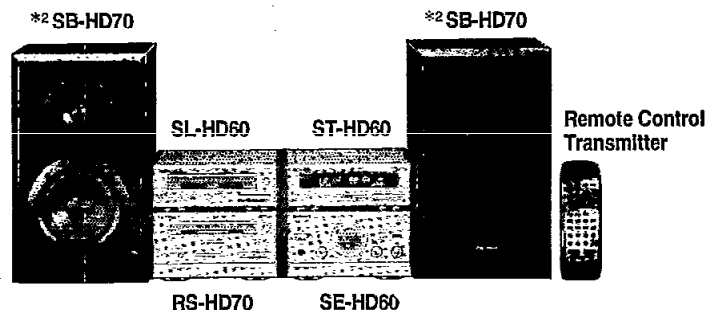


Service Manual

CD Player

System: SC-HD60



CD Player

SL-HD60

Colour

(N) Gold

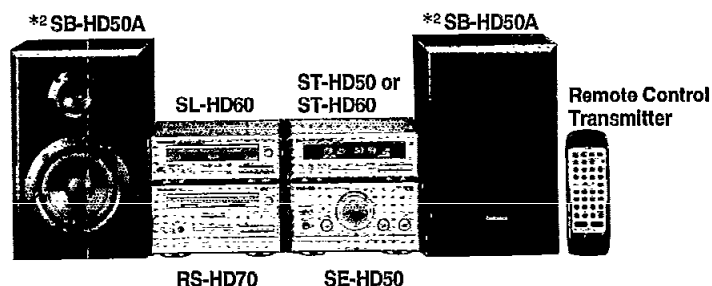
Areas

(E)/(EP) Europe, Russia.

COMPACT
disc
DIGITAL AUDIO

MASH^{*1}
multi-stage noise shaping

System: SC-HD50



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

*2

System	Areas	Tuner
SC-HD50	(Germany, Italy.)	ST-HD60
SC-HD50	(Europe, Russia.)	ST-HD50

Specifications

Audio

DA converter: 1 bit 2 DAC MASH^{*1}

Pickup

Wavelength: 780 nm

General

Dimensions: 196(W)/67(H)/228(D) mm

Weight: 1.3 kg

Notes:

Specifications are subject to change without notice.
Weight and dimensions are approximate.

*1 MASH is a trademark of NTT

System/SC-HD60:

Tuner: ST-HD60, Compact Disc Player: SL-HD60, Amplifier: SE-HD60, Cassette Deck: RS-HD70, Speakers: SB-HD70

System/SC-HD50:

Tuner: ST-HD50 or ST-HD60, Compact Disc Player: SL-HD60, Amplifier: SE-HD50, Cassette Deck: RS-HD70, Speakers: SB-HD50A

Notes: *2 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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■ Contents

	Page		Page
Handling Precautions for Traverse Deck	2	Error Code Display and Servo Adjustment Function	24, 25
Precaution of Laser Diode	3	To Supply Power Source	26
Location of Controls	3	Block Diagram	27, 28
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Operation Checks and		Replacement Parts List (Electrical)	31
Main Component Replacement Procedures	5 ~ 12	Resistors and Capacitors	32, 33
Schematic Diagram	13 ~ 17	Cabinet Parts Location	34
Type Illustration of IC's, Transistors and Diodes	18	Loading Mechanism Parts Location	35
Wiring Connection Diagram	18	Replacement Parts List	
Printed Circuit Board Diagram	19, 20	(Cabinet, Loading Mechanism and Jig/Tool)	36
Terminal Function of IC's	21 ~ 23		

NOTE:

Refer to the service manual for Model No. SE-HD60 (ORDER No. AD9701022C2) and Model No. SE-HD50 (ORDER No. AD9701017C2) for information on "Accessories", "Installation", "Connections" and "Packaging".

CAUTION:

THIS PRODUCT UTILIZES A LASER.

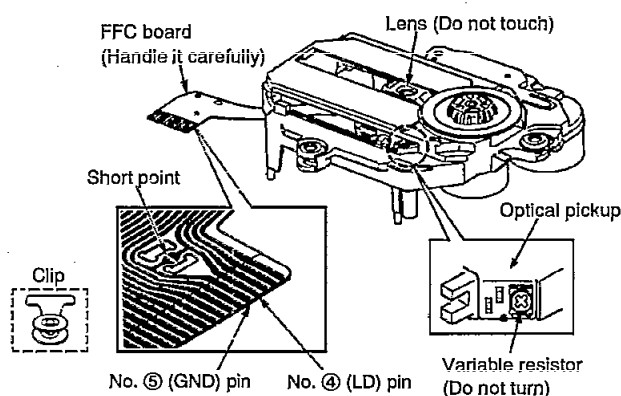
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

■ 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. To protect the laser diode against electrostatic breakdown, short the flexible board (FFC board) with a clip or similar object.
3. Take care not to apply excessive stress to the flexible board (FFC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

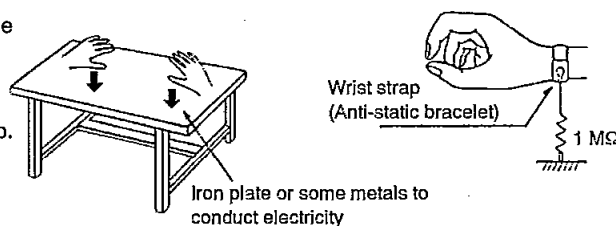


● Grounding for electrostatic breakdown prevention

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 traverse deck (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).



Caution when Replacing the Traverse Deck:

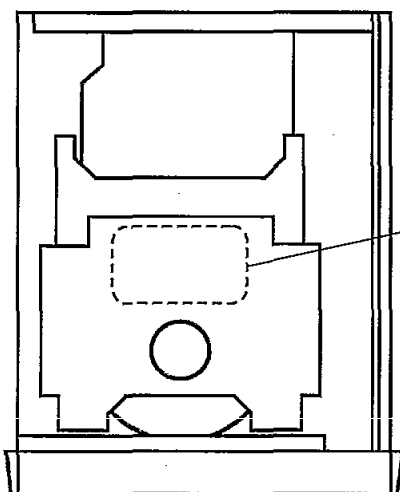
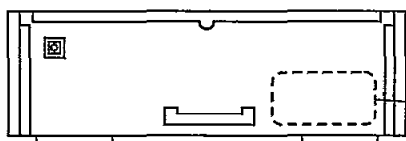
The traverse deck has a short point shorted with solder to protect the laser diode against electrostatic breakdown. Be sure to remove the solder from the short point before making connections.

■ Precaution of Laser Diode

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pick up lens.
Wave length: 780 nm
Maximum output radiation power from pick up: 100 μ W/VDE

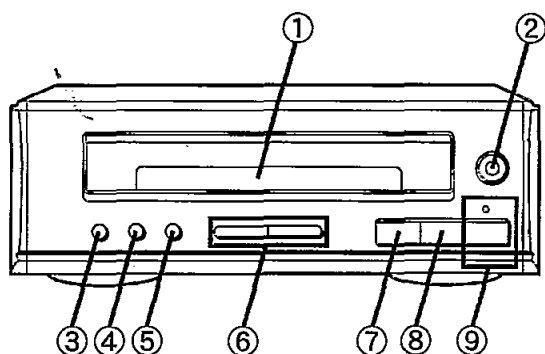
Laser radiation from the pick up unit is safety level, but be sure the followings:

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



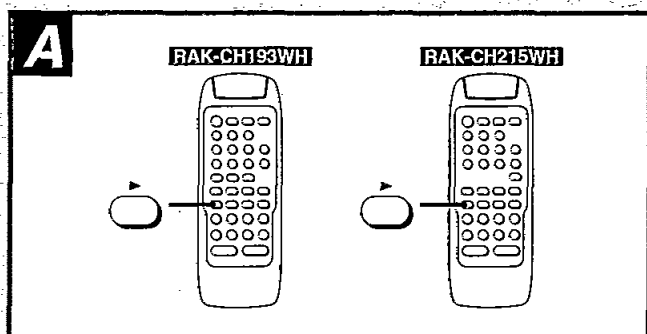
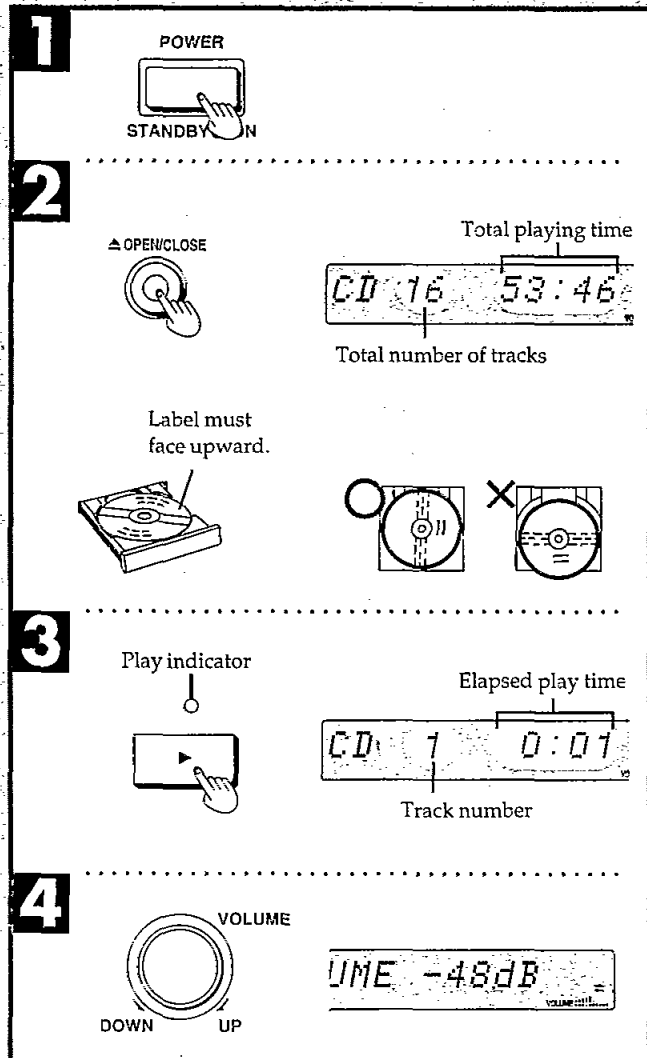
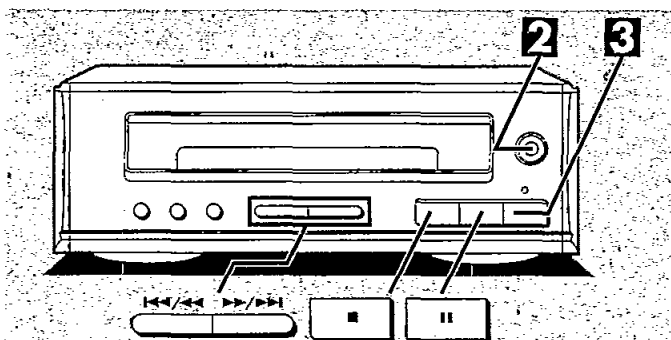
DANGER	INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBNING SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NAKYMÄTÖNTÄ LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING	OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRÄKTA EJ STRÅLEN.
ADVARSEL	USYNLIG LASERSTRÅLING NÄR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNDGÅ EKSPONERING FOR STRÅLEN.
VORSICHT	UNSIICHTBARE LASERSTRALUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.

■ Location of Controls



- ① Disc tray
- ② Disc tray open/close button (▲ OPEN/CLOSE)
- ③ Random play button (RANDOM)
- ④ Repeat button (REPEAT)
- ⑤ AI edit button (AI EDIT)
- ⑥ Skip/search buttons (◀◀/◀, ▶/▶▶)
- ⑦ Stop button (■)
- ⑧ Pause button (||)
- ⑨ Play button and indicator (▶)

■ Listening to Compact Disc



Sequential play

- 1** Switch on the power.
- 2** Press **▲ OPEN/CLOSE** to open the tray.
Set a CD on the tray.

Press **▲ OPEN/CLOSE** once again to close the tray.

When the "CD" input source is selected, total number of tracks and total playing time will appear on the display.

Note

The total playing time displayed when a disc is loaded includes intervals between tracks. This is why sometimes the displayed time is longer than that listed on the CD.

- 3** Press **▶**.
Play will start from the first track, and will stop automatically when the last track is finished.
- 4** Adjust the volume level as you like.

To stop the disc play:

Press **■**.

To temporarily stop the disc play:

Press **||**. The play indicator flashes up green.

To play again, press **▶**.

When "CD NO DISC" display appears:

It indicates that a CD has not been inserted in the tray.

About play indicator:

While stopped: Lights up orange.

While playing: Lights up green.

For your reference:

If you press **▶** instead of **▲ OPEN/CLOSE** after setting a CD, the tray will close and play will start directly from the track 1.

To search forward/backward:

Available only from the main unit

Hold down **◀◀/▶▶** or **▶▶/▶▶** during playback.

▶▶/▶▶: To search forward

◀◀/◀◀: To search backward

To skip forward/backward:

Press **◀◀/▶▶** or **▶▶/▶▶**.

▶▶/▶▶: To skip forward

◀◀/◀◀: To skip backward

Note

During random play, you can not skip to tracks which have already been played out. (page 18)

For your reference:

- During program play or random play, you can search-forward/backward only within the current track. (pages 18 and 19)
- During program play, skipping is always in the programmed order, whether forward or backward. (page 19)

One-touch play **A**

When the system is OFF, playing starts automatically when you press **▶** on the remote control.

The play will start with volume increasing gradually.

Note

Do not use CDs with poorly attached labels or stickers.

Adhesive protruding from underneath stickers or left over from peeled off stickers can cause your system to malfunction.

■ Operation Checks and Main Component Replacement Procedures

NOTE

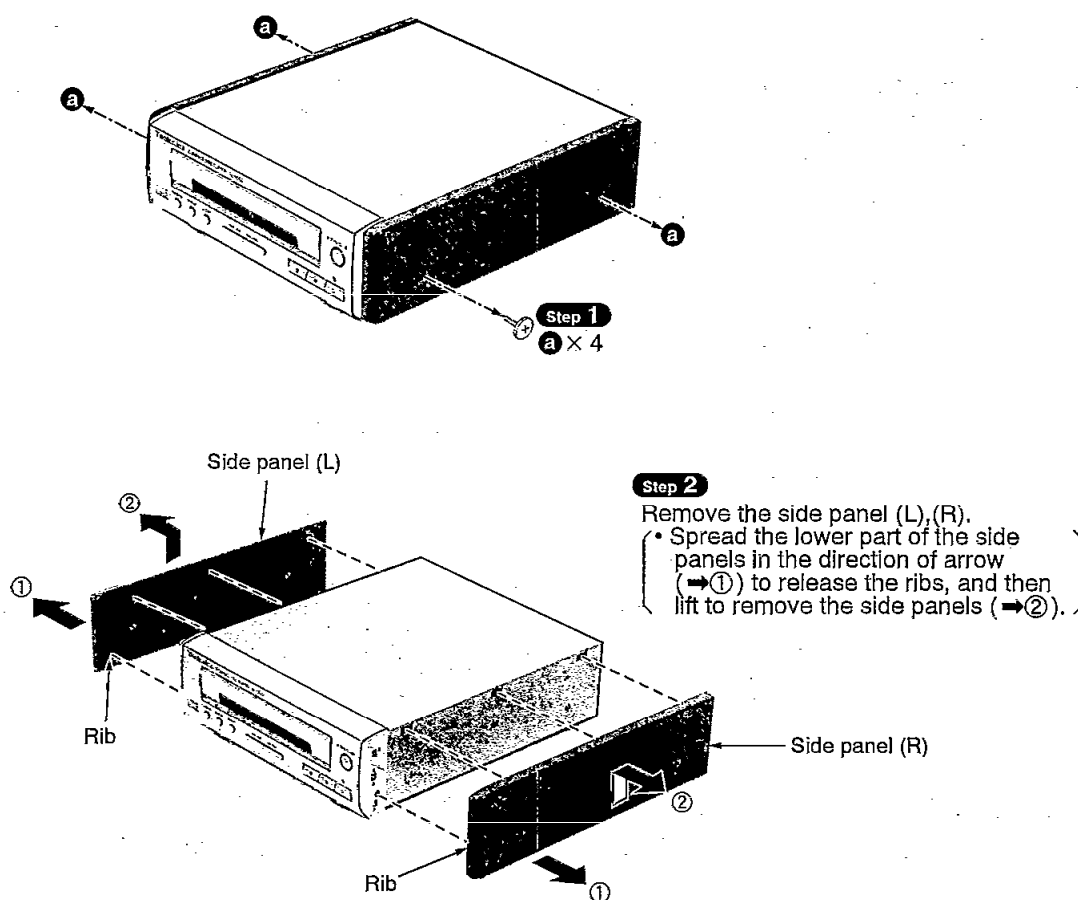
1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
3. Select 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 Procedure for each P.C.B.	Page.
1. Checking for the main P.C.B.	5,6.
2. Checking for the servo P.C.B.	7.
• Main Component Replacement Procedures	
1. Replacement for the traverse deck ass'y.	7 ~ 11.
2. Replacement for the belt, loading motor ass'y and loading switch.	12.

■ Checking Procedure for each P.C.B.

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



Step 3

b

Step 4

Remove the top cabinet.

Step 6

Remove the front panel ass'y.

c × 2

Step 5

Step 9

Release the 4 claws, and then remove the operation P.C.B..

Main P.C.B.

Claw

Operation P.C.B.

d × 3

Step 8

Claw

d

d

Claw

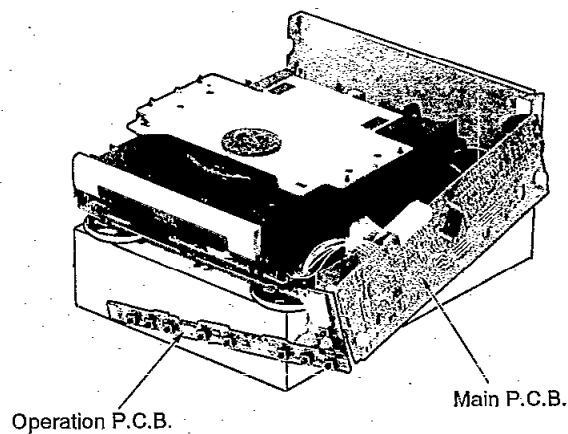
Step 7

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

Claw



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

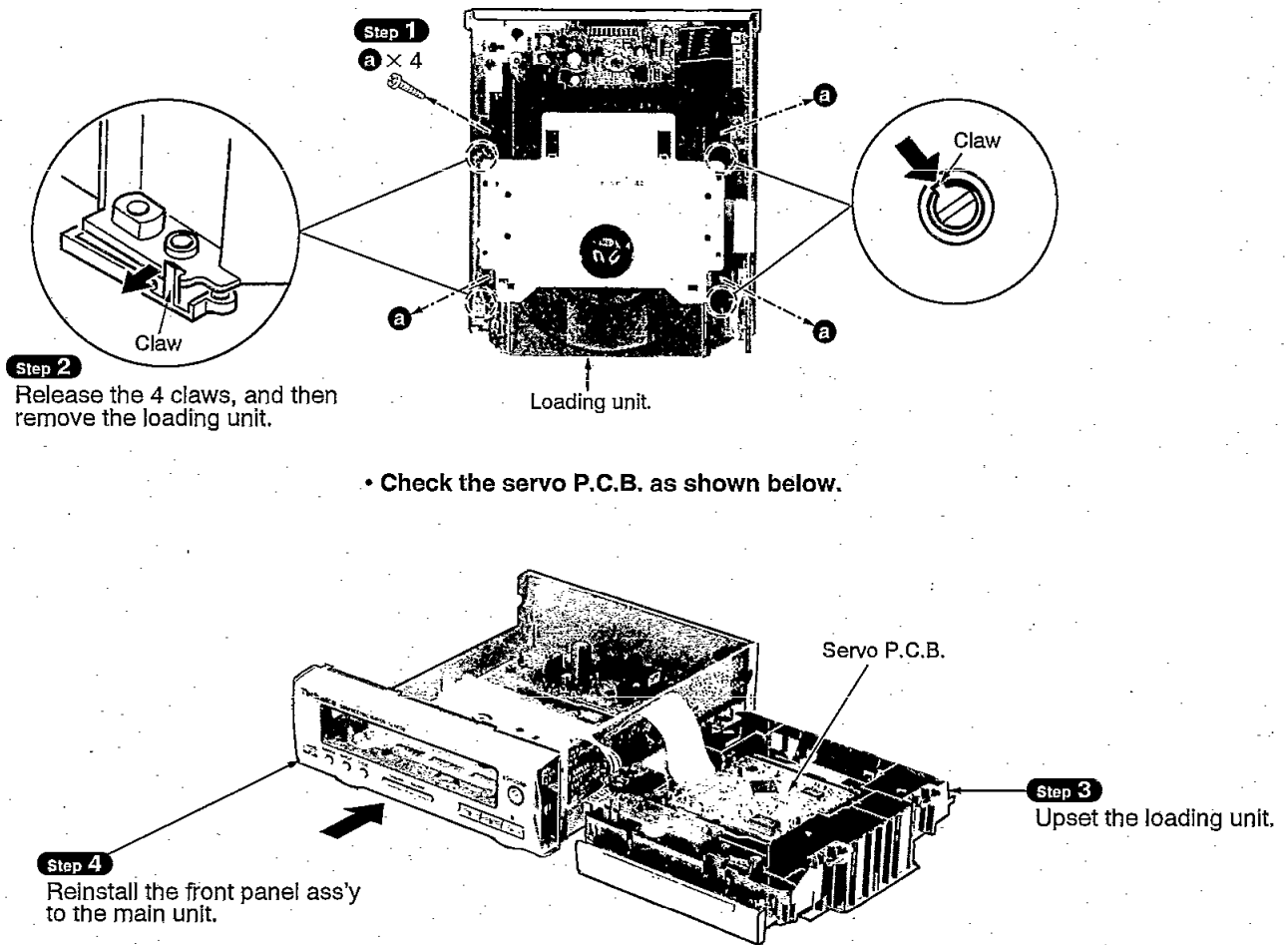


Operation P.C.B.

Main P.C.B.

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

- Follow the **Step 1** ~ **Step 6** of the Item 1 in checking procedure for each P.C.B. on pages 5 and 6.

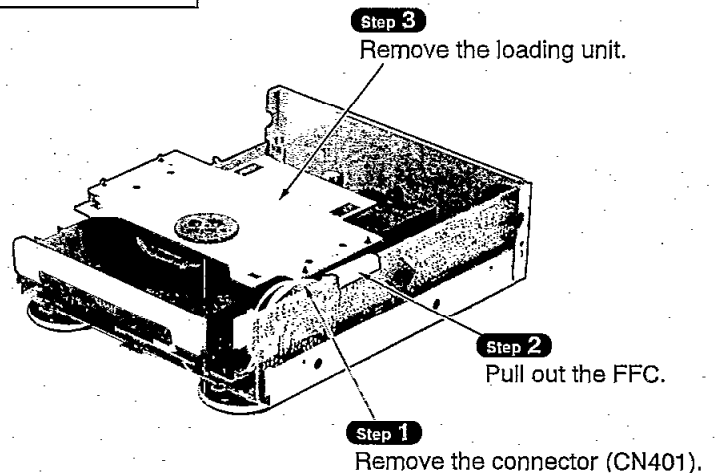


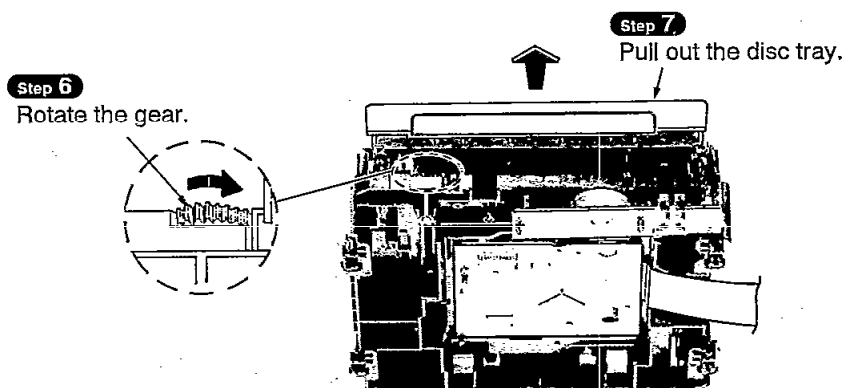
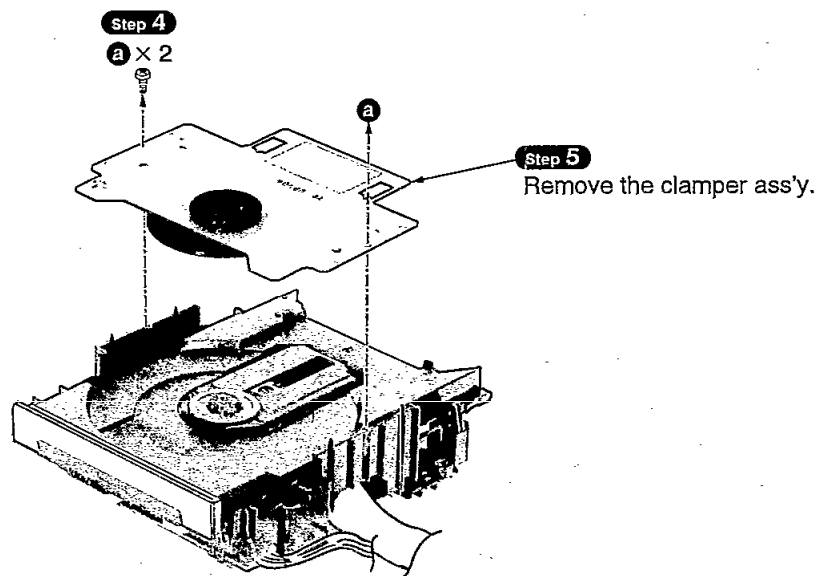
- Check the servo P.C.B. as shown below.

■ Main Component Replacement Procedures

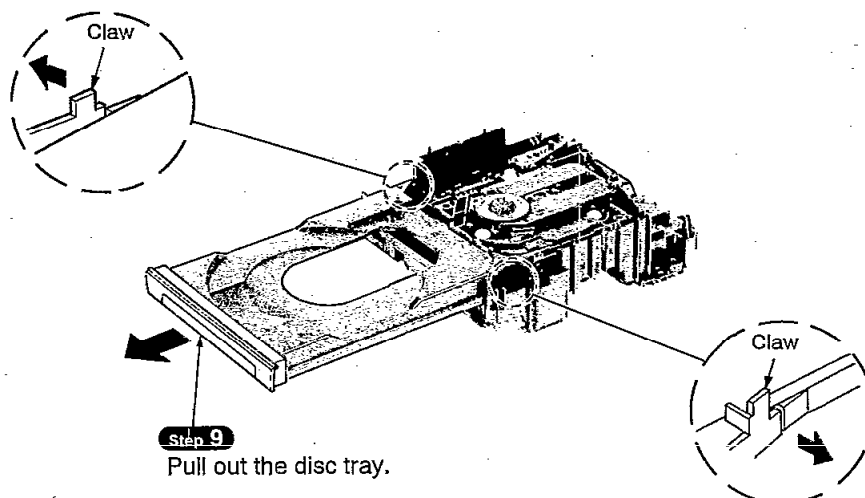
1. Replacement for the traverse deck ass'y

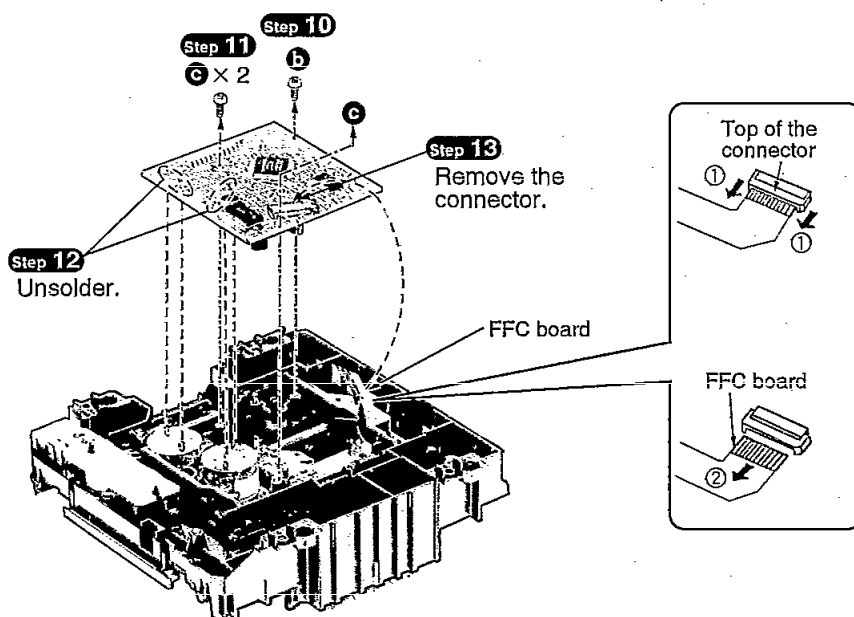
- Follow the **Step 1** ~ **Step 6** of the Item 1 in checking procedure for each P.C.B. on pages 5 and 6.
- Follow the **Step 1**, **Step 2** of the Item 2 in checking procedure for each P.C.B. on page 7.



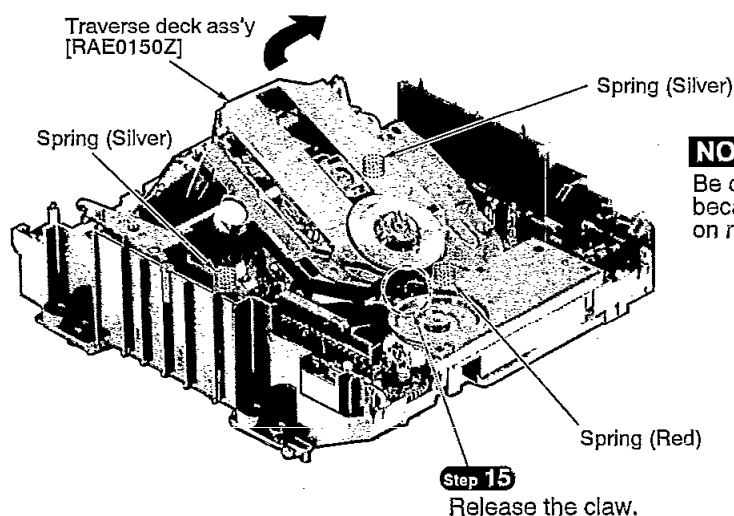
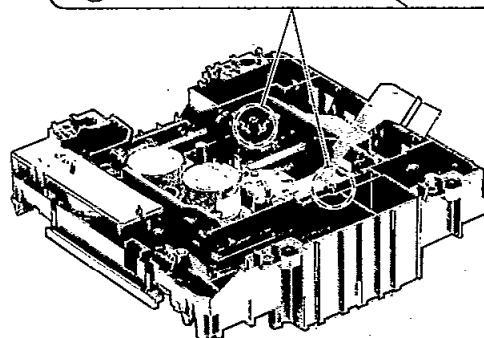
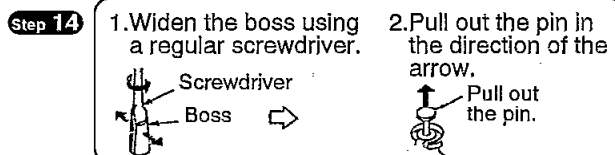
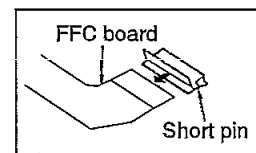


Step 8
Release the 2 claws.





Caution:
Insert a short pin into the traverse unit FFC board.
(Refer to "Handling Precautions for Traverse Deck" on page 2.)



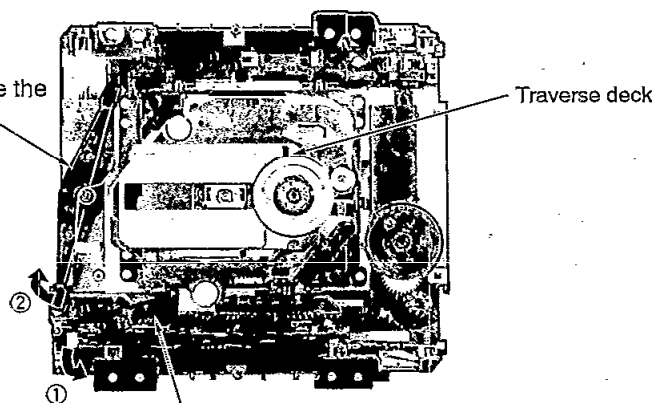
NOTE

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

Installation of the disc tray after replacement

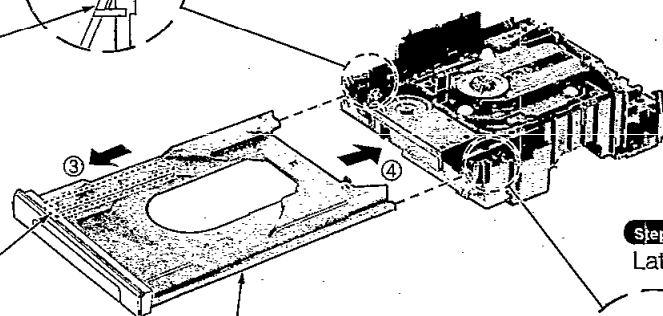
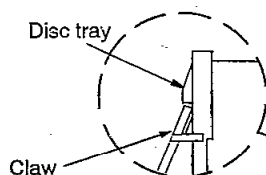
Step 2

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



Step 1

Release the lock lever.



Step 3

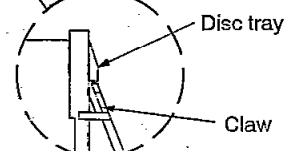
Move the drive rack ass'y in the direction of arrow ③.

Step 4

Install the disc tray.

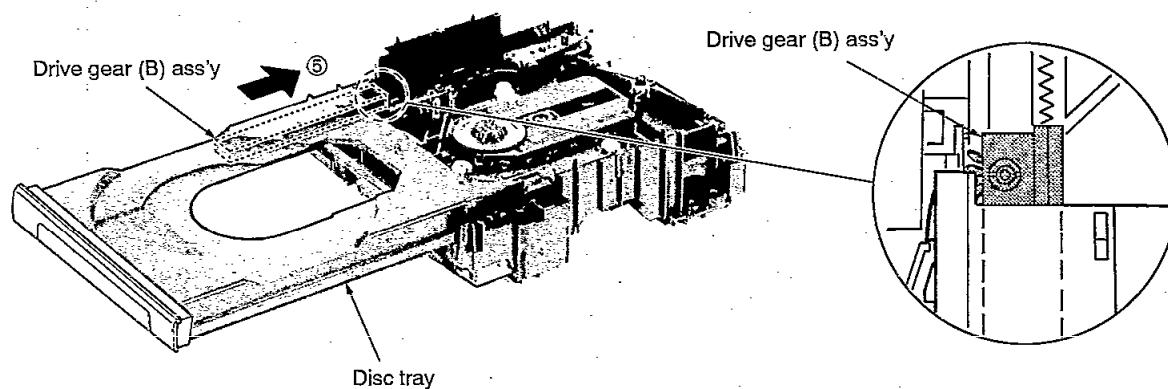
Step 5

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.

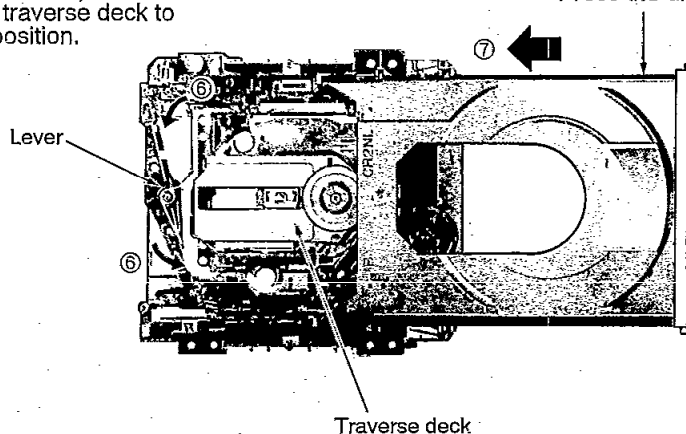


Step 7

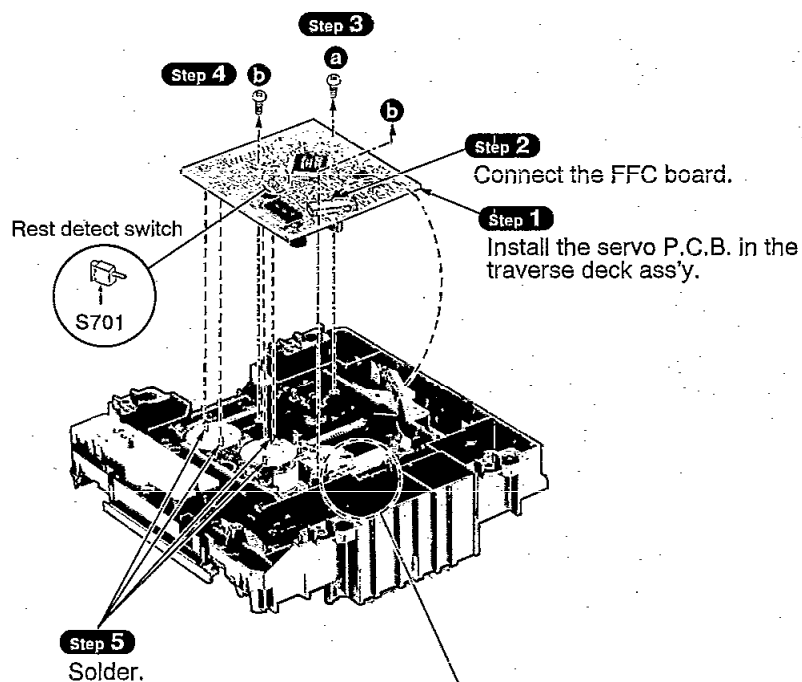
Operate the lever, and then locate the traverse deck to "DOWN" position.

Step 8

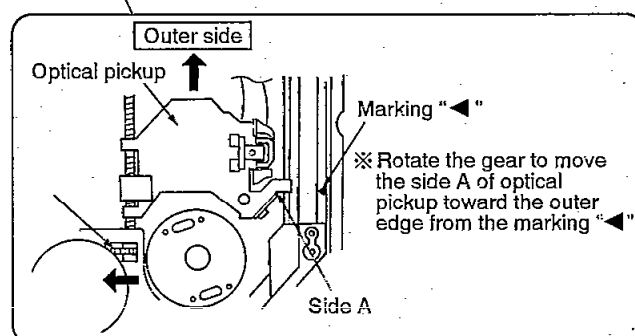
Press the disc tray.



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

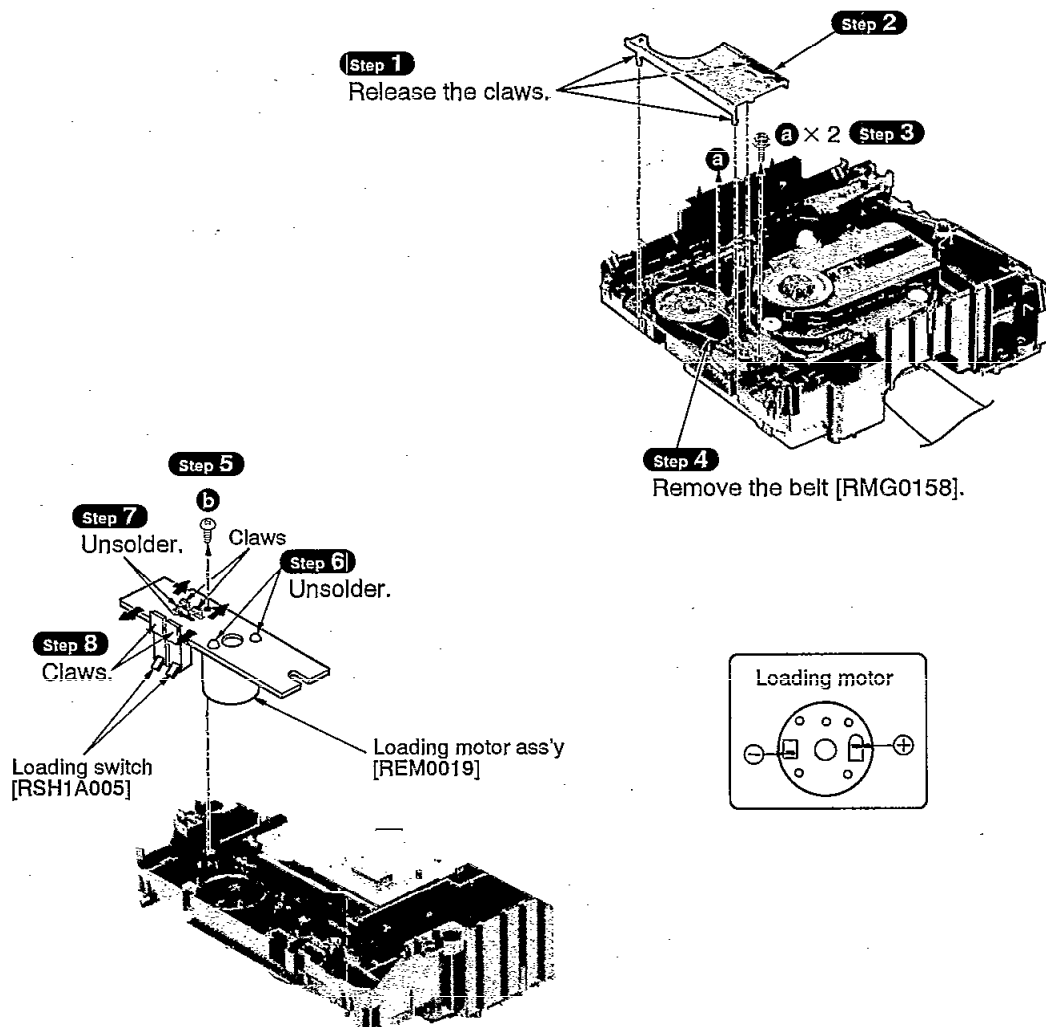
**NOTE**

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



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

- Follow the **Step 1** ~ **Step 6** of the item 1 in checking procedure for each P.C.B. on pages 5 and 6.
- Follow the **Step 1** , **Step 2** of the item 2 in checking procedure for each P.C.B. on page 7.
- Follow the **Step 1** ~ **Step 9** of the item 1 in main component procedures on pages 7 and 8.



■ Schematic Diagram

	Page
A SERVO CIRCUIT	14, 15
B LOADING MOTOR CIRCUIT	16
C MAIN CIRCUIT	16, 17
D OPERATION CIRCUIT	16
E POWER SUPPLY CIRCUIT	17

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

Notes:

- S701 : Rest detect switch in "OFF" position
- S790 : Tray open detect switch in "OFF" position
- S791 : Tray close detect switch in "OFF" position
- S801 : Tray open/close detect switch ( OPEN/CLOSE) in "OPEN" position
- S802 : Pause switch ()
- S803 : F. Skip/Search switch ( / )
- S804 : Play switch ()
- S805 : Stop switch ()
- S806 : R. Skip/Search switch ( / )
- S807 : Random play switch (RANDOM)
- S808 : AI edit switch (AI EDIT)
- S809 : Repeat switch (REPEAT)

- 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, 0 dB]

● Important safety notice:

Components identified by  mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer'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.

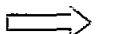
Put a conductive mat on the work table.

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

● Voltage and signal line

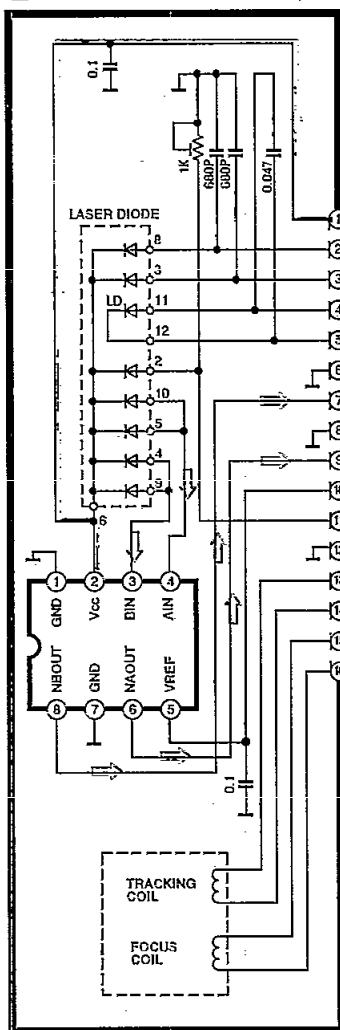
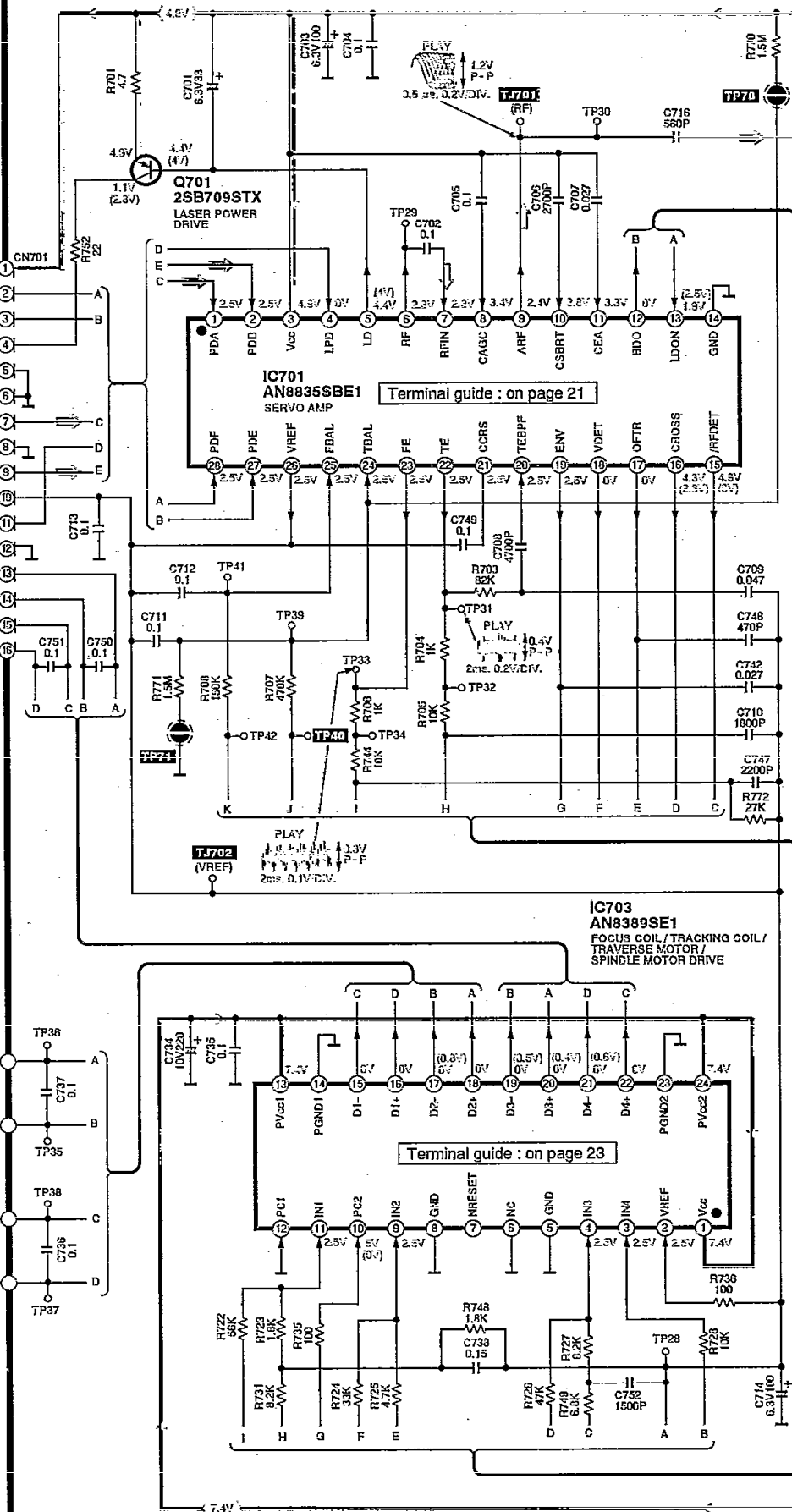
 : Positive voltage line

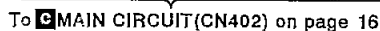
 : Negative signal line

 : CD signal line

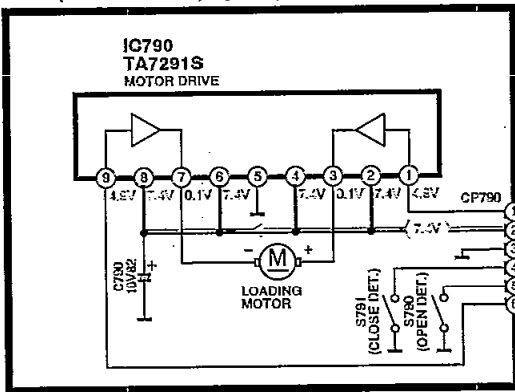
A SERVO CIRCUIT (P.C.Board: on page 19)

△ OPTICAL PICKUP CIRCUIT

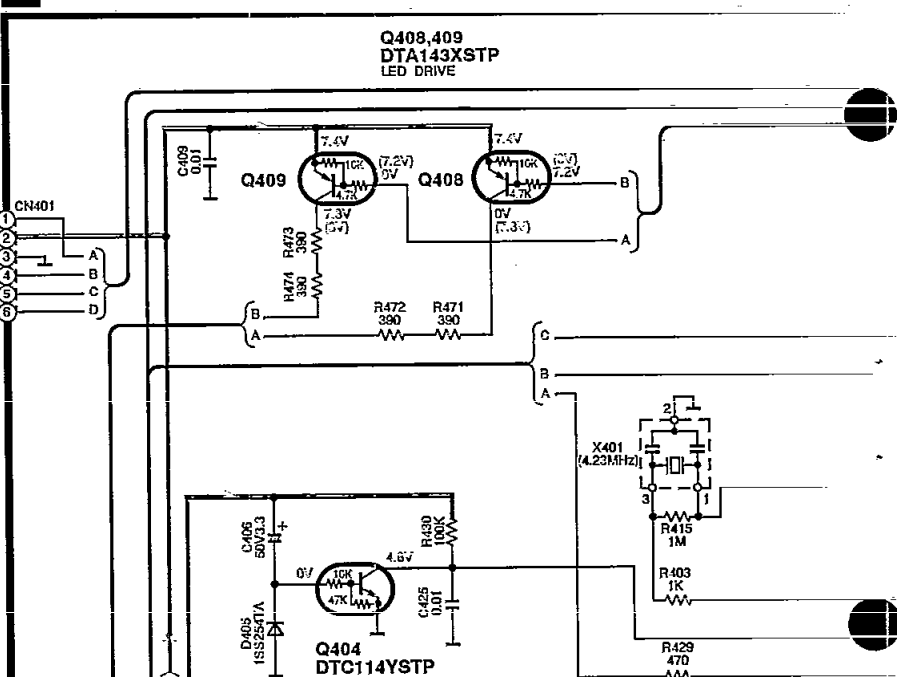
M702
SPINDLE
MOTORM701
TRAVERSE
MOTOR



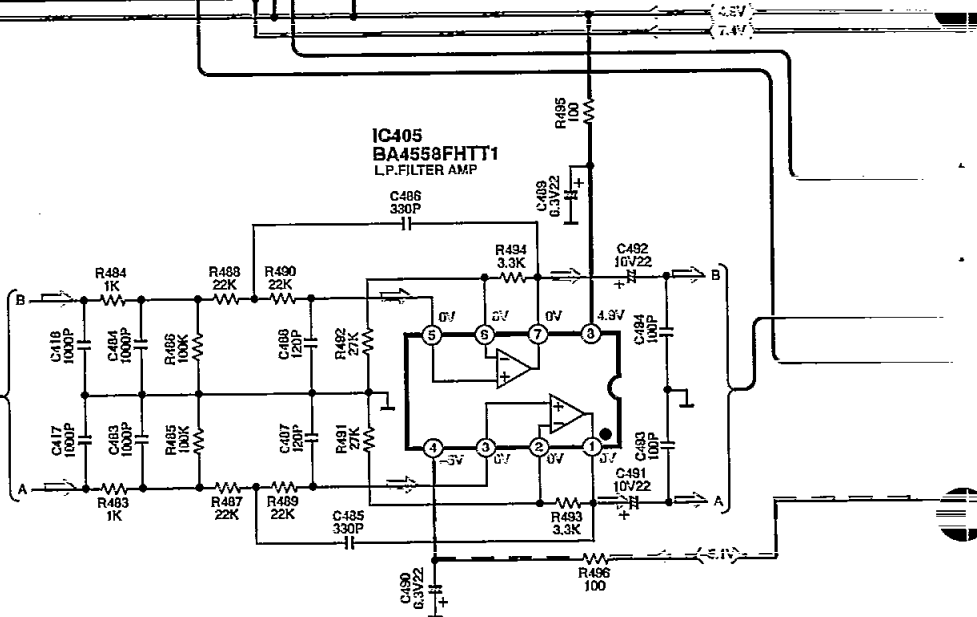
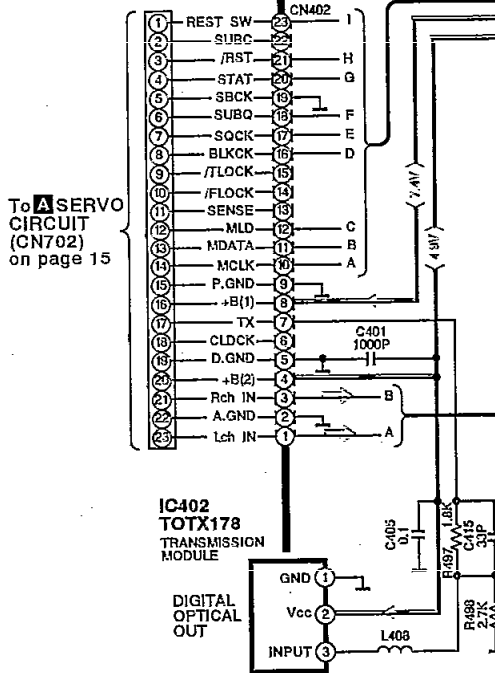
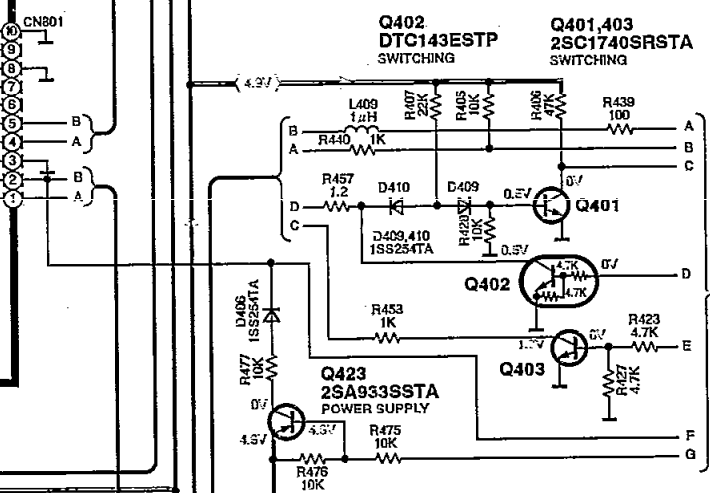
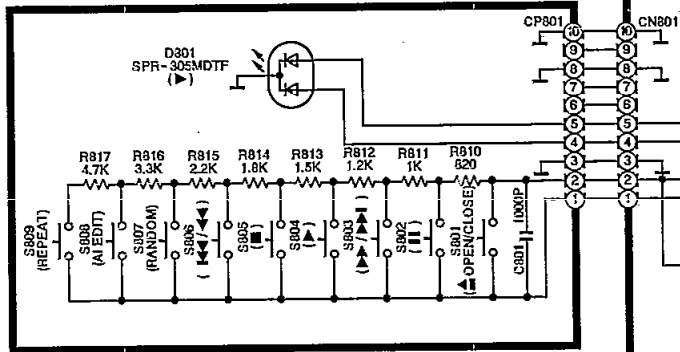
B **LOADING MOTOR CIRCUIT**
(P.C.Board: on page 20)



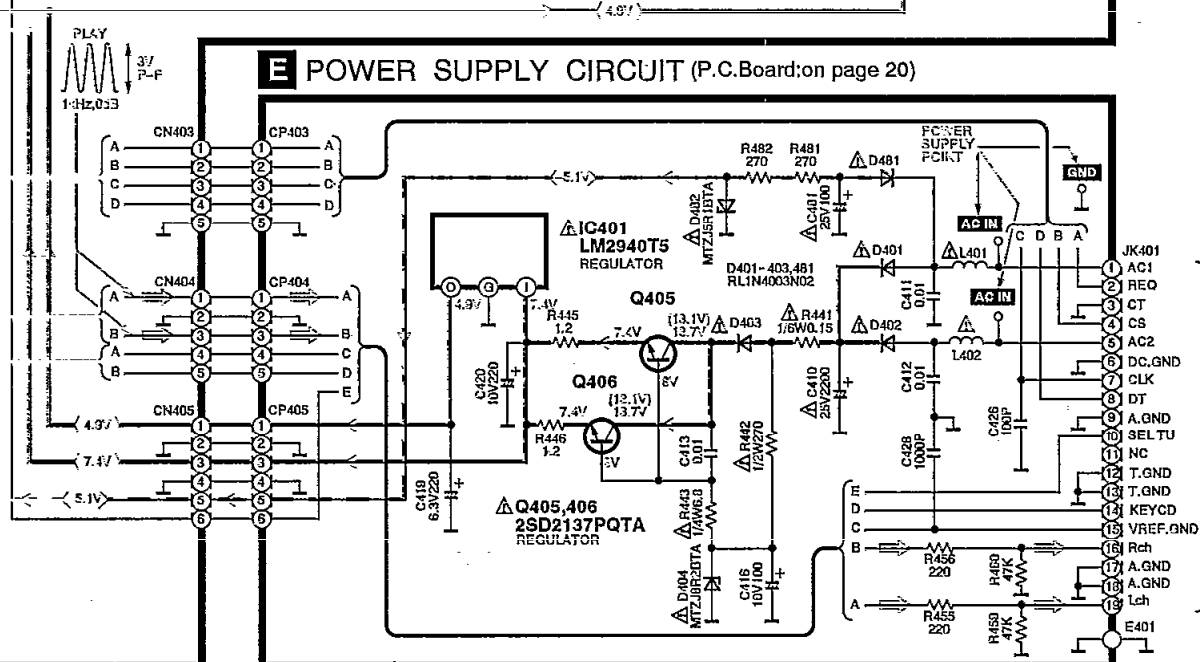
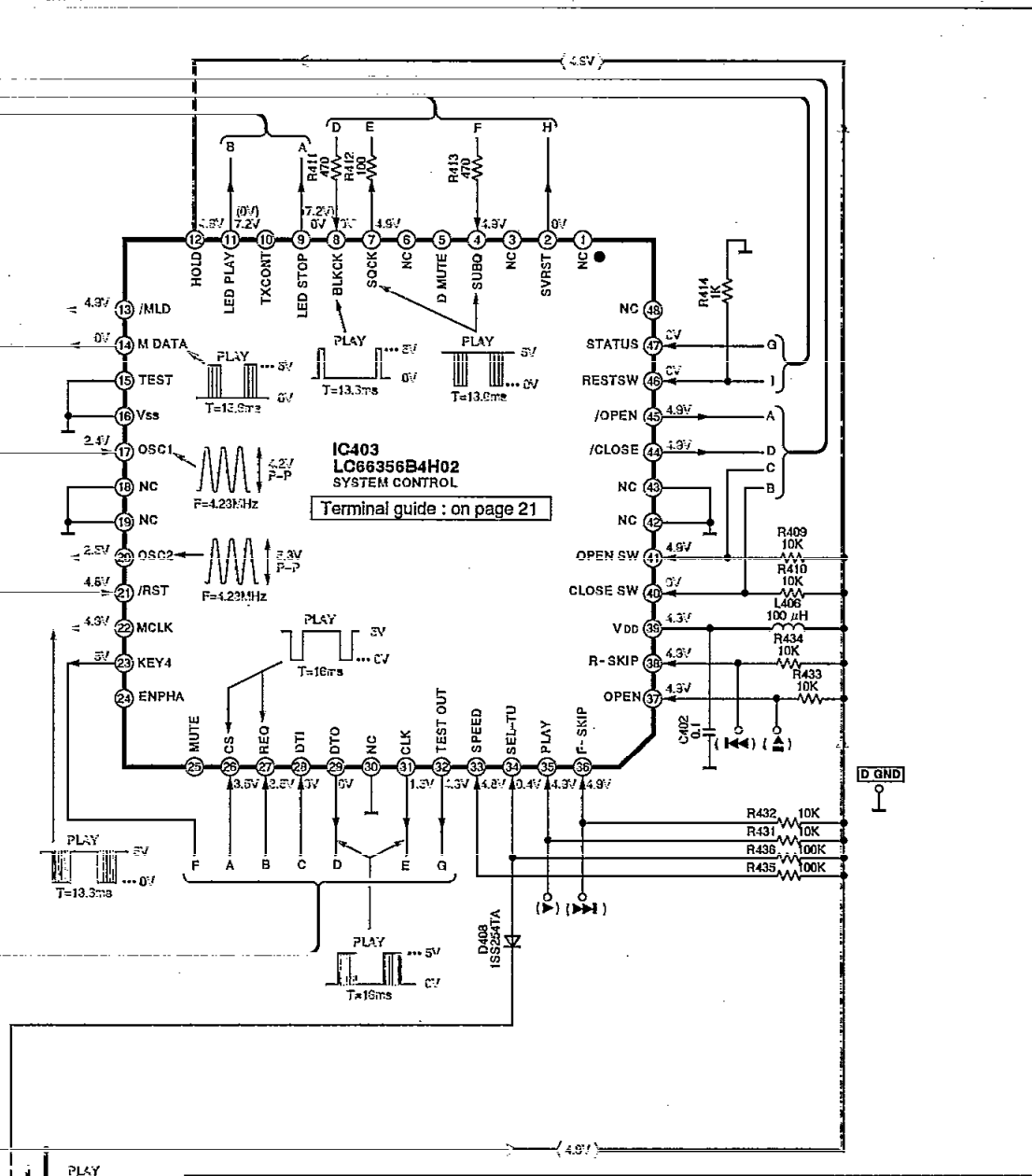
C MAIN CIRCUIT (P.C.Board: on page 20)



D OPERATION CIRCUIT
(P.C.Board: on page 20)



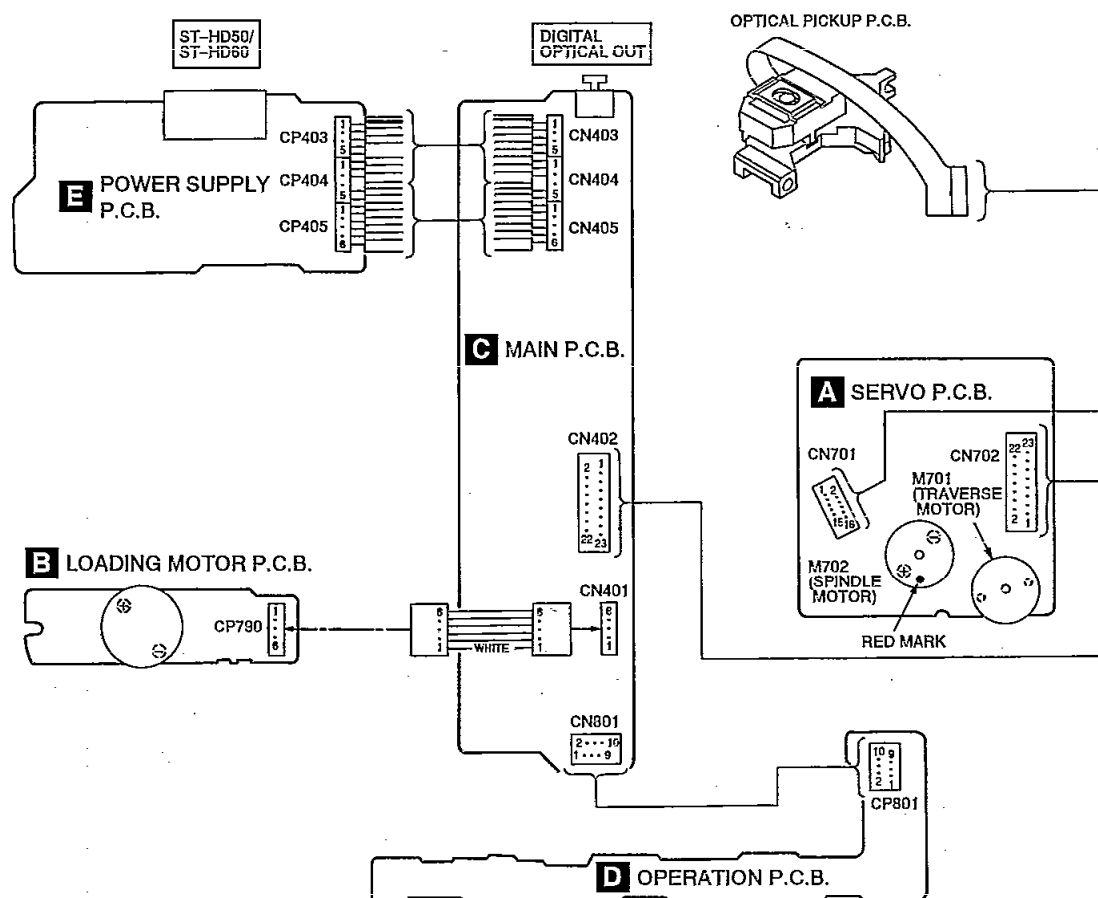
— : Positive voltage line - - - - - : Negative signal line → : CD signal line



■ Type Illustration of ICs, Transistors and Diodes

BA4558FHTT1 	AN8835SBE1 	AN8389SE1 	TA7291S 	LM2940T5M 	LC66356B4H02
MN662741RPA 	TOTX178 	2SB709STX 	2SD2137PQTA 	2SC1740SRSTA 2SA933SSTA DTC114YSTP DTC143ESTP DTA143XSTP	
RL1N4003N02 	MTZJ5R1BTA MTZJ8R2BTA 	1SS254TA 	SPR-305MDTF 		

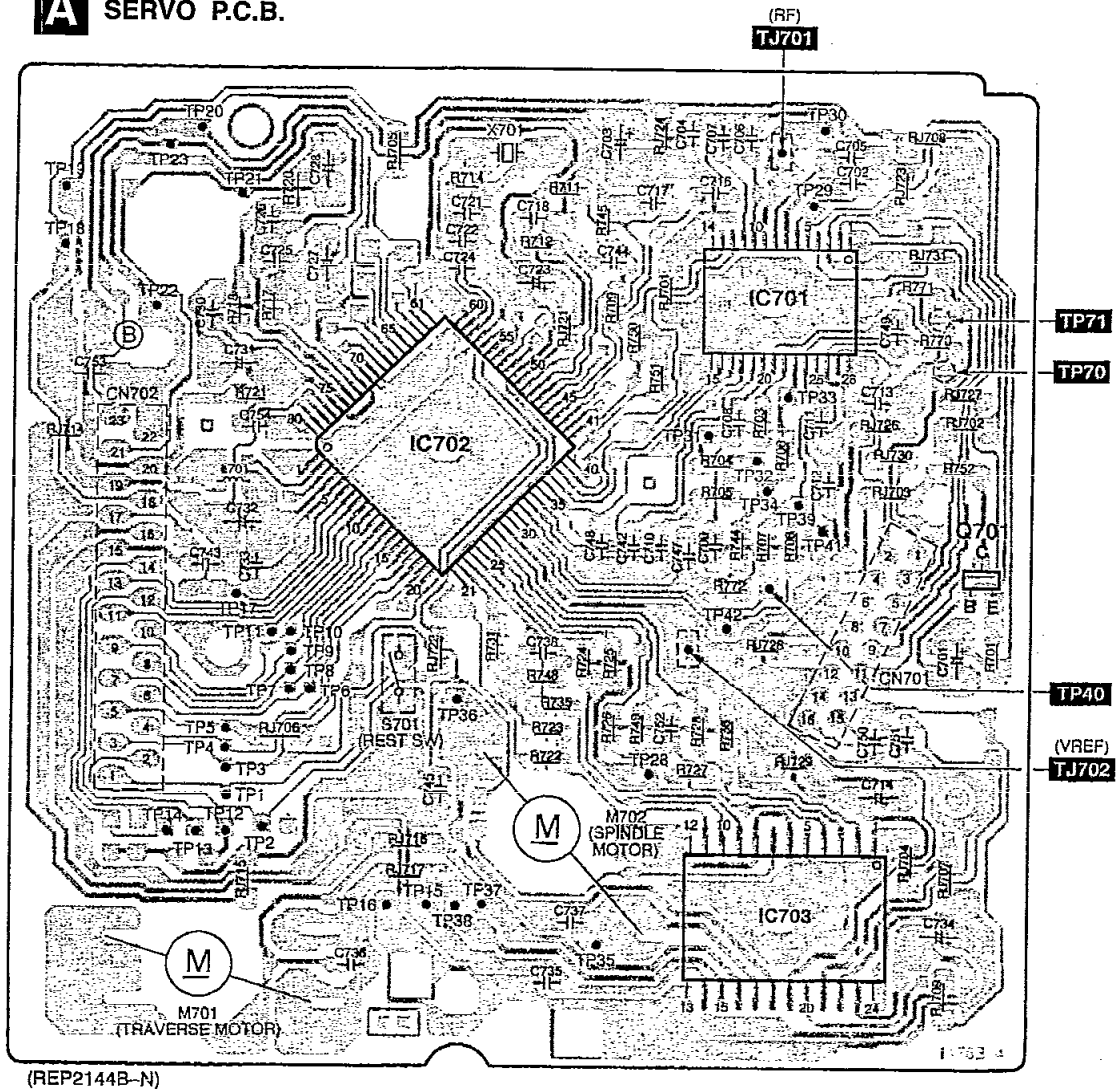
■ Wiring Connection Diagram



Printed Circuit Board Diagram

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

A SERVO P.C.B.



Terminal Function of IC's

● IC403 (LC66356B4H02): System Control

Pin No.	Terminal Name	I/O	Function
1	NC	—	Not used, open
2	SVRST	O	Reset signal output terminal
3	NC	—	Not used, open
4	SUBQ	I	Sub-code Q data input terminal
5	DMUTE	—	Not used, open
6	NC	—	Not used, open
7	SQCK	O	Sub-code Q resistor clock output terminal
8	BLKCK	I	Sub-code block clock input terminal (f = 75 Hz)
9	LED STOP	O	LED drive signal output terminal
10	TX CONT	—	Not used, open
11	LED PLAY	O	LED drive signal output terminal
12	HOLD	I	Not used, connected power supply
13	/MLD	O	Command load signal output terminal
14	MDATA	O	Command data signal output terminal
15	TEST	—	Test terminal
16	VSS	—	GND terminal
17	OSC1	I	Crystal OSC terminal (f = 4.2336 MHz)
18,19	NC	—	Not used, connected to GND
20	OSC2	O	Crystal OSC terminal (f = 4.2336 MHz)
21	/RST	I	Reset signal input terminal
22	MCLK	O	Command clock signal output terminal
23	KEY4	O	Key switch det. terminal
24	EMPHA	—	Not used, open
25	MUTE	—	Not used, open
26	CS	I	Communication chip select signal input terminal
27	REQ	I	Communication request signal input terminal
28	DTI	I	Communication data signal input/output terminal
29	DTO	O	
30	NC	—	Not used, open
31	CLK	O	Communication clock signal output terminal
32	TEST OUT	O	Not used, connected to power supply
33	SPEED	I	Not used, connected to resistor
34	SEL-TU	I	Communication data signal input terminal
35	PLAY	I	Not used, connected to resistor
36	F-SKIP	I	Not used, connected to resistor
37	OPEN	I	Not used, connected to resistor
38	R-SKIP	I	Not used, connected to resistor

Pin No.	Terminal Name	I/O	Function
39	VDD	I	Power supply input terminal
40	CLOSE SW	I	Disc tray "CLOSE" det. input terminal
41	OPEN SW	I	Disc tray "OPEN" det. input terminal
42,43	NC	—	Not used, connected to GND
44	/CLOSE	O	Loading motor "CLOSE" signal output terminal
45	/OPEN	O	Loading motor "OPEN" signal output terminal
46	RESTSW	I	Rest position det. input terminal
47	STATUS	I	Status signal input terminal
48	NC	—	Not used, open

● IC701 (AN8835SBE1): Servo Amp.

Pin No.	Terminal Name	I/O	Function
1	PDA	I	Focus (A-ch) signal input terminal
2	PDB	I	Focus (B-ch) signal input terminal
3	VCC	I	Power supply terminal
4	LPD	I	Laser PD signal input
5	LD	O	Laser power auto control signal output
6	RF	O	RF amp. terminal
7	RF IN	I	AGC input terminal
8	CAGC	I	AGC detection capacitor input
9	ARF	O	RF signal output
10	CSBRT	I	OFTR capacitor connection terminal
11	CEA	I	HPF-AMP capacitor connection terminal
12	BDO	O	Dropout detection control signal output
13	LDON	I	LD APC ON/OFF ("H": ON, "L": OFF)
14	GND	—	GND terminal
15	/RFDET	O	RF detection signal output ("L": det.)
16	CROSS	O	Tracking error zero cross output
17	OFTR	O	Off track detection signal output ("H": det.)
18	VDET	O	Vibration detection signal output ("H": det.)
19	ENV	O	Envelope output terminal
20	TEBPF	I	Vibration detection signal input ("H": det.)
21	CCRS	I	CROSS capacitor connection terminal
22	TE	O	Tracking error signal output
23	FE	O	Focus error signal output
24	TBAL	I	Tracking balance adjustment signal input
25	FBAL	I	Focus balance adjustment signal input
26	VREF	O	Reference voltage output
27	PDE	I	Tracking signal (E-ch) input terminal
28	PDF	I	Tracking signal (F-ch) input terminal

● IC702 (MN662741RPA): Servo Processor, Digital Signal Processor, Digital Filter, D/A Converter

Pin No.	Terminal Name	I/O	Function
1	BCLK	O	Bit clock output for serial data
2	LRCK	O	L/R clock signal output
3	SRDATA	O	Serial data output
4	DVDD1	—	Power supply input (for digital circuit)
5	DVSS1	—	GND (for digital circuit)
6	TX	O	Digital audio interface signal output
7	MCLK	I	Microprocessor command clock signal input (Latches data at first transition)
8	MDATA	I	Microprocessor command data signal input
9	MLD	I	Microprocessor command load signal input
10	SENSE	O	Sense signal output (OFT, FESL, MAGEND, NAJEND, POSAD, SFG) (Not used, open)
11	/FLOCK	O	Focus servo feeding signal output ("L": Feed)
12	/TLOCK	O	Tracking servo feeding signal output ("L": Feed) (Not used, open)
13	BLKCK	O	Sub-code block clock signal output (fBLKCK = 75 Hz during normal playback)
14	SQCK	I	External clock signal input for sub-code Q resistor
15	SUBQ	O	Sub-code Q code output
16	DMUTE	I	Muting input ("H": Mute)
17	STAT	O	Status signal output (CRC, CUE, CLVS, TTSTVP, FCLV, SQCK)
18	/RST	I	Reset signal input
19	SMCK	—	1/2-divided clock signal of crystal oscillating at MSEL = "H" (fSMCK = 8.4672 MHz) 1/4-divided clock signal of crystal oscillating at MSEL = "L" (fSMCK = 4.2336 MHz) (Not used, open)
20	PMCK	—	1/192-divided clock signal of crystal oscillating (fPMCK = 88.2 kHz) (Not used, open)
21	TRV	O	Traverse forced feed output
22	TVD	O	Traverse drive output
23	PC	O	Spindle motor ON signal output ("L": ON)
24	ECM	O	Spindle motor drive signal output (forced mode output)
25	ECS	O	Spindle motor drive signal output (servo error signal output)
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive output
28	FOD	O	Focus drive output
29	VREF	I	D/A (drive) output (TVD, ECS, TRD, FOD, FBAL, TBAL) reference voltage input
30	FBAL	O	Focus balance adjustment output
31	TBAL	O	Tracking balance adjustment output
32	FE	I	Focus error signal input (analog input)
33	TE	I	Tracking error signal input (analog input)
34	RFENV	I	RF envelope signal input
35	VDET	I	Vibration detection signal input ("H": detection)

Pin No.	Terminal Name	I/O	Function
36	OFT	I	Off-track signal input ("H": off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal input ("L": detection)
39	BDO	I	Dropout signal input ("H": Dropout)
40	LDON	O	Laser on signal output ("H": ON)
41	TES	O	Tracking error shunt signal output ("H": shunt)
42	PLAY	O	Play signal out ("H": PLAY) (Not used, open)
43	WVEL	O	Double speed status signal output ("H": Double speed) (Not used, open)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	—	DSL bias (Not used, open)
47	DSLIF	I/O	DSL loop filter
48	PLLIF	I/O	PLL loop filter
49	VCOF	I/O	VCO loop filter
50	AVDD2	—	Power supply input (for analog circuit)
51	AVSS2	—	GND (for analog circuit)
52	EFM	—	EFM signal output (Not used, open)
53	PCK	—	PLL extraction clock output (fPCK = 4.321 MHz during normal playback) (Not used, open)
54	PDO	—	Phase comparison signal of EFM and PCK signals (Not used, open)
55	SUBC	O	Sub-code serial data output
56	SBCK	I	Clock input for sub-code serial data
57	VSS	—	GND
58	X1	I	Crystal oscillating circuit input (f = 16.9344 MHz)
59	X2	O	Crystal oscillating circuit output (f = 16.9344 MHz)
60	VDD	—	Power supply input (for oscillating circuit)
61	BYTCK	—	Byte clock output (Not used, open)
62	/CLDCK	O	Sub-code frame clock signal output (fCLDCK = 7.35 kHz during normal playback)
63	FCLK	—	Crystal frame clock signal output (fFCLK = 7.35 kHz, double = 14.7 kHz) (Not used, open)
64	IPFLAG	O	Interpolation flag output ("H": Interpolation)
65	FLAG	O	Flag output (Not used, open)
66	CLVS	O	Spindle servo phase synchronizing signal output ("H": CLV, "L": rough servo) (Not used, open)
67	CRC	O	Sub-code CRC checked output ("H": OK, "L": NG) (Not used, open)
68	DEMPH	O	De-emphasis ON signal output ("H": ON) (Not used, open)
69	RESY	—	Frame re-synchronizing signal output (Not used, open)
70	/RST2	I	Reset input through MASH circuit ("L": Reset)
71	/TEST	I	Test input

● IC702 continued

Pin No.	Terminal Name	I/O	Function
72	AVDD1	—	Power supply input (for analog circuit)
73	OUTL	O	Left channel audio signal output
74	AVSS1	—	GND
75	OUTR	O	Right channel audio signal output
76	RSEL	I	RF signal polarity assignment input (at "H" level: RSEL = "H") (at "L" level: RSEL = "L")
77	CSEL	I	Crystal oscillating frequency designation input ("L": 16.9344 MHz, "H": 33.8688 MHz)
78	PSEL	I	Test terminal (Normal: "L") (Not used, connected to GND)
79	MSEL	I	"SCMK" terminal frequency select ("L": SCMK = 4.2336MHz) (Not used, connected to GND)
80	SSEL	I	"SCMK" terminal mode select ("H": Q code buffer) (Not used, connected to power supply)

● IC703 (AN8389SE1): Focus/Tracking Coil Drive
Traverse/Spindle Motor Drive

Pin No.	Terminal Name	I/O	Function
1	Vcc	—	Power supply
2	VREF	I	VREF input
3	IN4	I	Focus driver (4) input
4	IN3	I	Tracking driver (3) input
5	GND	—	Ground connection
6	NC	—	Ground connection
7	NRESET	—	Reset input (Not used, open)
8	GND	—	Ground connection
9	IN2	I	Spindle motor driver (2) input
10	PC2	I	PC2 (power cut) input
11	IN1	I	Traverse motor driver (1) input
12	PC1	I	PC1 (power cut) input
13	PVcc1	—	Power supply (1) for driver
14	PGND1	—	Ground connection (1) for driver
15	D1-	O	Traverse motor driver (1) reverse-action output
16	D1+	O	Traverse motor driver (1) forward-action output
17	D2-	O	Spindle motor driver (2) reverse-action output
18	D2+	O	Spindle motor driver (2) forward-action output
19	D3-	O	Tracking actuator (3) reverse-action output
20	D3+	O	Tracking actuator (3) forward-action output
21	D4-	O	Focus actuator (4) reverse-action output
22	D4+	O	Focus actuator (4) forward-action output
23	PGND2	—	Ground connection (2) for driver
24	PVcc2	—	Power supply (2) for driver

■ 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-HD50 or ST-HD60). It also has a servo adjustment function for displaying the status of servo system functions (Focus, Tracking, CLV Servo) 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 three functions. (This unit can be operated independently, although the error code display and servo adjustment functions cannot be used.)

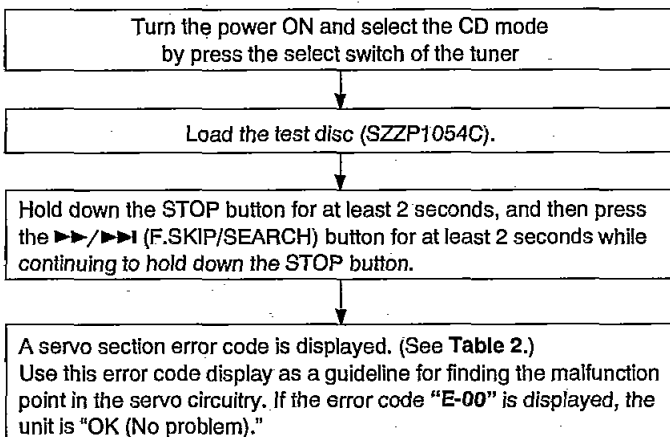
Use these two functions for guidance during fault diagnosis and repair.

Note:

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

● Error code display procedure

Automatic adjustment results

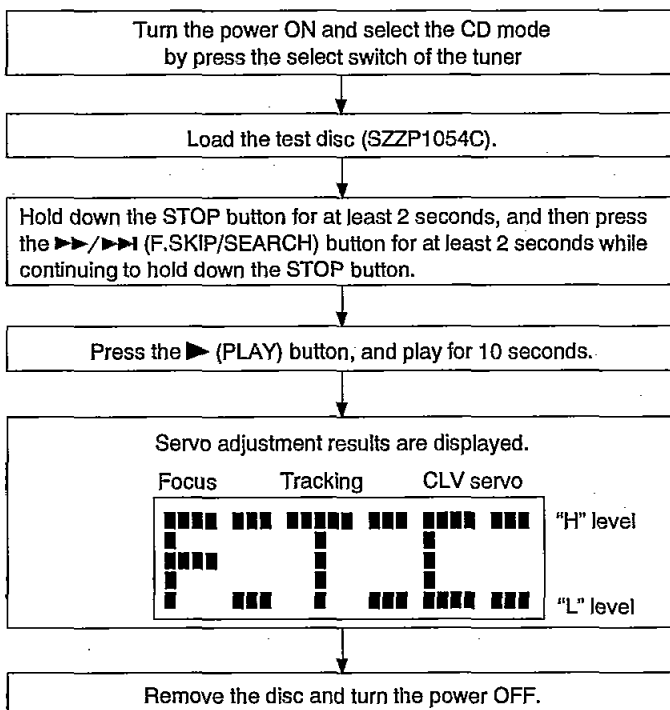


Checking the mechanism switches

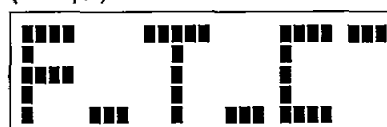
If there are mechanism errors, mechanism OK/NG error code is displayed. (See Table 1.)
This error code can be used to diagnose whether or not the mechanism is OK. If there are multiple errors, these can be displayed successively by pressing the F. SKIP button.

Remove the disc and turn the power OFF. (The error code display mode is canceled.)

● Servo adjustment procedure



(Example)



⇒ Normal

	"L" level	"H" level
Focus system	normal	defective
Tracking system	normal	defective
CLV servo system	defective	normal

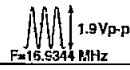
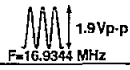
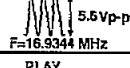
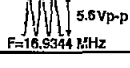
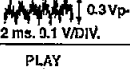
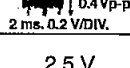
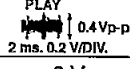
● Table 1

FL display	Symptom	Cause
H-15	When CD tray opens, it closes by itself.	Disc tray "Open" detection switch (S4) fault.
H-16	When CD tray close, it opens by itself.	
F-15	Does not play, even when CD play button is pressed.	Pickup rest position detection switch (S701) fault.
F-16	Traverse pushes up disc tray.	Up position detection switch (S3) fault.
F-26	Does not move even when "▶" (PLAY) button is pressed.	System control or servo processor IC (IC403, IC702) fault.

● Table 2

※ The unit is satisfactory if the error code is "E-00" or "E02".

※ Before testing, check that the test disc is free of scratches and optical pickup is clean.

FL error code display	Symptom	Probable cause	Signal to check		Normal voltage and waveform values	
			Location	Signal name	PLAY	STOP
E-01	Focus and tracking offset adjustments not completed in specified time period.	① Clocks X1 and X2, power supply VDD, and reset (/RST), all on IC702. ② MDATA, MCLK, MLD, and SENSE signals to/from mechanism controller.	IC702-8 pin	MDATA		0 V
			IC702-7 pin	MCLK		4.8 V
			IC702-9 pin	MLD		4.9 V
			IC702-10 pin	SENSE	0 V	0 V
			IC702-18 pin	/RST	4.9 V	4.9 V
			IC702-58 pin	X1		
			IC702-59 pin	X2		
E-02 E-03 E-05 E-06 E-07 E-09 E-0A E-0B E-0D E-0E E-0F	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	IC702-32 pin	F E		2.5 V
IC702-33 pin			T E		2.5 V	
IC702-28 pin			FOD	2.5 V	2.5 V	
IC702-27 pin			TRD	2.5 V	2.5 V	
IC702-26 pin			KICK	2.5 V	2.5 V	
IC702-11 pin			/FLOCK	0 V	4.9 V	
IC702-38 pin			/RF DET	0 V	4.9 V	
TJ701			R F		3.9 V	
IC702-17 pin			STAT	4.9 V	0 V	
E-04 E-08 E-0C			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	IC702-32 pin	F E
IC702-33 pin	T E				2.5 V	
IC702-36 pin	O F T	0 V			0 V	
IC702-12 pin	/TLOCK	0 V			0 V	

■ To Supply Power Source

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-HD60 is designed to operate on power supplied from the Amplifier SE-HD50 or SE-HD60 through the Tuner ST-HD50 or ST-HD60. When connecting the unit to other system components, do not connect to the Amplifier SE-HD50 or SE-HD60 directly. Be sure to connect this unit through the Tuner ST-HD50 or ST-HD60.

When operating the unit SL-HD60 alone for testing and servicing, without having power supplied from the Amplifier SE-HD50 or SE-HD60 and the Tuner ST-HD50 or ST-HD60, use the following method.

Power Supply to This Unit Alone

1. Short-circuit the section **AC IN** (L401), **GND** (J31) and **AC IN** (L402).
2. AC 11V supply to the short point just now.

Operate to This Unit Alone

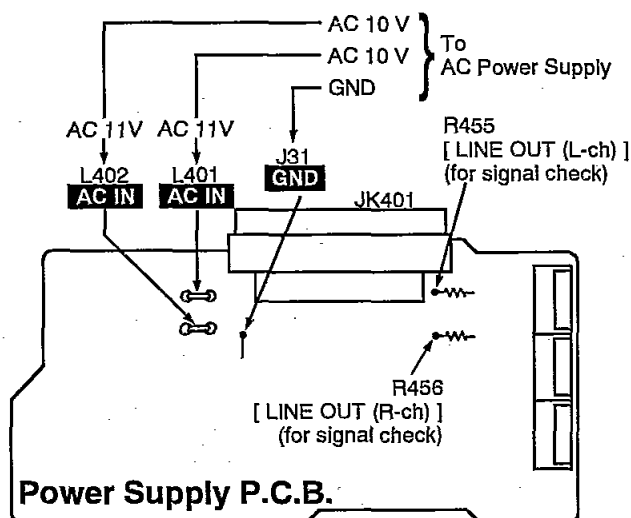
- If this unit SL-HD60 operates by alone, become to not operate the operation switches of the front panel. Therefore use following method as the operation switches.

When short the section following points for a moment, be able to operate as follows.

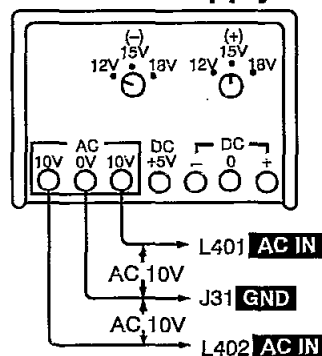
- short the section between **R431** and **J101** **PLAY**
- short the section between **R432** and **J101** **F. SKIP**
- short the section between **R433** and **J101** **OPEN/CLOSE of the Disc Tray**
- short the section between **R434** and **J101** **R. SKIP**

To Check Signals

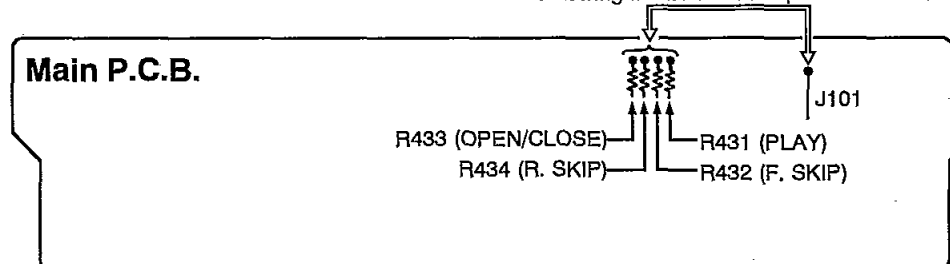
Connect the oscilloscope or the speaker with built-in amplifier to the section between **R455** [**LINE OUT (L-ch)**] and the **J31** (**GND**), as well as the section between **R456** [**LINE OUT (R-ch)**] and the **J31** (**GND**), and check if the signals are outputting from this unit as follow.



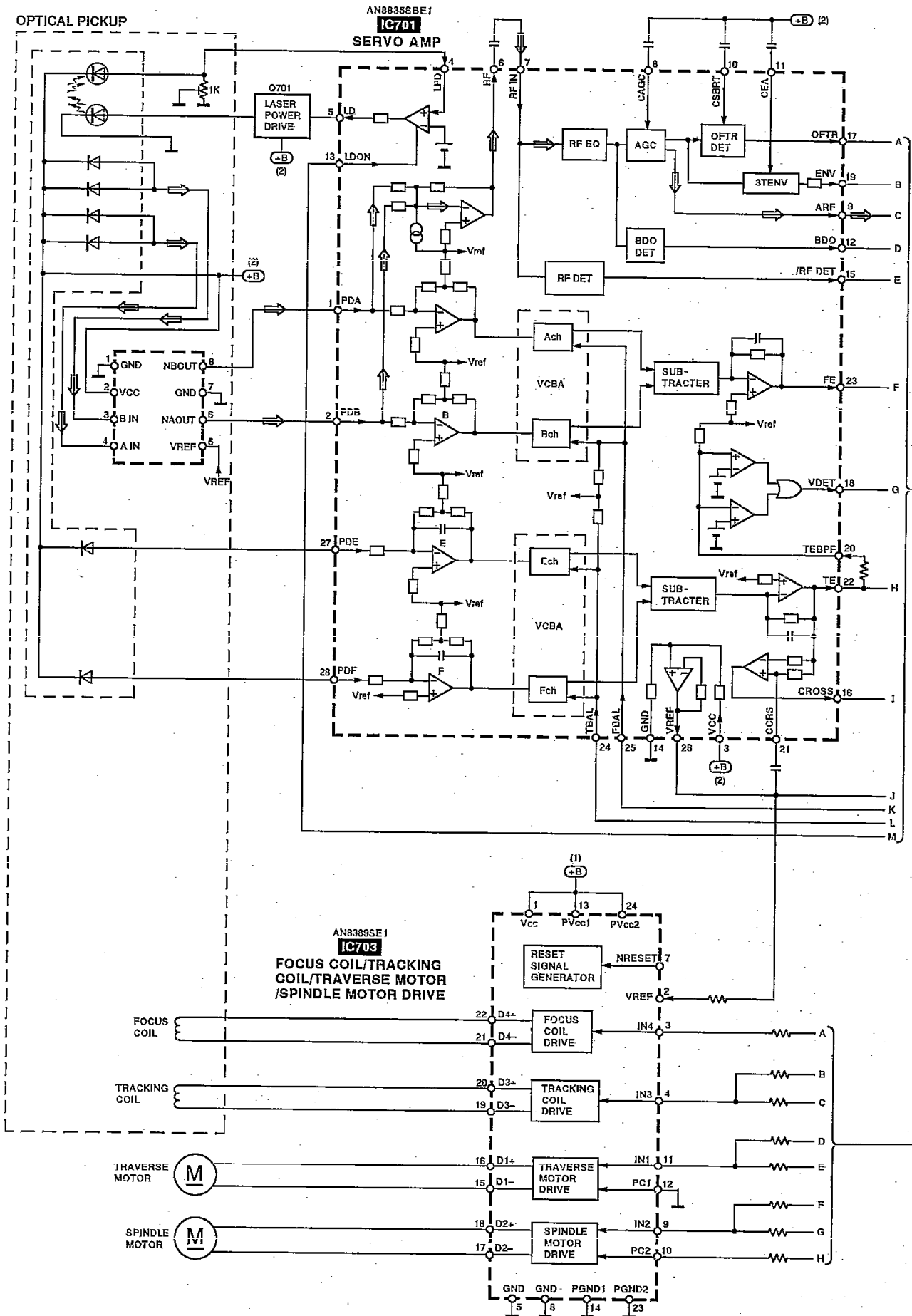
AC Power Supply



When short the section for a moment, use following method as the operation switches.



Block Diagram



MN682741RPA

IC702

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

TOTX178

IC402

BA4558FHTT1
IC405(1/2)

L.P.F.

JK401 (1/2)

Lch OUT

A.GND

A.GND

Rch OUT

L.P.F.

IC405(1/2)

BA4558FHTT1

L.RCK

SRDATA

BCLK

X2

X1

SMCK

DVDD1

AVDD2

AVDD1

VDD

VSS

VSS

VSS

VSS

VSS

VSS

VSS

VSS

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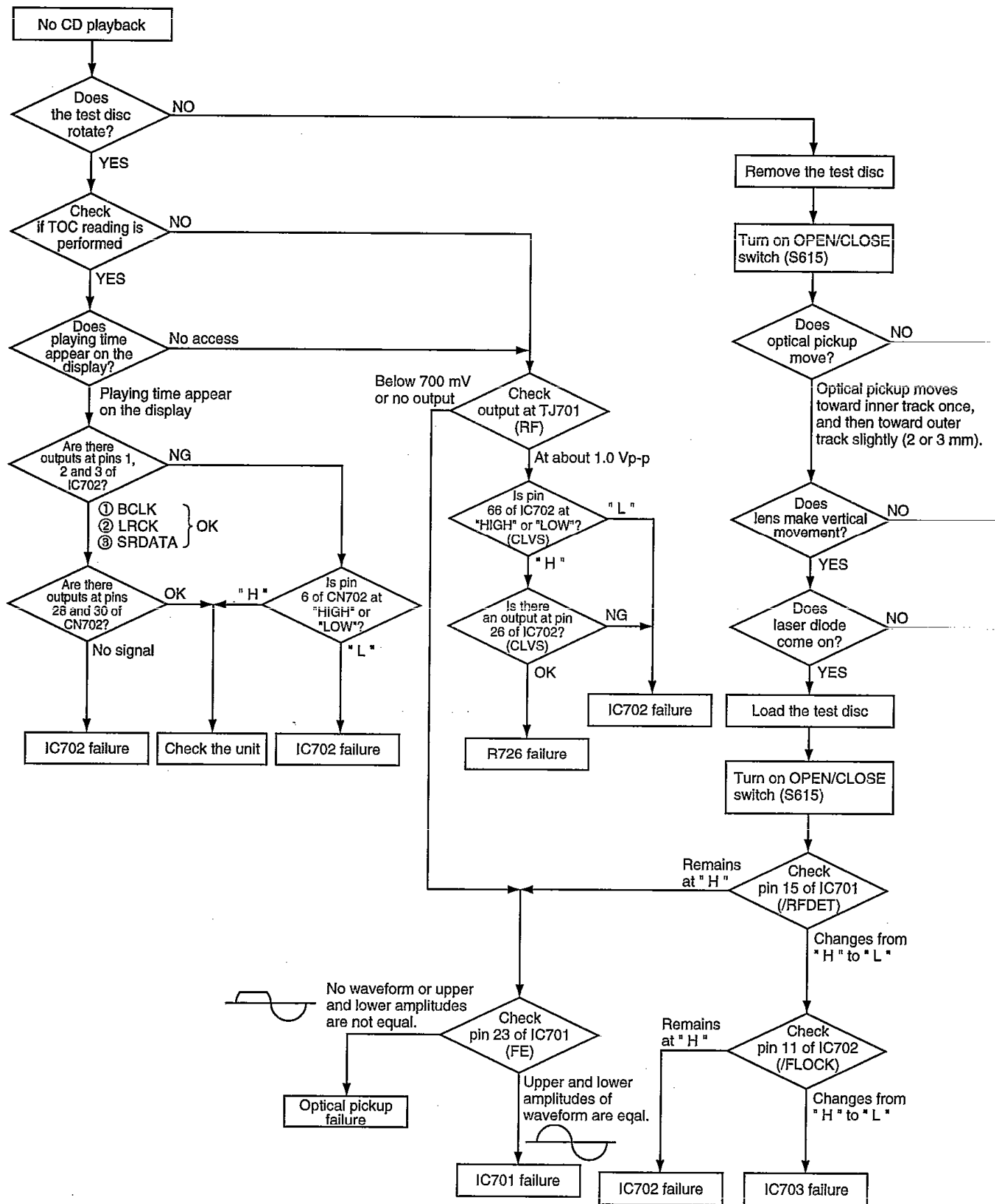
VSS

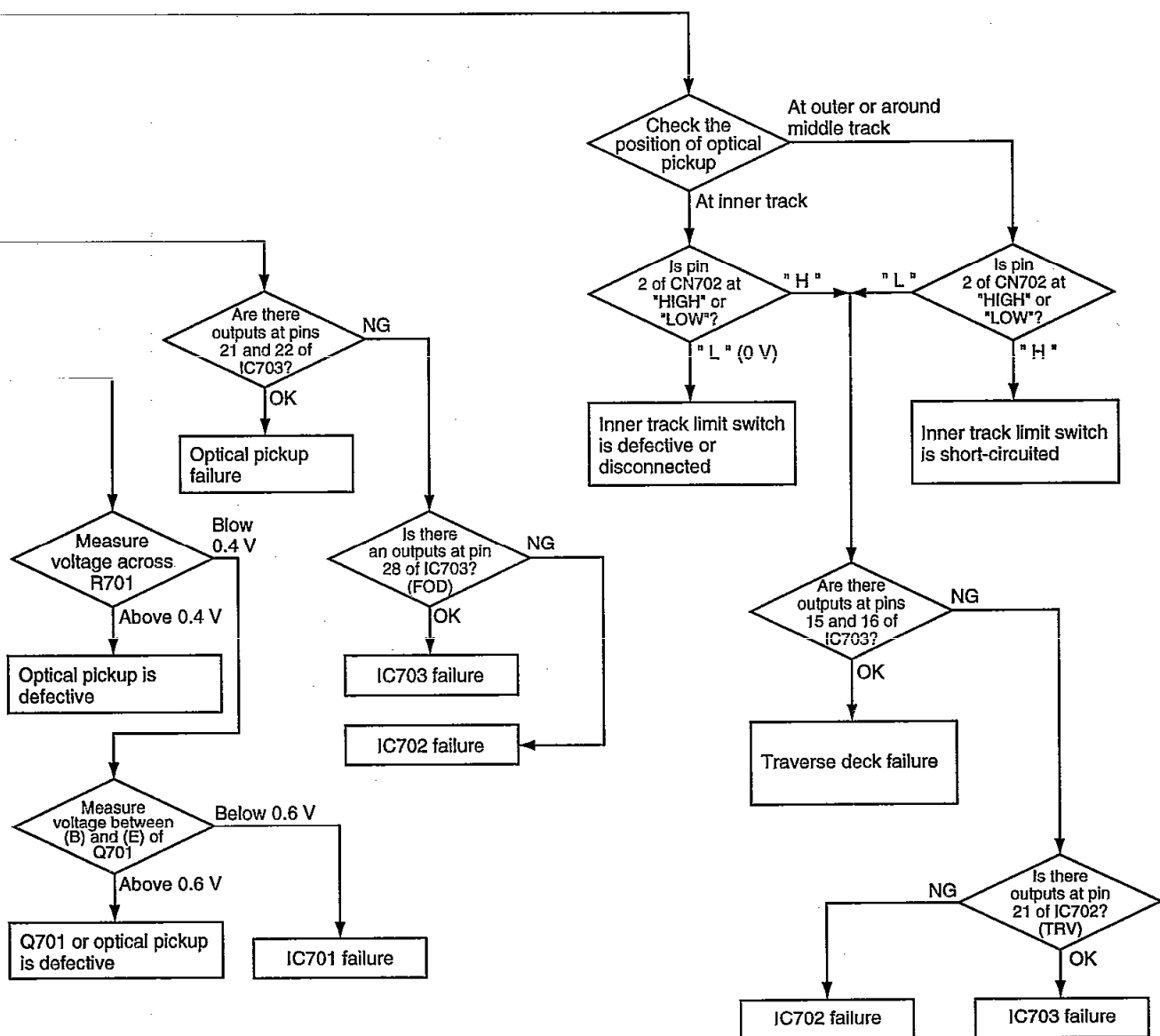
VSS

NOTE:

⇒ CD DIGITAL / ANALOG SIGNAL LINE

Troubleshooting Guide





■ Replacement Parts List (Electrical)

Notes: *Important safety notices:

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 manufacture's 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.

*[M] Indicates in Remarks columns parts that are supplied by MESA.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)					
IC401Δ	LM2940T5	IC	[M]	CN401	RJP6G17ZA	CONNECTOR(6P)	[M]
IC402	TOTX178	IC	[M]	CN402	RJS1A6223-1	CONNECTOR(23P)	[M]
IC403	LC66356B4HD2	IC	[M]	CN403, 404	RJS1A6605	CONNECTOR(5P)	[M]
IC405	BA4558FHT1	IC	[M]	CN405	RJS1A6606	CONNECTOR(6P)	[M]
IC790	TA7291S	IC	[M]	CN801	RJU099W10	CONNECTOR(10P)	[M]
		TRANSISTOR(S)		CP790	RJP6G17ZA	CONNECTOR(6P)	[M]
				CP801	RJT099W10-1	CONNECTOR(10P)	[M]
				JK401	RJT065K19	CONNECTOR(19P)	[M]
						GND PLATE	
Q401	2SC1740SRSTA	TRANSISTOR	[M]				
Q402	DTC143ESTP	TRANSISTOR	[M]	E401	SNE1004-2	GND PLATE	[M]
Q403	2SC1740SRSTA	TRANSISTOR	[M]				
Q404	DTC114YSTP	TRANSISTOR	[M]			CD SERVO CIRCUIT	
Q405, 406Δ	2SD2137PQTA	TRANSISTOR	[M]			INTEGRATED CIRCUIT(S)	
Q408, 409	DTA143XSSTP	TRANSISTOR	[M]				
Q423	2SA933SSTA	TRANSISTOR	[M]	IC701	AN8835SBE1	IC	[M]
		DIODE(S)		IC702	MV662741RPA	IC	[M]
				IC703	AN8389SE1	IC	[M]
						TRANSISTOR(S)	
D401-403Δ	RL1N4003N02	DIODE	[M]				
D404Δ	MTZJ0R2BTA	DIODE	[M]	Q701	2SB709S	TRANSISTOR	[M]
D405, 406	1SS254TA	DIODE	[M]				
D408-410	1SS254TA	DIODE	[M]			COIL(S)	
D481Δ	RL1N4003N02	DIODE	[M]				
D482Δ	MTZJ5R1BTA	DIODE	[M]	L701	RLBN102V-Y	COIL	[M]
D801	SPR-305MDTF	DIODE	[M]			OSCILLATOR(S)	
		COIL(S)					
				X701	RSXB16M9J02T	OSCILLATOR	[M]
L401, 402Δ	BL02RN2R65T2	COIL	[M]				
L406	ELEXT101KA9	COIL	[M]			SWITCH(ES)	
L408	BL02RN2R62T4	COIL	[M]				
L409	ELEXT1R0KA9	COIL	[M]	S701	RSM0006-P	SW	[M]
		OSCILLATOR(S)				CONNECTOR(S)	
X401	EFOEC4234T3	OSCILLATOR	[M]				
		SWITCH(ES)		CN701	RJU035T016-1	CONNECTOR(16P)	[M]
				CN702	RJS1A6723-1Q	CONNECTOR(23P)	[M]
S790, 791	RSH1A005	SW	[M]				
S801-809	EVQ21405R	SW	[M]				
		CONNECTOR(S)/JACK(S)					

Resistors and Capacitors

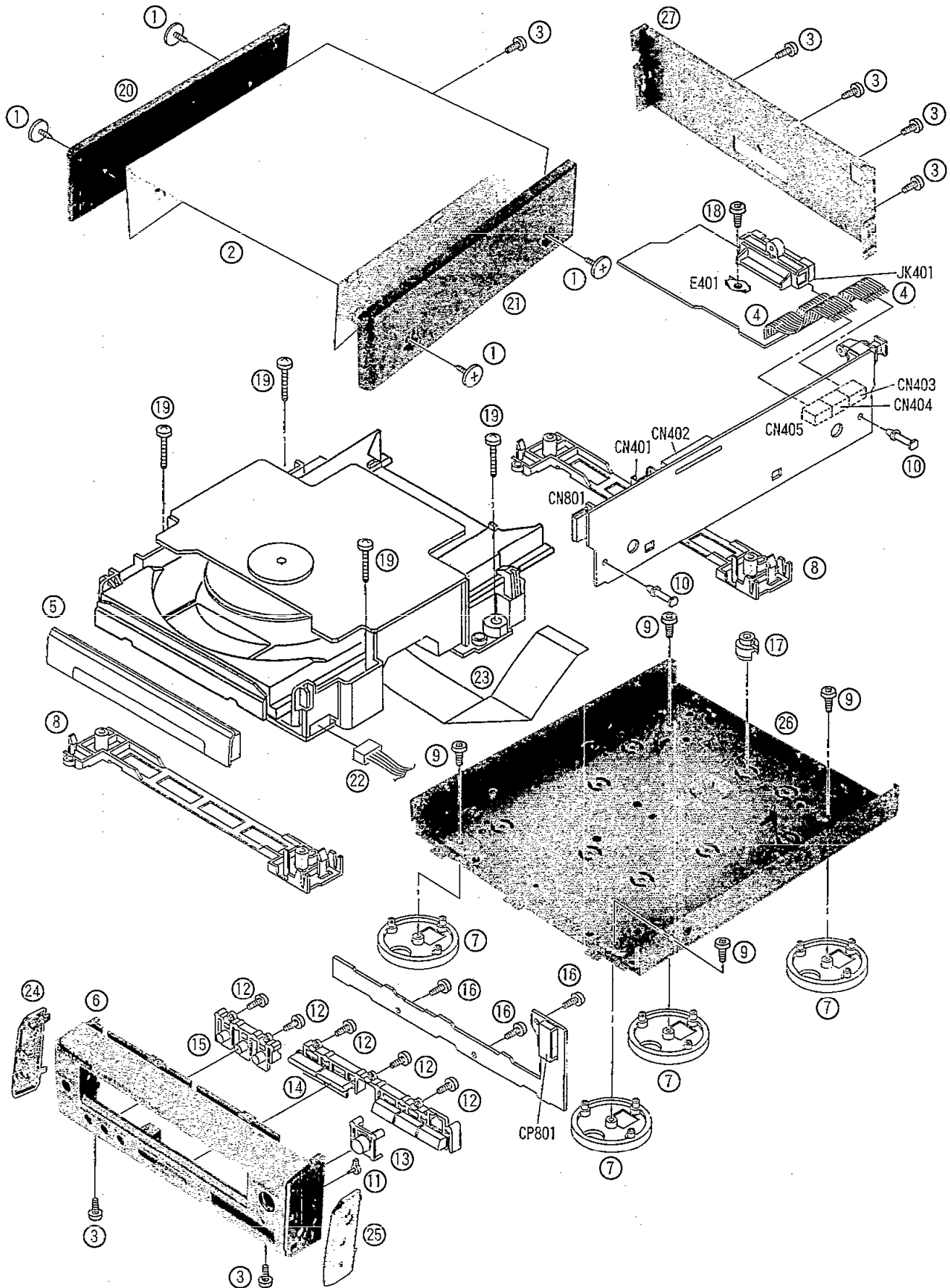
Notes: *Capacity values are in microfarads (μ F) unless specified otherwise, P = Pico-farads (pF) F = Farads (F)

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

*[M] Indicates in Remarks columns parts that are supplied by MESA.

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS			CAPACITORS	R726	ERJ6GEYJ473V	1/10W 47K [M]
R403	ERDS2TJ102	1/4W 1K [M]	C401	ECBT1H102KB5	50V 1000P [M]	R727	ERJ6GEYJ822V	1/10W 8.2K [M]
R405	ERDS2TJ103	1/4W 10K [M]	C402	ECBT1H104ZF5	50V 0.1U [M]	R728	ERJ6GEYJ103V	1/10W 10K [M]
R406	ERDS2TJ473	1/4W 47K [M]	C405	ECBT1H104ZF5	50V 0.1U [M]	R731	ERJ6GEYJ822V	1/10W 8.2K [M]
R407	ERDS2TJ223	1/4W 22K [M]	C406	RCE1HKS3R3BV	50V 3.3U [M]	R735, 736	ERJ6GEYJ101V	1/10W 100 [M]
R408, 410	ERDS2TJ103	1/4W 10K [M]	C409	ECBT1E103ZF	25V 0.01U [M]	R744	ERJ6GEYJ103V	1/10W 10K [M]
R411	ERDS2TJ471	1/4W 470 [M]	C410△	ECA1EM222B	25V 2200U [M]	R745	ERJ6GEYJ155V	1/10W 1.5M [M]
R412	ERDS2TJ101	1/4W 100 [M]	C411-413	ECBT1E103ZF	25V 0.01U [M]	R748	ERJ6GEYJ182V	1/10W 1.8K [M]
R413	ERDS2TJ471	1/4W 470 [M]	C415	ECBT1H330J5	50V 33P [M]	R749	ERJ6GEYJ682V	1/10W 6.8K [M]
R414	ERDS2TJ102	1/4W 1K [M]	C416	RCE1AKA101BG	10V 100U [M]	R750, 751	ERJ6GEYJ473V	1/10W 47K [M]
R415	ERDS2TJ105T	1/4W 1M [M]	C417, 418	ECBT1H102KB5	50V 1000P [M]	R752	ERJ8GEYJ220V	1/8W 22 [M]
R423	ERDS2TJ472	1/4W 4.7K [M]	C419	ECEA0JKA221B	6.3V 220U [M]	R770, 771	ERJ6GEYJ155V	1/10W 1.5M [M]
R427	ERDS2TJ472	1/4W 4.7K [M]	C420	ECEA1AKA221B	10V 220U [M]	R772	ERJ6GEYJ273V	1/10W 27K [M]
R428	ERDS2TJ103	1/4W 10K [M]	C425	ECBT1E103ZF	25V 0.01U [M]	RJ701-709	ERJ8GEYOR00A	1/8W 0.00 [M]
R429	ERDS2TJ471	1/4W 470 [M]	C426	ECBT1H101KB5	50V 100P [M]	RJ714-717	ERJ8GEYOR00A	1/8W 0.00 [M]
R430	ERDS2TJ104	1/4W 100K [M]	C428	ECBT1H102KB5	50V 1000P [M]	RJ721-724	ERJ6GEYOR00A	1/10W 0.00 [M]
R431-434	ERDS2TJ103	1/4W 10K [M]	C431△	ECA1EM101B	25V 100U [M]	RJ726-731	ERJ6GEYOR00A	1/10W 0.00 [M]
R435, 436	ERDS2TJ104	1/4W 100K [M]	C433, 434	ECBT1H102KB5	50V 1000P [M]			TEST JUMPER
R439	ERDS2TJ101	1/4W 100 [M]	C435, 436	ECBT1H331KB5	50V 330P [M]			
R440	ERDS2TJ102	1/4W 1K [M]	C437, 438	ECBT1H121KB5	50V 120P [M]	TJ701, 702	EYF8CU	[M]
R441△	ERQ16NKR15E	1/6W 0.15 [M]	C439, 440	ECEA0JKA220B	6.3V 22U [M]			CAPACITORS
R442△	ERDS1FVJ271T	1/2W 270 [M]	C491, 492	ECEA1AKA220B	10V 22U [M]			
R443△	ERD2FCJ6R8	1/4W 6.8 [M]	C493, 494	ECBT1H101KB5	50V 100P [M]	C1	ECUV1E473ZV	25V 0.047U [M]
R445, 446	ERDS2TJ1R2	1/4W 1.2 [M]	C790	ECA1AKF820E	10V 82U [M]	C2, 3	ECUVNE104KBN	0.1U [M]
R455, 456	ERDS2TJ221	1/4W 220 [M]	C801	ECBT1H102KB5	50V 1000P [M]	C4, 5	ECUV1H681KBV	50V 680P [M]
R457	ERDS2TJ1R2	1/4W 1.2 [M]				C701	ECEA0JKA330I	6.3V 33U [M]
R458	ERDS2TJ102	1/4W 1K [M]			CD SERVO CIRCUIT	C702	ECUZNE104MBN	25V 0.1U [M]
R459, 460	ERDS2TJ473	1/4W 47K [M]			RESISTORS	C703	ECEA0JKA101I	6.3V 100U [M]
R471-474	ERDS2TJ391	1/4W 390 [M]				C704, 705	ECUZNE104MBN	25V 0.1U [M]
R475-477	ERDS2TJ103	1/4W 10K [M]	R701	ERJ6GEYJ4R7V	1/10W 4.7 [M]	C706	ECUV1H272KBN	50V 2700P [M]
R481, 482	ERDS2TJ271	1/4W 270 [M]	R703	ERJ6GEYJ823	1/10W 82K [M]	C707	ECUV1E273KBN	25V 0.027U [M]
R483, 484	ERDS2TJ102	1/4W 1K [M]	R704	ERJ6GEYJ102A	1/10W 1K [M]	C708	ECUE1H472KBN	50V 4700P [M]
R485, 486	ERDS2TJ104	1/4W 100K [M]	R705	ERJ6GEYJ103V	1/10W 10K [M]	C709	ECUE1C473KBN	16V 0.047U [M]
R487-490	ERDS2TJ223	1/4W 22K [M]	R706	ERJ6GEYJ102A	1/10W 1K [M]	C710	ECUV1H182KBN	50V 1800P [M]
R491, 492	ERDS2TJ273	1/4W 27K [M]	R707	ERJ6GEYJ474V	1/10W 470K [M]	C711, 712	ECUWNE104ZFN	25V 0.1U [M]
R493, 494	ERDS2TJ332	1/4W 3.3K [M]	R708	ERJ6GEYJ154V	1/10W 150K [M]	C713	ECUV1C104MBM	16V 0.1U [M]
R495, 496	ERDS2TJ101	1/4W 100 [M]	R709	ERJ6GEYJ683V	1/10W 68K [M]	C714	ECEA0JKA101I	6.3V 100U [M]
R497	ERDS2TJ182	1/4W 1.8K [M]	R711	ERJ6GEYJ154V	1/10W 150K [M]	C716	ECUE1H561KBN	50V 560P [M]
R498	ERDS2TJ272T	1/4W 2.7K [M]	R712	ERJ6GEYJ221V	1/10W 220 [M]	C717	ECUWNE104ZFN	25V 0.1U [M]
R810	ERDS2TJ821	1/4W 820 [M]	R714	ERJ6GEYJ121V	1/10W 120 [M]	C718	ECUVNC224KBN	16V 0.22U [M]
R811	ERDS2TJ102	1/4W 1K [M]	R717, 718	ERJ6GEYJ102A	1/10W 1K [M]	C721, 722	ECUV1H100DCN	50V 10P [M]
R812	ERDS2TJ122	1/4W 1.2K [M]	R720	ERJ6GEYOR00A	1/10W 0.00 [M]	C723	ECEA1AKA221I	10V 220U [M]
R813	ERDS2TJ152	1/4W 1.5K [M]	R721	ERJ6GEYJ101V	1/10W 100 [M]	C724	ECUV1C104MBM	16V 0.1U [M]
R814	ERDS2TJ182	1/4W 1.8K [M]	R722	ERJ6GEYJ563V	1/10W 56K [M]	C725, 726	ECUE1H102KBN	50V 1000P [M]
R815	ERDS2TJ222	1/4W 2.2K [M]	R723	ERJ6GEYJ182V	1/10W 1.8K [M]	C727, 728	ECEA1HPK010I	50V 1U [M]
R816	ERDS2TJ332	1/4W 3.3K [M]	R724	ERJ6GEYJ333V	1/10W 33K [M]	C730	ECUWNE104ZFN	25V 0.1U [M]
R817	ERDS2TJ472	1/4W 4.7K [M]	R725	ERJ6GEYJ472V	1/10W 4.7K [M]	C731, 732	ECEA0JKA221I	6.3V 220U [M]

■ Cabinet Parts Location

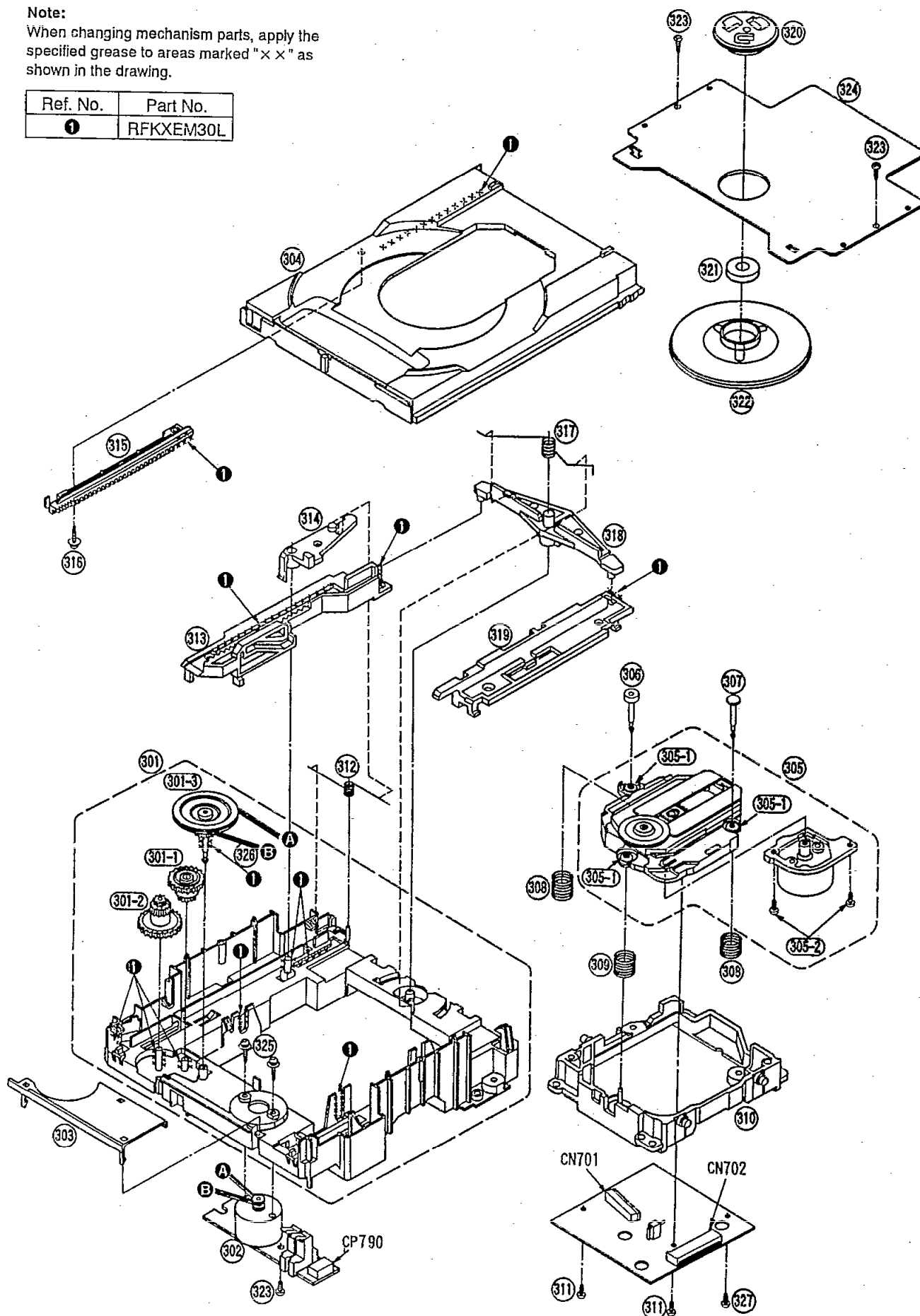


■ Loading Mechanism Parts Location

Note:

When changing mechanism parts, apply the specified grease to areas marked "×" as shown in the drawing.

Ref. No.	Part No.
①	RFKXEM30L



■ Replacement Parts List (Cabinet, Loading Mechanism and Jig/Tool)

Note: The reference number SA represent the grease and tool used for this unit.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET PART(S)		315	RFKNLP6440-K	GEAR ASS'Y	[M]
				316	RHD20009-1	SCREW	[M]
				317	RME0087	SPRING	[M]
1	RHD30073-K	SCREW	[M]	318	RML0349	LEVER	[M]
2	RKMD327-S	CABINET	[M]	319	RMD0059-1	SLIDE PLATE	[M]
3	XTBS3+8JFZ1	SCREW	[M]	320	RMR0334	HOLDER	[M]
4	REZ0888	WIRE ASS'Y	[M]	321	RHM245ZA	MAGNET	[M]
5	RFKNLHD7MDAN	TRAY ORNAMENT ASS'Y	[M]	322	RXQ0380	MAGNET HOLDER	[M]
6	RFKGLHD50EN	FRONT PANEL ASS'Y	[M]	323	XTN26+6G	SCREW	[M]
7	RKA0076-N	FOOT	[M]	324	RMA0793-1	CLAMPER	[M]
8	RMD0382	SPACER	[M]	325	XYN2+F6FZ	SCREW	[M]
9	XTB3+6G	SCREW	[M]	326	RMG0158	BELT	[M]
10	RMR0502	SPACER	[M]	327	XTN2+6G	SCREW	[M]
11	RGL0335-1Q	LENS	[M]			JIG/TOOL	
12	XQN26+AJ6FZ	SCREW	[M]			TEST DISC	
13	RFKNLHD7NB	BUTTON, OPEN/CLOSE	[M]	SA1	SZZP1054C	TEST DISC	[M]
14	RFKNLHD7NC	BUTTON, PLAY/STOP	[M]			GREASE	
15	RFKNLHD7ND	BUTTON, RDM/REP/REC	[M]	SA2	RFXKEM30L	GREASE	[M]
16	XTBS26+8J	SCREW	[M]				
17	SHE170-2	SPACER	[M]				
18	XTB3+12JFZ	SCREW	[M]				
19	XTB3+18JFZ	SCREW	[M]				
20	RGK0817-M	ORNAMENT 2·(L)	[M]				
21	RGK0818-M	ORNAMENT 2·(R)	[M]				
22	REX0844	WIRE ASS'Y	[M]				
23	REZ0887	FFC	[M]				
24	RGK0819-N	ORNAMENT 1·(L)	[M]				
25	RGK0820-N	ORNAMENT 1·(R)	[M]				
26	RMD0324A	CHASSIS	[M]				
27	RGR0243A-E	REAR PANEL	[M]				
		LOADING MECHANISM					
301	RFKJXD7D7-K	LOADING CHASSIS ASS'Y L	[M]				
301-1	RDG0142	GEAR	[M]				
301-2	RDG0193	GEAR	[M]				
301-3	RDP0065	PULLEY	[M]				
302	REM0019	LOADING MOTOR ASS'Y	[M]				
303	RMD0255	BELT COVER	[M]				
304	RGQ0144-K	DISC TRAY	[M]				
305△	RAE0150Z	TRAVERSE DECK	[M]				
305-1	SHGD113-1	RUBBER	[M]				
305-2	SNSD38	SCREW	[M]				
306	RMS0350	PIN (A)	[M]				
307	RMS0123-1	PIN (B)	[M]				
308	RME0109	SPRING (A)	[M]				
309	RME0142	SPRING (B)	[M]				
310	RMR0698-K	TRAVERSE CHASSIS	[M]				
311	XTV2+6G	SCREW	[M]				
312	RME0063	SPRING	[M]				
313	RMD0079-1	SLIDE PLATE	[M]				
314	RML0178-1	LEVER	[M]				