

Service Manual

COMPACT
disc
DIGITAL AUDIO

DIGITAL

Compact Disc Player
SL-P212

Color

(S)... Silver Type
(K)... Black Type



Area

Country Code	Area	Color
(E)	Continental Europe	(S) (K)

SPECIFICATIONS

■ Audio

No. of channels: 2 (left and right, stereo)
Frequency response: 2–20,000 Hz ± 0.5 dB
Output voltage: 2 V (at 0 dB)
Dynamic range: 96 dB
S/N ratio: 96 dB
Harmonic distortion: 0.003% (1 kHz, 0 dB)
Total harmonic distortion: 0.005% (1 kHz, 0 dB)
Wow and flutter: Below measurable limit
Output impedance: Approx. 600 Ω
Load impedance: More than 10 k Ω
Headphones output level: 15 mW max. 32 Ω (adjustable)

■ Signal Format

Sampling frequency: 44.1 kHz

■ Pickup

Wavelength: 780 nm

■ General

Power supply: AC 50/60 Hz, 220 V
Power consumption: 11 W
Dimensions (W×H×D): 430×92×274 mm
Weight: 3.6 kg

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

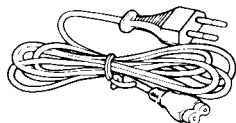
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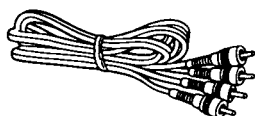
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ACCESSORIES

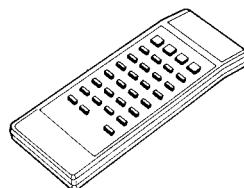
●AC power supply cord ... 1
(SJA187)



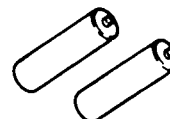
●Stereo connection cable 1
(SJP2249-3)



●Remote control transmitter 1
(EUR64766)...BLACK
(EUR64767)...SILVER

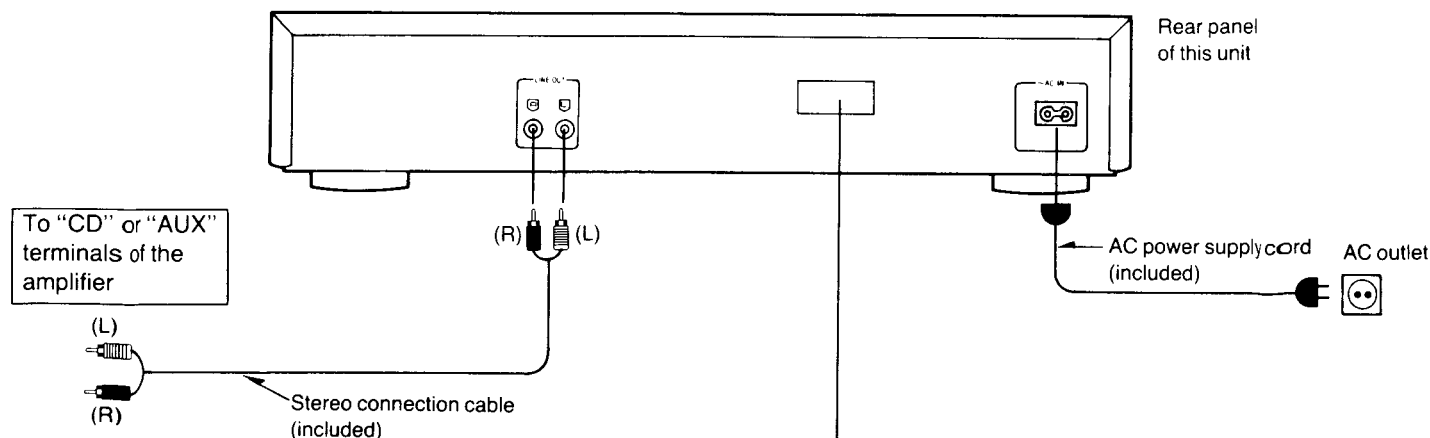


●Batteries 2
(UM-4NE/2S)



CONNECTIONS

Turn power off on all components before making connections.



Note:

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

LUOKAN 1 LASERLAITE

■ PRECAUTION OF LASER DIODE

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

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

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

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

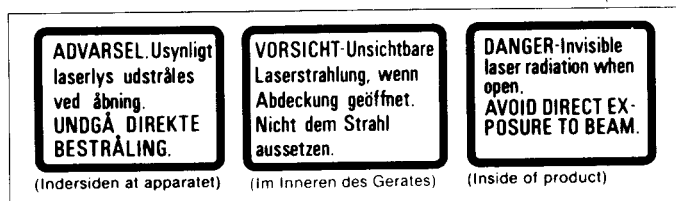
Wellenlänge: 780 nm
Maximale strahlungsleistung der lasereinheit: 100 μ W/VDE

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

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

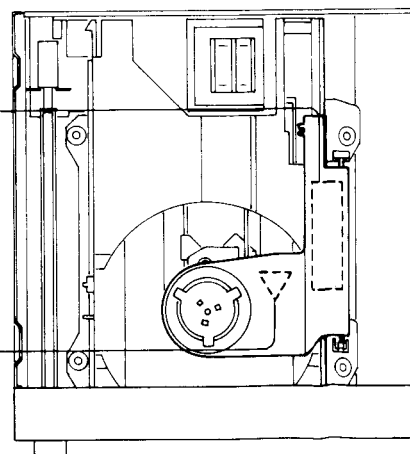
ADVARSEL: I dette a apparat anvendes laser.

(SQWD87)



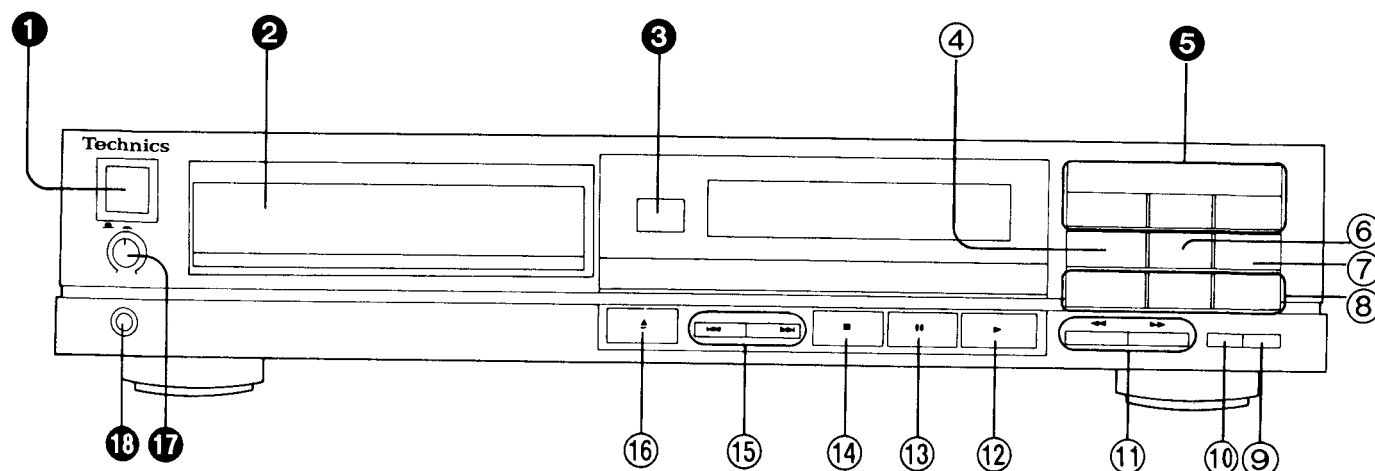
SQWD19

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



LOCATION OF CONTROLS

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



Control section

① Power switch (power)

If a disc has already been loaded, play will begin when the power is turned ON.

② Disc holder

③ Remote control signal sensor (remote sensor)

④ Time mode select button (time mode)

⑤ Buttons for edit function (edit)

•Edit tape length button (tape length)

When compact discs are to be recorded to tape, this button can be used to calculate the number of tracks that can be recorded on each side of the tape, depending on the length of the cassette tape used, so that as little tape as possible is wasted.

•Tape-side select button (side A/B)

When recording compact discs to tape, this button can be used to check the number of tracks and amount of tape left over for side A or B.

•Disc link button (disc link)

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

⑥ Random play button (random)

This button can be used to play the tracks on a disc in a random sequence.

⑦ Music scan button (music scan)

This button can be used to play the first part of each track in order.

⑧ Buttons for program function

•Programmed-play button (program)

Pressing this button initiates the programmed play mode. You can then enter specific tracks using the skip buttons.

•Clear button (clear)

This button can be used to clear tracks from the programmed sequence one at a time.

•Recall button (recall)

This button can be used to display the contents of the programmed track sequence for confirmation.

⑨ Auto cue button (auto cue)

Pressing this button causes the unit to skip automatically to the beginning of the next track on the disc and switch to the play standby mode.

⑩ Repeat button (repeat)

⑪ Search buttons (◀◀ search ▶▶)

These buttons can be used to move rapidly forward or backward on the disc during play. The search speed is slow when the button is pressed at first and becomes faster if the button is pressed and held continuously.

⑫ Play button (▶ play)

⑬ Pause button (⏸ pause)

⑭ Stop button (■ stop)

This button can be used to stop disc play, as well as to cancel the various play modes.

⑮ Skip buttons (◀◀ skip/skip ▶▶)

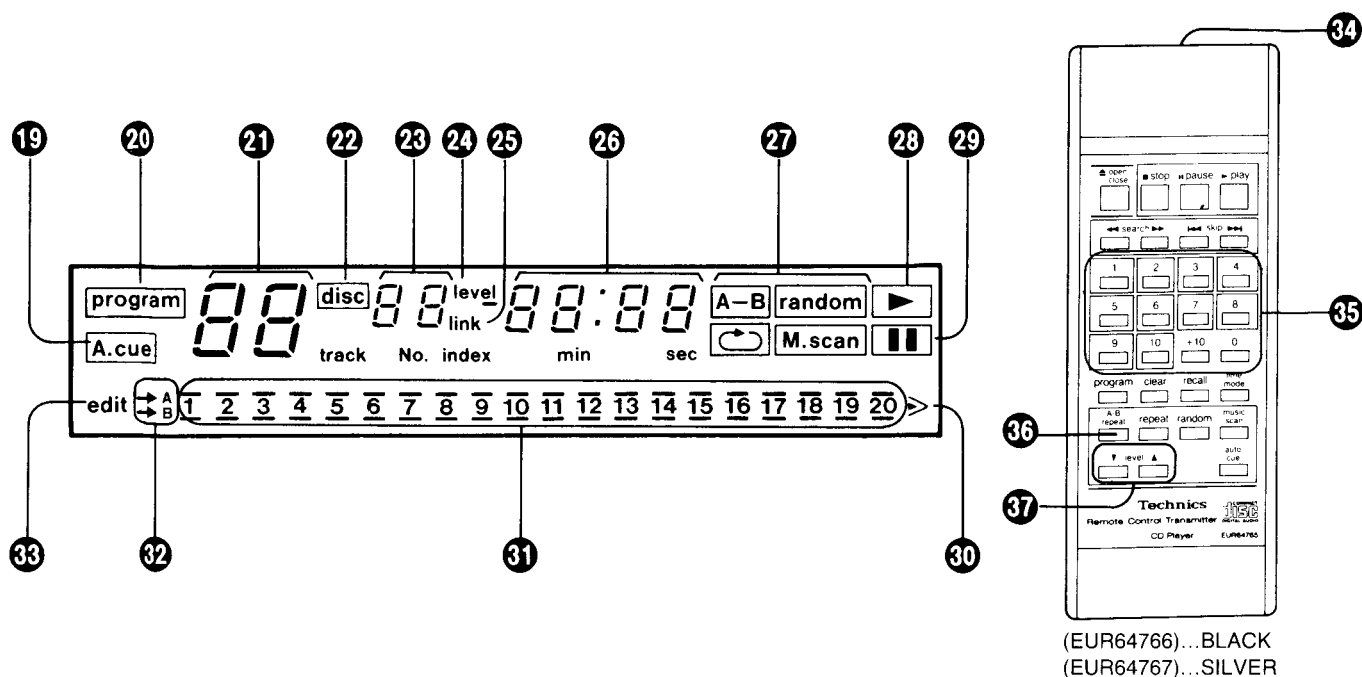
These buttons can be used to specify the number of the desired track and the desired recording time of the tape.

⑯ Disc holder open/close button (▲ open/close)

⑰ Headphones volume control (level)

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

⑱ Headphones jack (phones)



Indicators section

- 19** Auto cue indicator (**A.cue**)
- 20** Programmed-play indicator (**program**)
- 21** Track number display (track)
- 22** Disc indicator (**disc**)
- 23** Index/program number display (index/No.)
- 24** Level indicator (level)
This indicator lights when the output level is attenuated by the remote control.
- 25** Disc link indicator (link)
- 26** Time display (min/sec)
- 27** Operation indicators
The following indicators light during their respective operations.
A-B: A-B repeat play (remote control operation)
random: Random play
repeat: Repeat play
M. scan: Music scan
- 28** Play indicator (**▶**)
- 29** Pause indicator (**⏸**)
- 30** "Over" mark (**>**)
This indicator lights if the total number of tracks on the disc is 21 or more.
- 31** Track number indicator (**1-20**)
- 32** Tape side indicator (A/B)
- 33** Compact disc edit indicator (edit)

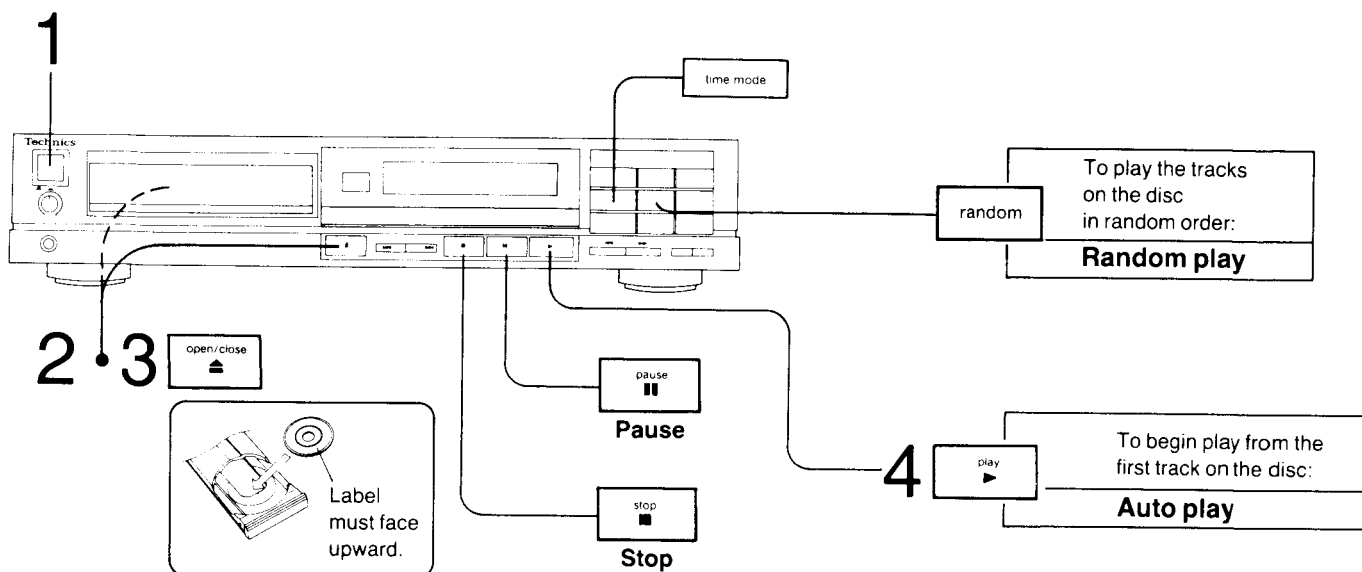
Unnumbered buttons on the remote control transmitter function identically to their corresponding parts on the unit.

Remote control transmitter

- 34** Remote control signal transmission window
- 35** Numeric buttons (+10, 0, 1~10)
- 36** A-B repeat button (A-B repeat)
This button can be used to play the portion of a disc between two points (A and B) chosen by you.
- 37** Level buttons (**▼ level ▲**)
These buttons can be used to control output level (from 0 dB to -12 dB).

BASIC OPERATION

Has the lock shaft been released?



Auto play

Playing an entire disc from the first track to the last.

Basic operations such as turning the power ON and OFF are the same for the other play modes as well.

1 Press the power switch to turn power ON.

Turn down your amplifier volume first. If, inadvertently, the volume is set too loud, damage to your speakers could result.

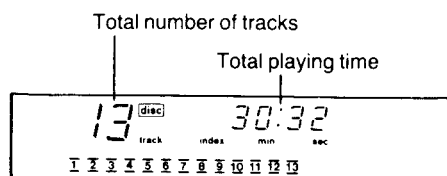
Auto-start function

If a disc has already been loaded into the disc holder, play will begin right away when the power is turned ON. This is for timer play.

2 Press the open/close button to open the disc holder and insert a disc.

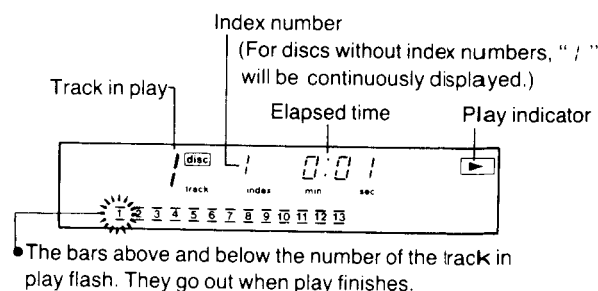
3 Press the open/close button again to close the disc holder.

The total number of tracks on the disc and the total playing time are displayed.



4 Press the play button.

Disc play begins from the first track on the disc.



- The unit stops automatically when the last track on the disc finishes playing. (The display returns to the total number of tracks and total playing time indications.)
- Switch power OFF when finished.

• To stop disc play, press the stop button.

The unit switches to the stop mode and the total number of tracks and total playing time are displayed.

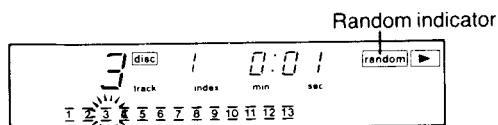
Notes:

- Attempting to change discs while the disc holder is in the process of opening can scratch or damage your discs.
- Before attempting to use the remote control transmitter to open the disc holder, make sure that there are no obstructions in front of the unit (the closed glass door of an audio rack, etc.)
- The total playing time displayed includes the silent sections between tracks. For this reason, it may differ by a few seconds from the playing time printed in the disc's liner notes.

Random play

All the tracks on the disc are played in a new, randomly selected order. The order is different every time. Listening to tracks in a different order can be a refreshing change of pace.

Press the random play button.



When play begins from track 3
(The bars above and below the number of the track in play flash. They go out when play finishes.)

- The unit stops automatically when all tracks on the disc finish playing.

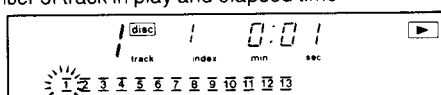
•To cancel random play while a disc is playing, press the random play button again.

When the track in play finishes playing, play continues from subsequent tracks in the normal order until the end of the disc is reached.

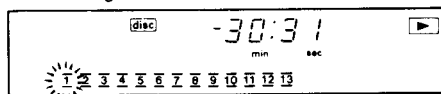
To change the indications of the time mode display

Each time the time mode select button is pressed during play or when the unit is in the pause mode switches the display among the following modes.

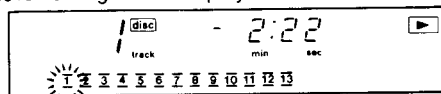
Number of track in play and elapsed time



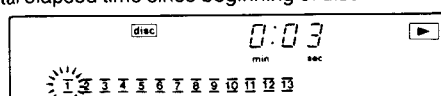
*Total remaining time on disc



Time remaining in track in play



*Total elapsed time since beginning of disc

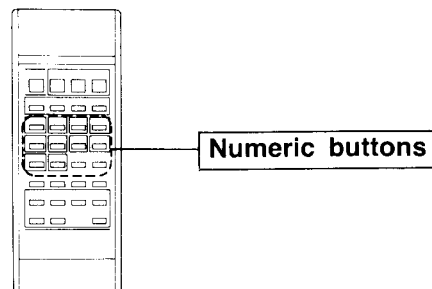


*not displayed during random play

Direct access play

(by the remote control transmitter only)

To listen to a disc from track 3, press the numeric button $\boxed{3}$ on the remote control transmitter. Play begins directly from track 3.



Choosing a specific track

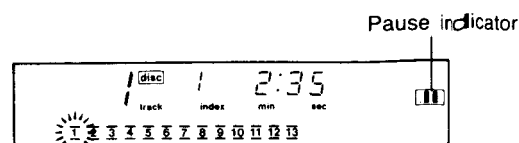
Tracks 1-10: Press the appropriate numeric button $\boxed{1}$ - $\boxed{10}$ on the remote control transmitter directly.

Tracks 11 and up: First press $\boxed{-10}$, then $\boxed{0}$ - $\boxed{9}$.
(Press $\boxed{-10}$ twice for 20, three times for 30, and so on.)

- Playback begins from the track selected and continues from subsequent tracks until the end of the disc is reached.
- The unit stops automatically when the last track on the disc finishes playing.

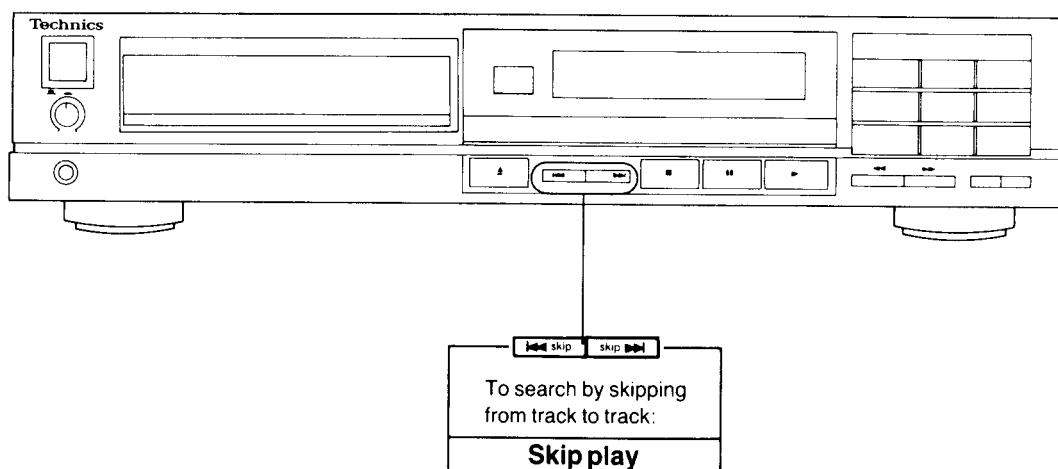
To temporarily stop disc play

Press the pause button.



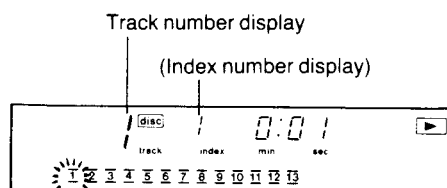
- Press the play button to play again.

■ SEARCH FUNCTIONS



Skip play

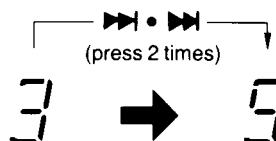
This function allows you to skip to the beginnings of tracks preceding or following the track in play and begins play immediately. It is a good idea to keep an eye on the track number display when using this function.



●To skip forward, press ►► button.

The unit skips ahead one track each time the button is pressed.

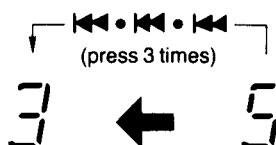
For example, to skip from track 3 to track 5:



●To skip backward, press ◄◄ button.

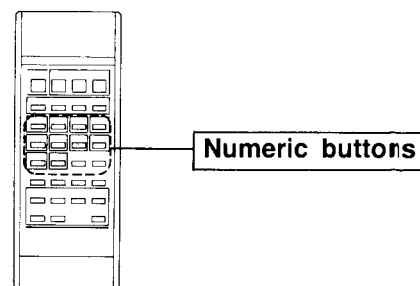
The first time the button is pressed, the unit skips back to the beginning of the track in play. Then it skips back one track for each additional press.

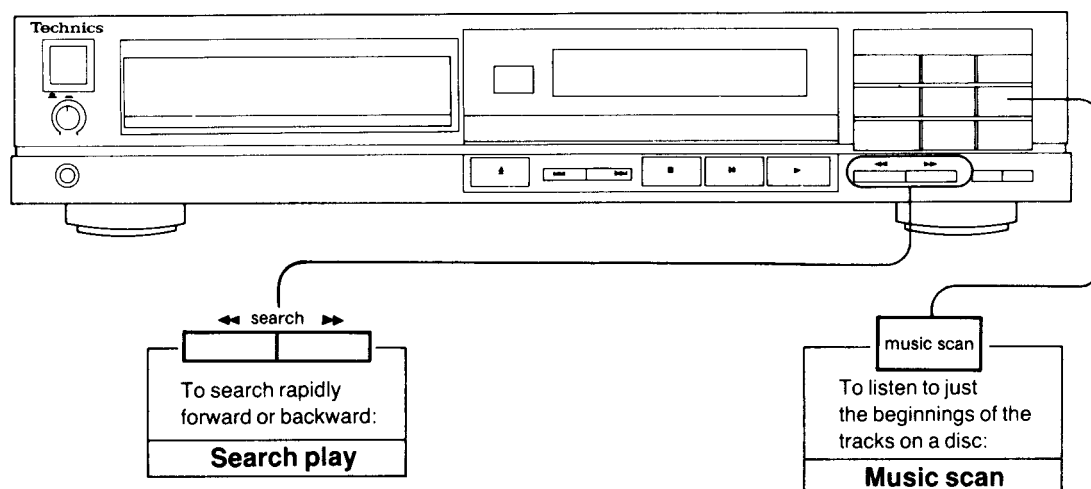
For example, to skip from track 5 to track 3 during play:



Helpful Hints:

- You can skip tracks when the unit is in the stop mode. Play begins automatically from the selected track and continues to the last track on the disc. The unit stops automatically when the last track on the disc finishes playing.
- You can also skip tracks when the unit is in the pause mode. The unit skips to the track selected and remains in the pause mode.
- You can also skip to the specific track directly by using the numeric buttons on the remote control transmitter. (During program play, this results in adding the programmed track.)





Search play

This function allows you to search rapidly forward or backward on the disc for specific sections.

- **To search forward, press ►► button.**
The unit begins searching in a forward direction.
- **To search backward, press ◄◄ button.**
The unit begins searching in a reverse direction.

The search speed is slow when the button is pressed at first and becomes faster if you keep it pressed down. Release the button when you reach the desired point on the disc.

■ Using search function in the pause mode

When the search button is released, the unit returns to the pause mode.

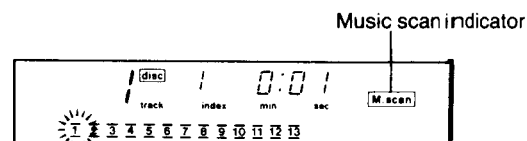
Music scan

This function plays only the first 15 seconds of each track on the disc.

It is useful for locating tracks in a disc when you are not sure of the contents of tracks.

Press the music scan button.

Music scan begins with playing the first 15 seconds of track 1.



- Once the beginning sections of all the tracks on the disc have finished playing, music scan is canceled and normal play begins from track 1.

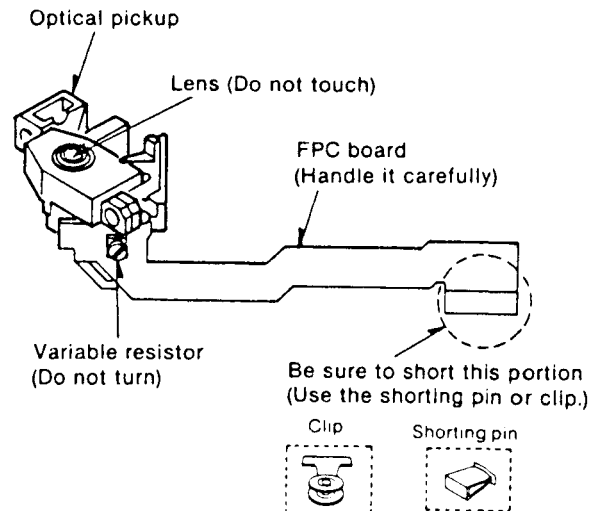
■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

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

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

• Handling of optical pickup

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

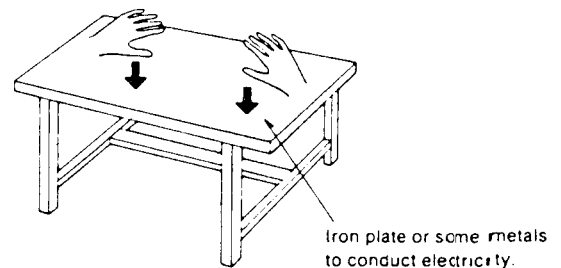
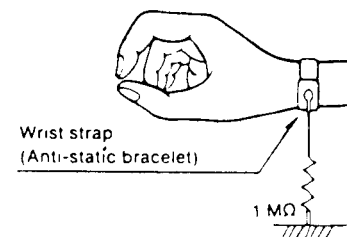


• Grounding for electrostatic breakdown prevention

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

Caution:

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

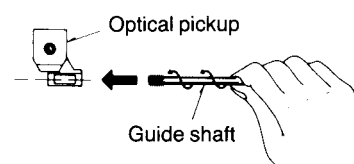
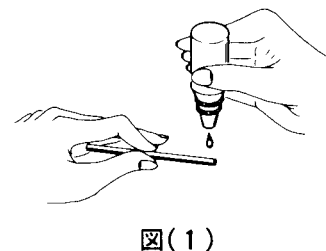


■ INSTRUCTIONS FOR TRAVERSE OIL (Part No. SZZ0L31)

The container contains 6 g (approx. 3 ml) of oil, and one application (one shaft) requires 0.05 ml of oil.

How to Use

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



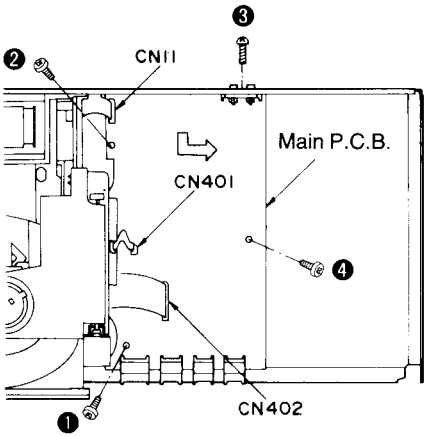
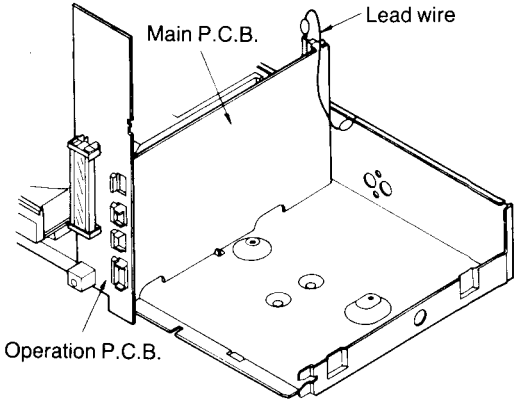
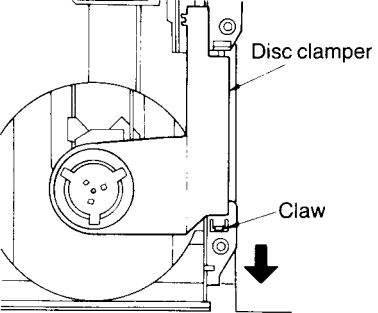
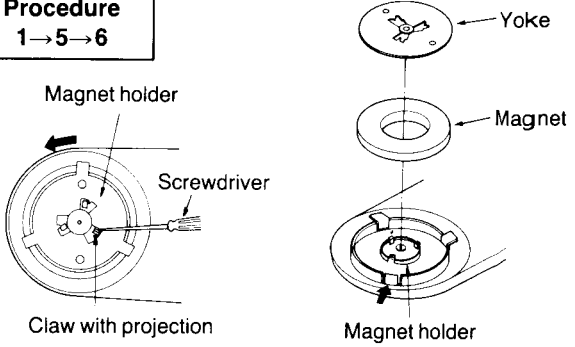
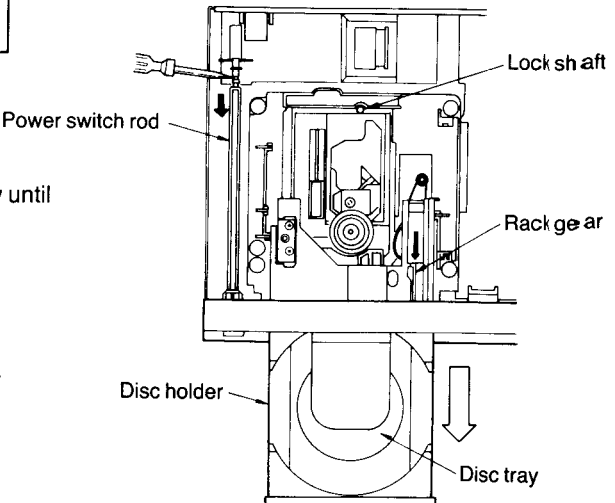
■ DISASSEMBLY INSTRUCTIONS

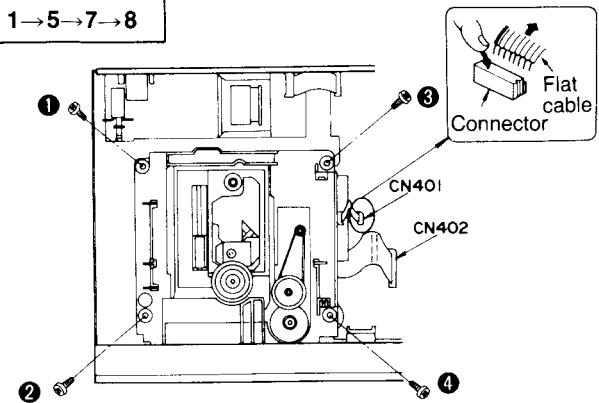
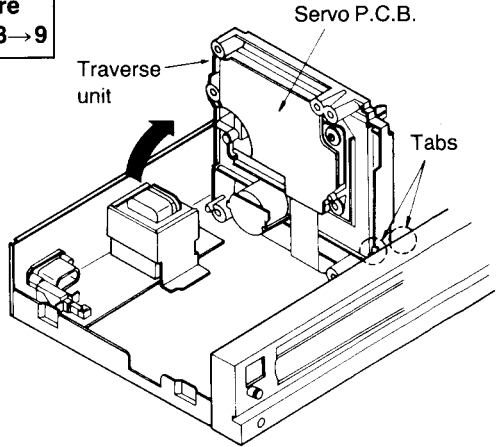
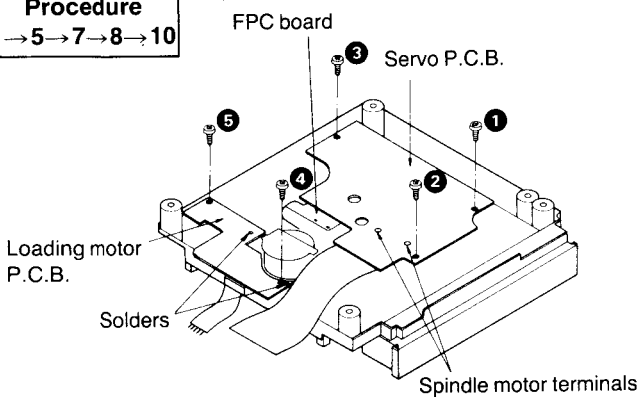
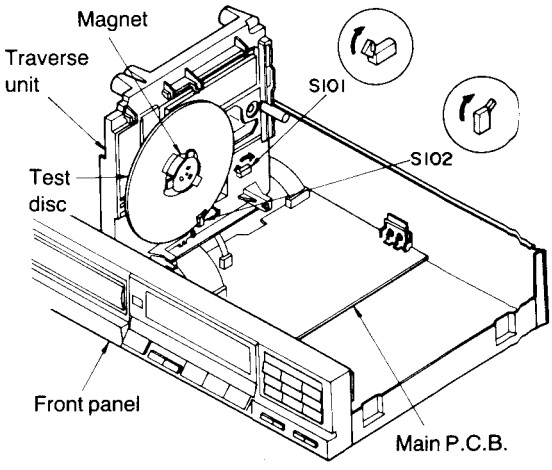
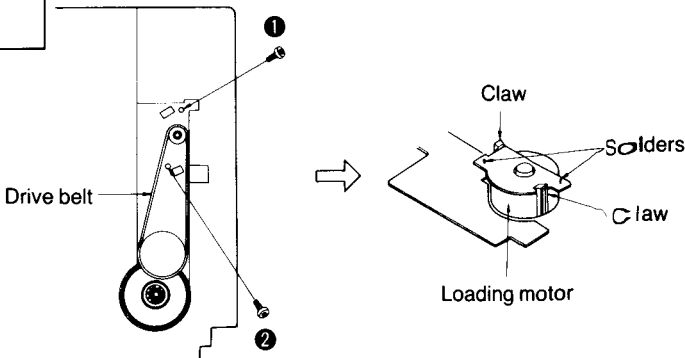
Warning: This product uses a laser diodes. Refer to caution statements on page 3.

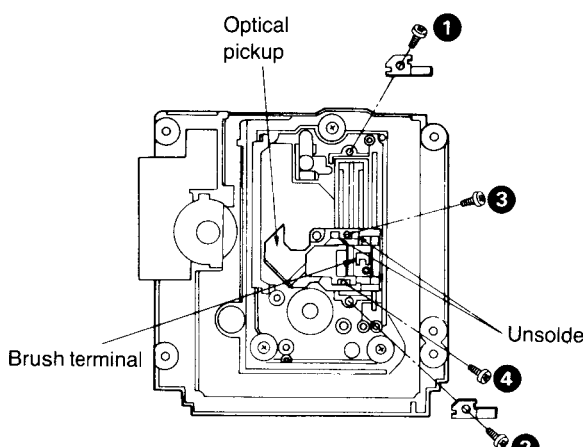
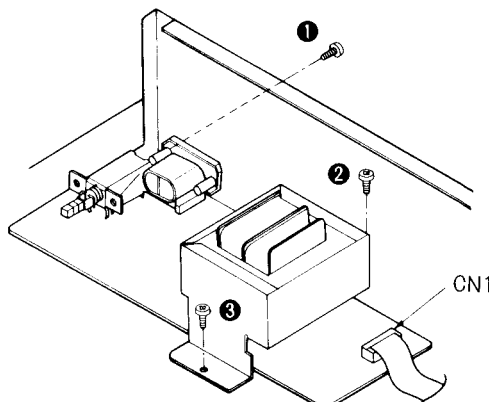
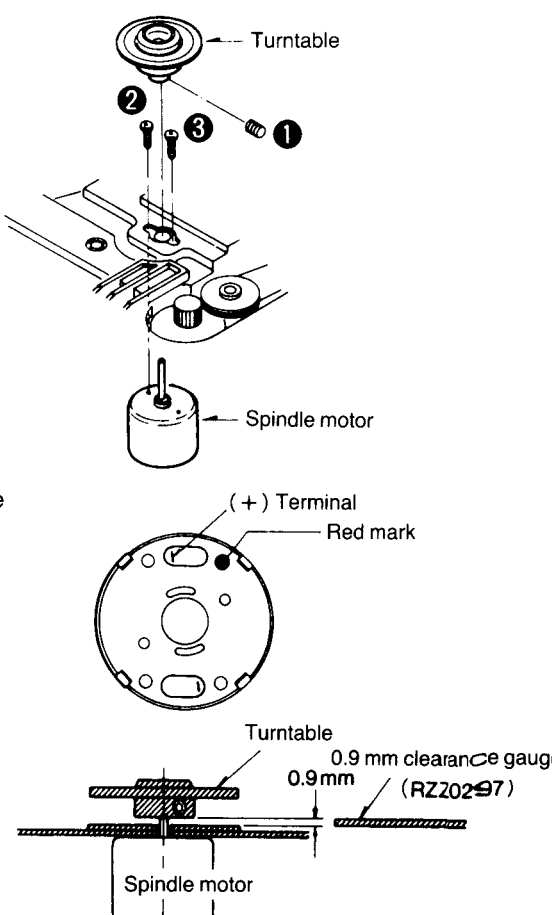
ACHTUNG: • Die Lasereinheit nicht zerlegen.

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

[illegible]

Ref. No. 4	Removal of the main P.C.B.	How to check the main P.C.B.
Procedure 1→2→3→4	 1. Remove the 4 screws (①~④). 2. Lift the main P.C.B. off the retention posts on the chassis. 3. Remove the main P.C.B. in the direction of the arrow.	●When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown. 1. Connect the main P.C.B. ground terminal (LINE OUT terminal) to the chassis with a lead wire. 2. Connect the loading base grounding terminal to the chassis with a lead wire. 3. Connect the operation P.C.B. ground terminal to the chassis with a lead wire. 
Ref. No. 5	Removal of the disc clamber	Ref. No. 6
Procedure 1→5	 ●Push the claw in the direction of the arrow and remove the disc clamber.	Procedure 1→5→6  1. While lifting the claw with a screwdriver, rotate magnet holder in the direction of the arrow and remove the yoke and magnet. 2. Release the claws of the magnet holder.
Ref. No. 7	Removal of the disc holder and power switch rod	 ●Removal of the disc holder 1. Push the rack gear slowly in the direction of the arrow until the disc tray comes up. 2. Pull out the disc holder further to remove it. Note: Make sure to release the lock shaft. ●Removal of the power switch rod. 1. Set the power switch to the "OFF" position. 2. Remove the power switch rod by using a screwdriver.

Ref. No. 8	Removal of the loading base	Ref. No. 9	How to check the servo P.C.B.
Procedure 1→5→7→8	 1. Remove the 4 screws (①~④). 2. Remove the 2 flat cables (CN401, CN402).	Procedure 1→5→7→8→9	 •When checking the soldered surfaces of the servo P.C.B. and replacing the parts, do as shown. •Flat cables (CN401 and CN402) should be left connected.
Ref. No. 10	Removal of the servo P.C.B. and loading motor P.C.B.	To play a disc	
Procedure 1→5→7→8→10	 •Removal of the servo P.C.B. 1. Remove the 3 screws (①~③). 2. Unsolder the 2 terminals of spindle motor. 3. Remove the FPC board from the optical pickup. Caution: To prevent the breakdown of the laser diode, antistatic shorting pin is inserted into the FPC board. •Removal of the loading motor P.C.B. 1. Remove the 2 screws (④, ⑤). 2. Unsolder the 2 terminals of loading motor.		 1. Place the test disc and magnet. 2. Switch the player on. 3. First push the Open/Close switch S102 in the direction of the arrow and then, within 4 seconds, push switch S101 in the direction of the arrow as shown in the figure.
Ref. No. 11	Removal of the loading motor	 1. Remove the drive belt. 2. Remove the 2 screws (①, ②). 3. Release the 2 claws. 4. Unsolder the 2 terminals of the lead wire of the loading motor.	

Ref. No. 12	Removal of the optical pickup	Ref. No. 13	Removal of the power supply P.C.B.
Procedure 1→5→7→8→ 10→12	Refer to the handling precautions for optical pickup and instructions for traverse oil (See page 10).	Procedure 1→5→7→13	
	1. Remove the 2 screws (①, ②). 2. Unsolder the 2 terminals and the 2 screws (③, ④).  Caution: Take care not to touch the brush terminal.		 1. Remove the 3 screws (①~③). 2. Remove the flat cable (CN1).
Ref. No. 14	Removal of the spindle motor		
Procedure 1→5→7→8→ 10→14			
	1. Loosen the screw (①) by using a 1.27 mm allen wrench and remove the turntable. 2. Remove the 2 screws (②, ③). Caution: 1. Turntable height adjustment is necessary any time the turntable or spindle motor is replaced. 2. The (+) terminal of the spindle motor is indicated by the red mark. Adjustment of turntable height 1. Insert a 0.9 mm clearance gauge (RZZ0297) between the turntable and loading base as shown in the figure. 2. Tighten the turntable set-screw by using a 1.27 mm allen wrench. Caution: Refer to turntable height adjustment (See page 16).		

MEASUREMENTS AND ADJUSTMENTS

Caution:

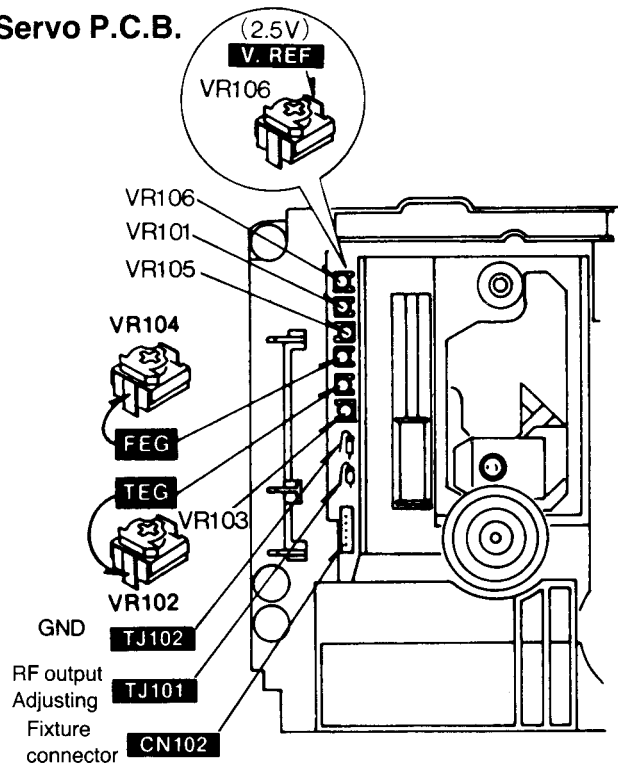
- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.)
With the unit turned "on", laser radiation is emitted from the pickup lens.
Avoid exposure to the laser beam, especially when performing adjustments.

PREPARATION

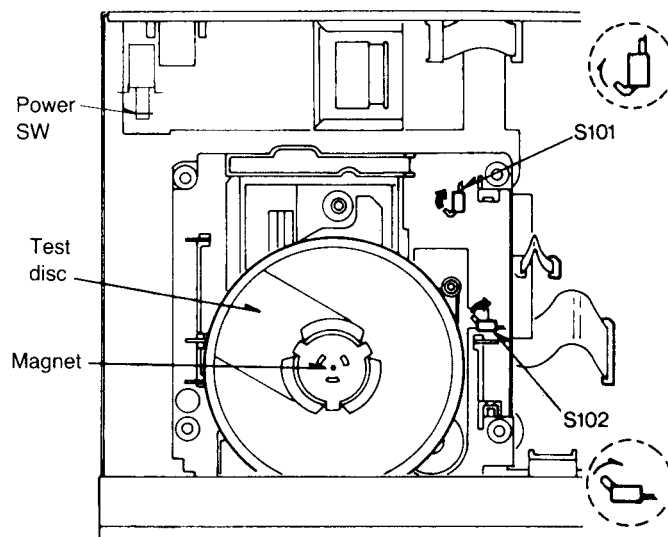
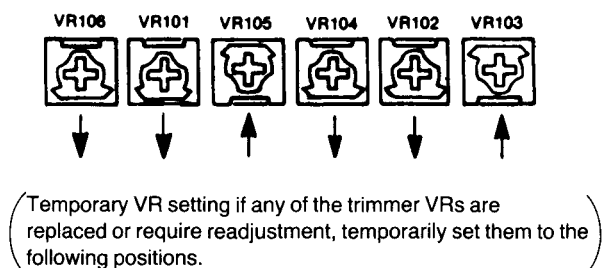
- Remove the cabinet (see Ref. No. 1 in disassembly instructions).
- Remove the disc clamber and magnet (see Ref. No. 6 of the same).
- Remove the disc holder and power switch rod (see Ref. No. 7 of the same).
- Place the test disc and magnet on the turntable.
- Switch the player on.
- First push the Open/Close switch S102 in the direction of the arrow, and then, within 4 seconds, push switch S101 in the direction of the arrow as shown in the figure.

ADJUSTMENT POINTS

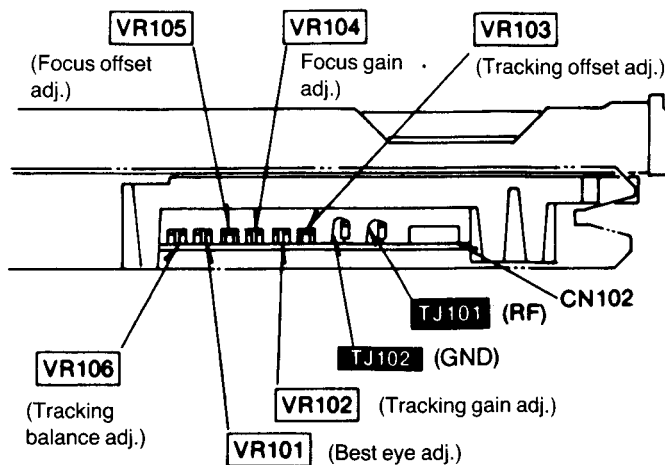
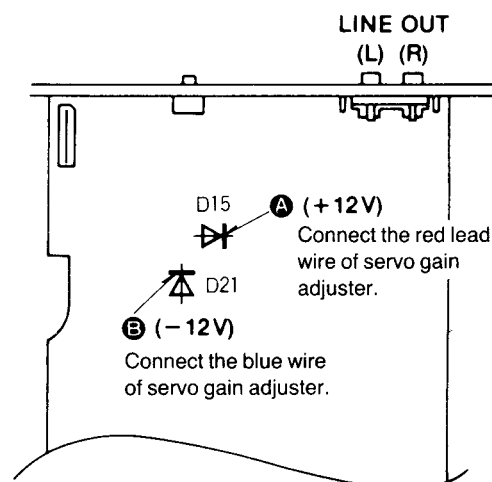
• Servo P.C.B.



• Temporary setting of each VR



• Main P.C.B.



Measuring Instruments and Special Tools

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

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

As to the replacement of the following parts, refer to the specified sections for adjustment.

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

Adjusting Procedure

- If you have replaced the spindle motor or turntable, perform the following adjustment:

(1) TURNTABLE HEIGHT ADJUSTMENT

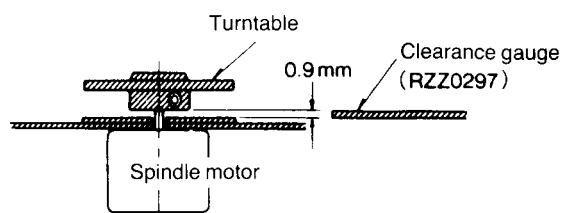
1. Insert the 0.9 mm clearance gauge (RZZ0297) between the turntable and the loading base (see the figure at right).
2. Tighten the turntable retention screw with the 1.27 mm allen wrench.
3. Connect the oscilloscope's CH. 1 probe across VR104's **FEG** (+) and VR106's **V. REF** (-) terminals via a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

Oscilloscope setting:

- | | |
|----------------|-------|
| VOLT | 50 mV |
| SWEEP | 1 ms. |
| Input coupling | DC |
4. Adjust oscilloscope's DC zero balance.
 5. Switch the player power **ON**, and play the test disc (SZZP1014F or SZZP1054C).
 6. Measure the DC level displayed on the oscilloscope.

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

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



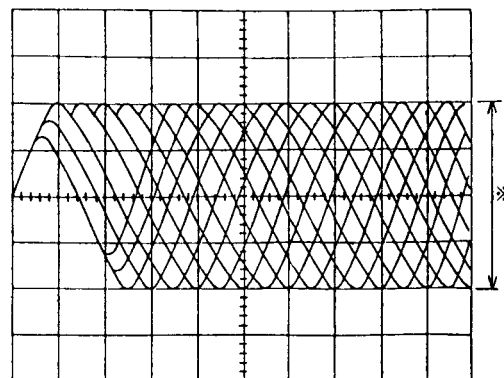
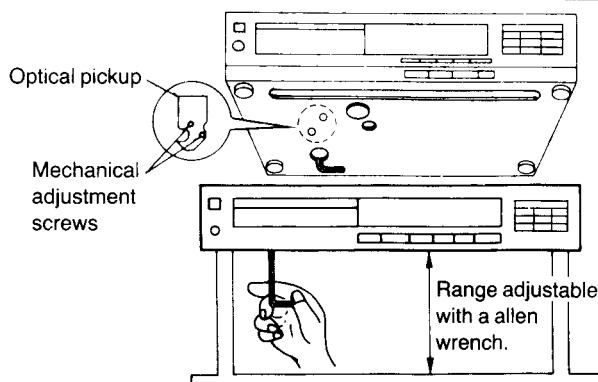
Note 2. If the measured amplitude greatly surpasses or falls short of the range above, set **VR105** at or around the center, then try to adjust the height again. (Then be sure to adjust the focus offset as well.)

(2) MECHANICAL ADJUSTMENT

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

Oscilloscope setting:

- | | |
|----------------|--------------|
| VOLT | 100 mV |
| SWEEP | 0.5 μ s. |
| Input coupling | AC |
2. Switch the player power **ON**, and play track 9 on the test disc (SZZP1056C).
 3. Leave the player in Play mode and place it as shown in the figure on the right.
 4. Alternately adjust the two mechanical adjusting screws with the 2.0 mm allen wrench until the RF signal amplitude variation on the oscilloscope is minimized.
 5. After completing the adjustment, lock the **mechanical adjustments** with lock paint (RZZOL01).



*Minimize the variation of amplitude.

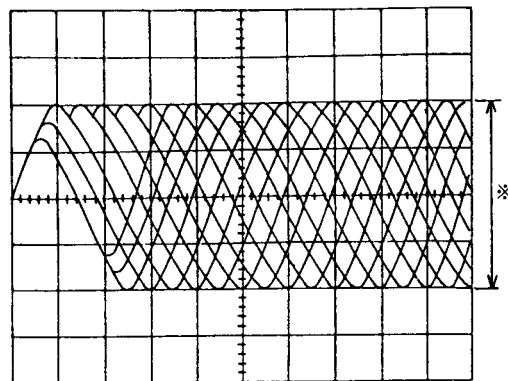
(3) BEST EYE (PD BALANCE) ADJUSTMENT

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

Oscilloscope setting:

VOLT 200 mV
 SWEEP 0.5 μ s.
 Input coupling AC

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.



*Maximize the amplitude.

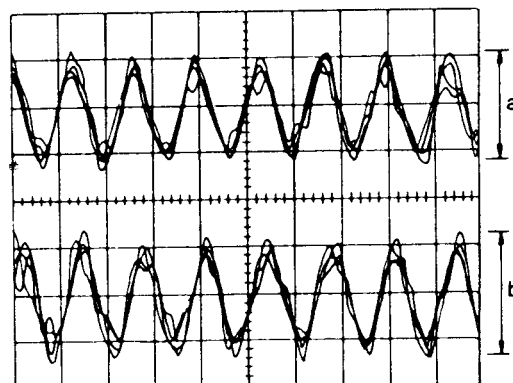
(4) FOCUS GAIN ADJUSTMENT

1. Connect the servo gain adjuster to the player (see page 19).
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 **825 Hz, 150 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
4. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, respectively (TP3 is GND).

Oscilloscope setting:

VOLT 100 mV (both channels)
 SWEEP 1 msec.
 Input coupling AC

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



*Adjust **VR104** until a equals b.

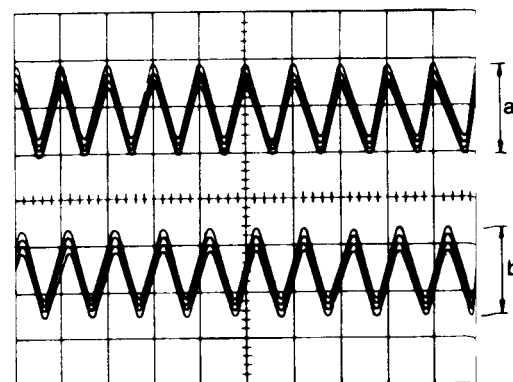
(5) TRACKING GAIN ADJUSTMENT

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

Oscilloscope setting:

VOLT 100 mV (both channels)
 SWEEP 1 msec.
 Input coupling AC

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



*Adjust **VR102** until a equals b.

(6) FOCUS OFFSET ADJUSTMENT

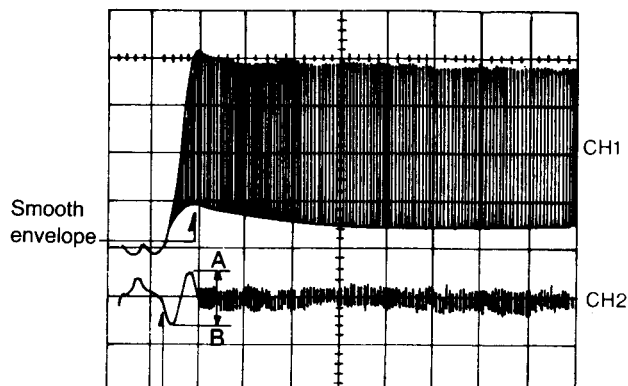
Note: Make sure that the servo gain adjuster's gain switch is set to position "2".

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

Oscilloscope setting:

VOLT 100 mV (CH. 1)
 100 mV (CH. 2)
 SWEEP 0.5 ms.
 Input coupling AC (both CH. 1 and 2)
 Trigger mode NORM (trigger CH. 1)

2. Switch the player power **ON**, and play the 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.



Minimize the amplitude on make A=B.

(7) TRACKING OF OFFSET ADJUSTMENT

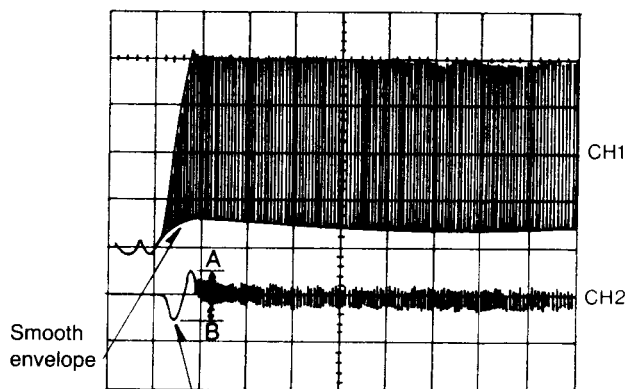
Note: Make sure that the servo gain adjuster's gain switch is set to position "2".

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)
 200 mV (CH. 2)
 SWEEP 0.5 ms.
 Input coupling AC (both CH. 1 and 2)
 Trigger mode NORM (trigger CH. 1.)

2. Switch the player power **ON**, and play rack 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.



Minimize the amplitude on make A=B.

(8) TRACKING BALANCE ADJUSTMENT

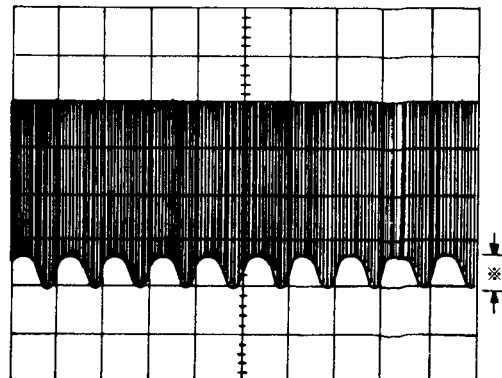
1. Make sure that servo gain adjuster's gain switch is set to position "2".
2. Set up the AF oscillator output for 1.1 kHz, 600 mVp-p, and connect it across the OSC and GND terminals on the servo gain adjuster.
3. Connect oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (-) on the Servo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

Oscilloscope setting:

VOLT 100 mV (CH. 1)
 SWEEP 0.5 msec.
 Input coupling AC (both CH. 1 and 2)
 Trigger mode NORM (trigger CH. 2)

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

5. Set the servo gain adjuster's gain switch to position "1", and adjust **VR106** 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.



*Jitter should be minimized.

(9) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

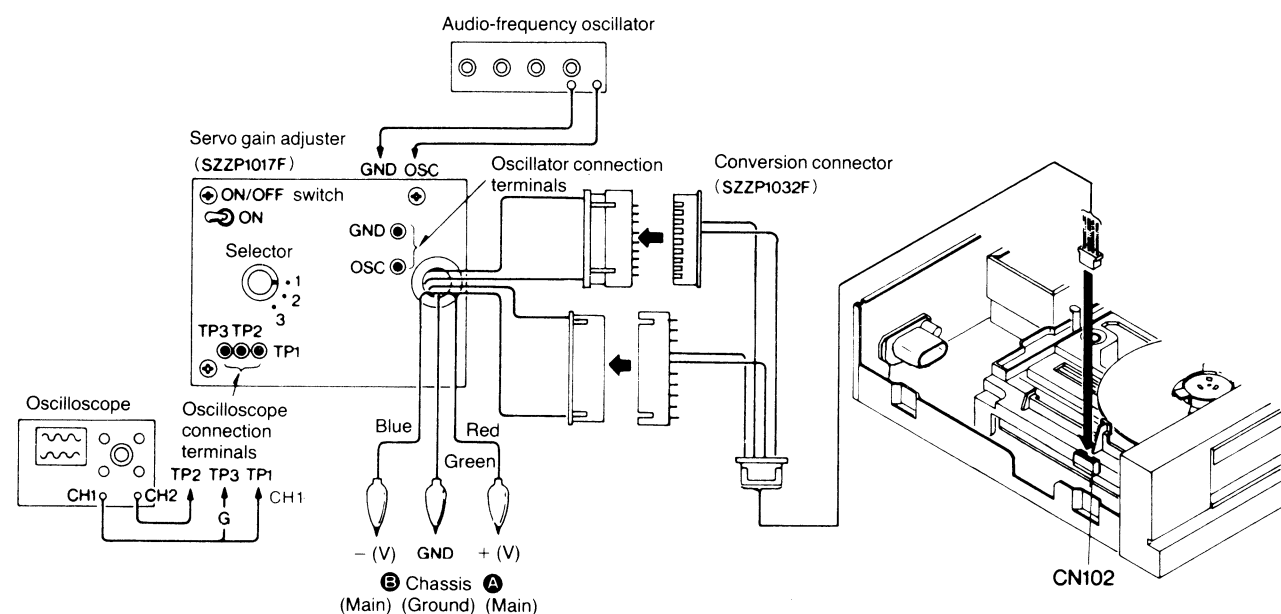
*Checking Skip Search

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



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

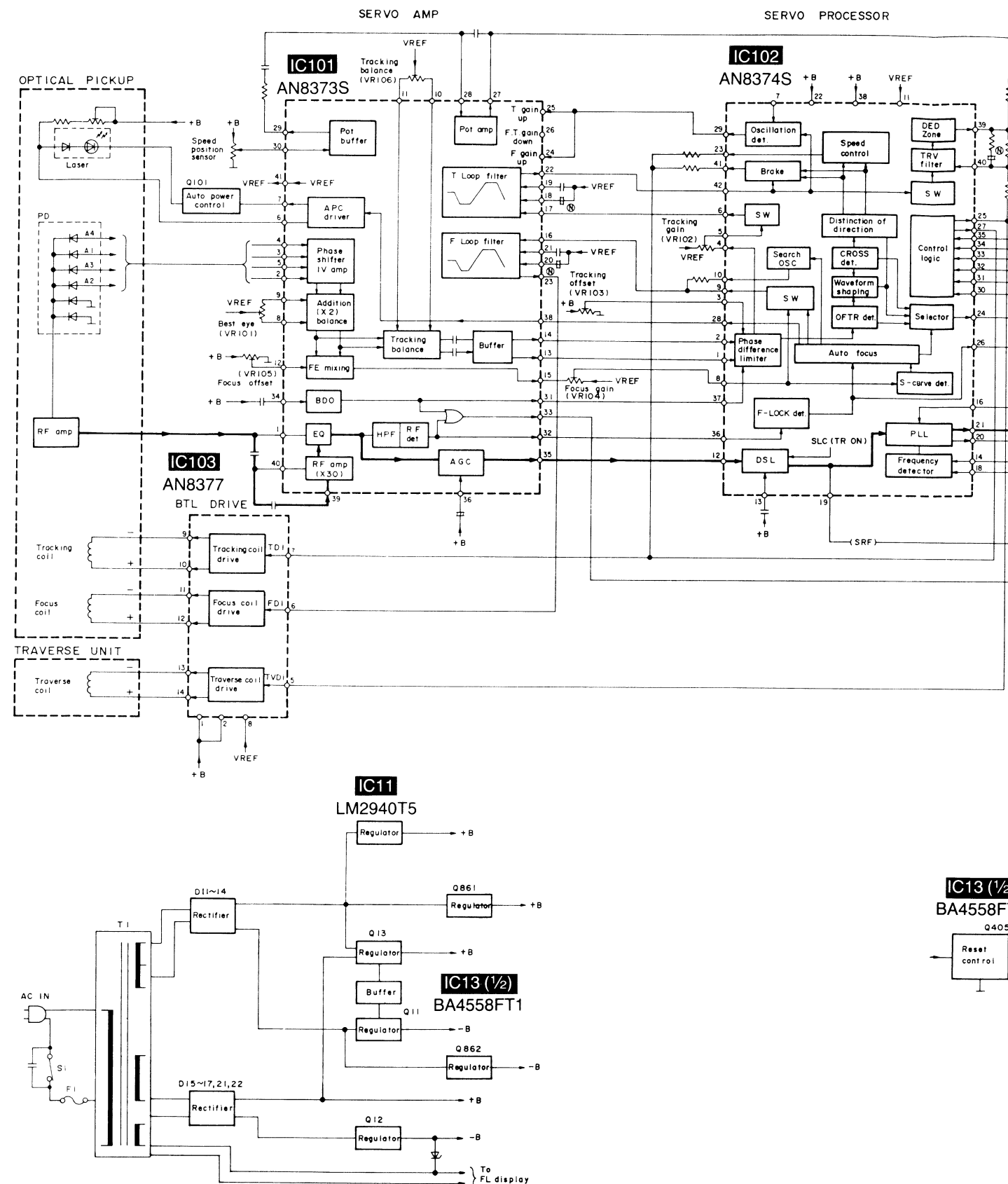
The following introduces the improved version of the current servo gain adjuster (SZZP1017F):

Part number: SZZP1094C

Features:

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

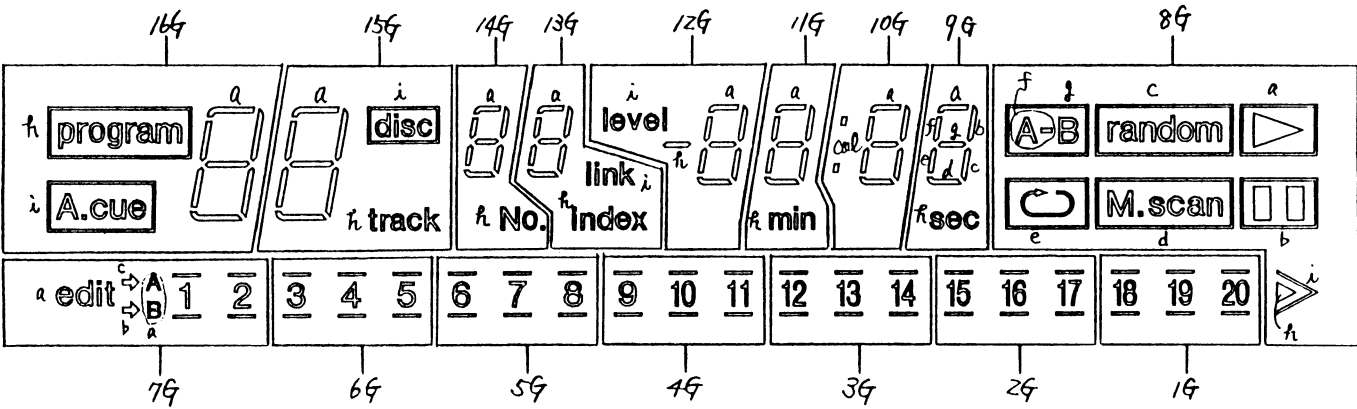
■ BLOCK DIAGRAM





DESCRIPTION OF FL PANEL

GRID ASSIGNMENT



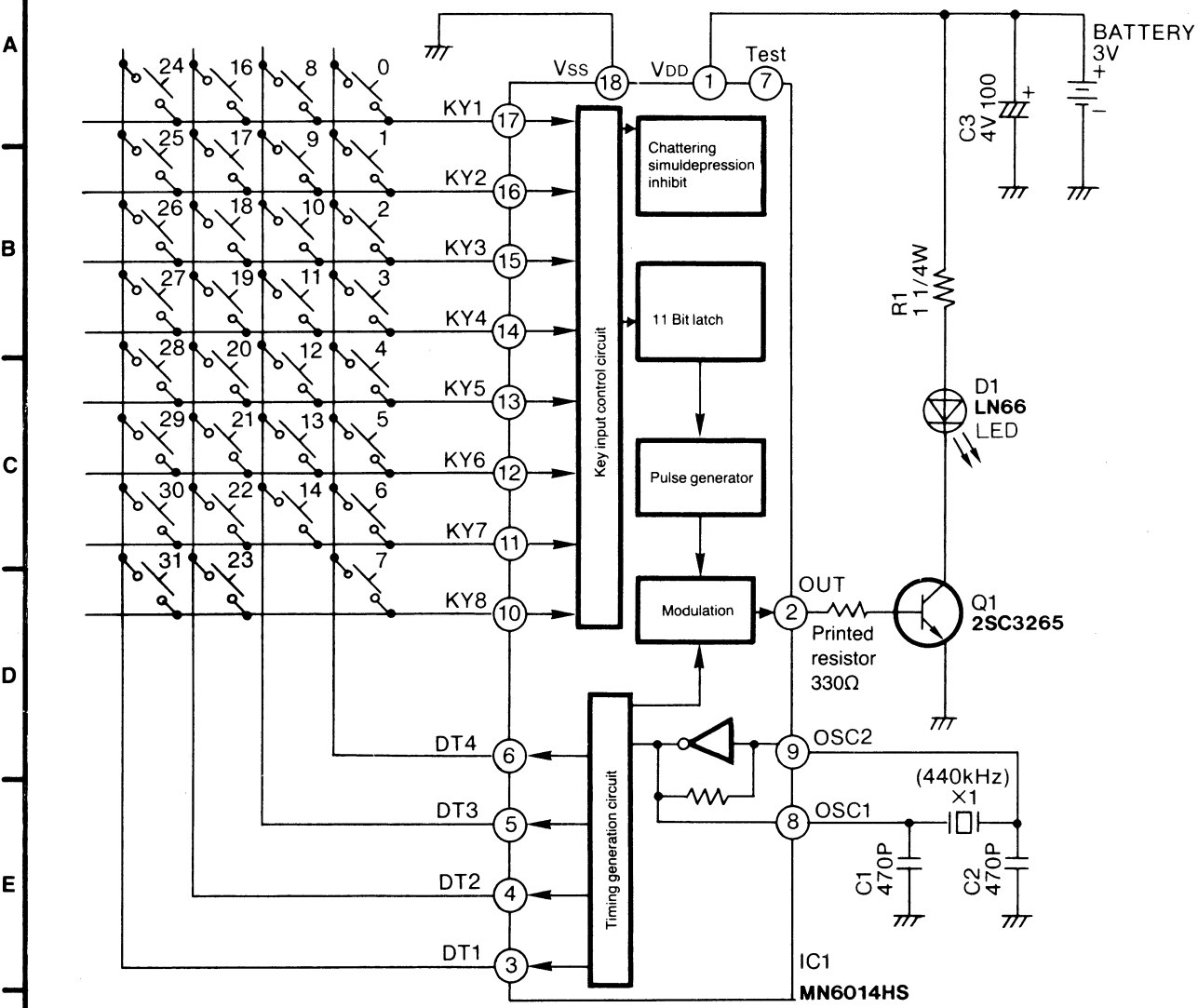
PIN CONNECTION

42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
F	F	N	a	b	c	d	N	N	N	e	f	g	h	i	16	15	14	13	N	N	N	N	12	11	10	9	8	7	6	5	4	N	N	N	N	3	2	1	N	F	F

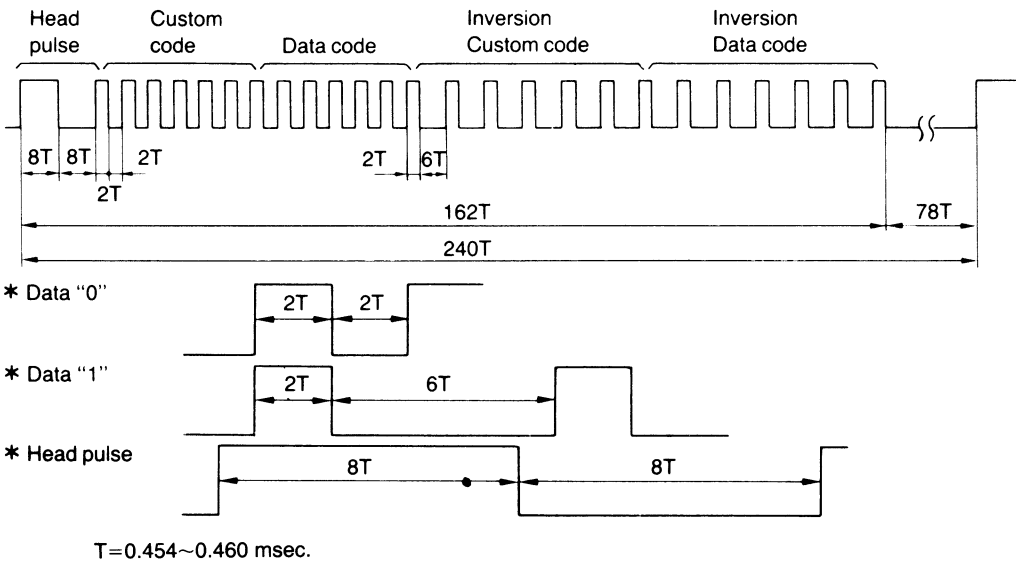
ANODE CONNECTION

	16G	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	a	a	a	a	a	a	a	a	edit	3	6	9	12	15	18	
b	b	b	b	b	b	b	b	b	(L)	3	6	9	12	15	18	
c	c	c	c	c	c	c	c	c	random	(H)	3	6	9	12	15	18
d	d	d	d	d	d	d	d	d	M.scan	1	4	7	10	13	16	19
e	e	e	e	e	e	e	e	e	(L)	1	4	7	10	13	16	19
f	f	f	f	f	f	f	f	f	(H)	1	4	7	10	13	16	19
g	g	g	g	g	g	g	g	g	B	2	5	8	11	14	17	20
h	program	track	No.	index	-	min	col	sec	(L)	2	5	8	11	14	17	20
i	A.cue	disc	-	link	level	-	-	-	(H)	2	5	8	11	14	17	20

Remote control unit



Remote control data code



SCH

(This schema

- S1:
- S101, S102:
- S601:
- S602, S603:
- S604:
- S605:
- S606:
- S619:
- S620:
- S621:
- S622:
- S623:
- S624:
- S625:
- S626:
- S627:
- S628:
- S629:
- S630, S631:
- The voltage
- oscilloscope
- Accordingly
- the measuring
- The parent
- stop mode.
- Important sa
- Component
- use only ma
- < > :
- Caution!
- IC and LSI ar
- Secondary tr
- Cover the pa
- Ground the s
- Put a conduc
- Do not touch

Key No.	
0	p
1	sl
2	4
3	8
4	0
5	ti
6	m
7	a
8	p
9	h
10	3
11	7
12	+
13	re
14	ra
16	s

SCHEMATIC DIAGRAM (Parts list on page 46~48)

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

- S1: Power switch
- S101, S102: Disc holder open/close detection switches
- S601: Disc holder open/close switch
- S602, S603: Skip switches (S602: ◀◀, S603: ▶▶)
- S604: Stop switch
- S605: Pause switch
- S606: Play switch
- S619: Edit tape length switch
- S620: Tape-side select switch
- S621: Disk link switch
- S622: Time mode select switch
- S623: Programmed-play switch
- S624: Clear switch
- S625: Recall switch
- S626: Repeat switch
- S627: Auto cue switch
- S628: Random play switch
- S629: Music scan switch
- S630, S631: Search switches (S630: ◀◀, S631: ▶▶)

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

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

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

•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.

—> : Positive voltage lines. ---> : Negative voltage lines. —•— : Audio signal lines.

Caution!

IC and LSI are sensitive to static electricity.

Secondary trouble can be prevented by taking care during repair.

*Cover the parts boxes made of plastics with aluminum foil.

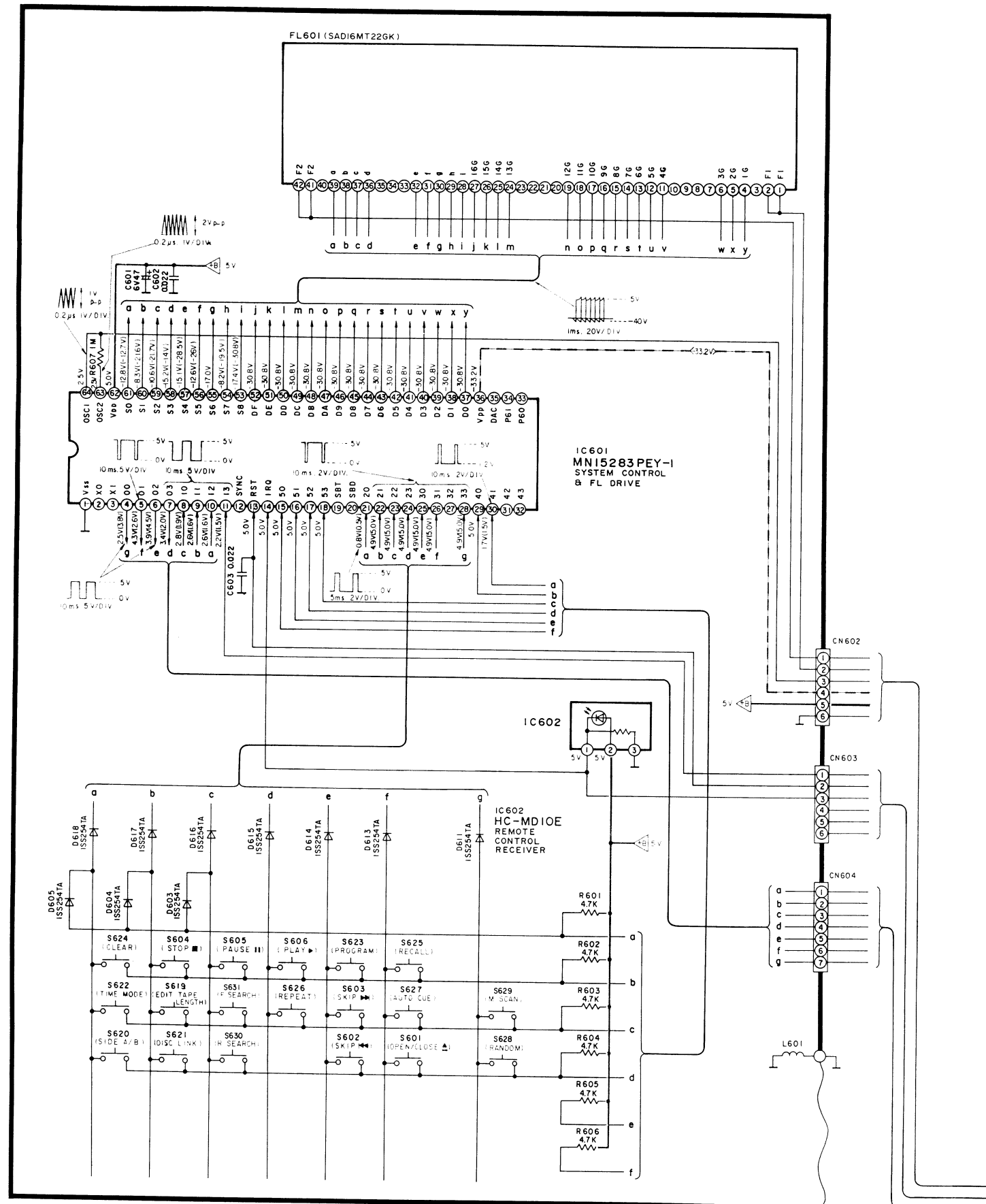
*Ground the soldering iron.

*Put a conductive mat on the work table.

*Do not touch the legs of IC or LSI with the fingers directly.

Key No.	Function	Custom Code	Data Code	Key No.	Function	Custom Code	Data Code
0	play	01100	001010	17	search ▶▶	01100	000101
1	skip ▶▶	01100	000011	18	2	01100	010001
2	4	01100	010011	19	6	01100	010101
3	8	01100	010111	20	10	01100	110000
4	0	01100	011001	21	clear	01100	001011
5	time mode	01100	101001	22	repeat	01100	000111
6	music scan	01100	001111	23	▲ level	01100	100100
7	auto cue	01100	100011	24	open/close	01100	001110
8	pause	01100	000110	25	◀◀ search	01100	000100
9	◀◀ skip	01100	000010	26	1	01100	010000
10	3	01100	010010	27	5	01100	010100
11	7	01100	010110	28	9	01100	011000
12	+10	01100	011010	29	program	01100	011101
13	recall	01100	001001	30	A-B repeat	01100	001000
14	random	01100	011111	31	▼ level	01100	100101
16	stop	01100	000000				

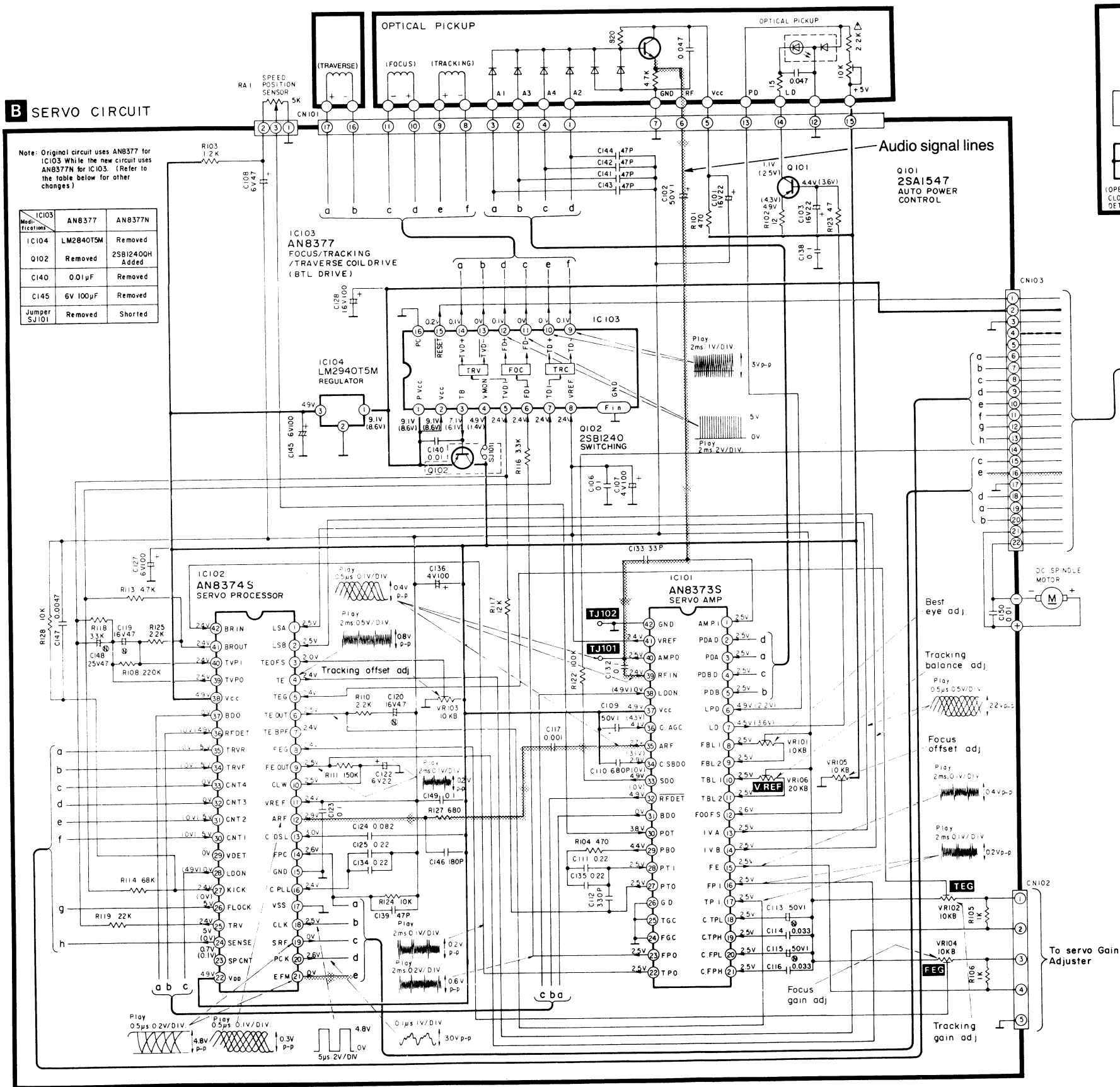
A OPERATION CIRCUIT



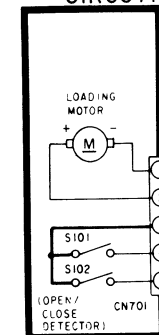
B SERVO CIRCUIT

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

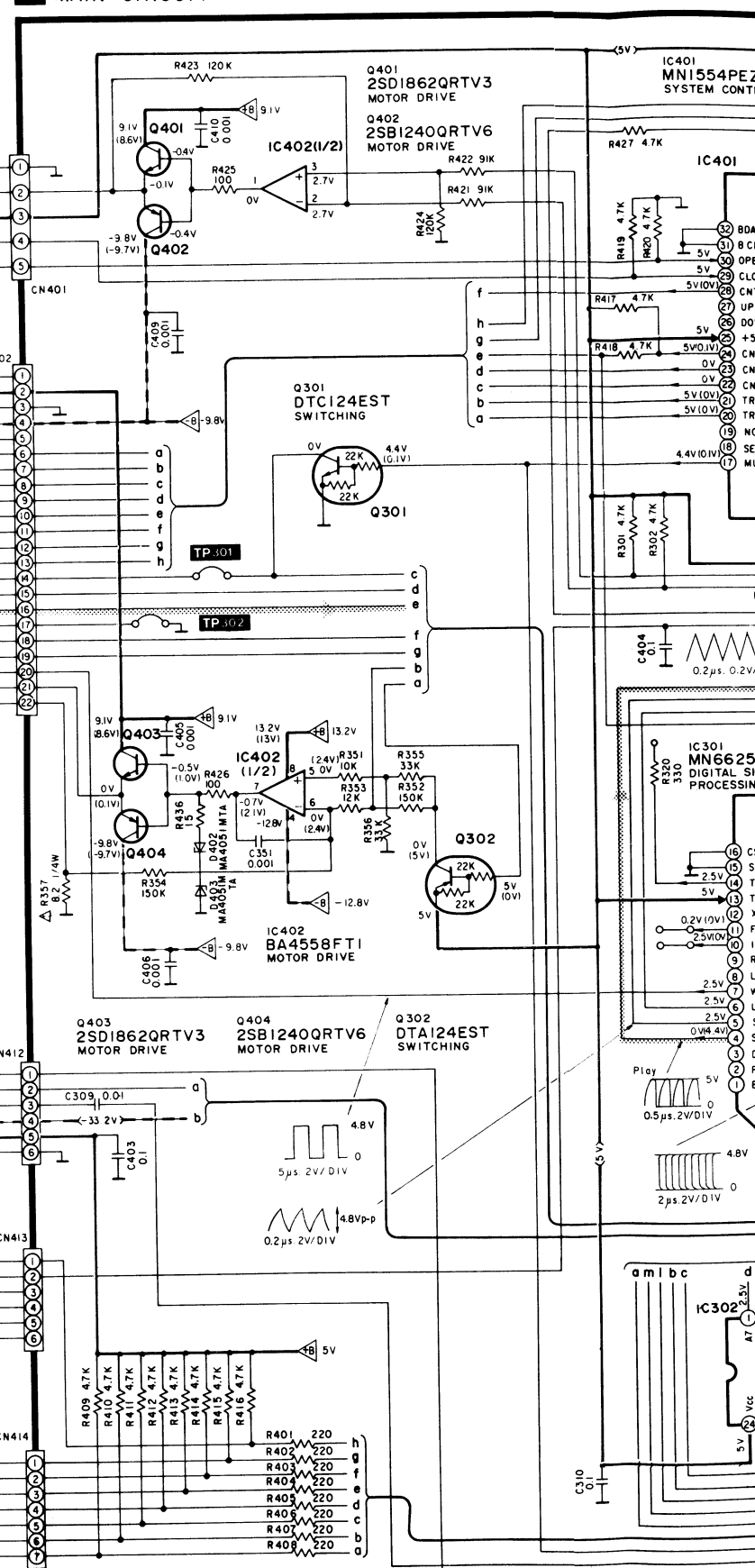
IC103	AN8377	AN8377N
IC104	LM2940T5M	Removed
Q102	Removed	2SB1240QH Added
Q140	0.01µF	Removed
C145	6V 100µF	Removed
Jumper SJ101	Removed	Shorted



C MOTOR / SWITCH CIRCUIT



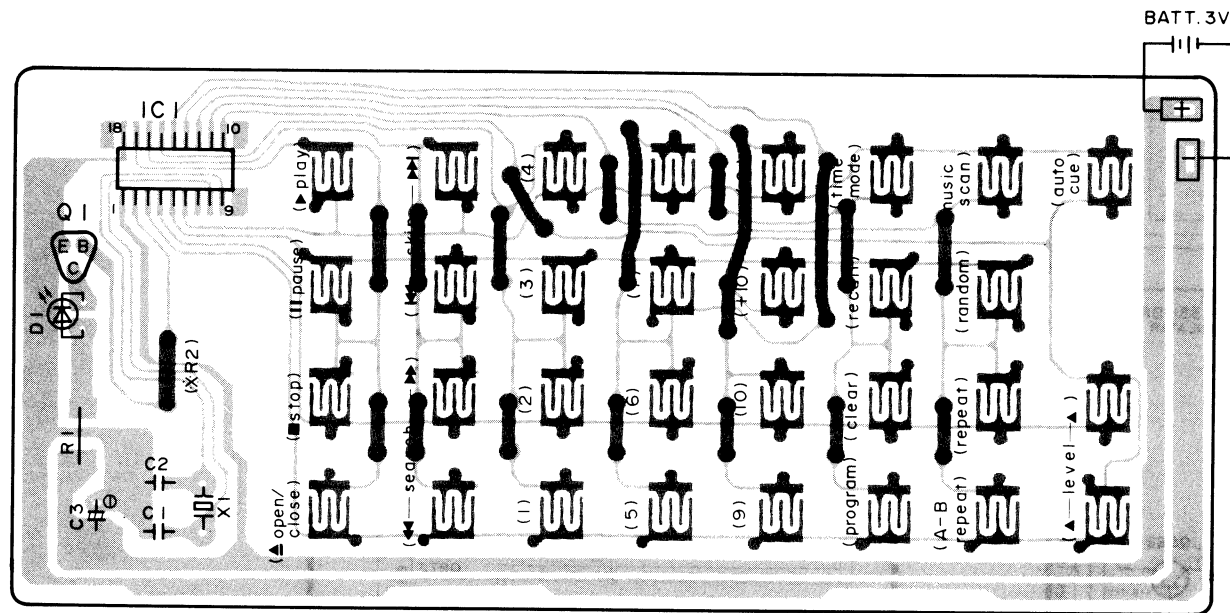
D MAIN CIRCUIT



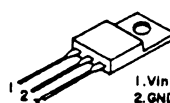
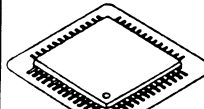
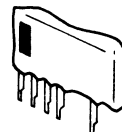
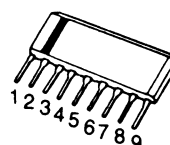
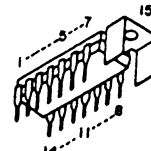
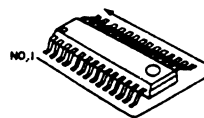
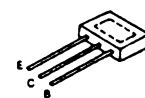
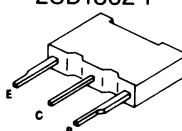
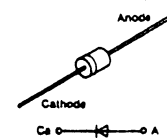
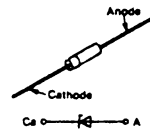


■ PRINTED CIRCUIT BOARDS

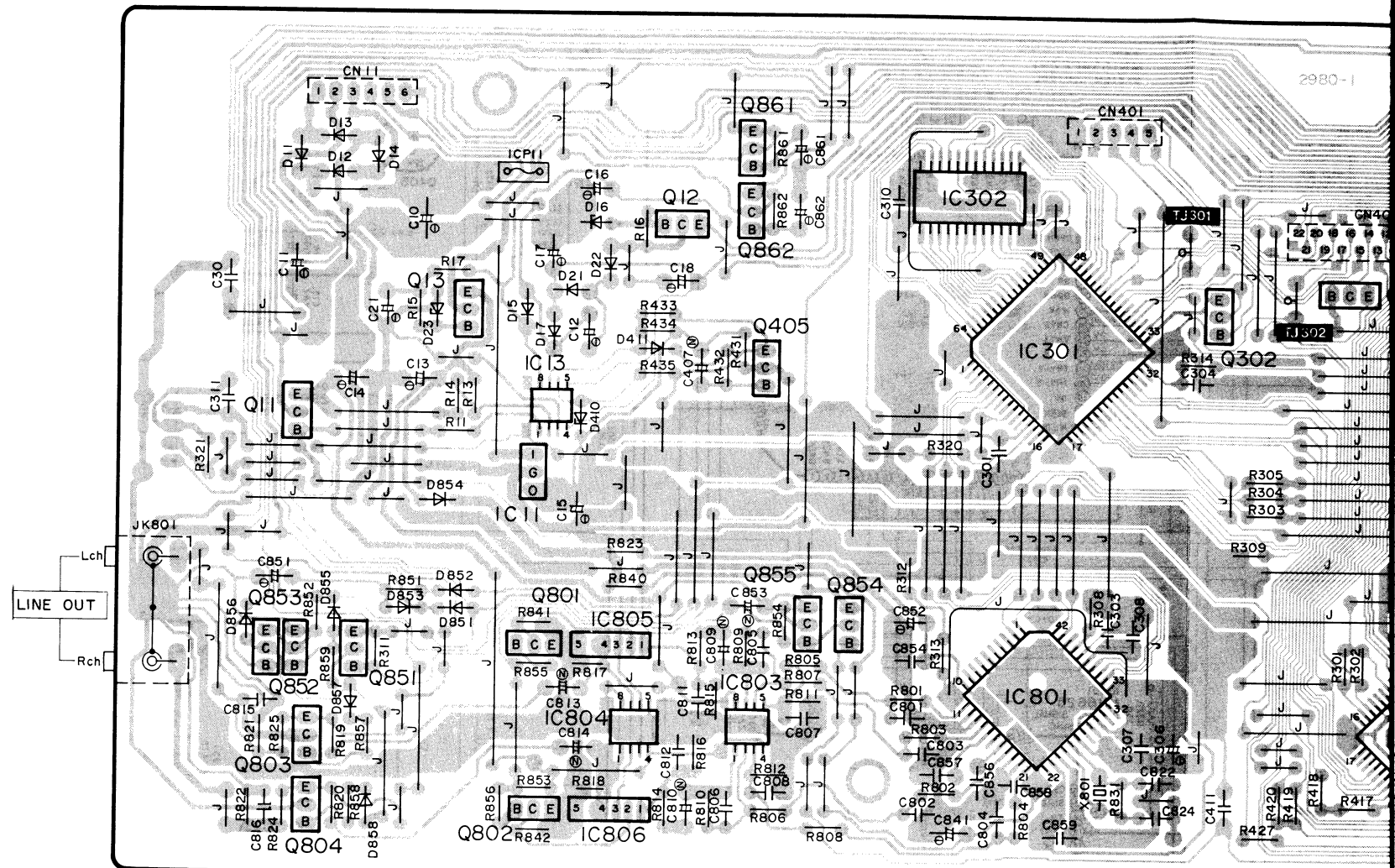
- Remote control unit



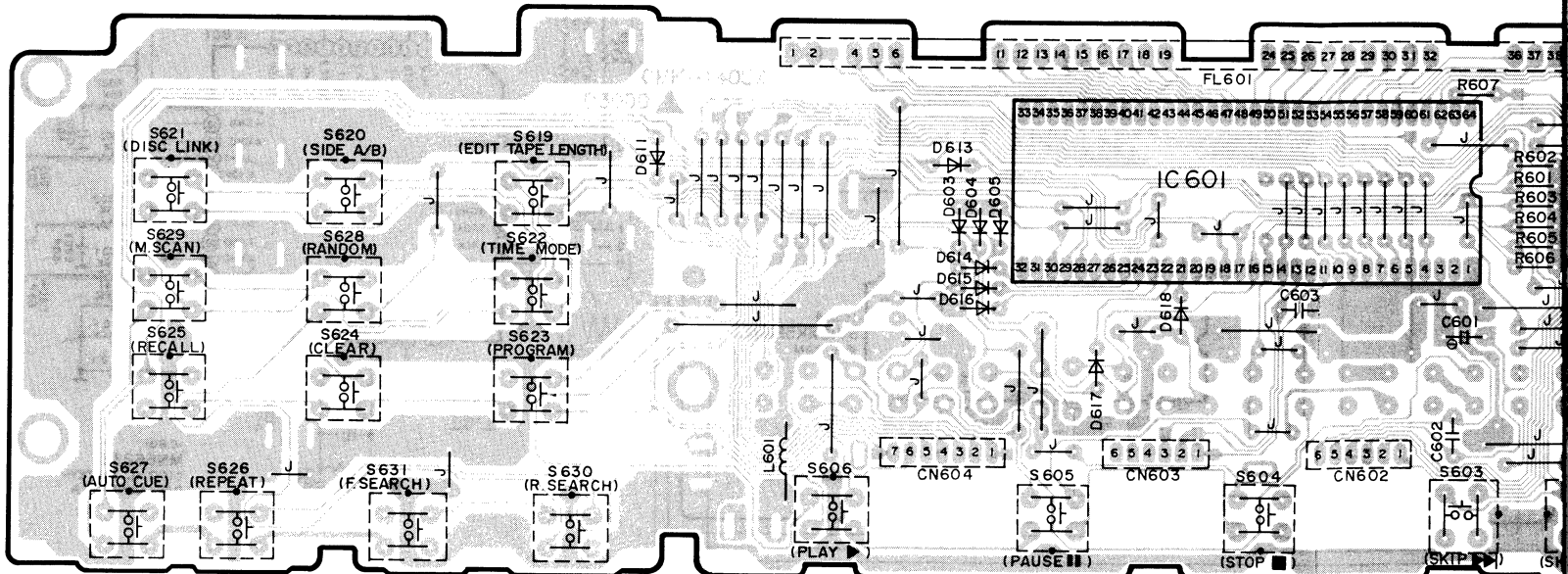
- Terminal guide of IC's, Transistors and Diodes.

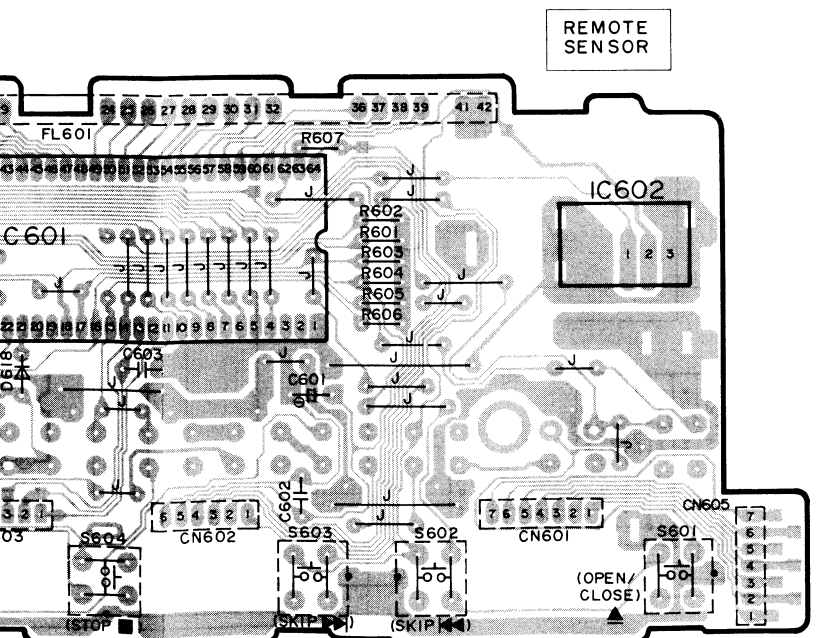
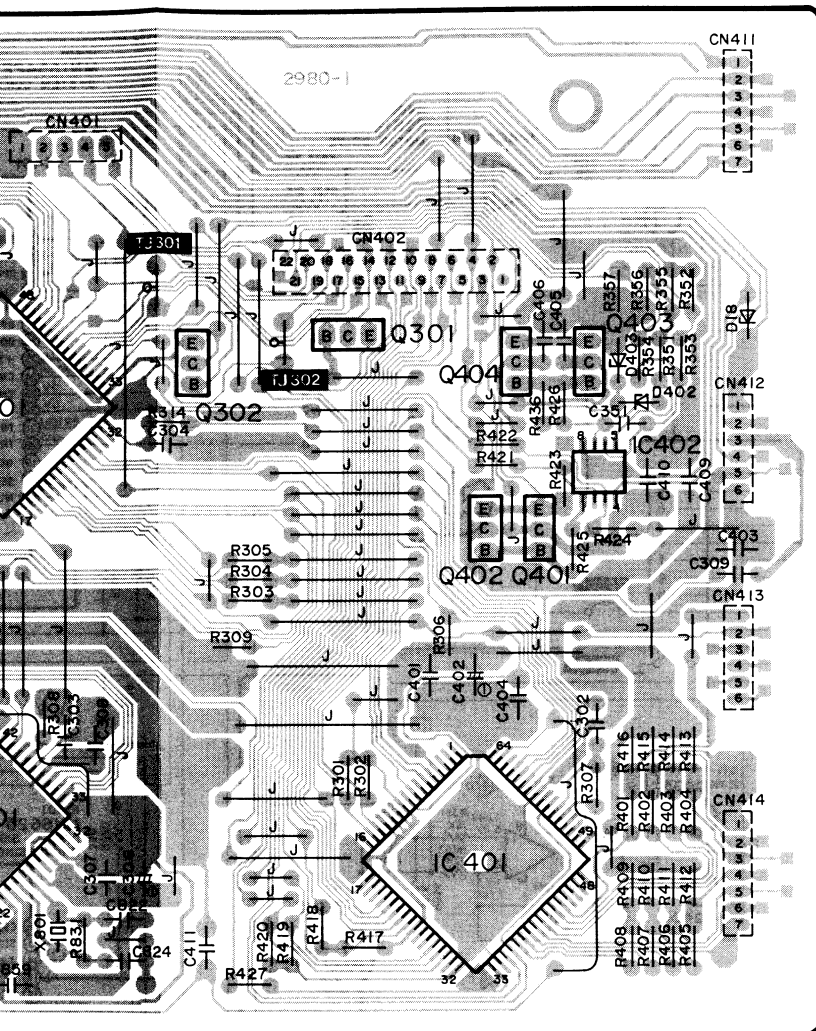
LN2940T5M  1. Vin 2. GND 3. Vout	8 pin BA4558FT1 LM833M NJM4560M 24 pin SVICXK5816M 64 pin MN15283PEY-1  NO.1 42 pin MN6623B 64 pin MN6625 MN1554PEZ-1	SVIH8DN2175 	
NJM4556SA  1 2 3 4 5 6 7 8 9  1 2 3 4 5 6 7 8 9 14 15 AN8377 16 pin	AN8373S AN8374S  NO.1	DTC124EST 2SA1309Q 2SC3311A-Q 2SD1450R DTA124EST 2SA1547QSTV2  E C B	
2SB1240-P 2SB1238QS 2SD1862-P  E C B	MA165 SVDS5688GT3  Anode Cathode Ca	MA4330M MA4062-H MA4150-M MA4033M  Anode Cathode Ca	

D MAIN P.C.B.

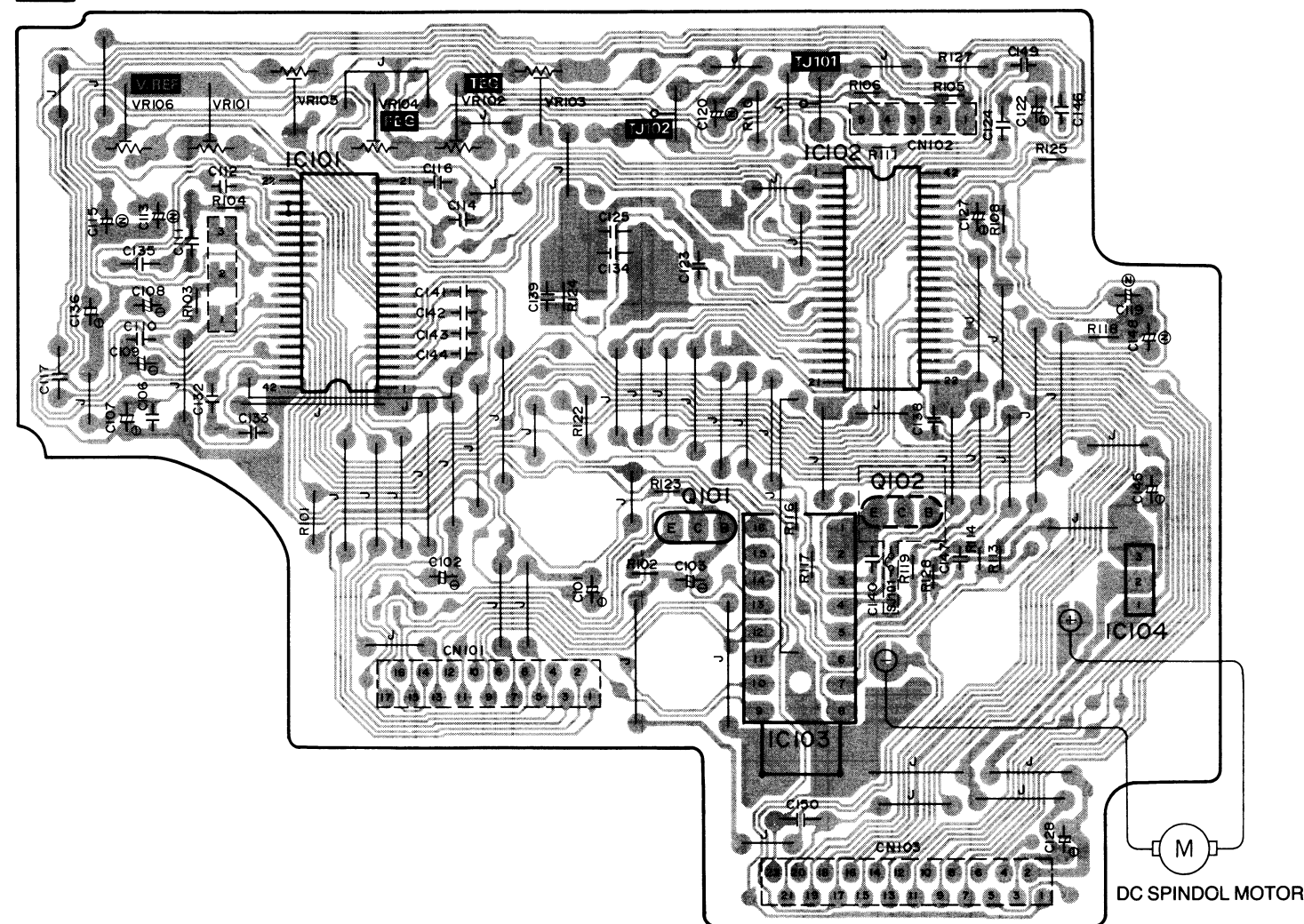


A OPERATION P.C.B.

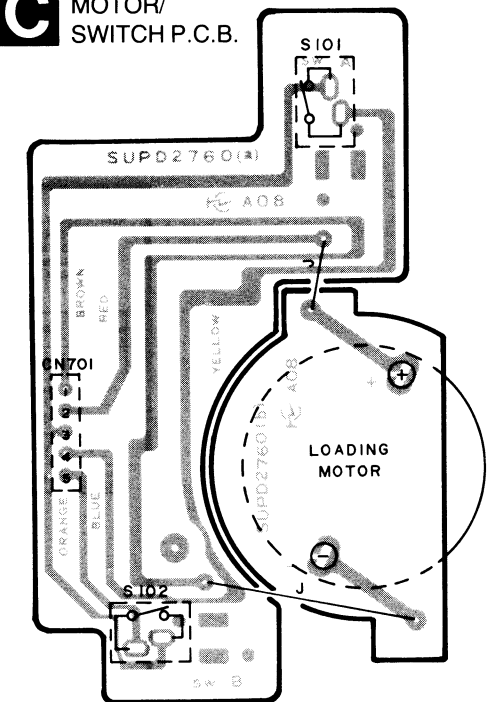




B SERVO P.C.B.



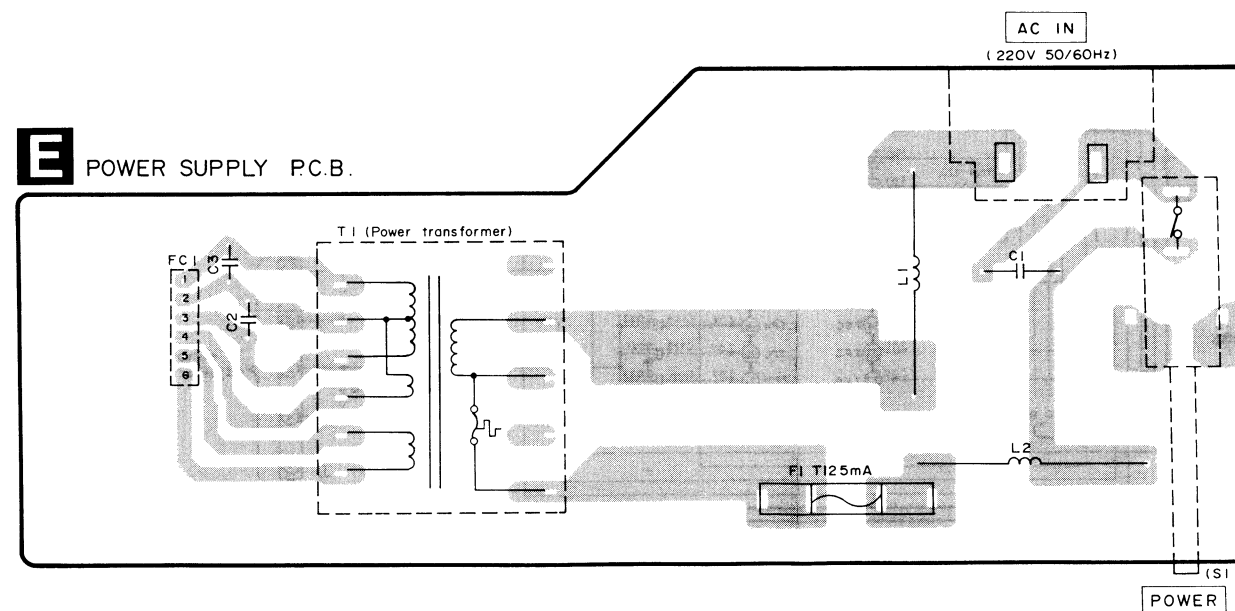
C MOTOR/ SWITCH P.C.B.



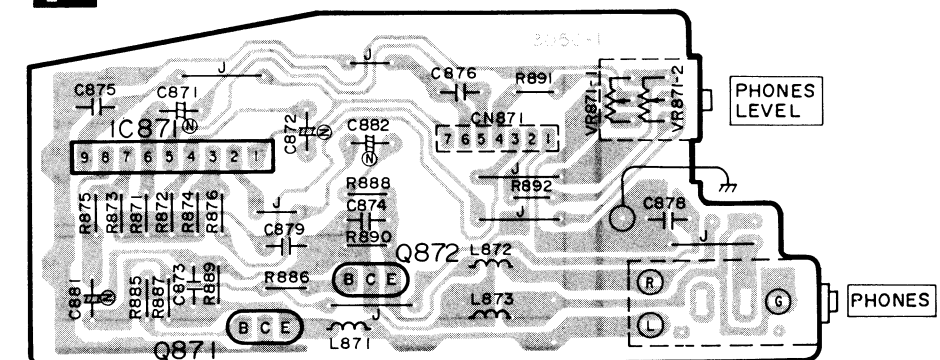
Note: Original circuit uses AN8377 for IC103 while the new circuit uses AN8377N for IC103.
(Refer to the table below for other changes.)

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

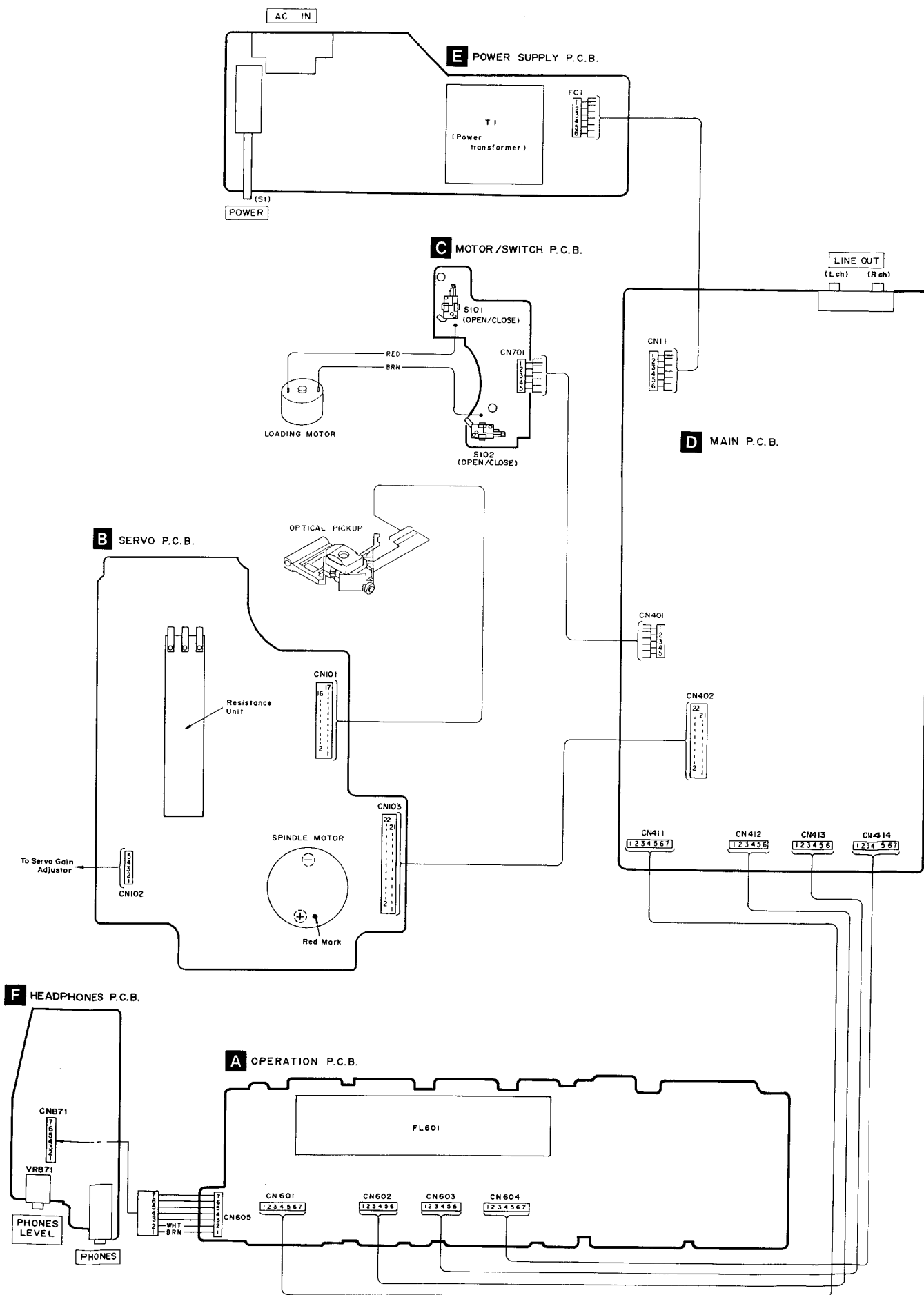
E POWER SUPPLY P.C.B.



F HEADPHONES P.C.B.



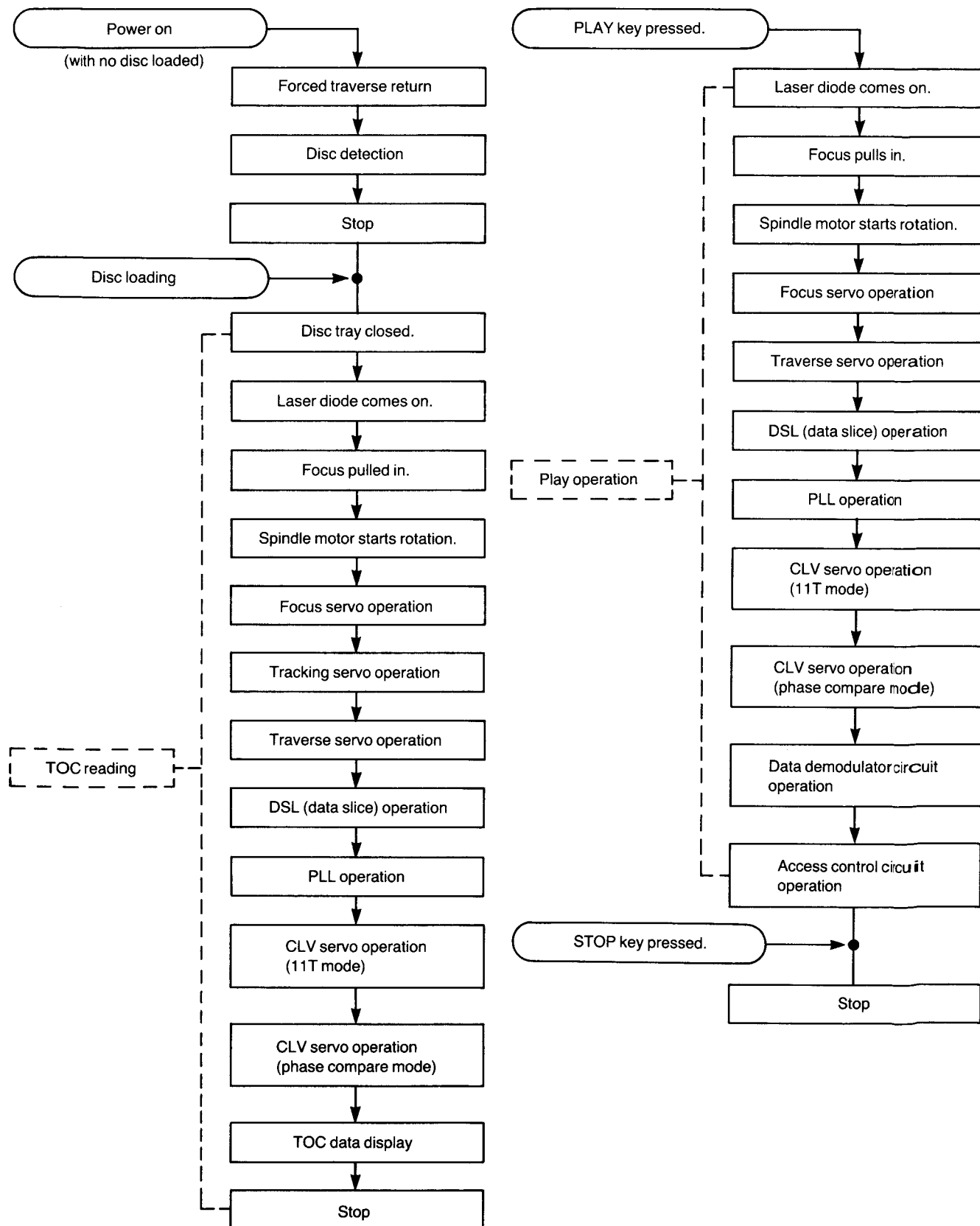
WIRING CONNECTION DIAGRAM



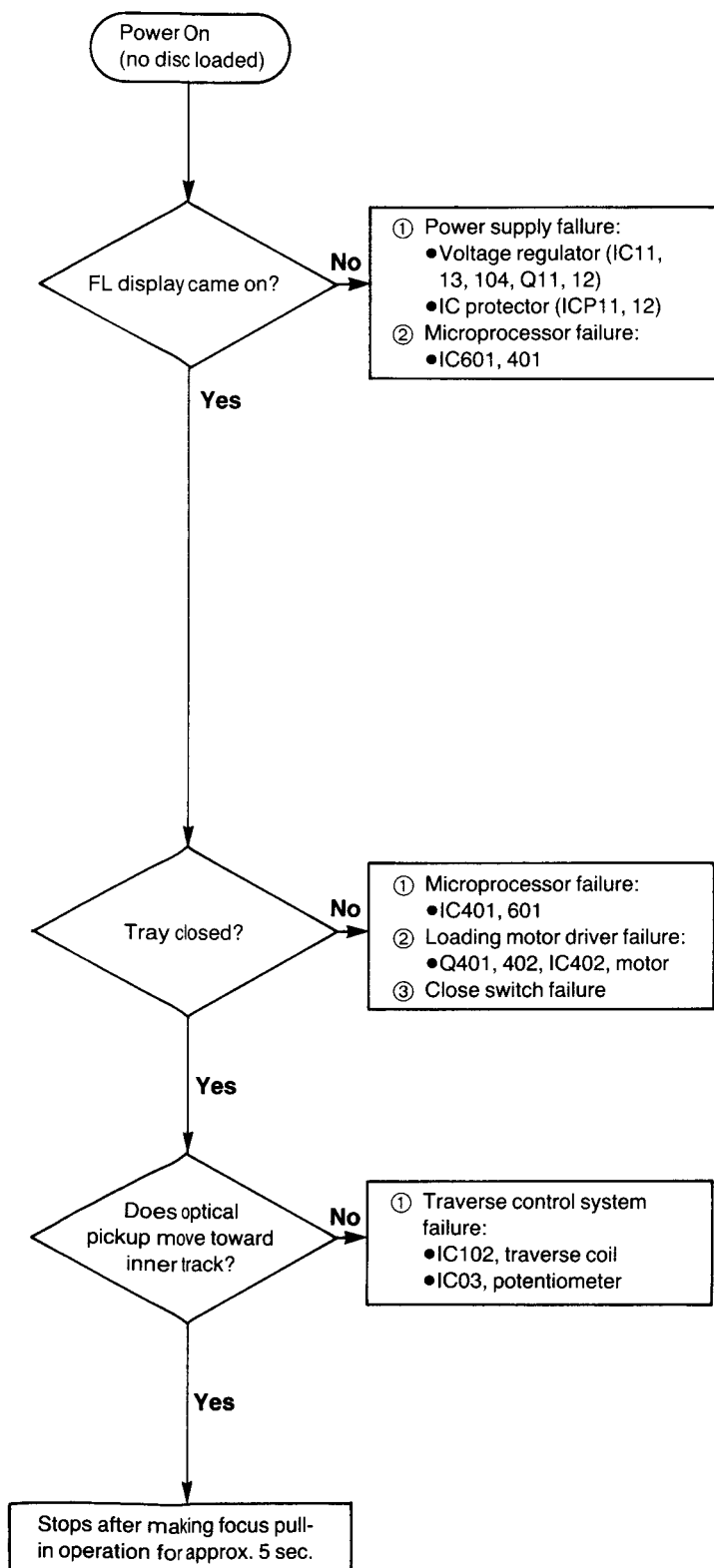
■ TROUBLESHOOTING GUIDE

SL-P212 Operation Sequence Check Sheet

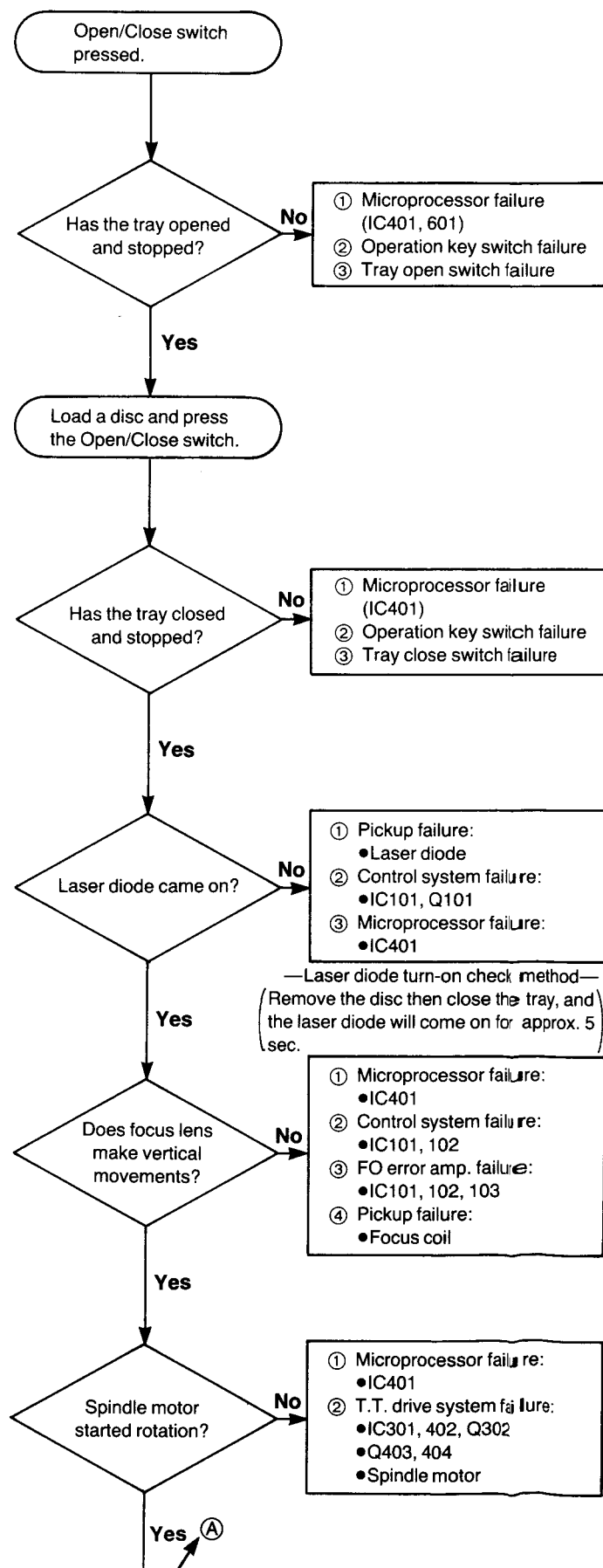
Play Operation Sequence

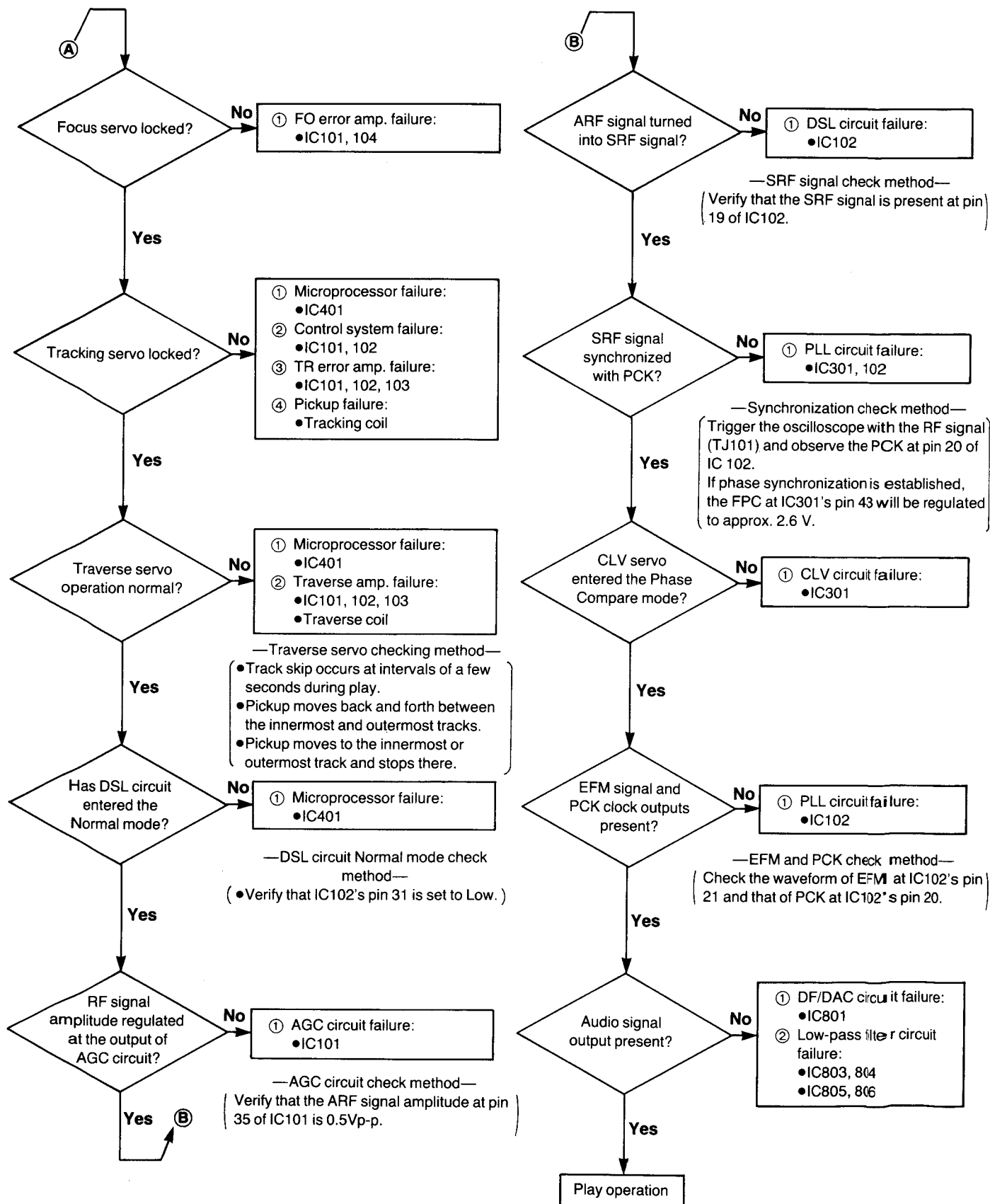


(Operation Sequence Just After Power On)



(TOC Read Operation-PLAY Operation)





■ FUNCTIONS OF IC TERMINALS

●IC101 (AN8373S): Servo amp.

Pin No.	Mark	I/O Division	Function
1	AMP1	I	RF signal input (×30 amp.)
2	PDAD	I	Photo detector current input (A2)
3	PDA	I	Photo detector current input (A1)
4	PDBD	I	Photo detector current input (A4)
5	PDB	I	Photo detector current input (A3)
6	LPD	I	Non-inverting laser power input
7	LD	O	Laser power auto control output
8	FBL1	I	PD balance adjustment
9	FBL2	I	
10	TBL1	I	Tracking balance adjustment
11	TBL2	I	
12	FOOFS	I	Focus offset adjustment
13	IVA	O	Current/voltage conversion output (A)
14	IVB	O	Current/voltage conversion output (B)
15	FE	O	Focus gain adjustment output
16	FPI	I	Focus error signal input
17	TPI	I	Tracking error signal input
18	C. TPL	I	Tracking error filter capacitor input
19	C. TPH		
20	C. FPL	I	Focus error filter capacitor input
21	C. FPH		

Pin No.	Mark	I/O Division	Function
22	TPO	O	Tracking error signal output
23	FPO	O	Focus error signal output
24	FGC	I	Focus gain up signal input (Not used, connected to GND)
25	TGC	I	Tracking gain up signal input (Not used, connected to GND)
26	GD	I	Focus/tracking gain down signal input (Not used, connected to GND)
27	PTO	O	Position detecting amp. output
28	PTI	I	Position detecting amp. input
29	PBO	O	Position detecting buffer output
30	POT	I	Position detecting buffer input
31	BDO	O	Dropout detection output
32	RFDET	O	RF detections signal output
33	SDO	O	Dropout detection pulse output
34	C. SBDO	I	Dropout detecting capacitor input
35	ARF	O	RF signal output
36	C AGC	I	AGC detecting capacitor input
37	VCC	I	Power supply (+5 V input)
38	LDON	I	Laser power control input
39	RF IN	I	RF signal input
40	AMPO	O	RF signal output
41	VREF	O	Reference voltage output
42	GND	I	Ground terminal

●IC102 (AN8374S): Servo processor

Pin No.	Mark	I/O Division	Function
1	LSA	I	Phase difference input (A)
2	LSB	I	Phase difference input (B)
3	TEOFS	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 input
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

Pin No.	Mark	I/O Division	Function
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	O	
41	BROUT	I	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 (+8.9 input)
2	VCC	I	Power supply (+8.9 V input)
3	TB	O	External transistor base driving output
4	VMON	O	Voltage output
5	TVDI	I	Traverse error signal input
6	FDI	I	Focus error signal input
7	TDI	I	Tracking error signal input
8	VREF	I	Reference voltage input

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

●IC301 (MN6625S): Digital signal processing

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

Pin No.	Mark	I/O Division	Function
25	MCLK	I	Command clock signal input
26	MDATA	I	Command data input
27	DMUTE	I	Muting control
28	TRON	I	Tracking servo ON signal (tracking servo ON at "L")
29	STAT	O	Processing condition (CRC, CUE, CLVS, TT STOP, FCLV)
30	SUBC	O	Sub-code serial output data (Not used, open)
31	SBCK	I	Clock for sub-code serial output (Not used, open)
32	SMCK	O	Clock output (4.2336 MHz)
33	VDD	I	Power supply (connected to +5 V)
34	MEMP	I	Emphasis signal input
35	FG	I	Spindle motor FG signal input (Not used, open)
36	PC	O	Spindle motor ON signal (ON at "L")
37	EC	O	Spindle motor drive signal
38	RESY	O	Resynchronizing signal (Not used, open)
39	DO	I	Drop-out signal (Drop-out at "H")
40	SRF	I	EFM signal input (DSL)
41	EFM	I	EFM signal input (PLL)
42	PCK	I	PLL extract clock input (4.3218 MHz)
43	FPC	O	PLL frequency comparison signal
44 } 51	D7 } D0	I/O	16 K RAM data input/output
52	RAM/OE	O	16 K RAM OE signal
53	RAM/WE	O	16 K RAM WE signal
54 } 64	RAM/A0 } RAM/A10	O	16 K RAM address signal (RAMA0: LSB, RAMA10: MSB)

●IC401 (MN1554PEZ-1): System control

Pin No.	Mark	I/O Division	Function
1	BRECV	—	(Not used, open)
2	BSEND	—	(Not used, open)
3	SYNC	O	(Not used, open)
4	SIRQ	I	Not used (connected to +5 V)
5	BLKCK	I	Sub-code block (Q data) clock input (75 Hz)
6	CLDCK	I	Sub-code block (Q data) clock input (7.35 kHz)
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 +5 V)
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 +5 V)
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 signal
39	ACK	I	Data discrimination signal
40	CLK	I	Data lock signal
41 44	DATA0 DATA3	I	Key scan signal
45 52	NC	I	Not connected
53	OSC2	I	Clock terminal
54	OSC1	I	Clock input
55	X1	I	Optical servo condition input
56	X0	O	(Not used, open)
57	GND	I	GND terminal
58	DMUTE	O	Muting control
59	MDATA	O	Command data output
60	MCLK	O	Data clock output (command clock signal)
61	MLD	O	Data output (command load signal)
62	DOUTON	O	Optical output control signal (Not used, open)
63	EMPH	O	Emphasis signal output
64	NC	—	Not connected

●IC601 (MN15283PEY-1): FL drive and Timing signal generator

Pin No.	Mark	Terminal Name	I/O Division	Function
1	VSS	GND	I	GND terminal
2	XO	—	O	(Not used, open)
3	XI	TRCNT	I	(Not used, open)
4	PO0	MRLY	O	Muting control terminal
5	PO1	MDATA	O	Command data output
6	PO2	MCLK	O	Data clock output (Command clock)
7	PO3	MLD	O	Data output (Command load)
8	P10	SLOW	O	Motor drive control
9	P11	FOW/REV	O	Motor drive control
10	P12	LOADING	O	Motor drive control
11	P13	HIGH	O	Motor drive control
12	$\overline{\text{SYNC}}$	—	O	(Not used, open)
13	$\overline{\text{RST}}$	$\overline{\text{RESET}}$	I	Reset signal input (Reset at "L")
14	$\overline{\text{IRQ}}$	$\overline{\text{BLKCK}}$	I	Sub-code (Q data) clock (75 kHz) input
15 └ 18	P50 └ P53	KEY	I	Key scan signal input
19	$\overline{\text{SBT}}$	$\overline{\text{CLDCK}}$	I	(Not used, open)
20	$\overline{\text{SBD}}$	$\overline{\text{SUBQ}}$	I	
21	P20	—	O	(Not used, open)
22	P21	—	O	
23	P22	$\overline{\text{REV}}$	O	Traverse "Reverse" Command signal

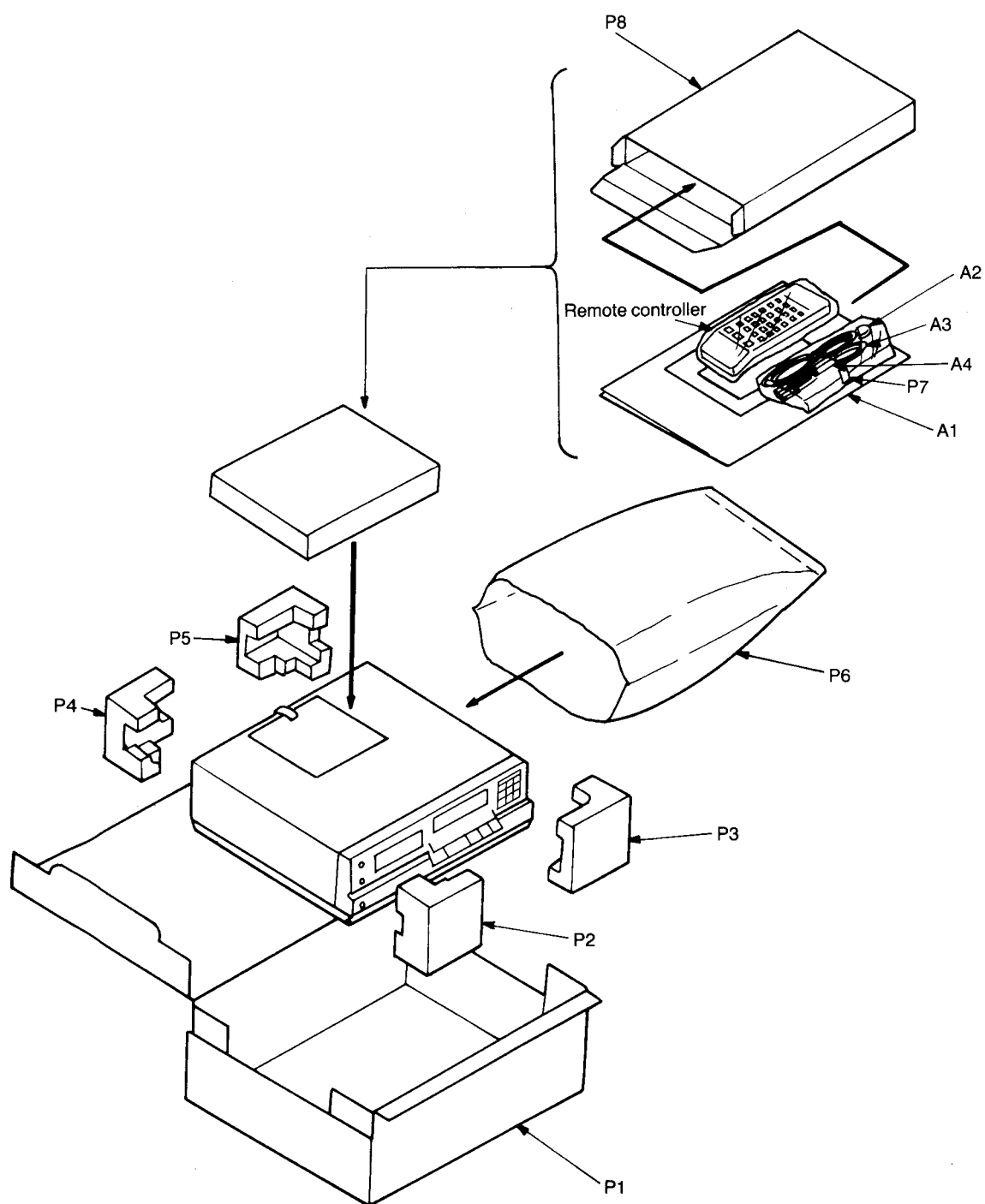
Pin No.	Mark	Terminal Name	I/O Division	Function
24	P23	$\overline{\text{FWD}}$	O	Traverse "Foward" Command signal
25	P30	CNT4	O	Optical servo IC control signal [KICKF: Kick direction (reverse) control]
26	P31	CNT3	O	Optical servo IC control signal [KICKF: Kick direction (forward) control]
27	P32	CNT2	O	Optical servo IC control signal (TRON: Tracking servo)
28	P33	CNT1	O	(Not used, open)
29	P40	STAT	I	Processing status input from signal processing LSI
30	P41	HIGHT	I	Elevator hight signal input
31	P42	$\overline{\text{FLOCK}}$	I	(Not used, open)
32	P43	SENSE	I	
33	P60	PAUSE	O	
34	P61	PLAY	O	(Not used, open)
35	DAC	DAC	O	
36	VPP	—	I	FL drive power supply
37 └ 52	D0 └ DF	—	O	FL grid signal and key scan signal
53 └ 61	S8 └ S0	—	O	FL anode signal
62	VDD	—	I	Power supply (connected to +5 V)
63	OSC2	—	I	Clock terminal
64	OSC1	—	I	Clock signal input

●IC801 (MN6623B): 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 +5 V)
11	OUTL (–)	O	Lch data output, (–) terminal
12	AVSS4	I	GND terminal
13	AVSS3	I	GND terminal
14	OUTL (+)	O	Lch data output, (+) terminal
15	AVDD3	I	Power supply (connected to +5 V)
16	NC	—	Not connected
17	AVDD2	I	Power supply (connected to +5 V)
18	OUTR (+)	O	Rch data output, (+) terminal
19	AVSS2	I	GND terminal (analog system)
20	AVSS1	I	GND terminal (analog system)
21	OUTR (–)	O	Rch data output, (–) terminal

Pin No.	Mark	I/O Division	Function
22	AVDD1	I	Power supply (connected to +5 V)
23	DVDD1	I	Power supply (connected to +5 V)
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 +5 V)
29	DVSS2	I	GND terminal (digital system)
30	NSUB	I	Sub-strate terminal
31	O OUT	—	Not used
32	192 fs	O	192 fs (Not used)
33	LRPOL	I	LR clock selector (Not used)
34	L/R	I	L/R clock
35	SRCK	I	Serial data best clock
36	SRDATA	I	Serial data input (MSB first)
37	DVSS3	I	GND terminal (digital system)
38	DVDD3	—	Power supply
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

■ PACKING



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 (1/4W)	Shape	Tolerance	Value (1K Ω)
ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470 Ω)

Numbering System For Capacitors

Example:

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001 μ F)	Tolerance	Unique
ECEA	50	M		330
Type	Voltage (50V)	Characteristics		Value (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

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W 12 : 1/2W	J : $\pm 5\%$
ERG : Metal Oxide	14 : 1/4W 25 : 1/4W	F : $\pm 1\%$
ERQ : Fuse Type Metal	1A : 1W 18 : 1/8W	G : $\pm 2\%$
ERX : Metal Film	S2 : 1/4W S1 : 1/2W	J : $\pm 5\%$
ERD L : Carbon (chip)	2F : 1/4W 50 : 1/2W	K : $\pm 10\%$
ERQ K : Metal Film (chip)	2A : 2W 3A : 3W	M : $\pm 20\%$
ERC : Solid	6G : 1/10W 8G : 1/8W	
ERF : Incombustible Box-Shaped		
ERM : Wire-Wound		
RRJ : Chip Resistor		
ERJ : Chip Resistor		

Capacitor Type	Voltage	Tolerance
ECE : Electrolytic	0J : 6.3V 1A : 10V	K : $\pm 10\%$
ECCD : Ceramic	1C : 16V 1E : 25V	M : $\pm 20\%$
ECKD : Ceramic Capacitor	1H : 50V 1V : 35V	Z : +80 % -20
ECQM : Polyester	50 : 50V 05 : 50V	J : $\pm 5\%$
ECQP : Polypropylene	2H : 500V 2A : 100V	G : $\pm 2\%$
ECG : Ceramic	1 : 100V 1J : 63V	F : $\pm 1\%$
ECEA N : Non Polar Electrolytic	KC : 400V AC	C : ± 0.25 pF
OCU : Ceramic (Chip Type)	KC : 125V AC (UL)	D : ± 0.5 pF
ECUX : Ceramic (Chip Type)		
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)			R413	ERDS2TJ472	4.7K 1/4	R815	ERDS2TJ474	470K 1/4
R11	ERDS2TJ101	100 1/4	R414	ERDS2TJ472	4.7K 1/4	R816	ERDS2TJ474	470K 1/4
R13	ERDS2TJ103	10K 1/4	R415	ERDS2TJ472	4.7K 1/4	R817	ERDS2TJ103	10K 1/4
R14	ERDS2TJ103	10K 1/4	R416	ERDS2TJ472	4.7K 1/4	R818	ERDS2TJ103	10K 1/4
R15	ERDS2TJ331	330 1/4	R417	ERDS2TJ472	4.7K 1/4	R819	ERDS2TJ471	470 1/4
R16	ERDS2TJ102	1K 1/4	R418	ERDS2TJ472	4.7K 1/4	R820	ERDS2TJ471	470 1/4
R17	ERDS2TJ471	470 1/4	R419	ERDS2TJ472	4.7K 1/4	R821	ERDS2TJ473	47K 1/4
R301	ERDS2TJ472	4.7K 1/4	R420	ERDS2TJ472	4.7K 1/4	R822	ERDS2TJ473	47K 1/4
R302	ERDS2TJ472	4.7K 1/4	R421	ERDS2TJ913T	91K 1/4	R823	ERDS2TJ331	330 1/4
R303	ERDS2TJ472	4.7K 1/4	R422	ERDS2TJ913T	91K 1/4	R824	ERDS2TJ221	220 1/4
R304	ERDS2TJ472	4.7K 1/4	R423	ERDS2TJ124	120K 1/4	R825	ERDS2TJ221	220 1/4
R305	ERDS2TJ472	4.7K 1/4	R424	ERDS2TJ124	120K 1/4	R826	ERDS2TJ102	1K 1/4
R306	ERDS2TJ472	4.7K 1/4	R425	ERDS2TJ101	100 1/4	R827	ERDS2TJ102	1K 1/4
R307	ERDS2TJ104	100K 1/4	R426	ERDS2TJ101	100 1/4	R831	ERDS2TJ472	4.7K 1/4
R308	ERDS2TJ561	560 1/4	R427	ERDS2TJ472	4.7K 1/4	R840	ERDS2TJ331	330 1/4
R309	ERDS2TJ472	4.7K 1/4	R431	ERDS2TJ472	4.7K 1/4	R841	ERDS2TJ105	1M 1/4
R311	ERDS2TJ472	4.7K 1/4	R432	ERDS2TJ101	100 1/4	R842	ERDS2TJ105	1M 1/4
R312	ERDS2TJ100	10 1/4	R433	ERDS2TJ153	15K 1/4	R851	ERDS2TJ102	1K 1/4
R313	ERDS2TJ100	10 1/4	R434	ERDS2TJ393	39K 1/4	R852	ERDS2TJ471	470 1/4
R314	ERDS2TJ182	1.8K 1/4	R435	ERDS2TJ102	1K 1/4	R853	ERDS2TJ333	33K 1/4
R320	ERDS2TJ331	330 1/4	R436	ERDS2TJ150	15 1/4	R854	ERDS2TJ183	18K 1/4
R321	ERDS2TJ822	8.2K 1/4	R601	ERDS2TJ472	4.7K 1/4	R855	ERDS2TJ102	1K 1/4
R351	ERDS2TJ103	10K 1/4	R602	ERDS2TJ472	4.7K 1/4	R856	ERDS2TJ102	1K 1/4
R352	ERDS2TJ154	150K 1/4	R603	ERDS2TJ472	4.7K 1/4	R857	ERDS2TJ102	1K 1/4
R353	ERDS2TJ123	12K 1/4	R604	ERDS2TJ472	4.7K 1/4	R858	ERDS2TJ102	1K 1/4
R354	ERDS2TJ154	150K 1/4	R605	ERDS2TJ472	4.7K 1/4	R859	ERDS2TJ102	1K 1/4
R355	ERDS2TJ333	33K 1/4	R606	ERDS2TJ472	4.7K 1/4	R861	ERDS2TJ102	1K 1/4
R356	ERDS2TJ333	33K 1/4	R607	ERDS2TJ105	1M 1/4	R862	ERDS2TJ102	1K 1/4
R357	ERD25FVJ8R2T	8.2 1/4	R801	ERDS2TJ103	10K 1/4	CAPACITORS(VALUE,VOLTAGE)		
R401	ERDS2TJ221	220 1/4	R802	ERDS2TJ103	10K 1/4	C1	Δ ECKDKC103PF2	0.01 25
R402	ERDS2TJ221	220 1/4	R803	ERDS2TJ103	10K 1/4	C2	ECKM1H103ZFX	0.01 50
R403	ERDS2TJ221	220 1/4	R804	ERDS2TJ103	10K 1/4	C3	ECKM1H103ZFX	0.01 50
R404	ERDS2TJ221	220 1/4	R805	ERDS2TJ273	27K 1/4	C10	ECEA1CU332	3300 16
R405	ERDS2TJ221	220 1/4	R806	ERDS2TJ273	27K 1/4	C11	ECEA1CU222	2200 16
R406	ERDS2TJ221	220 1/4	R807	ERDS2TJ273	27K 1/4	C12	ECEA1VU101	100 5
R407	ERDS2TJ221	220 1/4	R808	ERDS2TJ273	27K 1/4	C13	ECEA1AK101	100 0
R408	ERDS2TJ221	220 1/4	R809	ERDS2TJ473	47K 1/4	C14	ECEA1AK101	100 0
R409	ERDS2TJ472	4.7K 1/4	R810	ERDS2TJ473	47K 1/4	C15	ECEA0JK470	47 13
R410	ERDS2TJ472	4.7K 1/4	R811	ERDS2TJ473	47K 1/4	C16	ECEA1CU331	330 5
R411	ERDS2TJ472	4.7K 1/4	R812	ERDS2TJ473	47K 1/4	C17	ECEA1CU331	330 5
R412	ERDS2TJ472	4.7K 1/4	R813	ERDS2TJ221	220 1/4	C18	ECEA1VU101	100 5
			R814	ERDS2TJ221	220 1/4			

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
C21	ECEA1CU221	220 16	C815	ECBT1H102KB5	0.001 50	CAPACITORS(VALUE,VOLTAGE)		
C30	ECFR1E104ZF5	0.1 25	C816	ECBT1H102KB5	0.001 50	C101	ECEA1CKS220I	22 16
C301	ECFR1E104ZF5	0.1 25	C822	ECBT1H5R6K5	5.6P 50	C102	ECEA1HKS010I	1 50
C302	ECBT1C103NS5	0.01 16	C824	ECBT1H5R6K5	5.6P 50	C103	ECEA1CKS220I	22 16
C303	ECBT1H6R8K5	6.8P 50	C841	ECEA0JS331	330 6.3	C106	RCUV1E104ZF	0.1 25
C304	ECBT1H220J5	22P 50	C851	ECEA0JU47I	470 6.3	C107	ECEA0GKS101I	100 4
C306	ECEA0JK101	100 6.3	C852	ECEA0JS331	330 6.3	C108	ECEA0JKS470I	47 6.3
C307	ECFR1E104ZF5	0.1 25	C853	ECEA1CKN100B	10 16	C109	ECEA1HKS010I	1 50
C308	ECFR1E104ZF5	0.1 25	C854	ECFR1E104ZF5	0.1 25	C110	RCUV1H681KB	680P 50
C309	ECBT1C103NS5	0.01 16	C856	ECFR1E104ZF5	0.1 25	C111	ECUV1C224KR	0.22 16
C310	ECFR1E104ZF5	0.1 25	C857	ECFR1E104ZF5	0.1 25	C112	RCUV1H331KB	330P 50
C311	ECFR1E104ZF5	0.1 25	C858	ECFR1E104ZF5	0.1 25	C113	ECEA1HSN010I	1 50
C351	ECBT1H102KB5	0.001 50	C859	ECFR1E104ZF5	0.1 25	C114	RCUV1E333KB	0.033 25
C401	ECFR1E104ZF5	0.1 25	C861	ECEA1CU101	100 16	C115	ECEA1HSN010I	1 50
C402	ECEA0JK470	47 6.3	C862	ECEA1CU101	100 16	C116	RCUV1E333KB	0.033 25
C403	ECFR1E104ZF5	0.1 25	C881	ECEA1CN101SE	100 16	C117	ECBT1H102KB5	0.001 50
C404	ECFR1E104ZF5	0.1 25	C882	ECEA1CN101SE	100 16	C119	ECEA1CKN4R7I	4.7 16
C405	ECBT1H102KB5	0.001 50	RESISTORS(VALUE,WATTAGE)			C120	ECEA1CKN4R7I	4.7 16
C406	ECBT1H102KB5	0.001 50	R101	ERDS2TJ47I	470 1/4	C122	ECEA0JKS220I	22 6.3
C407	ECEA1HKN010B	1 50	R102	ERJ6GEYJ120V	12 1/10	C123	RCUV1E104ZF	0.1 25
C409	ECBT1H102KB5	0.001 50	R103	ERJ6GEYJ122	1.2K 1/10	C124	ECUV1E823KB	0.082 25
C410	ECBT1H102KB5	0.001 50	R104	ERJ6GEYJ47I	470 1/10	C125	ECUV1C224KR	0.22 16
C411	ECFR1E104ZF5	0.1 25	R105	RRJ6GCJ102TE	1K 1/6	C127	ECEA0JKF101I	100 6.3
C601	ECEA0JK470	47 6.3	R106	RRJ6GCJ102TE	1K 1/6	C128	ECEA1CKA101I	100 16
C602	ECBT1E223ZF	0.022 25	R108	ERJ6GEYJ224V	220K 1/10	C132	ECUV1E104KB	0.1 25
C603	ECBT1E223ZF	0.022 25	R110	ERDS2TJ222	2.2K 1/4	C133	RCUV1H330KC	33P 50
C801	ECBT1H680J5	68P 50	R111	ERJ6GEYJ154V	150K 1/10	C134	ECUV1C224KR	0.22 16
C802	ECBT1H680J5	68P 50	R113	ERJ6GEYJ472V	4.7K 1/10	C135	ECUV1C224KR	0.22 16
C803	ECBT1H680J5	68P 50	R114	ERJ6GEYJ683V	68K 1/10	C136	ECEA0GKS101I	100 4
C804	ECBT1H680J5	68P 50	R116	ERJ6GEYJ332V	3.3K 1/10	C138	RCUV1E104ZF	0.1 25
C805	ECBT1H470J5	47P 50	R117	ERJ6GEYJ123	12K 1/10	C139	RCUV1H470KC	47P 50
C806	ECBT1H470J5	47P 50	R118	ERJ6GEYJ333V	33K 1/10	C140	RCUV1E103KB	0.01 25
C807	ECBT1H470J5	47P 50	R119	RRJ6GCJ223TE	22K 1/6	C141	RCUV1H470KC	47P 50
C808	ECBT1H470J5	47P 50	R122	ERDS2TJ104	100K 1/4	C142	RCUV1H470KC	47P 50
C809	ECEA1EN3R3S	3.3 25	R123	ERJ6GEYJ470V	47 1/10	C143	RCUV1H470KC	47P 50
C810	ECEA1EN3R3S	3.3 25	R124	RRJ6GCJ103TE	10K 1/6	C144	RCUV1H470KC	47P 50
C811	ECBT1H102KB5	0.001 50	R125	RRJ6GCJ222TE	2.2K 1/6	C145	ECEA0JKF101I	100 6.3
C812	ECBT1H102KB5	0.001 50	R127	ERDS2TJ68I	680 1/4	C146	RCUV1H181KC	180P 50
C813	ECEA1CN220S	22 16	R128	RRJ6GCJ103TE	10K 1/6	C147	RCUV1H472KB	0.0047 50
C814	ECEA1CN220S	22 16				C148	ECEA1ESN4R7I	4.7 25
						C149	RCUV1E104ZF	0.1 25
						C150	RCUV1E103KB	0.01 25

REPLACEMENT PARTS LIST

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.

* "K" mark parts are used for black type only.

* "S" mark parts are used for silver type only.

Parts other than "K" and "S" marked are used for all color types

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

* ACHTUNG :

Die lasereinheit nicht zerlegen.

Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

* Remote control ass'y : Supply period for three years from termination of production.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
PACKING MATERIAL			P7	XZB26X17C03	PROTECTION BAG(CORDS)
P1	SPND369	PACKING CASE	P8	SPSD152	ACCESSORY BOX
P1	SPND365	PACKING CASE	ACCESSORIES		
P2	SPSD188	PAD(FL)	A1	SQU0412	INSTRUCTION MANUAL
P3	SPSD189	PAD(FR)	A1	SQU0413	INSTRUCTION MANUAL
P4	SPSD190	PAD(BL)	A2	SJA187	POWER CORD
P5	SPSD191	PAD(BR)	A3	SJP2249-3	OUTPUT CORD
P6	XZB60X60A01	PROTECTION BAG(UNIT)	A4	UM-4NE/2S	BATTERY

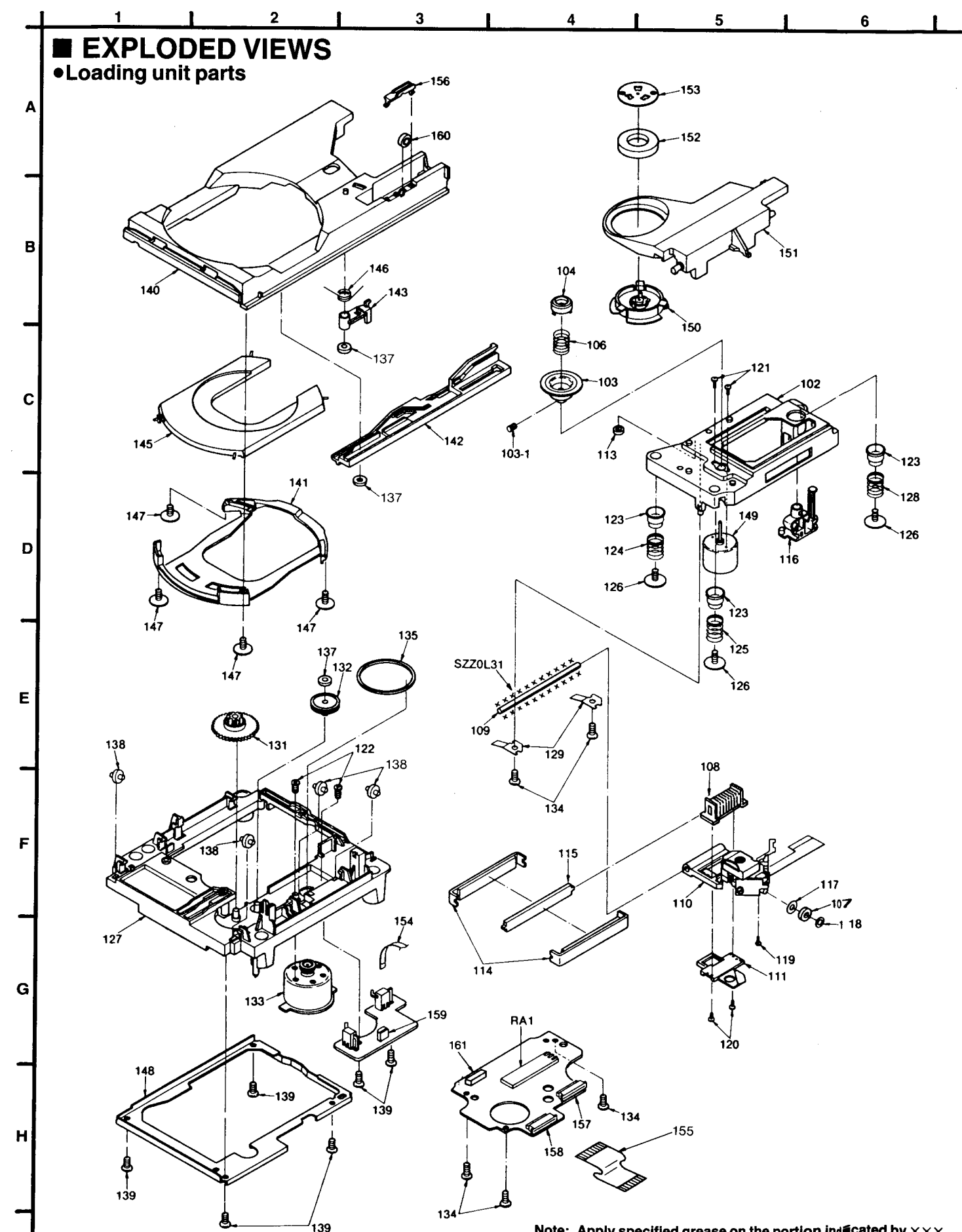
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
INTEGRATED CIRCUITS			D854	MA165	DIODE
IC11	LM2940T5	I.C. REGULATOR	D855	MA165	DIODE
IC13	BA4558FT1	I.C. RESET	D856	MA165	DIODE
IC301	MN6625	I.C. SIGNAL PROCESSING	D857	MA165	DIODE
IC302	SV1CXK5816M	I.C. 16K RAM	D858	MA165	DIODE
IC401	MN1554PEZ-1	I.C. SYSTEM CONTROL	VARIABLE RESISTORS		
IC402	BA4558FT1	I.C. MOTOR DRIVE	VR871	EVU57A022A14	V.R. HEADPHONES VOL
IC601	MN15283PEY-1	I.C. FL DRIVE	COILS AND TRANSFORMERS		
IC602	HC-MD10E	I.C. REMOTE SENSOR	L1	SLQX400-D	COIL
IC801	MN6623B	I.C. DF&D/A CONVERTER	L2	SLQX400-D	COIL
IC803	LM833M	I.C. BUFFER AMP	L601	VLP0053	COIL
IC804	NJMA4560M	I.C. BUFFER AMP	T1	SLTD5K097SE	POWER TRANSFORMER
IC805	SV1H8DN2175M	I.C. LPF	OSCILLATORS		
IC806	SV1H8DN2175M	I.C. LPF	X801	SVQ49U338S	OSCILLATOR
IC871	NJMA556SA	I.C. HEADPHONES AMP	DISPLAYS		
ICP11	SRUN15	I.C. PROTECTOR	FL601	SAD16MT22GK	DISPLAY TUBE
ICP12	SRUN15	I.C. PROTECTOR	FUSES		
(EK)			F1	XBA2C012TB0S	FUSE(250V,T125mA)
TRANSISTORS			SWITCHES		
Q11	2SB1240-P	TRANSISTOR	S1	ESB8249V	SW. POWER
Q12	2SB1238Q-S	TRANSISTOR	S101	SSPD17	SW. LOADING DETECTOR
Q13	2SD1862-P	TRANSISTOR	S102	SSPD18	SW. LOADING DETECTOR
Q301	DTC124EST	TRANSISTOR	S601	EVQQS705G	SW. OPEN/CLOSE
Q302	DTA124EST	TRANSISTOR	S602	EVQQS705G	SW. SKIP(R)
Q401	2SD1862-P	TRANSISTOR	S603	EVQQS705G	SW. SKIP(F)
Q402	2SB1240-P	TRANSISTOR	S604	EVQQS705G	SW. STOP
Q403	2SD1862-P	TRANSISTOR	S605	EVQQS705G	SW. PAUSE
Q404	2SB1240-P	TRANSISTOR	S606	EVQQS705G	SW. PLAY
Q405	DTC124EST	TRANSISTOR	S619	EVQQS705G	SW. EDIT TAPE LENGTH
Q801	2SC3311A-Q	TRANSISTOR	S620	EVQQS705G	SW. SIDE A/B
Q802	2SC3311A-Q	TRANSISTOR	S621	EVQQS705G	SW. DISC LINK
Q803	2SD1450R	TRANSISTOR	S622	EVQQS705G	SW. TIME MODE
Q804	2SD1450R	TRANSISTOR	S623	EVQQS705G	SW. PROGRAM
Q851	DTA124EST	TRANSISTOR	S624	EVQQS705G	SW. CLEAR
Q852	DTC124EST	TRANSISTOR	S625	EVQQS705G	SW. RECALL
Q853	DTA114EST	TRANSISTOR	S626	EVQQS705G	SW. REPEAT
Q854	DTC124EST	TRANSISTOR	S627	EVQQS705G	SW. AUTO CUE
Q855	DTA124EST	TRANSISTOR	S628	EVQQS705G	SW. RANDOM PLAY
Q861	2SC3311A-Q	TRANSISTOR	S629	EVQQS705G	SW. MUSIC SCAN
Q862	2SA1309A-R	TRANSISTOR	S630	EVQQS705G	SW. B SEARCH
DIODES			S631	EVQQS705G	SW. F SEARCH
D11	SVDS5688GT3	DIODE, SI	INTEGRATED CIRCUITS		
D12	SVDS5688GT3	DIODE, SI	IC101	AN8373S	I.C. SERVO AMP
D13	SVDS5688GT3	DIODE, SI	IC102	AN8374S	I.C. SERVO PROCESS
D14	SVDS5688GT3	DIODE, SI	IC103	AN8377	I.C. B.T.L DRIVE
D15	SVDS5688GT3	DIODE, SI	IC104	LM2940T5M	I.C. RESET
D16	MA4330M	DIODE	TRANSISTORS		
D17	SVDS5688GT3	DIODE, SI	Q101	2SA1547QSTV2	TRANSISTOR
D18	MA4062-H	DIODE	VARIABLE RESISTORS		
D21	SVDS5688GT3	DIODE, SI	VR101	EVND3AA00B14	V.R. BEST EYE ADJ.
D22	SVDS5688GT3	DIODE, SI	VR102	EVND3AA00B14	V.R. TRACKING GAIN ADJ.
D23	MA4062-H	DIODE	VR103	EVND3AA00B14	V.R. TRACKING OFFSET ADJ.
D402	MA4051-M	DIODE	VR104	EVND3AA00B14	V.R. FOCUS GAIN ADJ.
D403	MA4051-M	DIODE	VR105	EVND3AA00B14	V.R. FOCUS OFFSET ADJ.
D410	MA4033M	DIODE	VR106	EVND3AA00B24	V.R. TRACKING BALANCE AD
D411	MA165	DIODE	MAGNET RESISTOR ELEMENTS		
D603	MA165	DIODE	RA1	EWS7M0A00Q53	RESISTANCE UNIT
D604	MA165	DIODE			
D605	MA165	DIODE			
D611	MA165	DIODE			
D613	MA165	DIODE			
D614	MA165	DIODE			
D615	MA165	DIODE			
D616	MA165	DIODE			
D617	MA165	DIODE			
D618	MA165	DIODE			
D851	MA165	DIODE			
D852	MA165	DIODE			
D853	MA165	DIODE			

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
CABINET AND CHASSIS					
1	SKUD250ZF0A	CHASSIS	10-3	SGXD3371SW1A	ORNAMENT
2	SGPLP212-KE	REAR PANEL	11	RMC0013	BRACKET
3	SKLD08-E	FOOT	12	SBN1161-2	KNOB
4	SGXD3380ZK0A	ORNAMENT	12	SBN1161-3	KNOB, HEADPHONES VOL
4	SGXD3380MA0A	ORNAMENT	17	SJS9236	AC INLET
5	SUBD15-1	ROD	18	SJJ146B	JACK
6	SBC666-1	BUTTON, POWER	19	SJFD4M	TERMINAL BOARD
6	SBC666	BUTTON, POWER	21	SIKD552062	FLAT CABLE
7	SKCD512KE1A	CABINET	31	XTB3+8JFZ	SCREW
7	SKCD512SW1A	CABINET BODY	32	XTB3+8F	SCREW
8	SHE185-2	HOLDER	33	XTB3+16JFZ	SCREW
9	SHRD201	PLATE	34	SNE2129-1	SCREW
10	SGYLP212-KE	FRONT PANEL	34	SNE2129	SCREW
10	SGYLP212-SE	FRONT PANEL	41	SJT30643-VML	CONNECTOR (6P)(CN11)
10-1	SGUD224	ORNAMENT	42	SJT30543-VM	CONNECTOR (5P)(CN401)
10-2	SBCD5290ZK0B	BUTTON, OPERATION	43	SJSD2221M	SOCKET (22P)(CN402)
10-2	SBCD5290MA0A	BUTTON, OPERATION	44	SJS50780WLM	CONNECTOR (7P)(CN411, 414)
10-3	SGXD3371ZK1A	ORNAMENT	45	SJS50680WLM	SOCKET (6P)(CN412, 413)
			46	SJT30747WL	CONNECTOR (7P)(CN601, 604)
			47	SJT30647WL	CONNECTOR (6P)(CN602, 603)
			48	EMCS0750ZL	CONNECTOR (7P)(CN605)

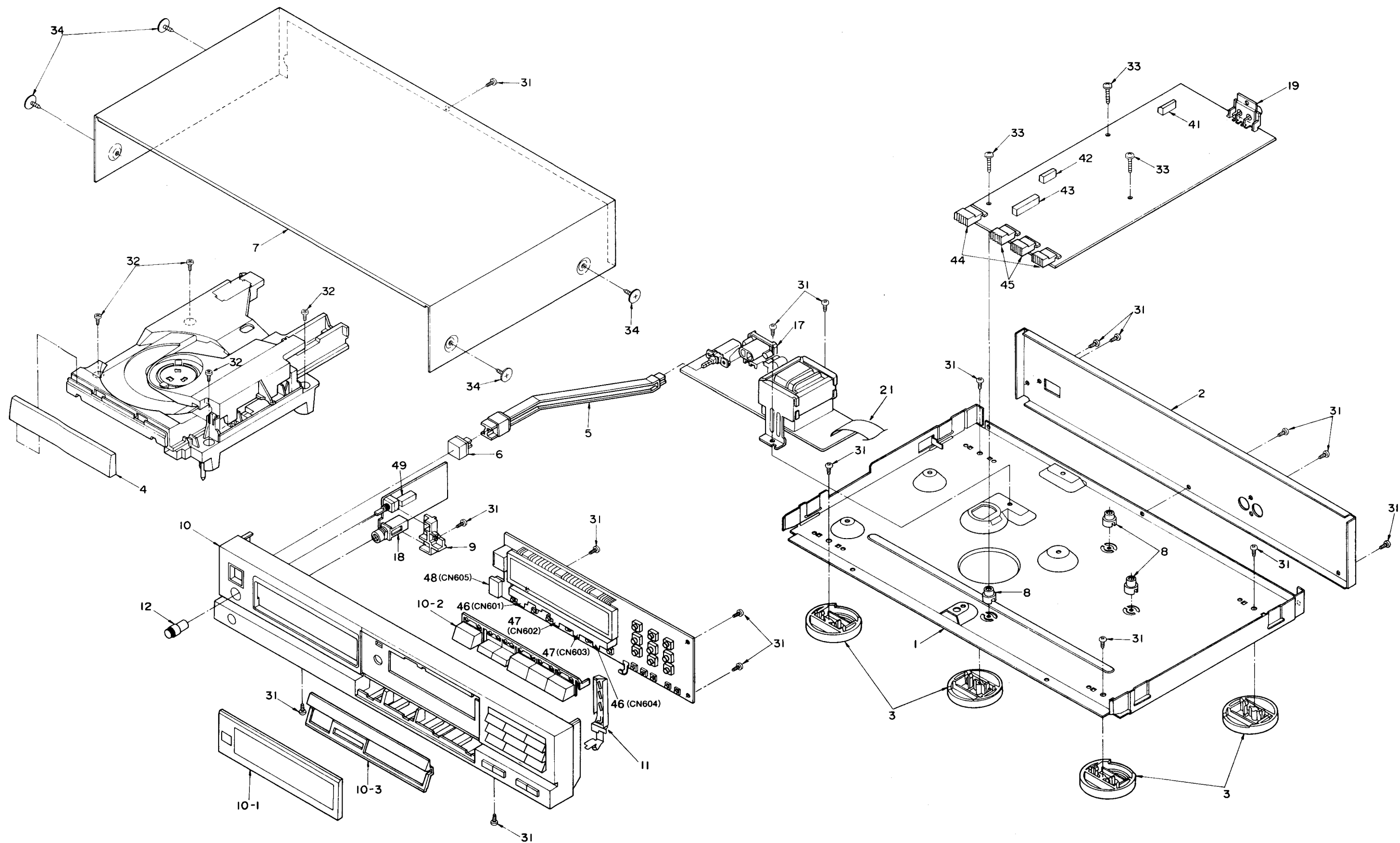
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
TRAVERSE DECK					
102	SISD22-1	TRAVERSE BASE	131	SDGD58	MAIN GEAR
103	S00D28-1E	TURNTABLE	132	SDGD59-2	GEAR
103-1	XXE26D5	SCREW	133	SIRD94-E	LOADING MOTOR
104	S00D29-2	RING	134	XTB3+10G	SCREW
106	SRQA010N04	SPRING	135	SMBD7	BELT
107	SORD37	ROLLER	137	SFUMZ15R61	WASHER
108	SORD38-E	COIL	138	SDRD14	ROLLER
109	SUXD123-1	GUIDE SHAFT	139	XTB3+8G	SCREW
110	SOAD70A	OPTICAL PICKUP	140	SIRD97-2E	HOLDER
111	SHRD176-E	COIL HOLDER	141	SIRD107-1	TRAY BASE
113	SHGD148	STOPPER	142	SIRD40-2	RACK GEAR
114	SOYD21-E	YOKE	143	SIRD96	LOCK LEVER
115	SOYD22	YOKE	145	SIRD98-2	DISC TRAY
116	SHRD177-1	LOCK UNIT	146	SUSD63	SPRING
117	SHWD33	WASHER	147	SNSD36	SCREW
118	SHWD34	WASHER	148	SIWD105	BRACKET
119	SNSD31	SCREW	149	SJGDRF310T-2	SPINDLE MOTOR
120	XTN2+5G	SCREW	150	SIRD51-1	HOLDER
121	XYN2+C8	SCREW	151	SIRD42-3	LEAD WIRE CLAMP
122	XYN2+J6	SCREW	152	SOMD4	MAGNET
123	SHGD153-1	CUSHION RUBBER	153	SOYD2	YOKE
124	SUSD136-1	SPRING	154	SIKD150051	FLAT CABLE
125	SUSD137-1	SPRING	155	SIKD150221-1	FLAT CABLE
126	SNSD33	SCREW	156	SHRD150	ROLLER HOLDER
127	SIWLP555-KN	LOADING BASE	157	SJSD1722M	SOCKET (17P)
128	SUSD145-1	SPRING	158	SJSD2222M	SOCKET (22P)
129	SUWD112	GUIDE SHAFT HOLDER	159	SJT30543-V	CONNECTOR (5P)
			160	SDRD12	ROLLER
			161	EMCS0552MP	CONNECTOR (5P)

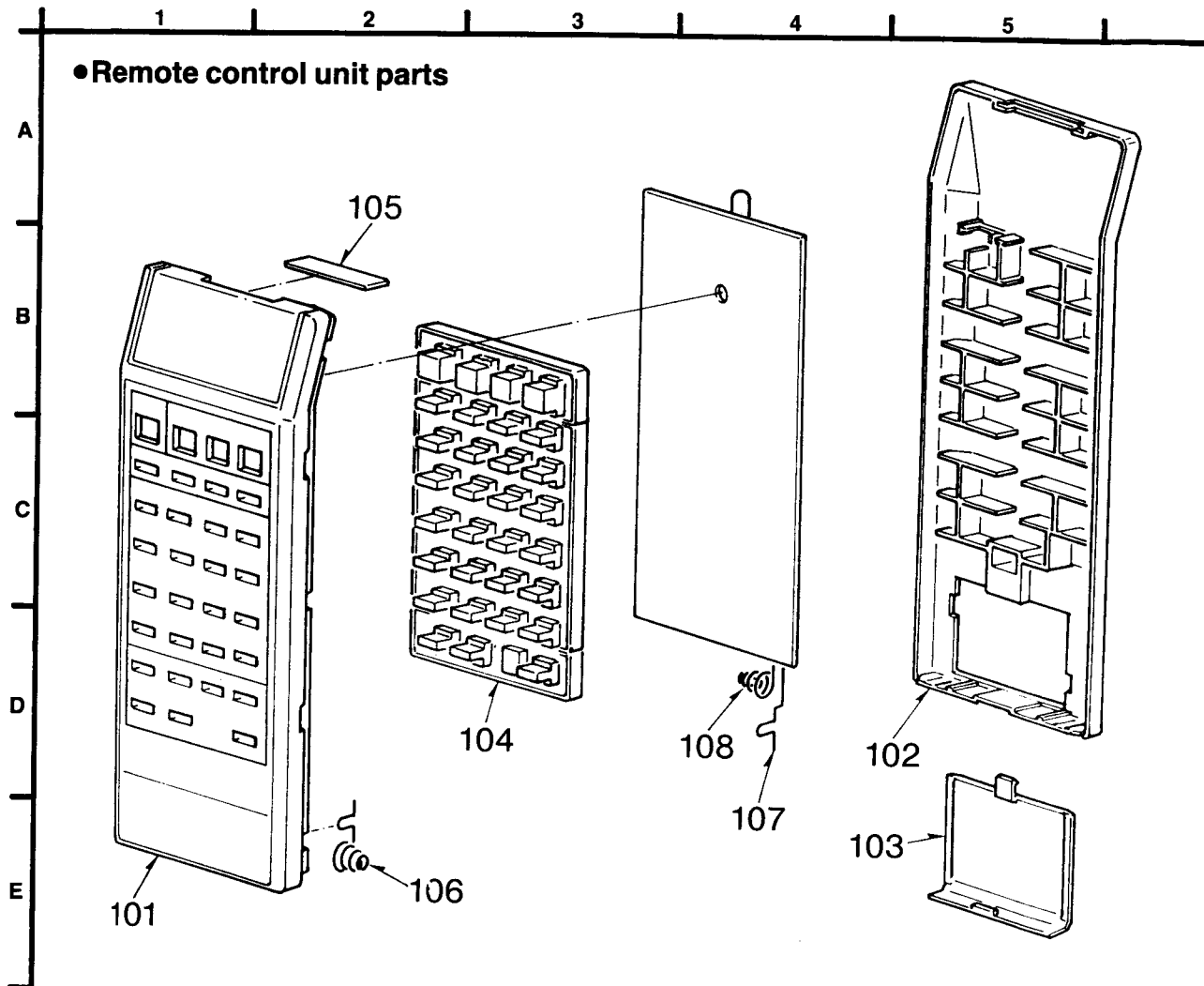
EXPLODED VIEWS

● Loading unit parts



● Cabinet parts





• Remote control unit parts list

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description	
REMOTE CONTROL			C2	ECUV1H471KCG	CAPACITOR	
INTEGRATED CIRCUITS			C3	ECEA0GK101	ELECTROLYTIC, 100 μ F, 4V	
IC1	MN6014HS	I.C.	MECHANISM PARTS			
TRANSISTORS			101	Ⓚ	UR64VCS710	UPPER CABINET
Q1	2SC3265Y	TRANSISTOR	101	Ⓢ	UR64VCS712	UPPER CABINET
DIODES			102	Ⓚ	UR64CS803A	LOWER CABINET
D1	LN66-S	L.E.D.	102	Ⓢ	UR64CS803B	LOWER CABINET
OSCILLATOR			103	Ⓚ	UR64EC804	BATTERY COVER
X1	CSB420PB6	OSCILLATOR	103	Ⓢ	UR64EC804A	BATTERY COVER
RESISTORS			104		UR64CT805K	BUTTON
R1	ERD25TLJ1R0J	RESISTOR	105		UR52SB327	PLATE(SMOKE)
CAPACITORS			106		UR64TD374	BATTERY TERMINAL(COMMON)
C1	ECUV1H471KCG	CAPACITOR	107		UR64TD808	TERMINAL (+)
			108		UR64TD809	TERMINAL (-)
			REMOTE CONTROL ASS'Y			
			RC1	Ⓚ	EUR64766	REMOTE CONTROL
			RC1	Ⓢ	EUR64767	REMOTE CONTROL

Compact Disc Player

DEUTSCH

SL-P202, P212,
P222, P333,
P555, P777

ELEKTRISCHE JUSTIERUNG

■ Abmessungen und Einstellungen

Achtung:

- Vermeiden Sie den Laserstrahl direkt anzublicken oder zu berühren, weil hohe Gefahr besteht. (Laserstrahlen sind unsichtbar). Während die CD-Einheit auf ON geschaltet ist, werden Laserstrahlen aus der Aufnahmelinse emittiert. Vermeiden Sie direkte Aussetzung von den Laserstrahlen besonders bei Einstellungsoperationen.

Vorbereitung

1. Beseitigen Sie das Kabinett (Siehe Ref. Nr. 1 des Wartungshandbuchs).
2. Beseitigen Sie den CD-Klemmer und Magnet (Siehe Ref. Nr. 2 des Wartungshandbuchs).
3. Beseitigen Sie den CD-Plattenhalter und Stromschalterstab (Siehe Ref. Nr. 3 des Wartungshandbuchs).
4. Setzen Sie die Test-CD-Platte und Magnet auf die Drehplatte.
5. Schalten Sie die CD-Einheit auf ON.
6. Drücken Sie zuerst den OPEN/CLOSE Schalter S102 in Pfeilrichtung, und danach (innerhalb von 4 Sekunden) drücken Sie den Schalter S101 in Pfeilrichtung, wie abgebildet.

Meßinstrumente und Fachgeräte

- Servoverstärkerregler (SZZP1017F oder SZZP1094C)
- Test-CD Platte
- 1. Test-CD-Platte (SZZP1054C oder SZZP1014F)
- 2. Unregelmäßige Test-CD-Platte (SZZP1056C)
- 3. Schwarzbandtest-CD-Platte (SZZP1057C)

- Normale CD-Platte
- Doppelstrahloszilloskop mit 30 MHz Bandbreite oder höher (zusammen mit EXT Auslöser und 1:1 Sonde)
- Tonfrequenzoszillator (AF)
- Konversionsanschluß (SZZP1032F)
- Allen Schraubendreher (M2,0)
- Allen Schraubendreher (M1,27)
- 0,9 mm Umgrenzungslehre (RZZ0297)

Führen Sie die Einstellungen an den Teilen die ersetzt werden wie folgend durch:

- (1) Spindelmotor Teile 1,3 bis 8
- (2) Drehplatte Teile 1,3 bis 8
- (3) Optischer Tonabnehmer Teile 2 bis 8

Einstellungsverfahren

- Falls Sie den Spindelmotor oder die Drehplatte ersetzt haben, gehen Sie wie folgend durch:

(1) Einstellung des Zwischenraumes der Drehplatte

1. Setzen Sie die 0,9 mm Umgrenzungslehre (RZZ0297) zwischen der Drehplatte und der CD-Empfangsgrundplatte (Siehe Abbildung rechts).
2. Ziehen Sie die Schraube der Drehplatte mit dem 1,27 mm Allen Schraubendreher fest.
3. Schließen Sie die CH. 1 Prüfungs-sonde des Oszilloskops durch die Terminale VR104 **REF** (+) und durch VR106 **VREF** (-) über einen Filter an.
(Anmerkung: Eine Voltzahl von 2,5 V befindet sich am Terminal V. REF. Bitte achten Sie darauf, daß Sie das Chassis der CD-Einheit mit dem Oszilloskop nicht berühren um einen Kurzschluß zu vermeiden).

Einstellung des Oszilloskops:

VOLT 50 mV
SWEEP 1 ms.
Eingabekopplung DC

4. Stellen Sie den DC Nullausgleich des Oszilloskops ein.

5. Schalten Sie den Plattenspieler auf **ON** und spielen Sie die Test-CD-Platte SZZP1014F oder SZZP1054C ab.
6. Messen Sie die Spannungsamplitude der Signal auf dem Oszilloskop ab.

Anmer-

- kung 1. Falls die bemessene Amplitude zwischen den Werten von ± 15 mV sich bewegt, liegt die Höhe der Drehplatte richtig. Falls die Amplitude außer den oben genannten Werten liegt, stellen Sie die Höhe der Drehplatte mit Hilfe der Umgrenzungslehre ein.

Falls die Amplitude $+15$ mV überschreitet, setzen Sie die Drehplatte etwas herab.

Falls die Amplitude -15 mV unterschreitet, setzen Sie die Drehplatte etwas herauf.

Anmer-

- kung 2. Falls die bemessene Amplitude weit über oder unter den oben benannten Werte übertrifft, setzen Sie **VR105** genau oder in der Nähe der Mitte und versuchen Sie erneut die Höhe einzustellen (Vergewissern Sie sich, daß Sie gleichzeitig die Fokusausschweifung mit einstellen sollen).

(2) Mechanische Einstellung

- Schließen Sie die CH. 1 Prüfungs-sonde des Oszilloskops durch **TJ101** (+) und durch **TJ102** (-) des Servos P.C.B. an.

Einstellung des Oszilloskops:

VOLT..... 100 mV

SWEEP..... 0,5 µs.

Eingabekopplung AC

- Schalten Sie den Plattenspieler auf **ON** und spielen Sie die Spur 9 auf der Test-CD-Platte (SZZP1056C).

- Stellen Sie die CD-Einheit im Betriebsmodus und setzen Sie die Einheit wie rechts abgebildet.

- Stellen Sie beide mechanische Einstellungsschrauben mit dem 2,0 mm Allen-Schraubendreher abwechselnd ein, bis die Amplitudevariation der RF-Signale des Oszilloskops auf das Minimum gebracht wird.

- Nach der Einstellung, verschließen Sie die mechanische Einstellungen mit dem Siegelack RZZOL01 dicht ab.

(3) "BEST EYE" (PD Ausgleich) Einstellung

- Schließen Sie die CH. 1 Prüfungs-sonde des Oszilloskops durch **TJ101** (+) und durch **TJ102** (-) des Servos P.C.B. an.

Einstellung des Oszilloskops:

VOLT..... 100 mV (CH. 1)

SWEEP..... 0,5 ms.

Eingabekopplung AC

- Schalten Sie den Plattenspieler auf **ON** und spielen Sie den 0,5 mm schwarzen Punkt auf der Test-CD-Platte SZZP1014F oder SZZP1054C ab.

- Stellen Sie den **VR101** bis die RF-Signalausgangsmusteramplitude maximal liegt.

4) Fokusstärkeeinstellung

- Schließen Sie die Servoverstärkerregelung an dem CD-Plattenspieler an. (Siehe Seite 7.)

- Setzen Sie den Verstärkungsschalter der Servoverstärkerregelung auf Position "2" ein und den ON/OFF Schalter auf **ON**.

- Setzen Sie die Oszillatorausgabe für **825 Hz, 150 mVp-p**, und schließen Sie diesen an den OSC und GND Terminale des Servoverstärkerreglers an.

- Schließen Sie die CH. 1 und CH. 2 Prüfungs-sonden des Oszilloskops an die entsprechenden Terminale der Servoverstärkerreglers TP1 und TP2 an. (TP3 ist Erde)

Einstellung des Oszilloskops:

VOLT..... 100 mV

SWEEP..... 1 ms.

Eingabekopplung AC

- Spülen Sie die Test-CD-Platte (SZZP1014F oder SZZP1054C) ab.

- Setzen Sie den Verstärkungsschalter der Servoverstärkerregelung auf Position "3" ein um eine 825 Hz-Signal auf dem Oszilloskop sehen zu können. Stellen Sie den **VR104** ein bis die Signalamplitude an beide Kanäle gleich werden.

- Setzen Sie den Verstärkungsschalter zur Position "2" wieder ein.

(5) Spurstärkeeinstellung

- Setzen Sie die Oszillatorausgabe für **1,1 kHz, 150 mVp-p**, und schließen Sie diesen an den OSC und GND Terminale des Servoverstärkerreglers.

- Schließen Sie die CH. 1 und CH. 2 Prüfungs-sonden des Oszilloskops an die entsprechenden Terminale der Servoverstärkerreglers TP1 und TP2. (TP3 ist Erde)

Einstellung des Oszilloskops:

VOLT..... 100 mV

beide Kanäle

SWEEP..... 1 ms.

Eingabekopplung AC

- Schalten Sie den Plattenspieler auf **ON** und spielen Sie die Test-CD-Platte SZZP1014F oder SZZP1054C ab.

- Setzen Sie den Verstärkungsschalter der Servoverstärkerregelung auf Position "1" ein und Sie werden eine 1,1 kHz-Signal auf dem Oszilloskop sehen. Stellen Sie den **VR102** ein bis die Signalamplitude an beide Kanäle gleich werden.

- Setzen Sie den Verstärkungsschalter an Position "2" wieder ein.

(6) Einstellung der Fokusausschweigung

Anmerkung: Vergewissern Sie sich, daß der Verstärkungsschalter der Servoverstärkerregelung sich in Position "2" befindet.

- Schließen Sie die CH. 1 Prüfungs-sonde des Oszilloskops durch **TJ101** (+) und durch **TJ102** (-) des Servos P.C.B. und die CH. 2 Sende (+) mit dem **FEG** Terminal des VR104 an.

Einstellung des Oszilloskops:

VOLT..... 100 mV (CH. 1)

SWEEP..... 0,5 ms.

Eingabekopplung AC (beide CH. 1 und CH. 2)

Auslösermodus NORM (Auslöser CH. 1)

- Schalten Sie den Plattenspieler auf **ON** und spielen Sie die Spur No. 9 auf der Test-CD-Platte SZZP1057C ab.

- Lösen Sie die Sonde CH. 1 des Oszilloskops in solcher Weise, daß folgende Wellenformen beobachtet werden können. Stellen Sie den **VR105** ein bis die Inklination der Hülle des RF-Signals der CH. 1 sanft herabsinkt und die Signalamplitude der CH. 2 auf das Minimum kommt, d.h., daß der Wert der Amplitude A den von Amplitude B entspricht.

REGLAGES ELECTRIQUES

■ Mesure et réglage

Attention:

- Il est très dangereux de voir ou de toucher le rayon laser. (Le rayonnement laser est invisible.) Une fois l'appareil mis sur la position "marche" (on), le rayon laser est émis de la lentille de la tête de lecture. Eviter donc l'exposition au rayon laser lors du réglage en particulier.

PREPARATION

1. Enlever le coffret (voir Ref. N° 1 dans le Manuel d'Entretien original).
2. Enlever le crampon de disque et l'aimant (voir Ref. N° 2 du même Manuel).
3. Enlever le support de disque et la tige d'interrupteur général (voir Ref. N° 2 du même Manuel).
4. Mettre le disque d'essai et l'aimant en place sur la platine tourne-disque.
5. Mettre le lecteur de disques sur la position "marche".
6. Pousser d'abord le commutateur ouverture/fermeture S102 dans la direction de la flèche, puis avant 4 secondes, pousser le commutateur S101 dans la direction de la flèche comme il est indiqué sur la figure.

Instruments de mesure et outils spéciaux

- Servorégleur de gain (SZZP1017F ou SZZP1094C)
- Disque d'essai
- 1. Disque d'essai de possibilité de lecture (SZZP1054C ou SZZP1014F)
- 2. Disque d'essai d'inégalité (SZZP1056C)
- 3. Disque d'essai de bande noire (SZZP1057C)
 - Disque normal
 - Oscilloscope double trace avec une largeur de bande de 30 MHz ou plus (avec déclencheur EXT et sonde 1:1)

- Oscillateur pour audiofréquences (AF)
- Connecteur de conversion (SZZP1032F)
- Clef hexagonale (M2, 0)
- Clef hexagonale (M1, 27)
- Calibre de tolérance de 0,9 mm (RZZ0297)

Le réglage doit être effectué selon la pièce remplacée, comme il est indiqué ci-dessous.

- (1) Moteur à broche Articles 1, 3 à 8
- (2) Platine tourne-disque Articles 1, 3 à 8
- (3) Tête de lecture optique Articles 2 à 8

Procédure de réglage

- Après avoir remplacé le moteur à broche ou la platine tourne-disque, effectuer le réglage suivant:

(1) Réglage de hauteur de platine tourne-disque

1. Introduire le calibre de tolérance de 0,9 mm (RZZ0297) entre la platine tourne-disque et la base de charge (voir la figure à droite).
2. Serrer la vis de fixation de platine tourne-disque à l'aide de la clef hexagonale de 1,27 mm.
3. Raccorder les bornes **FEG** (+) de VR104 et **V.REF** (-) de VR106 de la sonde de voie 1 (CH. 1) de l'oscilloscope par un filtre.
(Remarque: Une tension de 2,5 V apparaît à la borne V.REF. Veiller donc à ne pas court-circuiter le châssis du lecteur de disques et la terre de l'oscilloscope.)

Réglage de l'oscilloscope:

Tension (VOLT) 50 mV

Dent de scie (SWEEP) 1 ms.

Couplage d'entrée courant continu

4. Régler la balance nulle à courant continu de l'oscilloscope.

5. Mettre le lecteur de disques sur la position "marche" (ON), et commencer à lire le disque d'essai (SZZP1014F ou SZZP1054C).

6. Mesurer l'amplitude de tension du signal sur l'oscilloscope.

Remarque 1. Si l'amplitude mesurée est dans une fourchette de ± 15 mV, la hauteur de platine tourne-disque est correcte. Par contre, si elle est en dehors de cette fourchette, régler la hauteur de platine tourne-disque en utilisant le calibre de tolérance comme un levier.

Si l'amplitude dépasse +15 mV, abaisser la platine tourne-disque.

Si l'amplitude est inférieure à -15 mV, élever la platine tourne-disque.

Remarque 2. Si l'amplitude mesurée est largement supérieure ou inférieure à la fourchette mentionnée ci-dessus, régler VR105 au centre ou à ses environs, puis essayer de nouveau de régler la hauteur. (Ne pas omettre alors de régler également le foyer.)

(2) Réglage mécanique 1. Raccorder les bornes TJ101 (+) et TJ102 (–) de la sonde de voie 1 (CH. 1) de l'oscilloscope sur la plaquette de circuit imprimé auxiliaire. Réglage de l'oscilloscope: Tension (VOLT) 100 mV Dent de scie (SWEEP) 0,5 ms. Couplage d'entrée courant alternatif	2. Mettre le lecteur de disques sur la position "marche" (ON), et commencer à lire la voie 9 du disque d'essai (SZZP1058C). 3. Laisser le lecteur de disques en mode de lecture (PLAY), et le mettre en place comme il est indiqué sur la figure à droite. 4. Régler alternativement les deux vis de réglage mécanique à l'aide de la clef hexagonale de 2,0 mm jusqu'à ce que la variation d'amplitude de signaux de radiofréquence sur l'oscilloscope soit minimisée.
(3) Réglage de la meilleure mire (balance PD) 1. Raccorder les bornes TJ101 (+) et TJ102 (–) de la sonde de voie 1 (CH. 1) de l'oscilloscope sur la plaquette de circuit imprimé auxiliaire. Réglage de l'oscilloscope: Tension (VOLT) 100 mV Dent de scie (SWEEP) 0,5 ms. Couplage d'entrée courant alternatif	2. Mettre le lecteur de disques sur la position "marche" (ON), et commencer à lire le point noir de 0,5 mm sur le disque d'essai (SZZP1014F ou SZZP1054C). 3. Régler VR101 jusqu'à ce que l'amplitude de mire de signaux de radiofréquence soit maximisée.
(4) Réglage du gain de foyer 1. Raccorder le servorégleur de gain au lecteur de disques (voir page 7). 2. Mettre le commutateur de gain du servorégleur de gain sur la position "2" et l'interrupteur marche/arrêt sur la position "marche" (ON). 3. Régler la puissance de sortie de l'oscillateur pour audiofréquences sur 825 Hz, 150 mVp.p., et raccorder les bornes OSC (oscillateur) et GND (terre) de ce dernier sur le servorégleur de gain. 4. Raccorder respectivement les sondes de la voie 1 (CH. 1) et la voie 2 (CH. 2) de l'oscilloscope aux bornes TP1 et TP2 du servorégleur de gain [TP3 est la terre (GND)]. Réglage de l'oscilloscope: Tension (VOLT) 100 mV (pour les deux voies) Dent de scie (SWEEP) 1 ms. Couplage d'entrée courant alternatif	5. Commencer à lire le disque d'essai (SZZP1014F ou SZZP1054C). 6. Mettre le commutateur de gain du servorégleur de gain sur la position "3". Un signal de 825 Hz sera alors observé sur l'oscilloscope. Régler VR104 jusqu'à ce que les amplitudes de signaux des deux voies soient identiques l'une à l'autre. 7. Remettre le commutateur de gain sur la position "2".
(5) Réglage du gain de piste 1. Régler la puissance de sortie de l'oscillateur pour audiofréquences sur 1,1 kHz, 150 mVp.p., et raccorder les bornes OSC (oscillateur) et GND (terre) de ce dernier sur le servorégleur de gain. 2. Raccorder respectivement les sondes de la voie 1 (CH. 1) et la voie 2 (CH. 2) de l'oscilloscope aux bornes TP1 et TP2 du servorégleur de gain [TP3 est la terre (GND)]. Réglage de l'oscilloscope: Tension (VOLT) 100 mV (pour les deux voies) Dent de scie (SWEEP) 1 ms. Couplage d'entrée courant alternatif	3. Mettre le lecteur de disques sur la position "marche" (ON), et commencer à lire le disque d'essai (SZZP1014F ou SZZP1054C). 4. Mettre le commutateur de gain du servorégleur de gain sur la position "1". Un signal de 1,1 kHz sera alors observé sur l'oscilloscope. Régler VR102 jusqu'à ce que les amplitudes de signaux des deux voies soient identiques l'une à l'autre. 5. Remettre le commutateur de gain sur la position "2".

(6) Réglage de décalage de foyer Remarque: S'assurer que le commutateur de gain du servorégleur de gain est mis sur la position "2". 1. Raccorder les bornes TJ101 (+) et TJ102 (–) de la sonde de voie 1 (CH. 1) de l'oscilloscope sur la plaquette de circuit imprimé auxiliaire, et raccorder également la sonde de voie 2. (CH. 2) et la borne FEQ de VR104. Réglage de l'oscilloscope: Tension (VOLT) 100 mV (voie 1) 100 mV (voie 2) Dent de scie (SWEEP) 0,5 ms. Couplage d'entrée courant alternatif (pour les deux voies) Mode de déclenchement NORM (voie 1 de déclenchement)	2. Mettre le lecteur de disques sur la position "marche" (ON), et commencer à lire la voie 9 du disque d'essai (SZZP1057C). 3. Déclencher la voie 1 (CH. 1) de l'oscilloscope pour que les formes d'onde suivantes soient observées. Régler VR105 jusqu'à ce que l'inclinaison dans l'enveloppe de signaux de radiofréquence sur la voie 1 (CH. 1) soit en douceur et que l'amplitude de signaux de la voie 2 (CH. 2) soient minimisée, c'est-à-dire que l'amplitude A soit égale à celle B.
(7) Réglage de décalage de voie Remarque: S'assurer que le commutateur de gain du servorégleur de gain est mis sur la position "2". 1. Raccorder les bornes TJ101 (+) et TJ102 (–) de la sonde de voie 1 (CH. 1) de l'oscilloscope sur la plaquette de circuit imprimé auxiliaire, et raccorder également la sonde de voie 2. (CH. 2) et la borne TEG de VR102. Réglage de l'oscilloscope: Tension (VOLT) 100 mV (voie 1) 200 mV (voie 2) Dent de scie (SWEEP) 0,5 ms. Couplage d'entrée courant alternatif (pour les deux voies) Mode de déclenchement NORM (voie 1 de déclenchement)	2. Mettre le lecteur de disques sur la position "marche" (ON), et commencer à lire la voie 9 du disque d'essai (SZZP1057C). 3. Déclencher la voie 1 (CH. 1) de l'oscilloscope pour que les formes d'onde suivantes soient observées. Régler VR103 jusqu'à ce que l'inclinaison dans l'enveloppe de signaux de radiofréquence sur la voie 1 (CH. 1) soit en douceur et que l'amplitude de signaux de la voie 2 (CH. 2) soient minimisée, c'est-à-dire que l'amplitude A soit égale à celle B.
(8) Réglage de balance de voie 1. S'assurer que le commutateur de gain du servorégleur de gain est mis sur la position "2". 2. Régler la puissance de sortie de l'oscillateur pour audiofréquences sur 1,1 kHz, 600 mVp.p., et raccorder les bornes OSC (oscillateur) et GND (terre) de ce dernier sur le servorégleur de gain. 3. Raccorder les bornes TJ101 (+) et TJ102 (–) de la sonde de voie 1 (CH. 1) de l'oscilloscope sur la plaquette de circuit imprimé auxiliaire, et raccorder également la sonde de voie 2. (CH. 2) et la borne OSC sur le servorégleur de gain. Réglage de l'oscilloscope: Tension (VOLT) 100 mV (voie 1) Dent de scie (SWEEP) 0,5 ms. Couplage d'entrée courant alternatif (pour les deux voies) Mode de déclenchement NORM (voie 2 de déclenchement)	4. Mettre le lecteur de disques sur la position "marche" (ON), et commencer à lire le disque d'essai (SZZP1014F ou SZZP1054C). 5. Mettre le commutateur de gain du servorégleur de gain sur la position "1", et régler VR106 jusqu'à ce que le vacillement contenu dans la forme d'onde de la voie 1 (CH. 1) soit minimisé comme il est indiqué ci-dessous. 6. Débrancher les conducteurs du servorégleur de gain du lecteur de disques.

(9) Contrôle de fonctionnement de lecture après réglage

●Contrôle de la recherche par sauts

1. Lire un disque de programme musical ordinaire.
2. Appuyer sur la touche de saut pour contrôler le fonctionnement normal de recherche par sauts (dans les directions vers l'avant et vers l'arrière).

●Contrôle de la recherche manuelle

1. Lire un disque de programme musical ordinaire.
2. Appuyer sur la touche de recherche manuelle pour contrôler le fonctionnement normal de recherche manuelle à vitesse réduite ou élevée (dans les directions vers l'avant et vers l'arrière).

●Contrôle de l'utilisation d'un disque défectueux

1. Lire le point noir de 0,7 mm et le coin de 0,7 mm sur le disque d'essai défectueux (SZZP1054C), et vérifier qu'il ne se produit aucun saut sonore ou bruit.
2. Lire les voies du milieu du disque d'essai inégal, et vérifier qu'il ne se produit aucun saut sonore ou bruit.

ESPAÑOL

AJUSTE ELECTRICO

■ MEDICIONES Y AJUSTES

Precaución:

- Es muy peligroso mirar directamente o tocar los rayos de láser (Las radiaciones de láser son invisibles.) Cuando el aparato está encendido las radiaciones de láser son emitidas desde el lente de captación. Evite exponerse a los rayos de láser, especialmente mientras realice los ajustes.

PREPARACION

1. Quite la cabina (ver el número de referencia 1 en el manual de servicio original).
2. Quite el freno del disco y el imán (ver el número de referencia 2 del mismo manual).
3. Quite el soporte del disco y la barra del interruptor de corriente (ver el número de referencia 3 del mismo manual).
4. Coloque el disco de prueba e imán en el tornamesa.
5. Encienda el aparato.
6. Primero empuje el conmutador OPEN/CLOSE (S102) en la dirección de la flecha y luego, dentro de un lapso de 4 segundos, empuje el conmutador S101 en la dirección de la flecha como se muestra en la figura.

Instrumentos de medición y herramientas especiales

- Ajustador de servogancia (SZZP1017F o SZZP1094C)
- Discos de prueba
- 1. Disco para pruebas de reproducción (PLAY) (SZZP1054C o SZZP1014F).
- 2. Disco de superficie no uniforme para pruebas (SZZP1056C).
- 3. Disco de banda negra para pruebas (SZZP1057C)
- Disco normal
- Osciloscopio de dos canales con amplitud de banda de 30 MHz o mejorada (con "disparador" EXT y sonda de 1:1)

- Oscilador de frecuencia de audio (FA)
- Conector de conversión (SZZP1032F)
- Llave Allen (M2.0)
- Llave Allen (M1.27)
- Calibrador de 0.9 mm (RZZ0297)

Los ajustes a ejecutar dependen de las partes a ser remplazadas de acuerdo a lo siguiente:

- (1) Motor del eje Items 1, y del 3 al 8
- (2) Tornamesa Items 1, y del 3 al 8
- (3) Captador óptico Items del 2 al 8

Procedimiento de ajuste

- Si ha remplazado el motor del eje o tornamesa, realice los siguientes ajustes:

(1) AJUSTE DE LA ALTURA DEL TORNAMESA

1. Introduzca el calibrador de 0.9 mm (RZZ0297) entre el tornamesa y la base de carga (ver la figura a la derecha).
2. Ajuste el tornillo de retención del tornamesa con la llave Allen de 1.27 mm.
3. Conecte la sonda CH.1 del osciloscopio al **FEG** (+) del VR104 y el **V.REF** (-) del VR106 mediante un filtro. (Nota: Un voltaje de 2.5 voltios aparecerá en el terminal V.REF. Tener cuidado de que no se establezca un corto circuito entre el chasis del aparato y el conductor de tierra del osciloscopio).

Ajustes en el osciloscopio:

- Voltaje 50 mV
 "Sweep" 1 ms
 "Coupling" de entrada CD

(2) AJUSTES MECANICOS

1. Conecte la sonda CH1 del osciloscopio al TJ101 (+) y TJ102 (-) en el P.C.B. Servo.

Ajustes en el osciloscopio:

- Voltaje 100 mV
 "Sweep" 0.5 μ s.
 "Coupling" de entrada CA

2. Encienda el aparato, y reproduzca la banda 9 en el disco de prueba (SZZP1056C).

(3) AJUSTE VISUAL OPTIMO (EQUILIBRIO DE PD)

1. Conecte la sonda CH.1 del osciloscopio al **TJ101** (+) y **TJ102** (-) en el P.C.B. Servo.

Ajustes en el osciloscopio:

- Voltaje 100 mV
 "Sweep" 0.5 μ s.
 "Coupling" de entrada CA

(4) AJUSTE DE LA GANANCIA DE ENFOQUE

1. Conecte el ajustador de servogancia al aparato (ver la página 7).
2. Coloque el conmutador del ajustador de ganancia en la posición "2" y el interruptor ON/OFF en ON.
3. Ajuste la emisión del oscilador AF en **825 Hz, 150 mVp-p** y conéctelo a los terminales OSC y GND del ajustador de ganancia del servo.
4. Conecte las sondas CH.1 y CH.2 del osciloscopio a los terminales TP1 y TP2 del ajustador de servogancia respectivamente (el TP3 es para tierra).

Ajuste en el osciloscopio:

- Voltaje 100 mV
 (ambos canales)
 "Sweep" 1 ms
 "Coupling" de entrada CA

4. Ajuste el balance cero DC del osciloscopio.
5. Encienda el aparato y reproduzca el disco de prueba (SZZP1014F o SZZP1054C).
6. Mida la amplitud del voltaje de la señal en el osciloscopio.

Nota 1. Si la amplitud medida está en el rango de ± 15 mV, la altura del tornamesa es correcta. Si está fuera de este rango, ajuste la altura del tornamesa usando el calibrador como palanca.

Si la amplitud excede los ± 15 mV, baje el tornamesa. Si la amplitud es menor de -1 mV, eleve el tornamesa.

Nota 2. Si la amplitud medida, sobrepasa o está muy por debajo del rango arriba indicado, coloque el VR105 en o cerca del centro, y luego trate de ajustar la altura de nuevo. (Luego ajuste la compensación del foco.)

3. Con el aparato en el modo de reproducción, colóquelo en la posición indicada en la figura de la derecha.
4. Ajuste de manera alternada los dos tornillos de ajuste mecánicos con la llave Allen de 2.0 mm hasta que la señal RF de la variación de amplitud en el osciloscopio sea mínima.
5. Despues de completar los ajustes, selle los ajustes mecánicos con la pintura RZZOL01.

2. Encienda el aparato y reproduzca el punto negro de 0.5 mm del disco de prueba (SZZP1014F o SZZP1054C).
3. Ajuste el **VR101** hasta que la amplitud del patrón de "ojo" de la señal RF sea máxima.

5. Reproduzca el disco de prueba (SZZP1014F o SZZP1054C).
6. Coloque el conmutador del ajustador de ganancia en la posición "3" y verá una señal de 825 Hz en el osciloscopio. Ajuste el **VR104** hasta que las amplitudes de la señal en ambos canales sean idénticas unas a otras.
7. Coloque otra vez el conmutador de ganancia en la posición "2".

(5) AJUSTE DE LA GANANCIA DEL SEGUIMIENTO (TRACKING)

1. Ajuste la salida del oscilador de FA en **1.1 kHz**, **150 mVp-p** y conéctelo a los terminales OSC y GND del ajustador de servogancia.
 2. Coloque las sondas CH. 1 y CH. 2 del osciloscopio en los terminales TP1 y TP2 del ajustador de ganancia, respectivamente (el TP3 es de tierra).
- Ajustes en el osciloscopio:**
- Voltaje 100 mV
(ambos canales)
- "Sweep" 1 ms
- "Coupling" de entrada CA
3. Encienda el aparato y reproduzca el disco de prueba (SZZP1014F o SZZP1054C).
 4. Coloque el conmutador del ajustador de ganancia en la posición "1" verá una señal de 1,1 kHz en el osciloscopio. Ajuste el **VR102** hasta que las amplitudes de la señal en ambos canales sean idénticas unas a otras.
 5. Coloque otra vez el conmutador de ganancia en la posición "2".

(6) AJUSTE DE LA COMPENSACION DEL ENFOQUE

Nota: Asegúrese de que el conmutador del ajustador de servogancia esté colocado en la posición "2".

1. Conecte la sonda CH. 1 del osciloscopio al **TJ101** (+) y **TJ102** (-) del P.C.B. Servo y la sonda CH. 2 (+) al terminal **FEG** del VR104.
- Ajustes en el osciloscopio:**
- Voltaje 100 mV (CH. 1)
100 mV (CH. 2)
- "Sweep" 0,5 ms
- "Coupling" de entrada CA
(ambos canales 1 y 2)
- Modalidad de disparo NORMAL
(disparo del CH. 1)
2. Encienda el aparato y reproduzca la banda 9 del disco de prueba (SZZP1057C).
 3. Dispare el CH. 1 del osciloscopio de tal manera que las siguientes ondas aparezcan. Ajuste el **VR103** hasta que la base de la envoltura de la señal RF en el CH. 1 sea uniforme y la amplitud de la señal en el CH. 2 sea mínima, es decir, cuando la amplitud A sea igual a la amplitud B.

(7) AJUSTE DE LA COMPENSACION DEL SEGUIMIENTO (TRACKING)

Nota: Asegúrese de que el conmutador del ajustador de servogancia esté colocado en la posición "2".

1. Conecte la sonda CH. 1 del osciloscopio al **TJ101** (+) y **TJ102** (-) del P.C.B. Servo y la sonda CH. 2 (+) al terminal **TEG** del VR102.
- Ajustes en el osciloscopio:**
- Voltaje 100 mV (CH. 1)
200 mV (CH. 2)
- "Sweep" 0,5 ms
- "Coupling" de entrada CA
(ambos canales 1 y 2)
- Modalidad de disparo NORMAL
(disparo del CH. 1)
2. Encienda el aparato y reproduzca la banda 9 del disco de prueba (SZZP1057C).
 3. Dispare el CH. 1 del osciloscopio de tal manera que las siguientes ondas aparezcan. Ajuste el **VR103** hasta que la base de la envoltura de la señal RF en el CH. 1 sea uniforme y la amplitud de la señal en el CH. 2 sea mínima, es decir, cuando la amplitud A sea igual a la amplitud B.

(8) AJUSTE DEL BALANCE DEL SEGUIMIENTO (TRACKING)

1. Asegúrese de que el conmutador del ajustador de servogancia esté colocado en la posición "2".
 2. Ajuste la salida del oscilador de FA en **1,1 kHz**, **600 mVp-p** y conéctelo a los terminales OSC y GND del ajustador de servogancia.
 3. Conecte la sonda CH. 1 del osciloscopio al **TJ101** (+) y al **TJ102** (-) del P.C.B. Servo y la sonda CH. 2 (+) al terminal OSC del ajustador de servogancia.
- Ajustes en el osciloscopio:**
- Voltaje 100 mV (CH. 1)
- "Sweep" 0.5 ms
- "Coupling" de entrada CA
(ambos canales 1 y 2)
- Modalidad de disparo NORMAL
(disparo del CH. 2)
4. Encienda el aparato, y reproduzca el disco de prueba (SZZP1014F o SZZP1054C).
 5. Coloque el conmutador del ajustador de servogancia en la posición "1" y ajuste el **VR106** hasta que las irregularidades de las ondas de la señal en el CH. 2 sea mínima como se muestra más abajo.
 6. Desconecte el ajustador de servogancia del aparato.

(9) COMPROBACION DE LA FUNCION DE REPRODUCCION DESPUES DE LOS AJUSTES

•Comprobación de la localización de salto

1. Reproduzca un disco de programa musical ordinario.
2. Presione el botón de salto para comprobar la función normal de localización de salto (en ambas direcciones, de avance y retroceso).

•Comprobación de la localización manual

1. Reproduzca un disco de programa musical ordinario.
2. Presione el botón de localización manual para comprobar las funciones de localización manual a velocidad lenta o alta (en ambas direcciones, de avance y retroceso).

•Comprobación mediante el empleo de un disco defectuoso

1. Reproduzca el punto negro de 0,7 mm y el patrón de "cuña" de 0,7 mm del disco defectuoso de prueba (SZZP1054C) y compruebe de que no ocurran saltos ni ruidos.
2. Reproduzca las bandas intermedias del disco de prueba de superficie no uniforme para pruebas y verifique que no ocurran saltos ni ruidos.