

ORDER NO. AD8805083C9

Service Manual

COMPACT
disc
DIGITAL
DIGITAL AUDIO

Compact Disc Player
SL-PJ45



Color

(K)...Black Type

Area

Color	Area
(K)	(E).....Continental Europe.
(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)	(PC).....European Audio Club.

SPECIFICATIONS

■ Audio

No. of channels	2 (left and right stereo)
Frequency response	2~20,000Hz±0.5dB
Output voltage	2V (at 0dB)
Dynamic range	94dB
S/N ratio	96dB
Harmonic distortion	0.003% (1kHz, 0dB)
Total harmonic distortion	0.006% (1kHz, 0dB)
Wow and flutter	Below measurable limit
Output impedance	Approx. 600Ω
Load impedance	More than 10kΩ
Headphone output level	15mW, 32Ω
D-A conversion system	2 DAC System with 16-bit Resolution

■ Signal Format

Sampling frequency	44.1kHz
D-A conversion	16-bit linear

■ Pickup

Wavelength	780nm
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■ Infrared remote-control transmitter

Dimensions (W×H×D)	61×18×165mm
Batteries	UM-4 "AAA" batteries or IEC R03 or equivalent (1.5V×2)
Weight	100g (including batteries)

■ General

Power supply	For United Kingdom and Australia: AC 240V, 50/60Hz For Continental Europe: AC 220V, 50/60Hz For Others: AC 110V/127V/220V/240V, 50/60Hz
Power consumption	16W
Dimensions (W×H×D)	360×90×270mm
Weight	3.6kg

Specifications are subject to change without notice.

Weight and dimensions shown are approximate.

Technics

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

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

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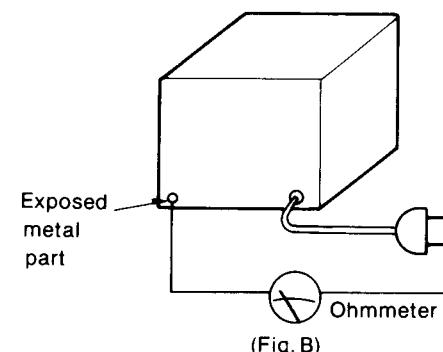
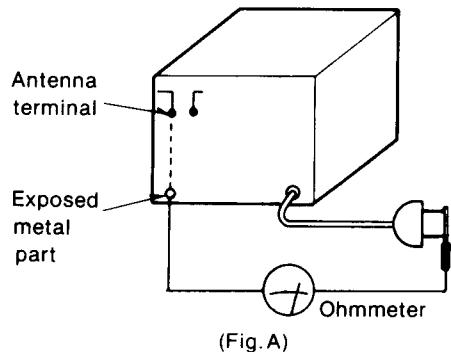
■ SAFETY PRECAUTION (This "safety precautions" is applied only in U.S.A.)

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 $3M\Omega$ and $5.2M\Omega$ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

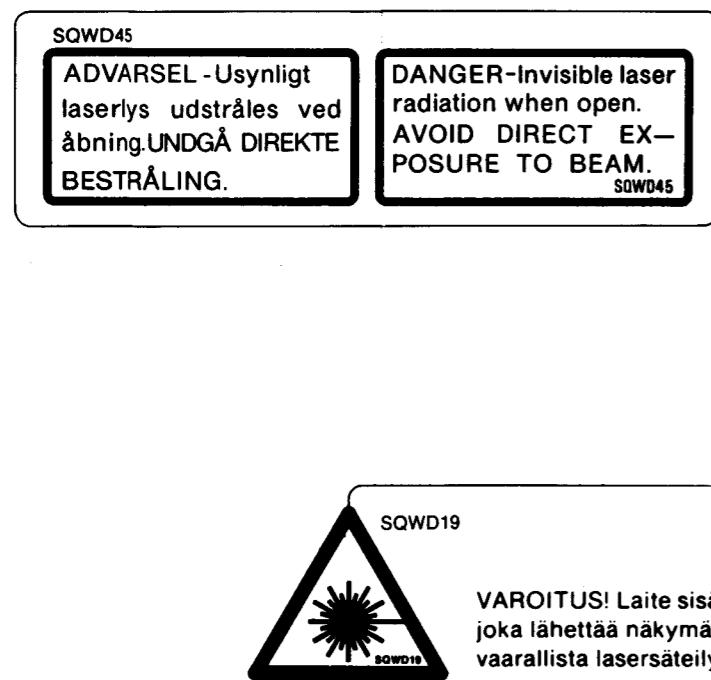
Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



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

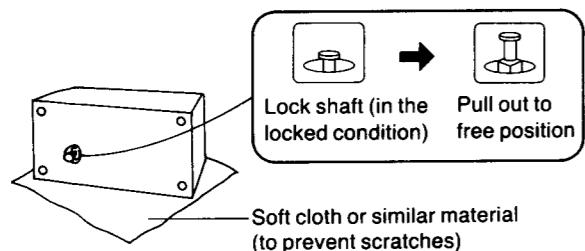
Caution: This product utilizes a laser diode.
ADVARSEL: I dette a apparat anvendes laser.



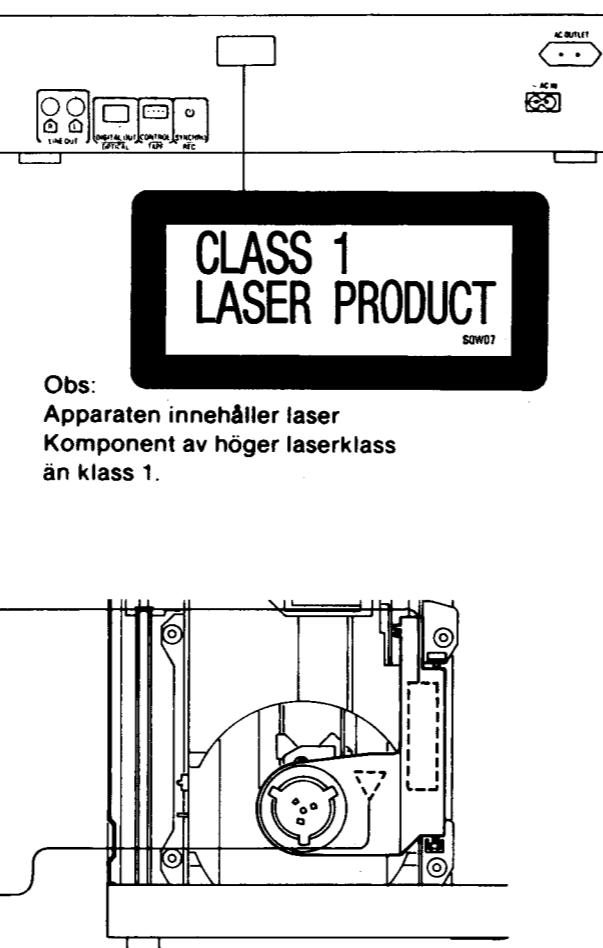
■ BEFORE USING THIS UNIT

Before placement

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



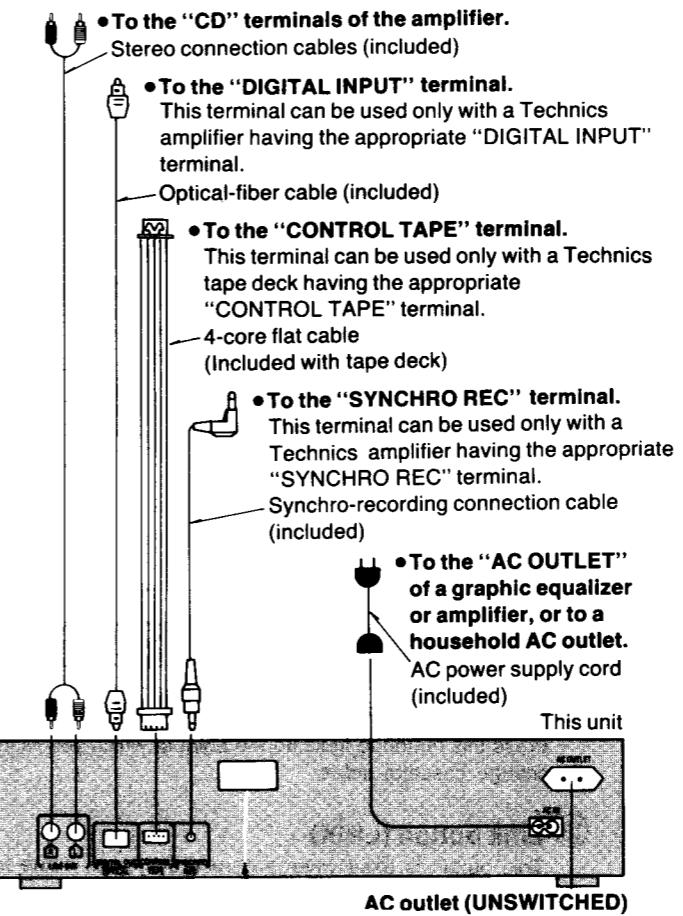
Caution:
 Do not transport the unit without locking the lock shaft.
Severe damage will result.
If the unit is transported again, perform the following steps:
 1) Remove the disc from the tray and turn off the power.
 2) Place the unit with the rear panel facing downward.
 3) Push the lock shaft to the in (LOCK) position (—).



Notes for placement

- Place on a flat, level surface so that the front-rear inclination does not exceed 5°.
- Avoid places such as the following:
 - Near any equipment or device that generates strong magnetism.
 - On any heat-generating equipment or device, or in any place where the temperature is high (40°C or higher).
 - Extremely cold places (5°C or below).
 - Near a tuner or TV. (It may cause noise in the broadcast, or disturbance of the TV picture.)
- Do not place heavy objects, other than system components, on top of the unit.
- When carrying or storing the unit, handle it with care so it is not subjected to any strong bumps.
 - Always remove the disc before storing the unit for any period of time.
- To avoid problems due to vibration.
 - Do not place a book or similar object under this unit.
 - Do not route the connection cables (of this or other units) across the operation panel, across the top, or under the unit.

■ CONNECTIONS



Notes:
 1. See the operating instructions of the amplifier for details.
 2. The configuration of the AC outlet and AC power supply cord differs according to area.

AC outlet (UNSWITCHED):

Power is always available, regardless of the unit's power switch setting.
 This outlet is exclusively for the connection of other audio equipment, such as an amplifier. Be sure the power consumption does not exceed the wattage specified near the AC outlet.

Digital output terminal (DIGITAL OUT)

The output signals of this unit are output from this terminal as digital signals.

Optical terminal (OPTICAL)

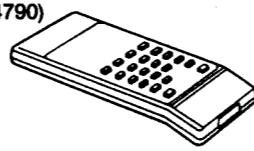
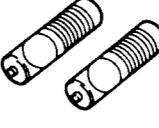
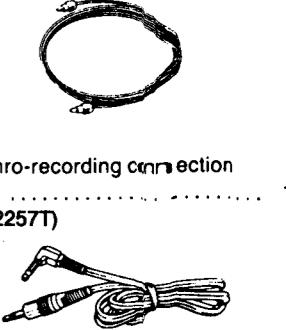
This terminal can be used for connection with other equipment that has a digital input terminal, such as an amplifier, by using an optical-fiber cable (included).
 A dust-protection cap is inserted in this terminal. Remove this cap only when a connection is to be made to this terminal.

CAUTION

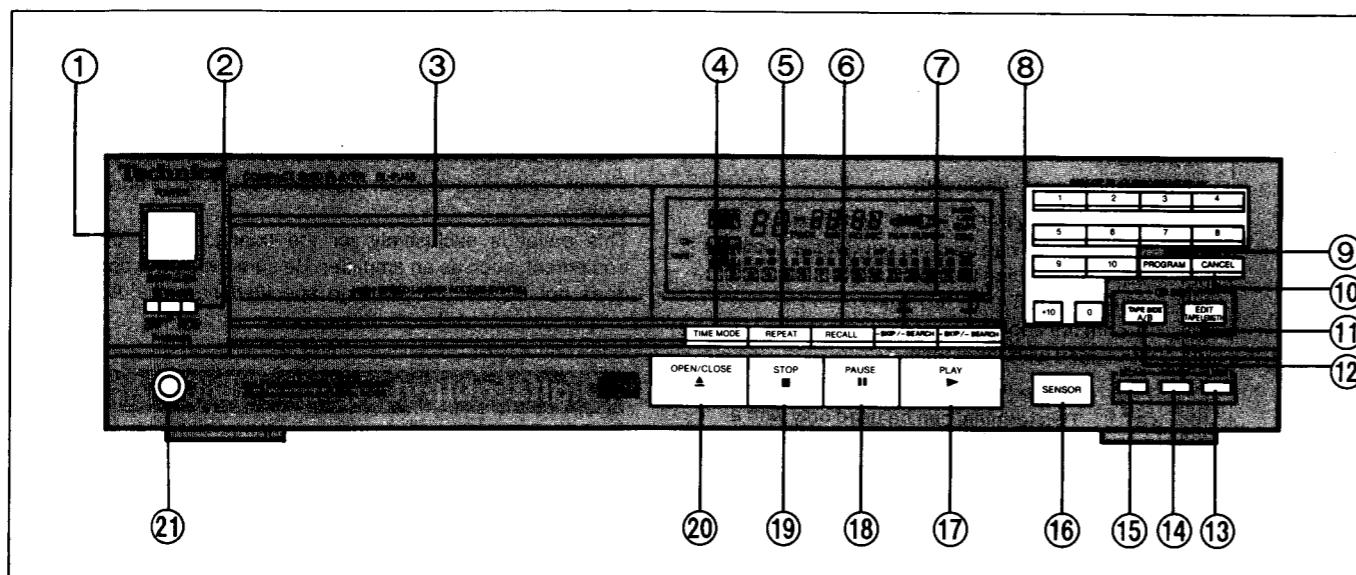
When using the optical-fiber cable, please keep the following points in mind:

1. The maximum length of optical cable to be used with this unit is 3 m (approx. 10 ft.).
2. Always make sure the plug is fully inserted. If the plug is not inserted all the way, an imperfect connection will result.
3. The optical-fiber cable must never be bent or coiled tightly. Doing so will permanently damage the optical-fiber in the cable and, therefore, prevent proper data transmission. If the cable must be coiled (for storage, etc.), the diameter of the loop should be at least 15 cm (approx. 6 inches).
4. Handle the optical cable's plug very carefully. Keep the plug free from dust or damage. Dust can be removed by wiping the plug with a soft cloth. Do not use any cleaners or solvents to clean the plug.

■ ACCESSORIES

• AC power supply cord 1 SFDAC05E03 (E, EB, EH, EG, EF, EI) SJA173 (XL) SJA188 (EK) SJA168 (XA, PC) SJA183 (XB)	• Stereo connection cable 1 (SJP2249-1)	• Optical-fiber cable 1 (SJPD16)
• Remote-control transmitter 1 (EUR64790)	• Batteries 2 (UM-4NE)	• Synchro-recording connection cable 1 (SJP2257T)
		

■ FRONT PANEL CONTROLS AND FUNCTIONS



Control section

① Power switch (POWER)

② Timer stand-by switch (TIMER)

③ Disc tray

④ Time-mode select button (TIME MODE)
Use this button to select the desired time display mode.

⑤ Repeat button (REPEAT)

⑥ Recall button (RECALL)
Press this button to display the program play sequence in the memory.

⑦ Skip/search buttons (SKIP/SEARCH)

⑧ Numeric buttons (+10, 0, 1~10)
These buttons can be used to select the track numbers and the recording time.

⑨ Programmed-play button (PROGRAM)

⑩ Cancel button (CANCEL)
To cancel a track number from memory, first press the appropriate numeric button to display the number of the track you wish to cancel, then press this button.

⑪ Compact-disc edit button (EDIT/TAPE LENGTH)
This button is used when recording from a compact disc. When the button is pressed and the tape's length is specified, the tracks to be recorded will be automatically selected, and, at the same time, the peak level search will begin.

⑫ Tape-side select button (TAPE SIDE A/B)
Press this button to indicate the point at which you wish to change cassette sides.

⑬ Link button (LINK)
This button is used when edit-recordings are made from several compact discs.

⑭ Warp button (WARP)
This button is used to select (during edit recording from a compact disc) tracks of the appropriate length (from the tracks remaining on the compact disc) and to add those tracks to an as-yet unrecorded space on the cassette tape, and to replace tracks on the A side and B side of the tape with other tracks.

⑮ Music scan button (SCAN)
This button can be used to play the first part of each track in order.
This is convenient to find the title or the track number.

⑯ Remote-control signal receptor (SENSOR)

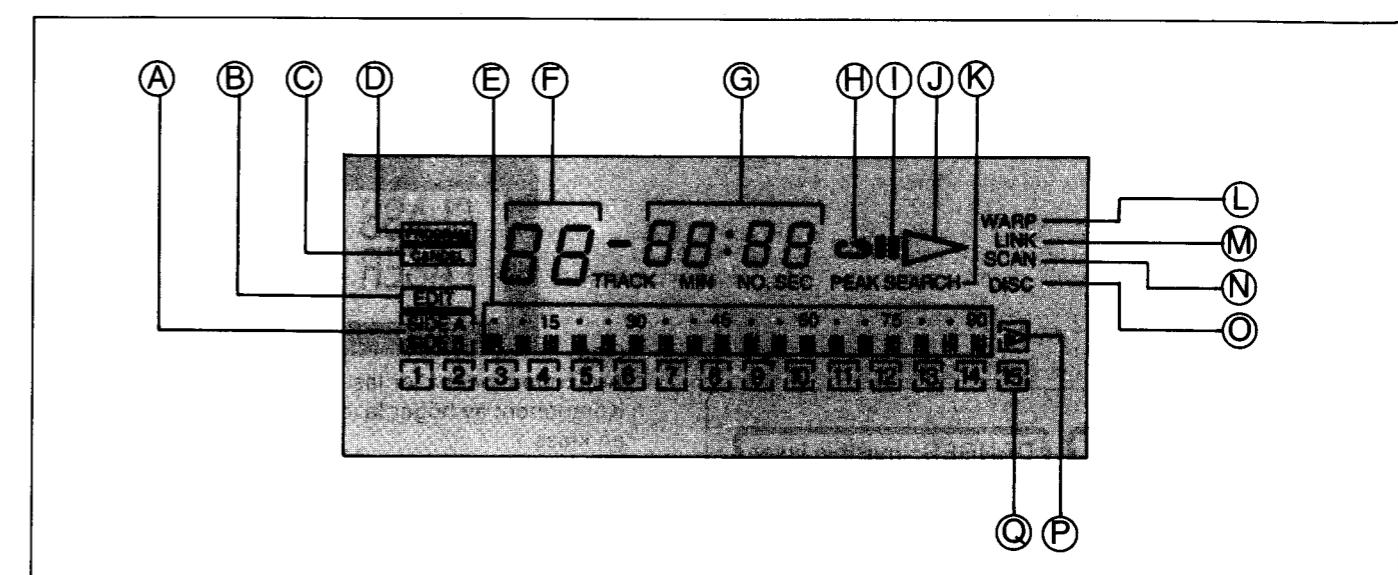
⑰ Play button (PLAY/▶)

⑱ Pause button (PAUSE/■)

⑲ Stop button (STOP/■)

⑳ Disc tray open/close button (OPEN/CLOSE/△)

㉑ Headphones jack (PHONES)



Indicators section

Ⓐ Tape side indicator (SIDE A / SIDE B)
This bracket indicator illuminates to show which cassette side, "A" or "B", has been selected with the tape side (A/B) select button.

Ⓑ Edit indicator (EDIT)
Illuminates when the edit button is pressed and goes out when the stop button is pressed.

Ⓒ Cancel indicator (CANCEL)
This indicator illuminates when the cancel button is used; a programmed track can be canceled during the time that this indicator is illuminated.

Ⓓ Programmed-play indicator (PROGRAM)

Ⓔ Time scale
The compact disc's play time, and the tape length for an edit-recording, are displayed by bars (in units of 5 minutes each). In addition, the play-position is indicated by continuous bar flashing.

Ⓕ Track number display (TRACK)

Ⓖ Time display (MIN/NO./SEC)

Ⓗ Repeat indicator (◀)
This indicator illuminates when the repeat button is pressed.

Ⓘ Pause indicator (■)
This indicator illuminates when the pause button is pressed.

Ⓙ Play indicator (▶)
This indicator illuminates when the play button is pressed.

Ⓚ Peak-level search indicator (PEAK SEARCH)
This indicator illuminates when the music scan button is pressed.

Ⓛ Warp indicator (WARP)
This indicator illuminates when the warp button is pressed.

Ⓜ Link indicator (LINK)
This indicator illuminates when the link button is pressed.

Ⓝ Scan indicator (SCAN)
This indicator illuminates when the music scan button is pressed.

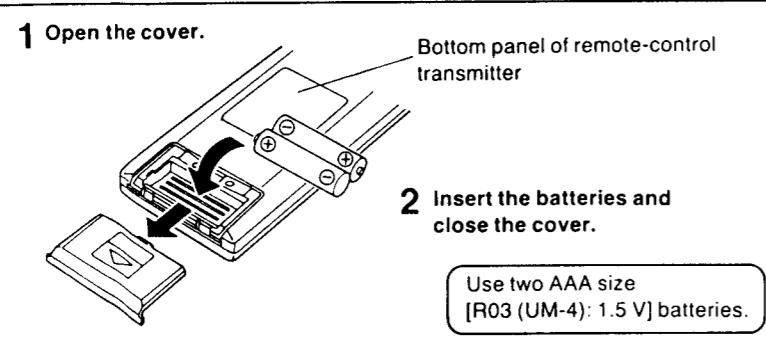
Ⓞ Disc indicator (DISC)
This indicator illuminates when a disc is loaded.

Ⓟ Over mark (▶)
The indicator illuminates if the total number of tracks on the disc is 16 tracks or more.
When the play reaches the 16th track and thereafter, the bracket indicator "—" begins flashing.

Ⓠ Music matrix (1~15)
The numbers of the tracks on the disc are displayed up to a maximum of 15.

■ REMOTE-CONTROL TRANSMITTER (EUR64790)

Insertion of remote-control transmitter batteries



■ To remove the batteries

Reverse procedure 2.

■ Battery life

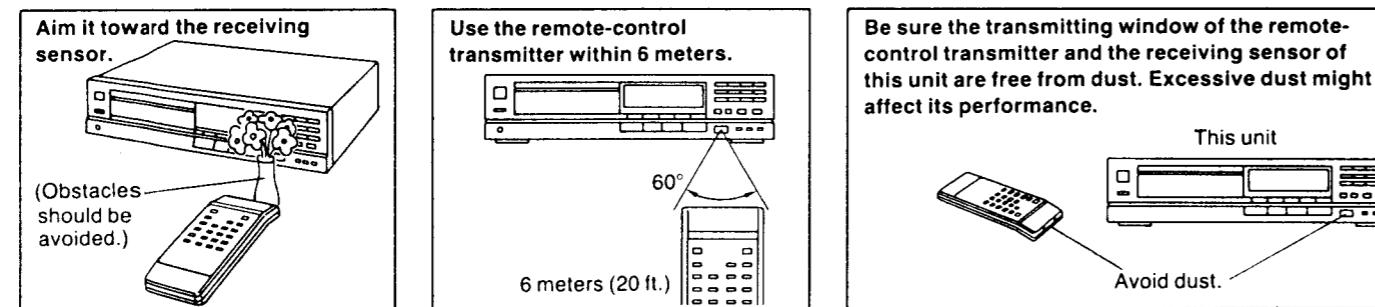
About 1 year.
(Depending on frequency of use.)

■ Notes concerning use of dry batteries

- Do not use chargeable batteries (Ni-Cd type).
- Be sure the batteries are inserted so that the positive (+) and negative (-) polarities are correct. Batteries installed with incorrect polarities may leak and damage the remote-control transmitter.
- Never subject the batteries to excessive heat or flame; do not attempt to disassemble them; and be sure they are not short-circuited.
- If the remote-control transmitter is not to be used for a long time, remove the batteries and store them in a cool dark place.
- Always remove old, weak or worn-out batteries promptly and dispose of them properly.
- Never mix old and new batteries, nor batteries of different types (carbon or alkaline).

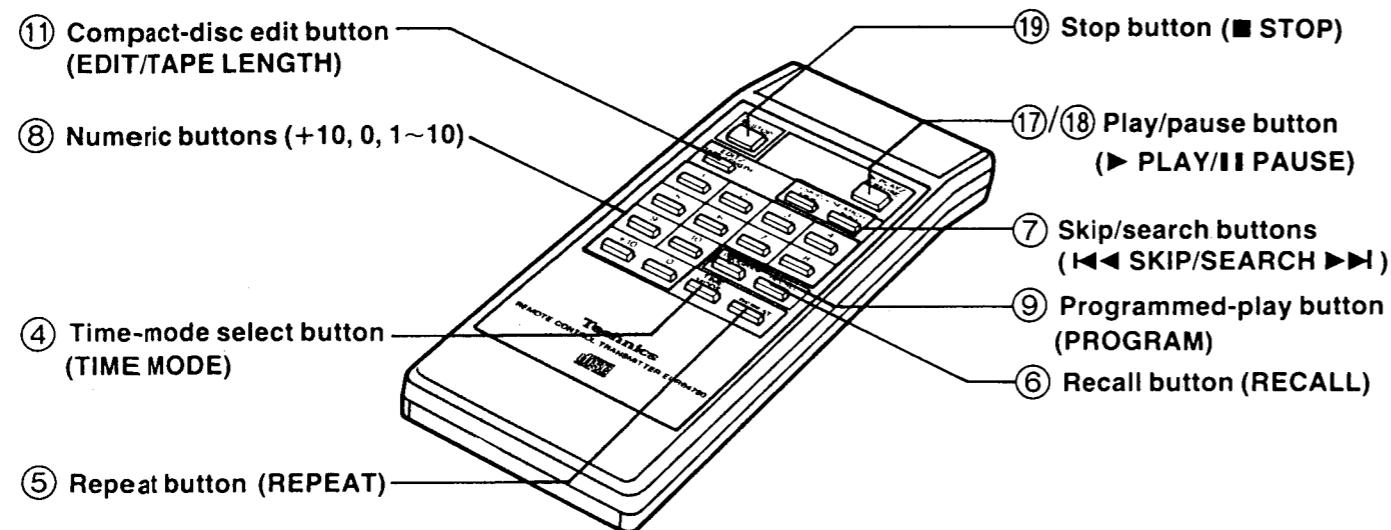
Operation notes

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



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

Control names



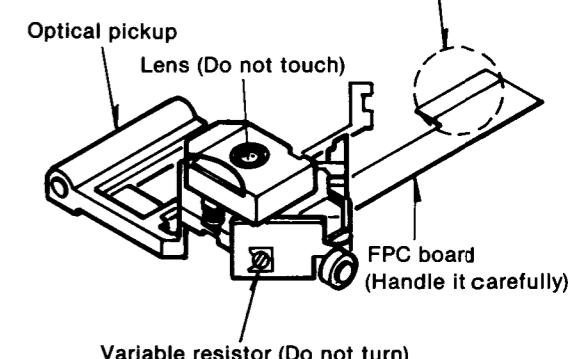
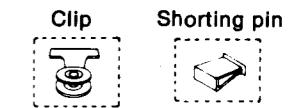
■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

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

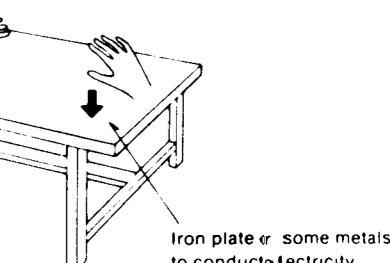
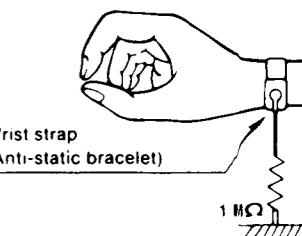
So, be careful of electrostatic breakdown during repair of the optical pickup.

■ 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)
3. When removing or connecting the short pin, finish the job in as short time as possible.
4. Take care not to apply excessive stress to the flexible board. (FPC board)
5. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.



Variable resistor (Do not turn)



Iron plate or some metals to conduct electricity

■ Grounding for electrostatic breakdown prevention

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

Caution:

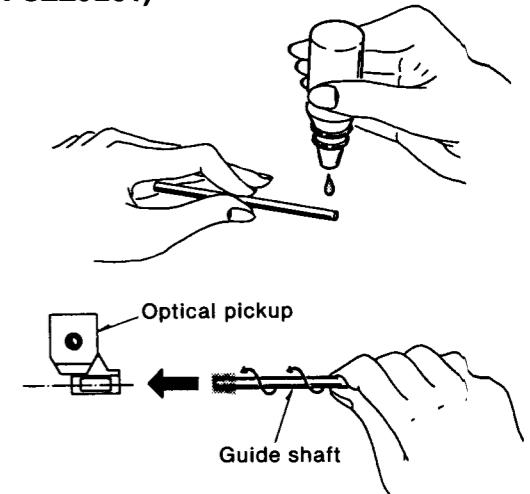
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.

■ INSTRUCTIONS FOR THE OIL (Part No. SZZ0L31)

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

How to Use

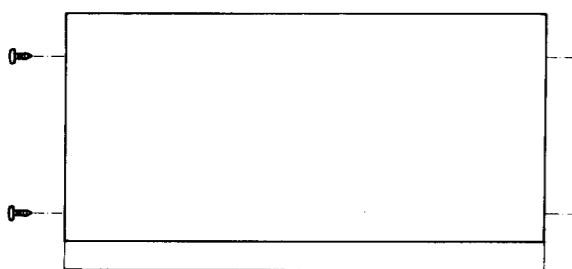
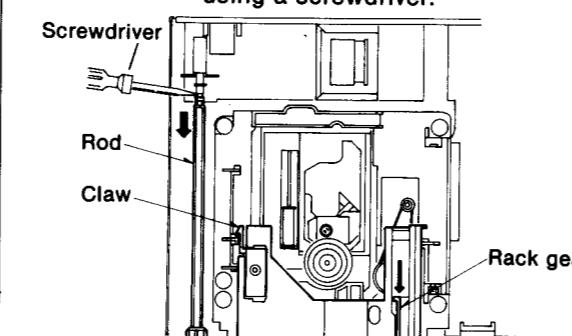
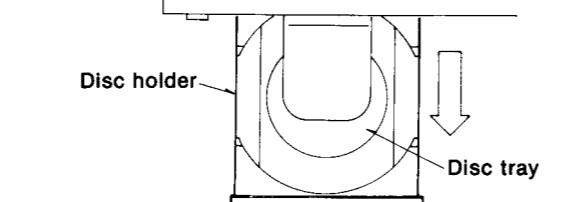
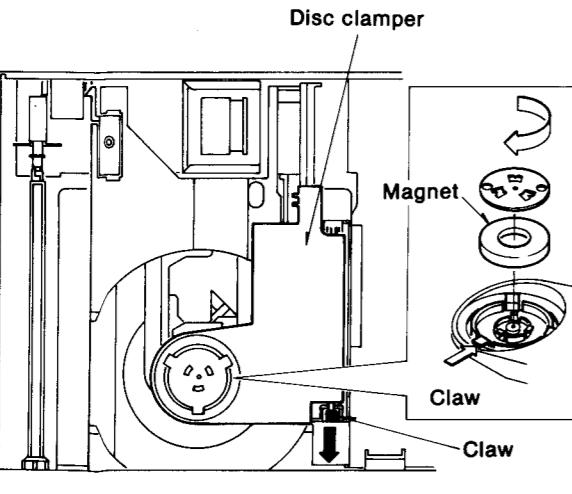
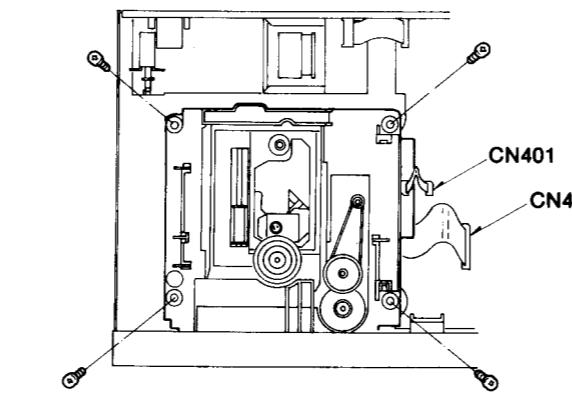
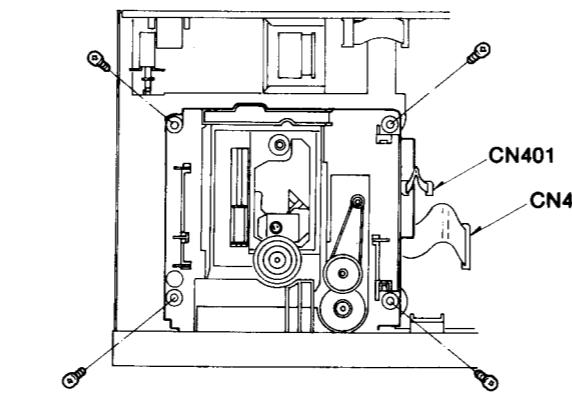
- (1) Remove the guide shaft in the traverse deck from the optical pickup and clean off any dust from the guide shaft.
- (2) Apply one drop of the SZZ0L31 to the tip of the guide shaft.
- (3) Hold the guide shaft so that its oiled end touches the optical pickup and insert it into the bearing while rotating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

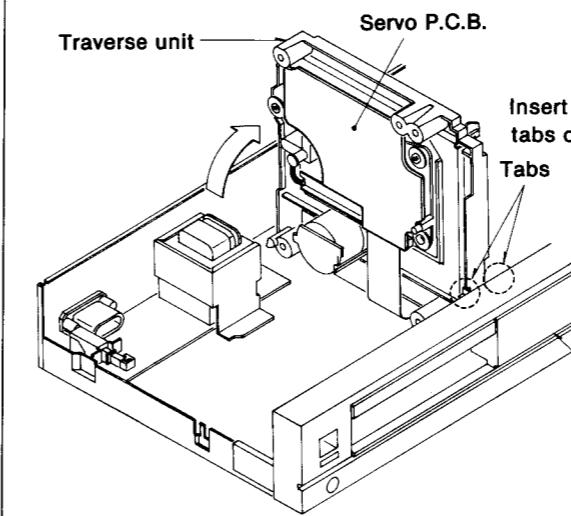
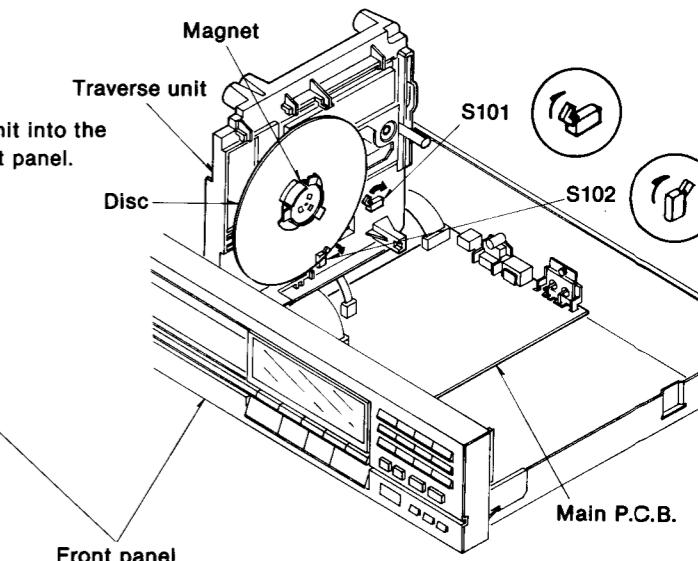
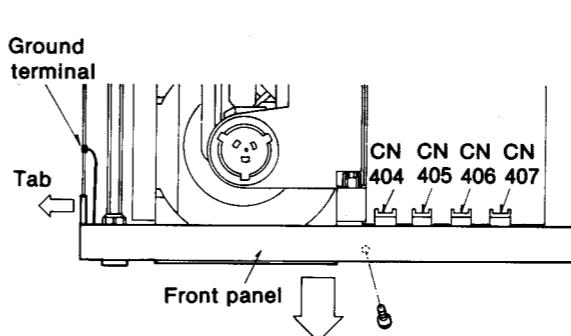
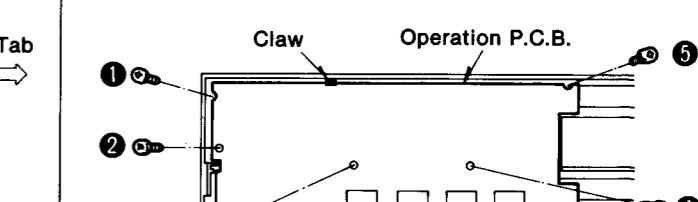
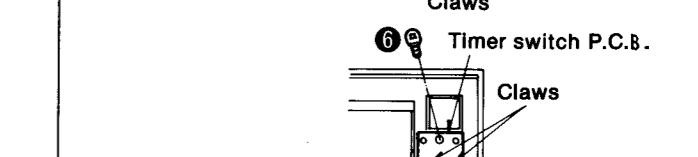
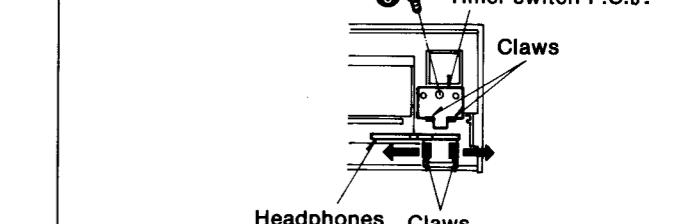


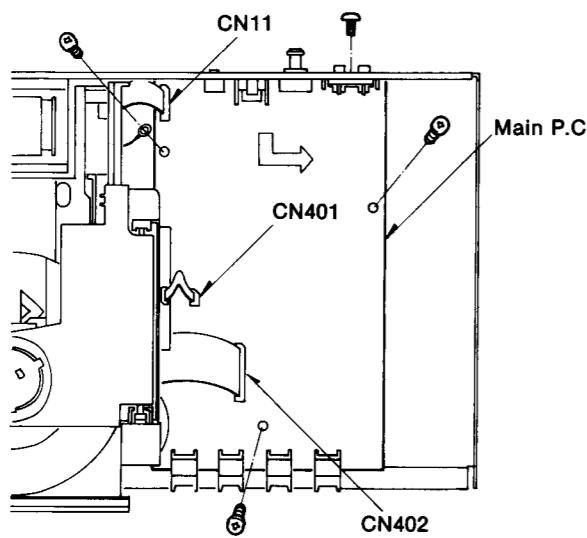
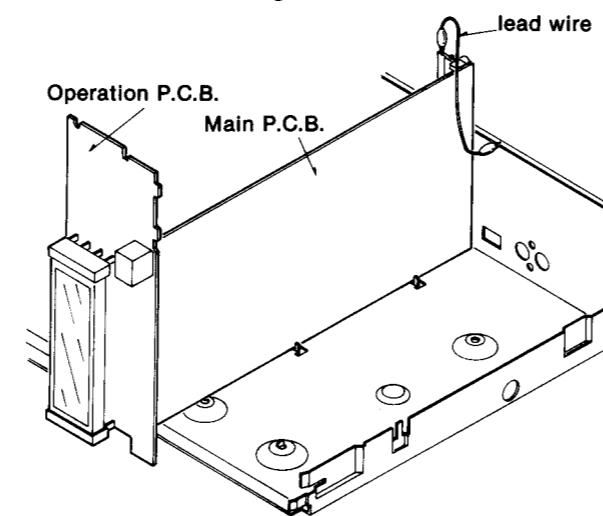
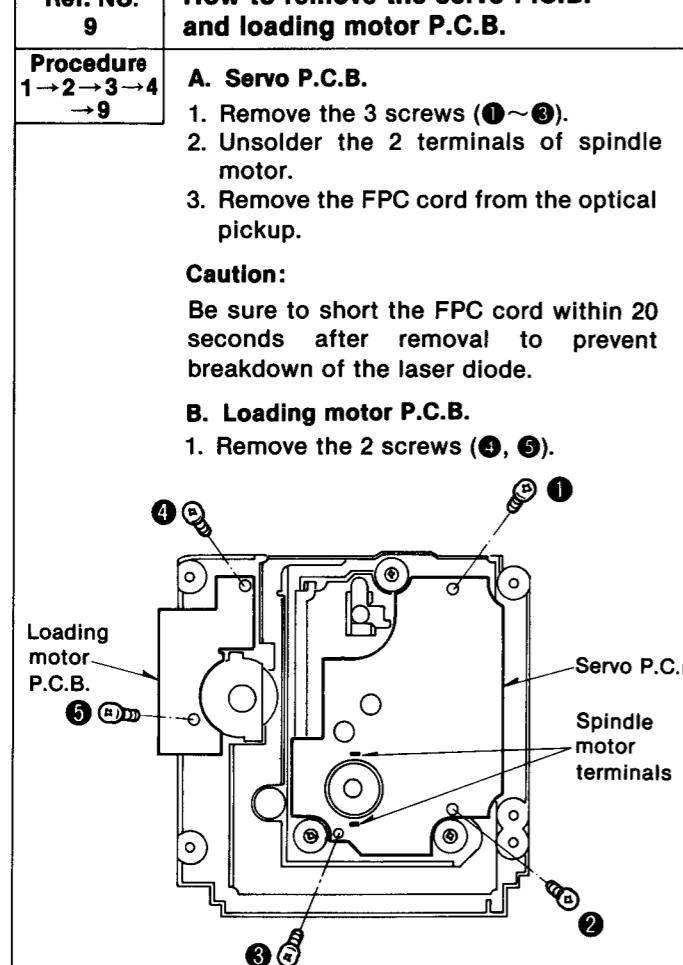
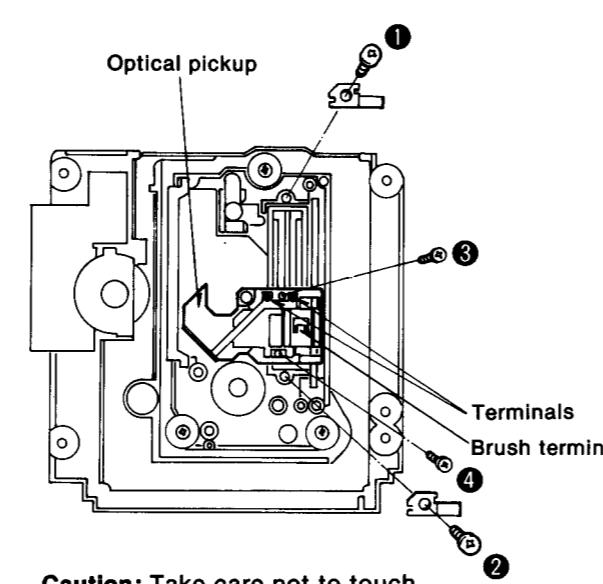
■ DISASSEMBLY INSTRUCTIONS

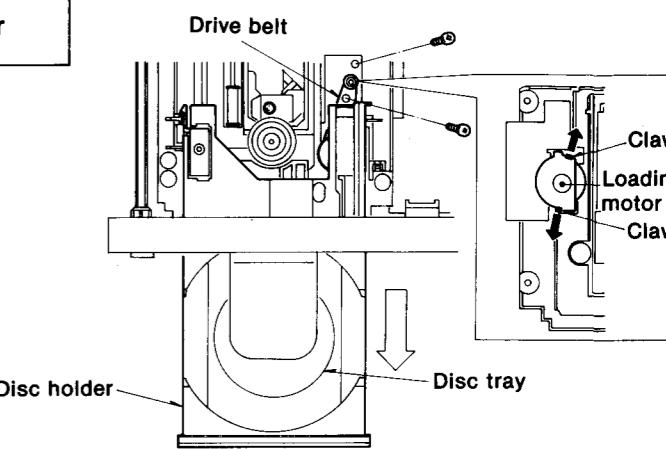
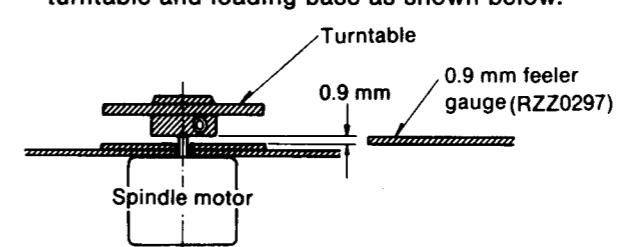
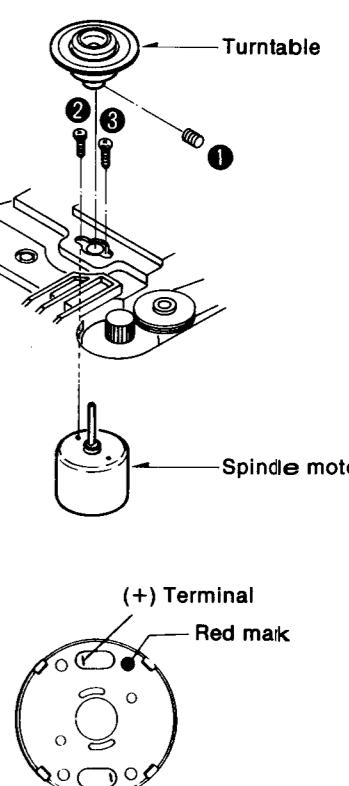
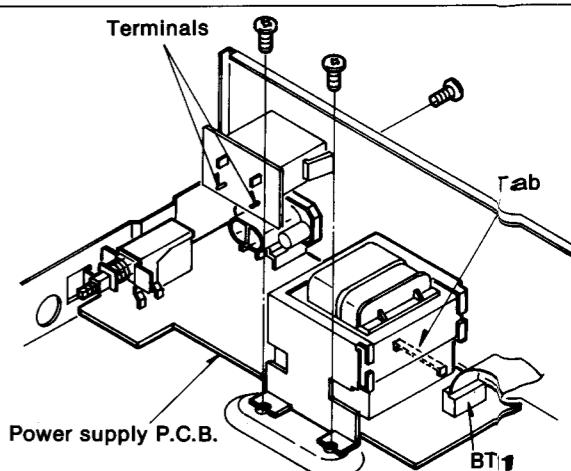
CAUTION:

- 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 removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.

Ref. No. 1	How to remove the cabinet	Ref. No. 3	How to remove the disc holder and power switch rod
Procedure 1	1. Remove the 4 screws.	Procedure 1→2→3	<p>A. Disc holder:</p> <ol style="list-style-type: none"> 1. Push the rack gear slowly in the direction of the arrow until the disc tray comes up. 2. Pull the disc holder until it stops. 3. Release the claw. 4. Pull out the disc holder further to remove it. <p>B. Power switch rod:</p> <ol style="list-style-type: none"> 1. Set the power switch in the "OFF" position. 2. Remove the power switch rod by using a screwdriver.
			 
Ref. No. 2	How to remove the disc clamper and magnet <p>A. Disc clamper:</p> <ul style="list-style-type: none"> • Release the claw. • Lift clamper and pull in the direction of the arrow. <p>B. Magnet:</p> <ul style="list-style-type: none"> • Turn the holder in the direction of the arrow to release the claw. 		
			
Ref. No. 4	How to remove the traverse unit <p>Procedure 1→2→3→4</p> <ul style="list-style-type: none"> • Remove the 4 screws. 		
			

Ref. No. 5	How to check the servo P.C.B.	(To play a disc)
Procedure 1→2→3→4 →5	<ul style="list-style-type: none"> • When checking the soldered surfaces of the servo P.C.B. and replacing the parts, do as shown. 	<ol style="list-style-type: none"> 1. Place the test disc and magnet. 2. Turn "ON" the power switch of the player while holding the levers of the switches (S101, S102) in the direction of the arrow.
		
Ref. No. 6	How to remove the front panel	Ref. No. 7
Procedure 1→6	<ul style="list-style-type: none"> • Remove the 1 screw. • Release the ground terminals. • Slightly pull out the tabs and remove the front panel in the direction of the arrow. 	<p>A. Operation P.C.B.</p> <ol style="list-style-type: none"> 1. Remove the 5 screws (①~⑤). 2. Release the 5 claws. <p>B. Headphones P.C.B.</p> <ol style="list-style-type: none"> 1. Release the claws. <p>C. Timer switch P.C.B.</p> <ol style="list-style-type: none"> 1. Remove the 1 screw (⑥). 2. Release the claws.
		  

Ref. No. 8	How to remove the main P.C.B.
Procedure 1→6→8	<ol style="list-style-type: none"> 1. Remove the 4 screws. 2. Lift the P.C.B. remove it from the chassis tab. 3. Remove the P.C.B. in the direction of the arrow. 
How to check the main P.C.B.	
<ul style="list-style-type: none"> • When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown. <p>Cautions:</p> <ul style="list-style-type: none"> • Be sure to connect the P.C.B. ground terminal (line out terminal) and the chassis with a lead wire. • Be sure to connect the GND lead wire from the loading base to the chassis. 	
Ref. No. 9	How to remove the servo P.C.B. and loading motor P.C.B.
Procedure 1→2→3→4 →9	<p>A. Servo P.C.B.</p> <ol style="list-style-type: none"> 1. Remove the 3 screws (①~③). 2. Unsolder the 2 terminals of spindle motor. 3. Remove the FPC cord from the optical pickup. <p>Caution: Be sure to short the FPC cord within 20 seconds after removal to prevent breakdown of the laser diode.</p> <p>B. Loading motor P.C.B.</p> <ol style="list-style-type: none"> 1. Remove the 2 screws (④, ⑤). 
Ref. No. 10	How to remove the optical pickup
Procedure 1→2→3→4 →9→10	<p>Refer to the optical pickup handling precautions and instructions for the oil (See page 8).</p> <ol style="list-style-type: none"> 1. Remove the 2 screws (①, ②). 2. Unsolder the 2 terminals and the 2 screws (③, ④).  <p>Caution: Take care not to touch the brush terminal.</p>

Ref. No. 11	How to remove the loading motor
Procedure 1→2→3 →4→11	<ol style="list-style-type: none"> 1. Remove the drive belt. 2. Remove the 2 screws. 3. Turn traverse unit over. 4. Release the claws. 5. Unsolder the terminals. 
Ref. No. 12	How to remove the spindle motor
Procedure 1→2→3→4 →9→12	<ol style="list-style-type: none"> 1. Loosen the screw (①) by using a 1.27mm hexagonal wrench and remove the turntable. 2. Remove the 2 screws (②, ③). <p>Caution:</p> <ol style="list-style-type: none"> 1. Turntable height adjustment is necessary any time the turntable or spindle motor is replaced. 2. The (+) terminal of the spindle motor is indicated by the red mark. <p>Adjustment of turntable height</p> <ol style="list-style-type: none"> 1. Insert a 0.9mm feeler gauge (RZZ0297) between the turntable and loading base as shown below.  <ol style="list-style-type: none"> 2. Tighten the turntable set-screw by using a 1.27mm hexagonal wrench. <p>Caution: Refer to turntable height adjustment (see page 18).</p> 
Ref. No. 13	How to remove the power transformer
Procedure 1→2→3→4 →13	<ol style="list-style-type: none"> 1. Remove the connector (BT11). 2. Remove the 3 screws. 3. Release the Tab. 4. Unsolder the terminals. 

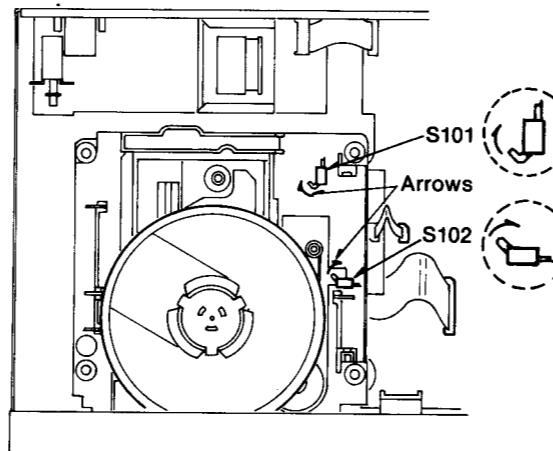
MEASUREMENTS AND ADJUSTMENTS

Caution:

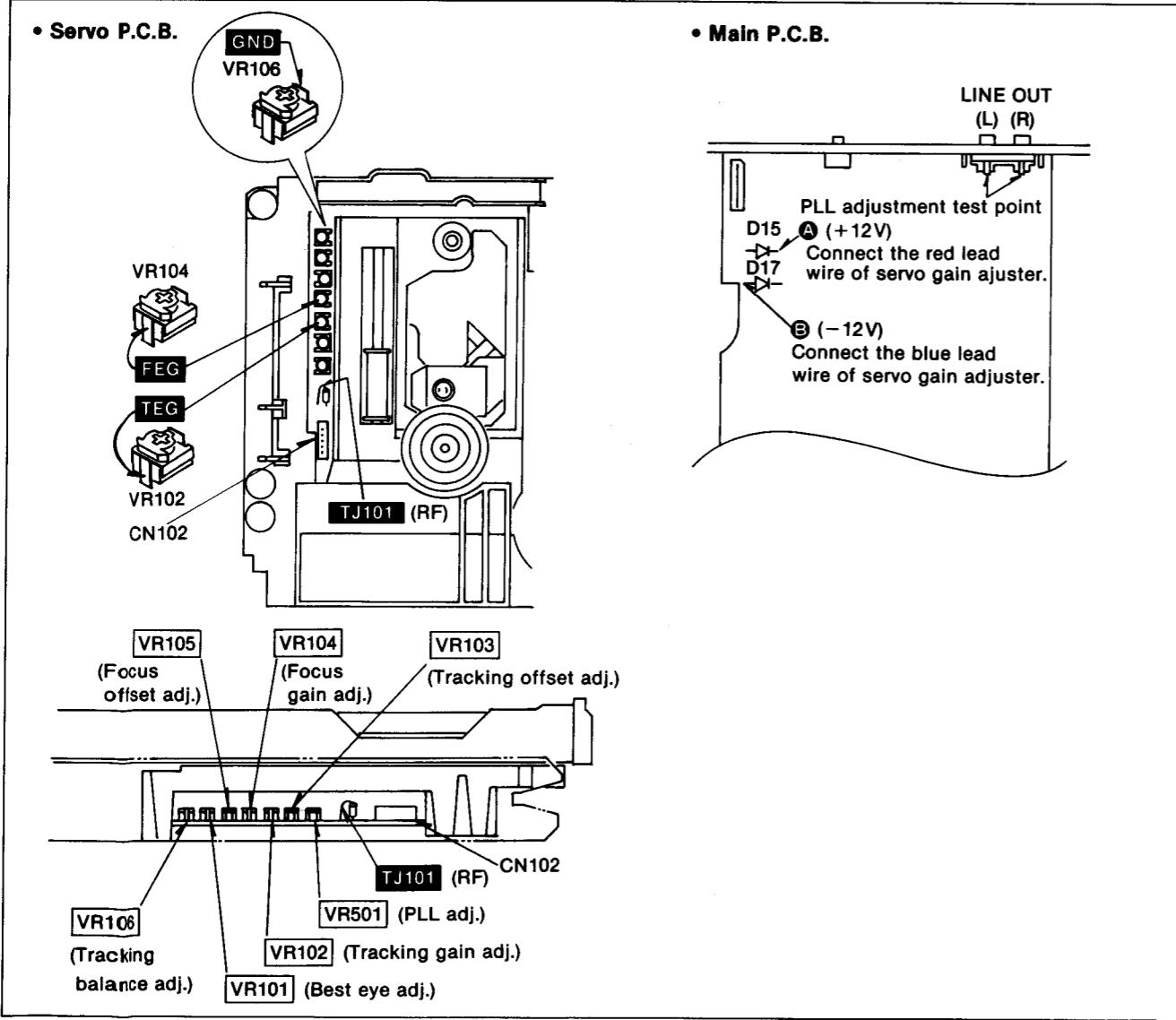
- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- Avoid exposure to the laser beam, especially when performing adjustments.

PREPARATION

- Remove the cabinet. (Refer to page 9.)
- Remove the disc clamper and magnet. (Refer to page 9.)
- Remove the disc holder and power switch rod. (Refer to page 9.)
- Place the test disc and magnet on the turntable.
- Turn "ON" the power switch of the player, while holding the levers of the switches (S101, S102) in the direction of the arrow.
- Release the levers of the switches (S101, S102) after the test disc starts rotating.



ADJUSTMENT POINTS

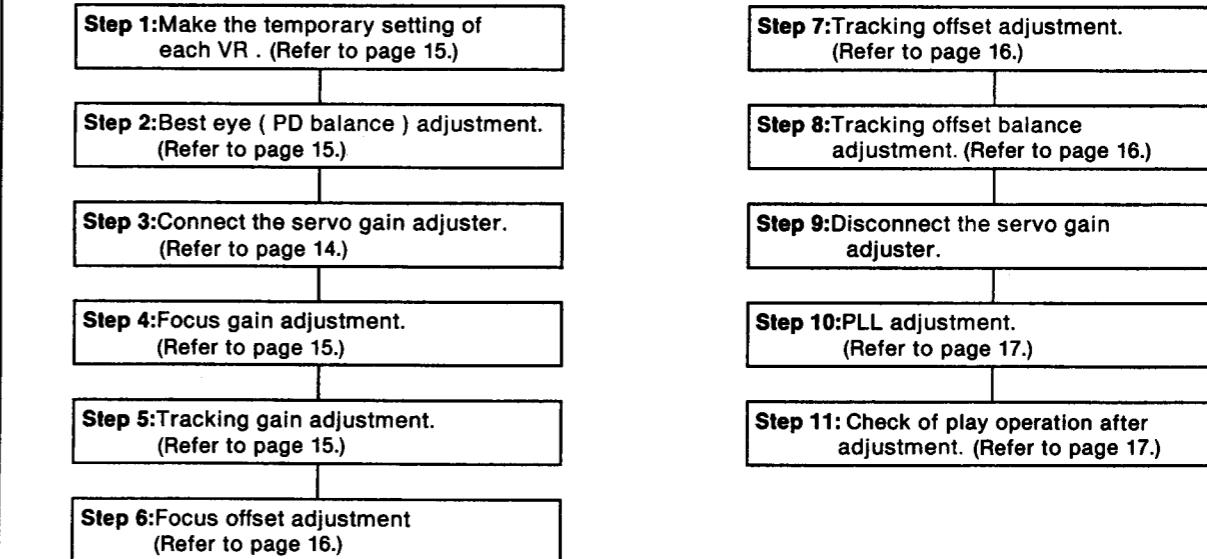


ELECTRICAL ADJUSTMENT

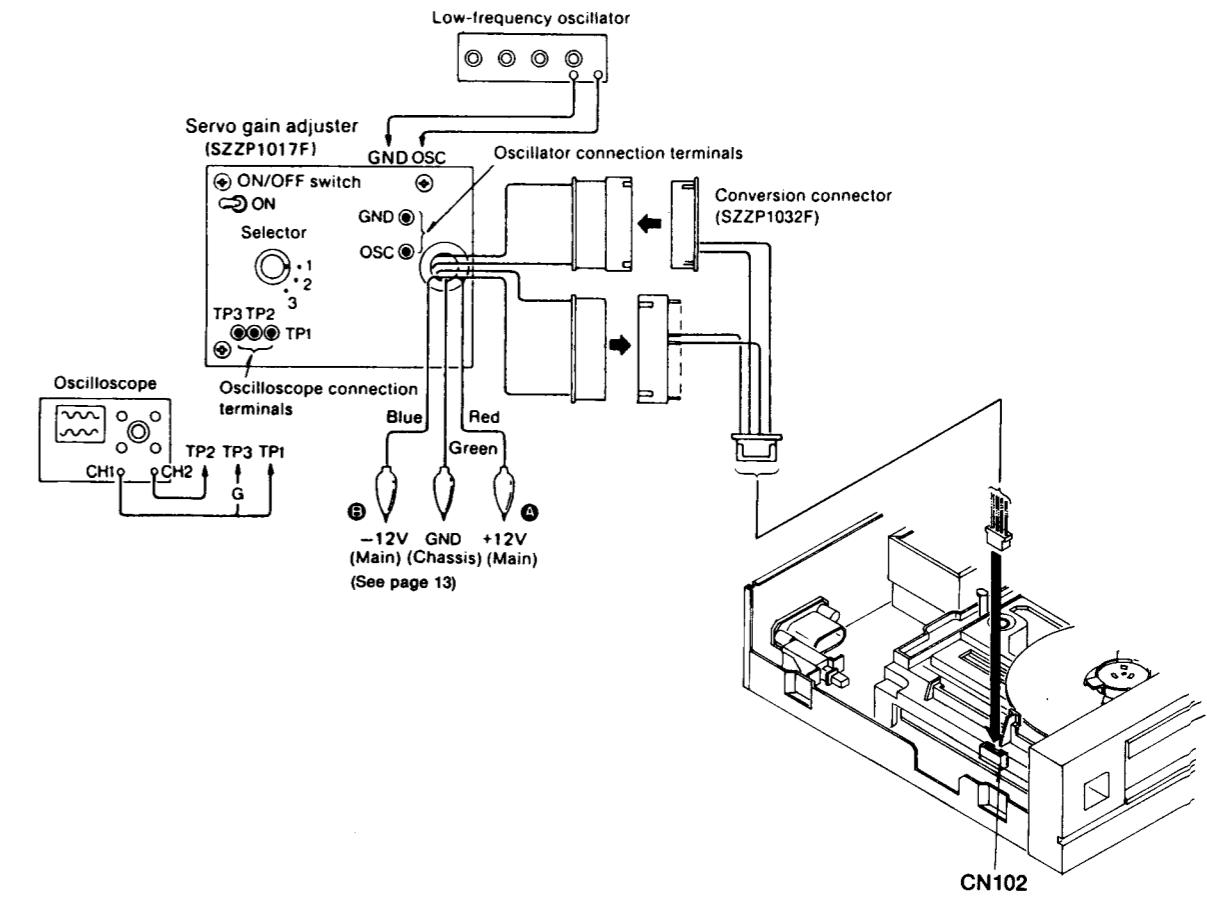
Measuring Instruments and Special Tools

- Servo gain adjuster (SZZP1017F)
- Test discs
- Test disc (SZZP1014F) old or 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)

Adjustment Procedure

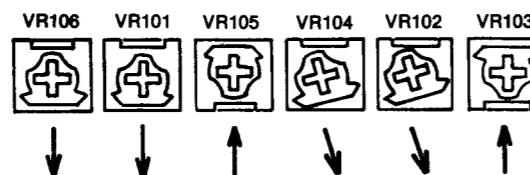


Connection of Servo Gain Adjuster



TEMPORARY SETTING OF EACH VR**Note :**

If a disc skips or can not be played back, adjust each VR temporarily, as shown.

**BEST EYE(PD BALANCE) ADJUSTMENT**

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

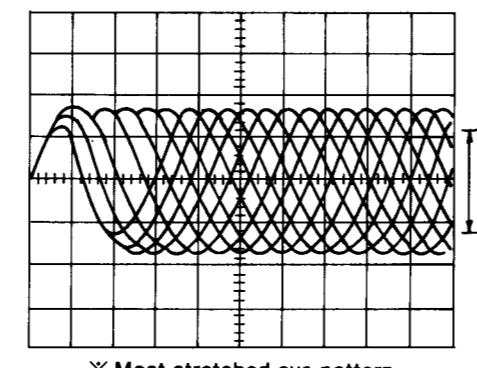
Oscilloscope setting: VOLT.....200mV
SWEEP.....0.5μsec.
INPUT.....AC

2. Set a test disc (SZZP1014F or SZZP1054C) and turn **ON** the power switch of the player. (Refer to page 13.)

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.

**FOCUS GAIN ADJUSTMENT**

1. Connect the servo gain adjuster. (Refer to page 12.)

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 **825Hz** and an output voltage of **100mVp-p**. Then connect the oscillator to **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.....100mV(both channels)
SWEEP.....1msec.
INPUT.....DC

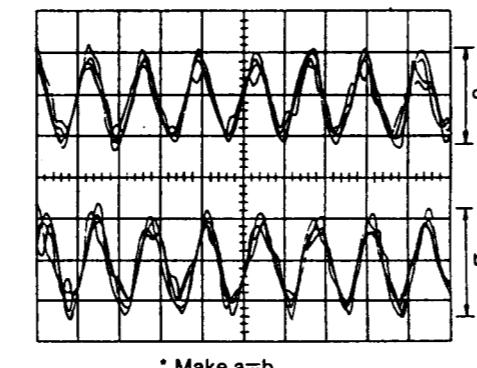
5. Set a test disc (SZZP1014F or SZZP1054C) and turn **ON** the power switch of the player. (Refer to page 13.)

6. Set the player to the play mode.

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

8. **825Hz** 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".

**TRACKING GAIN ADJUSTMENT**

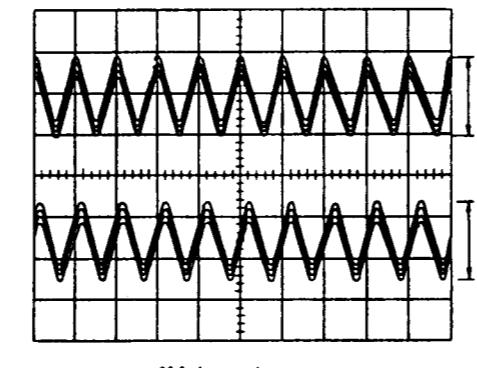
1. Oscilloscope setting and connections are the same as above.

2. Set the low frequency oscillator to a frequency of **1.0kHz** and an output voltage of **100mVp-p**.

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

4. **1.0kHz** signals will be displayed on the oscilloscope. Adjust **VR102** until the waveform amplitudes of both channels are equal.

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

**FOCUS OFFSET ADJUSTMENT**

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

Connect CH2 of the oscilloscope to **FEG (+)** and **GND (-)** of the servo P.C.B.

Oscilloscope setting: VOLT.....200mV(CH1),
500mV(CH2)

SWEEP.....0.5msec.

INPUT.....AC(CH1),DC(CH2)

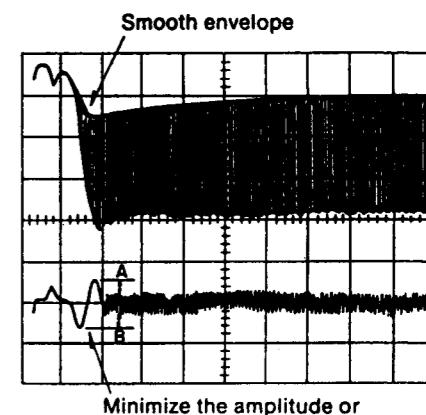
MODE.....NORM

(Triggering via CH1)

2. Set the test disc (SZZP1057C) and turn **ON** the power switch of the player. (Refer to page 13.)

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.

**TRACKING OFFSET ADJUSTMENT**

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

Connect CH2 of the oscilloscope to **TEG (+)** and **GND (-)** of the servo P.C.B.

Oscilloscope setting: VOLT.....200mV(CH1),
500mV(CH2)

SWEEP.....0.5msec.

INPUT.....AC(CH1),DC(CH2)

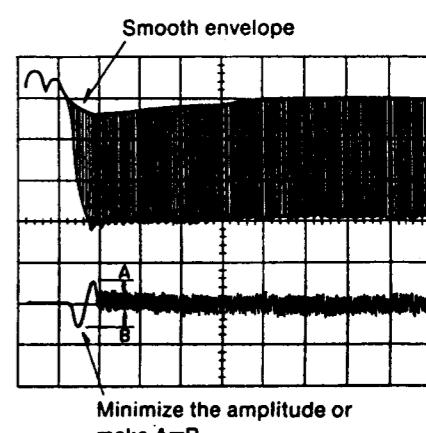
MODE.....NORM

(Triggering via CH1)

2. Set the test disc (SZZP1057C) and turn **ON** the power switch of the player. (Refer to page 13.)

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.

**TRACKING OFFSET BALANCE ADJUSTMENT**

1. Set the low frequency oscillator to a frequency of **1kHz** and an output voltage of **200mVp-p**. Then connect the oscillator to **OSC (+)** and **GND (-)** terminals of the servo gain adjuster.

2. Connect CH1 of the oscilloscope to **TJ101 (+)** and **GND (-)** of the servo P.C.B.

Oscilloscope setting: VOLT.....500mV

SWEEP.....0.5msec.

INPUT.....AC

2. Set a test disc (SZZP1014F or SZZP1054C) and turn **ON** the power switch of the player. (Refer to page 13.)

4. Set the player to the play mode.

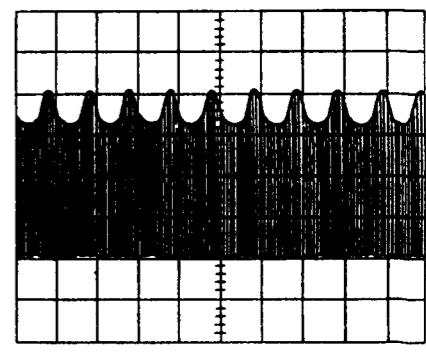
5. Set the selector switch of the servo gain adjuster from "2" to "1".

6. Adjust **VR106**, so that the output waveform is as shown (jitter is minimized).

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.



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

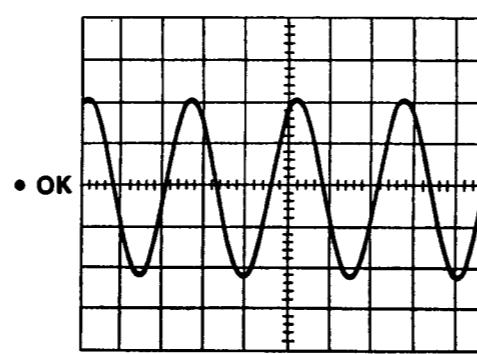
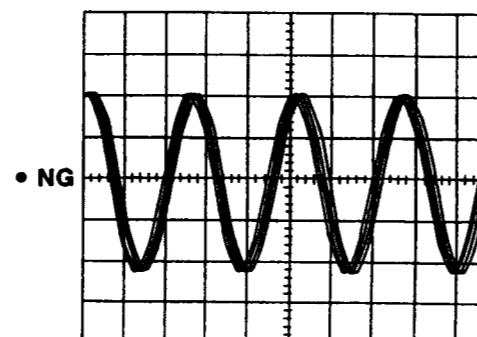
2. Set the test disc (SZZP1054C) and turn **ON** the power switch of the player. (Refer to page 13.)
 3. Play **Track No.6 (wedge 0.7mm)** of the test disc.
 4. Check the waveform displayed on the oscilloscope and adjust **VR501** in the following steps.

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".

Noise started to appear in output sound with **VR501** turned counterclockwise.

**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 No.6 (wedge 0.7mm) and verify that there is no skip sound or noise.
 3. Play the track No.13 (black dot 0.7mm) and verify that there is no skip sound or noise.

OPTICAL PICKUP ADJUSTMENT**Measuring Instruments and Special Tools**

- Two-channel oscilloscope (with trigger) of 30MHz or over
- Test discs
 Test disc (SZZP1014F) old or new type
 Inspection test disc (SZZP1054C)
 Uneven disc (SZZP1056C)
- Hexagonal wrench (2.0mm)
 ● Screw lock paint (RZZ0L01)
 ● Hexagonal wrench (1.27mm)
 ● Feeler gauge (RZZ0297)
 ● Filter (Refer to page 18)

Adjustment Procedure

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

Step 1: Make the temporary of each VR. (Refer to page 15.)

Step 2: Turntable height adjustment. (Refer to page 18.)

Step 3: Mechanical adjustment. (Refer to page 18.)

Step 4: Electrical adjustment. (Refer to page 14.)

TURNTABLE HEIGHT ADJUSTMENT

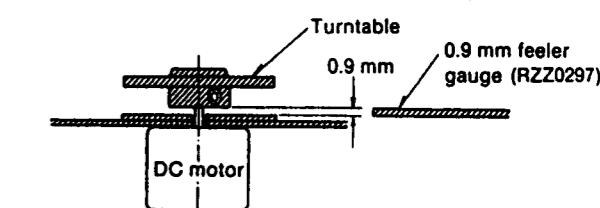
1. Connect CH1 of the oscilloscope to **FEG (+)** and **GND (-)** of the servo P.C.B. through the filter as shown below.
Oscilloscope setting: VOLT.....50mV
 SWEEP.....1msec.
 INPUT.....DC

2. Set the oscilloscope to DC zero balance.
 3. Set a test disc (SZZP1014F or SZZP1054C and turn **ON** the power switch of the player. (Refer to page 11.)

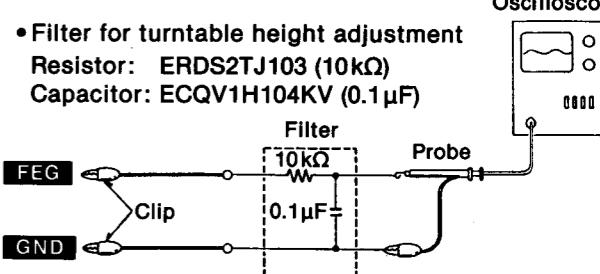
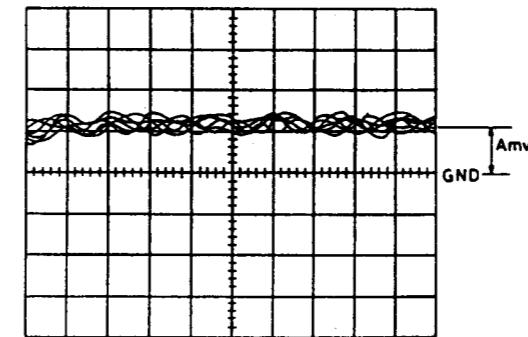
4. Set the player to the play mode.
 5. Measure the DC level (AmV) displayed on the oscilloscope.

- If the value of A is within the range of $\pm 60mV$, the turntable height is correct. If it is not within this range, make the necessary adjustments using the 0.9mm feeler gauge (RZZ0297).
 If A is more than $+60mV$, make the turntable lower.
 If A is less than $-60mV$, make the turntable higher.

Adjust the turntable height as follow:
A. Insert the 0.9mm feeler gauge (RZZ0297) as shown below.



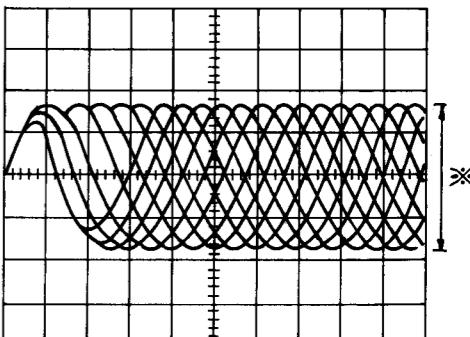
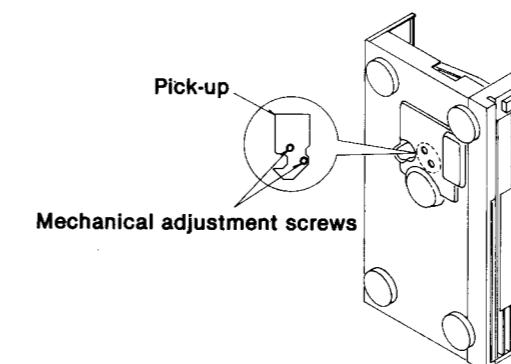
- B.** Loosen the turntable set-screw.
- C.** Adjust turntable height to 0.9mm with the feeler gauge as shown above.
- D.** Tighten the turntable set-screw by using the 1.27mm hexagonal wrench.
- E.** Check the turntable height adjustment by following steps 1 ~ 5 above.

**MECHANICAL ADJUSTMENT**

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

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

2. Set the test disc (SZZP1056C) and turn **ON** the power switch of the player. (Refer to page 13.)
 3. Using the manual search buttons, move the pickup so that the mechanical adjustment screws line up with the adjustment holes in the bottom panel.



Note: The mechanical adjustment screws have been already locked with screw lock paint at the factory. It might be hard to turn them.

■ TERMINAL FUNCTION OF LSI

● MN6622 (Digital Signal Processing: EFM Decoder, Error Correction, CLV Servo)

Pin No.	Mark	I/O	Function
1	MEMP	I	Emphasis signal input
2	PC	O	Spindle motor "ON" signal (ON at "L")
3	EC	O	Spindle motor drive signal
4	FG	I	Not connected
5	TTF	I	Not used (connected to GND)
6	FLAG0	O	Not connected
7	IPFLAG	O	Not connected
8	FLAG6	O	Not connected
9	PCK	I	PLL extract clock input (4.2336MHz)
10	VDD	I	Power supply (connected to +5V)
11	EFM	I	EFM signal input (PLL)
12	SRF	I	EFM signal input (DSL)
13	DO	I	Drop-out signal ("H" at drop-out)
14	CLVS	O	Not connected
15	FPC	O	PLL frequency comparison signal
16	BSSEL	O	Not connected
17	SRFO	I	Synchro rec control signal input
18	FSL	I	Not used (connected to GND)
19	SLEEP	I	Not used (connected to GND)
20	SUBC	O	Not connected
21	SBCK	I	Not connected
22	BLKCK	O	Sub-code block (Q-data) clock (75Hz)
23	CLDCK	O	Sub-code frame (Q-data) clock (7.35kHz)
24	SUBQ	O	Sub-code (Q-data) output
25	CRC	O	Not connected
26	RST	O	Reset signal input ("L"=Reset)
27	MLD	I	Data input (command load)
28	MCLK	I	Data clock input (command clock)
29	MDATA	I	Data input (command data)
30	DMUTE	I	Muting control (Not used, connected to GND)
31	TRON	I	Tracking servo "ON" signal (ON at "L")
32	STAT	O	Processing condition (CRC, OTC, CLVOK, TT, STOP) output

● AN8370S (Optical Servo Control)

Pin No.

Pin No.	Mark	I/O Division	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 non inversion input
13	VREFE	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	Trackcrossing speed control output (Not used, open)
18	C.MSP	I	Trackcrossing 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)
22	CNT1	I	Control input (FOON Focus servo "ON" signal)

● AN8371S (Data slice and PLL)

Pin No.

Pin No.	Mark	I/O Division	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 run frequency adjusting current input (not connected)
8, 9	VC1, 2	I	Capacitor connection for VCO oscillator frequency
10	VR	I	Resistor connection for VCO oscillator frequency
11	PD	I	Capacitor connection for PLL DO protection
12	PL1	I	PLL loop filter connection

● MN1554PEP (System Control)

Pin No.	Mark	I/O Division	Function
1	BRECV	—	(Not used, open)
2	BSEND	—	(Not used, open)
3	SYNC	O	(Not used, open)
4	SIRQ	I	Not used (connected to +5V)
5	BLKCK	I	Sub-code block (Q data) clock input (75Hz)
6	CLDCK	I	Sub-code block (Q data) clock input (7.35kHz)
7	SBO	I	(Not used, open)
8	SUBQ	I	Sub-code (Q data) input
9	RST	I	Reset signal input
10 13	P20 P23	O	Not used (connected to +5V)
14	CLOSE	O	Loading motor "Close" command
15	OPEN	O	Loading motor "Open" command
16	SLOW	O	(Not used, open)
17	MUTE	O	Muting control
18	SEEK	O	Traverse servo control (Not used, open)
19	NC	—	Not connected
20	TRV.R	O	Traverse "Reverse" command signal
21	TRV.F	O	Traverse "Forward" command signal
22	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [reverse] command)
23	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [forward] command)
24	CNT2	O	Optical servo IC control (TRON: Tracking servo)
25	VDD	I	Power supply (connected to +5V)
26	DOWN	O	(Not used, open)
27	UP	O	(Not used, open)
28	CNT1	O	Optical servo IC control signal (FOON: Focus servo)

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

● MN15283PEM (FL Drive and Timing Signal Generator)

Pin No.	Mark	I/O Division	Function
1	VSS	I	GND terminal
2	X0	O	(Not used, open)
3	X1	I	Optical servo condition input (Not used, open)
4	P00 (RECV)	O	Data receipt command signal
5	P01 (SEND)	O	Data transmission command signal
6	P02 (ACK)	O	Data discrimination signal
7	P03 (CLK)	O	Data lock signal
8 11	P10 (D0) P13 (D3)	O	Key scan signal
12	SYNC	O	(Not used, open)
13	RST	I	Reset signal input (reset at "L")
14	IRQ/TC1	I	Sub-code block (Q data) clock (75Hz) input (Not used, open)
15 16	P50 P51	I	Key return signal
17	P52	I	Timer play control signal
18	P53 (EST)	I	End detection signal of CD editing recording.
19	SBT	I	Sub-code frame clock (7.35kHz) (Not used, open)
20	SBD	I	Sub-code Q data input (Not used, open)

Pin No.	Mark	I/O Division	Function
21	P20 (CEM)	O	CD recording signal
22	P21 (PLE)	O	CD play signal
23 24	P22 P23	O	Synchro rec control signal
25 28	P30 P33	—	(Not used, open)
29 32	P40 P43	I	Key return signal
33	P60	I	(Not used, connected to +5V)
34 35	P61 DAC	—	(Not used, open)
36	VPP	I	FL drive power supply (connected to -33V)
37 52	D0 D9 DA DF	O	FL grid signal
53 61	S0 S8	O	FL anode signal
62	VDD	I	Power supply (connected to +5V)
63	OSC2	I	Clock terminal
64	OSC1	I	Clock input

● MN6623 (Digital Filter and D/A Converter)

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

Pin No.	Mark	I/O Division	Function
22	AVDD1	I	Power supply (connected to +5V)
23	AVDD1	I	Power supply (connected to +5V)
24	DVSS1	I	GND terminal (digital system)
25	X2	O	Clock output
26	X1	I	Clock input
27	NC	—	Not connected
28	DVDD2	I	Power supply (connected to +5V)
29	DVSS2	I	GND terminal (digital system)
30	NSUB	I	Not used (connected to GND)
31	768fs	O	768 fs (Not used)
32	192fs	O	192 fs (Not used)
33	LRPOL	I	LR clock selector (Not used)
34	LR	I	L/R clock
35	SRCK	I	Serial data best clock
36	SRDATA	I	Serial data input (MSB first)
37	DVSS 3	I	GND terminal (digital system)
38	NC	—	Not connected
39	384 fs	O	384 fs (16.9344 MHz) output
40	PD	I	Power down terminal
41	MDATA	I	Command data input
42	MCLK	I	Command clock input

■ REPLACEMENT PARTS LIST (Electrical parts)

Notes : * Important safety notice : Components identified by Δ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
 * Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.) Parts without these indications can be used for all areas.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
INTEGRATED CIRCUITS					
IC11	LM2940T5	I.C. REGULATOR	Q854	DTC124ES	TRANSISTOR
IC13	SV1BA4558F	I.C. REGULATOR	Q855	DTA124EST	TRANSISTOR
IC101	AN8370S	I.C. OPTICAL SERVO	Q856	DTA124EST	TRANSISTOR
IC102	MN6636	I.C. ANALOG SW			
IC103	AN6554NS	I.C. OPERATION AMP.			
IC104	AN6552S	I.C. REGULATOR			
IC105	AN6552S	I.C. REGULATOR			
IC106	AN6552S	I.C. REGULATOR			
IC201	LM2940T5	I.C. REGULATOR			
IC202	AN6552S	I.C. REGULATOR			
IC301	MN6622	I.C. LSI			
IC302	SV1CCK5816M	I.C. 16K RAM			
IC401	MN1554PEP	I.C. CONTROL			
IC402	SV1BA4558F	I.C. REGULATOR			
IC501	AN8371S	I.C. DATA SLICE-PLL			
IC601	MN15283PEM	I.C. OPERATION AMP.			
IC602	HC-MD10E	I.C. REMOTE SENSOR			
IC801	MN6623A	INTEGRATED CIRCUIT T.DF DAC			
IC803	LM833M	I.C. LPF			
IC804	NJM4560M	I.C. OPERATION AMP.			
IC805	SV1H80N2175	I.C. LPF			
IC806	SV1H80N2175	I.C. LPF			
IC809	SV1T0TX172	I.C.			
DIODES					
D11	Δ SVD1SR35200A	RECTIFIER	D19	MA4062HTA	DIODE
D12	Δ SVD1SR35200A	RECTIFIER	D23	MA4056-M	DIODE
D13	Δ SVD1SR35200A	RECTIFIER	D24	MA4150MHHTA	DIODE
D14	Δ SVD1SR35200A	RECTIFIER	D25	MA4150MHHTA	DIODE
D15	Δ SVD1SR35200A	RECTIFIER	D181	SVD1SS254	DIODE
D16	MA4300MHHTA	DIODE	D182	SVD1SS254	DIODE
D17	Δ SVD1SR35200A	RECTIFIER	D183	SVD1SS254	DIODE
D19	MA4062HTA	DIODE	D184	SVD1SS254	DIODE
D23	MA4056-M	DIODE	D201	MA4056-M	DIODE
D24	MA4150MHHTA	DIODE	D410	MA4033	DIODE
D25	MA4150MHHTA	DIODE	D411	SVD1SS254	DIODE
D181	SVD1SS254	DIODE	D601	SVD1SS254	DIODE
D182	SVD1SS254	DIODE	D602	SVD1SS254	DIODE
D183	SVD1SS254	DIODE	D603	SVD1SS254	DIODE
D184	SVD1SS254	DIODE	D604	SVD1SS254	DIODE
D201	MA4056-M	DIODE	D605	SVD1SS254	DIODE
D410	MA4033	DIODE	D651	SVD1SS254	DIODE
D411	SVD1SS254	DIODE	D652	SVD1SS254	DIODE
D601	SVD1SS254	DIODE	D653	SVD1SS254	DIODE
D602	SVD1SS254	DIODE	D654	SVD1SS254	DIODE
D603	SVD1SS254	DIODE	D655	SVD1SS254	DIODE
D604	SVD1SS254	DIODE	D656	SVD1SS254	DIODE
D605	SVD1SS254	DIODE	D657	SVD1SS254	DIODE
TRANSISTORS					
Q11	2SB1240QTV6	TRANSISTOR			
Q12	2SB1240QTV6	TRANSISTOR			
Q13	2SA1547QSTV3	TRANSISTOR			
Q14	2SD1862-P	TRANSISTOR			
Q15	2SB1240QTV6	TRANSISTOR			
Q16	2SD1862-P	TRANSISTOR			
Q101	2SA1547-Q	TRANSISTOR			
Q141	2SD1862-P	TRANSISTOR			
Q142	2SB1240-P	TRANSISTOR			
Q161	2SD1862-P	TRANSISTOR			
Q162	2SB1240-P	TRANSISTOR			
Q181	2SD1862-P	TRANSISTOR			
Q182	2SB1240-P	TRANSISTOR			
Q201	2SD1862-P	TRANSISTOR			
Q203	2SD1862-P	TRANSISTOR			
Q301	DTC124ES	TRANSISTOR			
Q351	DTA124EST	TRANSISTOR			
Q401	2SD1862-P	TRANSISTOR			
Q402	2SB1240QTV6	TRANSISTOR			
Q403	2SD1862-P	TRANSISTOR			
Q404	2SB1240QTV6	TRANSISTOR			
Q405	DTC124ES	TRANSISTOR			
Q406	DTC124ES	TRANSISTOR			
Q407	DTC124ES	TRANSISTOR			
Q601	DTC124ES	TRANSISTOR			
Q602	DTC124ES	TRANSISTOR			
Q603	DTC124ES	TRANSISTOR			
Q604	DTC124ES	TRANSISTOR			
Q605	DTC124ES	TRANSISTOR			
Q606	DTC124ES	TRANSISTOR			
Q607	DTC124ES	TRANSISTOR			
Q608	DTC124ES	TRANSISTOR			
Q609	DTC124ES	TRANSISTOR			
Q610	DTC124ES	TRANSISTOR			
Q611	DTC124ES	TRANSISTOR			
Q612	DTC124ES	TRANSISTOR			
Q801	2SC3311A-Q	TRANSISTOR			
Q802	2SC3311A-Q	TRANSISTOR			
Q803	2SD1330R	TRANSISTOR			
Q804	2SD1330R	TRANSISTOR			
Q805	2SC3311A-Q	TRANSISTOR			
Q806	2SC3311A-Q	TRANSISTOR			
Q851	DTA124EST	TRANSISTOR			
Q852	DTC124ES	TRANSISTOR			
Q853	DTA114EST	TRANSISTOR			
I.C. PROTECTORS					
ICP1	Δ SRUF38 (E, XA, XB)	I.C. PROTECTOR			
ICP2	Δ SRUF38 (E, XA, XB)	I.C. PROTECTOR			
ICP11	Δ SRUN15 (E, XA, XB)	I.C. PROTECTOR			
ICP12	Δ SRUN15 (E, XA, XB)	I.C. PROTECTOR			
VARIABLE RESISTORS					
VR101	EVND3AA00B53	V.R. BEST EYE ADJ.			
VR102	EVND3AA00B14	V.R. TR GAIN ADJ.			
VR103	EVND3AA00B14	V.R. TR OFFSET ADJ.			

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
T1	△ SLTD5V083X	POWER TRANSFORMER (XA, XB, PC)	S603	EVQQS405K	SW. CH3
			S604	EVQQS405K	SW. CH4
			S605	EVQQS405K	SW. CH5
			S606	EVQQS405K	SW. CH6
			S607	EVQQS405K	SW. CH7
			S608	EVQQS405K	SW. CH8
			S609	EVQQS405K	SW. CH9
			S610	EVQQS405K	SW. CH10
			S611	EVQQS405K	SW. PROGRAM
			S612	EVQQS405K	SW. CANCEL
			S613	EVQQS405K	SW. TIME
			S614	EVQQS405K	SW. REPEAT
			S615	EVQQS405K	SW. RECALL
			S616	EVQQS405K	SW. SKIP(FOR)
			S617	EVQQS405K	SW. SKIP(BACK)
			S618	EVQQS405K	SW. +10
			S619	EVQQS405K	SW(0)
			S620	EVQQS405K	SW. A/B
			S621	EVQQS405K	SW. EDIT
			S622	EVQQS405K	SW. OPEN/CLOSE
			S623	EVQQS405K	SW. STOP/CLEAR
			S624	EVQQS405K	SW. PAUSE
			S625	EVQQS405K	SW. PLAY
			S626	EVQQS405K	SW. SCAN
			S627	EVQQS405K	SW. WARP
			S628	EVQQS405K	SW. LINK
			S651	SSS148	SLIDE SWITCH, TIMER PLAY

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
PACKING MATERIAL					
P1	SPND311	PACKING CASE (E, EG, EB, EH) (E1, EK, XL) (XA, XB, PC)	A1	△ SJA188	POWER CORD (E1)
P1	SPND312	PACKING CASE (EF)	A2	SJP2249-1	OUTPUT CORD
P2	SPSD149	PAD(REAR) (XA, XL)	A3	SJP2257T	CORD, SYNCHRO REC
P3	SPSD148	PAD(FRONT) (E1)	A4	SQUD324	INSTRUCTION MANUAL
P4	XZB50X50A01	PROTECTION BAG (EG)	A4	SQUD326	INSTRUCTION MANUAL
P5	SPSD101	PROTECTION SHEET (EG)	A4	SQUD327	INSTRUCTION MANUAL
P6	XZB23X20C03	PROTECTION BAG (EF)	A4	SQUD328	INSTRUCTION MANUAL
P7	SPSD152	ACCESSORY BOX (E1)	A4	SQUD329	INSTRUCTION MANUAL
ACCESSORIES					
A1	△ SFDAC05E03	POWER CORD (E, EB, EH, EG) (EF, E1)	A4	SQUD330	INSTRUCTION MANUAL
A1	△ SJA168	POWER CORD (XA, PC)	A4	SQULPJ45-KB	INSTRUCTION MANUAL
A1	△ SJA173	POWER CORD (XL)	A4	SQULPJ45-KE	INSTRUCTION MANUAL
A1	△ SJA183	POWER CORD (XA, PC, XB)	A6	△ RJP120ZBS-H	AC PLUG ADAPTOR
			A7	UM-4NE-2P	PRIMARY BATTERY
			A8	SJPD16	OPTICAL OUTPUT CORD

■ RESISTORS AND CAPACITORS

Notes : * Important safety notice :

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

* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Numbering System of Resistor

Example:

Type	25	F	J	102
Type	Wattage (1/4W)	Shape	Tolerance (1kΩ)	Value
ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470Ω)

Numbering System of Capacitor

Example:

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001μF)	Tolerance	Peculiarity
ECEA	50	M	330	
Type	Voltage (50V)	Peculiarity	Value (33μF)	

● Capacity are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF), F = Farads (F).

● Resistance are in ohms (Ω), unless specified otherwise, 1K = 1,000Ω, 1M = 1,000kΩ

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W	J : ±5%
ERG : Metal Oxide	14 : 1/4W	F : ±1%
ERQ : Fuse Type Metal	1A : 1W	G : ±2%
ERX : Metal Film	S2 : 1/4W	J : ±5%
ERL : Carbon (chip)	2F : 1/4W	K : ±10%
ERO : Metal Film (chip)	2A : 2W	M : ±20%
ERC : Solid	6G : 1/10W	
ERF : Incombustible Box-Shaped	8G : 1/8W	
ERM : Wire-Wound		
RRJ : Chip Resistor		
ERJ : Chip Resistor		

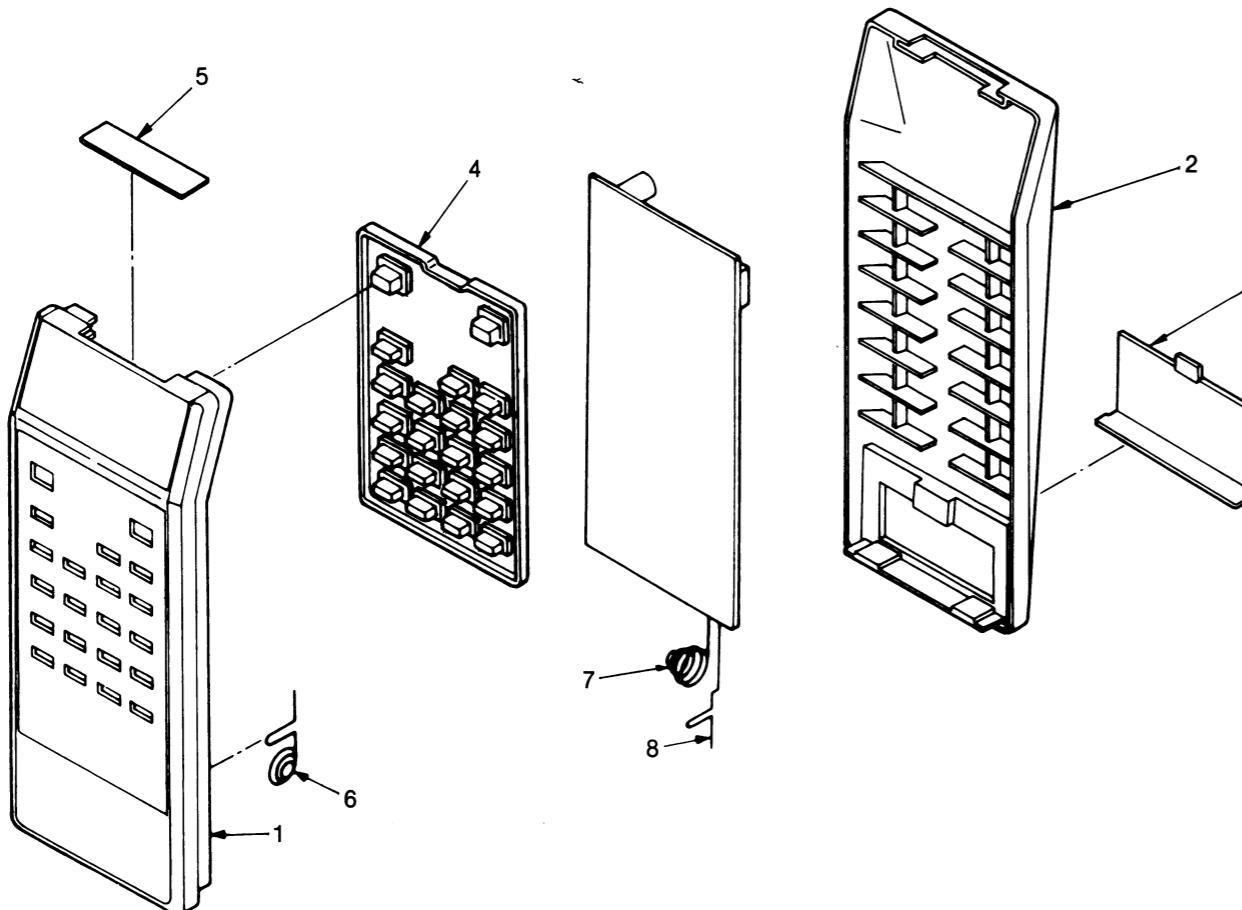
Capacitor Type	Voltage	Tolerance
ECE : Electrolytic	0J : 6.3V	K : ±10%
ECDD : Ceramic	1C : 16V	M : ±20%
ECKD : Ceramic Capacitor	1H : 50V	Z : ±80%
ECPM : Polyester	50 : 50V	-20
ECOP : Polypropylene	2H : 500V	J : ±5%
ECP : Ceramic	1 : 100V	G : ±2%
ECEA : Non Polar Electrolytic	KC : 400V AC	F : ±1%
QCU : Ceramic (Chip Type)	KC : 125V AC	C : ±0.25pF
ECUX : Ceramic (Chip Type)		D : ±0.5pF
ECF : Semiconductor (UL)		
EECW : Liquid electrolyte double layer capacitor		

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
RESISTORS(VALUE,WATTAGE)								
R11	ERDS2TJ101	100 1 4	R148	ERJ6GEYJ104V	100K 1:10	R205	ERJ6GEYJ682V	6.8K 1:10
R12	ERDS2TJ31	330 1 4	R149	ERJ6GEYJ152V	1.5K 1/10	R207	ERJ6GEYJ474V	470K 1:10
R13	ERDS2TJ103	10K 1/4	R150	ERJ6GEYJ103V	10K 1:10	R208	ERJ6GEYJ680V	68 1:10
R14	ERDS2TJ103	10K 1 4	R151	ERJ6GEYJ101V	100 1:10	R214	ERJ6GEYJ471V	470 1:10
R16	ERDS2TJ102	1K 1 4	R152	ERJ6GEYJ153V	15K 1:10	R217	ERJ6GEYJ331V	330 1:10
R17	ERDS2TJ392	3.9K 1 4	R153	ERJ6GEYJ270V	27 1:10	R218	ERJ6GEYJ101V	100 1:10
R18	ERDS2TJ392	3.9K 1 4	R154	ERJ6GEYJ3R3V	3.3 1:8	R219	ERJ6GEYJ103V	10K 1:10
R19	ERDS2TJ332	3.3K 1 4	R161	ERJ6GEYJ333V	33K 1:10	R230	ERJ6GEYJ223V	22K 1:10
R20	ERDS2TJ332	3.3K 1/4	R162	ERJ6GEYJ222V	2.2K 1:10	R231	ERJ6GEYJ273V	27K 1:10
R21	ERD25FVJ221T	220 1 4	R163	ERJ6GEYJ333V	33K 1:10	R232	ERJ6GEYJ681V	680 1:10
R22	ERDS2TJ221	220 1 4	R164	ERJ6GEYJ153V	15K 1:10	R233	ERJ6GEYJ471V	470 1:10
R25	ERDS2TJ821	820 1/4	R165	ERJ6GEYJ122	1.2K 1:10	R301	ERDS2TJ472	4.7K 1:4
R101	ERJ6GEYJ154V	150K 1 10	R166	ERJ6GEYJ102V	1K 1:10	R302	ERDS2TJ472	4.7K 1:4
R102	ERJ6GEYJ472V	4.7K 1 10	R167	ERJ6GEYJ681V	680 1:10	R303	ERDS2TJ472	4.7K 1:4
R103	ERJ6GEYJ472V	4.7K 1 10	R168	ERJ6GEYJ272V	2.7K 1:10	R304	ERDS2TJ472	4.7K 1:4
R104	ERJ6GEYJ223V	22K 1 10	R169	ERJ6GEYJ392V	3.9			

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
R413	ERDS2TJ472	4.7K 1/4	R840	ERDS2TJ561	560 1/4	C227	RCUV1E104ZF	0.1 25
R414	ERDS2TJ472	4.7K 1/4	R841	ERDS2TJ105	1M 1/4	C228	ECUV1E823KB	0.082 25
R415	ERDS2TJ472	4.7K 1/4	R842	ERDS2TJ105	1M 1/4	C230	ECUV1E473KB	0.047 25
R416	ERDS2TJ472	4.7K 1/4	R843	ERDS2TJ331	330 1/4	C301	ECFR1E104ZF5	0.1 25
R417	ERDS2TJ472	4.7K 1/4	R850	ERDS2TJ822	8.2K 1/4	C302	ECBT1C103NS5	0.01 16
R418	ERDS2TJ472	4.7K 1/4	R851	ERDS2TJ102	1K 1/4	C303	ECFR1E104ZF5	0.1 25
R419	ERDS2TJ472	4.7K 1/4	R852	ERDS2TJ102	1K 1/4	C306	ECEA0JS331	330 6.3
R420	ERDS2TJ472	4.7K 1/4	R853	ERDS2TJ333	33K 1/4	C307	ECFR1E104ZF5	0.1 25
R421	ERDS2TJ913T	91K 1/4	R854	ERDS2TJ183	18K 1/4	C308	ECFR1E104ZF5	0.1 25
R422	ERDS2TJ913T	91K 1/4	R855	ERDS2TJ102	1K 1/4	C309	ECBT1C103NS5	0.01 16
R423	ERDS2TJ124	120K 1/4	R856	ERDS2TJ102	1K 1/4	C351	ECBT1H102KB5	0.001 50
R424	ERDS2TJ124	120K 1/4	R857	ERDS2TJ102	1K 1/4	C401	ECEA0JU470	47 6.3
R425	ERDS2TJ101	100 1/4	R858	ERDS2TJ102	1K 1/4	C402	ECFR1E104ZF5	0.1 25
R426	ERDS2TJ101	100 1/4	R862	ERDS2TJ102	1K 1/4	C403	ECFR1E104ZF5	0.1 25
R427	ERDS2TJ223	22K 1/4	CAPACITORS(VALUE,VOLTAGE)			C404	ECFR1E104ZF5	0.1 25
R429	ERDS2TJ472	4.7K 1/4	C1	ECKDK103PF2	0.01 125	C405	ECBT1H102KB5	0.001 50
R431	ERDS2TJ472	4.7K 1/4	C10	ECEA1CU222	2200 16	C406	ECBT1H102KB5	0.001 50
R432	ERDS2TJ101	100 1/4	C11	ECEA1CU222	2200 16	C407	ECEA1HN010	1 50
R433	ERDS2TJ153	15K 1/4	C13	ECEA1AU101	100 10	C409	ECBT1H102KB5	0.001 50
R434	ERDS2TJ393	39K 1/4	C14	ECEA1AU101	100 10	C414	ECBT1C103NS5	0.01 16
R435	ERDS2TJ102	1K 1/4	C15	ECEA0JU470	47 6.3	C416	ECBT1C103NS5	0.01 16
R438	ERDS2TJ100	10 1/4	C16	ECEA1HU470	47 50	C420	ECBT1C103NS5	0.01 16
R440	ERDS2TJ102	1K 1/4	C17	ECEA1VU101	100 35	C421	ECBT1C103NS5	0.01 16
R442	ERDS2TJ102	1K 1/4	C19	ECBT1C103NS5	0.01 16	C422	ECBT1C103NS5	0.01 16
R443	ERDS2TJ102	1K 1/4	C20	ECEA1CU221	220 16	C501	ECUV1E104KB	0.1 25
R501	ERJ6GEYJ104V	100K 1/10	C30	ECBT1H102KB5	0.001 50	C502	ECQM1H104JZP	0.1 50
R502	ERJ6GEYJ562V	5.6K 1/10	C31	ECBT1C103NS5	0.01 16	C503	ECEA1AKK100	10 10
R503	ERJ6GEYJ474V	470K 1/10	C32	ECBT1C103NS5	0.01 16	C504	RCUV1E104ZF	0.1 25
R504	ERJ6GEYJ101V	100 1/10	C101	RCUV1E104ZF	0.1 25	C505	RCUV1E104ZF	0.1 25
R505	ERJ6GEYJ104V	100K 1/10	C102	RCUV1H102KB	0.001 50	C506	RCUV1H150K	15P 50
R506	ERJ6GEYJ333V	33K 1/10	C103	RCUV1H102KB	0.001 50	C507	RCUV1H102KB	0.001 50
R507	ERJ6GEYJ102V	1K 1/10	C104	RCUV1H681KB	680P 50	C508	ECEA1ASN100	10 10
R601	ERDS2TJ104	100K 1/4	C105	RCUV1H471KB	470P 50	C509	RCUV1H100DC	10P 50
R602	ERDS2TJ472	4.7K 1/4	C106	RCUV1H471KB	470P 50	C510	ECUV1E104KB	0.1 25
R603	ERDS2TJ472	4.7K 1/4	C107	RCUV1H220KC	22P 50	C511	ECEA1HKS47	0.47 50
R604	ERDS2TJ472	4.7K 1/4	C108	ECEA1HKK0R1	0.1 50	C512	RCUV1H681KB	680P 50
R605	ERDS2TJ472	4.7K 1/4	C109	ECEA1HKK010	1 50	C513	RCUV1H681KB	680P 50
R606	ERDS2TJ472	4.7K 1/4	C110	ECQM1H104JZP	0.1 50	C514	ECUV1C224KR	0.22 16
R607	ERDS2TJ472	4.7K 1/4	C111	ECEA1AKK100	10 10	C515	RCUV1E153KB	0.015 25
R617	ERDS2TJ103	10K 1/4	C112	ECEA1AKK100	10 10	C516	ECEA1VSN2R2	2.2 35
R801	ERDS2TJ103	10K 1/4	C113	ECEA1HSN010	1 50	C517	RCUV1H471KB	470P 50
R802	ERDS2TJ103	10K 1/4	C114	RCUV1H182KB	0.0018 50	C519	ECUV1C224KR	0.22 16
R803	ERDS2TJ103	10K 1/4	C115	RCUV1H682KB	0.0068 50	C520	RCUV1H472KB	0.0047 50
R804	ERDS2TJ103	10K 1/4	C116	RCUV1E333KB	0.033 25	C601	RCBC1H101KBY	100P 50
R805	ERDS2TJ223	22K 1/4	C117	RCUV1H221KB	220P 50	C602	RCBC1H101KBY	100P 50
R806	ERDS2TJ223	22K 1/4	C118	ECEA1HKK010	1 50	C603	RCBC1H101KBY	100P 50
R807	ERDS2TJ223	22K 1/4	C119	ECEA0JKS220	22 6.3	C604	RCBC1H101KBY	100P 50
R808	ERDS2TJ223	22K 1/4	C120	RCUV1H681KB	680P 50	C801	ECBT1H680K5	68P 50
R809	ERDS2TJ473	47K 1/4	C121	RCUV1E103KB	0.01 25	C802	ECBT1H680K5	68P 50
R810	ERDS2TJ473	47K 1/4	C122	RCUV1H101KC	100P 50	C803	ECBT1H680K5	68P 50
R811	ERDS2TJ473	47K 1/4	C123	RCUV1H101KC	100P 50	C804	ECBT1H680K5	68P 50
R812	ERDS2TJ473	47K 1/4	C125	ECEA0JKS220	22 6.3	C805	ECBT1H470J5	47P 50
R813	ERDS2TJ221	220 1/4	C126	ECEA0JKS470	47 6.3	C806	ECBT1H470J5	47P 50
R814	ERDS2TJ221	220 1/4	C127	RCUV1H102KB	0.001 50	C807	ECBT1H470J5	47P 50
R815	ERDS2TJ474	470K 1/4	C128	RCUV1H102KB	0.001 50	C808	ECBT1H470J5	47P 50
R816	ERDS2TJ474	470K 1/4	C129	RCUV1H681KB	680P 50	C809	ECEA1ENR3S3	3.3 25
R817	ERDS2TJ104	100K 1/4	C141	RCUV1E153KB	0.015 25	C810	ECEA1ENR3S3	3.3 25
R818	ERDS2TJ104	100K 1/4	C142	RCUV1H122KB	0.0012 50	C811	ECBT1H102KB5	0.001 50
R819	ERDS2TJ681	680 1/4	C143	ECUV1E473KB	0.047 25	C812	ECBT1H102KB5	0.001 50
R820	ERDS2TJ681	680 1/4	C144	ECEA1VSN2R2	2.2 35	C813	ECEA1CN220S	22 16
R821	ERDS2TJ473	47K 1/4	C145	ECEA1HSN2R2	0.22 50	C814	ECEA1CN220S	22 16
R822	ERDS2TJ473	47K 1/4	C161	RCUV1E153KB	0.015 25	C815	ECBT1H102KB5	0.001 50
R823	ERDS2TJ331	330 1/4	C162	RCUV1H681KB	680P 50	C816	ECBT1H102KB5	0.001 50
R825	ERDS2TJ273	27K 1/4	C163	RCUV1E103KB	0.01 25	C817	ECEA1HN010	1 50
R826	ERDS2TJ273	27K 1/4	C164	ECEA1ESN3R3	3.3 25	C818	ECEA1HN010	1 50
R827	ERDS2TJ223	22K 1/4	C165	ECEA1HSN0R1	0.1 50	C819	ECBT1H470J5	47P 50
R828	ERDS2TJ223	22K 1/4	C181	ECQM1H474JZ	0.47 50	C820	ECBT1H470J5	47P 50
R829	ERDS2TJ124	120K 1/4	C182	RCUV1H221KB	220P 50	C822	ECBT1H5R6K5	5.6P 50
R830	ERDS2TJ124	120K 1/4	C183	RCUV1H682KB	0.0068 50	C824	ECBT1H5R6K5	5.6P 50
R831	ERDS2TJ472	4.7K 1/4	C184	ECEA1HSN010	1 50	C840	ECFR1E104ZF5	0.1 25
R833	ERDS2TJ102	1K 1/4	C186	ECUV1C224KR	0.22 16	C841	ECEA0JS331	330 6.3
R834	ERDS2TJ102	1K 1/4						

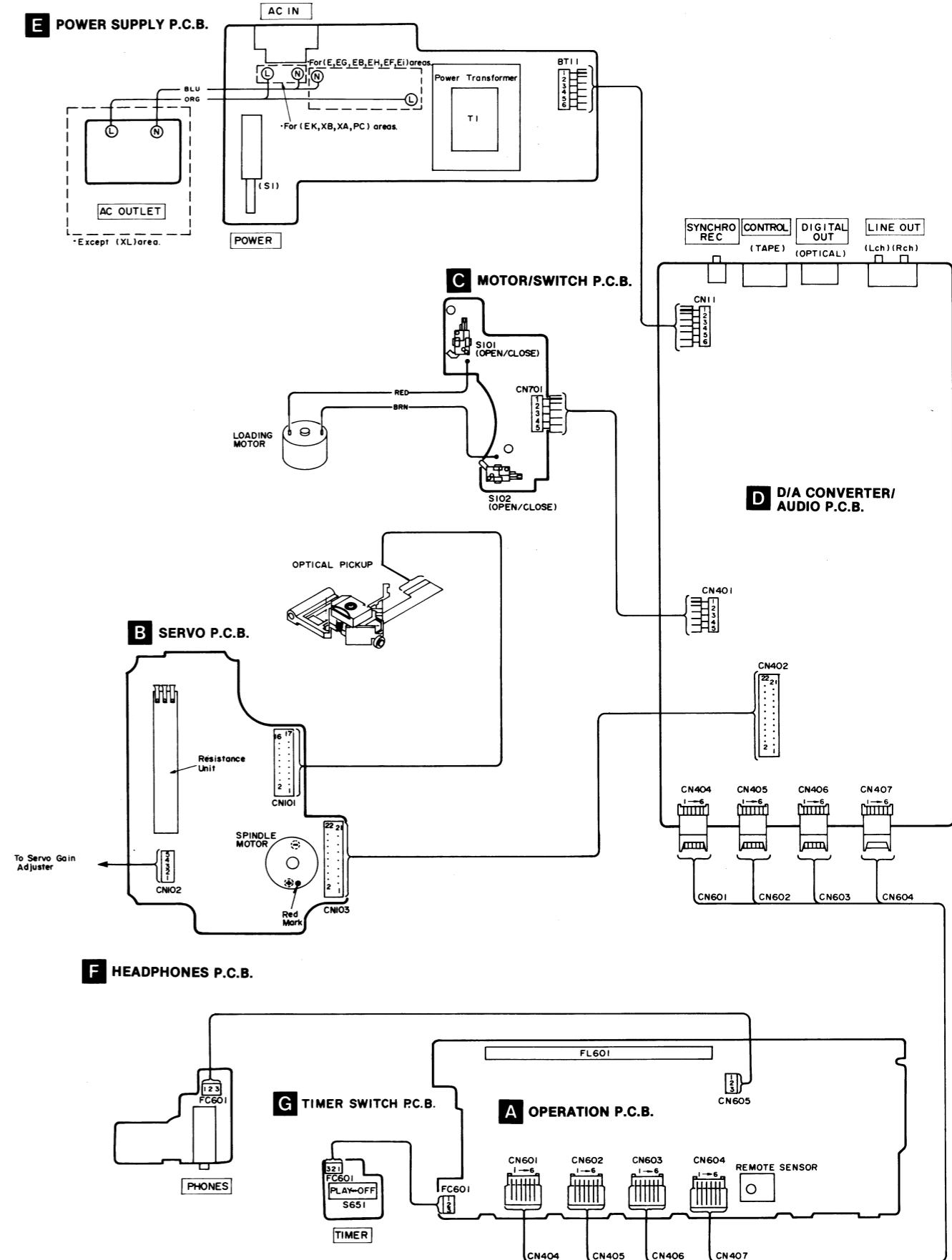
No.	Value.
04ZF	0.1 25
22KB	0.082 25
73KB	0.047 25
04ZF5	0.1 25
03NS5	0.01 16
04ZF5	0.1 25
331	330 6.3
04ZF5	0.1 25
03NS5	0.01 16
02KB5	0.001 50
470	47 6.3
04ZF5	0.1 25
04ZF5	0.1 25
04ZF5	0.1 25
02KB5	0.001 50
02KB5	0.001 50
010	1 50
02KB5	0.001 50
03NS5	0.01 16
04KB	0.1 25
04JZP	0.1 50
K100	10 10
04ZF	0.1 25
04ZF	0.1 25
50K	15P 50
02KB	0.001 50
N100	10 10
000DC	10P 50
04KB	0.1 25
SR47	0.47 50
81KB	680P 50
81KB	680P 50
24KR	0.22 16
53KB	0.015 25
N2R2	2.2 35
71KB	470P 50
24KR	0.22 16
72KB	0.0047 50
01KBY	100P 50
01KBY	100P 50
01KBY	100P 50
01KBY	100P 50
01KBY	100P 50
68P	68P 50
30K5	68P 50
70J5	47P 50
3R3S	3.3 25
3R3S	3.3 25
02KB5	0.001 50
02KB5	0.001 50
22OS	22 16
22OS	22 16
02KB5	0.001 50
02KB5	0.001 50
010	1 50
010	1 50
70J5	47P 50
70J5	47P 50
426K5	5.6P 50
86K5	5.6P 50
42ZF5	0.1 25
331	330 6.3
471	470 6.3
331	330 6.3
100S	10 16
42ZF5	0.1 25
42ZF5	0.1 25
42ZF5	0.1 25

■ REMOTE-CONTROL UNIT PARTS

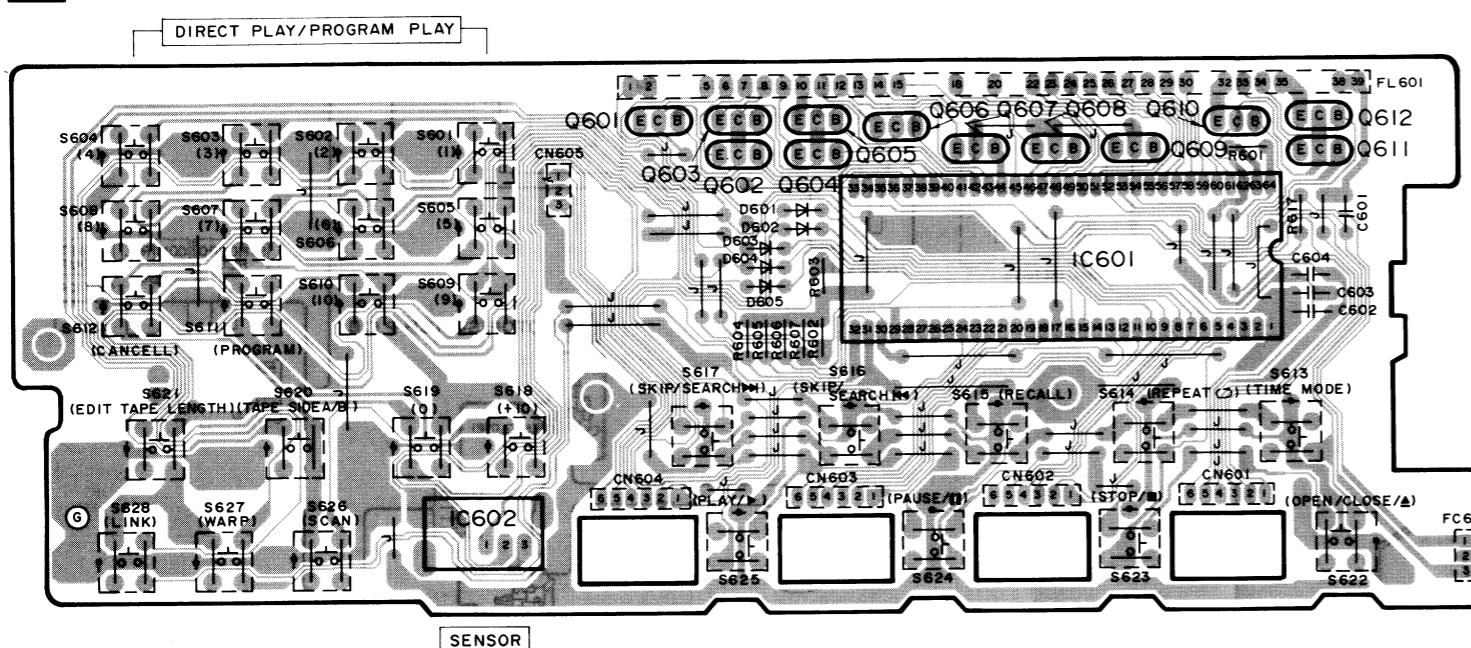


■ REPLACEMENT PARTS LIST

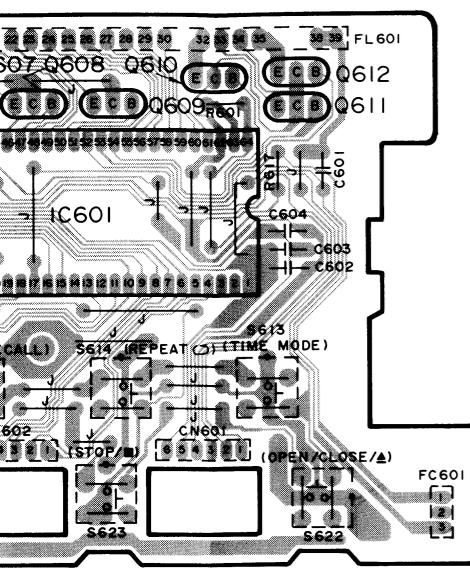
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
REMOTE CONTROL					
IC1	MN6030B	I.C	R1	ERDS2TJ1R0	CARBON, 1Ω, 1.4W
INTEGRATED CIRCUITS					
Q1	UN1231	TRANSISTOR	C1	ECKD1H471KB	CERAMIC, 470PF, 50V
TRANSISTORS			C2	ECKD1H121KB	CERAMIC, 120PF, 50V
Q1	UN1231	TRANSISTOR	C3	ECEA0GK101	ELECTROLYTIC, 100µF, 4V
DIODES			MECHANISM PARTS		
D1	LN66-S	L.E.D	1	UR64VCS571	UPPER CABINET
D2, D3	MA154WK	DIODE	2	UR64CS803A	LOWER CABINET
D4, D5	MA154WK	DIODE	3	UR64EC804	BATTERY COVER
D6, D7	MA154WA	DIODE	4	UR64CT811F	BUTTON
OSCILLATOR			5	UR52SB327	PLATE
X1	CSB420PB1	OSCILLATOR	6	UR64TD374	BATTERY TERMINAL(COMMON)
			7	UR64TD813	BATTERY TERMINAL(-)
			8	UR64TD812	BATTERY TERMINAL(+)
REMOTE CONTROL ASS'Y					
RC1	EUR64790	REMOTE CONTROLLER			



1 2 3 4 5 6 7 8 9 10

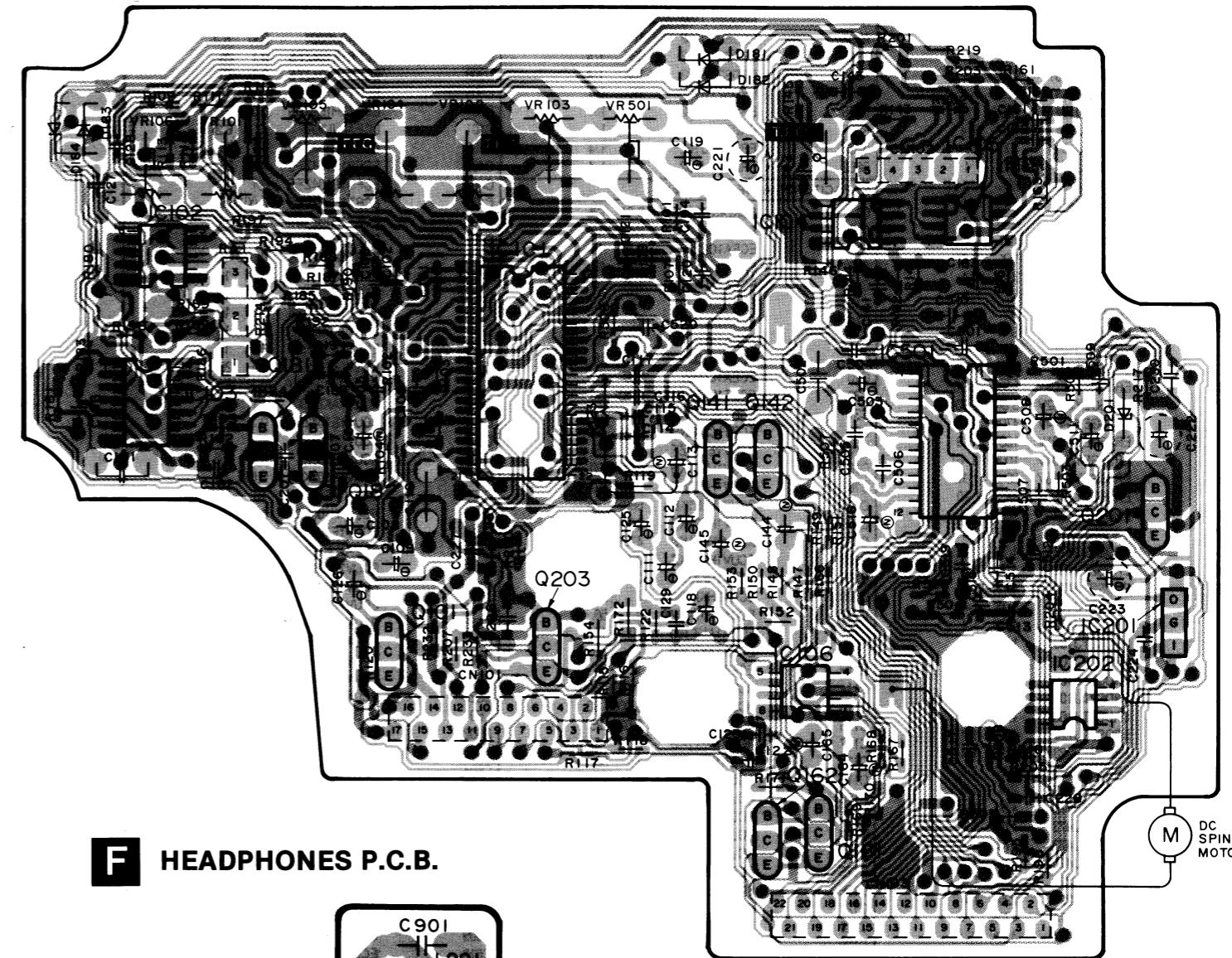
■ PRINTED CIRCUIT BOARDS**A OPERATION P.C.B.**

5 _____ 6 _____ 7 _____ 8 _____ 9 _____ 10 _____ 11 _____ 12 _____ 13 _____ 14 _____

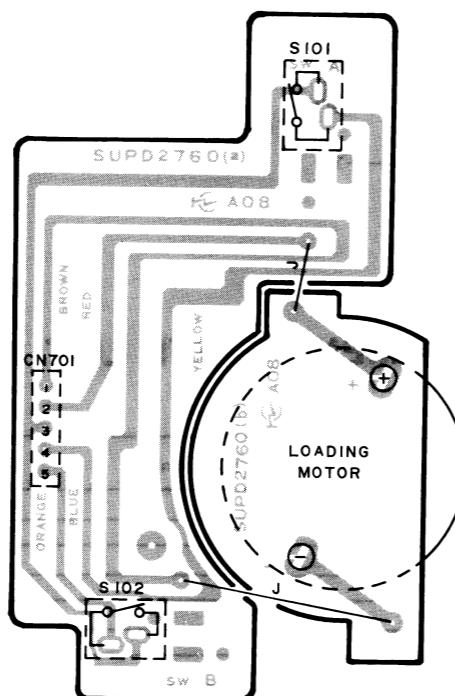
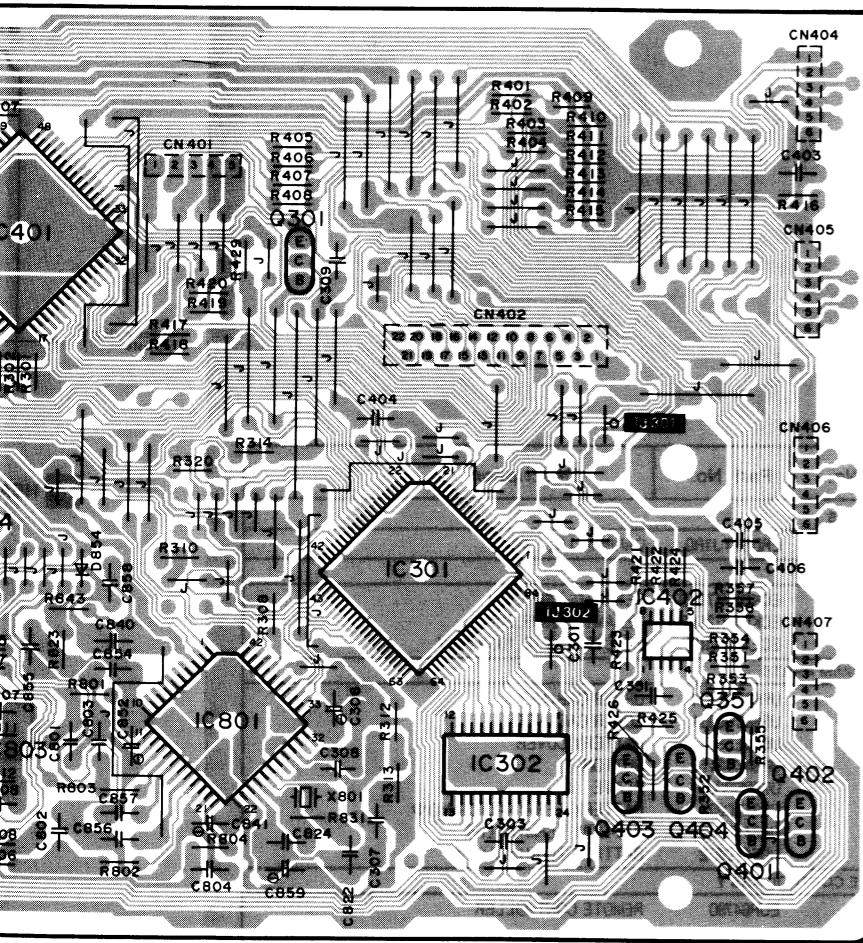


B SERVO P.C.B.

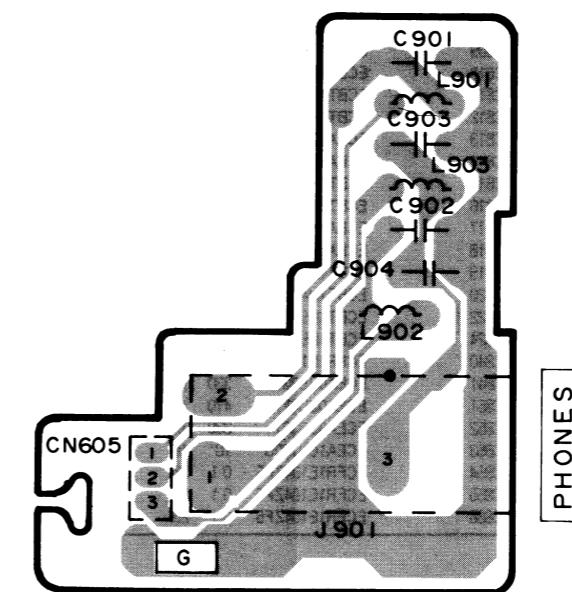
Circuit view on top of P.C.B.



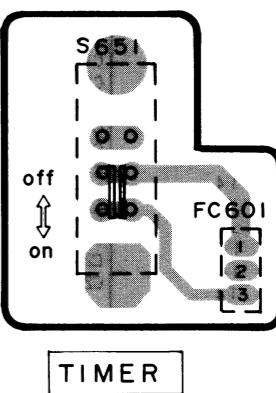
C MOTOR/SWITCH P.C.B



F HEADPHONES P.C.B.

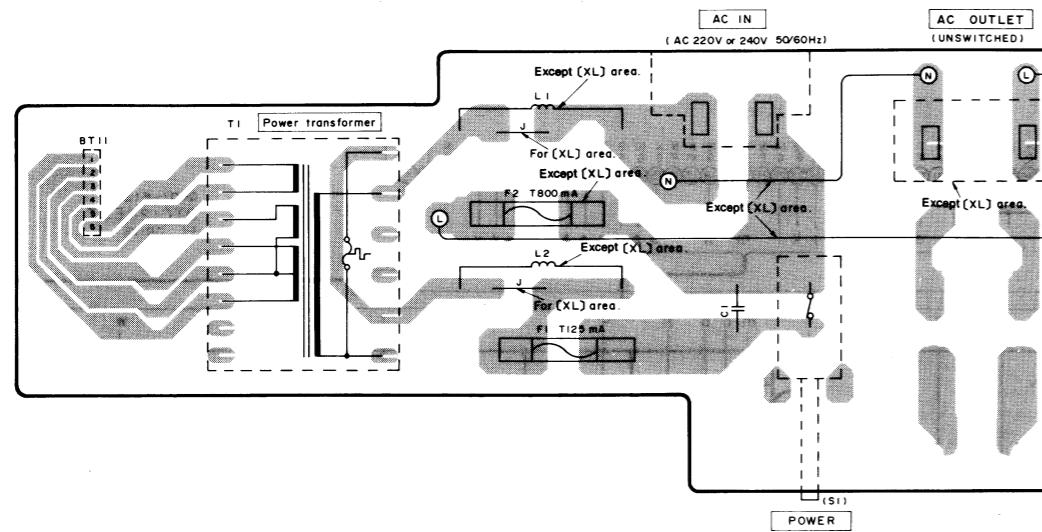


G TIMER SWITCH P.C.B.



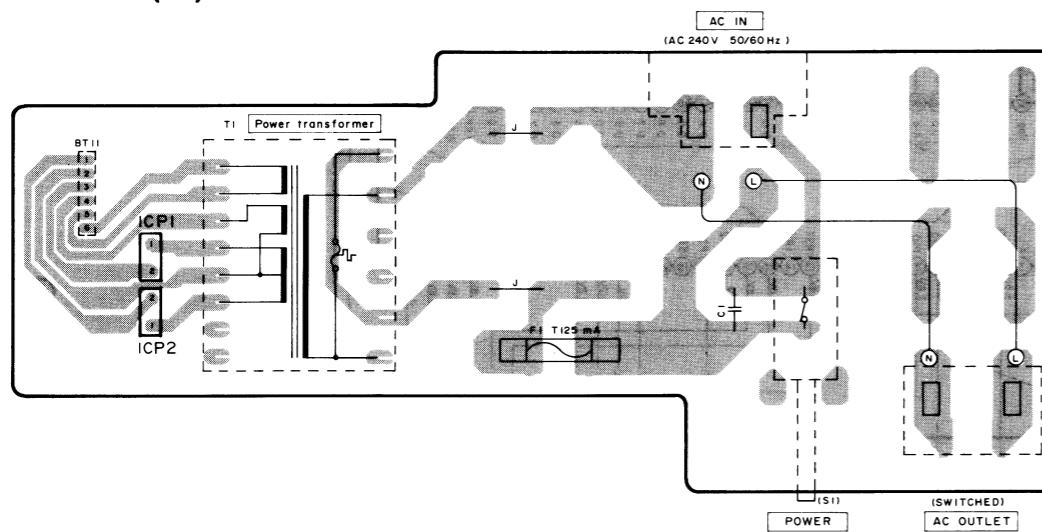
E POWER SUPPLY P.C.B.

- For (E), (EG), (EB), (EH), (EF), (Ei) and (XL) areas



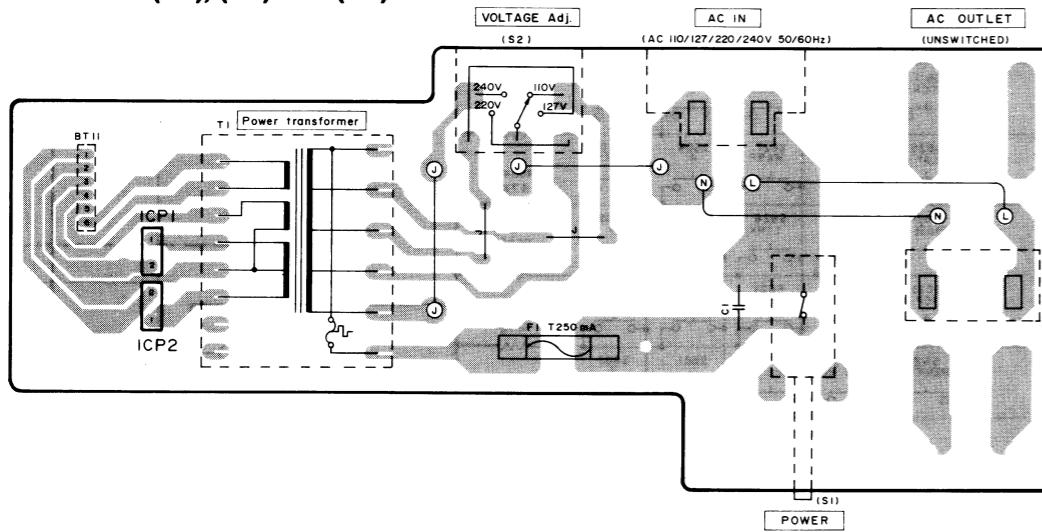
E POWER SUPPLY P.C.B.

- For (EK) area.

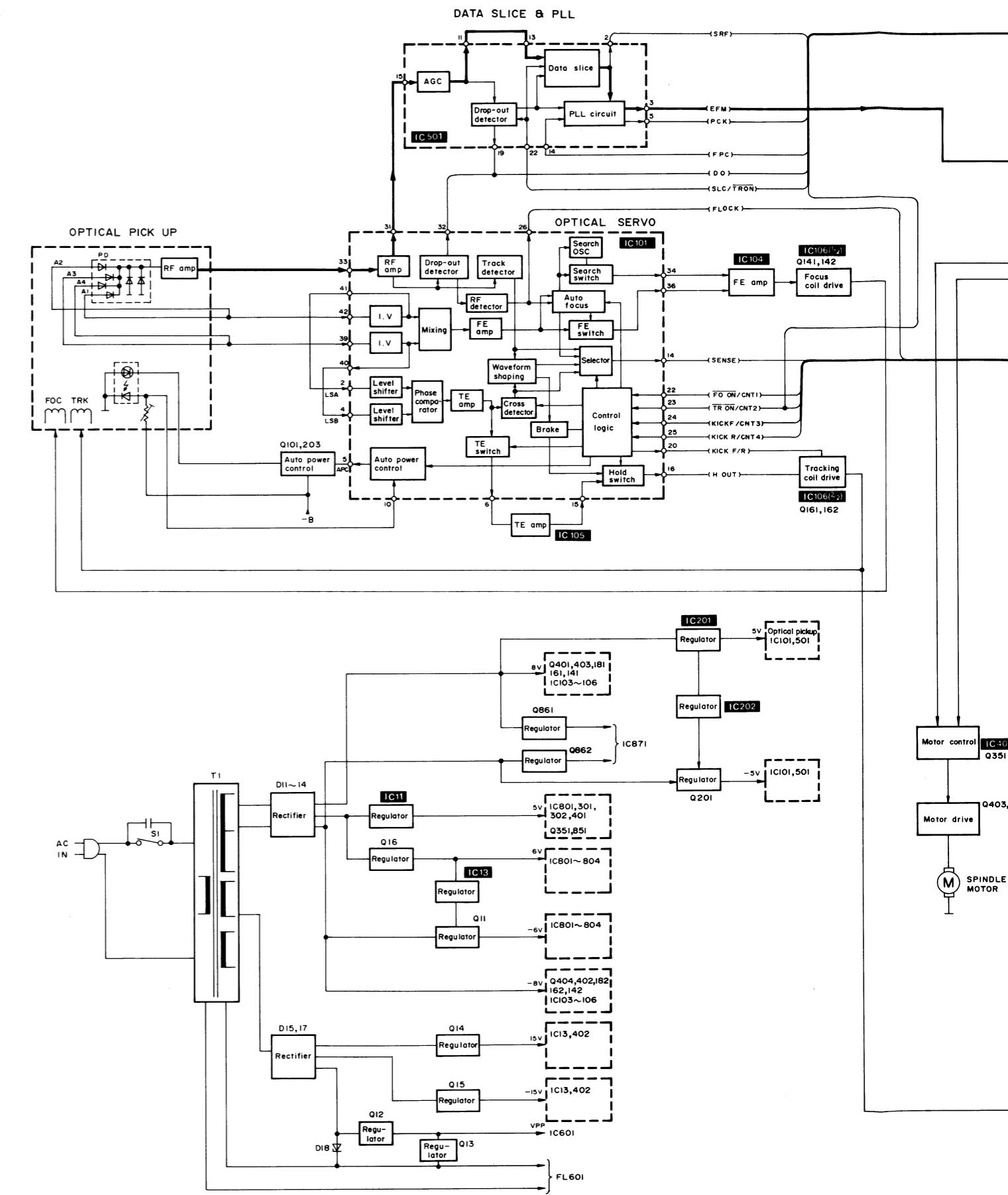


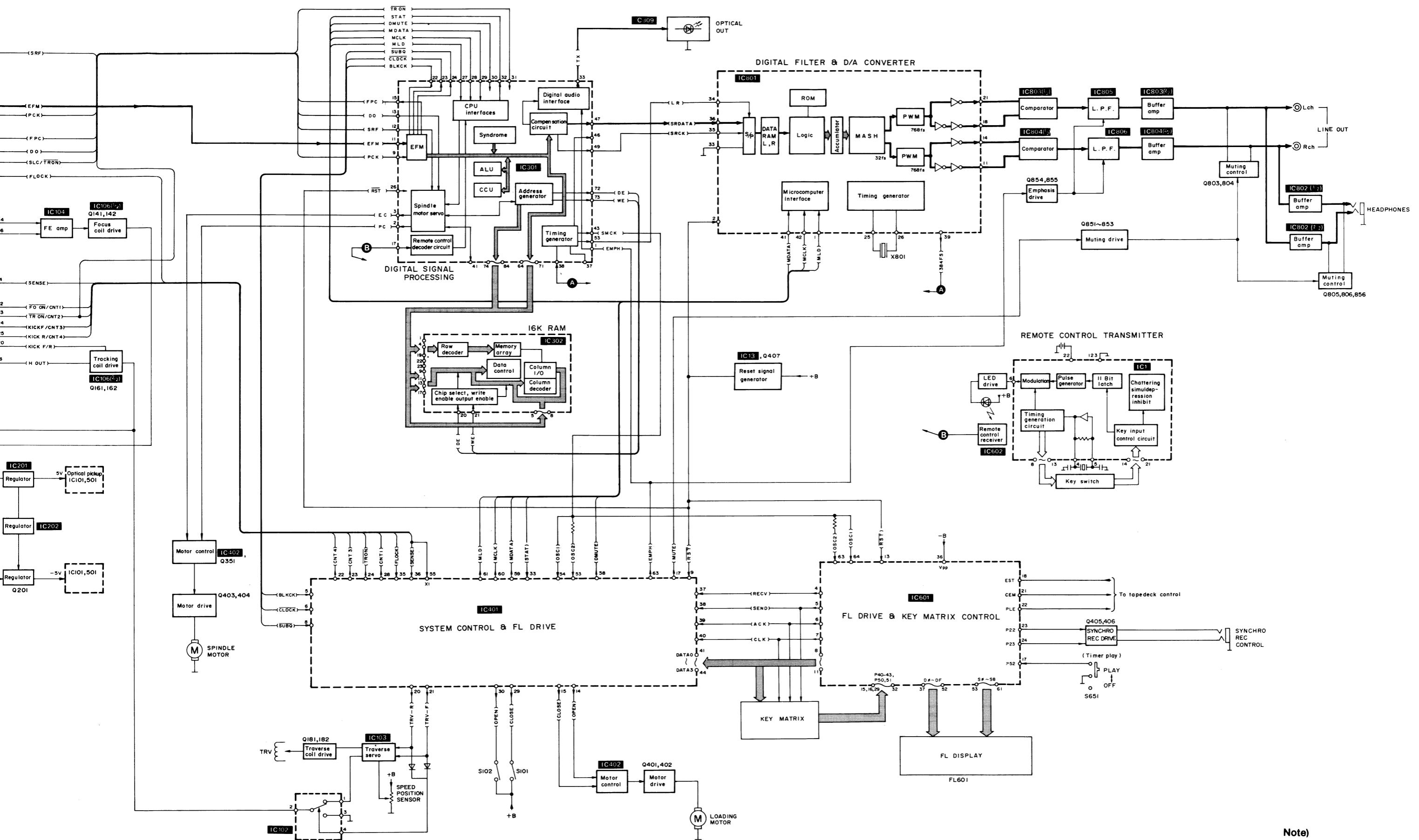
E POWER SUPPLY P.C.B.

- For (XA), (XB) and (PC) areas.



■ BLOCK DIAGRAM

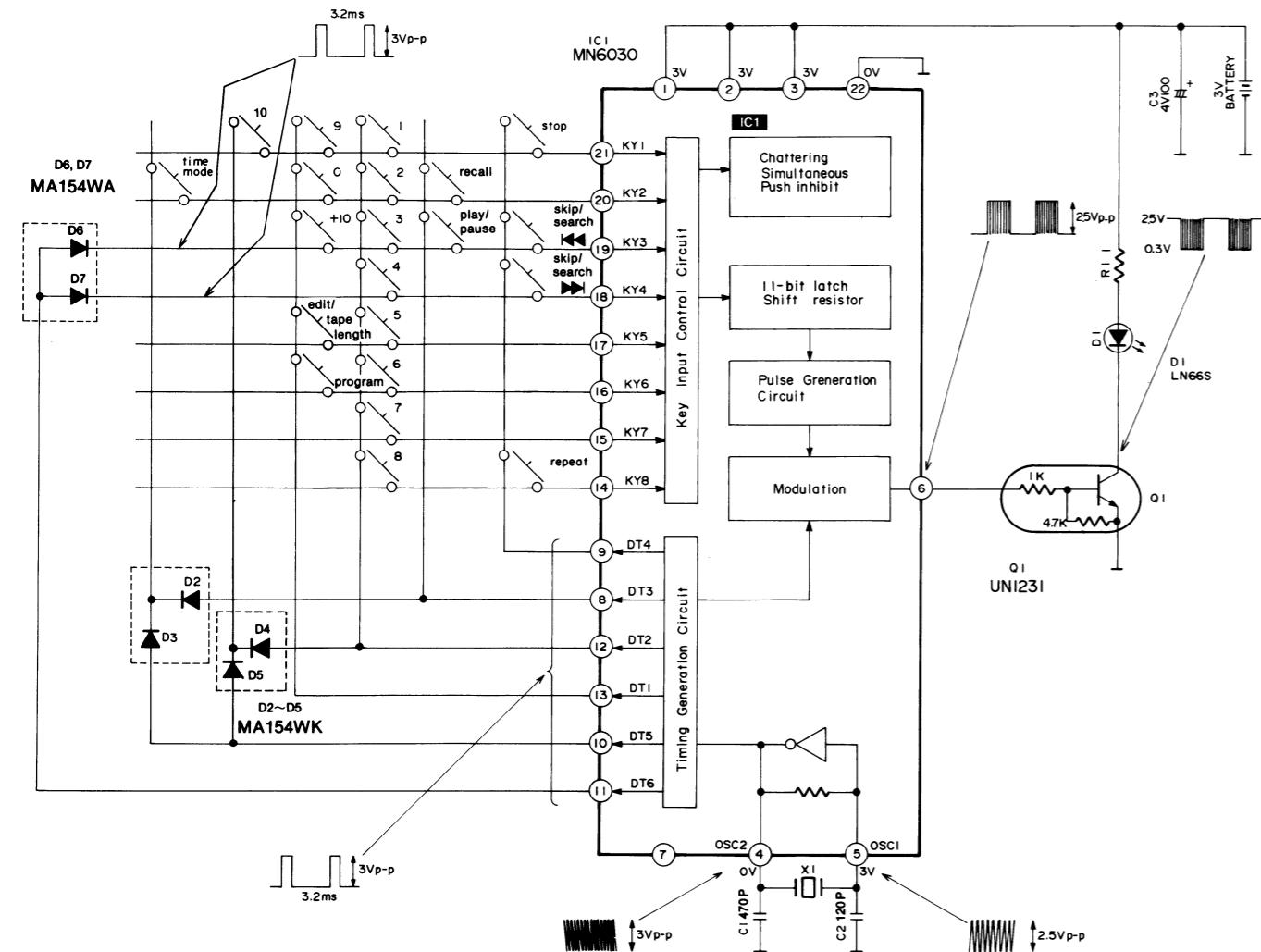




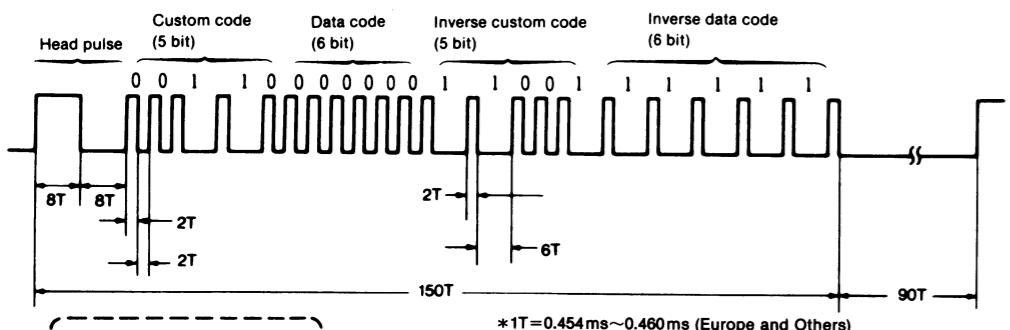
Note)

-  **Audio signal**

■ SCHEMATIC DIAGRAM OF REMOTE-CONTROL TRANSMITTER



• Key number description and data code

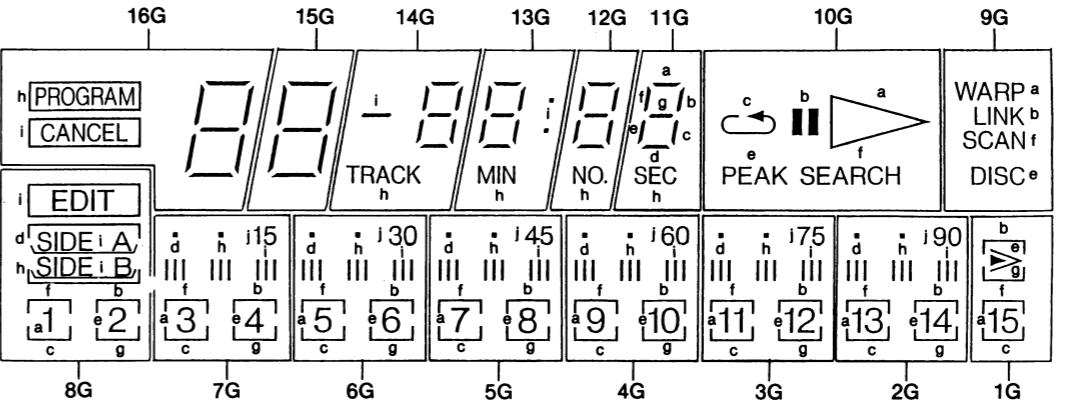


Function	Data Code
stop	000000
◀◀ skip/search	000010
0	010001
+10	010100
▶▶ skip/search	000011
edit/tape length	010011
repeat	000111
▶▶ play/pause	001010
time mode	101001
	110000

*Custom Code: 01100

■ INTERNAL CONNECTION OF FL

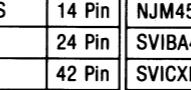
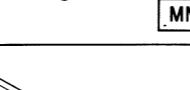
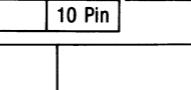
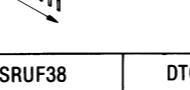
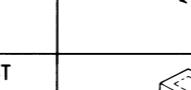
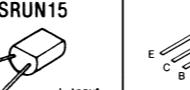
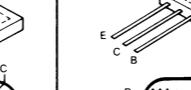
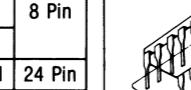
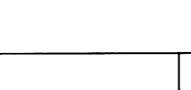
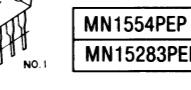
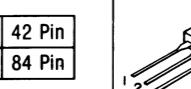
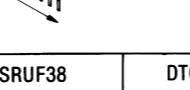
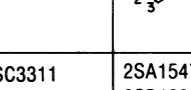
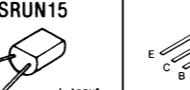
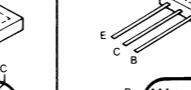
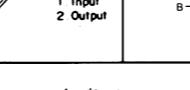
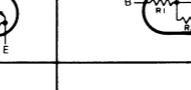
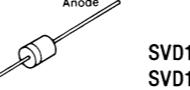
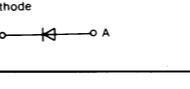
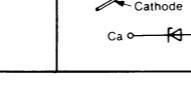
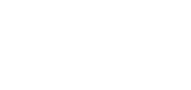
• Grid connection diagram

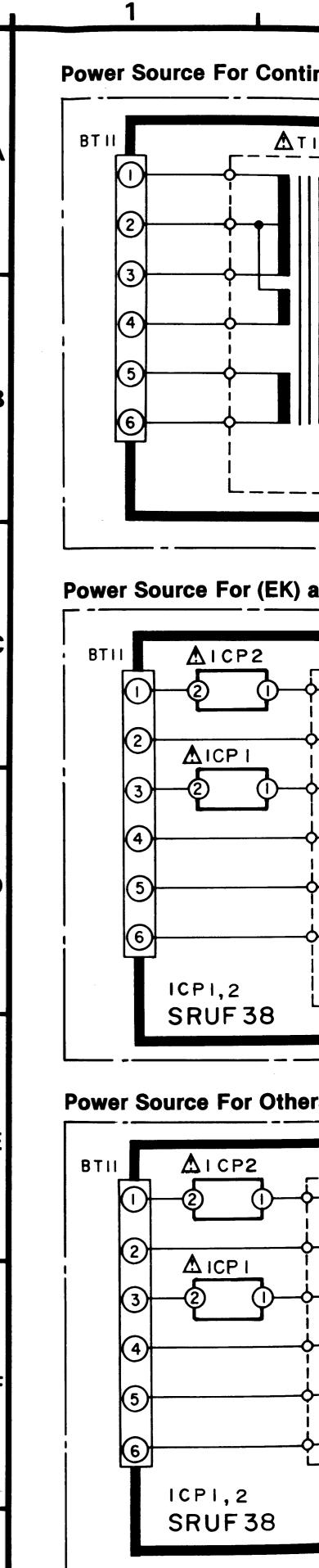


• Anode connection table

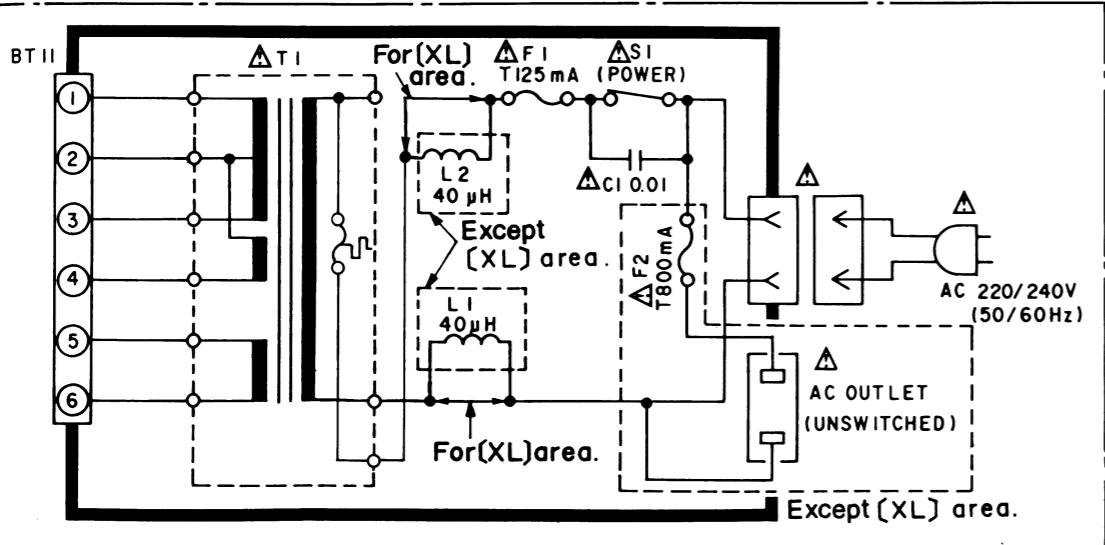
	16G	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	a	a	a	a	a	a	▷	WARP	1	3	5	7	9	11	13	15
b	b	b	b	b	b	b	II	LINK	2	4	6	8	10	12	14	▷
c	c	c	c	c	c	c	◁	—	1	3	5	7	9	11	13	16
d	d	d	d	d	d	d	—	—	III	III	III	III	III	III	III	—
e	e	e	e	e	e	e	PEAK	DISC	2	4	6	8	10	12	14	▷
f	f	f	f	f	f	f	SEARCH	SCAN	1	3	5	7	9	11	13	16
g	g	g	g	g	g	g	—	—	2	4	6	8	10	12	14	▷
h	PROGRAM	—	TRACK	MIN	NO.	SEC	—	—	III	III	III	III	III	III	III	—
i	CANCEL	—	—	•	—	—	—	—	SIDE A	SIDE B	EJECT	—	—	—	—	—
j	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

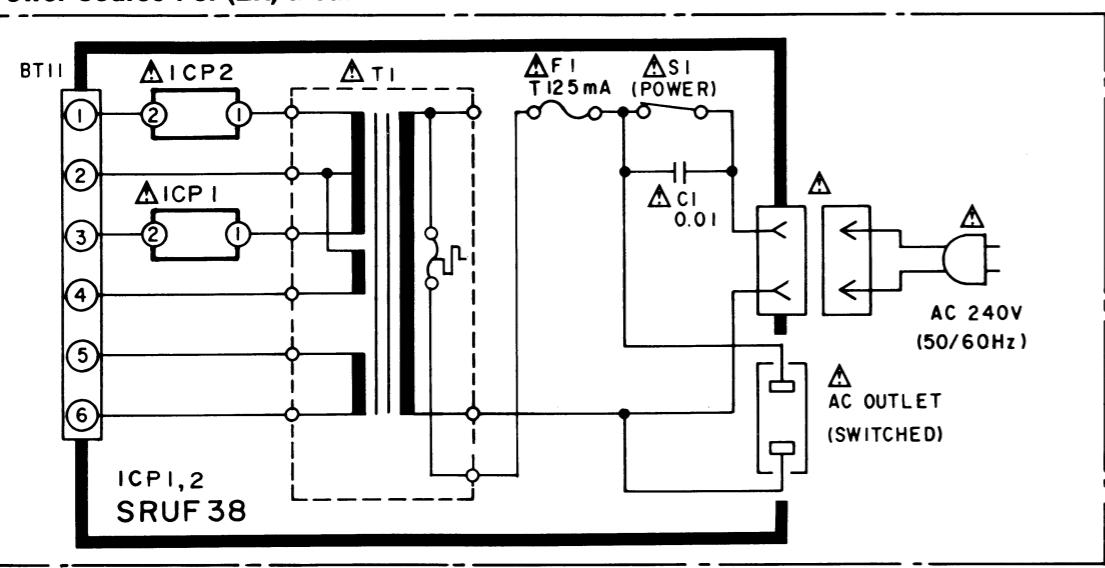
 NO.1	AN6552S 8 Pin	 NO.1	LM833M 8 Pin
 NO.1	AN6554NS 14 Pin	 NO.1	NJM4560M 24 Pin
 NO.1	AN8371S 24 Pin	 NO.1	SVIBA4558F 24 Pin
 NO.1	AN8370S 42 Pin	 NO.1	SVICXK5816M 24 Pin
 NO.1	MN6636 10 Pin	 NO.1	MN1554PEP 64 Pin
 NO.1	MN15283PEM 64 Pin	 NO.1	MN6623 42 Pin
 NO.1	MN6622 84 Pin	 NO.1	LM2940T5
 NO.1	SVI8HDN2175 5 Pin	 NO.1	MN6623 42 Pin
 NO.1	SVI8HDN2175 5 Pin	 NO.1	MN6622 84 Pin
 NO.1	SRUF38 SRUN15	 NO.1	DTC124EST
 NO.1	SRUF38 SRUN15	 NO.1	DTC124EST
 NO.1	DTC124EST	 NO.1	DTA114EST
 NO.1	DTA114EST	 NO.1	2SC3311
 NO.1	2SC3311	 NO.1	2SA1547 2SD1330R
 NO.1	2SA1547 2SD1330R	 NO.1	2SB1238
 NO.1	2SB1238	 NO.1	2SD1862
NO.1	2SD1862	NO.1	2SB1240
NO.1	2SB1240	NO.1	MA4330M
NO.1	MA4330M	NO.1	MA4062
NO.1	MA4062	NO.1	MA4033M
NO.1	MA4033M	NO.1	MA4056M
NO.1	MA4056M	NO.1	MA4150M
NO.1	SVD1SR35200A	NO.1	SVD1SS254
NO.1	SVD1SS254	NO.1	Anode Cathode
NO.1	Anode Cathode	NO.1	Anode Cathode



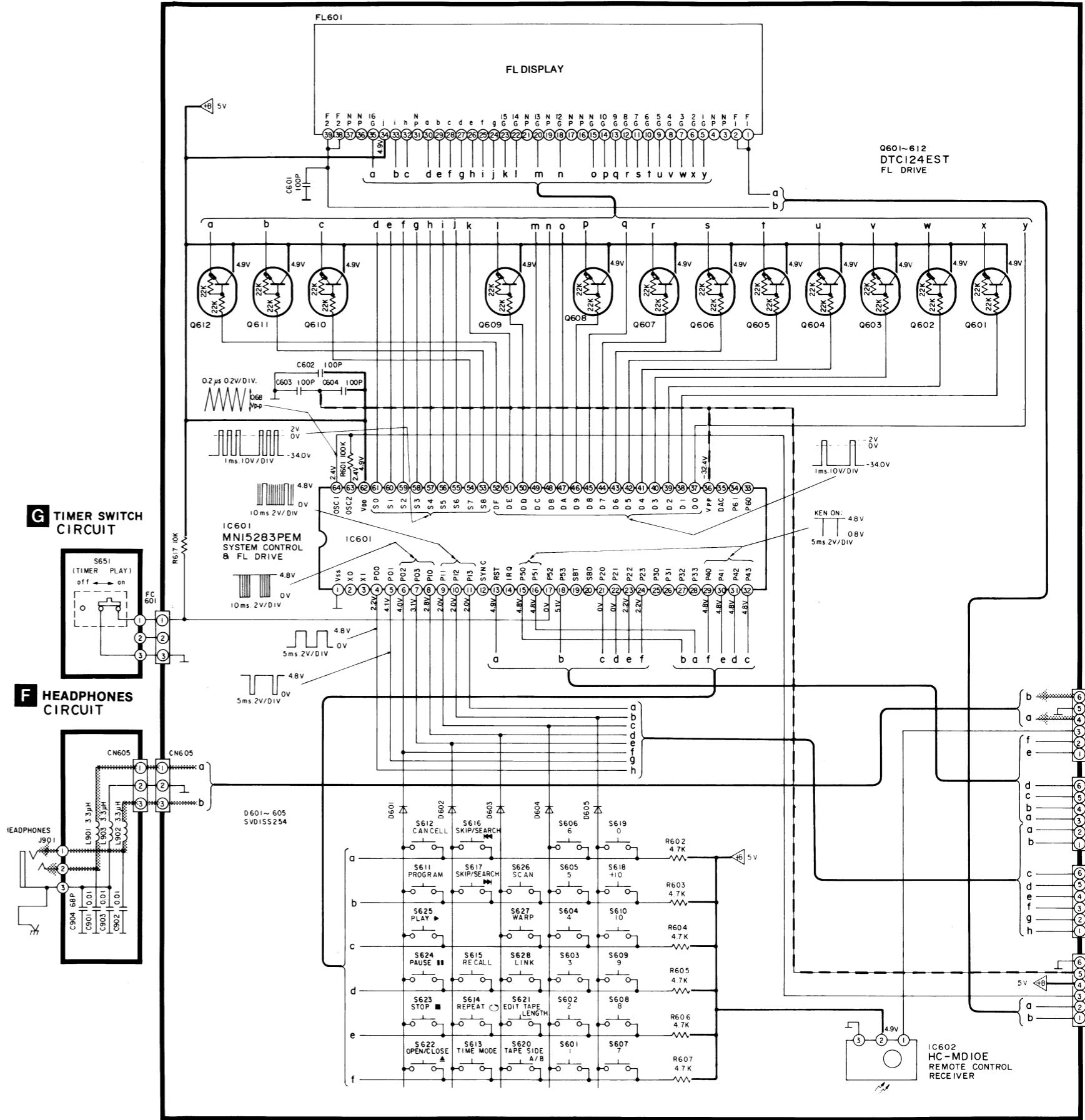
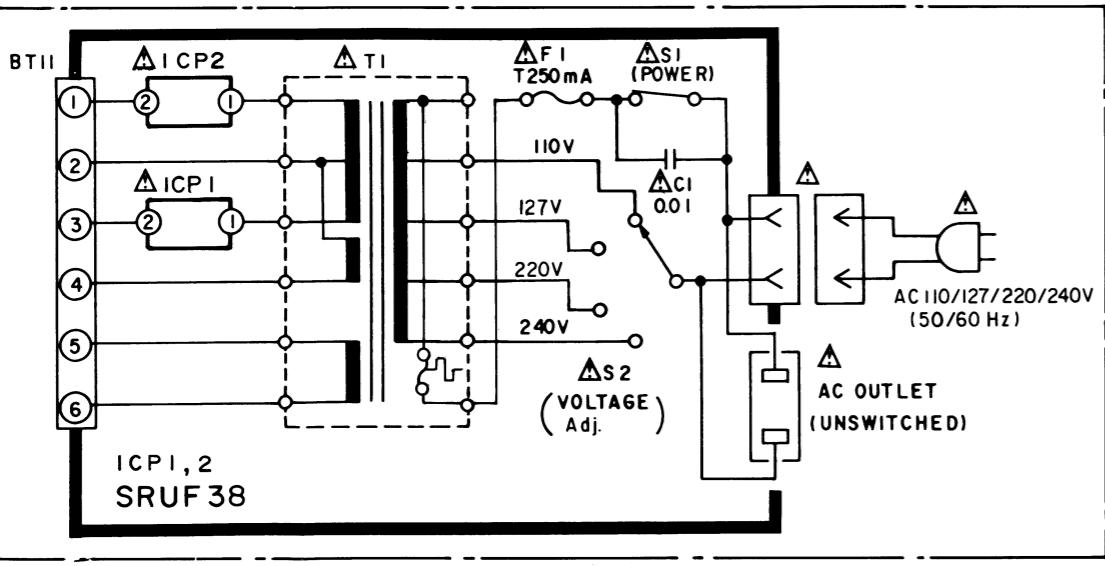
Power Source For Continental Europe and Australia.

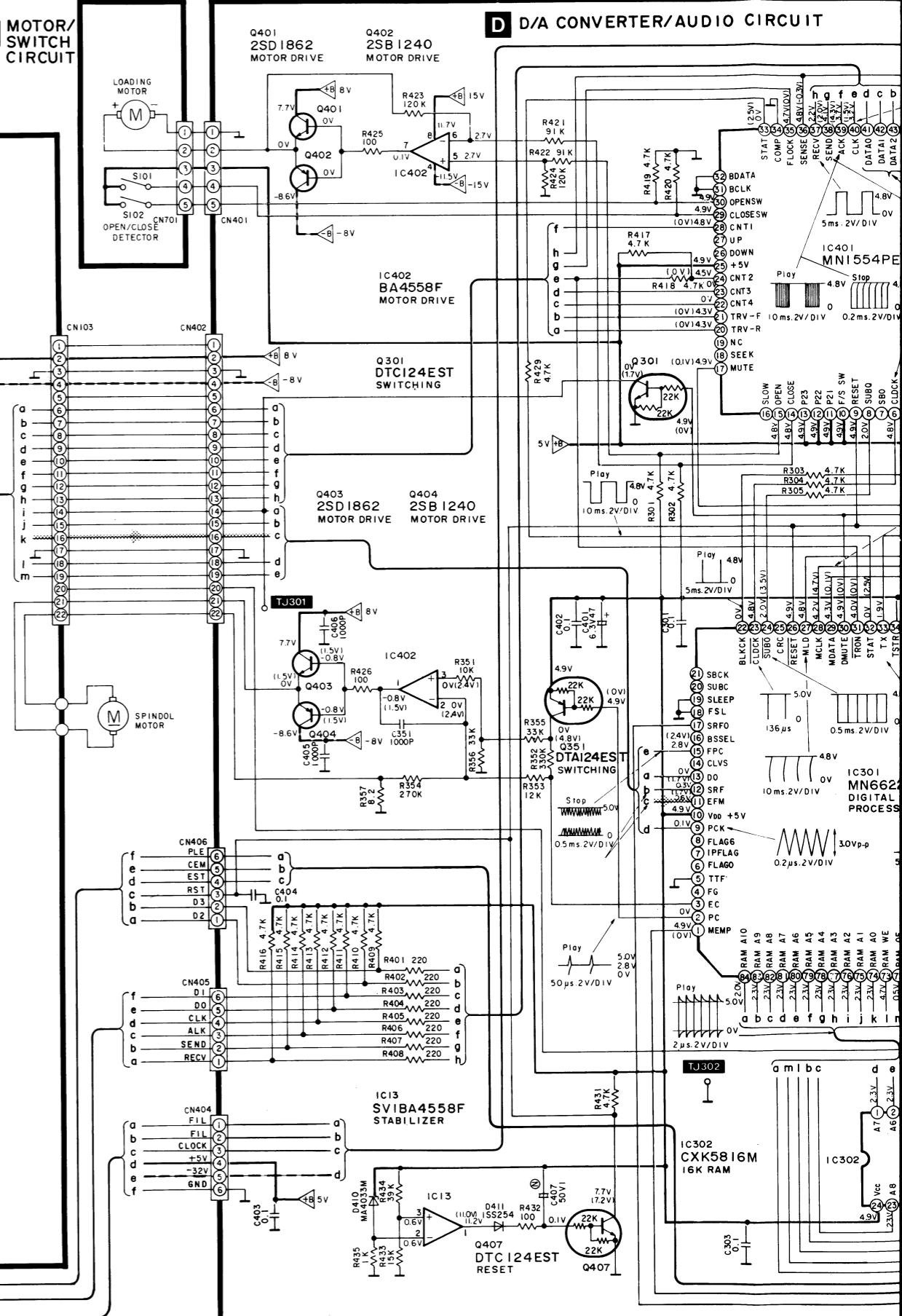
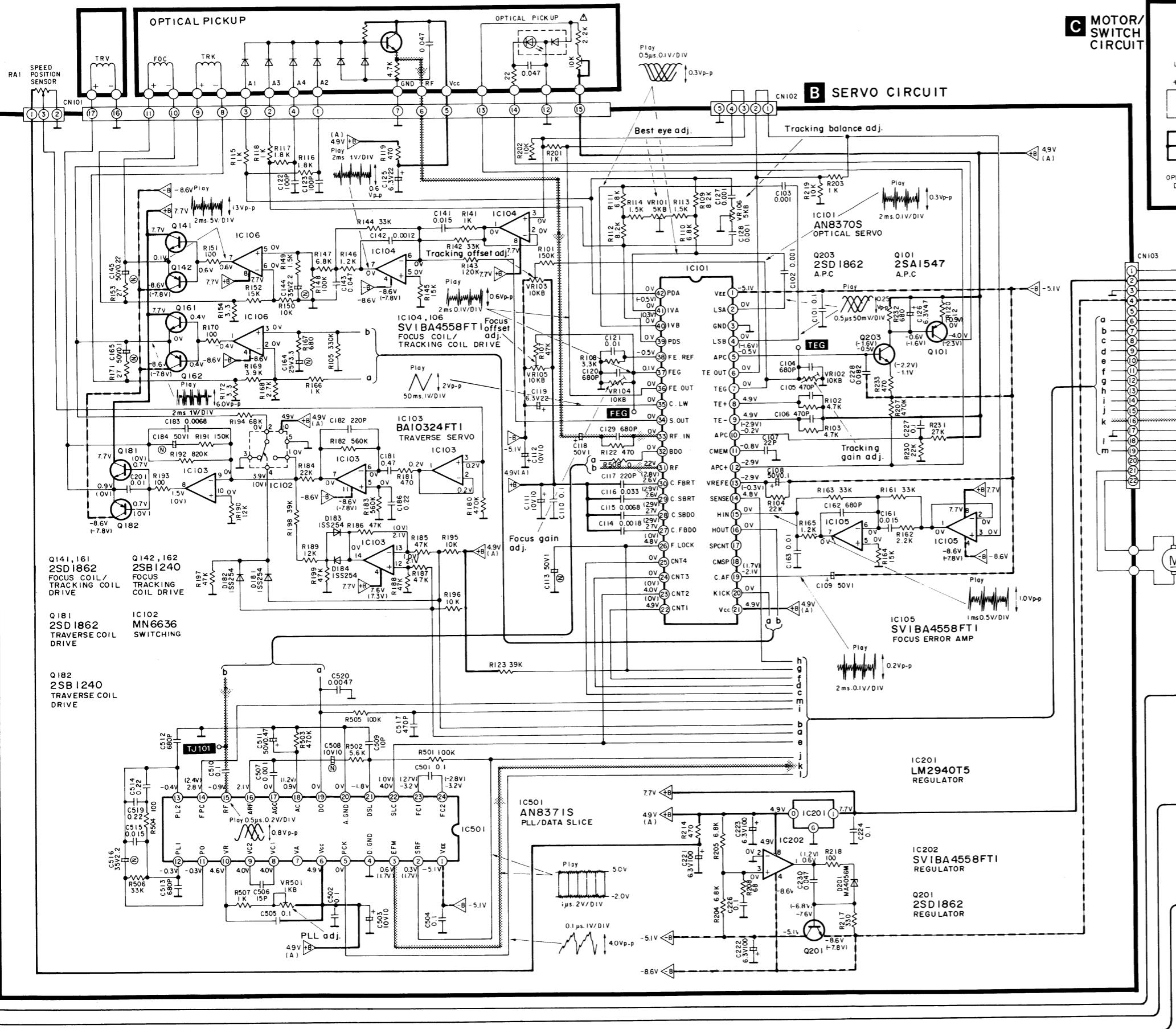


Power Source For (EK) area.



Power Source For Others.





E POWER SUPPLY CIRCUIT

■ SCHEMATIC DIAGRAM

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

Notes:

- S1 : Power switch in "on" position.
- S2 : Voltage selector switch.
(For [XA], [XB] and [PC] only.)
- S101 : Disc holder open/close detection switch.
- S102 : Disc holder open/close detection switch.
- S601~S610, : Numeric switch.
618, 619 [S601: 1, S602: 2, S603: 3, S604: 4,
S605: 5, S606: 6, S607: 7, S608: 8,
S609: 9, S610: 10, S618: +10, S619: 0]
- S611 : Programmed-play switch.
- S612 : Cancel switch.
- S613 : Time-mode select switch.
- S614 : Repeat switch.
- S615 : Recall switch.
- S616 : Forward skip/search switch.
- S617 : Backward skip/search switch.
- S620 : Tape-side select switch.
- S621 : Compact-disc edit switch.
- S622 : Disc tray open/close switch.
- S623 : Stop switch.
- S624 : Pause switch.
- S625 : Play switch.
- S626 : Music scan switch.
- S627 : Warp switch.
- S628 : Link switch.
- S651 : Timer stand-by switch.
- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.
Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
- * The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.
- Important safety notice:
Components identified by \triangle 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 !

- 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.

REPLACEMENT PARTS LIST (Mechanical parts)

Notes : * Important safety notice :

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

* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)

Parts without these indications can be used for all areas.

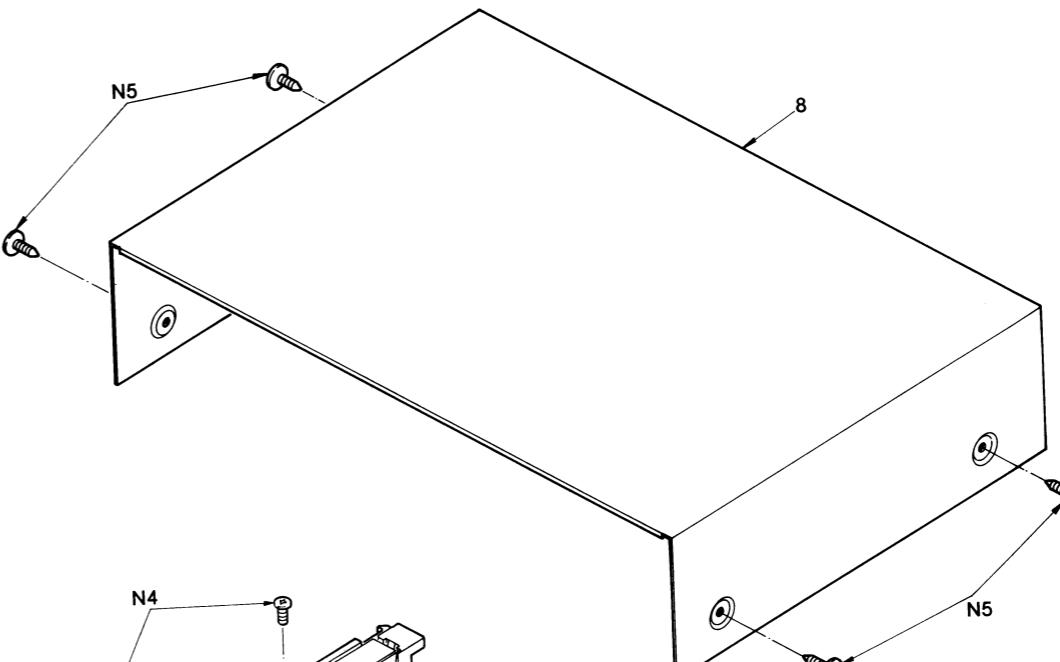
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description			
CABINET AND CHASSIS								
1 (E)	SGPD750ZF0A	REAR PANEL	21	SJT30640LX-V	CONNECTOR(6P)			
1 (EK)	SGPD750ZF1A	REAR PANEL	22	SJT30543-V	CONNECTOR(5P)			
1 (XL)	SGPD750ZF2A	REAR PANEL	23	SJSD2221	CONNECTOR			
1 (XB)	SGPD750ZF3A	REAR PANEL	24	SJS402	SOCKET(4P)			
1 (XA)	SGPD750ZF4A	REAR PANEL	25	SJS50680WL	CONNECTOR(6P)			
1 (PC)	SGLPJ45-KC	REAR PANEL	26	SHRD166	FL HOLDER			
1 (EG)	SGLPJ45-KG	REAR PANEL	27	SJT30647WL	CONNECTOR(6P)			
1 (EH, EB, EF)	SGLPJ45-KH	REAR PANEL	28	SJJ134B	JACK			
(E1)			30	△ SJS9225	AC OUTLET (E, EG, EB, EH) (EF, E1)			
2	SKL307	FOOT	30	△ SJS923B	AC OUTLET (XA, PC)			
4 (XA, PC)	SJS930A	AC OUTLET COVER	30	△ SJS933B	AC OUTLET (EK)			
4 (EK)	SJS932A	AC OUTLET COVER	31	SJT347	FUSE HOLDER			
6	SBC666-1	BUTTON	32	VJA7135	CAP			
7	SUBD16	ROD	33	△ SJSD16	AC INLET			
8	SKCD660KF	CABINET COVER	33	△ SJS9236	AC INLET (E, EG, EB, EH) (EF, EK, XB) (XA, PC, E1)			
9	SGWLPJ45-KE	FRONT PANEL ASS.Y	34	SUWD99	BRACKET			
10	SGYLPJ45-KE	FRONT GRILLE ASS.Y	SCREWS, WASHERS AND NUTS					
18	SBD143	KNOB	N1	XTB3+6G	SCREW			
19	SJFD4	OUTPUT TERMINAL(PHONO)	N2	XTB3+6J	SCREW			
20	SJJ130-3	JACK	N3	XTB3+6JFZ	SCREW			
			N4	XTB3+6F	SCREW			
			N5	SNE2129-1	SCREW			
			N6	XTB3+6G	SCREW			

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
LOADING MECHANICAL					
101	SGXD3130ZK0A	ORNAMENT	130	SURD13	ROLLER
102	S1SD22-1	TRaverse BASE	131	SDG058	MAIN GEAR
103	S00D29-1E	TURNTABLE	132	SDG059-2	GEAR
103-1	XXE26D5	SCREW	133	S1RD94-E	LOADING MOTOR
104	S00D29-2	RING	134	XTB3+10G	SCREW
106	SRQA010N04	SPRING	135	SMBD7	BELT
107	SORD37	ROLLER	136	S1RD101-1	LOADING BASE SHAFT
108	SORD38-E	COIL	137	SFUMZ15R61	WASHER
109	SUXD123-1	GUIDE SHAFT	138	SDRD14	ROLLER
110	△ SOAD70A	OPTICAL PICKUP	139	XTB3+6G	SCREW
111	SHRD176-E	COIL HOLDER	140	S1RD93E	ROD
112	SNSD35	SCREW	141	S1RD99	TRAY BASE
113	SHGD148	STOPPER	142	S1RD40-2	RACK GEAR
114	SOYD21-E	Yoke (AxA)	143	S1RD96	LOCK LEVER
115	SOYD22	Yoke (BxB)	144	SFUMZ15R61	WASHER
116	SHRD177-1	LOCK UNIT	145	S1RD98	DISC TRAY
117	SHWD33	WASHER	146	SUSD83	SPRING
118	SHWD34	WASHER	147	SFXGQ06N01	SCREW
119	SNSD31	SCREW	148	S1WD105	BRACKET
120	XTV2+5G	SCREW	149	SJGDRF310T-2	SPINDLE MOTOR
121	XYN2+C8	SCREW	150	S1RD51	HOLDER
122	XYN2+J6	SCREW	151	S1RD42-2	CLAMPER
123	SHGD153-1	CUSHION RUBBER	152	S0MD4	MAGNET
124	SUSD136-1	SPRING	153	SOYD2	Yoke
125	SUSD137-1	SPRING	154	S1KD150051	FLAT CABLE
126	SNSD33	SCREW	155	S1KD150221-1	FLAT CABLE
127	SIWLP150-KM	LOADING BASE	156	SHRD150	ROLLER HOLDER
128	SUSD145-1	SPRING	157	SJSD1722	CONNECTOR
129	SUWD112	GUIDE SHAFT HOLDER	158	SJSD2222	CONNECTOR(CN103)
			159	SJT30543-V	CONNECTOR(5P)
			160	SDRD12	ROLLER

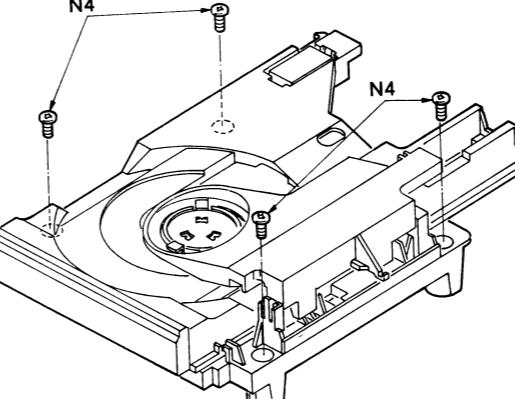
EXPLODED VIEWS

Cabinet and chassis parts

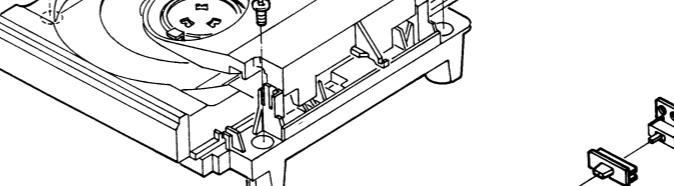
A



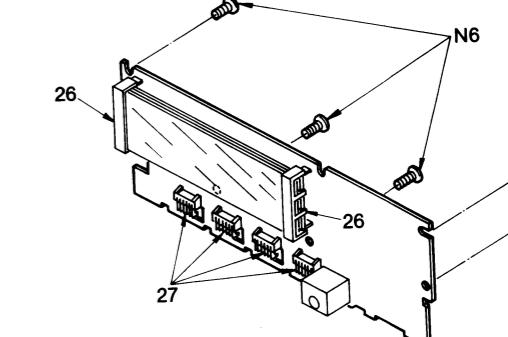
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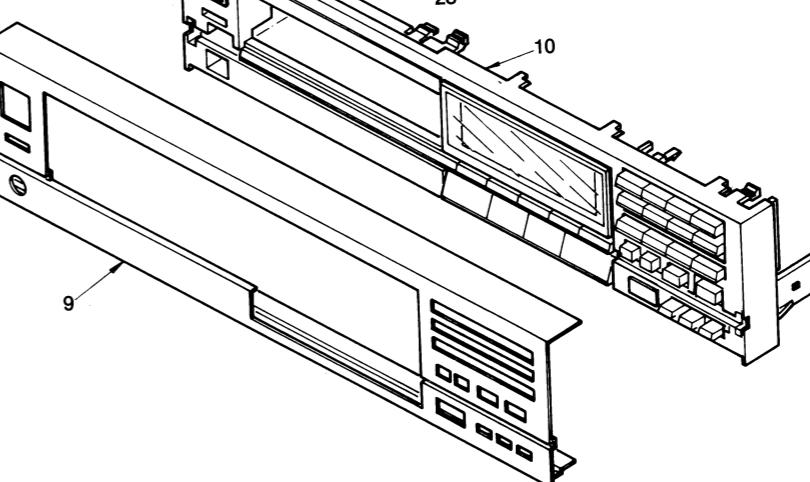
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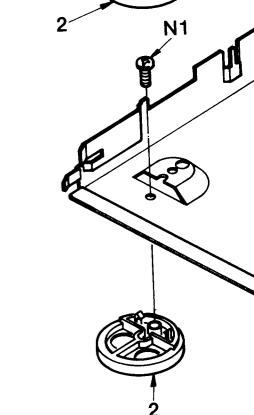
D



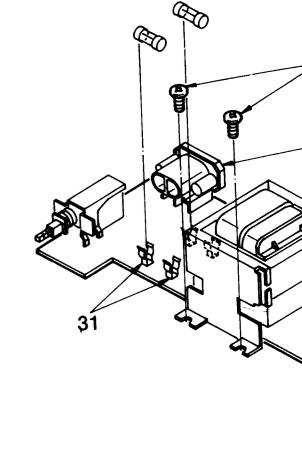
E

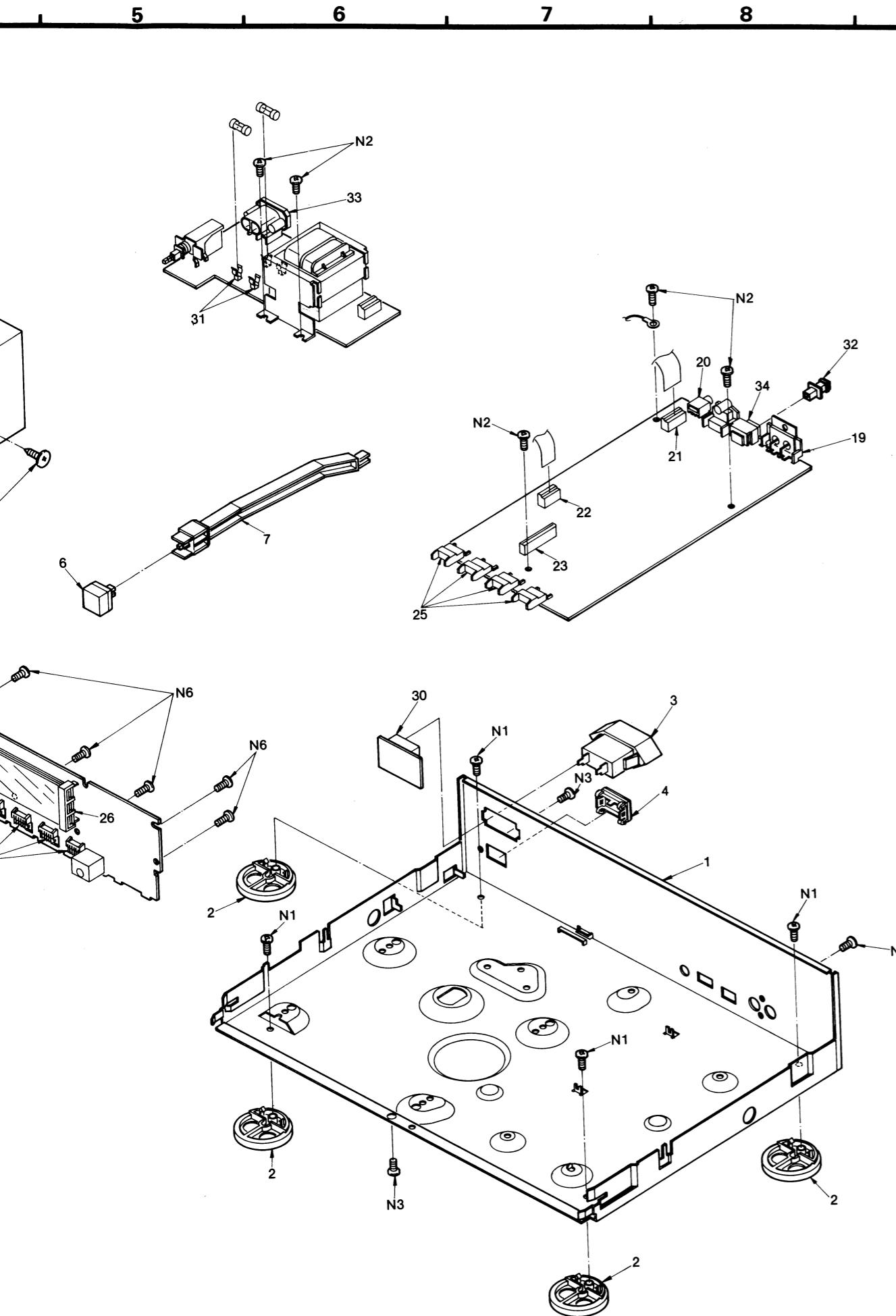


F



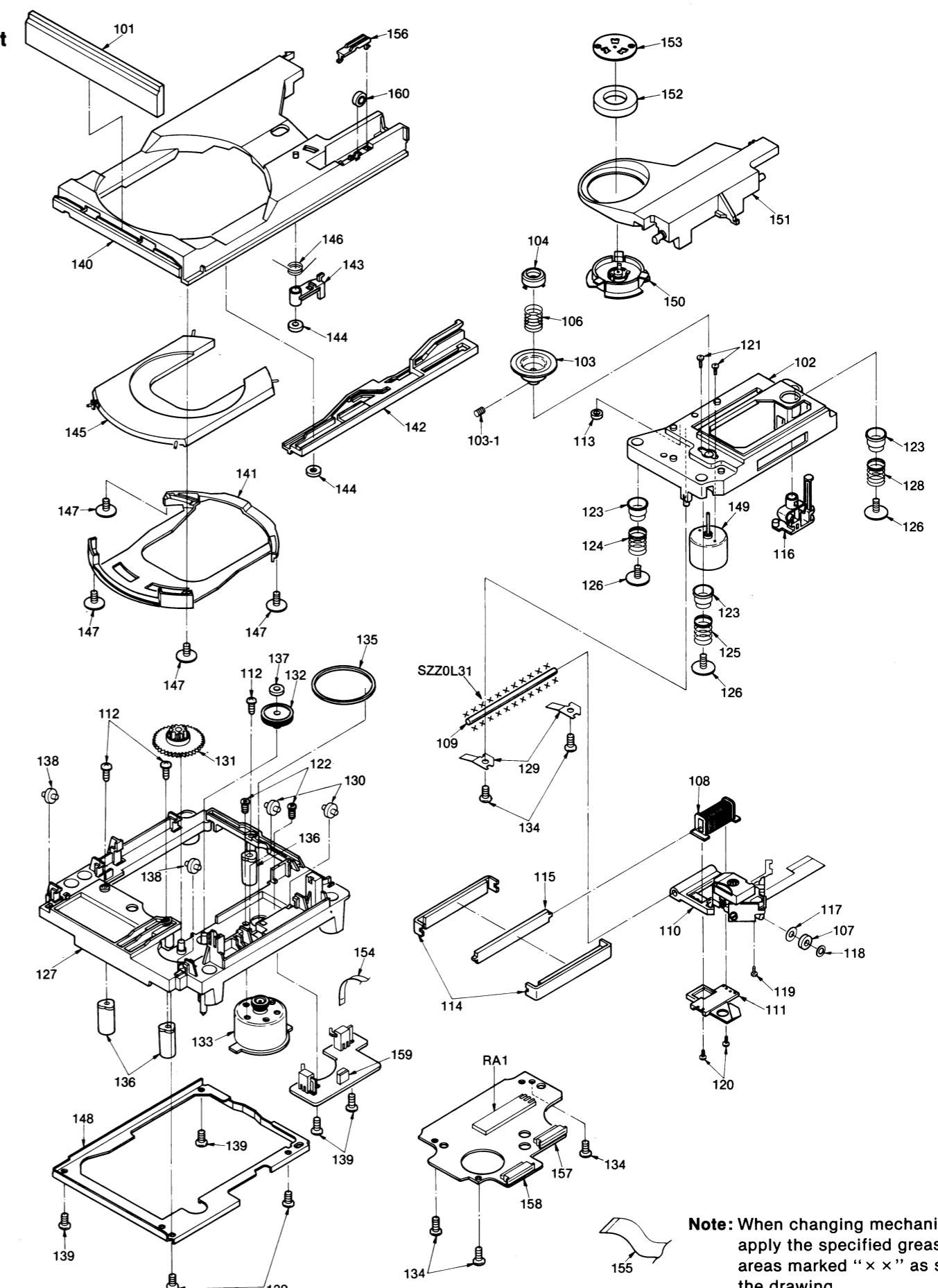
G





— 47 —

• Loading unit

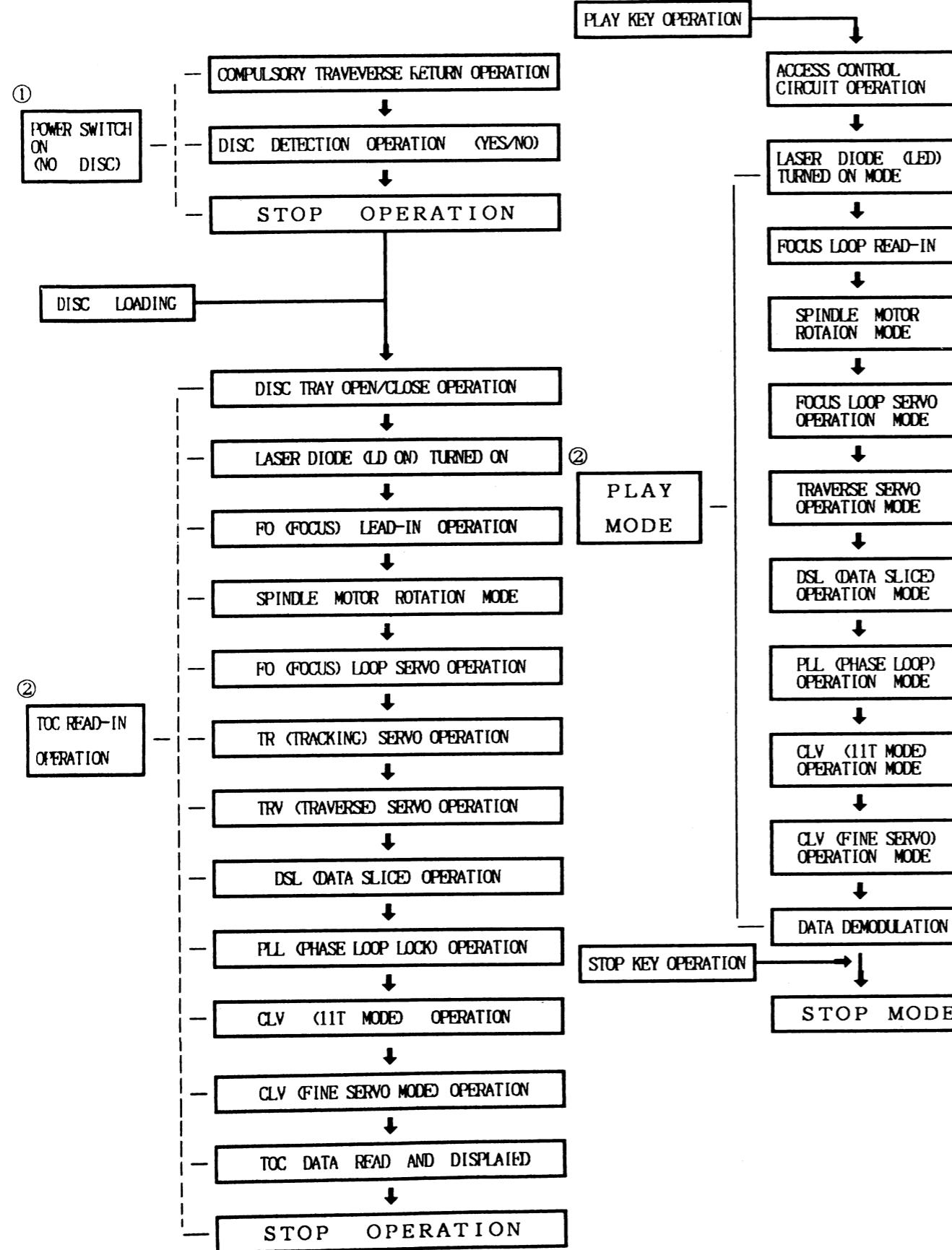


— 48 —

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

■ TROUBLESHOOTING GUIDE

PLAYBACK FLOW CHART



① POWER S/W ON MODE OPERATION

INDIVIDUAL CONDITIONS CONTROL BLOCK/ MAJOR PARTS OBSERVATION POINTS

POWER SWITCH (S1) ON MODE

DOES DISPLAY LIGHT UP?

① Power Circuit
IC-11 (LM2940)
IC-13 (BA4558)
IC-201 (LM2940T5)
Q11 (2SB1240), Q12 (2SB1240)
Q13 (2SA1547), Q14 (2SD1862), Q15 (2SB1240)
② Microprocessor Circuit
IC-601 (MN15283PEM)
IC-401 (MN1554PEP)

① Microprocessor Circuit
IC-601 (MN15283PEM)
IC-401 (MN1554PEP)
② Loading Motor Drive
Motor (MN-6FBC8S)
IC-402 (BA4558)
Q401 (2SD1862)
Q402 (2SB1240)
③ Close Switch (SSPD17)

① Traverse Servo Circuit
IC-102 (AN6636)
IC-103 (AN6654NS)
Q181 (2SD1862)
Q182 (2SB1240)
② Traverse Coil (SOR038-ED)
③ Speed Position Sensor
(W57LOA00053)

FOCUS LEAD-IN OPERATION
(IF THERE IS NO DISC LOADED
OR NO FUNCTION, OPERATION
STOPS IN ABOUT 5 SEC)

② TOC READ OPERATION ~ PLAY OPERATION

INDIVIDUAL CONDITIONS CONTROL BLOCK/MAJOR PARTS OBSERVATION POINTS

PRESS THE OPEN/CLOSE SWITCH
TO OPEN THE DISC TRAY

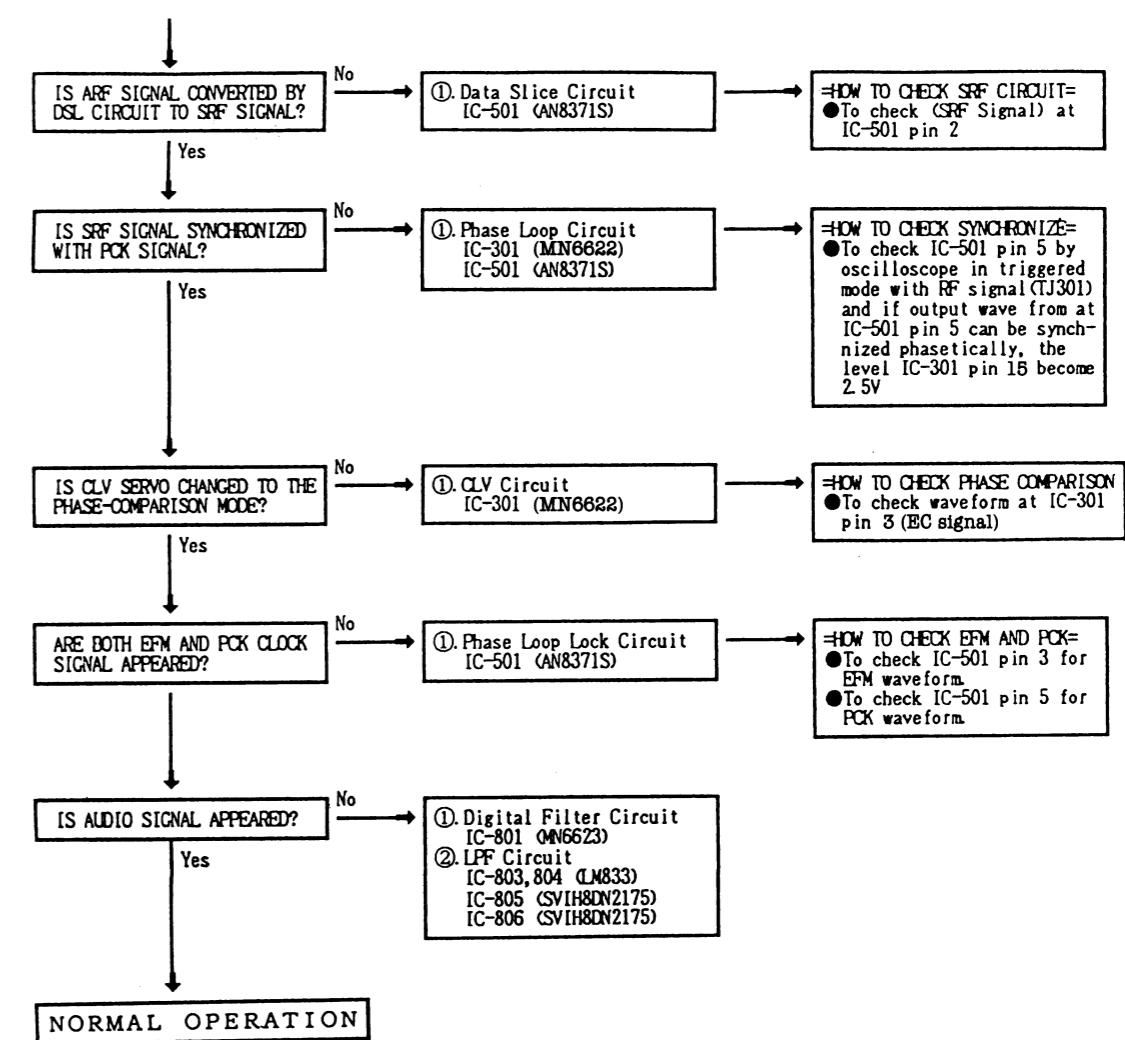
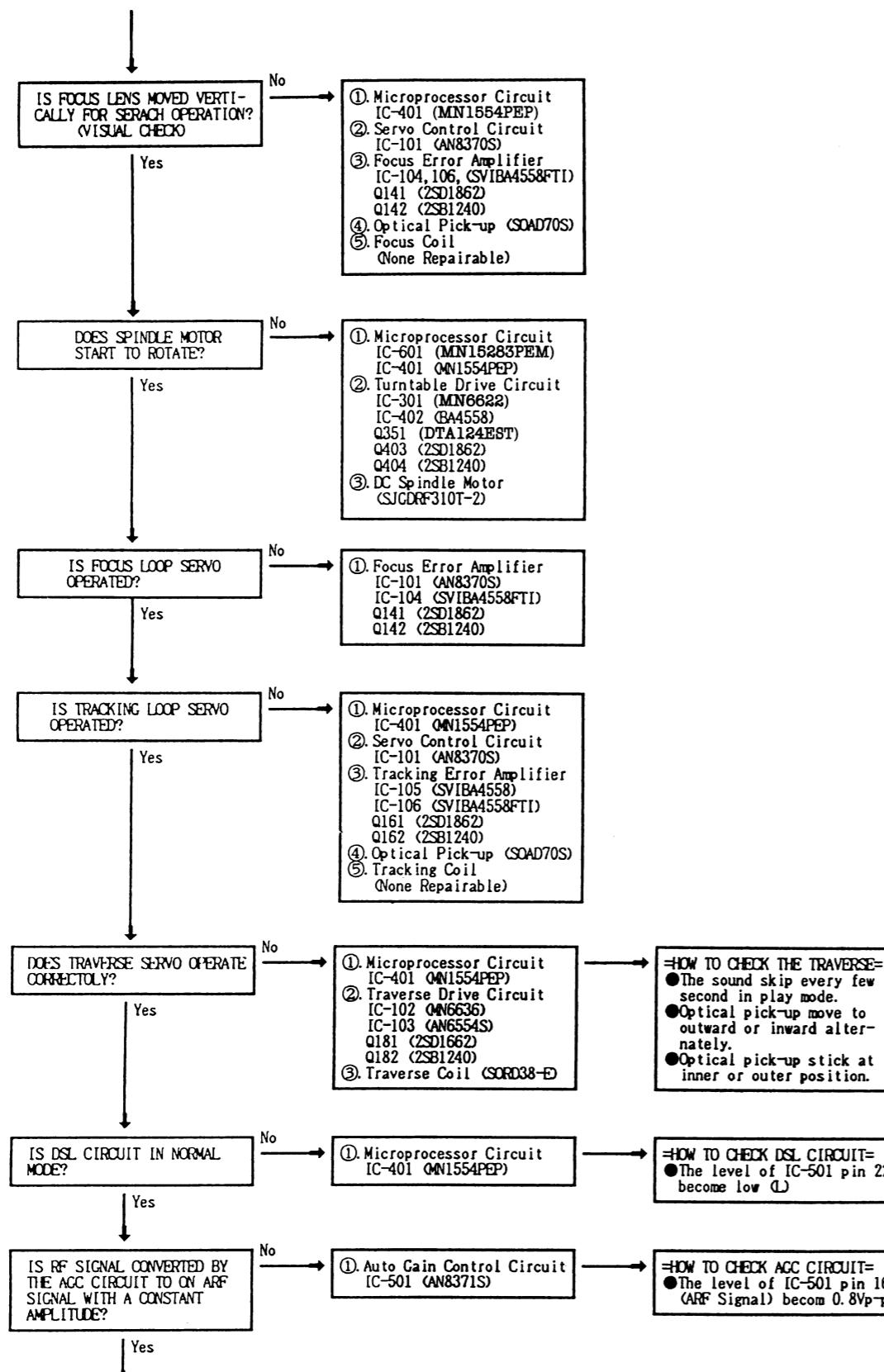
① Microprocessor Circuit
IC-601 (MN15283PEM)
IC-401 (MN1554PEP)
② Operation Key Matrix
③ Tray Open Switch

PLACE A DISC IN THE TRAY AND
PRESS THE OPEN/CLOSE SWITCH
TO THE CLOSE THE DISC TRAY

① Microprocessor Circuit
IC-401 (MN1554PEP)
② Operation Key Matrix
③ Tray Close Switch

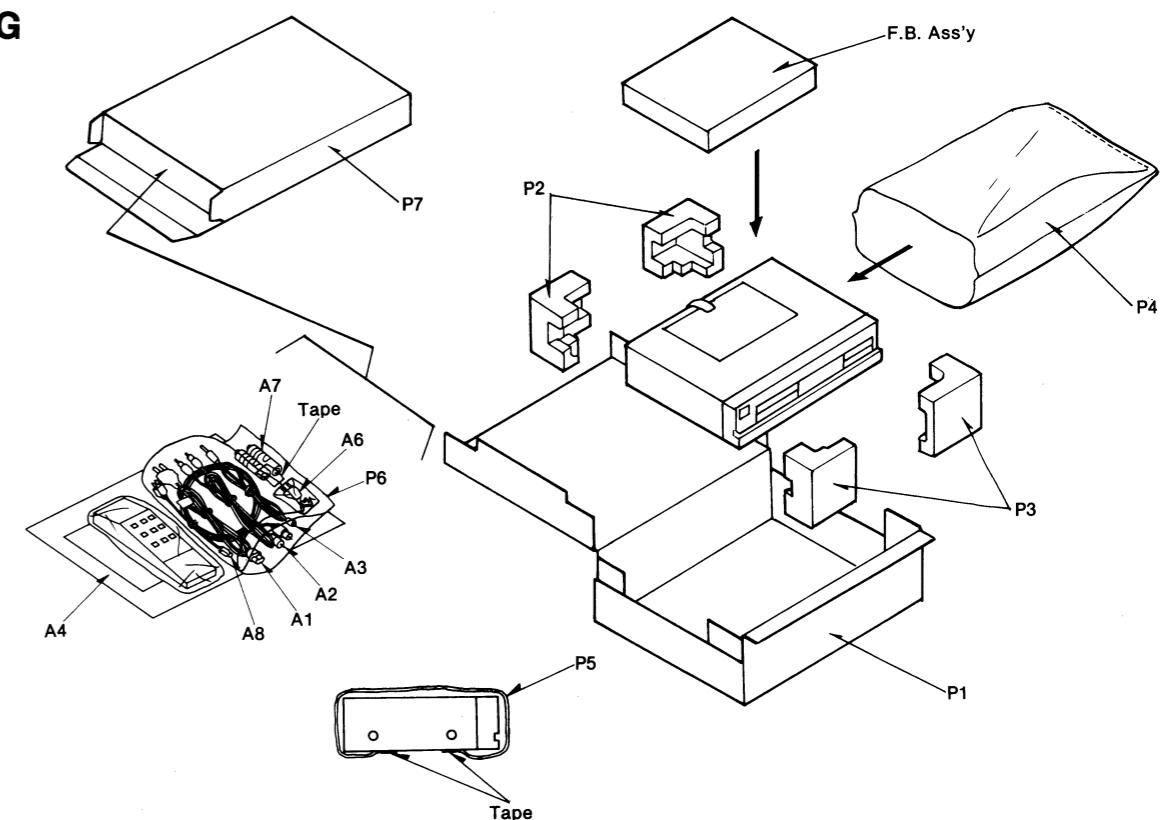
= HOW TO CHECK LASER DIODE =
Close the disc tray without
disc, Then laser diode will
illuminate for 5 sec.

SL-PJ45 SL-PJ45



■ PACKING

• F.B. Ass'y



Service Manual

Compact Disc Player

SL-PJ45

Color

(K) Black Type

Area

Color	Area
(K)	(E) Continental Europe.
(K)	(EK) ... United Kingdom.
(K)	(EG) ... F.R. Germany.

Supplement



DIGITAL

Please file and use this supplement manual together with the Service Manual for Model No. SL-PJ45,
Order No. AD8805083C9.

■ CHANGE OF REPLACEMENT PARTS LIST

Ref. No.	Change of Part No.		Description	Pcs.	Remarks
	Made in Japan	→ Made in Germany			
1	SGPLPJ45-KG	SGPLPJ45-KGM	Rear Panel	1	for (EG) area
1	SGPD750ZF1A	SGPD750ZF1B	Rear Panel	1	for (EK) area
1	SGPD750ZF0A	SGPLPJ45-KEG	Rear Panel	1	for (E) area
P1	SPND311	SPND8H312	Carton Box	1	

* : Indicates parts that are supplied by MBV.

MBV: MB Video G.m.b.H.

(Herzbergerstrasse 51, 3360 Osterode Harz, F.R. GERMANY)

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

 Printed in Japan
 F880807450 TS/TW

Service Manual

Supplement



DIGITAL

ORDER NO. AD8809238S9

Compact Disc Player
SL-PJ45

Color

(K)...Black Type

Area

Color	Area
(K)	(E)Continental Europe.
(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)	(PC)European Audio Club.

Modification of the Servo Circuit

Note: The SL-PJ45's servo circuit has been modified during its production. Major changes in its ICs and transistors are listed in the following table (next page). The IC401's peripheral circuit on the **D** P.C.B. has also been partially modified. The Supplementary Service Manual outlines all the circuitry except for the operation circuit. (No modification has been made to the operation circuit. For a schematic, see page 40 of the original Service Manual.) Use the original Service Manual (Order No. AD8805083C9) together with this Supplementary Service Manual.

CHANGES

Notes

- (1) Reason for Modifications: To simplify the servo circuit while improving its performance.
- (2) Modifications Effective: From July, 1988 and onward
- (3) Identification of Modified Units:
 - 1: A serial number suffix of **C** or beyond indicates a modified unit.
 - 2: A "CAUTION" label (THE ORIGINAL DESIGN HAS BEEN CHANGED. REFER TO SERVICE MANUAL (SUPPLEMENT).) has been affixed inside the chassis.

SL-PJ45

■ MAJOR CHANGES IN SEMICONDUCTOR DEVICES

Ref. No.	Change of Part No.		Part Name & Description	Remarks
	Original	New		
IC101	AN8370S	AN8373S	SERVO AMP	
IC102	MN6636	AN8374S	SERVO PROCESSOR	
IC103	AN6554NS	AN8377	BTL DRIVE	
IC104	AN6552S	LM2940T5M	REGULATOR	
IC105~106	AN6552S	Deletion	—	
IC201	LM2940T5	Deletion	—	
IC202	AN6552S	Deletion	—	
IC501	AN8371S	Deletion	—	
IC401 *	MN1554PEP	MN1554PEW	SYSTEM CONTROL	
Q101	2SA1547-Q	2SA1547QSTV2	A.P.C.	
Q141	2SD1862-P	Deletion	—	
Q142	2SB1240-P	Deletion	—	
Q161	2SD1862-P	Deletion	—	
Q162	2SB1240-P	Deletion	—	
Q181	2SD1862-P	Deletion	—	
Q182	2SB1240-P	Deletion	—	
Q201, 203	2SD1862-P	Deletion	—	

* IC401: System-controlling microprocessor on the **D** P.C.B. All other ICs and transistors listed in this table are used on the **B** Servo P.C.B.

* A comprehensive electrical parts list, regarding the servo circuit, appears on pages 21~23 of this Supplementary Service Manual.

(None of the mechanical parts have been affected by these modifications. Refer to the original Service Manual.)

■ CONTENTS

	Page
MEASUREMENTS AND ADJUSTMENTS	3~7
BLOCK DIAGRAM OF SERVO CIRCUIT	8
TERMINAL FUNCTION OF ICs (IC101, 102, 103)	9~11
TROUBLESHOOTING GUIDE.....	12~14
PRINTED CIRCUIT BOARDS.....	15, 16
SCHEMATIC DIAGRAM.....	17~20
RESISTORS AND CAPACITORS.....	21, 22
REPLACEMENT PARTS LIST (Electrical parts) ...	23, 24
NEW SERVO GAIN ADJUSTER (Servo Amp. Adjusting Fixture).....	24

Technics

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

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

SL-PJ45

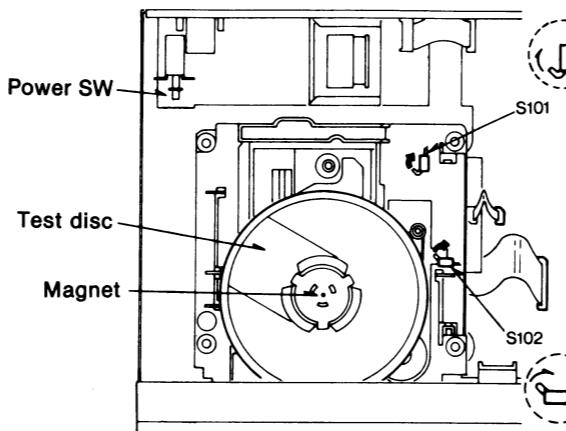
MEASUREMENTS AND ADJUSTMENTS

Caution:

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

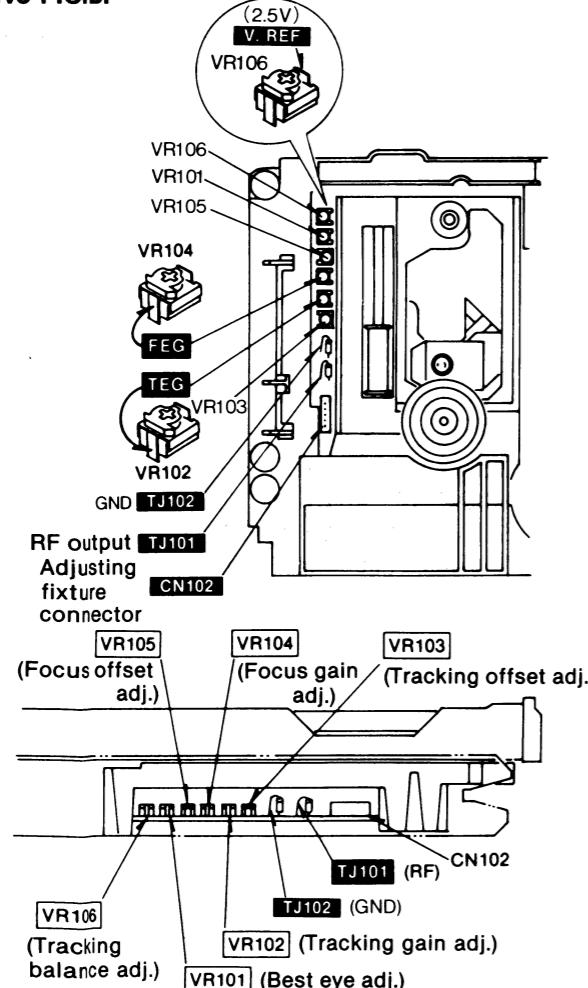
PREPARATION

- Remove the cabinet (see Ref. No. 1 in the original Service Manual).
- Remove the disc clamper and magnet (see Ref. No. 2 of the same).
- Remove the disc holder and power switch rod (see Ref. No. 3 of the same).
- Place the test disc and magnet on the turntable.
- While holding the Open/Close switches (S101, S102) in the directions indicated by the arrows, switch the player power ON.
- After the test disc starts rotating, release the Open/Close switch (S101, S102).

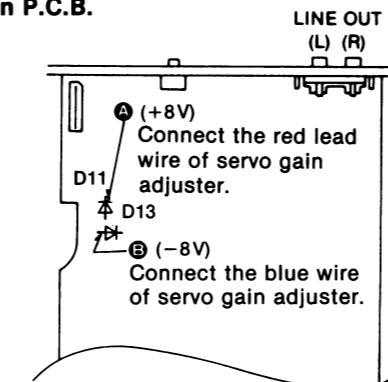


ADJUSTMENT POINTS

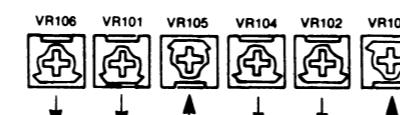
• Servo P.C.B.



• Main P.C.B.



• Temporary setting of each VR



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

Measuring Instruments and Special Tools

- Servo gain adjuster (SZZP1017F)
- Test discs
- 1. Playability test disc (SZZP1054C or SZZP1014F)
- 2. Uneven test disc (SZZP1056C)
- 3. Black band test disc (SZZP1057C)
- Normal disc
- Dual-beam oscilloscope with bandwidth of 30MHz or better (with EXT trigger and 1:1 probe).
- Audio frequency (AF) oscillator
- Conversion connector (SZZP1032F)
- Allen wrench (M2.0)
- Allen wrench (M1.27)
- 0.9mm clearance gauge (RZZ0297)

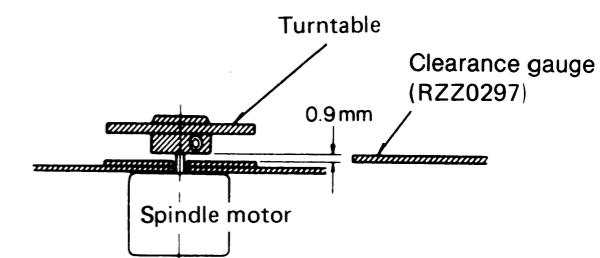
Perform adjustments depend on the part to be replaced according to followings:

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

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

If the amplitude exceeds $+15\text{mV}$, lower turntable.

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



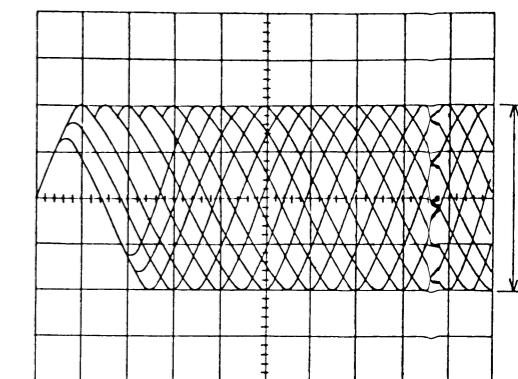
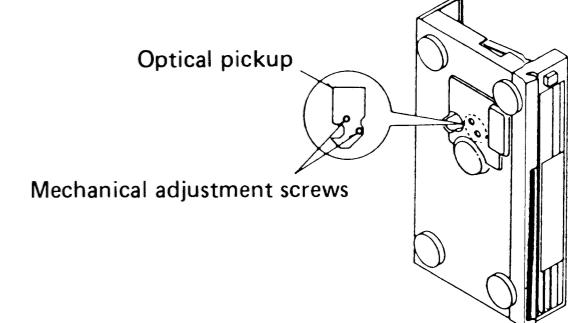
Note 2. If the measured amplitude greatly surpasses or falls short of the range above, set VR105 at or around the center, then try to adjust the height again. (Then be sure to adjust the focus offset as well.)

(1) TURNTABLE HEIGHT ADJUSTMENT

- Insert the 0.9mm clearance gauge (RZZ0297) between the turntable and the loading base (see the figure at right).
- Tighten the turntable retention screw with the 1.27mm allen wrench.
- Connect the oscilloscope's CH. 1 probe across VR104's FEG (+) and VR106's V. REF (-) terminals via a filter.
- (Note: A voltage of 2.5V appears at the V. REF terminal. Take care not to short the player's chassis to the oscilloscope ground.)
- Oscilloscope setting: VOLT 50 mV
SWEEP 1 ms.
Input coupling ... DC
- Adjust oscilloscope's DC zero balance.
- Switch the player power ON, and play the test disc (SZZP1014F or SZZP1054C).
- Measure the voltage amplitude of the signal on the oscilloscope.

(2) MECHANICAL ADJUSTMENT

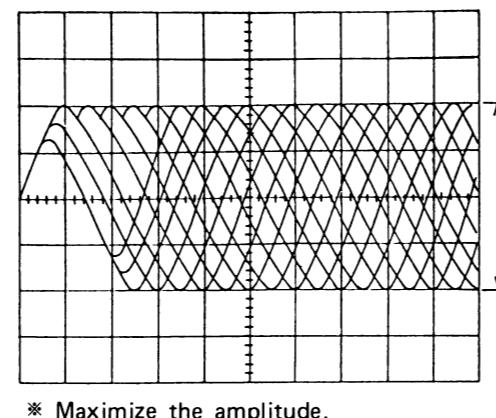
- Connect the oscilloscope's CH. 1 probe across TJ101 (+) and TJ102 (-) on the Servo P.C.B.
- Oscilloscope setting: VOLT 100 mV
SWEEP 0.5 μs .
Input coupling ... AC
- Switch the player power ON, and play track 9 on the test disc (SZZP1056C).
- Leave the player in Play mode, and place it on its right side as shown at right.
- Alternately adjust the two mechanical adjusting screws with the 2.0mm allen wrench until the RF signal amplitude variation on the oscilloscope is minimized.
- After completing the adjustment, lock the **mechanical adjustments** with lock paint (RZZOL01).



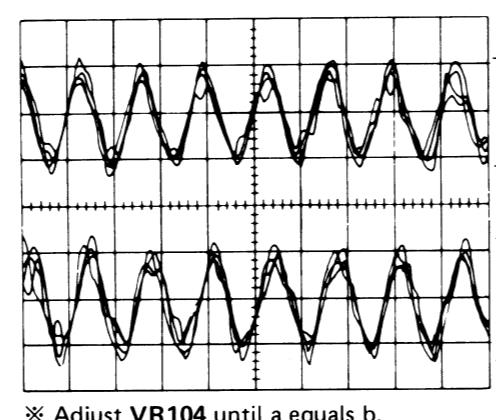
* Minimize the variation of amplitude.

(3) BEST EYE (PD BALANCE) ADJUSTMENT

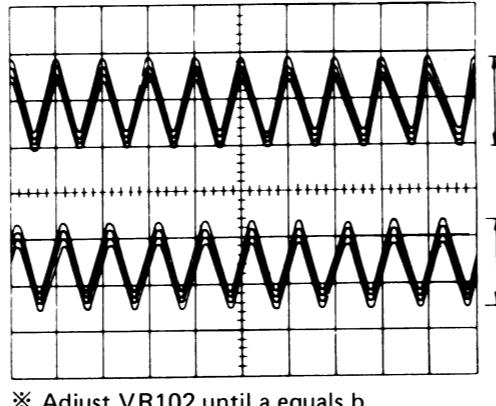
1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (-) on the Servo P.C.B.
2. Switch the player power **ON**, and play the 0.5 mm black dot on the test disc (SZZP1014F or SZZP1054C).
3. Adjust **VR101** until the RF signal eye pattern amplitude is maximized.

**(4) FOCUS GAIN ADJUSTMENT**

1. Connect the servo gain adjuster to the player (see page 7).
2. Set the servo gain adjuster's gain switch to position "2" and the ON/OFF switch to **ON**.
3. Set up the AF oscillator output for **825Hz, 150 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
4. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, respectively (TP3 is GND).
5. Play the test disc (SZZP1014F or SZZP1054C).
6. Set the servo gain adjuster's gain switch to position "3", and you will see a 825 Hz signal on the oscilloscope. Adjust **VR104** until the signal amplitudes on both channels become identical to each other.
7. Set the gain switch back to position "2".

**(5) TRACKING GAIN ADJUSTMENT**

1. Set up the AF oscillator output for **1.1 kHz, 150 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
2. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, respectively (TP3 is GND).
3. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
4. Set the servo gain adjuster's gain switch to position "1", and you will see a 1.1 kHz signal on the oscilloscope. Adjust **VR102** until the signal amplitudes on both channels become identical to each other.
5. Set the gain switch back to position "2".

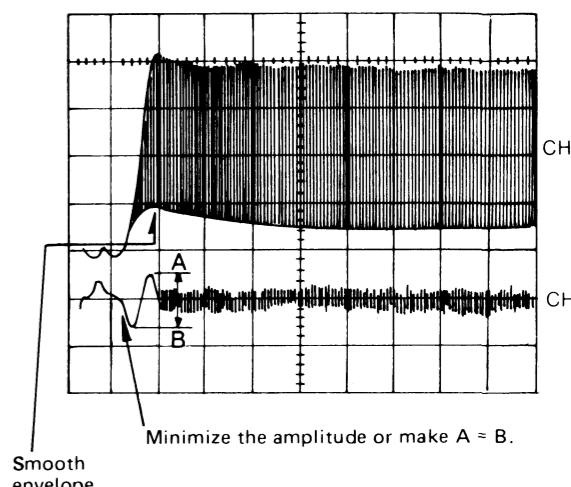
**(6) FOCUS OFFSET ADJUSTMENT**

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

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

Oscilloscope setting: VOLT. 100 mV (CH. 1)
100 mV (CH. 2)
SWEEP. 0.2 ms.
Input coupling... AC (both CH. 1 and 2)
Trigger mode NORM (trigger CH. 1.)

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

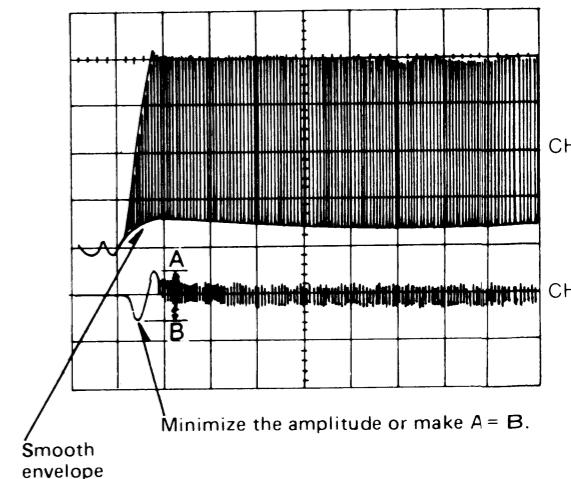
**(7) TRACKING OFFSET ADJUSTMENT**

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

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

Oscilloscope setting: VOLT. 100 mV (CH. 1)
100 mV (CH. 2)
SWEEP. 0.2 ms.
Input coupling... AC (both CH. 1 and 2)
Trigger mode.... NORM (trigger CH. 1.)

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

**(8) TRACKING BALANCE ADJUSTMENT**

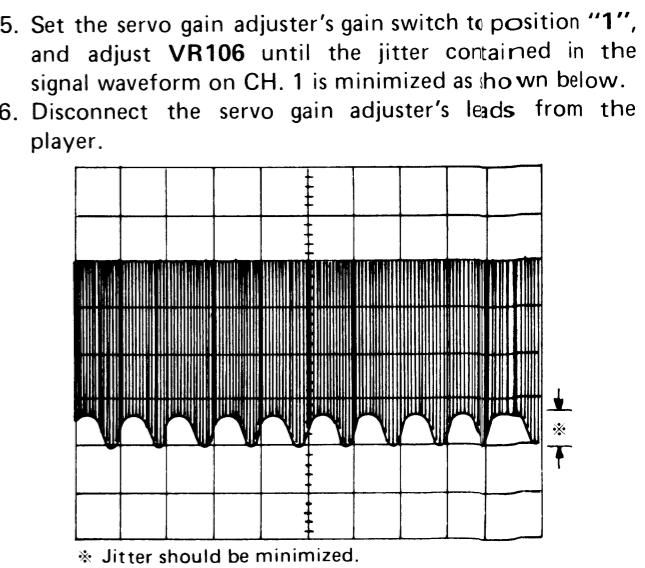
1. Make sure that servo gain adjuster's gain switch is set to position "2".

2. Set up the AF oscillator output for **1.1 kHz, 600 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.

3. Connect oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (-) on the Servo P.C.B. and CH. 2 probe (+) to the OSC terminal on the servo gain adjuster.

Oscilloscope setting: VOLT. 100 mV (CH. 1)
200 mV (CH. 2)
SWEEP. 0.1 ms.
Input coupling... AC (both CH. 1 and 2)

4. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR106** until the jitter contained in the signal waveform on CH. 1 is minimized as shown below.
5. Set the servo gain adjuster's gain switch to position "1", and adjust **VR106** until the jitter contained in the signal waveform on CH. 1 is minimized as shown below.
6. Disconnect the servo gain adjuster's leads from the player.

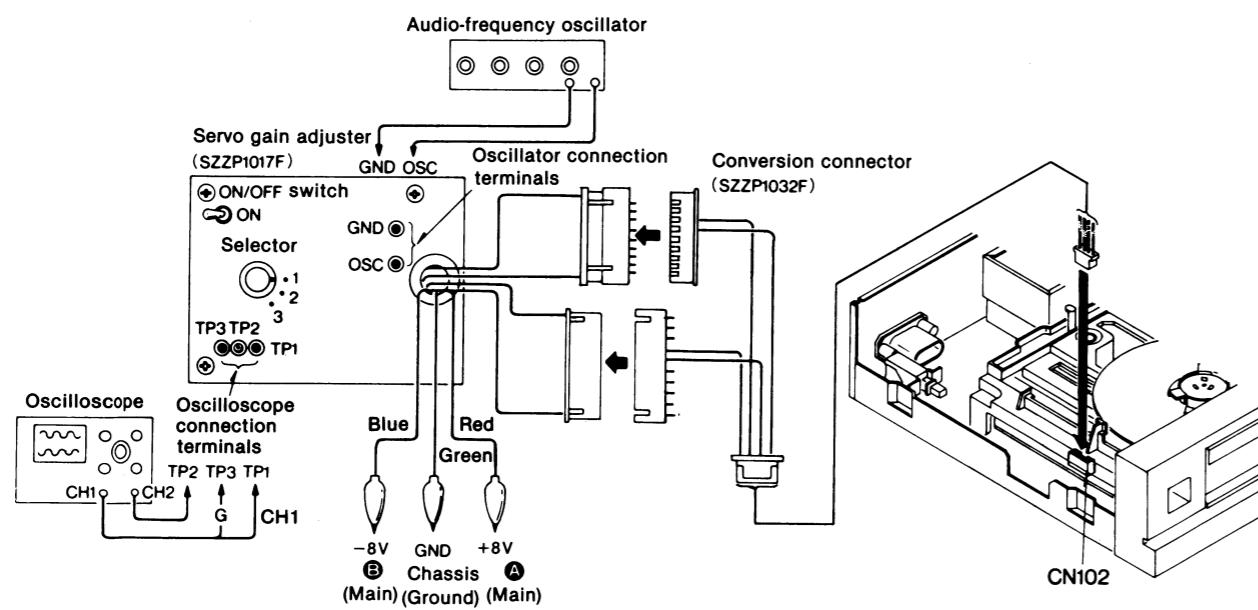


(9) CHECK OF PLAY OPERATION AFTER ADJUSTMENT*** Checking Skip Search**

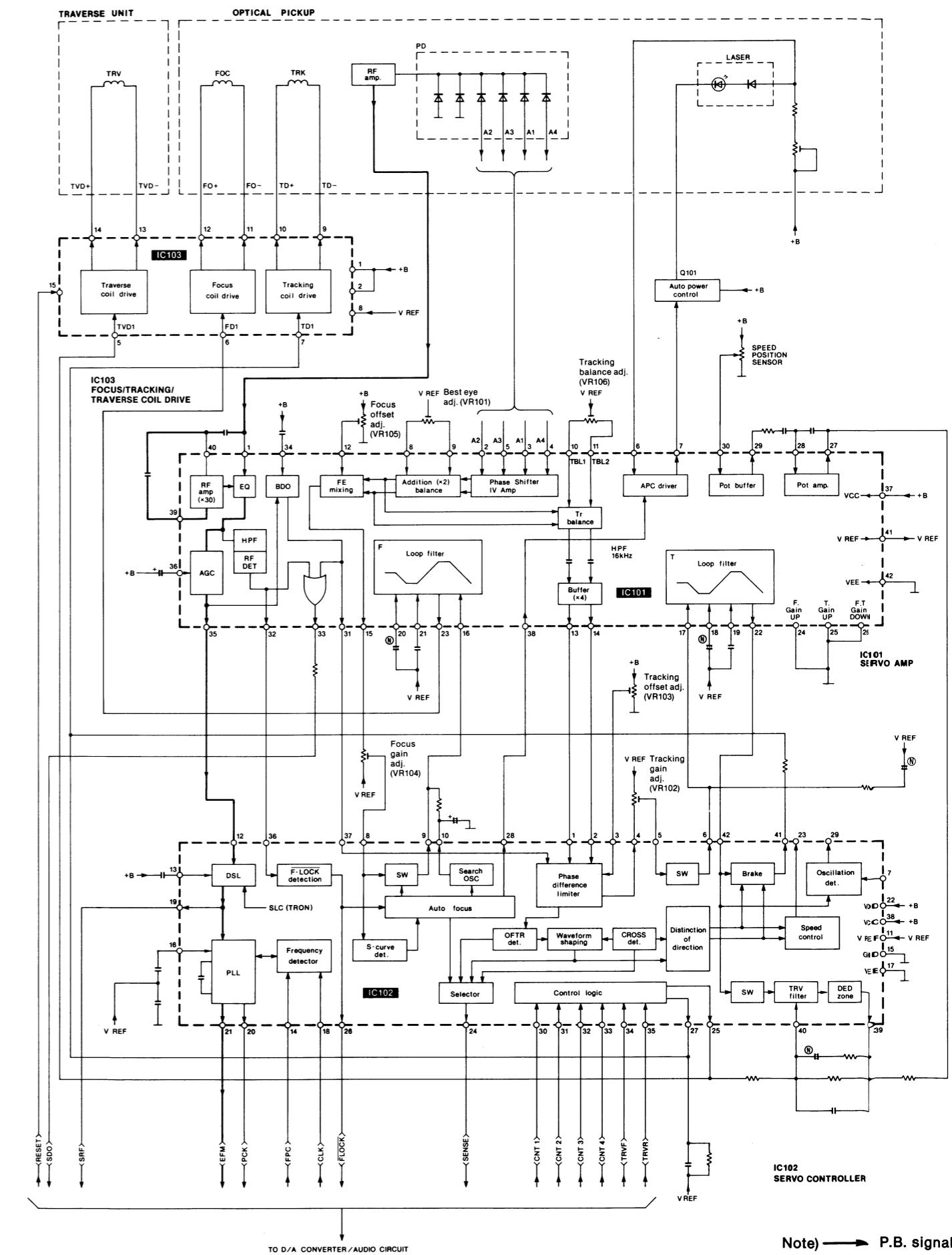
1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

*** Checking Manual Search**

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

• Connection of servo gain adjuster*** Checking Using Defect Disc**

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

■ BLOCK DIAGRAM OF SERVO CIRCUIT

Note) → P.B. signal

■ TERMINAL FUNCTION OF ICs

- **IC101 (AN8373S): Servo amp.**

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

- **IC102 (AN8374S): Servo processor**

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

- IC103 (AN8377): BTL drive

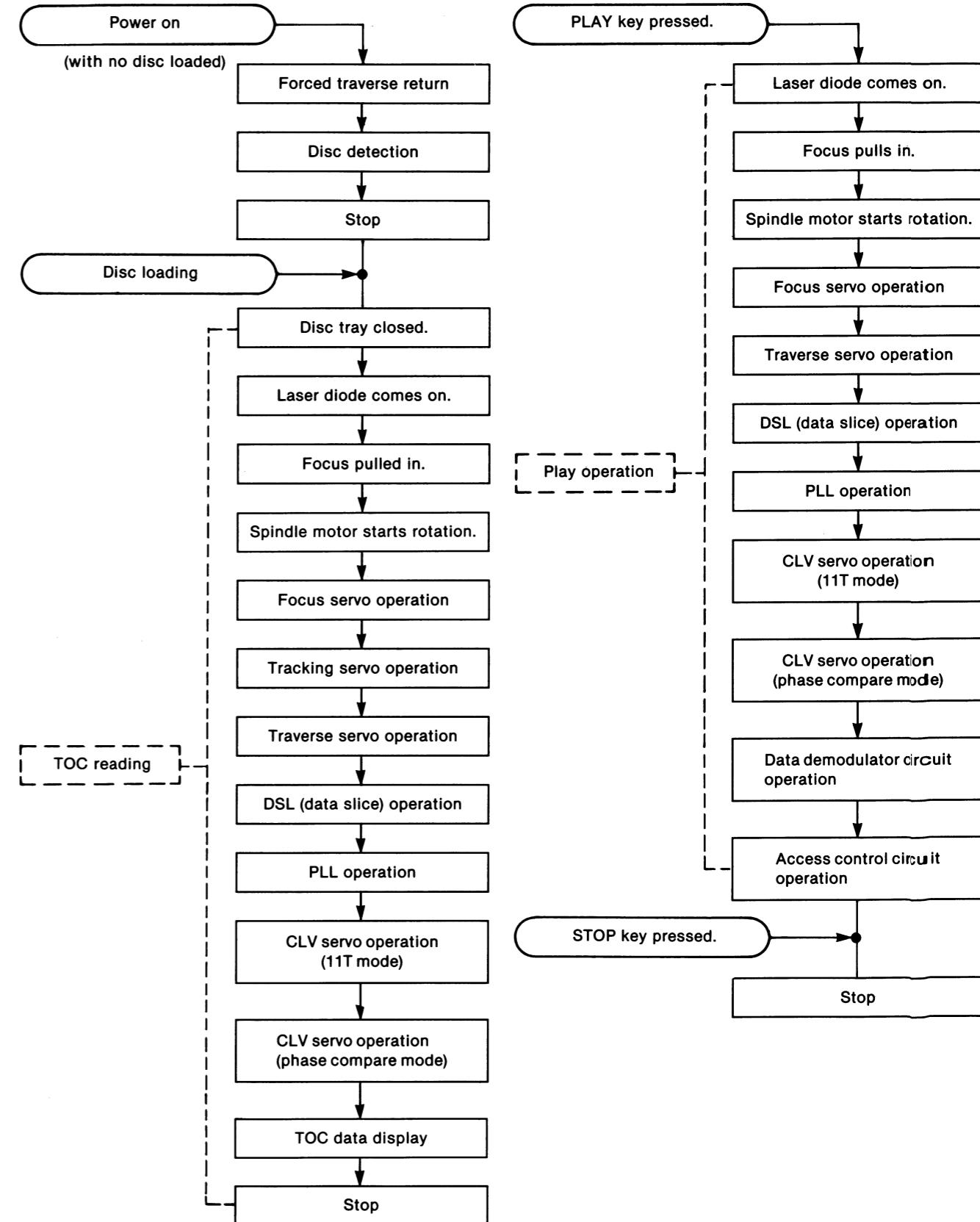
Pin No.	Mark	I/O Division	Function
1	PVCC	I	Driver power supply (+5 V input)
2	VCC	I	Power supply (+5 V input)
3	TB	O	External transistor base driving output
4	VMON	O	Voltage (+5 V) output
5	TVDI	I	Traverse error signal input
6	FDI	I	Focus error signal input
7	TDI	I	Tracking error signal input
8	VREF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

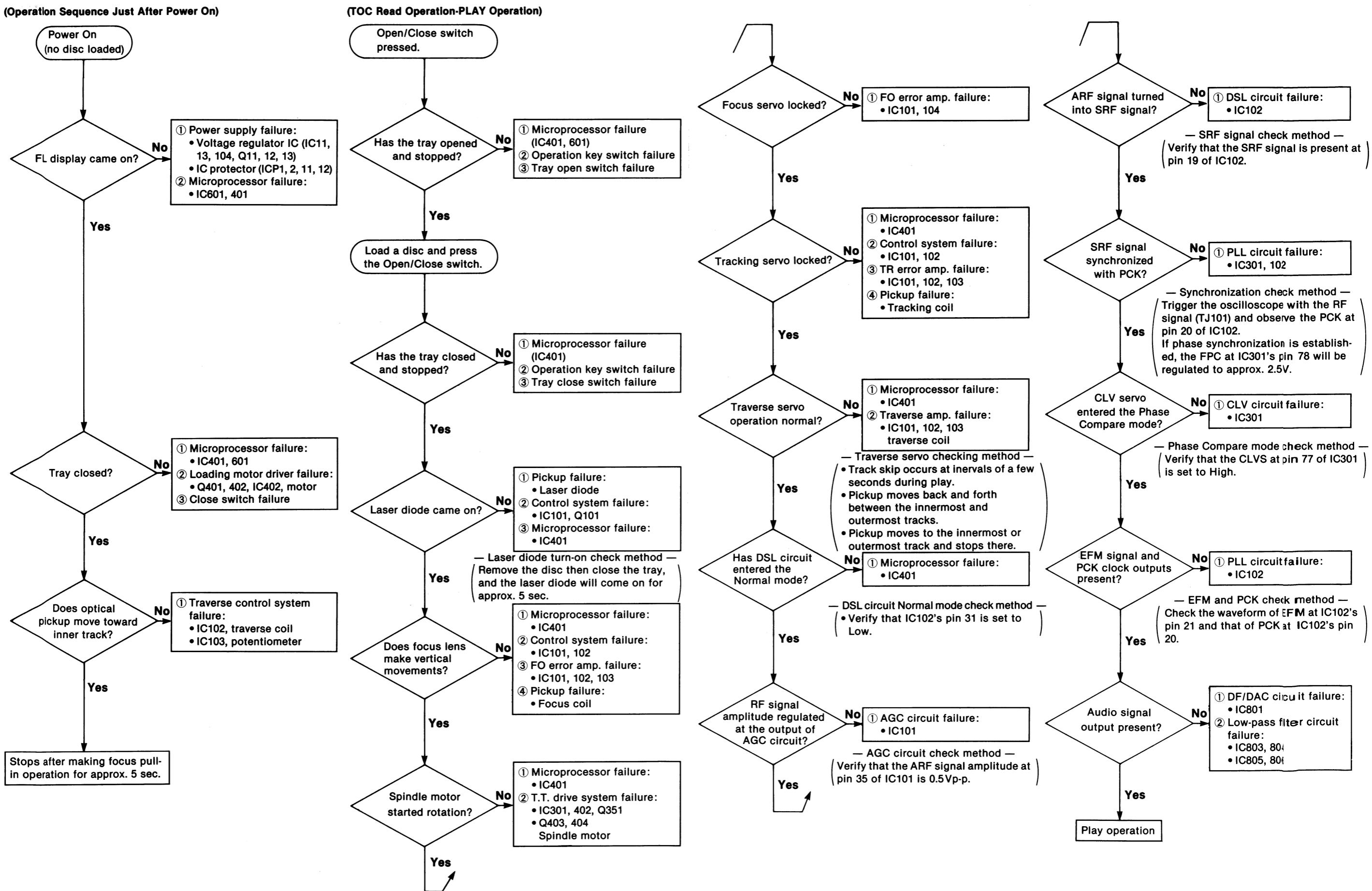
Pin No.	Mark	I/O Division	Function
9	TD-	O	Inverting output of tracking driver
10	TD+	O	Non-inverting output of tracking driver
11	FD-	O	Inverting output of focus driver
12	FD+	O	Non-inverting output of focus driver
13	TVD-	O	Inverting output of traverse driver
14	TVD+	O	Non-inverting output of traverse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

■ TROUBLESHOOTING GUIDE

SL-PJ45 Operation Sequence Check Sheet

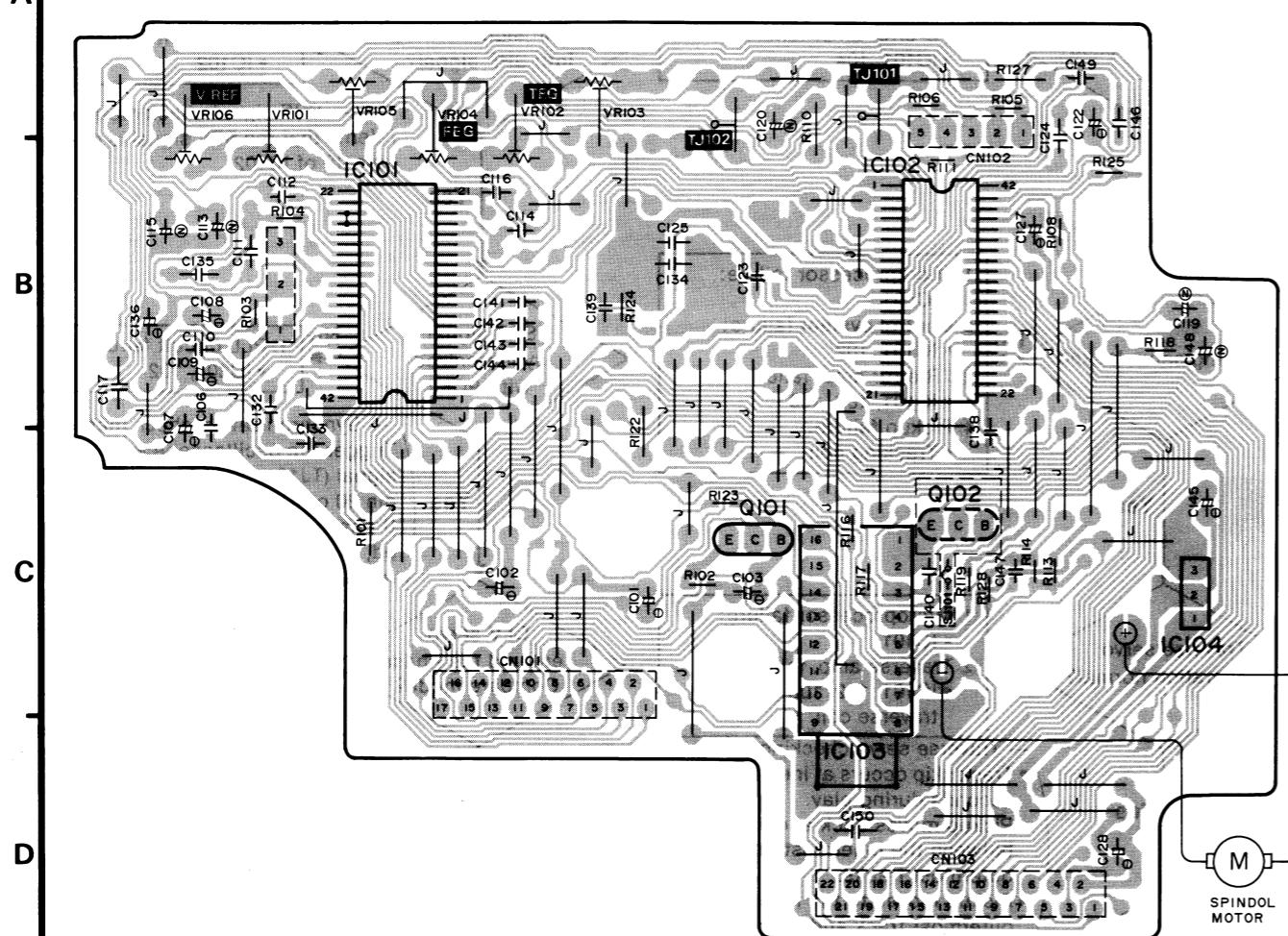
Play Operation Sequence





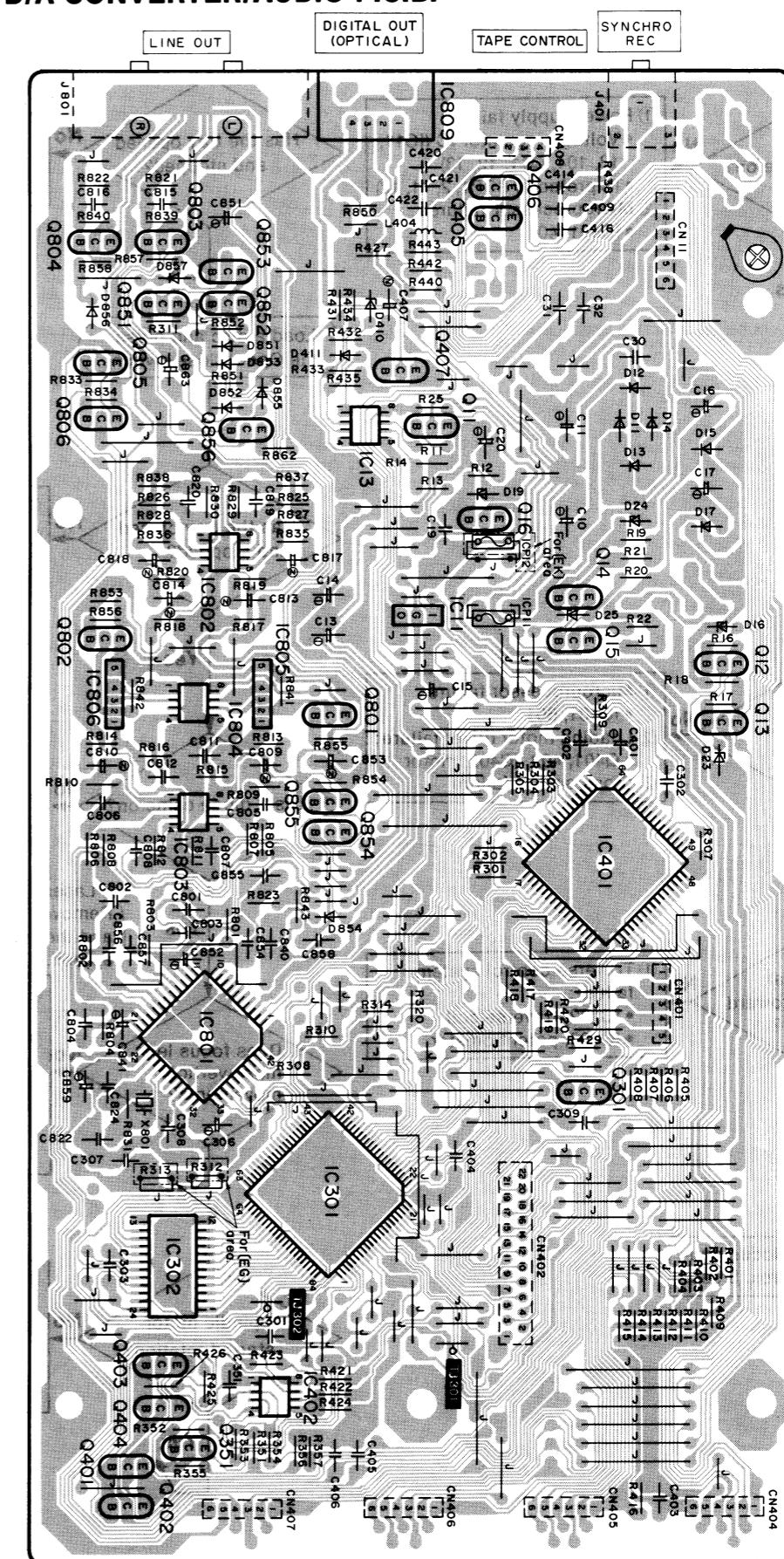
SL-PJ45 SL-PJ45

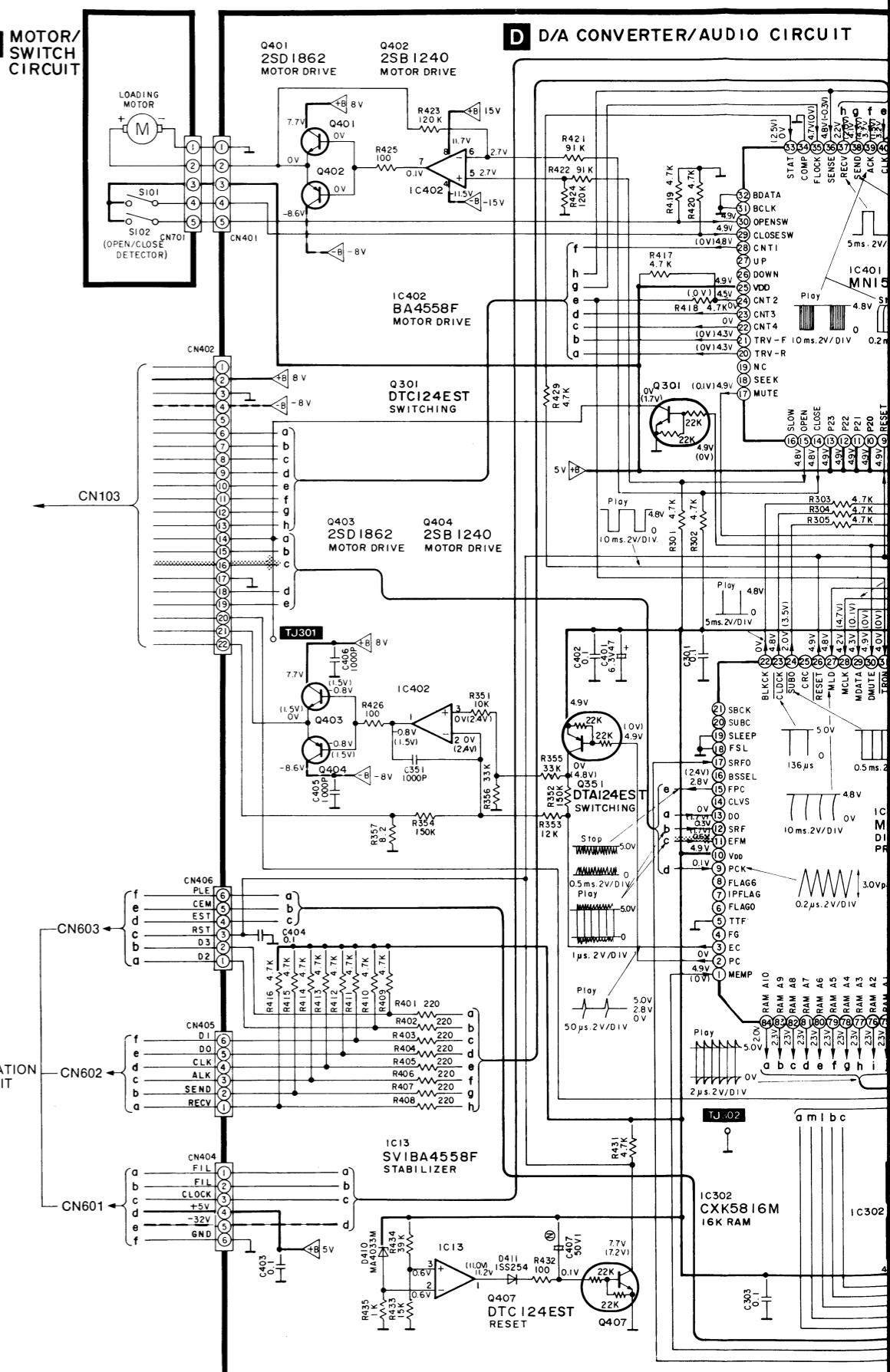
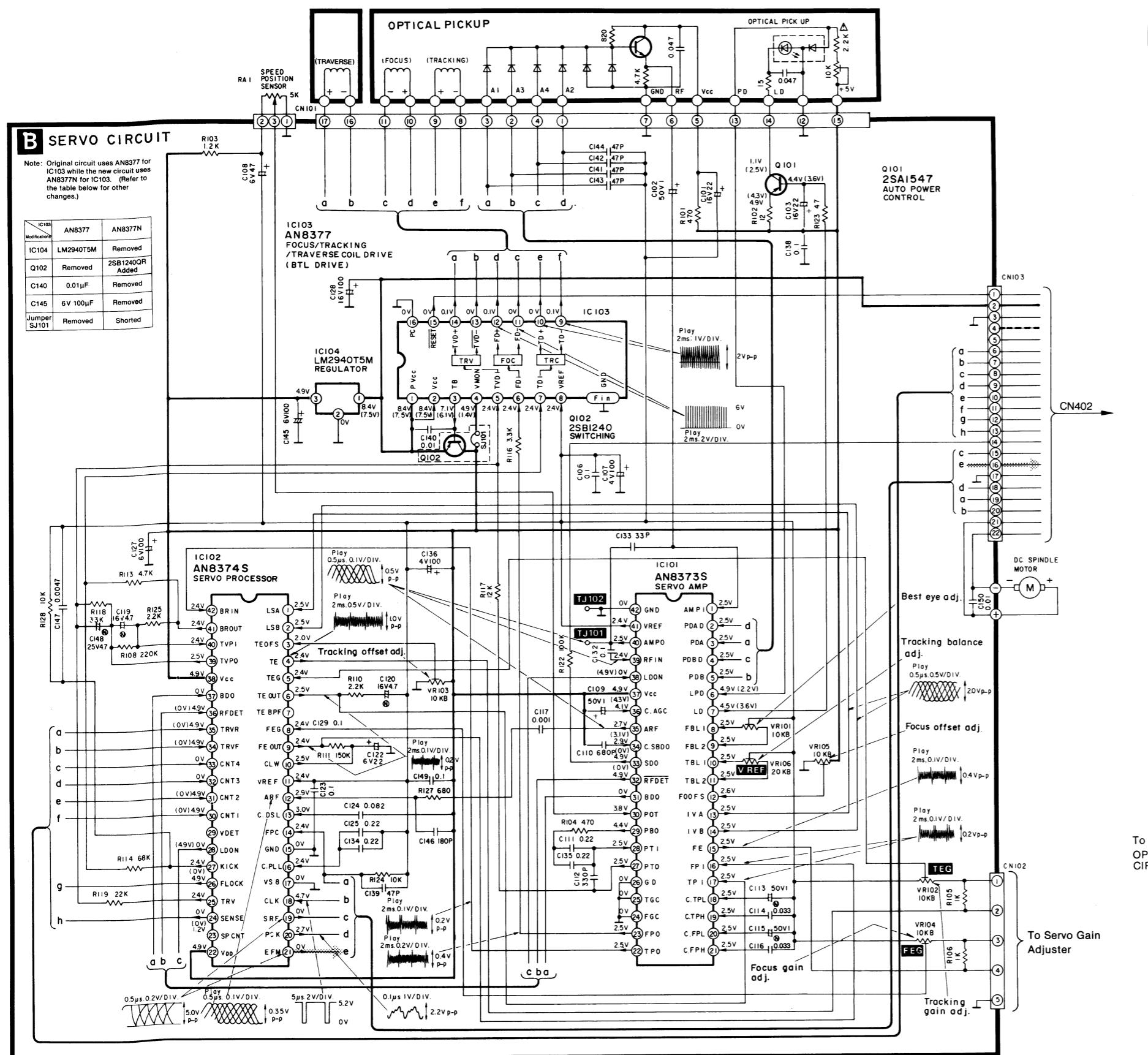
1 2 3 4 5 6 7 8 9

PRINTED CIRCUIT BOARDS**B SERVO P.C.B.**

Note: Original circuit uses AN8377 for IC103 while the new circuit uses AN8377N for IC103. (Refer to the table below for other changes.)

IC103 Modifications	AN8377	AN8377N
IC104	LM2940T5M	Removed
Q102	Removed	2SB1240QR Added
C140	0.01µF	Removed
C145	6V 100µF	Removed
Jumper SJ101	Removed	Shorted

D D/A CONVERTER/AUDIO P.C.B.



SCHEMATIC DIAGRAM

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

Notes:

- S1 : Power switch in "on" position.
- S2 : Voltage selector switch.
(For [XA], [XB] and [PC] only.)
- S101 : Disc holder open/close detection switch.
- S102 : Disc holder open/close detection switch.
- S601~S610: Numeric switch. (0~10, +10)
618, 619
- S611 : Programmed-play switch.
- S612 : Cancel switch.
- S613 : Time-mode select switch.
- S614 : Repeat switch.
- S615 : Recall switch.
- S616 : Forward skip/search switch.
- S617 : Backward skip/search switch.
- S620 : Tape-side select switch.
- S621 : Compact-disc edit switch.
- S622 : Disc tray open/close switch.
- S623 : Stop switch.
- S624 : Pause switch.
- S625 : Play switch.
- S626 : Music scan switch.
- S627 : Warp switch.
- S628 : Link switch.
- S651 : Timer stand-by switch.

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

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

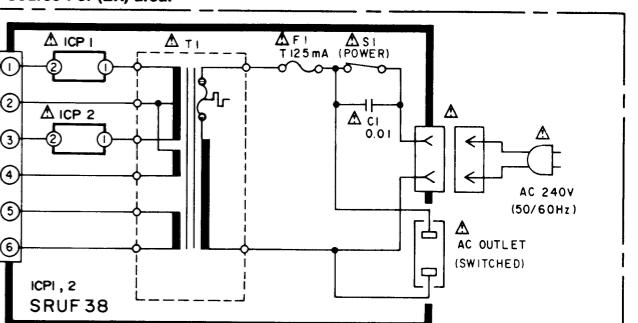
* The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.

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

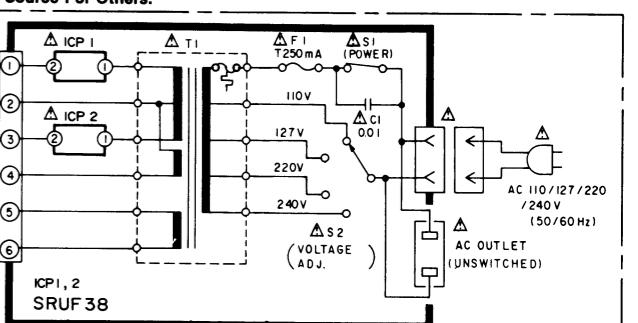
• : Positive voltage lines and negative voltage lines.

: Audio signal lines.

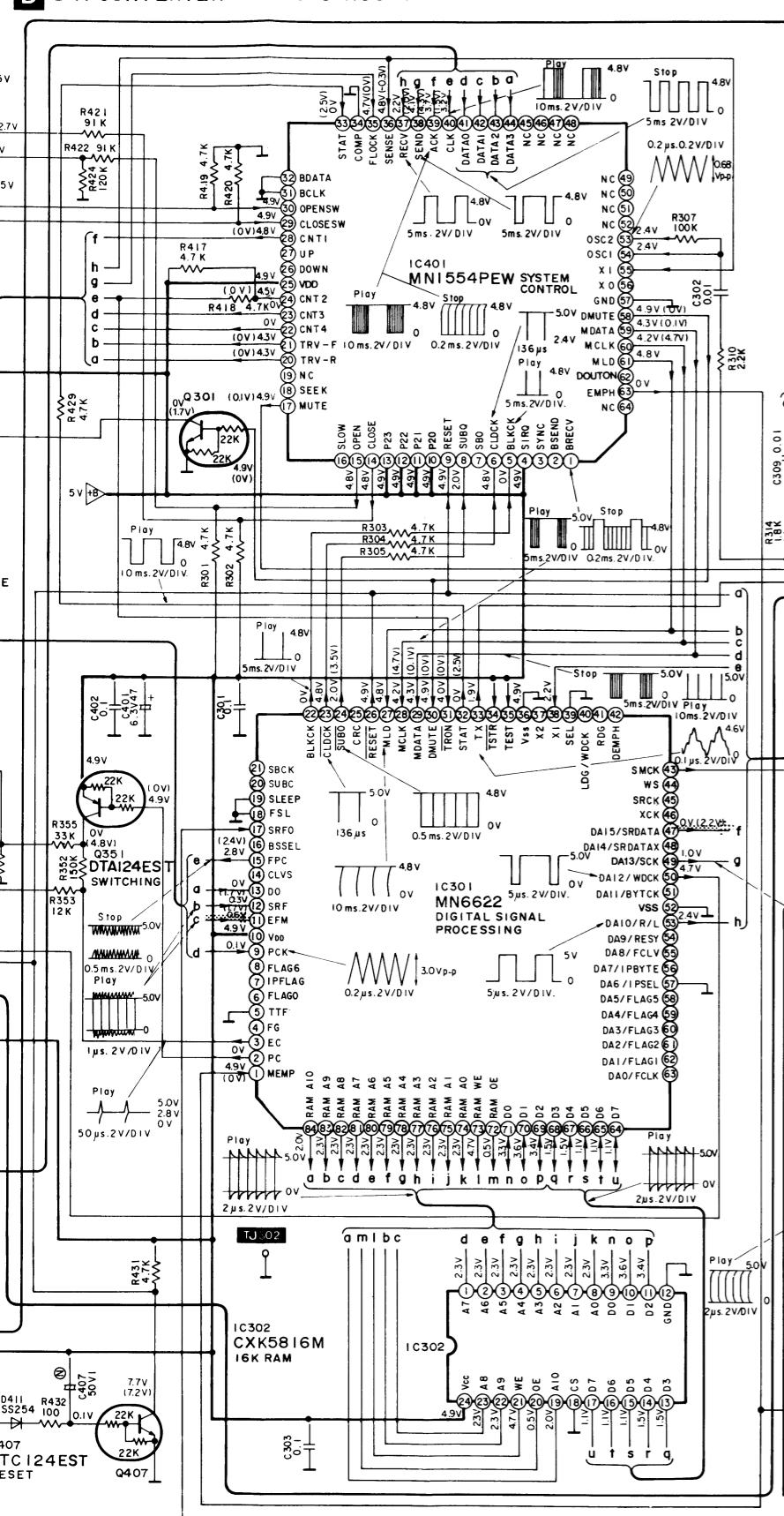
Power Source For (EK) area.



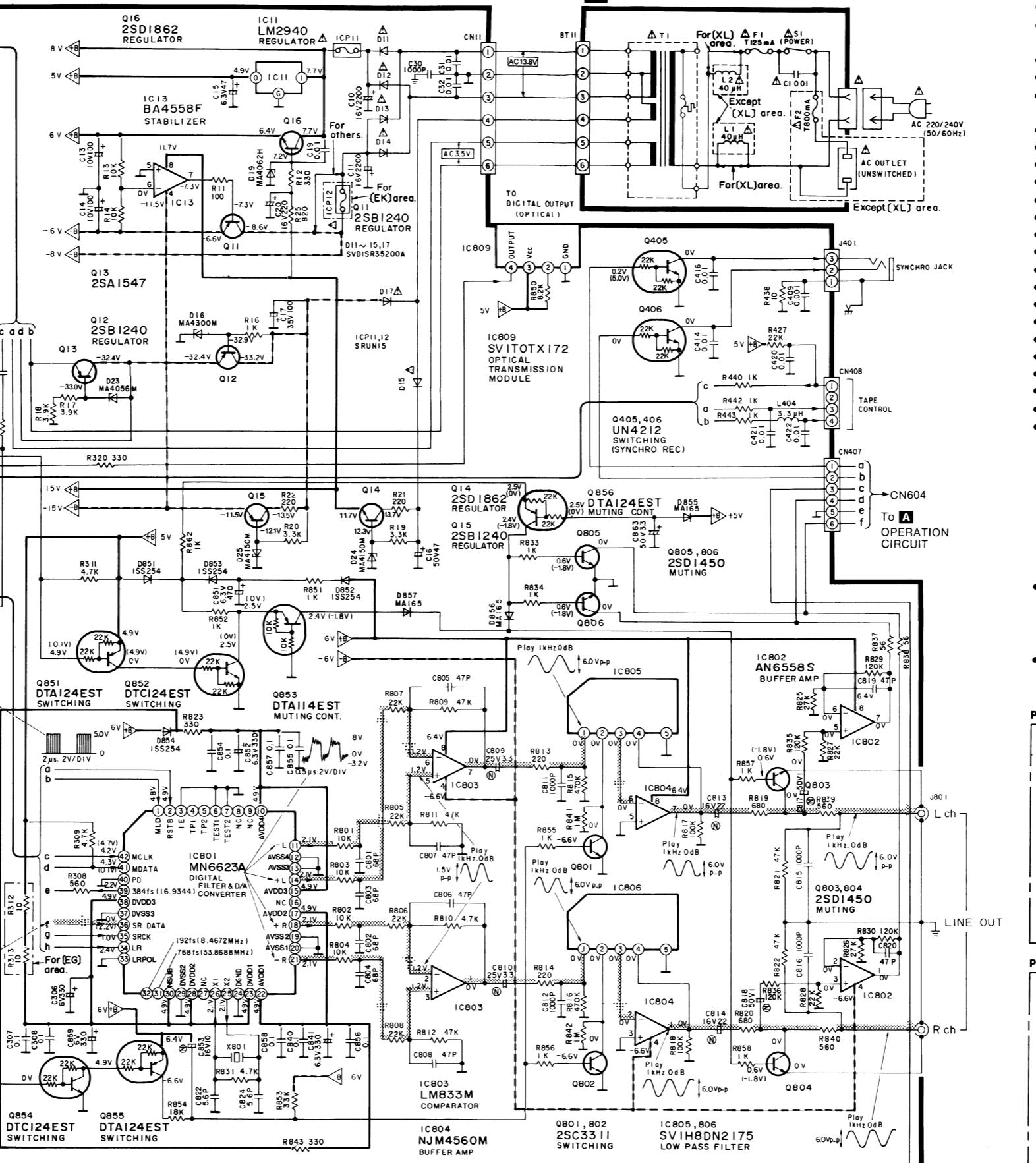
Power Source For Others.



D D/A CONVERTER/AUDIO CIRCUIT



E POWER SUPPLY CIRCUIT



■ RESISTORS AND CAPACITORS

Notes : * Important safety notice :

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

* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)

Parts without these indications can be used for all areas.

Numbering System For Resistors

Example:

ERD	25	F	J	102
Type	Wattage	Shape	Tolerance	Value
ERX	2	AN	J	(1k Ω) 471

Type	Wattage	Shape	Tolerance	Value
ERX	(2W)			(470 Ω)

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W	J : $\pm 5\%$
ERG : Metal Oxide	14 : 1/4W	F : $\pm 1\%$
ERQ : Fuse Type Metal	1A : 1W	G : $\pm 2\%$
ERX : Metal Film	S2 : 1/4W	J : $\pm 5\%$
ERD L : Carbon (chip)	2F : 1/4W	K : $\pm 10\%$
ERO K : Metal Film (chip)	2A : 2W	M : $\pm 20\%$
ERC : Solid	6G : 1/10W	
ERF : Incombustible	8G : 1/8W	
ECR : Box-Shaped		
ERM : Wire-Wound		
RRJ : Chip Resistor		
ERJ : Chip Resistor		

Numbering System For Capacitors

Example:

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Unique
ECEA	50	M	330	

Type	Voltage	Characteristics	Value
ECEA	(50V)	(33 μ F)	

● Capacity values are in microfarads (μ F) unless specified otherwise, P = Pico-farads (pF) F = Farads (F).

● Resistance values are in ohms (Ω), unless specified otherwise, 1K = 1,000 Ω , 1M = 1,000k Ω

Capacitor Type	Voltage	Tolerance
ECE : Electrolytic	0J : 6.3V	K : $\pm 10\%$
ECCD : Ceramic	1C : 16V	M : $\pm 20\%$
ECKD : Ceramic Capacitor	1H : 50V	Z : $\pm 80\%$
ECOM : Polyester	50 : 50V	-20
ECQP : Polypropylene	2H : 500V	J : $\pm 5\%$
ECG : Ceramic	1 : 100V	G : $\pm 2\%$
ECEA N : Non Polar Electrolytic	KC : 400V AC	F : $\pm 1\%$
QCU : Ceramic (Chip Type)	KC : 125V AC	C : $\pm 0.25pF$
ECUX : Ceramic (Chip Type)	(UL)	D : $\pm 0.5pF$
ECF : Semiconductor		
EECW : Liquid electrolyte double layer capacitor		

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
RESISTORS(VALUE,WATTAGE)								
R11	ERDS2TJ101	100 1/4	R409	ERDS2TJ472	4.7K 1/4	R806	ERDS2TJ223	22K 1/4
R12	ERDS2TJ331	330 1/4	R410	ERDS2TJ472	4.7K 1/4	R807	ERDS2TJ223	22K 1/4
R13	ERDS2TJ103	10K 1/4	R411	ERDS2TJ472	4.7K 1/4	R808	ERDS2TJ223	22K 1/4
R14	ERDS2TJ103	10K 1/4	R412	ERDS2TJ472	4.7K 1/4	R809	ERDS2TJ473	47K 1/4
R15	ERDS2TJ102	1K 1/4	R413	ERDS2TJ472	4.7K 1/4	R810	ERDS2TJ473	47K 1/4
R16	ERDS2TJ392	3.9K 1/4	R414	ERDS2TJ472	4.7K 1/4	R811	ERDS2TJ473	47K 1/4
R17	ERDS2TJ392	3.9K 1/4	R415	ERDS2TJ472	4.7K 1/4	R812	ERDS2TJ473	47K 1/4
R18	ERDS2TJ392	3.9K 1/4	R416	ERDS2TJ472	4.7K 1/4	R813	ERDS2TJ221	220 1/4
R19	ERDS2TJ332	3.3K 1/4	R417	ERDS2TJ472	4.7K 1/4	R814	ERDS2TJ221	220 1/4
R20	ERDS2TJ332	3.3K 1/4	R418	ERDS2TJ472	4.7K 1/4	R815	ERDS2TJ474	470K 1/4
R21	ERD25FVJ221T	220 1/4	R419	ERDS2TJ472	4.7K 1/4	R816	ERDS2TJ474	470K 1/4
R22	ERD25FVJ221T	220 1/4	R420	ERDS2TJ472	4.7K 1/4	R817	ERDS2TJ104	100K 1/4
R301	ERDS2TJ472	4.7K 1/4	R421	ERDS2TJ913T	91K 1/4	R818	ERDS2TJ104	100K 1/4
R302	ERDS2TJ472	4.7K 1/4	R422	ERDS2TJ913T	91K 1/4	R819	ERDS2TJ681	680 1/4
R303	ERDS2TJ472	4.7K 1/4	R423	ERDS2TJ124	120K 1/4	R820	ERDS2TJ681	680 1/4
R304	ERDS2TJ472	4.7K 1/4	R424	ERDS2TJ124	120K 1/4	R821	ERDS2TJ473	47K 1/4
R305	ERDS2TJ472	4.7K 1/4	R425	ERDS2TJ101	100 1/4	R822	ERDS2TJ473	47K 1/4
R307	ERDS2TJ104	100K 1/4	R426	ERDS2TJ101	100 1/4	R823	ERDS2TJ331	330 1/4
R308	ERDS2TJ561	560 1/4	R427	ERDS2TJ223	22K 1/4	R825	ERDS2TJ273	27K 1/4
R309	ERDS2TJ472	4.7K 1/4	R429	ERDS2TJ472	4.7K 1/4	R826	ERDS2TJ273	27K 1/4
R310	ERDS2TJ222	2.2K 1/4	R431	ERDS2TJ472	4.7K 1/4	R827	ERDS2TJ223	22K 1/4
R311	ERDS2TJ472	4.7K 1/4	R432	ERDS2TJ101	100 1/4	R828	ERDS2TJ223	22K 1/4
R312	ERDS2TJ100	10 1/4	R433	ERDS2TJ153	15K 1/4	R829	ERDS2TJ124	120K 1/4
(EG)			R434	ERDS2TJ393	39K 1/4	R830	ERDS2TJ124	120K 1/4
R313	ERDS2TJ100	10 1/4	R435	ERDS2TJ102	1K 1/4	R831	ERDS2TJ472	4.7K 1/4
(EG)			R436	ERDS2TJ100	10 1/4	R833	ERDS2TJ102	1K 1/4
R314	ERDS2TJ182	1.8K 1/4	R440	ERDS2TJ102	1K 1/4	R834	ERDS2TJ102	1K 1/4
R320	ERDS2TJ331	330 1/4	R442	ERDS2TJ102	1K 1/4	R835	ERDS2TJ124	120K 1/4
R351	ERDS2TJ103	10K 1/4	R443	ERDS2TJ102	1K 1/4	R836	ERDS2TJ124	120K 1/4
R352	ERDS2TJ154	150K 1/4	R601	ERDS2TJ104	100K 1/4	R837	ERDS2TJ560	56 1/4
R353	ERDS2TJ123	12K 1/4	R602	ERDS2TJ472	4.7K 1/4	R838	ERDS2TJ560	56 1/4
R354	ERDS2TJ154	150K 1/4	R603	ERDS2TJ472	4.7K 1/4	R839	ERDS2TJ561	560 1/4
R357	ERDS2TJ8P2	8.2 1/4	R604	ERDS2TJ472	4.7K 1/4	R840	ERDS2TJ561	560 1/4
R401	ERDS2TJ221	220 1/4	R605	ERDS2TJ472	4.7K 1/4	R841	ERDS2TJ105	1M 1/4
R402	ERDS2TJ221	220 1/4	R606	ERDS2TJ472	4.7K 1/4	R842	ERDS2TJ105	1M 1/4
R403	ERDS2TJ221	220 1/4	R607	ERDS2TJ472	4.7K 1/4	R843	ERDS2TJ331	330 1/4
R404	ERDS2TJ221	220 1/4	R617	ERDS2TJ103	10K 1/4	R850	ERDS2TJ822	8.2K 1/4
R405	ERDS2TJ221	220 1/4	R801	ERDS2TJ103	10K 1/4	R851	ERDS2TJ102	1K 1/4
R406	ERDS2TJ221	220 1/4	R802	ERDS2TJ103	10K 1/4	R852	ERDS2TJ102	1K 1/4
R407	ERDS2TJ221	220 1/4	R803	ERDS2TJ103	10K 1/4	R853	ERDS2TJ333	33K 1/4
R408	ERDS2TJ221	220 1/4	R804	ERDS2TJ103	10K 1/4	R854	ERDS2TJ183	18K 1/4
			R805	ERDS2TJ223	22K 1/4</td			

REPLACEMENT PARTS LIST (Electrical parts)

Notes : * Important safety notice : Components identified by Δ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
 * Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
 Parts without these indications can be used for all areas.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
INTEGRATED CIRCUITS					
IC11	LM2940T5	I.C. REGULATOR	D601	SVD1SS254	DIODE
IC13	SV1BA4558F	I.C. REGULATOR	D602	SVD1SS254	DIODE
IC301	MN6622	I.C. SIGNAL PROCESSING	D603	SVD1SS254	DIODE
IC302	SV1CKK581GM	I.C. 16K RAM	D604	SVD1SS254	DIODE
IC401	MN1554PEW	I.C. SYSTEM CONTROL	D605	SVD1SS254	DIODE
IC402	SV1BA4558F	I.C. REGULATOR	D651	SVD1SS254	DIODE
IC601	MN15283PEM	I.C. FL DRIVE	D652	SVD1SS254	DIODE
IC602	HC-MD10E	I.C. REMOTE SENSOR	D653	SVD1SS254	DIODE
IC801	MN6623A	I.C. DF & DAC	D654	SVD1SS254	DIODE
IC802	AN6558S	I.C. BUFFER AMP	D655	SVD1SS254	DIODE
IC803	LM833M	I.C. OPERATION AMP	D656	SVD1SS254	DIODE
IC804	NJM4560M	I.C. OPERATION AMP.	D857	SVD1SS254	DIODE
IC805	SV1H8DN2175	I.C. LPF	ICP11 Δ	SRUN15	I.C. PROTECTOR
IC806	SV1H8DN2175	I.C. LPF	ICP12 Δ	SRUN15	I.C. PROTECTOR
IC809	SV1TOTX172	I.C. OP MODULE	(EK)		
TRANSISTORS					
Q11	2SB1240-P	TRANSISTOR	L1	SLQX400-D	COIL
Q12	2SB1240-P	TRANSISTOR	(E, EG, EB, EH)		
Q13	2SA1547-Q	TRANSISTOR	(EF, E1)		
Q14	2SD1862-P	TRANSISTOR	L2	SLQX400-D	COIL
Q15	2SB1240-P	TRANSISTOR	(E, EG, EB, EH)		
Q16	2SD1862-P	TRANSISTOR	(EF, E1)		
Q301	DTC124EST	TRANSISTOR	L404	ELEY3R3KA	COIL
Q351	DTA124EST	TRANSISTOR	L901	ELEY3R3KA	COIL
Q401	2SD1862-P	TRANSISTOR	L902	ELEY3R3KA	COIL
Q402	2SB1240-P	TRANSISTOR	L903	ELEY3R3KA	COIL
Q403	2SD1862-P	TRANSISTOR	T1 Δ	SLTD5V081E	POWER TRANSFORMER
Q404	2SB1240-P	TRANSISTOR	(E, EG, EB, EH)		
Q405	DTC124EST	TRANSISTOR	(EF, E1)		
Q406	DTC124EST	TRANSISTOR	T1 Δ	SLTD5V082G	POWER TRANSFORMER
Q407	DTC124EST	TRANSISTOR	(EK, XL)		
Q601	DTC124EST	TRANSISTOR	T1 Δ	SLTD5V083X	POWER TRANSFORMER
Q602	DTC124EST	TRANSISTOR	(XA, XB, PC)		
Q603	DTC124EST	TRANSISTOR			
Q604	DTC124EST	TRANSISTOR			
Q605	DTC124EST	TRANSISTOR	X801	SVQ49U338S	OSCILLATOR
Q606	DTC124EST	TRANSISTOR			
Q607	DTC124EST	TRANSISTOR	DISPLAYS		
Q608	DTC124EST	TRANSISTOR	FL601	SADFV266G	DISPLAY TUBE
Q609	DTC124EST	TRANSISTOR			
Q610	DTC124EST	TRANSISTOR	FUSES		
Q611	DTC124EST	TRANSISTOR	F1 Δ	XBA2C012TB0S	FUSE(250V, T125mA)
Q612	DTC124EST	TRANSISTOR	(E, EG, EB, EH)		
Q801	2SC3311A-Q	TRANSISTOR	(EF, E1, EK)		
Q802	2SC3311A-Q	TRANSISTOR	(XL)		
Q803	2SD1450RST	TRANSISTOR	F1 Δ	XBA2C025TB0	FUSE, 250V, T250mA
Q804	2SD1450RST	TRANSISTOR	(XB, XA, PC)		
Q805	2SD1450RST	TRANSISTOR	F2 Δ	XBA2C08TB0	FUSE 250V, T800mA
Q806	2SD1450RST	TRANSISTOR	(E, EG, EB, EH)		
Q807	DTA124EST	TRANSISTOR	(EF, E1)		
Q852	DTC124EST	TRANSISTOR			
Q853	DTA114EST	TRANSISTOR	S1 Δ	ESB8249V	SW. POWER
Q854	DTC124EST	TRANSISTOR	S2 Δ	SSR187-1	SW. VOLTAGE SELECTOR
Q855	DTA124EST	TRANSISTOR	(XA, PC, XB)		
Q856	DTA124EST	TRANSISTOR	S101	SSPD17	SW. LOADING DET.
			S102	SSPD18	SW. LOADING DET.
			S601	EVQQS405K	SW. CH1
			S602	EVQQS405K	SW. CH2
			S603	EVQQS405K	SW. CH3
			S604	EVQQS405K	SW. CH4
			S605	EVQQS405K	SW. CH5
			S606	EVQQS405K	SW. CH6
			S607	EVQQS405K	SW. CH7
			S608	EVQQS405K	SW. CH8
			S609	EVQQS405K	SW. CH9
			S610	EVQQS405K	SW. CH10
			S611	EVQQS405K	SW. PROGRAM
			S612	EVQQS405K	SW. CANCEL
			S613	EVQQS405K	SW. TIME
			S614	EVQQS405K	SW. REPEAT
DIODES					
D11 Δ	SVD1SR35200A	DIODE			
D12 Δ	SVD1SR35200A	DIODE			
D13 Δ	SVD1SR35200A	DIODE			
D14 Δ	SVD1SR35200A	DIODE			
D15 Δ	SVD1SR35200A	DIODE			
D16	MA4300MHTA	DIODE			
D17 Δ	SVD1SR35200A	DIODE			
D19	MA4062-H	DIODE			
D23	MA4056-M	DIODE			
D24	MA4150MHTA	DIODE			
D25	MA4150MHTA	DIODE			
D410	MA4033M	DIODE			
D411	SVD1SS254	DIODE			

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
INTEGRATED CIRCUITS					
S615	EVQQS405K	SW. RECALL	IC101	AN8373S	I.C. SERVO AMP
S616	EVQQS405K	SW. SK1/P(FOR)	IC102	AN8374S	I.C. SERVO PROCESSOR
S617	EVQQS405K	SW. SK1/P(BACK)	IC103	AN8377	I.C. B.T.L DRIVE
S618	EVQQS405K	SW. +10	IC104	LM2940T5M	I.C. RESET
S619	EVQQS405K	SW(0)			
S620	EVQQS405K	SW. A/B			
S621	EVQQS405K	SW. EDIT			
S622	EVQQS405K	SW. OPEN/CLOSE			
S623	EVQQS405K	SW. STOP/CLEAR			
S624	EVQQS405K	SW. PAUSE			
S625	EVQQS405K	SW. PLAY			
S626	EVQQS405K	SW. SCAN			
S627	EVQQS405K	SW. WARP			
S628	EVQQS405K	SW. LINK			
S651	SSS148	SLIDE SWITCH, TIMER PLAY			
TRANSISTORS					
VARIABLE RESISTORS					
VR101	EVND3AA00B14	V.R. BEST EYE ADJ.			
VR102	EVND3AA00B14	V.R. TRACKING GAIN ADJ.			
VR103	EVND3AA00B14	V.R. TRACKING OFFSET ADJ.			
VR104	EVND3AA00B14	V.R. FOCUS GAIN ADJ.			
VR105	EVND3AA00B14	V.R. FOCUS OFFSET ADJ.			
VR106	EVND3AA00B24	V.R. TRACKING BALANCE ADJ.			
SERVO P.C.B.					
RA1	EWS7MOA00Q53	RESISTANCE UNIT			

NEW SERVO GAIN ADJUSTER (Servo Amp. Adjusting Fixture)

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

Part number: SZZP1094C

Features:

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

