

Service Manual

CD Player

Compact Disc Player

COMPACT
disc
DIGITAL AUDIO

MASH^{*1}
multi-stagenoiseshaping

※ MASH is a trademark of NTT.

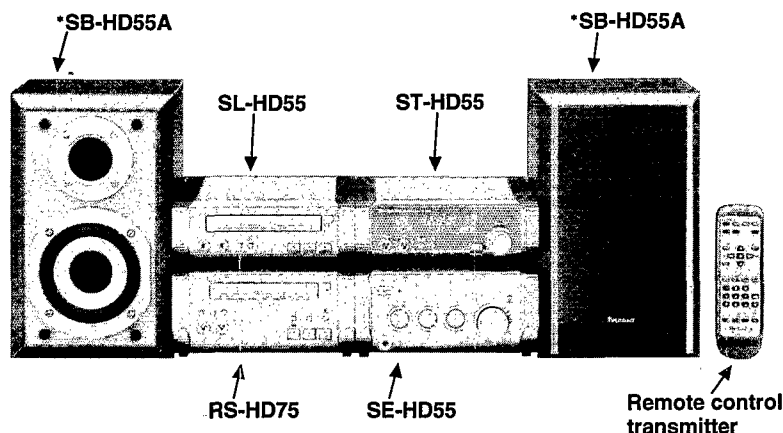
SL-HD55

Colour

(S) Silver Type

Area

E Europe.

System: SC-HD55


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

RAE0152Z Mechanism Series

Specifications

Audio

DA converter: 1 bit 2 DAC MASH[※]

Pickup

Wavelength: 780 nm

General

Dimensions : 202(Wide)/ 76(High)/ 254(Depth) mm

Weight: 1.4 kg

Notes:

1. Weight and dimensions shown are approximate.
2. Design and specifications are subject to change without notice.

System/SC-HD55:

Tuner: ST-HD55, Compact Disc Player: SL-HD55, Amplifier: SE-HD55, Cassette Deck: RS-HD75, Speakers: SB-HD55A

Notes: *.....Made in PAES

⚠ 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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NOTES:

- Refer to the service manual for Model No. ST-HD55 (ORDER No. AD9803051C2) for information on "Installation" and "Connections".
- Refer to the service manual for Model No. SE-HD55 (ORDER No. AD9803049C2) for information on "Accessories".

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.

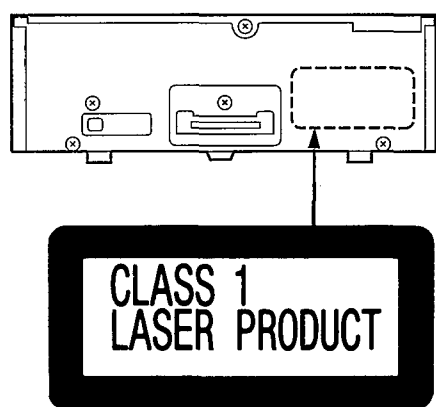
ACHTUNG: Dieses Produkt enthält eine Lasereinheit. Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Lasereinheit abgestrahlt.

Wellenlänge: 780 nm

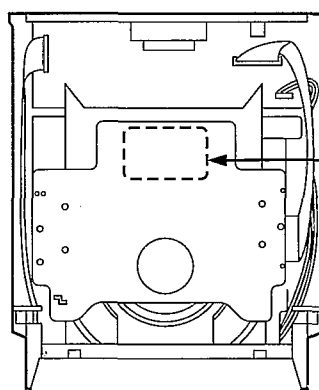
Maximale Strahlungsleistung der Lasereinheit: 100 μ W/VDE

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

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



**LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT**



RQLS0104

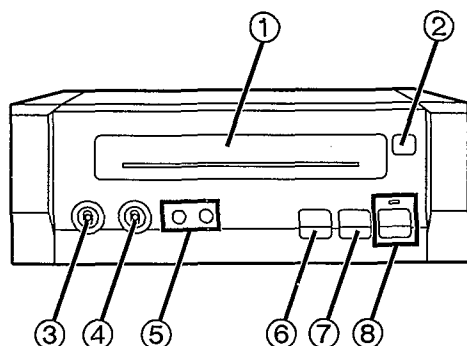
DANGER	INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBNING. UNØYKS SØKERHEDSADRIKKEDE ELLER UDE AF FUNKTION. UNØYKS SØKERHEDSADRIKKEDE FOR STRÅLING.
VARO!	AVOITTAESSA JA SUOJALUKUTUS OHTETTAESSA OLET ALTTIINA NUKYMAATONTA LASERSÄTELYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING	OSYNLIG LASERSTRÅLING NÄR DESSA DEL ÄR ÖPPNAD OCH SPÄNNEN ÄR URKOPPLAD. BETRÄKTA EJ STRÅLEN.
ADVARSEL	USYNLIG LASERSTRÅLING NÄR DESSA DEL ER ÅPNET OG SPENNINGEN ER FJÆRNED. UNØYKS SØKERHEDSADRIKKEDE FOR STRÅLING.
VORSICHT	UNSICHTBARE LASERSTRÄHLUNG, WEENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN. RQLS0104

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.

Location of Controls



- ① Disc tray
- ② Disc tray open/close button
(▲ OPEN/CLOSE)
- ③ CD-TEXT switch (CD TEXT)
- ④ One track all tracks switch (TRACK)
- ⑤ Skip/search buttons (I◀◀/◀▶, ▶▶/▶▶I)
- ⑥ Stop button (■)
- ⑦ Pause button (II)
- ⑧ Play button and indicator (▶)

The color of the lamp on the ▶ button depends on the operation.
If stopped: orange
If playing: green

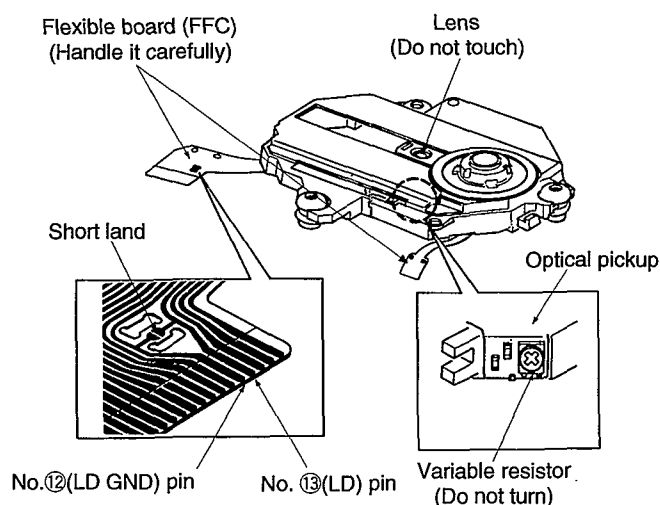
Handling Precautions for Traverse Deck

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).

• 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. ⑫ (GND) and No. ⑬ (LD) pins on the flexible board is shorted with a solder build-up to prevent damage to the laser diode.
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.

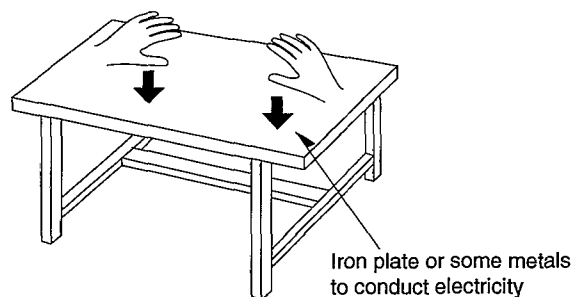
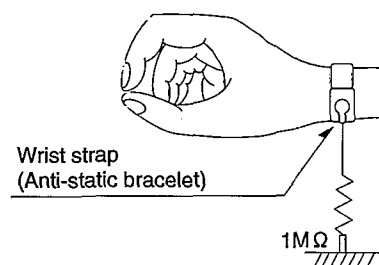


• Grounding for electrostatic breakdown prevention

1. Human body grounding
Use the anti-static wrist strap to discharge the static electricity from your body.
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).



■ Operation Checks and Component Replacement Procedures

NOTE

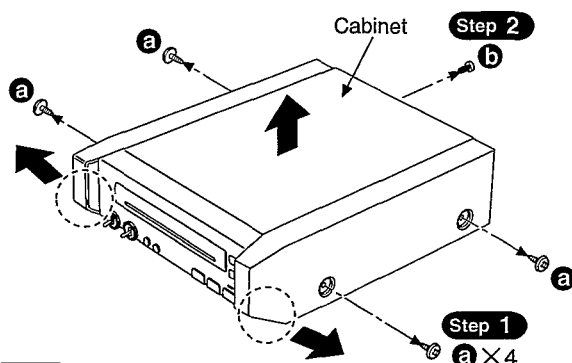
1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures.
3. Select items from the following index when checks or replacement are required.
4. Refer the parts No. on the page of "Main Component Replacement Procedures", if necessary.

● Contents

■ Checking Procedures for each P.C.B.	Page.
1. Checking for the CD servo P.C.B.	4.
2. Checking for the main P.C.B.	5.
 ■ Main Component Replacement Procedures	
1. Replacement for the traverse deck ass'y.	5~7.
2. Replacement for the belt, loading motor ass'y and loading switch.	8.
 ■ Lead wire and flat cable arrangement	8.

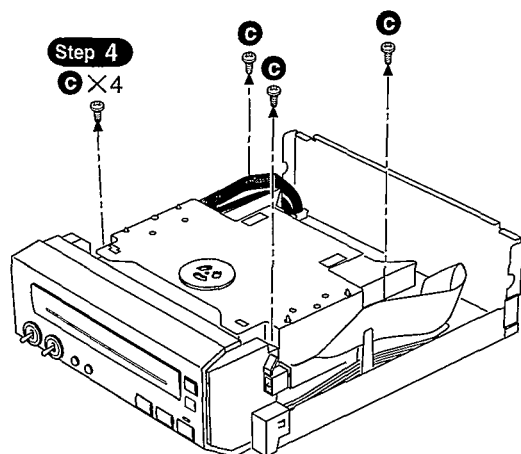
■ Checking Procedures for each P.C.B.

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



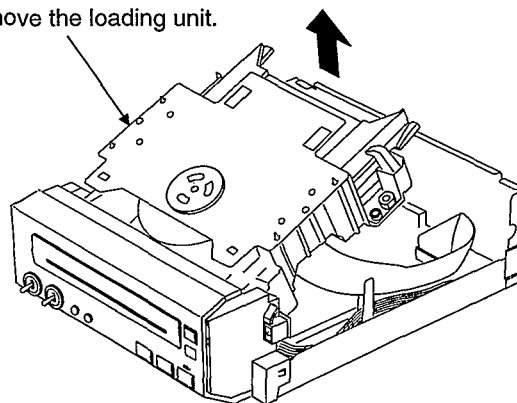
Step 3

Spreading the both front tails indicated with (○) of cabinet a small amount, lift up and remove the cabinet in the direction of arrow.

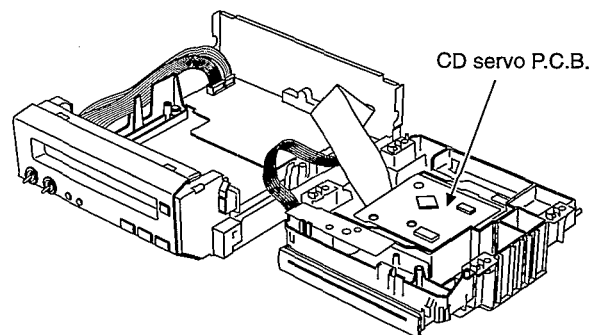


Step 5

Remove the loading unit.

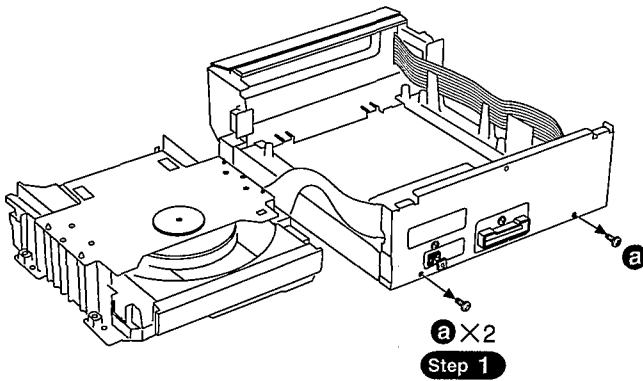


• Check the CD servo P.C.B. as shown below.



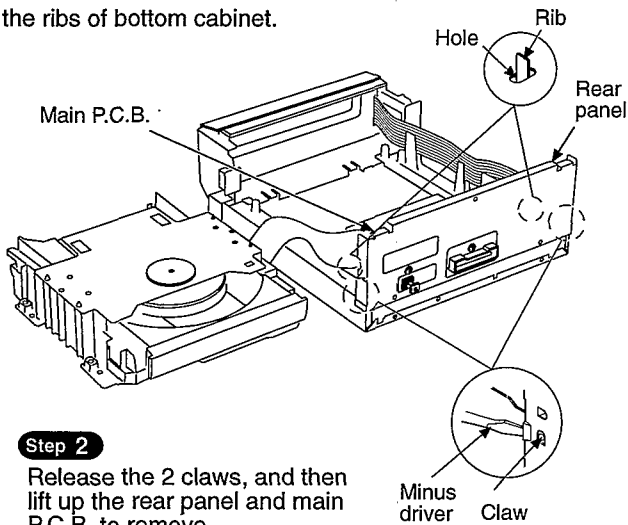
2. Checking for the main P.C.B.

- Follow the **Step 1** ~ **Step 5** of the item 1 in checking procedure for each P.C.B. on page 4.



NOTE

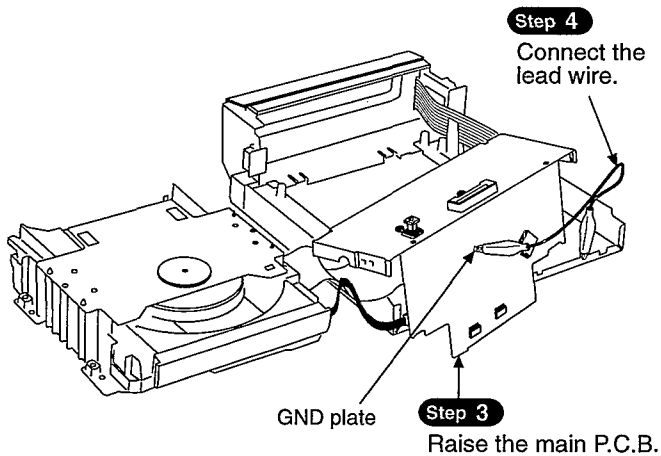
When installing the main P.C.B., make sure that the holes of main P.C.B. are aligned with the ribs of bottom cabinet.



Step 2

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

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



■ Main Component Replacement Procedures

1. Replacement for the traverse deck ass'y

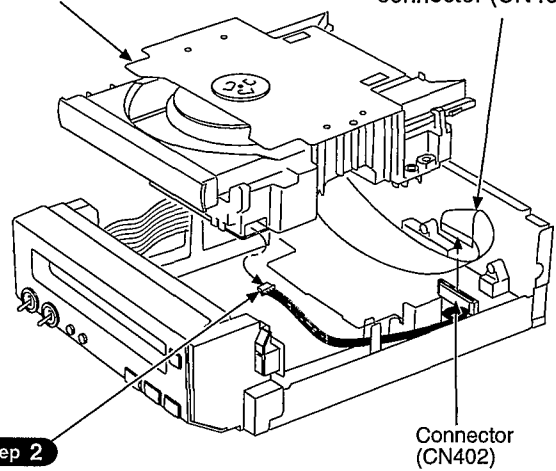
- Follow the **Step 1** ~ **Step 5** of the item 1 in checking procedure for each P.C.B. on page 4.

Step 3

Remove the loading unit.

Step 1

Pull out the FFC from connector (CN402).



Step 2

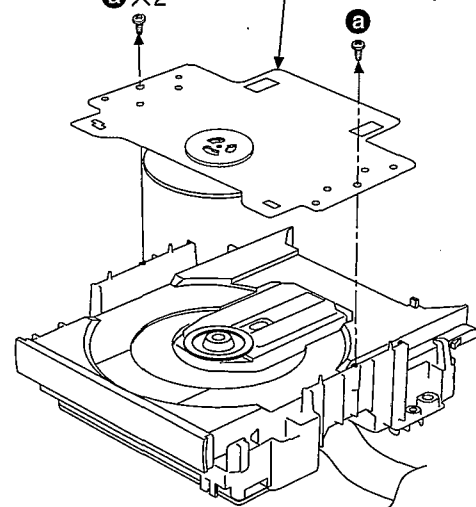
Remove the connector.

Step 4

a x 2

Step 5

Remove the clamber ass'y.

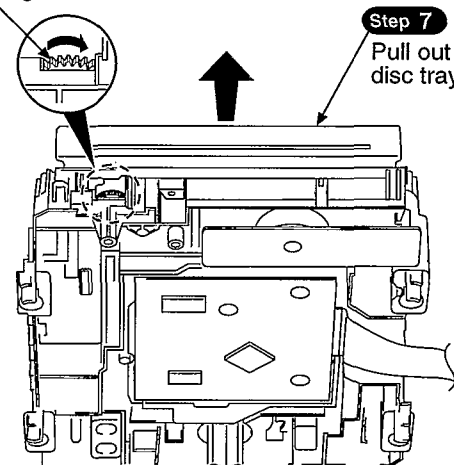


Step 6

Rotate the gear.

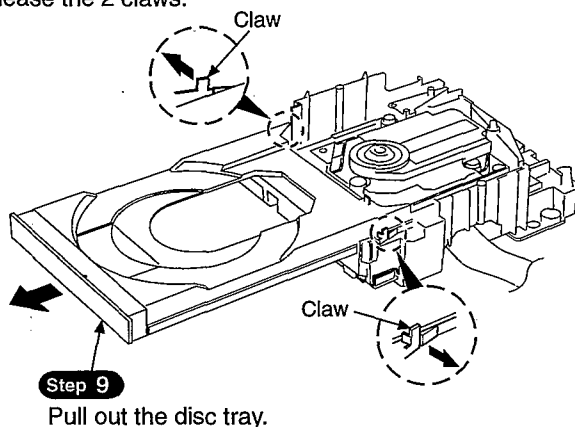
Step 7

Pull out the disc tray.



Step 8

Release the 2 claws.

**Step 11**

C × 2

Step 10

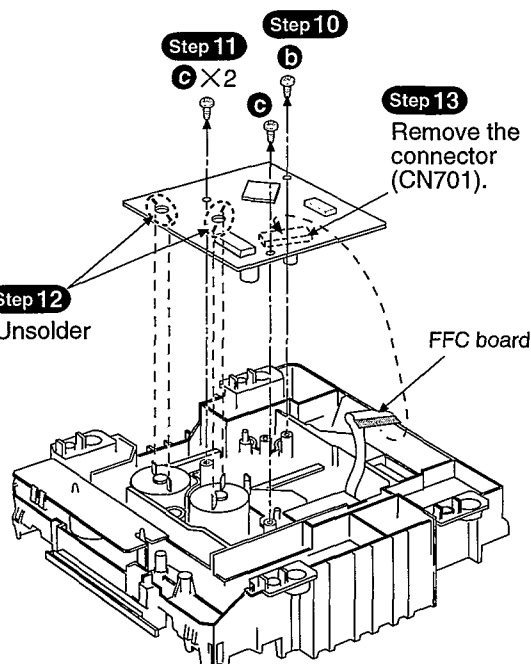
b

Step 13

Remove the connector (CN701).

Step 12
Unsolder

FFC board

**Removal of the FFC board**

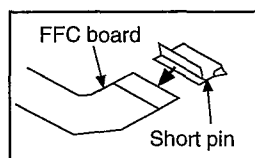
※ Push the top of the connector in the direction of arrow ①, and then pull out the FFC board in the direction of arrow ②.

Top of the connector

FFC board

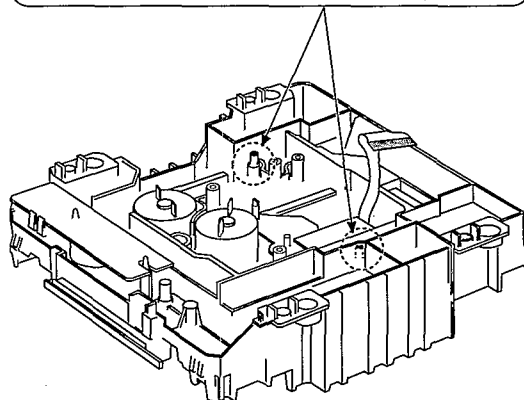
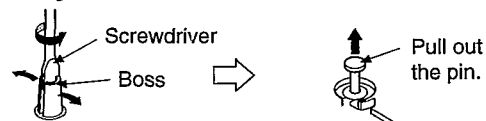
**Caution:**

Insert a short pin into the traverse unit FFC board.
(Refer to "Handling Precautions for Traverse Deck" on page 3.)

**Step 14**

1. Widen the boss using a regular screwdriver.

2. Pull out the pin in the direction of the arrow.



Traverse deck ass'y [RAE0152Z]

Spring (Silver)

Spring (Silver)

Spring (Red)

NOTE

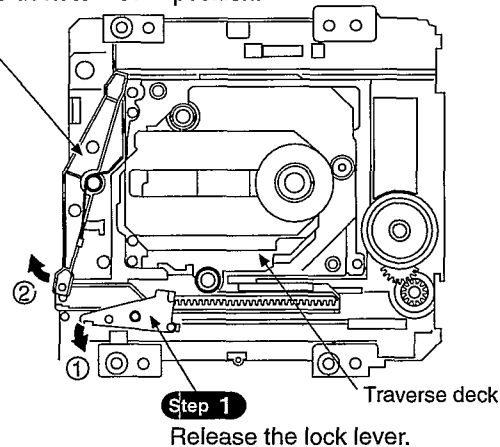
Be careful not to lose the 3 springs because those will also be removed on removal of the traverse deck ass'y.

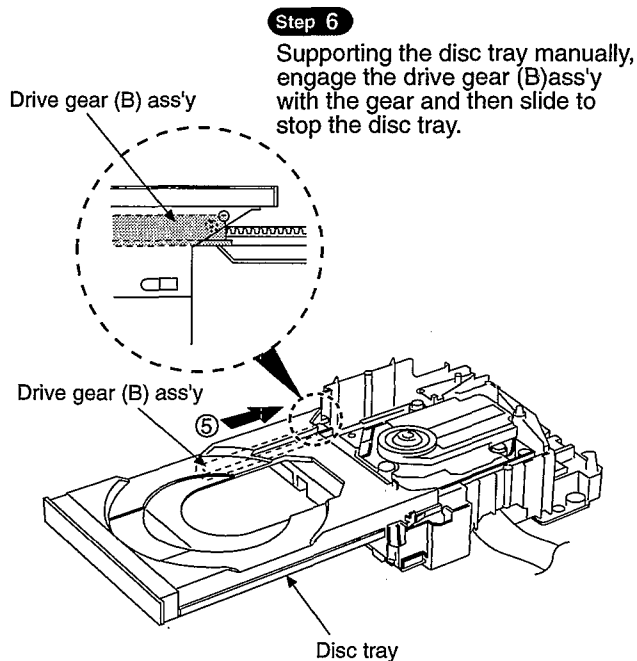
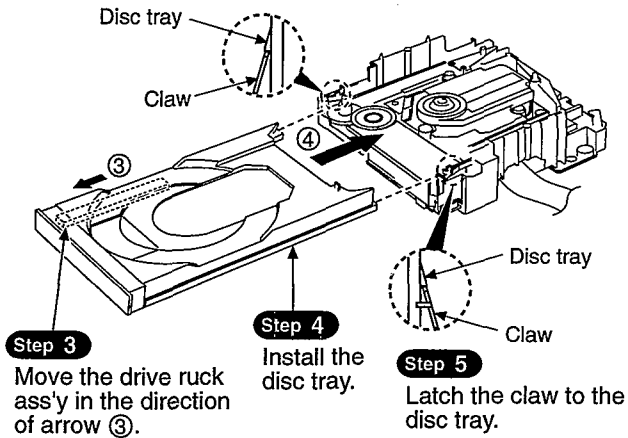
Step 15

Remove the claw.

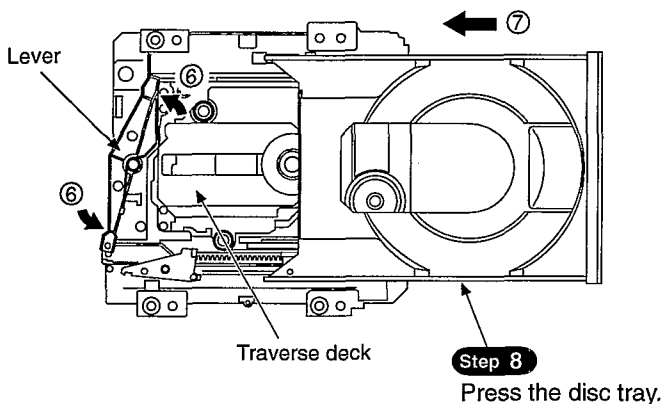
Installation of the disc tray after replacement**Step 2**

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

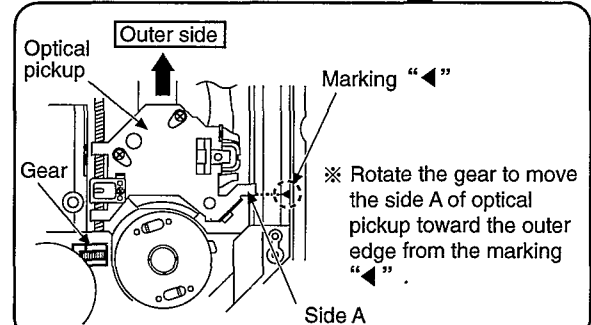
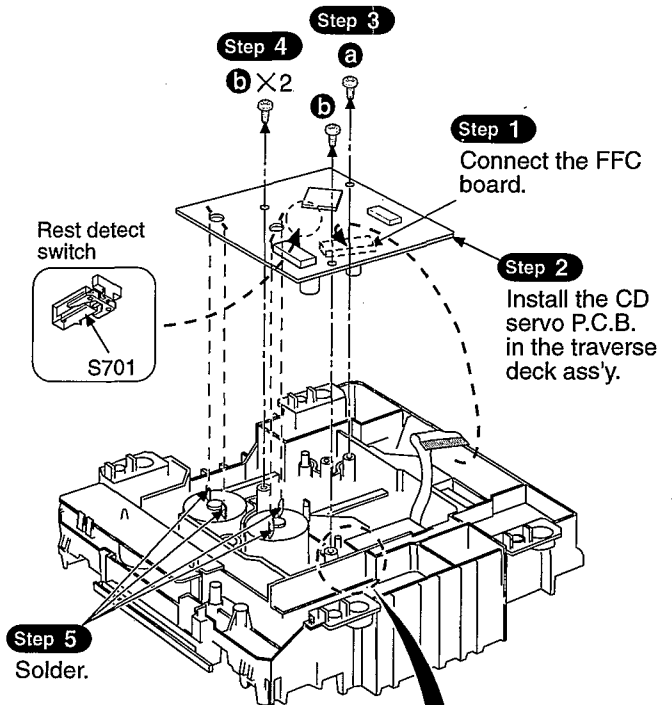




Step 7
Operate the lever, and then locate the traverse deck to "DOWN" position.



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

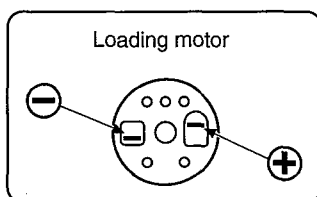
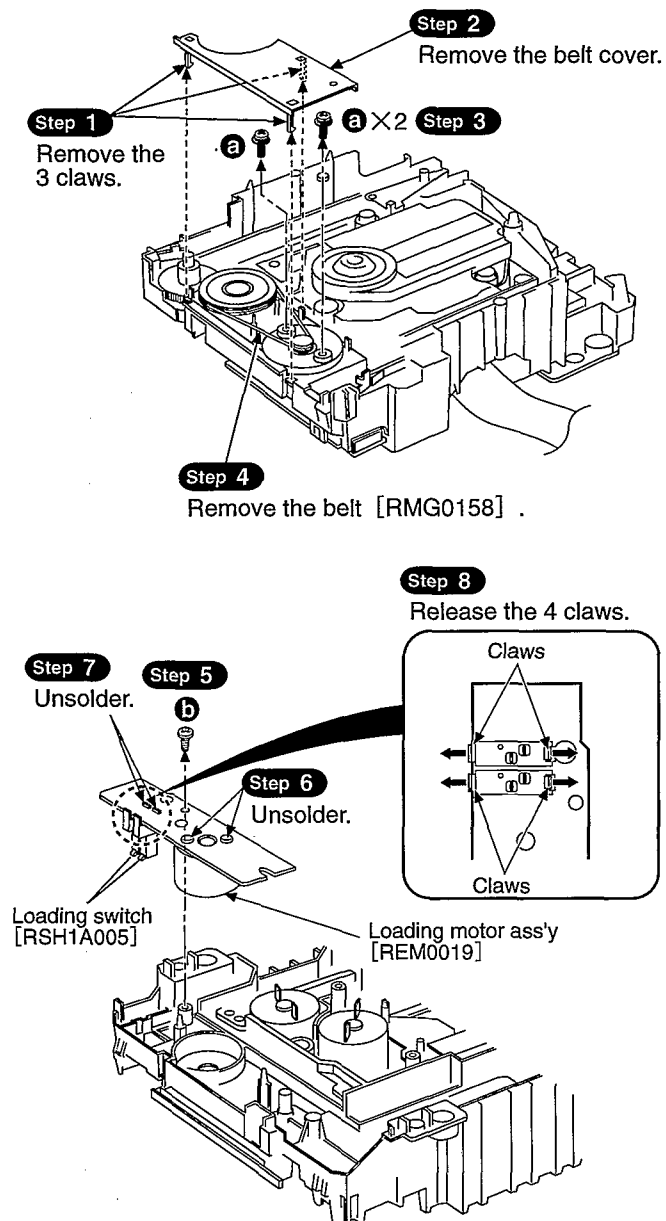


NOTE

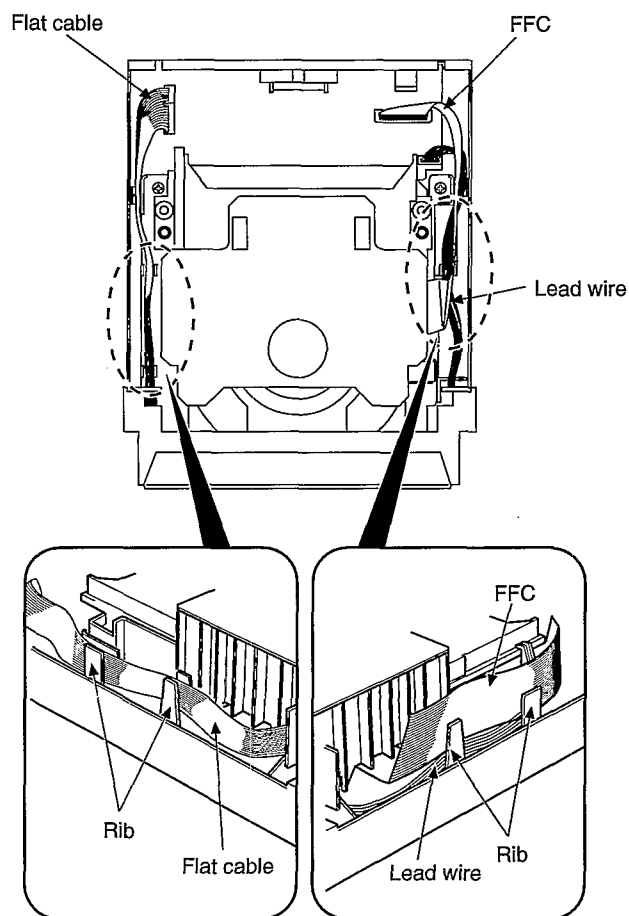
Before installing the CD servo P.C.B., move the optical pickup toward the outer edge from the mark "◀". [Otherwise, the rest detect switch (S701) mounted on the CD servo P.C.B. may be damaged.]

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

- Follow the **Step 1** ~ **Step 5** of the item 1 in checking procedure for each P.C.B. on page 4.
- Follow the **Step 1** ~ **Step 9** of the item 1 in main component replacement procedures on pages 5 and 6.



Lead wire and flat cable arrangement



■ Error Code Display and Servo Adjustment Function

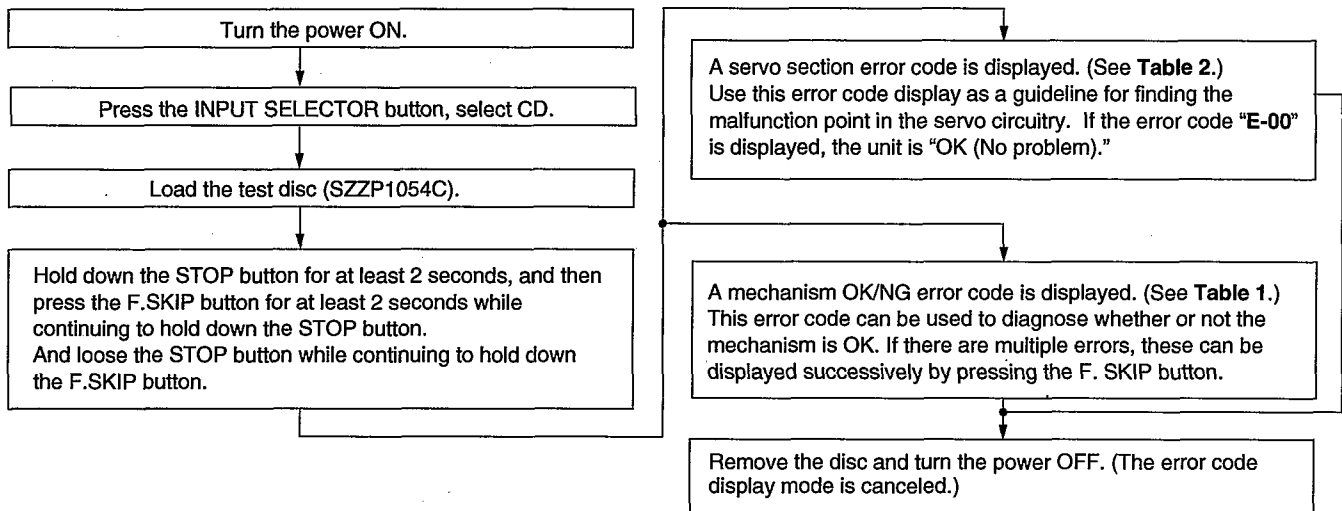
This unit has an error code display function, so that if the unit operates incorrectly, the fault is displayed using an error code on the FL display of the tuner (ST-HD55). It also has a servo adjustment function for displaying the status of servo system functions (focus, tracking, CLV) on the tuner's FL display.

The system control IC and FL display are part of the tuner so make sure the system has been connected properly before using these functions. (This unit can be operated independently, although the error code display and servo adjustment functions cannot be used.)

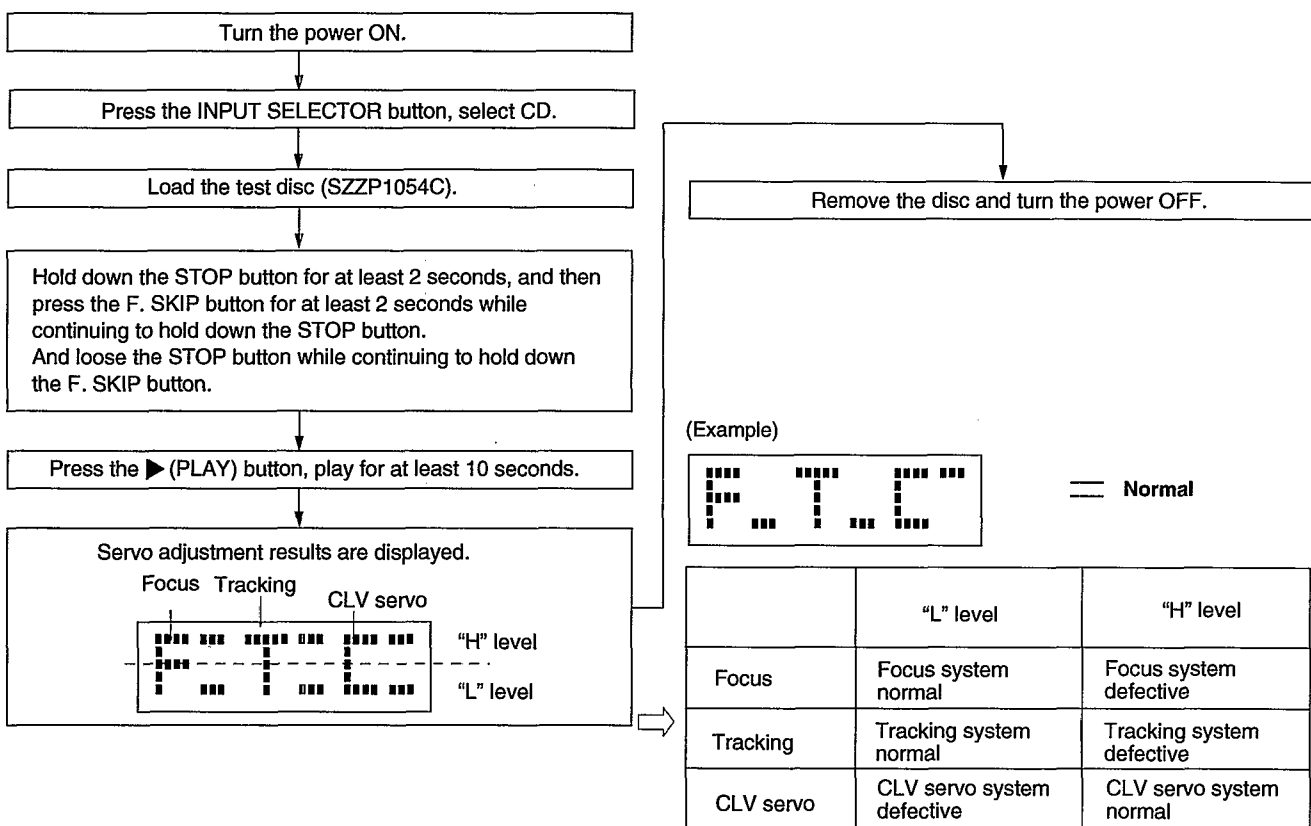
Use these two functions for guidance during fault diagnosis and repair.

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

● Error code display procedure



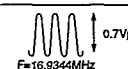
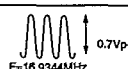
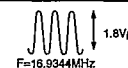
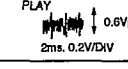
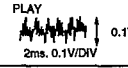
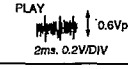
● Servo adjustment procedure



● 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 CD play button 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.

● 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, MLD and SENSE signal to/from IC401.	IC401 ⑧ pin	MDATA		0V
			IC401 ⑦ pin	MCLK		4.8V
			IC401 ⑨ pin	MLD	5V	5V
			IC401 ⑮ pin	/RST	5V	5V
			IC401 ⑦③ pin	X1		
			IC401 ⑦④ pin	X2		
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.	IC401 ④① pin	FE		2.5V
			IC401 ④② pin	TE		2.5V
			IC401 ④④ pin	FOD	2.5V	2.5V
			IC401 ④② pin	TRD	2.5V	2.5V
			IC401 ④③ pin	KICK	2.5V	2.5V
			IC401 ④⑦ pin	/RFDET	0V	5.0V
			IC401 ⑤④ pin	RF		2.5V
			IC401 ①⑦ pin	STAT	4.8V	0V
			IC401 ①① pin	/FLOCK	—	—
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.	IC401 ④① pin	FE		2.5V
			IC401 ④② pin	TE		2.5V
			IC401 ④⑤ pin	OFT	0V	0V
			IC401 ①② pin	/TLOCK	—	—

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.

This unit SL-HD55 is designed to operate on power supplied from the Amplifier SE-HD55 through the Tuner ST-HD55.

When connecting the unit to other system components, do not connect to the Amplifier SE-HD55 directly. Be sure to connect this unit through the Tuner ST-HD55.

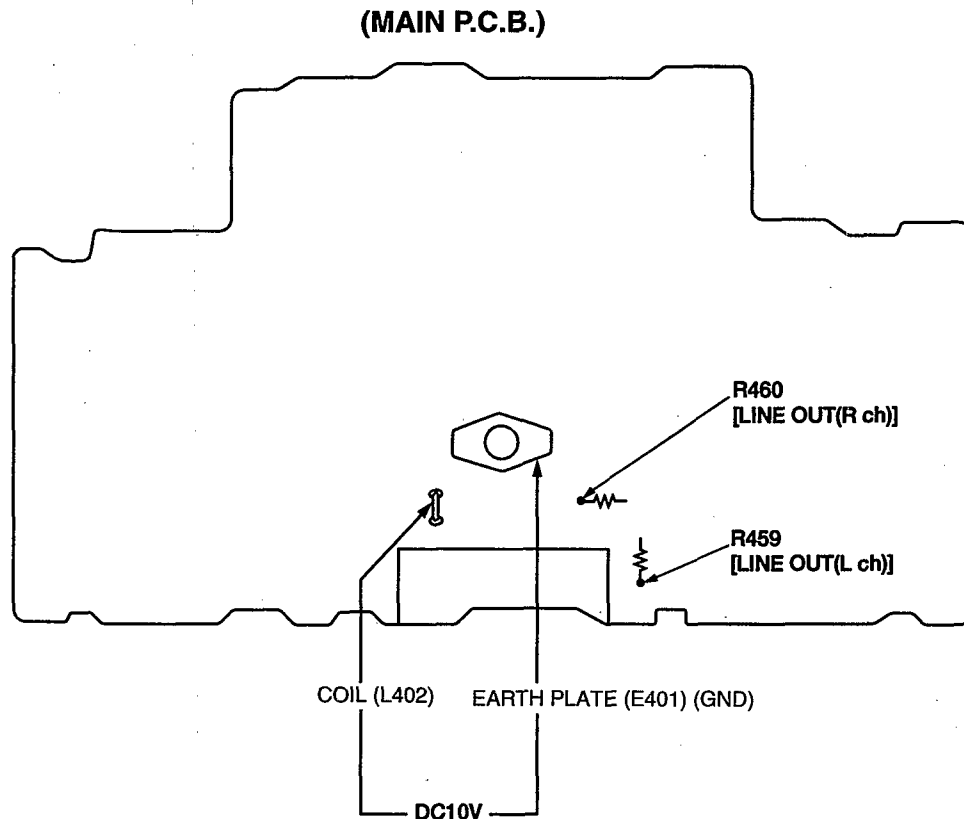
When operating the unit SL-HD55 alone for testing and servicing, without having power supplied from the Amplifier SE-HD55, use the following method.

Power Supply to This Unit alone

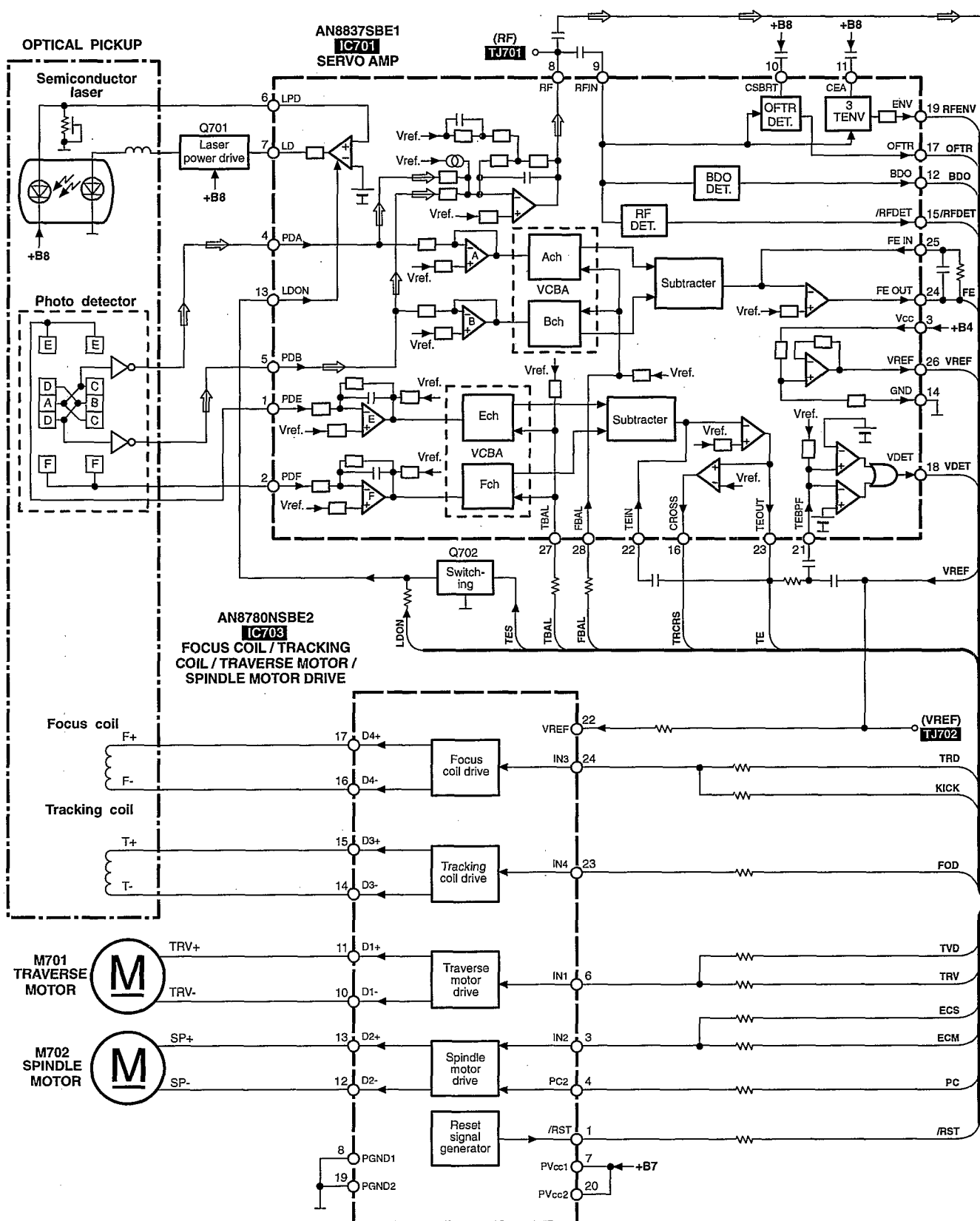
Apply 11V AC power to the section between the coil (L402) and the earth plate (E401) **GND**.

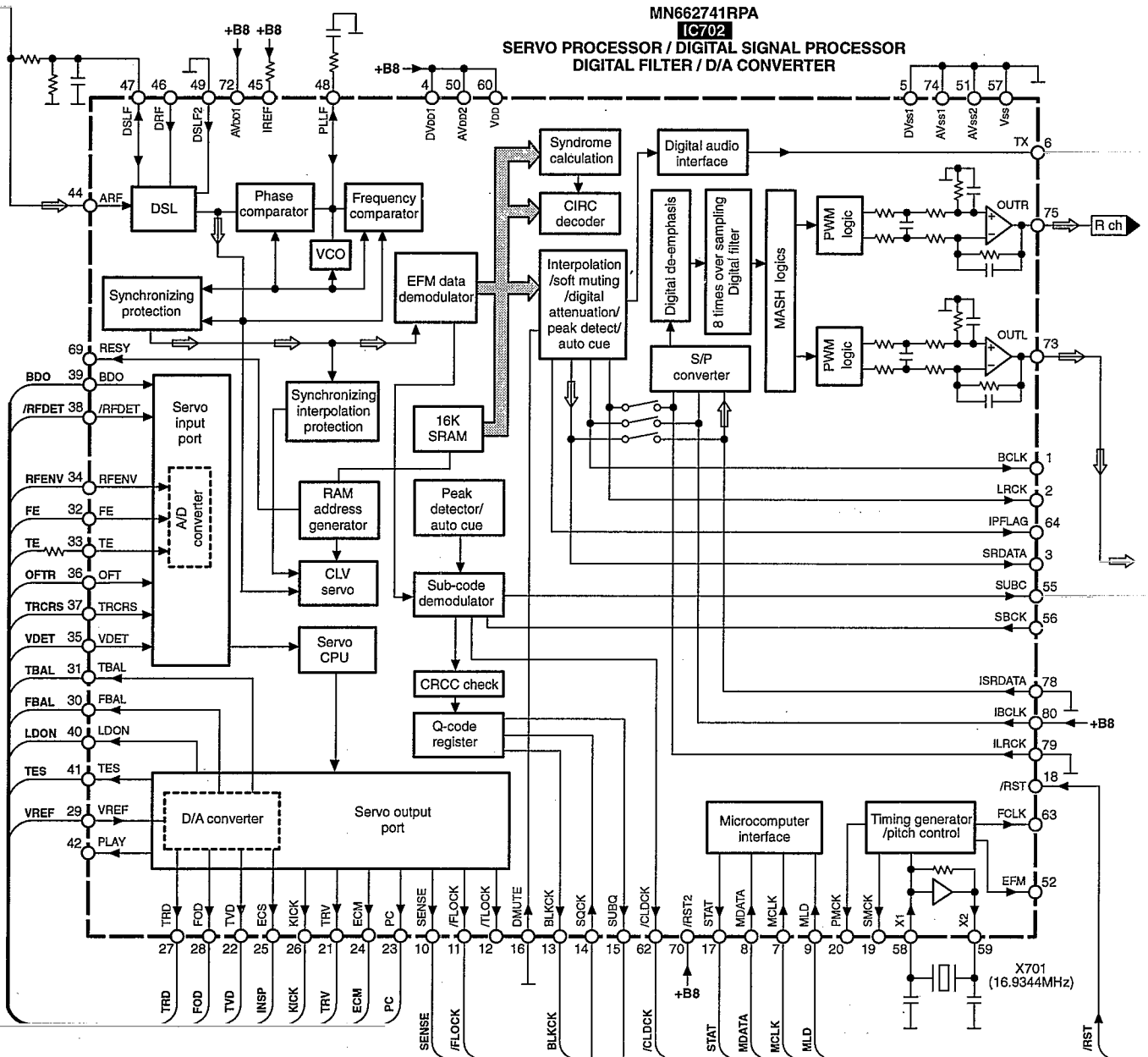
To Check Signals

Connect the oscilloscope or the speaker with built-in amplifier to the section between LINE OUT (L ch) of the resistor R459 and the **GND** point of the earth plate (E401) as well as the section between LINE OUT (R ch) of the resistor R460 and the **GND** point of the earth plate (E401) and check if the signals are outputting from this unit.

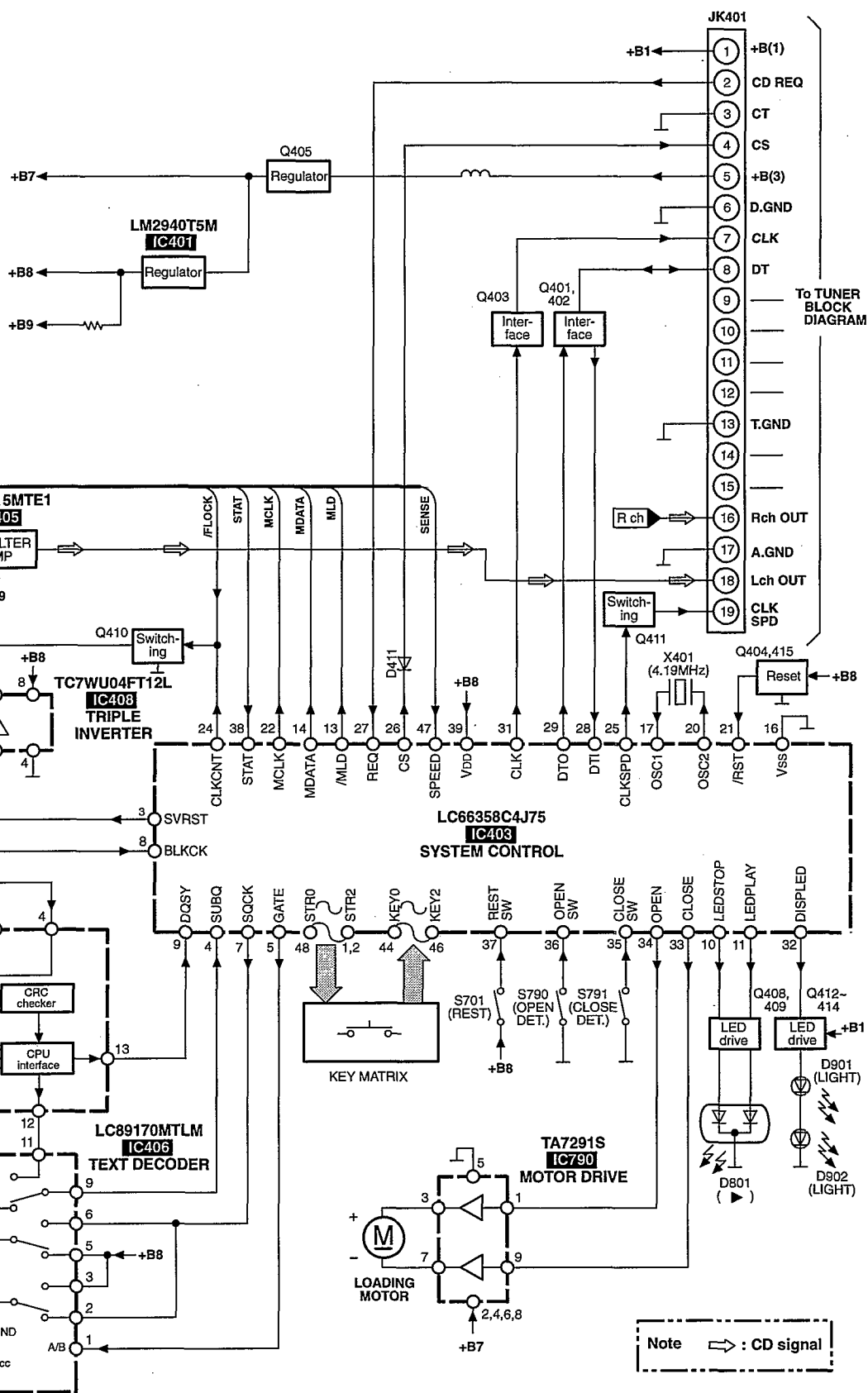


Block Diagram





T0TX178-12M
IC402
TRANSMISSION
MODULE



■ Blue LED

- The LED mounted to each side of the front panel of this set is very sensitive to static electricity. When handling the LED base plate, be very careful about it.
 - Do not replace a blue LED singly. If replaced singly, it may be subject to electrostatic breakdown or deterioration in quality. When replacing the LED base plate, be sure to replace L and R sides simultaneously to permit the brightness adjustment.
- *For configuration at the time of supply of replacement parts, refer to the PCB Diagram (on Page 22).

■ Schematic Diagram (Parts list on pages 31, 32.)

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

	Page		Page
A CD SERVO CIRCUIT	21	D OPERATION CIRCUIT	22
B LOADING MOTOR CIRCUIT	21	E LED (L) CIRCUIT	22
C MAIN CIRCUIT	22	F LED (R) CIRCUIT	22

Notes:

- **S701**: Rest position detect switch.
- **S790**: CD tray open switch.
- **S790**: CD tray close 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**: Track/all select (TRACK/ALL) 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  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 !

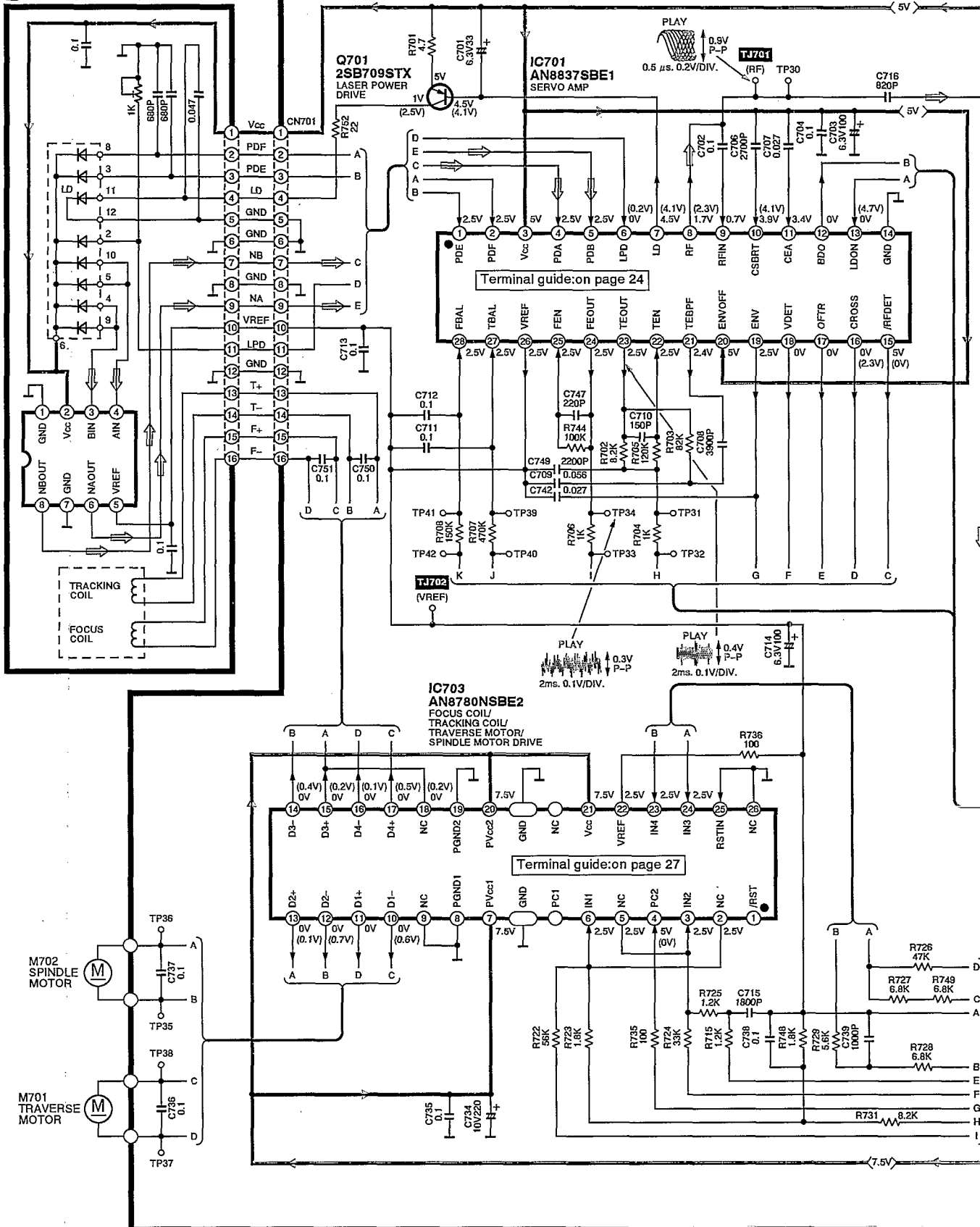
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
Cover the parts boxes made of plastics with aluminum foil.
Ground the soldering iron.
Put a conductive mat on the work table.
Do not touch the legs of IC or LSI with the fingers directly.

• Voltage and signal line

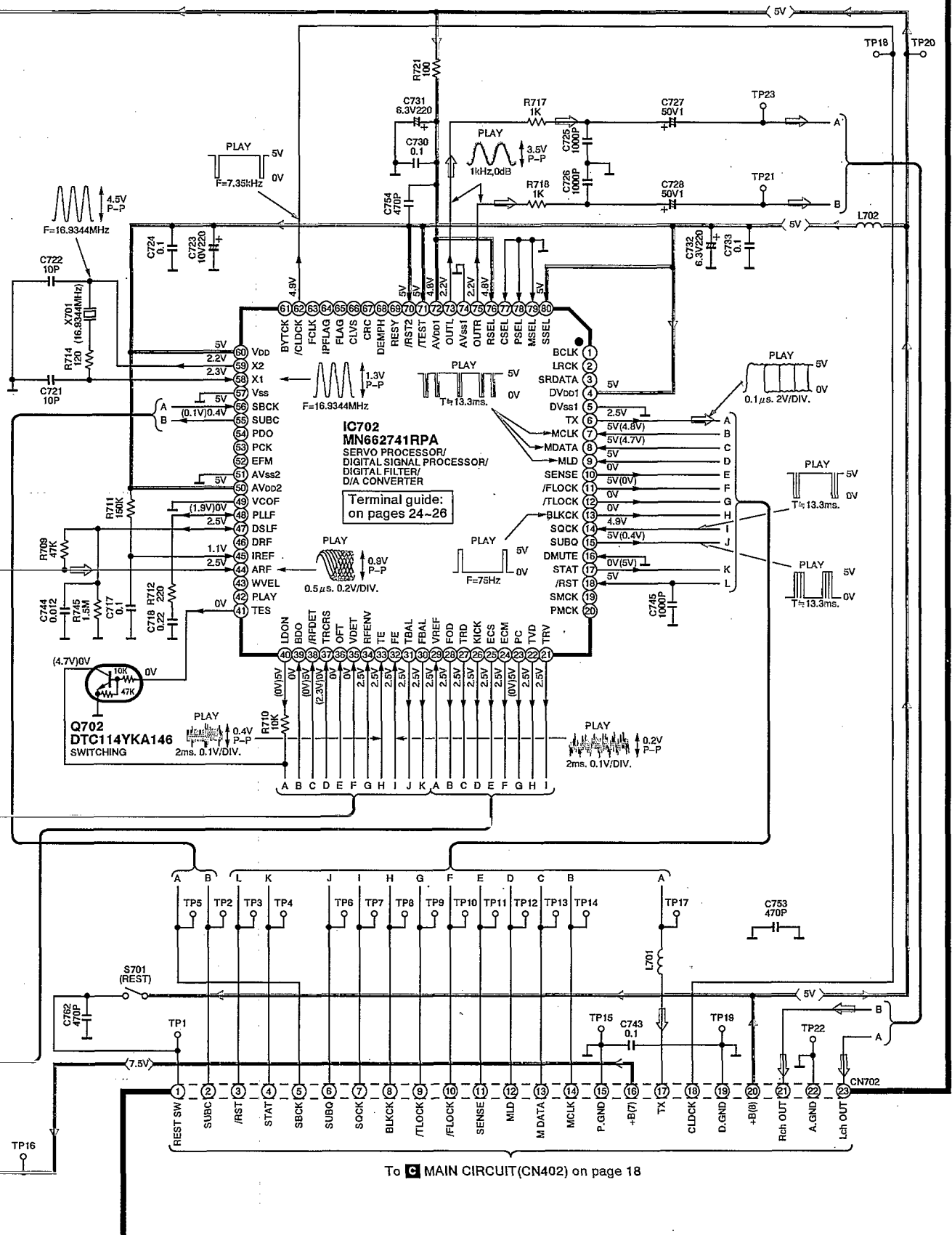
 : Positive voltage line  : Negative voltage line
 : CD signal line

A CD SERVO CIRCUIT (P.C.Board: on page 21)

OPTICAL PICKUP

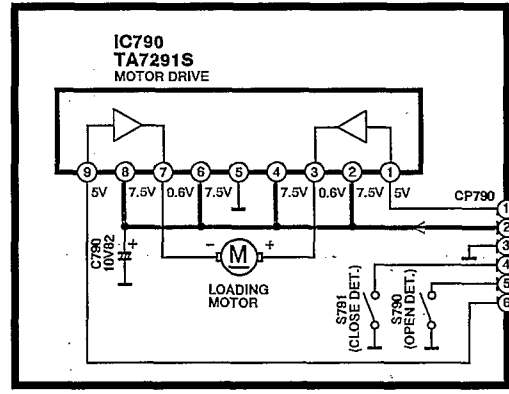


Note: ● → : CD signal line

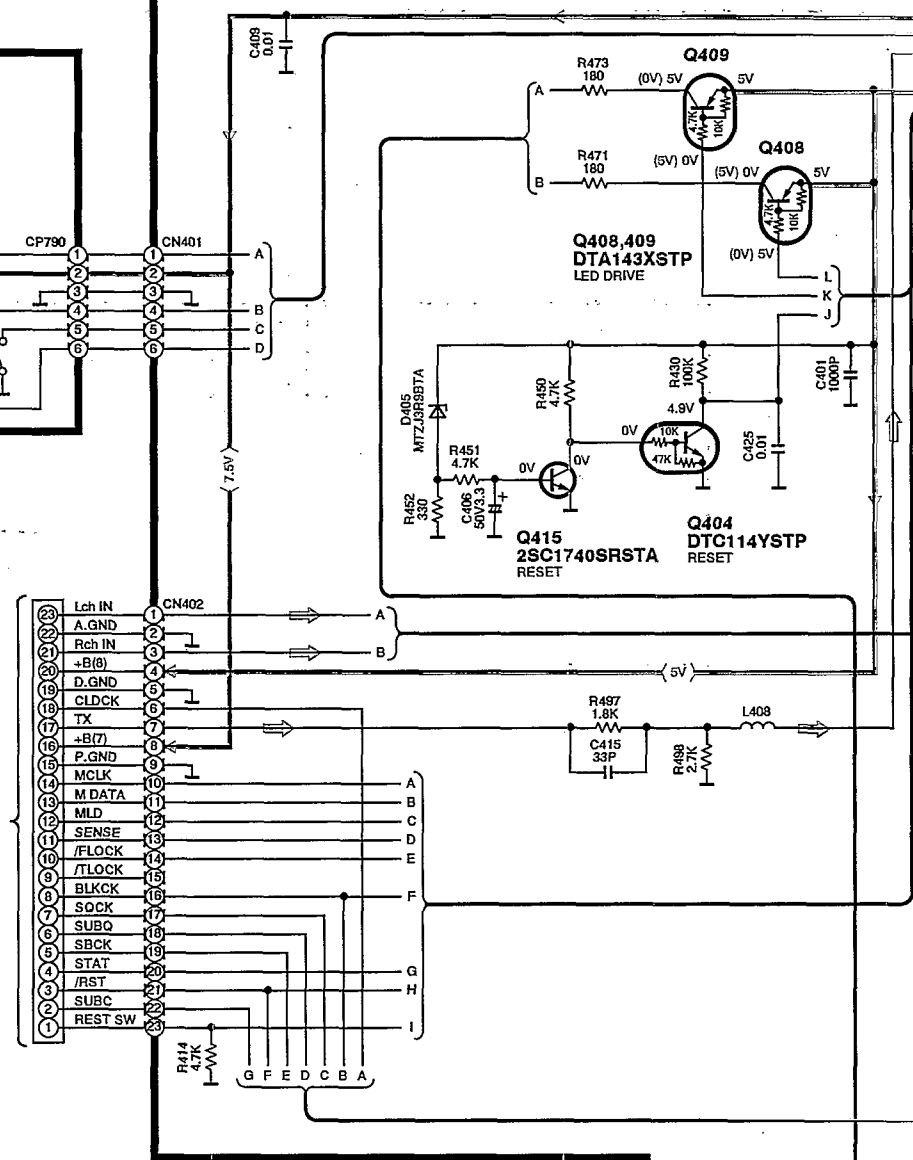


C MAIN CIRCUIT (P.C.Board: on page 22)

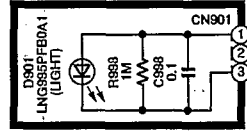
B LOADING MOTOR CIRCUIT
(P.C.Board: on page 21)



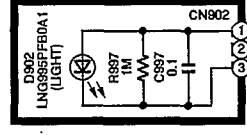
To **A** CD SERVO CIRCUIT (CN702) on page 17



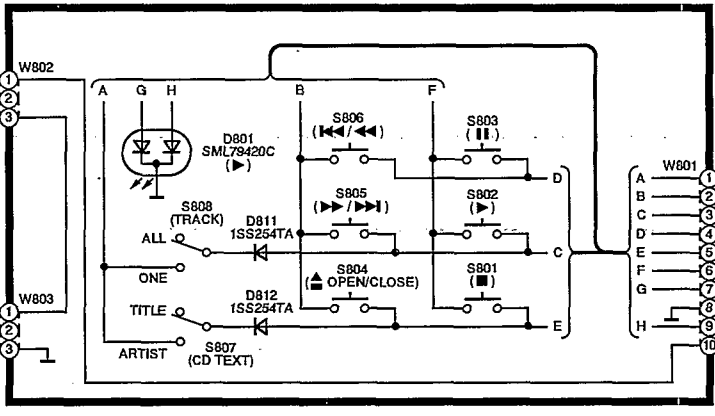
E LED(L) CIRCUIT
(P.C.Board: on page 22)



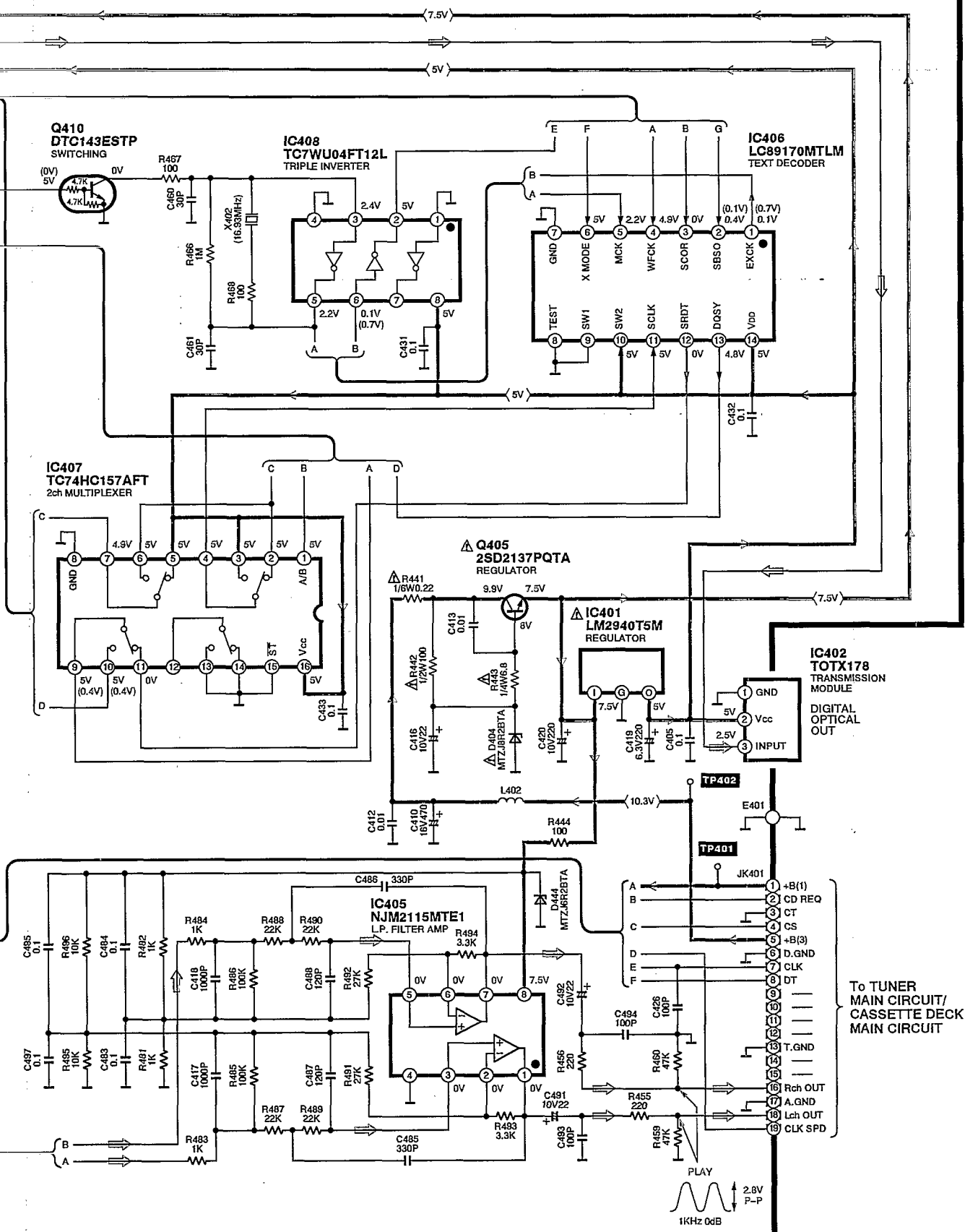
F LED(R) CIRCUIT
(P.C.Board: on page 22)



D OPERATION CIRCUIT (P.C.Board: on page 22)



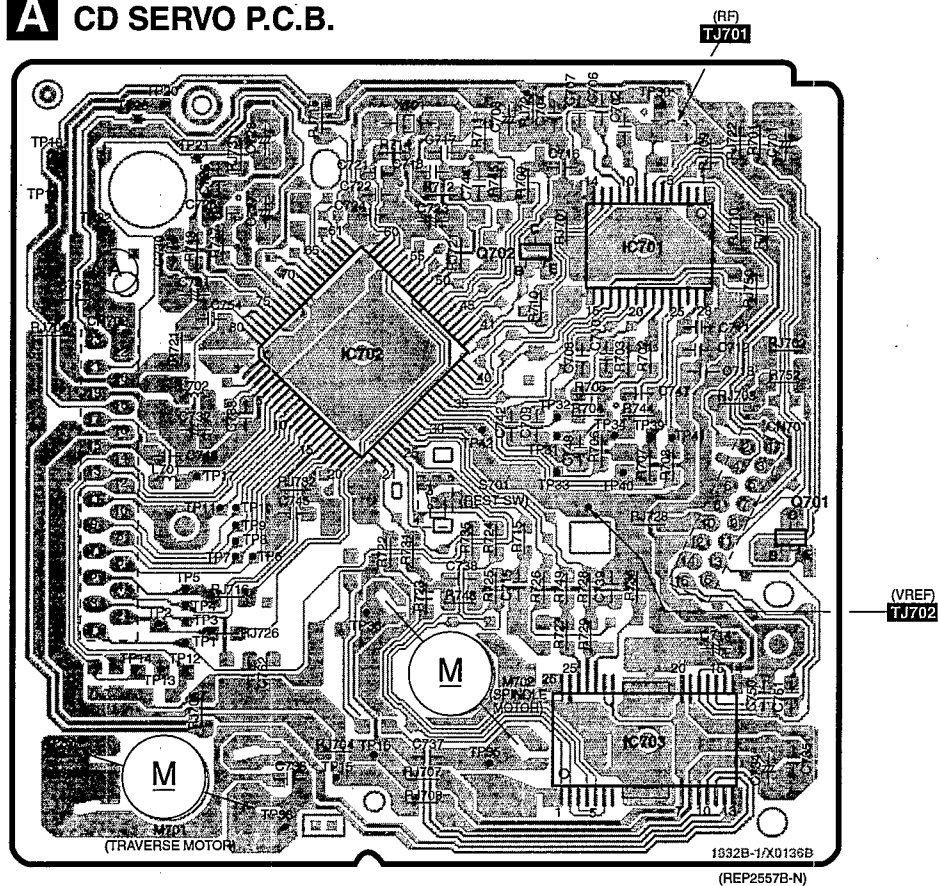


C MAIN CIRCUIT (P.C.Board: on page 22)

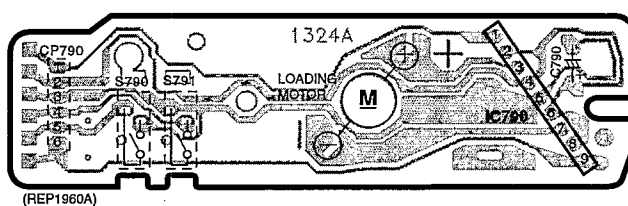
■ Printed Circuit Board Diagram

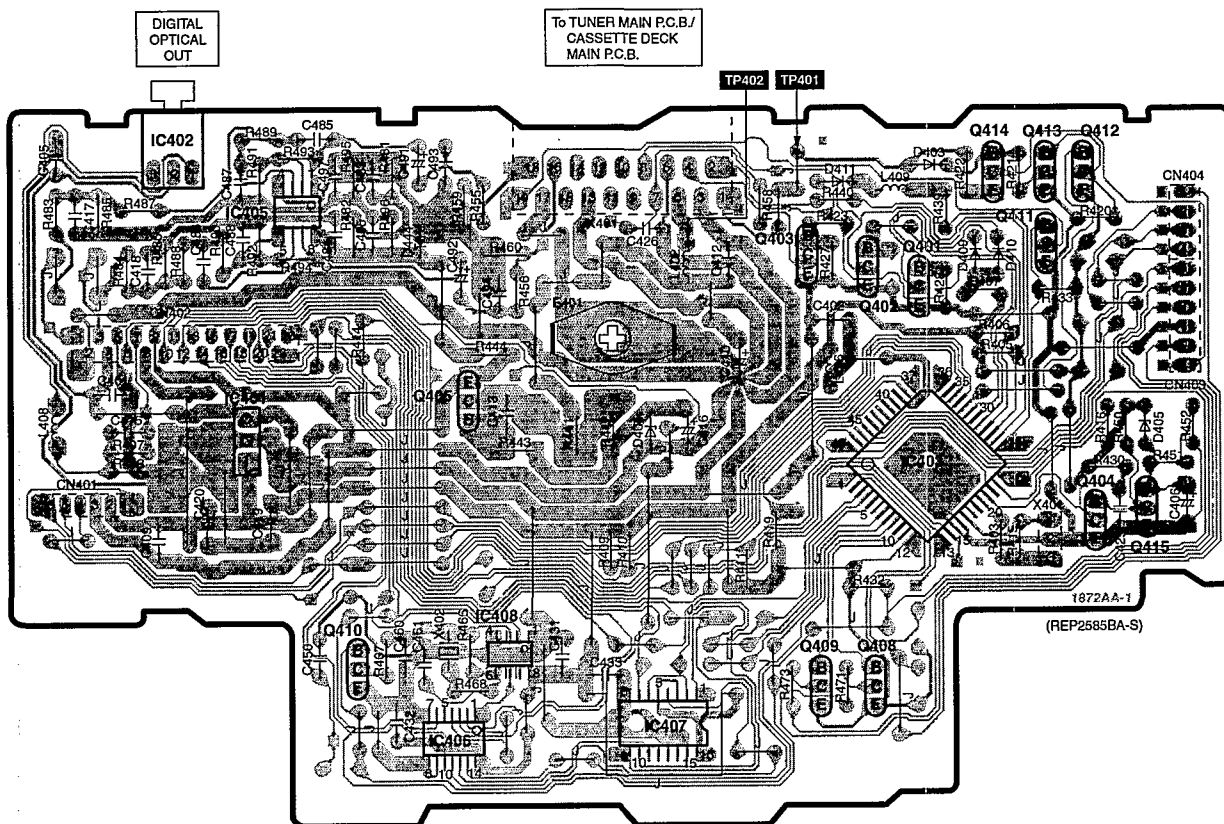
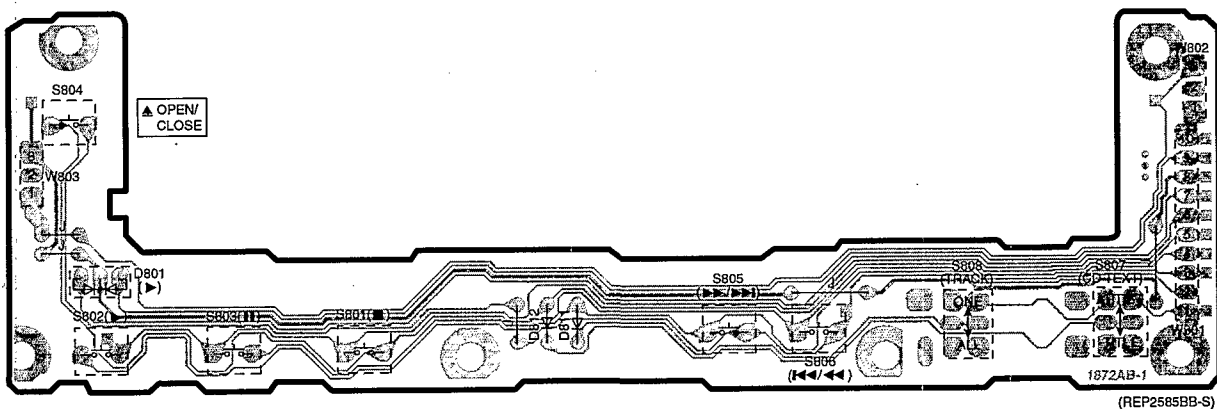
(This printed circuit board diagram may be modified at any time with the development of new technology.)

A CD SERVO P.C.B.

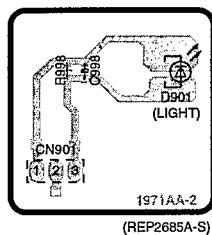
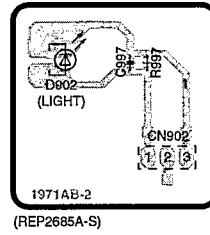


B LOADING MOTOR P.C.B.

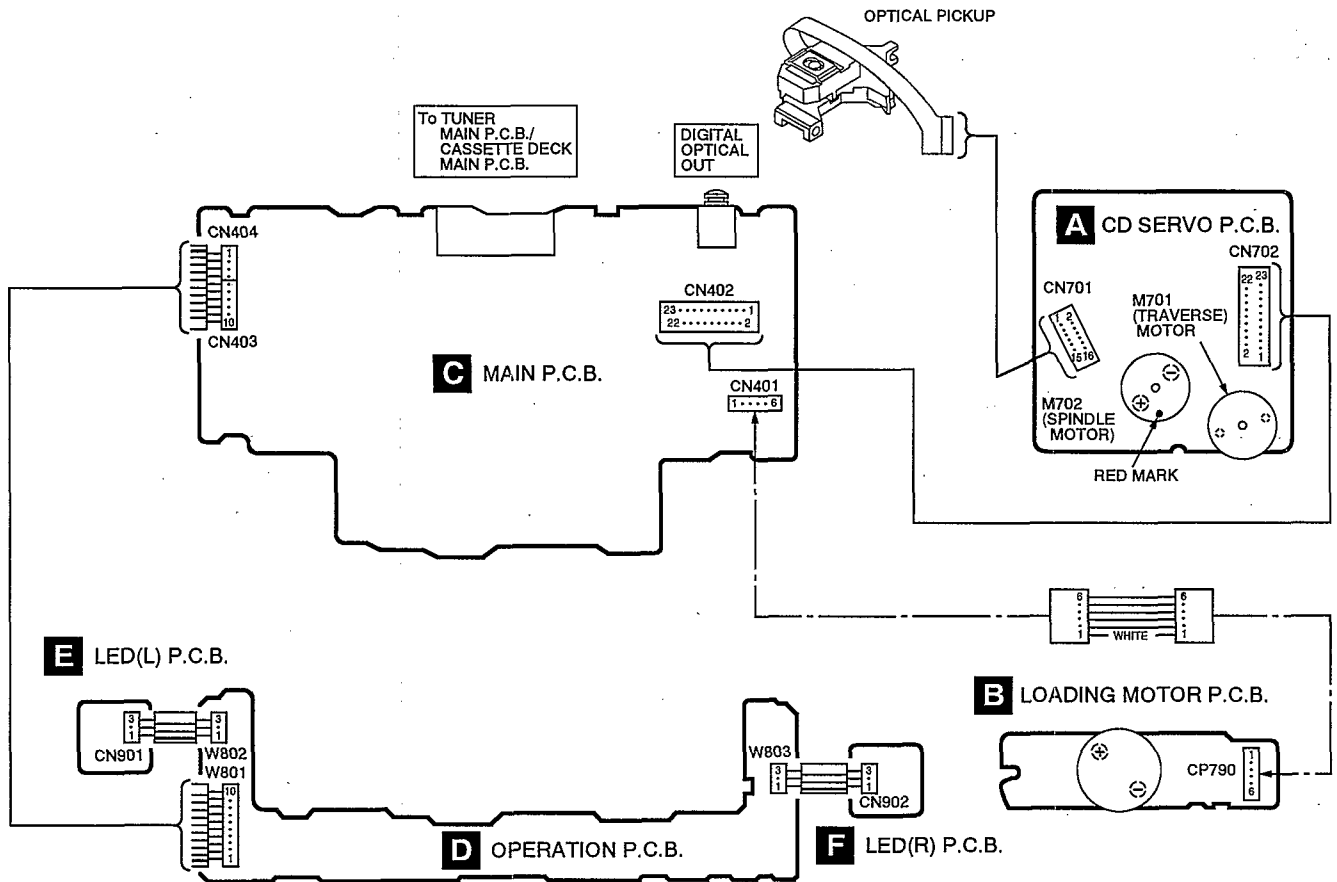


C MAIN P.C.B.**D** OPERATION P.C.B.

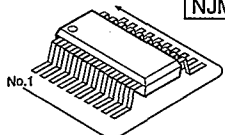
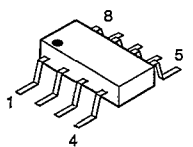
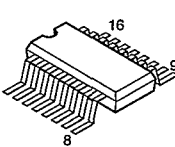
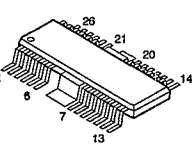
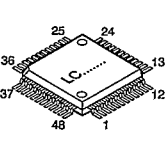
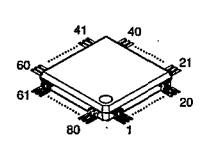
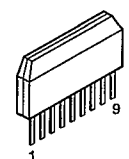
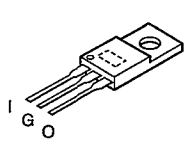
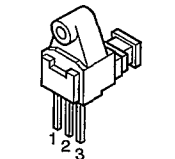
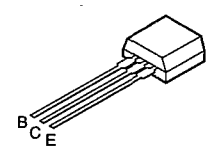
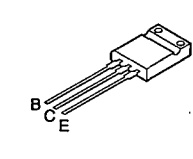
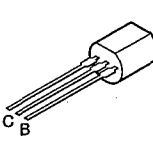
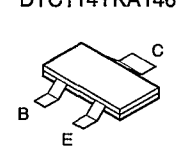
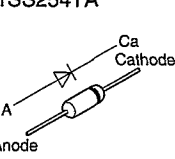
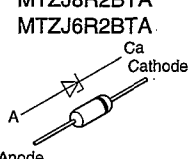
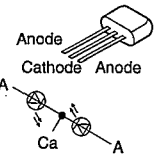
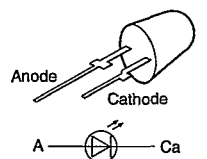
Keeping to the rule of unit supply, we do not supply single parts.

E LED(L) P.C.B.**F** LED(R) P.C.B.

Wiring Connecting Diagram



Type Illustration of IC's, Transistors and Diodes

 <table><tr><td>AN8837SBE1</td><td>28PIN</td></tr><tr><td>LC89170MTLM</td><td>14PIN</td></tr><tr><td>NJM2115MTE1</td><td>8PIN</td></tr></table>	AN8837SBE1	28PIN	LC89170MTLM	14PIN	NJM2115MTE1	8PIN				
AN8837SBE1	28PIN									
LC89170MTLM	14PIN									
NJM2115MTE1	8PIN									
 MN662741RPA	 TA7291S	 LM2940T5M	 TOTX178	 2SC1740SRSTA DTA143XSTP DTC114YSTP DTC143ESTP						
 2SD2137PQTA	 2SB621AQRSTA	 2SB709STX DTC114YKA146	 MA29TATA 1SS254TA	 MTZJ3R9BTA MTZJ8R2BTA MTZJ6R2BTA	 SML79420C					
 LNG995PFB0A1										

■ Terminal Function of IC's

● IC701 (AN8837SBE1): SERVO AMP

Pin No.	Mark	I/O Division	Function
1	PDA	I	Focus signal input terminal 1 (A ch)
2	PDB	I	Focus signal input terminal 2 (B ch)
3	VCC	I	Power supply terminal
4	LPD	I	APC amp. input terminal
5	LD	O	APC amp. output terminal
6	RF	O	RF amp. terminal
7	RF IN	I	AGC input terminal
8	CAGC	I	AGC loop filter connection terminal
9	ARF	O	AGC output terminal
10	CSBRT	I	OFTR capacitor connection terminal
11	CEA	I	HPF-AMP capacitor connection terminal
12	BDO	O	BDO output terminal
13	LDON	I	APC adj. terminal
14	GND	—	GND terminal

Pin No.	Mark	I/O Division	Function
15	/RFDET	O	NRFDET output terminal
16	CROSS	O	CROSS output terminal
17	OFTR	O	OFTR output terminal
18	VDET	O	VDET output terminal
19	ENV	O	3 TENV output terminal
20	TEBPF	I	VDET input terminal
21	CCRS	I	CROSS capacitor connection terminal
22	TE	O	Tracking error signal
23	FE	O	Focusing error signal
24	TBAL	I	Tracking balance adj. input
25	FBAL	I	Focus balance adj. input
26	VREF	O	VREF output terminal
27	PDE	I	Tracking signal input terminal 1 (E ch)
28	PDF	I	Tracking signal input terminal 2 (F ch)

● IC702 (MN662741RPA): SERVO PROCESSOR/DIGITAL SIGNAL PROCESSOR/DIGITAL FILTER D/A CONVERTER

Pin No.	Mark	I/O Division	Function
1	BCLK	O	Serial data bit clock terminal (Not used, open)
2	LRCK	O	L/R discriminating signal terminal (Not used, open)
3	SRDATA	O	Serial data terminal (Not used, open)
4	DVDD1	I	Power supply (digital circuit) terminal
5	DVSS1	—	GND (digital circuit) terminal
6	TX	O	Digital audio interface signal terminal
7	MCLK	I	Command clock signal terminal

Pin No.	Mark	I/O Division	Function
8	MDATA	I	Command data signal terminal
9	MLD	I	Command load signal terminal
10	SENSE	O	Sense signal terminal (OFT, FESL, NACEND, NAJEND, DATA, SFG) (Not used, open)
11	/FLOCK	O	Focus servo lead-in signal terminal ("L": lead-in) (Not used, open)
12	/TLOCK	O	Tracking servo lead-in signal terminal ("L": lead-in) (Not used, open)
13	BLKCK	O	Sub-code block clock terminal (fBLKCK=75 Hz: normal play)

Pin No.	Mark	I/O Division	Function
14	SQCK	I	Sub-code Q resistor clock signal terminal
15	SUBQ	O	Sub-code Q code terminal
16	DMUTE	I	Muting terminal ("H": mute) (Not used, connected to GND)
17	STAT	O	Status signal terminal (CRC, CUE, CLVS, TTSTOP, FCLV, SQOK)
18	/RST	I	Reset terminal
19	SMCK	O	Not used, open
20	PMCK	O	Not used, open
21	TRV	O	Traverse forced feed terminal
22	TVD	O	Traverse drive signal terminal
23	PC	O	Turntable motor drive signal terminal ("L": ON)
24	ECM	O	Turntable motor drive signal terminal (Forced mode)
25	ECS	O	Turntable motor drive signal terminal (Servo error signal)
26	KICK	O	Kick pulse terminal
27	TRD	O	Tracking drive signal terminal
28	FOD	O	Focus drive signal terminal
29	VREF	I	D/A driven output (TVD, ECS, TRD, FOD, FBAL, TBAL) normal voltage terminal
30	FBAL	O	Focus balance adj. terminal
31	TBAL	O	Tracking balance adj. terminal
32	FE	I	Focus error signal terminal (analog input)
33	TE	I	Tracking error signal terminal (analog input)
34	RFENV	I	RF envelope signal terminal
35	VDET	I	Oscillation det. signal terminal ("H": det.)

Pin No.	Mark	I/O Division	Function
36	OFT	I	Off track signal terminal ("H": off track)
37	TRCRS	I	Track cross signal terminal
38	/RFDET	I	RF detection signal terminal ("L": detection)
39	BDO	I	Dropout signal terminal ("H": Dropout)
40	LDON	O	Laser ON signal terminal ("H": ON)
41	TES	O	Tracking error shunt signal terminal ("H": Shunt)
42	PLAY	O	Play signal terminal ("H": Play) (Not used, open)
43	WVEL	O	Double velocity status signal terminal ("H": double) (Not used, open)
44	ARF	I	RF signal terminal
45	IREF	I	Reference current terminal
46	DRF	I	DSL bias terminal (Not used, open)
47	DSLIF	I/O	DSL loop filter terminal
48	PLLIF	I/O	PLL loop filter terminal
49	VCOF	I/O	VCO loop filter terminal (Not used, connected to GND)
50	AVDD2	I	Power supply (analog circuit) terminal
51	AVss2	—	GND (analog circuit) terminal
52	EFM	O	EFM signal terminal (Not used, open)
53	PCK	O	PLL extract clock terminal (fPCK=4.321 MHz: normal play) (Not used, open)
54	PDO	O	Test terminal (Not used, open)
55	SUBC	O	Sub-code serial data terminal
56	SBCK	I	Sub-code serial data clock terminal
57	Vss	—	GND terminal

Pin No.	Mark	I/O Division	Function
58	X1	I	Crystal oscillator terminal (f=33.8688 MHz)
59	X2	O	Crystal oscillator terminal (f=33.8688 MHz)
60	VDD	I	Power supply (oscillation circuit) terminal
61	BYTCK	O	Byte clock terminal (Not used, open)
62	/CLDCK	O	Sub-code frame clock signal terminal (fCLDCK=7.35 kHz: normal play)
63	FCLK	O	Crystal frame clock signal terminal (fCLK=7.35 kHz, double velocity 14.7 kHz) (Not used, open)
64	IPFLAG	O	Interpolation flag terminal ("H": interpolation) (Not used, open)
65	FLAG	O	Flag terminal (Not used, open)
66	CLVS	O	Turntable servo phase synchro signal terminal ("H": CLV, "L": Rough servo) (Not used, open)
67	CRC	O	Sub-code CRC check terminal ("H": ON, "L": NG) (Not used, open)
68	DEMPH	O	De-emphasis ON signal ("H": ON) (Not used, open)
69	RESY	O	Re-synchronizing signal of frame sync. (Not used, open)

Pin No.	Mark	I/O Division	Function
70	/RST2	I	Mode select terminal (Not used, connected to power supply)
71	/TEST	I	Test terminal (Not used, connected to power supply)
72	AVDD1	I	Power supply (analog circuit) terminal
73	OUTL	O	L ch audio signal terminal
74	AVss1	—	GND terminal
75	OUTR	O	R ch audio signal terminal
76	RSEL	I	Not used, connected to GND
77	CSEL	I	
78	PSEL	I	Test terminal (Normal: "L") (Not used, connected to GND)
79	MSEL	I	"SMCK" terminal frequency select terminal "H": SMCK=8.4672 MHz "L": SMCK=4.2336 MHz (Not used, connected to GND)
80	SSEL	O	"SUBQ" terminal mode select terminal ("H": Q code buffer) (Not used, connected power supply)

● IC703 (AN8780NSBE2): FOCUS COIL/TRACKING COIL/TRAVERSE MOTOR/SPINDLE MOTOR DRIVE

Pin No.	Mark	I/O Division	Function
1	Vcc	I	Power supply terminal
2	VREF	I	VREF input terminal
3	IN4	I	Motor driver (4) input
4	IN3	I	Motor driver (3) input
5	GND	—	GND terminal
6	NC	—	Not used, connected to GND
7	NRESET	O	Reset terminal (Not used, open)
8	GND	—	GND terminal
9	IN2	I	Motor driver (2) input
10	PC2	I	PC2 (power cut) input
11	IN1	I	Motor drive (1) input
12	PC1	I	PC1 (power cut) input (Not used, connected to GND)

Pin No.	Mark	I/O Division	Function
13	PVcc1	I	Driver power supply terminal (1)
14	PGND1	—	Driver GND terminal (1)
15	D1—	O	Motor driver (1) output terminal (—)
16	D1+	O	Motor driver (1) output terminal (+)
17	D2—	O	Motor driver (2) output terminal (—)
18	D2+	O	Motor driver (2) output terminal (+)
19	D3—	O	Motor driver (3) output terminal (—)
20	D3+	O	Motor driver (3) output terminal (+)
21	D4—	O	Motor driver (4) output terminal (—)
22	D4+	O	Motor driver (4) output terminal (+)
23	PGND2	—	Driver GND terminal (2)
24	PVcc2	I	Driver power supply (2)

● IC403 (LC66358C4J75): SYSTEM CONTROL

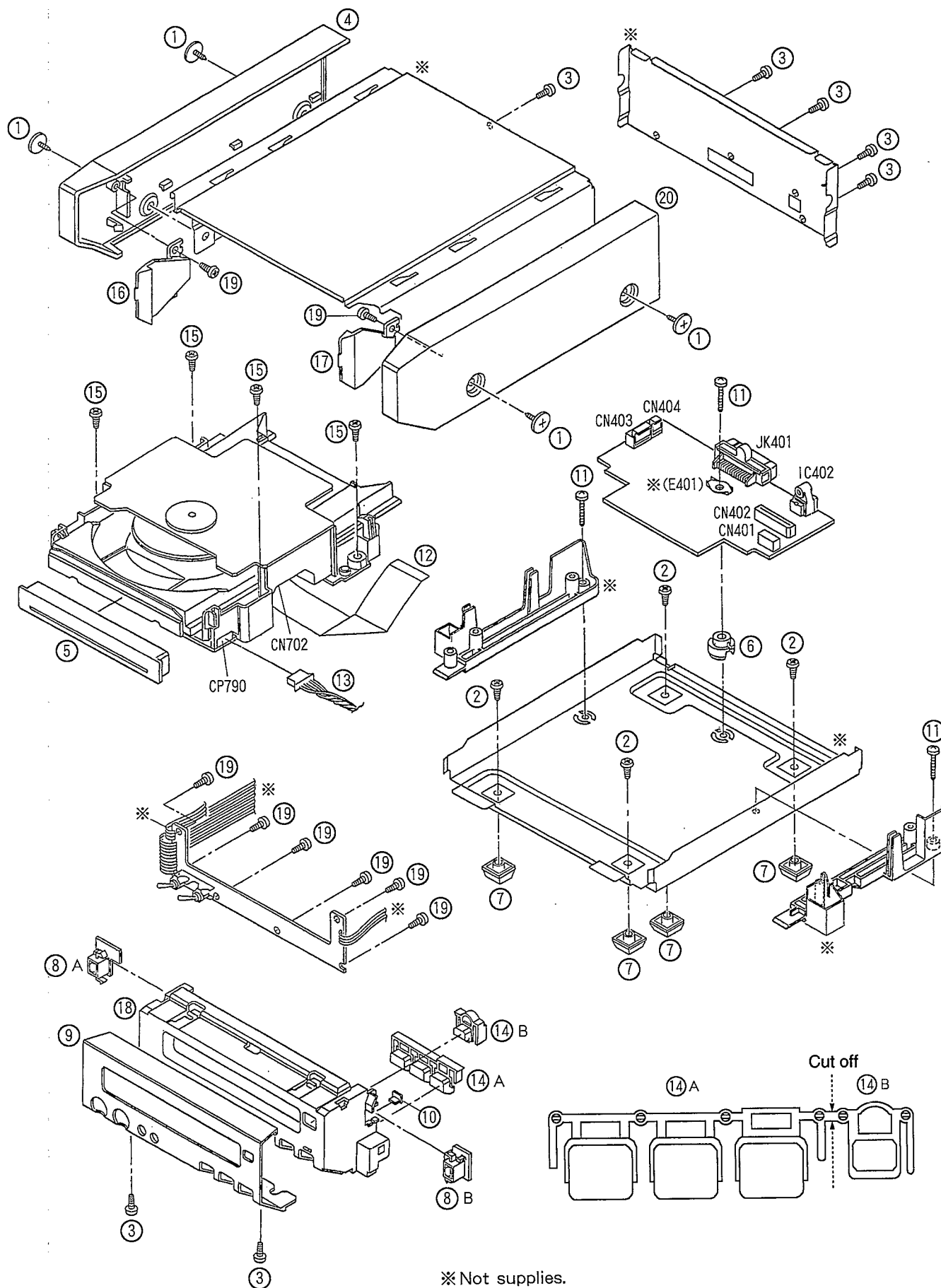
Pin No.	Mark	I/O Division	Function
1	STR1	O	Key switch det. terminal
2	STR2	O	Key switch det. terminal
3	SVRST	O	Reset signal terminal of servo IC (IC702)
4	SUBQ	I	Sub-code data terminal
5	GATE	O	Select signal terminal to IC407
6	NC	—	Not used, open
7	SQCK	O	Sub-code register clock terminal
8	BLKCK	I	Sub-code block signal terminal

Pin No.	Mark	I/O Division	Function
9	DQSY	I	Reading permission terminal of data from CD-TEXT decoder IC
10	LED STOP	O	LED drive signal terminal
11	LED PLAY	O	
12	HOLD	I	Not used, connected to GND
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	Vss	—	GND terminal

Pin No.	Mark	I/O Division	Function
17	OSC1	I	Crystal oscillator connected terminal
18	NC	—	Not used, open
19			
20	OSC2	O	Crystal oscillator connected terminal
21	/RST	I	Reset signal terminal
22	MCLK	O	Command clock terminal to IC702
23	CHK MODE	I	Not used (Connected to resistor)
24	CLK CNT	O	Clock control signal terminal
25	CLK SPD	O	Communication clock velocity select terminal
26	CS	O	Communication request receiving signal terminal to system control IC
27	REQ	I	Communication request signal terminal to system control IC
28	DTI	I	Data input terminal from system control IC
29	DTO	O	Data output terminal to system control IC
30	NC	—	Not used, open
31	CLK	O	Clock terminal to system control IC
32	DISPLED	O	Signal terminal to LED drive (Q412)

Pin No.	Mark	I/O Division	Function
33	CLOSE	O	Loading motor "CLOSE" command signal terminal
34	OPEN	O	Loading motor "OPEN" command signal terminal
35	CLOSE SW	I	Disc tray "CLOSE" det. switch signal terminal
36	OPEN SW	I	Disc tray "OPEN" det. switch signal terminal
37	REST SW	I	Rest position det. signal terminal
38	STAT	I	Status signal terminal
39	VDD	I	Power supply terminal
40	CDUNIT	I	Not used, connected to GND
41	NC	I	Not used, open
42	NC	O	
43	NC	I	
44	KEY0	I	Key switch det. terminal
45	KEY1		
46	KEY2		
47	SPEED	O	PLL filter of CD unit select terminal
48	STR0	O	Key switch det. terminal

Cabinet Parts Location



■ Replacement Parts List

Notes: * Important safety notice:

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

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

When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

* Warning: This product uses a laser diode. Refer to caution statements on page 2.

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

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

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1	RHD30007-S	SCREW	4	
2	XTB3+5JFZ	SCREW	4	
3	XTBS3+8JFZ1	SCREW	7	
4	RGK0969-S1	SIDE PANEL (L)	1	
5	RGK0974-S	TRAY ORNAMENT	1	
6	SHE170-2	P.C.B. SUPPORT	1	
7	RKA0098-K	FOOT	4	
8	REP2685A-S	LED (L, R) P.C.B. ASS'Y	1	
9	RG0146A-S	ALUMI PANEL	1	
10	RGL0386-Q	PANEL LIGHT	1	
11	XTB3+12JFZ	SCREW	3	
12	REZ1056-1	FFC (23P)	1	
13	REX0898	CONNECTOR ASS'Y (6P)	1	
14	RGU1600-S	OPERATION BUTTON	1	
15	XTB3+8JFZ	SCREW	4	
16	RGL0391-Q	PANEL LIGHT (L)	1	
17	RGL0392-Q	PANEL LIGHT (R)	1	
18	RG0641-S2	GRILLE	1	
19	XTBS26+8J	SCREW	8	
20	RGK0970-S1	SIDE PANEL (R)	1	
101	RFKJXD707-K	LOADING CHASSIS ASS'Y	1	
101A	RDG0142	LOADING GEAR	1	
101B	RDG0193	LOADING GEAR (1)	1	
101C	RD0065	PULLEY	1	
102	REM0019	MOTOR ASS'Y	1	
103	RME0063	LOCK LEVER SPRING	1	
104	RME0087	SPRING	1	
105	RMG0158	BELT	1	
106	RML0349	CONVERSION LEVER	1	
107	RML0178-1	LOCK LEVER	1	
108	RMM0059-1	SLIDE PLATE (2)	1	
109	RMM0079-1	SLIDE PLATE (1)	1	
110	XTN26+6G	SCREW	3	
111	XYN2+6FZ	SCREW	2	
112	RHM245ZA	MAGNET	1	
113	RFKNLCH530EA	DISC CLAMPER ASS'Y	1	
114	RWR0334	MAGNET HOLDER	1	
115	RXQ0380	DISC HOLDER	1	
116	RFKNLPG440-K	DRIVE RUCK ASS'Y	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
117	RGQ0144-K	DISC TRAY	1	
118	RHD20009-1	SCREW	1	
119	XTV2+6G	SCREW	2	
Δ 120	RAE0152Z	TRAVERSE DECK ASS'Y	1	
120A	SHGD113-1	FLOATING RUBBER	3	
120B	SNSD38	SCREW	2	
121	RME0109	SPRING (A)	2	
122	RME0142	SPRING (B)	1	
123	RWR0698-K	TRAVERSE CHASSIS	1	
124	RMS0627	PIN (A)	1	
125	RMS0350-1	PIN (B)	1	
126	XTN2+6G	SCREW	1	
127	RMK0255	COVER	1	
C401	ECBT1H102KB5	50V 1000P	1	
C402	ECBT1H104ZF5	50V 0.1U	1	
C405	ECBT1H104ZF5	50V 0.1U	1	
C406	ECEA1HKS3R3	50V 3.3U	1	
C409	ECBT1E103ZF5	25V 0.01U	1	
C410	ECA1CM471B	16V 470U	1	
C412, 13	ECBT1E103ZF5	25V 0.01U	2	
C415	ECBT1H330J5	50V 33P	1	
C416	ECEA1AKA220B	10V 22U	1	
C417, 18	ECBT1H102KB5	50V 1000P	2	
C419	ECEA0JKA221B	6.3V 220U	1	
C420	ECEA1AKA221B	10V 220U	1	
C425	ECBT1E103ZF5	25V 0.01U	1	
C426	ECBT1H101KB5	50V 100P	1	
C431-33	ECBT1H104ZF5	50V 0.1U	3	
C450	ECBT1E103ZF5	25V 0.01U	1	
C460, 61	ECBT1H300J5	50V 30P	2	
C483, 84	ECBT1H104ZF5	50V 0.1U	2	
C485, 86	ECBT1H331KB5	50V 330P	2	
C487, 88	ECBT1H121KB5	50V 120P	2	
C491, 92	ECEA1AKA220B	10V 22U	2	
C493, 94	ECBT1H101KB5	50V 100P	2	
C495	ECBT1H104ZF5	50V 0.1U	1	
C497	ECBT1H104ZF5	50V 0.1U	1	
C701	ECEA0JKA3301	6.3V 33U	1	
C702	ECUZNE104MBN	25V 0.1U	1	
C703	ECEA0JKA1011	6.3V 100U	1	
C704	ECUZNE104MBN	25V 0.1U	1	
C706	ECUE1H272KBN	50V 2700P	1	
C707	ECUV1E273KBN	25V 0.027U	1	
C708	ECUE1H392KBN	50V 3900P	1	
C709	ECUV1E563KBN	25V 0.056U	1	
C710	ECUE1H151KCN	50V 150P	1	
C711, 12	ECUWNE104ZFN	25V 0.1U	2	
C713	ECUZNE104MBN	25V 0.1U	1	
C714	ECEA0JKA1011	6.3V 100U	1	
C715	ECUE1H182KBN	50V 1800P	1	
C716	ECUE1H821KBN	50V 820P	1	
C717	ECUWNE104ZFN	25V 0.1U	1	
C718	ECUVNC224KBN	16V 0.22U	1	
C721, 22	ECUE1H100DCN	50V 10P	2	
C723	ECEA1AKA2211	10V 220U	1	
C724	ECUZNE104MBN	25V 0.1U	1	
C725, 26	ECUE1H102KBN	50V 1000P	2	
C727, 28	ECEA1HPK0101	50V 1P	2	
C730	ECUWNE104ZFN	25V 0.1U	1	
C731, 32	ECEA0JKA2211	6.3V 220U	2	
C733	ECUZNE104MBN	25V 0.1U	1	
C734	ECEA1AKA2211	10V 220U	1	
C735-37	ECUWNE104ZFN	25V 0.1U	3	
C738	ECUZNE104MBN	25V 0.1U	1	
C739	ECUE1H102KBN	50V 1000P	1	
C742	ECUV1E273KBN	25V 0.027U	1	
C743	ECUWNE104ZFN	25V 0.1U	1	
C744	ECUE1E123KBN	25V 0.012U	1	
C745	ECUE1H102KBN	50V 1000P	1	
C747	ECUE1H221KBN	50V 220P	1	
C749	ECUE1H222KBN	50V 2200P	1	
C750, 51	ECUZNE104MBN	25V 0.1U	2	
C753	ECUV1H471KBN	50V 470P	1	
C754	ECUE1H471KBN	50V 470P	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C762	ECUE1H471KBN	50V 470P	1		△ R443	ERD2FCJ6R8	1/4W 6.8	1	
C790	ECA1AKF820E	10V 82U	1		R444	ERDS2FJ101	1/4W 100	1	
					R450, 51	ERDS2FJ472	1/4W 4.7K	2	
CN401	RJP6G18ZA	CONNECTOR (6P)	1		R452	ERDS2TJ331T	1/4W 330	1	
CN402	RJS1A6823	CONNECTOR (23P)	1		R455, 56	ERDS2TJ221T	1/4W 220	2	
CN403	RJS1A6606	CONNECTOR (6P)	1		R458	ERDS2FJ102	1/4W 1K	1	
CN404	RJS1A6604	CONNECTOR (4P)	1		R459, 60	ERDS2TJ473T	1/4W 47K	2	
CN701	RJU035T016-1	CONNECTOR (16P)	1		R466	ERDS2FJ105	1/4W 1W	1	
CN702	RJS1A6723-1Q	CONNECTOR (23P)	1		R467, 68	ERDS2FJ101	1/4W 100	2	
					R471	ERDS2FJ181	1/4W 180	1	
CP790	RJP6G17ZA	CONNECTOR (6P)	1		R473	ERDS2FJ181	1/4W 180	1	
					R481, 82	ERDS2FJ103	1/4W 10K	2	
D403	WA29TATA	DIODE	1		R483, 84	ERDS2FJ102	1/4W 1K	2	
△ D404	WTZJ8R2BTA	DIODE	1		R485, 86	ERDS2FJ104	1/4W 100K	2	
D405	WTZJ3R9BTA	DIODE	1		R487-90	ERDS2TJ223T	1/4W 22K	4	
D409-11	1SS254TA	DIODE	3		R491, 92	ERDS2TJ273T	1/4W 27K	2	
D444	WTZJ6R2BTA	DIODE	1		R493, 94	ERDS2TJ332T	1/4W 3.3K	2	
D801	SML79420C	LED	1		R495, 96	ERDS2FJ103	1/4W 10K	2	
DB11, 12	1SS254TA	DIODE	2		R497	ERDS2TJ182T	1/4W 1.8K	1	
					R498	ERDS2FJ272	1/4W 2.7K	1	
△ IC401	LM2940T5W	IC	1		R701	ERJ6GEYJ4R7Z	1/10W 4.7	1	
IC402	TOTX178	IC	1		R702	ERJ6GEYJ822V	1/10W 8.2K	1	
IC403	LC66358C4J75	IC	1		R703	ERJ6GEYJ823Z	1/10W 82K	1	
IC405	NJM2115MTE1	IC	1		R704	ERJ6GEYJ102A	1/10W 1K	1	
IC406	LC89170MTLM	IC	1		R705	ERJ6GEYJ124Z	1/10W 120K	1	
IC407	TC74HC157AFY	IC	1		R706	ERJ6GEYJ102A	1/10W 1K	1	
IC408	TC7WU04FT12L	IC	1		R707	ERJ6GEYJ474Z	1/10W 470K	1	
IC701	AN8837SBE1	IC	1		R708	ERJ6GEYJ154V	1/10W 150K	1	
IC702	MN662741RPA	IC	1		R709	ERJ6GEYJ473Z	1/10W 47K	1	
IC703	AN8780NSBE2	IC	1		R710	ERJ6GEYJ103V	1/10W 10K	1	
IC790	TA7291S	IC	1		R711	ERJ6GEYJ154V	1/10W 150K	1	
					R712	ERJ6GEYJ221Z	1/10W 220	1	
JK401	RJT065K19	SYSTEM CONNECTOR (19P)	1		R714	ERJ6GEYJ121Z	1/10W 120	1	
					R715	ERJ6GEYJ122Z	1/10W 1.2K	1	
L402	BL02RN2R65T2	COIL, CHOKE	1		R717, 18	ERJ6GEYJ102A	1/10W 1K	2	
L406	ELEXT101KA9	COIL, CHOKE	1		R721	ERJ6GEYJ101Z	1/10W 100	1	
L408	BL02RN2R65T2	COIL, CHOKE	1		R722	ERJ6GEYJ563V	1/10W 56K	1	
L409	ELEXT10KA9	COIL, CHOKE	1		R723	ERJ6GEYJ182V	1/10W 1.8K	1	
L701, 02	RLBN102V-Y	COIL, CHOKE	2		R724	ERJ6GEYJ333Z	1/10W 33K	1	
					R725	ERJ6GEYJ122Z	1/10W 1.2K	1	
Q401	2SC1740SRSTA	TRANSISTOR	1		R726	ERJ6GEYJ473Z	1/10W 47K	1	
Q402	DTC143ESTP	TRANSISTOR	1		R727, 28	ERJ6GEYJ682Z	1/10W 6.8K	2	
Q403	2SC1740SRSTA	TRANSISTOR	1		R729	ERJ6GEYJ562V	1/10W 5.6K	1	
Q404	DTC114YSTP	TRANSISTOR	1		R731	ERJ6GEYJ822V	1/10W 8.2K	1	
△ Q405	2SD2137PQTA	TRANSISTOR	1		R735, 36	ERJ6GEYJ101Z	1/10W 100	2	
Q408, 09	DTA143XSTP	TRANSISTOR	2		R744	ERJ6GEYJ104Z	1/10W 100K	1	
Q410, 11	DTC143ESTP	TRANSISTOR	2		R745	ERJ6GEYJ155Z	1/10W 1.5M	1	
Q412	DTA143XSTP	TRANSISTOR	1		R748	ERJ6GEYJ182V	1/10W 1.8K	1	
Q413	DTC143ESTP	TRANSISTOR	1		R749	ERJ6GEYJ682Z	1/10W 6.8K	1	
Q414	2SB621AQRSTA	TRANSISTOR	1		R752	ERJ6GEYJ220V	1/8W 22	1	
Q415	2SC1740SRSTA	TRANSISTOR	1						
Q701	2SB709STX	TRANSISTOR	1		RJ701	ERJ6GEYOR00A	CHIP JUMPER	1	
Q702	DTC114YKA146	TRANSISTOR	1		RJ702-10	ERJ8GEYOR00A	CHIP JUMPER	9	
					RJ715, 16	ERJ8GEYOR00A	CHIP JUMPER	2	
R403	ERDS2FJ102	1/4W 1K	1		RJ721, 22	ERJ6GEYOR00A	CHIP JUMPER	2	
R405, 06	ERDS2FJ103	1/4W 10K	2		RJ724	ERJ6GEYOR00A	CHIP JUMPER	1	
R407	ERDS2TJ223T	1/4W 22K	1		RJ726-28	ERJ6GEYOR00A	CHIP JUMPER	3	
R409, 10	ERDS2FJ103	1/4W 10K	2		RJ731, 32	ERJ6GEYOR00A	CHIP JUMPER	2	
R411	ERDS2FJ472	1/4W 4.7K	1		RJ750	ERJ6GEYOR00A	CHIP JUMPER	1	
R414	ERDS2FJ472	1/4W 4.7K	1						
R415	ERDS2FJ105	1/4W 1W	1		S701	RSH1A043-U	SW, REST	1	
R416	ERDS2TJ223T	1/4W 22K	1		S790, 91	RSH1A005	SW, OPEN/CLOSE DET	2	
R419	ERDS2FJ103	1/4W 10K	1		S801-06	EVQPTD05Q	SW, TACT	6	
R420	ERDS2FJ472	1/4W 4.7K	1		S807, 08	RST2A001-D	SW, CD TEXT/TRACK	2	
R421	ERDS2FJ103	1/4W 10K	1						
R422	ERDS2FJ680	1/4W 68	1		SA1	SZP1054C	PLAYABILITY TEST DISK	1	
R423	ERDS2FJ472	1/4W 4.7K	1		SA2	RFKXEM30L	GREASE EM30L	1	
R427	ERDS2FJ472	1/4W 4.7K	1						
R428	ERDS2FJ103	1/4W 10K	1		TJ701	EYF8CU	TEST JUMPER	1	
R430	ERDS2FJ104	1/4W 100K	1						
R432, 33	ERDS2FJ472	1/4W 4.7K	2		X401	EF0EC4194T4	OSCILLATOR	1	
R439	ERDS2FJ101	1/4W 100	1		X402	RSX216W9M01T	OSCILLATOR	1	
R440	ERDS2FJ102	1/4W 1K	1		X701	RSXB16W9J02T	OSCILLATOR	1	
△ R441	ERQ16NKR22E	1/6W 22	1						
△ R442	ERDS1FJ101	1/2W 100	1						