ORDER NO. AD9501004C1
A6

Service Manual

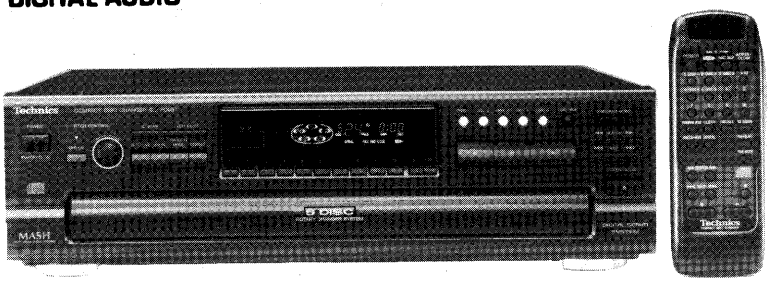
Compact Disc Changer

SL-PD987

COMPACT disc DIGITAL AUDIO

DIGITAL

MASH* multi-stage noise shaping



Colour

(K) ... Black Type

Area

Suffix for Model No.	Area	Colour
(PP)	U.S.A. and Canada.	(K)

※
- Technics (or Panasonic) developed the world's first MASH type DAC and ADC. MASH technology was invented by NTT (LSI Labs).
- MASH is a trademark of NTT.

RAE0113Z MECHANISM SERIES

■ SPECIFICATIONS

■ AUDIO

No. of channels	2 (left and right, stereo)
Frequency response	2–20,000 Hz, ±1 dB
Output voltage	2 V (at 0 dB)
Dynamic range	92 dB
S/N	100 dB
Total harmonic distortion	0.007 % (1 kHz, 0 dB)
Wow and flutter	Below measurable limit
DA converter	MASH (1 bit)
Output impedance	Approx. 1 kΩ
Load impedance	More than 10 kΩ

■ PICKUP

Wavelength	780 nm

■ GENERAL

Power consumption	12 W
Power supply	AC 120 V, 60 Hz
Dimensions (W × H × D)	430 × 125 × 377 mm (16-15/16″ × 4-15/16″ × 14-27/32″)
Weight	4.6 kg (10.1 lb.)

Note:

Disign and specifications are subject to change without notice.
Weight and dimensions are approximate.

■ CONTENTS

Technics®

Contents

⚠ 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.

■ PRECAUTION OF LASER DIODE

CAUTION: This unit utilizes a class 1 laser. Invisible laser radiation is emitted from the optical pickup lens when the unit is turned on:

1. Do not look directly into the pickup lens.
2. Do not use optical instruments to look at the pickup lens.
3. Do not adjust the preset variable resistor on the optical pickup.
4. Do not disassemble the optical pickup unit.
5. If the optical pickup is replaced, use the manufactures specified replacement pickup only.
6. Use of control or adjustments or performance of procedures other than those specified herin may result in hazardous radiation exposure.

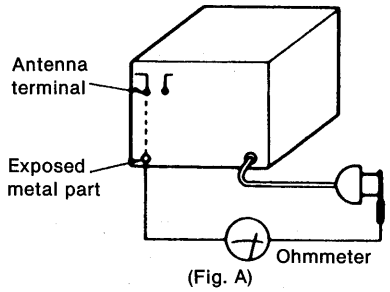
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

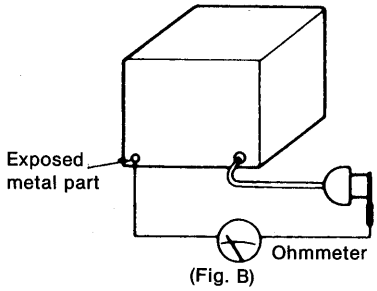
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance=3MΩ–5.2MΩ



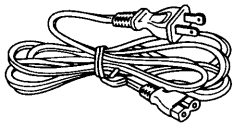
(Fig. B)

Resistance=Approx ∞

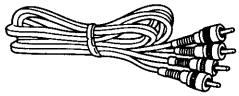
4. If the measurement is outside the specified limits, there is a possibilty of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ ACCESSORIES

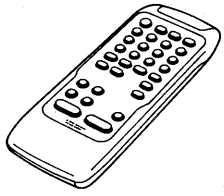
AC power supply cord... 1 pc. (SJA172)



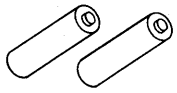
Stereo connection Cable..... 1 pc. (SJP2249-3)



Remote control transmitter..... 1 pc. (RAK-SL122WH)

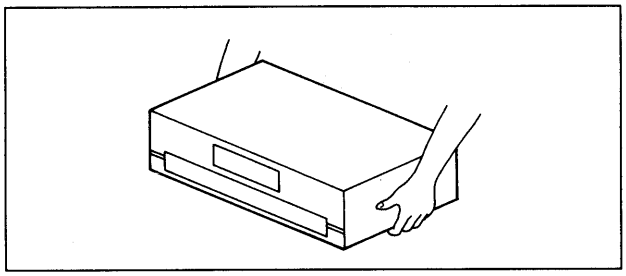


Batteries for remote control transmitter..... 2 pcs. (UM-4, "AAA", R03)



Note: These are available on sale route.

■ CAUTIONS CONCERNING THE MOVING OF THIS UNIT



CAUTION

Before moving the changer to another location, be sure to carry out the "Preparations for moving the unit" described below.

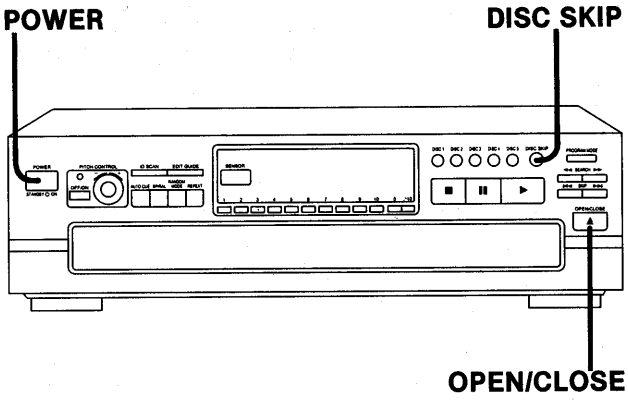
Failure to do so will expose the compact discs and the changer to the risk of severe damage.

Preparations for moving the unit

All of the discs must be removed so that the trays are completely empty.
Use the following procedure.

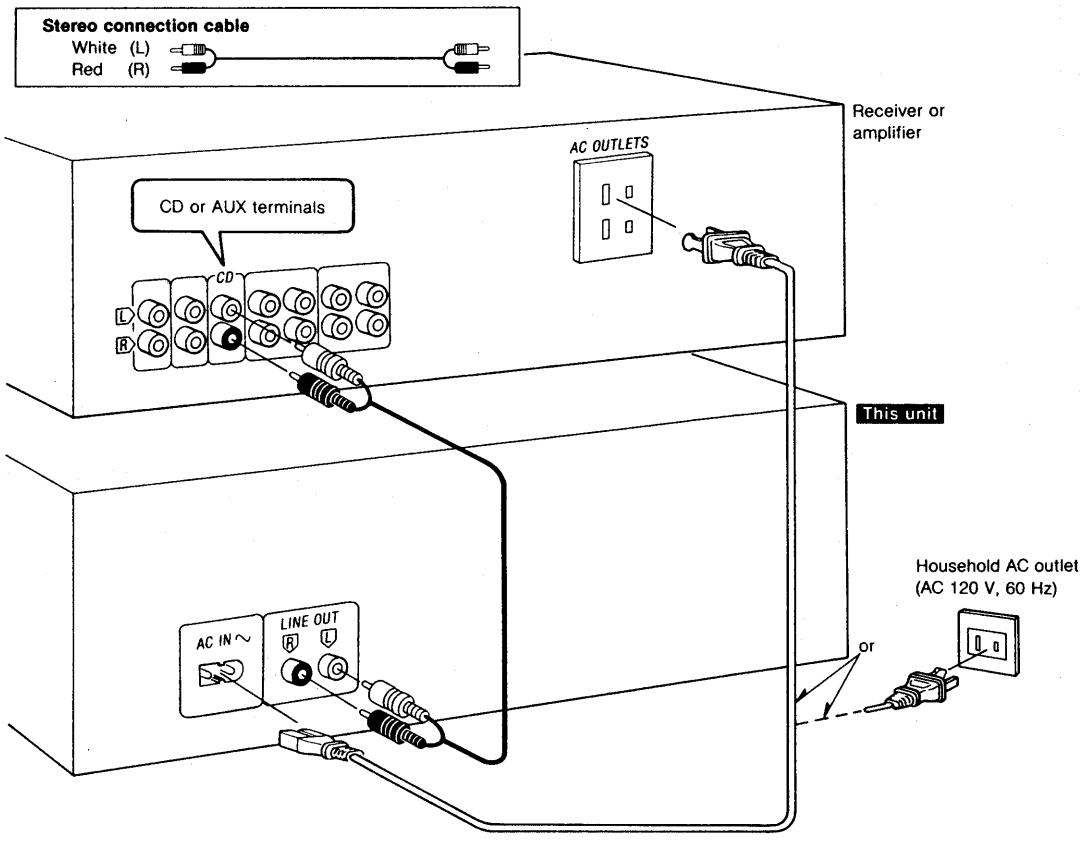
① Press POWER to switch off the unit.
② Press POWER to switch on the unit.
(If there is a disc in the play section, it will be returned to the disc tray at this time.)
③ Press OPEN/CLOSE to open the loading drawer.
④ Press DISC SKIP to rotate the disc trays and remove the discs from all disc trays.
⑤ Press OPEN/CLOSE to close the loading drawer.
⑥ Press POWER to switch off the unit.

If you have pressed a wrong button by mistake, return to step ①.

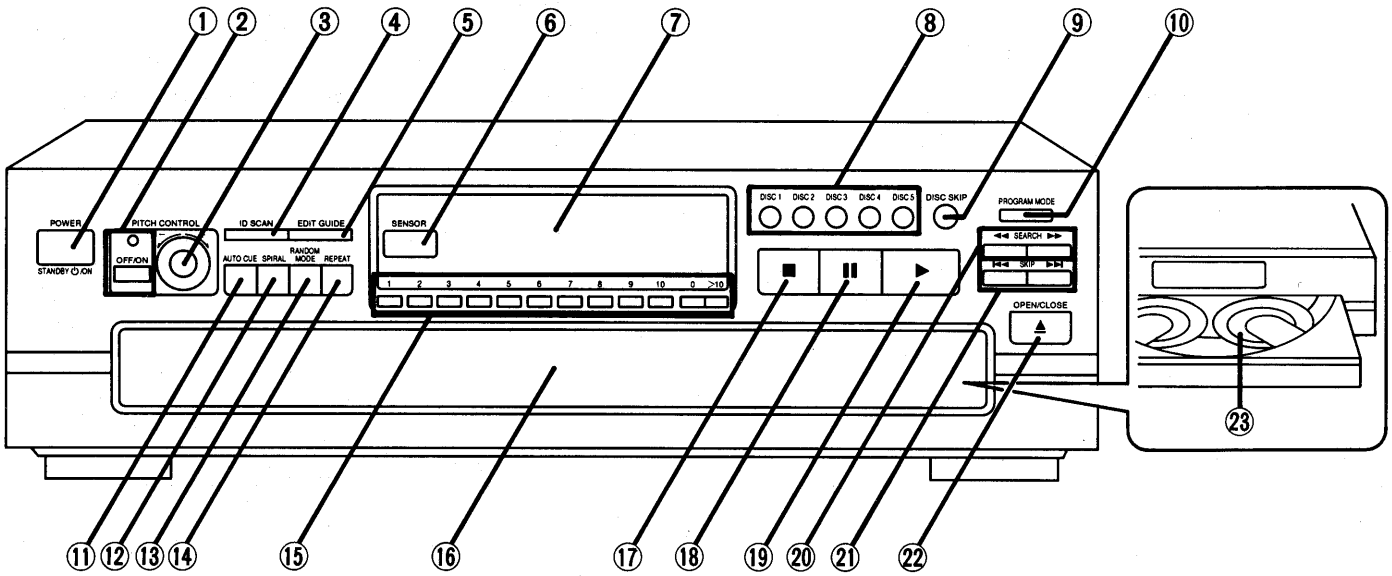


■ CONNECTIONS

Before connecting the changer to your audio system, make sure that the power of the changer and all other system components are turned off.



■ FRONT PANEL CONTROLS



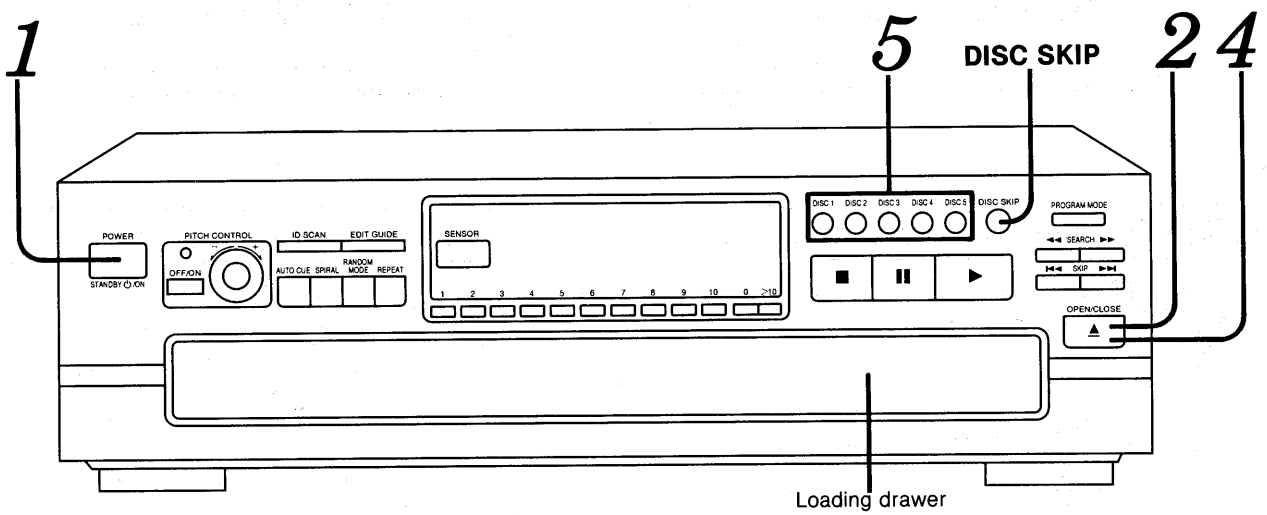
No.	*Name*
①	**Power "STANDBY ⏻ /ON" switch (POWER, STANDBY ⏻ /ON)** Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.
②	**Pitch control button/indicator (PITCH CONTROL, OFF/ON)**
③	**Pitch control knob (PITCH CONTROL, −, +)**
④	**ID scan button (ID SCAN)**
⑤	**Edit guide button (EDIT GUIDE)**
⑥	**Remote control signal sensor (SENSOR)**
⑦	**Display**
⑧	**Disc buttons (DISC 1 − 5)**
⑨	**Disc skip button (DISC SKIP)**
⑩	**Program mode button (PROGRAM MODE)**
⑪	**Auto cue button (AUTO CUE)**

No.	*Name*
⑫	**Spiral button (SPIRAL)**
⑬	**Random mode button (RANDOM MODE)**
⑭	**Repeat button (REPEAT)**
⑮	**Numeric buttons (1 − 10, 0, >10)**
⑯	**Loading drawer**
⑰	**Stop button (■)**
⑱	**Pause button (II)**
⑲	**Play button (▶)**
⑳	**Search buttons (◀◀ SEARCH ▶▶)**
㉑	**Skip buttons (I◀◀ SKIP ▶▶I)**
㉒	**Loading drawer open/close button (▲ OPEN/CLOSE)**
㉓	**Disc trays (1 − 5)**

■ BASIC OPERATIONS

Sequential play

All of the discs will be played, beginning from track 1 on the selected disc.



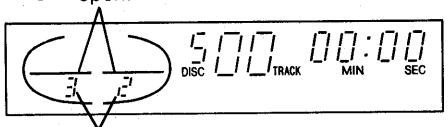
The explanation below is an example of operation in the case where all five disc trays in the changer are holding CDs.

1 POWER

Press POWER.
The unit will switch on.

2 OPEN/CLOSE

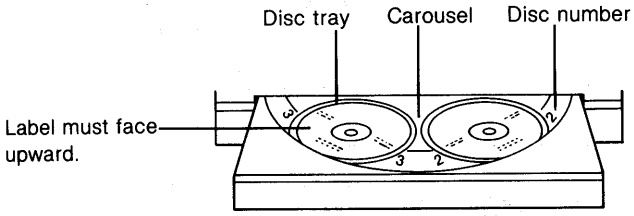
Press OPEN/CLOSE to open the loading drawer.
Indicates that the loading drawer is open.



Numbers of the trays in which discs are loaded.

3

Load the disc(s) on the disc tray(s).
The discs can be loaded two at a time by pressing DISC SKIP to rotate the carousel.



Note
Do not load 3″ (8 cm) and 5″ (12 cm) discs on the same disc tray.

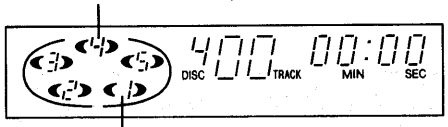
CAUTION
Do not touch the loading drawer and carousel while they are in motion, and do not attempt to rotate the carousel by hand; doing so could result in incorrect operation of the unit and/or damage to the discs.

4 OPEN/CLOSE

Press OPEN/CLOSE again to close the loading drawer.

Note
Do not attempt to close the drawer by hand.

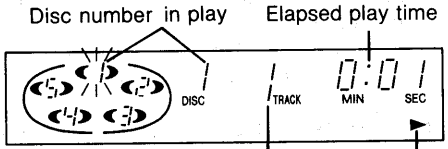
Current play position (The numeral illuminates with a red color.)



Illuminates when a disc is in the disc tray. If there is no disc in the disc tray, the indication disappears when the disc tray comes to the play position.

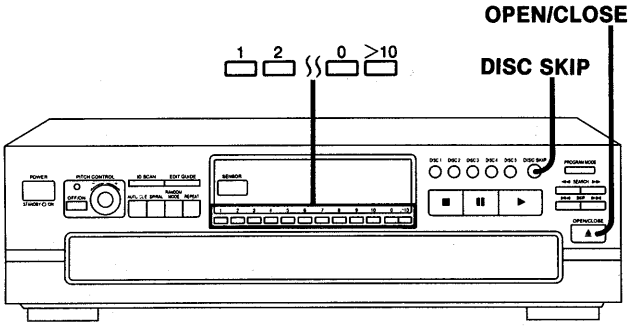
5 DISC 1 DISC 2 DISC 3 DISC 4 DISC 5

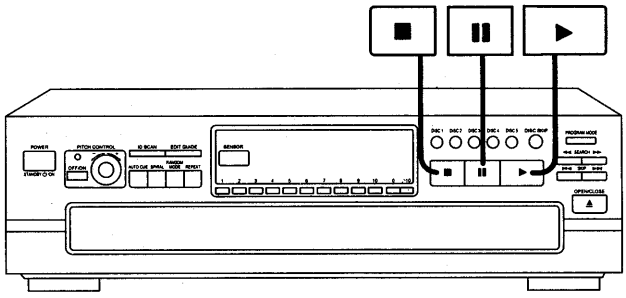
Press the desired disc button (1 – 5).
Play will begin from the selected disc. If a disc is not on the selected disc tray, the changer plays the disc at the next number.



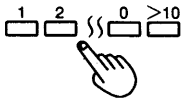
The illumination of a disc button indicates that there is a disc in the corresponding tray. During play, the illumination color will change to green.

The changer plays all the tracks on all the discs in order and stops automatically when the last track on the last disc finishes playing. The first disc will then be at the playing position.

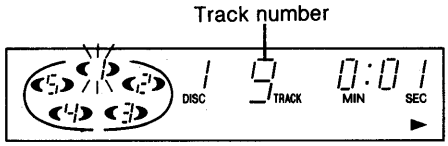




To directly access a desired track



Press the numeric button(s) to select the track.

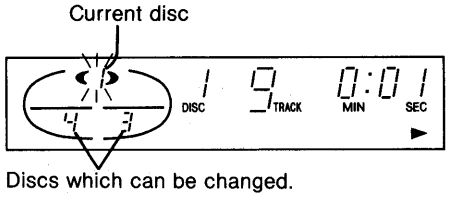


To select a track between 1 and 10:
Press the corresponding number on the numeric button.
To select a two-digit track number over 10:
First press >10, and then press the numbers for the two digits.
For example; number 20:
Press >10, then 2, and then 0.

To exchange discs during play

While playing a disc, it is possible to change the other discs without interrupting play.

① **Press OPEN/CLOSE to open the loading drawer.**



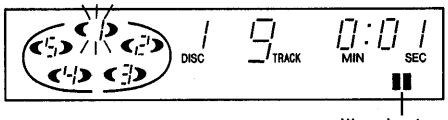
② **Press DISC SKIP to rotate the disc trays and exchange the discs.**
The carousel will move by one disc tray. Pressing again moves the carousel in the opposite direction by two disc trays.

③ **Press OPEN/CLOSE to close the loading drawer.**

Note
If you play a disc with the loading drawer open, discs other than the current disc cannot be played.

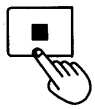
To temporarily stop play

Press ❚❚.

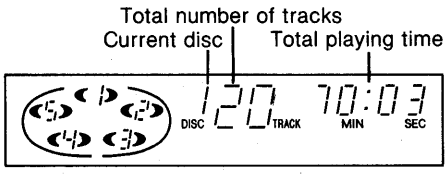


Press ▶ to resume play.

To stop play



Press ■.
The display will show the total number of tracks and the total playing time of the current disc.



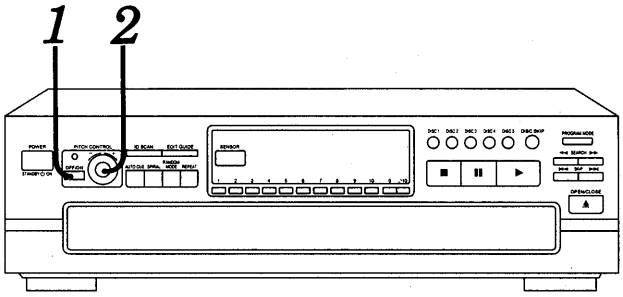
The total playing time displayed includes the silent sections between tracks. For this reason, it may be a few seconds longer than the playing time indicated on the disc.

Press ▶ to re-start play.

CAUTION
Do not move this changer with a compact disc inside the unit. If a disc comes off the disc tray, it might be scratched or the changer might become incapable of playing.
(Refer to "Cautions concerning the moving of this unit" on the back cover.)

■ PITCH CONTROL FUNCTION

The playback pitch can be changed as desired within a range of ±12.5%. (The tempo and the pitch of the sound will change simultaneously.)



1 OFF/ON

Press OFF/ON.

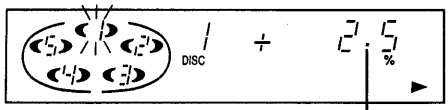
The pitch control indicator on this unit will illuminate.

2

Turn the knob in the "−" or "+" direction.

−: Pitch decreases
+: Pitch increases

The pitch will change while the knob is being held, and the changed values will show on the display.



If the knob is released, the pitch will stop changing, and after approximately 2 seconds the pitch display will change back to the time display.

Pitch changing steps:

The +5.9% position is a half tone-sharp (♯).
The −5.6% position is a half tone-flat (♭).

To fine-tune the pitch

Turn the knob and then immediately turn it back to the original position. In this case, the pitch will change by 0.1% only.

To play in 0% standard pitch

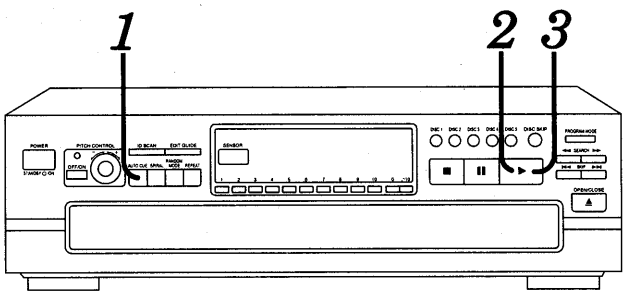
Press OFF/ON so that the pitch control indicator will switch off. Even after the pitch control indicator has been switched off, the pitch setting will remain in memory.

For your reference:

- The pitch can be adjusted by turning the knob even if the pitch control indicator is switched off. The playback sound will not change if this is done. To play back at the setting pitch, press OFF/ON to make the pitch control indicator illuminate.
- While changing the pitch, the time display will show the playback position only. This will not match the actual playback time.
- The pitch value and the on/off setting of the pitch control will remain stored in the memory even after the unit is switched off. However, if the power cord is unplugged or the power supply is otherwise interrupted for an extended length of time, the memory will be erased.

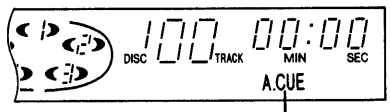
■ AUTO CUE FUNCTION

The auto cue function allows the unit to wait in a standby condition at the beginning of each track so as to start play right when you are ready.
When each track finishes playing, the unit skips to the beginning of the next track and switches to the play standby mode.



1 AUTO CUE

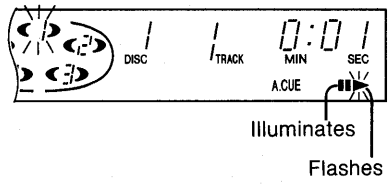
Press AUTO CUE.



2

Press ▶.

The changer switches to the play standby mode at the beginning of the track.



3

Press ▶ again to start play.

Press ▶ at the beginning of each track.

To cancel auto cue mode

AUTO CUE

Press AUTO CUE.

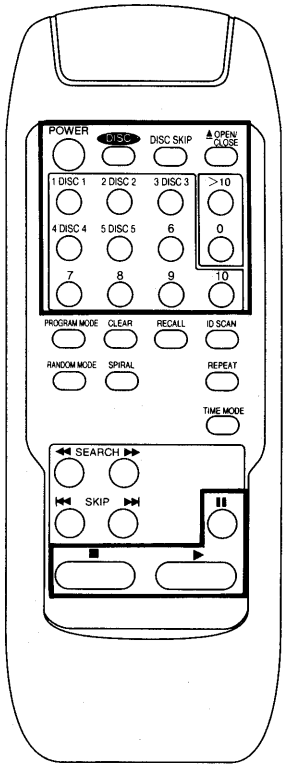
The "A.CUE" indicator will go out.

Note

The auto cue function may not cause the unit to wait exactly at the beginning of a track if the track begins with a very soft passage or if there is a lot of background noise.

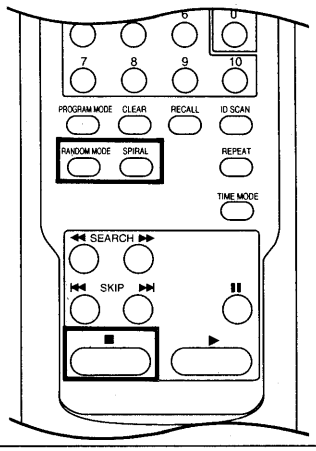
■ REMOTE CONTROL OPERATION

Basic operation



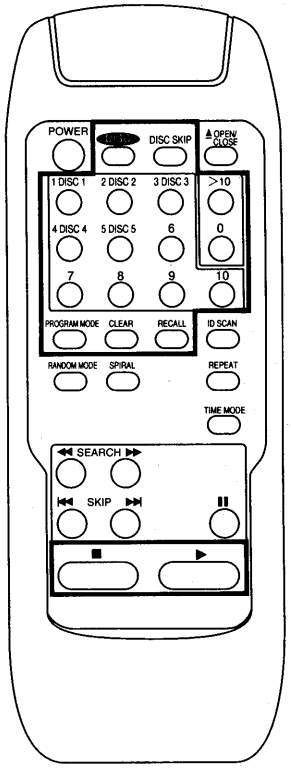
To turn OFF/ON the main unit	POWER
To open/close the loading drawer	▲OPEN/ CLOSE
To rotate the carousel	DISC SKIP
To select the desired disc number	DISC → 1 DISC 1, 2 DISC 2, 3 DISC 3, 4 DISC 4, 5 DISC 5
To select the desired track number	1 DISC 1, 2 DISC 2, 3 DISC 3, >10, 4 DISC 4, 5 DISC 5, 6, 0, 7, 8, 9, 10 **To select a track between 1 and 10:** Press the corresponding number on the keypad. **To select a two-digit track number over 10:** First press >10, and then press the numbers for the two digits.
To start play	▶
To stop play temporarily	II — Press ▶ button to resume play.
To stop play	■

Random/spiral play



To start one disc/full random play	RANDOM MODE — Each time the button is pressed, the random mode will change in the following order: One disc random → Full random → (off)
To start spiral play	SPIRAL — To cancel spiral mode, press this button again.
To stop random/spiral play	■ — Random/spiral mode is also canceled at the same time.

Program/delete play



To start program/delete play

① PROGRAM MODE

Select program or delete mode.
Each time the button is pressed, the program/delete mode will change in the following order:

Program → Delete → (off)

② DISC → 1 DISC 1, 2 DISC 2, 3 DISC 3, 4 DISC 4, 5 DISC 5

Select the disc number.

③ 1 DISC 1, 2 DISC 2, 3 DISC 3, >10, 4 DISC 4, 5 DISC 5, 6, 0, 7, 8, 9, 10

Select the track number.

Repeat steps ② and ③ until you have completed the desired entry.

④ ▶

Start play.

To check the entered contents

RECALL

The selections entered are displayed one by one each time this button is pressed.

To clear a single item of the entered contents

CLEAR

Only the selection which is currently displayed is cleared.

To clear all entered contents

(In the stop mode)

■

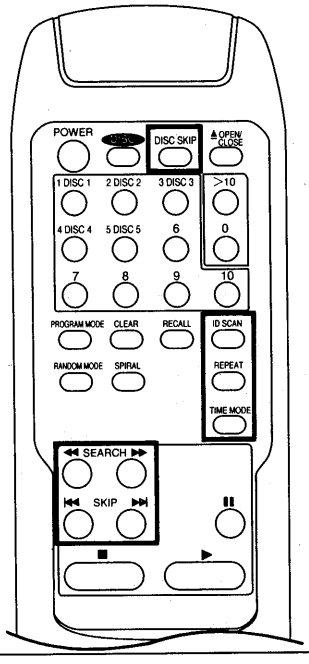
To cancel program/delete mode

(In the stop mode)

PROGRAM MODE

Press twice in program mode.
Press once in delete mode.

Other functions



To skip discs

DISC SKIP

To skip tracks

SKIP

To search for a desired place

(In the play or pause mode)

SEARCH

To start ID scan

ID SCAN

To cancel ID scan, press this button again.

To repeat play

REPEAT

To cancel repeat mode, press this button again.

To select time mode

TIME MODE

■ SELF-DIAGNOSTIC DISPLAY FUNCTION

Self-diagnostic display

This unit is equipped with a self-diagnostic display function which, if a problem occurs, will display an error code corresponding to the problem.
Use this function when performing maintenance on the unit.

Display procedure	Display location

Entering the Self-Diagnostic Mode

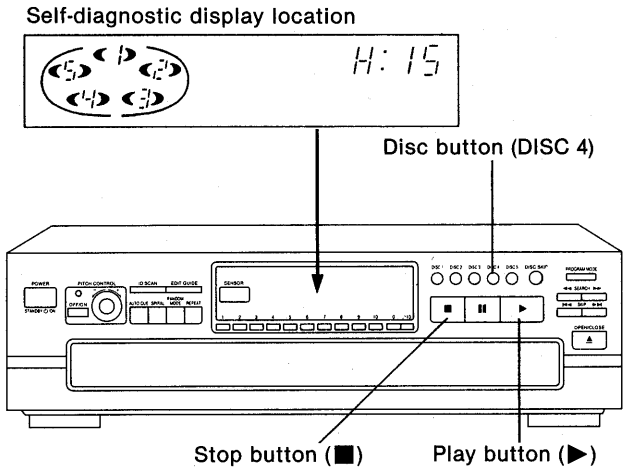
1. With no CD loaded in the tray, turn on the unit.
2. Unplug the power cord of the unit, and then plug it back in while pressing the STOP (■), PLAY (▶) and DISC 4 buttons together. This will bring up the FL display.
3. Release the above three buttons.

To Display Self-Diagnostic Results

1. When the FL display lights up, the unit automatically repeats an approximately 50-second cycle of the following operations.

※ → Tray opens. —Ⓐ→ Tray closes. —Ⓑ→ Traverse deck lifts. → Tray opens. → Tray closes. —Ⓑ→ Traverse deck lowers. → Rotary tray turns counter-clockwise two disc slots. —Ⓒ→ Traverse deck lifts once, and then lowers. → Rotary tray turns clockwise one disc slot. —Ⓒ→ Traverse deck lifts once, and then lowers. → Rotary tray turns clockwise three disc slots. —Ⓒ→ Traverse deck lifts once, and then lowers. → Rotary tray turns counterclockwise one disc slot. —Ⓒ→ Traverse deck lifts once, and then lowers. → Rotary tray turns counterclockwise two disc slots. → ※

Self-diagnostic display location



2. Self-diagnostic fault results appear on the FL display for approximately one second as "H15" at location Ⓐ, "H16" at Ⓑ and "F18" at Ⓒ, during the above cycle.
3. If there are no faults as a result of self-diagnostic, "00 TRACK 00:00 (MIN SEC)" appears on the FL display.

To Return to Normal Display

- Press the power button to turn off the unit, and then turn it on again.

To Display Self-Diagnostic Results Again

- Follow steps 1 through 3 of "Entering Self-Diagnostic Mode" above.

To Clear the Display of Self-Diagnostic Results

- Turn off the unit to clear the contents of the stored fault results.

Interpretation of error codes

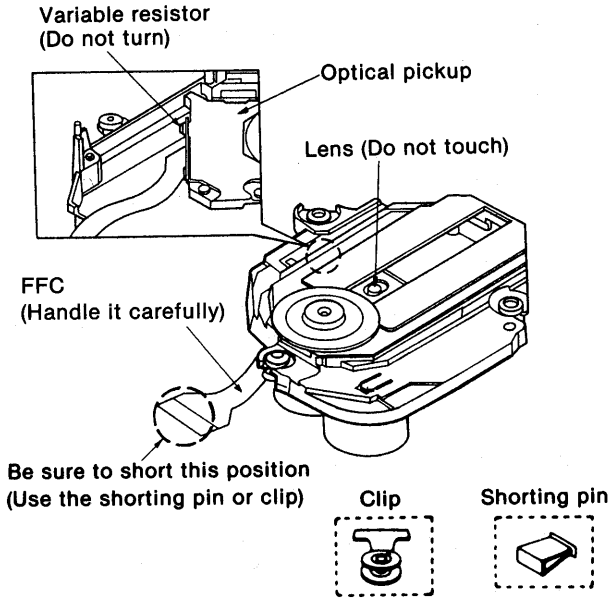
Error code	Problem condition	Correction procedure
H15	CD tray does not open or close when CD tray open/close (▲) button is pressed.	Faulty loading motor and motor drive IC (IC501), or faulty contact or short-circuit on open/close detect switch, S551. (Check and replace)
H16	When the CD tray open/close (▲) button is pressed, the CD tray closes momentarily but then opens again, or opens momentarily and then closes again.	
F18	Faulty rotary turret rotation detection. Example: The turret continues to turn at the initial position without stopping.	Check the optical sensor (D501) and replace if necessary.

■ 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 antistatic shorting pin is inserted into the flexible board (FFC).
   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).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

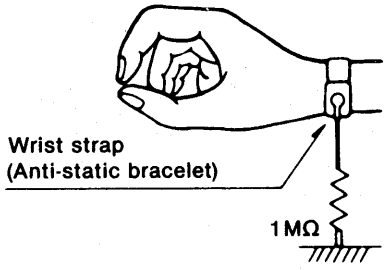


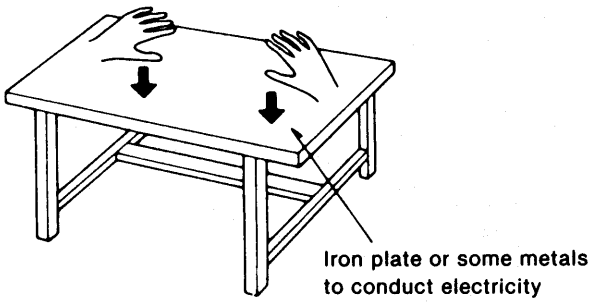
• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table gounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:

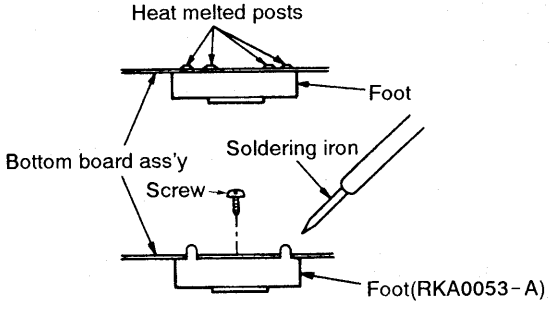
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).





■ REPLACEMENT OF THE FOOT

1. Remove the 4 heat melted posts on the Bottom board ass'y with a pair of nippers or similar tool.
2. To replace the foot (RKA0053-A) on the Bottom board ass'y melt the 4 posts with a soldering iron or install it with a screw (XTB3+6J).

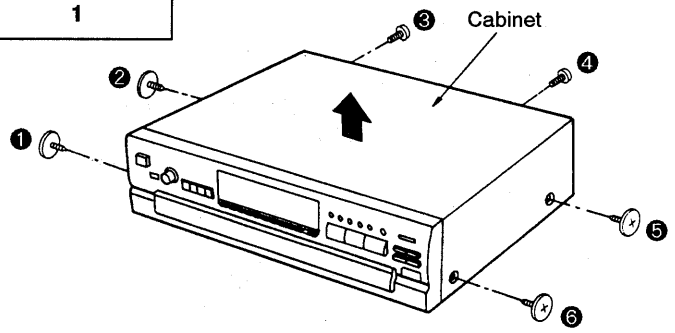


■ DISASSEMBLY INSTRUCTIONS

"ATTENTION SERVICER"
Some chassis components may have sharp edges. Be careful when disassembling and servicing.
Warning: This product uses a laser diode. Refer to caution statements on page 2.

Ref.No. 1	Removal of the cabinet

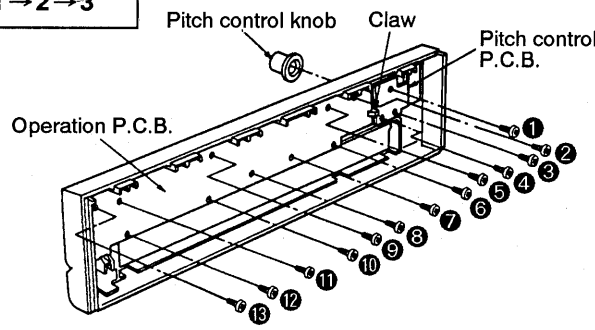
Procedure 1



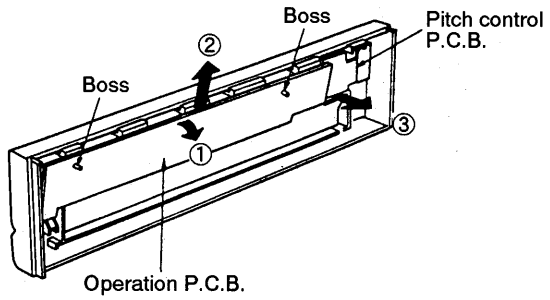
1. Remove the 6 screws(❶~❻).
2. Remove the cabinet in the direction of arrow.

Ref.No. 3	Removal of the operation P.C.B. and pitch control P.C.B.

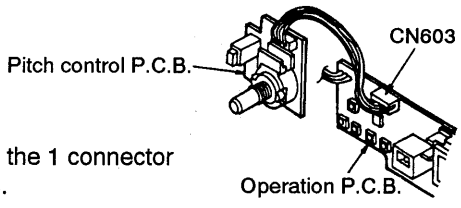
Procedure 1→2→3



1. Remove the pitch control knob.
2. Remove the 13 screws(❶~⓭).
3. Release the 1 claw.



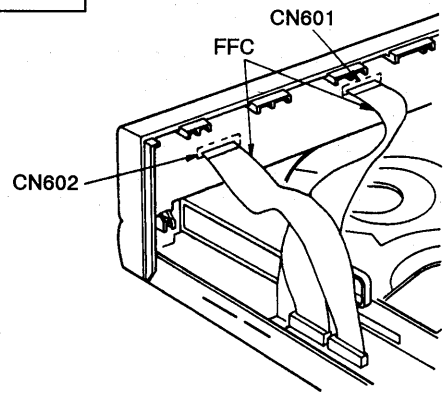
4. Tilt the operation P.C.B. in the direction of arrow① and release the bosses. Then, remove the operation P.C.B. in the direction of arrow②.
5. Remove the pitch control P.C.B. in the direction of arrow③.



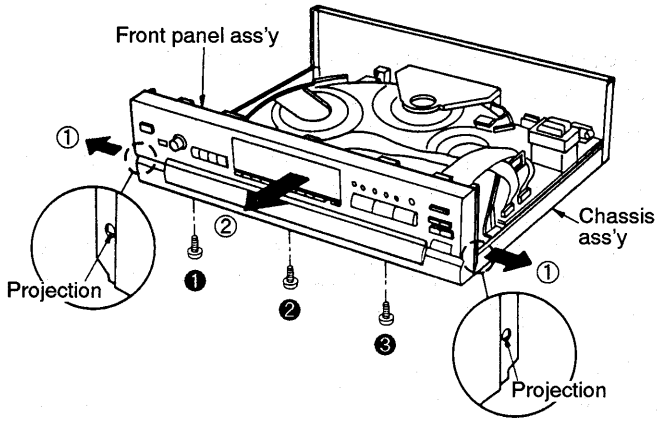
6. Remove the 1 connector (CN603).

Ref.No. 2	Removal of the front panel ass'y

Procedure 1→2



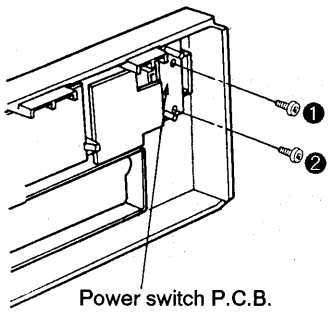
1. Pull out the FFC from connectors(CN601, CN602).



2. Remove the 3 screws(❶~❸).
3. Pull the front panel ass'y in both direction of arrow① to unlock it from the projections of the chassis ass'y.
4. Remove the front panel ass'y in the direction of arrow②.

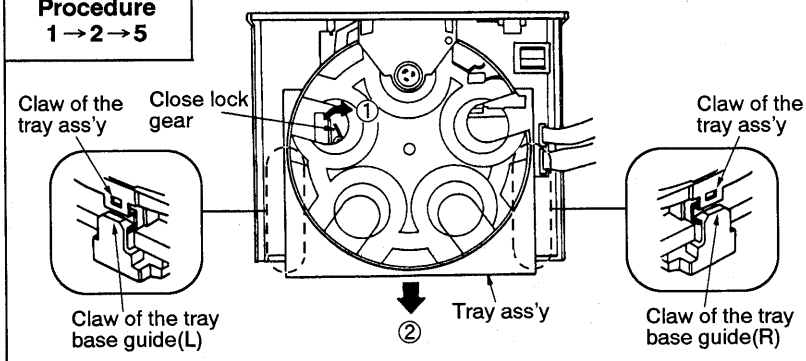
Ref.No. 4	Removal of the power switch P.C.B.

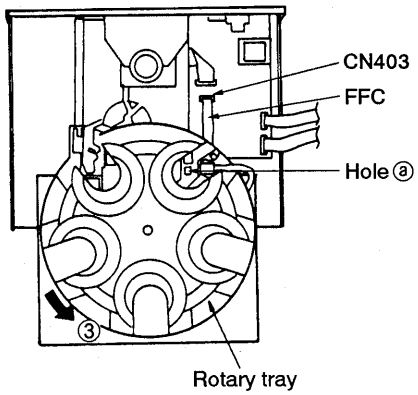
Procedure 1→2→4



Remove the 2 screws(❶, ❷).

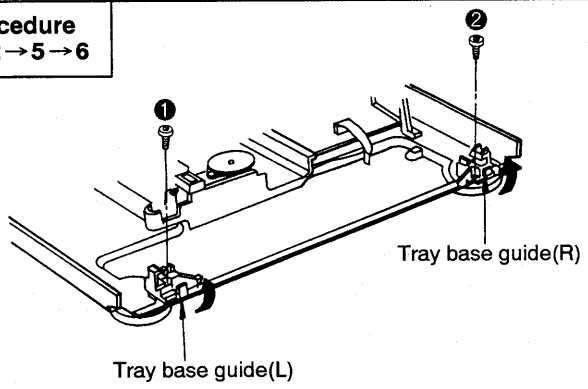
Ref.No. 5	Removal of the tray ass'y
Procedure 1→2→5	



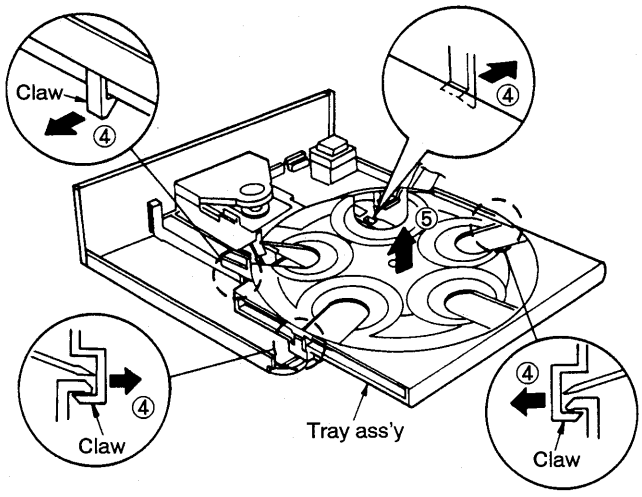


1. Keep the close lock gear pressed in the direction of arrow①, and move the tray ass'y in the direction of arrow②.
2. Fit the claw of the tray ass'y in the claw of the tray base guide(L).
3. Fit the claw of the tray ass'y in the claw of the tray base guide(R).
4. Pull out the FFC from connector(CN403).
5. Rotate the rotary tray to the position that can be confirmed the hole ⓐ in the direction of arrow③.

Ref.No. 6	Removal of the tray base guide(L) and tray base guide(R)
Procedure 1→2→5→6	

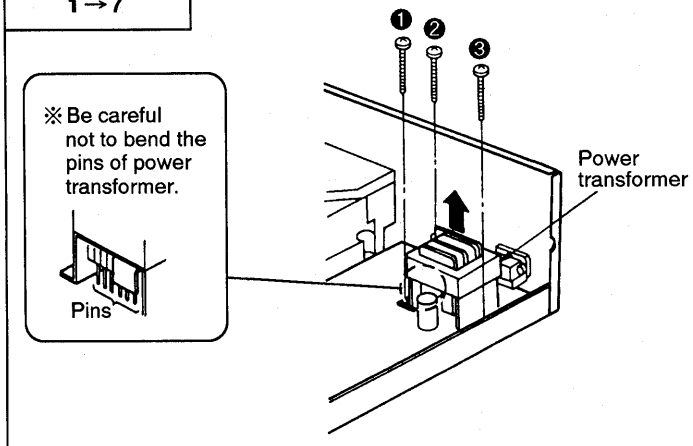


1. Remove the 2 screws(❶, ❷).
2. Remove the tray base guide(L) and tray base guide(R) in the direction of arrow.



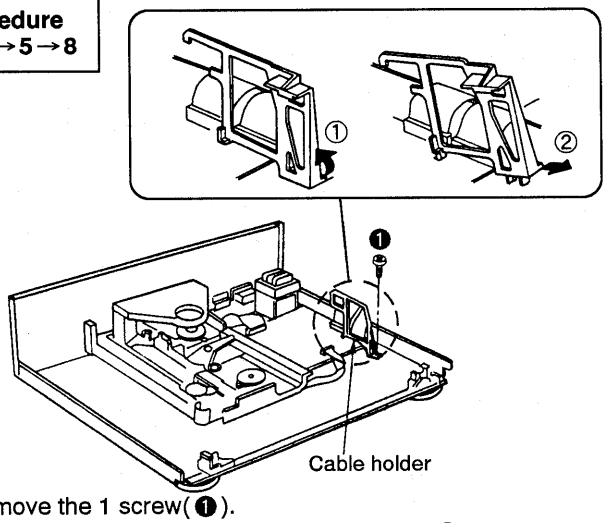
5. Push and release the 4 claws in the direction of arrow④, and then remove the tray ass'y in the direction of arrow⑤.

Ref.No. 7	Removal of the power transformer
Procedure 1→7	



1. Remove the 3 screws(❶~❸).
2. Remove the power transformer in the direction of arrow.

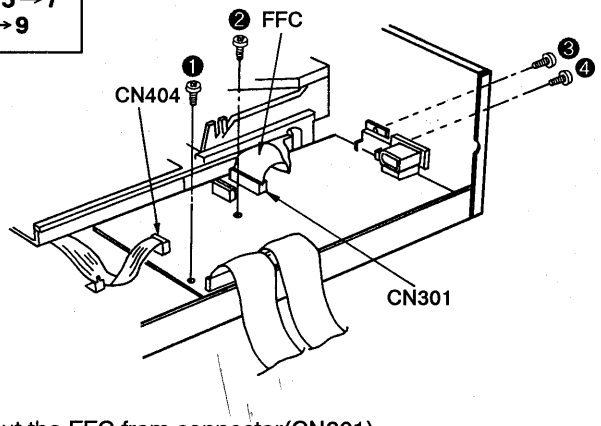
Ref.No. 8	Removal of the cable holder
Procedure 1→2→5→8	



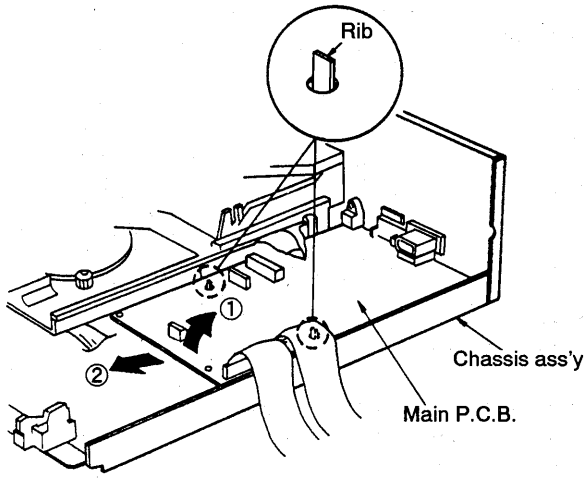
1. Remove the 1 screw(❶).
2. Lift the cable holder in the direction of arrow①, and then remove it in the direction of arrow②.

Ref.No. 9	Removal of the main P.C.B. and D/A CONV. P.C.B.

Procedure
1→2→5→7→8→9



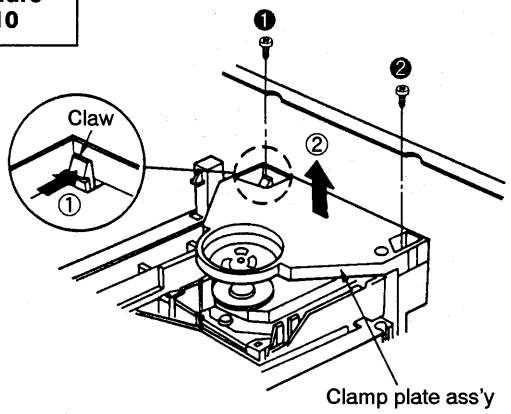
1. Pull out the FFC from connector(CN301).
2. Remove 1 connector(CN404).
3. Remove the 4 screws(❶~❹).



4. Lift up the main P.C.B. in the direction of arrow①, and release the 2 ribs on the chassis ass'y. Then , remove the main P.C.B. in the direction of arrow②.

Ref.No. 10	Removal of the clamp plate ass'y

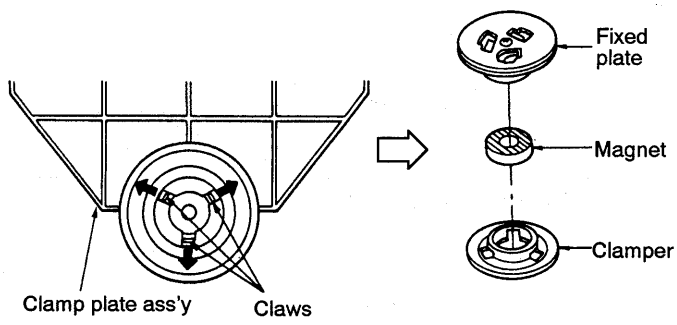
Procedure
1→10



1. Remove the 2 screws(❶, ❷).
2. Push the claw in the direction of arrow①, and then remove the clamp plate ass'y in the direction of arrow②.

Ref.No. 11	Removal of the fixed plate, magnet and clamper

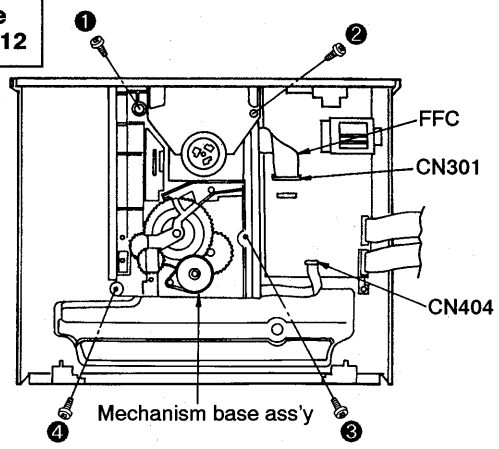
Procedure
1→10→11



• Release the 3 claws in the direction of arrow.

Ref.No. 12	Removal of the mechanism base ass'y

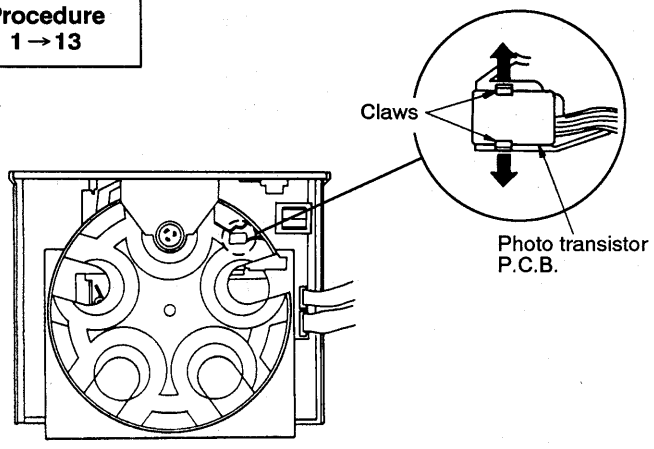
Procedure
1→2→5→12



1. Pull out the FFC from connector(CN301).
2. Remove 1 connector(CN404).
3. Remove the 4 screws(❶~❹).

Ref.No. 13	Removal of the photo transistor P.C.B.

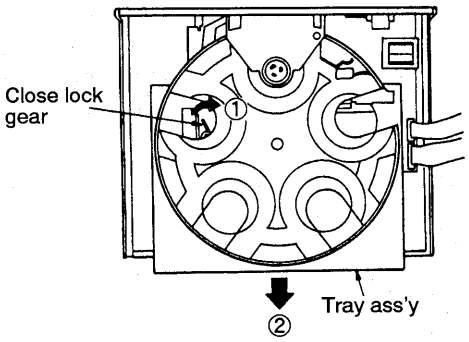
Procedure
1→13



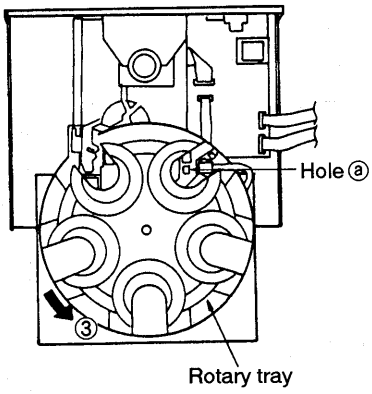
• Release the 2 claws in the direction of arrow.

Ref.No. 14	Removal of the rotary tray

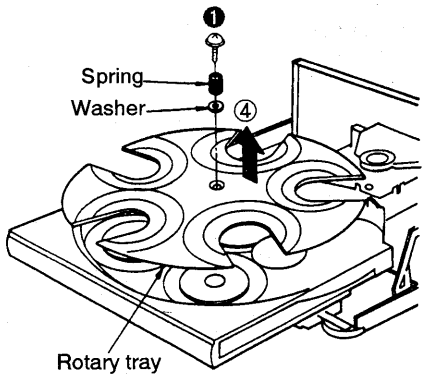
Procedure 1→2→14



1. Keep the close lock gear pressed in the direction of arrow①, and move the tray ass'y in the direction of arrow②.



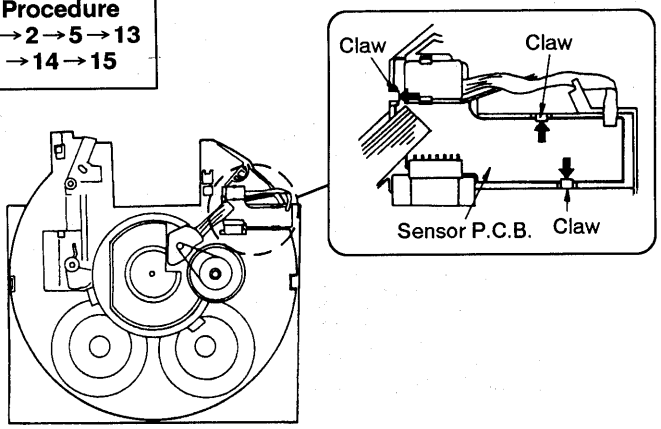
2. Rotate the rotary tray to the position that can be confirmed the hole ⓐ in the direction of arrow③.



3. Remove the 1 screw(❶).
4. Remove the spring and washer.
5. Remove the rotary tray in the direction of arrow④.

Ref.No. 15	Removal of the sensor P.C.B.

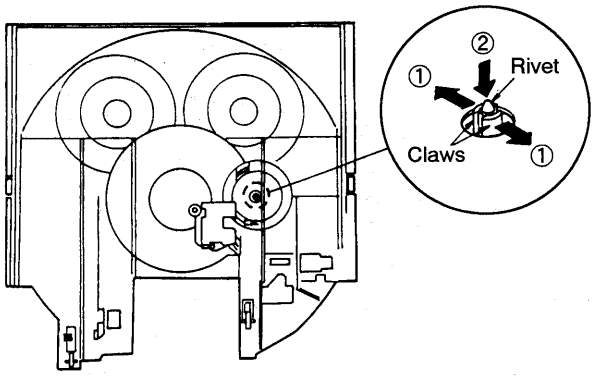
Procedure 1→2→5→13→14→15



- Release the 3 claws in the direction of arrow, and remove the sensor P.C.B.

Ref.No. 16	Removal of reduction gear

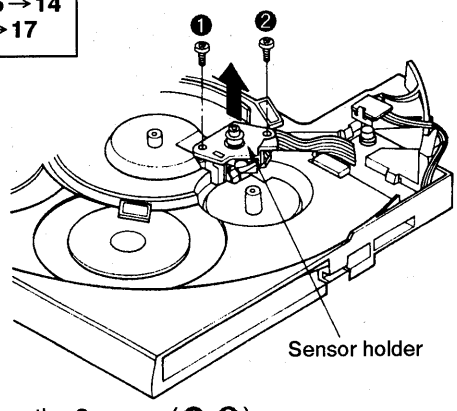
Procedure 1→2→5→14→16



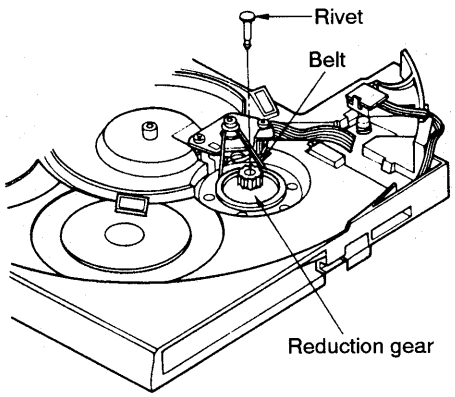
1. Release the 2 claws in the direction of arrow①, and then push the rivet in the direction of arrow②.

Ref.No. 17	Removal of motor holder and tray motor ass'y

Procedure 1→2→5→14→16→17



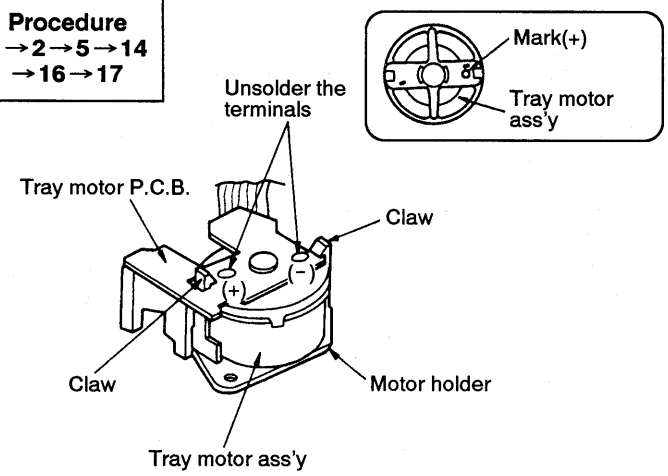
1. Remove the 2 screws(❶, ❷).
2. Remove the motor holder and sensor holder in the direction of arrow.



2. Pull out the rivet.
3. Remove the belt.
3. Remove the reduction gear.

Ref.No. 18 — Removal of the tray motor P.C.B.

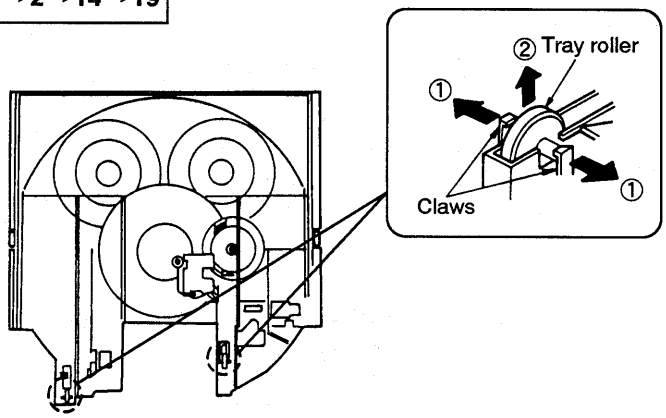
Procedure
1 → 2 → 5 → 14 → 16 → 17



1. Release the 2 claw, and then remove the motor holder.
2. Unsolder the terminals of the tray motor ass'y.

Ref.No. 19 — Removal of the tray roller

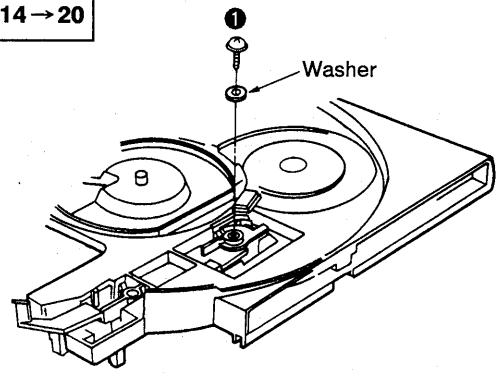
Procedure
1 → 2 → 14 → 19



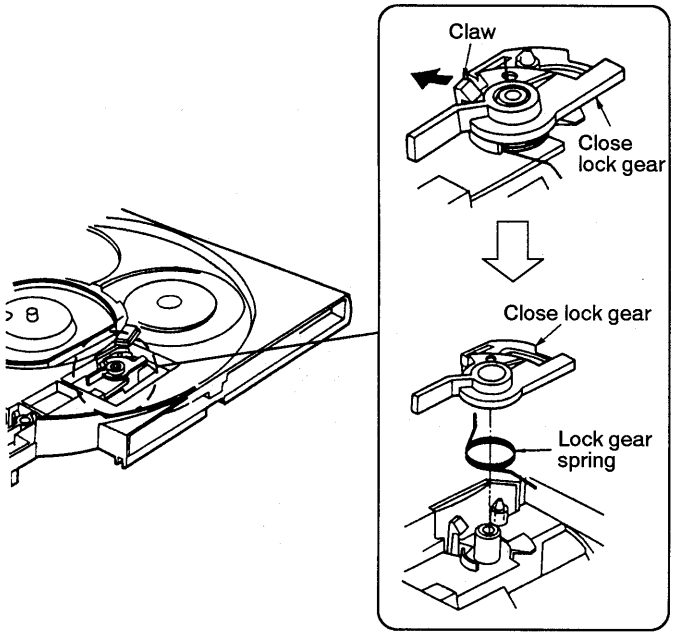
- Release the 2 claws in the direction of arrow ①, and then remove the tray roller in the direction of arrow ②.

Ref.No. 20 — Removal of the close lock gear

Procedure
1 → 2 → 14 → 20



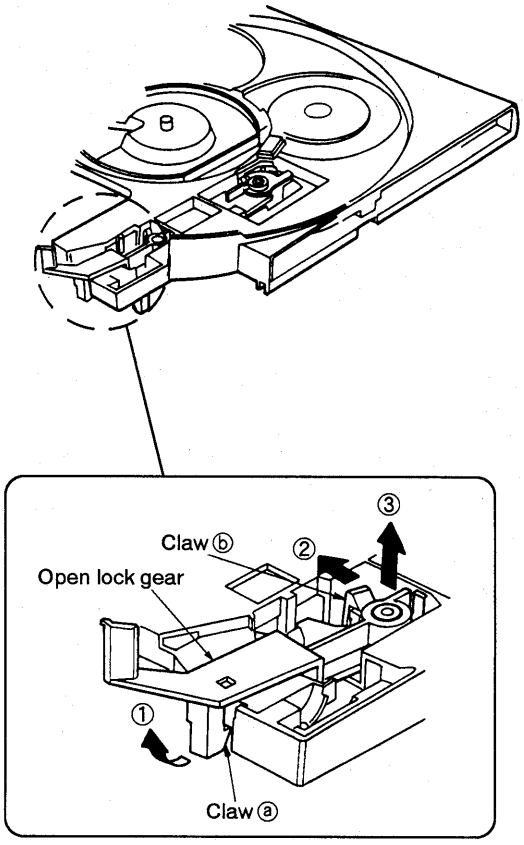
1. Remove the 1 screw(❶) and washer.



2. Release the 1 claw and then remove the close lock gear and lock gear spring.

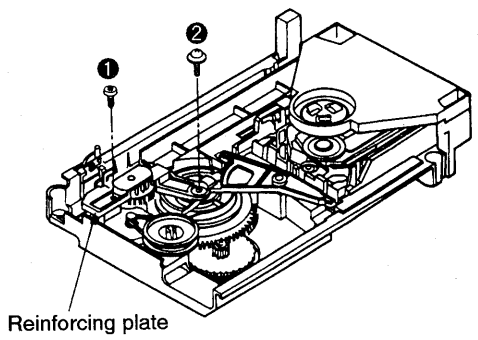
Ref.No. 21 — Removal of the open lock gear

Procedure
1 → 2 → 5 → 14 → 21

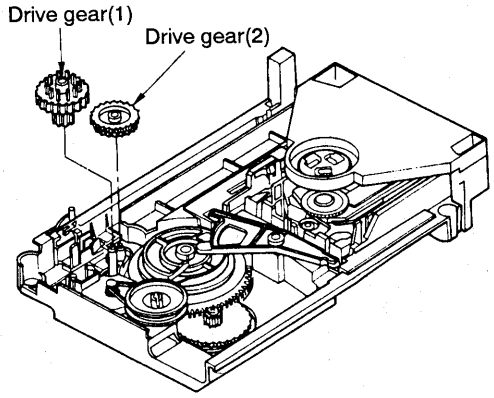


1. Release the claw ⓐ of open lock gear in the direction of arrow ①.
2. Release the claw ⓑ of open lock gear in the direction of arrow ②, and then remove the of open lock gear in the direction of arrow ③.

Ref.No. 22	Removal of the reinforcing plate, drive gear(1) and drive gear(2)
Procedure 1→2→5→22	

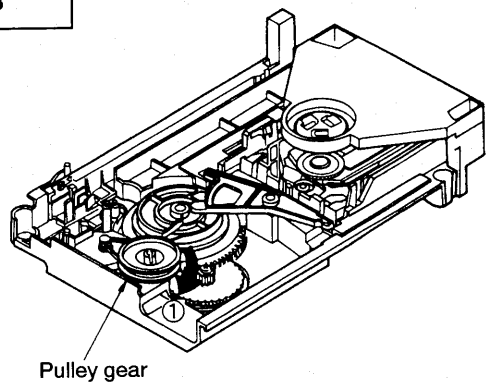


1. Remove the 2 screws(❶, ❷).
2. Remove the reinforcing plate.

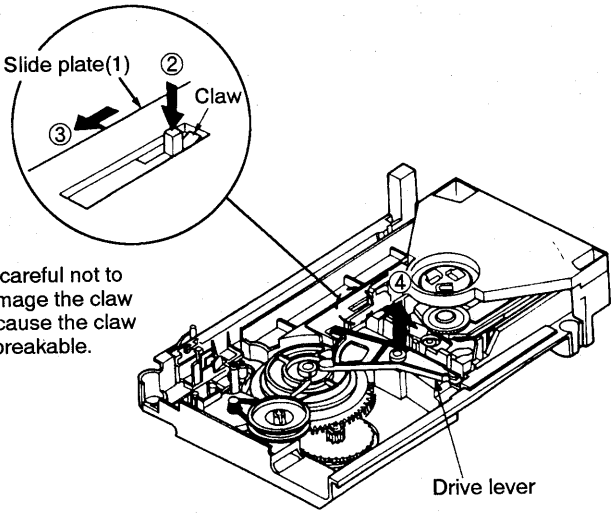


3. Remove the drive gear(1) and drive gear(2).

Ref.No. 23	Removal of the drive lever
Procedure 1→2→5→22 →23	



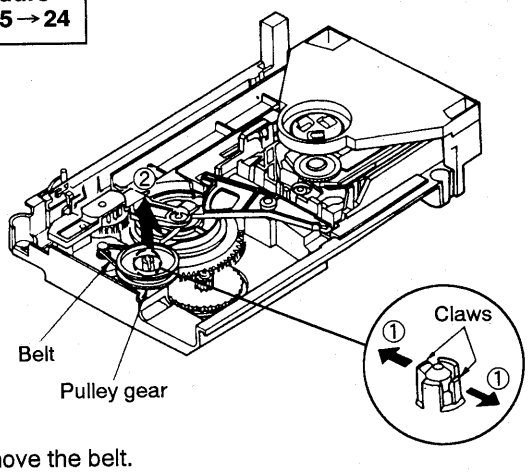
1. Rotate the pulley gear to full position in the direction of arrow①.



Note) Be careful not to damage the claw because the claw is breakable.

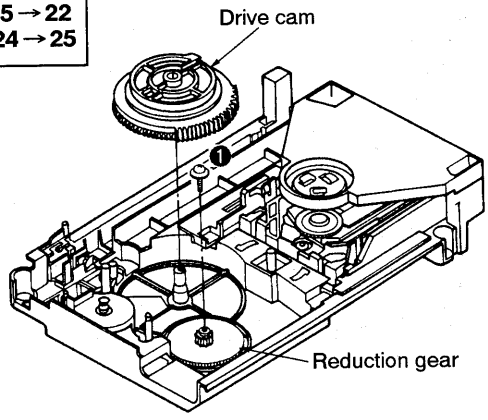
2. Push the claw in the direction of arrow②, and then move the slide plate(1) in the direction of arrow③.
3. Remove the drive lever in the direction of arrow④.

Ref.No. 24	Removal of the pulley gear
Procedure 1→2→5→24	



1. Remove the belt.
2. Release the 2 claws in the direction of arrow①, and then remove the pulley gear in the direction of arrow②.

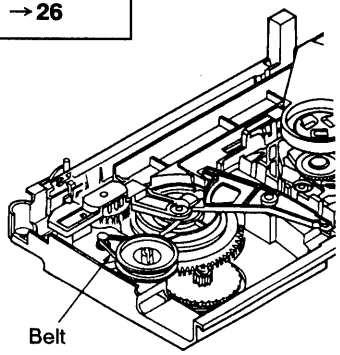
Ref.No. 25	Removal of the drive cam and reduction gear
Procedure 1→2→5→22 →23→24→25	

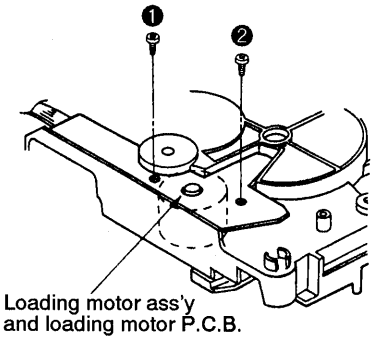


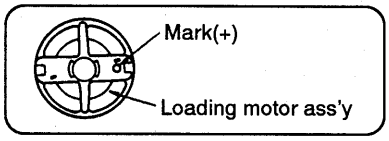
1. Remove the drive cam.
2. Remove 1 screw(❶).
3. Remove the reduction gear.

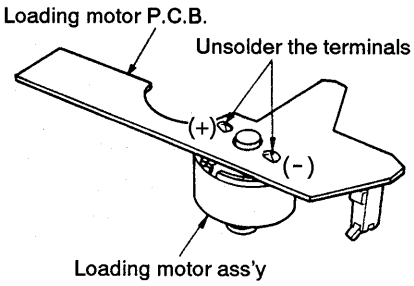
Ref.No. 26	Removal of the loading motor ass'y and loading motor P.C.B.

Procedure 1→2→5→12→26





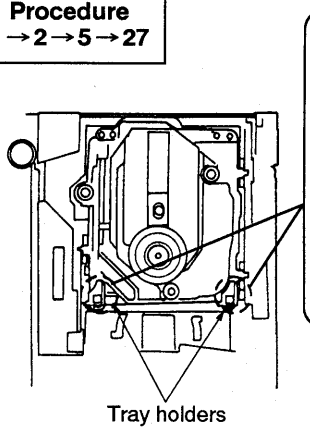


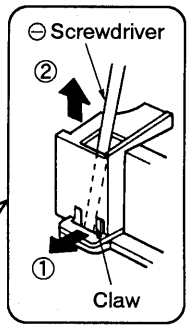


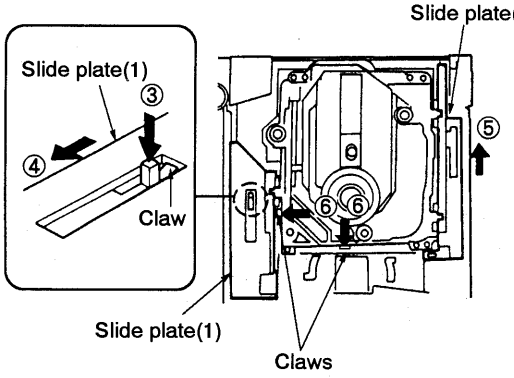
1. Remove the belt.
2. Remove the 2 screws(❶, ❷).
3. Remove the loading motor ass'y and loading motor P.C.B.
4. Unsolder the terminals of the loading motor ass'y.

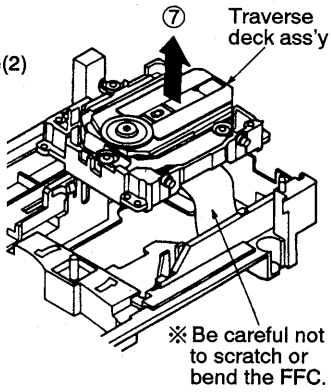
Ref.No. 27	Removal of the traverse deck ass'y

Procedure 1→2→5→27





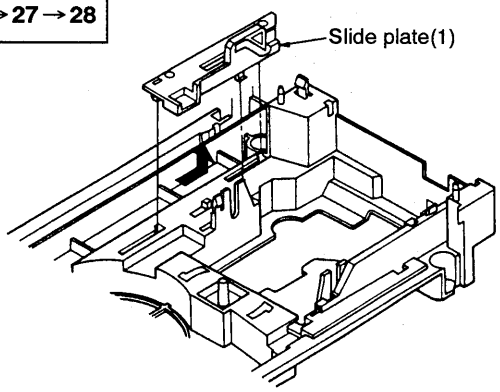




1. While pushing the claw of tray holders in the direction ① using the ⊖ screwdriver, remove the tray holder in the direction of arrow ②.
2. Push the claw in the direction of arrow ③, and then move the slide plate(1) in the direction of arrow ④.
3. Move the slide plate(2) in the direction of arrow ⑤.
4. Release the 2 claws in the direction of arrow ⑥, and then remove the traverse deck ass'y in the direction of arrow ⑦.

Ref.No. 28	Removal of the slide plate(1)

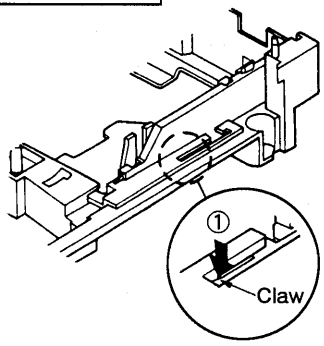
Procedure 1→2→5→22→23→27→28

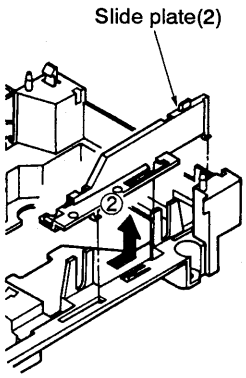


- Remove the slide plate(1) in the direction of arrow.

Ref.No. 29	Removal of the slide plate(2)

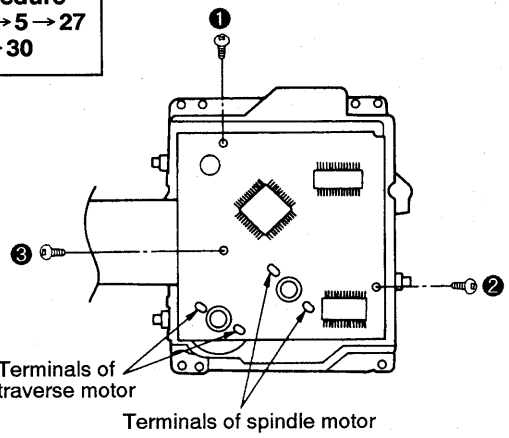
Procedure 1→2→5→22→23→27→29





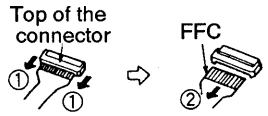
- Push the claw in the direction of arrow ①, and then remove the slide plate(2) in the direction of arrow ②.

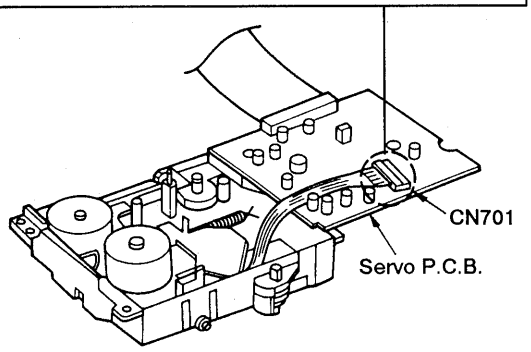
Ref.No. 30	Removal of the servo P.C.B.
Procedure 1→2→5→27→30	



1. Remove the 3 screws(❶~❸).
2. Unsolder the 2 terminals of spindle motor.
3. Unsolder the 2 terminals of traverse motor.

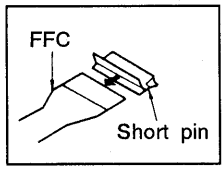
1. Push the top of the connector in the direction of arrow①.
2. Remove the FFC in the direction of arrow②.



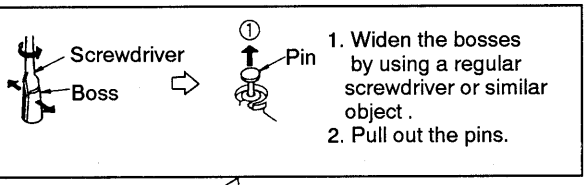


4. Remove the FFC from connector(CN701).

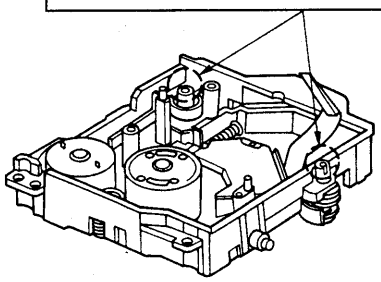
Caution:
Insert a short pin into the traverse unit FFC. (Refer to " handling precautions for traverse deck " on page 11.)



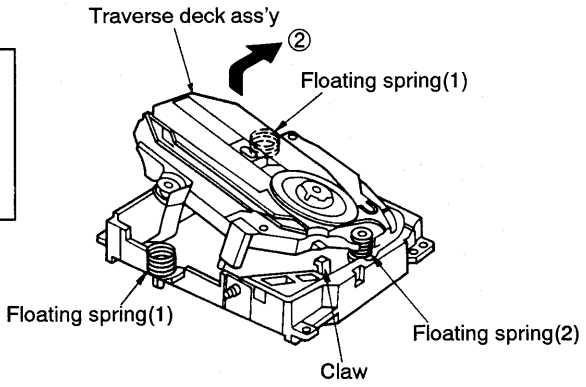
Ref.No. 31	Removal of the traverse deck ass'y
Procedure 1→2→5→27→30→31	



1. Widen the bosses by using a regular screwdriver or similar object.
2. Pull out the pins.



1. Remove the 2 pins in the direction of arrow①.



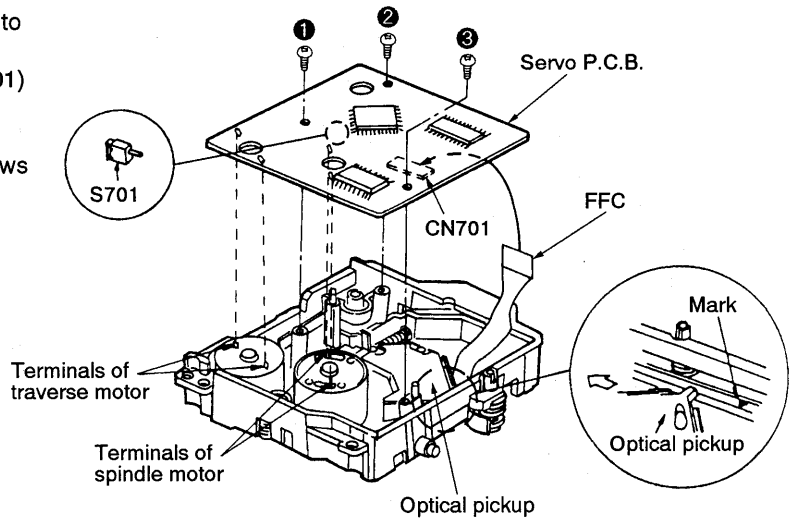
2. Release the claw, and then remove the traverse deck ass'y in the direction of arrow②.

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

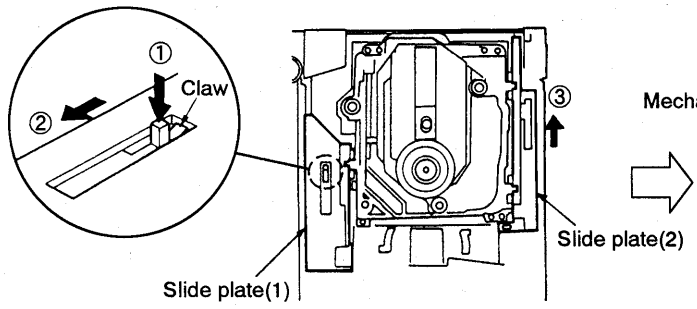
■ INSTALLATION OF SERVO P.C.B.

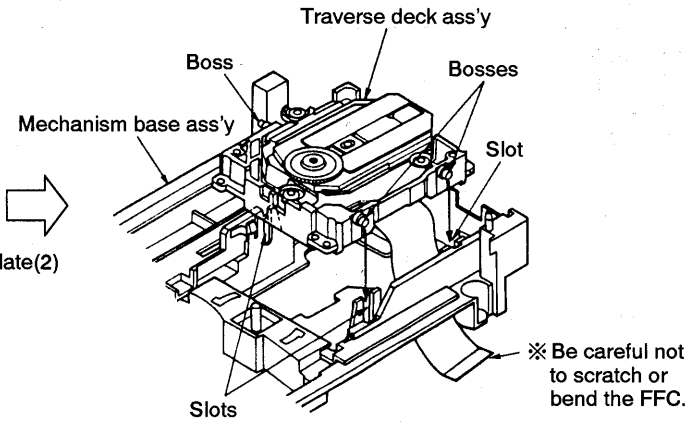
1. When installing servo P.C.B., move the optical pickup to the more external side than the mark (▲). (When the optical pickup is not moved, the switch(S701) on the servo P.C.B. may be broken.)
2. Connect the FFC to the connector(CN701).
3. Install the servo P.C.B. to the traverse unit with 3 screws (❶~❸).
4. Solder the 2 terminals of the traverse motor and the 2 terminals of the spindle motor.

Note: • Insert the FFC into the connector and lock securely.
• After installing the motor with screws, solder each motor terminal.



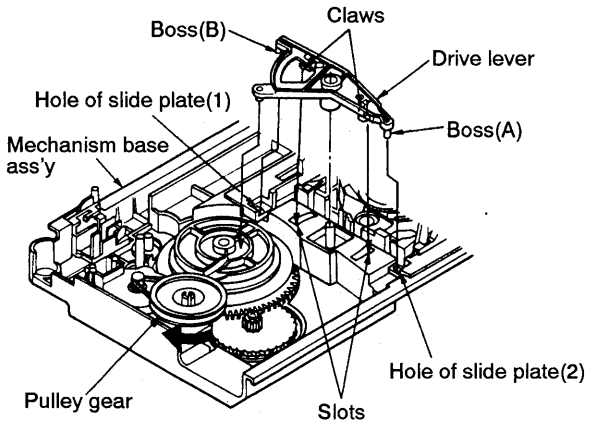
■ Installation of the traverse deck ass'y





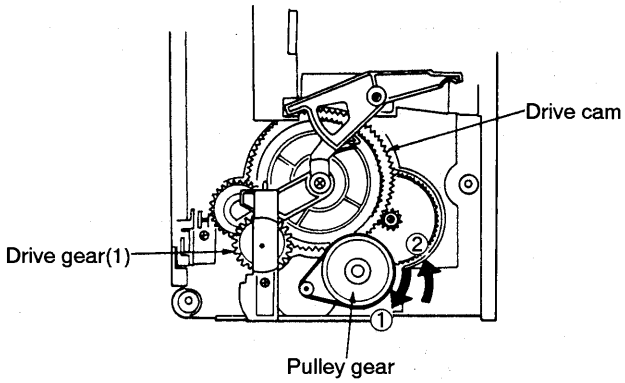
1. Push the claw in the direction of arrow①, and then move the slide plate(1) in the direction of arrow②.
2. Move the slide plate(2) in the direction of arrow③.
3. Align the 3 bosses of traverse deck ass'y with the slots of mechanism base ass'y.

■ Installation of the drive lever



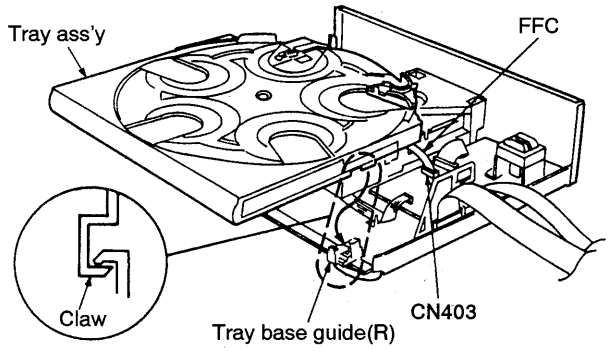
1. Rotate the pulley gear to full position in the direction of arrow.
2. Align the boss(A) with the hole of slide plate(2).
3. Align the boss(B) with the hole of slide plate(1).
4. Align the claws of drive lever with the slots of loading mechanism ass'y.

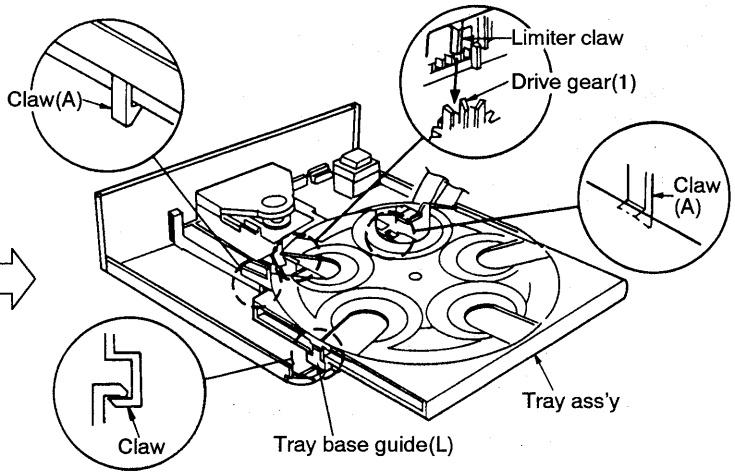
■ Positioning of the drive cam



1. Rotate the pulley gear to full position in the direction of arrow①.
2. Then, rotate the pulley gear in the direction of arrow②.
3. When the drive gear(1) stops rotating, turn off that pulley gear is rotating.

■ Installation of the tray ass'y





1. Attach the FFC to the connector(CN403).
2. Fit the claws on the right side of the tray ass'y underneath the claws on the tray base guide(R).
3. Fit the claws on the right side of the tray ass'y underneath the claws on the tray base guide(L).
4. Fit the limiter claw on the tray ass'y between the teeth of the drive gear(1).
5. Catch the 2 claws(A) with the mechanism base ass'y.
6. After installing the tray ass'y, check that it moves smoothly.

■ HOW TO CHECK THE MAIN AND SERVO P.C.B.

1. Remove the cabinet. (See Ref.No.1 of the disassembly instructions.)
2. Remove the front panel ass'y. (See Ref.No.2 of the disassembly instructions.)
3. Remove the tray ass'y. (See Ref.No.5 of the disassembly instructions.)
4. Remove the cable holder. (See Ref.No.8 of the disassembly instructions.)
5. Remove the clamp plate ass'y. (See Ref.No.10 of the disassembly instructions.)
6. Remove the fixed plate, magnet and clamper. (See Ref.No.11 of the disassembly instructions.)

● **Check the main P.C.B.**

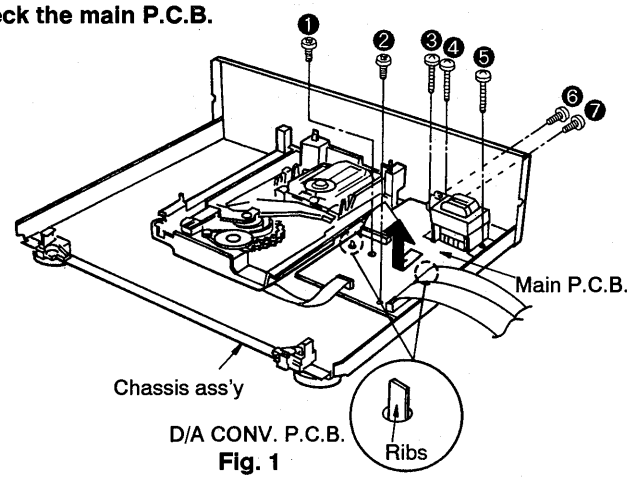


Fig. 1

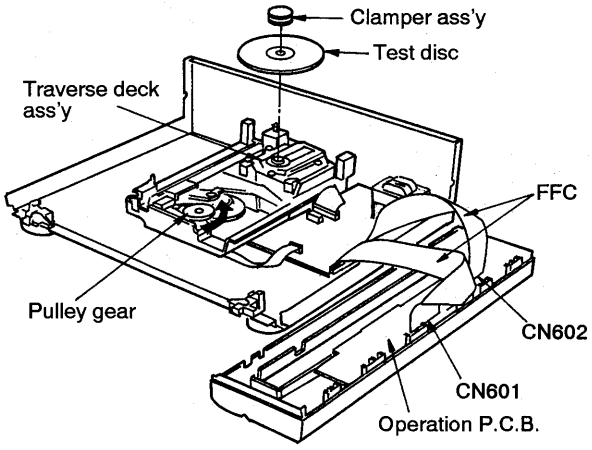


Fig. 2

7. Remove the 7 screws(❶~❼).
8. Lift up the main P.C.B. to release the 2 ribs of chassis ass'y, and then remove the main P.C.B. in the direction of arrow.

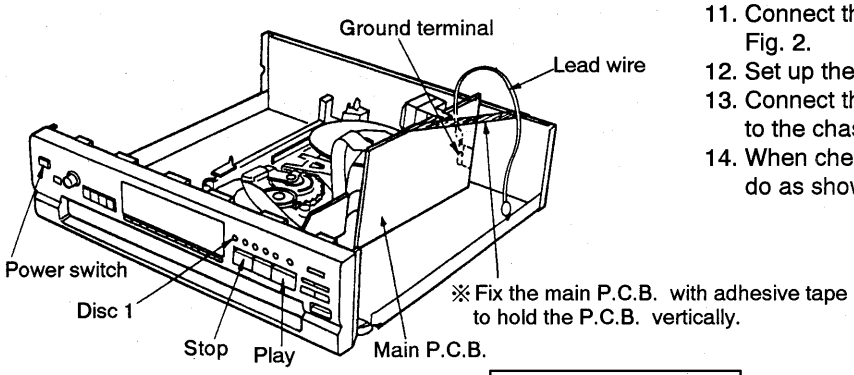


Fig. 3

9. Rotate the pulley gear in the direction of arrow until traverse deck ass'y comes up.
10. Place the test disc and secure it by using the clamper ass'y.
11. Connect the 2 FFC (CN601, CN602) as shown in Fig. 2.
12. Set up the main P.C.B.
13. Connect the main P.C.B. ground terminal (line out terminal) to the chassis ass'y with a lead wire.
14. When checking the soldered surface of the main P.C.B., do as shown in Fig. 3.

How to play the disc

Unplug the set previously.

↓

While pressing 3 keys of STOP(■), PLAY(▶), and DISC 1 simultaneously, insert the power plug of the set into the plug socket.

NOTE:
Be sure to begin pressing the 3 keys before plugging the set. Otherwise, the Service Mode cannot be set.

↓

FL lights up? — No → Press the POWER key (POWER ON). → FL lights up.

↓ Yes

Withdraw hand from the 3 keys.

↓

Mount the disc on the turntable and press the PLAY key.

NOTE:
Make sure that the traverse mechanism is then in UP(PLAY)position.

Service Mode setting

When checking the main/servo P.C.B. of this set, remove the rotary tray previously.
After the rotary tray is removed, the microcomputer is kept from issuing PLAY command even when the PLAY key is pressed.
Stated above is the procedure of setting the Service Mode for keeping the microcomputer in the PLAY mode even after removal of the rotary tray.

● **Check the servo P.C.B.**

7. Remove the mechanism base ass'y. (See Ref.No.12 of the disassembly instructions.)
8. Remove the traverse deck ass'y. (See Ref.No.27 of the disassembly instructions.)

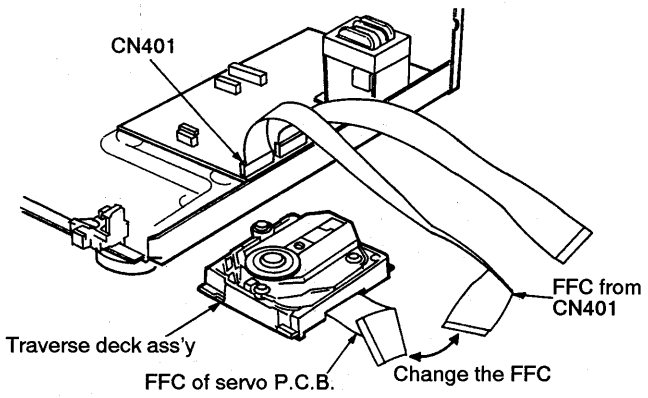


Fig. 4

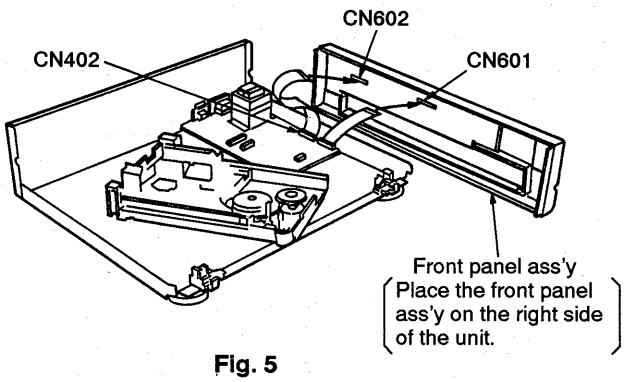


Fig. 5

9. Replace the FFC of servo P.C.B. to the FFC (CN401) of main P.C.B.

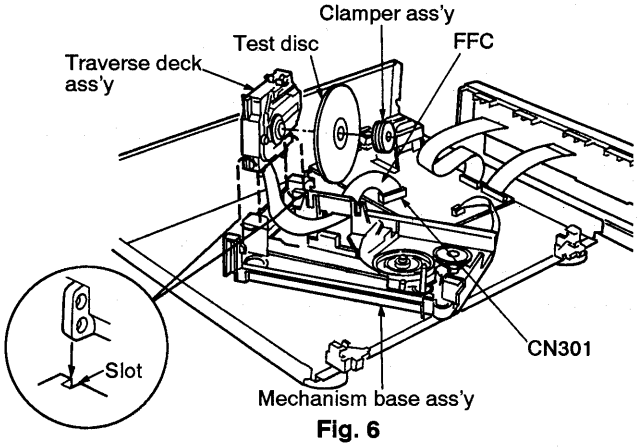
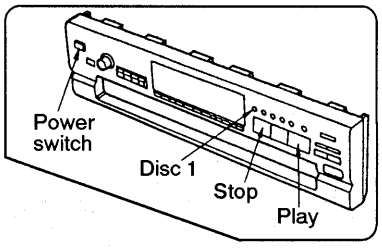


Fig. 6

10. Connect the FFC as shown in above.
    (Between CN401 and CN601
    Between CN402 and CN602)
11. Insert the traverse deck in the slot of mechanism base ass'y.
12. Connect the FFC of servo P.C.B. to the connector (CN301) of main P.C.B.
13. Set the test disc on the traverse deck ass'y, and then fix the traverse deck ass'y with clamper ass'y.
14. When checking the soldered surface of servo P.C.B., do as shown in Fig. 7.

Notes:

- After completing the check, restore the replaced FFC to their original positions.



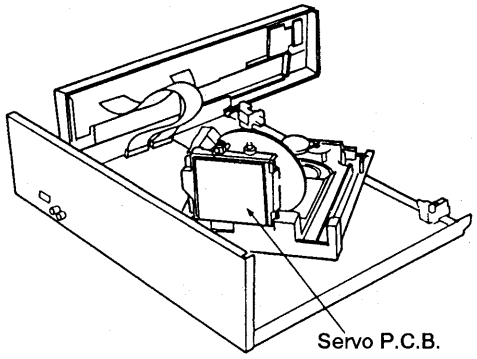


Fig. 7

How to play the disc

Unplug the set previously.

While pressing 3 keys of STOP(■), PLAY(▶), and DISC 1 simultaneously, insert the power plug of the set into the plug socket.

NOTE:
Be sure to begin pressing the 3 keys before plugging the set. Otherwise, the Service Mode cannot be set.

FL lights up?

No → Press the POWER key (POWER ON). → FL lights up.

Yes

Withdraw hand from the 3 keys.

Mount the disc on the turntable and press the PLAY key.

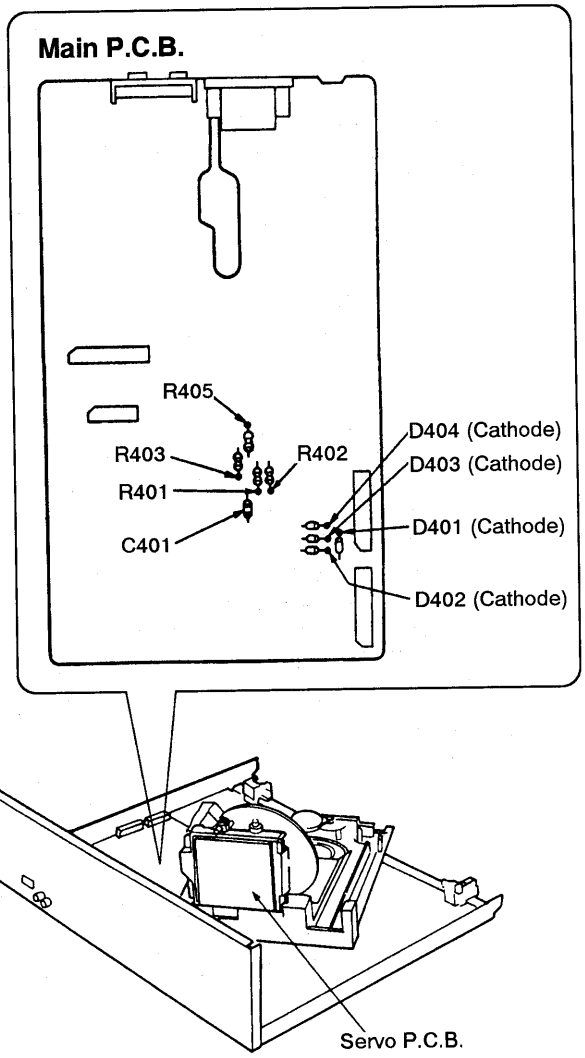
NOTE:
Make sure that the traverse mechanism is then in UP(PLAY)position.

Service Mode setting

When checking the main/servo P.C.B. of this set, remove the rotary tray previously.
After the rotary tray is removed, the microcomputer is kept from issuing PLAY command even when the PLAY key is pressed.
Stated above is the procedure of setting the Service Mode for keeping the microcomputer in the PLAY mode even after removal of the rotary tray.

■ OPERATING THE UNIT WITHOUT THE FRONT PANEL ASS'Y

(OPERATION P.C.B. AND KEYS)



A Turning off the back-up power to the microprocessor(IC 401)

1. Unplug the AC cord.
2. Short the ends of the C401 jumpers at 10 Ω (5W) resistance for at least 1 second.

B Turning the power on again

1. Plug the AC cord back in.
2. Short the between the following jumpers simultaneously:
   - The D401 cathode and R401 from IC401 (equivalent to pressing the STOP button).
   - The D401 cathode and R403 from IC401 (equivalent to pressing the PLAY button).
   - The D402 cathode and R401 from IC401 (equivalent to pressing the DISC 1 button).
3. Keeping the above shorts in place, short between the D404 cathode and R405 from IC401 for 1 second to turn on the power to the main unit.
4. Remove the shorts placed in step 2.

C Using the machine

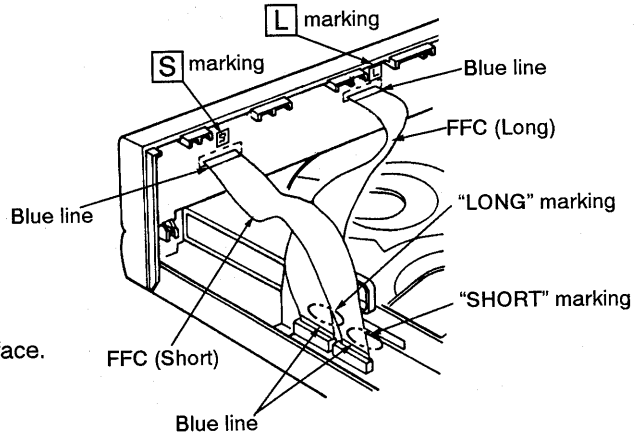
- To play, short between the D401 cathode and R403 from IC401 (equivalent to pressing the PLAY button).
- To pause, short between the D401 cathode and R402 from IC401 (equivalent to pressing the PAUSE button).
- To stop, short between the D401 cathode and R401 from IC401 (equivalent to pressing the STOP button).
- To move forward, short between the D402 cathode and R402 from IC401 (equivalent to pressing the F.SKIP button).
- To move backward, short between the D402 cathode and R403 from IC401 (equivalent to pressing the R.SKIP button).
- To search in the forward direction, short between the D403 cathode and R402 from IC401 (equivalent to pressing the F.SEARCH button).
- To search in the backward direction, short between the D403 cathode and R403 from IC401 (equivalent to pressing the R.SEARCH button).

D Finishing off

1. Unplug the AC cord.
2. Short the ends of the C401 jumpers at 10 Ω (5W) resistance.

■ Installation of the FFC

- When connecting the FFC, connect as shown right.
- Connect as follows:
  Short FFC ; between Connector S and SHORT
  Long FFC ; between Connector L and LONG
- Connect the FFC (Long/Short) with blue line upward to the operation P.C.B. connectors .
- Connect the FFC (Long/Short) with blue line outward to the main P.C.B. connectors.



NOTE:
The pin numbers of each connector are marked on the P.C.B. surface.

■ AUTOMATIC ADJUSTMENT RESULTS DISPLAY FUNCTION
(SELF-CHECK FUNCTION)

The unit contains a function which displays the result of the automatically adjustment of the servo circuits (tracking, focus servo, etc.) as an error code on the FL display.
The error code display serves as a repair guide showing the automatically adjustment circuit is at fault. The procedures for displaying the error codes are given below.

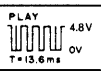
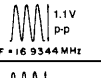
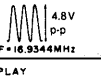
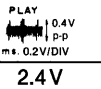
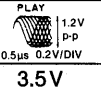
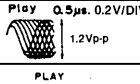
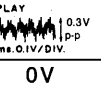
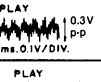
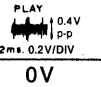
• Procedures to display the error code

(1) Procedure to display the error code before disassembly (finished unit)
1. When the [POWER] key is pressed while holding down the [STOP (■)], [PAUSE (▮▮)] and [PLAY (▶)] keys simultaneously, the FL display illuminates, release the power turns on.
2. When the FL display illuminates, release the [STOP (■)], [PAUSE (▮▮)] and [PLAY (▶)] keys.
3. Press the [OPEN/CLOSE (▲)] key to open the disc tray and load the test disc (SZZP1054C).
4. Press the [PLAY (▶)] key to start the play operation.
5. After the time display appears, press the [STOP (■)] key to display the error code. (e.g. **E-0**)
6. The error code display can be used as a repair guide showing which servo circuit is at fault. (See Error Code Based Troubleshooting.)

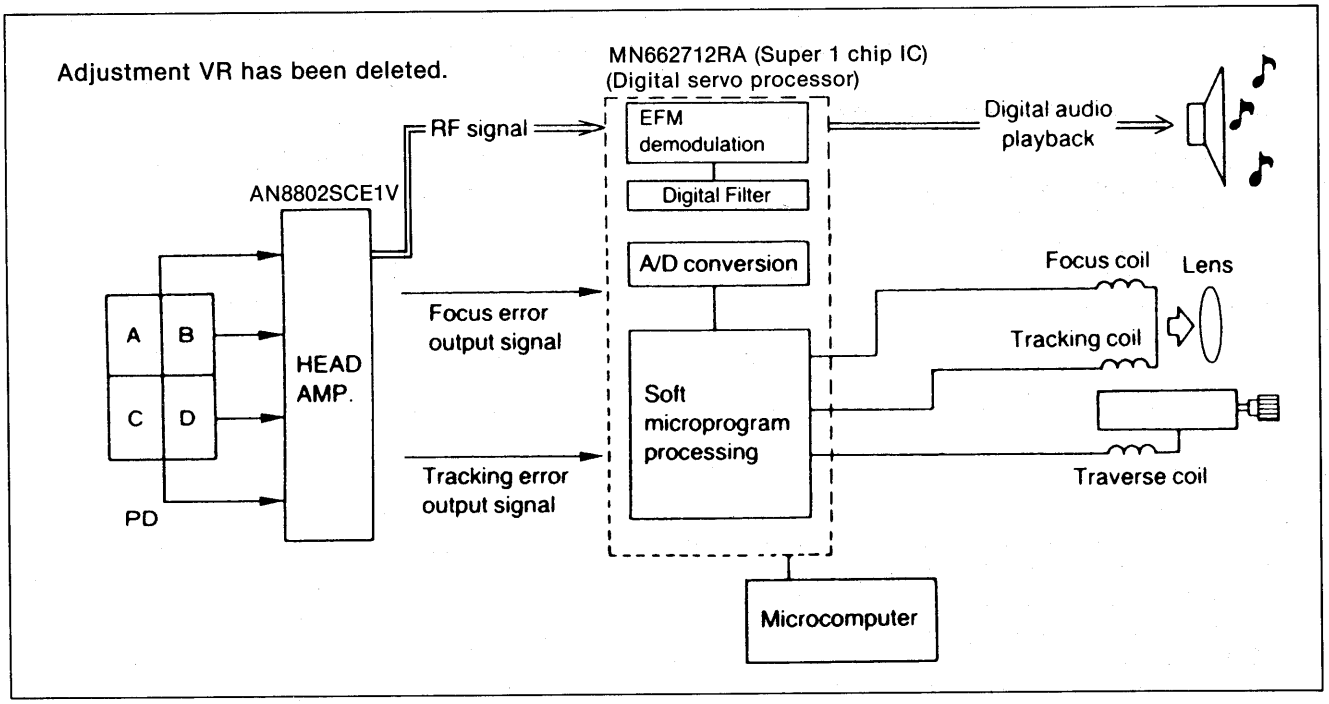
(2) Procedure to display the error code when disassembled
1. Prepare the unit as described in "How to Check the Main and Servo P.C.B." on pages 21, 22.
2. Press the [POWER] key while holding down the [STOP (■)], [PLAY (▶)] and [DISC 1] keys simultaneously.
3. When the FL display illuminates, release the [STOP (■)], [PLAY (▶)] and [DISC 1] keys.
4. Load the test disc (SZZP1054C) on the turntable and secure it with the clamper ass'y.
5. Perform steps 4 and 5 in section (1) above.

• Error code based troubleshooting

※ The unit is satisfactory if the error code is **E-0** of **E-2**.
※ Before testing, check that the test disc is free of scratches and dirt and optical pickup is clean.

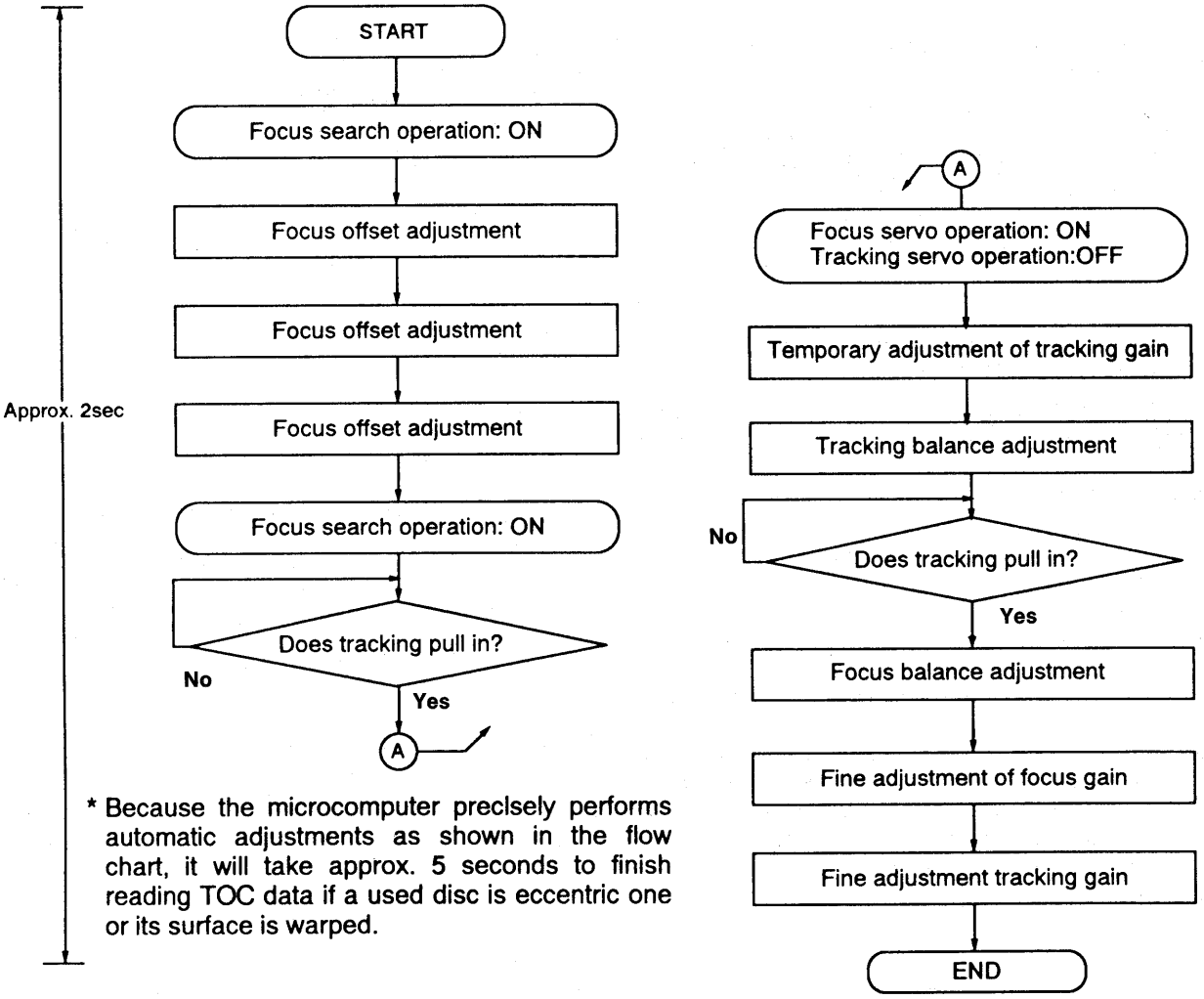
FL error code display	Symptom	Probable cause	Signal to check		Normal voltage and waveform values	
			Signal name	Location	PLAY	STOP
E-1	Focus and tracking offset adjustments not completed in specified time period.	① Clocks X1 and X2, power supply V_{DD}, and reset/RST, all on IC702 ② MDATA, MCLK, MLD, and SENSE signals to/from mechanism controller	MDATA	IC702 ⑧ pin		4.8V
			MCLK	IC702 ⑦ pin		4.8V
			MLD	IC702 ⑨ pin		
			SENSE	IC702 ⑩ pin	0V	0V
			/RST	IC702 ⑱ pin	4.9V	4.9V
			X1	IC702 ⑱ pin		
			X2	IC702 ⑲ pin		
E-3 E-5 E-7 E-9 E-B E-D E-F	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	FE	IC702 ㉜ pin		2.4V
			TE	IC702 ㉝ pin		2.4V
			FOD	IC702 ㉘ pin	2.4V	2.4V
			TRD	IC702 ㉗ pin	2.4V	2.4V
			KICK	IC702 ㉖ pin	2.4V	2.4V
			/FLOCK	IC702 ⑪ pin	0V	4.9V
			/RF DET	IC702 ㊳ pin	0V	4.8V
			RF	TJ701		1.5V
			STAT	IC702 ⑰ pin	3.5V	0V
E-4 E-6 E-C E-E	Best "Eye" (PD Balance) 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	FBAL	IC702 ㉚ pin	2.5±1.25V	2.5±1.25V
			RF	TJ701		1.5V
			FE	IC702 ㉜ pin		0V
			/TLOCK	IC702 ⑫ pin	0V	0V
			OFT	IC702 ㊱ pin	0V	0V
E-8 E-A	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	FE	IC702 ㉜ pin		2.4V
			TE	IC702 ㉝ pin		2.4V
			/TLOCK	IC702 ⑫ pin	0V	0V
			OFT	IC702 ㊱ pin	0V	0V

■ DIGITAL SERVO SYSTEM



The following flow chart shows the sequence of automatic adjustments.

● Flow chart automatic adjustment sequence



* Because the microcomputer precisely performs automatic adjustments as shown in the flow chart, it will take approx. 5 seconds to finish reading TOC data if a used disc is eccentric one or its surface is warped.

■ MEASUREMENTS AND ADJUSTMENTS

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

Measuring Instruments and Special Tools

* Test discs
1. Playability test disc (SZZP1054C)
2. Uneven test disc (SZZP1056C)

* Musical program disc (ordinary)
* Dual-beam oscilloscope with bandwidth of 30MHz or better (with EXT. trigger and 1:1 probe).
* Allen wrench (M2.0) (SZZP1101C)
* Lock paint (RZZ0L01)

PREPARATION

1. Remove the cabinet and front panel ass'y (refer to "disassembly instructions" Ref. No. 1, 2).
2. Set the power switch to ON and press the open/close key to close the loading drawer.
3. Press the play key and when the traverse deck reaches it's height position, set the power switch to OFF.
4. Remove the tray ass'y (refer to "disassembly instructions" Ref. No. 5).
5. Remove the clamp plate, fixed plate, magnet and clamper (refer to "disassembly instructions" Ref. No. 10, 11).
6. Place the test disc and secure it by using clamper ass'y. (Refer to Fig. 1)
   (refer to "disassembly instructions" Ref. No. 11).
7. Set the unit in the test mode as follows:
   (hold the play, stop and disc 1 keys (3 keys) on and set the power switch to ON.)
8. Press the play key and play the test disc.
9. Follow the adjustment procedure.

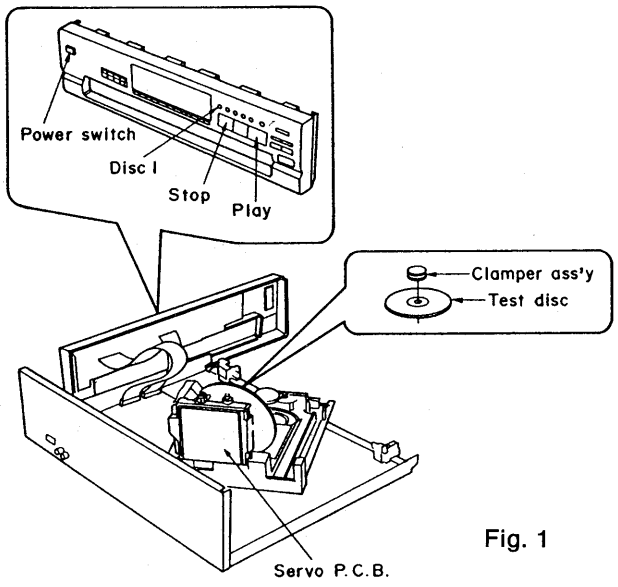
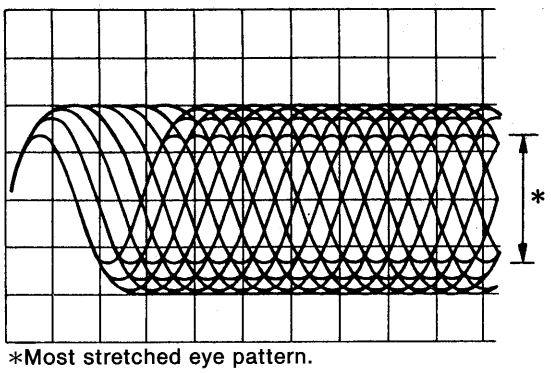


Fig. 1

(1) MECHANICAL ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across TJ701 (RF) and TJ702 (VREF) on the servo P.C.B. (Refer to Fig. 3 on page 27)
   Oscilloscope setting: VOLT 200mV
   SWEEP..... 0.5μs.
   Input coupling..... AC
2. Switch the player power **ON**, and play track **19** on the test disc (SZZP1056C).
   (Playing any other track will prevent the HEX screws from being accessed.)
3. Leave the player in play mode and place it as shown Fig. 3.
4. Alternately adjust the two HEX screws with the 2.0mm allen wrench (SZZP1101C) until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched. (Refer to Fig. 2)
5. After completing the adjustment, lock the HEX screws with lock paint (RZZ0L01).



*Most stretched eye pattern.

Fig. 2

(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 directions).

* **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 0.7mm black dot and the 0.7mm wedge on the playability test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

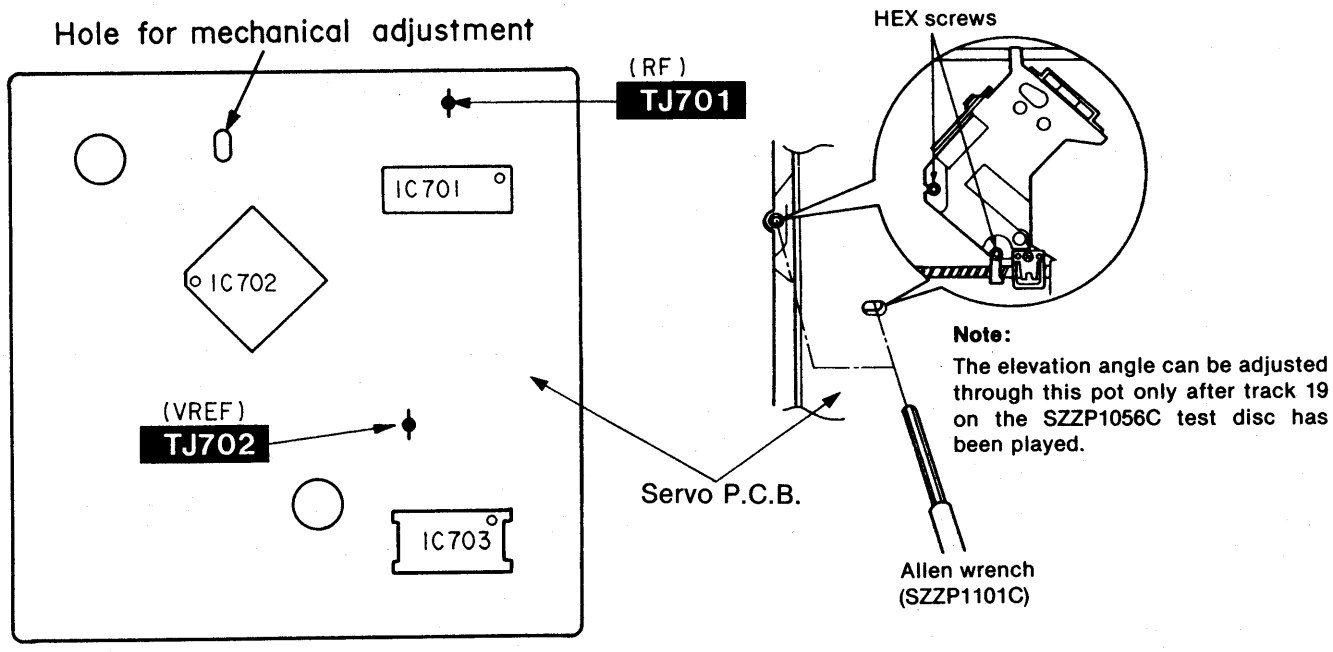
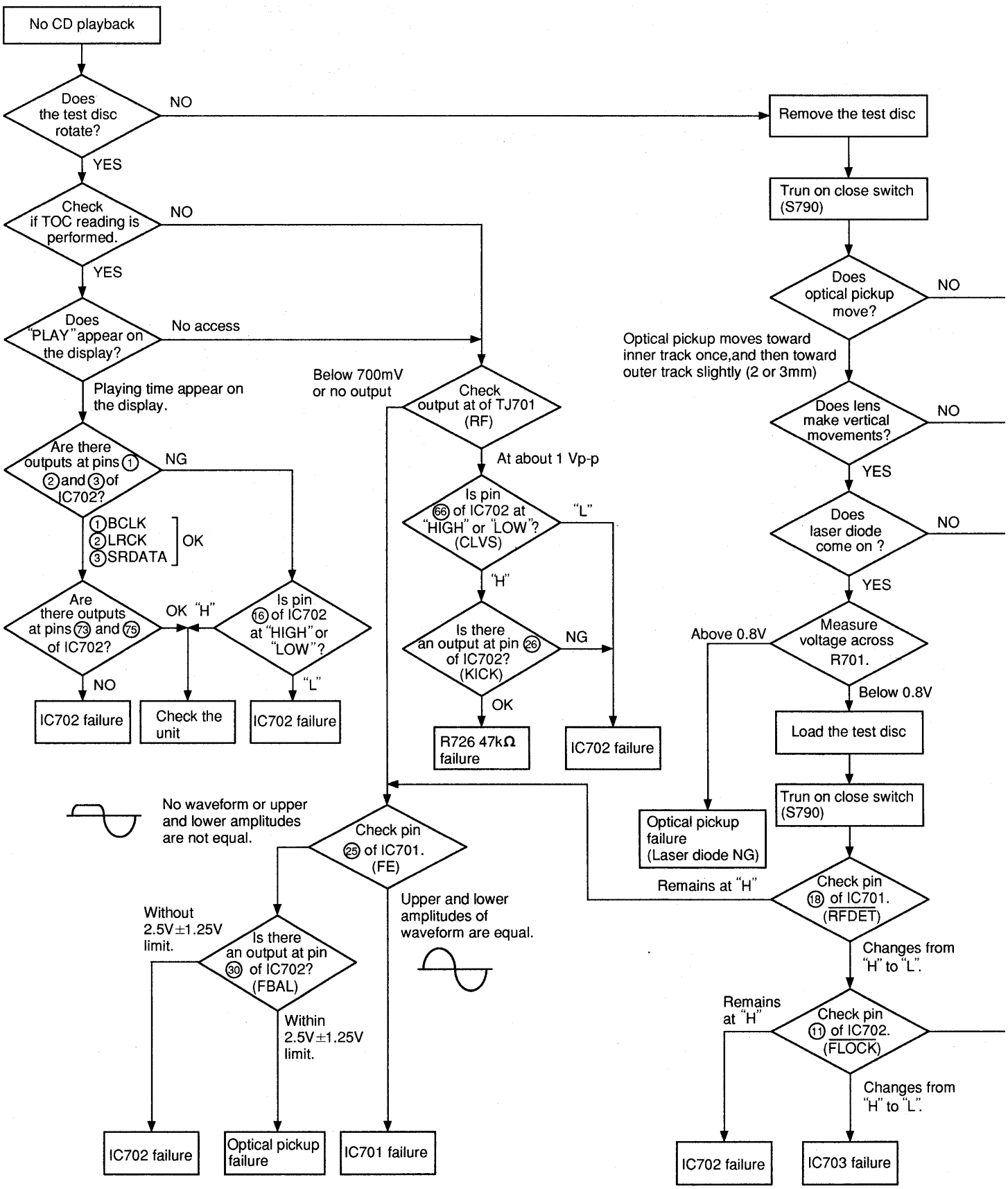
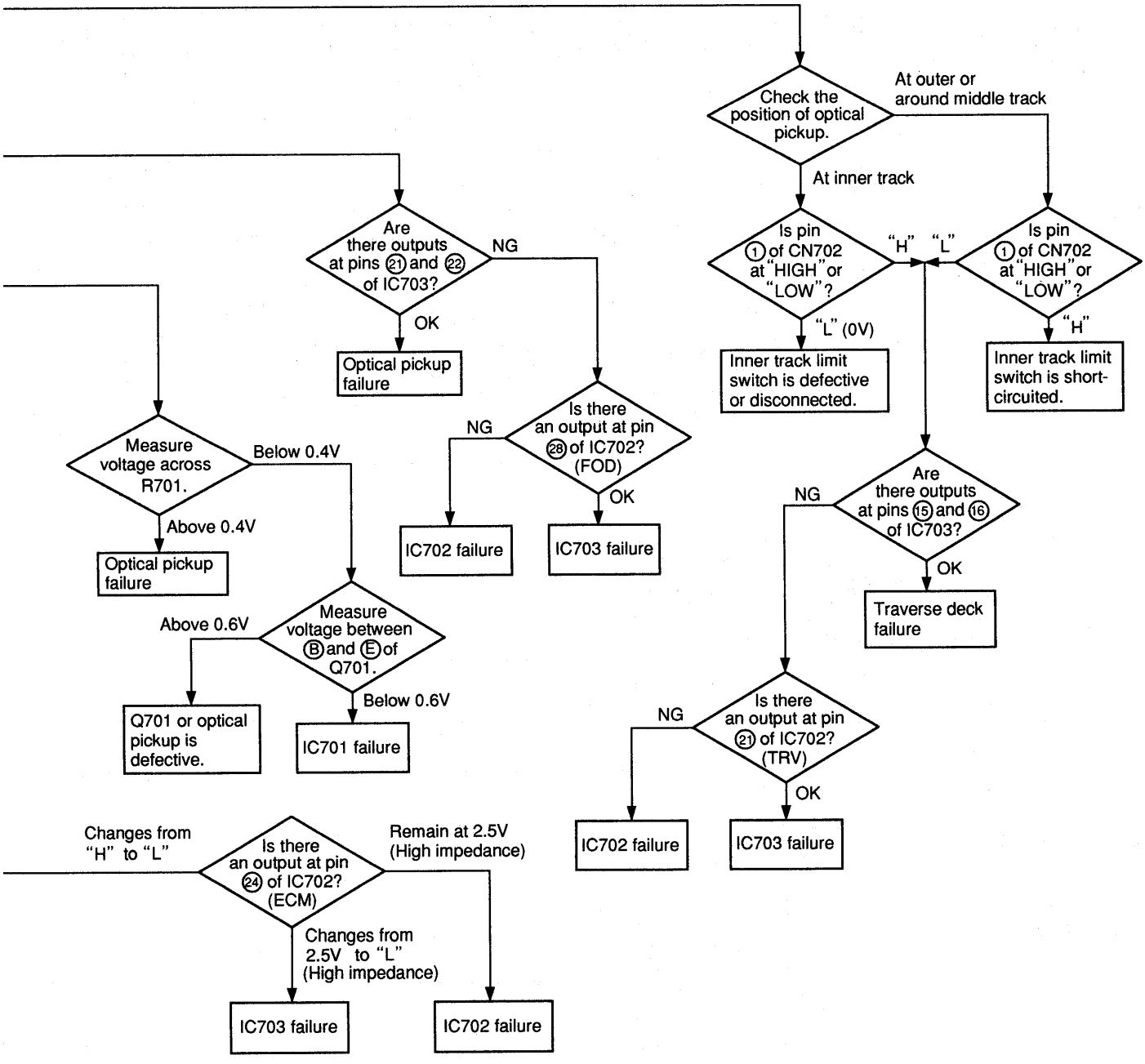


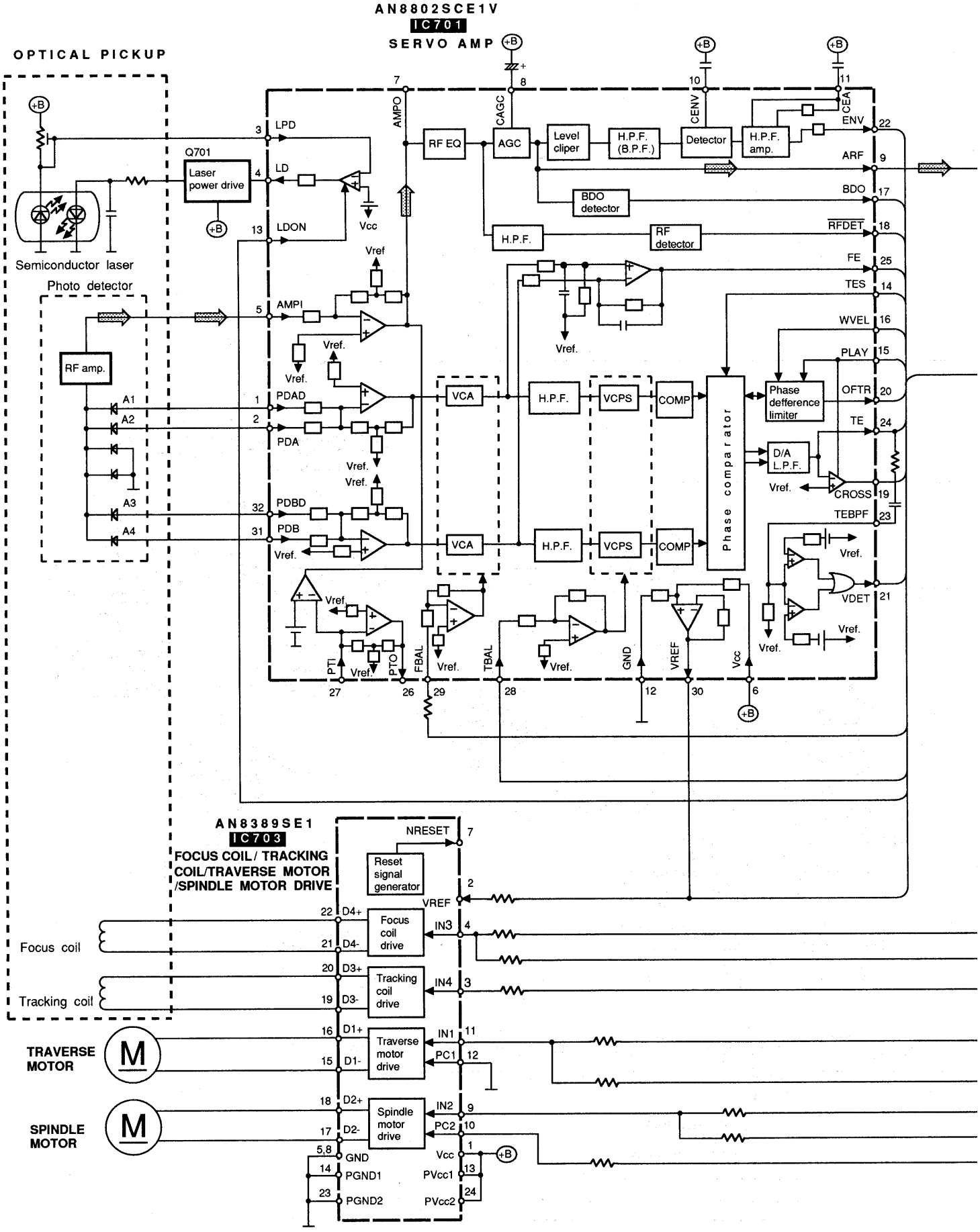
Fig. 3

■ TROUBLESHOOTING GUIDE




Check the position of optical pickup.
At outer or around middle track
At inner track
Is pin ① of CN702 at "HIGH" or "LOW"?
"H"
"L"
Is pin ① of CN702 at "HIGH" or "LOW"?
"L" (0V)
Inner track limit switch is defective or disconnected.
"H"
Inner track limit switch is short-circuited.
Are there outputs at pins ㉑ and ㉒ of IC703?
NG
OK
Optical pickup failure
Is there an output at pin ㉘ of IC702? (FOD)
NG
OK
IC702 failure
IC703 failure
Measure voltage across R701.
Below 0.4V
Above 0.4V
Optical pickup failure
Measure voltage between Ⓑ and Ⓔ of Q701.
Above 0.6V
Below 0.6V
Q701 or optical pickup is defective.
IC701 failure
Are there outputs at pins ⑮ and ⑯ of IC703?
NG
OK
Traverse deck failure
Is there an output at pin ㉑ of IC702? (TRV)
NG
OK
IC702 failure
IC703 failure
Changes from "H" to "L"
Is there an output at pin ㉔ of IC702? (ECM)
Remain at 2.5V (High impedance)
Changes from 2.5V to "L" (High impedance)
IC703 failure
IC702 failure

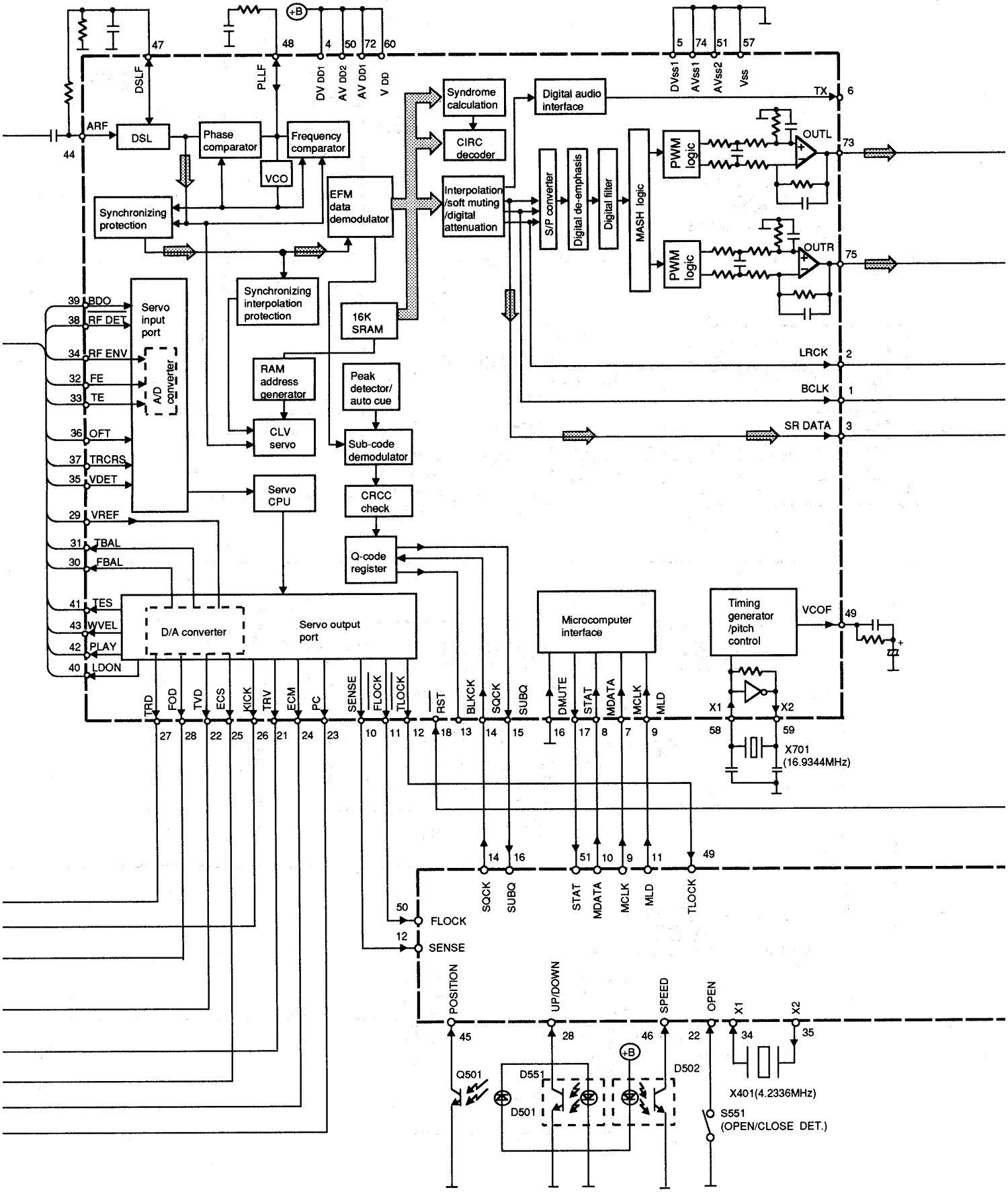
■ BLOCK DIAGRAM

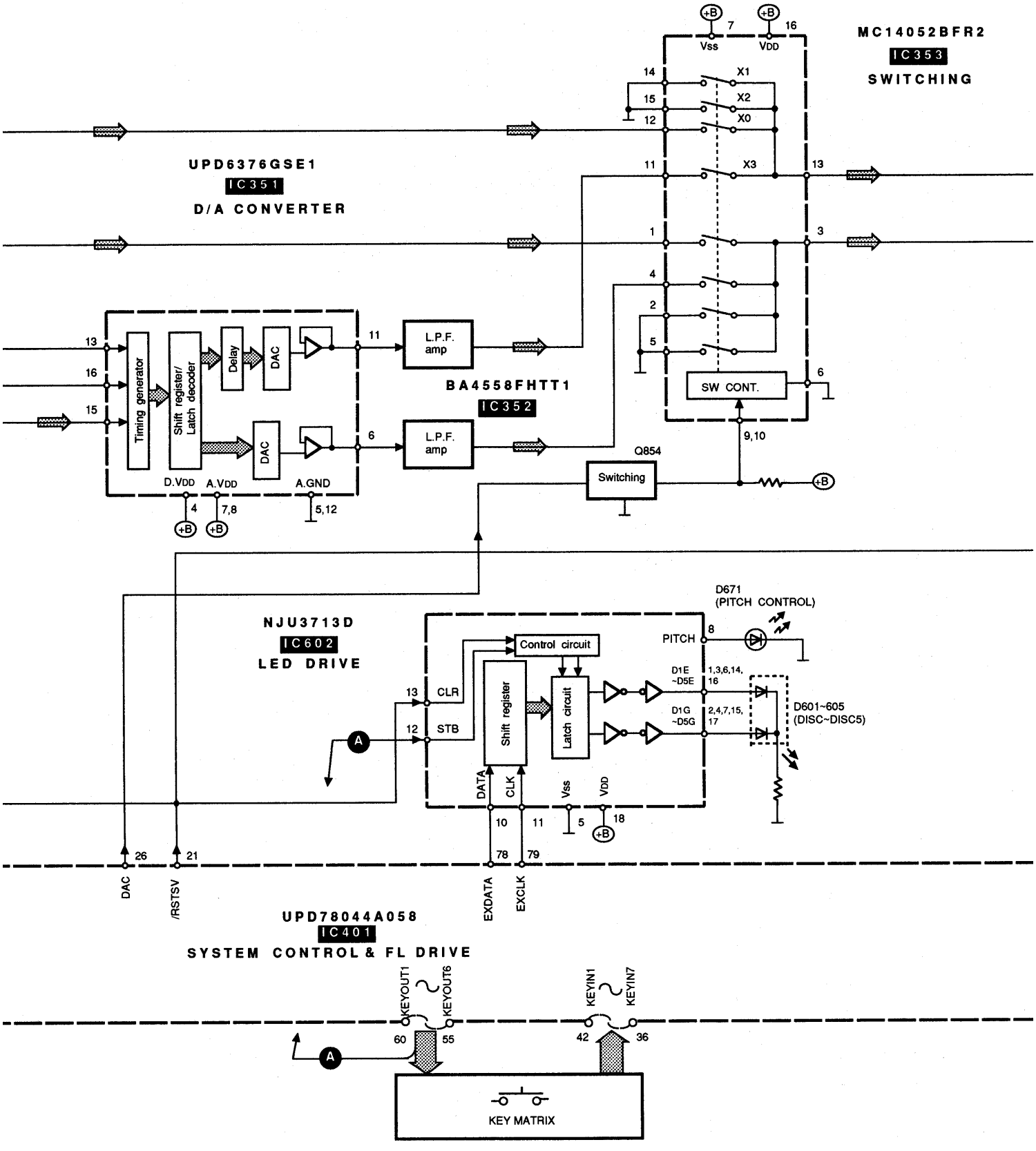


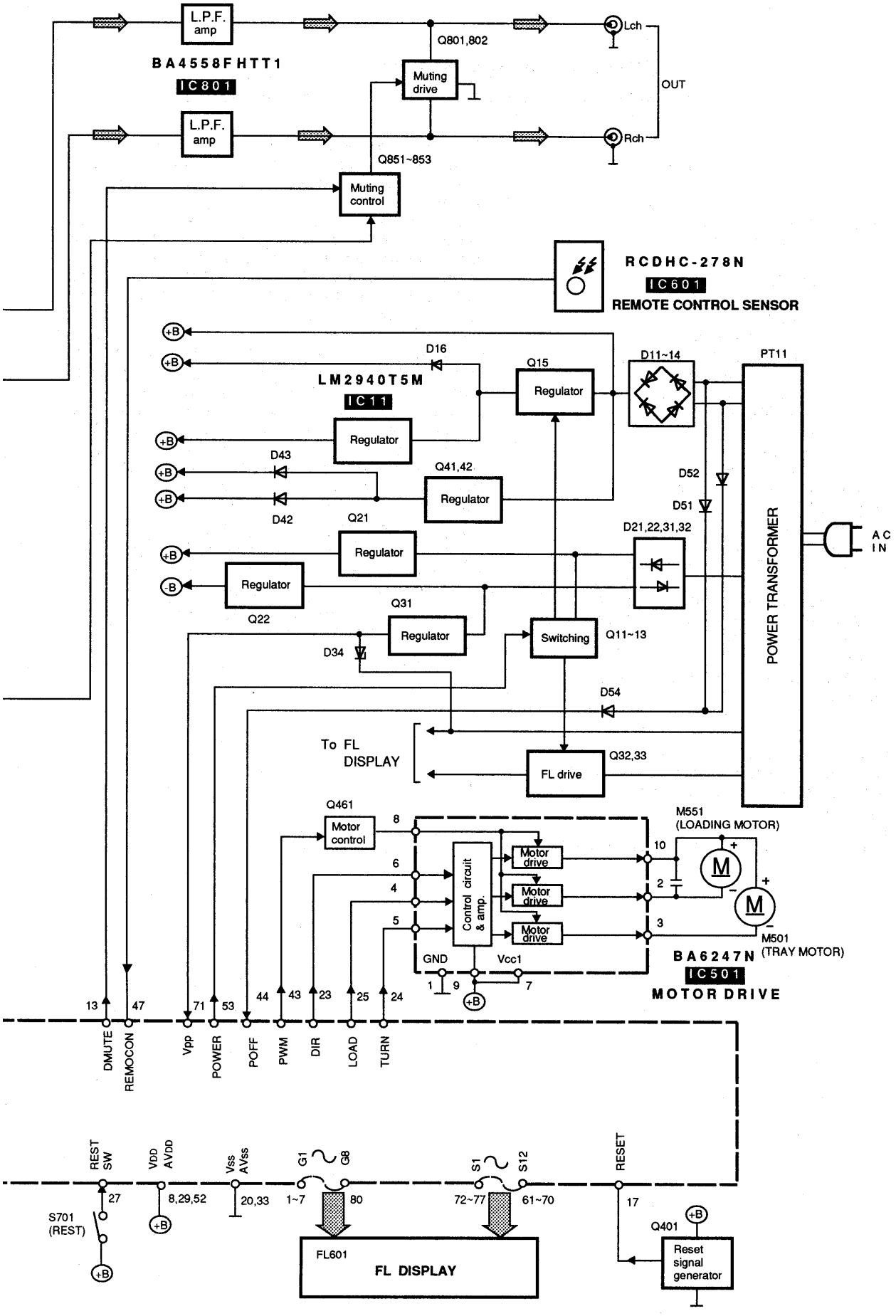
MN662712RA

IC702

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




MC14052BFR2
IC353
SWITCHING
Vss
VDD
X1
X2
X0
X3
SW CONT.
UPD6376GSE1
IC351
D/A CONVERTER
Timing generator
Shift register/ Latch decoder
Delay
DAC
L.P.F. amp
BA4558FHTT1
IC352
D.VDD
A.VDD
A.GND
Q854
Switching
NJU3713D
IC602
LED DRIVE
Control circuit
Shift register
Latch circuit
CLR
STB
DATA
CLK
PITCH
D671
(PITCH CONTROL)
D1E ~D5E
D1G ~D5G
D601~605
(DISC~DISC5)
DAC
/RSTSV
EXDATA
EXCLK
UPD78044A058
IC401
SYSTEM CONTROL & FL DRIVE
KEYOUT1
KEYOUT6
KEYIN1
KEYIN7
KEY MATRIX



Note: ⇨ Audio signal

■ SCHEMATIC DIAGRAM (Parts list on pages 54~57.)

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

Note:

- **S551** : Open/close det. switch.
- **S601** : Auto cue (AUTO CUE) switch.
- **S602** : Spiral (SPIRAL) switch.
- **S603** : Random mode (RANDOM MODE) switch.
- **S604** : Repeat (REPEAT) switch.
- **S605** : ID scan (ID SCAN) switch.
- **S606** : Edit guide (EDIT GUIDE) switch.
- **S607** : Stop (■) switch.
- **S608** : Pause (❚❚) switch.
- **S609** : Play (▶) switch.
- **S610~S614**: Disc (DISC 1~5) switches.
  [S610: 1, S611: 2, S612: 3, S613: 4, S614: 5]
- **S615** : Disc skip (DISC SKIP) switch.
- **S616** : Program mode (PROGRAM MODE) switch.
- **S617, 618** : Search (SEARCH) switches.
  [S617: ◀◀, S618: ▶▶]
- **S619, 620** : Skip (SKIP) switches.
  [S619: I◀◀, S620: ▶▶I]
- **S621** : Loading drawer open/close (▲ OPEN/CLOSE) switch.
- **S631** : Power "STANDBY ⏻ /ON" (POWER, STANDBY ⏻ ON) switch.
- **S651~S662**: Numeric (1~10, 0, > 10) switches.
  [S651: (1), S652: (2), S653: (3), S654: (4), S655: (5), S656: (6), S657: (7), S658: (8), S659: (9), S660: (10), S661: (> 10), S662: (0)]
- **S671** : Pitch control (PITCH CONTROL, OFF/ON) switch.
- **S672** : Pitch control (PITCH CONTROL, −, +) switch.

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 pins of IC or LSI with fingers directly.

- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
  Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.

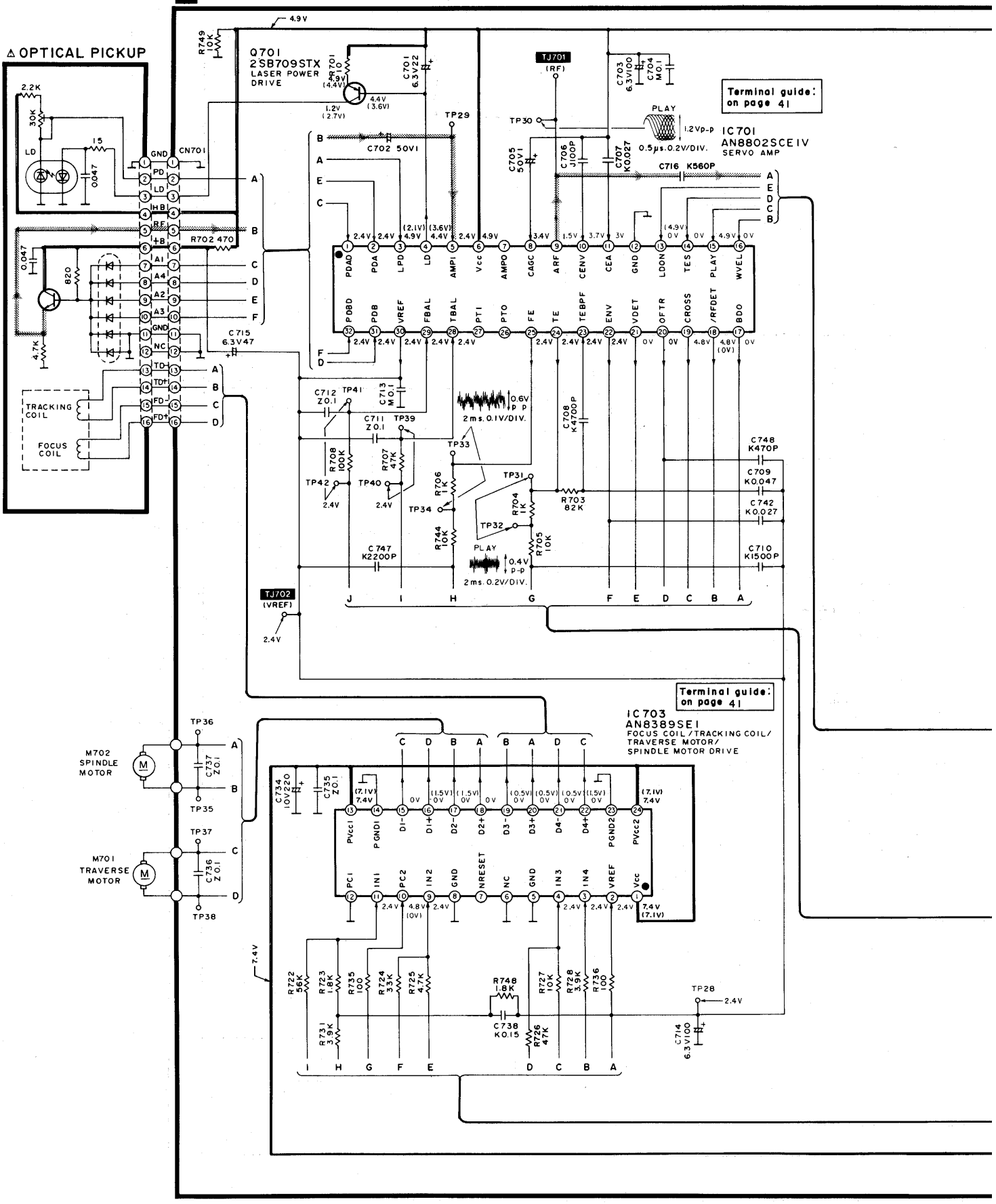
*The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.

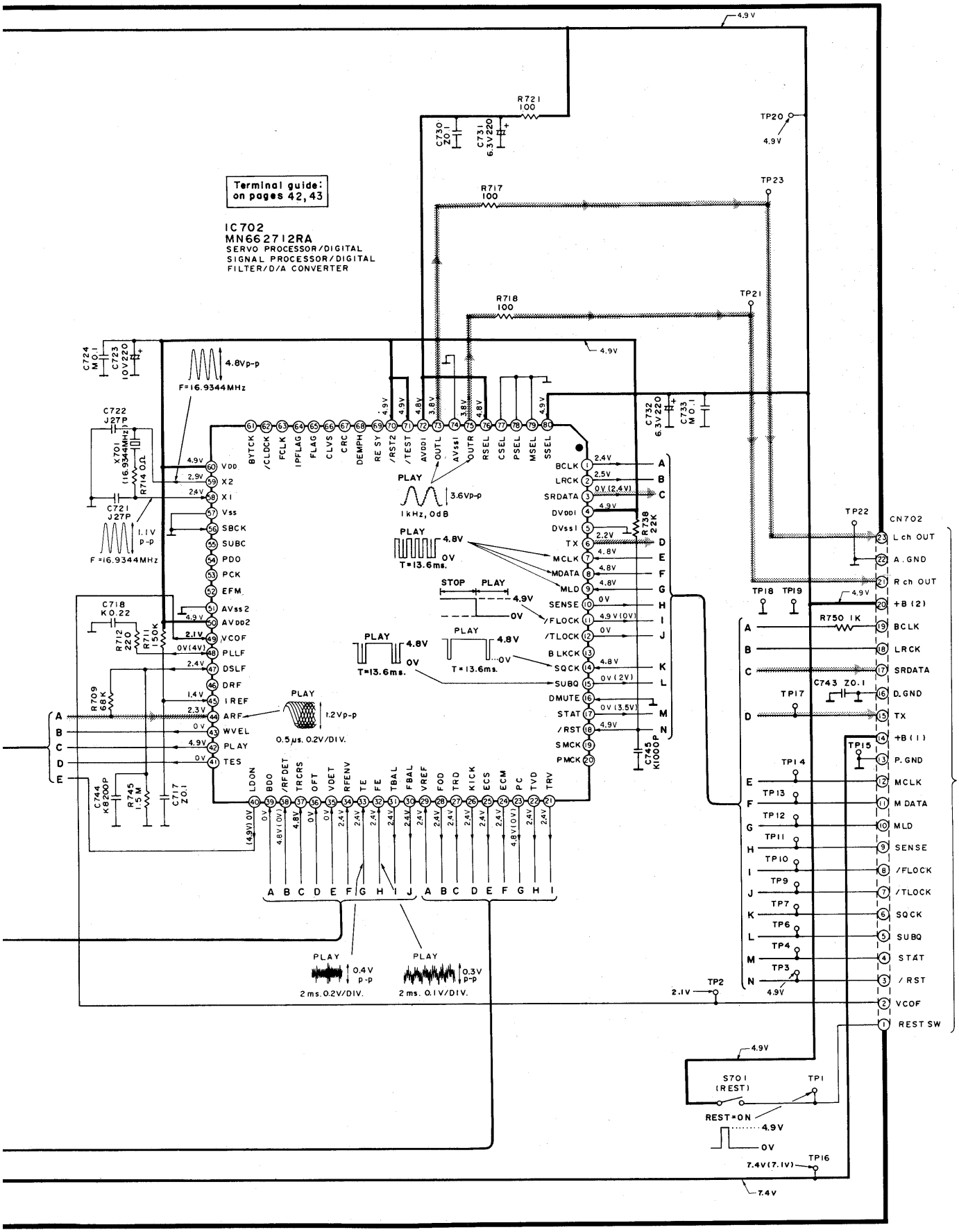
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used as occation calls. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
- The supply part number is described alone in the replacement parts.

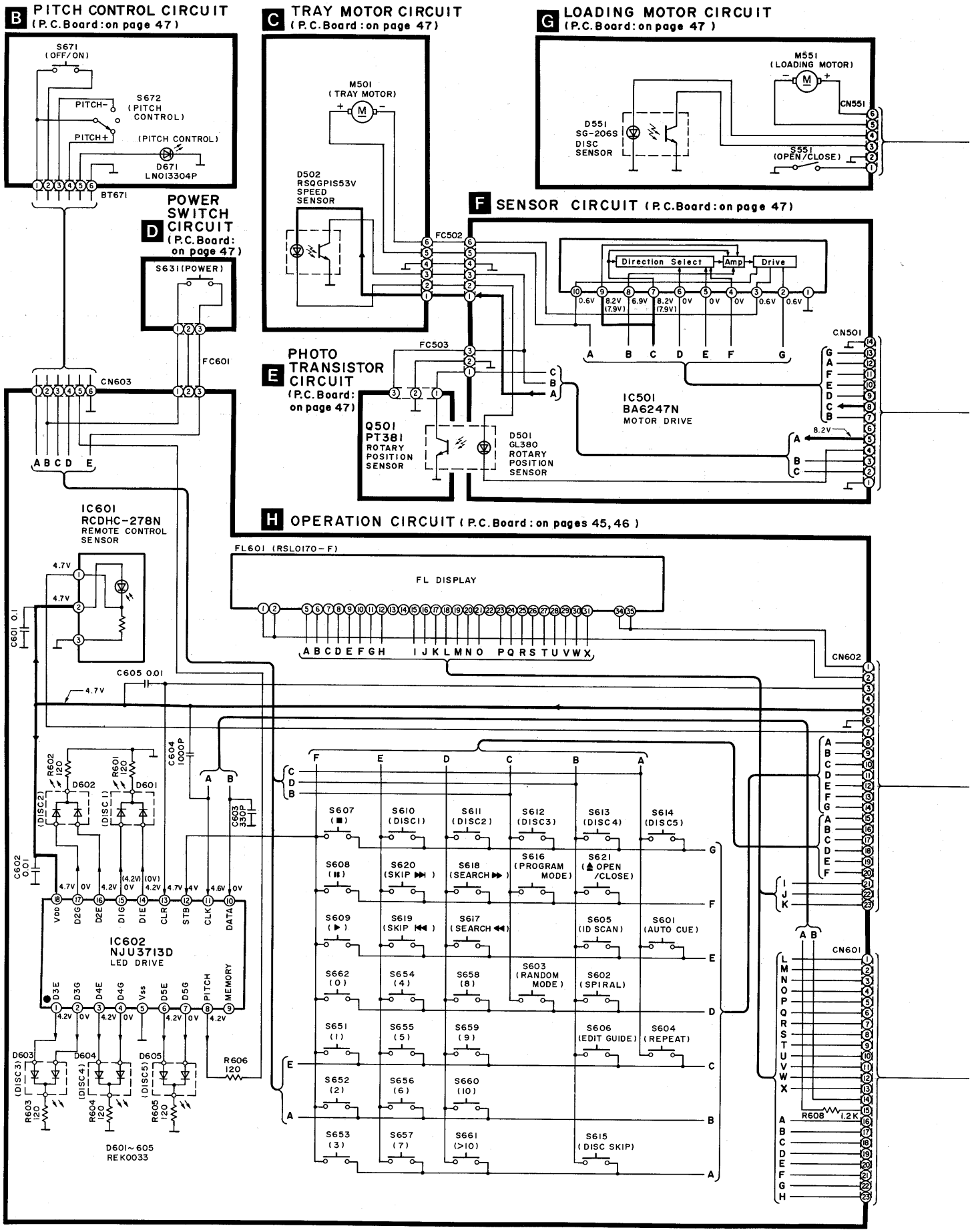
Part No.	Production Part No.	Supply Part No.
IC11	LM2940T5M	LM2940T5

- ▬▬▬ / ▬ ▬ ▬ : Positive voltage lines and negative voltage lines.
  ⇢⇢⇢ : audio signal lines.

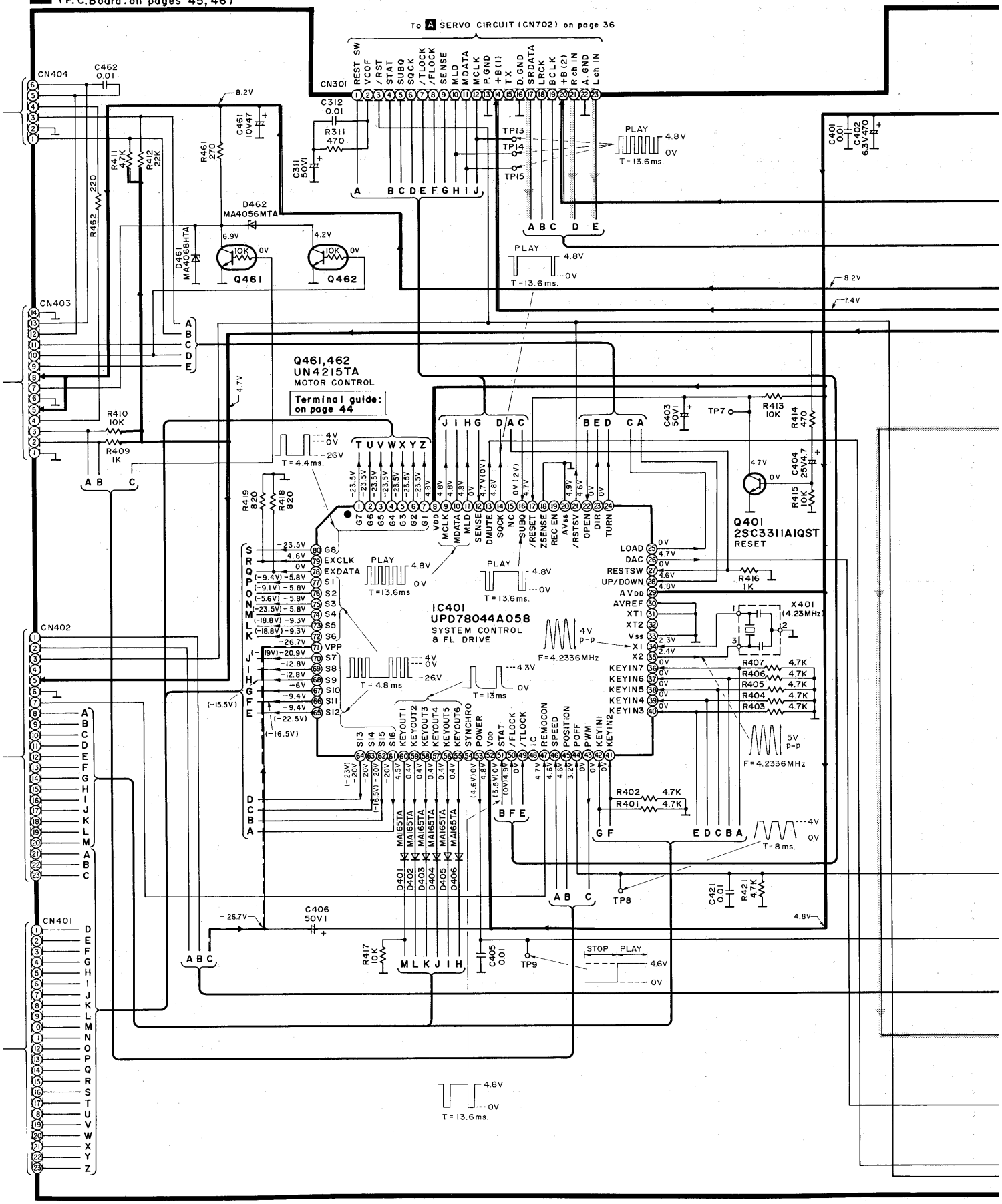
A SERVO CIRCUIT (P.C. Board: on page 45)



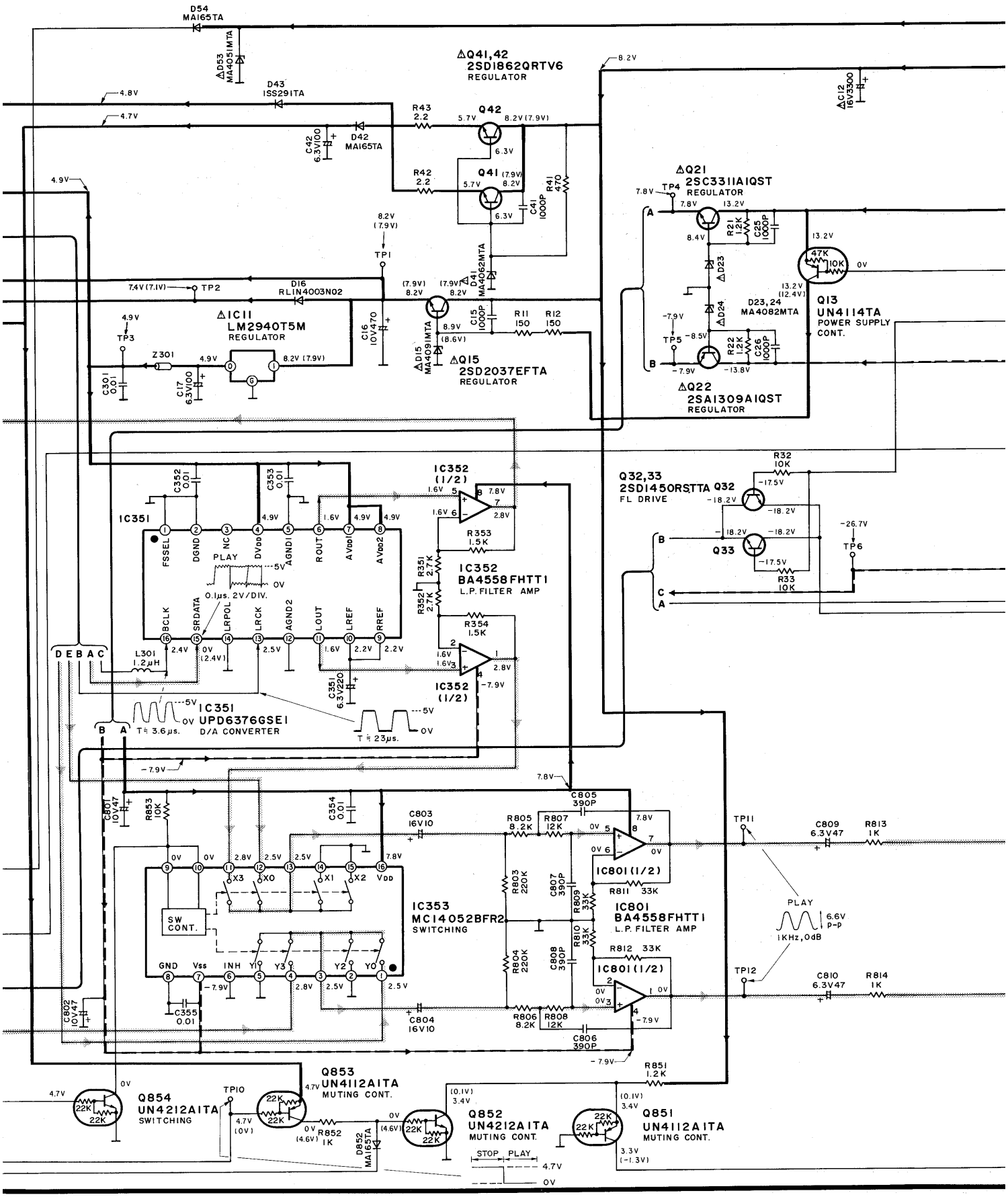

Terminal guide: on pages 42, 43
IC702
MN662712RA
SERVO PROCESSOR/DIGITAL SIGNAL PROCESSOR/DIGITAL FILTER/D/A CONVERTER
4.9V
R721 100
C730 Z0.1
C731 6.3V220
TP20
TP23
R717 100
TP21
R718 100
C724 M0.1
C723 10V220
4.8Vp-p
F=16.9344MHz
C722 J27P
X701 (16.9344MHz)
R714 0Ω
C721 J27P
1.1V p-p
F=16.9344MHz
C732 6.3V220
C733 M0.1
BYTCK /CLOCK FCLK IPFLAG FLAG CLVS CRC DEMPH RESY /RST2 /TEST AVDD1 OUTL AVSS1 OUTR RSEL CSEL PSEL MSEL SSEL
VDD X2 X1 Vss SBCK SUBC PDO PCK EFM AVSS2 AVDD2 VCOF PLLF DSLF DRF IREF ARF WVEL PLAY TES
BCLK LRCK SRDATA DVDD1 DVSS1 TX MCLK MDATA MLD SENSE /FLOCK /TLOCK BLKCK SQCK SUBQ DMUTE STAT /RST SMCK PMCK
PLAY 3.6Vp-p 1kHz, 0dB
R738 22K
PLAY 4.8V 0V T=13.6ms.
STOP PLAY 4.9V 0V
PLAY 4.8V 0V T=13.6ms.
PLAY 4.8V 0V T=13.6ms.
C718 K0.22
R712 220
R711 150K
R709 68K
PLAY 1.2Vp-p 0.5μs. 0.2V/DIV.
C744 K8200P
R745 1.5M
C717 Z0.1
LDON BDO /RFDET TRCRS OFT VDET RFENV TE FE TBAL FBAL VREF FOD TRD KICK ECS ECM PC TVD TRV
PLAY 0.4V p-p 2ms. 0.2V/DIV.
PLAY 0.3V p-p 2ms. 0.1V/DIV.
TP22
CN702
L ch OUT
A. GND
R ch OUT
+B (2)
BCLK
LRCK
SRDATA
D. GND
TX
+B (1)
P. GND
MCLK
M DATA
MLD
SENSE
/FLOCK
/TLOCK
SQCK
SUBQ
STAT
/RST
VCOF
REST SW
TP18 TP19 TP17 TP15 TP14 TP13 TP12 TP11 TP10 TP9 TP7 TP6 TP4 TP3
R750 1K
C743 Z0.1
To MAIN CIRCUIT (CN301) On page 38
TP2 2.1V
S701 (REST)
TP1
REST=ON
4.9V
0V
7.4V(7.1V)
TP16
7.4V

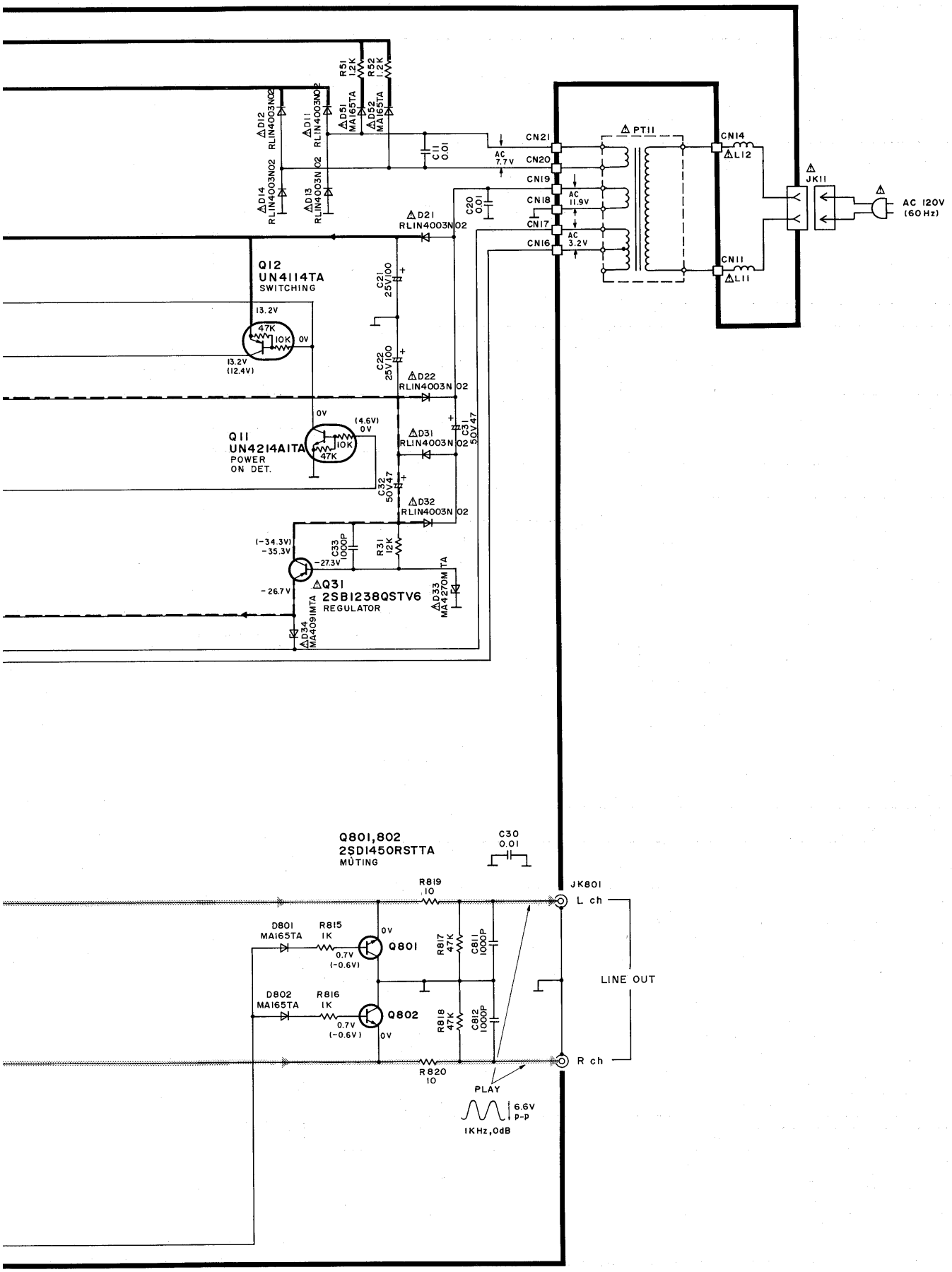

B PITCH CONTROL CIRCUIT (P.C.Board:on page 47)
S671 (OFF/ON)
PITCH-
S672 (PITCH CONTROL)
PITCH+
(PITCH CONTROL)
D671 LN0I3304P
BT671
C TRAY MOTOR CIRCUIT (P.C.Board:on page 47)
M501 (TRAY MOTOR)
D502 RSQGPIS53V SPEED SENSOR
G LOADING MOTOR CIRCUIT (P.C.Board:on page 47)
M551 (LOADING MOTOR)
CN551
D551 SG-206S DISC SENSOR
S551 (OPEN/CLOSE)
D POWER SWITCH CIRCUIT (P.C.Board: on page 47)
S631(POWER)
F SENSOR CIRCUIT (P.C.Board:on page 47)
FC502
Direction Select
Amp
Drive
0.6V
8.2V (7.9V)
6.9V
8.2V (7.9V)
0V
0V
0V
0.6V
0.6V
A B C D E F G
CN501
E PHOTO TRANSISTOR CIRCUIT (P.C.Board: on page 47)
FC503
Q501 PT381 ROTARY POSITION SENSOR
D501 GL380 ROTARY POSITION SENSOR
IC501 BA6247N MOTOR DRIVE
8.2V
FC601
CN603
A B C D E
IC601 RCDHC-278N REMOTE CONTROL SENSOR
H OPERATION CIRCUIT (P.C.Board:on pages 45,46)
FL601 (RSLOI70-F)
FL DISPLAY
A B C D E F G H I J K L M N O P Q R S T U V W X
CN602
CN601
C601 0.1
C605 0.01
4.7V
C604 1000P
C603 330P
C602 0.01
R602 120
R601 120
D602
D601
(DISC2)
(DISC1)
Vdd D2G D2E D1G D1E CLR STB CLK DATA
IC602 NJU3713D LED DRIVE
D3E D3G D4E D4G Vss D5E D5G PITCH MEMORY
D603
D604
D605
(DISC3)
(DISC4)
(DISC5)
R603 120
R604 120
R605 120
R606 120
D601~605 REK0033
S607 (■)
S610 (DISC1)
S611 (DISC2)
S612 (DISC3)
S613 (DISC4)
S614 (DISC5)
S608 (II)
S620 (SKIP ▶▶I)
S618 (SEARCH ▶▶)
S616 (PROGRAM MODE)
S621 (▲OPEN /CLOSE)
S609 (▶)
S619 (SKIP I◀◀)
S617 (SEARCH ◀◀)
S605 (ID SCAN)
S601 (AUTO CUE)
S662 (0)
S654 (4)
S658 (8)
S603 (RANDOM MODE)
S602 (SPIRAL)
S651 (1)
S655 (5)
S659 (9)
S606 (EDIT GUIDE)
S604 (REPEAT)
S652 (2)
S656 (6)
S660 (10)
S653 (3)
S657 (7)
S661 (>10)
S615 (DISC SKIP)
R608 1.2K

1 MAIN CIRCUIT
(P.C.Board: on pages 45, 46)



1 MAIN CIRCUIT
(P.C.Board:on pages 45,46)

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R52 1.2K
△D12 RLIN4003N02
△D11 RLIN4003N02
△D51 MA165TA
△D52 MA165TA
△D14 RLIN4003N02
△D13 RLIN4003N02
C11 0.01
CN21
CN20
CN19
CN18
CN17
CN16
AC 7.7V
AC 11.9V
AC 3.2V
△PT11
CN14
△L12
CN11
△L11
△JK11
AC 120V (60Hz)
C20 0.01
△D21 RLIN4003N02
Q12 UN4114TA SWITCHING
13.2V
47K
10K
0V
13.2V (12.4V)
C21 25V100
C22 25V100
△D22 RLIN4003N02
Q11 UN4214AITA POWER ON DET.
0V
(4.6V) 0V
10K
47K
△D31 RLIN4003N02
C31 50V47
C32 50V47
△D32 RLIN4003N02
(-34.3V) -35.3V
C33 1000P
R31 12K
-27.3V
△Q31 2SB1238QSTV6 REGULATOR
-26.7V
△D33 MA4270M TA
△D34 MA4091MTA
Q801,802 2SD1450RSTTA MUTING
C30 0.01
R819 10
JK801
L ch
D801 MA165TA
R815 1K
0V
Q801
0.7V (-0.6V)
R817 47K
C811 1000P
D802 MA165TA
R816 1K
Q802
0.7V (-0.6V)
0V
R818 47K
C812 1000P
LINE OUT
R820 10
R ch
PLAY
6.6V p-p
1KHz,0dB

■ TERMINAL GUIDE

• IC701 (AN8802SCE1V): Servo amp

Pin No.	Mark	I/O Division	Function
1	PDAD	I	Photo detector Bch input without delay
2	PDA	I	Photo detector Ach input without delay
3	LPD	I	Laser PD signal
4	LD	O	Laser power auto control output
5	AMPI	I	RF amp terminal
6	V_{CC}	I	Power supply terminal
7	AMPO	O	RF amp signal
8	CAGC	I	AGC detection capacitor input
9	ARF	O	RF signal
10	CENV	I	RF detect capacitor connection terminal
11	CEA	I	HPF-AMP capacitor connection terminal
12	GND	—	GND terminal
13	LDON	I	LD APC ON/OFF ("H": ON, "L": OFF)
14	TES	I	Tracking error shunt input ("H": shunt)
15	PLAY	I	Play signal ("H": ON, "L": OFF)
16	WVEL	I	Double velocity ("H": double, "L": single)

Pin No.	Mark	I/O Division	Function
17	BDO	O	Dropout detection control
18	/RFDET	O	RF det. signal ("L": det.)
19	CROSS	O	Tracking error zero cross output
20	OFTR	O	Off track detection ("H": det.)
21	VDET	O	Oscillation det. signal ("H": det.)
22	ENV	O	Envelope output terminal
23	TEBPF	I	Oscillation detect input terminal (Not used, open)
24	TE	O	Tracking error signal
25	FE	O	Focusing error signal
26	PTO	O	Potention amp output
27	PTI	I	Potention amp input
28	TBAL	I	Tracking balance adj. input
29	FBAL	I	Focus balance adj. input
30	VREF	O	Reference voltage output
31	PDB	I	Photo detector Ach input with delay
32	PDBD	I	Photo detector Bch input with delay

• IC703 (AN8389SE1): Focus coil/tracking coil/traverse motor/spindle motor drive

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

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

• IC702 (MN662712RA): Servo processor/digital signal processor/digital filter/D/A converter

Pin No.	Mark	I/O Division	Function
1	BCLK	O	Serial bit clock terminal
2	LRCK	O	L/R discriminating signal
3	SRDATA	O	Serial data (Not used, open)
4	$DV_{DD}1$	I	Power supply (digital circuit) terminal
5	$DV_{SS}1$	—	GND (digital circuit) terminal
6	TX	O	Digital audio interface signal
7	MCLK	I	Command clock signal
8	MDATA	I	Command data signal
9	MLD	I	Command load signal ("L": LOAD)
10	SENSE	O	Sense signal (OFT, FESL, NACEND, NAJEND, POSAD, SFG)
11	/FLOCK	O	Optical servo condition (focus) ("L": lead-in)
12	/TLOCK	O	Optical servo condition (tracking) ("L": lead-in)
13	BLKCK	O	Sub-code block clock (f=75Hz) (Not used, open)
14	SQCK	I	Sub-code Q register clock
15	SUBQ	O	Sub-code Q data
16	DMUTE	I	Muting input ("H": MUTE) (Not used, connected to GND)
17	STAT	O	Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQCK)
18	/RST	I	Reset signal ("L": reset)
19	SMCK	O	System clock (f=4.2336MHz) (Not used, open)
20	PMCK	O	Frequency division clock signal (Not used, open) ($f=\frac{1}{1.92}\times ck=88.2kHz$)
21	TRV	O	Traverse servo control
22	TVD	O	Traverse drive signal
23	PC	O	Turntable motor drive signal ("L": ON)
24	ECM	O	Turntable motor drive signal (Forced mode)
25	ECS	O	Turntable motor drive signal (Servo error signal)
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive signal output
28	FOD	O	Focus drive signal output
29	VREF	I	D/A drive output (TVD, ECS, TRD, FOD, FBAL, TBAL) normal voltage input terminal
30	FBAL	O	Focus balance adj. output (Not used, open)
31	TBAL	O	Tracking balance adj. output
32	FE	I	Focus error signal (analog input)
33	TE	I	Tracking error signal (analog input)
34	RFENV	I	RF envelope signal
35	VDET	I	Oscillation det. signal ("H": det.)
36	OFT	I	Off frack signal ("H": Off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal ("L": detection)
39	BDO	I	Dropout detection signal ("H": dropout)
40	LDON	O	Laser power control ("H": ON)
41	TES	O	Tracking error shunt output ("H": dropout)
42	PLAY	O	Play signal ("H": play)

Pin No.	Mark	I/O Division	Function
43	WVEL	O	Double velocity status signal ("H": double)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	I	DSL bias terminal (Not used, open)
47	DSLF	I/O	DSL loop filter terminal
48	PLLF	I/O	PLL loop filter terminal
49	VCOF	I/O	VCO loop filter terminal (Not used, open)
50	$AV_{DD}2$	I	Power supply (analog circuit) terminal (2)
51	$AV_{SS}2$	—	GND (analog circuit) terminal
52	EFM	O	EFM signal (Not used, open)
53	PCK	O	PLL extract clock (f=4.3218MHz)
54	PDO	O	Phase comparated signal of EFM and PCK (Not used, open)
55	SUBC	O	Sub-code serial output data (Not used, open)
56	SBCK	I	Sub-code serial input clock (Not used, connected to GND)
57	V_{SS}	—	GND terminal
58	X1	I	Crystal oscillator terminal (f=16.9344MHz)
59	X2	O	
60	V_{DD}	I	Power supply terminal
61	BYTCK	O	Byte clock signal (Not used, open)
62	/CLDCK	O	Sub-code frame clock signal (f CLDCK=7.35kHz: Normal) (Not used, open)

Pin No.	Mark	I/O Division	Function
63	FCLK	O	Crystal frame clock (Not used, open)
64	IPFLAG	O	Interpolation flag terminal
65	FLAG	O	Flag terminal
66	CLVS	O	Turntable servo phase synch signal ("H": CLV, "L": Rough servo) (Not used, open)
67	CRC	O	Sub-code CRC check terminal ("H": OK, "L": NG)
68	DEMPH	O	De-emphasis ON signal ("H": ON) (Not used, open)
69	RESY	O	Re-synchronizing signal of frame sync. (Not used, open)
70	/RST2	I	Reset terminal after "MASH" circuit
71	/TEST	I	Test terminal (Normal: "H")
72	$AV_{DD}1$	I	Power supply (analog circuit) terminal (1)
73	OUTL	O	Lch audio signal
74	$AV_{SS}1$	—	GND (analog circuit) terminal (1)
75	OUTR	O	Rch audio signal
76	RSEL	I	Polarity direction control terminal of RF signal
77	CSEL	I	Frequency control terminal of crystal oscillator (Not used, connected to GND)
78	PSEL	I	Test terminal (Normal: "L")
79	MSEL	I	"SMCK" terminal frequency select ("L": SMCK=4.2336MHz)
80	SSEL	I	"SUBQ" terminal mode select ("H": Q code buffer)

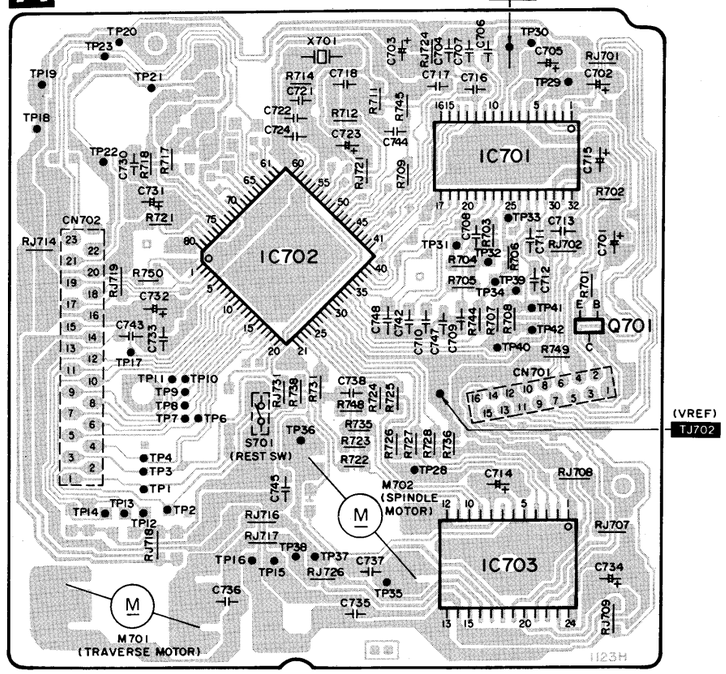
• IC401 (UPD78044A058): System control & FL drive

Pin No.	Mark	I/O Division	Function
1 ∫ 7	G7 ∫ G1	O	Grid signal of FL display
8	VDD	I	Power supply terminal
9	MCLK	O	Command clock signal
10	MDATA	O	Command data signal
11	MLD	O	Command load signal ("L" LOAD)
12	SENSE	I	Sense signal
13	DMUTE	O	Muting control signal
14	SQCK	O	Sub-code Q register clock
15	NC	—	Not connected
16	SUBQ	I	Sub-code Q data
17	/RESET	I	Reset signal input
18	ZSENSE	—	Not used, connected to GND
19	REC. EN	I	Synchro. rec. control terminal
20	AVSS	—	GND terminal
21	/RSTSV	O	Reset signal output
22	OPEN	I	Open detect terminal
23	DIR	O	Motor control signal
24	TRUN	O	
25	LOAD	O	Motor control signal
26	DAC	—	Not used, open
27	RESTSW	I	Rest position de
28	UP/DOWN	I	Traverse deck up/down det. terminal
29	AVDD	I	Power supply terminal
30	AVREF	I	Power supply terminal
31	XT1	—	Not used, connected to GND

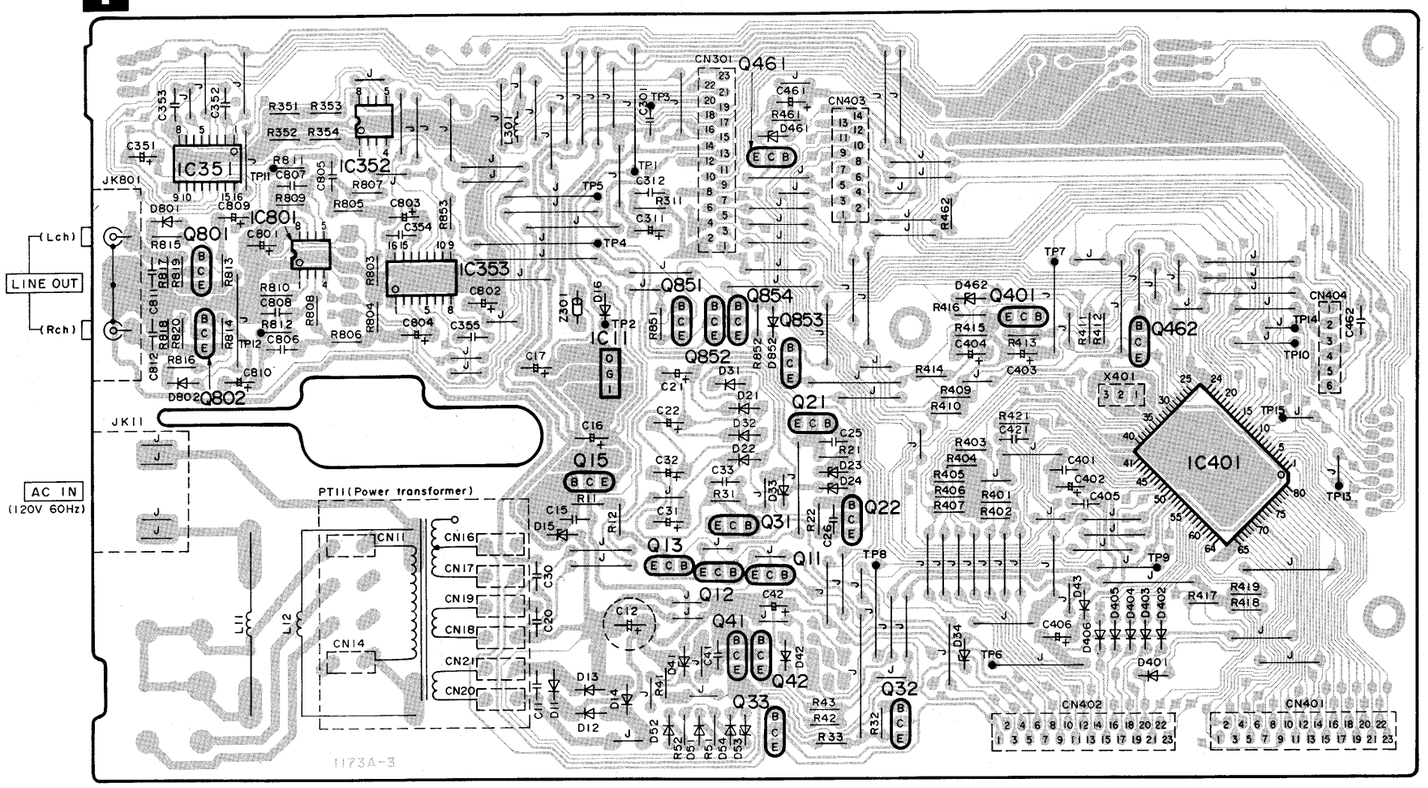
Pin No.	Mark	I/O Division	Function
32	XT2	—	Not used, open
33	VSS	—	GND terminal
34	X1	I	Crystal Osc terminal (F: 4.2336 MHz)
35	X2	O	
36 ∫ 42	KEYIN 7 ∫ KEYIN 1	I	Key return signal
43	PWM	O	Motor control signal
44	POFF	I	Power det. terminal
45	POSITION	I	Rotary tray position det. terminal
46	SPEED	I	Loading motor speed sensor signal
47	REMOCON	I	Remote control signal input
48	IC	—	Not used, connected to GND
49	/TLOCK	I	Optical servo condition (tracking) input
50	/FLOCK	I	Optical servo condition (focus) input
51	STAT	I	Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQCK)
52	VDD	I	Power supply terminal
53	POWER	O	Power ON/OFF output terminal
54	SYNCHRO	—	Not used, open
55 ∫ 60	KEYOUT 6 ∫ KEYOUT 1	O	Key scan signal
61 ∫ 70	S16 ∫ S7	O	Segment signal of FL display
71	VPP	I	Power supply terminal
72 ∫ 77	S6 ∫ S1	O	Segment signal of FL display
78	EXDATA	O	Not used, open
79	EXCLK	O	Not used, open
80	G8	O	Grid signal of FL display

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

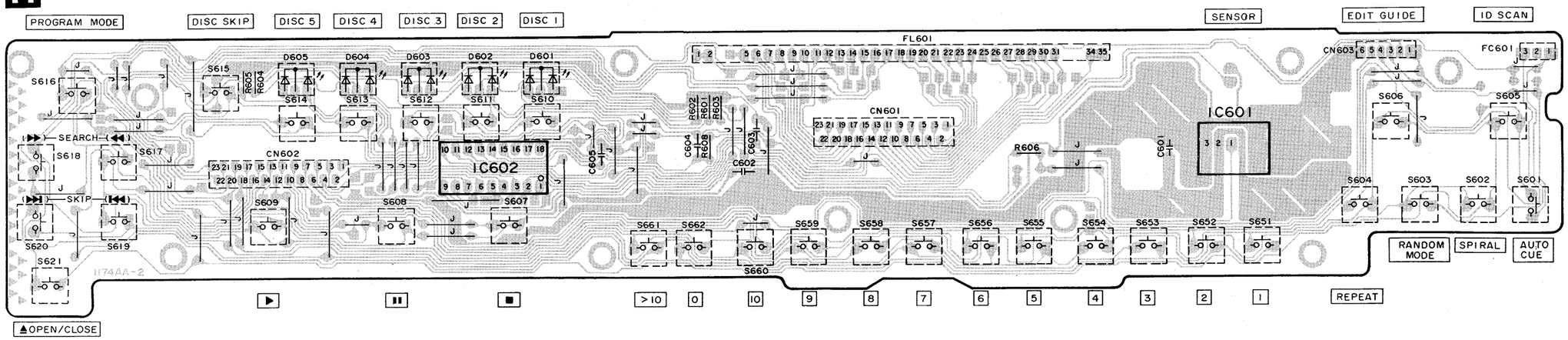
A SERVO P.C.B. (REPI843B-N)



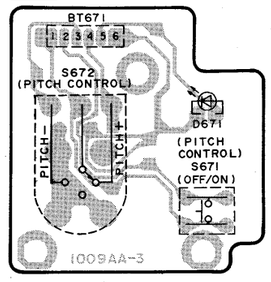
I MAIN P.C.B. (REPI822A-M)



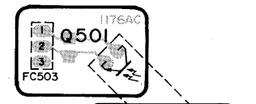
H OPERATION P.C.B. (REPI723F-S)



B PITCH CONTROL P.C.B.(REPI863A-S)



E PHOTO TRANSISTOR P.C.B.(REPI725A-N)



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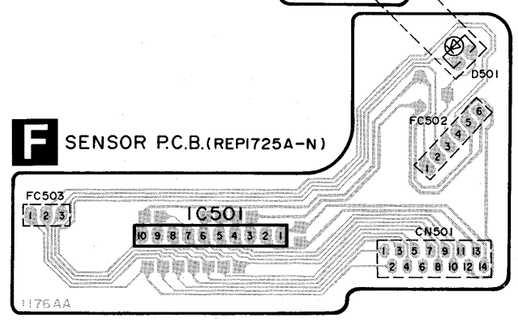
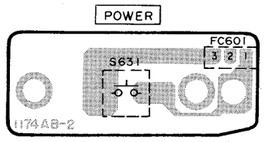
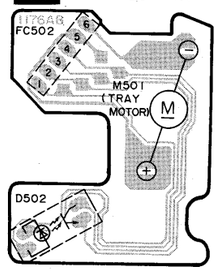


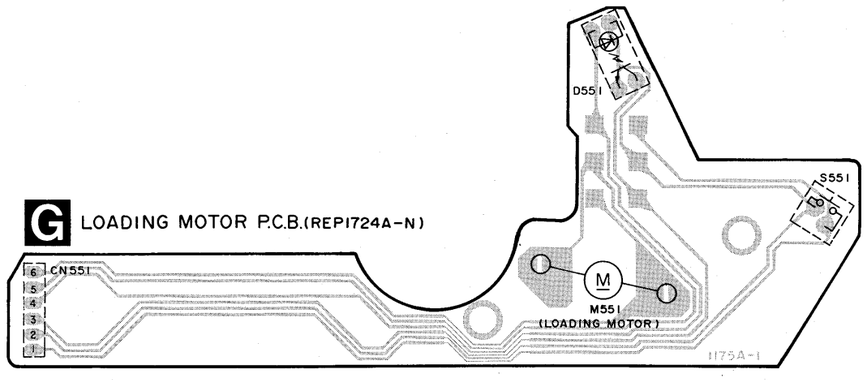
D POWER SWITCH P.C.B. (REPI723F-S)



C TRAY MOTOR P.C.B. (REPI725A-N)

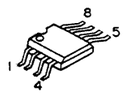


G LOADING MOTOR P.C.B.(REPI724A-N)



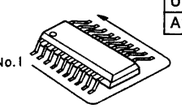
● Terminal guide of IC's transistor and diodes

BA4558FHTT1

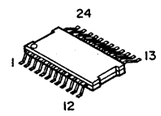


MC14052BFR2	16 Pin
UPD6376GSE1	16 Pin
AN8802SCE1V	32 Pin

No. 1



AN8389SE1



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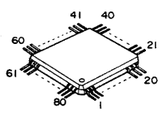

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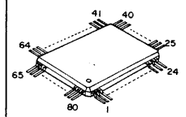

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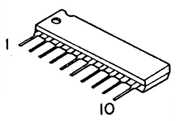

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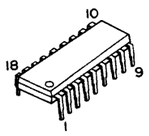

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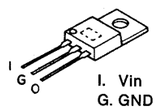
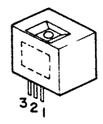
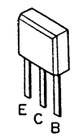


I. Vin
G. GND
O. Vout

RCDHC-278N





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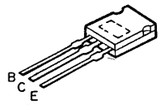
UN4112AITA
UN4114TA
UN4212AITA
UN4214AITA
UN4215TA

2SD2037EFTA



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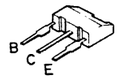
2SD1862QRTV6



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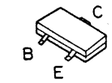

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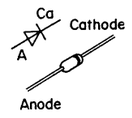

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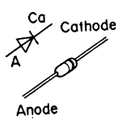

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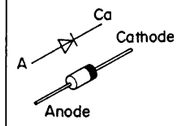

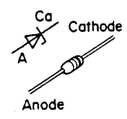

MA4051MTA
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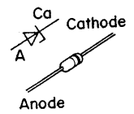
MA4062MTA
MA4068HTA
MA4082MTA
MA4091MTA

MA4270MTA



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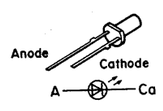

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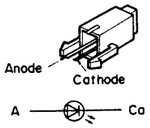

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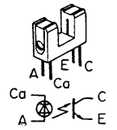

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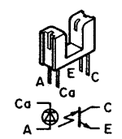

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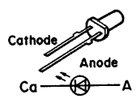
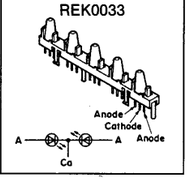
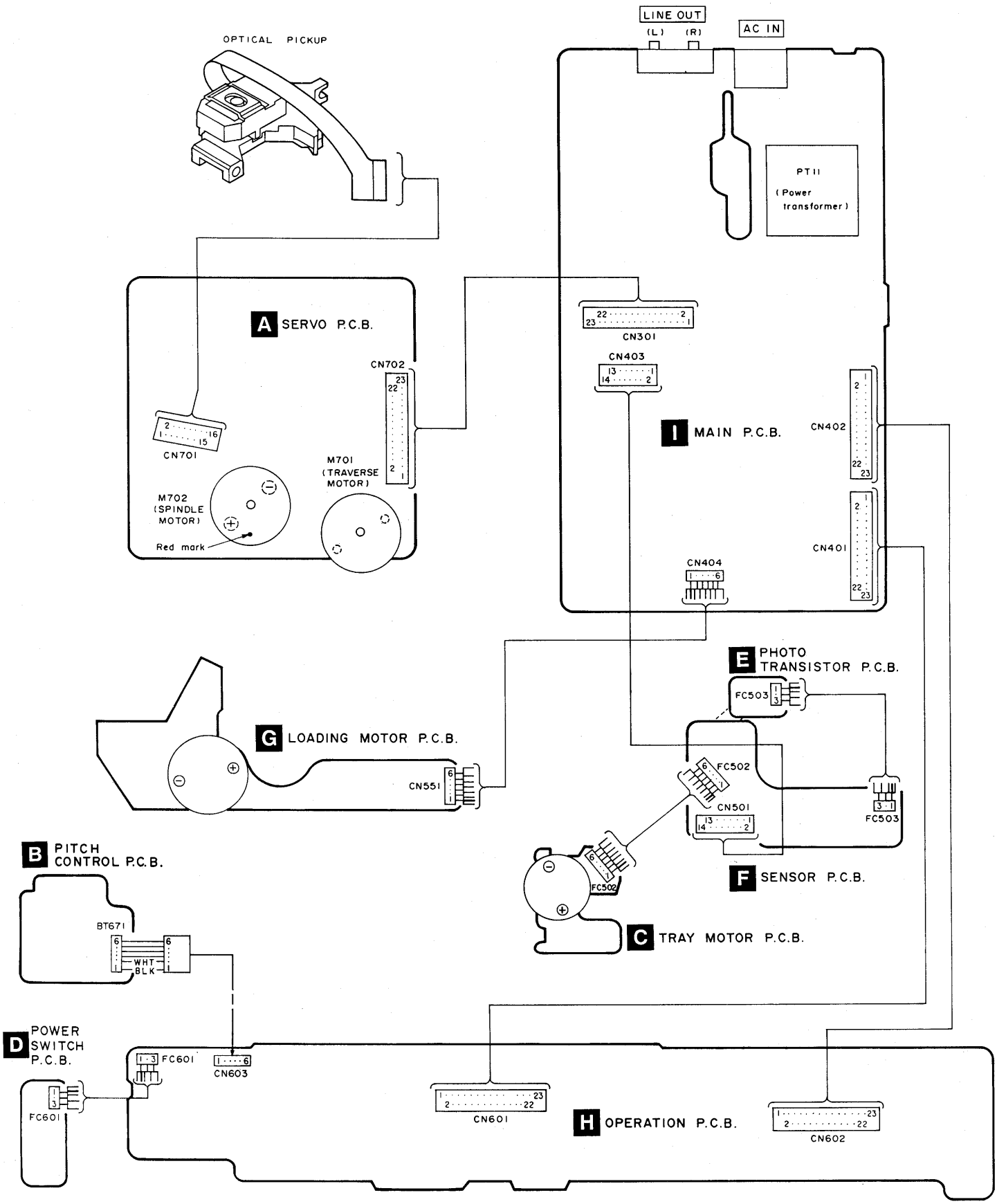


REK0033



■ WIRING CONNECTION DIAGRAM



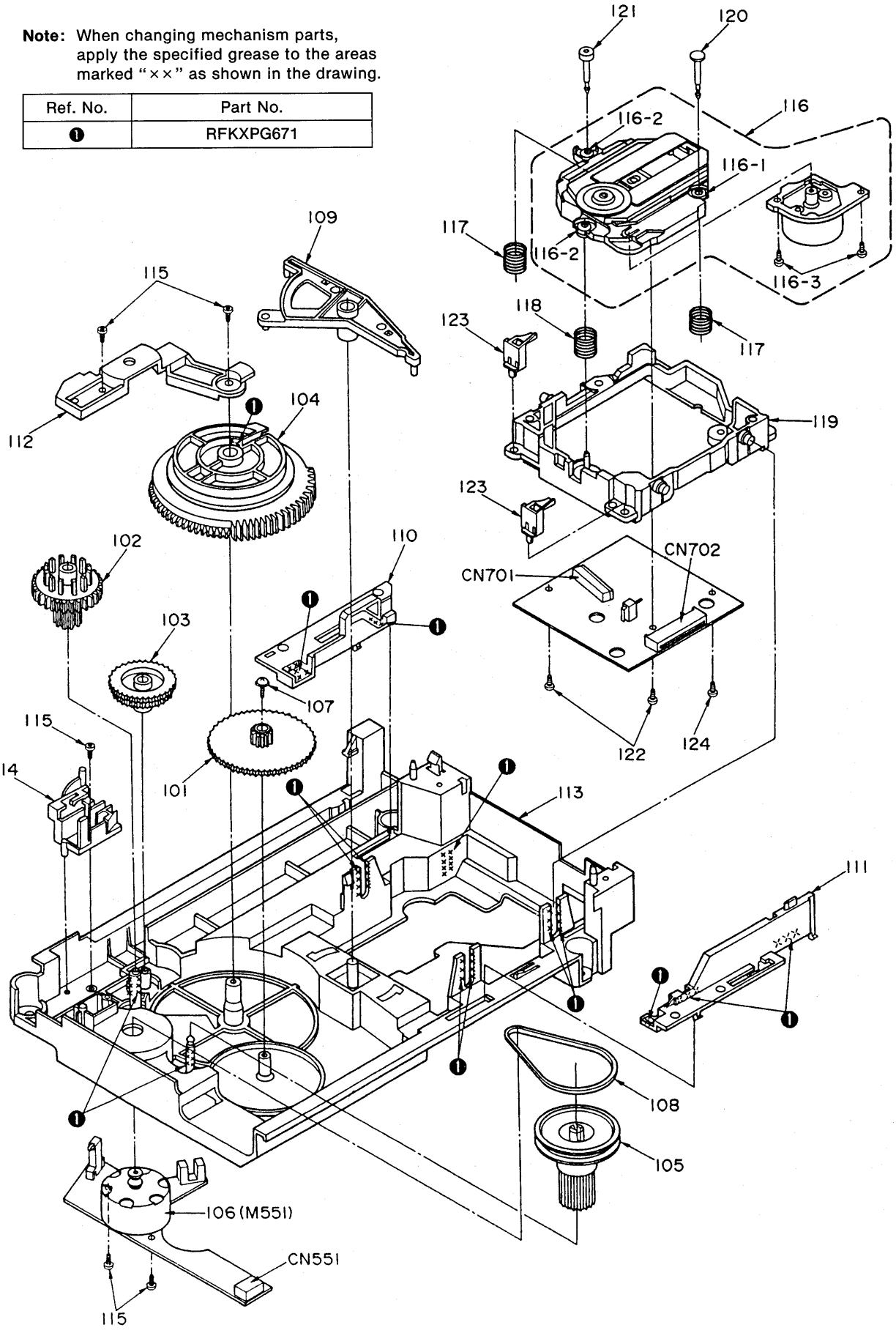
■ REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RKM0193-K	CABINET	
2	SNE2129-3	SCREW	
3	XTBS3+8JFZ1	SCREW	
4	RDG0267	REDUCTION GEAR	
5	RDG0268	CLOSE LOCK GEAR	
6	RDG0269	OPEN LOCK GEAR	
7	RDV0031	BELT	
8	RFKPLPD667PA	TRAY MOTOR(M501) ASS'Y	
9	RMN0254	LED HOLDER(D501, Q501)	
10	RMN0255	SENSOR HOLDER	
11	RMN0263	MOTOR HOLDER	
12	REZ0648	FFC(24P)	
13	RFKNLPD1000E	TRAY ASS'Y	
13-1	RMF0182	TRAY FELT	
13-2	RMG0200	SILENT RUBBER	
13-3	RMR0546-W	TRAY ROLLER	
14	RGT0019-1	ROTARY TRAY	
15	RHW81001-1	WASHER	
16	RMB0365	SPRING	
17	RME0152	LOCK GEAR SPRING	
18	RMS0123-1	RIVET	
19	XTB3+10G	SCREW	
20	XTWS3+10T	SCREW	
21	XWE3D13	WASHER	
22	REZ0623	FLAT CABLE(6P)	
23	REZ0635	FFC(23P)	
24	REZ0636	FFC(23P)	
25	REZ0637	FFC(23P)	
26	RGR0184A1G	REAR PANEL	
27	RFKJLPD667PK	CHASSIS ASS'Y	
27-1	RKA0053-A	FOOT	
28	RMR0749-W	CABLE HOLDER	
29	RMR0742-K	TRAY BASE GUIDE(L)	
30	RMR0743-K	TRAY BASE GUIDE(R)	
31	RMR0765-W1	TRANSFORMER BASE	
32	RHM245ZA	MAGNET	
33	RMR0334	FIXED PLATE	
34	RMR0744-W	CLAMP PLATE	
35	RMR0761-W	CLAMPER	
36	RMN0185-1	FL HOLDER	
37	RFKGLPD987PP	FRONT PANEL ASS'Y	
37-1	RGK0611C-K	FRONT ORNAMENT PLATE	
38	RGU1043-K	MAIN BUTTON	
39	RGU1019-K	10 KEY BUTTON	
40	RGU1015-K	POWER BUTTON	
41	RGU1017-K	SUB BUTTON	
42	RMG0200	STOPPER TUBE	
43	XTBS26+8J	SCREW	
44	XTB3+10JFZ	SCREW	
45	XTB3+20J	SCREW	
46	XTB3+8JFZ	SCREW	
47	RGL0098	PANEL LIGHT	
48	RGU0878-K	PITCH CONTROL BUTTON	
49	RGU1044-Q	DISC BUTTON	
50	RGW0043	PITCH CONTROL KNOB	
51	RMC0245	EARTH PLATE	
		LOADING MECHANISM	
101	RDG0270	REDUCTION GEAR	
102	RDG0271	DRIVE GEAR(1)	
103	RDG0272	DRIVE GEAR(2)	
104	RDK0025	DRIVE CAM	
105	RDP0050	PULLEY GEAR	
106	RFKPLPD667PB	LOADING MOTOR(M551) ASS'Y	
107	RHD26019	SCREW	
108	RMG0268-K	BELT	
109	RML0334	DRIVE LEVER	
110	RMM0117	SLIDE PLATE(1)	
111	RMM0118	SLIDE PLATE(2)	
112	RMR0746-W	REINFORCING PLATE	
113	RFKNLPD667PB	MECHANISM BASE ASS'Y	
114	RXQ0346	SLIDER ASS'Y	
115	XTB3+10JFZ	SCREW	
116	RAE0113Z	TRAVERSE DECK ASS'Y	
116-1	SHGD112	FLOATING RUBBER(1)	
116-2	SHGD113-1	FLOATING RUBBER(2)	
116-3	SNSD38	SCREW	
117	RME0109	FLOATING SPRING(1)	
118	RME0142	FLOATING SPRING(2)	
119	RMR0698-K	TRAVERSE CHASSIS	
120	RMS0123-1	TRAVERSE FIXED PIN(1)	
121	RMS0350	TRAVERSE FIXED PIN(2)	
122	XTV2+6G	SCREW	
123	RMX0094	TRAY HOLDER	
124	XTN2+6G	SCREW	

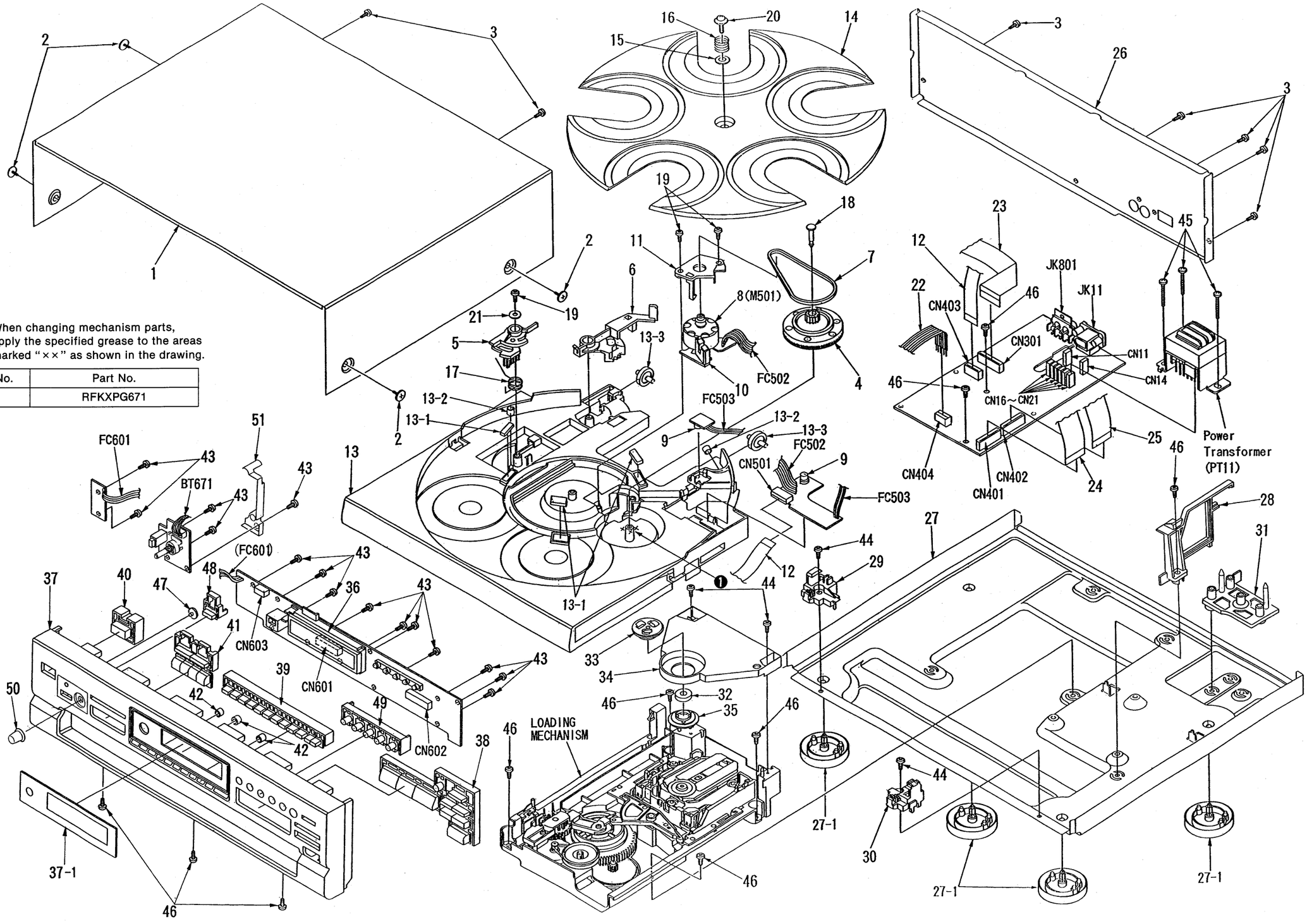
■ LOADING MECHANISM PARTS

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

Ref. No.	Part No.
❶	RFKXPG671



■ CABINET PARTS LOCATION



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

Ref. No.	Part No.
❶	RFKXPG671

■ REPLACEMENT PARTS LIST

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

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC11	LM2940T5	REGULATOR	⚠
IC351	UPD6376GSE1	D/A CONVERTER	
IC352	BA4558FHTT1	L. P. F. AMP.	
IC353	MC14052BFR2	SWITCHING	
IC401	UPD78044A058	SYSTEM CONTROL&FL DRIVE	
IC501	BA6247N	MOTOR DRIVE	
IC601	RCDHC-278N	REMOTE CONTROL SENSOR	
IC602	NJU3713D	LED DRIVE	
IC801	BA4558FHTT1	L. P. F. AMP.	
		TRANSISTOR(S)	
Q11	UN4214TA	TRANSISTOR	
Q12, 13	UN4114TA	TRANSISTOR	
Q15	2SD2037EFTA	TRANSISTOR	⚠
Q21	2SC3311AIQST	TRANSISTOR	⚠
Q22	2SA1309AIQST	TRANSISTOR	⚠
Q31	2SB1238QSTV6	TRANSISTOR	⚠
Q32, 33	2SD1450RTA	TRANSISTOR	
Q41, 42	2SD1862QRTV6	TRANSISTOR	⚠
Q401	2SC3311AIQST	TRANSISTOR	
Q461, 462	UN4215	TRANSISTOR	
Q501	PT381TB	TRANSISTOR	
Q801, 802	2SD1450RTA	TRANSISTOR	
Q851	UN4112AITA	TRANSISTOR	
Q852	UN4212TA	TRANSISTOR	
Q853	UN4112AITA	TRANSISTOR	
Q854	UN4212TA	TRANSISTOR	
		DIODE(S)	
D11-14	RL1N4003N02	DIODE	⚠
D15	MA4091-M	DIODE	⚠
D16	RL1N4003N02	DIODE	
D21, 22	RL1N4003N02	DIODE	⚠
D23, 24	MA4082MTA	DIODE	⚠
D31, 32	RL1N4003N02	DIODE	⚠
D33	MA4270	DIODE	⚠
D34	MA4091-M	DIODE	⚠
D41	MA4062MTA	DIODE	⚠
D42	MA165	DIODE	
D43	1SS291TA	DIODE	
D51, 52	MA165	DIODE	⚠
D53	MA4051MTA	DIODE	⚠

Ref. No.	Part No.	Part Name & Description	Remarks
D54	MA165	DIODE	
D401-406	MA165	DIODE	
D461	MA4068HTA	DIODE	
D462	MA4056MTA	DIODE	
D501	GL380TB	L. E. D.	
D502	RSQGP1S53V	DIODE	
D551	SG-206S	DIODE	
D601-605	REK0033	L. E. D. BLOCK	
D671	LN013304P	L. E. D.	
D801, 802	MA165	DIODE	
D852	MA165	DIODE	
		COIL(S)	
L11, 12	RLQX400MT-D	COIL	⚠
L301	ELEXT1R2KA9	COIL	
		TRANSFORMER(S)	
PT11	RTP1K4C019-X	POWER TRANSFORMER	⚠
		COMPONENT COMBINATION(S)	
Z301	BL02RN2R65T2	COMBINATION PART	
		OSCILLATOR(S)	
X401	RSXY4M23M01T	OSCILLATOR(4. 2336MHz)	
		DISPLAY TUBE(S)	
FL601	RSL0170-F	DISPLAY TUBE	
		SWITCH(ES)	
S551	RSH1A005	OPEN/CLOSE DETECTOR	
S601	EVQ21405R	AUTO CUE	
S602	EVQ21405R	SPIRAL	
S603	EVQ21405R	RANDOM MODE	
S604	EVQ21405R	REPEAT	
S605	EVQ21405R	ID SCAN	
S606	EVQ21405R	EDIT GUIDE	
S607	EVQ21405R	STOP	
S608	EVQ21405R	PAUSE	
S609	EVQ21405R	PLAY	
S610	EVQ21405R	DISC 1	
S611	EVQ21405R	DISC 2	

Ref. No.	Part No.	Part Name & Description	Remarks
S612	EVQ21405R	DISC 3	
S613	EVQ21405R	DISC 4	
S614	EVQ21405R	DISC 5	
S615	EVQ21405R	DISC SKIP	
S616	EVQ21405R	PROGRAM MODE	
S617	EVQ21405R	R. SEARCH	
S618	EVQ21405R	F. SEARCH	
S619	EVQ21405R	R. SKIP	
S620	EVQ21405R	F. SKIP	
S621	EVQ21405R	OPEN/CLOSE	
S631	EVQ21405R	POWER	
S651	EVQ21405R	NUMERIC 1	
S652	EVQ21405R	NUMERIC 2	
S653	EVQ21405R	NUMERIC 3	
S654	EVQ21405R	NUMERIC 4	
S655	EVQ21405R	NUMERIC 5	
S656	EVQ21405R	NUMERIC 6	
S657	EVQ21405R	NUMERIC 7	
S658	EVQ21405R	NUMERIC 8	
S659	EVQ21405R	NUMERIC 9	
S660	EVQ21405R	NUMERIC 10	
S661	EVQ21405R	NUMERIC >10	
S662	EVQ21405R	NUMERIC 0	
S671	EVQQB005R	PITCH CONTROL OFF/ON	
S672	RSR2A003-A	PITCH CONTROL -/+	
		CONNECTOR(S)	
CN11	RJS1A1101T1	CONNECTOR(1P)	
CN14	RJS1A1101T1	CONNECTOR(1P)	
CN16-21	RJS1A1101T1	CONNECTOR(1P)	
CN301	RJS1A6823	CONNECTOR(23P)	
CN401, 402	RJS1A6823	CONNECTOR(23P)	
CN403	RJS1A6814	CONNECTOR(14P)	
CN404	RJS1A6606	CONNECTOR(6P)	
CN501	RJS1A6714	CONNECTOR(14P)	
CN551	RJS2A1506	CONNECTOR(6P)	
CN601, 602	RJS1A6223-1	CONNECTOR(23P)	
CN603	RJP6G20ZA	CONNECTOR(6P)	
BT671	REX0493	CONNECTOR(6P)	
		JACK(S)	
JK11	SJSD16	AC INLET	⚠
JK801	RJH3201N	LINE OUT	
		FLAT CABLE(S)	
FC502	REZ0612	FLAT CABLE(6P)	
FC503	REZ0613	FLAT CABLE(3P)	
FC601	REZ0610	FLAT CABLE(3P)	

Ref. No.	Part No.	Part Name & Description	Remarks
		<SERVO P.C.B.>	
		INTEGRATED CIRCUIT(S)	
IC701	AN8802SCE1V	SERVO AMP	
IC702	MN662712RA	SERVO PROCESSOR	
IC703	AN8389SE1	MOTOR DRIVE	
		TRANSISTOR(S)	
Q701	2SB709S	TRANSISTOR	
		OSCILLATOR(S)	
X701	RSXZ16M9M02T	OSCILLATOR(16.9344MHz)	
		SWITCH(ES)	
S701	RSM0006-P	REST DETECTOR	
		CONNECTOR(S) AND SOCKET(S)	
CN701	RJU035T016-1	SOCKET(16P)	
CN702	RJS1A6723-1Q	CONNECTOR(23P)	

■ RESISTORS AND CAPACITORS

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
		RESISTORS
R11, 12	ERDS2TJ151	1/4W 150
R21, 22	ERDS2TJ122	1/4W 1.2K
R31	ERDS2TJ123	1/4W 12K
R32, 33	ERDS2TJ103	1/4W 10K
R41	ERDS2TJ471	1/4W 470
R42, 43	ERDS2TJ2R2T	1/4W 2.2
R51, 52	ERDS2TJ122	1/4W 1.2K
R311	ERDS2TJ471	1/4W 470
R351, 352	ERDS2TJ272T	1/4W 2.7K
R353, 354	ERDS2TJ152	1/4W 1.5K
R401-407	ERDS2TJ472	1/4W 4.7K
R409	ERDS2TJ102	1/4W 1K
R410	ERDS2TJ103	1/4W 10K
R411	ERDS2TJ472	1/4W 4.7K
R412	ERDS2TJ223	1/4W 22K
R413	ERDS2TJ103	1/4W 10K
R414	ERDS2TJ471	1/4W 470
R415	ERDS2TJ103	1/4W 10K
R416	ERDS2TJ102	1/4W 1K
R417	ERDS2TJ103	1/4W 10K
R418, 419	ERDS2TJ821	1/4W 820
R421	ERDS2TJ472	1/4W 4.7K
R461	ERDS2TJ271	1/4W 270
R462	ERDS2TJ221	1/4W 220
R601-606	ERDS2EJ121	1/4W 120
R608	ERDS2TJ122	1/4W 1.2K
R803, 804	ERDS2TJ224T	1/4W 220K
R805, 806	ERDS2TJ822	1/4W 8.2K
R807, 808	ERDS2TJ123	1/4W 12K
R809-812	ERDS2TJ333	1/4W 33K
R813-816	ERDS2TJ102	1/4W 1K
R817, 818	ERDS2TJ473	1/4W 47K
R819, 820	ERDS2TJ100	1/4W 10
R851	ERDS2TJ122	1/4W 1.2K
R852	ERDS2TJ102	1/4W 1K
R853	ERDS2TJ103	1/4W 10K
		CAPACITORS
C11	ECBT1E103ZF	25V 0.01U
C12	ECA1CM332B	16V 3300U ⚠
C15	ECBT1H102KB5	50V 1000P
C16	RCE1AM471BV	10V 470U
C17	RCE0JKA101BV	6.3V 100U
C20	ECBT1E103ZF	25V 0.01U
C21, 22	RCE1EM101BV	25V 100U

Ref. No.	Part No.	Values & Remarks
C25, 26	ECBT1H102KB5	50V 1000P
C30	ECBT1E103ZF	25V 0.01U
C31, 32	RCE1HM470BV	50V 47U
C33	ECBT1H102KB5	50V 1000P
C41	ECBT1H102KB5	50V 1000P
C42	RCE0JKA101BV	6.3V 100U
C301	ECBT1C103NS5	16V 0.01U
C311	ECEA1HKA010B	50V 1U
C312	ECBT1C103NS5	16V 0.01U
C351	RCE0JKA221BV	6.3V 220U
C352-355	ECBT1C103NS5	16V 0.01U
C401	ECBT1C103NS5	16V 0.01U
C402	RCE0JM471BV	6.3V 470U
C403	ECEA1HKA010B	50V 1U
C404	ECEA1EKA4R7B	25V 4.7U
C405	ECBT1C103NS5	16V 0.01U
C406	ECEA1HKA010B	50V 1U
C421	ECBT1C103NS5	16V 0.01U
C461	RCE1AKA470BG	10V 47U
C462	ECBT1C103NS5	16V 0.01U
C601	ECFR1E104ZF5	25V 0.1U
C602	ECBT1C103NS5	16V 0.01U
C603	ECBT1H331KB5	50V 330P
C604	ECBT1H102KB5	50V 1000P
C605	ECBT1C103NS5	16V 0.01U
C801, 802	RCE1AKA470BG	10V 47U
C803, 804	RCE1CKA100BG	16V 10U
C805-808	ECCR1H391J5	50V 390P
C809, 810	RCE0JKA470BG	6.3V 47U
C811, 812	ECBT1H102KB5	50V 1000P
		<SERVO P.C.B.>
		RESISTORS
R701	ERJ6GEYJ100	1/10W 10
R702	ERJ6GEYJ471V	1/10W 470
R703	ERJ6GEYJ823	1/10W 82K
R704	ERJ6GEYJ102A	1/10W 1K
R705	ERJ6GEYJ103V	1/10W 10K
R706	ERJ6GEYJ102A	1/10W 1K
R707	ERJ6GEYJ473V	1/10W 47K
R708	ERJ6GEYJ104V	1/10W 100K
R709	ERJ6GEYJ683V	1/10W 68K
R711	ERJ6GEYJ154V	1/10W 150K
R712	ERJ6GEYJ221V	1/10W 220
R717, 718	ERJ6GEYJ101V	1/10W 100
R721	ERJ6GEYJ101V	1/10W 100
R722	ERJ6GEYJ563V	1/10W 56K
R723	ERJ6GEYJ182V	1/10W 1.8K

Ref. No.	Part No.	Values & Remarks
R724	ERJ6GEYJ333V	1/10W 33K
R725	ERJ6GEYJ472V	1/10W 4.7K
R726	ERJ6GEYJ473V	1/10W 47K
R727	ERJ6GEYJ103V	1/10W 10K
R728	ERJ6GEYJ392V	1/10W 3.9K
R731	ERJ6GEYJ392V	1/10W 3.9K
R735, 736	ERJ6GEYJ101V	1/10W 100
R738	ERJ6GEYJ223V	1/10W 22K
R744	ERJ6GEYJ103V	1/10W 10K
R745	ERJ6GEYJ155V	1/10W 1.5M
R748	ERJ6GEYJ182V	1/10W 1.8K
R749	ERJ8GEYJ103V	1/8W 10K
R750	ERJ6GEYJ102A	1/10W 1K
		CHIP JUMPERS
R714	ERJ6GEY0R00A	CHIP JUMPER
J701, 702	ERJ8GEY0R00A	CHIP JUMPER
J707-709	ERJ8GEY0R00A	CHIP JUMPER
J714	ERJ8GEY0R00A	CHIP JUMPER
J716-719	ERJ8GEY0R00A	CHIP JUMPER
J721	ERJ6GEY0R00A	CHIP JUMPER
J724	ERJ6GEY0R00A	CHIP JUMPER
J726	ERJ6GEY0R00A	CHIP JUMPER
J731	ERJ6GEY0R00A	CHIP JUMPER
		CAPACITORS
C701	ECEA0JKA220	6.3V 22U
C702	ECEA1HKA010I	50V 1U
C703	ECEA0JKA101I	6.3V 100U
C704	ECUZ1E104MBN	25V 0.1U
C705	ECEA1HKA010I	50V 1U
C706	ECUE1H101JCN	50V 100P
C707	ECUV1E273KBN	25V 0.027U
C708	ECUE1H472KBN	50V 4700P
C709	ECUE1C473KBN	16V 0.047U
C710	ECUE1H152KBN	50V 1500P
C711, 712	ECUW1E104ZFN	25V 0.1U
C713	ECUV1C104MBM	16V 0.1U
C714	ECEA0JKA101I	6.3V 100U
C715	ECEA0JKA470I	6.3V 47U
C716	ECUE1H561KBN	50V 560P
C717	ECUW1E104ZFN	25V 0.1U
C718	ECUV1C224KBM	16V 0.22U
C721, 722	ECUE1H270JCN	50V 27P
C723	ECEA1AKA221I	10V 220U
C724	ECUV1C104MBM	16V 0.1U
C730	ECUW1E104ZFN	25V 0.1U

Ref. No.	Part No.	Values & Remarks
C731, 732	ECEA0JK221I	6.3V 220U
C733	ECUZ1E104MBN	25V 0.1U
C734	ECEA1AKA221I	10V 220U
C735-737	ECUW1E104ZFN	25V 0.1U

Ref. No.	Part No.	Values & Remarks
C738	ECUV1C154KBN	16V 0.15U
C742	ECUV1E273KBN	25V 0.027U
C743	ECUW1E104ZFN	25V 0.1U
C744	ECUE1E822KBN	25V 8200P

Ref. No.	Part No.	Values & Remarks
C745	ECUE1H102KBN	50V 1000P
C747	ECUE1H222KBN	50V 2200P
C748	ECUV1H471KBM	50V 470P

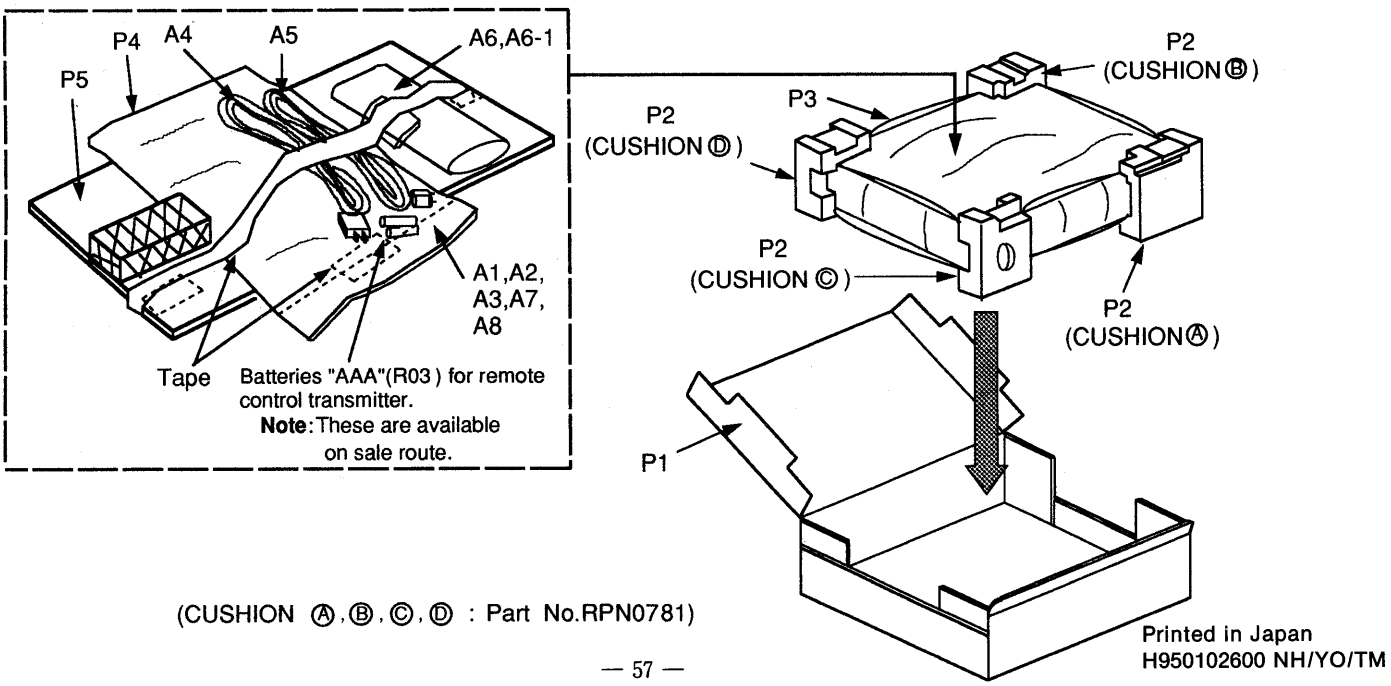
■ REPLACEMENT PARTS LIST

Notes: *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.
*Remote Control Ass'y: Supply period for three years from termination of production.
*The "(SF)" mark denotes the standard part.

Ref. No.	Part No.	Part Name & Description	Remarks
		PACKING MATERIAL	
P1	RPG2366	PACKING CASE	
P2	RPN0781	CUSHION	
P3	SPP730	PROTECTION BAG(UNIT)	
P4	RPF0139	PROTECTION BAG(F.B.)	
P5	RPQ0535	PAD	
		ACCESSORIES	
A1	RFKSLPD987PP	INSTRUCTION MANUAL ASS'Y	
A2	RQA0085	WARRANTY CARD	
A3	RQCB0391	SERVICENTER LIST	
A4	SJA172	AC POWER SUPPLY CORD	⚠(SF)
A5	SJP2249-3	STEREO CONNECTION CABLE	
A6	RAK-SL122WH	REMOTE CONTROL TRANSMITTER	
A6-1	RKK0057-K	BATTERY COVER	FOR R/C TRANSMITTER
A7	RQA0049	WARRANTY CARD FOR CANADA	

Ref. No.	Part No.	Part Name & Description	Remarks
A8	SQX9131	SERVICENTER LIST FOR CANADA	
		<GREASE OR JIG/TOOL>	
		TEST DISC	
SA1	SZZP1054C	PLAYABILITY TEST DISC	
SA2	SZZP1056C	UNEVEN TEST DISC	
		ALLEN WRENCH	
SA3	SZZP1101C	ALLEN WRENCH (M2.0)	
		LOCK PAINT	
SA4	RZZ0L01	LOCK PAINT	
		GREASE	
SA5	RFKXPG671	MOLYCOAT GREASE PG671	

■ PACKAGING



(CUSHION Ⓐ, Ⓑ, Ⓒ, Ⓓ : Part No.RPN0781)

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