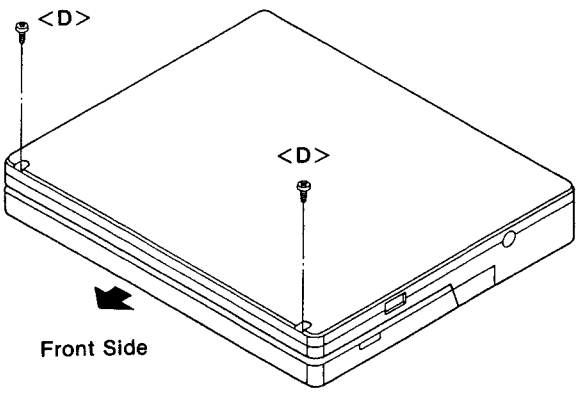


Figure 5

(7) Turn over the computer and remove two screws <D> (3φ×10mm) as shown in Figure 5.

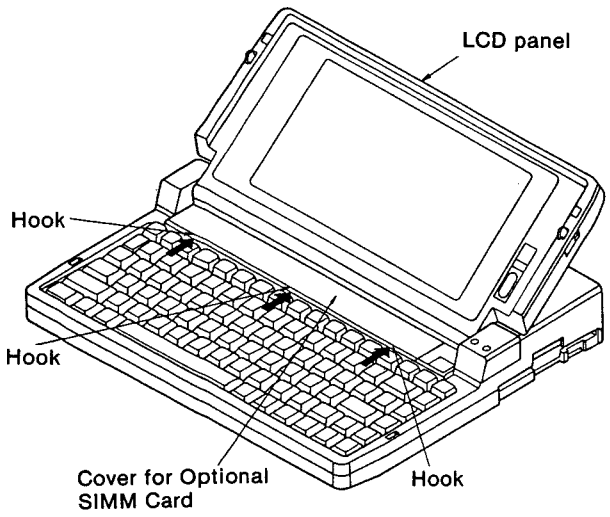


Figure 6

(8) Turn over the computer again so that the front is facing you.

(9) Open the display panel as shown in Figure 6.

(10) Pushing in the direction of the arrows, unlatch the three hooks of the cover for optional SIMM card as shown in Figure 6.

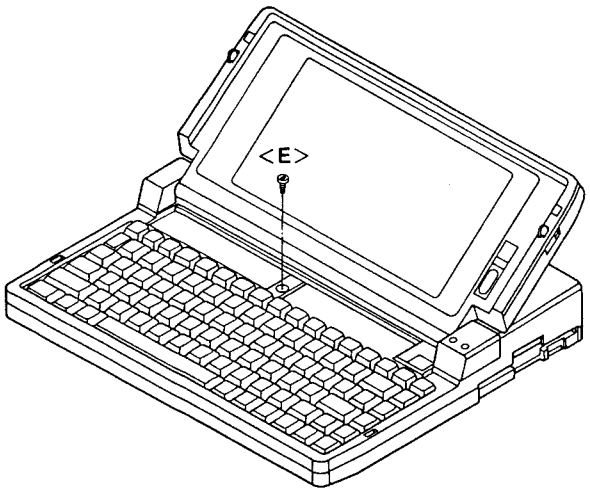


Figure 7

(11) Remove one screw <E> (3φ×6mm) as shown in Figure 7.

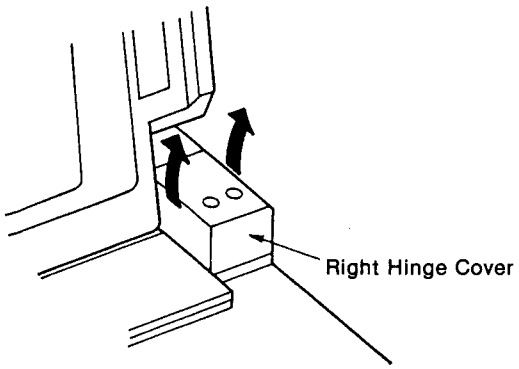


Figure 8

(12) Remove the right hinge cover by lifting up the rear end of the cover as shown in Figure 8.

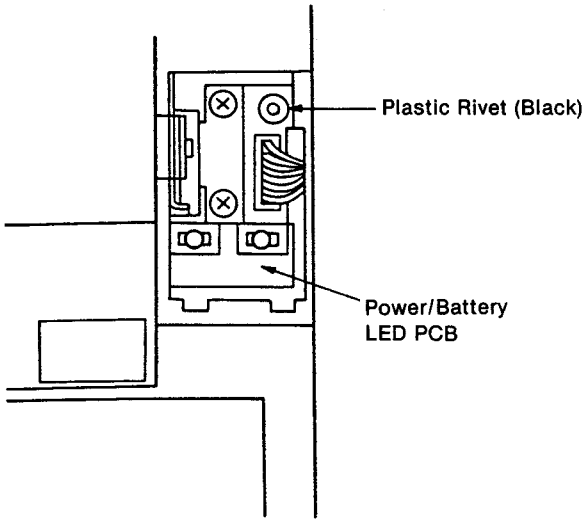


Figure 9

(13) Pull up the plastic rivet as shown in Figure 9 and slightly move the power/battery LED PCB so that you can access the screw <F> as shown in Figure 10.

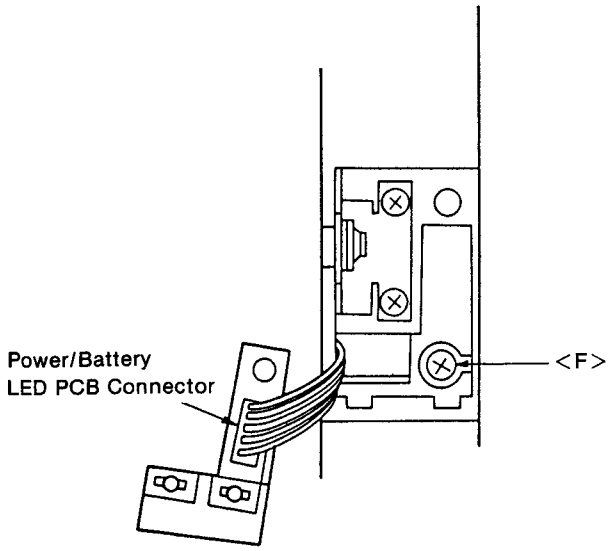


Figure 10

(14) Remove one screw <F> (3φ×8mm) as shown in Figure 10.

(15) Disconnect the connector of power/battery LED PCB as shown in Figure 10.

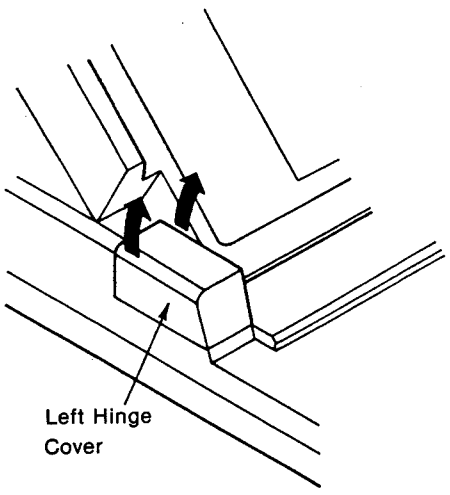


Figure 11

(16) Remove the left hinge cover by lifting up the rear end of the cover as shown in Figure 11.

(17) Remove the front screw <G> (3φ×6mm) as shown in Figure 12.

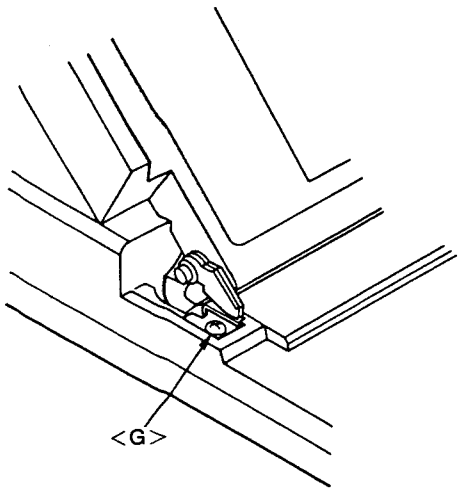


Figure 12

(18) Gradually lift up the rear end of the top case so that hooks can be easily unlatched and then disconnect the LCD connector as shown in Figure 13.

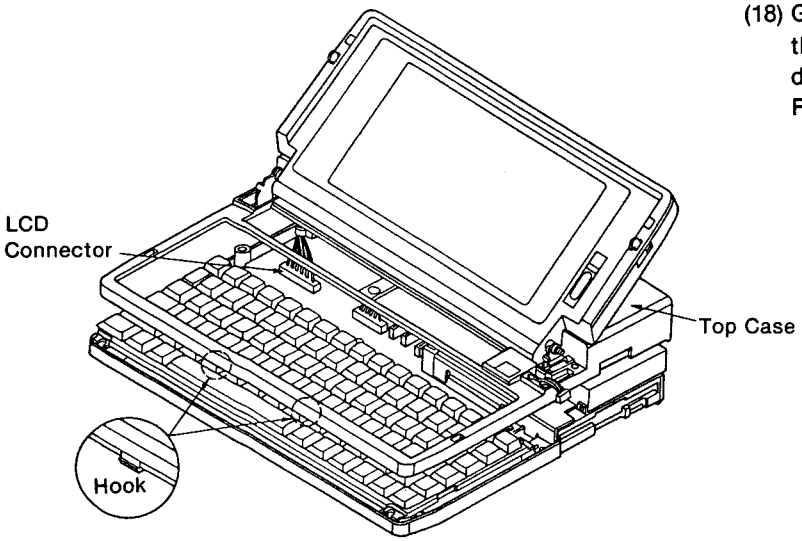


Figure 13

4.2 Keyboard Ass'y

(1) After removing the top case, remove three screws <A> (3φ×6mm) fixing keyboard as shown in Figure 14.

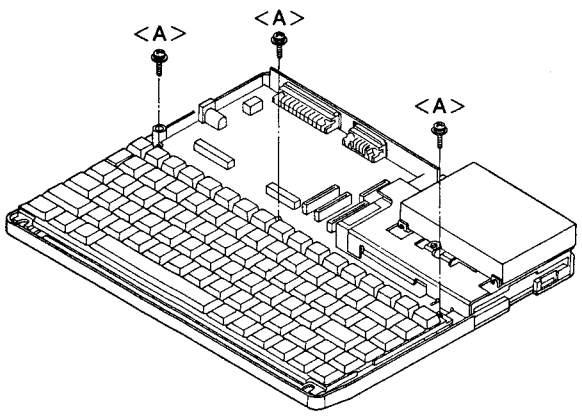


Figure 14

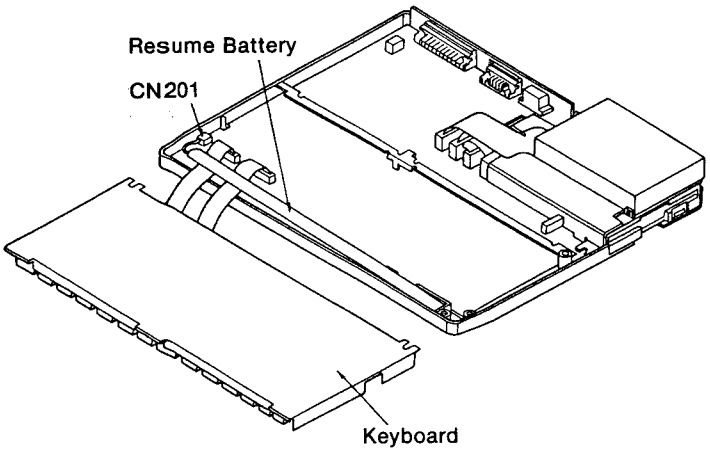


Figure 15

(2) Turn over the keyboard and then disconnect resume battery connector (CN201).

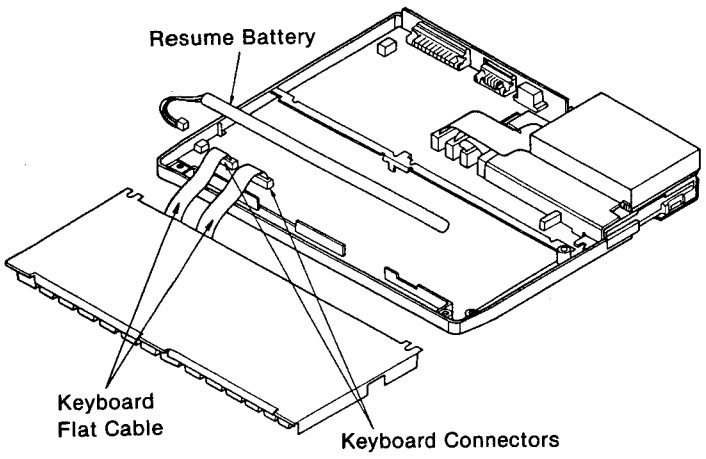


Figure 16

(3) Remove the resume battery and then disconnect keyboard connectors as shown in Figure 16.

Note: These flat cables can be removed by sliding their connectors in the direction of <Y> as shown in Figure 16A.

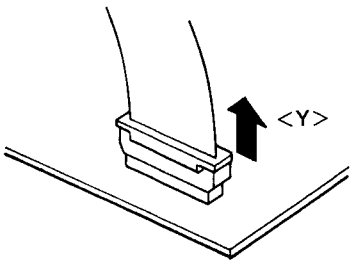


Figure 16A

4.3 Hard Disk Drive (HDD)

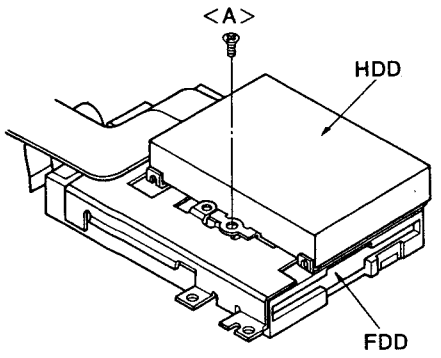


Figure 17

(1) After removing the top case, remove one screw <A> (2.8φ×5mm) as shown in Figure 17.

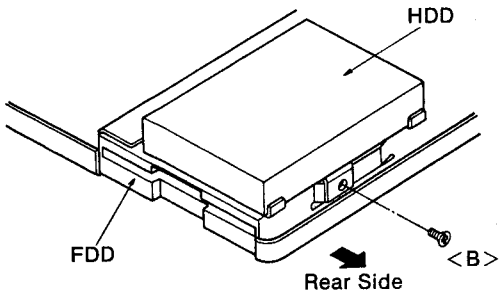


Figure 18

(2) Remove one screw <B> (2.8φ×5mm) as shown in Figure 18.

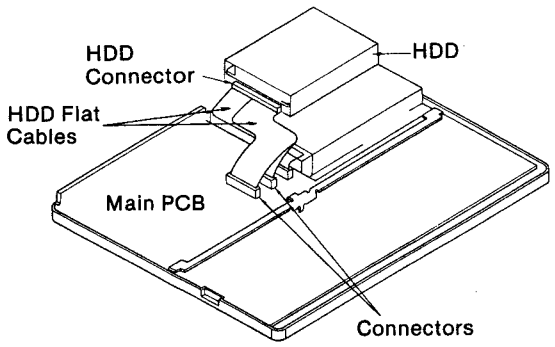


Figure 19

(3) Gently pull up the HDD flat cables from the connectors on the main PCB as shown in Figure 19.

(4) Carefully remove the HDD flat cables from the HDD by using a small flat head screw driver as shown in Figure 19A.

CAUTION:
Do not pull out the HDD flat cables forcefully.

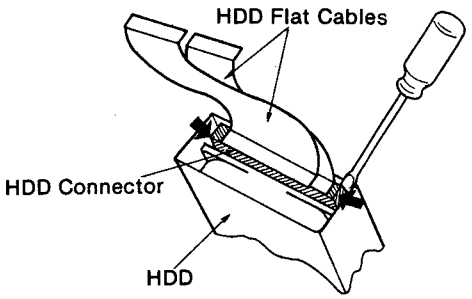


Figure 19A

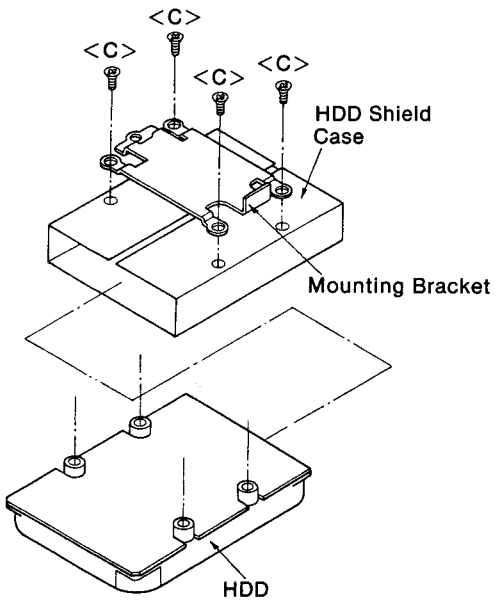


Figure 20

(5) Turn over the HDD and remove four screws <C> (2.8φ×5mm) from the mounting bracket of the HDD as shown in Figure 20.

(6) Remove the HDD shield case from the HDD as shown in Figure 20.

CAUTION:
When reassembly, do not tight the screws <C> forcefully. The best tightening torque is 3.0± 0.2kg•cm.

* Reassemble in the reverse order.

4.4 Floppy Disk Drive (FDD)

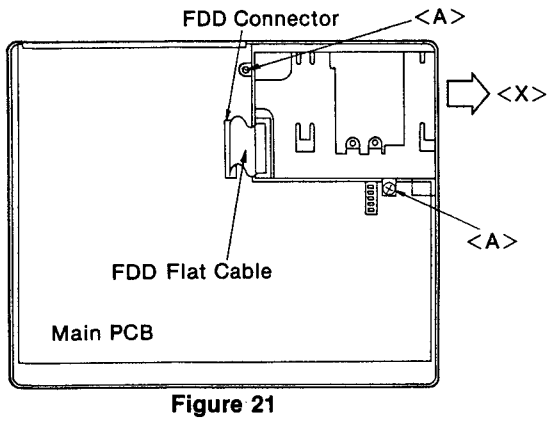


Figure 21

(1) After removing the HDD, remove two screws <A> (3φ×6mm) as shown in Figure 21.

(2) While lifting up the FDD slightly, slide it in the direction of <X> as shown in Figure 21.

(3) Disconnect the FDD flat cable from FDD connector on the main PCB as shown in Figure 21.

NOTE: Do not disconnect the flat cable from the FDD. This is one piece.

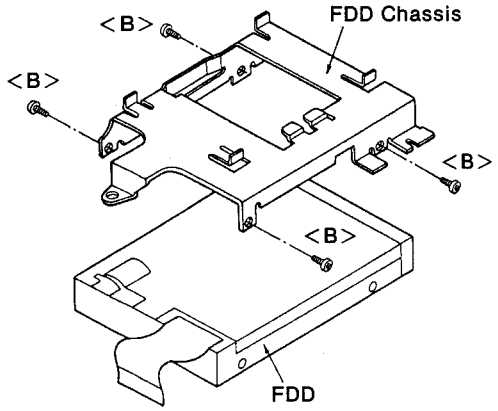


Figure 22

(4) Remove four screws <B> (3φ×5mm) from the FDD bracket and then remove the FDD bracket as shown in Figure 22.

*Reassemble in the reverse order.

4.5 Main PCB

Note: To protect the main PCB from static electricity, use a static safe wrist strap.

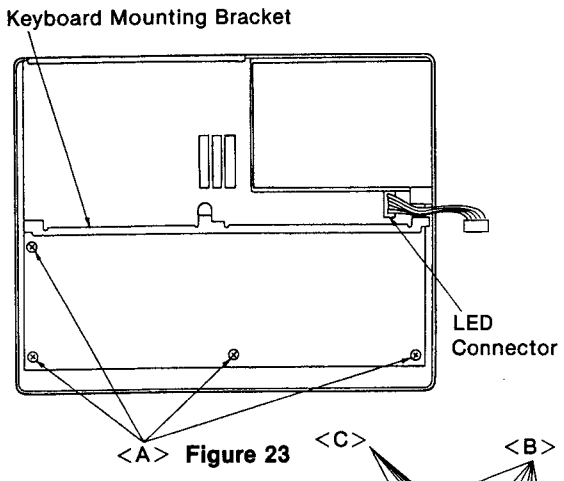


Figure 23

(1) After removing the top case, keyboard, hard disk drive and floppy diskdrive, remove the keyboard mounting bracket as shown in Figure 23.

(2) Disconnect the LED connector as shown in Figure 23.

(3) Remove four screws <A> (3φ×6mm) as shown in Figure 23.

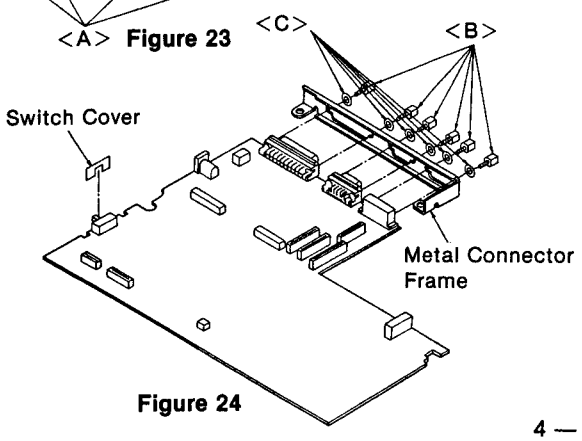


Figure 24

(4) Lift up the main PCB from the bottom case as shown in Figure 24.

(5) Remove the switch cover as shown in Figure 24.

(6) Remove the metal connector frame from the main PCB by loosening six screws <B> and six spring washers <C> shown in Figure 24.

Note: Please use a needle nose pliers or wrench to loosen those six screws <B>.

4.6 LCD Unit

Note: To protect the LCD unit from static electricity, use a static safe wrist strap.

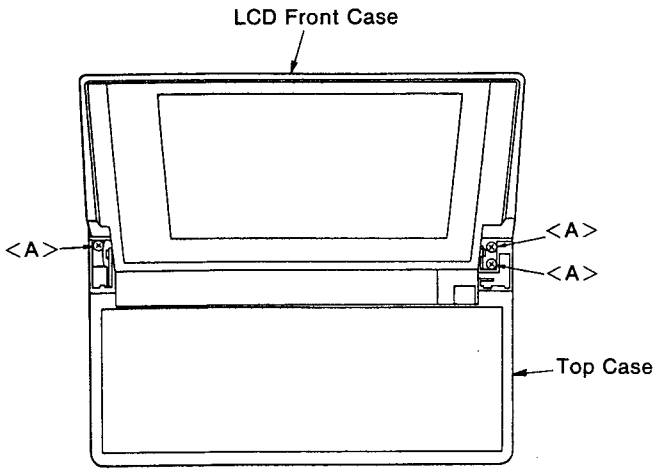


Figure 25

(1) Remove three screws <A> (3φ×6mm) as shown in Figure 25 and gently remove the top case from the LCD front case.

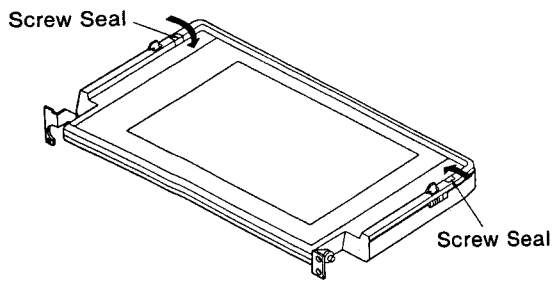


Figure 26

(2) Gently remove two screw seals by pressing them with a flat head screw driver in the direction of arrows as shown in Figure 26.

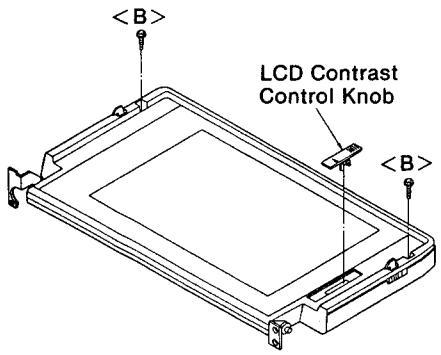


Figure 27

(3) Remove two screws <B> (2.6φ×6mm) as shown in Figure 27.

(4) Gently lift up the LCD contrast control knob by holding its both ends.

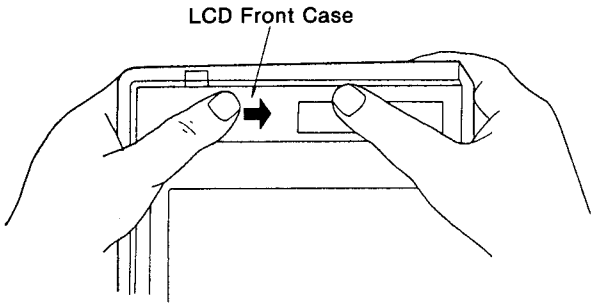


Figure 28

(5) Stand the LCD on its side so that the contrast control switch is on top and facing you.
Slowly slide the LCD front case over (approx. 2mm) from the LCD rear case in the direction of arrow as shown in Figure 28.
Then repeat the same procedure for the other side of it.

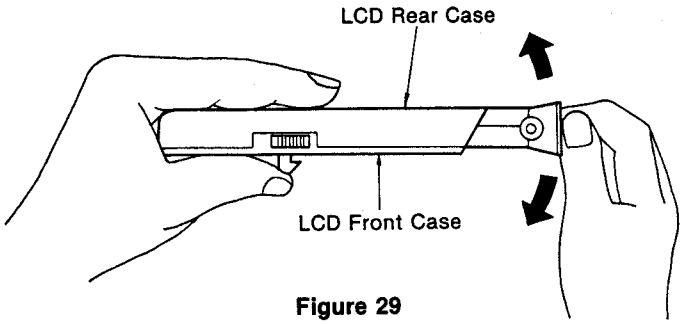


Figure 29

(6) Gradually open the LCD rear case from the LCD front case as shown in Figure 29.

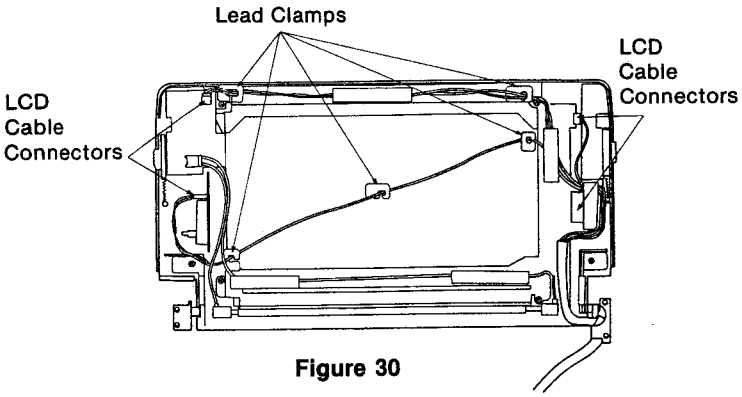


Figure 30

(7) After removing the LCD rear case, release lead wires from the lead clamps as shown in Figure 30.

(8) Disconnect LCD cable connectors as shown in Figure 30.

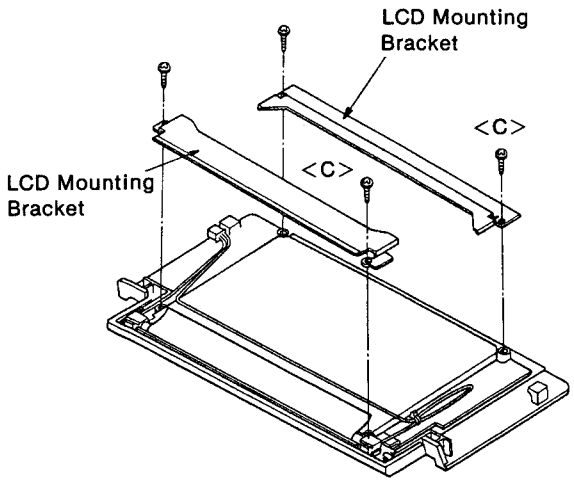


Figure 31

(9) Remove four screws <C> (2.6ϕ×6mm) and then remove LCD mounting brackets as shown in Figure 31.

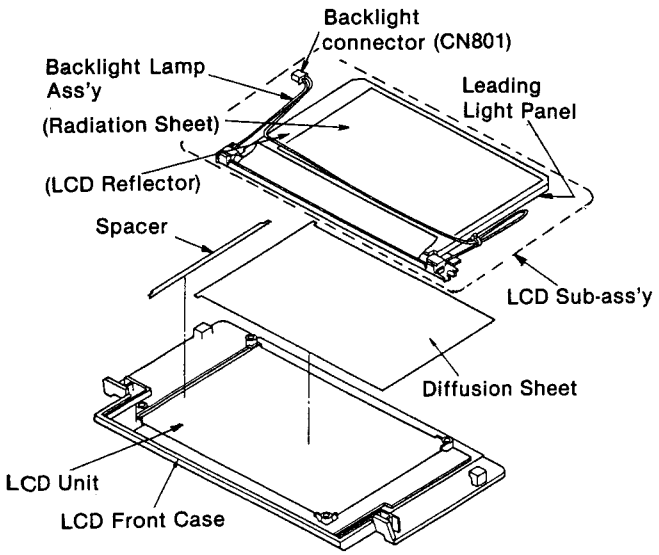


Figure 32

(10) Disconnect backlight connector (CN801).

(11) Gently lift up the LCD sub-ass'y, and then remove the spacer, diffusion sheet and LCD unit from the LCD front case as shown in Figure 32.

Note: Do not get the LCD unit face stained with fingerprints and dust.

4.7 LCD Unit and Backlight Lamp Reassembling

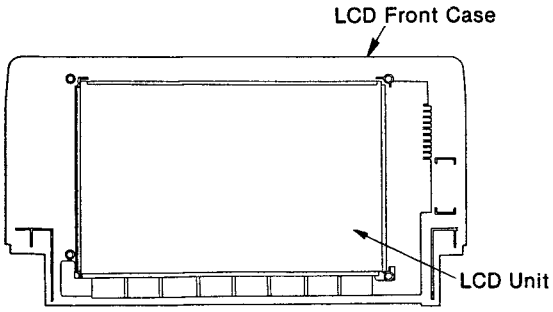


Figure 33

(1) Put the LCD Unit on the LCD front case as shown in Figure 33.

Note: Do not get the LCD front panel face stained with fingerprints and dust.

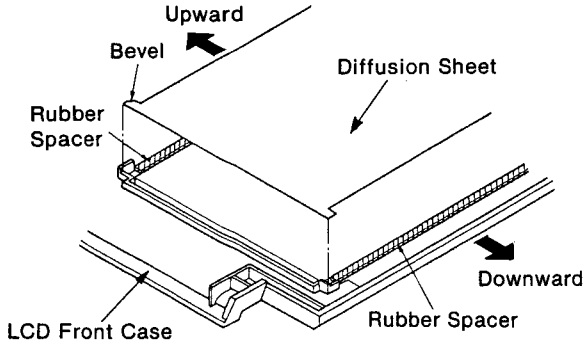


Figure 34

(2) Put the diffusion sheet on the LCD unit as shown in Figure 34.

Note: 1. When installing the diffusion sheet, be sure that the bevel of the sheet should be upward.
2. Be sure not to place the diffusion sheet on the rubber spacers as shown in Figure 34.

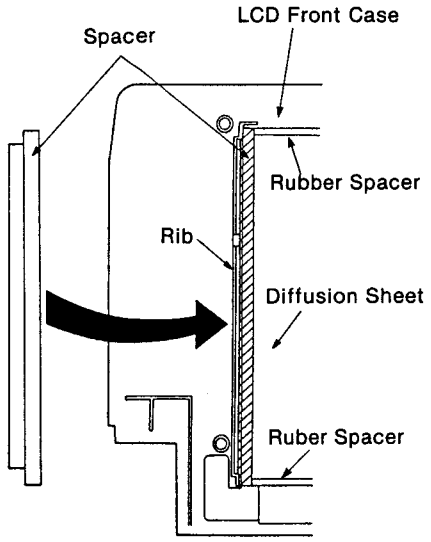


Figure 35

(3) Put the spacer into the clearance between the rib of LCD front case and LCD unit as shown in Figures 35 and 35A.

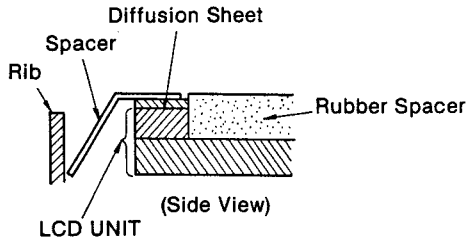


Figure 35A

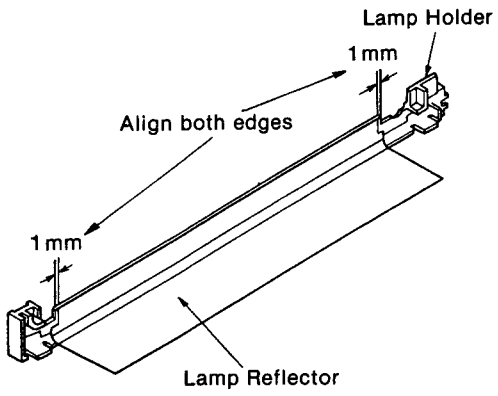


Figure 36

(4) Stick the backlight lamp reflector to the lamp holder as shown in Figure 36.

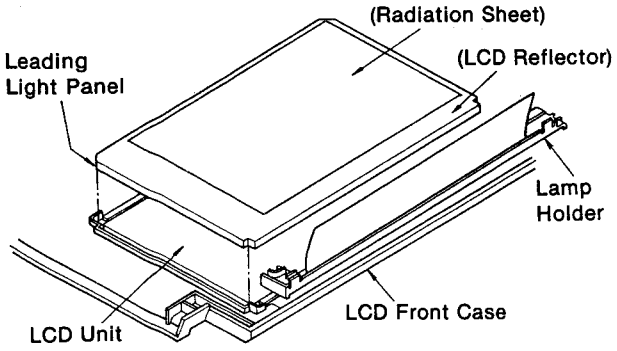


Figure 37

(5) Install the lamp holder and leading light panel on the LCD unit as shown in Figure 37.

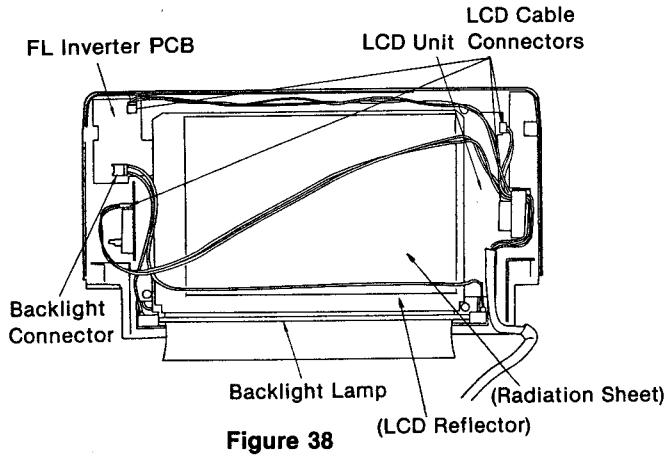


Figure 38

(6) Put the backlight lamp into the lamp holder as shown in Figure 38.

(7) Connect the backlight lamp connector to the FL inverter PCB as shown in Figure 38.

(8) Connect the LCD cable connector to the LCD unit as shown in Figure 38.

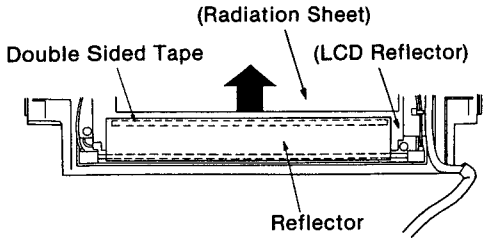


Figure 39

(9) Stick the lamp reflector to the LCD reflector by pulling in the direction of arrow as shown in Figure 39.

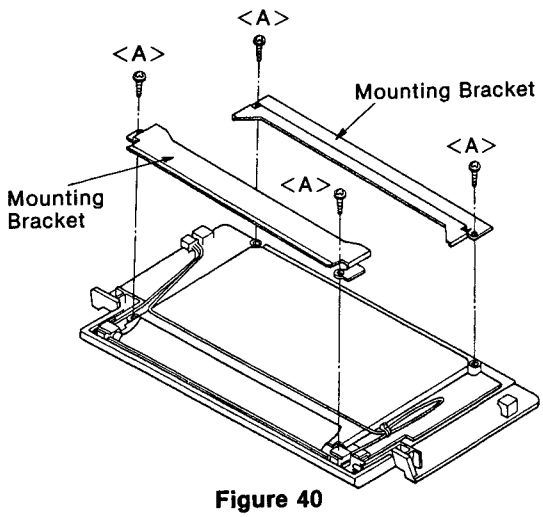


Figure 40

(10) Install the LCD mounting brackets to the LCD front panel with four screws <A> (2.6φ×6mm) shown in Figure 40.

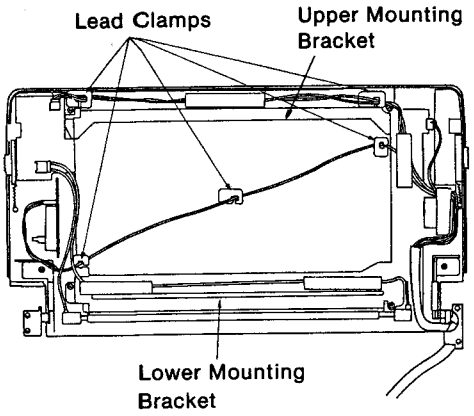


Figure 41

(11) Route the wires with the lead clamps as shown in Figure 41.

(12) Place the LCD rear case on the LCD front case.

5. Adjustment

5.1 Main PCB Adjustment

1) Adjustment items and voltage check

(1) LCD Brightness adjustment
(2) Backup Battery Voltage check
(3) Real Time Clock Frequency adjustment

2) Test Equipment

(1) DC Power Supply (or AC Adapter)
(2) Digital Voltmeter
(3) Frequency Counter
(4) Nonmetaric Flathead Screwdriver (for the adjustment of LCD Brightness Control)
(5) Installation Disk 2

3) Adjustment Methods

(1) LCD Contrast (VR1) Adjustment

Note: The following adjustment should be performed at 77°F (25°C) of environmental temperature.
Preparation:
Remove the Battery Contact Board so that you can access VR1.

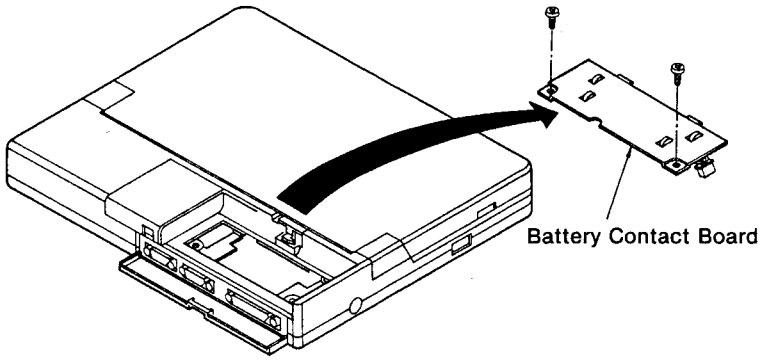


Figure 5-1

Procedure:
1-1) Apply 16V DC to the connector CN19 (DC IN Jack) with DC power supply as shown in Figure 5-2.
1-2) Press the power switch to turn ON the computer.
1-3) Slide the LCD brightness control knob to its center position.
1-4) Switch the backlight brightness switch (locating at left side of the computer) into the High position.
1-5) Confirm that the LCD displays some characters.
1-6) Carefully adjust the variable resistor VR1 to obtain the best contrast.

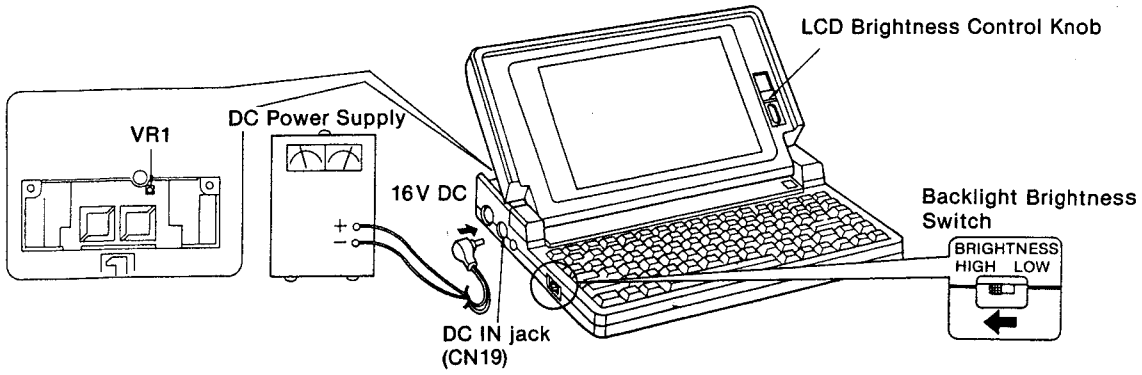


Figure 5-2

(2) Backup Battery Voltage Check

Preparation:

Remove the Top Case. (Refer to 4.1 Top Case)

Procedure:

2-1) Remove the DC power supply from the connector CN19 (DC IN Jack).

2-2) Confirm that the voltage of the backup battery is between 2.0V and 3.0V by connecting digital voltmeter to pins 1 and 4 (GND) of the connector CN11.

2-3) Connect the voltmeter to pins 1 and 2 and then confirm the voltage is between 2mV and 25mV as shown in Figure 5-3.

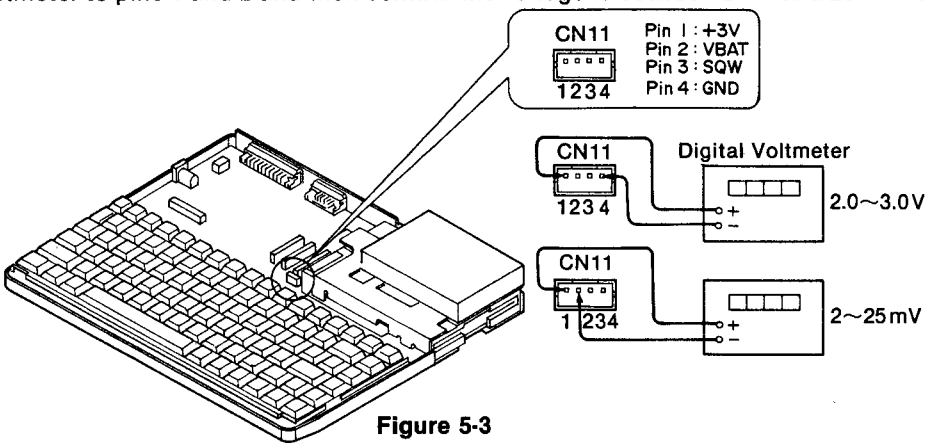


Figure 5-3

(3) TC1 (Real Time Clock Adjustment)

Preparation:

Remove the Top Case and turn over the Keyboard. (Refer to 4.1 Top Case)

Procedure:

3-1) Apply 16V DC to the connector CN19 (DC-IN Jack) with DC power supply as shown in Figure 5-4. Then press the power switch to turn ON the computer.

3-2) Type the commands listed below by executing "DEBUG. COM" stored on the "Installation Disk 2".

3-3) Connect a frequency counter to Pins 3 and 4 (GND) of the connector CN11 as shown in Figure 5-4.

3-4) Adjust the trimmer capacitor TC1 so that frequency counter reading is 8.1920KHz as shown in Figure 5-4.

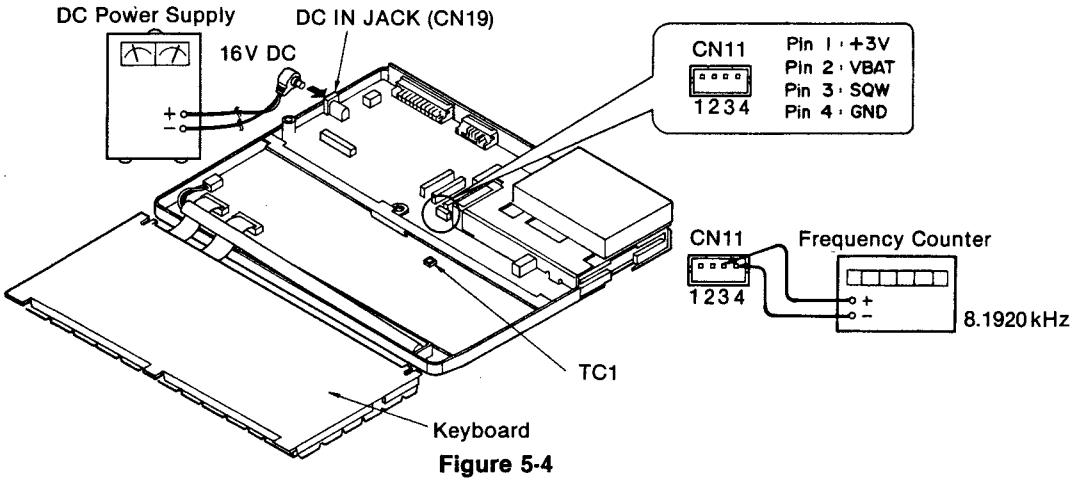
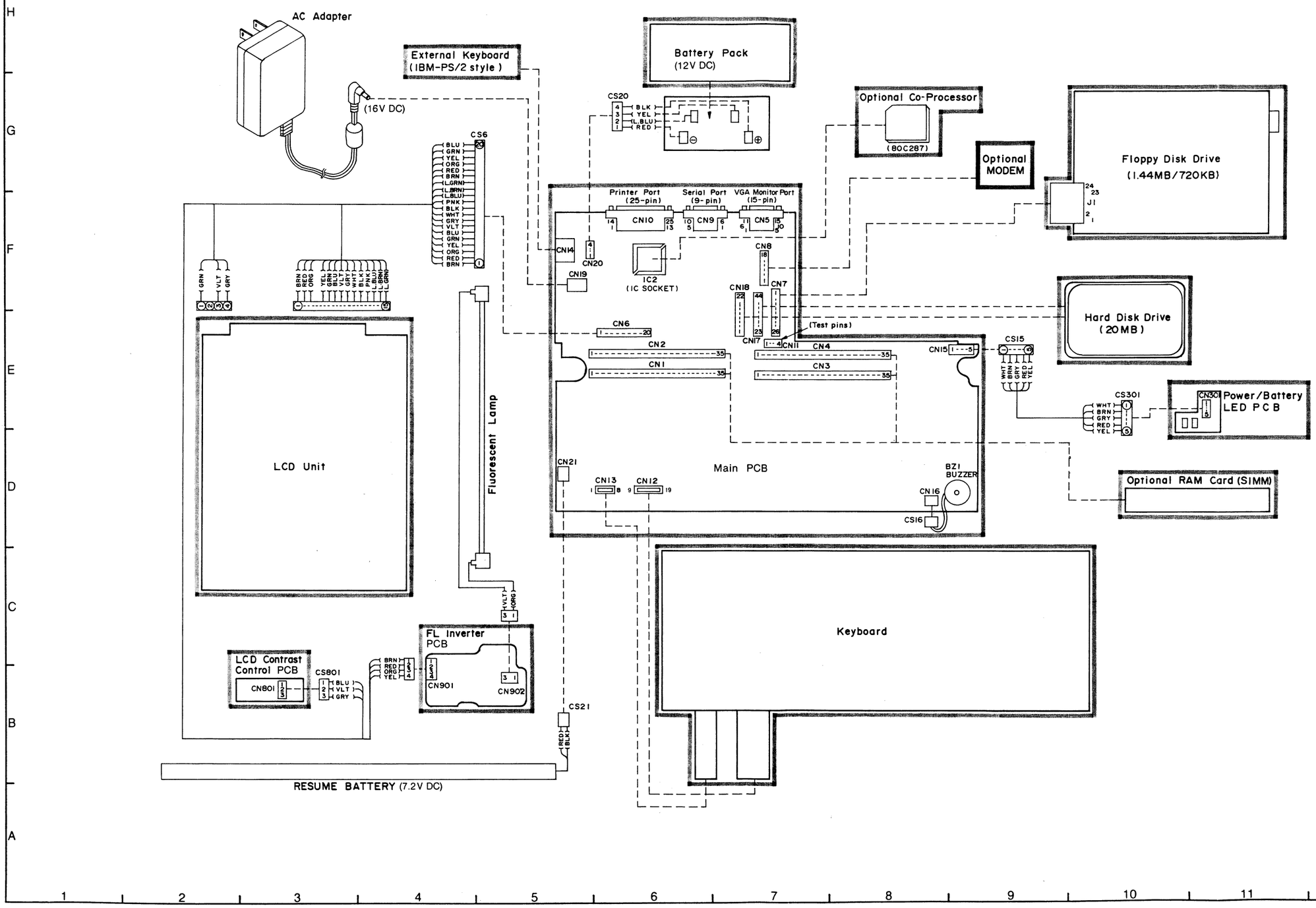


Figure 5-4

Displayed Messages	Key Operations
A>DEBUG	D E B U G <ENTER>
-O 70 0B	O <SPACE> 7 0 <SPACE> 0 B <ENTER>
-O 71 08	O <SPACE> 7 1 <SPACE> 0 8 <ENTER>
-O 70 0A	O <SPACE> 7 0 <SPACE> 0 A <ENTER>
-O 71 23	O <SPACE> 7 1 <SPACE> 2 3 <ENTER>
-Q	Q <ENTER>

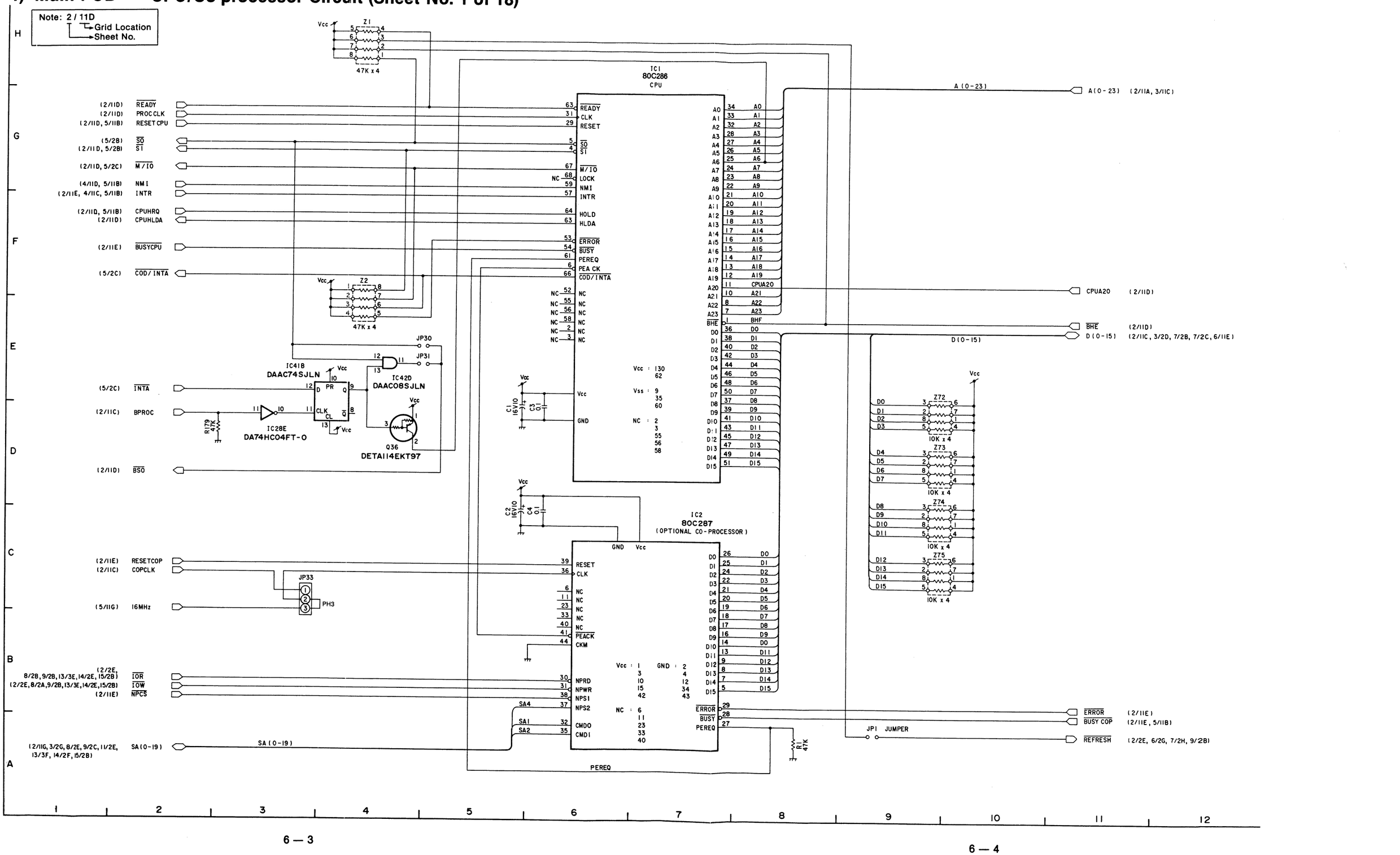
6. Schematic Diagrams/Parts Location/Replacement Parts List

6.1 Wiring Connection Diagram

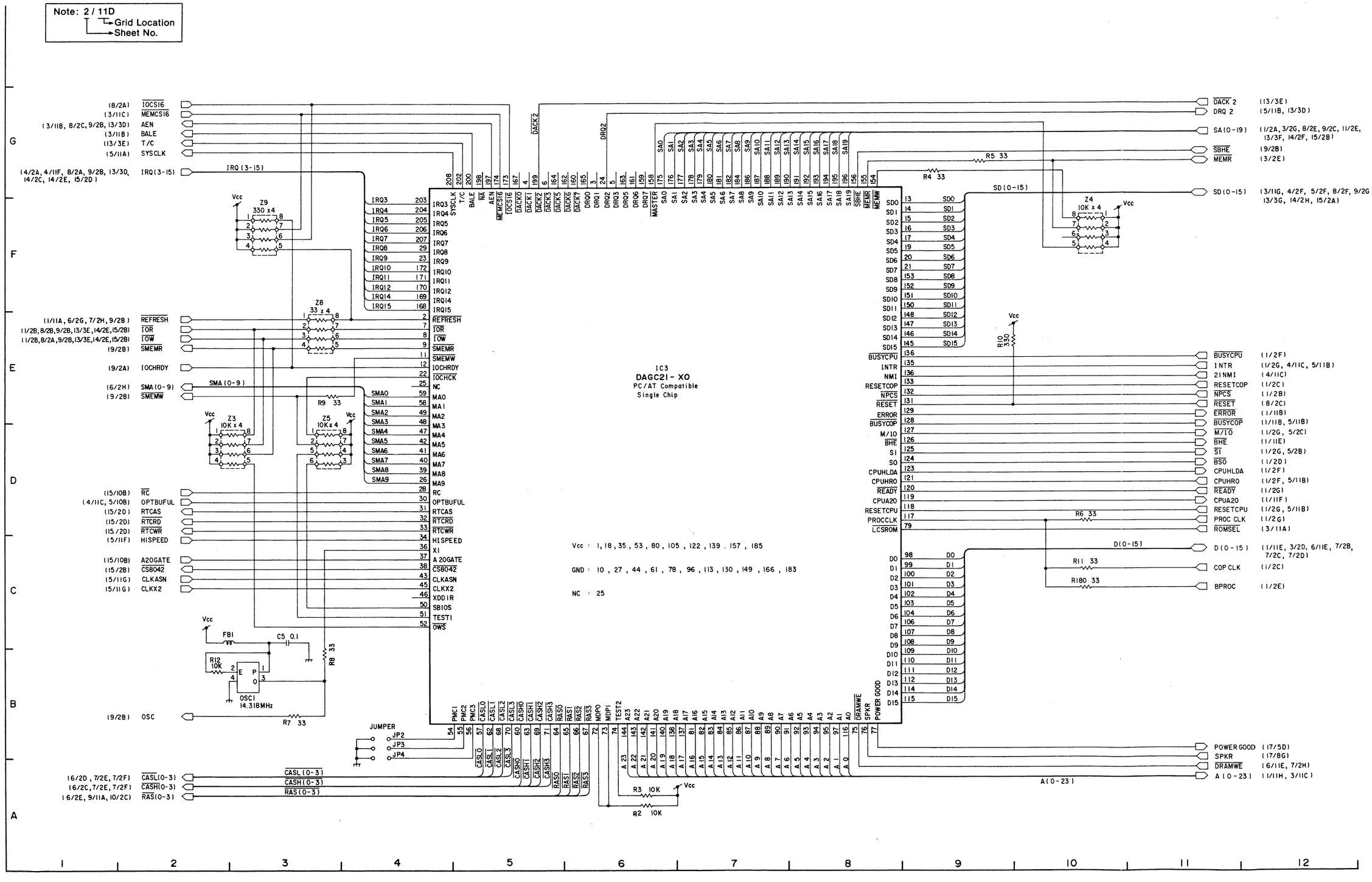


6.2 Schematic Diagrams

1) Main PCB CPU/Co-processor Circuit (Sheet No. 1 of 18)

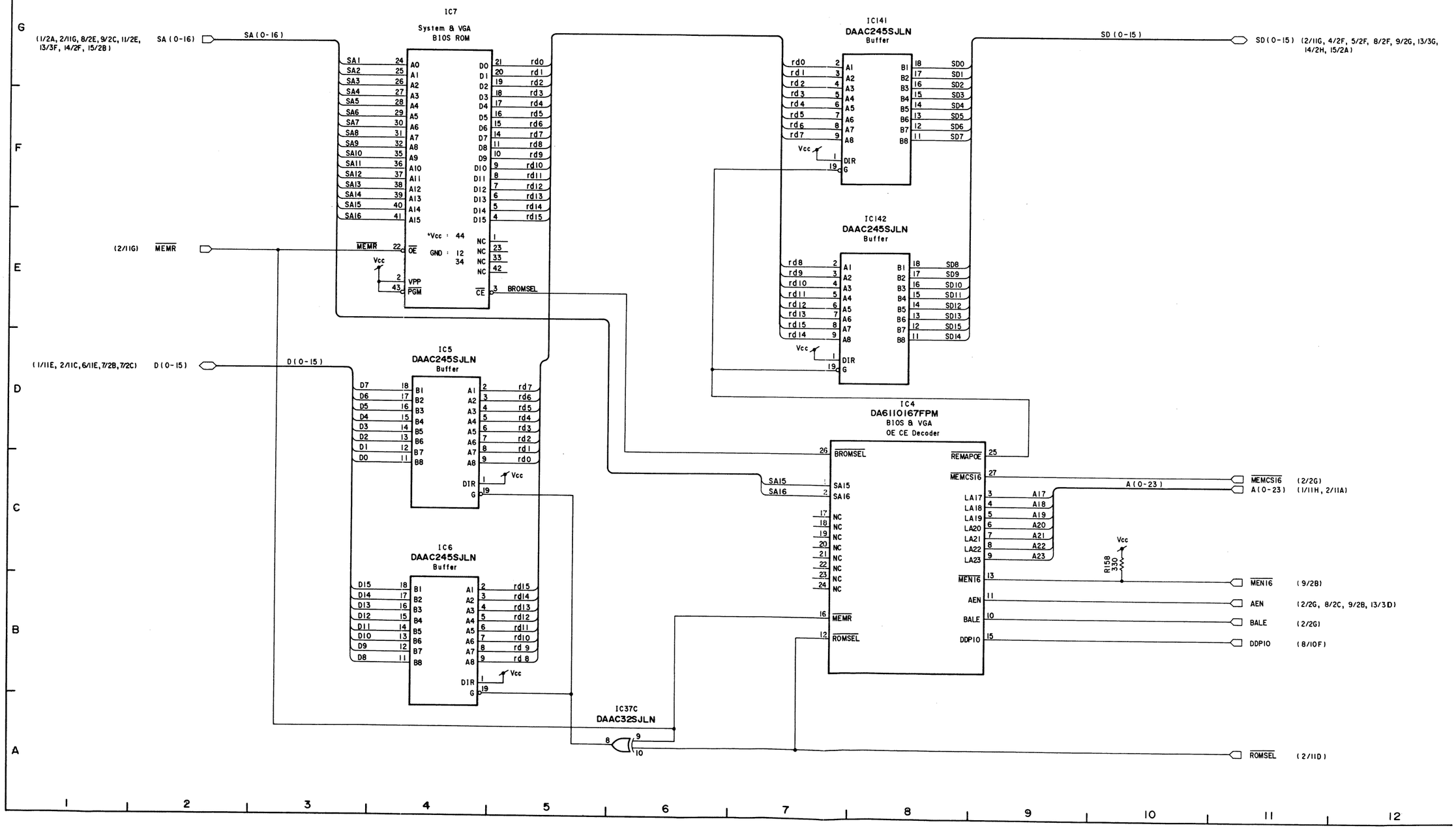


PC/AT Compatible Single Chip (GC21) Circuit (Sheet No. 2 of 18)

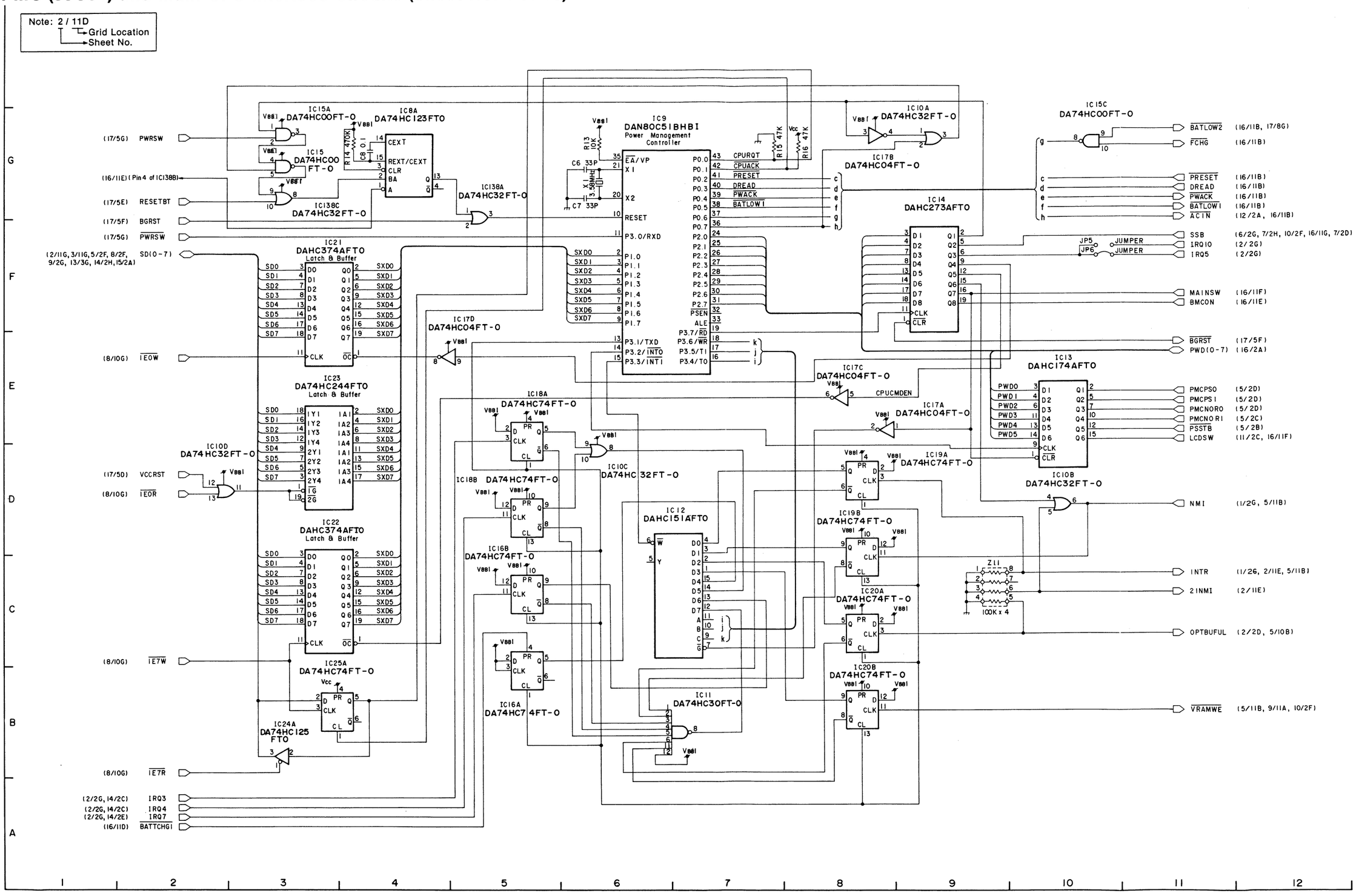


Memory Mapper and BIOS ROM Circuits (Sheet No. 3 of 18)

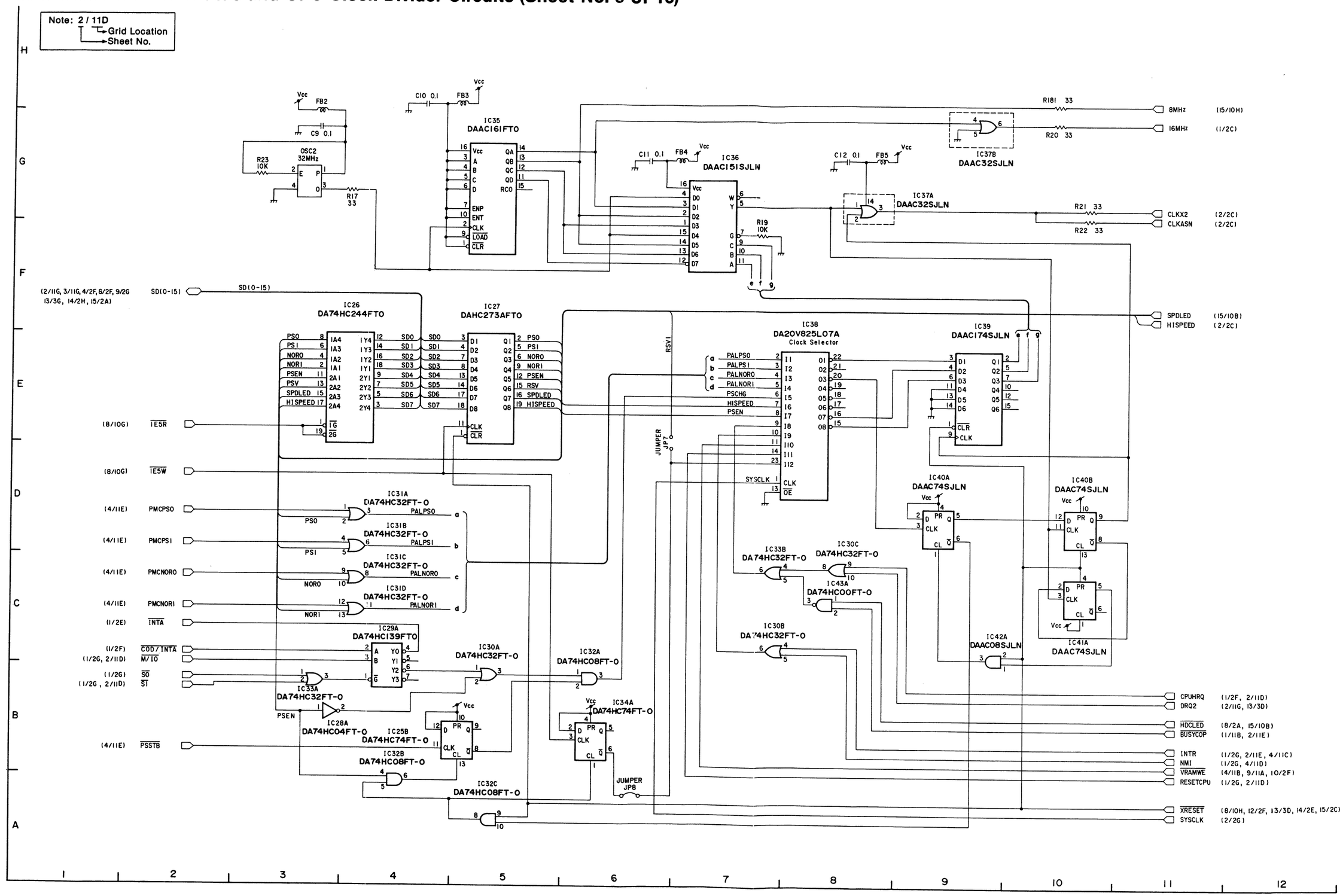
Note: 2 / 11D
Grid Location
Sheet No.



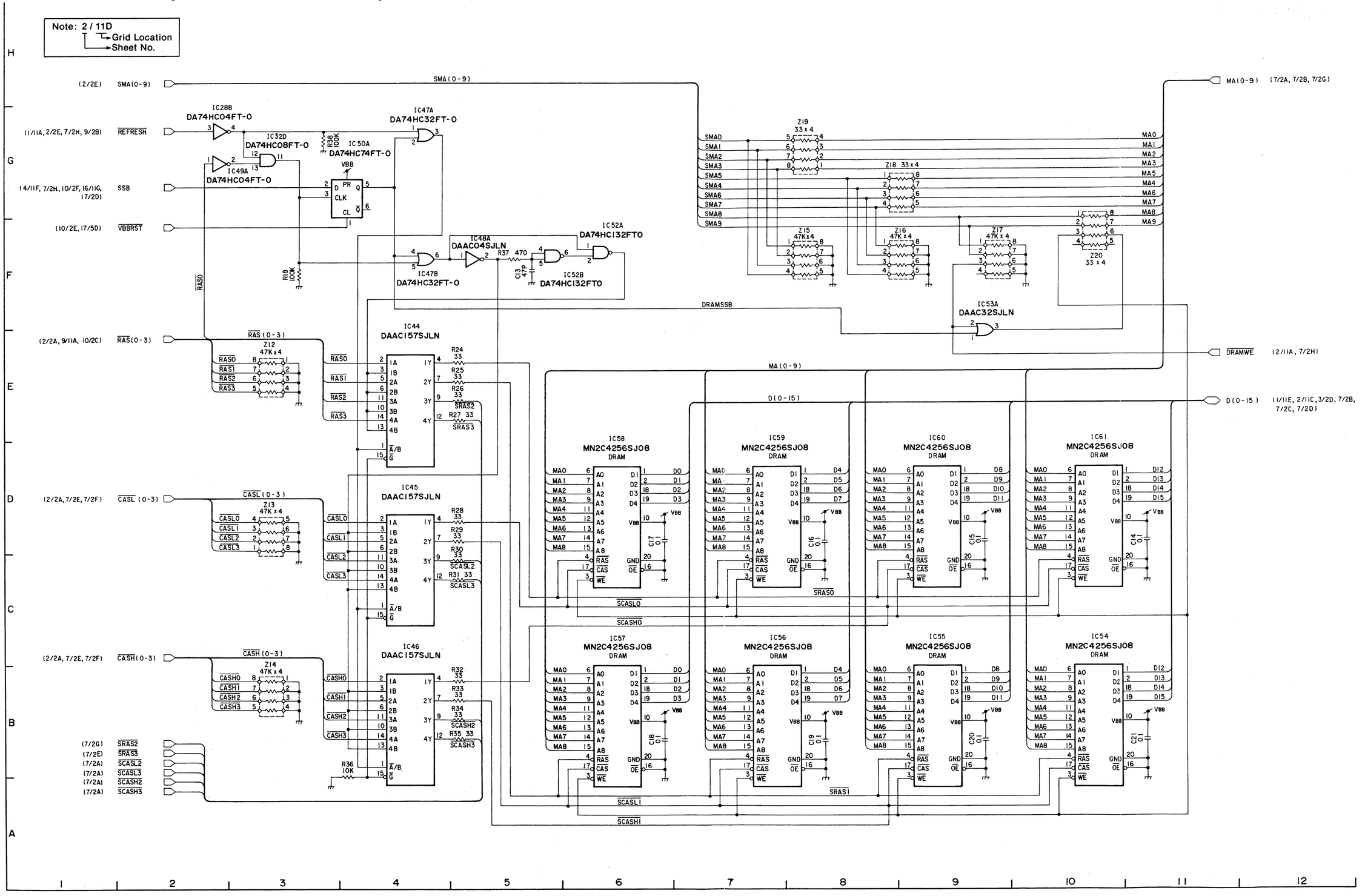
PMC (80C51) and Main CPU Interface Circuits (Sheet No. 4 of 18)



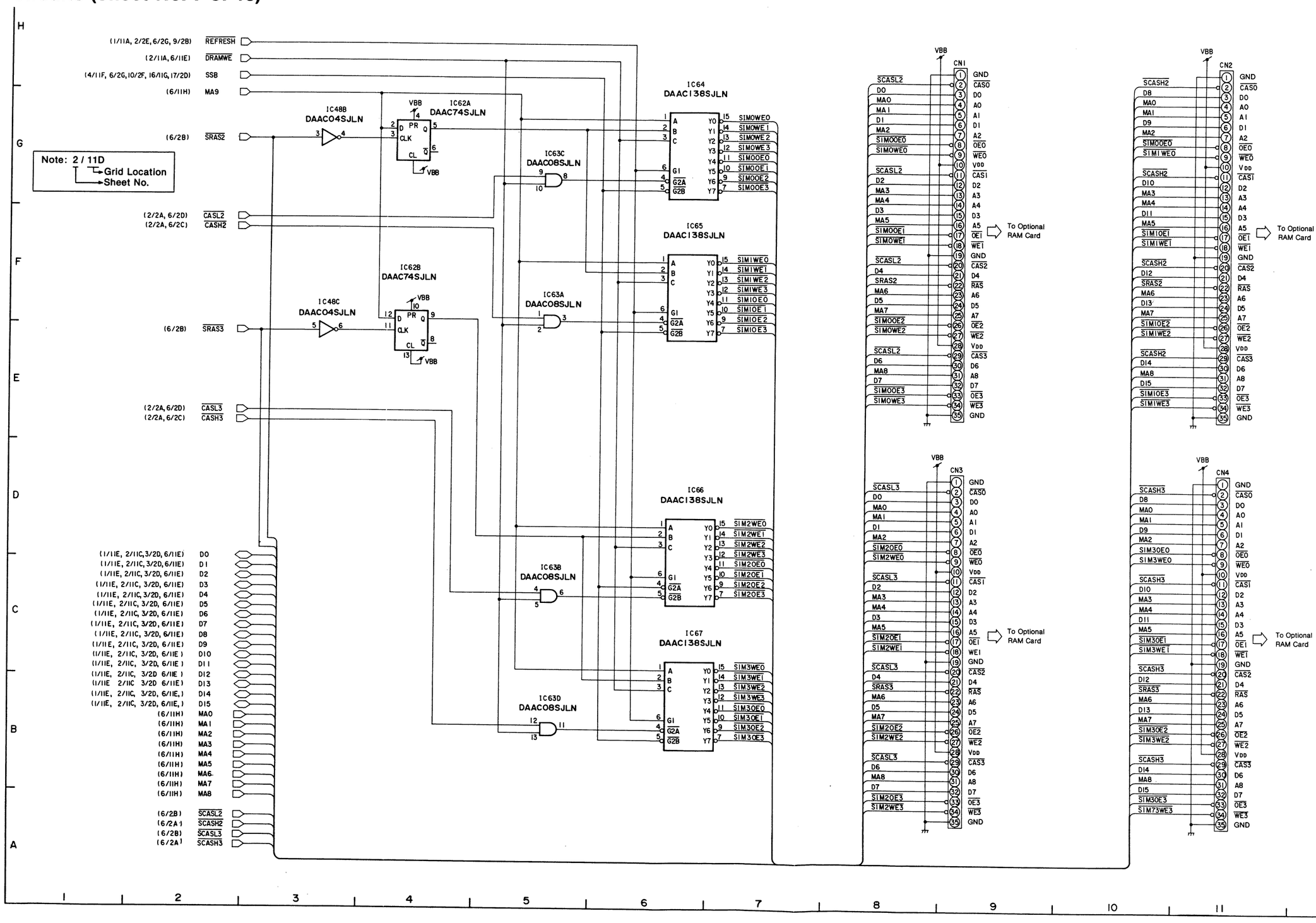
CPU Clock Control Status and CPU Clock Divider Circuits (Sheet No. 5 of 18)



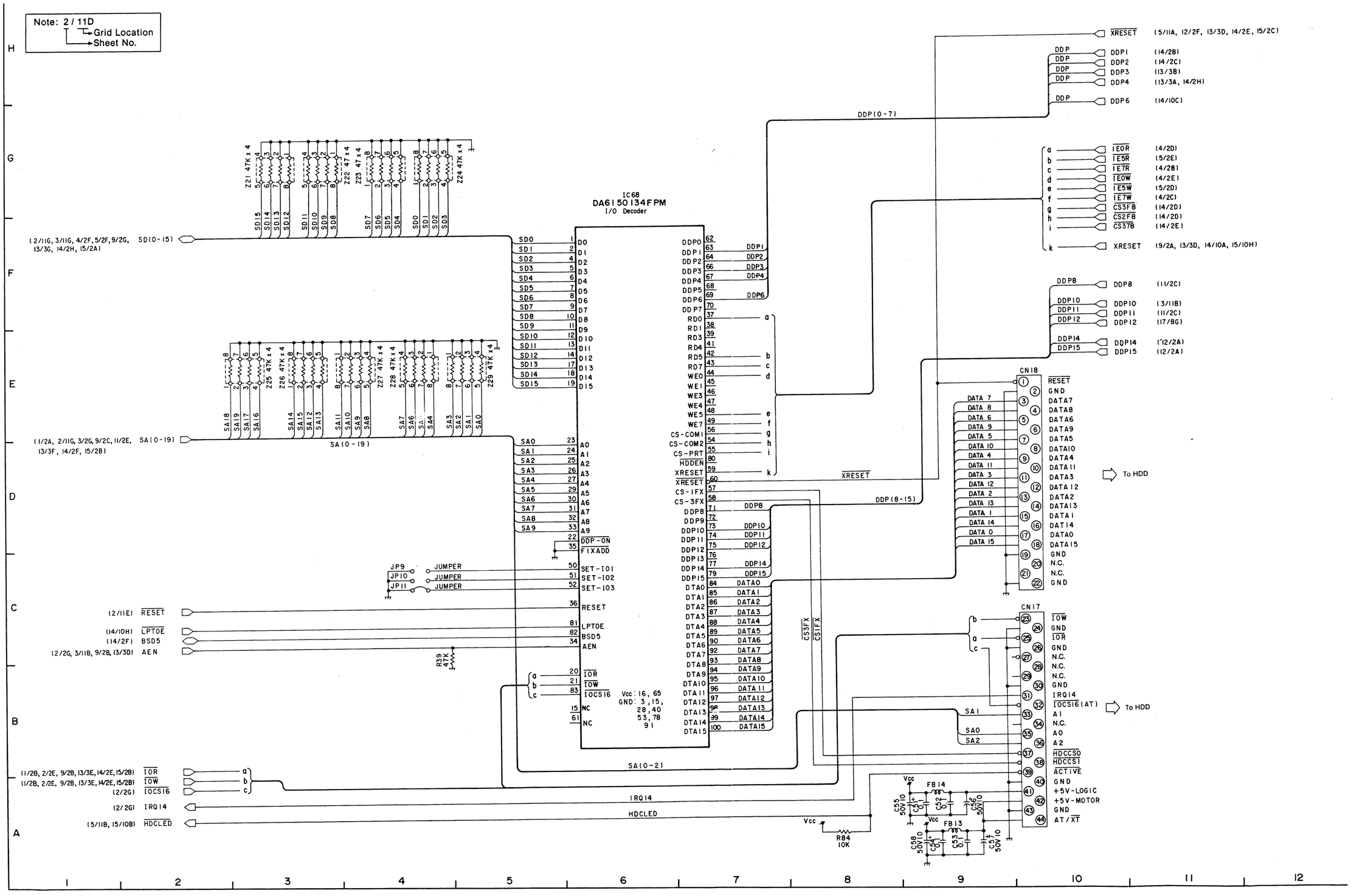
Slow Refresh Multiplexer and Main Memory Circuits (Sheet No. 6 of 18)



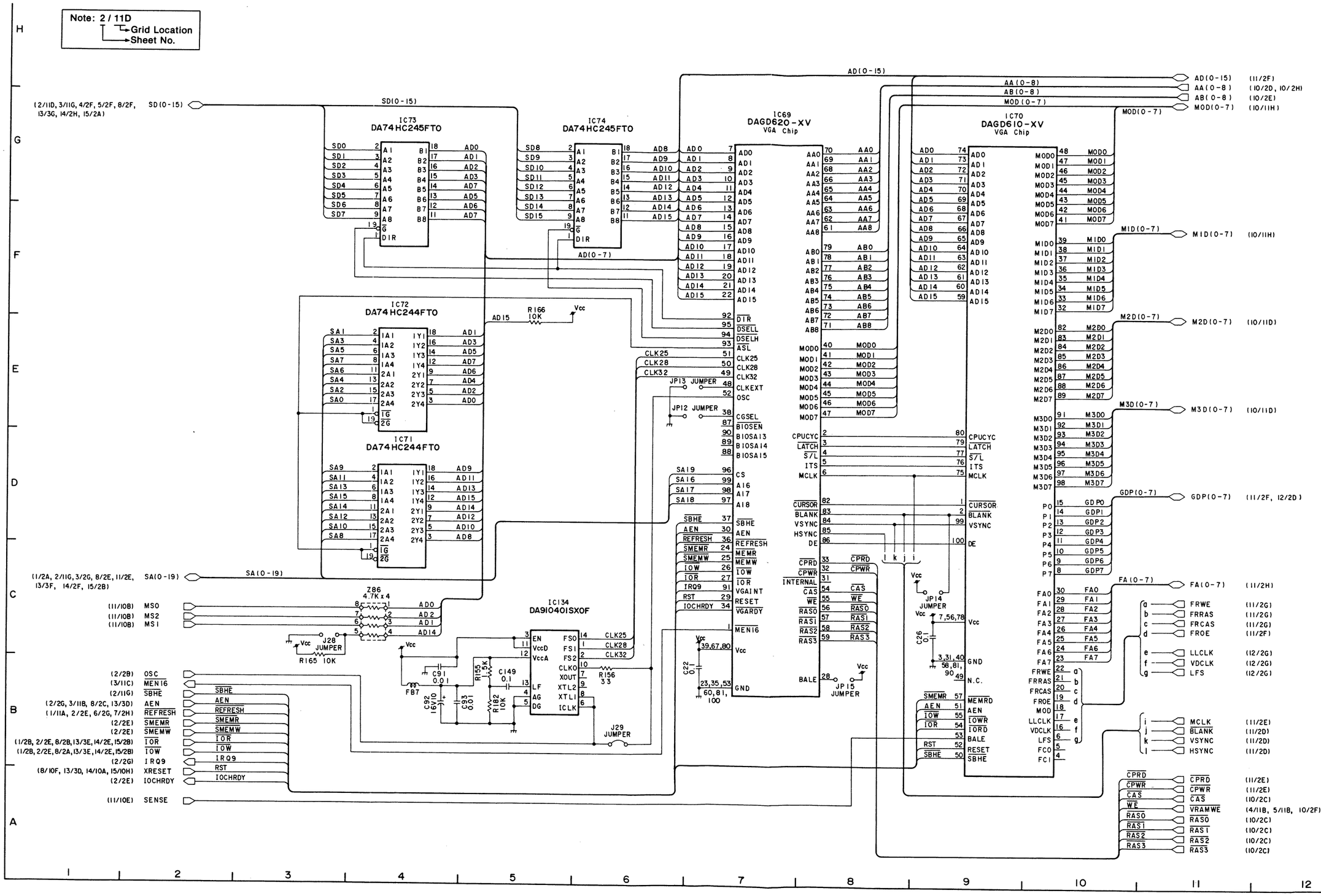
Extended Memory Bank Selector, Extended Memory Bank 2 and Extended Memory Bank 3 Circuits (Sheet No. 7 of 18)



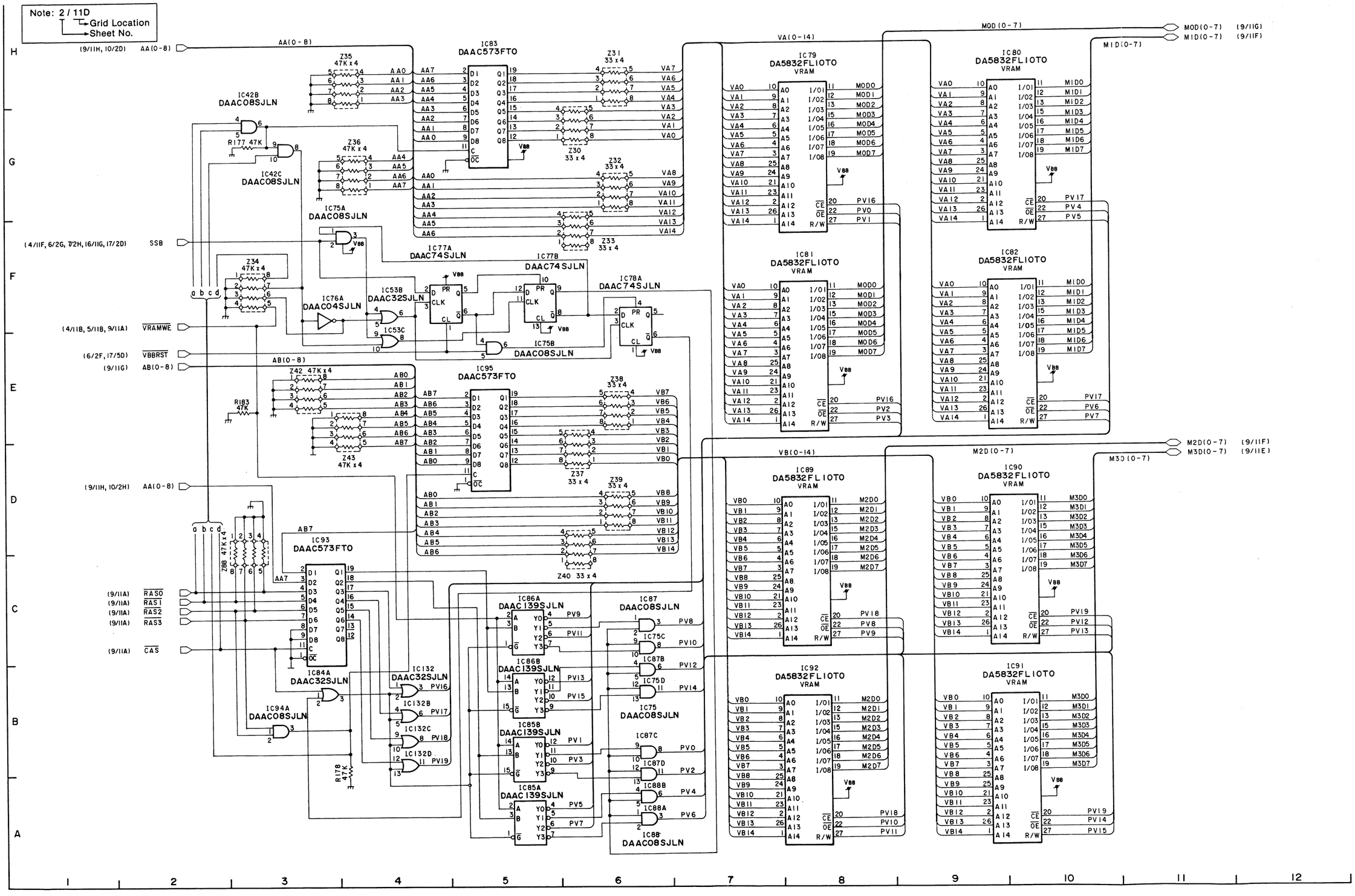
GP DEC (I/O Decode) and HDD Connector Circuits (Sheet No. 8 of 18)



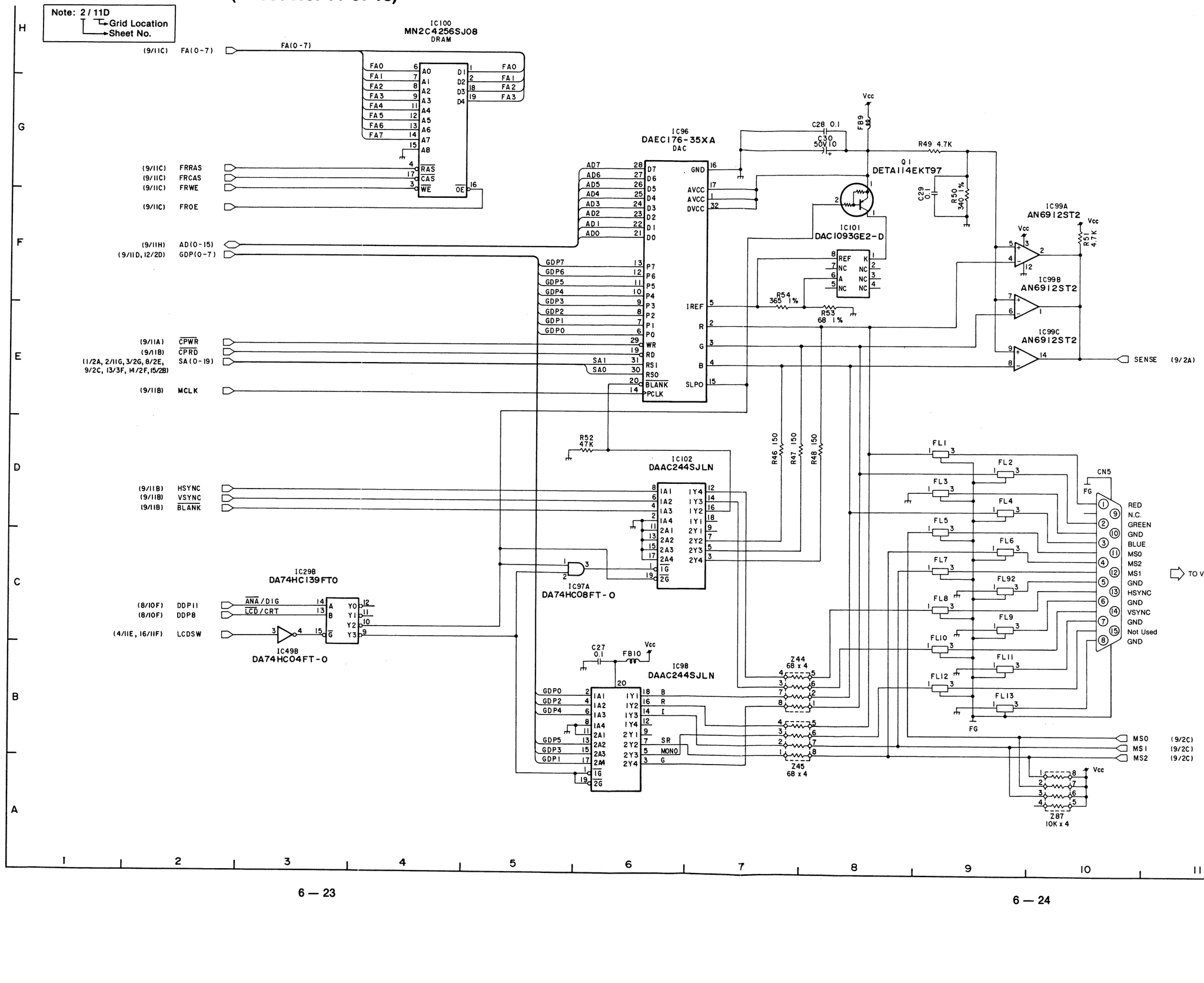
LCDC 1 GD610/GD620 Circuit (Sheet No. 9 of 18)



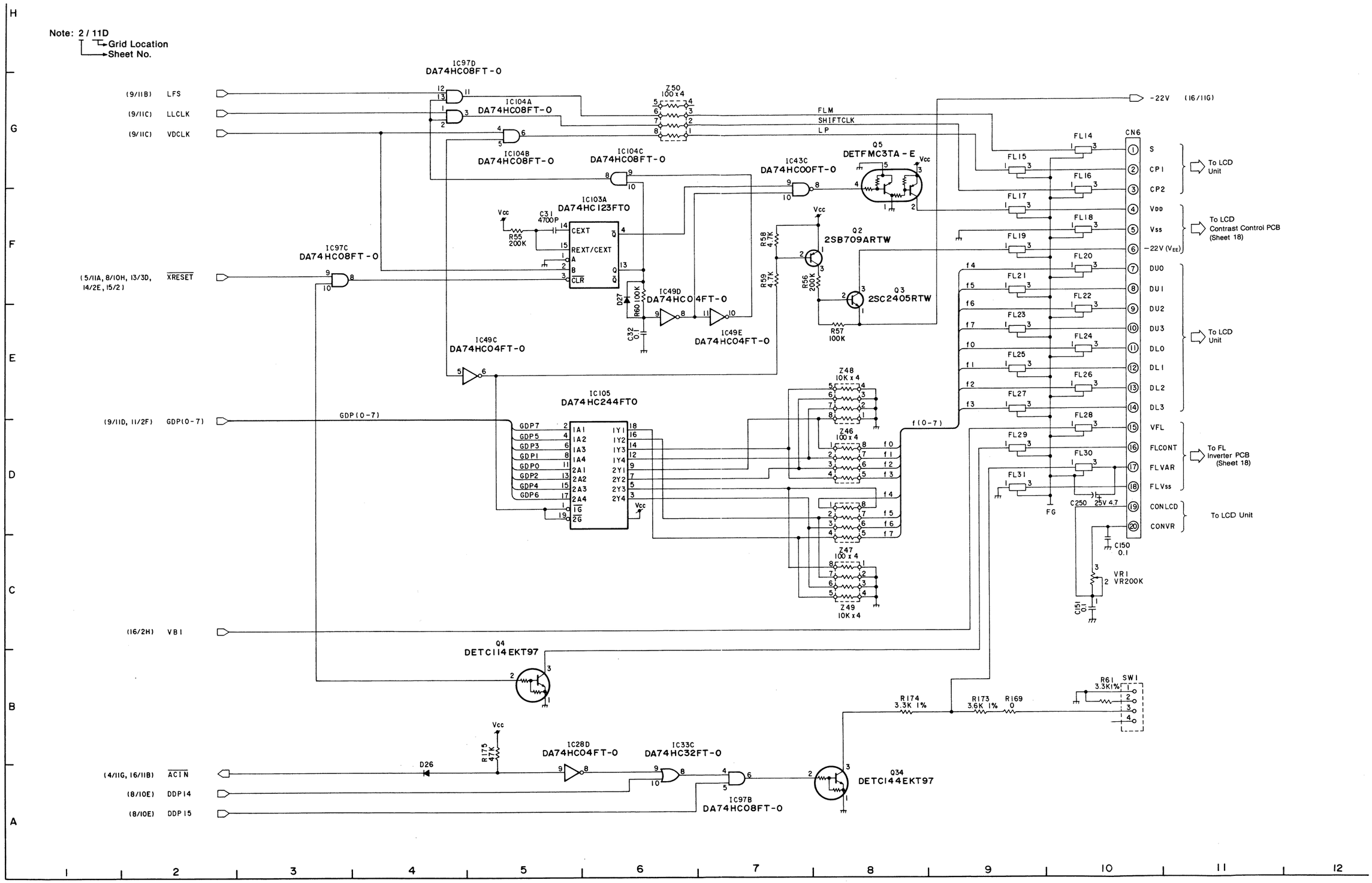
LCDC 2 Video RAM No. 1 and LCDC 3 Video RAM No. 2 Circuits (Sheet No. 10 of 18)



LCDC 4 RAMDAC Circuit (Sheet No. 11 of 18)



LCDC 5 LCD Interface Circuit (Sheet No. 12 of 18)



FDC Circuit (Sheet No. 13 of 18)

Note: 2 / 11D
Grid Location
Sheet No.

IC109
DA2052F0AW
FDC

C37 0.1 Vcc FB11 C36 16V10 C33 0.1

(2/11G, 3/11G, 4/2F, 5/2F, 8/2F, 9/2G, 14/2H, 15/2A) SD(0-15) SD(0-7)
SD0 42
SD1 43
SD2 44
SD3 47
SD4 48
SD5 49
SD6 50
SD7 52

(1/2A, 2/11G, 3/2G, 9/2C, 11/2E, 14/2F, 15/2B) SA(0-19) SA(0-19)
SA0 55
SA1 56
SA2 57
SA3 58
SA4 59
SA5 60
SA6 61
SA7 62
SA8 63
SA9 64

(1/2B, 2/2E, 8/2B, 9/2B, 14/2E, 15/2B) IOR 70
(1/2B, 2/2E, 8/2A, 9/2B, 14/2E, 15/2B) IOW 71
(2/11G) DACK2 66
(2/2G) T/C 67
(8/10F, 9/2A, 13/3D, 14/10A, 15/10H) XRESET 72
(2/11G, 5/11B) DRQ2 54
(2/2G) IRQ6 53
(2/2G, 3/11B, 8/2C, 9/2B) AEN 55
(5/11A, 8/10H, 12/2F, 14/2E, 15/2C) XRESET 73

D0 D1 D2 D3 D4 D5 D6 D7
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9
RD WR DACK TC SRES DRQ INT AEN REST TO TPS0 TPS1 TVF4 PSA PA2D
Vcc: 6 12 45 74 79
GND: 7 13 28 31 34 37 40 46 51 75 76
VDD VDD VDD VDD VDDA
X1 X2 X2 24MHz
REWL IDX MOTOR1 DS2 DS1 MOTOR2 DIR STEP WRDT WRGT TPK0 WPRT REDT HSLL RDY/DCG TSYNC TWIND TDT TVF1 TVF10 TVF9 CS DECE TPI PCXT TVF6 TF TV

Z52 47Kx4 Vcc
Z53 47Kx4 Vcc
Z54 10Kx4 Vcc MB MA DA DB
R63 2.2K R64 2.2K Vcc
D29 Vcc Vcc1
Z51 2.2K x4 Vcc

a cn12 b cn14 c cn16 d cn18 e cn20 f cn22 g cn24 h cn26 i cn6

CN11 CN2
cn2 cn4 cn6 cn10 cn11 cn12 cn14 cn16 cn18 cn20 cn22 cn24 cn26

CN7
1 +5V (VCC)
2 INDEX
3 +5V (VCC)
4 DRIVESELECT
5 +5V (VCC)
6 DISKCHANGE
7 +5V (VCC)
8 N.C.
9 N.C.
10 MOTORON
11 MODESELECT
12 DIHFCTION
13 GND
14 STEP
15 GND
16 WRITEDATA
17 GND
18 WRITEGATE
19 GND
20 TRACK00
21 GND
22 WRITEPROTECT
23 GND
24 READDATA
25 GND
26 SIDESELECT
TO FDD

IC108
DAAC157SJLN
Vcc1
MB MA DB DA MA MB DA DB
1A 1B 2A 2B 3A 3B 4A 4B A/B G
1Y 2Y 3Y 4Y
cn27 cn28 cn10 cn4

IC106
DAACT244SJLN
Vcc1
cn27 cn28 cn16 cn18 cn11 cn26 cn12 cn14
1A1 1A2 1A3 1A4 2A1 2A2 2A3 2A4 1G 2G
1Y1 1Y2 1Y3 1Y4 2Y1 2Y2 2Y3 2Y4
C10 C11 C12 C13 C14 C15 C16 C17
C(0-17) C(0-17) (14/10H)

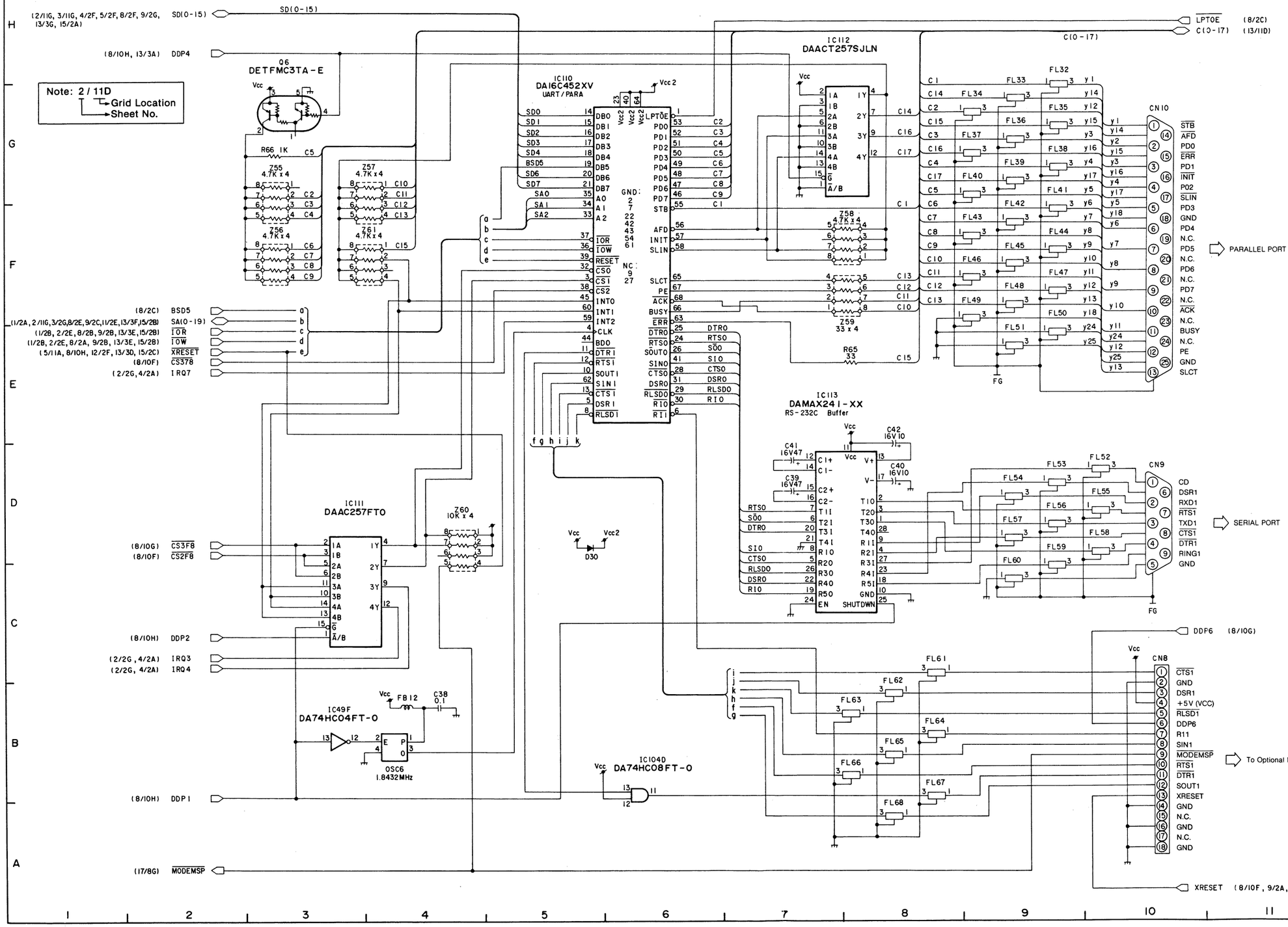
IC107
DAACT244SJLN
Vcc1
cn2 cn20 cn22 cn24 cn6
1A1 1A2 1A3 1A4 2A1 2A2 2A3 2A4 1G 2G
1Y1 1Y2 1Y3 1Y4 2Y1 2Y2 2Y3 2Y4
C2 C3 C4 C5 C6

(8/10H) DDP3
(8/10H, 14/2H) DDP4

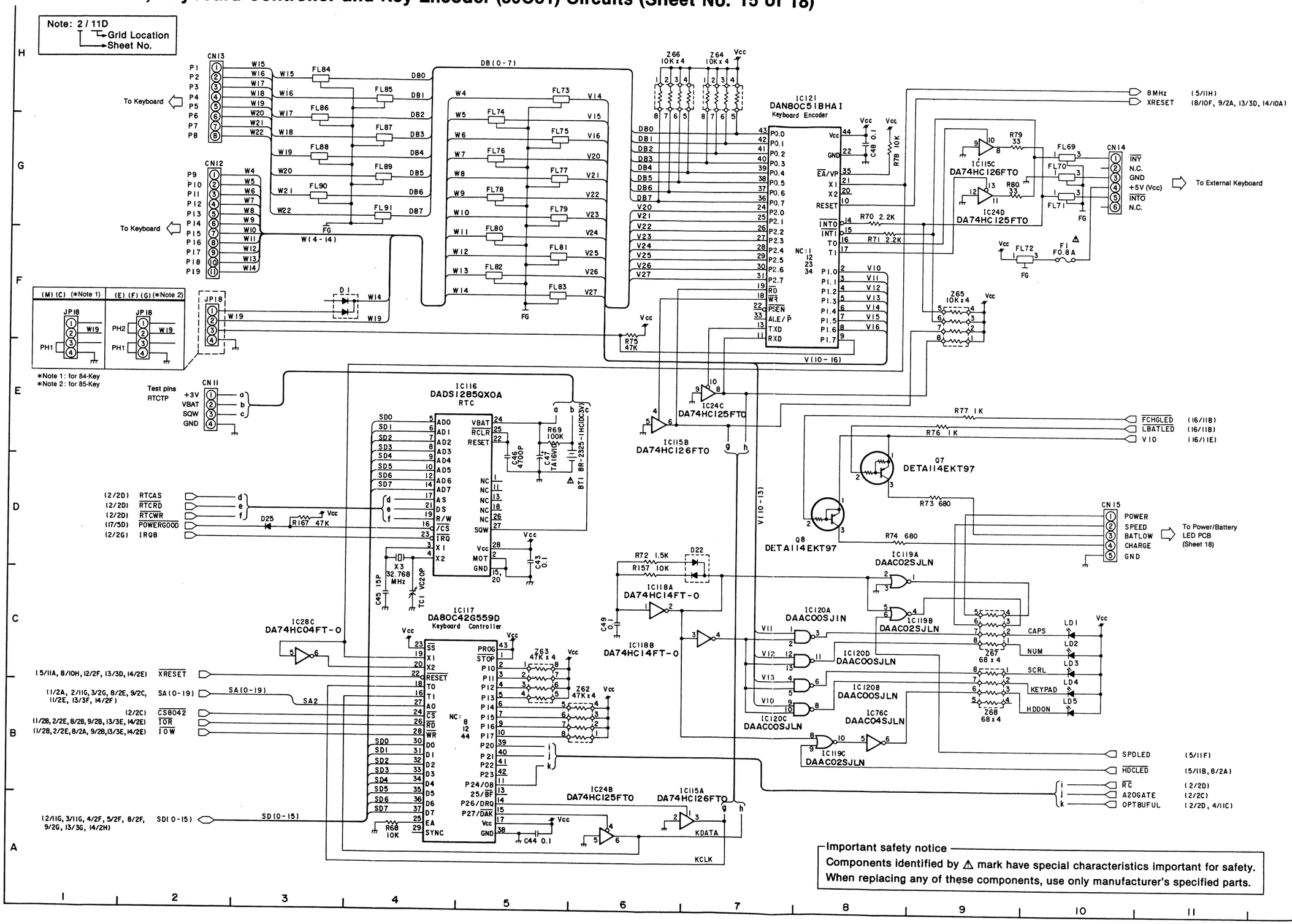
IC76B
DAAC04SJLN

IC37D
DAAC32SJLN

Parallel and Serial Port Circuits (Sheet No. 14 of 18)



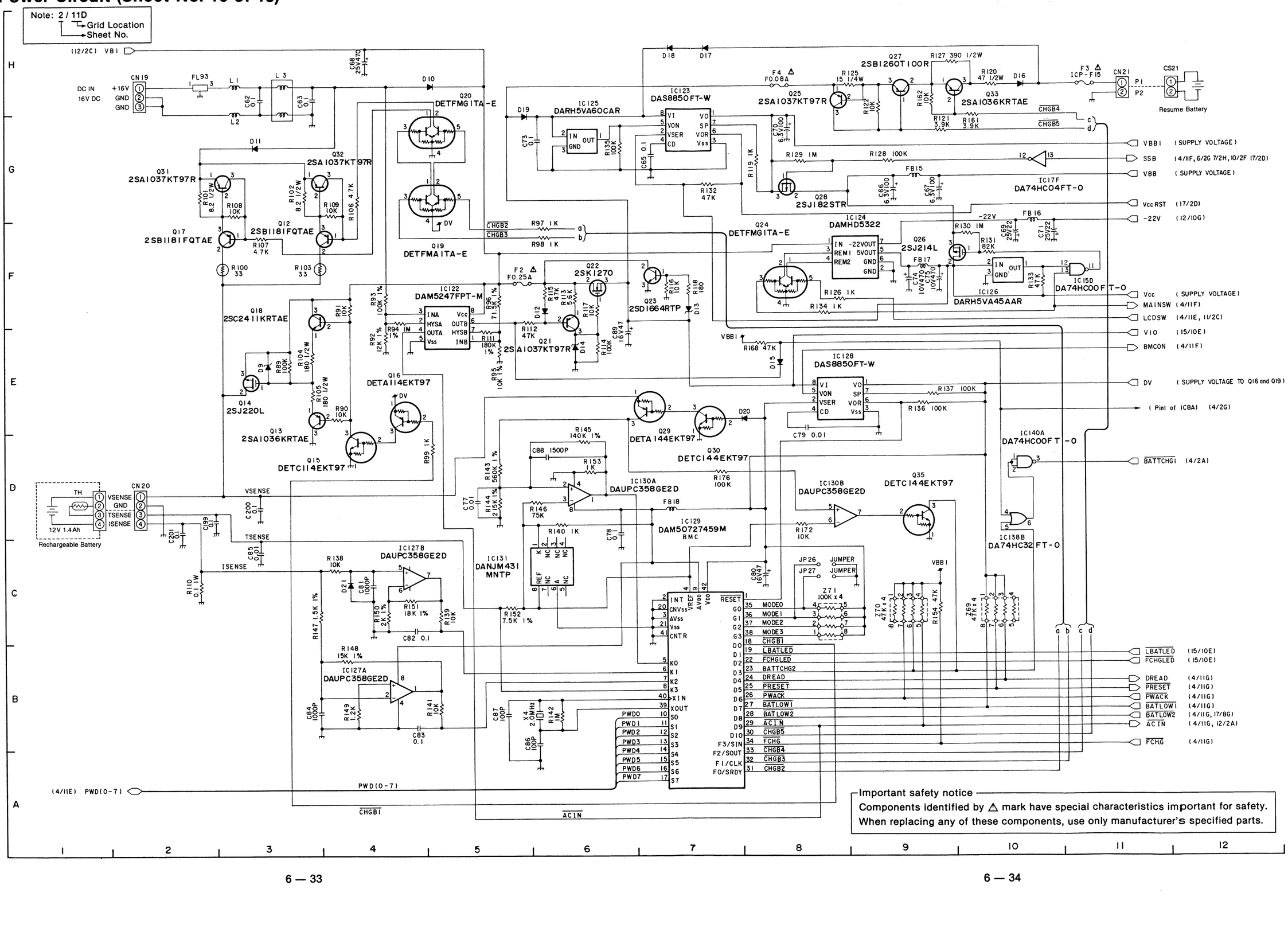
RTC Controller, Keyboard Controller and Key Encoder (80C51) Circuits (Sheet No. 15 of 18)



Important safety notice

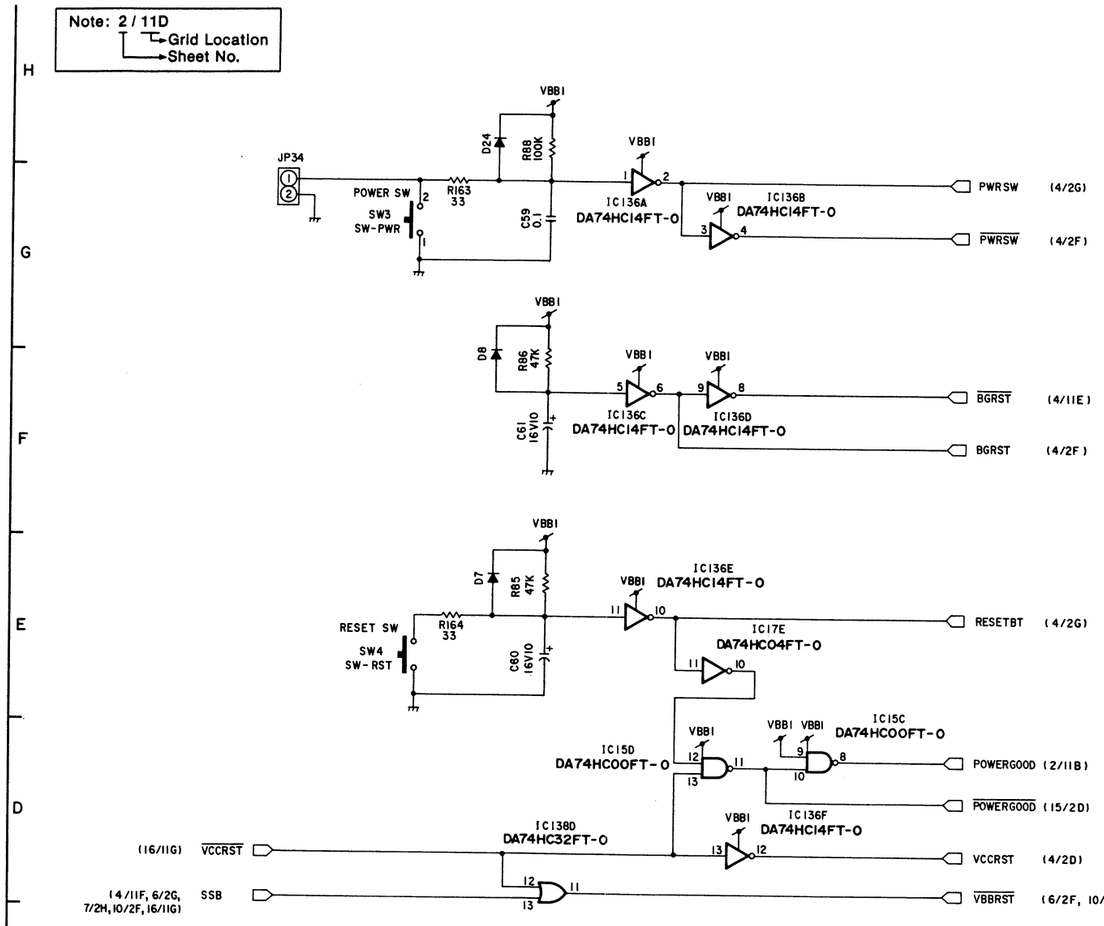
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

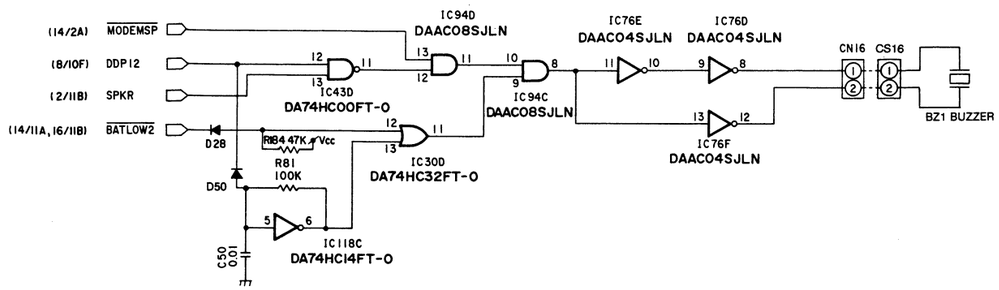
Power Circuit (Sheet No. 16 of 18)

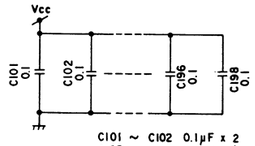


Reset Logic and Buzzer Driver Circuits (Sheet No. 17 of 18)

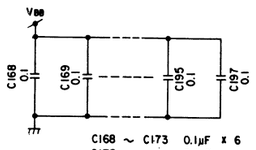
Note: 2 / 11D
Grid Location
Sheet No.



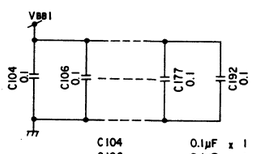




C101 ~ C102 0.1μF x 2
C105 ~ 0.1μF x 1
C107 ~ C126 0.1μF x 20
C128 ~ C130 0.1μF x 4
C136 ~ C141 0.1μF x 6
C143 ~ C147 0.1μF x 5
C174 0.1μF x 1
C179 ~ C182 0.1μF x 4
C186 0.1μF x 1
C188 ~ C189 0.1μF x 1
C191 0.1μF x 1
C193 0.1μF x 1
C196 0.1μF x 1
C198 0.1μF x 1

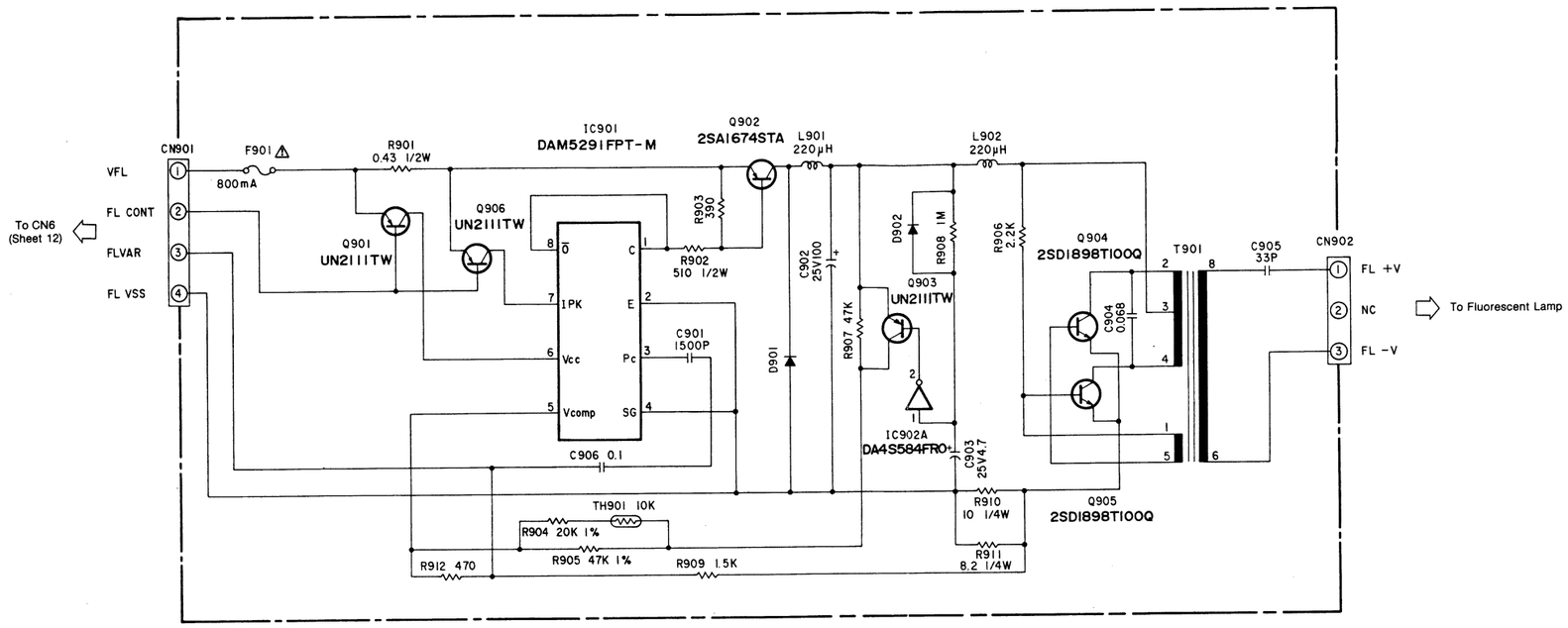


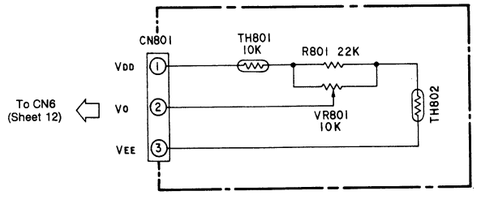
C168 ~ C173 0.1μF x 6
C175 0.1μF x 1
C184 ~ C185 0.1μF x 2
C187 0.1μF x 1
C194 ~ C195 0.1μF x 2
C197 0.1μF x 1

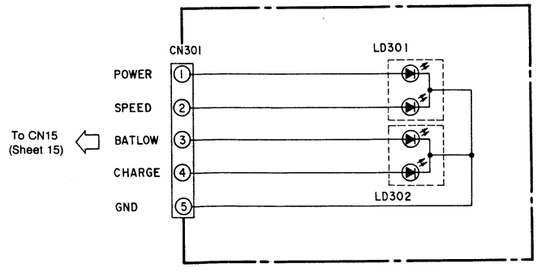


C104 0.1μF x 1
C106 0.1μF x 1
C127 0.1μF x 1
C131 ~ C132 0.1μF x 2
C134 0.1μF x 1
C177 0.1μF x 1
C192 0.1μF x 1

2) FL Inverter, LCD Contrast Control and Power/Battery LED PCBs (Sheet No. 18 of 18)





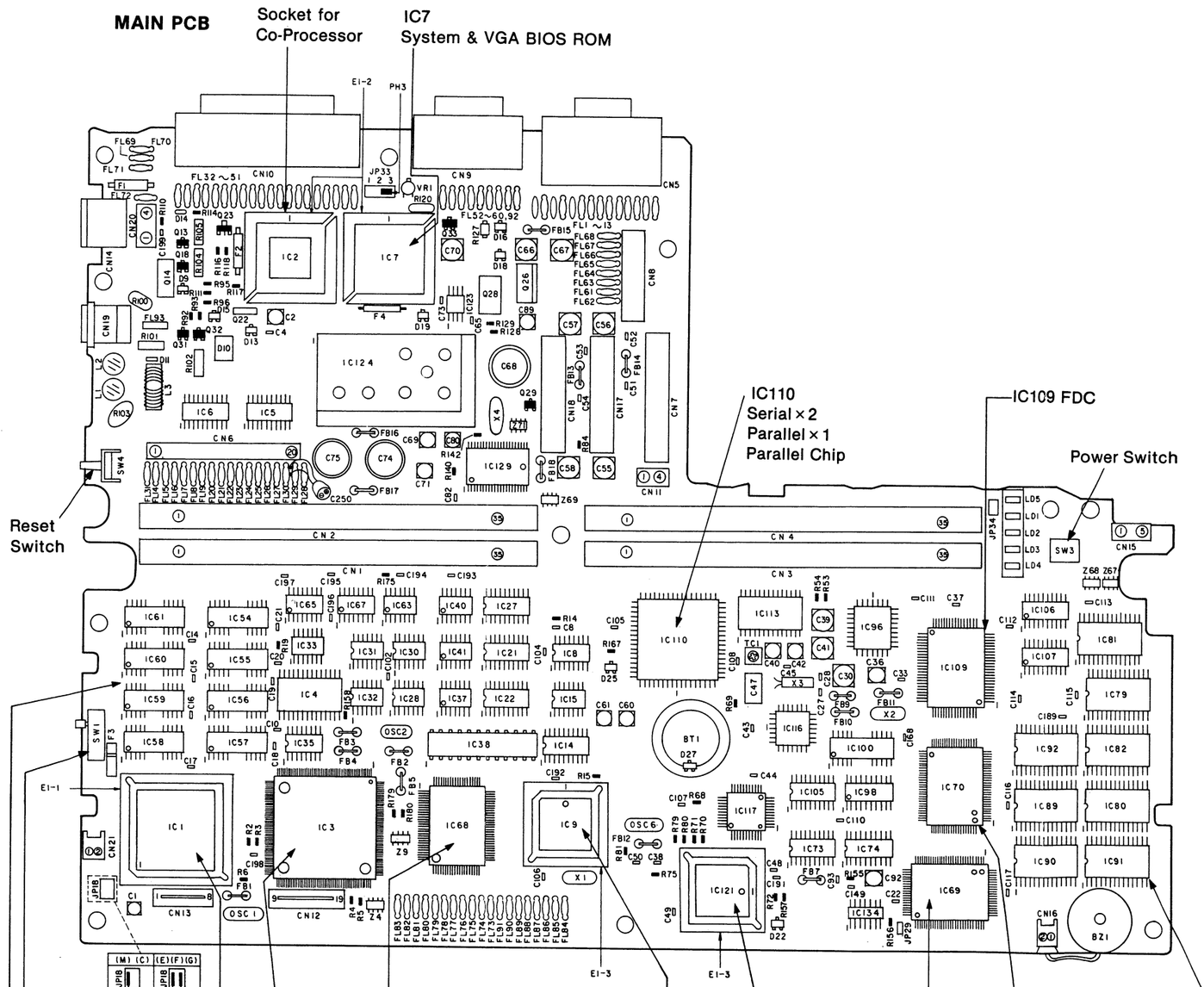


Important safety notice

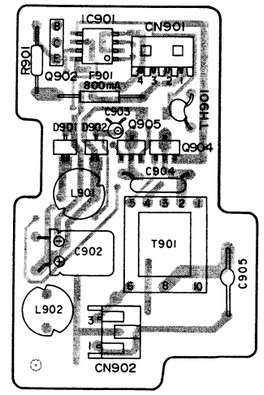
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

6.3 Printed Circuit Board Parts Locations

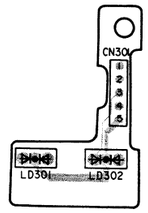
TOP VIEWS



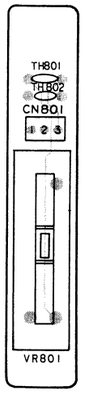
FL Inverter PCB



Power /Battery LED PCB

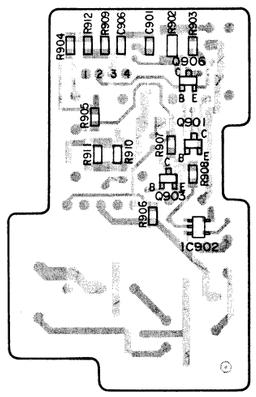


LCD Contrast Control PCB



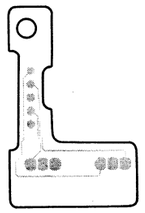
BOTTOM VIEWS

FL Inverter PCB

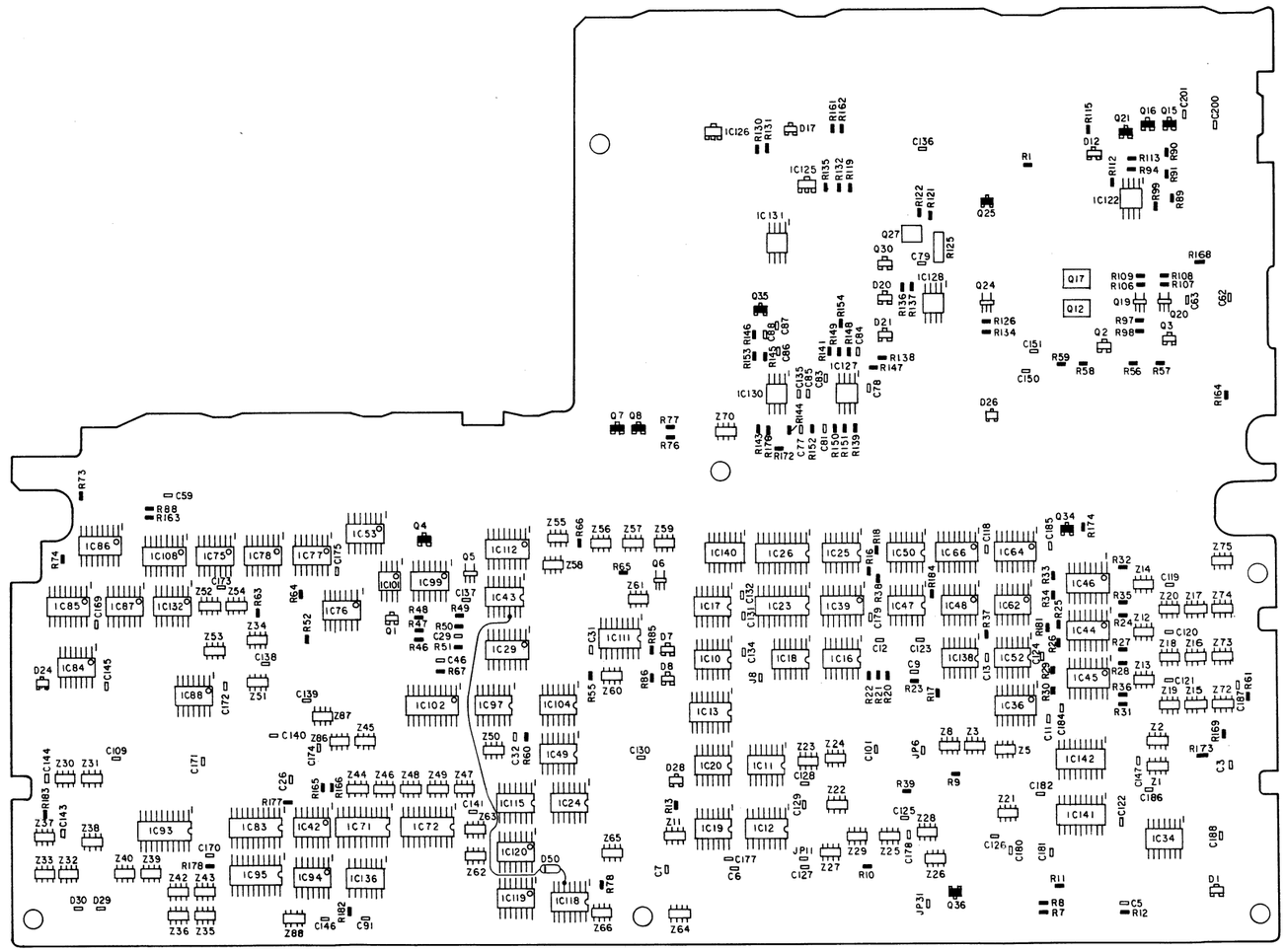


LCD Contrast Control PCB

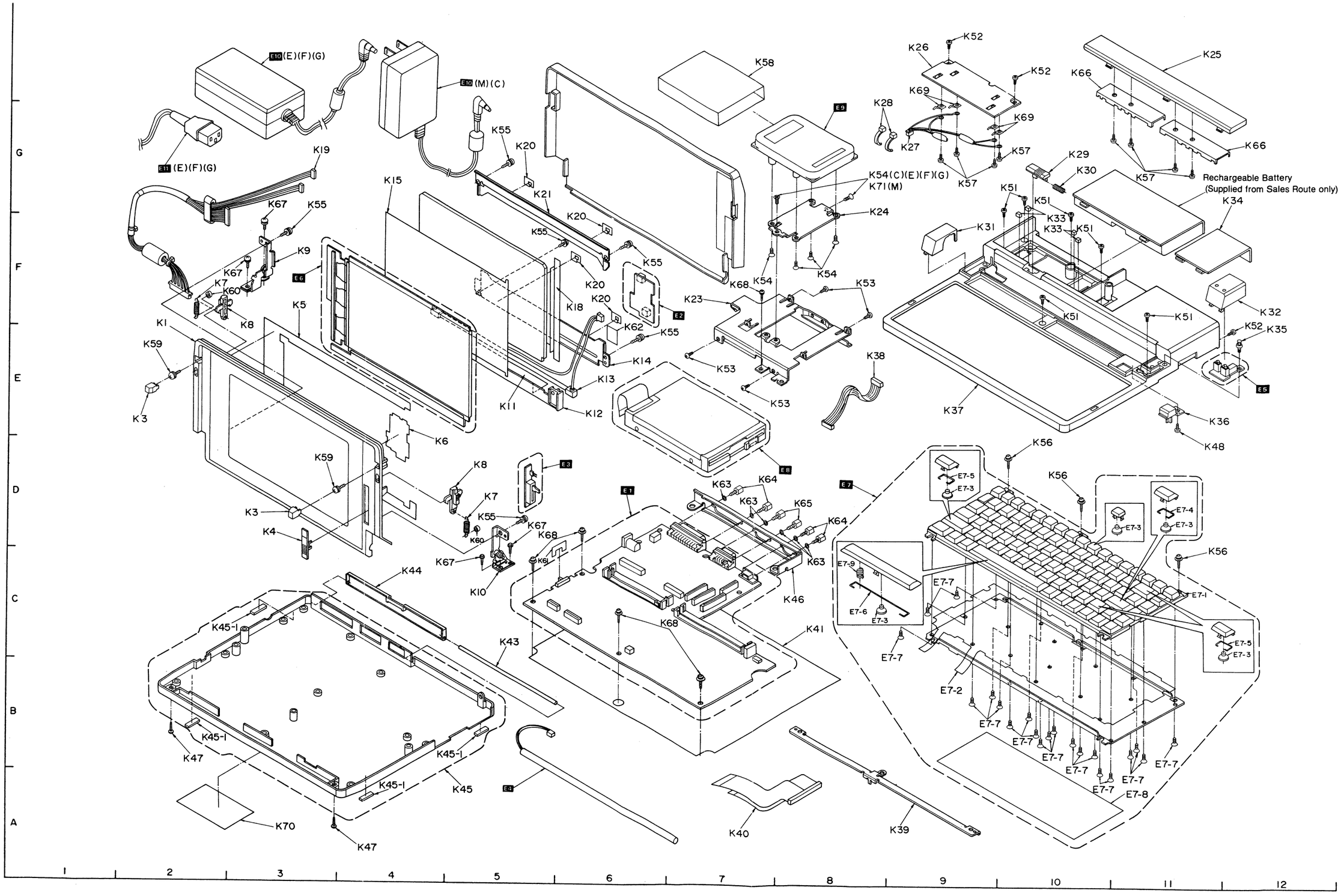
Power/Battery LED PCB



MAIN PCB



6.4 Exploded View



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

NOTE: 1. Important safety notice.
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

Ref. No.	Part No.	DESCRIPTION	Qtty.
MECHANICAL PARTS			
K 1 (M)(C)	DFWV80C0152	CABINET, LCD, INNER	1
(E)(F)(G)	DFWV80C0164	CABINET, LCD, INNER	1
K 3	DFHG924ZA-1	PLUG, SCREW, RUBBER	2
K 4	DFBD0029ZA-0	KNOB, LCD CONTROL	1
K 5	DFMX0173ZA	SHEET, INSULATION, LCD, (A)	1
K 6	DFMX0175ZA	SHEET, INSULATION, LCD, (C)	1
K 7	DFUD0011ZA	SPRING, LCD LOCK	2
K 8	DFHR5186ZA-1	HOLDER, LCD	2
K 9	DFBH1012YA	HINGE, LEFT	1
K10	DFBH1013YA	HINGE, RIGHT	1
K11	DFHR7106ZA	REFLECTOR	1
K12	DFMP0005ZA	HOLDER, LCD	1
K13	DFAC0001XBW	LAMP, FL, BACKLIGHT	1
K14	DFMD2033ZA	FRAME, LCD HOLD, (A)	1
K15	DFHR7120ZA	DEFUSER, LIGHT, LCD	1
K16	DFWV52H0002	PLATE, LEADING LIGHT	1
K18 (M)	DFHR7122ZB	SPACER, LEADING LIGHT	1
(C)(E)(F)(G)	DFHR7122ZA	SPACER, LEADING LIGHT	1
K19	DFJS01Z39YAV	CABLE, LCD	1
K20	DFHR1059ZA	CLAMP, CABLE	4
K21	DFWV65A0181	FRAME, LCD HOLD, (B)	1
K22 (M)(C)	DFWV84A0063	CABINET, LCD	1
(E)(F)(G)	DFWV84A0068	CABINET, LCD	1
K23	DFMD2032ZA	FRAME, FDD HOLD	1
K24	DFMD2036ZA	FRAME, HDD HOLD	1
K25 (M)(C)(E)	DFKE0169TA-3	LID, EXPANTION HOUSING	1
(F)(G)	DFKE0169SA-3	LID, EXPANTION HOUSING	1
K26 (M)(E)(G)	DFWV82A0019	BASE, BATTERY	1
(C)(F)	DFWV82A0026	BASE, BATTERY	1
K27	DLJS003A02A	CONNECTOR, BATTERY	1
K28	RHR166ZA	CLAMP, CABLE	2
K29	DFBD0030ZA-1	KNOB, SLIDE	1
K30	DFUD0010ZA	SPRING, BATTERY EJECT	1
K31	DFKE0166ZA-3	COVER, HINGE, LEFT	1
K32	DFKE0167YA-3	COVER, HINGE, RIGHT	1
K33	DFHG694ZA	RUBBER, TERMINAL BATTERY	4
K34 (M)(C)	DFWV82A0018	LID, MODEM HOUSING	1
(E)(F)(G)	DFWV82A0020	LID, MODEM HOUSING	1
K35	DFHR5187ZA	RIVET, PLASTICS	1
K36	DFBC0096WA-1	KNOB, POWER	1
K37	DFWV80A0098	Ass'y, CABINET, TOP	1
K38	DLJS003A01A	CABLE, LED	1
K39	DFMD1042ZA	FRAME ANGLE, KEYBOARD	1
K40	DFJS01Z33ZA	CABLE, HDD	1
K41	DFMX0171YA	SHEET, INSULATION, MAIN PCB	1
K43	DFDF3049ZA	SHAFT, LID, EXTERNAL CONNECTOR	1
K44	DFGX0080YA-3	LID, EXTERNAL CONNECTOR	1
K45 (M)	DFWV80C0179	Ass'y, CABINET, BOTTOM *	1
(C)	DFWV80C0156	Ass'y, CABINET, BOTTOM	1
(E)(F)(G)	DFWV80C0163	Ass'y, CABINET, BOTTOM	1
K45-1	DFKL0013ZA	FOOT, RUBBER, BOTTOM CABINET	4
K46	DFUA0099ZAK	FRAME, METAL, CONNECTOR, MAIN PCB	1

Ref. No.	Part No.	DESCRIPTION	Qtty.
K47	XTB3+10GFN	SCREW, M3x10mm	2
K48	XTB3+8G	SCREW, M3x8mm	1
K51	XSB3+8	SCREW, M3x8mm	6
K52	XSBDF3+5FN	SCREW, M3x5mm	3
K53	XYN3+C5	SCREW, M3x5mm, FDD	4
K54 (M)	XSSDF28+6FN	SCREW, M2.8x6mm, HDD	4
(C)(E)(F)(G)	XSSDF28+5	SCREW, M2.8x6mm, HDD	6
K55	XYN26+C6	SCREW, PAN HEAD WITH WASHER AND SPRING	6
K56	XSB3+6K	SCREW, M3x6mm	3
K57	XTN2+4G	SCREW, M2x4mm	8
K58	DFMC0256ZA	PLATE, SHIELD, HDD	1
K59	XSB26+6	SCREW, M2.6x7mm	2
K61	DFUV0041ZA	COVER, SWITCH	1
K62	DFHR1064ZA	PLATE, LCD CABLE	1
K63	XWA3B	SPRING WASHER	6
K64	DFHE5013ZA	SCREW, HEXAGONAL HEAD	4
K65	DFHE5015ZA	SCREW, HEXAGONAL HEAD	2
K66	DFMC0261ZA	PLATE SPRING, LID	2
K67	XYN3+C6FN	SCREW, M3x6mm	4
K68	XYN3+J6	SCREW, M3x6mm	6
K69	DFJC9904ZA	TERMINAL, BATTERY	4
K70 (M)	DFWV86C0030	RATING LABEL *	1
K71 (M)	XSS28+5K	SCREW, M2.8x5mm, HDD	2
MAIN BLOCK UNITS			
E 1 (M)	DL3K10393BA	Ass'y, MAIN, PCB *	1
(C)	DL3U10393CA	Ass'y, MAIN, PCB	1
(E)(F)(G)	DL3U10393EA	Ass'y, MAIN, PCB	1
E 2	DL3U10401AA	Ass'y PCB, LCD Inverter	1
E 3	DL3U20401AA	Ass'y PCB, LCD Contrast	1
E 4	DFBA6N120TSK	BATTERY, RESUME, NiCd, 7.2VDC	1
E 5 (M)	DL3K20393BA	Ass'y, LED BOARD, POWER/BATTERY	1
(C)(E)(F)(G)	DL3U20393CA	Ass'y, LED BOARD, POWER/BATTERY	1
E 6	DFWV08A008Z	Ass'y, LCD Unit	1
E 7 (M)(C)	DFWV43H053Z	Ass'y, KEYBOARD	1
(E)	DFWV43H065Z	Ass'y, KEYBOARD	1
(F)	DFWV43H066Z	Ass'y, KEYBOARD	1
(G)	DFWV43H067Z	Ass'y, KEYBOARD	1
E 8	EME263MGP	Ass'y, FLOPPY DISK DRIVE	1
E 9	DFWV44K0003	Ass'y, HDD	1
E10 (M)(C)	CF-AA183MK	AC ADAPTER, 120VAC(INPUT)16VDC(OUTPUT), 1.25ADC	1
(E)(F)(G)	CF-AA184G	AC ADAPTER, 187V-264VAC(INPUT)16VDC(OUTPUT), 1.25ADC	1
E11 (E)	DFJA04ZA-K	AC CABLE	1
(F)(G)	DFJA05YA-K	AC CABLE	1
MAIN PCB			
E 1 (M)	DL3K10393BA	Ass'y, MAIN, PCB	1
(C)	DL3U10393CA	Ass'y, MAIN, PCB	1
(E)(F)(G)	DL3U10393EA	Ass'y, MAIN, PCB	1
E 1-1	DFJS68R24ZA	SOCKET, 68-PIN, PLCC IC(IC1, CPU)	1
E 1-2	DFJS44R17YAK	SOCKET, 44-PIN, PLCC IC(IC2,7)	2
E 1-3	DFJS44R24ZA	SOCKET, 44-PIN, PLCC IC(IC9,121)	2

Ref. No.	Part No.	DESCRIPTION	Qtty.
BT1	BR-2325-1HC	BATTERY, LITHIUM, 3VDC, ⚠	1
BZ1	EFB-RS45D003	BUZZER, PIEZO	1
C 1-2, 36, 40, 42, 60-61 92	ECEV1CV100SR	CAPACITOR, ELECTROLYTIC, Chip, 10uF, +/-20%, 16V	8
C 3, 5, 9, 11-12, 26, 29, 32, 59, 62-63, 78, 83, 101, 109, 118-132, 134-141, 143-147, 150-151, 169-175, 177-182, 184-188, 200-201	ECUV1E104ZFG	CAPACITOR, CERAMIC, Chip, 0.1uF, +80/-20%, 25V	65
C 4, 8, 10, 14-22, 27-28, 33, 37-38, 43-44, 48-49, 51-54, 65, 73, 82, 102, 104-108, 110-117, 149, 168, 189, 191-199	ECUV1E104ZFG	CAPACITOR, CERAMIC, Chip, 0.1uF, +80/-20%, 25V	54
C 6, 7	ECUV1H330JCN	CAPACITOR, CERAMIC, Chip, 33pF, 50V	2
C 13	ECUV1H470JCG	CAPACITOR, CERAMIC, Chip, 47pF, 50V	1
C 30, 55-58	ECEV1HV100SP	CAPACITOR, ELECTROLYTIC, Chip, 10uF, +/-20%, 50V	5
C 31, 46	ECUV1H472KBG	CAPACITOR, CERAMIC, Chip, 4700pF, 50V	2
C 39, 41, 80, 89	ECEV1CV470SP	CAPACITOR, ELECTROLYTIC, Chip, 47uF, +/-20%, 16V	4
C 45	ECUV1H150JCN	CAPACITOR, CERAMIC, Chip, 15pF, 50V	1
C 47	ECST1CD106ZM	CAPACITOR, ELECTROLYTIC, 10uF, 16V	1
C 50, 77, 79, 85, 91, 93	ECUV1H103KBG	CAPACITOR, CERAMIC, Chip, 0.01uF, 50V	6
C 66-67, 70	ECEV0JV101SP	CAPACITOR, ELECTROLYTIC, Chip, 100uF, +/-20%, 6.3V	3
C 68	ECA1EFQ471	CAPACITOR, ELECTROLYTIC, 470uF, 25V	1
C 69, 71	ECEV1EV220SP	CAPACITOR, ELECTROLYTIC, Chip, 22uF, +/-20%, 25V	2
C 74, 75	ECEA1ASS471B	CAPACITOR, ELECTROLYTIC, 470uF, 10V	2
C 81, 84	ECUV1H102JCG	CAPACITOR, CERAMIC, Chip, 1000pF, 50V	2
C 86-87	ECUV1H101JCG	CAPACITOR, CERAMIC, Chip, 100pF, 50V	2
C 88	ECUV1H152KBN	CAPACITOR, CERAMIC, Chip, 1500pF, 50V	1
C250	ECEA1EKK4R7	CAPACITOR, ELECTROLYTIC, 4.7uF, 25V	1
CN 1-4	DFJS35S02ZAJ	CONNECTOR, 35-PIN, SIMM FEMALE	4
CN 5	DFJS15E12XA	CONNECTOR, 15-PIN, VGA FEMALE	1
CN 6	DFJP20C54ZAJ	CONNECTOR, 20-PIN, LCD MALE	1
CN 7	DFJS26N13ZAW	CONNECTOR, 26-PIN, FEMALE	1
CN 8	DFJS18N13ZAW	CONNECTOR, 18-PIN, MODEM FEMALE	1
CN 9	DFJP09E07TAD	CONNECTOR, 9-PIN, RS-232C MALE	1
CN 10	DFJS25E05TAD	CONNECTOR, 25-PIN, PARALLEL FEMALE	1
CN 11	DFJP04C30ZAB	CONNECTOR, 4-PIN, TEST PIN MALE	1
CN 12	DFJS11N21ZAW	CONNECTOR, 11-PIN, KEYBOARD FEMALE	1
CN 13	DFJS08N21ZAW	CONNECTOR, 8-PIN, KEYBOARD FEMALE	1
CN 14	DFJS06G08ZBH	EXTERNAL KEYBOARD JACK, 6-PIN, FEMALE	1
CN 15	DFJP05C30ZAB	CONNECTOR, 5-PIN, MALE	1
CN 16, 21	DFJP02C11ZAB	CONNECTOR, 2-PIN, BUZZER MALE	2
CN 17-18	DFJS22N13ZAW	CONNECTOR, 22-PIN, HDD FEMALE	2
CN 19	DFJJB3Z07ZAH	CONNECTOR, DC-IN	1
CN 20	RJP4G4YA	CONNECTOR, BATTERY, 4-PIN	1
D 1	MA151WKTW	DIODE, SWITCHING, DUAL, SI EPITAXIAL PLANAR, Chip	1
D 7-8, 24	MA151ATW	DIODE, SWITCHING, SI EPITAXIAL PLANAR, Chip,	3
D 9	MA3200LTW	DIODE, ZENER 19.8V, SI PLANAR	1

Ref. No.	Part No.	DESCRIPTION	Qtty.
D 10	DED30QS04FTF	DIODE, SCHOTTKY BARRIER	1
D 11, 29-30	MA701ATW	DIODE, SCHOTTKY BARRIER, HIGH FREQUENCY, Chip	3
D 12, 20	DEDA119T97	DIODE, SCHOTTKY BARRIER, HIGH FREQUENCY, Chip	2
D 13	MA3110HTW	DIODE, ZENER 12.3V, SI PLANAR, Chip	1
D 14	DEDHZK11CLTL	DIODE, ZENER 11.4V, LOW LEAKAGE, Chip	1
D 15, 25, 27	MA704ATW	DIODE, SCHOTTKY BARRIER, HIGH FREQUENCY, Chip	3
D 16-19	MA720TW	DIODE, SCHOTTKY BARRIER, HIGH FREQUENCY, Chip	4
D 21, 26, 28	MA704ATW	DIODE, SCHOTTKY BARRIER, HIGH FREQUENCY, Chip	3
D 22	MA153TW	DIODE, SWITCHING, DUAL, SI EPITAXIAL PLANAR, Chip	1
D 50	MA165	DIODE, SWITCHING, SI PLANAR	1
F 1	XBADSNR80003	FUSE, FAST BLOW, UL, CSA, 800mA, 125V ⚠	1
F 2	XBADSNR25003	FUSE, FAST BLOW, UL, CSA, 250mA, 125V ⚠	1
F 3	DFAHICPF15	FUSE, 600mA, IC PROTECTOR ⚠	1
F 4	XBADSNR08003	FUSE, FAST BLOW, UL, CSA, 80mA, 125V ⚠	1
FB 1-5, 9-10, 12-17	DDB6Z011L-F	FERRITE BEAD	13
FB 7, 11, 18	ELEPL101KA	FERRITE BEAD	3
FL 1-8, 10, 12, 15-16, 32-68, 73-92	DEAS51101STD	FILTER, EMI	69
FL 9, 11, 13	DF0J05AAT	FILTER, EMI	3
FL14, 17-31, 69-72	DEAS51471STD	FILTER, EMI	20
FL93	DEA306B102TL	FILTER, EMI	1
IC 1 (M)	DFWV06B0066	IC, CPU *	1
IC 1 (C)(E)(F)(G)	DAC286-16XJ	IC, CPU	1
IC 3	DAGC21-X0	IC, PC/AT COMPATIBLE SINGLE CHIP(GATE ARRAY)	1
IC 4	DA6110167FPM	IC, OE CE DECODER	1
IC 5-6, 141-142	DAAC245SJLN	IC, OCTAL BUS TRANSCEIVERS, C-MOS, 20-PIN	4
IC 7 (M)	DFWV06B0067	IC, SYSTEM & VGA BIOS ROM *	1
IC 7 (C)	DA270M1	IC, SYSTEM & VGA BIOS ROM	1
IC 7 (E)(F)(G)	DA270E1	IC, SYSTEM & VGA BIOS ROM	1
IC 8, 103	DA74HC123FT0	IC, CLOCK	2
IC 9	DAN80C51BHBI	IC, PMC	1
IC 10, 30-31, 33, 47, 138	DA74HC32FT-0	IC, QUAD 2-INPUT OR GATES, C-MOS, 14-PIN	6
IC 11	DA74HC30FT-0	IC, 8-INPUT NAND GATE, C-MOS, 14-PIN	1
IC 12	DAHC151AFT0	IC, 8-LINE TO 1 LINE DATA SELECT/MPX, C-MOS, 16-PIN	1
IC 13	DAHC174AFT0	IC, HEX D-TYPE FUP-FLOPS, C-MOS, 16-PIN	1
IC 14, 27	DAHC273AFT0	IC, OCTAL D-TYPE FLID-FLOPS, C-MOS, 20-PIN	2
IC 15, 43, 140	DA74HC00FT-0	IC, QUAD 2-INPUT NAND GATES, C-MOS, 14-PIN	3
IC 16, 18-20, 25, 34, 50	DA74HC74FT-0	IC, DUAL D-TYPE FLIP-FLOPS, C-MOS, 14-PIN	7
IC 17, 28, 49	DA74HC04FT-0	IC, HEX INVERTERS, C-MOS, 14-PIN	3
IC 21-22	DAHC374AFT0	IC, OCTAL D-TYPE FLIP-FLOPS, C-MOS, 14-PIN	2
IC 23, 26, 71-72, 105	DA74HC244FT0	IC, OCTAL BUFFERS AND LINE DRIVERS, C-MOS, 20-PIN	5
IC 24	DA74HC125FT0	IC, QUAD BUS BUFFER GATES, C-MOS, 14-PIN	1
IC 29	DA74HC139FT0	IC, DUAL 2-LINE TO 4-LINE DECODE/DEMPX, C-MOS, 16-PIN	1
IC 32, 97, 104	DA74HC08FT-0	IC, QUAD 2-INPUT AND GATES, C-MOS, 14-PIN	3
IC 35	DAAC161FT0	IC, SYNCHRONOUS 4-BIT COUNTERS, C-MOS, 16-PIN	1
IC 36	DAAC151SJLN	IC, 8-LINE TO 1-LINE DATA SELECT/MPX, C-MOS, 16-PIN	1
IC 37, 53, 84, 132	DAAC32SJLN	IC, QUAD 2-INPUT OR GATES, C-MOS, 14-PIN	4
IC 38	DA20V825L07A	IC, C-MOS	1
IC 39	DAAC174SJLN	IC, HEX D-TYPE FLIP-FLOPS, C-MOS, 16-PIN	1
IC 40-41, 62, 77-78	DAAC74SJLN	IC, DUAL D-TYPE FLIP-FLOPS, C-MOS, 14-PIN	5

Ref. No.	Part No.	DESCRIPTION	Qtty.
IC 42, 63, 75, 87-88, 94	DAAC08SJLN	IC, QUAD 2-INPUT AND GATES, C-MOS, 14-PIN	6
IC 44-46, 108	DAAC157SJLN	IC, QUAD 2-LINE TO 1-LINE DATA SELECT/MPX, C-MOS, 16-PIN	4
IC 48, 76	DAAC04SJLN	IC, HEX INVERTERS, C-MOS, 14-PIN	2
IC 52	DA74HC132FT0	IC, QUAD 2-INPUT NAND SCHMIT TRIGGER, 14-PIN	1
IC 54-61, 100	MN2C4256SJ08	IC, DRAM	9
IC 64-67	DAAC138SJLN	IC, 3-LINE TO 8-LINE DECODE/DEMPX, C-MOS, 16-PIN	4
IC 68	DA6150134FPM	IC, I/O DECODER	1
IC 69	DAGD620-XV	IC, VGA CHIP	1
IC 70	DAGD610-XV	IC, VGA CHIP	1
IC 73, 74	DA74HC245FT0	IC, OCTAL BUS TRANSCEIVERS, C-MOS, 20-PIN	2
IC 79, 80-82, 89, 90-92	DA5832FL10T0	IC, VRAM	8
IC 83, 93, 95	DAAC573FT0	IC, OCTAL D-TYPE TRANSPARENT LATCHES, C-MOS, 20-PIN	3
IC 85, 86	DAAC139SJLN	IC, 2-LINE TO 4-LINE DECODE/DEMPX, C-MOS, 16-PIN	2
IC 96	DAEC176-35XA	IC, DAC	1
IC 98, 102	DAAC244SJLN	IC, OCTAL BUFFERS AND LINE DRIVERS, C-MOS, 20-PIN	2
IC 99	AN6912ST2	IC, COMPARATOR	1
IC101	DAC1093GE2-D	IC, 2.5V SHUNT REGULATOR	1
IC106, 107	DAACT244SJLN	IC, OCTAL BUFFERS/LINE DRIVERS/LINE RECEIVERS, TTL, 20-PIN	2
IC109	DA2052F0AW	IC, FDC, SPC2052FOA, C-MOS, 80-PIN	1
IC110	DA16C452XV	IC, VL16C452, UART/PARA, C-MOS, 68-PIN	1
IC111	DAAC257FT0	IC, QUAD DATA SELECTORS/MULTIPLEXERS, C-MOS, 16-PIN	1
IC112	DAACT257SJLN	IC, PARALLEL BUFFER	1
IC113	DAMAX241-XX	IC, RS-232C BUFFER	1
IC115	DA74HC126FT0	IC, QUAD BUS BUFFERS, C-MOS, 14-PIN	1
IC116	DADS1285QX0A	IC, RTC	1
IC117	DA80C42G559D	IC, KEYBOARD CONTROLLER	1
IC118, 136	DA74HC14FT-0	IC, HEX SCHMITT-TRIGGER INVERTERS, C-MOS, 14-PIN	2
IC119	DAAC02SJLN	IC, QUAD 2-INPUT NOR GATES, C-MOS, 14-PIN	1
IC120	DAAC00SJLN	IC, QUAD 2-INPUT NAND GATES, C-MOS, 14-PIN	1
IC121	DAN80C51BHAI	IC, KEYBOARD ENCODER	1
IC122	DAM5247FPT-M	IC, 5247, RESET, 8-PIN	1
IC123, 128	DAS8850FT-W	IC, VOLTAGE REGULATOR	2
IC124	DAMHD5322	IC, DC-DC CONVERTER	1
IC125	DARH5VA60CAR	IC, RESET SIGNAL GENERATOR	1
IC126	DARH5VA45AAR	IC, RESET SIGNAL GENERATOR	1
IC127, 130	DAUPC358GE2D	IC, OP AMP	2
IC129	DAM50727459M	IC, BMC	1
IC131	DANJM431MNTP	IC, 2.5V SHUNT REGULATOR	1
IC134	DA910401SX0F	IC, PSO	1
JP 18	DFJP04T15ZA	JUMPER	1
JP 6, 8, 11, 31	ERJ6GEY0R00V	JUMPER	4
JP29	ERJ6GEY0R00V	JUMPER	1
JP33	DFJP03T16ZA	JUMPER	1
JP34	DFJP02T15ZA	CONNECTOR, 2-PIN, TEST PIN MALE	1
L 1, 2	DDB6Z057-D	FILTER, INDUCTOR, FERRITE BEAD	2
L 3	DDB8Z012-F	FILTER, 0.8mH 2A	1
LD 1-5	LN322GPHU	LED, GREEN	5
OS1	DECL14318P1H	OSCILLATOR, 14.318MHz	1
OS2	DECL32000P1H	OSCILLATOR, 32MHz	1
OS6	DECL01843P1H	OSCILLATOR, 1.8432MHz	1

Ref. No.	Part No.	DESCRIPTION	Qtty.
PH1, 2, 3 (E)(F)(G)	DFJS02T07ZA	JUMPER, PLUG	3
PH1, 3 (M)(C)	DFJS02T07ZA	JUMPER, PLUG	2
Q 1, 7-8, 16	DETA114EKT97	TRANSISTOR, RESISTOR BUILT-IN, CHIP	4
Q 2	2SB709ARTW	TRANSISTOR, PNP TYPE, CHIP	1
Q 3	2SC2405RTW	TRANSISTOR, NPN TYPE, CHIP	1
Q 4, 15	DETC114EKT97	TRANSISTOR, RESISTOR BUILT-IN, CHIP	2
Q 5-6	DETFMC3TA-E	TRANSISTOR, PNP NPN TYPE, CHIP	2
Q 12, 17	2SB1181FQTAE	TRANSISTOR, PNP TYPE, CHIP	2
Q 13, 33	2SA1036KRTAE	TRANSISTOR, PNP TYPE, CHIP	2
Q 14	2SJ220L	TRANSISTOR, FET	1
Q 18	2SC2411KRTAE	TRANSISTOR, NPN TYPE, CHIP	1
Q 19	DETFMA1TA-E	TRANSISTOR, PNP TYPE	1
Q 20, 24	DETFMG1TA-E	TRANSISTOR, NPN TYPE	2
Q 21, 25, 31-32	2SA1037KT97R	TRANSISTOR, PNP TYPE, CHIP	4
Q 22	2SK1270	TRANSISTOR, FET	1
Q 23	2SD1664RTP	TRANSISTOR, NPN TYPE, CHIP	1
Q 26	2SJ214L	TRANSISTOR, FET	1
Q 27	2SB1260T100R	TRANSISTOR, PNP TYPE, CHIP	1
Q 28	2SJ182STR	TRANSISTOR, FET	1
Q 29, 36	DETA144EKT97	TRANSISTOR, RESISTOR BUILT-IN, CHIP	2
Q 30, 34-35	DETC144EKT97	TRANSISTOR, NPN TYPE	3
R 1, 15, 16, 39, 52, 75, 85, 86, 112, 115, 132, 133, 154, 167, 168, 175, 177, 178, 179, 183, 184	ERJ6GEYJ473V	RESISTOR, METAL OXIDE, Chip, 47Kohm, +/-5%, 1/10W	21
R 2, 3, 12, 13, 19, 23, 36, 68, 78, 84, 90, 91, 108, 109, 116, 117, 122, 138, 139, 141, 157, 162, 165, 166, 172, 182	ERJ6GEYJ103V	RESISTOR, METAL OXIDE, Chip, 10Kohm, +/-5%, 1/10W	26
R 4-9, 11, 17, 20-22, 24-35, 65, 79-80, 156, 163-164, 180-181	ERJ6GEYJ330V	RESISTOR, METAL OXIDE, Chip, 33ohm, +/-5%, 1/10W	31
R 10, 158	ERJ6GEYJ331V	RESISTOR, METAL OXIDE, Chip, 330ohm, +/-5%, 1/10W	2
R 14	ERJ6GEYJ474V	RESISTOR, METAL OXIDE, Chip, 470Kohm, +/-5%, 1/10W	1
R 18, 38, 57, 60, 69, 81, 88-89, 114, 128, 135-137 176	ERJ6GEYJ104V	RESISTOR, METAL OXIDE, Chip, 100Kohm, +/-5%, 1/10W	14
R 37	ERJ6GEYJ471V	RESISTOR, METAL OXIDE, Chip, 470ohm, +/-5%, 1/10W	1
R 46-48	ERJ6GEYJ151V	RESISTOR, METAL OXIDE, Chip, 150ohm, +/-5%, 1/10W	3
R 49, 51, 58-59, 106-107	ERJ6GEYJ472V	RESISTOR, METAL OXIDE, Chip, 4.7Kohm, +/-5%, 1/10W	6
R 50	ERJ6ENF3400V	RESISTOR, METAL OXIDE, Chip, 340ohm, +/-1%, 1/10W	1
R 53	ERJ6ENF68R0V	RESISTOR, METAL OXIDE, Chip, 68ohm, +/-1%, 1/10W	1
R 54	ERJ6ENF3650V	RESISTOR, METAL OXIDE, Chip, 365ohm, +/-1%, 1/10W	1
R 55-56	ERJ6GEYJ204V	RESISTOR, METAL OXIDE, Chip, 200Kohm, +/-5%, 1/10W	2
R 61, 174	ERJ6ENF3301V	RESISTOR, METAL OXIDE, Chip, 3.3Kohm, +/-1%, 1/10W	2
R 63-64, 70-71	ERJ6GEYJ222V	RESISTOR, METAL OXIDE, Chip, 2.2Kohm, +/-5%, 1/10W	4
R 66, 76-77, 97-99, 119, 126, 134, 140, 153	ERJ6GEYJ102V	RESISTOR, METAL OXIDE, Chip, 1Kohm, +/-5%, 1/10W	11
R 72, 155	ERJ6GEYJ152V	RESISTOR, METAL OXIDE, Chip, 1.5Kohm, +/-5%, 1/10W	2
R 73-74	ERJ6GEYJ681V	RESISTOR, METAL OXIDE, Chip, 680ohm, +/-5%, 1/10W	2

Ref. No.	Part No.	DESCRIPTION	Qtty.
R 92	ERJ6ENF1202V	RESISTOR, METAL OXIDE, Chip, 12Kohm, +/-1%, 1/10W	1
R 93	ERJ6ENF1003V	RESISTOR, METAL OXIDE, Chip, 100Kohm, +/-1%, 1/10W	1
R 94	ERJ6ENF1004V	RESISTOR, METAL OXIDE, Chip, 1Mohm, +/-1%, 1/10W	1
R 95	ERJ6ENF1002V	RESISTOR, METAL OXIDE, Chip, 10Kohm, +/-1%, 1/10W	1
R 96	ERJ6ENF7152V	RESISTOR, METAL OXIDE, Chip, 71.5Kohm, +/-1%, 1/10W	1
R100, 103	DBVP60AR330B	RESISTOR, POSISTOR, 33ohm	2
R101-102	ERJ12YJ8R2H	RESISTOR, METAL OXIDE, Chip, 8.2ohm, +/-5%, 1/2W	2
R104-105	ERJ12YJ181H	RESISTOR, METAL OXIDE, Chip, 180ohm, +/-5%, 1/2W	2
R110	ERX1SZJR10P	RESISTOR, METAL FILM, 0.1ohm, +/-5%, 1W	1
R111	ERJ6ENF1803V	RESISTOR, METAL OXIDE, Chip, 180Kohm, +/-1%, 1/10W	1
R113	ERJ6GEYJ562V	RESISTOR, METAL OXIDE, Chip, 5.6Kohm, +/-5%, 1/10W	1
R118	ERJ6GEYJ181V	RESISTOR, METAL OXIDE, Chip, 180ohm, +/-5%, 1/10W	1
R120	ERJ12YJ470H	RESISTOR, METAL OXIDE, Chip, 47ohm, +/-5%, 1/2W	1
R121, 161	ERJ6GEYJ392V	RESISTOR, METAL OXIDE, Chip, 3.9Kohm, +/-5%, 1/10W	2
R125	ERJ14YJ150H	RESISTOR, METAL OXIDE, Chip, 15ohm, +/-5%, 1/4W	1
R127	ERJ12YJ391H	RESISTOR, METAL OXIDE, Chip, 390ohm, +/-5%, 1/2W	1
R129-130, 142	ERJ6GEYJ105V	RESISTOR, METAL OXIDE, Chip, 1Mohm, +/ 5%, 1/10W	3
R131	ERJ6GEYJ823V	RESISTOR, METAL OXIDE, Chip, 82Kohm, +/-5%, 1/10W	1
R143	ERJ6ENF5603V	RESISTOR, METAL OXIDE, Chip, 560Kohm, +/-1%, 1/10W	1
R144	ERJ6ENF2153V	RESISTOR, METAL OXIDE, Chip, 215Kohm, +/-1%, 1/10W	1
R145	ERJ6ENF1403V	RESISTOR, METAL OXIDE, Chip, 140Kohm, +/-1%, 1/10W	1
R146	ERJ6GEYJ753V	RESISTOR, METAL OXIDE, Chip, 75Kohm, +/-5%, 1/10W	1
R147	ERJ6ENF1501V	RESISTOR, METAL OXIDE, Chip, 1.5Kohm, +/-1%, 1/10W	1
R148	ERJ6ENF1502V	RESISTOR, METAL OXIDE, Chip, 15Kohm, +/-1%, 1/10W	1
R149	ERJ6GEYJ122V	RESISTOR, METAL OXIDE, Chip, 1.2Kohm, +/-5%, 1/10W	1
R150	ERJ6ENF2001V	RESISTOR, METAL OXIDE, Chip, 2Kohm, +/-1%, 1/10W	1
R151	ERJ6ENF1802V	RESISTOR, METAL OXIDE, Chip, 18Kohm, +/-1%, 1/10W	1
R152	ERJ6ENF7501V	RESISTOR, METAL OXIDE, Chip, 7.5Kohm, +/-1%, 1/10W	1
R169	ERJ6GEY0R00V	RESISTOR, METAL OXIDE, Chip, 0ohm, +/-5%, 1/10W	1
R173	ERJ6ENF3601V	RESISTOR, METAL OXIDE, Chip, 3.6Kohm, +/-1%, 1/10W	1
SW1	DFSS3A04ZAH	SWITCH, LCD	1
SW3	DFSH1A05ZAXA	SWITCH, POWER	1
SW4	DFSH1A19ZAXA	SWITCH, RESET	1
TC1	ECRJA020E12W	CAPACITOR, TRIMMER, Chip, 20PF, +50%, -0%, DC100V	1
VR 1	DENAE1B204TL	POTENTIOMETER, 200Kohm	1
X1	DECK03579L2M	CRYSTAL, PMC, 3.58MHz	1
X2	DECX24000H1H	CRYSTAL, FDC, 24MHz	1
X3	DECQ00032H3W	CRYSTAL RTC, 32.768KHz	1
X4	DEBM2R00N1LX	CERAMICS, 2.0MHz	1
Z 1-2, 12-17, 21-29, 34-36, 42-43, 52-53, 62-63, 69-70, 88	DEANR4J5J473	RESISTOR ARRAY, METAL OXIDE, 47Kohm x4	29
Z 3-5, 48-49, 54, 60-61, 64-66, 72-75, 87	DEANR4J5J103	RESISTOR ARRAY, METAL OXIDE, 10Kohm x4	16
Z 8, 18-20, 30-33, 37-40, 59	DEANR4J5J330	RESISTOR ARRAY, METAL OXIDE, 33ohm x4	13
Z 9	DEANR4J5J331	RESISTOR ARRAY, METAL OXIDE, 330ohm x4	1
Z11, 71	DEANR4J5J104	RESISTOR ARRAY, METAL OXIDE, 100Kohm x4	2
Z44-45, 67-68	DEANR4J5J680	RESISTOR ARRAY, METAL OXIDE, 68ohm x4	4

Ref. No.	Part No.	DESCRIPTION	Qtty.
Z46-47, 50	DEANR4J5J101	RESISTOR ARRAY, METAL OXIDE, 100ohm x4	3
Z51	DEANR4J5J222	RESISTOR ARRAY, METAL OXIDE, 2.2Kohm x4	1
Z55-58, 86	DEANR4J5J472	RESISTOR ARRAY, METAL OXIDE, 4.7Kohm x4	5
FL INVERTER PCB			
E 2	DL3U10401AA	Ass'y PCB, LCD Inverter	1
C901	ECUV1H152JG	CAPACITOR, CERAMIC, Chip, 1500pF, 50V	1
C902	ECEA1EU101	CAPACITOR, ELECTROLYTIC, 100uF, 25V	1
C903	ECEA1EKK4R7	CAPACITOR, ELECTROLYTIC, 4.7uF, 25V	1
C904	ECHS1H683JZ	CAPACITOR, FILM, 0.068uF, 50V	1
C905	DCCD3F330J-L	CAPACITOR, CERAMIC, 33pF, 3KV	1
C906	ECUV1E104ZFG	CAPACITOR, CERAMIC, Chip, 0.1uF, +80/-20%, 25V	1
CN901	DFJP04C55ZAJ	CONNECTOR, 4-PIN, FL INVERTER MALE	1
CN902	DFJP03C11YAB	CONNECTOR, 3-PIN, FL	1
D901, 902	MA701ATW	DIODE, SCHOTTKY BARRIER, HIGH FREQUENCY	2
F901	XBADSNR80003	FUSE, FAST BLOW, UL, CSA, 800mA, 125V ⚠	1
IC901	DAM5291FPT-M	IC, VOLTAGE REGULATOR	1
IC902	DA4S584FR0	IC, SCHMITT TRIGGER INVERTER	1
L901, 902	DDAWZ221KV-Z	COIL, INDUCTOR, 220uH	2
Q901, 903, 906	UN2111TW	TRANSISTOR, RESISTOR BUILT-IN	3
Q902	2SA1674STA	TRANSISTOR	1
Q904, 905	2SD1898T100Q	TRANSISTOR	2
R901	ERX12SJR43	RESISTOR, METAL FILM, 0.43ohm, +/-5%, 1/2W	1
R902	ERJ12YJ511H	RESISTOR, METAL OXIDE, Chip, 510ohm, +/-5%, 1/2W	1
R903	ERJ6GEYJ391V	RESISTOR, METAL OXIDE, Chip, 3.9Kohm, +/-5%, 1/10W	1
R904	ERJ6ENF2002V	RESISTOR, METAL OXIDE, Chip, 20Kohm, +/-1%, 1/10W	1
R905, 907	ERJ6ENF4702V	RESISTOR, METAL OXIDE, Chip, 47Kohm, +/-1%, 1/10W	2
R906	ERJ6GEYJ222V	RESISTOR, METAL OXIDE, Chip, 2.2Kohm, +/-5%, 1/10W	1
R908	ERJ6GEYJ105V	RESISTOR, METAL OXIDE, Chip, 1Mohm, +/-5%, 1/10W	1
R909	ERJ6GEYJ152V	RESISTOR, METAL OXIDE, Chip, 1.5Kohm, +/-5%, 1/10W	1
R910	ERJ14YJ100H	RESISTOR, METAL OXIDE, Chip, 10ohm, +/-5%, 1/4W	1
R911	ERJ14YJ8R2H	RESISTOR, METAL OXIDE, Chip, 8.2ohm, +/-5%, 1/4W	1
R912	ERJ6GEYJ471V	RESISTOR, METAL OXIDE, Chip, 470ohm, +/-5%, 1/10W	1
T901	DDI9Z014-Z	TRANSFORMER, INVERTER	1
TH901	DBT103J-U	THERMISTOR, 10Kohm	1
LCD CONTRAST CONTROL PCB			
E 3	DL3U20401AA	Ass'y PCB, LCD Contrast	1
CN801	DFJP03C54ZAJ	CONNECTOR, 3-PIN, LCD CONTRAST CONTROL MALE	1

Ref. No.	Part No.	DESCRIPTION		Qtty.
R801	ERJ6GEYJ223V	RESISTOR, METAL OXIDE, Chip, 22Kohm, +/-5%, 1/10W		1
TH801	DBT103J-U	THERMISTOR, 10Kohm		1
TH802	ERPF3A4M332A	THERMISTOR, 3300ohm		1
VR801	DEVAI1B103-A	POTENTIOMETER, 10Kohm		1

POWER/BATTERY LED PCB

E 5	DL3K20393BA	Ass'y, LED BOARD		1
CN301	DFJP05C30ZAB	CONNECTOR, 5-PIN, MALE		1
LD301, 302	LN086WP38	LED, RED/GREEN		2

ACCESSORIES

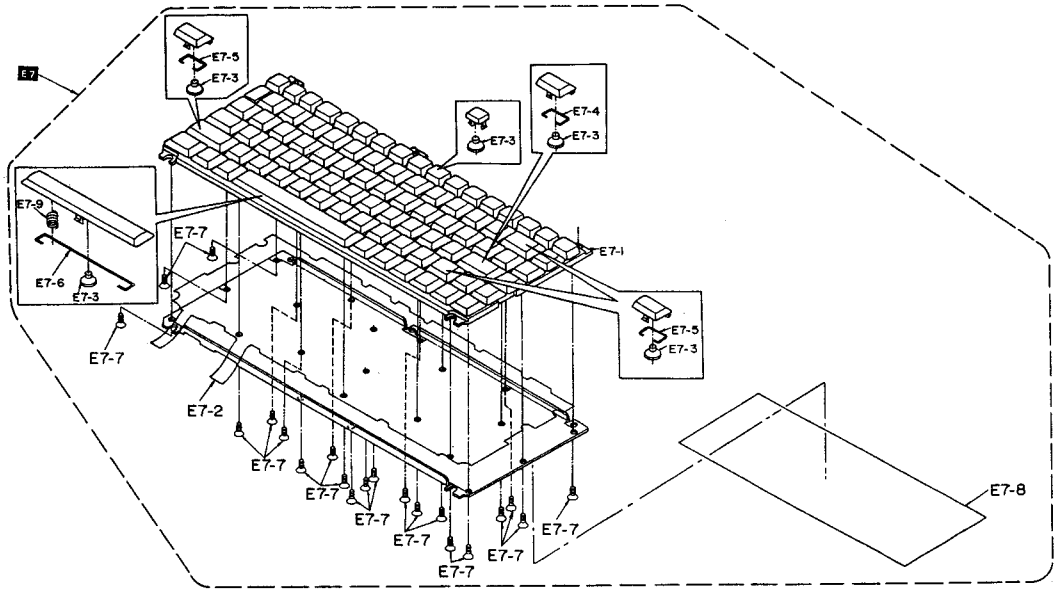
A1 (M)(C)	DFQX2280ZB	MANUAL, GETTING STARTED	*	1
(E)	DFQX2291ZA	MANUAL, GETTING STARTED		1
(F)	DFQX2289ZA	MANUAL, GETTING STARTED		1
(G)	DFQX2287ZA	MANUAL, GETTING STARTED		1
A2 (M)(C)	DFQX2292ZA	MANUAL, USER'S GUIDE	*	1
(E)	DFQX2314ZA	MANUAL, USER'S GUIDE		1
(F)	DFQX2315ZA	MANUAL, USER'S GUIDE		1
(G)	DFQX2316ZA	MANUAL, USER'S GUIDE		1
A3	DFQX2293ZA	MANUAL, QUICK REFERENCE	*	1
A4	DFQX2294YA	MANUAL, SHELL USER'S GUIDE	*	1
A5 (M)(C)	DFJN231ZA	DISK, INSTALLATION DISK 1	*	1
(E)	DFJN233ZA	DISK, INSTALLATION DISK 1		1
(F)	DFJN237ZA	DISK, INSTALLATION DISK 1		1
(G)	DFJN235ZA	DISK, INSTALLATION DISK 1		1
A6 (M)(C)	DFJN232ZA	DISK, INSTALLATION DISK 2	*	1
(E)	DFJN234ZA	DISK, INSTALLATION DISK 2		1
(F)	DFJN238ZA	DISK, INSTALLATION DISK 2		1
(G)	DFJN236ZA	DISK, INSTALLATION DISK 2		1

PACKING MATERIALS

P1 (M)(C)	DFPN0344ZA	PAD	*	1
(E)(F)(G)	DFPN0357ZA	PAD		1
P2	DFPN0368ZA	PAD, BATTERY	*	1
P3 (M)	DFWV97C0031	PACKING CASE	*	1
P3 (C)	DFPK0455ZA	PACKING CASE		1
(E)(F)(G)	DFPK0456ZA	PACKING CASE		1
P4 (M)(C)	DFPE0025ZA	HANDLE	*	1
P5	DFPN0342ZA	CUSHION(R)	*	1
P6	DFPN0343ZA	CUSHION(L)	*	1

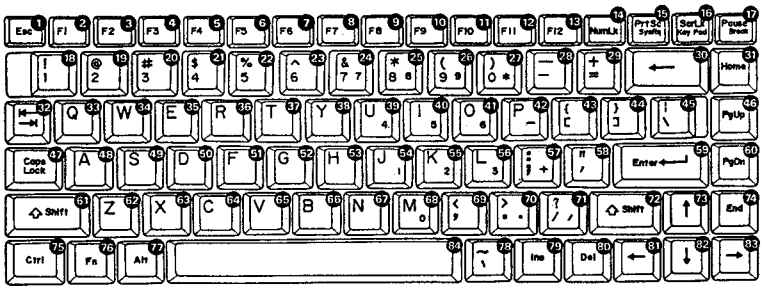
6.6 Keyboard Parts Locations

• **Keyboard Unit**

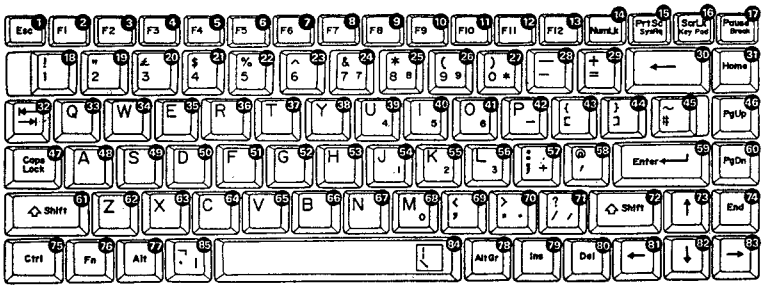


• **Keytop**

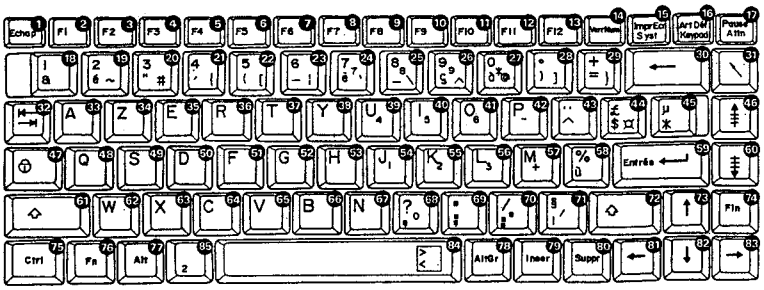
Keytop for U.S.A. and Canada (M) (C)



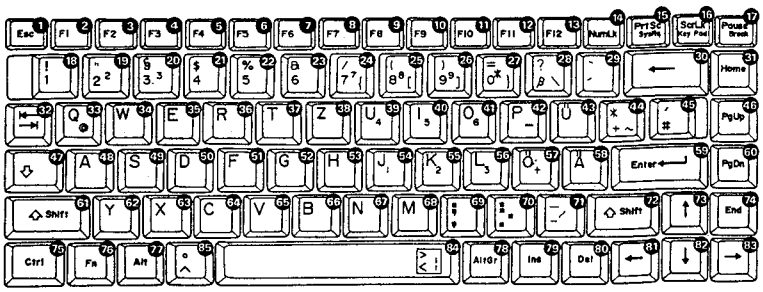
Keytop for U.K. (E)



Keytop for France (F)



Keytop for F.R. Germany (G)



6.7 Replacement Parts List (Keyboard)

- **Keyboard for U.S.A. (M) and Canada (C)**

Ref.	Part NO.	Description	Qtty.
Keyboard for U.S.A. and Canada			
E 7	DFWV43H053Z	KEYBOARD(U.S.A.)	1
E 7-1	DFWV70C4638	KIT, KEYTOP	1
1	DFWV70C4639	KEYTOP, Esc	1
2	DFWV70C4640	KEYTOP, F1	1
3	DFWV70C4641	KEYTOP, F2	1
4	DFWV70C4642	KEYTOP, F3	1
5	DFWV70C4643	KEYTOP, F4	1
6	DFWV70C4644	KEYTOP, F5	1
7	DFWV70C4645	KEYTOP, F6	1
8	DFWV70C4646	KEYTOP, F7	1
9	DFWV70C4647	KEYTOP, F8	1
10	DFWV70C4648	KEYTOP, F9	1
11	DFWV70C4649	KEYTOP, F10	1
12	DFWV70C4650	KEYTOP, F11	1
13	DFWV70C4651	KEYTOP, F12	1
14	DFWV70C4652	KEYTOP, NumLk	1
15	DFWV70C4653	KEYTOP, PrtSc SysRq	1
16	DFWV70C4654	KEYTOP, ScrLk Key Pad	1
17	DFWV70C4655	KEYTOP, Pause Break	1
18	DFWV70C4656	KEYTOP, ! 1	1
19	DFWV70C4657	KEYTOP, @ 2	1
20	DFWV70C4658	KEYTOP, # 3	1
21	DFWV70C4659	KEYTOP, $ 4	1
22	DFWV70C4660	KEYTOP, % 5	1
23	DFWV70C4661	KEYTOP, ^ 6	1
24	DFWV70C4662	KEYTOP, & 7	1
25	DFWV70C4663	KEYTOP, * 8	1
26	DFWV70C4664	KEYTOP, (9	1
27	DFWV70C4665	KEYTOP,) 0	1
28	DFWV70C4666	KEYTOP, _ -	1
29	DFWV70C4667	KEYTOP, + =	1
30	DFWV70C4668	KEYTOP, ←	1
31	DFWV70C4669	KEYTOP, Home	1
32	DFWV70C4670	KEYTOP, ⇆	1
33	DFWV70C4671	KEYTOP, Q	1
34	DFWV70C4672	KEYTOP, W	1
35	DFWV70C4673	KEYTOP, E	1
36	DFWV70C4674	KEYTOP, R	1
37	DFWV70C4675	KEYTOP, T	1
38	DFWV70C4676	KEYTOP, Y	1
39	DFWV70C4677	KEYTOP, U	1
40	DFWV70C4678	KEYTOP, I	1
41	DFWV70C4679	KEYTOP, O	1
42	DFWV70C4680	KEYTOP, P	1
43	DFWV70C4681	KEYTOP, { [	1
44	DFWV70C4682	KEYTOP, }]	1
45	DFWV70C4683	KEYTOP, | \	1
46	DFWV70C4684	KEYTOP, PgUp	1
47	DFWV70C4685	KEYTOP, Caps Lock	1
48	DFWV70C4686	KEYTOP, A	1
49	DFWV70C4687	KEYTOP, S	1
50	DFWV70C4688	KEYTOP, D	1
51	DFWV70C4689	KEYTOP, F	1
52	DFWV70C4690	KEYTOP, G	1
53	DFWV70C4691	KEYTOP, H	1
54	DFWV70C4692	KEYTOP, J	1
55	DFWV70C4693	KEYTOP, K	1
56	DFWV70C4694	KEYTOP, L	1
57	DFWV70C4695	KEYTOP, : ; +	1
58	DFWV70C4696	KEYTOP, " '	1
59	DFWV70C4697	KEYTOP, Enter	1
60	DFWV70C4698	KEYTOP, PgDn	1
61	DFWV70C4699	KEYTOP, Shift(L)	1
62	DFWV70C4700	KEYTOP, Z	1
63	DFWV70C4701	KEYTOP, X	1
64	DFWV70C4702	KEYTOP, C	1
65	DFWV70C4703	KEYTOP, V	1
66	DFWV70C4704	KEYTOP, B	1
67	DFWV70C4705	KEYTOP, N	1
68	DFWV70C4706	KEYTOP, M	1
69	DFWV70C4707	KEYTOP, < ,	1
70	DFWV70C4708	KEYTOP, > .	1
71	DFWV70C4709	KEYTOP, ? /	1
72	DFWV70C4710	KEYTOP, Shift(R)	1
73	DFWV70C4711	KEYTOP, ↑	1
74	DFWV70C4712	KEYTOP, End	1
75	DFWV70C4713	KEYTOP, Ctrl	1
76	DFWV70C4714	KEYTOP, Fn	1
77	DFWV70C4715	KEYTOP, Alt	1
78	DFWV70C4716	KEYTOP, ⌥	1
79	DFWV70C4717	KEYTOP, Ins	1
80	DFWV70C4718	KEYTOP, Del	1
81	DFWV70C4719	KEYTOP, ←	1
82	DFWV70C4720	KEYTOP, ↓	1
83	DFWV70C4721	KEYTOP, →	1
84	DFWV70C4722	KEYTOP, Space	1
E 7-2	DFWV48C169	SWITCH, MEMBRANE,	1
E 7-3	DFWV65D0031	SPRING, RUBBER, KEYTOP	84
E 7-4	DFWV71H0034	ROD, ENTER	1
E 7-5	DFWV71H0035	ROD, SHIFT(LEFT), SHIFT(R	3
E 7-6	DFWV71H0036	ROD, SPACE BAR	1
E 7-7	DFWV50A0025	SCREW, KEYBOARD	21
E 7-8	DFMX0194ZAK	SHEET, INSULATION, KEYBOA	1
E 7-9	DFWV72G0072	SPRING, COIL, SPACE BAR	1

• Keyboard for U.K. (E)

Ref.	Part No.	Description	Qtty.
Keyboard for U.K.			
E 7	DFWV43H065Z	KEYBOARD(U.K.)	1
E 7-1	DFWV70C5502	KIT, KEYTOP	1
1	DFWV70C5247	KEYTOP, Esc	1
2	DFWV70C5248	KEYTOP, F1	1
3	DFWV70C5249	KEYTOP, F2	1
4	DFWV70C5250	KEYTOP, F3	1
5	DFWV70C5251	KEYTOP, F4	1
6	DFWV70C5252	KEYTOP, F5	1
7	DFWV70C5253	KEYTOP, F6	1
8	DFWV70C5254	KEYTOP, F7	1
9	DFWV70C5255	KEYTOP, F8	1
10	DFWV70C5256	KEYTOP, F9	1
11	DFWV70C5257	KEYTOP, F10	1
12	DFWV70C5258	KEYTOP, F11	1
13	DFWV70C5259	KEYTOP, F12	1
14	DFWV70C5260	KEYTOP, NumLK	1
15	DFWV70C5261	KEYTOP, PrtSc SysRq	1
16	DFWV70C5262	KEYTOP, ScrLK KeyPad	1
17	DFWV70C5263	KEYTOP, Pause Break	1
18	DFWV70C5264	KEYTOP, ! 1	1
19	DFWV70C5265	KEYTOP, " 2	1
20	DFWV70C5266	KEYTOP, £ 3	1
21	DFWV70C5267	KEYTOP, $ 4	1
22	DFWV70C5268	KEYTOP, % 5	1
23	DFWV70C5269	KEYTOP, ^ 6	1
24	DFWV70C5270	KEYTOP, & 7	1
25	DFWV70C5271	KEYTOP, * 8	1
26	DFWV70C5272	KEYTOP, (9	1
27	DFWV70C5273	KEYTOP,) 0	1
28	DFWV70C5274	KEYTOP, _ -	1
29	DFWV70C5275	KEYTOP, + =	1
30	DFWV70C5276	KEYTOP, ←	1
31	DFWV70C5277	KEYTOP, Home	1
32	DFWV70C5278	KEYTOP, ⇆	1
33	DFWV70C5279	KEYTOP, Q	1
34	DFWV70C5280	KEYTOP, W	1
35	DFWV70C5281	KEYTOP, E	1
36	DFWV70C5282	KEYTOP, R	1
37	DFWV70C5283	KEYTOP, T	1
38	DFWV70C5284	KEYTOP, Y	1
39	DFWV70C5285	KEYTOP, U	1
40	DFWV70C5286	KEYTOP, I	1
41	DFWV70C5287	KEYTOP, O	1
42	DFWV70C5288	KEYTOP, P	1
43	DFWV70C5289	KEYTOP, { [	1
44	DFWV70C5290	KEYTOP, }]	1
45	DFWV70C5291	KEYTOP, ~ #	1
46	DFWV70C5292	KEYTOP, PgUp	1
47	DFWV70C5293	KEYTOP, Caps Lock	1
48	DFWV70C5294	KEYTOP, A	1
49	DFWV70C5295	KEYTOP, S	1
50	DFWV70C5296	KEYTOP, D	1
51	DFWV70C5297	KEYTOP, F	1
52	DFWV70C5298	KEYTOP, G	1
53	DFWV70C5299	KEYTOP, H	1
54	DFWV70C5300	KEYTOP, J	1
55	DFWV70C5301	KEYTOP, K	1
56	DFWV70C5302	KEYTOP, L	1
57	DFWV70C5303	KEYTOP, : + ;	1
58	DFWV70C5304	KEYTOP, @ '	1
59	DFWV70C5305	KEYTOP, Enter	1
60	DFWV70C5306	KEYTOP, PgDn	1
61	DFWV70C5307	KEYTOP, Shift(L)	1
62	DFWV70C5308	KEYTOP, Z	1
63	DFWV70C5309	KEYTOP, X	1
64	DFWV70C5310	KEYTOP, C	1
65	DFWV70C5311	KEYTOP, V	1
66	DFWV70C5312	KEYTOP, B	1
67	DFWV70C5313	KEYTOP, N	1
68	DFWV70C5314	KEYTOP, M	1
69	DFWV70C5315	KEYTOP, < ,	1
70	DFWV70C5316	KEYTOP, > .	1
71	DFWV70C5317	KEYTOP, ? /	1
72	DFWV70C5318	KEYTOP, Shift(R)	1
73	DFWV70C5319	KEYTOP, ↑	1
74	DFWV70C5320	KEYTOP, End	1
75	DFWV70C5321	KEYTOP, Ctrl	1
76	DFWV70C5322	KEYTOP, Fn	1
77	DFWV70C5323	KEYTOP, Alt	1
78	DFWV70C5324	KEYTOP, AltGr	1
79	DFWV70C5325	KEYTOP, Ins	1
80	DFWV70C5326	KEYTOP, Del	1
81	DFWV70C5327	KEYTOP, ←	1
82	DFWV70C5328	KEYTOP, ↓	1
83	DFWV70C5329	KEYTOP, →	1
84	DFWV70C5330	KEYTOP, Space ¦ \	1
85	DFWV70C5331	KEYTOP, ¬ `	1
E 7-2	DFWV48C169	SWITCH, MEMBRANE,	1
E 7-3	DFWV65D0031	SPRING, RUBBER, KEYTOP	85
E 7-4	DFWV71H0034	ROD, ENTER	1
E 7-5	DFWV71H0035	ROD, SHIFT(L), SHIFT(R)	3
E 7-6	DFWV71H0036	ROD, SPACE BAR	1
E 7-7	DFWV50A0025	SCREW, KEYBOARD	21
E 7-8	DFMX0194ZAK	SHEET, INSULATION	1
E 7-9	DFWV72G0072	SPRING, COIL, SPACE BAR	1

• Keyboard for France (F)

Ref.	Part No.	Description	Qtty.
Keyboard for France			
E 7	DFWV43H066Z	KEYBOARD(France)	1
E 7-1	DFWV70C5503	KIT, KEYTOP	1
1	DFWV70C5332	KEYTOP, Echap	1
2	DFWV70C5333	KEYTOP, F1	1
3	DFWV70C5334	KEYTOP, F2	1
4	DFWV70C5335	KEYTOP, F3	1
5	DFWV70C5336	KEYTOP, F4	1
6	DFWV70C5337	KEYTOP, F5	1
7	DFWV70C5338	KEYTOP, F6	1
8	DFWV70C5339	KEYTOP, F7	1
9	DFWV70C5340	KEYTOP, F8	1
10	DFWV70C5341	KEYTOP, F9	1
11	DFWV70C5342	KEYTOP, F10	1
12	DFWV70C5343	KEYTOP, F11	1
13	DFWV70C5344	KEYTOP, F12	1
14	DFWV70C5345	KEYTOP, Verr Num	1
15	DFWV70C5346	KEYTOP, Impr Ecr Syst	1
16	DFWV70C5347	KEYTOP, Art Déf KeyPad	1
17	DFWV70C5348	KEYTOP, Pause Attn	1
18	DFWV70C5349	KEYTOP, 1 &	1
19	DFWV70C5350	KEYTOP, 2 é	1
20	DFWV70C5351	KEYTOP, 3 "	1
21	DFWV70C5352	KEYTOP, 4 '	1
22	DFWV70C5353	KEYTOP, 5 (	1
23	DFWV70C5354	KEYTOP, 6 -	1
24	DFWV70C5355	KEYTOP, 7 è	1
25	DFWV70C5356	KEYTOP, 8 _	1
26	DFWV70C5357	KEYTOP, 9 ç	1
27	DFWV70C5358	KEYTOP, 0 à	1
28	DFWV70C5359	KEYTOP, °)	1
29	DFWV70C5360	KEYTOP, + =	1
30	DFWV70C5361	KEYTOP, ←	1
31	DFWV70C5362	KEYTOP, \	1
32	DFWV70C5363	KEYTOP, ⇄	1
33	DFWV70C5364	KEYTOP, A	1
34	DFWV70C5365	KEYTOP, Z	1
35	DFWV70C5366	KEYTOP, E	1
36	DFWV70C5367	KEYTOP, R	1
37	DFWV70C5368	KEYTOP, T	1
38	DFWV70C5369	KEYTOP, Y	1
39	DFWV70C5370	KEYTOP, U	1
40	DFWV70C5371	KEYTOP, I	1
41	DFWV70C5372	KEYTOP, O	1
42	DFWV70C5373	KEYTOP, P	1
43	DFWV70C5374	KEYTOP, ¨ ^	1
44	DFWV70C5375	KEYTOP, £ $	1
45	DFWV70C5376	KEYTOP, µ	1
46	DFWV70C5377	KEYTOP, ⇞	1
47	DFWV70C5378	KEYTOP, @	1
48	DFWV70C5379	KEYTOP, Q	1
49	DFWV70C5380	KEYTOP, S	1
50	DFWV70C5381	KEYTOP, D	1
51	DFWV70C5382	KEYTOP, F	1
52	DFWV70C5383	KEYTOP, G	1
53	DFWV70C5384	KEYTOP, H	1
54	DFWV70C5385	KEYTOP, J	1
55	DFWV70C5386	KEYTOP, K	1
56	DFWV70C5387	KEYTOP, L	1
57	DFWV70C5388	KEYTOP, M	1
58	DFWV70C5389	KEYTOP, % ù	1
59	DFWV70C5390	KEYTOP, EntRée	1
60	DFWV70C5391	KEYTOP, ⇟	1
61	DFWV70C5392	KEYTOP, ⇧	1
62	DFWV70C5393	KEYTOP, W	1
63	DFWV70C5394	KEYTOP, X	1
64	DFWV70C5395	KEYTOP, C	1
65	DFWV70C5396	KEYTOP, V	1
66	DFWV70C5397	KEYTOP, B	1
67	DFWV70C5398	KEYTOP, N	1
68	DFWV70C5399	KEYTOP, ?	1
69	DFWV70C5400	KEYTOP, . ;	1
70	DFWV70C5401	KEYTOP, / :	1
71	DFWV70C5402	KEYTOP, § !	1
72	DFWV70C5403	KEYTOP, ⇧	1
73	DFWV70C5404	KEYTOP, ↑	1
74	DFWV70C5405	KEYTOP, Fin	1
75	DFWV70C5406	KEYTOP, Ctrl	1
76	DFWV70C5407	KEYTOP, Fn	1
77	DFWV70C5408	KEYTOP, Alt	1
78	DFWV70C5409	KEYTOP, AltGr	1
79	DFWV70C5410	KEYTOP, Inser	1
80	DFWV70C5411	KEYTOP, Suppr	1
81	DFWV70C5412	KEYTOP, ←	1
82	DFWV70C5413	KEYTOP, ↓	1
83	DFWV70C5414	KEYTOP, →	1
84	DFWV70C5415	KEYTOP, Space > <	1
85	DFWV70C5416	KEYTOP, 2	1
E 7-2	DFWV48C169	SWITCH, MEMBRANE,	1
E 7-3	DFWV65D0031	SPRING, RUBBER, KEYTOP	85
E 7-4	DFWV71H0034	ROD, ENTER	1
E 7-5	DFWV71H0035	ROD, SHIFT(L), SHIFT(R)	3
E 7-6	DFWV71H0036	ROD, SPACE BAR	1
E 7-7	DFWV50A0025	SCREW, KEYBOARD	21
E 7-8	DFMX0194ZAK	SHEET, INSULATION	1
E 7-9	DFWV72G0072	SPRING, COIL, SPACE BAR	1

• Keyboard for F.R. Germany (G)

Ref.	Part No.	Description	Qtty.
Keyboard for F.R.Germany			
E 7	DFWV43H067Z	KEYBOARD(F.R.Germany)	1
E 7-1	DFWV70C5504	KIT, KEYTOP	1
1	DFWV70C5417	KEYTOP, Esc	1
2	DFWV70C5418	KEYTOP, F1	1
3	DFWV70C5419	KEYTOP, F2	1
4	DFWV70C5420	KEYTOP, F3	1
5	DFWV70C5421	KEYTOP, F4	1
6	DFWV70C5422	KEYTOP, F5	1
7	DFWV70C5423	KEYTOP, F6	1
8	DFWV70C5424	KEYTOP, F7	1
9	DFWV70C5425	KEYTOP, F8	1
10	DFWV70C5426	KEYTOP, F9	1
11	DFWV70C5427	KEYTOP, F10	1
12	DFWV70C5428	KEYTOP, F11	1
13	DFWV70C5429	KEYTOP, F12	1
14	DFWV70C5430	KEYTOP, NumLK	1
15	DFWV70C5431	KEYTOP, PrtSc SysRq	1
16	DFWV70C5432	KEYTOP, ScrLK KeyPad	1
17	DFWV70C5433	KEYTOP, Pause Break	1
18	DFWV70C5434	KEYTOP, 1 !	1
19	DFWV70C5435	KEYTOP, 2 "	1
20	DFWV70C5436	KEYTOP, 3 §	1
21	DFWV70C5437	KEYTOP, 4 $	1
22	DFWV70C5438	KEYTOP, 5 %	1
23	DFWV70C5439	KEYTOP, 6 &	1
24	DFWV70C5440	KEYTOP, 7 /	1
25	DFWV70C5441	KEYTOP, 8 (	1
26	DFWV70C5442	KEYTOP, 9)	1
27	DFWV70C5443	KEYTOP, 0 =	1
28	DFWV70C5444	KEYTOP, ß ?	1
29	DFWV70C5445	KEYTOP, ` '	1
30	DFWV70C5446	KEYTOP, ←	1
31	DFWV70C5447	KEYTOP, Home	1
32	DFWV70C5448	KEYTOP, ⇆	1
33	DFWV70C5449	KEYTOP, Q	1
34	DFWV70C5450	KEYTOP, W	1
35	DFWV70C5451	KEYTOP, E	1
36	DFWV70C5452	KEYTOP, R	1
37	DFWV70C5453	KEYTOP, T	1
38	DFWV70C5454	KEYTOP, Z	1
39	DFWV70C5455	KEYTOP, U	1
40	DFWV70C5456	KEYTOP, I	1
41	DFWV70C5457	KEYTOP, O	1
42	DFWV70C5458	KEYTOP, P	1
43	DFWV70C5459	KEYTOP, Ü	1
44	DFWV70C5460	KEYTOP, * +	1
45	DFWV70C5461	KEYTOP, # '	1
46	DFWV70C5462	KEYTOP, PgUp	1
47	DFWV70C5463	KEYTOP, ⇩	1
48	DFWV70C5464	KEYTOP, A	1
49	DFWV70C5465	KEYTOP, S	1
50	DFWV70C5466	KEYTOP, D	1
51	DFWV70C5467	KEYTOP, F	1
52	DFWV70C5468	KEYTOP, G	1
53	DFWV70C5469	KEYTOP, H	1
54	DFWV70C5470	KEYTOP, J	1
55	DFWV70C5471	KEYTOP, K	1
56	DFWV70C5472	KEYTOP, L	1
57	DFWV70C5473	KEYTOP, Ö	1
58	DFWV70C5474	KEYTOP, Ä	1
59	DFWV70C5475	KEYTOP, Enter	1
60	DFWV70C5476	KEYTOP, PgDn	1
61	DFWV70C5477	KEYTOP, Shift(L)	1
62	DFWV70C5478	KEYTOP, Y	1
63	DFWV70C5479	KEYTOP, X	1
64	DFWV70C5480	KEYTOP, C	1
65	DFWV70C5481	KEYTOP, V	1
66	DFWV70C5482	KEYTOP, B	1
67	DFWV70C5483	KEYTOP, N	1
68	DFWV70C5484	KEYTOP, M	1
69	DFWV70C5485	KEYTOP, ; ,	1
70	DFWV70C5486	KEYTOP, : .	1
71	DFWV70C5487	KEYTOP, _ -	1
72	DFWV70C5488	KEYTOP, Shift(R)	1
73	DFWV70C5489	KEYTOP, ↑	1
74	DFWV70C5490	KEYTOP, End	1
75	DFWV70C5491	KEYTOP, Ctrl	1
76	DFWV70C5492	KEYTOP, Fn	1
77	DFWV70C5493	KEYTOP, Alt	1
78	DFWV70C5494	KEYTOP, AltGr	1
79	DFWV70C5495	KEYTOP, Ins	1
80	DFWV70C5496	KEYTOP, Del	1
81	DFWV70C5497	KEYTOP, ←	1
82	DFWV70C5498	KEYTOP, ↓	1
83	DFWV70C5499	KEYTOP, →	1
84	DFWV70C5500	KEYTOP, Space > < ¦	1
85	DFWV70C5501	KEYTOP, ° ^	1
E 7-2	DFWV48C169	SWITCH, MEMBRANE,	1
E 7-3	DFWV65D0031	SPRING, RUBBER, KEYTOP	85
E 7-4	DFWV71H0034	ROD, ENTER	1
E 7-5	DFWV71H0035	ROD, SHIFT(L), SHIFT(R)	3
E 7-6	DFWV71H0036	ROD, SPACE BAR	1
E 7-7	DFWV50A0025	SCREW, KEYBOARD	21
E 7-8	DFMX0194ZAK	SHEET, INSULATION	1
E 7-9	DFWV72G0072	SPRING, COIL, SPACE BAR	1

ORDER NO. CPD9105015S0

Service Manual

Laptop Computer

CF-270

Supplement

Cabinet Part List and Exploded View

Please file and use this supplement manual together with the service manual for Model No. CF-270, Order No. CPD9010459C0, or CPD9011462A8.

This is the Service Manual for the following areas.

M	.....for U.S.A.
C	.....for Canada
E	.....for U.K.
F	.....for France
G	.....for F.R. Germany
IT	.....for Italy
NL	.....for Netherlands
SP	.....for Spain
SW	.....for Sweden
FN	.....for Finland
SS	.....for Switzerland
A	.....for Australia
HK	.....for Hong Kong
BE	.....for Belgium

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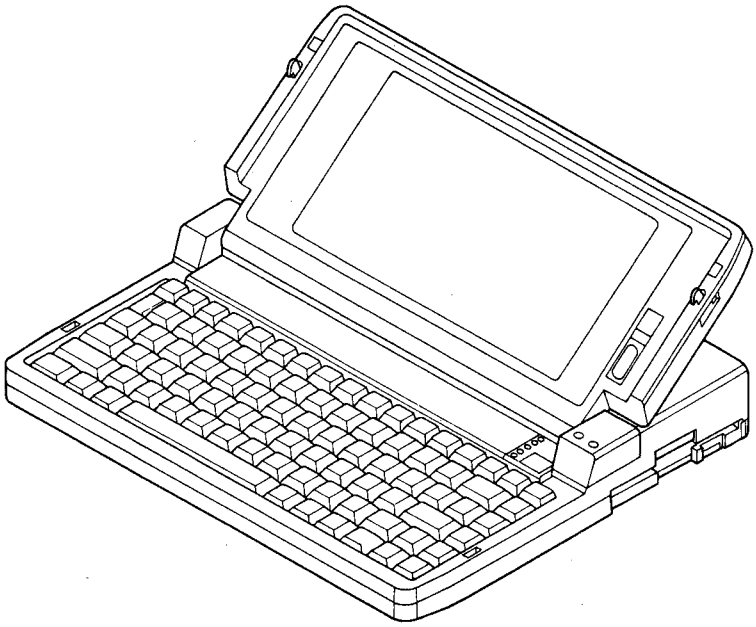

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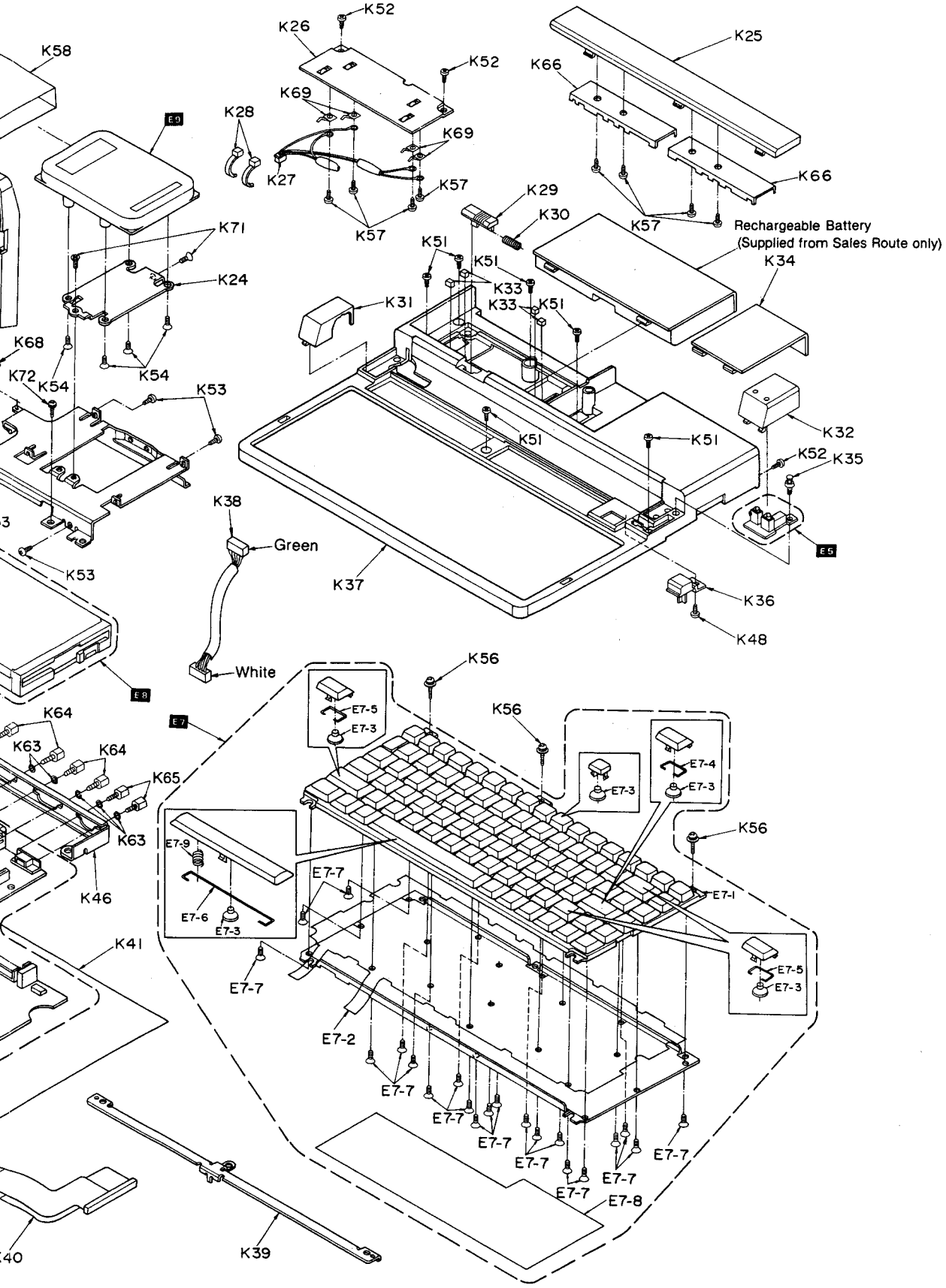
Replacement Parts List (Cabinet)

NOTE: 1. Important safety notice.
Components identified by ⚠ mark have special characteristics important for safety. When replaceing any of these components, use only manufacturer's specified parts.

Ref. No.	Part No.	DESCRIPTION	Qtty.
CABINET PARTS			
K 1 (M)(C)	DFWV80C0152	CABINET, LCD, INNER	1
K 1 (E)(F)(G)(IT)(NL)(SP)(SW)(FN)(SS)(A)(HK)(BE) [(E)(NL) Version 1]	DFWV80C0164	CABINET, LCD, INNER	1
K 3	DFHG924ZA-1	PLUG, SCREW, RUBBER	2
K 4	DFBD0029ZA-0	KNOB, LCD CONTROL	1
K 5	DFMX0173ZA	SHEET, INSULATION, LCD, (A)	1
K 6	DFMX0175ZA	SHEET, INSULATION, LCD, (C)	1
K 7	DFUD0011ZA	SPRING, LCD LOCK	2
K 8	DFHR5186ZA-1	HOLDER, LCD	2
K 9	DFBH1012YA	HINGE, LEFT	1
K10	DFBH1013YA	HINGE, RIGHT	1
K11	DFHR7106ZA	REFLECTOR	1
K12	DFMP0005ZA	HOLDER, LCD	1
K13	DFAC0001XBW	LAMP, FL, BACKLIGHT	1
K14	DFMD2033ZA	FRAME, LCD HOLD, (A)	1
K15	DFHR7120ZA	DEFUSER, LIGHT, LCD	1
K16	DFWV52H0002	PLATE, LEADING LIGHT	1
• K18	DFHR7122ZC	SPACER, LEADING LIGHT	1
K19	DFJS01Z39YAV	CABLE, LCD	1
K20	DFHR1059ZA	CLAMP, CABLE	4
K21	DFWV65A0181	FRAME, LCD HOLD, (B)	1
K22 (M)(C)	DFWV84A0063	CABINET, LCD	1
K22 (E)(F)(G)(IT)(NL)(SP)(SW)(FN)(SS)(A)(HK)(BE) [(E)(NL) Version 1]	DFWV84A0068	CABINET, LCD	1
• K23	DFMD2032YB	FRAME, FDD HOLD	1
• K24	DFMD2036YA	FRAME, HDD HOLD	1
K25 (M)(C)(E)(IT)(NL)(SP)(SW)(FN)(SS)(A)(HK) [(E)(NL) Version 1]	DFKE0169TA-3	LID, EXPANTION HOUSING	1
K25 (F)(G)(BE)	DFKE0169SA-3	LID, EXPANTION HOUSING	1
K26 (M)(E)(G)(IT)(NL)(SP)(SW)(FN)(SS)(A)(HK)(BE) [(E)(NL) Version 1]	DFWV82A0019	BASE, BATTERY	1
K26 (C)(F)	DFWV82A0026	BASE, BATTERY	1
• K27	DLJS0003A02A	CONNECTOR, BATTERY	1
K28	RHR166ZA	CLAMP, CABLE	2
• K29	DFBD0030XA-1	KNOB, SLIDE	1
K30	DFUD0010ZA	SPRING, BATTERY EJECT	1
K31	DFKE0166ZA-5	COVER, HINGE, LEFT	1
K32	DFKE0167YA-5	COVER, HINGE, RIGHT	1
K33	DFHG694ZA	RUBBER, TERMINAL BATTERY	4
K34 (M)(C)(A)(HK)	DFWV82A0018	LID, MODEM HOUSING	1
K34 (E)(F)(G)(IT)(NL)(SP)(SS)(SW)(FN)(BE) [(E)(NL) Version 1]	DFWV82A0020	LID, MODEM HOUSING	1

The marked parts by "•" have been changed.



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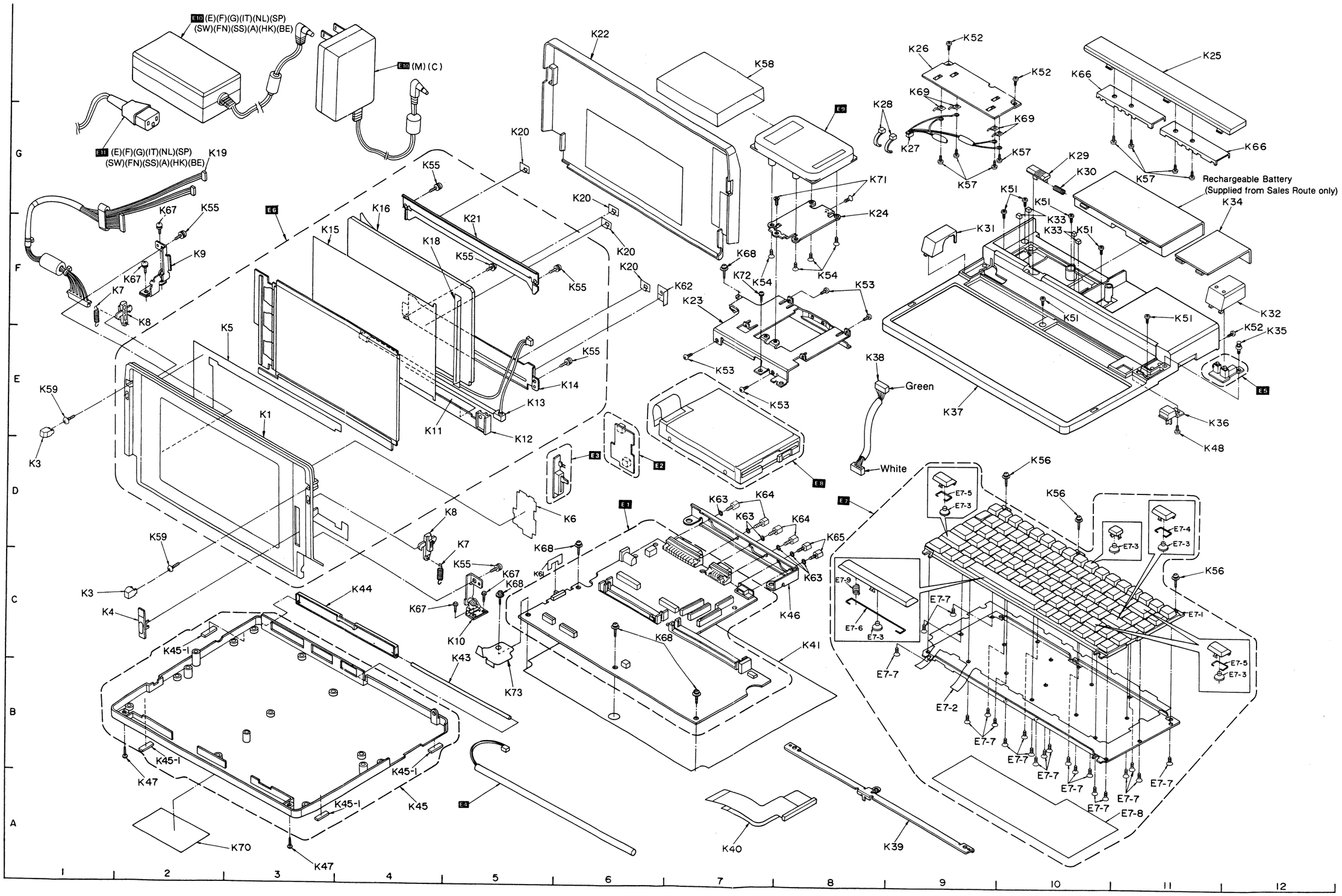
	Ref. No.	Part No.	DESCRIPTION	Qtty.
	K35	DFHR5187ZA	RIVET, PLASTICS	1
	K36	DFBC0096WA-1	KNOB, POWER	1
	K37	DFWV80A0098	Ass'y, CABINET, TOP	1
•	K38	DLJS0003A01A	CABLE, LED	1
	K39	DFMD1042ZA	FRAME ANGLE, KEYBOARD	1
•	K40	DFJS01Z33ZAK	CABLE, HDD	1
•	K41	DFMX0171XA	SHEET, INSULATION, MAIN PCB	1
	K43	DFDF3049ZA	SHAFT, LID, EXTERNAL CONNECTOR	1
	K44	DFGX0080YA-3	LID, EXTERNAL CONNECTOR	1
	K45 (M)	DFWV80C0179	Ass'y, CABINET, BOTTOM *	1
	K45 (C)	DFWV80C0156	Ass'y, CABINET, BOTTOM	1
•	K45 (E)(F)(G)(A)(HK)(IT)(NL)(SP)(SS)(BE)(FN)	DFWV80C0181	Ass'y, CABINET, BOTTOM	1
•	K45 (SW)	DFWV80C0180A	Ass'y, CABINET, BOTTOM	1
	K45 [(E)(NL) Version 1]	DFWV80C0193	Ass'y, CABINET, BOTTOM	1
	K45-1	DFKL0013ZA	FOOT, RUBBER, BOTTOM CABINET	4
•	K46	DFUA0099ZA	FRAME, METAL, CONNECTOR, MAIN PCB	1
	K47	XTB3+10GFN	SCREW, M3x10mm	2
	K48	XTB3+8G	SCREW, M3x8mm	1
	K51	XSB3+8	SCREW, M3x8mm	6
	K52	XSB3+5FN	SCREW, M3x5mm	3
	K53	XYN3+C5	SCREW, M3x5mm, FDD	4
	K54	XSSDF28+6FN	SCREW, M2.8x6mm, HDD	4
	K55	XYN26+C6	SCREW, PAN HEAD WITH WASHER AND SPRING	6
	K56	XSB3+6	SCREW, M3x6mm	3
	K57	XTN2+4G	SCREW, M2x4mm	8
•	K58	DFMC0256XA	PLATE, SHIELD, HDD	1
	K59	XSB26+6	SCREW, M2.6x6mm	2
	K61	DFUV0041ZA	COVER, SWITCH	1
	K62	DFHR1064ZA	PLATE, LCD CABLE	1
	K63	XWA3B	SPRING WASHER	6
	K64	DFHE5013ZA	SCREW, HEXAGONAL HEAD	4
	K65	DFHE5015ZA	SCREW, HEXAGONAL HEAD	2
	K66	DFMC0261ZA	PLATE SPRING, LID	2
	K67	XYN3+C6FN	SCREW, M3x6mm	4
	K68	XYN3+J6	SCREW, M3x6mm	5
	K69	DFJC9904ZA	TERMINAL, BATTERY	4
	K70 (M)	DFWV86C0030	RATING LABEL *	1
	K71	XSSDF28+5	SCREW, M2.8x5mm, HDD	2
	K72	XYN3+F8	SCREW, M3x8mm	1
•	K73	DFHR7169ZA	COVER, CABLE, BATTERY, RESUME	1
	MAIN BLOCK UNITS			
•	E 6 (M)(C)	DFWV08A015ZA	Ass'y, LCD BLOCK	1
•	E 6 (E)(F)(G)(IT)(NL)(SP)(SW)(FN)(SS)(A)(HK)(BE)[(E)(NL) Version 1]	DFWV08A016ZA	Ass'y, LCD BLOCK	1

The marked parts by "•" have been changed.

6.4 Exploded View



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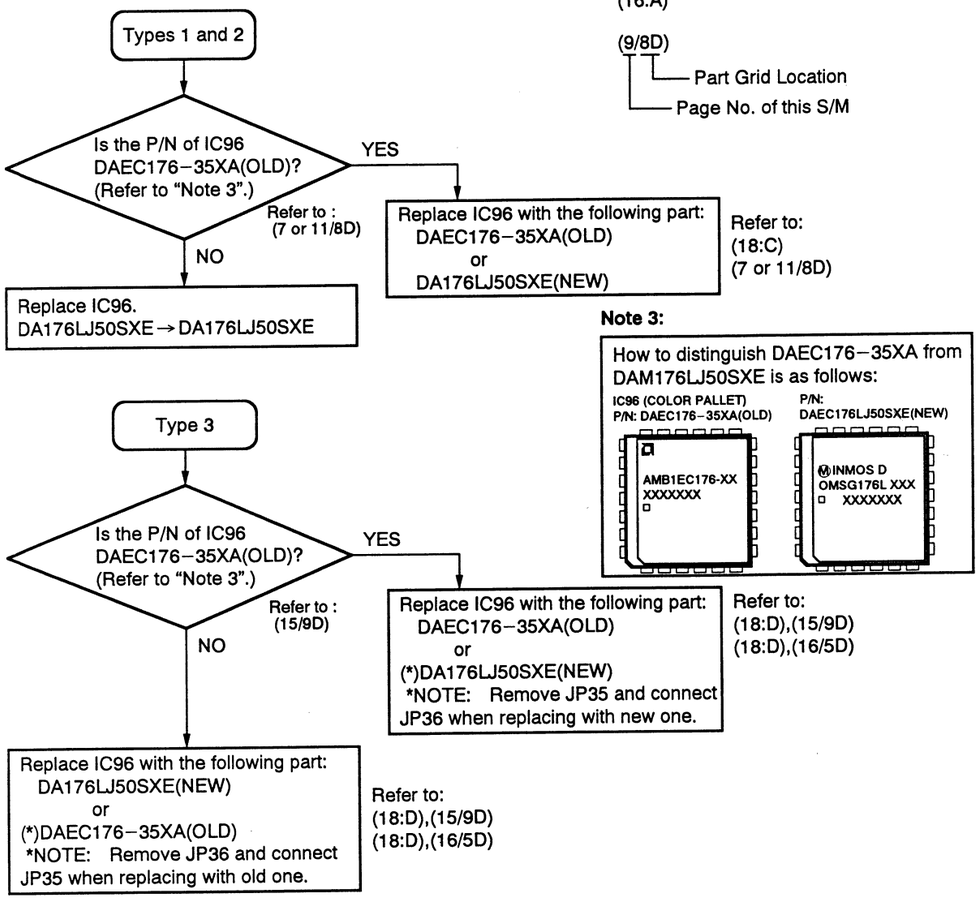
Note:
- Page No. of this S/M
- Schematic Diagram

(16:A)

(9/8D)
- Part Grid Location
- Page No. of this S/M

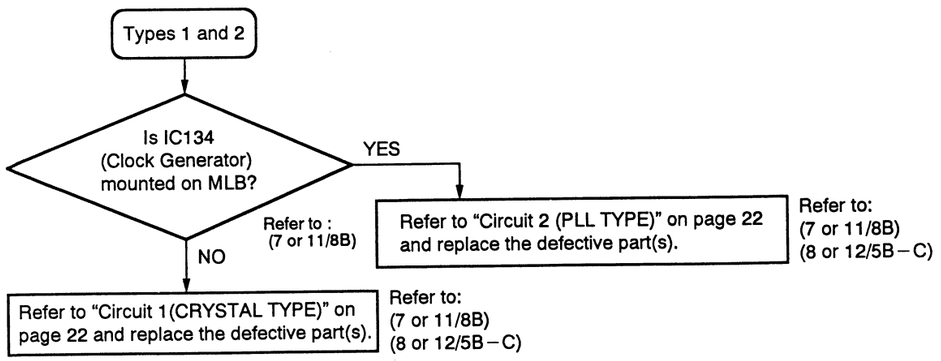
● **In case of Color Pallet (IC96) replacement:**



Note 3:

How to distinguish DAEC176−35XA from DAM176LJ50SXE is as follows:

● **In case of Video Oscillator replacement:**



3. Parts Comparison Table

	TYPE 1	TYPE 2	TYPE 3
IC			
BMC(IC129)	DAM50727459M	DAM50727465M	
IC200	DAHC27FT0	—	
RESISTOR			
R56	ERJ6GEYJ204V 200 Kohm		ERJ6GEYJ223V 22 Kohm
R57	ERJ6GEYJ104V 100 Kohm		ERJ6GEYJ102V 1 Kohm
R176	ERJ6GEYJ104V 100 Kohm		ERJ6GEYJ103V 10 Kohm
R185	—		ERJ6GEYJ5R1V 5.1 ohm
R186	—		ERJ6GEYJ5R1V 5.1 ohm
R187	—		ERJ6GEYJ103V 10 Kohm
R188	—		ERJ6GEYJ100V 10 ohm
R189	—		ERJ6GEYJ222V 2.2 Kohm
CAPACITOR			
C91	ECUV1H103KBG 0.01 µF		—
C92	ECEV1CV100SR 10 µF		ECEV1CV470SP 47 µF
C202	—		ECUV1E104ZFG 0.1 µF
C203	—		ECUV1E104ZFG 0.1 µF
DIODE			
D50	MA165		MA151A
D51	—		MA701ATW
D52	—		MA704ATW
TRANSISTOR			
Q1	DETA114EKT97		—
Q5	DETFMC3TA-E		—
Q37	—		2SB1260T100Q
Q38	—		DETC144EKT97
JUMPER			
JP12	ERJ6GEY0R00V		—
JP35	—		ERJ6GEY0R00V
JP36	—		ERJ6GEY0R00V
JP37	—		ERJ6GEY0R00V
OSC			
OSC1	DECL14318P1H		DECL14318P1H or DECL14318P2H
OSC2	DECL32000P1H		DECL32000P1H or DECL32000P2H

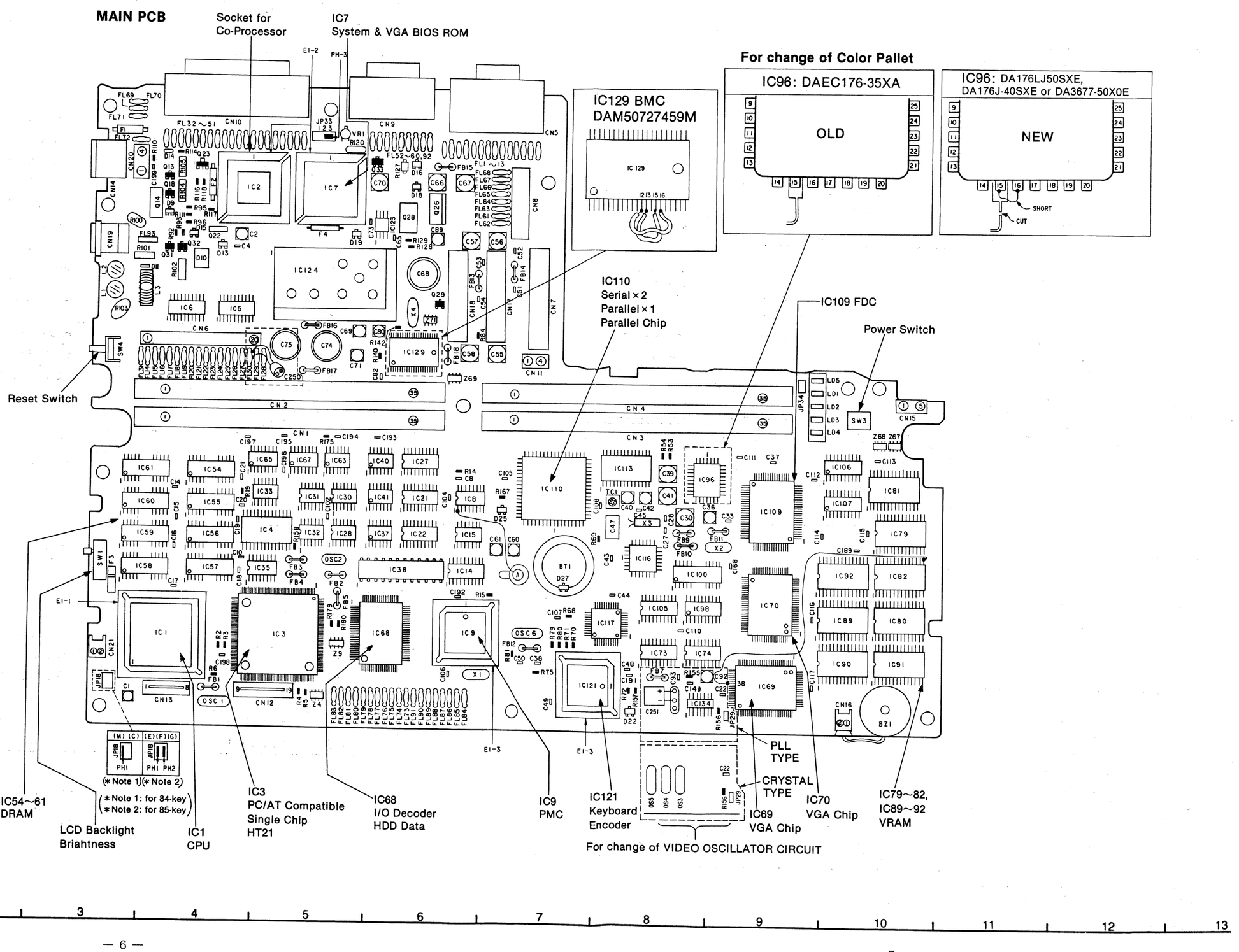
Bare Board Numbers:
DFUP0393ZAB
DFUP0393ZAZ1

Bare Board Number:
DFUP0393ZAZ2

4. Parts Location of MLB (Main Logic Board)

[Type 1]

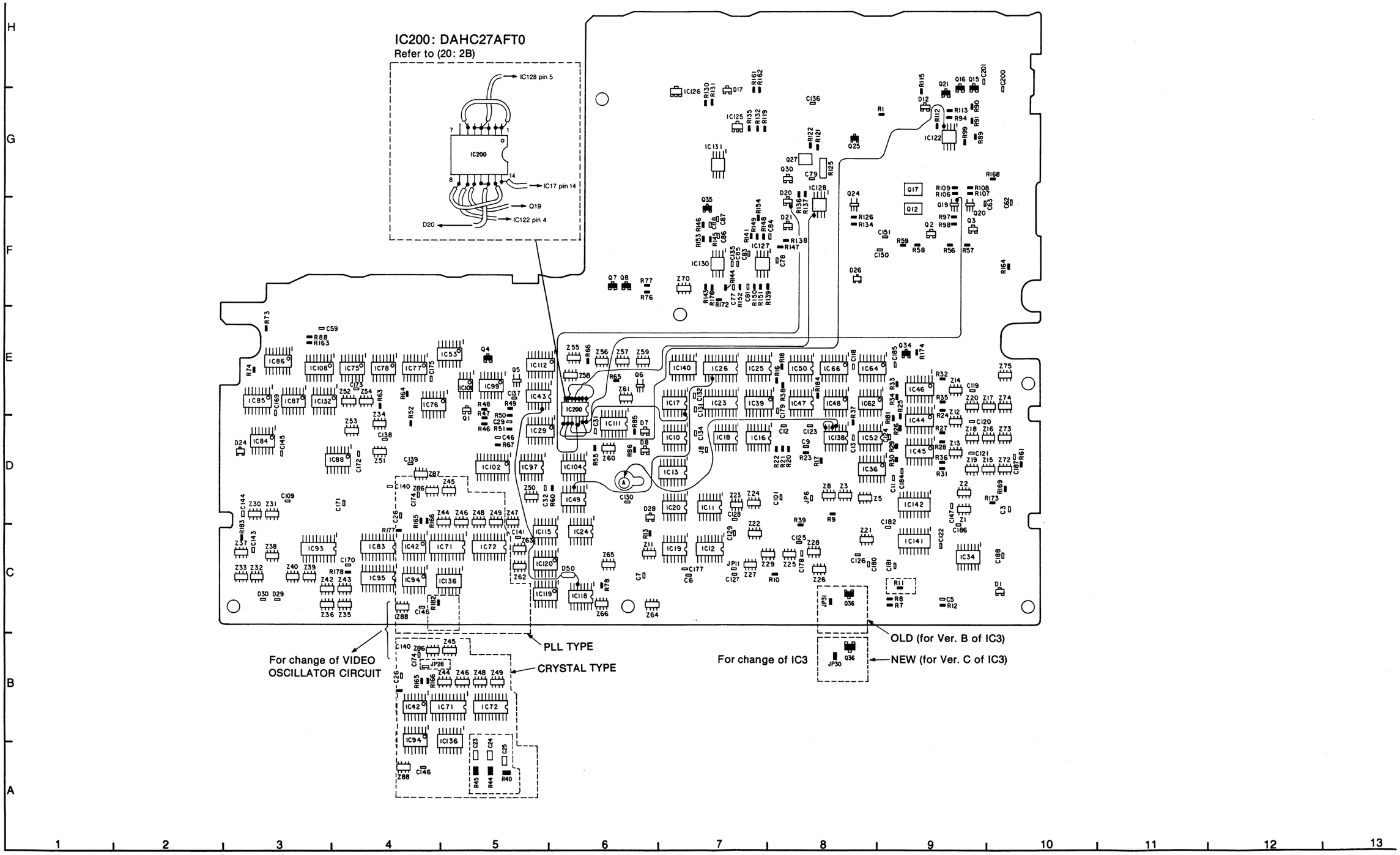
TOP VIEWS



BOTTOM VIEWS

[Type 1]

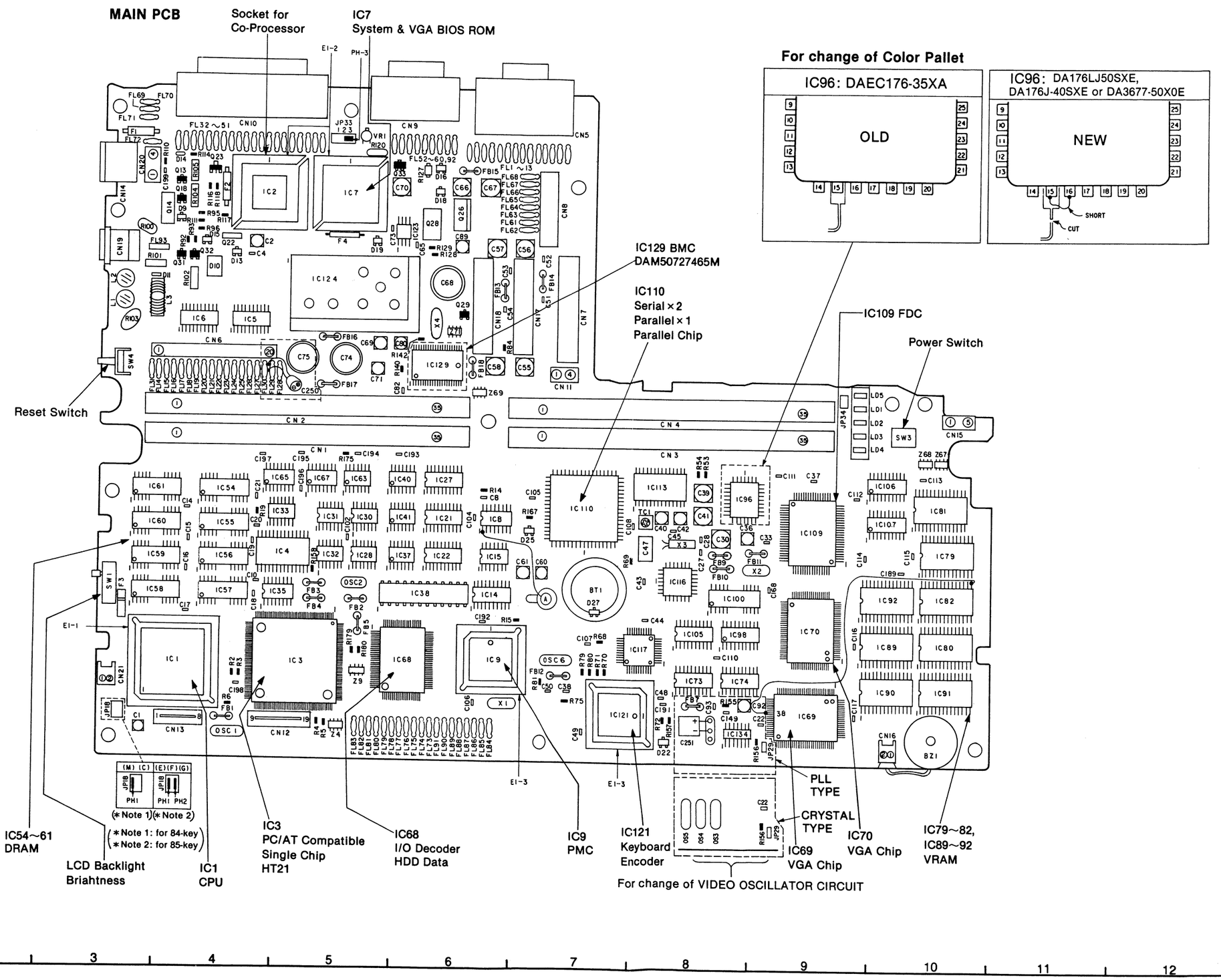
MAIN PCB



Parts Location of MLB (Main Logic Board)

[Type 2]

TOP VIEWS



BOTTOM VIEWS

[Type 2]

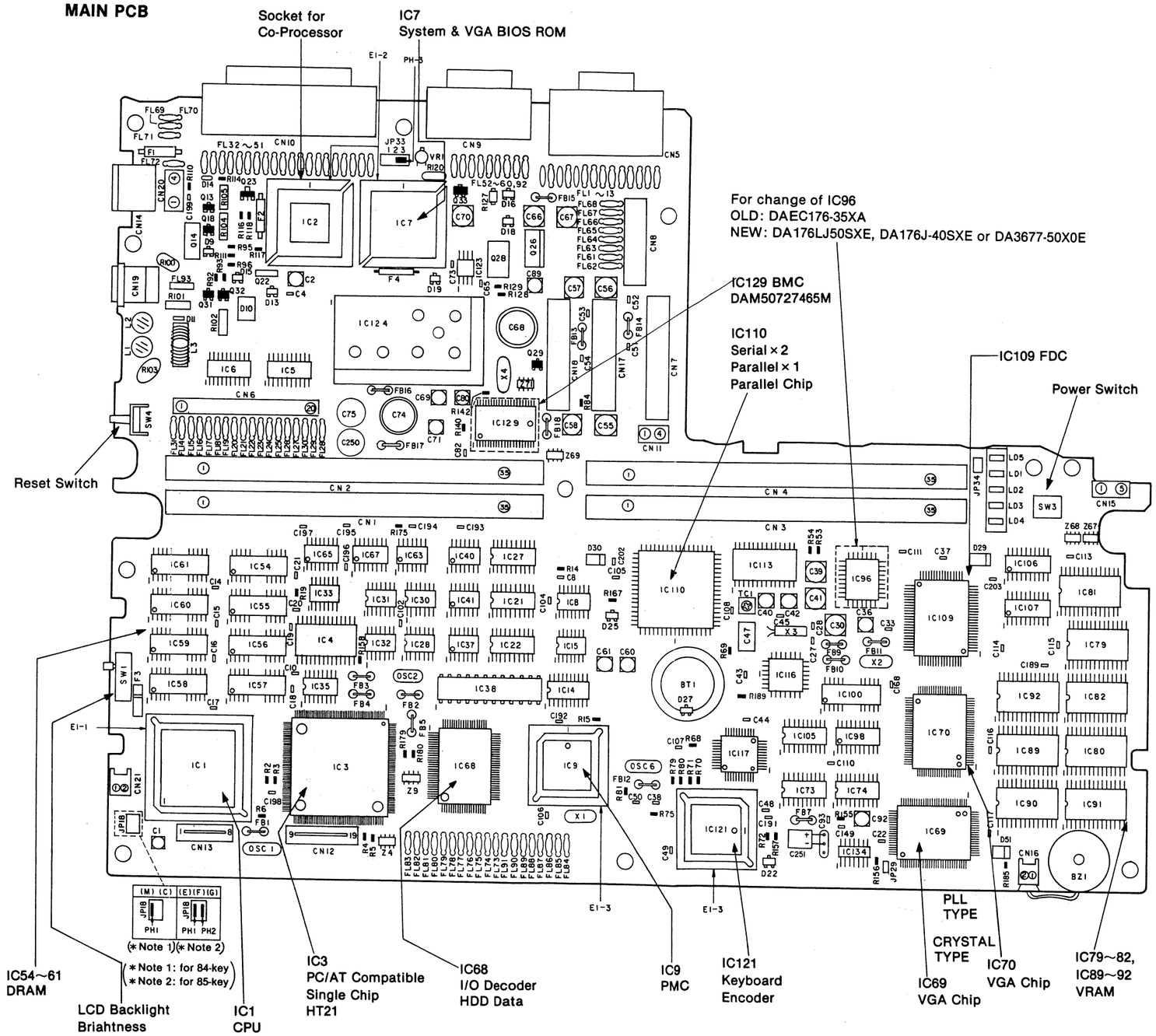
MAIN PCB

Parts Location of MLB (Main Logic Board)

[Type 3]

TOP VIEWS

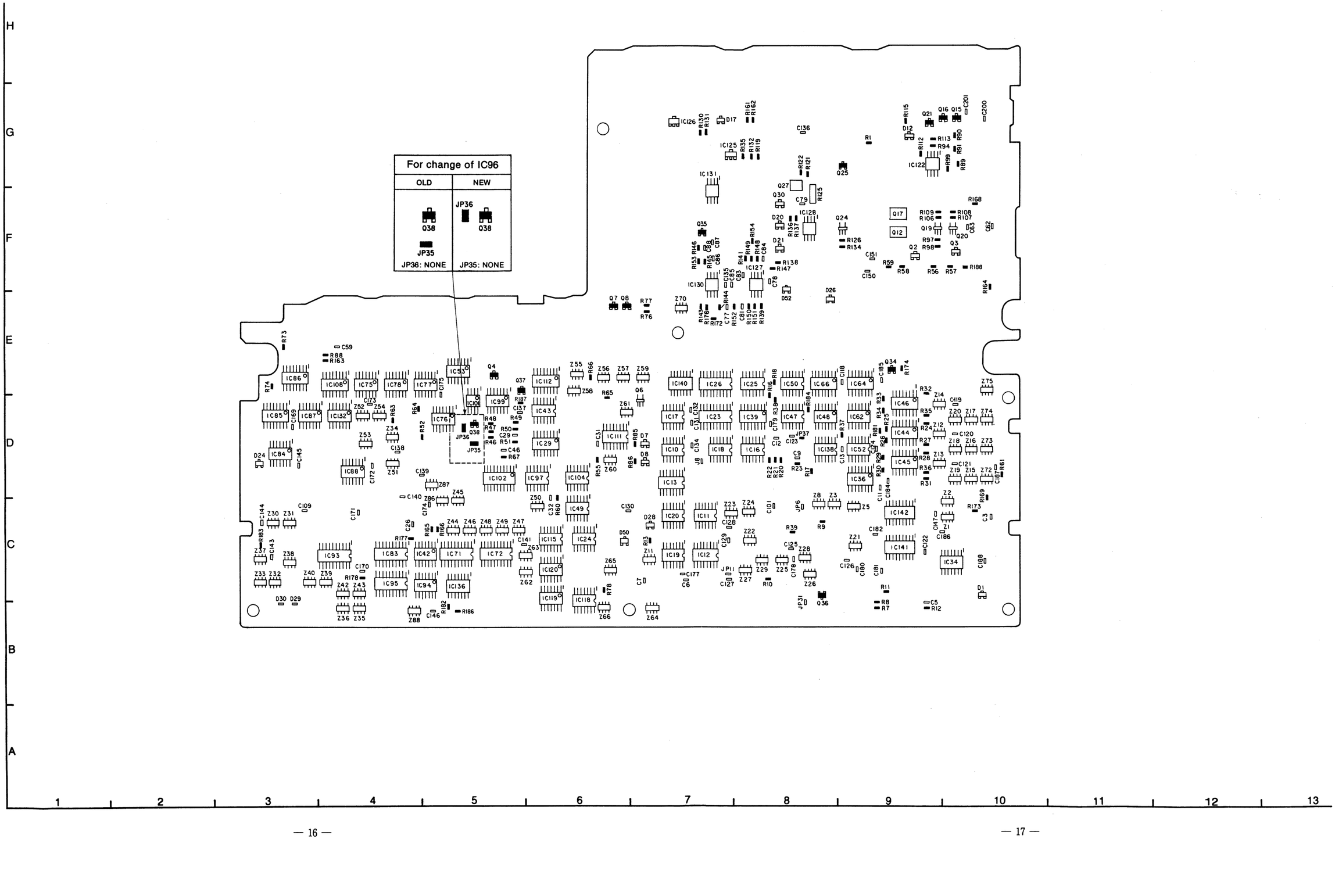
MAIN PCB



BOTTOM VIEWS

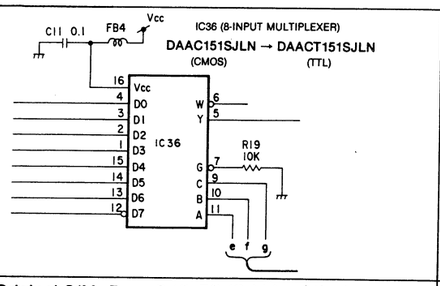
[Type 3]

MAIN PCB

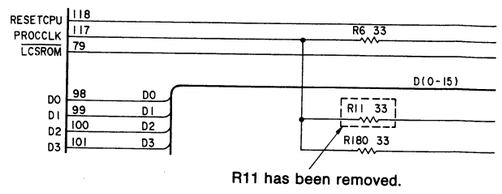


5. Schematic Diagrams

Diagram "A"

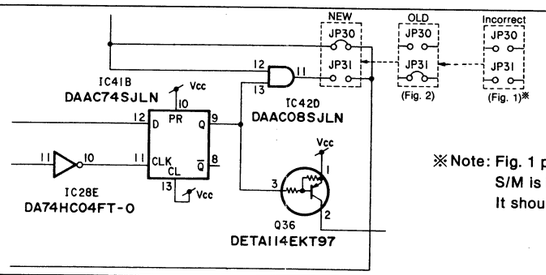


Original S/M: Page 6-12, 7G (Grid Location)



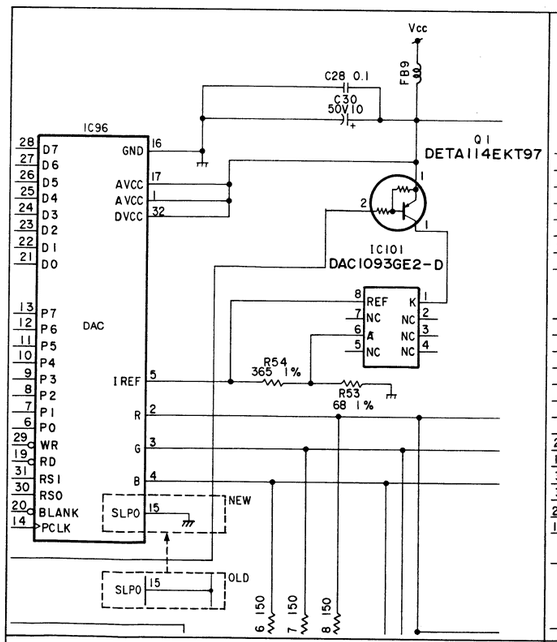
Original S/M: Page 6-6, 10C (Grid Location)

Diagram "B"



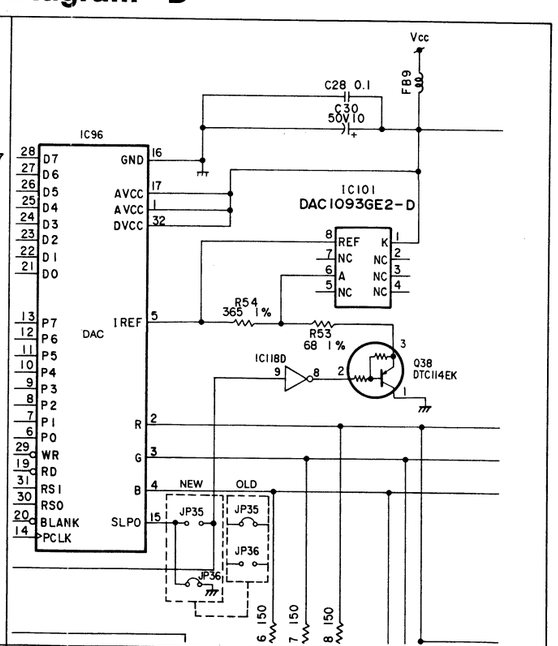
Original S/M: Page 6-3, 4E (Grid Location)

Diagram "C"



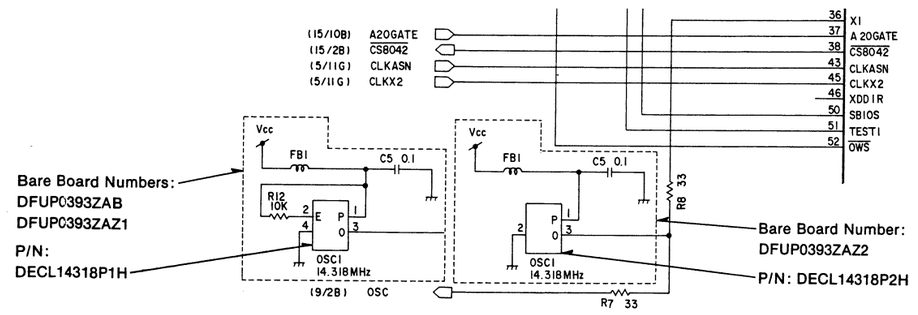
Original S/M: Page 6-24, 7F (Grid Location)

Diagram "D"

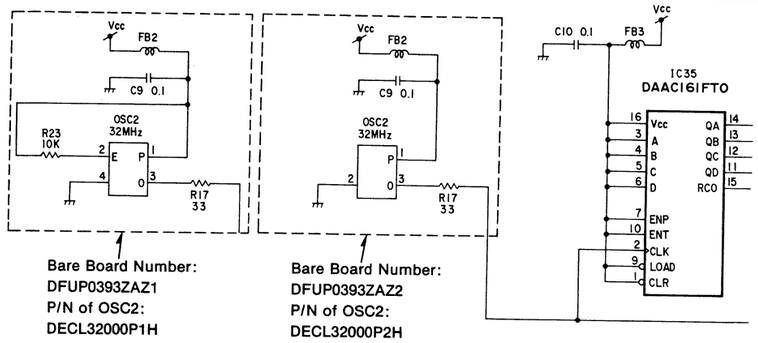


Original S/M: Page 6-24, 7F (Grid Location)

Diagram "E"



Original S/M: Page 6-5, 3B (Grid Location)

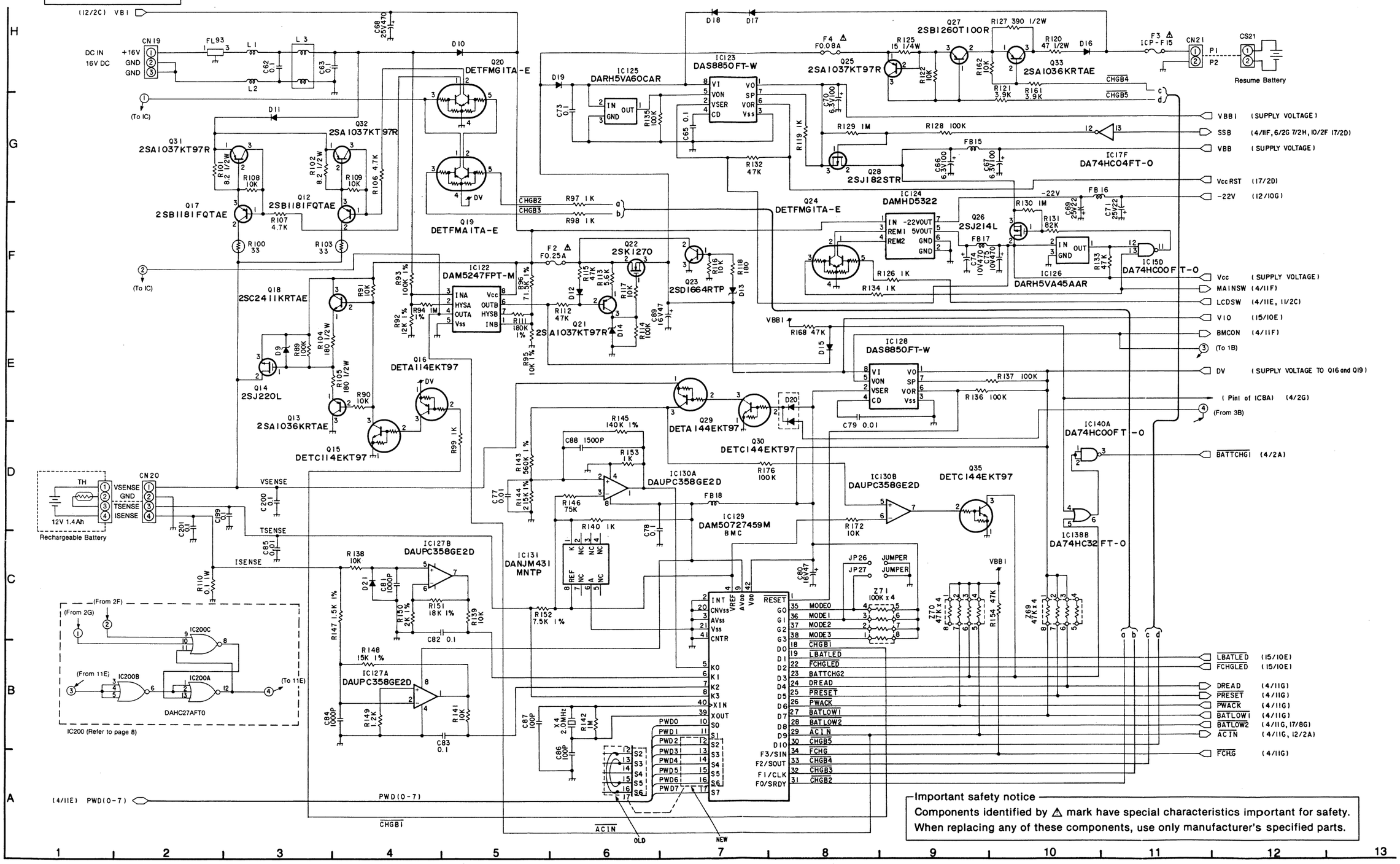


Original S/M: Page 6-11, 3G (Grid Location)

Diagram "F" (For BMC (IC129) replacement: Refer to page 3.)

Power Circuit (Refer to "Sheet No. 6" of the original service manual.)

Note: 2 / 11D
Grid Location
Sheet No.



Important safety notice

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When replacing any of these components, use only manufacturer's specified parts.

6. Video Oscillator Circuit

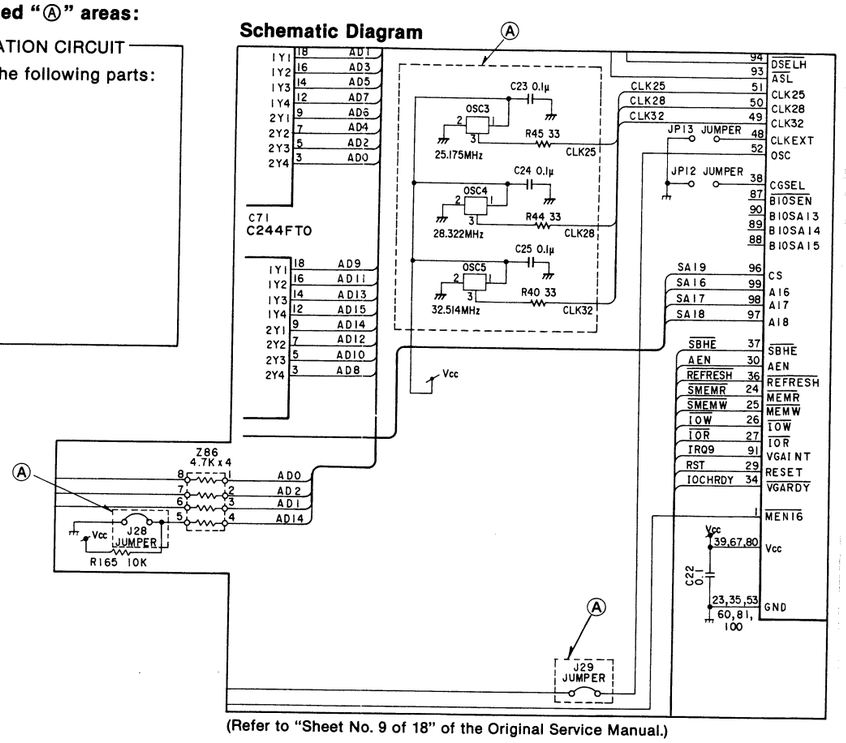
[Circuit 1] **Marked "Ⓐ" areas:**

CRYSTAL TYPE OSCILLATION CIRCUIT

This circuit consists of the following parts:

OS3	DECL25175P2H
OS4	DECL28322P2H
OS5	DECL32514P2H
C23	ECUV1E104ZFG
C24	ECUV1E104ZFG
C25	ECUV1E104ZFG
R40	ERJ6GEYJ330V
R44	ERJ6GEYJ330V
R45	ERJ6GEYJ330V
JP28	ERJ6GEY0R00V
JP29	ERJ6GEY0R00V

Schematic Diagram



(Refer to "Sheet No. 9 of 18" of the Original Service Manual.)

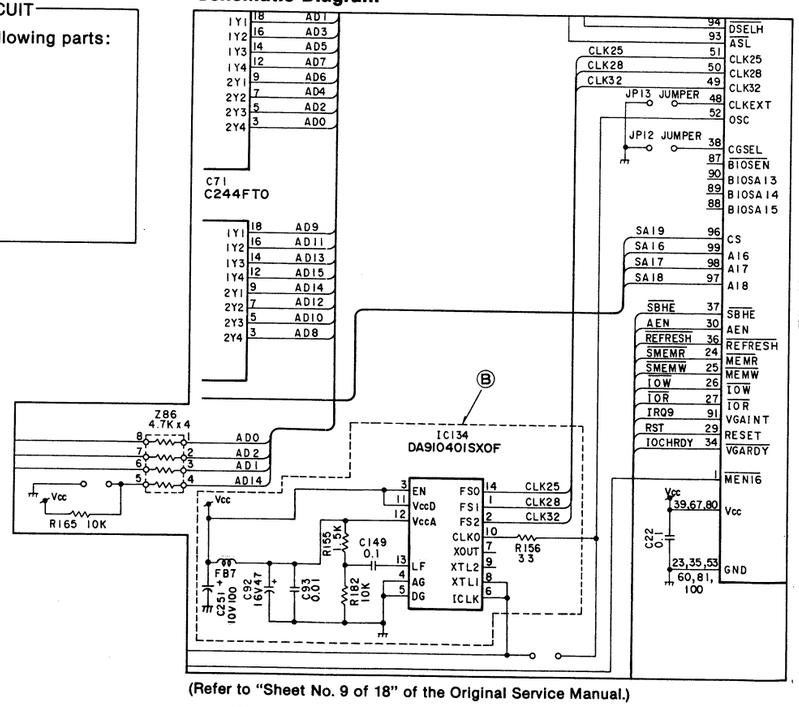
[Circuit 2] **Marked "Ⓑ" area:**

PLL TYPE OSCILLATION CIRCUIT

This circuit consists of the following parts:

IC134	DA910401SX0F
C92	ECEV1CV470SP
C93	ECUV1H103KBG
C149	ECUV1E104ZFG
C251	ECEA1AU101
R155	ERJ6GEYJ152V
R182	ERJ6GEYJ103V
FB7	ELEPL101KA

Schematic Diagram



(Refer to "Sheet No. 9 of 18" of the Original Service Manual.)

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ORDER NO. CPD9104011S8

Service Manual

Laptop Computer

CF-270

Supplement

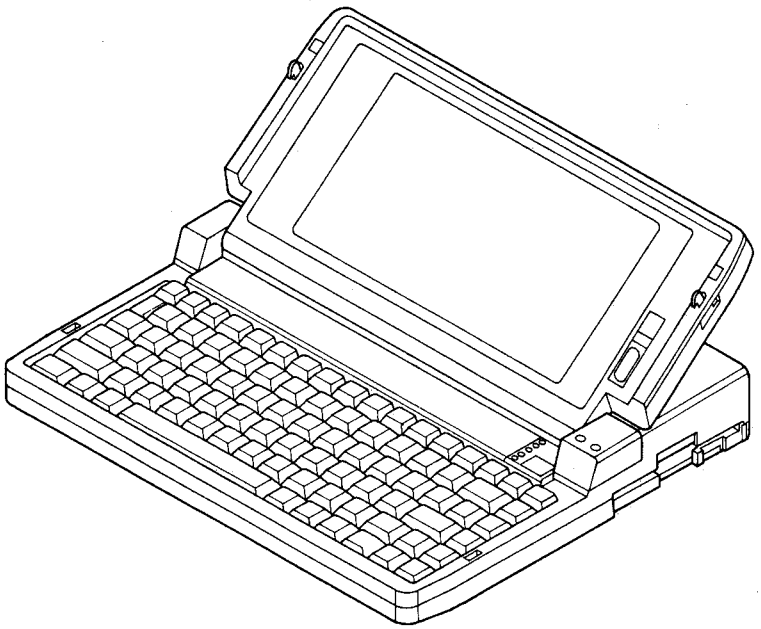
V04384

Please file and use this manual together with the service manual for Model No. CF-270, Order No. CPD9010459C0 and Order No. CPD9011462A8.

This is the Service Manual for the following areas.

E	for U.K.
F	for France
G	for F.R. Germany
IT	for Italy
NL	for Netherlands
SP	for Spain
SW	for Sweden
FN	for Finland
SS	for Switzerland
A	for Australia
HK	for Hong Kong
BE	for Belgium

Notebook Computer



10060230 91000241 30
SPL2-CF270 1 ST
SVC MNL SUPPL

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Parts Comparison Tables

AC ADAPTER

For (E), (F) and (G) areas

Ref. No.	Part No.	
	Original	New
E10	CF-AA184G	CF-AA184G3

For (IT), (NL), (SP), (SW), (FN), (SS), (A), (HK) and (BE) areas

Ref. No.	Part No.	
	Original	New
E10	CF-AA184	CF-AA184G3

AC Cable

For (E) area

Ref. No.	Part No.	
	Original	New
E11	DFJA04ZA-K	DFJA04ZBKK

For (F) and (G) areas

Ref. No.	Part No.	
	Original	New
E11	DFJA05YA-K	DFJA0032ZAKK

For (A) area

Ref. No.	Part No.	
	Original	New
E11	DFJA07YA-K	DFJA07YB-K

For (HK), (IT), (NL), (SP), (SW), (FN) and (BE) areas

Ref. No.	Part No.	
	Original	New
E11	DFJA05YA-K	DFJA0032ZAKK

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Service Manual

Laptop Computer

CF-270

Supplement

Cabinet Part List and Exploded View

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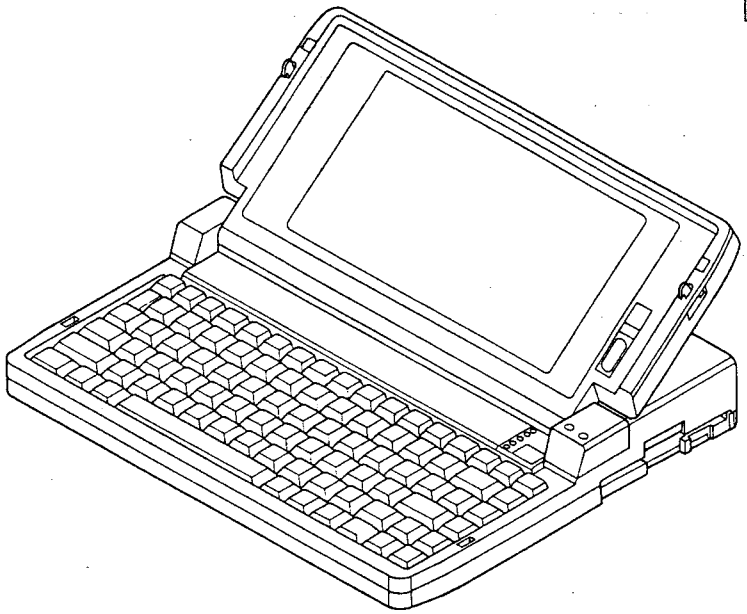

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Replacement Parts List (Cabinet)

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CABINET PARTS			
K 1 (M)(C)	DFWV80C0152	CABINET, LCD, INNER	1
K 1 (E)(F)(G)(IT)(NL)(SP)(SW)(FN)(SS)(A)(HK)(BE)[(E)(NL) Version 1]	DFWV80C0164	CABINET, LCD, INNER	1
K 3	DFHG924ZA-1	PLUG, SCREW, RUBBER	2
K 4	DFBD0029ZA-0	KNOB, LCD CONTROL	1
K 5	DFMX0173ZA	SHEET, INSULATION, LCD, (A)	1
K 6	DFMX0175ZA	SHEET, INSULATION, LCD, (C)	1
K 7	DFUD0011ZA	SPRING, LCD LOCK	2
K 8	DFHR5186ZA-1	HOLDER, LCD	2
K 9	DFBH1012YA	HINGE, LEFT	1
K10	DFBH1013YA	HINGE, RIGHT	1
K11	DFHR7106ZA	REFLECTOR	1
K12	DFMP0005ZA	HOLDER, LCD	1
K13	DFAC0001XBW	LAMP, FL, BACKLIGHT	1
K14	DFMD2033ZA	FRAME, LCD HOLD, (A)	1
K15	DFHR7120ZA	DEFUSER, LIGHT, LCD	1
K16	DFWV52H0002	PLATE, LEADING LIGHT	1
• K18	DFHR7122ZC	SPACER, LEADING LIGHT	1
K19	DFJS01Z39YAV	CABLE, LCD	1
K20	DFHR1059ZA	CLAMP, CABLE	4
K21	DFWV65A0181	FRAME, LCD HOLD, (B)	1
K22 (M)(C)	DFWV84A0063	CABINET, LCD	1
K22 (E)(F)(G)(IT)(NL)(SP)(SW)(FN)(SS)(A)(HK)(BE)[(E)(NL) Version 1]	DFWV84A0068	CABINET, LCD	1
• K23	DFMD2032YB	FRAME, FDD HOLD	1
• K24	DFMD2036YA	FRAME, HDD HOLD	1
K25 (M)(C)(E)(IT)(NL)(SP)(SW)(FN)(SS)(A)(HK)[(E)(NL) Version 1]	DFKE0169TA-3	LID, EXPANTION HOUSING	1
K25 (F)(G)(BE)	DFKE0169SA-3	LID, EXPANTION HOUSING	1
K26 (M)(E)(G)(IT)(NL)(SP)(SW)(FN)(SS)(A)(HK)(BE)[(E)(NL) Version 1]	DFWV82A0019	BASE, BATTERY	1
K26 (C)(F)	DFWV82A0026	BASE, BATTERY	1
• K27	DLJS0003A02A	CONNECTOR, BATTERY	1
K28	RHR166ZA	CLAMP, CABLE	2
• K29	DFBD0030XA-1	KNOB, SLIDE	1
K30	DFUD0010ZA	SPRING, BATTERY EJECT	1
K31	DFKE0166ZA-5	COVER, HINGE, LEFT	1
K32	DFKE0167YA-5	COVER, HINGE, RIGHT	1
K33	DFHG694ZA	RUBBER, TERMINAL BATTERY	4
K34 (M)(C)(A)(HK)	DFWV82A0018	LID, MODEM HOUSING	1
K34 (E)(F)(G)(IT)(NL)(SP)(SS)(SW)(FN)(BE)[(E)(NL) Version 1]	DFWV82A0020	LID, MODEM HOUSING	1

The marked parts by "•" have been changed.

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Service Manual

Laptop Computer

CF-270

Supplement

VOL384

Cabinet Part List and Exploded View

Please file and use this supplement manual together with the service manual for Model No. CF-270, Order No. CPD9105015S0.

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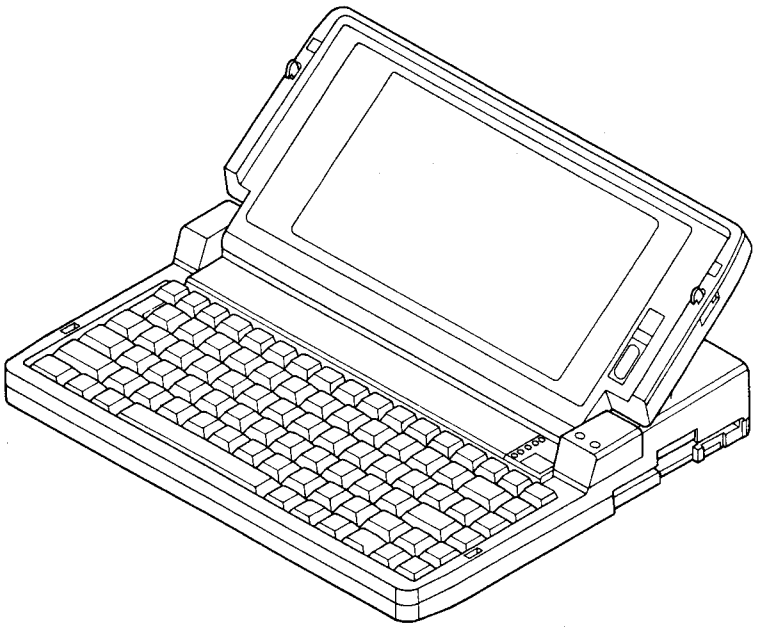

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PARTS COMPARISON TABLES

Ass'y Cabinet, Top

Ref. No.	Part No.		Qtty.
	Original	New	
K37	DFWV80A0098	DFWV80A0108	1

SCREW, M3x6mm

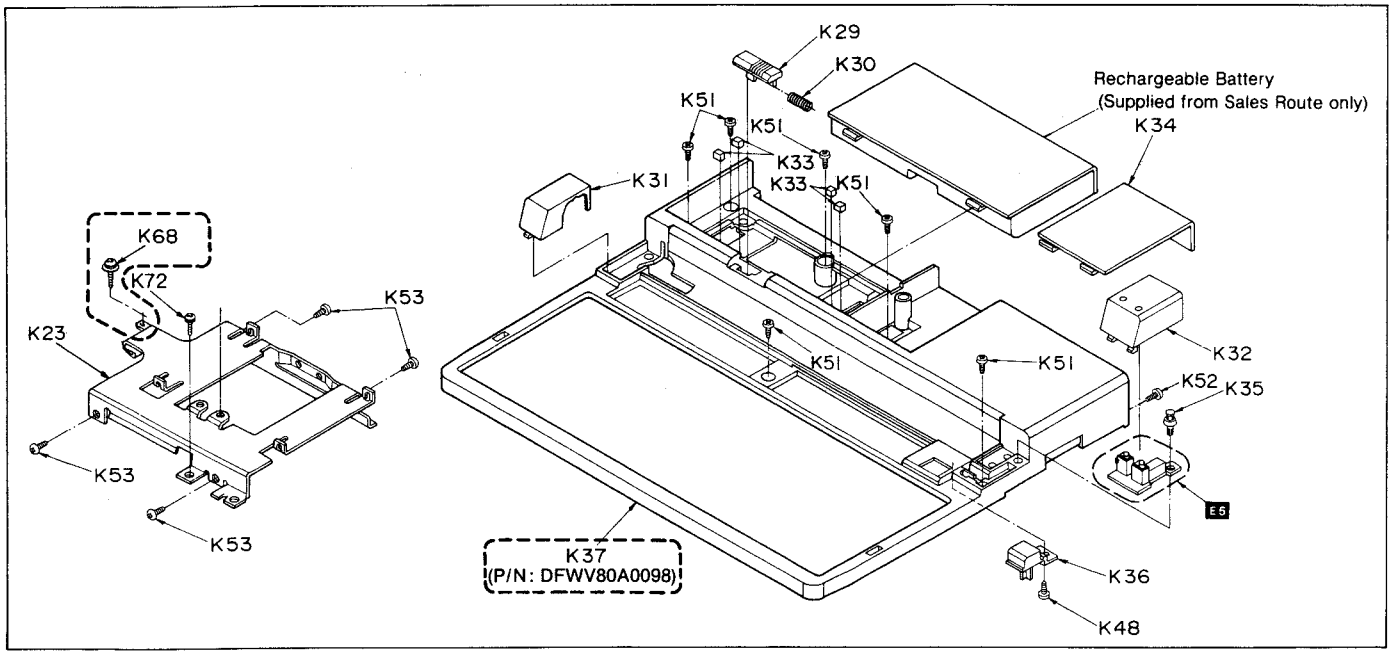
Ref. No.	Part No.	Qtty.	
		Original	New
K68	XYN3+J6	5	4

SCREW, M3x8mm

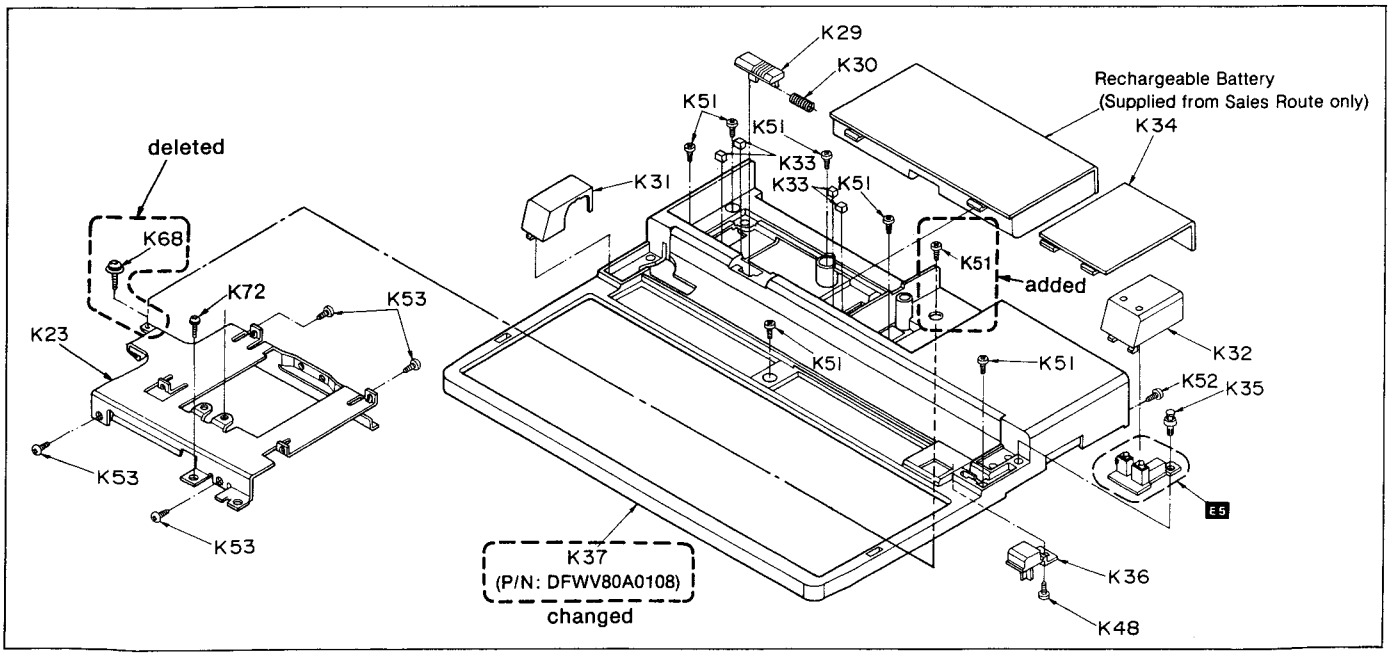
Ref. No.	Part No.	Qtty.	
		Original	New
K51	XSB3+8	6	7

EXPLODED VIEWS

OLD



NEW



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Service Manual

Laptop Computer

CF-270
CF-270H6

Supplement

Circuit change of FL Inverter Circuit

V0439C

Please file and use this supplement manual together with the service manual for Model No. CF-270, Order No. CPD9010459C0.

Befor you start servicing the FL Inverter PCB for CF-270 or CF-270H6, please refer to the followings:

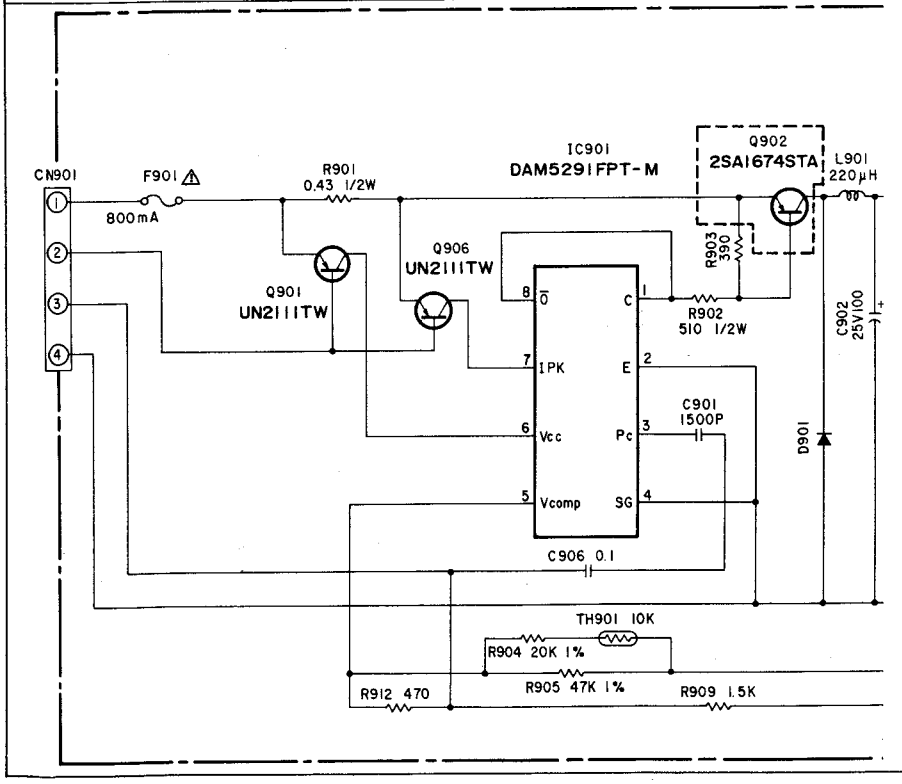
Parts Comparison Table

Ref. No.	Parts Name	Parts No.		
		Original	Modified	New
Q902	Transistor	2SA1674STA	2SB1241RTV2	2SB1241RTV2
C907	Capacitor 0.1µF	——	ECFZ1E104ZFB	ECUV1F104ZFG
C908	Capacitor 0.1µF	——	——	ECUV1F104ZFG

Schematic Diagram and Circuit Board

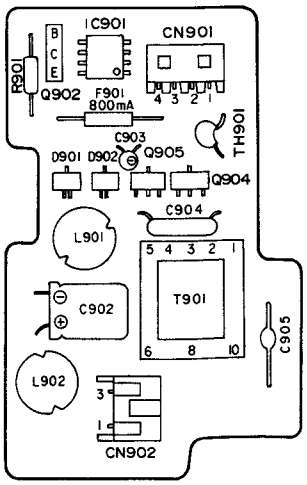
Original

Schematic Diagram



Circuit Board

Top View



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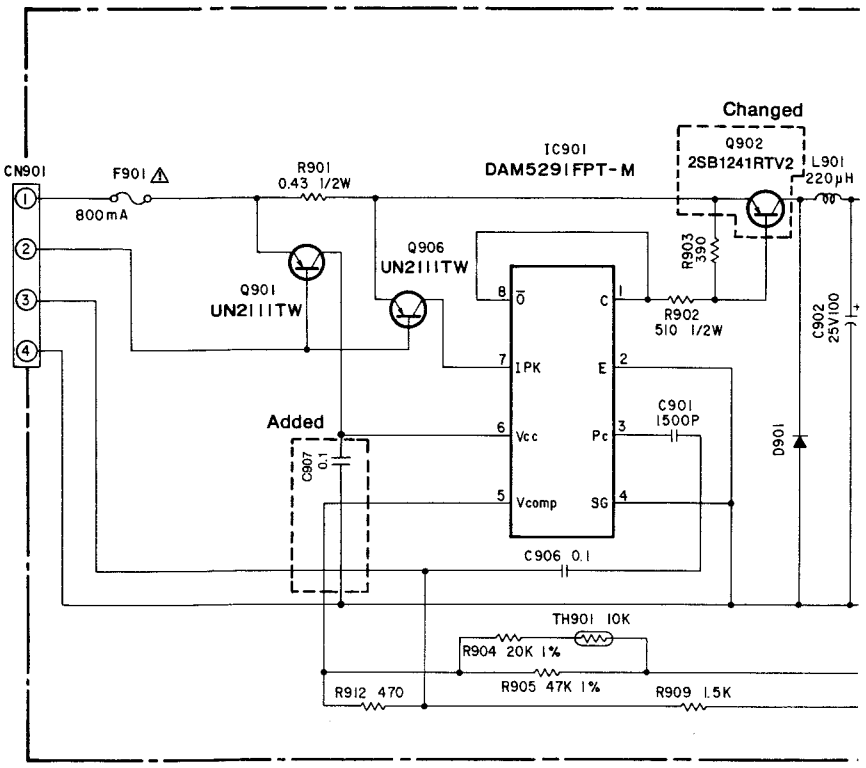
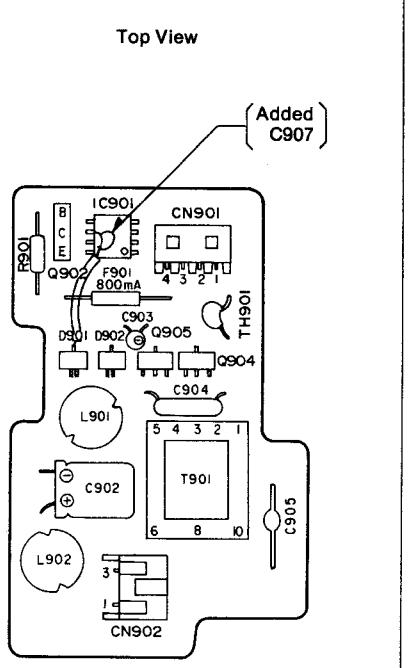
Schematic Diagram and Circuit Board

Modified

Schematic Diagram

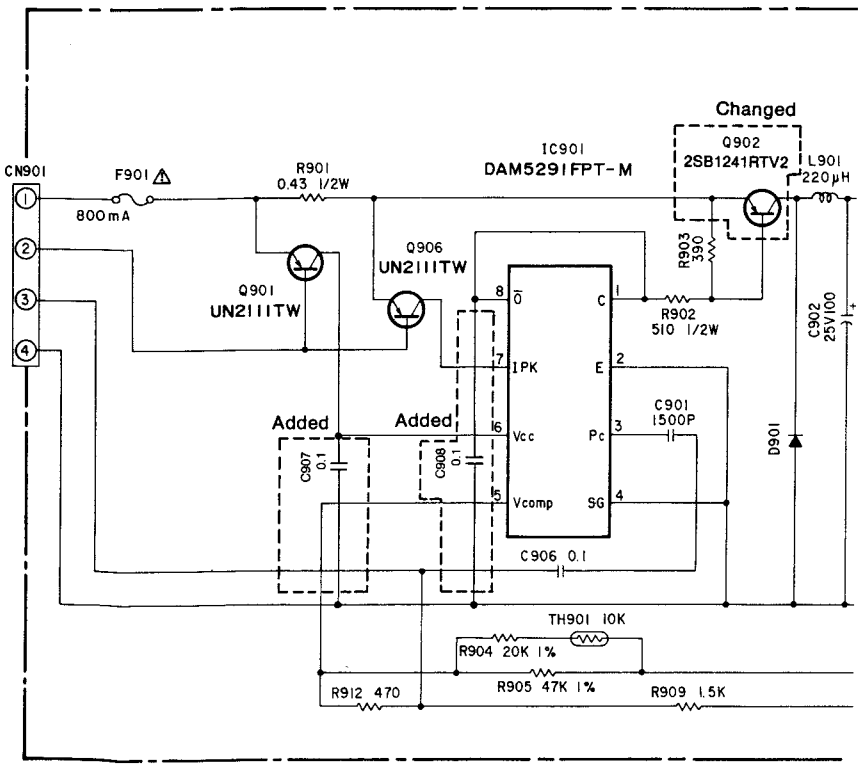


Circuit Board

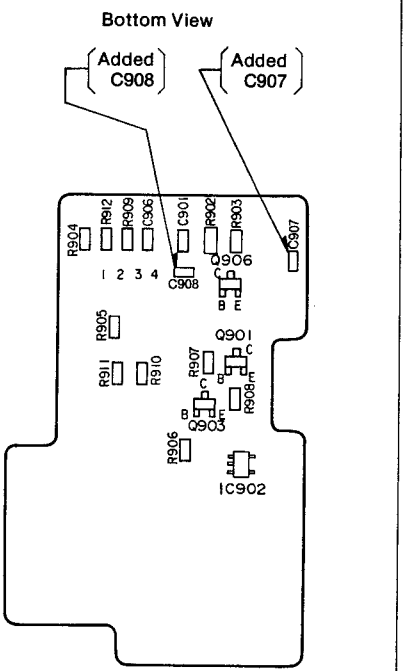


New

Schematic Diagram



Circuit Board



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Service Manual

Laptop Computer

CF-270

Supplement

V04384

Please file and use this supplement manual together with the service manual for Model No. CF-270, Order No. CDP9010459C0 and Order No. CPD9103009S0

Video Oscillator Circuit (for TYPE3 MLB)

When servicing Video Oscillator Circuit in TYPE3 MLB, refer to following schematic diagram.

Note:
How to distinguish MLB type (TYPE1, TYPE2 and TYPE3) is discribed on page 1 of Service Manual (Order No. CPD9103009S0).

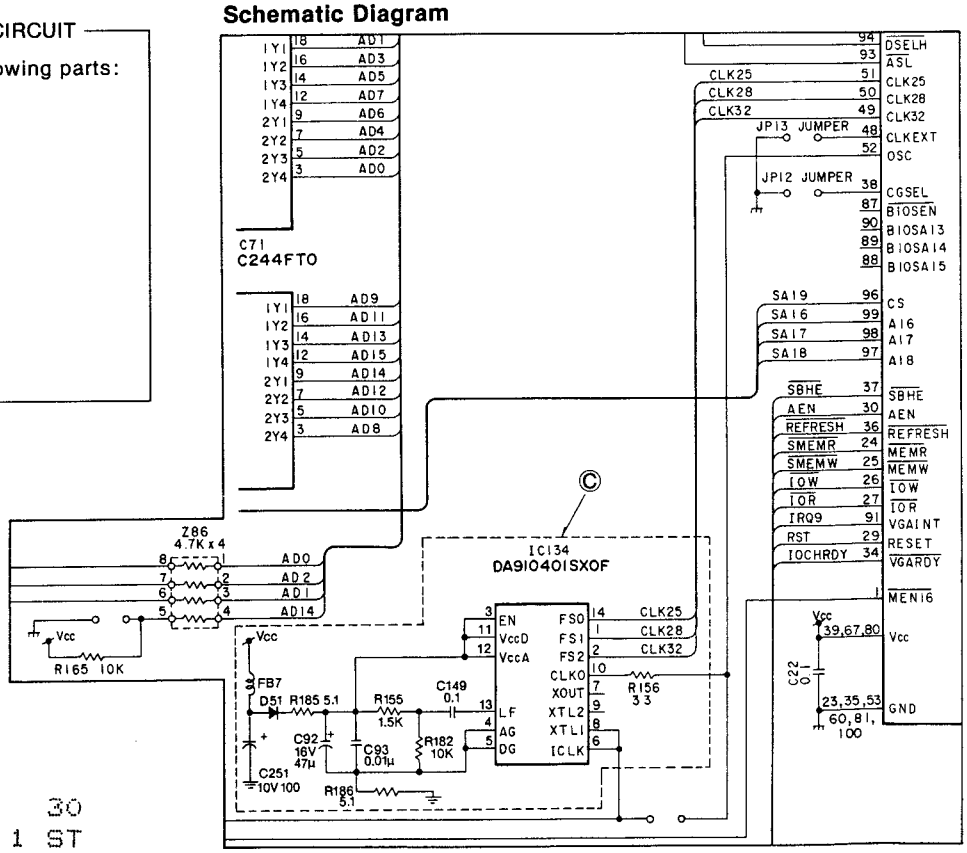
【Circuit 2】 Marked "©" area:

PLL TYPE OSCILLATION CIRCUIT

This circuit consists of the following parts:

IC134	DA910401SX0F
D51	MA701ATW
C92	ECEV1CV470SP
C93	ECUV1H103KBG
C149	ECUV1E104ZFG
C251	ECEA1AU101
R155	ERJ6GEYJ152V
R182	ERJ6GEYJ103V
R185	ERJ6GEYJ5R1V
R186	ERJ6GEYJ5R1V
FB7	ELEPL101KA

Schematic Diagram



(Refer to "Sheet No. 9 of 18" of the Original Service Manual.)

10060230 91000241 30
SPL6-CF270 1 ST
SVC MNL SUPPL

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Service Manual

Laptop Computer

CF-270
CF-270H6

Supplement

V04384

PCB change of FL Inverter and LCD Contrast Control

- Please file and use this supplement manual together with the service manual for Model No. CF-270, Order No. CPD9010459C0.
- This supplement manual supersedes Order No. CPD9107019S0.

Before you start servicing the FL Inverter PCB and LCD Contrast Control PCB for CF-270 or CF-270H6, please refer to the followings:

Parts Comparison Tables

LCD Contrast Control PCB

Ref. No.	Parts Name	Parts No.	
		Original	New
R802	CHIP JUMPER	—	ERJ6GEYJ0R00V
TH801	THERMISTOR, 10K ohm	DBT103J-U	—
TH803	THERMISTOR, 10K ohm	—	DBT103J-U
VR801	POTENTIOMETER, 10K ohm	DEVAI1B103-A	—
VR802	POTENTIOMETER, 10K ohm	—	DEVAI1B103-A

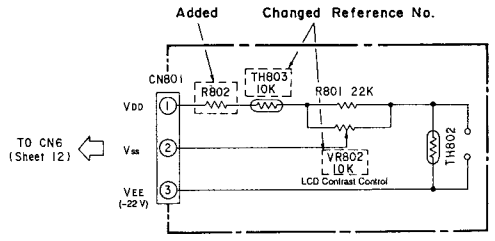
FL Inverter PCB

Ref. No.	Parts Name	Parts No.		
		Original	Modified	New
Q902	Transistor	2SA1674STA	2SB1241RTV2	2SB1241RTV2
C907	Capacitor 0.1µF	—	ECFZ1E104ZFB	ECUV1E104ZFG
C908	Capacitor 0.1µF	—	—	ECUV1E104ZFG

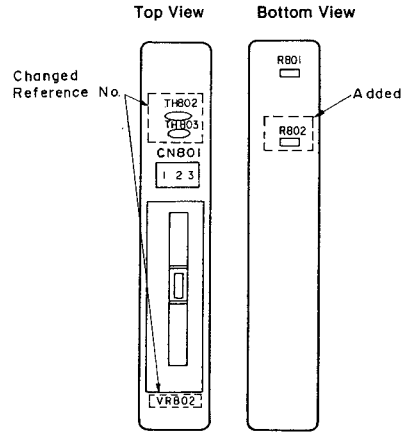
Schematic Diagram and Circuit Board

New LCD Contrast Control PCB

Schematic Diagram



Circuit Board



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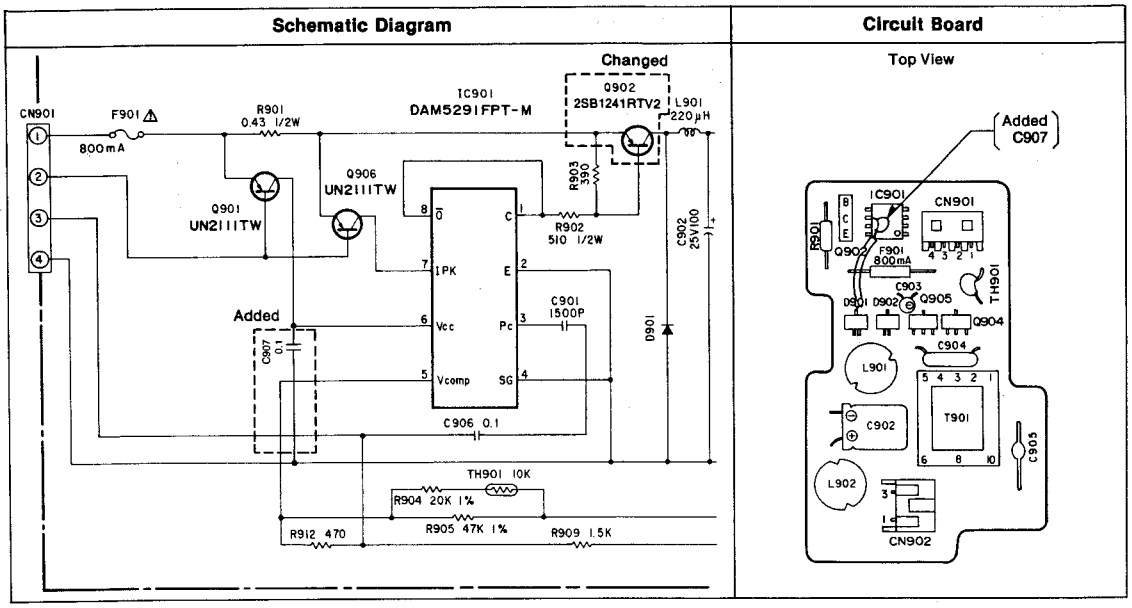
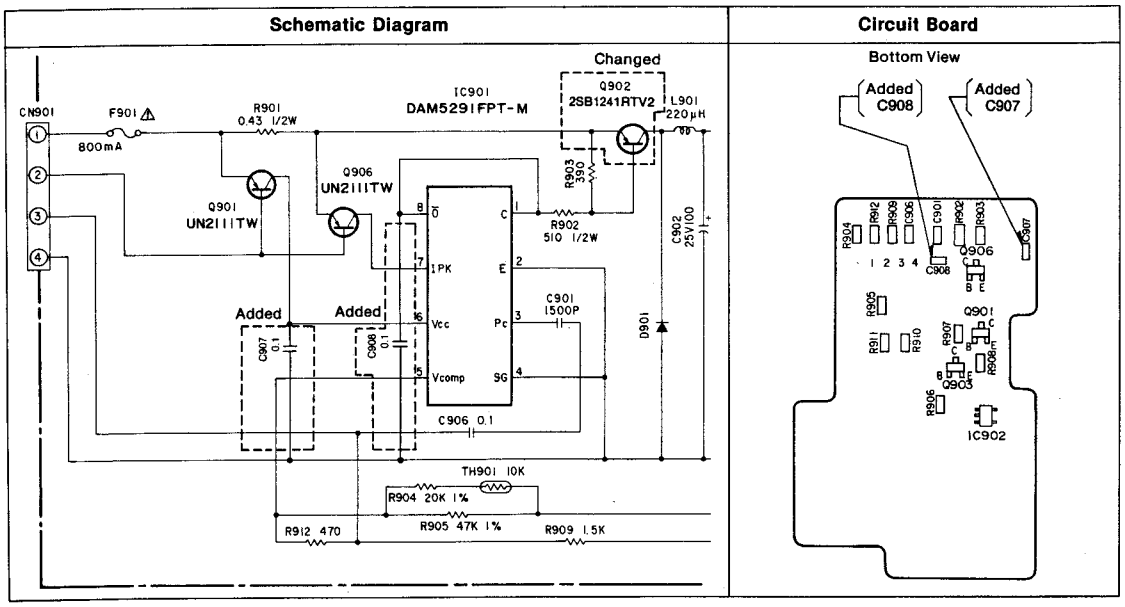
Modified FL Inverter PCB



New FL Inverter PCB



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Service Manual

Laptop Computer

CF-270
CF-270H6

Supplement

Circuit change of FL Inverter Circuit

Please file and use this supplement manual together with the service manual for Model No. CF-270, Order No. CPD9010459C0.

Befor you start servicing the FL Inverter PCB for CF-270 or CF-270H6, please refer to the followings:

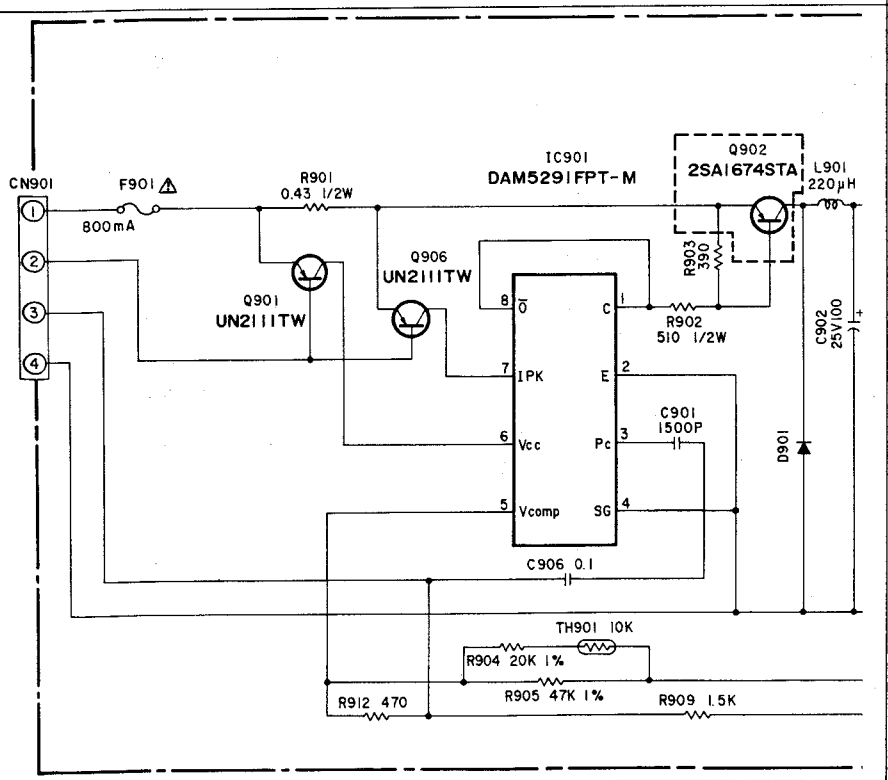
Parts Comparison Table

Ref. No.	Parts Name	Parts No.		
		Original	Modified	New
Q902	Transistor	2SA1674STA	2SB1241RTV2	2SB1241RTV2
C907	Capacitor 0.1µF	——	ECFZ1E104ZFB	ECUV1F104ZFG
C908	Capacitor 0.1µF	——	——	ECUV1F104ZFG

Schematic Diagram and Circuit Board

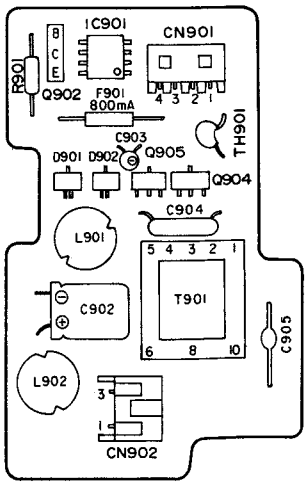
Original

Schematic Diagram



Circuit Board

Top View



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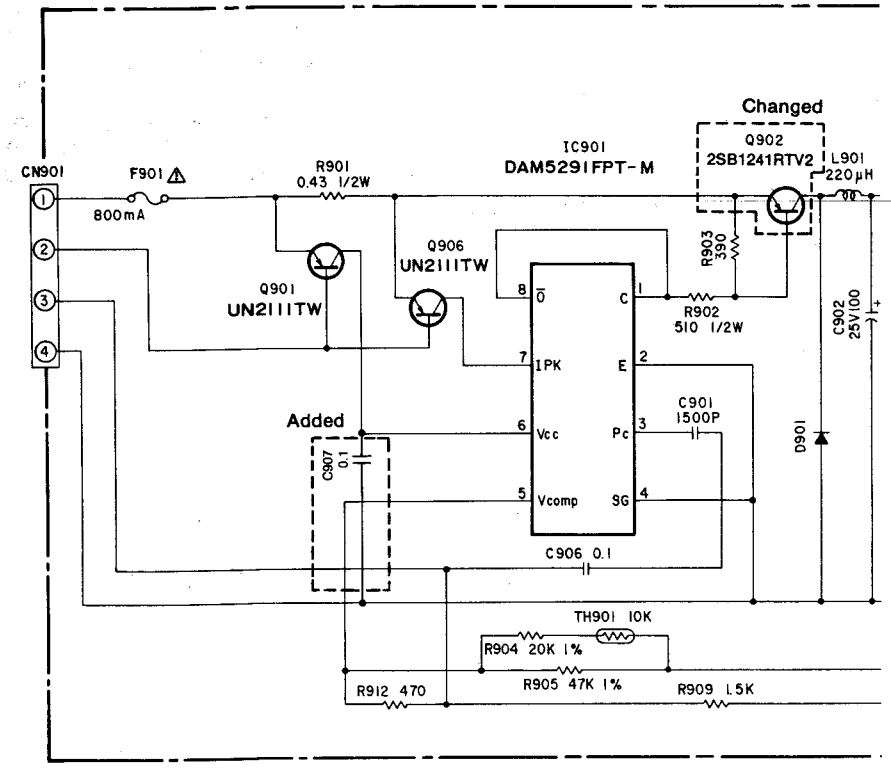
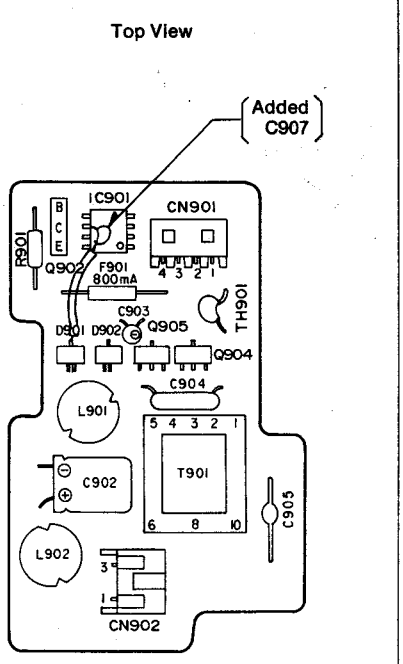
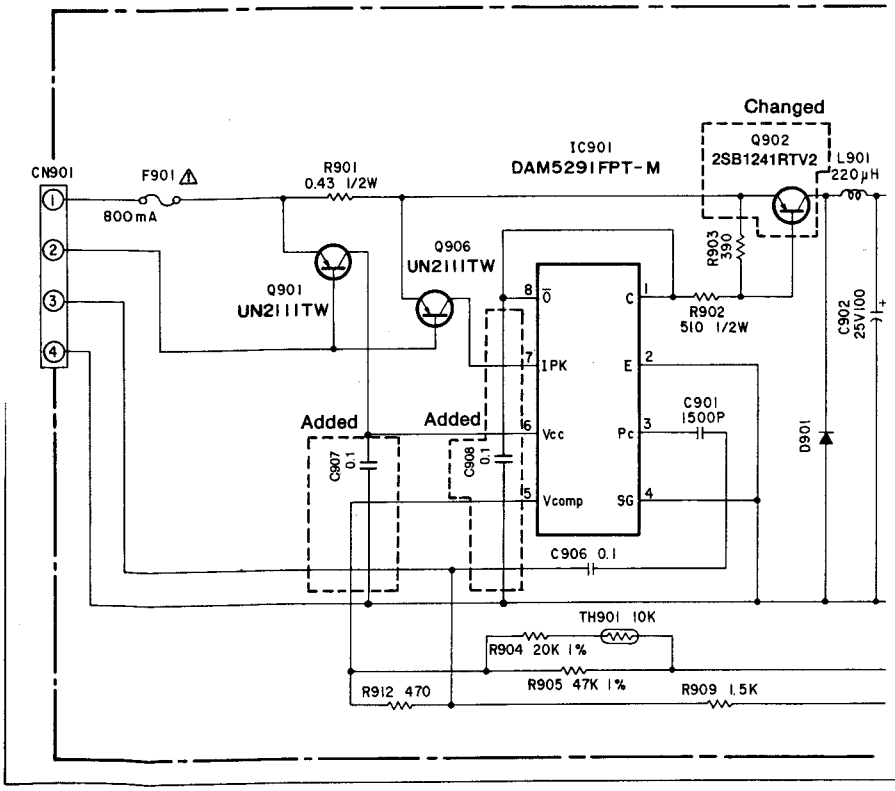
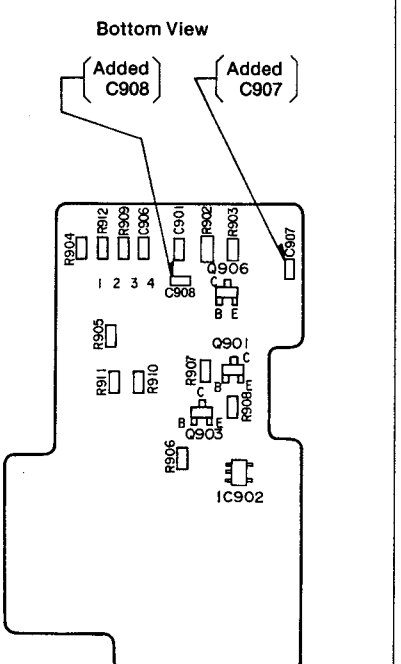
Schematic Diagram and Circuit Board

Modified

Schematic Diagram	Circuit Board
	

New

Schematic Diagram	Circuit Board
	

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Service Manual

Laptop Computer

CF-270

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Cabinet Part List and Exploded View

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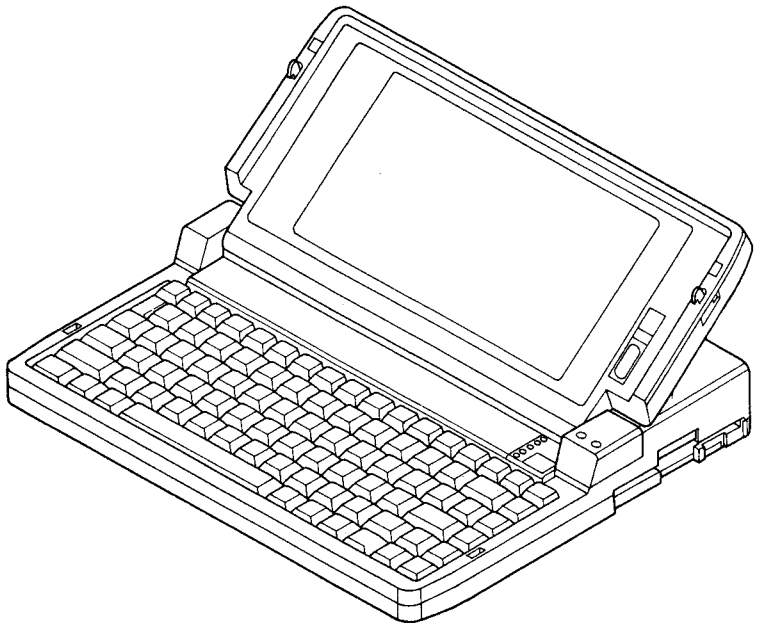

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PARTS COMPARISON TABLES

Ass'y Cabinet, Top

Ref. No.	Part No.		Qtty.
	Original	New	
K37	DFWV80A0098	DFWV80A0108	1

SCREW, M3x6mm

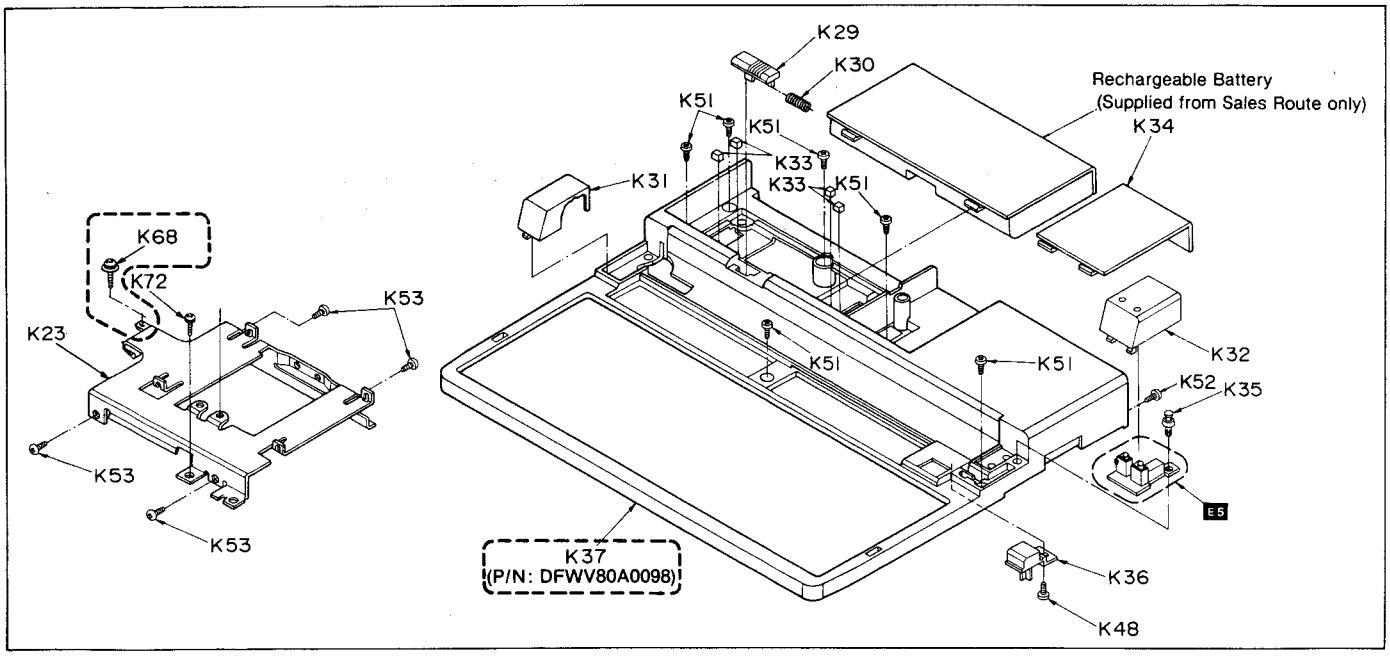
Ref. No.	Part No.	Qtty.	
		Original	New
K68	XYN3+J6	5	4

SCREW, M3x8mm

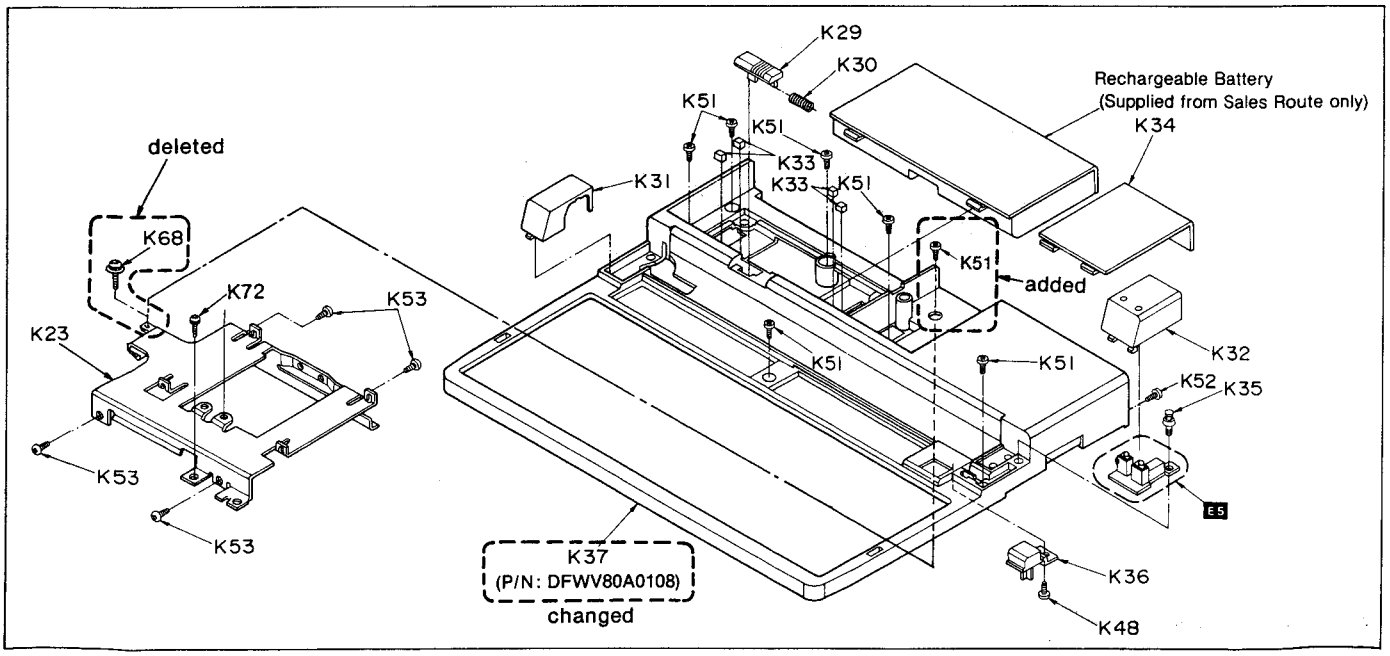
Ref. No.	Part No.	Qtty.	
		Original	New
K51	XSB3+8	6	7

EXPLODED VIEWS

OLD



NEW



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Service Manual

Laptop Computer

CF-270

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Please file and use this supplement manual together with the service manual for Model No. CF-270, Order No. CPD9010459C0.

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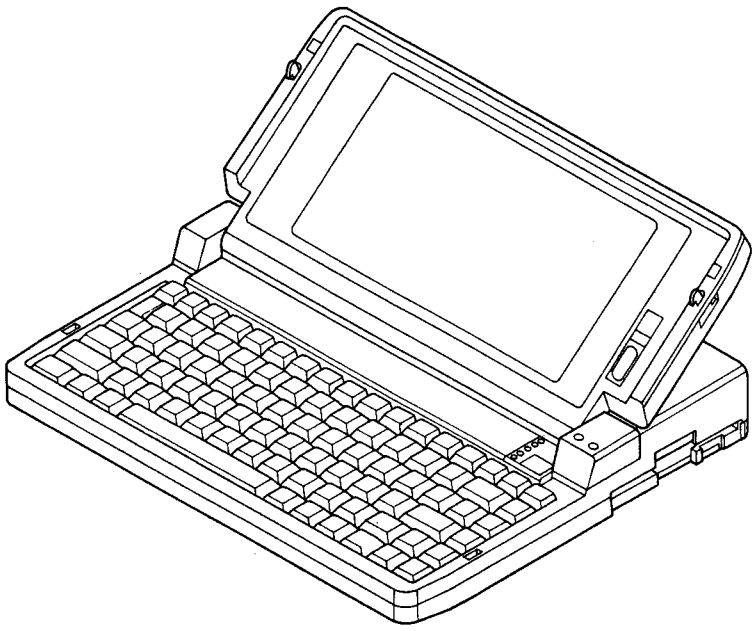

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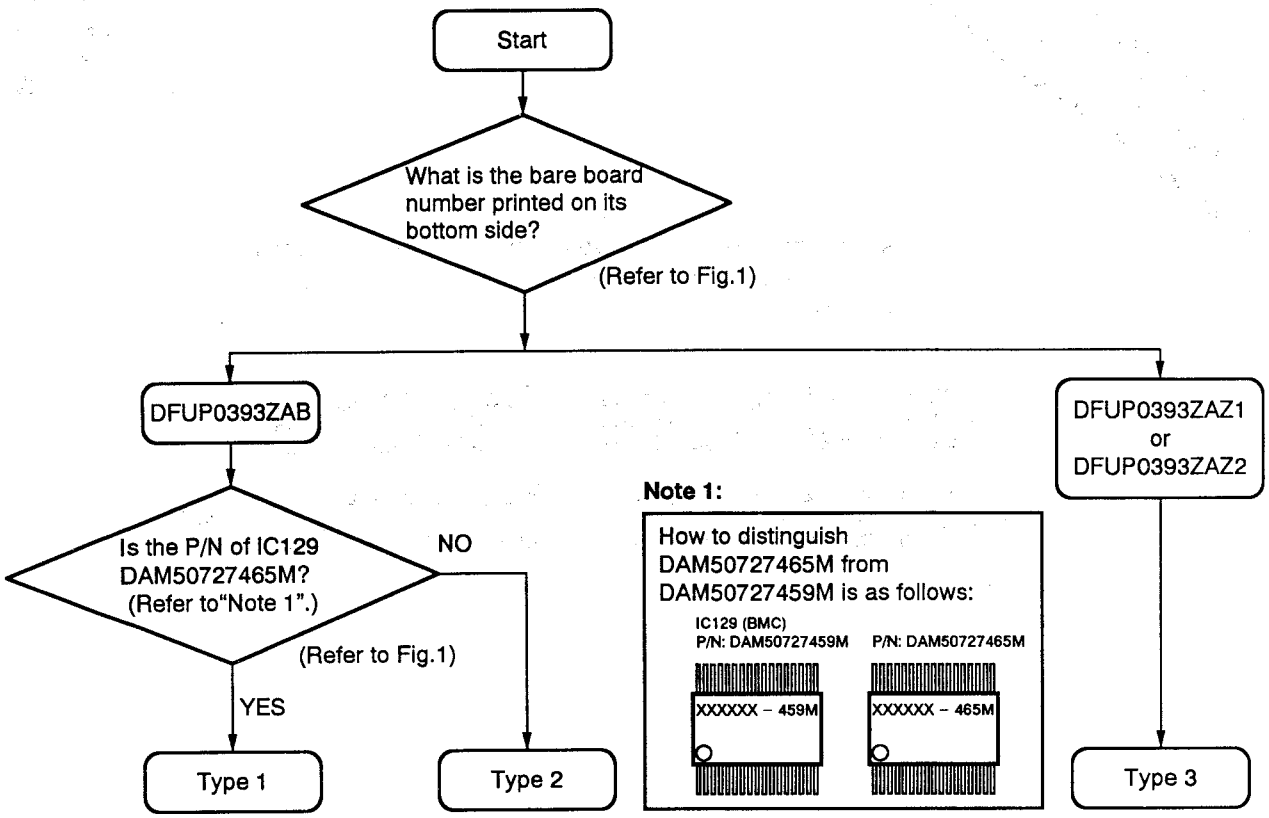
1. Selection of Main Logic Board

Before you start servicing the Main Logic Board (hereafter abbreviated to MLB) for CF-270, please follow the following flowchart to select the right schematic diagrams and parts locations for the MLB, since there are mainly 3 different types of MLBs (Type 1, Type 2 and Type 3).



Refer to the following parts location and schematic diagram according to the type of MLB selected.

Type	Parts Location	Schematic Diagram
Type 1	Pages 6~9	Diagrams A, B and C on Page 18. Diagram E on Page 19. Diagram F on Page 20 and 21.
Type 2	Pages 10~13	Diagrams A, B and C on Page 18. Diagram E on Page 19.
Type 3	Pages 14~17	Diagram D on Page 18. Diagram E on Page 19.

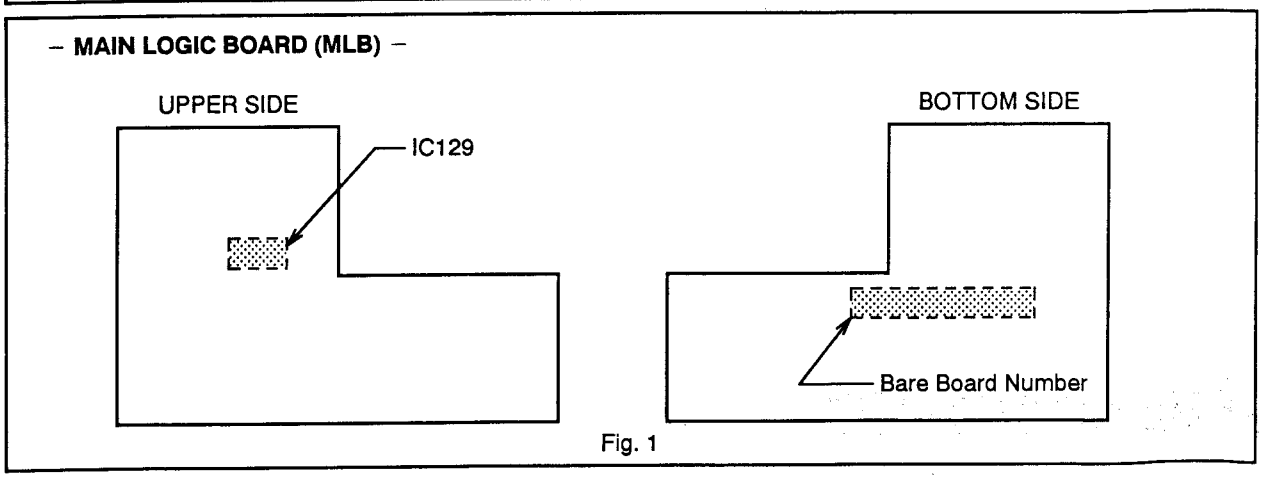
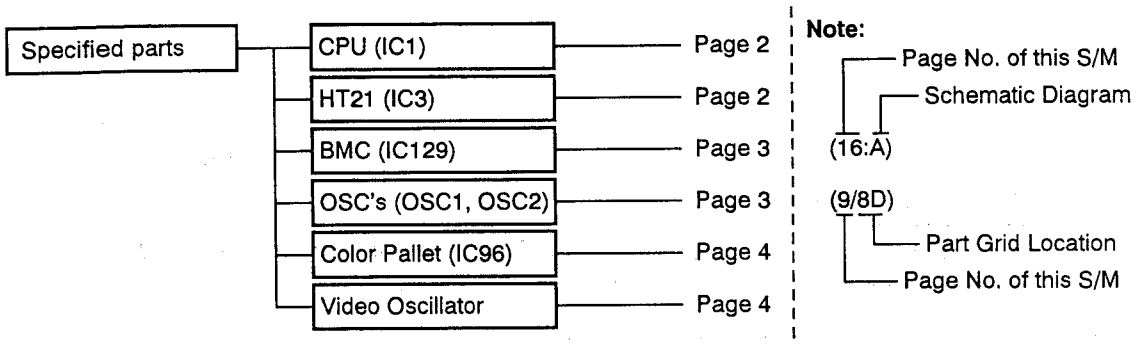


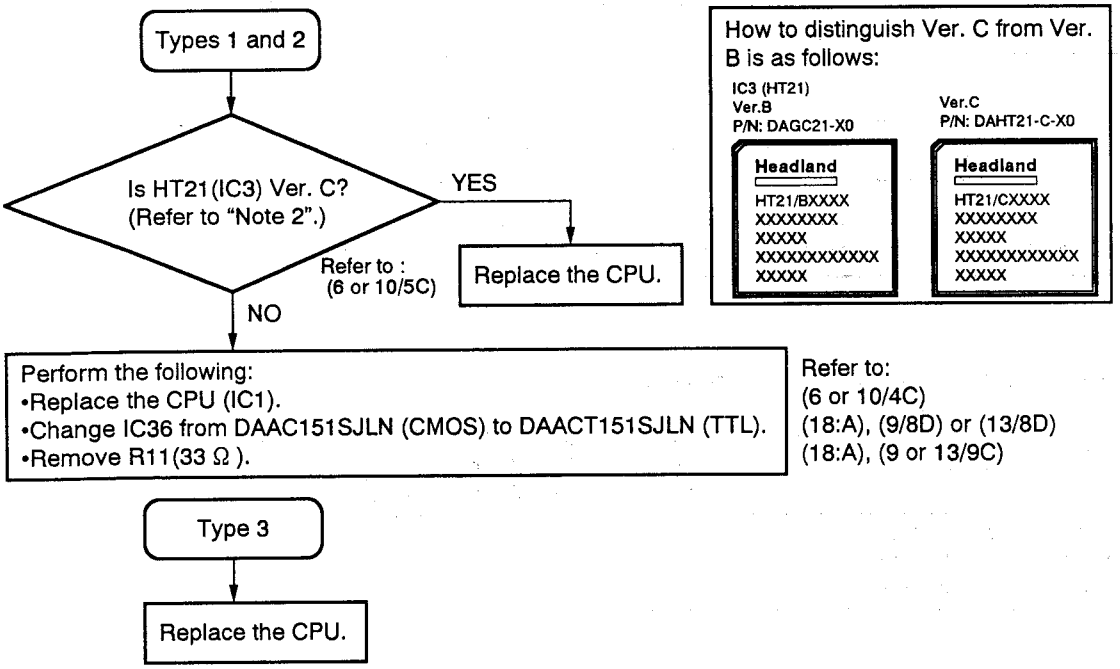
Fig. 1

2. Replacement of Specified Parts

When you need to replace the following specified part(s) for repairing MLB, please follow the following flowchart according to the type of MLB selected on Page 1.



● **In case of CPU(IC1) replacement:**



Note 2:

How to distinguish Ver. C from Ver. B is as follows:

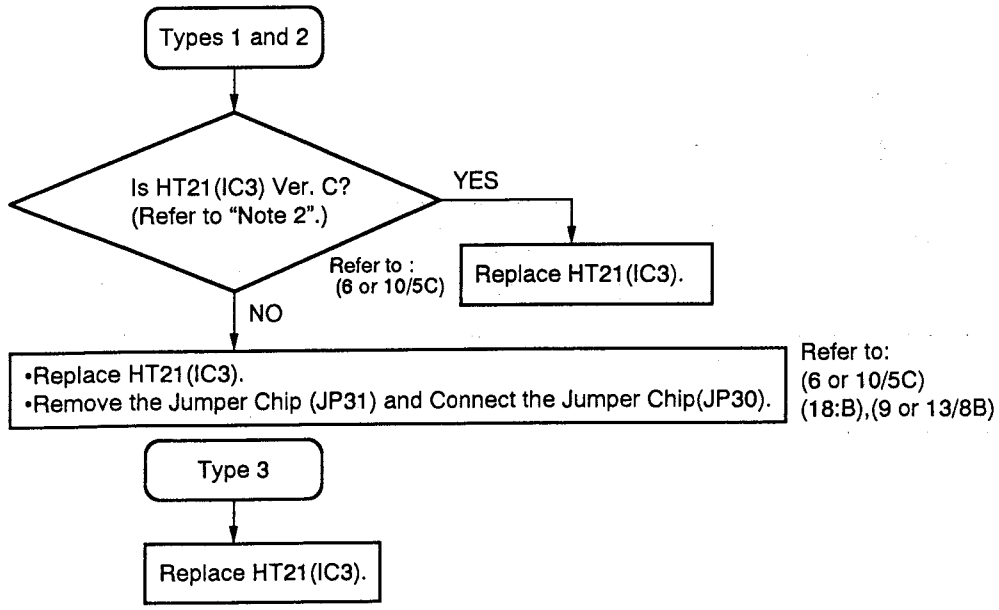
IC3 (HT21)
Ver.B
P/N: DAGC21-X0

Headland
HT21/BXXXX
XXXXXXXX
XXXXX
XXXXXXXXXXXX
XXXXX

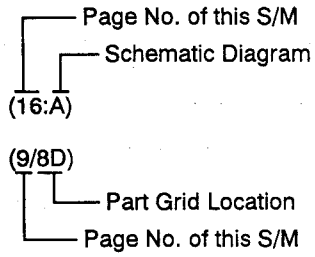
Ver.C
P/N: DAHT21-C-X0

Headland
HT21/CXXXX
XXXXXXXX
XXXXX
XXXXXXXXXXXX
XXXXX

● **In case of HT21(IC3) replacement:**



Note:



● **In case of BMC(IC129) replacement:**

Type 1

Note: The following BMC(IC129) is mounted on this type of MLB:
IC129 : DAM50727459M(OLD)

Perform the following: •Replace BMC(IC129) with old one, DAM50727459M. •Connect a jumper wire between Pins 13 and 15 of IC129. •Connect a jumper wire between Pins 12 and 16 of IC129	Refer to: (6/6E) (20:6A), (7/8G) (20:6A), (7/8G)

Types 2 and 3

Note: The following BMC(IC129) is mounted on this type of MLB:
IC129 : DAM50727465M(NEW)

Replace BMC(IC129) with new one, DAM50727465M.	Refer to: (10/6E) or (14/6E)

● **In case of OSC's(OSC1, OSC2) replacement:**

Types 1 and 2

Note: The following OSC's are mounted on these types of MLB:
OSC1: DECL14318P1H(4−Pin type)
OSC2: DECL32000P1H(4−Pin type)

Replace OSC(s) with the following part(s). OSC1: DECL14318P1H OSC2: DECL32000P1H	Refer to: (6 or 10/4B) (6 or 10/5D)

Type 3

Is the bare board number DFUP0393ZAZ1?

YES

Replace OSC(s) with the following part(s): OSC1: DECL14318P1H OSC2: DECL32000P1H	Refer to: (19:E),(14/5B) (19:E),(14/6D)

NO

Replace OSC(s) with the following part(s). OSC①: DECL14318P2H(3−Pin type) OSC2: DECL32000P2H(3−Pin type)	Refer to: (19:E),(14/5B) (19:E),(14/6D)

V02320

ORDER NO. CPD9103010C0

Service Manual

Laptop Computer

CF-270H6

60MB HDD

Please file and use this manual together with the service manuals for Model No. CF270, Order No. CPD9010459C0 and Model No. CF-270, Order No. CPD9011462A8.

This is the Service Manual for the following areas.

C	... for Canada
E	.....for U.K.
F	.....for France
G	.....for F.R. Germany
IT	.....for Italy
NL	.....for Netherlands
SP	.....for Spain
SW	.....for Sweden
FN	.....for Finland
SS	.....for Switzerland
A	.....for Australia
HK	.....for Hong Kong
BE	.....for Belgium

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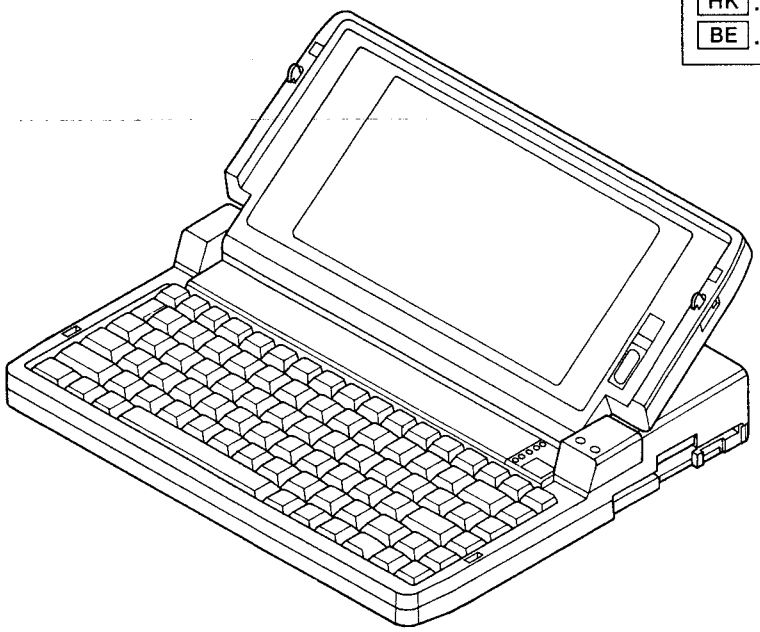

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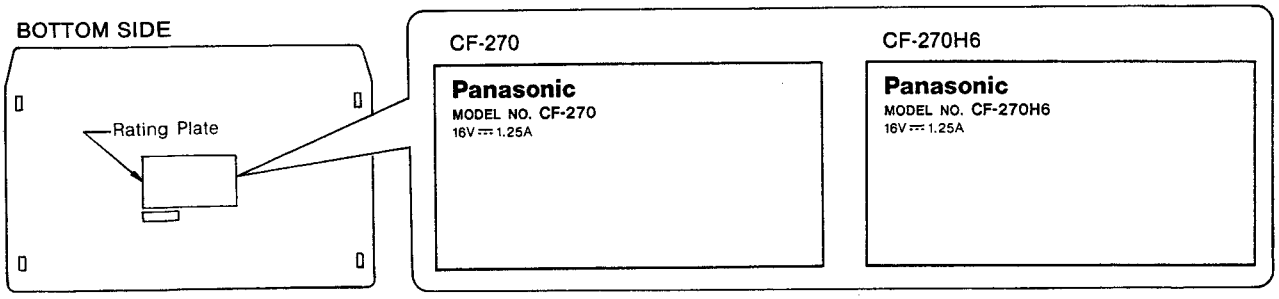
How to distinguish CF-270H6(60MB) from CF-270(20MB) is as follows:



Notes:"Basic Manual" denotes the original service manuals (Order Number CPD9010459C0 and CPD9011462A8).
For other parts which are not listed in the following table, refer to the original service manuals.

Parts Comparison Table

Ref. No.	Description	Part No.		Basic Manual Page No.
		CF-270	CF-270H6	
K23	FRAME, FDD HOLD	DFMD2032ZA	DFMD2032YB	6-45
K24	FRAME, HDD HOLD	DFMD2036ZA	DFMD2036YA	6-45
K45	Ass'y, CABINET, BOTTOM			
	(C)	DFWV80C0156	DFWV80C0198	6-45
	(E), (F), (G)	DFWV80C0163	DFWV80C0200	6-45
	(A), (BE), (HK)	DFWV80C0163	DFWV80C0200	1
	(IT), (NL), (SP), (SS)	DFWV80C0163	DFWV80C0200	1
	(SW)	DFWV80C0180	DFWV80C0200	1
	(FN)	DFWV80C0181	DFWV80C0199	1
K58	PLATE, SHIELD, HDD	DFMC0256ZA	DFMC0256XA	6-46
E1	Ass'y, MAIN, PCB			
	(C)	DL3U10393CA	DL3U10393CBD	6-46
	(F), (G)	DL3U10393EA	DL3U10393EBD	6-46
	(IT), (SP), (SS)	DL3U10393EA	DL3U10393EBD	1
	(SW), (FN), (BE)	DL3U10393EA	DL3U10393EBD	1
	(A), (HK)	DL3U10393FA	DL3U10393FBC	1
	(E), (NL)	DL3U10393EA	DL3U10393TAB	1
E9	Ass'y, HDD	DFWV44K0003	DFWV44K0004	6-46
IC7	IC, SYSTEM & VGA BIOS ROM			
	(C)	DA270M1	DA270M4	6-48
	(A), (HK)	DA270M1	DA270M4	2
	(F), (G)	DA270E1	DA270E2	6-48
	(IT), (SP), (SS)	DA270E1	DA270E2	2
	(SW), (FN), (BE)	DA270E1	DA270E2	2
	(E)	DA270E1	DA270B2	6-48
	(NL)	DA270E1	DA270B2	2
A1	MANUAL, GETTING STARTED			
	(C)	DFQX2280ZB	DFQX2337Z	6-53
	(E)	DFQX2291ZA	DFQX2338Z	6-53
	(A), (NL), (HK), (FN), (BE)	DFQX2291ZA	DFQX2338Z	2

(Continued)

Ref. No.	Description	Part No.		Basic Manual Page No.
		CF-270	CF-270H6	
	(F)	DFQX2289ZA	DFQX2340Z	6-53
	(G)	DFQX2287ZA	DFQX2339Z	6-53
	(SW)	DFQX2302Z	DFQX2343Z	2
	(SP)	DFQX2299Z	DFQX2342Z	2
	(IT)	DFQX2297Z	DFQX2341Z	2
	(SS) :GERMAN	DFQX2287ZA	DFQX2339Z	2
	(SS) :FRENCH	DFQX2289ZA	DFQX2340Z	2
A2	MANUAL, USER'S GUIDE			
	(C)	DFQX2292ZA	DFQX2292Y	6-53
	(E)	DFQX2314ZA	DFQX2314X	6-53
	(A), (NL), (HK), (FN), (BE)	DFQX2314ZA	DFQX2314X	2
	(F)	DFQX2315ZA	DFQX2315Y	6-53
	(G)	DFQX2316ZA	DFQX2316Y	6-53
	(SW)	DFQX2317Z	DFQX2317Y	2
	(SP)	DFQX2318Z	DFQX2318Y	2
	(IT)	DFQX2319Z	DFQX2319Y	2
	(SS) :GERMAN	DFQX2316ZA	DFQX2316Y	2
	(SS) :FRENCH	DFQX2315ZA	DFQX2315Y	2
A4	MANUAL, SHELL USER'S GUIDE			
	(C)	DFQX2294YA	DFQX2294Y	6-53
	(E)	DFQX2294YA	DFQX2294Y	6-53
	(A), (NL), (HK), (FN), (BE)	DFQX2294YA	DFQX2294Y	2
	(F)	DFQX2322Z	DFQX2322Z	---
	(G)	DFQX2321ZA	DFQX2321ZA	---
	(SW)	DFQX2323Z	DFQX2323Z	2
	(SP)	DFQX2324Z	DFQX2324Z	2
	(IT)	DFQX2325Z	DFQX2325Z	2
	(SS) :GERMAN	DFQX2321ZA	DFQX2321ZA	2
	(SS) :FRENCH	DFQX2322ZA	DFQX2322ZA	2
A5	DISK, INSTALLATION DISK 1			
	(C)	DFJN231ZA	DFJN231ZB	6-53
	(E)	DFJN233ZA	DFJN233ZB	6-53
	(A), (NL), (HK), (FN), (BE)	DFJN233ZA	DFJN233ZB	2
	(SW), (SP), (IT)	DFJN233ZA	DFJN233ZB	2
	(F)	DFJN237ZA	DFJN237ZB	6-53
	(G)	DFJN235ZA	DFJN235ZB	6-53
	(SS)	DFJN235ZA	DFJN235ZB	2
A6	DISK, INSTALLATION DISK 2			
	(C)	DFJN232ZA	DFJN247ZA	6-53
	(E)	DFJN234ZA	DFJN249ZA	6-53
	(A), (NL), (HK), (FN), (BE)	DFJN234ZA	DFJN249ZA	2
	(SW), (SP), (IT)	DFJN234ZA	DFJN249ZA	2
	(F)	DFJN238ZA	DFJN253ZA	6-53
	(G)	DFJN236ZA	DFJN251ZA	6-53
	(SS)	DFJN236ZA	DFJN251ZA	2

(Continued)

Ref. No.	Description	Part No.		Basic Manual Page No.
		CF-270	CF-270H6	
P3	PACKING CASE			
	(C)	DFPK0455ZA	DFPK0497ZA	6-53
	(E), (F), (G)	DFPK0456ZA	DFPK0498ZA	6-53
	(IT), (NL), (SS), (A), (BE)	DFPK0456ZA	DFPK0498ZA	2
	(FN), (HK), (SW)	DFPK0456ZA	DFPK0498ZA	2
	(SP)	DFPK0457Z	DFPK0499ZA	2

AC ADAPTER

For (C) area

Ref. No.	Part No.
	CF-270H6
E10	CF-AA183MK

For (E), (F), (G), (NL), (SP), (SW), (FN), (SS), (A), (HK) and (BE) areas

Ref. No.	Part No.
	CF-270H6
E10	CF-AA184G3

AC Cable

For (E) area

Ref. No.	Part No.
	CF-270H6
E11	DFJA04ZBKK

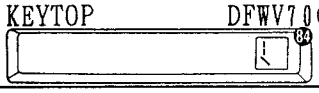
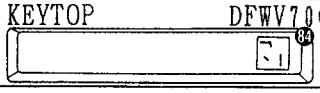
For (F), (G), (HK), (IT), (NL), (SP), (SW), (FN) and (BE) areas

Ref. No.	Part No.
	CF-270H6
E11	DFJA0032ZAKK

For (A) area

Ref. No.	Part No.
	CF-270H6
E11	DFJA07YB-K

Only for (E) and (NL) areas.

Ref. No.	Part No. and Description				Basic Manual Page No.
	CF-270(E)(NL)		CF-270H6(E)(NL)		
E7	KEYBOARD	DFWV43H065Z	KEYBOARD	DFWV43H072Z	6-56
E7-1	KEYTOP Ass'y	DFWV70C5502	KEYTOP Ass'y	DFWV70C6108	6-56
45	KEYTOP 	DFWV70C5291	KEYTOP 	DFWV70C6067	6-56
84	KEYTOP 	DFWV70C5330	KEYTOP 	DFWV70C6106	6-56
85	KEYTOP 	DFWV70C5331	KEYTOP 	DFWV70C6107	6-56

Keyboard Encoder

Ref. No.	Part No.		Basic Manual Page No.
	CF-270(E)(NL)	CF-270H6(E)(NL)	
IC121	DAN80C51BHAI	DAN80C51BKAI	6-49

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Service Manual

Laptop Computer

CF-270H6

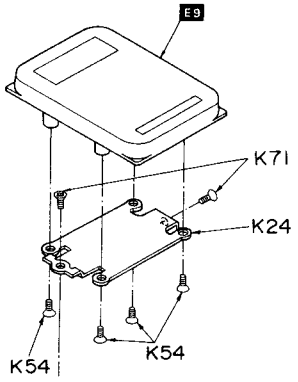
60MB HDD

Supplement

Please file and use this supplement manual together with the service manual for Model No. CF-270H6, Order No. CPD9102008A1 or Order No. CPD9103010C0.

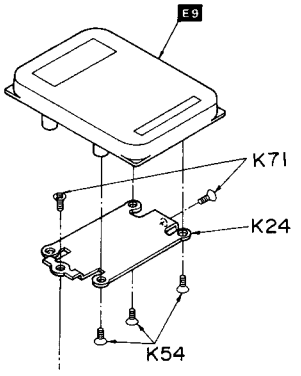
CF-270

Ref. No.	Part No.	DESCRIPTION	Qtty.
K54	XSSDF28+6FN	SCREW, M2.8×6mm, HDD	4



CF-270H6

Ref. No.	Part No.	DESCRIPTION	Qtty.
K54	XSS3+6FN	SCREW, M3×6mm, HDD	3



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Service Manual

Laptop Computer

CF-270
CF-270H6

Supplement

PCB change of FL Inverter and LCD Contrast Control

- Please file and use this supplement manual together with the service manual for Model No. CF-270, Order No. CPD9010459C0.
- This supplement manual supersedes Order No. CPD9107019S0.

Before you start servicing the FL Inverter PCB and LCD Contrast Control PCB for CF-270 or CF-270H6, please refer to the followings:

Parts Comparison Tables

LCD Contrast Control PCB

Ref. No.	Parts Name	Parts No.	
		Original	New
R802	CHIP JUMPER	—	ERJ6GEYJ0R00V
TH801	THERMISTOR, 10K ohm	DBT103J-U	—
TH803	THERMISTOR, 10K ohm	—	DBT103J-U
VR801	POTENTIOMETER, 10K ohm	DEVAI1B103-A	—
VR802	POTENTIOMETER, 10K ohm	—	DEVAI1B103-A

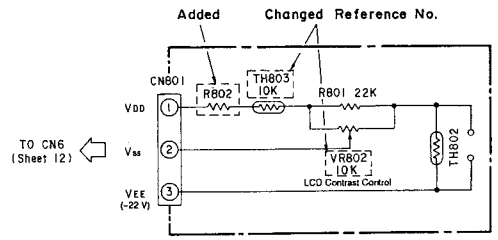
FL Inverter PCB

Ref. No.	Parts Name	Parts No.		
		Original	Modified	New
Q902	Transistor	2SA1674STA	2SB1241RTV2	2SB1241RTV2
C907	Capacitor 0.1µF	—	ECFZ1E104ZFB	ECUV1E104ZFG
C908	Capacitor 0.1µF	—	—	ECUV1E104ZFG

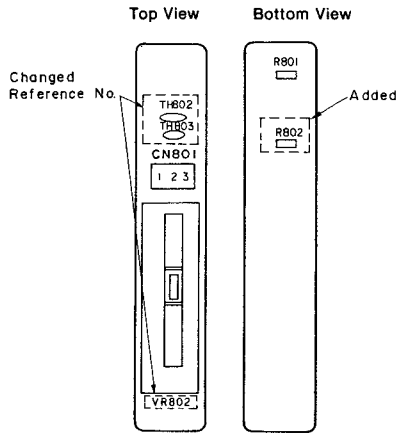
Schematic Diagram and Circuit Board

New LCD Contrast Control PCB

Schematic Diagram



Circuit Board



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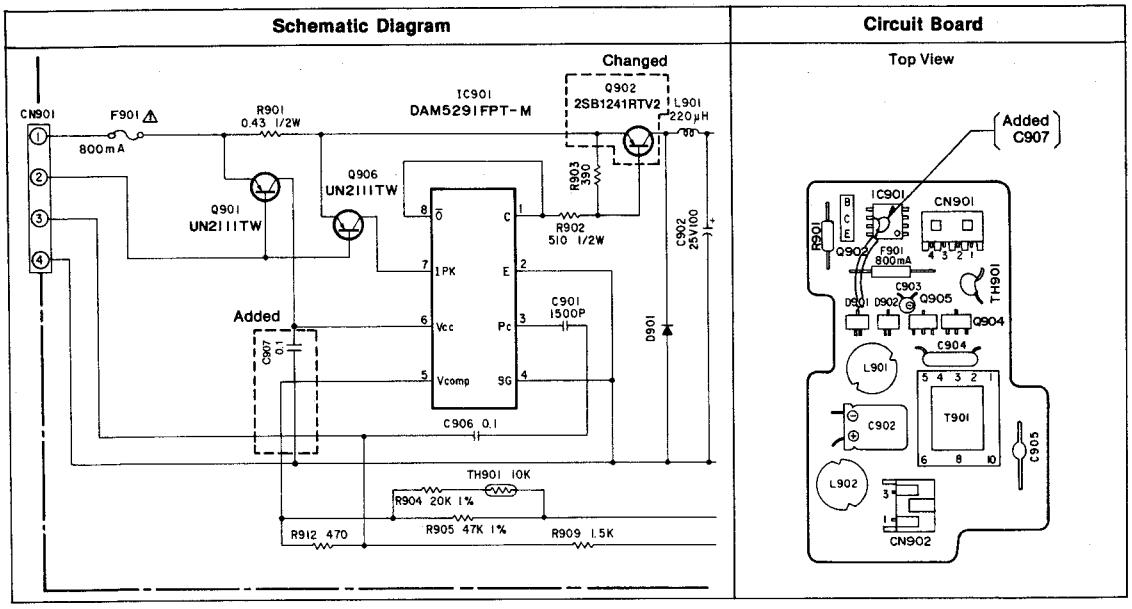
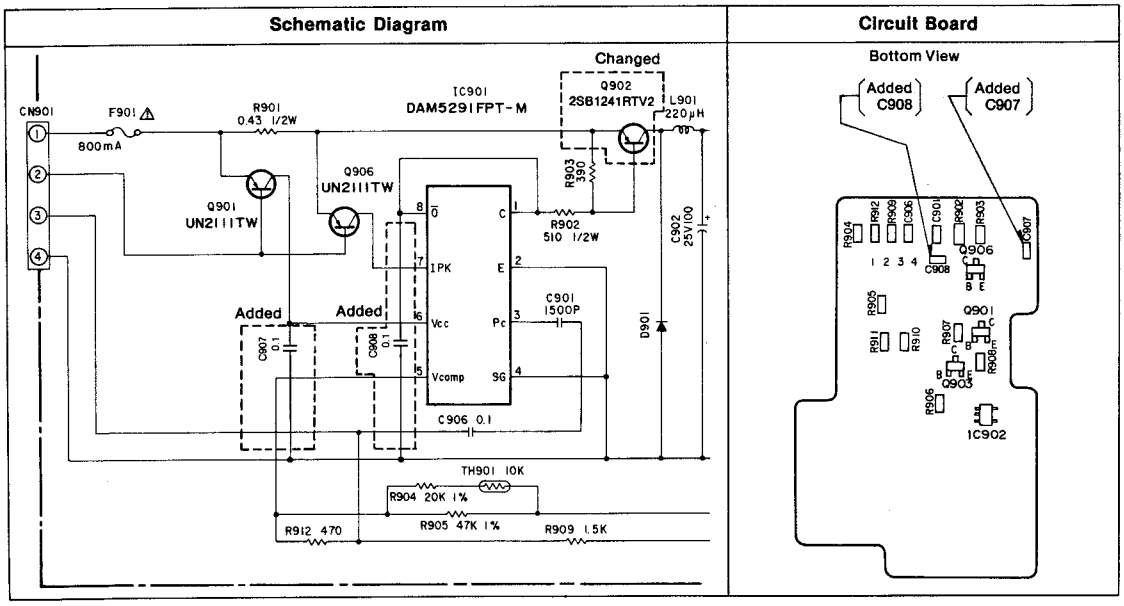
Modified FL Inverter PCB



New FL Inverter PCB



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