

Service Manual

Compact Disc Player

Compact Disc Player

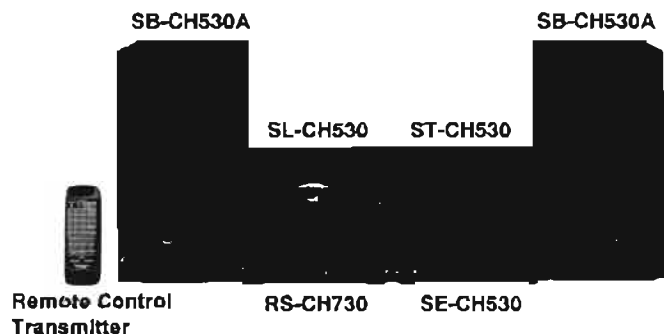
COMPACT
disc
 DIGITAL AUDIO

DIGITAL
MASH *1
 * multi-stage noise shaping

SL-CH530

Colour

(K) : Black



Areas

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

System: SC-CH530

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

RAE0113Z 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

■ General

Dimensions (W x H x D)

270 x 89 x 266 mm

Weight

1.5 kg

*1 MASH is a trademark of NTT.

System	Tuner/sound processor	Compact disc player	Amplifier	Cassette deck	Speakers
SC-CH530	ST-CH530	SL-CH530	SE-CH530	RS-CH730	*2 SB-CH530A

*2: For Europe Made in PAES
 For other areas 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.

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NOTE:

Refer to the service manual for Model No. SE-CH530 (ORDER No. AD9505126C2) 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)

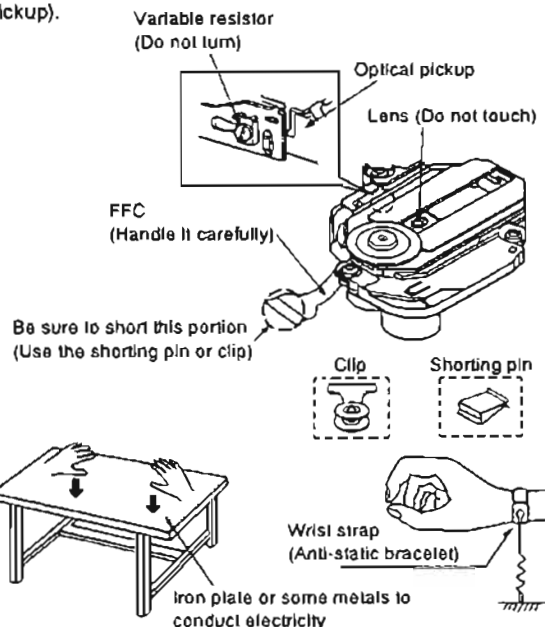
1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board (FFC board). When removing or connecting the short pin, finish the job in as short time as possible.
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).



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

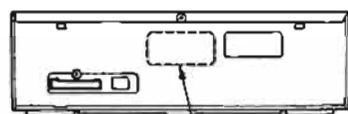
Laser radiation from the pick up unit is safety level, but be sure the followings:

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.

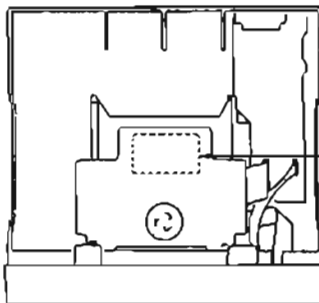
ACHTUNG: Dieses produkt enthält eine laserdioden. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit abgestrahlt.
Wellenlänge: 780 nm
Maximale strahlungsleistung der lasereinheit: 100 μ W/VDE

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

1. Die lasereinheit nicht zerlegen, da die strahlung an der freigelegten laserdioden 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.

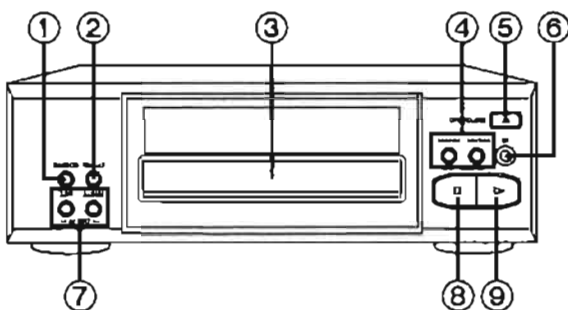


**LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT**



DANGER	IMVISIBLE LASER RADIATION WHEN OPEN AVOID DIRECT EXPOSURE TO BEAM
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBENING UNNØDIGT UDSÆTTELSE FOR STRÅLING
VARO!	AVATTAMISSA JA SUOJAA ERMÄKSI OHIETÄISSÄ OLET ALITILAIN NÄKYMÄTÖNÄ LASERLAITE, JOLLE ALI KÄYTTÖ SÄTEESKIN
VARNING	ÖSTYNLIG LASERSTRÅLNING NÄR DÖRRNÄR ÖPPNAD OCH SPÄRRNÄR ÅR (UNNÖDIGT) BÄTRÄKTA ELSSTRÅLNING
ADVARSEL	USYNLIG LASERSTRÅLING NÄR DØRSEJ ÅPNER OG SIKKERHEDS BRYTER UNNØDIGT UDSÆTTELSE FOR STRÅLING
VORSICHT	UNGSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET NICHT DEM STRAH AUSSETZEN

■ Location of Controls



- ① Random play button (RANDOM)
- ② Repeat button (REPEAT)
- ③ Disc tray
- ④ Skip/search buttons
(◀◀/▶▶, ▶▶/▶▶, -SKIP/-SEARCH)
- ⑤ Disc tray open/close button (OPEN/CLOSE, ▲)
- ⑥ Pause button (||)
- 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.
- 3 Press ▲ OPEN/CLOSE to close the tray.
- 4 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.
- 5 Adjust the volume level as you like.

To stop the disc play:

Press □.

To temporarily stop the disc play:

Press || button. ▶ Indicator flashes up green.
To play again, press ▶.

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.

When "NO DISC" display appears:

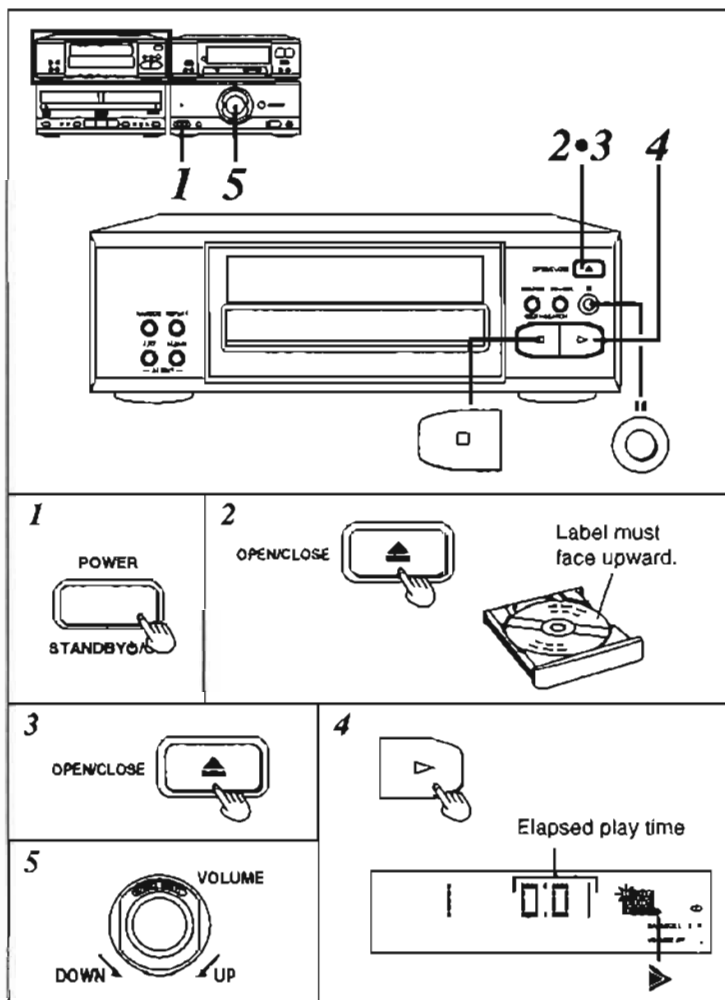
It indicates that a CD has not been installed.

About ▶ indicator:

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

About the total playing time:

The total playing time displayed includes the silent sections between
tracks. Hence, there will be a difference between the total playing
time and the liner notes.



■ 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

• Checking Procedures for each P.C.B.

	Page.
1. Checking for the main P.C.B..	4.
2. Checking for the servo P.C.B..	5.

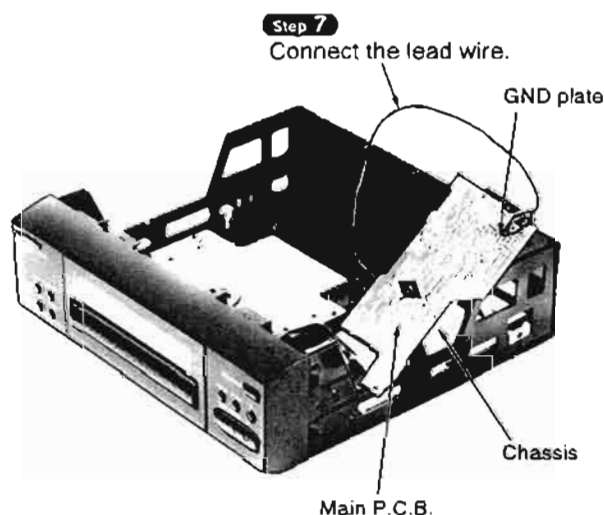
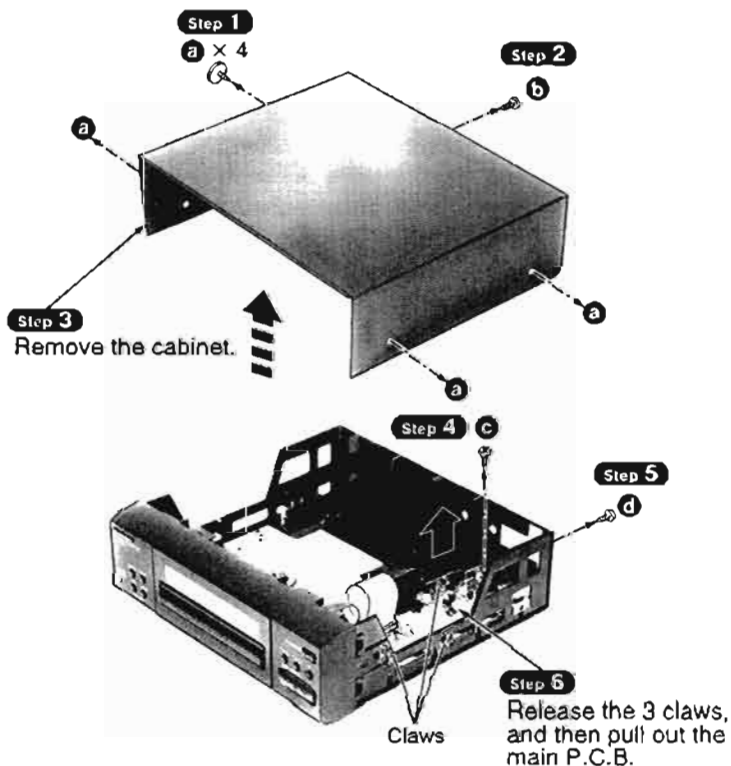
• Main Component Replacement Procedures

1. Replacement for the traverse deck ass'y.	5~7.
2. Replacement for the belt, loading motor ass'y and loading switch.	7.

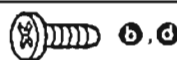
■ Checking Procedure for each P.C.B.

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

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



[RHD30007-K1] (Black)

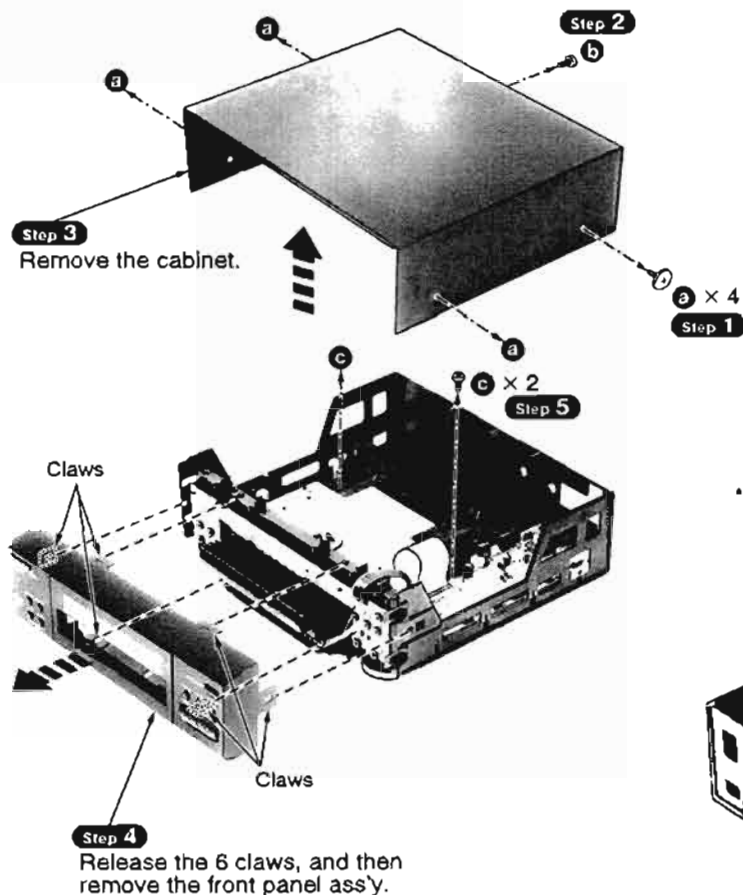


[XTBS3+8JFZ1] (Black)



[XTB3+8JFZ] (Black)

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



[RHD30007-K1] (Black)

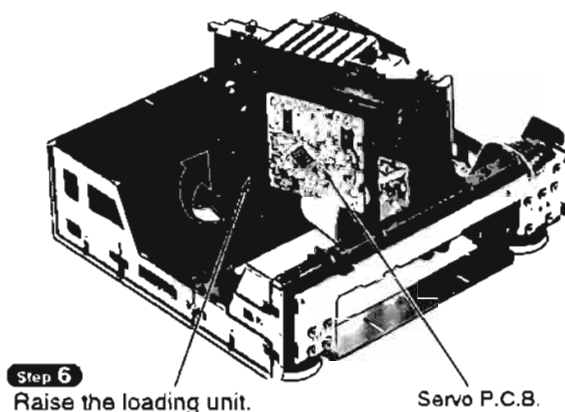


[XTBS3+8JFZ1] (Black)



[XTB3+8JFZ] (Black)

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



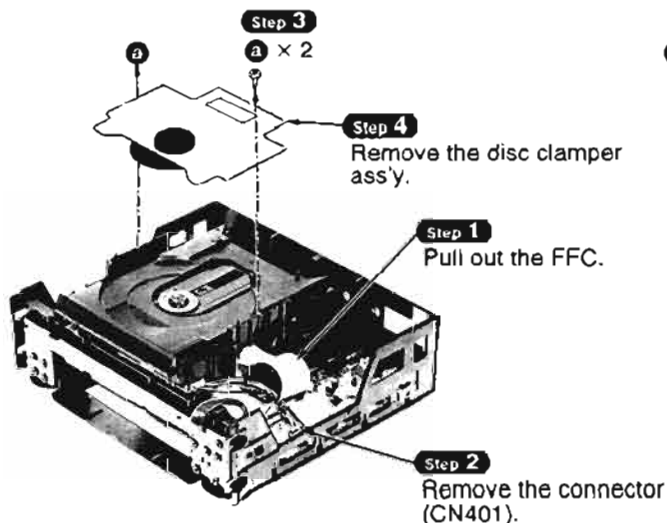
■ Main Component Replacement Procedures

1. Replacement for the traverse deck ass'y

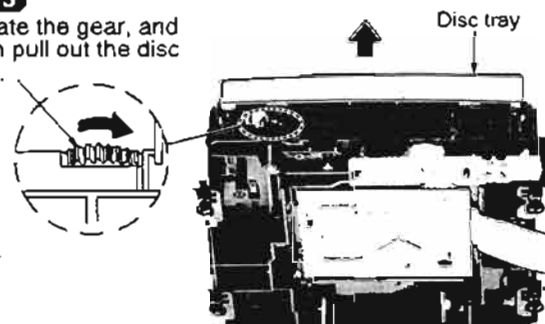
• Follow the item 2 (**Step 1** ~ **Step 5**) in checking procedures for each P.C.B. on page 5.



[XTN26+6G]



Step 5
Rotate the gear, and then pull out the disc tray.





b



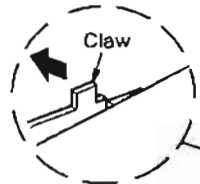
c

[XTN2+6G]

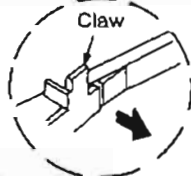
[XTV2+6G]

Step 6

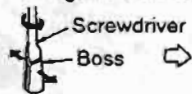
Release the claw.

**Step 7**

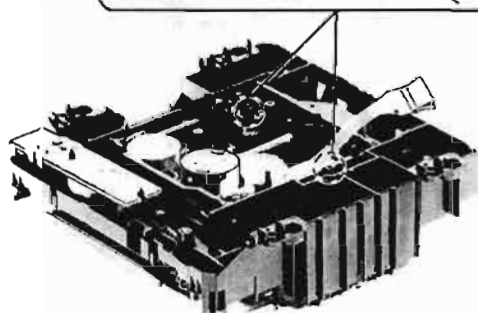
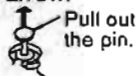
Pull out the disc tray.

**Step 12**

1. Widen the boss using a regular screwdriver.

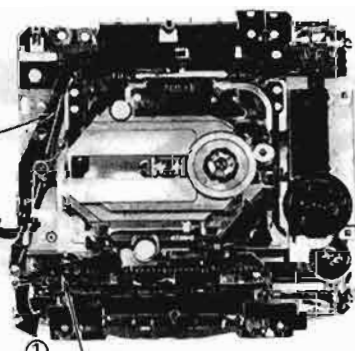


2. Pull out the pin in the direction of the arrow.

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

2

1

Step 1

Claw

3

Step 3

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

Step 4

Install the disc tray.



Claw

Step 10

c x 2

b

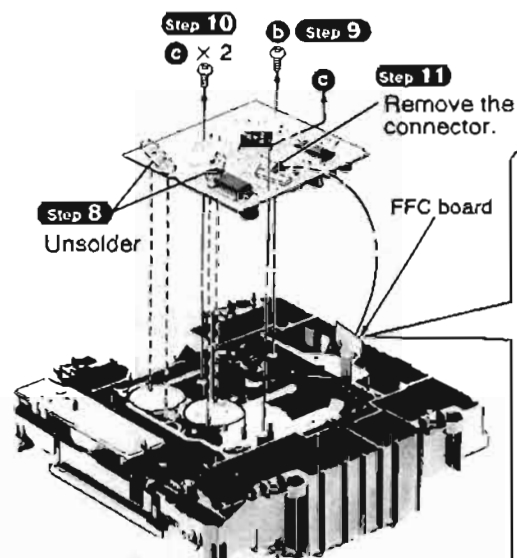
Step 9**Step 11**

Remove the connector.

Step 8

Unsolder

FFC board



Top of the connector



FFC board

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

FFC board



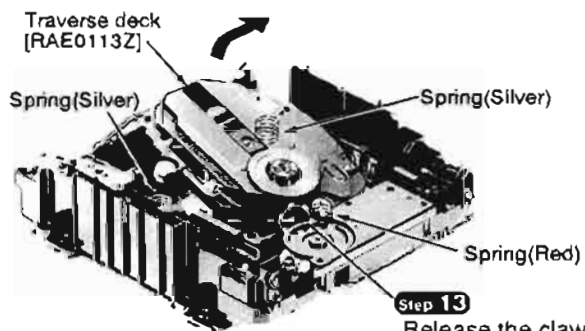
Short pin

Traverse deck
[RAE0113Z]

Spring(Silver)

Spring(Silver)

Spring(Red)

**Step 13**

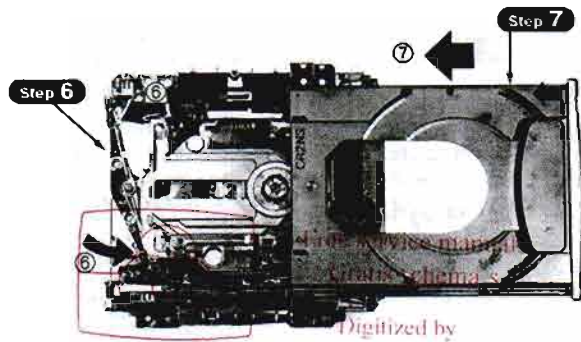
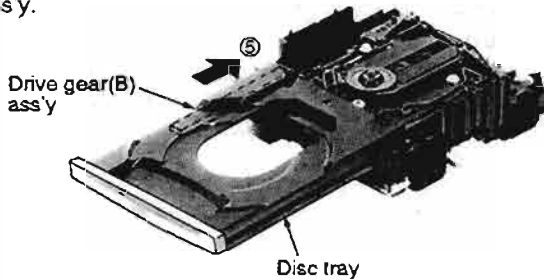
Release the claw.

NOTE

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

Step 5

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

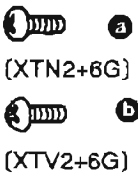
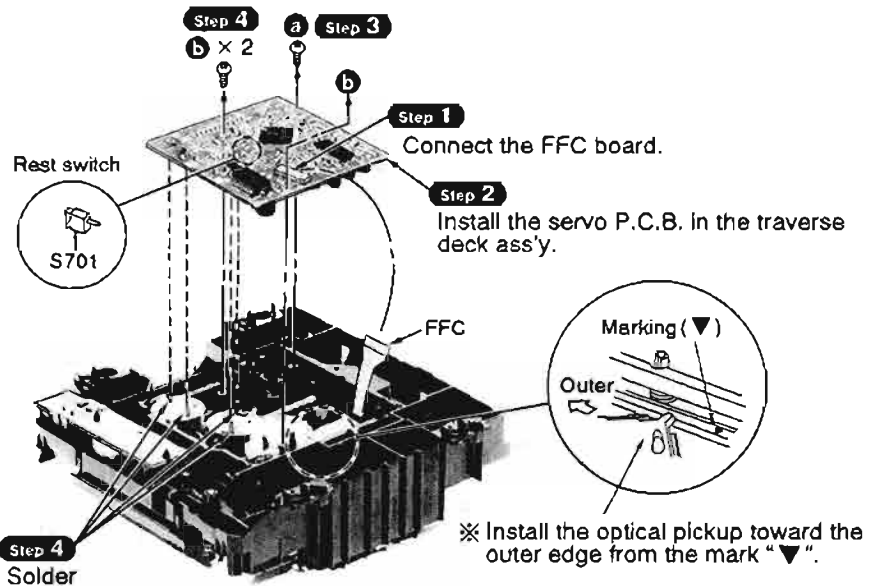


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Installation of the servo P.C.B. after replacement

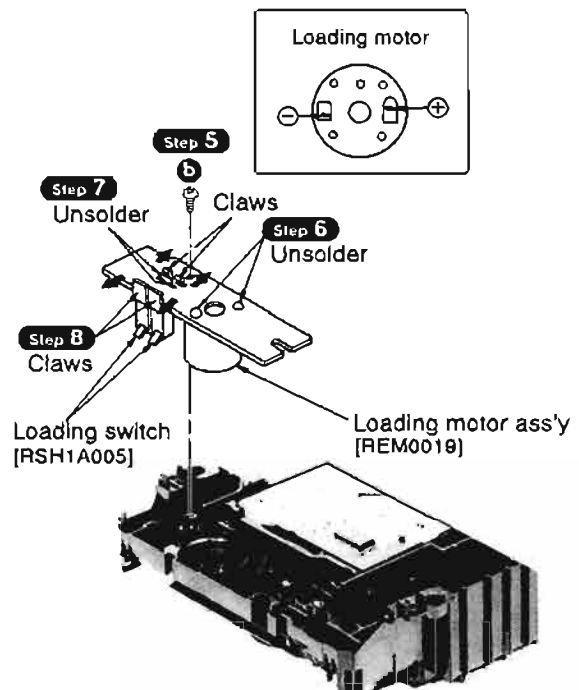
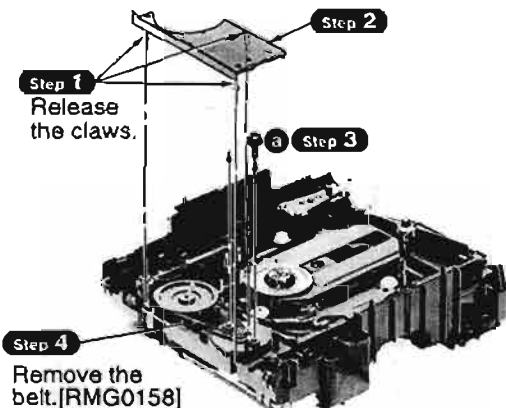
NOTE

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



Automatic Adjustment Results Display Function

Self-Check Function

- The system control IC is incorporated only in the tuner (ST-CH530), 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-CH530 (SL-CH530, ST-CH530, SE-CH530, RS-CH730, SB-CH530A)

- This unit is able to utilize the display panel of the tuner (ST-CH530) 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		4.8V
			IC702 ⑦ pin	MCLK		4.8V
			IC702 ⑨ pin	MLD	0V	0V
			IC702 ⑩ pin	SENSE	0V	0V
			IC702 ⑪ pin	/RST	4.9V	4.9V
			IC702 ⑫ pin	X1		
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 ⑬ pin	F E		2.4V
			IC702 ⑭ pin	T E		2.4V
			IC702 ⑮ pin	FOD	2.4V	2.4V
			IC702 ⑯ pin	TRD	2.4V	2.4V
			IC702 ⑰ pin	KICK	2.4V	2.4V
			IC702 ⑱ pin	/FLOCK	0V	4.9V
			IC702 ⑲ pin	/RF DET	0V	4.8V
			TJ701	R F		3.4V
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 circuits (check waveforms, voltages, and part values.) ③ Optical pickup	IC702 ⑳ pin	FBAL	2.5V ± 1.25V	2.5V ± 1.25V
			TJ701	R F		3.4V
			IC702 ㉑ pin	F E		0V
			IC702 ㉒ pin	O F T	0V	0V
			IC702 ㉓ pin	/TLOCK	0V	0V
E-08 E-0A	Focus or Tracking gain adjustment not completed in 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 ㉔ pin	F E		2.4V
			IC702 ㉕ pin	T E		2.4V
			IC702 ㉖ pin	O F T	0V	0V
			IC702 ㉗ pin	/TLOCK	0V	0V

■ Measurements and Adjustments

Cautions:

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

This unit SL-CH530 is designed to operate on power supplied from the Amplifier SE-CH530 through the Tuner/Sound Processor ST-CH530.

When connecting the unit to other system components, do not connect to the Amplifier SE-CH530 directly. Be sure to connect this unit through the Tuner/Sound Processor ST-CH530.

When operating the unit SL-CH530 alone for testing and servicing, without having power supplied from the Amplifier SE-CH530 and the Tuner/Sound Processor ST-CH530, 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)

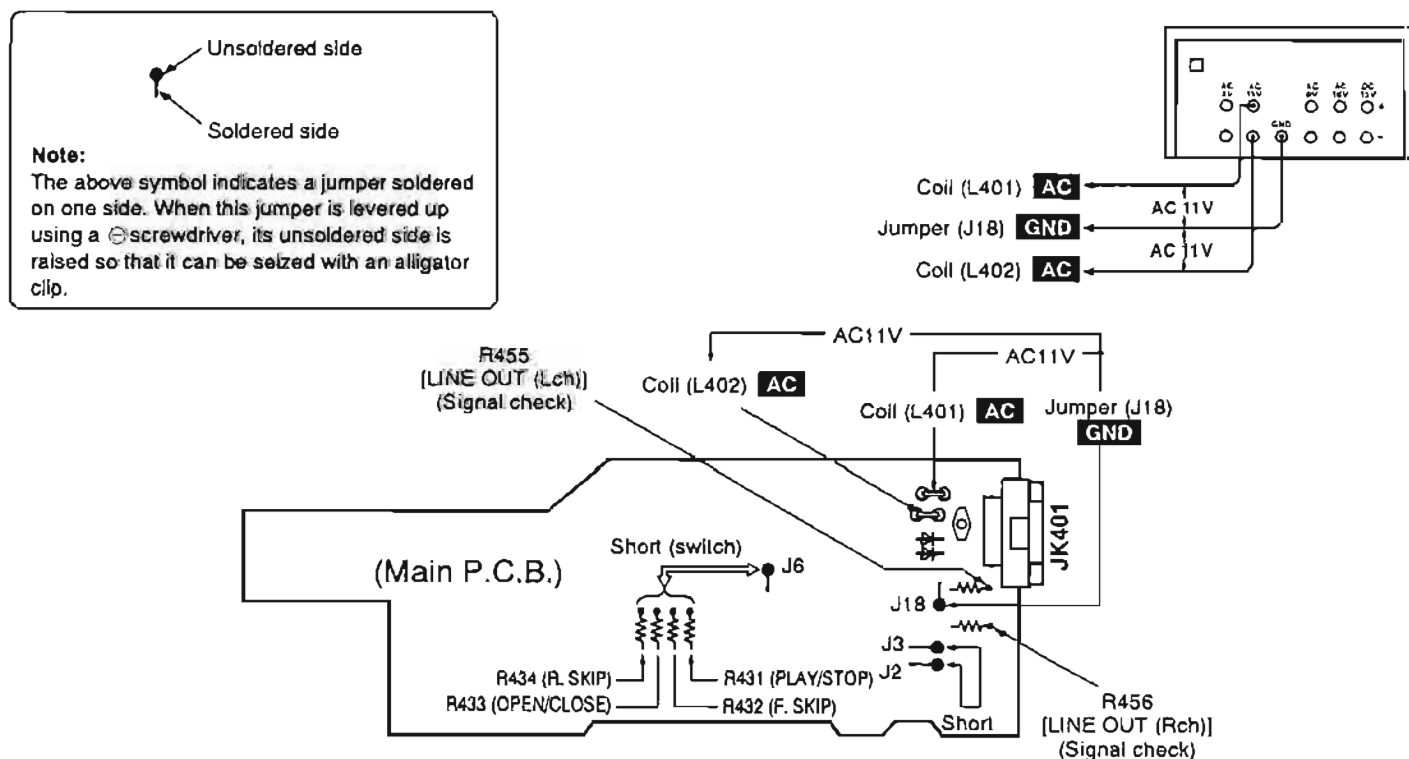
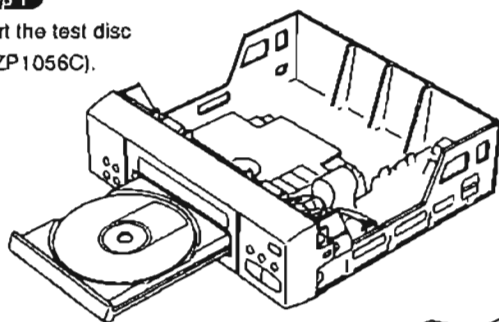


Fig. 1

• Preparation of Adjustment

Step 1

Insert the test disc (SZZP1056C).



NOTE:

The elevation angle adjusting pot is accessible only after track 19 on the test disc (SZZP1056C), has been played.

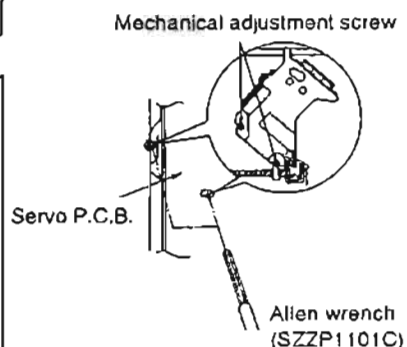
Step 2

Stand the unit as shown and play track 19 on the test disc (SZZP1056C).

Oscilloscope (+)
TJ701 (RF)

Oscilloscope (-)
TJ702 (VREF)

Allen wrench



Measuring Instruments and Special Tools

• Test disc

1. Playability test disc (SZZP1054C)
2. Uneven test disc (SZZP1056C)

- Allen wrench (M2.0) (SZZP1101C)
- Oscilloscope

(1) MECHANICAL ADJUSTMENT

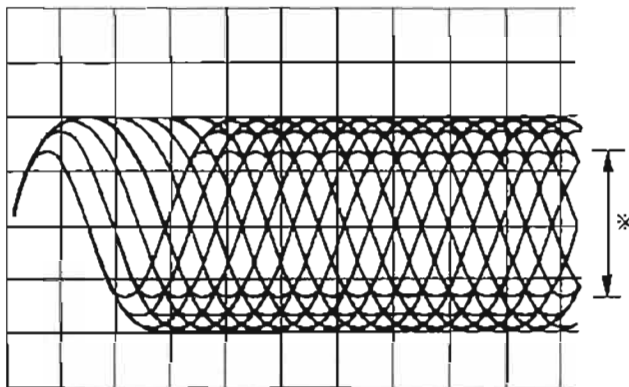
- When the traverse deck is replaced, making adjustments is not necessary. (The traverse deck ass'y is already adjusted.)
- Make adjustments to improve playability when the traverse deck has not been replaced. Make the electrical adjustments first.

1. Connect the oscilloscope's CH. 1 probe across **TJ701** (+) and **TJ702** (VREF) on the Servo P.C.B. (See page 20)

Oscilloscope setting:

VOLT 200 mV
SWEEP 0.5 μ sec
Input coupling AC

2. Switch the player power ON, and play track 19 on the test disc (SZZP1056C).
3. Leave the player in Play mode and place it as shown in the figure on the right.
4. Alternately adjust the two mechanical adjusting screws with the 2.0 mm allen wrench (SZZP1101C) until the RF signal amplitude on the oscilloscope is maximized.
5. After completing the adjustment, lock the mechanical adjustments with lock paint (RZZ0L01).



※ Maximize the amplitude.

(2) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

• Checking Skip Search

1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse direction).

• Checking Manual Search

1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

• Checking playability

1. Play the 0.7 mm black dot and the 0.7 mm wedge on the test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc and verify that no sound skip or noise occurs.

Schematic Diagram

	Page
A SERVO CIRCUIT	12, 13
B OPERATION CIRCUIT	14
C LOADING MOTOR CIRCUIT	14
D 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

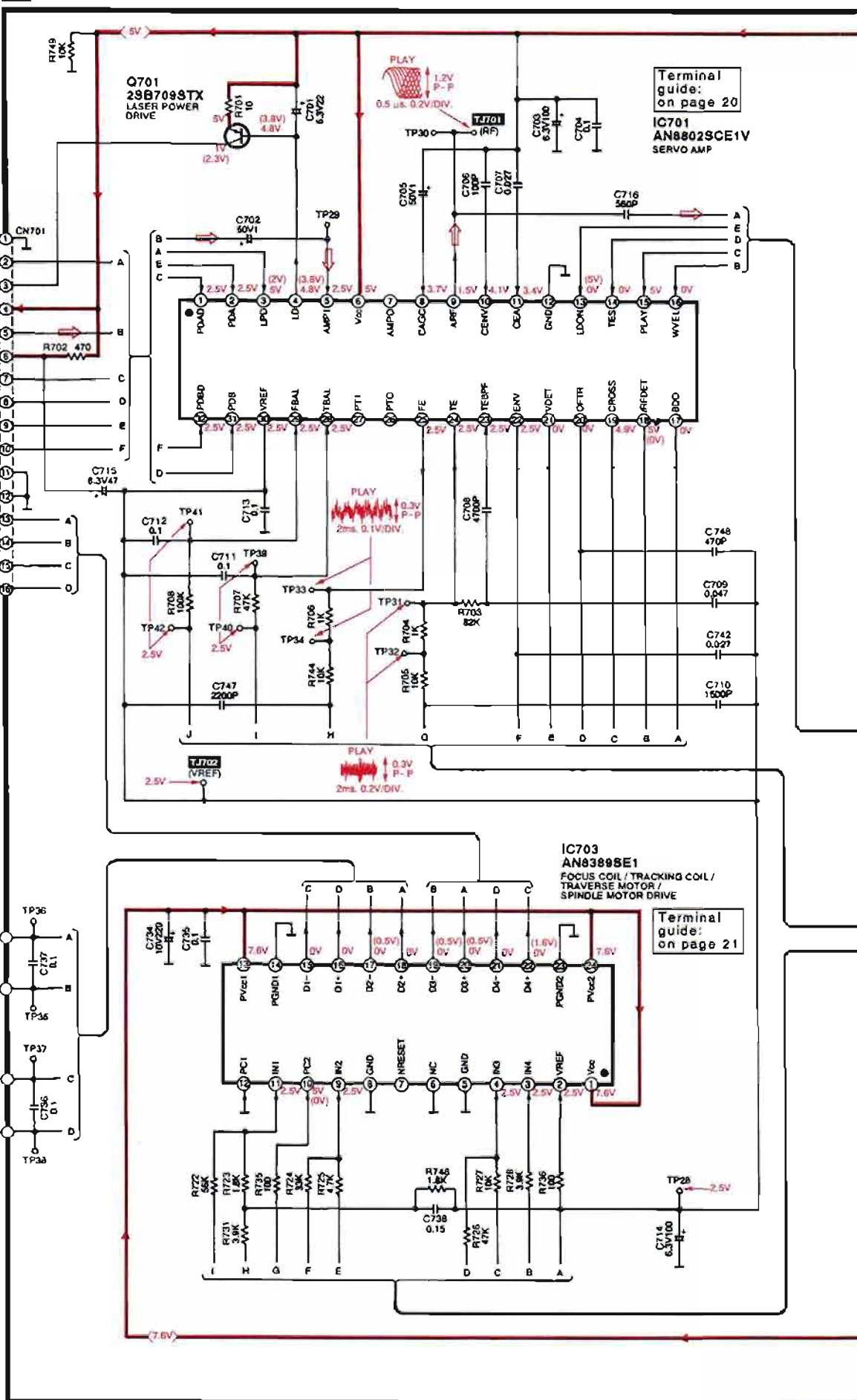
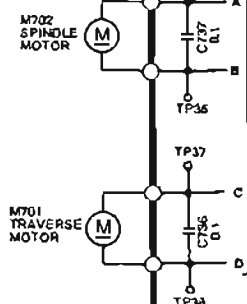
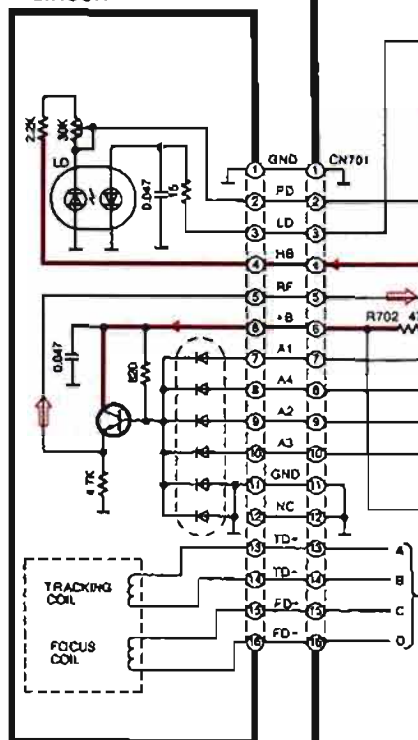
————▶ : Positive voltage line

-----▶ : Negative voltage line

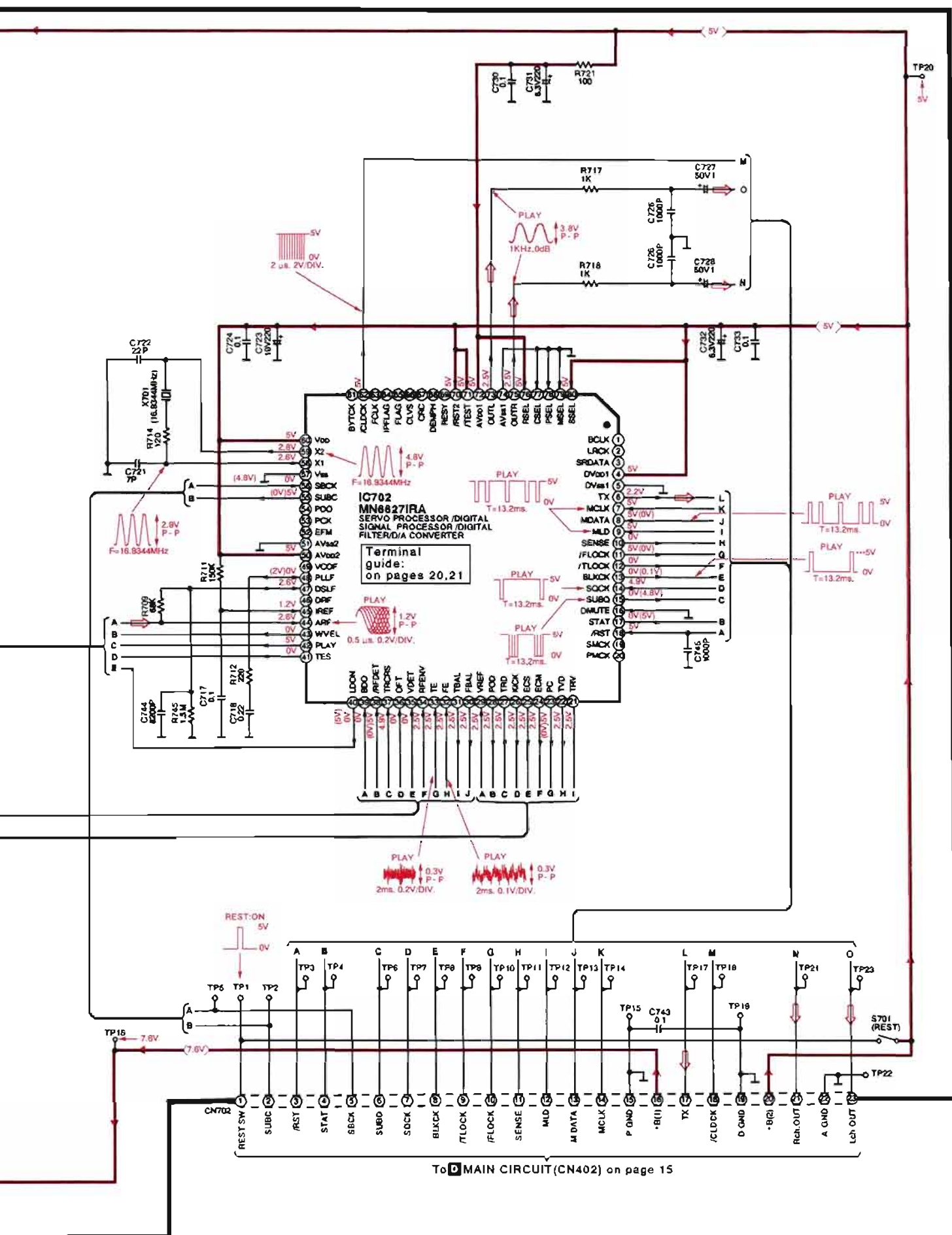
◁———— : CD signal Line

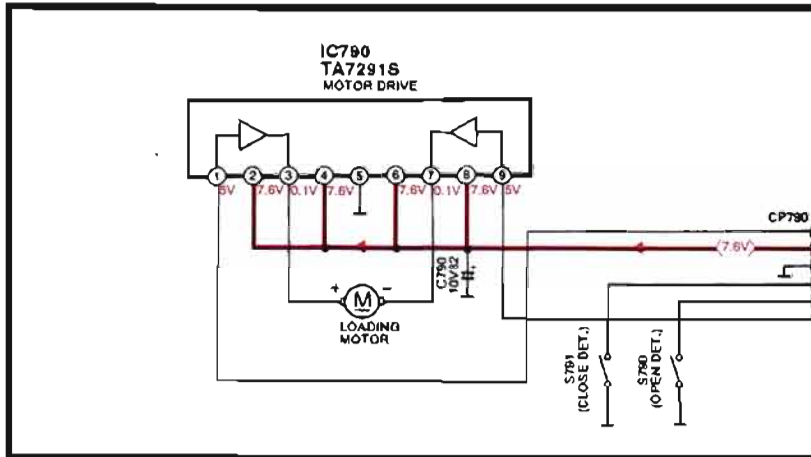
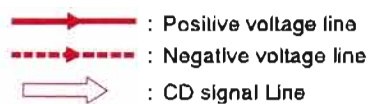
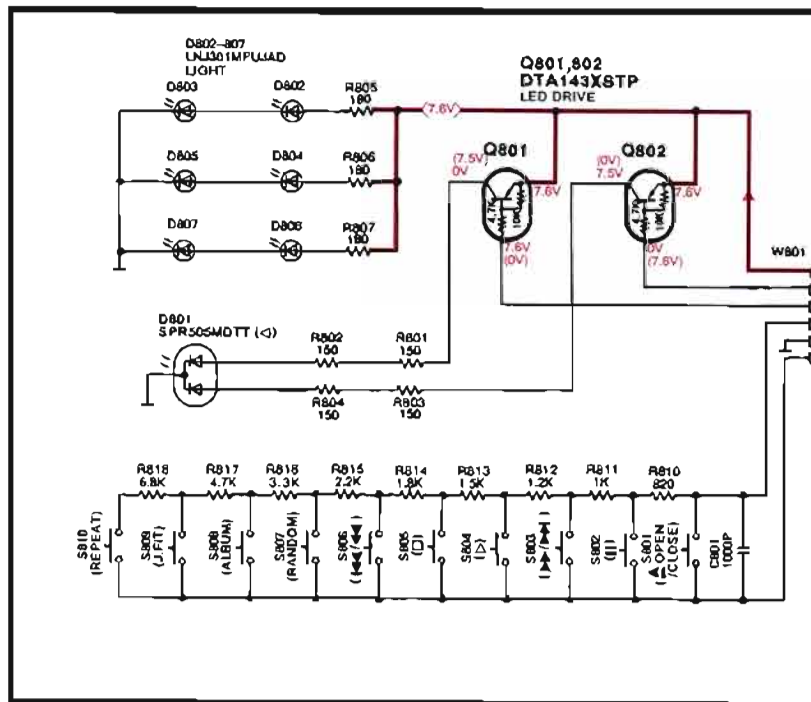
A SERVO CIRCUIT (P.C.Board: on page 16)

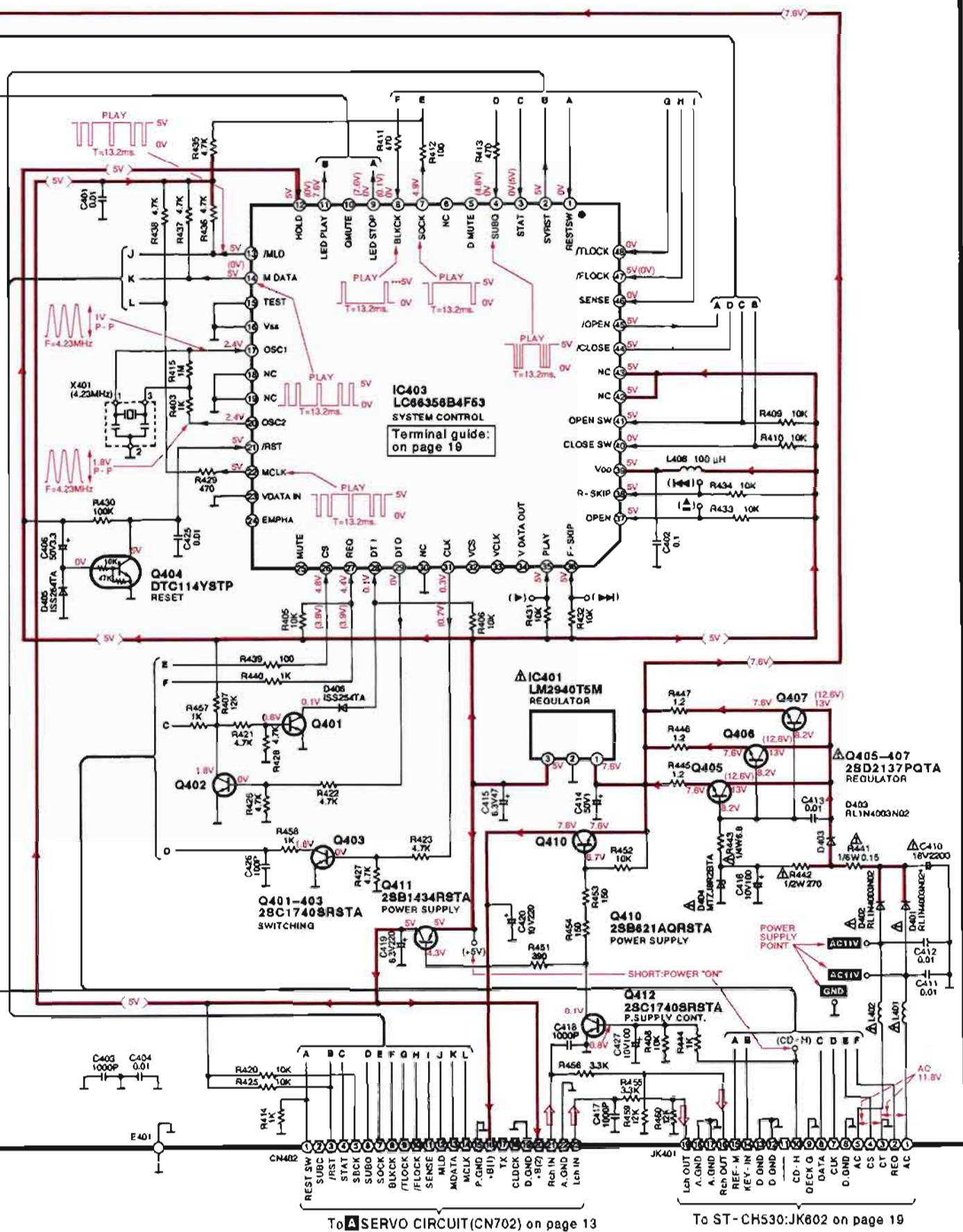
△ OPTICAL PICKUP
CIRCUIT



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



B LOADING MOTOR CIRCUIT (P.C.Board: on page 16)**C** OPERATION CIRCUIT (P.C.Board: on page 17)



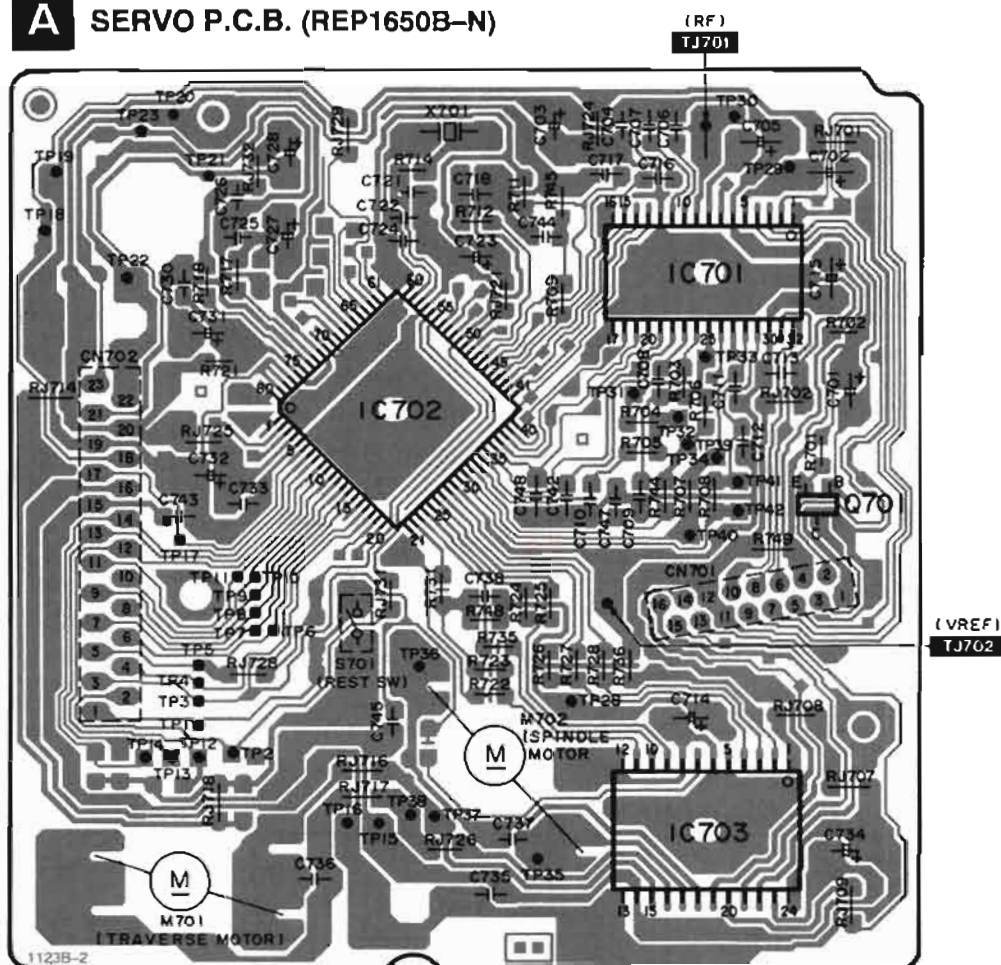
To **A** SERVO CIRCUIT (CN702) on page 13

To ST-CH530:JK602 on page 19

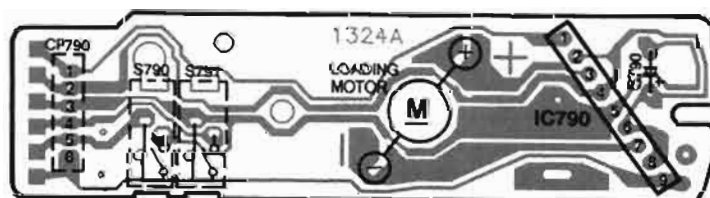
Printed Circuit Board Diagram

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

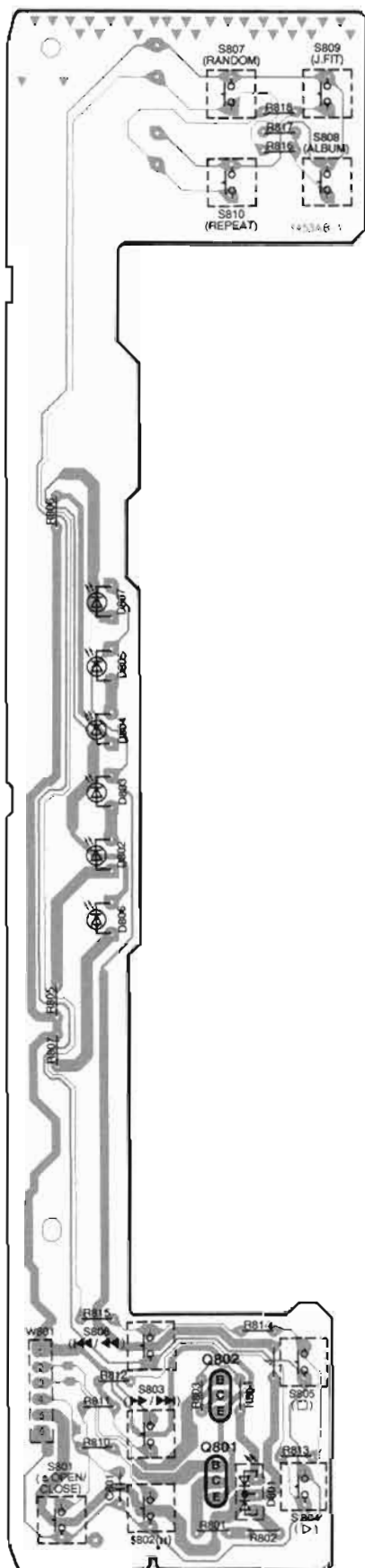
A SERVO P.C.B. (REP1650B-N)



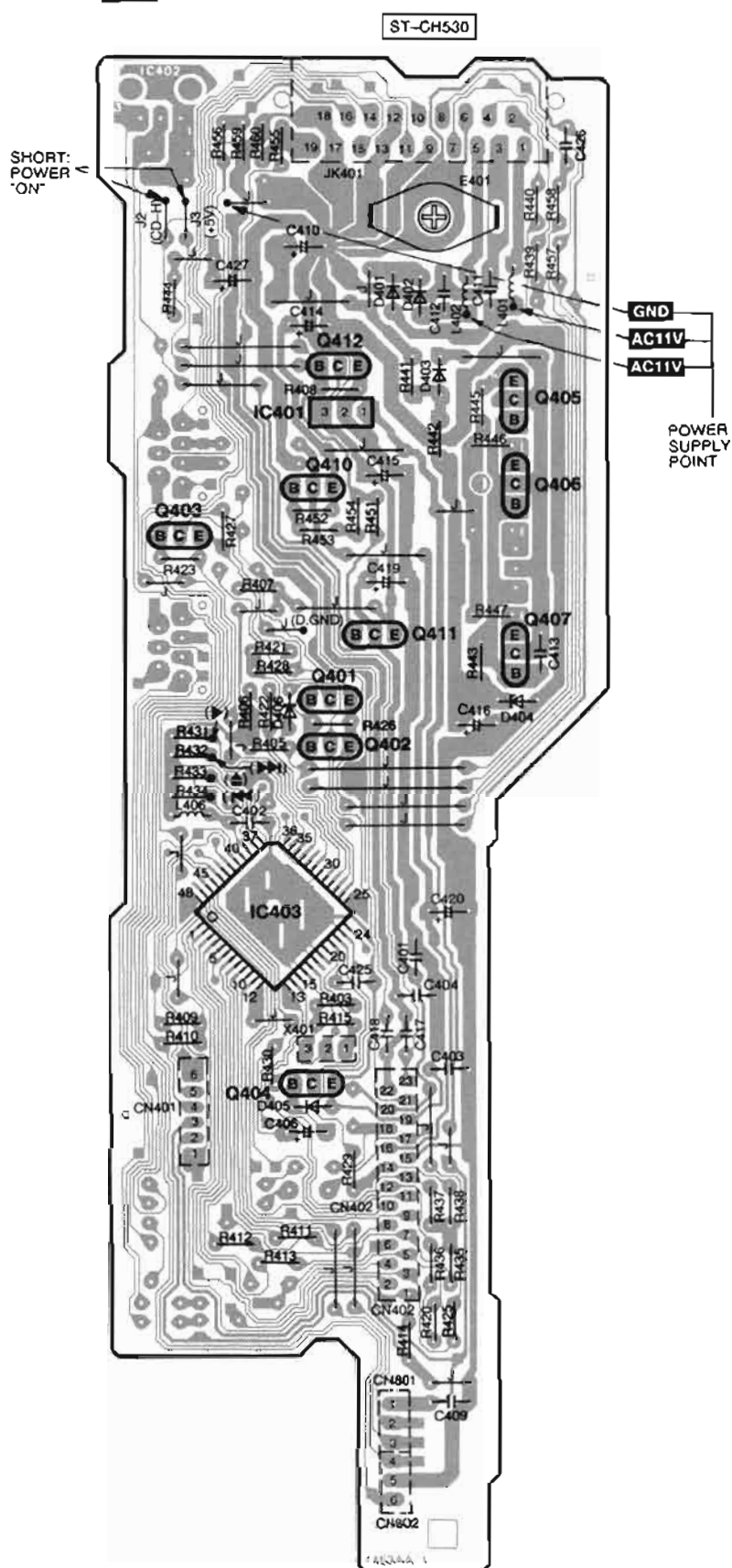
B LOADING MOTOR P.C.B. (REP1960A)

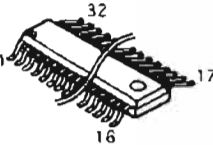
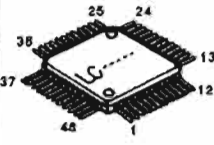
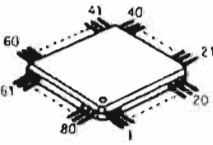
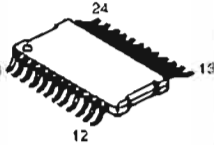
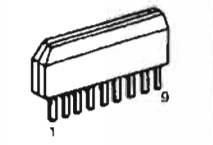
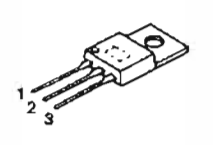
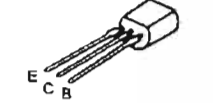
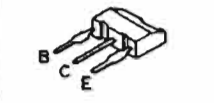
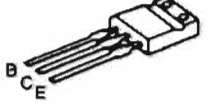
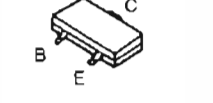
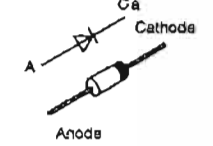
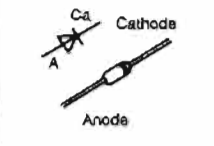
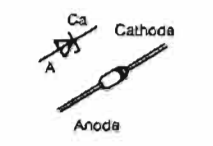
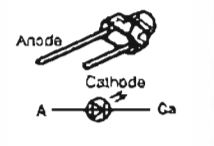
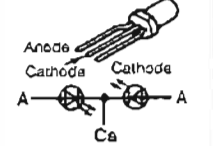


C OPERATION P.C.B. (REP2113A-M)

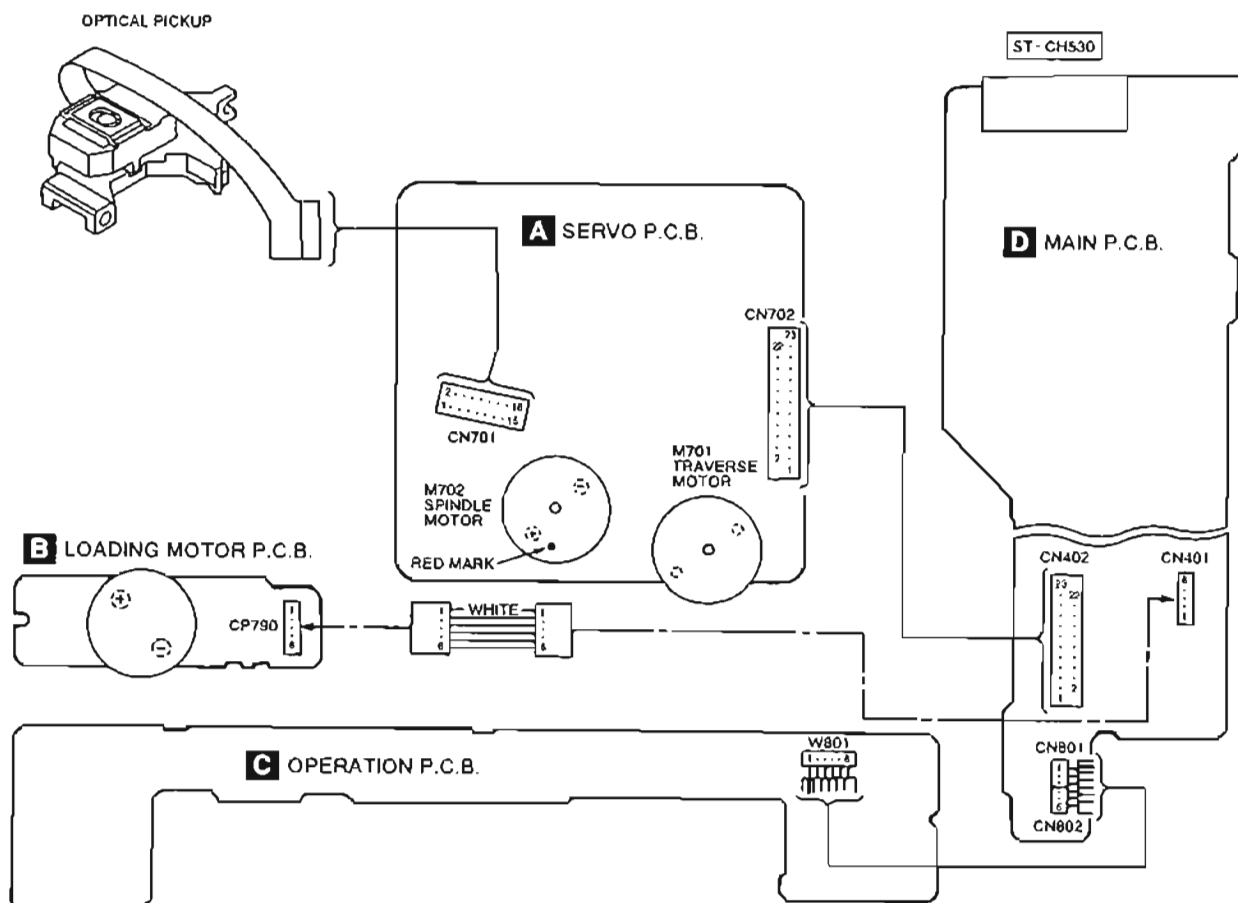


D MAIN P.C.B. (REP2113A-M)



AN8802SCE1V 	LC66356B4F53 	MN66271RA 	AN8389SE1 	TA7291S 	LM2940T5 
2SB621A-R 	2SB1434RSTA 	2SD2137PQTA 	DTA143XSTP DTC114YSTP 2SC1740SRSTA 		2SB709S 
RL1N4003N02 	1SS254TA 	MTZJ8R2BTA 	LNJ301MPUJAD 	SPR505MDTT 	

■ Wiring Connection Diagram



Function of IC Terminals

● IC403 (LC66356B4F53)

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	—	Not used
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	—	Not used (Connected to GND)
16	VSS	—	Connected to GND
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	ENPHIA	—	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 (AN8802SCE1V)

Pin No.	Terminal Name	I/O	Function
1	PDAD	I	PD A channel signal input with delay
2	PDA	I	PD A channel signal input without delay
3	LPD	I	Laser PD connection
4	LD	O	Power supply for LD driving
5	AMPI	I	RF amplifier input
6	Vcc	I	Power supply connection
7	AMPO	O	RF amplifier output (no used, open)
8	CAGC	I	AGC loop filter connection
9	ARF	O	RF AGC output
10	CENV	I	Capacitor connection for RF detection
11	CEA	I	Capacitor connection for HPF amplifier
12	GND	—	Ground connection
13	LDON	I	ON/OFF input of LD APC ("H": on, "L" OFF)
14	TES	I	Tracking error shunt signal input ("H": shunt)
15	PLAY	I	Play signal input ("H": PLAY)
16	WVEL	I	WVEL control
17	BDO	O	BDO output
18	/RFDET	O	NRFDET output
19	CROSS	O	CROSS output
20	DFTR	O	OFTR output
21	VDET	O	VDET output
22	ENV	O	ENV output
23	TEBPF	I	Vibration detection input
24	TE	O	Tracking error output
25	FE	O	Focus error output
26	PTO	O	Potential amplifier output (no used, open)
27	PTI	I	Potential amplifier inversion input (no used, open)
28	TBAL	I	Tracking balance input
29	FBAL	I	Focus balance input
30	VREF	O	VREF output
31	POB	I	PD B channel signal input without delay
32	PDBD	I	PD B channel signal input with delay

● IC702 (MN66271RA)

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 (BLKCK = 75 Hz during normal playback)
14	SOCK	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, SOCK)
18	/RST	I	Reset input
19	SMCK	—	1/2-divided clock signal of crystal oscillating at MSEL = "H" (ISMCK = 8.4672 MHz) 1/4-divided clock signal of crystal oscillating at MSEL = "L" (ISMCK = 4.2336 MHz) (no used, open)
20	PMCK	—	1/192-divided clock signal of crystal oscillating (PMCK = 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

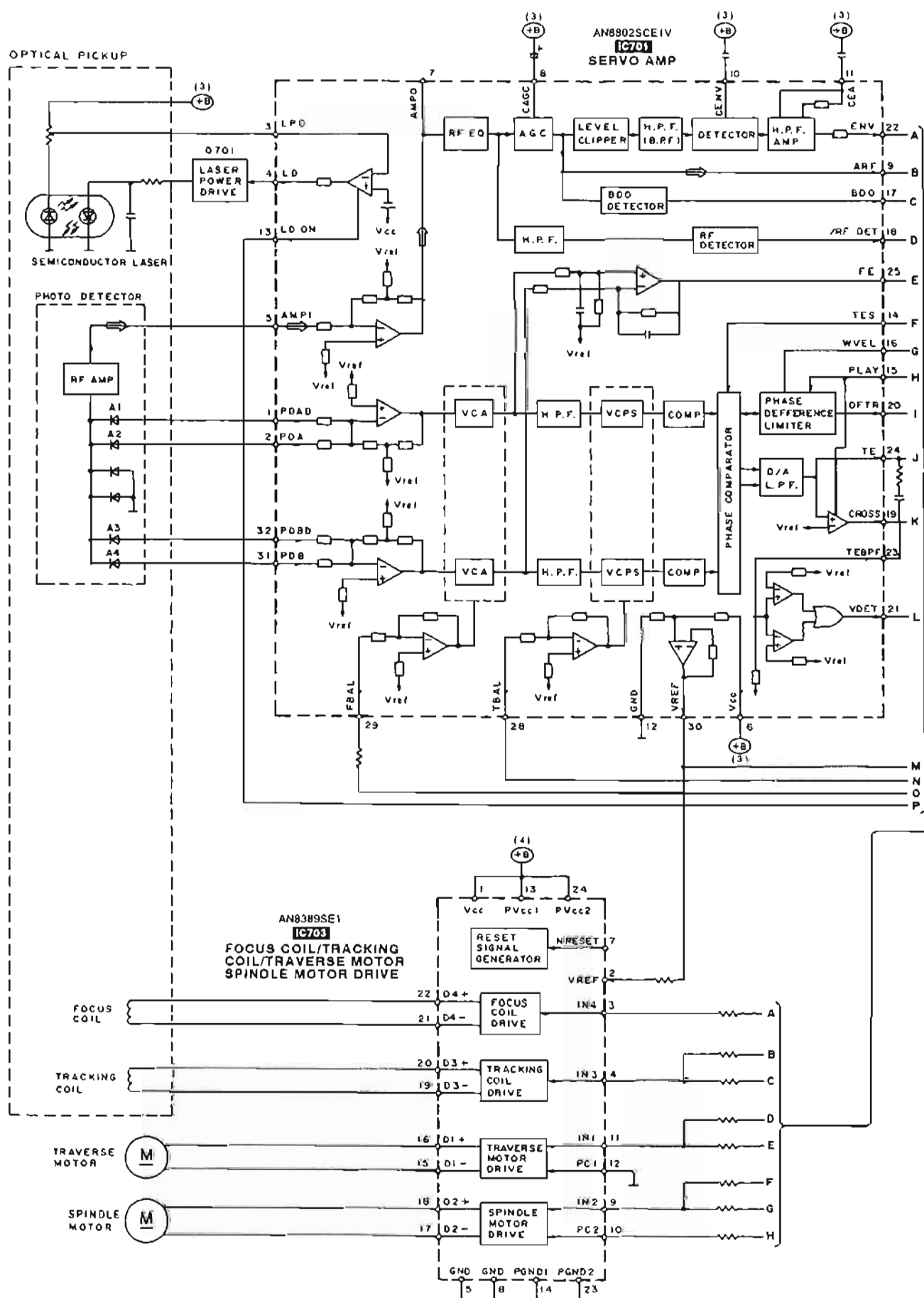
Pin No.	Terminal Name	I/O	Function
36	OFT	I	Off-track signal input ("H": off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal input ("L": detection)
39	BDO	I	Dropout signal input ("H": Dropout)
40	LDON	O	Laser on signal output ("H": ON)
41	TES	O	Tracking error shunt signal output ("H": shunt)
42	PLAY	O	Play signal out ("H": PLAY)
43	WVEL	O	Double speed status signal output ("H": Double speed)
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	PLLF	I/O	PLL loop filter
49	VCOF	I/O	VCO loop filter (no used, open)
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 (IPCK = 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	S8CK	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 (ICLDCK = 7.35 kHz during normal playback)
63	FCLK	—	Crystal frame clock signal output (IFCLK = 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 resynchronizing 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 SUBO terminal ("H": Q code buffer mode)

● IC703 (AN8389SE1)

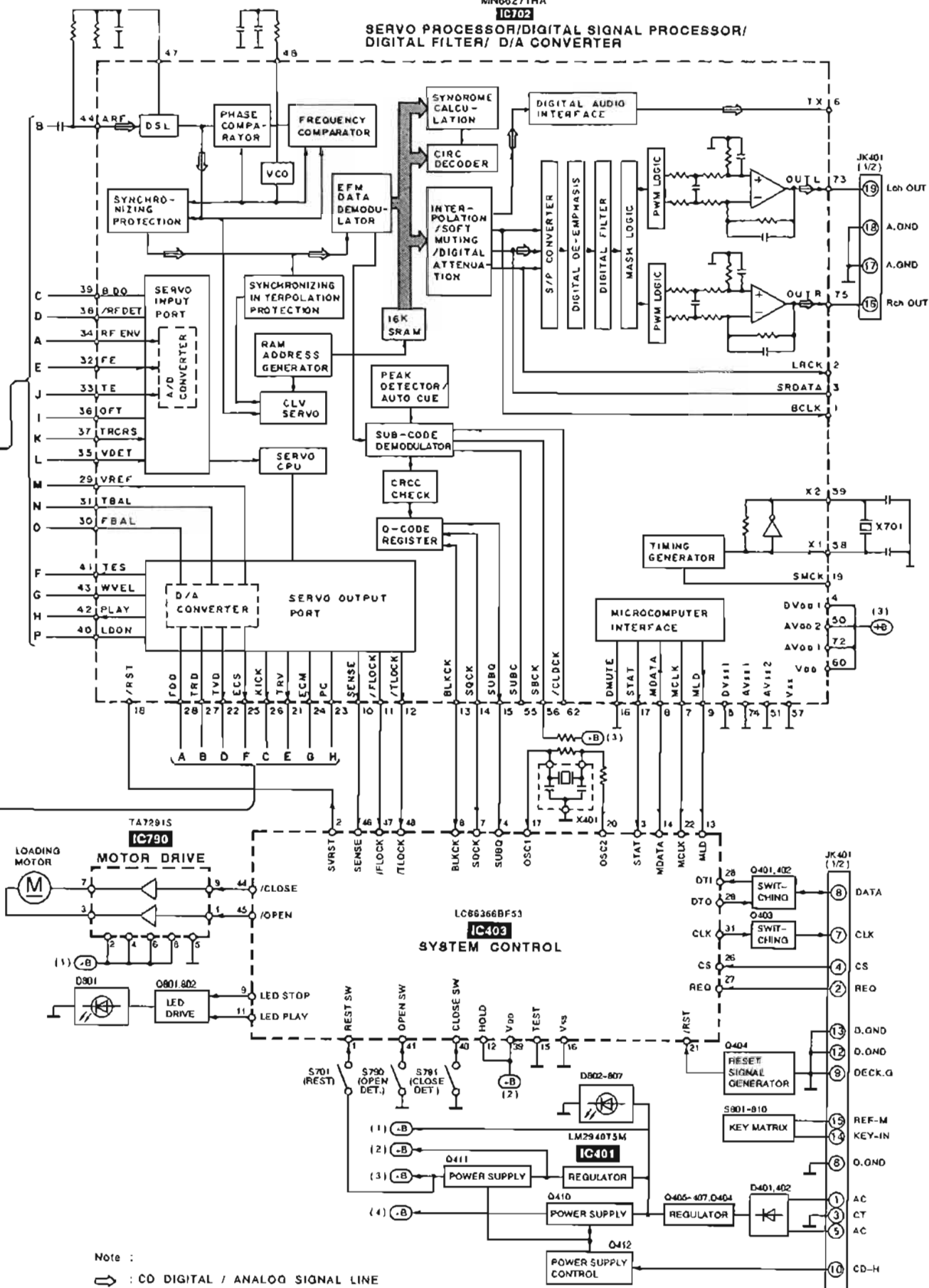
Pin No.	Terminal Name	I/O	Function
1	VCC	—	Power supply
2	VREF	I	VREF input
3	IN4	I	Motor driver (4) input
4	IN3	I	Motor driver (3) input
5	GND	—	Ground connection
6	NC	—	Ground connection
7	NRESET	—	Reset input (no used, open)
8	GND	—	Ground connection
9	IN2	I	Spindle motor driver (2) input
10	PC2	I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

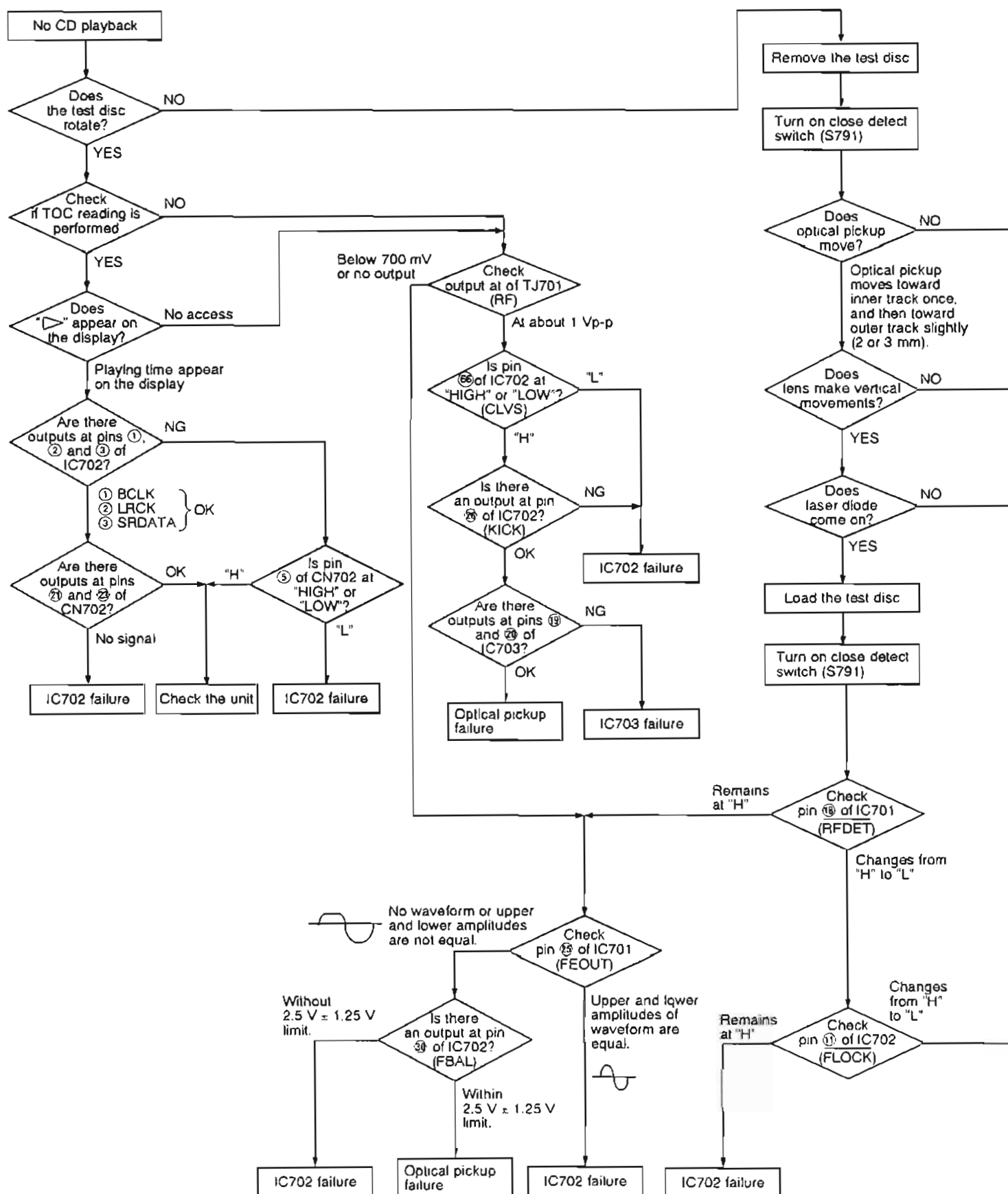


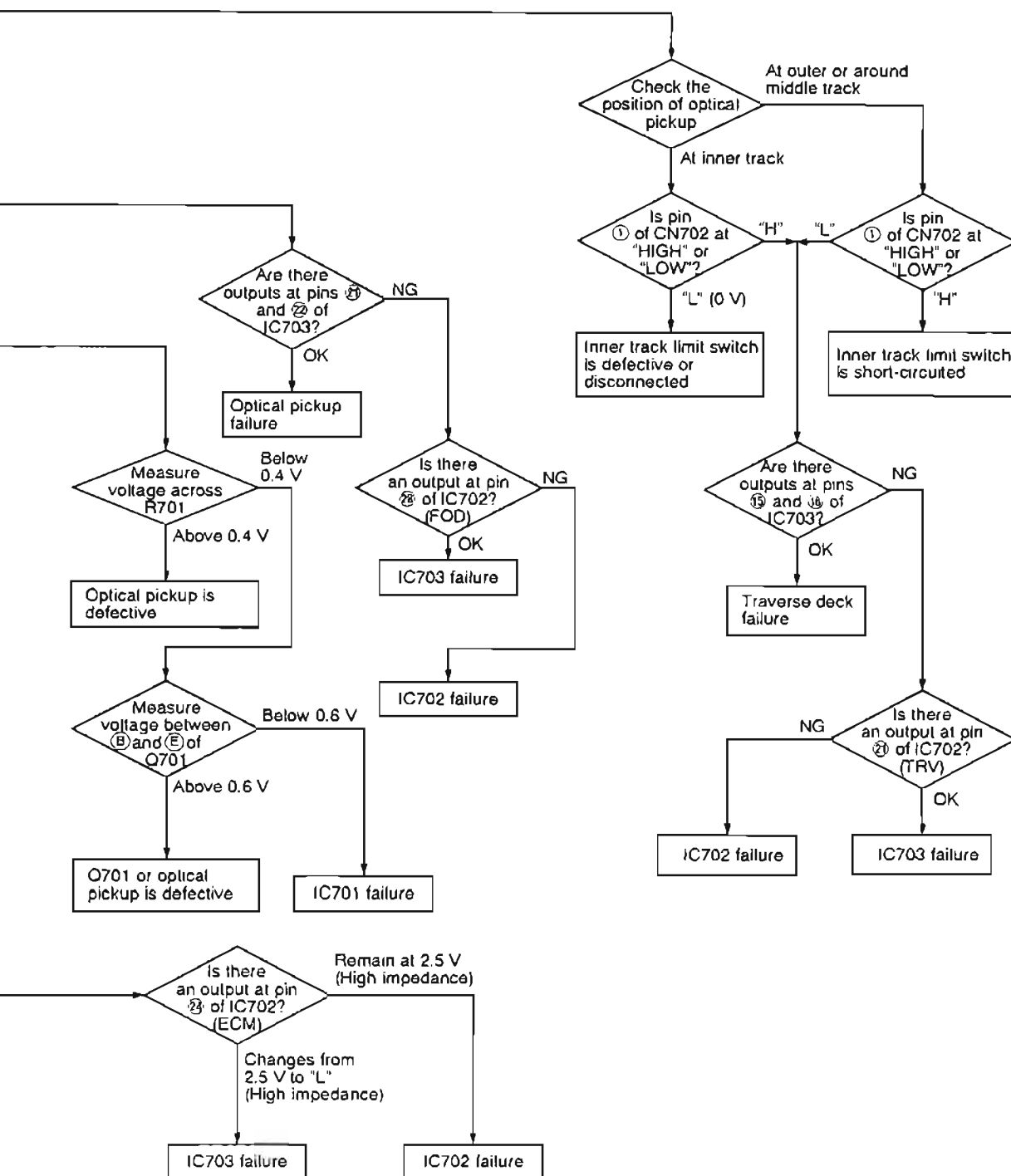
MN66271RA

IC702

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

Troubleshooting Guide





■ Replacement Parts List

Notes: *Important safety notice:

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

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

When replacing any of components, be sure to use only 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.

*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)		S802	EVQ21405R	SW, PAUSE	
				S803	EVQ21405R	SW, F. SKIP	
				S804	EVQ21405R	SW, PLAY	
IC401	LM2940TS	IC, REGULATOR	Δ	S805	EVQ21405R	SW, STOP	
IC403	LC66356B4F53	IC, SYSTEM CONTROL		S806	EVQ21405R	SW, R. SKIP	
IC701	AN8802SCE1V	IC, SERVO AMP.		S807	EVQ21405R	SW, RANDOM	
IC702	MN66271RA	IC, SERVO PROCESSOR		S808	EVQ21405R	SW, ALBUM	
IC703	AN8389SE1	IC, MOTOR DRIVE		S809	EVQ21405R	SW, J. FIT	
IC790	TA7291S	IC, MOTOR DRIVE		S810	EVQ21405R	SW, REPEAT	
		TRANSISTOR(S)				CONNECTOR(S)	
Q401-403	2SC1740SRSTA	TRANSISTOR		CN401	RJP6G182A	CONNECTOR (6P)	
Q404	DTCL14YSTP	TRANSISTOR		CN402	RJSLA6823	CONNECTOR (23P)	
Q405-407	2SD2137PQTA	TRANSISTOR	Δ	CN801, 802	RJSIA6603	CONNECTOR (3P)	
Q410	2SB621A-R	TRANSISTOR		CN701	RJU035T016-1	SOCKET (16P)	
Q411	2SB1434RSTA	TRANSISTOR		CN702	RJSLA6723-1Q	SOCKET (23P)	
Q412	2SC1740SRSTA	TRANSISTOR		CP790	RJP6G172A	CONNECTOR (6P)	
Q701	2SB709S	TRANSISTOR				GND PLATE	
Q801, 802	8TA44TXSTP	TRANSISTOR					
		DIODE(S)		E401	SNE1004-2	GND PLATE	
						JACK	
D401-402	RL1N4003N02	DIODE	Δ				
D403	RL1N4003N02	DIODE					
D404	MTZJ8R2BTA	DIODE	Δ DQ	JK401	RJT065K19	CONNECTOR (SYSTEM) 19P	
D405, 406	1SS254TA	DIODE				TEST JUMPER(S)	
D801	SPR505MDTT	DIODE					
D802-807	LNJ301MPUJAD	DIODE		TJ701, 702	EYF8CU	TEST JUMPER	
		COIL(S)					
L401, 402	BL02RN2R62T4	COIL	Δ				
L406	ELEXT101KA9	COIL					
		OSCILLATOR(S)					
X401	EFOEC4234T3	OSCILLATOR (4.23MHz)					
X701	PSXB16M9J01T	OSCILLATOR (16.9344MHz)					
		SWITCH(ES)					
S701	RSM0006-P	SW, REST					
S790	RSH1A005	SW, LOADING OPEN DETECT					
S791	RSH1A005	SW, LOADING CLOSE DETECT					
S801	EVQ21405R	SW, OPEN/CLOSE					

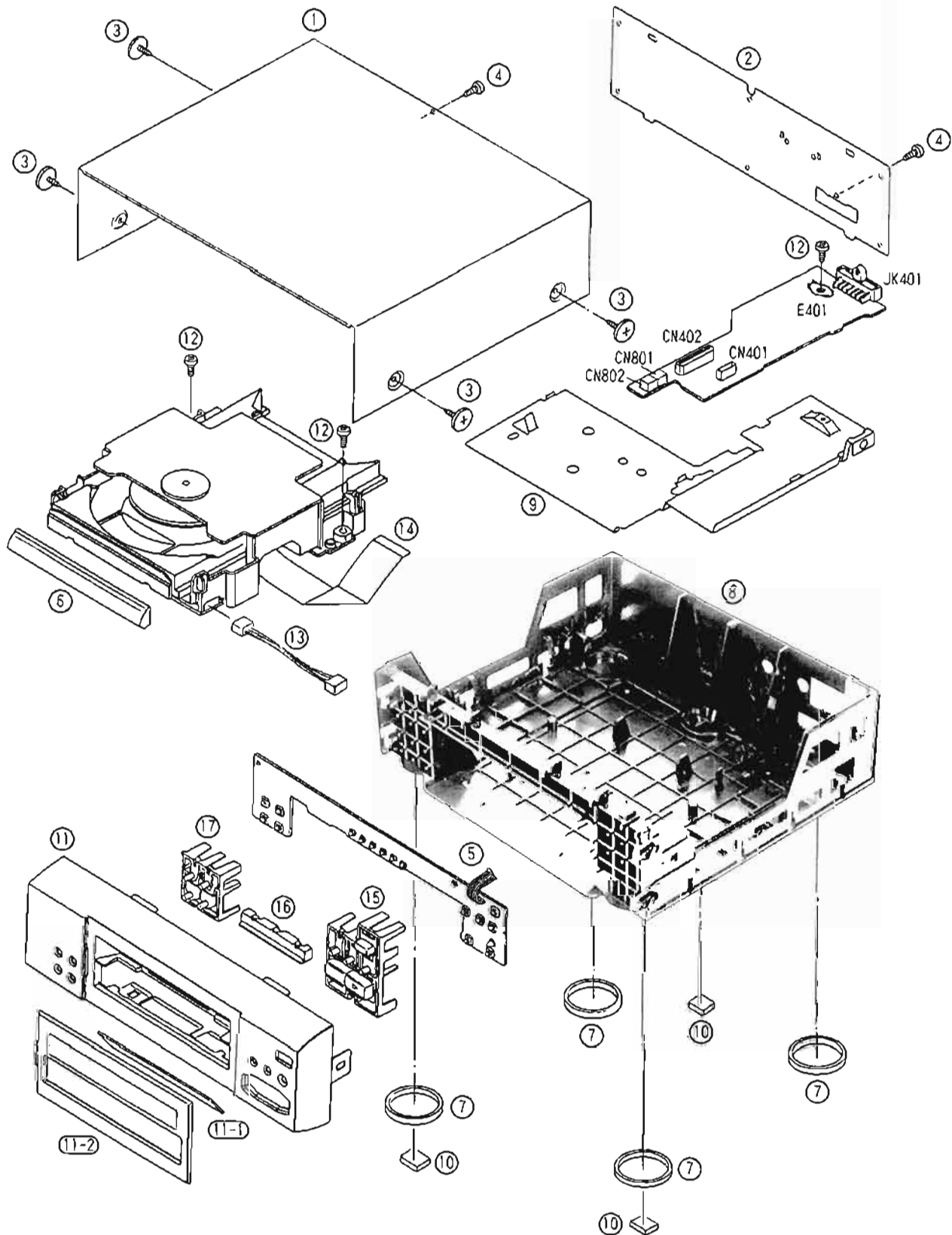
Notes : • Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
• Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM) , 1M=1,000k (OHM)

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS	R724	ERJ6GEYJ333V	1/10W 33K	C420	ECEA1AKA221B	10V 220U
			R725	ERJ6GEYJ472V	1/10W 4.7K	C425	ECBT1E103ZF	25V 0.01U
			R726	ERJ6GEYJ473V	1/10W 47K	C426	ECBT1H01KB5	50V 100P
R403	ERDS2TJ102	1/4W 1K	R727	ERJ6GEYJ103V	1/10W 10K	C427	ECEA1AKA101B	10V 100U
R405, 406	ERDS2TJ103	1/4W 10K	R728	ERJ6GEYJ392V	1/10W 3.9K	C701	ECEA0JKA220	6.3V 22U
R407	ERDS2TJ123	1/4W 12K	R731	ERJ6GEYJ392V	1/10W 3.9K	C702	ECEA1HKA010I	50V 1U
R408-410	ERDS2TJ103	1/4W 10K	R735, 736	ERJ6GEYJ101V	1/10W 100	C703	ECEA0JKA101I	6.3V 100U
R411	ERDS2TJ471	1/4W 470	R744	ERJ6GEYJ103V	1/10W 10K	C704	ECUZ1E104MBN	25V 0.1U
R412	ERDS2TJ101	1/4W 100	R745	ERJ6GEYJ155V	1/10W 1.5M	C705	ECEA1HKA010I	50V 1U
R413	ERDS2TJ471	1/4W 470	R748	ERJ6GEYJ182V	1/10W 1.8K	C706	ECUE1H01JCN	50V 100P
R414	ERDS2TJ102	1/4W 1K	R749	ERJ6GEYJ103V	1/8W 10K	C707	ECUV1E273KBN	25V 0.027U
R415	ERDS2TJ105T	1/4W 1M	R801-804	ERDS2TJ151	1/4W 150	C708	ECUE1H472KBN	50V 4700P
R420	ERDS2TJ103	1/4W 10K	R805-807	ERDS2TJ181T	1/4W 180	C709	ECUE1C473KBN	16V 0.047U
R421-423	ERDS2TJ472	1/4W 4.7K	R810	ERDS2TJ821	1/4W 820	C710	ECUE1H052KBN	50V 1500P
R425	ERDS2TJ103	1/4W 10K	R811	ERDS2TJ102	1/4W 1K	C711, 712	ECUZ1E104MBN	25V 0.1U
R426-428	ERDS2TJ472	1/4W 4.7K	R812	ERDS2TJ122	1/4W 1.2K	C713	ECUV1C104MBN	16V 0.1U
R429	ERDS2TJ471	1/4W 470	R813	ERDS2TJ152	1/4W 1.5K	C714	ECEA0JKA101I	6.3V 100U
R430	ERDS2TJ104	1/4W 100K	R814	ERDS2TJ182	1/4W 1.8K	C715	ECEA0JKA470I	6.3V 47U
R431-434	ERDS2TJ103	1/4W 10K	R815	ERDS2TJ222	1/4W 2.2K	C716	ECUE1H561KBN	50V 560P
R435-438	ERDS2TJ472	1/4W 4.7K	R816	ERDS2TJ332	1/4W 3.3K	C717	ECUZ1E104MBN	25V 0.1U
R439	ERDS2TJ101	1/4W 100	R817	ERDS2TJ472	1/4W 4.7K	C718	ECUV1C224KBN	16V 0.22U
R440	ERDS2TJ102	1/4W 1K	R818	ERDS2TJ682T	1/4W 6.8K	C721	ECUV1H070DCN	50V 7P
R441 Δ	ERQ16NKR15E	1/5W 0.15				C722	ECUV1H220JCN	50V 22P
R442 Δ	ERDS1FVJ271T	1/2W 270			CHIP JUMPER(S)	C723	ECEA1AKA221I	10V 220U
R443 Δ	ERD2FCVJ6R8T	1/4W 6.8				C724	ECUV1C104MBN	16V 0.1U
R444	ERDS2TJ102	1/4W 1K	J701, 702	ERJ8GEYR000A	1/8W 0	C725, 726	ECUV1H102JCN	50V 1000P
R445-447	ERDS2TJ1R2	1/4W 1.2	J707-709	ERJ8GEYR000A	1/8W 0	C727, 728	ECEA1HPK010I	50V 1U
R451	ERDS2TJ391	1/4W 390	J714	ERJ8GEYR000A	1/8W 0	C730	ECUZ1E104MBN	25V 0.1U
R452	ERDS2TJ103	1/4W 10K	J716-718	ERJ8GEYR000A	1/8W 0	C731, 732	ECEA0JK221I	6.3V 220U
R453, 454	ERDS2TJ151	1/4W 150	J721	ERJ6GEYR000A	1/10W 0	C733	ECUZ1E104MBN	25V 0.1U
R455, 456	ERDS2TJ332	1/4W 3.3K	J724-726	ERJ6GEYR000A	1/10W 0	C734	ECEA1AKA221I	10V 220U
R457, 458	ERDS2TJ102	1/4W 1K	J728, 729	ERJ8GEYR000A	1/8W 0	C735-737	ECUZNE104MBN	25V 0.1U
R459, 460	ERDS2TJ123	1/4W 12K	J731, 732	ERJ6GEYR000A	1/10W 0	C738	ECUV1C154KBN	16V 0.15U
R701	ERJ6GEYJ100	1/10W 10				C742	ECUV1E273KBN	25V 0.027U
R702	ERJ6GEYJ471V	1/10W 470			CAPACITORS	C743	ECUZNE104MBN	25V 0.1U
R703	ERJ6GEYJ823	1/10W 82K	C401	ECBT1E103ZF	25V 0.01U	C744	ECUE1E822KBN	25V 8200P
R704	ERJ6GEYJ102A	1/10W 1K	C402	ECBT1H104ZF5	50V 0.1U	C745	ECUE1H102KBN	50V 1000P
R705	ERJ6GEYJ103V	1/10W 10K	C403	ECBT1H102KB5	50V 1000P	C747	ECUE1H222KBN	50V 2200P
R706	ERJ6GEYJ102A	1/10W 1K	C404	ECBT1E103ZF	25V 0.01U	C748	ECUV1H471KBN	50V 470P
R707	ERJ6GEYJ473V	1/10W 47K	C406	ECEA1HKA3R3B	50V 3.3U	C790	ECA1AKF820E	10V 82U
R708	ERJ6GEYJ104V	1/10W 100K	C409	ECBT1E103ZF	25V 0.01U	C801	ECBT1H102KB5	50V 1000P
R709	ERJ6GEYJ683V	1/10W 68K	C410 Δ	ECA1CM222B	16V 2200U			
R711	ERJ6GEYJ154V	1/10W 150K	C411-413	ECBT1E103ZF	25V 0.01U			
R712	ERJ6GEYJ221V	1/10W 220	C414	ECEA1HKA010B	50V 1U			
R714	ERJ6GEYJ121V	1/10W 120	C415	ECEA0JKA470B	6.3V 47U			
R717, 718	ERJ6GEYJ102A	1/10W 1K	C416	ECEA1AKA101B	10V 100U			
R721	ERJ6GEYJ101V	1/10W 100	C417, 418	ECBT1H102KB5	50V 1000P			
R722	ERJ6GEYJ563V	1/10W 56K	C419	ECEA0JKA221B	6.3V 220U			
R723	ERJ6GEYJ182V	1/10W 1.8K						

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	CABINET		101	RFKJXD07-K	CHASSIS ASS'Y	
2	RGRD217A-A	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(W801)6P		102	REM0019	MOTOR ASS'Y	
6	RKMD722-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	RFKGLCH530EK	FRONT PANEL ASS'Y		108	RMM0059-1	SLIDE PLATE(2)	
11-1	RGC0013-S	MIRROR		109	RMM0079-1	SLIDE PLATE(1)	
11-2	RKMD394-Q2	PANEL		110	XTN26+6G	SCREW	
12	XTB3+8JFZ	SCREW		111	XYN2+F6FZ	SCREW	
13	REX0510	CABLE ASS'Y(6P)		112	RHM245ZA	MAGNET	
14	REZ0560	FFC(23P)		113	RFKNLCH530EA	DISC CLAMPER ASS'Y	
15	RFKNLCH530EK	BUTTON ASS'Y		114	RMRO334	MAGNET HOLDER	
16	RGL0289-Q	LEADING LIGHT PANEL		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	RAED113Z	TRAVERSE UNIT ASS'Y	
				120A	SHGD112	RUBBER	
				120B	SHGD113-1	RUBBER	
				120C	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	RMKD255	COVER	
						GREASE OR JIG/TOOL	
				SA1	SZZP1054C	TEST DISC(PLAYABILITY)	
				SA2	SZZP1056C	TEST DISC(UNEVEN)	
				SA3	SZZP1101C	HEXAGONAL WRENCH	
				SA4	RFKXEM30L	GREASE(CD MECHANISM)	

■ Cabinet Parts Location



■ Loading Unit Parts Location

Note:

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

Ref No.	Part No.
①	RFKXEM30L

