

Service Manual

COMPACT
disc
DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-PS50

Color

(K)... Black Type



SL-P333 MECHANISM SERIES (SIWD113-3ZA)

Area

Country Code	Area	Color
(E)	Continental Europe.	(K)
(EB)	Great Britain.	(K)
(EG)	F.R. Germany & Italy.	(K)
(GC)	Third Region.	(K)
(GN)	Oceania.	(K)

SPECIFICATIONS

Audio

No. of channels	2 (left and right, stereo)
Frequency response	2-20,000 Hz ± 0.5 dB
Output voltage	2 V (at 0 dB)
Dynamic range	96 dB
S/N ratio	103 dB
Total harmonic distortion	0.003% (1 kHz, 0 dB)
Harmonic distortion	0.002% (1 kHz, 0 dB)
Wow and flutter	Below measurable limit
DA converter	MASH* (4 DAC)
Output impedance	Approx. 1 k Ω
Load impedance	More than 10 k Ω
Headphone output level	15 mW max. 32 Ω (adjustable)

*MASH

- MASH (Multi-Stage Noise Shaping) is an effective over-sampling D/A conversion technique which realizes a high S/N ratio and needs no highly complex manufacturing processes such as a laser trimming.
- MASH is a trademark of NTT (Nippon Telegraph and Telephone Corporation).

Pickup

Wavelength	780 nm
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General

Power supply

For Great Britain and Oceania: AC 50/60 Hz, 240 V
For Continental Europe and F.R. Germany & Italy: AC 50/60 Hz, 220 V
For others: AC 50/60 Hz, 110 V/127 V/220 V/240 V

Power consumption

11 W

Dimensions (W×H×D)

430×126.5×332.5 mm

Weight

5.2 kg

Specifications subject to change without notice.

Weight and dimensions shown are approximate.

Technics

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

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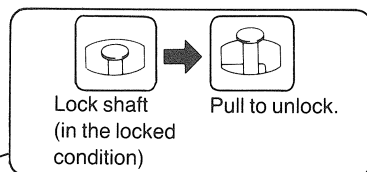
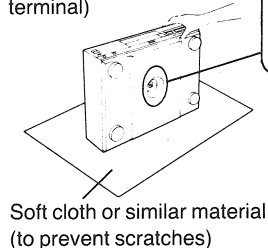
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PLACEMENT

Before placement

The optical pickup is secured to prevent damage during transport. Be sure to release it before use.

(With inclination not to damage the optical output terminal)



Note:

When carrying this unit, be sure to remove the compact disc from inside the unit, and press the lock shaft to secure the optical pickup. (Make sure to place the unit with the rear panel facing downward.)

Notes of placement

■ This unit is a precision instrument. Be sure to place it on a flat surface.

■ Avoid places such as the following:

- Near any equipment or device that generates strong magnetism.
- On any heat-generating equipment or device, or in any place where the temperature is high (35°C or higher).
- Extremely cold places (5°C or below).
- Near a tuner or TV (It may cause noise in the broadcast, or disturbance of the TV picture.)

■ When carrying or storing the unit, handle it with care so it is not subjected to any strong bumps.

Always remove the disc before storing the unit for any period of time.

■ To avoid problems due to vibration.

- Do not place a book or similar object under this unit.
- Do not route the connection cables (of this or other units) across the operation panel, across the top, or under the unit.

ACCESSORIES

• AC power supply cord..... 1
 SJA187: (E, EG)
 SJA193: (EB)
 SJA173: (GN)
 RJA0004: (GC)

• Stereo connection cable..... 1
 (SJP2249-3)

• Remote control transmitter..... 1
 (RAK-SL3009W)

• Batteries..... 2
 (UM-4NE/2S)

■ PRECAUTION OF LASER DIODE

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

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

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

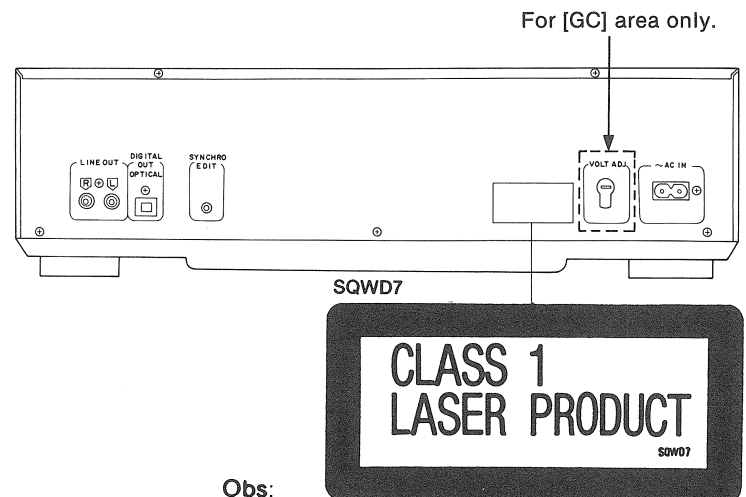
ACHTUNG: Dieses produkt enthält eine laserdioden. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit abgestrahlt.

Wellenlänge: 780nm
Maximale strahlungsleistung der lasereinheit: 100μW/VDE

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

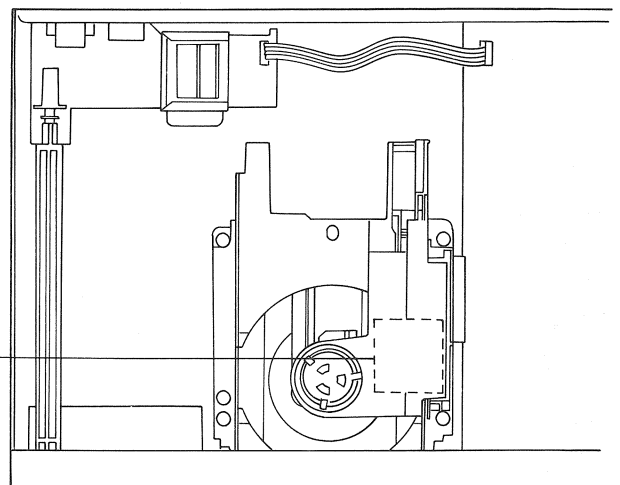
1. Die lasereinheit nicht zerlegen, da die strahlung an der freigelegten laserdioden gefährlich ist.
2. Den werksseitig justierten einstellregler der lasereinheit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.

ADVARSEL: I dette a apparat anvendes laser.



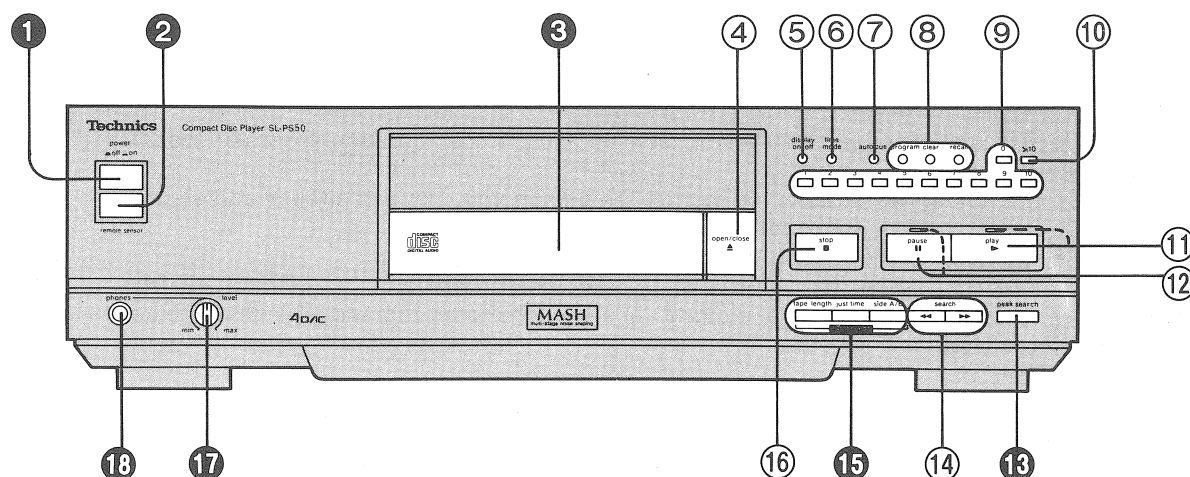
Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

RQLS0021



LOCATION OF CONTROLS

The functions indicated by the black numbers (with white background, ④ etc.) can also be activated using the remote control transmitter.

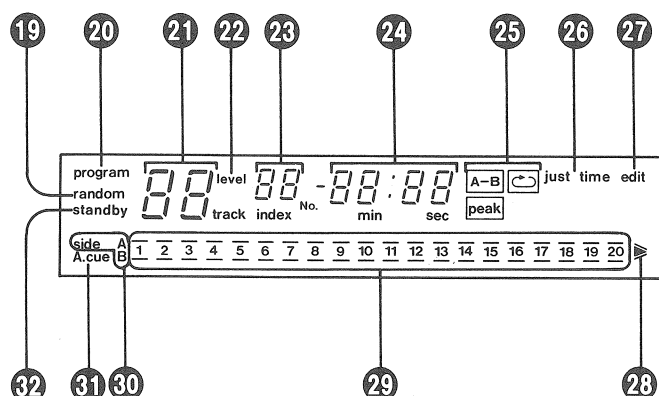


Control section

- ① **Power switch** (power off on)
- ② **Remote control signal sensor** (remote sensor)
- ③ **Disc holder**
- ④ **Disc holder open/close button** (open/close)
- ⑤ **Display on/off button** (display on/off)
Pressing this button enables the unit to delete the indicators on the display in two steps.
- ⑥ **Time mode select button** (time mode)
- ⑦ **Auto cue button** (auto cue)
Pressing this button enables the unit to stop at the beginning of every track and switch to the play standby mode.
- ⑧ **Buttons for program function**
 - **Program button** (program)
Pressing this button initiates the programmed play mode. You can then enter specific tracks using the numeric buttons.
 - **Clear button** (clear)
Each pressing this button makes one track cleared from the programmed sequence.
 - **Recall button** (recall)
This button can be used to display the contents of the programmed track sequence for confirmation.
- ⑨ **Numeric buttons** (0~10)
- ⑩ **Input mode button** (>10)
Press this button and then the numeric buttons (0~9) to specify the track number 11 and up.
- ⑪ **Play button and indicator** (play)
- ⑫ **Pause button and indicator** (pause)
- ⑬ **Peak level search button** (peak search)
Pressing this button enables the unit to search for the "peak signal" locations in tracks on a disc so as to adjust the suitable recording level on the cassette deck.
- ⑭ **Search buttons** (search)
These buttons can be used to move rapidly forward or backward on the disc during play.
- ⑮ **Buttons for edit function** (**synchro edit**)
 - **Edit tape length button** (tape length)
When compact discs are to be recorded to tape, this button can be used to calculate the number of tracks that can be recorded on each side of the tape, depending on the length of the cassette tape used, so that as little tape as possible is wasted.
 - **Just time edit button** (just time)
When recording compact discs to tape, this button can be used to edit the tracks on a disc so as to leave the least possible amount of blank space on the cassette tape.
 - **Tape-side select button** (side A/B)
When recording compact discs to tape, this button can be used to check the number of tracks and amount of tape left over for side A or B.
- ⑯ **Stop button** (stop)
This button can be used to stop disc play, as well as to cancel the various play modes.
- ⑰ **Headphones volume control** (level)

Avoid listening to music at high volume levels for extended periods of time.

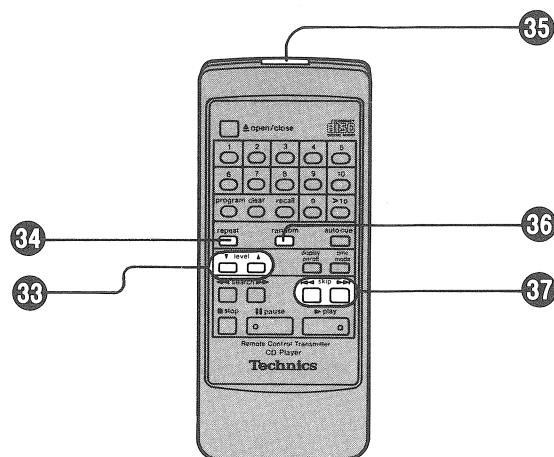
- ⑱ **Headphones jack** (phones)



Indicators section

- 19 Random indicator (random)**
- 20 Program indicator (program)**
- 21 Track number display (track)**
- 22 Level indicator (level)**
This indicator lights when the output level is attenuated by the remote control.
- 23 Index/program number display (index/No.)**
- 24 Time display (min/sec)**
- 25 Operation indicators**
The following indicators light during their respective operations.

A-B ↺ peak : Peak level search
↺ : Repeat play
- 26 Just time edit indicator (just time)**
- 27 Compact disc edit indicator (edit)**
- 28 "Over" mark (▶)**
This indicator lights if the total number of tracks on the disc is 21 or more.
- 29 Track number indicator (1-20)**
- 30 Tape side indicator (side A/B)**
- 31 Auto cue indicator (A. cue)**
- 32 Standby indicator (standby)**
This indicator lights when the display on/off button is pressed twice in the stop mode.



Unnumbered buttons on the remote control transmitter function identically to their corresponding parts on the unit.

Remote control transmitter

- 33 Level button (▼ level ▲)**
These buttons can be used to control output level (from 0 dB to -12 dB).
- 34 Repeat button (repeat)**
- 35 Remote control signal transmission window**
- 36 Random button (random)**
This button can be used to play the tracks on a disc in a random sequence.
- 37 Skip buttons (◀◀ skip ▶▶)**
These buttons are used to skip by track in the forward or reverse direction.

■ CONNECTIONS

Turn power off on all components before making connections.

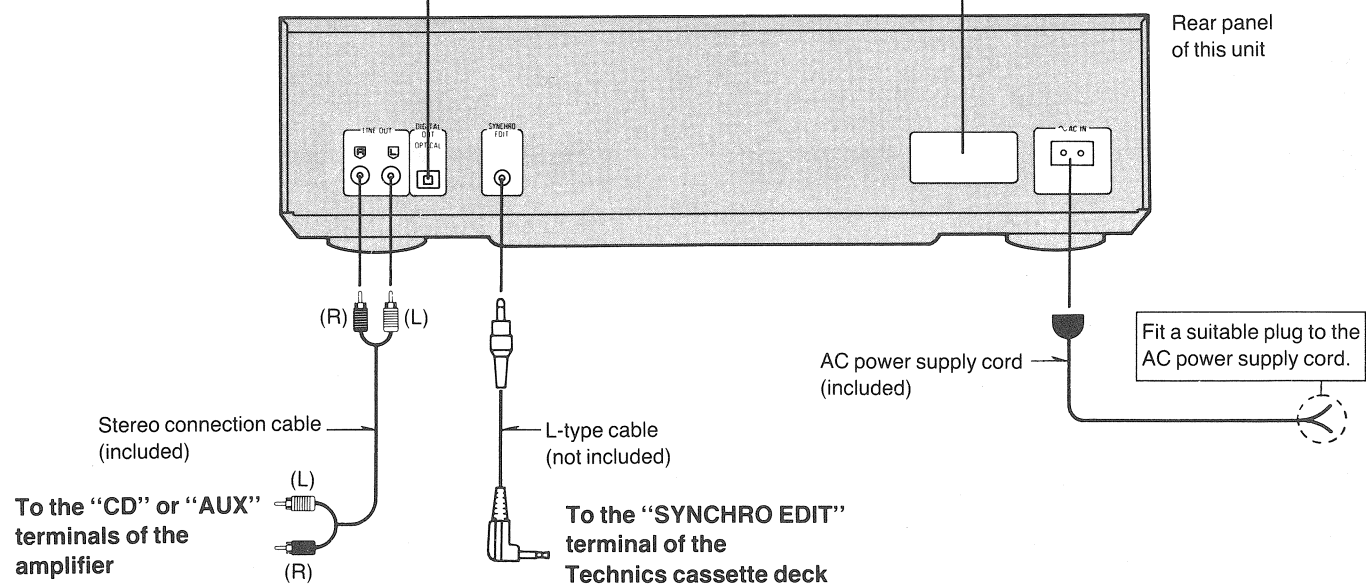
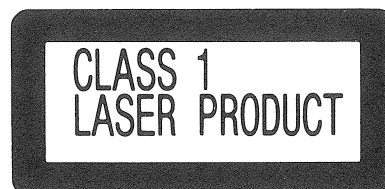
●Optical output terminal (DIGITAL OUT/OPTICAL)

This terminal can be used for connection with other equipment that has a digital input terminal, such as an amplifier, by using an optical cable (optional). A dust-protection cap is inserted in this terminal. Remove this cap only when a connection is to be made to this terminal.

Note:

When the unit is working with digital output, the following functions do not work;

- Output level adjustment



Note:

Be sure to connect the stereo connection cable with the amplifier when using the synchro edit function even if the optical cable has been connected.

Note:

The configuration of the AC outlet and AC power supply cord differs according to area.

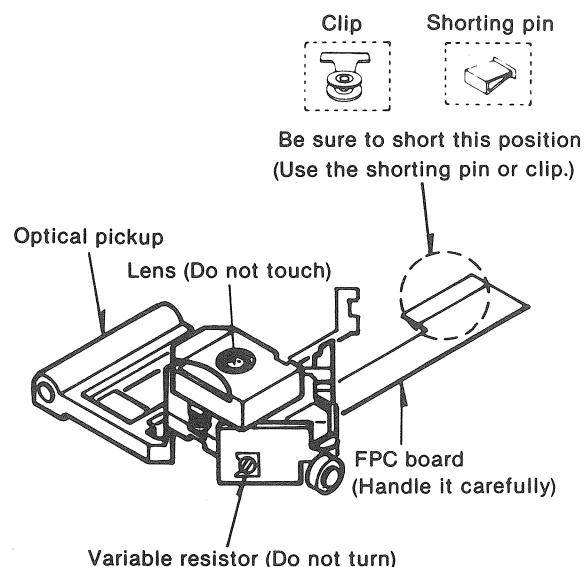
■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the 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 optical pickup.

● Handling of optical pickup

1. Do not give excessive shock to the optical pickup because it is of extremely precise structure.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. (FPC board)
When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board. (FPC board)
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

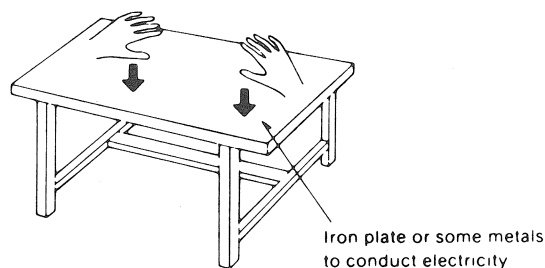
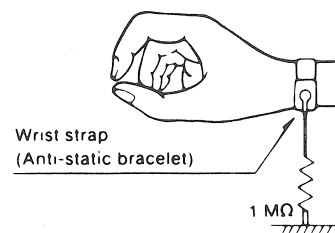


● Grounding for electrostatic breakdown prevention

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

Caution:

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

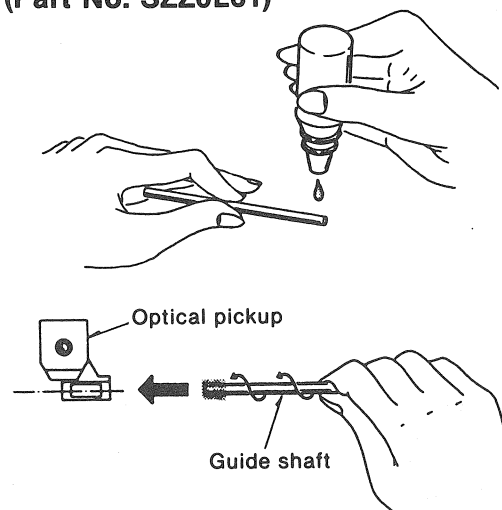


■ INSTRUCTIONS FOR TRAVERSE OIL (Part No. SZZ0L31)

The container contains 6g (approx. 3ml) of oil. Since one application (one shaft) uses 0.05ml of oil.

How to Use

- (1) Remove the guide shaft in the traverse deck from the optical pickup and clean off any dust from the guide shaft.
- (2) Apply one drop of the SZZ0L31 to the tip of the guide shaft.
- (3) Hold the guide shaft so that its oiled end touches the optical pickup and insert it into the bearing while rotating it slowly.
- (4) After securing the guide shaft, move the optical pickup by hand several times to the left and right to distribute the oil on the guide shaft.

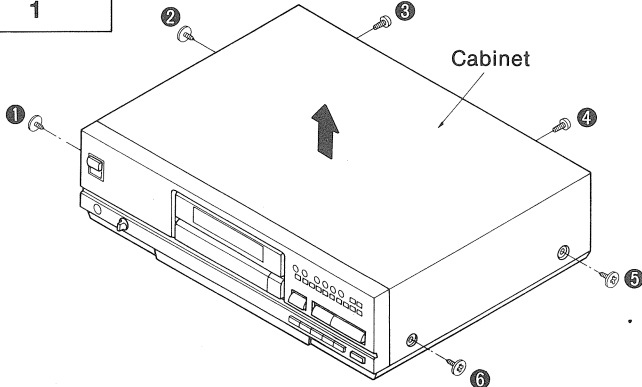
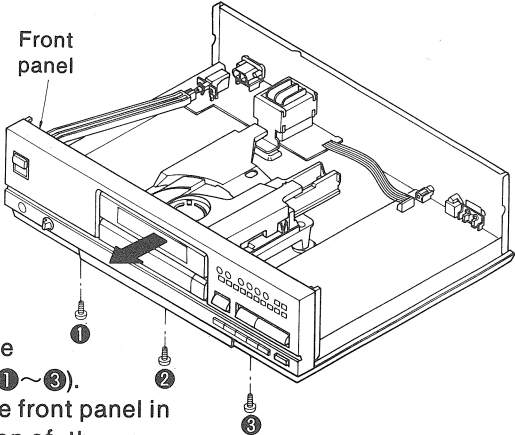
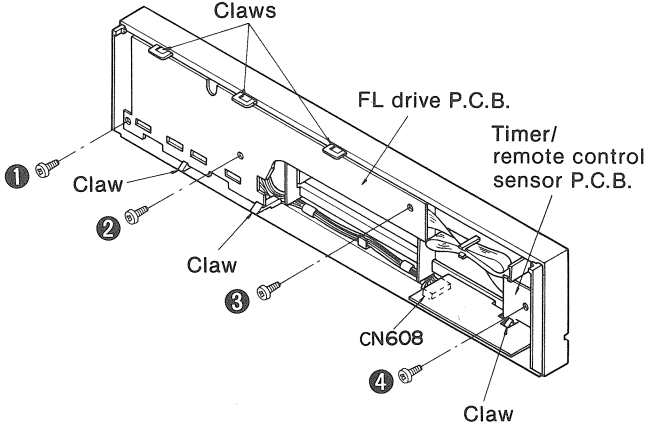
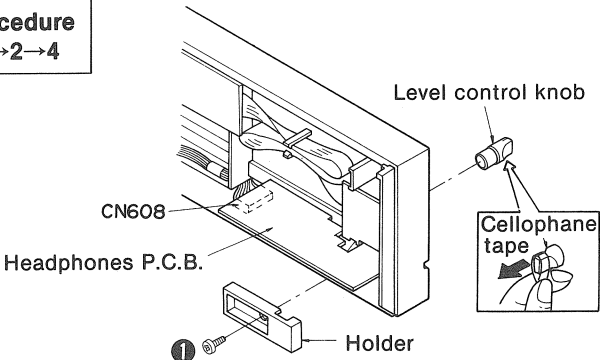
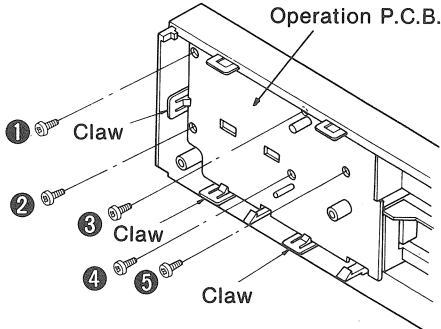


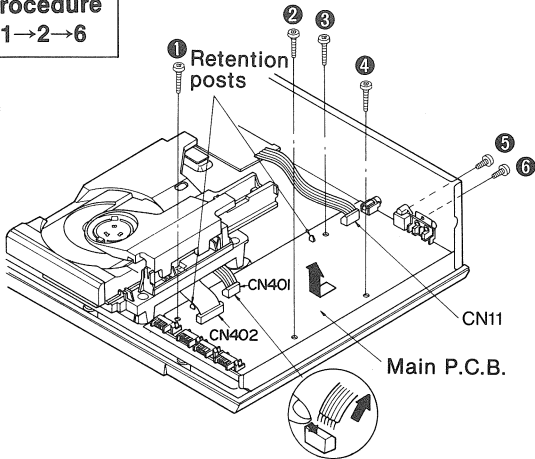
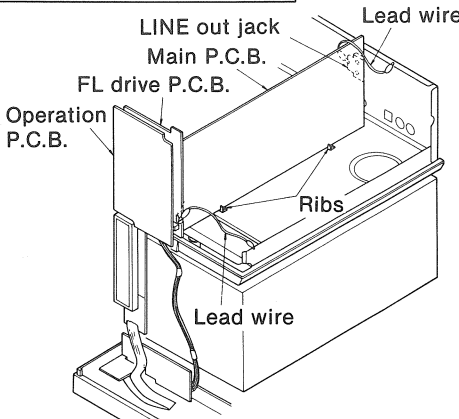
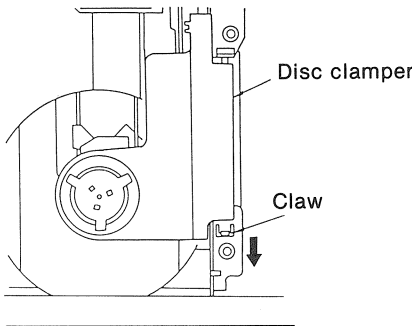
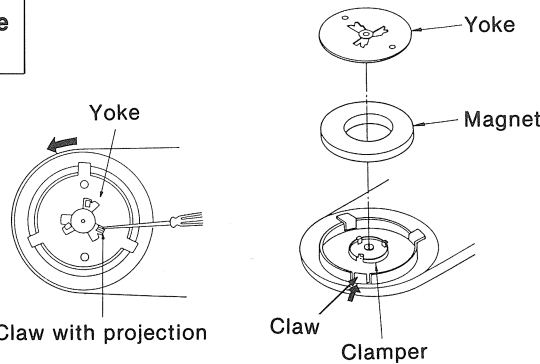
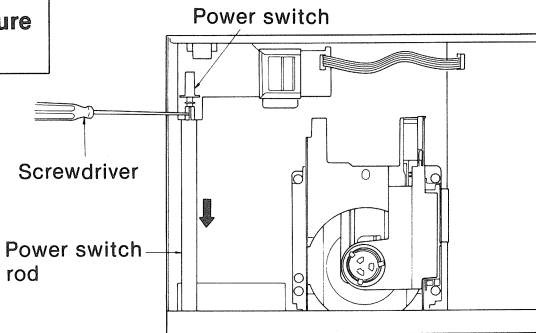
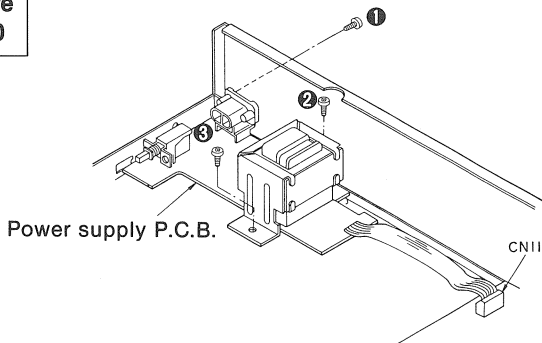
DISASSEMBLY INSTRUCTIONS

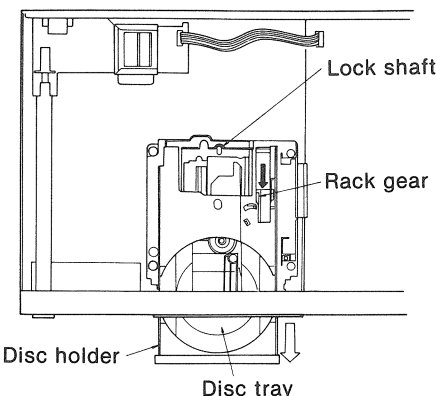
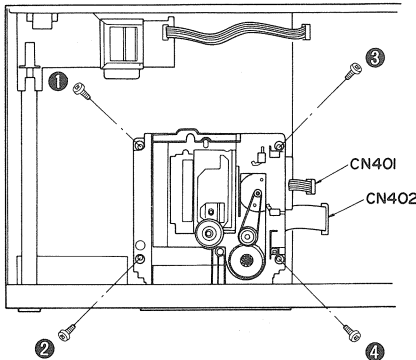
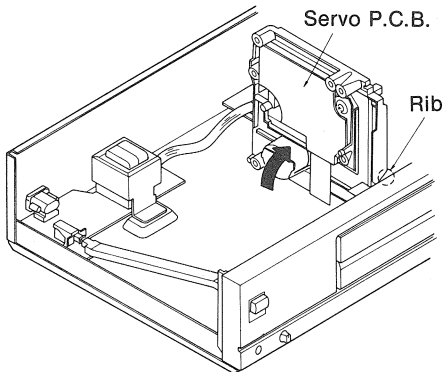
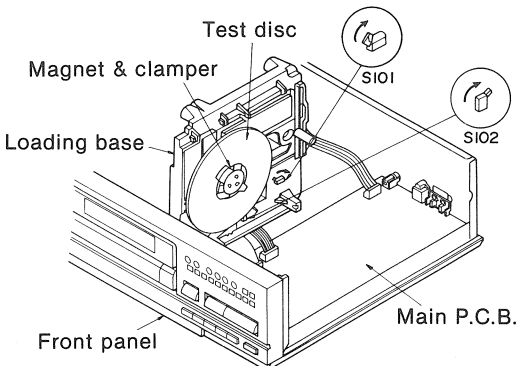
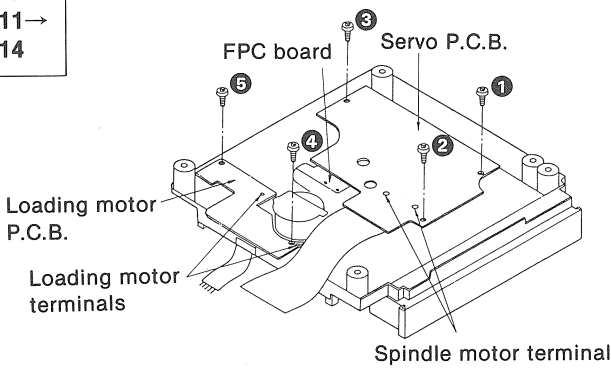
Warning: This product uses a laser diode. Refer to caution statements on page 3.

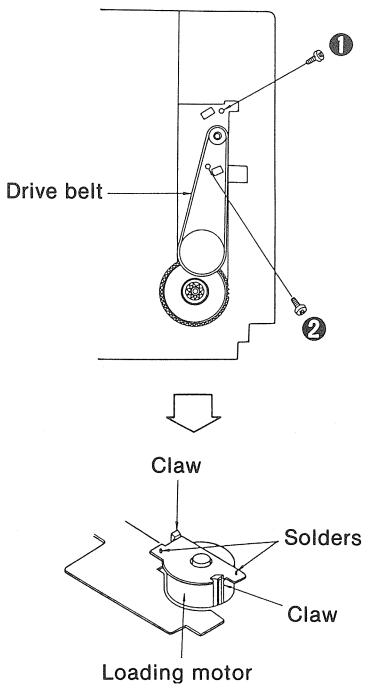
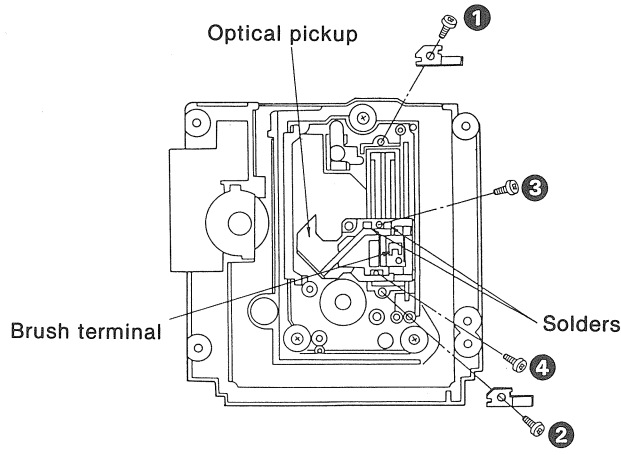
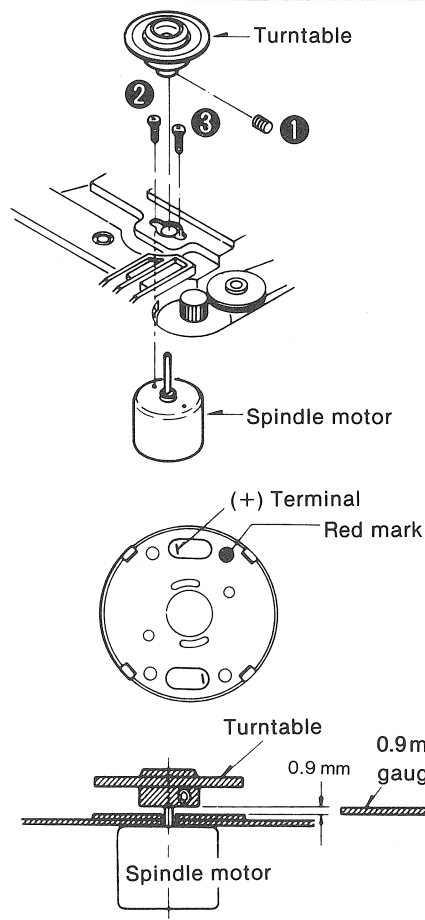
ACHTUNG: •Die lasereinheit nicht zerlegen.
•Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

* This CD player is equipped with FPC board so handle them with care during disassembly and reassembly.

Ref. No. 1	Removal of the cabinet	Ref. No. 2	Removal of the front panel
Procedure 1	 • Remove the 6 screws (①~⑥).	Procedure 1→2	 1. Remove the 3 screws (①~③). 2. Remove the front panel in the direction of the arrow.
Ref. No. 3	Removal of the FL drive P.C.B. and timer/remote control sensor P.C.B.	 1. Remove the 1 connector (CN608). 2. Remove the 3 screws (①~③). 3. Remove the 5 claws. ■ Removal of the timer/remote control sensor P.C.B. 1. Remove the 1 screw (④). 2. Remove the 1 claw.	
Ref. No. 4	Removal of the headphones P.C.B.	Ref. No. 5	Removal of the operation P.C.B.
Procedure 1→2→4	 1. Pull out the level control knob. 2. Remove the 1 connector (CN608). 3. Remove the 1 screw (①). 4. Remove the holder.	Procedure 1→2→3→5	 1. Remove the 5 screws (①~⑤). 2. Remove the 3 claws.

Ref. No. 6	Removal of the main P.C.B.	How to check the main P.C.B.	
Procedure 1→2→6	 1. Remove the 3 flat cable (CN11, CN401, CN402). 2. Remove the 6 screws (①～⑥). 3. Lift the main P.C.B. off the retention posts on the chassis. 4. Remove the main P.C.B. in the direction of the arrow.	 • When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown. • Don't remove the 3 flat cables (CN11, CN401, CN402). 1. Connect the main P.C.B. ground terminal (LINE OUT terminal) to the chassis with a lead wire. 2. Connect the FL drive P.C.B. ground terminal to the chassis with a lead wire.	
Ref. No. 7	Removal of the disc clamber	Ref. No. 8	Removal of the magnet and clamber
Procedure 1→7	 • Push the claw in the direction of the arrow and remove the disc clamber.	Procedure 1→7→8	 1. While lifting the claw with a screwdriver, rotate clamber in the direction of the arrow and remove the yoke and magnet. 2. Release the claw of the clamber.
Ref. No. 9	Removal of the power switch rod	Ref. No. 10	Removal of the power supply P.C.B.
Procedure 1→9	 1. Set the power switch in the "OFF" position. 2. Remove the power switch rod by using a screwdriver.	Procedure 1→9→10	 1. Remove the 3 screws (①～③). 2. Remove the 1 connector (CN11).

Ref. No. 11	Removal of the disc holder	Ref. No. 12	Removal of the loading base
Procedure 1→7→11	 Lock shaft Rack gear Disc holder Disc tray 1. Push the rack gear slowly in the direction of the arrow until the disc tray comes up. 2. Pull out slowly the disc holder. Note: Make sure to release the lock shaft.	Procedure 1→7→11→12	 1 2 3 4 CN401 CN402 1. Remove the 4 screws (①～④). 2. Remove the 2 flat cables (CN401, CN402).
Ref. No. 13	How to check the servo P.C.B.	How to play the disc	
Procedure 1→7→11→12→13	 Servo P.C.B. Rib • When checking the soldered surface of the servo P.C.B. and replacing the parts, do as shown. • Don't remove the 2 flat cables (CN401, CN402).	1. Place the test disc and magnet on the turntable. 2. Switch the player ON. 3. First push the open/close switch (S102) and next, push the S101. 4. After the test disc starts rotating, release the open/close switches (S101, S102).  Test disc Magnet & clasper Loading base Front panel Main P.C.B. S101 S102	
Ref. No. 14	Removal of the servo P.C.B. and loading motor P.C.B.	• Removal of the servo P.C.B.	
Procedure 1→7→11→12→14	 FPC board Servo P.C.B. 1 2 3 4 5 Loading motor P.C.B. Loading motor terminals Spindle motor terminal • Removal of the servo P.C.B. 1. Remove the 3 screws (①～③). 2. Unsolder the 2 terminals of spindle motor. 3. Remove the FPC board from the optical pickup. Caution: To prevent the breakdown of the laser diode, antistatic shorting pin is inserted into the FPC board. • Removal of the loading motor P.C.B. 1. Remove the 2 screws (④, ⑤). 2. Unsolder the 2 terminals of loading motor.	1. Remove the 3 screws (①～③). 2. Unsolder the 2 terminals of spindle motor. 3. Remove the FPC board from the optical pickup.	

Ref. No. 15	Removal of the loading motor	Ref. No. 16	Removal of the optical pickup
Procedure 1→7→11→ 12→15	 1. Remove the drive belt. 2. Remove the 2 screws (①, ②). 3. Release the 2 claws. 4. Unsolder the 2 terminals of the lead wire of the loading motor.	Procedure 1→7→11→ 12→14→16	Refer to the handling precautions for optical pickup and instructions for traverse oil (See page 7). 1. Remove the 2 screws (①, ②). 2. Unsolder the 2 terminals and the 2 screws (③, ④).  Caution: Take care not to touch the brush terminal.
Ref. No. 17	Removal of the spindle motor	 1. Loosen the screw (①) by using a 1.27 mm allen wrench and remove the turntable. 2. Remove the 2 screws (②, ③). Caution: 1. Turntable height adjustment is necessary any time the turntable or spindle motor is replaced. 2. The (+) terminal of the spindle motor is indicated by the red mark. Adjustment of turntable height 1. Insert a 0.9mm clearance gauge (RZZ0297) between the turntable and loading base as shown right. 2. Tighten the turntable set-screw by using a 1.27mm allen wrench. Caution: Refer to turntable height adjustment (see page 13).	

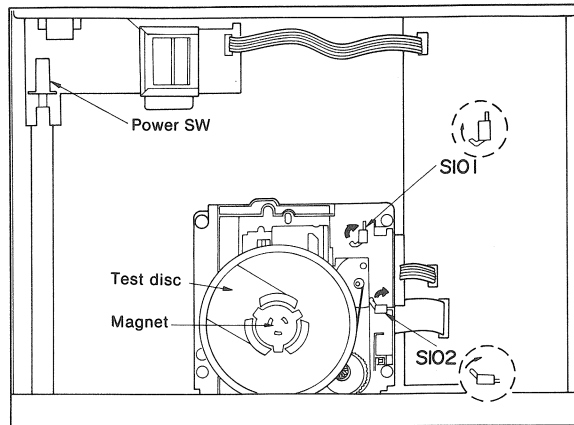
MEASUREMENTS AND ADJUSTMENTS

Caution:

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

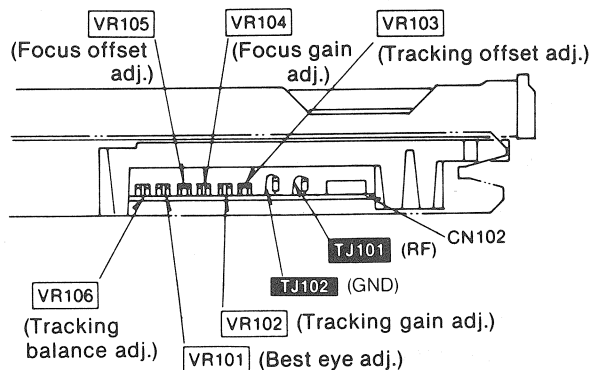
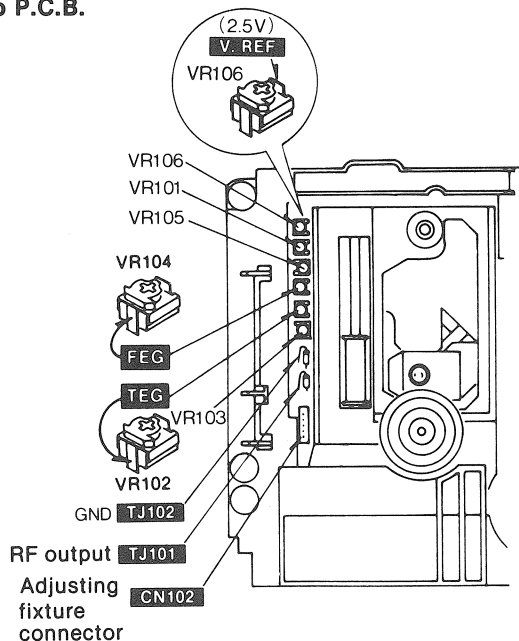
PREPARATION

- Remove the cabinet (see Ref. No. 1 of the disassembly instructions).
- Remove the disc clumper and magnet (see Ref. No. 7, 8 of the same).
- Remove the disc holder and power switch rod (see Ref. No. 9, 11 of the same).
- Place the test disc and magnet on the turntable.
- Switch the player on.
- First push the Open/Close switch S102 in the direction of the arrow and then, push switch S101 in the direction of the arrow as shown in the figure.

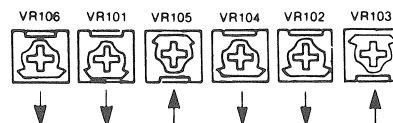


ADJUSTMENT POINTS

• Servo P.C.B.



• Temporary setting of each VR



(Temporary VR setting if any of the trimmer VRs are replaced or require readjustment, temporarily set them to the following positions.)

Measuring Instruments and Special Tools

- * Servo gain adjuster (SZZP1017F or SZZP1094C-1)
- * Test discs
 1. Playability test disc (SZZP1054C or SZZP1014F)
 2. Uneven test disc (SZZP1056C)
 3. Black band test disc (SZZP1057C)
- * Normal disc
- * Dual-beam oscilloscope with bandwidth of 30 MHz or better (with EXT trigger and 1 : 1 probe).
- * Audio frequency (AF) oscillator
- * Conversion connector (SZZP1032F)

- * Allen wrench (M2.0) (SZZP1101C)
- * Allen wrench (M1.27)
- * 0.9mm clearance gauge (RZZ0297)
- * Filter

Perform adjustments depend on the part to be replaced according to followings:

- (1) Spindle motor Items (1), (3) to (8)
 (2) Turntable Items (1), (3) to (8)
 (3) Optical pickup Items (2) to (8)

Adjusting Procedure

- * If you have replaced the optical pickup, spindle motor, or turntable, do the following adjustment:

(1) TURNTABLE HEIGHT ADJUSTMENT

1. Insert the 0.9 mm clearance gauge (RZZ0297) between the turntable and the loading base (see the figure at right).
2. Tighten the turntable retention screw with the 1.27 mm allen wrench.
3. Connect the oscilloscope's CH. 1 probe across VR104's **FEG** (+) and VR106's **V. REF** (–) terminals via a filter.
 (Note: A voltage of 2.5V appears at the V. REF terminal. Take care not to short the player's chassis to the oscilloscope ground.)

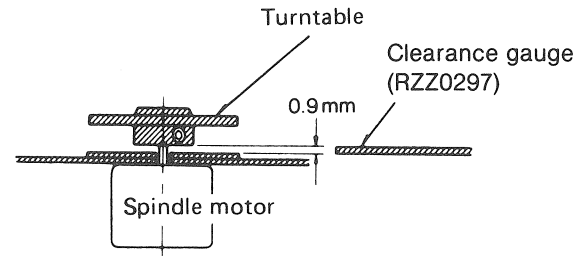
Oscilloscope setting: VOLT 50 mV
 SWEEP 1 ms.
 Input coupling ... DC

4. Adjust oscilloscope's DC zero balance.
5. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
6. Measure the voltage amplitude of the signal on the oscilloscope.

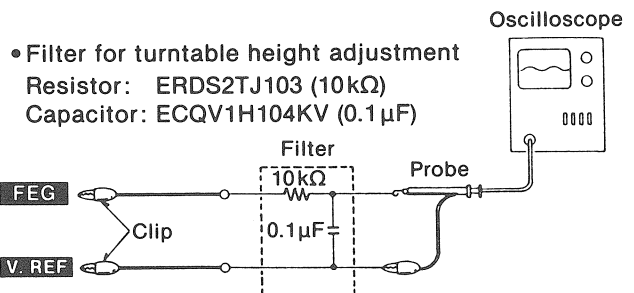
Note 1. If the measured amplitude is within a range of ± 15 mV, the turntable height is correct. If it is outside this range, adjust the turntable height by using the clearance gauge as a pry.

If the amplitude exceeds +15 mV, lower turntable.

If the amplitude is below -15 mV, elevate the turntable.



Note 2. If the measured amplitude greatly surpasses or falls short of the range above, set **VR105** at or around the center, then try to adjust the height again. (Then be sure to adjust the focus offset as well.)

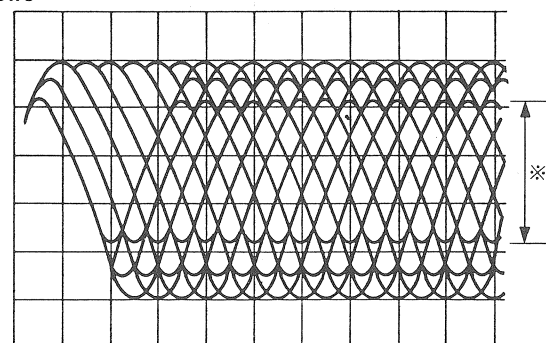
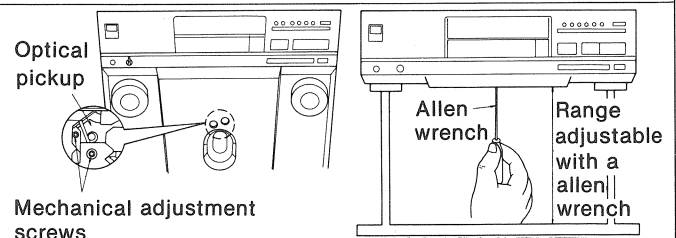


(2) MECHANICAL ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B.

Oscilloscope setting: VOLT 100 mV
 SWEEP 0.5 μs.
 Input coupling ... AC

2. Switch the player power **ON**, and play track 9 on the test disc (SZZP1056C). (Playing any other track may yield a false adjustment.)
3. Leave the player in Play mode, and place it as shown in the figure on the right.
4. Alternately adjust the two mechanical adjusting screws with the 2.0mm allen wrench (SZZP1101C) until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.
5. After completing the adjustment, lock the **mechanical adjustments** with lock paint (RZZOL01).



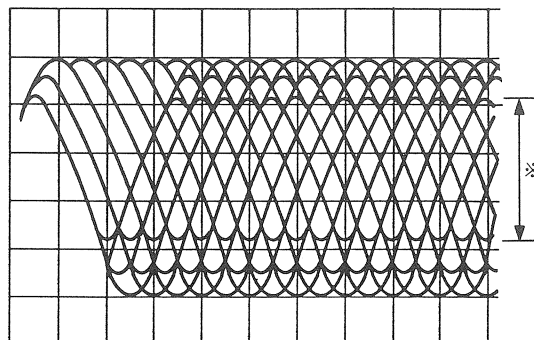
* Most stretched eye pattern.

(3) BEST EYE (PD BALANCE) ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B.

Oscilloscope setting: VOLT 100 mV
 SWEEP 0.5 μ s
 Input coupling . . . AC

2. Switch the player power **ON**, and play the 1kHz (track 1) on the test disc (SZZP1054C).
3. Adjust **VR101** until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.



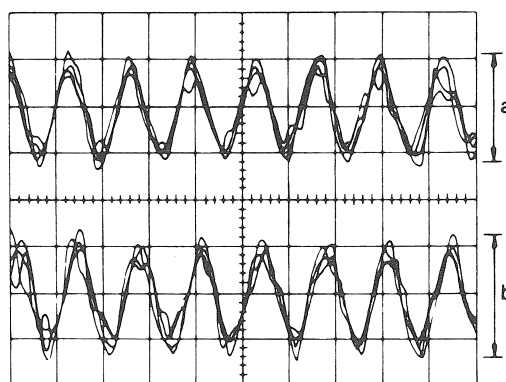
※ Most stretched eye pattern.

(4) FOCUS GAIN ADJUSTMENT

1. Connect the servo gain adjuster to the player (see page 15).
2. Set the servo gain adjuster's gain switch to position "2" and the ON/OFF switch to **ON**.
3. Set up the AF oscillator output for **825Hz, 150 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
4. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, respectively (TP3 is GND).

Oscilloscope setting: VOLT 100 mV
 (both channels)
 SWEEP 0.2 ms.
 Input coupling . . . AC

5. Play the test disc (SZZP1014F or SZZP1054C).
6. Set the servo gain adjuster's gain switch to position "3", and you will see a 825 Hz signal on the oscilloscope. Adjust **VR104** until the signal amplitudes on both channels become identical to each other.
7. Set the gain switch back to position "2".



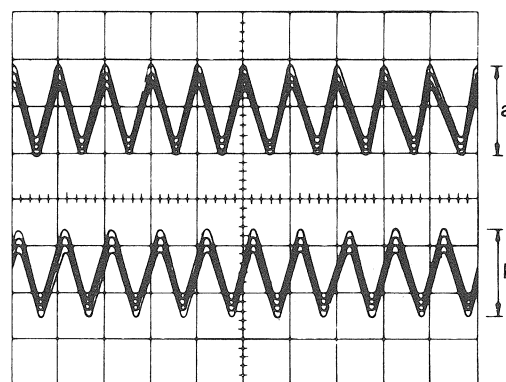
※ Adjust **VR104** until a equals b.

(5) TRACKING GAIN ADJUSTMENT

1. Set up the AF oscillator output for **1.1 kHz, 150 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
2. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, respectively (TP3 is GND).

Oscilloscope setting: VOLT 100 mV
 (both channels)
 SWEEP 0.2 ms.
 Input coupling . . . AC

3. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
4. Set the servo gain adjuster's gain switch to position "1", and you will see a 1.1 kHz signal on the oscilloscope. Adjust **VR102** until the signal amplitudes on both channels become identical to each other.
5. Set the gain switch back to position "2".



※ Adjust **VR102** until a equals b.

(6) FOCUS OFFSET ADJUSTMENT

Note: Make sure that the servo gain adjuster's gain switch is set to position "2".

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B. and its CH. 2 probe (+) to VR104's **FEG** terminal.

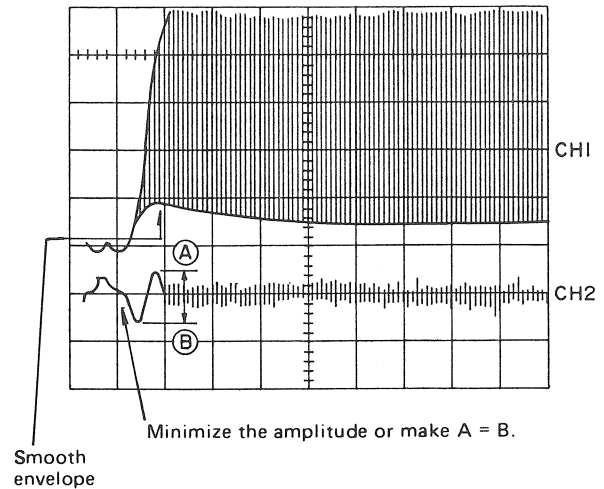
Oscilloscope setting: VOLT. 100 mV (CH. 1)
100 mV (CH. 2)

SWEEP. 0.2 ms.

Input coupling. . . AC (both CH. 1
and 2)

Trigger mode . . . NORM (trigger
CH. 1.)

2. Switch the player power **ON**, and play track 9 on the test disc (SZZP1057C).
3. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR105** until the dip in the RF signal envelope on CH. 1 is smooth and the signal amplitude on CH. 2 is minimized, i.e. when amplitude A equals amplitude B.

**(7) TRACKING OFFSET ADJUSTMENT**

Note: Make sure that the servo gain adjuster's gain switch is set to position "2".

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B., and its CH. 2 probe (+) to VR102's **TEG** terminal.

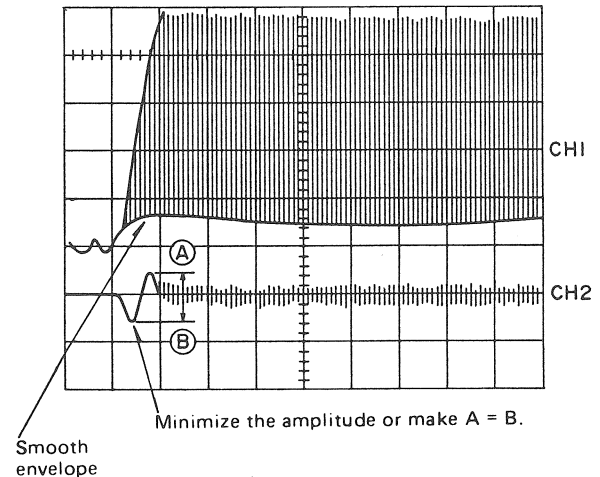
Oscilloscope setting: VOLT. 100 mV (CH. 1)
100 mV (CH. 2)

SWEEP. 0.2 ms.

Input coupling. . . AC (both CH. 1
and 2)

Trigger mode. . . NORM (trigger
CH. 1.)

2. Switch the player power **ON**, and play track 9 on the test disc (SZZP1057C).
3. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR103** until the dip in the RF signal envelope on CH. 1 is smooth and the signal amplitude on CH. 2 is minimized, i.e. when amplitude A equals amplitude B.

**(8) TRACKING BALANCE ADJUSTMENT**

1. Make sure that the servo gain adjuster's gain switch is set to position "2".
2. Set up the AF oscillator output for 1.1 kHz, 600 mVp-p, and connect it across the OSC and GND terminals on the servo gain adjuster.
3. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B. and CH. 2 probe (+) to the OSC terminal on the servo gain adjuster.

Oscilloscope setting: VOLT. 100 mV (CH. 1)
200 mV (CH. 2)

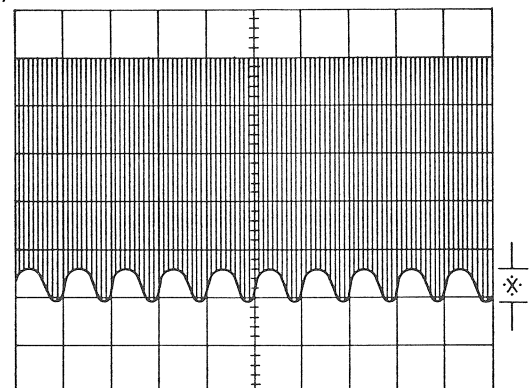
SWEEP. 0.1 ms.

Input coupling. . . AC (both CH. 1
and 2)

Trigger mode . . . NORM (trigger
CH. 2)

4. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).

5. Set the servo gain adjuster's gain switch to position "1", and adjust **VR106** so that the waveform of the output section marked with ✖ is balanced.
6. Disconnect the servo gain adjuster's leads from the player.



✖ This section of the waveform must be balanced.

(9) CHECK OF PLAY OPERATION AFTER ADJUSTMENT*** Checking Skip Search**

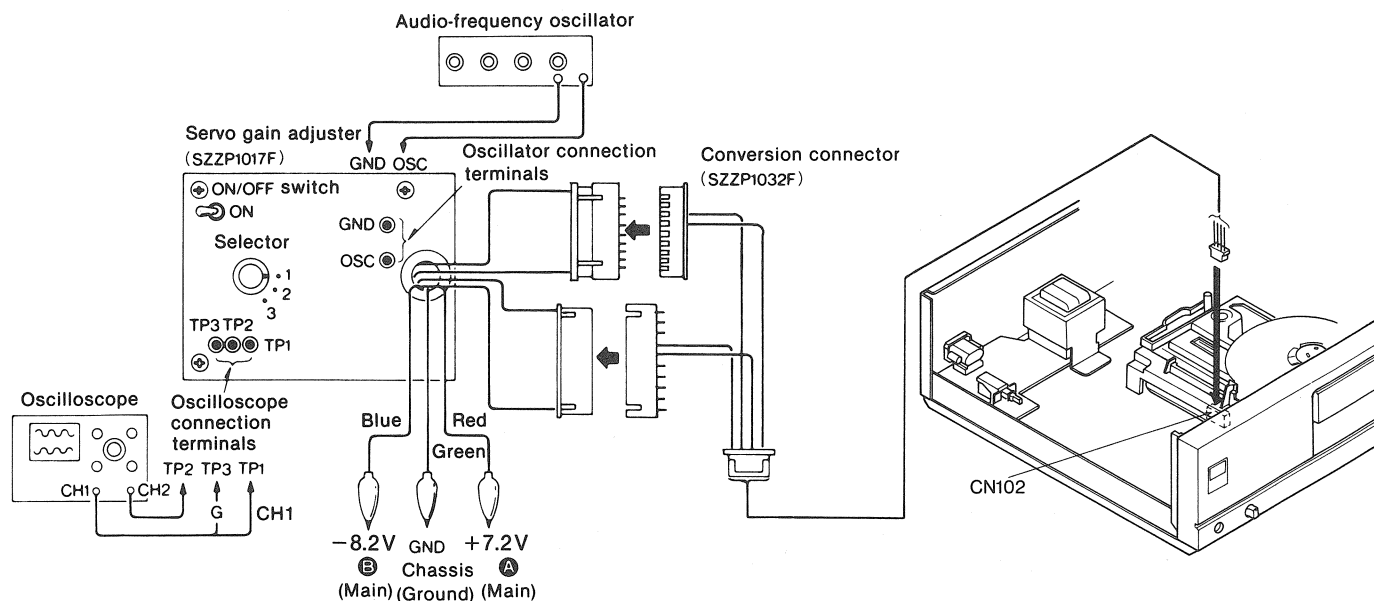
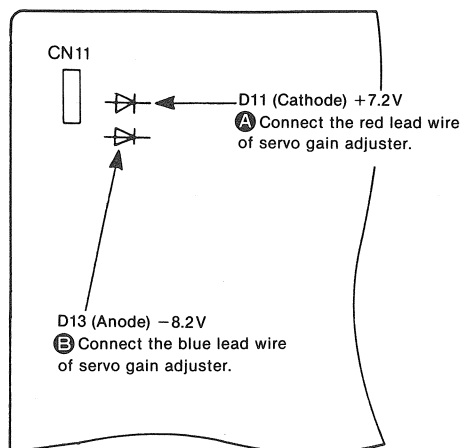
1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

*** 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 Using Defect Disc**

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

• Connection of servo gain adjuster**• Main P.C.B.****■ NEW SERVO GAIN ADJUSTER (Servo Amp. Adjusting Fixture)**

The following introduces the improved version of the current servo gain adjuster (SZZP1017F):

Part number: SZZP1094C-1

Features:

- (1) Contains all oscillation frequencies and output adjustments needed for focus servo gain, tracking servo gain, and tracking balance adjustment (requires no external oscillator).
- (2) Panel indicators indicate the best points of focus and tracking servo gains (no oscilloscope needed).
- (3) Internal power supply eliminates the need for power supply from the CD player.

■ TERMINAL FUNCTION OF IC'S

● IC101 (AN8373S): Servo amp.

Pin No.	Mark	I/O Division	Function
1	AMP1	I	RF signal input (X30 amp.)
2	PDAD	I	Photo detector current input (A2)
3	PDA	I	Photo detector current input (A1)
4	PDBD	I	Photo detector current input (A4)
5	PDB	I	Photo detector current input (A3)
6	LPD	I	Non-inverting laser power input
7	LD	O	Laser power auto control output
8	FBL1	I	PD balance adjustment
9	FBL2	I	
10	TBL1	I	Tracking balance adjustment
11	TBL2	I	
12	FOOFS	I	Focus offset adjustment
13	IVA	O	Current/voltage conversion output (A)
14	IVB	O	Current/voltage conversion output (B)
15	FE	O	Focus gain adjustment output
16	FPI	I	Focus error signal input
17	TPI	I	Tracking error signal input
18	C. TPL	I	Tracking error filter capacitor input
19	C. TPH		
20	C. FPL	I	Focus error filter capacitor input
21	C. FPH		

Pin No.	Mark	I/O Division	Function
22	TPO	O	Tracking error signal output
23	FPO	O	Focus error signal output
24	FGC	I	Focus gain up signal input (Not used, connected to GND)
25	TGC	I	Tracking gain up signal input (Not used, connected to GND)
26	GD	I	Focus/Tracking down signal input (Not used, connected to GND)
27	PTO	O	Position detecting amp. output
28	PTI	I	Position detecting amp. input
29	PBO	O	Position detecting buffer output
30	POT	I	Position detecting buffer input
31	BDO	O	Dropout detection output
32	$\overline{\text{RFDET}}$	O	RF detection signal output
33	SDO	O	Dropout detection pulse output
34	C. SBDO	I	Dropout detecting capacitor input
35	ARF	O	RF signal output
36	C. AGC	I	AGC detecting capacitor input
37	VCC	I	Power supply terminal
38	LDON	I	Laser power control input
39	RF IN	I	RF signal input
40	AMPO	O	RF signal output
41	VREF	O	Reference voltage output
42	GND	—	Ground terminal

• IC102 (AN8374S): Servo processor

Pin No.	Mark	I/O Division	Function
1	LSA	I	Phase difference input (A)
2	LSB	I	Phase difference input (B)
3	TEOFS	O	Tracking offset adjustment
4	TE	O	Tracking gain adjustment
5	TEG	I	
6	TE OUT	O	Tracking error signal output
7	TE BPF	I	Tracking error gain detecting filter (Not used, open)
8	FEG	I	Focus gain adjustment
9	FE OUT	O	Focus error signal output
10	CLW	O	Triangular wave oscillator capacitor output
11	VREF	I	Reference voltage input
12	ARF	I	RF signal input
13	CDSL	I	Data slice filter capacitor input
14	FPC	I	Frequency difference signal input
15	GND	—	Ground terminal
16	C. PLL	I	PLL loop filter constant
17	VSS	—	Ground terminal
18	CLK	I	Frequency pull-in clock signal (88.2 kHz) input
19	SRF	O	Sliced and digitized RF signal output
20	PCK	O	Clock output extracted from SRF
21	EFM	O	EFM signal output synchronous with PCK

Pin No.	Mark	I/O Division	Function
22	VDD	I	Power supply terminal
23	SPCNT	O	Track crossing speed control output (Not used, open)
24	SENSE	O	Selector output (track crossing state)
25	TRV	O	Traverse servo control output
26	$\overline{\text{FLOCK}}$	O	Focus lock signal output
27	KICK	O	Track kick signal output
28	LDON	O	Laser power control output
29	VDET	O	Focus/tracking gain up output (Not used, open)
30	CNT1	I	Control input (FOON: Focus Servo On signal)
31	CNT2	I	Control input (TRON: Tracking Servo On signal)
32	CNT3	I	Control input (KICKF: Kick Direction (Forward) command)
33	CNT4	I	Control input (KICKR: KICK Direction (Backward) command)
34	TRVF	I	Traverse forward command signal
35	TRVR	I	Traverse backward command signal
36	$\overline{\text{RFDET}}$	I	RF detection signal input
37	BDO	I	Dropout detection input
38	VCC	I	Power supply terminal
39	TVPO	O	Traverse position detecting resistor/capacitor inputs
40	TVPI	I	
41	BROUT	O	Tracking drive control output
42	BRIN	I	Tracking error signal input

• IC103 (AN3877N): BTL drive

Pin No.	Mark	I/O Division	Function
1	PVCC	I	Drive power supply
2	VCC	I	Power supply terminal
3	TB	O	External transistor base driving output
4	VMON	O	Voltage output
5	TVDI	I	Traverse error signal input
6	FDI	I	Focus error signal input
7	TDI	I	Tracking error signal input
8	VREF	I	Reference voltage input

Pin No.	Mark	I/O Division	Function
9	TD—	O	Inverting output of tracking driver
10	TD+	O	Non-inverting output of tracking driver
11	FD—	O	Inverting output of focus driver
12	FD+	O	Non-inverting output of focus driver
13	TVD—	O	Inverting output of traverse driver
14	TVD+	O	Non-inverting output of traverse driver
15	$\overline{\text{RESET}}$	O	Reset signal output
16	PC	I	PC input (connect to GND.)

• IC301 (MN6625): Digital signal processor

Pin No.	Mark	I/O Division	Function
1	BYTCK	O	Serial data byte clock (Not used, open)
2	FCLK	O	Crystal frame clock (7.35 kHz) (Not used, open)
3	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")
4	SRDATA	O	Serial data output (MSB first)
5	SCK	O	Serial bit clock output
6	LRCK	O	LR discrimination signal output
7	WDCK	O	Serial data output word clock
8	LDG	O	L channel deglitch signal (Not used, open)
9	RDG	O	R channel deglitch signal (Not used, open)
10	IPFLAG	O	Interpolation flag (interpolation at "H")
11	FLAG	O	Error flag terminal
12	XCK	O	Clock (16.9344 MHz) output (Not used, open)
13	TEST	I	Test mode selection (Not used, connected to power supply.)
14	TX	O	Digital signal output (Not used, open)
15	SLEEP	I	Mode selector ("L": normal, "H": SLEEP mode) (Not used, connected to GND)
16	CSEL	I	Test terminal ("L": normal) (Not used, connected to GND)
17	X1	I	Clock input (16.9344 MHz)
18	X2	O	Clock output (16.9344 MHz) (Not used, open)
19	VSS	—	GND terminal
20	BLKCK	O	Sub-code block (Q data) clock (75 Hz)
21	CLDCK	O	Sub-code frame (Q data) clock (7.35 kHz)
22	SUBQ	O	Sub-code (Q data) output
23	RST	I	Reset signal input (reset at "L")
24	MLD	I	Command load signal input

Pin No.	Mark	I/O Division	Function
25	MCLK	I	Command clock signal input
26	MDATA	I	Command data input
27	DMUTE	I	Muting control
28	TRON	I	Tracking servo ON signal (tracking servo ON at "L")
29	STAT	O	Processing condition (CRC, CUE, CLVS, TT STOP, FCLV)
30	SUBC	O	Sub-code serial output data (Not used, open)
31	SBCK	I	Clock for sub-code serial output (Not used, open)
32	SMCK	O	Clock output (4.2336 MHz)
33	VDD	I	Power supply terminal
34	MEMP	I	Emphasis signal input (Not used, open)
35	FG	I	Spindle motor FG signal input (Not used, open)
36	PC	O	Spindle motor ON signal (ON at "L")
37	EC	O	Spindle motor drive signal
38	RESY	O	Resynchronizing signal (Not used, open)
39	DO	I	Drop-out signal (Drop-out at "H")
40	SRF	I	EFM signal input (DSL)
41	EFM	I	EFM signal input (PLL)
42	PCK	I	PLL extract clock input (4.3218 MHz)
43	FPC	O	PLL frequency comparison signal
44 51	D7 D0	I/O	16 K RAM data input/output
52	RAM/OE	O	16 K RAM $\overline{OE}$ signal
53	RAM/WE	O	16 K RAM $\overline{WE}$ signal
54 64	RAM/A0 RAM/A10	O	16 K RAM address signal (RAMA0: LSB, RAMA10: MSB)

• IC401 (MN1554PJZ-1): System control

Pin No.	Mark	I/O Division	Function
1	BRECV	—	(Not used, open)
2	BSEND	—	(Not used, open)
3	SYNC	O	(Not used, open)
4	SIRQ	I	Not used (connected to power supply)
5	BLKCK	I	Sub-code block (Q data) clock input (75Hz)
6	CLDCK	I	Sub-code block (Q data) clock input (7.35kHz)
7	SBO	I	(Not used, open)
8	SUBQ	I	Sub-code (Q data) input
9	RST	I	Reset signal input
10 └ 13	F/S SW, P21 └ P23	O	Not used (connected to power supply)
14	CLOSE	O	Loading motor "Close" command
15	OPEN	O	Loading motor "Open" command
16	SLOW	O	(Not used, open)
17	MUTE	O	Muting control
18	SEEK	O	Traverse servo control (Not used, open)
19	NC	—	Not connected
20	TRV.R	O	Traverse "Reverse" command signal
21	TRV.F	O	Traverse "Forward" command signal
22	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [reverse] command)
23	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [forward] command)
24	CNT2	O	Optical servo IC control (TRON: Tracking servo)
25	VDD	I	Power supply terminal
26	DOWN	O	(Not used, open)
27	UP	O	(Not used, open)
28	CNT1	O	Optical servo IC control signal (FOON: Focus servo)

Pin No.	Mark	I/O Division	Function
29	CLOSE SW	I	Disc holder "Open" detection
30	OPEN SW	I	Disc holder "Close" detection
31	BCLK	I	(Not used, connected to GND)
32	BDATA	I	(Not used, connected to GND)
33	STAT	I	Processing status input from signal processing LSI
34	COMP	O	TOC reading control (ON at "L") (connected to GND)
35	FLOCK	I	Optical servo condition (focus) input
36	SENSE	I	Optical servo condition (track cross) input
37	RECV	I	Data receipt command signal
38	SEND	I	Data transmission command signal
39	ACK	I	Data discrimination signal
40	CLK	I	Data lock signal
41 └ 44	DATA0 └ DATA3	I	Key scan signal
45 └ 52	NC	I	Not connected
53	OSC2	I	Clock terminal
54	OSC1	I	Clock input
55	X1	I	Optical servo condition input
56	X0	O	(Not used, open)
57	GND	—	GND terminal
58	DMUTE	O	Muting control
59	MDATA	O	Command data output
60	MCLK	O	Data clock output (command clock signal)
61	MLD	O	Data output (command load signal)
62	DOUTON	O	Optical output control signal (Not used, open)
63	EMPH	O	Emphasis signal output
64	NC	—	Not connected

• IC601 (MB88725BPJV): System control and FL drive

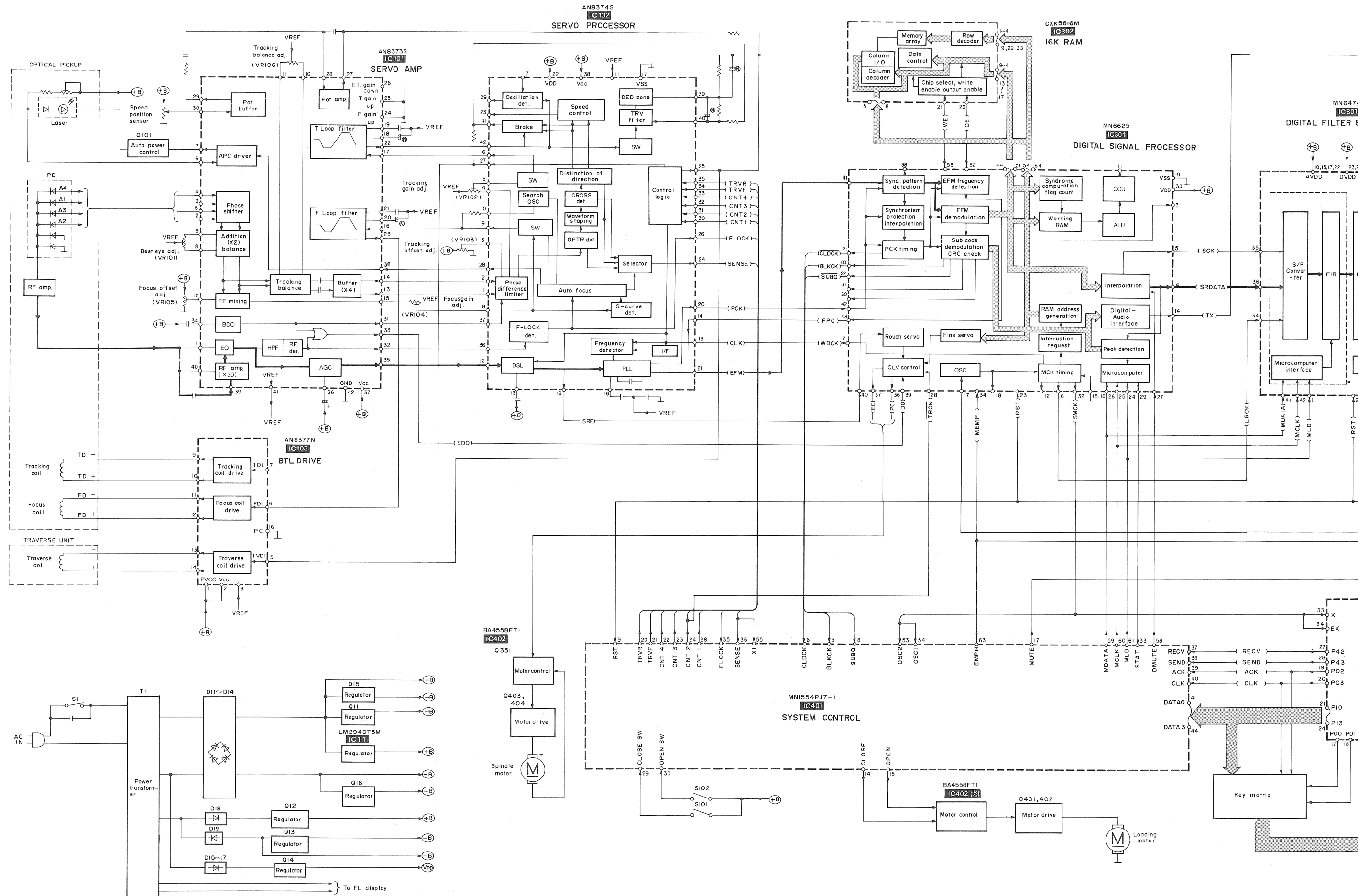
Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1 └ 14	C0 └ C13	O	FL grid signal	33	X	I	Clock signal input (4.2336 MHz)
				34	EX		
15	C14	O	LED drive signal (PAUSE)	35	SE	I	Not used, connected to power supply
16	C15	O	LED drive signal (PLAY)	36	FD	—	GND terminal
17	P00	O	Key scan signal	37	XL	O	Not used, open
18	P01			38	EXL	O	(Not used, connected to GND)
19	P02	O	Data discrimination signal signal	39 └ 42	P60 └ P63	I	Key return signal
20	P03	O	Data lock signal	43 └ 46	P70 └ P73		
21 └ 24	P10 └ P13	O	Key scan signal				
25	P40	I	Remote control signal input	47	VPP	I	FL drive power supply
26	P41	—	(Not used, connected to GND)	48 └ 63	S0 └ S15	O	FL anode signal
27	P42	O	Data receipt command signal	64	VCC	I	Power supply terminal
28	P43	O	Data transmission command signal				
29	P50	—	Synchro edit control terminal				
30	P51	I					
31	$\overline{\text{RES}}$	I	Reset signal input (reset at "L")				
32	VSS	—	GND terminal				

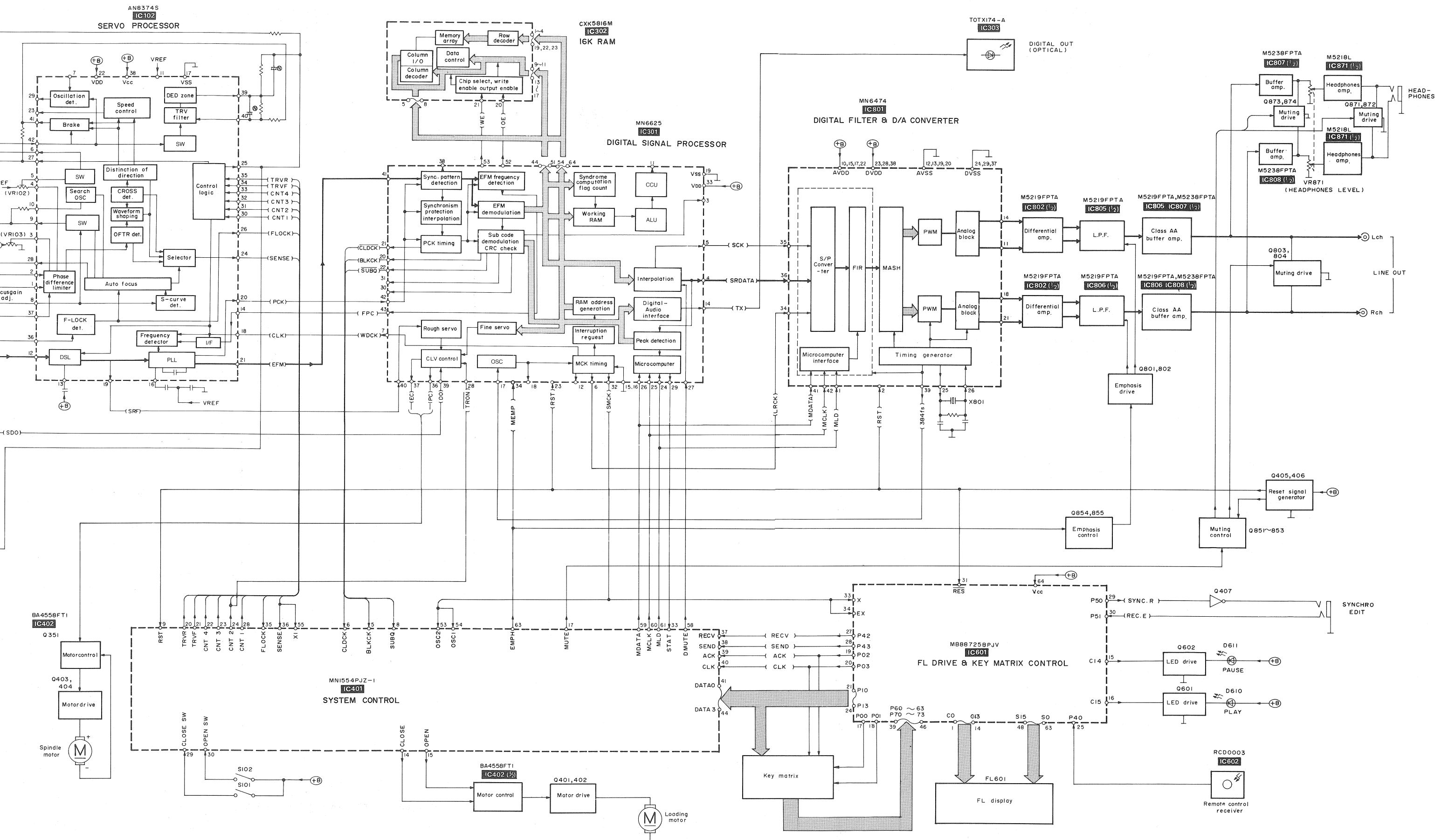
• IC801 (MN6474): Digital filter & D/A converter

Pin No.	Mark	I/O Division	Function
1	MLD	I	Command load input (load: L)
2	RSTB	I	Reset command
3	IE	I	Not used, connected to GND
4	TP1	—	TEST terminal
5	TP2	—	
6	TEST1	I	TEST terminal 1 (connected to GND)
7	TEST2	I	TEST terminal 2 (connected to GND)
8	NC	—	Not connected
9	NC	—	Not connected
10	AVDD4	I	Power supply (connected to +4.8V)
11	OUTL (–)	O	Lch data output, (–) terminal
12	AVSS4	I	GND terminal
13	AVSS3	I	GND terminal
14	OUTL (+)	O	Lch data output, (+) terminal
15	AVDD3	I	Power supply (connected to +4.8V)
16	NC	—	Not connected
17	AVDD2	I	Power supply (connected to +4.8V)
18	OUTR (+)	O	Rch data output, (+) terminal
19	AVSS2	I	GND terminal (analog system)
20	AVSS1	I	GND terminal (analog system)
21	OUTR (–)	O	Rch data output, (–) terminal

Pin No.	Mark	I/O Division	Function
22	AVDD1	I	Power supply (connected to +4.8V)
23	DVDD1	I	Power supply (connected to +4.9V)
24	DVSS1	I	GND terminal (digital system)
25	X2	O	Clock output
26	X1	I	Clock input
27	NC	—	Not connected
28	DVDD2	I	Power supply (connected to +4.9V)
29	DVSS2	I	GND terminal (digital system)
30	NSUB	I	Sub-strate terminal (Not used, connected to +4.9V)
31	ZFLGB	O	Zero input detector terminal (Not used, open)
32	192fs	O	192 fs (8.4672 MHz) (Not used, open)
33	LRPOL	I	LR clock selector (Not used, connected to +4.9V)
34	LRCLK	I	LR discrimination signal input
35	BCLK	I	Serial bit clock input
36	SRDATA	I	Serial data input (MSB first)
37	DVSS 3	I	GND terminal (digital system)
38	DVDD	I	Power supply (connected to +4.9V)
39	384 fs	O	384 fs (16.9344 MHz) output
40	PD	I	Power down terminal (Not used, connected to GND)
41	MDATA	I	Mode control data
42	MCLK	I	Data clock for MDATA

BLOCK DIAGRAM





Note:
→ Audio signal

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

- **S1** : Power switch in “on” position.
- **S2** : Tape selector switch. ([GC] area only.)
- **S101, 102** : Disc holder open/close detection switch.
- **S601** : Tape side select (side A/B) switch.
- **S602** : Search (▶▶ search) switch.
- **S603** : Program (program) switch.
- **S604** : Tape length (tape length) switch.
- **S605** : Peak level search (peak search) switch.
- **S606** : Display on/off (display on/off) switch.
- **S607** : Recall (recall) switch.
- **S608** : Search (◀◀ search) switch.
- **S609** : Just time (just time) switch.
- **S610** : Time mode select (time mode) switch.
- **S611** : Clear (Clear) switch.
- **S612~614**, **617, 619** : Numeric (0~10) switches.

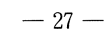
~621, 624, 626, 627, 632, 633	{	S612: 1, S613: 5, S614: 9, S617: 0, S619: 2, S620: 6, S621: 10, S624: > 10, S626: 3, S627: 7, S632: 4, S633: 8	}
-------------------------------------	---	--	---
- **S618** : Disc holder open/close (▲ open/close) switch.
- **S625** : Stop (■ stop) switch.
- **S631** : Pause (▢ pause) switch.
- **S637** : Play (▶ play) switch.
- **S639** : Auto cue (auto cue) switch.

Caution!

IC and LSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair.

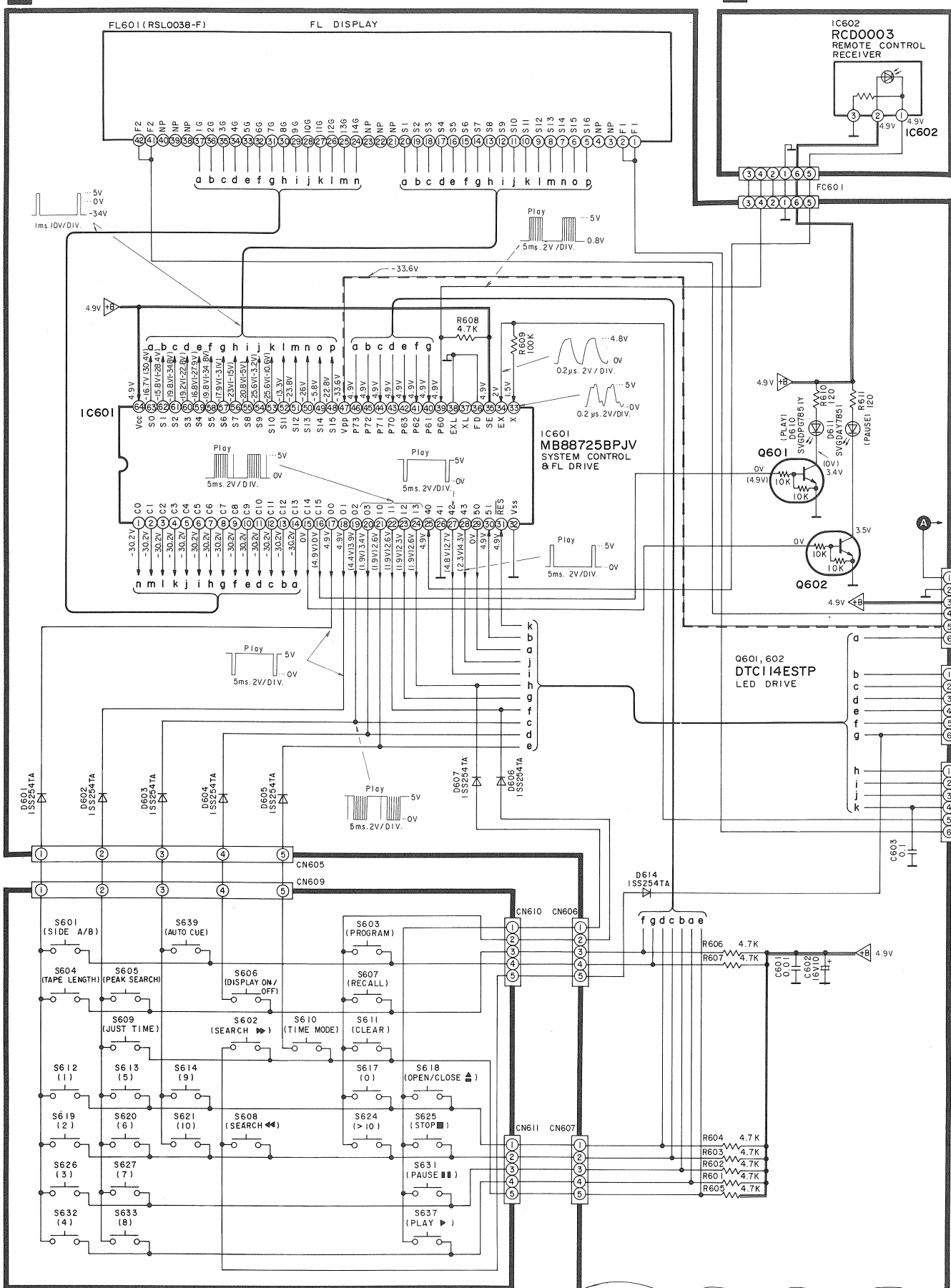
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

NO. 1	MB88725BPJV 64 Pin	NO. 1 <table border="1"> <tr> <td>MN6625</td><td>64 Pin</td></tr> <tr> <td>MN6474</td><td>42 Pin</td></tr> <tr> <td>MN1554PJZ-1</td><td>64 Pin</td></tr> </table>	MN6625	64 Pin	MN6474	42 Pin	MN1554PJZ-1	64 Pin								
MN6625	64 Pin															
MN6474	42 Pin															
MN1554PJZ-1	64 Pin															
NO. 1	<table border="1"> <tr> <td>AN8373S</td><td rowspan="2">42 Pin</td><td rowspan="4">CXX5816M</td><td rowspan="4">24 Pin</td></tr> <tr> <td>AN8374S</td></tr> <tr> <td>BA4558FTI</td><td colspan="3" rowspan="2">8 Pin</td></tr> <tr> <td>M5219FPTA</td></tr> <tr> <td>M5238FPTA</td><td></td><td></td><td></td></tr> </table>	AN8373S	42 Pin	CXX5816M	24 Pin	AN8374S	BA4558FTI	8 Pin			M5219FPTA	M5238FPTA				M5218L 8 Pin NO. 1
AN8373S	42 Pin	CXX5816M				24 Pin										
AN8374S																
BA4558FTI	8 Pin															
M5219FPTA																
M5238FPTA																
AN8377N 16 Pin NO. 1	DTC114EST, DTC124EST	DTA114EST, DTA124EST	Anode Cathode Ca 1SS254TA, SVDS5688GT3 MA29WATA													
Anode Cathode Ca MA4039MTA, MA4062HTA, MA4082MTA, MA4051MTA, MA4330MTA	LM2940T5M 1 Vin 2 GND 3 Vout	2SC3311QRSTA, 2SD1450RSTTA, 2SA1309QRSTA E C B	2SB1238QSTV6, 2SD1862QRTV6, 2SB1240QRTV6 B C E													
TOTX174-A 1 2 3 4	SVGDPG7851Y, SVGDAY7851 Anode Cathode Ca															



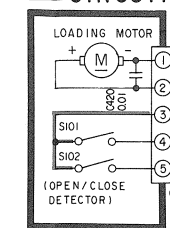


B FL DRIVE CIRCUIT

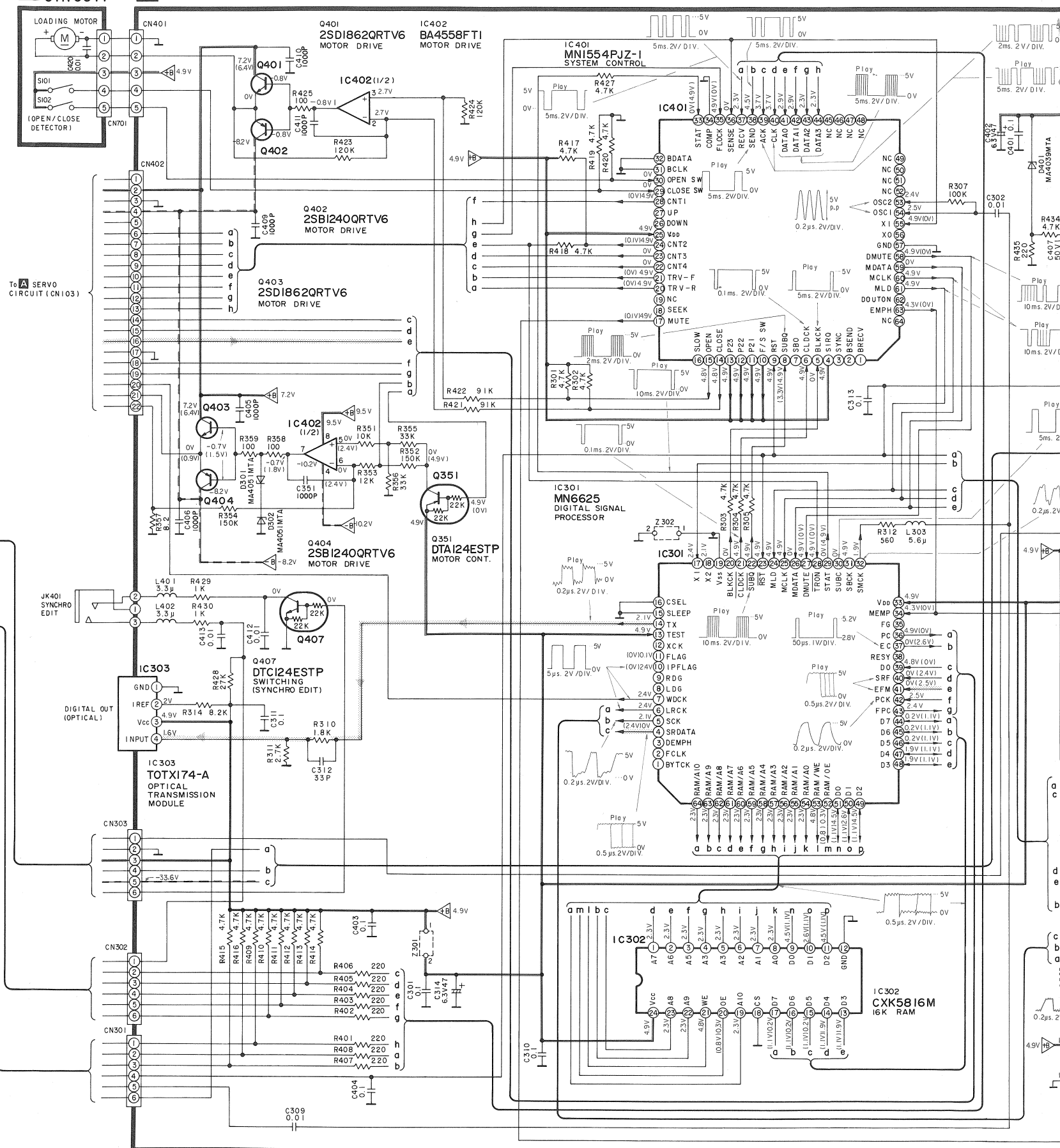


D REMOTE SENSOR CIRCUIT

E MOTOR/
SWITCH
CIRCUIT



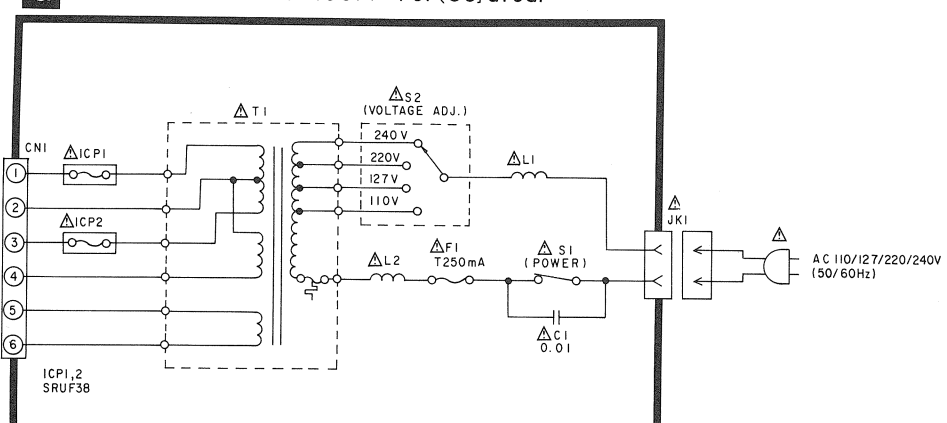
F MAIN CIRCUIT



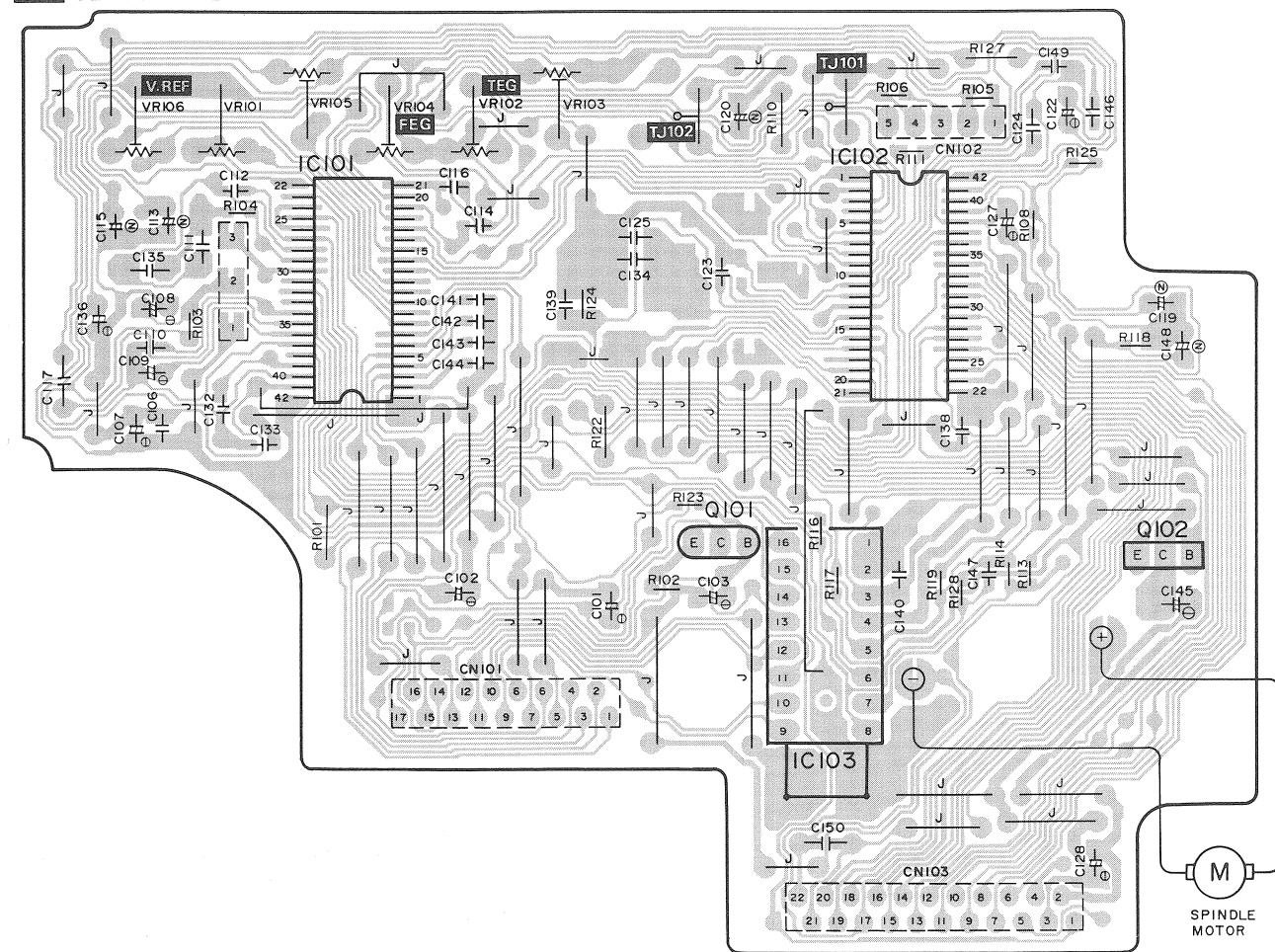
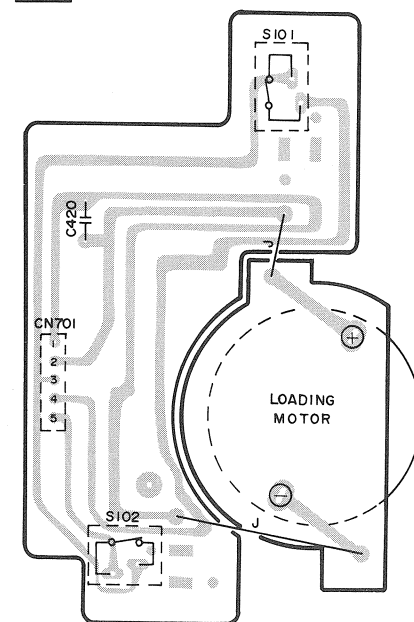
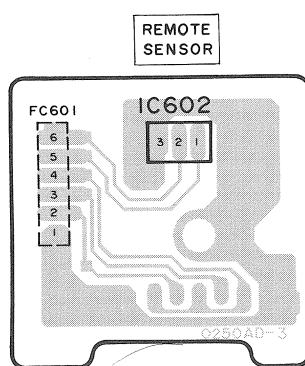
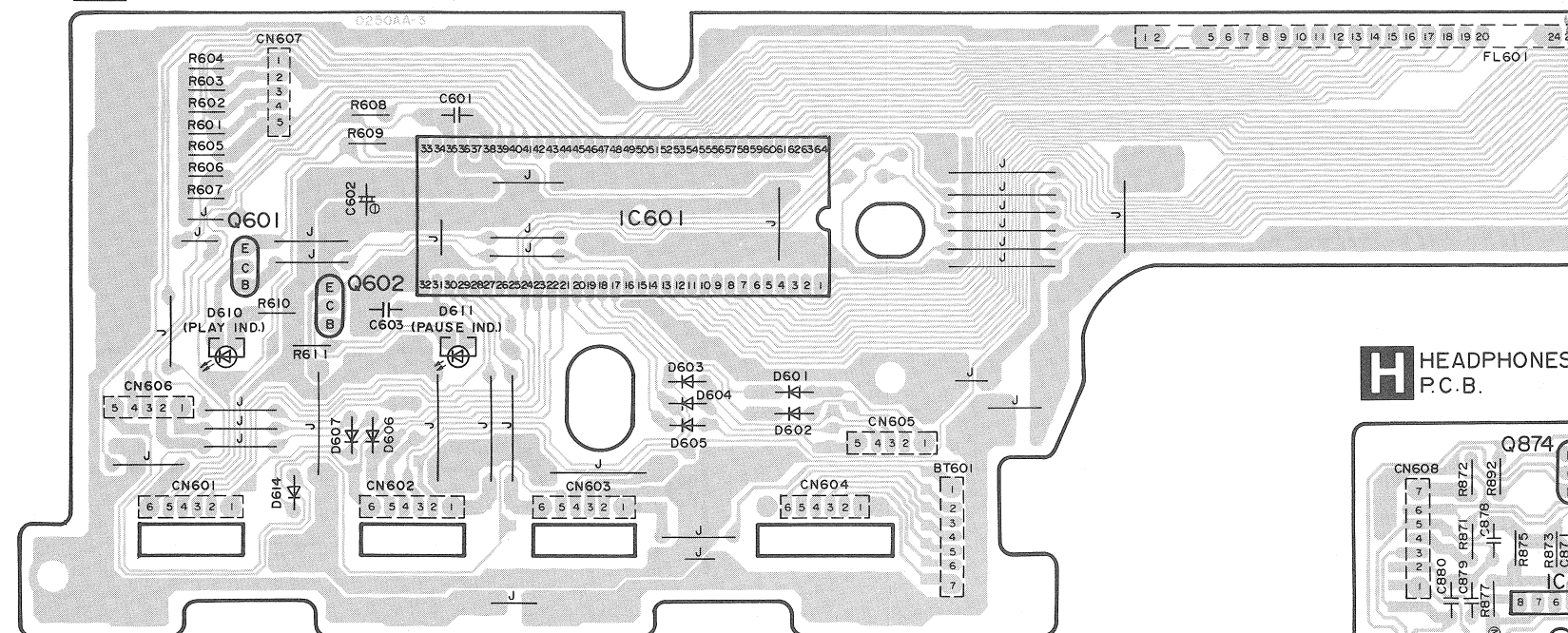
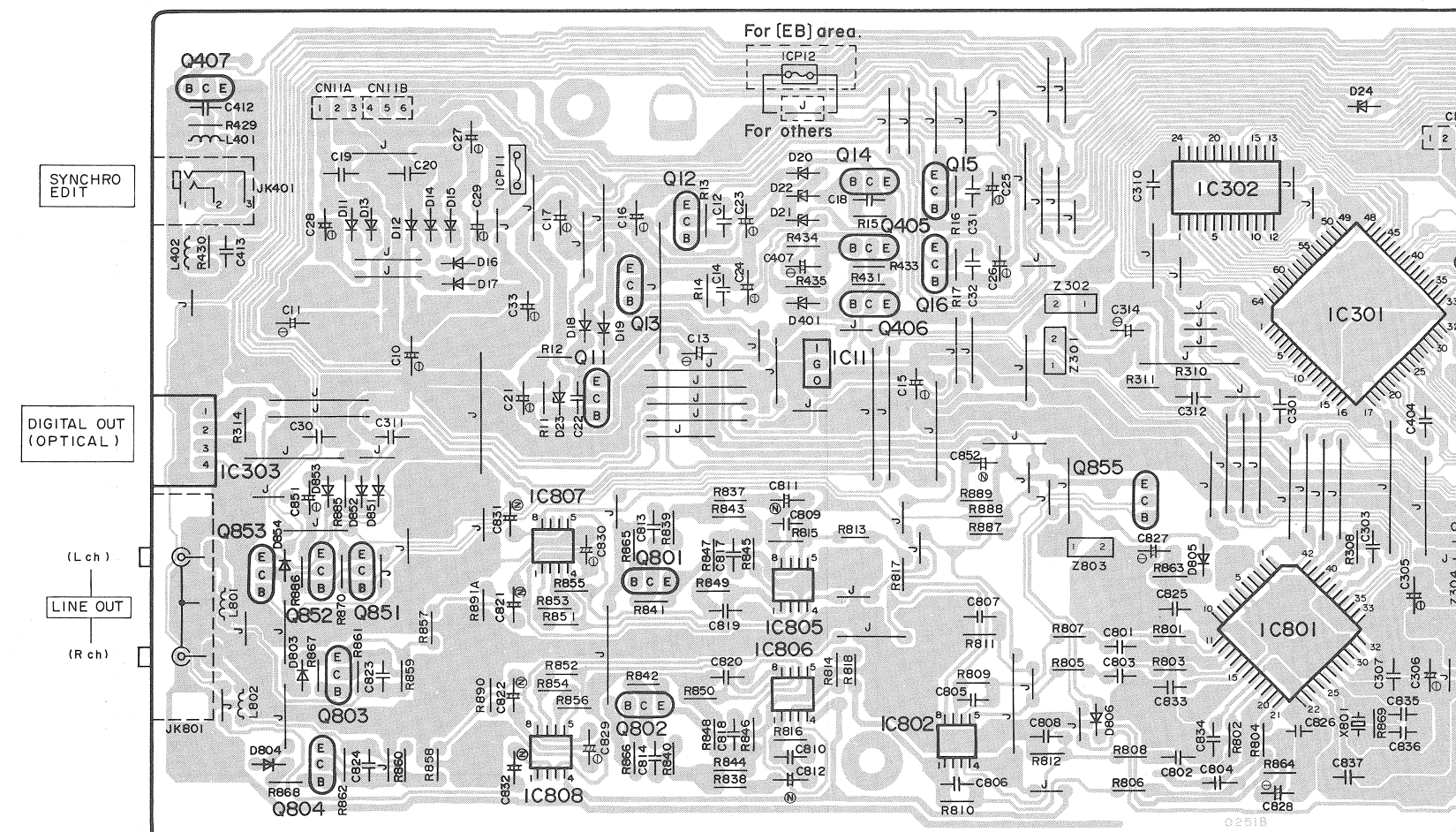
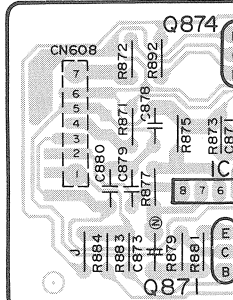
C OPERATION CIRCUIT



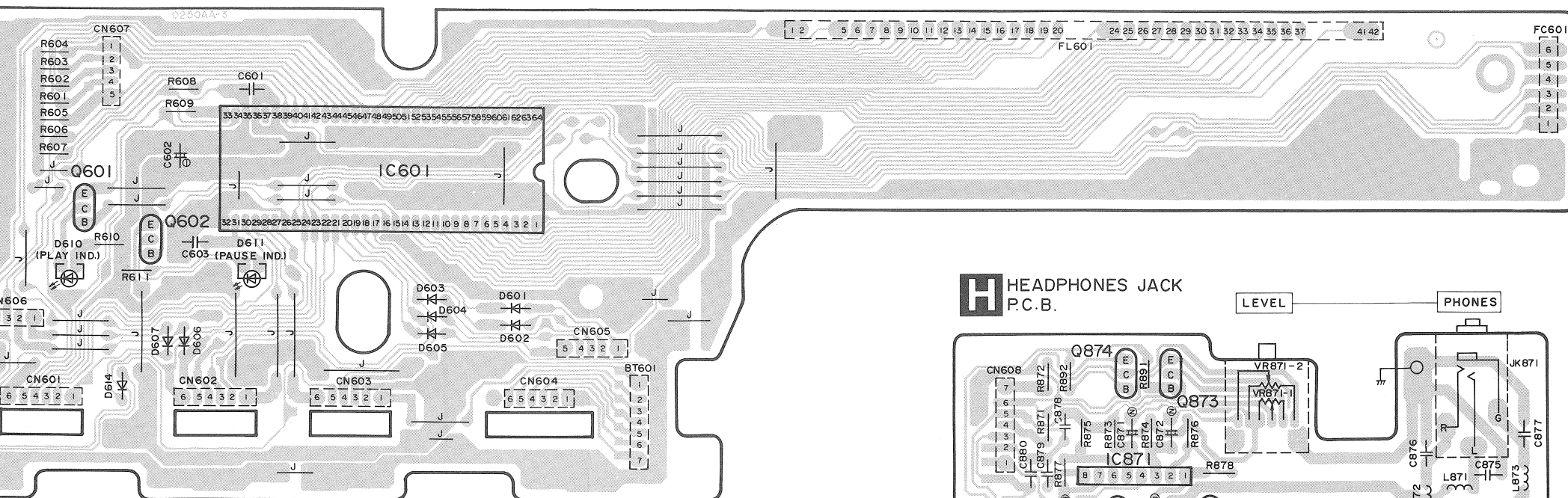
H HEADPHONES JACK CIRCUIT



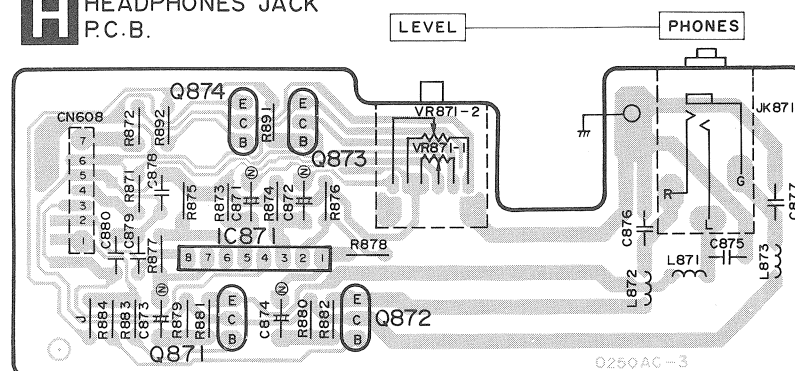
PRINTED CIRCUIT BOARDS

A SERVO P.C.B.**E** MOTOR/SWITCH P.C.B.**D** REMOTE SENSOR P.C.B.**B** FL DRIVE P.C.B.**F** MAIN P.C.B.**H** HEADPHONES P.C.B.

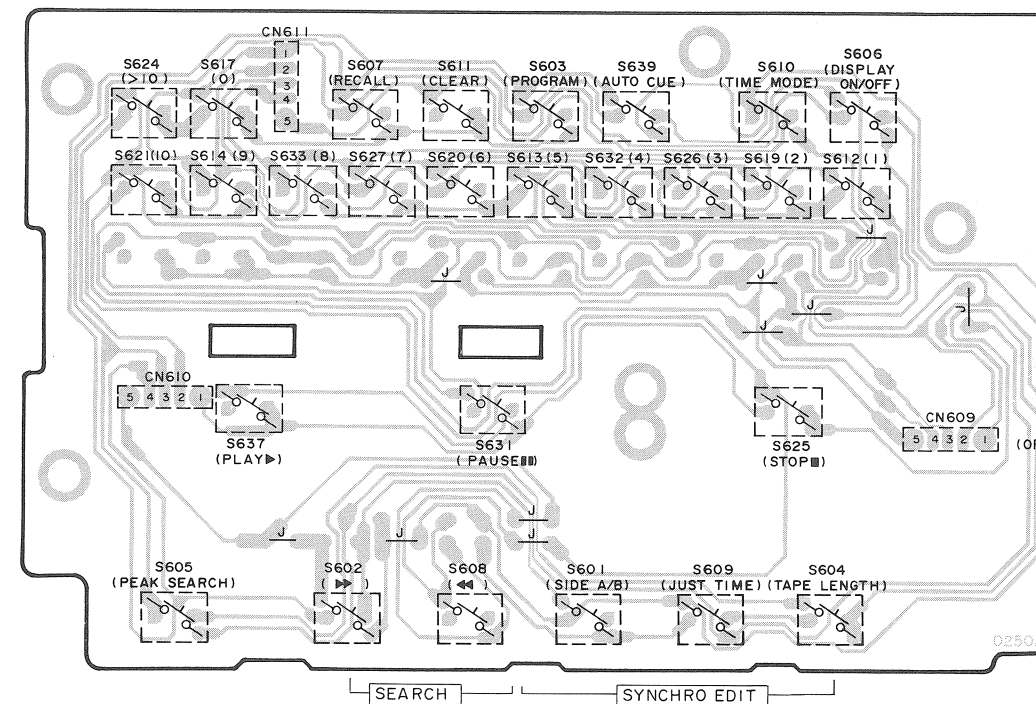
FL DRIVE P.C.B



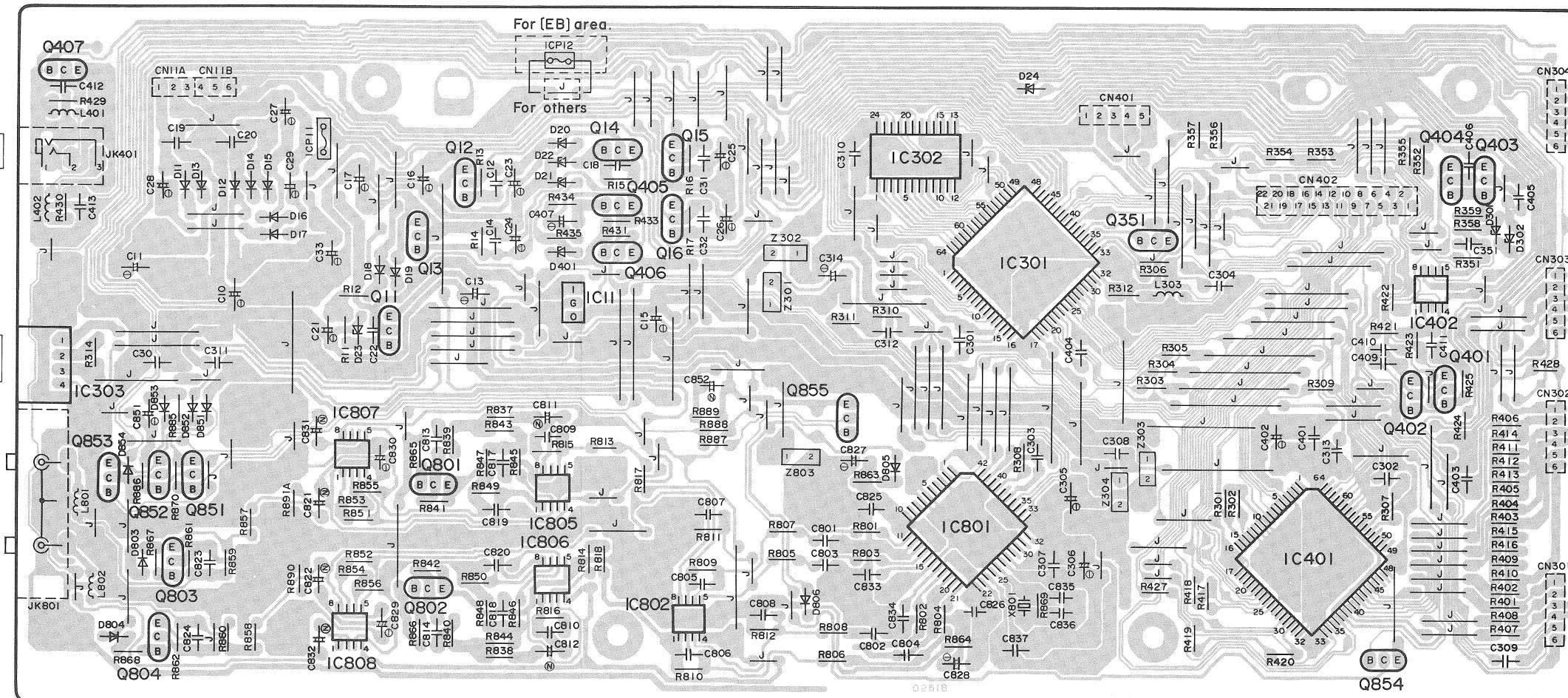
H HEADPHONES JACK P.C.B.



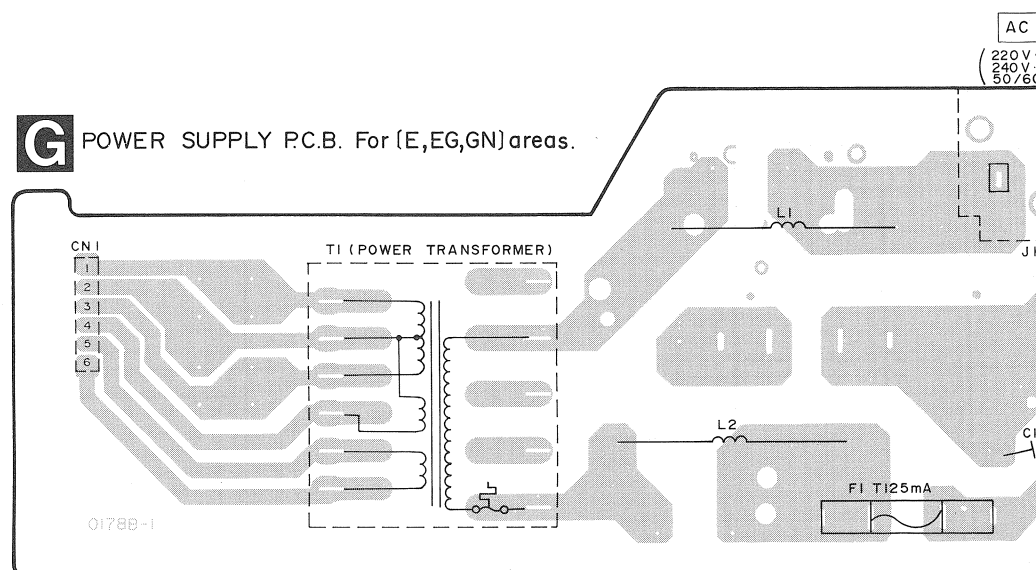
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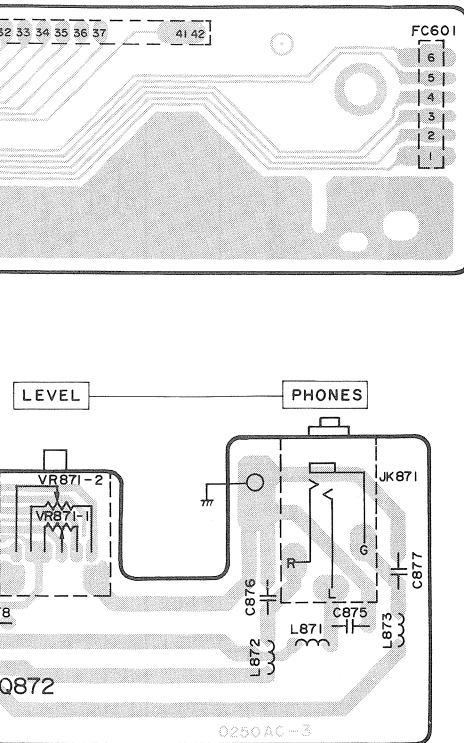


F MAIN P.C.B.

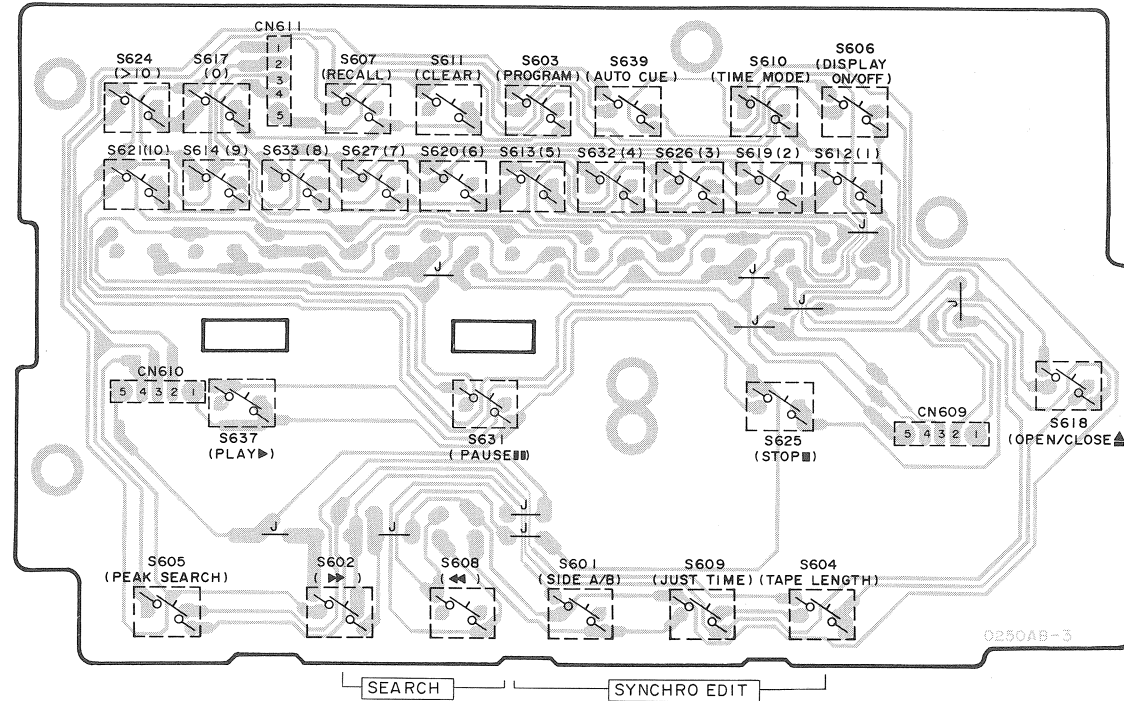


G POWER SUPPLY P.C.B. For (E,EG,GN) areas.

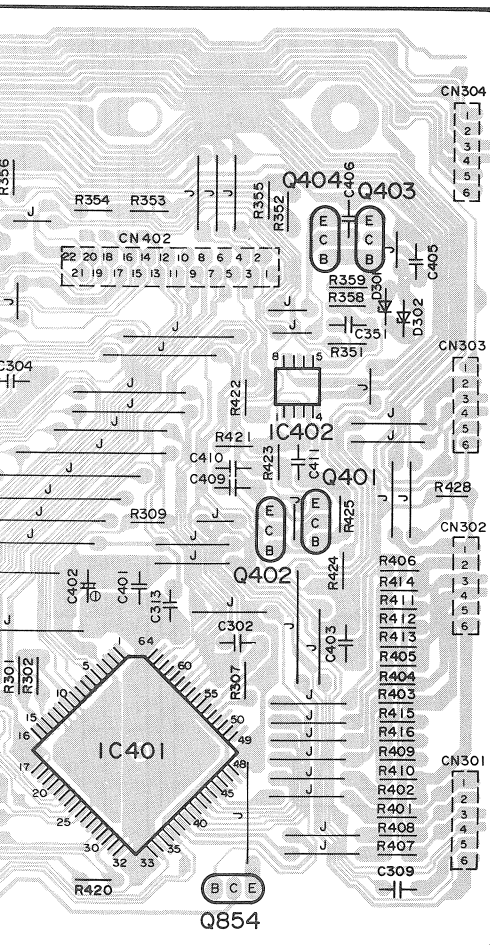
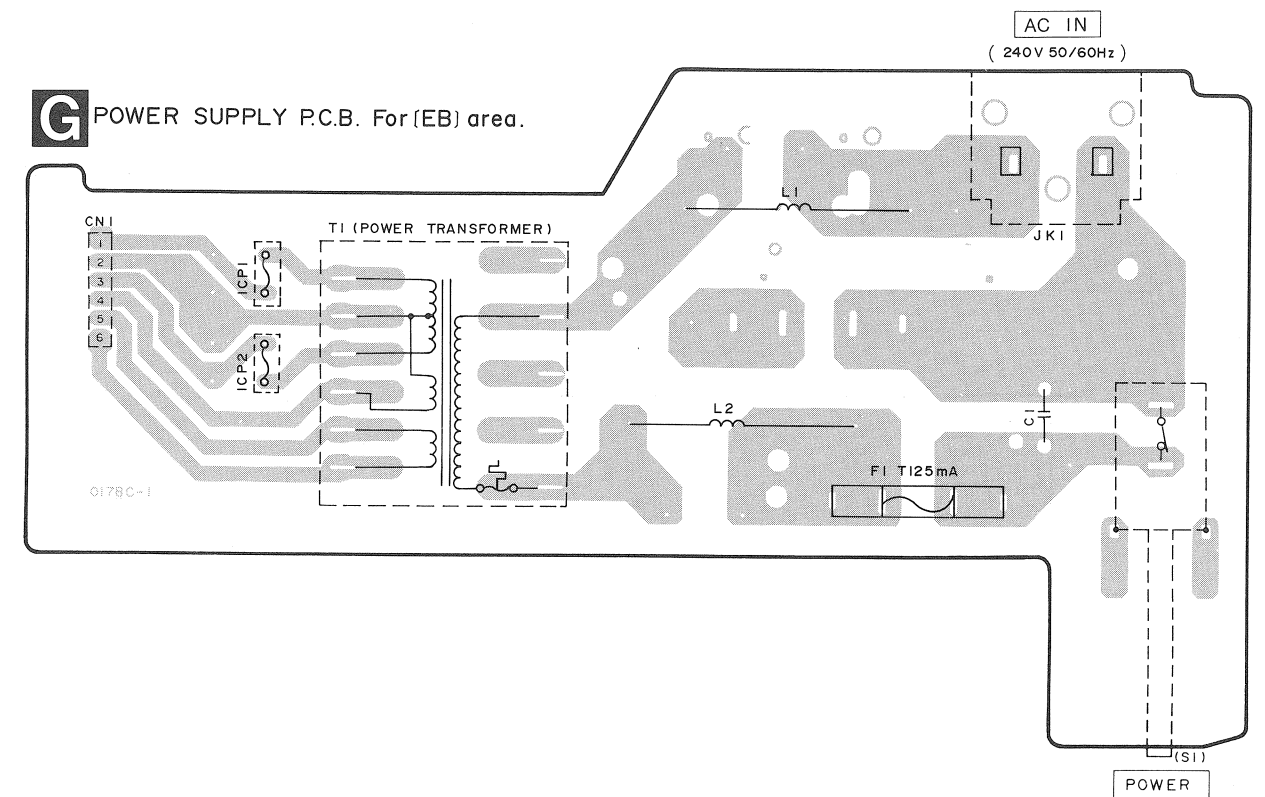




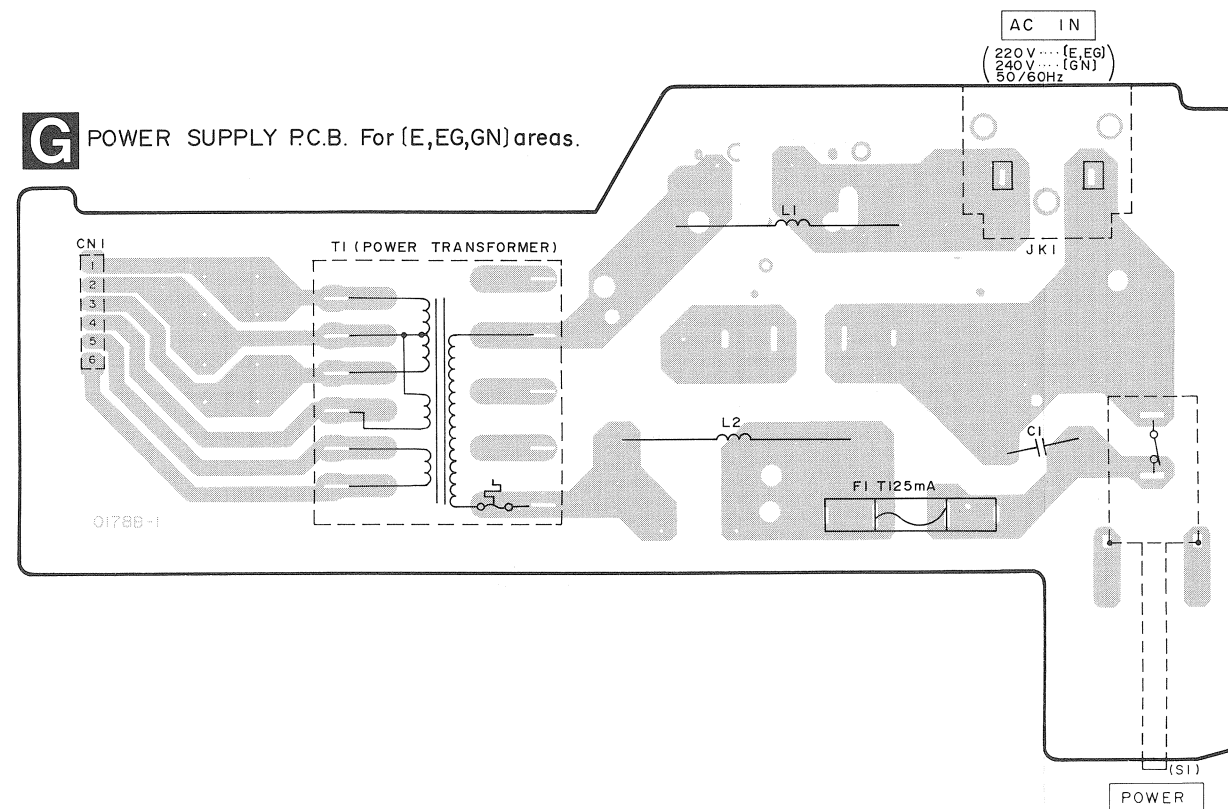
C OPERATION P.C.B.



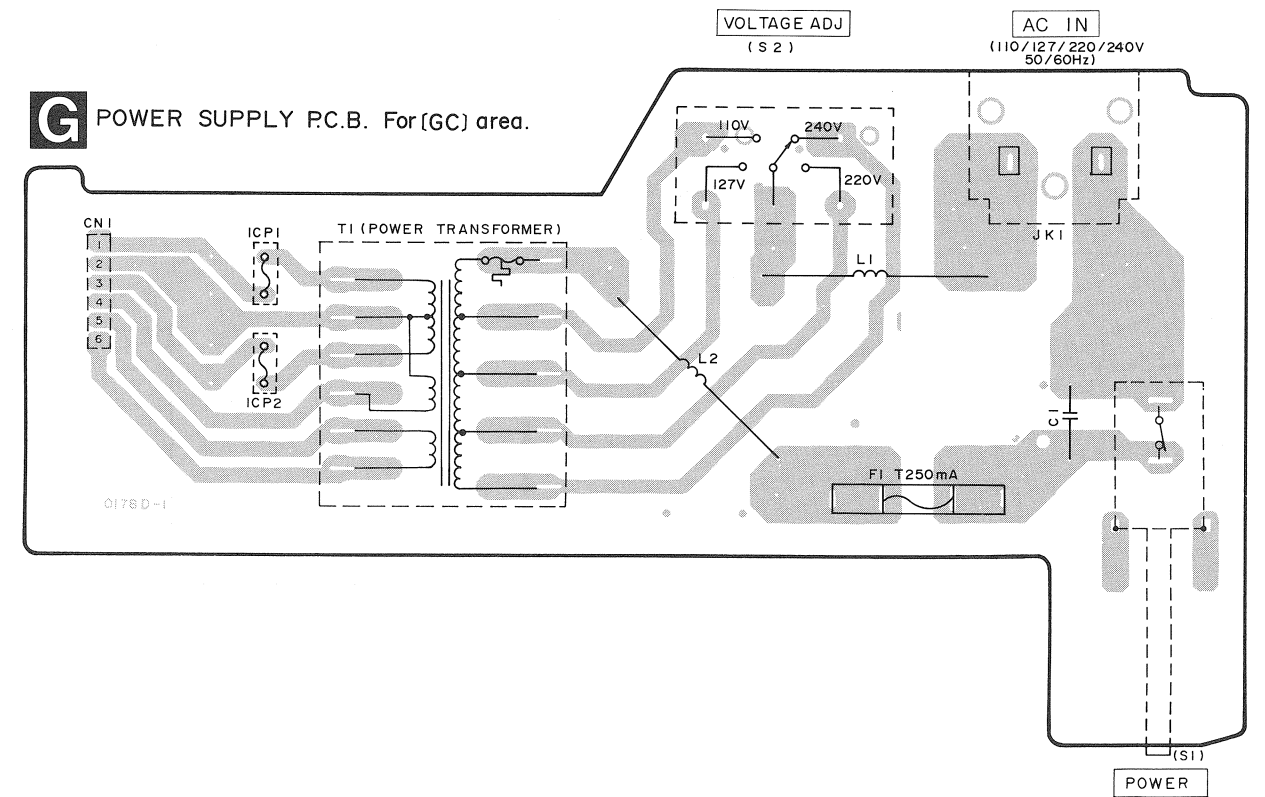
G POWER SUPPLY P.C.B. For (EB) area.



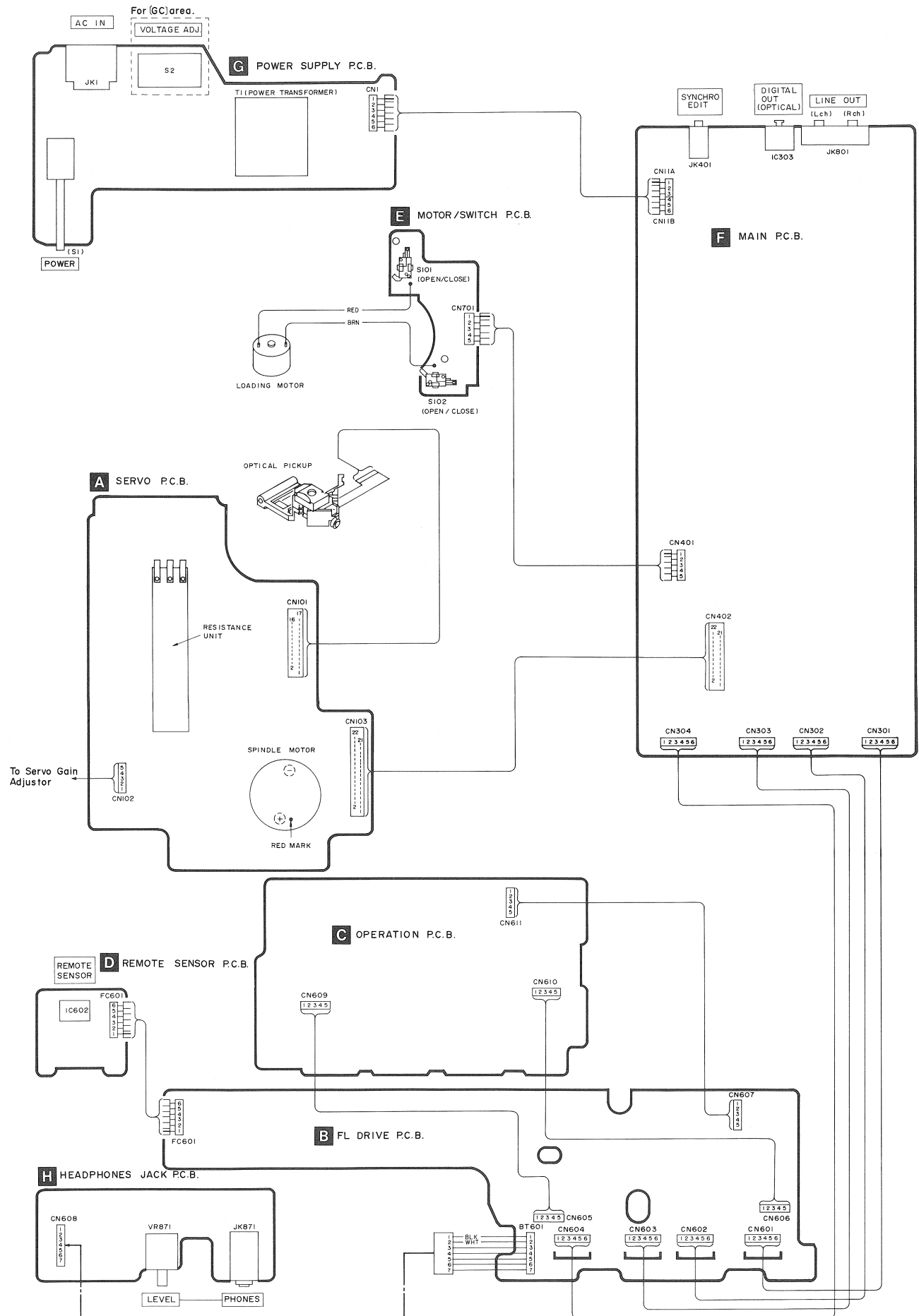
G POWER SUPPLY P.C.B. For (E,EG,GN) areas.



G POWER SUPPLY P.C.B. For (GC) area.

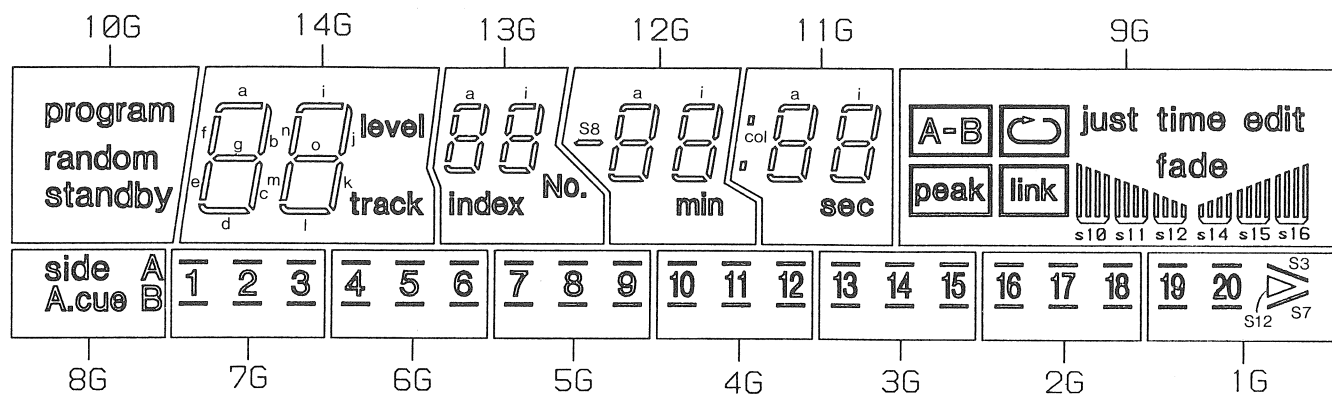


WIRING CONNECTION DIAGRAM



INTERNAL CONNECTION OF FL

• Grid connection diagram



• Anode connection table

	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
S1	a	a	a	a	random	just	A.cue	— (1)	— (4)	— (7)	— (10)	— (13)	— (16)	— (19)
S2	b	b	b	b	program	time	-	— (2)	— (5)	— (8)	— (11)	— (14)	— (17)	— (20)
S3	f	f	f	f	-	edit	A	— (3)	— (6)	— (9)	— (12)	— (15)	— (18)	—
S4	g	g	g	g	-	link	B	1	4	7	10	13	16	19
S5	c	c	c	c	-	peak	side	— (1)	— (4)	— (7)	— (10)	— (13)	— (16)	— (19)
S6	e	e	e	e	-	A-	-	— (2)	— (5)	— (8)	— (11)	— (14)	— (17)	— (20)
S7	d	d	d	d	-	B	-	— (3)	— (6)	— (9)	— (12)	— (15)	— (18)	—
S8	level	No.	—	col	-	—	-	2	5	8	11	14	17	20
S9	i	i	i	i	-	-	-	-	-	-	-	-	-	-
S10	j	j	j	j	-		-	-	-	-	-	-	-	-
S11	n	n	n	n	standby		-	-	-	-	-	-	-	-
S12	o	o	o	o	-		-	3	6	9	12	15	18	▶
S13	k	k	k	k	-	fade	-	-	-	-	-	-	-	-
S14	m	m	m	m	-		-	-	-	-	-	-	-	-
S15	ℓ	ℓ	ℓ	ℓ	-		-	-	-	-	-	-	-	-
S16	track	index	min	sec	-		-	-	-	-	-	-	-	-

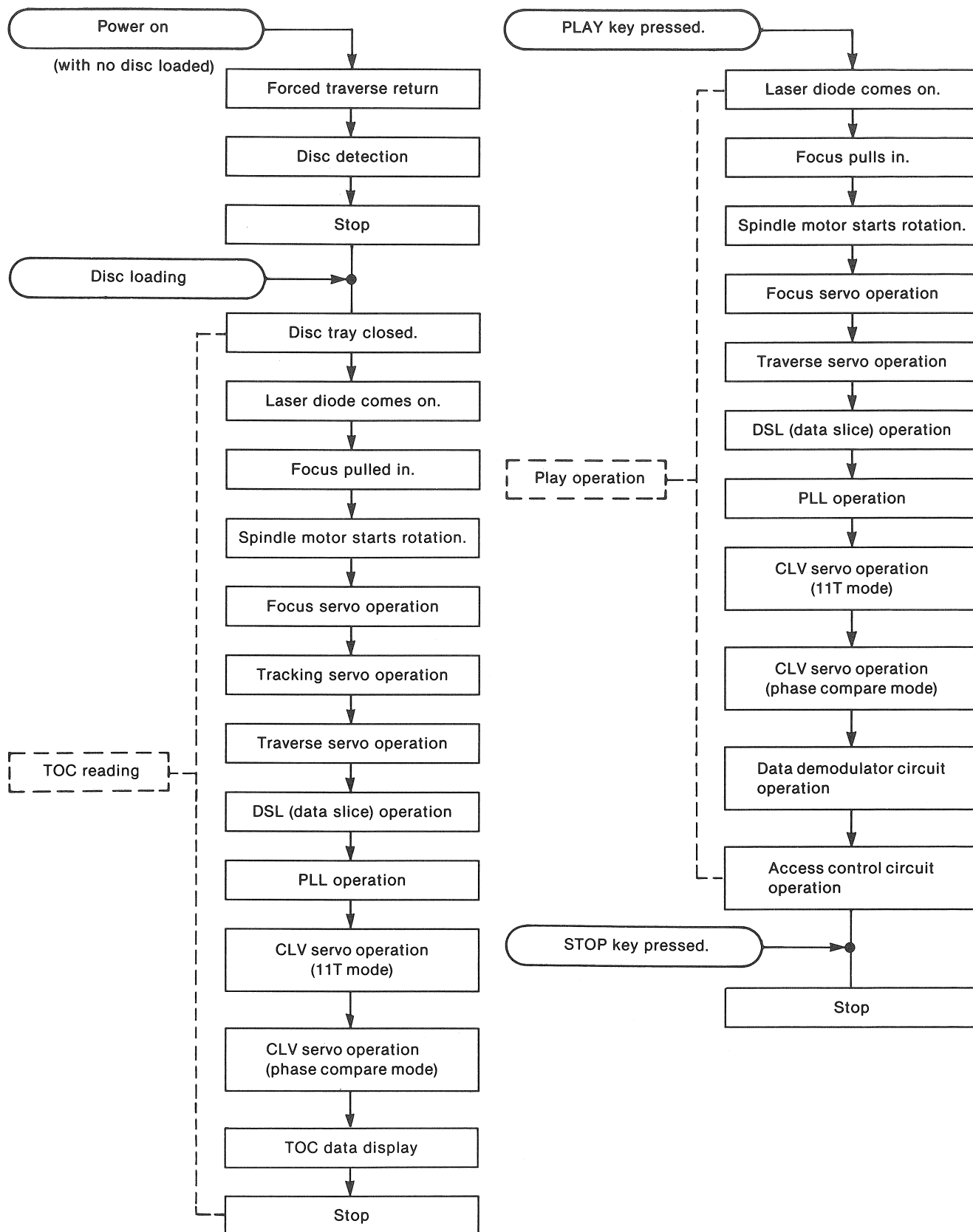
• Pin connection

Pin No.	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Connection	F2	F2	N2	N2	N2	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G	14G	N2	N2	N2	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	N2	N2	F1	F1

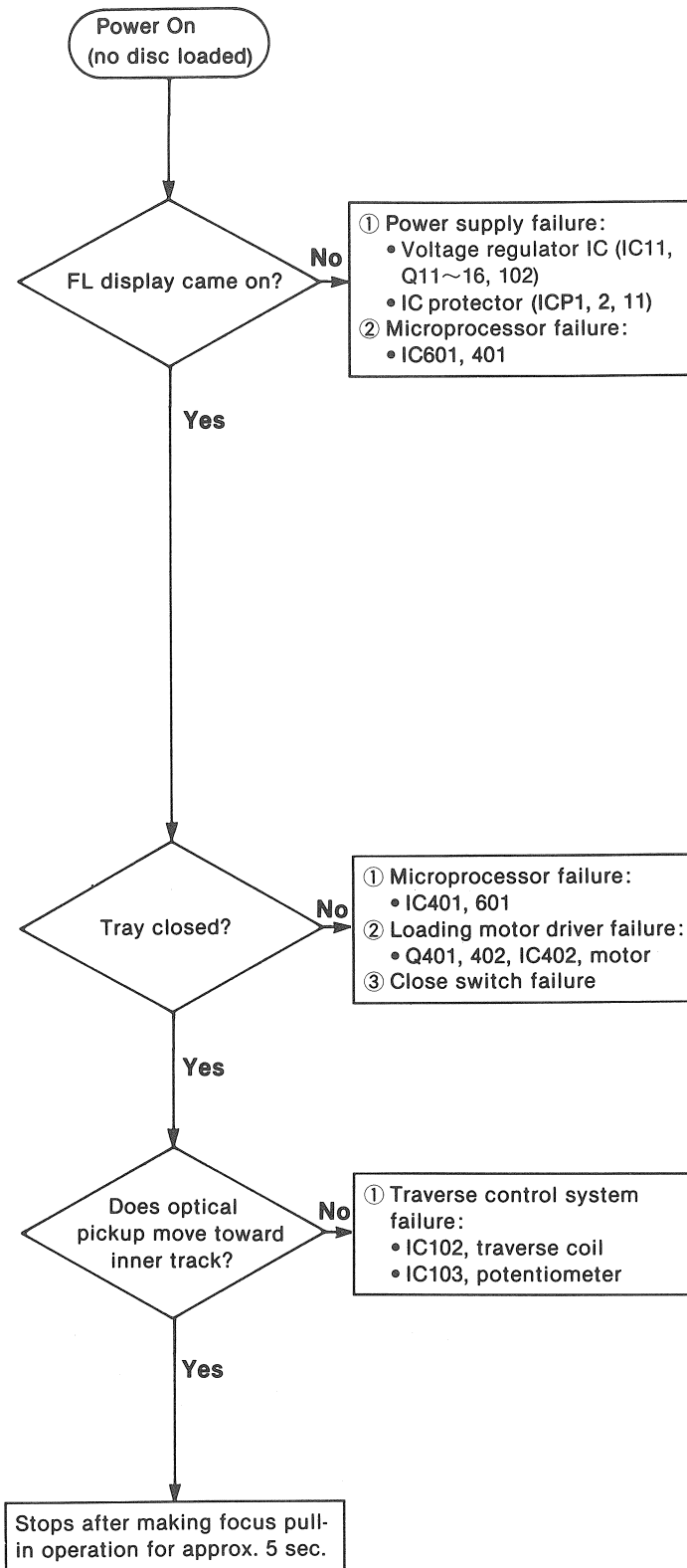
■ TROUBLESHOOTING GUIDE

SL-PS50 Operation Sequence Check Sheet

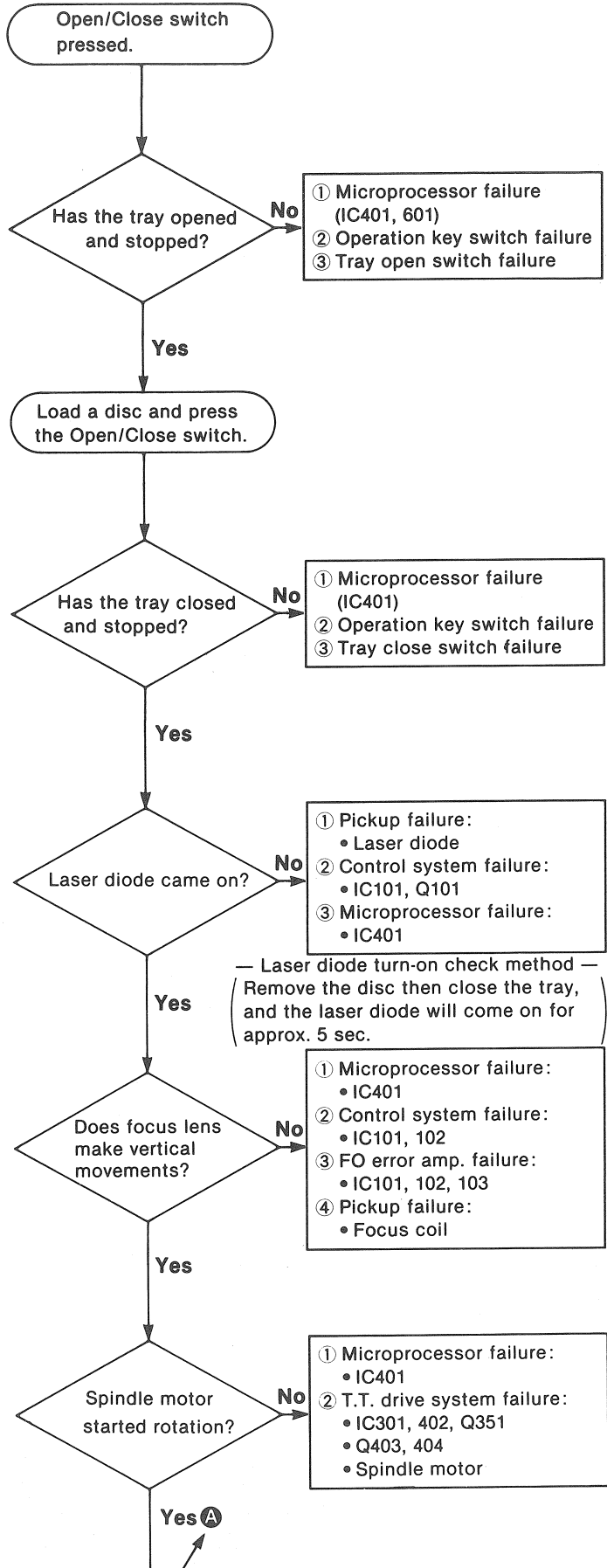
Play Operation Sequence

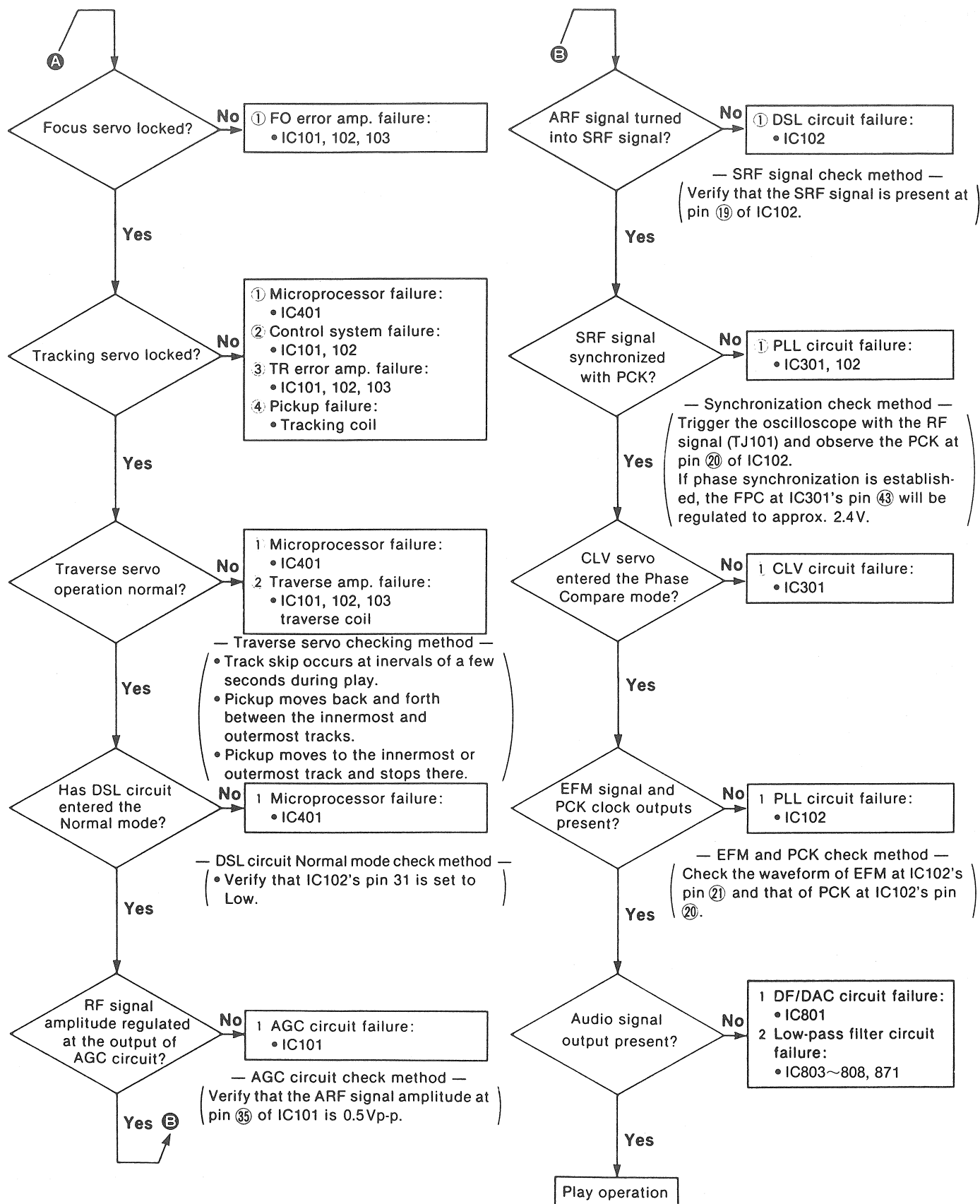


(Operation Sequence Just After Power On)



(TOC Read Operation-PLAY Operation)





REPLACEMENT PARTS LIST

Notes : * Important safety notice:

Components identified by $\triangle$ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

* The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

Ref.No.	Part No.	Part Name & Description	Remarks	Ref.No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)		D23	MA4062HTA	DIODE	
				D24	MA4082MTA	DIODE	
				D301, 302	MA4051MTA	DIODE	
IC11	LM2940T5M	I. C, REGULATOR		D401	MA4039MTA	DIODE	
IC301	MN6625	I. C, DIGITAL S. P.		D601-607	1SS254TA	DIODE	
IC302	CXK5816M	I. C, 16K RAM		D610	SVGDPG7851Y	DIODE	
IC303	TOTX174-A	I. C, OPTICAL OUT		D611	SVGDAY7851	DIODE	
IC401	MN1554PJZ-1	I. C, SYSTEM CONTROL		D614	1SS254TA	DIODE	
IC402	BA4558FT1	I. C, MOTOR DRIVE		D803-806	1SS254TA	DIODE	
IC601	MB88725BPJV	I. C, SYSTEM CONTROL&FL DRIVE		D851	1SS254TA	DIODE	
IC602	RC00003	I. C, REMOTE CONTROL RECEIVER		D852	MA29WATA	DIODE	
IC801	MN6474	I. C, DIGITAL FILTER&D/A CONV		D853, 854	1SS254TA	DIODE	
IC802	M5219FP	I. C, BUFFER AMP					
IC805-808	M5219FP	I. C, BUFFER AMP				I. C. PROTECTOR(S)	
IC871	M5218L	I. C, HEADPHONES AMP					
		TRANSISTOR(S)		ICP1, 2	SRUF38	IC PROTECTOR	(EB, GC) $\triangle$
				ICP11	SRUN15T	IC PROTECTOR	
				ICP12	SRUN15T	IC PROTECTOR	(EB)
						VARIABLE RESISTOR(S)	
Q11	2SD1862QRTV6	TRANSISTOR		VR871	EVJCB0F02A15	V. R, HEADPHONES	
Q12	2SC3311QRSTA	TRANSISTOR					
Q13	2SA1309QRSTA	TRANSISTOR				COMPONENT COMBINATION(S)	
Q14	2SB1238QSTV6	TRANSISTOR					
Q15	2SC3311QRSTA	TRANSISTOR					
Q16	2SA1309QRSTA	TRANSISTOR					
Q351	DTA124EST	TRANSISTOR		Z301-304	EXCELDR35V	COMBINATION PART	
Q401	2SD1862QRTV6	TRANSISTOR		Z803	EXCELDR35V	COMBINATION PART	
Q402	2SB1240QRTV6	TRANSISTOR					
Q403	2SD1862QRTV6	TRANSISTOR				COIL(S)	
Q404	2SB1240QRTV6	TRANSISTOR					
Q405, 406	2SC3311QRSTA	TRANSISTOR					
Q407	DTC124ESTP	TRANSISTOR		L1, 2	SLQX400-D	COIL	$\triangle$
Q601, 602	DTC114ESTP	TRANSISTOR		L303	RLQZP5R6KT-Y	COIL	
Q801, 802	2SC3311QRSTA	TRANSISTOR		L401, 402	RLQZP3R3KT-Y	COIL	
Q803, 804	2SD1450RSTTA	TRANSISTOR		L801, 802	RLQZP3R3KT-Y	COIL	
Q851	DTA114ESTP	TRANSISTOR		L871-873	RLQZP3R3KT-Y	COIL	
Q852	2SA1309QRSTA	TRANSISTOR					
Q853	DTA124EST	TRANSISTOR				TRANSFORMER(S)	
Q854	DTC124ESTP	TRANSISTOR					
Q855	DTA124EST	TRANSISTOR		T1	SLTD5K098SG	POWER TRANSFORMER	(EB, GN) $\triangle$
Q871, 872	2SD1450RSTTA	TRANSISTOR		T1	SLTD5K099SX	POWER TRANSFORMER	(GC) $\triangle$
Q873, 874	2SC3311QRSTA	TRANSISTOR		T1	SLTD5K097SE	POWER TRANSFORMER	(E, EG) $\triangle$
		DIODE(S)				FUSE(S)	
D11-19	SVDS5688GT3	DIODE	$\triangle$	F1	XBA2C025TB0	FUSE	(GC) $\triangle$
D20, 21	MA4082MTA	DIODE		F1	XBA2C012TB0	FUSE	(E, EB, EG, GN) $\triangle$
D22	MA4330MTA	DIODE					

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		OSCILLATOR(S)		CN605-607	SJT30549BB1	CONNECTOR(5P)	
				CN608	RJP7G17ZA	CONNECTOR(7P)	
X801	SVQ49U338S	OSCILLATOR		CN609-611	SJS50581BB	SOCKET(5P)	
		DISPLAY TUBE		CN11A, 11B	RJS1A1703	CONNECTOR (3P)	
						FLAT CABLE(S)	
FL601	RSL0038-F	DISPLAY TUBE		FC1	REZ0156	FLAT CABLE (6P)	
		SWITCH(ES)		FC601	REZ0157	FLAT CABLE (6P)	
						JACK(S)	
S1	ESB8249V	SW, POWER	△				
S2	SSR187-1	SW, VOLTAGE SELECTOR	(GC) △				
S101	SSPD17	SW, OPEN/CLOSE DET.		JK1	SJS9236	JACK, AC INLET	(E, EG, EB, GC)△
S102	SSPD18	SW, OPEN/CLOSE DET.		JK1	SJSD16	JACK, AC INLET	(GN) △
S601	EVQQTG05R	SW, SIDE A/B		JK401	RJ33T01	JACK, SYNCHRO EDIT	
S602	EVQQTG05R	SW, SEARCH(F)		JK801	RJH3201N	JACK, LINE OUT	
S603	EVQQTG05R	SW, PROGRAM		JK871	QJA0455ZC	JACK, HEADPHONES	
S604	EVQQTG05R	SW, TAPE LENGTH					
S605	EVQQTG05R	SW, PEAK SEARCH				<SERVO P. C. B>	
S606	EVQQTG05R	SW, DISPLAY ON/OFF				INTEGRATED CIRCUITS	
S607	EVQQTG05R	SW, RECALL					
S608	EVQQTG05R	SW, SEARCH(R)		IC101	AN8373S	IC, SERVO AMP	
S609	EVQQTG05R	SW, JUST TIME		IC102	AN8374S	IC, SERVO PROCESSOR	
S610	EVQQTG05R	SW, TIME MODE		IC103	AN8377N	IC, B. T. L. DRIVE	
S611	EVQQTG05R	SW, CLEAR					
S612	EVQQTG05R	SW, NUMERIC 1				TRANSISTORS<SERVO P. C. B. >	
S613	EVQQTG05R	SW, NUMERIC 5					
S614	EVQQTG05R	SW, NUMERIC 9		Q101	2SA1547QSTV2	TRANSISTOR	
S617	EVQQTG05R	SW, NUMERIC 0		Q102	2SB1240QR	TRANSISTOR	
S618	EVQQTG05R	SW, OPEN/CLOSE					
S619	EVQQTG05R	SW, NUMERIC 2				<SERVO P. C. B>	
S620	EVQQTG05R	SW, NUMERIC 6				VARIABLE RESISTORS	
S621	EVQQTG05R	SW, NUMERIC 10					
S624	EVQQTG05R	SW, NUMERIC >10		VR101	EVND3AA00B14	V. R, BEST EYE ADJ.	
S625	EVQQTG05R	SW, STOP		VR102	EVND3AA00B14	V. R, TRACKING GAIN ADJ.	
S626	EVQQTG05R	SW, NUMERIC 3		VR103	EVND3AA00B14	V. R, TRACKING OFFSET ADJ.	
S627	EVQQTG05R	SW, NUMERIC 7		VR104	EVND3AA00B14	V. R, FOCUS GAIN ADJ.	
S631	EVQQTG05R	SW, PAUSE		VR105	EVND3AA00B14	V. R, FOCUS OFFSET ADJ.	
S632	EVQQTG05R	SW, NUMERIC 4		VR106	EVND3AA00B24	V. R, TRACKING BALANCE ADJ.	
S633	EVQQTG05R	SW, NUMERIC 8					
S637	EVQQTG05R	SW, PLAY				<SERVO P. C. B>	
S639	EVQQTG05R	SW, AUTO CUE				MAGNET RESISTOR ELEMENTS	
		CONNECTOR(S) & SOCKET(S)		RA1	EWS7M0A00Q53	RESISTANCE UNIT	
BT601	REX0144	CONNECTOR ASS' Y					
CN301-303	RJU003K006M1	SOCKET (6P)					
CN304	RJU003K006M1	SOCKET (6P)					
CN401	RJS1A1705	CONNECTOR (5P)					
CN402	SJSD2221	CONNECTOR (22P)					
CN601-603	RJT003K006M	CONNECTOR (6P)					
CN604	RJT003K006M	CONNECTOR (6P)					

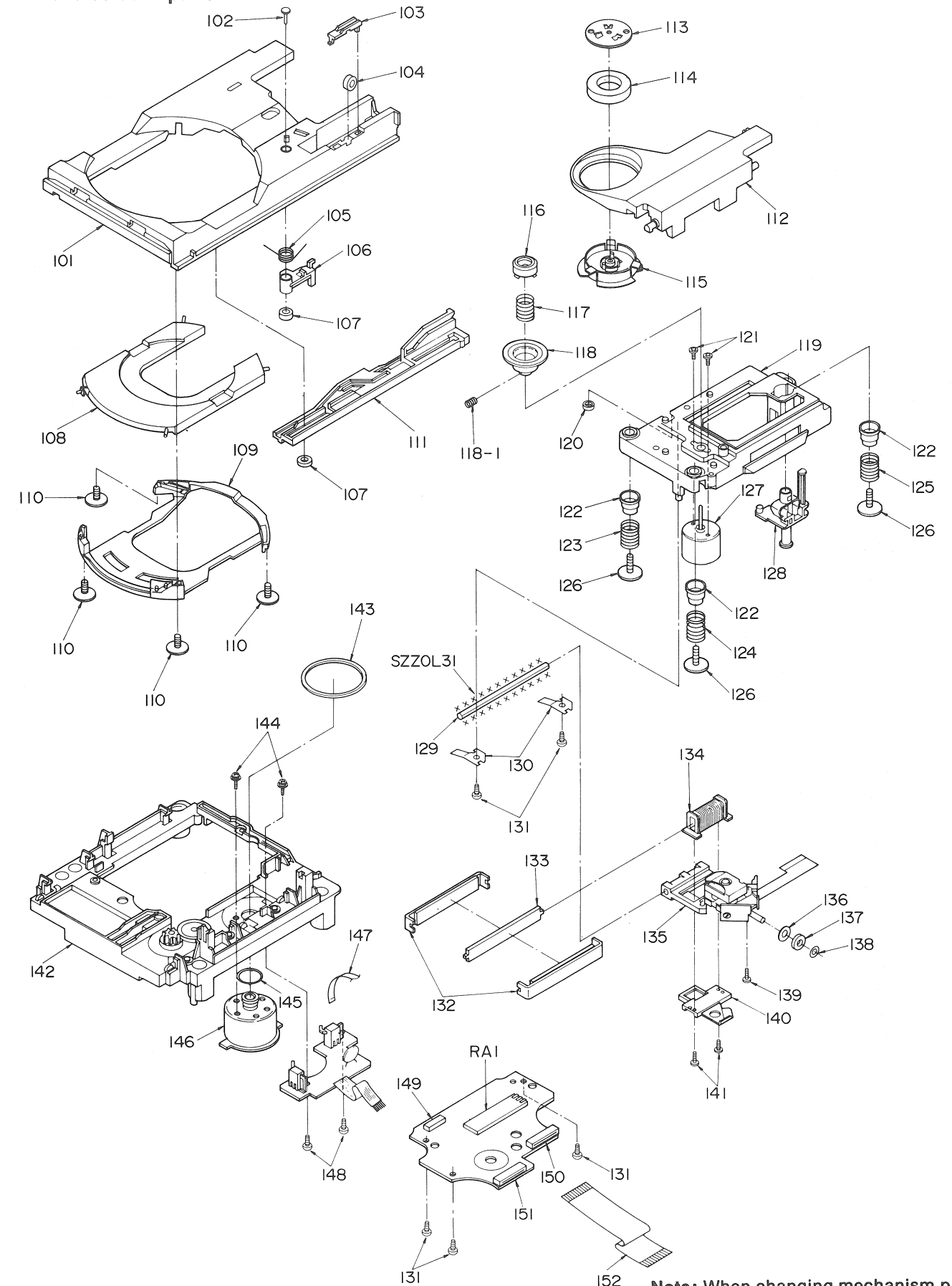
Notes : * Important safety notice:
Components identified by △ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
				P4	RPN0311C	CUSHION (BL.)	(GN, GC)
		CABINET AND CHASSIS		P4	RPN0237C	CUSHION (BL.)	(E, EG, EB)
				P5	RPN0311D	CUSHION (BR)	(GN, GC)
1	RKM0089-1K	TOP CASE		P5	RPN0237D	CUSHION (BR)	(E, EG, EB)
2	SNE2129-1	SCREW		P6	XZB60X60A01	PROTECTION BAG UNIT	
3	XTB3+8JFZ	SCREW		P7	SPSD152	ACCESSORIES BOX	
4	RGK0168B-K	TRAY ORNAMENT		P8	XZB26X17C03	PROTECTION BAG (F. B)	
5	RFKHLPS50E-K	REAR PANEL ASS' Y	(E)			ACCESSORIES	
5	RFKHLPS50EBK	REAR PANEL ASS' Y	(EB, GN)				
5	RGR0064B-B	REAR PANEL	(GC)				
5	RGR0064A-F	REAR PANEL	(EG)	A1	RFKSLPS50E-K	INSTRUCTION MANUAL ASS' Y	(E)
6	RGU0030	POWER BUTTON		A1	RQT0415-G	INSTRUCTION MANUAL	(GN, GC)
7	RKU0014	BOTTOM BOARD	(E, EB, EG)	A1	RQT0417-D	INSTRUCTION MANUAL	(EG)
8	RFKJLPS50GNK	CHASSIS ASS' Y	(GC, GN)	A1	RQT0420-B	INSTRUCTION MANUAL	(EB)
8	RMK0073-1	CHASSIS	(E, EB, EG)	A2	SQX7186	WARRANTY CARD	(GN)
8-1	RKA0009-1	FOOT	(GC, GN)	A2	RQA0013	WARRANTY CARD	(E, EB, EG)
9	RM00048	POWER SWITCH ROD		A3	RQCB0169	SERVICENTER LIST	
10	RM00063	H. P. EARTH ANGLE		A4	SJA193	POWER CORD	(EB) △
11	RMN0056	FL HOLDER		A4	SJA173	POWER CORD	(GN) △
12	SHRD169	LED HOLDER		A4	RJA0004	POWER CORD	(GC) △
14	RGW0048	KNOB, H. P. LEVEL		A4	SJA187	POWER CORD	(E, EG) △
15	RM00222	H. P. P. C. B. FIXER		A5	SJP2249-3	PIN CORD	
16	RFKGLPS50E-K	FRONT PANEL ASS' Y		A6	RAK-SL3009W	REMOTE CONTROL TRANSMITTER	
16-1	RGB0020-1	MASH BADGE		A7	RKK0008	BATTERY CASE	
17	RFKNLPS70-K	FRONT GRILLE ASS' Y		A8	SJP9215	AC PLUG ADAPTOR	(GC) △
17-1	RKW0070	FL ORNAMENT BOARD				TRAVERSE DECK	
18	RGK0213	POWER BUTTON SLEEVE					
19	RGU0265B	KNOB, OPERATION					
20	RGU0268B	KNOB, OPEN/CLOSE		101	RFKNLP370PAK	DISC TRAY ASS' Y	
22	SHRD133	OPTICAL CONDUCTION PLATE		102	RMQ0044	PIN	
23	SHRD170	COVER, REMOTE CONTROL RECEIV		103	SHRD150	ROLLER HOLDER	
24	SHE185-2	P. C. B. SUPPORTER		104	SDRD12	ROLLER	
25	SKLD8-E	FOOT	(E, EB, EG)	105	SUSD83	SPRING	
26	XTBS3+8JFZ1	SCREW		106	SIRD96-1	LOCK LEVER	
27	XTB3+16JFZ	SCREW		107	SFUMZ15R61	WASHER	
28	XTB3+8F	SCREW		108	SIRD98-3	DISC TRAY	
29	VJA1034	PROTECTION CAP		109	SIRD107-1	TRAY BASE	
30	SJT390	FUSE HOLDER	△	110	SNSD36	SCREW	
				111	SIRD40-2	RACK GEAR	
		PACKING MATERIAL		112	SIRD42-5	CLAMPER	
				113	SOYD2	CLAMPER YOKE	
P1	RPG0449	PACKING CASE	(GN, GC)	114	SOMD4	CLAMPER MAGNET	
P1	RPG0448	PACKING CASE	(E, EG, EB)	115	SIRD51-1	CLAMPER HOLDER	
P2	RPN0311A	CUSHION (FL)	(GN, GC)	116	SD0D29-2	RING	
P2	RPN0237A	CUSHION (FL)	(E, EG, EB)	117	SRQA010N04	SPRING	
P3	RPN0311B	CUSHION (FR)	(GN, GC)	118	SD0D28-1E	TURNTABLE	
P3	RPN0237B	CUSHION (FR)	(E, EG, EB)	118-1	XXE26D5	SCREW	

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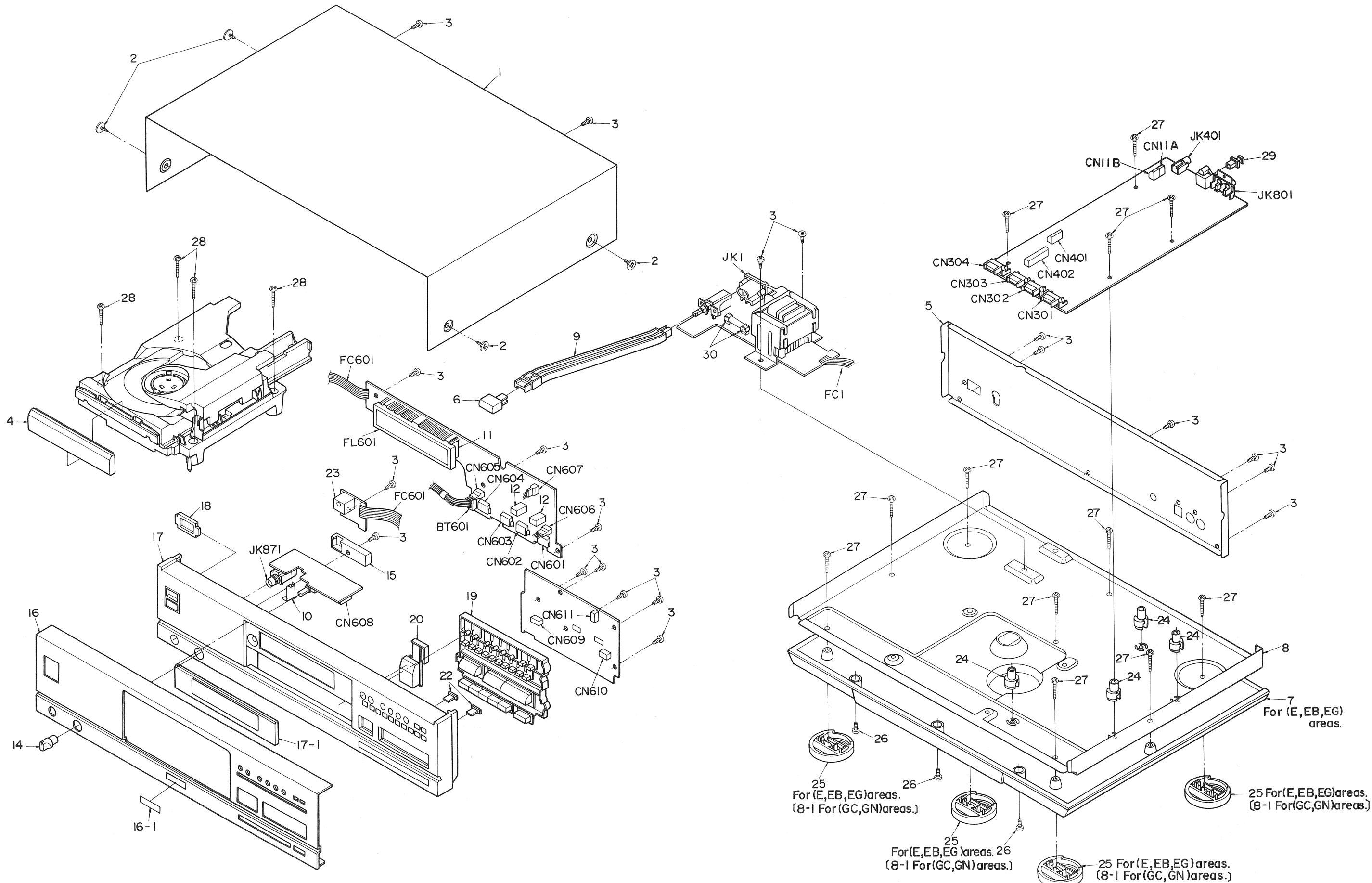
■ EXPLODED VIEWS

- **Traverse deck parts**



Note: When changing mechanism parts, apply the specified grease to the areas marked “x x” as shown in the drawing.

• Cabinet and chassis parts



RESISTORS & CAPACITORS

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

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS						
R11	ERDS2TJ331T	1/4W 330	R853, 854	ERDAS3J332T	1/4W 3. 3K	C306	ECEAJU101B	6. 3V 100U
R12	ERDS2TJ471T	1/4W 470	R855, 856	ERDAS3J102T	1/4W 1K	C307	ECFR1E104ZF5	25V 0. 1U
R13-17	ERDS2TJ102T	1/4W 1K	R857-860	ERDAS3J471T	1/4W 470	C308, 309	ECBT1C103NS5	16V 0. 01U
R301-306	ERDS2TJ472T	1/4W 4. 7K	R861, 862	ERDAS3J124T	1/4W 120K	C310, 311	ECFR1E104ZF5	25V 0. 1U
R307	ERDS2TJ104T	1/4W 100K	R863, 864	ERDS2TJ331T	1/4W 330	C312	ECBT1H330J5	50V 33P
R308	ERDS2TJ561T	1/4W 560	R865-868	ERDS2TJ102T	1/4W 1K	C313	ECFR1E104ZF5	25V 0. 1U
R309	ERDS2TJ472T	1/4W 4. 7K	R869	ERDS2TJ472T	1/4W 4. 7K	C314	ECEAJU470B	6. 3V 47U
R310	ERDS2TJ182T	1/4W 1. 8K	R870	ERDS2TJ332T	1/4W 3. 3K	C351	ECBT1H102KB5	50V 1000P
R311	ERDS2TJ272T	1/4W 2. 7K	R871, 872	ERDS2TJ153T	1/4W 15K	C401	ECFR1E104ZF5	25V 0. 1U
R312	ERDS2TJ561T	1/4W 560	R873-876	ERDS2TJ183T	1/4W 18K	C402	ECEAJU470B	6. 3V 47U
R314	ERDS2TJ822T	1/4W 8. 2K	R877, 878	ERDS2TJ224T	1/4W 220K	C403, 404	ECFR1E104ZF5	25V 0. 1U
R351	ERDS2TJ103T	1/4W 10K	R879, 880	ERDS2TJ473T	1/4W 47K	C405, 406	ECBT1H102KB5	50V 1000P
R352	ERDS2TJ154T	1/4W 150K	R881, 882	ERDS2TJ101T	1/4W 100	C407	ECEAHU010B	50V 1U
R353	ERDS2TJ123T	1/4W 12K	R883, 884	ERDS2TJ222T	1/4W 2. 2K	C409-411	ECBT1H102KB5	50V 1000P
R354	ERDS2TJ154T	1/4W 150K	R885	ERDS2TJ102T	1/4W 1K	C412, 413	ECBT1C103NS5	16V 0. 01U
R355, 356	ERDS2TJ333T	1/4W 33K	R886	ERDS2TJ103T	1/4W 10K	C420	ECKW1H103KB5	50V 0. 01U
R357	ERDS2TJ8R2	1/4W 8. 2	R887	ERDS2TJ822T	1/4W 8. 2K	C601	ECBT1C103NS5	16V 0. 01U
R358, 359	ERDS2TJ101T	1/4W 100	R888	ERDS2TJ333T	1/4W 33K	C602	ECEA1CKS100	16V 10U
R401-408	ERDS2TJ221T	1/4W 220	R889	ERDS2TJ474T	1/4W 470K	C603	ECFR1E104ZF5	25V 0. 1U
R409-420	ERDS2TJ472T	1/4W 4. 7K	R890, 891A	ERDS2TJ222T	1/4W 2. 2K	C801-804	ECBT1H680J5	50V 68P
R421, 422	ERDS2TJ913T	1/4W 91K	R891	ERDS2TJ472T	1/4W 4. 7K	C805-808	ECBT1H470J5	50V 47P
R423, 424	ERDS2TJ124T	1/4W 120K	R892	ERDS2TJ472T	1/4W 4. 7K	C809, 810	ECBT1H221KBY	50V 220P
R425	ERDS2TJ101T	1/4W 100			CAPACITORS	C811, 812	ECEA1CB2330B	16V 33U
R427	ERDS2TJ472T	1/4W 4. 7K	C1	ECKDKC103PF2	400V 0. 01U Δ	C813, 814	ECHR1H822GZ3	50V 8200P
R428	ERDS2TJ273T	1/4W 27K	C10	ECA1CPXS222E	16V 2200U	C817, 818	ECHR1H102GZ3	50V 1000P
R429, 430	ERDS2TJ102T	1/4W 1K	C11	ECA1CPXS102E	16V 1000U	C819, 820	ECHR1H121JZ3	50V 120P
R431	ERDS2TJ472T	1/4W 4. 7K	C12	ECBT1C103NS5	16V 0. 01U	C821, 822	ECEA1CB2330B	16V 33U
R433, 434	ERDS2TJ472T	1/4W 4. 7K	C13	ECEA1AU101B	10V 100U	C823, 824	ECHR1H102GZ3	50V 1000P
R435	ERDS2TJ221T	1/4W 220	C14	ECBT1C103NS5	16V 0. 01U	C825, 826	ECFR1E104ZF5	25V 0. 1U
R601-608	ERDS2TJ472T	1/4W 4. 7K	C15	ECEAJU470B	6. 3V 47U	C827, 828	ECEAJU331B	6. 3V 330U
R609	ERDS2TJ104T	1/4W 100K	C16, 17	ECEA1CU331B	16V 330U	C829, 830	ECEA1AU470B	10V 47U
R610, 611	ERDS2TJ121	1/4W 120	C18	ECBT1C103NS5	16V 0. 01U	C831, 832	ECEA1EKN2R2	25V 2. 2U
R801-804	ERDAS3G103T	1/4W 10K	C19, 20	ECFR1E103KR	25V 0. 01U	C833, 834	ECBT1C103NS5	16V 0. 01U
R805-808	ERDAS3G273T	1/4W 27K	C21	ECEA1CU221B	16V 220U	C835, 836	ECBT1H5R6K5	50V 5. 6P
R809-812	ERDAS3G473	1/4W 47K	C22	ECBT1C103NS5	16V 0. 01U	C837	ECFR1E104ZF5	25V 0. 1U
R813, 814	ERDAS3G123T	1/4W 12K	C23, 24	ECEA1CU100B	16V 10U	C851	ECEAJU471B	6. 3V 470U
R815, 816	ERDAS3G153T	1/4W 15K	C25, 26	ECEA1CU101B	16V 100U	C852	ECEA1CN100SB	16V 10U
R817, 818	ERDAS3G152T	1/4W 1. 5K	C27	ECEA1EU101B	25V 100U	C871, 872	ECEA1AKN100B	10V 10U
R837, 838	ERDAS3G822T	1/4W 8. 2K	C28, 29	ECEA1HU101	50V 100U	C873, 874	ECEA1AN470SB	10V 47U
R839, 840	ERDAS3G222T	1/4W 2. 2K	C30	ECFR1E104ZF5	25V 0. 1U	C875-880	ECBT1C103NS5	16V 0. 01U
R841, 842	ERDAS3J105T	1/4W 1M	C31, 32	ECBT1C103NS5	16V 0. 01U			RESISTORS<SERVO P. C. B. >
R843, 844	ERDAS3G103T	1/4W 10K	C33	ECEA1CU102B	16V 1000U	R101	ERDS2TJ471	1/4W 470
R845, 846	ERDAS3G153T	1/4W 15K	C301	ECFR1E104ZF5	25V 0. 1U	R102	ERJ6GEYJ120V	1/10W 12
R847, 848	ERDAS3G183	1/4W 18K	C302	ECBT1C103NS5	16V 0. 01U	R103	ERJ6GEYJ122	1/10W 1. 2K
R849, 850	ERDAS3J100T	1/4W 10	C303	ECBT1H6R8K5	50V 6. 8P	R104	ERJ6GEYJ471	1/10W 470
R851, 852	ERDAS3J330T	1/4W 33	C304	ECFR1E104ZF5	25V 0. 1U	R105, 106	RRJ6GCJ102TE	1/6W 1K
			C305	ECEAJU331B	6. 3V 330U	R108	ERJ6GEYJ224V	1/10W 220K

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks			
R110	ERDS2TJ222	1/4W 2. 2K	C113	ECEA1HSNO101	50V 1U			
R111	ERJ6GEYJ154V	1/10W 150K	C114	RCUV1E333KB	25V 0. 033U			
R113	ERJ6GEYJ472V	1/10W 4. 7K	C115	ECEA1HSNO101	50V 1U			
R114	ERJ6GEYJ683V	1/10W 68K	C116	RCUV1E333KB	25V 0. 033U			
R116	ERJ6GEYJ332V	1/10W 3. 3K	C117	ECBT1H102KB5	50V 0. 001U			
R117	ERJ6GEYJ123	1/10W 12K	C119, 120	ECEA1CKN4R71	16V 4. 7U			
R118	ERJ6GEYJ333V	1/10W 33K	C122	ECEA0JKS2201	6. 3V 22U			
R119	RRJ6GCJ223TE	1/6W 22K	C123	RCUV1E104ZF	25V 0. 1U			
R122	ERDS2TJ104	1/4W 100K	C124	ECUV1E823KB	25V 0. 082U			
R123	ERJ6GEYJ470V	1/10W 47	C125	ECUV1C224KR	16V 0. 22U			
R124	RRJ6GCJ103TE	1/6W 10K	C127	ECEA0JFK1011	6. 3V 100U			
R125	RRJ6GCJ222TE	1/6W 2. 2K	C128	ECEA1CKA101	16V 100U			
R127	ERDS2TJ681	1/4W 680	C132	ECUV1E104KB	25V 0. 1U			
R128	RRJ6GCJ103TE	1/6W 10K	C133	RCUV1H330KC	50V 33P			
		CAPACITORS<SERVO P. C. B>	C134, 135	ECUV1C224KR	16V 0. 22U			
			C136	ECEA0GKS1011	4V 100U			
			C138	RCUV1E104ZF	25V 0. 1U			
C101	ECEA1CKS2201	16V 22U	C139	RCUV1H470KC	50V 47P			
C102	ECEA1HKS0101	50V 1U	C140	RCUV1E103KB	25V 0. 01U			
C103	ECEA1CKS2201	16V 22U	C141-144	RCUV1H470KC	50V 47P			
C106	RCUV1E104ZF	25V 0. 1U	C145	ECEA0JFK1011	6. 3V 100U			
C107	ECEA0GKS1011	4V 100U	C146	RCUV1H181KC	50V 180P			
C108	ECEA0JKS4701	6. 3V 47U	C147	RCUV1H472KB	50V 4700P			
C109	ECEA1HKS0101	50V 1U	C148	ECEA1ESM4R71	25V 4. 7U			
C110	RCUV1H681KB	50V 680P	C149	RCUV1E104ZF	25V 0. 1U			
C111	ECUV1C224KR	16V 0. 22U	C150	RCUV1E103KB	25V 0. 01U			
C112	RCUV1H331KB	50V 330P						

PACKING

