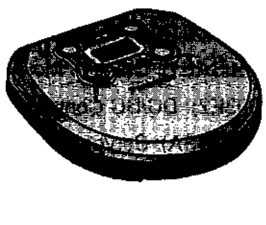
ORDER No. AD0002032C2

Service Manual

Portable CD Player

COMPACT disc DIGITAL AUDIO

MASH multi-stagenoiseshaping



SL-SX270

Traverse Deck: RAE0145Z Mechanism Series

Colours

(S)............Silver Type

(A)............Blue Type [(EG) area only]

Areas

EB..............Great Britain.

EG..............Europe and Russia

Specification

●Audio (Anti-shock off)

No. of channels:	2 channels (left and right, stereo)
Frequency response:	20 to 20,000 Hz (+0.5dB, -1.5dB)
Output voltage:	0.6 V (50kΩ)
S/N:	more than 96 dB*
Wow and flutter:	Below measurable limit
DA converter:	1 bit, MASH
Headphones output level:	Max. 9mW+9mW/ 16Ω (adjustable)

●Pickup

Light source:	Semiconductor laser
Wavelength:	780 nm

●General

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

●Power consumption

Power source	**ANTI-SHOCK MEMORY 3.0 OFF/ ON**
AC adaptor	3.2W/ 3.4W
Battery (DC 3V)	0.4W/ 0.45W
When recharging:	4.0W

●Play time

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

Batteries used	**ANTI-SHOCK MEMORY 3.0 OFF/ ON**
2 "AA" (LR6) alkaline batteries	About 23h/ 28h
Rechargeable batteries (recharhging time)	11h/ 13h (5h)

batteries

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

Dimensions (WxHxD)	128x25.9x131.5mm
Weight:	237g (with batteries) 191g (without batteries)

Notes:

Specifications are subject to change without notice.

Weight and dimensions are approximate.

⚠ 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.

Panasonic®

CONTENTS

1 Accessories

- Stereo headphones.......................1 pc.
  (RFEV335P-KS)
- Ear pad.......................1 pc.
  (STE31H-K3)
- Wird remote control.......................1 pc.
  (RFEV015PCKS)

For EB area

- AC adaptor.......................1 pc.
  (RFEA403B-S)

For EG area

- AC adaptor.......................1 pc.
  (RFEA419E-M)

2 Precaution of Laser Diode

CAUTION:

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

Wave length: 780 nm

Maximum output radiation power from pickup: 100 μW/VDE

Laser radiation 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 enthalt eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Leserstrahlung von der Lasereinheit abgestrahlt.

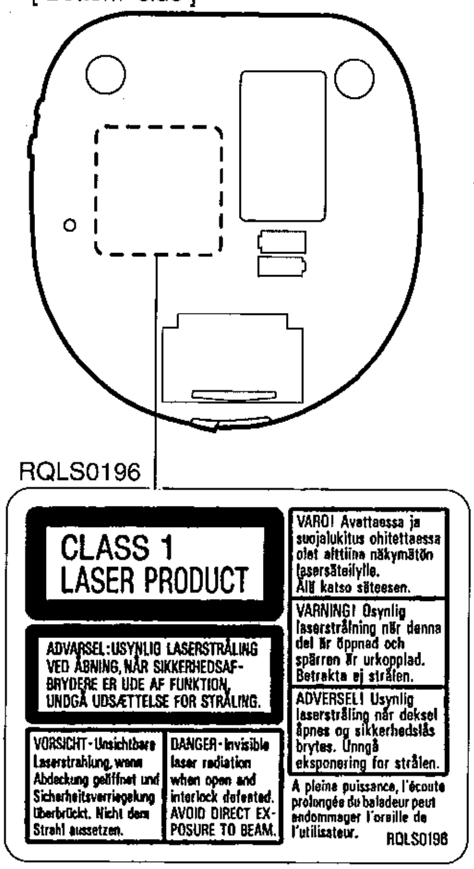
Wellenlage: 780 nm

Maximale Strahlungsleistung der Lasereinheit: 100 μW/VDE

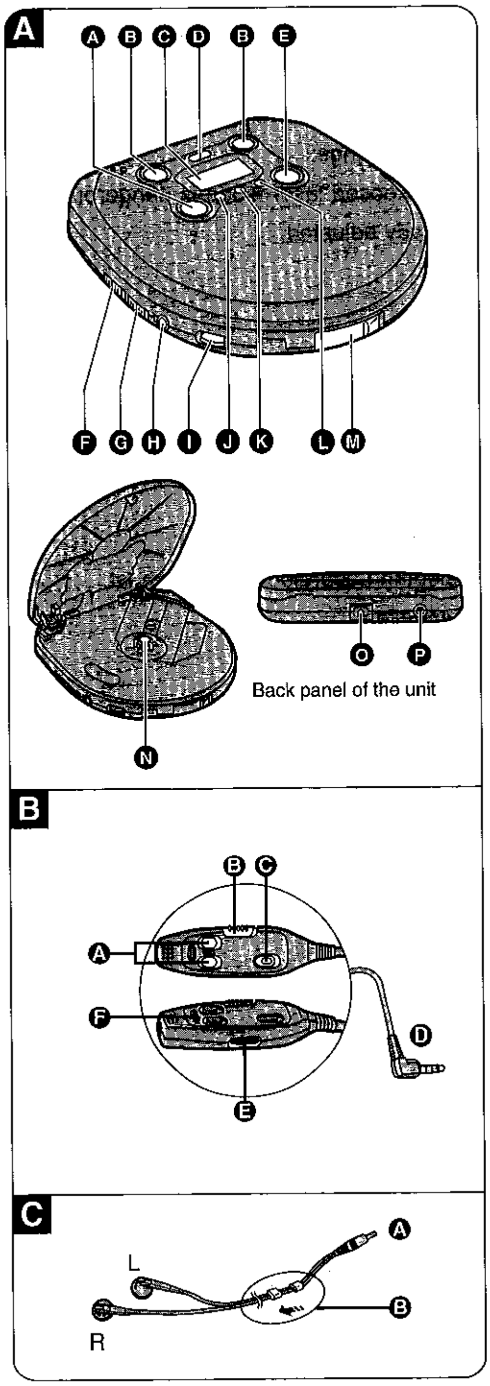
Die Strahlung an der Lasereinheit ist ungefahrlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefahrlich ist.
2. Den werkseitig Justierten Einstellregler der Lasereinheit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlines blicken.
4. Nicht uber langere Zeit in die Fokussierlines blicken.

[Bottom side]



3 Operating Instructions



Portable CD Player A

- A Stop/operation off button (■, OPR OFF)
- B Skip/search buttons (|◀◀, ▶▶| ◀◀, ▶▶)
- C Display
- D Anti-shock button (A.SHOCK)
- E Play/pause button (▶ ❚❚)
- F Play mode selector (NOR, RANDOM, RESUME)
- G Hold switch (HOLD)
- H Headphone jack (🎧)
- I Headphones volume control (VOLUME)
- J EQ button (EQ)
- K Memory/recall button (MEMORY/RECALL)
- L Repeat button ( )
- M Open switch (OPEN)
- N CD release button (PUSH)
- O Hole for car mounting base
- P DC IN jack (DC IN 4.5 V)

Wired remote control B

- A Skip/search buttons (+, −)
- B HOLD switch (HOLD)
- C Play/stop/off button
- D Plug
- E Volume control (VOL)
- F HOLD indicator

Stereo earphones C

- A Plug
- B Slider

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**)

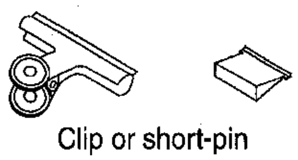


Fig.1

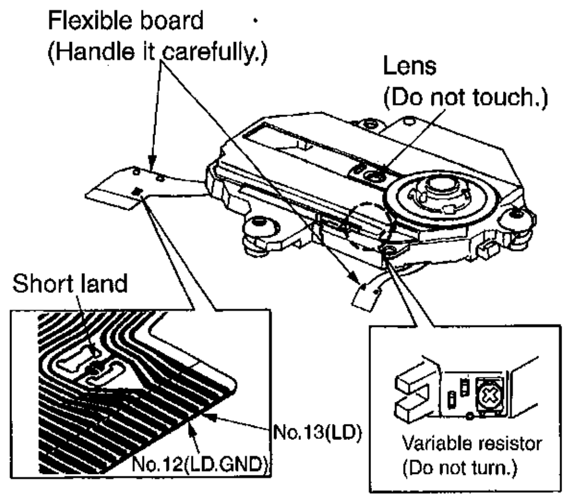


Fig.2

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 fround 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).

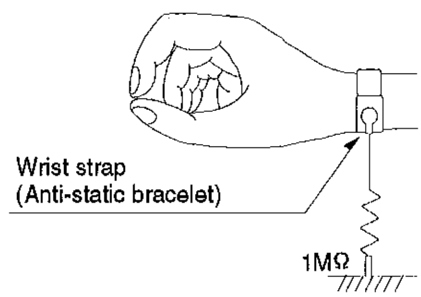


Fig.3

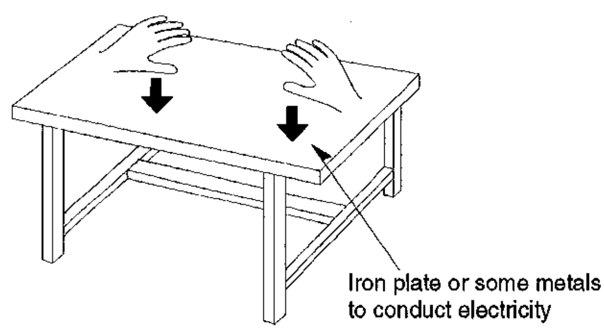


Fig.4

5 Operation Checks and Component Replacement Procedures

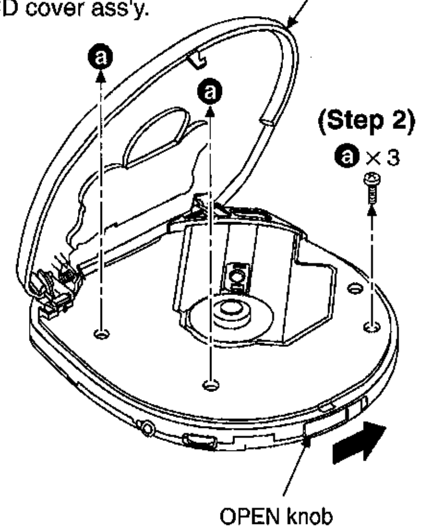
- This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
- For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.

5.1. Checking for the main P.C.B.

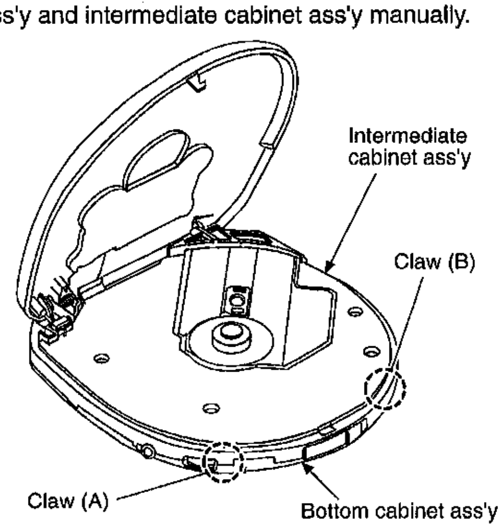
5.1.1. Checking for the main P.C.B. (A side)

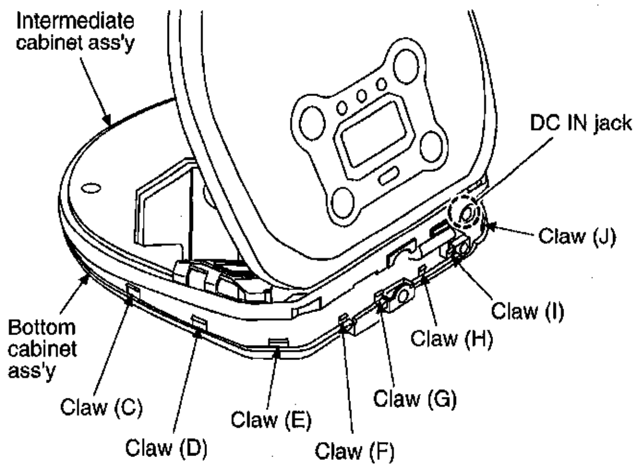
(Step 1)
Sliding the OPEN knob to right, open the CD cover ass'y.

(Step 2)
ⓐ × 3



(Step 3)
Spread the clearance between the bottom cabinet ass'y and intermediate cabinet ass'y manually.



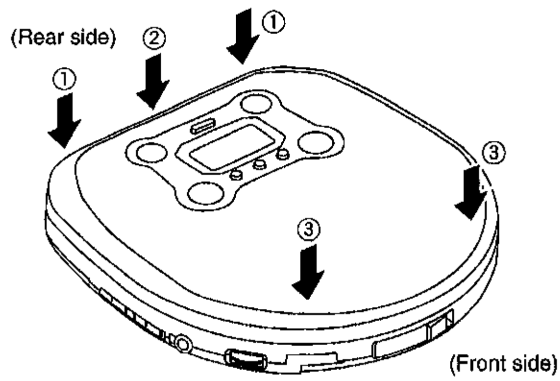


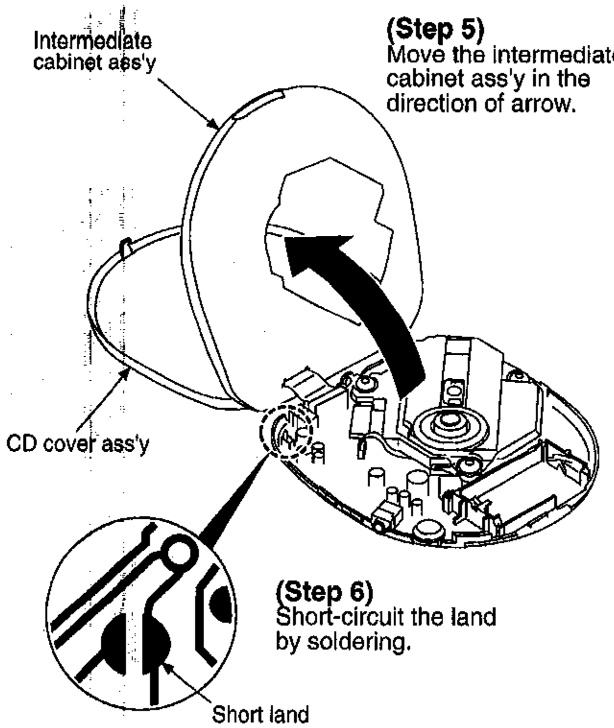
(Step 4)
Open the clearance between the bottom cabinet ass'y and intermediate cabinet ass'y, and then release the claw (C) to claw (J) in turn.

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

■ 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)

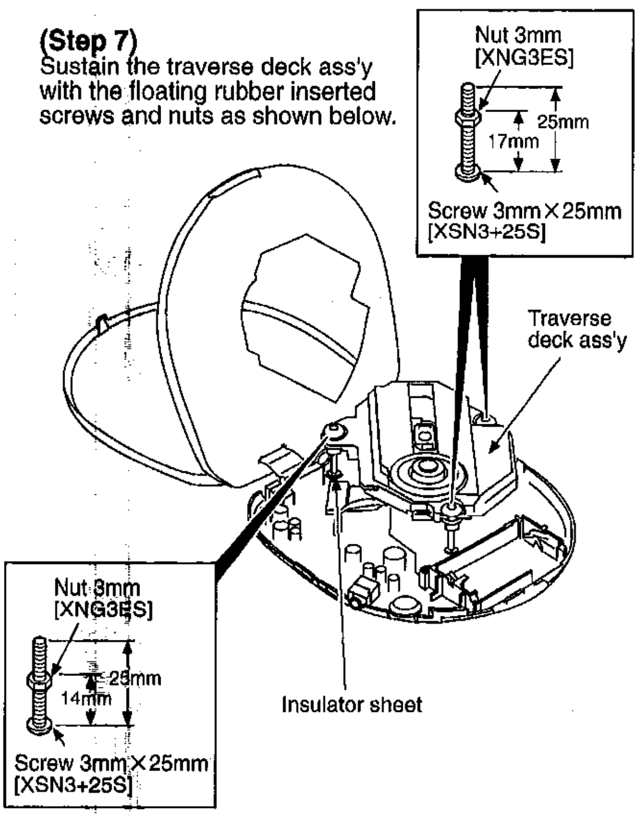




(Step 5)
Move the intermediate cabinet ass'y in the direction of arrow.

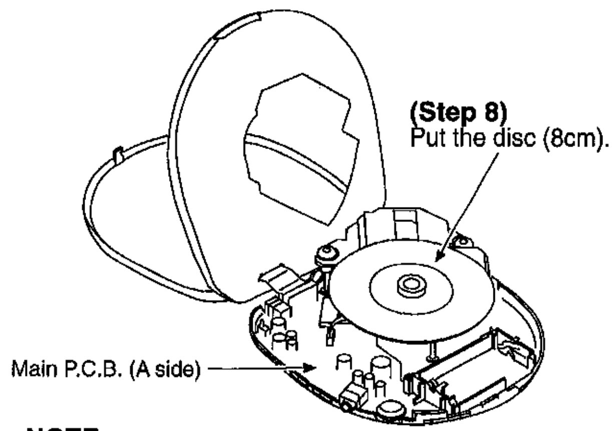
(Step 6)
Short-circuit the land by soldering.

(Step 7)
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 main P.C.B. (A side) as shown below.**

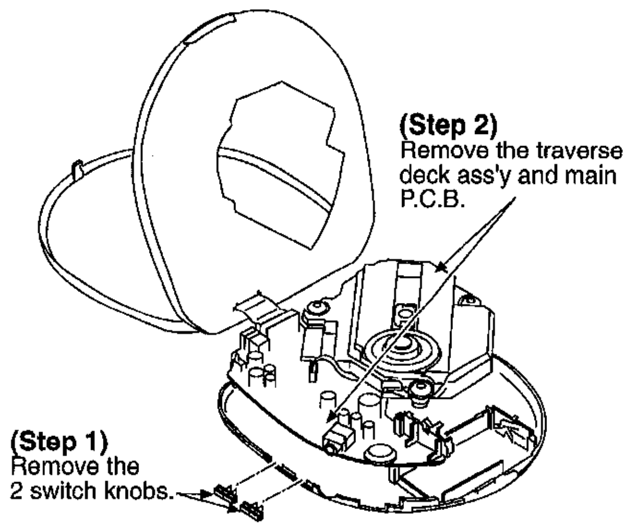


(Step 8)
Put the disc (8cm).

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

5.1.2. Checking for the main P.C.B. (B side)

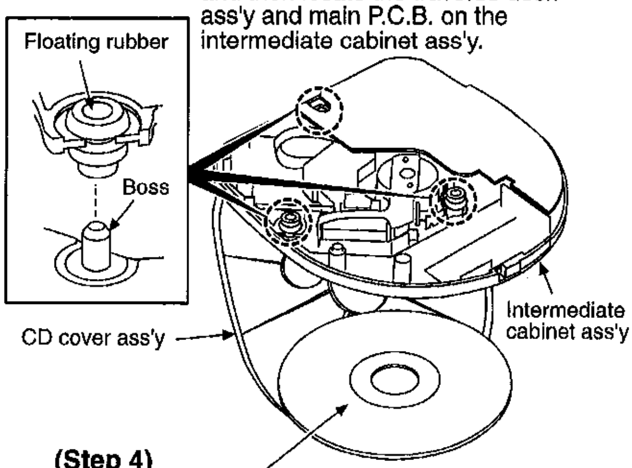
- Follow the **(Step 1)** - **(Step 6)** of item 5.1.1.



(Step 1)
Remove the 2 switch knobs.

(Step 2)
Remove the traverse deck ass'y and main P.C.B.

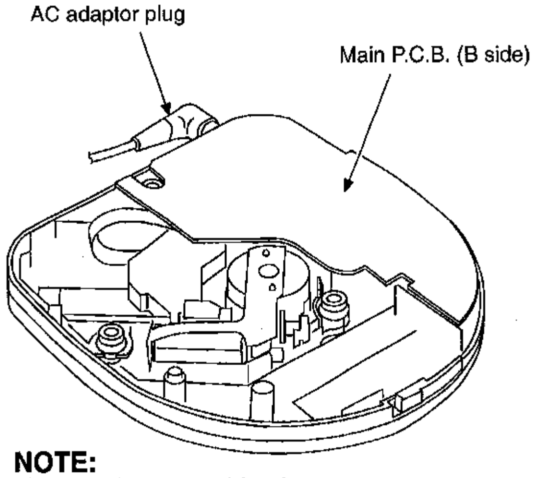
(Step 3)
Align the floating rubbers with bosses, and then locate the traverse deck ass'y and main P.C.B. on the intermediate cabinet ass'y.



(Step 4)
Put the test disc, and then close the CD cover ass'y.

- **Check the main P.C.B. (B side) as shown below.**

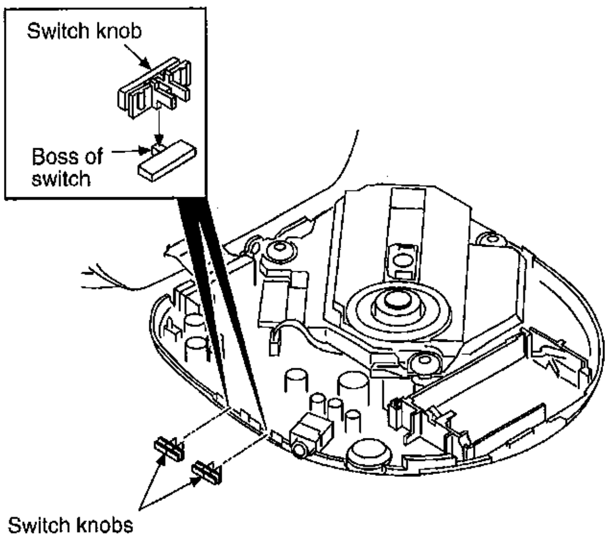
(Step 5)
Insert the AC adaptor plug into the DC IN jack, and then apply the power.



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

Notice for installation of switch knobs

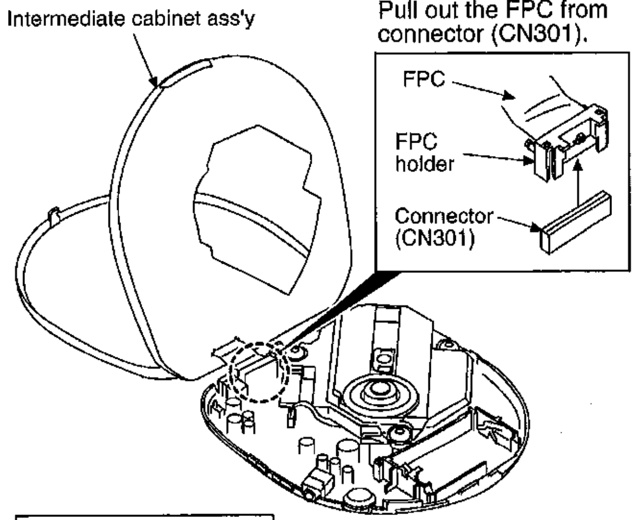
- Make sure the bosses of switch are fit in the switch knobs.

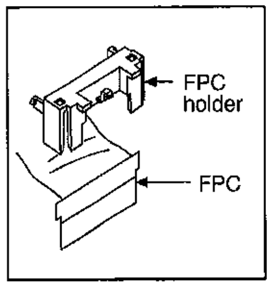


5.2. Replacement for the CD cover ass'y and LCD

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

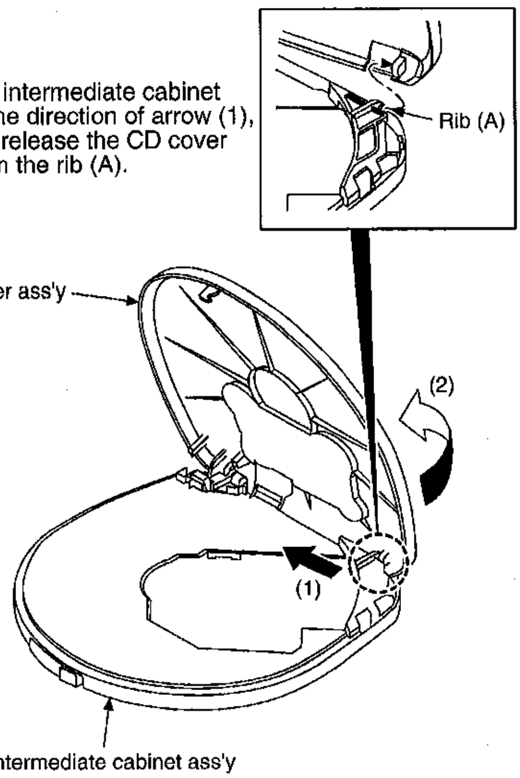
(Step 1)
Pull out the FPC from connector (CN301).





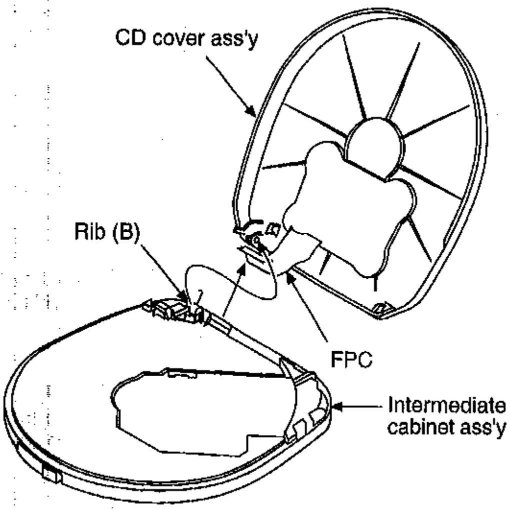
(Step 2)
Remove the FPC holder from FPC.

(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).

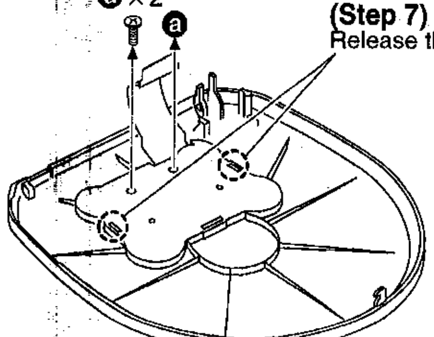


(Step 4)
Remove the CD cover ass'y from the rib (B).

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

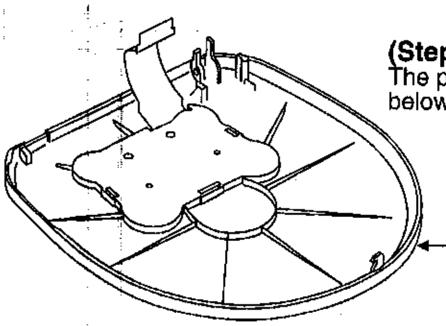


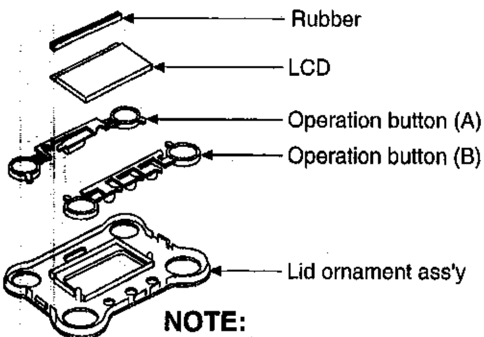
(Step 6)
ⓐ × 2



(Step 7)
Release the 2 claws.

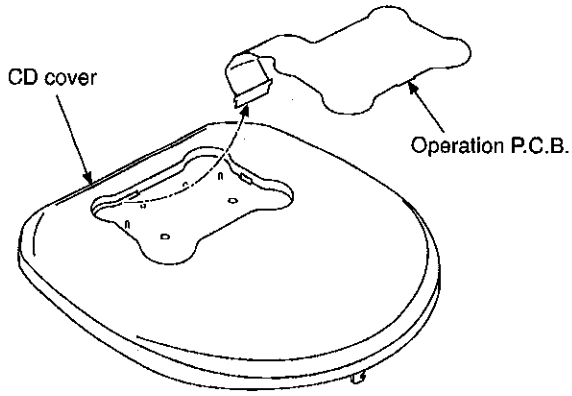
(Step 8)
The parts illustrated below will be free.





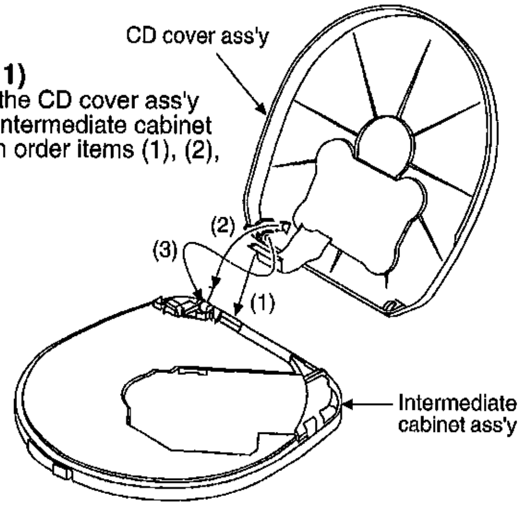
NOTE:
Be careful not to be applied the dust or smudge on the surface rubber.

(Step 9)
Remove the operation P.C.B. from CD cover.

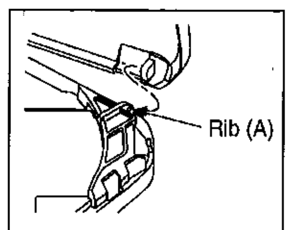


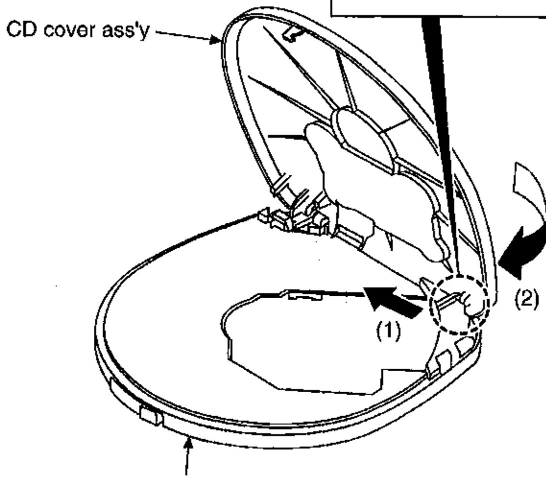
Installation of CD cover ass'y

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



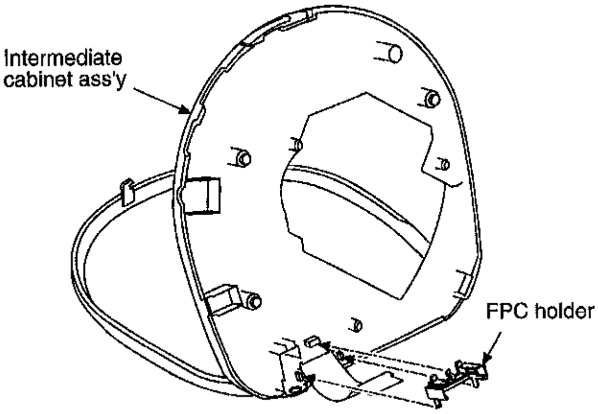
(Step 2)
Bend the intermediate cabinet ass'y in the direction of arrow (1), and then align the CD cover ass'y with the rib (A).

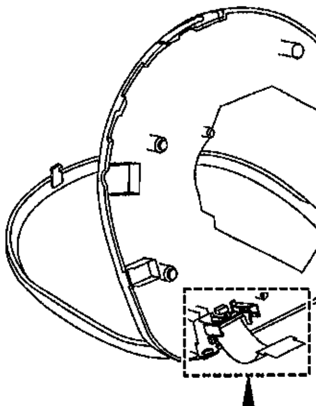




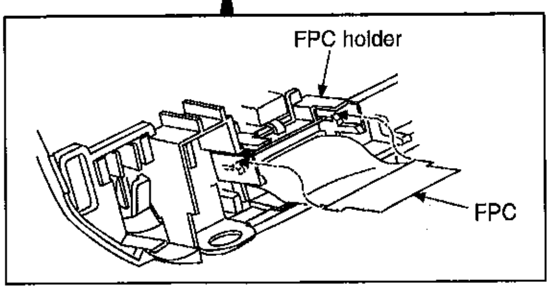
Installation of intermediate cabinet ass'y

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

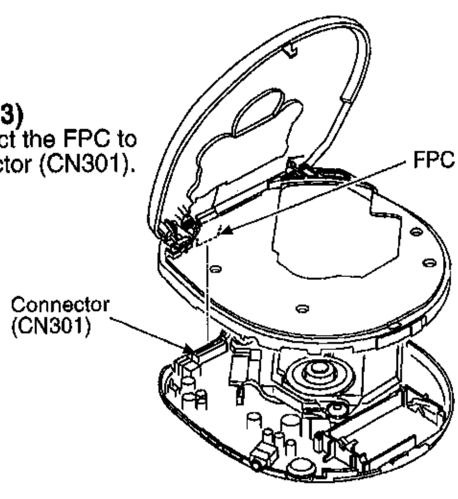




(Step 2)
Install the FPC to FPC holder.

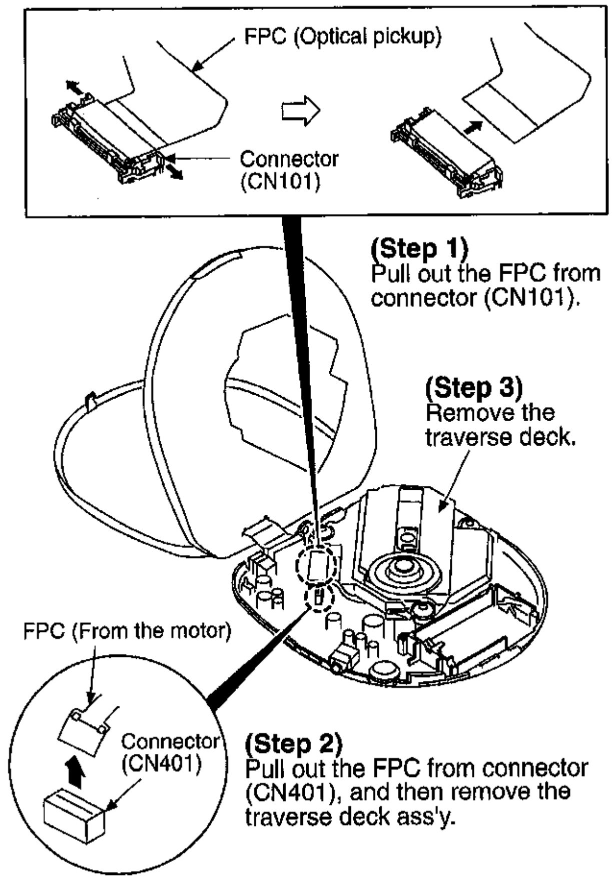


(Step 3)
Connect the FPC to connector (CN301).



5.3. Replacement for the traverse motor

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

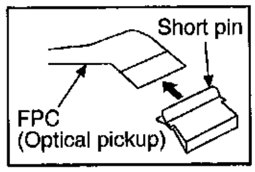


(Step 1)
Pull out the FPC from connector (CN101).

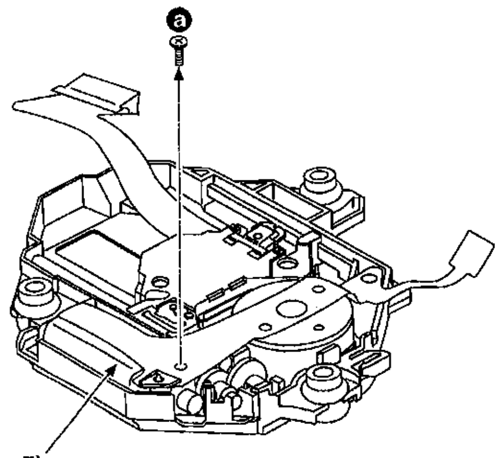
(Step 3)
Remove the traverse deck.

(Step 2)
Pull out the FPC from connector (CN401), and then remove the traverse deck ass'y.

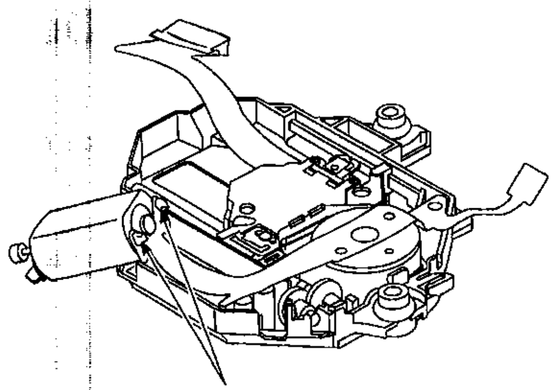
NOTE:
Insert a short pin into the traverse deck's FPC.
(Refer to **"Handling Precautions for Traverse Deck"**.)



(Step 4)

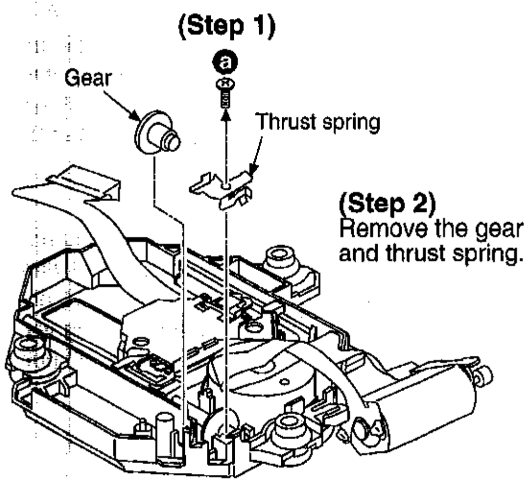


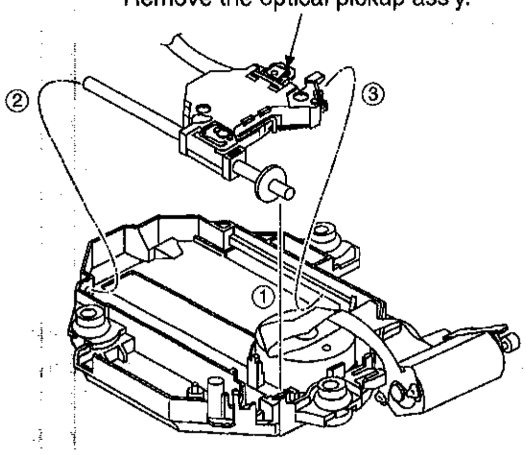
(Step 5)
Remove the traverse motor.

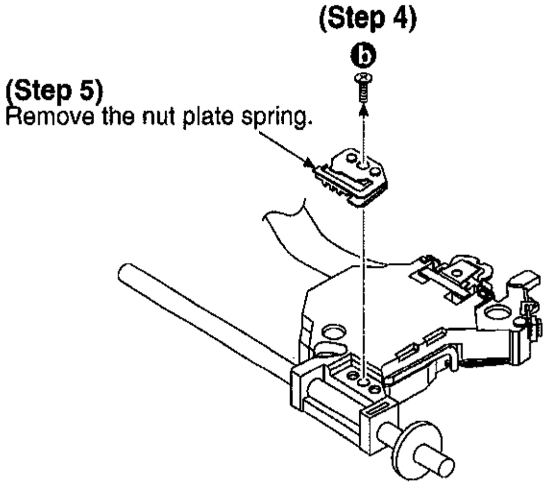


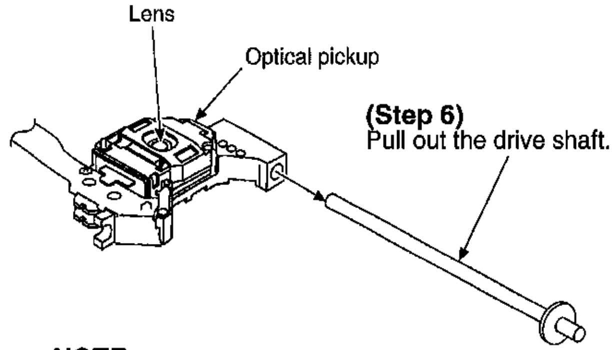
5.4. Replacement for the optical pickup

- Follow the **(Step 1)** - **(Step 5)** 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 Display of Self-Diagnostic Function

This unit (SL-SX270) has self-diagnostic function, it may display below-mentioned on the LCD of this unit.

- The substance of self-diagnostic display.

LCD display

F15

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

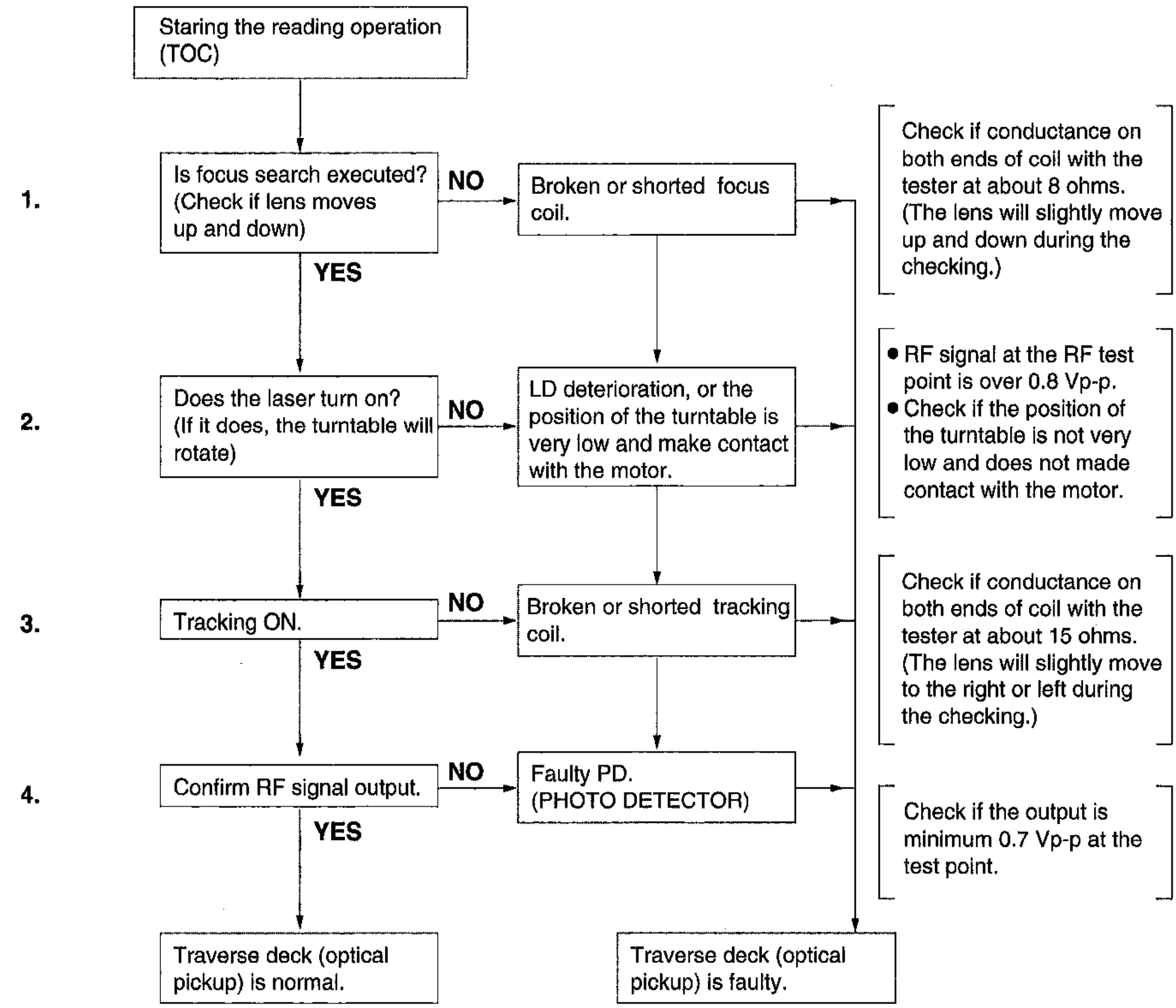
In the case of this display, it may be causing for abnormally movements of traverse deck, touching failure of REST det. SW. and coming off or cutting off the flexible P.C.B.. It is necessary for confirmation or repair and replacement each parts.

7 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)**



※Replace the traverse deck.

- 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 foward 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.

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

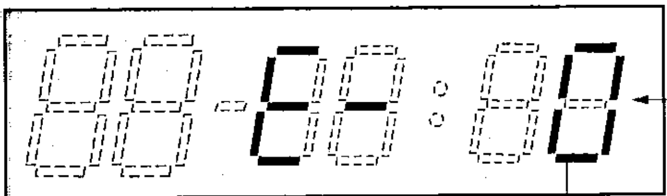
On this unit (SL-SX270), each automatic adjustment results are displayed on the LCD. This function is convenient to check or identify which automatic adjustment circuit is incorrect. The followings are the contents of the automatic adjustment result displays (self-check function). (Using the new Servo IC: MN662784SA)

8.1. 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.

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

LCD Display



4 bits (TGC, FGC, TBC, FBC) are displayed in hexadecimal system from 0~F.

(Each bit.........TGC, FGC, TBC, FBC)
0... OK
1... NG

<Example>

	MSB TGC	FGC	TBC	LSB FBC	
1)	0	0	0	0	⇨ "E—0" is displayed.
	(All adjustments are OK.)				Normal
2)	0 (OK)	0 (OK)	0 (OK)	1 (NG)	⇨ "E—1" is displayed.
	(Focus balance adjustment is NG (incorrect).)				
3)	0 (OK)	1 (NG)	0 (OK)	0 (OK)	⇨ "E—4" is displayed.
	(Focus gain adjustment is NG.)				
4)	1	1	1	1	⇨ "E—F" is displayed.
	(All adjustments are NG.)				
5)	1 (NG)	0 (OK)	0 (OK)	0 (OK)	⇨ "E—8" is displayed.
	(Tracking gain adjustment is NG.)				

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 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.)

● 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.

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

9.1. 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.

9.2. 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 conduced to reduction of required memory capacity from 16M bits to 4M bits for securing the accumulation time equivalent to the conventional.

All-inclusive Block Diagram

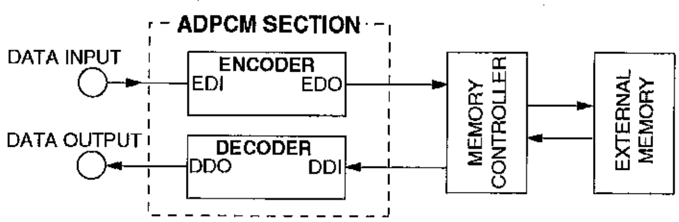
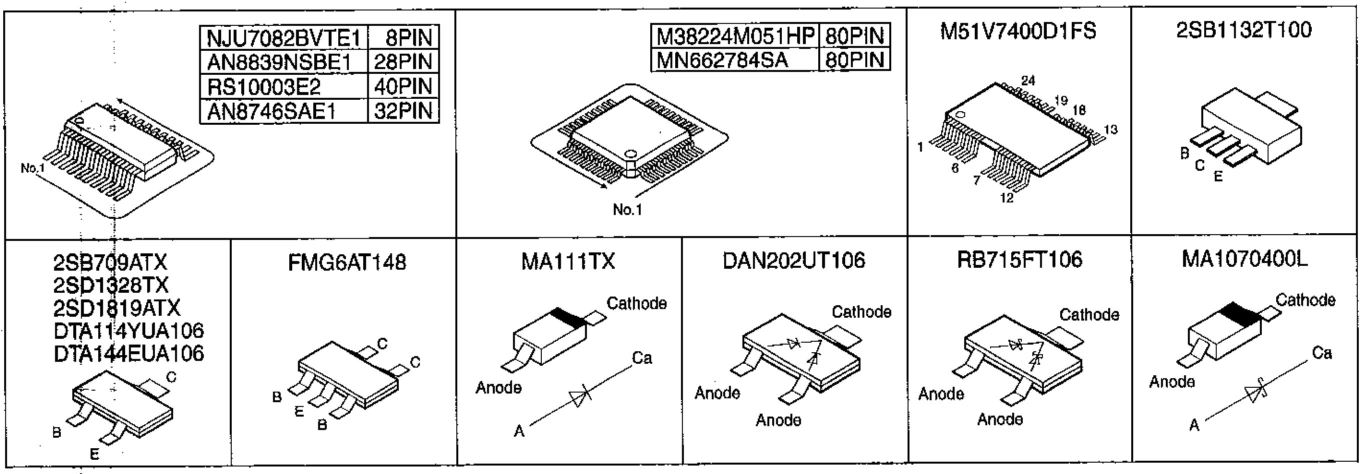


Fig.5

10 Schematic Diagram Note

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



10.2. Schematic Diagram Notes

Notes:

- S201: Laser ON/OFF switch in "OFF" position.
  (It turns "ON" with disc holder closed.)
- S202: Rest detector in "OFF" position.
  (It turns "ON" when optical pickup comes to innermost periphery.)
- S309: Play mode selector (MODE) in "NORMAL" position.
  (RESUME ⇔ RANDOM ⇔ NORMAL)
- S310: Hold (HOLD) switch in "OFF" position.
- S801: Anti-shock (A.SHOCK) switch in "OFF" position.
- S802, 804: Skip/search (▶▶ / ▶▶| , |◀◀ / ◀◀) switch.
- S803: Play/pause (▶II) switch.
- S805: Stop/power off (■ /OPR OFF) switch.
- S806: EQ (EQ) switch in "OFF" position.
- S807: Memory/recall (MEMORY/RECALL) switch.
- S808: Repeat (⟲)switch.
- VR701-1,2: Headphones volume (VOLUME) control.
- 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.
- ⇨ : CD 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:

  *AC adaptor is used for power supply.

  *Set the headphones (earphones) VR(VR701) to center position(No.5).

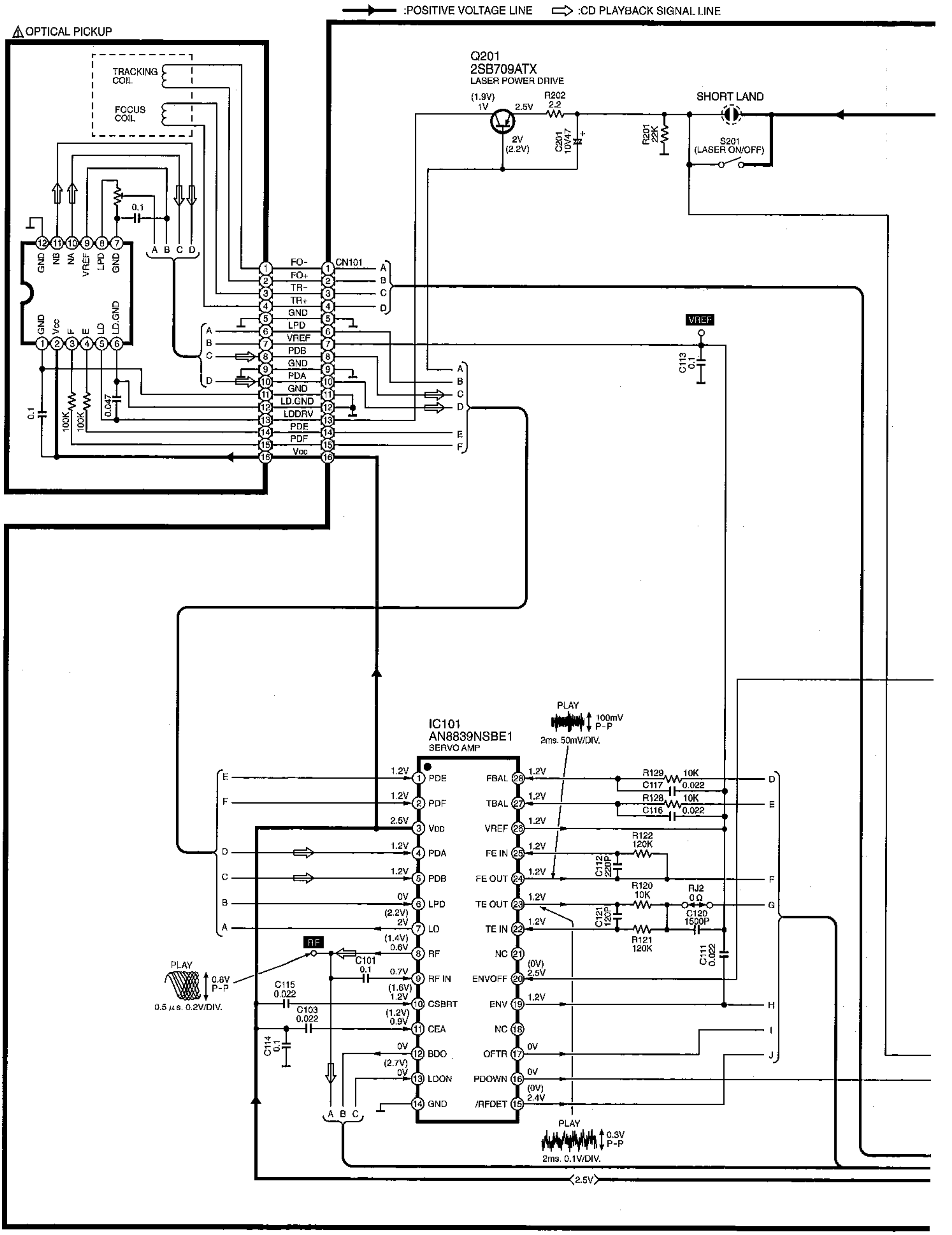
  *( ).......CD playback mode (Test disc 1kHz, L+R, 0dB)
  Set the hold unlock and ANTI-SHOCK switches to OFF.

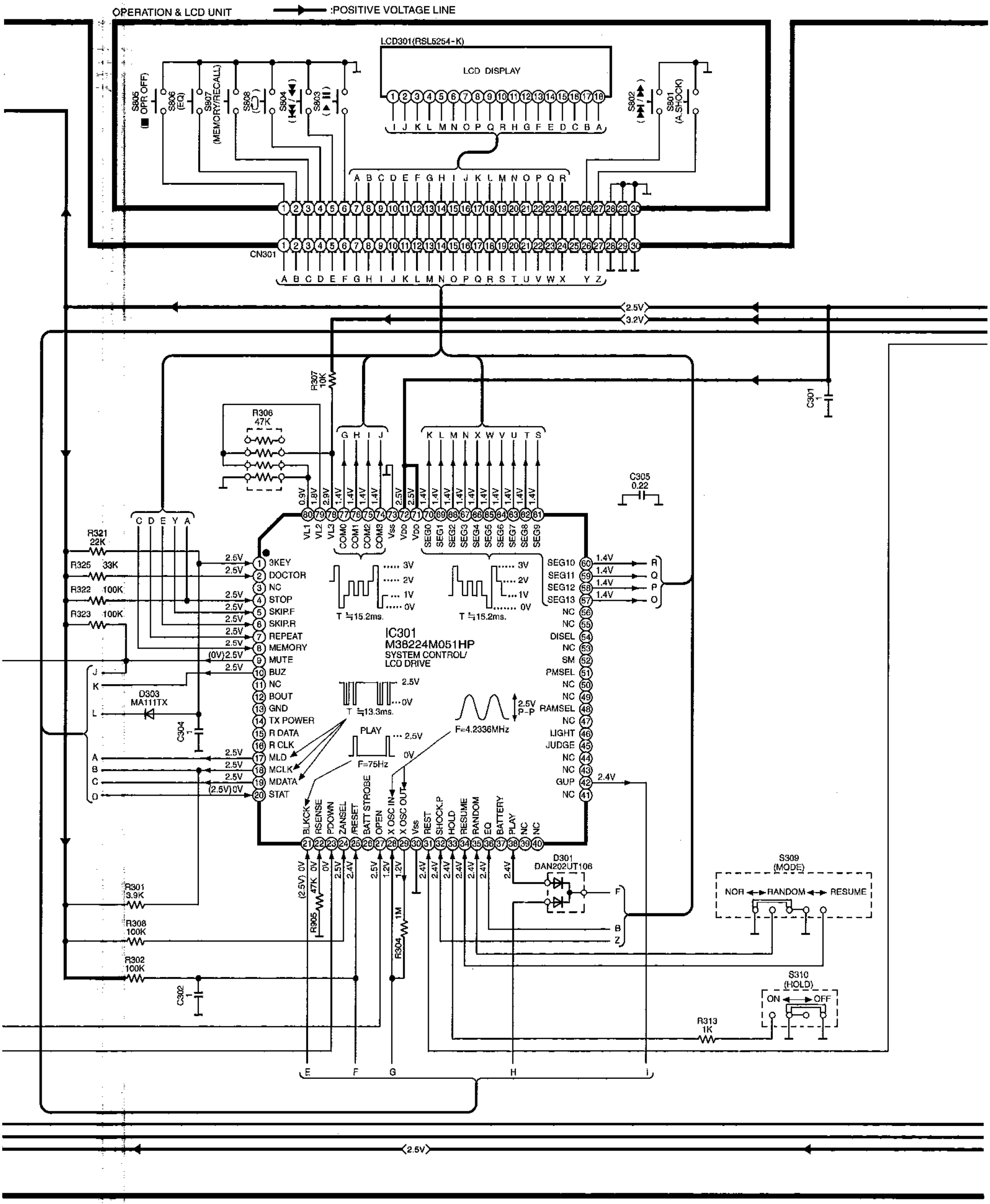
  *No mark.......CD stop mode

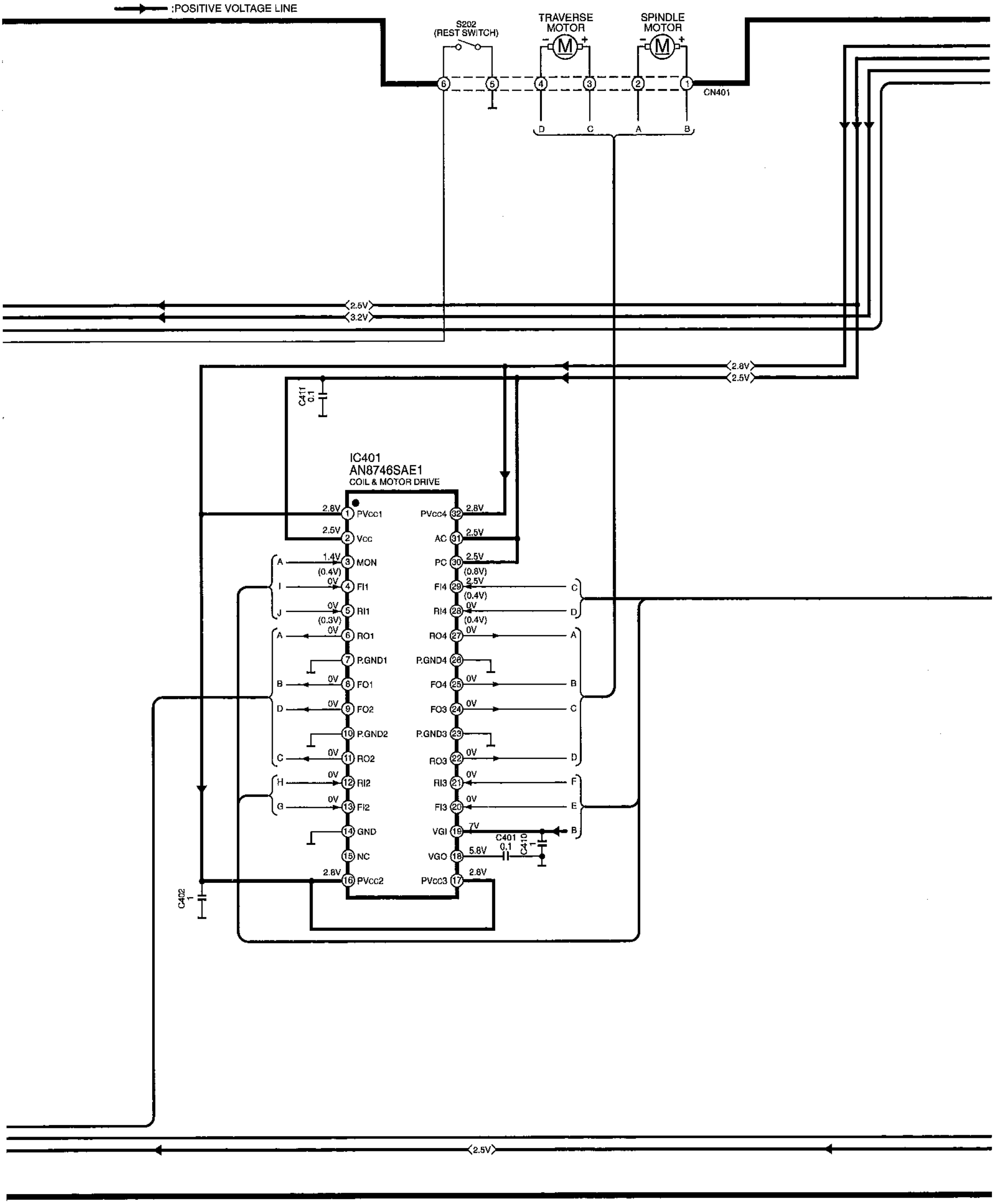
Caution!!

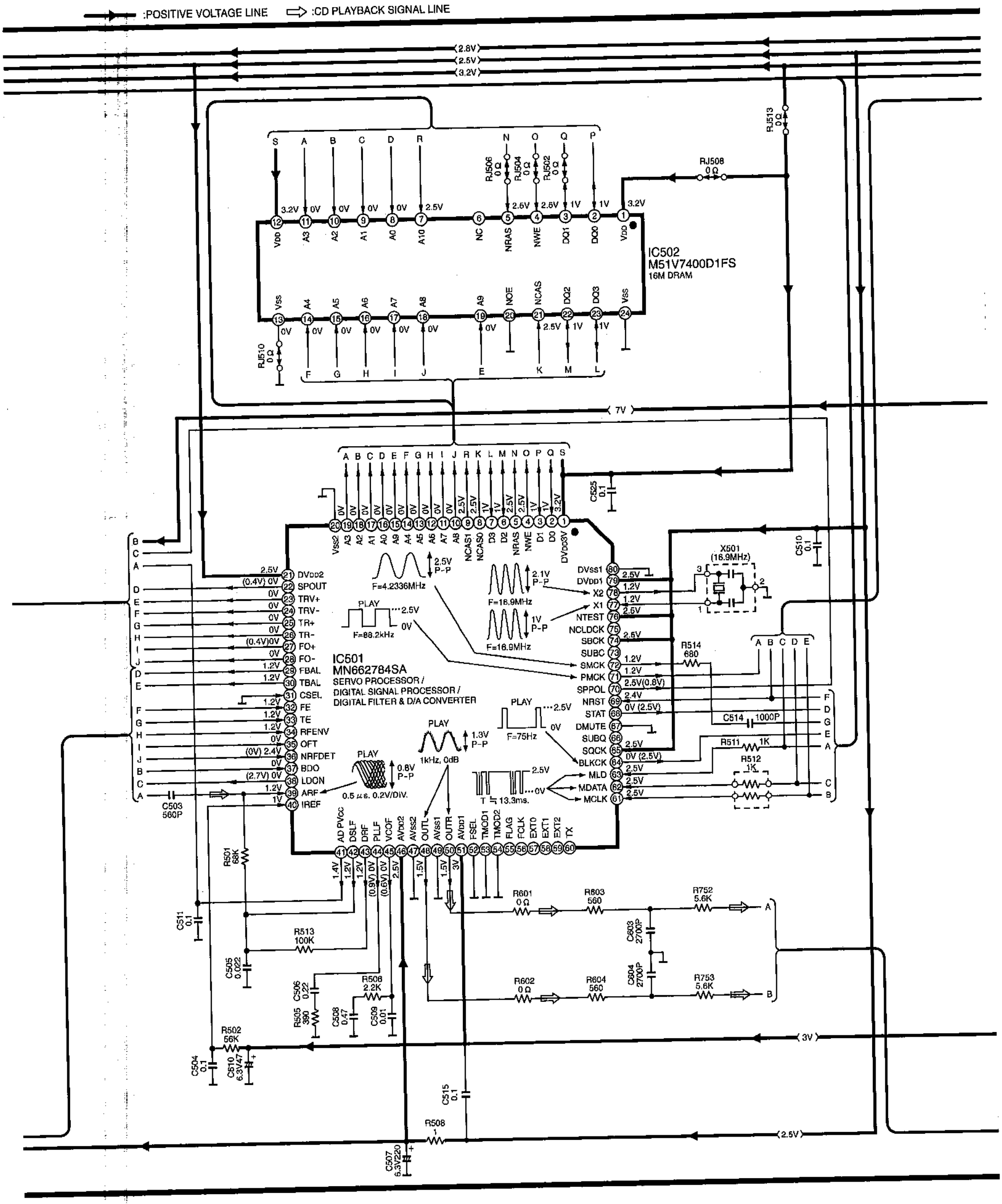
- IC and LSI are sensitive to static electricity.
- Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

11 Schematic Diagram

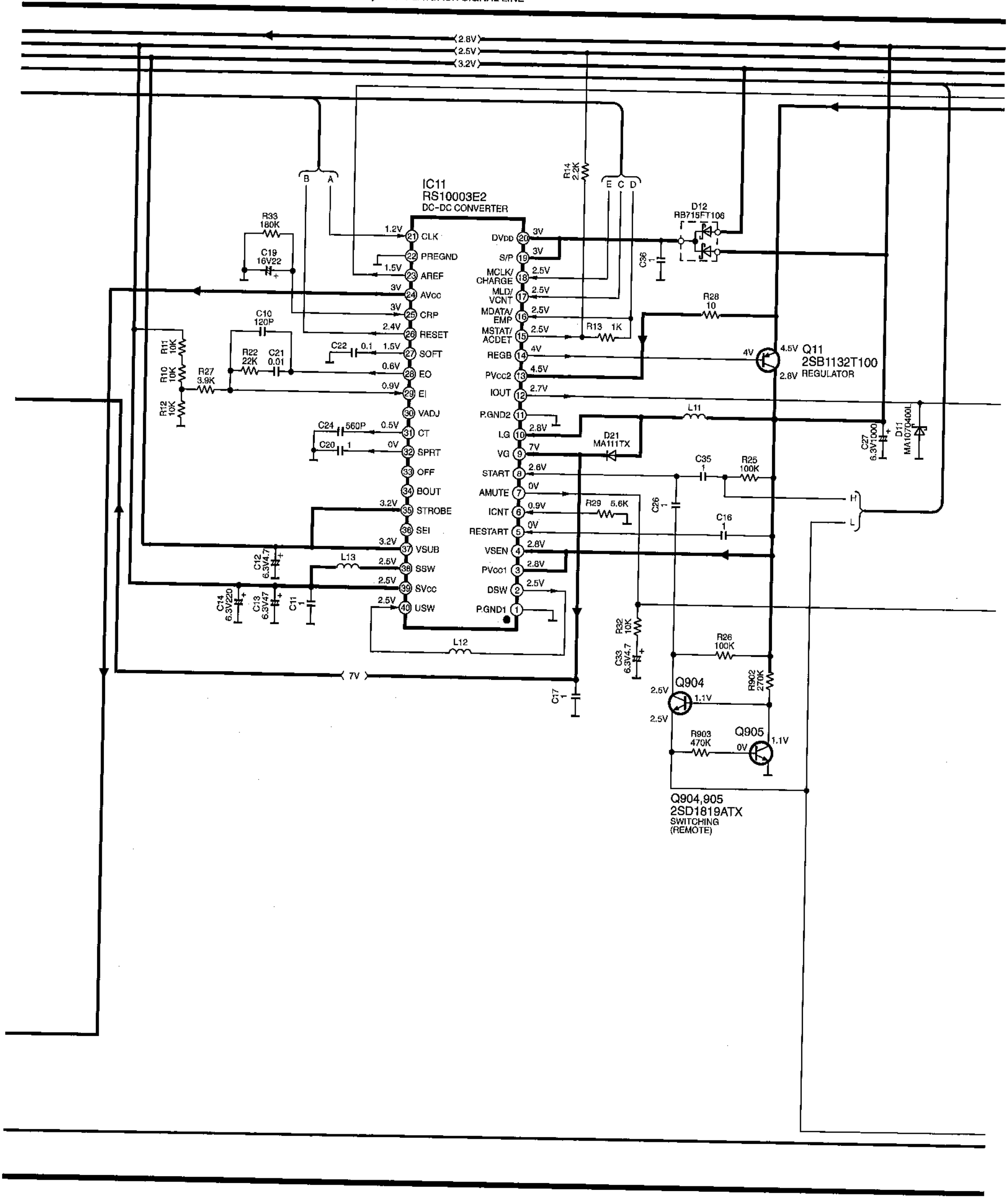


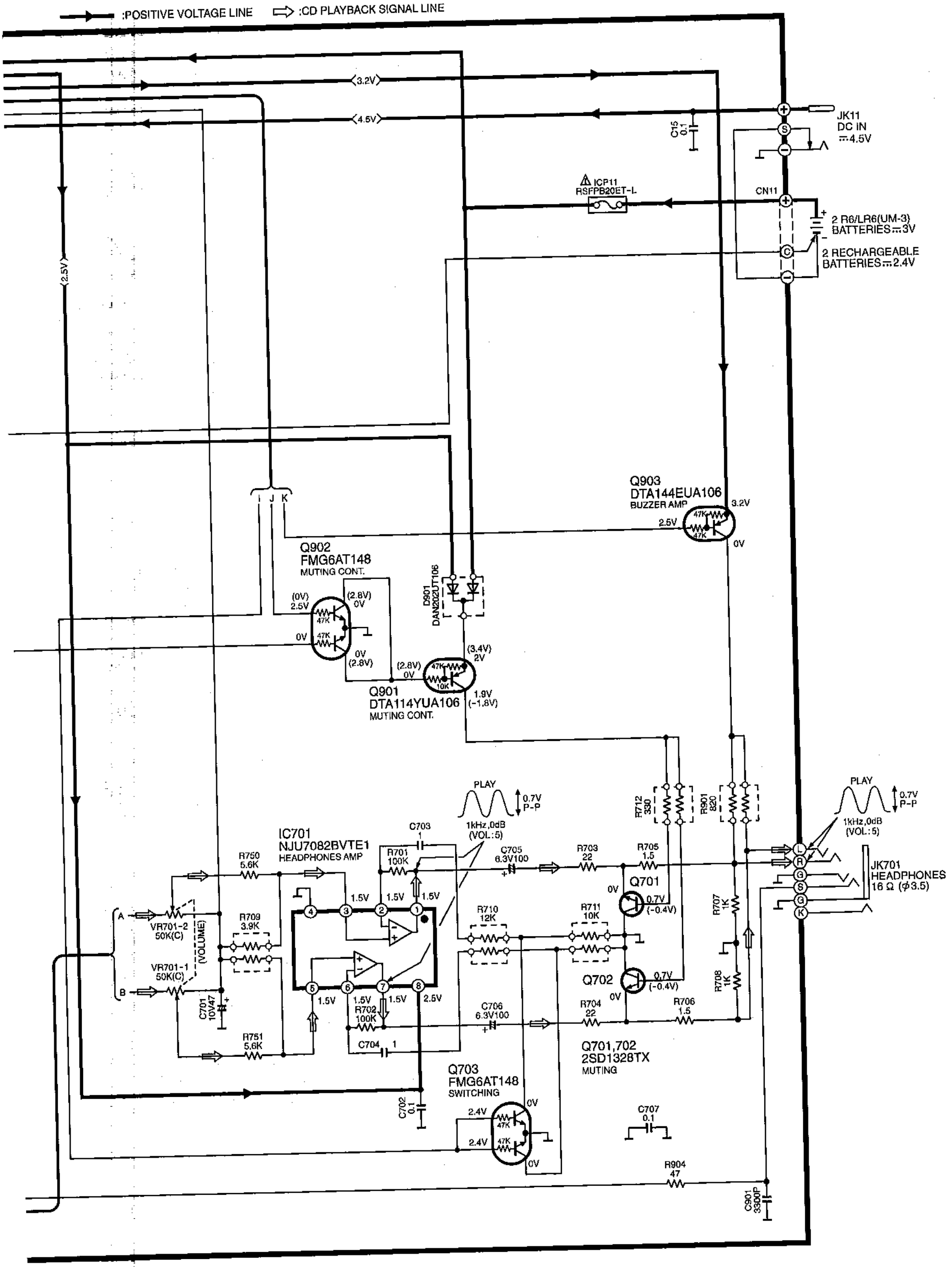

OPERATION & LCD UNIT
:POSITIVE VOLTAGE LINE
LCD301(RSL5254-K)
LCD DISPLAY
S805 (■ OPR OFF)
S806 (EQ)
S807 (MEMORY/RECALL)
S808
S804
S803 (▶/II)
S802
S801 (A.SHOCK)
CN301
R307 10K
R306 47K
C301 1
C305 0.22
R321 22K
R325 33K
R322 100K
R323 100K
D303 MA111TX
C304 1
IC301
M38224M051HP
SYSTEM CONTROL/
LCD DRIVE
3KEY
DOCTOR
NC
STOP
SKIP.F
SKIP.R
REPEAT
MEMORY
MUTE
BUZ
BOUT
GND
TX POWER
R DATA
R CLK
MLD
MCLK
MDATA
STAT
VL1
VL2
VL3
COM0
COM1
COM2
COM3
Vss
VDD
SEG0
SEG1
SEG2
SEG3
SEG4
SEG5
SEG6
SEG7
SEG8
SEG9
SEG10
SEG11
SEG12
SEG13
DISEL
SM
PMSEL
RAMSEL
LIGHT
JUDGE
GUP
BLKCK
RSENSE
PDOWN
ZANSEL
/RESET
BATT STROBE
OPEN
X OSC IN
X OSC OUT
REST
SHOCK.P
HOLD
RESUME
RANDOM
EQ
BATTERY
PLAY
T ≒15.2ms.
T ≒13.3ms.
PLAY
F=75Hz
F=4.2336MHz
2.5V P-P
D301
DAN202UT106
S309 (MODE)
NOR ◀━▶ RANDOM ◀━▶ RESUME
S310 (HOLD)
ON ◀━▶ OFF
R313 1K
R301 3.9K
R308 100K
R302 100K
C302 1
R905 47K
R304 1M
2.5V
3.2V


:POSITIVE VOLTAGE LINE
S202
(REST SWITCH)
TRAVERSE
MOTOR
SPINDLE
MOTOR
CN401
IC401
AN8746SAE1
COIL & MOTOR DRIVE
PVcc1
Vcc
MON
FI1
RI1
RO1
P.GND1
FO1
FO2
P.GND2
RO2
RI2
FI2
GND
NC
PVcc2
PVcc4
AC
PC
FI4
RI4
RO4
P.GND4
FO4
FO3
P.GND3
RO3
RI3
FI3
VGI
VGO
PVcc3
C411
0.1
C401
0.1
C410
1
C402
1
2.5V
3.2V
2.8V
1.4V
(0.4V)
(0.3V)
(0.8V)
7V
5.8V


:POSITIVE VOLTAGE LINE
:CD PLAYBACK SIGNAL LINE
IC502
M51V7400D1FS
16M DRAM
IC501
MN662784SA
SERVO PROCESSOR /
DIGITAL SIGNAL PROCESSOR /
DIGITAL FILTER & D/A CONVERTER
X501
(16.9MHz)
F=4.2336MHz
F=16.9MHz
F=88.2kHz
F=75Hz
1kHz, 0dB
0.5 μs. 0.2V/DIV.
T ≒ 13.3ms.
PLAY

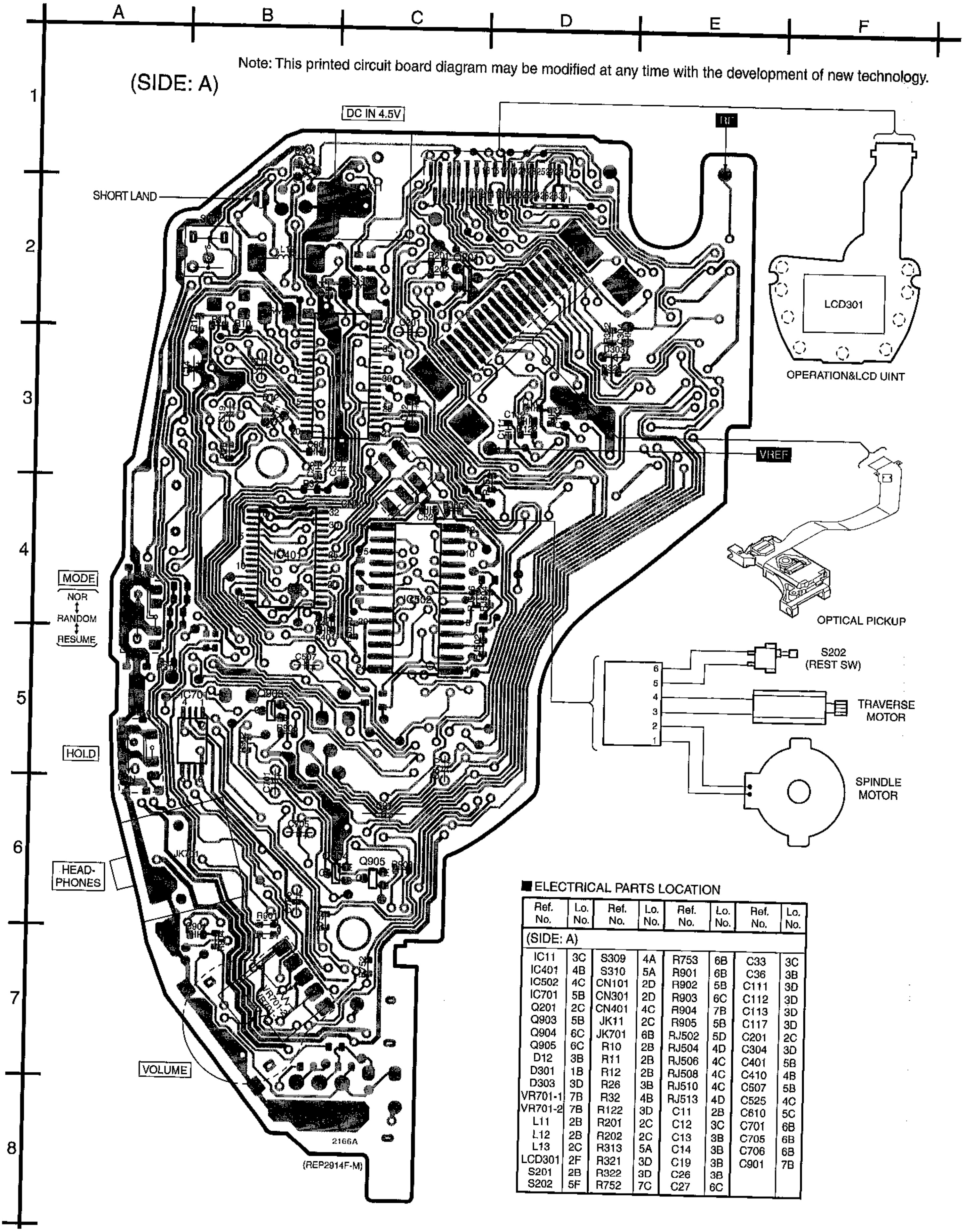
:POSITIVE VOLTAGE LINE :CD PLAYBACK SIGNAL LINE




:POSITIVE VOLTAGE LINE
:CD PLAYBACK SIGNAL LINE
JK11
DC IN
4.5V
C15 0.1
ICP11
RSFPB20ET-L
CN11
2 R6/LR6(UM-3) BATTERIES 3V
2 RECHARGEABLE BATTERIES 2.4V
Q903
DTA144EUA106
BUZZER AMP
Q902
FMG6AT148
MUTING CONT.
D901
DAN202UT106
Q901
DTA114YUA106
MUTING CONT.
R712 330
R901 820
PLAY
0.7V P-P
1kHz,0dB (VOL:5)
IC701
NJU7082BVTE1
HEADPHONES AMP
R750 5.6K
R701 100K
C703 1
C705 6.3V100
R703 22
R705 1.5
Q701
JK701
HEADPHONES
16 Ω (φ3.5)
VR701-2 50K(C)
VR701-1 50K(C)
(VOLUME)
R709 3.9K
R710 12K
R711 10K
R707 1K
R708 1K
Q702
C701 10V47
R702 100K
C706 6.3V100
R704 22
R706 1.5
R751 5.6K
C704 1
Q701,702
2SD1328TX
MUTING
Q703
FMG6AT148
SWITCHING
C702 0.1
C707 0.1
R904 47
C901 3300P

12 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.

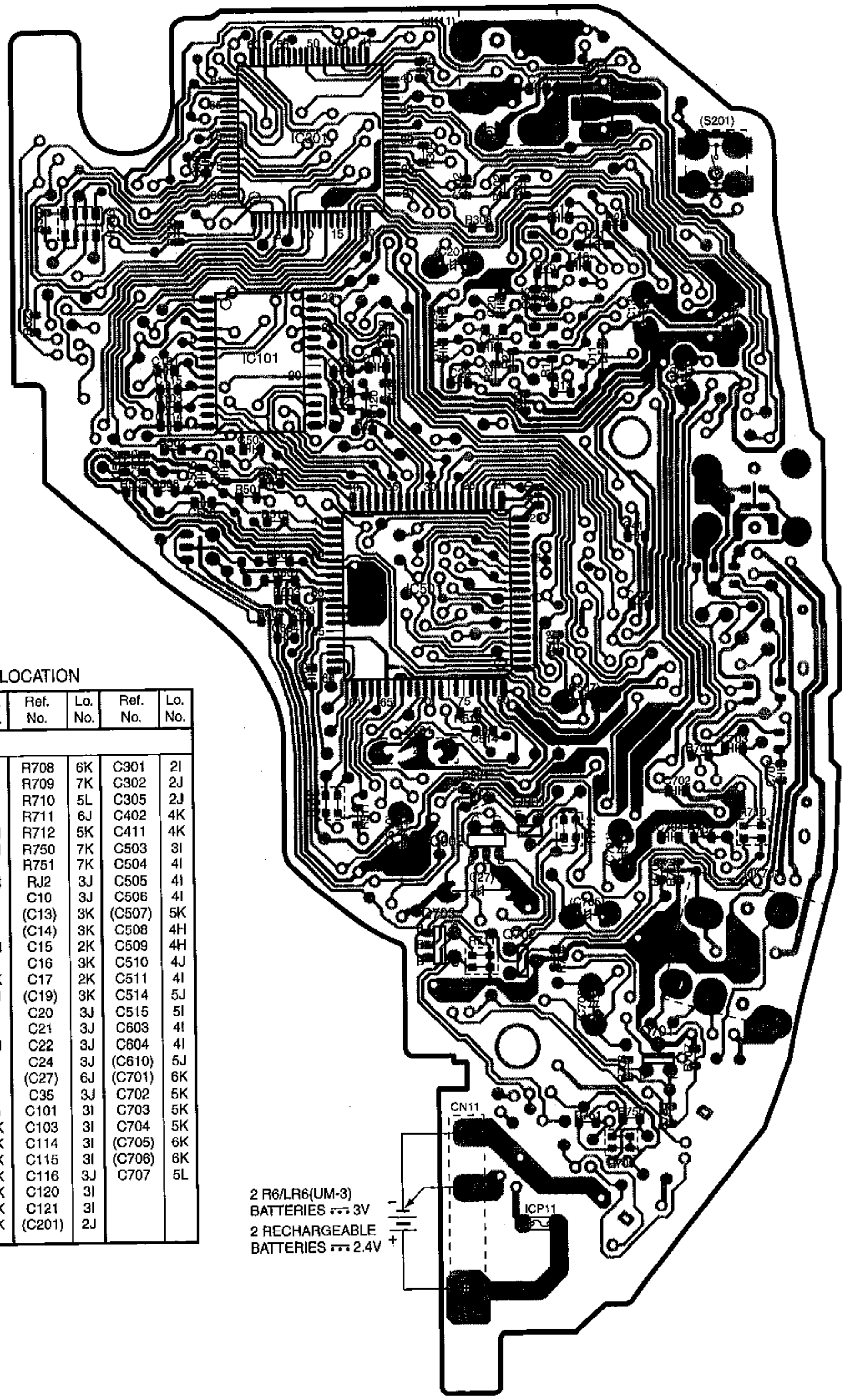


■ ELECTRICAL PARTS LOCATION

Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.
(SIDE: A)							
IC11	3C	S309	4A	R753	6B	C33	3C
IC401	4B	S310	5A	R901	6B	C36	3B
IC502	4C	CN101	2D	R902	5B	C111	3D
IC701	5B	CN301	2D	R903	6C	C112	3D
Q201	2C	CN401	4C	R904	7B	C113	3D
Q903	5B	JK11	2C	R905	5B	C117	3D
Q904	6C	JK701	6B	RJ502	5D	C201	2C
Q905	6C	R10	2B	RJ504	4D	C304	3D
D12	3B	R11	2B	RJ506	4C	C401	5B
D301	1B	R12	2B	RJ508	4C	C410	4B
D303	3D	R26	3B	RJ510	4C	C507	5B
VR701-1	7B	R32	4B	RJ513	4D	C525	4C
VR701-2	7B	R122	3D	C11	2B	C610	5C
L11	2B	R201	2C	C12	3C	C701	6B
L12	2B	R202	2C	C13	3B	C705	6B
L13	2C	R313	5A	C14	3B	C706	6B
LCD301	2F	R321	3D	C19	3B	C901	7B
S201	2B	R322	3D	C26	3B		
S202	5F	R752	7C	C27	6C		

G H I J K L

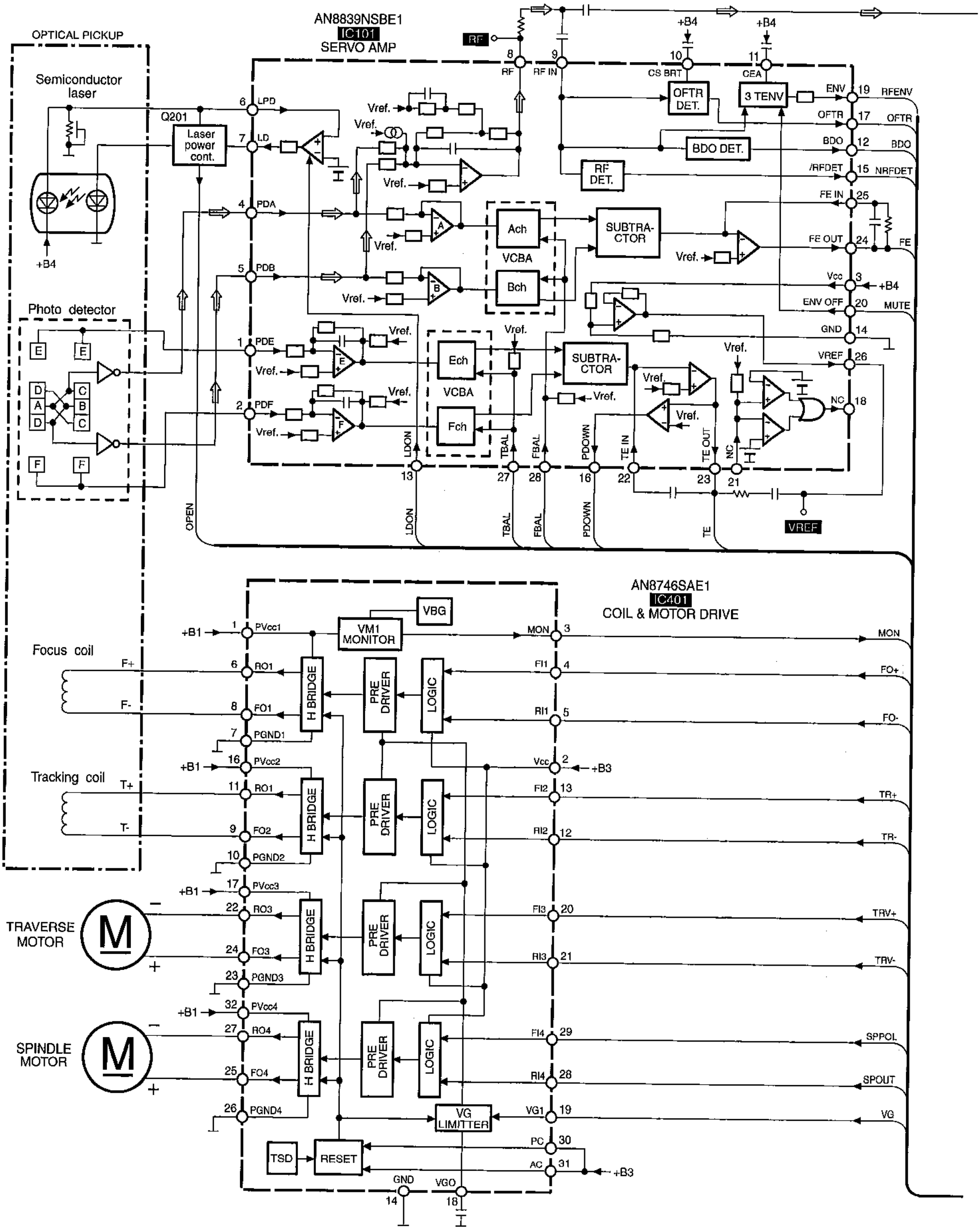
(SIDE: B)

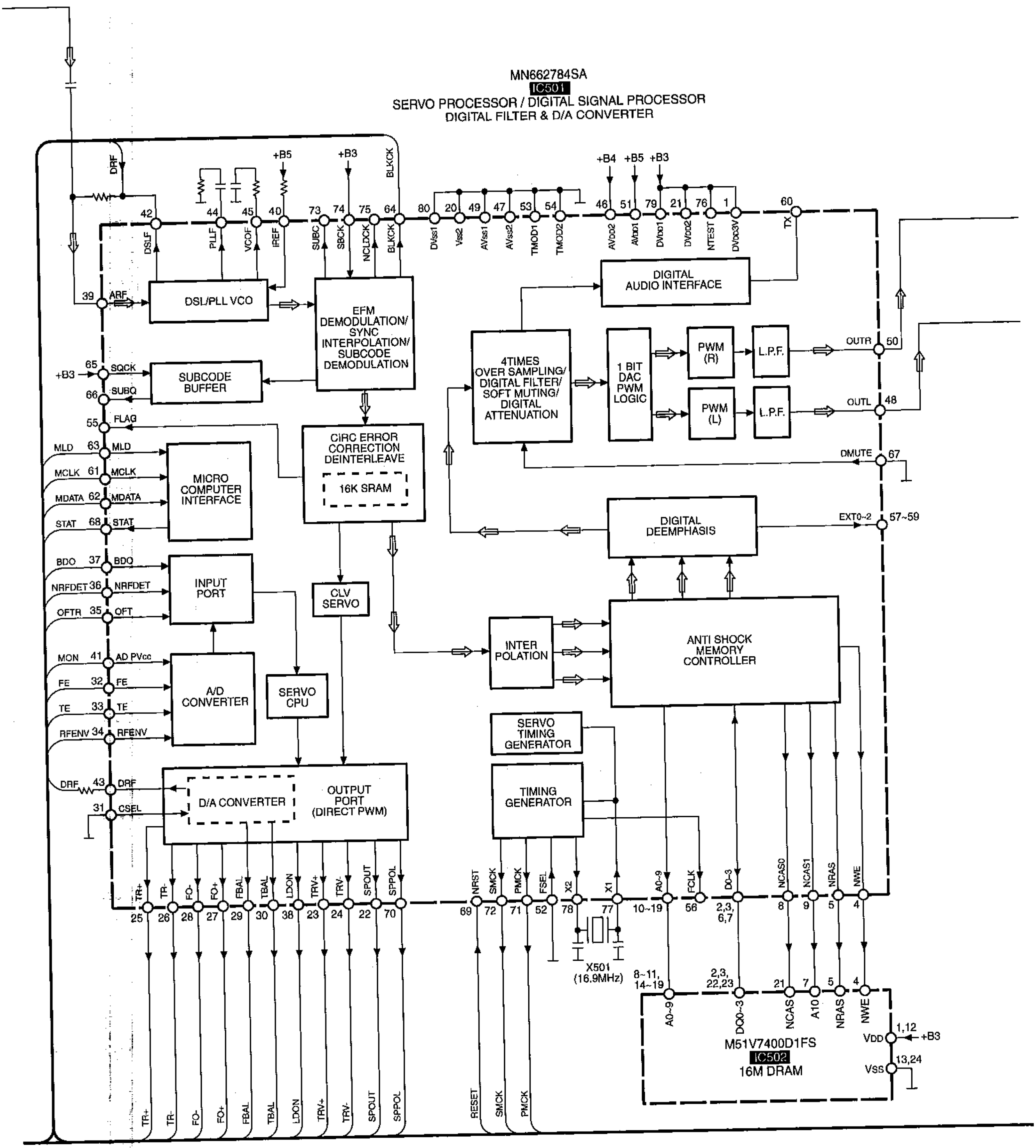


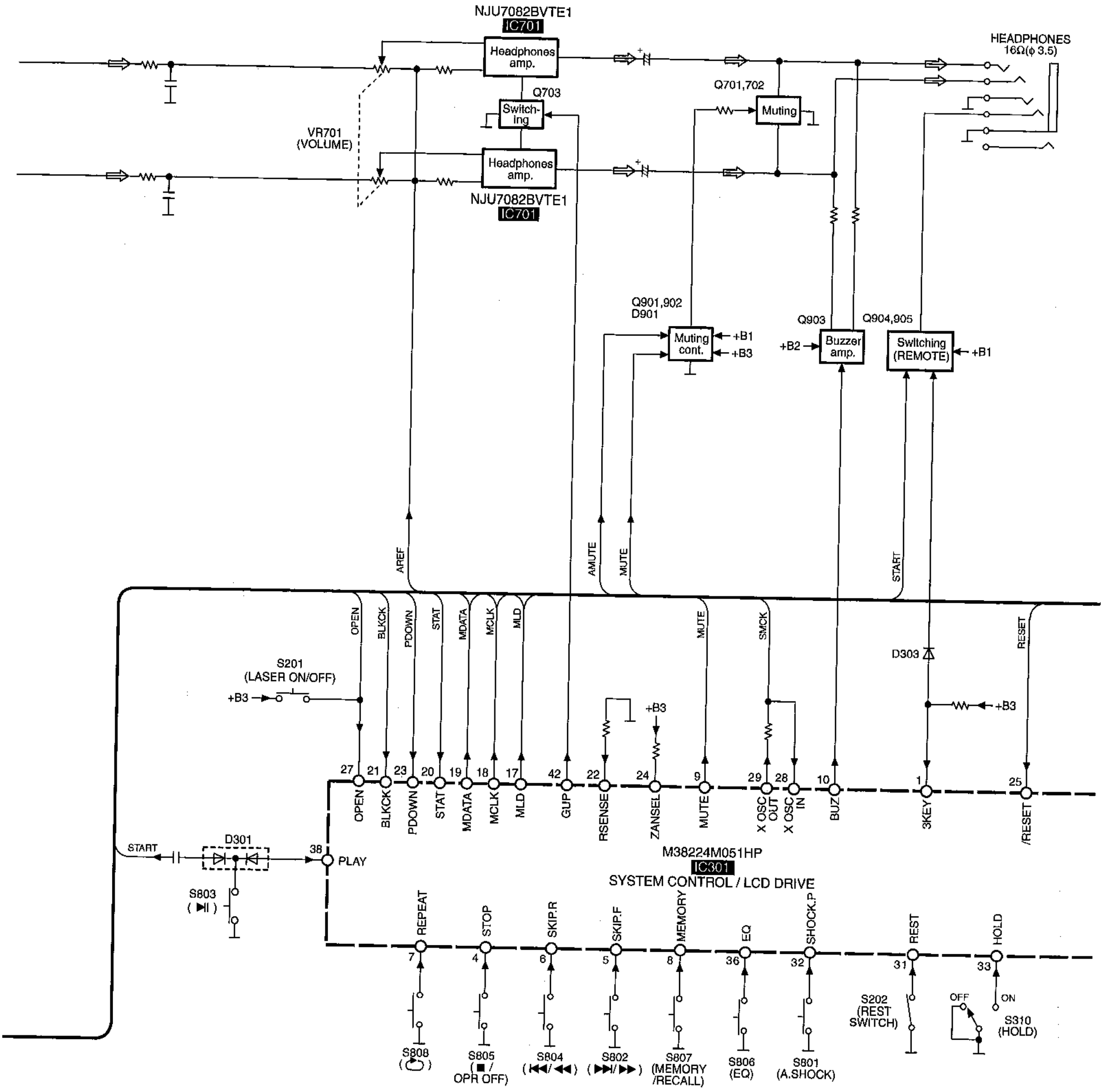
■ ELECTRICAL PARTS LOCATION

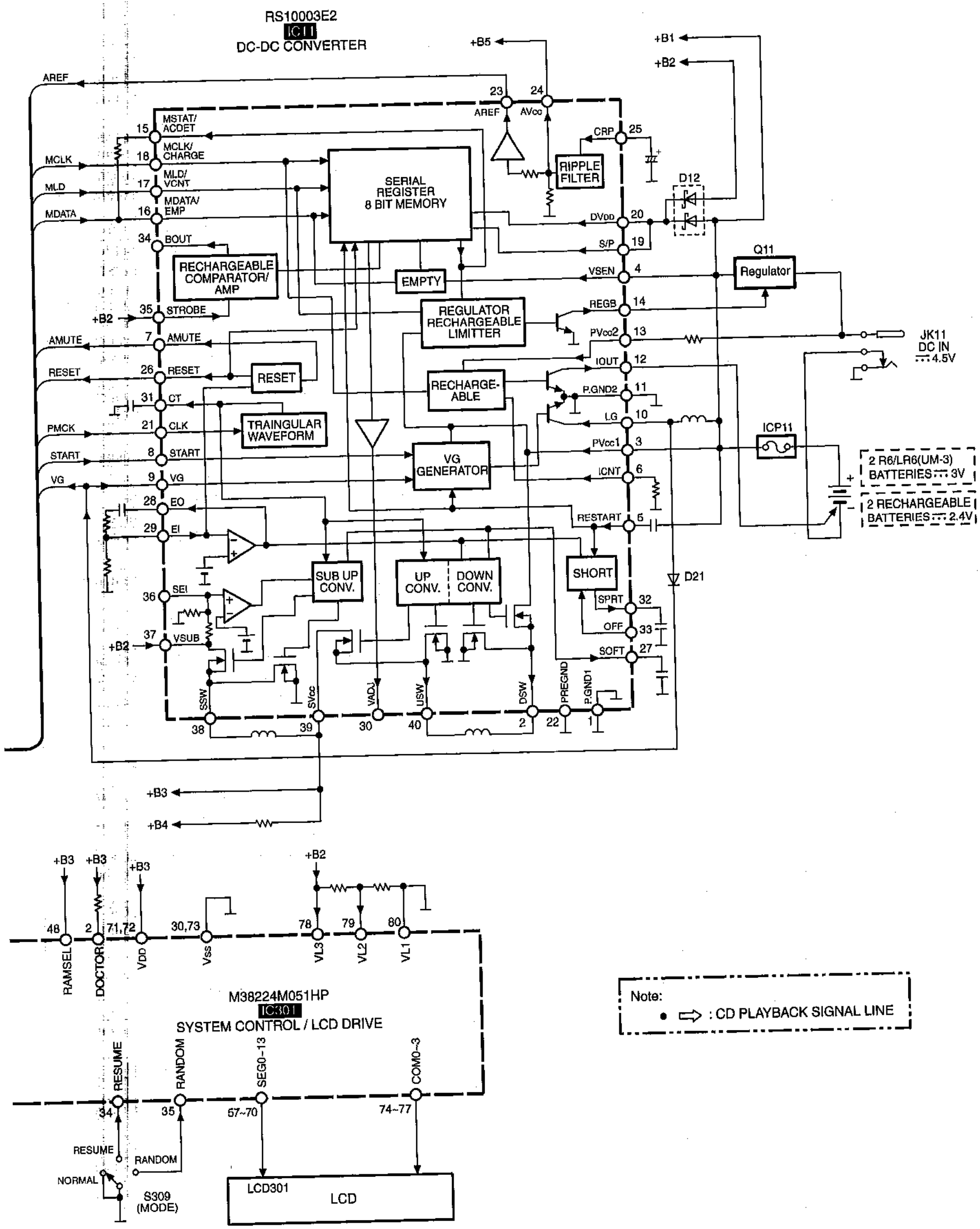
Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.
(SIDE: B)							
IC101	3I	R129	3J	R708	6K	C301	2I
IC301	2I	R301	2J	R709	7K	C302	2J
IC501	4J	R302	2J	R710	5L	C305	2J
Q11	2K	R304	2J	R711	6J	C402	4K
Q701	7K	R306	2H	R712	5K	C411	4K
Q702	6J	R307	2H	R750	7K	C503	3I
Q703	6J	R308	2J	R751	7K	C504	4I
Q901	5J	R323	3H	RJ2	3J	C505	4I
Q902	5J	R325	2I	C10	3J	C506	4I
D11	3K	R501	4I	(C13)	3K	(C507)	5K
D21	2K	R502	3I	(C14)	3K	C508	4H
D901	5J	R505	4H	C15	2K	C509	4H
ICP11	7J	R506	4I	C16	3K	C510	4J
X501	5J	R508	4K	C17	2K	C511	4I
(S201)	2K	R511	5J	(C19)	3K	C514	5J
CN11	7J	R512	5I	C20	3J	C515	5I
(JK11)	2J	R513	4I	C21	3J	C603	4I
(JK701)	6L	R514	5J	C22	3J	C604	4I
R13	3K	R601	4I	C24	3J	(C610)	5J
R14	3K	R602	4I	(C27)	6J	(C701)	6K
R22	3J	R603	4I	C35	3J	C702	5K
R25	3K	R604	4I	C101	3I	C703	5K
R27	3J	R701	5K	C103	3I	C704	5K
R28	2K	R702	5K	C114	3I	(C705)	6K
R29	3K	R703	7K	C115	3I	(C706)	6K
R33	3J	R704	6K	C116	3J	C707	5L
R120	3J	R705	7K	C120	3I		
R121	3I	R706	6K	C121	3I		
R128	3J	R707	7K	(C201)	2J		

13 Block Diagram




MN662784SA
IC501
SERVO PROCESSOR / DIGITAL SIGNAL PROCESSOR
DIGITAL FILTER & D/A CONVERTER
DSL/PLL VCO
EFM DEMODULATION/ SYNC INTERPOLATION/ SUBCODE DEMODULATION
SUBCODE BUFFER
CIRC ERROR CORRECTION DEINTERLEAVE
16K SRAM
MICRO COMPUTER INTERFACE
INPUT PORT
CLV SERVO
A/D CONVERTER
SERVO CPU
D/A CONVERTER
OUTPUT PORT (DIRECT PWM)
DIGITAL AUDIO INTERFACE
4TIMES OVER SAMPLING/ DIGITAL FILTER/ SOFT MUTING/ DIGITAL ATTENUATION
1 BIT DAC PWM LOGIC
PWM (R)
PWM (L)
L.P.F.
DIGITAL DEEMPHASIS
INTER POLATION
ANTI SHOCK MEMORY CONTROLLER
SERVO TIMING GENERATOR
TIMING GENERATOR
X501 (16.9MHz)
M51V7400D1FS
IC502
16M DRAM
+B3
+B4
+B5
DRF
ARF
DSLF
PLLF
VCOF
IREF
SUBC
SBCK
NCLDCK
BLKCK
DVss1
Vss2
AVss1
AVss2
TMOD1
TMOD2
AVDD2
AVDD1
DVDD1
DVDD2
NTEST
DVDD3V
TX
SQCK
SUBQ
FLAG
MLD
MCLK
MDATA
STAT
BDO
NRFDET
OFTR
OFT
MON
AD PVcc
FE
TE
RFENV
CSEL
OUTR
OUTL
DMUTE
EXT0~2
57~59
TR+
TR-
FO-
FO+
FBAL
TBAL
LDON
TRV+
TRV-
SPOUT
SPPOL
NRST
RESET
SMCK
PMCK
FSEL
X2
X1
A0~9
FCLK
D0~3
DO0~3
NCAS0
NCAS1
NCAS
A10
NRAS
NWE
VDD
VSS
1,12
13,24
8~11, 14~19
2,3, 22,23
2,3, 6,7
10~19


NJU7082BVTE1
IC701
Headphones amp.
Q703
Switch-ing
VR701 (VOLUME)
Headphones amp.
NJU7082BVTE1
IC701
Q701,702
Muting
HEADPHONES
16Ω(φ 3.5)
Q901,902
D901
Muting cont.
+B1
+B3
Q903
+B2
Buzzer amp.
Q904,905
Switching (REMOTE)
+B1
AREF
AMUTE
MUTE
START
OPEN
BLKCK
PDOWN
STAT
MDATA
MCLK
MLD
MUTE
SMCK
RESET
D303
S201
(LASER ON/OFF)
+B3
+B3
+B3
27 21 23 20 19 18 17 42 22 24 9 29 28 10 1 25
OPEN BLKCK PDOWN STAT MDATA MCLK MLD GUP RSENSE ZANSEL MUTE X OSC OUT X OSC IN BUZ 3KEY /RESET
START
D301
38
PLAY
S803
(▶II)
M38224M051HP
IC301
SYSTEM CONTROL / LCD DRIVE
REPEAT STOP SKIP.R SKIP.F MEMORY EQ SHOCK.P REST HOLD
7 4 6 5 8 36 32 31 33
S808
S805
(■ / OPR OFF)
S804
(⏮/◀◀)
S802
(⏭/▶▶)
S807
(MEMORY /RECALL)
S806
(EQ)
S801
(A.SHOCK)
S202
(REST SWITCH)
OFF
ON
S310
(HOLD)



Note:
• ⇨ : CD PLAYBACK SIGNAL LINE

14 Terminal Function of IC's

14.1. IC101(AN8839NSBE1): 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	VDD	I	Power supply input 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 OFTR
11	CEA	I	HPF amplifier capacitor connection input terminal
12	BDO	O	Dropout signal output terminal (H: dropout)
13	LDON	I	APC control input terminal
14	GND	—	Connected to GND
15	/RFDET	O	RF detection signal output terminal (L: detection)
16	PDOWN	O	Reduced voltage detection signal output terminal
17	OFTR	O	Off-track signal output terminal (H: off-track)
18	NC	—	Not used, open
19	ENV	O	RF envelop signal output terminal
20	ENV OFF	I	Envelop control input terminal
21	NC	—	Not used, open
22	TE IN	I	Tracking error amplifier input terminal
23	TE OUT	O	Tracking error amplifier output terminal
24	FE OUT	O	Focus error amplifier output terminal
25	FE IN	I	Focus error amplifier input terminal
26	VREF	O	Reference voltage output terminal
27	TBAL	I	Tracking balance signal input terminal
28	FBAL	I	Focus balance signal input terminal

14.2. IC301(M38224M051HP): System Control / LCD Drive

Pin No.	Mark	I/O Division	Function
1	3KEY	I	A/D key input terminal
2	DOCTOR	I	Doctor mode input terminal (connected to power supply through resistor)
3	NC	—	Not used, open
4	STOP	I	STOP key input terminal
5	SKIP.F	I	SKIP.F key input terminal
6	SKIP.R	I	SKIP.R key input terminal
7	REPEAT	I	REPEAT key input terminal
8	MEMORY	I	MEMORY key input terminal
9	MUTE	O	Hard mute output terminal
10	BUZ	O	Buzzer control output terminal
11	NC	—	Not used, open
12	BOUT	I	Input terminal of battery charging voltage measurement (L: end) (Not used, open)
13	GND	—	Not used, open
14	TXPOWER	O	Optical output ON signal output terminal (Not used, open)
15	RDATA	O	Output terminal to LCD remote control (Not used, open)
16	RCLK	O	LCD remote control clock output terminal (Not used, open)
17	MLD	O	Output terminal of serial command latch to peripheral IC
18	MCLK	O	LCD remote control clock output terminal
19	MDATA	O	Command data output terminal
20	STAT	I	Data input terminal
21	BLKCK	I	Block clock input terminal
22	RSENSE	I	LCD remote control input terminal
23	PDOWN	I	Headphones power OFF input terminal
24	ZANSEL	I	For selection of battery remaining power indication input terminal
25	/RESET	I	Reset detection input terminal
26	BATT STROBE	O	Output terminal for measurement of battery charging voltage (measured by Hi-Z) (Not used, open)
27	OPEN	I	Cover open detection input terminal
28	XOSCIN	I	Clock signal input When MSEL is H: Crystal oscillator 1/2 frequency divided clock signal input terminal (I SMCK= 8.4672 MHz) When MSEL is L: Crystal oscillator 1/4 frequency divided clock signal input (I SMCK= 4.2336 MHz)
29	XOSCOUT	O	Crystal oscillator 1/2 frequencydivided clock signal output terminal
30	VSS	—	Connected to GND
31	REST	I	Reset detection input terminal
32	SHOCK.P	I	SHOCK.P key input terminal
33	HOLD	I	HOLD switch input terminal
34	RESUME	I	RESUM switch input terminal
35	RANDOM	I	RANDOM switch input terminal
36	EQ	I	EQ key input terminal
37	BATTERY	I	BATT CHECK key input terminal (Not used, open)
38	PLAY	I	PLAY key input terminal
39~41	NC	—	Not used, open
42	GUP	O	Gain control output terminal for during XBS operation (When ON: increased 6 dB)
43~44	NC	—	Not used, open
45	JUDGE	—	Not used, open
46	LIGHT	—	Not used, open
47	NC	—	Not used, open
48	RAMSEL	I	For selection of 4M/16M DRAM input terminal (Not used, open)
49~50	NC	—	Not used, open
51	PMSEL	I	When 16MRAM: For selection of power management input terminal (Not used, open)
52	SM	I	When SP OFF: ANTI SHOCK detection OFF switching input terminal (Not used, open)
53	NC	—	Not used, open
54	DISEL	—	Not used, open
55~56	NC	—	Not used, open
57~70	SEG13~SEG0	O	LCD segment signal output terminal
71~72	VDD	I	Power supply input terminal
73	VSS	—	GND terminal
74~77	COM3~COM0	O	LCD segment signal output terminal
78	VL3	I	Power supply input terminal
79~80	VL2~VL1	I	Power supply input terminal (LCD drive bias)

14.3. IC401(AN8746SAE1): Coil and Motor Drive

Pin No.	Mark	I/O Division	Function
1	PVCC1	I	Power supply input terminal
2	VCC	I	Power supply input terminal
3	MON	I	A/D reference voltage monitor input terminal
4	FI1	I	Focus coil (+) drive signal input terminal
5	RI1	I	Focus coil (-) drive signal input terminal
6	RO1	O	Focus coil (-) drive signal output terminal
7	PGND1	—	GND terminal
8	FO1	O	Focus coil (+) drive signal output terminal
9	FO2	O	Tracking coil (+) drive signal output terminal
10	PGND2	—	GND terminal
11	RO2	O	Tracking coil (-) drive signal output terminal
12	RI2	I	Tracking coil (-) drive signal input terminal
13	FI2	I	Tracking coil (+) drive signal input terminal
14	GND	—	GND terminal
15	NC	—	Not used, open
16	PVCC2	I	Power supply input terminal
17	PVCC3	I	Power supply input terminal
18	VGO	O	Output terminal to power supply
19	VGI	I	Power supply input terminal
20	FI3	I	Traverse motor (+) drive signal input terminal
21	RI3	I	Traverse motor (-) drive signal input terminal
22	RO3	O	Traverse motor (-) drive signal output terminal
23	PGND3	—	GND terminal
24	FO3	O	Traverse motot (+) drive signal output terminal
25	FO4	O	Traverse motot (+) drive signal output terminal
26	PGND4	—	GND terminal
27	RO4	O	Traverse motor (-) drive signal output terminal
28	RI4	I	Traverse motor (-) drive signal input terminal
29	FI4	I	Traverse motor (+) drive signal input terminal
30	PC	I	Hard mute input terminal
31	AC	I	Power supply input terminal
32	PVCC4	I	Power supply input terminal

14.4. IC11(RS10003E2): DC/DC Converter

Pin No.	Mark	I/O Division	Function
1	PGND1	—	GND terminal
2	DSW	O	DC/DC converter coil drive output terminal
3	PVCC1	I	Power supply input terminal
4	VSEN	I	Empty detection input terminal (connected to power supply)
5	RESTART	I	DC/DC converter drive input terminal
6	ICNT	I	Setting of charging current input terminal (Connected to GND through resistor)
7	AMUTE	O	Muting signal output terminal
8	START	I	Starting of DC/DC converter input terminal
9	VG	I	Power supply input terminal
10	LG	I	Coil drive input terminal for VG voltage increase (connected to power supply)
11	PGND2	—	GND terminal
12	IOUT	O	Charging signal and charging feedback output terminal
13	PVCC2	I	Power supply input terminal
14	REGB	O	Regulator drive signal output terminal
15	MSTAT/ACDET	O	DC jack detection output terminal
16	MDATA/EMP	I	Power drop detection input terminal
17	MLD/VCNT	I	Regulator voltage switching input terminal
18	MCLK/CHARGE	I	Charging ON/OFF input terminal
19	S/P	I	Serial/parallel switching input terminal (connected to power supply)
20	DVDD	I	Power supply input terminal
21	CLK	I	DC/DC converter external clock input terminal
22	PREGND	—	GND terminal
23	AREF	O	Audio reference output terminal
24	AVCC	O	Ripple filter output terminal
25	CRP	I	Ripple filter smoothing capacitor connection terminal
26	RESET	O	Reset detection output terminal
27	SOFT	O	Soft start setting output terminal (connected GND through capacitor)
28	EO	O	DC/DC converter error amplifier output terminal
29	EI	I	DC/DC converter error amplifier input terminal
30	VADJ	O	Output for varying DC/DC converter output terminal (Not used, open)
31	CT	O	Triangular wave output terminal (connected GND through capacitor)
32	SPRT	O	Output terminal for setting of constants anti-power OFF (connected to GND through capacitor)
33	OFF	—	DC/DC converter OFF(Not used, open)
34	BOUT	O	Amplifier output terminal (Not used, open)
35	STROBE	I	Strobe input terminal
36	SEI	I	Sub DC/DC converter error amplifier input terminal (Not used, open)
37	VSUB	I	Power supply input terminal
38	SSW		
39	SVCC		
40	USW	I	DC/DC converter coil drive input terminal

14.5. IC501(MN662784SA): Servoprocessor, Digital Signal Processor, Digital Filter and D/A Converter

Pin No.	Mark	I/O Division	Function
1	DVDD3V	I	Power supply input terminal for DRAM
2	D0	I/O	Data input/output terminal for DRAM
3	D1		

Pin No.	Mark	I/O Division	Function
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	A8~4	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	VSS2	—	GND terminal
21	DVDD2	I	Power supply input terminal for digital circuits
22	SPOUT	O	Spindle motor drive output terminal
23	TRV+	O	Traverse motot drive(+) output terminal
24	TRV-	O	Traverse motot drive (-) output terminal
25	TR+	O	Tracking coil drive (+) output terminal
26	TR-	O	Tracking coil drive (-) output terminal
27	FO+	O	Focus coil drive (+) output terminal
28	FO-	O	Focus coil drive (-) output terminal
29	FBAL	O	Focus balance adjustment output terminal
30	TBAL	O	Tracking balance adjustment output terminal
31	CSEL	—	Connected to GND
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	BDO	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	AD PVCC	O	A/D reference voltage output terminal
42	DSLF	O	Loop filter output terminal for DSL
43	DRF	O	Bias output terminal for DSL
44	PLLF	O	Loop filter output terminal for PLL
45	VCOF	O	Loop filter output terminal for jitter-free VCO
46	AVDD2	I	Power supply input terminal for analog circuits
47	AVSS2	—	Connected to GND
48	OUTL	O	Left channel audio signal output terminal
49	AVSS1	—	Connected to GND
50	OUTR	O	Right channel audio signal output terminal
51	AVDD1	I	Power supply input terminal for analog circuits
52	FSEL	I	Noise filter ON/OFF switching input (L: ON) (Connected to GND)
53	TMOD1	I	Terminal mode switching input 1 (L: normal) (Connected to GND)
54	TMOD2	I	Terminal mode switching input 2 (L: normal) (Connected to GND)
55	FLAG	—	Flag signal output (Not used, open)

Pin No.	Mark	I/O Division	Function
56	FCLK	—	LCD frame click signal output (Not used, open)
57~58	EXT0 ~EXT2	I	Not used, open
60	TX	O	Digital audio interface signal output terminal (Not used, open)
61	MCLK	I	Microprocessor command clock signal input terminal (detected at leading edge)
62	MDATA	I	Microprocessor command data signal input terminal
63	MLD	I	Microprocessor command control signal input terminal (L: load)
64	BLKCK	O	Sub-code block clock signal output terminal (I=75Hz)
65	SQCK	I	External clock input terminal for sub-code Q resistor (Connected to power supply)
66	SUBQ	—	Sub-code Q data output terminal (Not used, open)
67	DMUTE	—	Mute input terminal (H: mute) (Not used, connected 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
71	PMCK	O	Clock signal output terminal
72	SMCK	O	System clock signal output terminal
73	SUBC	O	Sub-code output terminal (Not used, open)
74	SBCK	I	Clock input terminal for sub-code output terminal (Connected to power supply)
75	NCLDCK	O	Sub-code frame clock signal output terminal (Not used, open)
76	NTEST	I	Test terminal (normal: H)
77	X1	I	Crystal oscillator circuit input terminal (F=16.9MHz)
78	X2	O	Crystal oscillator circuit output terminal (F=16.9MHz)
79	DVDD1	I	Power supply input terminal for digital circuits
80	DVSS1	—	Connected to GND

15 Replacement Parts List

Notes:

*Inportant 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 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 (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, 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>,<IB>, <IC>" marks in Remarks indicate languages of instruction manuals.

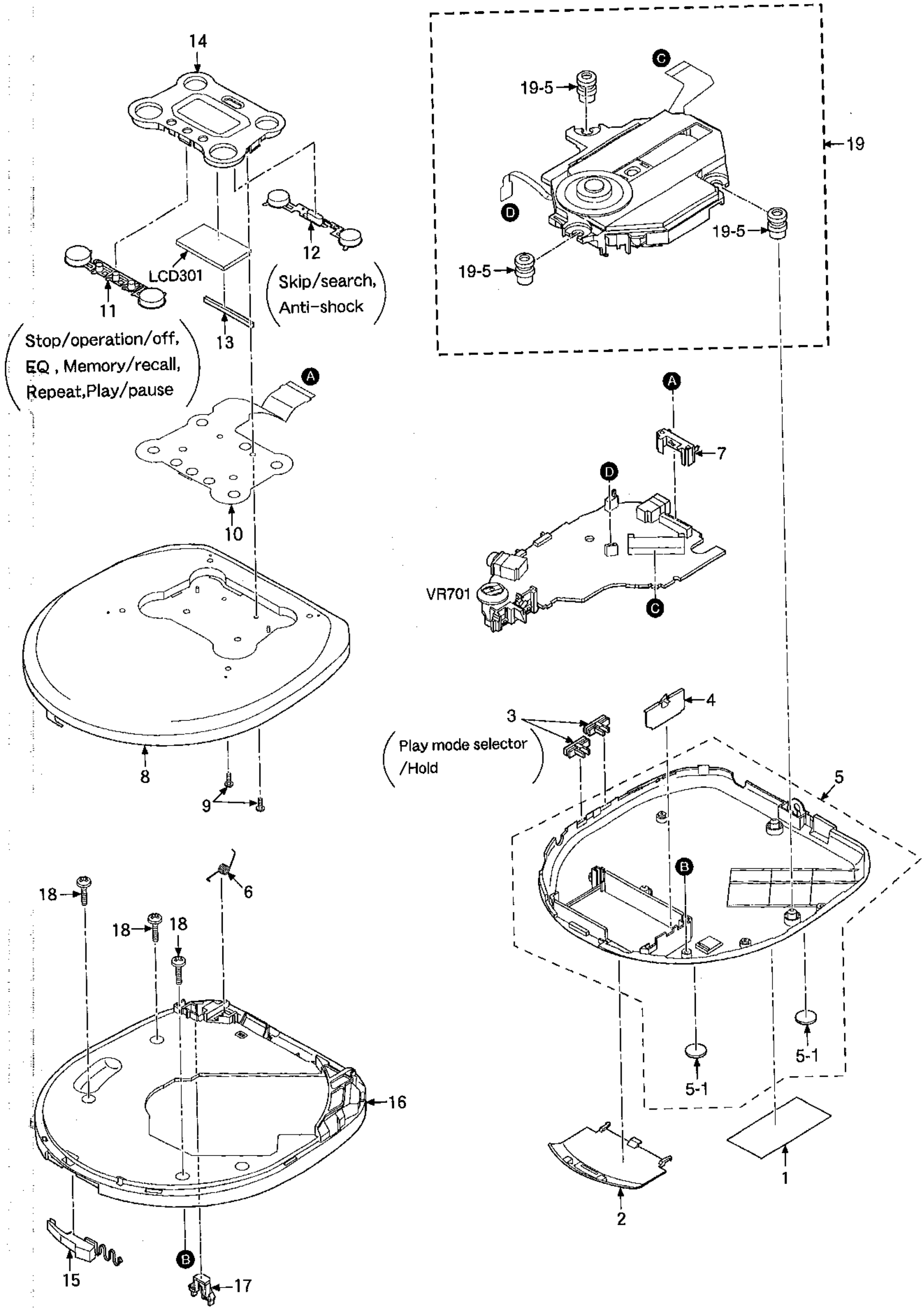
[<IA>:English/Spanish/Swedish/German/Italian/French, <IB>:Netherlands/Russian/Polish/Danish/Czeco,<IC>: English]

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1	RGN1905-K	NAME PLATE	1	(EB)
1	RGN1904-K	NAME PLATE	1	(EG)
2	RKK0135-H	BATTERY LID	1	
3	RGV0200-K	SWITCH KNOB	2	
4	RJC93020	BATTERY TERMINAL	1	
5	RFKJLSX270EG	BOTTOM CABINET ASS'Y	1	
5-1	RKA0112-K	FOOT	2	
6	RME0308	OPEN SPRING	1	
7	RML0578	FPC HOLDER	1	
8	RGD0065-A	CD COVER	1	(A)
8	RGD0065-S	CD COVER	1	(S)
9	RHE5119YA	SCREW	2	
10	RSG0052-L	OPERATION P.C.B.	1	
11	RGU1837-S	OPERATION BUTTON(B)	1	
12	RGU1836-S	OPERATION BUTTON(A)	1	
13	RSQ0070	RUBBER	1	
14	RYF0541-4A	LID ORNAMENT ASS'Y	1	(A)
14	RYF0541-A	LID ORNAMENT ASS'Y	1	(S)
15	RGU1838-H	OPEN KNOB	1	
16	RKM0411-H	INTERMEDIATE CABINET	1	
17	RML0580	STOPPER	1	
18	XTN17+6GFZ	SCREW	3	
19	RAE0145Z	TRAVERSE DECK	1	⚠
19-1	RAF0142A	OPTICAL PICKUP	1	⚠
19-2	RDG0305	GEAR	1	
19-3	RDG0306	GEAR	1	
19-4	RJB2106A	TRAVERSE FPC	1	
19-5	RMG0449-H	FLOATING RUBBER	3	
19-6	RMC0264	THRUST SPRING	1	
19-7	RXQ0482	NUT PLATE SPRING	1	
19-8	RXQ0525	TRAVERSE MOTOR	1	
19-9	SNSD38	SCREW	1	
19-10	XQN17+BG45	SCREW	1	
19-11	XQN17+CG45	SCREW	1	
19-12	XQN2+BG55	SCREW	1	
A1	RFEA403B-S	AC ADAPTOR	1	(EB) ⚠
A1	RFEA419E-M	AC ADAPTOR	1	(EG) ⚠
A2	RFEV335P-KS	STEREO EARPHONES	1	
A3	RFEV015PCKS	REMOTE CONTROLLER	1	
A4	RQA0117	WARRANTY CARD	1	
A5	RQCB0169	SERVICE CENTER LIST	1	
A6	RQT5361-E	INSTRUCTION MANUAL	1	(EG)<IA>
A6	RQT5362-H	INSTRUCTION MANUAL	1	(EG)<IB>
A6	RQT5363-B	INSTRUCTION MANUAL	1	(EB)<IC>
C10	ECUV1H121KCV	50V 120P	1	
C11	ECUVNA105ZFV	10V 1U	1	
C12	ECST0JY475RR	6.3V 4.7U	1	
C13	RCE0JSL470IX	6.3V 47U	1	
C14	RCE0JKA221IG	6.3V 220U	1	
C15	ECUZNC104ZFV	16V 0.1U	1	
C16,17	ECUVNA105ZFV	10V 1U	2	
C19	ECA1CAK220XH	16V 22U	1	
C20	ECUVNA105ZFV	10V 1U	1	
C21	ECUVNH103KBV	50V 0.01U	1	
C22	ECUZNC104ZFV	16V 0.1U	1	
C24	ECUV1H561KBV	50V 560P	1	
C26	ECUVNA105ZFV	10V 1U	1	
C27	RCE0JRC102BG	6.3V 1000U	1	
C33	ECST0JY475RR	6.3V 4.7U	1	
C35,36	ECUVNA105ZFV	10V 1U	2	
C101	ECUVNC104KBV	16V 0.1U	1	
C103	ECUVNE223KBV	25V 0.022U	1	
C111	ECUVNE223KBV	25V 0.022U	1	
C112	ECUV1H221KBV	50V 220P	1	
C113,1 4	ECUZNC104ZFV	16V 0.1U	2	
C115- 17	ECUVNE223KBV	25V 0.022U	3	
C120	ECUV1H152KBV	50V 1500P	1	
C121	ECUV1H121KCV	50V 120P	1	
C201	ECEA1AKS470	10V 47U	1	
C301,0 2	ECUVNA105ZFV	10V 1U	2	
C304	ECUVNJ105KBN	63V 1U	1	
C305	ECUV1C224ZFV	16V 0.22U	1	
C401	ECUZNC104ZFV	16V 0.1U	1	
C402	ECUVNA105ZFV	10V 1U	1	
C410	ECUVNA105ZFV	10V 1U	1	
C411	ECUZNC104ZFV	16V 0.1U	1	
C503	ECUV1H561KBV	50V 560P	1	
C504	ECUZNC104ZFV	16V 0.1U	1	
C505	ECUVNE223KBV	25V 0.022U	1	
C506	ECUVNA224KBV	10V 0.22U	1	
C507	RCE0JKA221IG	6.3V 220U	1	
C508	ECUV0J474KBV	6.3V 0.47U	1	
C509	ECUVNH103KBV	50V 0.01U	1	
C510,1 1	ECUZNC104ZFV	16V 0.1U	2	
C514	ECUV1H102KBV	50V 1000P	1	
C515	ECUZNC104ZFV	16V 0.1U	1	
C525	ECUZNC104ZFV	16V 0.1U	1	
C603,0 4	ECUV1H272KBV	50V 2700P	2	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C610	ECA0JAK470XH	6.3V 47U	1	
C701	ECEA1AKS470	10V 47U	1	
C702	ECUZNC104ZFV	16V 0.1U	1	
C703,04	ECUVNJ105KBV	63V 1U	2	
C705,06	ECA0JAK101XH	6.3V 100U	2	
C707	ECUZNC104ZFV	16V 0.1U	1	
C901	ECUV1H332KBV	50V 3300P	1	
CN11	RJH8303-2	BATTERY TERMINAL	1	
CN101	RJS2A6216T	CONNECTOR(16P)	1	
CN301	RJS2A6130T	CONNECTOR(30P)	1	
CN401	RJS2A5106T1	CONNECTOR(6P)	1	
D11	MA1070400L	DIODE	1	
D12	MA741WKTX	DIODE	1	
D21	MA111TX	DIODE	1	
D301	MA142WKTX	DIODE	1	
D303	MA111TX	DIODE	1	
D901	MA142WKTX	DIODE	1	
IC11	RS10003E2	IC	1	
IC101	AN8839NSBE2	IC	1	
IC301	M38224M051HP	IC	1	
IC401	AN8746SAE1	IC	1	
IC501	MN662784SA	IC	1	
IC502	MNV7400CT1T	IC	1	
IC701	NJU7082BVTE1	IC	1	
ICP11	RSFPB20ET-L	IC PROTECTOR	1	⚠
JK11	RJJ43K09-C	JACK,DC IN	1	
JK701	RJJ36T02-C	JACK,HEADPHONES	1	
L11	RLQU331KT-W	COIL	1	
L12	RLQS101KT1-D	COIL	1	
L13	RLQU331KT-W	COIL	1	
LCD301	RSL5254-K	LCD	1	
P1	RPK1400	PACKING CASE	1	(A)
P1	RPK1399	PACKING CASE	1	(S)
P2	RPQ0836-1	PAD	1	
P3	RPQ0924	PAD	1	
P4	RPQ0966	PAD	1	
P5	RPF0046	PROTECTION BAG(F.B.)	1	(EG)
P6	RPF0111	PROTECTION BAG(UNIT)	1	
PCB1	REP2914F-M	MAIN P.C.B.ASS'Y	1	(RTL)
Q11	2SB1132T100	TRANSISTOR	1	
Q201	2SB709ATX	TRANSISTOR	1	
Q701,02	2SD1328QRSTX	TRANSISTOR	2	
Q703	FMG6AT148	TRANSISTOR	1	
Q901	DTA114YUA106	TRANSISTOR	1	
Q902	FMG6AT148	TRANSISTOR	1	
Q903	UN5113TX	TRANSISTOR	1	
Q904,05	2SD1819ATX	TRANSISTOR	2	
R10-12	ERJ3GEYD103V	1/16W 10K	3	
R13	ERJ3GEYJ102V	1/16W 1K	1	
R14	ERJ3GEYJ222V	1/16W 1	1	
R22	ERJ3GEYJ223V	1/16W 22K	1	
R25,26	ERJ3GEYJ104Z	1/16W 100K	2	
R27	ERJ3GEYJ392V	1/16W 3.9K	1	
R28	ERJ3GEYJ100V	1/16W 10	1	
R29	ERJ3GEYJ562V	1/16W 5.6K	1	
R32	ERJ3GEYJ103Z	1/16W 10K	1	
R33	ERJ3GEYD184V	1/16W 180K	1	
R120	ERJ3GEYJ103Z	1/16W 10K	1	
R121,22	ERJ3GEYJ124V	1/16W 120K	2	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R128,29	ERJ3GEYJ103Z	1/16W 10K	2	
R201	ERJ3GEYJ223V	1/16W 22K	1	
R202	ERJ3GEYJ2R2V	1/16W 2.2	1	
R301	ERJ3GEYJ392V	1/16W 3.9K	1	
R302	ERJ3GEYJ104Z	1/16W 100K	1	
R304	ERJ3GEYJ105V	1/16W 1M	1	
R306	EXBV8V473JV	1/16W 47K	1	
R307	ERJ3GEYJ103Z	1/16W 10K	1	
R308	ERJ3GEYJ104Z	1/16W 100K	1	
R313	ERJ3GEYJ102V	1/16W 1K	1	
R321	ERJ3GEYJ223V	1/16W 22K	1	
R322,23	ERJ3GEYJ104Z	1/16W 100K	2	
R325	ERJ3GEYJ333V	1/16W 33K	1	
R501	ERJ3GEYJ683V	1/16W 68K	1	
R502	ERJ3GEYJ563V	1/16W 56K	1	
R505	ERJ3GEYJ391V	1/16W 390	1	
R506	ERJ3GEYJ222V	1/16W 2.2K	1	
R508	ERJ3GEYJ1R0V	1/16W 1	1	
R511	ERJ3GEYJ102V	1/16W 1K	1	
R512	EXBV4V102JV	1/32W 1K	1	
R513	ERJ3GEYJ104Z	1/16W 100K	1	
R514	ERJ3GEYJ681V	1/16W 680	1	
R601,02	ERJ3GEY0R00V	1/16W 0	2	
R603,04	MCR03PZHJ561	1/16W 560	2	
R701,02	ERJ3GEYJ104Z	1/16W 100K	2	
R703,04	ERJ3GEYJ220V	1/16W 22	2	
R705,06	ERJ3GEYJ1R5V	1/16W 1.5	2	
R707,08	ERJ3GEYJ102V	1/16W 1K	2	
R709	EXBV4V392J	1/32W 3.9K	1	
R710	EXBV4V123J	1/32W 12K	1	
R711	EXBV4V103JV	1/32W 10K	1	
R712	EXBV4V331JV	1/32W 330	1	
R750-53	ERJ3GEYJ562V	1/16W 5.6K	4	
R901	EXBV4V821JV	1/32W 820	1	
R902	ERJ3GEYJ274V	1/16W 270K	1	
R903	ERJ3GEYJ474V	1/16W 470K	1	
R904	ERJ3GEYJ470V	1/16W 47	1	
R905	ERJ3GEYJ473V	1/16W 47K	1	
RJ2	ERJ3GEY0R00V	1/16W 0	1	
RJ502	ERJ3GEY0R00V	1/16W 0	1	
RJ504	ERJ3GEY0R00V	1/16W 0	1	
RJ506	ERJ3GEY0R00V	1/16W 0	1	
RJ508	ERJ3GEY0R00V	1/16W 0	1	
RJ510	ERJ3GEY0R00V	1/16W 0	1	
RJ512,13	ERJ3GEY0R00V	1/16W 0	2	
S201	ESE11SV6	SW,LASER ON/OFF	1	
S202	ESE11HS4	SW,REST DET.	1	
S309	RSS3A007-1A	SW,MODE	1	
S310	RSS2A010-1A	SW,HOLD	1	
VR701	EVUTUFB11C54	V.R.,VOLUME	1	
X501	RSXY16M9F02T	OSCILLATOR	1	

16 Cabinet Parts Location



17 Traverse Parts Location