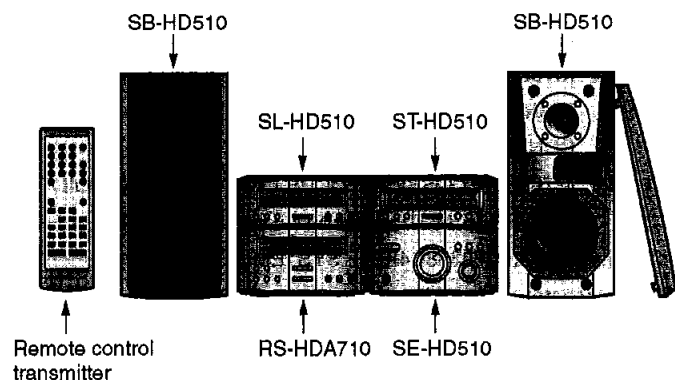


Service Manual

Compact Disc Player

COMPACT
disc
DIGITAL AUDIO

MASH
multi-stagenoise-shaping



SL-HD510 SL-HD310

Traverse Deck : RAE0152Z Mechanism Series

Colour

(N).....Gold Type

Area

E.....Europe.

System:SC-HD510

SC-HD310

Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.

Note: Refer to the service manual for Model No.SE-HD510,SE-HD310 (ORDER NO.AD0001015C2, AD0001018C2) for information on "ACCESSORIES" and "PACKAGING".

Specification

●Audio		
DA converter:	1 bit 2 DAC MASH	
Digital output terminal:	Opticalx1	
●Pickup		
Wavelength:	780nm	
●Format		
Sampling frequency:	44.1kHz	
●General		
Dimensions (WxHxD):	196x76.8x243.1mm	
Weight:	1.2kg	
Power Supply[For (E) area only]:	DC13V/10V	
Power Consumption:	10W	
Notes:	1.Design and specifications are subject to change without notice. 2.Dimensions and weight are approximate.	
●System/SC-HD510	Tuner:ST-HD510,Compact Disc Player:SL-HD510,Amplifier:SE-HD510,Cassette Deck:RS-HDA710,Speakers:SB-HD510(Made in MAES.)	
●System/SC-HD310	Tuner:ST-HD310, Compact Disc Player:SL-HD310, Amplifier:SE-HD310, Cassette Deck:RS-HD310 ,Speakers:SB-HD310 (Made in MAES.)	

⚠ 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.

Technics®

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1 Before Repair

These equipments (SL-HD510/310), which are the components of these systems, are supplied with power from the amplifiers (SE-HD510/310) through the tuners (ST-HD510/310). When repairing these equipments or checking operation of the systems, be sure to connect the amplifiers and tuners with it.

These equipments, even in the state of it as a single equipment, permits power supply and operation check. When operating it as a single equipment without the amplifier and tuner, refer to the paragraph of "Measurements and Adjustments."

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 μ W/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 enthält eine Laserdiode.

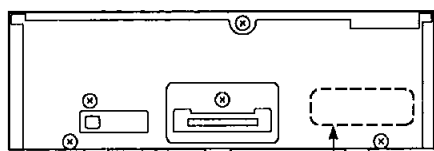
Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Lasereinheit abgestrahlt.

Wellenlänge: 780 nm

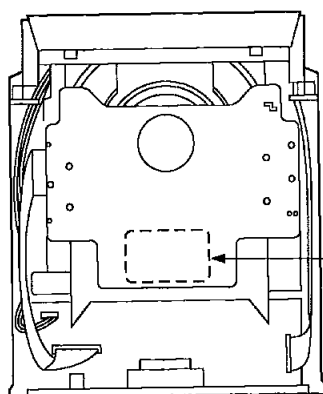
Maximale Strahlungsleistung der Lasereinheit: 100 μ W/VDE

Die Strahlungen der Lasereinheit ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Lasereinheit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlines blicken.
4. Nicht über längere Zeit in die Fokussierlines blicken.



LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT



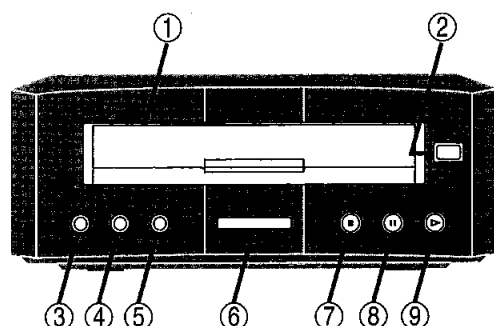
DANGER	INVISIBLE LASER RADIATION WHEN OPEN AVOID DIRECT EXPOSURE TO BEAM.
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBENING, NR SIKKERHEDSÅBNEDERE ER LIGE AF FUNKTION. LINDS UDSEENDELSE FOR STRÅLING.
VARO!	AVATTARESSA JA SUOJALUKUTUS OHITETTÄESSÄ OLETÄLTIIN NÄKYMÄT... NT LASERSTEILYLLÄ... L. KATSO STEESEN.
VARNING	OSYNLIG LASERSTRÅLING NR DENNA DEL R...PPNAD OCH SPRÄD R. LUKOPLAD... BETRÄKTA EJ STRÅLEN.
ADVARSEL	USYNLIG LASERSTRÅLING NR DENSEL PNESS OGSIKKERHEDSLS BRYTES... LING EKSPOSERING FOR STRÅLEN.
VORSICHT	UNSICHTBARE LASERSTRABHLUNG WENN ABERDECKUNG GE...TNET. NICHT DEM STRAHL AUSSETZEN.

CAUTION!

THIS PRODUCT UTILIZES A LASER.

USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

3 Operating Instructions



- ① Disc tray
- ② Disc tray open/close button (▲ OPEN/CLOSE)
- ③ CD TEXT button (CD TEXT)
- ④ Scroll button (SCROLL)
- ⑤ AI edit button (AI EDIT)
- ⑥ Skip/search buttons (◀◀ / ◀, ▶▶ / ▶)
- ⑦ Stop button (■)
- ⑧ Pause button (||)
- ⑨ Play button and indicator (▷)

The color of the indicator depends on the operation taking place.

If stopped: orange

If playing: green

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 of traverse deck (optical pickup)

1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. The short land between the No. 5 (GND) and No. 4 (LD) pins on the flexible board is shorted with a solder build-up to prevent damage to the laser diode. (As shown in Fig. 1.) To connect to the PC board, be sure to open by removing the solder build-up, and finish the work quickly.
3. Take care not to apply excessive stress to the flexible board (FFC).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted. (As shown in Fig. 1.)

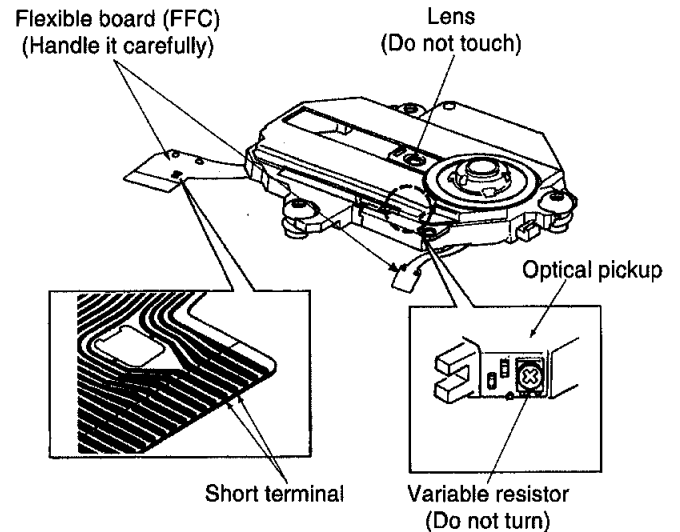


Fig. 1

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. 2.)
2. Work table grounding
Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

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).

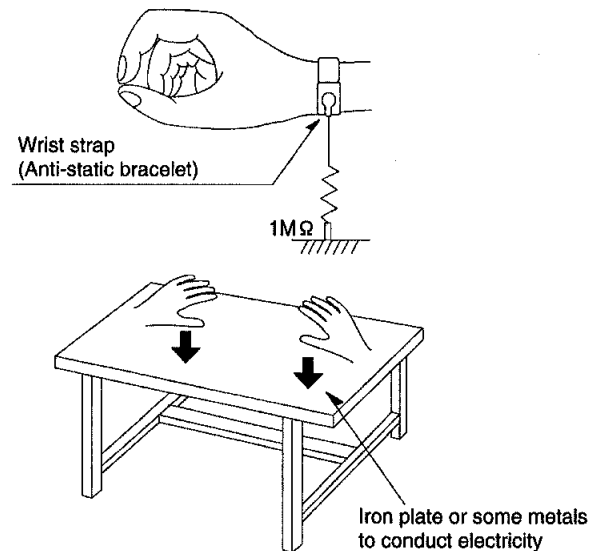
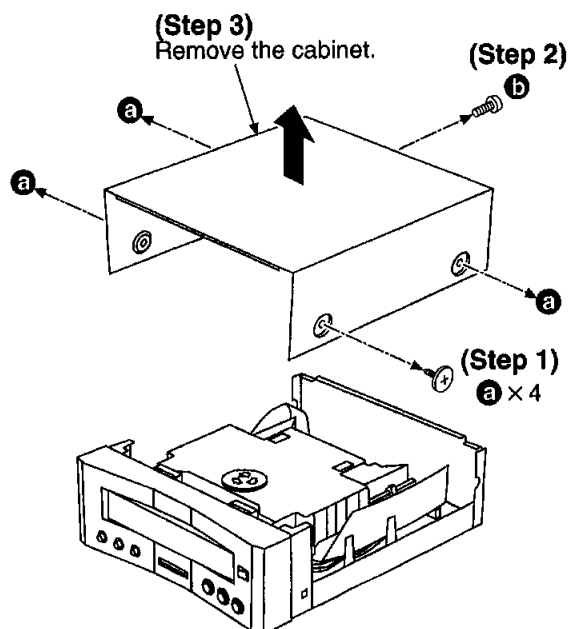


Fig. 2

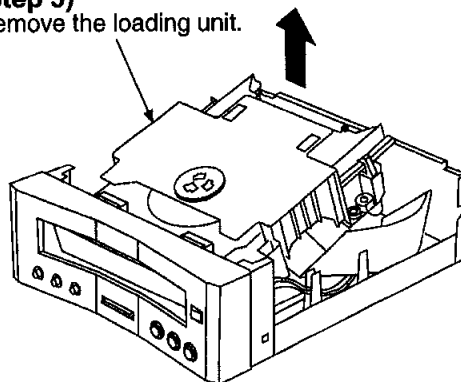
5 Operation Checks and Component Replacement Procedures

- 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.

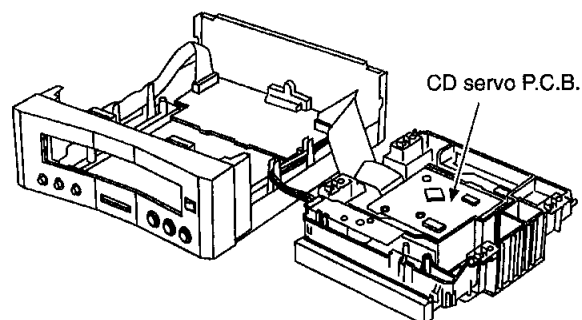
5.1. Checking for the CD servo P.C.B.



(Step 5)
Remove the loading unit.

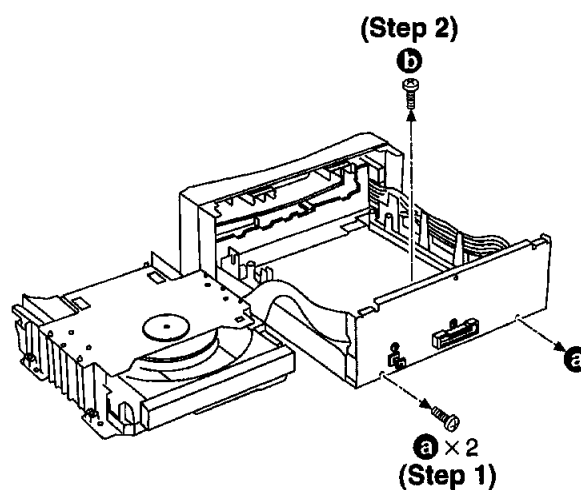
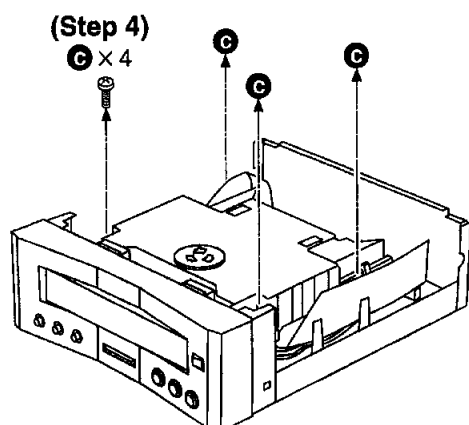


- Check the CD servo P.C.B. as shown below.



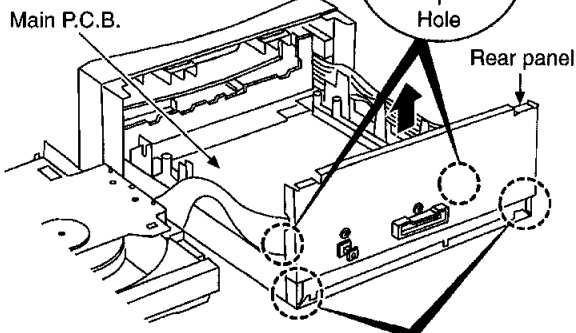
5.2. Checking for the main P.C.B.

- Follow the (Step 1) - (Step 5) of item 5.1.

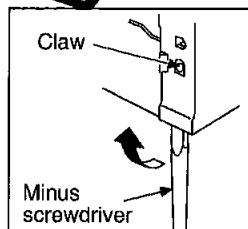


NOTE:

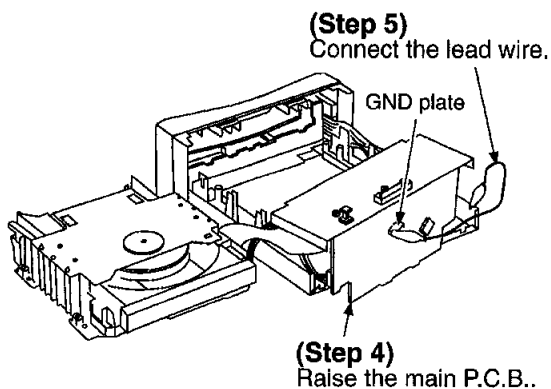
When installing the main P.C.B., make sure that the holes of main P.C.B. are aligned with the ribs of bottom cabinet.

**(Step 3)**

Release the 2 claws, and then remove the main P.C.B. and rear panel.

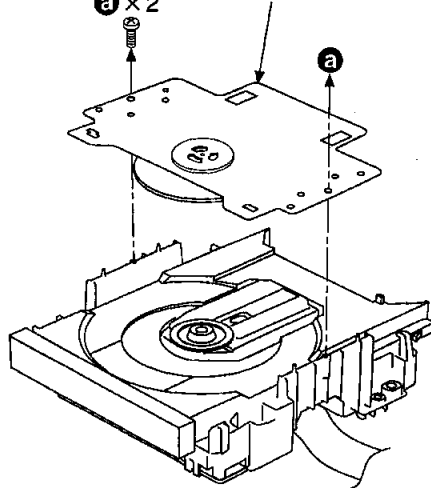


• Check the main P.C.B. as shown below.

**(Step 4) (Step 5)**

a × 2

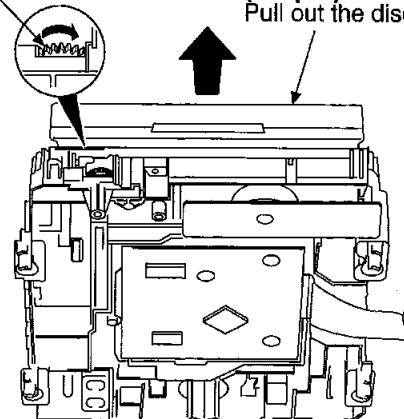
Remove the disc clamber ass'y.

**(Step 6)**

Rotate the gear.

(Step 7)

Pull out the disc tray.



5.3. Replacement for the traverse deck ass'y

• Follow the (Step 1) - (Step 5) of item 5.1.

(Step 3)

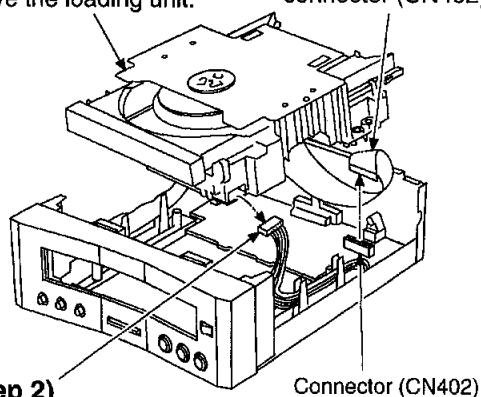
Remove the loading unit.

(Step 1)

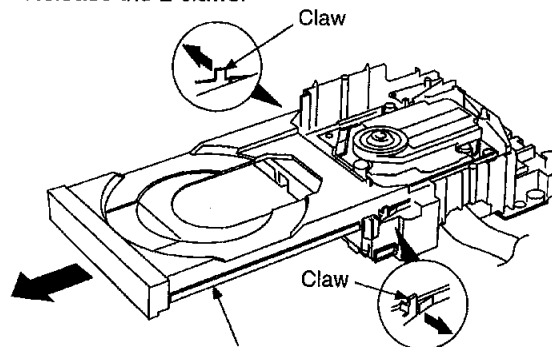
Pull out the FFC from connector (CN402).

(Step 2)

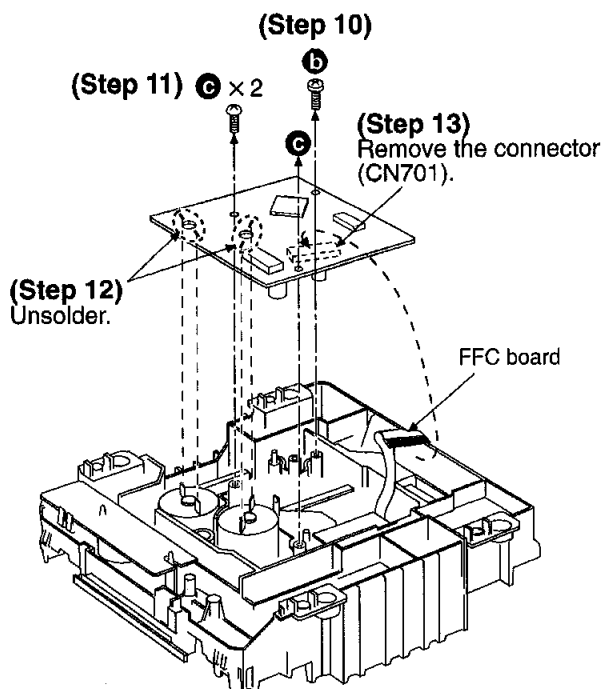
Remove the connector.

**(Step 8)**

Release the 2 claws.

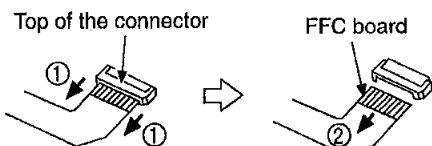
**(Step 9)**

Pull out the disc tray.



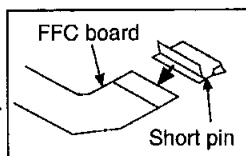
■ Removal of the FFC board

※ Push the top of the connector in the direction of arrow ①, and then pull out the FFC board in the direction of arrow ②.



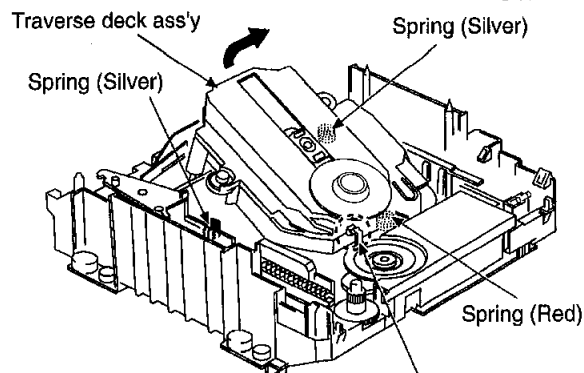
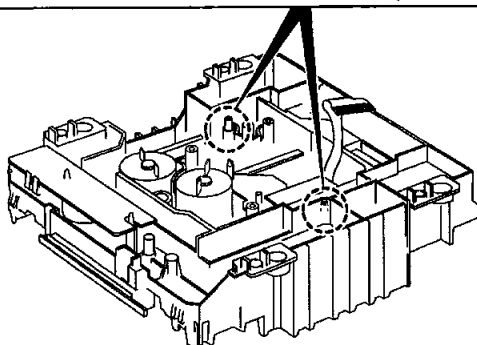
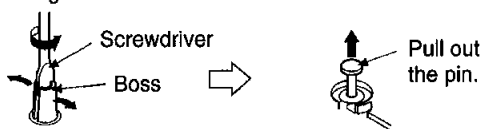
NOTE:

Insert a short pin into the traverse unit FFC board.
(Refer to "Handling Precautions for Traverse Deck".)



(Step 14)

1. Widen the boss using a regular screwdriver.
2. Pull out the pin in the direction of the arrow.



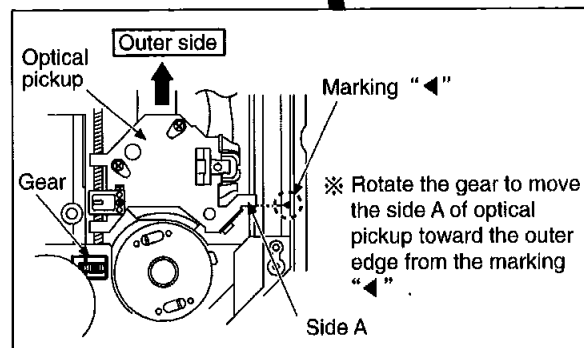
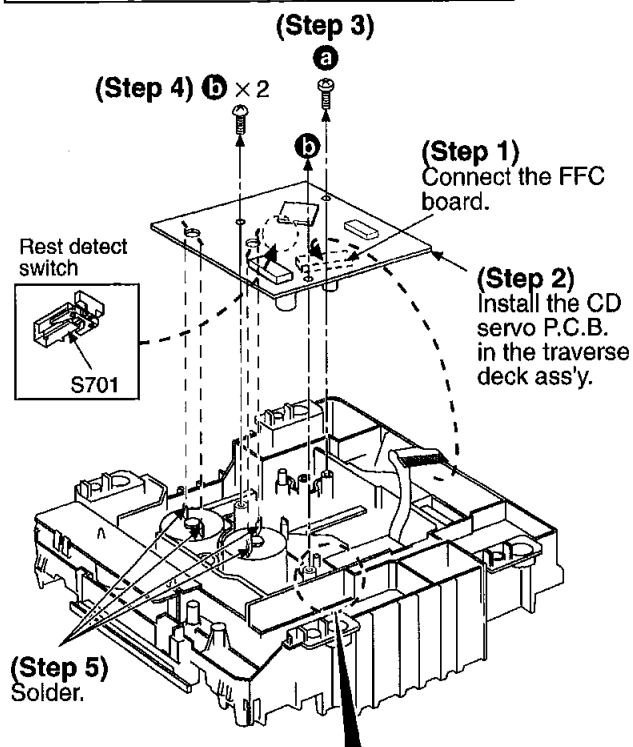
NOTE:

Be careful not to lose the 3 springs because those will also be removed on removal of the traverse deck ass'y.

(Step 15)

Remove the claw.

Installation of the CD servo P.C.B. after replacement



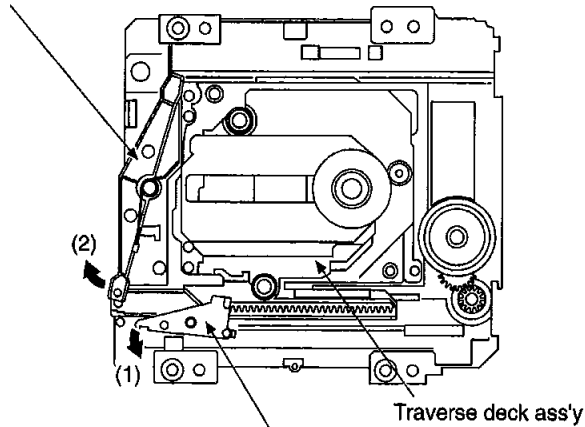
NOTE:

Before installing the CD servo P.C.B., move the optical pickup toward the outer edge from the mark "◀".
[Otherwise, the rest detect switch (S701) mounted on the CD servo P.C.B. may be damaged.]

Installation of the disc tray after replacement

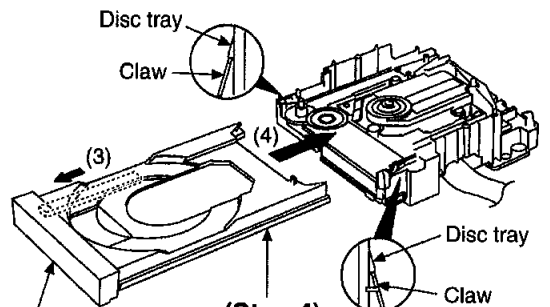
(Step 2)

Operate the conversion lever, and then locate the traverse deck ass'y to "UP" position.



(Step 1)

Release the lock lever.



(Step 3)

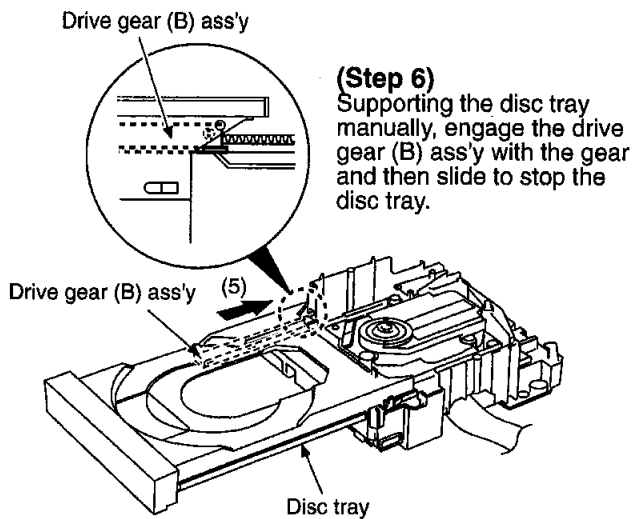
Move the drive ruck ass'y in the direction of arrow (3).

(Step 4)

Install the disc tray.

(Step 5)

Latch the claw to the disc tray.

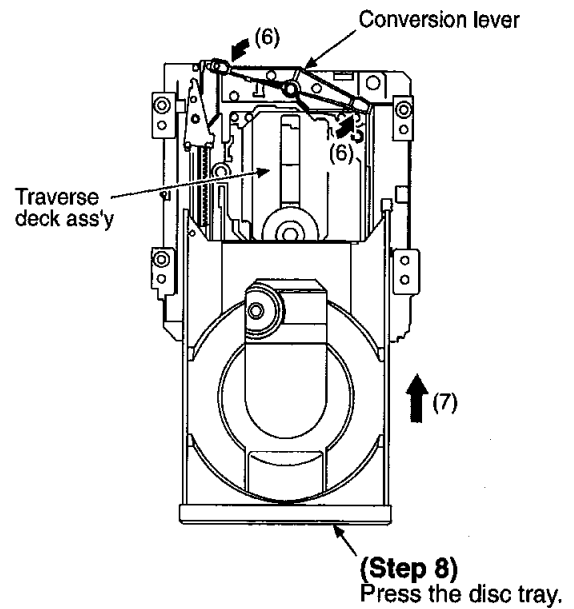


(Step 6)

Supporting the disc tray manually, engage the drive gear (B) ass'y with the gear and then slide to stop the disc tray.

(Step 7)

Operate the conversion lever, and then locate the traverse deck to "DOWN" position.

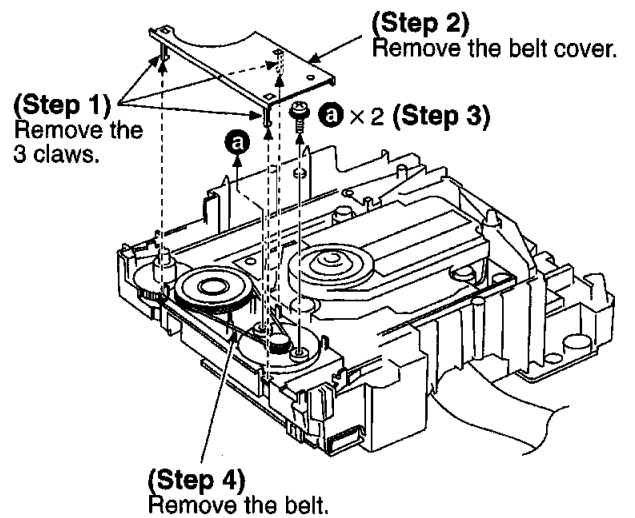


(Step 8)

Press the disc tray.

5.4. Replacement for the belt, loading motor ass'y and loading switch

- Follow the (Step 1) - (Step 5) of item 5.1.
- Follow the (Step 1) - (Step 9) of item 5.3.



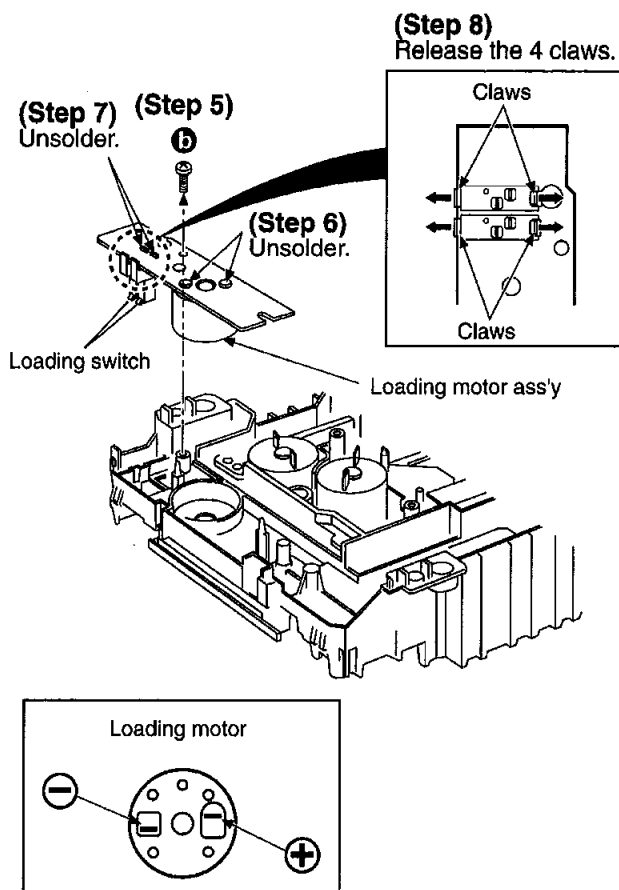
(Step 1)
Remove the
3 claws.

(Step 2)

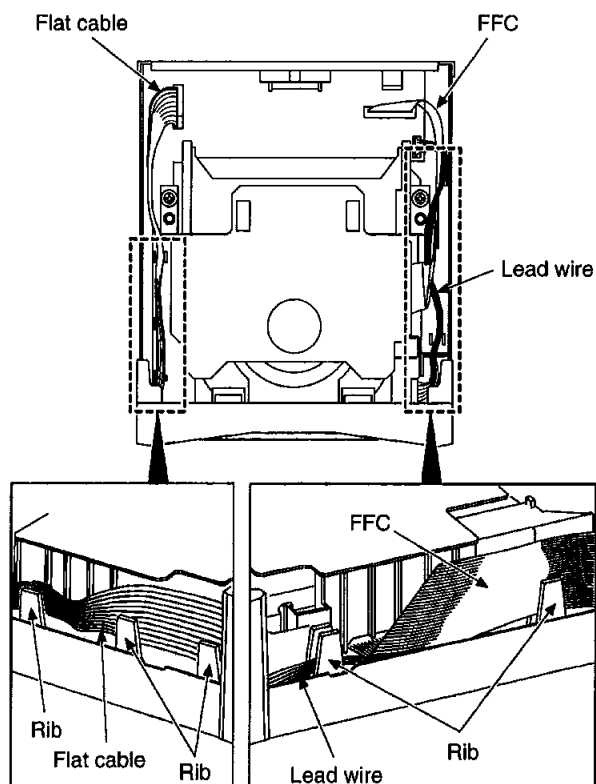
Remove the belt cover.

(Step 4)

Remove the belt.



5.5. Lead wire and flat cable arrangement



6 Error Code Display and Servo Adjustment Function

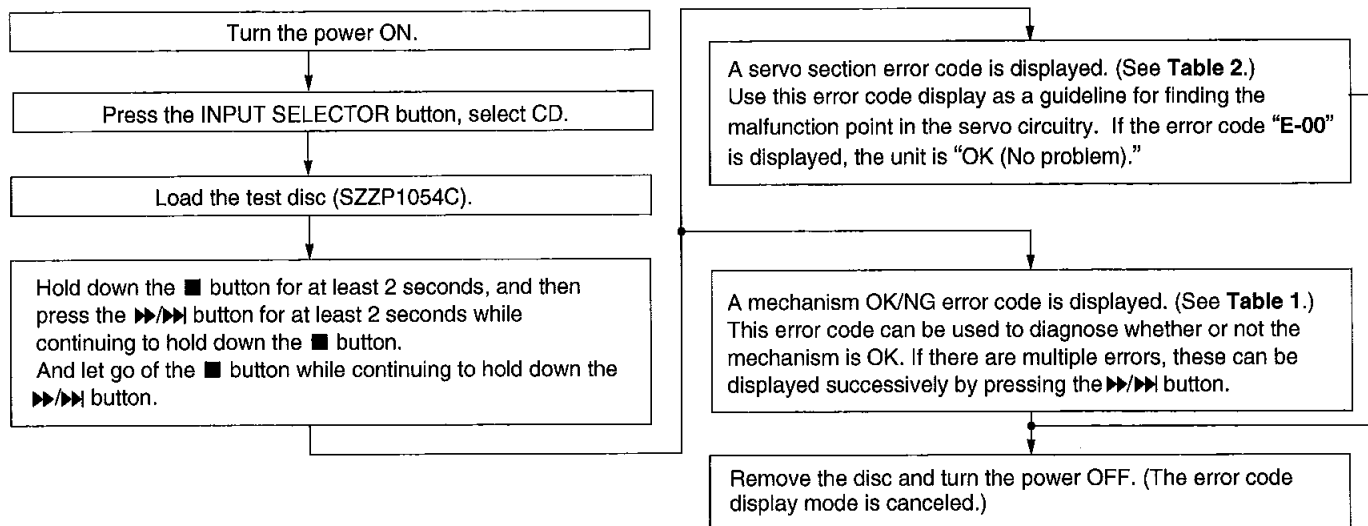
These units have an error code display function, so that if the units operate incorrectly, the fault is displayed using an error code on the FL display of the tuners (ST-HD510/310). They also have a servo adjustment function for displaying the status of servo system functions (focus, tracking, CLV) on the tuner's FL display. The systems control IC and FL display are part of the tuners so make sure the system have been connected properly before using these functions. (These units can be

operated independently, although the error code display and servo adjustment functions cannot be used.) Use these two functions for guidance during fault diagnosis and repair.

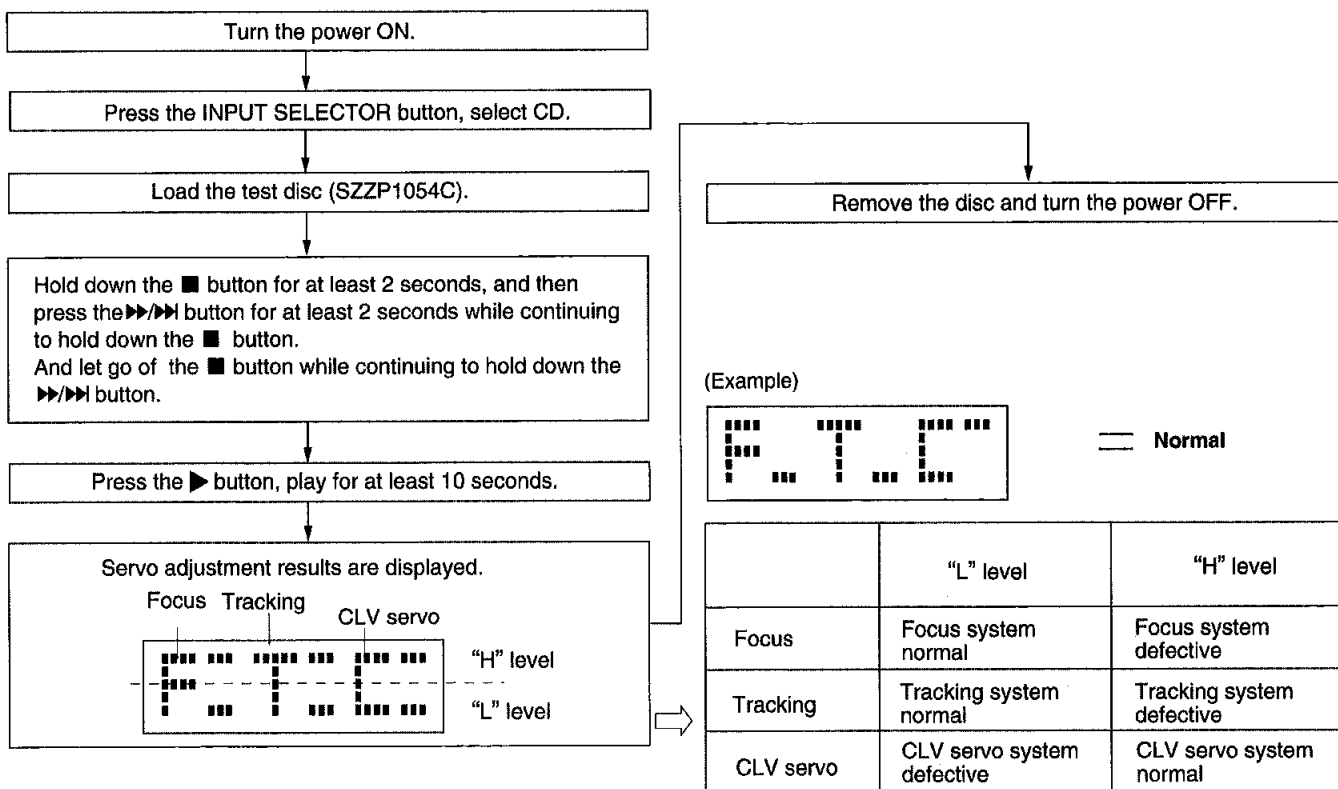
Note:

Check beforehand for scratching or soiling of the test disc (SZZP1054C), and soiling or other problems with the optical pickup lens.

6.1. Error code display procedure



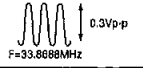
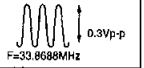
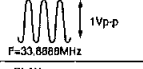
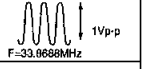
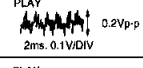
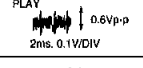
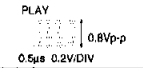
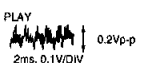
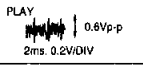
6.2. Servo adjustment procedure



6.3. Table 1

FL display	Symptom	Cause
H - 15	When CD tray opens, it closes by itself.	Disc tray "Open" detection sensor fault.
H - 16	When CD tray closes, it opens by itself.	Disc tray "Closed" detection sensor fault.
F - 15	Does not play, even when ► (PLAY) is pressed.	Pickup rest position detection switch fault.
F - 26	Does not move even when ► (PLAY) is pressed.	System control or servo processor IC fault.

6.4. Table 2

FL error code display	Symptom	Probable cause	Signal to check		Normal voltage and waveform values	
			Signal name	Location	PLAY	STOP
E-01	Focus and tracking offset adjustments not completed in the specified time period.	1. Clocks X1, power supply VDD and reset/RST, all on IC702. 2. MDATA, MCLK, and MLD signal to/from IC403.	IC702 ⑧pin	MDATA		0V
			IC702 ⑦pin	MCLK		3.4V
			IC702 ⑨pin	MLD		
			IC702 ⑱pin	/RST	3.3V	3.3V
			IC702 ⑤8pin	X1 IN		
			IC702 ⑤9pin	X2 OUT		
E-02 E-04 E-06 E-0A E-0C E-0E	Disc play unstable.	1. Scratches or contaminants on disc surface. 2. Focus and tracking servo circuits. (check waveforms, voltages, and part values.) 3. Spindle driver circuit. 4. Optical pickup.	IC702 ③2pin	FE		1.7V
			IC702 ③3pin	TE		1.7V
			IC702 ②8pin	FOD	1.7V	1.7V
			IC702 ②7pin	TRD	1.7V	1.7V
			IC702 ③8pin	/RFDET	0V	3.4V
			TJ 701	RF		1.0 V
			IC702 ⑱pin	STAT	3.3V	0V
			IC702 ③0pin	FBAL	1.7 ± 0.85V	1.7 ± 0.85V
E-08 E-0A	Focus or Tracking gain adjustment not completed in the specified time period.	1. Scratches or contaminants on disc surface. 2. Focus and Tracking servo circuit. (check waveforms, voltages, and part values.) 3. Optical pickup.	IC702 ③2pin	FE		1.7V
			IC702 ③3pin	TE		1.7V
			IC702 ③6pin	OFT	0V	0V

7 Measurements and Adjustments

Cautions:

- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned "ON", laser radiation is emitted from the pickup lens.
- Avoid exposure to the laser beam, especially when performing adjustments.

These units SL-HD510/310 are designed to operate on power supplied from the Amplifiers SE-HD510/310 through the Tuners ST-HD510/310. When connecting the unit to other system components, do not connect to the Amplifiers SE-HD510/310 directly. Be sure to connect these units through the Tuner ST-HD510/310. When operating the units SL-HD510/310 alone for testing and servicing, without having power supplied from the Amplifiers SE-HD510/310, use the following method.

7.1. Power Supply to This Unit alone

Apply 10V DC power to the section between TP402 (far side from rear panel of R441) and earth plate (E401). (As shown in Fig. 3.)

7.2. To Check Signals

Connect the oscilloscope or the speaker with built-in amplifier to the section between JK401-⑬ pin (Rch out) and earth plate (E401) (GND) as well as the section between JK401-⑭ pin (Lch out) and earth plate (E401) (GND) and check if the signals are outputting from this unit. (As shown in Fig. 3.)

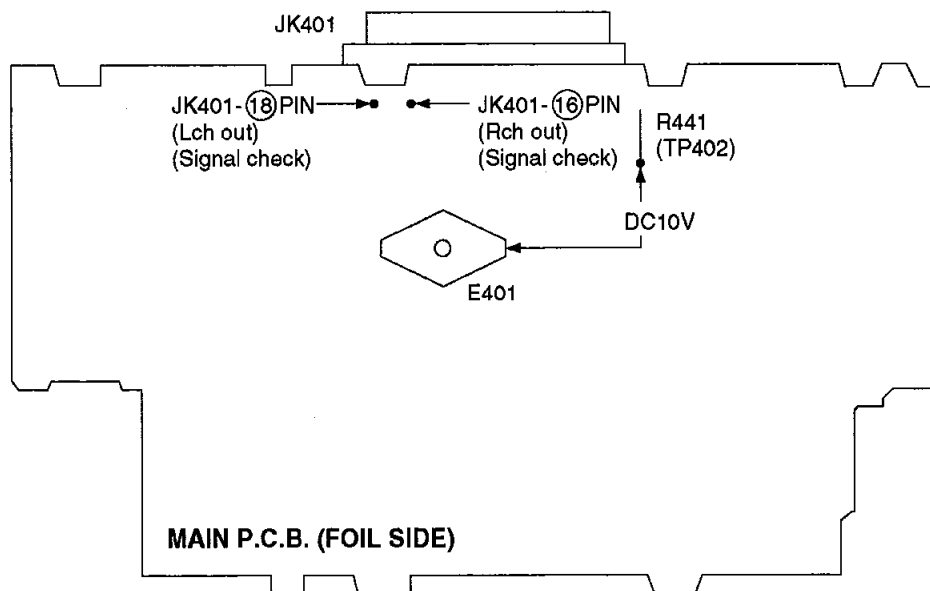
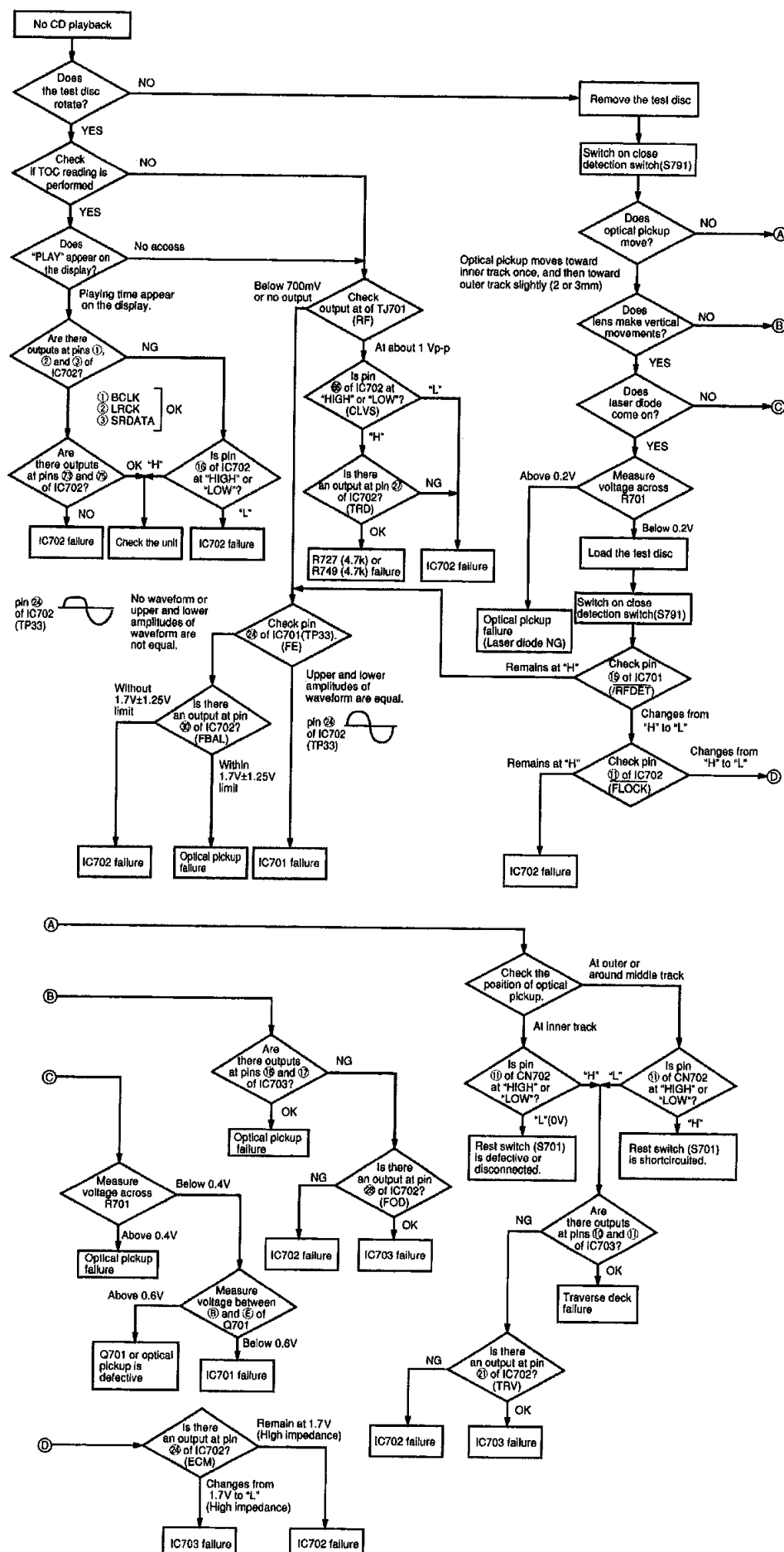


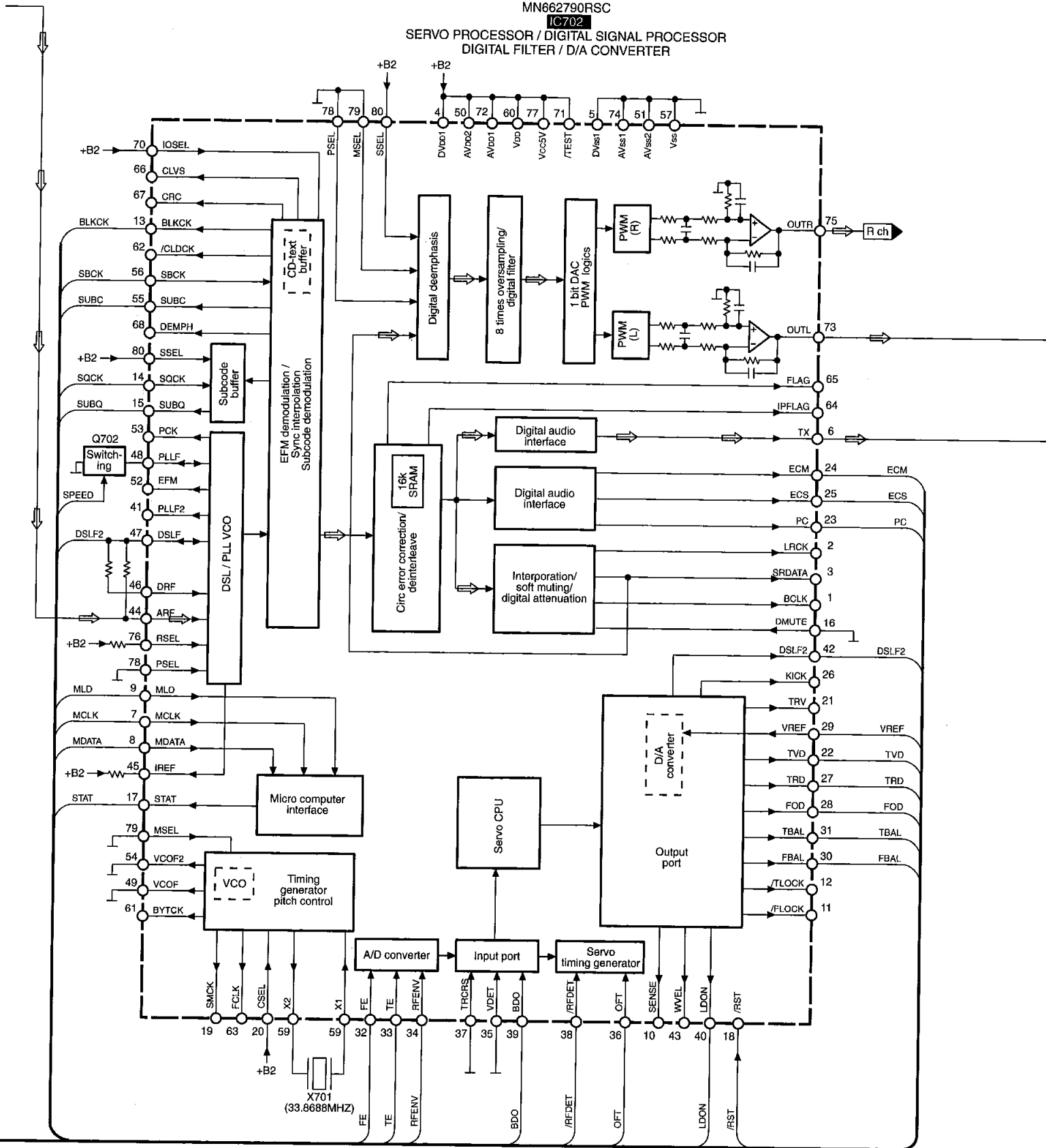
Fig. 3

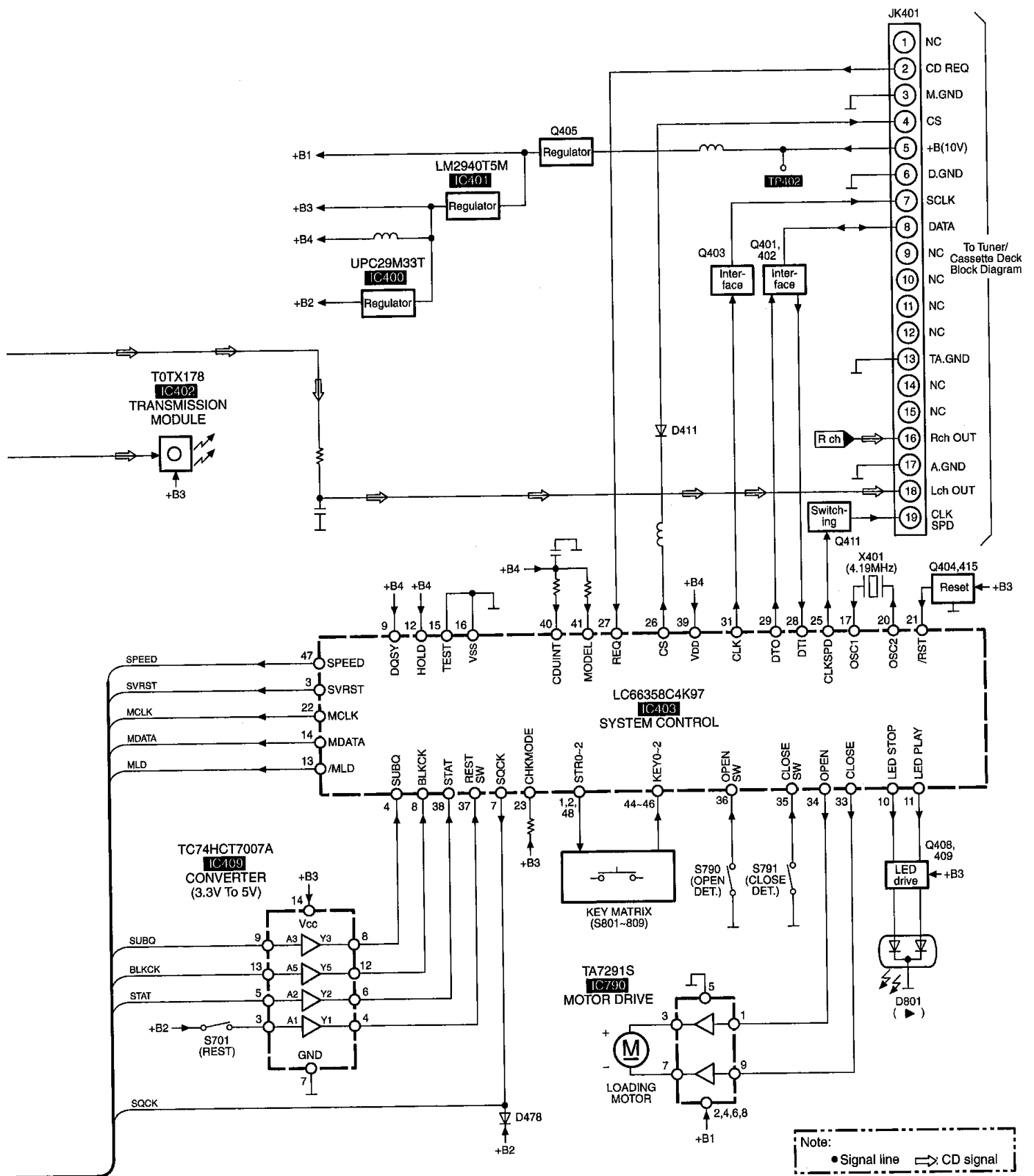
8 Troubleshooting Guide





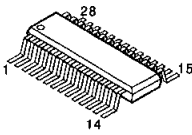
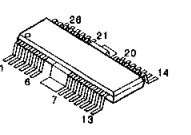
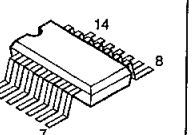
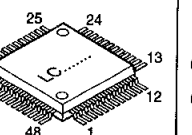
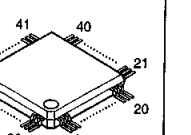
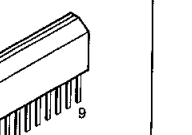
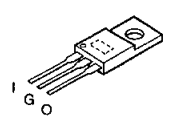
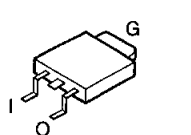
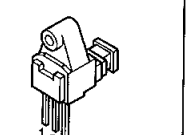
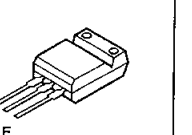
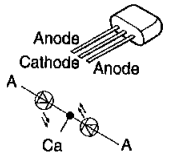
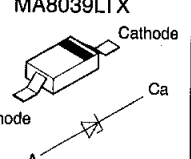
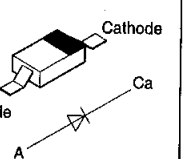
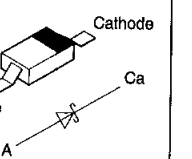
MN662790RSC
IC702
 SERVO PROCESSOR / DIGITAL SIGNAL PROCESSOR
 DIGITAL FILTER / D/A CONVERTER





10 Schematic Diagram Notes

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

AN8839NSBE2 	AN8739SBE2 	TC74HCT7007A 	LC66358C4K97 	MN662790RSC 	TA7291S 
LM2940T5M 	UPC29M33T 	T0TX178 	2SD2137PQTA 	2SB709STX 2SC4081STX DTA143XUT106 DTC114YUT106 DTC143EUT106 DTC143XUA106	
SML79420C 	MA8082MTX MA8039LTX 	MA111TX 	MA728TX 		

10.2. Schematic Diagram Notes

This schematic diagram may be modified at any time with the development of new technology.

Notes:

- S701 : Rest position detect switch in "OFF" position. (It turns "ON" when optical pickup comes to innermost periphery)
- S790 : CD tray open detection switch.
- S791 : CD tray close detection switch.
- S801 : Stop (■) switch.
- S802 : Play (▶) switch.
- S803 : Pause (||) switch.
- S804 : CD tray open/close (▲ OPEN/CLOSE) switch.
- S805 : F. skip/ search (▶▶ / ▶▶▶) switch
- S806 : R. skip/ search (◀◀ / ◀◀◀) switch.
- S807 : CD text select (CD TEXT) switch.
- S808 : AI edit (AI EDIT) switch.
- S809 Scroll (SCROLL) Switch.
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

No mark: CD STOP

(): CD play [1kHz, L+R, 0dB]

Important safety notice:

Components identified by $\triangle$ mark have special characteristics important for safety.

Furthermore, special parts which have purpose of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.

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 legs of IC or LSI with the fingers directly.

Voltage and signal lines

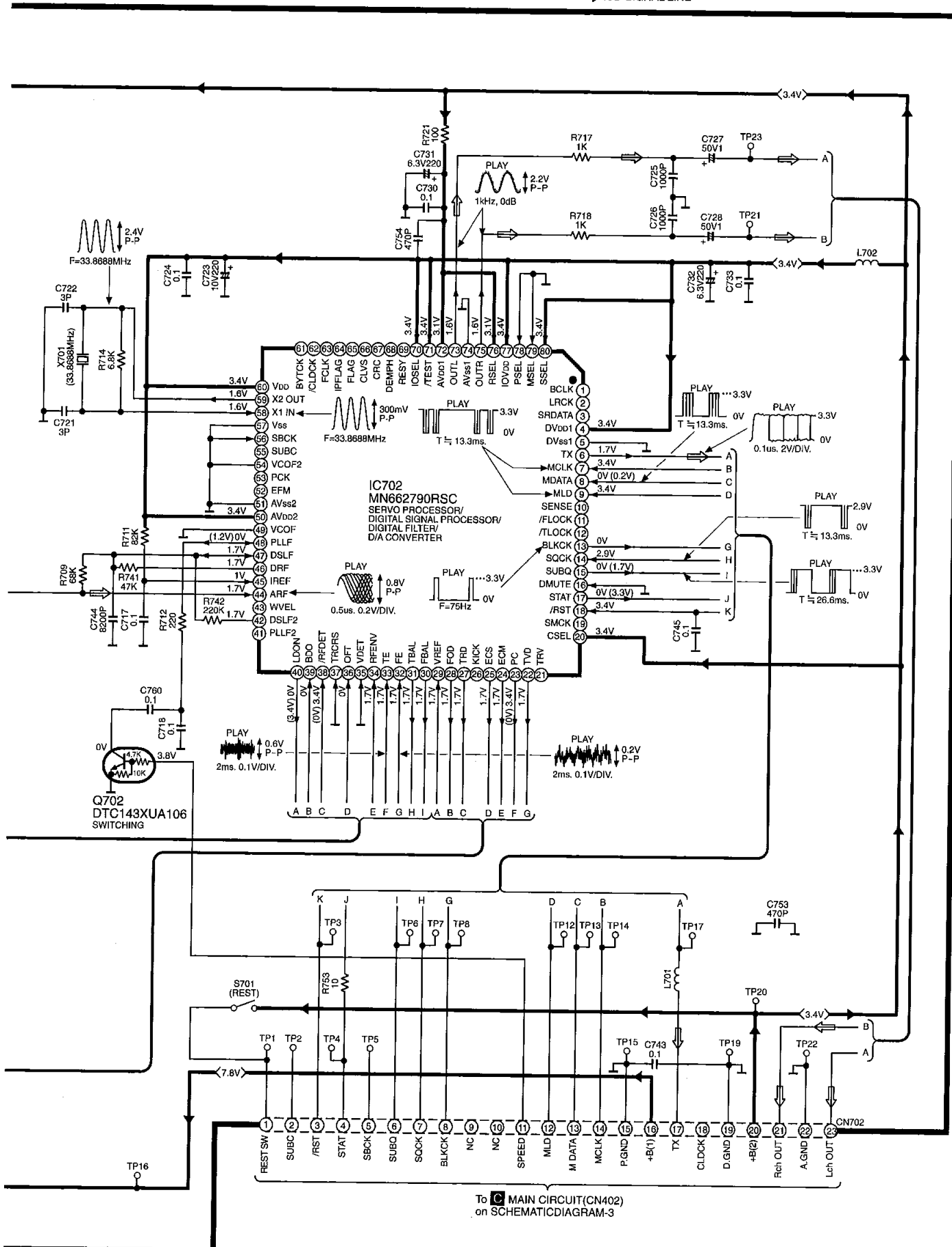
-  : Positive voltage line
-  : CD signal line

NOTE:
The number which noted at the connectors on the schematic diagram as "SCHEMATIC DIAGRAM-1" or "SCHEMATIC DIAGRAM-2" indicates the schematic diagram serial number located on the left corner in the schematic diagram.



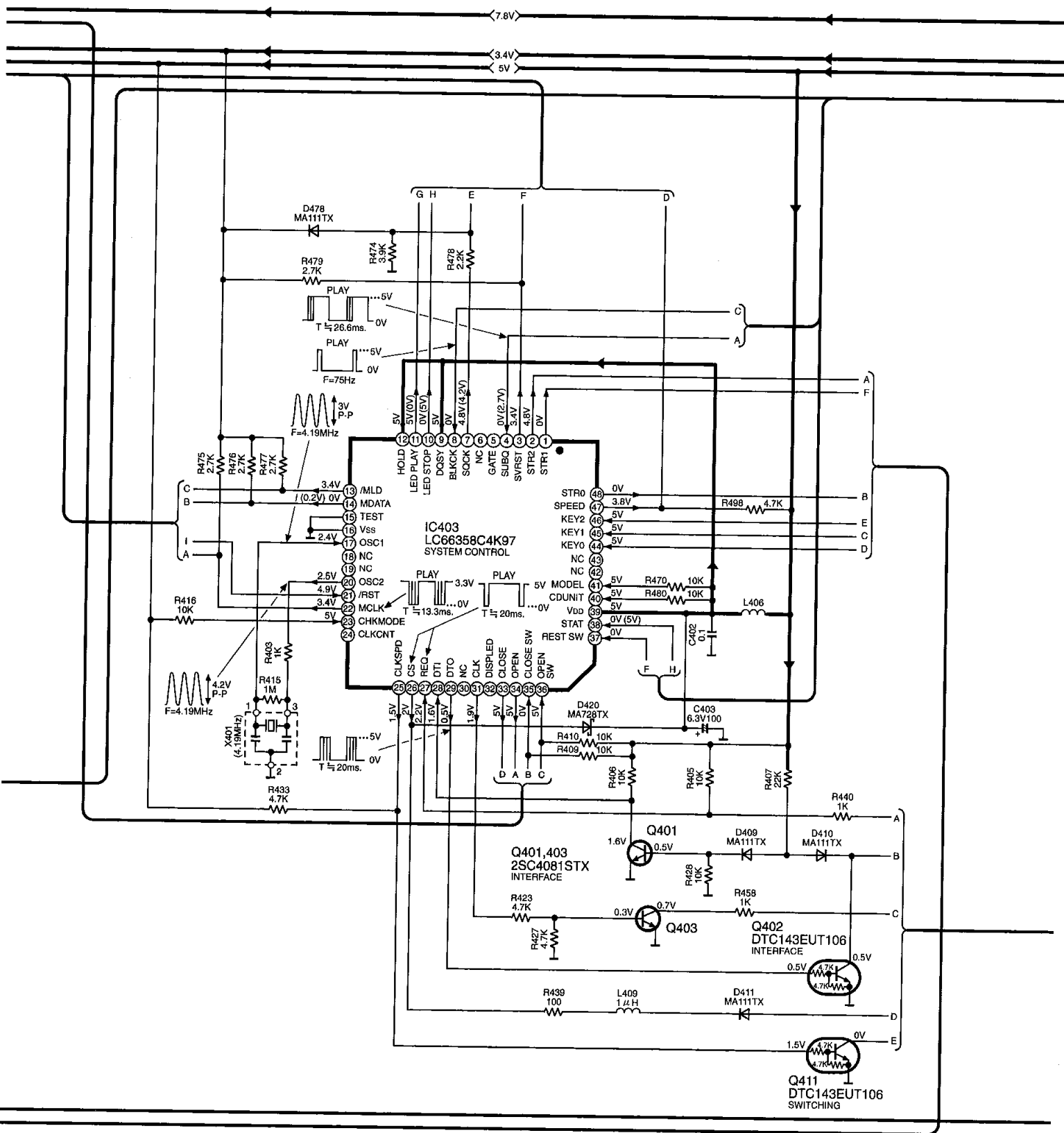
SCHEMATIC DIAGRAM-2

→ POSITIVE VOLTAGE LINE ⇨ CD SIGNAL LINE



To **MAIN CIRCUIT (CN402)**
on SCHEMATIC DIAGRAM-3

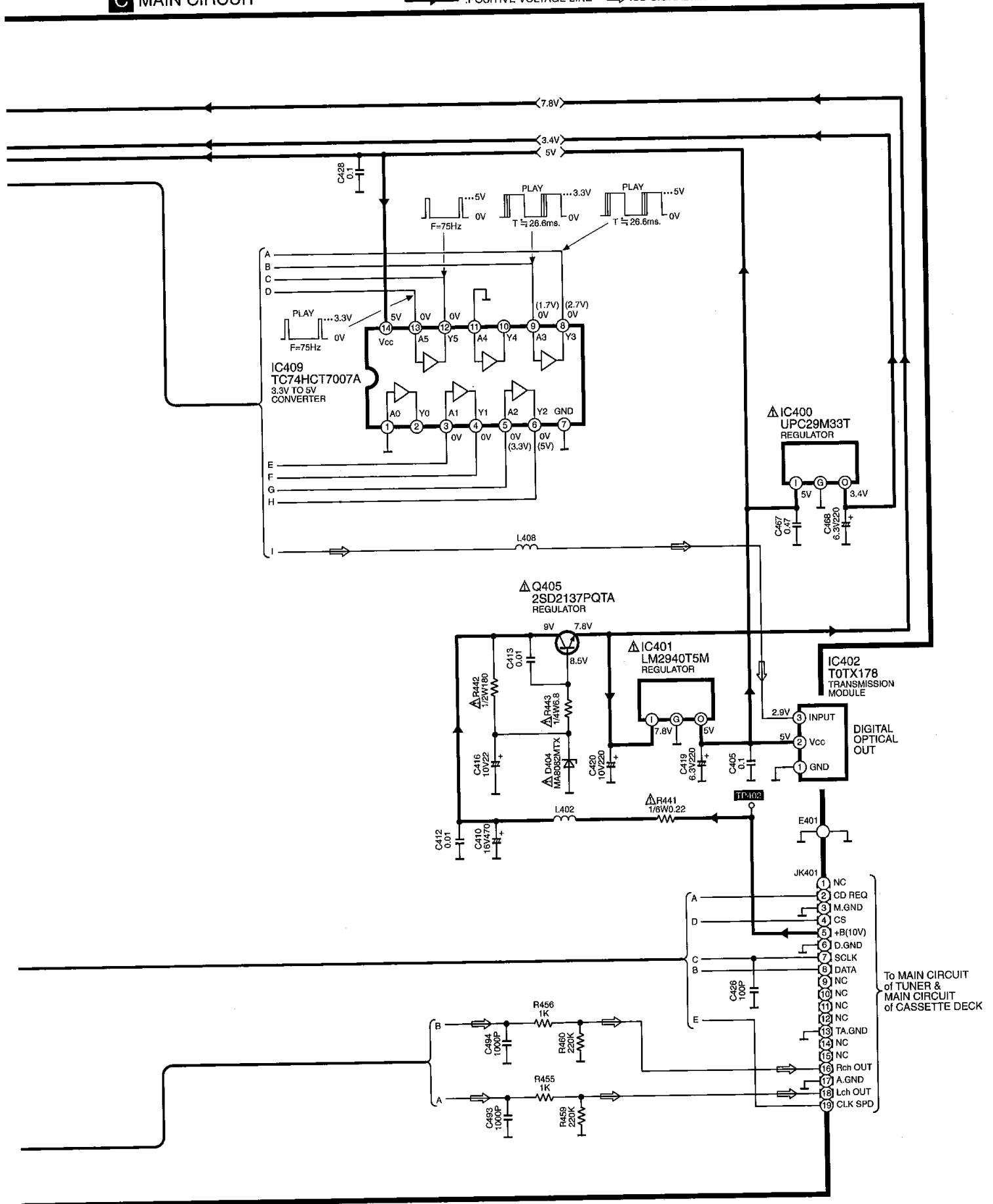
SCHEMATIC DIAGRAM-4

 : POSITIVE VOLTAGE LINE


SCHEMATIC DIAGRAM-5

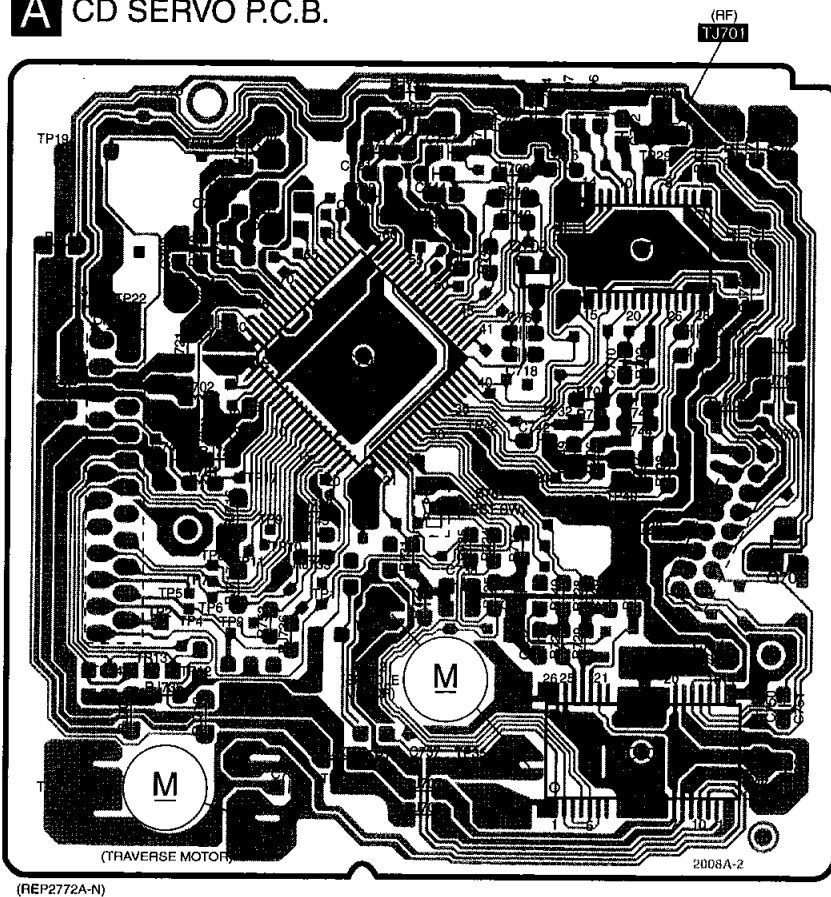
C MAIN CIRCUIT

→ : POSITIVE VOLTAGE LINE ⇨ : CD SIGNAL LINE

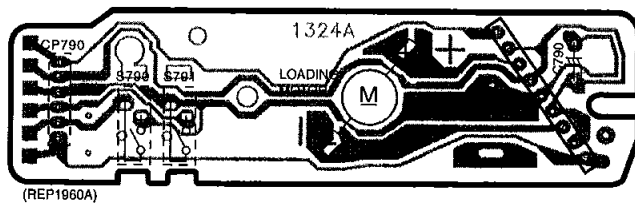


12 Printed Circuit Board Diagram

A CD SERVO P.C.B.



B LOADING MOTOR P.C.B.



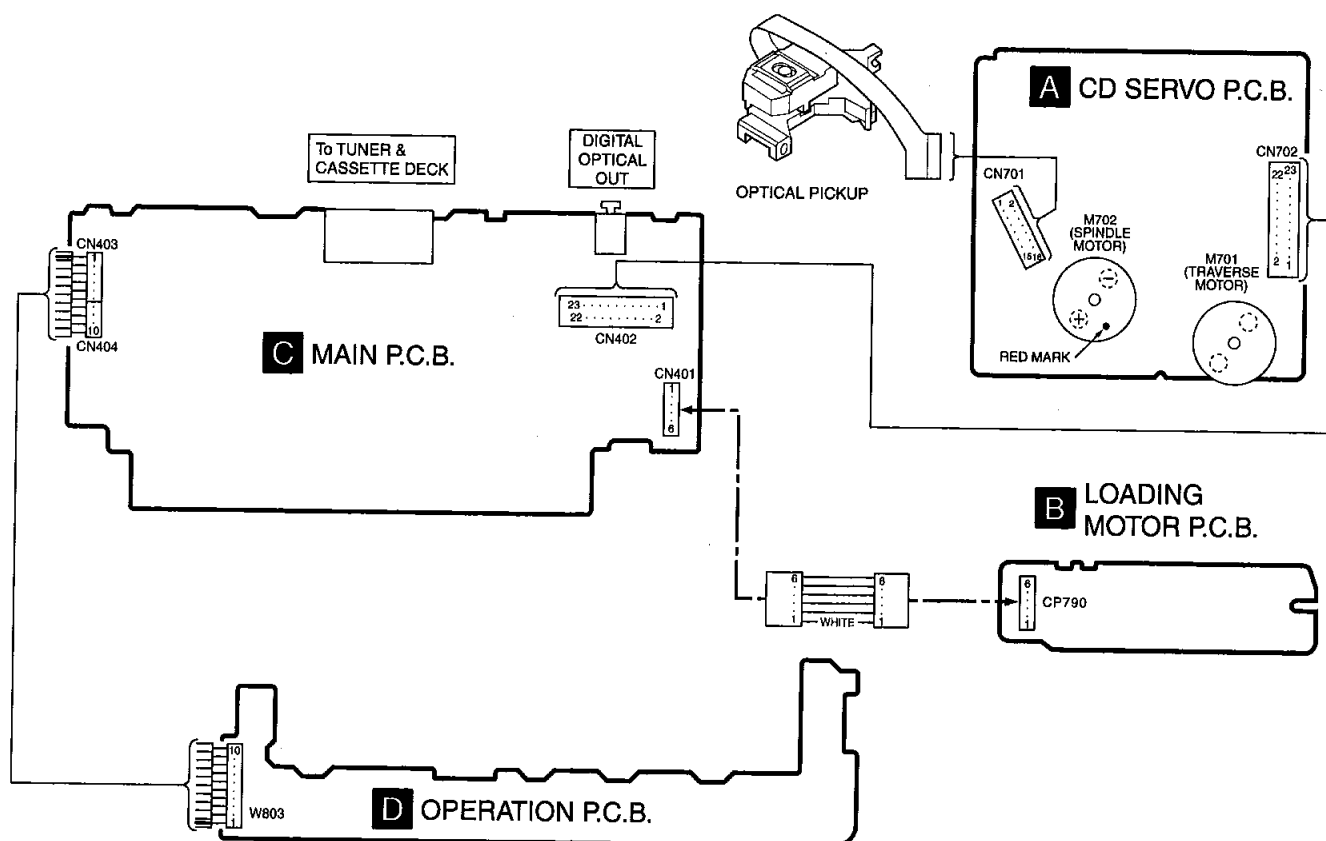
ELECTRICAL PARTS LOCATION

Ref. No.	Lo. No.	Ref. No.	Lo. No.
A CD SERVO P.C.B.			
IC701	2D	R754	1B
IC702	3B	RJ701	2C
IC703	4D	RJ702	3D
Q701	3D	RJ703	3D
Q702	2C	RJ704	4B
L701	3A	RJ705	4A
L702	3B	RJ706	3A
X701	1C	RJ707	4C
S701	3C	RJ708	5C
CN701	3D	RJ709	2D
CN702	3A	RJ710	2D
M701	4A	RJ712	3D
M702	4C	RJ713	4B
TP1	4B	RJ714	2A
TP2	4A	RJ716	4B
TP3	4B	RJ717	3B
TP4	4B	RJ721	2C
TP5	4B	RJ722	2D
TP6	3B	RJ724	1C
TP7	3B	RJ726	4B
TP8	3B	RJ727	2D
TP12	4A	RJ728	3D
TP13	4A	RJ731	2B
TP14	4A	RJ732	3B
TP15	4B	RJ734	1C
TP16	4B	RJ735	4A
TP17	3B	RJ750	2D
TP18	2A	C701	2D
TP19	2A	C702	2D
TP20	1A	C703	1C
TP21	2B	C704	1C
TP22	2A	C706	1C
TP23	1A	C707	1C
TP29	2D	C710	3D
TP30	1D	C711	2D
TP32	3C	C712	3D
TP33	3C	C713	3D
TP35	4C	C714	4D
TP36	4B	C715	4C
TP37	5A	C716	2C
TP38	5B	C717	2C
TP40	3D	C718	3C
TP42	3C	C721	2B
R701	2D	C722	2B
R702	3D	C723	2C
R704	3C	C724	2B
R705	3C	C725	2B
R706	3C	C726	2B
R707	3D	C727	2B
R708	3D	C728	2B
R709	2C	C730	2A
R711	2C	C731	2B
R712	2C	C732	3B
R714	2B	C733	3B
R715	3C	C734	4D
R717	2B	C735	4D
R718	2B	C736	4B
R721	3B	C737	4C
R723	4C	C738	4C
R724	3C	C739	4C
R725	4C	C742	3C
R727	4C	C743	3A
R728	4C	C744	2C
R729	4C	C745	3B
R731	3C	C747	3D
R735	3C	C749	3C
R736	4D	C750	4D
R741	2C	C751	4D
R742	2C	C752	4C
R744	3D	C753	2A
R749	4C	C754	2B
R753	3B	C760	2C
B LOADING MOTOR P.C.B.			
IC790	7D	CP790	7B
S790	7B	C790	7D
S791	7B		



Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.
MAIN P.C.B.															
IC400	3B	D410	2F	R406	2F	R450	3F	R480	2E	RJ608	3D	RJ802	3D	C412	2E
IC401	2D	D411	2E	R407	2F	R451	3F	R498	3D	RJ609	3D	RJ803	3D	C413	2E
IC402	2B	D420	3E	R409	3B	R452	3F	RJ501	2F	RJ610	3D	RJ901	2B	C416	2E
IC403	3E	D478	3B	R410	3B	R455	2C	RJ502	2F	RJ614	3D	RJ902	2B	C419	2D
IC409	3C	L402	2D	R414	3C	R456	2C	RJ503	2E	RJ616	3C	RJ903	1B	C420	2E
Q401	2F	L406	3D	R415	3E	R458	2E	RJ508	3D	RJ617	3C	RJ904	2B	C425	3E
Q402	2F	L408	3A	R416	3F	R459	2C	RJ509	3D	RJ618	2C	RJ905	2B	C426	2D
Q403	2E	L409	2E	R423	2E	R460	2C	RJ510	3D	RJ619	3C	RJ906	2B	C428	3C
Q404	3F	X401	3E	R427	2F	R470	2E	RJ511	3D	RJ621	2B	RJ907	2B	C467	2B
Q405	2E	CN401	3A	R428	2F	R471	4E	RJ514	3C	RJ622	3B	RJ908	2B	C468	3B
Q408	4E	CN402	2A	R430	3F	R473	4E	RJ601	2F	RJ623	2B	C401	2A	C493	2C
Q409	4E	CN403	2F	R433	3F	R474	2B	RJ602	2E	RJ625	3D	C402	3D	C494	2C
Q411	2F	CN404	2F	R439	2E	R475	3A	RJ603	3E	RJ627	2B	C403	3D	C499	2A
Q415	3F	JK401	2D	R440	2E	R476	3B	RJ604	4E	RJ628	3B	C405	2A		
D404	2E	E401	2D	R441	2D	R477	3B	RJ605	3D	RJ629	3B	C406	3F		
D405	3F	R403	4E	R442	2E	R478	2B	RJ606	3D	RJ630	2A	C409	3A		
D409	2F	R405	2F	R443	2E	R479	3B	RJ607	3D	RJ631	3E	C410	2D		
OPERATION P.C.B.															
DB01	6A	S802	6A	S804	5A	S806	6D	S808	6E	W803	6F				
S801	6B	S803	6B	S805	6C	S807	6F	S809	6E						

13 Wiring Connection Diagram



14 Terminal Function of IC's

14.1. IC701 (AN8839NSBE2): SERVO AMP

Pin No.	Mark	I/O Division	Function
1	PDE	I	Tracking signal input terminal 1 (E ch)
2	PDF	I	Tracking signal input terminal 2 (F ch)
3	VCC	I	Power supply terminal
4	PDA	I	Focus signal input terminal 1 (A ch)
5	PDB	I	Focus signal input terminal 2 (B ch)
6	LPD	I	APC amp. input terminal
7	LD	O	APC amp. output terminal("L": laser ON)
8	RF	O	RF adding output terminal
9	RFIN	I	AGC input terminal
10	CSBRT	I	OFTR capacitor connection terminal
11	CEA	I	HPF-AMP capacitor connection terminal
12	BDO	O	Drop out output terminal("H": Drop out)
13	LDON	I	Laser ON signal input terminal("H": laser ON)
14	GND	—	GND terminal
15	/RFDET	O	RF detection signal output terminal("H": detection)
16	PDOWN	—	Connected to GND
17	OFTR	O	Off track signal output terminal ("H": off track)
18	NC	—	—
19	ENV	O	RF envelope signal output terminal

Pin No.	Mark	I/O Division	Function
20	NC	—	—
21	NC	—	—
22	TEN	I	Tracking error amp input terminal
23	TEOUT	O	Tracking error amp. output terminal
24	FEOUT	O	Focus error amp. output terminal
25	FEN	I	Focus error amp. input terminal
26	VREF	O	VREF output terminal
27	TBAL	I	Tracking balance adj. input terminal
28	FBAL	I	Focus balance adj. input terminal

14.2. IC702 (MN662790RSA): SERVO PROCESSOR/DIGITAL SIGNAL PROCESSOR/DIGITAL FILTER/D-A CONVERTER

Pin No.	Mark	I/O Division	Function
1	BCLK	O	Serial data bit clock output terminal(Not used, open)
2	LRCK	O	L/R discriminating signal output terminal(Not used, open)
3	SRDATA	O	Serial data output terminal(Not used, open)
4	DV _{DD1}	I	Power supply (digital circuit) terminal
5	DV _{SS1}	—	GND (digital circuit) terminal

Pin No.	Mark	I/O Division	Function
6	TX	O	Digital audio interface signal output terminal
7	MCLK	I	Microcomputer command clock signal input terminal(Latching on the data by rising edge)
8	MDATA	I	Microcomputer command data signal input terminal
9	MLD	I	Microcomputer command load signal input terminal
10	SENSE	O	Sense signal output terminal (OFT, FESL, NACEND, NAJEND, DATA, SFG) (Not used, open)
11	/FLOCK	O	Focus servo lead-in signal output terminal ("L": lead-in) (Not used, open)
12	/TLOCK	O	Tracking servo lead-in signal output terminal ("L": lead-in) (Not used, open)
13	BLKCK	O	Sub-code block clock signal output terminal (fBLKCK=75 Hz: normal play)
14	SQCK	I	Sub-code Q resistor external clock signal input terminal
15	SUBQ	O	Sub-code Q code output terminal
16	DMUTE	I	Muting input terminal ("L": mute) (Connected to GND)
17	STAT	O	Status signal output terminal (CRC, CUE, CLVS, TTSTOP, FCLV, SQOK)
18	/RST	O	Reset input terminal
19	SMCK	O	Not used, open
20	CSEL	O	Power supply terminal
21	TRV	O	Traverse forced feed terminal(Not used, open)
22	TVD	O	Traverse drive signal output terminal
23	PC	O	Spindle motor drive signal output terminal ("L": ON)
24	ECM	O	Spindle motor drive signal output terminal (Forced mode)
25	ECS	O	Spindle motor drive signal output terminal (Servo error signal)
26	KICK	O	Kick pulse output terminal (Not used, open)
27	TRD	O	Tracking drive signal output terminal
28	FOD	O	Focus drive signal output terminal
29	VREF	I	VREF input terminal
30	FBAL	O	Focus balance adj. output terminal
31	TBAL	O	Tracking balance adj. output terminal
32	FE	I	Focus error signal input terminal(analog input)
33	TE	I	Tracking error signal input terminal(analog input)
34	RFENV	I	RF envelope signal input terminal
35	VDET	I	Oscillation det. signal input terminal("H": det.) (Connected to GND)
36	OFT	I	Off track signal input terminal("H": off track)
37	TRCRS	I	Track cross signal input terminal(Connected to GND)
38	/RFDET	I	RF detection signal input terminal("L": detection)
39	BDO	I	Dropout signal input terminal ("H": dropout)
40	LDON	O	Laser ON signal output terminal ("H": ON)
41	PLL2	—	PLL loop filter 2 terminal(Not used, open)
42	DSL2	—	DSL loop filter 2 terminal
43	WVEL	O	Double velocity status signal output terminal ("H": double) (Not used, open)
44	ARF	I	RF signal input terminal

Pin No.	Mark	I/O Division	Function
45	IREF	I	Reference current input terminal
46	DRF	I	DSL bias input terminal
47	DSL2	I/O	DSL loop filter terminal
48	PLL2	I/O	PLL loop filter terminal
49	VCOF	—	VCO loop filter terminal(Not used, connected to GND)
50	AV _{DD2}	I	Power supply (analog circuit) terminal
51	AV _{SS2}	—	GND (analog circuit) terminal
52	EFM	O	EFM signal output terminal(Not used, open)
53	PCK	O	PLL extract clock output terminal (fPCK=4.321 MHz: normal play)(Not used, open)
54	VCOF2	—	VCO loop filter 2 terminal(Connected to GND)
55	SUBC	O	Sub-code serial data output terminal(Not used, open)
56	SBCK	I	Sub-code serial data clock input terminal (Connected to GND)
57	V _{SS}	—	GND terminal
58	X1 IN	I	Crystal oscillator input terminal(f=33.8688 MHz)
59	X2 OUT	O	Crystal oscillator output terminal(f=33.8688 MHz)
60	V _{DD}	I	Power supply (oscillation circuit) terminal
61	BYTCK	O	Byte clock output terminal (Not used, open)
62	/CLDCK	O	Sub-code frame clock signal output terminal (fCLDCK=7.35 kHz: normal play) (Not used, open)
63	FCLK	O	Crystal frame clock signal output terminal (fCLK=7.35 kHz, double velocity 14.7 kHz) (Not used, open)
64	IPFLAG	O	Data error flag output terminal("H": interpolation) (Not used, open)
65	FLAG	O	Flag output terminal (Not used, open)
66	CLVS	O	Spindle servo phase synchro signal output terminal ("H": CLV, "L": Rough servo) (Not used, open)
67	CRC	O	Sub-code CRC check output terminal("H": ON, "L": NG) (Not used, open)
68	DEMPH	O	De-emphasis ON signal output terminal ("H": ON) (Not used, open)
69	RESY	O	Re-synchronizing signal of frame sync.output terminal (Not used, open)
70	IOSEL	I	Power supply (digital circuit) terminal
71	/TEST	I	Test input terminal (Connected to power supply)
72	AV _{DD1}	I	Power supply (analog circuit) terminal
73	OUTL	O	L ch audio signal output terminal
74	AV _{SS1}	—	GND terminal
75	OUTR	O	R ch audio signal output terminal
76	RSEL	I	RF signal polarity designation input terminal (Connected to power supply)
77	IOVDD	I	Crystal oscillator frequency designation input terminal(Connected to power supply)
78	PSEL	I	Test input terminal(Usually:"H") (Connected to GND)
79	MSEL	I	Output frequency switching terminal of SMAC("H":SMCK=8.4672MHz, "L":SMCK=4.2336MHz) (Connected to GND)
80	SSEL	I	Output mode switching terminal of SUBQ("H":Q-code buffer using mode) (Connected to power supply)

14.3. IC703(AN8739SBE2): FOCUS COIL/TRACKING COIL/ TRAVERSE MOTOR/ SPINDLE MOTOR DRIVE

Pin No.	Mark	I/O Division	Function
1	/RST	—	Reset output terminal (Not used, open)
2	NC	—	Not used
3	IN2	I	Motor driver (2) input terminal
4	PC2	I	PC2 (power cut) input terminal
5	NC	—	Not used
6	IN1	I	Motor driver (1) input terminal
7	PVCC1	I	Power supply (for driver) terminal
8	PGND1	—	GND (for driver) terminal (1)
9	NC	—	Not used
10	D1-	O	Traverse motor driver (1) output terminal (-)
11	D1+	O	Traverse motor driver (1) output terminal (+)
12	D2-	O	Spindle motor driver (2) output terminal (-)
13	D2+	O	Spindle motor driver (2) output terminal (+)
14	D3-	O	Tracking coil signal output terminal (-)
15	D3+	O	Tracking coil signal output terminal (+)
16	D4-	O	Focus coil signal output terminal (-)
17	D4+	O	Focus coil signal output terminal (+)
18	NC	—	Not used
19	PGND2	—	GND (for driver) terminal (2)
20	PVCC2	I	Power supply (for driver) terminal (2)
21	VCC	I	Power supply terminal
22	VREF	I	Reference voltage input terminal
23	IN4	I	Motor driver (4) input terminal
24	IN3	I	Motor driver (3) input terminal
25	RSTIN	I	Reset input terminal (Connected to GND)
26	NC	—	Not used, connected to GND

14.4. IC403(LC66358C4K97): SYSTEM CONTROL

Pin No.	Mark	I/O Division	Function
1	STR1	O	Key switch 1 det. output terminal
2	STR2	O	Key switch 2 det. output terminal
3	SVRST	O	Reset signal output terminal of servo IC (IC702)
4	SUBQ	I	Sub-code data input terminal
5	GATE	O	Select signal output terminal (Not used, open)
6	NC	—	Not used, open
7	SQCK	O	Sub-code register clock output terminal
8	BLKCK	I	Sub-code block signal input terminal
9	DQSY	I	Reading permission terminal of data (Not used, connected to power supply)
10	LED STOP	O	LED drive signal output terminal
11	LED PLAY	O	
12	HOLD	I	Not used, connected to power supply
13	/MLD	O	Command load signal terminal to IC702
14	MDATA	O	Command data signal terminal to IC702
15	TEST	—	Not used, connected to GND
16	V _{ss}	—	GND terminal
17	OSC1	I	Crystal oscillator connected terminal (f=4.19MHz)

Pin No.	Mark	I/O Division	Function
18	NC	—	Not used, open
19			
20	OSC2	O	Crystal oscillator connected terminal (f=4.19MHz)
21	/RST	I	Reset signal input terminal
22	MCLK	O	Command clock output terminal to IC702
23	CHK MODE	I	Not used (Connected to power supply through resistor)
24	CLK CNT	O	Clock control signal output terminal (Not used, open)
25	CLK SPD	O	Communication clock velocity select input terminal
26	CS	O	Communication request receiving signal terminal to FL drive/ system control IC
27	REQ	I	Communication request signal terminal to FL drive/ system control IC
28	DTI	I	Data input terminal from FL drive/ system control IC
29	DTO	O	Data output terminal to FL drive/ system control IC
30	NC	—	Not used, open
31	CLK	O	Clock terminal to FL drive/ system control IC
32	DISPLE D	O	LED drive signal output terminal (Not used, open)
33	CLOSE	O	Loading motor "CLOSE" command signal output terminal
34	OPEN	O	Loading motor "OPEN" command signal output terminal
35	CLOSE SW	I	Disc tray "CLOSE" det. switch signal input terminal
36	OPEN SW	I	Disc tray "OPEN" det. switch signal input terminal
37	REST SW	I	Rest position det. signal input terminal
38	STAT	I	Status signal input terminal
39	V _{DD}	I	Power supply input terminal
40	CDUNIT	I	Connected to power supply through resistor
41	MODEL	I	
42	NC	—	Not used, open
43	NC	—	
44	KEY0	I	Key switch 0 det. input terminal
45	KEY1	I	Key switch 1 det. input terminal
46	KEY2	I	Key switch 2 det. input terminal
47	SPEED	O	PLL filter of CD unit select output terminal
48	STR0	O	Key switch 0 det. output terminal