

Service Manual

COMPACT
disc
DIGITAL AUDIO

DIGITAL

MASH*
multi-stage noise shaping

Compact Disc Changer
SL-PD647



Colour

(K) ... Black Type

Area

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

NEW MECHANISM SERIES
(RAE0301: Type A/RAE0302: Type B)

SPECIFICATIONS

■ Audio

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

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

■ Pickup

Wavelength 780nm

■ General

Power consumption 15W

Power supply

For (E, GN) areas.: AC 50/60Hz, 230–240V

For (GC) area: AC 50/60Hz, 110V/127V/220V/240V

Dimensions (W × H × D) 430 × 130 × 401 mm

Weight 5.0kg

Note:

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

■ CONTENTS

| | Page |
|---|--------|
| PRECAUTION OF LASER DIODE | 2 |
| ACCESSORIES..... | 3 |
| CONNECTIONS..... | 3 |
| FRONT PANEL CONTROLS AND FUNCTIONS..... | 4, 5 |
| BEFORE MOVING | 6 |
| HANDLING PRECAUTIONS FOR OPTICAL PICKUP | 7 |
| INSTRUCTIONS FOR TRAVERSE OIL | 7 |
| DISASSEMBLY INSTRUCTIONS | 8~15 |
| HOW TO CHECK THE MAIN AND SERVO P.C.B. | 16, 17 |
| OPERATING THE UNIT WITHOUT THE FRONT PANEL ASS'Y (OPERATING P.C.B. AND KEYS) | 18 |
| DISPLAY FUNCTION OF AUTOMATICALLY-ADJUSTED RESULTS (SELF-CHECK FUNCTION)..... | 19, 20 |
| NEW DIGITAL SERVO CIRCUIT..... | 20 |

| | Page |
|-----------------------------------|--------|
| NEW DIGITAL SERVO SYSTEM | 21, 22 |
| TROUBLESHOOTING GUIDE..... | 23, 24 |
| MEASUREMENTS AND ADJUSTMENTS..... | 25, 26 |
| TERMINAL FUNCTION OF IC'S..... | 27~30 |
| BLOCK DIAGRAM | 31~33 |
| SCHEMATIC DIAGRAM..... | 34~39 |
| PRINTED CIRCUIT BOARDS | 40~43 |
| WIRING CONNECTION DIAGRAM | 44 |
| INTERNAL CONNECTION OF FL..... | 45 |
| REPLACEMENT PARTS LIST | 46~48 |
| PACKAGING..... | 47 |
| EXPLODED VIEWS..... | 49~52 |
| RESISTORS AND CAPACITORS..... | 53 |

Technics

■ PRECAUTION OF LASER DIODE

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

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

1. Do not disassemble the optical pickup 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 pickup lens for a long time.

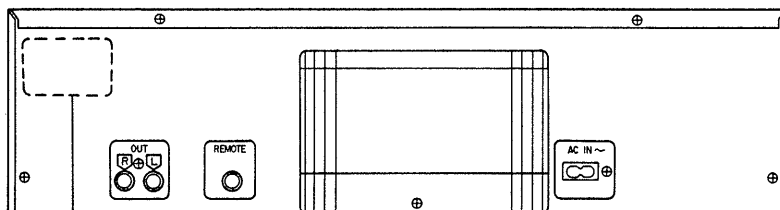
ACHTUNG: Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Lasereinheit abgestrahlt.

Wellenlänge: 780nm
Maximale Strahlungsleistung der Lasereinheit: 100 μ W/VDE

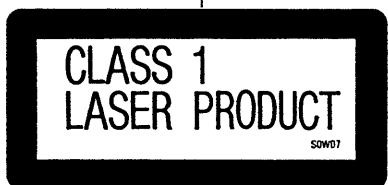
Die Strahlung an der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig 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.

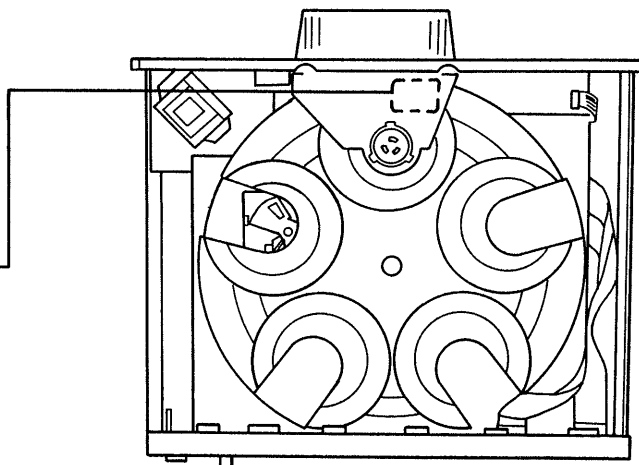
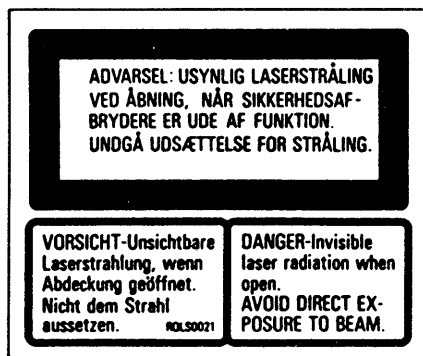


SQWD7

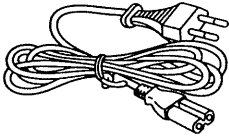


LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

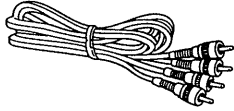
RQLS0021



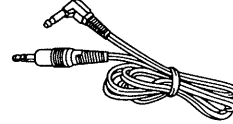
ACCESSORIES (included)



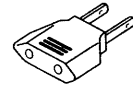
AC power supply
cord..... 1 pc.
[RJA0019-2K (E, GC)]
[SJA173 (GN)]



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



Remote control
cable..... 1 pc.
(SJP2257T)



Power plug adaptor... 1 pc.
(SJP5213-2)
For (GC) area.

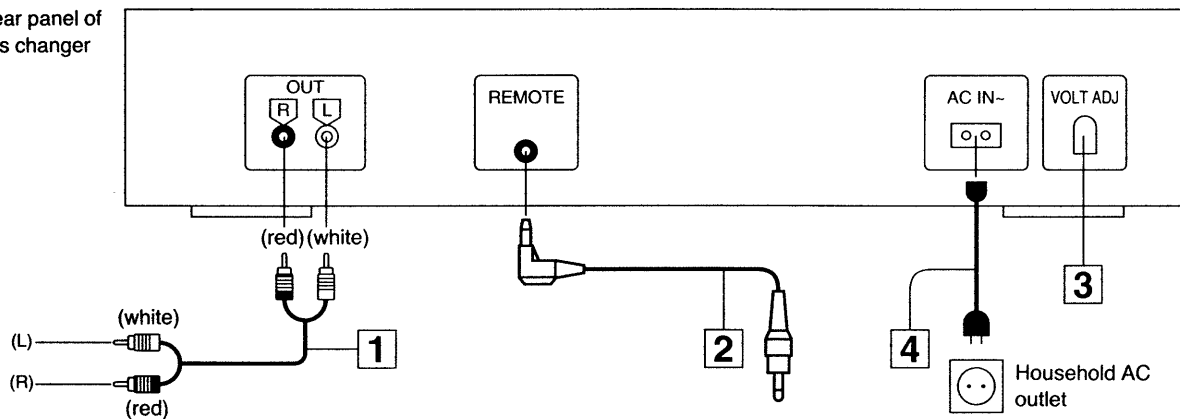
CONNECTIONS

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

Note:

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

Rear panel of
this changer



- 1** Connect the stereo connection cable (included) to CD or AUX terminals of the amplifier or the receiver.
- 2** To operate with the remote control, connect the remote control cable (included) to the REMOTE CONTROL OUT terminal of Technics component.

The operations such as play, stop, skip etc. can be operated by remote control included with Technics receiver or the component system. For details, refer to the operating instructions of the receiver or the system to be used.

For (GC) area.

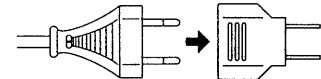
- 3** Set the voltage selector (VOLT ADJ) to the voltage setting for the area in which the unit will be used.

- Use a minus (-) screwdriver.
- Note that this unit will be seriously damaged if this setting is not made correctly.
- If the power supply in your area is 117 V or 120 V, set to the "127 V" position.

- 4** Connect the power supply cord (included) to the household AC outlet or to AC OUTLET of Technics component.

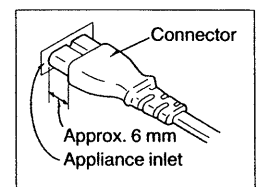
For (GC) area.

If the power plug will not fit your socket, use the power plug adaptor (included).

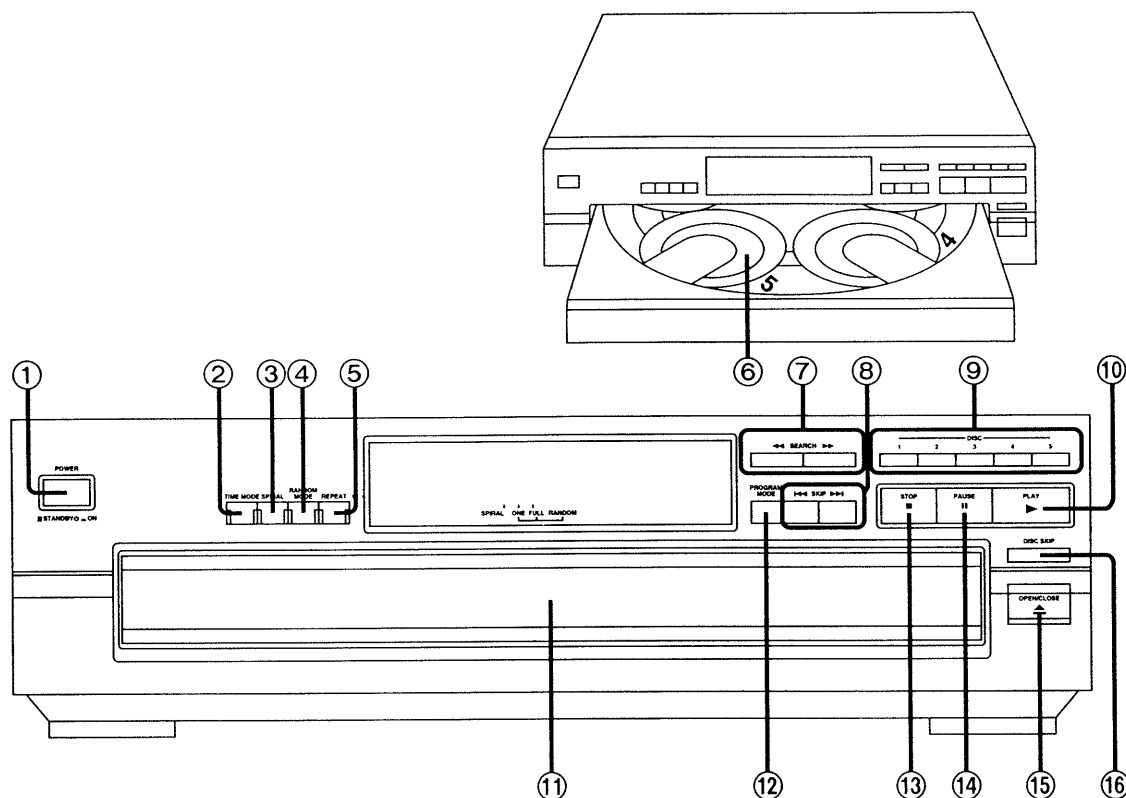


Insertion of Connector

Even when the connector is perfectly inserted, depending on the type of inlet used, the front part of the connector may jut out as shown in the drawing. However there is no problem using the unit.

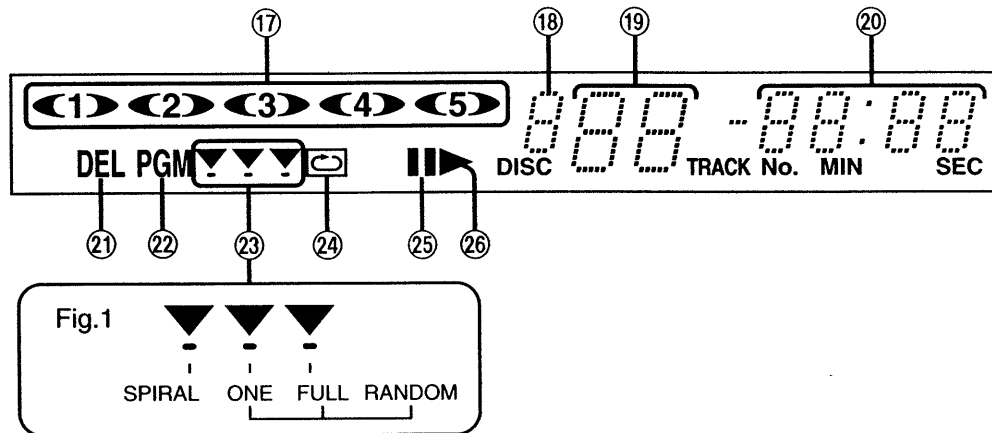


FRONT PANEL CONTROLS AND FUNCTIONS



Control section

- ① **Power “STANDBY \odot /ON” switch (POWER, \blacksquare STANDBY \odot \blacksquare ON)**
Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.
- ② **Time mode select button (TIME MODE)**
Use to select the desired time mode. Each time you press the button, the display information will change as follows.
1. Track number and its elapsed play time of the current track.
 2. Total remaining time on the disc.
 3. Track number and remaining time of the current track.
 4. Total elapsed play time on the disc.
- ③ **Spiral button (SPIRAL)**
Press to play the first tracks on all the loaded discs in sequence, followed by the second tracks on all the discs, and so on.
- ④ **Random mode button (RANDOM MODE)**
The mode changes as follows each time the button is pressed.
- Sequential → One disc random → Full random
- ⑤ **Repeat button (REPEAT)**
Press to repeat tracks.
- ⑥ **Disc trays (1–5)**
You can load up to five discs, one disc per one tray.
- ⑦ **Search buttons (◀◀ SEARCH ▶▶)**
Press to move forward or backward through the tracks on the disc.
- ⑧ **Skip buttons (◀◀ SKIP ▶▶)**
Use to skip to the beginning of the track.
- ⑨ **Disc buttons (DISC 1–5)**
Use to select desired disc.
- ⑩ **Play button (▶ PLAY)**
- ⑪ **Loading drawer**
You can load and unload discs when this drawer is open.
- ⑫ **Program mode button (PROGRAM MODE)**
The mode changes as follows each time the button is pressed.
- Sequential → Program → Delete
- ⑬ **Stop button (■ STOP)**
- ⑭ **Pause button (|| PAUSE)**
- ⑮ **Loading drawer open/close button (▲ OPEN/CLOSE)**
- ⑯ **Disc skip button (DISC SKIP)**
Use to rotate the disc tray.



Display section

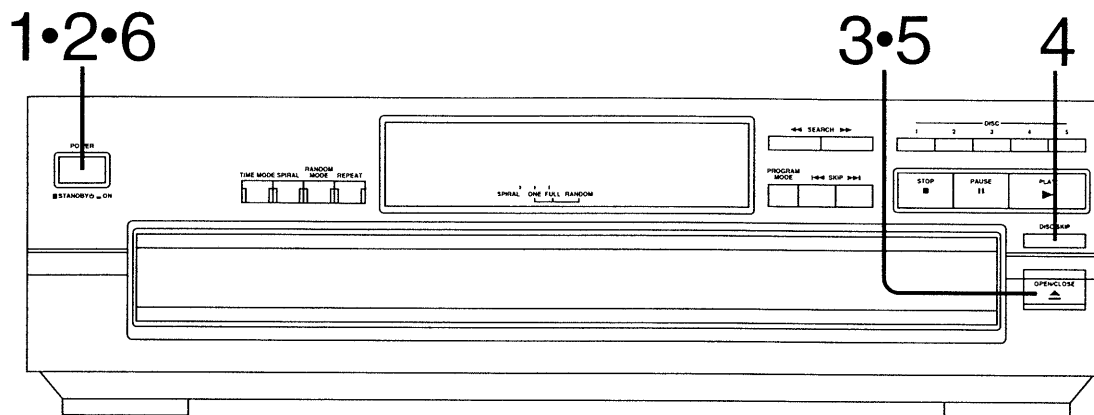
- ①⑦ **Disc indicators (<1> ~ <5>)**
The indicator corresponding to the playing disc flashes.
In the program play mode, programmed disc indicators will illuminate. In the delete play mode, disc indicators to be deleted will go out.
- ①⑧ **Disc number display**
Shows the number (1-5) of disc.
- ①⑨ **Track number display**
Shows the number (up to 99) of track.
- ②⑩ **Time/program sequence display**
Shows the elapsed playing time of the track in play.
Also shows the program sequence in the program play mode, and the sequence you entered in the delete play mode.
- ②① **Delete play indicator (DEL)**
Lights in the delete play mode.
- ②② **Program play indicator (PGM)**
Lights in the program play mode.
- ②③ **Play mode indicators (▼▼▼) (Fig. 1)**
Each indicator points to the following play modes:
SPIRAL: Spiral play
ONE: One disc random play
FULL: Full random play
- ②④ **Repeat indicator (◁▷)**
Lights when the repeat function is activated.
- ②⑤ **Pause indicator (||)**
Lights in the pause mode.
- ②⑥ **Play indicator (▶)**
Lights in the play mode.

BEFORE MOVING

CAUTION:

Before moving this changer to another location, be sure that no discs were left in the changer and that the power was not switched to the standby condition while in the play mode.

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



- 1** Press **POWER** to switch to the standby condition.
- 2** Press **POWER** to switch on the power.
- 3** Press **OPEN/CLOSE** to open the loading drawer.
- 4** Press **DISC SKIP** to rotate the disc trays and remove the discs from all disc trays.
- 5** Press **OPEN/CLOSE** to close the loading drawer.
- 6** Press **POWER** to switch to the standby condition.

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

The optical pickup will be automatically released when using the changer again.

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

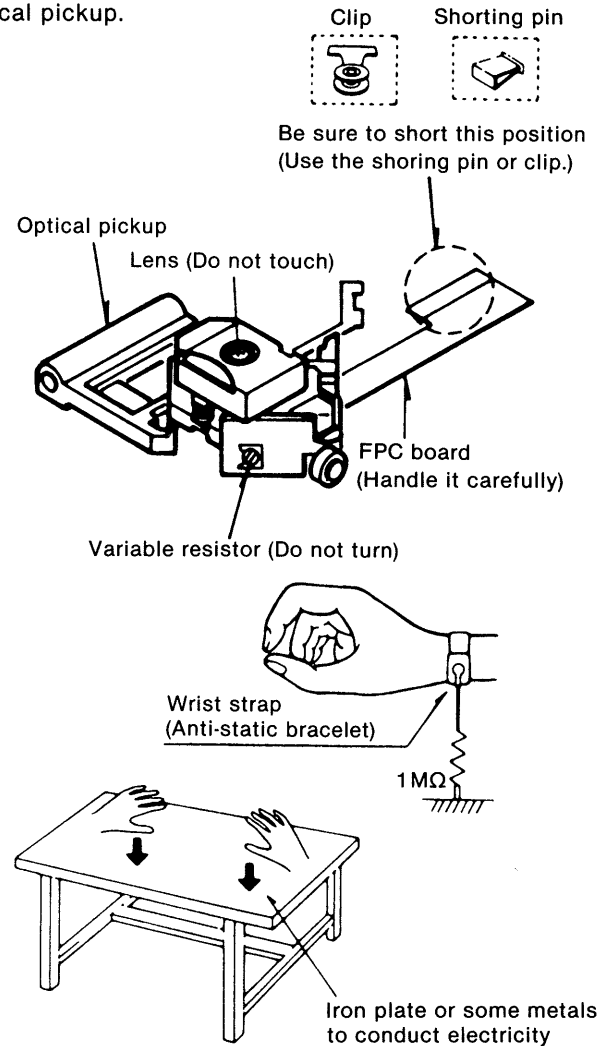
1. Do not subject the optical pickup to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an antistatic shorting pin is inserted into the flexible board (FPC board).
When removing or connecting the short pin, finish the job in as short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

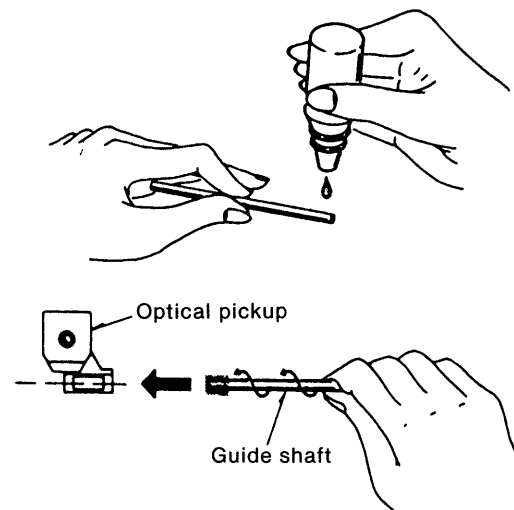


INSTRUCTIONS FOR TRAVERSE OIL (Part No. SZZ0L31)

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 SZZ0L31 to the tip of the guide shaft.
- (3) Hold the guide shaft so that its oiled end touches the optical pickup and insert it into the bearing while rotating it slowly.
- (4) After securing the guide shaft, move the optical pickup by hand several times to the left and right to distribute the oil on the guide shaft.

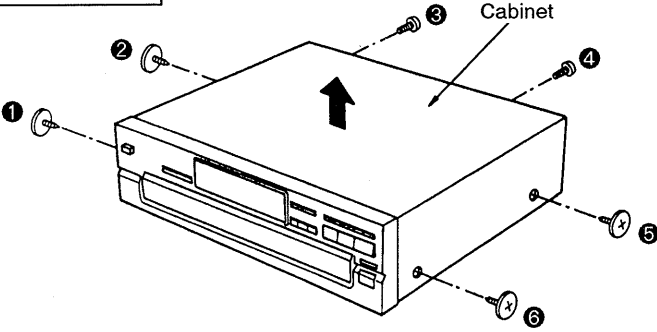
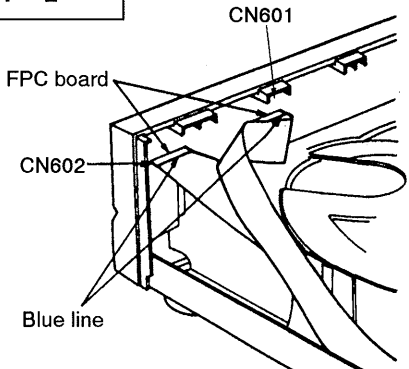
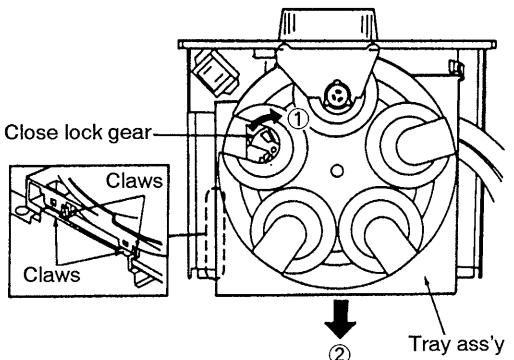
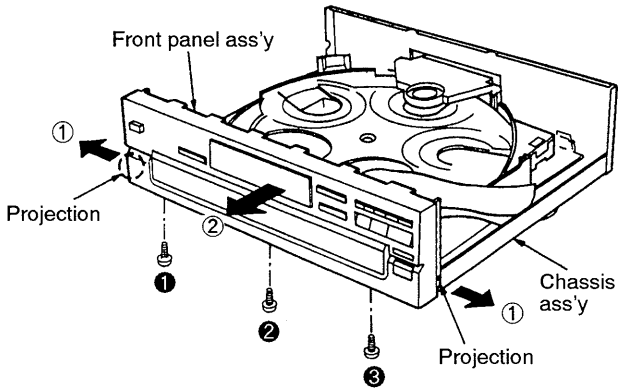
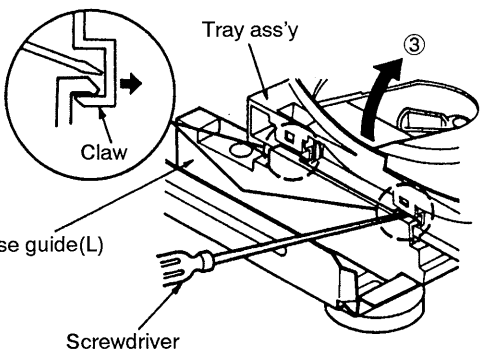
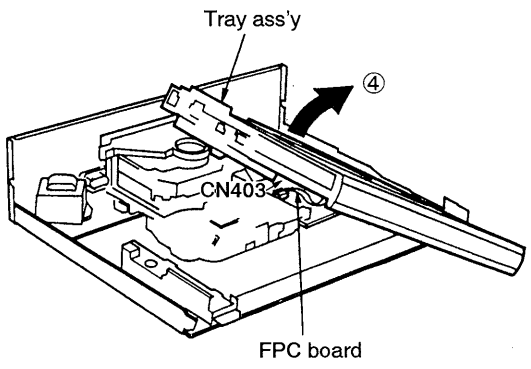


DISASSEMBLY INSTRUCTIONS

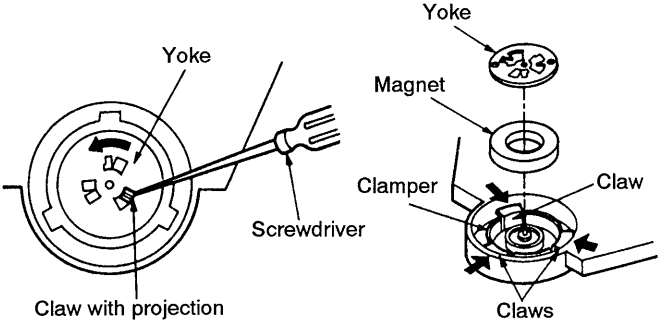
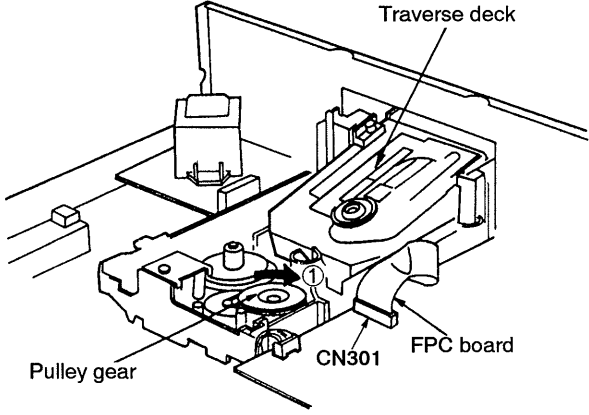
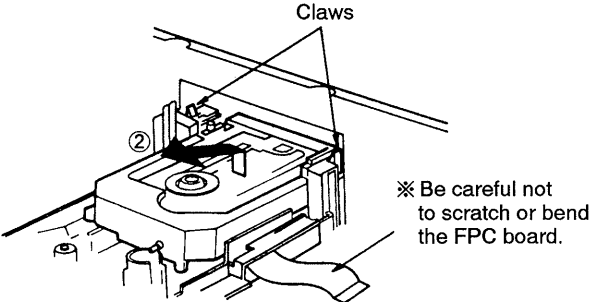
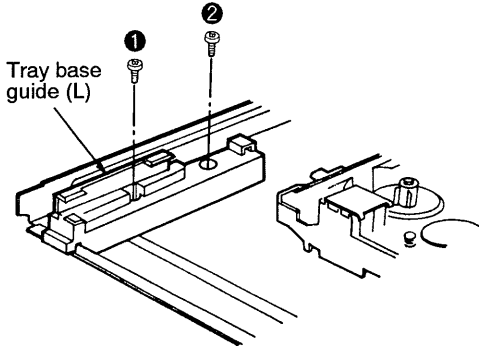
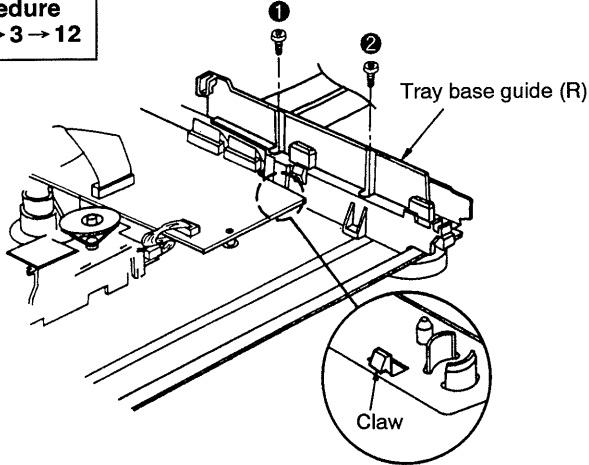
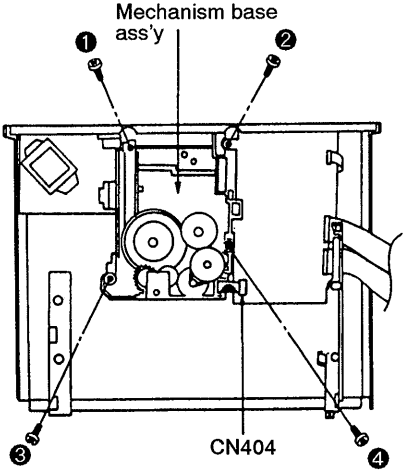
Warning: This product uses a laser diode. Refer to caution statements on page 2.

ACHTUNG:

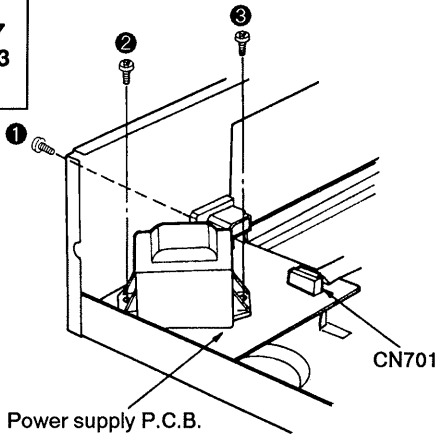
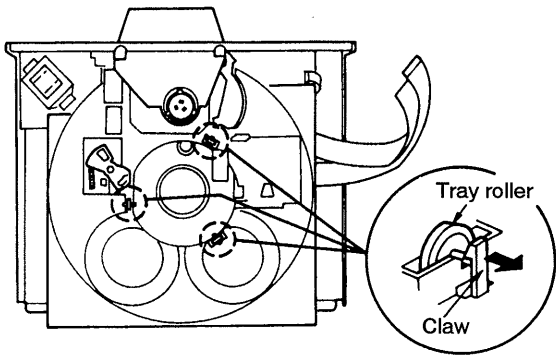
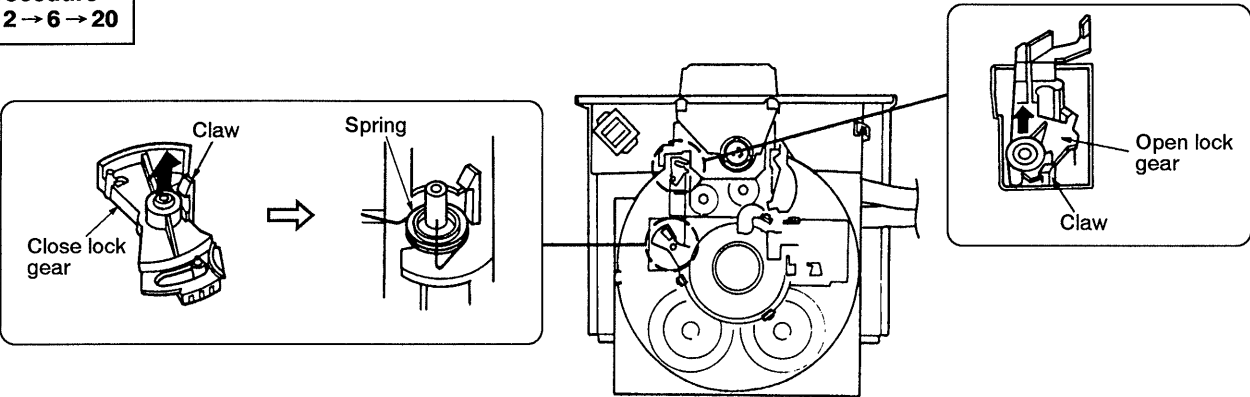
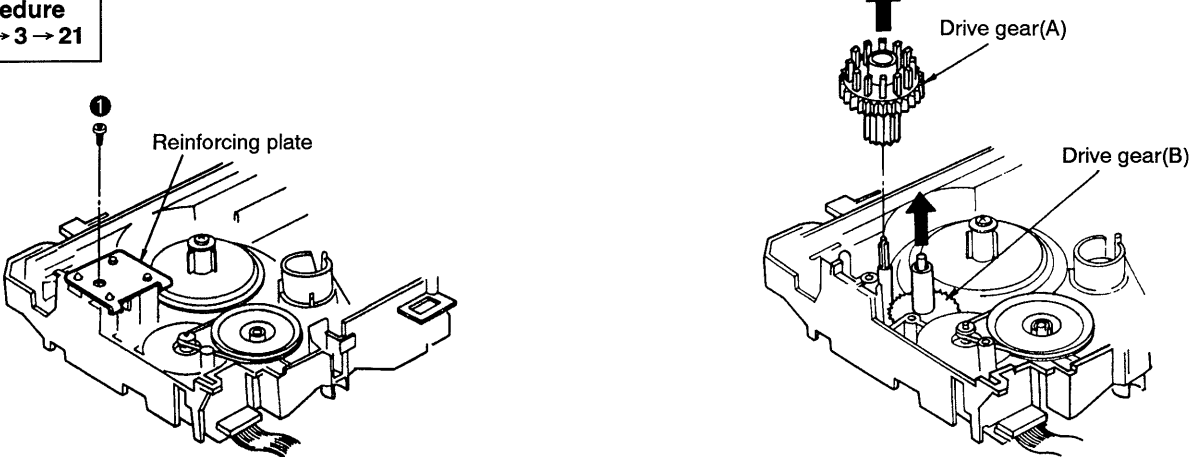
- Die Lasereinheit nicht zerlegen.
- Die Lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

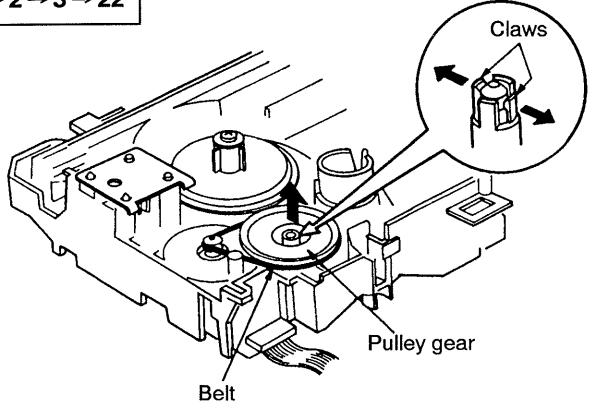
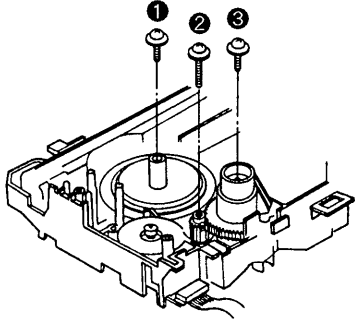
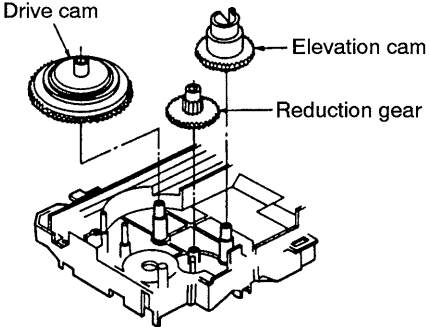
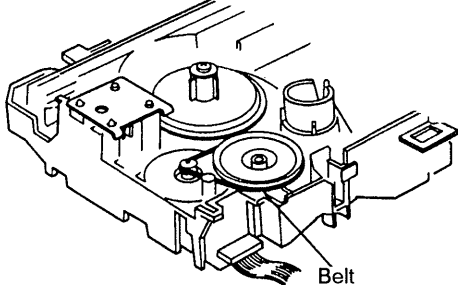
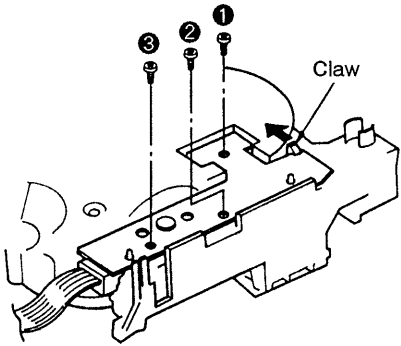
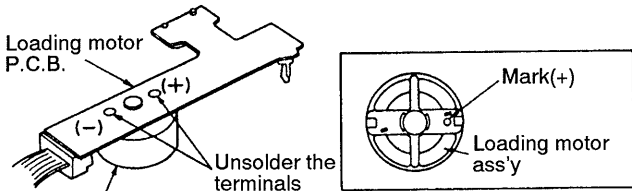
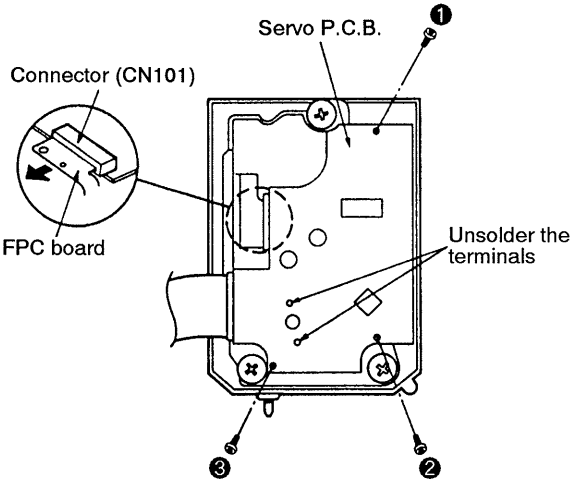
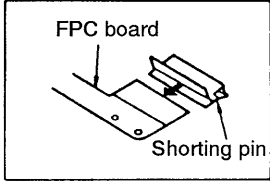
| | | | |
|--|---|---------------------------------|--|
| <p>Ref.No. 1</p> | <p>Removal of the cabinet</p> | <p>Ref.No. 2</p> | <p>Removal of the front panel ass'y</p> |
| <p>Procedure 1</p> |  <p>1. Remove the 6 screws (①~⑥).</p> <p>2. Remove the cabinet in the direction of arrow.</p> | <p>Procedure 1→2</p> |  <p>Note on installation Connect the FPC board with the blue line upward.</p> <p>1. Pull out the FPC board.</p> |
| <p>Ref.No. 3</p> | <p>Removal of the tray ass'y</p> | | |
| <p>Procedure 1→2→3</p> | <p>Note: Be sure the close position to remove the tray ass'y.</p>  <p>1. Keep the close lock gear pressed in the direction of arrow ① and move the tray ass'y in the direction of arrow ②.</p> <p>2. Fit the claws of the tray ass'y in the claws of the tray base guide (L).</p> | |  <p>2. Remove the 3 screws (①~③).</p> <p>3. Pull the front panel ass'y in both directions of arrow ① to unlock it from the projection of the chassis ass'y.</p> <p>4. Remove the front panel ass'y in the direction of arrow ②.</p> |
|  <p>3. Remove the tray ass'y in the direction of arrow ③ by pressing the claw of the tray ass'y with a screw driver or another suitable object.</p> | | |  <p>4. Raise the left side of the tray ass'y in the direction of arrow ④ and remove the claw on the right side.</p> <p>5. Pull out the FPC board.</p> |

| | | | |
|---------------------------------------|--|--|---|
| <p>Ref.No. 4</p> | <p>Removal of the operation P.C.B.</p> | <p>Ref.No. 5</p> | <p>Removal of the power switch P.C.B.</p> |
| <p>Procedure 1 → 2 → 4</p> | <div data-bbox="207 310 787 625" data-label="Image"> </div> <ol style="list-style-type: none"> 1. Remove the 7 screws(❶ ~ ❷). 2. Release the 1 claw. | | <div data-bbox="1068 331 1430 615" data-label="Image"> </div> <ul style="list-style-type: none"> • Remove the 2 screws(❶ , ❷). |
| <p>Ref.No. 6</p> | <p>Removal of the rotary tray</p> | <div data-bbox="207 852 751 1297" data-label="Image"> </div> <div data-bbox="862 831 1471 1262" data-label="Image"> </div> <ol style="list-style-type: none"> 1. Keep the close lock gear pressed in the direction of arrow ❶ and move the tray ass'y in the direction of arrow ❷ . 2. Remove the 1 screw(❶). 3. Remove the spring and washer. 4. Remove the rotary tray in the direction of arrow ❸ . | |
| <p>Ref.No. 7</p> | <p>Removal of the rear cover</p> | <p>Ref.No. 8</p> | <p>Removal of the clamp plate ass'y</p> |
| <p>Procedure 1 → 7</p> | <div data-bbox="155 1549 821 1875" data-label="Image"> </div> <ol style="list-style-type: none"> 1. Remove the 1 screw(❶). 2. Release the 4 claws. | | <div data-bbox="873 1566 1414 1913" data-label="Image"> </div> <ol style="list-style-type: none"> 1. Remove the 2 screws(❶ , ❷). 2. Release the 1 claw. |

| | | | |
|--|--|---|--|
| <p>Ref.No. 9</p> | <p>Removal of the clamber ass'y (yoke, magnet and clamber)</p> | <p>Ref.No. 10</p> | <p>Removal of the traverse deck</p> |
| <p>Procedure 1 → 8 → 9</p> |  <p>1. While lifting the claw with a screwdriver, rotate yoke in the direction of arrow and remove the yoke and magnet. 2. Release the 3 claws of the clamber.</p> | <p>Procedure 1 → 2 → 3 → 7 → 8 → 10</p> |  <p>1. Rotate the pulley gear in the direction of arrow ① until the traverse deck comes up. 2. Pull out the FPC board (CN301).</p>  <p>3. Release the 2 claws. 4. Remove the traverse deck in the direction of arrow ②.</p> <p>※ Be careful not to scratch or bend the FPC board.</p> |
| <p>Ref.No. 11</p> | <p>Removal of the tray base guide (L)</p> | | |
| <p>Procedure 1 → 2 → 3 → 11</p> |  <p>• Remove the 2 screws (①, ②).</p> | | |
| <p>Ref.No. 12</p> | <p>Removal of the tray base guide (R)</p> | <p>Ref.No. 13</p> | <p>Removal of the mechanism base ass'y</p> |
| <p>Procedure 1 → 2 → 3 → 12</p> |  <p>1. Remove the 2 screws (①, ②). 2. Release the 1 claw.</p> <p>[Bottom side]</p> | <p>Procedure 1 → 2 → 3 → 7 → 8 → 10 → 13</p> |  <p>1. Remove the 1 flat cable (CN404). 2. Remove the 4 screws (① ~ ④).</p> |

| | | | |
|---|---|------------------------------|---|
| <p>Ref.No. 14</p> | <p>Removal of the main P.C.B.</p> | | |
| <p>Procedure 1 → 2 → 3 → 12 → 14</p> | <ol style="list-style-type: none"> 1. Remove the 3 screws(❶ ~ ❸). 2. Lift the main P.C.B. off the retention post on the chassis ass'y. 3. Remove the 2 flat cable(CN11, CN404). 4. Pull out the FPC board(CN301). 5. Remove the main P.C.B. in the direction of arrow. | | |
| <p>Ref.No. 15</p> | <p>Removal of the worm base and sensor P.C.B.</p> | | |
| <p>Procedure 1 → 2 → 3 → 6 → 15</p> | <ol style="list-style-type: none"> 1. Remove the 1 screw(❶). 2. Release the 2 claws and then remove the worm base in the direction of arrow ❶. 3. Remove the belt. 4. Release the 3 claws. | | |
| <p>Ref.No. 16</p> | <p>Removal of the tray motor ass'y</p> | <p>Ref.No. 17</p> | <p>Removal of the worm ass'y</p> |
| <p>Procedure 1 → 2 → 3 → 6 → 15 → 16</p> | <p>• Unsolder the terminals of the tray motor ass'y.</p> | | <p>Procedure 1 → 2 → 3 → 6 → 15 → 17</p> <ol style="list-style-type: none"> 1. Raise the worm pulley in the direction of arrow ❶. 2. Remove the worm ass'y by pressing the claw in the direction of arrow ❷. |

| | | | |
|--|---|--|--|
| <p>Ref.No. 18</p> | <p>Removal of the power supply P.C.B.</p> | <p>Ref.No. 19</p> | <p>Removal of the tray roller</p> |
| <p>Procedure 1 → 2 → 3 → 7 → 8 → 10 → 13 → 18</p> |  <p>CN701 Power supply P.C.B.</p> <ol style="list-style-type: none"> 1. Remove the 1 flat cable(CN701). 2. Remove the 3 screws(① ~ ③). | <p>Procedure 1 → 2 → 6 → 19</p> |  <p>Tray roller Claw</p> <ul style="list-style-type: none"> • Release the claw in the direction of arrow. |
| <p>Ref.No. 20</p> | <p>Removal of the close lock gear and open lock gear</p> |  <p>Close lock gear Claw Spring Open lock gear Claw</p> <p>■ Close lock gear</p> <ol style="list-style-type: none"> 1. Release the claw and then remove the close lock gear in the direction of arrow. 2. Remove the spring. <p>■ Open lock gear</p> <ul style="list-style-type: none"> • Release the claw and then remove the open lock gear in the direction of arrow. | |
| <p>Ref.No. 21</p> | <p>Removal of the drive gear(A) and drive gear(B)</p> |  <p>Reinforcing plate Drive gear(A) Drive gear(B)</p> <ol style="list-style-type: none"> 1. Remove the 1 screw(①). 2. Remove the reinforcing plate. 3. Remove the drive gear(A) and drive gear(B). | |

| | | | |
|---|--|--|--|
| <p>Ref.No. 22</p> | <p>Removal of the pulley gear</p> | <p>Ref.No. 23</p> | <p>Removal of the drive cam, elevation cam and reduction gear</p> |
| <p>Procedure 1 → 2 → 3 → 22</p> |  <p>1. Remove the belt. 2. Release the 2 claws and then remove the pulley gear in the direction of arrow.</p> | <p>Procedure 1 → 2 → 3 → 21 → 22 → 23</p>  <p>1. Remove the 3 screws (① ~ ③).</p>  <p>2. Remove the drive cam, elevation cam and reduction gear.</p> | |
| <p>Ref.No. 24</p> | <p>Removal of the loading motor P.C.B.</p> | <p>Ref.No. 25</p> | <p>Removal of the servo P.C.B.</p> |
| <p>Procedure 1 → 2 → 3 → 7 → 8 → 10 → 13 → 24</p>  <p>1. Remove the belt.</p>  <p>2. Remove the 3 screws (① ~ ③). 3. Release the 1 claw.</p>  <p>4. Unsolder the terminals of the loading motor ass'y.</p> | | <p>Procedure 1 → 2 → 3 → 7 → 8 → 10 → 25</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.</p>  <p>Caution: To prevent the breakdown of the laser diode, antistatic shorting pin is inserted into the FPC board.</p>  | |

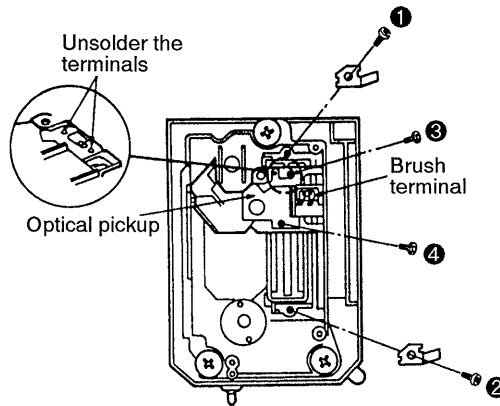
Ref.No. 26 **Removal of the optical pickup**

Procedure
 1 → 2 → 3 → 7
 → 8 → 10 → 25
 → 26

Refer to handling precautions for optical pickup and instructions for traverse oil (See page 7).

1. Remove the 2 screws(❶, ❷).
2. Unsolder the 2 terminals and the 2 screws(❸, ❹).

Caution: Take care not to touch the brush terminal.



Ref.No. 27 **Removal of the spindle motor**

Procedure
 1 → 2 → 3 → 7
 → 8 → 10 → 25
 → 27

1. Loosen the 1 screw(❶) by using a 1.27mm allen wrench and remove the turntable.
2. Remove the 2 screws(❷, ❸).

Caution:

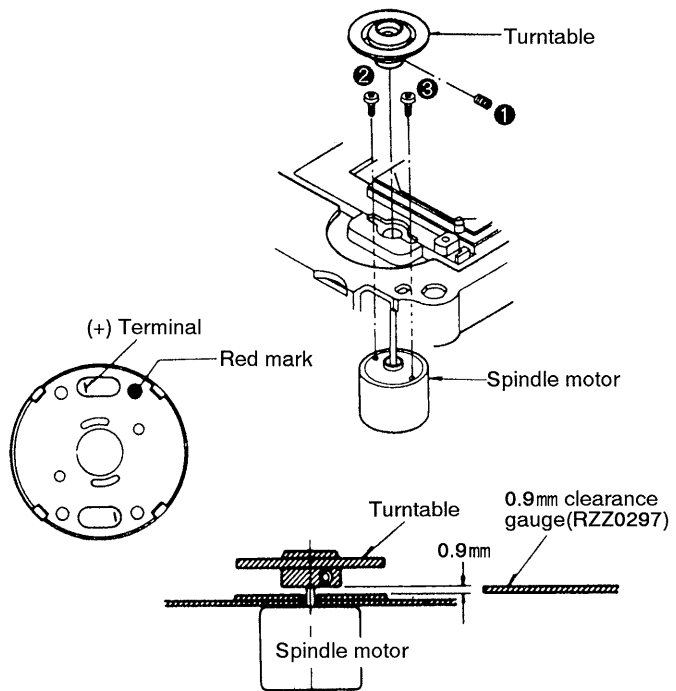
1. Turntable height adjustment is necessary any time the turntable or spindle motor is replaced.
2. The (+)terminal of the spindle motor is indicated by the red mark.

Adjustment of turntable height

1. Insert a 0.9mm clearance gauge (RZZ0297) between the turntable and loading base as shown in the figure.
2. Tighten the turntable set-screw by using a 1.27mm allen wrench.

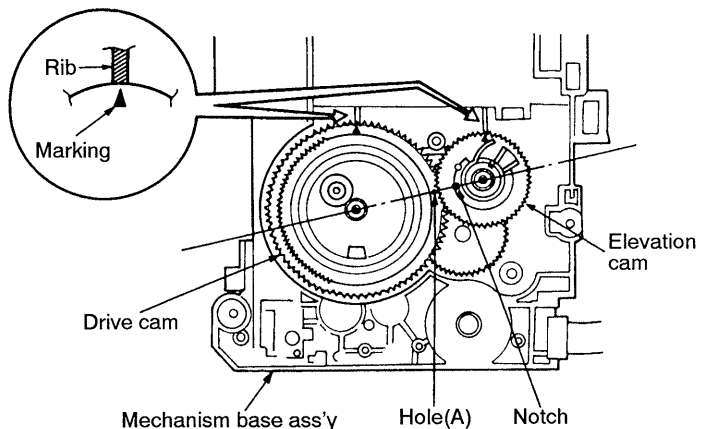
Caution:

Refer to turntable height adjustment (See page 25).



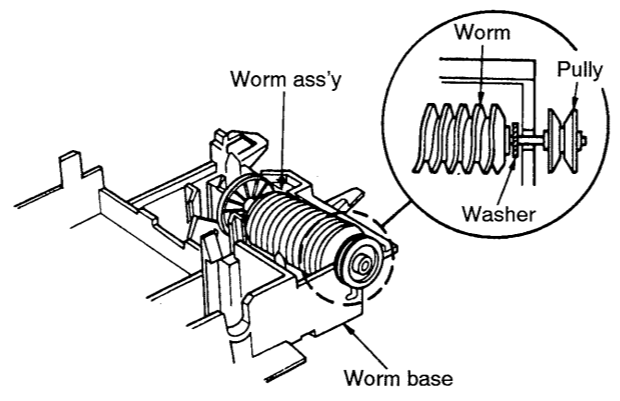
● **Installation of the elevation cam and drive cam**

1. Align the drive cam, the marking (▲) on the elevation cam, and the rib on the mechanism base ass'y.
2. Check that hole(A) on the drive cam and the notch on the elevation cam are aligned in a straight line.



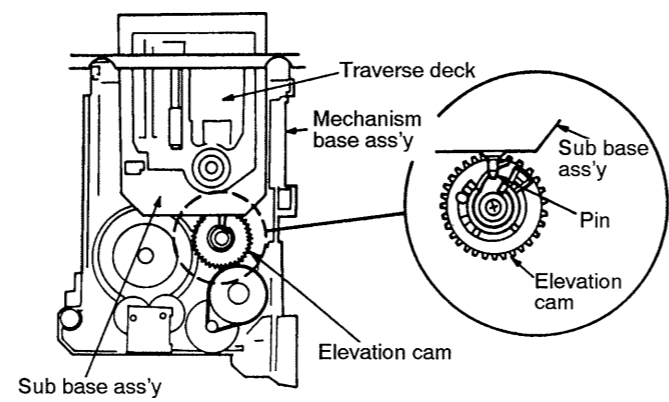
● **Installation of the worm ass'y**

When installing the worm ass'y onto the worm base, move the washer located between the worm and pulley next to the worm.



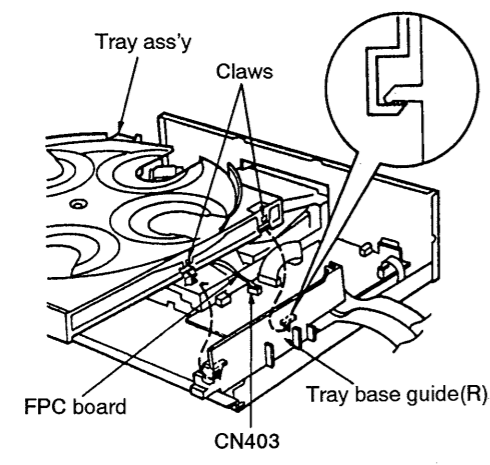
● **Installation of the traverse deck**

1. Position the elevation cam as shown in the figure on the right.
2. When the traverse deck is mounted on the mechanism base ass'y, check that the pin of the sub base ass'y is positioned at the slanted part of the rib on the elevation cam.

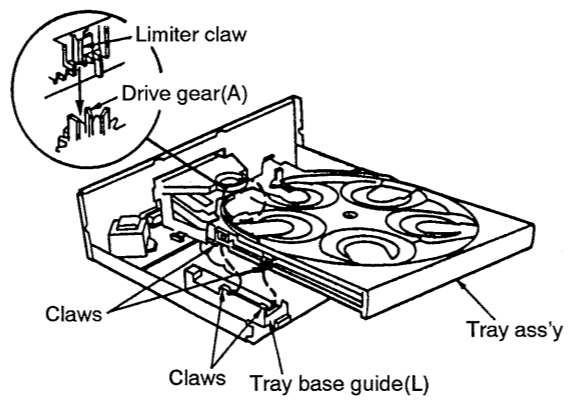


● **Installation of the tray ass'y**

1. Attach the FPC board to the connector(CN403).
2. Fit the claws on the right side of the tray ass'y underneath the claws on the tray base guide(R).

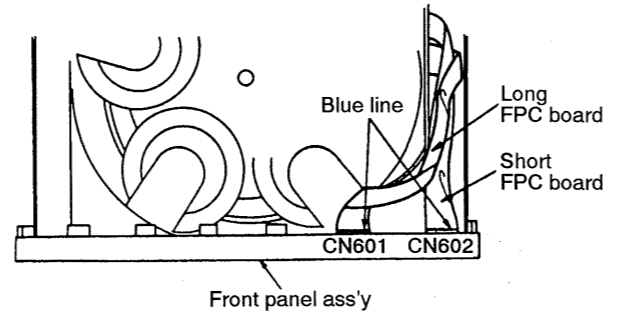


3. Fit the limiter claw on the tray ass'y between the teeth of the drive gear(A).
4. Align the claws on the left side of the tray ass'y with the claws on the tray base guide(L) and push the tray ass'y until the claws catch.
5. After installing the tray ass'y, check that it moves smoothly.



● **Notes on the installation of the FPC board for the front panel ass'y**

1. With its blue line facing up, fully insert the FPC board until the foil is no longer exposed.
2. Insert the short FPC board first and then insert the long FPC board over it.



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

● **Check the main P.C.B.**

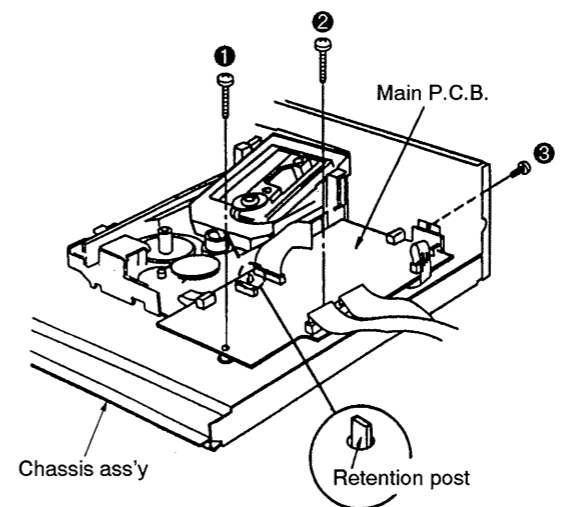


Fig. 1

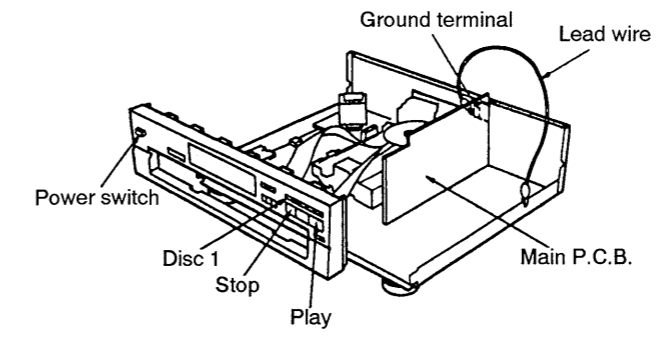


Fig. 3

● **Check the servo P.C.B.**

When checking the servo P.C.B., place the traverse deck sideways. There are two ways(A) & (B) of securing the traverse deck as shown below.

(A) **Securing the traverse deck to the chassis ass'y.**

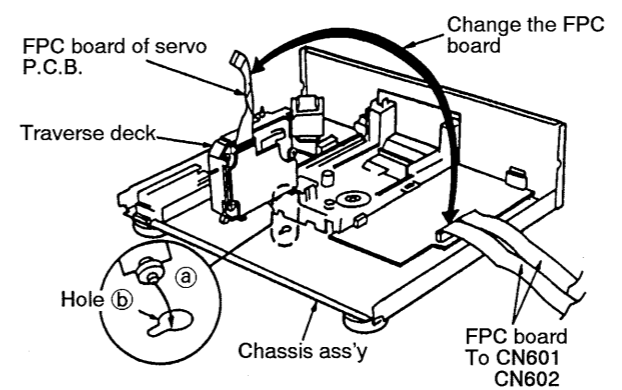


Fig. 4

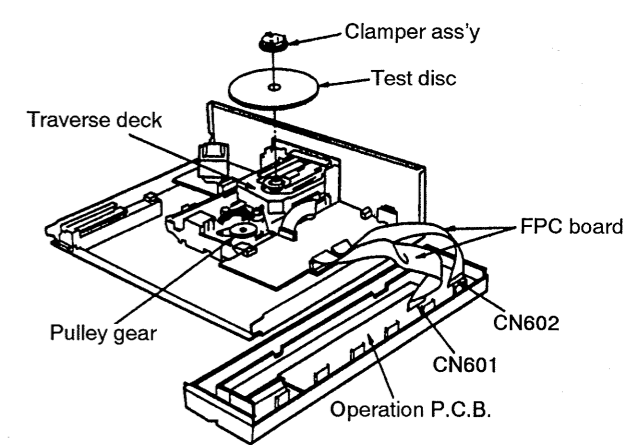


Fig. 2

1. Rotate the pulley gear in the direction of arrow until traverse deck comes up.
2. Place the test disc and secure it by using the clamper ass'y.
3. Connect the 2 FPC board(CN601, CN602) as shown in Fig. 2.
4. Remove the 3 screws(1~3) as shown in Fig. 1.
5. Lift the main P.C.B. off the retention post on the chassis ass'y.
6. Set up the main P.C.B.
7. Connect the main P.C.B. ground terminal (line out terminal) to the chassis ass'y with a lead wire.

How to play the disc

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. Press the **play** key and play the test disc.
10. When checking the soldered surface of the main P.C.B., do as shown in Fig. 3.

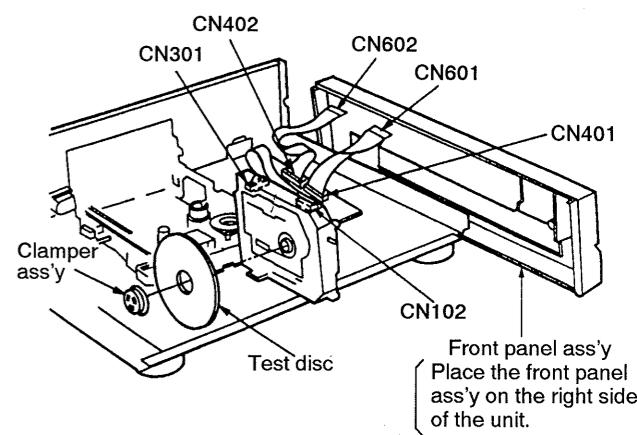


Fig. 5

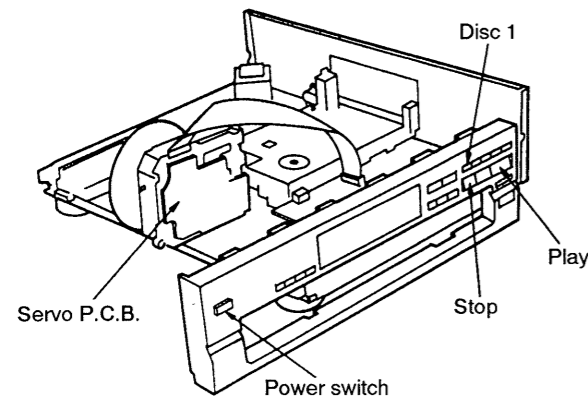


Fig. 6

1. Connect the FPC boards as shown in Fig. 5.
 - Between CN401 and CN601
 - Between CN402 and CN602
 - Between CN102 and CN301
 Replace the FPC board for the servo P.C.B. (between CN102 and CN301) with the FPC board on the main P.C.B. (between CN401 and CN601 or between CN402 and CN602). (Reference the arrows in Fig. 4.)

(B) Securing the traverse deck to the mechanism base ass'y.

(The traverse deck cannot be secured unless the rear panel has been removed.)

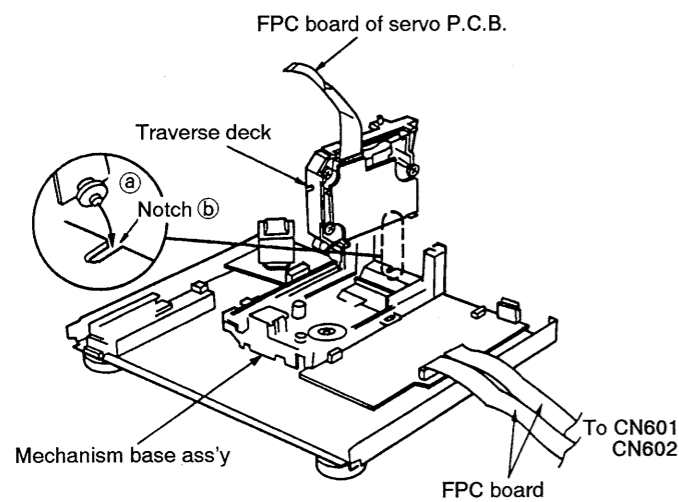


Fig. 7

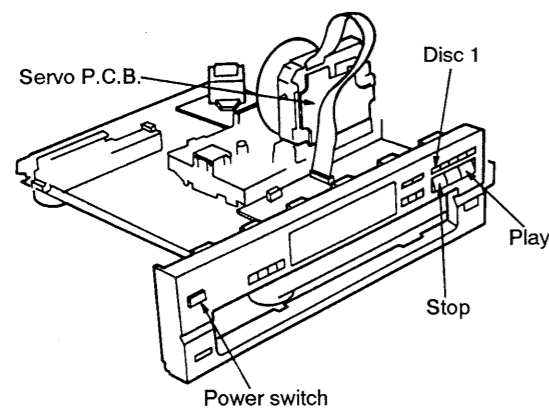


Fig. 9

Notes:

- The FPC board cannot be connected because it is too short when the traverse deck is secured sideways. Replace it with the long FPC board.
- After completing the check, restore the replaced FPC boards to their original positions.

2. Insert part (a) of the traverse deck into hole (b) of the chassis ass'y as shown in Fig. 4.

How to play the disc

3. 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.)
4. Press the **play** key and play the test disc.
5. When checking the soldered surface of the servo P.C.B., do as shown in Fig. 6.

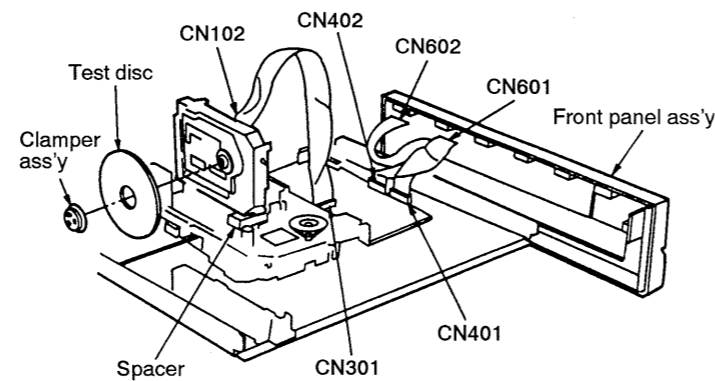


Fig. 8

1. Connect the FPC boards in the same manner as described in (A) above.
2. Insert part (a) of the traverse deck into notch (b) of the mechanism base ass'y as shown in Fig. 7.
3. Install the spacer so that the traverse deck is horizontal as shown in Fig. 8.

How to play the disc

4. 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.)
5. Press the **play** key and play the test disc.
6. When checking the soldered surface of the servo P.C.B., do as shown in Fig. 9.

OPERATING THE UNIT WITHOUT THE FRONT PANEL ASS'Y

(OPERATING P.C.B. AND KEYS)

The main operations of the unit can be performed by shorting jumper wires on the main P.C.B. even if the FPC board from the control panel is not connected to the main P.C.B.

(When bent the jumper wire, pay attention not to cut it.)

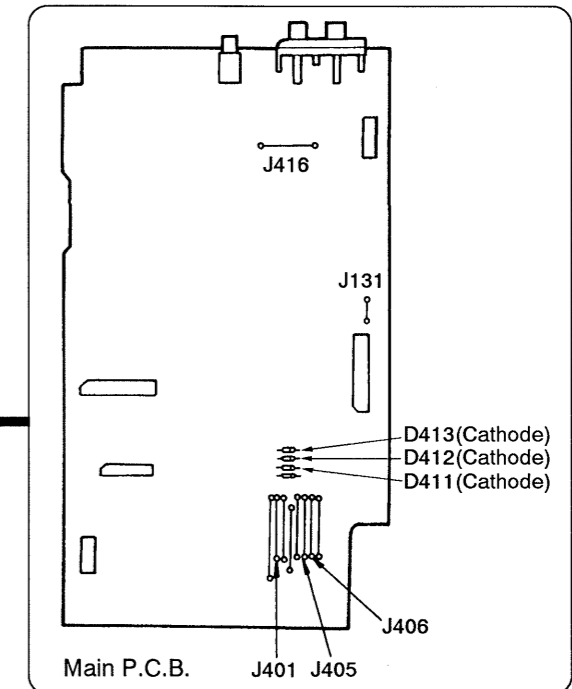
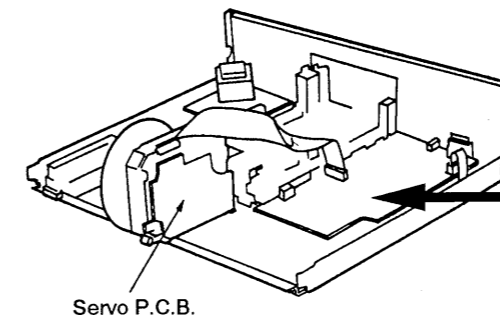
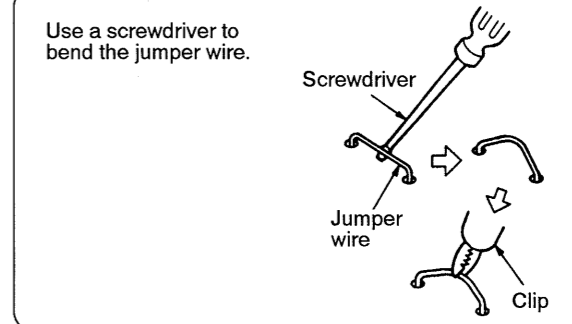


Fig. 1



1. Short the jumpers on the main P.C.B.
 - a. J406 - Cathode of D411 (equivalent to pressing the PLAY key)
 - b. J406 - Cathode of D413 (equivalent to pressing the STOP key)
 - c. J401 - Cathode of D411 (equivalent to pressing the DISC 1 key)
2. Shorting J131 to J416 turns the power ON.
3. After turning on the power, open the 3 shorted jumpers (a to c) in 1.
4. Momentarily short the jumpers shown below as needed. (Fig. 1)
 - To PLAY, short J406 to cathode of D411 (equivalent to pressing the PLAY key)
 - To FWD, short J405 to cathode of D413 (equivalent to pressing the ►► SKIP key)
 - To REW, short J405 to cathode of D411 (equivalent to pressing the ◄◄ SKIP key)
 - To FORWARD, short J401 to cathode of D412 (equivalent to pressing the ►► SEARCH key)
 - To BACKWARD, short J401 to cathode of D413 (equivalent to pressing the ◄◄ SEARCH key)
 - To STOP, short J406 to cathode of D413 (equivalent to pressing the STOP key)
5. The operations for the 6 modes above can be performed.

■ DISPLAY FUNCTION OF AUTOMATICALLY-ADJUSTED RESULTS

(SELF-CHECK FUNCTION)

The unit contains a function which displays the result of the automatically adjustment of the servo circuits (tracking, focus servo, etc.) as an error code on the FL display.

The error code display serves as a repair guide showing the automatically adjustment circuit is at fault. The procedures for displaying the error codes are given below.

• Procedures to display the error code

(1) Procedure to display the error code before disassembly (finished unit)

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

(2) Procedure to display the error code when disassembled

- Prepare the unit as described in "How to Check the Main and Servo P.C.B." on pages 16, 17.
- Press the **POWER** key while holding down the **STOP** (■), **PLAY** (▶) and **DISC 1** keys simultaneously.
- When the FL display illuminates, release the **STOP** (■), **PLAY** (▶) and **DISC 1** keys.
- Load the test disc (SZZP1054C) on the turntable and secure it with the clasper ass'y.
- Perform steps 4 and 5 in section (1) above.

• Error code based troubleshooting

※ The unit is satisfactory if the error code is **E-0** of **E-2**.

※ Before testing, check that the test disc is free of scratches and dirt and optical pickup is clean.

| FL error code display | Symptom | Probable cause | Signal to check | | Normal the values of voltage and waveform | |
|---|--|---|-----------------|--------------|---|------|
| | | | Signal name | Location | PLAY | STOP |
| E-1 | Focus and tracking offset adjustments did not complete in the specified time period. | ① Clocks X1 and X2, power supply VDD, and reset/RST, all on IC702 ② MDATA, MCLK, MLD, and SENSE signals to/from the mechanism controller | MDATA | IC102 ⑧ pin | | 4.9V |
| | | | MCLK | IC102 ⑦ pin | | 4.9V |
| | | | MLD | IC102 ⑨ pin | | 4.9V |
| | | | SENSE | IC102 ⑩ pin | 0V | 0V |
| | | | /RST | IC102 ⑱ pin | 4.9V | 4.9V |
| | | | X1 | IC102 ⑤⑨ pin | | |
| X2 | IC102 ⑤⑨ pin | | | | | |
| E-3 E-5 E-7 E-9 E-B E-D E-F | Disc play unstable | ① Scratches or contaminants on disc surface ② Focus and tracking servo circuits (check waveforms, voltages, and part constants.) ③ Spindle driver circuit ④ Optical pickup | FE | IC102 ⑳ pin | | 2.4V |
| | | | TE | IC102 ⑳ pin | | 2.4V |
| | | | FOD | IC102 ⑳ pin | 2.4V | 2.4V |
| | | | TRD | IC102 ⑳ pin | 2.4V | 2.4V |
| | | | KICK | IC102 ⑳ pin | 2.4V | 2.4V |
| | | | /FLOCK | IC102 ⑲ pin | 0V | 4.9V |
| | | | /RF DET | IC102 ⑳ pin | 0V | 4.8V |
| | | | RF | TJ101 | | 3.4V |
| | | | STAT | IC102 ⑲ pin | 2.8V | 0V |

| FL error code display | Symptom | Probable cause | Signal to check | | Normal the values of voltage and waveform | |
|-----------------------|---|---|-----------------|-------------|---|------|
| | | | Signal name | Location | PLAY | STOP |
| E-4 E-6 | Focus gain adjustment did not complete in the specified time period. | ① Scratches or contaminants on disc surface ② Focus servo circuit (check waveforms, voltages, and part constants.) ③ Optical pickup | FE | IC102 ⑳ pin | | 2.4V |
| | | | OFT | IC102 ⑳ pin | 0V | 0V |
| | | | /TLOCK | IC102 ⑲ pin | 0V | 0V |
| E-8 E-A | Tracking gain adjustment did not complete in the specified time period. | ① Scratches or contaminants on disc surface ② Tracking circuit (check waveforms, voltages, and part constants.) ③ Optical pickup | TE | IC102 ⑳ pin | | 2.4V |
| | | | OFT | IC102 ⑳ pin | 0V | 0V |
| | | | /TLOCK | IC102 ⑲ pin | 0V | 0V |
| E-C E-E | Perform the same check as for error codes <E4, E6> and <E8, A>. | | FE | IC102 ⑳ pin | | 2.4V |
| | | | TE | IC102 ⑳ pin | | 2.4V |
| | | | OFT | IC102 ⑳ pin | 0V | 0V |
| | | | /TLOCK | IC102 ⑲ pin | 0V | 0V |

■ NEW DIGITAL SERVO CIRCUIT

Notes:

- There are two types A and B of new digital servo circuit.
- Refer to "How to distinguish between A and B" shown below.
- There are two types (MN66271 and MN662712RA) for IC102. When changing IC102, use MN662712RA.

• How to distinguish between types A and B.

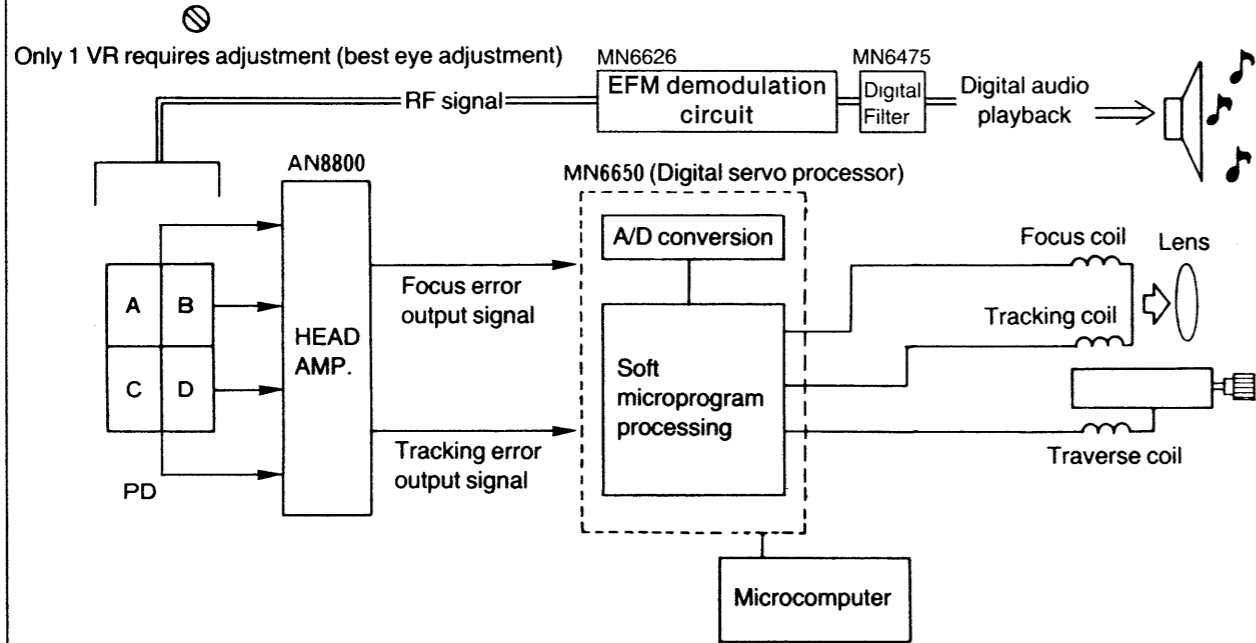
| Part No. | Type A | Type B |
|-------------------|--------------|--------------|
| Ref. No. | | |
| IC | | |
| IC102 | MN66271 | MN662712RA |
| VARIABLE RESISTOR | | |
| VR101 | EVND3AA00B14 | Not mounted |
| RESISTORS | | |
| R114 | ERJ6GEYJ224V | ERJ6GEYJ104V |
| R134-136 | ERJ6GEY0R00V | ERJ6GEYJ331V |
| CHIP JUMPERS | | |
| RJ101 | Not mounted | ERJ6GEY0R00V |
| CAPACITORS | | |
| C105 | Not mounted | ECUV1E273KBN |
| C106 | Not mounted | ECUV1H101JCN |
| C112 | Not mounted | ECUV1E273KBN |
| C143 | Not mounted | ECBT1H331KB5 |
| C144 | Not mounted | ECBT1H331KB5 |

NEW DIGITAL SERVO SYSTEM

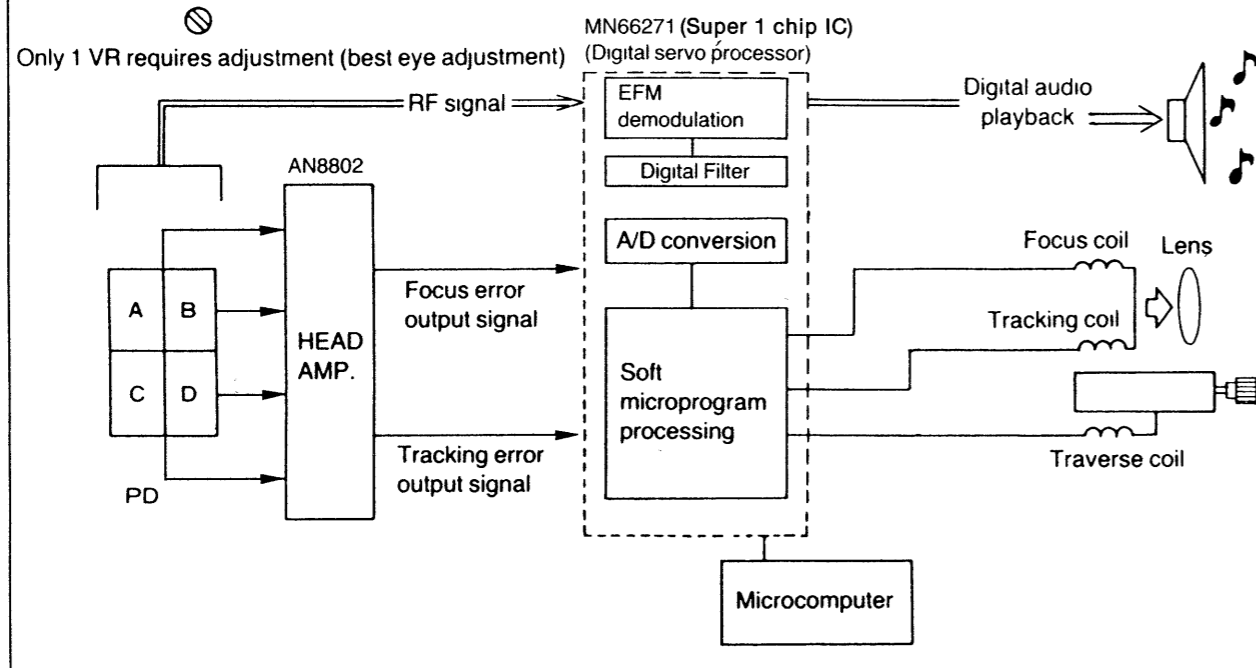
This model employs a new digital servo circuit (super 1 chip IC: MN66271/MN662712RA). Compared to the old digital servo circuit, the following points have been improved.

- 1. Reduced number of parts**
Use of a super 1 chip IC
3 chips (MN6626, MN6650, MN6475) are reduced to a super 1 chip (MN66271/MN662712RA)
- 2. Reduced access time**
[[old] 2.9 seconds → (new) 1.9 seconds]
Change of traverse gear
- 3. Improved vibration resistance**
Rubber and spring 2-level floating mechanism [fo=50 Hz (old) → 20 Hz (new)]
- 4. All adjustment VRs have been deleted for type B.**

DIGITAL SERVO SYSTEM (OLD)

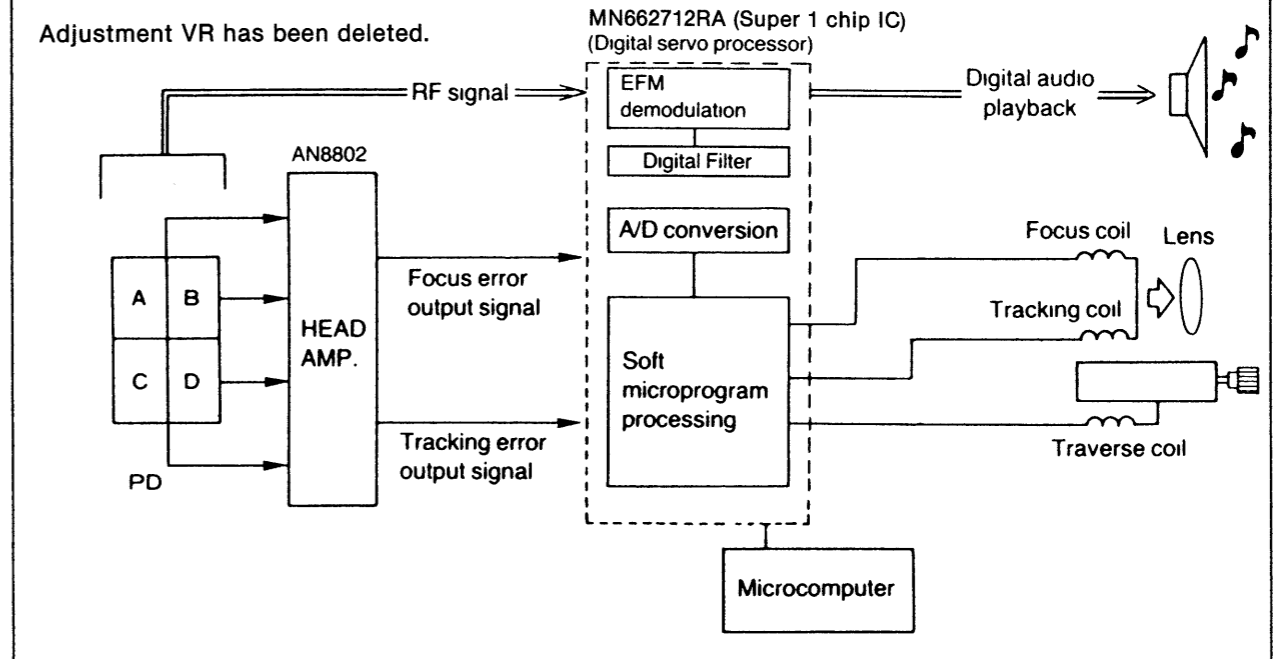


DIGITAL SERVO SYSTEM FOR TYPE A (NEW)



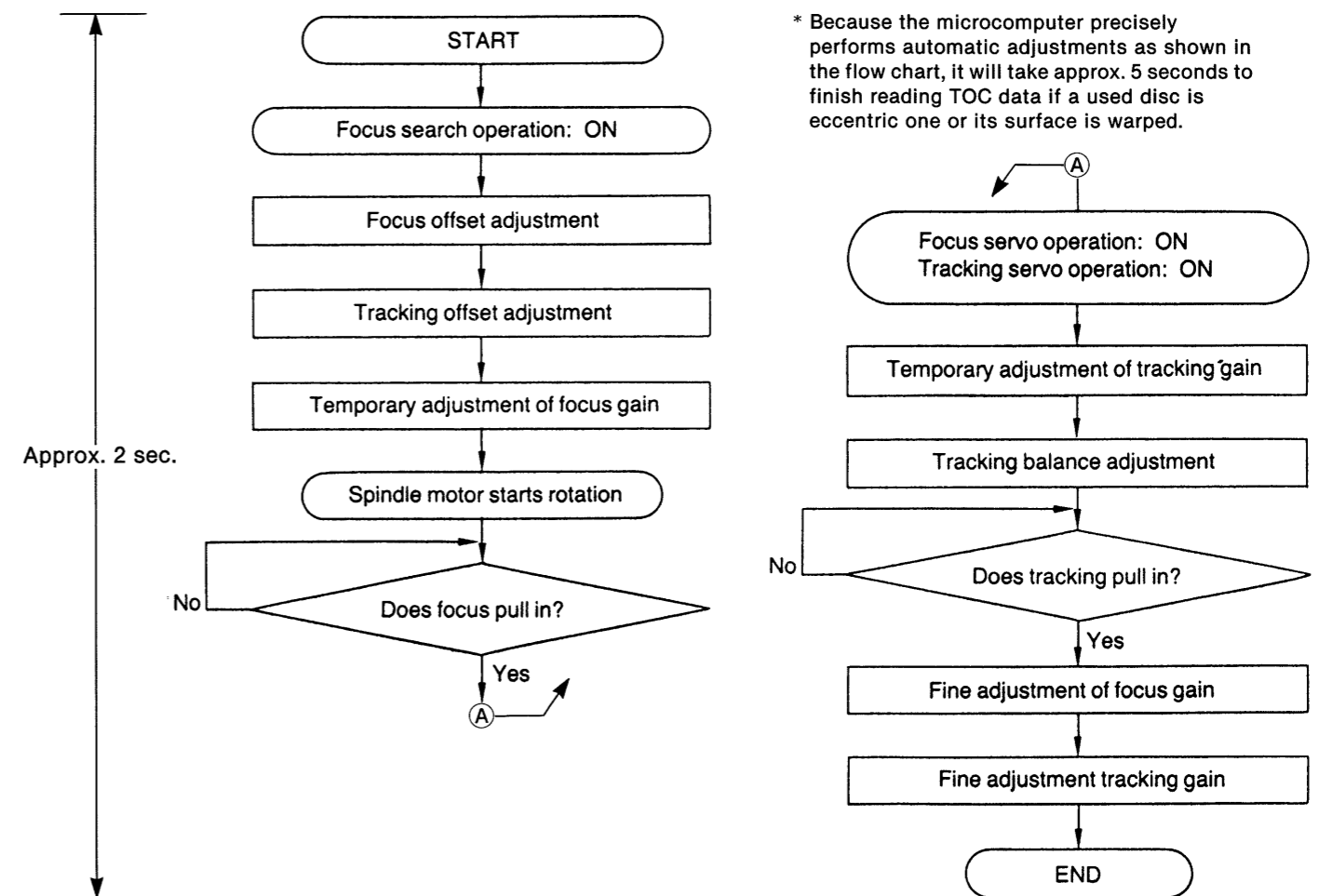
DIGITAL SERVO SYSTEM FOR TYPE B (NEW)

Adjustment VR has been deleted.

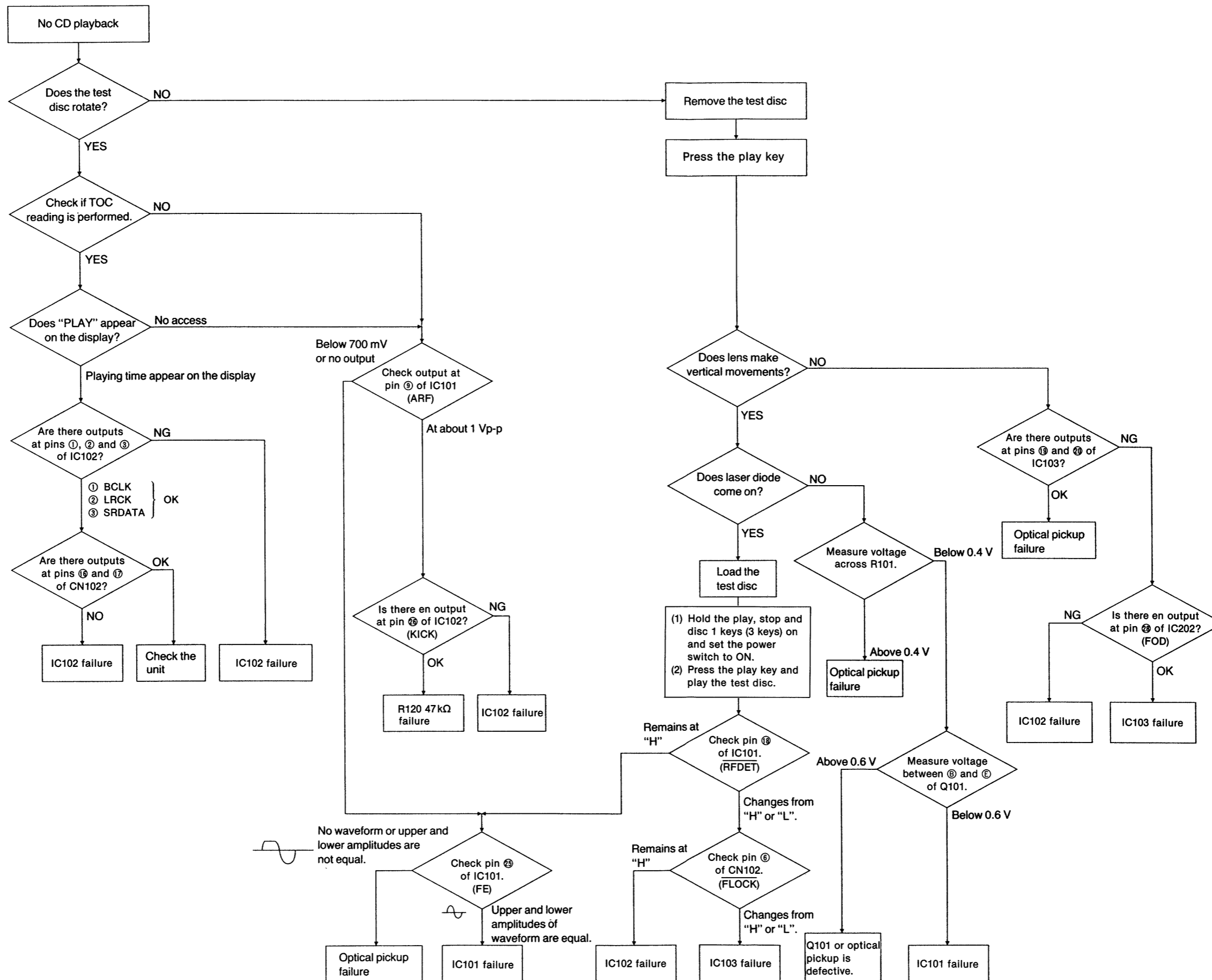


The following flow chart shows the sequence of automatic adjustments.

Flow chart on automatic adjustment sequence



■ TROUBLESHOOTING GUIDE



MEASUREMENTS AND ADJUSTMENTS

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

Measuring Instruments and Special Tools

- * Test discs
- 1. Playability test disc (SZZP1054C)
- 2. Uneven test disc (SZZP1056C)
- * Musical program disc (ordinary)
- * Dual-beam oscilloscope with bandwidth of 30MHz or better (with EXT. trigger and 1:1 probe).
- * Allen wrench (M2.0) (SZZP1101C)
- * Allen wrench (M1.27)
- * 0.9mm clearance gauge (RZZ0297)
- * Filter
- * Lock paint (RZZ0L01)

PREPARATION

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

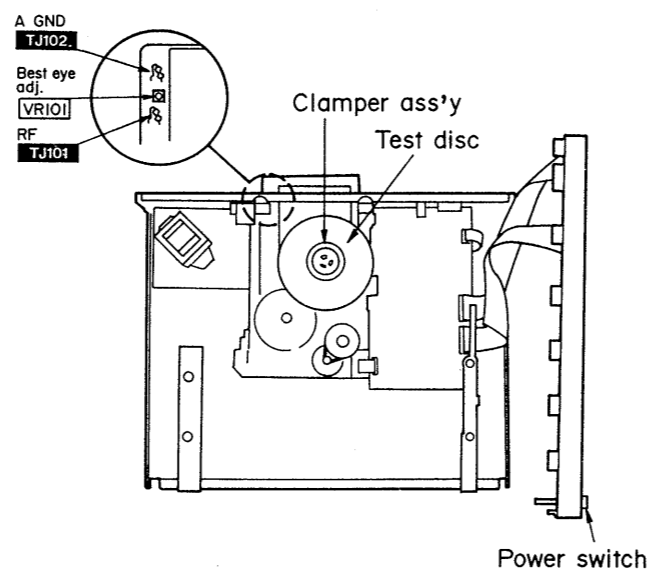


Fig. 1

Adjusting Procedure

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

(1) TURNTABLE HEIGHT ADJUSTMENT

1. Insert the 0.9mm clearance gauge (RZZ0297) between the turntable and the loading base. (Refer to Fig. 2).
 2. Tighten the turntable retention screw with the 1.27mm allen wrench.
 3. Connect the oscilloscope's CH. 1 probe across **TP1** (+) and **TP2** (-) terminal via a filter (Refer to Fig. 3).
- Note:** For the connection of oscilloscope's CH. 1 probe to servo P.C.B. on foil side, refer to fig. 2.
- Oscilloscope setting:** VOLT 500mV
SWEEP 5ms.
Input coupling..... DC
4. Adjust oscilloscope's DC zero balance.
 5. Switch the play power ON, and play the test disc (SZZP1054C).
 6. Measure the voltage amplitude of the signal on the oscilloscope.

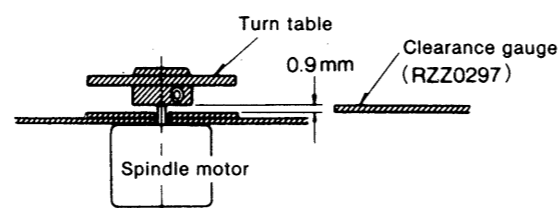


Fig. 2

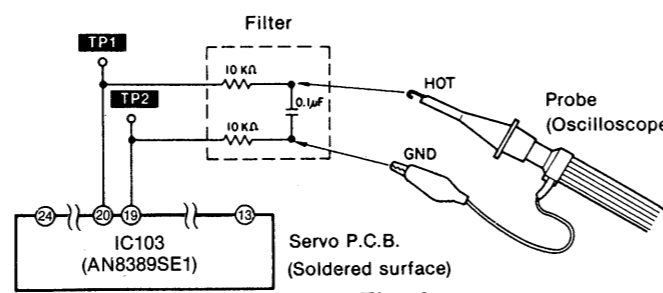
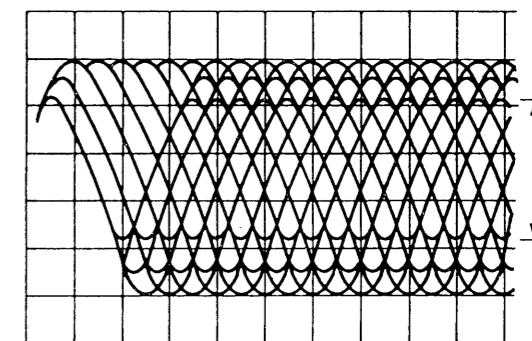


Fig. 3

7. Adjust the height until the voltage is $0 \pm 1.0V$.
If the voltage exceeds $+1.0V$, lower turntable.
If the voltage is below $-1.0V$, elevate the turn table.
- Note:** Measure the voltage as 0V as possible.

(2) MECHANICAL ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (GND) on the servo P.C.B. (Refer to Fig. 1)
- Oscilloscope setting:** VOLT 100mV
SWEEP 0.5 μ s.
Input coupling..... AC
2. Switch the player power ON, and play track 7 on the test disc (SZZP1056C). (Playing any other track will prevent the HEX screws from being accessed.)
 3. Leave the player in play mode and place it as shown Fig. 5.
 4. Alternately adjust the two HEX screws with the 2.0mm allen wrench (SZZP1101C) until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched. (Refer to Fig. 4)
 5. After completing the adjustment, lock the HEX screws with lock paint (RZZ0L01).



* Most stretched eye pattern.

Fig. 4

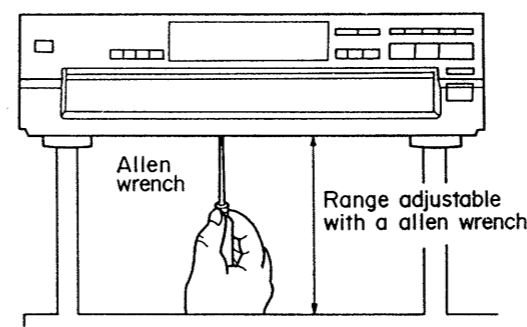
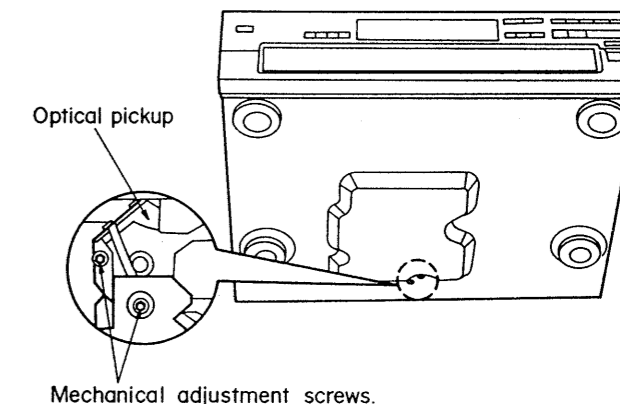
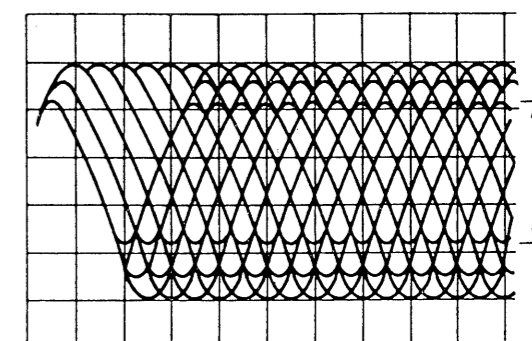


Fig. 5



(3) BEST EYE (PD BALANCE) ADJUSTMENT FOR TYPE A

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (GND) on the servo P.C.B. (Refer to Fig. 1)
- Oscilloscope setting:** VOLT 100mV
SWEEP 0.5 μ s.
Input coupling..... AC
2. Switch the player power ON, and play the 1kHz (track 1) on the test disc (SZZP1054C).
 3. Adjust **VR101** until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched. (Refer to Fig. 6)



* Most stretched eye pattern.

Fig. 6

(4) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

* Checking Skip Search

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

* Checking Manual Search

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

* Checking Playability

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

■ TERMINAL FUNCTION OF IC'S

• IC101 (AN8802SCE1V): Servo amp

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

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

• IC103 (AN8389SE1): Coil/motor drive

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

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

• IC102 (MN66271/MN662712RA): Servo processor/digital signal processor/digital filter & D/A converter

| Pin No. | Mark | I/O Division | Function |
|---------|-------------------|--------------|---|
| 1 | BCLK | O | Serial bit clock terminal |
| 2 | LRCK | O | L/R discriminating signal |
| 3 | SRDATA | O | Serial data (Not used, open) |
| 4 | DV _{DD1} | I | Power supply (digital circuit) terminal |
| 5 | DV _{SS1} | — | GND (digital circuit) terminal |
| 6 | TX | O | Digital audio interface signal |
| 7 | MCLK | I | Command clock signal |
| 8 | MDATA | I | Command data signal |
| 9 | MLD | I | Command load signal ("L": LOAD) |
| 10 | SENSE | O | Sense signal (OFT, FESL, NACEND, NAJEND, POSAD, SFG) |
| 11 | /FLOCK | O | Optical servo condition (focus) ("L": lead-in) |
| 12 | /TLOCK | O | Optical servo condition (tracking) ("L": lead-in) |
| 13 | BLKCK | O | Sub-code block clock (f=75 Hz) (Not used, open) |
| 14 | SQCK | I | Sub-code Q register clock |
| 15 | SUBQ | O | Sub-code Q data |
| 16 | DMUTE | I | Muting input ("H": MUTE) (Not used, connected to GND) |
| 17 | STAT | O | Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQCK) |
| 18 | /RST | I | Reset signal ("L": reset) |
| 19 | SMCK | O | System clock (f=4.2336 MHz) (Not used, open) |
| 20 | PMCK | O | Frequency division clock signal (Not used, open) $f = \frac{1}{1.92} \times ck = 88.2 \text{ kHz}$ |
| 21 | TRV | O | Traverse servo control |

| Pin No. | Mark | I/O Division | Function |
|---------|--------|--------------|---|
| 22 | TVD | O | Traverse drive signal |
| 23 | PC | O | Turntable motor drive signal ("L": ON) |
| 24 | ECM | O | Turntable motor drive signal (Forced mode) |
| 25 | ECS | O | Turntable motor drive signal (Servo error signal) |
| 26 | KICK | O | Kick pulse output |
| 27 | TRD | O | Tracking drive signal output |
| 28 | FOD | O | Focus drive signal output |
| 29 | VREF | I | D/A drive output (TVD, ECS, TRD, FOD, FBAL, TBAL) normal voltage input terminal |
| 30 | FBAL | O | Focus balance adj. output (Not used, open) |
| 31 | TBAL | O | Tracking balance adj. output |
| 32 | FE | I | Focus error signal (analog input) |
| 33 | TE | I | Tracking error signal (analog input) |
| 34 | RFENV | I | RF envelope signal |
| 35 | VDET | I | Oscillation det. signal ("H": det.) |
| 36 | OFT | I | Off track signal ("H": Off track) |
| 37 | TRCRS | I | Track cross signal input |
| 38 | /RFDET | I | RF detection signal ("L": detection) |
| 39 | BDO | I | Dropout detection signal ("H": dropout) |
| 40 | LDON | O | Laser power control ("H": ON) |
| 41 | TES | O | Tracking error shunt output ("H": dropout) |
| 42 | PLAY | O | Play signal ("H": play) |

| Pin No. | Mark | I/O Division | Function |
|---------|-------------------|--------------|--|
| 43 | WVEL | O | Double velocity status signal ("H": double) |
| 44 | ARF | I | RF signal input |
| 45 | IREF | I | Reference current input |
| 46 | DRF | I | DSL bias terminal (Not used, open) |
| 47 | DSL F | I/O | DSL loop filter terminal |
| 48 | PLL F | I/O | PLL loop filter terminal |
| 49 | VCO F | I/O | VCO loop filter terminal (Not used, open) |
| 50 | AV _{DD2} | I | Power supply (analog circuit) terminal (2) |
| 51 | AV _{SS2} | — | GND (analog circuit) terminal |
| 52 | EFM | O | EFM signal (Not used, open) |
| 53 | PCK | O | PLL extract clock (f=4.3218MHz) |
| 54 | PDO | O | Phase compared signal of EFM and PCK (Not used, open) |
| 55 | SUBC | O | Sub-code serial output data (Not used, open) |
| 56 | SBCK | I | Sub-code serial output clock (Not used, connected to GND) |
| 57 | V _{SS} | — | GND terminal |
| 58 | X1 | I | Crystal oscillator terminal (f=16.9344 MHz) |
| 59 | X2 | O | |
| 60 | V _{DD} | I | Power supply terminal |
| 61 | BYTCK | O | Byte clock signal (Not used, open) |
| 62 | /CLDCK | O | Sub-code frame clock signal (f CLDCK=7.35kHz: Normal) (Not used, open) |

| Pin No. | Mark | I/O Division | Function |
|---------|-------------------|--------------|---|
| 63 | FCLK | O | Crystal frame clock (Not used, open) |
| 64 | IPFLAG | O | Interpolation flag terminal |
| 65 | FLAG | O | Flag terminal |
| 66 | CLVS | O | Turntable servo phase synch. signal ("H": CLV, "L": Rough servo) (Not used, open) |
| 67 | CRC | O | Sub-code CRC check terminal ("H": OK, "L": NG) |
| 68 | DEMPH | O | De-emphasis ON signal ("H": ON) (Not used, open) |
| 69 | RESY | O | Re-synchronizing signal of frame sync. (Not used, open) |
| 70 | /RST2 | I | Reset terminal after "MASH" circuit |
| 71 | /TEST | I | Test terminal (Normal: "H") |
| 72 | AV _{DD1} | I | Power supply (analog circuit) terminal (1) |
| 73 | OUTL | O | Lch audio signal |
| 74 | AV _{SS1} | — | GND (analog circuit) terminal (1) |
| 75 | OUTR | O | Rch audio signal |
| 76 | RSEL | I | Polarity direction control terminal of RF signal |
| 77 | CSEL | I | Frequency control terminal of crystal oscillator (Not used, connected to GND) |
| 78 | PSEL | I | Test terminal (Normal: "L") |
| 79 | MSEL | I | "SMCK" terminal frequency select ("L": SMCK=4.2336 MHz) |
| 80 | SSEL | I | "SUBQ" terminal mode select ("H": Q code buffer) |
| | | | |

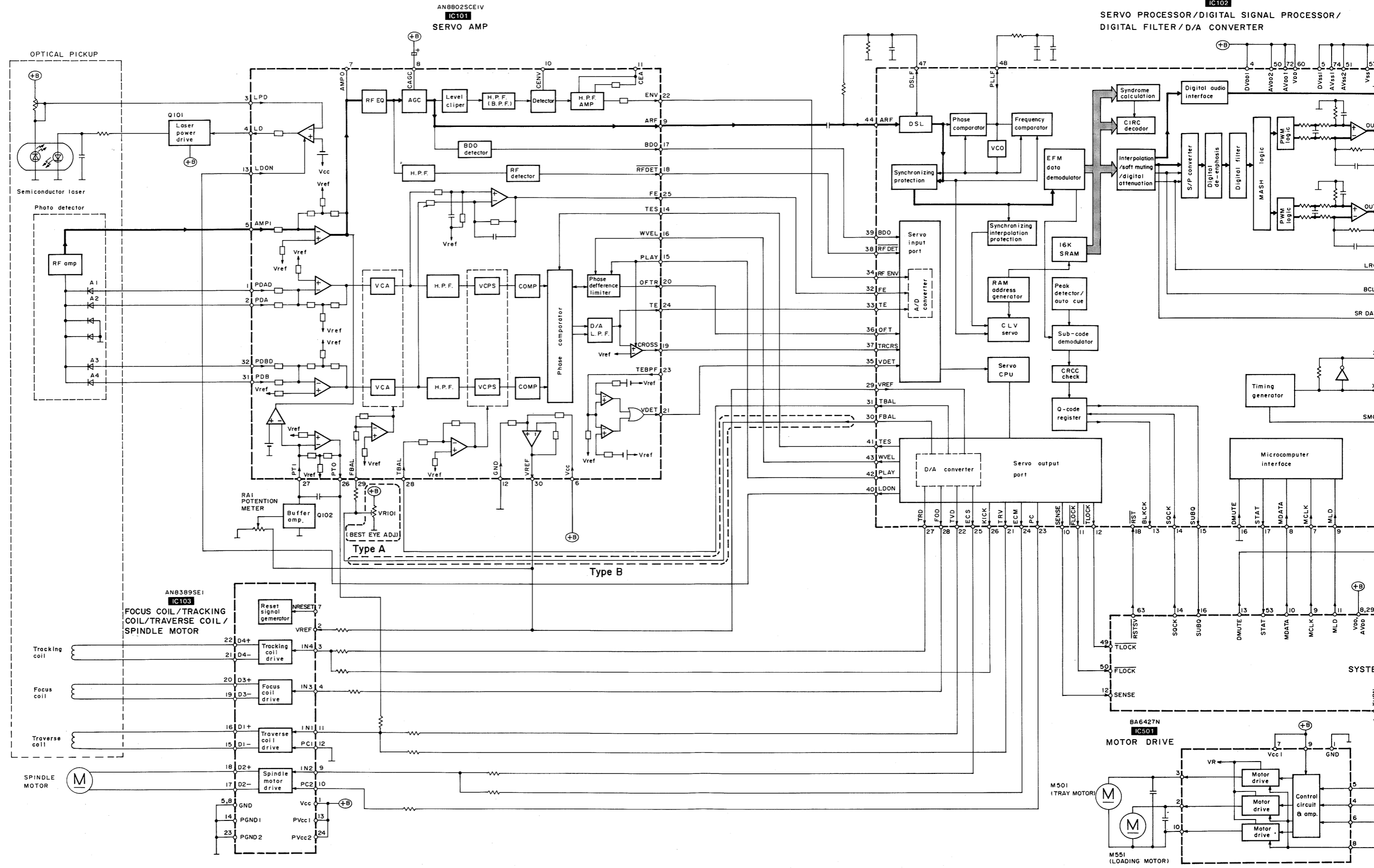
• IC401 (UPD78043B014): System control & FL drive

| Pin No. | Mark | I/O Division | Function |
|---------------|---------------------------|--------------|--|
| 1 ┆ 7 | G7 ┆ G1 | O | FL grid signal |
| 8 | VDD | I | Power supply terminal |
| 9 | MCLK | O | Command clock signal |
| 10 | MDATA | O | Command data signal |
| 11 | MLD | O | Command load signal ("L": LOAD) |
| 12 | SENSE | I | Sense signal |
| 13 | DMUTE | O | Muting control signal |
| 14 | SQCK | O | Sub-code Q register clock |
| 15 | NC | — | Not connected |
| 16 | SUBQ | I | Sub-code Q data |
| 17 | /RESET | I | Reset signal input |
| 18 | TIMER | — | Not used, connected to GND |
| 19 | REC. EN | I | Synchro rec. control terminal |
| 20 | AVSS | — | GND terminal |
| 21 ┆ 24 | KEY IN 8 ┆ KEY IN 5 | I | Key return signal |
| 25 ┆ 28 | KEY IN 4 ┆ KEY IN 1 | I | Key return signal |
| 29 | AVDD | I | Power supply terminal |
| 30 | AVREF | I | Power supply terminal |
| 31 | XT1 | — | Not used, connected to GND |
| 32 | XT2 | — | Not used, open |
| 33 | VSS | — | GND terminal |
| 34 | X1 | I | Crystal OSC terminal (f=4.2336 MHz) |
| 35 | X2 | O | |
| 36 | DISC | I | Disc det. terminal |
| 37 | OPEN | I | Open detect terminal |
| 38 | DOWN | I | Traverse deck down det. terminal |
| 39 | UP | I | Traverse deck up det. terminal |
| 40 | DRAW | O | Motor control signal |

| Pin No. | Mark | I/O Division | Function |
|---------------|-----------------------------|--------------|--|
| 41 | TRUN | O | Motor control signal |
| 42 | DIR | O | |
| 43 | PWM | O | |
| 44 | POSITION | I | Rotary tray position det. terminal |
| 45 | SYNCHRO | O | Synchro rec. control terminal |
| 46 | SPEED | I | Loading motor speed sensor signal |
| 47 | REMOCON | I | Remote control signal |
| 48 | IC | — | Not used, connected to GND |
| 49 | /TLOCK | I | Optical servo condition (tracking) input |
| 50 | /FLOCK | I | Optical servo condition (focus) input |
| 51 | PITCHLED | O | Not used, open |
| 52 | VDD | I | Power supply terminal |
| 53 | STAT | I | Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQOK) |
| 54 ┆ 58 | KEY OUT 5 ┆ KEY OUT 1 | O | Key scan signal |
| 59 | MODEL 2 | — | Model selector terminal (Not used, open) |
| 60 | MODEL 1 | — | |
| 61 | PMETHOD | — | Not used, open |
| 62 | EMPHA | — | Not used, open |
| 63 | /RSTSV | O | Reset terminal of servo IC |
| 64 | DAC | — | Not used, open |
| 65 ┆ 70 | S12 ┆ S7 | O | FL segment signal |
| 71 | VPP | I | Power supply terminal |
| 72 ┆ 77 | S6 ┆ S1 | O | FL segment signal |
| 78 | G10 | — | Not used, open |
| 79 • 80 | G9 • G8 | O | FL grid signal |

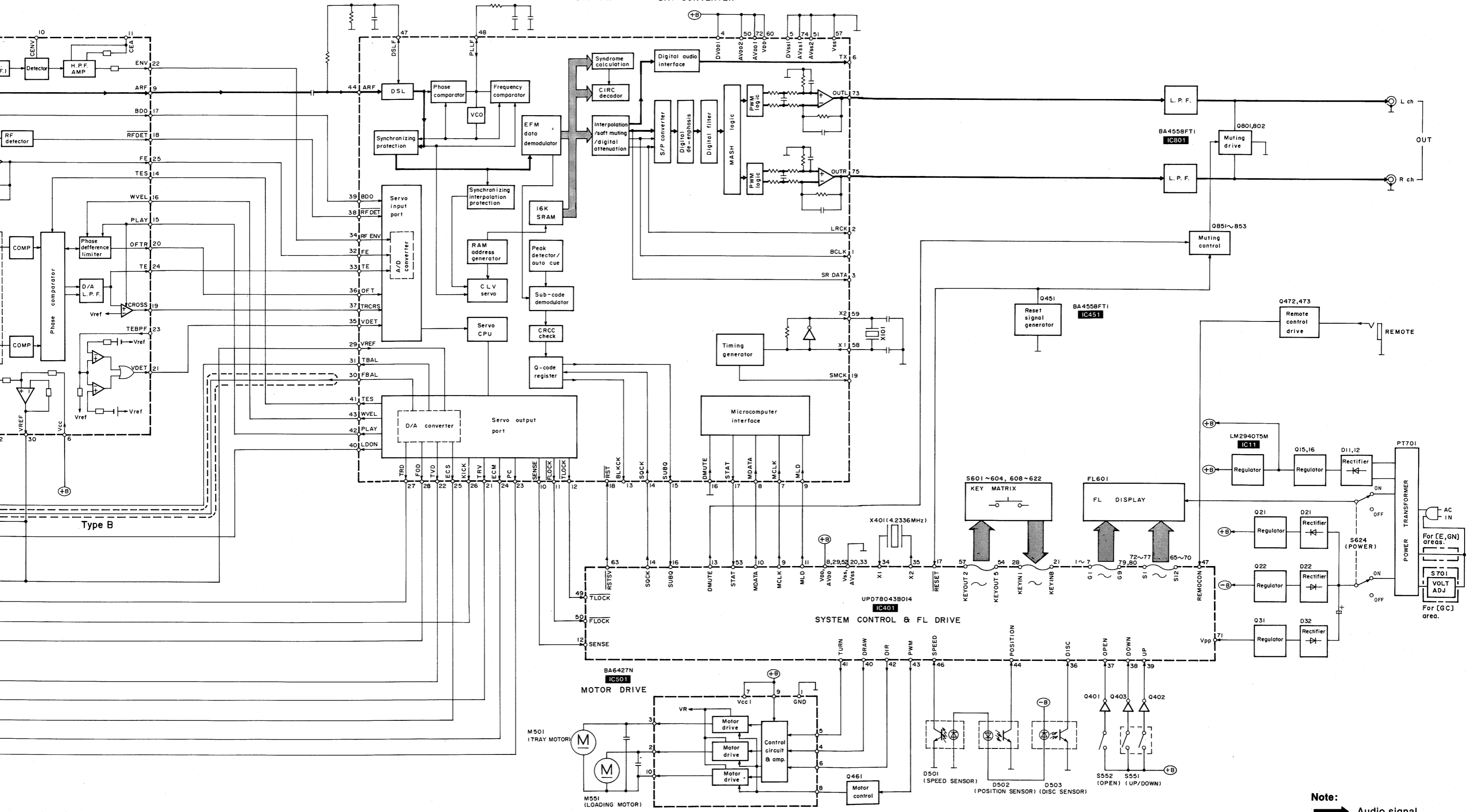
BLOCK DIAGRAM

MN66271... Type A
MN662712RA... Type B
IC102



MN66271... Type A
MN662712RA... Type B
IC102

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



Note:
➔ Audio signal

SCHEMATIC DIAGRAM (Parts list on pages 46, 47, 53.)

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

Note:

- S551 : Up/down det. switch.
- S552 : Open det. switch.
- S601 : Time mode (TIME MODE) select switch.
- S602 : Spiral (SPIRAL) switch.
- S603 : Random (RANDOM) switch.
- S604 : Repeat (REPEAT) switch.
- S608, 609 : Search (SEARCH) switches.
[S608: ◀◀, S609: ▶▶]
- S610~614 : Disc (DISC 1~5) switches.
[S610: 1, S611: 2, S612: 3, S613: 4, S614: 5]
- S615 : Program mode (PROGRAM MODE) switch.
- S616, 617 : Skip (SKIP) switches.
[S616: ◀◀, S617: ▶▶]
- S618 : Disc skip (DISC SKIP) switch.
- S619 : Loading drawer open/close (▲ OPEN/CLOSE) switch.
- S620 : Stop (■ STOP) switch.
- S621 : Pause (■ PAUSE) switch.
- S622 : Play (▶ PLAY) switch.
- S624 : Power (POWER) switch.
- S701 : Voltage adj. switch in "240V" position.
(110V ↔ 127V ↔ 220V ↔ 240V)
[For (GC) area only.]

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

| Part No. | Production Part No. | Supply Part No. |
|------------|---------------------|-----------------|
| IC11 | LM2940T5M | LM2940T5 |
| IC451, 801 | BA4558FT1 | SVIBA4558F |

- ——— / - - - - : 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.

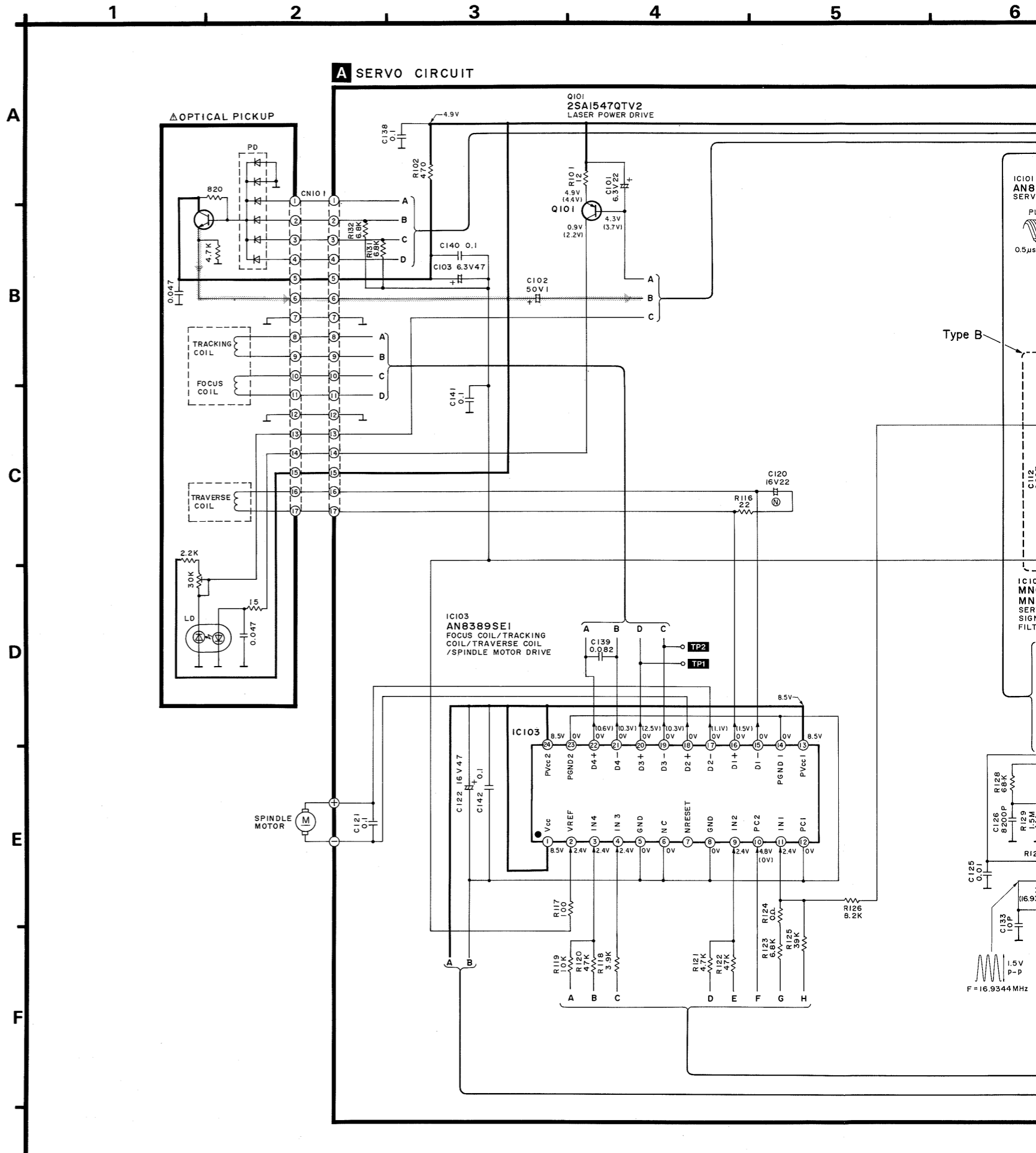
The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.

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.

Terminal guide of IC's, transistors and diodes

| | | | | |
|---|---|-------------------------------------|---|---------------------|
| <p>BA4558FT1</p> | <p>AN8802SCE1V</p> | <p>AN8389SE1</p> | <p>MN66271 (Type A) MN662712RA (Type B)</p> | <p>UPD78043B014</p> |
| <p>BA6247N</p> | <p>LM2940T5M</p> | <p>2SA1547QTV2 2SB1238QSTV6</p> | <p>2SD2037EFTA</p> | |
| <p>2SC3311QRSTA 2SA1309QRSTA 2SD1450RSTTA UN4112TA UN4212TA UN4215TA DTC143ESTP</p> | <p>MA165TA</p> | <p>RL1N4003N02</p> | <p>RSQGP1S53V</p> | |
| <p>RPR-363A</p> | <p>MA4091MTA MA4100MTA MA4270MTA MA4082MTA MA4062MTA M4051MTA</p> | <p>RCDHC-577-E</p> | | |



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A4558F

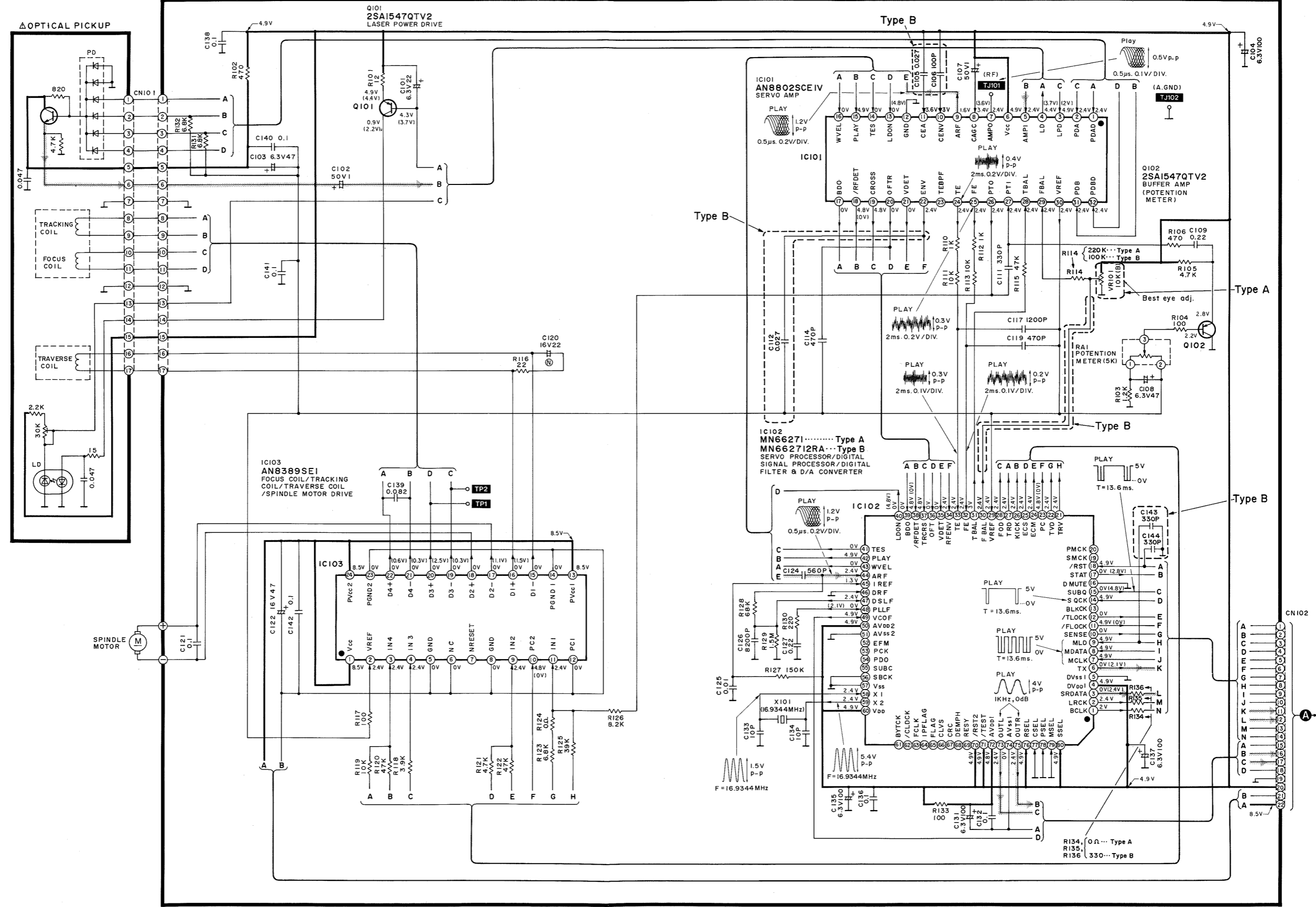
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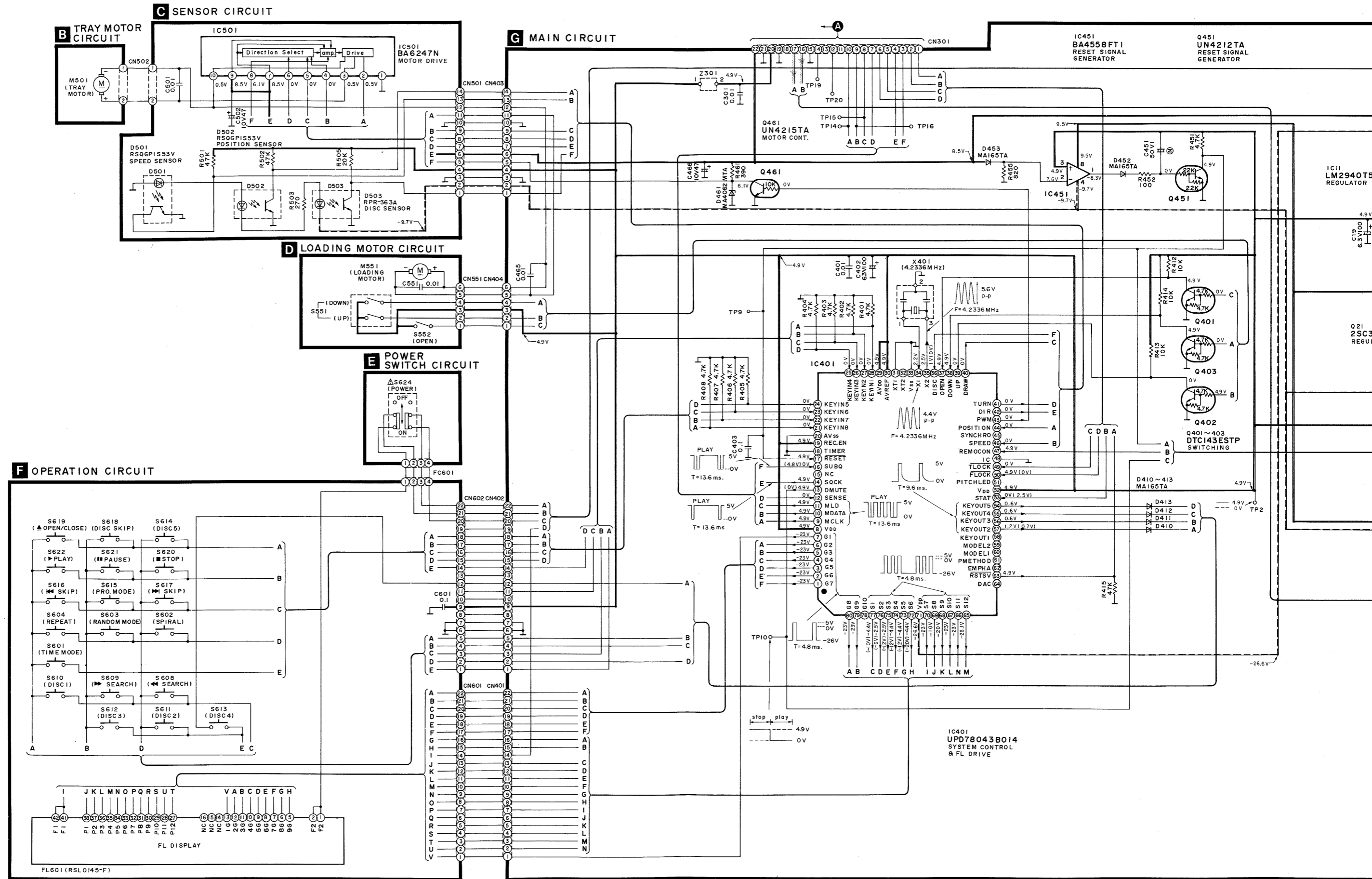
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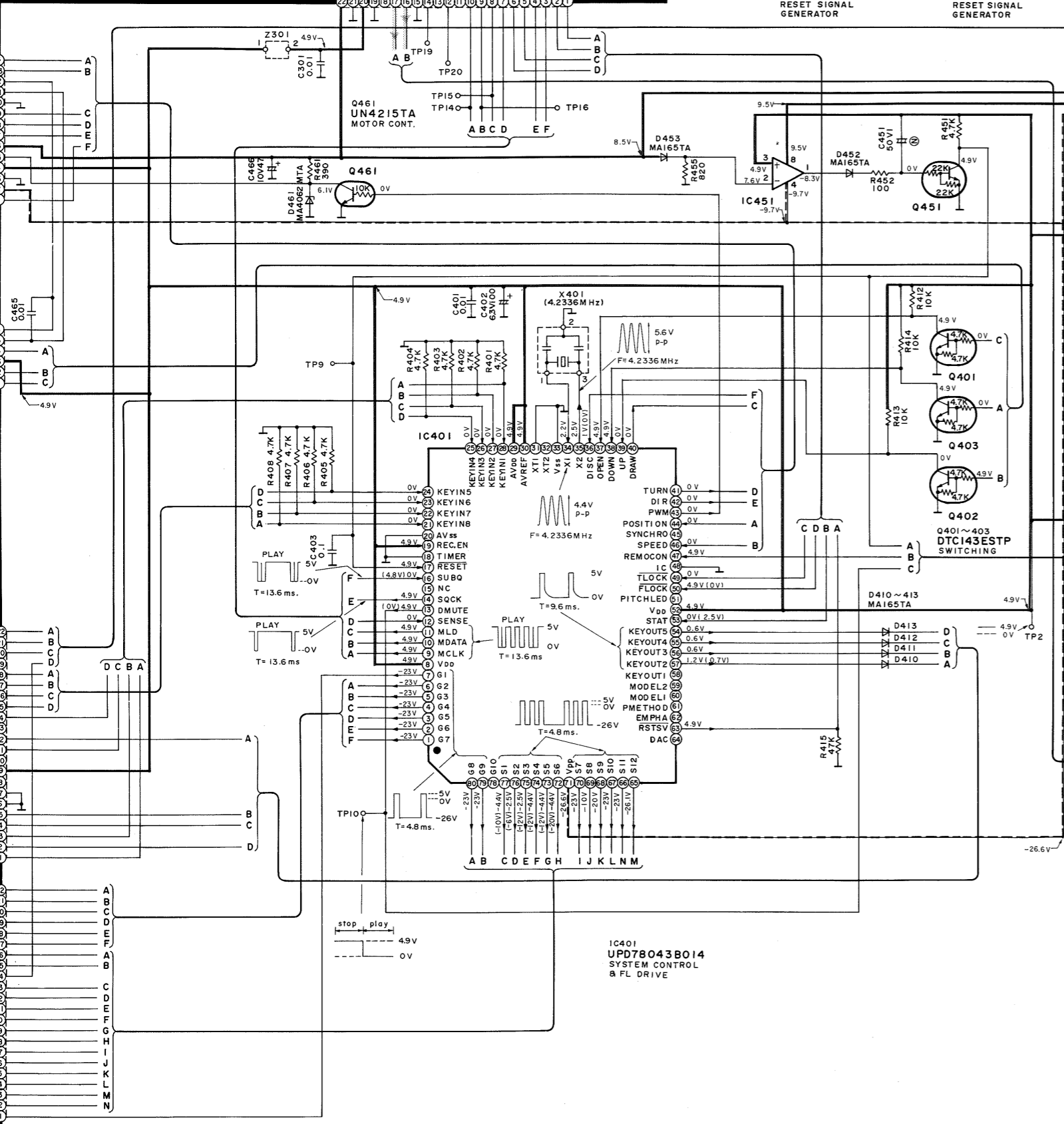
A
B
C
D
E
F

A SERVO CIRCUIT

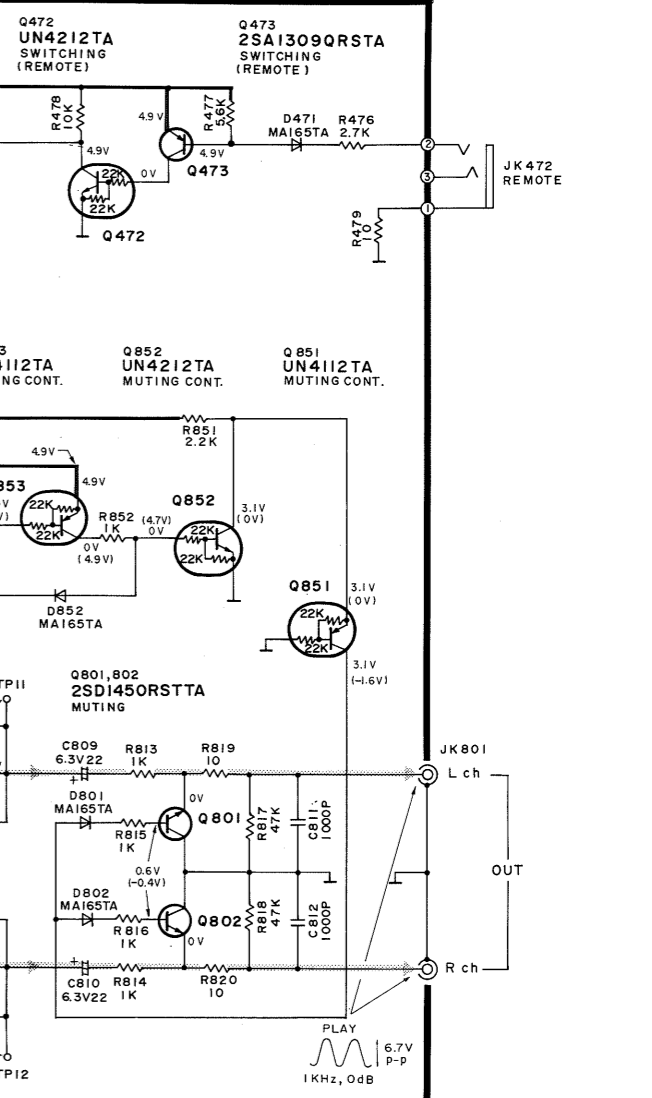
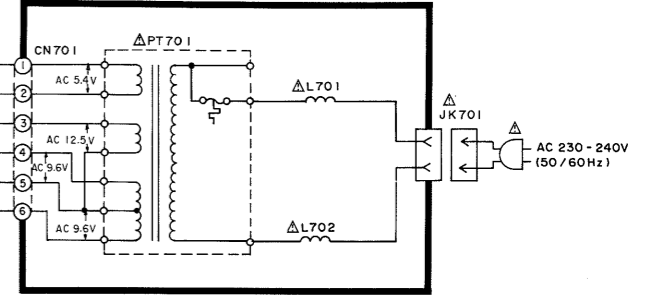




G MAIN CIRCUIT

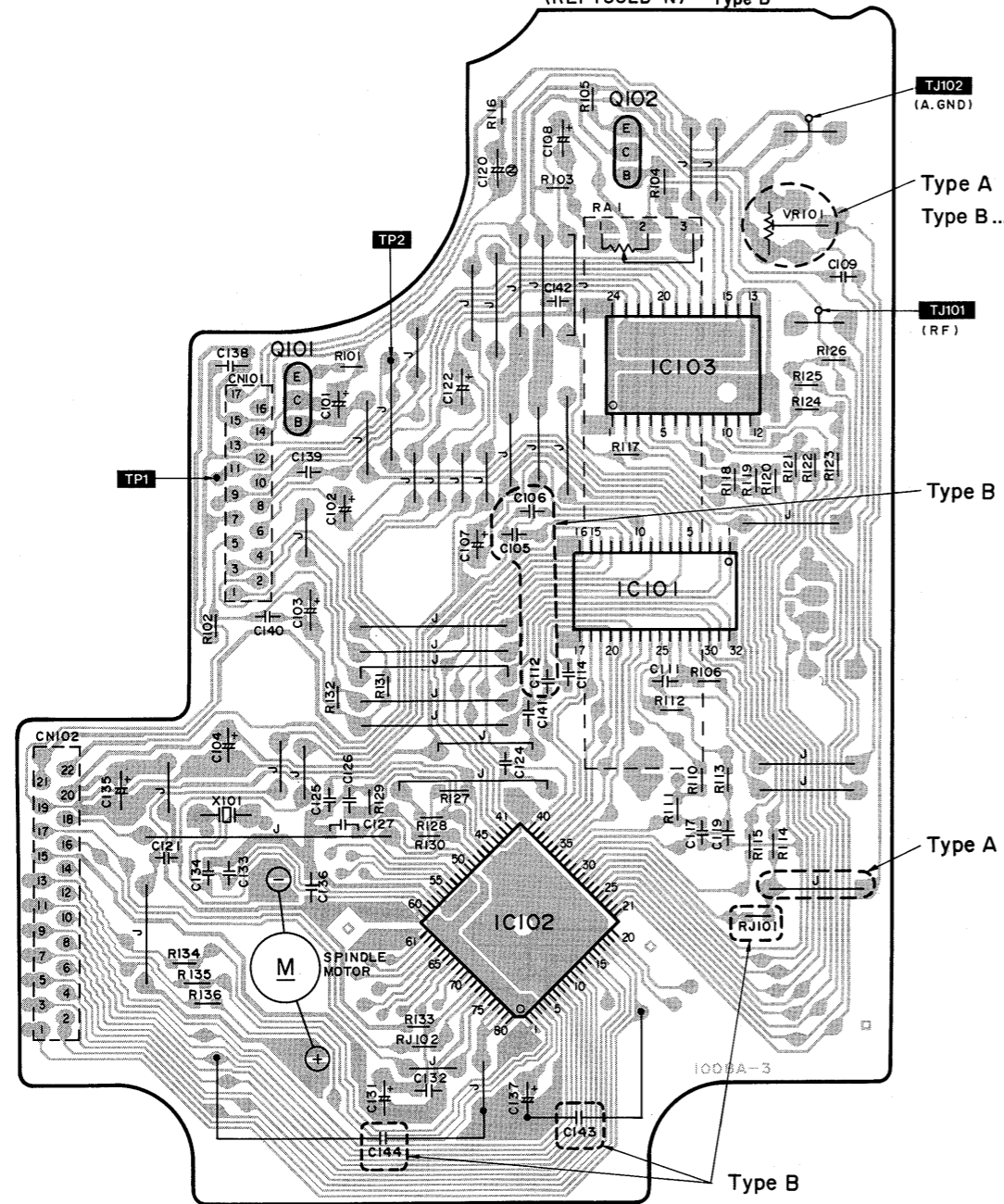


H POWER SUPPLY CIRCUIT For (E,GN) areas.



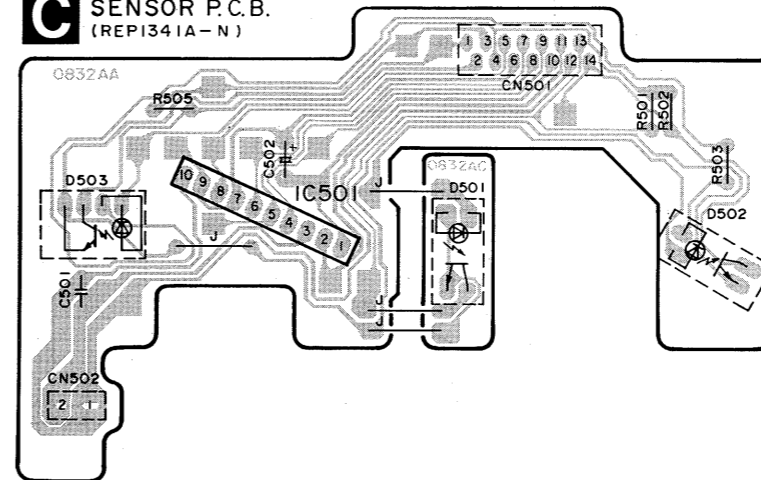
PRINTED CIRCUIT BOARDS

A SERVO P.C.B.
(REP1562A-N) ... Type A
(REP1562B-N) ... Type B

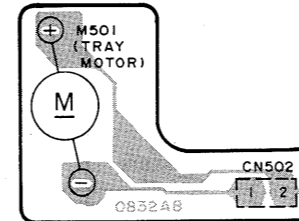


Type A
Type B..... VR101 is not installed on the P.C.B. The foil pattern for VR101 is left open.

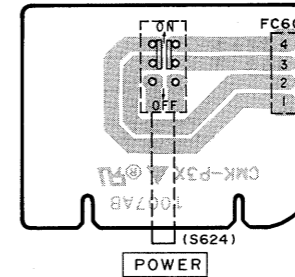
C SENSOR P.C.B.
(REP1341A-N)



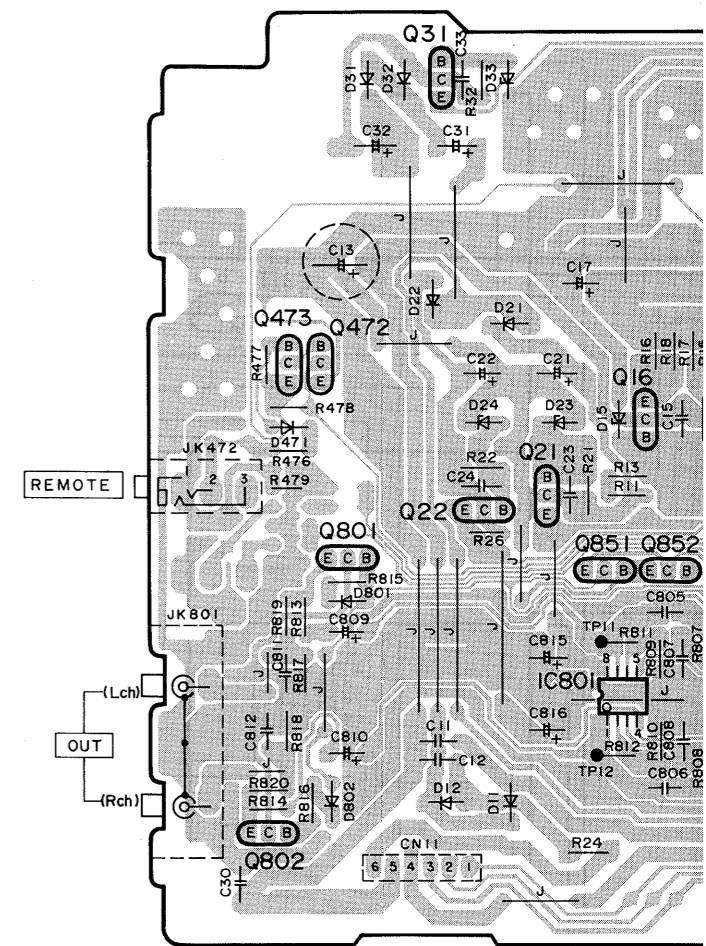
B TRAY MOTOR P.C.B.
(REP1341A-N)



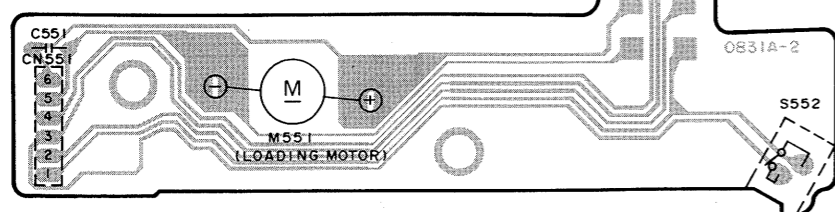
E POWER SWITCH P.C.B.
(REP1561A-S)



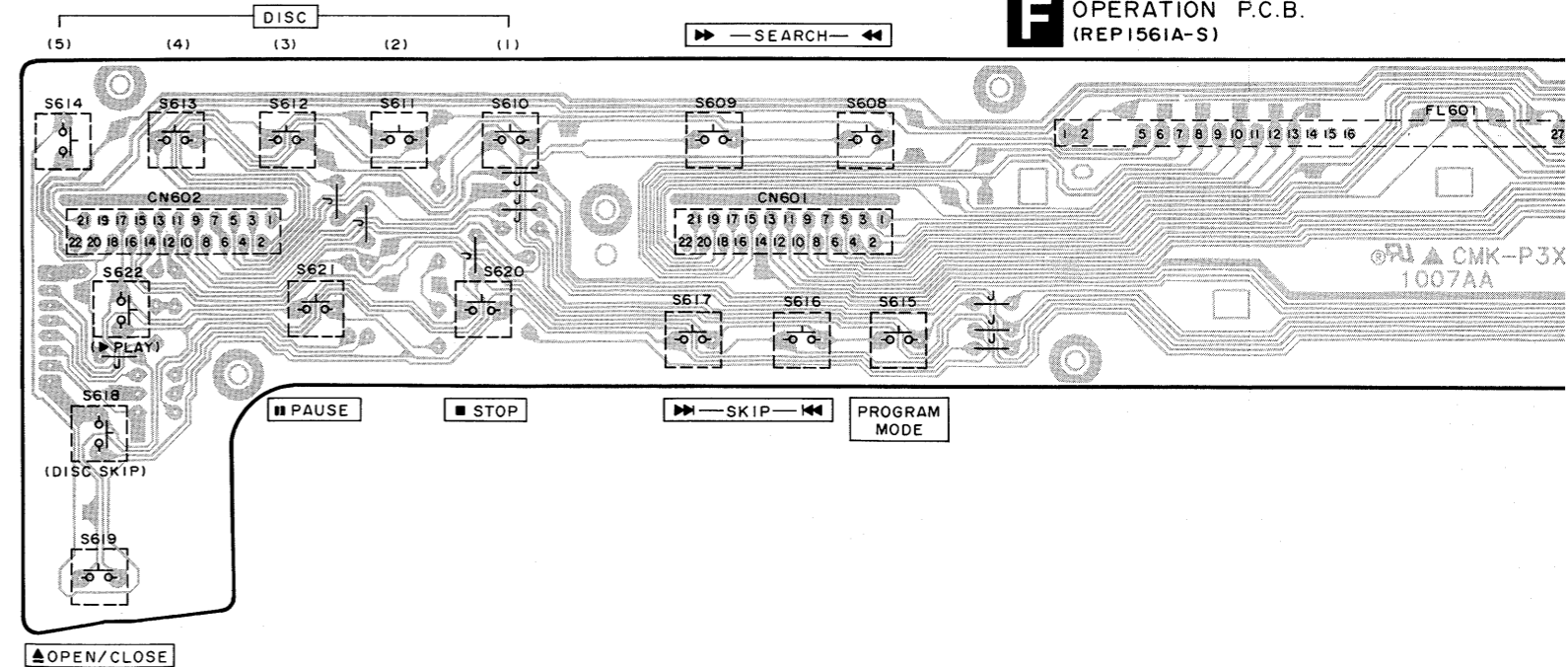
G MAIN P.C.B. (REP1560B-M)

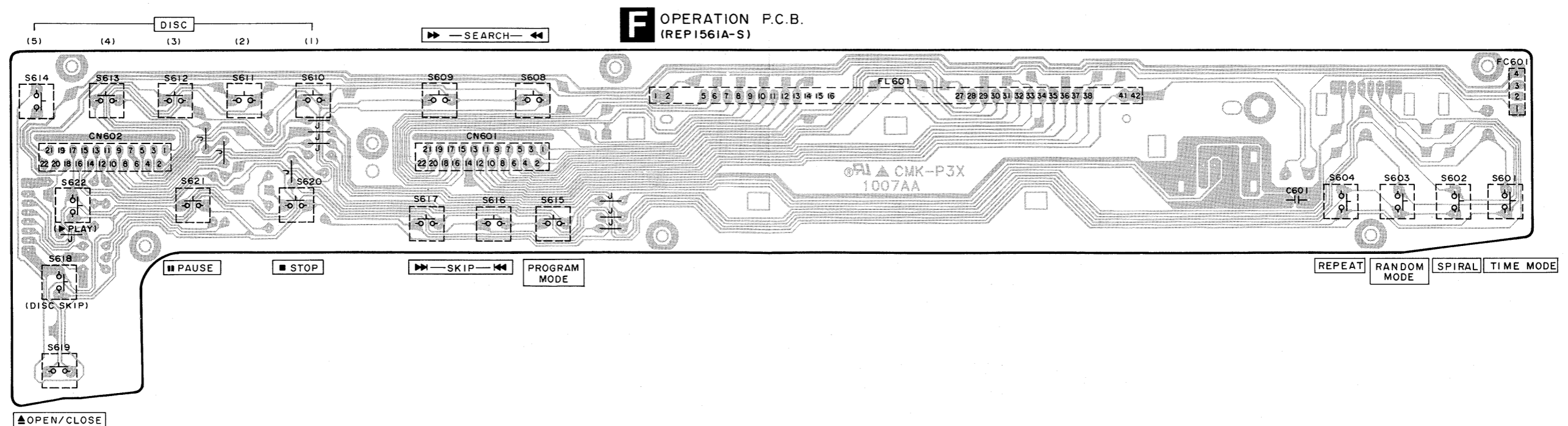
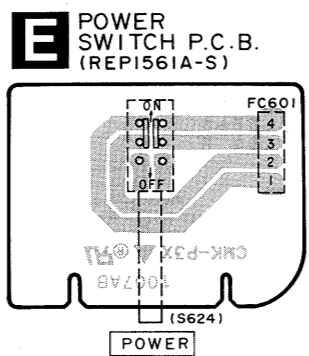
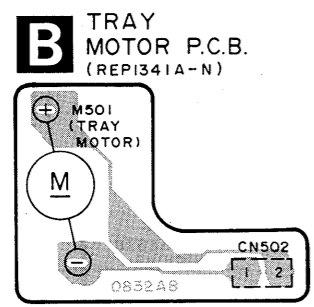
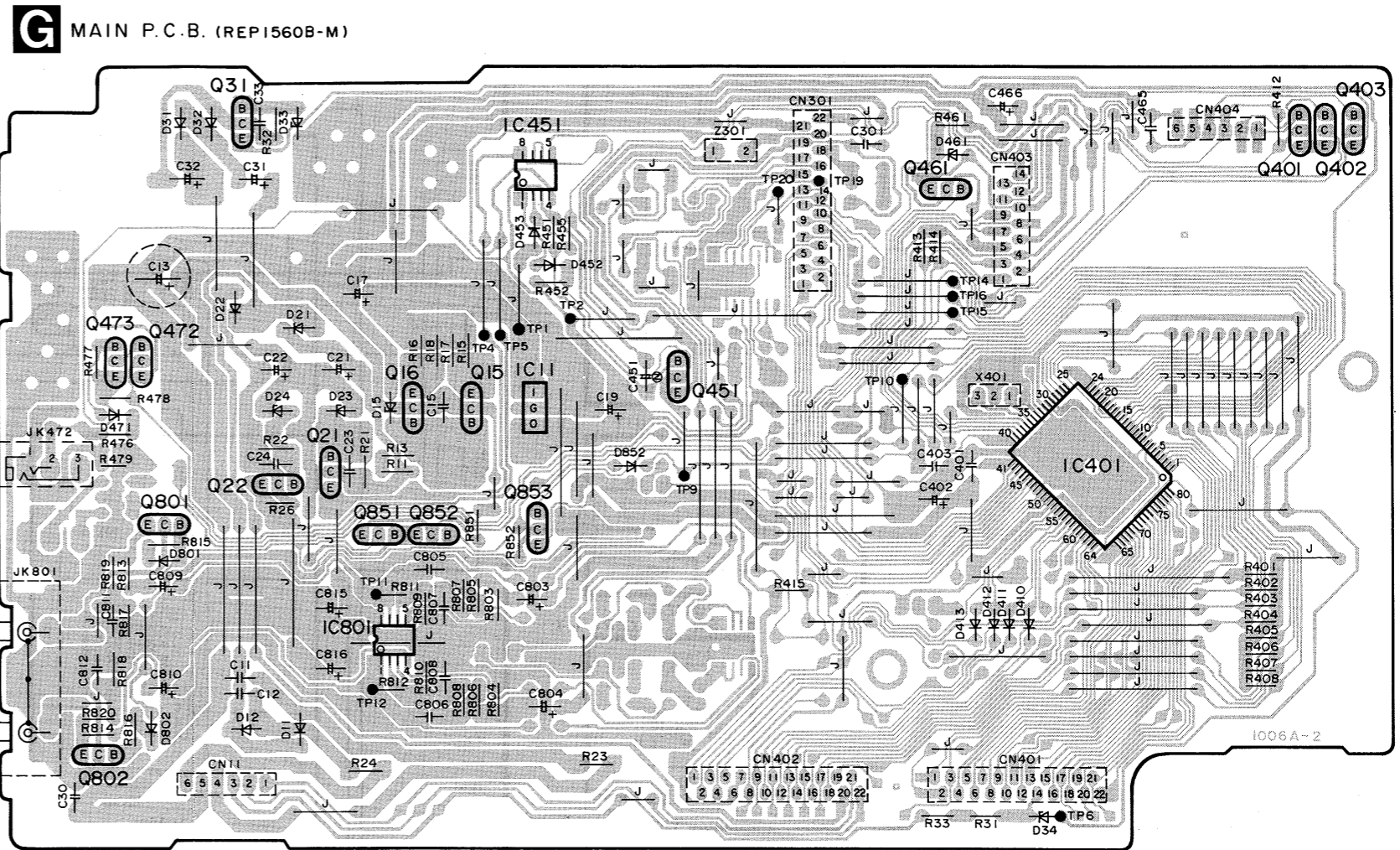
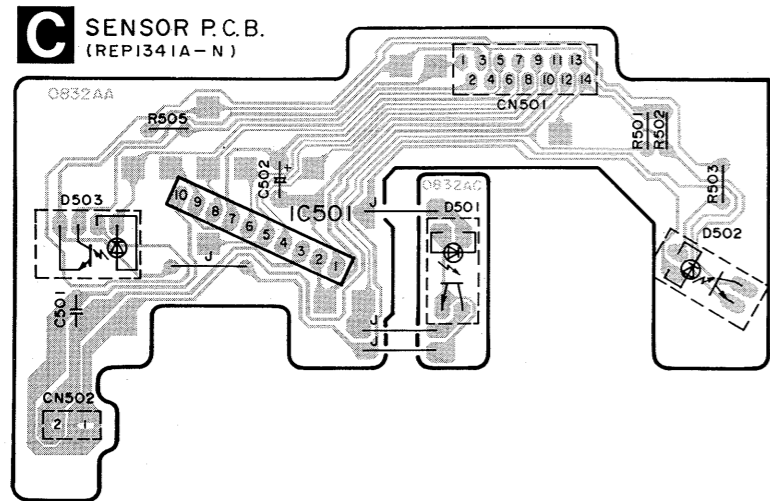


D LOADING MOTOR P.C.B.
(REP1340A-N)



F OPERATION P.C.B.
(REP1561A-S)



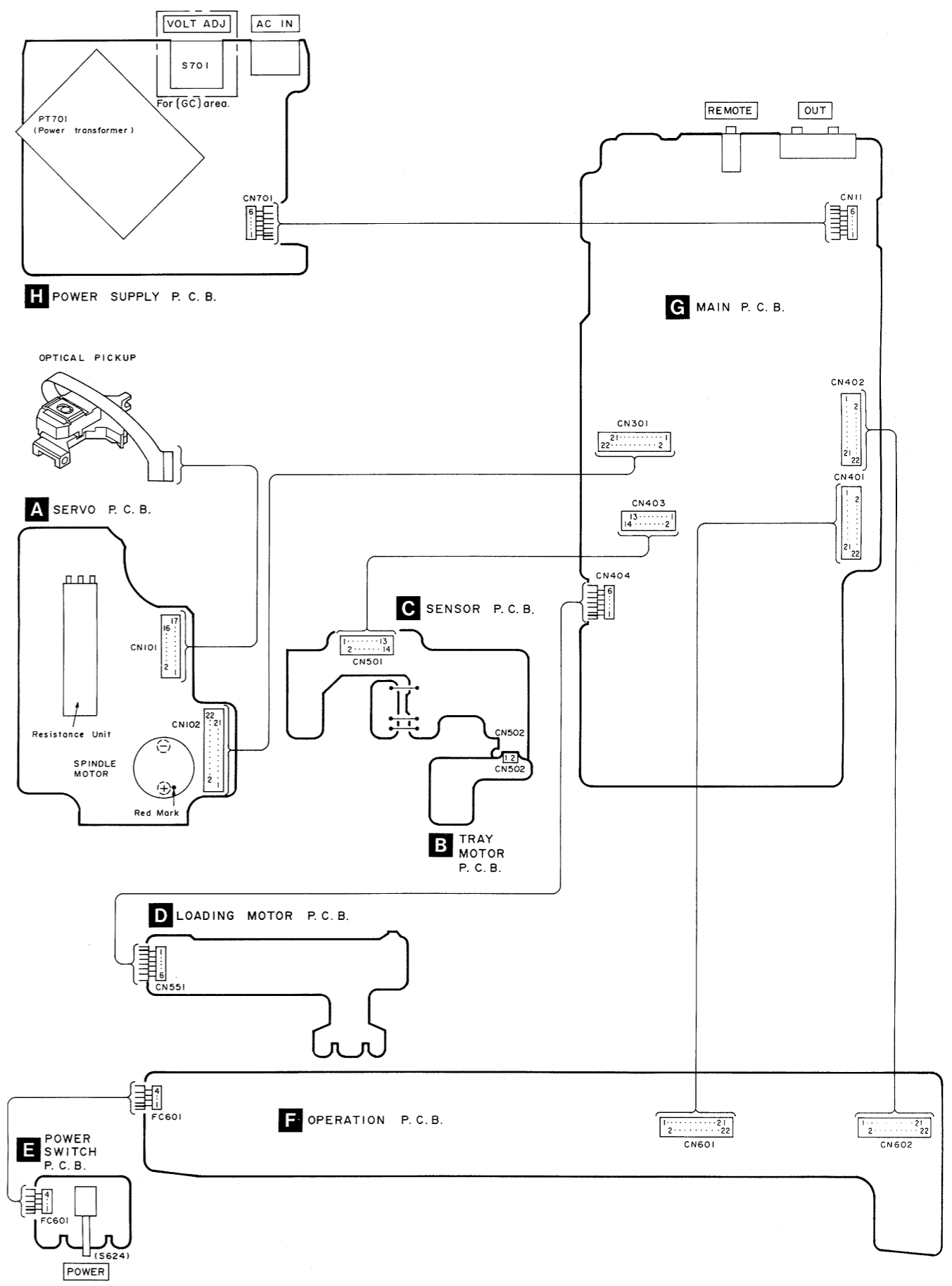
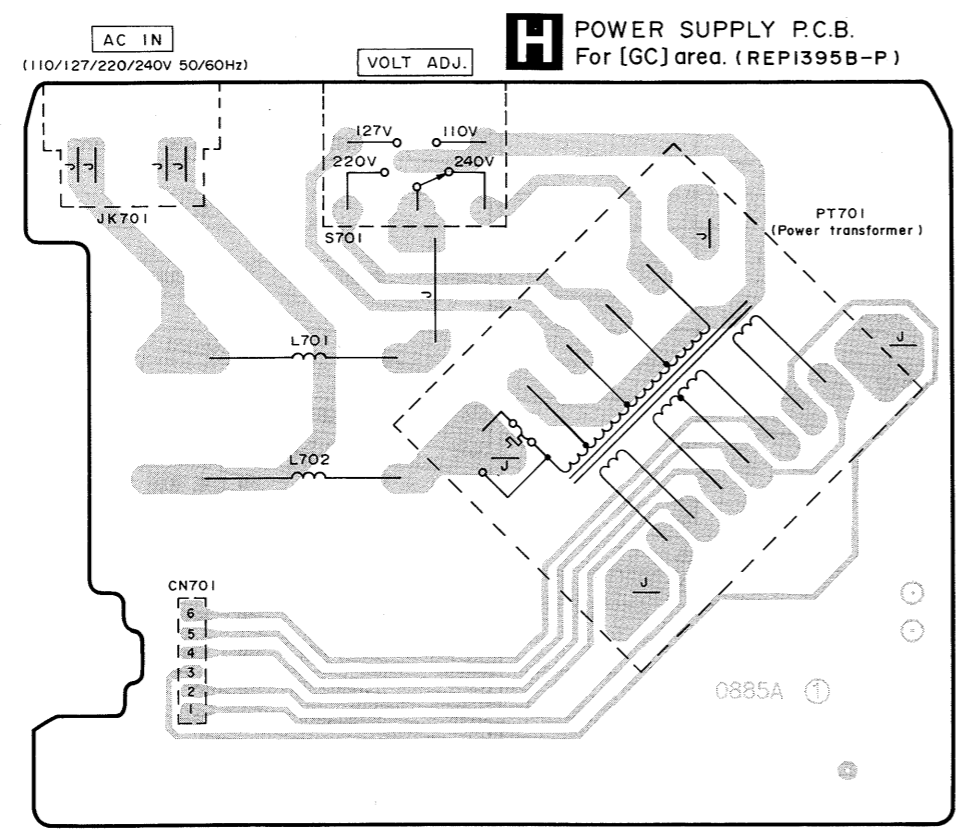
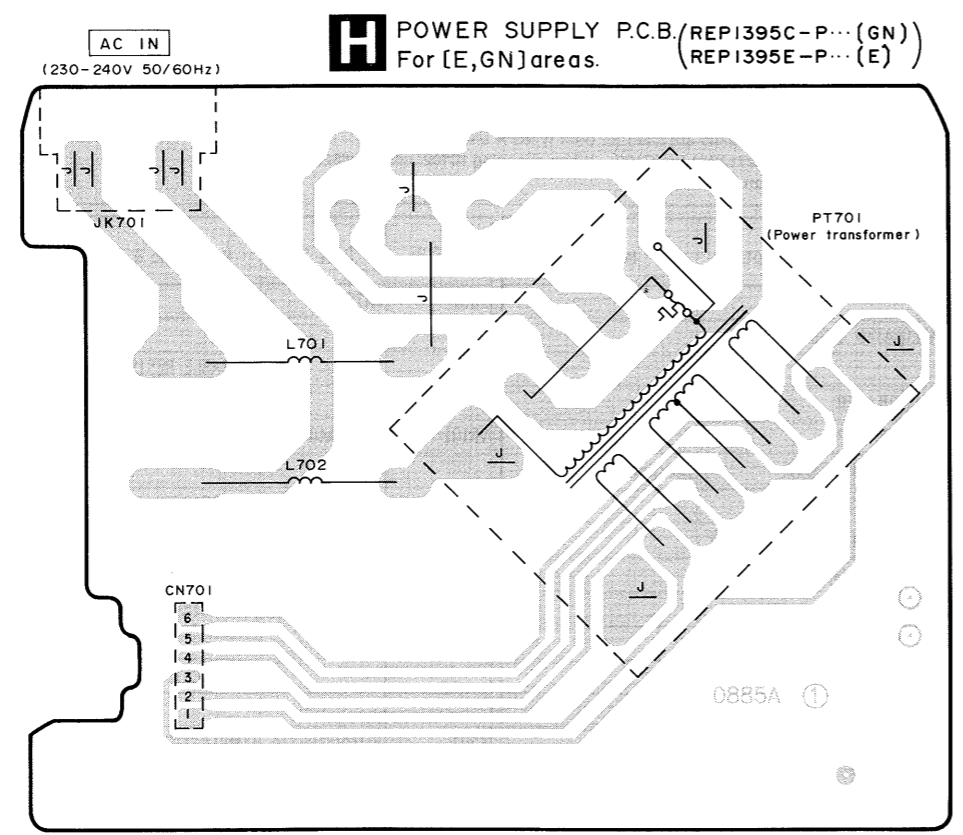


TJ102 (A.GND)
Type A
Type B..... VR101 is not installed on the P.C.B. The foil pattern for VR101 is left open.
TJ101 (RF)

Type B

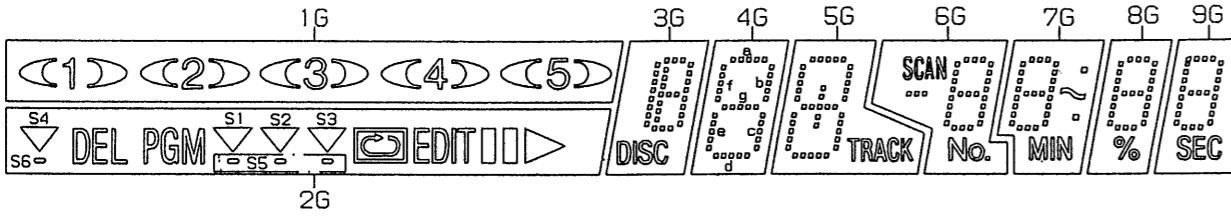
Type A

WIRING CONNECTION DIAGRAM



INTERNAL CONNECTION OF FL

• Grid connection diagram



• Anode connection table

| | 1G | 2G | 3G | 4G | 5G | 6G | 7G | 8G | 9G |
|-----|-------|------|------|----|-------|------|---------|----|-----|
| P 1 | ((1)) | ▷ | a | a | a | a | a | a | a |
| P 2 | ((2)) | □□ | b | b | b | b | b | b | b |
| P 3 | ((3)) | DEL | c | c | c | c | c | c | c |
| P 4 | ((4)) | EDIT | d | d | d | d | d | d | d |
| P 5 | ((5)) | □ | e | e | e | e | e | e | e |
| P 6 | 1 | S3 | f | f | f | f | f | f | f |
| P 7 | 2 | S2 | g | g | g | g | g | g | g |
| P 8 | 3 | S1 | DISC | - | TRACK | ⋮ | MIN | % | SEC |
| P 9 | 4 | PGM | ⋮ | - | ⋮ | No. | (UPPER) | - | - |
| P10 | 5 | S5 | - | - | - | SCAN | ∞ | - | - |
| P11 | - | S4 | - | - | - | - | (LOWER) | - | - |
| P12 | - | S6 | - | - | - | - | - | - | - |

• Pin connection

| PIN NO. | 44 | 43 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 22 | 22 | 22 | 22 | 22 | 22 | 21 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | | |
|------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|
| CONNECTION | F | F | N | N | P | P | P | P | P | P | P | P | P | P | P | P | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

NOTE 1) F1, F2 --- Filament 4) 1G~9G --- Grid
 2) NP ----- No pin
 3) NC ----- No connection

REPLACEMENT PARTS LIST

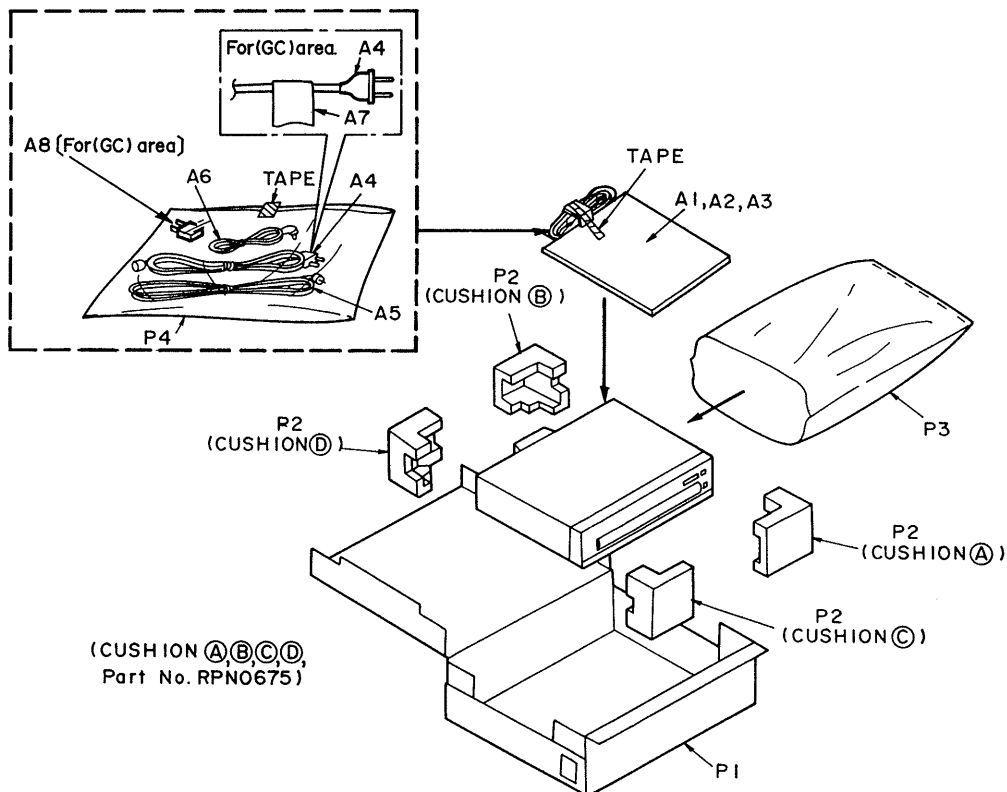
Notes: *Important safety notice:

Components identified by Δ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list. *The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
 Parts without these indications can be used for all areas.
 *Warning: This product uses a laser diode. Refer to caution statements on page 2.
 *ACHTUNG: Die Lasereinheit nicht zerlegen.
 Die Lasereinheit darf nur gegen eine vom Hersteller spezifizierte Einheit ausgetauscht werden.
 **"Type A" marked parts are used for type A only, while "Type B" marked parts are for type B only. Parts other than "Type A" and "Type B" marked are used for both types A and B.
 *There are two types (MN66271 and MN662712RA) for IC102. When changing IC102, use MW662712RA.
 *The "(SF)" mark denotes the standard part.

| Ref. No. | Part No. | Part Name & Description | Remarks | Ref. No. | Part No. | Part Name & Description | Remarks |
|-----------|--------------|-----------------------------|------------|-----------|--------------|---------------------------|-----------|
| | | | | D852 | MA165 | DIODE | |
| | | | | | | | |
| | | INTEGRATED CIRCUIT(S) | | | | | |
| | | | | | | VARIABLE RESISTOR(S) | |
| IC11 | LM2940T5 | IC, REGULATER | △ | | | | |
| IC101 | AN8802SCE1V | IC, SERVO AMP | | VR101 | EVND3AA00B14 | V. R, BEST EYE ADJUSTMENT | Type A |
| IC102 | MN662712RA | IC, SERVO PROCESSOR | See Notes. | | | | |
| IC103 | AN8389SE1 | IC, COIL/MOTOR DRIVE | | | | TRANSFORMER(S) | |
| IC401 | UPD78043B014 | IC, SYSTEM CONTROL&FL DRIVE | | | | | |
| IC451 | SV1BA4558F | IC, RESET SIGNAL GENERATOR | | PT701 | RTP1K4B012 | POWER TRANSFORMER | (E, GN) △ |
| IC501 | BA6247N | IC, MOTOR DRIVE | | PT701 | RTP1K4E020 | POWER TRANSFORMER | (GC) △ |
| IC801 | SV1BA4558F | IC, L. P. F. | | | | | |
| | | | | | | COMPONENT COMBINATION(S) | |
| | | TRANSISTOR(S) | | Z301 | BLO2RN2R62T4 | COMBINATION PART | |
| Q15, 16 | 2SD2037EFTA | TRANSISTOR | △ | | | | |
| Q21 | 2SC3311A-Q | TRANSISTOR | △ | | | COIL(S) | |
| Q22 | 2SA1309A-R | TRANSISTOR | △ | | | | |
| Q31 | 2SB1238QSTV6 | TRANSISTOR | △ | L701, 702 | SLQX400-D | COIL | △ |
| Q101, 102 | 2SA1547QTV2 | TRANSISTOR | | | | | |
| Q401-403 | DTC143ESTP | TRANSISTOR | | | | OSCILLATOR(S) | |
| Q451 | UN4212TA | TRANSISTOR | | | | | |
| Q461 | UN4215 | TRANSISTOR | | X101 | RSXZ16M9M01T | OSCILLATOR (16. 9344MHz) | |
| Q472 | UN4212TA | TRANSISTOR | | X401 | RSXY4M23M01T | OSCILLATOR (4. 2336MHz) | |
| Q473 | 2SA1309A-R | TRANSISTOR | | | | | |
| Q801, 802 | 2SD1450RTA | TRANSISTOR | | | | DISPLAY TUBE(S) | |
| Q851 | UN4112 | TRANSISTOR | | | | | |
| Q852 | UN4212TA | TRANSISTOR | | FL601 | RSL0145-F | DISPLAY TUBE | |
| Q853 | UN4112 | TRANSISTOR | | | | | |
| | | | | | | SWITCH(ES) | |
| | | DIODE(S) | | S551 | RSH2A001-2 | SW, UP/DOWN DETECTOR | |
| D11, 12 | RL1N4003N02 | DIODE | △ | S552 | RSH1A017-U | SW, OPEN DETECTOR | |
| D15 | MA4091-M | DIODE | △ | S601 | EVQ21405R | SW, TIME MODE | |
| D21, 22 | RL1N4003N02 | DIODE | △ | S602 | EVQ21405R | SW, SPIRAL | |
| D23, 24 | MA4100MTA | DIODE | △ | S603 | EVQ21405R | SW, RANDOM | |
| D31, 32 | RL1N4003N02 | DIODE | △ | S604 | EVQ21405R | SW, REPEAT | |
| D33 | MA4270 | DIODE | △ | S608 | EVQ21405R | SW, R. SEARCH | |
| D34 | MA4082MTA | DIODE | △ | S609 | EVQ21405R | SW, F. SEARCH | |
| D410-413 | MA165 | DIODE | | S610 | EVQ21405R | SW, DISC 1 | |
| D452, 453 | MA165 | DIODE | | S611 | EVQ21405R | SW, DISC 2 | |
| D461 | MA4062MTA | DIODE | | S612 | EVQ21405R | SW, DISC 3 | |
| D471 | MA165 | DIODE | | S613 | EVQ21405R | SW, DISC 4 | |
| D501, 502 | RSQGP1S53V | DIODE | | S614 | EVQ21405R | SW, DISC 5 | |
| D503 | RPR-363A | DIODE | | S615 | EVQ21405R | SW, PROGRAM | |
| D801, 802 | MA165 | DIODE | | S616 | EVQ21405R | SW, R. SKIP | |

| Ref. No. | Part No. | Part Name & Description | Remarks | Ref. No. | Part No. | Part Name & Description | Remarks |
|------------|--------------|------------------------------|---------|----------|--------------|--------------------------|----------------|
| S617 | EVQ21405R | SW, F. SKIP | | JK472 | RJJ33TR01 | REMOTE CONTROL | |
| S618 | EVQ21405R | SW, DISC SKIP | | JK701 | SJS9236 | AC INLET | (E, GC) △ |
| S619 | EVQ21405R | SW, OPEN/CLOSE | | JK701 | SJSD16 | AC INLET | (GN) △ |
| S620 | EVQ21405R | SW, STOP | | JK801 | RJH3201N | LINE OUT | |
| S621 | EVQ21405R | SW, PAUSE | | | | MAGNET RESISTOR ELEMENTS | |
| S622 | EVQ21405R | SW, PLAY | | | | | |
| S624 | SSH1230 | SW, POWER | △ | | | | |
| S701 | SSR187-1 | SW, VOLTAGE ADJ. | (GC) △ | RA1 | EWS7M0A00Q53 | RESISTANS UNIT | |
| | | CONNECTOR (S) AND SOCKET (S) | | | | PACKING MATERIAL | |
| CN11 | RJS1A6606 | CONNECTOR (6P) | | P1 | RPG1495 | PACKING CASE | |
| CN101 | RJS1A6717-1Q | CONNECTOR (17P) | | P2 | RPN0675 | CUSHION | |
| CN102 | RJS1A6722-1Q | CONNECTOR (22P) | | P3 | XZB60X65A01Z | PROTECTION BAG (UNIT) | |
| CN301 | RJS1A6822 | CONNECTOR (22P) | | P4 | XZB22X20C03 | PROTECTION BAG (CORD) | |
| CN401, 402 | RJS1A6822 | CONNECTOR (22P) | | | | ACCESSORIES | |
| CN403 | RJS1A6814 | CONNECTOR (14P) | | | | | |
| CN404 | RJS1A6606 | CONNECTOR (6P) | | | | | |
| CN501 | RJS1A6714 | CONNECTOR (14P) | | A1 | RQT1987-E | INSTRUCTION MANUAL | (E) |
| CN502 | RJR0094 | SOCKET (2P) | | A1 | RFKSLPD647GC | INSTRUCTION MANUAL ASS'Y | (GC) |
| CN551 | SJT30644-H | CONNECTOR (6P) | | A1 | RQT1839-L | INSTRUCTION MANUAL | (GN) |
| CN601, 602 | RJS1A6222 | CONNECTOR (22P) | | A2 | RQA0013 | WARRANTY CARD | (E) |
| CN701 | SJT30643-V | CONNECTOR (6P) | | A2 | RQX7433ZA | WARRANTY CARD | (GN) |
| | | FLAT CABLE (S) | | A3 | RQCB0169 | SERVICENTER LIST | |
| FC601 | REZ0455-1 | FLAT CABLE (4P) | | A4 | RJA0019-2K | AC POWER SUPPLY CORD | (E, GC) △ (SF) |
| | | JACK (S) | | A4 | SJA173 | AC POWER SUPPLY CORD | (GN) △ (SF) |
| | | | | A5 | SJP2249-3 | STEREO CONNECTION CABLE | |
| | | | | A6 | SJP2257T | REMOTE CONTROL CABLE | |
| | | | | A7 | RQLA0134 | VOLTAGE CAUTION LABEL | (GC) |
| | | | | A8 | SJP5213-2 | POWER PLUG ADAPTOR | (GC) △ |

PACKAGING



REPLACEMENT PARTS LIST

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

| Ref. No. | Part No. | Part Name & Description | Remarks | Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|--------------------------|---------|----------|--------------|-----------------------------|---------|
| | | CABINET AND CHASSIS | | 42 | XTB3+10JFZ | SCREW | |
| | | | | 43 | XTB3+20J | SCREW | |
| | | | | | | LOADING MECHANISM | |
| 1 | RKMO193-K | CABINET | | 101 | SJED10 | POTENTIOMETER HOLDER | |
| 2 | SNE2129-3 | SCREW | | 102 | RME0115 | SIDE PRESSURE SPRING | |
| 3 | XTBS3+8JFZ1 | SCREW | | 103 | RMQ0299 | SCREW | |
| 4 | RDGO239 | OPEN LOCK GEAR | | 104 | RMRO463 | ROLLER | |
| 5 | RDGO199-2 | CLOSE LOCK GEAR | | 105 | SDOD28-2E | TURNTABLE | |
| 6 | REZO590 | FPC BOARD (22P) | | 105-1 | XXE26D5 | SCREW | |
| 7 | REZO474 | FPC BOARD (22P) | | 106 | SDOD29-2 | TURNTABLE RING | |
| 8 | REZO475 | FPC BOARD (22P) | | 107 | SRQA010N04 | TURNTABLE SPRING | |
| 9 | REZO476 | FPC BOARD (14P) | | 108 | RXQ0232 | SIDE PRESSURE PULLEY | |
| 10 | REZO477 | FLAT CABLE (6P) | | 109 | SHRD176-E | BRUSH HOLDER | |
| 11 | REZO478 | FLAT CABLE (6P) | | 110 | SISD22-7 | TRAVERSE BASE | |
| 12 | RFKHLPD647EK | REAR PANEL ASS' Y | (E) | 111 | SJGDRF310T-2 | SPINDLE MOTOR | |
| 12 | RFKHLPD647GC | REAR PANEL ASS' Y | (GC) | 112 | SNSD31 | SCREW | |
| 12 | RFKHLPD647GN | REAR PANEL ASS' Y | (GN) | 113 | SUWD112-2 | SHAFT HOLDER | |
| 13 | RGTO007 | ROTARY TRAY | | 114 | SUXD123-1 | GUIDE SHAFT | |
| 14 | RHW81001-1 | WASHER | | 115 | SOAD70A | OPTICAL PICKUP | |
| 15 | RKQ0089 | P. C. B. SUPPORT | | 116 | RFKNLPC363P | YOKE (A) ASS' Y | |
| 16 | RKQ0104 | REAR COVER | | 117 | SORD46-E | COIL ASS' Y | |
| 17 | RMBO255 | SPRING (DISC TRAY) | | 118 | SOYD22-1 | YOKE (B) | |
| 18 | RME0133-1 | SPRING (LOCK GER) | | 119 | XTB3+10G | SCREW | |
| 19 | RFKJLPD627PK | CHASSIS ASS' Y | | 120 | XTN2+5G | SCREW | |
| 19-1 | RKA0053-A | FOOT | | 121 | SHGD148 | STOPPER RUBBER | |
| 20 | RMRO540-K1 | TRAY BASE GUIDE (L) | | 122 | SHWD33 | WASHER | |
| 21 | RMRO593-K | TRAY BASE GUIDE (R) | | 123 | SHWD34 | WASHER | |
| 22 | XTB3+8JFZ | SCREW | | 124 | RDGO196-1 | DRIVE GEAR (B) | |
| 23 | XTWS3+10T | SCREW | | 125 | RDK0017 | DRIVE CAM | |
| 24 | RMRO575-W | SLIDER (B) | | 126 | RDK0018 | ELEVATION CAM | |
| 25 | RMRO577-W | ROLLER | | 127 | RDPO050 | PULLEY GEAR | |
| 26 | RFKNLDP827GC | CLAMP PLATE ASS' Y | | 128 | RXQ0252 | LOADING MOTOR ASS' Y (M551) | |
| 27 | SIRD51-1 | CLAMPER | | 129 | RXQ0302 | MECHANISM BASE ASS' Y | |
| 28 | SOMD4 | MAGNET | | 130 | RXQ0251 | SUB BASE ASS' Y | |
| 29 | SOYD2 | YOKE | | 131 | RHD30029 | SCREW | |
| 30 | RDV0024 | BELT | | 132 | RHD30030 | SCREW | |
| 31 | RMNO174 | SENSOR HOLDER | | 133 | RHD30031 | SCREW | |
| 32 | RMRO547-K | WORM BASE | | 134 | RMA0581 | REINFORCING PLATE | |
| 33 | RXG0026 | WORM ASS' Y | | 135 | RMG0268-K | BELT | |
| 34 | REMO026 | TRAY MOTOR ASS' Y (M501) | | 136 | RDGO195 | DRIVE GEAR (A) | |
| 35 | RXQ0289 | TRAY ASS' Y | | 137 | RMRO565-W3 | SLIDER | |
| 35-1 | RMRO546-K | TRAY ROLLER | | 138 | SHGD153-1 | FLOATING RUBBER | |
| 35-2 | RMRO564-W2 | ROLLER (A) | | 139 | SUSD136-1 | FLOATING SPRING (A) | |
| 35-3 | RMG0269-H1 | CUSHION RUBBER | | 140 | SUSD137-1 | FLOATING SPRING (B) | |
| 35-4 | RMG0200 | RUBBER | | 141 | SUSD145-1 | FLOATING SPRING (C) | |
| 36 | RMNO172 | FL HOLDER | | 142 | XTB3+10JFZ | SCREW | |
| 37 | RFKGLPD647EK | FRONT PANEL ASS' Y | | 143 | RDGO194 | REDUCTION GEAR | |
| 37-1 | RGK0470 | FRONT ORNAMENT PLATE | | | | | |
| 38 | RGU0030 | POWER BUTTON | | | | | |
| 39 | RGU0726 | MAIN BUTTON | | | | | |
| 40 | RGU0727 | SUB BUTTON | | | | | |
| 41 | XTB26+8J | SCREW | | | | | |

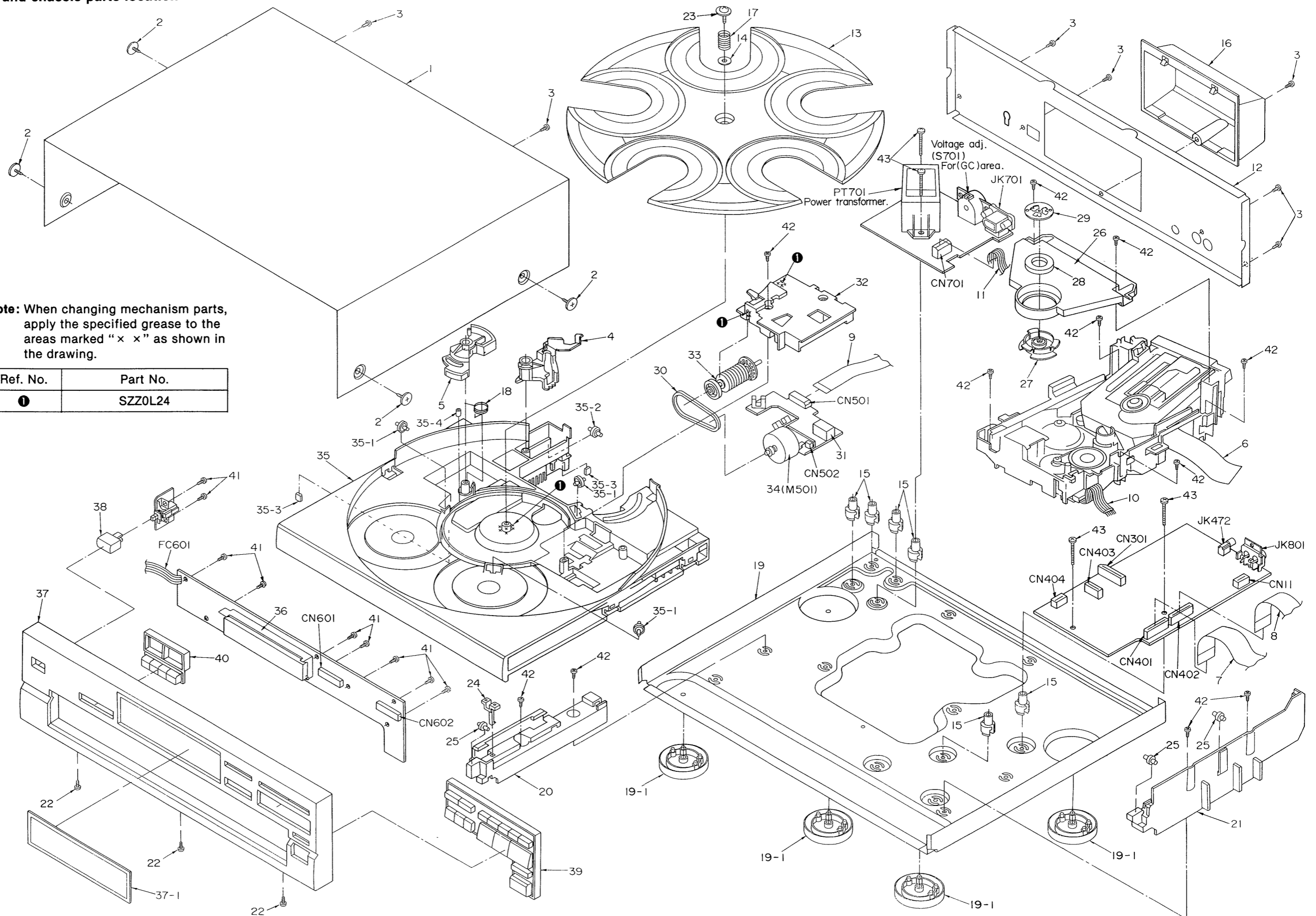
EXPLODED VIEWS

• Cabinet and chassis parts location

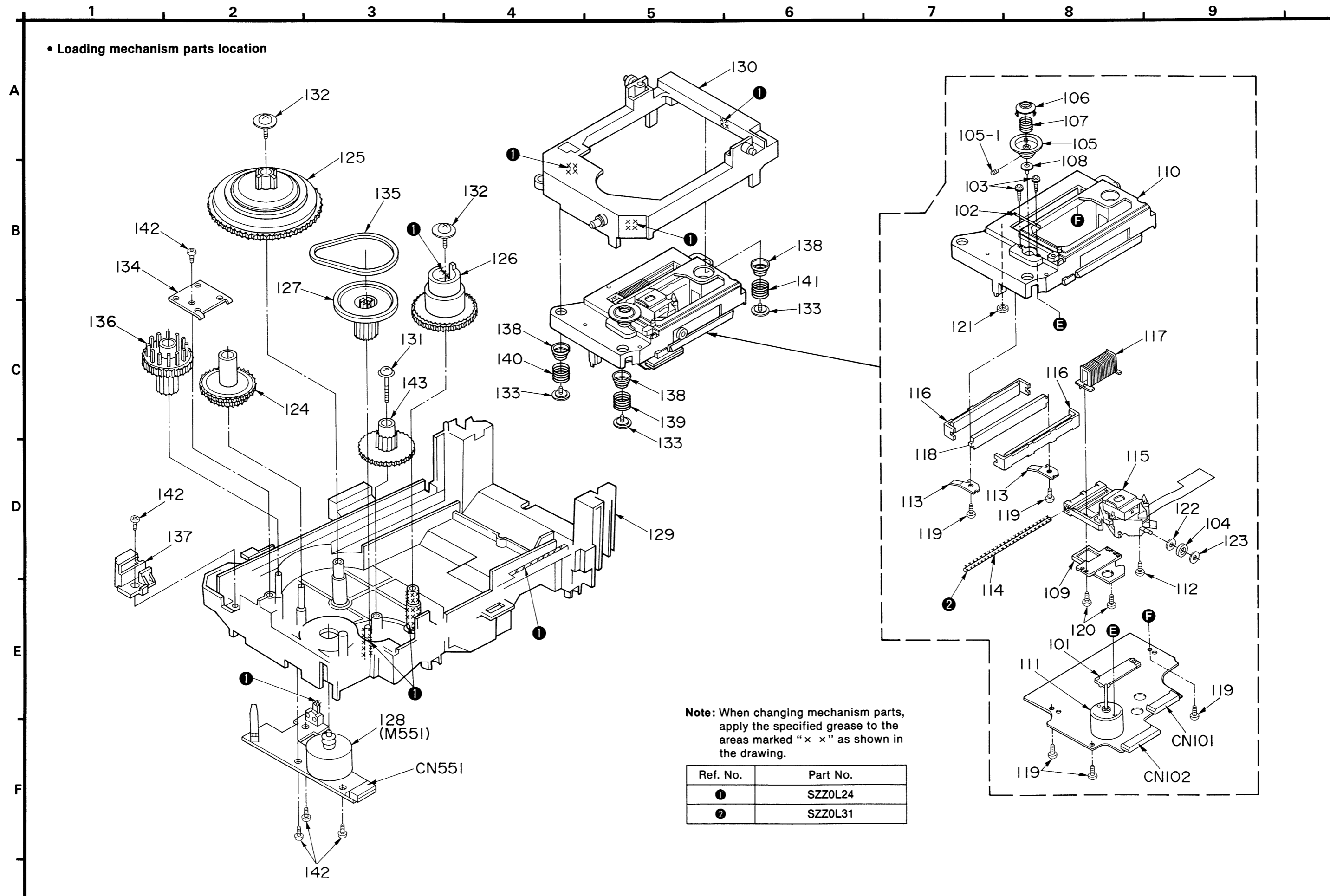
A
B
C
D
E
F

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

| Ref. No. | Part No. |
|----------|----------|
| ① | SZZ0L24 |



• Loading mechanism parts location



RESISTORS AND CAPACITORS

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

| Ref. No. | Part No. | Values & Remarks | Ref. No. | Part No. | Values & Remarks | Ref. No. | Part No. | Values & Remarks |
|-----------|--------------|-------------------|------------|--------------|--------------------|-----------|--------------|------------------|
| | | RESISTORS | R476 | ERDS2TJ272T | 1/4W 2.7K | C114 | ECUV1H471KBN | 50V 470P |
| R11 | ERDS2TJ271 | 1/4W 270 | R477 | ERDS2TJ562 | 1/4W 5.6K | C117 | ECUV1H122KBN | 50V 1200P |
| R13 | ERDS2TJ271 | 1/4W 270 | R478 | ERDS2TJ103 | 1/4W 10K | C119 | ECUV1H471KBN | 50V 470P |
| R15-18 | ERDS2TJ1R0 | 1/4W 1.0 | R479 | ERDS2TJ100 | 1/4W 10 | C120 | ECEA1CSN220I | 16V 22U |
| R21, 22 | ERDS2TJ102 | 1/4W 1K | R501, 502 | ERDS2TJ473 | 1/4W 47K | C121 | ECUV1C104ZFN | 16V 0.1U |
| R23, 24 | ERQ16NKR15E | 1W 0.15 Δ | R503 | ERDS2TJ271 | 1/4W 270 | C122 | ECEA1CKS470I | 16V 47U |
| R26 | ERDS2TJ102 | 1/4W 1K | R505 | ERDS2TJ203T | 1/4W 20K | C124 | ECUV1H561KBN | 50V 560P |
| R31 | ERDS2TJ100 | 1/4W 10 | R803, 804 | ERDS2TJ224T | 1/4W 220K | C125 | ECUV1E103KBN | 25V 0.01U |
| R32 | ERDS2TJ123 | 1/4W 12K | R805, 806 | ERDS2TJ822 | 1/4W 8.2K | C126 | ECUV1E822KBN | 25V 8200P |
| R33 | ERDS2TJ120T | 1/4W 12 | R807, 808 | ERDS2TJ153 | 1/4W 15K | C127 | ECUV1C224KBM | 16V 0.22U |
| R101 | ERJ6GEYJ120V | 1/10W 12 | R809-812 | ERDS2TJ333 | 1/4W 33K | C131 | ECEA0JKS101I | 6.3V 100U |
| R102 | ERJ6GEYJ471V | 1/10W 470 | R813-816 | ERDS2TJ102 | 1/4W 1K | C132 | ECUV1C104ZFN | 16V 0.1U |
| R103 | ERJ6GEYJ122V | 1/10W 1.2K | R817, 818 | ERDS2TJ473 | 1/4W 47K | C133, 134 | ECUV1H100DCN | 50V 10P |
| R104 | ERJ6GEYJ101V | 1/10W 100 | R819, 820 | ERDS2TJ100 | 1/4W 10 | C135 | ECA0JKF101I | 6.3V 100U |
| R105 | ERJ6GEYJ472V | 1/10W 4.7K | R851 | ERDS2TJ222 | 1/4W 2.2K | C136 | ECUV1E104ZFM | 25V 0.1U |
| R106 | ERJ6GEYJ471V | 1/10W 470 | R852 | ERDS2TJ102 | 1/4W 1K | C137 | ECA0JKF101I | 6.3V 100U |
| R110 | ERJ6GEYJ102V | 1/10W 1K | | | CHIP JUMPERS | C138 | ECUV1E104ZFM | 25V 0.1U |
| R111 | ERJ6GEYJ103V | 1/10W 10K | R124 | ERJ6GEYOR00V | CHIP JUMPER | C139 | ECUV1E823KBN | 25V 0.082U |
| R112 | ERJ6GEYJ102V | 1/10W 1K | R134-136 | ERJ6GEYOR00V | CHIP JUMPER Type A | C140-142 | ECUV1C104ZFN | 16V 0.1U |
| R113 | ERJ6GEYJ103V | 1/10W 10K | RJ101 | ERJ6GEYOR00V | CHIP JUMPER Type B | C143, 144 | ECBT1H331KB5 | 50V 330P Type B |
| R114 | ERJ6GEYJ224V | 1/10W 220K Type A | RJ102 | ERJ6GEYOR00V | CHIP JUMPER | C301 | ECBT1C103NS5 | 16V 0.01U |
| R114 | ERJ6GEYJ104V | 1/10W 100K Type B | TJ101, 102 | ERD25VOR00T | CHIP JUMPER | C401 | ECBT1C103NS5 | 16V 0.01U |
| R115 | ERJ6GEYJ473V | 1/10W 47K | | | CAPACITORS | C402 | ECEA0JKA101B | 6.3V 100U |
| R116 | ERJ6GEYJ220 | 1/10W 22 | C11, 12 | ECBT1E103ZF | 25V 0.01U | C403 | ECFR1E104ZF5 | 25V 0.1U |
| R117 | ERJ6GEYJ101V | 1/10W 100 | C13 | ECEA1EU222B | 25V 2200U Δ | C451 | ECEA1HKNO10B | 50V 1U |
| R118 | ERJ6GEYJ392V | 1/10W 3.9K | C15 | ECBT1H102KB5 | 50V 1000P | C465 | ECBT1C103NS5 | 16V 0.01U |
| R119 | ERJ6GEYJ103V | 1/10W 10K | C17 | ECA1AM471B | 10V 470U | C466 | ECEA1AKA470B | 10V 47U |
| R120 | ERJ6GEYJ473V | 1/10W 47K | C19 | ECEA0JKA101B | 6.3V 100U | C501 | ECBT1C103NS5 | 16V 0.01U |
| R121 | ERJ6GEYJ472V | 1/10W 4.7K | C21 | ECA1EM101B | 25V 100U Δ | C502 | ECEA1AKA470E | 10V 47U |
| R122 | ERJ6GEYJ473V | 1/10W 47K | C22 | ECA1EM221B | 25V 220U Δ | C551 | ECBT1C103NS5 | 16V 0.01U |
| R123 | ERJ6GEYJ682V | 1/10W 6.8K | C23, 24 | ECBT1H102KB5 | 50V 1000P | C601 | ECFR1E104ZF5 | 25V 0.1U |
| R125 | ERJ6GEYJ393V | 1/10W 39K | C30 | ECFR1E104ZF5 | 25V 0.1U | C803, 804 | ECEA1CKA100B | 16V 10U |
| R126 | ERJ6GEYJ822V | 1/10W 8.2K | C31, 32 | ECA1HM470B | 50V 47U | C805, 806 | ECCR1H391J5 | 50V 390P |
| R127 | ERJ8GEYJ154V | 1/8W 150K | C33 | ECBT1H102KB5 | 50V 1000P | C807, 808 | ECCR1H331J5 | 50V 330P |
| R128 | ERJ6GEYJ683V | 1/10W 68K | C101 | ECEA0JKA220 | 6.3V 22U | C809, 810 | ECEA0JKA220B | 6.3V 22U |
| R129 | ERJ6GEYJ155V | 1/10W 1.5M | C102 | ECEA1HKS010 | 50V 1U | C811, 812 | ECBT1H102KB5 | 50V 1000P |
| R130 | ERJ6GEYJ221V | 1/10W 220 | C103 | ECEA0JKS470 | 6.3V 47U | C815, 816 | ECEA1AKA470B | 10V 47U |
| R131, 132 | ERJ6GEYJ682V | 1/10W 6.8K | C104 | ECEA0JKS101I | 6.3V 100U | | | |
| R133 | ERJ6GEYJ101V | 1/10W 100 | C105 | ECUV1E273KBN | 25V 0.027U Type B | | | |
| R134-136 | ERJ6GEYJ331V | 1/10W 330 Type B | C106 | ECUV1H101JCN | 50V 100P Type B | | | |
| R401-408 | ERDS2TJ472 | 1/4W 4.7K | C107 | ECEA1HKS010 | 50V 1U | | | |
| R412-414 | ERDS2TJ103 | 1/4W 10K | C108 | ECEA0JKS470 | 6.3V 47U | | | |
| R415 | ERDS2TJ473 | 1/4W 47K | C109 | ECUV1C224KBM | 16V 0.22U | | | |
| R451 | ERDS2TJ472 | 1/4W 4.7K | C111 | ECUV1H331KBN | 50V 330P | | | |
| R452 | ERDS2TJ101 | 1/4W 100 | C112 | ECUV1E273KBN | 25V 0.027U Type B | | | |
| R455 | ERDS2TJ821 | 1/4W 820 | | | | | | |
| R461 | ERDS2TJ391 | 1/4W 390 | | | | | | |