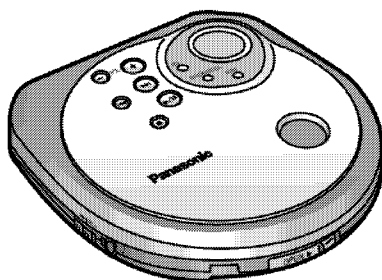


Service Manual

Portable CD Player



SL-SX390P
SL-SX390PC
SL-SX390EB
SL-SX390EG

Traverse Deck: RAE0145Z Mechanism Series

Colours

(S).....Silver Type
(A).....Blue Type [For (EB) (EG) areas only.]

Areas

P.....Puerto Rico, Costa Rica, Peru and Guatemala and Mexico.

PC.....Canada.

EB.....Great Britain.

EG.....Europe, East Europe and Russia

Specifications

IAudio

No. of channels: 2 channels (left and right, stereo)
Frequency response: 20 ~ 20,000 Hz (+0dB ~ -7dB)
DA converter: 1 bit, MASH
Headphones output level: Max. 8mW+8mW/ 16Ω (adjustable)

[For (P) (PC) areas.]

3.7W

[For (EB) (EG) areas.]

Battery (DC 3V)

0.35W

IPickup

Light source: Semiconductor laser
Wavelength: 780 nm

IGeneral

Operational temperature range: 0°C-40°C
Rechargeable temperature range: 5°C-40°C
Power supply: DC 4.5V

IPower consumption

Power source:
AC adaptor 2.8W

IPlay time

[When used in hold mode, at 25°C (77°F) temperature and on flat and stable surface]

Batteries used

2 "AA" (LR6) alkaline batteries 40h

The play time may be less depending on the operating conditions.

Dimensions (WxHxD)

128x26.3x131.5mm

(5¹/₁₆"x1¹/₃₂"x5³/₁₆"

Weight:

243g (8.6oz.) (with batteries)

197g (6.9oz.) (without batteries)

Note:

Specifications are subject to change without notice.

Weight and dimensions are approximate.

Panasonic®

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⚠ WARNING

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

CONTENTS

	Page		Page
1 Precaution of Laser Diode	2	9 Display of Self-Diagnostic Function	14
2 Accessories	3	10 Schematic Diagram Notes	15
3 Operating Instructions	3	11 Schematic Diagram	17
4 Handling Precautions for Traverse Deck	4	12 Printed Circuit Board and Wiring Connection Diagram	21
5 Operation Checks and Component Replacement Procedures	5	13 Block Diagram	23
6 Checking the Operation Problems on the Traverse Deck		14 Terminal Function of ICs	25
(Optical Pickup)	12	15 Replacement Parts List	27
7 Automatic Adjustment Results Display Function (Self-check		16 Cabinet Parts Location	29
Function)	13	17 Traverse Parts Location	30
8 Outline of 40-Second Sound Keeper Technique Used for		18 Packaging	31
Prevention of Sound from Skipping	14		

1 Precaution of Laser Diode

CAUTION:

This unit utilizes a class 1 laser. Invisible laser radiation is emitted from the pickup lens when the unit is turned on:

1. Do not look directly into the pickup lens.
2. Do not use optical instruments to look at the pickup lens.
3. Do not adjust the preset variable resistor on the optical pickup.
4. Do not disassemble the optical pickup unit.
5. If the optical pickup is replaced, use the manufactures specified replacement pickup only.
6. Use of control or adjustments or performance of procedures other than those specified herin may result in hazardous radiation exposure.

CAUTION:

This product utilizes a liser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.

Wave length: 780nm

Maximum output wadiation power from pickup: 100 μ W/VDE

Laserradiation from the pickup lens is safety level, but be sure the followings:

1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

ACHTUNG:

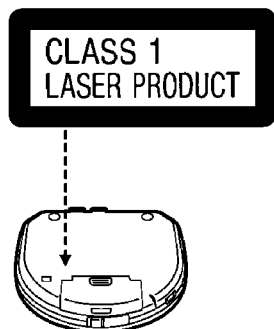
Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand Wird unsichtbare Leserstrahlung von der Lasereinheit abgestrahlt.

Wellenlage: 780nm

Maximale Strahlungsleistung der Lasereinheit: 100 μ W/VDE

Die Strahlungas der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zeriegen, de die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Denwerkseitig Justierten Einstellregler der Lasereinhit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlines blicken.
4. Nicht über langere Zeit in die Fokussierlines blicken.



DANGER	INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBNING. NÅR SIKKERHEDSÅFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSETELSE FOR STRÅLING.
VARO!	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTIINA NÄKYMÄTÖNTÄ LASERSÄTELYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING	OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRÄKTA EJ STRÅLEN.
ADVARSEL	USYNLIG LASERSTRÅLING NÄR DEKSEL ÅPNEES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VORSICHT	UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.

2 Accessories

For (P) area:

- Headphone.....1 pc.
(RFEV716P-SS)
- Remote control unit.....1 pc.
(N2QCB000023)

For (PC) area:

- Innerphone.....1 pc.
(L0BAB0000124)
- Remote control unit.....1 pc.
(N2QCB000023)

For (EB) area:

- Innerphone.....1 pc.

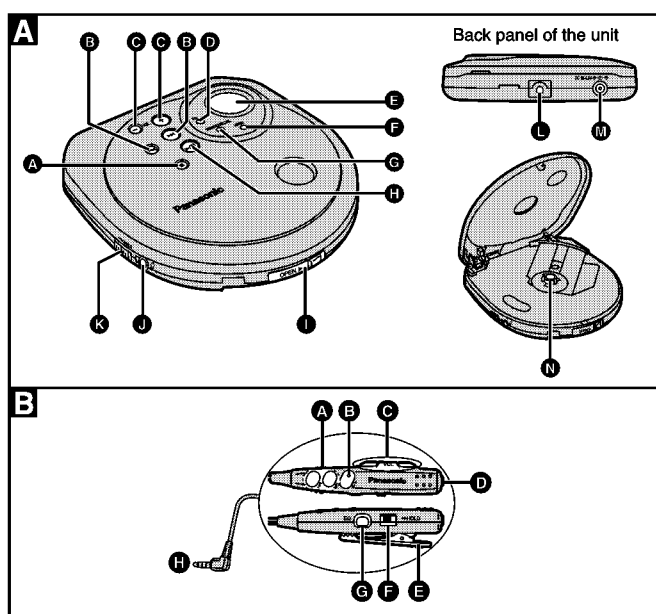
(L0BAB0000124)

- Remote control unit.....1 pc.
(N2QCB000010)
- AC adaptor.....1 pc.
(N0JCCE000004)

For (EG) area:

- Innerphone.....1 pc.
(L0BAB0000124)
- Remote control unit.....1 pc.
(N2QCB000010)
- AC adaptor.....1 pc.
(RFEA419E-M)

3 Operating Instructions



Portable CD Player **A**

- A** Stop/operation off button (■)
- B** Skip/search buttons (◀, ▶)
- C** Headphone volume control buttons (–, VOL, +)
- D** EQ button (EQ)
- E** Display
- F** Mode button (MODE)
- G** Memory/recall button (MEMORY/RECALL)
- H** Play/pause button (▶/||)
- I** Open switch (OPEN ▶)
- J** Headphone jack (◡)
- K** Hold switch (HOLD)
- L** Hole for car mounting base
- M** DC IN jack (DC IN 4.5 V ◊—◊)
- N** CD release button (PUSH)

Wired remote control **B**

- A** Skip/search buttons (◀, ▶)
- B** Play/stop/operation off button (■/▶)
- C** Volume control buttons (–, VOL, +)
- D** Headphone jack/ earphone jack
- E** Clip
- F** Hold switch (HOLD)
- G** EQ button (EQ)
- H** Plug

4 Handling Precautions for Traverse Deck

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body.

So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

4.1. Handling the traverse deck (optical pickup)

1. The traverse deck (optical pickup) is an extremely high-precision construction and must not be subjected to impact, excessive vibration, or other types of rough handling.
2. In order to prevent static electricity damage to the laser diode, use a short pin or similar tool to short the optical pickup's flexible circuit boards after they have been disconnected from the main circuit board. (as shown in **Fig. 1**)
3. Handle the flexible circuit boards with care; excessive force could cause them to be broken.
4. Do not turn the pre-set variable resistor (for adjustment of the laser power); it has been adjusted at the factory. (as shown in **Fig. 2**)



Clip or short-pin

Fig. 1

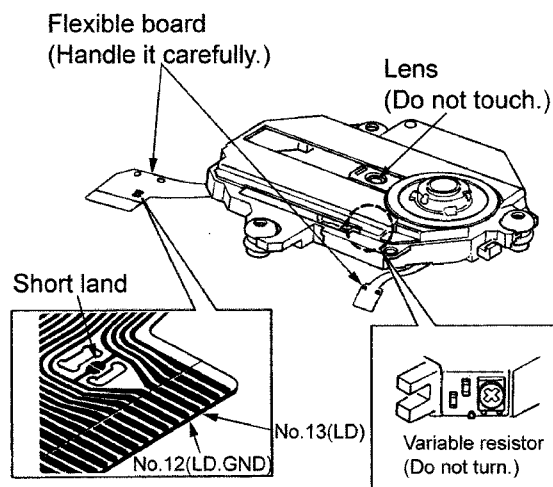


Fig. 2

4.2. Grounding for electrostatic breakdown prevention

1. Human body grounding

Use the anti-static wrist strap to discharge the static electricity from your body. (as shown in **Fig. 3**)

2. Work table grounding

Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet. (as shown in **Fig. 4**)

Caution

The static electricity of your clothes will not be grounded through the wrist strap.

So, take care not to let your clothes touch the traverse deck (optical pickup).

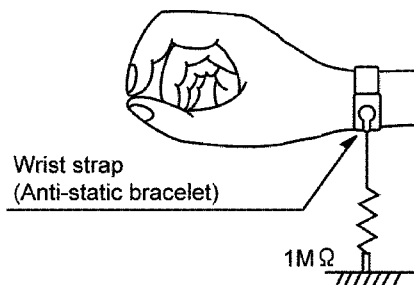


Fig. 3

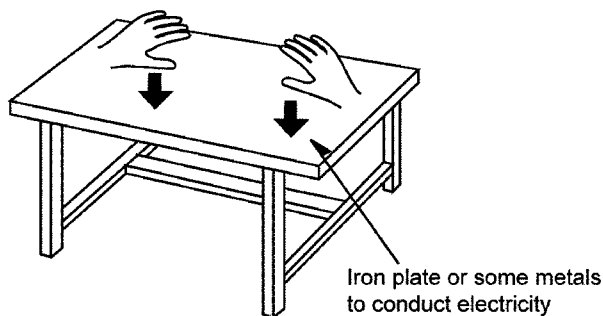


Fig. 4

5 Operation Checks and Component Replacement Procedures

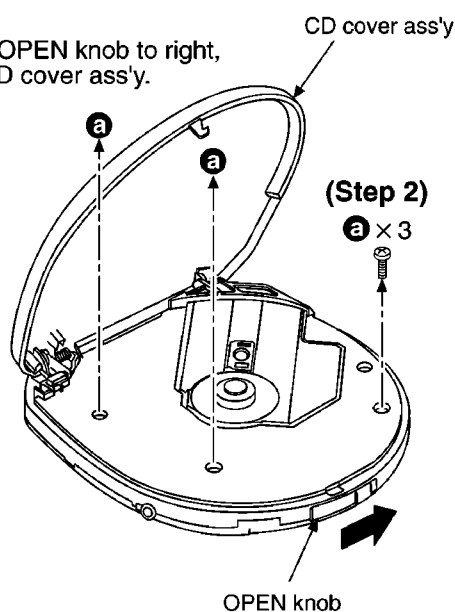
- This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
- For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.

5.1. Checking for the P.C.B. ass'y

5.1.1. Checking for the P.C.B. ass'y (A side)

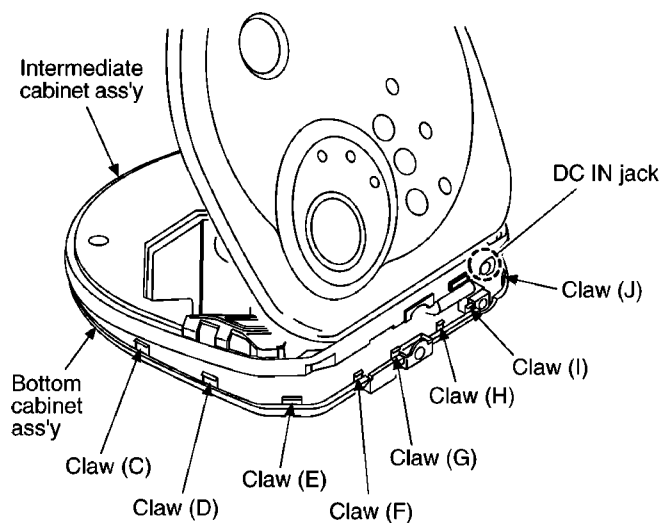
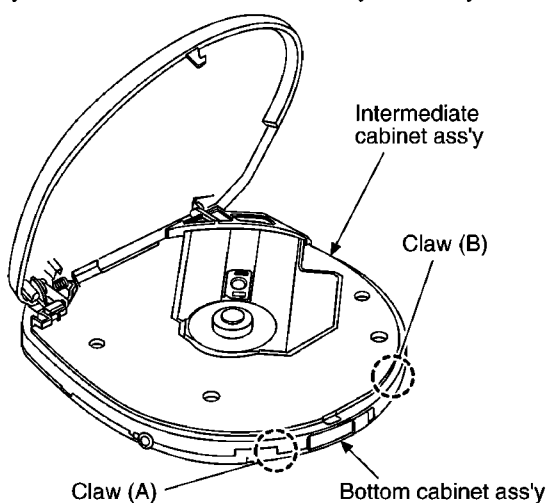
(Step 1)

Sliding the OPEN knob to right, open the CD cover ass'y.



(Step 3)

Spread the clearance between the bottom cabinet ass'y and intermediate cabinet ass'y manually.

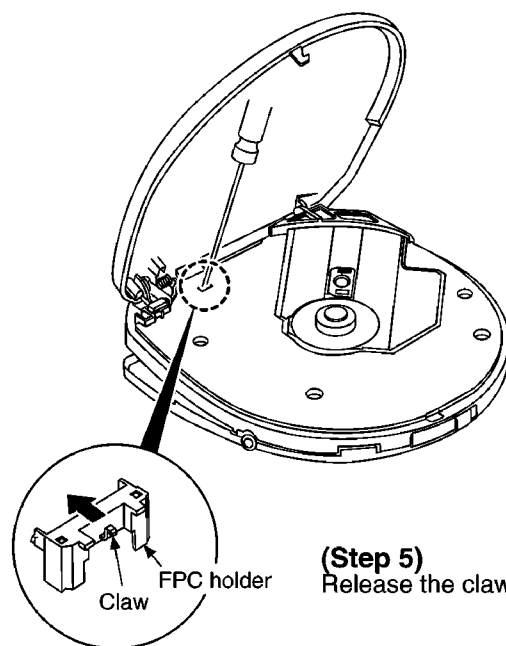


(Step 4)

Open the clearance between the bottom cabinet ass'y and intermediate cabinet ass'y, and then release the claw (C) to claw (J) in turn.

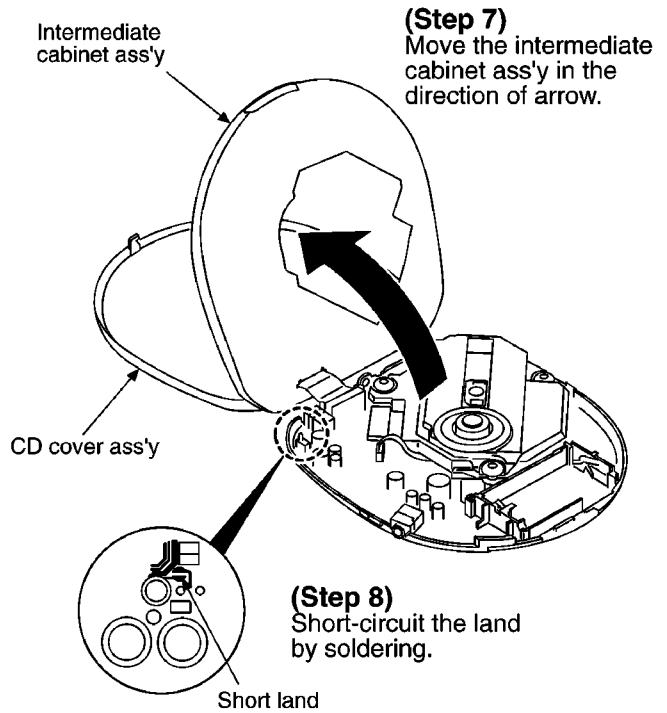
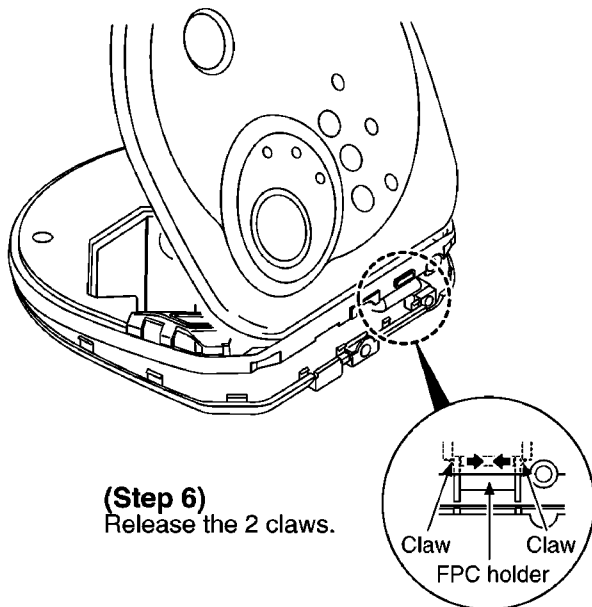
NOTE:

Take care not to break the DC IN Jack provided with intermediate cabinet.



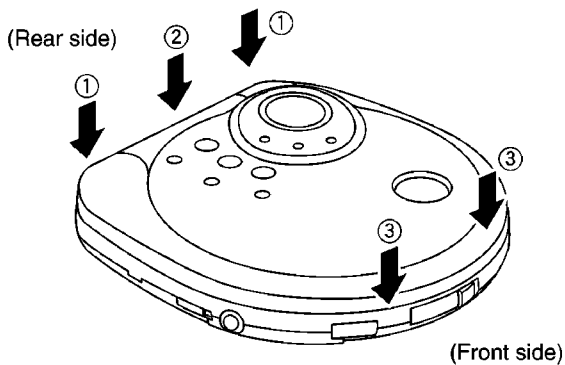
(Step 5)

Release the claw.

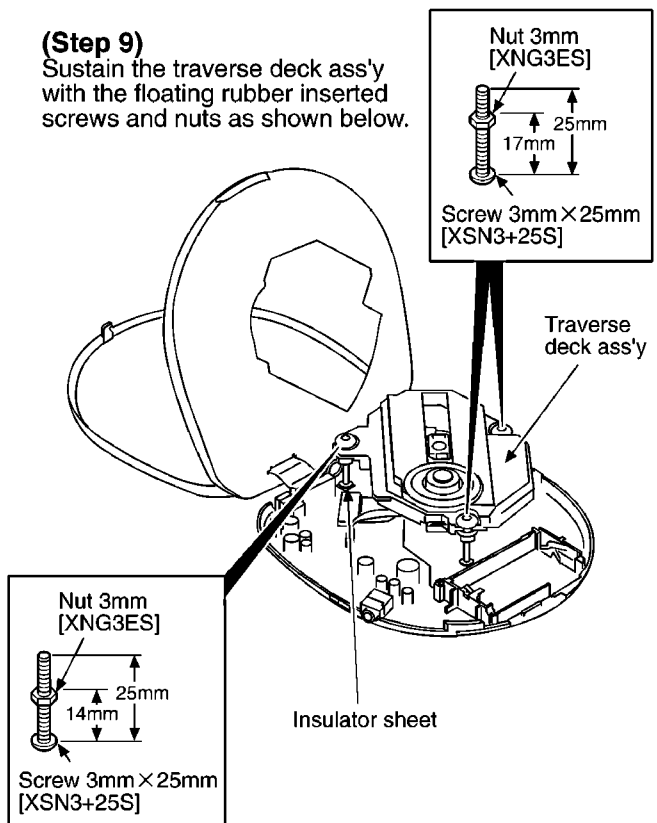


■ CD cover ass'y and intermediate reassembly procedure

- ① Fit together right side and left side of rear part.
(Either right or left side)
- ② Fit together the center of rear part.
- ③ Fit together the right and left of front part.
(Either right or left side)



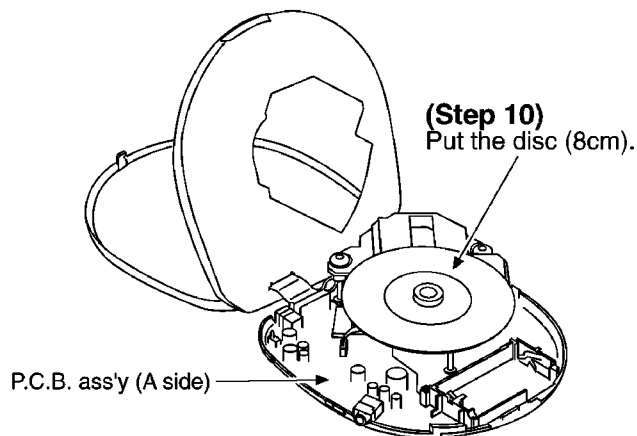
- (Step 9)**
Sustain the traverse deck ass'y with the floating rubber inserted screws and nuts as shown below.



NOTE:

- The tip of screw must not protrude above the floating rubber.
- To keep insulation, place the insulator sheet (paper etc.) between the P.C.B. and the head of screws.

- Check the P.C.B. ass'y (A side) as shown below.

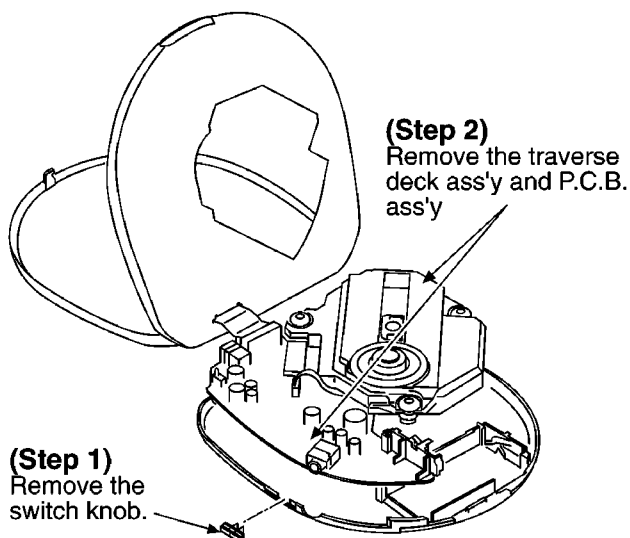


NOTE:

After checking, unsolder the short land to open circuit.

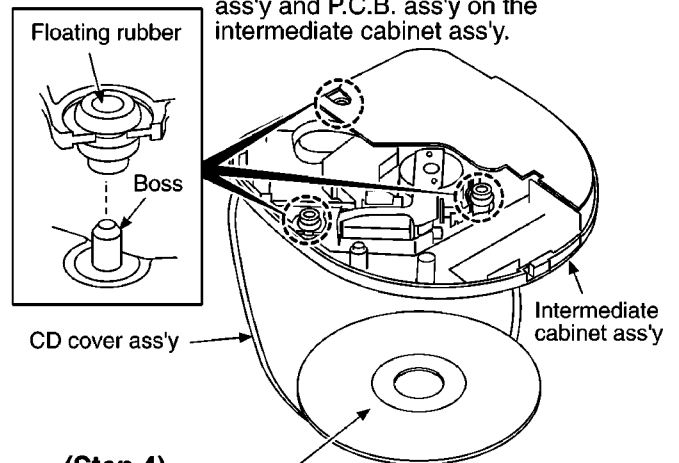
5.1.2. Checking for the P.C.B. ass'y (B side)

- Follow the (Step 1) - (Step 8) of item 5.1.1.



(Step 3)

Align the floating rubbers with bosses, and then locate the traverse deck ass'y and P.C.B. ass'y on the intermediate cabinet ass'y.



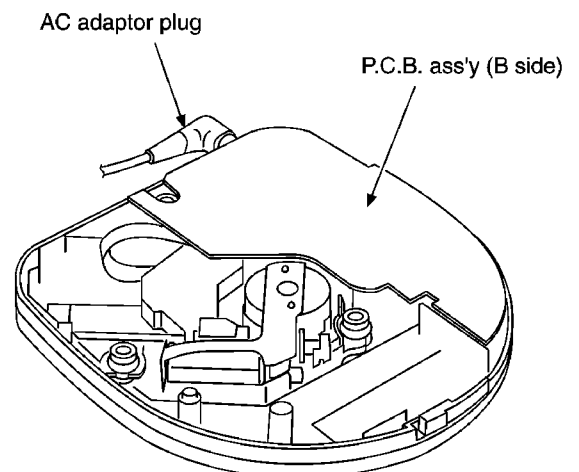
(Step 4)

Put the test disc, and then close the CD cover ass'y.

- Check the P.C.B. ass'y (B side) as shown below.

(Step 5)

Insert the AC adaptor plug into the DC IN jack, and then apply the power.

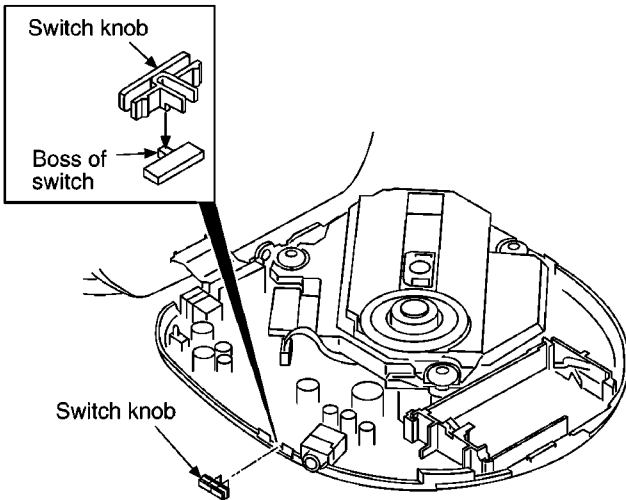


NOTE:

After checking, unsolder the short land to open circuit.

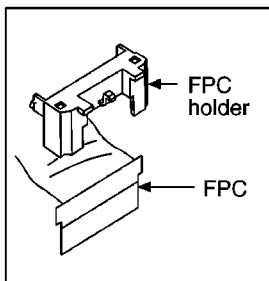
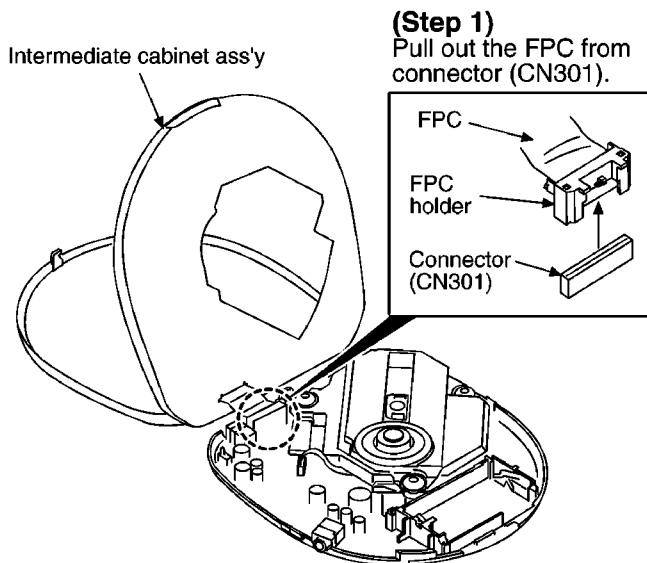
Notice for installation of switch knobs

- Make sure the bosses of switch are fit in the switch knob.



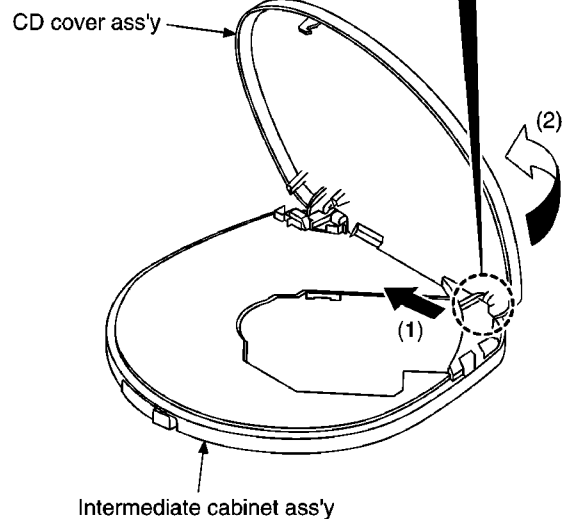
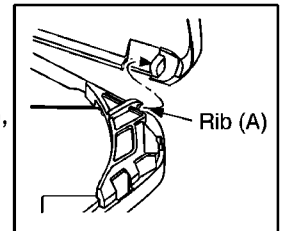
5.2. Replacement for the CD cover ass'y and LCD

- Follow the (Step 1) - (Step 7) of item 5.1.1.



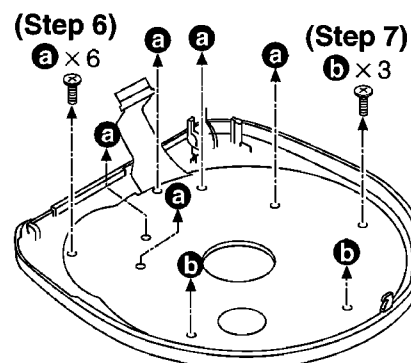
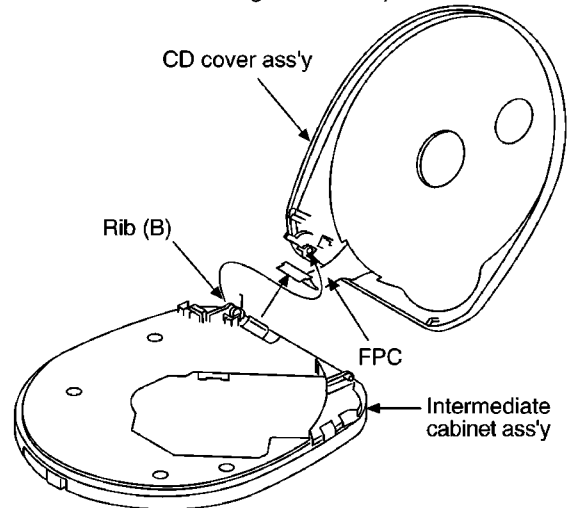
- (Step 2)**
Remove the FPC holder from FPC.

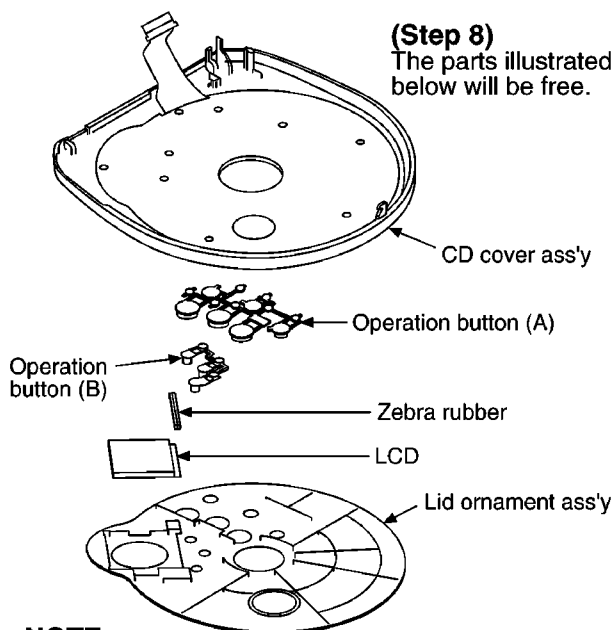
- (Step 3)**
Bend the intermediate cabinet ass'y in the direction of arrow (1), and then release the CD cover ass'y from the rib (A).



- (Step 4)**
Remove the CD cover ass'y from the rib (B).

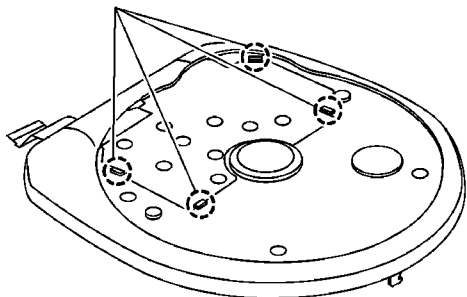
- (Step 5)**
Draw the FPC from the intermediate cabinet ass'y. (Take care not to damage the FPC.)



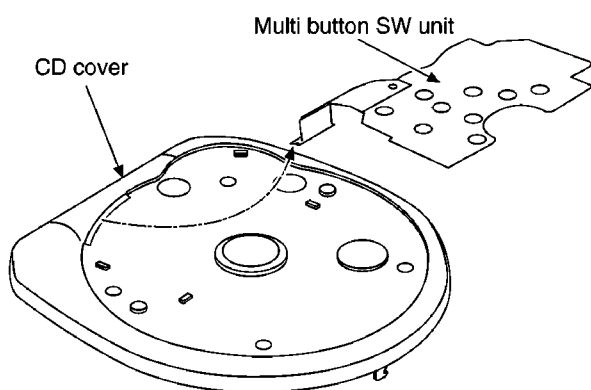


NOTE:
Be careful not to be applied the dust or smudge on the surface zebra rubber.

(Step 9)
Release the 4 claws.

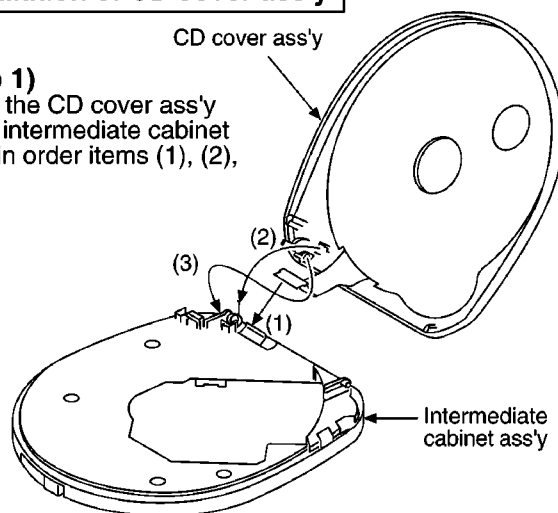


(Step 10)
Remove the multi button SW unit from CD cover.

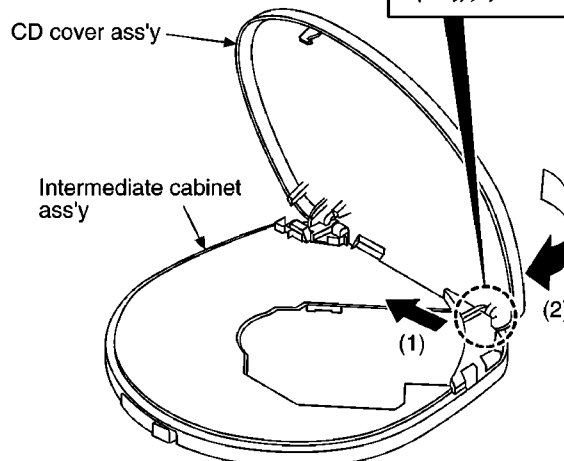
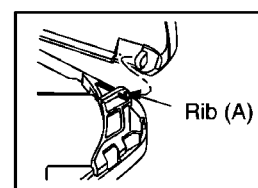


Installation of CD cover ass'y

(Step 1)
Install the CD cover ass'y to the intermediate cabinet ass'y in order items (1), (2), (3).

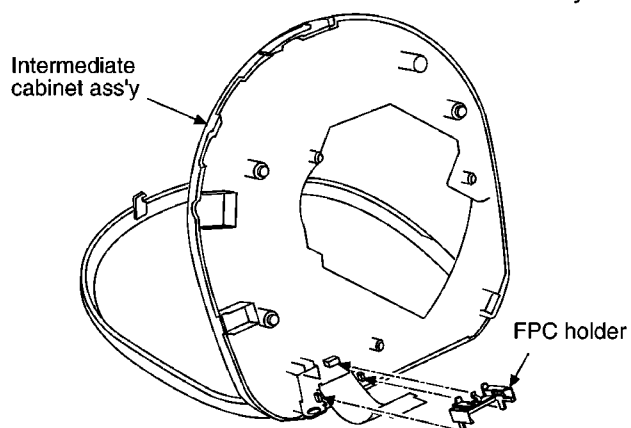


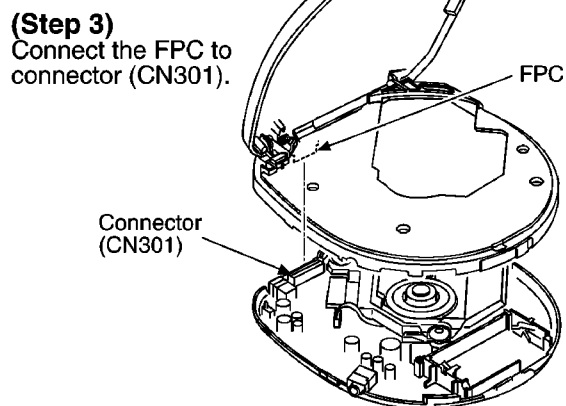
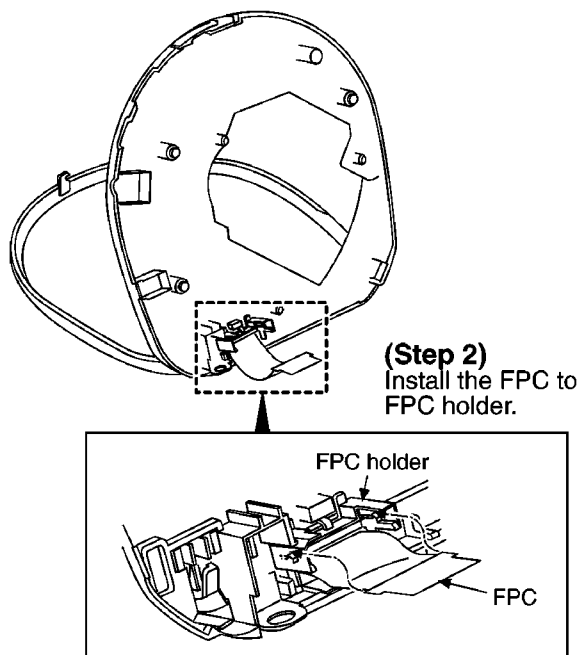
(Step 2)
Bend the intermediate cabinet ass'y in the direction of arrow (1), and then align the CD cover ass'y with the rib (A).



Installation of intermediate cabinet ass'y

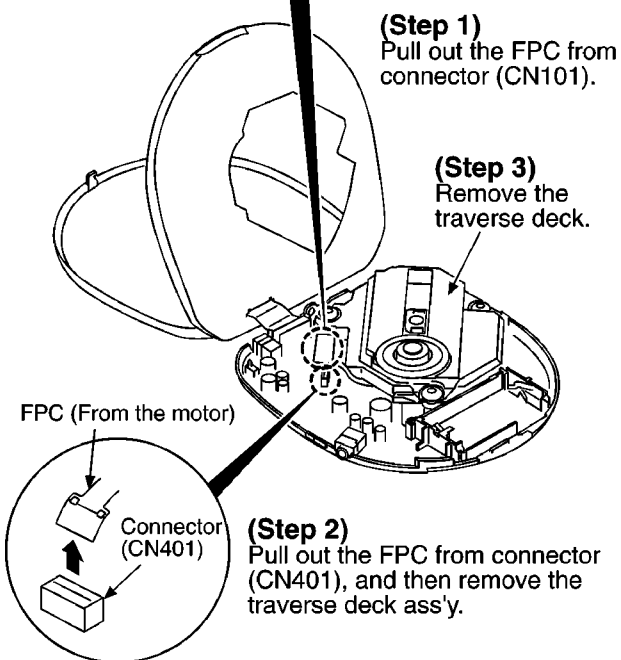
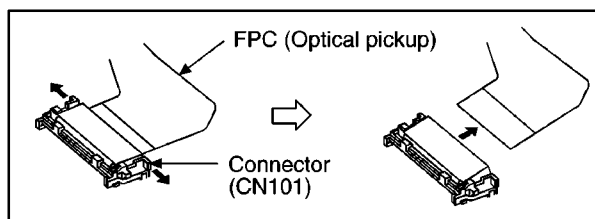
(Step 1)
Install the FPC holder to intermediate cabinet ass'y.



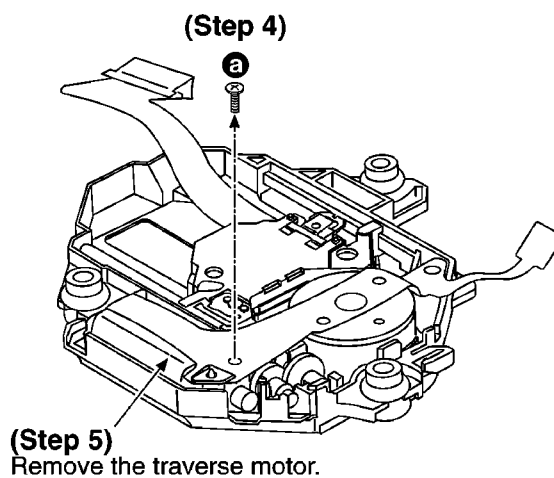
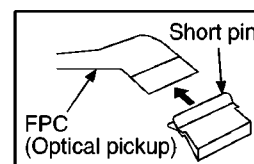


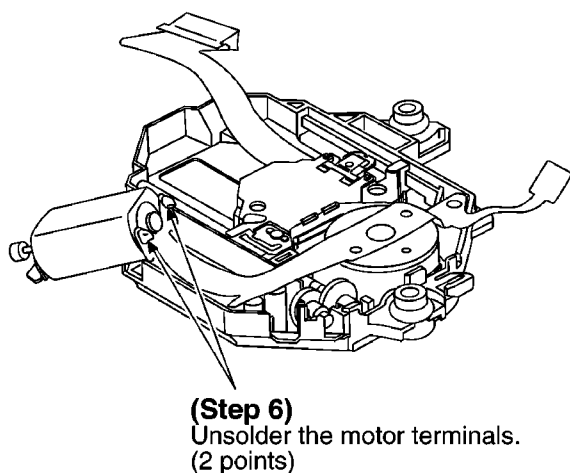
5.3. Replacement for the traverse motor

• Follow the **(Step 1)** - **(Step 7)** of item 5.1.1.



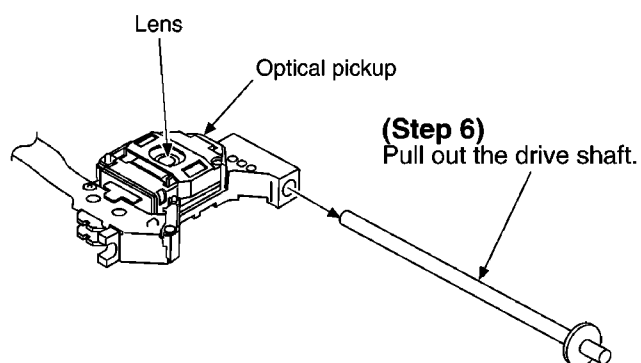
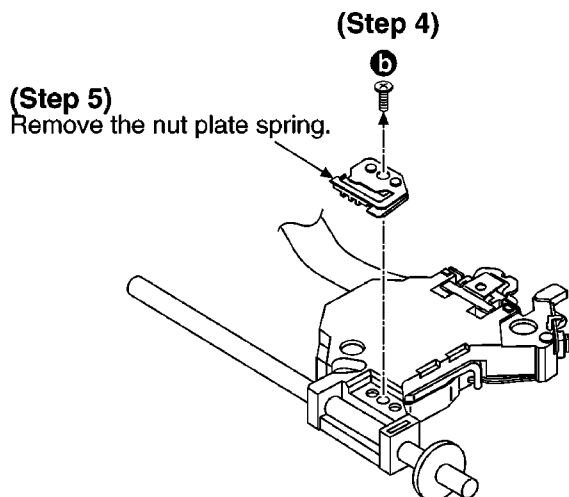
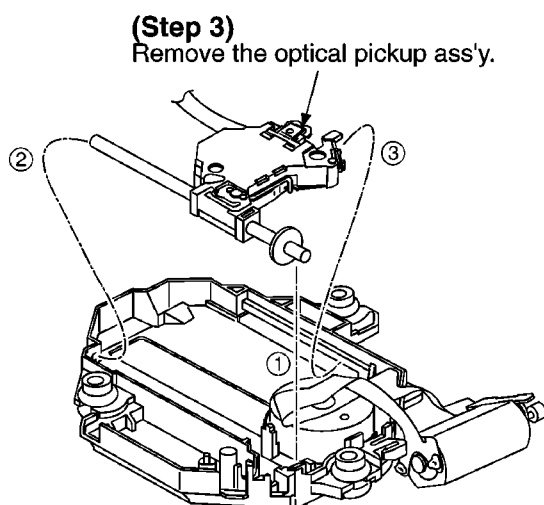
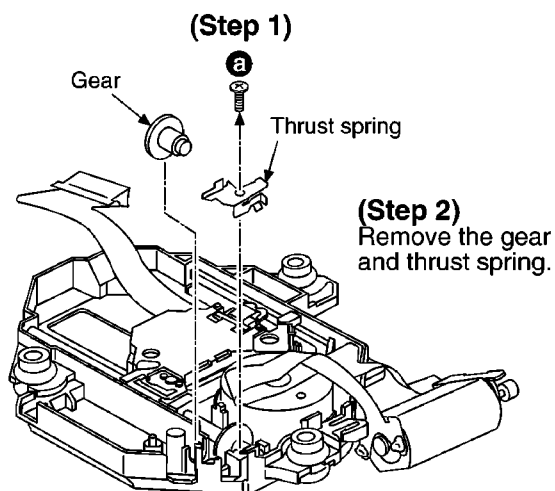
NOTE:
Insert a short pin into the traverse deck's FPC.
(Refer to "Handling Precautions for Traverse Deck".)





5.4. Replacement for the optical pickup

- Follow the (Step 1) - (Step 7) of item 5.1.1.
- Follow the (Step 1) - (Step 5) of item 5.3.



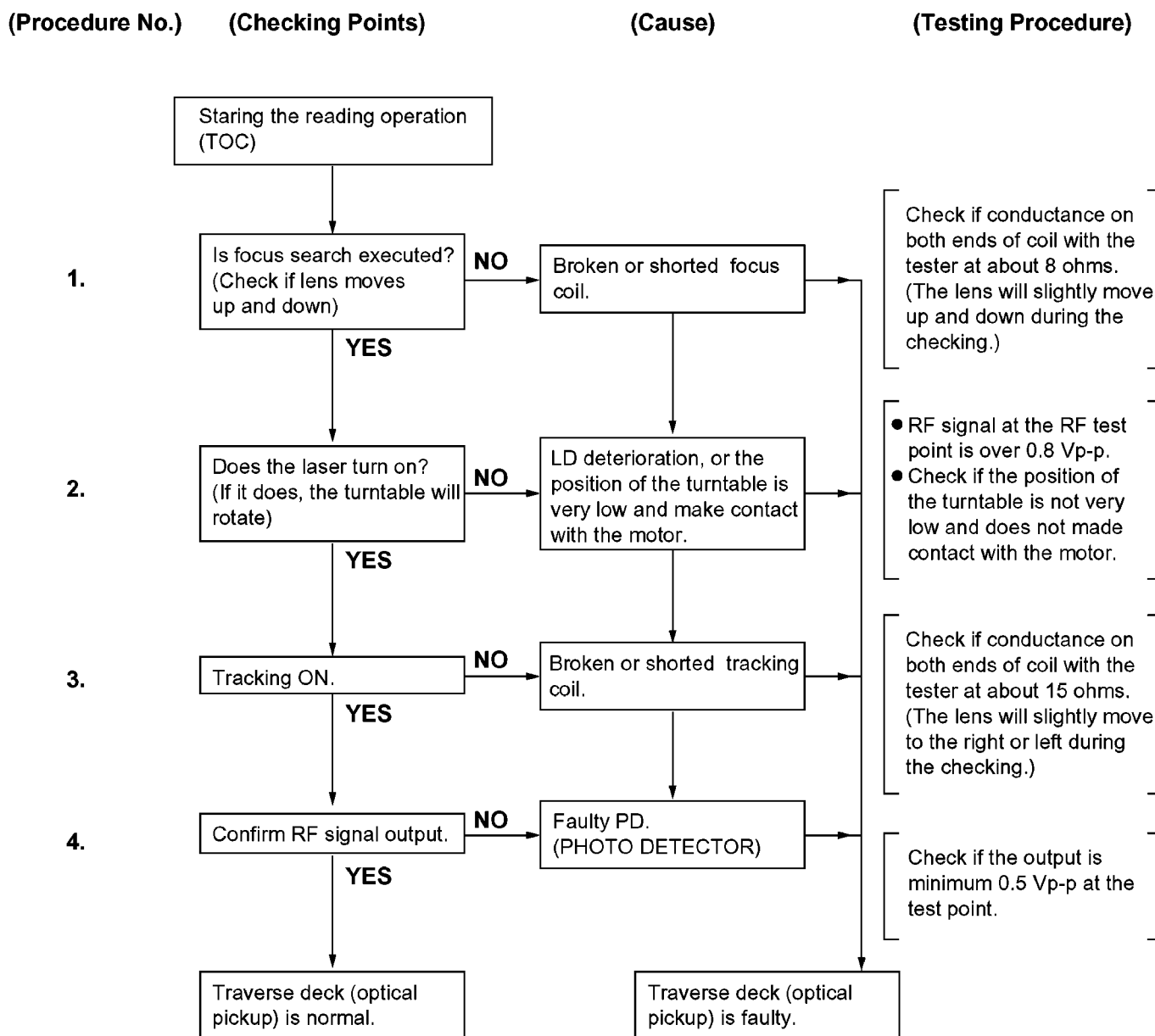
NOTE:

1. Use care to prevent damage the optical pickup, due to the precision construction.
2. Do not apply the grease on the lens of optical pickup.
3. Do not touch the lens of the optical pickup.

6 Checking the Operation Problems on the Traverse Deck (Optical Pickup)

Make sure to follow the procedures below to check the operation problems of the traverse deck (optical pickup) before replacing it.

Replace the traverse deck only after the problem is identified.



※ Replace the traverse deck.

- Check electrical circuit.
- Check for flaws on disc or if it is warped or not centered.

Check the operations described below on the traverse deck after replacing it.

*Checking Skip Search

1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

*Checking Manual Search

1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

*Checking Playability

1. Play the 0.7 mm black dot and the 0.7 mm wedge on the playability test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

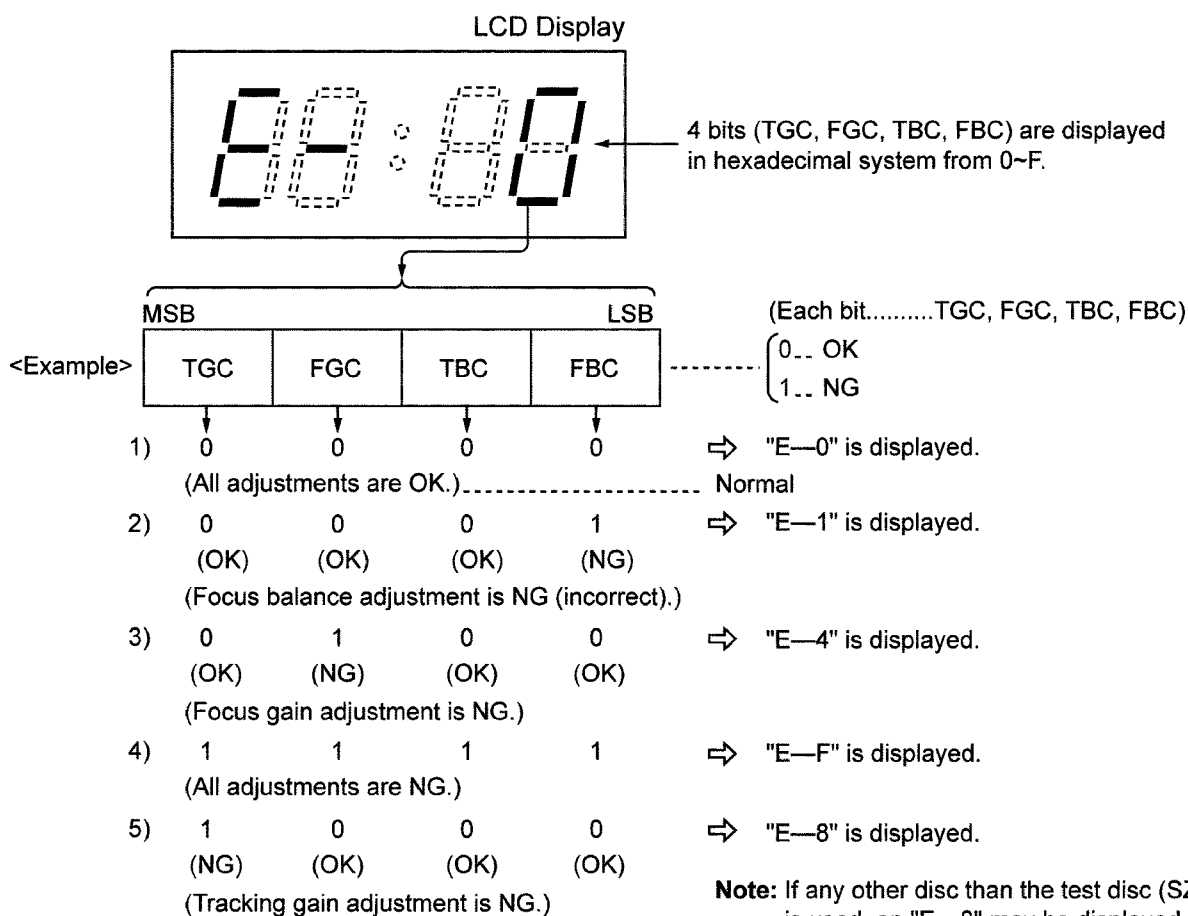
7 Automatic Adjustment Results Display Function (Self-check Function)

On this unit (SL-SX390), each automatic adjustment results are displayed on the LCD. This function is convenient to check or identify which automatic adjustment circuit is incorrect. The followings are the contents of the automatic adjustment result displays (self-check function). (Using the new Servo IC: MN662787SC)

7.1. How to display automatic adjustment results

1. Load the test disc (SZZP1054C).
2. Press the ◀◀ (SKIP/SEARCH) and ▶▶ (SKIP/SEARCH) Buttons simultaneously and hold them, and additionally press the ▶|| (PLAY/PAUSE) Button.
3. Press the ■ (OPR OFF) Button once.
4. An automatic adjustment result is displayed on the LCD.

7.2. Display of automatic adjustment results (self-check function)



<Example>

Follow the below steps when "E-1" is displayed.

(Cause: Focus balance (FBC) is set beyond the limit.)

1 Check if

1. the waveform or voltage of the focus servo circuit is correct. (check the waveform or voltage.)
2. the optical pickup returns to the normal state by exchanging the traverse deck.

Follow the below steps when "E-4" is displayed.

(Cause: Focus gain (FGC) is set beyond the limit.)

1 Check if

1. the waveform or voltage of the focus servo circuit is

correct. (check the waveform or voltage.)

2. the focus coil of the optical pickup is correct (around 15 ohms).
3. the optical pickup returns to the normal state by exchanging the traverse deck.

Follow the below steps when "E-F" is displayed.

(Cause: All adjustments (TGC, FGC, TBC, FBC) are set beyond the limit.)

1 Check if

1. the optical pickup returns to the normal state by exchanging the traverse deck.
2. the waveform or voltage of the servo IC's are correct.

(check the waveform or voltage.)

Note:

It is not always necessary to exchange the traverse deck when an error message is displayed.

Be sure to check if the circuit is defective or not before

exchanging the traverse deck.

Note:

If any other disc than the test disc (SZZP1054C) is used, an error message may be displayed. This is not a malfunction.

8 Outline of 40-Second Sound Keeper Technique Used for Prevention of Sound from Skipping

8.1. Conventional Shockproofing Technique

Input information read out of the CD at double speed is demodulated, stored in the memory, and while sound-marking signal is supplied at normal speed from the memory to the D/A converter, the residual data is accumulated in the memory.

If reaccess to the break point is accomplished before the memory becomes empty, apparent playback sound is entirely kept free from breaking even when information pauses due to vibration, etc. It was necessary to use the 16M bit memory for securing the accumulation time of about 40 seconds.

8.2. Compression-shockproofing [Outline]

Fig. 5 is a block diagram showing the compression-shockproofing mechanism, the difference of which from the conventional mechanism is as follows: Input information read out at double speed undergoes data compression (16 bits -- 4

bits) by the encoder in the ADPCM (Adaptive Difference PCM) and stored in the external memory; the stored memory information undergoes data elongation (4 bits -- 16 bits) by the decoder in the ADPCM and supplied at normal speed to the D/A converter.

The data compression technique has conducted to reduction of required memory capacity from 16M bits to 4M bits for securing the accumulation time equivalent to the conventional.

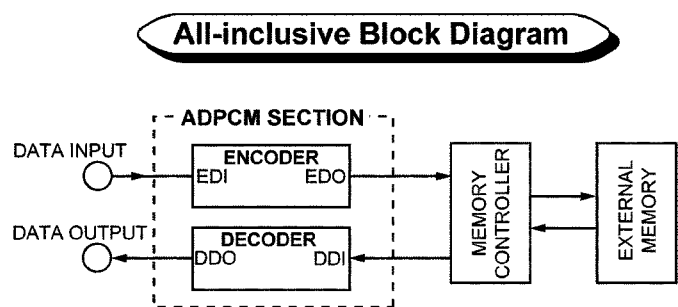
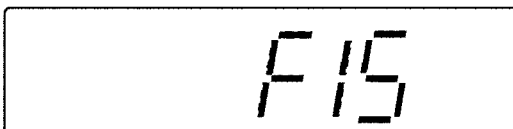


Fig. 5

9 Display of Self-Diagnostic Function

This model is equipped with a self-diagnosis function and shows, when necessary, the following indication in the LCD section of the set.

LCD display



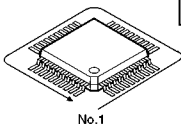
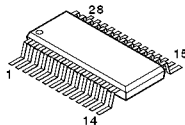
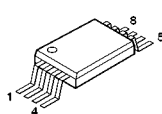
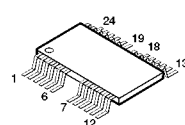
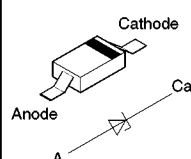
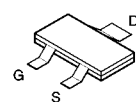
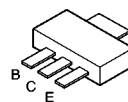
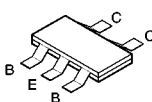
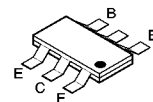
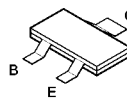
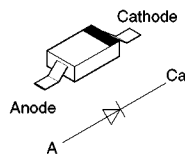
(Press PLAY and STOP button. After 15 seconds, it is displayed for 2 seconds.)

"F15"---This indication appears when the Down switch fails to turn ON since the magnetic head fails to move up/down normally (Due to trouble of the magnetic head or trouble of the magnetic head up/down motor) or the magnetic head P.C.B. is out of position or a foreign matter has mixed in or for some other reason.

In such a case, check the peripheral parts of the magnetic head, repair or replace defective parts with normal ones.

10 Schematic Diagram Notes

10.1. Type Illustration of IC's, Transistors and Diodes

 <table><tr><td>MN662787SC</td><td>80PIN</td></tr><tr><td>C2BBFD000353</td><td>80PIN</td></tr><tr><td>C0DBFFB00003</td><td>48PIN</td></tr></table>		MN662787SC	80PIN	C2BBFD000353	80PIN	C0DBFFB00003	48PIN				
MN662787SC	80PIN										
C2BBFD000353	80PIN										
C0DBFFB00003	48PIN										
2SK1958T1 B1CDGD000001 	2SB1132T100 	FMG6AT148 	XN0F26300L 	 2SB709ATX DTA114YUA106 DTA144EUA106 DTC143EUA106							
MA111TX 											

10.2. Schematic Diagram Notes

Notes:

- IS201: Laser ON/OFF switch in "OFF" position.
(It turns "ON" with disc holder closed.)
- IS202: Rest detector in "OFF" position.
(It turns "ON" when optical pickup comes to innermost periphery.)
- IS310: Hold (HOLD) switch in "OFF" position.
- IS801: Stop/operation off (■) button.
- IS802,809: Skip/search (►► , ◀◀) buttons.
- IS803: Play/pause (► / ||) button.
- IS804: EQ (EQ) button in "OFF" position.
- IS805, 807: Headphone volume control (VOL -, VOL +) buttons.
- IS806: Memory/recall (MEMORY/RECALL) button.
- IS808: Mode (MODE) button.

- Components identified by △ mark have special characteristics important for safety.
- When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.
- The supply part number is described alone in the replacement parts.

• Signal line

-  : Positive voltage line.
-  : Playback signal line.

- The voltage value and waveforms are the reference voltage of this measured by DC electronic voltmeter

(high impedance) and oscilloscope on the basis of GND terminal (DC IN Jack). Accordingly, there may arise some errors in the voltage values and waveforms depending upon the internal impedance of the tester or measuring unit.

Measurement conditions:

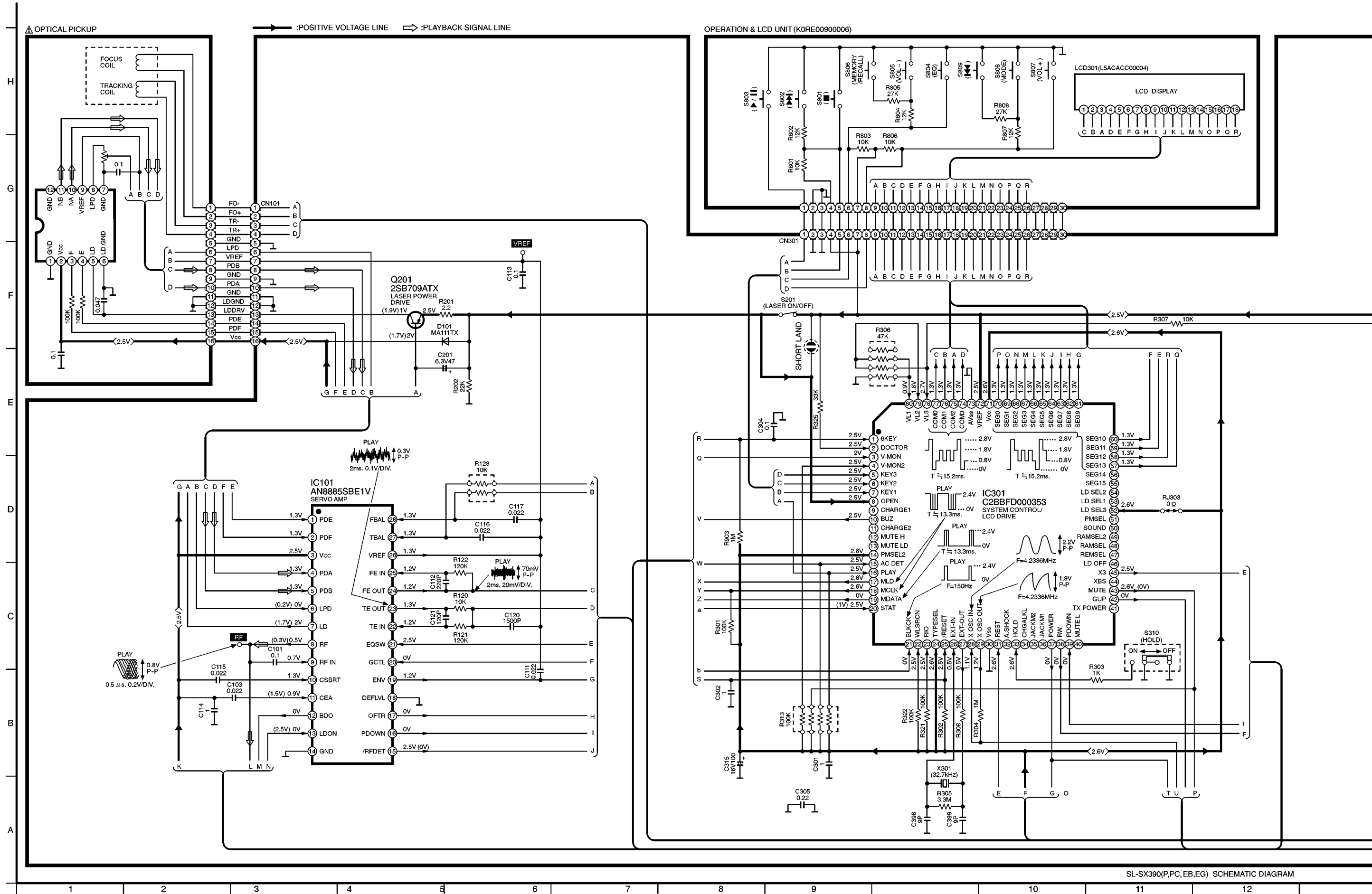
* ()CD playback mode (Test disc 1kHz, L+R, 0dB)

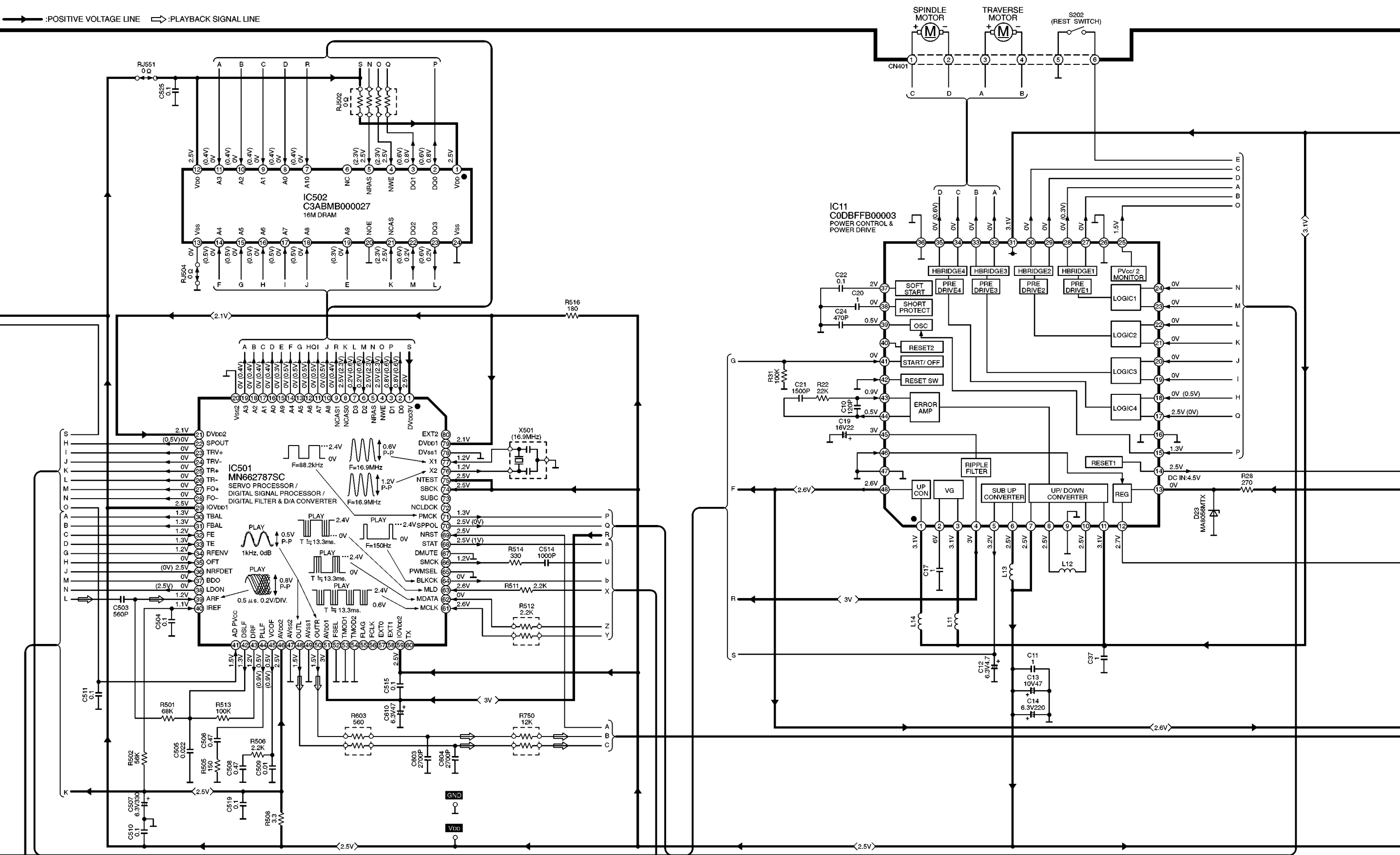
* No markCD stop mode

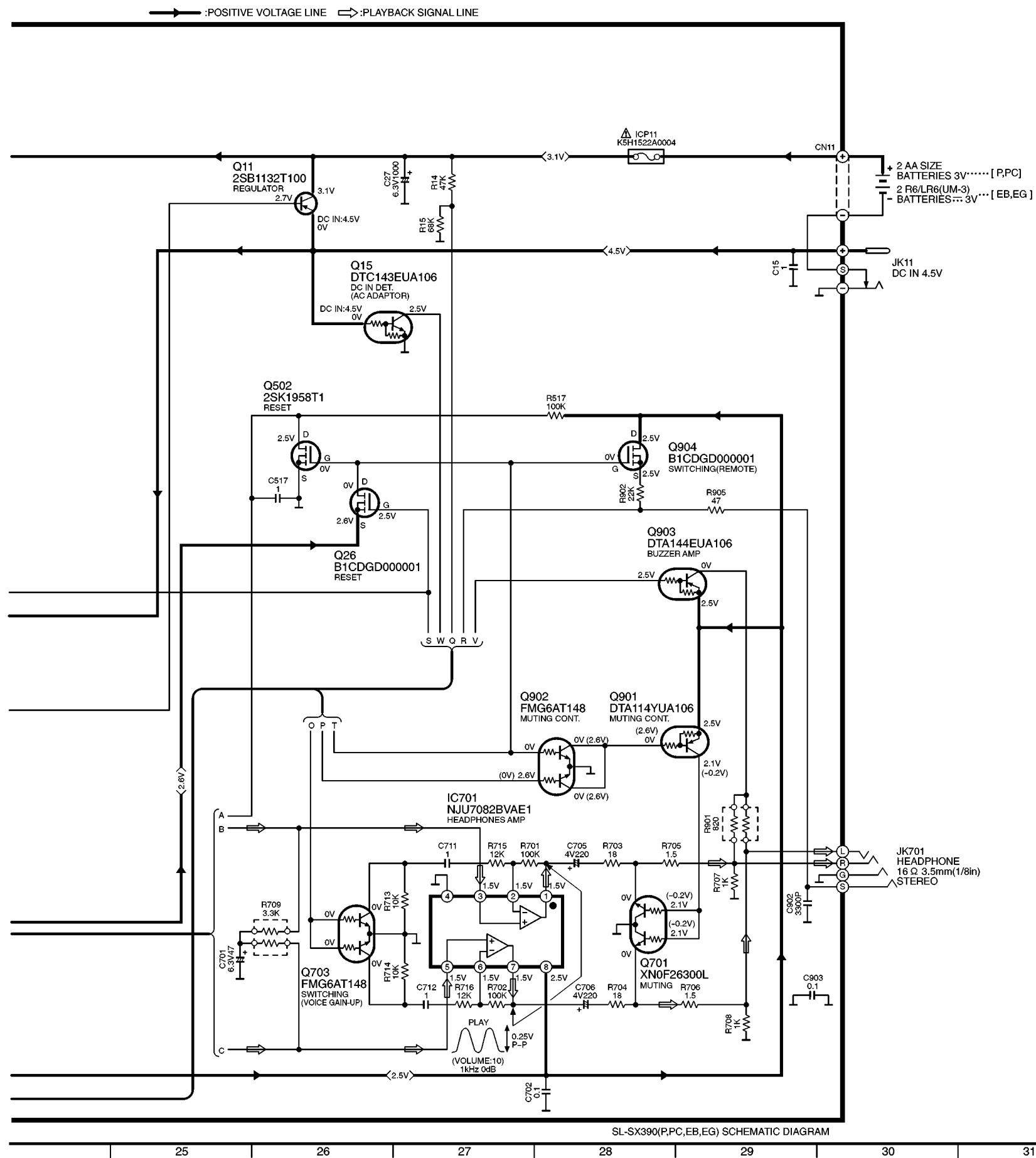
Caution!!

- IC and LSI are sensitive to static electricity.
- Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

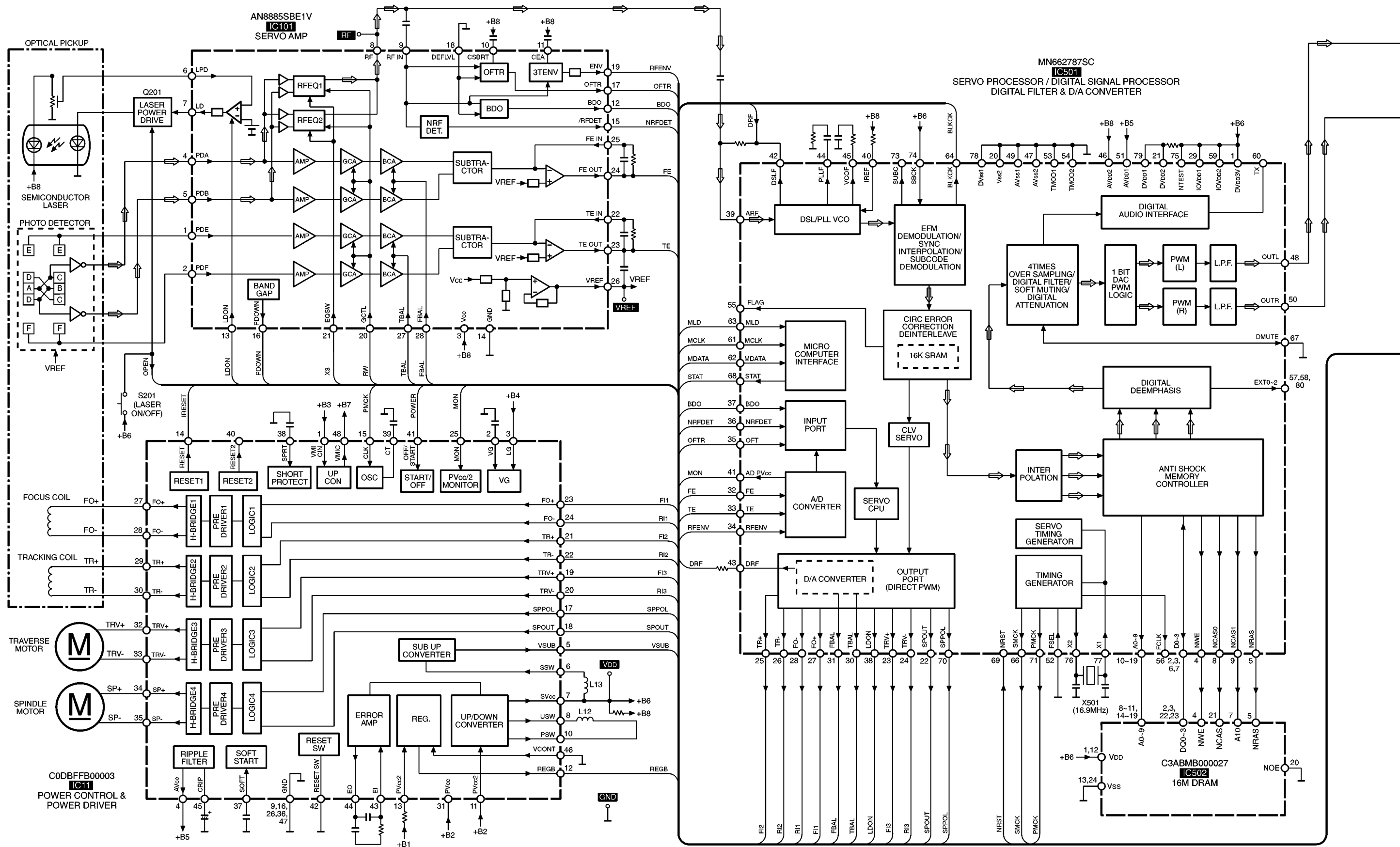
11 Schematic Diagram



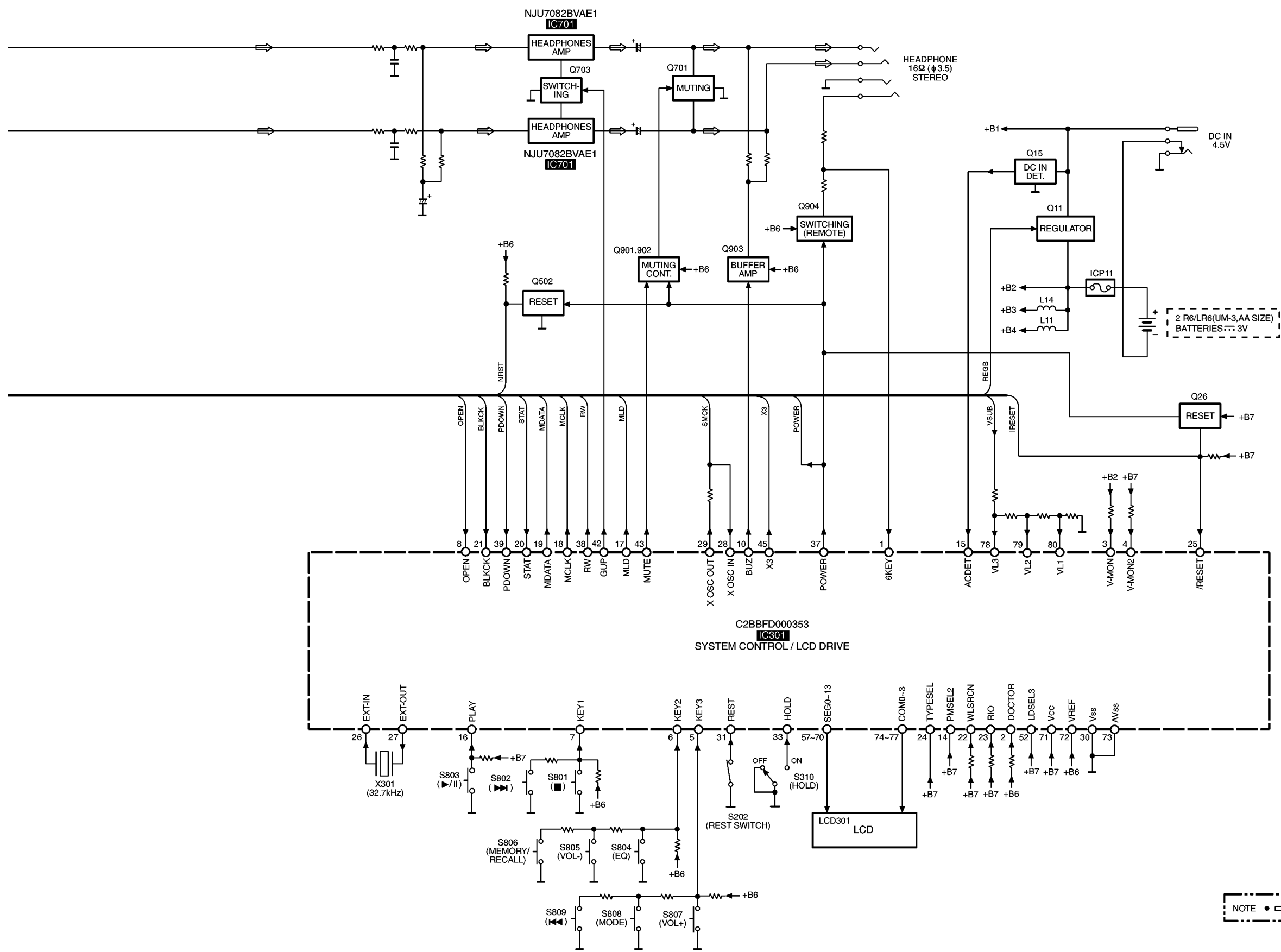




13 Block Diagram



SL-SX390(P,PC,EB,EG) BLOCK DIAGRAM



14 Terminal Function of IC's

14.1. IC101(AN8885SBE1V): Servo Amplifier

Pin No.	Mark	I/O Division	Function
1	PDE	I	Tracking signal input (1) terminal
2	PDF	I	Tracking signal input (2) terminal
3	V _{CC}	O	Power supply output terminal
4	PDA	I	Focus signal input (1) terminal
5	PDB	I	Focus signal input (2) terminal
6	LPD	I	APC amplifier input terminal
7	LD	O	APC amplifier output terminal
8	RF	O	RF addition output terminal
9	RF IN	I	RF detection signal input terminal
10	CSBRT	I	Capacitor connection terminal for detection of RF envelope signal
11	CEA	I	Capacitor connection terminal for H.P.F. amplifier
12	BD0	O	BD0 output terminal
13	LDON	I	APC control terminal
14	GND	—	Connected to GND
15	/RFDET	O	NRFDET output terminal
16	PDOWN	O	Power down mode control terminal
17	OFTR	O	Off-track signal output terminal (H:off-track)
18	DEFLVL	—	OFTR/BD0 detection level control terminal
19	ENV	O	3TENV output terminal
20	GCTL	I	RF/FE/TE gain control terminal
21	EQSW	I	EQ characteristic control terminal
22	TE IN	I	TE amplifier reverse input terminal
23	TE OUT	O	TE amplifier output terminal
24	FE OUT	O	FE amplifier output terminal
25	FE IN	I	FE amplifier reverse input terminal
26	VREF	O	VREF output terminal
27	TBAL	I	TBAL control terminal
28	FBAL	I	FBAL control terminal

14.2. IC301(C2BBFD000353): System Control/LCD Drive

Pin No.	Mark	I/O Division	Function
1	6KEY	I	A/D key signal input terminal
2	DOCTOR	I	Doctor mode input terminal (Connected to power supply through resistor)
3	V-MON	I	Rechargeable battery voltage measurement decline voltage judgement signal input
4	V-MON2	I	Battery remaining measurement signal input terminal
5	KEY3	I	Operation key signal input terminal
6	KEY2		
7	KEY1		
8	OPEN	I	CD cover open detect signal input terminal
9	CHARGE	O	Charging ON signal output terminal
10	BUZ	O	Buzzer control output terminal
11	CHARGE2	O	Charging ON signal output(2) terminal
12	MUTEH	O	Headphone muting signal output terminal
13	MUTELD	—	Not used, open
14	PMSEL2	I	Power supply input terminal
15	AC DET	I	AC detect signal input terminal
16	PLAY	I	PLAY key signal input terminal

Pin No.	Mark	I/O Division	Function
17	MLD	O	Serial command latch output terminal
18	MCLK	O	Serial command clock output terminal
19	MDATA	O	Serial command data output terminal
20	STAT	I	Status signal input terminal
21	BLKCK	I	Sub code block clock signal input terminal
22	WLSRCN	I	Wire-less remote control signal input terminal
23	RIO	I	Remote control LCD communication signal input terminal
24	TYPESEL	I	Model select input terminal
25	/RESET	I	Reset detect signal input terminal
26	EXT-IN	I	Oscillator connected input terminal (F=32.7kHz)
27	EXT-OUT	O	Oscillator connected output terminal (F=32.7kHz)
28	XOSCIN	I	System clock signal input terminal
29	XOSCOU	O	System clock signal output terminal
30	V _{SS}	—	GND terminal
31	REST	I	Rest detect switch signal input terminal
32	ASHOCK	—	Not used, open
33	HOLD	I	HOLD switch signal input
34	CHGALKL	—	Not used, open
35	JACKM2	—	Not used, open
36	JACKM1	—	Not used, open
37	POWER	O	Power supply detect signal output terminal
38	RW	O	RF/FE/TE gain control signal output terminal
39	PDOWN	I	Headphone power OFF signal input terminal
40	MUTEL	—	Line out muting signal output terminal (Not used, open)
41	TXPOWER	—	Not used, open
42	GUP	O	Gain control output terminal for during XBS/TRAIN/LIVE operation (When ON:increased 6dB)
43	MUTE	O	Muting signal output terminal
44	XBS	—	Not used, open
45	X3	O	RF equalizer triple speed signal output terminal
46	LD-OFF	—	Not used, open
47	REMSEL	—	Not used, open
48	RAMSEL	—	DRAM select signal input terminal (Not used, open)
49	RAMSEL2	—	DRAM select signal input terminal (Not used, open)
50	SOUND	—	Not used, open
51	PMSEL	—	Not used, open
52	LDSEL3	I	Power supply input terminal
53	LDSEL2	—	Not used, open
54	LDSEL1	—	Not used, open
55~70	SEG15 ~SEG0	O	LCD segment signal output terminal
71	V _{CC}	I	Power supply terminal
72	VREF	I	Reference voltage input terminal
73	AV _{SS}	—	GND
74~77	COM3 ~COM0	O	LCD common signal output terminal
78	VL3	I	Power supply terminal
79	VL2	I	Power supply terminal (LCD drive bias)
80	VL1	I	

14.3. IC501(MN662787SC): Servoprocessor, Digital Signal Processor, Digital Filter, and D/A Converter

Pin No.	Mark	I/O Division	Function
1	DV _{DD} 3V	I	Power supply input terminal for DRAM interface
2	D0	I/O	Data input/output terminal for DRAM
3	D1		
4	NWE	O	Write enable output terminal for DRAM
5	NRAS	O	RAS control signal output terminal for DRAM
6	D2	I/O	Data 2/3 input /output terminal for DRAM
7	D3		
8	NCAS0	O	CAS control 0 signal output terminal for DRAM
9	NCAS1	O	CAS control 1 signal output terminal for DRAM
10~14	A8~A4	O	Addresses 8~4 output terminal for DRAM
15	A9	O	Address 9 output terminal for DRAM
16~19	A0~A3	O	Addresses 0~3 output terminal for DRAM
20	V _{SS} 2	—	Connected to GND
21	DV _{DD} 2	I	Power supply input terminal for digital circuit
22	SPOUT	O	Spindle motor drive output terminal (absolute value)
23	TRV+	O	Traverse motor drive (+) output terminal
24	TRV-	O	Traverse motor drive (-) output terminal
25	TR+	O	Tracking motor drive (+) output terminal
26	TR-	O	Tracking motor drive (-) output terminal
27	FO+	O	Focus motor drive (+) output terminal
28	FO-	O	Focus motor drive (-) output terminal
29	IOVDD1	I/O	Power supply input/output terminal
30	TBAL	O	Tracking balance adjustment output terminal
31	FBAL	O	Focus balance adjustment output terminal
32	FE	I	Focus error signal input terminal (Analog input)
33	TE	I	Tracking error signal input terminal (Analog input)
34	RFENV	I	RF envelope signal input terminal (Analog input)
35	OFT	I	Off-track signal input terminal (H:off-track)
36	NRFDET	I	RF detection signal input terminal (L:detection)
37	BD0	I	Dropout signal input terminal (H:dropout)
38	LDON	O	Laser ON signal output terminal (H:ON)
39	ARF	I	RF signal input terminal
40	IREF	I	Reference current input terminal
41	ADPV _{CC}	O	A/D reference voltage output terminal (Analog input)
42	DSL F	O	Loop filter output terminal for DSL
43	DRF	I	Bias input terminal for DSL
44	PLL F	O	Loop filter output terminal for PLL
45	VCO F	O	Loop filter output terminal for jitter-free VCO

Pin No.	Mark	I/O Division	Function
46	AV _{DD} 2	I	Power supply input terminal for analog circuit (DSL,PLL,VCOF,AD,DA)
47	AV _{SS} 2	I	GND for analog circuit (DSL,PLL,VCOF,AD,DA)
48	OUTL	O	Left channel audio signal output terminal
49	AV _{SS} 1	—	Connected to GND
50	OUTR	O	Right channel audio signal output terminal
51	AV _{DD} 1	I	Power supply input terminal for analog circuit
52	FSEL	I	Noise filter ON/OFF switching input terminal (L:ON/H:OFF) (Connected to GND)
53	TMOD1	—	Test terminal (L:normal) (Connected to GND)
54	TMOD2		
55	FLAG	—	Flag signal output terminal (Not used, open)
56	FCLK	—	Not used, open
57	EXT0	—	Extension IN/OUT port (0) (Not used, open)
58	EXT1	—	Extension IN/OUT port (1) (Not used, open)
59	IOV _{DD} 2	I	Power supply input terminal
60	TX	O	Digital audio interface signal output terminal (Not used, open)
61	MCLK	I	Microprocessor command clock signal input terminal
62	MDATA	I	Microprocessor command data signal input terminal
63	MLD	I	Microprocessor command load signal input terminal (L:load)
64	BLKCK	O	Sub-code block clock signal output terminal (f=75Hz:during normal speed playback)
65	PWMSEL	I/O	PWM output mode select input terminal (L:direct, H:3 value) (Connected to GND)
66	SMCK	O	System clock signal output terminal (f=4.236/8.4672MHz)
67	DMUTE	I/O	Mute input terminal (H:mute) (Connected to GND)
68	STAT	O	Status signal output terminal
69	NRST	I	Reset signal input terminal (H:reset)
70	SPPOL	O	Spindle motor drive signal output terminal (polarity output)
71	PMCK	O	Clock signal output terminal (f=88.2KHz)
72	NCLDCK	O	Frame clock signal output terminal (f=7.35KHz:during normal speed playback)(Not used, open)
73	SUBC	O	Sub-code serial output terminal (Not used, open)
74	SBCK	I	Clock input terminal for sub-code output terminal
75	NTEST	I	Test input terminal (H:normal)
76	X2	O	Crystal oscillator circuit output terminal (f=16.9344MHz)
77	X1	I	Crystal oscillator circuit input terminal (f=16.9344MHz)
78	DV _{SS} 1	—	Connected to GND
79	DV _{DD} 1	I	Power supply input terminal for digital circuits
80	EXT2	I	Extension IN/OUT port (2) (Not used, open)

15 Replacement Parts List

Notes:

*Important safety notice:

Components identified by Δ mark have special characteristics important for safety.

*Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

*When replacing any of components, be sure to use only manufactures specified parts shown in the parts list.

*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

*The parenthesized indications in the Remarks columns specify the colours. (Refer to the cover page for colour.)

Parts without these indications can be used for all colours.

*Warning: This product uses a laser diode. Refer to caution statements.

*Capacity values are in microfarads (μ F) unless specified otherwise, P=Pico-farads (pF), F=Farads (F).

*Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM).

*The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

**<IA>-<IE>" marks in Remarks indicate languages of instruction manuals.

[<IA>: English, <IB>: Canadian French, <IC>:English, <ID>:English/Spanish/Swedish/German/Italian/French, <IE>:Netherlands/Danish/Russian/Czeco/Polish/Portuguese]

*All parts are supplied by MESA.

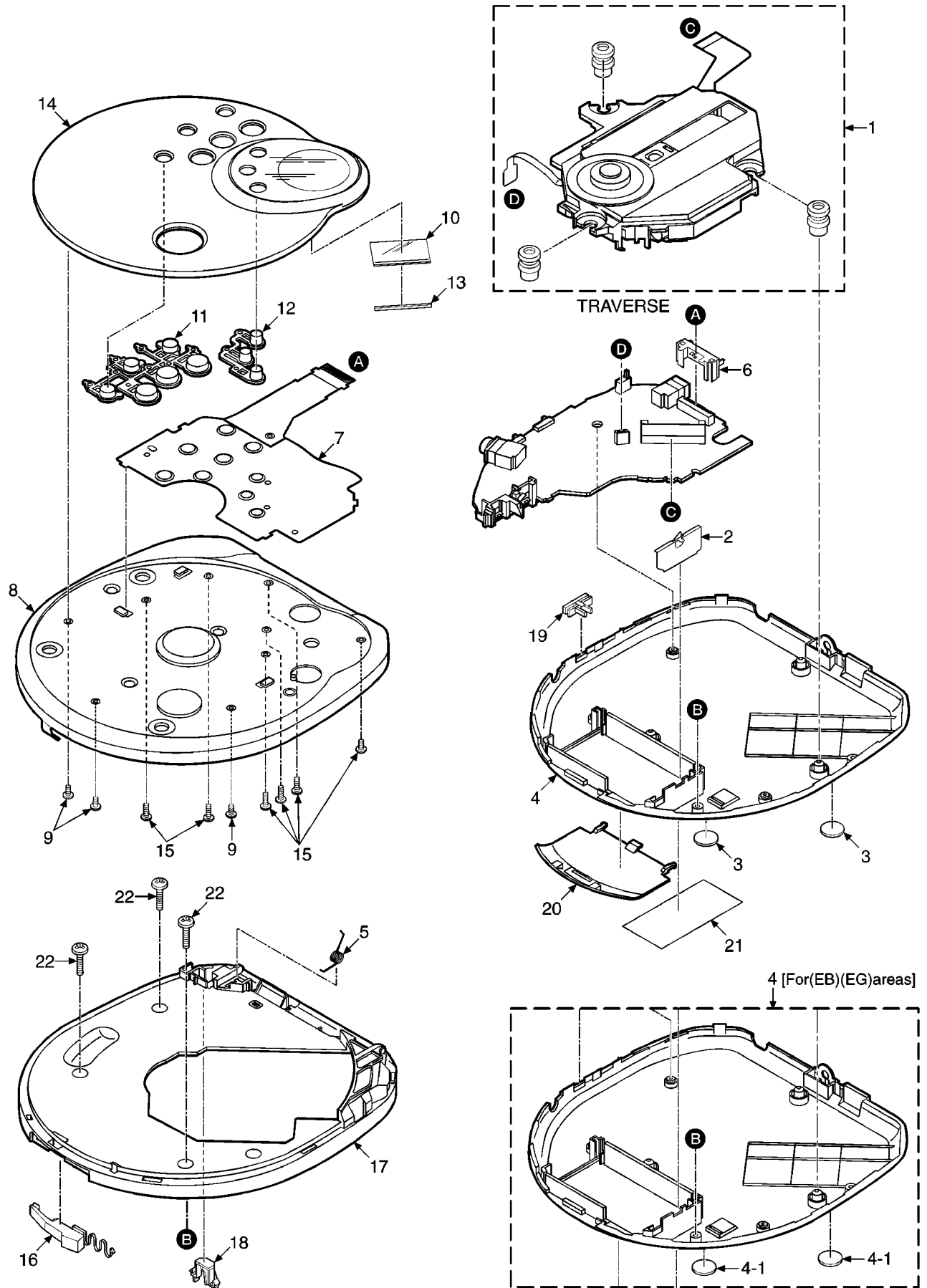
Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1	RAE0145Z	TRAVERSE DECK	1	Δ
1-1	RAF0142A	OPTICAL PICKUP	1	Δ
1-2	RDG0305	GEAR	1	
1-3	RDG0306	GEAR	1	
1-4	RJB2106A	TRAVERSE FPC	1	
1-5	RMG0449-H	FLOATING RUBBER	3	
1-6	RMC0264	THRUST SPRING	1	
1-7	RXQ0482	NUT PLATE SPRING	1	
1-8	RXQ0525	TRAVERSE MOTOR	1	
1-9	SNSD38	SCREW	1	
1-10	XQN17+BG45	SCREW	1	
1-11	XQN17+CG45	SCREW	1	
1-12	XQN2+BG55	SCREW	1	
2	RJC93020-1	BATTERY TERMINAL	1	
3	RKA0112-K	FOOT	2	(P) (PC)
4	RFKJLSX390ES	BOTTOM CABINET ASS'Y	1	(EB) (EG)
4	RKS0322C-A	BOTTOM CABINET	1	(P) (PC)
4-1	RKA0112-K	FOOT	2	(EB) (EG)
5	RME0308	OPEN SPRING	1	
6	RML0578	FPC HOLDER	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
7	K0RE00900006	MULTI BUTTON SW UNIT	1	
8	RGD0082-A	CD LID	1	(P) (PC) (EB-A) (EG-A)
8	RGD0082-H	CD LID	1	(EB-S) (EG-S)
9	RHQ0032-K	SCREW	3	
10	L5ACACC00004	LCD (LCD301)	1	
11	RGU2051-S	OPERATION BUTTON (A)	1	
12	RGU2052-A	OPERATION BUTTON (B)	1	(P) (PC)
12	RGU2052-S	OPERATION BUTTON (B)	1	(EB) (EG)
13	RSQ0085	ZEBRA RUBBER	1	
14	RYF0621-1S	LID ORNAMENT	1	(EB-S) (EG-S)
14	RYF0621-A	LID ORNAMENT	1	(EB-A) (EG-A)
14	RYF0621-S	LID ORNAMENT	1	(P) (PC)
15	XQN14+BG3FC	SCREW	6	
16	RGU1838-H	OPEN KNOB	1	
17	RKM0411A-A	INTERMEDIATE CABINET	1	
18	RML0580	STOPPER	1	
19	RGV0200-H1	HOLD KNOB	1	
20	RKK0135-A	BATTERY LID	1	
21	RGN2185-H	NAME PLATE	1	(P) (PC)
21	RGN2222-H	NAME PLATE	1	(EG)
21	RGN2223-H	NAME PLATE	1	(EB)
22	XTN17+6GFZ	SCREW	3	
A1	RFEV716P-SS	HEADPHONE	1	L0BAD0000154 (P)
A1-1	STE31H-K3	EAR PAD	2	
A2	N2QCBD000010	REMOTE CONTROL UNIT	1	(EB) (EG)
A2	N2QCBD000023	REMOTE CONTROL UNIT	1	(P) (PC)
A3	RQT6190-P	INSTRUCTION MANUAL	1	<IA> (P)
A3	RQT6332-C	INSTRUCTION MANUAL	1	<IB> (PC)
A3	RQT6335-B	INSTRUCTION MANUAL	1	<IC> (EB)
A3	RQT6333-E	INSTRUCTION MANUAL	1	<ID> (EG)
A3	RQT6334-H	INSTRUCTION MANUAL	1	<IE> (EG)
A4	L0BAB0000124	INNERPHONE	1	(PC) (EB) (EG)
A5	N0JCC000004	AC ADAPTOR	1	(EB) Δ
A5	RFEA419E-M	AC ADAPTOR	1	(EG) Δ
C10	ECUV1H121KCV	50V 120P	1	
C11	ECUVNA105KBN	10V 1U	1	F1J1A105A003
C12	ECST0JY475RR	6.3V 4.7U	1	ECST0JY475R
C13	F3H1A476A001	10V 47U	1	
C14	RCE0JKA221IG	6.3V 220U	1	F2A0J2210012
C15	ECUVNA105ZFV	10V 1U	1	F1H1A105A030
C17	ECUVNA105ZFV	10V 1U	1	F1H1A105A030
C19	ECA1CAK220X	16V 22U	1	
C20	ECUVNA105ZFX	10V 1U	1	F1H1A105A030
C21	ECUV1H152KBV	50V 1500P	1	F1H1H152A013
C22	ECUZNC104ZFV	16V 0.1U	1	F1H1C1040008
C24	ECUV1H471KBV	50V 470P	1	F1H1H471A013
C27	RCE0JRS102BJ	6.3V 1000U	1	F2A0J102A130
C37	ECUVNA105ZFX	10V 1U	1	F1H1A105A030
C101	ECUVNC104KBV	16V 0.1U	1	ECJ1VB1C104K
C103	ECUVNE223KBV	25V 0.022U	1	F1H1E223A050
C111	ECUVNE223KBV	25V 0.022U	1	F1H1E223A050
C112	ECUV1H221KBV	50V 220P	1	F1H1H2210001
C113	ECUZNC104ZFX	16V 0.1U	1	F1H1C1040008
C114	ECUVNA105KBV	10V 1U	1	F1H1A105A028
C115-17	ECUVNE223KBV	25V 0.022U	3	F1H1E223A050
C120	ECUV1H152KBV	50V 1500P	1	F1H1H152A013
C121	ECUV1H121KCV	50V 120P	1	
C201	ECA0JAK470X	6.3V 47U	1	
C301,02	ECUVNA105ZFV	10V 1U	2	F1H1A105A030
C304	ECUVNC104KBV	16V 0.1U	1	ECJ1VB1C104K
C305	ECUVNA224KBV	10V 0.22U	1	F1H1A224A028

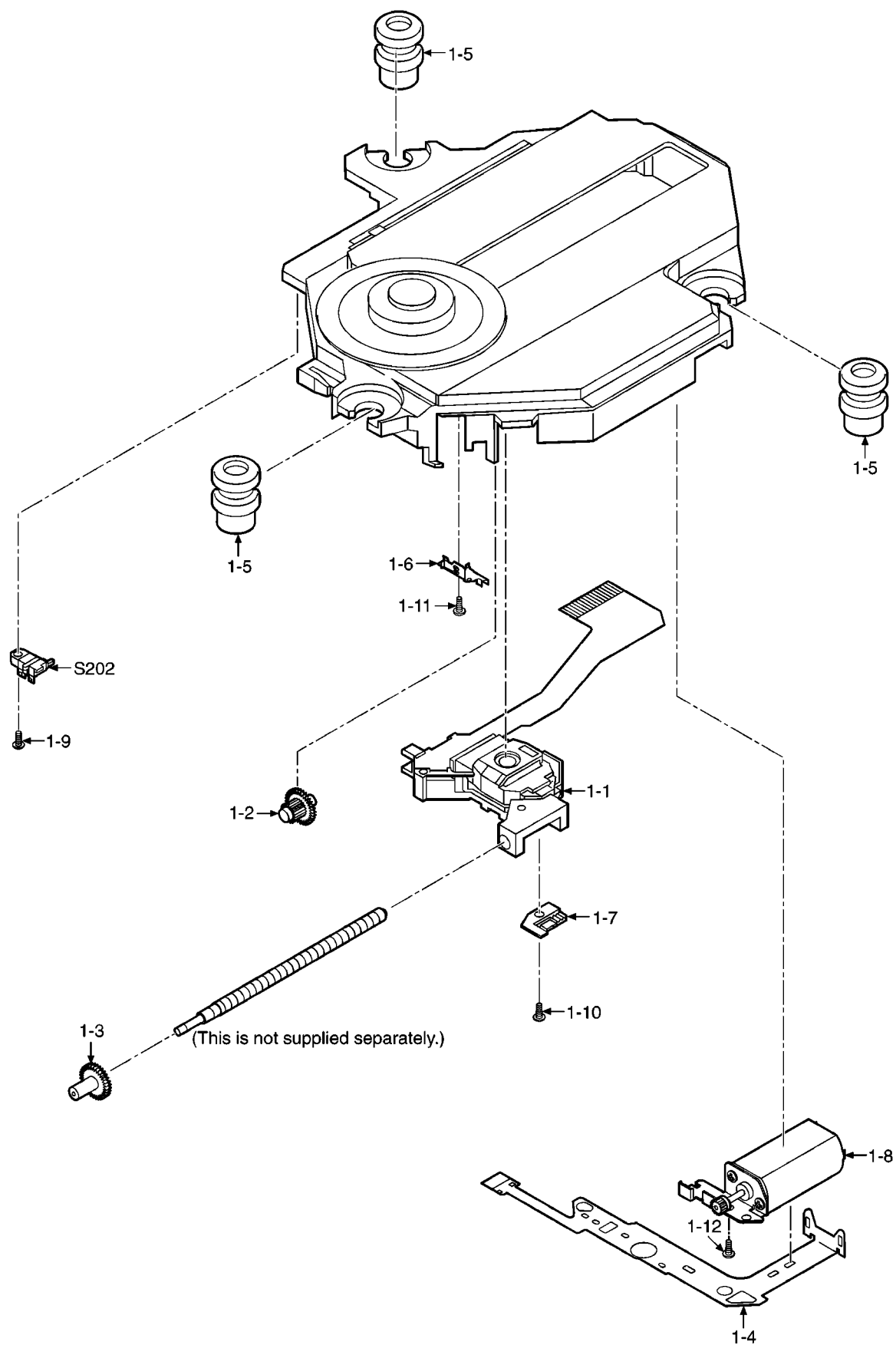
Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C315	ECEA1CKS101	16V 100U	1	
C398,99	ECUV1H090DCV	50V 9P	2	F1H1H9R0A244
C503	ECUV1H561KBV	50V 560P	1	F1H1H561A013
C504	ECUZNC104ZFB	16V 0.1U	1	F1H1C1040008
C505	ECUVNE223KEV	25V 0.022U	1	F1H1E223A050
C506	ECUVNJ474KEV	6.3V 0.47U	1	F1H0J474A002
C507	ECEA0JKA331	6.3V 330U	1	
C508	ECUVNJ474KEV	6.3V 0.47U	1	F1H0J474A002
C509	ECUVNH103KBV	50V 0.01U	1	F1H1H103A748
C510,11	ECUZNC104ZFB	16V 0.1U	2	F1H1C1040008
C514	ECUV1H102KEV	50V 1000P	1	ECJ1VB1H102K
C515	ECUZNC104ZFB	16V 0.1U	1	F1H1C1040008
C517	ECUVNA105ZFB	10V 1U	1	F1H1A105A030
C519	ECUZNC104ZFB	16V 0.1U	1	F1H1C1040008
C525	ECUZNC104ZFB	16V 0.1U	1	F1H1C1040008
C603,04	ECUV1H272KEV	50V 2700P	2	F1H1H272A009
C610	ECA0JAK470X	6.3V 47U	1	
C701	ECEA0JKS470	6.3V 47U	1	
C702	ECUZNC104ZFB	16V 0.1U	1	F1H1C1040008
C705,06	ECA0GAD221X	4V 220U	2	
C711,12	ECUVNA105KEV	10V 1U	2	F1H1A105A028
C902	ECUV1H332KEV	50V 3300P	1	F1H1H332A013
C903	ECUZNC104ZFB	16V 0.1U	1	F1H1C1040008
CN11	K4ZZ02000071	BATTERY TERMINAL	1	
CN101	RJS2A6216T	CONNECTOR (16P)	1	K1MN16B00027
CN301	RJS2A6130T	CONNECTOR (30P)	1	K1MN30A00023
CN401	RJS2A5106T1	CONNECTOR (6P)	1	K1MN06A00021
D23	MA8056M	DIODE	1	MAZ80560ML
DI01	MA111TX	DIODE	1	MA2J11100L
IC11	C0DEBFFB00003	IC	1	
IC101	AN8885SBE1V	IC	1	
IC301	C2BBFD0000353	IC	1	
IC501	MN662787SC	IC	1	
IC502	C3ABMB000027	IC	1	
IC701	NJU7082BVAE1	IC	1	
ICP11	K5H1522A0004	IC PROTECTOR	1	△
JK11	RJJ43K09-C	JACK, DC IN	1	K2EB2B000006
JK701	VJJ0627	JACK, HEADPHONE	1	K2HC104B0013
L11	RLQU331KT-W	COIL	1	G1C331K00004
L12	RLQS101KT1-T	COIL	1	G1C101M000011
L13	RLQU331KT-W	COIL	1	G1C331K00004
L14	RLQU101KT-W	COIL	1	G1C101K00008
P1	RPN1490	TRAY1	1	(P) (PC) (EB)
P2	RPN1489	TRAY2	1	(P) (PC)
P2	RPN1509	TRAY2	1	(EB)
P3	RPQ1276	SHEET	1	(P)
P3	RPQ1289	SHEET	1	(EB-S)
P3	RPQ1290	SHEET	1	(EB-A)
P3	RPQ1320	SHEET	1	(PC)
P5	RPK1714	PACKING CASE	1	(EG-S)
P5	RPK1715	PACKING CASE	1	(EG-A)
P6	RPQ0836-3	PAD	1	(EG)
P7	RPQ1346	PAD	1	(EG)
PCB1	REP3286A-M	P.C.B. ASS'Y	1	
Q11	2SB1132T100	TRANSISTOR	1	B1ADMD000007
Q15	DTC143EUA106	TRANSISTOR	1	B1GBCFGG0011
Q26	B1CDGD000001	TRANSISTOR	1	
Q201	2SB709ASTX	TRANSISTOR	1	2SB0709ASL
Q502	2SK1958T1	TRANSISTOR	1	B1CFHA000001
Q701	XN0F26300L	TRANSISTOR	1	
Q703	FMG6AT148	TRANSISTOR	1	B1GBCEJA0001
Q901	DTA114YUA106	TRANSISTOR	1	B1GDCFJN0011
Q902	FMG6AT148	TRANSISTOR	1	B1GBCEJA0001
Q903	DTA144EUA106	TRANSISTOR	1	B1GDCFNN0007

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
Q904	B1CDGD000001	TRANSISTOR	1	
R14	ERJ3GEYJ473	1/16W 47K	1	
R15	ERJ3GEYJ683	1/16W 68K	1	
R22	ERJ3GEYJ223	1/16W 22K	1	
R28	ERJ3GEYJ271	1/16W 270	1	
R31	ERJ3GEYJ104Z	1/16W 100K	1	
R120	ERJ3GEYJ103Z	1/16W 10K	1	
R121,22	ERJ3GEYJ124V	1/16W 120K	2	D0GB124JA002
R128	EXBV4V103JV	1/32W 10K	1	
R201	ERJ3GEYJ2R2V	1/16W 2.2	1	D0GB2R2JA002
R202	ERJ3GEYJ223	1/16W 22K	1	
R301,02	ERJ3GEYJ104Z	1/16W 100K	2	
R303	ERJ3GEYJ102V	1/16W 1K	1	ERJ3GEYJ102Z
R304	ERJ3GEYJ105	1/16W 1M	1	
R305	ERJ3GEYJ335	1/16W 3.3M	1	
R306	EXBV8V473JV	1/16W 47K	1	
R307	ERJ3GEYJ103Z	1/16W 10K	1	
R308	ERJ3GEYJ104Z	1/16W 100K	1	
R313	EXBV8V104J	1/16W 100K	1	
R321,22	ERJ3GEYJ104Z	1/16W 100K	2	
R325	ERJ3GEYJ333	1/16W 33K	1	
R501	ERJ3GEYJ683	1/16W 68K	1	
R502	ERJ3GEYJ563	1/16W 56K	1	
R505	ERJ3GEYJ151	1/16W 150	1	
R506	ERJ3GEYJ222	1/16W 2.2K	1	
R508	ERJ3GEYJ3R3	1/16W 3.3	1	
R511	ERJ3GEYJ222	1/16W 2.2K	1	
R512	EXBV4V222J	1/32W 2.2K	1	
R513	ERJ3GEYJ104Z	1/16W 100K	1	
R514	ERJ3GEYJ331V	1/16W 330	1	D0GB331JA002
R516	ERJ3GEYJ181	1/16W 180	1	
R517	ERJ3GEYJ104Z	1/16W 100K	1	
R603	EXBV4V561JV	1/32W 560	1	
R701,02	ERJ3GEYJ104Z	1/16W 100K	2	
R703,04	ERJ3GEYJ180	1/16W 18	2	
R705,06	ERJ3GEYJ1R5	1/16W 1.5	2	
R707,08	ERJ3GEYJ102V	1/16W 1K	2	ERJ3GEYJ102Z
R709	EXBV4V332J	1/32W 3.3K	1	
R713,14	ERJ3GEYJ103Z	1/16W 10K	2	
R715,16	ERJ3GEYJ123	1/16W 12K	2	
R750	EXBV4V123J	1/32W 12K	1	D1H412320001
R901	EXBV4V821J	1/32W 820	1	
R902	ERJ3GEYJ223	1/16W 22K	1	
R903	ERJ3GEYJ105	1/16W 1M	1	
R905	ERJ3GEYJ470	1/16W 47	1	
RJ303	ERJ3GEY0R00V	1/16W 0	1	
RJ502	EXBV8VR000V	1/16W 0	1	
RJ504	ERJ3GEY0R00V	1/16W 0	1	
RJ551	ERJ3GEY0R00V	1/16W 0	1	
S201	ESE11SV6	SW, OPEN DET.	1	
S202	ESE11HS4	SW, REST DET.	1	
S310	RSS2A010-1A	SW, HOLD	1	K0D112B00071
X301	RSXC32K7L01T	OSCILLATOR	1	H0J327200034
X501	H2D169500015	OSCILLATOR	1	

16 Cabinet Parts Location

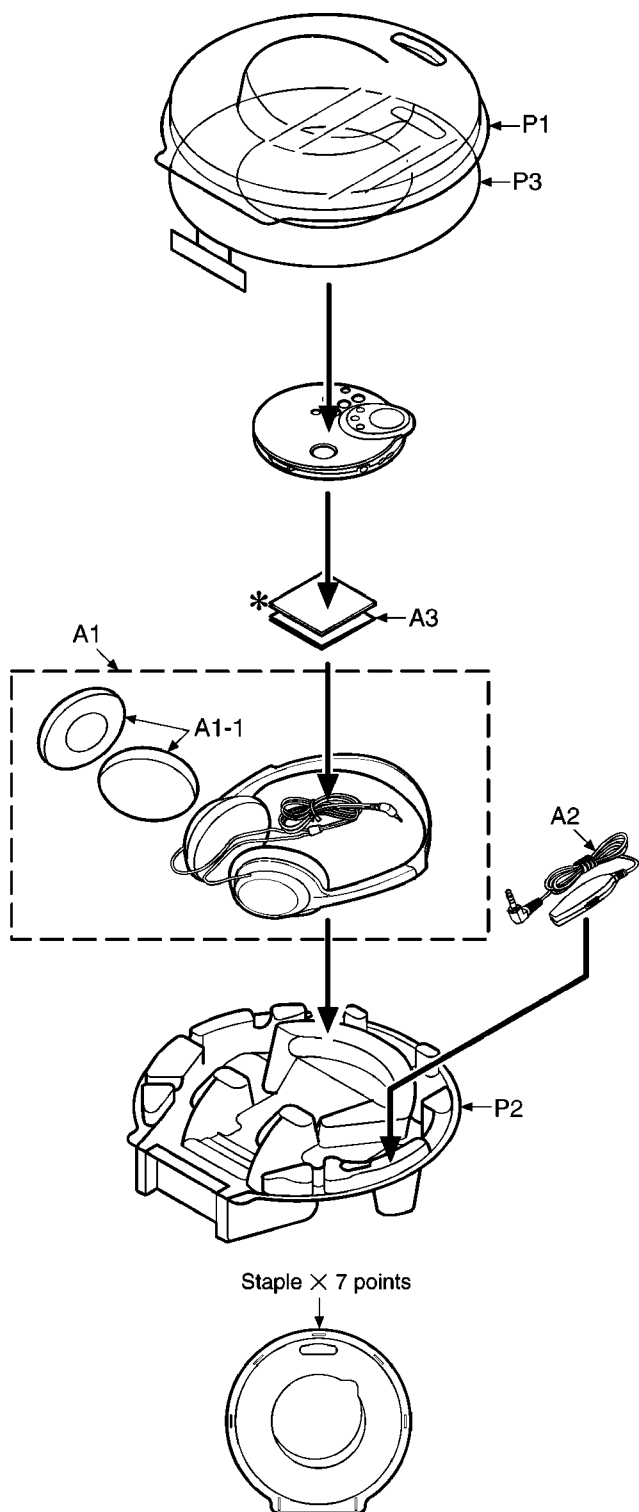


17 Traverse Parts Location

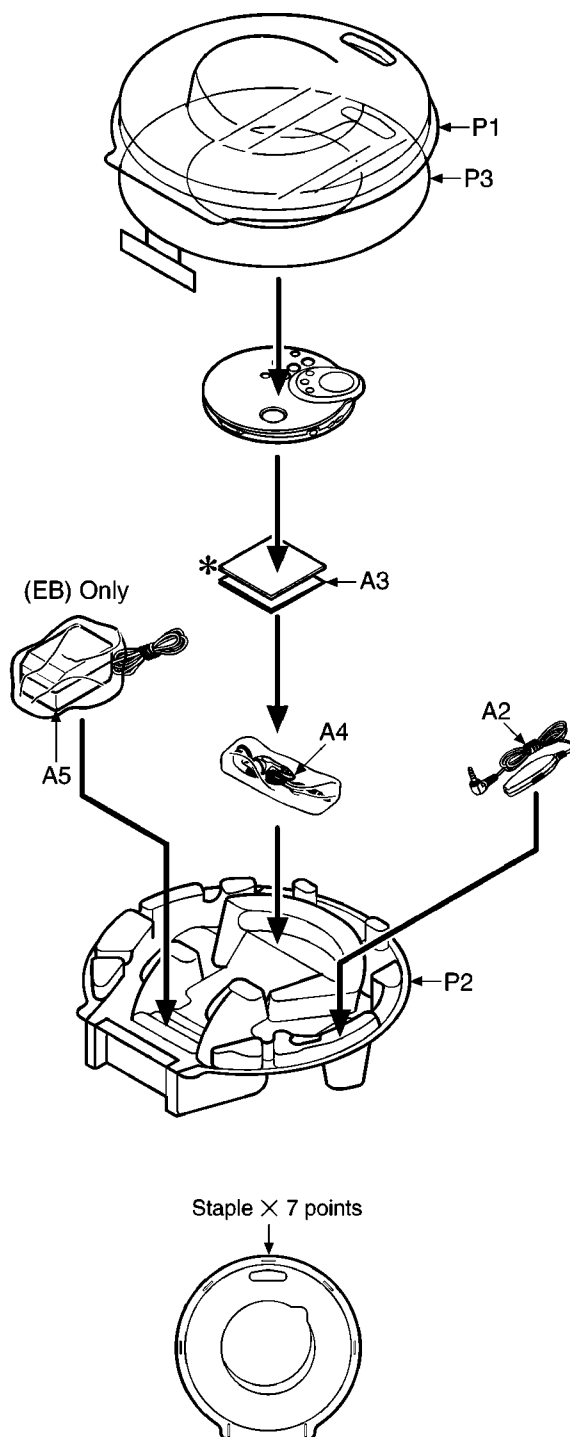


18 Packaging

(P)

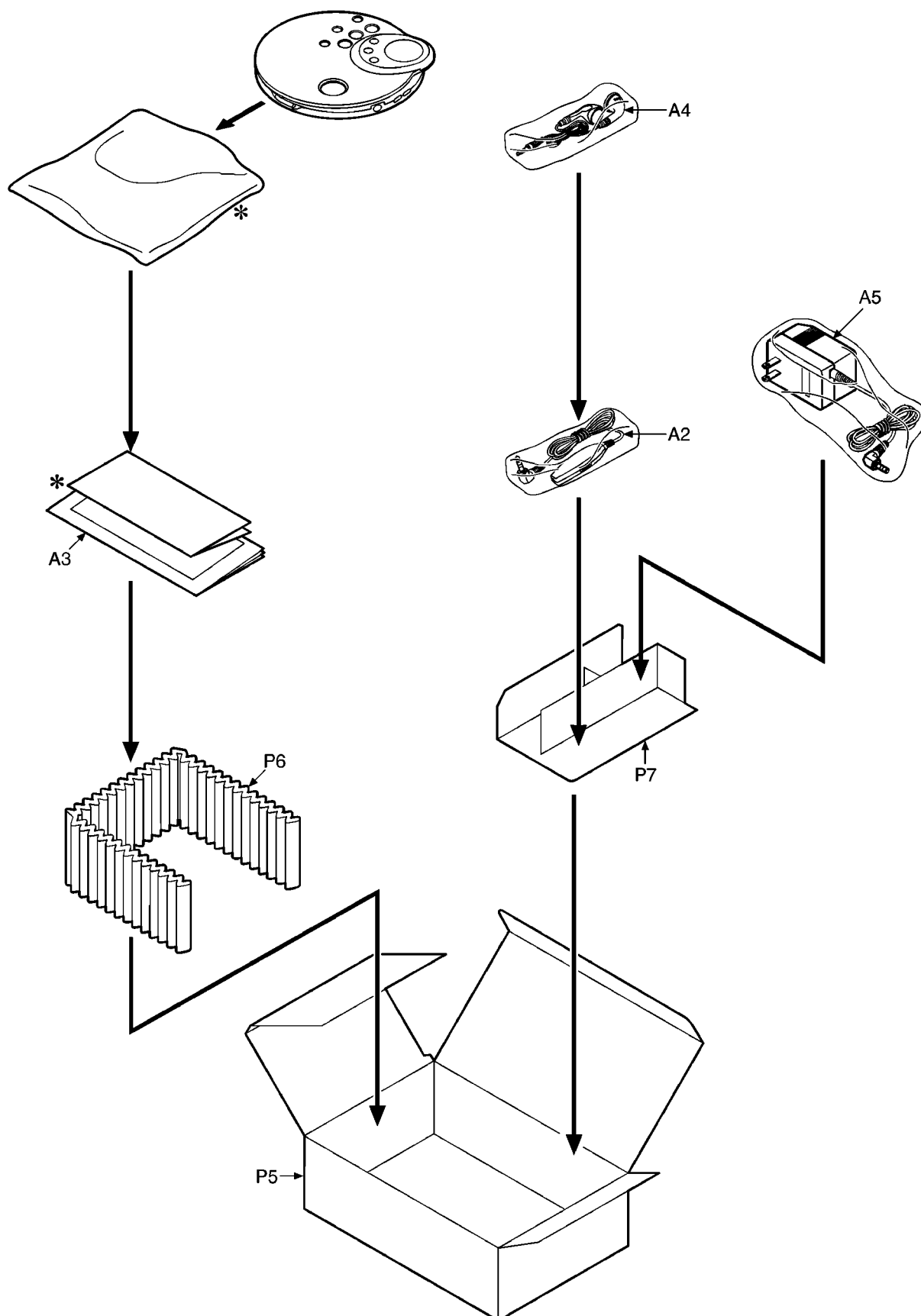


(PC/EB)



Note : We do not supply those items of parts marked *.

(EG)



Note : We do not supply those items of parts marked *.