SERV. 34 822

ORDER NO. AD8812312C9

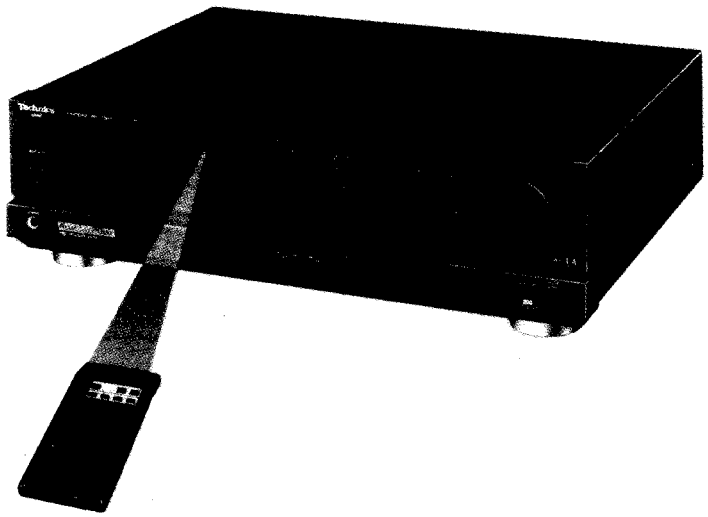
Service Manual

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-P999



Color

(K)... Black Type

Area

Country Code	Area	Color
(E)	Continental Europe.	(K)
(EK)	United Kingdom.	(K)
(XL)	Australia.	(K)
(EG)	F.R. Germany.	(K)
(EB)	Belgium.	(K)
(EH)	Holland.	(K)
(EF)	France.	(K)
(Ei)	Italy.	(K)
(XA)	Asia, Latin America, Middle Near East, Africa and Oceania.	(K)
(XB)	Saudi Arabia.	(K)
(PA)	Far East PX.	(K)
(PE)	European Military.	(K)
(PC)	European Audio Club.	(K)

SPECIFICATIONS

■ Audio

No. of channels	2 channel (stereo)
Output voltage	2.5Vrms
Frequency response	2~20,000Hz±0.3dB
Dynamic range	100dB
S/N ratio	113dB
Total harmonic distortion	0.0023%
Harmonic distortion	0.0013%
Channel separation	110dB
Digital filter	20-bit realizing high resolution output 8 times oversampling
DA converter	4 DAC system
Output impedance	600Ω
Digital output	optical
Realizing resolution output	20-bit

■ Signal format

Sampling frequency	44.1kHz
Error correction	Technics New Super Decoding Algorithm (8 Samples Linear Interpolation)

■ Pickup

Type	Aspherical Surface Glass Press Lens Fine focus 1 beam
Beam source	Semiconductor laser
Wave length	780nm

■ Traverse unit

Type	High speed linear motor

■ General

Power supply	
For Continental Europe	AC 50/60Hz, 220V
For United kingdom	AC 50/60Hz, 110V/127V/220V/240V
For Australia	AC 50/60Hz, 240V
For others	AC 50/60Hz, 110V/127V/220V/240V
Power consumption	16W
Headphones output level	60mW/32Ω
Dimensions (W×H×D)	430×126.5×338mm
Weight	6kg

Specifications subject to change without notice.
Weight and dimensions shown are approximately.

Technics

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

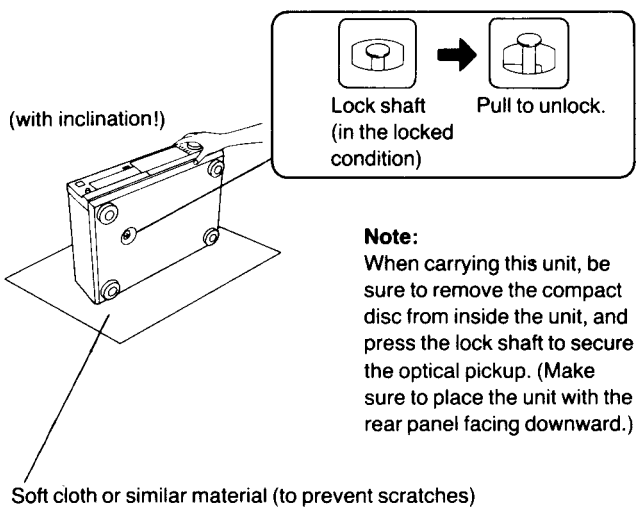
Panasonic Tokyo Sales Department
Matsushita Electric Industrial Co., Ltd.
World Trade Center Bldg., 4-1, Hamamatsu-cho, 2-chome, Minato-ku, Tokyo 105, Japan

■ CONTENTS

■ PLACEMENT

Before placement

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



Note:
When carrying this unit, be sure to remove the compact disc from inside the unit, and press the lock shaft to secure the optical pickup. (Make sure to place the unit with the rear panel facing downward.)

Notes of placement

■ **Place on a flat, level surface so that the front-rear inclination does not exceed 5°.**

■ **Avoid places such as the following:**

- Near any equipment or device that generates strong magnetism.
- On any heat-generating equipment or device, or in any place where the temperature is high (40°C or higher).
- Extremely cold places (5°C or below).
- Near a tuner or TV (It may cause noise in the broadcast, or disturbance of the TV picture.)

■ **Do not place heavy objects, other than system components, on top of the unit.**

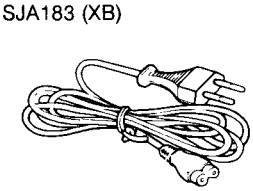
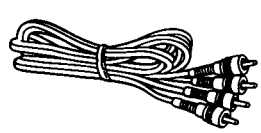
■ **When carrying or storing the unit, handle it with care so it is not subjected to any strong bumps.**
Always remove the disc before storing the unit for any period of time.

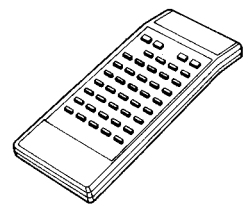
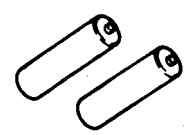
■ **To avoid problems due to vibration.**

- Do not place a book or similar object under this unit.
- Do not route the connection cables (of this or other units) across the operation panel, across the top, or under the unit.

■ ACCESSORIES

•AC power supply cord 1	•Stereo connection cable 1	•Optical cable 1	•Remote control transmitter 1	•Batteries 2
SJA187 (E, EG, EB, EH, EF, Ei) SJA173 (XL) SJA193 (EK) SJA168-1 (XA, PA, PE, PC) SJA183 (XB)	(SJP2249-4)	(SJPD16)	(EUR64729)	(UM-4NE/2S)

D

■PRECAUTION OF LASER DIODE

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pick up lens.
Wave length: 780nM
Maximum output radiation power from pick up: 100μW/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 laserd 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 laserdiode. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit abgestrahlt.

Wellenlänge: 780nM
Maximale strahlungsleistung der lasereinheit: 100μW/VDE

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

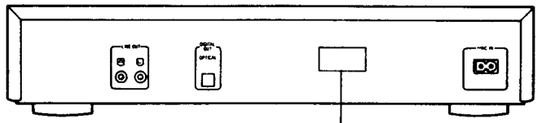
1. Die lasereinheit nicht zerlegen, da die strahlung an der freigelegten laserdiode gefährlich ist.
2. Den werksseitig justierten einstellregler der lasereinreit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.

ADVARSEL: I dette a apparat anvendes laser.

• Use of caution labels

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

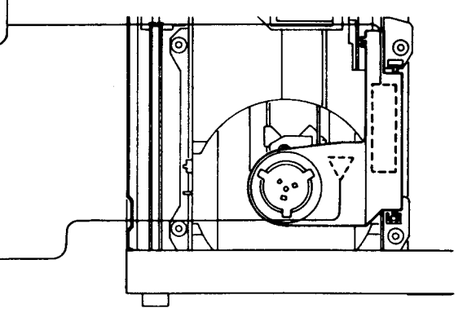
Areas	SQWD7	SQWD87	SQWD19
(PA, PE, PC)	×	○	○
Others	○	○	○



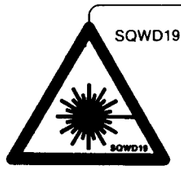
SQWD7

SQWD87

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



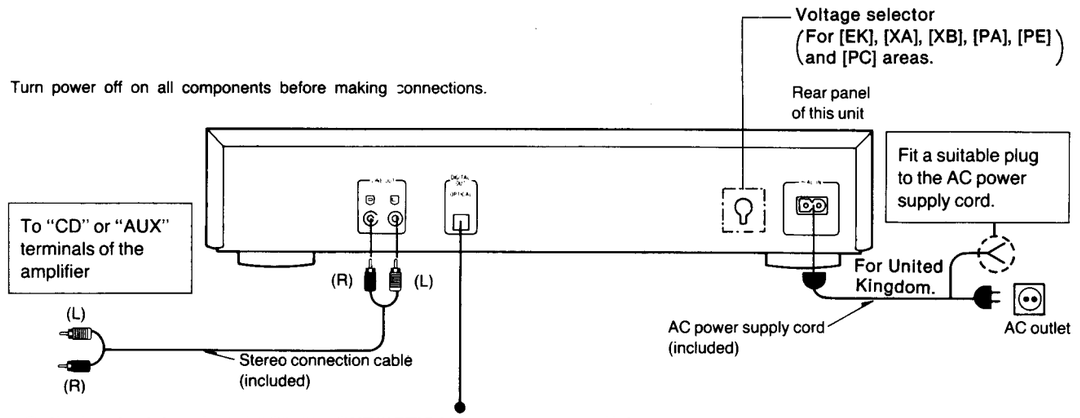
SQWD19



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

■ CONNECTIONS

Turn power off on all components before making connections.



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

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

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

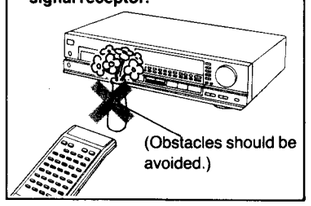
Note:
The configuration of the AC outlet and AC power supply cord differs according to area.

■ REMOTE CONTROL TRANSMITTER

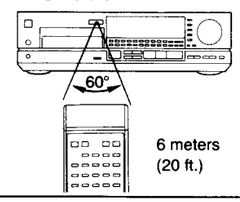
Remote control transmitter operation notes

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

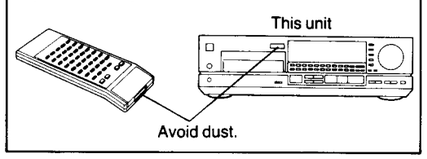
Face it toward the remote control signal receptor.



Use the remote control transmitter within 6 meters.



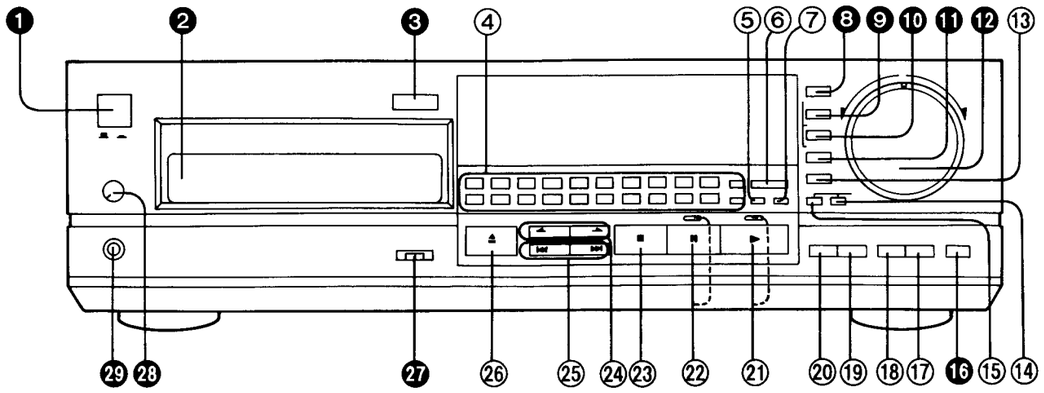
Be sure the transmitter part of the remote control transmitter and the receptor part of this unit are free from dust. Excessive dust might prevent reception.



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

■ LOCATION OF CONTROLS

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



Control section

❶ Power switch (power)

❷ Disc holder

❸ Remote control signal sensor (remote sensor)

④ Numeric buttons (+10, 0, 1~20)

⑤ Clear button (clear)
This button can be used to clear tracks from the programmed sequence one at a time.

⑥ Programmed-play button (program)
Pressing this button initiates the programmed play mode. You can then enter specific tracks using the numeric buttons.

⑦ Recall button (recall)
This button can be used to display the contents of the programmed track sequence for confirmation.

❽ Window search button (window)
Press this button to perform searches when the unit is in the pause mode. Search for any point on the disc using the search dial. Release the dial at the desired point and that point on the disc is repeated again and again.

❾ Edit tape length button (edit 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.

❿ 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.

⓫ Disc link button (disc link)
This button can be used for edit recording from several discs.

⓬ Search dial (search)
This dial can be used to locate specific places on the disc during play at high speed, either forward or reverse.

⑬ Peak level search button (peak search)
This button can be used to locate the maximum signal level (peak level) for the signals on the disc.

⑭ Time mode select button (time mode)

⑮ Display mode select button (display mode)

⓰ Digital output button (digital output)
This button can be used to switch to on and off for digital output.

⑰ Auto cue/auto space button (auto cue/edit auto space)
Pressing this button causes the unit to switch to the play standby mode.
When editing, this button can be used to insert the silent gaps between the tracks.

⑱ Random play button (random)
This button can be used to play the tracks on a disc in a random sequence.

⑲ Repeat button (repeat)

⑳ 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.

㉑ Play button and indicator (▶ play)

㉒ Pause button and indicator (❚❚ pause)

㉓ Stop button (■ stop)
This button can be used to stop disc play, as well as to cancel the various play modes.

㉔ Index skip buttons (—index/index—)
These buttons can be used to skip by index number (smaller divisions within specific tracks).

㉕ Skip buttons (|◀◀ skip/skip ▶▶|)
These buttons can be used to skip by track in the forward or reverse direction.

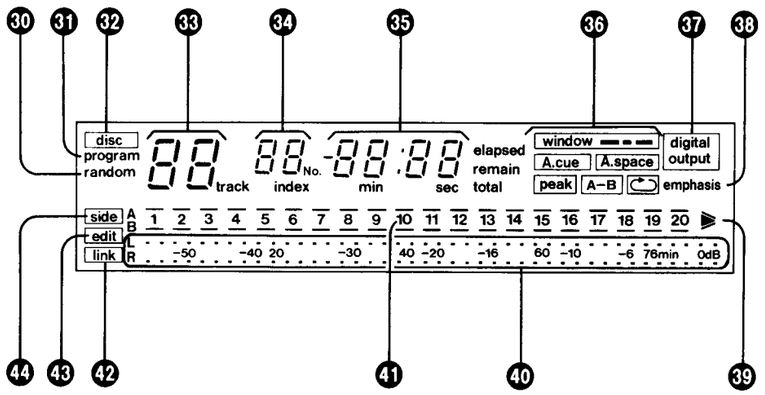
㉖ Disc holder open/close button (▲ open/close)

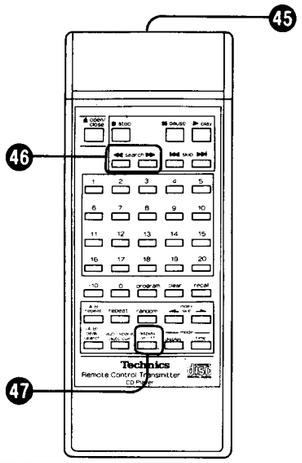
㉗ Timer start switch (timer)
This switch allows you to use a separately purchased audio timer to switch the unit on automatically at a preset time.

㉘ Headphones volume control (phones level)

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

㉙ Headphones jack (phones)





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

Indicators section

㉚ Random play indicator (random)

㉛ Programmed-play indicator (program)

㉜ Disc indicator (disc)

㉝ Track number display (track)

㉞ Index/program number display (index/No.)

㉟ Time display (min/sec)
The indicators display the following types of time information.
"elapsed": time elapsed since the beginning of the current selection
"remain": time remaining until the end of the current selection
"total": total elapsed time since the beginning of the disc or total time remaining until the end of the disc, depending on whether the "elapsed" or "remain" indicator is illuminated.

㊱ Operation indicators
The indicators below illuminate during their respective operations.

window	window search
A.cue	auto cue
A.space	auto space
peak	peak level search
A–B	A–B peak level search and A–B repeat play
↻	repeat play

㊲ Digital output indicator (digital output)

㊳ Emphasis indicator (emphasis)
This indicator illuminates when discs recorded with pre-emphasis in the high-frequency range are played.

㊴ "Over" mark (▶)
This indicator lights if the total number of tracks on the disc is 21 or more.

㊵ Play position/output level indicator
This indicator toggles between its 2 modes each time the display mode select button is pressed.

㊶ Track number indicator (1–20)

㊷ Disc link indicator (link)

㊸ Compact disc edit indicator (edit)

㊹ Tape side indicator (side A/B)

Remote control transmitter

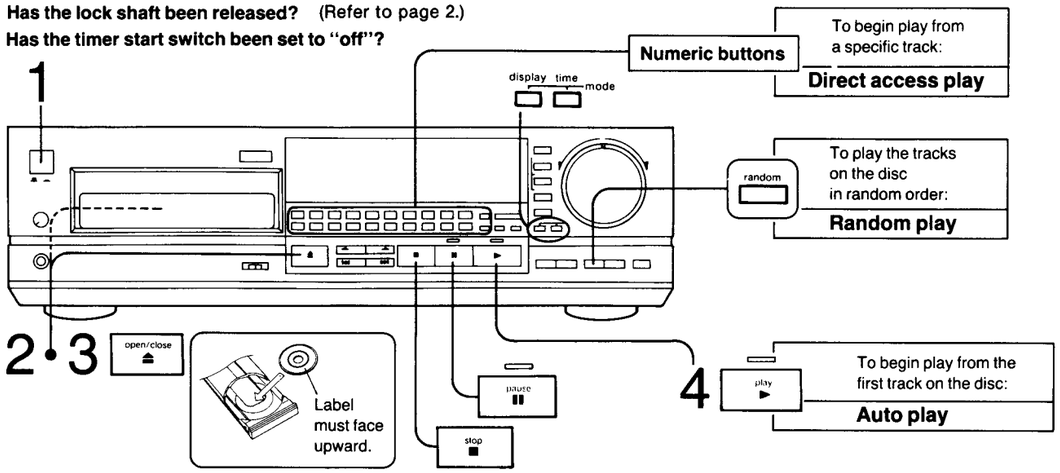
㊺ Remote control signal transmission window

㊻ 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.

㊼ Display switch (display on/off)
This switch allows you to turn off the display during play if you wish.
The display returns for about 5 seconds whenever an operation button is pressed and then goes out again.

■ BASIC OPERATION

Has the lock shaft been released? (Refer to page 2.)
Has the timer start switch been set to "off"?



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.

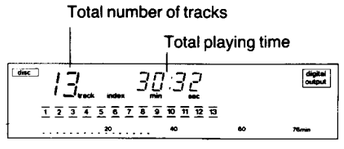
1 Press the power switch to turn power ON.

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

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.

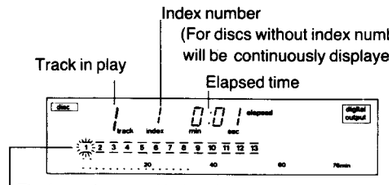


Notes:

- 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.

4 Press the play button.

Disc play begins from the first track on the disc and the play indicator lights up.



- The bars above and below the number of the track in play flash. They go out when play finishes.

- 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.

•To temporarily stop disc play, press the pause button.

- The pause indicator lights up.
- Press the play button to play again.

Direct access play

To listen to a disc from track 3, press the numeric button [3]. Play begins directly from track 3.

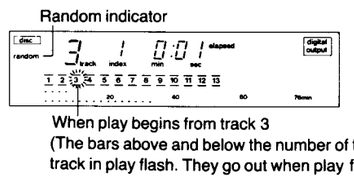
Choosing a specific track
Tracks 1–20: Press the appropriate numeric button [1]–[20] directly.
Tracks 21 and up: First press [+10], then [0]–[9]. (Press [+10] twice for 20, three times for 30, and so on.)

- 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.

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.



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

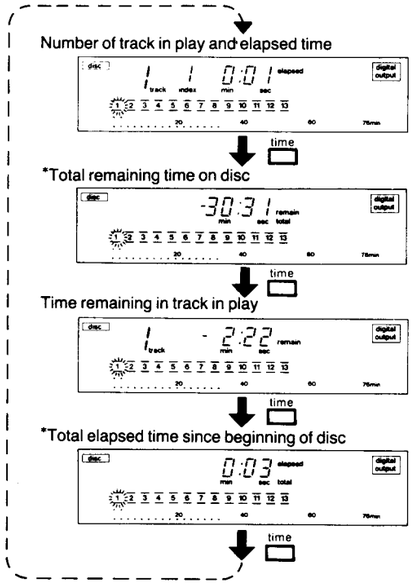
•To cancel random play while a disc is playing, press the random play button again.

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

Changing the indications of the time mode display and bar indication.

Time display

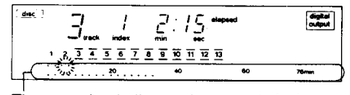
Each time the time mode select button is pressed during play or when the unit is in the pause mode switches the display among the following modes.



Bar indication

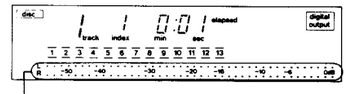
Pressing the display mode select button switches the play position display to an output level meter. (Press the display mode select button again to switch back.)

Play position display



The upper bar indicates the current playing position. The lower bar shows the total playing time on the disc. (min=minutes)

Output level meter



The upper bar indicates the output level for the left channel and the lower bar the output level for the right channel. (dB=decibel)

*not displayed during random play

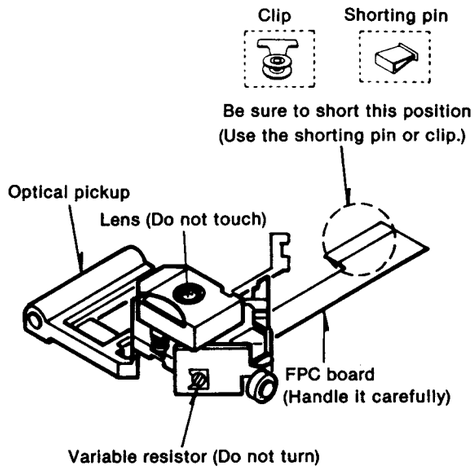
D

■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.

• Handling of optical pickup

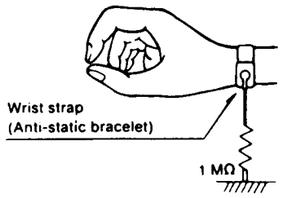
1. Do not subject the optical pickup to static electricity as it is extremely sensitive to electrical shok.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. **(FPC board)**
   When removing or connecting the short pin, finish the job in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

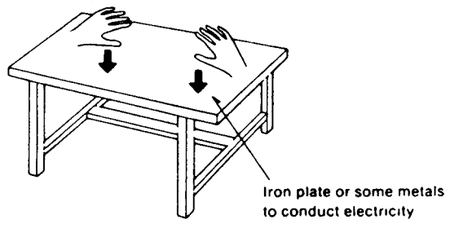


• Grounding for electrostatic breakdown prevention

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

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



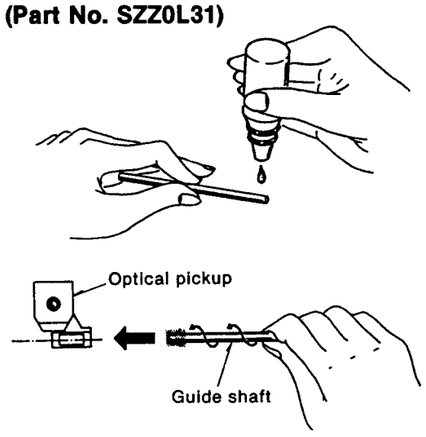


■ INSTRUCTIONS FOR TRAVERSE OIL (Part No. SZZ0L31)

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

How to Use

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



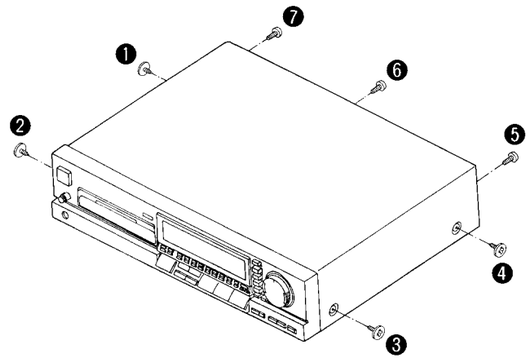
■ DISASSEMBLY INSTRUCTIONS

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

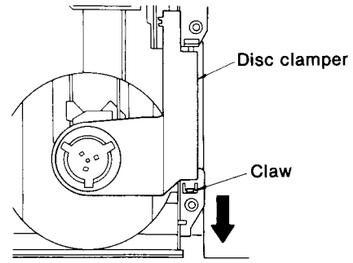
ACHTUNG:
- Die lasereinheit nicht zerlegen.
- Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

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

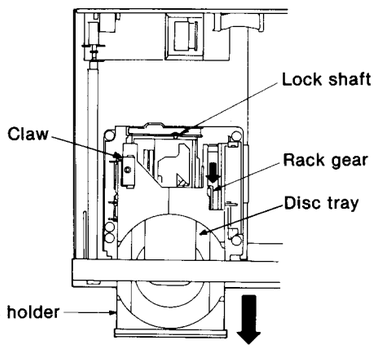
Ref. No. 1	How to remove the cabinet
Procedure 1	1. Remove the 7 screws (❶~❼).



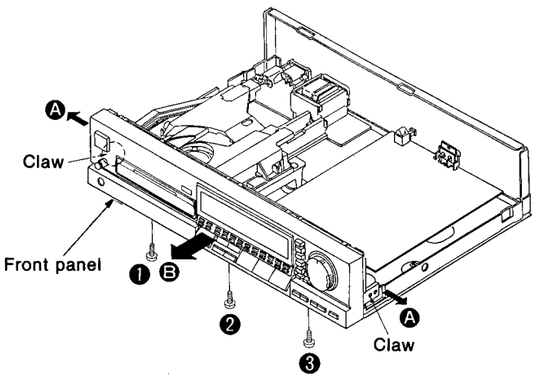
Ref. No. 2	How to remove the disc clamper
Procedure 1→2	1. Push the claw in the direction of the arrow and remove the disc clamper.



Ref. No. 3	How to remove the disc holder
Procedure 1→2→3	1. Push the rack gear slowly in the direction of the arrow until the disc tray comes up. 2. Pull the disc holder until it stops. 3. Release the claw. 4. Pull out the disc holder further to remove it. **Note:** Make sure to release the lock shaft.



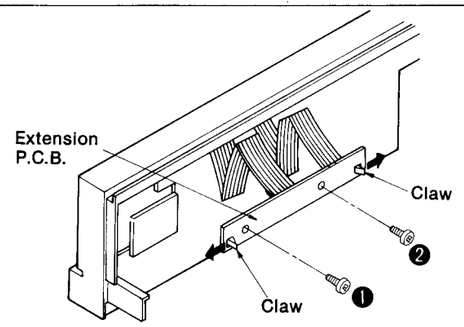
Ref. No. 4	How to remove the front panel
Procedure 1→2→3→4	1. Remove the 3 screws (❶~❸). 2. Slightly pull out the 2 claws in the direction of the arrow Ⓐ. 3. Remove the front panel in the direction of the arrow Ⓑ.



Ref. No. 5 — **How to remove the extension P.C.B.**

Procedure 1→2→3 →4→5

1. Remove the 2 screws (❶, ❷)
2. Push the 2 claws in the direction of the arrow and remove the extension P.C.B.

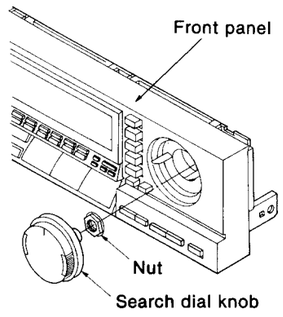


Ref. No. 6 — **How to remove the search P.C.B., disc illuminator P.C.B. and operation P.C.B.**

Procedure 4→5→6

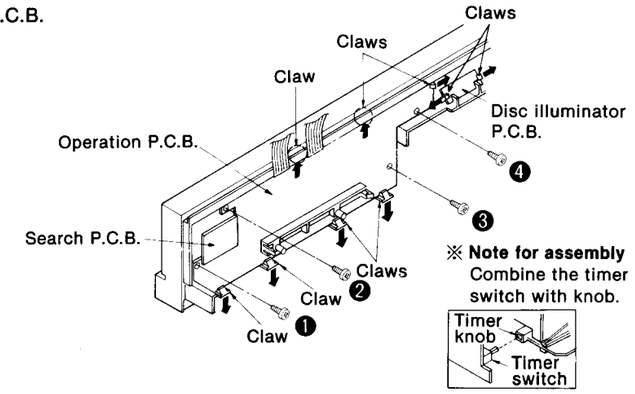
A. Search P.C.B.
1. Remove the search dial knob and nut.

B. Disc illuminator P.C.B.
1. Push the 2 claws in the direction of the arrow and remove the LED P.C.B.



C. Operation P.C.B.
1. Remove the 4 screws (❶~❹).
2. Push the 7 claws in the direction of the arrow and remove the operation P.C.B.

Note: To remove the search dial knob, push it with a screwdriver through the front panel's back opening.



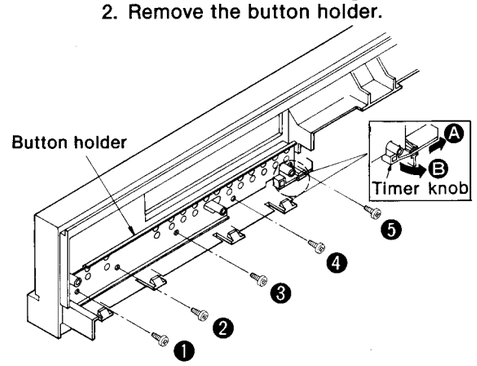
※ **Note for assembly**
Combine the timer switch with knob.

Ref. No. 7 — **How to remove the timer knob and operation buttons**

Procedure 4→5→6 →7

A. Timer knob
1. Push the timer knob in the direction of the arrow Ⓐ and remove it in the direction of the arrow Ⓑ.

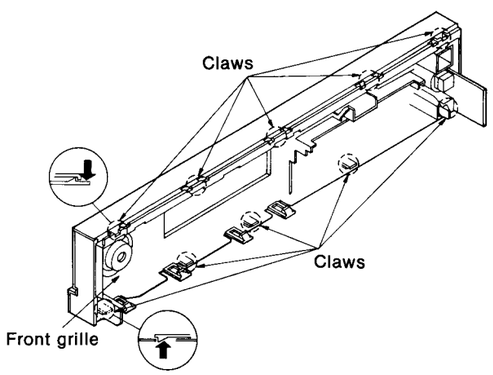
B. Operation buttons
1. Remove the 5 screws (❶~❺).
2. Remove the button holder.



Ref. No. 8 — **How to remove the front grille**

Procedure 4→5→6 →8

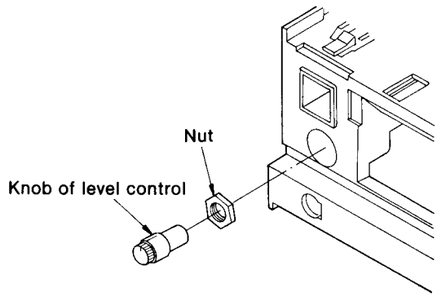
1. Release the 10 claws.

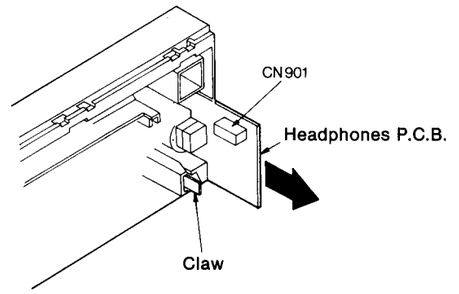


Ref. No. 9 — **How to remove the headphones P.C.B.**

Procedure 4→5→6 →8→9

1. Remove the level control knob and nut.
2. Remove the connector (CN901).
3. Release the claw.

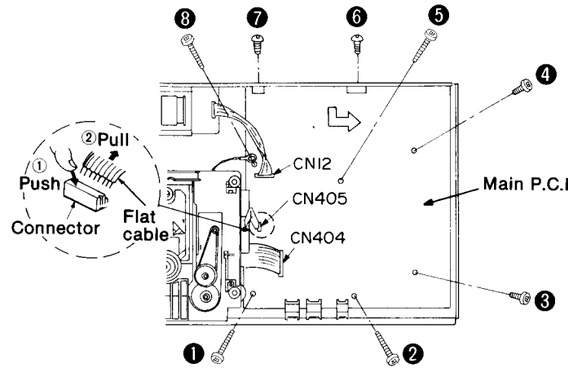




Ref. No. 10 — **How to remove the main P.C.B.**

Procedure 1→2→3 →4→10

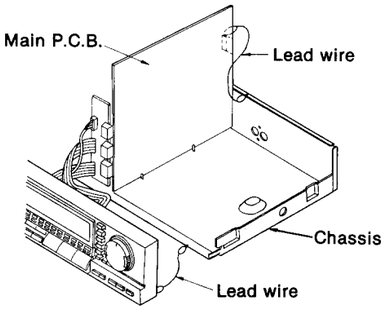
1. Remove the 8 screws (❶~❽).
2. Remove the 2 flat cables (CN404, CN405) and the connector (CN12).
3. Lift the main P.C.B. off the retention posts on the chassis.
4. Remove the main P.C.B. in the direction of the arrow.



How to check the main P.C.B.

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

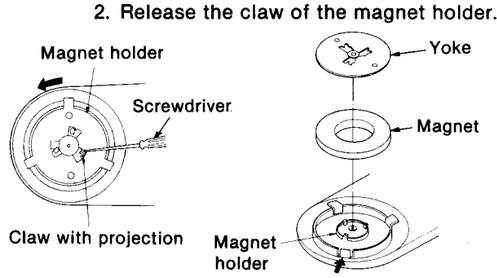
1. Connect the main P.C.B. ground terminal (LINE OUT terminal) to the chassis with a lead wire.
2. Connect the loading base ground terminal to the chassis with a lead wire.
3. Connect the operation P.C.B. ground terminal to the chassis with a lead wire.



Ref. No. 11 — **How to remove the magnet and holder**

Procedure 1→2→11

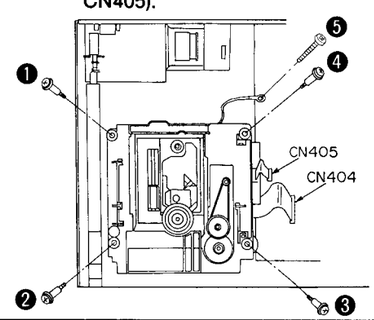
1. While lifting the claw with a screwdriver, rotate magnet holder in the direction of the arrow and remove the yoke and magnet.
2. Release the claw of the magnet holder.



Ref. No. 12 — **How to remove the loading base**

Procedure 1→2→3 →4→12

1. Remove the 5 screws (❶~❺).
2. Remove the flat cables (CN404, CN405).



D

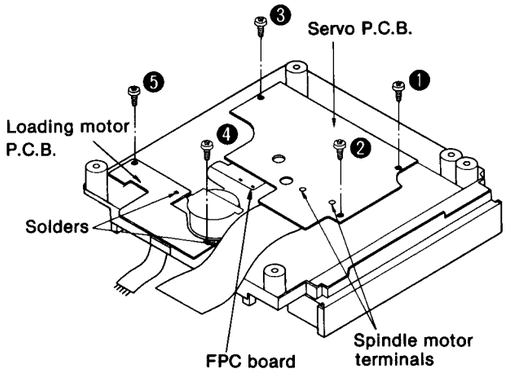
Ref. No. 13	How to remove the servo P.C.B. and loading motor P.C.B.

Procedure 12→13

A. Servo P.C.B.
1. Remove the 3 screws (❶~❸).
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.

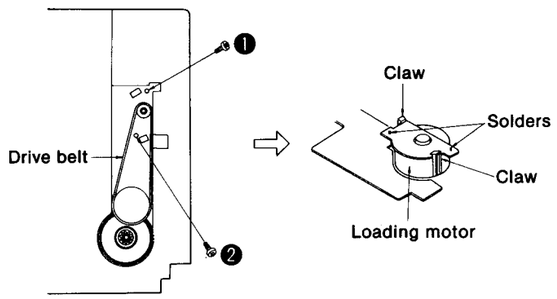
B. Loading motor P.C.B.
1. Remove the 2 screws (❹, ❺).
2. Unsolder the 2 terminals of loading motor.



Ref. No. 14	How to remove the loading motor

Procedure 12→14

1. Remove the drive belt.
2. Remove the 2 screws (❶, ❷).
3. Release the 2 claws.
4. Unsolder the 2 terminals of the lead wire of loading motor.

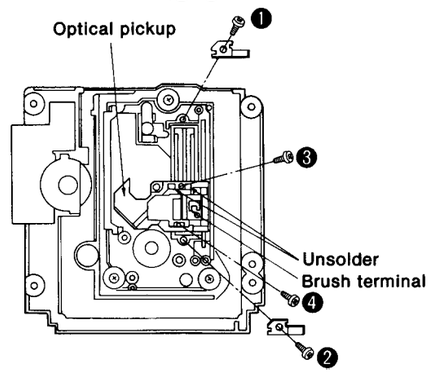


Ref. No. 15	How to remove the optical pickup

Procedure 12→13→15

Refer to the handling precautions for optional pickup and instructions for traverse oil (See page 9).

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



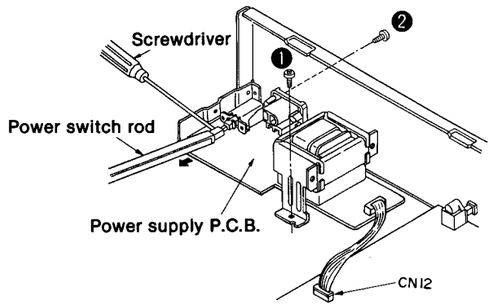
Caution: Take care not to touch the brush terminal.

Ref. No. 16	How to remove the power switch rod and power supply P.C.B.

Procedure 1→16

A. Power switch rod
1. Set the power switch in the "OFF" position.
2. Remove the power switch rod by using a screwdriver.

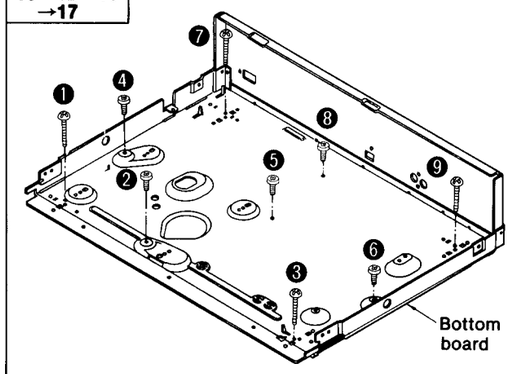
B. Power supply P.C.B.
1. Remove the 2 screws (❶, ❷).
2. Release the flat cable (CN12).



Ref. No. 17	How to remove the bottom board

Procedure 10→12→16→17

1. Remove the 9 screws (❶~❾).



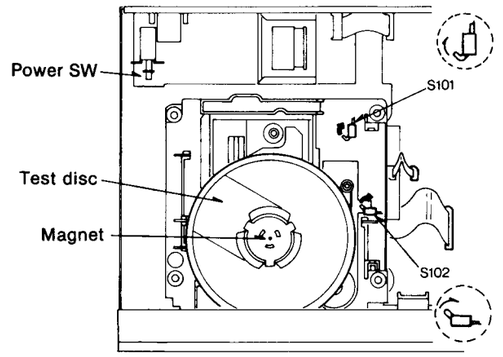
D

■ 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.

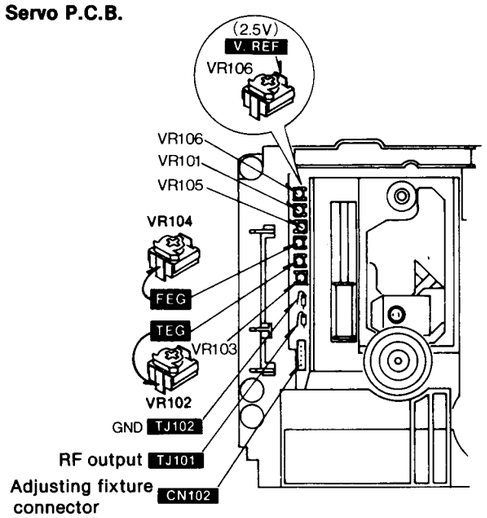
PREPARATION

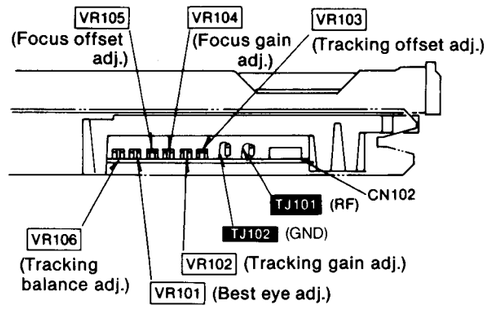
1. Remove the cabinet (see Ref. No. 1 of the disassembly instructions).
2. Remove the disc clamper and magnet (see Ref. No. 2 and No. 11 of the same).
3. Remove the disc holder and power switch rod (see Ref. No. 3 and No. 16 of the same).
4. Place the test disc and magnet on the turntable.
5. While holding the Open/Close switches (S101, S102) in the directions indicated by the arrows, switch the player power ON.
6. After the test disc starts rotating, release the Open/Close switch (S101, S102).



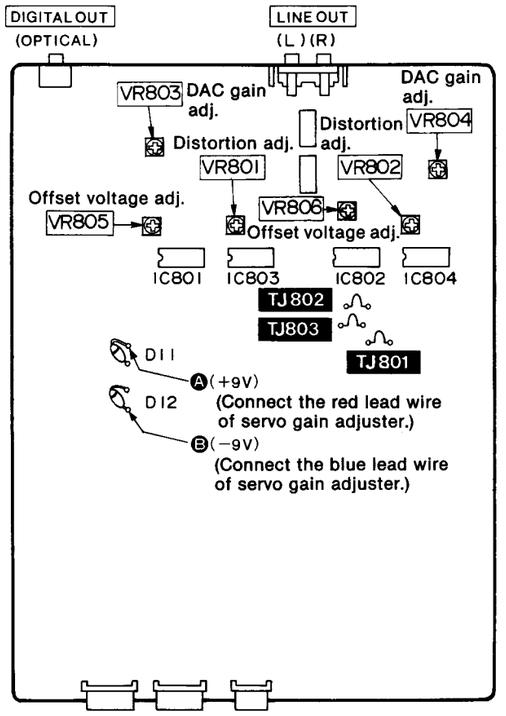
ADJUSTMENT POINTS

• Servo P.C.B.

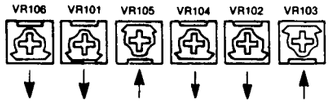




• Main P.C.B.



• Temporary setting of each VR



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

Measuring Instruments and Special Tools

* Servo gain adjuster (SZZP1017F)
...Refer to page 18.
* Test discs
1. Playability test disc (SZZP1054C or SZZP1014F)
2. Uneven test disc (SZZP1056C)
3. Black band test disc (SZZP1057C)
* Normal disc
* Dual-beam oscilloscope with bandwidth of 30MHz or better (with EXT trigger and 1:1 probe).
* Audio frequency (AF) oscillator
* AC electronic voltmeter
* Distortion analyser
* Adapter (SZZP1032F)
* Allen wrench (M2.0)
* Allen wrench (M1.27)
* 0.9mm 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)

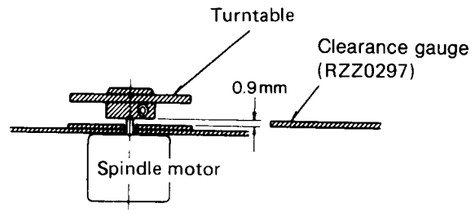
Adjusting Procedure

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

(1) TURNTABLE HEIGHT ADJUSTMENT

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

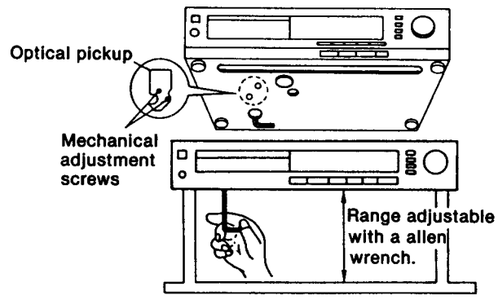
Note 1. If the measured amplitude is within a range of +/− 15mV, the turntable height is correct. If it is outside this range, adjust the turntable height by using the clearance gauge as a pry.
If the amplitude exceeds +15mV, lower turntable.
If the amplitude is below −15mV, elevate the turntable.

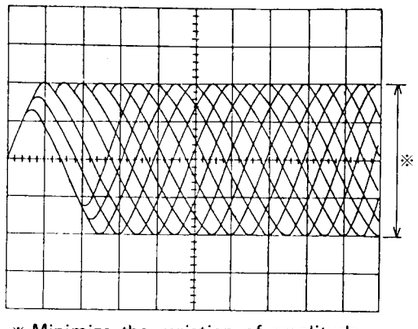


Note 2. If the measured amplitude greatly surpasses or falls short of the range above, set **VR105** at or around the center, then try to adjust the height again. (Then be sure to adjust the focus offset as well.)

(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 μs.
Input coupling ... AC
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1056C). (Playing any other track may yield a false adjustment.)
3. Leave the player in Play mode, and place it as shown in the figure on the right.
4. Alternately adjust the two mechanical adjusting screws with the 2.0mm allen wrench until the RF signal amplitude variation on the oscilloscope is minimized.
5. After completing the adjustment, lock the **mechanical adjustments** with lock paint (RZZOL01).

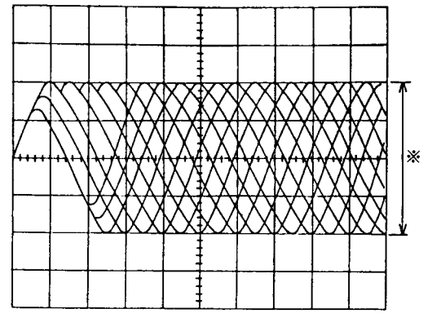




※ Minimize the variation of amplitude.

(3) BEST EYE (PD BALANCE) ADJUSTMENT

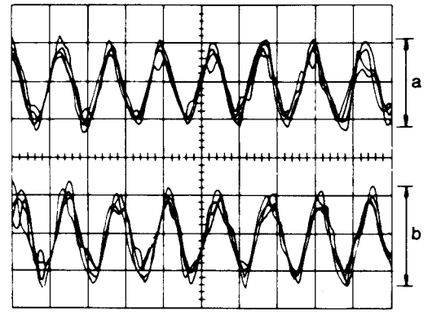
1. Connect the oscilloscope's CH. 1 probe across TJ101 (+) and TJ102 (−) on the Servo P.C.B.
Oscilloscope setting: VOLT 100mV
SWEEP ..... 0.5 μ s.
Input coupling ... AC
2. Switch the player power **ON**, and play the 0.5 mm black dot on the test disc (SZZP1014F or SZZP1054C).
3. Adjust **VR101** until the RF signal eye pattern amplitude is maximized.



※ Maximize the amplitude.

(4) FOCUS GAIN ADJUSTMENT

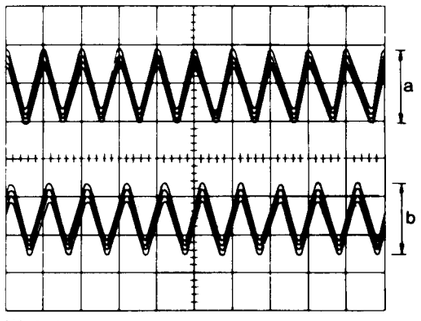
1. Connect the servo gain adjuster to the player (see page 18).
2. Set the servo gain adjuster's gain switch to position **"2"** and the ON/OFF switch to **ON**.
3. Set up the AF oscillator output for **825Hz, 150 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
4. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, respectively (TP3 is GND).
Oscilloscope setting: VOLT ..... 100 mV
(both channels)
SWEEP ..... 1ms.
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 ..... 1ms.
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"**.

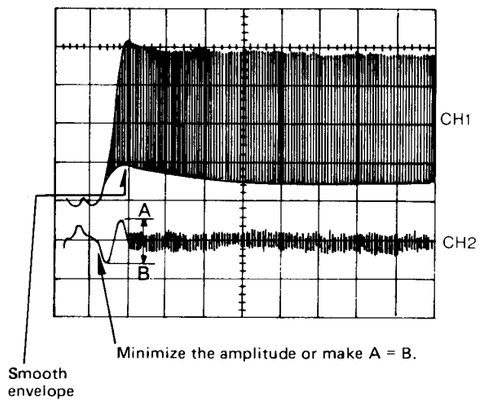


※ Adjust VR102 until a equals b.

(6) FOCUS OFFSET ADJUSTMENT

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

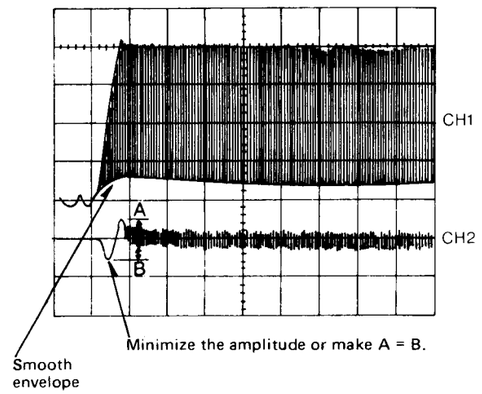
1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B. and its CH. 2 probe (+) to VR104's **FEG** terminal.
   Oscilloscope setting: VOLT. . . . . .100 mV (CH. 1)
   100 mV (CH. 2)
   SWEEP. . . . . **0.5ms.**
   Input coupling. . . AC (both CH. 1 and 2)
   Trigger mode . . . . NORM (trigger CH. 1.)
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1057C).
3. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR105** until the dip in the RF signal envelope on CH. 1 is smooth and the signal amplitude on CH. 2 is minimized, i.e. when amplitude A equals amplitude B.



(7) TRACKING OFFSET ADJUSTMENT

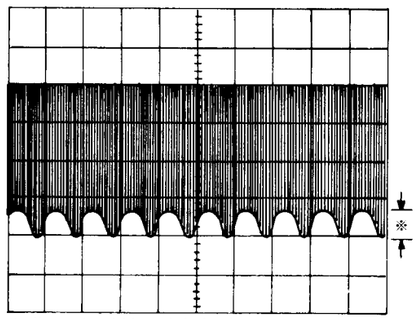
Note: Make sure that the servo gain adjuster's gain switch is set to position **"2"**.

1. Connect the oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B., and its CH. 2 probe (+) to VR102's **TEG** terminal.
   Oscilloscope setting: VOLT. . . . . **100mV (CH. 1)**
   200mV (CH. 2)
   SWEEP. . . . . **0.5ms.**
   Input coupling. . AC (both CH. 1 and 2)
   Trigger mode. . . NORM (trigger CH. 1.)
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1057C).
3. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR103** until the dip in the RF signal envelope on CH. 1 is smooth and the signal amplitude on CH. 2 is minimized, i.e. when amplitude A equals amplitude B.



(8) TRACKING BALANCE ADJUSTMENT

1. Make sure that servo gain adjuster's gain switch is set to position **"2"**.
2. Set up the AF oscillator output for **1.1 kHz, 600 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
3. Connect oscilloscope's CH. 1 probe across **TJ101** (+) and **TJ102** (–) on the Servo P.C.B. and CH. 2 probe (+) to the OSC terminal on the servo gain adjuster.
   Oscilloscope setting: VOLT. . . . . .100 mV (CH. 1)
   SWEEP. . . . . .0.5ms.
   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.

D

(9) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

*** Checking Skip Search**

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

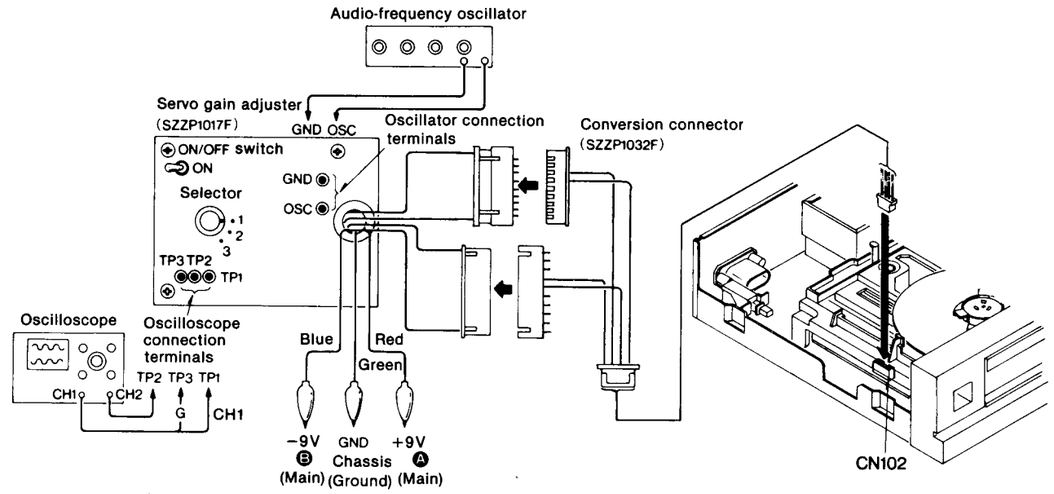
*** Checking Manual Search**

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

*** Checking Using Defect Disc**

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

• Connection of servo gain adjuster



• Adjustment of D/A converter circuit

(1) DISTORTION ADJUSTMENT

1. Connect the distortion analyser to the LINE OUT terminal and ground.
2. Switch the player power **ON**, and play track **1** (1kHz 0dB) on the test disc (SZZP1014F).
3. Adjust **VR801** (Lch) and **VR802** (Rch) so that the distortion factor is minimized.

(2) DAC GAIN ADJUSTMENT

1. Connect the AC electronic voltmeter to the LINE OUT terminal and ground.
2. Short **TJ801** and **TJ802** with a clip.
3. Switch the player power **ON**, and play track **5** (1kHz –24dB) on the test disc (SZZP1014F).
4. Adjust **VR803** (Lch) and **VR804** (Rch) so that the output voltage is minimized.

(3) OFFSET VOLTAGE ADJUSTMENT

1. Connect the distortion analyser to the LINE OUT terminal and ground.
2. Short **TJ803** and ground.
3. Switch the player power **ON**, and play track **5** (1kHz –24dB) on the test disc (SZZP1014F).
4. Adjust **VR805** (Lch) and **VR806** (Rch) so that the distortion factor is minimized.

■ TERMINAL FUNCTION OF IC's

• IC101 (AN8373S): Servo amp.

Pin No.	Mark	I/O Division	Function
1	AMP1	I	RF signal input (X30 amp.)
2	PDAD	I	Photo detector current input (A2)
3	PDA	I	Photo detector current input (A1)
4	PDBD	I	Photo detector current input (A4)
5	PDB	I	Photo detector current input (A3)
6	LPD	I	Non-inverting laser power input
7	LD	O	Laser power auto control output
8	FBL1	I	PD balance adjustment
9	FBL2	I	
10	TBL1	I	Tracking balance adjustment
11	TBL2	I	
12	FOOFS	I	Focus offset adjustment
13	IVA	O	Current/voltage conversion output (A)
14	IVB	O	Current/voltage conversion output (B)
15	FE	O	Focus gain adjustment output
16	FPI	I	Focus error signal input
17	TPI	I	Tracking error signal input
18	C. TPL	I	Tracking error filter capacitor input
19	C. TPH		
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	$\overline{\text{RFDET}}$	O	RF detection 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 output (Not used, open)
24	SENSE	O	Selector output (track crossing state)
25	TRV	O	Traverse servo control output
26	$\overline{\text{FLOCK}}$	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	$\overline{\text{RFDET}}$	I	RF detection signal input
37	BDO	I	Dropout detection input
38	VCC	I	Power supply (+5 V input)
39	TVPO	O	Traverse position detecting resistor/capacitor inputs
40	TVPI	I	
41	BROUT	O	Tracking drive control output
42	BRIN	I	Tracking error signal input

• IC103 (AN8377): BTL drive

Pin No.	Mark	I/O Division	Function
1	PVCC	I	Driver power supply (+8.7V input)
2	VCC	I	Power supply (+8.7V 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	$\overline{\text{RESET}}$	O	Reset signal output
16	PC	I	PC input (connect to GND)

• IC301 (MN6622): Digital signal processing

Pin No.	Mark	I/O Division	Function
1	MEMP	I	Emphasis signal input
2	PC	O	Spindle motor "ON" signal (ON at "L")
3	EC	O	Spindle motor drive signal
4	FG	I	Not used, open
5	TTF	I	Focus lock signal input
6	FLAG0	O	Not used, open
7	IPFLAG	O	Not used, open
8	FLAG6	O	Not used, open
9	PCK	I	PLL extract clock input (4.2336 MHz)
10	VDD	I	Power supply (connected to +5V)
11	EFM	I	EFM signal input (PLL)
12	SRF	I	EFM signal input (DSL)
13	DO	I	Drop-out signal ("H" at drop-out)
14	CLVS	O	Not used, open
15	FPC	O	PLL frequency comparison signal
16	BSSEL	O	Not connected
17	$\overline{\text{RIN}}$	I	Remote control signal input
18	FSL	I	Not used (connected to GND)
19	SLEEP	I	Not used (connected to GND)
20	SUBC	O	Not used, open
21	SBCK	I	Not used, open
22	BLKCK	O	Sub-code block (Q-data) clock (75 Hz)
23	$\overline{\text{CLDCK}}$	O	Sub-code frame (Q-data) clock (7.35 kHz)
24	$\overline{\text{SUBQ}}$	O	Sub-code (Q-data) output
25	CRC	O	Not used, open
26	$\overline{\text{RST}}$	I	Reset signal input ("L" = Reset)
27	MLD	I	Data input (command load)
28	MCLK	I	Data clock input (command clock)
29	MDATA	I	Data input (command data)
30	DMUTE	I	Muting control input
31	$\overline{\text{TRON}}$	I	Tracking servo "ON" signal (ON at "L")
32	STAT	O	Processing condition (CRC, OTC, CLVOK, TT, STOP) output
33	TX	O	Digital output signal
34	$\overline{\text{TSTR}}$	I	Not used (connected to +5V)
35	$\overline{\text{TEST}}$	I	Not used (connected to +5V)
36	VSS	I	GND terminal
37	X2	O	Clock output (16.9344 MHz)
38	X1	I	Clock input (16.9344 MHz)
39	SEL	I	Not used (connected to GND)
40	LDG/ WDCKS	O	Frequency pull-in clock signal (88.2 kHz)
41	RDG	O	Not used, open
42	DEMPH	O	Not used, open
43	SMCK	O	Clock output (4.2336 MHz)
44	WS	O	Not used, open
45	SRCK	O	Not used, open
46	XCK	O	Clock output
47	DA15/ SRDATA	O	DA parallel output (MSB)/serial data output (MSB FIRST)
48	DA14/ SRDATA	O	Not used, open
49	DA13/ SCK	O	DA parallel output/serial data output bit clock
50	DA12/ WDCK	O	Not used, open
51	DA11/ BYTCK	O	Not used, open
52	VSS	I	GND terminal
53	DA10/R/L	O	DA parallel output/R/L signal (R at "H")
54 ⟆ 56	DA9 ⟆ DA7	O	Not used, open
57	DA6	O	Not used (connected to GND)
58 ⟆ 63	DA5 ⟆ DA0	O	Not used, open
64 ⟆ 71	D7 ⟆ D0	I/O	16K RAM DATA
72	RAMOE	O	16K RAM OE signal
73	RAMWE	O	16K RAM WE signal
74 ⟆ 84	RAMA0 ⟆ RAMA10	O	16K RAM address

• IC304 (MN53015PEU): 4DAC gate array

Pin No.	Mark	I/O Division	Function
1	GAINL	O	Gain select signal (Lch). [High signal (0 ~ −42dB): "H" / Low signal (less than −42dB): "L"]
2	SHL	O	Sampling hold signal (Lch). [At sampling: "H" / At hold: "L"]
3	BIT20L	O	Output signal of 20 bits (Lch).
4	BIT19L	O	Output signal of 19 bits (Lch).
5	BIT18L	O	Output signal of 18 bits (Lch).
6	BIT17L	O	Output signal of 17 bits (Lch).
7	VDD	I	Power supply (connected to +5V).
8	VSS	I	GND terminal.
9	NC	—	Not connected.
10	BCOAL	O	Bit clock of DOAL data signal.
11	WCOAL	O	Word clock of DOAL data signal.
12	DOAL	O	Input data signal to (+) DAC (Lch).
13	VSS	I	GND terminal.
14	BCOBL	O	Bit clock of DOBL data signal.
15	WCOBL	O	Word clock of DOBL data signal.
16	DOBL	O	Input data signal to (−) DAC (Lch).
17	GAINR	O	Gain select signal (Rch). [High signal (0 ~ −42dB): "H" / Low signal (less than −42dB): "L"]
18	SHR	O	Sampling hold signal (Rch). [At sampling: "H" / At hold: "L"]
19	BIT20R	O	Output signal of 20 bits (Rch).
20	BIT19R	O	Output signal of 19 bits (Rch).
21	BIT18R	O	Output signal of 18 bits (Rch).
22	BIT17R	O	Output signal of 17 bits (Rch).
23	NC	—	Not connected.
24	VSS	I	GND terminal.
25	VDD	I	Power supply (connected to +5V)
26	BCOAR	O	Bit clock of DOAR data signal.
27	WCOAR	O	Word clock of DOAR data signal.
28	DOAR	O	Input data signal to (+) DAC (Rch).
29	VDD	I	Power supply (connected to +5V).
30	BCOBR	O	Bit clock of DOBR data signal.
31	WCOBR	O	Word clock of DOBR data signal.
32	DOBR	O	Input data signal to (−) DAC (Rch).
33	NNS	I	Input signal to set NS of serial data (MDT). [NS ON: "L" / NS OFF: "H"]
34	LRPL	I	Use to set the LRPL of the mode setting serial data (MDT) for digital filter. [Set to "L" to start operation at the rising edge of LRCI. / Set to "H" to start operation at the falling edge of LRCI.]
35	SLDG	I	Use to select silent or ordinary degritching. [Set to "H" to activate silent degritching. / Set to "L" to select ordinary degritching.]
36	SIFT	I	Use to switch in the small signal mode at a play signal level of less than −42dB. [Set to "H" to switch in the S.S. mode. / Set to "L" to remain out of the S.S. mode.]
37	HALF	I	Use to switch in the half-wave (non-zero cross) operation at a play signal level of less than −42dB. ["H" : Half-wave operation / "L" : Full-wave operation]
38	NTEST1	I	The small signal mode is switched in with the delay time selected with these pins after the play signal level is reduced to less than −42dB.
39	NTEST2		

NTEST1	NTEST2	Delay time
H	H	186 msec
H	L	93 msec
L	H	93 msec
L	L	2.8 μsec (1 sample)

Pin No.	Mark	I/O Division	Function
40	NTEST3	I	Use to reset all the chip's internal D-FFs and T-FFs when the chip requires checkout (active "L").
41	PHASE	I	Use to invert the polarity of input data, DIL and DIR, to invert overall system phase ("H" to invert).
42	H16L18	I	This is the input to select the order of the output data bits. [At "H" : 16 bits DAC / At "L" : 18 bits DAC]
43	H1L2BS	I	Input signal to set the data bits of the bit shift. [At "H" : 1 bit shift / At "L" : 2 bit shift]
44	DOBINV	I	Use to invert the polarity of output data, DOBL and DOBR ("H" to invert).

D

Pin No.	Mark	I/O Division	Function
45	NDACC	I	Use to nullify output data, DOAL, DOBL, DOAR and DOBR ("L" to nullify).
46	DOUTON	I	Input signal to select ON/OFF of digital output. [At "H" : ON / At "L" : OFF]
47	MS2MS3	O	Control signal to set the mode of digital filter.
48	MDT	O	Data signal to set the mode of digital filter.
49	NMEN	O	Digital filter's mode setting data sampling pulse output.
50	VSS	I	GND terminal.
51	BCKI	I	Bit clock of DIL, DIR data signal.
52	WCKI	I	Word clock of DIL, DIR data signal.
53	DIL	I	Input data signal (Lch).
54	DIR	I	Input data signal (Rch).
55	DGI	I	Deglitch signal of digital filter.
56	VDD	I	Power supply (connected to +5V).
57	VSS	I	GND terminal.
58	NLRCK	O	Inverter signal of LRCK signal.
59	NC	—	Not connected.
60	LRCK	I	Starting signal of operation for digital filter.
61	DIN	I	Input terminal of digital output signal.
62	NC	—	Not connected.
63	DOUT1	O	Digital output signal.
64	DOUT2	O	Digital output signal (Not used, open).

•IC302 (SM5813): Digital filter

Pin No.	Mark	I/O Division	Function
1	DIN	I	Serial data input signal.
2	BCKI	I	Serial bit clock input signal.
3	$\overline{CKSL}$	I	Input terminal to select input frequency of XTI terminal.
4	$\overline{CKDV}$		
5	NC	I	Not used, connected to GND.
6	XTI	I	Clock input terminal. [384fs: $\overline{CKSL}$ = "H" / $\overline{CKDV}$ = "L"]
7	XTO	O	Clock output terminal.
8	VSS1	I	GND terminal.
9	CKO	O	Clock output terminal (Not used, open).
10	$\overline{SYN}$	I	Use to select either Jitter free mode or forced sync. mode ("H" for Jitter free mode: "L" for forced sync. mode).
11	NC (MS2MS3)	I	Mode select control signal.
12			
13	NC (MDT)	I	Mode select data signal.
14	$\overline{RST}$	I	Reset signal input (reset at "L").
15	$\overline{COB}$	I	Use to select either two's complement or COB ("H" for two's complement: "L" for COB).
16	$\overline{OW20}$	I	Input terminal to select output bits data.
17	$\overline{OW18}$		
18	NC	—	Not used, connected to GND.
19	NC	—	Not used, open.
20	DG	O	Deglitch control clock signal.
21	VSS2	I	GND terminal.
22	VDD	I	Power supply (connected to +5V).
23	DOR	O	8fs output data signal (Rch).
24	DOL	O	8fs output data signal (Lch).
25	WCKO	O	Word clock of output data signal.
26	BCKO	O	Bit clock of output data signal.
27	FSCO	O	Internal operation timing clock with a period of fs (Not used, open).
28	LRCI	I	Sample rate (fs) clock of input data ("H" : Lch, "L" : Rch)

Output bit	16	18	20
$\overline{OW18}$	H	L	H
$\overline{OW20}$	H	H	L

• 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 +5V)
5	BLKCK	I	Sub-code block (Q data) clock input (75Hz)
6	CLDCK	I	Sub-code block (Q data) clock input (7.35kHz)
7	SBO	I	(Not used, open)
8	SUBQ	I	Sub-code (Q data) input
9	RST	I	Reset signal input
10 ∫ 13	P20 ∫ P23	O	Not used (connected to +5V)
14	CLOSE	O	Loading motor "Close" command
15	OPEN	O	Loading motor "Open" command
16	SLOW	O	(Not used, open)
17	MUTE	O	Muting control
18	SEEK	O	Traverse servo control (Not used, open)
19	NC	–	Not connected
20	TRV.R	O	Traverse "Reverse" command signal
21	TRV.F	O	Traverse "Forward" command signal
22	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [reverse] command)
23	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [forward] command)
24	CNT2	O	Optical servo IC control (TRON: Tracking servo)
25	VDD	I	Power supply (connected to +5V)
26	DOWN	O	(Not used, open)
27	UP	O	(Not used, open)
28	CNT1	O	Optical servo IC control signal (FOON: Focus servo)
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
63	EMPH	O	Emphasis signal output
64	NC	——	Not connected

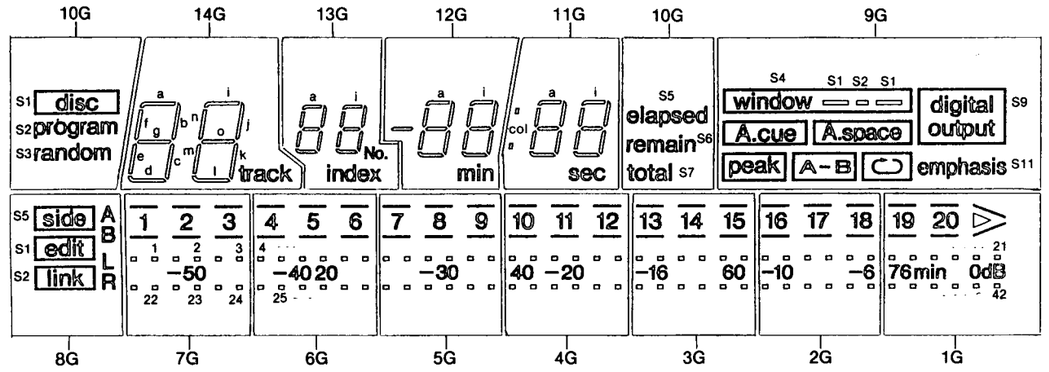
• IC601 (MB88724BPEV1): System control and FL drive

Pin No.	Mark	I/O Division	Function
1 ⟆ 14	C0 ⟆ C13	O	FL grid signal
15	C14	O	LED drive signal (PAUSE)
16	C15	O	LED drive signal (PLAY)
17	P00	O	Key scan signal
18	P01		
19	P02	O	Data discrimination signal signal
20	P03	O	Data lock signal
21 ⟆ 24	P10 ⟆ P13	O	Key scan signal
25	P40	I	Remote control signal input (Not used, open)
26	P41	—	Not used, open
27	P42	O	Data receipt dommand signal
28	P43	O	Data transmission command signal
29	P50	—	Not used, open
30	P51	I	GND terminal
31	$\overline{RES}$	I	Reset signal input (reset at "L")
32	VSS	I	GND terminal

Pin No.	Mark	I/O Division	Function
33	X	I	Clock signal input (4.2336MHz)
34	EX		
35	SE	I	Not used, connected to +5V
36	WD	I	GND terminal
37	XL	O	Not used, open
38	EXL	O	Not used, open
39 ⟆ 42	P60 ⟆ P63	I	Key return signal
43 ⟆ 46	P70 ⟆ P73		
47	VF	I	FL drive power supply (connected to −31.3V)
48 ⟆ 63	S0 ⟆ S15	O	FL anode signal
64	VCC	I	Power supply (connected to +5V)

■ INTERNAL CONNECTION OF FL

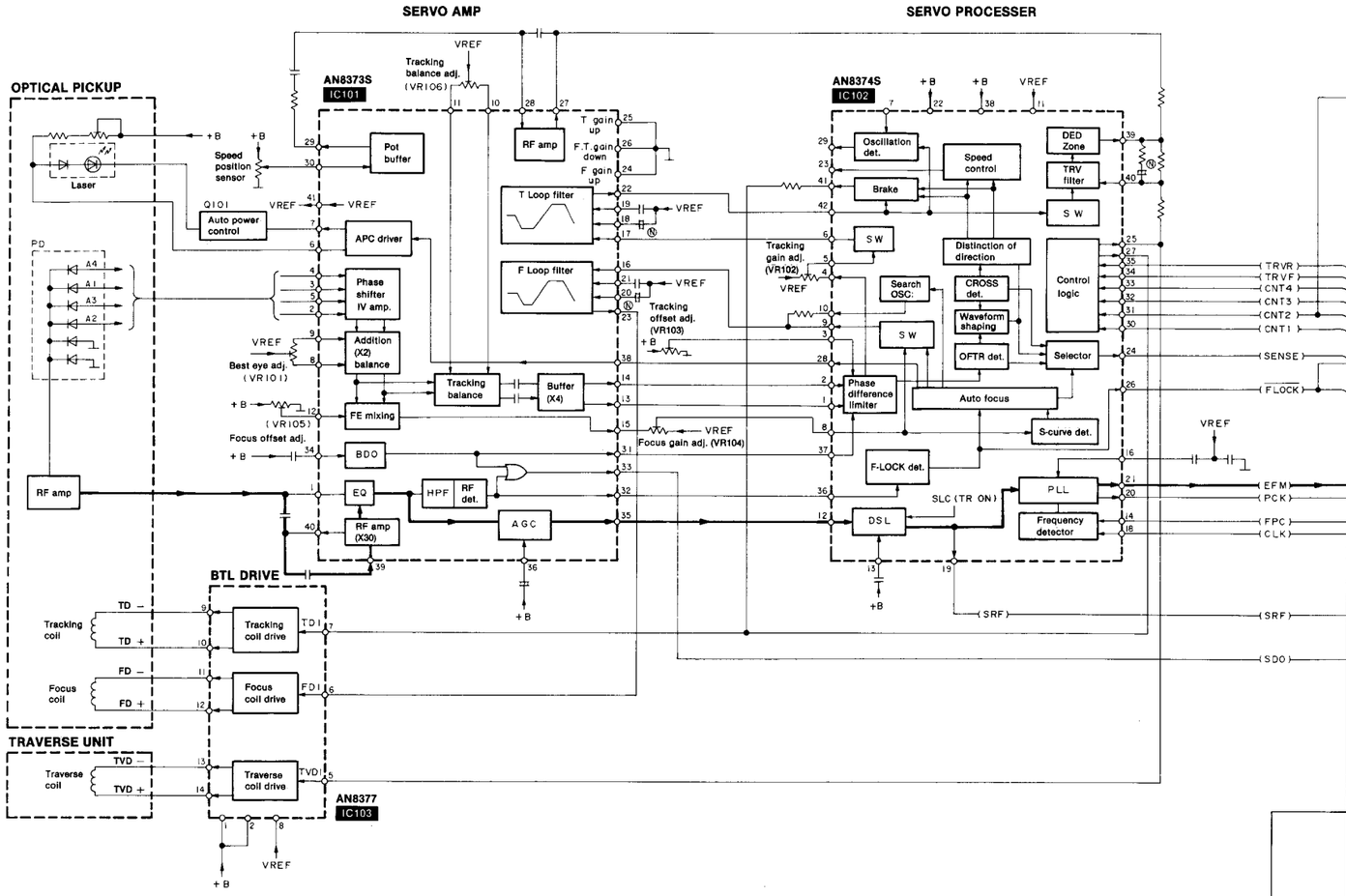
• Grid connection diagram

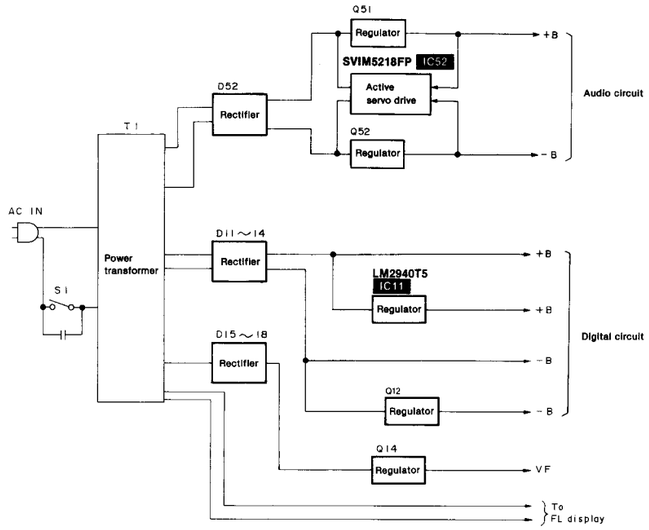


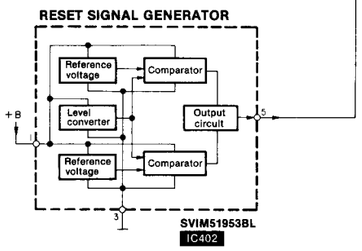
• Anode connection table

	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
S1	a	a	a	a	disc	— —	edit	— 1	— 4	— 7	— 10	— 13	— 16	— 19
S2	b	b	b	b	program	—	link	— 2	— 5	— 8	— 11	— 14	— 17	— 20
S3	f	f	f	f	random	A.space	A	— 3	— 6	— 9	— 12	— 15	— 18	／
S4	g	g	g	g	-	window	B	1	4	7	10	13	16	19
S5	c	c	c	c	elapsed	peak	side	— 1	— 4	— 7	— 10	— 13	— 16	— 19
S6	e	e	e	e	remain	A-	-	— 2	— 5	— 8	— 11	— 14	— 17	— 20
S7	d	d	d	d	total	B	-	— 3	— 6	— 9	— 12	— 15	— 18	／
S8	-	No.	—	col	-	↻	-	2	5	8	11	14	17	20
S9	i	i	i	i	-	digital output	-	- - 1	- - 4	- - 7	- - 10	- - 13	- - 16	- - 19
S10	j	j	j	j	-	A.cue	-	- - 2	- - 5	- - 8	- - 11	- - 14	- - 17	- - 20
S11	n	n	n	n	-	emphasis	-	- - 3	- - 6	- - 9	- - 12	- - 15	- - 18	- - 21
S12	o	o	o	o	-	-	-	3	6	9	12	15	18	►
S13	k	k	k	k	-	-	-	- - 22	- - 25	- - 28	- - 31	- - 34	- - 37	- - 40
S14	m	m	m	m	-	-	-	- - 23	- - 26	- - 29	- - 32	- - 35	- - 38	- - 41
S15	ℓ	ℓ	ℓ	ℓ	-	-	-	- - 24	- - 27	- - 30	- - 33	- - 36	- - 39	- - 42
S16	track	index	min	sec	-	-	-	-	20	-	40	60	-	76min
S17	-	-	-	-	-	-	L R	-50	-40	-30	-20	-16	-10 -6	0 dB

■ BLOCK DIAGRAM







ER

DED Zone
TRV filter
S W
Control logic
Selector
S-curve det.
PLL
Frequency detector
VREF
TRVR
TRVF
CNT4
CNT3
CNT2
CNT1
SENSE
FLOCK
EFM
PCK
FPC
CLK
SRF
SDO

DIGITAL SIGNAL PROCESSING

CLK/LDG
TRON
STAT
DMUTE
MDATA
MCLK
MLD
SUBQ
CLDCK
BLKCK
FPC
SDO/DO
SRF
EFM
PCK
TTF
RST
EC
PC
CPU interface
Digital audio interface
Compe-nsation circuit
Syndrome
EFM
ALU
CCU
Address generator
Spindle motor servo
Remote control decoder circuit
Timing generator
X301
MN6622
IC301
SMCK
TX
LR
SRDATA
SCK
MEMP
OE
WE
XCK

20 bit • 8fs DIGITAL FILTER

SM5813
IC302
Input interface
Filter operation circuit
Output interface
System clock
Timing control
DOL
DOR
WCKO
BCKO
DG
NLRCK

4 DAC GATE ARRAY

MN530I5PEU
IC304
MDT
MS2MS3
Clock generator
Output gate
4 bit serial/parallel converter
20 bit serial/parallel converter
13 bit adding machine
20 bit parallel/serial converter
Level det.
Counter
Timing clock generator
DOAL
DOBL
WCOAL
BCOAL
SHL
WCOAR
SHR
GAINR
GAINL
DOAR
DOBR
NDACC

PCM56P-J IC801
M5218FPTA IC815 (1/2) Q801
Bit control
PCM56P-J IC803
PCM56P-J IC802
Bit control
IC815 (1/2) Q804
M5218FPTA
PCM56P-J IC804

20 bit • 8fs D/A CO

SVIBA4558FTI
IC403 (1/2)
Motor control
Q404
Motor drive
Q451, 452
SPINDLE MOTOR

LC3517BML15T
IC302
16K RAM
Row decoder
Memory array
Data control
Column I/O
Column decoder
Chip select, write enable output enable

VREF

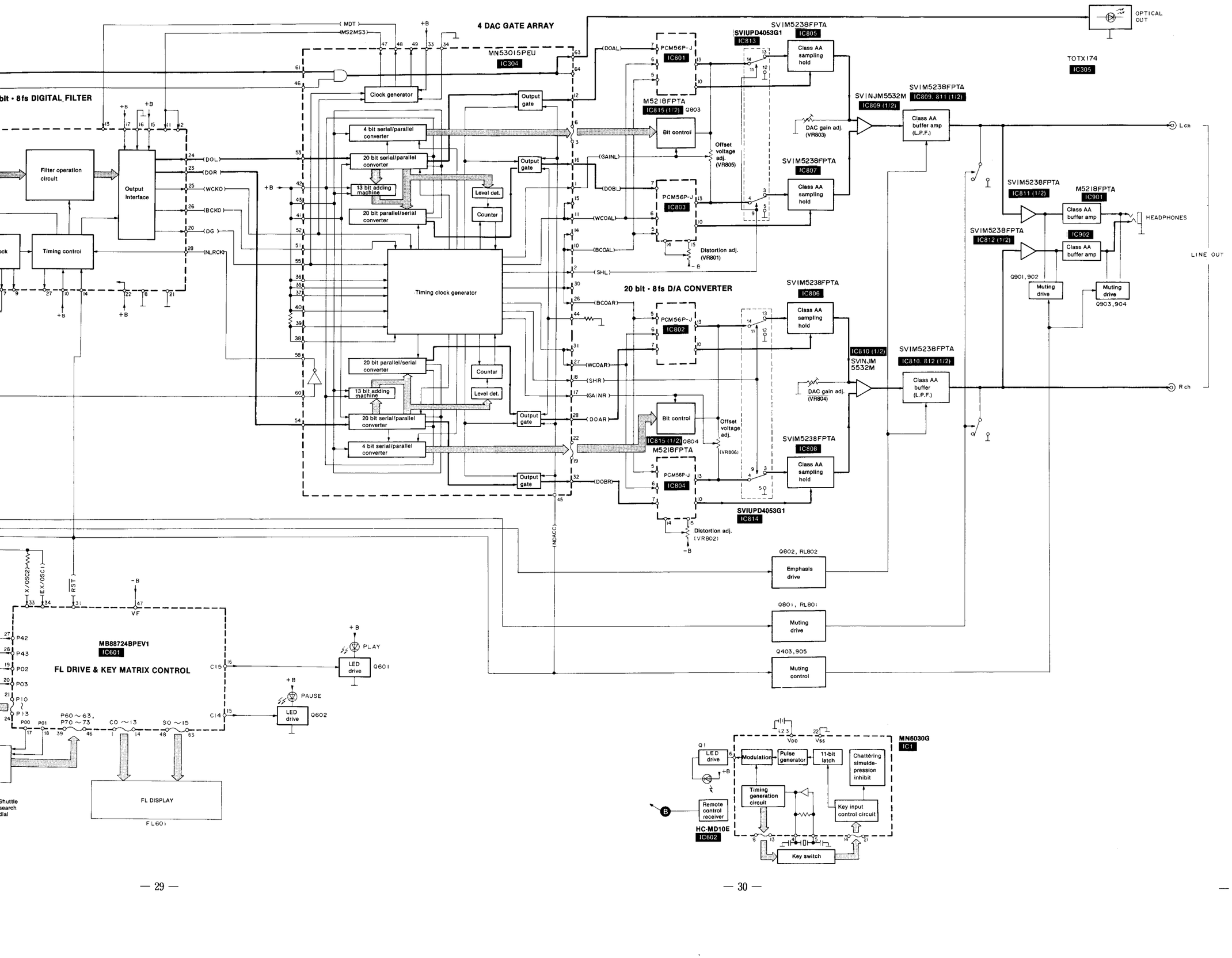
SIGNAL GENERATOR
Comparator
Output circuit
Comparator
SVIM51953BL
IC402

CNT4
CNT3
TRON
CNT1
FLOCK
SENSE
TRV-R
TRV-F
MLD
MCLK
MDATA
STAT
OSCI
OSC2
DMUTE
DOUT ON
EMPH
MUTE
RST
X/OSC2
EX/OSC1
RST
-B
VF
X1

MN1554PEZ-1
IC401
SYSTEM CONTROL
BLKCK
CLDCK
SUBQ
RECV
SEND
ACK
CLK
DATA0 ~ DATA3
P42
P43
P02
P03
P10 ~ P13
P00
P01
P60 ~ 63, P70 ~ 73
C0 ~ 13
S0 ~ 15

MB88724BPEV1
IC601
FL DRIVE & KEY MATRIX CONTROL
C15
C14
+B
PLAY
LED drive
Q601
PAUSE
LED drive
Q602
KEY MATRIX
VR601
Shuttle search dial
FL DISPLAY
FL601

OPEN
CLOSE
S102
S101
+B
CLOSE
OPEN
SVIBA4558FTI
IC403 (2/2)
Motor control
Q453, 454
Motor drive
LOADING MOTOR



Note)

• ⟶ Audio signal

SL-P999 SL-P999

■ SCHEMATIC DIAGRAM

(Parts list on pages 54~58.)

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

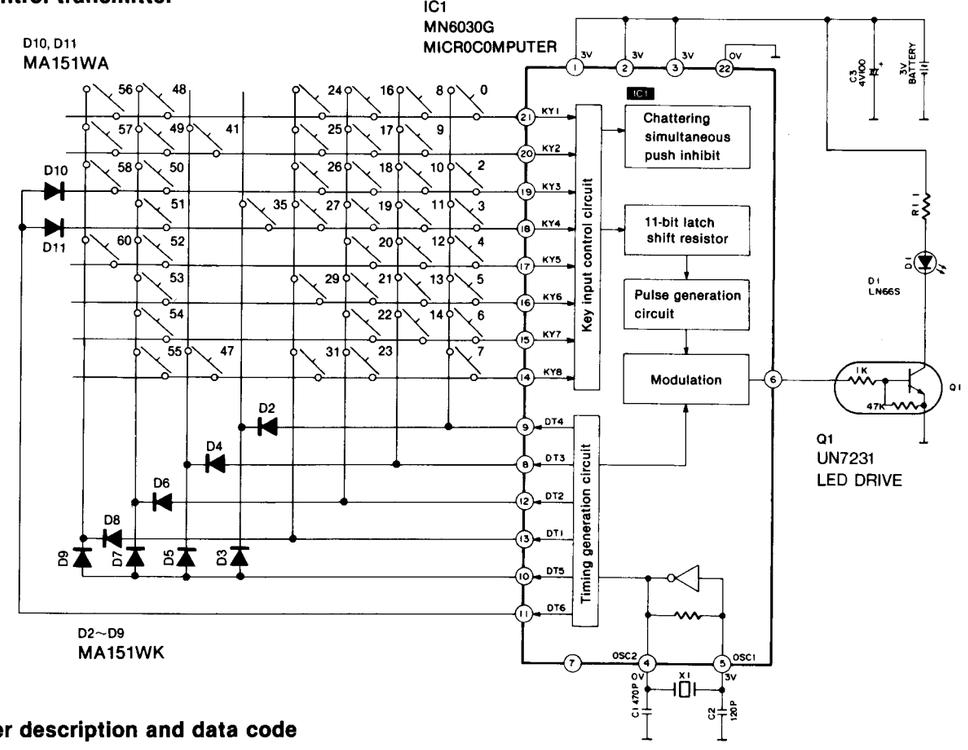
Notes:

- **S1** : Power switch in "**on**" position.
- **S2** : Voltage selector switch. (For [EK], [XA], [XB], [PA], [PE] and [PC] only.)
- **S101** : Disc holder open/close detection switch.
- **S102** : Disc holder open/close detection switch.
- **S601** : Edit tape length (edit tape length) switch.
- **S602** : Random play (random) switch.
- **S603** : Auto cue/auto space (auto cue/edit auto space) switch.
- **S604** : Digital output (digital output) switch.
- **S606** : Programmed-play (program) switch.
- **S609** : Window search (window) switch.
- **S610** : Disc link (disc link) switch.
- **S611** : Repeat (repeat) switch.
- **S613** : Display mode select (display mode) switch.
- **S614** : Recall (recall) switch.
- **S617** : Tape-side select (side A/B) switch.
- **S619** : A-B repeat (A-B repeat) switch.
- **S620** : Peak level search (peak search) switch.
- **S621** : Time mode select (time mode) switch.
- **S622** : Clear (clear) switch.
- **S625~630, 633~638, 641~645, 649~653** : [S625: 1, S626: 5, S627: 9, S628: 13, S629: 17, S630: 0, S633: 2, S634: 6, S635: 10, S636: 14, S637: 18, S638: +10, S641: 3, S642: 7, S643: 11, S644: 15, S645: 19, S649: 4, S650: 8, S651: 12, S652: 16, S653: 20]
- **S632** : Disc holder open/close (▲ open/close) switch.
- **S640** : Stop (■ stop) switch.
- **S646, 654** : Index skip (⊣index/index⊢) switch. S646: ⊢(F), S654: ⊣(R)
- **S648** : Pause (▮▮ pause) switch.
- **S647, 655** : Skip (⊣◀◀ skip/skip ▶▶⊢) switch. S647: ▶▶⊢ (F), S655: ⊣◀◀ (R)
- **S656** : Play (▶ play) switch.
- **S657** : Timer start (timer) switch.
- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
  ∗The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- −< >−/---< >---: Positive voltage lines and negative voltage lines.
  ⟿ : Audio signal lines.

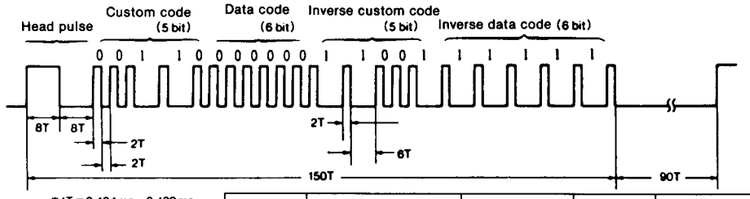
Caution!

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

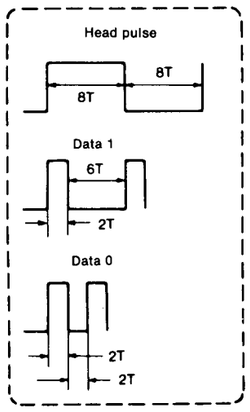
• Remote control transmitter



• Key number description and data code



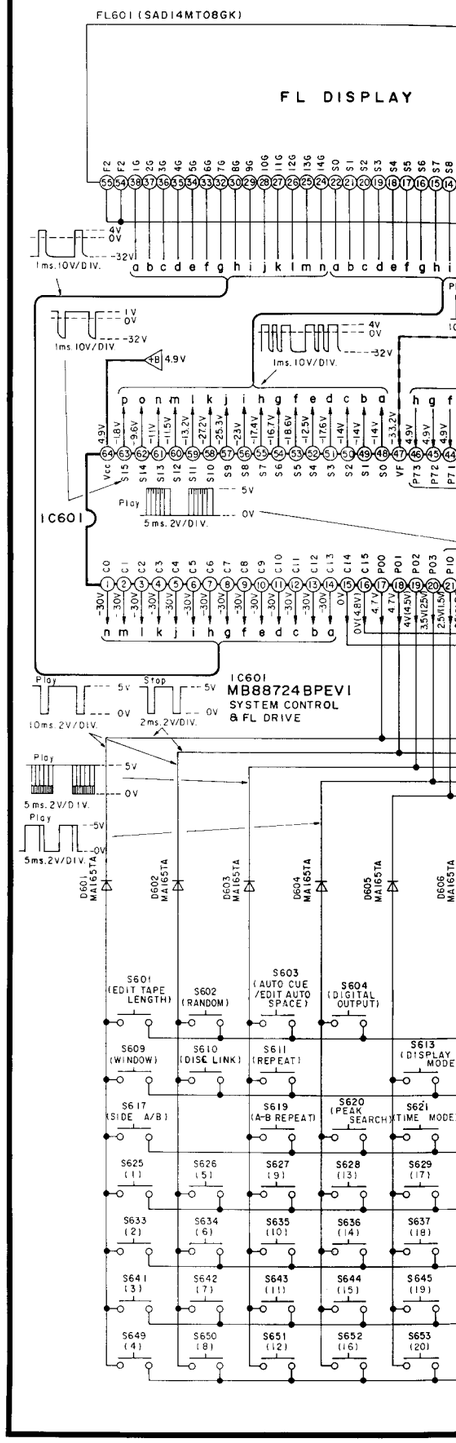
∗1T = 0.434ms ~ 0.439ms

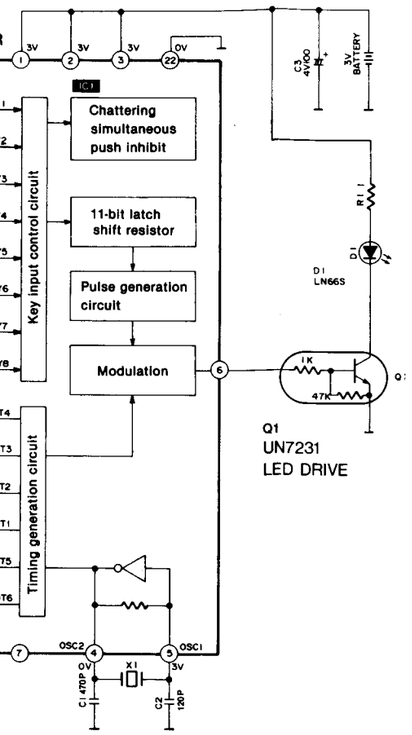


Key No.	Function	Data code	Key No.	Function	Data code
0	stop	000000	24	9	011000
2	skip ⊣◀◀	000010	25	0	011001
3	skip ▶▶⊢	000011	26	+10	011010
4	search ◀◀	000100	27	display ON/OFF	011011
5	search ▶▶	000101	29	program	011101
6	pause	000110	31	random	011111
7	repeat	000111	35	auto cue	100011
8	A-B repeat	001000	41	time mode	101001
9	recall	001001	47	display mode	101111
10	play	001010	48	10	110000
11	clear	001011	49	11	110001
12	index skip ⊣	001100	50	12	110010
13	index skip ⊢	001101	51	13	110011
14	open/close	001110	52	14	110100
16	1	010000	53	15	110101
17	2	010001	54	16	110110
18	3	010010	55	17	110111
19	4	010011	56	18	111000
20	5	010100	57	19	111001
21	6	010101	58	20	111010
22	7	010110	60	(A-B) peak search	111100
23	8	010111			

※Custom code: 01100

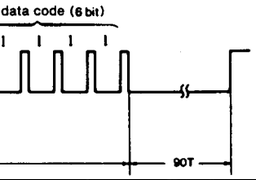
A OPERATION CIRCUIT





Q1
UN7231
LED DRIVE

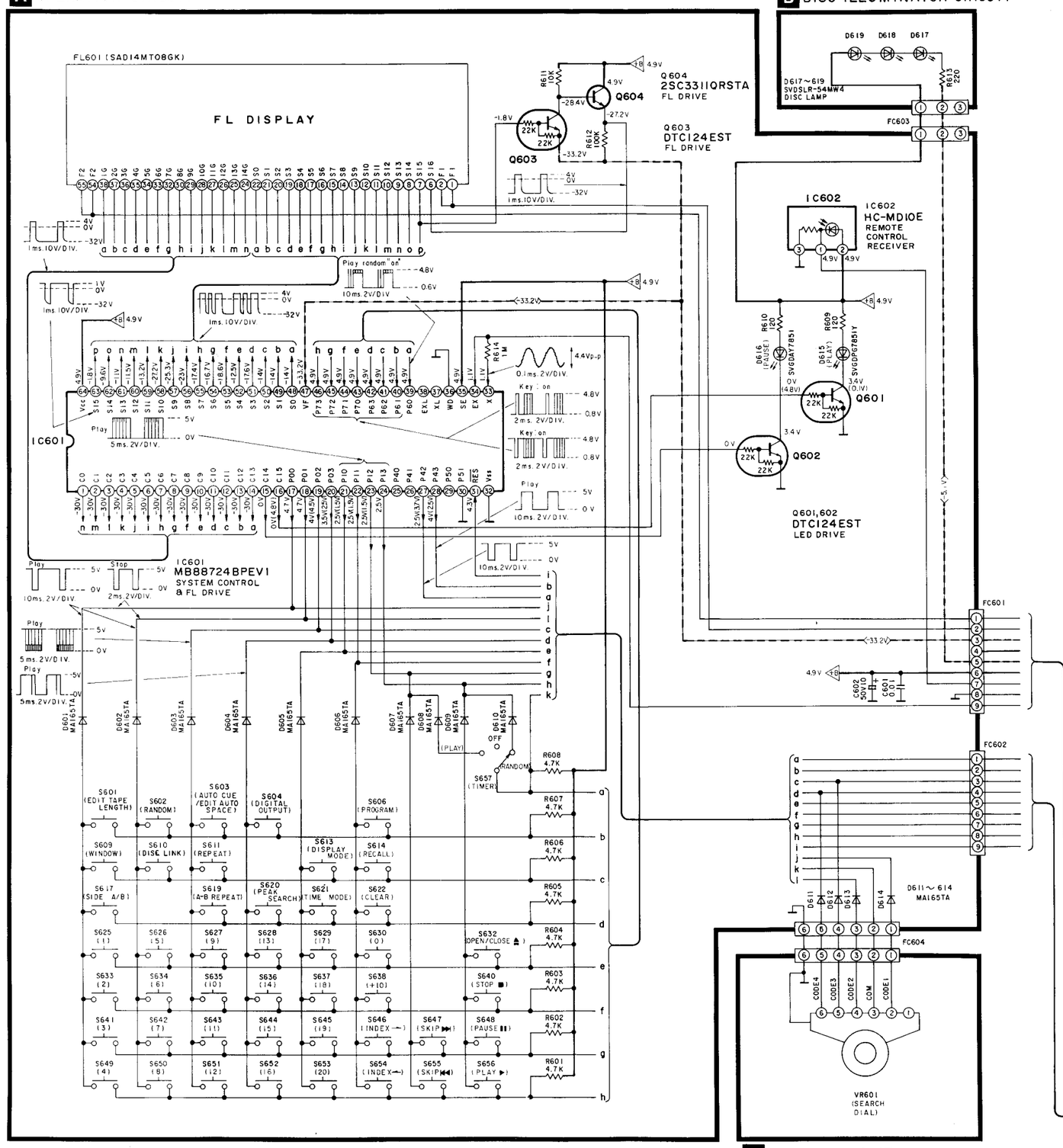
data code (6 bit)



Data code	Key No.	Function	Data code
000000	24	9	011000
000010	25	0	011001
000011	26	+10	011010
000100	27	display ON/OFF	011011
000101	29	program	011101
000110	31	random	011111
000111	35	auto cue	100011
001000	41	time mode	101001
001001	47	display mode	101111
001010	48	10	110000
001011	49	11	110001
001100	50	12	110010
001101	51	13	110011
001110	52	14	110100
010000	53	15	110101
010001	54	16	110110
010010	55	17	110111
010011	56	18	111000
010100	57	19	111001
010101	58	20	111010
010110	60	(A-B) peak search	111100
010111			

※Custom code: 01100

A OPERATION CIRCUIT



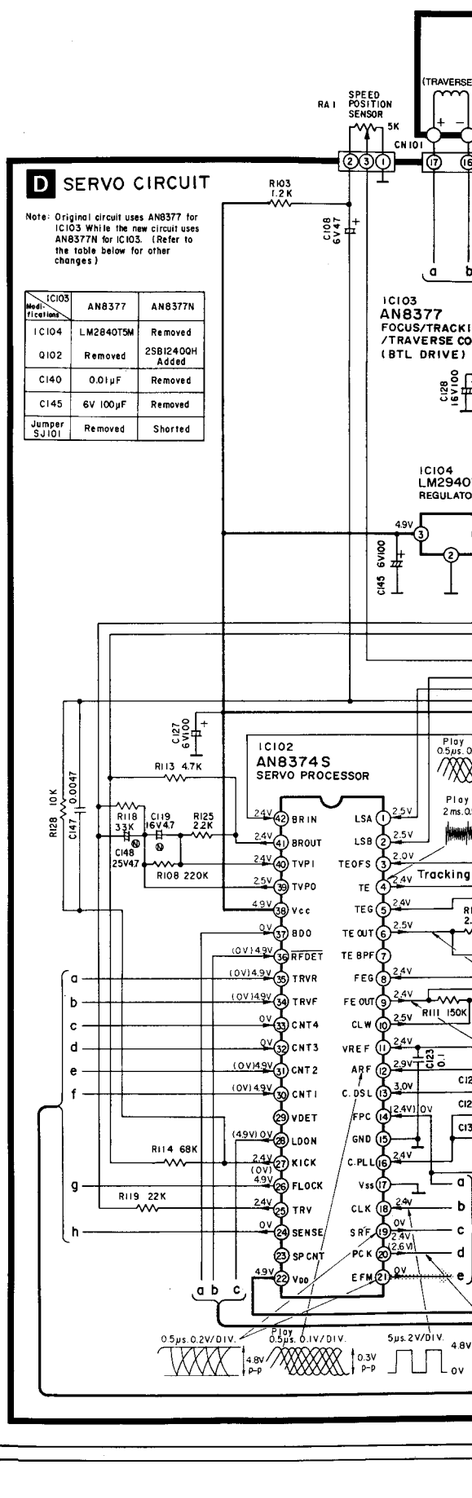
B DISC ILLUMINATOR CIRCUIT

C SEARCH CIRCUIT

D 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 / Modifications	AN8377	AN8377N
IC104	LM2840T5M	Removed
Q102	Removed	2SB1240QH Added
C140	0.01μF	Removed
C145	6V 100μF	Removed
Jumper SJ101	Removed	Shorted



10 11 12 13 14 15 16 17 18 19

B DISC ILLUMINATOR CIRCUIT

D619 D618 D617

D617~619 SVDSLR-54MW4 DISC LAMP

R615 220

FC603

C SEARCH CIRCUIT

Q604 2SC3311ORSTA FL DRIVE

Q603 DTC124EST FL DRIVE

IC602 HC-MD10E REMOTE CONTROL RECEIVER

D616 (PAUSE) SVGOAT7851

D615 (PLAY) SVGDP7851Y

Q601

Q602

Q601,602 DTC124EST LED DRIVE

FC601

FC602

D611~614 MA165TA

FC604

VR601 (SEARCH DIAL)

D 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 / Modification	AN8377	AN8377N
IC104	LM2840T5M	Removed
Q102	Removed	2SB1240QH Added
C140	0.01μF	Removed
C145	6V 100μF	Removed
Jumper SJ101	Removed	Shorted

OPTICAL PICKUP

SPEED POSITION SENSOR 5K

CN101

IC103 AN8377 FOCUS/TRACKING /TRAVERSE COIL DRIVE (BTL DRIVE)

IC104 LM2940T5M REGULATOR

Q101 2SA1547 AUTO POWER CONTROL

Q102 2SB1240 SWITCHING

IC102 AN8374S SERVO PROCESSOR

IC101 AN8373S SERVO AMP

CN103

DC SPINDLE MOTOR

CN102

Best eye adj.

Tracking balance adj

Focus offset adj.

Tracking gain adj.

Focus gain adj.

To Servo Adjustor

E MOTOR/SWITCH CIRCUIT

G MAIN CIRCUIT

F EXTENSION CIRCUIT

LOADING MOTOR

S101 S102 (OPEN/CLOSE DETECTOR)

CN405 CN701 CN404 CN601 CN602 CN401 CN402

Q453 2SD1862PRTV6 MOTOR DRIVE

Q454 2SB1240PRTV6 MOTOR DRIVE

Q451 2SD1862PRTV6 MOTOR DRIVE

Q452 2SB1240PRTV6 MOTOR DRIVE

IC403 SV1BA4558FT1 MOTOR DRIVE

IC401 MN1554PEZ-1 SYSTEM CONTROL

IC303 LC35178ML15T 16K RAM

IC301 MN6622 DIGITAL SIGNAL PROCESSING

IC404 DTA124EST SWITCHING (MOTOR CONT.)

IC305 TOTX174 OPTICAL TRANSMISSION MODULE

DIGITAL OUT (OPTICAL)

Q14 2SB1238QSTV6 REGULATOR

IC11 LM2940T5 REGULATOR

Q12 2SB1185EF REGULATOR

IC304 MN53015PEU 4DAC GATE ARRAY

IC815 M5218FPTA BUFFER AMP

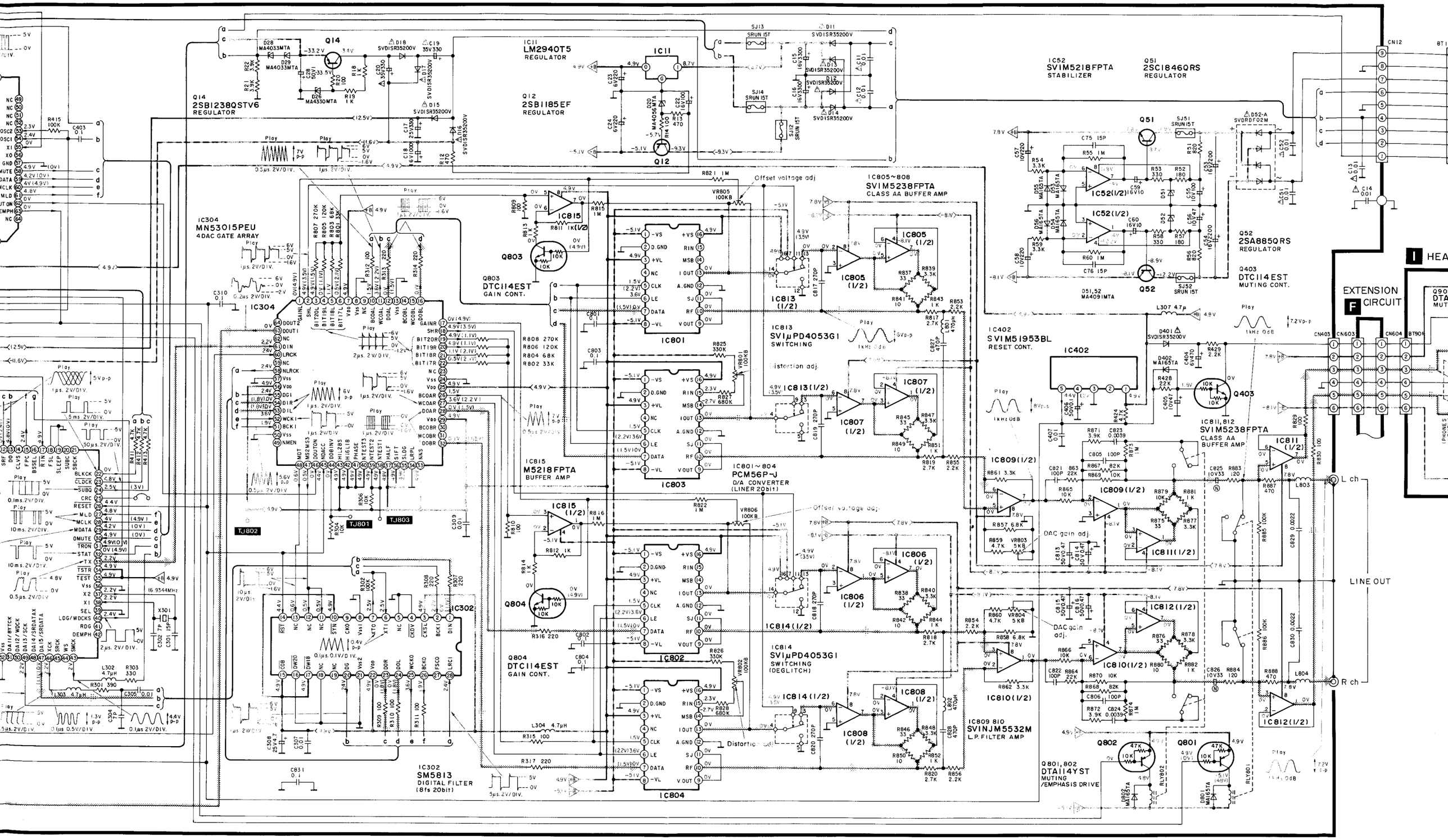
IC302 SM5813 DIGITAL FILTER (8fs 20bit)

Q803 DTC114EST GAIN CONT.

Q804 DTC114EST GAIN CONT.

IC801 IC802 IC803 IC804

TJ801 TJ802 TJ803


Q14
2SB1238QSTV6
REGULATOR
IC11
LM2940T5
REGULATOR
Q12
2SB1185EF
REGULATOR
IC52
SVIM5218FPTA
STABILIZER
Q51
2SC1846QRS
REGULATOR
Q52
2SA885QRS
REGULATOR
Q403
DTC114EST
MUTING CONT.
IC304
MN53015PEU
4DAC GATE ARRAY
IC815
M5218FPTA
BUFFER AMP
IC801~804
PCM56P-J
D/A CONVERTER
(LINER 20bit)
IC803
IC802
IC804
IC805~808
SVIM5238FPTA
CLASS AA BUFFER AMP
IC813
SVIμPD4053G1
SWITCHING
IC814
SVIμPD4053G1
SWITCHING
(DEGLITCH)
Q803
DTC114EST
GAIN CONT.
Q804
DTC114EST
GAIN CONT.
IC302
SM5813
DIGITAL FILTER
(8fs 20bit)
IC402
SVIM51953BL
RESET CONT.
IC809 810
SVINJM5532M
L.P.FILTER AMP
Q801,802
DTA114YST
MUTING
/EMPHASIS DRIVE
IC811,812
SVIM5238FPTA
CLASS AA
BUFFER AMP
EXTENSION
F CIRCUIT
L ch
R ch
LINE OUT
Offset voltage adj
Distortion adj
DAC gain adj.
TJ801
TJ802
TJ803
X301
16.9344MHz

31 32 33 34 35 36 37 38 39 40

H POWER SUPPLY CIRCUIT

I HEADPHONES CIRCUIT

EXTENSION F CIRCUIT

IC52 SVIM5218FPTA STABILIZER

Q51 2SC1846QRS REGULATOR

Q52 2SA8850RS REGULATOR

Q403 DTC114EST MUTING CONT.

IC805~808 SVIM5238FPTA CLASS AA BUFFER AMP

IC402 SVIM51953BL RESET CONT.

IC809,810 SVINJM5532M L.P.FILTER AMP

IC811,812 SVIM5238FPTA CLASS AA BUFFER AMP

Q801,802 DTA114YST MUTING /EMPHASIS DRIVE

Q905 DTA114YST MUTING CONT.

Q901~904 2SD1450RSTTA MUTING

IC901,902 M5218FPTA HEADPHONES AMP

AC IN
220V 50/60Hz
---For Continental Europe
240V 50/60Hz
---For Australia

LINE OUT

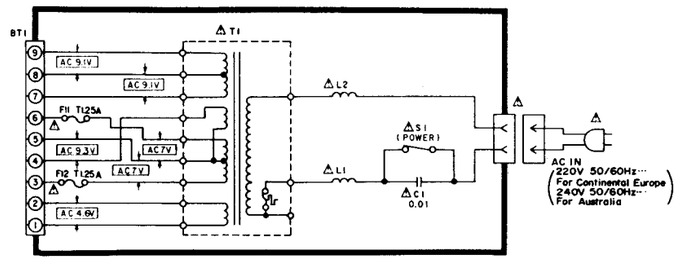
L ch

R ch

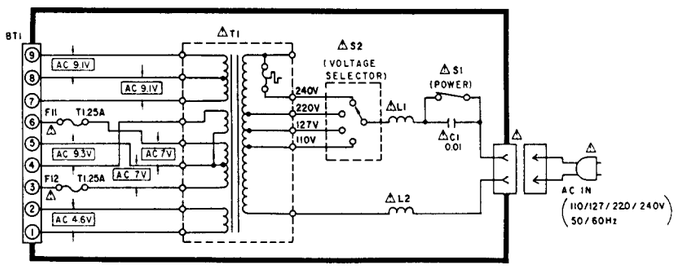
HEADPHONES

JK901

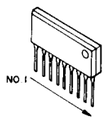
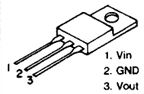
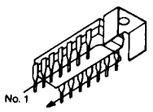
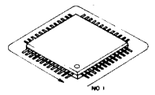
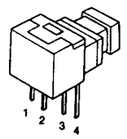
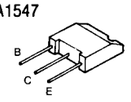
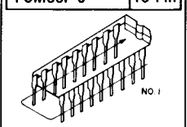
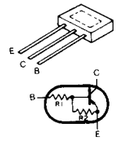
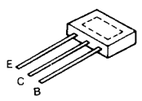
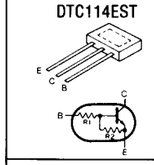
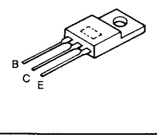
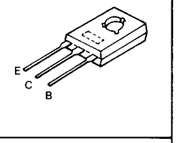
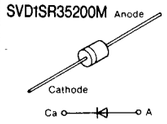
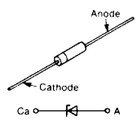
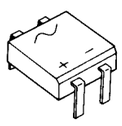
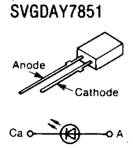
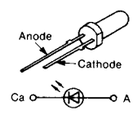
- **Power supply circuit for (E), (XL), (EG), (EB), (EH) and (Ei) areas.**



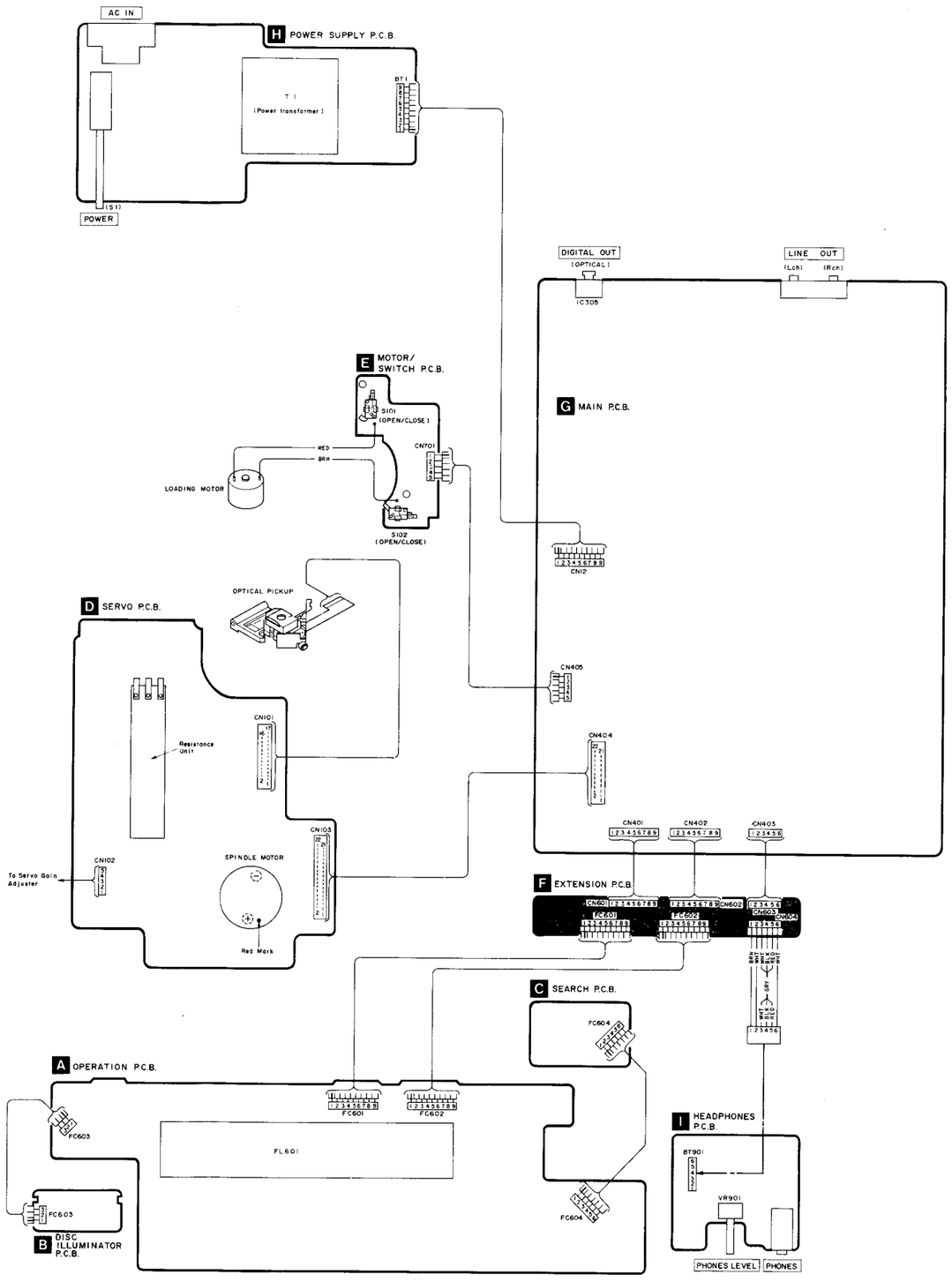
- **Power supply circuit for (EK), (XA), (XB), (PA), (PE) and (PC) areas.**



■ TERMINAL GUIDE OF IC's TRANSISTORS AND DIODE'S

	SVIM51953BL	5 Pin	LM2940T5, LM2940T5M  1. Vin 2. GND 3. Vout	
	SVINJM5532M SVIMS219FPTA SVIM5238FPTA BA4558FTI M5218FPTA	8 Pin	SVIUPD4053G1 SM5813 LC3517BML15T AN8373S AN8374S	16 Pin 28 Pin 24 Pin 42 Pin
AN8377	16 Pin			
		MN1554PEZ-1 MN53015PEU MN6622	64 Pin 84 Pin	
MB88724BPEV1 PCM56P-J	64 Pin 16 Pin	T0TX174 	2SB1238, 2SD1862, 2SB1240, 2SA1547 	
				
	DTA124EST, DTA114YST		2SD1450, 2SC3311 	
DTC124EST, DTC114EST 	2SB1185 		2SA885, 2SC1846 	
MA165, SVD1SR35200M Anode  Cathode Ca A	 Anode Cathode Ca A		MA4056M, MA4330M, MA4091M, MA4033M, MA4051M	
SVDRDF02M 	SVGDPG7851Y, SVGDAY7851  Anode Cathode Ca A		SVDSLR-54MW4  Anode Cathode Ca A	

■ WIRING CONNECTION DIAGRAM



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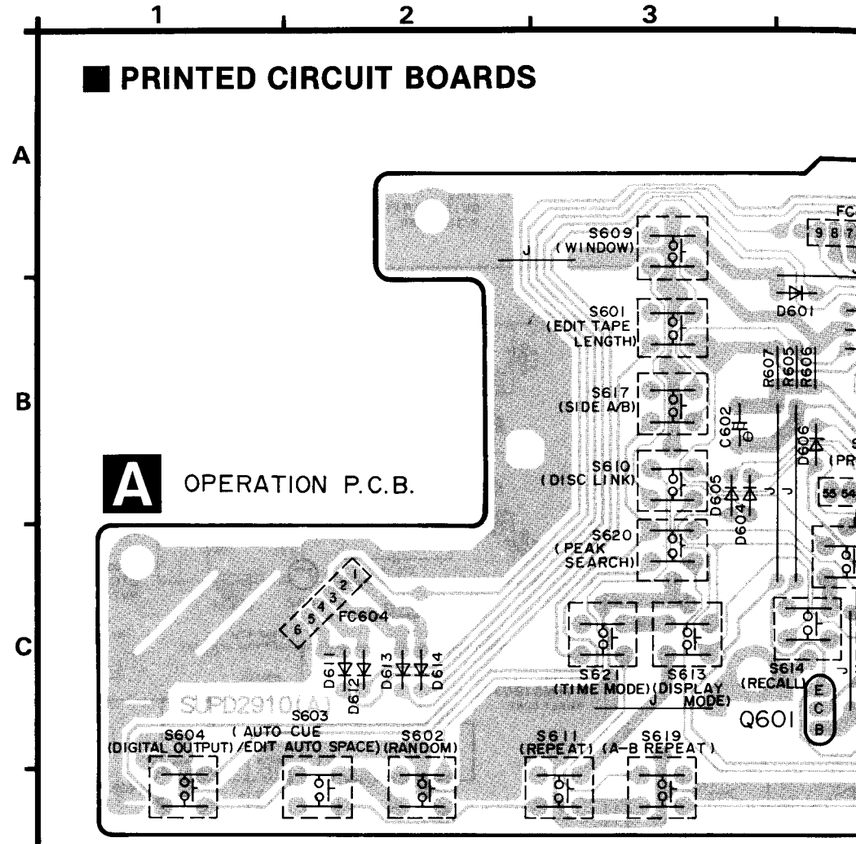
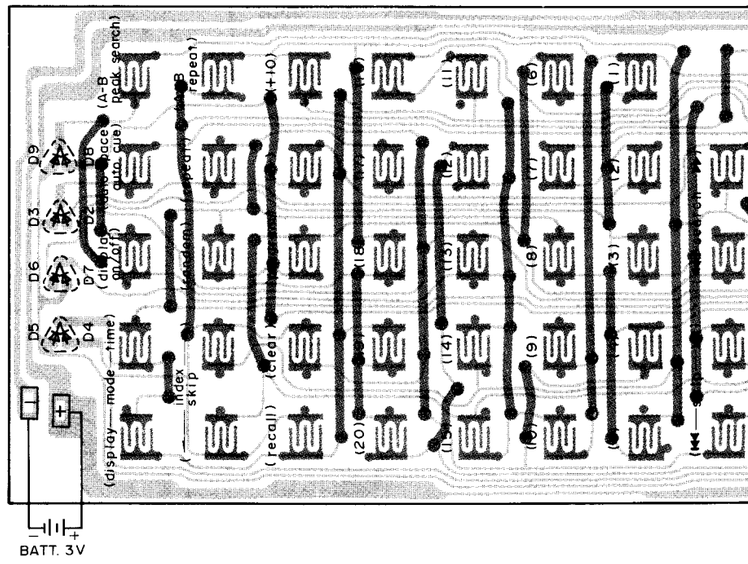
■ PRINTED CIRCUIT BOARDS

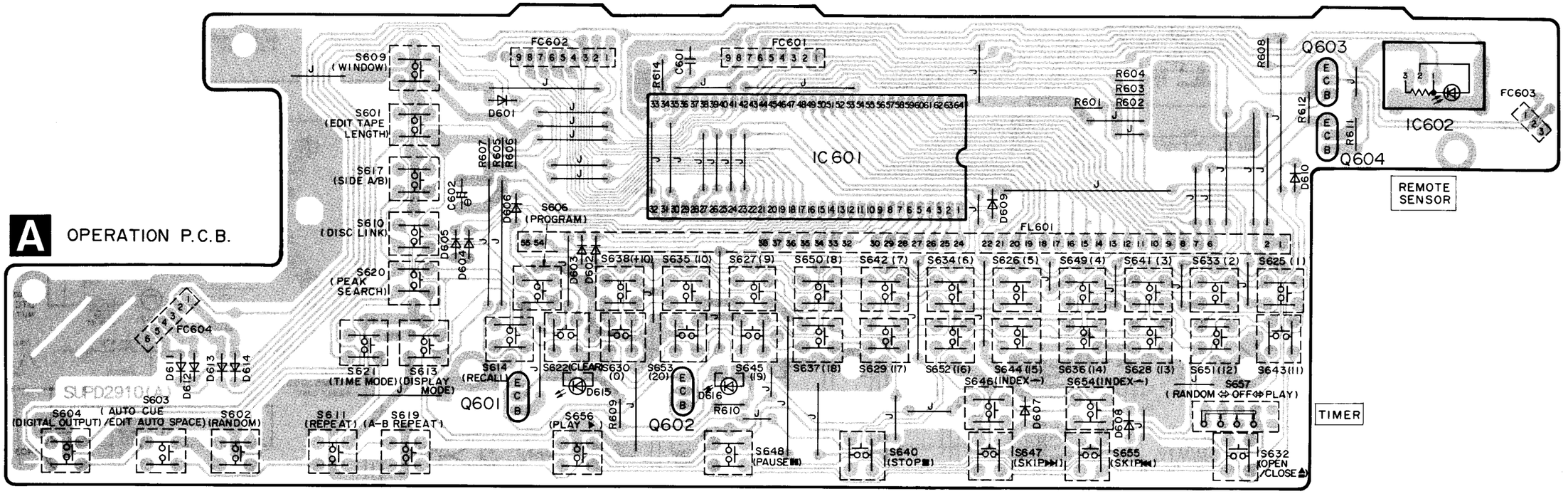


• **Remote control transmitter**

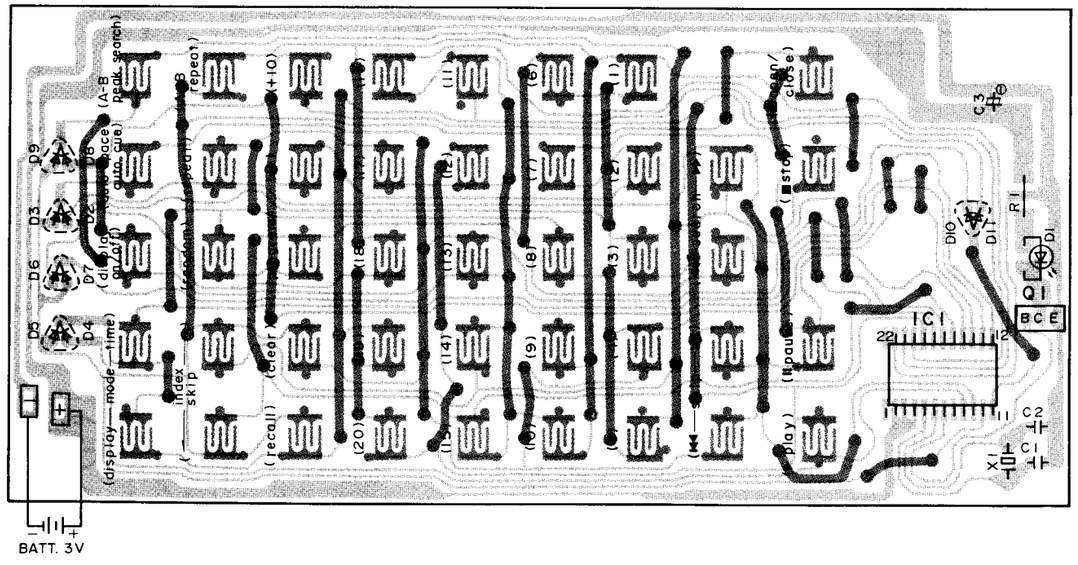


■ PRINTED CIRCUIT BOARDS

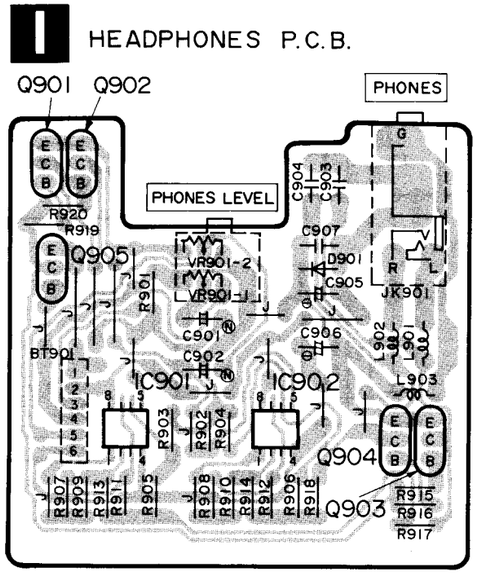
A OPERATION P.C.B.



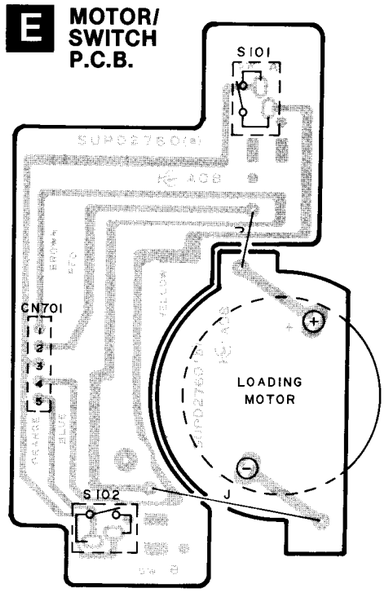
• **Remote control transmitter**

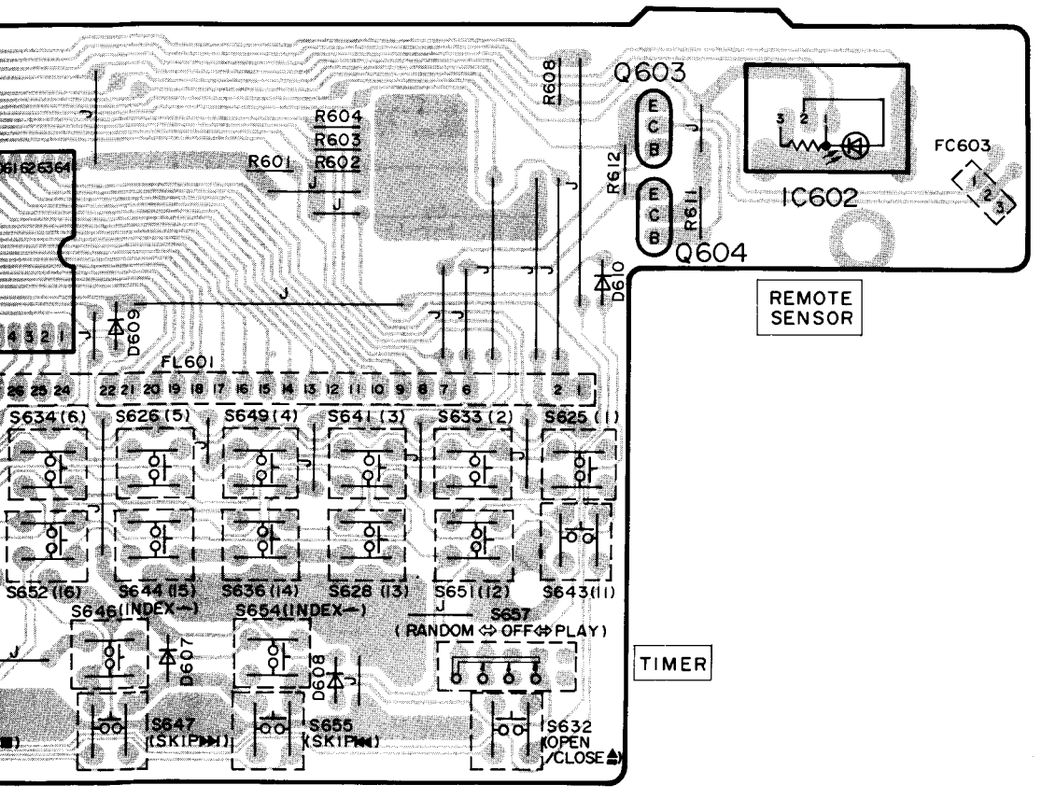


I HEADPHONES P.C.B.

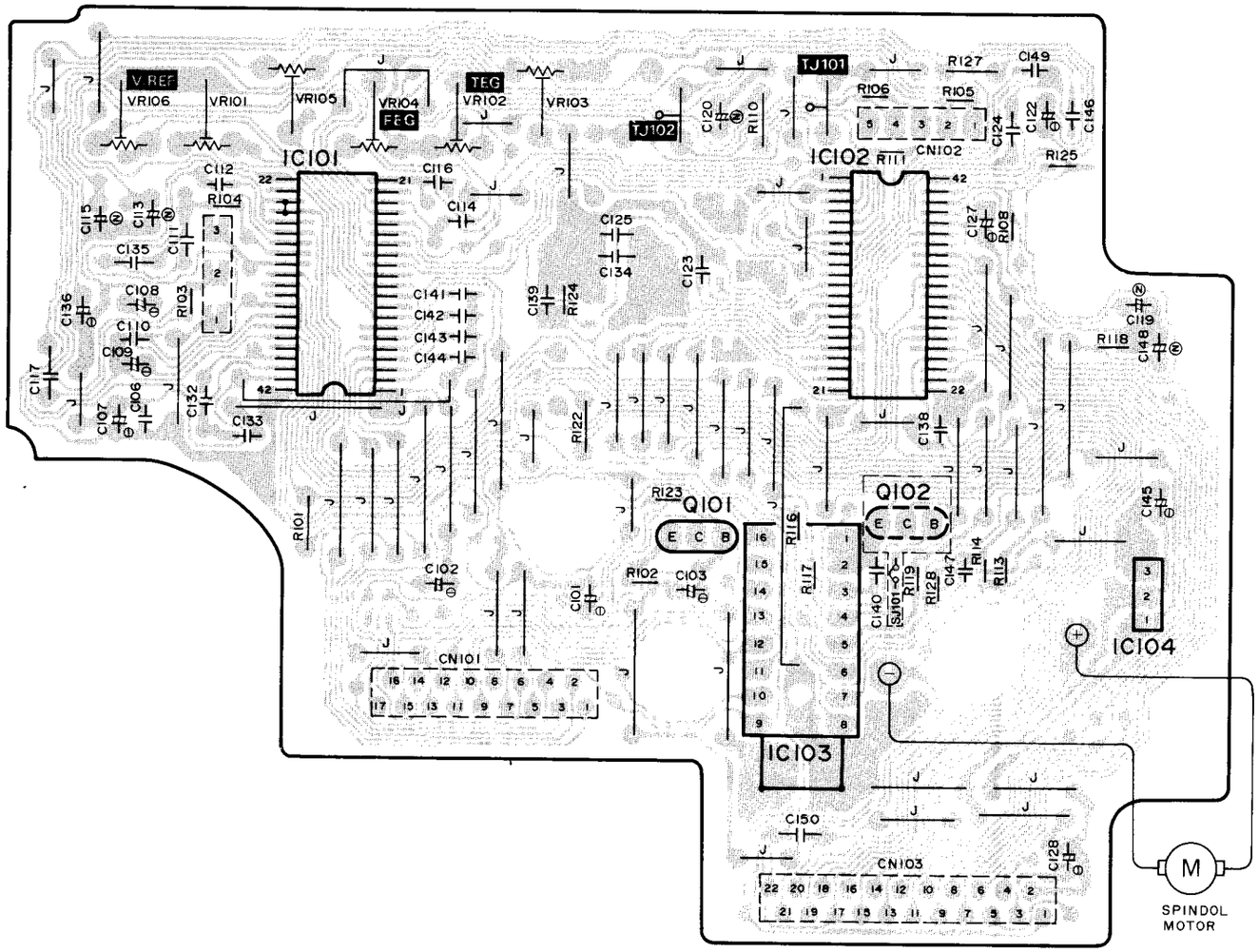


E MOTOR/ SWITCH P.C.B.





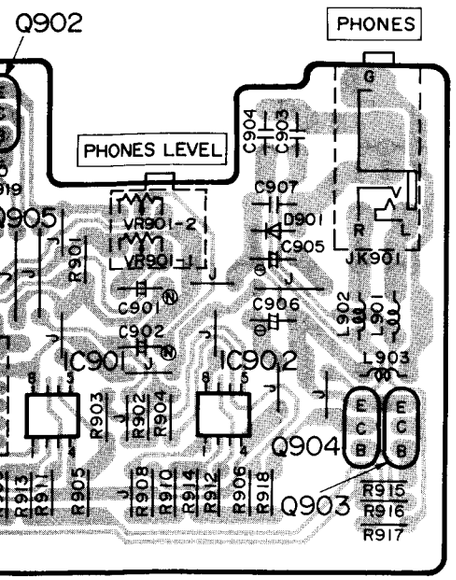
D SERVO P.C.B.



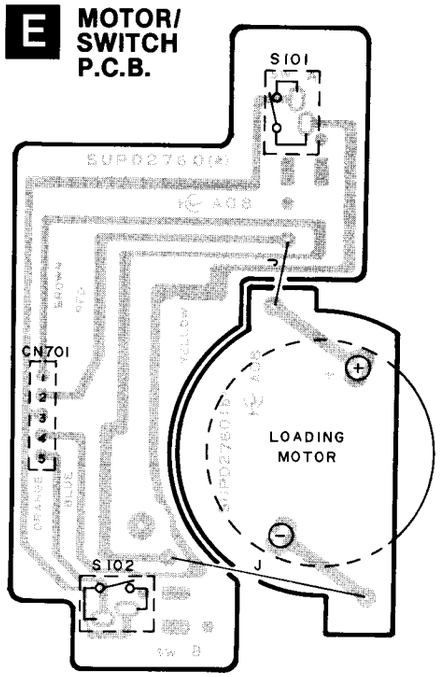
Note: Original circuit uses AN8377 for IC103 while the new circuit uses AN8377N for IC103. (Refer to the table below for other changes.)

IC103 / Modifications	AN8377	AN8377N
IC104	LM2940T5M	Removed
Q102	Not used	2SB1240QR Added
C140	0.01µF	Removed
C145	6V 100µF	Removed
Jumper SJ101	Not used	Shorted

HEADPHONES P.C.B.

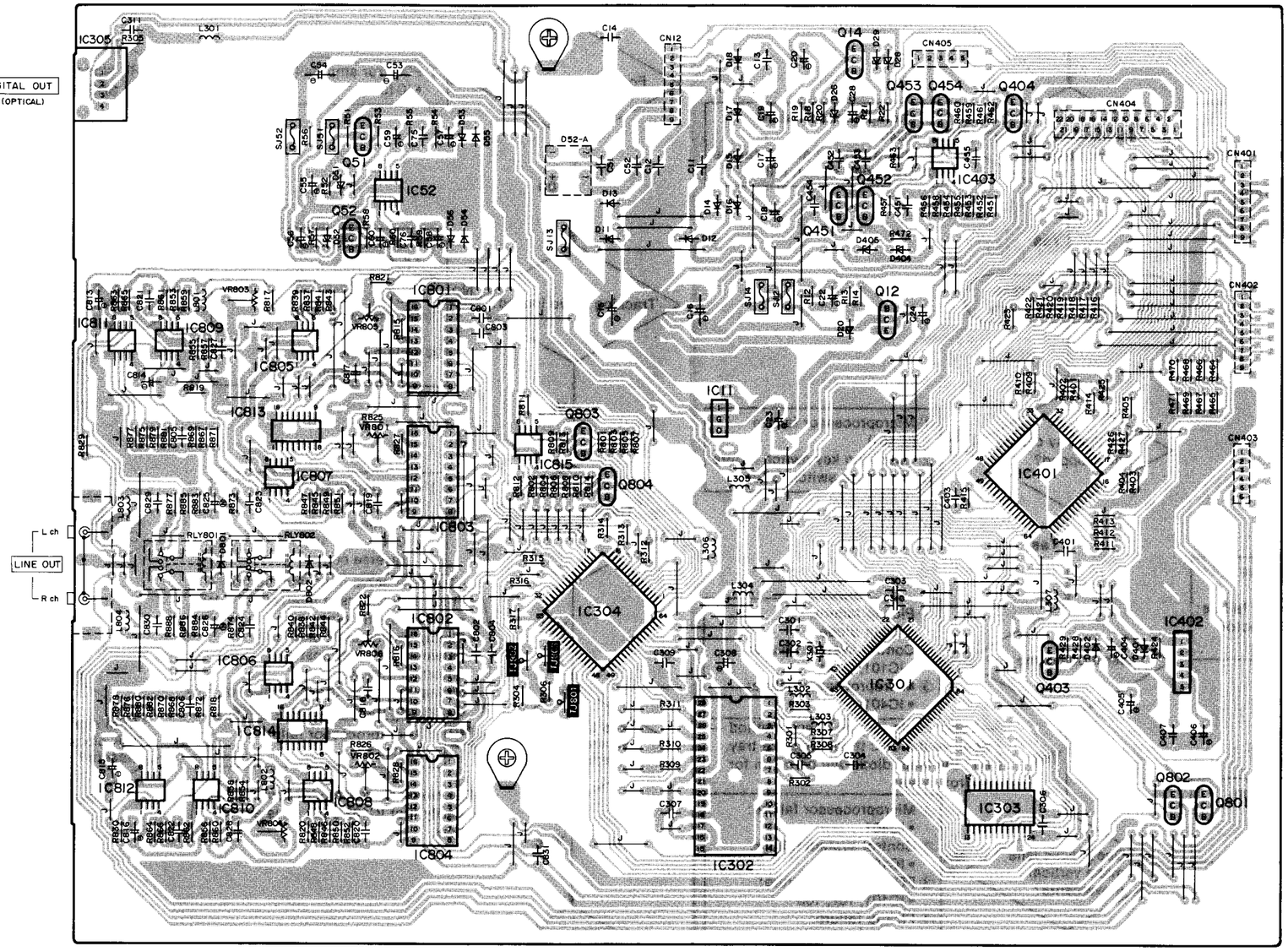


E MOTOR/ SWITCH P.C.B.

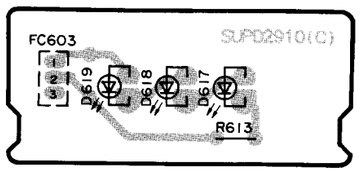


15 16 17 18 19 20 21 22 23 24 25

G MAIN P.C.B.

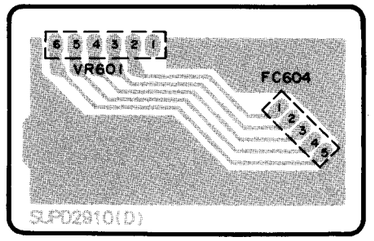


B DISC ILLUMINATOR P.C.B.

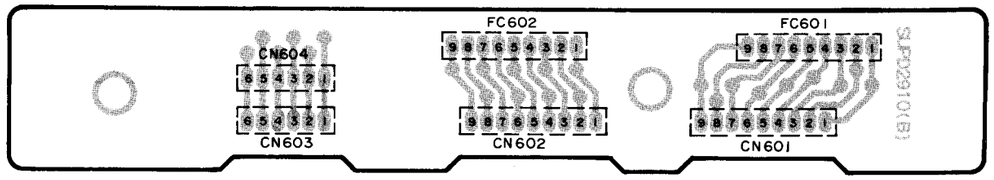


C SEARCH P.C.B.

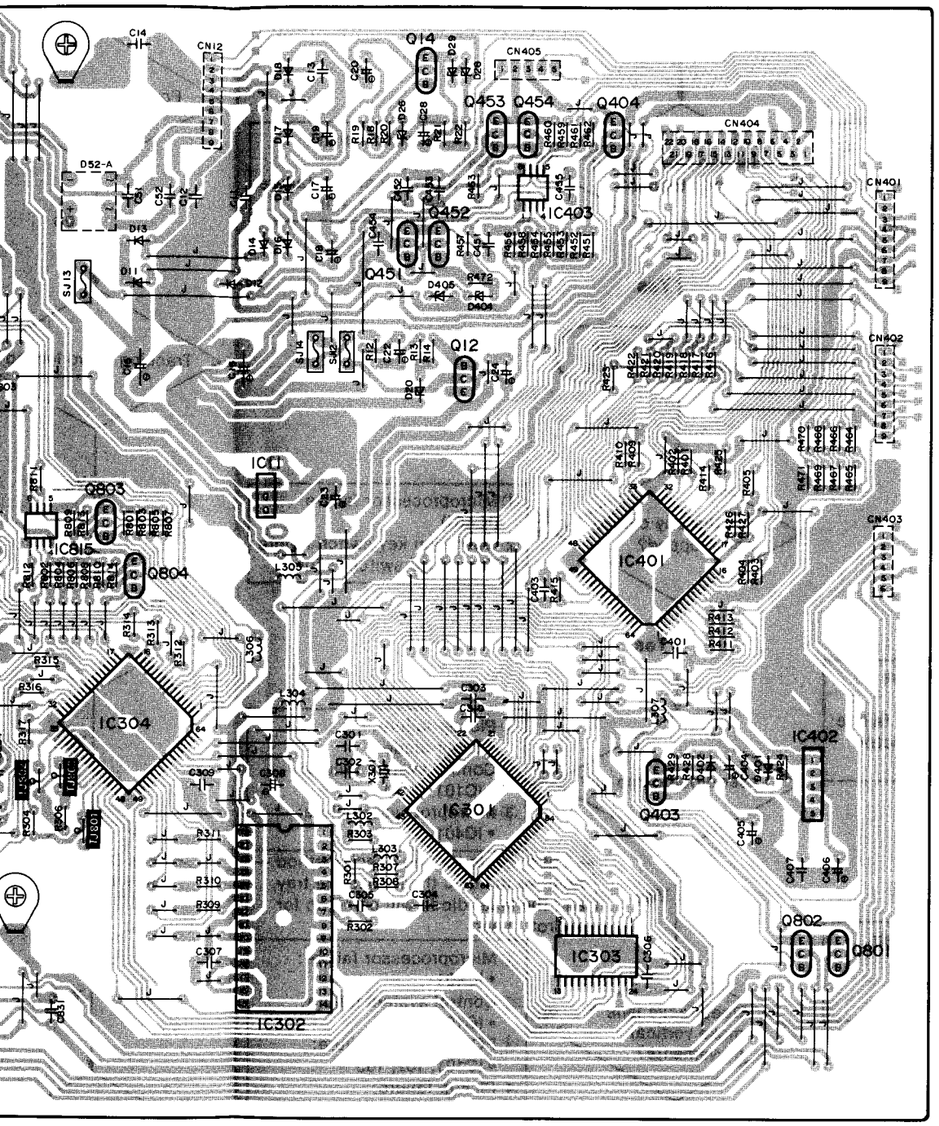
SEARCH



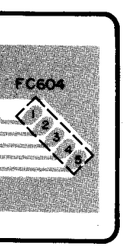
F EXTENSION P.C.B.



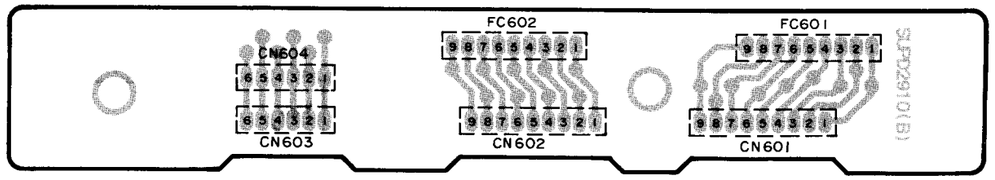
9 20 21 22 23 24 25 26 27 28 29



C. B.

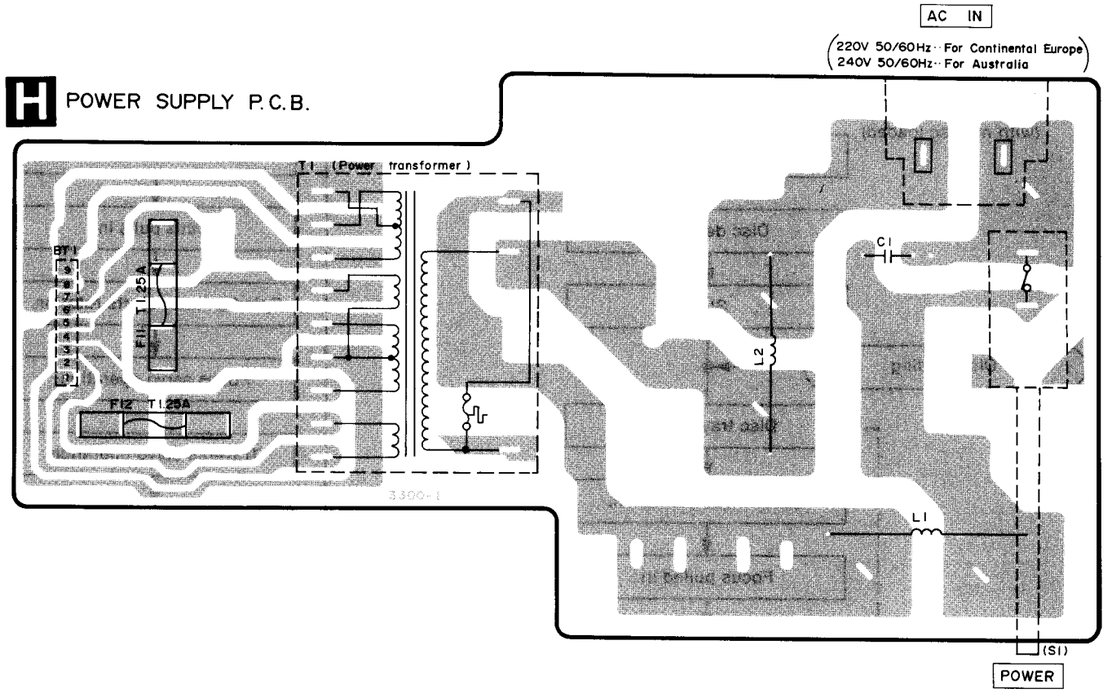


F EXTENSION P. C. B.



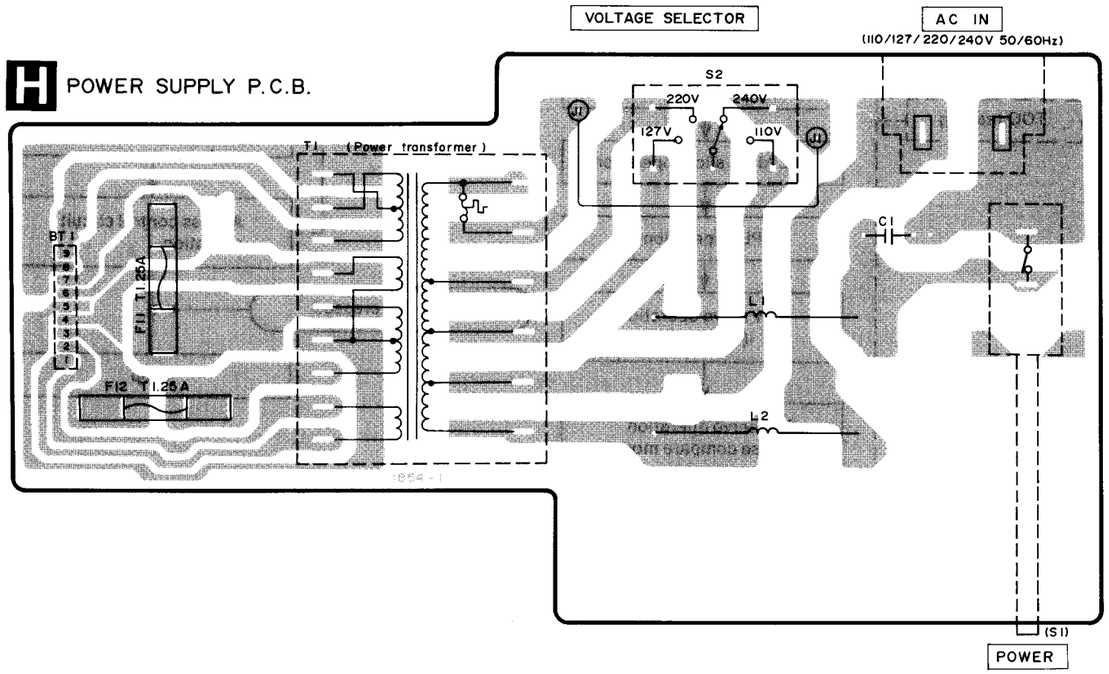
• **For (E), (XL), (EG), (EB), (EH) and (Ei) areas.**

H POWER SUPPLY P. C. B.



• **For (EK), (XA), (XB), (PA), (PE) and (PC) areas.**

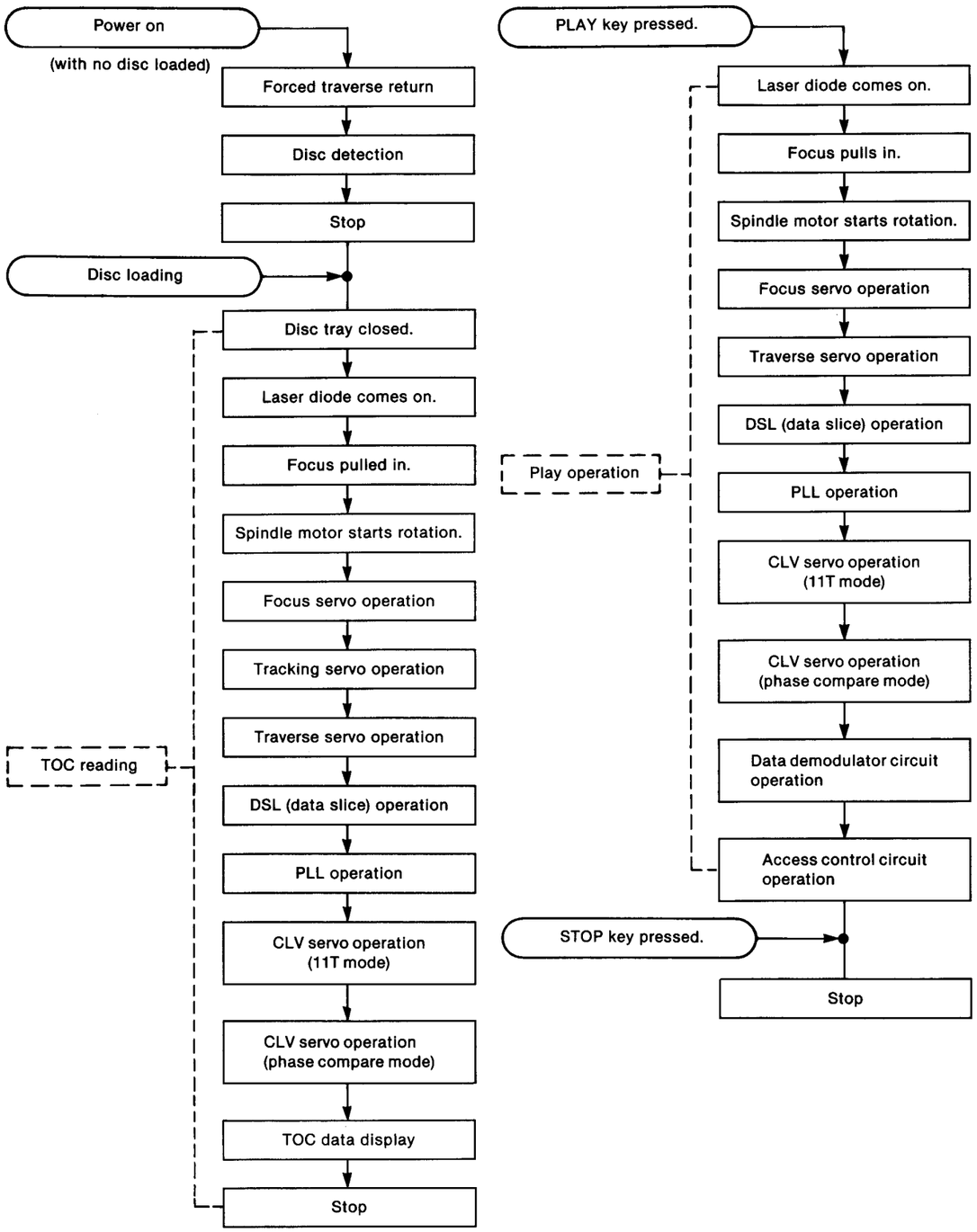
H POWER SUPPLY P. C. B.



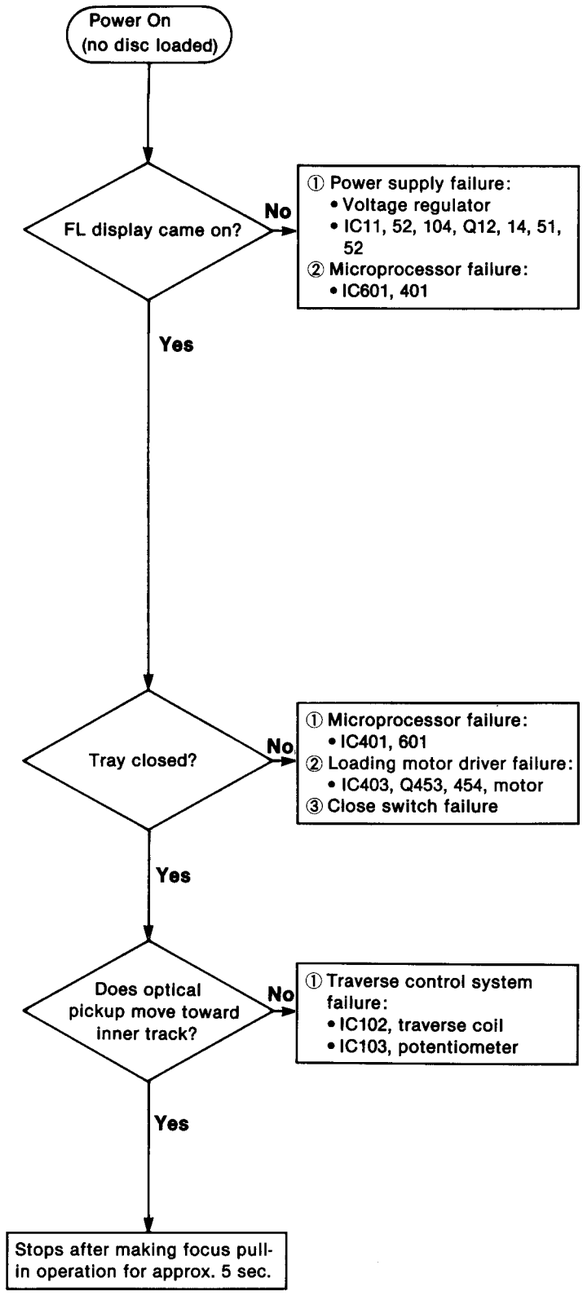
■ TROUBLESHOOTING GUIDE

SL-P999 Operation Sequence Check Sheet

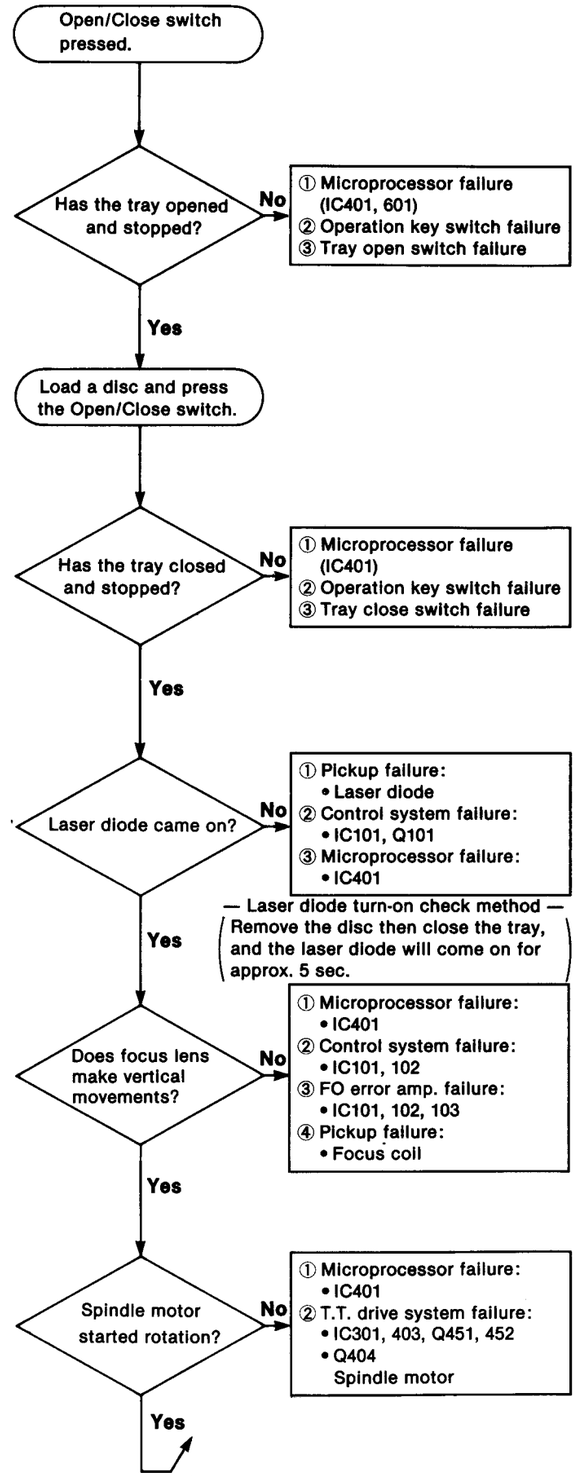
Play Operation Sequence



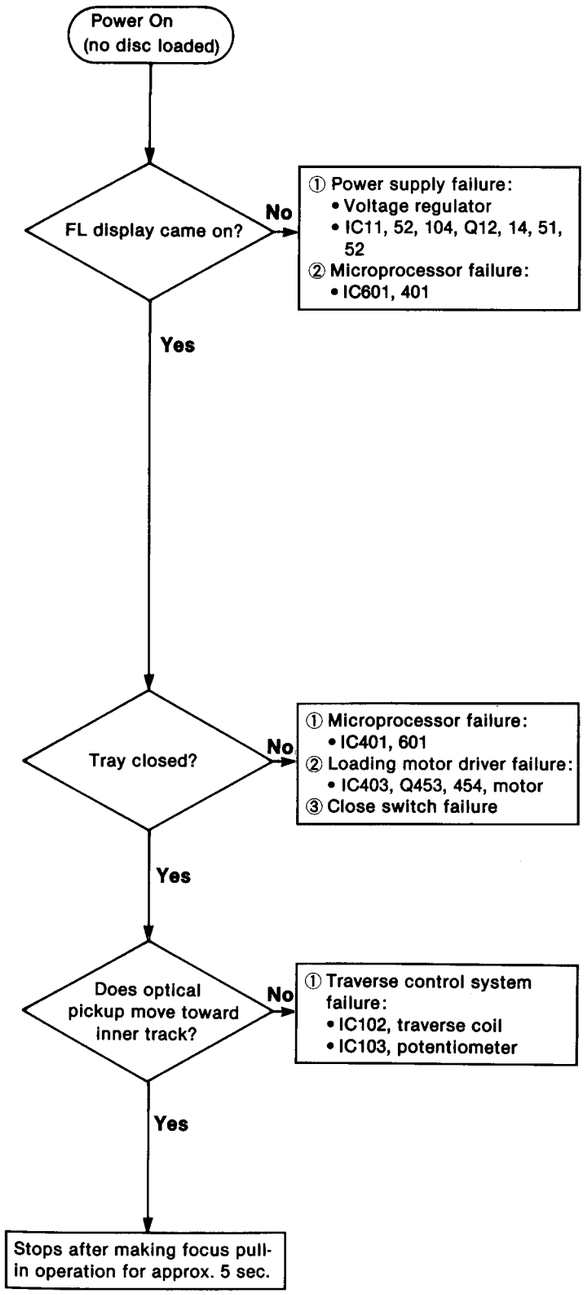
(Operation Sequence Just After Power On)



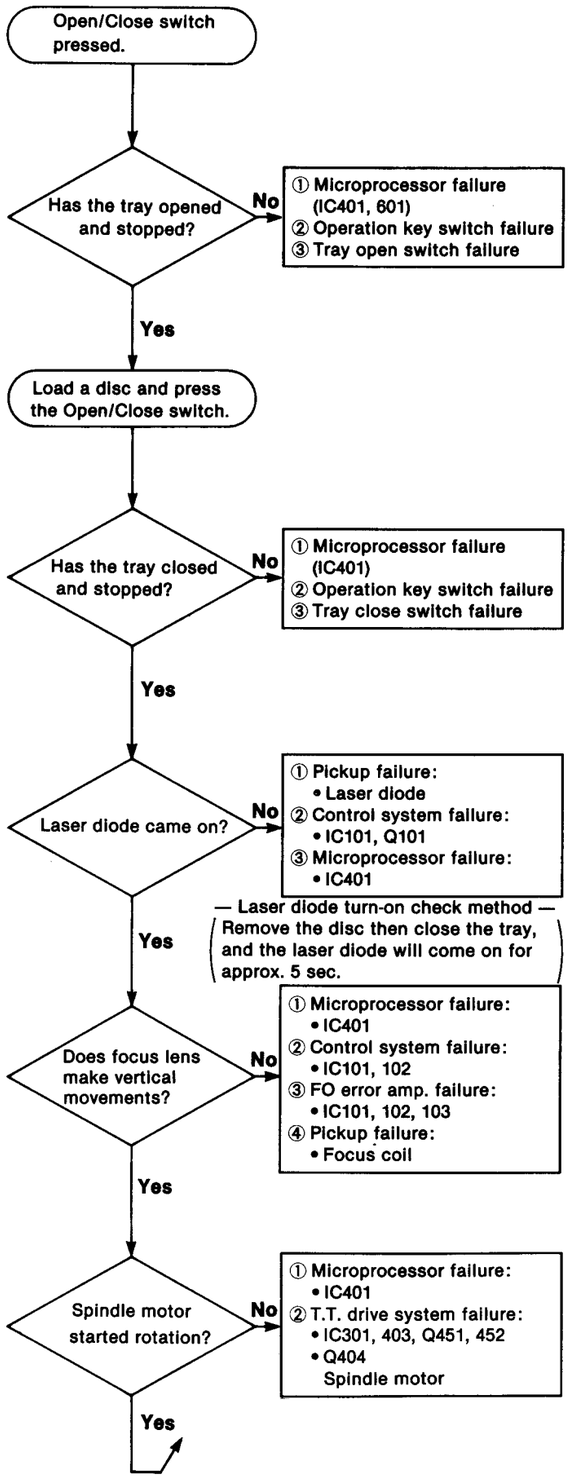
(TOC Read Operation-PLAY Operation)

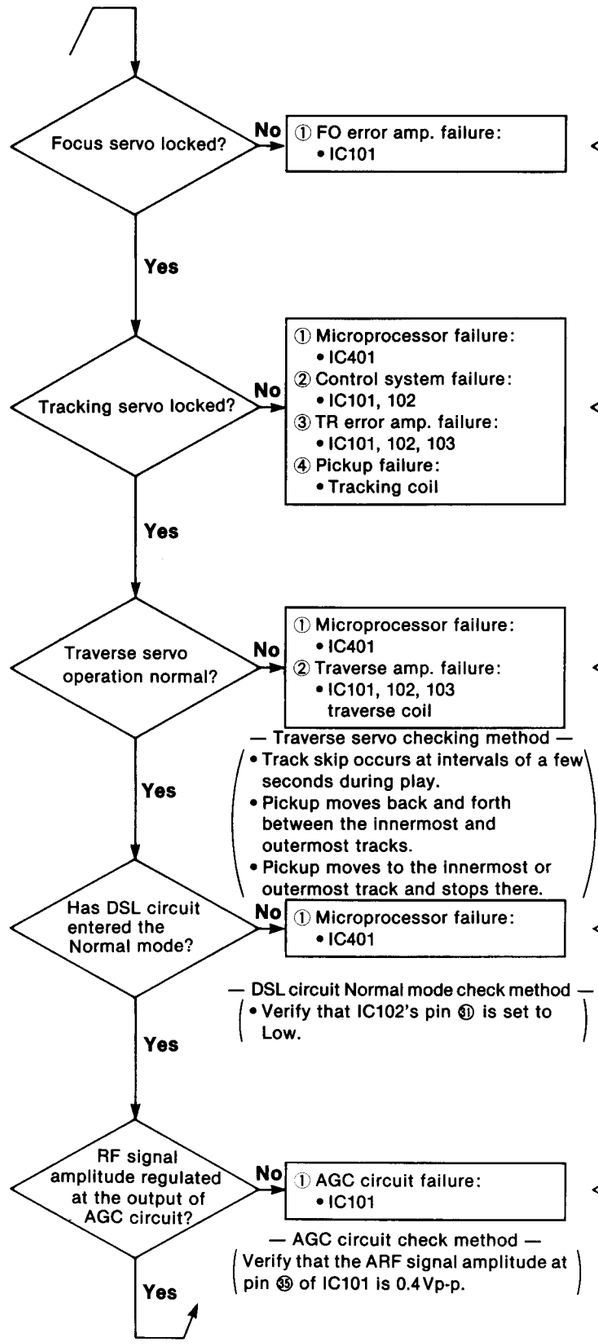


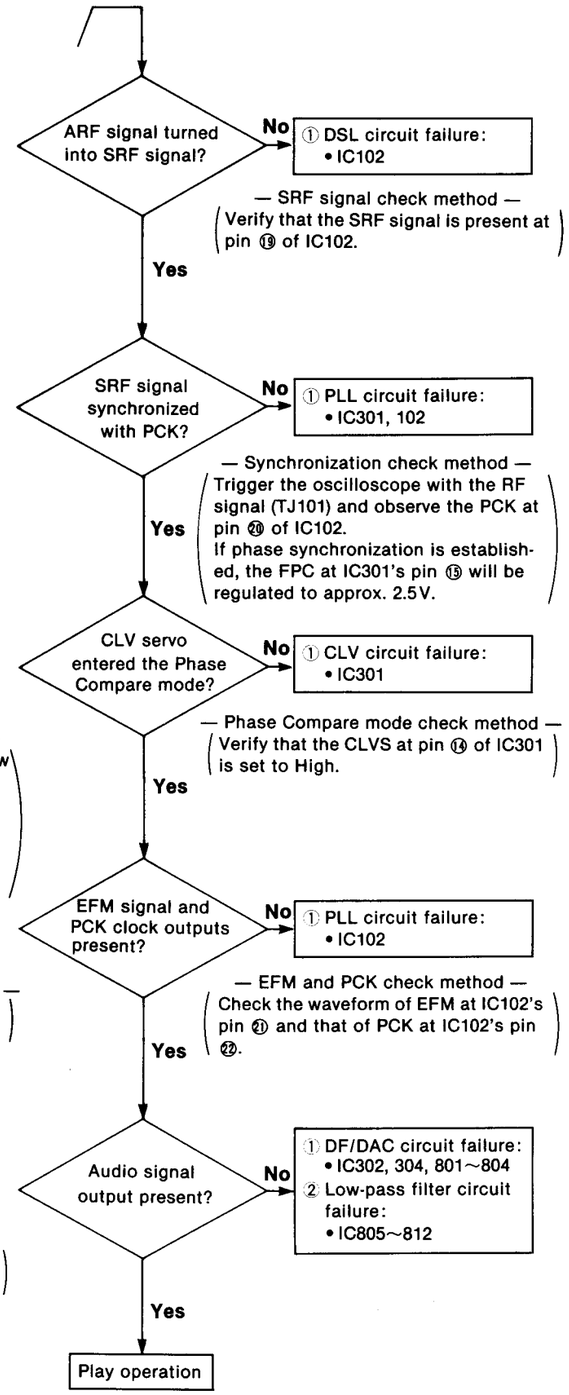
(Operation Sequence Just After Power On)



(TOC Read Operation-PLAY Operation)

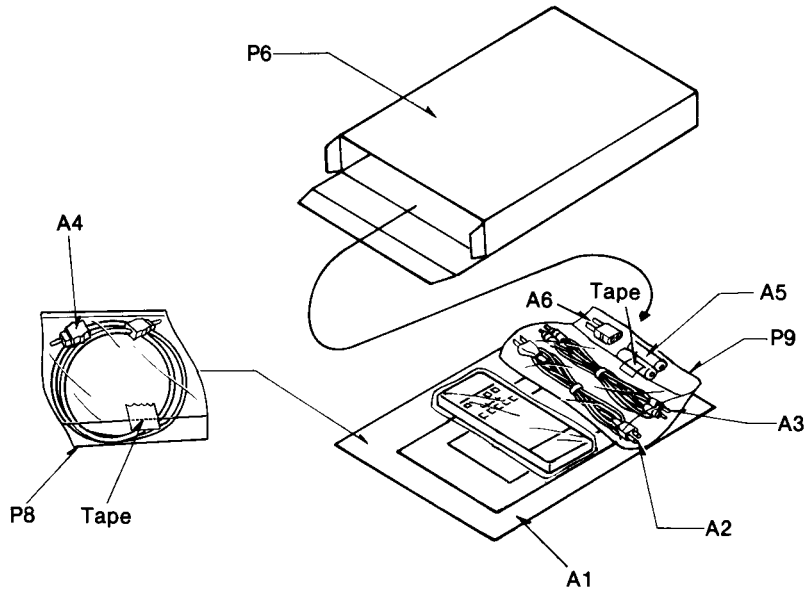


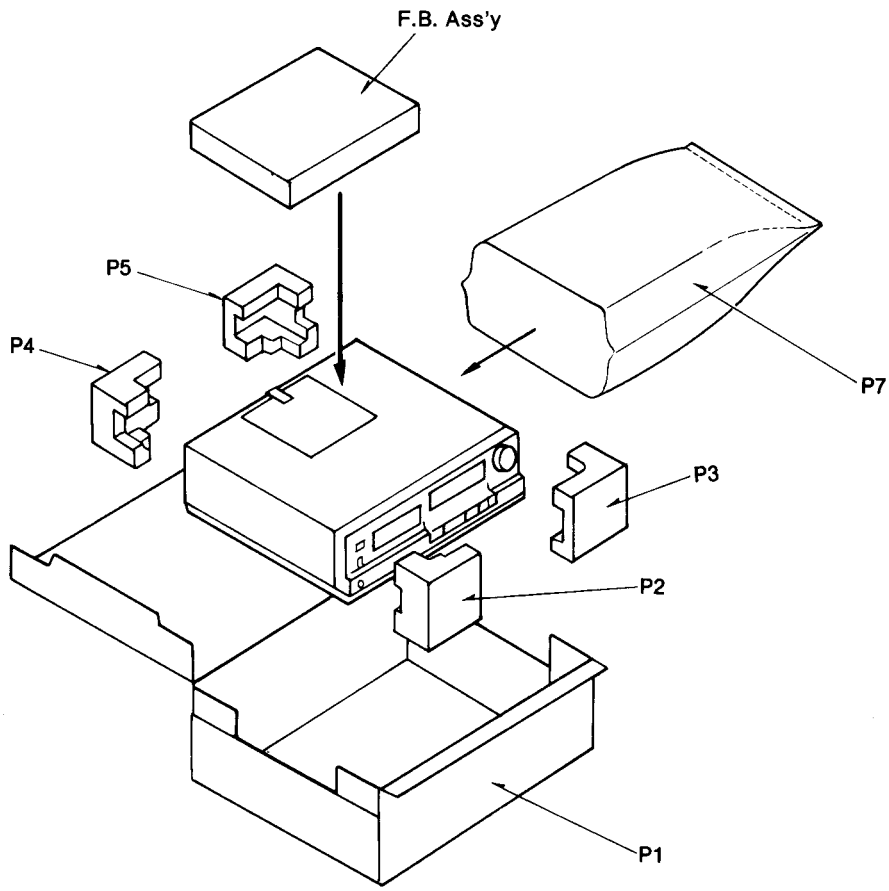




■ PACKING

• **F.B. Ass'y**





■ RESISTORS AND CAPACITORS

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

Numbering System For Resistors

Example:

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

Numbering System For Capacitors

Example:

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

● Capacity values are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F).
● Resistance values are in ohms (Ω), unless specified otherwise, 1K = 1,000Ω, 1M = 1,000kΩ

Resistor Type	Wattage		Tolerance
ERD : Carbon	10 : 1/8W	12 : 1/2W	J : ±5%
ERG : Metal Oxide	14 : 1/4W	25 : 1/4W	F : ±1%
ERQ : Fuse Type Metal	1A : 1W	18 : 1/8W	G : ±2%
ERX : Metal Film	S2 : 1/4W	S1 : 1/2W	J : ±5%
ERD L : Carbon (chip)	2F : 1/4W	50 : 1/2W	K : ±10%
ERO K : Metal Film (chip)	2A : 2W	3A : 3W	M : ±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 : ±10%
ECCD : Ceramic	1C : 16V	1E : 25V	M : ±20%
ECKD : Ceramic Capacitor	1H : 50V	1V : 35V	Z : +80 % −20
ECQM : Polyester	50 : 50V	05 : 50V	J : ±5%
ECQP : Polypropylene	2H : 500V	2A : 100V	G : ±2%
ECG : Ceramic	1 : 100V	1J : 63V	F : ±1%
ECEA N : Non Polar Electrolytic	KC : 400V AC		C : ±0.25pF
QCU : Ceramic (Chip Type)	KC : 125V AC		D : ±0.5pF
ECUX : Ceramic (Chip Type)	(UL)		
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)								
R12	ERDS2TJ471	470 1/4	R409	ERDS2TJ472	4.7K 1/4	R472	ERDS2TJ101	100 1/4
R13	ERDS2TJ471	470 1/4	R410	ERDS2TJ472	4.7K 1/4	R601	ERDS2TJ472	4.7K 1/4
R14	ERDS2TJ101	100 1/4	R411	ERDS2TJ472	4.7K 1/4	R602	ERDS2TJ472	4.7K 1/4
R18	ERDS2TJ102	1K 1/4	R412	ERDS2TJ472	4.7K 1/4	R603	ERDS2TJ472	4.7K 1/4
R19	ERDS2TJ102	1K 1/4	R413	ERDS2TJ472	4.7K 1/4	R604	ERDS2TJ472	4.7K 1/4
R20	ERDS2TJ101	100 1/4	R414	ERDS2TJ472	4.7K 1/4	R605	ERDS2TJ472	4.7K 1/4
R21	ERDS2TJ392	3.9K 1/4	R415	ERDS2TJ104	100K 1/4	R606	ERDS2TJ472	4.7K 1/4
R22	ERDS2TJ392	3.9K 1/4	R416	ERDS2TJ221	220 1/4	R607	ERDS2TJ472	4.7K 1/4
R51	ERDS2TJ821	820 1/4	R417	ERDS2TJ221	220 1/4	R608	ERDS2TJ472	4.7K 1/4
R52	ERDS2TJ181	180 1/4	R418	ERDS2TJ221	220 1/4	R609	ERDS2TJ121	120 1/4
R53	ERDS2TJ331	330 1/4	R419	ERDS2TJ221	220 1/4	R610	ERDS2TJ121	120 1/4
R54	ERDS2TJ332	3.3K 1/4	R420	ERDS2TJ221	220 1/4	R611	ERDS2TJ103	10K 1/4
R55	ERDS2TJ105	1M 1/4	R421	ERDS2TJ221	220 1/4	R612	ERDS2TJ104	100K 1/4
R56	ERDS2TJ821	820 1/4	R422	ERDS2TJ221	220 1/4	R613	ERDS2TJ221	220 1/4
R57	ERDS2TJ181	180 1/4	R423	ERDS2TJ221	220 1/4	R614	ERDS2TJ105	1M 1/4
R58	ERDS2TJ331	330 1/4	R424	ERDS2TJ472	4.7K 1/4	R801	ERDS2TJ333	33K 1/4
R59	ERDS2TJ332	3.3K 1/4	R425	ERDS2TJ472	4.7K 1/4	R802	ERDS2TJ333	33K 1/4
R60	ERDS2TJ105	1M 1/4	R426	ERDS2TJ472	4.7K 1/4	R803	ERDS2TJ683	68K 1/4
R301	ERDS2TJ391	390 1/4	R427	ERDS2TJ472	4.7K 1/4	R804	ERDS2TJ683	68K 1/4
R302	ERDS2TJ104	100K 1/4	R428	ERDS2TJ223	22K 1/4	R805	ERDS2TJ124	120K 1/4
R303	ERDS2TJ331	330 1/4	R429	ERDS2TJ222	2.2K 1/4	R806	ERDS2TJ124	120K 1/4
R304	ERDS2TJ103	10K 1/4	R451	ERDS2TJ154	150K 1/4	R807	ERDS2TJ274	270K 1/4
R305	ERDS2TJ822	8.2K 1/4	R452	ERDS2TJ333	33K 1/4	R808	ERDS2TJ274	270K 1/4
R306	ERDS2TJ103	10K 1/4	R453	ERDS2TJ333	33K 1/4	R809	ERDS2TJ101	100 1/4
R307	ERDS2TJ221	220 1/4	R454	ERDS2TJ123	12K 1/4	R810	ERDS2TJ101	100 1/4
R308	ERDS2TJ221	220 1/4	R455	ERDS2TJ103	10K 1/4	R811	ERDS2TJ102	1K 1/4
R309	ERDS2TJ101	100 1/4	R456	ERDS2TJ154	150K 1/4	R812	ERDS2TJ102	1K 1/4
R310	ERDS2TJ101	100 1/4	R457	ERDS2TJ101	100 1/4	R813	ERDS2TJ102	1K 1/4
R311	ERDS2TJ101	100 1/4	R458	ERDS2TJ8R2	8.2 1/4	R814	ERDS2TJ102	1K 1/4
R312	ERDS2TJ101	100 1/4	R459	ERDS2TJ913T	91K 1/4	R815	ERDS2TJ105	1M 1/4
R313	ERDS2TJ221	220 1/4	R460	ERDS2TJ124	120K 1/4	R816	ERDS2TJ105	1M 1/4
R314	ERDS2TJ221	220 1/4	R461	ERDS2TJ913T	91K 1/4	R817	ERDS2TJ272	2.7K 1/4
R315	ERDS2TJ101	100 1/4	R462	ERDS2TJ124	120K 1/4	R818	ERDS2TJ272	2.7K 1/4
R316	ERDS2TJ221	220 1/4	R463	ERDS2TJ101	100 1/4	R819	ERDS2TJ272	2.7K 1/4
R317	ERDS2TJ221	220 1/4	R464	ERDS2TJ472	4.7K 1/4	R820	ERDS2TJ272	2.7K 1/4
R401	ERDS2TJ472	4.7K 1/4	R465	ERDS2TJ472	4.7K 1/4	R821	ERDS2TJ105	1M 1/4
R402	ERDS2TJ472	4.7K 1/4	R466	ERDS2TJ472	4.7K 1/4	R822	ERDS2TJ105	1M 1/4
R403	ERDS2TJ472	4.7K 1/4	R467	ERDS2TJ472	4.7K 1/4	R825	ERDS2TJ334	330K 1/4
R404	ERDS2TJ472	4.7K 1/4	R468	ERDS2TJ472	4.7K 1/4	R826	ERDS2TJ334	330K 1/4
R405	ERDS2TJ103	10K 1/4	R469	ERDS2TJ472	4.7K 1/4	R827	ERDS2TJ684	680K 1/4
			R470	ERDS2TJ472	4.7K 1/4	R828	ERDS2TJ684	680K 1/4
			R471	ERDS2TJ472	4.7K 1/4	R829	ERDS2TJ101	100 1/4

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
R830	ERDS2TJ101	100 1/4	C1 ⚠	ECKDKC103PF2	0.01 125	C830	ECQV1H222JZ3	0.0022 50
R837	ERDS2TJ330	33 1/4	C11 ⚠	ECFTD103KXL	0.01 25	C831	ECFR1E104ZF5	0.1 25
R838	ERDS2TJ330	33 1/4	C12 ⚠	ECFTD103KXL	0.01 25	C901	AR1EN3R3M0T	3.3 25
R839	ERDS2TJ332	3.3K 1/4	C13 ⚠	ECFTD103KXL	0.01 25	C902	AR1EN3R3M0T	3.3 25
R840	ERDS2TJ332	3.3K 1/4	C14 ⚠	ECFTD103KXL	0.01 25	C903	ECFTD103KXL	0.01 25
R841	ERDS2TJ100	10 1/4	C15	ECEA1CU332	3300 16	C904	ECFTD103KXL	0.01 25
R842	ERDS2TJ100	10 1/4	C16	ECEA1CU332	3300 16	C905	ARA1A220M0T	22 10
R843	ERDS2TJ102	1K 1/4	C17	ECEA1EU331E	330 25	C906	ARA1A220M0T	22 10
R844	ERDS2TJ102	1K 1/4	C18	ECEA16V1000	1000 16	C907	ECFTD103KXL	0.01 25
R845	ERDS2TJ330	33 1/4	C19 ⚠	ECEA1VU331E	330 35	SERVO P.C.B		
R846	ERDS2TJ330	33 1/4	C20 ⚠	ECEA1VU331E	330 35	RESISTORS(VALUE,WATTAGE)		
R847	ERDS2TJ332	3.3K 1/4	C22	ECEA1CK101	100 16	R101	ERDS2TJ471	470 1/4
R848	ERDS2TJ332	3.3K 1/4	C23	UKS0J221M1TA	220 6.3	R102	ERJ6GEYJ120V	12 1/10
R849	ERDS2TJ100	10 1/4	C24	UKS0J221M1TA	220 6.3	R103	ERJ6GEYJ122	1.2K 1/10
R850	ERDS2TJ100	10 1/4	C28	ECEA1HK010	1 50	R104	ERJ6GEYJ471	470 1/10
R851	ERDS2TJ102	1K 1/4	C51 ⚠	ECFTD103KXL	0.01 25	R105	RRJ6GCJ102TE	1K 1/6
R852	ERDS2TJ102	1K 1/4	C52 ⚠	ECFTD103KXL	0.01 25	R106	RRJ6GCJ102TE	1K 1/6
R853	ERDAS3G222T	2.2K 1/4	C53	UKS1C222M1AA	0.0022 16	R108	ERJ6GEYJ224V	220K 1/10
R854	ERDAS3G222T	2.2K 1/4	C54	UKS1C222M1AA	0.0022 16	R110	ERDS2TJ222	2.2K 1/4
R855	ERDAS3G222T	2.2K 1/4	C55	UKS1A101M1TA	100 10	R111	ERJ6GEYJ154V	150K 1/10
R856	ERDAS3G222T	2.2K 1/4	C56	UKS1A470M1TA	47 10	R113	ERJ6GEYJ472V	4.7K 1/10
R857	ERDAS3G682T	6.8K 1/4	C57	UKS1A221M1TA	220 10	R114	ERJ6GEYJ683V	68K 1/10
R858	ERDAS3G682T	6.8K 1/4	C58	UKS1A221M1TA	220 10	R116	ERJ6GEYJ332V	3.3K 1/10
R859	ERDAS3G472T	4.7K 1/4	C59	UKS1C100M1TA	10 16	R117	ERJ6GEYJ123	12K 1/10
R860	ERDAS3G472T	4.7K 1/4	C60	UKS1C100M1TA	10 16	R118	ERJ6GEYJ333V	33K 1/10
R861	ERDAS3G332T	3.3K 1/4	C75	ECCD1H150KC	15P 50	R119	RRJ6GCJ223TE	22K 1/6
R862	ERDAS3G332T	3.3K 1/4	C76	ECCD1H150KC	15P 50	R122	ERDS2TJ104	100K 1/4
R863	ERDAS3G223T	22K 1/4	C301	ECCR1H150C5	15P 50	R123	ERJ6GEYJ470V	47 1/10
R864	ERDAS3G223T	22K 1/4	C302	ECCR1H070C5	7P 50	R124	RRJ6GCJ103TE	10K 1/6
R865	ERDAS3G103T	10K 1/4	C303	ECFTD103KXL	0.01 25	R125	RRJ6GCJ222TE	2.2K 1/6
R866	ERDAS3G103T	10K 1/4	C304	ECCR1H070C5	7P 50	R127	ERDS2TJ681	680 1/4
R867	ERDAS3G823T	82K	C305	ECFTD103KXL	0.01 25	R128	RRJ6GCJ103TE	10K 1/6
R868	ERDAS3G823T	82K	C306	ECFTD103KXL	0.01 25	CAPACITORS(VALUE,VOLTAGE)		
R869	ERDAS3G103T	10K 1/4	C307	ECFTD103KXL	0.01 25	C101	ECEA1CKS220I	22 16
R870	ERDAS3G103T	10K 1/4	C308	ECEA1EK4R7	4.7 25	C102	ECEA1HKS0101	1 50
R871	ERDAS3G392T	3.9K 1/4	C309	ECFTD103KXL	0.01 25	C103	ECEA1CKS220I	22 16
R872	ERDAS3G392T	3.9K 1/4	C310	ECFR1E104ZF5	0.1 25	C106	RCUV1E104ZF	0.1 25
R873	ERDAS3J105T	1M	C311	ECFR1E104ZF5	0.1 25	C107	ECEA0GKS1011	100 4
R874	ERDAS3J105T	1M	C401	ECFR1E104ZF5	0.1 25	C108	ECEA0JKS470I	47 6.3
R875	ERDAS3G330T	33 1/4	C403	ECFR1E104ZF5	0.1 25	C109	ECEA1HKS0101	1 50
R876	ERDAS3G330T	33 1/4	C404	ECEA0JU471	470 6.3	C110	RCUV1H681KB	680P 50
R877	ERDAS3G332T	3.3K 1/4	C405	ECEA1AU470	47 10	C111	ECUV1C224KR	0.22 16
R878	ERDAS3G332T	3.3K 1/4	C406	ECEA1HK0R1	0.1 50	C112	RCUV1H331KB	330P 50
R879	ERDAS3G100T	10 1/4	C407	ECFTD103KXL	0.01 25	C113	ECEA1HSN0101	1 50
R880	ERDAS3G100T	10 1/4	C451	ECKD1H102KB	1000P 50	C114	RCUV1E333KB	0.033 25
R881	ERDAS3G102T	1K 1/4	C452	ECFR1H102KDY	0.001 50	C115	ECEA1HSN0101	1 50
R882	ERDAS3G102T	1K 1/4	C453	ECFR1H102KDY	0.001 50	C116	RCUV1E333KB	0.033 25
R883	ERDAS3J121T	120 1/4	C454	ECFTD103KXL	0.01 25	C117	ECBT1H102KB5	0.001 50
R884	ERDAS3J121T	120 1/4	C455	ECKD1H102KB	1000P 50	C119	ECEA1CKN4R7I	4.7 16
R885	ERDAS3J104T	100K 1/4	C601	ECBT1E103ZF	0.01 25	C120	ECEA1CKN4R7I	4.7 16
R886	ERDAS3J104T	100K 1/4	C602	ECEA1HKS100B	10 50	C122	ECEA0JKS220I	22 6.3
R887	ERDAS3J471T	470 1/4	C801	ECFR1E104ZF5	0.1 25	C123	RCUV1E104ZF	0.1 25
R888	ERDAS3J471T	470 1/4	C802	ECFR1E104ZF5	0.1 25	C124	ECUV1E823KB	0.082 25
R901	ERDS2TJ103	10K 1/4	C803	ECFR1E104ZF5	0.1 25	C125	ECUV1C224KR	0.22 16
R902	ERDS2TJ103	10K 1/4	C804	ECFR1E104ZF5	0.1 25	C127	ECEA0JKF101I	100 6.3
R903	ERDS2TJ123	12K 1/4	C805	ECQP1101JZ3	100P	C128	ECEA1CKA101I	100 16
R904	ERDS2TJ123	12K 1/4	C806	ECQP1101JZ3	100P	C132	ECUV1E104KB	0.1 25
R905	ERDS2TJ104	100K 1/4	C813	UKS1HR47M1TA	0.47 50	C133	RCUV1H330KC	33P 50
R906	ERDS2TJ104	100K 1/4	C814	UKS1HR47M1TA	0.47 50	C134	ECUV1C224KR	0.22 16
R907	ERDS2TJ330	33 1/4	C815	UKS1HR47M1TA	0.47 50	C135	ECUV1C224KR	0.22 16
R908	ERDS2TJ330	33 1/4	C816	UKS1HR47M1TA	0.47 50	C136	ECEA0GKS101I	100 4
R909	ERDS2TJ332	3.3K 1/4	C817	ECQP2A271JSP	270P 100	C138	RCUV1E104ZF	0.1 25
R910	ERDS2TJ332	3.3K 1/4	C818	ECQP2A271JSP	270P 100	C139	RCUV1H470KC	47P 50
R911	ERDS2TJ100	10 1/4	C819	ECQP2A271JSP	270P 100	C140	RCUV1E103KB	0.01 25
R912	ERDS2TJ100	10 1/4	C820	ECQP2A271JSP	270P 100	C141	RCUV1H470KC	47P 50
R913	ERDS2TJ102	1K 1/4	C821	ECQP1101JZ3	100P	C142	RCUV1H470KC	47P 50
R914	ERDS2TJ102	1K 1/4	C822	ECQP1101JZ3	100P	C143	RCUV1H470KC	47P 50
R915	ERDS2TJ222	2.2K 1/4	C823	ECQP2A392JSP	0.0039 100	C144	RCUV1H470KC	47P 50
R916	ERDS2TJ222	2.2K 1/4	C824	ECQP2A392JSP	0.0039 100	C145	ECEA0JKF101I	100 6.3
R917	ERDS2TJ121	120 1/4	C825	AR1AN330M0T	33 10	C146	RCUV1H181KC	180P 50
R918	ERDS2TJ121	120 1/4	C826	AR1AN330M0T	33 10	C147	RCUV1H472KB	0.0047 50
R919	ERDS2TJ222	2.2K 1/4	C827	ECQP1471JZ	470P 125	C148	ECEA1ESN4R7I	4.7 25
R920	ERDS2TJ222	2.2K 1/4	C828	ECQP1471JZ	470P 125	C149	RCUV1E104ZF	0.1 25
CAPACITORS(VALUE,VOLTAGE)			C829	ECQV1H222JZ3	0.0022 50	C150	RCUV1E103KB	0.01 25

Ref. No.	Part No.	Value.
R830	ERDS2TJ101	100 1/4
R837	ERDS2TJ330	33 1/4
R838	ERDS2TJ330	33 1/4
R839	ERDS2TJ332	3.3K 1/4
R840	ERDS2TJ332	3.3K 1/4
R841	ERDS2TJ100	10 1/4
R842	ERDS2TJ100	10 1/4
R843	ERDS2TJ102	1K 1/4
R844	ERDS2TJ102	1K 1/4
R845	ERDS2TJ330	33 1/4
R846	ERDS2TJ330	33 1/4
R847	ERDS2TJ332	3.3K 1/4
R848	ERDS2TJ332	3.3K 1/4
R849	ERDS2TJ100	10 1/4
R850	ERDS2TJ100	10 1/4
R851	ERDS2TJ102	1K 1/4
R852	ERDS2TJ102	1K 1/4
R853	ERDAS3G222T	2.2K 1/4
R854	ERDAS3G222T	2.2K 1/4
R855	ERDAS3G222T	2.2K 1/4
R856	ERDAS3G222T	2.2K 1/4
R857	ERDAS3G682T	6.8K 1/4
R858	ERDAS3G682T	6.8K 1/4
R859	ERDAS3G472T	4.7K 1/4
R860	ERDAS3G472T	4.7K 1/4
R861	ERDAS3G332T	3.3K 1/4
R862	ERDAS3G332T	3.3K 1/4
R863	ERDAS3G223T	22K 1/4
R864	ERDAS3G223T	22K 1/4
R865	ERDAS3G103T	10K 1/4
R866	ERDAS3G103T	10K 1/4
R867	ERDAS3G823T	82K
R868	ERDAS3G823T	82K
R869	ERDAS3G103T	10K 1/4
R870	ERDAS3G103T	10K 1/4
R871	ERDAS3G392T	3.9K 1/4
R872	ERDAS3G392T	3.9K 1/4
R873	ERDAS3J105T	1M
R874	ERDAS3J105T	1M
R875	ERDAS3G330T	33 1/4
R876	ERDAS3G330T	33 1/4
R877	ERDAS3G332T	3.3K 1/4
R878	ERDAS3G332T	3.3K 1/4
R879	ERDAS3G100T	10 1/4
R880	ERDAS3G100T	10 1/4
R881	ERDAS3G102T	1K 1/4
R882	ERDAS3G102T	1K 1/4
R883	ERDAS3J121T	120 1/4
R884	ERDAS3J121T	120 1/4
R885	ERDAS3J104T	100K 1/4
R886	ERDAS3J104T	100K 1/4
R887	ERDAS3J471T	470 1/4
R888	ERDAS3J471T	470 1/4
R901	ERDS2TJ103	10K 1/4
R902	ERDS2TJ103	10K 1/4
R903	ERDS2TJ123	12K 1/4
R904	ERDS2TJ123	12K 1/4
R905	ERDS2TJ104	100K 1/4
R906	ERDS2TJ104	100K 1/4
R907	ERDS2TJ330	33 1/4
R908	ERDS2TJ330	33 1/4
R909	ERDS2TJ332	3.3K 1/4
R910	ERDS2TJ332	3.3K 1/4
R911	ERDS2TJ100	10 1/4
R912	ERDS2TJ100	10 1/4
R913	ERDS2TJ102	1K 1/4
R914	ERDS2TJ102	1K 1/4
R915	ERDS2TJ222	2.2K 1/4
R916	ERDS2TJ222	2.2K 1/4
R917	ERDS2TJ121	120 1/4
R918	ERDS2TJ121	120 1/4
R919	ERDS2TJ222	2.2K 1/4
R920	ERDS2TJ222	2.2K 1/4
CAPACITORS(VALUE,VOLTAGE)		

Ref. No.	Part No.	Value.
C1 ⚠	ECKDKC103PF2	0.01 125
C11 ⚠	ECFTD103KXL	0.01 25
C12 ⚠	ECFTD103KXL	0.01 25
C13 ⚠	ECFTD103KXL	0.01 25
C14 ⚠	ECFTD103KXL	0.01 25
C15	ECEA1CU332	3300 16
C16	ECEA1CU332	3300 16
C17	ECEA1EU331E	330 25
C18	ECEA16V1000	1000 16
C19 ⚠	ECEA1VU331E	330 35
C20 ⚠	ECEA1VU331E	330 35
C22	ECEA1CK101	100 16
C23	UKS0J221M1TA	220 6.3
C24	UKS0J221M1TA	220 6.3
C28	ECEA1HK010	1 50
C51 ⚠	ECFTD103KXL	0.01 25
C52 ⚠	ECFTD103KXL	0.01 25
C53	UKS1C222M1AA	0.0022 16
C54	UKS1C222M1AA	0.0022 16
C55	UKS1A101M1TA	100 10
C56	UKS1A470M1TA	47 10
C57	UKS1A221M1TA	220 10
C58	UKS1A221M1TA	220 10
C59	UKS1C100M1TA	10 16
C60	UKS1C100M1TA	10 16
C75	ECCD1H150KC	15P 50
C76	ECCD1H150KC	15P 50
C301	ECCR1H150C5	15P 50
C302	ECCR1H070C5	7P 50
C303	ECFTD103KXL	0.01 25
C304	ECCR1H070C5	7P 50
C305	ECFTD103KXL	0.01 25
C306	ECFTD103KXL	0.01 25
C307	ECFTD103KXL	0.01 25
C308	ECEA1EK4R7	4.7 25
C309	ECFTD103KXL	0.01 25
C310	ECFR1E104ZF5	0.1 25
C311	ECFR1E104ZF5	0.1 25
C401	ECFR1E104ZF5	0.1 25
C403	ECFR1E104ZF5	0.1 25
C404	ECEA0JU471	470 6.3
C405	ECEA1AU470	47 10
C406	ECEA1HK0R1	0.1 50
C407	ECFTD103KXL	0.01 25
C451	ECKD1H102KB	1000P 50
C452	ECFR1H102KDY	0.001 50
C453	ECFR1H102KDY	0.001 50
C454	ECFTD103KXL	0.01 25
C455	ECKD1H102KB	1000P 50
C601	ECBT1E103ZF	0.01 25
C602	ECEA1HKS100B	10 50
C801	ECFR1E104ZF5	0.1 25
C802	ECFR1E104ZF5	0.1 25
C803	ECFR1E104ZF5	0.1 25
C804	ECFR1E104ZF5	0.1 25
C805	ECQP1101JZ3	100P
C806	ECQP1101JZ3	100P
C813	UKS1HR47M1TA	0.47 50
C814	UKS1HR47M1TA	0.47 50
C815	UKS1HR47M1TA	0.47 50
C816	UKS1HR47M1TA	0.47 50
C817	ECQP2A271JSP	270P 100
C818	ECQP2A271JSP	270P 100
C819	ECQP2A271JSP	270P 100
C820	ECQP2A271JSP	270P 100
C821	ECQP1101JZ3	100P
C822	ECQP1101JZ3	100P
C823	ECQP2A392JSP	0.0039 100
C824	ECQP2A392JSP	0.0039 100
C825	AR1AN330M0T	33 10
C826	AR1AN330M0T	33 10
C827	ECQP1471JZ	470P 125
C828	ECQP1471JZ	470P 125
C829	ECQV1H222JZ3	0.0022 50

Ref. No.	Part No.	Value.
C830	ECQV1H222JZ3	0.0022 50
C831	ECFR1E104ZF5	0.1 25
C901	AR1EN3R3M0T	3.3 25
C902	AR1EN3R3M0T	3.3 25
C903	ECFTD103KXL	0.01 25
C904	ECFTD103KXL	0.01 25
C905	ARA1A220M0T	22 10
C906	ARA1A220M0T	22 10
C907	ECFTD103KXL	0.01 25
SERVO P.C.B		
RESISTORS(VALUE,WATTAGE)		
R101	ERDS2TJ471	470 1/4
R102	ERJ6GEYJ120V	12 1/10
R103	ERJ6GEYJ122	1.2K 1/10
R104	ERJ6GEYJ471	470 1/10
R105	RRJ6GCJ102TE	1K 1/6
R106	RRJ6GCJ102TE	1K 1/6
R108	ERJ6GEYJ224V	220K 1/10
R110	ERDS2TJ222	2.2K 1/4
R111	ERJ6GEYJ154V	150K 1/10
R113	ERJ6GEYJ472V	4.7K 1/10
R114	ERJ6GEYJ683V	68K 1/10
R116	ERJ6GEYJ332V	3.3K 1/10
R117	ERJ6GEYJ123	12K 1/10
R118	ERJ6GEYJ333V	33K 1/10
R119	RRJ6GCJ223TE	22K 1/6
R122	ERDS2TJ104	100K 1/4
R123	ERJ6GEYJ470V	47 1/10
R124	RRJ6GCJ103TE	10K 1/6
R125	RRJ6GCJ222TE	2.2K 1/6
R127	ERDS2TJ681	680 1/4
R128	RRJ6GCJ103TE	10K 1/6
CAPACITORS(VALUE,VOLTAGE)		
C101	ECEA1CKS220I	22 16
C102	ECEA1HKS010I	1 50
C103	ECEA1CKS220I	22 16
C106	RCUV1E104ZF	0.1 25
C107	ECEA0GKS101I	100 4
C108	ECEA0JKS470I	47 6.3
C109	ECEA1HKS010I	1 50
C110	RCUV1H681KB	680P 50
C111	ECUV1C224KR	0.22 16
C112	RCUV1H331KB	330P 50
C113	ECEA1HSN010I	1 50
C114	RCUV1E333KB	0.033 25
C115	ECEA1HSN010I	1 50
C116	RCUV1E333KB	0.033 25
C117	ECBT1H102KB5	0.001 50
C119	ECEA1CKN4R7I	4.7 16
C120	ECEA1CKN4R7I	4.7 16
C122	ECEA0JKS220I	22 6.3
C123	RCUV1E104ZF	0.1 25
C124	ECUV1E823KB	0.082 25
C125	ECUV1C224KR	0.22 16
C127	ECEA0JKF101I	100 6.3
C128	ECEA1CKA101I	100 16
C132	ECUV1E104KB	0.1 25
C133	RCUV1H330KC	33P 50
C134	ECUV1C224KR	0.22 16
C135	ECUV1C224KR	0.22 16
C136	ECEA0GKS101I	100 4
C138	RCUV1E104ZF	0.1 25
C139	RCUV1H470KC	47P 50
C140	RCUV1E103KB	0.01 25
C141	RCUV1H470KC	47P 50
C142	RCUV1H470KC	47P 50
C143	RCUV1H470KC	47P 50
C144	RCUV1H470KC	47P 50
C145	ECEA0JKF101I	100 6.3
C146	RCUV1H181KC	180P 50
C147	RCUV1H472KB	0.0047 50
C148	ECEA1ESN4R7I	4.7 25
C149	RCUV1E104ZF	0.1 25
C150	RCUV1E103KB	0.01 25

■ REPLACEMENT PARTS LIST

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Parts without these indications can be used for all areas.
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Supply period for three years from termination of production.
* 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 spezifizierteeinheit ausgetauscht werden.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC11	LM2940T5	I.C, REGULATOR
IC52	SVIM5218FPTA	I.C., STABILIZER
IC301	MN6622	I.C, DIGITAL SIGNAL PROCESSOR
IC302	SM5813	I.C, DIGTAL FILTER
IC303	LC3517BML15T	I.C, 16K RAM
IC304	MN53015PEU	I.C, 4DAC GATE ARRAY
IC305	T0TX174	I.C, TRANSMISSION MODULE
IC401	MN1554PEZ-1	I.C, SYSTEM CONTROL
IC402	SVIM51953BL	I.C, RESET CONT
IC403	SVIBA4558F	I.C, MOTOR DRIVE
IC601	MB88724BPEV1	I.C, FL DRIVE/SYSTEM CONTROL
IC602	HC-MD10E	I.C, REMOTE SENSOR
IC801	PCM56P-J	I.C, D/A CONVERTER
IC802	PCM56P-J	I.C, D/A CONVERTER
IC803	PCM56P-J	I.C, D/A CONVERTER
IC804	PCM56P-J	I.C, D/A CONVERTER
IC805	SVIM5238FP	I.C, CLASS AA BUFFER AMP
IC806	SVIM5238FP	I.C, CLASS AA BUFFER AMP
IC807	SVIM5238FP	I.C, CLASS AA BUFFER AMP
IC808	SVIM5238FP	I.C, CLASS AA BUFFER AMP
IC809	SVINJM5532M	I.C, L.P.F. AMP
IC810	SVINJM5532M	I.C, L.P.F. AMP
IC811	SVIM5238FP	I.C, BUFFER AMP
IC812	SVIM5238FP	I.C, BUFFER AMP
IC813	SVIUPD4053G1	I.C, SWITCHING
IC814	SVIUPD4053G1	I.C, SWITCHING
IC815	M5218FPTA	I.C, BUFFER AMP
IC901	M5218FPTA	I.C, HEADPHONES AMP
IC902	M5218FPTA	I.C, HEADPHONES AMP
TRANSISTORS		
Q12	2SB1185EF	TRANSISTOR
Q14	2SB1238QSTV6	TRANSISTOR
Q51	2SC1846-Q	TRANSISTOR
Q52	2SA885-QRS	TRANSISTOR
Q403	DTC114EST	TRANSISTOR
Q404	DTA124EST	TRANSISTOR
Q451	2SD1862PRTV6	TRANSISTOR
Q452	2SB1240PRTV6	TRANSISTOR
Q453	2SD1862PRTV6	TRANSISTOR
Q454	2SB1240PRTV6	TRANSISTOR
Q601	DTC124EST	TRANSISTOR
Q602	DTC124EST	TRANSISTOR
Q603	DTC124EST	TRANSISTOR
Q604	2SC3311A-Q	TRANSISTOR
Q801	DTA114YST	TRANSISTOR
Q802	DTA114YST	TRANSISTOR
Q803	DTC114EST	TRANSISTOR
Q804	DTC114EST	TRANSISTOR
Q901	2SD1450R	TRANSISTOR
Q902	2SD1450R	TRANSISTOR
Q903	2SD1450R	TRANSISTOR
Q904	2SD1450R	TRANSISTOR
Q905	DTA114YST	TRANSISTOR
DIODES		
D11 ⚠	SVD1SR35200A	DIODE
D12 ⚠	SVD1SR35200A	DIODE
D13 ⚠	SVD1SR35200A	DIODE
D14 ⚠	SVD1SR35200A	DIODE
D15 ⚠	SVD1SR35200A	DIODE
D16 ⚠	SVD1SR35200A	DIODE
D17 ⚠	SVD1SR35200A	DIODE
D18 ⚠	SVD1SR35200A	DIODE
D20	MA4056-M	DIODE
D26	MA4330M	DIODE

Ref. No.	Part No.	Description
D28	MA4033M	DIODE
D29	MA4033M	DIODE
D51	MA4091-M	DIODE
D52	MA4091-M	DIODE
D52-A ⚠	SVDRDF02M	DIODE
D53	MA165	DIODE
D54	MA165	DIODE
D55	MA165	DIODE
D56	MA165	DIODE
D401 ⚠	SVD1SR35200A	DIODE
D402	MA165	DIODE
D404	MA4051-M	DIODE
D405	MA4051-M	DIODE
D601	MA165	DIODE
D602	MA165	DIODE
D603	MA165	DIODE
D604	MA165	DIODE
D605	MA165	DIODE
D606	MA165	DIODE
D607	MA165	DIODE
D608	MA165	DIODE
D609	MA165	DIODE
D610	MA165	DIODE
D611	MA165	DIODE
D612	MA165	DIODE
D613	MA165	DIODE
D614	MA165	DIODE
D615	SVGDPG7851Y	L.E.D
D616	SVGDAY7851	L.E.D
D617	SVDSLR-54MW4	L.E.D
D618	SVDSLR-54MW4	L.E.D
D619	SVDSLR-54MW4	L.E.D
D801	MA165	DIODE
D802	MA165	DIODE
D901	MA4091-M	DIODE
I.C.PROTECTORS		
SJ12 ⚠	SRUN15	I.C.PROTECTOR
SJ13 ⚠	SRUN15	I.C.PROTECTOR
SJ14 ⚠	SRUN15	I.C.PROTECTOR
SJ51 ⚠	SRUN15	I.C.PROTECTOR
SJ52 ⚠	SRUN15	I.C.PROTECTOR
VARIABLE RESISTORS		
VR601	EVQWVP02504E	V.R, SEARCH DIAL
VR801	EVND3AA00B15	V.R, DISTORTION ADJ.
VR802	EVND3AA00B15	V.R, DISTORTION ADJ.
VR803	EVND3AA00B53	V.R, DAC GAIN ADJ.
VR804	EVND3AA00B53	V.R, DAC GAIN ADJ.
VR805	EVN38CA00B15	V.R, OFFSET ADJ.
VR806	EVN38CA00B15	V.R, OFFSET ADJ.
VR901	EVU57A022A14	V.R, HEADPHONES
COILS AND TRANSFORMERS		
L1 ⚠	SLQX400-D	COIL
L2 ⚠	SLQX400-D	COIL
L301	ELEPK1R0KA	COIL
L302	ELEPK4R7KA	COIL
L303	ELEPK4R7KA	COIL
L304	ELEPK4R7KA	COIL
L305	EXCELDR35V	COMBINATION PART
L306	EXCELDR35V	COMBINATION PART
L307	ELEPK4R7KA	COIL
L801	ELEV471KA	COIL
L802	ELEV471KA	COIL
L803	EXCELDR35V	COMBINATION PART
L804	EXCELDR35V	COMBINATION PART
L901	ELEV2R7KA	COIL

Ref. No.	Part No.	Description
L902	ELEV2R7KA	COIL
L903	ELEV2R7KA	COIL
T1 ⚠ (E, EB, EF, EI) (EH, EG)	SLTD5V086E	POWER TRANSFORMER
T1 ⚠ (EK, XA, XB) (PA, PE, PC)	SLTD5V087G	POWER TRANSFORMER
T1 ⚠ (XL)	SLTD5V088X	POWER TRANSFORMER
OSCILLATORS		
X301	SVQAT1693	16.9344MHZ
DISPLAYS		
FL601	SAD14MT08GK	DISPLAY
FUSES		
F11 ⚠	XBA2C12TR0	FUSE(250V,T125MA)
F12 ⚠	XBA2C12TR0	FUSE(250V,T125MA)
SWITCHES		
S1 ⚠	ESB8249V	SW, POWER
S2 ⚠ (EK, XA, XB) (PA, PE, PC)	SSR187-1	SW, VOLTAGE SELECTER
S101	SSPD17	SW, LOADING DET
S102	SSPD18	SW, LOADING DET
S601	EVQQS405K	SW, EDIT TAPELENGTH
S602	EVQQS405K	SW, RANDOM
S603	EVQQS405K	SW, AUTO CUE/EDIT SPASE
S604	EVQQS405K	SW, DIGITAL OUTPUT
S606	EVQQS405K	SW, PROGRAM
S609	EVQQS405K	SW, WINDOW
S610	EVQQS405K	SW, DISC LINK
S611	EVQQS405K	SW, REPEAT
S613	EVQQS405K	SW, DISPLAY MODE
S614	EVQQS405K	SW, RECALL
S617	EVQQS405K	SW, SIDE A/B
S619	EVQQS405K	SW, A-B REPEAT
S620	EVQQS405K	SW, PEAK SEARCH
S621	EVQQS405K	SW, TIME MODE
S622	EVQQS405K	SW, CLEAR
S625	EVQQS405K	SW, NO1
S626	EVQQS405K	SW, NO5
S627	EVQQS405K	SW, NO9
S628	EVQQS405K	SW, NO13
S629	EVQQS405K	SW, NO17
S630	EVQQS405K	SW, NO0
S632	EVQQS405K	SW, OPEN/CLOSE
S633	EVQQS405K	SW, NO2
S634	EVQQS405K	SW, NO6
S635	EVQQS405K	SW, NO10
S636	EVQQS405K	SW, NO14
S637	EVQQS405K	SW, NO18
S638	EVQQS405K	SW, +10
S640	EVQQS405K	SW, STOP
S641	EVQQS405K	SW, NO3
S642	EVQQS405K	SW, NO7
S643	EVQQS405K	SW, NO11
S644	EVQQS405K	SW, NO15
S645	EVQQS405K	SW, NO19
S646	EVQQS405K	SW, I.F.SKIP
S647	EVQQS405K	SW, F.SKIP
S648	EVQQS405K	SW, PAUSE
S649	EVQQS405K	SW, NO4
S650	EVQQS405K	SW, NO8
S651	EVQQS405K	SW, NO12
S652	EVQQS405K	SW, NO16
S653	EVQQS405K	SW, NO20
S654	EVQQS405K	SW, I.R.SKIP
S655	EVQQS405K	SW, R.SKIP
S656	EVQQS405K	SW, PLAY
S657	RSS3A18YA-H	SW, TIMER
RELAYS		
RLY801	AG80239	RELAY
RLY802	AG80239	RELAY
JACKS		
JK801	SJFD4-1	TERMINAL PLATE
JK901	SJJD19	JACK
SERVO P.C.B		
INTEGRATED CIRCUITS		
IC101	AN8373S	I.C, SERVO AMP
IC102	AN8374S	I.C, SERVO PROCESSOR
IC103	AN8377	I.C, B.T.L DRIVE
IC104	LM2940T5M	I.C, RESET
TRANSISTORS		
Q101	2SA1547QSTV2	TRANSISTOR
VARIABLE RESISTORS		
VR101	EVND3AA00B14	V.R, BEST EYE ADJ.
VR102	EVND3AA00B14	V.R, TRACKING GAIN ADJ.
VR103	EVND3AA00B14	V.R, TRACKING OFFSET ADJ.
VR104	EVND3AA00B14	V.R, FOCUS GAIN ADJ.
VR105	EVND3AA00B14	V.R, FOCUS OFFSET ADJ.
VR106	EVND3AA00B24	V.R, TRACKING BALANCE ADJ.
MAGNET RESISTOR ELEMENTS		
RA1	EWS7M0A00Q53	RESISTANCE UNIT

Ref. No.	Part No.	Description
REMOTE CONTROL		
INTEGRATED CIRCUITS		
IC1	MN6030G	I.C
TRANSISTORS		
Q1	UN7231	TRANSISTOR
DIODES		
D1	LN66-S	L.E.D
D2	MA151WK	DIODE
D3	MA151WK	DIODE
D4	MA151WK	DIODE
D5	MA151WK	DIODE
D6	MA151WK	DIODE
D7	MA151WK	DIODE
D8	MA151WK	DIODE
D9	MA151WK	DIODE
D10	MA151WA	DIODE
D11	MA151WA	DIODE
OSCILLATOR		
X1	CSB420PB1	OSCILLATOR

Ref. No.	Part No.	Description
RESISTORS		
R1	ERD25TLJ1R0U	RESISTOR
CAPACITORS		
C1	ECUV1H471KCG	CAPACITOR
C2	ECUV1H121KCG	CAPACITOR
C3	ECEA0GK101	ELECTROLYTIC, 100㎌, 4V
MECHANISM PARTS		
101	UR64VCS719	UPPER CABINET
102	UR64CS365	LOWER CABINET
103	UR64EC366	BATTERY COVER
104	UR64CT369	RUBBER CONTACT
105	UR52SB327	PLATE(SMOKE)
106	UR64TD374	BATTERY TERMINAL(COMMON)
107	UR64TD372	BATTERY TERMINAL (+)
108	UR64TD373	BATTERY TERMINAL (-)
109	SBCLP990-KN1	BUTTON(A)
110	SBCLP990-KN2	BUTTON(B)
111	XTS26+10GFZ	SCREW
REMOTE CONTROL ASS'Y		
RC1	EUR64729	REMOTE CONTROL

Ref. No.	Part No.	Description
PACKING MATERIAL		
P1 (E, EH, EB, EI) (EG, EK, XA) (XB, XL, PA) (PE, PC)	SPND333	CARTON BOX
P1 (EF)	SPND335	CARTON BOX
P2	SPSD180	PAD
P3	SPSD181	PAD
P4	SPSD196	PAD
P5	SPSD197	PAD
P6	SPSD152	ACCESSORY BOX
P7	XZB60X60A01	PROTECTION BAG(UNIT)
P8	XZB23X20C03	PROTECTION BAG
P9	XZB26X17C03	PROTECTION BAG(CORDS)
ACCESSORIES		
A1 (EF, EK, XA) (XL)	SQUD365	INSTRUCTION MANUAL
A1 (EG)	SQUD367	INSTRUCTION MANUAL
A1	SQUD368	INSTRUCTION MANUAL

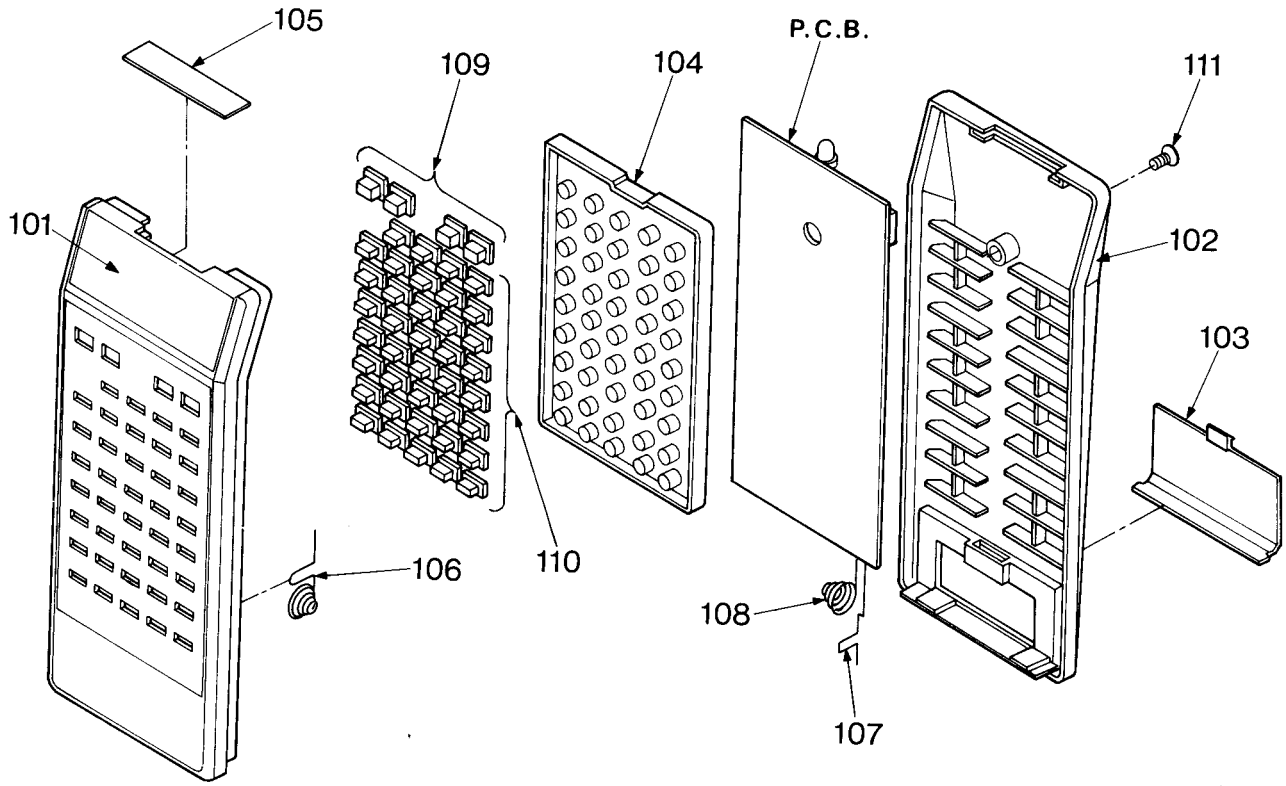
Ref. No.	Part No.	Description
(EI)		
A1 (E, EB, EH)	SQULP999-E	INSTRUCTION MANUAL
A1 (PA, PE, PC)	SQULP999-PA	INSTRUCTION MANUAL
A1 (XB)	SQULP999-XB	INSTRUCTION MANUAL
A2 ⚠ (XA, PA, PE) (PC)	SJA168	POWER CORD
A2 ⚠ (XL)	SJA173	POWER CORD
A2 ⚠ (XB)	SJA183	POWER CORD
A2 ⚠ (E, EB, EH, EG) (EI, EF)	SJA187	POWER CORD
A2 ⚠ (EK)	SJA193	POWER CORD
A3	SJP2249-4	CORD
A4	SJPD16	OPTICAL OUTPUT CORD
A5	UM-4NE/2S	BATTERY
A6 ⚠ (XA, XB, PA) (PE, PC)	RJP120ZBS-H	AC PLUG ADAPTOR

1 2 3 4 5

A B C D E F G

■ EXPLODED VIEW

• **Remote control unit parts**



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■ REPLACEMENT PARTS LIST

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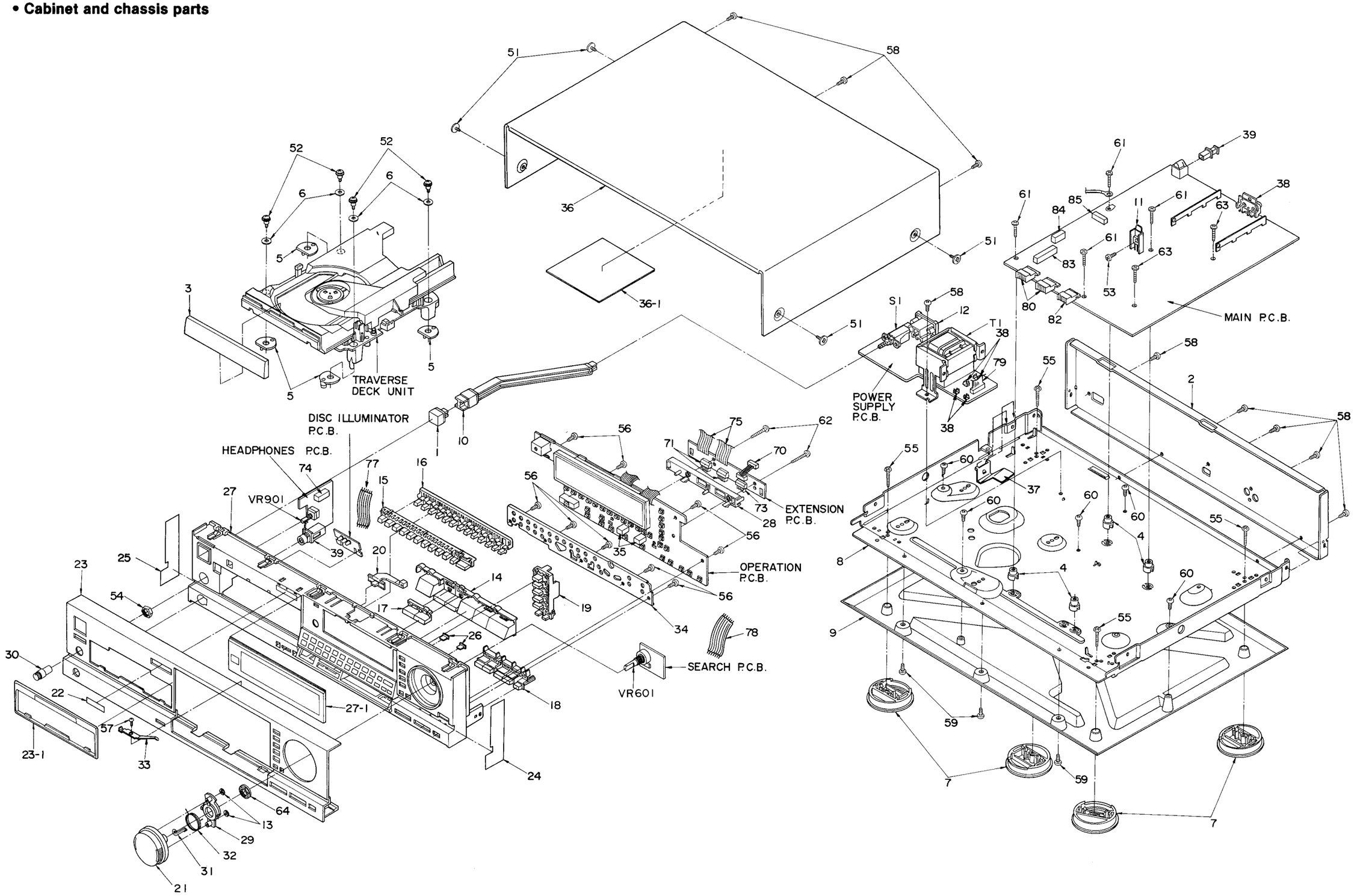
Ref. No.	Part No.	Description
CABINET AND CHASSIS		
1	SBC666-1	BUTTON
2	SGPD720ZF5A	REAR PANEL
(XA)		
2	SGPLP999-KE	REAR PANEL
(E)		
2	SGPLP999-KEF	REAR PANEL
(EF, EH, EB)		
(EI)		
2	SGPLP999-KEG	REAR PANEL
(EG)		
2	SGPLP999-KEK	REAR PANEL
(EK)		
2	SGPLP999-KPA	REAR PANEL
(PA, PE, PC)		
2	SGPLP999-KXL	REAR PANEL
(XL, XB)		
3	SGXD3330ZK0A	ORNAMENT
4	SHE185-2	HOLDER
5	SHGD171	RUBBER
6	SHGD174	RUBBER SPACER
7	SKLD8-E	FOOT
8	SKUD193ZF2A	CHASSIS
9	SKUD230KF0A	BOTTOM COVER
10	SUBD12	POWER SWITCH ROD
11	SMYD6	HEAT SHIELD
12 ⚠	SJSD16	AC INLET
(XL)		
12 ⚠	SJS9236	AC INLET
(E, EF, EH, EB)		
(EG, EI, EK)		
(XB, XA, PA)		
(PE, PC)		
13	CSTW-2	WASHER
14	SBCD4760ZK0B	BUTTON
15	SBCD4770ZK0B	BUTTON
16	SBCD4780ZK0B	BUTTON
17	SBCD4790ZK0B	BUTTON
18	SBCD4811ZK0A	BUTTON
19	SBCD4840ZK0A	BUTTON
20	SBDD92ZK0A	KNOB
21	SBNLP777-KE	KNOB
22	SGUD214	ORNAMENT
23	SGWLP999-KE	FRONT PANEL

Ref. No.	Part No.	Description
23-1	SGXLP777-K	ORNAMENT
24	SGXD3160KE0A	ORNAMENT(R)
25	SGXD3170KE0A	ORNAMENT(L)
26	SHRD133	LED BLOCK
27	SGYLP777-KE	FRONT GRILL
27-1	SGUD192	FILTER
28	SHRD197	HOLDER
29	SHRD202	SPRING
30	SBN1161-2	KNOB
31	SHR9451	SPACER
32	SUSD162	SPRING
33	SUSD167	PLATE
34	SUWD94-1	BRACKET
35	SHRD169	LED HOLDER
36	SYQD772KME1	CABINET
36-1	SHGD35	RUBBER CUSHION
37	SUWD116	BRACKET
38	SJT390	FUSE HOLDER
39	VJA1024	CAP
51	SNE2129-3	SCREW
52	SNSD17	SCREW
53	XTN3+8J	SCREW
54	XNS7	NUT
55	XTB3+20G	SCREW
56	XTB3+8G	SCREW
57	XTN17+3JFN	SCREW
58	XTBS3+8JFZ1	SCREW
59	XTB3+10JFZ	SCREW
60	XTB3+12G	SCREW
61	XTB3+16JFZ	SCREW
62	XTB3+20G	SCREW
63	XTB3+8JFZ	SCREW
64	SNE4021	NUT
70	SWKD772061	CONNECTOR(6P)BT601
71	SJT30947WL	CONNECTOR (9P)CN601,602
73	SJT30647WL	CONNECTOR(6P)CN603
74	EMCS0650ZL	CONNECTOR(6P), CN604
75	SIKD772091	FLAT CABLE(9P)
77	RWJ1003050KK	FLAT CABLE(3P)
78	SIKD552061	FLAT CABLE
79	SWKD530091	CONNECTOR(9P), BT1
80	SJS50980WL	SOCKET(9P)CN401,402
82	SJS50680WL	SOCKET(6P)CN403
83	SJSD2221	SOCKET(22P)CN404
84	SJT30543-V	CONNECTOR(5P)CN405
85	EMCS0950Z	CONNECTOR(9P)CN12

■ EXPLODED VIEW

• **Cabinet and chassis parts**



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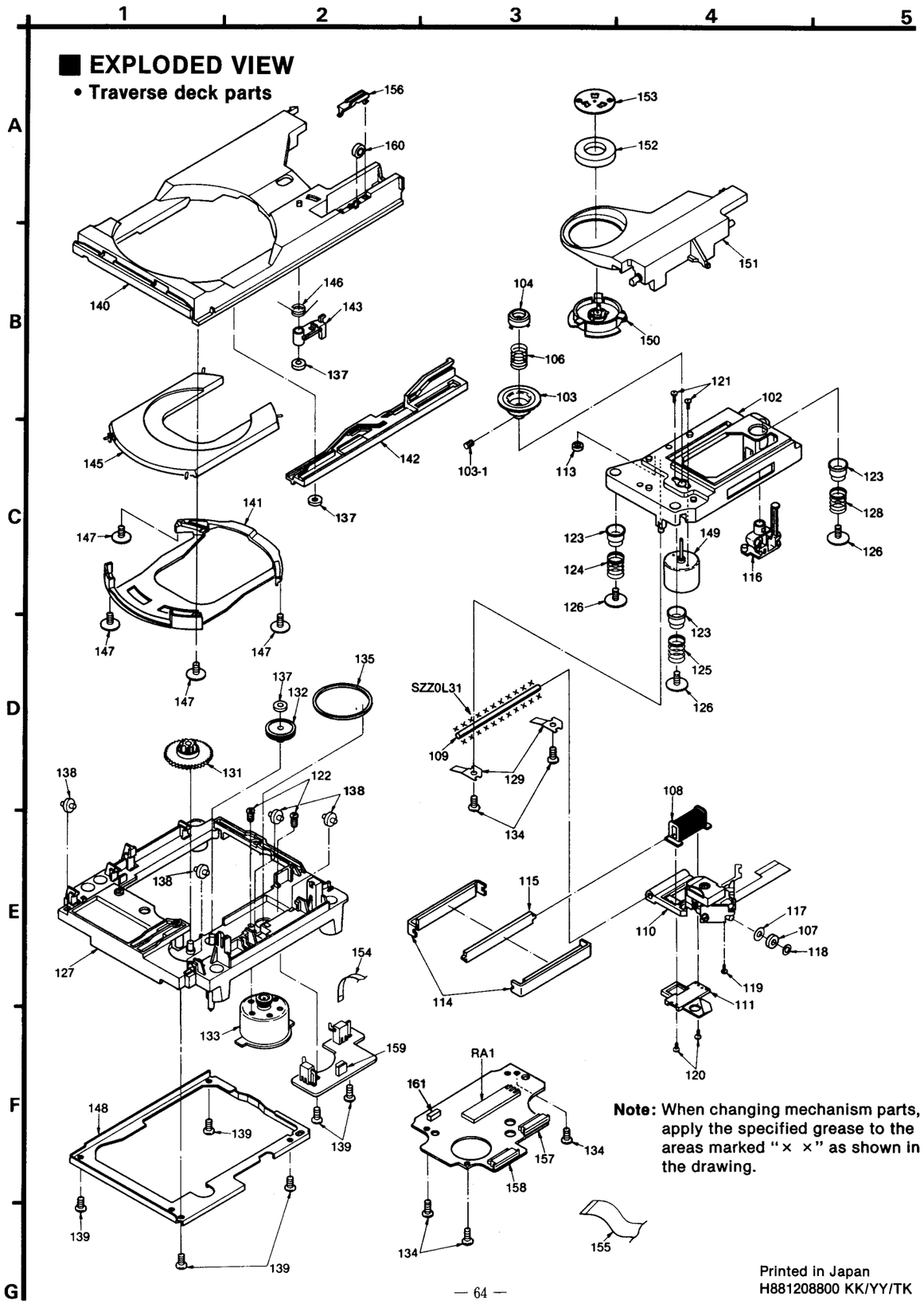
Ref. No.		Part No.	Description
TRAVERSE			
TRAVERSE DECK			
102		SISD22-1	TRAVERSE BASE
103		SDOD28-1E	TURNTABLE
103-1		XXE26D5	SCREW
104		SDOD29-2	RING
106		SRQA010N04	SPRING
107		SORD37	ROLLER
108		SORD38-E	COIL
109		SUXD123-1	GUIDE SHAFT
110	⚠	SOAD70A	OPTICAL PICKUP
111		SHRD176-E	COIL HOLDER
113		SHGD148	STOPPER
114		SOYD21-E	YOKE
115		SOYD22	YOKE
116		SHRD177-1	LOCK UNIT
117		SHWD33	WASHER
118		SHWD34	WASHER
119		SNSD31	SCREW
120		XTN2+5G	SCREW
121		XYN2+C8	SCREW
122		XYN26+J6	SCREW
123		SHGD153-1	CUSHION RUBBER
124		SUSD136-1	SPRING
125		SUSD137-1	SPRING
126		SNSD33	SCREW
127		SIWLP555-KN	LOADING BASE
128		SUSD145-1	SPRING
129		SUWD112	GUIDE SHAFT HOLDER
131		SDGD58	MAIN GEAR
132		SDGD59-2	GEAR
133		SIRD94-E	LOADING MOTOR
134		XTB3+10G	SCREW
135		SMBD7	BELT
137		SFUMZ15R61	WASHER
138		SDRD14	ROLLER
139		XTB3+8G	SCREW
140		SIRD97-2E	HOLDER
141		SIRD107-1	TRAY BASE
142		SIRD40-2	RACK GEAR
143		SIRD96	LOCK LEVER
145		SIRD98-2	DISC TRAY
146		SUSD83	SPRING
147		SNSD36	SCREW
148		SIWD105	BRACKET
149		SJGDRF310T-2	SPINDLE MOTOR
150		SIRD51-1	HOLDER
151		SIRD42-3	LEAD WIRE CLAMP
152		SOMD4	MAGNET
153		SOYD2	YOKE
154		SIKD150051	FLAT CABLE
155		SIKD150221-1	FLAT CABLE
156		SHRD150	ROLLER HOLDER
157		SJSD1722M	SOCKET(17P)
158		SJSD2222M	SOCKET(22P)
159		SJT30543-V	CONNECTOR(5P)
160		SDRD12	ROLLER
161		EMCS0552MP	CONNECTOR(5P)

■ EXPLODED VIEW

• **Traverse deck parts**



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

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Compact Disc Player

SL-P999

DEUTSCH

■ MESSUNGEN UND ABGLEICHUNGEN

Zur Beachtung:

- Es ist sehr gefährlich, in den Laserstrahl zu schauen oder diesen zu berühren. (Laser-Strahlung ist unsichtbar.)
  Wenn das Gerät eingeschaltet ist, wird Laser-Strahlung von der Abtasterlinse abgegeben. Vermeiden Sie Kontakt mit dem Laserstrahl, insbesondere beim Durchführen von Abgleichungen.

Meßinstrumente und Spezialwerkzeuge

- Servoverstärkungs-Einsteller (SZZP1017F)
  ...Siehe Seite 18
- Testdiscs

1. Spielbarkeit-Testdisc (SZZP1054C oder SZZP1014F)
2. Ungleichmäßige Testdisc (SZZP1056C)
3. Schwarzstreifen-Testdisc (SZZP1057C)

- Normale Disc
- Doppelstrahl-Oszilloskop mit einer Bandbreite von 30MHz oder größer (mit EXT-Trigger und 1: 1 Meßfühler)
- Audiofrequenz-(AF)-Oszillator
- Elektronische Wechselstrom-Voltmeter
- Verzerrungs-Analystator
- Konversionsstecker (SZZP1032F)
- Inbusschlüssel (M2, 0)
- Inbusschlüssel (M1, 27)
- 0.9mm Abstandslehre (RZZ0297)

Die Abgleichungen, abhängig vom auszuwechselnden Teil wie folgt durchführen:

(1) Spindelmotor ..... Punkte 1, 3 bis 8
(2) Discteller ..... Punkte 1, 3 bis 8
(3) Optischer Abtaster ..... Punkte 2 bis 8

Einstellverfahren

- Wenn der Spindelmotor oder der Discteller ersetzt wurde, die folgenden Einstellungen Durchfähren:

(1) EINSTELLUNG DER DISCTELLER-HÖHE

1. Die 0,9mm Abstandslehre (RZZ0297) zwischen dem Discteller und der Ladebasis einschieben (siehe die Abbildung rechts).
2. Die Discteller-Halteschraube mit dem 1,27mm Inbusschlüssel anziehen.
3. Den Kanal-1-Meßfühler des Oszilloskops zwischen den Klemmen FEG (+) von VR104 und V.REF (−) von VR106 anschließen.
   (Hinweis: An der Klemme V.REF liegt eine Spannung von 2,5V an. Darauf achten, das Chassis des CD-Spielers nicht mit der Oszilloskop-Masse kurzzuschließen.)
   Oszilloskop-Einstellung:
   VOLT 50mV
   KIPP 1ms
   Eingangskopplung ..... Gleichstrom
4. Die Gleichstrom-Nullbalance des Oszilloskops einstellen.
5. Die Spannungsversorgung des CD-Spielers einschalten und die Testdisc (SZZP1014F oder SZZP1054C) wiedergeben.
6. Die Spannungsamplitude des Signals auf dem Oszilloskop messen.

Hinweis 1. Wenn die gemessene Amplitude im Bereich von +/−15mV liegt, ist die Discteller-Höhe korrekt.
Wenn der Meßwert außerhalb dieses Bereiches liegt, die Discteller-Höhe mit der Abstandslehre einstellen.
Wenn die Amplitude größer als +15mV ist, den Discteller absenken.
Wenn die Amplitude Kleiner als −15mV ist, den Discteller anheben.
Hinweis 2. Wenn der gemessene Wert stark nach oben oder unten vom oben angegebenen Bereich abweicht, **VR105** auf oder nahe der Mitte einstellen und dann erneut versuchen, die Höhe einzustellen. (Indiesem Fall muß auch der Fokusversatz eingestellt werden.)

D

(2) MECHANISCHE EINSTELLUNG

1. Den Kanal-1-Meßfühler des Oszilloskops zwischen TJ101 (+) und TJ102 (−) der Servo-Platine anschließen.
   Oszilloskop-Einstellung:
   VOLT 100mV
   KIPP 0,5µs
   Eingangskopplung ..... Wechselstrom
2. Die Spannungsversorgung des CD-Spielers einschalten und Titel **9** der Testdisc (SZZP1056C) wiedergeben.
3. Den CD-Spieler in der Wiedergabe-Betriebsart lassen und ihn auf seine rechte Seite stellen, wie rechts dargestellt.
4. Die beiden Schrauben für mechanische Einstellung abwechselnd mit dem 2,0mm Inbusschlüssel einstellen, bis die Amplitudenschwankung des HF-Signals auf dem Oszilloskop minimal wird.
5. Nach Durchführung der Einstellung die mechanischen Einstellungen mit Sicherungsfarbe (RZZOL01) sichern.

(3) EINSTELLUNG FÜR BESTES AUGENMUSTER (PD-BALANCE)

1. Den Kanal-1-Meßfühler des Oszilloskops zwischen TJ101 (+) und TJ102 (−) der Servo-Platine anschließen.
   Oszilloskop-Einstellung:
   VOLT 100mV
   KIPP 0,5µs
   Eingangskopplung ..... Wechselstrom
2. Die Spannungsversorgung des CD-Spielers einschalten und den 0,5mm schwarzen Punkt auf der Testdisc (SZZP1014F oder SZZP1054C) wiedergeben.
3. **VR101** einstellen, bis die Augenmuster-Amplitude des HF-Signals maximal wird.

(4) EINSTELLUNG DER FOKUSVERSTÄRKUNG

1. Den Servoverstärkungs-Einsteller an den CD-Spieler anschließen (siehe Seite 18).
2. Den Verstärkungsschalter des Servoverstärkungs-Einstellers auf Position "**2**" und den ON/OFF-Schalter auf **ON** stellen.
3. Den Ausgang des AF-Oszillators auf **825Hz, 150mVs-s** einstellen und den AF-Oszillator zwischen den Klemmen OSC und GND des Servoverstärkungs-Einstellers anschließen.
4. Den Kanal-1-und den Kanal-2-Meßfühler des Oszilloskops an die Klemmen TP1 bzw. TP2 des Servoverstärkungs-Einstellers anschließen (TP3 ist GND).
   Oszilloskop-Einstellung:
   VOLT ..... 100mV (beide Kanäle)
   KIPP 1ms
   Eingangskopplung ..... Wechselstrom
5. Die Testdisc (SZZP1014F oder SZZP1054C) wiedergeben.
6. Den Verstärkungsschalter des Servoverstärkungs-Einstellers auf Position "**3**" einstellen, dann erscheint ein **825Hz** Signal auf dem Oszilloskop.
   VR104 einstellen, bis die Signalamplituden auf beiden Kanälen identisch zueinander werden.
7. Den Verstärkungsschalter zurück auf Position "**2**" stellen.

(5) EINSTELLUNG DER SPURHALTUNGSVERSTÄRKUNG

1. Den Ausgang des AF-Oszillators auf **1,1kHz, 150mVs-s** einstellen und den AF-Oszillator zwischen den Klemmen OSC und GND des Servoverstärkungs-Einstellers anschließen.
2. Den Kanal-1-und den Kanal-2-Meßfühler des Oszilloskops an die Klemmen TP1 bzw. TP2 des Servoverstärkungs-Einstellers anschließen (TP3 ist GND).
   Oszilloskop-Einstellung:
   VOLT ..... 100mV (beide Kanäle)
   KIPP 1ms
   Eingangskopplung ..... Wechselstrom
3. Die Spannungsversorgung des CD-Spielers einschalten und die Testdisc (SZZP1014F oder SZZP1054C) wiedergeben.
4. Den Verstärkungsschalter des Servoverstärkungs-Einstellers auf Position "**1**" einstellen, dann erscheint ein **1,1kHz** Signal auf dem Oszilloskop.
   VR102 einstellen, bis die Signalamplituden auf beiden Kanälen identisch zueinander werden.
5. Den Verstärkungsschalter zurück auf Position "**2**" stellen.

(6) FOKUSVERSATZ-EINSTELLUNG

Hinweis: Sicherstellen, daß der Verstärkungsschalter des Servoverstärkungs-Einstellers auf Position "**2**" eingestellt ist.

1. Den Kanal-1-Meßfühler des Oszilloskops zwischen **TJ101** (+) und **TJ102** (−) auf der Servo-Platine und seinen Kanal-2-Meßfühler (+) an die Klemme **FEG** des VR104 anschließen.
   Oszilloskop-Einstellung:
   VOLT ..... 100mV (Kanal 1)
   100mV (Kanal 2)
   KIPP 0,5ms
   Eingangskopplung ..... Wechselstrom
   (Kanal 1 und Kanal 2)
   Triggermodus ..... NORM
   (Triggerung von Kanal 1)
2. Die Spannungsversorgung des CD-Spielers einschalten und Titel **9** der Testdisc (SZZP1057C) wiedergeben.
3. Kanal 1 des Oszilloskops triggern, so daß die folgenden Wellenformen beobachtet werden. **VR105** einstellen, bis der Durchhang in der Hüllkurve des HF-Signals auf Kanal 1 gleichmäßig und die Signalamplitude auf Kanal minimal wird, d.h. wenn Amplitude A der Amplitude B gleicht.

(7) SPURHALTEVERSATZ-EINSTELLUNG

Hinweis: Sicherstellen, daß der Verstärkungsschalter des Servoverstärkungs-Einstellers auf Position "**2**" eingestellt ist.

1. Den Kanal-1-Meßfühler des Oszilloskops zwischen **TJ101** (+) und **TJ102** (−) auf der Servo-Platine und seinen Kanal-2-Meßfühler (+) an die Klemme **TEG** des VR102 anschließen.
   Oszilloskop-Einstellung:
   VOLT ..... 100mV (Kanal 1)
   200mV (Kanal 2)
   KIPP 0,5ms
   Eingangskopplung ..... Wechselstrom
   (Kanal 1 und Kanal 2)
   Triggermodus ..... NORM
   (Triggerung von Kanal 1)
2. Die Spannungsversorgung des CD-Spielers einschalten und Titel **9** der Testdisc (SZZP1057C) wiedergeben.
3. Kanal 1 des Oszilloskops triggern, so daß die folgenden Wellenformen beobachtet werden. **VR103** einstellen, bis der Durchhang in der Hüllkurve des HF-Signals auf Kanal 1 gleichmäßig und die Signalamplitude auf Kanal minimal wird, d.h. wenn Amplitude A der Amplitude B gleicht.

(8) EINSTELLUNG DER SPURHALTE-BALANCE

1. Sicherstellen, daß der Verstärkungsschalter des Servoverstärkungs-Einstellers auf Position "**2**" eingestellt ist.
2. Den Ausgang des AF-Oszillators auf **1,1kHz, 600mVs-s** einstellen und den AF-Oszillator zwischen den Klemmen OSC und GND des Servoverstärkungs-Einstellers anschließen.
3. Den Kanal-1-Meßfühler des Oszilloskops zwischen **TJ101** (+) und **TJ102** (−) auf der Servo-Platine und den Kanal-2-Meßfühler (+) an die Klemme OSC auf dem Servoverstärkungs-Einsteller anschließen.
   Oszilloskop-Einstellung:
   VOLT ..... 100mV (Kanal 1)
   KIPP 0,5ms
   Eingangskopplung ..... Wechselstrom
   (Kanal 1 und Kanal 2)
   Triggermodus ..... NORM
   (Triggerung von Kanal 2)
4. Die Spannungsversorgung des CD-Spielers einschalten und die Testdisc (SZZP1014F oder SZZP1054C) wiedergeben.
5. Den Verstärkungsschalter des Servoverstärkungs-Einstellers auf Position "**1**" stellen und **VR106** einstellen, bis das in der Signalwellenform auf Kanal 1 enthaltene Zittern minimal wird, wie unten dargestellt.
6. Die Kabel des Servoverstärkungs-Einstellers vom CD-Spieler abtrennen.

(9) ÜBERPRÜFUNG DES WIEDERGABEBETRIEBS NACH DER EINSTELLUNG

• Überprüfung des Überspringsuchlaufs

1. Eine normale Disc, die Musik enthält, wiedergeben.
2. Die Überspring-Taste drücken und auf normalen Überspringsuchlauf prüfen (in Vorwärts- und in Rückwärtsrichtung).

• Überprüfung des manuellen Suchlaufs

1. Eine normale Disc, die Musik enthält, wiedergeben.
2. Die Taste für manuellen Suchlauf drücken und auf gleichmäßigen manuellen Suchlauf mit niedriger oder hoher Geschwindigkeit prüfen (in Vorwärts-und in Rückwärtsrichtung).

• Überprüfung mit einer defekten Disc

1. Den 0,7mm schwarzen Punkt und den 0,7mm Keil auf der defekten Testdisc (SZZP1054C) wiedergeben und sicherstellen, daß kein Tonausfall und keine Störgeräusche auftreten.
2. Die mittleren Titel der ungleichmäßigen Testdisc wiedergeben und sicherstellen, daß kein Tonausfall und keine Störgeräusche auftreten.

• Einstellung des D/A-Konverterschaltkreises

(1) EINSTELLUNG DER VERZERRUNG

1. Den Verzerrungs-Analysator an die LINE OUT-Buchse und Masse anschließen.
2. Die Spannungsversorgung des CD-Spielers einschalten und Titel 1 (1kHz, 0dB) der Testdisc (SZZP1014F) wiedergeben.
3. **VR801** (linker Kanal) und **VR802** (rechter Kanal) so einstellen, daß der Verzerrungsfaktor minimal wird.

(2) EINSTELLUNG DER DAC-VERSTÄRKUNG

1. Das elektronische Wechselstrom-Voltmeter an die LINE OUT-Buchse und Masse anschließen.
2. TJ801 und TJ802 mit einer Klammer kurzschließen.
3. Die Spannungsversorgung des CD-Spielers einschalten und Titel 5 (1kHz, −24dB) der Testdisc (SZZP1014F) wiedergeben.
4. **VR803** (linker Kanal) und **VR804** (rechter Kanal) so einstellen, daß die Ausgangsspannung minimal wird.

(3) EINSTELLUNG DER VERSATZSPANNUNG

1. Den Verzerrungs-Analysator an die LINE OUT-Buchse und Masse anschließen.
2. TJ803 und Masse kurzschließen.
3. Die Spannungsversorgung des CD-Spielers einschalten und Titel 5 (1kHz, −24dB) der Testdisc (SZZP1014F) wiedergeben.
4. **VR805** (linker Kanal) und **VR806** (rechter Kanal) so einstellen, daß der Verzerrungsfaktor minimal wird.

FRANCAIS

■MESURES ET REGLAGES

Attention:

- Il est dangereux de toucher ou de regarder le faisceau du laser dont la radiation est invisible. Dès que l'appareil est sous tension, une radiation laser est émise par le capteur; éviter d'être exposé à cette radiation au cours des réglages.

Instruments de mesure et outillage spécial

- Boîte de réglage du gain de la boucle d'asservissement (SZZP1017F)...Se reporter page 18
- Disques d'essai
  1. Disques de vérification (SZZP1054C ou SZZP1014F)
  2. Disque voilé (SZZP1056C)
  3. Disque à bande noire (SZZP1057C)
- Disque ordinaire
- Oscilloscope double trace avec une hande passante minimale de 30 MHz (déclenchement extérieur et sonde 1: 1)
- Générateur basse fréquence
- Voltmètre électronique à C.A.
- Analyseur de distorsion
- Connecteur d'adaptation (SZZP1032F)
- Clé hexagonale coudée (M2,0)
- Clé hexagonale coudée (M1,27)
- Jauge d'épaisseur 0,9 mm (RZZ0297)

Procéder aux réglages en fonction des pièces remplacées:

(1) Moteur d'entraînement ..... Rubriques 1, 3 à 8
(2) Plateau tournant ..... Rubriques 1, 3 à 8
(3) Capteur optique ..... Rubriques 2 à 8

Procédure de réglage

- Dans le cas du remplacement du moteur d'entraînement ou du plateau tournant, procéder aux opérations ci-dessous.

(1) REGLAGE DE LA HAUTEUR DU PLATEAU TOURNANT

1. Introduire la jauge d'épaisseur de 0,9 mm (RZZ0297) entre le plateau tournant et la surface de pose (voir l'illustration).
2. Serrer la vis de maintien du plateau tournant au moyen de la clé hexagonale coudée de 1,27 mm.
3. Relier la sonde CH1 de l'oscilloscope entre FEG (+) de VR104 et V.REF (−) de VR106.

   (Remarque: Une tension de 2,5 V est présente sur la borne V.REF. Veiller à ce que le châssis du lecteur ne soit mis à la masse de l'oscilloscope.)

   Réglages de l'oscilloscope:
   TENSION ..... 50 mV
   BALAYAGE ..... 1 ms
   ENTREE CC
4. Régler le zéro de l'oscilloscope.
5. Mettre sous tension le lecteur et lire le disque de vérification (SZZP1054C ou SZZP1014F).
6. Mesurer l'amplitude du signal sur l'oscilloscope.

Remarque 1:
Si l'amplitude du signal est comprise entre ±15 mV, la hauteur du plateau tournant est correcte. Dans le cas contraire, reprendre le réglage de la hauteur en faisant levier avec la jauge.
Si l'amplitude est supérieure à +15 mV, abaisser le plateau tournant.
Si l'amplitude est inférieure à −15 mV, relever le plateau tournant.
Remarque 2:
Si l'amplitude du signal diffère considérablement des valeurs indiquées, régler **VR105** au centre et reprendre le réglage de la hauteur. (Dans ce cas, ne pas oublier de régler l'erreur de mise au point.)

(2) REGLAGE MECANIQUE

1. Relier la sonde CH1 de l'oscilloscope aux bornes TJ101 (+) et TJ102 (−) du circuit d'asservissement.
   Réglages de l'oscilloscope:
   TENSION ..... 100 mV
   BALAYAGE ..... 0,5 µs
   ENTREE ..... CA
2. Mettre sous tension le lecteur et lire la piste **9** du disque d'essai (SZZP1056C).
3. Conserver le lecteur en mode de lecture et le placer sur le côté, comme le montre l'illustration.
4. Régler alternativement les vis au moyen de la clé hexagonale coudée de 2,0 mm de manière que la variation de l'amplitude du signal radiofréquence soit minimale.
5. Cela fait, appliquer une goutte de vernis de blocage (RZZOL01) sur les vis avec un vernis.

(3) REGLAGE VISUEL (EQUILIBRAGE DU PHOTODETECTEUR)

1. Relier la sonde CH1 de l'oscilloscope aux bornes TJ101 (+) et TJ102 (−) du circuit d'asservissement.
   Réglages de l'oscilloscope:
   TENSION ..... 100 mV
   BALAYAGE ..... 0,5 µs
   ENTREE ..... CA
2. Mettre sous tension le lecteur et placer un disque d'essai (SZZP1014F ou SZZP1054C). Lire la portion repérée par le point noir de 0.5 mm.
3. Régler **VR101** de sorte que la figure du signal radiofréquence soit aussi étirée que possible.

(4) REGLAGE DU GAIN DE FOCALISATION

1. Brancher la boîte de réglage du gain de la boucle d'asservissement. (Se reporter page 18.)
2. Placer le commutateur de cette boîte sur la position **2** et l'interrupteur d'alimentation sur la position **ON.**
3. Régler le générateur basse fréquence de sorte que le signal de sortie soit à la fréquence de **825 Hz** avec une amplitude de **150 mV** crête à crête. Brancher ce générateur entre les bornes OSC et GND de la boîte de réglage.
4. Relier les entrées CH1 et CH2 de l'oscilloscope aux bornes TP1 et TP2 de la boîte de réglage. (TP3 est la borne de masse.)

   Réglages de l'oscilloscope:
   TENSION ..... 100 mV (sur les deux entrées)
   BALAYAGE ..... 1 ms
   ENTREE ..... CA
5. Lire le disque d'essai (SZZP1014F ou SZZP1054C).
6. Basculer le commutateur de la boîte de réglage de la position **3.** Deux traces du signal à **825 Hz** apparaissent sur l'écran de l'oscilloscope. Régler **VR104** de sorte que les amplitudes des deux traces soient identiques.
7. Basculer le commutateur de la boîte de réglage de la position **2.**

(5) REGLAGE DU GAIN DE POURSUITE

1. Régler le générateur basse fréquence de sorte que le signal de sortie soit à la fréquence de **1,1 kHz** avec une amplitude de **150 mV** crête à crête. Brancher ce générateur entre les bornes OSC et GND de la boîte de réglage.
2. Relier les entrées CH1 et CH2 de l'oscilloscope aux bornes TP1 et TP2 de la boîte de réglage. (TP3 est la borne de masse.)

   Réglages de l'oscilloscope:
   TENSION ..... 100 mV (sur les deux entrées)
   BALAYAGE ..... 1 ms
   ENTREE ..... CA
3. Mettre sous tension le lecteur et lire un disque d'essai (SZZP1014F ou SZZP1054C).
4. Basculer le commutateur de la boîte de réglage de la position **2** à la position **1.** Deux traces du signal à **1,1 kHz** apparaissent sur l'écran de l'oscilloscope.
   Régler **VR102** de sorte que les amplitudes des deux traces soient identiques.
5. Basculer le commutateur de la boîte de réglage de la position **1** à la position **2.**

(6) REGLAGE DE L'ERREUR DE FOCALISATION

Remarque: Veiller à ce que le commutateur de la boîte de réglage de gain soit sur la position **2.**

1. Relier la sonde CH1 de l'oscilloscope aux bornes **TJ101** (+) et **TJ102** (−) du circuit d'asservissement.
   Relier la sonde CH2 (+) de l'oscilloscope à la borne **FEG** de VR104.

   Réglages de l'oscilloscope:
   TENSION..... 100mV (CH1)
   100mV (CH2)
   BALAYAGE..... 0,5ms
   ENTREE..... CA (CH1 et CH2)
   MODE..... NORM
   (le déclenchement est commandé par CH1)
2. Mettre sous tension le lecteur et lire la piste **9** du disque d'essai (SZZP1057C).
3. Déclencher l'entrée CH1 de manière à obtenir les traces figurant sur l'illustration. Régler **VR105** de sorte que le creux de l'enveloppante du signal radiofréquence (CH1) soit lisse et que l'amplitude du signal appliqué sur CH2 soit minimale, c'est-à-dire que les amplitudes A et B soient égales.

(7) REGLAGE DE L'ERREUR DE POURSUITE

Remarque: Veiller à ce que le commutateur de la boîte de réglage de gain soit sur la position **2.**

1. Relier la sonde CH1 de l'oscilloscope aux bornes **TJ101** (+) et **TJ102** (−) du circuit d'asservissement.
   Relier la sonde CH2 (+) de l'oscilloscope à la borne **TEG** de VR102.

   Réglages de l'oscilloscope:
   TENSION..... 100mV (CH1)
   200mV (CH2)
   BALAYAGE..... 0,5ms
   ENTREE..... CA (CH1 et CH2)
   MODE..... NORM
   (le déclenchement est commandé par CH1)
2. Mettre sous tension le lecteur et lire la piste **9** du disque d'essai (SZZP1057C).
3. Déclencher l'entrée CH1 de manière à obtenir les traces figurant sur l'illustration. Régler **VR103** de sorte que le creux de l'enveloppante du signal radiofréquence (CH1) soit lisse et que l'amplitude du signal appliqué sur CH2 soit minimale, c'est-à-dire que les amplitudes A et B soient égales.

(8) REGLAGE DE L'EQUILIBRE DE POURSUITE

1. Veiller à ce que le commutateur de la boîte de réglage de gain soit sur la position **2.**
2. Régler le générateur basse fréquence de sorte que le signal de sortie soit à la fréquence de **1,1kHz** avec une amplitude de **600mV** crête à crête. Brancher ce générateur entre les bornes OSC (+) et GND (−) de la boîte de réglage.
3. Relier la sonde CH1 de l'oscilloscope aux bornes **TJ101** (+) et **TJ102** (−) du circuit d'asservissement.

   Réglages de l'oscilloscope:
   TENSION..... 100mV (CH1)
   BALAYAGE..... 0,5ms
   ENTREE..... CA (CH1 et CH2)
   MODE..... NORM
   (le déclenchement est commandé par CH2)
4. Mettre sous tension le lecteur et lire le disque d'essai (SZZP1014F ou SZZP1054C).
5. Basculer le commutateur de la boîte de réglage de la position **2** à la position **1**. Régler **VR106** de sorte que l'allure du signal appliqué sur CH1 soit celle de l'illustration (l'instabilité de phase est minimale).
6. Débrancher la boîte de réglage.

(9) VERIFICATION DU FONCTIONNEMENT APRES REGLAGES

• Vérification du saut de plage

1. Lire un disque ordinaire.
2. Appuyer sur la touche de commande de saut de plage et s'assurer que le fonctionnement est correct dans les deux sens.

• Vérification de la recherche manuelle

1. Lire un disque ordinaire.
2. Appuyer sur la touche de recherche manuelle et s'assurer que le fonctionnement s'effectue sans à-coups dans les deux sens et aux deux vitesses possibles.

• Vérification de la lecture

1. Lire le disque défectueux à l'emplacement du point noir de 0,7mm et du coin de 0,7mm (SZZP1054C) et s'assurer qu'il n'y ni bruit ni perte de signal.
2. Lire les pistes situées au milieu du disque et s'assurer qu'il n'y a ni bruit ni perte d'information.

• Réglage du convertisseur D/A

(1) REGLAGE DE LA DISTORSION

1. Brancher un distortiomètre entre la borne LINE OUT et la masse.
2. Mettre le lecteur sous tension et lire la plage 1 (1kHz, 0dB) du disque d'essai (SZZP1014F).
3. Régler **VR801** (voie gauche) et **VR802** (voie droite) de manière que la distorsion soit minimale.

(2) REGLAGE DU GAIN DU CONVERTISSEUR D/A

1. Brancher le voltmètre électronique entre la borne LINE OUT et la masse.
2. Placer une jarretière entre **TJ801** et **TJ802**.
3. Mettre le lecteur sous tension et lire la plage 5 (1kHz, −24dB) du disque d'essai (SZZP1014F).
4. Régler **VR803** (voie gauche) et **VR804** (voie droite) de manière que la tension de sortie soit minimale.

(3) REGLAGE DE LA TENSION DE DECALAGE

1. Brancher le distortiomètre entre la borne LINE OUT et la masse.
2. Placer une jarretière entre **TJ803** et la masse.
3. Mettre le lecteur sous tension et lire la plage 5 (1kHz, −24dB) du disque d'essai (SZZP1014F).
4. Régler **VR805** (voie gauche) et **VR806** (voie droite) de manière que la distorsion soit minimale.

ESPAÑOL

■ MEDICIONES Y AJUSTES

Precaucin:

- Es muy peligroso dirigir la vista hacia los rayos laser otocarios. (La radicacin laser es invisible.) Cuando el aparato está encendido, se emite radiacin laser desde las lentes de captacin. Evite exponerse a los rayos laser, especialmente al realizar ajustes.

Instrumentos de medición y herramientas especiales

- Ajustador de servoganancia (SZZP1017F)
  ...Vea la página 18
- Discos de prueba
  1. Disco de prueba de reproducibilidad (SZZP1054C o SZZP1014F)
  2. Prueba de disco desparejo (SZZP1056C)
  3. Disco de prueba de banda negra (SZZP1057C)
- Disco normal
- Osciloscopio de doble haz con ancho de banda de 30MHz o mayor (con disparador EXT y sonda 1 : 1)
- Oscilador de audiofrecuencia (AF)
- Conector de conversión (SZZP1032F)
- Voltimetro electrónico de CA
- Analizador de distorsiones
- Llave Allen (M2, 0)
- Llave Allen (M1, 27)
- Calibrador de 0,9mm (RZZ0297)

Realice los ajustes según la pieza que vaya a cambiarse, de acuerdo con lo siguiente:

(1) Motor del eje ..... Items 1, 3 a 8
(2) Plato giradiscos..... Items 1, 3 a 8
(3) Toma óptica..... Items 2 a 8

Procedimiento de ajuste

- Si ha cambiado el motor del eje o el plato giradiscos, realice el siguiente ajuste:

(1) AJUSTE DE LA ALTURA DEL PLATO GIRADISCOS

1. Inserte el calibrador de 0,9mm (RZZ0297) entre el plato giradiscos y la base de carga (vea la figura de la derecha).
2. Ajuste el tornillo de retención del plato giradiscos con la llave Allen de 1,27mm.
3. Conecte la sonda CH. 1 del oscilocopio a través de los terminales **FEG** (+) de VR104 y **V.REF** (−) de VR106.

   (Nota: En el terminal V.REF se presenta una tensión de 2,5V. Tenga cuidado para no poner en cortocircuito el bastidor del reproductor con la masa del osciloscopio.)
   Ajuste del osciloscopio:
   VOLT 50mV
   BARRIDO ..... 1ms.
   Acoplamiento de entrada CC
4. Ajuste el balance de cero de CC del osciloscopio.
5. Ponga el interruptor de alimentación del reproductor en ON, y reproduzca el disco de prueba (SZZP1014F o SZZP1054C).
6. Mida la amplitud de tensión de la señal en el osciloscopio.

Nota 1. Si la amplitud medida está en la gama de ±15mV, la altura del plato giradiscos es correcta. Si está fuera de esta gama, regule la altura del plato giradiscos utilizando el calibrador como palanca. Si la amplitud es mayor que +15mV, baje el plato giradiscos. Si la amplitud es menor que −15mV, eleve el plato giradiscos.

Nota 2. Si la amplitud medida resulta muy superior o muy inferior a la gama mencionada anteriormente, regule **VR105** en el centro, o aproximadamente en el centro, y luego trate de regular nuevamente la altura. (Luego asegúrese de regular también la desviación del enfoque.)

(2) AJUSTE MECANICO

1. Conecte la sonda CH. 1 del osciloscopio a través de **TJ101** (+) y **TJ102** (−) del servo P.C.B.
   Ajuste del osciloscopio:
   VOLT 100mV
   BARRIDO..... 0,5µs.
   Acoplamiento de entrada ..... CA
2. Ponga el interruptor de alimentación del reproductor en ON, y reproduzca el surco 9 del disco de prueba (SZZP1056C).
3. Deje el reproductor en la modalidad de reproducción y colóquelo sobre su lado derecho, como se muestra a la derecha.
4. Como alternativa, regule los dos tornillos de ajuste mecánico con la llave Allen de 2,0mm hasta que la variación de la amplitud de la señal de RF se haga mìnima en el osciloscopio.
5. Después de completar el ajuste, trabe los ajustes mecánicos con adherencia de cierre de tornillo (RZZOL01).

(3) AJUSTE VISUAL OPTIMO (EQUILIBRIO DE PD)

1. Conecte la sonda CH. 1 del osciloscopio a través de **TJ101** (+) y **TJ102** (−) en el servo P.C.B.
   Ajuste del osciloscopio:
   VOLT 100mV
   BARRIDO..... 0,5µs.
   Acoplamiento de entrada ..... CA
2. Ponga el interruptor de alimentación del reproductor en ON, y reproduzca el punto negro de 0,5mm del disco de prueba (SZZP1014F o SZZP1054C).
3. Ajuste **VR101** hasta que el patrón óptico de la señal de RF se haga máximo.

(4) AJUSTE DE LA GANANCIA DE SEGUIMIENTO

1. Conecte el ajustador de servoganacia al reproductor (vea la página 18).
2. Ponga el conmutador de ganancia del ajustador de servoganancia en la posición "**2**" y el conmutador ON/OFF en **ON**.
3. Disponga la salida del oscilador de AF para **825Hz** y **150mVp-p**, y conéctelo a través de los terminales OSC y GND del ajustador de servoganancia.
4. Conecte las sondas CH. 1 y CH. 2 del osciloscopio a los terminales TP1 y TP2 del ajustador de servoganancia, respectivamente (TP3 es GND).
   Ajuste del osciloscopio:
   VOLT ..... 100mV (ambos canales)
   BARRIDO ..... 1ms.
   Acoplamiento de entrada ..... CA
5. Reproduzca el disco de prueba (SZZP1014F o SZZP1054C).
6. Ponga el conmutador de ganancia del ajustador de servoganancia en la posición "**3**" y verá una señal de **825Hz** en el osciloscopio. Regule **VR104** hasta que las amplitudes de la señal de ambos canales sean idénticas entre sì.
7. Vuelva a poner el conmutador de la ganancia en la posición "**2**" .

(5) AJUSTE DE LA GANANCIA DE SEGUIMIENTO

1. Disponga la salida del oscilador de AF para **1,1kHz** y **150mVp-p**, y conéctelo a través de los terminales OSC y GND del ajustador de servoganancia.
2. Conecte las sondas CH. 1 y CH. 2 del osciloscopio a los terminales TP1 y TP2 del ajustador de servoganancia, respectivamente (TP3 es GND).
   Ajuste del osciloscopio:
   VOLT ..... 100mV (ambos canales)
   BARRIDO ..... 1ms.
   Acoplamiento de entrada ..... CA
3. Ponga el interruptor de alimentación del reproductor en ON y reproduzca el disco de prueba (SZZP1014F o SZZP1054C).
4. Ponga el conmutador de la ganancia del ajustador de servoganancia en la posición "**1**" , y verá en el osciloscopio una señal de **1,1kHz**. Regule **VR102** hasta que las amplitudes de la señal de ambos canales sean idénticas entre sì.
5. Vuelva a poner el conmutador de la ganancia en la posición "**2**" .

D

(9) COMPROBACION DEL FUNCIONAMIENTO DE REPRODUCCION DESPUES DEL AJUSTE

• Comprobación de la búsqueda por omisión

1. Reproduzca un disco común con programas musicales.
2. Pulse el botón de omisión para verificar el funcionamiento normal de la búsqueda por omisión (en la dirección de avance y en la dirección de retroceso).

• Comprobación de la búsqueda manual

1. Reproduzca un disco común con programas musicales.
2. Pulse el botón de búsqueda manual para verificar el funcionamiento suave de la búsqueda manual, tanto a baja como a alta velocidad (en la dirección de avance y en la dirección de retroceso).

• Comprobación utilizando el disco defectuoso

1. Reproduzca el punto negro de 0,7 mm y la cuña de 0,7 mm del disco de prueba defectuoso (SZZP1054C) y compruebe que no ocurra omisión del sonido ni ruido.
2. Reproduzca los surcos intermedios del disco de prueba desparejo y verifique que no ocurra omisión del sonido ni ruido.

• Ajuste del circuito convertidor D/A

(1) AJUSTE DE DISTORSION

1. Conecte el analizador de distorsión al terminal LINE OUT y a tierra.
2. Ponga el interruptor del reproductor en la posición ON, y reproduzca la pista 1 (1 kHz 0 dB) del disco de prueba (SZZP1014F).
3. Ajuste **VR801** (Canal izquierdo) y **VR802** (Canal derecho) de modo que el factor de distorsión se haga mínimo.

(2) AJUSTE DE LA GANANCIA DEL CONVERTIDOR D/A

1. Conecte el voltímetro electrónico de CA al terminal LINE OUT y a tierra.
2. Ponga en cortocircuito **TJ801** y **TJ802** con una pinza de contacto.
3. Ponga el interruptor del reproductor en la posición ON, y reproduzca la pista 5 (1 kHz −24 dB) del disco de prueba (SZZP1014F).
4. Ajuste **VR803** (Canal izquierdo) y **VR804** (Canal derecho) de modo que el factor de distorsión se haga mínimo.

(3) AJUSTE DE LA CONTRATENSION

1. Conecte el analizador de distorsión al terminal LINE OUT y a tierra.
2. Ponga en cortocircuito **TJ803** y la tierra.
3. Ponga el interruptor del reproductor en la posición ON, y reproduzca la pista 5 (1 kHz −24 dB) del disco de prueba (SZZP1014F).
4. Ajuste **VR805** (Canal izquierdo) y **VR806** (Canal derecho) de modo que el factor de distorsión se haga mínimo.

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