DD-1EX

SERVICE MANUAL

US Model
AEP Model
UK Model

DATA Discman

Model Name Using Similar Mechanism	NEW
CD Mechanism Type	CDM-DD1
Optical Pick-up Block	KSS-300A

SPECIFICATIONS

Model — Electronic book player
D/A conversion — 16-bit linear digital filter

Laser diode properties
Material — GaAlAs
Wave length — 780 nm
Emission duration — Continuous
Laser output — Less than 44.6 μW
(This output is the value measured at the distance of 200 mm from the objective lens surface on the Optical Pick-up Block.)

Output connector
When the power voltage is 9 V
VIDEO OUT — Mini jack
Maximum output level 1 Vp-p
Load impedance 75 ohms
PHONES — Stereo mini jack
Maximum output level 7 mW + 7 mW
Load impedance 32 ohms

Power
Power requirements — Supplied:
- DC IN 9 V jack accepts the Sony AC power adaptor.
  120 V AC, 60 Hz
- BP-45 rechargeable battery pack

Not supplied:
- Six size AA (LR6) dry batteries using the supplied EBP-45 battery case
- 12 V DC using the DCC-E190M car battery cord

Power consumption — 2.5 W DC

General
Dimensions — Approximately 107.6 × 43.1 × 159.2 mm ($4\frac{1}{4} \times 1\frac{11}{16} \times 6\frac{3}{8}$ in.) (w/h/d) including the rechargeable battery pack
Weight — Approximately 580 g (1 lb 20 oz) not including the rechargeable battery pack
Approximately 705 g (1 lb 25 oz) including the rechargeable battery pack
Supplied accessories — AC power adaptor (1)
Rechargeable battery pack (1)
Battery case (1)
Video connecting cord (1)
Electronic book

Design and specifications are subject to change without notice.

使用時は添付資料も参照のこと
Refer to the additional documents.

ELECTRONIC BOOK PLAYER

SONY®

TABLE OF CONTENTS

SECTION 1
SERVICING NOTES

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Before Replacing the Optical Block

Please be sure to check thoroughly the parameters as par the "Optical Block Checking Procedures" (Part No. : 9-960-027-11) issued separately before replacing the optical block. Note and specifications required to check are given below.

- FOK output : IC501 (9) pin
  When checking FOK, remove the solder between R553 and IC501 (32) pin (FE).
- S carve P-to-P value : 2.95 Vp-p.
- Adjusted part for focus gain adjustment: RV503
- RF signal P-to-P value : 0.75 – 1.4 Vp-p
- Traverse signal P-to-P value : 1.8 Vp-p
- The repairing grating holder is impossible.
- Adjusted part for tracking gain adjustment : RV504

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe more than 30cm away from the objective lens.

Laser Diode Check Procedure

The laser diode on this set will not emit unless the top panel is closed and S806 (OPEN DOOR SW) is turned on.
The laser diode will always emit even if focus is not performed in service mode.
The laser diode is checked using the current value which flows to the laser diode inside the optical pick-up block.

Procedure 1 (service mode or normal operation)

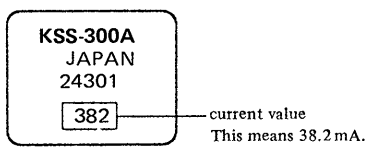
Check the laser diode emission with the eye.

1. Open upper panel.
2. S806 on as Fig. 1.
   (In service mode, this operation is not necessary.)
3. Press the ▶II key.
   (In service mode, this operation is not necessary.)
4. Observe the objective lens and confirm that the laser diode is emitting light. At this time, the laser diode goes on about 10 seconds due to focus serarch. If it does not, APC circuit or optical pick-up block is defective.

Procedure 2 (service mode or normal operation)

Check by the current with flows in the laser diode.

1. Close the top panel.
2. Remove the main board and read the current value on the label affixed to the optical pick-up block.
   (Label on optical pick-up block)



   The current value varies with the set.
3. Connect a VOM to TP1 and TP2 (R544 both ends.) on SERVO board (See page 26.)
4. Press the ▶II key.
5. Calculate the current by the VOM reading.
   VOM reading (V) ÷16.5=current (A)
   ex. VOM reading=0.63 V
   0.63 V÷16.5=0.038 (A) =38 mA
6. Confirm within the range given below.
   value on label $^{+5}_{-11}$ mA (25℃)
   variation relative to temperature : 0.4mA/℃
   (Current increases when temperature rises and decreases when it drops.)

If the value is more than the range give, APC circuit has been defective or the laser diode has deteriorated.
If it is less, APC circuit or optical pick-up block is defective.

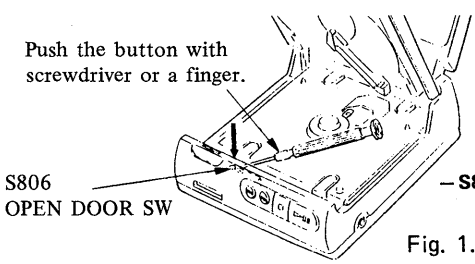


Fig. 1.

SERVICE MODE (service program)

This set has built-in service program in the microcomputer as usual sets.
The operation method of service program is explained below.

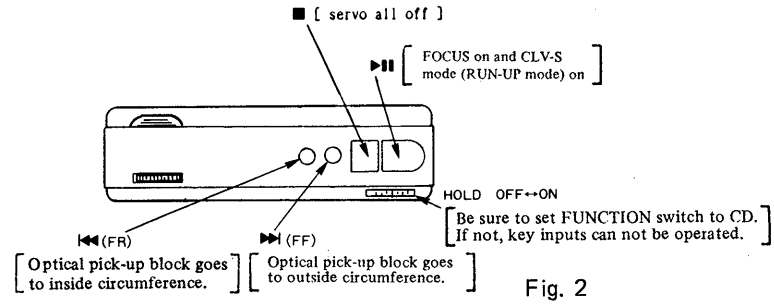


Fig. 2

- **Step 1 (Service Mode setting method)**

The following are two methods of setting this unit into the service mode.

Pressing multiple operation buttons at one time

1. Press the STOP (■) button to set the unit into the power off condition.
2. While pressing the ⏮ , (ALPHABET/NUMBER), and (F1) buttons simultaneously, press the ▶II (POWER ON) button.

Short-circuiting the soldering bridge

1. Solder the service mode tap to short-circuit it, with the external power removed (Do not supply power to the set). (Refer to page 26 for the position.)
2. Supply the external power.
3. Press the PLAY button.

After the above, the set mode switches to the service mode (F1 mode).

- **Step 2 (Service Mode operation)**

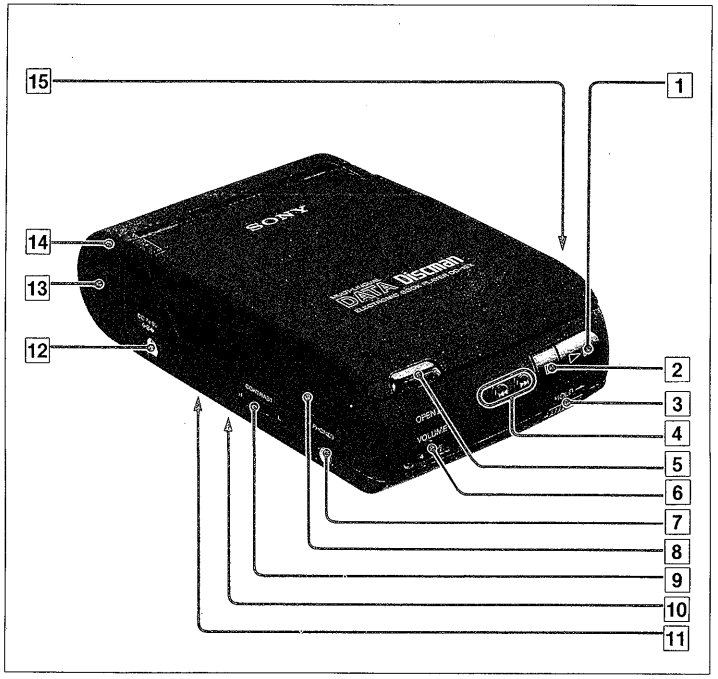
1. When service mode is set, the display will change 5 times, and those 5 changes will be repeated over and over with 3 second interval.
   With this the LCD display should be present in service mode. Even if LCD dose not display, other operations will be performed.
2. When ⏭ or ⏮ key is pressed, the optical pick-up block moves to the inside or outside circumference. Tracking servo and sled servo go off when this is done, so press KEY-MODE to turn on the tracking servo if necessary.
3. When ▶II key is pressed, CLV-S (pull-in mode) starts while performing focus search. When there is no disc installed, focus search is repeated several times while disc motor is rotating.
4. When KEY-MODE is pressed, tracking servo, sled servo and CLV-A (servo during PLAY) go ON.
5. When 3 and 4 are performed, the disc begins to play. At this time, the top panel should be closed and S801 is to be ON. A sound is not produced as muting is ON.
6. All servo (focus, tracking, sled and spindle) go off when ■ key is pressed.

- **Step 3 (Service Mode release)**

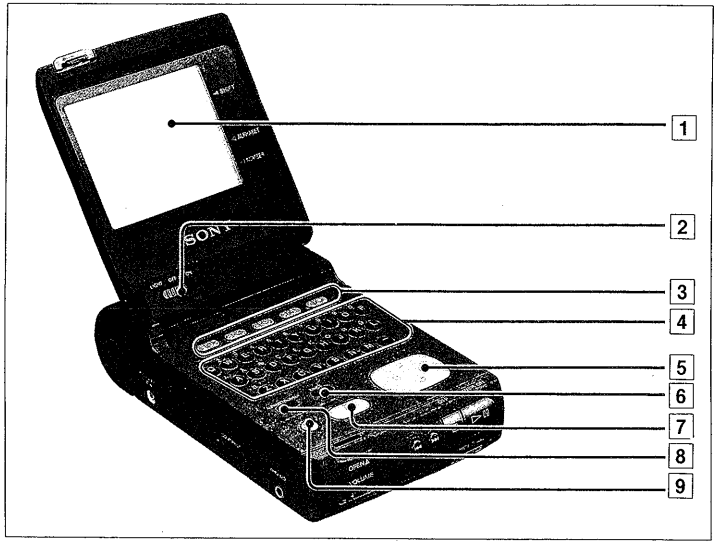
1. First be sure to unplug the external power supply, then remove the soldering bridge in case it has been short-circuited in step 1.
2. The set will now operated normally.

Locating the Controls

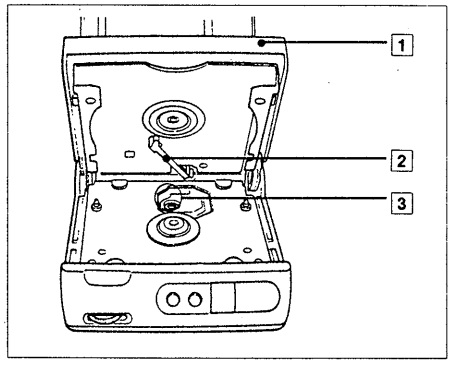
This section describes the location of the controls. Refer to the pages indicated to learn how to operate the controls. To learn how to operate the keyboard, refer to the User's Guide.



1 ▶II (POWER ON) button (page 26)
2 ■ (OFF) button (page 27)
3 HOLD switch (page 28)
4 I◀◀ ▶▶I buttons (page 32)
5 OPEN ▲ button (page 24)
6 VOLUME control (page 31)
7 PHONES jack (page 30)
8 Tab (page 24)
9 CONTRAST control (page 27)
10 TV select switch (page 21)
11 Reset switch (page 41)
12 DC IN 9V jack (pages 13 and 20)
13 RELEASE button (page 14)
14 Rechargeable battery pack (page 14)
15 VIDEO OUT jack (page 21)



1 Display
2 LIGHT switch (page 28)
3 Function keys
4 Letter and number keys
5 ▲▼◀▶ (cursor) key
6 SHIFT key
7 YES key
8 ALPHABET/NUMBER key
9 NO key



1 Disc compartment lid
2 Open lever
3 Lens (page 37)

What is an Electronic Book?

An electronic book is an 8 cm (3 inch) CD-ROM (Compact Disc – Read Only Memory). It is a device used to store information, such as text, pictures, etc., just like an ordinary book.
The electronic book caddy is specially designed to hold and protect the data on the CD-ROM.

What is the Electronic Book Player?

When you read a regular book, all you have to do is open the book and flip through the pages. To read an electronic book, you need a special device to read and visually display information. The device you need is called the Electronic Book Player.

What You Can Do with the Electronic Book Player

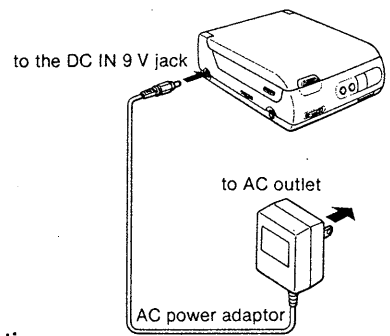
With the electronic book player, you can search for articles in an electronic book. Several methods, such as Word Search, Keyword Search, Menu Search, etc., are available to search for the desired information in an electronic book. See the User's Guide for details.

Choosing a Power Source

The electronic book player can be used with various power sources, such as with the current in your home or office, the rechargeable battery pack, batteries or a car battery. Read the information that follows to learn how to connect the electronic book player to the different power sources.

Using the Current in Your Home or Office

You need to use the AC power adaptor (supplied) to access the current in your home or office.
To connect the AC power adaptor, see the illustration.

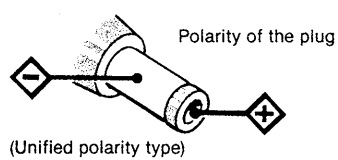


Caution

Do not plug the AC power adaptor into an AC outlet while using dry batteries. This will cause the batteries to discharge quickly.

Note on the AC power adaptor

- Use only the supplied AC power adaptor.
- Never use any other adaptor manufactured by Sony because the polarity of the supplied adaptor is opposite that of conventional adaptors.



(Unified polarity type)

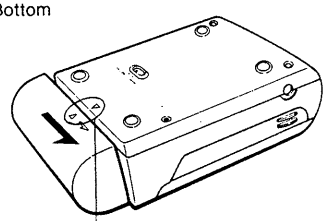
Using the Rechargeable Battery Pack

To use the rechargeable battery pack (supplied), see the information below.

When the rechargeable battery pack should be charged
The rechargeable battery pack should be fully charged when using it for the first time or you see the flashing ▬ mark in the lower right corner of the display.

Attaching the rechargeable battery pack
To attach the rechargeable battery pack, see the illustration.

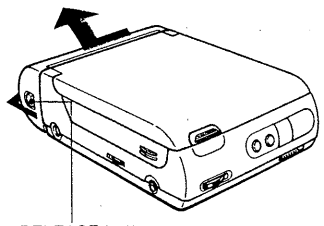
Bottom



Match the marks (▶◀) and slide in the direction of the arrow.

Removing the rechargeable battery pack
To remove the rechargeable battery pack, see the illustration.

Press and hold down the RELEASE button in the direction of the arrow, and remove the pack.



RELEASE button

Charging the rechargeable battery pack
To charge the rechargeable battery pack, follow this procedure:

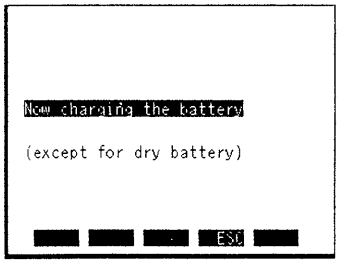
1 Attach the rechargeable battery pack to the player.

2 Connect the AC power adaptor (refer to "Using the Current in Your Home or Office" on page 13).

3 Press ▶II (POWER ON).

A message appears on the display.
If no message is visible, adjust the contrast (see "Adjusting the Contrast" on page 27).

4 When "BATT" appears in the center black box at the bottom of the display, press F3.
Wait for the message "Now charging the battery" to appear.
It takes about five hours to charge completely.



After charging, "Charge complete" appears on the display.
The battery pack is ready to use.

5 Disconnect the AC power adaptor.

The rechargeable battery pack usually lasts for about 2.5 hours when it is fully charged, and for about 2 hours when the display light is used (see "Using the Display Light" on page 28).

Notes

- When recharging the fully discharged battery pack, the message "Cannot charge the battery" appears on the display. But the message "Now charging the battery" appears soon after connecting the AC power adaptor.
- Pressing ■ (OFF) or opening the disc compartment lid of the player does not interrupt charging.

To operate the player while charging

Press (NO) or (F4) (ESC).

To stop charging the battery pack

Disconnect the AC power adaptor.

Checking the amount of remaining power

To check the amount of remaining power in the battery pack, follow this procedure:

1 Disconnect the AC power adaptor.

2 Press ▶II (POWER ON).

3 Press (F3) (BATT).

The amount appears on the display.
If the rechargeable battery pack is discharged under a certain level, "The battery is empty" appears.
If the battery pack is completely discharged, no message appears or you cannot turn on the player.

Battery life

Buy a new BP-45 rechargeable battery pack when you see that the operating time is reduced to about half of the normal time when a fully charged battery pack is used.

Notes on charging

- Be sure to use the supplied AC power adaptor when charging the battery pack.
- When you disconnect the AC power adaptor while charging the battery pack, the existing amount of power is displayed. However, the precise amount is not displayed due to conditions of temperature, usage, etc. Therefore, allow the battery pack to fully charge for at least five hours.
- The battery life of the battery pack will be significantly reduced if you regularly recharge the pack before it has been completely discharged. We recommend that you recharge the battery pack when the flashing ▬ mark appears in the lower right of the display.

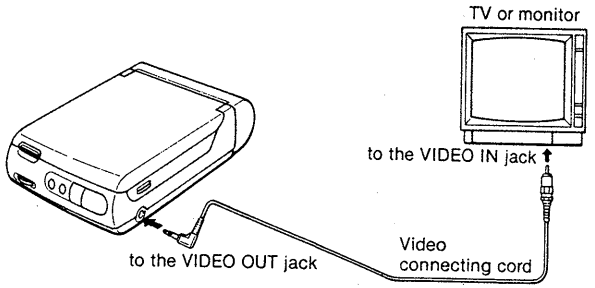
Notes on the rechargeable battery pack

- Store the battery pack at a temperature between 5°C (41°F) and 35°C (95°F) for best performance.
- Keep the battery pack away from fire.
- Do not short-circuit the battery terminals.
- Do not disassemble the battery pack.

Connecting the Electronic Book Player to Your TV

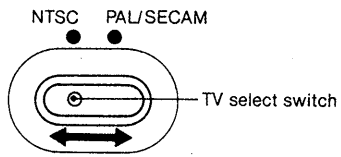
Use the video connecting cord (supplied) to connect the electronic book player to your TV or a monitor. The TV or monitor must have a VIDEO IN jack in order to view the display of the player on the screen.
To connect the electronic book player to your TV or monitor, follow this procedure:

1 Connect the video connecting cord as illustrated.



2 Set the TV select switch with a pointed device such as a pen. See the table below to select the correct position of the switch.

If you have bought the TV in	Set to
USA	NTSC
Europe	PAL/SECAM

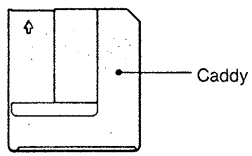


Notes on using a TV or monitor

- The contrast on the liquid crystal display screen may change if you connect or disconnect the cord from the VIDEO OUT jack while operating the player. If this happens, adjust the contrast on the liquid crystal display screen by adjusting the CONTRAST control on the player. See "Adjusting the Contrast" on page 27.
- When the displayed information changes, the screen may flutter. This is not a malfunction.
- The ratio of length and width of the TV conforming to PAL/SECAM system is different from the liquid crystal display. When using the TV conforming to PAL/SECAM, the displayed information may look different from the display screen of the player.
- You may not be able to record a video when connecting the player to a video cassette recorder.
- Do not change the TV select switch while turning on the player.

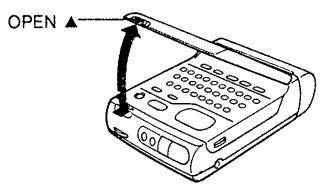
Inserting an Electronic Book

All electronic books are protected by a caddy as illustrated below.
Use the electronic book with this caddy.

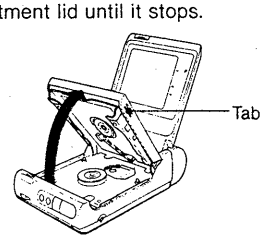


To insert the electronic book (with caddy) into the electronic book player, follow this procedure:

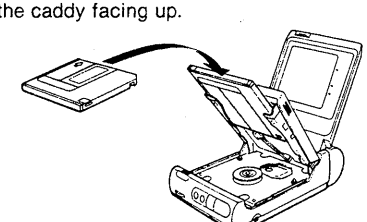
1 Press OPEN ▲ and lift the cover.



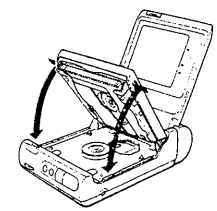
2 Hold both tabs on each side of the player and lift the disc compartment lid until it stops.



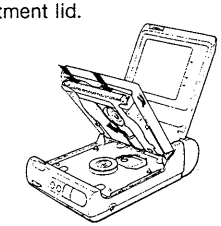
3 Insert the electronic book into the slot with the label side of the caddy facing up.



4 Push the electronic book into the slot until you hear a slight click. Push the left side of the caddy down into the slot where "PUSH Electronic Book" is printed. Do not hold the shutter while you are pushing the electronic book.



5 Make sure that the shutter is completely open. Gently hold both tabs on each side of the player and close the disc compartment lid.



Closing the disc compartment lid properly

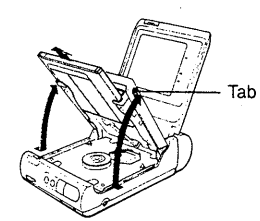
Do not force the disc compartment lid to shut.
When the disc compartment lid does not close properly, it means that the caddy is not inserted correctly. The following may be the cause:

- The disc compartment lid was not opened enough when the caddy was inserted.
- The shutter of the caddy did not open when the caddy was inserted.

When the disc compartment lid does not close properly, lift the lid and remove the caddy, and re-insert the caddy.

Removing the electronic book

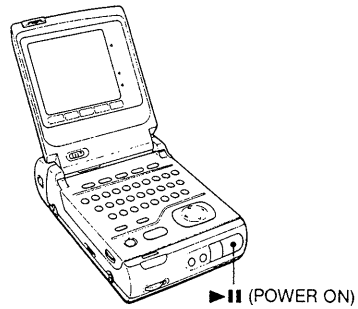
To remove the electronic book from the player, hold both tabs on each side, and lift the disc compartment lid.
The caddy automatically pops out of the slot.



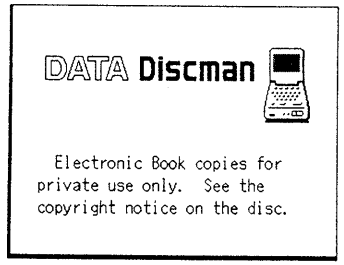
Playing an Electronic Book

To play an electronic book:

Press ►II (POWER ON) to turn on the power.



An opening message appears on the display.



Starting a search
Refer to the manual supplied with the electronic book.

When you are not sure how to perform the search method explained in the manual supplied with the electronic book you are using, refer to the User's Guide supplied with the electronic book player.

Stopping Play

To stop playing an electronic book, follow this procedure:

1 Press ■ (OFF).

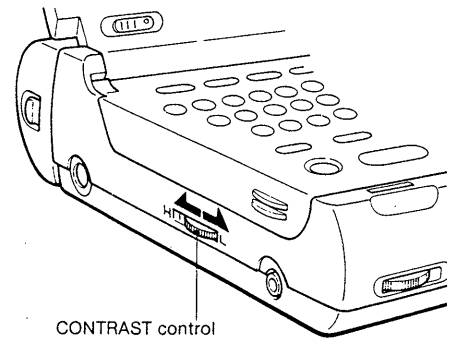
2 Remove the electronic book from the player.
See "Removing the electronic book" on page 25.

Note

If you do not operate the player for about 20 minutes while using the rechargeable battery pack or batteries, the player automatically turns off to save the power of the battery.

Adjusting the Contrast

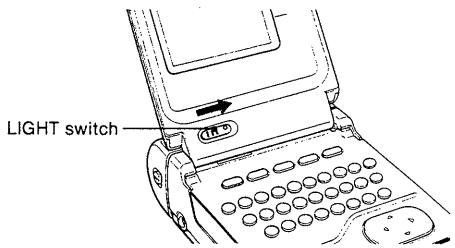
Adjust the contrast of the display with the CONTRAST control. Moving the control towards the H makes the screen darker; towards the L makes the screen lighter.



Using the Display Light

Use the display light to view the display more clearly. Remember, the rechargeable battery and the batteries are discharged more quickly when the display light is used.

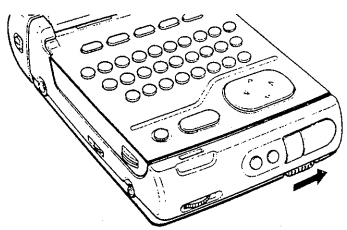
To use the display light
Slide the LIGHT switch to ON.



Locking the Controls

The HOLD switch allows you to lock the controls after you have set them. It is convenient to use when you:
— carry the player.
— listen to a compact disc in an unstable environment.

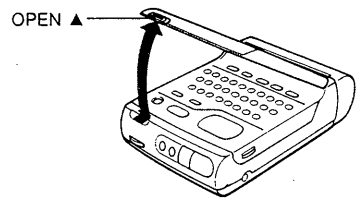
To lock the controls
Slide the HOLD switch in the direction of the arrow.
The orange dot indicates the controls are locked.



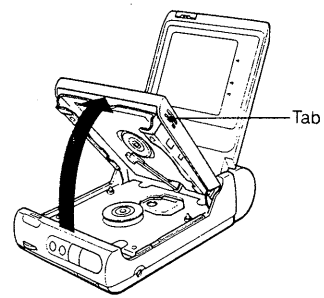
Playing a Compact Disc

The electronic book player is capable of playing a compact disc (CD) single audio disc. To play a disc, follow this procedure:

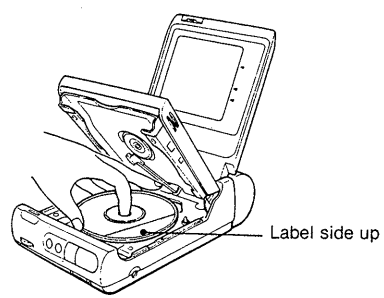
1 Press OPEN ▲ and lift the cover.



2 Hold both tabs on each side of the electronic book player, and lift the disc compartment lid until it stops.

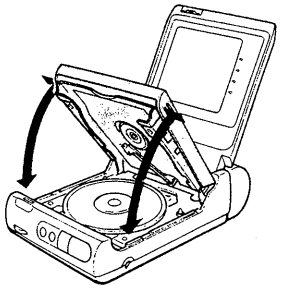


3 Insert the disc into the electronic book player by placing the disc on the rotation device in the player.

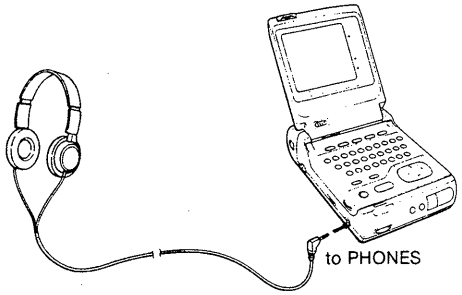


(Continued)

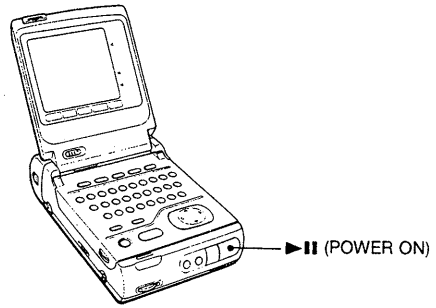
4 Close the disc compartment lid by holding both tabs on each side of the player.



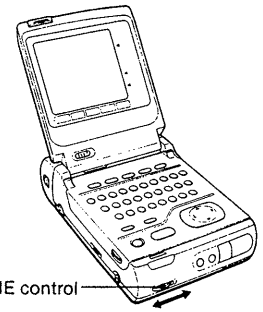
5 Plug the headphones into the PHONES jack.



6 Press ►II (POWER ON).



7 Adjust the volume with the VOLUME control.



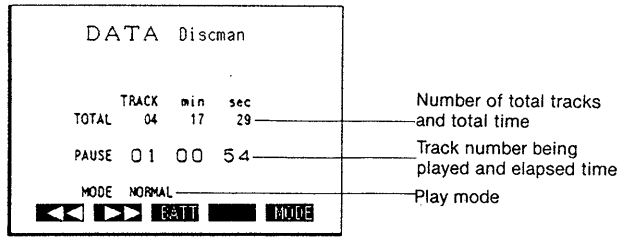
To stop play
Press ■.

To interrupt play
Press ►II.
"PAUSE" appears on the display screen.

To resume play
Press ►II again.

Looking at the Display

While playing a disc, the information about the disc can be seen on the display screen.



Searching for the Selections on the Disc

Refer to the following table to learn how to search for the selections while playing the disc.

To search for	Press
The next selection	▶▶I Each time you press ▶▶I , you can search for one selection after the other.
The beginning of the selection being played	I◀◀
The previous selection	I◀◀ twice Each time you press I◀◀, you can search for previous selections one after the other.

Searching for a Desired Point

Refer to the following table to learn how to search for a desired point on the disc while playing the disc.

To search for a desired point	Press and hold
Forward	(F2) (▶▶)
Backward	(F1) (◀◀)

Using the Various Play Modes

Use the following play modes while playing the disc.

To use the play modes, press (F5). Each time you press (F5), the mode changes as follows:

Play mode

NORMAL → 1 REPEAT → ALL REPEAT
↑ SHUFFLE REPEAT ←

- To repeat play a particular selection...1 REPEAT
- To repeat play all the selections...ALL REPEAT
- To repeat play all the selections in a random order...SHUFFLE REPEAT

For the Electronic Books and the Compact Discs

When data on the electronic book cannot be read

Make sure that the electronic book is inserted properly into the caddy to protect the data on the electronic book. If the data on the electronic book cannot be read, it means dust may have accumulated on the electronic book because of electrostatic attraction, etc. If this happens, follow this procedure:

1 Remove the electronic book from its caddy.

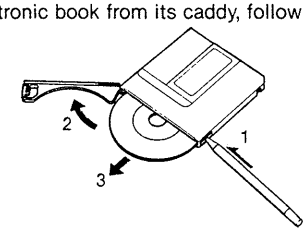
2 Clean the electronic book.

3 Insert the electronic book into the caddy again.

See the information below for details on each step.

Removing the electronic book from its caddy

To remove the electronic book from its caddy, follow this procedure:



1 Use a pointed device such as a pen to open the caddy. Insert the pen into the slot located on the right side of the caddy. Gently push and slide the pen towards you so that the cover pops open.

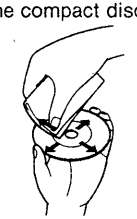
2 Open the cover of the caddy all of the way to slide the disc out.

3 Take out the electronic book by holding the disc by its edges.

To insert the electronic book back into the caddy, make sure that the electronic book is inserted with the label side facing up.

Cleaning the electronic book and the compact disc

Clean the electronic book and the compact disc with a cleaning cloth. Wipe the disc from the center out.



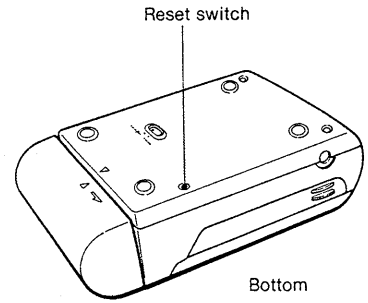
Do not use solvents such as benzine, thinner, commercially available cleaners or anti-static spray intended for use with records.

If the Player Does Not Operate

If the electronic book player stops operating while you are using it, reset the player.

To reset the player

Press the reset switch with a pointed device such as the tip of a pen.



The player goes off so you can re-start the operation.

SECTION 3
IC PIN DESCRIPTION

IC811 LCD CONTROLLER (SED1336FOA) Stores the character row data transmitted from the system controller (IC801) in the display memory (IC810), reads it periodically, converts it to a signal for LCD, and outputs it.

Pin No.	Terminal	I/O	Description
1	VA5	O	Address output to IC810 (Display memory).
2	VA4	O	
3	VA3	O	
4	VA2	O	
5	VA1	O	
6	VA0	O	
7	VR/$\overline{W}$	O	Read/Write control signal output to IC810 (Display memory).
8	$\overline{VCE}$	O	Chip select output to IC810 (Display memory).
9	$\overline{REF}$	O	Output for test, Not used in this unit.
10	$\overline{RES}$	I	System reset input.
11	SYNC	O	Output for test, Not used in this unit.
12	CLO	O	
13	$\overline{RD}$	I	Data read control signal input from IC801 (System controller).
14	$\overline{WR}$	I	Data write control signal input from IC801 (System controller).
15	SEL 2	I	Clock select; PAL (GND), NTSC (+5 V).
16	SEL 1	I	System controller interface bus select input (Always GND).
17	XG	I	Clock input; PAL (6.0625 MHz), NTSC (6.105 MHz).
18	XD	O	Clock output.
19	$\overline{CS}$	I	Chip select input from IC802 (Expansion I/O).
20	AO	I	Internal register select input.
21	V_{DD}	–	Power supply terminal (+5 V).
22	D0	I/O	Data bus with IC801 (System controller).
23	D1	I/O	
24	D2	I/O	
25	D3	I/O	
26	D4	I/O	
27	D5	I/O	
28	D6	I/O	
29	D7	I/O	
30	XD3	O	Data output for LCD X driver.
31	XD2	O	
32	XD1	O	
33	XD0	O	
34	XECL	O	Enable chain clock output for LCD X driver.
35	XSCL	O	Data shift clock output for LCD X driver.
36	V_{SS}	–	GND
37	LP	O	LCD X driver latch pulse output.
38	WF	O	Frame signal output, Not used in this unit.
39	YDIS	O	LCD display OFF output, Not used in this unit.
40	YD	O	Data output for LCD Y driver.
41	YSCL	O	Data shift clock output for LCD Y driver.
42	VD7	I/O	Data bus with IC810 (Display memory).
43	VD6	I/O	
44	VD5	I/O	
45	VD4	I/O	
46	VD3	I/O	
47	VD2	I/O	
48	VD1	I/O	
49	VD0	I/O	
50	VA15	O	Address output to IC810 (Display memory).

Pin No.	Terminal	I/O	Description
51	VA14	O	Address output to IC810 (Display memory).
52	VA13	O	
53	VA12	O	
54	VA11	O	
55	VA10	O	
56	VA9	O	
57	VA8	O	
58	VA7	O	
59	VA6	O	
60	N.C.	–	

IC607 CD-ROM DECODER (LC8951-422)

Takes in the CD-ROM data played back by the CD section, corrects errors which may be present, and transmits the data out in accordance with the system controller (IC801) request.

Pin No.	Terminal	I/O	Description
1	GND	–	GND
2	RA6	O	Address output to IC608 (Data buffer RAM). (Not used in RA13 to 15.)
3	RA7	O	
4	RA8	O	
5	RA9	O	
6	RA10	O	
7	RA11	O	
8	RA12	O	
9	RA13	O	
10	RA14	O	
11	RA15	O	
12	$\overline{RWE}$	O	Data write control signal output to IC608 (Data buffer RAM).
13	GND	–	GND
14	$\overline{ROE}$	O	Data read control signal output from IC608 (Data buffer RAM).
15	ERA	–	Not used in this unit (Always GND).
16	I/O 8	I/O	Data bus with IC608 (Data buffer RAM).
17	I/O 7	I/O	
18	I/O 6	I/O	
19	I/O 5	I/O	
20	I/O 4	I/O	
21	I/O 3	I/O	
22	I/O 2	I/O	
23	I/O 1	I/O	
24	GND	–	GND
25	XTALCK	I	Clock input (16.93 MHz).
26	XTAL	O	Clock output.
27	TEST 1	–	Not used in this unit (Always GND).
28	TEST 2	–	
29	CSEL	I	Input which controls the timing for taking in the SDATA (Always GND).
30	LMSEL	I	

Pin No.	Terminal	I/O	Description
31	V_{DD}	–	Power supply terminal (+5 V).
32	LRCK	I	LR clock input from IC601 (DSP).
33	SDATA	I	Serial data input from IC601 (DSP).
34	BCK	I	Bit clock input from IC601 (DSP).
35	C4LR	I	Not used in this unit (Always GND).
36	C2PO	I	
37	MCK	O	Master clock output (8.467 MHz).
38	D0	I/O	Data bus with IC801 (System controller).
39	D1	I/O	
40	D2	I/O	
41	GND	–	GND
42	D3	I/O	Data bus with IC801 (System controller).
43	D4	I/O	
44	D5	I/O	
45	D6	I/O	
46	D7	I/O	
47	RS	I	Internal register select input.
48	RD	I	Data read control signal input from IC802 (Expanded I/O).
49	WR	I	Data write control in signal input from IC802 (Expanded I/O).
50	CS	I	Chip select input from IC802 (Expanded I/O) (During data take in).
51	$\overline{INT}$	O	Interruption request output to IC802 (Expanded I/O).
52	GND	–	GND
53	$\overline{RESET}$	I	System reset input.
54	$\overline{ENABLE}$	I	Chip select input from IC802 (Expanded I/O) (During data transmission)
55	$\overline{HWR}$	I	Not used in this unit (Always +5 V).
56	$\overline{HRD}$	I	Data read control signal input from IC802 (Expanded I/O) (During data transmission).
57	$\overline{CMD}$	I	Not used in this unit (Always +5 V).
58	$\overline{WAIT}$	O	Not used in this unit.
59	$\overline{DTEN}$	O	
60	$\overline{STEN}$	O	
61	$\overline{EOP}$	O	
62	$\overline{DOUT}$	O	
63	$\overline{HDE}$	O	
64	GND	–	GND
65	HD7	I/O	Data bus with IC801 (System controller) (Data transmitted to the system controller).
66	HD6	I/O	
67	HD5	I/O	
68	HD4	I/O	
69	HD3	I/O	
70	HD2	I/O	
71	HD1	I/O	
72	HD0	I/O	
73	V_{DD}	–	Power supply terminal (+5 V).
74	$\overline{SELDRQ}$	I	Data transfer mode select input (Always +5 V).
75	RA0	O	Address output to IC608 (Data buffer RAM).
76	RA1	O	
77	RA2	O	
78	RA3	O	
79	RA4	O	
80	RA5	O	

IC802 EXPANDED I/O (CXD8111Q)

Performs the operations of the whole unit as an expansion port of the system controller (IC801).

Pin No.	Terminal	I/O	Description
1	V_{DD}	–	Power supply terminal (+5 V).
2	WR	I	Data write control signal input of IC801 (System controller). Timing is adjusted in IC807 (WR TIMING ADJUST) before input.
3	INT	O	Interruption request output to IC801 (System controller).
4	MRS	O	Chip select output to IC804 (Main RAM).
5	RCE	O	Chip select output to IC803 (Main ROM).
6	RST	I	System reset signal input.
7	BUSC	–	Not used in this unit.
8	LCS	O	Chip select output to IC811 (LCD controller).
9	LP	I	LCD X driver latch pulse input from IC811 (LCD controller).
10	VJDET	I	Input which detects that the video output (J801) is connected to a cord.
11	SELQ	–	Not used in this unit.
12	INT 2	I	Interruption request input from IC607 (CD ROM Decorder).
13	RCPS	O	Chip select output to IC607 (CD ROM Decoder) (During data take in).
14	RWR	O	Data write control signal output to IC607 (CD ROM Decoder).
15	RRD	O	Data read control signal output to IC607 (CD ROM Decoder).
16	16M	O	Clock output (16.93MHz) to IC607 (CD ROM Decoder).
17	GND	–	GND
18	GND	–	
19	Y7	–	Not used in this unit.
20	Y6	–	
21	Y5	–	
22	Y4	O	Keyboard matrix output.
23	Y3	O	
24	Y2	O	
25	Y1	O	
26	Y0	O	
27	X7	I	Keyboard matrix input.
28	X6	I	
29	X5	I	
30	X4	I	
31	X3	I	
32	X2	I	
33	X1	I	
34	V_{DD}	–	Power supply terminal (+5 V).
35	GND	–	GND
36	GND	–	
37	XO	–	Keyboard matrix input.
38	–	–	Not used in this unit.
39	XOFF	O	Power supply rising signal output, Becomes "H" when the PLAY key is pressed during power off.
40	LCDON	O	LCD rising signal output, Becomes "L" when LCD is ON, and "H" when LCD is OFF.
41	FOK	I	Focus OK signal input from IC501 (RF AMP). "H"= OK
42	ROM	O	Mode switchover output to IC601 (DSP).
43	SENSE	I	SENS input from IC502 (Servo) and IC601 (DSP).
44	XRST	O	Reset output to IC502 (Servo) and IC601 (DSP).
45	DATA	O	Serial data output to IC502 (Servo) and IC601 (DSP).
46	LATCH	O	Data latch control output to IC502 (Servo) and IC601 (DSP).
47	XCLK	O	Serial data transmission clock output to IC502 (Servo) and IC601 (DSP).

Pin No.	Terminal	I/O	Description
48	LDON	O	Laser diode ON/OFF switchover output to IC501 (RF AMP).
49	X/96	O	Clock output (176 kHz) to IC503 (PWM driver).
50	X/192	O	Clock output (88.2 kHz) for auto sequence to IC502 (Servo).
51	GFS	I	CFS signal input from IC601 (DSP). "L"= NG, "H"= OK
52	SUBQ	I	Sub code Q signal input from IC601 (DSP).
53	SCOR	I	Sub code S0 + S1 detection input from IC601 (DSP).
54	PCON	O	Power rising signal output of the CD section.
55	DATA I	I	Serial data input from IC601 (DSP).
56	CDX	O	Clock output (16.93 MHz) to IC601 (DSP).
57	DOOR	I	CD lid open/close detection switch input (S806), Close = "L".
58	CDAX	–	Not used in this unit.
59	DF	O	LCD drive signal polarity inverse output, Polarity is inverted every 13 pulse of the LP signal.
60	AMUTE	O	Analog mute control output.
61	PEN	O	De-emphasis control output of IC303 (AMP).
62	DATA O	O	Digital music data output to IC301 (D/A converter).
63	14W	–	Not used in this unit.
64	14R	–	
65	–	–	
66	8M	–	
67	GND	–	GND
68	GND	–	
69	V_{DD}	–	Power supply terminal (+5 V).
70	XOUT	O	Clock output.
71	XIN	I	Clock input (16.93 MHz).
72	KCE	O	Chip select output of IC805 (FONT ROM).
73	CA0	O	Character code output to IC805 (FONT ROM).
74	CA1	O	
75	CA2	O	
76	CA3	O	
77	CA4	O	
78	CA5	O	
79	CA6	O	
80	CA7	O	
81	CA8	O	
82	CA9	O	
83	CA10	O	
84	CA11	O	
85	GND	–	GND
86	GND	–	
87	CA12	O	Character code output to IC805 (FONT ROM).
88	WAT	–	Not used in this unit.
89	15W	O	Address data latch output for ROM area switchover.
90	15R	–	Not used in this unit.
91	CDPZ	–	
92	EXCS	–	
93	CDFR	I	" ⏮ " key input.
94	CDFF	I	" ⏭ " key input.
95	CDST	I	"■" key input.
96	ONKEY	I	PLAY key input.

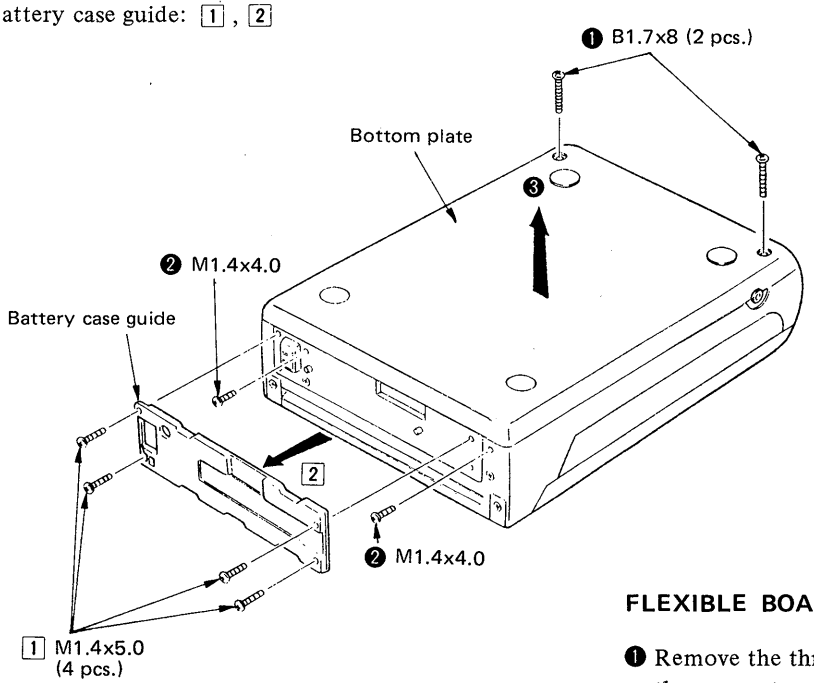
Pin No.	Terminal	I/O	Description
97	BATA	I	Battery voltage detection input.
98	DCDET	I	Voltage detection input of DC IN jack.
99	CGON	O	Battery charging switchover output, "H" = During charging.
100	DTRD	O	Data read control signal output to IC607 (CD ROM).
101	ENABLE	O	Chip select output (During data reading) to IC607 (CD ROM).
102	V_{DD}	–	Power supply terminal (+5 V).
103	GND	–	GND
104	GND	–	
105	CPURST	O	Reset output to IC801 (System controller).
106	–	–	Not used in this unit.
107	FUL	I	Battery voltage detection input (FULL).
108	MID	I	Battery voltage detection input (MIDDLE).
109	BE	I	Battery voltage detection input (EMPTY).
110	BW	I	Battery voltage detection input (WARNING).
111	BTX	–	Not used in this unit.
112	SPEC	–	
113	TEST 0	–	Not used in this unit (Always pull up).
114	TEST 1	–	
115	A0	I	Address bus.
116	A1	I	
117	A2	I	
118	A3	I	
119	A4	I	
120	A14	I	
121	A15	I	
122	D7	I/O	Data bus.
123	D6	I/O	
124	D5	I/O	
125	D4	I/O	
126	D3	I/O	
127	D2	I/O	
128	D1	I/O	
129	D0	I/O	
130	4M	O	Clock output to IC801 (System controller) and IC808 (WR TIMING ADJUST).
131	MREQ	I	MREQ signal input from IC801 (System controller).
132	IORQ	I	IORQ signal input from IC801 (System controller).
133	–	–	Not used in this unit.
134	RD	I	Data read signal input from IC801 (System controller).
135	GND	–	GND
136	GND	–	

SECTION 4
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

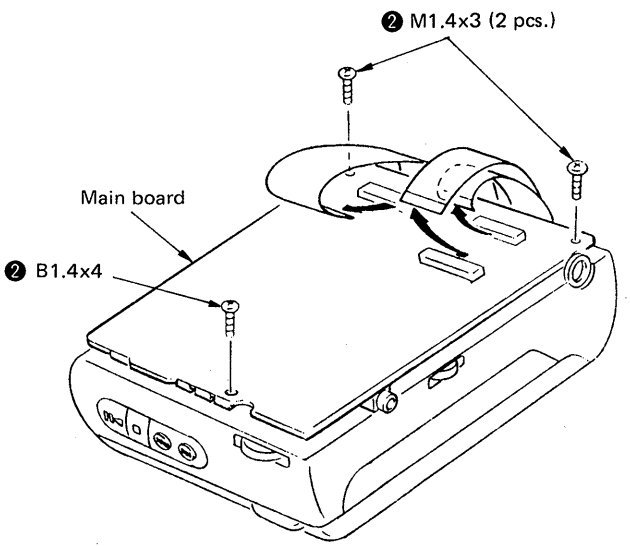
BOTTOM PLATE, BATTERY CASE GUIDE

Bottom plate: ❶ to ❸
Battery case guide: [1] , [2]



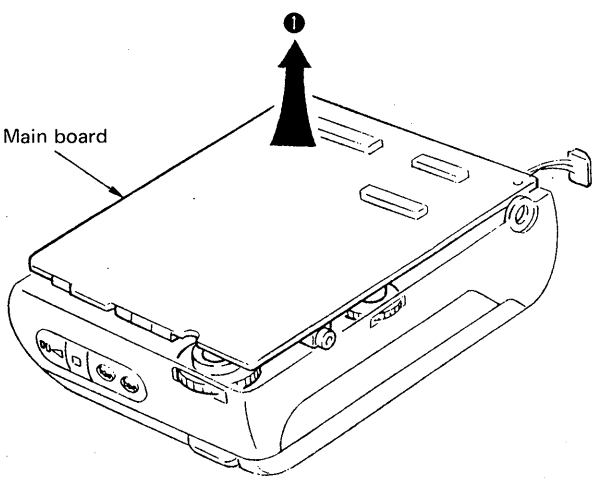
FLEXIBLE BOARD/MAIN BOARD

❶ Remove the three flexible boards from the connector.



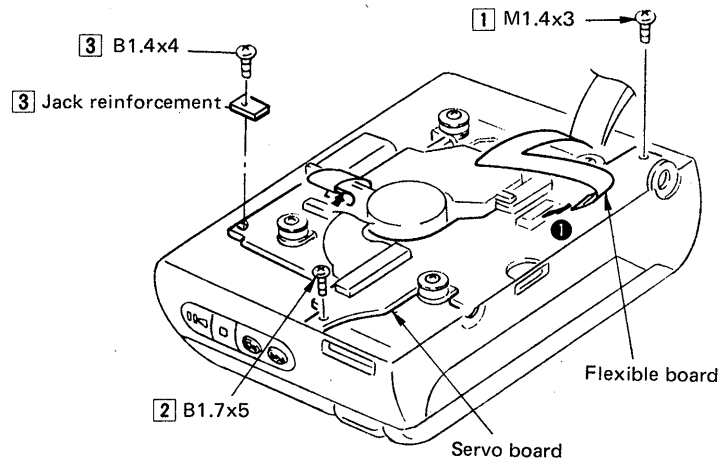
MAIN BOARD

❶ Lift up the main board in the direction shown by the arrow.



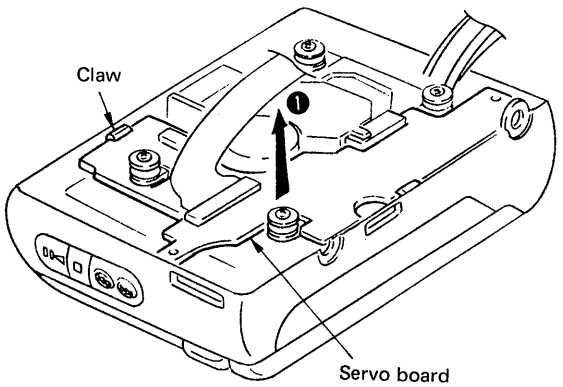
FLEXIBLE BOARD/SERVO BOARD

Flexible board: ❶ Remove the flexible board from the connector.
Servo board: [1], [2], [3]

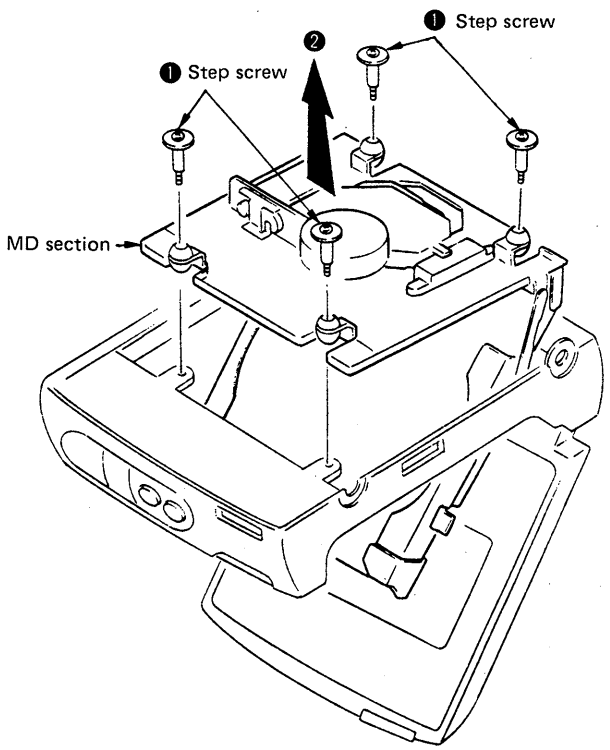


SERVO BOARD

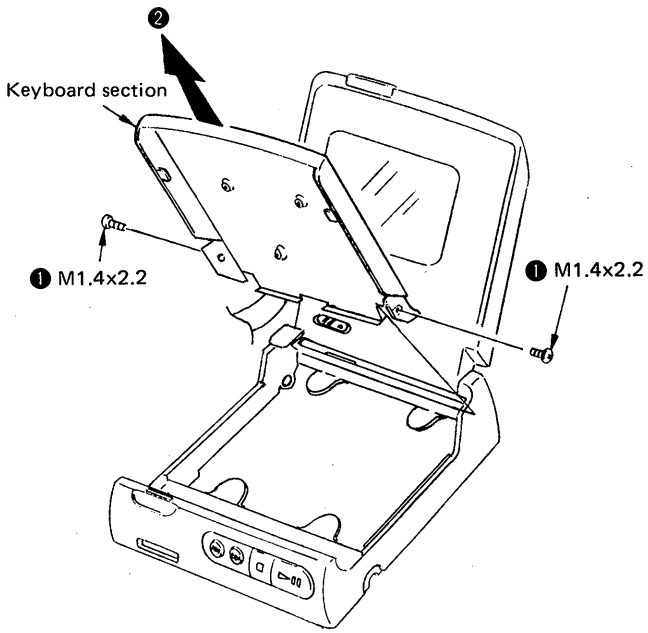
❶ Remove the servo board in the direction shown by the arrow while paying attention to the claw.

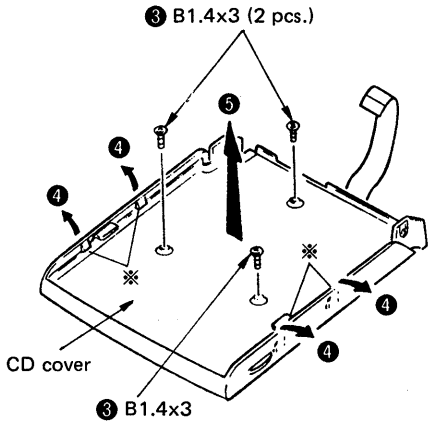


MD SECTION



KEYBOARD SECTION



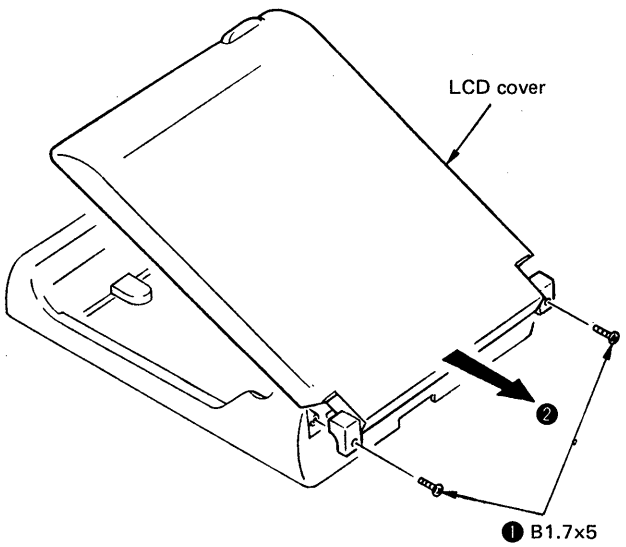


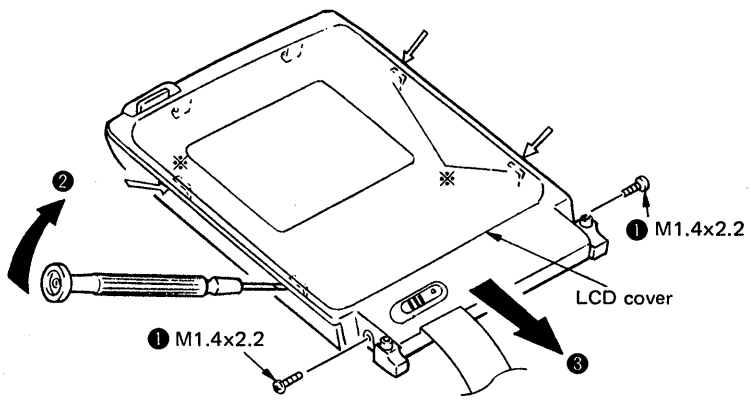
※ While stretching the four claws in the direction shown by arrow ❹, remove the CD lid in the direction shown by arrow ❺.

LCD COVER

LCD PANEL

❶ Remove the two screws.
❷ Remove the three claws (※ sections) with a driver, etc.
❸ Remove the LCD cover in the direction of the arrow.





SECTION 5
ADJUSTMENTS

Notes on Adjustment

1. Perform adjustments in service mode.
   Be sure to release service mode after completing adjustments.
   (Refer to "Service Mode (service program)" on page 3.)
2. Perform adjustments in the order given.
3. Use disc to be avilable on the market. (8 cm single disc)
4. Power supply voltage : DC 9V
   HOLD switch: OFF

PREPARATION

Put the set into service mode (See page 3.) and perform the following checks. Repair if there are any abnormalities.

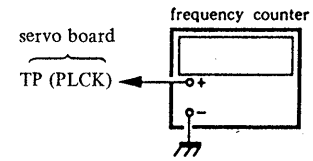
• Sled Motor Check

1. Press the OPEN button and open the top panel.
2. Press the ⏭, ⏮ keys and make sure that the opticl pick-up block moves smoothly, without catching, from the inmost → outmost → inmost circumference.
   ⏭ : opticl pick-up block moves outward
   ⏮ : opticl pick-up block moves inward

• Focus Search Check

1. Press the OPEN button and open the top panel.
2. Press the ⏯ key. (Focus search is performed continuously.)
3. Observe the opticl pick-up block objective lens and check that it moves smoothly up and down with no catching or noises.
4. Press the ■ key.
   Check that focus search operation stops. If it does not, press the ■ key again.

PLL Free Frequency Adjustment



Procedure :

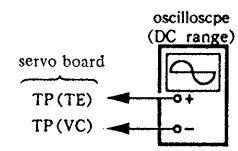
1. Put the set into service mode.
2. Release the solder jumper terminal of IC501 pin 8 (EFM).
3. Check that the frequency counter reading is 4.31±0.01 MHz. If not, adjust RV505.
4. After adjustment, solder the terminal (EFM).

Adjustment Location: Servo board (See page 26.)

Tracking Balance Adjustment

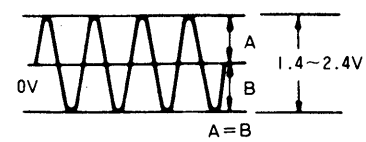
Conditions :

The set should be placed either horizontally.



Procedure :

1. Put the set into service mode.
2. Put disc in and playback.
3. Adjust RV501 so that the oscilloscope waveform is symmetrical on the top and bottom in relation to 0V and check this level.

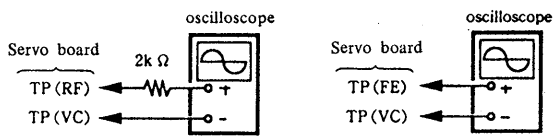


Adjustment Location: Servo board (See page 26.)

Focus Bias Adjustment

Conditions :

The set should be placed either horizontally.

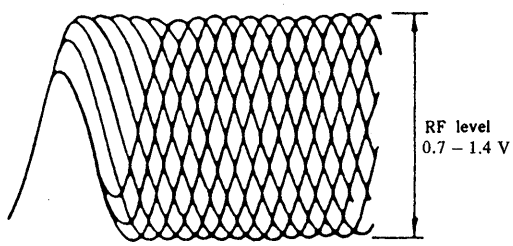


Procedure :

1. Put the set into service mode.
2. Put disc in and playback.
3. Adjust RV502 so that the oscilloscope waveform eye pattern is good. A good eye pattern means that the diamond shape (◇) in the center of the waveform can be clearly distinguished.
4. Press the ■ key.
5. Connect the oscilloscope to test point TP (FE).
6. When the waveform of the oscilloscope is 20 to 60mV, readjust with RV502 so that it becomes 60mV.

• RF Signal Reference Waveform (eye pattern)

VOLT/DIV : 200mV
TIME/DIV : 500nS



When observing the eye pattern, set the oscilloscope for AC range and raise vertical sensitivity.

Adjustment Location: Servo board (See page 26.)

Battery Voltage Detection Adjustment

1. Remove the power supplied to the DC IN jack, and supply a 9 V power to the battery terminal (BATT).
2. Put the set into the service mode.
3. Press "F4" on the keyboard (Fig. 1).
4. Then press B (Fig. 2).
5. Press "U" on the keyboard. (Pin ⑨⑨ CGON of IC802 becomes LOW.)
6. Decrease the voltage supplied to the battery terminal to 5.5 V.
7. Adjust RV801 so that the potential difference between TP (BREF) and TP (EMP) becomes 0±10 mV.
8. Press "Q" on the keyboard. (Pin ⑨⑨ CGON of IC802 becomes HIGH.)
9. Adjust the voltage supplied to the battery terminal to 7.8 V.
10. Adjust RV802 so that the potential difference between TP (BREF) and TP (CHG) becomes 0±10 mV.

F4 : Diagnostic

Z : LCD controler interface check
X : R-CHIP interface check
C : Main RAM check
V : Kanji ROM check
B : CXD8111Q terminal low mode
N : Servo commander mode
M : Port output commander mode
– : Port input commander mode

Fig. 1. The LCD Display when F4 is Pressed (F4 mode)

F4 : Diagnostic

B : CXD8111Q terminal low mode

Low level :

terminal key

Q=(42)–ROM	W=(44) –XRST
E=(48)–LDON	R=(58) –<CDAX>
T=(60)–AMUTE	Y=(61) –PEN
U=(99)–CGON	I=(112)–<SPEC>

Fig. 2. The LCD Display when B is Pressed in the F4 Mode

Reference

Focus/Tracking Gain Adjustment

A frequency responce analyzer or CD jig is necessary in order to perform this adjustment exactly.

However, this gain has a margin, so even if it is slightly off, there is no problem. Therefore, do not perfrom this adjustment.

On this set, it is very difficult to simplify this adjustment. For those sets on which symptoms such as "occasional skipping" are hard to discover, or it is hard to tell if the set has been repaired, use the CD jig and perform this adjustment. Refer to the diagram below for connection of the CD jig. The adjustment procedure is described in the separate CD jig Instruction Manual.

Focus/tracking gain determines the pick-up followup (vertical and horizontal) relative to mechanical noise and mechanical shock when the 2-axis device operate.
However, as these reciprocate, the adjustment is at the point where both are satisfied.

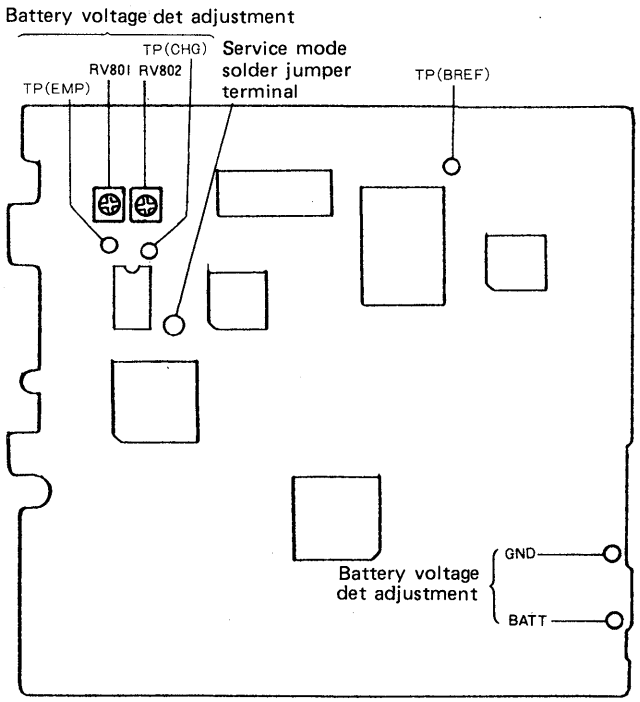
- When gain is high, the noise when the 2-axis device operates increases.
- When gain is low, it is more susceptible to mechanical shock and skipping occurs more easily.

This adjustment is to be performed when replacing the following parts :

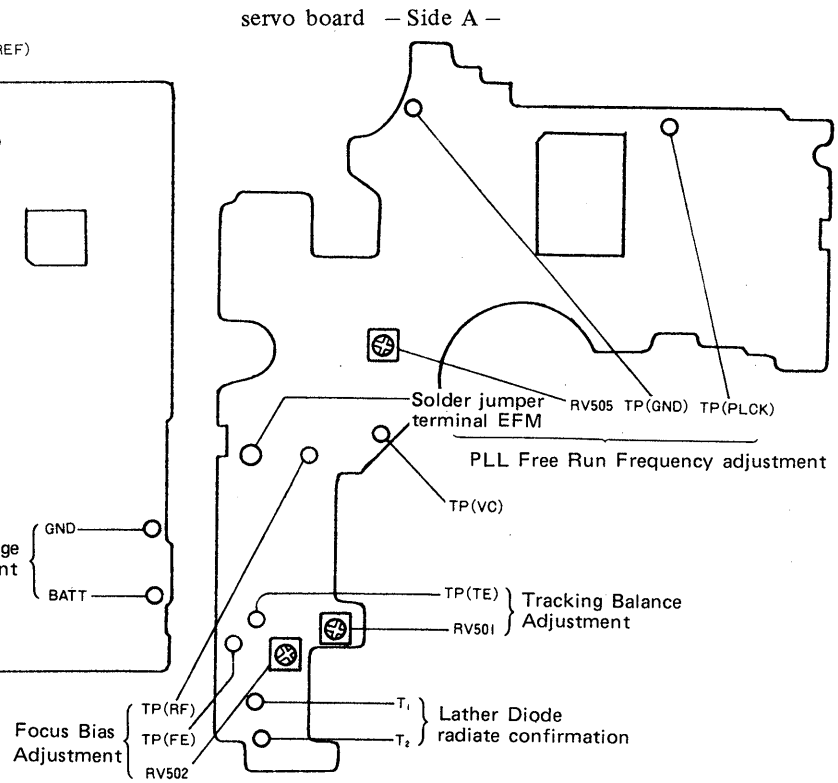
- Optical pick-up block
- RV503 (focus gain volume)
- RV504 (tracking gain volume)

Please be careful not to move RV503 (focus gain volume), RV504 (tracking gain volume) ordinarily.

Adjustment Location: main board – Side B –

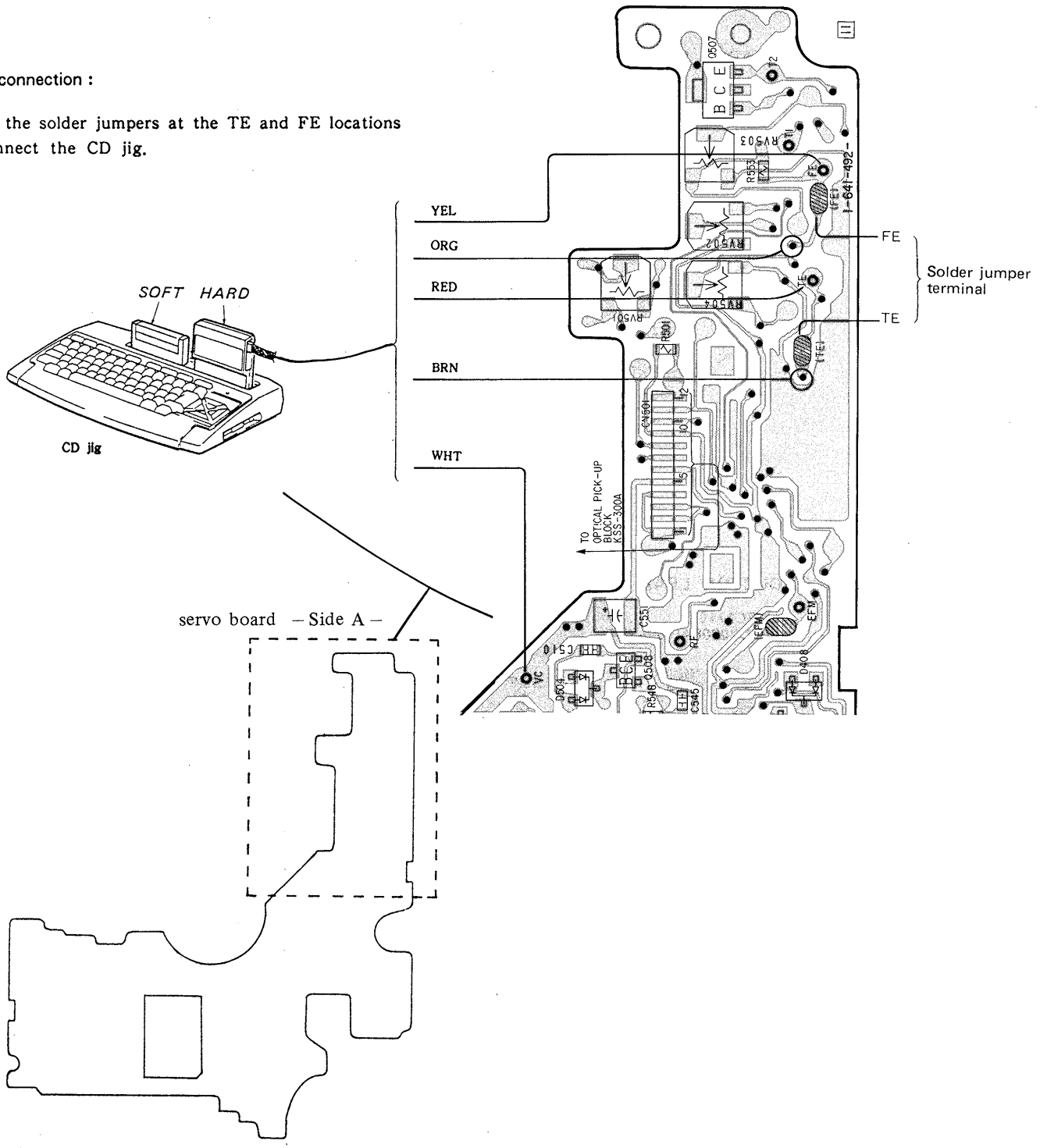


servo board – Side A –



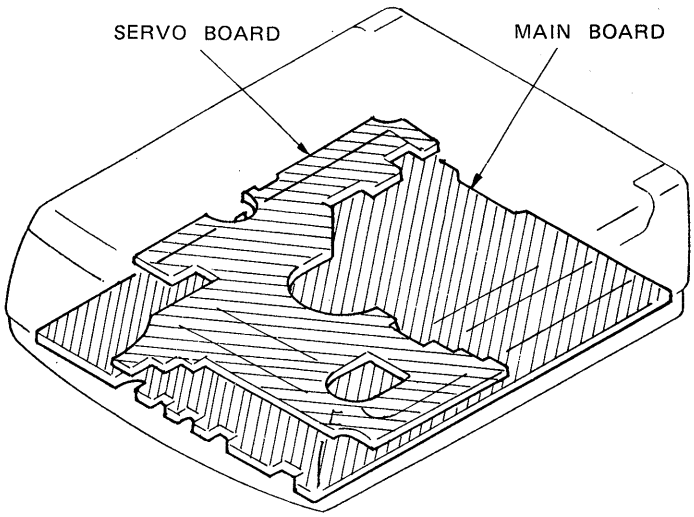
CD jig connection :

Remove the solder jumpers at the TE and FE locations and connect the CD jig.



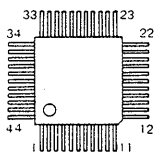
SECTION 6
DIAGRAMS

6-1. CIRCUIT BOARDS LOCATION

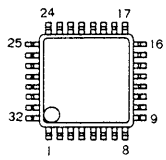


6-2. SEMICONDUCTOR LEAD LAYOUTS

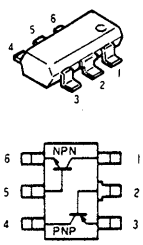
MPC1715
μPD70008AGB-6-3B4



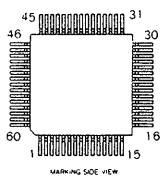
CXA1081Q



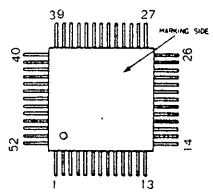
IMD2



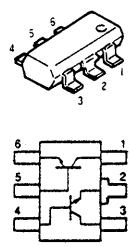
SED1336FOA



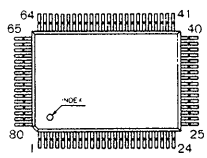
μPD23C2000GC-F66-3B6



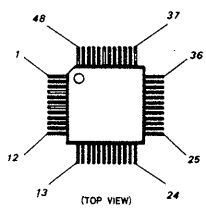
XN5501



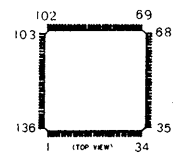
CXD1167Q
LC8951-422



CXA1082BQ



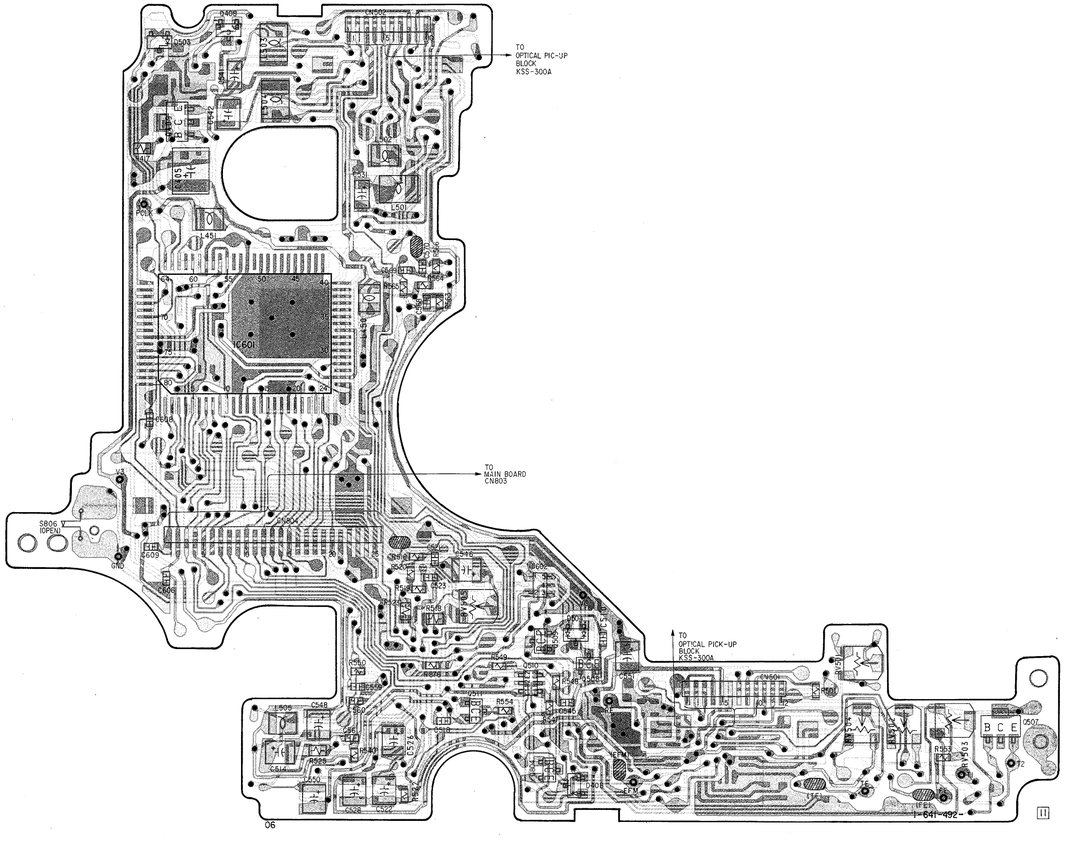
CXD8111Q



6-7. PRINTED WIRING BOARDS (SERVO Section)

- **Refer to page 28 for circuit boards location.**
- **Refer to page 28 for semiconductor lead layouts.**
- **Refer to page 31 for note.**

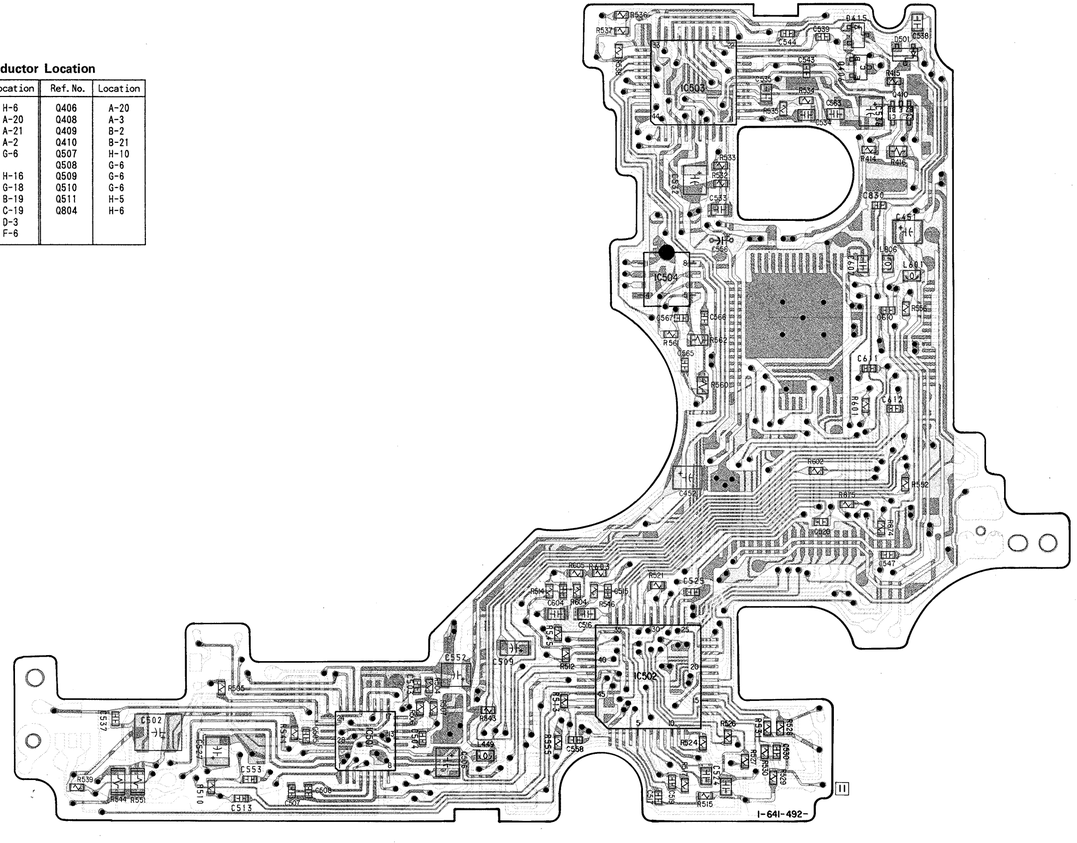
【SERVO BOARD (SIDE A)



- **Semiconductor Location**

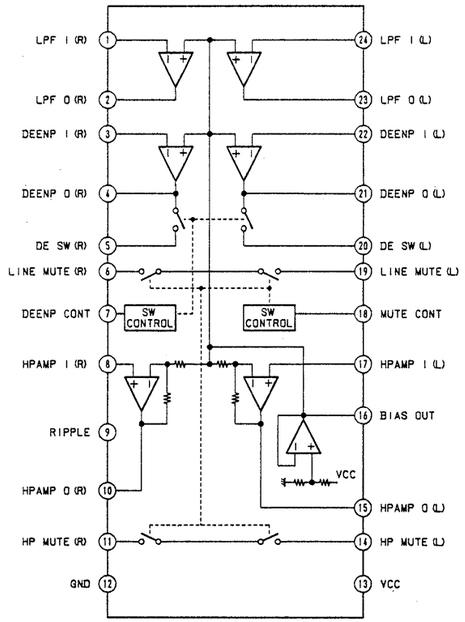
Ref. No.	Location	Ref. No.	Location
D408	H-6	Q406	A-20
D415	A-20	Q408	A-3
D501	A-21	Q409	B-2
D503	A-2	Q410	B-21
D504	G-6	Q507	H-10
		Q508	G-6
IC501	H-16	Q509	G-6
IC502	G-18	Q510	G-6
IC503	B-19	Q511	H-5
IC504	C-19	Q804	H-6
IC601	D-3		
IC602	F-6		

【SERVO BOARD】(SIDE B)

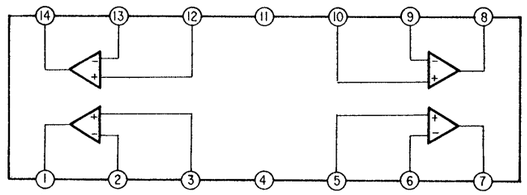


6-8. IC BLOCK DIAGRAMS

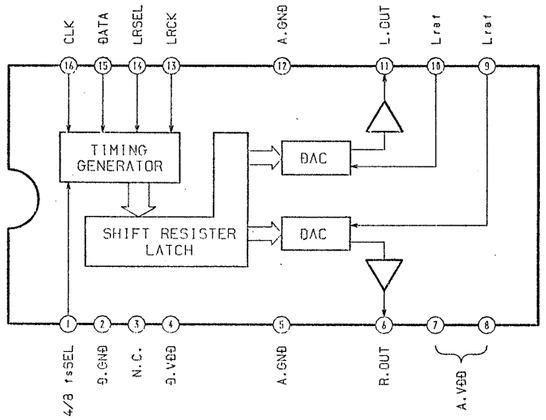
IC303 M51568



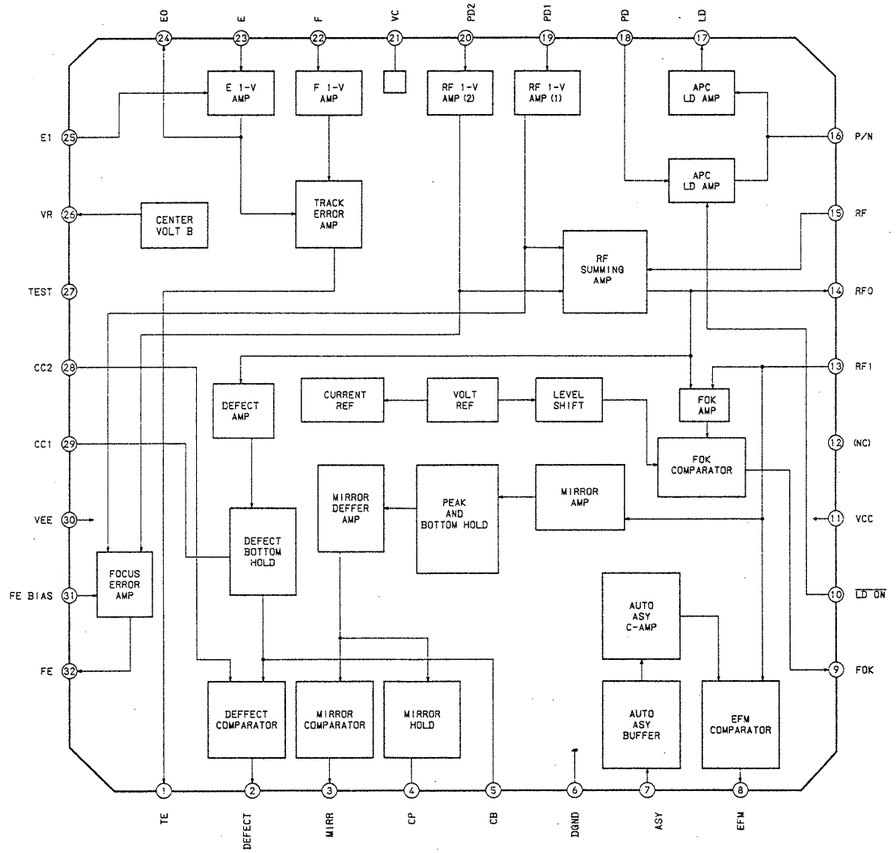
IC405 BA10324F



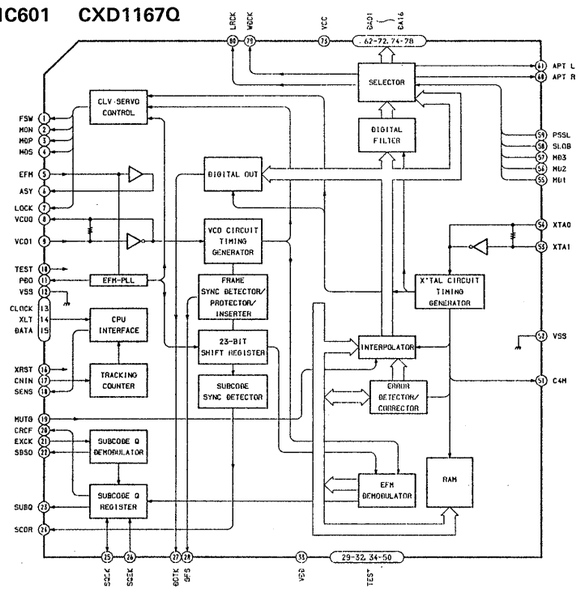
IC301 μPD6376



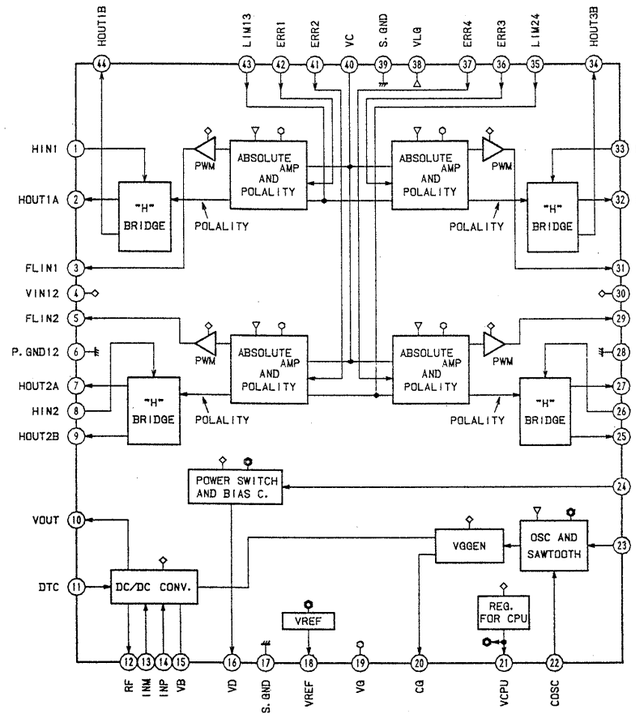
IC501 CXA1081Q



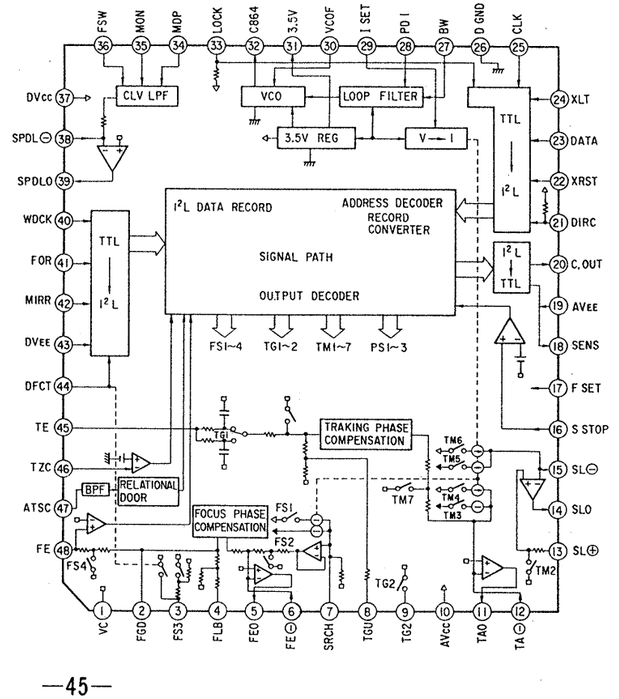
IC601 CXD1167Q



IC503 MPC1715FU

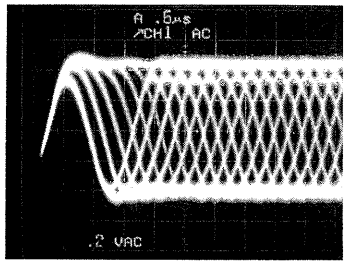


IC502 CXA1082BQ

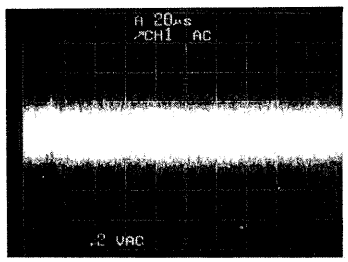


6-9. WAVEFORMS

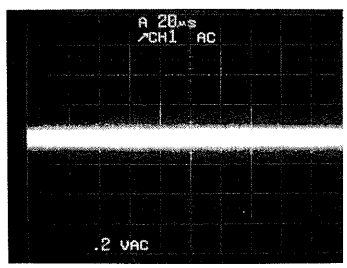
❶ IC501 ⑭ pin (RFO)



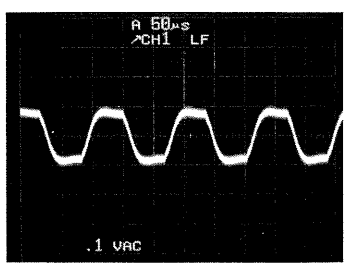
❷ IC501 ① pin (TE)



❸ IC501 ㉜ pin (FE)



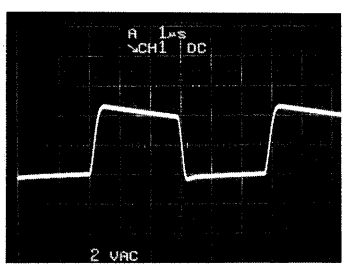
❹ IC502 ⑤ pin (FEO)(Test Mode)



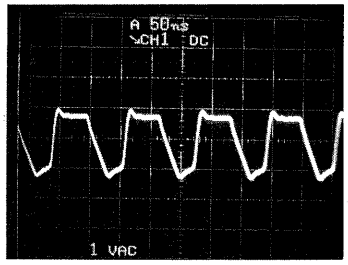
2.2
3V

(About 2 seconds cycle.)

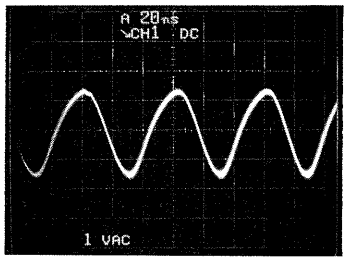
❺ IC503 ㉓ pin (SYNC)



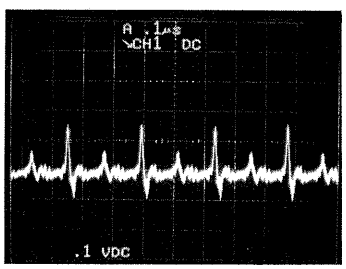
❻ IC601 ⑨ pin (VCOI)



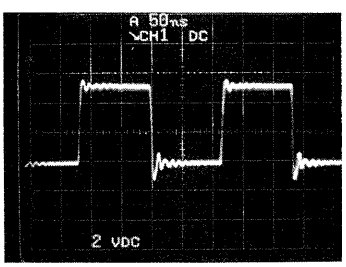
❼ IC601 ㊹ pin 16.9MHz



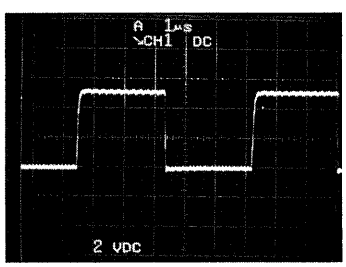
❽ IC601 ㊺ pin (C2F2)



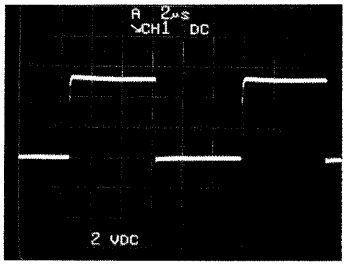
❿ IC601 ⑦⓪ pin (PLCK) 4.25 MHz



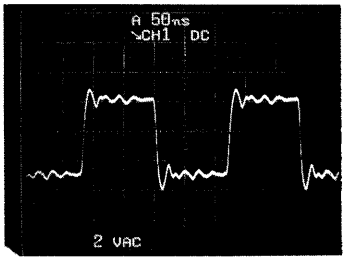
⓫ IC601 ⑦⑨ pin (WDCK) 179 kHz



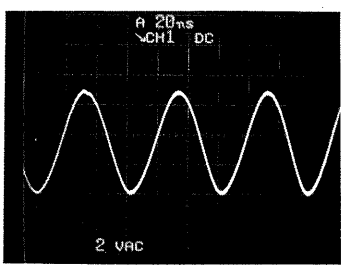
⓬ IC601 ⑧⓪ pin (LRCK) 88.2kHz



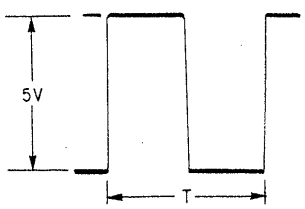
⓮ IC802 ⑬⓪ pin (4M) 4.16 MHz



⓯ IC802 ⑯ pin (16M) 16.9MHz

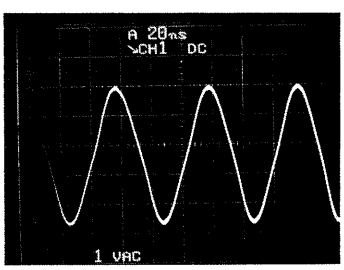


⓰ IC802 ⑤⑨ pin (DF)

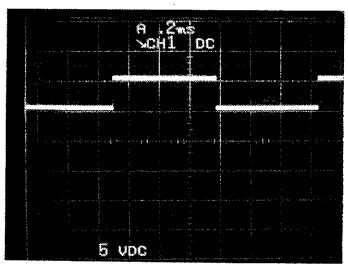


V: 3.4mS NTSC/PAL
N: 3.7mS NTSC/PAL

⓱ IC802 ⑦⓪ pin (XOUT) 16.9MHz

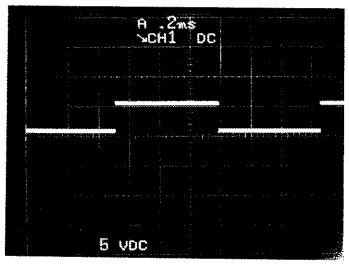


⑱ D410 cathode



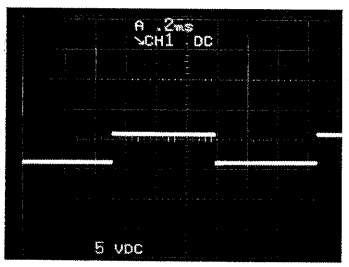
—0V

⑲ D411 cathode



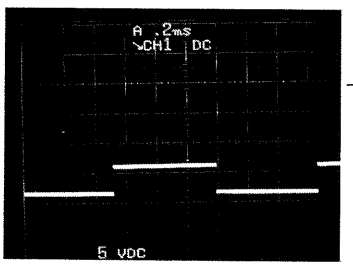
—0V

⑳ D412 cathode



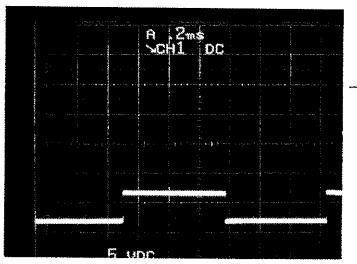
—0V

㉑ D413 cathode



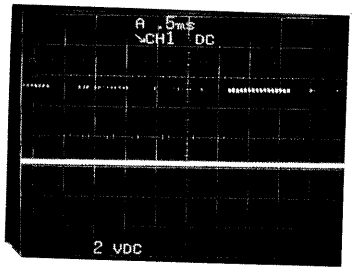
—0V

㉒ D414 cathode

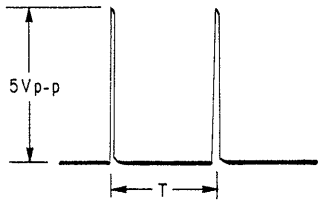


—0V

㉓ IC811 ㉚ pin (XD3)

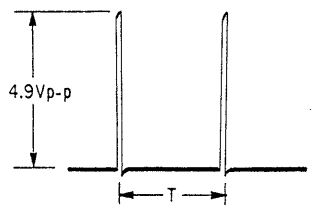


㉔ IC811 ㊲ pin (LP)



V : 62μS NTSC/PAL
N: 70μS NTSC/PAL

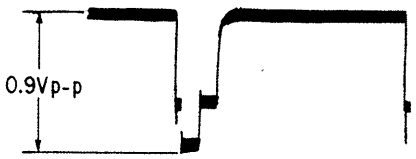
㉕ IC811 ㊵ pin (YD)



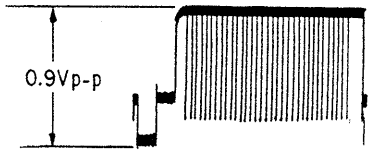
V: 16mS NTSC
20mS PAL
N: 14mS NTSC/PAL

㉖ VIDEO OUT

(Display testmode white)

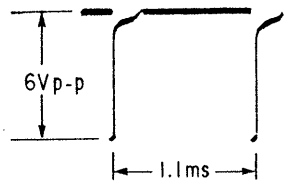


(Display testmode vertical stripes)



V

㉗ IC404 ④ pin VCC=6 V



Note:

- The numbers with ○ are coincidental numbers in the waveform diagrams. (Refer to the circuit diagram.)
- The waveforms are reference diagrams measured by the oscilloscope.
  V: When the video jack is connected.
  N: When nothing is connected to the video jack.

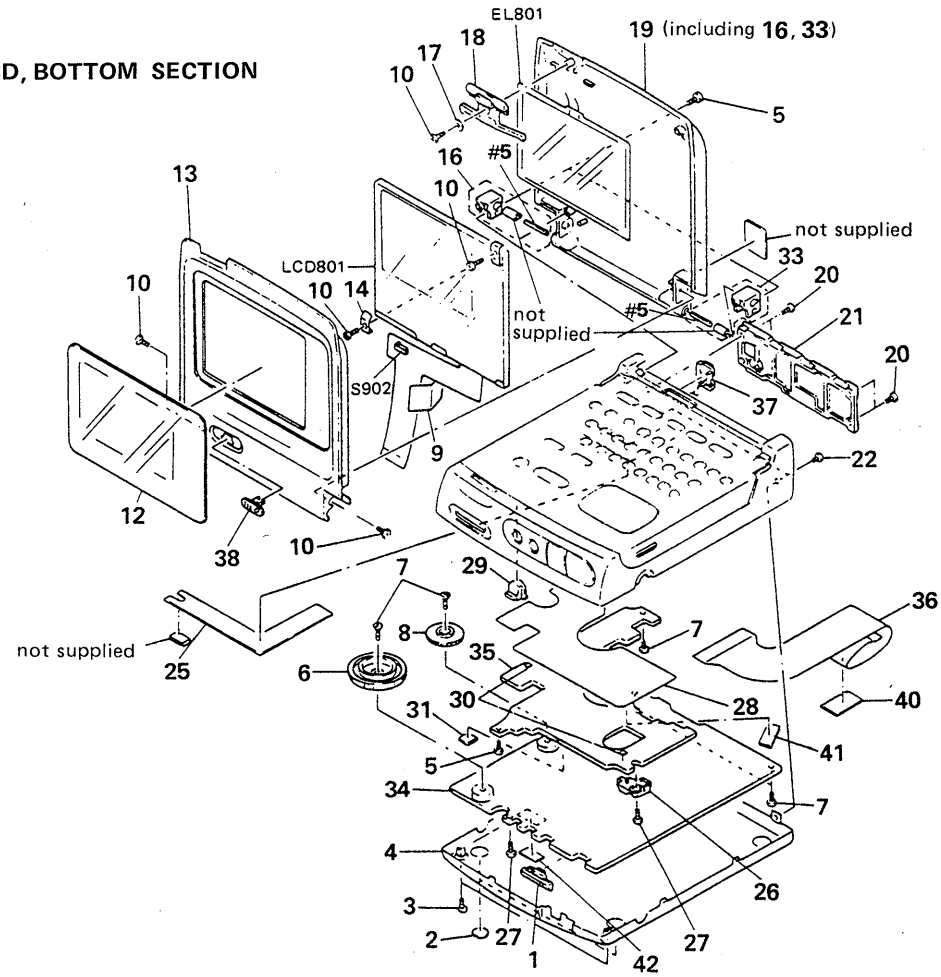
SECTION 7 EXPLODED VIEWS

NOTE:

- –XX, –X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts color / Cabinet's color
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

7-1. LCD, BOTTOM SECTION

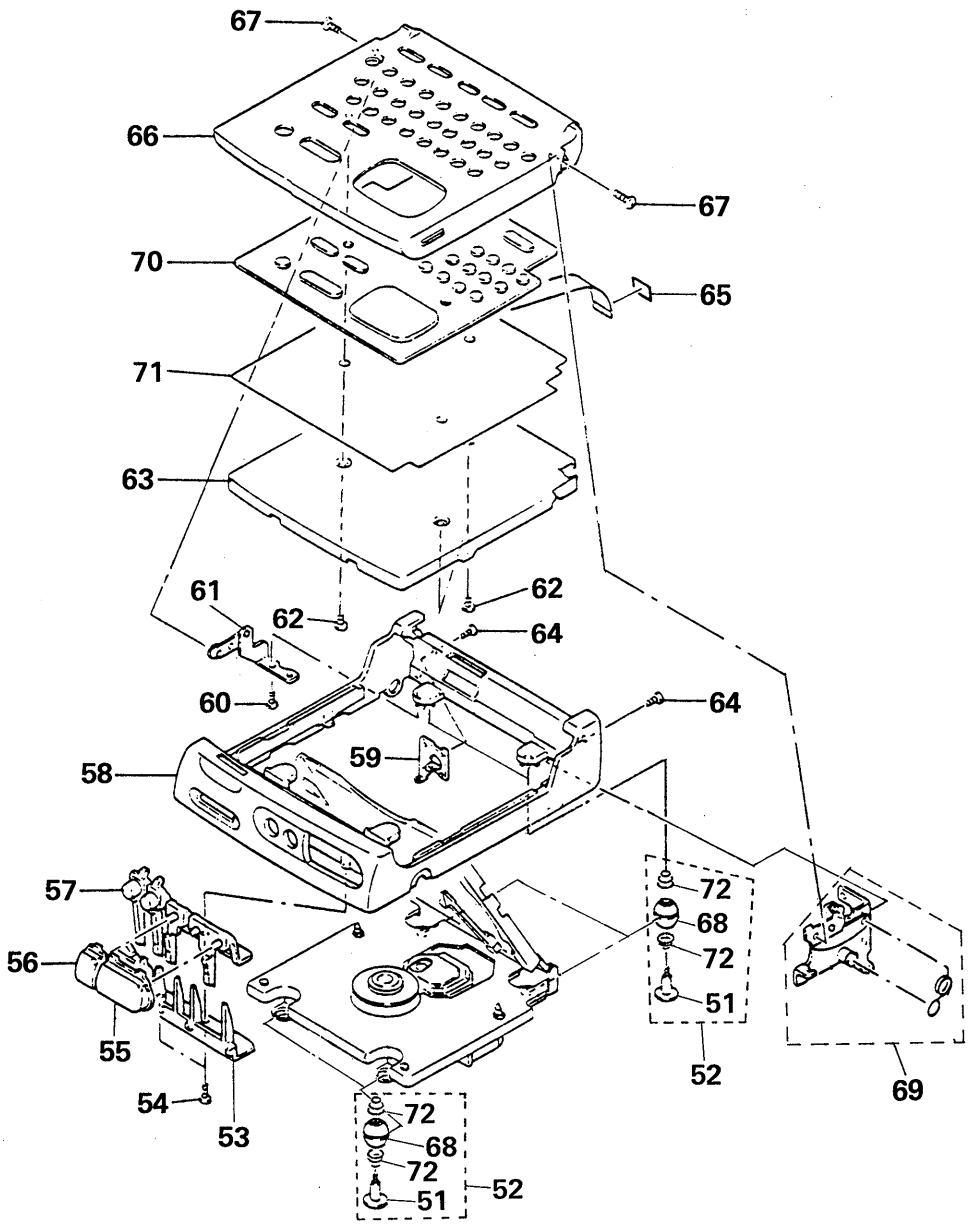


Ref. No.	Part No.	Description	Remark
1	4-938-937-11	KNOB, HOLD	
2	4-912-641-01	FOOT, RUBBER	
3	3-318-203-31	SCREW (B1.7X8), TAPPING	
4	X-4941-976-1	PLATE ASSY (EX), BOTTOM	
5	3-318-203-71	SCREW (B1.7X5), TAPPING	
6	4-938-938-01	KNOB, VOLUME	
7	3-345-648-01	SCREW (M1.4X3)	
8	4-938-920-01	KNOB, CONTR	
9	4-938-905-01	SHEET, FLEXIBLE	
10	3-895-823-11	SCREW (B1.4X3), TAPPING	
12	4-945-770-11	WINDOW, LCD	
13	4-945-776-01	COVER, LCD	
14	* 4-938-933-01	RETAINER, LCD	
16	X-4941-701-1	FULCRUM (L) ASSY (EX), LCD LID	
17	4-941-677-01	WASHER, M	
18	4-945-774-01	CLAW, LOCK	
19	4-945-775-01	LID, LCD	
20	3-703-816-82	SCREW (M1.4X6.0), SPECIAL HEAD	
21	4-938-940-11	GUIDE, BATT CASE	
22	3-703-816-72	SCREW (M1.4X3.0), SPECIAL HEAD	

Ref. No.	Part No.	Description	Remark
25	4-938-919-01	SHIELD, FLEXIBLE	
26	4-938-998-01	REINFORCEMENT, JACK	
27	3-895-823-41	SCREW (B1.4X4), TAPPING	
28	4-938-907-01	SHEET, INSULATING, SERVO	
29	4-939-302-11	BUTTON, MAIN SW	
30	3-315-751-11	SPACER (B), KNOB	
31	9-911-840-XX	CUSHION, MOTHER	
33	X-4941-700-1	FULCRUM (R) ASSY (EX), LCD LID	
34	A-3275-227-A	MAIN BOARD, COMPLETE	
35	A-3275-226-A	SERVO BOARD, COMPLETE	
36	1-639-550-11	PC BOARD, FLEXIBLE	
37	1-569-951-11	SOCKET, CONNECTOR	
38	4-945-769-01	KNOB, SWITCH	
40	* 4-926-115-01	CUSHION (P)	
41	* 3-561-902-11	CLOTH, RETAINING, CASSETTE	
42	* 4-926-587-01	SPACER	
EL801	1-809-436-11	ELEMENT, EL (BACK LIGHT)	
LCD801	1-809-439-11	DISPLAY PANEL, LIQUID CRYSTAL	
S902	1-570-397-11	SWITCH, SLIDE (LIGHT)	

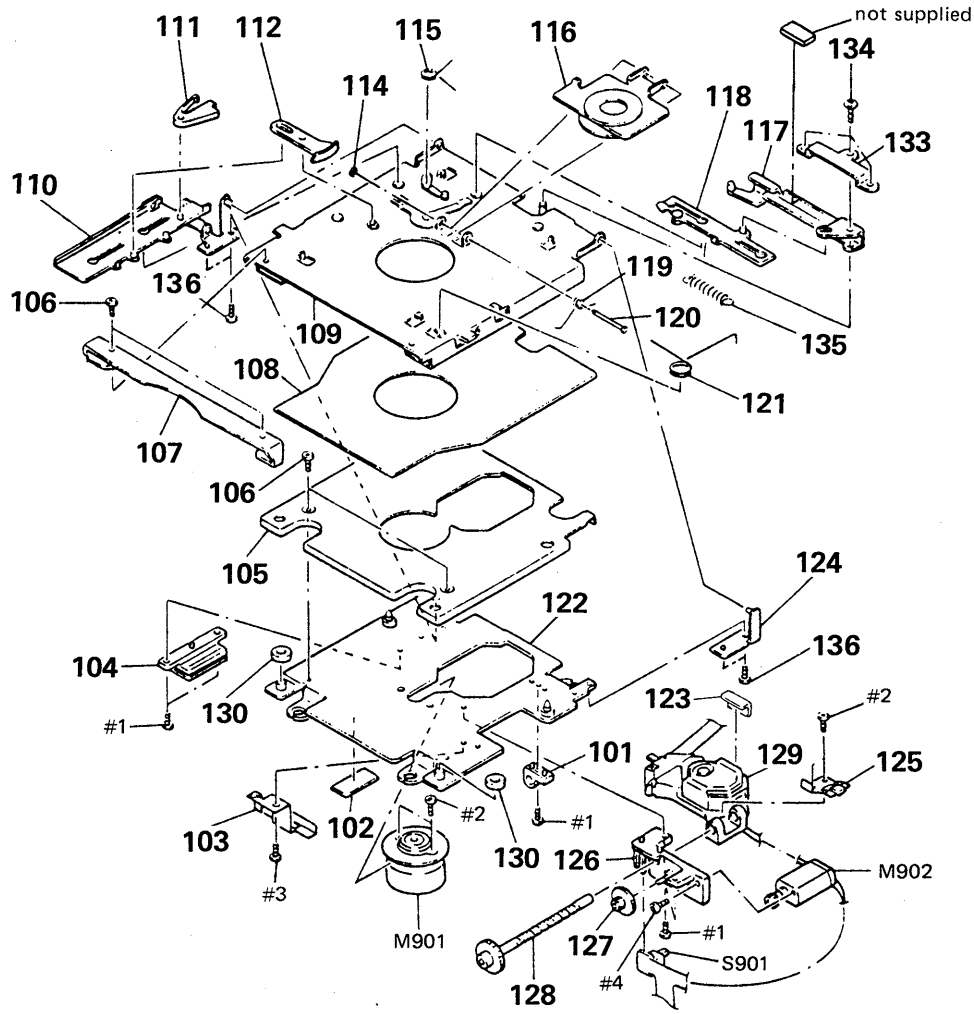
REVISED

7-2. LID CD, CABINET SECTION



Ref. No.	Part No.	Description	Remark
51	4-920-209-01	SCREW (INSULATOR), STEP	
52	X-4917-723-1	INSULATOR ASSY	
53	4-938-926-01	PLATE, FUNCTION, SW	
54	3-318-203-31	SCREW (B1.7X8), TAPPING	
55	4-938-924-01	BUTTON, PLAY	
56	4-938-925-01	BUTTON, STOP	
57	4-938-936-12	SPRING, FR BUTTON	
58	4-938-942-11	CABINET	
59	* 4-938-927-01	BRACKET, BOTTOM PLATE	
60	3-318-203-71	SCREW (B1.7X5), TAPPING	
61	X-4938-904-2	PLATE (B) ASSY, SWITCHING	
62	3-895-823-11	SCREW (B1.4X3), TAPPING	
63	4-938-935-01	LID, CD	
64	4-927-594-01	SCREW (M1.4X4), TAPPING	
65	3-831-441-XX	SPACER, KNOB	
66	4-938-943-22	COVER, CD LID	
67	3-704-197-42	SCREW (M1.4X2.2), LOCKING	
68	* 4-920-210-11	DAMPER	
69	X-4938-903-2	PLATE (A) ASSY, SWITCHING	
70	1-572-405-11	SWITCH, RUBBER KEY	
71	1-635-655-11	PC BAORD, FLEXIBLE	
72	4-920-251-02	SPRING, COMPRESSION	

7-3. MECHANISM SECTION (CDM-DD1)



Ref. No.	Part No.	Description	Remark
101	4-938-988-01	BRACKET, FEED SCREW	
102	3-831-441-11	CUSHION (B)	
103	4-938-985-01	SPRING, RETAINER	
104	4-938-989-01	GUIDE, FEED	
105	* 4-938-995-01	COVER, MD	
106	3-703-816-02	SCREW (M1.4X2.0), SPECIAL HEAD	
107	4-938-993-01	GUIDE, CADDY	
108	4-938-996-01	SHEET, HOLDER	
109	X-4938-914-1	HOLDER ASSY, CADDY	
110	X-4938-910-1	SLIDE ASSY, SWITCHING	
111	4-938-977-01	LEVER, RELEASE	
112	4-938-976-01	CAM, CHUCK	
114	4-938-972-01	WASHER (CHUCK SWITCHING SHAFT)	
115	4-938-971-01	SPRING, LOCK	
116	A-3049-088-A	CHUCKING BLOCK ASSY	
117	X-4938-908-1	LEVER ASSY, OPEN	
118	X-4938-909-1	SLIDE ASSY, OPEN	
119	4-938-973-01	SPRING, CHUCK RETAINER	
120	4-938-974-01	SHAFT, CHUCK SWITCHING	
121	4-938-970-01	SPRING, P	

Ref. No.	Part No.	Description	Remark
122	X-4938-913-1	CHASSIS ASSY, MD	
123	4-938-978-01	SHEET, 2 SHAFT	
124	X-4938-912-1	PLATE (B) ASSY, SWITCHING, CADDY	
125	4-938-979-01	RACK (OUTSERT)	
126	4-938-987-01	BRACKET, SLED	
127	4-938-986-01	GEAR (B)	
128	X-4938-911-1	SCREW ASSY, FEED	
129 ⚠	8-848-177-11	DEVICE, OPTICAL KSS-300A	
130 *	1-452-570-11	MAGNET	
133	4-938-975-01	REINFORCEMENT	
134	3-703-816-32	SCREW (M1.4X1.6), SPECIAL HEAD	
135	4-938-997-01	SPRING (A), TENSION	
136	3-366-048-01	SCREW (+P1.7X2.0) (NK)	
M901	A-3133-418-A	MOTOR ASSY, CLV	
M902	A-3133-419-A	MOTOR ASSY, SLED	
S901	1-570-953-11	SWITCH, PUSH (1 KEY) (LIMIT)	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SECTION 8
ELECTRICAL PARTS LIST

MAIN

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- –XX, –X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description			Remark
	A-3275-227-A	MAIN BOARD, COMPLETE			
		**********			
	3-345-648-01	SCREW (M1.4X3)			
*	4-926-587-01	SPACER			
	4-938-920-01	KNOB, CONTR			
	4-938-938-01	KNOB, VOLUME			
		< CAPACITOR >			
C101	1-163-209-00	CERAMIC CHIP	0.0015uF	5%	50V
C102	1-163-212-00	CERAMIC CHIP	0.002uF	5%	50V
C103	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C104	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C105	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C106	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C108	1-124-584-00	ELECT	100uF	20%	10V
C109	1-163-209-00	CERAMIC CHIP	0.0015uF	5%	50V
C110	1-135-174-11	TANTAL. CHIP	10uF	20%	10V
C201	1-163-209-00	CERAMIC CHIP	0.0015uF	5%	50V
C202	1-163-212-00	CERAMIC CHIP	0.002uF	5%	50V
C203	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C204	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C205	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C206	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C208	1-124-584-00	ELECT	100uF	20%	10V
C209	1-163-209-00	CERAMIC CHIP	0.0015uF	5%	50V
C210	1-135-174-11	TANTAL. CHIP	10uF	20%	10V
C301	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C303	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C304	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C305	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C306	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C307	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C308	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V

Ref. No.	Part No.	Description			Remark
C309	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C310	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C311	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C312	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C313	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C401	1-135-232-11	TANTAL. CHIP	10uF	20%	16V
C402	1-126-204-11	ELECT CHIP	47uF	20%	16V
C403	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C404	1-124-584-00	ELECT	100uF	20%	10V
C406	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C407	1-164-346-11	CERAMIC CHIP	1uF		16V
C408	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C409	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C410	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C411	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C412	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C413	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C414	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C415	1-126-204-11	ELECT CHIP	47uF	20%	16V
C416	1-126-397-11	ELECT	33uF	20%	25V
C417	1-126-397-11	ELECT	33uF	20%	25V
C418	1-126-400-11	ELECT	22uF	20%	35V
C419	1-126-400-11	ELECT	22uF	20%	35V
C420	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C421	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C422	1-135-232-11	TANTAL. CHIP	10uF	20%	16V
C450	1-126-369-11	ELECT	220uF	20%	6.3V
C453	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C454	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C455	1-164-346-11	CERAMIC CHIP	1uF		16V
C456	1-164-346-11	CERAMIC CHIP	1uF		16V
C457	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C458	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C459	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V

MAIN

Ref. No.	Part No.	Description			Remark
C460	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C461	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C462	1-135-174-11	TANTAL. CHIP	10uF	20%	10V
C463	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C464	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C465	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C470	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C605	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C801	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C802	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C803	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C804	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C805	1-124-584-00	ELECT	100uF	20%	10V
C806	1-164-346-11	CERAMIC CHIP	1uF		16V
C807	1-164-346-11	CERAMIC CHIP	1uF		16V
C808	1-164-346-11	CERAMIC CHIP	1uF		16V
C809	1-164-346-11	CERAMIC CHIP	1uF		16V
C810	1-164-346-11	CERAMIC CHIP	1uF		16V
C811	1-164-346-11	CERAMIC CHIP	1uF		16V
C812	1-164-346-11	CERAMIC CHIP	1uF		16V
C813	1-164-346-11	CERAMIC CHIP	1uF		16V
C815	1-164-346-11	CERAMIC CHIP	1uF		16V
C816	1-164-346-11	CERAMIC CHIP	1uF		16V
C817	1-164-346-11	CERAMIC CHIP	1uF		16V
C818	1-124-472-11	ELECT	470uF	20%	10V
C821	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C822	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C823	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C824	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C826	1-164-346-11	CERAMIC CHIP	1uF		16V
C828	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C829	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C831	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C833	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C834	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C835	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C836	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C838	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V

< CONNECTOR >

				Remark
CN401	1-566-535-11	CONNECTOR, FPC (ZIF)	19P	
CN801	1-569-949-11	CONNECTOR, FPC	13P	
CN803	1-569-031-21	CONNECTOR, FPC (ZIF)	25P	

< DIODE >

D301	8-719-400-18	DIODE	MA152WK
D302	8-719-977-34	DIODE	DTZ12
D401	8-719-975-46	DIODE	RB471E
D402	8-719-106-44	DIODE	RD9.1M-B2
D403	8-719-975-33	DIODE	RB110C
D404	8-719-975-40	DIODE	RB411D
D405	8-719-106-54	DIODE	RD10M-B3
D406	8-719-400-18	DIODE	MA152WK
D409	8-719-938-72	DIODE	SB01-05CP
D410	8-719-938-72	DIODE	SB01-05CP
D411	8-719-938-72	DIODE	SB01-05CP
D412	8-719-938-72	DIODE	SB01-05CP
D413	8-719-938-72	DIODE	SB01-05CP
D414	8-719-938-72	DIODE	SB01-05CP
D416	8-719-975-33	DIODE	RB110C
D420	8-719-400-18	DIODE	MA152WK
D421	8-719-400-18	DIODE	MA152WK
D422	8-719-104-34	DIODE	1S2836
D423	8-719-400-18	DIODE	MA152WK
D424	8-719-400-18	DIODE	MA152WK
D425	8-719-400-18	DIODE	MA152WK
D426	8-719-800-76	DIODE	1SS226
D427	8-719-977-34	DIODE	DTZ12
D428	8-719-977-34	DIODE	DTZ12
D801	8-719-106-71	DIODE	RD12M-B2
D803	8-719-400-18	DIODE	MA152WK
D804	8-719-106-71	DIODE	RD12M-B2
D805	8-719-106-71	DIODE	RD12M-B2
D806	8-719-106-71	DIODE	RD12M-B2
D807	8-719-106-71	DIODE	RD12M-B2
D808	8-719-106-71	DIODE	RD12M-B2
D809	8-719-106-71	DIODE	RD12M-B2
D810	8-719-106-71	DIODE	RD12M-B2
D811	8-719-104-34	DIODE	1S2836

< IC >

IC301	8-759-148-30	IC	uPD6376
IC303	8-759-630-75	IC	M51568FP
IC404	8-759-503-44	IC	RF5RD501AC
IC405	8-759-978-27	IC	BA10324F
IC406	8-759-925-74	IC	SN74HC04ANS
IC407	8-759-503-60	IC	S-80740AN-D4-S
IC408	8-759-503-60	IC	S-80740AN-D4-S
IC409	8-759-939-41	IC	S-81230AG-RB
IC607	8-759-822-85	IC	LC8951-422
IC608	8-759-824-06	IC	LC3664RML-12
IC801	8-759-140-93	IC	uPD70008AGB-6-3B4
IC802	8-759-150-41	IC	CXD8111Q
IC803	8-759-058-78	IC	uPD23C1000AG-356-E1
IC804	8-752-337-78	IC	CXK58257AM-10L
IC805	8-759-154-57	IC	uPD23C2000GC-F66-3B6

Ref. No.	Part No.	Description	Remark
IC806	8-759-982-77	IC BA10339F	
IC807	8-759-035-93	IC SC7S32F	
IC808	8-759-925-90	IC SN74HC74ANS	
IC809	8-759-925-90	IC SN74HC74ANS	
IC810	8-752-337-78	IC CXK58257AM-10L	
IC811	8-759-045-10	IC SED1336F0A	
		< JACK >	
J301	1-562-975-11	JACK (PHONES)	
J401	1-580-428-11	JACK, DC (DC IN 9V)	
J801	1-569-950-11	JACK (VIDEO OUT)	
		< COIL >	
L301	1-410-993-11	INDUCTOR, CHIP 1uH	
L302	1-410-993-11	INDUCTOR, CHIP 1uH	
L303	1-410-993-11	INDUCTOR, CHIP 1uH	
L305	1-410-997-31	INDUCTOR CHIP 2.2uH	
L401	1-459-961-11	COIL (WITH CORE) 120uH	
L452	1-412-029-11	INDUCTOR, CHIP 10uH	
L453	1-412-032-11	INDUCTOR, CHIP 100uH	
L801	1-410-993-11	INDUCTOR, CHIP 1uH	
L802	1-410-993-11	INDUCTOR, CHIP 1uH	
L803	1-410-997-31	INDUCTOR, CHIP 2.2uH	
L804	1-410-997-31	INDUCTOR, CHIP 2.2uH	
L808	1-410-997-31	INDUCTOR, CHIP 2.2uH	
L809	1-410-993-11	INDUCTOR, CHIP 1uH	
L810	1-410-997-31	INDUCTOR, CHIP 2.2uH	
L811	1-410-997-31	INDUCTOR, CHIP 2.2uH	
L812	1-410-997-31	INDUCTOR, CHIP 2.2uH	
L813	1-410-997-31	INDUCTOR, CHIP 2.2uH	
L814	1-410-997-31	INDUCTOR, CHIP 2.2uH	
L815	1-410-997-31	INDUCTOR, CHIP 2.2uH	
L816	1-410-997-31	INDUCTOR, CHIP 2.2uH	
L817	1-410-997-31	INDUCTOR, CHIP 2.2uH	
L818	1-410-997-31	INDUCTOR, CHIP 2.2uH	
		< TRANSISTOR >	
Q101	8-729-141-75	TRANSISTOR 2SD596DV345	
Q201	8-729-141-75	TRANSISTOR 2SD596DV345	
Q301	8-729-907-39	TRANSISTOR IMD2	
Q302	8-729-159-65	TRANSISTOR 2SD596	
Q401	8-729-900-53	TRANSISTOR DTC114EK	
Q402	8-729-922-34	TRANSISTOR 2SD1758F5-QR	
Q403	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q404	8-729-101-07	TRANSISTOR 2SB798-DL	
Q405	8-729-901-00	TRANSISTOR DTC124EK	
Q407	8-729-923-36	TRANSISTOR 2SD1963-Q, R	

Ref. No.	Part No.	Description	Remark
Q411	8-729-216-22	TRANSISTOR 2SA1162	
Q412	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q413	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q414	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q415	8-729-141-75	TRANSISTOR 2SD596DV345	
Q416	8-729-141-75	TRANSISTOR 2SD596DV345	
Q418	8-729-141-75	TRANSISTOR 2SD596DV345	
Q419	8-729-907-39	TRANSISTOR IMD2	
Q420	8-729-901-00	TRANSISTOR DTC124EK	
Q421	8-729-901-05	TRANSISTOR DTA124EK	
Q422	8-729-101-07	TRANSISTOR 2SB798-DL	
Q423	8-729-901-00	TRANSISTOR DTC124EK	
Q424	8-729-101-07	TRANSISTOR 2SB798-DL	
Q425	8-729-901-00	TRANSISTOR DTC124EK	
Q426	8-729-101-07	TRANSISTOR 2SB798-DL	
Q427	8-729-402-75	TRANSISTOR XN5501	
Q428	8-729-901-00	TRANSISTOR DTC124EK	
Q450	8-729-806-75	TRANSISTOR 2SB1120	
Q451	8-729-901-00	TRANSISTOR DTC124EK	
Q452	8-729-101-07	TRANSISTOR 2SB798-DL	
Q453	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q454	8-729-901-00	TRANSISTOR DTC124EK	
Q455	8-729-901-00	TRANSISTOR DTC124EK	
Q456	8-729-901-05	TRANSISTOR DTA124EK	
Q457	8-729-901-00	TRANSISTOR DTC124EK	
Q458	8-729-101-07	TRANSISTOR 2SB798-DL	
Q459	8-729-901-00	TRANSISTOR DTC124EK	
Q460	8-729-402-75	TRANSISTOR XN5501	
Q461	8-729-907-39	TRANSISTOR IMD2	
Q801	8-729-901-00	TRANSISTOR DTC124EK	
Q802	8-729-907-39	TRANSISTOR IMD2	
Q806	8-729-901-00	TRANSISTOR DTC124EK	
Q807	8-729-100-66	TRANSISTOR 2SC1623	
Q808	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q809	8-729-901-00	TRANSISTOR DTC124EK	
		< RESISTOR >	
R101	1-216-596-11	METAL GLAZE 2.7K 1% 1/10W	
R102	1-216-334-11	METAL GLAZE 22K 1% 1/10W	
R103	1-216-324-11	METAL GLAZE 10K 1% 1/10W	
R104	1-216-334-11	METAL GLAZE 22K 1% 1/10W	
R105	1-216-335-11	METAL GLAZE 24K 1% 1/10W	
R106	1-216-748-11	METAL CHIP 39K 1% 1/10W	
R107	1-216-542-11	METAL CHIP 12K 1% 1/10W	
R108	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R109	1-216-801-11	METAL CHIP 22 5% 1/16W	
R110	1-216-818-11	METAL CHIP 560 5% 1/16W	
R111	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R112	1-216-819-11	METAL CHIP 680 5% 1/16W	

MAIN

Ref. No.	Part No.	Description				Remark
R113	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R201	1-216-596-11	METAL GLAZE	2.7K	1%	1/10W	
R202	1-216-334-11	METAL GLAZE	22K	1%	1/10W	
R203	1-216-324-11	METAL GLAZE	10K	1%	1/10W	
R204	1-216-334-11	METAL GLAZE	22K	1%	1/10W	
R205	1-216-335-11	METAL GLAZE	24K	1%	1/10W	
R206	1-216-748-11	METAL CHIP	39K	1%	1/10W	
R207	1-216-542-11	METAL CHIP	12K	1%	1/10W	
R208	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R209	1-216-801-11	METAL CHIP	22	5%	1/16W	
R210	1-216-818-11	METAL CHIP	560	5%	1/16W	
R211	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R212	1-216-819-11	METAL CHIP	680	5%	1/16W	
R213	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R301	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R302	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R304	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R401	1-216-813-11	METAL CHIP	220	5%	1/16W	
R402	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R403	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R404	1-216-144-00	METAL CHIP	5.6	5%	1/8W	
R405	1-216-144-00	METAL CHIP	5.6	5%	1/8W	
R406	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R407	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R408	1-216-810-11	METAL CHIP	120	5%	1/16W	
R409	1-216-813-11	METAL CHIP	220	5%	1/16W	
R411	1-216-819-11	METAL CHIP	680	5%	1/16W	
R412	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R413	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R423	1-216-819-11	METAL CHIP	680	5%	1/16W	
R424	1-216-819-11	METAL CHIP	680	5%	1/16W	
R425	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R426	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R427	1-216-602-11	METAL GLAZE	6.8K	1%	1/10W	
R428	1-216-602-11	METAL GLAZE	6.8K	1%	1/10W	
R429	1-216-094-00	METAL GLAZE	75K	1%	1/10W	
R430	1-216-602-11	METAL GLAZE	6.8K	1%	1/10W	
R431	1-216-602-11	METAL GLAZE	6.8K	1%	1/10W	
R432	1-216-805-11	METAL CHIP	47	5%	1/16W	
R433	1-216-805-11	METAL CHIP	47	5%	1/16W	
R434	1-216-805-11	METAL CHIP	47	5%	1/16W	
R435	1-216-805-11	METAL CHIP	47	5%	1/16W	
R436	1-216-805-11	METAL CHIP	47	5%	1/16W	
R437	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R438	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R439	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R440	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R441	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R450	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R451	1-216-819-11	METAL CHIP	680	5%	1/16W	
R452	1-218-627-11	METAL CHIP	120	5%	1W	
R453	1-218-613-11	METAL CHIP	8.2	5%	1W	
R454	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R455	1-218-602-11	METAL CHIP	1	5%	1W	
R456	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R457	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R458	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R459	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R461	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R462	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R463	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R470	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R471	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R472	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R473	1-216-817-11	METAL CHIP	470	5%	1/16W	
R474	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R475	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R476	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R477	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R478	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R479	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R480	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R606	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R607	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R801	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R804	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R805	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R806	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R807	1-216-817-11	METAL CHIP	470	5%	1/16W	
R808	1-216-811-11	METAL CHIP	150	5%	1/10W	
R818	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R819	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R820	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R821	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R822	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R823	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R824	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R825	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R826	1-216-817-11	METAL CHIP	470	5%	1/16W	
R827	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R828	1-216-817-11	METAL CHIP	470	5%	1/16W	
R837	1-216-693-11	METAL CHIP	56K	0.5%	1/10W	
R838	1-216-671-11	METAL CHIP	6.8K	0.5%	1/10W	
R839	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W	
R840	1-216-664-11	METAL CHIP	3.6K	0.5%	1/10W	
R841	1-216-773-11	METAL GLAZE	68K	1%	1/10W	
R842	1-216-869-11	METAL GLAZE	130K	1%	1/10W	

MAIN **SERVO**

Ref. No.	Part No.	Description			Remark
R843	1-216-837-11	METAL CHIP	22K	5%	1/16W
R844	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R845	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R846	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R847	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R848	1-216-833-11	METAL CHIP	10K	5%	1/16W
R851	1-216-837-11	METAL CHIP	22K	5%	1/16W
R852	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R854	1-216-656-11	METAL CHIP	1.6K	0.5%	1/10W
R855	1-216-627-11	METAL CHIP	100	0.5%	1/10W
R856	1-216-630-11	METAL CHIP	130	0.5%	1/10W
R857	1-216-649-11	METAL CHIP	820	0.5%	1/10W
R858	1-216-647-11	METAL CHIP	680	0.5%	1/10W
R859	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R860	1-216-833-11	METAL CHIP	10K	5%	1/16W
R861	1-216-813-11	METAL CHIP	220	5%	1/16W
R862	1-216-805-11	METAL CHIP	47	5%	1/16W
R863	1-216-853-11	METAL CHIP	470K	5%	1/16W
R864	1-218-285-11	METAL GLAZE	75	5%	1/16W
R870	1-216-811-11	METAL CHIP	150	5%	1/16W
R871	1-216-811-11	METAL CHIP	150	5%	1/16W
R872	1-216-811-11	METAL CHIP	150	5%	1/16W
R873	1-216-821-11	METAL CHIP	1K	5%	1/16W
R877	1-216-809-11	METAL CHIP	100	5%	1/16W
R878	1-216-809-11	METAL CHIP	100	5%	1/16W
R879	1-216-809-11	METAL CHIP	100	5%	1/16W
R880	1-216-809-11	METAL CHIP	100	5%	1/16W
R881	1-216-809-11	METAL CHIP	100	5%	1/16W
R882	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R883	1-216-821-11	METAL CHIP	1K	5%	1/16W
R886	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R887	1-216-839-11	METAL CHIP	33K	5%	1/16W
R888	1-216-839-11	METAL CHIP	33K	5%	1/16W
R889	1-216-839-11	METAL CHIP	33K	5%	1/16W
R890	1-216-839-11	METAL CHIP	33K	5%	1/16W
R891	1-216-839-11	METAL CHIP	33K	5%	1/16W
R892	1-216-839-11	METAL CHIP	33K	5%	1/16W
R893	1-216-839-11	METAL CHIP	33K	5%	1/16W
R894	1-216-839-11	METAL CHIP	33K	5%	1/16W
R895	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R896	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R897	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R898	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R899	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R900	1-216-815-11	METAL CHIP	330	5%	1/16W
R901	1-216-821-11	METAL CHIP	1K	5%	1/16W
R903	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R904	1-216-821-11	METAL CHIP	1K	5%	1/16W
R910	1-216-833-11	METAL CHIP	10K	5%	1/16W
R911	1-216-833-11	METAL CHIP	10K	5%	1/16W
R912	1-216-833-11	METAL CHIP	10K	5%	1/16W

< VARIABLE RESISTOR >

RV301	1-230-485-11	RES, VAR, CARBON 10K/10K (VOLUME)
RV401	1-230-939-11	RES, VAR, CARBON 10K (CONTRAST)
RV801	1-230-874-11	RES, ADJ, METAL 100K
RV802	1-230-874-11	RES, ADJ, METAL 100K

< SWITCH >

S801	1-570-204-11	SWITCH, KEY BOARD (▶II)
S802	1-570-204-11	SWITCH, KEY BOARD (STOP)
S803	1-570-204-11	SWITCH, KEY BOARD (⏮)
S804	1-570-204-11	SWITCH, KEY BOARD (⏭)
S805	1-571-737-21	SWITCH, KEY BOARD (REFLOW) (RESET)
S807	1-570-397-11	SWITCH, SLIDE (HOLD)
S810	1-571-277-11	SWITCH, SLIDE (NTSC/PAL)

< TRANSFORMER >

T100	1-466-576-11	INVERTER UNIT

< CRYSTAL >

X801	1-567-737-11	VIBRATOR, CRYSTAL (16.934MHz)
X802	1-579-472-21	VIBRATOR, CRYSTAL (6.0625MHz)
X803	1-579-474-21	VIBRATOR, CRYSTAL (6.105MHz)

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A-3275-226-A SERVO BOARD, COMPLETE

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4-938-907-01 SHEET, INSULATING, SERVO

< CAPACITOR >

C405	1-135-231-11	TANTAL. CHIP	33uF	20%	6.3V
C451	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C452	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C502	1-135-231-11	TANTAL. CHIP	33uF	20%	6.3V
C503	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C504	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C505	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V
C506	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C507	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C508	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C509	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C510	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C513	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C514	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C515	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V

SERVO

Ref. No.	Part No.	Description			Remark
C516	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C517	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C518	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C519	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C520	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C521	1-164-315-11	CERAMIC CHIP	470PF	10%	50V
C522	1-135-156-21	TANTALUM CHIP	6.8uF	10%	10V
C523	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V
C524	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C525	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C526	1-135-156-21	TANTALUM CHIP	6.8uF	10%	10V
C527	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C528	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C529	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C530	1-162-956-11	CERAMIC CHIP	180PF	5%	50V
C531	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C532	1-135-232-11	TANTAL. CHIP	10uF	20%	16V
C533	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C534	1-163-986-00	CERAMIC CHIP	0.027uF	10%	25V
C535	1-164-346-11	CERAMIC CHIP	1uF		16V
C536	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C537	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C538	1-164-346-11	CERAMIC CHIP	1uF		16V
C539	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C541	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C542	1-135-232-11	TANTAL. CHIP	10uF	20%	16V
C543	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C544	1-164-362-11	CERAMIC CHIP	470PF		50V
C545	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C546	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C547	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C548	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C550	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C551	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C552	1-135-144-11	TANTAL. CHIP	22uF	20%	6.3V
C553	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C556	1-124-584-00	ELECT	100uF	20%	10V
C558	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C559	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C560	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C561	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C563	1-164-346-11	CERAMIC CHIP	1uF		16V
C565	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C566	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V
C567	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C568	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C569	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C570	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C603	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C604	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C606	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C607	1-164-346-11	CERAMIC CHIP	1uF		16V
C608	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C609	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C610	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C611	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C612	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C830	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V

< CONNECTOR >

CN501	1-566-528-21	CONNECTOR, FPC (ZIF)	12P
CN502	1-566-526-11	CONNECTOR, FPC (ZIF)	10P
CN804	1-569-031-21	CONNECTOR, FPC (ZIF)	25P

< DIODE >

D408	8-719-400-18	DIODE	MA152WK
D415	8-719-938-72	DIODE	SB01-05CP
D501	8-719-938-72	DIODE	SB01-05CP
D503	8-719-938-72	DIODE	SB01-05CP
D504	8-719-400-18	DIODE	MA152WK

< IC >

IC501	8-752-033-14	IC	CXA1081Q
IC502	8-752-037-50	IC	CXA1082BQ
IC503	8-759-030-17	IC	MPC1715
IC504	8-759-970-89	IC	BA10358F
IC601	8-752-335-92	IC	CXD1167Q
IC602	8-759-710-79	IC	NJM2107F

< COIL >

L449	1-410-997-31	INDUCTOR, CHIP	2.2uH
L450	1-412-029-11	INDUCTOR, CHIP	10uH
L451	1-412-029-11	INDUCTOR, CHIP	10uH
L501	1-412-039-51	INDUCTOR, CHIP	100uH
L502	1-412-032-11	INDUCTOR, CHIP	100uH
L503	1-412-039-51	INDUCTOR, CHIP	100uH
L504	1-412-039-51	INDUCTOR, CHIP	100uH
L505	1-412-029-11	INDUCTOR, CHIP	10uH
L601	1-410-997-31	INDUCTOR, CHIP	2.2uH
L806	1-410-997-31	INDUCTOR, CHIP	2.2uH

< TRANSISTOR >

Q406	8-729-901-05	TRANSISTOR	DTA124EK
Q408	8-729-901-00	TRANSISTOR	DTC124EK
Q409	8-729-101-07	TRANSISTOR	2SB798-DL
Q410	8-729-903-10	TRANSISTOR	FMW1
Q507	8-729-101-07	TRANSISTOR	2SB798-DL
Q508	8-729-805-43	TRANSISTOR	2SC3396

Ref. No.	Part No.	Description			Remark
Q509	8-729-141-48	TRANSISTOR	2SB624-BV345		
Q510	8-729-402-75	TRANSISTOR	XN5501		
Q511	8-729-901-00	TRANSISTOR	DTC124EK		
Q804	8-729-901-05	TRANSISTOR	DTA124EK		
		< RESISTOR >			
R414	1-216-837-11	METAL CHIP	22K	5%	1/16W
R415	1-216-817-11	METAL CHIP	470	5%	1/16W
R416	1-216-662-11	METAL CHIP	3K	0.5%	1/10W
R417	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R501	1-218-286-11	METAL GLAZE	91	5%	1/16W
R504	1-216-833-11	METAL CHIP	10K	5%	1/16W
R505	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R506	1-216-835-11	METAL CHIP	15K	5%	1/16W
R507	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R510	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R512	1-216-837-11	METAL CHIP	22K	5%	1/16W
R513	1-216-857-11	METAL CHIP	1M	5%	1/16W
R514	1-216-837-11	METAL CHIP	22K	5%	1/16W
R515	1-216-843-11	METAL CHIP	68K	5%	1/16W
R516	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R517	1-216-845-11	METAL CHIP	100K	5%	1/16W
R518	1-216-062-00	METAL CHIP	3.6K	5%	1/10W
R519	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R520	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R521	1-216-848-11	METAL CHIP	180K	5%	1/16W
R522	1-216-849-11	METAL CHIP	220K	5%	1/16W
R523	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R524	1-216-844-11	METAL CHIP	82K	5%	1/16W
R525	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R526	1-216-844-11	METAL CHIP	82K	5%	1/16W
R527	1-216-837-11	METAL CHIP	22K	5%	1/16W
R528	1-218-273-11	METAL GLAZE	510K	5%	1/16W
R529	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R530	1-216-847-11	METAL CHIP	150K	5%	1/16W
R531	1-216-833-11	METAL CHIP	10K	5%	1/16W
R532	1-216-845-11	METAL CHIP	100K	5%	1/16W
R533	1-216-840-11	METAL CHIP	39K	5%	1/16W
R534	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R535	1-216-857-11	METAL CHIP	1M	5%	1/16W
R536	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R537	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R538	1-216-817-11	METAL CHIP	470	5%	1/16W
R539	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R540	1-216-833-11	METAL CHIP	10K	5%	1/16W
R541	1-216-859-11	METAL GLAZE	1.5M	5%	1/16W
R543	1-216-837-11	METAL CHIP	22K	5%	1/16W
R544	1-216-162-00	METAL GLAZE	33	5%	1/8W
R545	1-216-841-11	METAL CHIP	47K	5%	1/16W
R546	1-216-857-11	METAL CHIP	1M	5%	1/16W
R547	1-216-851-11	METAL CHIP	330K	5%	1/16W
R548	1-216-837-11	METAL CHIP	22K	5%	1/16W
R549	1-216-833-11	METAL CHIP	10K	5%	1/16W
R550	1-216-821-11	METAL CHIP	1K	5%	1/16W
R551	1-216-162-00	METAL GLAZE	33	5%	1/8W
R552	1-216-821-11	METAL CHIP	1K	5%	1/16W
R553	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R554	1-216-863-11	METAL GLAZE	3.3M	5%	1/16W
R555	1-216-851-11	METAL CHIP	330K	5%	1/16W
R556	1-216-845-11	METAL CHIP	100K	5%	1/16W
R560	1-216-102-00	METAL GLAZE	160K	5%	1/10W
R561	1-216-844-11	METAL CHIP	82K	5%	1/16W
R562	1-216-102-00	METAL GLAZE	160K	5%	1/10W
R563	1-216-849-11	METAL CHIP	220K	5%	1/16W
R564	1-216-848-11	METAL CHIP	180K	5%	1/16W
R565	1-216-836-11	METAL CHIP	18K	5%	1/16W
R566	1-218-448-11	METAL GLAZE	430K	5%	1/16W
R601	1-216-845-11	METAL CHIP	100K	5%	1/16W
R602	1-216-833-11	METAL CHIP	10K	5%	1/16W
R603	1-216-847-11	METAL CHIP	150K	5%	1/16W
R604	1-216-847-11	METAL CHIP	150K	5%	1/16W
R605	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R874	1-216-811-11	METAL CHIP	150	5%	1/16W
R875	1-216-811-11	METAL CHIP	150	5%	1/16W
R876	1-216-811-11	METAL CHIP	150	5%	1/16W
		< VARIABLE RESISTOR >			
RV501	1-230-871-11	RES, ADJ, METAL 22K			
RV502	1-230-873-11	RES, ADJ, METAL 47K			
RV503	1-230-873-11	RES, ADJ, METAL 47K			
RV504	1-230-869-11	RES, ADJ, METAL 4.7K			
RV505	1-230-867-11	RES, ADJ, METAL 1K			
		< SWITCH >			
S806	1-570-953-11	SWITCH, PUSH (1 KEY) (OPEN)			

****

MISCELLANEOUS

****

36		1-639-550-11	PC BOARD, FLEXIBLE
37		1-569-951-11	SOCKET, CONNECTOR
70		1-572-405-11	SWITCH, RUBBER KEY
71		1-635-655-11	PC BAORD, FLEXIBLE
129	⚠	8-848-177-11	DEVICE, OPTICAL KSS-300A
130	*	1-452-570-11	MAGNET
EL801		1-809-436-11	ELEMENT, EL (BACK LIGHT)
LCD801		1-809-439-11	DISPLAY PANEL, LIQUID CRYSTAL
M901		A-3133-418-A	MOTOR ASSY, CLV
M902		A-3133-419-A	MOTOR ASSY, SLED

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS	
		**********	
⚠•	1-465-609-11	ADAPTOR, AC (AC-96N) (US)	
⚠•	1-465-668-11	ADAPTOR, AC (AC-96N) (UK)	
⚠•	1-465-817-21	ADAPTOR, AC (AC-96NES) (AEP)	
	1-528-332-21	PACK, BATTERY (BP-45)	
	1-543-584-11	CORE (for connection cord)	
	1-550-596-21	CASE, BATTERY (EBP-45)	
	1-575-875-11	CORD, CONNECTION	
	3-754-001-21	MANUAL (ENGLISH) (US)	
	3-754-001-41	MANUAL (ENGLISH) (UK)	
	3-754-001-51	MANUAL (ENGLISH, FRENCH, GERMAN, SPANISH, ITALIAN) (AEP)	
*	4-938-902-01	CUSHION (UPPER)	
*	4-947-361-01	CUSHION (BOTTOM)	
*	4-947-360-01	INDIVIDUAL CARTON (US)	
*	4-947-814-01	INDIVIDUAL CARTON (AEP, UK)	

****

HARDWARE LIST

****

#1	7-627-552-38	SCREW, PRECISION +P 1.7X3
#2	7-627-552-28	SCREW, PRECISION +P 1.7X2
#3	7-627-552-18	SCREW, PRECISION +P 1.7X1.6
#4	7-627-553-38	SCREW, PRECISION +P 2X3
#5	7-626-314-31	SPRING PIN 2X16

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

9-956-480-11
(Including 9-956-480-92)

Sony Corporation
General Audio Group

English
9110688-1
Printed in Japan

Published by Customer Relations and Service Group

DD-1EX

SONY
SERVICE MANUAL

US Model
AEP Model
UK Model

SUPPLEMENT-1

File this supplement with the service manual.

Subject : Test Mode

This unit includes the features described in the Service Manual in addition to the following 5 test modes (Service Modes).

F1 Mode : LCD check, servo system operation (normal CD Service Mode)
F2 Mode : Data access operation (CD-ROM readout operation check)
F3 Mode : Keyboard check
F4 Mode : Self diagnosis, commander mode (Connection and operation check of each LSI, partially used for electrical adjustments.)
F5 Mode : Debug mode **(This mode is not applicable for service use.)**

This supplement contains startup procedures of the test modes, as well as descriptions and procedures of the F1-F4 modes to assist in repair inspections.

9-956-480-81

Sony Corporation
General Audio Group

English
91L0689-1
Printed in Japan

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1. TEST MODE STARTUP PROCEDURE

There are 2 methods to enable the startup of the test mode of the unit.

1-1. Multiple button operation method

1. Press the STOP (■) button to set the POWER OFF.
2. While pressing the 3 ⏮ · ALPHABET/NUMBER F1 buttons, press the ▷▯▯ (POWER ON) button.
3. **Sony Bus Mode** will be displayed on the LCD screen. Press function keys F1 - F4 and enter the appropriate mode.

1-2. Solder bridge short circuiting method

1. Solder and short circuit the Service Mode on the main board with the external power supply removed (power is not supplied to the unit). Refer to the Service Guide for more details on the position of the tap.
2. Plug the external power supply.
3. Press the PLAY button to enter the F1 mode.

After startup of the test mode, function keys F1 - F4 can be used any time. When entering another mode or restarting the same mode, press the appropriate function key of the mode. The current mode will be aborted and the selected mode will be entered.

2. EXITING THE TEST MODE

Exit the test mode by pressing the reset switch located under the main unit or by removing the external power supply. Remove the soldered tap which was short circuited during the test mode startup.

3. F1 MODE

The F1 mode performs the LCD dot check (FONT ROM check) and servo system operation check.

3-1. LCD check

When this mode is entered, the following 5 patterns (white→black→horizontal line→vertical line→Kanji) are displayed repeatedly on the LCD screen at every 3-second interval. The current display on the screen is paused by pressing the YES key on the keyboard and released by pressing the NO key. When the Kanji is displayed without any distortion, it is assumed that the FONT ROM check turned out OK. (The FONT ROM check is also performed in the F4 mode.)

The servo system operation check will still be performed when the connectors are removed and the LCD screen is not displaying.

3-2. Servo system operation check

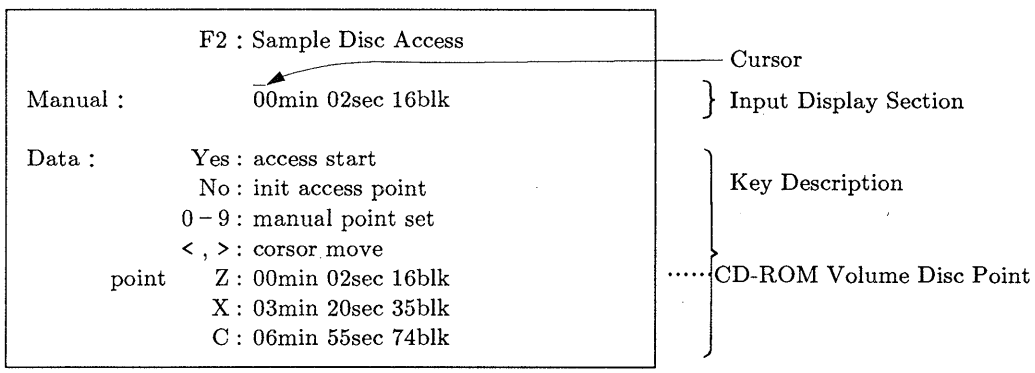
1. When the ⏭ or ⏮ button is pressed, the optical pickup moves to the inner or outer periphery.
   When the 3 servo is turned ON and this operation is executed, the tracking servo and threading servo will turn OFF.
2. When the ▷▯▯ key is pressed, the unit will enter CLV-S (With draw mode) while focus searching.
   When there is no disc, the spindle motor will turn and perform focus search.
3. When the operations described in step 2 are performed, press the ▷▯▯ key once more. Muting will be cancelled and the tracking servo, threading servo and CLV-A (servo during PLAY) will be turned ON.
4. PLAY will start when the operations in step 2 and 3 are performed. At this point, if S806 (door OPEN switch) is disabled, sound will not be emitted due to the muting operation, but it will be enabled by pushing the ▷▯▯ button again.
5. All servos (focus, tracking, threading and spindle) will be turned OFF when the ■ key is pressed.
   ※ Use chucking plate assembly X-4924-729-1 and insert an 8cm CD when performing the above operation with the CD cover open. (Do not use radio cassette recorder chucking plate tool X-4918-255-1.)

4. F2 MODE

The F2 mode performs a CD-ROM data readout operation check. A hexadecimal data readout is displayed on the screen. The readout data is retrieved from the disk which is inserted in the electronic book player. The data is read out from an assigned location based on absolute time input designated by the user.

The following screen is displayed when the unit enters the F2 mode.

○ **Initial Screen**

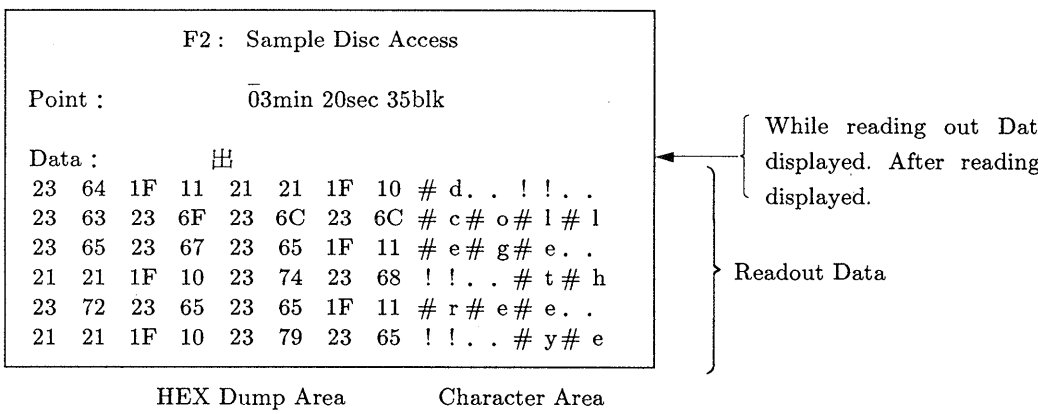


Press the numerical keys ⓪ - ⑨ and set the absolute time in the input display section. Press [YES], the electronic book will read out the data and display a 1-line 8-byte hexadecimal or ASCII coded character after "Data : " readout. The CD-ROM operation check is OK when the following is displayed without any error.

The Ⓩ, Ⓧ and Ⓒ keys contain preset values. Pressing these keys will access and display the data from the preset point. The [NO] key initializes the input display section and enables time setting with the left and right cursors.

○ **Screen After Data Readout**

・Normal Readout Enabled



Note : Only CDs that are compatible with the electronic book player can display data. Ordinary music CDs cannot display data. The contents of the data may vary depending on the electronic book player.

· **Error Screen**

```
                F2 : Sample Disc Access

Point :              03min 20sec 35blk

Data :           NG! audio track


    code=81  00  12  00  08  F5  21  01
         2C  00  23  80
```

"NG!" is displayed after "Data : "
Followed by the description of the error
The error code is displayed in the dump area (details are not disclosed)

※ The screen on the left indicates that the point cannot be read since the disc contains audio data

* Error Messages

① invalid address	:	Invalid address has been assigned.
② failed data	:	Data cannot be processed.
② not found	:	Address cannot be found.
② lead out	:	Address is found in the lead out area.
② not read	:	Disc cannot be read due to damage.
③ no disc	:	Disc is not inserted.
① illegal disc	:	Illegal disc which cannot be played (i.e., 4ch audio disc, etc.) is inserted.
④ audio track	:	Data cannot be displayed since the disc contains audio data.
① other mode track	:	Disc cannot be read since data is other than MODE1, MODE2 (discs other than those stipulated in the Yellow Book).
① mode0 track	:	Data display is meaningless since the data is MODE0.
① form mismatch	:	Data cannot be displayed since the data is MODE2/*FORM2.

→ Under normal operation, ① : "Disc is not compatible."
② : "Disc is dirty or damaged."
③ : "Insert disc."
④ : "Switch to audio operation."

the above measures are displayed.

* FORM2 : ADPCM (Compressed audio) region stipulated in CD ROM-XA.

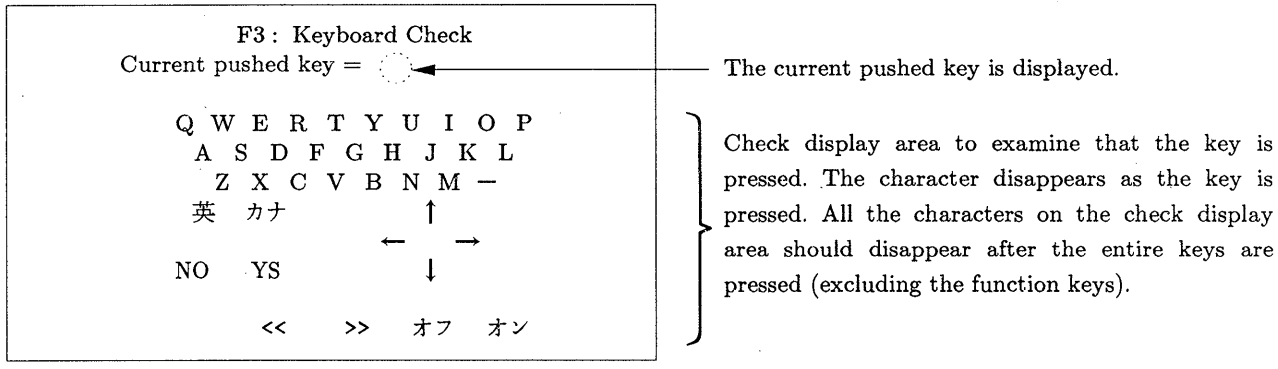
5. F3 MODE

The F3 mode performs the operation and connection check of the 39 keys on the keyboard (excluding function keys [F1] - [F5]).

When the keyboard is pressed, the corresponding keys are displayed. The check area display of the corresponding keys disappear as the keys are entered. The F3 keyboard check is OK when all the check area characters disappear after all the keys are entered (excluding the function keys).

Function key check is performed in the initial screen of other test modes.

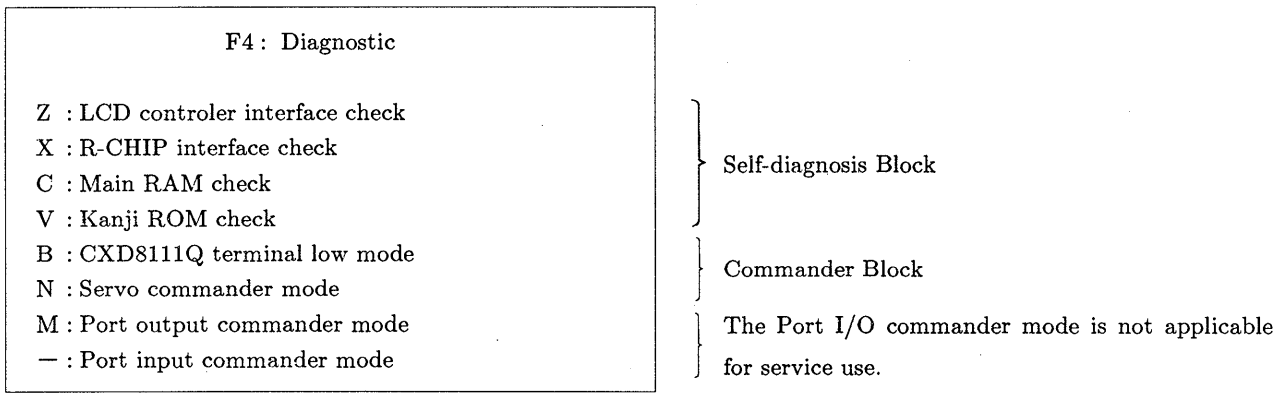
○ Initial Screen



6. F4 MODE

The F4 mode contains eight additional check functions (two of which are not applicable for service use) that are assigned to the keyboard. These can be roughly divided into two blocks : self-diagnosis and commander.

○ Initial Screen



Press the appropriate Ⓩ, Ⓧ, Ⓒ, Ⓥ, Ⓑ and Ⓝ keys from the initial screen to advance to the corresponding blocks.

6-1. LCD controller (IC811) interface check

When Ⓩ is pressed from the F4 mode initial screen, data is written to the display memory (IC810) via LCD controller (IC811) and read out to check whether a normal value is returned. "OK" will be displayed when the unit operates normally; "NG" will be displayed when the unit malfunctions. Check the connection between system controller (IC801), extension I/O (IC 802) and LCD controller (IC402) as well as the connection between LCD controller (IC401) and display memory (IC402). IC401 and IC402 may be possibly defective.

6-2. CD-ROM decoder (IC607) interface check

When Ⓧ is pressed from the F4 mode initial screen, data is written to the register in the CD-ROM decoder (IC607) and read out to check whether a normal value is returned.

"OK" will be displayed when the unit operates normally; "NG" will be displayed when the unit malfunctions. When NG, IC607 may be possibly defective or check the connection between extension I/O (IC802) and the CD-ROM decoder (IC607).

6-3. Main RAM (IC804) check

When Ⓒ is pressed from the F4 mode initial screen, a 55 H (hexadecimal) data is written to the main RAM (IC 804) from the leading address (8000H) in order and read out to check whether the data has been properly written. (A "*" mark is indicated for every 256 bytes when OK.) If OK, a similar check is performed for the AAH (hexadecimal) data. (A "#" mark is indicated when "OK".) When an error arises, "NG!" will be immediately indicated (see below). Although 8000H - 80FFH and FF 00H - FFFFH are indicated with a "?" at all times, note that this is not an error.

· Normal

```
F4 : Diagnostic

C : Main RAM check
 8000  : ? ################
 9000  : ################
A000  : ################
B000  : ################
C000  : ################
D000  : ################
E000  : ################
F000  : ################ ? OK !
```

· Error (example)

```
F4 : Diagnostic

C : Main RAM check
 8000  : ? ****************
 9000  : ****************
A000  : ********* NG !
```

Since "NG!" is indicated in the tenth position of the "*" mark for "A000 : ", this indicates that an error has occurred after the A900H address.

6-4. I (Kanji) font ROM (IC805) check

When Ⓥ is pressed from the F4 mode initial screen, the Kanji font ROM (IC805) check can be performed.
The entire data of the (Kanji) font ROM is divided into eight sections from page 0 - 7. The checksum results of each page is displayed. When NG, perform the address data bus check (especially for CA12 - CA0). Use in conjunction with the F1 screen.

· Normal

```
F4 : Diagnostic

V : Kanji ROM check
page0    OK !
    1    OK !
    2    OK !
    3    OK !
    4    OK !
    5    OK !
    6    OK !
    7    OK !
```

· Error (example)

```
F4 : Diagnostic

V : Kanji ROAM check
page0    OK !
    1    OK !
    2    OK !
    3              NG !
    4    OK !
    5    OK !
    6              NG !
    7    OK !
```

Address-Page Relationship

Page \ Address	CA10	CA11	CA12
0	0	0	0
1	1	0	0
2	0	1	0
3	1	1	0
4	0	0	1
5	1	0	1
6	0	1	1
7	1	1	1

6-5. Extension I/O (IC802) terminal Low mode

When Ⓑ is pressed from the F4 mode initial screen, the terminals assigned with the keyboard of the extension I/O (IC802) will be set to the LOW level.

Keyboard	Extension I/O (IC802) Terminal No.	Function/Use
Q	42	CD digital signal processing (IC601) mode selection "H" : CD-ROM processing (no compensation) "L" : Music disc processing
W	44	Servo (IC502) and CD digital signal processing (IC601) reset Reset when "L".
E	48	Optical pickup laser diode ON/OFF selection "L" : Light ON
R	58	Not applicable for use in this unit.
T	60	Analog mute control. Mutes headphones amplifier (IC303) and its output. "H" : Mute
Y	61	Headphones amplifier (IC303) de-emphasis control "H" : De-emphasis ON
U	99	Battery recharge ON/OFF selection. Use this mode to unconditionally set the unit to the recharging mode during battery voltage adjustments.
I	112	Not applicable for use in this unit.

○ **Initial Screen**

F4 : Diagnostic

B : CXD8111Q terminal low mode

Low level :

terminal key

Q=(42)−ROM	W=(44)−XRST
E=(48)−LDON	R=(58)−<CDAX>
T=(60)−AMUTE	Y=(61)−PEN
U=(99)−CGON	I =(112)−<SPEC>

○ **Operation (example : when the E key is pressed)**

F4 : Diagnostic

B : CXD8111Q terminal low mode

Low level : E=(48)−LDON

terminal key

Q=(42)−ROM	W=(44)−XRST
E=(48)−LDON	R=(58)−<CDAX>
T=(60)−AMUTE	Y=(61)−PEN
U=(99)−CGON	I =(112)−<SPEC>

Indicates the current L level terminal after the "Low level : " area.

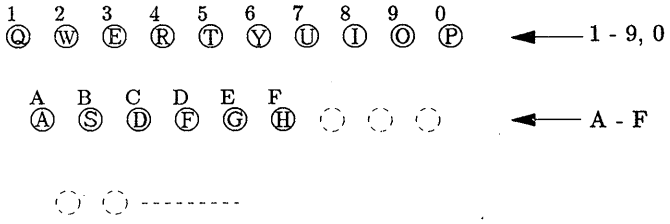
Note : All terminals other than those indicated in the display section after the "Low level" area is " H" level.

6-6. Direct command output mode to servo system (IC502, IC601)

When Ⓝ is pressed from the F4 mode initial screen, direct command is sent to the servo (IC502) and CD digital signal processing (IC601) to enable manual control.

To facilitate input, Ⓐ - Ⓗ is changed to the A, B, ...F keyboard arrangement in place of hexadecimal command input.

○ **Key Assignment**



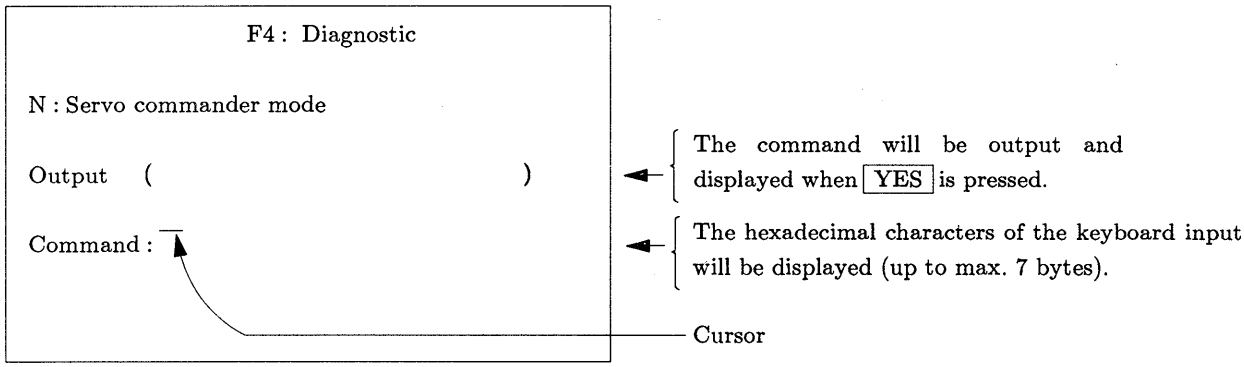
◄ ► : Cursor movement

YES : Command output

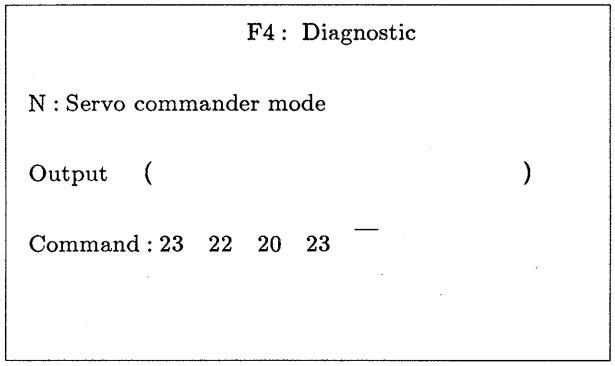
NO : LCD screen is initialized in the current mode prior to current input

All commands that have been input will be reset when reentry to the F4 mode is performed.

○ **Initial Screen**



○ **Command Input (example)**



○ Command Output (example)

```
F4 : Diagnostic

N : Servo commander mode

Output   (23  22  20  23                )

Command : 23  22  20  23  _
```

```
F4 : Diagnostic

N : Servo commander mode

Output   (23  22  20                    )

Command : 23  22  20  23̄
```

The commands up to the left side of the cursor will be output when the [YES] key is pressed. The actual data output will be displayed on the upper section. Commands on the left side of the cursor that are less than 1 byte will not be output.
Correction via cursor movements and re-outputs are enabled since the data is still displayed on the command -side after the commands have been output.

○ Command Examples

- 00 Focus search ON
- 02 Focus search UP
- 03 Focus search DOWN

→ Focus

- 20 Threading servo OFF
- 22 Optical pickup moves to outer periphery
- 23 Optical pickup moves to inner periphery

→ Threading

- 40 Auto sequence cancel
- 47 Focus withdraw (auto focus)

→ Servo (IC502)

- E0 Spindle STOP
- E8 Spindle NORMAL (kick)
- EA Spindle REVERSE (brake)
- EE Rough servo (CLV-S)
- E6 Normal PLAY (CLV-A)

→ Spindle → Digital CD signal processing (IC601)

※ For more details, refer to the CXA1082BQ and CXD1167Q Specifications.

○ CXA1082BQ (IC502) Command List

Item		ADDRESS	DATA				SENS Output
		D7D6D5D4	D3	D2	D1	D0	
Focus Control		0 0 0 0	FS4 Focus ON	FS3 Gain Down	FS2 Search ON	FS1 Search UP	FZC
Tracking Control		0 0 0 1	Anti Shock	Brake ON	TG2 Gain Set *1	TG1	A.S
Tracking Mode		0 0 1 0	Tracking Mode *2		Sled Mode *3		TZC
Select		0 0 1 1	PS4 Focus Search+2	PS3 Focus Search+1	PS2 Sled Kick+2	PS1 Sled Kick+1	SSTOP
Auto sequence *4		0 1 0 0	AS3	AS2	AS1	AS0	$\overline{\text{BUSY}}$
*5 RAM SET	Blind (A, E)/Overflow (C)	0 1 0 1	0.18ms	0.09ms	0.045ms	0.022ms	Hi-Z
	Brake (B)		0.36ms	0.18ms	0.09ms	0.045ms	
	Kick (D)	0 1 1 0	11.6ms	5.8ms	2.9ms	1.45ms	
	Track Jump (N)	0 1 1 1	64	32	16	8	
	Track Move (M)		128	64	32	16	

*1 Gain SET

TG1 and TG2 can be independently set.

When ANTI SHOCK=1 (00011XXX), TG1 and TG2 is inverted when internal ANTI SHOCK=H.

*2 TRACKING MODE

	D3	D2
OFF	0	0
ON	0	1
FWD JUMP	1	0
REV JUMP	1	1

*3 SLED MODE

	D1	D0
OFF	0	0
ON	0	1
FWD MOVE	1	0
REV MOVE	1	1

*4 AUTO SEQUENCE

	AS3	AS2	AS1	AS0
CANCEL	0	0	0	0
FOCUS ON	0	1	1	1
1 TRACK JUMP	1	0	0	X
10 TRACK JUMP	1	0	1	X
2N TRACK JUMP	1	1	0	X
M TRACK MOVE	1	1	1	X

X= 0 FORWARD

X= 1 REVERSE

- The unit will return to the previous AUTO SEQUENCE mode (prior to sending $4X) when CANCEL $40 is sent.
- The AUTO SEQUENCE mode will startup with the rising edge of the input pulse (WDCK) of the initial 40 address terminal after the $4X transmission and LATCH pulse startup.

*5 RAM SET

- The available SET values are $0 - $E. ($F is not usable.)
- The above SET values are applicable when a 40-pin WDCK (88.2kHz) is input.
- RAM will be POWER ON PRESET. The initial preset values of the RAM are shown below.

ADDRESS	DATA
0 1 0 1	0 1 0 1
0 1 1 0	0 1 1 1
0 1 1 1	1 1 1 0

- The actual count value and SET value may differ slightly.

A	SET value + 4 - 5	WDCK
B,D,E	SET value + 3	WDCK
C	SET value + 5	WDCK
N,M	SET value + 3	C.OUT

○ CXD1167Q (IC601) Command List

XRST=L and D3~D0 is "0"

Register	Command	Address D7 - D4	Data D3	D2	D1	D0	SENS Terminal
9*1	New function control	1 0 0 1	ZCMT	HZPD	NCLV	CRCQ	Z
A*2	Sync compensation, attenuator control	1 0 1 0	GSEM	GSEL	WSEL	ATTM	Z
B	Counter set Lower 4-bit	1 0 1 1	Tc3	Tc2	Tc1	Tc0	$\overline{\text{COMPLETE}}$
C	Counter set Higher 4-bit	1 1 0 0	Tc7	Tc6	Tc5	Tc4	$\overline{\text{COUNT}}$
D*3	CLV control	1 1 0 1	DIV	T_B	T_P	GAIN	Z
E*4	CLV mode	1 1 1 0	CLV mode				$\overline{Pw \geqq 64}$

*1) Register 9

		Dn= 0	Dn= 1
ZCMT	D3	Zero cross MUTE OFF	Zero cross MUTE ON
HZPD	D2	PDO terminal active at all times	PDO terminal is Z at GFS trailing edge
NCLV	D1	CLV-P servo by frame sync signal	CLV-P servo by base counter
CRCQ	D0	CRCF is not superposed to SUBQ	SUBQ=CRCF when SCOR is rising

*2) Register A

GSEM	GSEL	Frame
0	0	2
0	1	4
1	0	8
1	1	13

WSEL	Clock
0	±3
1	±7

ATTM	MUTG terminal	dB
0	0	0
0	1	−∞
1	0	−12
1	1	−12

*3) Register D

DIV	D3	0	RFCK/4, WFCK/4	Phase comparison frequency during CLV-P mode
		1	RFCK/4, WFCK/4	
T_B	D2	0	RFCK/32	Bottom hold frequency during CLV-S and CLV-H mode
		1	RFCK/16	
T_P	D1	0	RFCK/4	Peak hold frequency during CLV-S mode
		1	RFCK/2	
GAIN	D0	0	−12dB	MDP terminal gain during CLV-S and CLV-H mode
		1	0dB	

*4) Register E

Mode	D3 - D0	MON terminal	FSW terminal	MDS terminal	MDP terminal
STOP	0 0 0 0	L	Z	L	L
KICK	1 0 0 0	H	Z	L	H
BRAKE	1 0 1 0	L	Z	L	H
CLV-S	1 1 1 0	CLV-S	Z	L	H
CLV-H	1 1 0 0	CLV-H	Z	L	H
CLV-P	1 1 1 1	CLV-P	CLV-P	Z	H
CLV-A	0 1 1 0	CLV-S or CLV-P	Z or CLV-P	L or Z	H
CLV-A'	0 1 0 1	CLV-S' or CLV-P	Z or CLV-P	L or Z	H

Z : High impedance