

# Service Manual

Compact Disc Player

## SL-P111

COMPACT  
**disc**  
DIGITAL AUDIO

DIGITAL

Compact Disc Player

Color

(K) .... Black Type



Color	Areas
(K)	[M] .... U.S.A.
(K)	[MC] ... Canada.
(K)	[E] ..... Switzerland and Scandinavia.
(K)	[EK] ... United Kingdom.
(K)	[XL] ... Australia.
(K)	[EG] ... F.R. Germany.
(K)	[EB] ... Belgium.
(K)	[EH] ... Holland.
(K)	[EF] ... France.
(K)	[Ei] .... Italy.
(K)	[XA] ... Asia, Latin America, Middle Near East, Africa and Oceania.
(K)	[XB] ... Saudi Arabia.
(K)	[PA] ... East PX.
(K)	[PE] ... European Military.
(K)	[PC] ... European Audio Club.

Please use this manual together with the service manual for Model No. SL-P117, Order No. HAD8703018C1.

**Notes:** ★ Mentioned in this service manual are the differences from Model No. SL-P117.

★ Please note the following major difference when servicing.

- This product is not provided with the AC outlet.

# Technics

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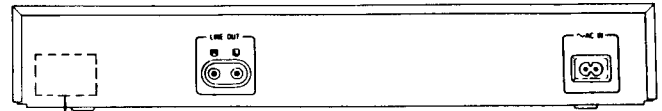
**Panasonic Tokyo Office  
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6th Floor, World Trade Center Bldg.,  
No. 4-1, Hamamatsu-cho 2-Chome,  
Minato-ku, Tokyo 105, Japan

## ■ PRECAUTION OF LASER DIODE

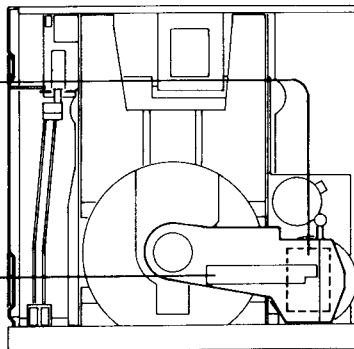
**Caution: This product utilizes a laser diode.**  
**ADVARSEL: I dette a apparat anvendes laser.**

● **Use of caution labels** Note: ○ Mark is used, × Mark is not used.

Areas	Disc clamper	SQWD33	SQWD48	SRNZ010S01	SRNZ010S02
[M], [PA], [PE], [PC]	○	×	×	×	×
[MC]	○	○	×	×	×
[E]	○	×	○	○	○
[EK], [XL], [EG] [EB], [EH], [EF] [E], [XB], [XA]	○	×	×	○	○



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



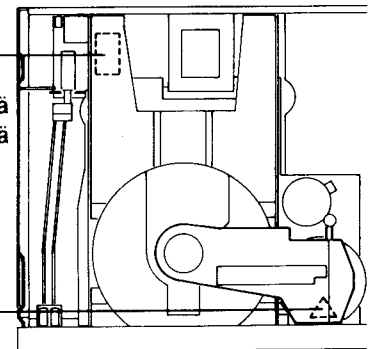
Disc clamper

**DANGER-Invisible laser radiation when open.**  
**AVOID DIRECT EXPOSURE TO BEAM.**

SQWD48

ADVARSEL - Usynligt laserlys udstråles ved åbning. UNDGÅ DIREKTE BESTRÅLING.

VAROITUS! Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilyä



# CHANGES

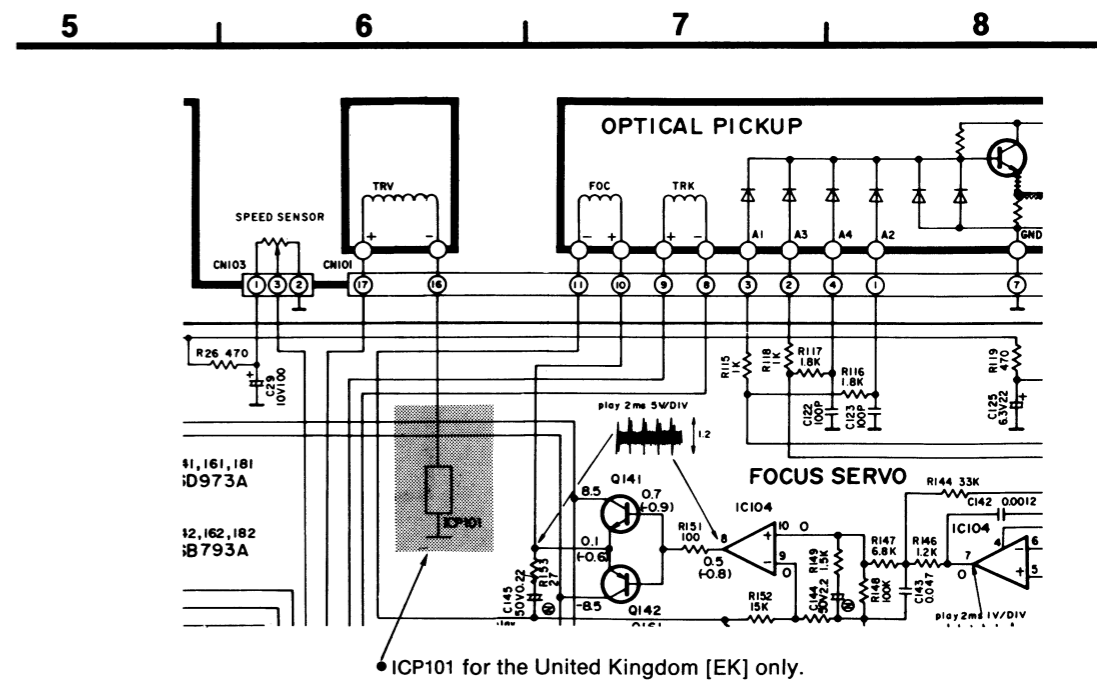
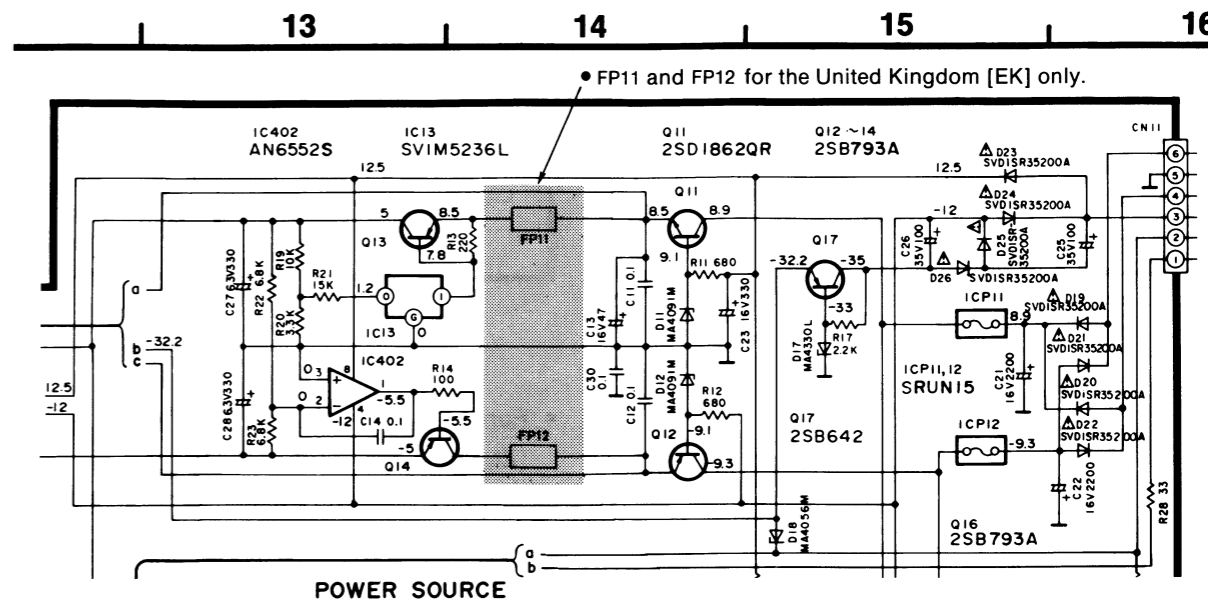
## REPLACEMENT PARTS LIST

**Note:** Mentioned in this parts list are only those parts different from Model No. SL-P117 for each destination. Other parts are the same as for Model No. SL-P117 for each destination.

Ref. No.	Change of Part No.		Part Name & Description	Remarks
	SL-P117 (K)	SL-P111 (K)		
<b>[CABINET AND CHASSIS]</b>				
1 (M)	SGPLP117-KM	<b>SGPLP111-KM</b>	CHASSIS	
1 (EK)	---	<b>SGPLP111-KEK</b>	CHASSIS	Addition
1 (EG)	---	<b>SGPLP111-KEG</b>	CHASSIS	Addition
1 (EB, EH, EF, Ei)	---	<b>SGPLP111-KEB</b>	CHASSIS	Addition
1 (PA, PE, PC)	---	<b>SGPLP111-KPA</b>	CHASSIS	Addition
1 (XL)	---	<b>SGPLP111-KXA</b>	CHASSIS	Addition
1 (XB)	---	<b>SGPLP111-KXB</b>	CHASSIS	Addition
1 (MC)	SGPLP117-KM	<b>SGPLP111-KMC</b>	CHASSIS	
2 (XL)	---	<b>SJSD16</b>	AC SOCKET	Addition
2 (E, EG, EB, EF, Ei, EK) (EH, PC, XA, XB, PE, PA)	---	<b>SJS9236</b>	AC SOCKET	Addition
9	SBC666-1	<b>SBC666-5</b>	BUTTON POWER	
23	SGYLP117-KM	<b>SGYLP111-KM</b>	FRONT PANEL	
29	SJS9331A	---	AC OUT LET COVER	Deletion
30	SJS9331B	---	AC OUT LET	Deletion
<b>[LOADING MECHANICAL]</b>				
131	SIRLP117-KM1	<b>SIRLP111-KM1</b>	DISC HOLDER	
131-2	---	<b>SHSD13</b>	SHEET	Addition
<b>[I.C. PROTECTORS]</b>				
IC 1.2 (EK)	---	<b>SRUF38</b>	I.C. PROTECTORS	Addition
ICP101	---	<b>SRUN10</b>	I.C. PROTECTORS	Addition
<b>[FUSES]</b>				
FP11 (EK)	---	<b>SRUDPF06F6</b>	FUSE	Addition
FP12 (EK)	---	<b>SRUDPT08F6</b>	FUSE	Addition
F1 (E, EG, EB, EH) (EF, Ei, EB, XL)	---	<b>XBA2C012TB0</b>	FUSE	Addition
F1 (XB, XA, PA) (PE, PC)	---	<b>XBA2C025TB0</b>	FUSE	Addition
<b>[COILS AND TRANSFORMERS]</b>				
T1 (E, EG, EB, EH) (EF, Ei)	---	<b>SLTD5K028SE</b>	POWER TRANSFORMER	Addition
T1 (XL, EK)	---	<b>SLTD5K029SG</b>	POWER TRANSFORMER	Addition
T1 (XB, XA, PA, PE, PC)	---	<b>SLTD5K030SX</b>	POWER TRANSFORMER	Addition
<b>[SWITCHES]</b>				
S2 (XB, PA, PE, PC, XA)	---	<b>SSR187-1</b>	SW. VOLTAGE SELECT	Addition
<b>[ACCESSORIES]</b>				
A1 (M)	SQUD197	<b>SQUD189</b>	INSTRUCTION MANUAL	
A1 (MC)	SQULP117-KMC	<b>SQULP111-KMC</b>	INSTRUCTION MANUAL	
A1 (E, EB, EH)	---	<b>SQULP111-KE</b>	INSTRUCTION MANUAL	Addition
A1 (EK)	---	<b>SQUD192</b>	INSTRUCTION MANUAL	Addition
A1 (EG)	---	<b>SQUD193</b>	INSTRUCTION MANUAL	Addition
A1 (EF)	---	<b>SQUD194</b>	INSTRUCTION MANUAL	Addition
A1 (Ei)	---	<b>SQUD195</b>	INSTRUCTION MANUAL	Addition
A1 (XL, XA)	---	<b>SQUD196</b>	INSTRUCTION MANUAL	Addition
A1 (PA, PE, PC)	---	<b>SQULP111-KPA</b>	INSTRUCTION MANUAL	Addition
A1 (XB)	---	<b>SQULP111-KPB</b>	INSTRUCTION MANUAL	Addition
A2 (XL)	---	<b>SJA173</b>	AC CORD	Addition
A2 (E, EG, EB, EH, EF, Ei)	---	<b>SJA171</b>	AC CORD	Addition
A2 (XB)	---	<b>SJA183</b>	AC CORD	Addition
A2 (XA, PA, PE, PC)	---	<b>SJA168-1</b>	AC CORD	Addition
A2 (EK)	---	<b>SFDAC05G02</b>	AC CORD	Addition
A4 (XB, XA, PA, PE, PC)	---	<b>SJP9215</b>	ADAPTOR	Addition
<b>[PACKINGS]</b>				
P1 (M)	SPND192	<b>SPND188</b>	CARTON BOX	
P1 (E, EG, EB, EH, Ei, EK) (XL, XA, XB, PA, PE, PC)	---	<b>SPND188</b>	CARTON BOX	Addition
P1 (MC)	SPND193	<b>SPND189</b>	CARTON BOX	
P1 (EF)	---	<b>SPND190</b>	CARTON BOX	Addition

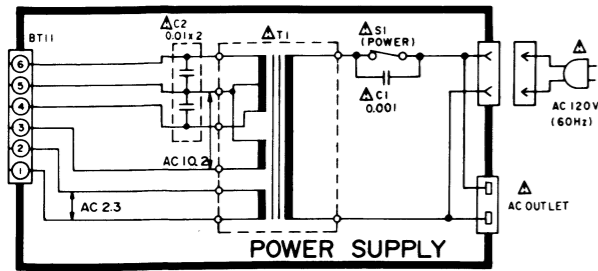
## SCHEMATIC DIAGRAM

• indicates addition for the United Kingdom [EK] only.

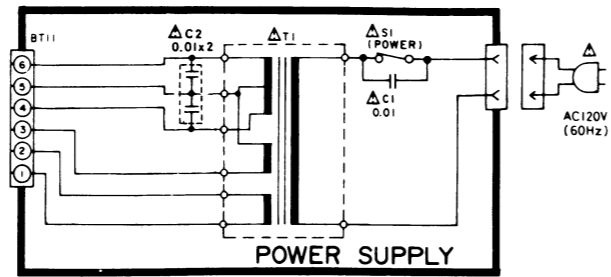


• ICP101 for the United Kingdom [EK] only.

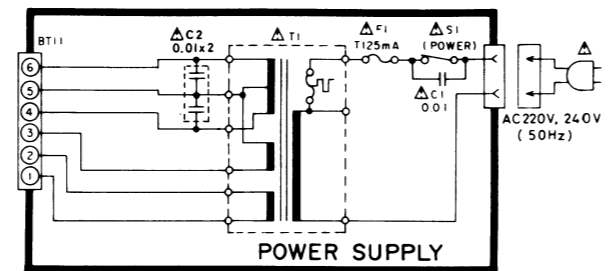
• Power supply circuit



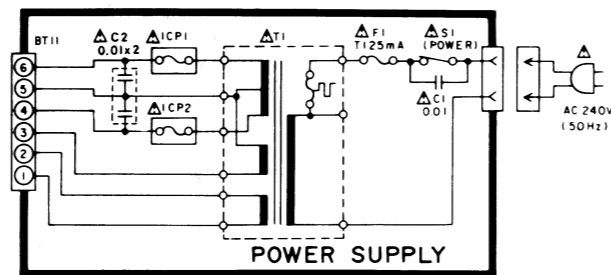
• For [M] and [MC] areas



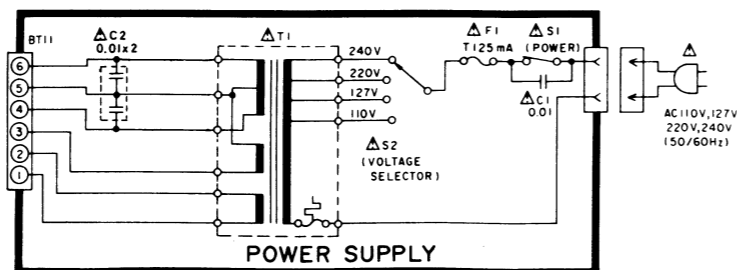
• For [E], [EG], [EB], [EH], [EF], [Ei] and [XL] areas



• For [EK] area



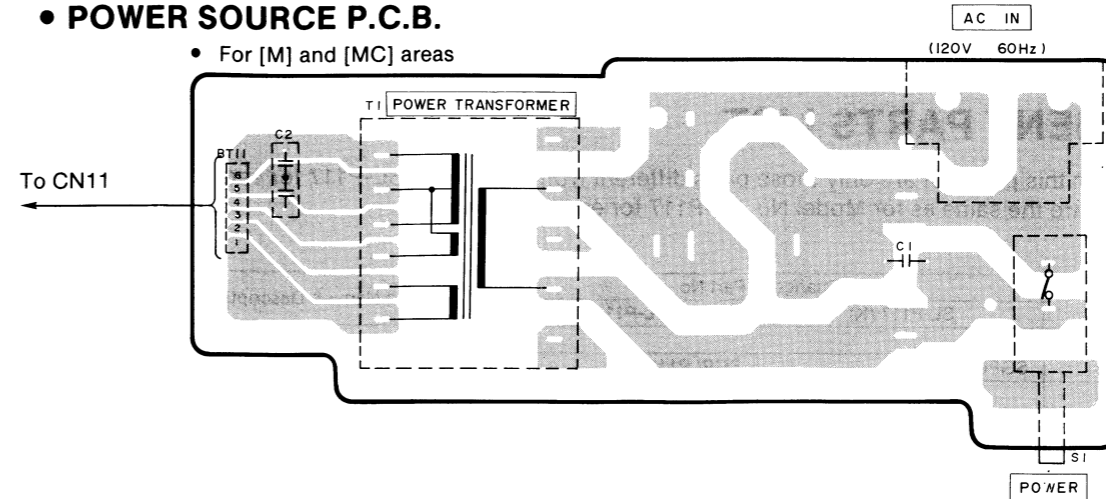
• For [XA], [XB], [PA], [PE] and [PC] areas



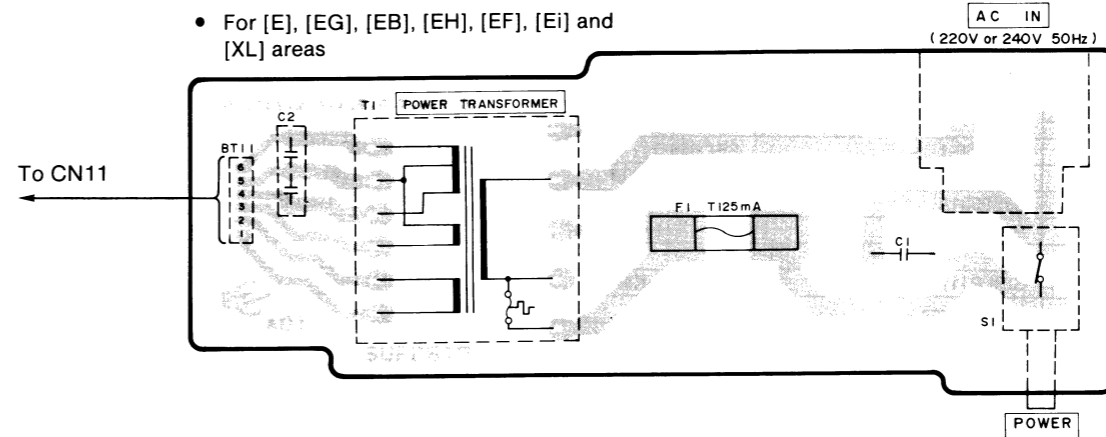
■ CIRCUIT BOARDS

• POWER SOURCE P.C.B.

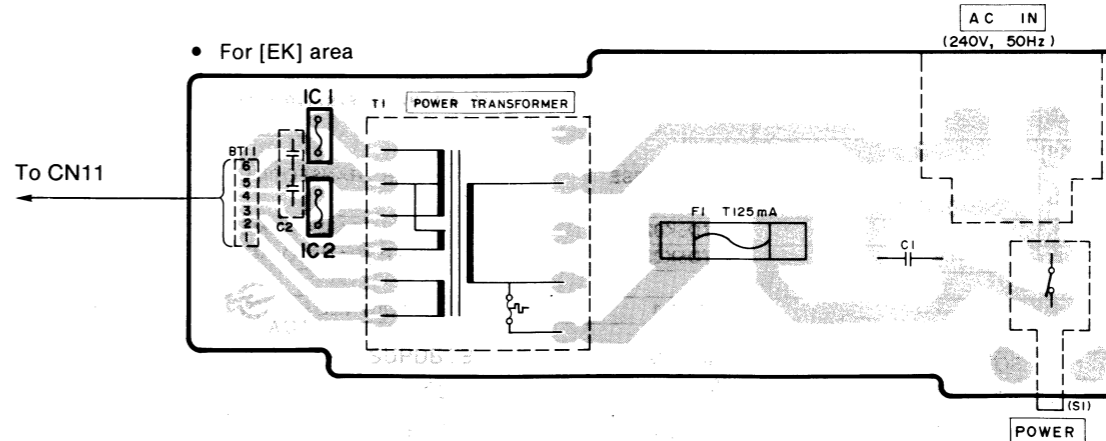
• For [M] and [MC] areas



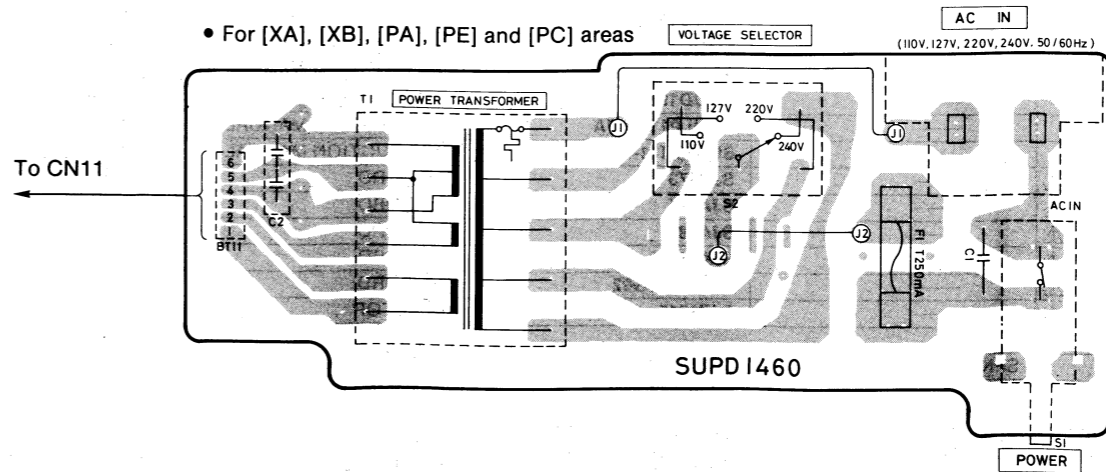
• For [E], [EG], [EB], [EH], [EF], [Ei] and [XL] areas



• For [EK] area



• For [XA], [XB], [PA], [PE] and [PC] areas



# Service Manual

Compact Disc Player

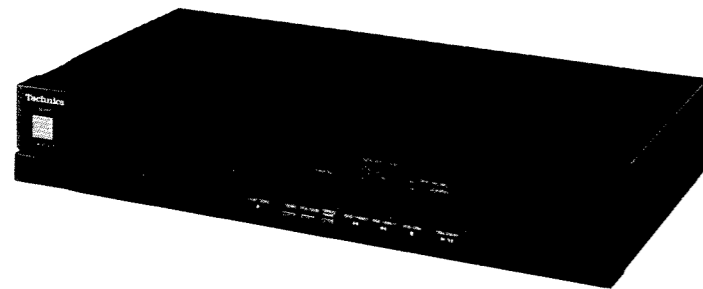
## SL-P117

Color

(K) .....Black Type



Compact Disc Player



Area	
Color	Area
(K)	(M).....U.S.A.
(K)	(MC).....Canada.

### SPECIFICATIONS

#### Audio

**Number of channels:** 2 (left and right, stereo)  
**Frequency response:** 2~20,000 Hz (EIAJ)  
**Dynamic range:** 92dB  
**S/N ratio:** 96dB (EIAJ)  
**Harmonic distortion:** 0.004% (1kHz, 0dB)  
**Total harmonic distortion:** 0.006% (1kHz, 0dB) (EIAJ)  
**Channel separation:** 96dB (EIAJ)  
**Wow and flutter:** Below measurable limit  
**Low-pass filter:** High-resolution digital filter

#### Signal Format

**Sampling frequency:** 44.1kHz  
**Correction system:** Technics Super Decoding Algorithm  
**D-A conversion:** 16-bit linear

#### Pickup

**Access time:** 1 second (access to the last track)  
**Light source:** Semiconductor laser  
**Wave length:** 780nm  
**Traverse system:** High-speed linear access system

#### Functions

**Automatic play:** All tracks  
**Direct access play:** Track number  
**Repeat play:** Entire disc or programmed tracks  
**Search:** Forward/backward track skip  
 Forward/backward manual search  
**Program play:** For up to 20 selections

#### Preset edit play:

#### Display:

#### Time display:

#### Indicators:

#### Disc loading:

#### Remote control terminal:

#### General

**Power supply:** AC 120V, 60 Hz  
**Power consumption:** 10W  
**Output voltage:** 2V (at 0dB) (EIAJ)  
**Output impedance:** Approx. 550Ω  
**Load impedance:** More than 10kΩ  
**Dimensions(WxDxH):** 43 X 24 X 7.7 cm (16-15/16" X 9-7/16" X 3-1/32")  
 < When disc holder is opened:  
 37.2 cm (14-21/32") (D) >  
**Weight:** 3.1kg (6.8lbs.)

Specifications are subject to change without notice.  
 Weight and dimensions are approximate.  
 Measured by EIAJ (CP-307).

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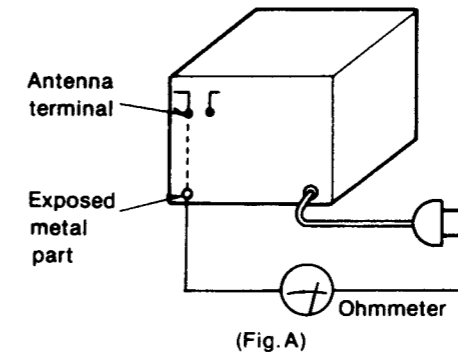
### SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

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

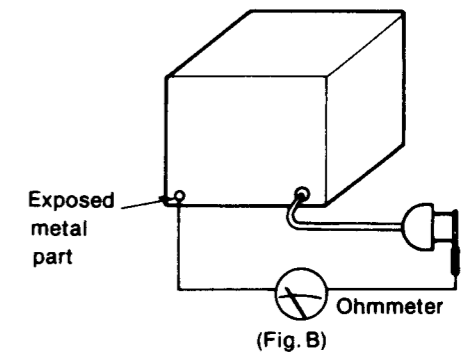
### INSULATION RESISTANCE TEST

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

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



Resistance = 3MΩ—5.2MΩ



Resistance = Approx ∞

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

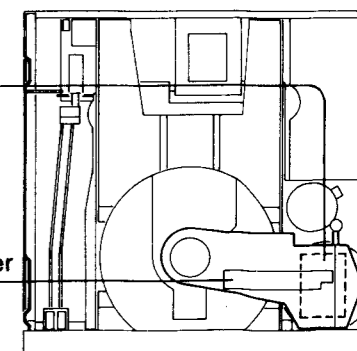
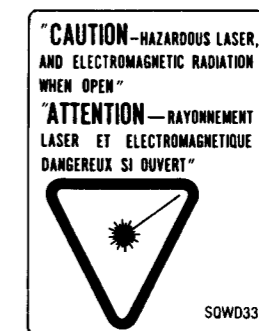
### PRECAUTION OF LASER DIODE

Caution: This product utilizes a laser diode.

#### Use of caution label

Area	Disc clamber	SQWD33
U.S.A.	○	×
Canada	○	○

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

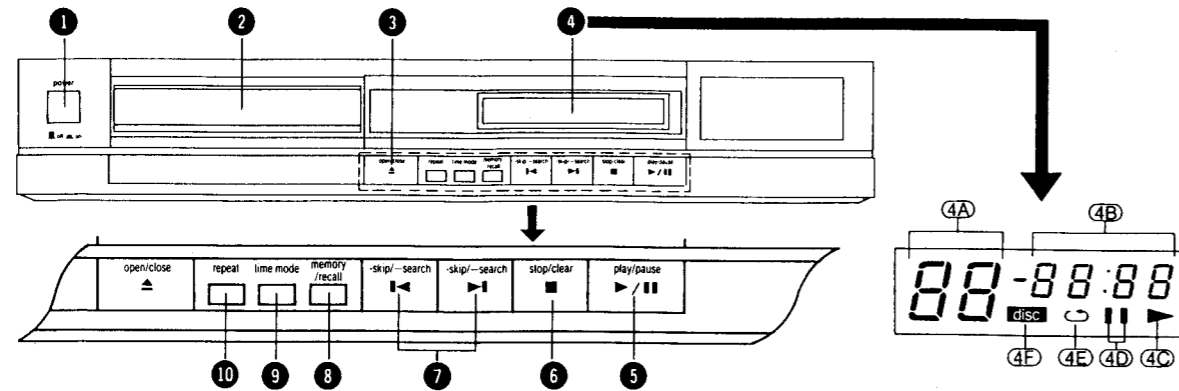


**DANGER-Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.**

# Technics

## ■ LOCATION OF CONTROL

### Front panel



#### 1 Power switch

#### 2 Disc holder

#### 3 Open/close button

#### 4 Display panel

##### 4A Track number display (track)

Track numbers (up to 99) are shown here.

##### 4B Time display

This display shows four time modes and programmed order.

##### 4C Play indicator (▶)

Illuminates when the play mode is activated and goes out when the play is stopped.

##### 4D Pause indicator (||)

Illuminates when the pause mode is activated and goes out when the pause mode is cancelled.

##### 4E Repeat indicator (↻)

Illuminates when the repeat mode is activated and goes out when the repeat mode is cancelled.

##### 4F Disc indicator (disc)

Flashes on and off when the disc holder is opening or closing.

Illuminates when a disc is in the holder (if power is on) and the disc holder is closed.

#### 5 Play/pause button

This button activates either play or pause, depending on the operating mode of the unit.

- If the button is pressed while the unit is in the stop mode or in the pause mode, play begins and the play indicator illuminates.
- If the button is pressed during play, the unit goes to the pause mode, and the pause indicator illuminates.

##### Pause mode:

The disc rotates while the unit is in the pause mode.

#### 6 Stop/clear button

This button activates both stop and program clear.

Press this button to stop play and/or cancel all previous program settings.

When this button is pressed during play, the unit returns to the stop mode.

##### Stop mode:

In the stop mode, the pickup is at the beginning of the first track and the display shows the total number of tracks and total playing time of the disc. (The disc does not rotate.)

#### 7 Forward and backward skip/search buttons

These buttons are used for the following four operations.

##### 1. To program track numbers before starting play (program play).

Press either button before starting play.

##### 2. To start play from a specific track (direct access play).

Press either button before starting play.

##### 3. To skip to the beginning of a specific track (skip play).

Press either button momentarily (less than one second) during play or in the pause mode.

(The number of tracks skipped is the same as the number of times one of these buttons is pressed.)

##### 4. To move the pickup forward or backward to a desired point (manual search play).

Keep either button pressed during play or in the pause mode and release it when the pickup reaches the desired point.

The pickup moves slowly at first and then rapidly if one of the skip/search buttons is held down for more than about 3 seconds.

##### 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.

#### 8 Memory/recall button

This button is used for the following three operations.

- To program track numbers before starting play (program play). (A maximum of 20 selections can be programmed.)
- To display programmed track numbers during program play (program confirmation).
- To enter preset editing time into memory.

#### 9 Time mode select button

This button is used for the following two operations.

- To select the time display mode (time display mode selection).  
Each time this button is pressed during play or in the pause mode the time display mode changes.
- To specify playing time (preset edit play).  
Press this button in the stop mode, and then press the forward or backward skip/search button to specify a desired playing time in minutes.  
For program play and repeat play a maximum of 99 minutes can be specified.

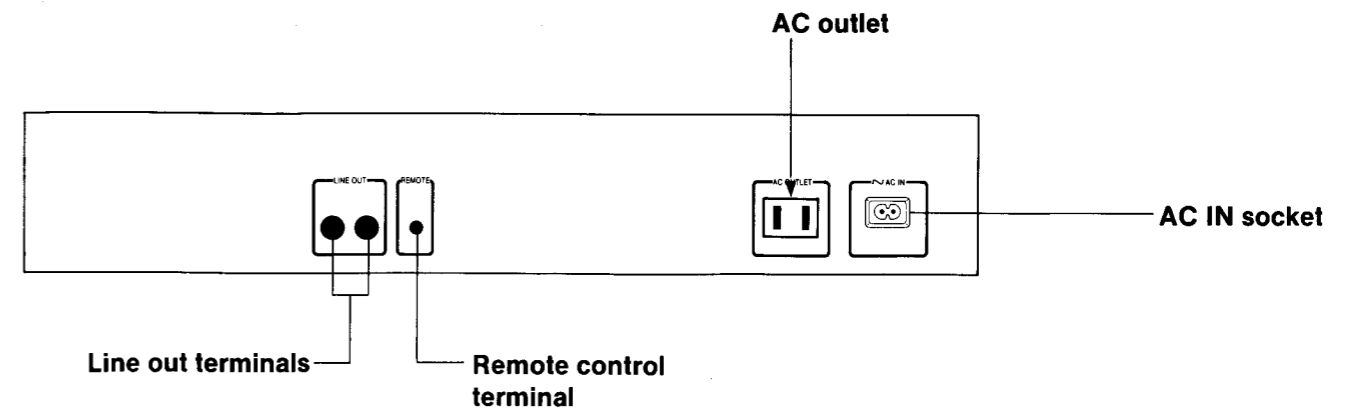
#### 10 Repeat button

This button activates repeat play mode.

Press this button to activate the repeat mode. (The repeat indicator illuminates.)

Press again to cancel the repeat mode.

### Rear panel



## ■ BEFORE USING THIS UNIT

### NOTE:

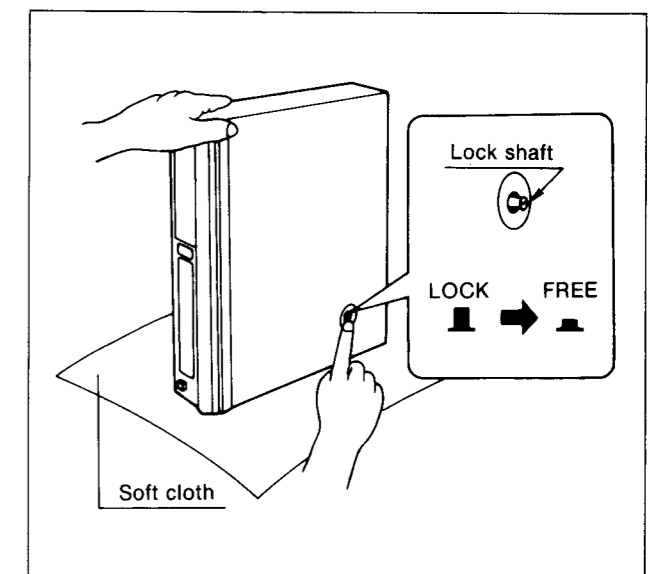
**IF THE UNIT IS TRANSPORTED AGAIN, PERFORM THE FOLLOWING STEPS:**

- Remove the disc from the holder.
- Pull the lock shaft to the out (LOCK) position (▶).

### CAUTION:

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

- Place a soft cloth under the unit to protect it from scratches.
- Press the lock shaft on the bottom panel to the in (FREE) position (◀).



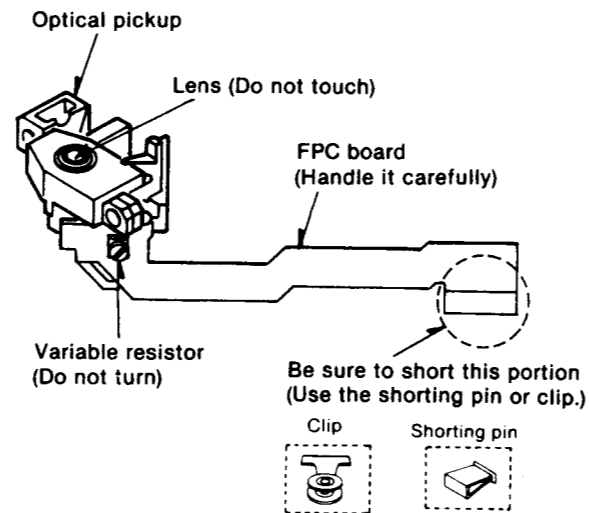
## ■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

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

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

### ● Handling of optical pickup

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

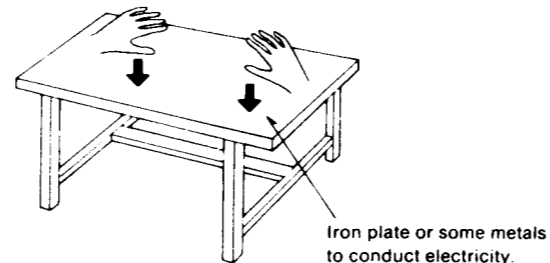
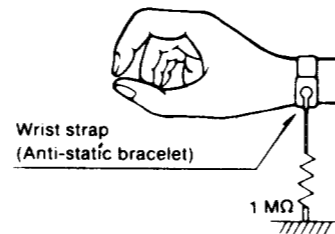


### ● Grounding for electrostatic breakdown prevention

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

#### Caution:

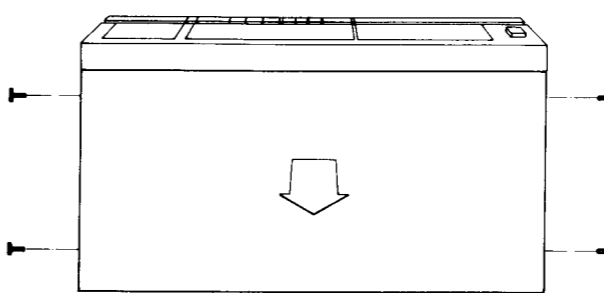
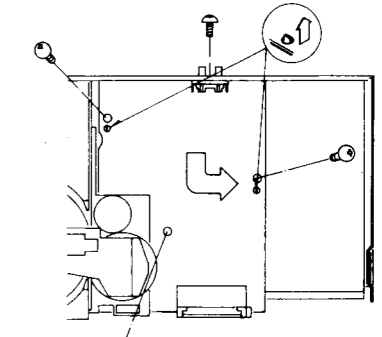
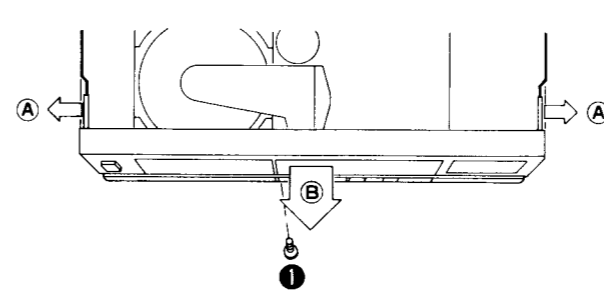
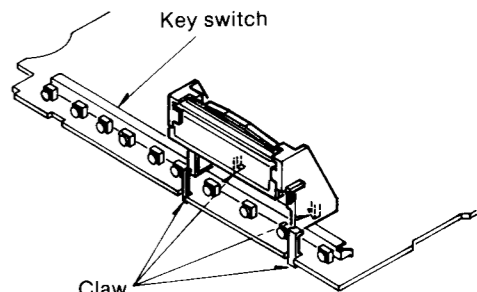
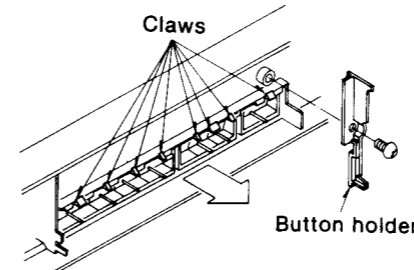
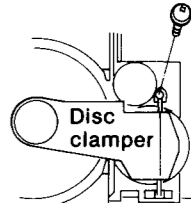
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.



## ■ DISASSEMBLY INSTRUCTIONS

### CAUTION:

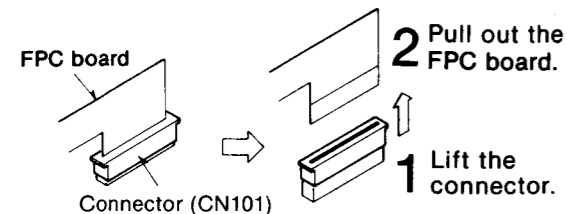
- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When doing the job, removing the cabinet and disc clamber of this unit, be sure to turn the power supply off.

<p><b>Ref. No.</b> 1</p> <p><b>How to remove the cabinet</b></p>	<p><b>Ref. No.</b> 4</p> <p><b>How to remove the main P.C.B.</b></p>
<p><b>Procedure</b> 1</p> <ul style="list-style-type: none"> <li>• Remove the 4 screws.</li> </ul>  <p><b>Note:</b> When doing the job, lock the lock shaft at bottom of the unit. (See page 4).</p>	<p><b>Procedure</b> 1 → 2 → 4</p> <ol style="list-style-type: none"> <li>1. Remove the 4 screws.</li> <li>2. Lift the P.C.B. to remove it from the chassis tabs.</li> <li>3. Remove in the direction of the arrow.</li> </ol> 
<p><b>Ref. No.</b> 2</p> <p><b>How to remove the front panel</b></p>	<p><b>Ref. No.</b> 5</p> <p><b>How to remove the F.L</b></p>
<p><b>Procedure</b> 1 → 2</p> <ol style="list-style-type: none"> <li>1. Remove the screw ❶.</li> <li>2. Slightly pull the tabs outward (arrows ❷).</li> <li>3. Remove in the direction of the arrow ❸.</li> </ol> 	<p><b>Procedure</b> 1 → 2 → 4 → 5</p> <ol style="list-style-type: none"> <li>1. Unsolder the terminals of FL.</li> <li>2. Remove FL from the P.C.B.</li> <li>3. Release the claws of FL holder and remove it to remove the switches.</li> </ol> 
<p><b>Ref. No.</b> 3</p> <p><b>How to remove the operation button</b></p>	<p><b>Ref. No.</b> 6</p> <p><b>How to remove the disc clamber</b></p>
<p><b>Procedure</b> 1 → 2 → 3</p> <ol style="list-style-type: none"> <li>1. Remove the screw and button holder.</li> <li>2. Release the 8 claws.</li> </ol> 	<p><b>Procedure</b> 1 → 6</p> <ul style="list-style-type: none"> <li>• Remove the screw.</li> </ul> 

### How to check the main P.C.B.

•When checking the soldered surfaces of the main P.C.B. and replacing the parts, do as shown.

1. Remove the main P.C.B.
2. Remove the FPC board (CN101).

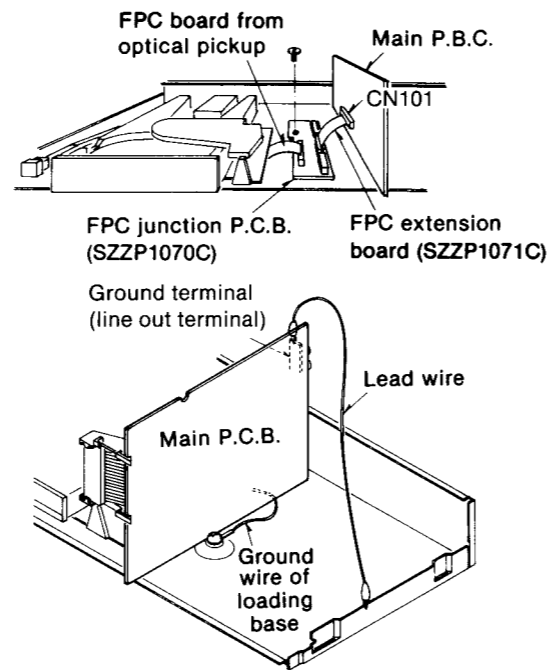


**Caution:** Insert the short pin into the FPC board in order to prevent breakdown of laser diode. (See page 5)

3. Mount FPC junction P.C.B. (SZZP1070C) on the chassis. (Do the job as shown by using the main P.C.B. set-screw.)
4. Connect FPC board from optical pickup to FPC junction P.C.B.
5. Connect FPC extension cord (SZZP1071C) to FPC junction P.C.B. and CN101 of main P.C.B.
6. Place the main P.C.B. as shown in the figure.

### Cautions:

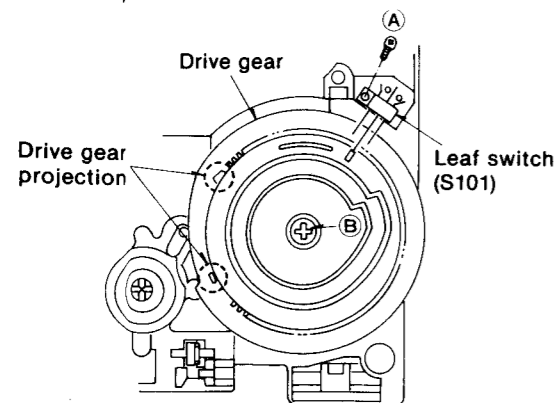
1. Be sure to connect the P.C.B. ground terminal (line out terminal) and chassis with a lead wire.
2. Connect the ground wire of loading base to the chassis.



### Ref. No. 7 How to remove the disc holder (disc tray)

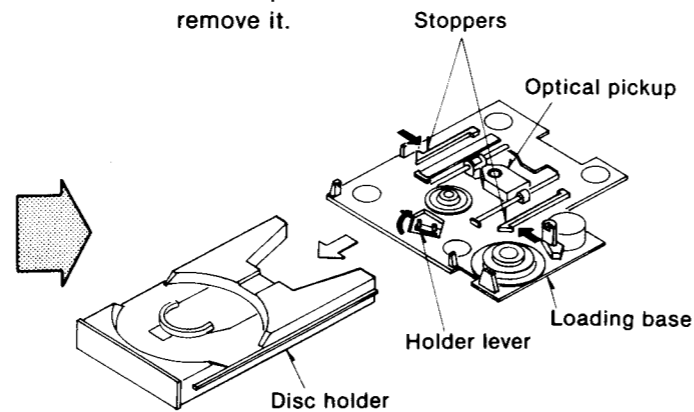
Procedure 1 → 2 → 6 → 7

•Set the drive gear as shown below. (Turn it completely to the right, then turn it to the left by about 20° so that drive gear teeth or projection will not touch the rack of disc holder.)



•To remove the drive gear  
Remove the screw (A) of leaf switch (S101), then remove the drive gear setscrew (B).

1. Push the holder lever backward, (From underneath the loading base.)
2. Pull the disc holder and bend the 2 claws of disc holder stopper of loading base toward the optical pickup.
3. Further pull out the disc holder to remove it.



•Caution for fitting  
When fitting the disc holder, make the drive gear as shown on the left, and then insert the disc holder along the guide of loading base. After inserting the disc holder completely, turn the drive gear to the right completely.

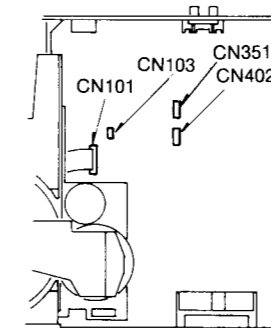
### Ref. No. 8 How to remove the loading base

Procedure 1 → 2 → 8

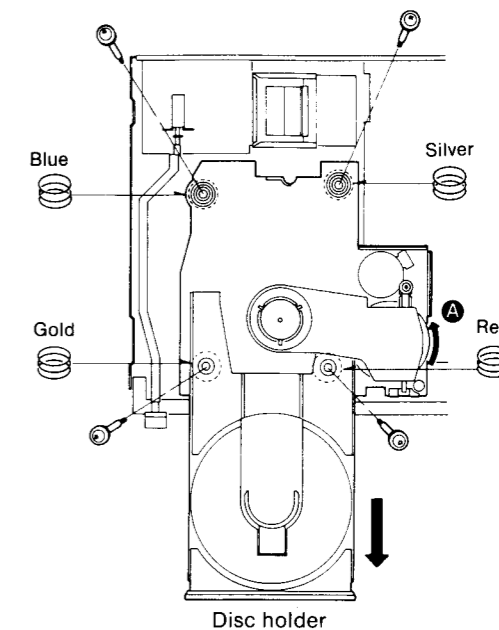
1. Turn the drive gear in the direction of the arrow (A) so that the disc holder comes out.
2. Remove the 4 screws.

**Caution:** Note the color of each spring, they must be reinstalled to their original positions.

3. Remove the 3 connectors (CN103, CN351, CN402).
4. Remove the FPC board (CN101).



Refer to optical pickup handling precautions (See Page 5).



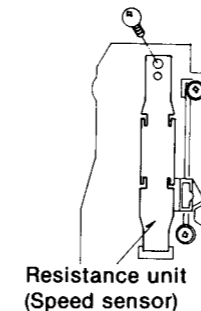
### Ref. No. 9 How to remove the optical pickup

Procedure 7 → 8 → 9

• Follow the numerical order shown.

Refer to the optical pickup handling precautions (See page 5).

- 1 Remove the screw.



- 2 Remove the resistance unit.

- 3 Unsolder the 2 terminals.

- 5 Remove the 3 screws (A).

- 6 Pull out the optical pickup from the 2 guide shafts.

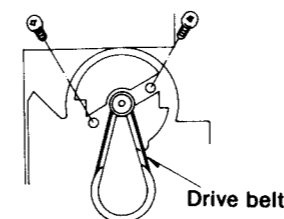
- 4 Remove the 2 screws (B). (Underneath)

### Ref. No. 10 How to remove the loading motor

Procedure 7 → 8 → 10

• Follow the numerical order shown.

- 2 Remove the 2 screws.



- 1 Remove the drive belt.

- 5 Lift up the drive motor.

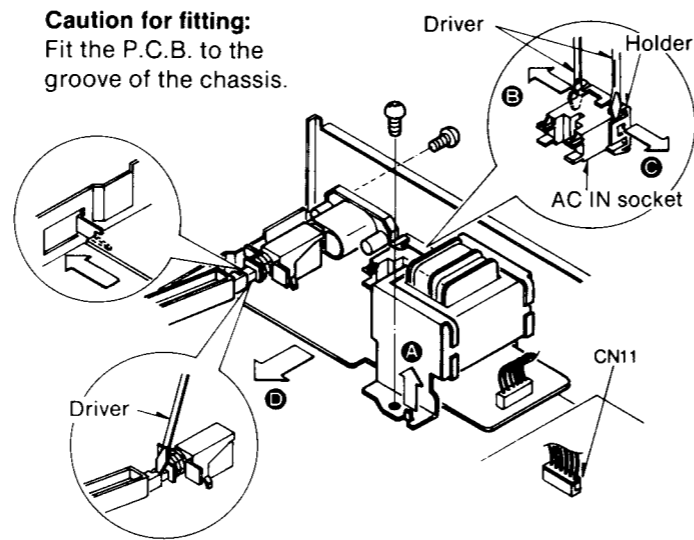
- 3 Remove the screw.
- 4 Release the 2 Tabs in the direction of the arrows.



**Ref. No. 11**  
**How to remove the power transformer**

**Procedure**  
1 ▶ 2 ▶ 8 ▶ 11

1. Remove the connector (CN11).
  2. Remove the 2 screws.
  3. Lift the power transformer to remove it from the chassis tab. (arrow A)
  4. Separate the AC IN socket from the holder by using a screw driver. (arrow B, C)
  5. Remove the power source P.C.B. in the direction of the arrow D.
- **How to remove the power switch rod**
1. Set the power switch in "OFF" position.
  2. Remove the power switch rod by using a screwdriver.



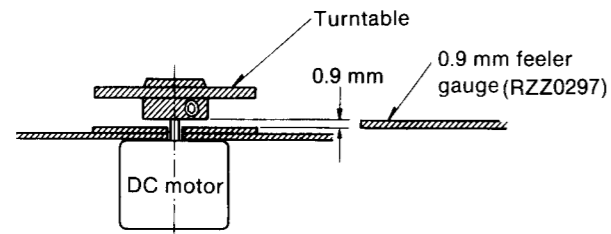
**Caution for fitting:**  
Fit the P.C.B. to the groove of the chassis.

**Ref. No. 12**  
**How to remove the spindle motor**

**Procedure**  
1 ▶ 2 ▶ 8 ▶ 12

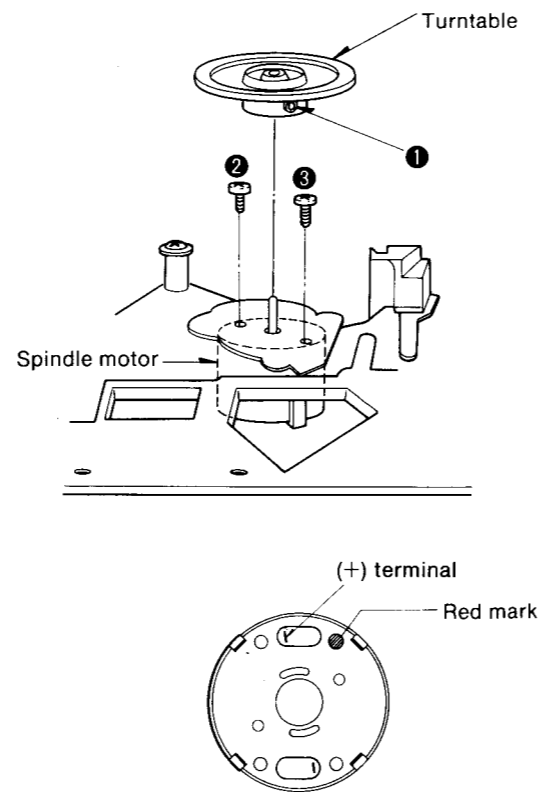
1. Loosen the screw ① by using a 1.27 mm hexagonal wrench and remove the turntable.
  2. Remove the 2 screws ②, ③.
- Caution:**
1. Turntable height adjustment is necessary any time the turntable or spindle motor is replaced.
  2. The (+) terminal of the spindle motor is indicated by the red mark.

- Adjustment of turntable height**
1. Insert a 0.9 mm feeler gauge (RZZ0297) between the turntable and loading base as shown below.

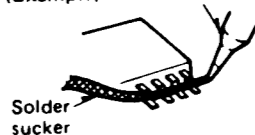

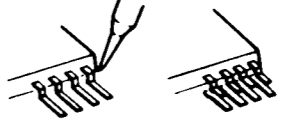
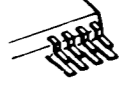


2. Tighten the turntable set-screw by using a 1.27 mm hexagonal wrench.

**Caution:**  
Refer to optical pickup adjustment (see page 16).



**■ HOW TO REPLACE IC'S (Small outline type)**

Replacing procedure		Cautions	
1	Reduce the amount of solder on each pin of the integrated circuit by use of a solder sucker.	(Example) H-130 	<ul style="list-style-type: none"> <li>• Recommended tool .....Special soldering iron * H605M and H-130. * H605E and H-130.</li> <li>• Do not touch the soldering iron to the area for a long time. It may otherwise cause removal of the print foil.</li> <li>• When shifting the pin upward, do the job quickly while the solder is melting. If the solder is hard, it may cause removal or breakage of the print foil.</li> <li>• When using a pencil type soldering iron.                             <ol style="list-style-type: none"> <li>1. Completely remove the solder from each IC pin by use of solder sucker.</li> <li>2. Raise each pin by means of an eyeleteer, hold the pliers then remove IC package from P.C.B.</li> </ol> </li> </ul>
2	Melt the solder on the pin (one electrode) with the soldering iron.		
3	While the solder is melting, shift the pin upward by the soldering iron to remove it from the foil.		
4	Remove each pin from the foil according to the above-mentioned procedure.		

\* **Special soldering iron**  
(Refer to Technical Information, ORDER NO. GAD84125486T1)

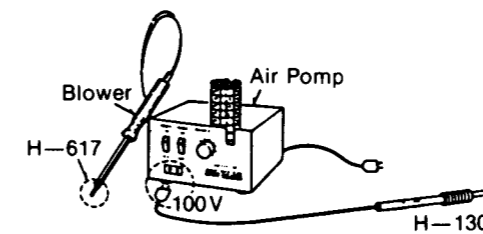
• **H-605 Spot Heater (hot-air solder iron)**

This device that uses hot air to melt solder was developed to remove Flat-Package ICs, RHCs and chip parts.

- H-605M (For 120V power source)
- H-605E (For 200V/220V/240V power source)

• **H-617 Twin Nozzle (for spot heater)**

Special nozzle for the removal of RHCs and chip resistors. (Nozzle diameter: 1.0mm x 2)



• **H-130 Slim Pencil Solder Iron**

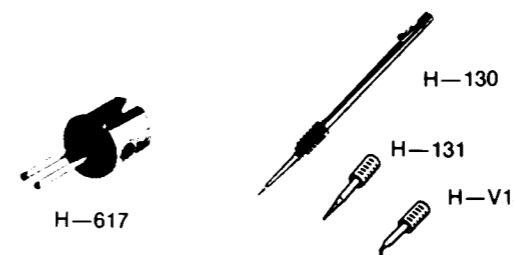
An ultrasmall ceramic heater solder iron is extremely handy for soldering chip parts, RHCs, ICs etc., to high-density circuit boards.

- Features:**
- Rated power: 100V, 15W
  - Max. temp.: 400°C
  - Heater: ceramic (long life)
  - Insulation resistance: 100MΩ
  - Length: 178mm
  - Weight: 16g (not including cord)

• **H-131, H-V13 Cap Bits**

Solder tip for the slim pencil Solder Iron is composed of a bit holder and a corrosion resistance solder tip. Permits changing of solder tips even while still hot.

- Solder tip: 0.3mm

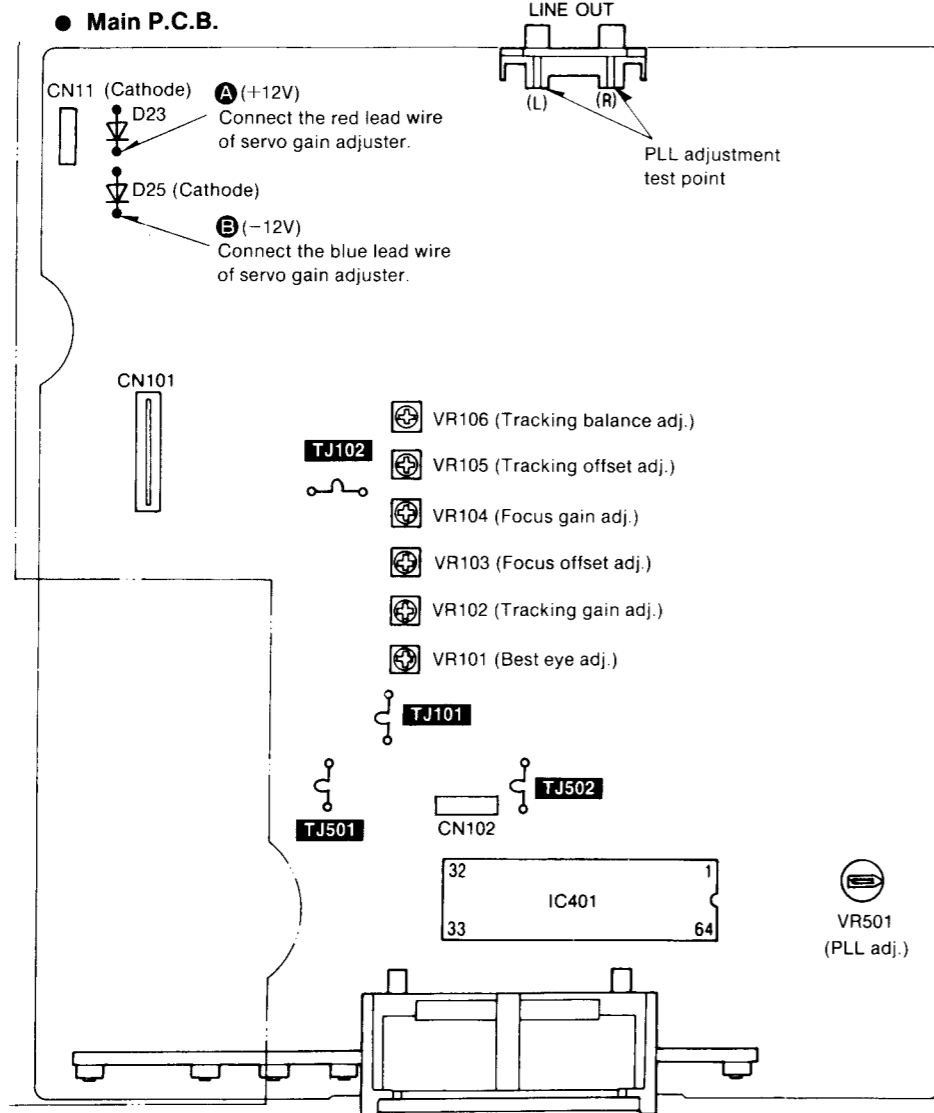


## MEASUREMENTS AND ADJUSTMENTS

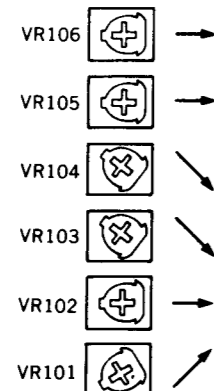
### Caution:

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

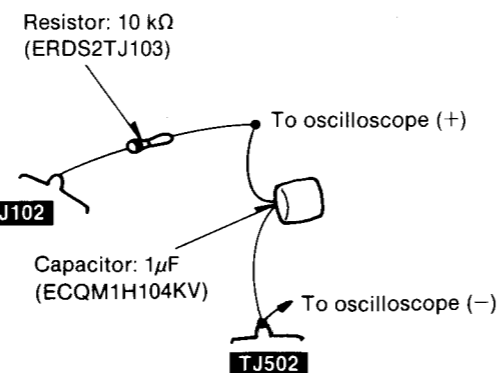
### ADJUSTMENT POINTS



### Temporary Setting of Each VR



### Filter for focus offset (1)

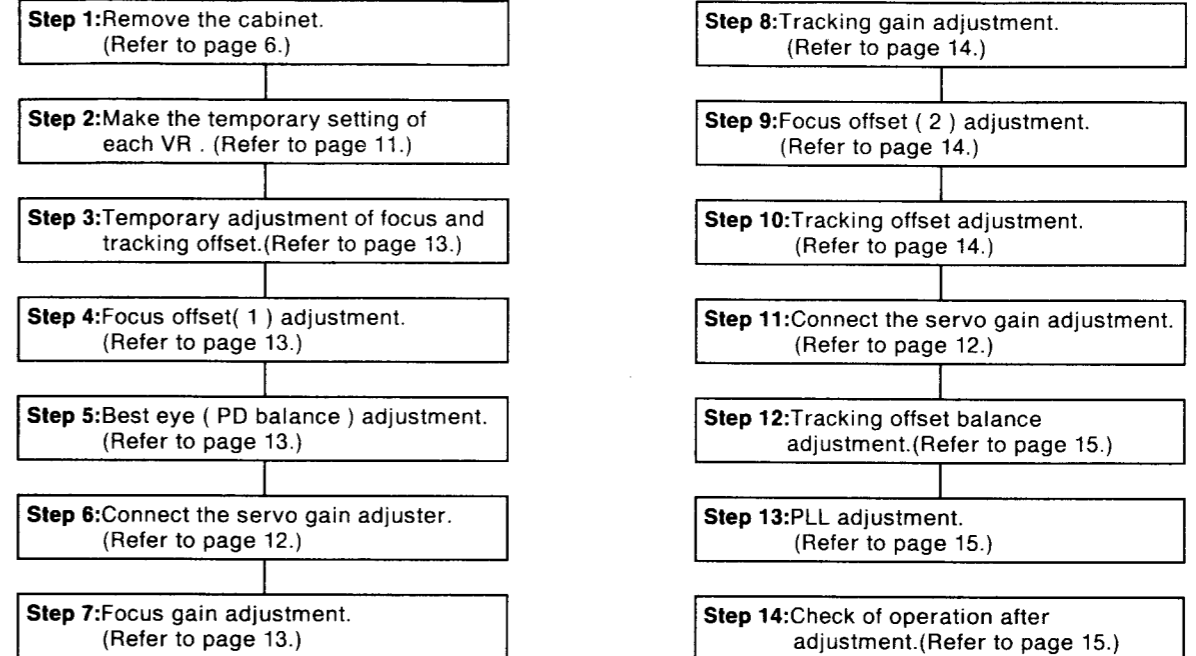


## ELECTRICAL ADJUSTMENT

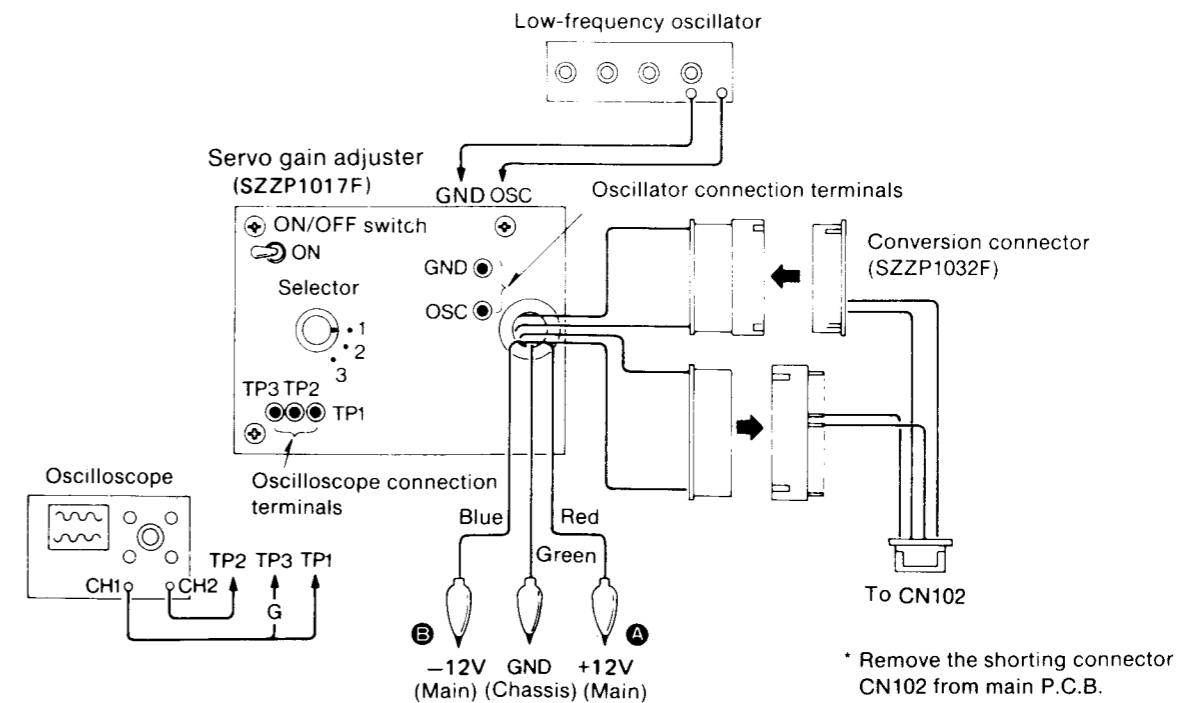
### Measuring Instruments and Special Tools

- Servo gain adjuster (SZZP1017F)
- Test disc
  - Test disc (SZZP1014F) old and new type
  - Inspection test disc (SZZP1054C)
  - Uneven disc (SZZP1056C)
  - Black band disc (SZZP1057C)
- Ordinary disc
- Two-channel oscilloscope (with trigger) of 30MHz or over
- Low frequency oscillator
- Conversion connector (SZZP1032F)
- Filter (Low-pass)

### Adjustment Procedure



### Connection of Servo Gain Adjuster



### TEMPORARY ADJUSTMENT OF FOCUS AND TRACKING OFFSET

#### ( Temporary adjustment of focus offset )

1. Connect CH1 of the oscilloscope **TJ102 (+)** and **TJ502 (-)** of the main P.C.B.

**Oscilloscope setting:** VOLT.....100mV  
SWEEP.....5msec.  
INPUT.....DC

2. Turn **ON** the power switch of the player and insert a test disc (SZZP1057C).

3. Set the player to the play mode.

4. After reading TOC, set the player to the stop mode.

5. Adjust **VR105** so that the voltage at the waveform center of the oscilloscope is **0mV**.

#### ( Temporary adjustment of tracking offset )

1. Connect CH1 of the oscilloscope to **TJ101 (+)** and **TJ502 (-)** of the main P.C.B.

**Oscilloscope setting:** VOLT.....100mV  
SWEEP.....5msec.  
INPUT.....DC

2. Turn **ON** the power switch of the player and insert a test disc (SZZP1057C).

3. Set the player to the play mode.

4. After reading TOC, set the player to the stop mode.

5. Adjust **VR103** so that the voltage at the waveform center of the oscilloscope is **0mV**.

### FOCUS OFFSET( 1 ) ADJUSTMENT

1. Connect CH1 of the oscilloscope to the **TJ102 (+)** and **TJ502 (-)** of the main P.C.B. through the filter. (Refer to page 11.)

**Oscilloscope setting:** VOLT.....50mV  
SWEEP.....1msec.  
INPUT.....DC

2. Set the oscilloscope to DC zero balance.

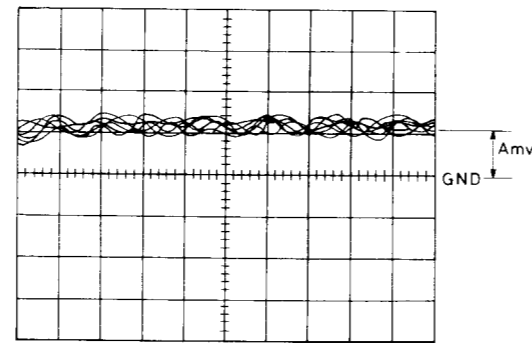
3. Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).

4. Set the player to the play mode.

5. Measure the DC level (AmV) displayed on the oscilloscope.

6. After measuring, set the player to the stop mode.

7. Adjust **VR105** so that the voltage is  $AmV \pm 10mV$ .



### BEST EYE(PD BALANCE) ADJUSTMENT

1. Connect CH1 of the oscilloscope to **TJ501 (+)** and **TJ502 (-)** of the main P.C.B.

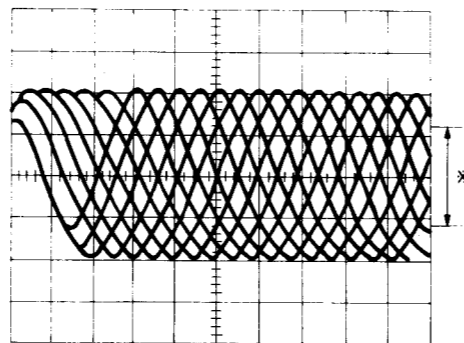
**Oscilloscope setting:** VOLT.....200mV  
SWEEP.....0.5μsec.  
INPUT.....AC

2. Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).

3. Set the player to the play mode.

4. Adjust **VR101** so that the eye pattern of RF signal is stretched to maximum.

5. Turn **OFF** the power switch of the player.



\*Most stretched eye pattern

### FOCUS GAIN ADJUSTMENT

1. Connect the servo gain adjuster. (Refer to page 6.)

2. Set the selector switch of the servo gain adjuster to **2** and ON-OFF switch to **ON**.

3. Set the low frequency oscillator to a frequency of **750Hz** and an output voltage of **100mVp-p**. Then connect the oscillator to the **OSC (+)** and **GND (-)** terminals of the servo gain adjuster.

4. Connect CH1 and CH2 of the oscilloscope to **TP1** and **TP2** of the servo gain adjuster. (TP3 is the ground terminal.)

**Oscilloscope setting:** VOLT.....200mV (both channels)  
SWEEP.....1msec.  
INPUT.....DC

5. Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).

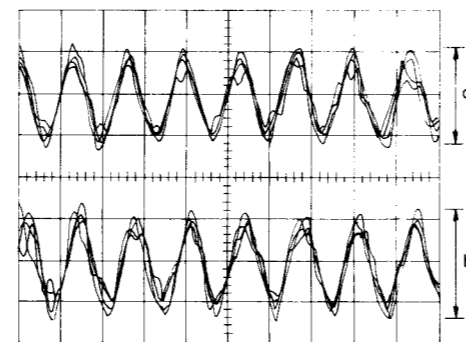
6. Set the player to the play mode.

7. Set the selector switch of the servo gain adjuster from **"2" to "3"**.

8. **750Hz** signals will be displayed on the oscilloscope. Adjust **VR104** until the waveform amplitudes of both channels are equal.

9. Shift the selector switch of the servo gain adjuster from **"3" to "2"**.

10. Turn **OFF** the power switch of the player.



\* Make a=b

### TRACKING GAIN ADJUSTMENT

1. Set the low frequency oscillator to a frequency of **1.0kHz** and an output voltage of **100mVp-p**. Then connect the oscillator to the **OSC (+)** and **GND (-)** terminals of the servo gain adjuster.

2. Connect CH1 and CH2 of the oscilloscope to **TP1** and **TP2** of the servo gain adjuster. (TP3 is the ground terminal.)

**Oscilloscope setting:** VOLT.....200mV (both channels)  
SWEEP.....1msec.  
INPUT.....DC

3. Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).

4. Set the player to the play mode.

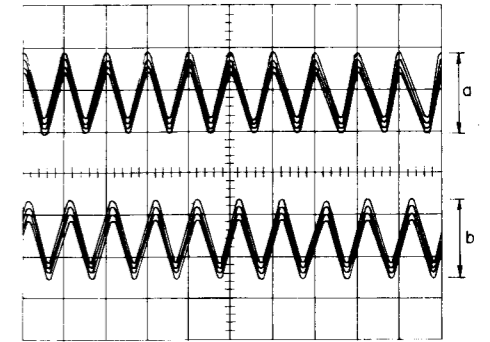
5. Set the selector switch of the servo gain adjuster from **"2" to "1"**.

6. **1.0kHz** signals will be displayed on the oscilloscope. Adjust **VR102** until the waveform amplitudes of both channels are equal.

7. Shift the selector switch of the servo gain adjuster from **"1" to "2"**.

8. Turn **OFF** the power switch of the player.

9. Disconnect the servo gain adjuster, and insert the short connector of CN102 to the original position.



\*Make a=b

### FOCUS OFFSET( 2 ) ADJUSTMENT

1. Connect CH1 of the oscilloscope to the **TJ501 (+)** and **TJ502 (-)** of the main P.C.B.

Connect CH2 of the oscilloscope to the **TJ102 (+)** and **TJ502 (-)** of the main P.C.B.

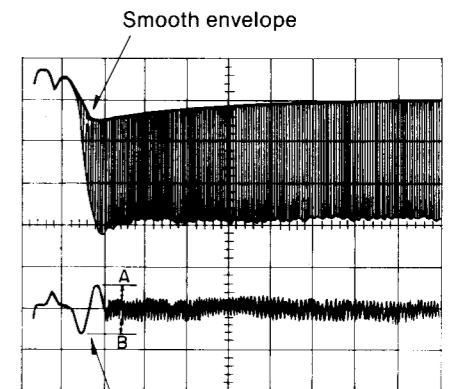
**Oscilloscope setting:** VOLT.....200mV (both channels)  
SWEEP.....0.5msec.  
INPUT.....AC (CH1), DC (CH2)  
MODE.....NORM

(Triggering via CH1)

2. Turn **ON** the power switch of the player and insert a test disc (SZZP1057C).

3. Set the player to the play mode.

4. Check the waveform of CH1 and CH2 on the oscilloscope and adjust **VR105**, so that the waveform around the triggering point becomes as shown in the illustration.



Minimize the amplitude or make A=B

### TRACKING OFFSET ADJUSTMENT

1. Connect CH1 of the oscilloscope to the **TJ501 (+)** and **TJ502 (-)** of the main P.C.B.

Connect CH2 of the oscilloscope to the **TJ101 (+)** and **TJ502 (-)** of the main P.C.B.

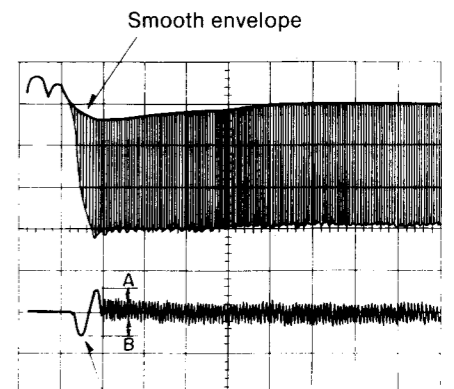
**Oscilloscope setting:** VOLT.....200mV (both channels)  
SWEEP.....0.5msec.  
INPUT.....AC (CH1), DC (CH2)  
MODE.....NORM

(Triggering via CH1)

2. Turn **ON** the power switch of the player and insert a test disc (SZZP1057C).

3. Set the player to the play mode.

4. Check the waveform of CH1 and CH2 on the oscilloscope and adjust **VR103**, so that the waveform around the triggering point becomes as shown in the illustration.

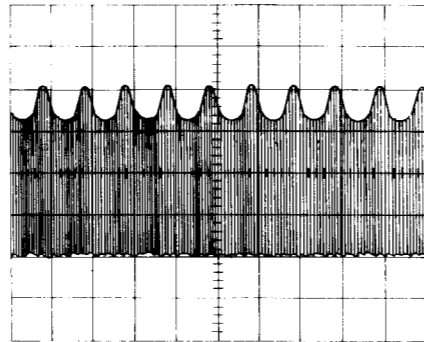


Minimize the amplitude or make A=B

### TRACKING OFFSET BALANCE ADJUSTMENT

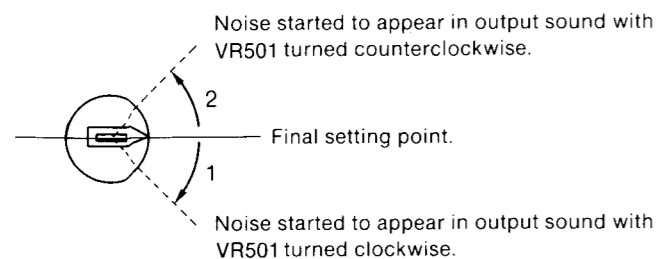
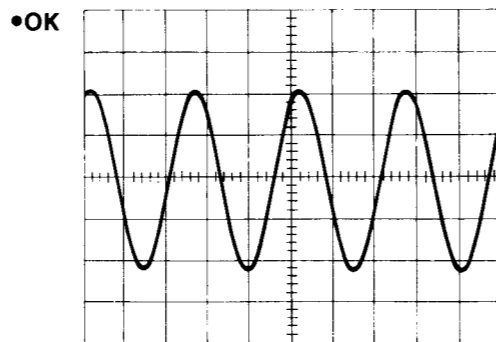
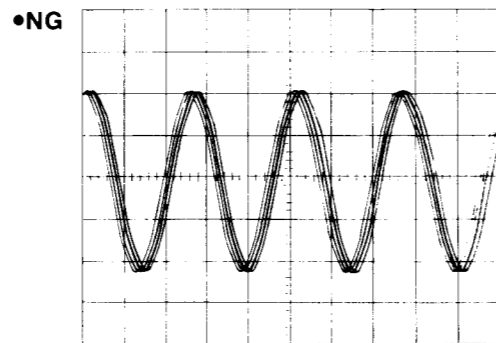
1. Connect the servo gain adjuster. (Refer to page 6.)
2. Set the selector switch of the servo gain adjuster to **2** and ON-OFF switch to **ON**.
3. Set the low frequency oscillator to a frequency of **1kHz** and an output voltage of **200mVp-p**. Then connect the oscillator to the **OSC (+)** and **GND (-)** terminals of the servo gain adjuster.
4. Connect CH1 of the oscilloscope to **TJ501 (+)** and **TJ502 (-)** of the main P.C.B.  
**Oscilloscope setting:** VOLT.....200mV  
 SWEEP.....0.5msec.  
 INPUT.....AC
5. Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
6. Set the player to the play mode.
7. Set the selector switch of the servo gain adjuster from **"2" to "1"**.
8. Adjust **VR106** so that the output waveform is as shown (jitter is minimized).

9. Shift the selector switch of the servo gain adjuster from **"1" to "2"**.
10. Turn **OFF** the power switch of the player.
11. Disconnect the servo gain adjuster, and insert the short connector of CN102 to the original position.



### PLL ADJUSTMENT

1. Connect CH1 of the oscilloscope to the **LINE OUT terminal** (either of Lch or Rch) and **ground**.  
**Oscilloscope setting:** VOLT.....1V  
 SWEEP.....1msec.  
 INPUT.....DC
2. Turn **ON** the power switch of the player and insert a test disc (SZZP1054C).
3. Play **Track 6 (wedge 0.7mm)** of the test disc.
4. Check the waveform displayed on the oscilloscope and adjust **VR501** in the following steps.  
**Step 1.** Turn **VR501** clockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.  
**Step 2.** Turn **VR501** counterclockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.  
**Step 3.** Set **VR501** in the middle between the points observed in the above steps "1" and "2".



### CHECK OF PLAY OPERATION AFTER ADJUSTMENT

#### Check of skip search

1. Play an ordinary disc.
2. Press the skip button and verify skip search operation (forward and reverse).

#### Check of manual search

1. Play an ordinary disc.
2. Press the manual search button and verify that smooth manual search can be performed at low and high speeds (forward and reverse).

#### Check of playability

1. Play the test disc (SZZP1054C).
2. Play the track 6 (wedge 0.7mm) and verify that there is no skip sound or noise.
3. Play the track 13 (black dot 0.7mm) and verify that there is no skip sound or noise.

### OPTICAL PICKUP ADJUSTMENT

#### Measuring Instruments and Special Tools

- Tow-channel oscilloscope (with trigger) of 30MHz or over
- Test disc (SZZP1014F) old and new type inspection test disc (SZZP1054C) Unever disc (SZZP1056C)

- Hexagonal wrench (SZZP1044C...1.5 mm)
- Hexagonal wrench (1.27 mm)
- Screw lock paint (RZZ0L01)

#### Adjustment Procedure

- If the optical pickup and spindle motor are replaced, adjust it according to the following procedure.

**Step 1:** Make the temporary setting of each VR. (Refer to page 11.)

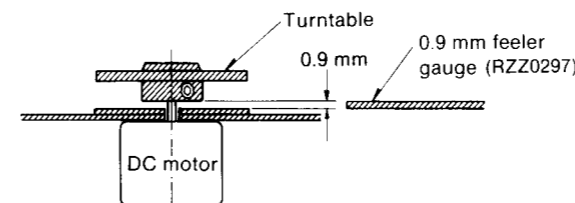
**Step 2:** Turntable height adjustment. (Refer to page 16.)

**Step 3:** Mechanical adjustment. (Refer to page 16.)

**Step 4:** Electrical adjustment. (Refer to page 12.)

### TURNTABLE HEIGHT ADJUSTMENT

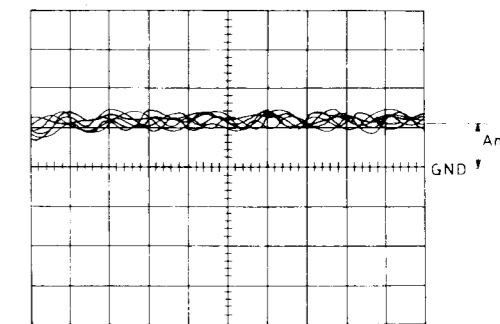
1. Insert a 0.9 mm feeler gauge (RZZ0297) between the turntable and loading base as shown below.



2. Tighten the turntable set-screw by using a 1.27 mm hexagonal wrench.
3. Temporary adjustment of focus adjustment. (Refer to page 13).
4. Connect CH1 of the oscilloscope to the **TJ102 (+)** and **TJ502 (-)** of the main P.C.B. through the filter. (Refer to page 11).

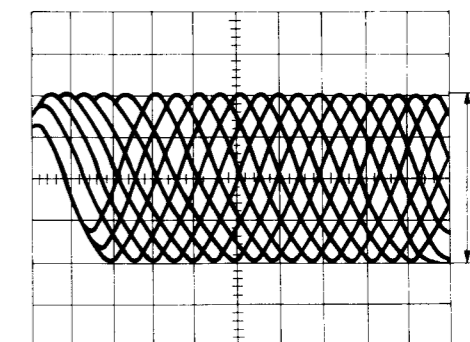
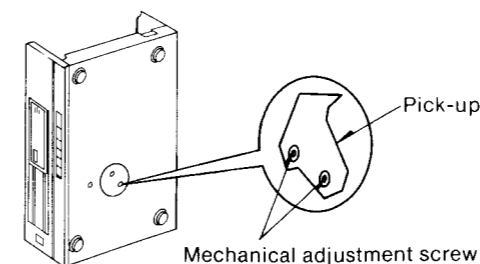
**Oscilloscope setting:** VOLT..... 50mV  
 SWEEP... 1msec.  
 INPUT.... DC

5. Set the oscilloscope to DC zero balance.
6. Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
7. Set the player to the play mode.
8. Measure the DC level (AmV) displayed on the oscilloscope.
9. After measuring, set the player to the stop mode.
10. Adjust **VR105** so that the voltage is AmV  $\pm$  10mV.



### MECHANICAL ADJUSTMENT

1. Connect CH1 of the oscilloscope to **TJ501 (+)** and **TJ502 (-)** of the main P.C.B.  
**Oscilloscope setting:** VOLT..... 200 mV  
 SWEEP... 0.5  $\mu$ sec.  
 INPUT.... AC
2. Turn **ON** the power switch of the player and insert a test disc (SZZP1056C).
3. Monitoring the RF signal on the oscilloscope, adjust the **two adjusting screws** alternately so that the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.
4. Turn **OFF** the power switch of the player.
5. After the adjustment, apply **screw lock paint (RZZ0L01)** to the adjusting screw.



**Note:** The mechanical adjustment screws has been already locked with screw lock paint at the factory. So, it might be hard to turn them.



# 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.  
 \* Bracketed indications in Ref. No. columns specify the area.  
 Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Code	Description	Ref. No.	Part No.	Part Code	Description
<b>INTEGRATED CIRCUITS</b>				Q803, Q804	2SD1330R	001 030 2521 6	TRANSISTOR
IC13	M5236L	001 060 5358 9	I.C., REGULATOR	Q805	UN4112	001 030 3018 2	TRANSISTOR
IC101	AN8370S	001 060 8399 8	I.C., SERVO	Q806	UN4212	001 030 3019 1	TRANSISTOR
IC102	MN6636S	001 061 3044 7	I.C., ANALOG SW.	Q807	UN4112	001 030 3018 2	TRANSISTOR
IC103, IC104	AN6554NS	001 060 4860 4	I.C., OPERATION AMP.	Q808	UN4212	001 030 3019 1	TRANSISTOR
IC301	MN6617	001 060 8411 9	I.C., SIGNAL PROCESSING	<b>DIODES</b>			
IC302	MN6618A	001 061 3043 8	I.C., DIGITAL FILTER	D11, D12	MA4091-M	001 032 7213 5	DIODE
IC303	SV1CXK5816M	001 061 3238 7	I.C., 16K RAM	D15, D16	MA4068M	001 032 4954 7	DIODE
IC351	AN6552S	001 060 7386 7	I.C., OPERATION AMP.	D17	MA4330L	001 032 7228 8	DIODE
IC401	MN15261PDU	001 061 3086 7	I.C., SYSTEM CONTROL	D18	MA4056-M	001 032 7209 1	DIODE
IC402	AN6552S	001 060 7386 7	I.C., OPERATION AMP.	D19- D26 $\Delta$	SVD1SR35200A	001 032 3951 4	RECTIFIER
IC403	MN1280-R	001 060 8669 5	I.C., RESET	D181, D182	MA165	001 032 0494 0	DIODE
IC404	MN1550PDT	001 061 3639 6	I.C., MICRO COMPUTER	D401- D404	MA165	001 032 0494 0	DIODE
IC501	AN8371S	001 060 8400 2	I.C., PLL	D406, D407	MA165	001 032 0494 0	DIODE
IC801	SV1PCM55HP-2	001 061 4892 1	I.C., D/A CONVERTER	D412, D413	MA165	001 032 0494 0	DIODE
IC802	MN6636S	001 061 3044 7	I.C., ANALOG SW.	D415- D418	MA165	001 032 0494 0	DIODE
IC803	SV1LM833M	001 061 4829 8	I.C., OPERATION AMP.	D422	MA165	001 032 0494 0	DIODE
IC804	SV1BA4560F	001 061 4890 3	I.C., OPERATION AMP.	D801- D807	MA165	001 032 0494 0	DIODE
IC805, IC806	SV1GA011	001 061 3045 6	I.C., FILTER	D809, D810	MA165	001 032 0494 0	DIODE
IC807	MN1280-S	001 061 3084 9	I.C., MUTING	<b>I.C. PROTECTORS</b>			
<b>TRANSISTORS</b>				ICP11, ICP12	SRUN15	001 061 2834 9	I.C. PROTECTOR 1.5A
Q11	2SD1862QR	001 030 7210 8	TRANSISTOR	<b>VARIABLE RESISTORS</b>			
Q12, Q13	2SB793A-QRS	001 030 2370 3	TRANSISTOR	VR101	EVND3AA00B53	001 180 2644 9	V.R., 5K $\Omega$ (B)
Q14	2SB793A-QRS	001 030 2370 3	TRANSISTOR	VR102, VR103	EVND3AA00B14	001 180 2642 1	V.R., 10K $\Omega$ (B)
Q15	2SD973A-QRS	001 030 1947 8	TRANSISTOR	VR104, VR105	EVND3AA00B14	001 180 2642 1	V.R., 10K $\Omega$ (B)
Q16	2SB793A-QRS	001 030 2370 3	TRANSISTOR	VR106	EVND3AA00B53	001 180 2644 9	V.R., 5K $\Omega$ (B)
Q17	2SB642-QRS	001 030 2556 5	TRANSISTOR	VR501	EVN38CA00B13	001 180 0549 5	V.R., 1K $\Omega$ (B)
Q101	2SD637	001 030 1794 7	TRANSISTOR	<b>COILS AND TRANSFORMERS</b>			
Q141	2SD973A-QRS	001 030 1947 8	TRANSISTOR	L301	ELEY100KA	001 210 7162 7	COIL
Q142	2SB793A-QRS	001 030 2370 3	TRANSISTOR	L302	ELEY3R3KA	001 211 3807 4	COIL
Q161	2SD973A-QRS	001 030 1947 8	TRANSISTOR	T1 $\Delta$	SLTD5K027SC	001 202 8858 4	POWER TRANSFORMER
Q162	2SB793A-QRS	001 030 2370 3	TRANSISTOR	<b>OSCILLATORS</b>			
Q181	2SD973A-QRS	001 030 1947 8	TRANSISTOR	X301	SVQ16CKSS	001 250 1471 7	16.9344MHZ
Q182	2SB793A-QRS	001 030 2370 3	TRANSISTOR	<b>DISPLAYS</b>			
Q351	UN4112	001 030 3018 2	TRANSISTOR	FL401	SADD9	001 001 0513 7	DISPLAY
Q354	2SD973A-QRS	001 030 1947 8	TRANSISTOR	<b>SWITCHES</b>			
Q355	2SB793A-QRS	001 030 2370 3	TRANSISTOR	S1 $\Delta$	ESB8249V	003 435 5877 0	POWER SWITCH
Q402	2SD973A-QRS	001 030 1947 8	TRANSISTOR	S101	SSPD5	003 434 1032 8	SW. REST
Q403	2SB793A-QRS	001 030 2370 3	TRANSISTOR	S401- S408	SSGD1-2	003 437 0912 4	SW. OPERATION
Q408	UN4112	001 030 3018 2	TRANSISTOR				
Q409	UN4212	001 030 3019 1	TRANSISTOR				
Q801, Q802	2SC311A-Q	001 030 5279 5	TRANSISTOR				

Ref. No.	Part No.	Part Code	Description	Ref. No.	Part No.	Part Code	Description
<b>CABINET AND CHASSIS</b>				108	SD0028-E	016 766 0225 3	TURNTABLE
1	SGPLP117-KM	016 840 7681 0	CHASSIS	109	SRQA010N04	017 726 0412 8	SPRING
1-1	SRGA006N01	016 653 0916 1	RUBBER CUSHION	110	SD0029	005 512 0855 0	RING
2	SJSD16	003 400 7436 6	AC SOCKET	111	SNSD10	005 500 5675 8	SCREW
3	SUSD92	016 726 0999 8	SPRING (RED)	112	XTV3+8G	005 501 0913 8	SCREW
4	SUSD91	016 726 0998 9	SPRING (BLUE)	113	XTN2+4G	005 501 2780 5	SCREW
5	SUSD42	016 726 0841 9	SPRING (SILVER)	114	XQN17+AG	005 500 4900 2	SCREW
6	SUSD43	016 726 0842 8	SPRING (GOLD)	115	S1SD12	016 630 1828 3	LOADING BASE
7	SMND7-1	016 631 0050 8	HOLDER	116	SOYD8E	016 634 0128 8	YOKE
8	SUB05-1M	016 712 0361 6	ROD	117	SOYD9	016 634 0125 1	YOKE
9	SBC666-1	016 702 6076 0	BUTTON	118	SORD10E	001 211 3219 8	COIL
10	SKCD40KZ	016 800 2876 5	CABINET	119	SHRD23	016 652 0633 4	LOCK SHAFT
11	XTV3+8J	005 501 0901 2	SCREW	120	XXE26D5	005 500 5095 2	SCREW
12	XTV3+8JFZ	005 501 0919 2	SCREW	121	SJGDRF310T	002 310 2552 2	SPINDLE MOTOR
13	XTV3+8G	005 501 0913 8	SCREW	122	SDGD19	016 745 0199 5	GEAR
14	SNE2129-1	005 500 7938 6	SCREW	123	SDGD20-1	016 745 0202 7	GEAR
15	EMCS0250Z	003 402 1223 1	CONNECTOR (CN351)	124	SMBD2-1	016 754 0059 5	BELT
16	EMCS0350Z	003 402 1227 7	CONNECTOR (CN103)	125	SHRD19	016 652 0634 3	LEVER
17	EMCS0550Z	003 402 1233 9	CONNECTOR (CN402)	126	SUSD31	016 726 0843 7	SPRING
18	EMCS0650Z	003 402 1235 7	CONNECTOR (CN11)	127	SHGD69	016 653 1078 0	RUBBER
19	EMCS0552M	003 402 0112 1	CONNECTOR (CN102)	128	SNSD10	005 500 5675 8	SCREW
20	SJSD1709	003 403 6503 1	CONNECTOR (CN101)	129	SIRD51		HOLDER
21	SRDJ001N14E	003 410 6157 8	SHORTING PIN (CN102)	130	XSN26+6	005 500 1364 6	SCREW
22	SJFD4	003 410 7707 6	OUTPUT TERMINAL	131	SIRLP117-KM1		DISC HOLDER
23	SGYLP117-KM	016 840 7705 9	FRONT PANEL	131-1	SHGD107	016 653 1194 7	RUBBER CUSHION
24	SBCLP117-KM2	016 702 7068 6	BUTTON	132	XTN2+5G	005 501 3534 3	SCREW
25	SBGD4570ZK0A	016 702 7026 6	BUTTON	133	XYM2+C12	005 503 1322 1	SCREW
26	SGXD3040ZK0A	016 846 3797 5	ORNAMENT PLATE	134	SFXGQ06N01	005 500 4983 3	SCREW
27	SHRD22-M	016 650 5257 8	BRACKET	135	SHGD116	016 653 1188 5	RUBBER CUSHION
28	SJJ130-2	003 400 7317 2	JACK, REMOTE	136	SIRLP117-KM	016 631 0060 6	DISC TRAY
29	SJS9331A	003 403 7236 7	AC OUTLET COVER	136-1	SHGD49	016 653 1079 9	RUBBER CUSHION
30	SJS9331B	003 403 7275 0	AC OUTLET	137	SIRD20	016 718 3355 2	LEVER
31	SBCLP117-KM1	016 702 7067 7	BUTTON	138	SUWD46	016 650 5256 9	BRACKET
<b>LOADING MECHANICAL</b>				139	SUSD29-1	016 726 0845 5	SPRING
101	SHGD95-1	016 653 1136 7	RUBBER CUSHION	140	SUSD51	016 726 0846 4	SPRING
102	SGXD270ZK0C	016 846 3800 7	ORNAMENT PLATE	141	SNSD10	005 500 5675 8	SCREW
103	SDALP1200-KM	001 271 0632 3	OPTICAL PICKUP ASS'Y	142	SFXGQ06N01	005 500 4983 3	SCREW
104	EWSL04A00000	016 631 0044 6	HOLDER	143	SHDD1-5	016 652 0759 1	SCREW
105	EWS7B0A00Q53	001 174 8773 3	RESISTANCE UNIT	144	SIRD17-2E		CLAMPER
106	SUXD25	016 634 0124 2	SHAFT	145	SOMD4	003 453 0241 8	MAGNET
107	SHGD47	016 653 1070 8	SPACER	146	SOYD2	016 634 0111 7	YOKE
<b>PACKINGS</b>				147	SJGD8E	002 310 2569 3	MOTOR
P1	SPND192	016 971 5028 1	CARTON BOX	<b>ACCESSORIES</b>			
(M)				A1	SQUD197	016 983 5142 4	INSTRUCTION MANUAL
P1	SPND193	016 971 5029 0	CARTON BOX	A1	SQULP117-KMC	016 983 5141 5	INSTRUCTION MANUAL
(MC)				(MC)			
P2	SPSD122	016 977 3311 9	PAD	A2 $\Delta$	SJA172	003 490 4069 7	POWER CORD
P3	SPSD123	016 977 3312 8	PAD	(MC)			
P4	XZB5X40A01	016 978 0472 0	PROTECTION BAG	A2 $\Delta$	SJA175-1T	003 490 5406 6	POWER CORD
P5	SPSD68	016 977 3081 4	SHEET	(M)			
P6	XZB26X17C03	016 978 0526 3	POLYETHYLENE BAG	A3	SJP2249-1	003 492 6446 4	OUTPUT CORD

# RESISTORS AND CAPACITORS

## 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.

\* Bracketed indications in Ref. No. columns specify the area.

Parts without these indications can be used for all areas.

## Numbering System of Resistor

### Example

ERD	25	F	J	102
Type	Wattage	Shape	Tolerance	Value
ERX	2	AN	J	471
Type	Wattage	Shape	Tolerance	Value
				$47 \times 10^1$ (ohm)

## Numbering System of Capacitor

### Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity
ECEA	50	M		330
Type	Voltage	Peculiarity		Value
				$(33 \times 10^0$ microfarad)

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W	J : $\pm 5\%$
ERG : Metal Oxide	12 : 1/2W	F : $\pm 1\%$
ERX : Metal Film	25 : 1/4W	G : $\pm 2\%$
ERQ : Fuse Type Metal	1A : 1W	K : $\pm 10\%$
ERD $\square$ L : Carbon (chip)	18 : 1/8W	
ERO : Metal Film	S2 : 1/4W	
ERC : Solid	S1 : 1/2W	
	2F : 1/4W	
	50 : 1/2W	
	2A : 2W	

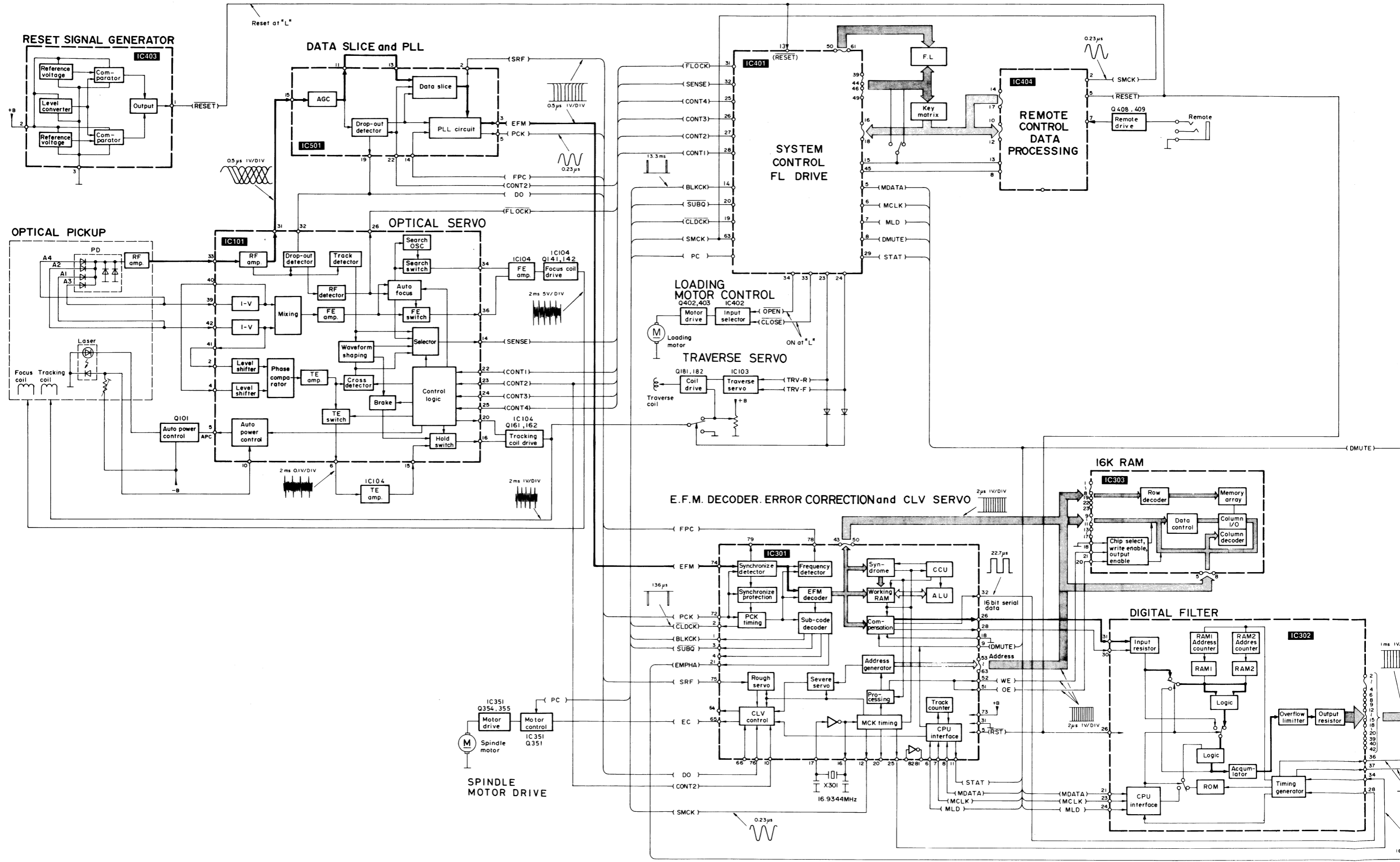
Capacitor Type	Voltage	Tolerance
ECE : Electrolytic	0J : 6.3V	C : $\pm 0.25\text{pF}$
ECCD : Ceramic	1A : 10V	J : $\pm 5\%$
ECKD : Ceramic	1C : 16V	K : $\pm 10\%$
ECQM : Polyester	1E : 25V	Z : $+80\%$
	1H : 50V	P : $+100\%$
ECQP : Polypropylene	1V : 35V	
	50 : 50V	-0%
	05 : 50V	M : $\pm 20\%$
ECG : Ceramic	2H : 500V	
ECEADDDN : Non Polar Electrolytic	2A : 100V	D : $\pm 0.5\text{pF}$
QCU $\square$ : Ceramic (Chip Type)	1 : 100V	G : $\pm 2\%$
ECUX : Ceramic (Chip Type)	KC : 400V AC	
ECF : Semiconductor	KC : 125VAC (UL)	
	1J : 63V	
EECW : Liquid electrolyte double layer capacitor		

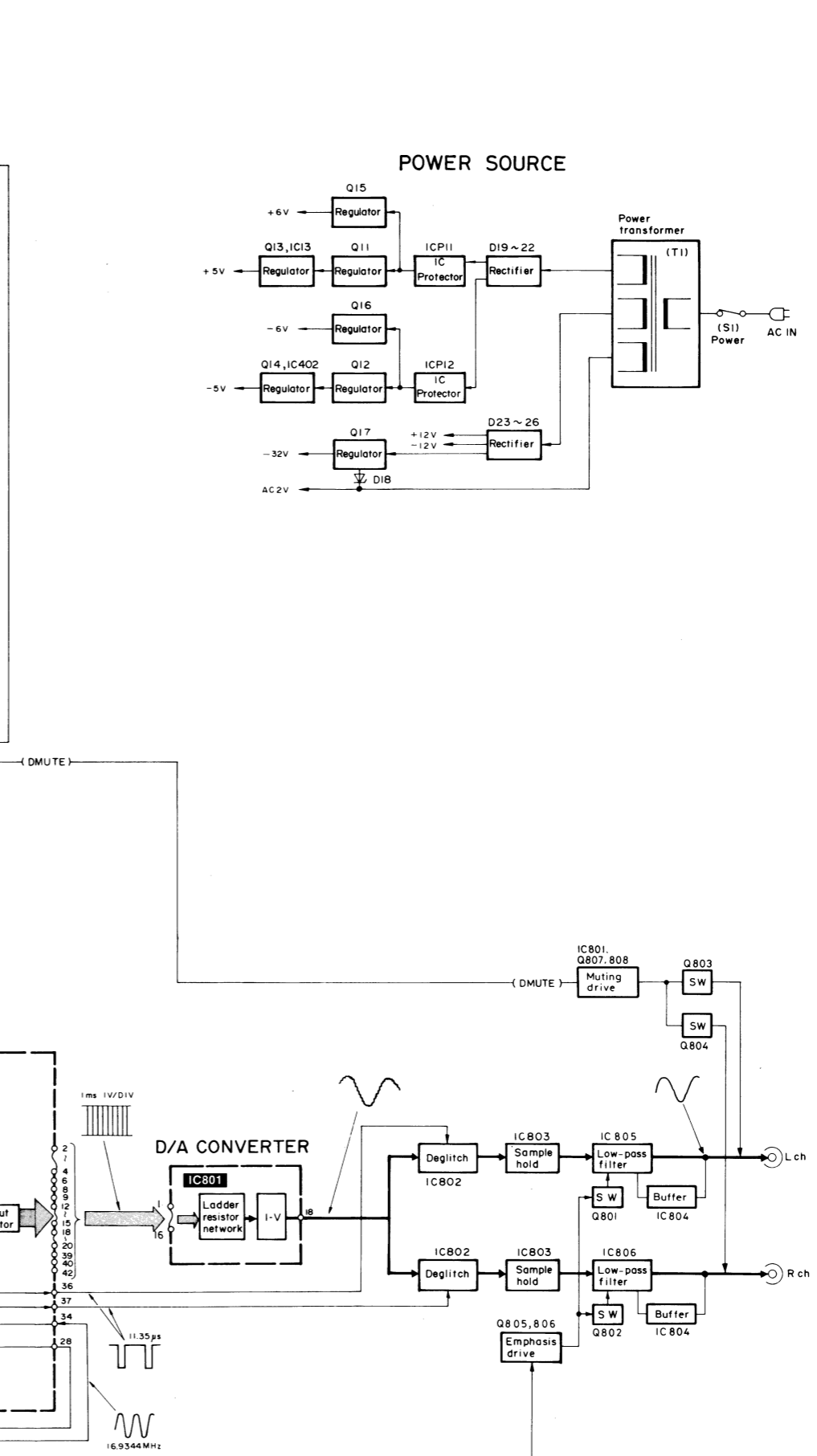
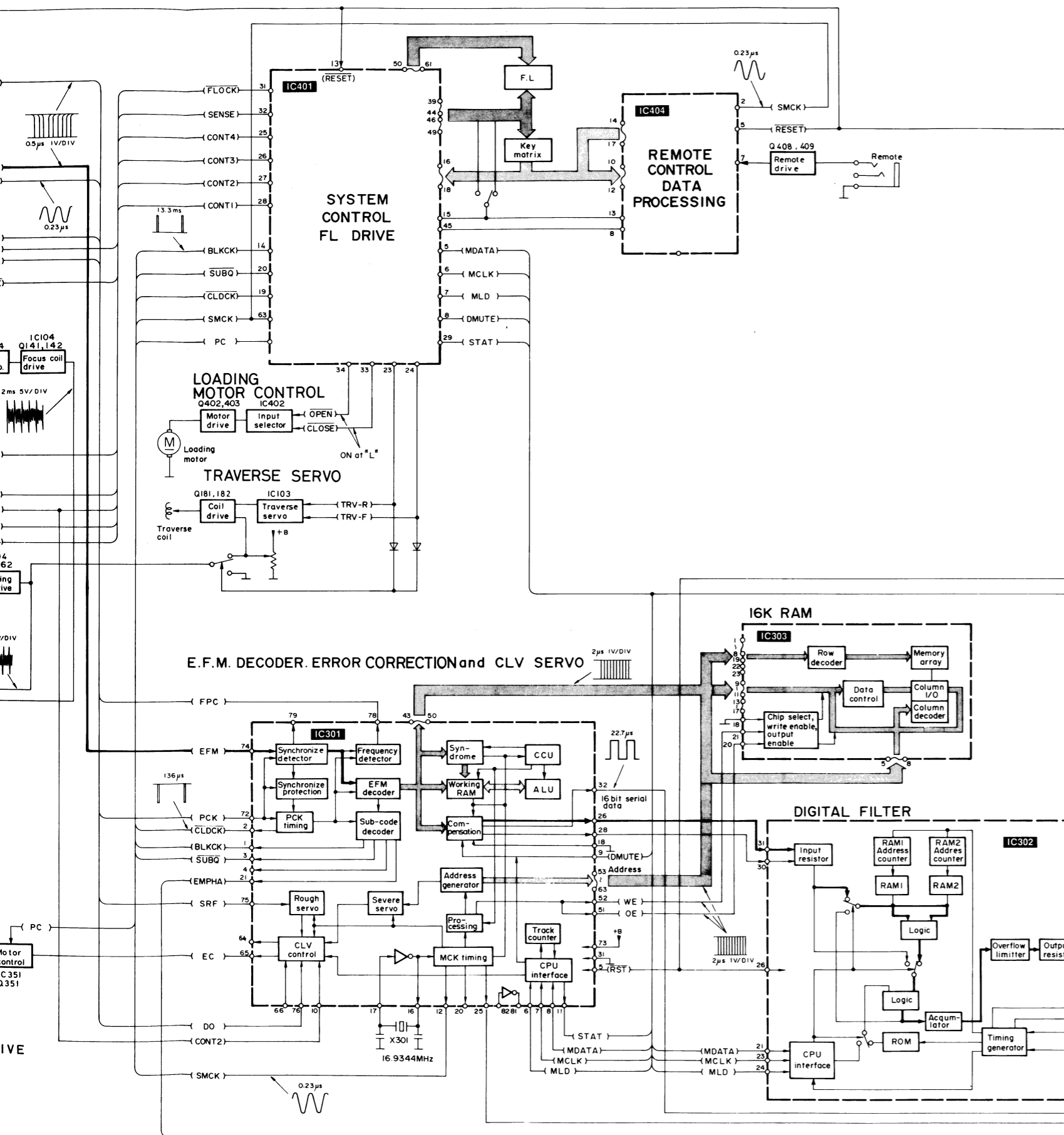
Ref. No.	Part No.	Part Code	Ref. No.	Part No.	Part Code	Ref. No.	Part No.	Part Code
RESISTORS								
R11, R12	ERDS2TJ681	001 152 2449 8	R152	ERDS2TJ153	001 152 2351 7	R363	ERDS2TJ101	001 152 2421 0
R13	ERDS2TJ221	001 152 2431 8	R153	ERDS2TJ270	001 152 2434 5	R406	ERDS2TJ394	001 152 2441 6
R14	ERDS2TJ101	001 152 2421 0	R154	ERDS2TJ3R3	001 152 3152 8	R407	ERDS2TJ152	001 152 2350 8
R15, R16	ERDS2TJ561	001 152 2364 2	R161	ERDS2TJ333	001 152 2358 0	R409, R410	ERDS2TJ472	001 152 2362 4
R17	ERDS2TJ222	001 152 2353 5	R162	ERDS2TJ222	001 152 2353 5	R411, R412	ERDS2TJ472	001 152 2362 4
R18	ERDS2TJ392	001 152 2439 0	R163	ERDS2TJ333	001 152 2358 0	R413, R414	ERDS2TJ472	001 152 2362 4
R19	ERDS2TJ103	001 152 2347 3	R164	ERDS2TJ153	001 152 2351 7	R415	ERDS2TJ472	001 152 2362 4
R20	ERDS2TJ332	001 152 2357 1	R165	ERDS2TJ122	001 152 2423 8	R416	ERDS2TJ823	001 152 2456 9
R21	ERDS2TJ153	001 152 2351 7	R166	ERDS2TJ102	001 152 2346 4	R417	ERDS2TJ124	001 152 2425 6
R22, R23	ERDS2TJ682	001 152 2365 1	R167	ERDS2TJ681	001 152 2449 8	R418	ERDS2TJ823	001 152 2456 9
R24, R25	ERDS2TJ471	001 152 2361 5	R168	ERDS2TJ272	001 152 2354 4	R419	ERDS2TJ124	001 152 2425 6
R26	ERDS2TJ471	001 152 2361 5	R169	ERDS2TJ392	001 152 2439 0	R420	ERDS2TJ101	001 152 2421 0
R27	ERDS2TJ392	001 152 2439 0	R170	ERDS2TJ101	001 152 2421 0	R423	ERDS2TJ103	001 152 2347 3
R28	ERDS2TJ330	001 152 2355 3	R171	ERDS2TJ270	001 152 2434 5	R424	ERDS2TJ473	001 152 2363 3
R101	ERDS2TJ154	001 152 2427 4	R172	ERDS2TJ3R3	001 152 3152 8	R425, R426	ERDS2TJ103	001 152 2347 3
R102, R103	ERDS2TJ472	001 152 2362 4	R179	ERDS2TJ332	001 152 2357 1	R427, R428	ERDS2TJ103	001 152 2347 3
R104	ERDS2TJ223	001 152 2432 7	R180	ERDS2TJ474	001 152 2443 4	R429, R430	ERDS2TJ222	001 152 2353 5
R105	ERDS2TJ334	001 152 2438 1	R181	ERDS2TJ471	001 152 2361 5	R431, R432	ERDS2TJ222	001 152 2353 5
R107	ERDS2TJ473	001 152 2363 3	R182, R183	ERDS2TJ564	001 152 2447 0	R433	ERDS2TJ103	001 152 2347 3
R108	ERDS2TJ332	001 152 2357 1	R184	ERDS2TJ223	001 152 2432 7	R434	ERDS2TJ124	001 152 2362 4
R109	ERDS2TJ822	001 152 2455 0	R185	EROS2TKF4302	001 151 7115 2	R435, R436	ERDS2TJ822	001 152 2455 0
R110, R111	ERDS2TJ682	001 152 2365 1	R186, R187	EROS2TKF4702	001 151 5723 2	R501	ERDS2TJ224	001 152 2433 6
R112	ERDS2TJ822	001 152 2455 0	R188	EROS2TKF4702	001 151 5723 2	R502	ERDS2TJ562	001 152 2445 2
R113, R114	ERDS2TJ152	001 152 2350 8	R189, R190	ERDS2TJ123	001 152 2424 7	R503	ERDS2TJ474	001 152 2443 4
R115	ERDS2TJ102	001 152 2346 4	R191	ERDS2TJ154	001 152 2427 4	R504	ERDS2TJ221	001 152 2431 8
R116, R117	ERDS2TJ182	001 152 2352 6	R192	ERDS2TJ824	001 152 2457 8	R505	ERDS2TJ104	001 152 2348 2
R118	ERDS2TJ102	001 152 2346 4	R193	ERDS2TJ101	001 152 2421 0	R506	ERDS2TJ333	001 152 2358 0
R119	ERDS2TJ471	001 152 2361 5	R194	ERDS2TJ683	001 152 2450 5	R507	ERDS2TJ102	001 152 2346 4
R120	ERDS2TJ120	001 152 3146 6	R195, R196	ERDS2TJ103	001 152 2347 3	R801, R802	ERDS2TJ222	001 152 2353 5
R122	ERDS2TJ471	001 152 2361 5	R197	ERDS2TJ473	001 152 2363 3	R803, R804	ERDS2TJ272	001 152 2354 4
R141	ERDS2TJ102	001 152 2346 4	R198	ERDS2TJ333	001 152 2440 7	R805, R806	ERDS2TJ561	001 152 2364 2
R142	ERDS2TJ333	001 152 2358 0	R302	ERDS2TJ472	001 152 2362 4	R809, R810	ERDS2TJ473	001 152 2363 3
R143	ERDS2TJ124	001 152 2425 6	R303, R304	ERDS2TJ102	001 152 2346 4	R811, R812	ERDS2TJ472	001 152 2362 4
R144	ERDS2TJ333	001 152 2358 0	R306	ERDS2TJ102	001 152 2346 4	R813, R814	ERDS2TJ472	001 152 2362 4
R145	ERDS2TJ153	001 152 2351 7	R308	ERDS2TJ121	001 152 2349 1	R815, R816	ERDS2TJ102	001 152 2346 4
R146	ERDS2TJ122	001 152 2423 8	R309	ERDS2TJ472	001 152 2362 4	R817	ERDS2TJ104	001 152 2348 2
R147	ERDS2TJ682	001 152 2365 1	R352	ERDS2TJ334	001 152 2438 1	R818	ERDS2TJ471	001 152 2361 5
R148	ERDS2TJ104	001 152 2348 2	R355, R356	ERDS2TJ333	001 152 2358 0	R819	ERDS2TJ102	001 152 2346 4
R149	ERDS2TJ152	001 152 2350 8	R357	ERDS2TJ123	001 152 2424 7	R820	ERDS2TJ473	001 152 2363 3
R150	ERDS2TJ103	001 152 2347 3	R358	ERDS2TJ103	001 152 2347 3	CAPACITORS		
R151	ERDS2TJ101	001 152 2421 0	R359	ERDS2TJ274	001 152 2437 2	C1 $\Delta$	ECKDKC103PF2	001 103 3734 7
			R361	ERDS2TJ103	001 152 2347 3	C2 $\Delta$	RXAF103Z22EY	001 230 0547 0
			R362	ERDS2TJ8R2	001 152 5486 1			

Ref. No.	Part No.	Part Code	Ref. No.	Part No.	Part Code	Ref. No.	Part No.	Part Code
C11, C12	ECFF1E104ZF	001 103 4992 7	C122, C123	ECKD1H101KB	001 103 1412 0	C401	ECFF1E104ZF	001 103 4992 7
C13	ECEA1CU470	001 120 2835 0	C124	ECKD1H222KB	001 103 1494 2	C402	ECEA0JU470	001 120 3125 9
C14	ECFF1E104ZF	001 103 4992 7	C125	ECEA0JU220	001 120 4670 5	C403	ECFTD103KXL	001 108 0341 7
C15, C16	ECEA1CU221	001 120 2833 2	C126	ECEA0JU470	001 120 3125 9	C405	ECFF1E104ZF	001 103 4992 7
C17, C18	ECFF1E104ZF	001 103 4992 7	C127, C128	ECKD1H102KB	001 103 1414 8	C406	ECCD1H220K	001 103 0493 7
C19, C20	ECEA1AU101	001 120 2830 5	C129	ECKD1H681K	001 103 1580 5	C408	ECFTD103KXL	001 108 0341 7
C21, C22	ECEA1CU222	001 120 3074 3	C141	ECQM1H153JZ	001 106 0704 0	C501	ECQM1H104JZ	001 106 0675 8
C23, C24	ECEA1CU331	001 120 3200 5	C142	ECQM1H122JZ	001 106 0683 8	C502	ECFF1E104ZF	001 103 4992 7
C25, C26	ECEA1VU101	001 120 2929 5	C143	ECQM1H473JZ	001 106 0810 9	C503	ECEA1CU100	001 120 2905 3
C27, C28	ECEA0JS331	001 120 2975 9	C144	ECEA1HSN2R2	001 120 3239 0	C504, C505	ECFF1E104ZF	001 103 4992 7
C29	ECEA1AU101	001 120 2830 5	C145	ECEA1HSNR22	001 120 4836 1	C506	ECCD1H150KC	001 103 0410 6
C30, C101	ECFF1E104ZF	001 103 4992 7	C161	ECQM1H153JZ	001 106 0704 0	C507	ECKD1H102KB	001 103 1414 8
C102, C103	ECKD1H102KB	001 103 1414 8	C162	ECKD1H681K	001 103 1580 5	C508	RBP1CN100CT	001 120 6146 2
C104	ECKD1H681K	001 103 1580 5	C163	ECQM1H103JZ	001 106 0667 8	C509	ECCD1H100KC	001 103 0321 6
C105, C106	ECKD1H471KB	001 103 1551 0	C164	ECEA1ESN3R3	001 120 5060 1	C510	ECQM1H104JZ	001 106 0675 8
C107	ECCD1H220K	001 103 0493 7	C165	ECEA1HSNR1	001 120 4837 0	C511	ECEA1HUR47	001 120 3249 8
C108	ECEA1HSOR1	001 120 3250 5	C181	ECQM1H474JZ	001 106 2709 7	C512, C513	ECKD1H681K	001 103 1580 5
C109	ECEA1HU010	001 120 2842 1	C182	ECKD1H221KB	001 103 1487 1	C514	ECQM1H154JZ	001 106 0712 0
C110	ECQV1H104JZ	001 106 2571 7	C183	ECQM1H682JZ	001 106 0832 3	C515	ECQM1H153JZ	001 106 0704 0
C111, C112	ECEA1HU100	001 120 3251 4	C184	ECEA1HSN010	001 120 3237 2	C516	ECEA1HSN2R2	001 120 3239 0
C113	ECEA1HNR33BV	001 120 5949 9	C186	ECQM1H224JZ	001 106 0746 0	C517	ECKD1H471KB	001 103 1551 0
C114	ECKD1H182KB	001 103 1479 1	C187	ECEA1HSN2R2	001 120 3239 0	C801, C802	ECKD1H271KB	001 103 1515 4
C115	ECKD1H682KB	001 103 1592 1	C301	ECCD1H220K	001 103 0493 7	C803, C804	RBP1CN100CT	001 120 6146 2
C116	ECQM1H333JZ	001 106 0779 1	C302	ECCD1H070CC	001 103 0271 9	C805, C806	ECKD1H102KB	001 103 1414 8
C117	ECKD1H221KB	001 103 1487 1	C306, C307	ECFF1E104ZF	001 103 4992 7	C807	ECEA1HSN2R2	001 120 3239 0
C118	ECEA1HU010	001 120 2842 1	C310	ECFF1E104ZF	001 103 4992 7	C808, C809	ECEA0JU471	001 120 2924 0
C119	ECEA0JU220	001 120 4670 5	C351	ECKD1H222KB	001 103 1494 2	C810	ECEA0JU471	001 120 2924 0
C120	ECKD1H681K	001 103 1580 5	C352, C353	ECKD1H102KB	001 103 1414 8	C812	ECQV1H104JZ	001 106 2571 7
C121	ECFTD103KXL	001 108 0341 7	C354	ECFF1E563MR	001 108 1083 2	C817	ECFF1E104ZF	001 103 4992 7

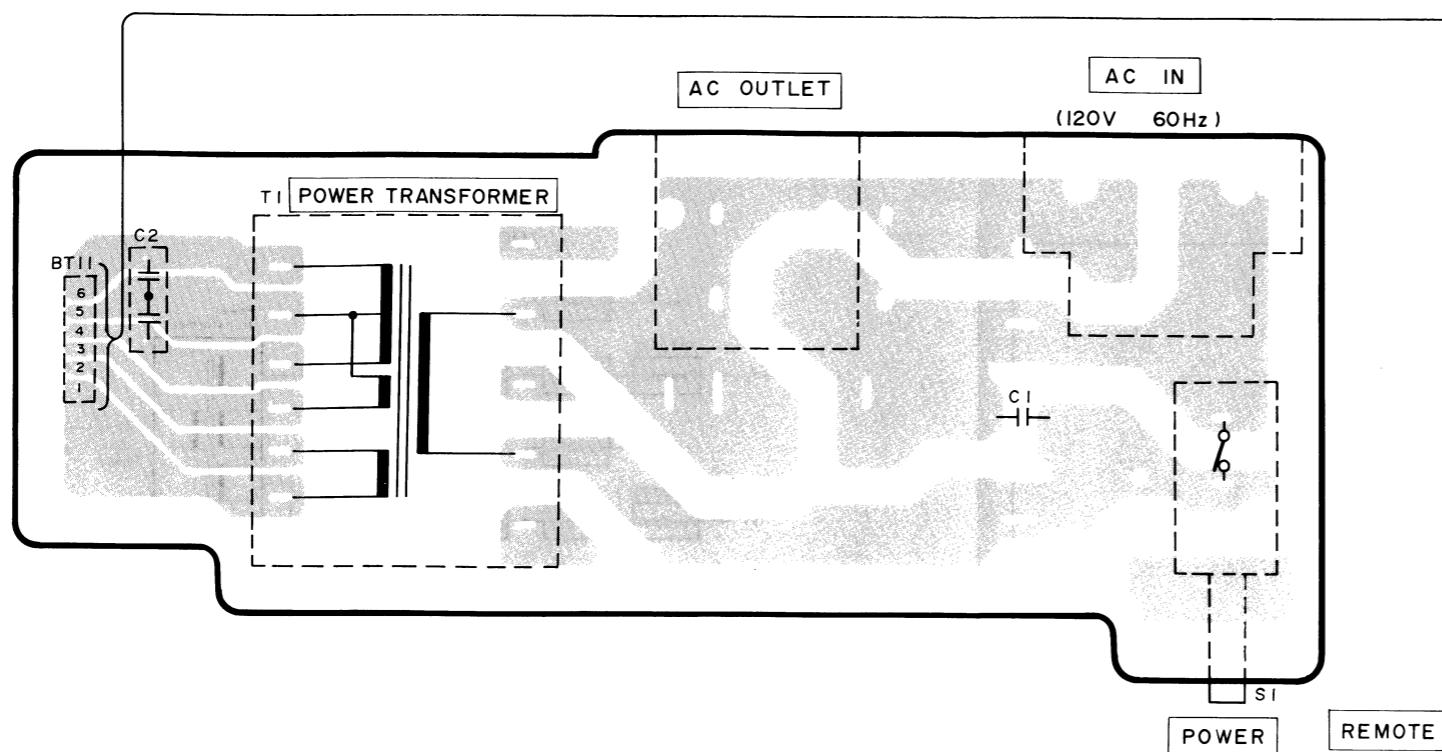


# ■ BLOCK DIAGRAM

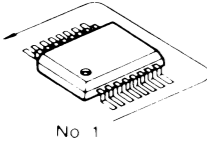
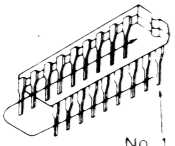
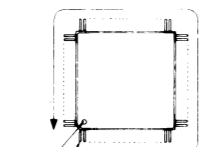
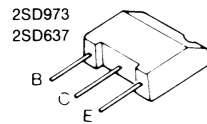
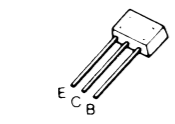
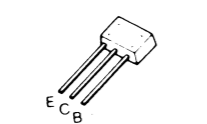
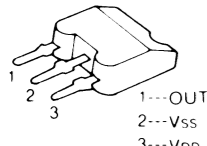
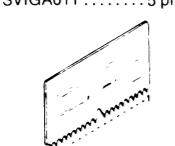
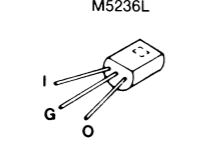
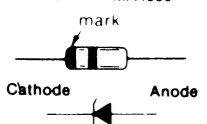
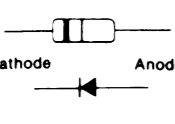
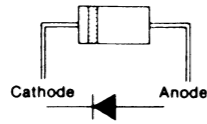


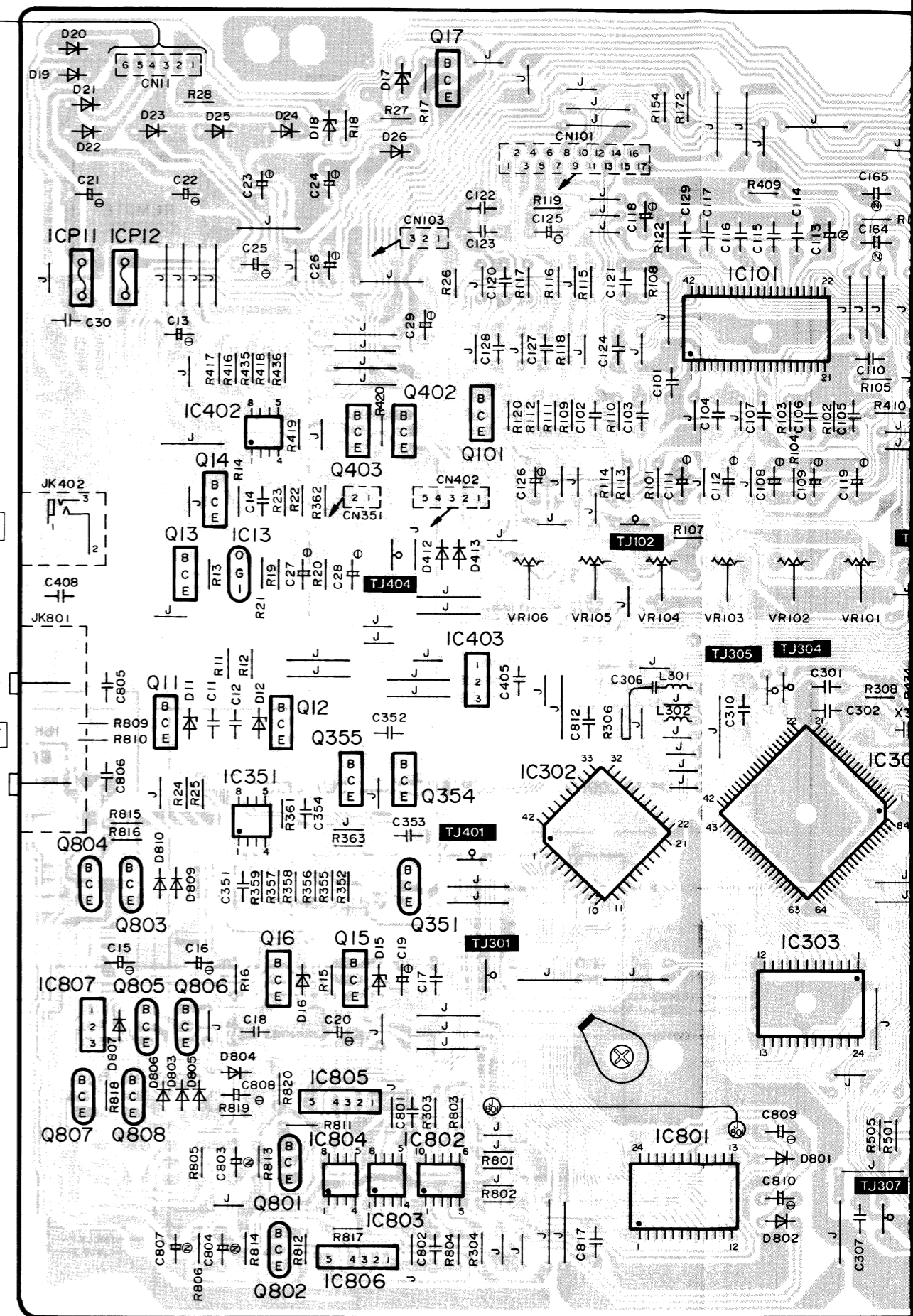
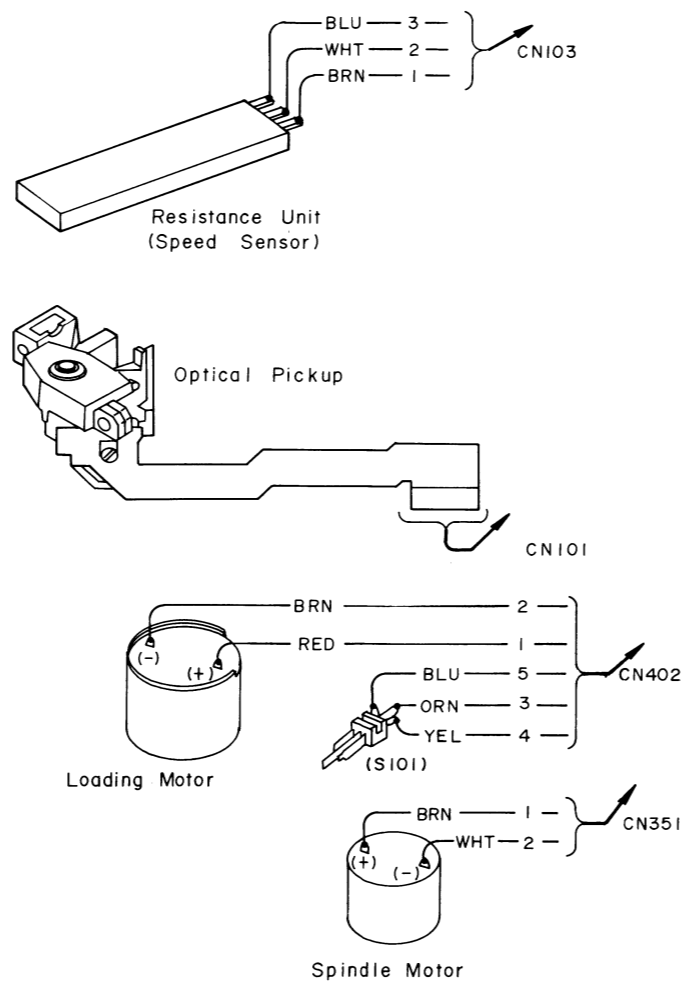


# ■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



## • Terminal guide of IC's, transistors and diodes

AN8370S ..... 42 pin SVIL833M ..... 8 pin SVIBA4560F ..... 8 pin AN6552 ..... 8 pin MN6636S ..... 10 pin AN6554NS ..... 14 pin MN1550PDT ..... 18 pin AN8371S ..... 24 pin SVICX5816M ..... 24 pin  No. 1	MN15261PDU ..... 64 pin SVIPCM55HP-2 ..... 24 pin  No. 1	MN6617S ..... 84 pin MN6618A ..... 42 pin  Mark No. 1
2SB1862 2SB793 2SD973 2SD637  B, C, E	2SD1450 2SC3311  E, C, B	UN4112 UN4212  E, C, B
MN1280-R  1---OUT, 2---V <sub>SS</sub> , 3---V <sub>DD</sub>	SVIGA011 ..... 5 pin 	M5236L  I, O
MA4068 MA4056 MA4091-M MA4330  Cathode, Anode	MA165  Cathode, Anode	SVD1SR35200A  Cathode, Anode







# SCHEMATIC DIAGRAM

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

## Notes:

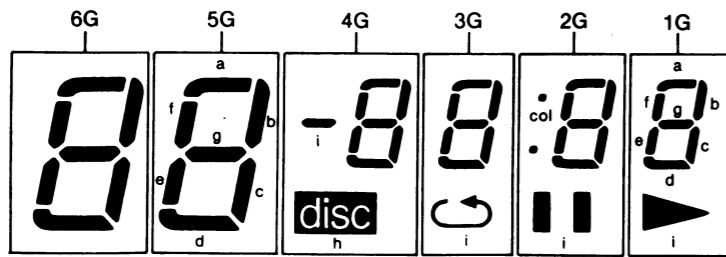
- S1** : Power switch in "on" position.
- S101** : Disc holder open/close detection switch.
- S401** : Open/close switch.
- S402** : Repeat switch.
- S403** : Time mode select switch.
- S404** : Memory switch.
- S405** : Backward skip switch.
- S406** : Forward skip switch.
- S407** : Stop/clear switch.
- S408** : Play/pause switch.
- The voltage value and waveform 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 legs of IC or LSI with the fingers directly.

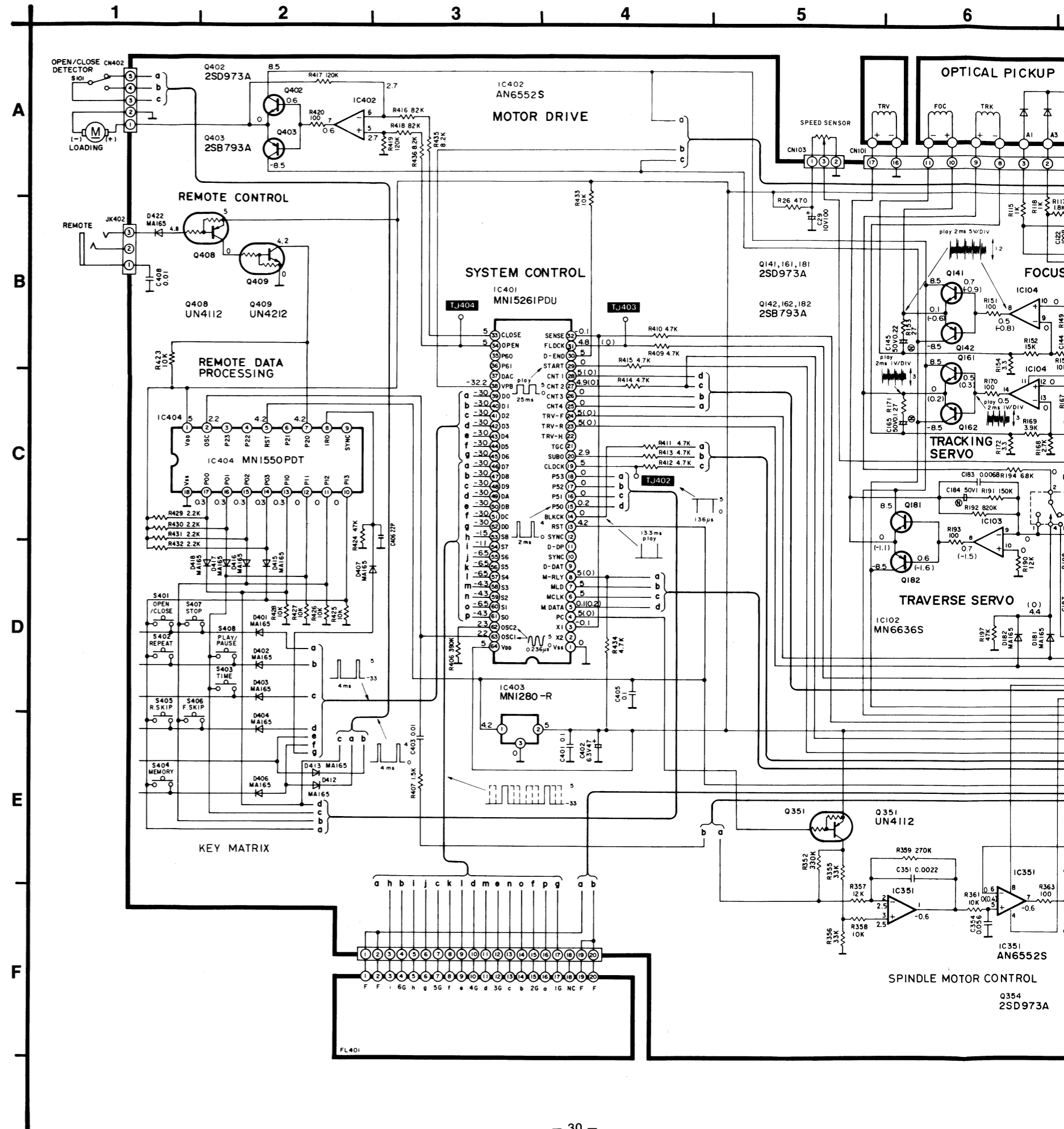
## Internal connection of FL

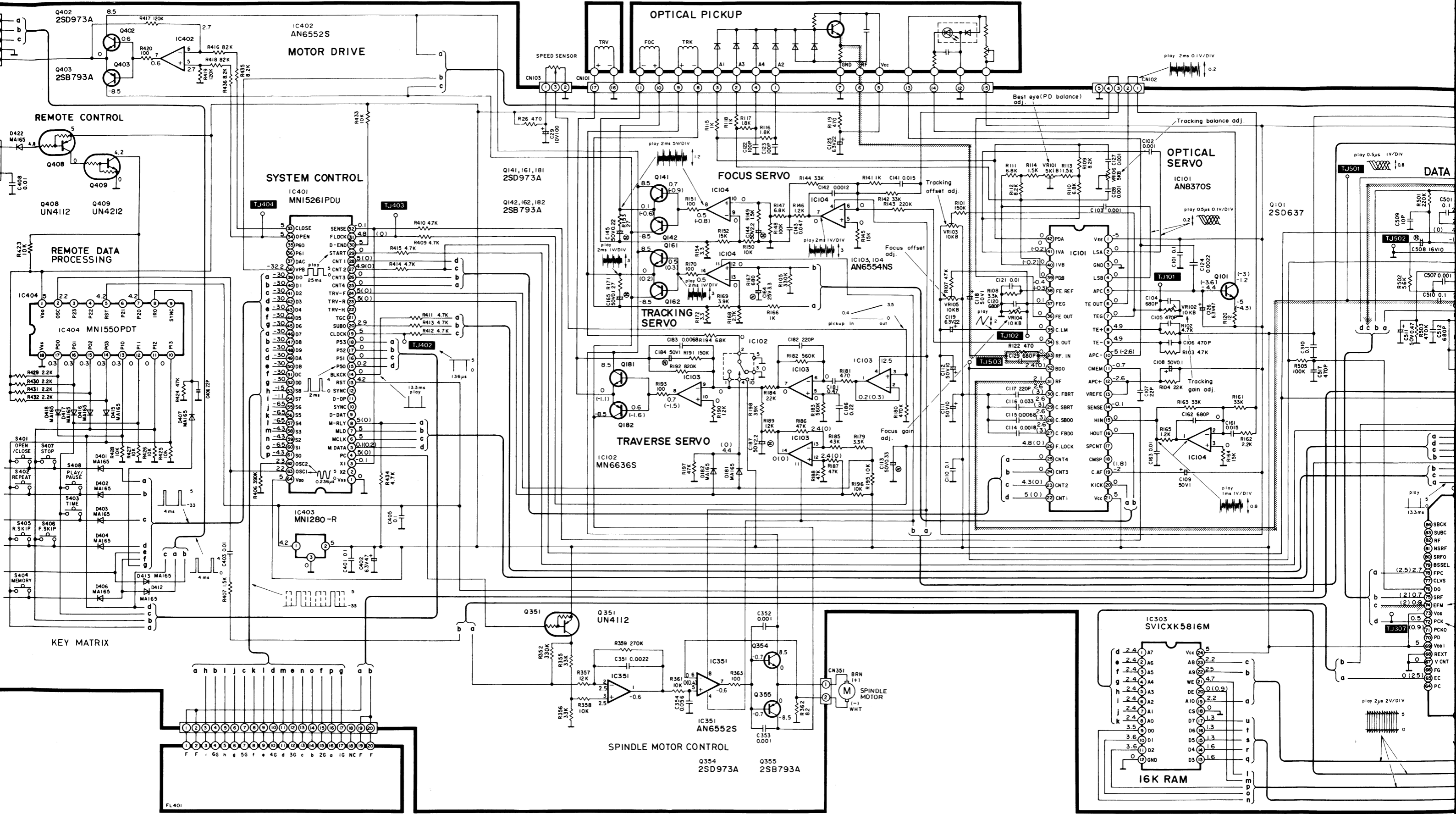
### • Grid connection diagram

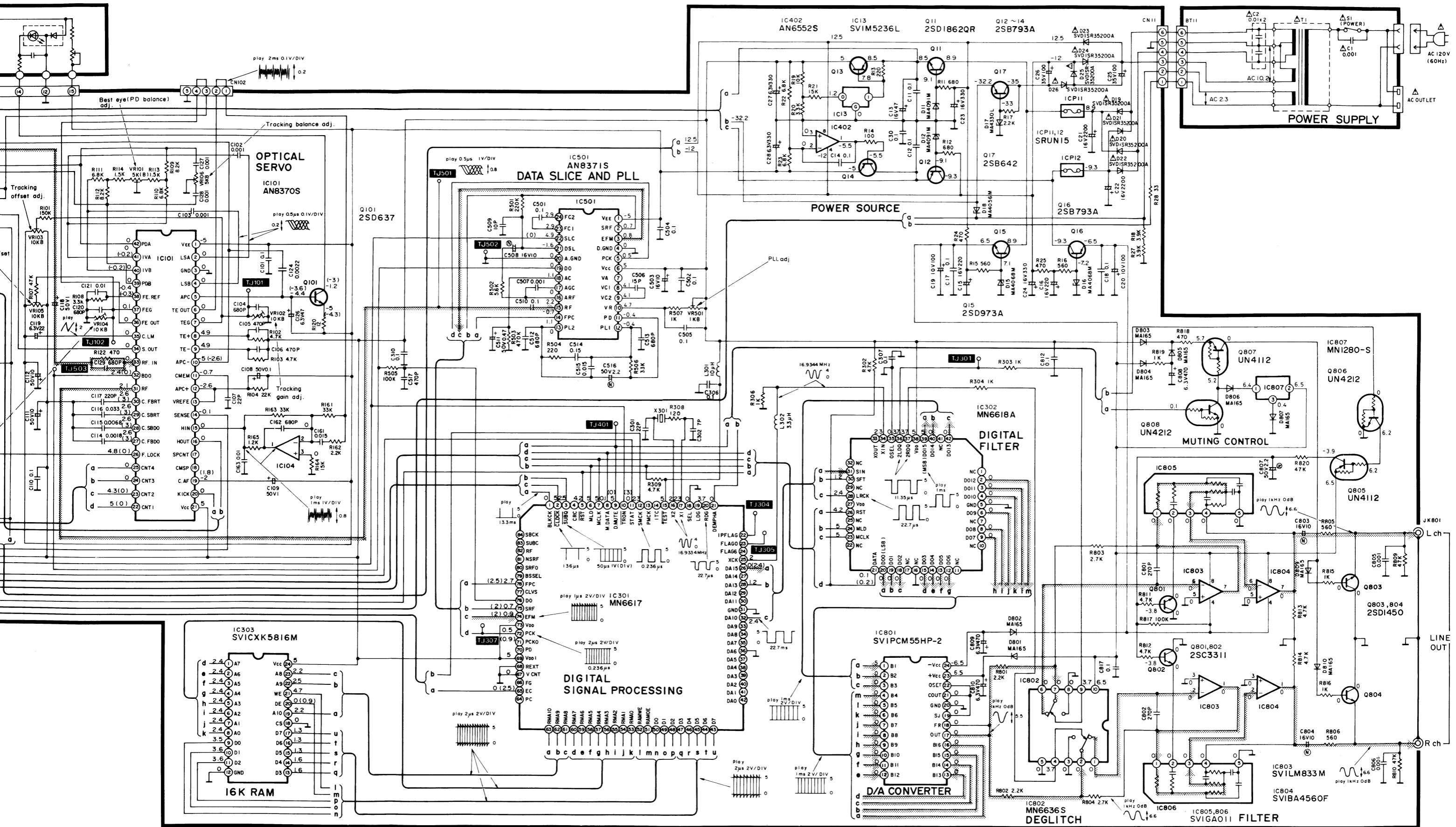


### • Anode connection table

	6G	5G	4G	3G	2G	1G
a	a	a	a	a	a	a
b	b	b	b	b	b	b
c	c	c	c	c	c	c
d	d	d	d	d	d	d
e	e	e	e	e	e	e
f	f	f	f	f	f	f
g	g	g	g	g	g	g
h	-	-	disc	-	col	-
i	-	-	-	↻		▶







## ■ TERMINAL FUNCTION OF LSI

### ● MN6617 (Digital Signal Processing : EFM Decoder, Error Correction, CLV Servo)

Pin No.	Mark	I/O	Function	Pin No.	Mark	I/O	Function
1	BLKCK	O	Sub-code block (Q data) clock (75 Hz)	34	DA8	O	16-bit data output (Not used)
2	CLDCK	O	Sub-code frame (Q data) clock (7.35 kHz)	35	DA7	O	16-bit data output (Not used)
3	SUBQ	O	Sub-code (Q data) output	36	DA6	I/O	16-bit data output (Not used)
4	CRC	O	Sub-code (Q data) CRC check (Not used, open)	37	DA5	O	16-bit data output (Not used)
5	RST	I	Reset signal input (reset at "L")	38	DA4	O	16-bit data output (Not used)
6	MLD	I	Command load input	39	DA3	O	16-bit data output (Not used)
7	MCLK	I	Command clock input	40	DA2	O	16-bit data output (Not used)
8	MDATA	I	Command data input	41	DA1	O	16-bit data output (Not used)
9	DMUTE	I	Muting control (muting ON at "H")	42	DA0	O	16-bit data output (Not used)
10	TRON	I	Tracking servo ON signal (tracking servo ON at "L")	43 } 44 } 45 } 46 } 47 } 48 } 49 } 50 } D7 } D0 } I/O	16 K RAM data output		
11	STAT	O	Processing condition (CRC, OTC, CLVOK, TT STOP) output	51	RAMOE	O	16 K RAM OE signal
12	SMCK	O	Clock output (4.2336 MHz)	52	RAMWE	O	16 K RAM WE signal
13	PMCK	O	Pitch control clock output (Not used, open)	53 } 54 } 55 } 56 } 57 } 58 } 59 } 60 } 61 } 62 } 63 } RAMA 0 } RAMA10 }	16 K RAM address signal (RAMA0 : LSB, RAMA10 : MSB)		
14	ITC	I	Track counter input signal (Not used, open)	64	PC	O	Spindle motor ON signal (ON at "L")
15	TEST	I	Test mode selection (Not used, connected to +5V)	65	EC	O	Spindle motor drive signal
16	X2	O	Clock output (16.9344 MHz)	66	FG	I	Spindle motor FG signal input
17	X1	I	Clock input (16.9344 MHz)	67	VCNT	—	—
18	SEL	I	DA output parallel/serial selection (serial at "L")	68	REXT	—	—
19	LDG	O	L channel deglitch signal (Not used)	69	VDD	I	Power supply (Connected to +5V)
20	RDG	O	Clock output (Spindle motor control)	70	PD	—	—
21	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")	71	PCKO	—	—
22	IPFLAG	O	Interpolation flag (interpolation at "H")	72	PCK	I	PLL extract clock input
23	FLAG0	O	Error flag (error at "H")	73	VDD	I	Power supply (connected to +5V)
24	FLAG6	O	16 K RAM address reset signal (reset at "H")	74	EFM	I	EFM signal input (PLL)
25	XCK	O	Clock (16.9344 MHz) output	75	SRF	I	EFM signal input (DSL)
26	DA15	O	16-bit data output	76	DO	I	Drop-out signal (Drop-out at "H")
27	DA14	O	16-bit data output (Not used)	77	CLVS	O	11T servo OK signal (OK at "H")
28	DA13	O	16-bit data output	78	FPC	O	PLL frequency comparison signal
29	DA12	O	16-bit data output (Not used)	79	BSEL	O	PLL frequency in take operation signal. (Not used)
30	DA11	O	16-bit data output (Not used)	80	SRFO	—	—
31	GND	I	GND terminal	81	NSRF	—	—
32	DA10	O	16-bit data output	82	RF	—	—
33	DA9	O	16-bit data output (Not used)	83	SUBC	O	Sub-code serial output data (Not used)
				84	SBCK	I	Clock for sub-code serial output (Not used)

### ● AN8370S (Optical Servo Control)

Pin No.	Mark	I/O	Function
1	VEE	I	Power supply (connected to -5V)
2	LSA	I	Phase difference input (A)
3	GND	I	GND terminal
4	LSB	I	Phase difference input (B)
5	APC	O	Auto laser power control output
6	TEOUT	O	Tracking error signal output
7	TEG	I	Tracking error gain adjusting input
8	TE+	I	Phase difference-to-voltage conversion (+)
9	TE-	I	Phase difference-to-voltage conversion (-)
10	APC-	I	Laser power inversion input
11	C-MEM	I	Capacitor connection for phase difference memory
12	APC+	I	Laser power input
13	VREF	O	Reference current generation
14	SENSE	O	Selector output (track-crossed)
15	HIN	I	Tracking hold circuit input
16	HOUT	O	Tracking hold circuit output
17	SPCNT	O	Track-cross speed control output (not used, open)
18	C-MSP	I	Track-cross reference speed setting capacitor connection (not used, open)
19	C-AF	I	Auto focus timer capacitor connection
20	KICK	O	Track kick signal output
21	VCC	I	Power supply (connected to +5V)

### ● AN8371S (Data slice and PLL)

Pin No.	Mark	I/O	Function
1	VEE	I	Power supply (connected to -5V)
2	SRF	O	RF signal output data-sliced into digital value
3	EFM	O	EFM signal output synchronized with PCK
4	D-GND	I	GND terminal (digital system)
5	PCK	O	Clock output extracted from SRF
6	VCC	I	Power supply (connected to +5V)
7	VA	I	VCO free ran frequency adjusting current input
8	VC1	I	Capacitor connection for VCO oscillation frequency
9	VC2	I	Capacitor connection for VCO oscillation frequency
10	VR	I	Resistor connection for VCO oscillation frequency
11	PD	I	Capacitor connection for PLL DO protection
12	PL1	I	PLL loop filter constant connection

### ● MN15261PDU (

Pin No.	Mark	Signal
1	VSS	GND
2	XO	—
3	XI	SENSE
4	P00	PC
5	P01	M DATA
6	P02	MCLK
7	P03	MLD
8	P10	MRLY
9	P11	D-DAT
10	P12	SYNC
11	P13	D-DP
12	SYNC	—
13	RST	RESET
14	IRQ	BLKCK
15 } 16 } 17 } 18 } P50 } P53 }	KEY	
19	SBT	CLDCK
20	SBD	SUBQ
21	P20	TGC
22	P21	TRV-H
23	P22	TRV-R
24	P23	TRV-F
25	P30	CNT4

### ● MN1550PDT (

Pin No.	Mark	Signal
1	VDD	—
2	OSC1	SMCK
3	OSC2	—
4	P22	—
5	RST	RESET
6	P21	—
7	P20	—
8	IRQ	—



• MN15261PDU (System Control and FL Drive)

Pin No.	Mark	Signal	I/O	Function	Pin No.	Mark	Signal	I/O	Function
1	VSS	GND	I	GND terminal	26	P31	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [Forward] command)
2	XO	—	O	Not used (Open)	27	P32	CNT2	O	Optical servo IC control signal (TRON: Tracking servo)
3	XI	SENSE	I	Optical servo condition input	28	P33	CNT1	O	Optical servo IC control signal (FOON: Focus servo)
4	P00	PC	O	Spindle motor control	29	P40	START	I	Key input strobe and processing status input from signal processing LSI traverse position detection.
5	P01	M DATA	O	Command data output	30	P41	D-END	O	Connected to 5V
6	P02	MCLK	O	Command clock output	31	P42	FLOCK	I	Optical servo condition (focus) input
7	P03	MLD	O	Command load output	32	P43	SENSE	I	Optical servo condition (track cross) input
8	P10	MRLY	I	Muting control	33	PE0	CLOSE	O	Loading motor close signal
9	P11	D-DAT	I	(Not used, open)	34	PE1	OPEN	O	Loading motor open signal
10	P12	SYNC	I	(Not used, open)	35	P60	PAUSE	O	(Not used, open)
11	P13	D-DP	I	(Not used, open)	36	P61	PLAY	O	(Not used, open)
12	SYNC	—	O	(Not used, open)	37	DAC	DAC	O	(Not used, open)
13	RST	RESET	I	Reset signal input (reset at "L")	38	VPP	—	I	FL drive power supply (connected to -32V)
14	IRQ	BLKCK	I	Sub-code block (Q data) clock (75 Hz) input	39	D0	—	O	FL grid signal and key scan signal
15	P50	KEY	I	Key scan input	52	DD	—	O	FL grid signal and key scan signal
18	P53				53	S8	—	O	FL anode signal
19	SBT	CLDCK	I	Sub-code frame clock (7.35 kHz)	61	S0	—	O	FL anode signal
20	SBD	SUBQ	I	Sub-code Q data input	62	OSC2	—	I	Clock terminal
21	P20	TGC	O	(Not used, open)	63	OSC1	—	I	Clock input
22	P21	TRV-H	O	(Not used, open)	64	VDD	—	I	Power supply (connected to +5V)
23	P22	TRV-R	O	Traverse reverse command signal					
24	P23	TRV-F	O	Traverse forward command signal					
25	P30	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [Reverse] command)					

• MN6618A (Digital Filter)

Pin No.	Mark	I/O	Function	Pin No.	Mark	I/O	Function
1	NC	—	Not connected	23	MCLK	I	Command clock input
2	D012	O	16-bit data output	24	MLD	I	Command load input
3	D011	O	16-bit data output	25	NC	—	Not connected
4	D010	O	16-bit data output	26	RST	I	Reset signal input (reset at "L")
5	GND	I	GND terminal	27	—	—	—
6	D09	O	16-bit data output	28	LRCK	I	L/R channel changeover signal
7	NC	—	Not connected	29	NC	—	Not connected
8	D08	O	16-bit data output	30	SFT	I	Serial data input clock
9	D07	O	16-bit data output	31	SIN	I	Serial data input
10	NC	—	Not connected	32	NC	—	Not connected
11	NC	—	Not connected	33	X OUT	O	Clock output (Not used, open)
12	D06	O	16-bit data output	34	X IN	I	Clock input (16.9244 MHz)
13	D05	O	16-bit data output	35	OSEL	I	DA output parallel/serial changeover (Parallel at "L")
14	D04	O	16-bit data output	36	LDGL	O	L channel deglitch signal
15	D03	O	16-bit data output	37	RDGL	O	R channel deglitch signal
16	NC	—	Not connected	38	VDD	I	Power supply (connected to +5V)
17	NC	—	Not connected	39	D015	O	16-bit data output (MSB)
18	D02	O	16-bit data output	40	D014	O	16-bit data output
19	D01	O	16-bit data output	41	NC	—	Not connected
20	D00	O	16-bit data output	42	D013	O	16-bit data output
21	M DATA	I	Command data input				
22	NC	—	Not connected				

• MN1550PDT (Remote Control Signal Processing)

Pin No.	Mark	Signal	I/O	Function	Pin No.	Mark	Signal	I/O	Function
1	VDD	—	I	Power supply (connected to +5V)	9	P31	SYNC	O	Not used, open
2	OSC1	SMCK	I	Clock input	10	P13 P10	Data	I	Key strobe
3	OSC2	—	—	Not used, open	13				
4	P22	—	—	Not used, open	14	P03 P00	Data	I	Key strobe
5	RST	RESET	I	Reset signal input	17				
6	P21	—	—	Not used, open	18	VSS	GND	I	GND terminal
7	P20	—	I	Remote control signal input					
8	IRQ	—	I	Program enable/de-enable control					