

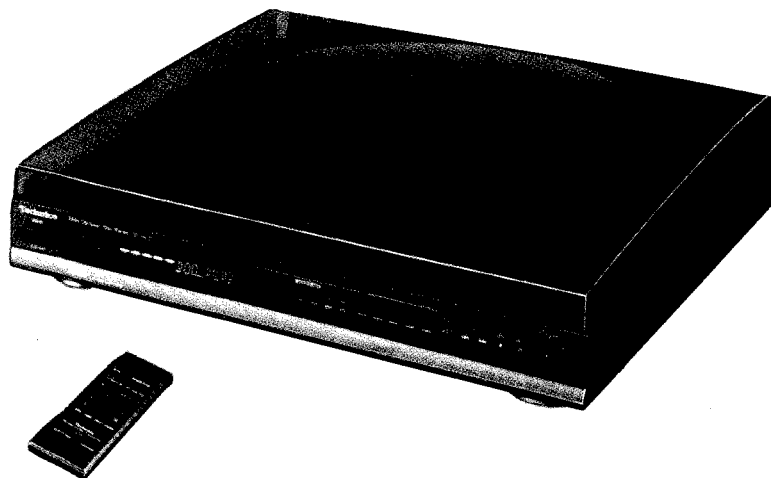
# Service Manual

Multi Compact Disc Player

## SL-PC25

COMPACT  
disc  
DIGITAL AUDIO

DIGITAL



Color

(K)... Black Type

## Area

Country Code	Area	Color
(E)	Continental Europe.	(K)
(EB)	Great Britain.	
(GC)	Asia, Latin America, Middle Near East and Africa.	
(GN)	Oceania.	
(PX)	Far East-PX.	

SL-PC10 MECHANISM SERIES (RXK0087)

## SPECIFICATIONS

### ■ Audio

No. of channels	2 (left and right, stereo)
Frequency response	2-20,000 Hz $\pm$ 1 dB
Output voltage	2 V (at 0 dB)
Dynamic range	96 dB
S/N ratio	96 dB
Total harmonic distortion	0.005% (1 kHz, 0 dB)
Wow and flutter	Below measurable limit
DA converter	MASH* (4 DAC)
Output impedance	1 k $\Omega$
Load impedance	More than 10 k $\Omega$

### \*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 trademark of NTT (Nippon Telegraph and Telephone Corporation).

### ■ Pickup

Wavelength 780 nm

### ■ General

Power supply	AC 50/60 Hz, 220 V
For Continental Europe:	AC 50/60 Hz, 240 V
For Great Britain and Oceania:	AC 50/60 Hz, 110 V/127 V/220 V/240 V
For others:	13 W
Power consumption	430 $\times$ 109.5 $\times$ 362 mm
Dimensions (W $\times$ H $\times$ D)	4.1 kg
Weight	

Specifications are 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

Panasonic Tokyo Sales Department  
Matsushita Electric Industrial Co., Ltd.  
World Trade Center Bldg., 4-1, Hamamatsu-cho,  
2-chome, Minato-ku, Tokyo 105, Japan

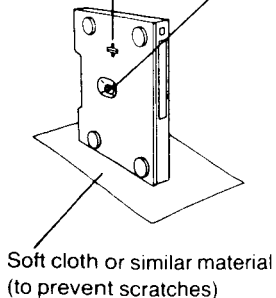
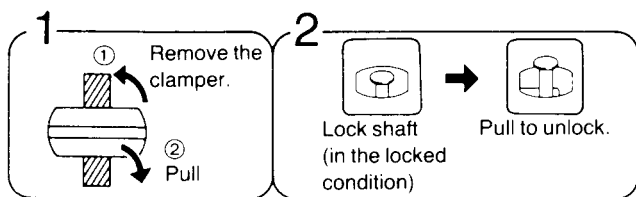
## CONTENTS

	Page		Page
INSTALLATION	2	INTERNAL CONNECTION OF FL	28
ACCESSORIES	2	SCHEMATIC DIAGRAM	29 ~ 35
PRECAUTION OF LASER DIODE	3	TERMINAL GUIDE OF IC'S	
CONNECTIONS	4	TRANSISTORS AND DIODES	36
FRONT PANEL CONTROLS AND FUNCTIONS	5	PRINTED CIRCUIT BOARDS	37 ~ 40
PLAYING A DISC	6, 7	WIRING CONNECTION DIAGRAM	41
REMOTE CONTROL TRANSMITTER	7	REPLACEMENT PARTS LIST	42 ~ 45
HANDLING PRECAUTIONS FOR OPTICAL PICKUP	8	EXPLODED VIEWS	46 ~ 48
INSTRUCTIONS FOR TRAVERSE OIL		RESISTORS & CAPACITORS	49, 50
(Part No. SZZ0L31)	8	PACKING	50
DISASSEMBLY INSTRUCTIONS	9 ~ 13	TROUBLESHOOTING FLOW CHART	51 ~ 54
MEASUREMENTS AND ADJUSTMENTS	13 ~ 19	* TECHNICAL INFORMATION	
TERMINAL FUNCTION OF IC'S	20 ~ 24	* This technical information is located on pp 45 ~ 56 of the SL-PC10 Service Manual (Order No. AD8904091C1). Therefore, refer to that Service Manual.	
BLOCK DIAGRAM	25 ~ 27		

## INSTALLATION

### Transport lock

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



- NOTE:**  
**IF THE UNIT IS TRANSPORTED AGAIN, PERFORM THE FOLLOWING STEPS:**
1. Turn the power on and remove all discs from the trays.
  2. PRESS THE DISC SKIP BUTTON on the top panel and turn the power off.
  3. Insert the clamber into the slot on the bottom of the unit and turn it clockwise.
  4. Place the unit with the right panel facing downward. Press the lock shaft to the LOCK position (■ — ■).

**CAUTION:**  
 Do not transport the unit without locking the lock shaft.  
**SEVERE DAMAGE WILL RESULT.**

### Placement notes

- **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.)
  - For long periods of time in direct sunlight.
  - In dusty or smoky locations.
  - In locations prone to vibrations.
  - In locations where the rear panel is less than 10 cm (about 4") away from the wall or back of an audio rack.
  - Within reach of children.
- **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)
[ SJA193 (EB)
[ SJA173 (GN)
[ RJA0004 (GC, PX)
- Stereo connection cable . . . . 1  
 (SJP2249-3)
- Dust cover . . . . . 1  
 (RYF0082)
- Remote control transmitter . . . . . 1  
 (EUR64789B)
- Batteries . . . . . 2  
 (UM-4NE/2S)
- AC plug adaptor . . . . . 1  
 [SJP9215 (GC, PX)]

## ■ 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: 100 $\mu$ W/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.

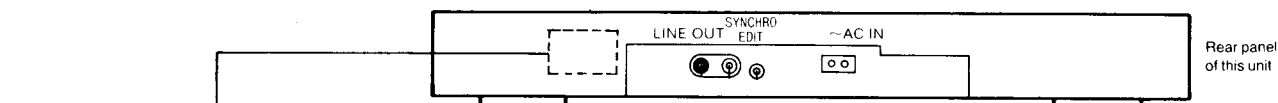
**ACHTUNG:** Dieses produkt enthält eine laserdioden. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit abgestrahlt.

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

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

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



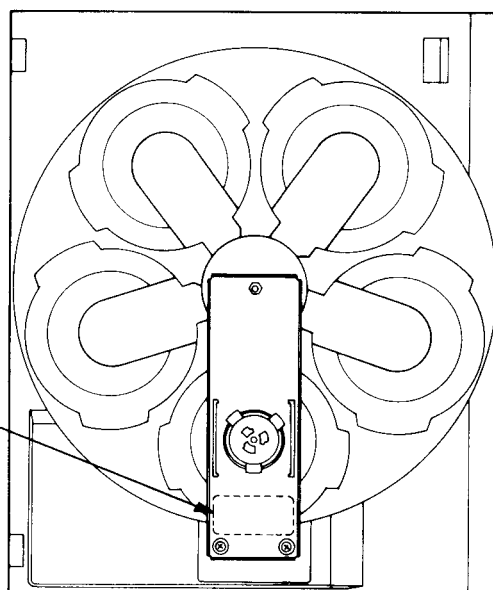
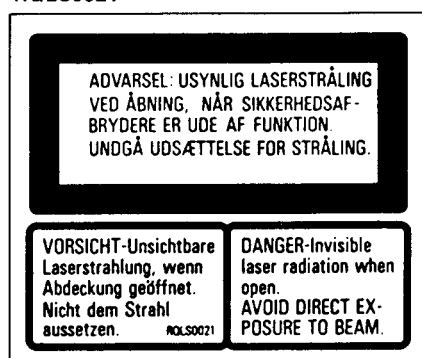
Obs:  
Apparaten innehåller laser  
Komponent av höger laserklass  
än klass 1.

### • Use of caution labels

Note: ○ Mark is used, × Mark is not used.

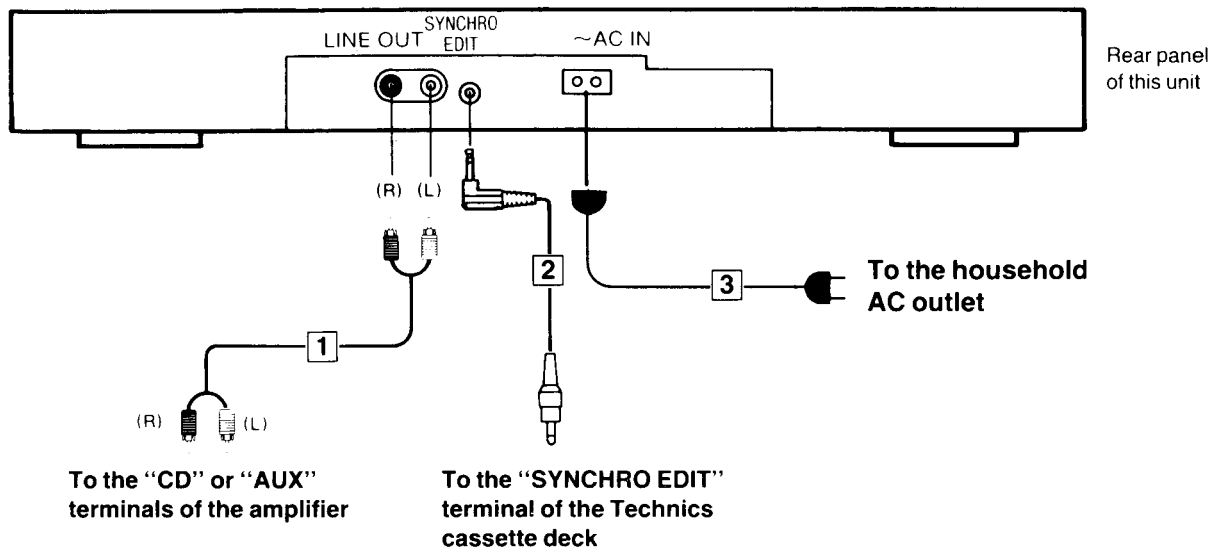
Areas	SQWD7	RQLS0021
(PX)	×	×
Others	○	○

RQLS0021



## ■ CONNECTIONS

• Before making connections, be sure that the power to this unit and all other connected equipment is first turned off.



**1** Stereo connection cable (included)

**2** L-type cable

**Note:**

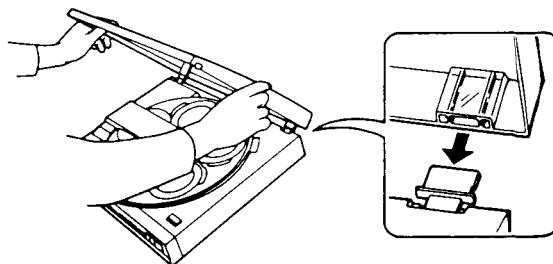
This cable is included only with the cassette deck having the appropriate "SYNCHRO EDIT" terminal.

**3** AC power supply cord (included)

**Note:**

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

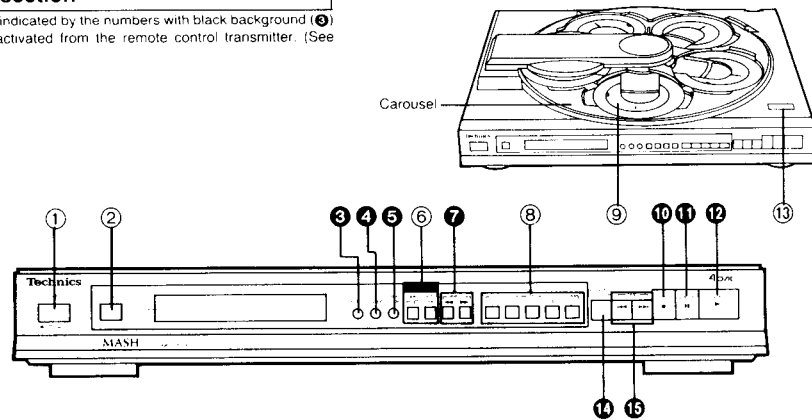
**How to install the dust cover.**



# FRONT PANEL CONTROLS AND FUNCTIONS

## Control section

The functions indicated by the numbers with black background (●) can also be activated from the remote control transmitter. (See page 7.)



### 1 Power switch (power)

Press (■) to switch the power on.  
Press again (■) to switch the power off.

### 2 Remote control signal sensor (remote sensor)

### 3 Random button (random)

Press this button to let the microcomputer make a random selection of the sequence in which discs and tracks are played during continuous play or program play. Press the button again to cancel the random play mode.

### 4 Repeat button (repeat)

Press this button to activate the repeat mode. The repeat indicator illuminates. Press again to cancel the repeat mode. The repeat indicator will no longer illuminate.

### 5 Time mode button (time mode)

Use this button to select the desired time mode. The display information will change as follows each time the button is pressed.

- 1 Track number and its elapsed play time.
- 2 Track number and remaining time of current track.
- 3 Total track numbers and playing time of the current disc.
- 4 Total elapsed play time of the current disc.

### 6 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.

#### ● Auto link button (auto link)

This button can be used for automatic edit recording from several discs.

### 7 Search buttons (◀ search ▶)

Use these buttons to move the pickup forward and backward.

### 8 Disc button (disc 1~5)

These buttons are used to select the desired disc for sequential or program play.

### 9 Disc trays (1~5)

One disc per tray can be loaded.

### 10 Stop button (■ stop)

### 11 Pause button (|| pause)

### 12 Play button (▶ play)

### 13 Disc skip button (disc skip)

Each time this button is pressed, the carousel will rotate in a clockwise direction to the next tray position. This allows for loading or unloading of discs.

This button is also used to select the next disc, in the continuous or random play mode.

### 14 Program/continue button (program/continue)

This button is used to select either the continuous play or program play mode.

The mode changes each time the button is pressed.

The continuous play mode is automatically selected when the power is switched on.

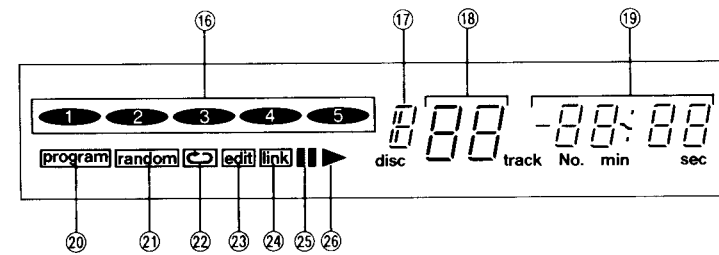
### 15 Skip buttons (◀◀ skip ▶▶)

Press one of these buttons briefly to move the pickup (backward and forward) to the beginning of a specific track.

#### Pickup:

The pickup is a laser device that reads the information on the disc surface. The pickup moves across the disc as the disc is played, but it is not visible from outside the cabinet.

## Display section



### 16 Disc indicators (●~●)

The indicator corresponding to the disc being played flashes during play.

When the unit is in the program mode, these indicators show the programmed discs.

### 17 Disc number/tape side display (disc)

Shows the number (1~5) of the current disc, or shows the tape side (A or B) in the edit mode.

### 18 Track number display (track)

Shows the number (up to 99) of the current track.

### 19 Time/programmed number display (No., min, sec)

This display shows the elapsed playing time of the track being played. When the unit is in the program play mode, this display shows the program sequence.

### 20 Program play indicator (program)

Illuminates when the unit is in the programming or program play mode.

### 21 Random indicator (random)

Illuminates when the random play mode is selected.

### 22 Repeat indicator (repeat)

Illuminates when the repeat mode is activated.

### 23 Compact disc edit indicator (edit)

Illuminates when the edit mode is activated.

### 24 Auto link indicator (link)

Illuminates when the unit is in the condition that the automatic disc link is possible.

### 25 Pause indicator (||)

Illuminates when the pause mode is activated.

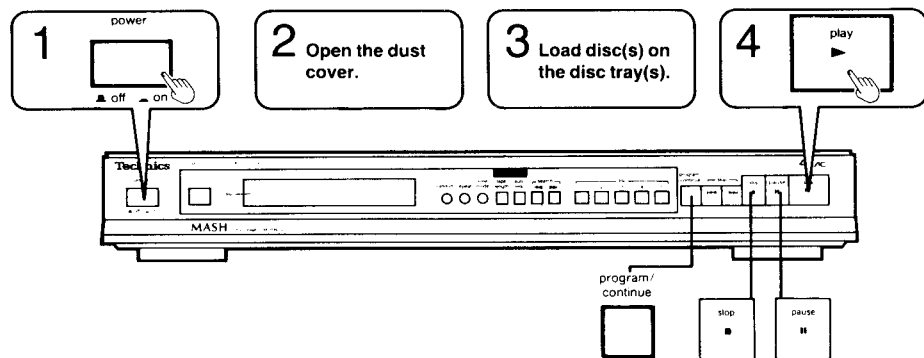
### 26 Play indicator (▶)

Illuminates when the play mode is activated.

# PLAYING A DISC

## Continuous play (from the stop mode)

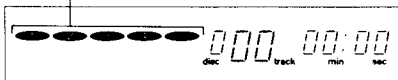
Continuous play refers to play of the first track of the first disc to the last track of the last disc.



**1 Press the power switch to turn on (I/O).**  
The disc trays turn clockwise, and the disc 1 tray resets to the front position.

- Continuous play is automatically selected when the power is switched on. If the program play indicator is illuminated, press the program/continue button.

Disc indicators



**2 Open the dust cover.**

**3 Load the disc(s) on the disc tray(s).**

- Continuous play begins from disc 1 when the play button is pressed.
- For loading disc 5, press the disc skip button or turn the disc trays manually.

**Notes:**

- Do not touch the disc tray while rotating.
- During play, other discs can be changed.
- Discs of the 8 cm (3") size and 12 cm (5") size cannot be used together on the same number disc tray.
- The disc skip button cannot be used during program play.
- If intermittent noises are produced while the carousel is rotating, this means that the lock shaft is not released. Set the power switch to off and release the shaft according to the procedure on page 2.

**4 Press the play button to start play.**

The play indicator will illuminate and continuous play will start.

The indicator corresponding to the disc being played flashes.



At the end of the last track of the last disc, the unit switches to the stop mode.

### To briefly interrupt play

- Press the pause button. The unit switches to the pause mode and the pause indicator illuminates.
- Press the play button to resume play.

**Pause mode:**

Play is stopped, but the pickup remains where it was at the time when the pause button was pressed. The disc rotates while the unit is in the pause mode.

### To stop play

- Press the stop button.

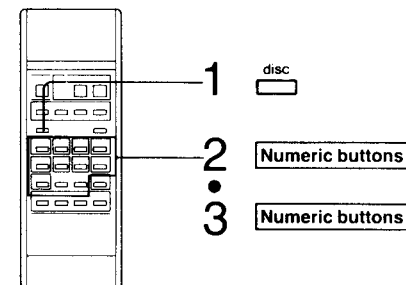
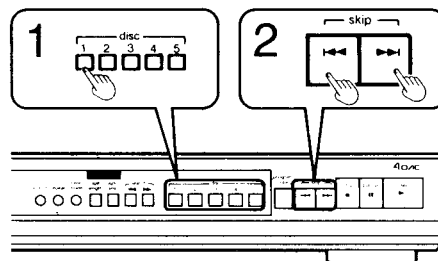
**Stop mode:**

In the stop mode the pickup is at its rest position; the disc does not rotate, and the display will show all zeros.

## Continuous play (continued)

### To select the desired track (or disc) to be played (from the stop mode or during play)

By selecting the disc or track to be played first in the play sequence, all subsequent tracks will be played on that disc(s) in order from that track to last. (There is no need to press the play button.)



**1 Press the disc select button.**

If the disc only is selected, play of all tracks on that disc (beginning from its first track) will begin in about ten seconds.

**For example:** To select the 3rd disc, press the [3] button.

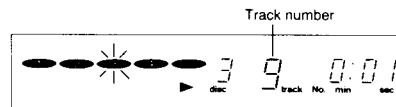
The selected disc indicator will flash.



**2 Press the skip (←→) button to select the track number.**

Play will start from the selected track.

**For example:** To select the 9th track, press the [←→] button 8 times (or keep pressing the button until the display shows "9").



If you go past the desired track, press the [←→] button to return to the desired track.

### By the remote control transmitter (See page 7.)

**1 Press the disc button.**

**2 Press the numeric button (1-5) to specify the disc.**

**3 Press the numeric button to specify the track.**

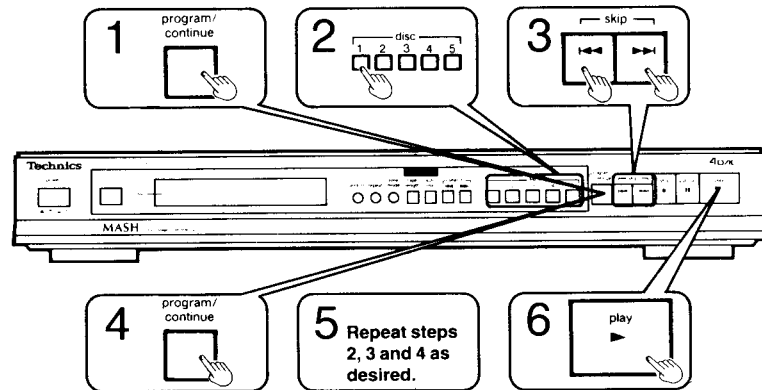
- Play will start from the selected track.
- To select the 10th and subsequent tracks: Press the [→10] button to select the "tens" digit, and then press (one of the [0]-[9]) buttons to select the "units" digit. **Example: to select the 32nd track** Press the [→10] button three times to select 3, and then press the [2] button.
- Steps 1 and 2 are not necessary if the track is specified on the 1st disc.

**Notes:**

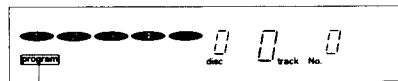
- If a disc number not on the disc tray is specified, the next higher number disc will be played.
- When a track number not on the disc is specified, the selection cannot be entered.

## Program play (from the stop mode)

As many as 32 selections from the five discs can be selected and programmed to play in any desired sequence.



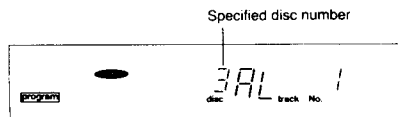
- 1 Press the program/continue button.**  
The play mode will then change from continuous play to program play.



Program play indicator

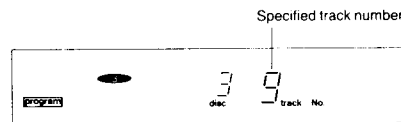
**Note:**  
The mode does not change if the program/continue button is pressed during play.

- 2 Press the disc select button.**  
For example: To select the 3rd disc, press the [3] button.

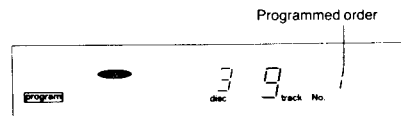


**Note:**  
If the disc only is selected, all tracks on that disc (beginning from its first track) will be programmed.

- 3 Select the track number.**  
For example: To select the 9th track, press the [9] button 9 times.



- 4 Press the program/continue button.**



- 5 Repeat steps 2, 3 and 4 until the desired program is completed.**  
•Steps 3 and 4 are not necessary if selecting the disc only.  
•Step 2 is not necessary to select the disc number if the next track selected is on the same disc.

**Note:**  
If selections of non-existing disc(s) or track(s) are programmed, the corresponding indicator (disc or track) will illuminate and the selection will be included in the program count. However, during play the selection(s) will be cancelled and the subsequent program selection will be played.

- 6 Press the play button to start play.**

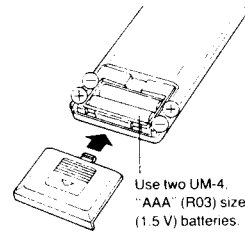
## REMOTE CONTROL TRANSMITTER

### Insertion of remote control transmitter batteries

**BATTERY LIFE:** About 1 year.

#### Notes concerning use of dry batteries

- Do not use re-chargeable batteries (Ni-Cd type).
- Be sure the batteries are inserted so that the positive (+) and negative (-) polarities are correct. Batteries installed with incorrect polarities may leak and damage the remote control transmitter.
- Never subject the batteries to excessive heat or flame; do not attempt to disassemble them; and be sure they are not short-circuited.
- If the remote control transmitter is not to be used for a long time, remove the batteries and store them in a cool dark place.
- Always remove old, weak or worn-out batteries promptly and dispose of them.



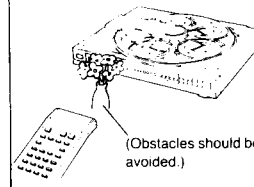
Use two UM-4, "AAA" (R03) size (1.5 V) batteries.

- Never mix old and new batteries, nor batteries of different types (carbon or alkaline).
- Although battery life varies depending on how often the remote control transmitter is used, the batteries should be replaced about once every year on the average.
- The batteries should also be replaced if commands from the remote control transmitter are not received by this player even when the transmitter is held close to the player's front panel.
- If the batteries leak, clean the battery holder well before inserting new batteries.
- Do not use remote control transmitter for TV sets, VTRs or other components at the same time as this player's remote control transmitter since this could result in a mistaken operation.

### Remote control transmitter operation notes

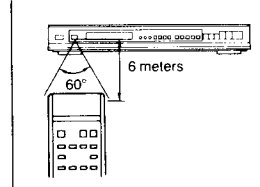
Note that operation may not be correct if direct sunlight or other strong light strikes the remote control signal receptor part of this unit. If there is a problem, place the unit away from the direct sunlight or other strong light source.

Face it toward the remote control signal receptor.

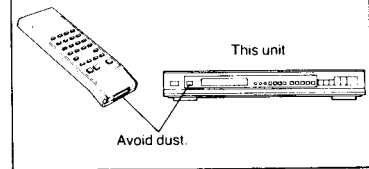


(Obstacles should be avoided.)

Use the remote control transmitter within 6 meters.



Be sure the transmitter part of the remote control transmitter and the receptor part of this unit are free from dust. Excessive dust might prevent reception.



**Note:** The control panel of the remote control transmitter may be covered by a clear plastic protective sheet. This sheet may be removed if desired.

### Remote functions

- R** On the remote control transmitter only.
- 10** Stop button (■ stop)
  - 7** Search buttons (◀◀ search ▶▶)
  - R** Disc button (disc)
  - R** Numeric buttons (1-9, 0, +10)
  - R** Clear button (clear)
  - R** Recall button (recall)
  - 11** Pause button (|| pause)
  - 12** Play button (▶ play)
  - 15** Skip buttons (◀◀ skip ▶▶)
  - 14** Program/continue button (program/continue)
  - 5** Time mode select button (time mode)
  - 3** Random button (random)
  - 4** Repeat button (repeat)

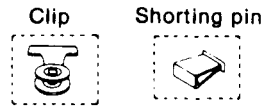
## HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.

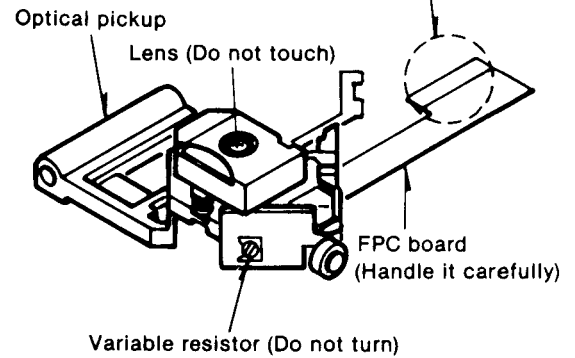
So, be careful of electrostatic breakdown during repair of the optical pickup.

### Handling of optical pickup

1. Do not subject the optical pickup to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. (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



Be sure to short this position  
(Use the shorting pin or clip.)

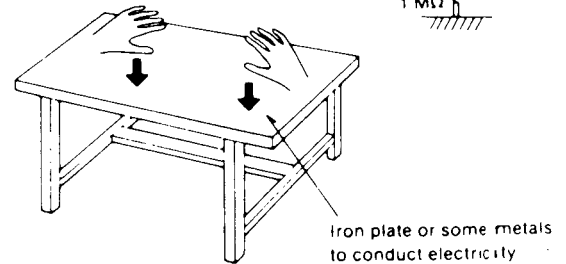
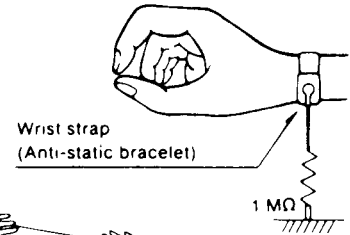


### Grounding for electrostatic breakdown prevention

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

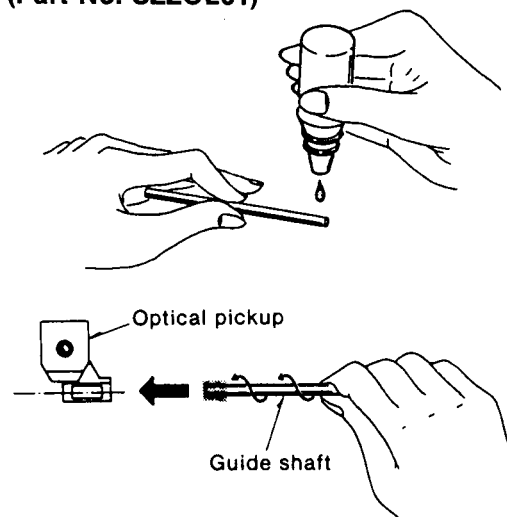


## INSTRUCTIONS FOR TRAVERSE OIL (Part No. SZZOL31)

The container contains 6g (approx. 3ml) of oil.  
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 SZZOL31 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.



### “ATTENTION SERVICER”

Some chassis components may have sharp edges. Be careful when disassembling and servicing.



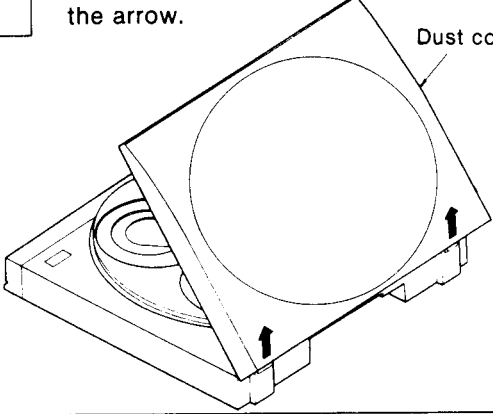
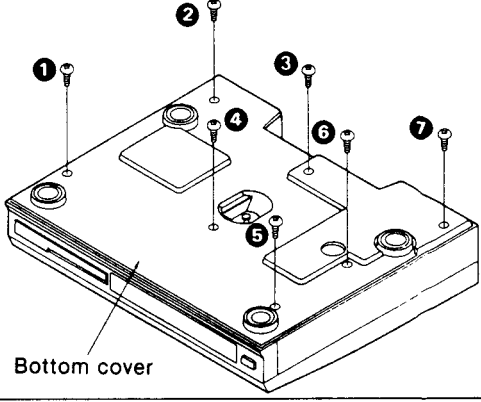
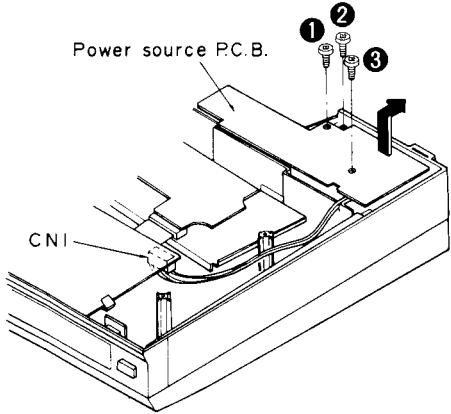
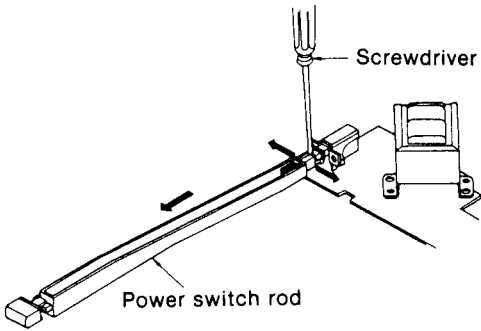
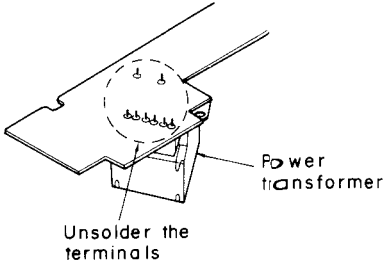
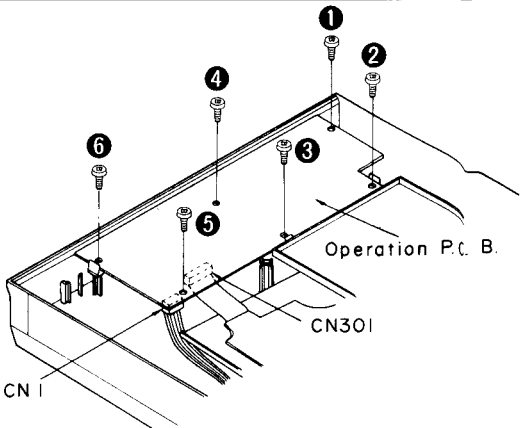
## DISASSEMBLY INSTRUCTIONS

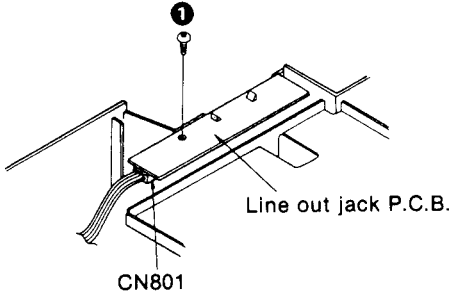
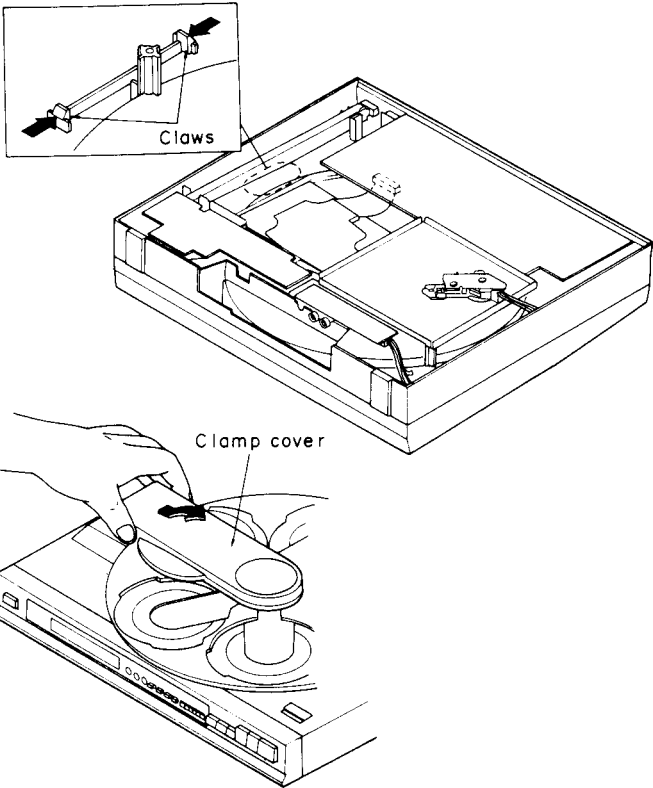
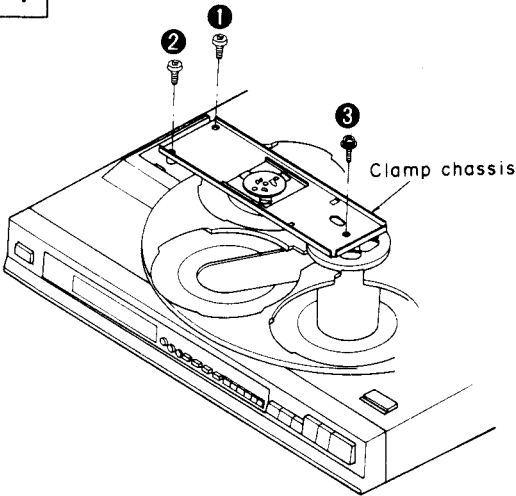
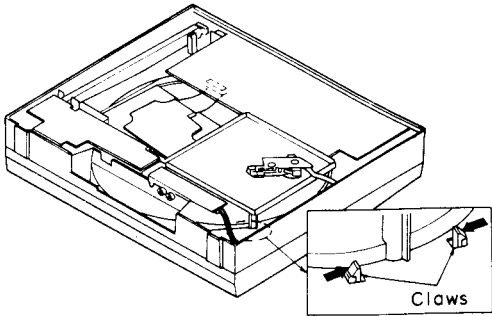
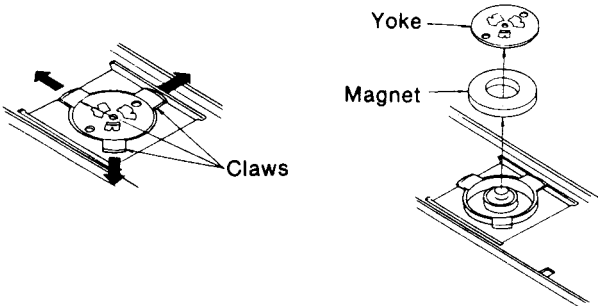
**Warning:** This product uses a laser diode. Refer to caution statements on page 3.

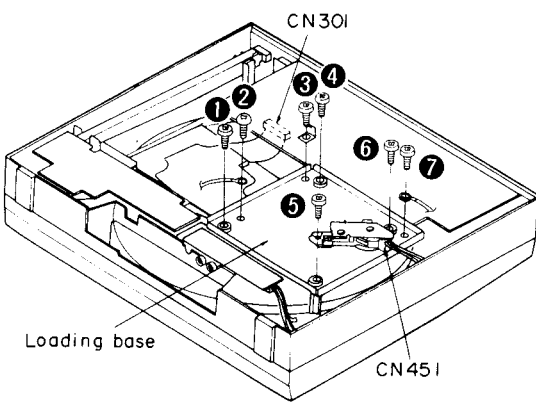
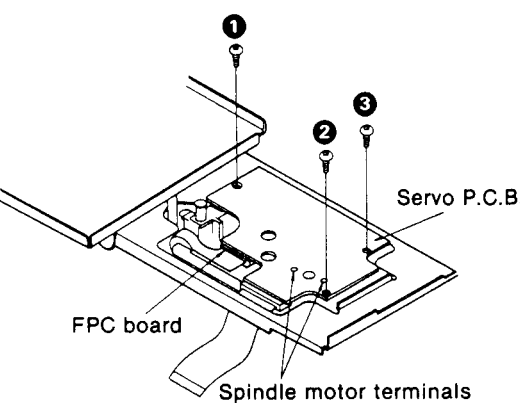
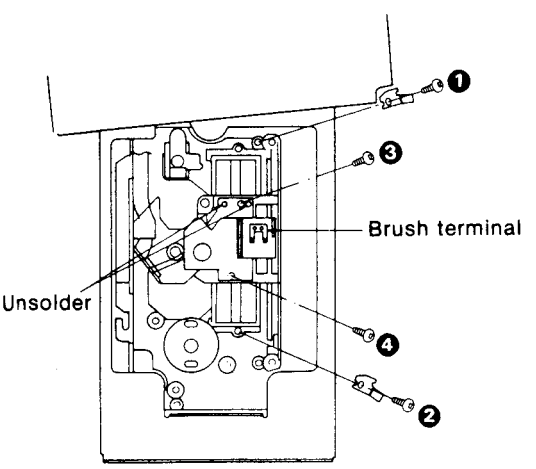
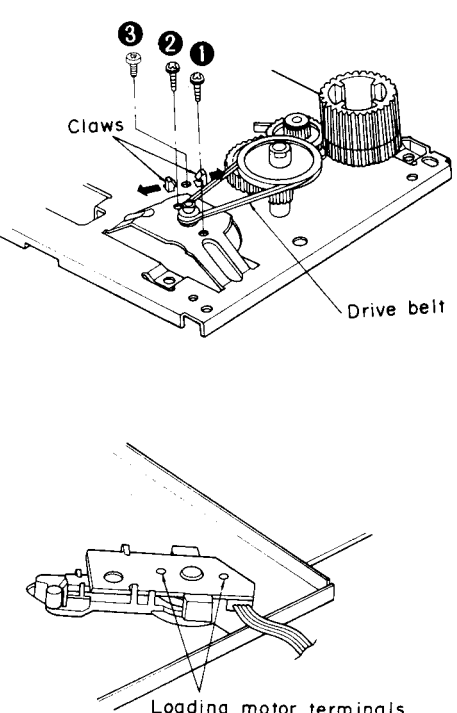
**ACHTUNG:**

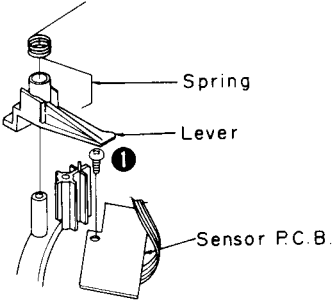
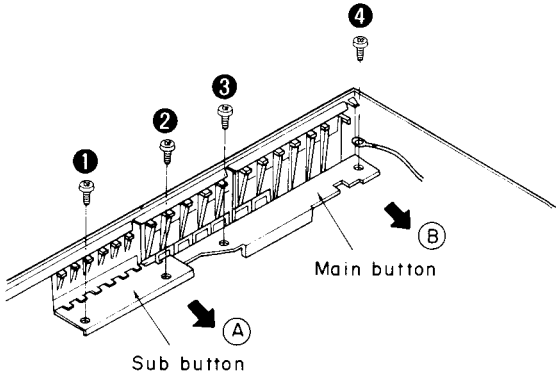
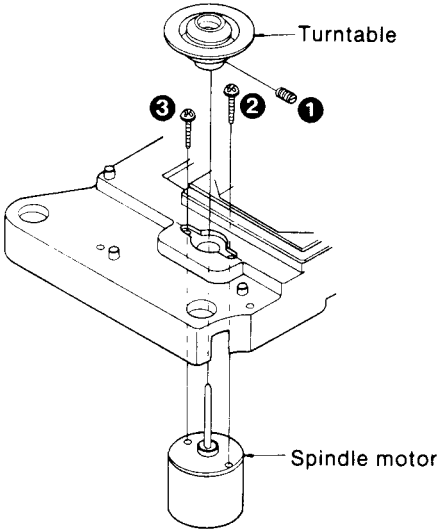
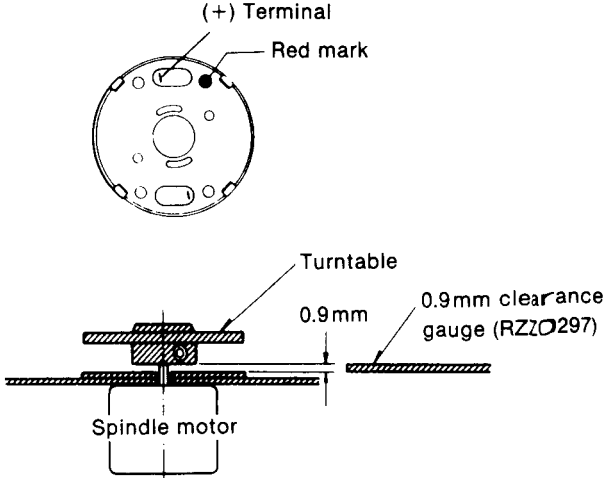
- Die Lasereinheit nicht zerlegen.
- Die Lasereinheit darf nur gegen eine vom Hersteller spezifizierte Einheit ausgetauscht werden.

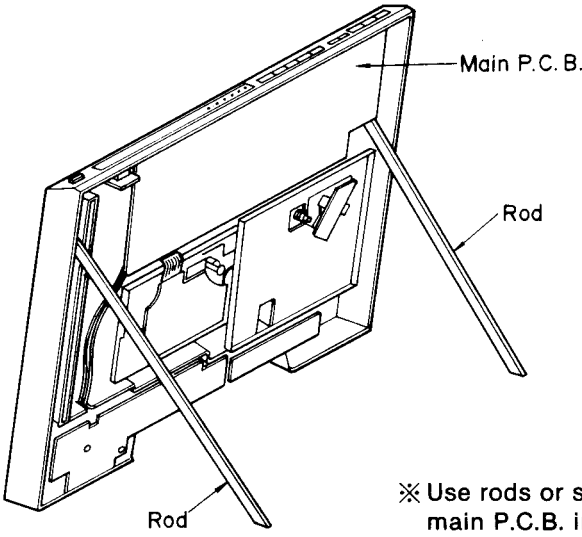
\* This CD player is equipped with FPC boards, so handle them with care during disassembly and reassembly.

Ref. No. 1	<b>Removal of the dust cover</b>	Ref. No. 2	<b>Removal of the bottom cover</b>
Procedure 1	<ul style="list-style-type: none"> <li>• Remove the dust cover in the direction of the arrow.</li> </ul>	Procedure 2	<ul style="list-style-type: none"> <li>• Remove the 7 screws (1~7).</li> </ul>
			
Ref. No. 3	<b>Removal of the power source P.C.B., power transformer and power switch rod</b>	<p>4. Remove the power switch rod by using a screwdriver.</p> <p>5. Unsolder the terminals of the power transformer.</p> <p><b>Note:</b> Set the power switch to the "OFF" position.</p>	
Procedure 2→3	<ol style="list-style-type: none"> <li>1. Remove the 3 screws (1~3).</li> <li>2. Remove the 1 connector (CN1).</li> <li>3. Remove the power source P.C.B. in the direction of the arrow.</li> </ol>		
		 	
Ref. No. 4	<b>Removal of the operation P.C.B.</b>		
Procedure 2→4	<ul style="list-style-type: none"> <li>■ <b>Removal of the operation P.C.B.</b></li> </ul> <ol style="list-style-type: none"> <li>1. Remove the 6 screws (1~6).</li> <li>2. Remove the 2 connectors (CN1, CN301).</li> </ol>		
			

<p><b>Ref. No.</b> 5</p>	<p><b>Removal of the line out jack P.C.B.</b></p>	<p><b>Ref. No.</b> 6</p>	<p><b>Removal of the clamp cover</b></p>
<p><b>Procedure</b> 2→5</p>	<p>1. Remove the 1 screw (❶). 2. Remove the 1 connector (CN801).</p>	<p><b>Procedure</b> 1→2→6</p>	<p>1. Release the 2 claws. 2. Remove the clamp cover in the direction of the arrow.</p>
			
<p><b>Ref. No.</b> 7</p>	<p><b>Removal of the clamp chassis</b></p>	<p><b>Ref. No.</b> 8</p>	
<p><b>Procedure</b> 1→2→6→7</p>	<p>1. Remove the 3 screws (❶~❸).</p>	<p><b>Procedure</b> 1→2→6 →7→8</p>	
		<p>1. Release the 2 claws of the tray holder.</p> 	
<p><b>Ref. No.</b> 9</p>	<p><b>Removal of the magnet</b></p>	<p>2. Remove the disc tray in the direction of the arrow.</p>	
<p><b>Procedure</b> 1→2→6 →7→9</p>	<p>• Release the 3 claws.</p>		

<p>Ref. No. 10</p>	<p><b>Removal of the loading chassis</b></p>	<p>Ref. No. 11</p>	<p><b>Removal of the servo P.C.B.</b></p>
<p>Procedure 8→10</p>	<p>1. Remove the 7 screws (①~⑦). 2. Remove the 2 connectors (CN301, CN451).</p>	<p>Procedure 8→10→11</p>	
			 <p>1. Remove the 3 screws (①~③). 2. Unsolder the 2 terminals of spindle motor. 3. Remove the FPC board from the optical pickup. <b>Caution:</b> To prevent the breakdown of the laser diode, antistatic shorting pin is inserted into the FPC board.</p>
<p>Ref. No. 12</p>	<p><b>Removal of the optical pickup</b></p>	<p>Ref. No. 13</p>	<p><b>Removal of the loading motor</b></p>
<p>Procedure 8→10→12</p>	<p>Refer to the handling precautions for optical pickup and instructions for traverse oil (See page 8).</p>	<p>Procedure 8→10→13</p>	
	<p>1. Remove the 2 screws (①, ②). 2. Unsolder the 2 terminals and the 2 screws (③, ④).</p>  <p><b>Caution:</b> Take care not to touch the brush terminal.</p>		<p>1. Remove the drive belt. 2. Remove the 3 screws (①~③). 3. Release the 2 claws. 4. Unsolder the 2 terminals of the loading motor.</p> 

<p><b>Ref. No.</b> 14</p>	<p><b>Removal of the sensor P.C.B.</b></p>	<p><b>Ref. No.</b> 15</p>	<p><b>Removal of the sub button and main button</b></p>
<p><b>Procedure</b> 2→5→14</p>	<p>1. Remove the spring and lever. 2. Remove the 1 screw (❶).</p> 	<p><b>Procedure</b> 2→4→15</p>	<p>1. Remove the 2 screws (❶, ❷). 2. Remove the sub button in the direction of the arrow (A). 3. Remove the 2 screws (❸, ❹). 4. Remove the main button in the direction of the arrow (B).</p> 
<p><b>Ref. No.</b> 16</p>	<p><b>Removal of the spindle motor</b></p>		
<p><b>Procedure</b> 8→10→12 →16</p> <p>1. Loosen the screw (❶) by using a 1.27 mm allen wrench and remove the turntable. 2. Remove the 2 screws (❷, ❸).</p> <p><b>Caution:</b></p> <p>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.</p> <p><b>Adjustment of turntable height</b></p> <p>1. Insert a 0.9mm clearance gauge (RZZ0297) between the turntable and loading base as shown in the figure. 2. Tighten the turntable set-screw by using a 1.27 mm allen wrench.</p> <p><b>Caution:</b> Refer to turntable height adjustment (See page 16).</p>	 		

Ref. No. 17	How to check the main P.C.B.
Procedure 1→2→6→7 →8→9→17	<p>•When checking the foil side of the main P.C.B. and replacing the parts, do as shown here.</p>  <p>※ Use rods or similar object to hold the main P.C.B. in an upright position.</p>

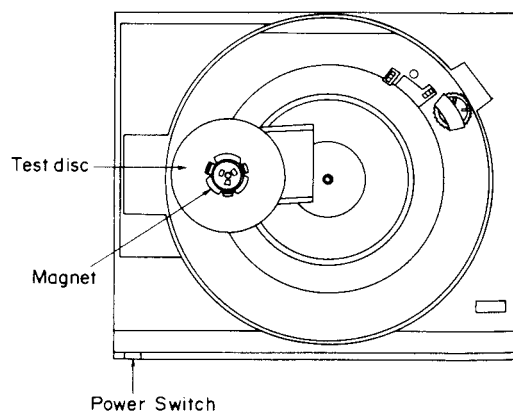
## MEASUREMENTS AND ADJUSTMENTS

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

**Caution:** During adjustment, never connect CH-2 probe's GND to any place for it may short Vref line. (Connect CH-1 probe's GND to specified TP. described in each section.)

### PREPARATION

1. Remove the dust cover (refer to disassembly instruction Ref. No. 1).
2. Remove the bottom cover (refer to disassembly instruction Ref. No. 2).
3. Remove the clamp cover (refer to disassembly instruction Ref. No. 6).
4. Remove the clamp chassis (refer to disassembly instruction Ref. No. 7).  
Set the power switch to ON.
5. (1) The carousel rotates clockwise and stops at the fifth tray.  
(2) Set the power switch to OFF and then to ON again, when the optical deck reaches it's height position, set the power switch to OFF.
6. Remove the disc tray (refer to disassembly instruction Ref. No. 8).
7. Place the test disc and secure it by using the magnet (refer to disassembly instruction Ref. No. 9).
8. 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.
9. Follow the adjustment procedure.



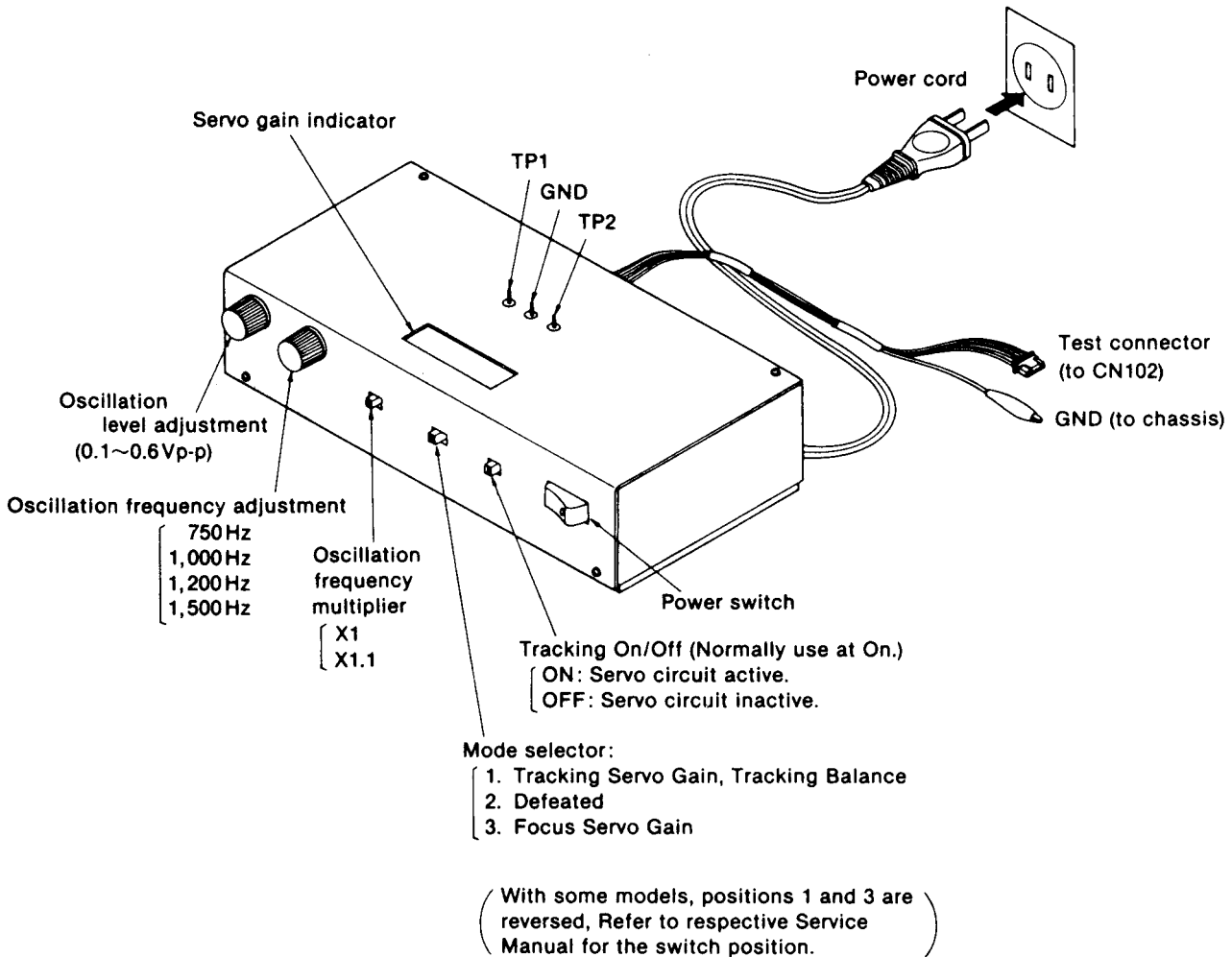
## NEW SERVO GAIN ADJUSTER (Servo Amp. Adjusting Fixture)

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

**Part number:** SZZP1094C-1

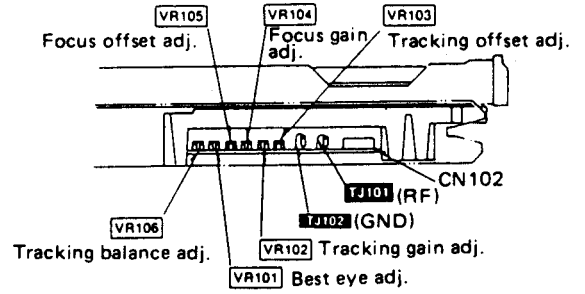
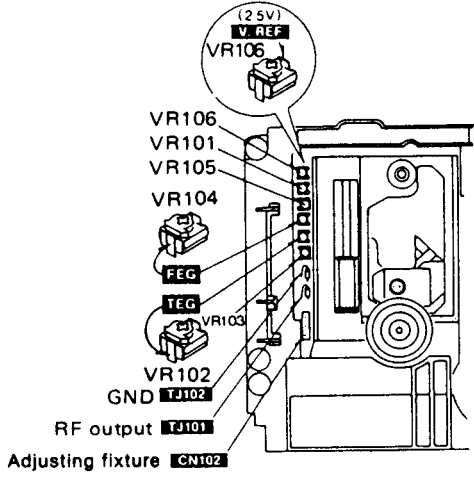
**Features:**

- (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.

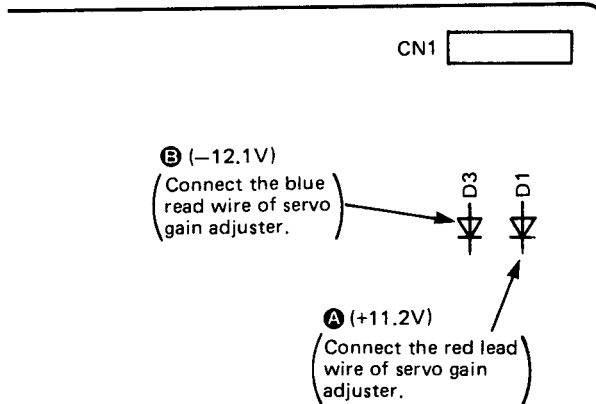


**ADJUSTMENT POINTS**

• Servo P.C.B.

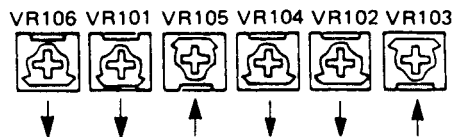


• Main P.C.B. (Power supply for SZZP1017F only.)



• 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**

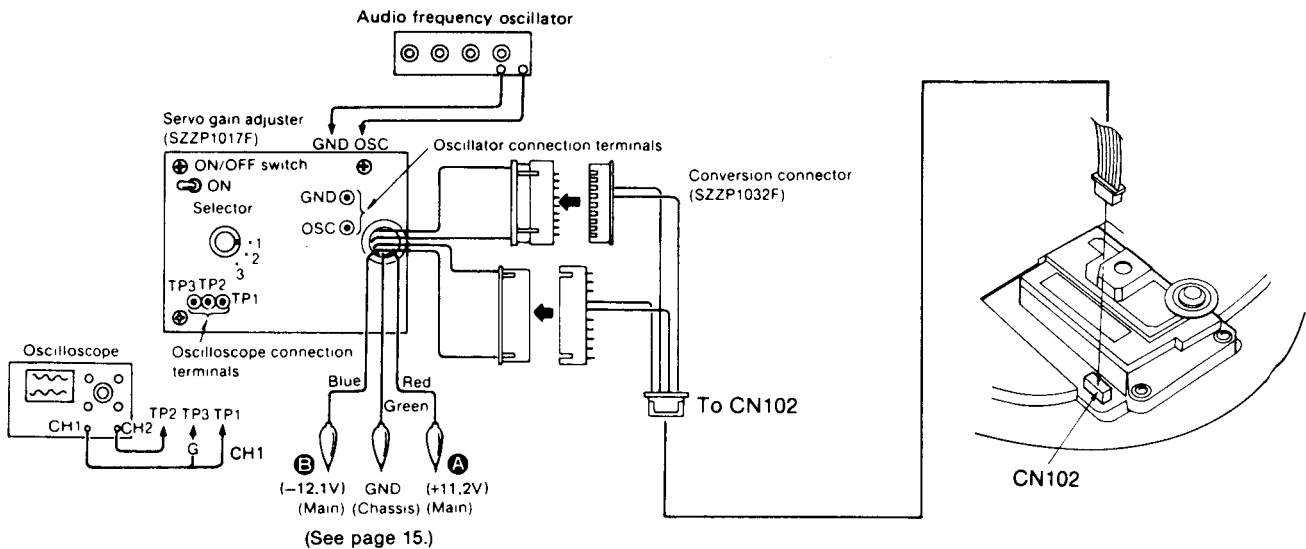
- \* Servo gain adjuster (SZZP1017F or SZZP1094C-1)
- \* Test discs
- 1. Playability test disc (SZZP1054C or SZZP1014F)
- 2. Uneven test disc (SZZP1056C)
- 3. Black band test disc (SZZP1057C)
- \* Normal disc
- \* Dual-beam oscilloscope with bandwidth of 30 MHz or better (with EXT trigger and 1 : 1 probe).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

**Connection of servo gain adjuster (If you use SZZP1094C, refer to included operating instructions.)**



**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.

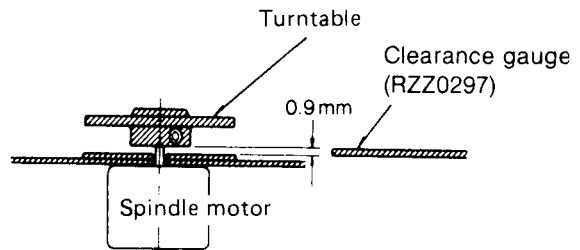
(Note: A voltage of 2.5V appears at the V. REF terminal. Take care not to short the player's chassis to the oscilloscope ground.)

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

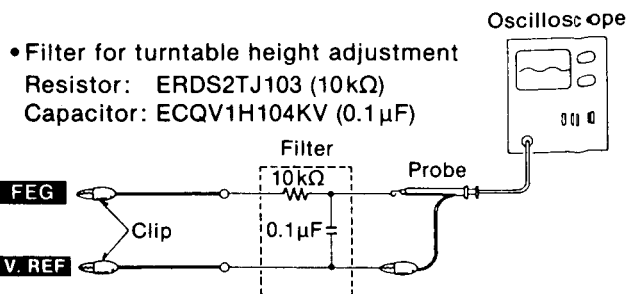
4. Adjust oscilloscope's DC zero balance.
5. Switch the player power ON, and play the test disc (SZZP1014F or SZZP1054C).
6. Measure the voltage amplitude of the signal on the oscilloscope.

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.)

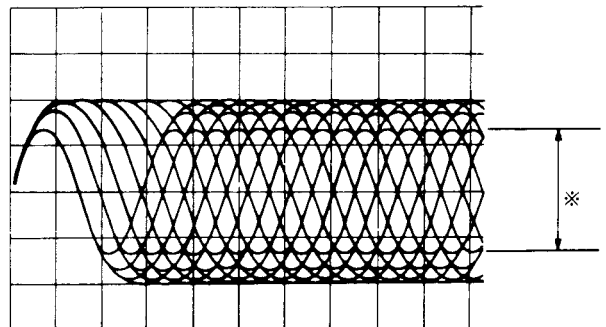
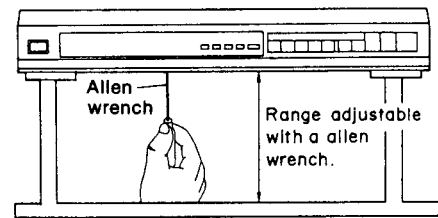
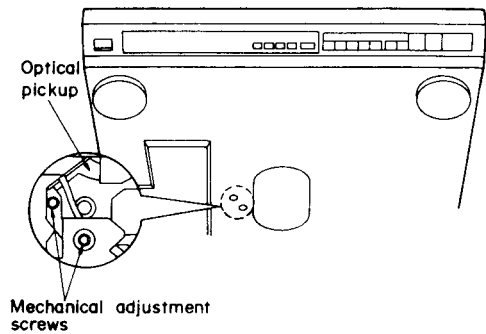


- Filter for turntable height adjustment
- Resistor: ERDS2TJ103 (10kΩ)
- Capacitor: ECQV1H104KV (0.1μF)



**(2) MECHANICAL ADJUSTMENT**

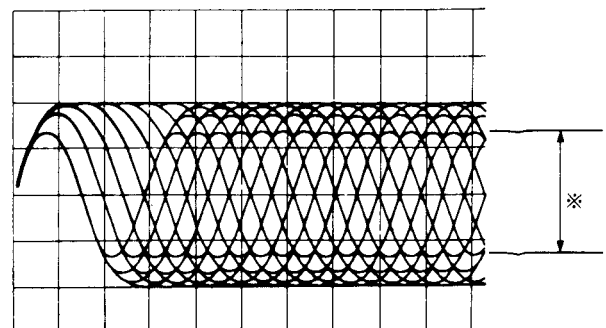
1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (-) on the Servo P.C.B.  
**Oscilloscope setting:** VOLT ..... 100 mV  
SWEEP ..... 0.5  $\mu$ s.  
Input coupling ... AC
2. Switch the player power **ON**, and play track 9 on the test disc (SZZP1056C). (Playing any other track 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  $\mu$ 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.



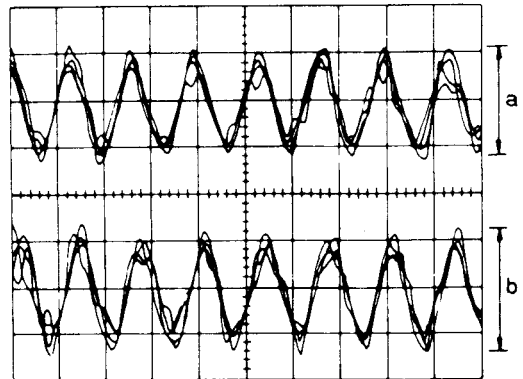
※ Most stretched eye pattern.

**(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".



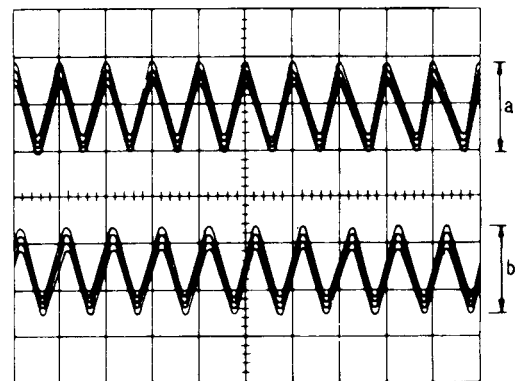
※ Adjust **VR104** until a equals b.

**(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.

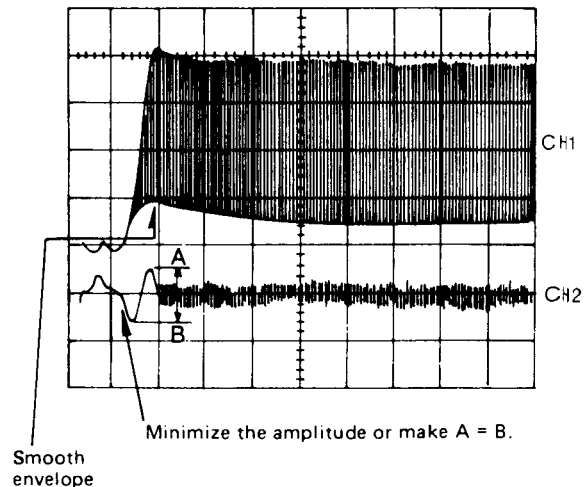
**(6) FOCUS OFFSET ADJUSTMENT**

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.



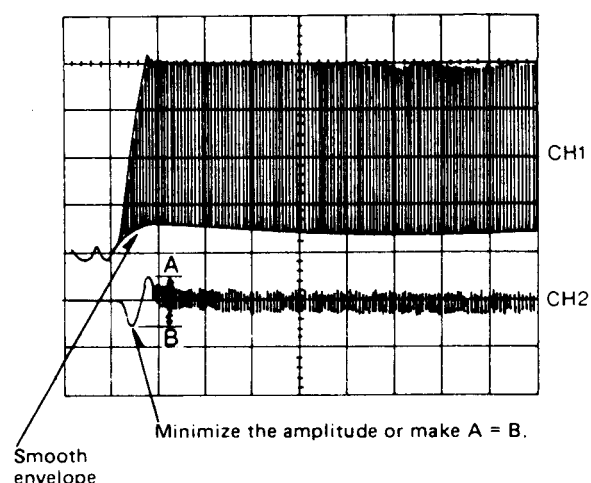
### (7) TRACKING OFFSET ADJUSTMENT

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

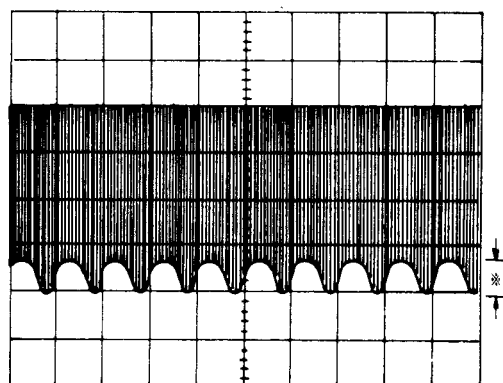
1. Make sure that the servo gain adjuster's gain switch is set to position "2".
2. Set up the AF oscillator output for 1.1 kHz, 600 mVp-p, and connect it across the OSC and GND terminals on the servo gain adjuster.

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.

## ■ TERMINAL FUNCTION OF IC'S

### ● IC101 (AN8373S): Servo amp.

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	AMP1	I	RF signal input (X30 amp.)	22	TPO	O	Tracking error signal output
2	PDAD	I	Photo detector current input (A2)	23	FPO	O	Focus error signal output
3	PDA	I	Photo detector current input (A1)	24	FGC	I	Focus gain up signal input (Not used, connected to GND)
4	PDBD	I	Photo detector current input (A4)	25	TGC	I	Tracking gain up signal input (Not used, connected to GND)
5	PDB	I	Photo detector current input (A3)	26	GD	I	Focus/Tracking down signal input (Not used, connected to GND)
6	LPD	I	Non-inverting laser power input	27	PTO	O	Position detecting amp. output
7	LD	O	Laser power auto control output	28	PTI	I	Position detecting amp. input
8	FBL1	I	PD balance adjustment	29	PBO	O	Position detecting buffer output
9	FBL2	I		30	POT	I	Position detecting buffer input
10	TBL1	I	Tracking balance adjustment	31	BDO	O	Dropout detection output
11	TBL2	I		32	RFDET	O	RF detection signal output
12	FOOFS	I	Focus offset adjustment	33	SDO	O	Dropout detection pulse output
13	IVA	O	Current/voltage conversion output (A)	34	C. SBDO	I	Dropout detecting capacitor input
14	IVB	O	Current/voltage conversion output (B)	35	ARF	O	RF signal output
15	FE	O	Focus gain adjustment output	36	C. AGC	I	AGC detecting capacitor input
16	FPI	I	Focus error signal input	37	VCC	I	Power supply (+5 V input)
17	TPI	I	Tracking error signal input	38	LDON	I	Laser power control input
18	C. TPL	I	Tracking error filter capacitor input	39	RF IN	I	RF signal input
19	C. TPH			40	AMPO	O	RF signal output
20	C. FPL	I	Focus error filter capacitor input	41	VREF	O	Reference voltage output
21	C. FPH			42	GND	I	Ground terminal

• IC102 (AN8374S): Servo processor

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	LSA	I	Phase difference input (A)	22	VDD	I	Power supply (+5 V input)
2	LSB	I	Phase difference input (B)	23	SPCNT	O	Track crossing speed control output (Not used, open)
3	TEOFS	O	Tracking offset adjustment	24	SENSE	O	Selector output (track crossing state)
4	TE	O	Tracking gain adjustment	25	TRV	O	Traverse servo control output
5	TEG	I		26	FLOCK	O	Focus lock signal output
6	TE OUT	O	Tracking error signal output	27	KICK	O	Track kick signal output
7	TE BPF	I	Tracking error gain detecting filter (Not used, open)	28	LDON	O	Laser power control output
8	FEG	I	Focus gain adjustment	29	VDET	O	Focus/tracking gain up output (Not used, open)
9	FE OUT	O	Focus error signal output	30	CNT1	I	Control input (FOON: Focus Servo On signal)
10	CLW	O	Triangular wave oscillator capacitor output	31	CNT2	I	Control input (TRON: Tracking Servo On signal)
11	VREF	I	Reference voltage input	32	CNT3	I	Control input (KICKF: Kick Direction (Forward) command)
12	ARF	I	RF signal input	33	CNT4	I	Control input (KICKR: KICK Direction (Backward) command)
13	CDSL	I	Data slice filter capacitor input	34	TRVF	I	Traverse forward command signal
14	FPC	I	Frequency difference signal input	35	TRVR	I	Traverse backward command signal
15	GND	I	Ground terminal	36	RFDET	I	RF detection signal input
16	C. PLL	I	PLL loop filter constant	37	BDO	I	Dropout detection input
17	VSS	I	Ground terminal	38	VCC	I	Power supply (+5 V input)
18	CLK	I	Frequency pull-in clock signal (88.2 kHz) input	39	TVPO	O	Traverse position detecting resistor/capacitor inputs
19	SRF	O	Sliced and digitized RF signal output	40	TVPI	I	
20	PCK	O	Clock output extracted from SRF	41	BROUT	O	Tracking drive control output
21	EFM	O	EFM signal output synchronous with PCK	42	BRIN	I	Tracking error signal input

• IC103 (AN3877N): BTL drive

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	PVCC	I	Driver power supply (+7.7V input)	9	TD-	O	Inverting output of tracking driver
2	VCC	I	Power supply (+7.7V input)	10	TD+	O	Non-inverting output of tracking driver
3	TB	O	External transistor base driving output	11	FD-	O	Inverting output of focus driver
4	VMON	O	Voltage (+4.9V) output	12	FD+	O	Non-inverting output of focus driver
5	TVDI	I	Traverse error signal input	13	TVD-	O	Inverting output of traverse driver
6	FDI	I	Focus error signal input	14	TVD+	O	Non-inverting output of traverse driver
7	TDI	I	Tracking error signal input	15	RESET	O	Reset signal output
8	VREF	I	Reference voltage input	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 (Not used, open)
3	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")
4	SRDATA	O	Serial data output (MSB first)
5	SRCK	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 (16.9344MHz) output (Not used, open)
13	TEST	I	Test mode selection (Not used, connected to +5V)
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 (16.9344MHz)
18	X2	O	Clock output (16.9344MHz) (Not used, open)
19	VSS	I	GND terminal
20	BLKCK	O	Sub-code block (Q data) clock (75Hz)
21	CLDCK	O	Sub-code frame (Q data) clock (7.35kHz)
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 (4.2336MHz)
33	VDD	I	Power supply (connected to +5V)
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 (4.3218MHz)
43	FPC	O	PLL frequency comparison signal
44 51	D7 D0	I/O	16K RAM data input/output
52	RAM/OE	O	16K RAM $\overline{OE}$ signal
53	RAM/WE	O	16K RAM $\overline{WE}$ signal
54 64	RAM/A0 RAM/A10	O	16K RAM address signal (RAMA0: LSB, RAMA10: MSB)

● IC401 (MN187124PKD4): System control

Pin No.	Mark	I/O Division	Function
1	VDD	I	Power supply terminal
2	OSC2	I	Clock terminal (Not used, open)
3	OSC1	I	Clock input
4	Vss	—	GND terminal
5	XI	I	Optical servo condition input (Not used, connected to GND)
6	XO	O	Not used, open
7	STAT	I	Key input strobe and processing status input from signal processor LSI traverse position detector
8	FLOCK	I	Optical servo condition (Focus) input
9	CNT1	O	Optical servo IC control signal (FOON: Focus servo)
10	CNT2	O	Optical servo IC control signal (TR ON: Tracking servo)
11	CNT3	O	Optical servo IC control signal (KICK F: Kick direction [Forward] command)
12	CNT4	O	Optical servo IC control signal (KICK R: Kick direction [Reverse] command)
13	FWD	O	Traverse forward command signal
14	REV	O	Traverse reverse command signal
15	REMOCON	I	Remote control signal
16	BLKCK	I	Sub-code block (Q-data) clock (75 kHz)
17	MUTE	I	Muting signal
18	REC. EN	I	Synchro rec control signal
19	SYNCHRO	O	Synchro rec control signal
20	SENSE	I	Optical servo condition (Track cross)
21	RESET	I	Reset signal (Treset at "L")
22	CLDCK	I	Sub-code frame clock (7.35 kHz)

Pin No.	Mark	I/O Division	Function
23	SUBQ	I	Sub-code "Q" data signal
24	NC	—	Not connected
25	MCLK	O	Command clock signal
26	MLD	O	Command load signal
27	MDATA	O	Command data signal
28	NC	—	Not connected
29	NC	—	Not used connected to GND
30 } 37	P47 } P40	I	Key scan signal
38 } 46	D0 } D8	O	FL glide signal
47	D9	—	Not used, open
48	DRAW	O	Motor drive control
49	TURN	O	Motor drive control
50	F/R	O	Motor drive control
51	SLOW	O	Motor drive control
52 53	NC	—	Not connected
54 } 63	S9 } S0	O	FL segment signal and key Scan signal
64	Vpp	I	FL drive power supply terminal

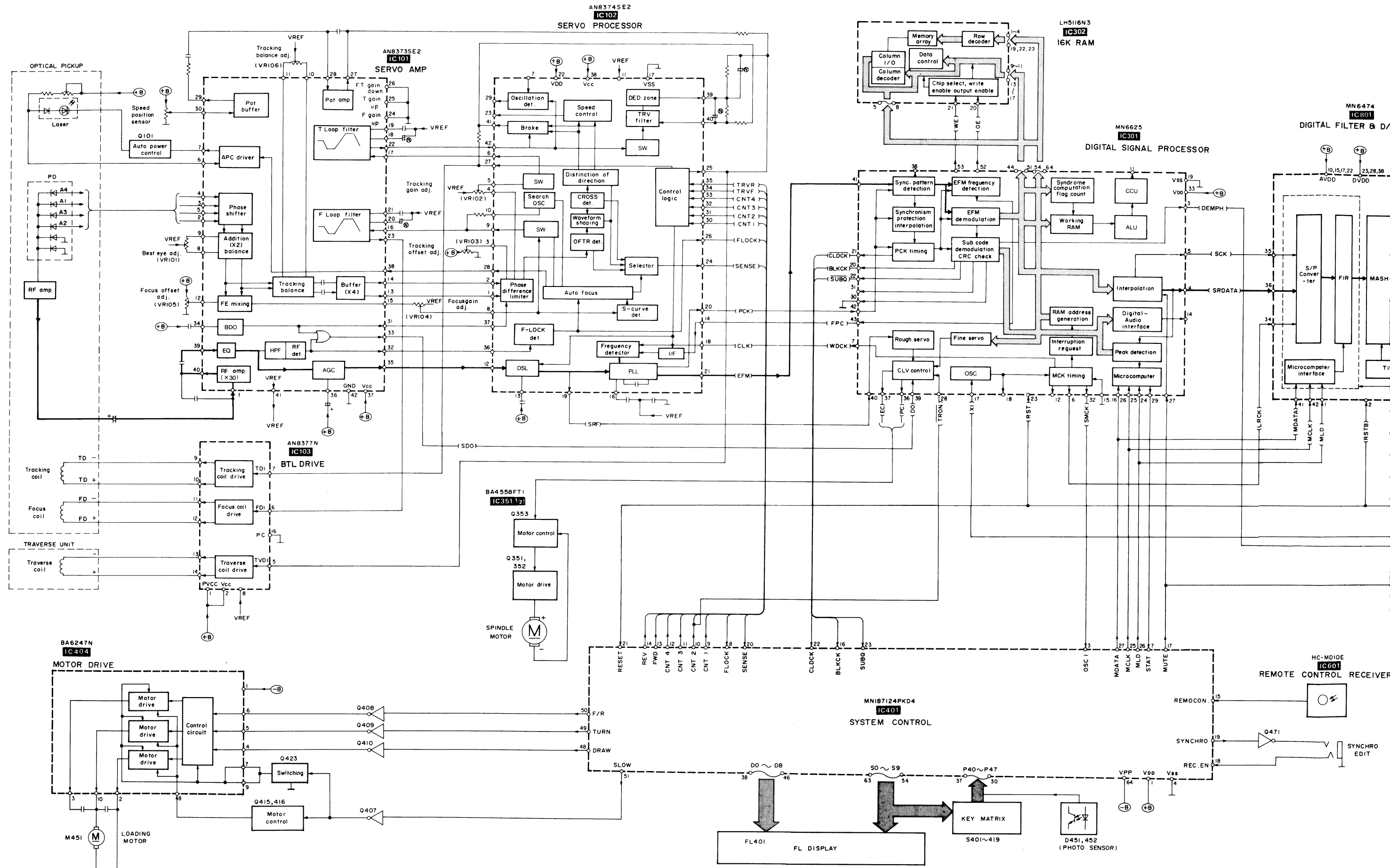
## • IC801 (MN6474): Digital filter &amp; D/A converter

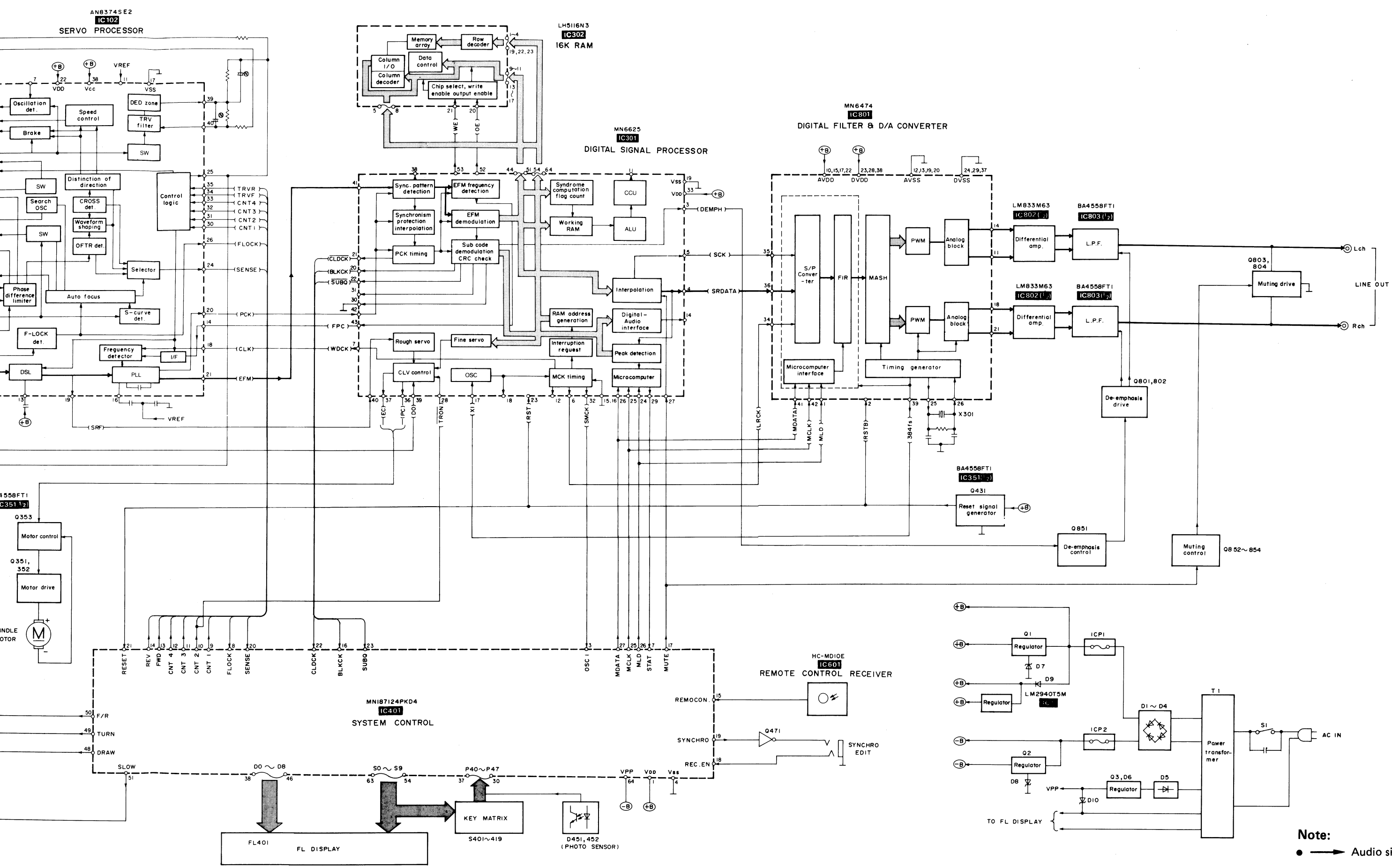
Pin No.	Mark	I/O Division	Function
1	MLD	I	Command load input (load: L)
2	RSTB	I	Reset command
3	IE	I	Not used, connected to GND
4	TP1	O	TEST terminal
5	TP2		
6	TEST1	I	TEST terminal 1 (connected to GND)
7	TEST2	I	TEST terminal 2 (connected to GND)
8	NC	—	Not connected
9			
10	AVDD4	I	Power supply
11	L (-)	O	Lch data output, (-) terminal
12	AVSS4	—	GND terminal
13	AVSS3		
14	L (+)	O	Lch data output, (+) terminal
15	AVDD3	I	Power supply
16	NC	—	Not connected
17	AVDD2	I	Power supply
18	R (+)	O	Rch data output, (+) terminal
19	AVSS2	—	GND terminal (analog system)
20	AVSS1		
21	R (-)	O	Rch data output, (-) terminal
22	AVDD1	I	Power supply

Pin No.	Mark	I/O Division	Function
23	DVDD1	I	Power supply
24	DVSS1	—	GND terminal (digital system)
25	X2	O	Clock output
26	X1	I	Clock input
27	NC	—	Not used, open
28	DVDD2	I	Power supply
29	DVSS2	—	GND terminal (digital system)
30	NSUB	I	Sub-strate terminal (Not used, connected to power supply)
31	768 fs	O	768 fs (33.8688 MHz) (Not used, open)
32	192fs	O	192fs (8.4672 MHz) (Not used, open)
33	LRPOL	—	LR clock selector (Not used, connected to power supply)
34	L/R	I	LR discrimination signal input
35	SRCK	I	Serial bit clock input
36	SRDATA	I	Serial data input (MSB first)
37	DVSS3	—	GND terminal (digital system)
38	DVDD	I	Power supply
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	MLCK	I	Data clock for MDATA



# BLOCK DIAGRAM

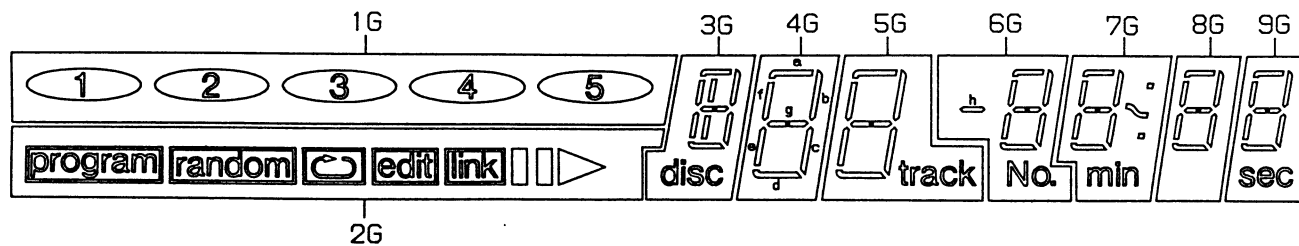




Note:  
 ● → Audio signal

### INTERNAL CONNECTION OF FL

#### Grid connection diagram



#### Anode connection table

	1G	2G	3G	4G	5G	6G	7G	8G	9G
a	-	▶	a	a	a	a	a	a	a
b	5		b	b	b	b	b	b	b
c	4	program	c	c	c	c	c	c	c
d	3	random	d	d	d	d	d	d	d
e	2	↻	e	e	e	e	e	e	e
f	1	edit	f	f	f	f	f	f	f
g	-	link	g	g	g	g	g	g	g
h	-	-	disc	-	track	-	min	-	sec
i	-	-	/	-	-	No.	.	-	-
j	-	-	-	-	-	-	~	-	-

#### Pin connection

PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42		
CONNECTION	F	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1	2	3	4	5	6	7	8	9	j	i	h	g	f	e	d	c	b	a	N	N	F	F	2

Note 1.) NP..... No pin.  
 2.) F1, F2..... Filament  
 3.) 1G~9G..... Grid

### SCHEMATIC DIAGRAM

(Parts list on pages 42, 43, 49 and 50)

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

- S1 : Power switch in "on" position.
- S2 : Voltage selector switch. (For [GC, PX] areas.)
- SW41 : SW block (S410-S418).
- SW42 : SW block (S401-S409).
- S401 : Play (play) switch.
- S402 : Pause (pause) switch.
- S403 : Stop (stop) switch.
- S404, 405 : Skip (skip) switch.  
[S404: F. SKIP, S405: B. SKIP]
- S406 : Program/continue (program/continue) switch.
- S407 ~ 411 : Disc (disc 1 ~ 5) switches.  
[S407: 5, S408: 4, S409: 3, S410: 2, S411: 1]
- S412, 413 : Search (search) switches.  
[S412: F. SEARCH, S413: B. SEARCH]
- S414 : Auto link (auto link) switch.
- S415 : Edit tape length (tape length) switch.
- S416 : Time mode (time mode) switch.
- S417 : Repeat (repeat) switch.
- S418 : Random (random) switch.
- S419 : Disc skip (disc skip) switch.
- S451 : Clamp switch.

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.

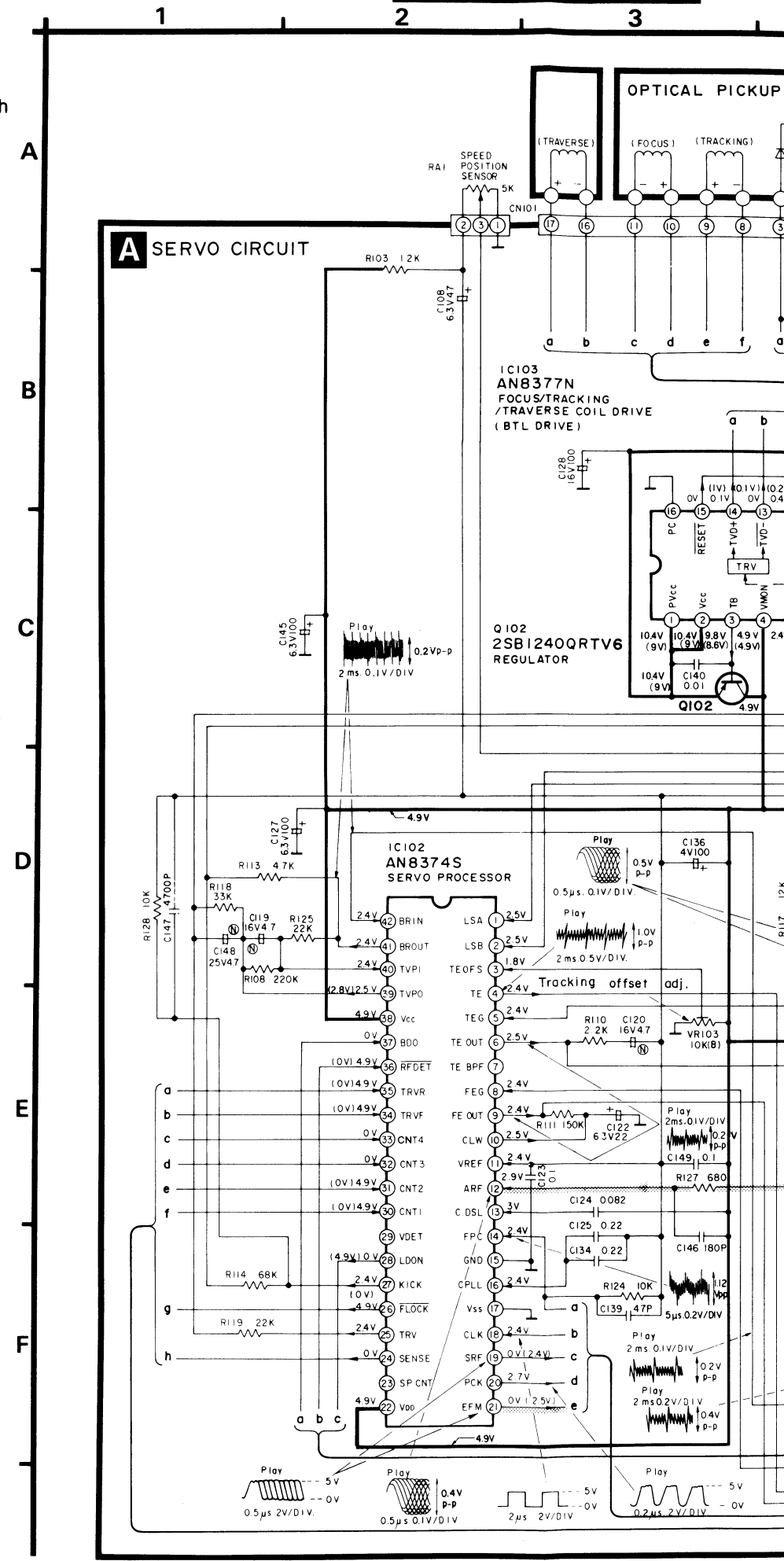
Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.

\* 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 Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

— / — : Positive voltage lines and negative voltage lines.  
 ~ : audio signal lines.

- 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.



# SCHEMATIC DIAGRAM

(Parts list on pages 42, 43, 49 and 50)

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

- S1 : Power switch in "on" position.
- S2 : Voltage selector switch. (For [GC, PX] areas.)
- SW41 : SW block (S410-S418).
- SW42 : SW block (S401-S409).
- S401 : Play (play) switch.
- S402 : Pause (pause) switch.
- S403 : Stop (stop) switch.
- S404, 405 : Skip (skip) switch.  
[S404: F. SKIP, S405: B. SKIP]
- S406 : Program/continue (program/continue) switch.
- S407 ~ 411 : Disc (disc 1 ~ 5) switches.  
[S407: 5, S408: 4, S409: 3,  
S410: 2, S411: 1]
- S412, 413 : Search (search) switches.  
[S412: F. SEARCH, S413: B. SEARCH]
- S414 : Auto link (auto link) switch.
- S415 : Edit tape length (tape length) switch.
- S416 : Time mode (time mode) switch.
- S417 : Repeat (repeat) switch.
- S418 : Random (random) switch.
- S419 : Disc skip (disc skip) switch.
- S451 : Clamp switch.

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.

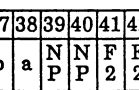
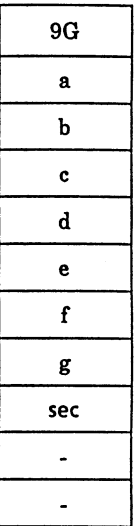
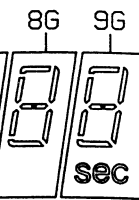
Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.

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

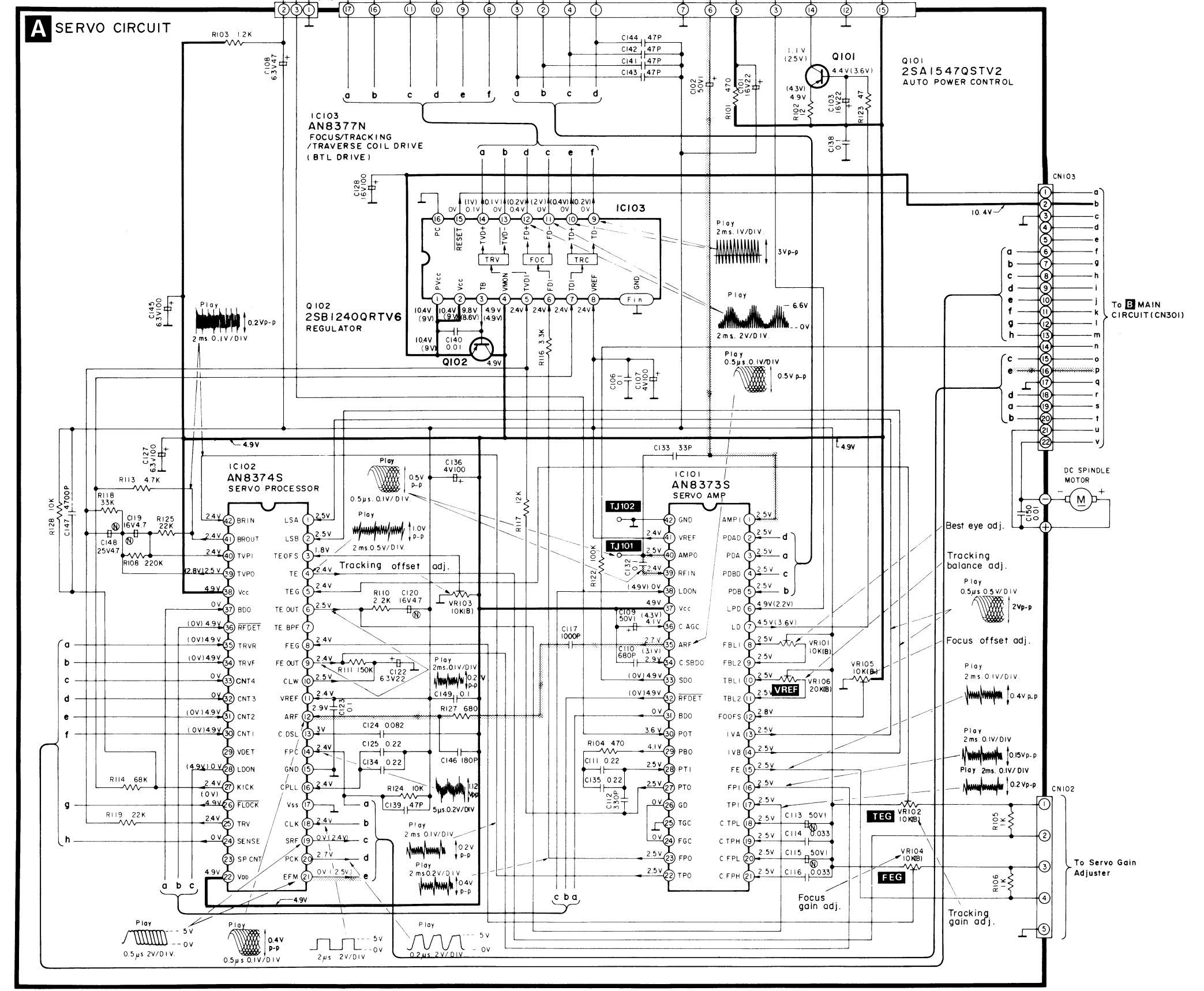
**Important safety notice:**  
Components identified by  $\Delta$  mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

— / — — — — : Positive voltage lines and negative voltage lines.  
~~~~~ : audio signal lines.

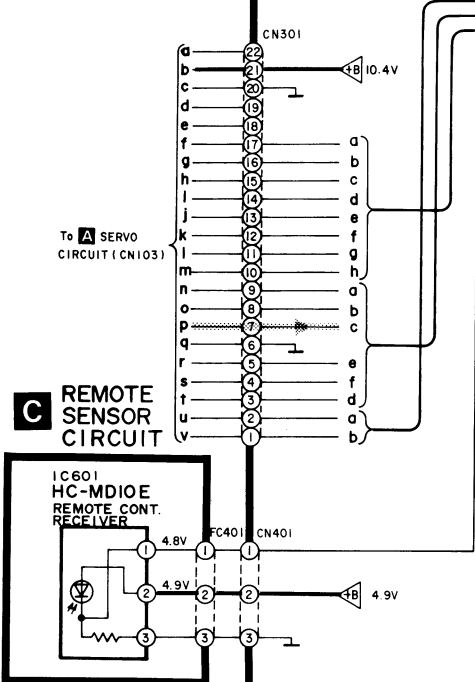
- Caution!**  
IC and LSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with aluminum foil.
  - Ground the soldering iron.
  - Put a conductive mat on the work table.
  - Do not touch the pins of IC or LSI with fingers directly.



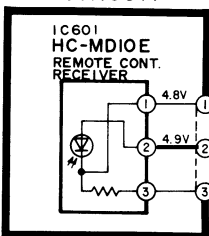
A  
B  
C  
D  
E  
F



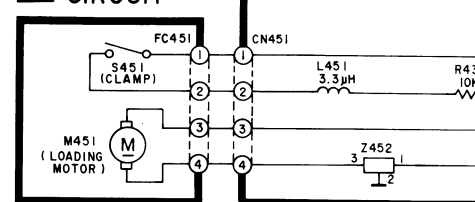
**B MAIN CIRCUIT**



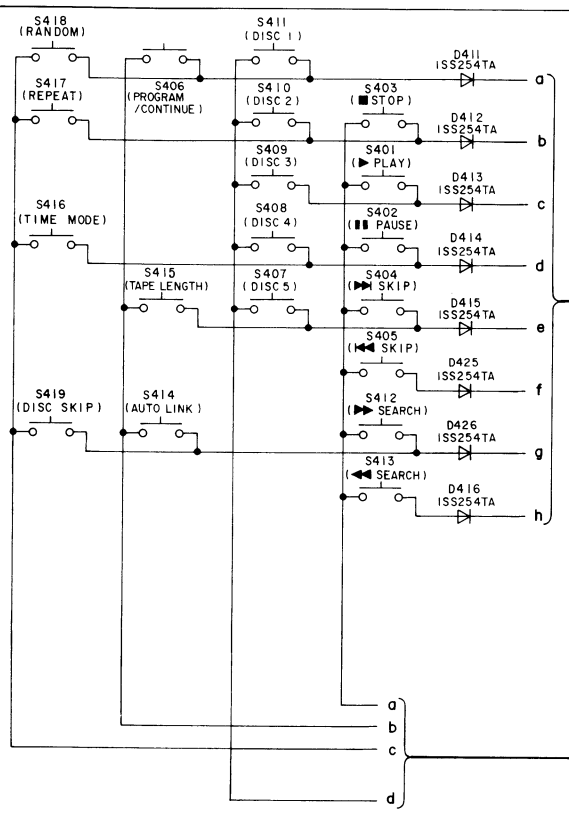
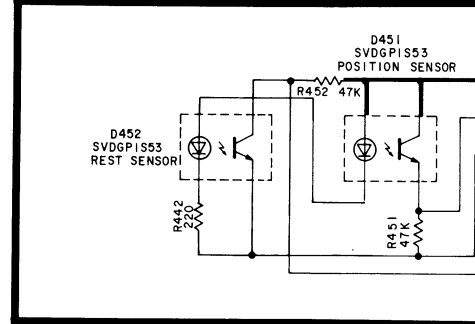
**C REMOTE SENSOR CIRCUIT**



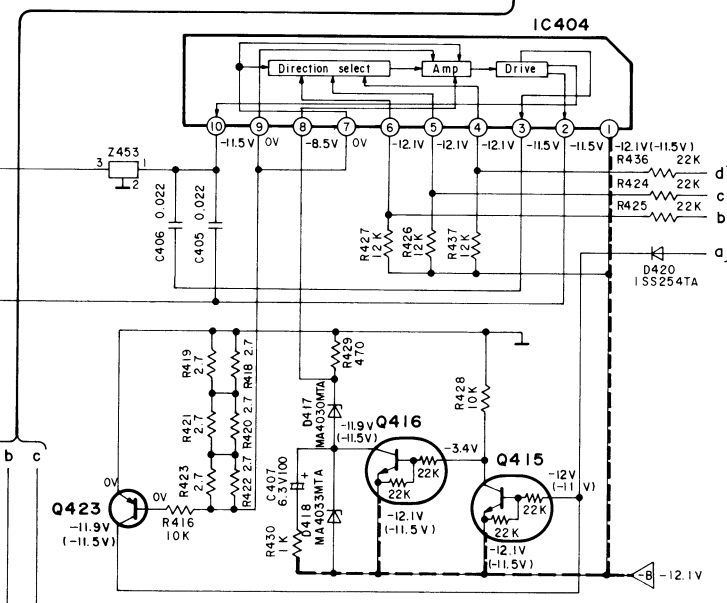
**D MOTOR CIRCUIT**



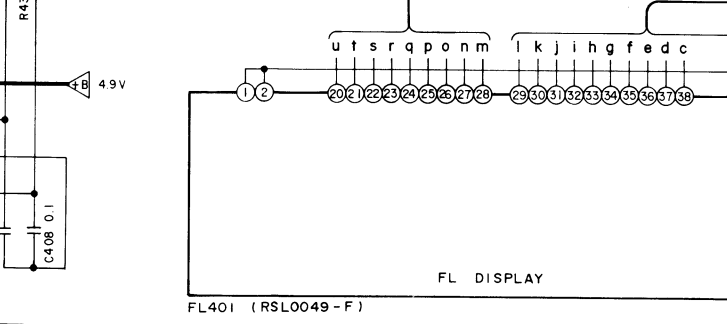
**E SENSOR CIRCUIT**



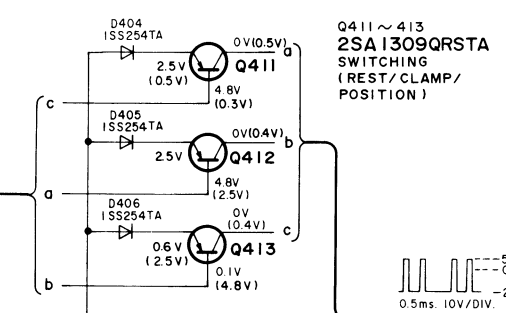
**IC404 BA6247N MOTOR DRIVE**



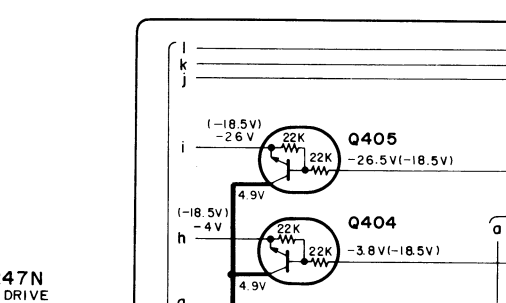
**Q423 2SA1309RSTA SWITCHING UN4212TA SWITCHING**



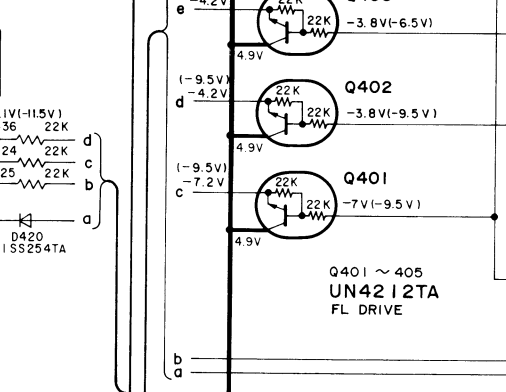
FL401 (RSL0049-F)



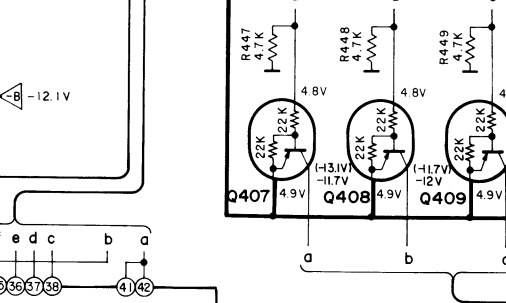
**Q411 ~ 413 2SA1309RSTA SWITCHING (REST/CLAMP/POSITION)**



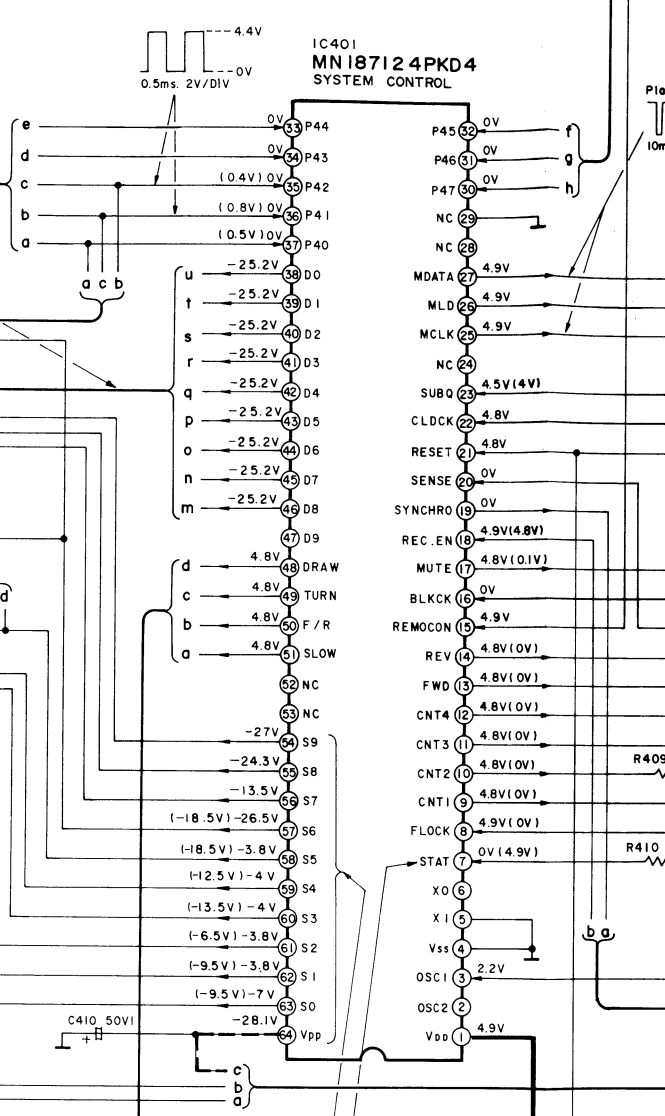
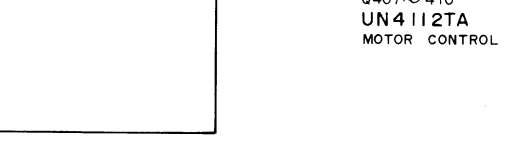
**Q401 ~ 405 2N412TA FL DRIVE**



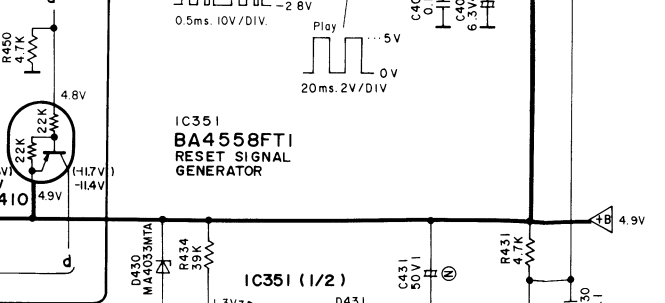
**Q407 ~ 410 UN412TA MOTOR CONTROL**

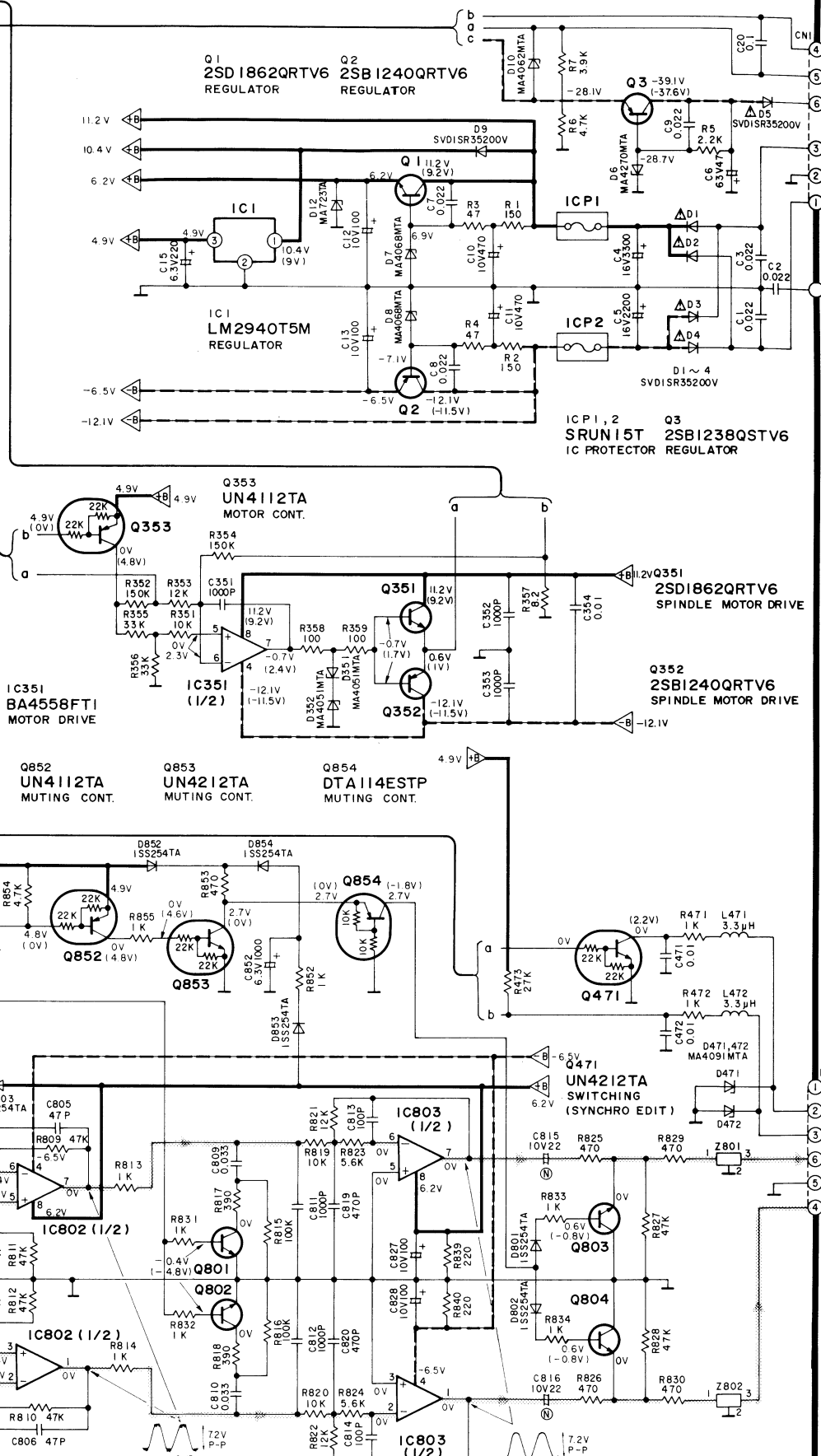
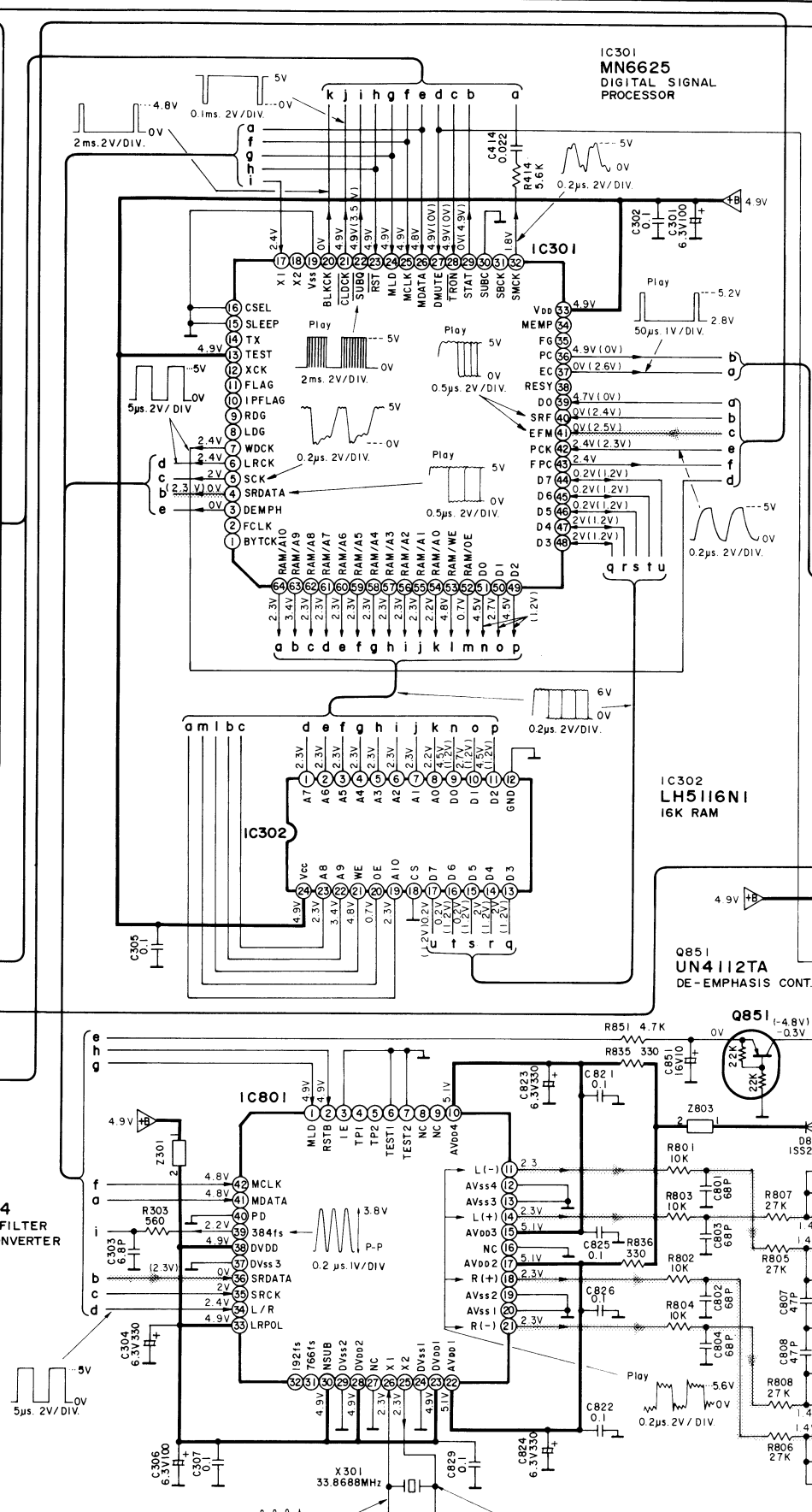
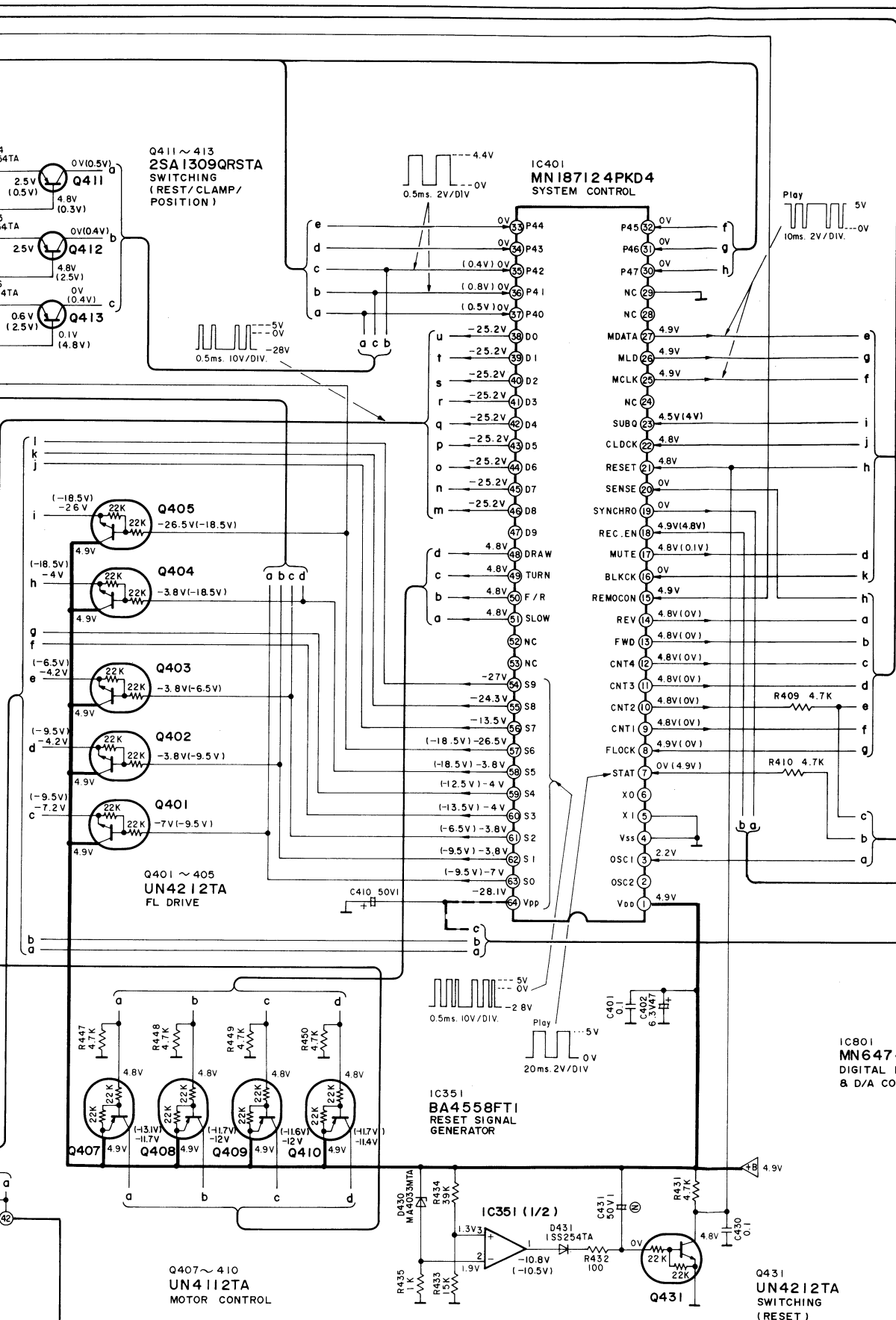


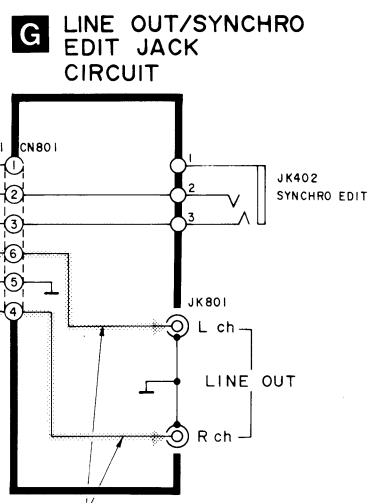
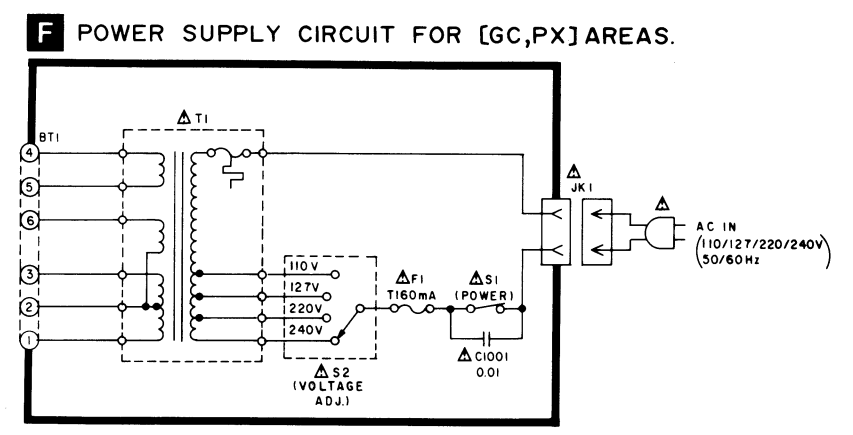
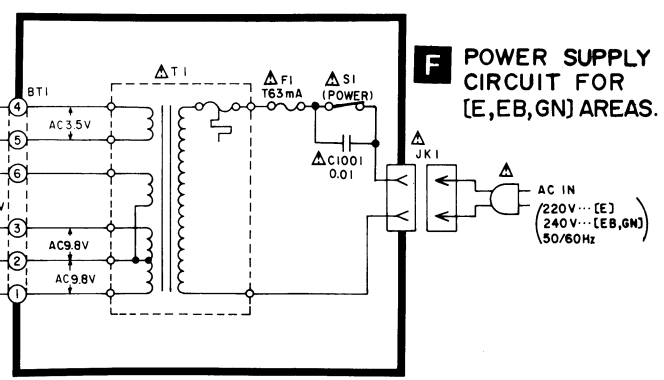
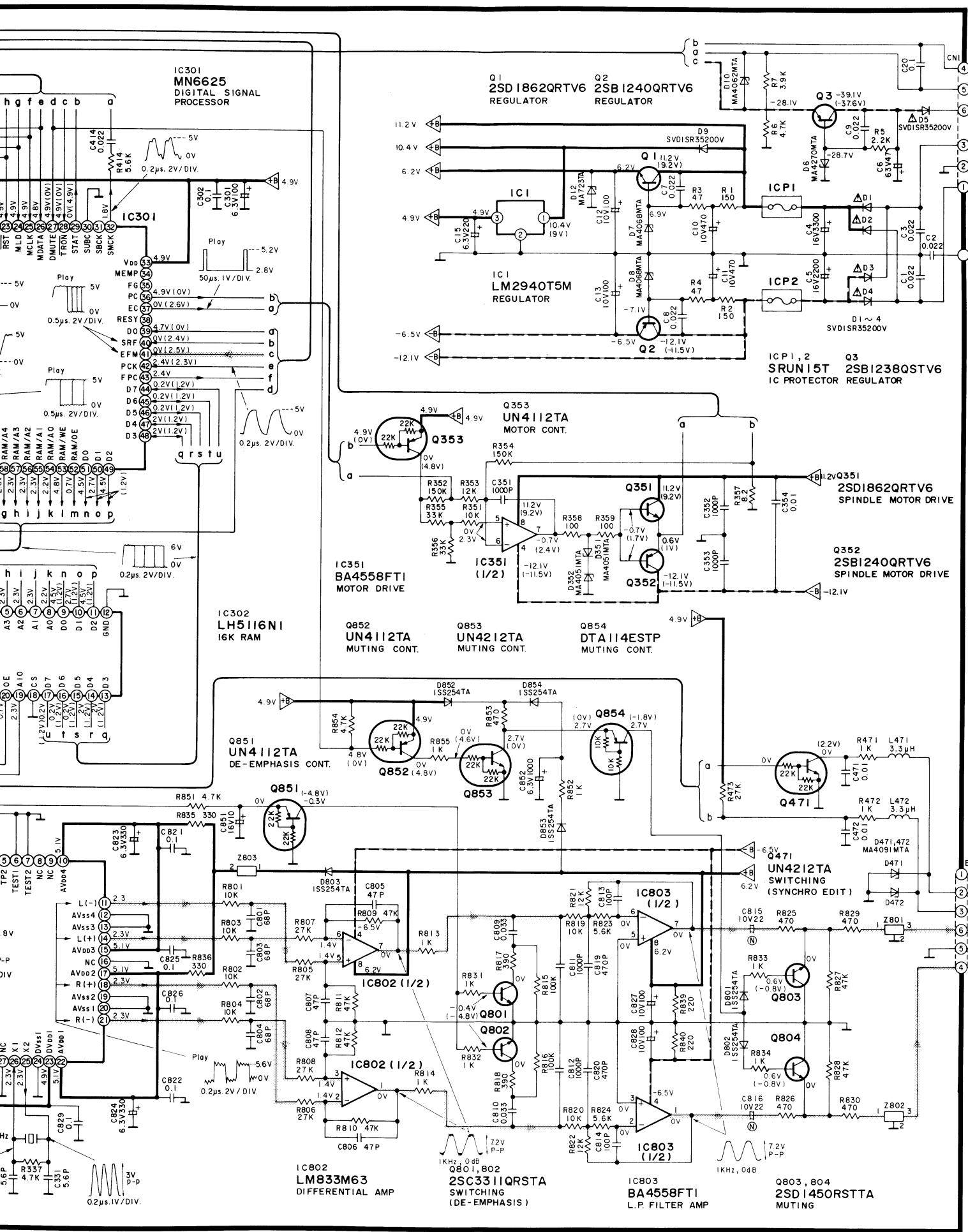
**IC351 BA4558FT1 RESET SIGNAL GENERATOR**



**Q431 UN4212TA SWITCHING (RESET)**





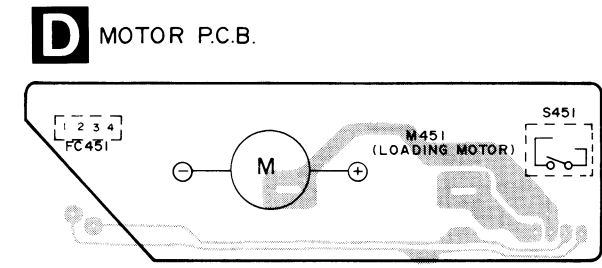
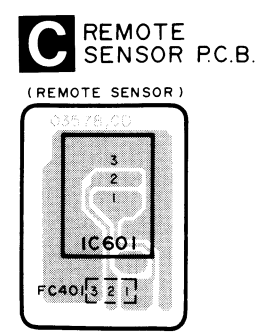
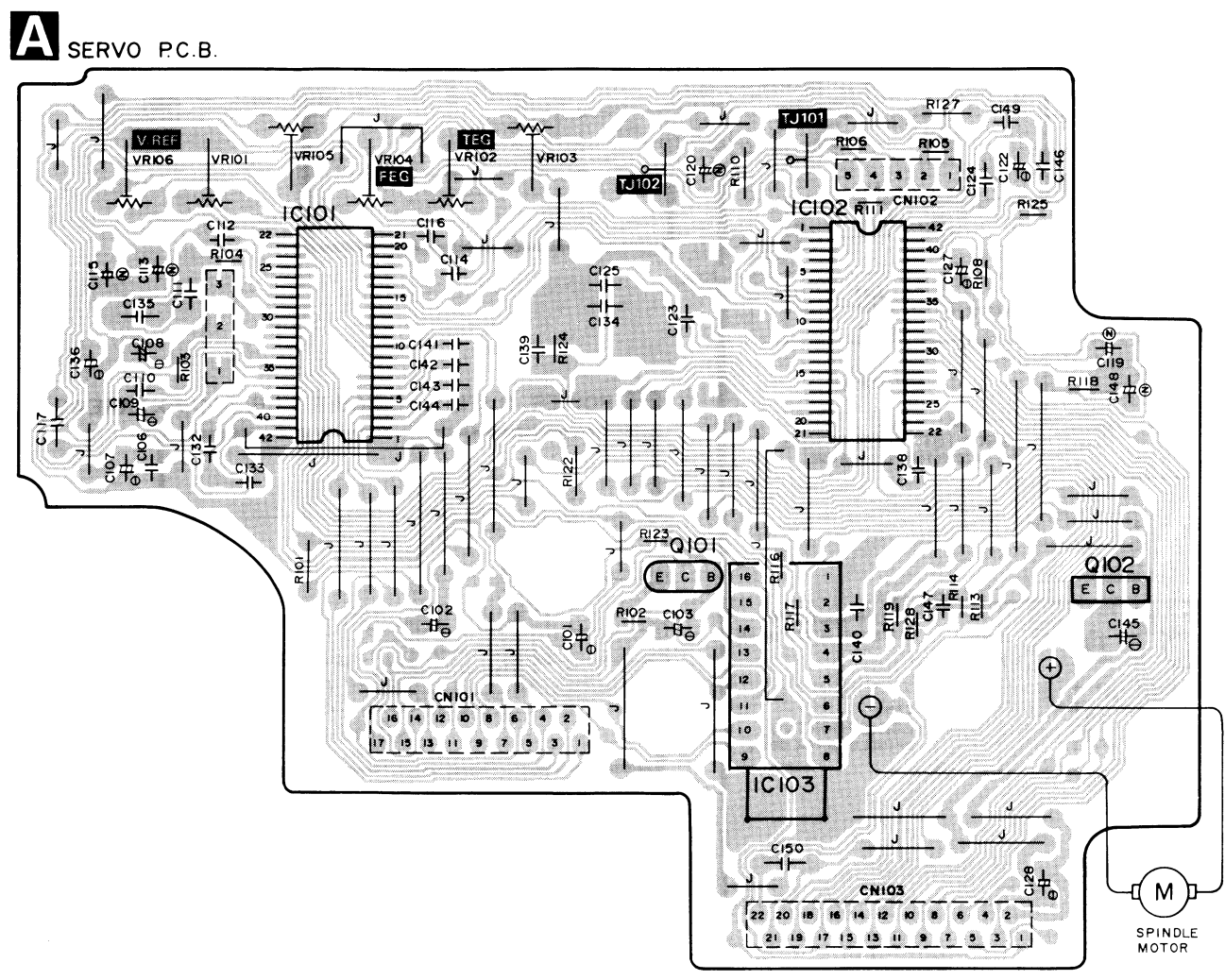


# TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

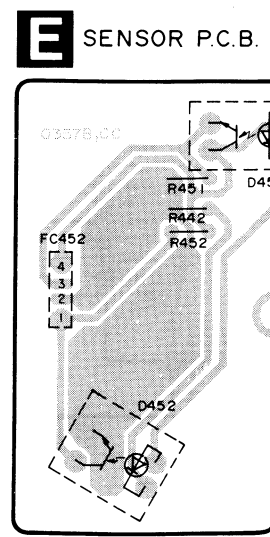
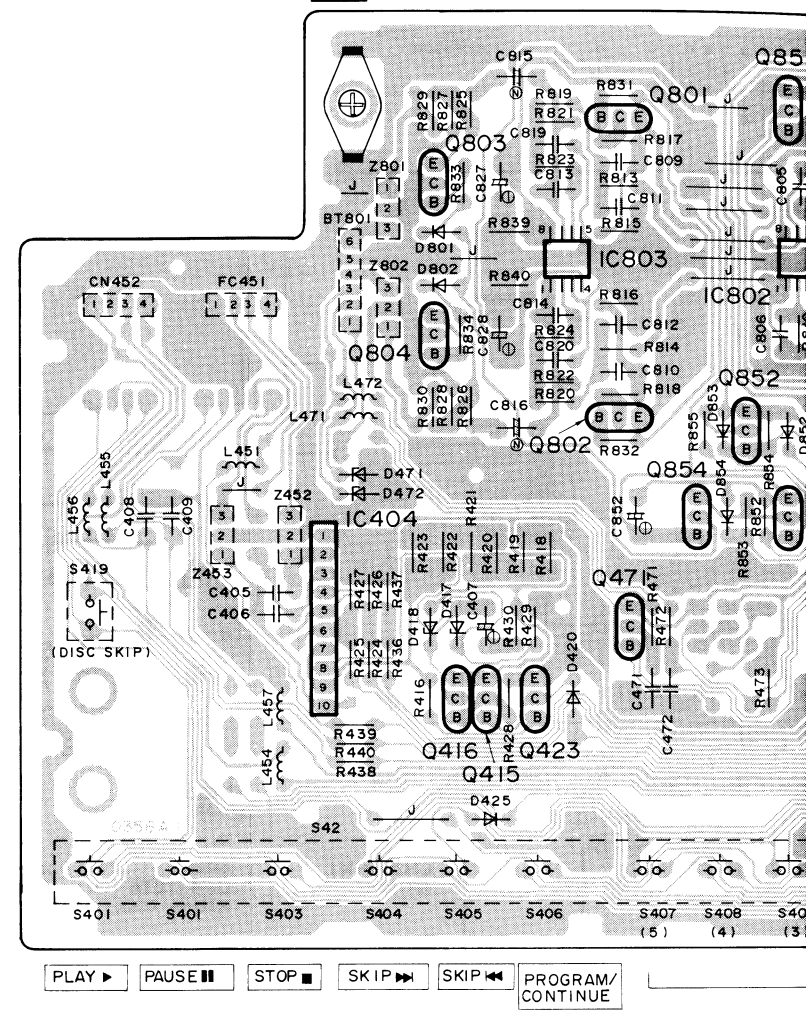
|                                                                |                                                                                                            |                                                                   |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| <b>BA6247N</b> 10 Pin<br>                                      | <b>SVDGP1S53</b><br>                                                                                       | <b>LM2940T5M</b><br><br>1 Vin<br>2 GND<br>3 Vout                  |
| <b>LM833M63</b><br><b>BA4558FTI</b><br><b>LH5116N3</b>         | 8 Pin<br>24 Pin                                                                                            | <b>AN8373S</b><br><b>AN8374S</b><br>42 Pin                        |
| <b>AN8377N</b> 16 Pin<br>                                      | <b>MN6625</b> 64 Pin<br><b>MN6474</b> 42 Pin                                                               | <b>MN187124PKD4</b> 64 Pin<br>                                    |
| <b>SRUN15T</b><br><br>1 Input<br>2 Output                      | <br><b>UN4112TA, DTA114ESTP</b>                                                                            |                                                                   |
| <b>2SD1450RSTTA, 2SC3311QRSTA, 2SA1309QRSTA</b><br>            | <b>UN4212TA</b><br>                                                                                        | <b>2SB1238QSTV6, 2SD1862QRTV6, 2SB1240QRTV6, 2SA1547QSTV2</b><br> |
| <b>SVD1SR35200V, MA723TA, 1SS254TA</b><br><br>Anode<br>Cathode | <br><b>MA4091MTA, MA4030MTA, MA4062MTA, MA4033MTA, MA4051MTA, MA4068MTA, MA4270MTA</b><br>Anode<br>Cathode |                                                                   |

# PRINTED CIRCUIT BOARDS

A  
B  
C  
D  
E  
F  
G

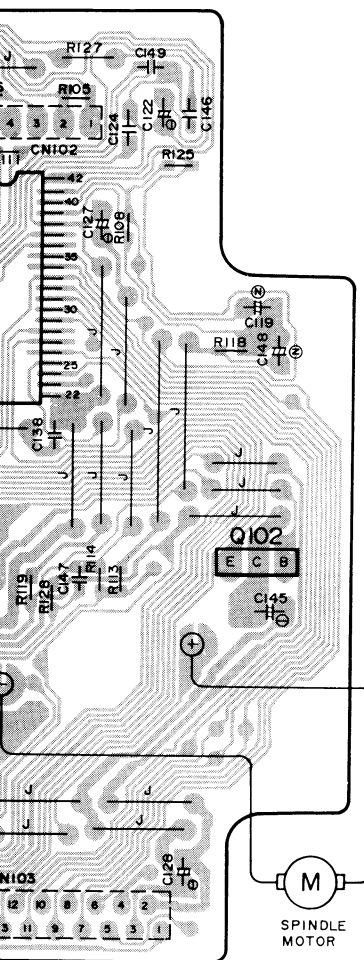
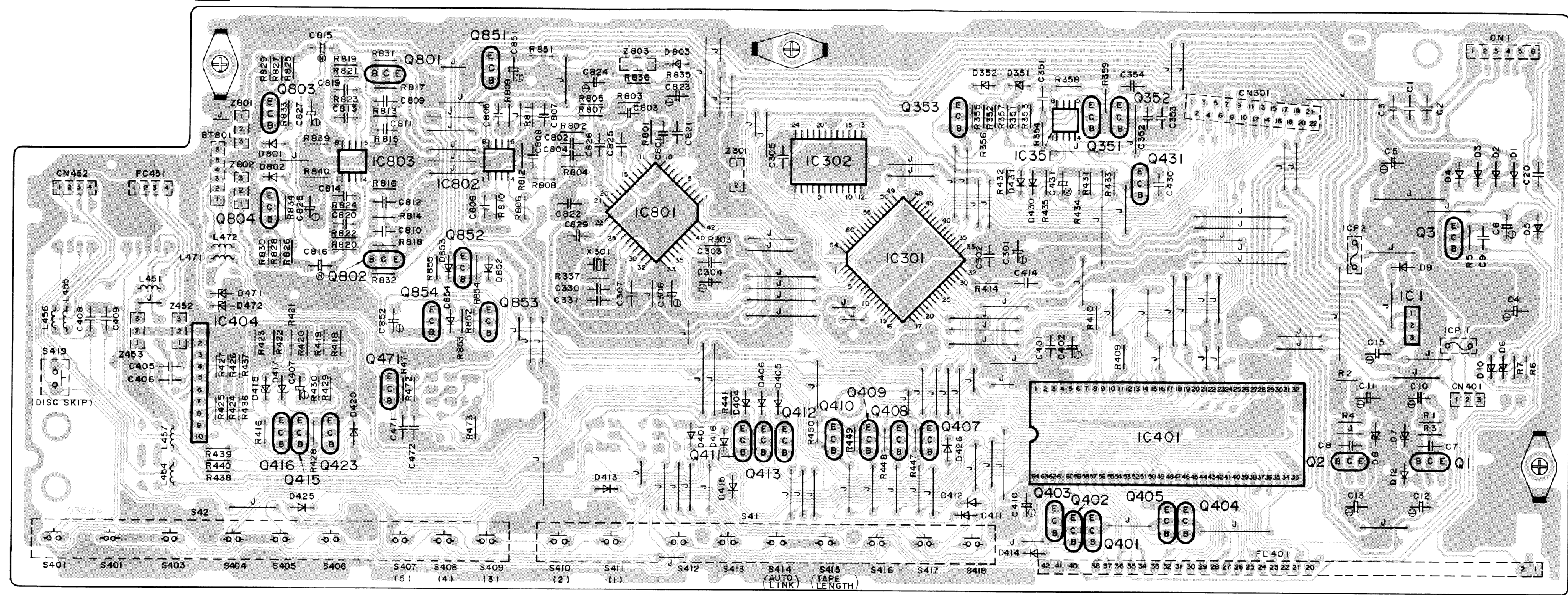


# B MAIN P.C.B.

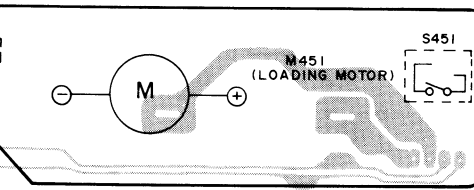




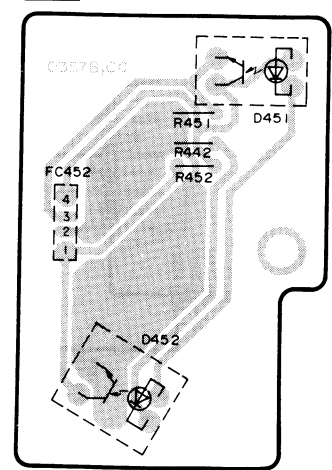
**B** MAIN P.C.B.



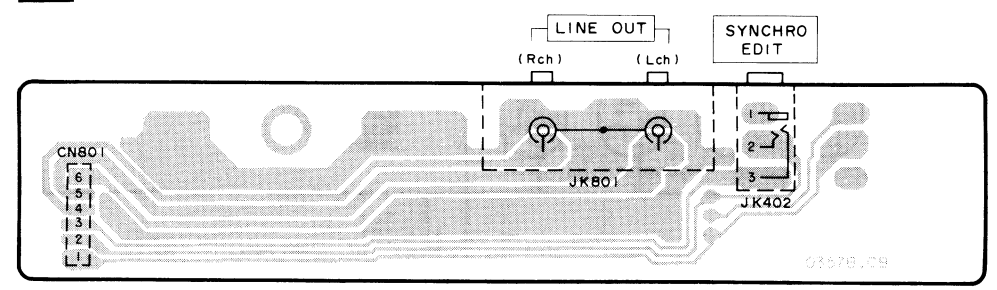
MOTOR P.C.B.

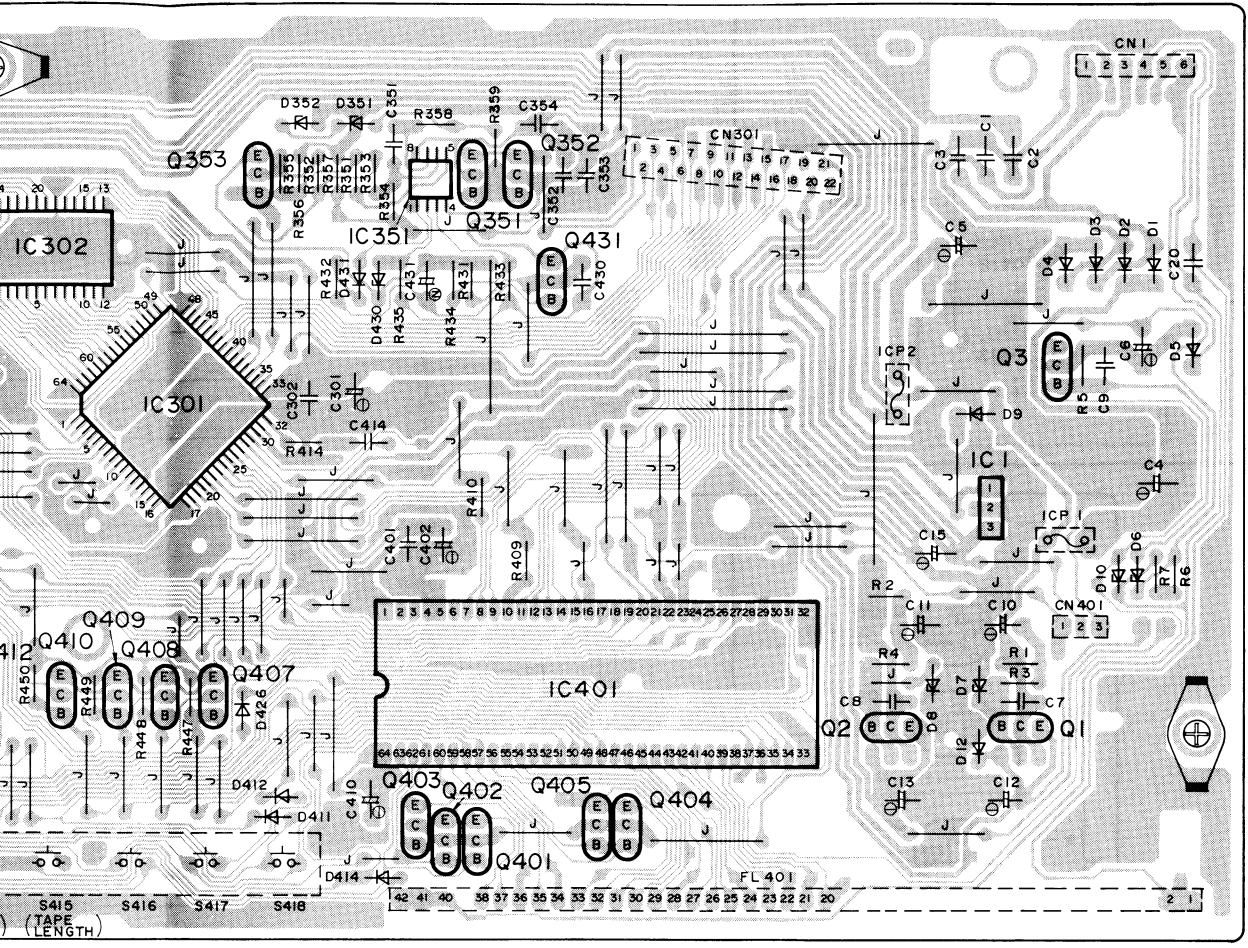


**E** SENSOR P.C.B.

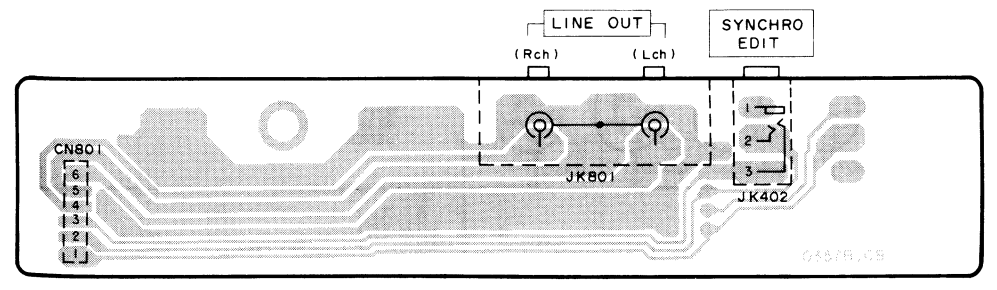


**G** LINE OUT/SYNCHRO EDIT JACK P.C.B.

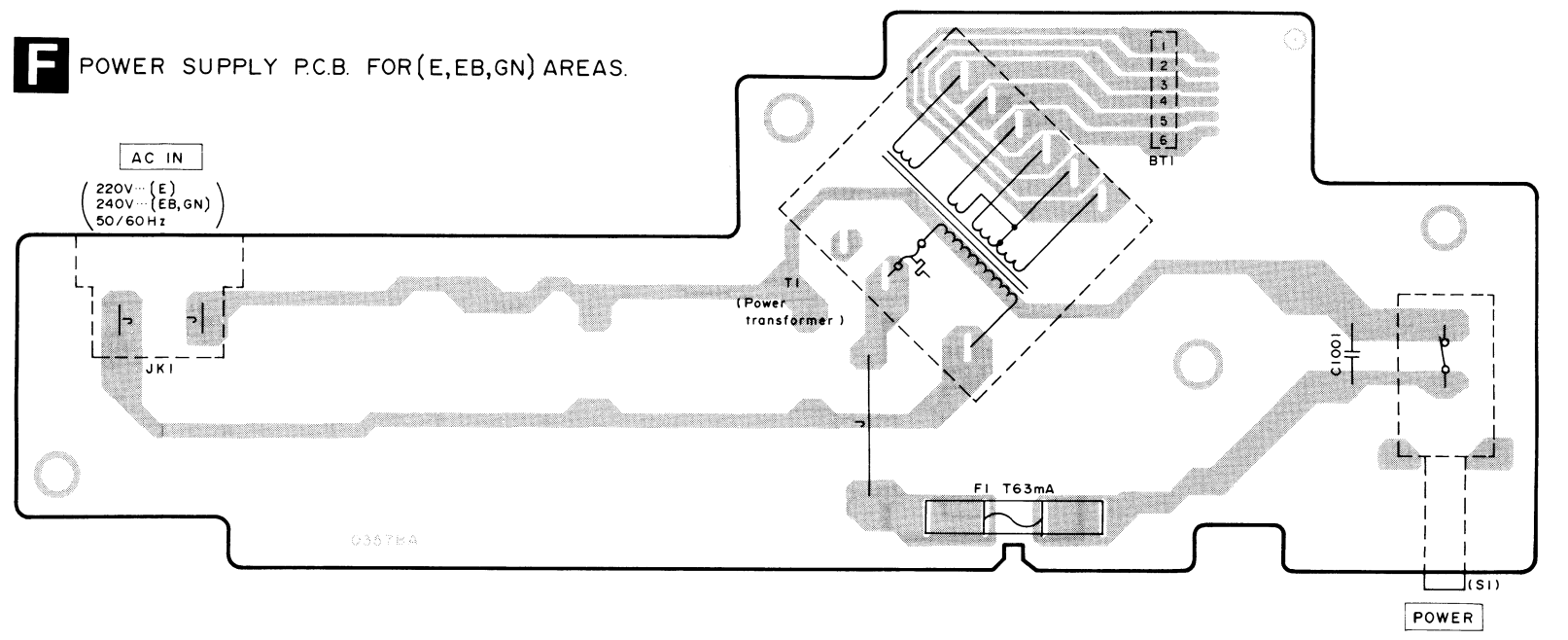




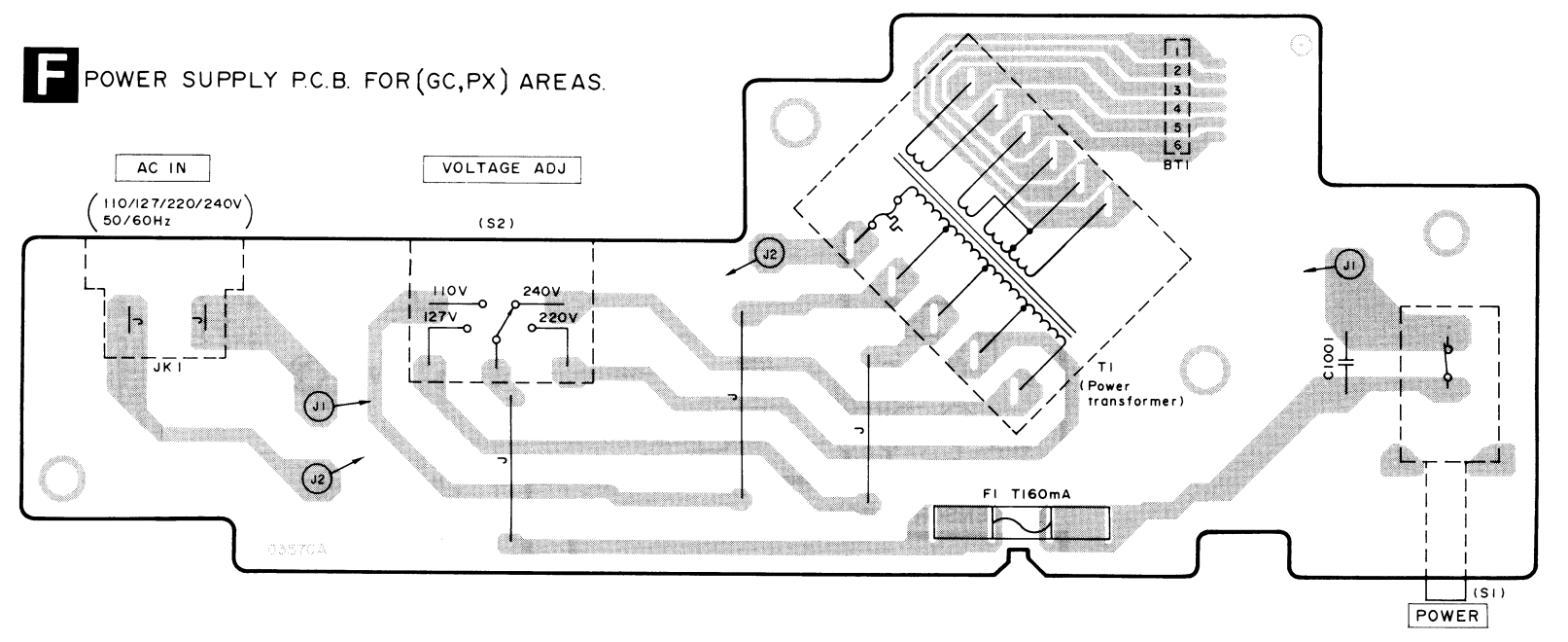
**G** LINE OUT/SYNCHRO EDIT JACK P.C.B.



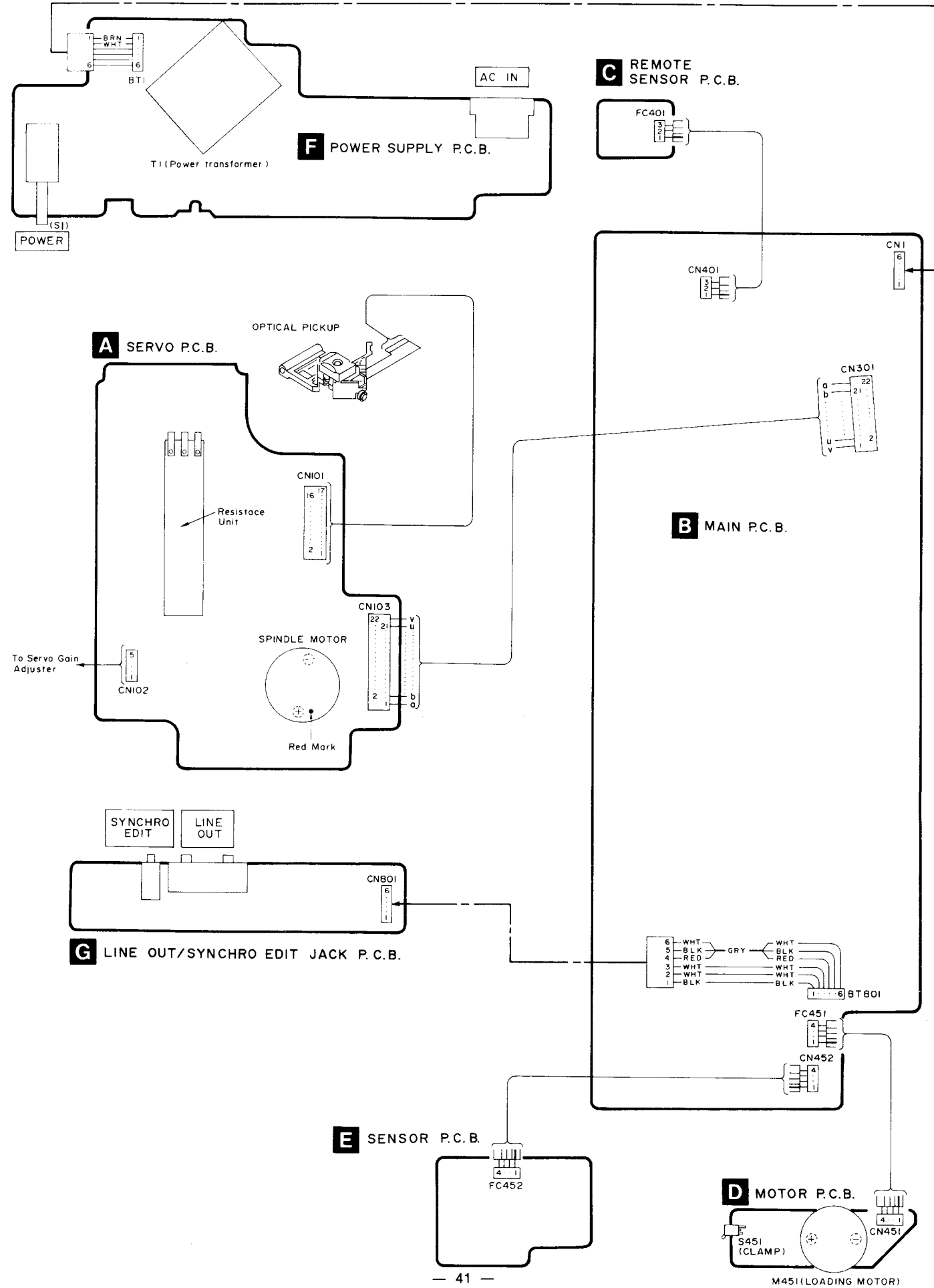
**F** POWER SUPPLY P.C.B. FOR (E,EB,GN) AREAS.



**F** POWER SUPPLY P.C.B. FOR (GC,PX) AREAS.



# WIRING CONNECTION DIAGRAM



# REPLACEMENT PARTS LIST

Notes : \* Important safety notice:  
 Components identified by  $\Delta$  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.  
 \* 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.

| Ref. No.              | Part No.     | Part Name & Description      | Remarks | Ref. No.                 | Part No.     | Part Name & Description | Remarks              |
|-----------------------|--------------|------------------------------|---------|--------------------------|--------------|-------------------------|----------------------|
| INTEGRATED CIRCUIT(S) |              |                              |         | D351, 352                | MA4051MTA    | DIODE                   |                      |
|                       |              |                              |         | D404-406                 | 1SS254TA     | DIODE                   |                      |
|                       |              |                              |         | D411-416                 | 1SS254TA     | DIODE                   |                      |
| IC1                   | LM2940T5     | IC, REGULATOR                |         | D417                     | MA4030MTA    | DIODE                   |                      |
| IC301                 | MN6625       | IC, DIGITAL SIGNAL PROCESSOR |         | D418                     | MA4033TA     | DIODE                   |                      |
| IC302                 | LH5116N3     | IC, 16K RAM                  |         | D420                     | 1SS254TA     | DIODE                   |                      |
| IC351                 | SV1BA4558F   | IC, MOTOR DRIVE&RESET        |         | D425, 426                | 1SS254TA     | DIODE                   |                      |
| IC401                 | MN187124PKD4 | IC, SYSTEM CONTROL           |         | D430                     | MA4033TA     | DIODE                   |                      |
| IC404                 | BA6247N      | IC, MOTOR DRIVE              |         | D431                     | 1SS254TA     | DIODE                   |                      |
| IC601                 | HC-MD10E     | IC, REMOTE CONTROL RECEIVER  |         | D451, 452                | SVDGP1S53    | PHOTO COUPLER           |                      |
| IC801                 | MN6474       | IC, DIF&D/A CONVERTER        |         | D471, 472                | MA4091-M     | DIODE                   |                      |
| IC802                 | LM833M63     | IC, DIFFERENTIAL AMP         |         | D801-803                 | 1SS254TA     | DIODE                   |                      |
| IC803                 | SV1BA4558F   | IC, L. P. F.                 |         | D852-854                 | 1SS254TA     | DIODE                   |                      |
| IC PROTECTOR(S)       |              |                              |         | COMPONENT COMBINATION(S) |              |                         |                      |
| ICP1, 2               | SRUN15       | IC PROTECTOR                 |         | Z301                     | EXCELDR35V   | COMBINATION PART        |                      |
| TRANSISTOR(S)         |              |                              |         | Z452, 453                | DSS36431B102 | COMBINATION PART        |                      |
| Q1                    | 2SD1862QRTV6 | TRANSISTOR                   |         | Z801, 802                | DSS36431B102 | COMBINATION PART        |                      |
| Q2                    | 2SB1240-P    | TRANSISTOR                   |         | Z803                     | EXCELDR35V   | COMBINATION PART        |                      |
| Q3                    | 2SB1238QSTV6 | TRANSISTOR                   |         | COIL(S)                  |              |                         |                      |
| Q351                  | 2SD1862QRTV6 | TRANSISTOR                   |         | L451                     | RLQZP3R3KT-Y | COIL                    |                      |
| Q352                  | 2SB1240-P    | TRANSISTOR                   |         | L454-457                 | RLQZP3R3KT-Y | COIL                    |                      |
| Q353                  | UN4112       | TRANSISTOR                   |         | L471, 472                | RLQZP3R3KT-Y | COIL                    |                      |
| Q401-405              | UN4212TA     | TRANSISTOR                   |         | TRANSFORMER(S)           |              |                         |                      |
| Q407-410              | UN4112       | TRANSISTOR                   |         | T1                       | RTP1K4E007-V | POWER TRANSFORMER       | $\Delta$ (E)         |
| Q411-413              | 2SA1309A-R   | TRANSISTOR                   |         | T1                       | RTP1K4B006-V | POWER TRANSFORMER       | $\Delta$ (EB, GN)    |
| Q415, 416             | UN4212TA     | TRANSISTOR                   |         | T1                       | RTP1K4G002-V | POWER TRANSFORMER       | $\Delta$ (GC, PX)    |
| Q423                  | 2SA1309A-R   | TRANSISTOR                   |         | FUSE(S)                  |              |                         |                      |
| Q431                  | UN4212TA     | TRANSISTOR                   |         | F1                       | XBA2C006TBO  | FUSE, 250V, T63mA       | $\Delta$ (E, EB, GN) |
| Q471                  | UN4212TA     | TRANSISTOR                   |         | F1                       | XBA2C016TBO  | FUSE, 250V, T160mA      | $\Delta$ (GC, PX)    |
| Q801, 802             | 2SC3311A-Q   | TRANSISTOR                   |         | OSCILLATOR(S)            |              |                         |                      |
| Q803, 804             | 2SD1450RTA   | TRANSISTOR                   |         | X301                     | SVQ49U338S   | OSCILLATOR              |                      |
| Q851, 852             | UN4112       | TRANSISTOR                   |         | DIODE(S)                 |              |                         |                      |
| Q853                  | UN4212TA     | TRANSISTOR                   |         | D1-5                     | SVD1SR35200A | DIODE                   | $\Delta$             |
| Q854                  | DTA114ESTP   | TRANSISTOR                   |         | D6                       | MA4270       | DIODE                   |                      |
|                       |              |                              |         | D7, 8                    | MA4068M      | DIODE                   |                      |
|                       |              |                              |         | D9                       | SVD1SR35200A | DIODE                   |                      |
|                       |              |                              |         | D10                      | MA4062MTA    | DIODE                   |                      |
|                       |              |                              |         | D12                      | MA723TA      | DIODE                   |                      |
|                       |              |                              |         | FL401                    | RSL0049-F    | DISPLAY TUBE            |                      |
|                       |              |                              |         | SWITCH(ES)               |              |                         |                      |

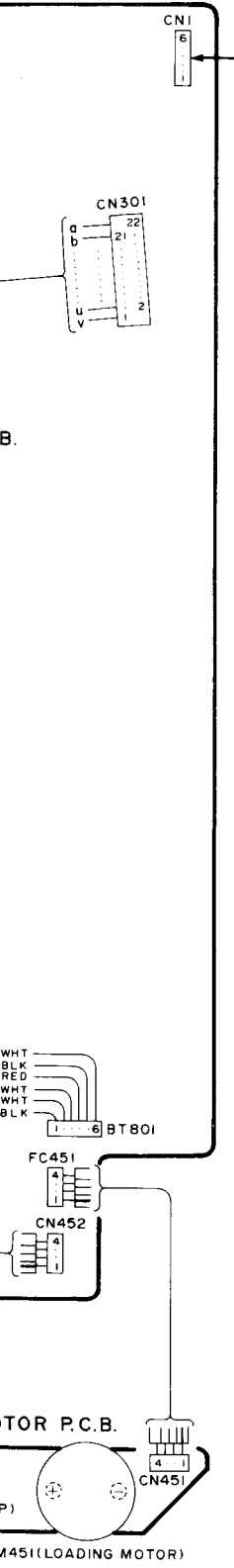
| Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|----------|-------------------------|---------|
| S1       |          |                         |         |
| S2       |          |                         |         |
| S419     |          |                         |         |
| S451     |          |                         |         |
| SW41     |          |                         |         |
| SW42     |          |                         |         |
| BT1      |          |                         |         |
| BT801    |          |                         |         |
| CN1      |          |                         |         |
| CN301    |          |                         |         |
| CN401    |          |                         |         |
| CN451    |          |                         |         |
| CN452    |          |                         |         |
| CN801    |          |                         |         |
| FC401    |          |                         |         |
| FC451    |          |                         |         |
| FC452    |          |                         |         |
| K401     |          |                         |         |
| JK1      |          |                         |         |
| JK1      |          |                         |         |
| JK402    |          |                         |         |
| JK801    |          |                         |         |
| IC101    |          |                         |         |
| IC102    |          |                         |         |
| IC103    |          |                         |         |
| Q101     |          |                         |         |
| Q102     |          |                         |         |
| VR101    |          |                         |         |
| VR102    |          |                         |         |

# REPLACEMENT PARTS LIST

Notes : \* Important safety notice:  
 Components identified by  $\Delta$  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.  
 \* 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.

| Ref. No.  | Part No.     | Part Name & Description      | Remarks  | Ref. No.  | Part No.     | Part Name & Description  | Remarks              |
|-----------|--------------|------------------------------|----------|-----------|--------------|--------------------------|----------------------|
|           |              | INTEGRATED CIRCUIT(S)        |          | D351, 352 | MA4051MTA    | DIODE                    |                      |
|           |              |                              |          | D404-406  | 1SS254TA     | DIODE                    |                      |
|           |              |                              |          | D411-416  | 1SS254TA     | DIODE                    |                      |
| IC1       | LM2940T5     | IC, REGULATOR                |          | D417      | MA4030MTA    | DIODE                    |                      |
| IC301     | MN6625       | IC, DIGITAL SIGNAL PROCESSOR |          | D418      | MA4033TA     | DIODE                    |                      |
| IC302     | LH5116N3     | IC, 16K RAM                  |          | D420      | 1SS254TA     | DIODE                    |                      |
| IC351     | SVIBA4558F   | IC, MOTOR DRIVE&RESET        |          | D425, 426 | 1SS254TA     | DIODE                    |                      |
| IC401     | MN187124PKD4 | IC, SYSTEM CONTROL           |          | D430      | MA4033TA     | DIODE                    |                      |
| IC404     | BA6247N      | IC, MOTOR DRIVE              |          | D431      | 1SS254TA     | DIODE                    |                      |
| IC601     | HC-MD10E     | IC, REMOTE CONTROL RECEIVER  |          | D451, 452 | SYDGP1S53    | PHOTO COUPLER            |                      |
| IC801     | MN6474       | IC, DIF&D/A CONVERTER        |          | D471, 472 | MA4091-M     | DIODE                    |                      |
| IC802     | LM833M63     | IC, DIFFERENTIAL AMP         |          | D801-803  | 1SS254TA     | DIODE                    |                      |
| IC803     | SVIBA4558F   | IC, L. P. F.                 |          | D852-854  | 1SS254TA     | DIODE                    |                      |
|           |              | IC PROTECTOR(S)              |          |           |              | COMPONENT COMBINATION(S) |                      |
| ICP1, 2   | SRUN15       | IC PROTECTOR                 |          | Z301      | EXCELDR35V   | COMBINATION PART         |                      |
|           |              | TRANSISTOR(S)                |          | Z452, 453 | DSS36431B102 | COMBINATION PART         |                      |
|           |              |                              |          | Z801, 802 | DSS36431B102 | COMBINATION PART         |                      |
|           |              |                              |          | Z803      | EXCELDR35V   | COMBINATION PART         |                      |
| Q1        | 2SD1862QRTV6 | TRANSISTOR                   |          |           |              | COIL(S)                  |                      |
| Q2        | 2SB1240-P    | TRANSISTOR                   |          |           |              |                          |                      |
| Q3        | 2SB1238QSTV6 | TRANSISTOR                   |          | L451      | RLQZP3R3KT-Y | COIL                     |                      |
| Q351      | 2SD1862QRTV6 | TRANSISTOR                   |          | L454-457  | RLQZP3R3KT-Y | COIL                     |                      |
| Q352      | 2SB1240-P    | TRANSISTOR                   |          | L471, 472 | RLQZP3R3KT-Y | COIL                     |                      |
| Q353      | UN4112       | TRANSISTOR                   |          |           |              | TRANSFORMER(S)           |                      |
| Q401-405  | UN4212TA     | TRANSISTOR                   |          |           |              |                          |                      |
| Q407-410  | UN4112       | TRANSISTOR                   |          | T1        | RTP1K4E007-V | POWER TRANSFORMER        | $\Delta$ (E)         |
| Q411-413  | 2SA1309A-R   | TRANSISTOR                   |          | T1        | RTP1K4B006-V | POWER TRANSFORMER        | $\Delta$ (EB, GN)    |
| Q415, 416 | UN4212TA     | TRANSISTOR                   |          | T1        | RTP1K4G002-V | POWER TRANSFORMER        | $\Delta$ (GC, PX)    |
| Q423      | 2SA1309A-R   | TRANSISTOR                   |          |           |              | FUSE(S)                  |                      |
| Q431      | UN4212TA     | TRANSISTOR                   |          |           |              |                          |                      |
| Q471      | UN4212TA     | TRANSISTOR                   |          |           |              | OSCILLATOR(S)            |                      |
| Q801, 802 | 2SC331A-Q    | TRANSISTOR                   |          |           |              |                          |                      |
| Q803, 804 | 2SD1450RTA   | TRANSISTOR                   |          | F1        | XBA2C006TB0  | FUSE, 250V T63mA         | $\Delta$ (E, EB, GN) |
| Q851, 852 | UN4112       | TRANSISTOR                   |          | F1        | XBA2C016TB0  | FUSE, 250V, T160mA       | $\Delta$ (GC, PX)    |
| Q853      | UN4212TA     | TRANSISTOR                   |          |           |              |                          |                      |
| Q854      | DTA114ESTP   | TRANSISTOR                   |          |           |              | OSCILLATOR               |                      |
|           |              | DIODE(S)                     |          | X301      | SVQ49U338S   | OSCILLATOR               |                      |
| D1-5      | SVD1SR35200A | DIODE                        | $\Delta$ |           |              | DISPLAY TUBE             |                      |
| D6        | MA4270       | DIODE                        |          |           |              |                          |                      |
| D7, 8     | MA4068M      | DIODE                        |          | FL401     | RSL0049-F    | DISPLAY TUBE             |                      |
| D9        | SVD1SR35200A | DIODE                        |          |           |              | SWITCH(ES)               |                      |
| D10       | MA4062MTA    | DIODE                        |          |           |              |                          |                      |
| D12       | MA723TA      | DIODE                        |          |           |              |                          |                      |

| Ref. No. | Part No.     | Part Name & Description  | Remarks                  | Ref. No. | Part No.     | Part Name & Description     | Remarks |
|----------|--------------|--------------------------|--------------------------|----------|--------------|-----------------------------|---------|
|          |              |                          |                          | VR103    | EVND3AA00B14 | V. R, TRACKING OFFSET ADJ.  |         |
| S1       | ESB8249V     | SW, POWER                | $\Delta$                 | VR104    | EVND3AA00B14 | V. R, FOCUS GAIN ADJ.       |         |
| S2       | SSR187-1     | SW, VOLTAGE SELECTOR     | $\Delta$ (GC, PX)        | VR105    | EVND3AA00B14 | V. R, FOCUS OFFSET ADJ.     |         |
| S419     | EVQ21405R    | SW, DISK SKIP            |                          | VR106    | EVND3AA00B24 | V. R, TRACKING BALANCE ADJ. |         |
| S451     | SSPD12       | SW, CLAMP                |                          |          |              | MAGNET RESISTOR ELEMENTS    |         |
| SW41     | RMNO067      | SWITCH BLOCK(9) S410-418 |                          |          |              |                             |         |
| SW42     | RMNO068      | SWITCH BLOCK(9) S401-409 |                          |          |              |                             |         |
|          |              | CABLE(S)                 |                          | RA1      | EWS7M0A00Q53 | RESISTANCE UNIT             |         |
|          |              |                          |                          |          |              |                             |         |
| BT1      | REX0165      | FLAT CABLE               |                          |          |              |                             |         |
| BT801    | REX0194      | FLAT CABLE               |                          |          |              |                             |         |
|          |              | CONNECTOR(S)             |                          |          |              |                             |         |
|          |              |                          |                          |          |              |                             |         |
| CN1      | EMCS0660MT6  | CONNECTOR(6P)            |                          |          |              |                             |         |
| CN301    | SJSD2221     | CONNECTOR(22P)           |                          |          |              |                             |         |
| CN401    | SJSD0305     | CONNECTOR(3P)            |                          |          |              |                             |         |
| CN451    | RJSAT7ZA     | CONNECTOR(4P)            |                          |          |              |                             |         |
| CN452    | SJSD0405     | CONNECTOR(4P)            |                          |          |              |                             |         |
| CN801    | RJP6G28ZA    | CONNECTOR(6P)            |                          |          |              |                             |         |
| FC401    | REZ0222      | FLAT CABLE               |                          |          |              |                             |         |
| FC451    | REX0029-1    | FLAT CABLE               |                          |          |              |                             |         |
| FC452    | REZ0011      | FLAT CABLE               |                          |          |              |                             |         |
|          |              | HOLDER                   |                          |          |              |                             |         |
|          |              |                          |                          |          |              |                             |         |
| K401     | RMNO014-1    | FL HOLDER                |                          |          |              |                             |         |
|          |              | JACKS                    |                          |          |              |                             |         |
|          |              |                          |                          |          |              |                             |         |
| JK1      | SJS9236      | AC INLET                 | $\Delta$ (E, EB, GC, PX) |          |              |                             |         |
| JK1      | SJSD16       | AC INLET                 | $\Delta$ (GN)            |          |              |                             |         |
| JK402    | RJJ33T01     | SYNCHRO EDIT             |                          |          |              |                             |         |
| JK801    | RJH3201N     | LINE OUT                 |                          |          |              |                             |         |
|          |              | <SERVO P. C. B>          |                          |          |              |                             |         |
|          |              | INTEGRATED CIRCUITS      |                          |          |              |                             |         |
|          |              |                          |                          |          |              |                             |         |
| IC101    | AN8373S      | IC, SERVO AMP            |                          |          |              |                             |         |
| IC102    | AN8374S      | IC, SERVO PROCESSOR      |                          |          |              |                             |         |
| IC103    | AN8377N      | IC, B. T. L. DRIVE       |                          |          |              |                             |         |
|          |              | TRANSISTORS              |                          |          |              |                             |         |
|          |              |                          |                          |          |              |                             |         |
| Q101     | 2SA1547QSTV2 | TRANSISTOR               |                          |          |              |                             |         |
| Q102     | 2SB1240-P    | TRANSISTOR               |                          |          |              |                             |         |
|          |              | VARIABLE RESISTORS       |                          |          |              |                             |         |
|          |              |                          |                          |          |              |                             |         |
| VR101    | EVND3AA00B14 | V. R, BEST EYE ADJ.      |                          |          |              |                             |         |
| VR102    | EVND3AA00B14 | V. R, TRACKING GAIN ADJ. |                          |          |              |                             |         |



| Ref. No. | Part No.     | Part Name & Description      | Remarks  | Ref. No. | Part No.     | Part Name & Description | Remarks |
|----------|--------------|------------------------------|----------|----------|--------------|-------------------------|---------|
|          |              | CABINET AND CHASSIS          |          | 47       | RDK0009      | ELEVATOR CAM            |         |
| 1        | RKC0002      | HINGE                        |          | 48       | RMC0007      | CONTROL SPRING          |         |
| 2        | RE20218      | FLAT CABLE (22P)             |          | 49       | RMQ0155      | GUIDE SHAFT BASE        |         |
| 3        | RGK0060      | FOOT                         |          | 50       | RXK0086      | MECH. CHASSIS ASS'Y     |         |
| 4        | RFKRLPC25E-K | CABINET ASS'Y                | (E)      | 51       | RXL0009      | MAIN ARM ASS'Y          |         |
| 4        | RFKRLPC25EBK | CABINET ASS'Y                | (EB, GN) | 51-1     | RDG0036      | COMPONENT GEAR          |         |
| 4        | RFKRLPC25GCK | CABINET ASS'Y                | (GC)     | 51-2     | RMB0036-1    | SPRING                  |         |
| 4        | RFKRLPC25PXX | CABINET ASS'Y                | (PX)     | 51-3     | RXL0010      | MAIN ARM                |         |
| 5        | RGQ0012A     | CLAMP COVER                  |          | 51-4     | SHWD27       | WASHER                  |         |
| 6        | RGTO001      | ROTARY TRAY                  |          | 52       | RMK0029-2    | SW INSTALLATION HOLDER  |         |
| 7        | RGU0030      | BUTTON, POWER                |          | 53       | RML0044-1    | SW LEVER                |         |
| 8        | RGU0073      | BUTTON, SKIP                 |          | 54       | SMBD6        | BELT                    |         |
| 9        | RGU0388A-1   | BUTTON, MAIN                 |          | 55       | SJT388       | FUSE HOLDER             |         |
| 10       | RGU0389A     | BUTTON, SUB                  |          |          |              | SCREWS                  |         |
| 11       | RKQ0007      | VOLUME COVER                 |          | N1       | XTB3+8JFZ    | SCREW                   |         |
| 12       | RKQ0008      | TRAY HOLDER                  |          | N2       | XTB3+10JFZ   | SCREW                   |         |
| 13       | RMA0062      | EARTH PLATE                  |          | N3       | XTB3+14J     | SCREW                   |         |
| 14       | RMA0305-1    | HOLDER, MAIN BUTTON          |          | N4       | XTB3+8G      | SCREW                   |         |
| 15       | RMA0306      | HOLDER, SUB BUTTON           |          | N5       | XTW3+8T      | SCREW                   |         |
| 16       | RMCD079      | EARTH PLATE                  |          | N6       | XYN3+F8      | SCREW                   |         |
| 17       | RME0027      | LOCK LEVER SPRING            |          | N7       | RHD30004     | SCREW                   |         |
| 18       | RME0028      | SET LEVER SPRING             |          | N8       | RHD30005     | SCREW                   |         |
| 19       | RML0048-2    | LOCK LEVER                   |          | N9       | XYN26+C4     | SCREW                   |         |
| 20       | RMM0015      | POWER BUTTON ROD             |          |          |              | CABINET <TRVERSE DECK>  |         |
| 21       | RMA0059      | CLAMP PLATE                  |          | 102      | SISD22-1     | TRAVERSE BASE           |         |
| 22       | RMRO098-1    | CLAMPER                      |          | 103      | SD0D28-1E    | TURNTABLE               |         |
| 23       | SOMD8        | MAGNET                       |          | 103-1    | XXE26D5      | SCREW                   |         |
| 24       | SOYD2        | YOKE                         |          | 104      | SD0D29-2     | RING                    |         |
| 25       | RXL0008-1    | SET LEVER ASS'Y              |          | 106      | SRQAD10N04   | SPRING                  |         |
| 26       | RKU0004-4    | BOTTOM BOARD                 |          | 107      | SORD37       | ROLLER                  |         |
| 27       | RSC0031-1    | SHIELD PLATE                 |          | 108      | SORD38-E     | COIL                    |         |
| 28       | SHG3020      | FOOT RUBBER                  |          | 109      | SUXD123-1    | GUIDE SHAFT             |         |
| 29       | SHRD170      | COVER, REMOTE CONTROL SENSOR |          | 110      | SOAD70A      | OPTICAL PICKUP          | △       |
| 30       | RYF0082      | DUST COVER                   |          | 111      | SHRD176-E    | COIL HOLDER             |         |
| 31       | RMG0146      | RUBBER CUSHION               |          | 113      | SHGD148      | STOPPER                 |         |
| 32       | RMS0228      | GUIDE SHAFT                  |          | 114      | SOYD21-E     | YOKE                    |         |
| 33       | RMB0037      | GUIDE SPRING                 |          | 115      | SOYD22       | YOKE                    |         |
| 34       | RMG0091      | CUSHION RUBBER               |          | 116      | SHRD177-1    | LOCK UNIT               |         |
| 35       | RMK0098      | GUIDE PLATE                  |          | 117      | SHWD33       | WASHER                  |         |
| 36       | RMRO079-1    | TRAVERSE SPACER              |          | 118      | SHWD34       | WASHER                  |         |
| 37       | RMS0229      | ROLLER SHAFT                 |          | 119      | SNSD31       | SCREW                   |         |
| 38       | SHGD153-1    | FLOATING RUBBER              |          | 120      | XTN2+5G      | SCREW                   |         |
| 39       | SUSD136-3    | FLOATING SPRING A            |          | 121      | XYN2+C8      | SCREW                   |         |
| 40       | SUSD137-1    | FLOATING SPRING B            |          | 129      | SUWD112      | GUIDE SHAFT HOLDER      |         |
| 41       | SUSD145-1    | FLOATING SPRING C            |          | 134      | XTB3+10G     | SCREW                   |         |
| 42       | XJC3FY       | E. RING                      |          | 149      | SJGDRF310T-2 | SPINDLE MOTOR           |         |
| 43       | RFKPLPC362PK | MOTOR ASS'Y (M451)           |          | 157      | SJSD1722M    | SOCKET (17P)            |         |
| 44       | RDG0035-1    | MAIN GEAR                    |          | 158      | SJSD2222M    | SOCKET (22P)            |         |
| 45       | RDG0037      | DRIVE GEAR                   |          |          |              |                         |         |
| 46       | RDG0130      | PULLEY GEAR                  |          |          |              |                         |         |

| Ref. No. | Part No.     | Part Name & Description     | Remarks         |  |  |  |  |
|----------|--------------|-----------------------------|-----------------|--|--|--|--|
| 161      | EMCS0552MP   | CONNECTOR (5P)              |                 |  |  |  |  |
|          |              | PACKING MATERIAL            |                 |  |  |  |  |
| P1       | RPG0624      | PACKING CASE                | (E, EB, GC, GN) |  |  |  |  |
| P1       | RPG0491      | PACKING CASE                | (PX)            |  |  |  |  |
| P2       | RPN0338A     | PAD (FRONT)                 |                 |  |  |  |  |
| P3       | RPN0338B     | PAD (BACK)                  |                 |  |  |  |  |
| P5       | RPQ0017-3    | CLAMPER                     |                 |  |  |  |  |
| P6       | SPB1061      | PROTECTION BAG (F. B.)      |                 |  |  |  |  |
| P7       | RPF0024      | PROTECTION BAG (DUST COVER) |                 |  |  |  |  |
| P8       | XZB26X17C03  | PROTECTION BAG (CORD)       |                 |  |  |  |  |
| P9       | XZB60X60A01  | PROTECTION BAG (UNIT)       |                 |  |  |  |  |
|          |              | ACCESSORIES                 |                 |  |  |  |  |
| A1       | RFKSLPC25E-K | INST. MANUAL ASS'Y          | (E)             |  |  |  |  |
| A1       | RQT0665-B    | INSTRUCTION MANUAL          | (EB)            |  |  |  |  |
| A1       | RQT0666-G    | INSTRUCTION MANUAL          | (GC, GN)        |  |  |  |  |
| A1       | RQT0502-P    | INSTRUCTION MANUAL          | (PX)            |  |  |  |  |
| A2       | RQA0013      | WARRANTY CARD               | (E, EB, GC)     |  |  |  |  |
| A2       | SQX7186      | WARRANTY CARD               | (GN)            |  |  |  |  |
| A2       | SQX7071-1    | WARRANTY CARD               | (PX)            |  |  |  |  |
| A3       | SJA187       | POWER CORD                  | △ (E)           |  |  |  |  |
| A3       | SJA193       | POWER CORD                  | △ (EB)          |  |  |  |  |
| A3       | RJA0004      | POWER CORD                  | △ (GC, PX)      |  |  |  |  |
| A3       | SJA173       | POWER CORD                  | △ (GN)          |  |  |  |  |
| A4       | SJP2249-3    | STEREO CONNECTION CABLE     |                 |  |  |  |  |
| A5       | EUR64789B    | REMOTE CONTROL TRANSMITTER  |                 |  |  |  |  |
| A6       | UR64EC804    | BATTERY COVER               |                 |  |  |  |  |
| A7       | RQC0024      | CAUTION CARD                |                 |  |  |  |  |
| A8       | RYF0082      | DUST COVER                  |                 |  |  |  |  |
| A9       | SJP9215      | AC PLUG ADAPTOR             | △ (GC, PX)      |  |  |  |  |

EXPLO

• Travers

A

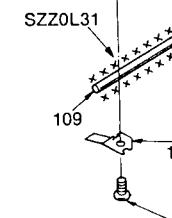
B

C

D

E

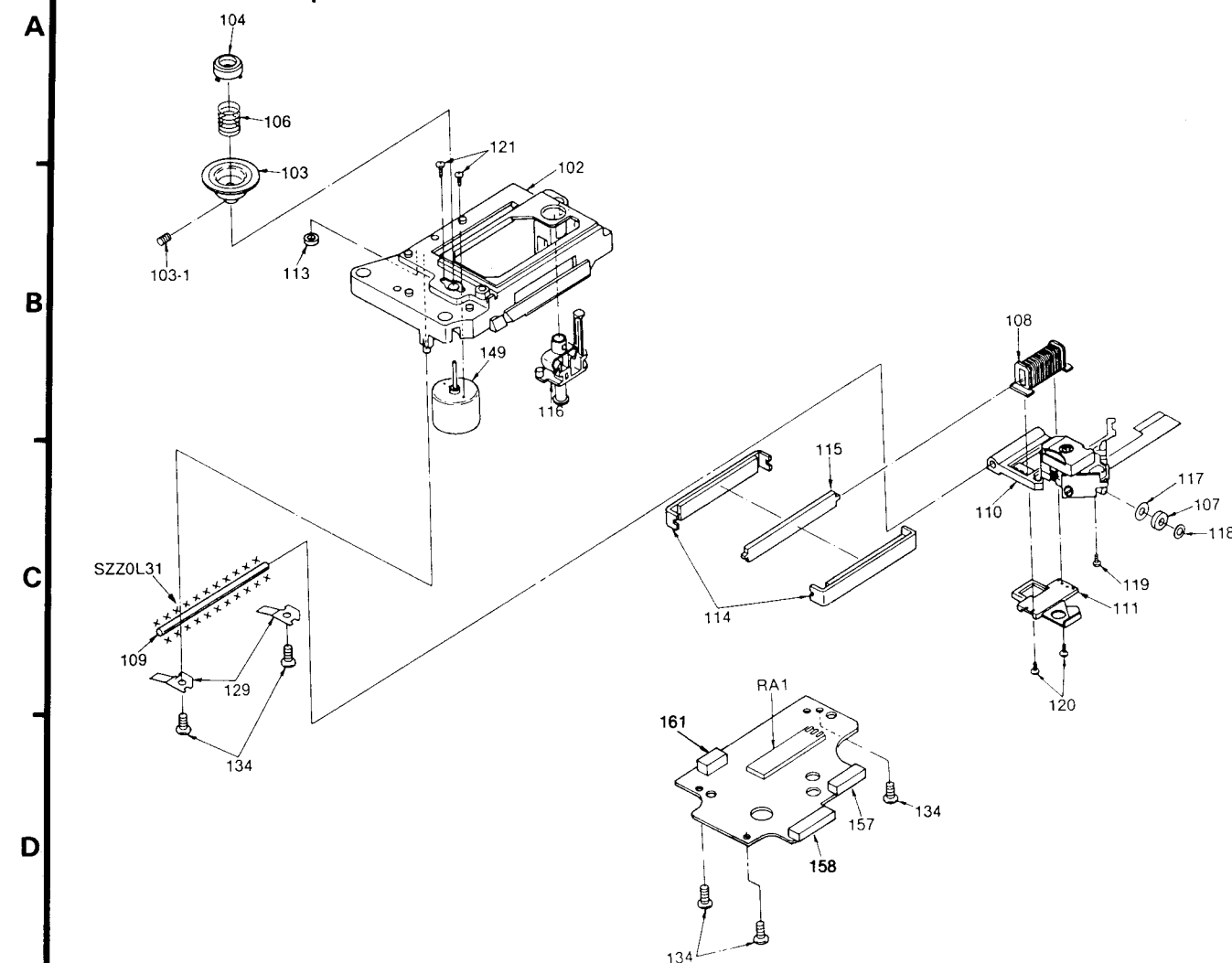
F



| Remarks | Ref. No. | Part No.     | Part Name & Description     | Remarks         |
|---------|----------|--------------|-----------------------------|-----------------|
|         | 161      | EMCS0552MP   | CONNECTOR (5P)              |                 |
|         |          |              | PACKING MATERIAL            |                 |
|         | P1       | RPG0624      | PACKING CASE                | (E, EB, GC, GN) |
|         | P1       | RPG0491      | PACKING CASE                | (PX)            |
|         | P2       | RPNO338A     | PAD (FRONT)                 |                 |
|         | P3       | RPNO338B     | PAD (BACK)                  |                 |
|         | P5       | RPQ0017-3    | CLAMPER                     |                 |
|         | P6       | SPB1061      | PROTECTION BAG (F. B.)      |                 |
|         | P7       | RPF0024      | PROTECTION BAG (DUST COVER) |                 |
|         | P8       | XZB26X17C03  | PROTECTION BAG (CORD)       |                 |
|         | P9       | XZB60X60A01  | PROTECTION BAG (UNIT)       |                 |
|         |          |              | ACCESSORIES                 |                 |
|         | A1       | RFKSLPC25E-K | INST. MANUAL ASS'Y          | (E)             |
|         | A1       | RQT0665-B    | INSTRUCTION MANUAL          | (EB)            |
|         | A1       | RQT0666-G    | INSTRUCTION MANUAL          | (GC, GN)        |
|         | A1       | RQT0502-P    | INSTRUCTION MANUAL          | (PX)            |
|         | A2       | RQA0013      | WARRANTY CARD               | (E, EB, GC)     |
|         | A2       | SQX7186      | WARRANTY CARD               | (GN)            |
|         | A2       | SQX7071-1    | WARRANTY CARD               | (PX)            |
|         | A3       | SJA187       | POWER CORD                  | △(E)            |
|         | A3       | SJA193       | POWER CORD                  | △(EB)           |
|         | A3       | RJA0004      | POWER CORD                  | △(GC, PX)       |
|         | A3       | SJA173       | POWER CORD                  | △(GN)           |
|         | A4       | SJP2249-3    | STEREO CONNECTION CABLE     |                 |
|         | A5       | EUR64789B    | REMOTE CONTROL TRANSMITTER  |                 |
|         | A6       | UR64EC804    | BATTERY COVER               |                 |
|         | A7       | RQCA0024     | CAUTION CARD                |                 |
|         | A8       | RYF0082      | DUST COVER                  |                 |
|         | A9       | SJP9215      | AC PLUG ADAPTOR             | △(GC, PX)       |

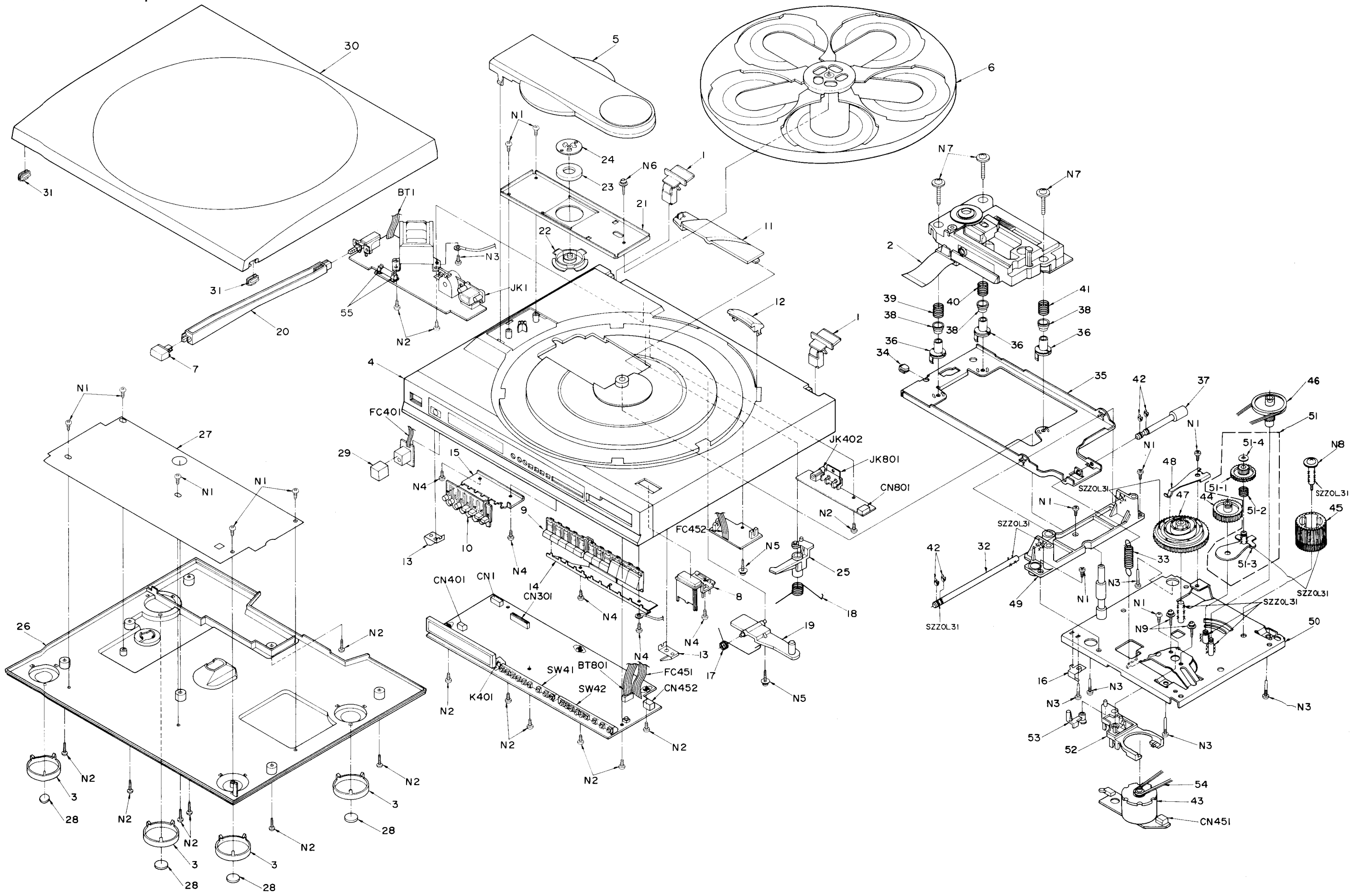
## EXPLODED VIEWS

### • 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

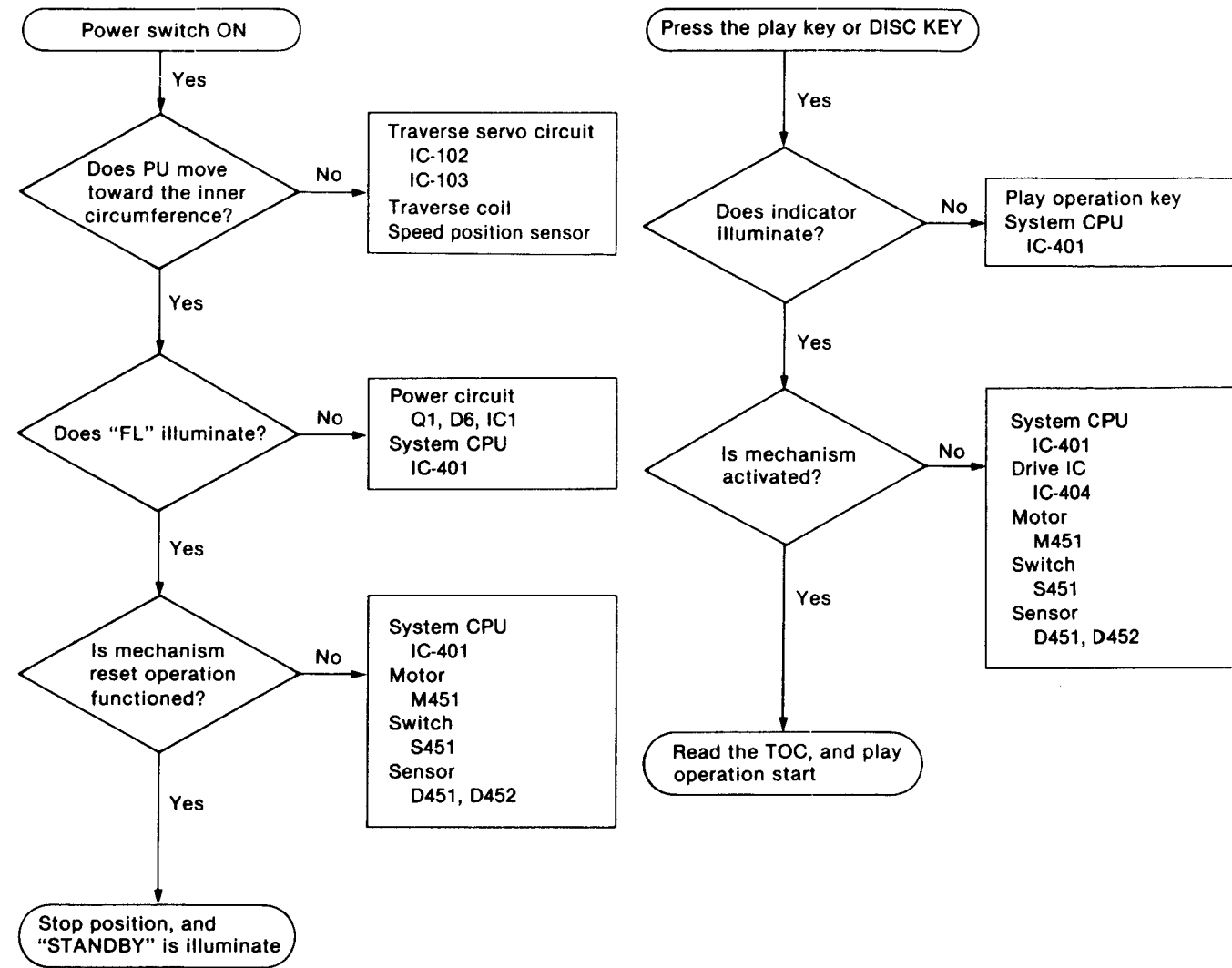
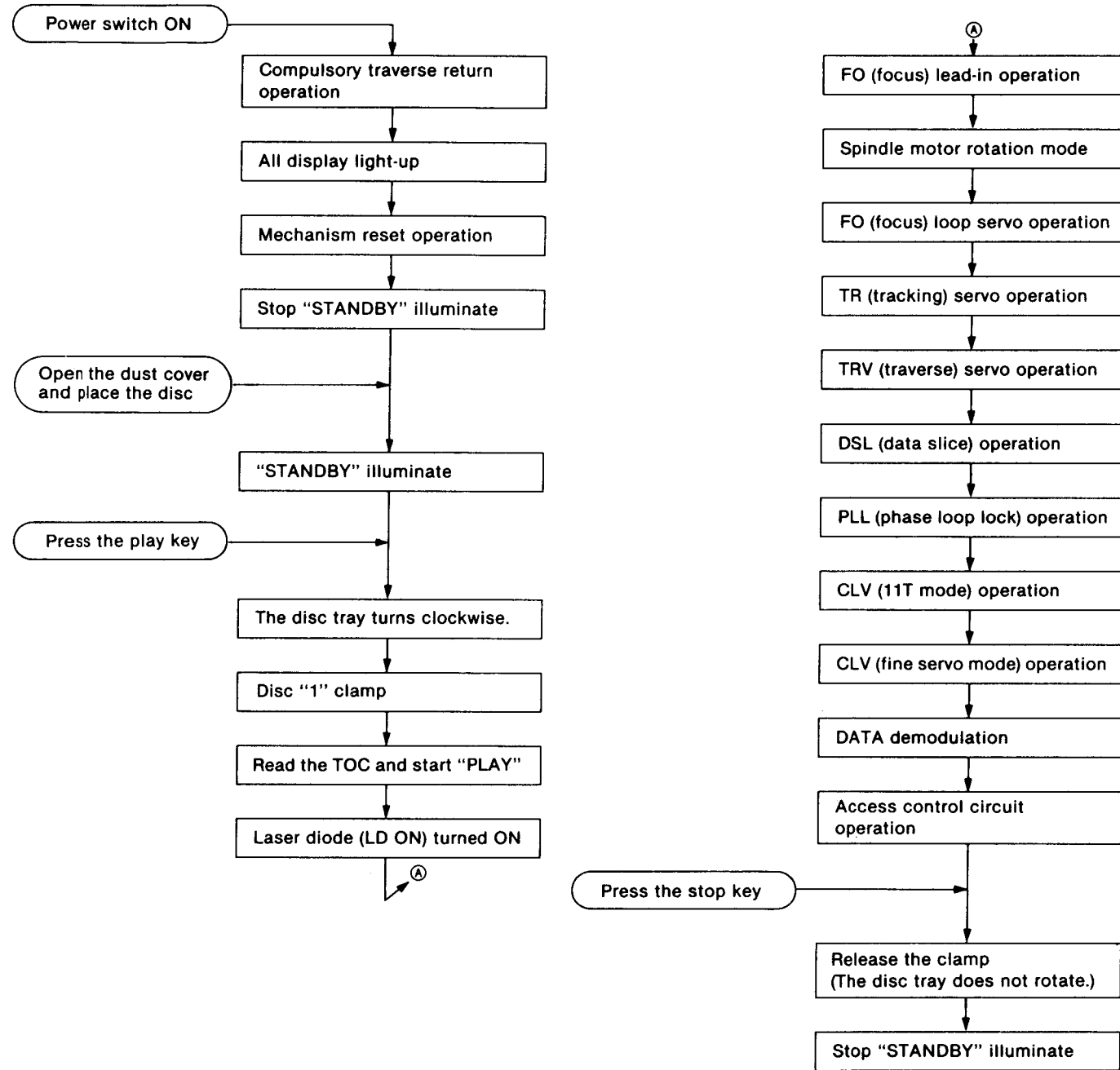






■ TROUBLESHOOTING FLOW CHART

PLAYBACK FLOW CHART



**TOC READ OPERATION - PLAY OPERATION**

