

# Service Manual

Compact Disc Player

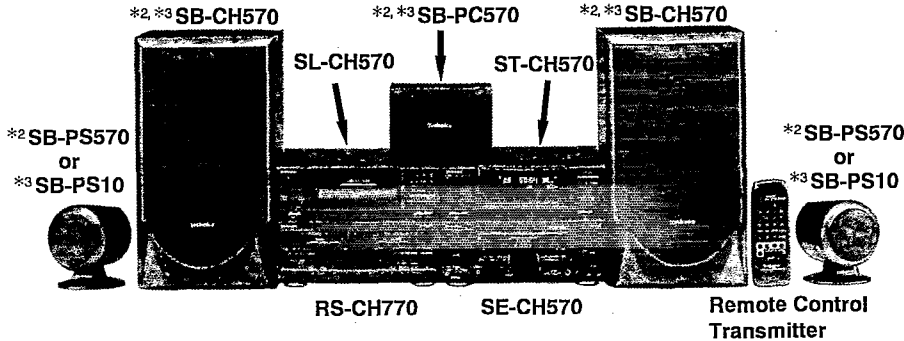
Compact Disc Player

## SL-CH570



Colour

(K) : Black



Areas

Suffix for Model No.	Area	Colour
(E)	Europe, Asia, Latin America, Middle East, Africa and Oceania	(K)

Note: The design of SB-PS10 is differ from the above picture.

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

System: SC-CH570

### RAE0150Z MECHANISM SERIES

### Specifications

■ Audio

DA converter 1 bit 2 DAC MASH\*1

Notes:

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

■ Pickup

Wavelength 780 nm

\*1 MASH is a trademark of NTT.

■ General

Dimensions (W x H x D) 270 x 89 x 272 mm

Weight 1.5 kg

System	Tuner/sound processor	Compact disc player	Amplifier	Cassette deck	Front speakers	Center speaker	Surround speakers
SC-CH570	ST-CH570	SL-CH570	SE-CH570	RS-CH770	*2, *3 SB-CH570	*2 SB-PT570	
						*2 SB-PC570	*2 SB-PS570
						*3 SB-PT570A	
						*3 SB-PC570	*3 SB-PS10

\*2 For Europe area: ..... Made in PAES  
 \*3 Except for Europe area : ..... Made in NABEL

**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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### NOTE:

Refer to the service manual for Model No. SE-CH570 (ORDER No. AD9603054C8) for information on "Accessories", "Stacking the Components", "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  $\mu$ W/VDE

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

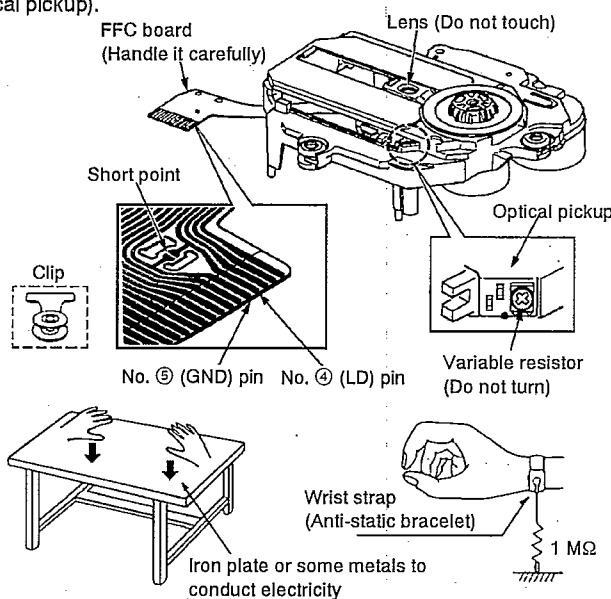
1. Do not disassemble the pick up unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pick up unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pick up lens for a long time.

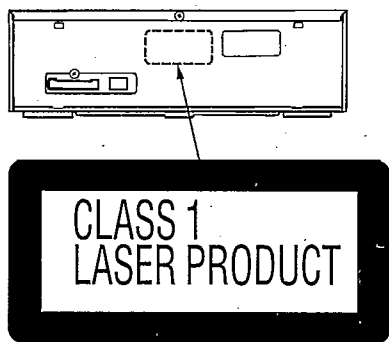
**ACHTUNG:** Dieses produkt enthält eine laserdiode. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit adgestrahlt.

Wellenlänge: 780 nm  
Maximale strahlungsleistung der lasereinheit: 100  $\mu$ W/VDE

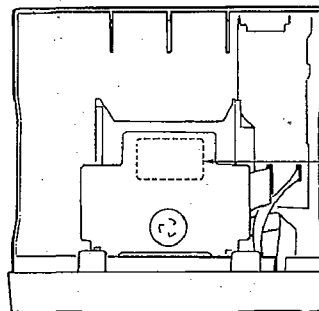
Die strahlung an der lasereinheit ist ungefährlich, wenn folgende punkte beachtet werden:

1. Die lasereinheit nicht zerlegen, da die strahlung an der freigelegten laserdiode gefährlich ist.
2. Den werksseitig justierten einstellregler der lasereinheit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.



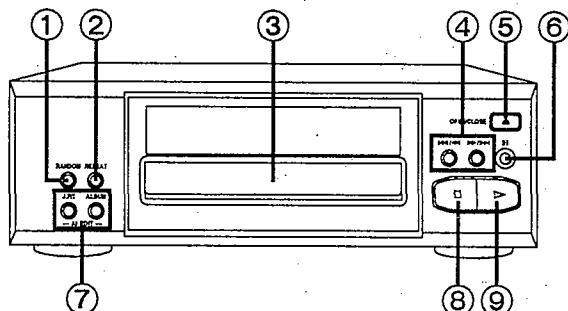


LUOKAN 1 LASERLAITE  
KLASS 1 LASER APPARAT



DANGER	INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBNING. NÅR SIKKERHEDSAFBRYDERE ER LØSE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	AVATTAESSA JA SUOJALUKITUS OIKETTÄESSÄ OLET ALTTI NA NÄKYMÄTÖNTÄ LASERSÄTELYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING	OSYNLIG LASERSTRÅLING NÅR DENNA DEL ÄR ÖPPNAD OCH SPÅREN ÄR LURKOPLAD. BETRÄKTA EJ STRÅLEN.
ADVARSEL	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLAS ER LØSE. UNDGÅ EKSPONERING FOR STRÅLEN.
VORSICHT	UNSICHTBARE LASERSTRAHLEUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEN STRAHLE AUSSETZEN.

## Location of Controls



- ① Random play button (RANDOM)
- ② Repeat button (REPEAT)
- ③ Disc tray
- ④ Skip/search buttons  
(I◀◀/◀◀, ▶▶/▶▶I, -SKIP/-SEARCH)
- ⑤ Disc tray open/close button (OPEN/CLOSE, ▲)
- ⑥ Pause button (II)
- ⑦ CD edit buttons (AI EDIT, J. FIT, ALBUM)
- ⑧ Stop button (□)
- ⑨ Play button and indicator (▷)

## Listening to Compact Discs

- 1 Switch on the power.
- 2 Press ▲ OPEN/CLOSE to open the tray.  
Insert the CD with label facing upward.  
Do not put your finger through the hole in the middle of the tray.  
It could get caught when the tray closes.  
Press ▲ OPEN/CLOSE 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 on the CD.  
Play will stop automatically when the last track on the CD finishes playing.  
When there are 13 or more tracks on the CD, "▶" will appear.
- 4 Adjust the volume level as you like.

### To stop the disc play:

Press □.

### To temporarily stop the disc play:

Press II button. ▷ indicator flashes up green.  
To play again, press ▷.

### When "NO DISC" display appears:

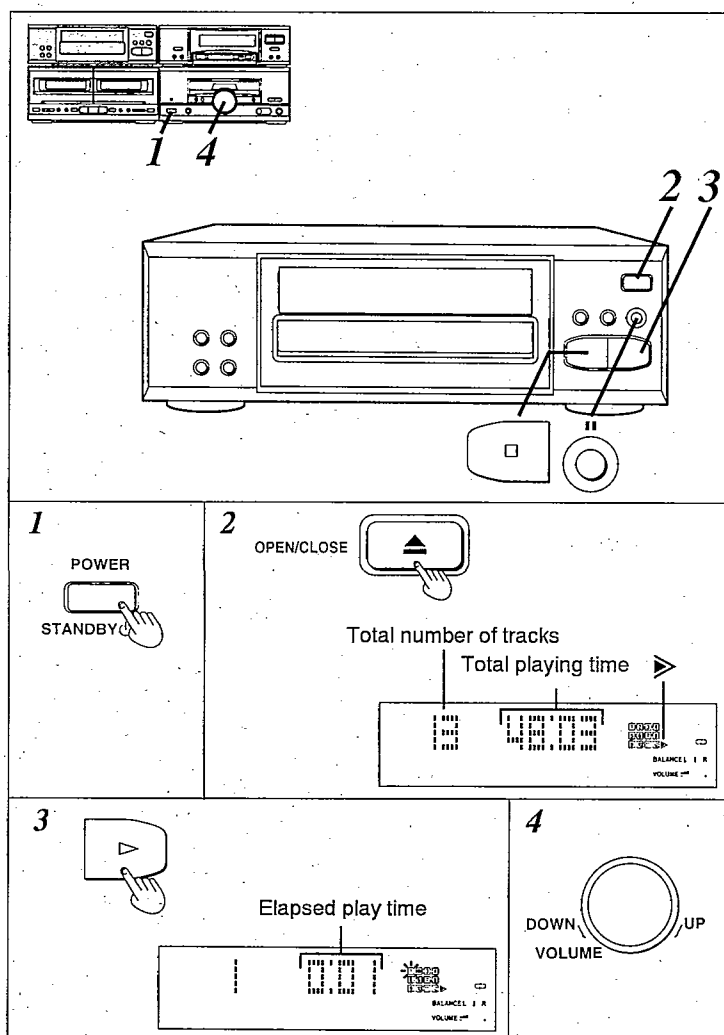
It indicates that a CD has not been installed.

### About ▷ indicator:

While halted: Lights orange.  
While playing: Lights up green.

### For your reference:

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



## ■ Operation Check and Main Component Replacement Procedures

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

**ACHTUNG:** •Die lasereinheit nicht zerlegen.

•Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

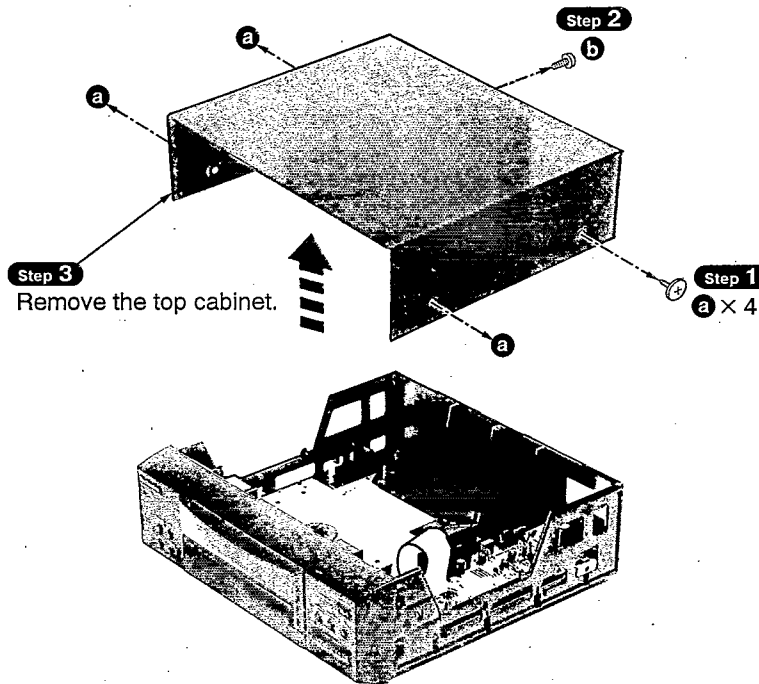
- NOTE**
1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
  2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
  3. Select items from the following index when checks or replacement are required.
  4. Illustrated screws are equivalent to actual size.
  5. Refer the parts No. on the page of "Main component Replacement Procedures", if necessary.

### ● Contents

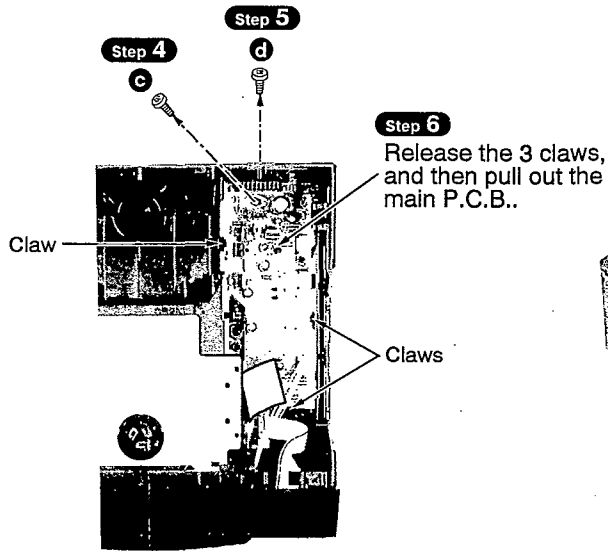
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2. Checking for the servo P.C.B..	5.
• Main Component Replacement Procedures	
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2. Replacement for the belt, loading motor ass'y and loading switch.	8.

## ■ Checking Procedure for each P.C.B.

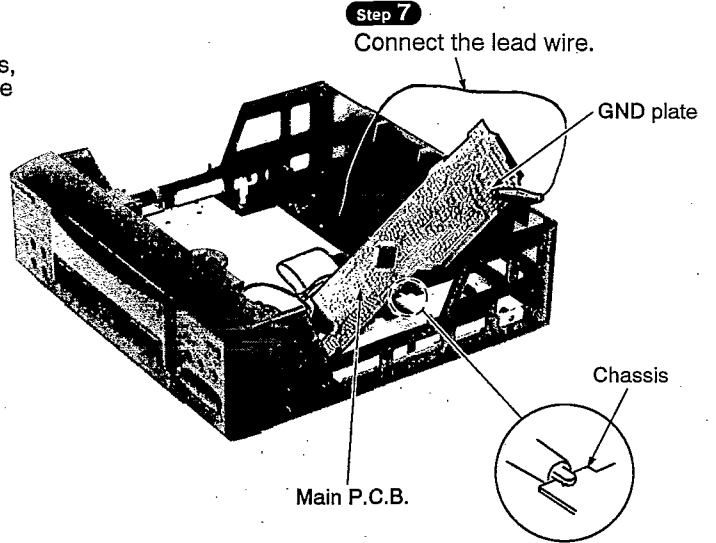
### 1. Checking for the main P.C.B.



- |                       |          |
|-----------------------|----------|
|                       | <b>a</b> |
| [RHD30007-K1] (Black) |          |
|                       | <b>b</b> |
| [XTBS3+8JFZ1] (Black) |          |



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



c

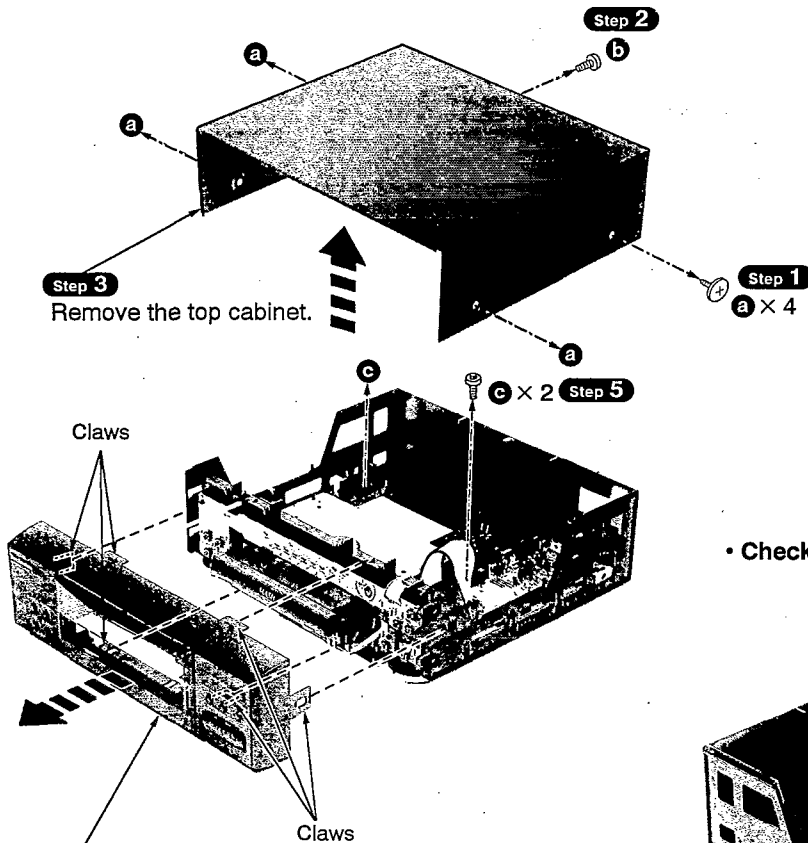


d

[XTB3+8JFZ] (Black)

[XTBS3+8JFZ1] (Black)

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



a

[RHD30007-K1] (Black)



b

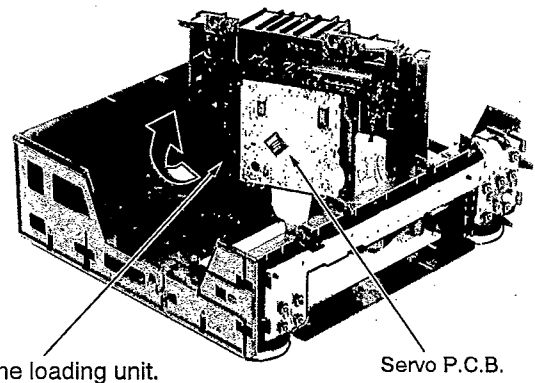
[XTBS3+8JFZ1] (Black)



c

[XTB3+8JFZ] (Black)

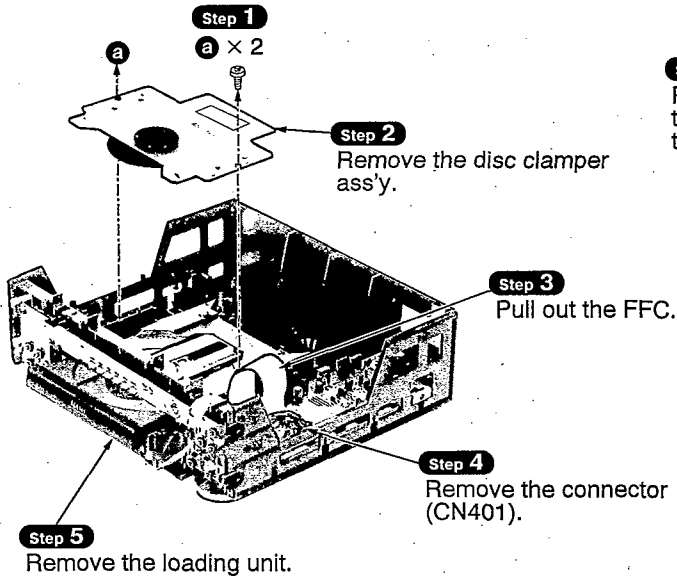
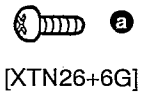
• Check the servo P.C.B. as shown below.



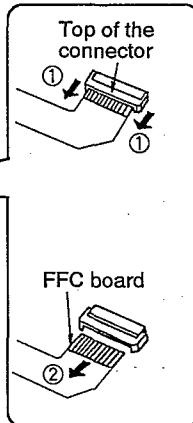
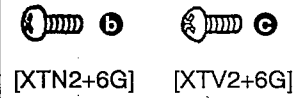
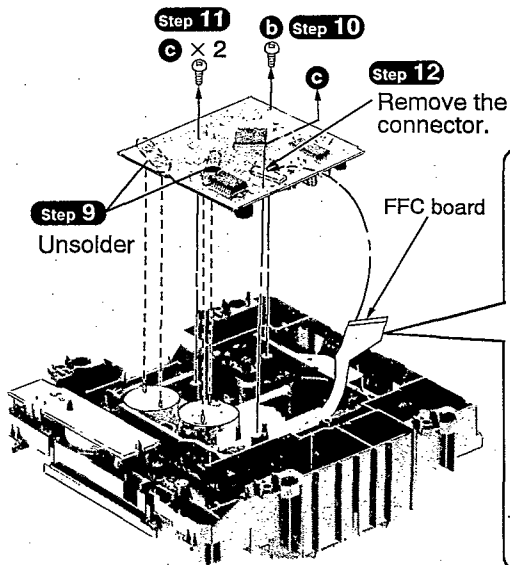
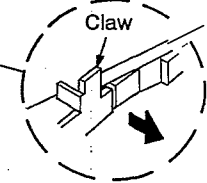
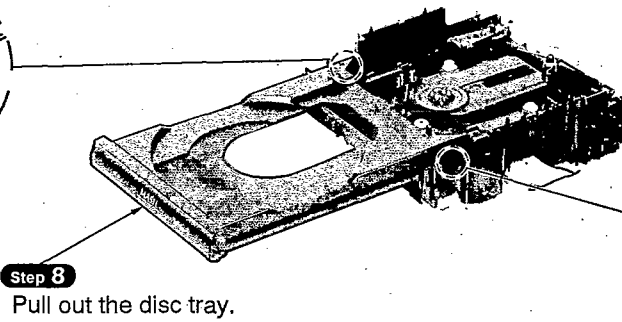
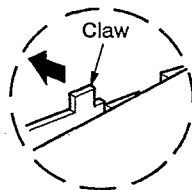
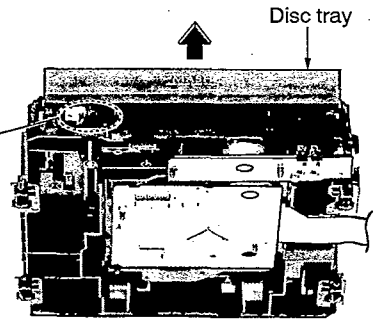
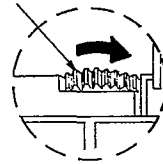
# Main Component Replacement Procedures

## 1. Replacement for the traverse deck ass'y

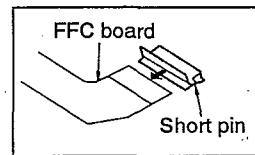
• Follow the item 2 ( **Step 1** ~ **Step 5** ) in checking procedures for each P.C.B. on page 5.



**Step 6**  
Rotate the gear, and then pull out the disc tray.

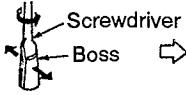


**Caution:**  
Insert a short pin into the traverse unit FFC board.  
(Refer to "Handling Precautions for Traverse Deck" on page 2.)

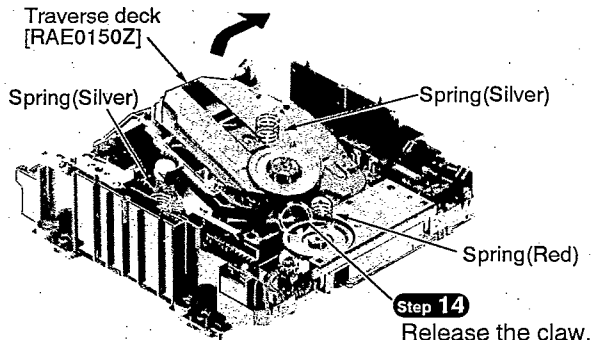
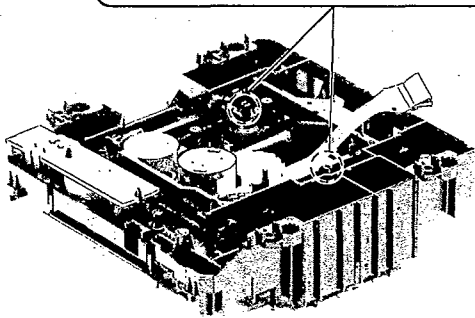
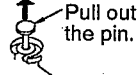


**Step 13**

1. Widen the boss using a regular screwdriver.



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



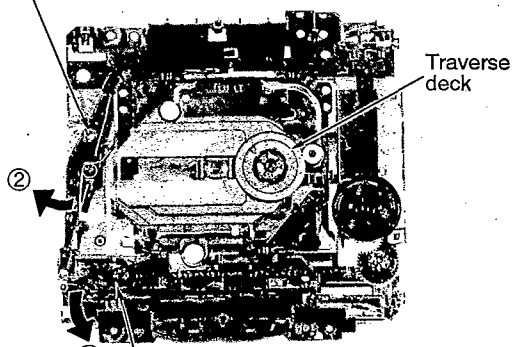
**NOTE**

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

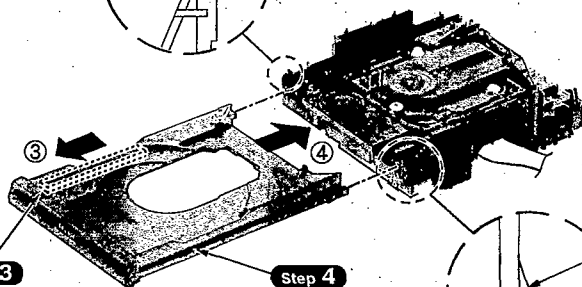
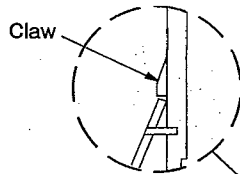
**Installation of the disc tray after replacement**

**Step 2**

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

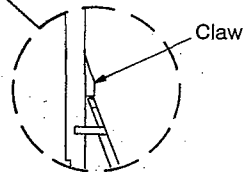


**Step 1**  
Release the lock lever.



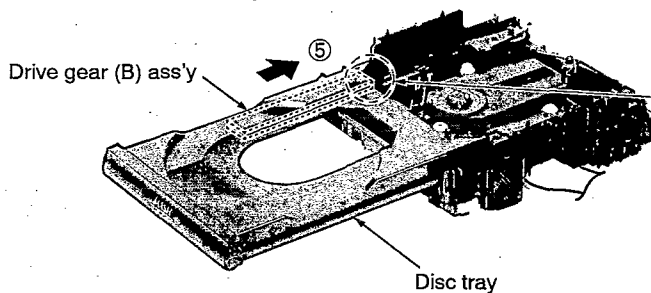
**Step 3**  
Move the drive rack ass'y in the direction of arrow ③.

**Step 4**  
Install the disc tray.

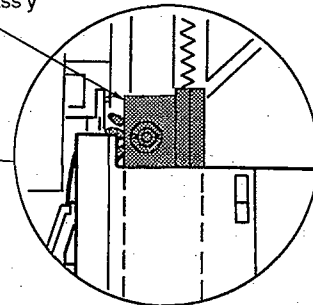


**Step 5**

Hold the disc tray and slide the drive rack ass'y.

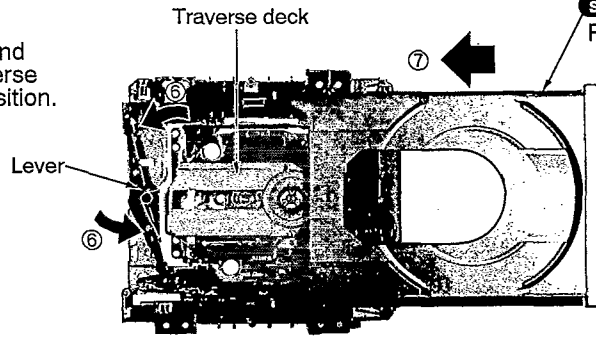


Drive gear (B) ass'y

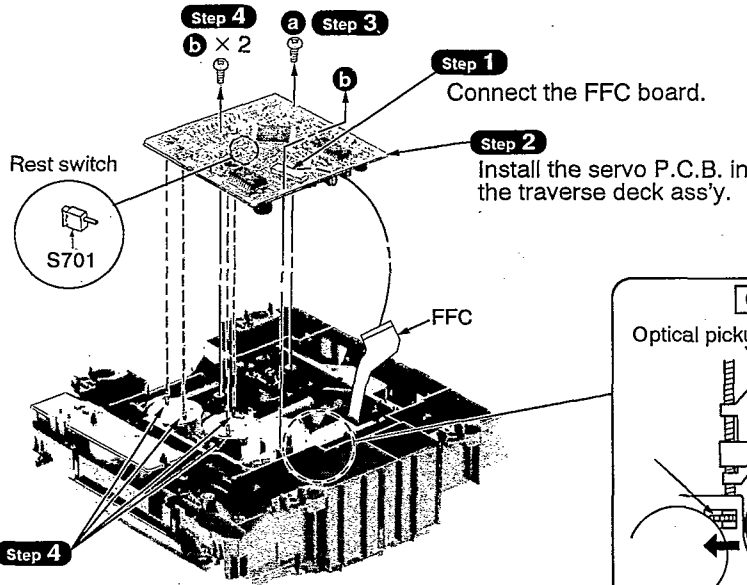


**Step 6**

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



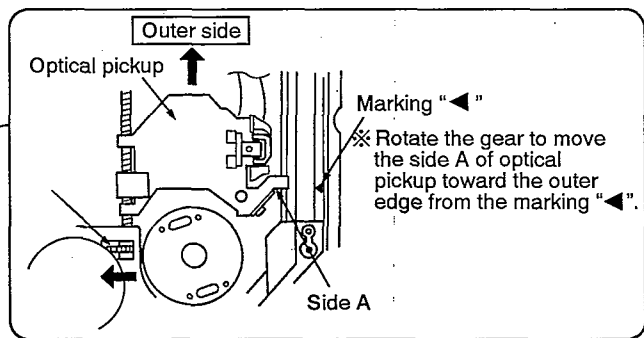
**Installation of the servo P.C.B. after replacement**



- a
- [XTN2+6G]
- b
- [XTV2+6G]

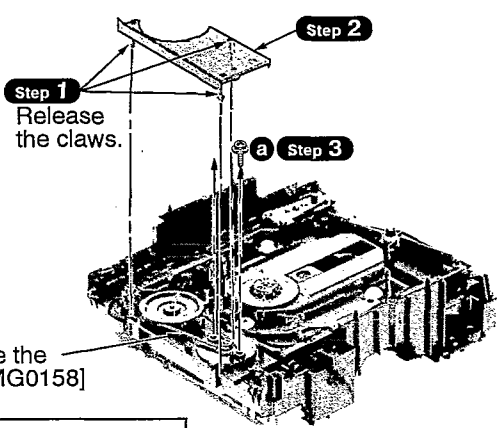
**NOTE**

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.]

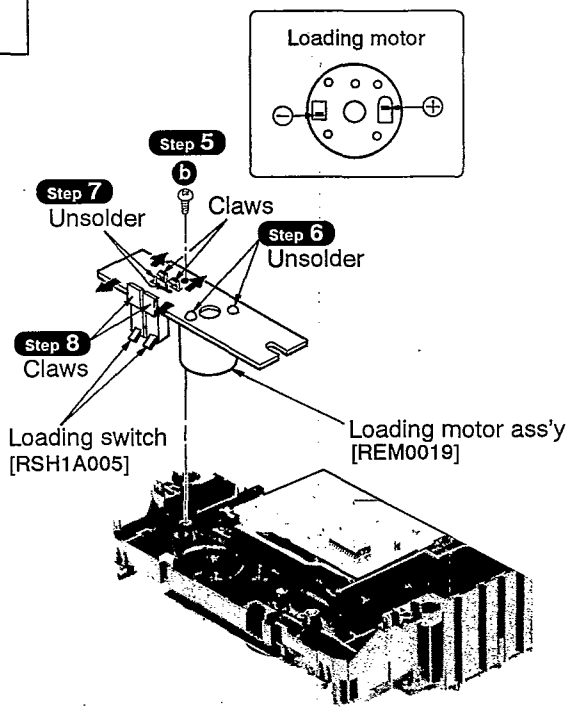


**2. Replacement for the belt, loading motor ass'y and loading ass'y**

- Follow the item 2 ( **Step 1** ~ **Step 5** ) in checking procedures for each P.C.B. on page 5.
- Follow the item 1 ( **Step 1** ~ **Step 7** ) in main component procedures on page 6.



- a
- b
- [XYN2+F6FZ]
- [XYN26+6G]





## Automatic Adjustment Results Display Function

### Self-Check Function

- The system control IC is incorporated only in the tuner (ST-CH570), but can be directly connected to any other system module to carry out diagnostic checks. As each system module is checked, a result code is indicated on the tuner's display panel.

#### SC-CH570 (SL-CH570, ST-CH570, SE-CH570, RS-CH770 or SB-CH570)

- This unit is able to utilize the display panel of the tuner (ST-CH570) to indicate the results of automatic adjustment of the servo-circuit (tracking, focus, offset, etc.) as error codes. The error code display indicates the location of failures from automatic adjustment circuit. The following procedure displays the error codes from the self-diagnostic function.

### Procedure for displaying automatic adjustment codes

- Turn on the power supply switch.
- Push the OPEN/CLOSE button to open the disc tray and then load the test disc (SZZP1054C).
- Push the OPEN/CLOSE button again to close the disc tray.
- Push the REPEAT button for two seconds. With the REPEAT button held down, push the STOP button for two seconds.
- After automatic adjustment, the code display indicates the location of failures in the servo circuit.

**Notes:** If "E-00" is displayed as an error code, this means no error was found.

- Next, push the FWD SKIP button and fault diagnoses of the following switches will be displayed:

"H-15": disc tray open detection switch is faulty.

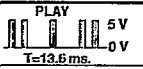



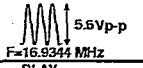
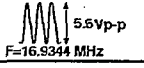
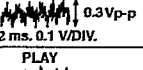
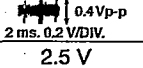
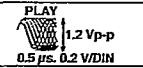
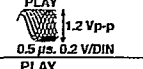
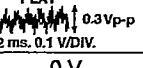
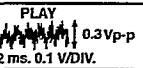
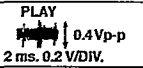
"H-16": disc tray close detection switch is faulty.

"F-15": rest switch is faulty.

- Take out the test disc and turn off the power, which terminates the automatic adjustment results mode.

### Troubleshooting using the automatic adjustment code

**Notes:** Check the disc and laser-detector lens for damage, contamination or stains.

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	0 V	0 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-03 E-05 E-07 E-09 E-0B E-0D 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 ⑳ pin	FE		2.5 V
IC702 ㉑ pin			TE		2.5 V	
IC702 ㉒ pin			FOD	2.5 V	2.5 V	
IC702 ㉓ pin			TRD	2.5 V	2.5 V	
IC702 ㉔ pin			KICK	2.5 V	2.5 V	
IC702 ⑴ pin			/FLOCK	0 V	4.9 V	
IC702 ⑤⑨ pin			/RF DET	0 V	4.9 V	
TJ701			RF		2.4 V	
IC702 ⑴⑷ pin			STAT	4.9 V	0 V	
E-04 E-06 E-0C E-0E	Best "eye" (PD balance) adjustment not completed in specified time period.	① Scratches or contaminants on disc surface ② Focus servo circuit (check waveforms, voltages, and part values.) ③ Optical pickup	IC702 ⑳ pin	FBAL	2.5 V ± 1.25 V	2.5 V ± 1.25 V
TJ701			RF		2.4 V	
IC702 ㉑ pin			FE		2.5 V	
IC702 ⑤⑥ pin			OFT	0 V	0 V	
IC702 ⑴⑲ pin			/TLOCK	0 V	0 V	
E-08 E-0A	Focus or Tracking gain adjustment not completed in specified time period.	① Scratches or contaminants on disc surface ② Focus servo circuit (check waveforms, voltages, and part values.) ③ Optical pickup	IC702 ㉑ pin	FE		2.5 V
IC702 ㉑ pin			TE		2.5 V	
IC702 ⑤⑥ pin			OFT	0 V	0 V	
IC702 ⑴⑲ 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-CH570 is designed to operate on power supplied from the Amplifier SE-CH570 through the Tuner/Sound Processor ST-CH570.

When connecting the unit to other system components, do not connect to the Amplifier SE-CH570 directly. Be sure to connect this unit through the Tuner/Sound Processor ST-CH570.

When operating the unit SL-CH570 alone for testing and servicing, without having power supplied from the Amplifier SE-CH570 and the Tuner/Sound Processor ST-CH570, use the following method.

**Power Supply to This Unit alone**

Apply 11V AC power to the section between **AC** of the coil (L401) and the jumper (J18) **GND** as well as the section between **AC** of the coil (L402) and the jumper (J18) **GND**. (Shown in Fig. 1)

**To Perform Specific Operations**

1. Short-circuit the section between jumper J2 and jumper J3.
2. Simultaneously shorting the section between jumper J6 and each resistor (R431, R432, R433 and R434) allows the following operations to be carried out:
  - R431 ..... Play and stop
  - R432 ..... Forward skip
  - R433 ..... Disc tray open and close
  - R434 ..... Reverse skip

**To Check Signals**

Connect the oscilloscope or the speaker with built-in amplifier to the section between LINE OUT (Lch) of the resistor R455 and the GND point of the jumper J18 as well as the section between LINE OUT (Rch) of the resistor R456 and the GND point of the jumper J18 and check if the signals are outputting from this unit. (Shown in Fig. 1)

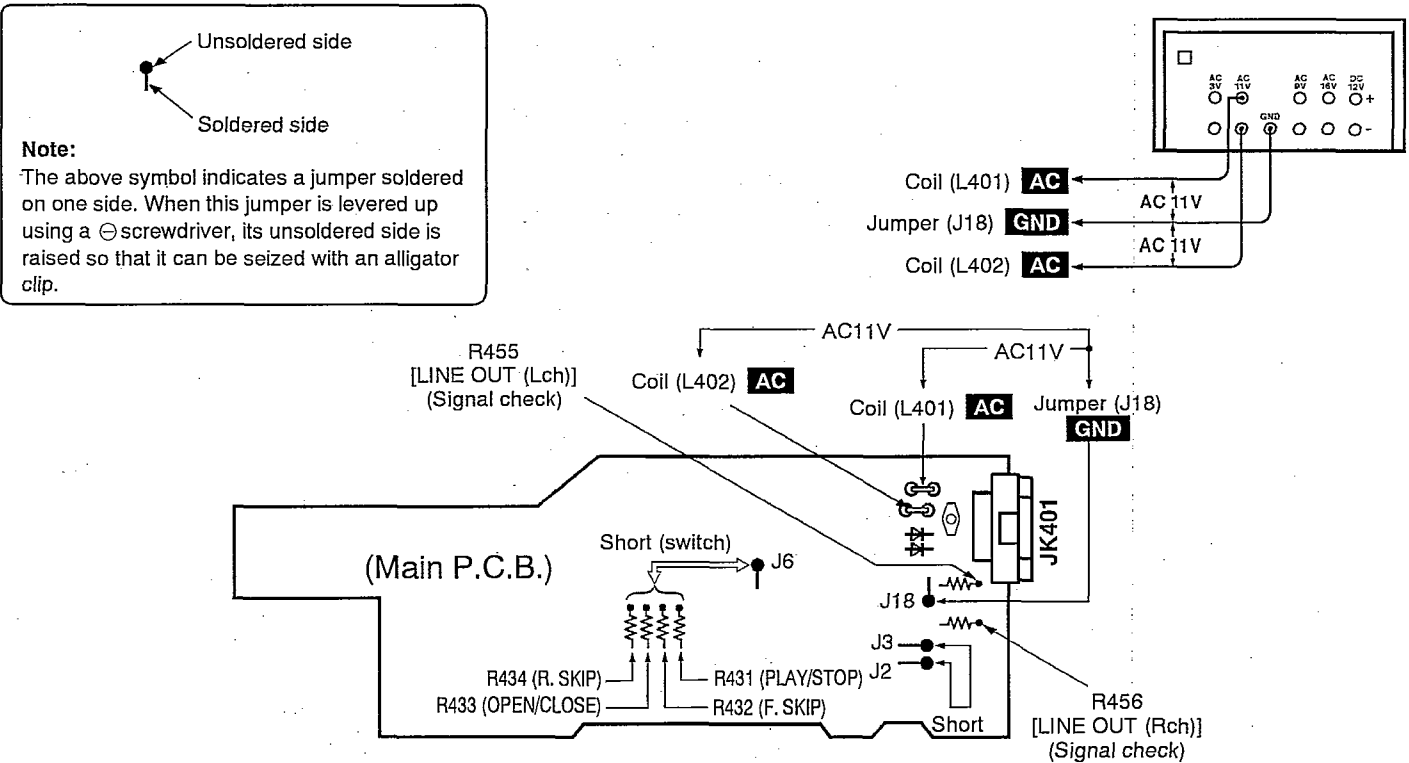


Fig. 1

## ■ Schematic Diagram

	Page
<b>A</b> SERVO CIRCUIT .....	12, 13
<b>B</b> LOADING MOTOR CIRCUIT .....	14
<b>C</b> OPERATION CIRCUIT .....	14
<b>D</b> MAIN CIRCUIT .....	14, 15

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

### Notes:

- S701 : Rest switch
- S790 : Disc tray open detection switch
- S791 : Disc tray close detection switch
- S801 : Disc tray open/close switch (▲ OPEN/CLOSE)
- 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 (ALBUM) switch
- S809 : AI edit (J.FIT) switch
- S810 : 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.

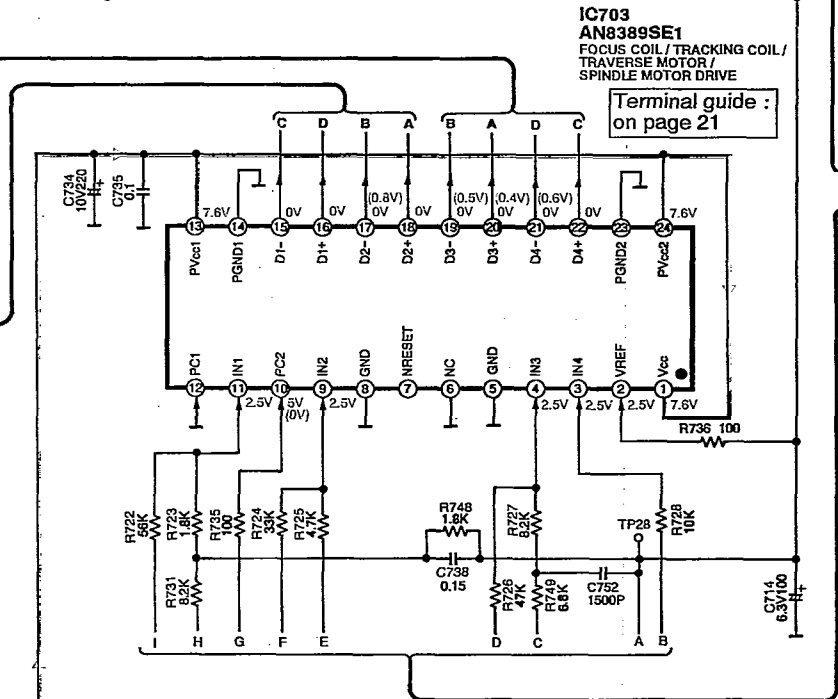
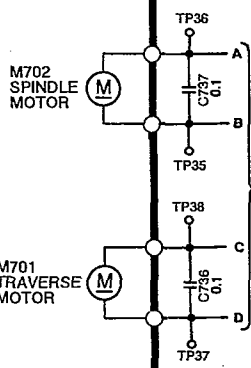
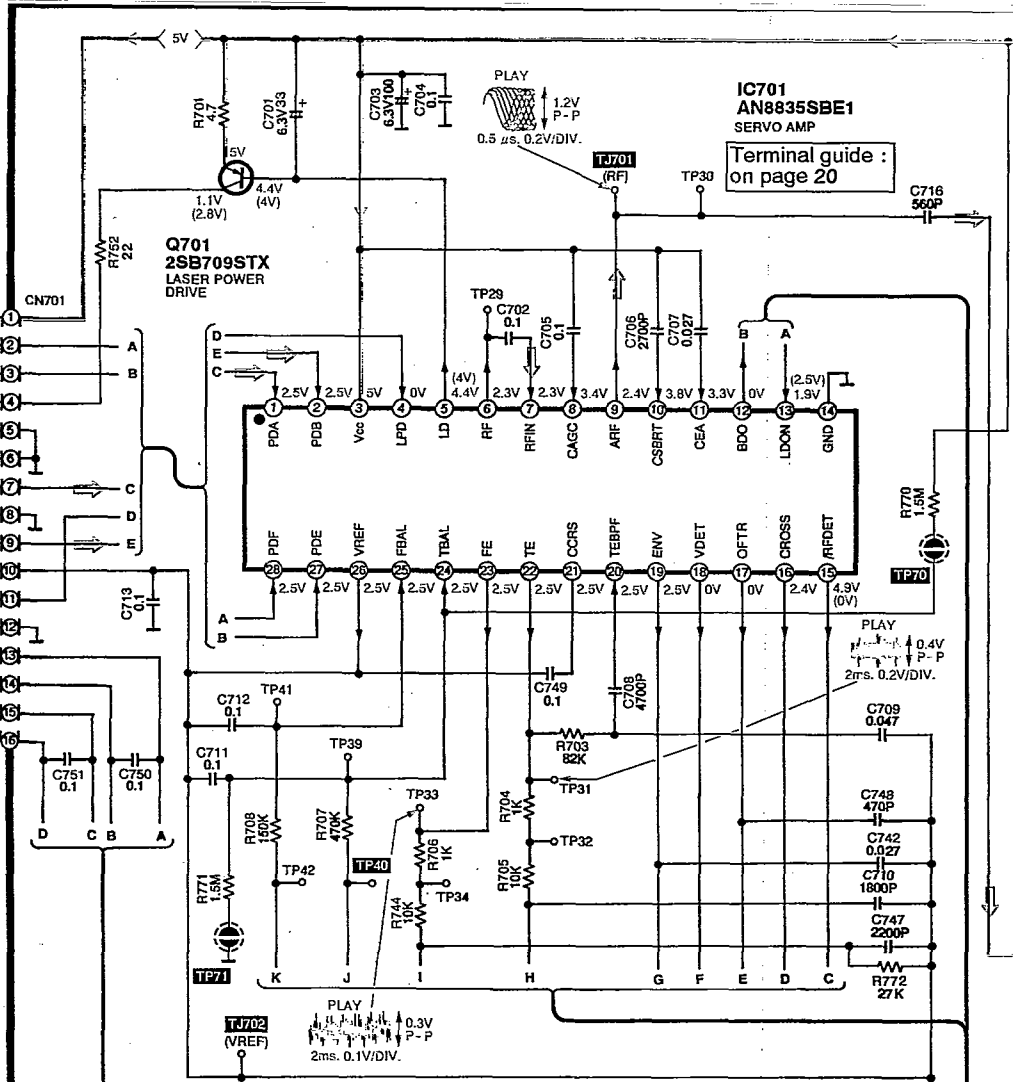
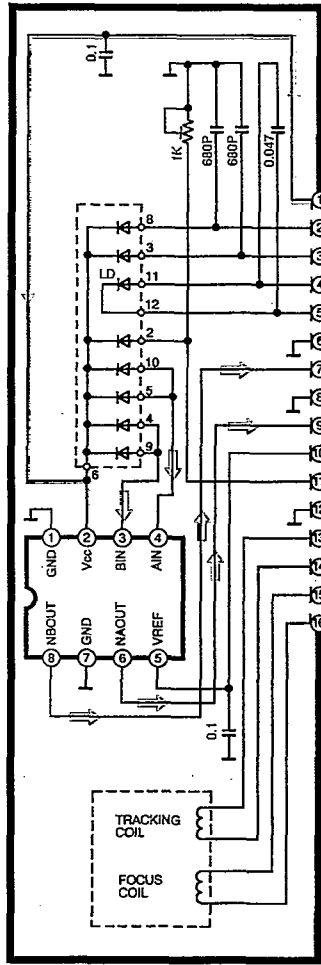
- Voltage and signal line

—————▶ : Positive voltage line

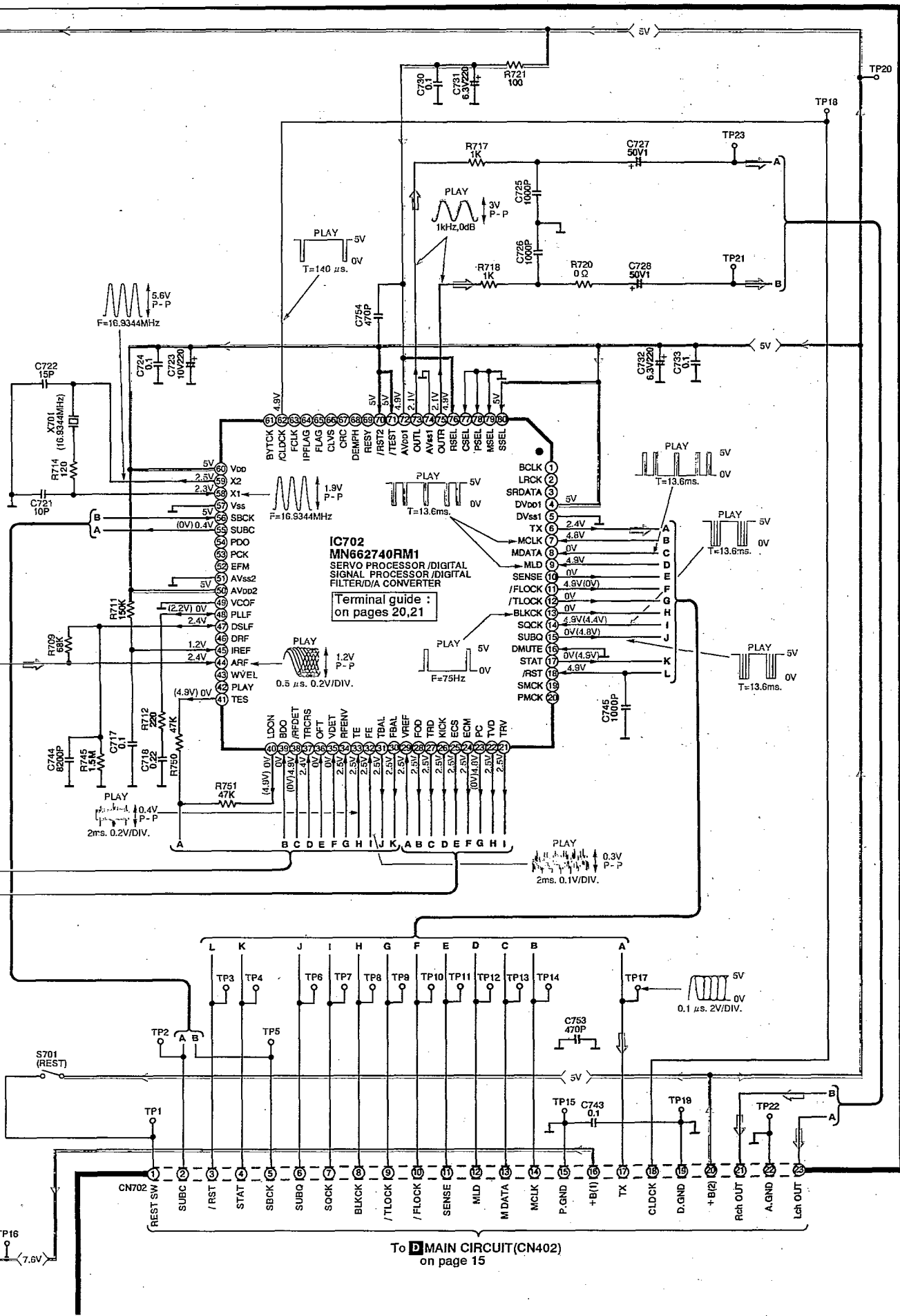
—————▶ : CD signal Line

**A** SERVO CIRCUIT  
(P.C. Board : on page 16)

**△** OPTICAL PICKUP CIRCUIT

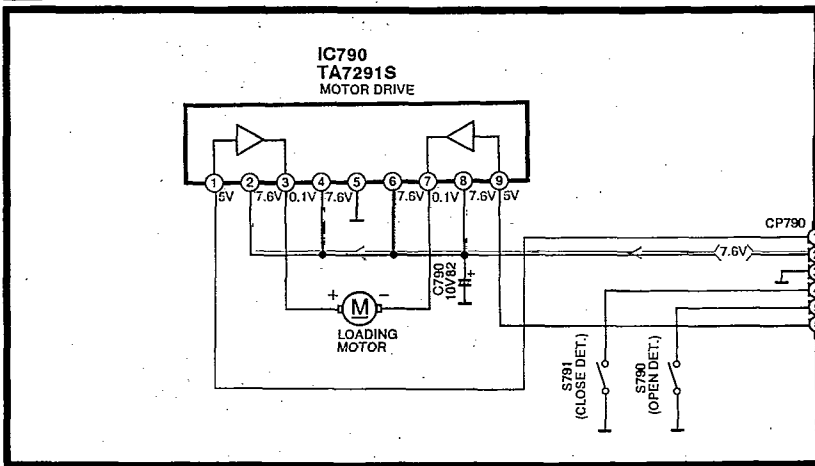


→ : Positive voltage line    → : CD signal Line

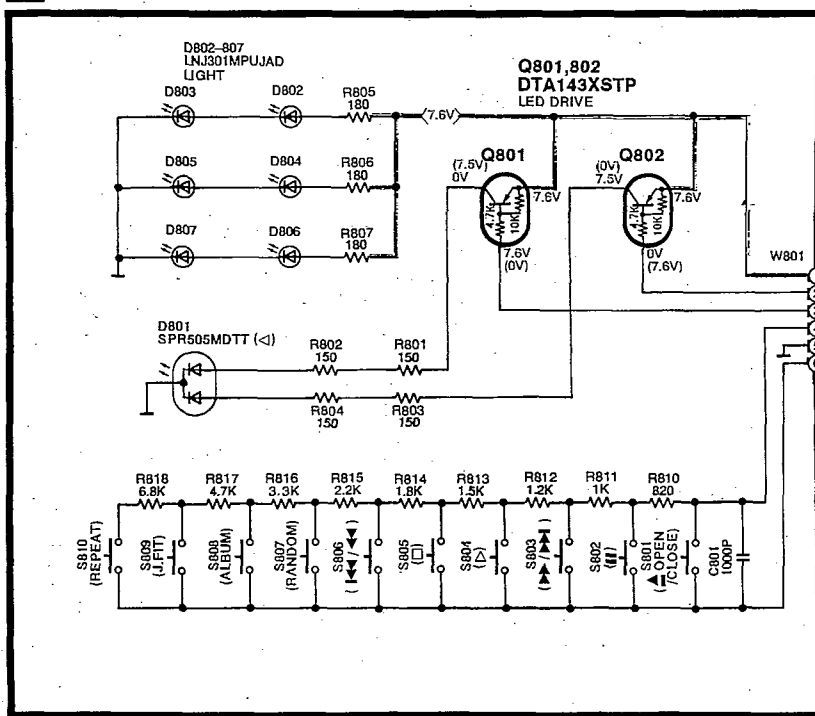


To D MAIN CIRCUIT (CN402) on page 15

**B** LOADING MOTOR CIRCUIT (P.C.Board: on page 16)

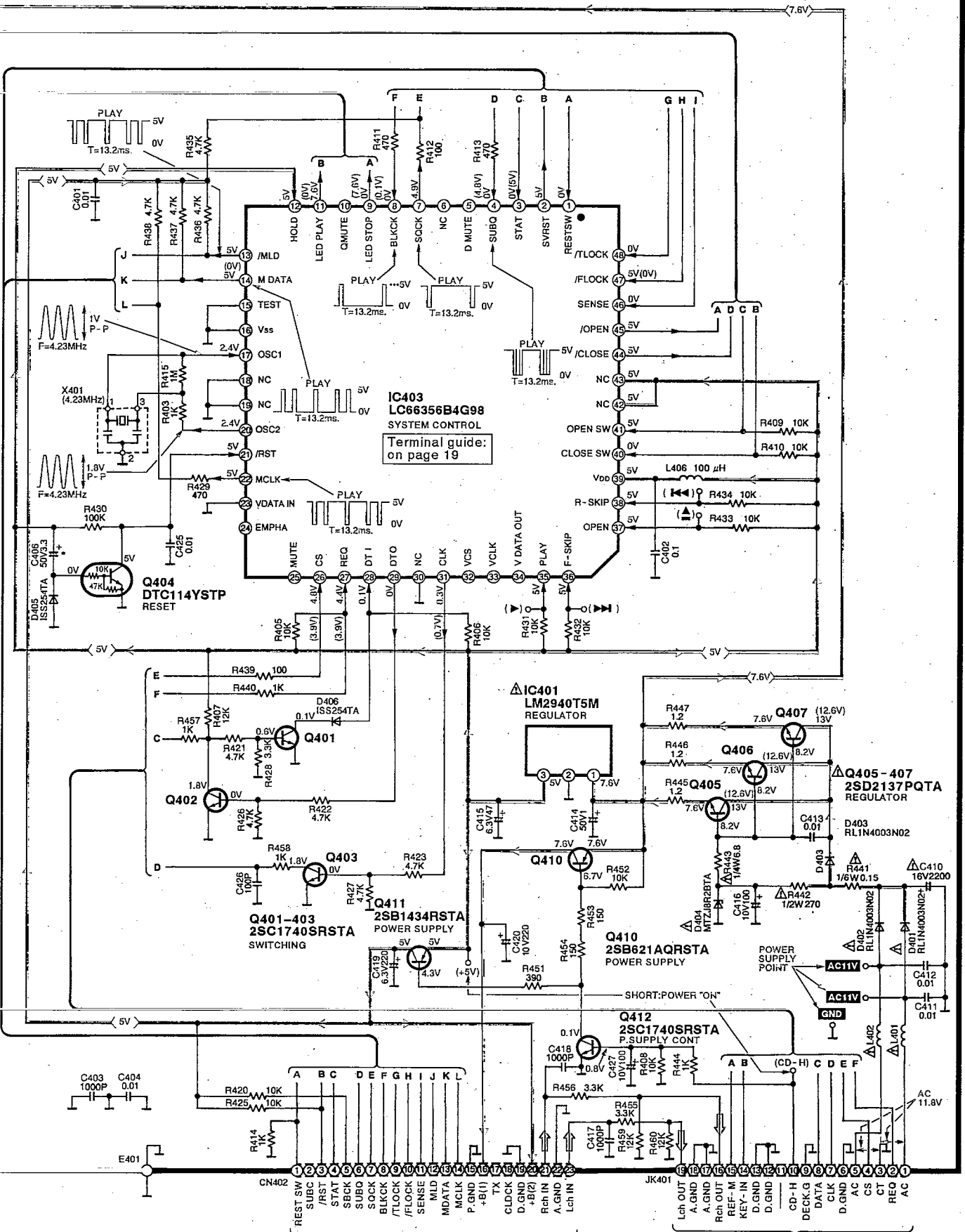


**C** OPERATION CIRCUIT (P.C.Board: on page 17)



: Positive voltage line  
 : CD signal Line

D MAIN CIRCUIT (P.C.Board: on page 17)



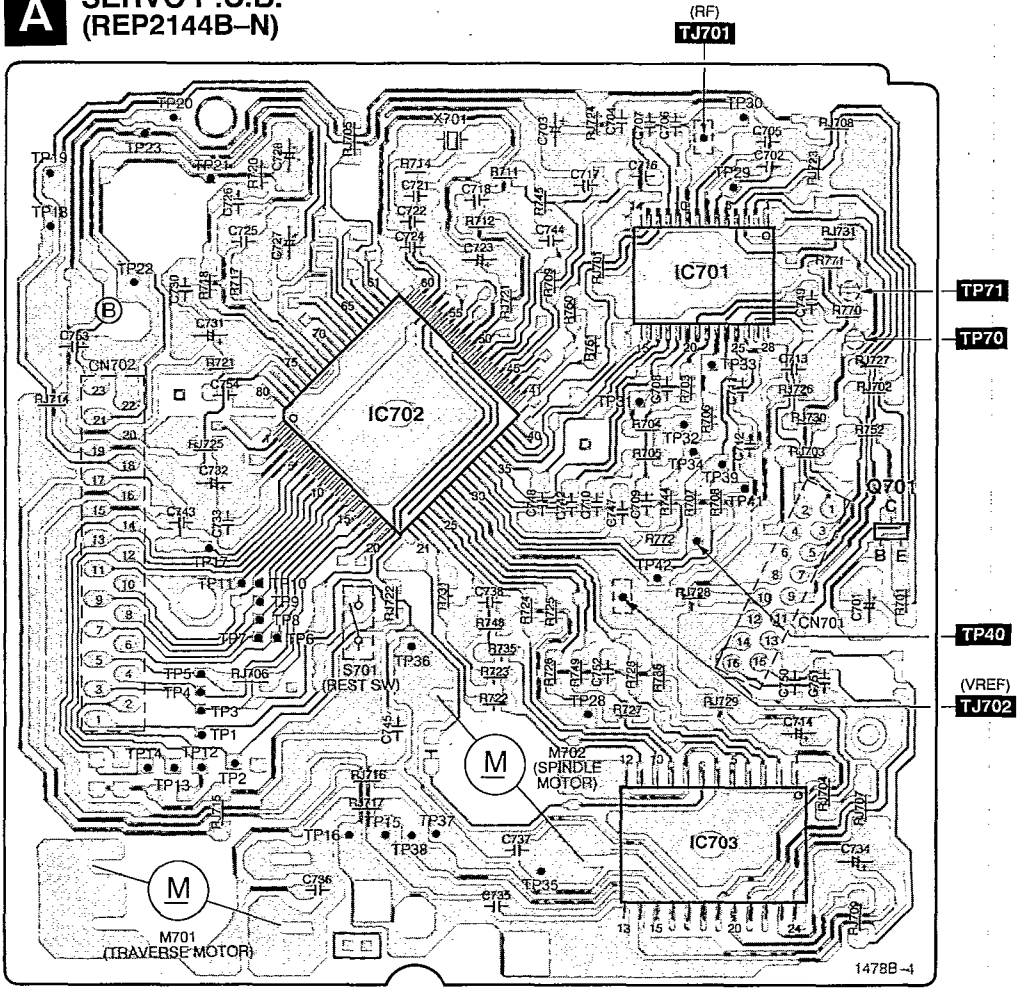
To A SERVO CIRCUIT (CN702) on page 13

To ST-CH570: JK602 on page 21

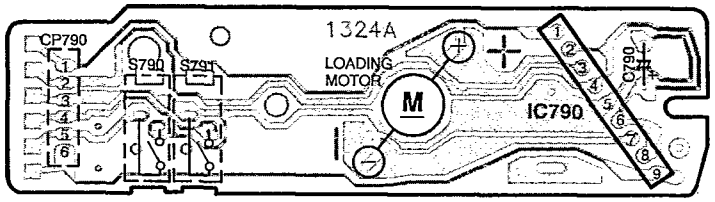
# Printed Circuit Board Diagram

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

## A SERVO P.C.B. (REP2144B-N)

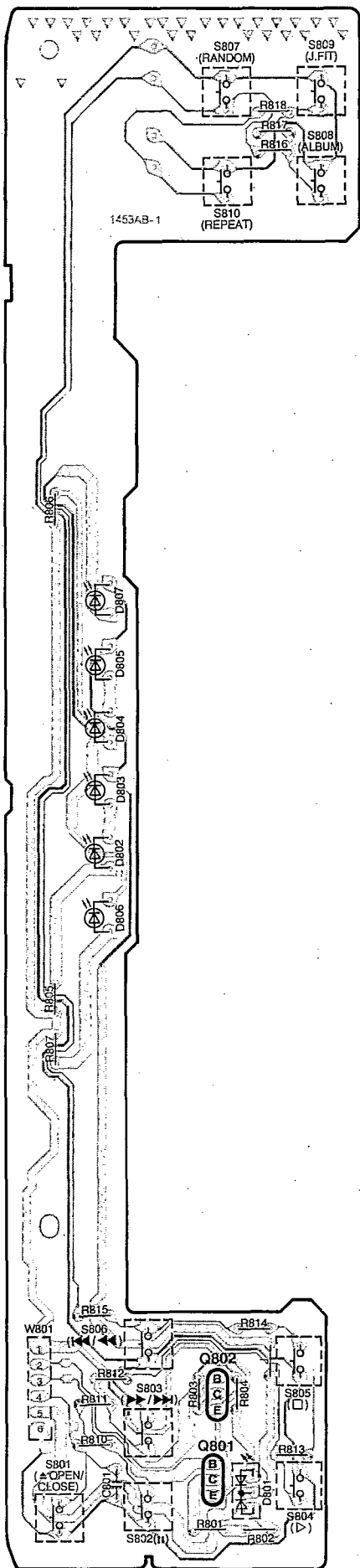


## B LOADING MOTOR P.C.B. (REP1960A)

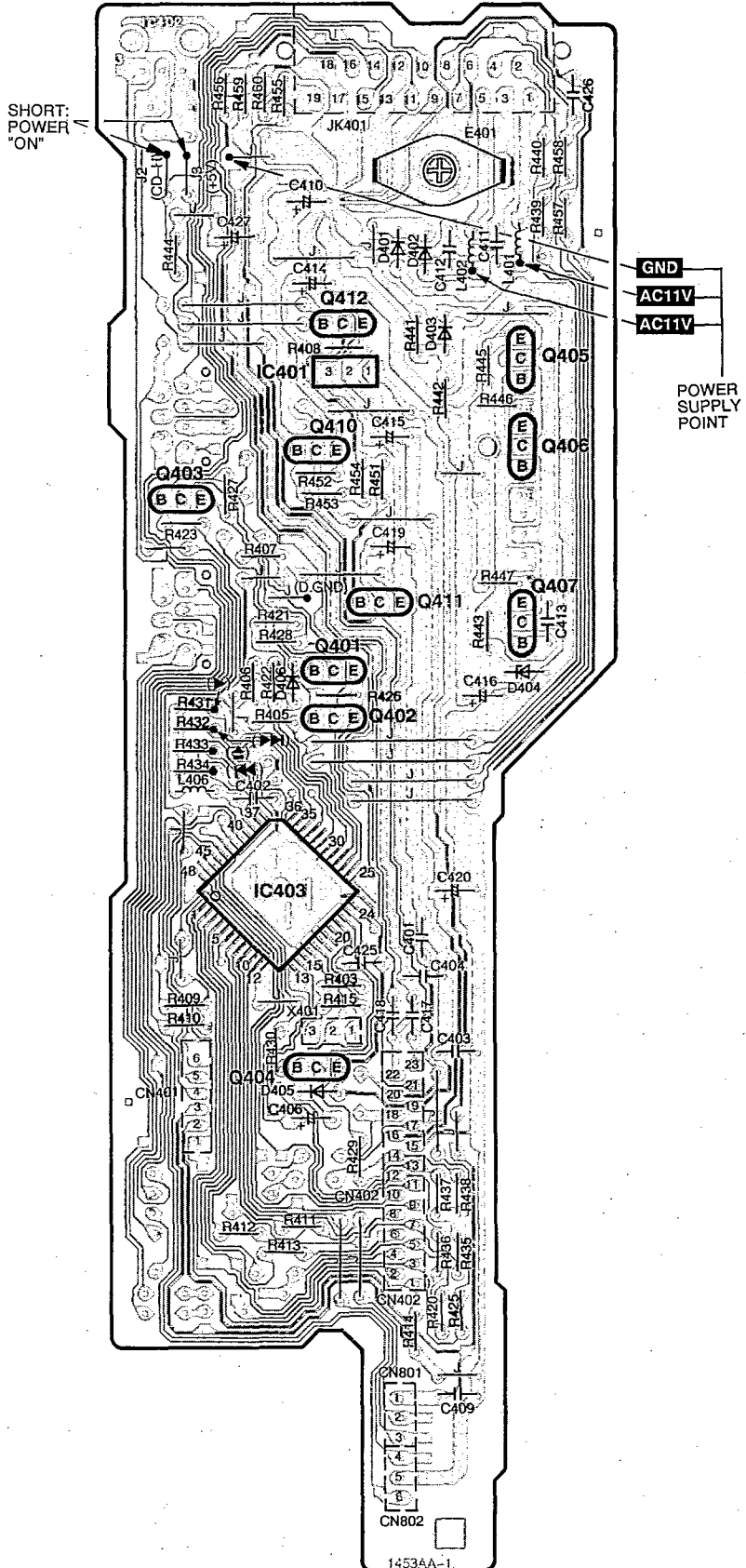




**C** OPERATION P.C.B.  
(REP2213C-M)

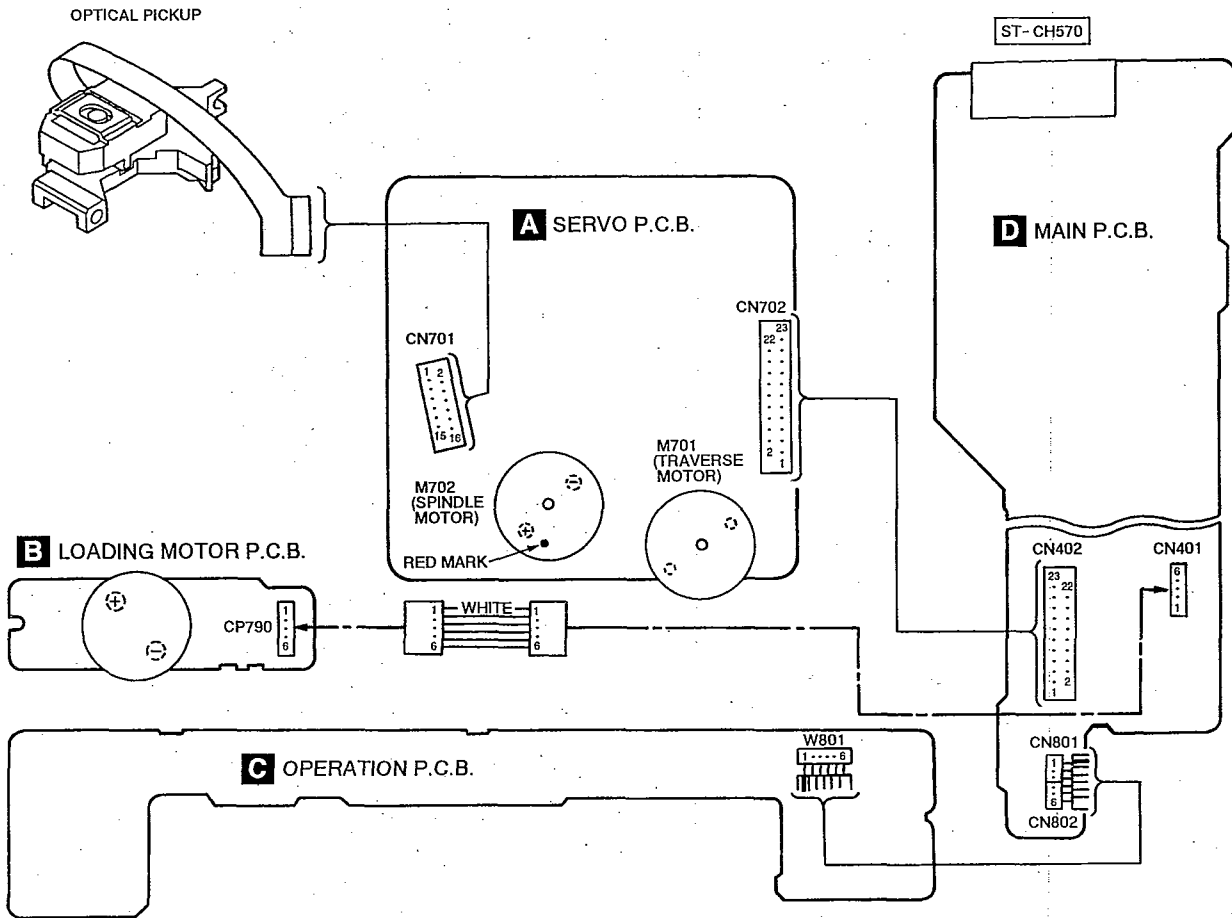


**D** MAIN P.C.B.  
(REP2113C-M) ST-CH570



<p>LM2940T5</p>	<p>LC66356B4G98</p>	<p>AN8389SE1</p>	<p>AN8835SBE1</p>	<p>TA7291S</p>	<p>MN662740RM1</p>
<p>2SD2137PQTA</p>	<p>2SC1740SRSTA DTA143XSTP DTC114YSTP</p>	<p>2SB621A-R</p>	<p>2SB709S</p>	<p>2SB1434RSTA</p>	<p>RL1N4003N02</p>
<p>MTZJ8R2BTA</p>	<p>1SS254TA</p>	<p>LNJ301MPUJAD</p>	<p>SPR505MDTT</p>		

## ■ Wiring Connection Diagram



## ■ Function of IC Terminals

### ● IC403 (LC66356B4G98)

Pin No.	Terminal Name	I/O	Function
1	REST SW	I	Innermost track sense switch (S701: rest switch) signal input
2	SVRST	O	Servo IC (IC702) reset signal output
3	STAT	I	Status signal input
4	SUBQ	I	Sub-code Q data input
5	DMUTE	O	Servo IC (IC702) digital muting control signal output
6	NC	—	Not used
7	SQCK	O	Sub-code Q data clock output
8	BLKCK	I	Sub-code block clock input
9	LED STOP	O	LED (D801: STANDBY) drive signal output
10	GMUTE	O	Not used
11	LED PLAY	O	LED (D801: PLAY) drive signal output
12	HOLD	I	Not used (Connected to VDD)
13	/MLD	O	IC702 command load signal output
14	MDATA	O	IC702 command data output
15	TEST	—	Test terminal (Not used) (Connected to GND)
16	VSS	—	GND terminal
17	OSC1	I	Clock signal input
18	NC	—	Not used
19	NC	—	Not used
20	OSC2	O	Clock signal output
21	/RST	I	Reset signal input
22	MCLK	O	IC702 command clock output
23	V DATA IN	—	Not used
24	ENPHA	—	Not used
25	MUTE	—	Not used
26	CS	O	Serial data communication starting signal output
27	REQ	I	Command request data input
28	DTI	I	Serial data input
29	DTO	O	Serial data output
30	NC	—	Not used
31	CLK	O	Serial clock output
32	VCS	—	Not used

Pin No.	Terminal Name	I/O	Function
33	VCLK	—	Not used
34	V DATA OUT	—	Not used
35	PLAY	I	Play/stop switch signal input
36	F-SKIP	I	F. Skip switch signal input
37	OPEN	I	Disc tray open/close switch signal input
38	R-SKIP	I	R. Skip switch signal input
39	VDD	—	Power supply (+5V)
40	CLOSE SW	I	Disc tray "close" detection switch signal input
41	OPEN SW	I	Disc tray "open" detection switch signal input
42	NC	—	Not used
43	NC	—	Not used
44	/CLOSE	O	Disc tray "close" command signal output
45	/OPEN	O	Disc tray "open" command signal output
46	SENCE	I	IC702 sense signal input
47	/FLOCK	I	IC702 focus lock signal input
48	/TLOCK	I	IC702 tracking signal input

## ● IC701 (AN8835SBE1)

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	CWA	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 (MN662740RM1)

Pin No.	Terminal Name	I/O	Function
1	BCLK	O	Bit clock output for serial data (no used, open)
2	LRCK	—	L/R identification signal output (no used, open)
3	SRDATA	—	Serial data output (no used, open)
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)
11	/FLOCK	O	Focus servo feeding signal output ("L": Feed)
12	/TLOCK	O	Tracking servo feeding signal output ("L": Feed)
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) (no used, open)
20	PMCK	—	1/192-divided clock signal of crystal oscillating (fPMCK = 88.2 kHz) (no 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)

## IC702 Continued

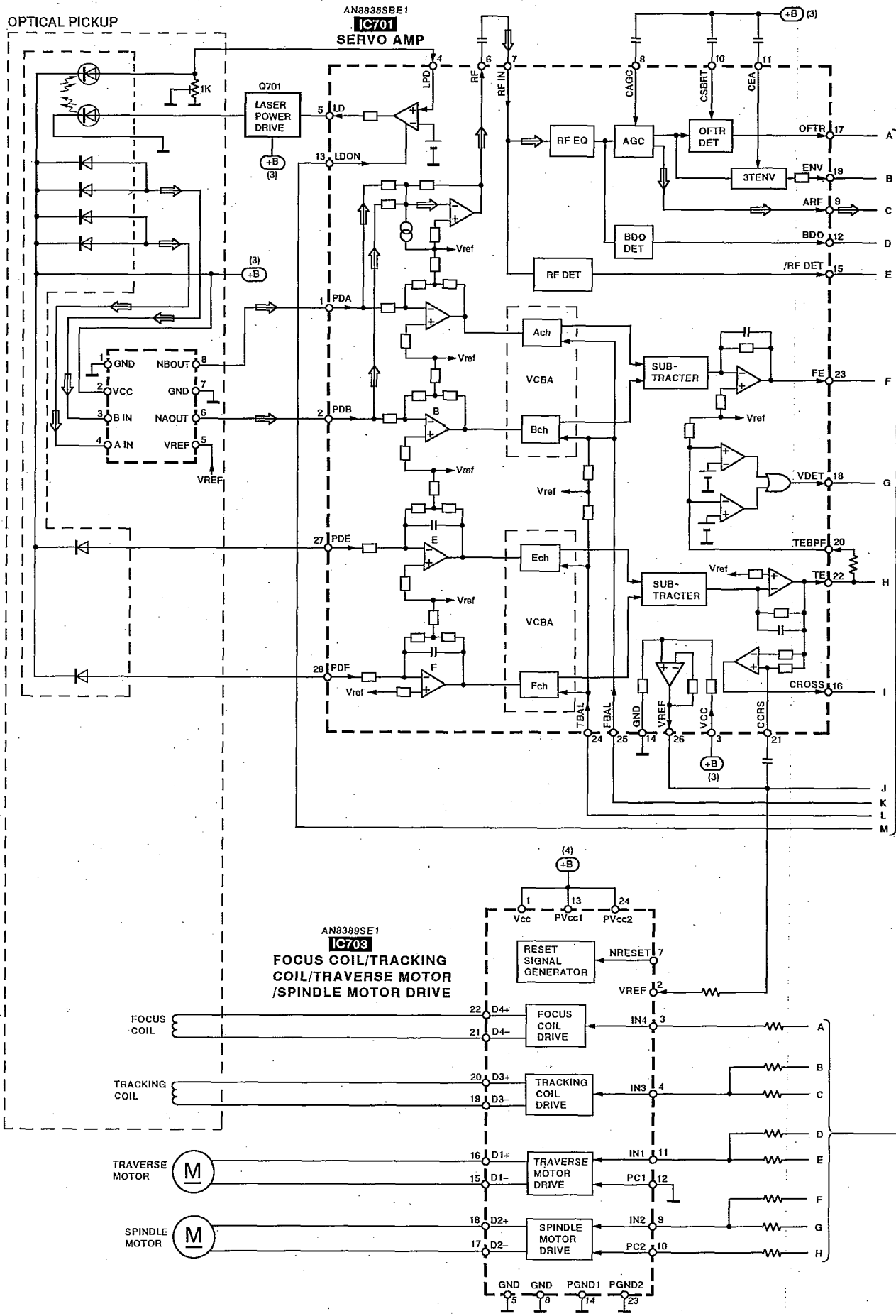
Pin No.	Terminal Name	I/O	Function
36	OFT	I	Off-track signal input ("H": off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal input ("L": detection)
39	BDO	I	Dropout signal input ("H": Dropout)
40	LDON	O	Laser on signal output ("H": ON)
41	TES	O	Tracking error shunt signal output ("H": shunt)
42	PLAY	O	Play signal out ("H": PLAY) (no used, open)
43	WVEL	O	Double speed status signal output ("H": Double speed) (no used, open)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	—	DSL bias (no 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 (no used, open)
53	PCK	—	PLL extraction clock output (fPCK = 4.321 MHz during normal playback) (no used, open)
54	PDO	—	Phase comparison signal of EFM and PCK signals (no 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 (no 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) (no used, open)
64	IPFLAG	O	Interpolation flag output ("H": Interpolation) (no used, open)
65	FLAG	O	Flag output (no used, open)
66	CLVS	O	Spindle servo phase synchronizing signal output ("H": CLV, "L": rough servo) (no used, open)
67	CRC	O	Sub-code CRC checked output ("H": OK, "L": NG) (no used, open)
68	DEMPH	O	De-emphasis ON signal output ("H": ON) (no used, open)
69	RESY	—	Frame re-synchronizing signal output (no used, open)
70	/RST2	I	Reset input through MASH circuit ("L": Reset)
71	/TEST	I	Test input

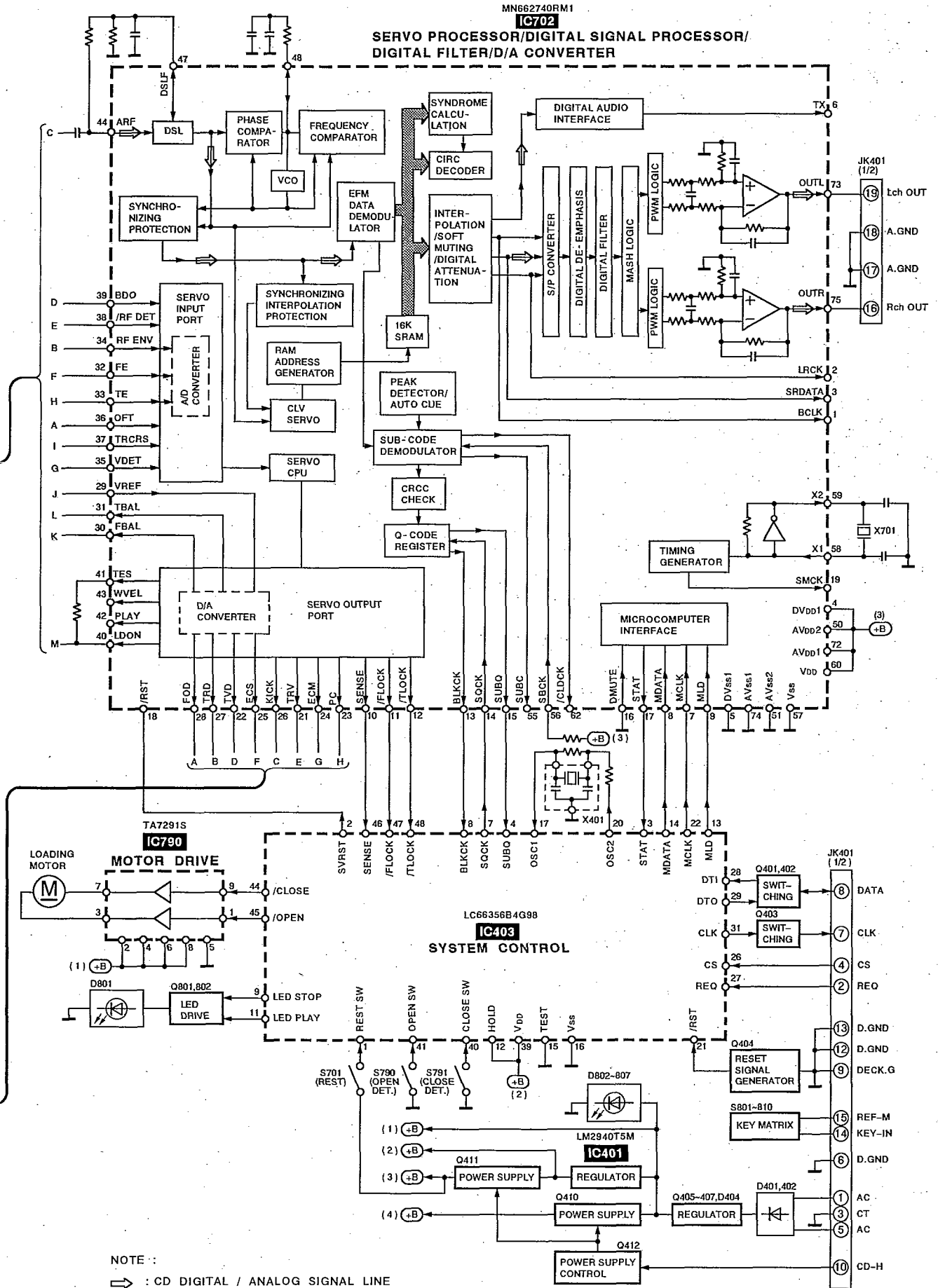
Pin No.	Terminal Name	I/O	Function
72	AVDD1	—	Power supply input (for analog circuit)
73	OUTL	O	Left channel audio signal output
74	AVSS1	—	GND
75	OUTR	O	Right channel audio signal output
76	RSEL	I	RF signal polarity assignment input (at "H" level: RSEL = "H") (at "L" level: RSEL = "L")
77	CSEL	I	Crystal oscillating frequency designation input ("L": 16.9344 MHz) ("H": 33.8688 MHz)
78	PSEL	I	Test input (normally, "L")
79	MSEL	I	Output frequency switching for SMCK terminal ("H": SMCK = 8.4672 MHz) ("L": SMCK = 4.2336 MHz)
80	SSEL	I	Output mode switching of SUBQ terminal ("H": Q code buffer mode)

## ● IC703 (AN8389SE1)

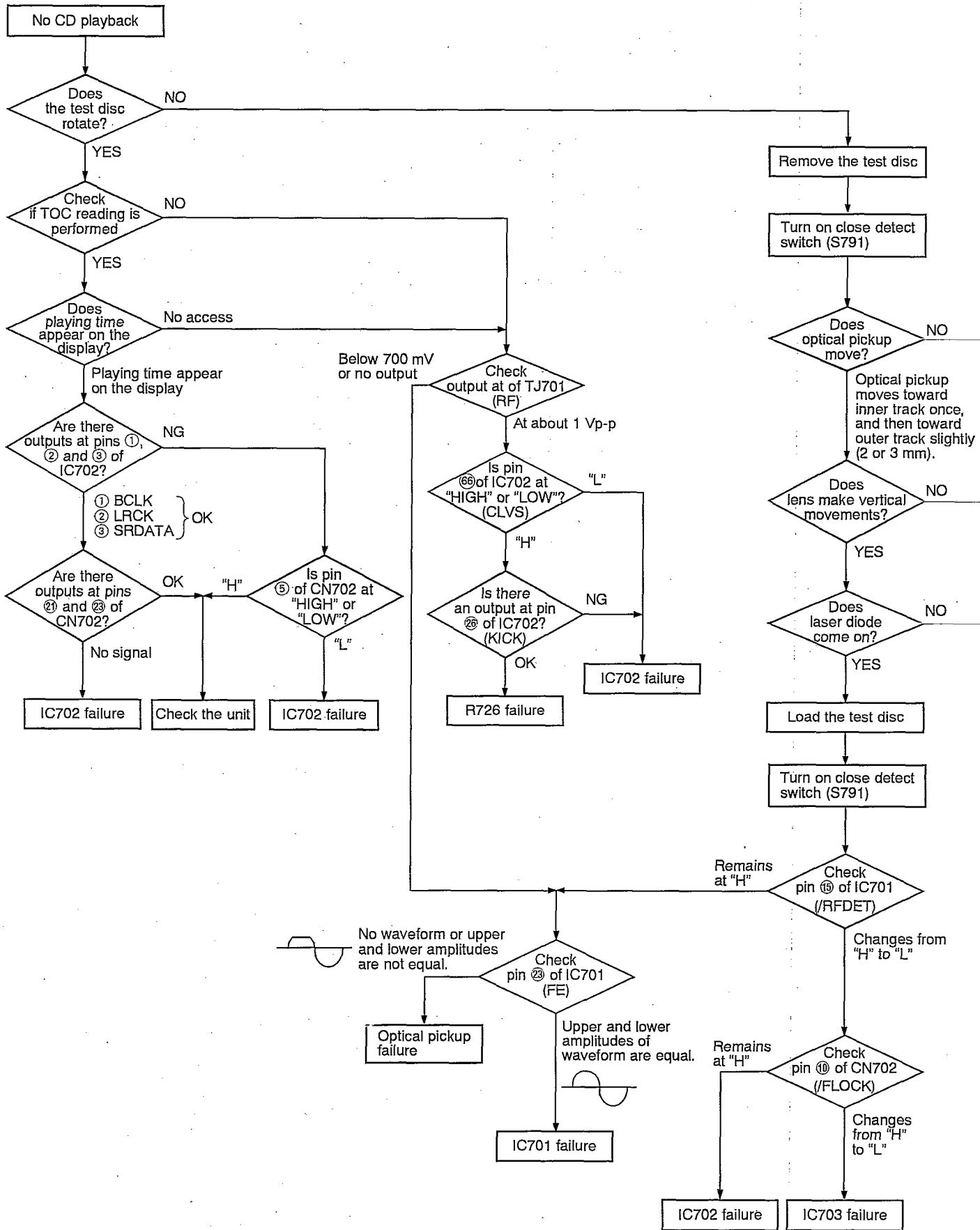
Pin No.	Terminal Name	I/O	Function
1	VCC	—	Power supply
2	VREF	I	VREF input
3	IN4	I	Motor driver (4) input
4	IN3	I	Motor driver (3) input
5	GND	—	Ground connection
6	NC	—	Ground connection
7	NRESET	—	Reset input (no used, open)
8	GND	—	Ground connection
9	IN2	I	Spindle motor driver (2) input
10	PC2	I	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

# Block Diagram

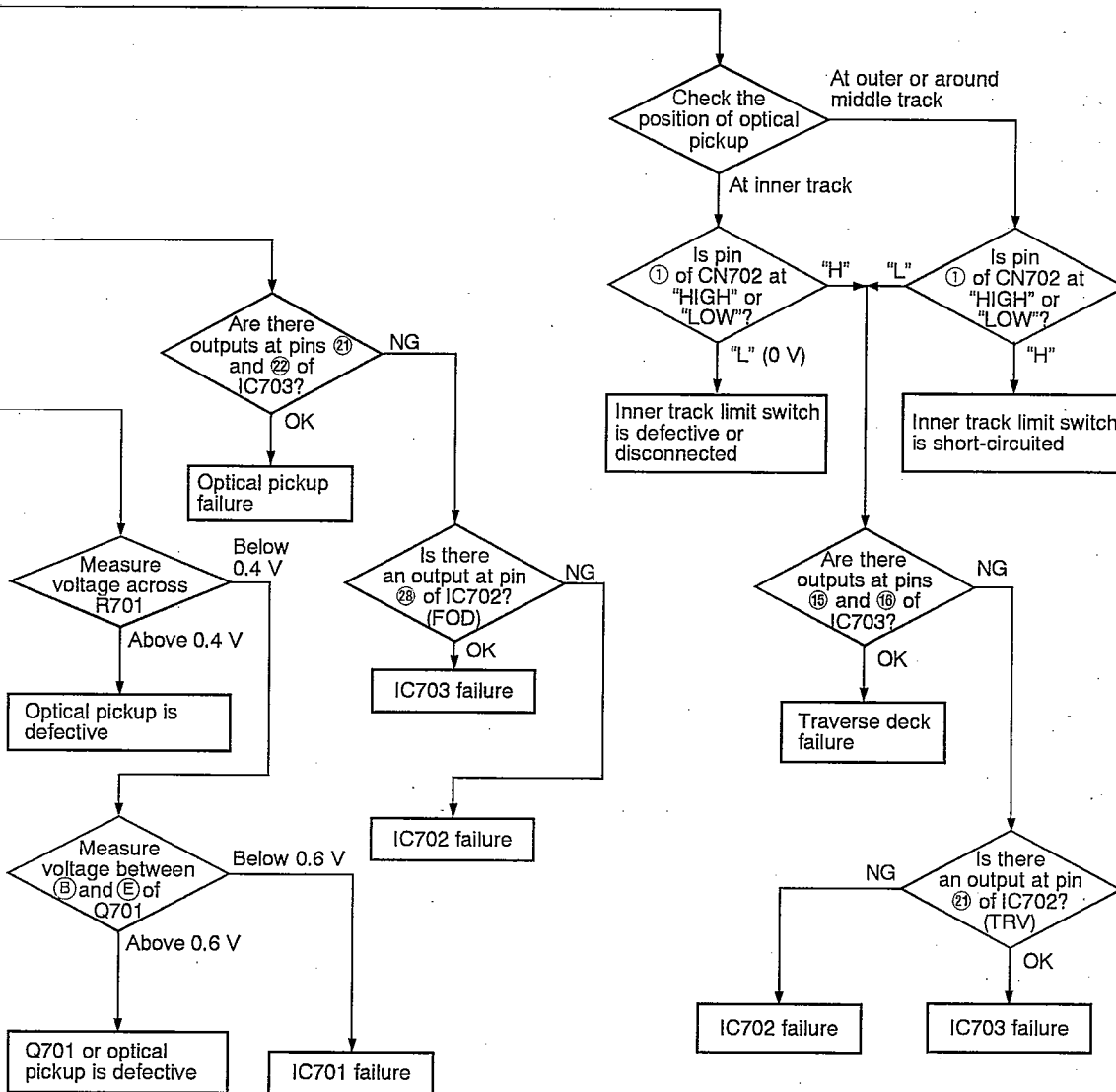




# ■ Troubleshooting Guide







# Replacement Parts List

**Notes:** \*Important safety notice:

 Components identified by  $\Delta$  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.

\*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.

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

\*ACHTUNG: Die Lasereinheit nicht zerlegen.

Die Lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)		S803	EVQ21405R	SW, F. SKIP	
				S804	EVQ21405R	SW, PLAY	
				S805	EVQ21405R	SW, STOP	
IC401	LM2940T5	IC, REGULATOR	$\Delta$	S806	EVQ21405R	SW, R. SKIP	
IC403	LC66356B4G98	IC, SYSTEM CONTROL		S807	EVQ21405R	SW, RANDOM	
IC701	AN8835SBE1	IC, SERVO AMP.		S808	EVQ21405R	SW, ALBUM	
IC702	MN662740RM1	IC, SERVO PROCESSOR		S809	EVQ21405R	SW, J. FIT	
IC703	AN8389SE1	IC, MOTOR DRIVE		S810	EVQ21405R	SW, REPEAT	
IC790	TA7291S	IC, MOTOR DRIVE				CONNECTOR(S)	
		TRANSISTOR(S)					
				CN401	RJP6G18ZA	CONNECTOR(6P)	
Q401-403	2SC1740SRSTA	TRANSISTOR		CN402	RJS1A6823	CONNECTOR(23P)	
Q404	DTC114YSTP	TRANSISTOR		CN701	RJU035T016-1	CONNECTOR(16P)	
Q405-407	2SD2137PQTA	TRANSISTOR	$\Delta$	CN702	RJS1A6723-1Q	CONNECTOR(23P)	
Q410	2SB621A-R	TRANSISTOR		CN801, 802	RJS1A6603	CONNECTOR(3P)	
Q411	2SB1434RSTA	TRANSISTOR		CP790	RJP6G17ZA	CONNECTOR(6P)	
Q412	2SC1740SRSTA	TRANSISTOR				GND PLATE	
Q701	2SB709S	TRANSISTOR					
Q801, 802	DTA143XSTP	TRANSISTOR		E401	SNE1004-2	GND PLATE	
		DIODE(S)				JACK(S)	
D401-403	RL1N4003N02	DIODE	$\Delta$	JK401	RJT065K19	SYSTEM CONNECTOR(19P)	
D404	MTZJ8R2BTA	DIODE	$\Delta$ [M]			TEST JUMPER(S)	
D405, 406	1SS254TA	DIODE					
D801	SPR505MDTT	L. E. D.		TJ701, 702	EYF8CU	TEST JUMPER	
D802-807	LNJ301MPUJAD	L. E. D.					
		COIL(S)					
L401, 402	BL02RN2R62T4	COIL	$\Delta$				
L406	ELEXT101KA9	COIL					
		OSCILLATOR(S)					
X401	EFOEC4234T3	OSCILLATOR(4.23 MHz)					
X701	RSXB16M9J02T	OSCILLATOR(16.9344 MHz)					
		SWITCH(ES)					
S701	RSM0006-P	SW, REST					
S790	RSH1A005	SW, LOADING OPEN DETECT					
S791	RSH1A005	SW, LOADING CLOSE DETECT					
S801	EVQ21405R	SW, OPEN/CLOSE					
S802	EVQ21405R	SW, PAUSE					

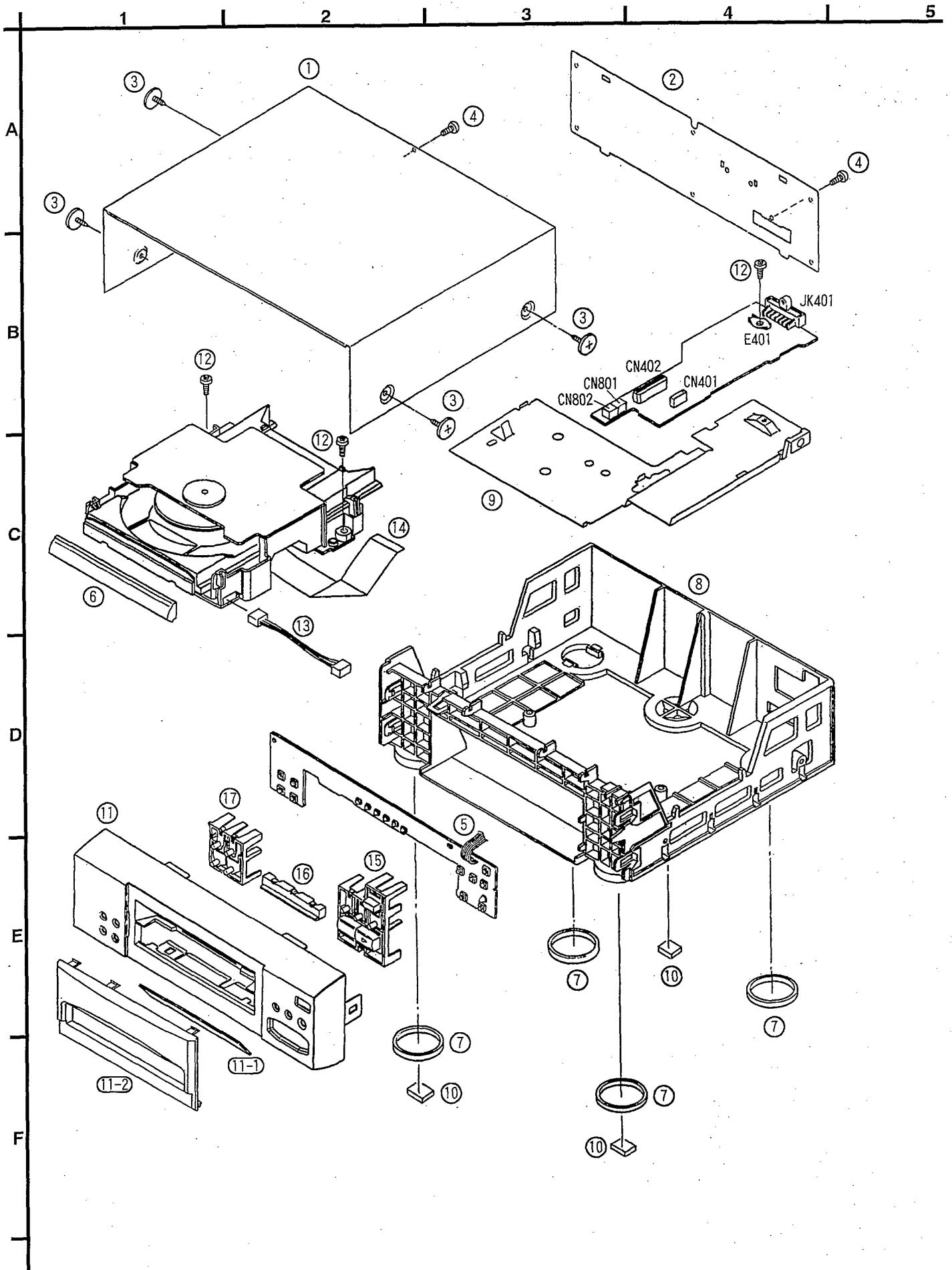
Notes : \* Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)  
 \* Resistance values are in ohms, unless specified otherwise, 1K=1,000(OHM) , 1M=1,000k(OHM)

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS	R723	ERJ6GEYJ182V	1/10W 1.8K	C420	ECEA1AKA221B	10V 220U
			R724	ERJ6GEYJ333V	1/10W 33K	C425	ECBT1E103ZF	25V 0.01U
			R725	ERJ6GEYJ472V	1/10W 4.7K	C426	ECBT1H101KB5	50V 100P
R403	ERDS2TJ102	1/4W 1K	R726	ERJ6GEYJ473V	1/10W 47K	C427	ECEA1AKA101B	10V 100U
R405, 406	ERDS2TJ103	1/4W 10K	R727	ERJ6GEYJ822V	1/10W 8.2K	C701	ECEA0JKA330I	6.3V 33U
R407	ERDS2TJ123	1/4W 12K	R728	ERJ6GEYJ103V	1/10W 10K	C702	ECUZNE104MBN	25V 0.1U
R408-410	ERDS2TJ103	1/4W 10K	R731	ERJ6GEYJ822V	1/10W 8.2K	C703	ECEA0JKA101I	6.3V 100U
R411	ERDS2TJ471	1/4W 470	R735, 736	ERJ6GEYJ101V	1/10W 100	C704, 705	ECUZNE104MBN	25V 0.1U
R412	ERDS2TJ101	1/4W 100	R744	ERJ6GEYJ103V	1/10W 10K	C706	ECUV1H272KBN	50V 2700P
R413	ERDS2TJ471	1/4W 470	R745	ERJ6GEYJ155V	1/10W 1.5M	C707	ECUV1E273KBN	25V 0.027U
R414	ERDS2TJ102	1/4W 1K	R748	ERJ6GEYJ182V	1/10W 1.8K	C708	ECUE1H472KBN	50V 4700P
R415	ERDS2TJ105T	1/4W 1M	R749	ERJ6GEYJ682V	1/10W 6.8K	C709	ECUE1C473KBN	16V 0.047U
R420	ERDS2TJ103	1/4W 10K	R750, 751	ERJ6GEYJ473V	1/10W 47K	C710	ECUV1H182KBN	50V 1800P
R421-423	ERDS2TJ472	1/4W 4.7K	R752	ERJ8GEYJ220V	1/8W 22	C711, 712	ECUWNE104ZFN	25V 0.1U
R425	ERDS2TJ103	1/4W 10K	R770, 771	ERJ6GEYJ155V	1/10W 1.5M	C713	ECUV1C104MBM	16V 0.1U
R426, 427	ERDS2TJ472	1/4W 4.7K	R772	ERJ6GEYJ273V	1/10W 27K	C714	ECEA0JKA101I	6.3V 100U
R428	ERDS2TJ332	1/4W 3.3K	R801-804	ERDS2TJ151	1/4W 150	C716	ECUE1H561KBN	50V 560P
R429	ERDS2TJ471	1/4W 470	R805-807	ERDS2TJ181T	1/4W 180	C717	ECUWNE104ZFN	25V 0.1U
R430	ERDS2TJ104	1/4W 100K	R810	ERDS2TJ821	1/4W 820	C718	ECUVNC224KBN	16V 0.22U
R431-434	ERDS2TJ103	1/4W 10K	R811	ERDS2TJ102	1/4W 1K	C721	ECUV1H100DCN	50V 10P
R435-438	ERDS2TJ472	1/4W 4.7K	R812	ERDS2TJ122	1/4W 1.2K	C722	ECUV1H150JCN	50V 15P
R439	ERDS2TJ101	1/4W 100	R813	ERDS2TJ152	1/4W 1.5K	C723	ECEA1AKA221I	10V 220U
R440	ERDS2TJ102	1/4W 1K	R814	ERDS2TJ182	1/4W 1.8K	C724	ECUV1C104MBM	16V 0.1U
R441 Δ	ERQ16NKR15E	1/6W 0.15	R815	ERDS2TJ222	1/4W 2.2K	C725, 726	ECUE1H102KBN	50V 1000P
R442 Δ	ERDS1FVJ271T	1/2W 270	R816	ERDS2TJ332	1/4W 3.3K	C727, 728	ECEA1HPK010I	50V 1U
R443 Δ	ERD2FCVJ6R8T	1/4W 6.8	R817	ERDS2TJ472	1/4W 4.7K	C730	ECUWNE104ZFN	25V 0.1U
R444	ERDS2TJ102	1/4W 1K	R818	ERDS2TJ682T	1/4W 6.8K	C731, 732	ECEA0JKA221I	6.3V 220U
R445-447	ERDS2TJ1R2	1/4W 1.2			CHIP JUMPER(S)	C733	ECUZNE104MBN	25V 0.1U
R451	ERDS2TJ391	1/4W 390				C734	ECEA1AKA221I	10V 220U
R452	ERDS2TJ103	1/4W 10K				C735-737	ECUWNE104ZFN	25V 0.1U
R453, 454	ERDS2TJ151	1/4W 150	J701-709	ERJ8GEYOR00A	1/8W 0	C738	ECUV1C154KBN	16V 0.15U
R455, 456	ERDS2TJ332	1/4W 3.3K	J714-717	ERJ8GEYOR00A	1/8W 0	C742	ECUV1E273KBN	25V 0.027U
R457, 458	ERDS2TJ102	1/4W 1K	J721-731	ERJ6GEYOR00A	1/10W 0	C743	ECUWNE104ZFN	25V 0.1U
R459, 460	ERDS2TJ123	1/4W 12K				C744	ECUE1E822KBN	25V 8200P
R701	ERJ6GEYJ4R7V	1/10W 4.7			CAPACITORS	C745	ECUE1H102KBN	50V 1000P
R703	ERJ6GEYJ823	1/10W 82K				C747	ECUE1H222KBN	50V 2200P
R704	ERJ6GEYJ102A	1/10W 1K	C401	ECBT1E103ZF	25V 0.01U	C748	ECUV1H471KBM	50V 470P
R705	ERJ6GEYJ103V	1/10W 10K	C402	ECBT1H104ZF5	50V 0.1U	C749	ECUZNE104MBN	25V 0.1U
R706	ERJ6GEYJ102A	1/10W 1K	C403	ECBT1H102KB5	50V 1000P	C750	ECUV1C104MBM	16V 0.1U
R707	ERJ6GEYJ474V	1/10W 470K	C404	ECBT1E103ZF	25V 0.01U	C751	ECUZNE104MBN	25V 0.1U
R708	ERJ6GEYJ154V	1/10W 150K	C406	ECEA1HKA3R3B	50V 3.3U	C752	ECUE1H152KBN	50V 1500P
R709	ERJ6GEYJ683V	1/10W 68K	C409	ECBT1E103ZF	25V 0.01U	C753	ECUV1H471KBM	50V 470P
R711	ERJ6GEYJ154V	1/10W 150K	C410 Δ	ECA1CM222B	16V 2200U	C754	ECUE1H471KBN	50V 470P
R712	ERJ6GEYJ221V	1/10W 220	C411-413	ECBT1E103ZF	25V 0.01U	C790	ECA1AKF820E	10V 82U
R714	ERJ6GEYJ121V	1/10W 120	C414	ECEA1HKA010B	50V 1U	C801	ECBT1H102KB5	50V 1000P
R717, 718	ERJ6GEYJ102A	1/10W 1K	C415	ECEA0JKA470B	6.3V 47U			
R720	ERJ6GEYOR00A	1/10W 0.00	C416	ECEA1AKA101B	10V 100U			
R721	ERJ6GEYJ101V	1/10W 100	C417, 418	ECBT1H102KB5	50V 1000P			
R722	ERJ6GEYJ563V	1/10W 56K	C419	ECEA0JKA221B	6.3V 220U			

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 PARTS				LOADING UNIT PARTS	
1	RKMD302-K	TOP CABINET		101	RFKJXDT07-K	CHASSIS ASS'Y	
2	RGRO217A-C	REAR PANEL		101A	RDG0142	LOADING GEAR	
3	RHD30007-K1	SCREW		101B	RDG0193	LOADING GEAR(1)	
4	XTBS3+8JFZ1	SCREW		101C	RDP0065	PULLEY	
5	REZ0762	FLAT CABLE (6P) (W801)		102	REMD019	MOTOR ASS'Y	
6	RGK0838-K	ORNAMENT		103	RME0063	LOCK LEVER SPRING	
7	RKA0068-N	FOOT		104	RME0087	SPRING	
8	RKS0203-K	BOTTOM FRAME		105	RMG0158	BELT	
9	RSC0417	SHIELD PLATE		106	RML0349	CONVERSION LEVER	
10	SHG1654	FELT		107	RML0178-1	LOCK LEVER	
11	RFKGLCH570EK	FRONT PANEL ASS'Y		108	RMM0059-1	SLIDE PLATE (2)	
11-1	RGCO013-S	MIRROR		109	RMM0079-1	SLIDE PLATE (1)	
11-2	RKW0467-Q	PANEL		110	XTN26+6G	SCREW	
12	XTB3+8JFZ	SCREW		111	XYN2+F6FZ	SCREW	
13	REX0510	CABLE ASS'Y (6P)		112	RHM245ZA	MAGNET	
14	REZ0537	FFC (23P)		113	RFKNLCH530EA	DISC CLAMPER ASS'Y	
15	RFKNLCH530EK	BUTTON ASS'Y		114	RMRO334	MAGNET HOLDER	
16	RGL0289-Q	PANEL LIGHT		115	RXQ0380	DISC HOLDER	
17	RGU1232-K	BUTTON		116	RFKNLPG440-K	DRIVE RUCK ASS'Y	
				117	RGQ0144-K	DISC TRAY	
				118	RHD20009-1	SCREW	
				119	XTV2+6G	SCREW	
				120	RAE0150Z	TRAVERSE UNIT ASS'Y	
				120A	SHGD113-1	RUBBER	
				120B	XQS17+A35FZ	SCREW	
				121	RME0109	SPRING (A)	
				122	RME0142	SPRING (B)	
				123	RMRO698-K	TRAVERSE CHASSIS	
				124	RMS0123-1	PIN (A)	
				125	RMS0350	PIN (B)	
				126	XTN2+6G	SCREW	
				127	RMK0255	COVER	
						GREASE OR JIG/TOOL	
				SA1	SZZP1054C	TEST DISC (PLAYABILITY)	
				SA2	RFKXEM30L	GREASE (CD MECHANISM)	

# Cabinet Parts Location



# Loading Unit Parts Location

1022

**Note:**

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

Ref No.	Part No.
①	RFKXEM30L

A

B

C

D

E

F

