ORDER No.AD0502006C8

Service Manual

Portable CD Player

COMPACT disc DIGITAL AUDIO

SL-SX450EB
SL-SX450EE
SL-SX450EG
SL-SX450GC
SL-SX450GN

Colours

(S).....Silver Type

(A).....Blue Type (Only SL-SX450EE)

Specification

●Audio (CD-DA)

Sampling frequency:	44.1 kHz
No. of channels:	2 (left and right, stereo)
Frequency response:	20 to 20,000 Hz (+0.5dB to -7dB)
Headphone output level:	RMS max. 6mW+6mW/ 16Ω (adjustable)

●Pickup

Light source:	Semiconductor laser
Wavelength:	780 nm

●MP3

Supported bit-rates:	32 kbps to 320 kbps (128 kbps is recommended)
Supported sampling frequency:	48 kHz/44.1 kHz/32 kHz
Maximum number of items (total no. of albums and tracks):	999
Maximum album levels:	100

●General

Power supply:

DC input; DC 4.5V

AC adaptor input; (AC adaptor is not included in SL-SX450EB.)

EB: AC 220 - 240V 50/60Hz

EE: AC 220 - 230V 50/60Hz

EG: AC 220 - 230V 50/60Hz

GC: AC 110 - 127, 220 - 240V 50/60Hz

GN: AC 230 - 240V 50Hz

Power consumption: (AC adaptor is not included in SL-SX450EB.)

Using AC adaptor;	0.7W
Recharging;	3.1W

Play time:

Using on a flat stable surface at 25°C, EQ is off, Hold is on, Anti-skip is on POS 1 (CD-DA), recommended bit rate (MP3: 128 kbps), and the Digital Re-master is off (MP3).Play time are inhoursand approximate.

Batteries used:

Panasonic

2 optional alkaline batteries;	MP3 disc....85h CD-DA disc....50h
2 optional rechargeable batteries;	MP3 disc....40h CD-DA disc....23h
Recharging time:	4 to 5 hours

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

・Play time will be considerably reduced when playing CD-RW.

Operational temperature range:	0°C-40°C
Rechargeable temperature range:	5°C-40°C
Dimensions (WxHxD):	135x23.8x135mm
Mass:	202g (with batteries) 158g (without batteries)

Note:

Specifications are subject to change without notice.

Mss and dimensions are approximate.

Note on CD-R and CD-RW:

This unit can play CD-R and CD-RW recorded with CD-DA or MP3. Use an audio recording disc for CD-DA and finalize* it when you finish recording. The unit may not be able to play some discsduetothe condition of the recording.

*A process performed after recording that enables CD-R/CD-RW players to play audio CD-R and CD-RW.

⚠ 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.

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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:

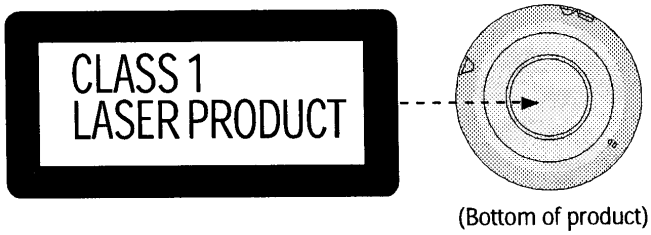
This product utilizes a liser diode with the unit turned “on”, invisible laser radiation is emitted from the pickup lens.
Wave length: 780nm
Maximum output wadiation power from pickup: 100 µW/VDE
Laserradiationfromthepickup lens is safety level, but be sure the followings:

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 enthalt eine Laserdiode. Im eingeschalteten Zustand Wird unsichtbare Leserstrahlung von der Lasereinheit abgestrahlt.
Wellenlage: 780nm
Maximale Strahlungsleistung der Lasereinheit: 100 µW/VDE
Die StrahlungasderLasereinheitist ungefahrlich, wenn folgende Punkte beachtet werden:

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



(Bottom of product)

(Inside of product)

2 Accessories

For all areas:

- Stereo earphones.....1 pc.
  (L0BAB0000182)

For (EE, EG) area:

- AC adaptor.....1 pc.
  (RFEA431E-S)

For (GC) area:

- AC adaptor.....1 pc.
  (RFEA444Z-S)
- Power Plug Adaptor.....1 pc.
  (RJP1SG05-Z)

For (GN) area:

- AC adaptor.....1 pc.
  (RFEA436A-S)

3 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).

3.1. 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. To protect the laser diode against electrostatic breakdown, be sure that the short land A and B of the flexible board (FFC board) should be short-circuit by solder before pulling out the FFC. Then inserting a short pin or similar object intothetip of the flexible board.
   (Refer to **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. 1**)

Handling Precautions for Traverse Deck

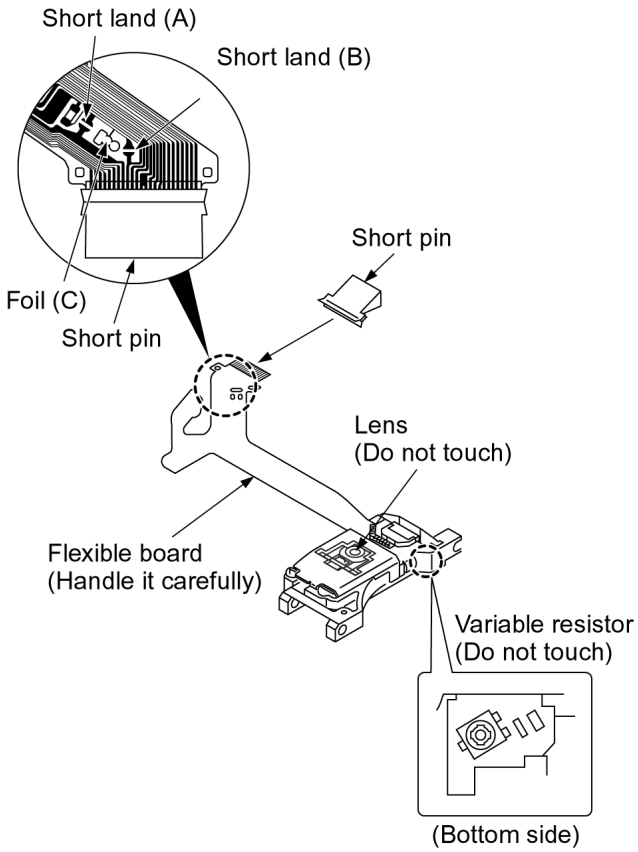


Fig. 1

3.2. Caution when replacing traverse deck

The new traverse deck short-circuits by the short pin, the foil (C) and short lands to protect the laser diode against electrostatic breakdown. Be sure to replace to new one following procedures.

1. Remove the short pin from the FFC, and then connect it to the connector.
2. Cut the foil (C). (Refer to **Fig. 1**) (Take care not to make contact with cutting point each other.)
3. Unsolder the short lands. (Refer to **Fig. 1**)

3.3. 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. 2**)
2. Work table grounding

   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and fround the sheet. (as shown in **Fig. 3**)

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).

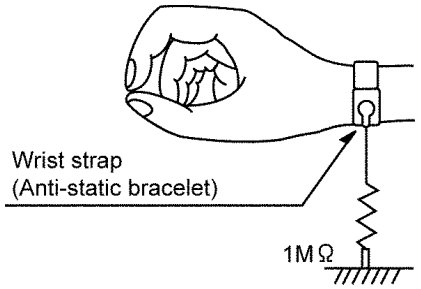


Fig. 2

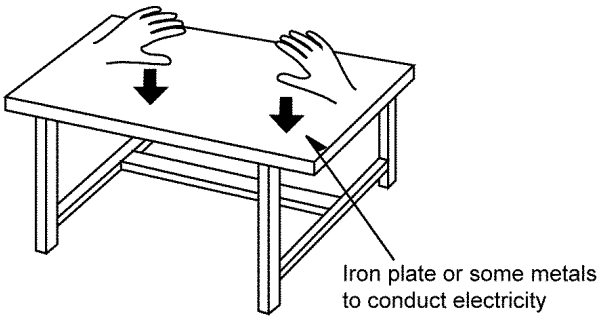


Fig. 3

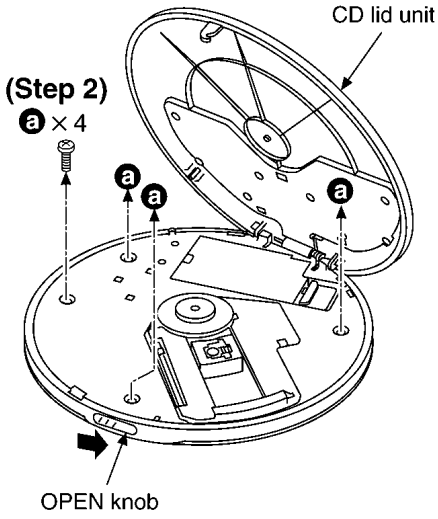
4 Operation Checks and Component Replacement Procedures

- **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.**

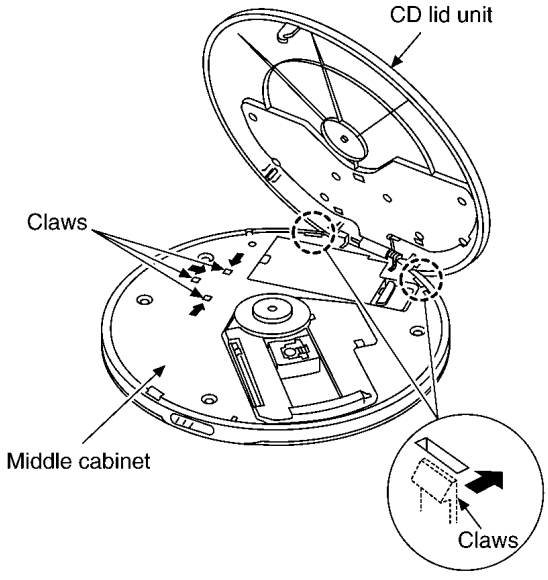
4.1. Checking for the P.C.B. ass'y

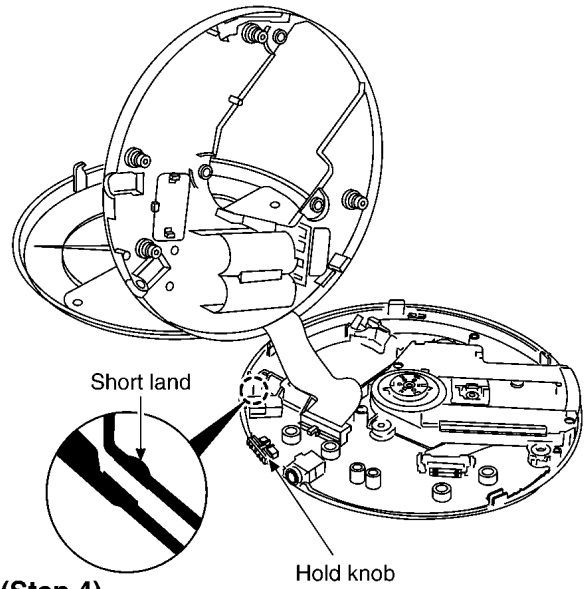
4.1.1. Checking for the P.C.B. ass'y (A side)

(Step 1)
Pressing the OPEN knob, open the CD lid unit.



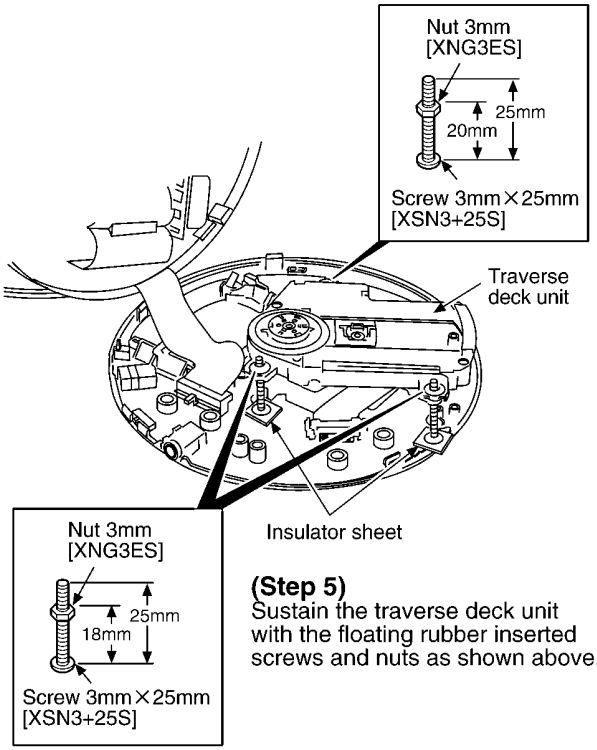
(Step 3)
Release the 5 claws, and then remove the middle cabinet and CD lid unit.





(Step 4)
Short-circuit the land by soldering.

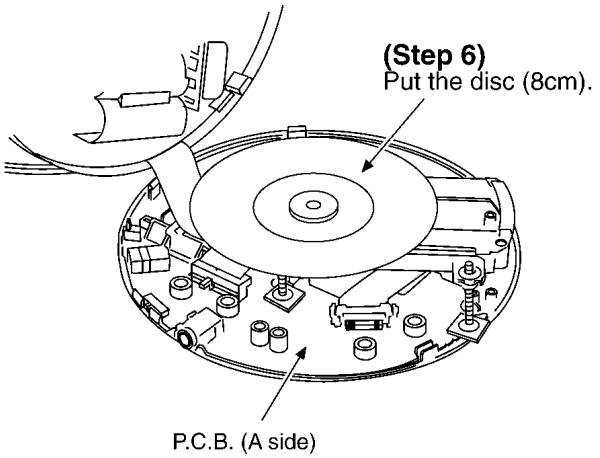
NOTE:
Before checking, remove the hold knob so as not to come off.



(Step 5)
Sustain the traverse deck unit with the floating rubber inserted screws and nuts as shown above.

NOTE:
- The tip of screw must not protrude more than 4 mm above the floating rubber.
- To keep insulation, place the insulator sheet (paper etc.) between the P.C.B. and the head of screws.

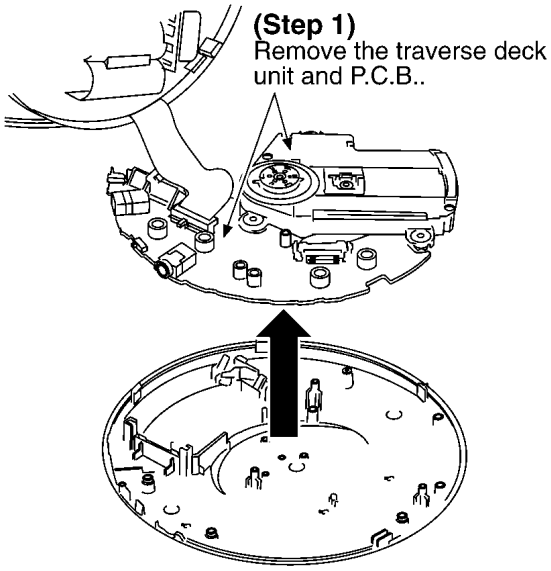
· **Check the P.C.B. ass'y (A side) as shown below.**

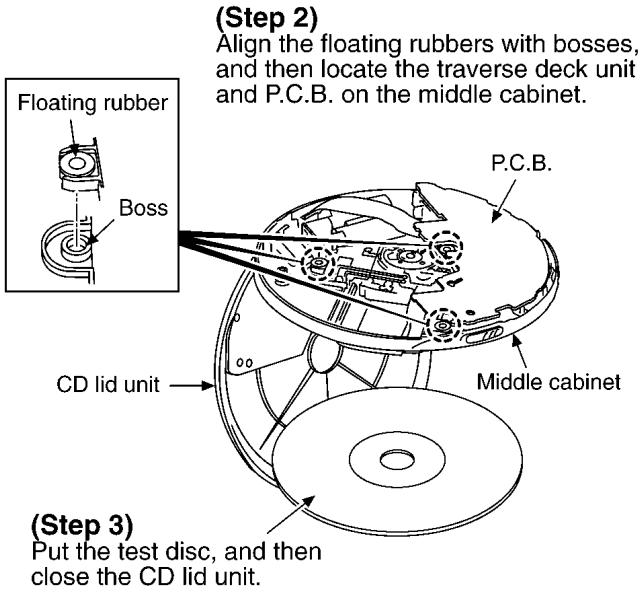


NOTE:
After checking, unsolder the short land to open circuit.

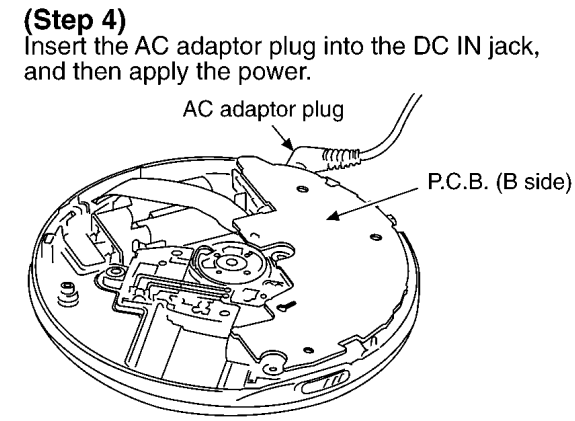
4.1.2. Checking for the P.C.B. ass'y (B side)

· Follow the (Step1)-(Step5) of item 4.1.1.





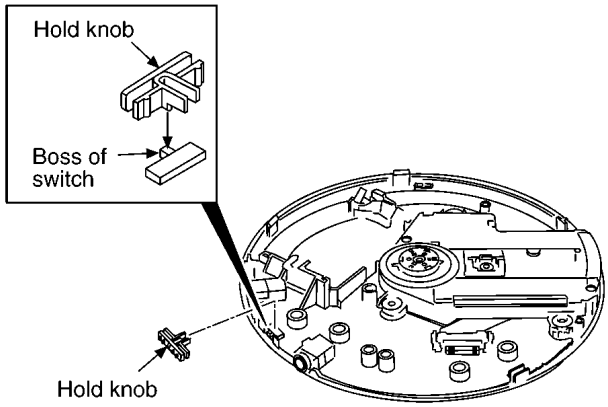
· **Check the P.C.B. ass'y (B side) as shown below.**



NOTE:
After checking, unsolder the short land to open circuit.

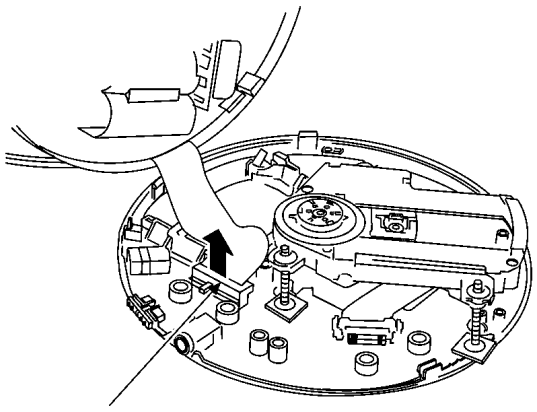
Notice for installation of hold knob

· Make sure the boss of switch is fit in the hold knob.

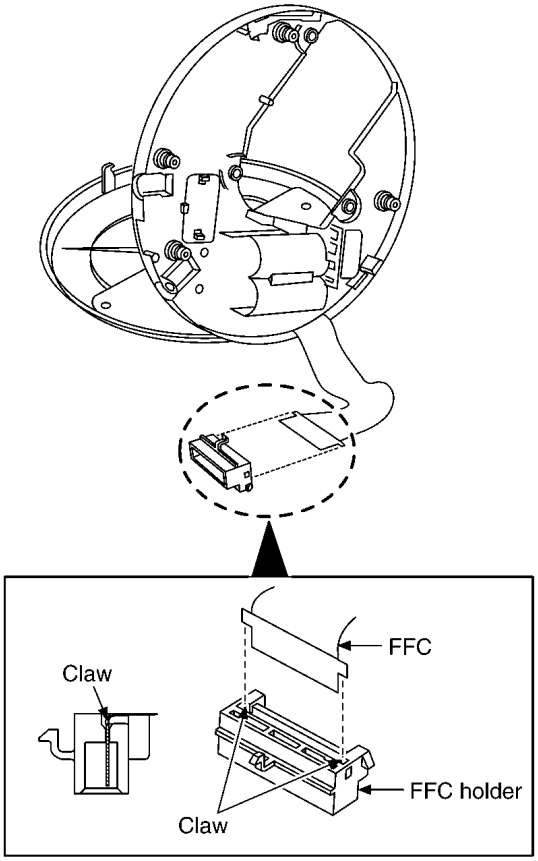


4.2. Replacement for the CD lid unit

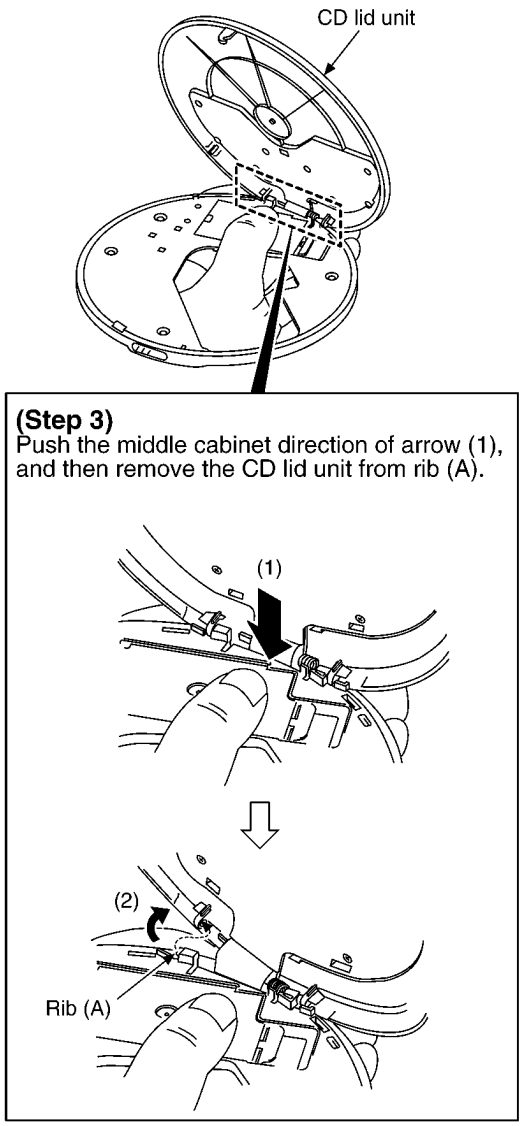
・Follow the (Step1)-(Step3) of item 4.1.1.



(Step 1)
Remove the FFC holder.



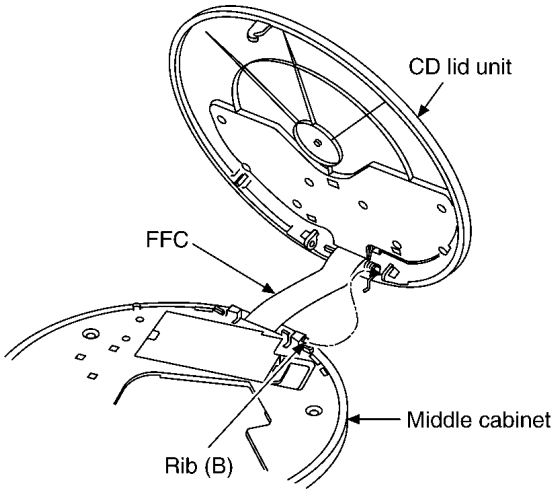
(Step 2)
Release the 2 claws, and then remove the FFC from FFC holder.



(Step 3)
Push the middle cabinet direction of arrow (1), and then remove the CD lid unit from rib (A).

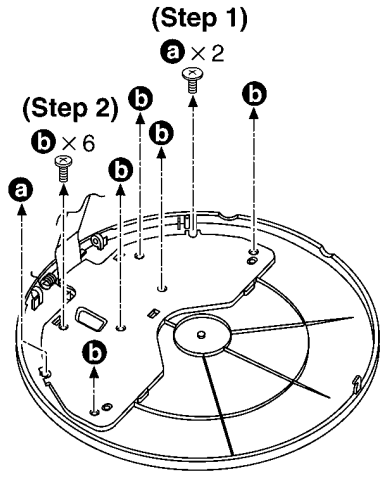
(Step 4)
Remove the CD lid unit from rib (B).

(Step 5)
Draw the FFC from the middle cabinet .
(Take care not to damage the FFC.)

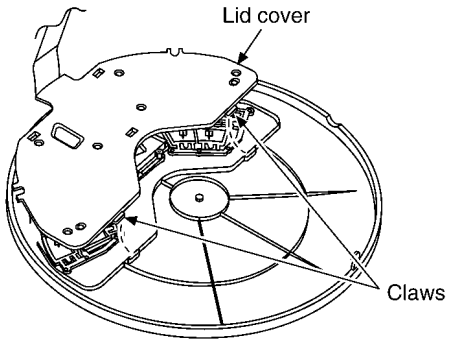


4.3. Replacement for the LCD, button L, button R and multi button SW unit

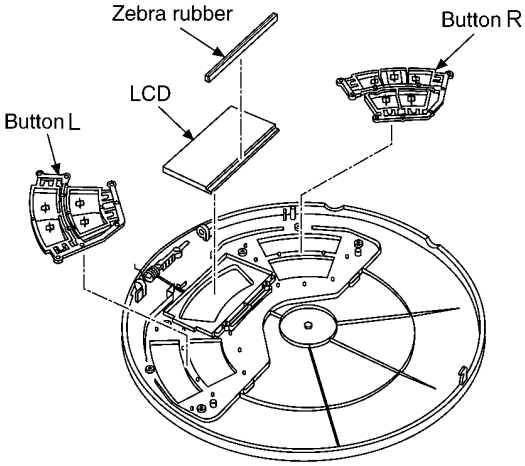
- Follow the (Step1)-(Step3) of item 4.1.1.
- Follow the (Step1)-(Step5) of item 4.2.



(Step 3)
Release the 2 claws, and then remove the lid cover.

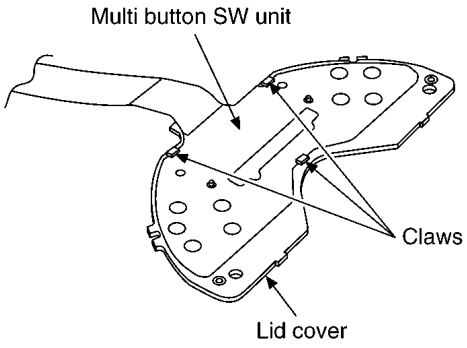


(Step 4)
The parts illustrated below will be free.



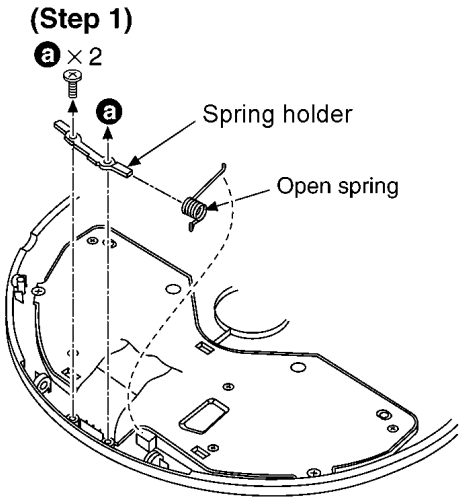
NOTE:
Be careful not to be applied the dust or smudge on the surface zebra rubber.

(Step 5)
Release the 3 claws, and then remove the multi button SW unit.



4.4. Replacement for the spring holder and open spring

- Follow the (Step1)-(Step3) of item 4.1.1.
- Follow the (Step1)-(Step5) of item 4.2.



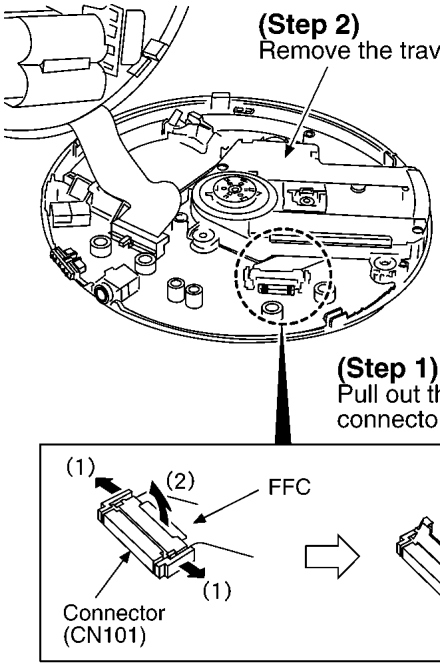
(Step 2)
Remove the Spring holder and open spring.

4.5. Replacement for the traverse motor

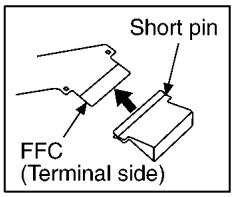
・Follow the (Step1)-(Step3) of item 4.1.1.

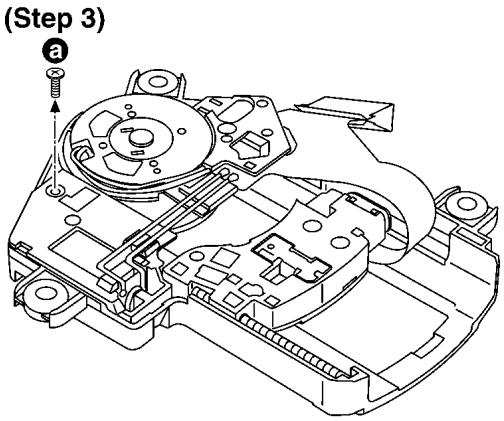
NOTE:

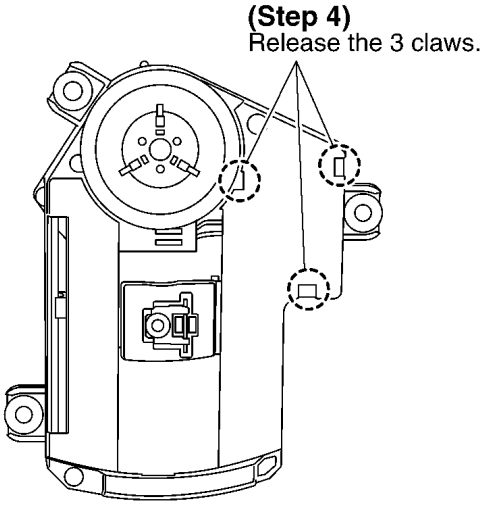
Be sure to confirm the item 3 “Handling Precautions for Traverse Deck” before removing the traverse deck unit.

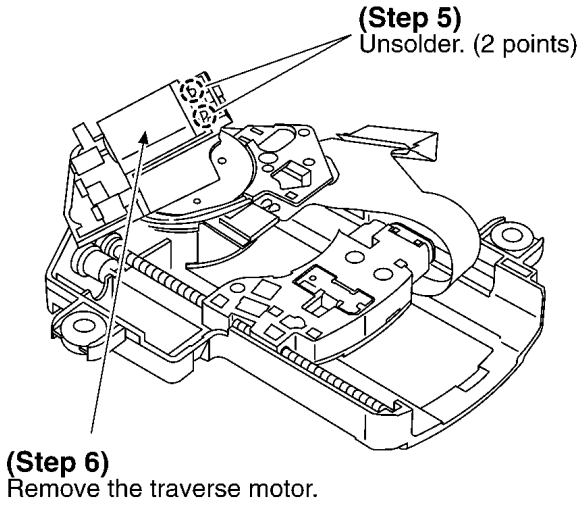


NOTE:
Insert a short pin into the traverse deck's FFC (Terminal side).
(Refer to “**Handling Precautions for Traverse Deck**”.)





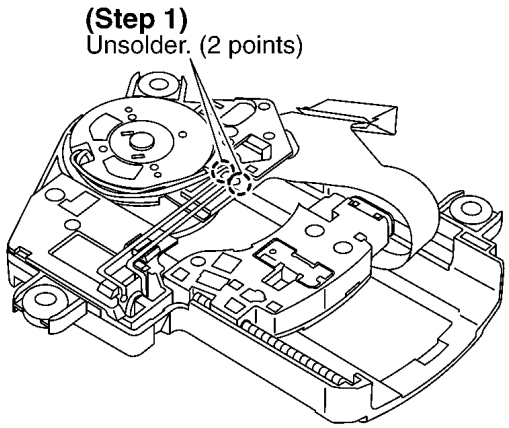




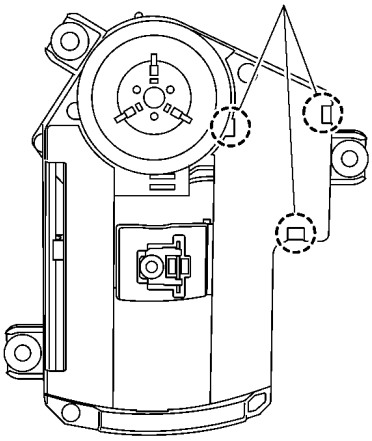
4.6. Replacement for the optical pick-up

・Follow the (Step1)-(Step3) of item 4.1.1.

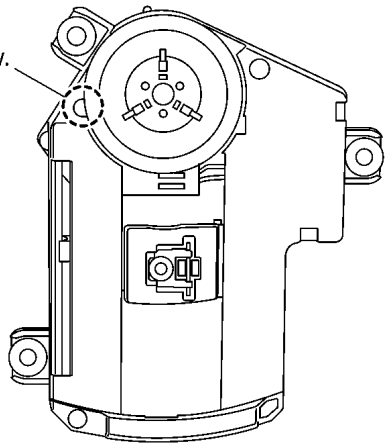
・Follow the (Step1)-(Step3) of item 4.5.



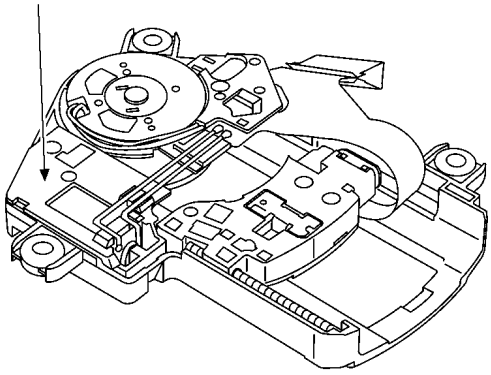
(Step 2)
Release the 3 claws.



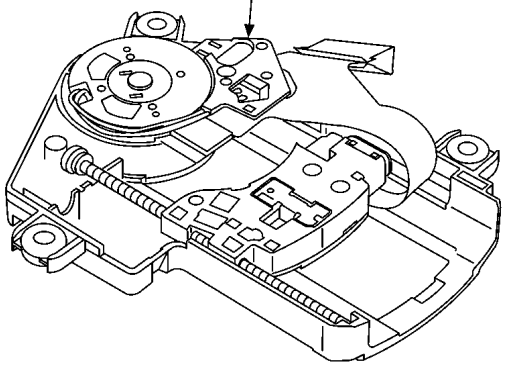
(Step 7)
Release the claw.



(Step 3)
Remove the holder and traverse motor.

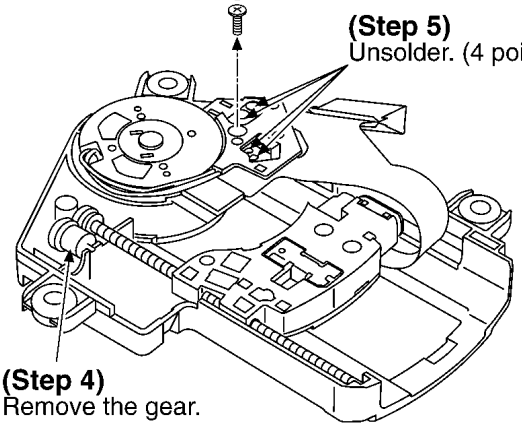


(Step 8)
Remove the FFC holder.



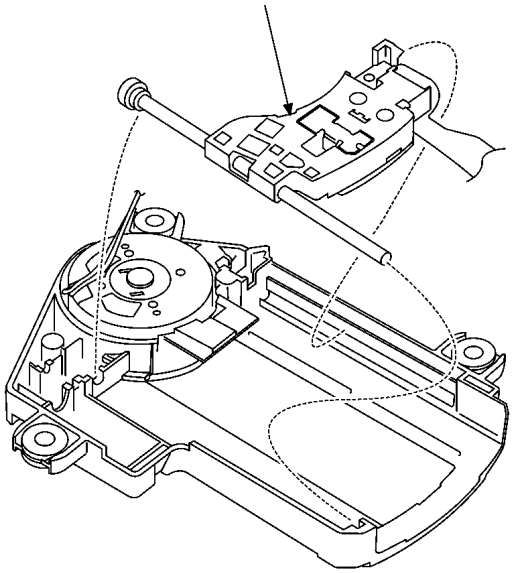
(Step 6)
ⓐ

(Step 5)
Unsolder. (4 points)

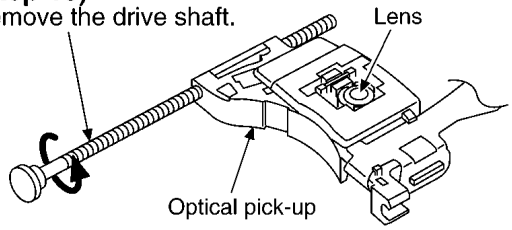


(Step 4)
Remove the gear.

(Step 9)
Remove the optical pick-up ass'y.



(Step 10)
Remove the drive shaft.

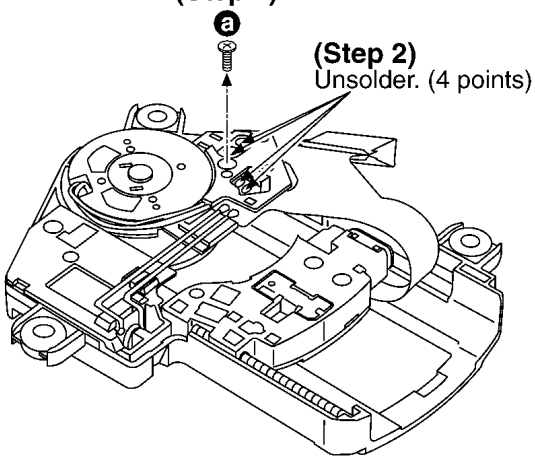


NOTE:
1. Use care to prevent damage the optical pick-up, due to the precision construction.
2. Do not apply the grease on the lens of optical pick-up.
3. Do not touch the lens of the optical pick-up.

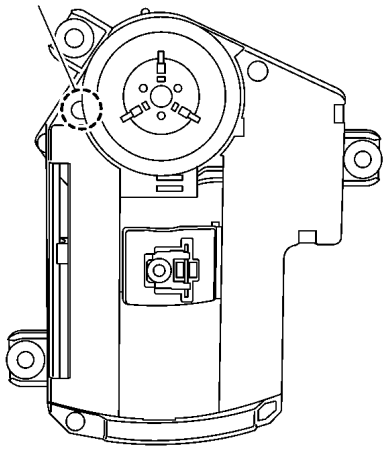
4.7. Replacement for the rest switch

- Follow the (Step1)-(Step3) of item 4.1.1.
- Follow the (Step1), (Step2) of item 4.5.

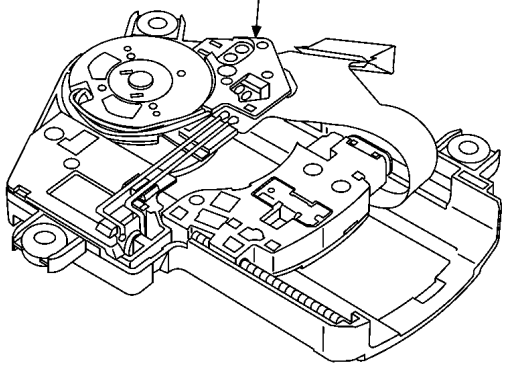
(Step 1)

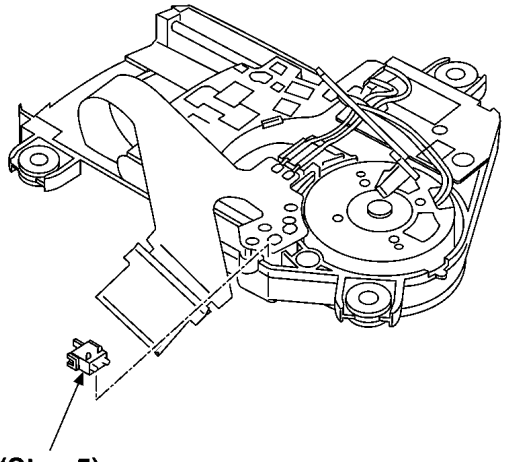


(Step 3)
Release the claw.



(Step 4)
Remove the FFC holder.





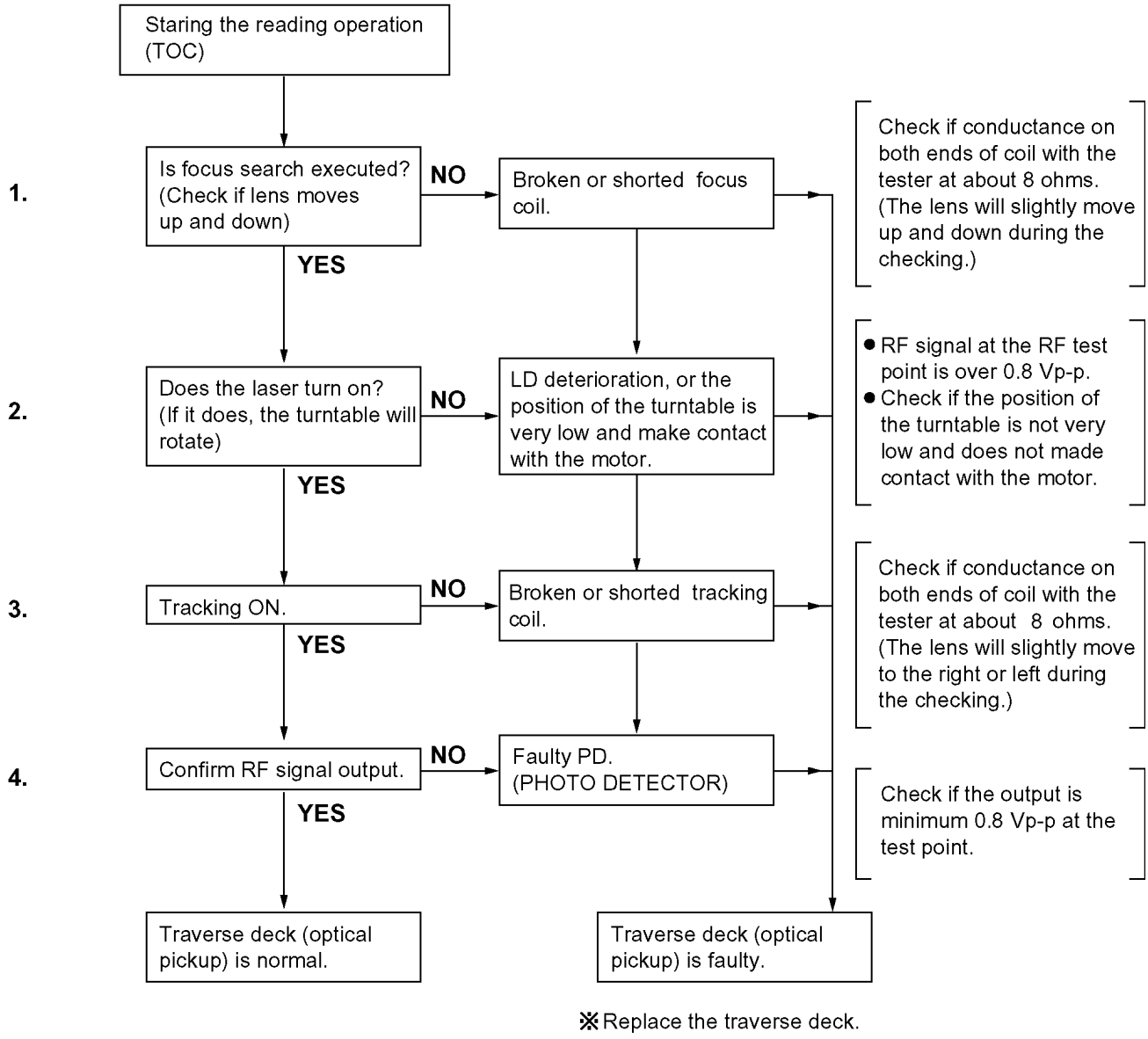
(Step 5)
Remove the rest switch.

5 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.

(Procedure No.) (Checking Points) (Cause) (Testing Procedure)



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

●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.

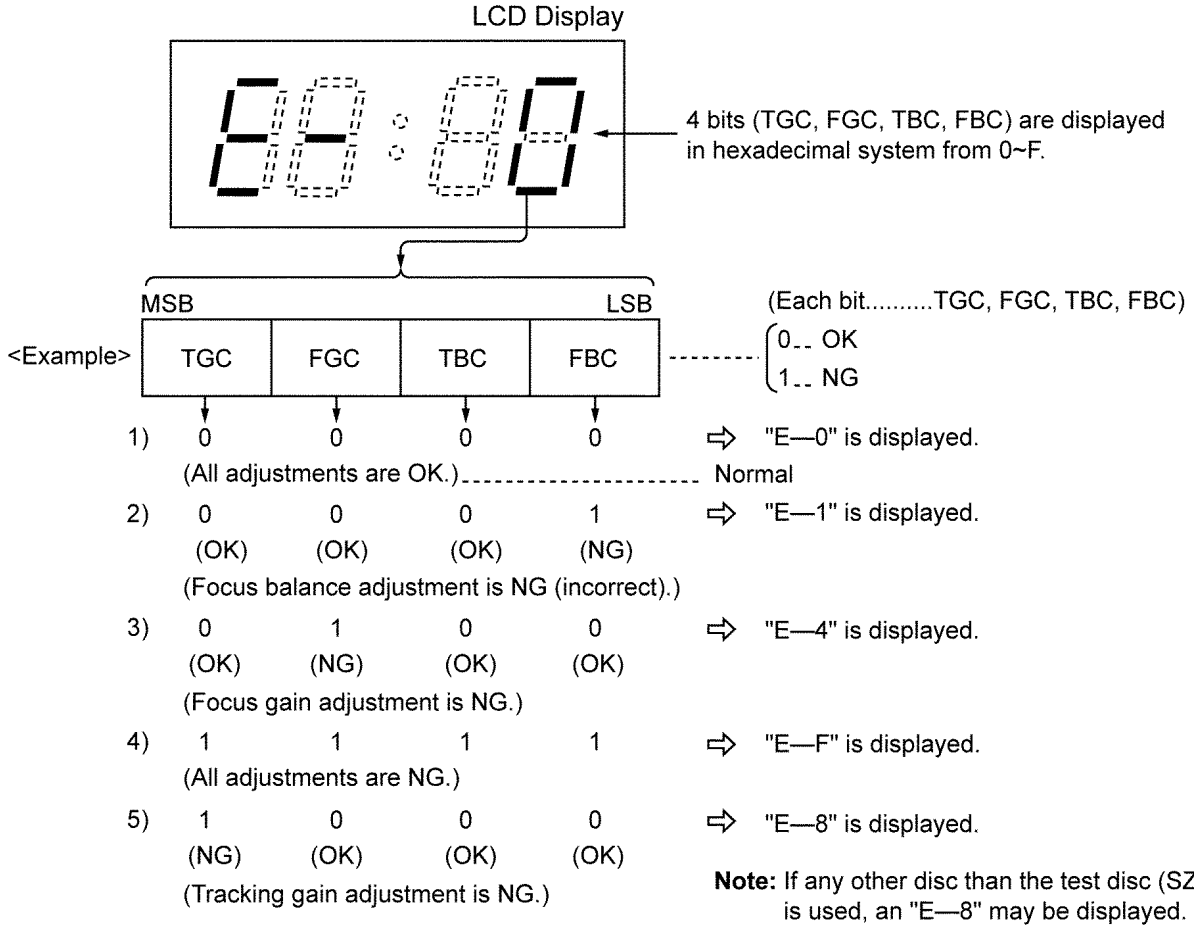
6 Automatic Adjustment Results Display Function (Self-check Function)

On this units, 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 thecontentsof the automaticadjustmentresultdisplays (self-check function).

6.1. 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 pressthe ▶ / ▌▌ (PLAY/PAUSE) Button.
3. Press the ■ (Stop/operation off) Button once.
4. An automatic adjustment result is displayed on the LCD.

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



Note: If any other disc than the test disc (SZZP1054C) is used, an "E—8" may be displayed.

<Example>

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

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

● 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.)

● 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 8 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.)

● 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.

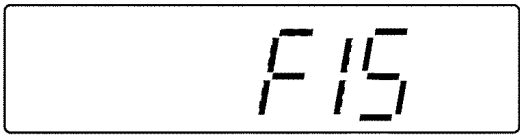
Note:

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

7 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



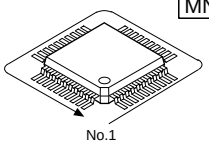
(Press PLAY and STOP button. After 15 seconds,it is displayed for 2 seconds.)

"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)orthemagnetichead P.C.B. is out of position or a foreign matter has mixed in or for some other reason.

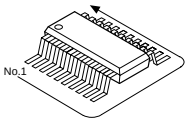
In such a case, check the peripheral parts of the magnetic head, repair or replace defective parts with normal ones.

8 Type Illustration of IC´s, Transistors and Diodes

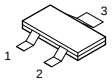
C0DBFFB00004	48PIN
C2BBGE000792	80PIN
MN6627935CM	100PIN



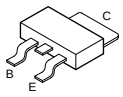
AN22003A-NF	32PIN
C3ABMG000207	50PIN
C3EBCG000096	8PIN

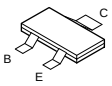


C0CBAAB00043
C0CBAAC00159



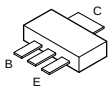
B1BDND000001



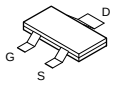


UNR511300L UNR521500L
UNR511400L UNR521L00L
UNR521400L UNR521000L
UNR521M00L 2SB0709A0L

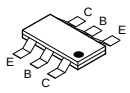
B1ABMD000004



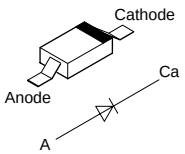
B1CFHA000002
B1CHMC000001



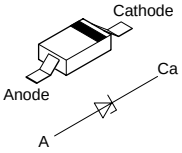
B1GFGCAA0001



MA2J11100L



MAZ80560ML



9 Schematic Diagram Notes

Note:

- ●S201: Laser ON/OFF switch in “ON” position. (It turns “ON” with CD Lid.)
- ●S202: Rest switch in “OFF” position. (It turns “ON” when optical pickup comes to innermost periphery.)
- ●S310: Hold (HOLD) switch in “OFF” position.
- ●S821: Program play/ Digital Re-master/ Anti-skip mode selection (MEMO) switch.
- ●S822: Play mode/ Album mode selection (MODE) switch.
- ●S823: Sound quality selection (EQ) switch.
- ●S824: Play/pause (▶ / ▌▌) switch.
- ●S825: Stop/Turn off (■) switch.
- ●S826, 827: Skip/search/ Album skip (|◀◀ , ▶▶|) switch.
- ●S828, 829: Volume control (VOL+,VOL -) switch.

・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). Circuit voltage and waveform described herein shall be regarded as reference information when probing defect point, because it may differ from an actual measuring value due to difference of Measuring instrument and its measuring condition and product itself.

Measurement conditions:

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

*No mark.....CD stop mode

Caution!!

・IC and LSI are sensitive to static electricity.

・Secondary trouble can be prevented by taking care during repair.

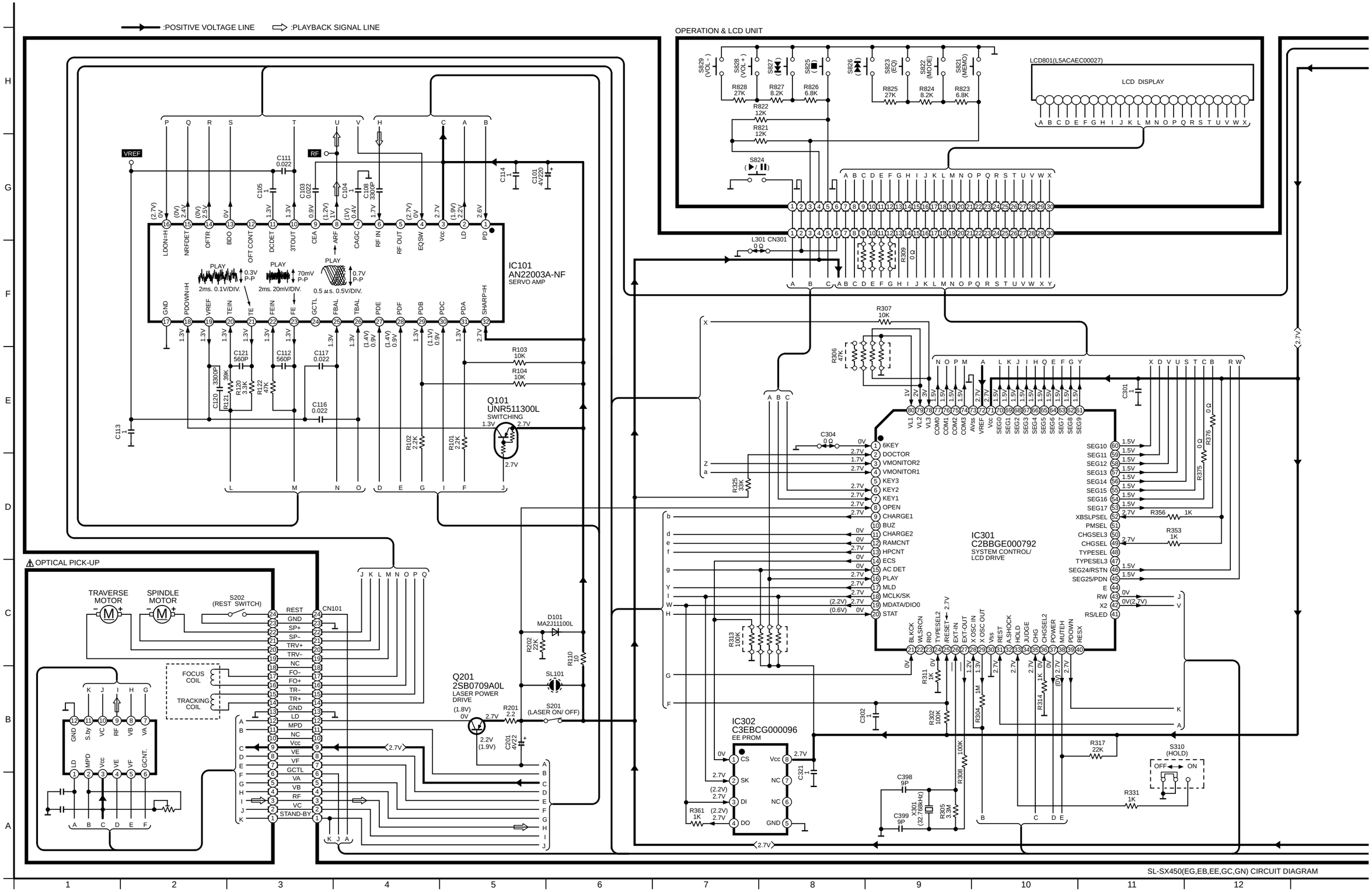
・Cover the parts boxes made of plastics with aluminum foil.

・Ground the soldering iron.

・Put a conductive mat on the work table.

・Do not touch the pins of IC or LSI with fingers directly.

10 Schematic Diagram



:POSITIVE VOLTAGE LINE :PLAYBACK SIGNAL LINE

IC501
MN6627935CM
SERVO PROCESSOR/
DIGITAL SIGNAL PROCESSOR/
DIGITAL FILTER &
D/A CONVERTER

IC651
C0CBAAC00159
REGULATOR

IC13
C0CBAAB00043
REGULATOR

IC11
C0DBFFB00004
POWER SUPPLY/
MOTOR DRIVE

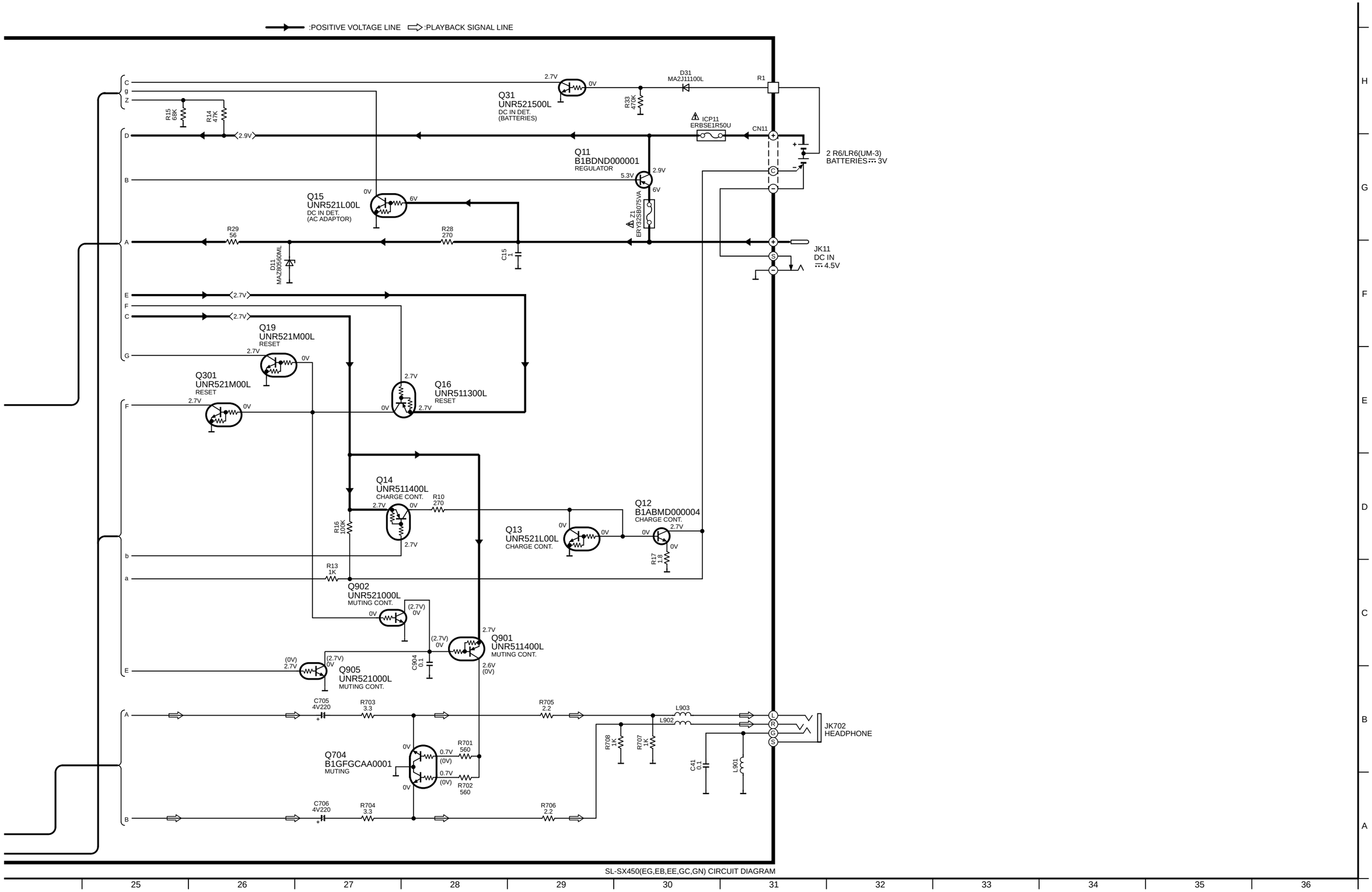
Q41
B1CHMC000001
POWER SUPPLY

Q42
UNR521400L
POWER SUPPLY
CONT.

Q502
B1CFHA000002
SWITCHING

IC503
C3ABMG000207
DRAM

SL-SX450(EG,EB,EE,GC,GN) CIRCUIT DIAGRAM

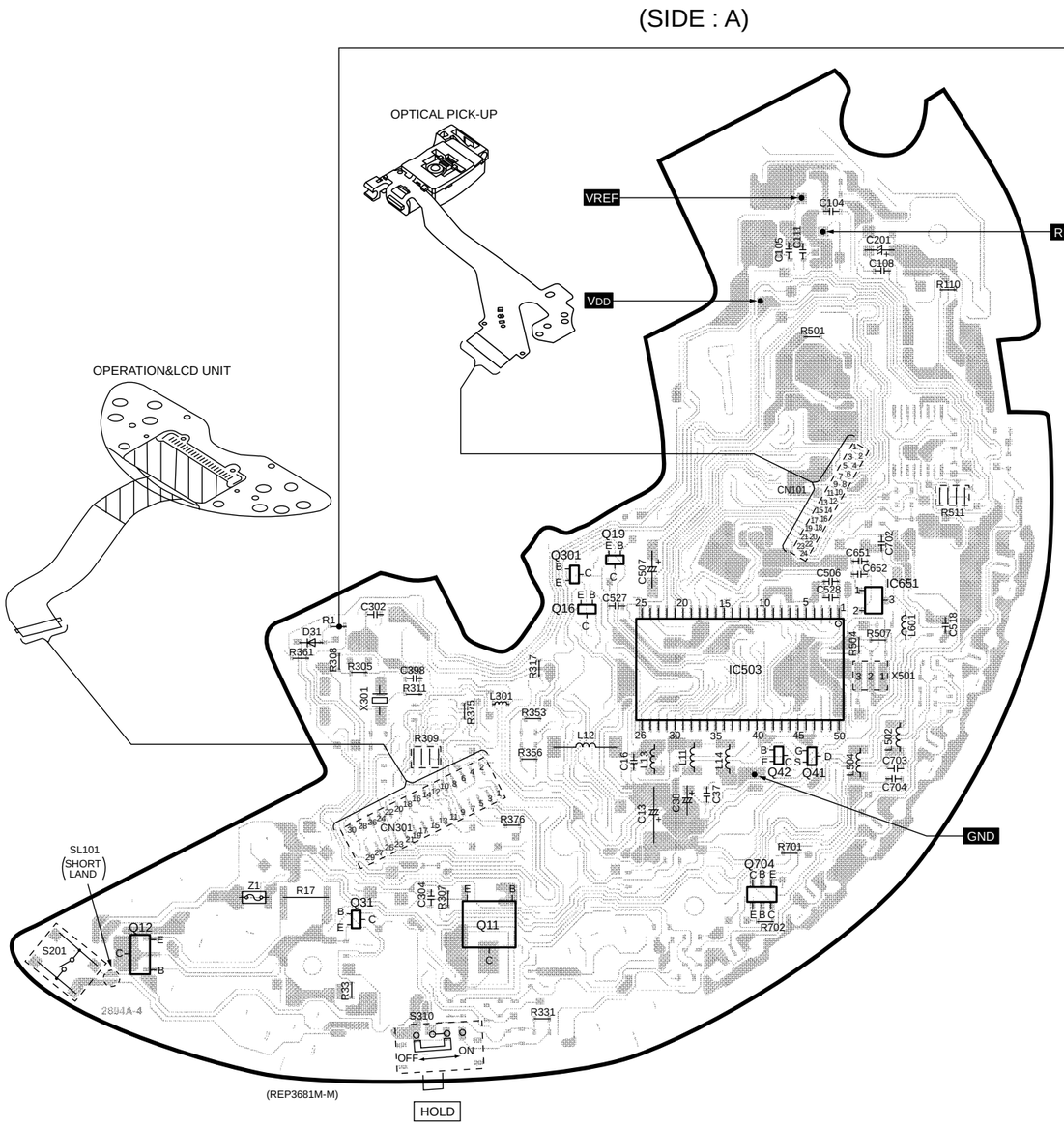

:POSITIVE VOLTAGE LINE
:PLAYBACK SIGNAL LINE
Q31
UNR521500L
DC IN DET.
(BATTERIES)
D31
MA2J11100L
R1
R33
470K
ICP11
ERBSE1R50U
CN11
2 R6/LR6(UM-3)
BATTERIES 3V
R15
68K
R14
47K
Q11
B1BDND000001
REGULATOR
Z1
ERY32SB0755VA
Q15
UNR521L00L
DC IN DET.
(AC ADAPTOR)
R29
56
R28
270
C15
1
D11
MAZ80560ML
JK11
DC IN
4.5V
Q19
UNR521M00L
RESET
Q301
UNR521M00L
RESET
Q16
UNR511300L
RESET
Q14
UNR511400L
CHARGE CONT.
R10
270
R16
100K
Q13
UNR521L00L
CHARGE CONT.
Q12
B1ABMD000004
CHARGE CONT.
R17
1K
R13
1K
Q902
UNR521000L
MUTING CONT.
Q901
UNR511400L
MUTING CONT.
Q905
UNR521000L
MUTING CONT.
C904
0.1
C705
4V220
R703
3.3
R705
2.2
L903
L902
JK702
HEADPHONE
Q704
B1GFGCAA0001
MUTING
R701
560
R702
560
R708
1K
R707
1K
C41
0.1
L901
C706
4V220
R704
3.3
R706
2.2
SL-SX450(EG,EB,EE,GC,GN) CIRCUIT DIAGRAM

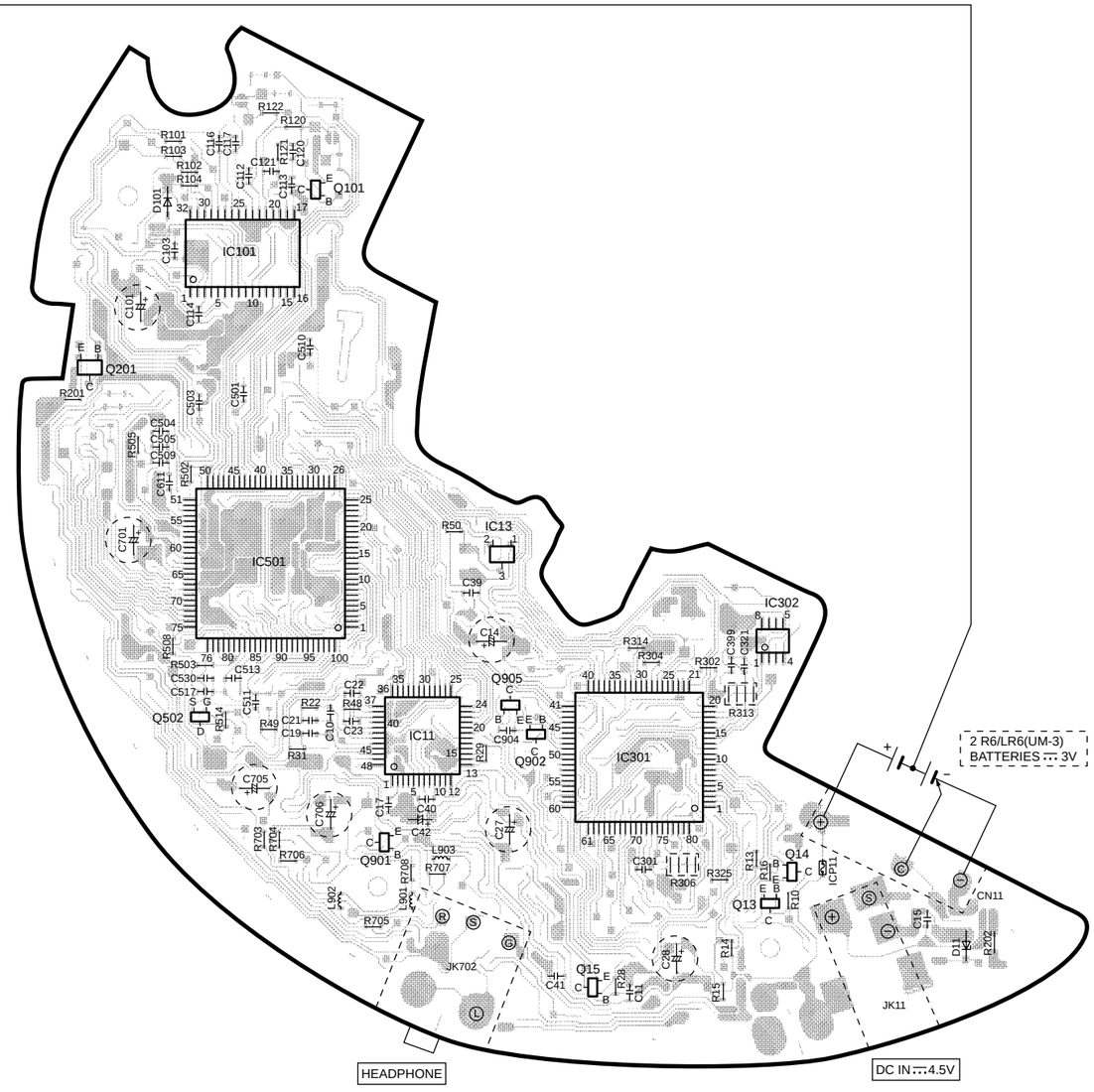
11 Printed Circuit Board and Wiring Connection Diagram

Note: This printed circuit board diagram may be modified at any time with the development of new technology.

(SIDE : A)

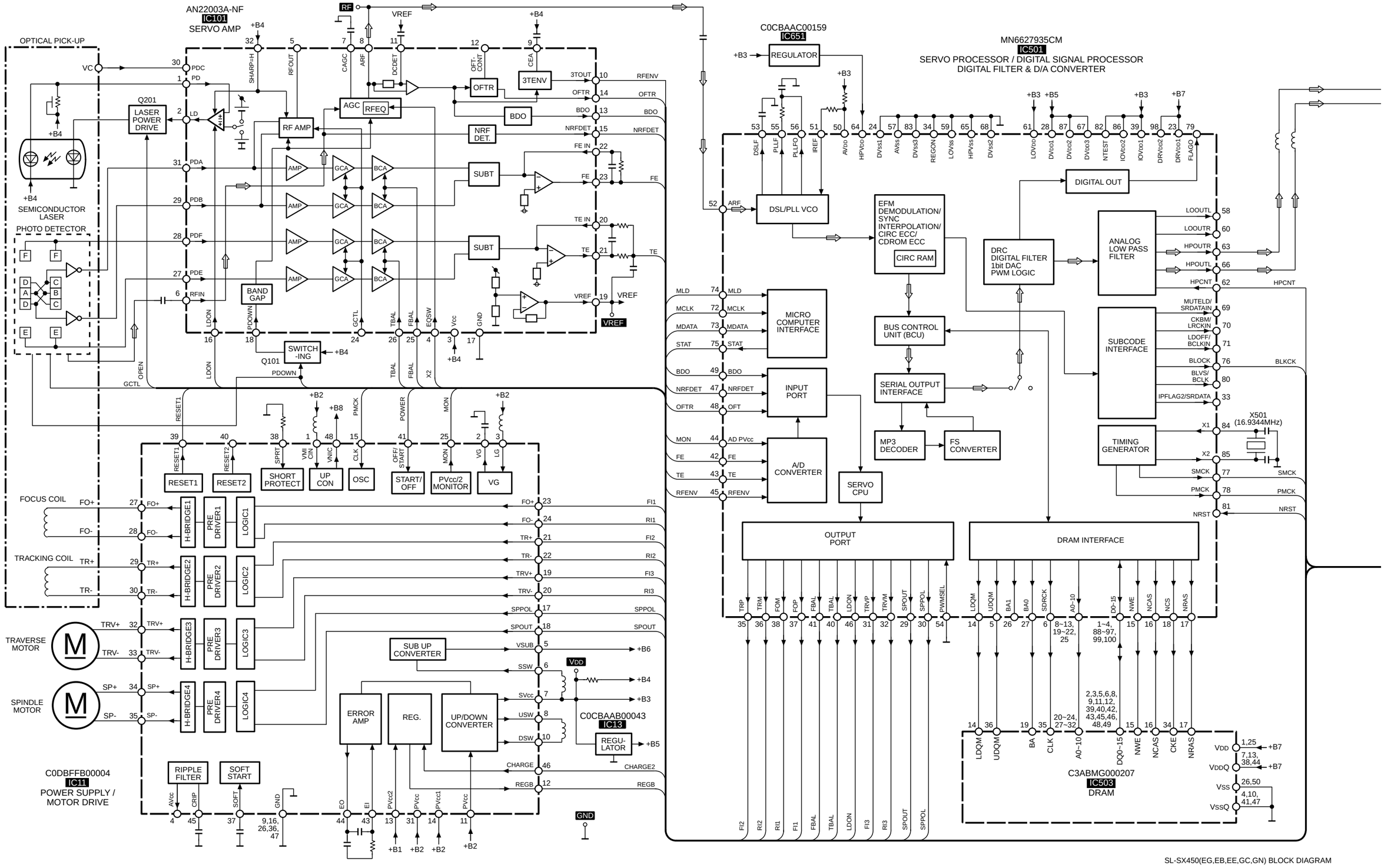
(SIDE : B)



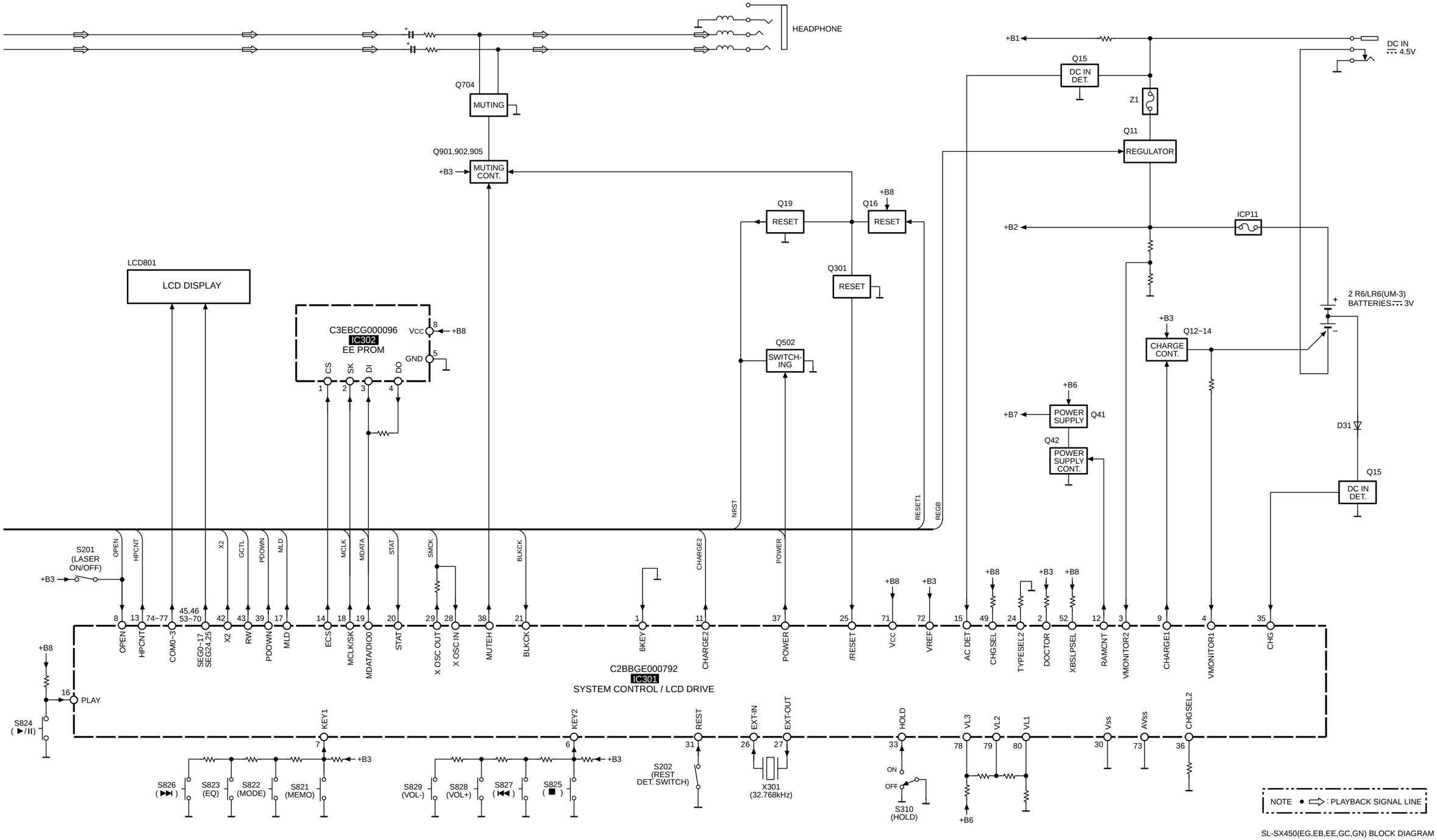


SL-SX450(EG,EB,EE,GC,GN) P.C.B.

12 Block Diagram



SL-SX450(EG,EB,EE,GC,GN) BLOCK DIAGRAM



SL-SX450(EG,EB,EE,GC,GN) BLOCK DIAGRAM

13 Terminal Function of ICs

13.1. IC101(AN22003A-NF): Servo Amplifier

Pin No.	Terminal Name	I/O	Function
1	PD	I	APC amplifier input terminal
2	LD	O	Laser power drive signal output
3	V_{CC}	I	Power supply terminal
4	EQSW	I	EQ characteristic drive signal input
5	RFOUT	-	Not used, open
6	RF IN	I	RF signal input terminal
7	CAGC	-	AGC loop filter capacity connection terminal
8	ARF	O	RF signal output terminal
9	CEA	I	H.P.F. Capacitor connection terminal
10	3TOUT	O	RF envelope signal output terminal
11	DCDET	I	The H.P.F. capacitor connection terminal for detection systems
12	OFTCONT	-	Not used, open
13	BDO	O	Dropout signal output terminal
14	OFTR	O	Off-track signal output terminal
15	NRFDET	O	RF detection signal output terminal
16	LDON=H	I	Laser ON signal input terminal
17	GND	-	GND
18	PDOWN=H	I	Reduced voltage detection signal input
19	VREF	O	Reference voltage output terminal
20	TEIN	I	Tracking error amplifier input terminal
21	TE	O	Tracking error amplifier output terminal
22	FEIN	I	Focus error amplifier input terminal
23	FE	O	Focus error amplifier output terminal
24	GCTL	-	Not used, open
25	FBAL	I	Focus balance signal input terminal
26	TBAL	I	Tracking balance signal input terminal
27	PDE	I	Tracking signal input terminal
28	PDF	I	Tracking signal input terminal
29	PDB	I	Focus signal input terminal
30	PDC	I	RF addition amplifier input terminal
31	PDA	I	Focus signal input terminal
32	SHARP=H	I	LD reference voltage input terminal

13.2. IC301(C2BBGE000792): System Control / LCD Drive

Pin No.	Terminal Name	I/O	Function
1	6KEY	I	6Key Remote control key signal input
2	DOCTOR	I	Doctor mode select signal input
3	VMONITOR2	I	Battery remaining measurement/battery shorting detect signal input
4	VMONITOR1	I	Rechargeable battery/alkaline battery voltage signal input
5	KEY3	-	Not used, open
6	KEY2	I	Operation key signal input
7	KEY1	I	Operation key signal input
8	OPEN	I	CD cover open detect signal input
9	CHARGE1	O	Charge control signal output
10	BUZ	-	Not used, open
11	CHARGE2	O	PVCC1 voltage up signal output
12	RAMCNT	O	DRAM control signal output
13	HPCNT	O	Headphone out control signal output
14	ECS	O	EEPROM communication selection output
15	ACDET	I	AC Power supply detect signal input
16	PLAY	I	PLAY key signal input
17	MLD	O	Serial command latch output
18	MCLK/SK	O	Serial command clock / EEPROM clock output
19	MDATA/DIO0	O	Serial command data output / EEPROM data output
20	STAT	I	Status signal input
21	BLKCK	I	Block clock signal input
22	WLSRCN	-	Not used, open
23	RIO	-	Not used, open
24	TYPESEL2	I	Model selection input
25	/RESET	I	Reset detect signal input
26	EXT-IN	I	Oscillator connected terminal (F=32.7 kHz)
27	EXT-OUT	O	
28	XOSCIN	I	System clock signal
29	XOSCOUT	O	
30	V_{SS}	-	GND
31	REST	I	Rest detect switch signal input
32	A.SHOCK	-	Not used, open
33	HOLD	I	HOLD switch signal input
34	JUDGE	-	Not used, open
35	CHG	I	Alkaline battery detect signal input
36	CHGSEL2	I	Charge selection2
37	POWER	O	Power supply control signal output
38	MUTE	O	MUTE signal output
39	PDOWN	O	Headamp power off signal output
40	RESX	-	Not used, open
41	RS/LED	-	Not used, open
42	X2	O	RF equalizer twice speed signal output
43	RW	O	Output for CD-RW
44	E	-	Not used, open
45	SEG25/PDN	O	LCD segment signal output
46	SEG24/RSTN	O	LCD segment signal output
47	TYPESEL3	-	Not used, open
48	TYPESEL	-	Not used, open
49	CHGSEL	I	Charge method selection signal input
50	CHGSEL3	-	Not used, open
51	PMSEL	-	Not used, open
52	XBSLPSEL	I	XBS LPF Setting select signal input
53 | 70	SEG17 | SEG0	O	LCD segment signal output
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	Power supply terminal (LCD drive bias)

13.3. IC501(MN6627935CM): Servo Processor/ Digital Signal Processor/ Digital Filter & D/A Converter

Pin No.	Terminal Name	I/O	Function
1 | 4	D11 | D8	I/O	DRAM data input/output signal
5	UDQM	O	High byte data mask signal output
6	SDRCK	O	Clock signal output

Pin No.	Terminal Name	I/O	Function
7	A11	-	Not used, open
8 | 13	A9 | A4	O	DRAM address signal output
14	LDQM	O	Low byte data mask signal output
15	NWE	O	Write enable signal output
16	NCAS	O	CAS control signal output
17	NRAS	O	RAS control signal output
18	NCS	O	Chip select signal output
19 | 22	A3 | A0	O	DRAM address signal output
23	DRV_{DD} 1	I	Power supply terminal
24	DV_{SS} 1	-	GND
25	A10	O	DRAM address signal output
26	BA1/LRCK	-	Not used, open
27	BA0	O	Bank select signal output
28	DV_{DD} 1	I	Power supply terminal
29	SPOUT	O	Spindle motor drive output terminal
30	SPPOL	O	Spindle motor drive output terminal
31	TRVP	O	Traverse drive (+) output terminal
32	TRVM	O	Traverse drive (-) output terminal
33	IPFLAG2/SRDATA	-	Not used, open
34	REGON	-	Not used, connected to GND
35	TRP	O	Tracking coil drive (+) output terminal
36	TRM	O	Tracking coil drive (-) output terminal
37	FOP	O	Focus coil drive (+) output terminal
38	FOM	O	Focus coil drive (-) output terminal
39	IOV_{DD} 1	I	Power supply terminal
40	TBAL	O	Tracking balance adjustment signal output
41	FBAL	O	Focus balance adjustment signal output
42	FE	I	Focus error signal input terminal
43	TE	I	Tracking error signal input terminal
44	$ADPV_{CC}$	I	A/D convertor reference voltage input
45	RFENV	I	RF envelope signal input terminal
46	LDON	O	Laser ON signal output
47	NRFDET	I	RF detection signal input terminal
48	OFT	I	Off-track signal input terminal
49	BDO	I	Dropout signal input terminal
50	AV_{DD}	I	Power supply terminal
51	IREF	I	Reference current input terminal
52	ARF	I	RF signal input terminal
53	DSLF	O	DSL loop filter
54	PWMSEL	I	PWM output mode select signal
55	PLLF	O	PLL loop filter
56	PLLFO	O	PLL loop filter
57	AV_{SS}	-	GND
58	LOOUTL	-	Not used, open
59	LOV_{SS}	-	GND
60	LOOUTR	-	Not used, open
61	LOV_{DD}	I	Power supply terminal
62	HPCNT	I	Headphone output control signal
63	HPOUTR	O	R ch for headphone signal output
64	HPV_{DD}	I	Power supply terminal
65	HPV_{SS}	-	GND
66	HPOUTL	O	L ch for headphone signal output
67	DV_{DD} 3	I	Power supply terminal
68	DV_{SS} 2	-	GND
69	MUTELD/SRDATAIN	-	Not used, open
70	CK8M/LRCKIN	-	Not used, open
71	LDOFF/BCLKIN	-	Not used, open
72	MCLK	I	Serial command clock input

Pin No.	Terminal Name	I/O	Function
73	MDATA	I	Serial command data input
74	MLD	I	Serial command latch input
75	STAT	O	Status signal output terminal
76	BLOCK	O	Sub-code block clock signal output
77	SMCK	O	System clock signal output
78	PMCK	O	Clock signal output (88.2kHz)
79	FLAGO	-	Not used, open
80	BLVS/BCLK	-	Not used, open
81	NRST	I	Reset signal input
82	NTEST	I	Test signal
83	DV_{SS} 3	-	GND
84	X1	I	Oscillator connected (F=16.9 MHz)
85	X2	O	
86	IOV_{DD} 2	I	Power supply terminal
87	DV_{DD} 2	I	Power supply terminal
88	D2	I/O	DRAM data signal input/output
89	D1	I/O	DRAM data signal input/output
90	D0	I/O	DRAM data signal input/output
91 | 95	D3 | D7	I/O	DRAM data signal input/output
96	D15	I/O	DRAM data signal input/output
97	D14	I/O	DRAM data signal input/output
98	DRV_{DD} 2	I	Power supply terminal
99	D13	I/O	DRAM data signal input/output
100	D12	I/O	DRAM data signal input/output

14 Replacement Parts List

Notes:

*Important safety notice:

Components identified by ⚠ 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 product.
(EB): SL-SX450EB-S
(EEA): SL-SX450EE-A
(EES): SL-SX450EE-S
(EG): SL-SX450EG-S
(GC): SL-SX450GC-S
(GN): SL-SX450GN-S

Parts without these indications can be used for all products.

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

*Capacity values are in microfarads (µF) 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, it will no longer be available.

*All parts are supplied by ASPC.

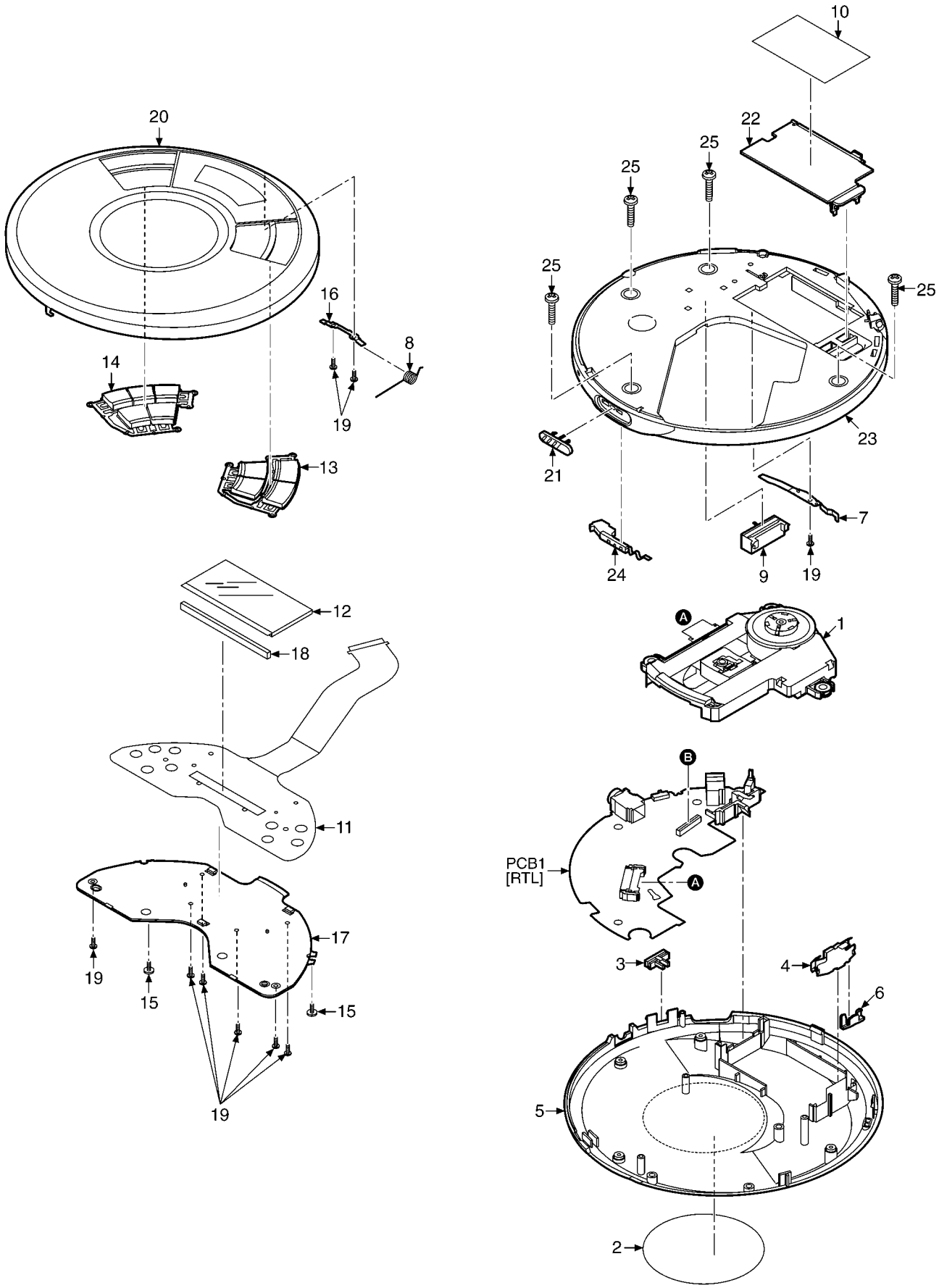
Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1	RAE0241Z-X	TRAVERSE DECK UNIT	1	⚠
1-1	RAF0241A	OPTICAL PICK-UP	1	
1-2	RDG0554	GEAR 1	1	
1-3	RDG0555	GEAR 2	1	
1-4	RMG0605-K	FLOATING RUBBER	3	
1-5	RMQ1125	MOTOR HOLDER	1	
1-6	RMS0782	SHAFT	1	
1-7	RXQ0971-4	TRAVERSE MOTOR ASS'Y	1	
1-8	XQN17+BG45FJ	SCREW	2	
2	RGN2830-H	NAME PLATE	1	(EB)(EG) ⚠
2	RGN2831-H	NAME PLATE	1	(EEA)(EES) ⚠
2	RGN2835-H	NAME PLATE	1	(GN) ⚠
2	RGN2834-H	NAME PLATE	1	(GC) ⚠
3	RGV0200-H1	KNOB,HOLD	1	
4	RJC93039-1	BATTERY TERMINAL	1	
5	RKS0392-A1	BOTTOM CABINET	1	
6	RMR1618-X1	REVERSE PREVENT PLATE	1	
7	RMC0585	DETECTION PLATE	1	
8	RME0435	OPEN SPRING	1	
9	RMR1514-K	FFC HOLDER	1	
10	RQLS0244-1	LASER LABEL	1	
11	K0RC00900008	MULTI BUTTON SW UNIT	1	
12	L5ACAEC00027	LCD	1	
13	RGU2390-A	OPERATION BUTTON L	1	(EB)(EES)(EG)(GC)(GN)
13	RGU2390-1A	OPERATION BUTTON L	1	(EEA)
14	RGU2391-A	OPERATION BUTTON R	1	(EB)(EES)(EG)(GC)(GN)
14	RGU2391-1A	OPERATION BUTTON R	1	(EEA)
15	RHQ0088-S	SCREW	2	
16	RMA1775-1	SPRING HOLDER	1	
17	RMR1700-H	LID COVER	1	(EB)(EES)(EG)(GC)(GN)
17	RMR1700-A	LID COVER	1	(EEA)
18	RSQ0109	ZEBRA RUBBER	1	
19	XQN14+BG3FC	SCREW	9	
20	RYF0761A-S	CD LID UNIT	1	(EB)(EES)(EG)(GC)(GN)
20	RYF0761A-A	CD LID UNIT	1	(EEA)
21	RGV0313-H	KNOB,OPEN	1	
22	RKK0172-A	BATTERY LID	1	
23	RKM0499-A2	MIDDLE CABINET	1	
24	RMR1488-K	LOCK PLATE	1	
25	XTN17+6GFJK	SCREW	4	
A1	L0BAB0000182	STEREO EARPHONES	1	
A2	RFEA431E-S	AC ADAPTOR	1	(EEA) (EES) (EG)
A2	RFEA436A-S	AC ADAPTOR	1	(GN)
A3	RFEA444Z-S	AC ADAPTOR	1	(GC)
A4	RJP1SG05-Z	POWER PLUG ADAPTOR	1	(GC)
A5	RQT8060-R	O/I BOOK	1	(EEA)(EES) Russian Ukrainian
A6	RQT8063-E	O/I BOOK	1	(EG) German Italian French Netherlands Danish Spanish Swedish Polish Czeco Portuguese
A7	RQT8065-B	O/I BOOK	1	(EB) (EG) (GC) (GN) English
A8	RQT8085-G	O/I BOOK	1	(GC) Chinese Arabic
C10	ECUV1H271JCV	50V 270P	1	
C11	ECUV1A105KBV	10V 1U	1	
C13	F3H1A476A001	10V 47U	1	
C14	F2A0G221A012	4V 220P	1	
C15	ECUV1A105ZFV	10V 1U	1	
C16	ECUV1A105KBV	10V 1U	1	
C17	ECUV1A105ZFV	10V 1U	1	
C19	ECUV1A105ZFV	10V 1U	1	
C21	ECUV1H222KBV	50V 2200P	1	
C22	ECUZ1C104ZFV	16V 0.1U	1	
C23	F1H1C104A008	16V 0.1U	1	
C27	ECEA0GKS471I	4V 470M	1	
C28	ECEA0GKS471I	4V 470M	1	
C37	ECUV1A105KBV	10V 1U	1	
C38	F3F0J226A004	6.3V 22U	1	
C39	ECUV1A105KBV	10V 1U	1	
C40	ECUV1A105KBV	10V 1U	1	
C41	ECUZ1C104ZFV	16V 0.1U	1	
C42	F3F0J226A004	6.3V 22U	1	
C101	F2A0G221A012	4V 220P	1	
C103	ECUV1E223KBV	25V 0.022U	1	
C104	ECUV1A105KBV	10V 1U	1	
C105	ECUV1A105KBV	10V 1U	1	
C108	ECUV1H332KBV	50V 3300P	1	
C111	ECUV1E223KBV	25V 0.022U	1	
C112	ECUV1H561KBV	50V 560P	1	
C113	ECUV1A105KBV	10V 1U	1	
C114	ECUV1A105KBV	10V 1U	1	
C116	ECUV1E223KBV	25V 0.022U	1	
C117	ECUV1E223KBV	25V 0.022U	1	
C120	ECUV1H332KBV	50V 3300P	1	
C121	ECUV1H561KBV	50V 560P	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C201	F3F0G226A001	4V 22U	1	
C301	ECUV1A105ZFV	10V 1U	1	
C302	ECUV1A105ZFV	10V 1U	1	
C304	ERJ3GEY0R00V	1/10W 0	1	
C321	ECUV1A105ZFV	10V 1U	1	
C398	ECUV1H090DCV	50V 9P	1	
C399	ECUV1H090DCV	50V 9P	1	
C501	ERJ3GEYJ224V	1/10W 220K	1	
C503	ECUV1H391JCV	50V 390P	1	
C504	ECUZ1C104ZFV	16V 0.1U	1	
C505	ECUV1E223KBV	25V 0.022U	1	
C506	ECUV1A105ZFV	10V 1U	1	
C507	EEE0GA470SR	4V 47U	1	
C509	ECUV1C104KBV	16V 0.1U	1	
C510	ECUZ1C104ZFV	16V 0.1U	1	
C511	ECUV1C104KBV	16V 0.1U	1	
C513	ECUZ1C104ZFV	16V 0.1U	1	
C517	F1H1A474A028	10V 0.47U	1	
C518	ECUV1H101KCV	50V 100P	1	
C527	ECUZ1C104ZFV	16V 0.1U	1	
C528	ECUZ1C104ZFV	16V 0.1U	1	
C530	ECUV1H330JCV	50V 33P	1	
C611	ECUZ1C104ZFV	16V 0.1U	1	
C651	ECUV1A105KBV	10V 1U	1	
C652	ECUV1A105KBV	10V 1U	1	
C701	ECEA0GKS471I	4V 470M	1	
C702	ECUV1A105KBV	10V 1U	1	
C703	ECUV1C104KBV	16V 0.1U	1	
C704	ECUV1C104KBV	16V 0.1U	1	
C705	F2A0G221A012	4V 220P	1	
C706	F2A0G221A012	4V 220P	1	
C904	ECUZ1C104ZFV	16V 0.1U	1	
CN11	K4BC03B00020	BATTERY TERMINAL	1	
CN101	K1MN24B00114	CONNECTOR	1	
CN301	K1MN30A00061	CONNECTOR(30P)	1	
D11	MAZ80560ML	DIODE	1	
D31	MA2J11100L	DIODE	1	
D101	MA2J11100L	DIODE	1	
IC11	C0DBFFB00004	IC	1	
IC13	C0CBAAB00043	IC	1	
IC101	AN22003A-NF	IC	1	
IC301	C2BBGE000792	IC	1	
IC302	C3EBCG000096	IC	1	
IC501	MN6627935CM	IC	1	
IC503	C3ABMG000207	IC	1	
IC651	C0CBAAC00159	IC	1	
ICP11	ERBSE1R50U	IC PROTECTOR	1	⚠
JK11	K2EB2B000006	JACK,DC IN	1	
JK702	K2HC104B0013	JACK,HEADPHONE	1	
L11	G1C331K00008	COIL	1	
L12	G1A101D00009	COIL	1	
L13	G1C101K00033	COIL	1	
L14	G1C331K00008	COIL	1	
L301	ERJ3GEY0R00V	1/10W 0	1	
L502	G1C101K00033	COIL	1	
L504	G1C101K00033	COIL	1	
L601	J0JCC0000181	COIL	1	
L901	J0JCC0000077	COIL	1	
L902	J0JBC0000014	COIL	1	
L903	J0JBC0000014	COIL	1	
P1	RPF0111-2	PROTECTION BAG	1	(EEA)(EES) (EGS)(GC)(GN)
P2	RPK2291	GIFT BOX	1	(EES)(EG)(GN)
P2	RPK2323	GIFT BOX	1	(EEA)
P3	RPN1695	TRAY 1	1	(EB)
P4	RPK2297	GIFT BOX	1	(GC)

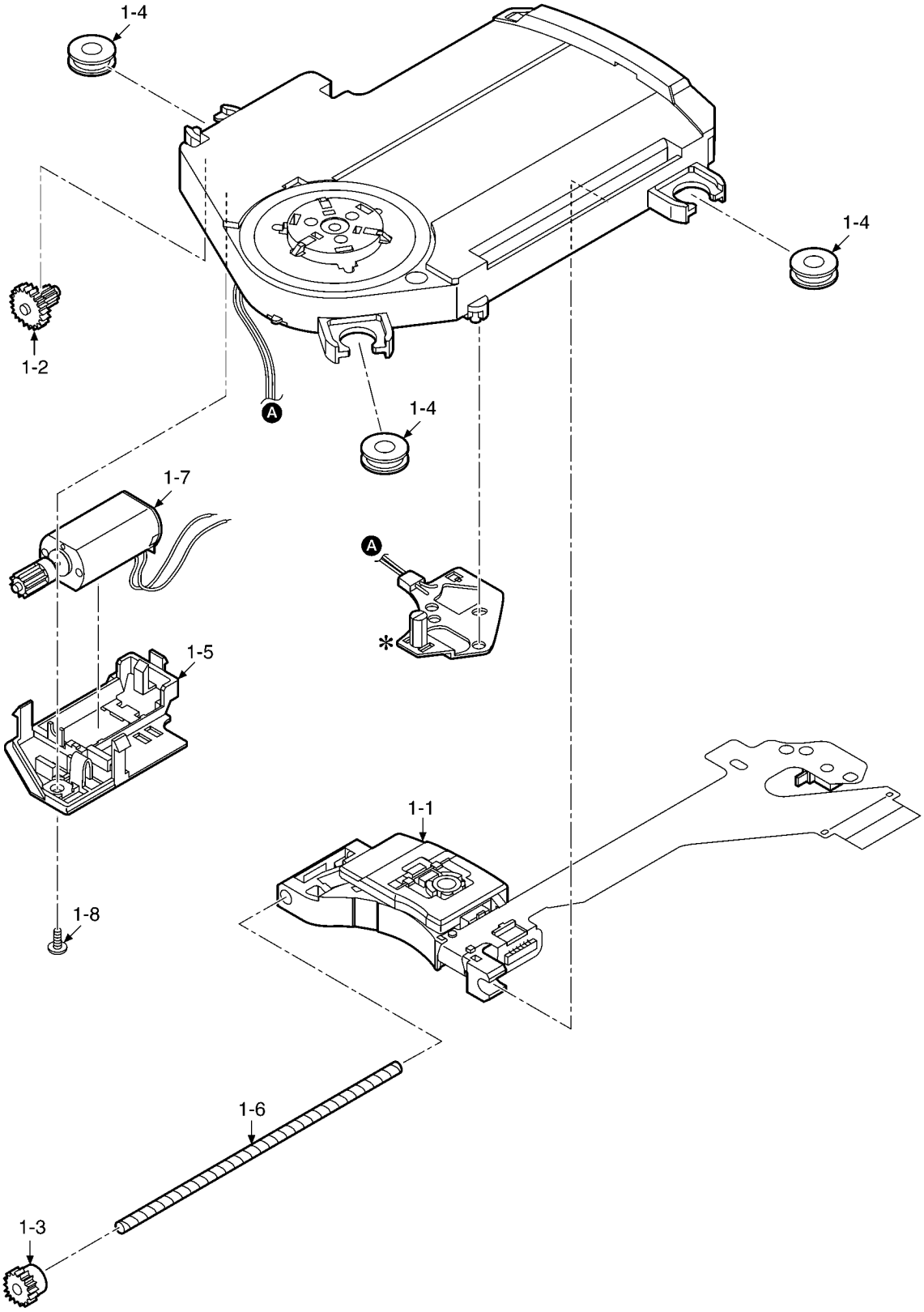
Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
P5	RPN1696	TRAY 2	1	(EB)
P6	RPQ1934	PAD	1	(EEA)(EES) (EG)(GN)
P7	RPQ1932	SHEET 1	1	(EB)
P8	RPQ1947	PAD	1	(GC)
P9	RPQ1935	SHEET 2	1	(EB)
PCB1	REP3681M-M	P.C.B. ASS'Y	1	[RTL]
Q11	B1BDND000001	TRANSISTOR	1	
Q12	B1ABMD000004	TRANSISTOR	1	
Q13	UNR521L00L	TRANSISTOR	1	
Q14	UNR511400L	TRANSISTOR	1	
Q15	UNR521L00L	TRANSISTOR	1	
Q16	UNR511300L	TRANSISTOR	1	
Q19	UNR521M00L	TRANSISTOR	1	
Q31	UNR521500L	TRANSISTOR	1	
Q41	B1CHMC000001	TRANSISTOR	1	
Q42	UNR521400L	TRANSISTOR	1	
Q101	UNR511300L	TRANSISTOR	1	
Q201	2SB0709A0L	TRANSISTOR	1	
Q301	UNR521M00L	TRANSISTOR	1	
Q502	B1CFHA000002	TRANSISTOR	1	
Q704	B1GFGCAA0001	TRANSISTOR	1	
Q901	UNR511400L	TRANSISTOR	1	
Q902	UNR521000L	TRANSISTOR	1	
Q905	UNR521000L	TRANSISTOR	1	
R1	D0YBR0000010	CHIP RING	1	
R10	ERJ3GEYJ271V	1/10W 270	1	
R13	ERJ3GEYJ102V	1/10W 1K	1	
R14	ERJ3RBD473V	1/16W 47K	1	
R15	ERJ3RBD683V	1/16W 68K	1	
R16	ERJ3GEYJ104V	1/10W 100K	1	
R17	ERJ12YJ1R8U	1/2W 1.8	1	
R22	ERJ3GEYJ223V	1/10W 22K	1	
R28	ERJ3GEYJ271V	1/10W 270	1	
R29	ERJ3GEYJ560V	1/10W 56	1	
R31	ERJ3GEYJ473V	1/10W 47K	1	
R33	ERJ3GEYJ474V	1/10W 470K	1	
R48	ERJ3GEYJ103V	1/10W 10K	1	
R49	ERJ3GEYJ104V	1/10W 100K	1	
R50	ERJ3GEY0R00V	1/10W 0	1	
R101	ERJ3GEYJ222V	1/10W 2.2K	1	
R102	ERJ3GEYJ222V	1/10W 2.2K	1	
R103	ERJ3GEYJ103V	1/10W 10K	1	
R104	ERJ3GEYJ103V	1/10W 10K	1	
R110	ERJ3GEYJ100V	1/10W 10	1	
R120	ERJ3GEYJ332V	1/10W 3.3K	1	
R121	ERJ3GEYJ393V	1/10W 39K	1	
R122	ERJ3GEYJ473V	1/10W 47K	1	
R201	ERJ3GEYJ2R2V	1/10W 2.2	1	
R202	ERJ3GEYJ223V	1/10W 22K	1	
R302	ERJ3GEYJ104V	1/10W 100K	1	
R304	ERJ3GEYJ105V	1/10W 1M	1	
R305	ERJ3GEYJ335V	1/10W 3.3M	1	
R306	EXBV8V473JV	1/16W 47K	1	
R307	ERJ3GEYJ103V	1/10W 10K	1	
R308	ERJ3GEYJ104V	1/10W 100K	1	
R309	EXBV8VR000V	1/8W 0	1	
R311	ERJ3GEYJ102V	1/10W 1K	1	
R313	EXBV8V104JV	1/16W 100K	1	
R314	ERJ3GEYJ102V	1/10W 1K	1	
R317	ERJ3GEYJ223V	1/10W 22K	1	
R325	ERJ3GEYJ333V	1/10W 33K	1	
R331	ERJ3GEYJ102V	1/10W 1K	1	
R353	ERJ3GEYJ102V	1/10W 1K	1	
R356	ERJ3GEYJ102V	1/10W 1K	1	
R361	ERJ3GEYJ102V	1/10W 1K	1	
R375	ERJ3GEY0R00V	1/10W 0	1	
R376	ERJ3GEY0R00V	1/10W 0	1	
R501	ERJ3GEYJ100V	1/10W 10	1	
R502	ERJ3GEYJ563V	1/10W 56K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R503	ERJ3GEYJ224V	1/10W 220K	1	
R504	ERJ3GEYJ473V	1/10W 47K	1	
R505	ERJ3GEYJ561V	1/10W 560	1	
R507	ERJ3GEYJ471V	1/10W 470	1	
R508	ERJ3GEYJ102V	1/10W 1K	1	
R511	EXBV8V222JV	1/16W 2.2K	1	
R514	ERJ3GEYJ331V	1/10W 330	1	
R701	ERJ3GEYJ561V	1/10W 560	1	
R702	ERJ3GEYJ561V	1/10W 560	1	
R703	ERJ3GEYJ3R3V	1/10W 3.3	1	
R704	ERJ3GEYJ3R3V	1/10W 3.3	1	
R705	ERJ3GEYJ2R2V	1/10W 2.2	1	
R706	ERJ3GEYJ2R2V	1/10W 2.2	1	
R707	ERJ3GEYJ102V	1/10W 1K	1	
R708	ERJ3GEYJ102V	1/10W 1K	1	
S201	ESE11MV9T	SW,LASER ON/OFF	1	
S202	K0L1BB000025	SW,REST DET.	1	
S310	K0D112B00071	SW,HOLD	1	
X301	H0J327200126	OSCILLATOR	1	
X501	H2D169500027	OSCILLATOR	1	
Z1	ERY32SB075VA	IC PROTECTOR	1	⚠

15 Cabinet Parts Location



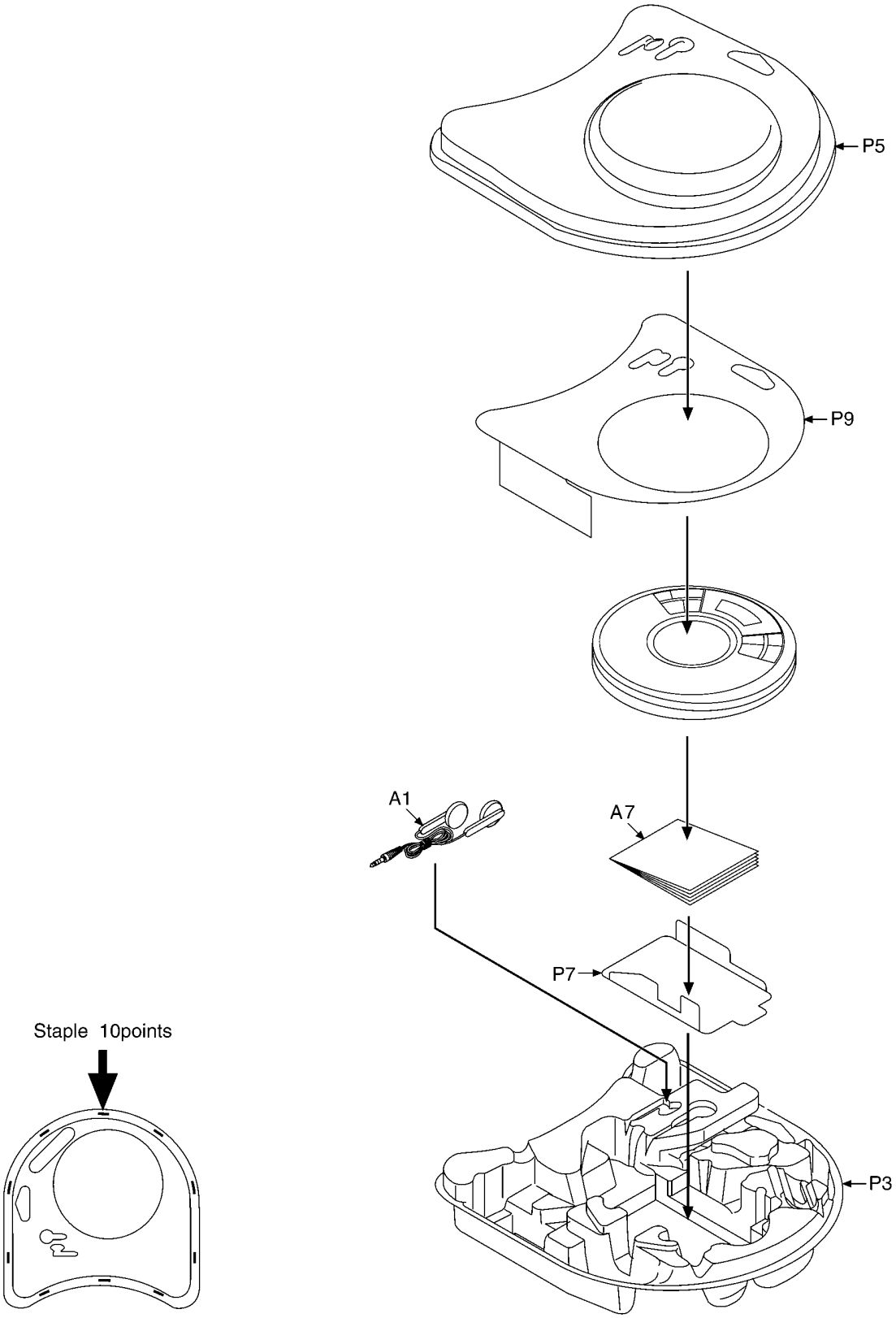
16 Traverse Parts Location



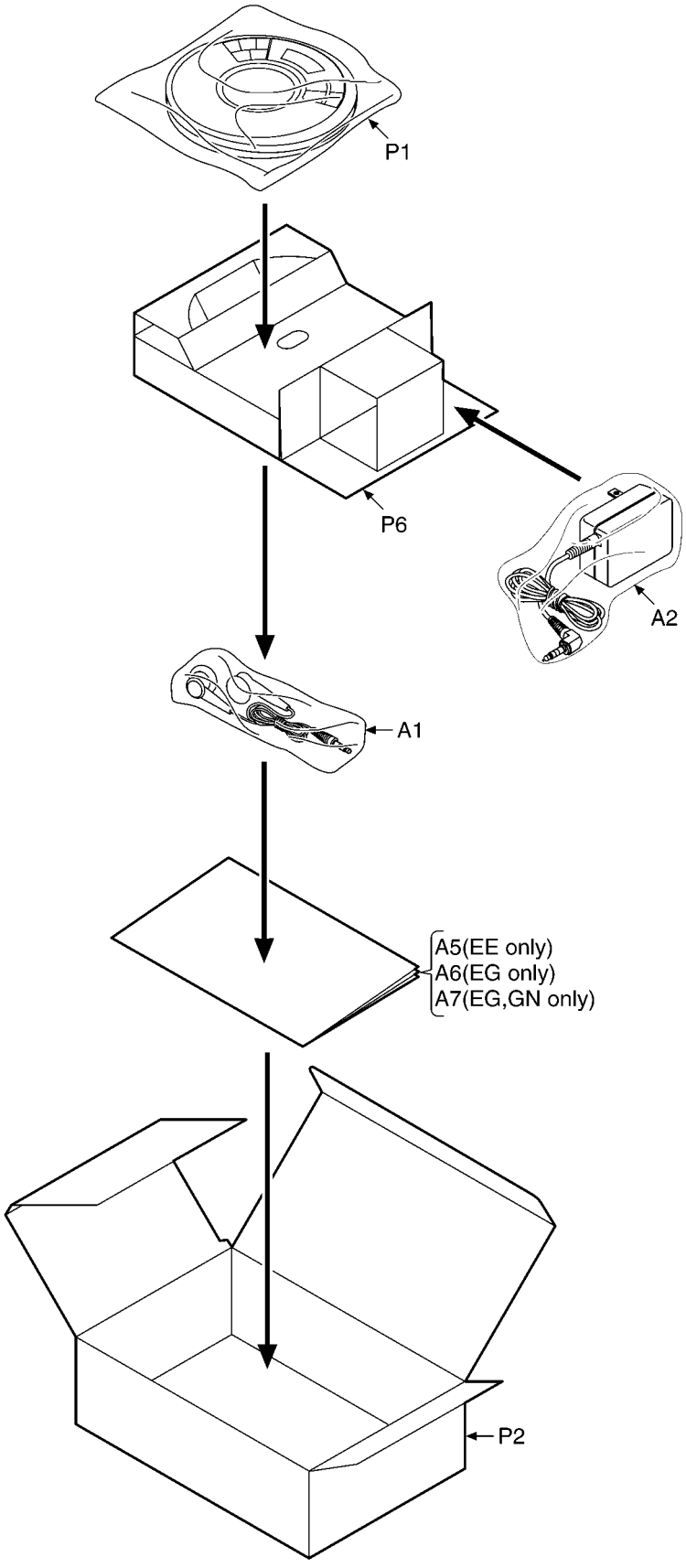
Note : We do not supply those items of parts marked ✻.

17 Packaging

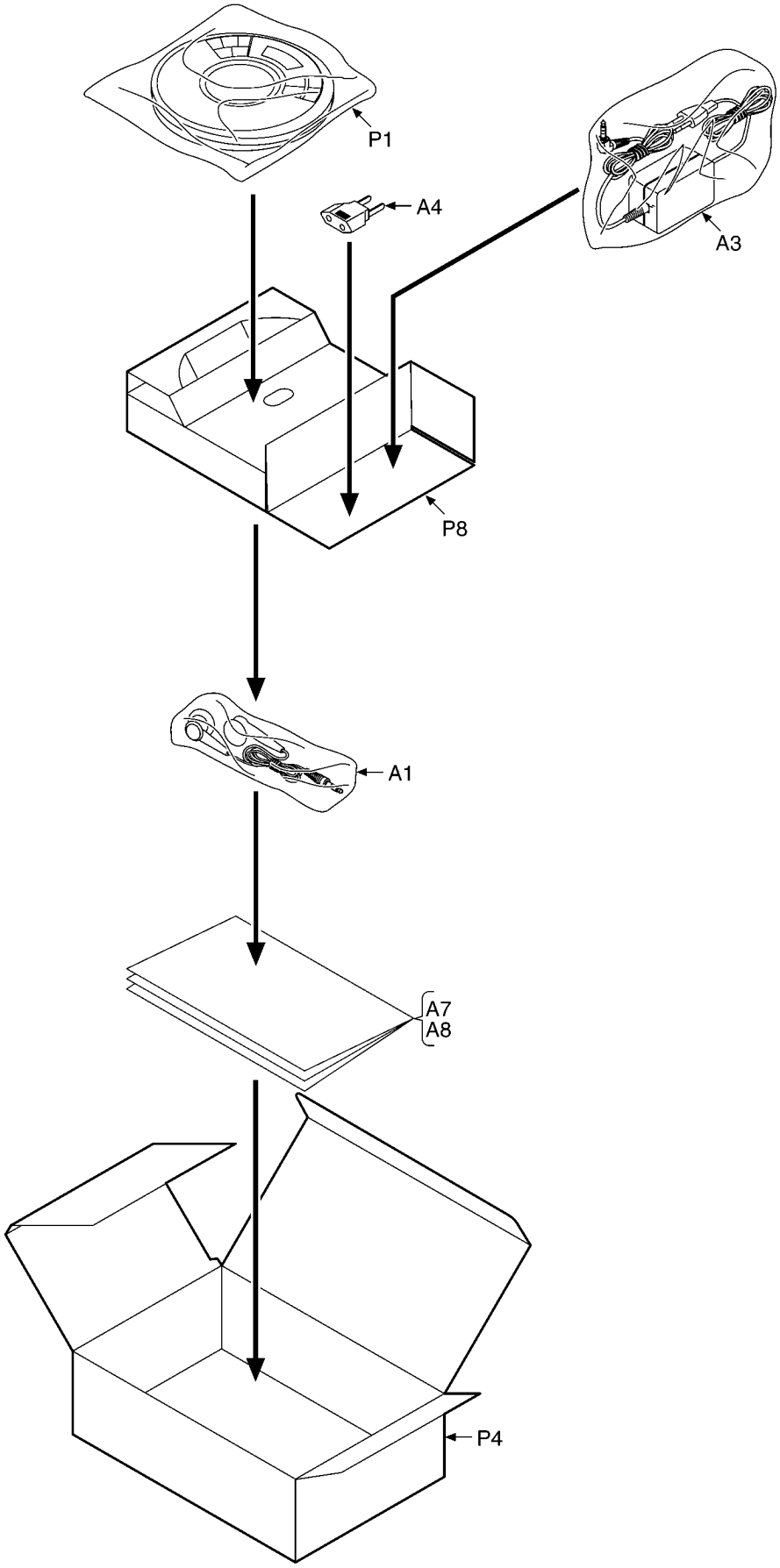
17.1. SL-SX450EB



17.2. SL-SX450EE/EG/GN



17.3. SL-SX450GC



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