

Service Manual

COMPACT
disc
DIGITAL AUDIO

DIGITAL

Compact Disc Player SL-P277A

Color

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

Area

Country Code	Area	Color
(E)	Continental Europe.	(K) (S)
(EB)	Great Britain.	(K) (S)
(EG)	F.R. Germany & Italy.	(K) (S)



SPECIFICATIONS

Audio

No. of channels	2 (left and right, stereo)
Frequency response	2-20,000 Hz $\pm$ 0.5 dB
Output voltage	2 V (at 0 dB)
Dynamic range	96 dB
S/N ratio	96 dB
Total harmonic distortion	0.005% (1 kHz, 0 dB)
Harmonic distortion	0.003% (1 kHz, 0 dB)
Wow and flutter	Below measurable limit
DA converter	MASH* (4 DAC)
Output impedance	Approx. 600 Ω
Load impedance	More than 10 k Ω
Headphone output level	15 mW max. 32 Ω (adjustable)

*MASH

- MASH (Multi-Stage Noise Shaping) is an effective over-sampling D/A conversion technique which realizes a high S/N ratio and needs no highly complex manufacturing processes such as a laser trimming.
- MASH is a trademark of NTT (Nippon Telegraph and Telephone Corporation).

Pickup

Wavelength 780 nm

Infrared remote control transmitter

Dimensions (W×H×D) 60×18×165 mm
Batteries UM-4 "AAA" batteries or IEC R03 or equivalent (1.5 V×2)
100 g (including batteries)

Weight

General

Power supply
For Great Britain: AC 50/60 Hz, 240V
For others: AC 50/60 Hz, 220V
Power consumption 10 W
Dimensions (W×H×D) 430×92×283 mm
Weight 3.6 kg

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

CONTENTS

	Page
PLACEMENT	2
CLEANING OF LENS	2
ACCESSORIES	2
PRECAUTION OF LASER DIODE	3
LOCATION OF CONTROLS	4, 5
CONNECTIONS	6
DISASSEMBLY INSTRUCTIONS	7 ~ 10
MEASUREMENTS AND ADJUSTMENTS	11, 12
TERMINAL FUNCTIONS OF IC'S	13 ~ 16
INTERNAL CONNECTION OF FL	17
BLOCK DIAGRAM	18, 19
SCHEMATIC DIAGRAM	20 ~ 27

	Page
TERMINAL GUIDE OF IC'S,	
TRANSISTORS & DIODES	28
PRINTED CIRCUIT BOARDS	29 ~ 32
WIRING CONNECTION DIAGRAM	33
REPLACEMENT PARTS LIST	34 ~ 38
EXPLODED VIEWS	39 ~ 41
RESISTORS & CAPACITORS	42, 43
PACKING	44
TROUBLESHOOTING GUIDE	45 ~ 47

TECHNICAL INFORMATION

* This technical information is located on pp 49 ~ 56 of the SL-PJ46A Service Manual (Order No. AD8902036C2). Therefore, refer to that Service Manual

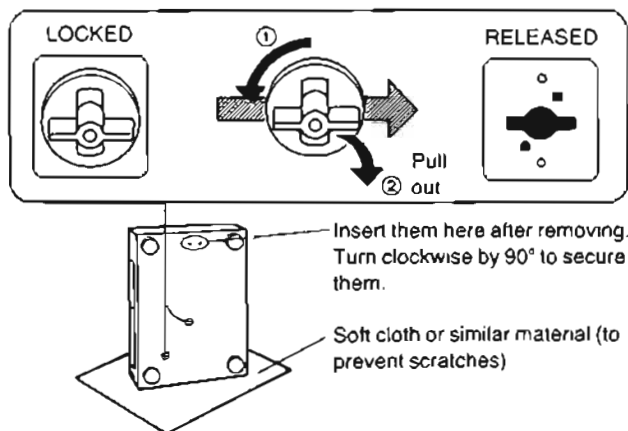
Technics

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

■ PLACEMENT

Before placement

Two transport security devices are secured to prevent the optical pickup from damage during transport. Be sure to release them before use.



Note:

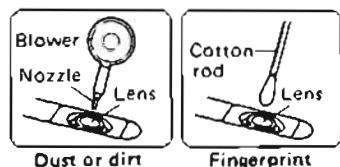
When transporting the unit, be sure to remove the compact disc from inside the unit. And replace the transport security devices again following the reverse order not to damage the optical pickup.

■ CLEANING OF LENS

If the lens is stained causing sound skip or operation failure, open the top cover by pressing the open button, and clean the lens.

● To remove dust or dirt

Blow the lens with the blower provided in the cleaning kit to remove dust or dirt.



● To remove fingerprint

If the blower is not enough, moisten the cotton rod with the lens cleaner solution and wipe the lens with it from center of the lens to outside.

■ ACCESSORIES

- AC power supply cord 1
[SJA187 (E, EG)]
[SJA193 (EB)]
- Remote control transmitter 1
[EUR64796 (K)]
[EUR64797 (S)]

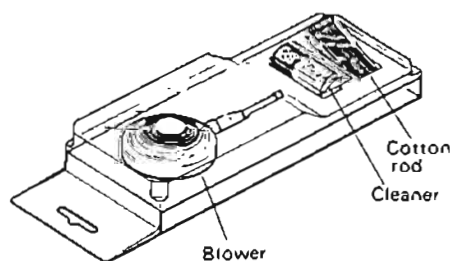
Notes of placement

- This unit is a precision instrument. Be sure to place it on a flat surface.
- 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 (35°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.)
- 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.

Cautions:

- Do not directly apply the cleaner solution to the lens. Do not apply too much solution to the cotton rod or otherwise the solution will flow into the player.
- Wipe the lens carefully. Do not give too much stress to the lens or otherwise it may scratch the lens or cause optical pickup trouble.
- If the solution should be too much applied, wipe the lens with a dry cotton rod.

Lens cleaning kit (Part No. : SZZP1038C)



- Stereo connection cable 1
(SJP2249-3)
- Batteries 2
(UM-4NE/2S)

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

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

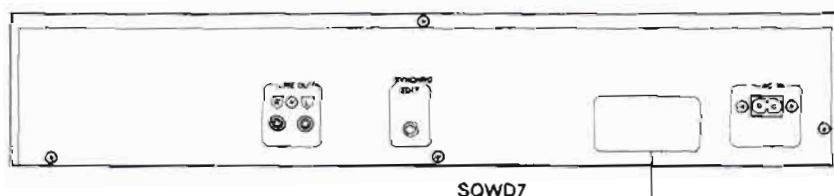
Wellenlänge: 780 nm

Maximale strahlungsleistung der lasereinheit: 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 laserdioden gefährlich ist.
2. Den werkseitig justierten einstellregler der lasereinheit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.

ADVARSEL: I dette a apparat anvendes laser.



SOWD7

**CLASS 1
LASER PRODUCT**

SOWD7

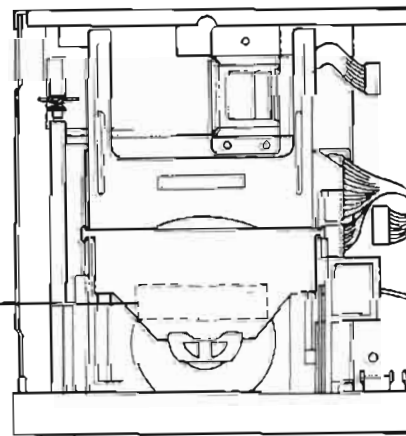
Obs:

Apparatet innehåller laser
Komponent av högre laserklass
än klass 1.

R0LS0022

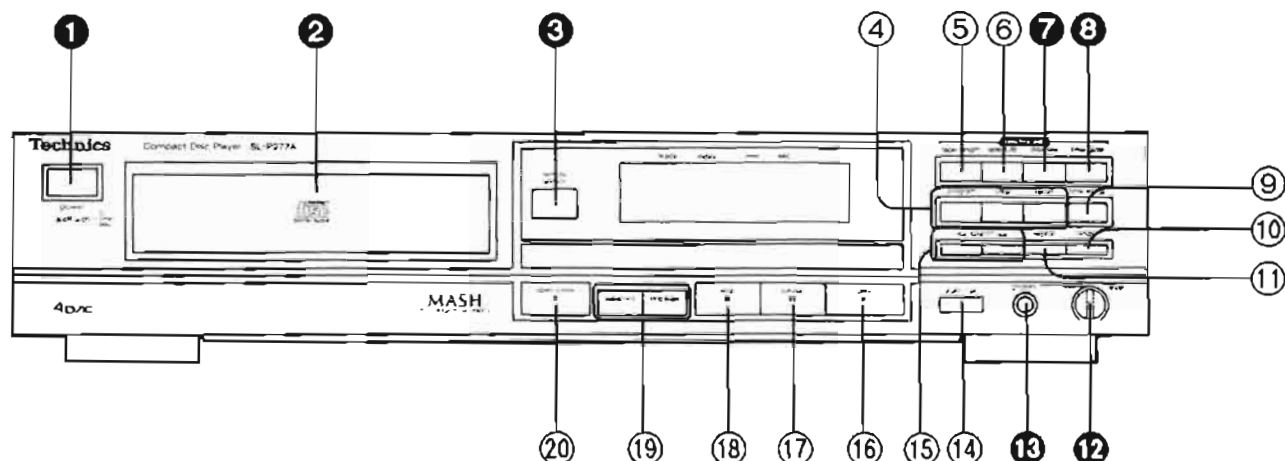
ADVARSEL: USYNLIG LASERSTRÅLING
VED ÅBNING, NÅR SIKKERHEDSAF-
BRYDERE ER UDE AF FUNKTION.
UNDGÅ UDSÆTTELSE FOR STRÅLING.

VORSICHT-unsichtbare
Laserstrahlung, wenn
Abdeckung geöffnet.
Nicht dem Strahl
aussetzen. R0LS0022



■ LOCATION OF CONTROLS

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



Control section

① Power switch (power off on)

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

② Disc holder

③ Remote control signal sensor (remote sensor)

④ Buttons for program function

• Programmed-play button (program)

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

• Clear button (clear)

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

• Recall button (recall)

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

⑤ Edit tape length button (tape length)

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

⑥ 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.

⑦ Disc link button (disc link)

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

⑧ Time fade button (time fade)

Pressing this button in the pause or stop mode causes the fade-out function to work at the specified time.

Pressing this button in the edit mode causes the fade-out function to work at the end of the tape when the track added exceeds the remaining time of the tape.

⑨ Time mode select button (time mode)

⑩ Random play button (random)

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

⑪ Repeat button (repeat)

⑫ Headphones volume control (level)

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

⑬ Headphones jack (phones)

⑭ Auto cue button (auto cue)

Pressing this button enables the unit to stop at the beginning of every track and switch to the play standby mode.

⑮ 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.

⑯ Play button (▶ play)

⑰ Pause button (|| pause)

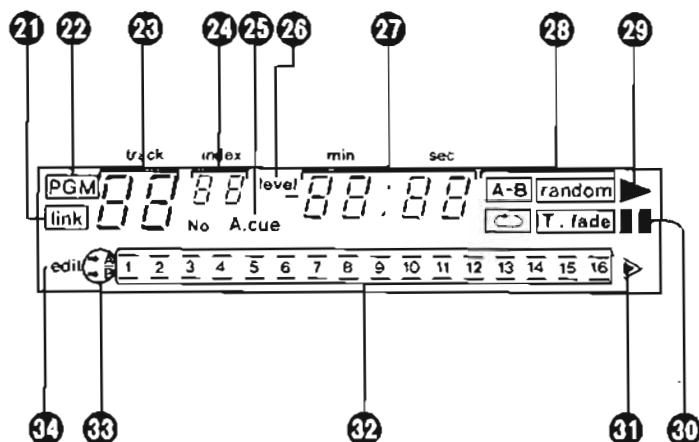
⑱ Stop button (■ stop)

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

⑲ Skip buttons (<< skip/skip >>)

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

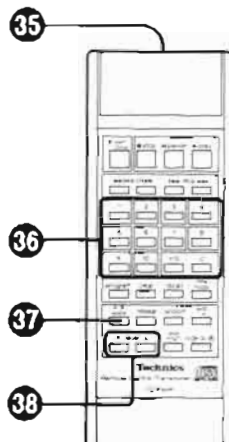
⑳ Disc holder open/close button (▲ open/close)



Indicators section

- 21** Disc link indicator (**[link]**)
- 22** Programmed-play indicator (**[PGM]**)
- 23** Track number display (track)
- 24** Index/program number display (Index/No.)
- 25** Auto cue indicator (A. cue)
- 26** Level indicator (level)
This indicator lights when the output level is attenuated by the remote control.
- 27** Time display (min/sec)
- 28** Operation indicators
The following indicators light during their respective operations.

A-B :	A-B repeat play (remote control operation)
random :	Random play
[repeat] :	Repeat play
T. fade :	Time fade (fade-out)
- 29** Play indicator (**[▶]**)
- 30** Pause indicator (**[⏸]**)
- 31** "Over" mark (**[▶▶]**)
This indicator lights if the total number of tracks on the disc is 17 or more.
- 32** Track number indicator (**[1-16]**)
- 33** Tape side indicator (A/B)
- 34** Compact disc edit indicator (edit)



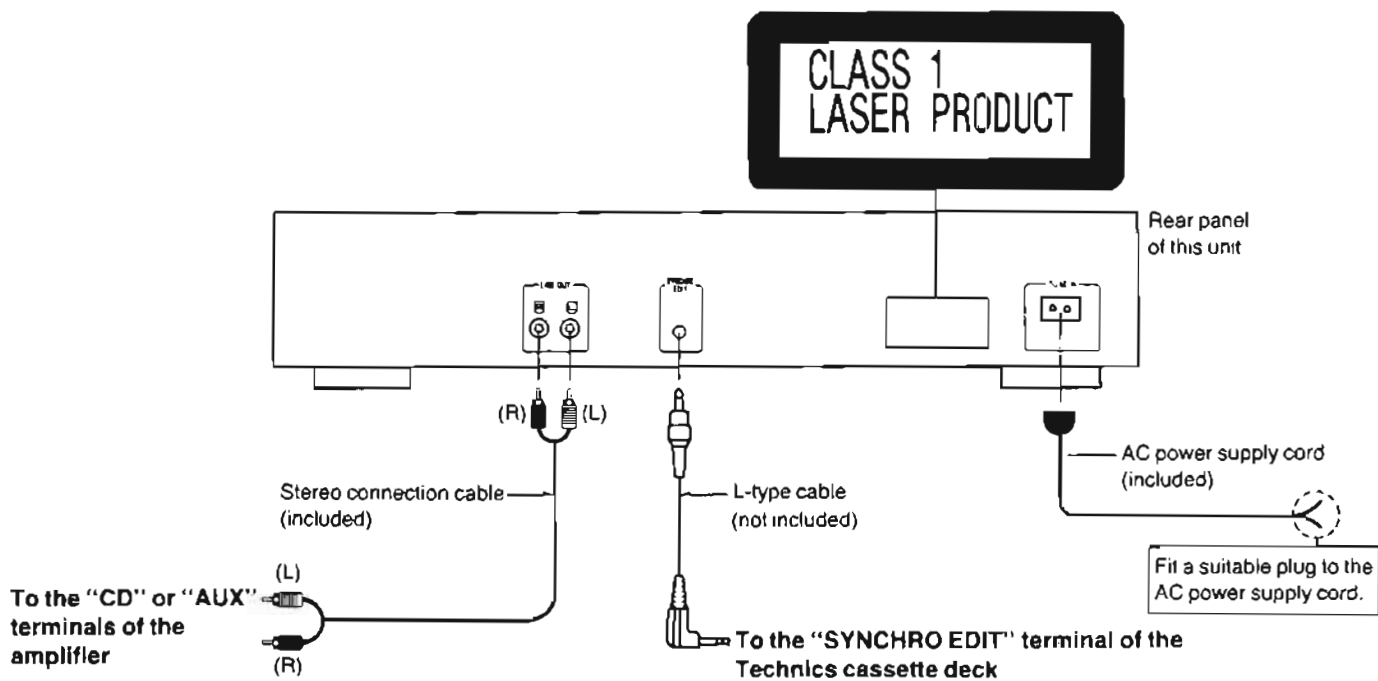
Unnumbered buttons on the remote control transmitter function identically to their corresponding parts on the unit.

Remote control transmitter

- 35** Remote control signal transmission window
- 36** Numeric buttons (+10, 0, 1~10)
- 37** 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.
- 38** Level buttons (**[▼ level ▲]**)
These buttons can be used to control output level (from 0 dB to -12 dB).

■ CONNECTIONS

Turn power off on all components before making connections.



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

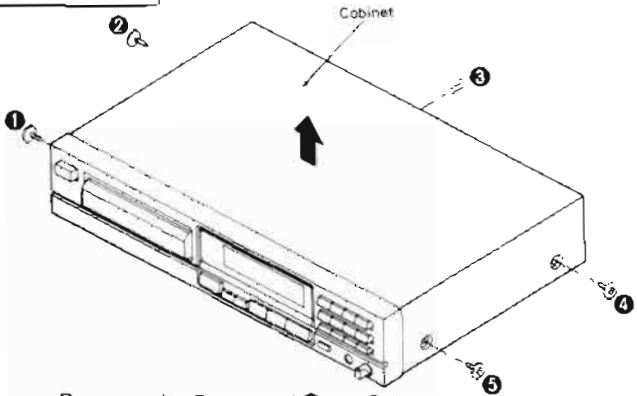
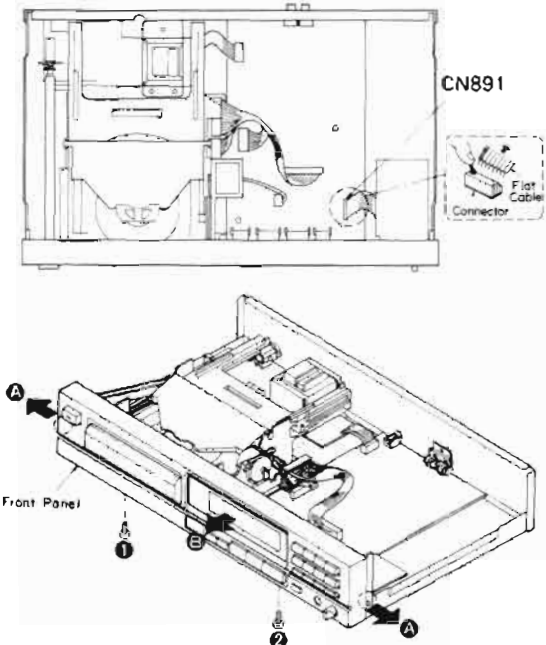
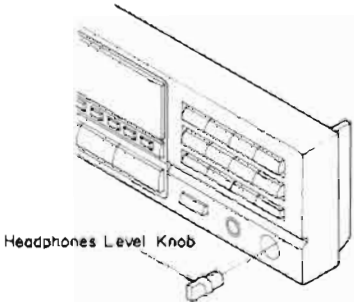
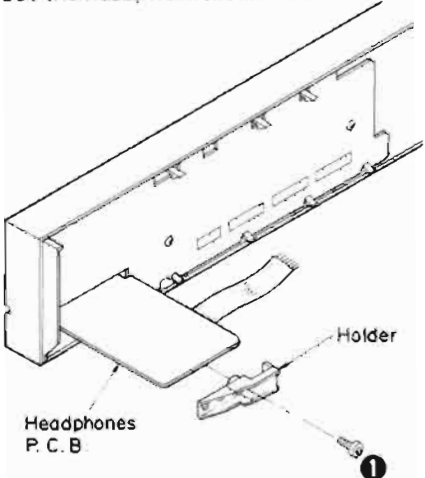
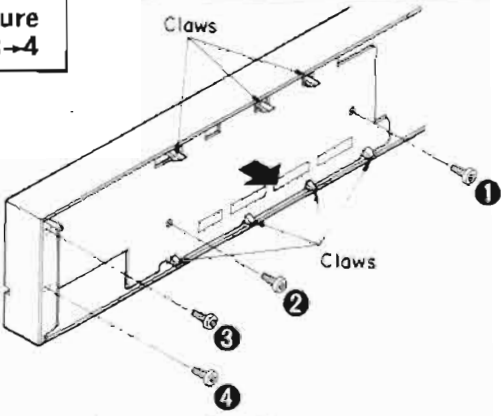
■ DISASSEMBLY INSTRUCTIONS

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

ACHTUNG: •Die lasereinheit nicht zerlegen.

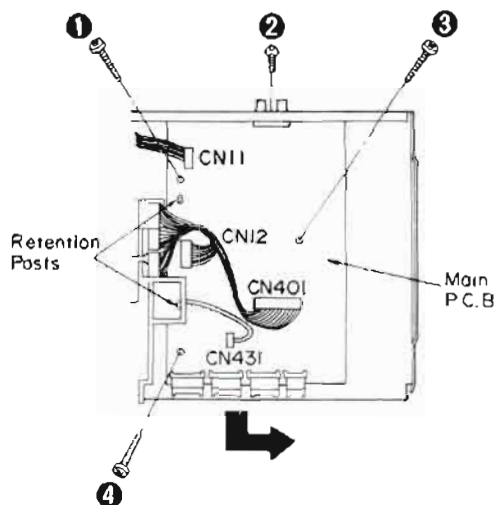
•Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

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

Ref. No. 1	Removal of the cabinet	Ref. No. 2	Removal of the front panel
Procedure 1	 ● Remove the 5 screws (1 ~ 5).	Procedure 1 → 2	1. Remove the 1 flat cable (CN891).  2. Remove the 2 screws (1, 2). 3. Slightly pull out the front panel in the direction of the arrow (A). 4. Remove the front panel in the direction of the arrow (B).
Ref. No. 3	Removal of the headphones P.C.B.	Ref. No. 4	Removal of the operation P.C.B. and search P.C.B.
Procedure 1 → 2 → 3	 1. Pull out the headphones level knob.  2. Remove the 1 screw (1). 3. Remove the holder.	Procedure 1 → 2 → 3 → 4	 1. Remove the 4 screws (1 ~ 4). 2. Release the 7 claws. 3. Remove the operation P.C.B. in the direction of the arrow.

Ref. No.
5

Removal of the main P.C.B.

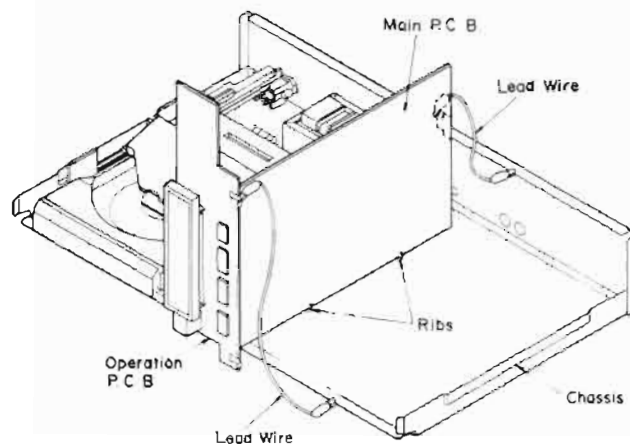
Procedure
1→2→3→4→5

- 1 Remove the 4 screws (1 ~ 4).
- 2 Remove the 3 connectors (CN12, CN401, CN431).
- 3 Remove the 1 flat cable (CN11).
- 4 Lift the main P.C.B. off the retention posts on the chassis.
- 5 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 below.

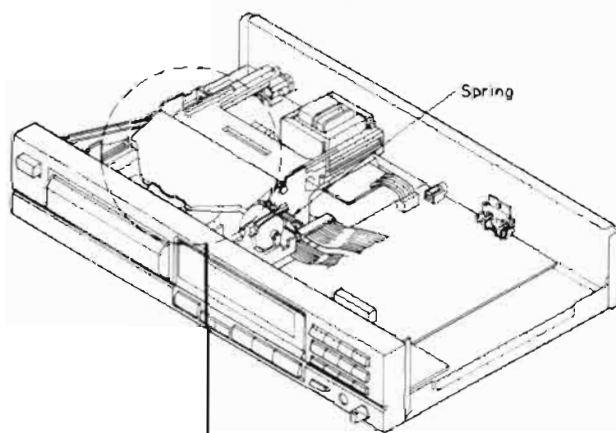
1. Don't remove the connectors (CN12, CN401, CN431) and flat cable (CN11).
2. Connect the main P.C.B. ground terminal (LINE OUT terminal) to the chassis with a lead wire.
3. Connect the operation P.C.B. ground terminal to the chassis with a lead wire.

Ref. No.
6

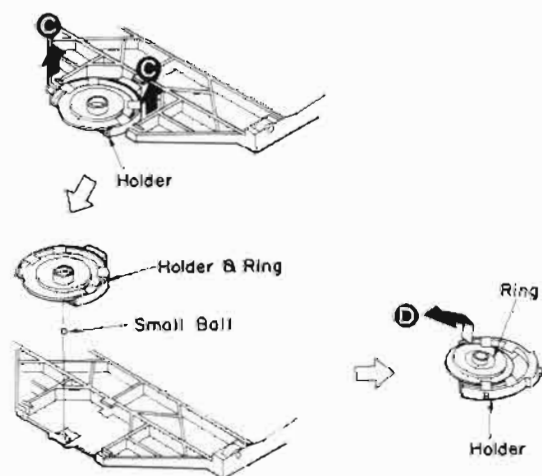
Removal of the disc lid and holder

Procedure
1→6

1. Remove the spring.
2. Move the disc lid in the direction of the arrow (A) and pull out this in the direction of the arrow (B).

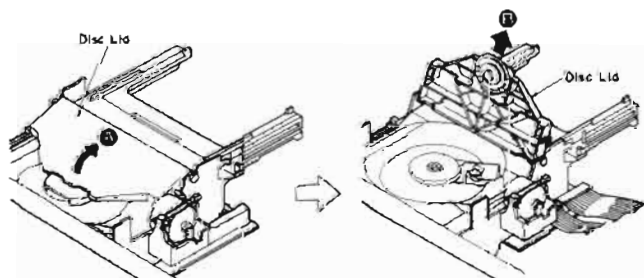


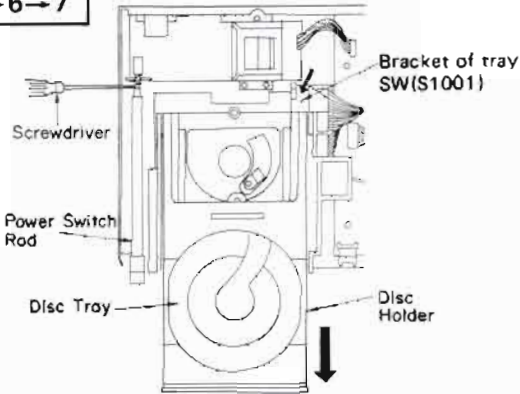
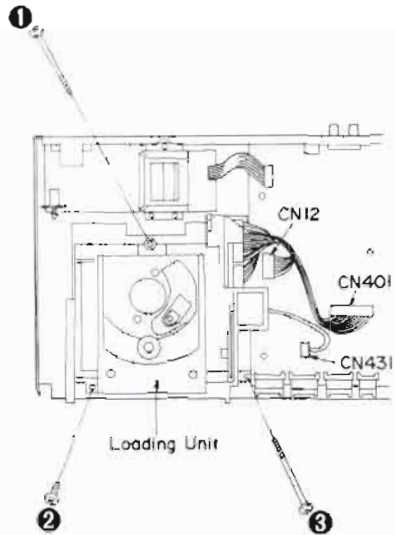
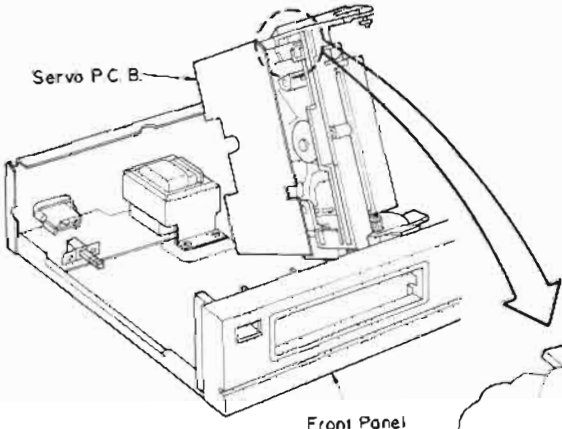
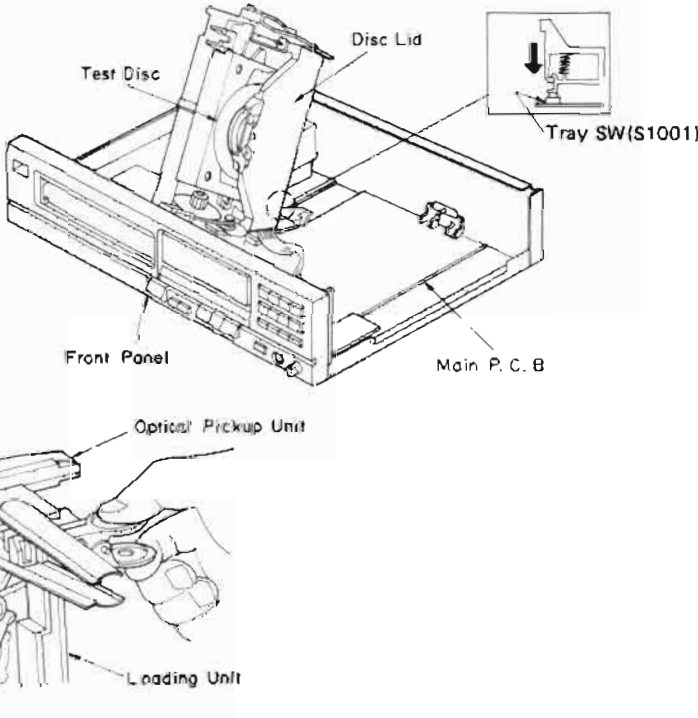
3. Pull out the holder in the direction of the arrow (C).

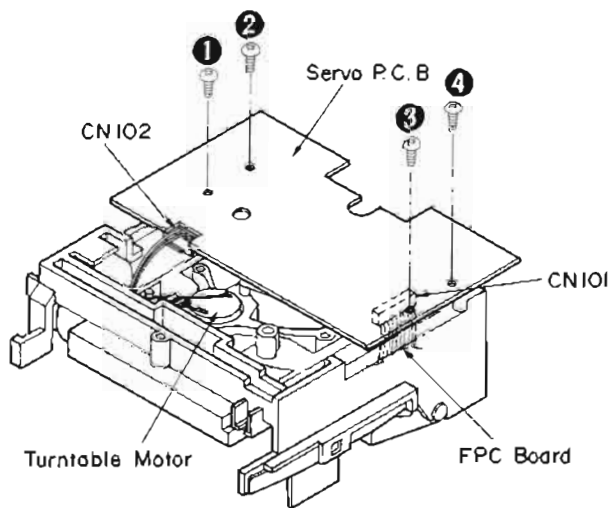
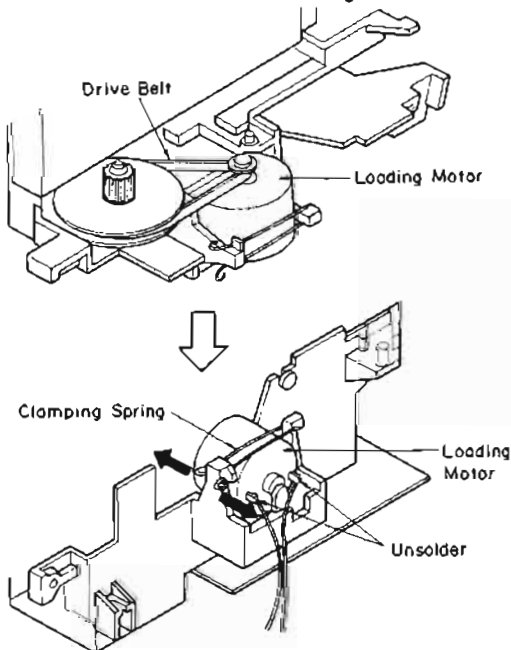
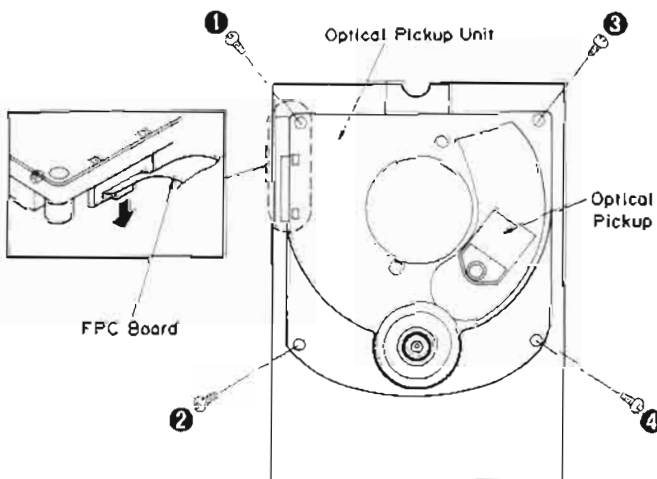
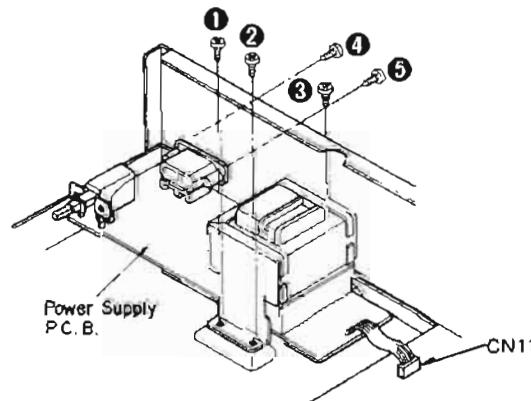


Caution: Be sure to handle the small ball carefully.

4. Remove the ring in the direction of the arrow (D).



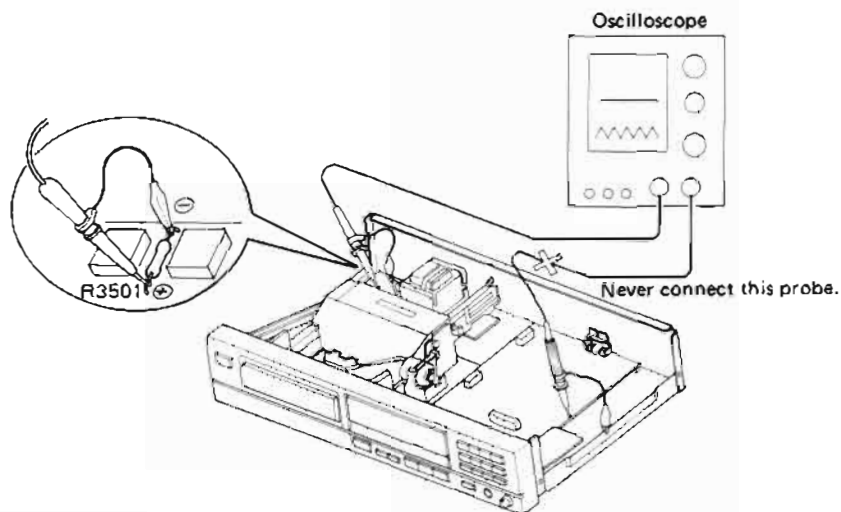
Ref. No. 7	Removal of the power switch rod and disc holder	Ref. No. 8	Removal of the loading unit
Procedure 1→2→6→7	 ■ Power switch rod 1. Set the power switch in the "OFF" position. 2. Remove the power switch rod by using a screwdriver. ■ Disc holder 1. Pull the disc holder slowly in the direction of the arrow until the disc tray comes up. 2. Pull the disc holder until it stops. 3. Push the bracket of tray SW (S1001) in the direction of the arrow. 4. Pull out the disc holder further to remove it.	Procedure 1→2→6→7→8	 1. Remove the 3 screws (① ~ ③). 2. Remove the 3 connectors (CN12, CN401, CN431).
Ref. No. 9	Checking of the servo P.C.B.		
Procedure 1→2→6→7→8→9	•When checking the soldered surface of the servo P.C.B. and replacing the parts, do as shown below.		
Note: Insert the loading unit into the tabs of the front panel. (Fixed loading unit) Secure the optical pickup assembly with a clip. (Otherwise the clamper will interfere with the disc, restricting turntable rotation.) 		(To play a disc) 1. Place the test disc. 2. Reinstall the disc lid to the loading unit. 3. Turn "ON" the power switch of the player. 4. Push the bracket of tray SW (S1001) in the direction of the arrow and release it. Note: If the test disc fails to rotate, press the tray switch again. 	

Ref. No. 10	Removal of the servo P.C.B.		
Procedure 1→2→6 →7→8→10			
1. Remove the 4 screws (❶ ~ ❹). 2. Remove the FPC board (CN101) from the optical pickup. 3. Remove the 1 connector (CN102) of the turntable motor. Caution : To prevent the breakdown of the laser diode, antistatic shorting pin is inserted into the FPC board.			
Ref. No. 11	Removal of the loading motor	Ref. No. 12	Removal of the optical pickup unit
Procedure 1→2→6 →7→11	1. Remove the drive belt. 2. Release the clamping spring. 3. Unsolder the 2 terminals of the lead wire of the loading motor.		
		1. Remove the 4 screws (❶ ~ ❹). 2. Remove the FPC board from the optical pickup. 	
Ref. No. 13	Removal of the power supply P.C.B.		
Procedure 1→2→6→7 →13	1. Remove the 5 screws (❶ ~ ❺). 2. Remove the 1 connector (CN11).		
			

■ MEASUREMENTS AND ADJUSTMENTS

Caution:

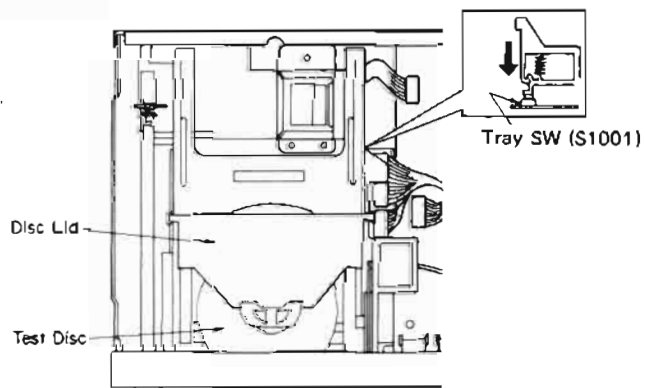
1. It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.)
With the unit turned "on", laser radiation is emitted from the pickup lens.
Avoid exposure to the laser beam, especially when performing adjustments.
2. During laser power or focus offset adjustment, never connect the other probe to the unit.
(Otherwise the unit's power supply will sustain damage.)



PREPARATION

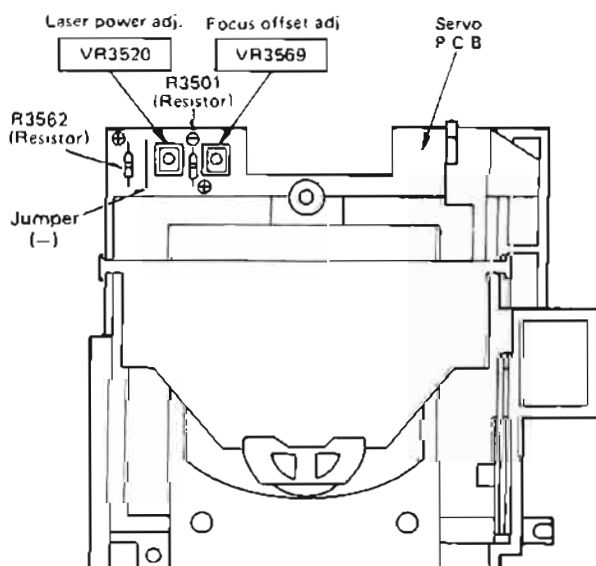
1. Remove the cabinet (see Ref No. 1 of the disassembly instructions).
2. Remove the disc-holder (see Ref No. 7 of the same)
3. Place the test disc on the turntable.
4. Turn "ON" the power switch at the player.
5. Push the bracket of tray SW (S1001) in the direction of the arrow and release it

Note: If the test disc fails to rotate, press the tray switch again.

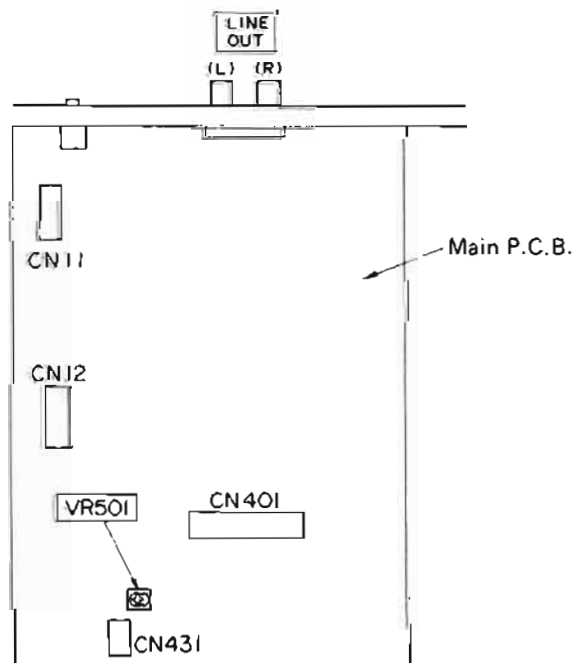


ADJUSTMENT POINTS

• Servo P.C.B.



• Main P.C.B.



Measuring Instruments

- Playability test disc (SZZP1054C).
- Normal disc.

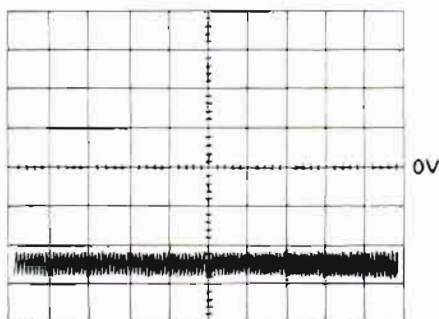
- Dual-beam oscilloscope with bandwidth of 30MHz or better (with EXT trigger and 1:1 probe).

(1) LASER POWER ADJUSTMENT

1. Connect the oscilloscope's CH1 probe across (+) and (—) of **R3501** (Resistor) on the servo P.C.B.
2. Switch the player power ON, and play track No. 1 on the test disc (SZZP1054C).
3. Adjust **VR3520** so that the voltage is $-50 \pm 2\text{mV}$.

Oscilloscope setting:

VOLT 20mV INPUT DC
SWEEP 0.2msec.

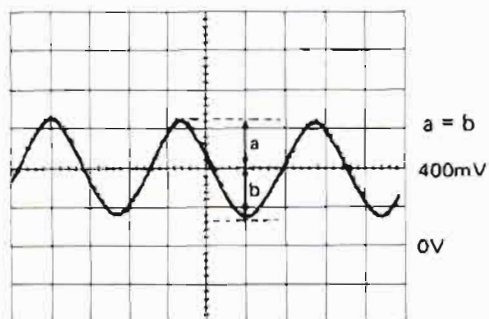


(2) FOCUS OFFSET ADJUSTMENT

1. Connect the oscilloscope's CH1 probe across **R3562** (Resistor)(+) and **Jumper**(—) on the servo P.C.B.
2. Switch the player power ON, and play track No.1 on the test disc (SZZP1054C).
3. Adjust **VR3569** until the signal amplitude become in the center of **400mV**.

Oscilloscope setting:

VOLT 200 mV INPUT DC
SWEEP 5msec.



(3) PLL ADJUSTMENT

1. Connect CH1 of the oscilloscope to the **LINE OUT** terminal (either of Lch or Rch) and **ground**.

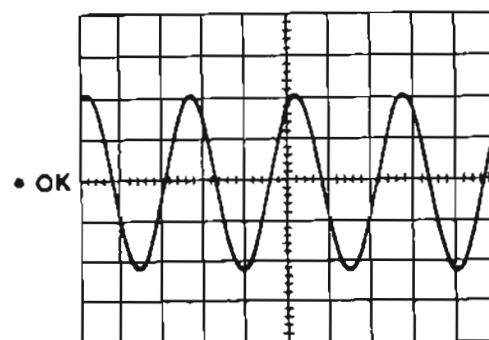
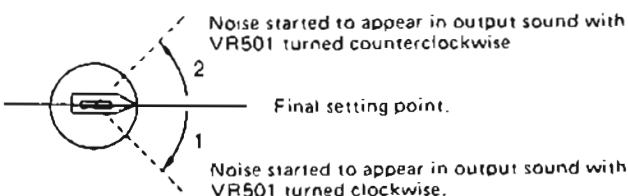
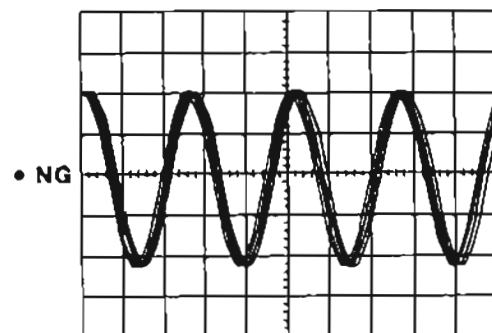
Oscilloscope setting: VOLT 1V
SWEEP 1msec.
INPUT DC

2. Switch the player power ON, and play track No. 6 (wedge 0.7mm) on the test disc (SZZP1054C).
3. Check the waveform displayed on the oscilloscope and adjust **VR501** in the following steps

Step 1. Turn **VR501** clockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.

Step 2. Turn **VR501** counterclockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.

Step 3. Set **VR501** in the middle between the points observed in the above steps "1" and "2"



(4) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

• Checking Skip Search

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

• Checking Manual Search

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

• Playability check by test disc

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

■ TERMINAL FUNCTIONS OF IC'S

• IC6501 (TDA8808T): Photo diode signal processor

Pin No.	Mark	I/O Division	Function
1	GCHF	I	Gain control input of HF amplifier. Current output from HF amplitude detector
2	Vp	I	Positive supply voltage
3	HFout	O	HF amplifier and equalizer voltage output
4	DET	I	HF detector voltage input
5	Sc	I	Starting up capacitor input
6	Si/RD	I/O	On/off control (start input); ready signal output (starting up procedure successful)
7	Beq	I	Equalizer reference current input
8	Bgc	I	DC and LF gain control reference current input
9	FOC START	I	Focus normalizing circuit, starting current
10	PLLH	O	PLL on hold output
11	TL	O	Track loss output
12	DODS	I	Drop out detector suppression input
13	Vext	I	Negative supply connection for FE and FEIag output stage; also substrate connection
14	LPF	O	Low pass filter for Iret, used in track loss (TL) detector and LF gain control

Pin No.	Mark	I/O Division	Function
15	FE	O	Current output of normalized, switched focus error signal
16	FEIag	O	Current output of switched focus error signal, intended for lag network
17	LO	O	Laser amplifier current output
18	LM	I	Laser monitor diode input
19	GCLF	I	Gain control input for AC and LF amplifiers. Current output from LF amplitude detector
20	Re2	O	Summation of amplified currents from D3 and D4
21	Re1	O	Summation of amplified currents from D1 and D2
22, 23	D1, D2	I	Current inputs to DC and LF photo diode amplifier
24, 25	D3, D4	I	Current inputs to DC and LF photo diode amplifier
26	HFin	I	Current input to HF amplifier
27	GND	I	Ground connection of device
28	DEC	I	Decoupling input (internal bypass)

• IC6503 (TDA8809T): Radial error signal processor

Pin No.	Mark	I/O Division	Function
1	Vp	I	Positive supply voltage
2	Cosc1	I	Frequency setting capacitors for oscillator
3	Cosc2		
4	Rwob	I	Wobble generator input
5	Rosc	I	Biassing resistor for oscillator frequency and internal amplitude
6	DIV4	I	Divide-by-4 input
7	REdig	O	Digital output of sign (Re2 – Re1)
8	B3	I	Input control bits for off-, catch-, play-status and DAC output current
9	B2		
10	B1		
11	B0		
12	Vext(+)	I	Positive external voltage input
13	Vext(–)	I	Negative external voltage input (also substrate connection)
14	GND	I	GND terminal
15	RADout	O	Current output of amplified (Re2 – Re1) input currents
16	REin	I	Radial error input
17	REIag	O	Voltage output of integrated (Re2 – Re1) input currents

Pin No.	Mark	I/O Division	Function
18	Lag	I	Connection of integrator capacitor for (Re1 – Re2) input currents
19	Lead	O	Lead output
20	Vref	I	Internal reference voltage output
21	AGC	I	Gain control input for radial error signal
22	RDAC	O	Biassing resistor for current output for track jumping (3½ bits)
23	offset in	I	Offset control input for radial offset
24	offset off	O	Offset control output for radial offset
25	CLPF	I	Low-pass filter for Re1 and Re2, used for radial offset control
26	CHPF	I	High-pass filter for Re1 and Re2, used for radial offset control
27	Re1	I	Input for amplified currents from photo-diodes D1 and D2
28	Re2	I	Input for amplified currents from photo diodes D3 and D4

• IC301 (MN6625): Digital signal processor

Pin No.	Mark	I/O Division	Function
1	BYTCK	O	Serial data byte clock (Not used, open)
2	FCLK	O	Crystal frame clock (Not used, open)
3	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")
4	SRDATA	O	Serial data output (MSB first)
5	SCLK	O	Serial bit clock output
6	LRCK	O	LR discrimination clock (88.2kHz)
7	WDCK	O	Serial data output word clock (Not used, open)
8	LOG	O	L channel deglitch signal (Not used, open)
9	RDG	O	R channel deglitch signal (Not used, open)
10	IPFLAG	O	Interpolation flag (interpolation at "H") (Not used, open)
11	FLAG	O	Error flag terminal (Not used, open)
12	XCK	O	Clock (16.9344 MHz) output (Not used, open)
13	TEST	I	Test mode selection (Not used, connected to +4.9V)
14	TX	O	Digital signal output
15	SLEEP	I	Mode selector ("L": normal, "H": SLEEP mode) (Not used, connected to GND)
16	CSEL	I	Test terminal ("L": normal) (Not used, connected to GND)
17	X1	I	Clock input (16.9344 MHz)
18	X2	O	Clock output (16.9344 MHz) (Not used, open)
19	VSS	I	GND terminal
20	BLKCK	O	Sub-code Q data block clock (75Hz)
21	CLOCK	O	Sub-code frame clock (7.35kHz)
22	SUBO	O	Sub-code Q data
23	RST	I	Reset command
24	MLD	I	Load command for mode control data

Pin No.	Mark	I/O Division	Function
25	MCLK	I	Data clock for MDATA
26	MDATA	I	Mode control data
27	DMUTE	I	Data mute command
28	TRON	I	Tracking servo ON signal (tracking servo ON at "L")
29	STAT	O	Status command for CRC etc. . .
30	SUBC	O	Sub-code serial output data (Not used, open)
31	SBCK	I	Clock for sub-code serial output (Not used, open)
32	SMCK	O	System clock (4.2336MHz)
33	VDD	I	Power supply (connected to +4.9V)
34	MEMP	I	Deemphasis command
35	FG	I	Turntable motor FG signal input (Not used, open)
36	PC	O	Turntable motor ON command (ON at "L")
37	EC	O	Turntable motor drive signal
38	RESY	O	Resynchronizing signal (Not used, open)
39	DO	I	Drop-out detection signal (Drop-out at "H")
40	SRF	I	Sliced RF signal
41	EFM	I	Modulation data
42	PCK	I	PLL extract clock (4.2336MHz)
43	FPC	O	PLL frequency comparison signal
44 51	D7 D0	I/O	16 K RAM data input/output
52	RAM OE	O	Read out enable
53	RAM WE	O	Write enable
54 64	RAM A0 RAM A10	O	16 K RAM address signal (RAMA0: LSB, RAMA10: MSB)

• IC401 (MN187124): System control & FL drive

Pin No.	Mark	I/O Division	Function
1 7	SEG6 / SEG0	O	FL segment signal
8	VPP	I	FL drive power supply (connected to -31.4V)
9	VDD	I	Power supply (Connected to 4.9V)
10	OSC2	I	Clock terminal
11	OSC1	I	Clock input
12	VSS	—	GND terminal
13	XI	I	Digital input of sign (Re2 – Re1)
14	XO	—	Not used, open
15	P27	O	Synchro rec control terminal
16	P26	O	Loading motor control signal
17	P25	O	Muting control signal
18	P24	I/O	On/off control (start input); ready signal output (starting up procedure successful)
19 22	P23 P20	O	Output control bits for off-, catch-, play- status and DAC output current
23	IRQ1	I	Remote control signal
24	IRQ0	I	Digital input of sign (Re2 – Re1)
25	P13	O	Mode control data
26	P12	O	Data clock for MDATA
27	P11	O	Load command for mode control data

Pin No.	Mark	I/O Division	Function
28	P10	I	Track loss input
29	RST	I	Reset command
30	P05	I	Sub-code frame clock (7.35 kHz)
31	P04	I	Sub-code Q data
32	P03	I	Disc holder open/close det. signal input
33	SBT0	I	Sub-code Q data block clock (75 Hz)
34	S80	O	Drop out detector/Tracking servo ON signal output
35	P00	I	Status command for CRC etc.
36	SYNC	—	Not used, open
37	CM	—	GND terminal
38	P47	O	Divide-by 4 output
39	P46	O	Deemphasis command
40	P45	I	PLL on hold input
41 45	P44 P41	I	Key return signal and key scan signal.
46 61	DGT0 DGT15	O	FL digit signal and key scan signal
62	P61	O	Synchro rec control signal
63 64	SEG8 SEG7	O	FL segment signal

• IC501 (AN8371S): Data slice and PLL

Pin No.	Mark	I/O Division	Function
1	VEE	I	Power supply (connected to -5.2V)
2	SRF	O	Sliced RF signal
3	EFM	O	Modulation data
4	D.GND	I	GND terminal (digital system)
5	PCK	O	PLL extract clock (4.2336MHz)
6	VCC	I	Power supply (connected to +4.9V)
7	VA	I	VCO free run frequency adjusting current input (Not used, open)
8, 9	VC1, 2	I	Capacitor connection for VCO oscillator frequency
10	VR	I	Resistor connection for VCO oscillator frequency
11	PD	I	Capacitor connection for PLL DO protection
12	PL1	I	PLL loop filter connection

Pin No.	Mark	I/O Division	Function
13	PL2	I	PLL loop filter connection
14	FPC	I	PLL frequency comparison signal
15	RF	I	Data
16	ARF	O	RF signal output with AGC output
17	AGC	I	ARF signal input for AGC drop-out detection input
18	AC	I	Loop filter for AGC connected
19	DO	O	Drop-out detection signal
20	A.GND	I	GND terminal (analog system)
21	DSL	I	RF signal input for data slicing
22	SLC	I	Slicing level control signal input (Not used, connected to GND)
23	FC1	I	Filter capacitor for data slicer connected
24	FC2	I	Filter capacitor for data slicer connected

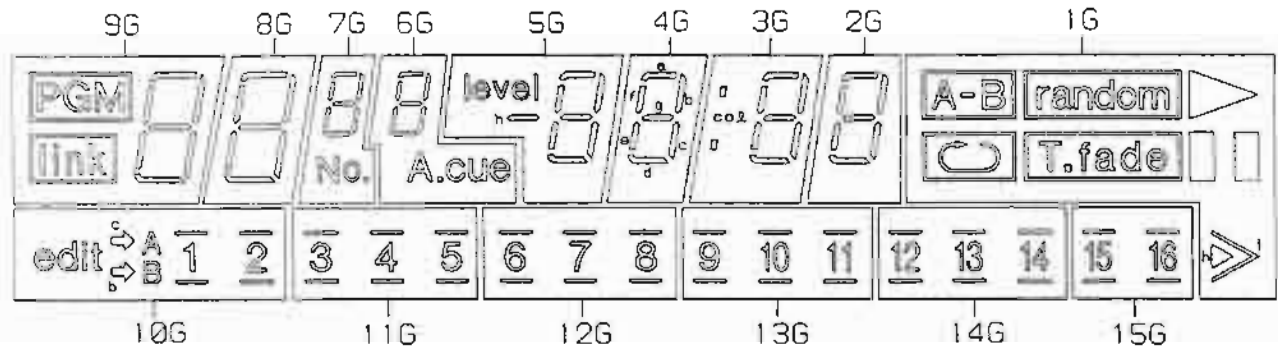
• IC801 (MN6474): Digital filter and D/A converter

Pin No.	Mark	I/O Division	Function
1	MLD	I	Command load input (load: L)
2	RSTB	I	Reset command
3	IE	I	Not used, connected to GND
4	TP1	—	TEST terminal
5	TP2	—	
6	TEST1	I	TEST terminal 1 (connected to GND)
7	TEST2	I	TEST terminal 2 (connected to GND)
8	NC	—	Not connected
9	NC	—	Not connected
10	AVDD4	I	Power supply (connected to +4.7V)
11	OUTL (-)	O	Lch data output, (-) terminal
12	AVSS4	I	GND terminal
13	AVSS3	I	GND terminal
14	OUTL (+)	O	Lch data output, (+) terminal
15	AVDD3	I	Power supply (connected to +4.7V)
16	NC	—	Not connected
17	AVDD2	I	Power supply (connected to +4.7V)
18	OUTR (+)	O	Rch data output, (+) terminal
19	AVSS2	I	GND terminal (analog system)
20	AVSS1	I	GND terminal (analog system)
21	OUTR (-)	O	Rch data output, (-) terminal

Pin No.	Mark	I/O Division	Function
22	AVDD1	I	Power supply (connected to +4.7V)
23	DVDD1	I	Power supply (connected to +4.8V)
24	DVSS1	I	GND terminal (digital system)
25	X2	O	Clock output
26	X1	I	Clock input
27	NC	—	Not connected
28	DVDD2	I	Power supply (connected to +4.8V)
29	DVSS2	I	GND terminal (digital system)
30	NSUB	I	Sub-strate terminal (Not used, connected to +4.8V)
31	ZFLGB	O	Zero input detector terminal (Not used, open)
32	192fs	O	192 fs (8.4672MHz) (Not used, open)
33	LRPOL	I	LR clock selector (Not used, connected to +4.8V)
34	LRCLK	I	LR discrimination signal input
35	8CLK	I	Serial bit clock input
36	SRDATA	I	Serial data input (MSB first)
37	DVSS 3	I	GND terminal (digital system)
38	DVDD	I	Power supply (connected to +4.8V)
39	384 fs	O	384 fs (16.9344MHz) output
40	PD	I	Power down terminal (Not used, connected to GND)
41	MDATA	I	Mode control data
42	MCLK	I	Data clock for MDATA

INTERNAL CONNECTION OF FL

Grid assignment



Anode connection

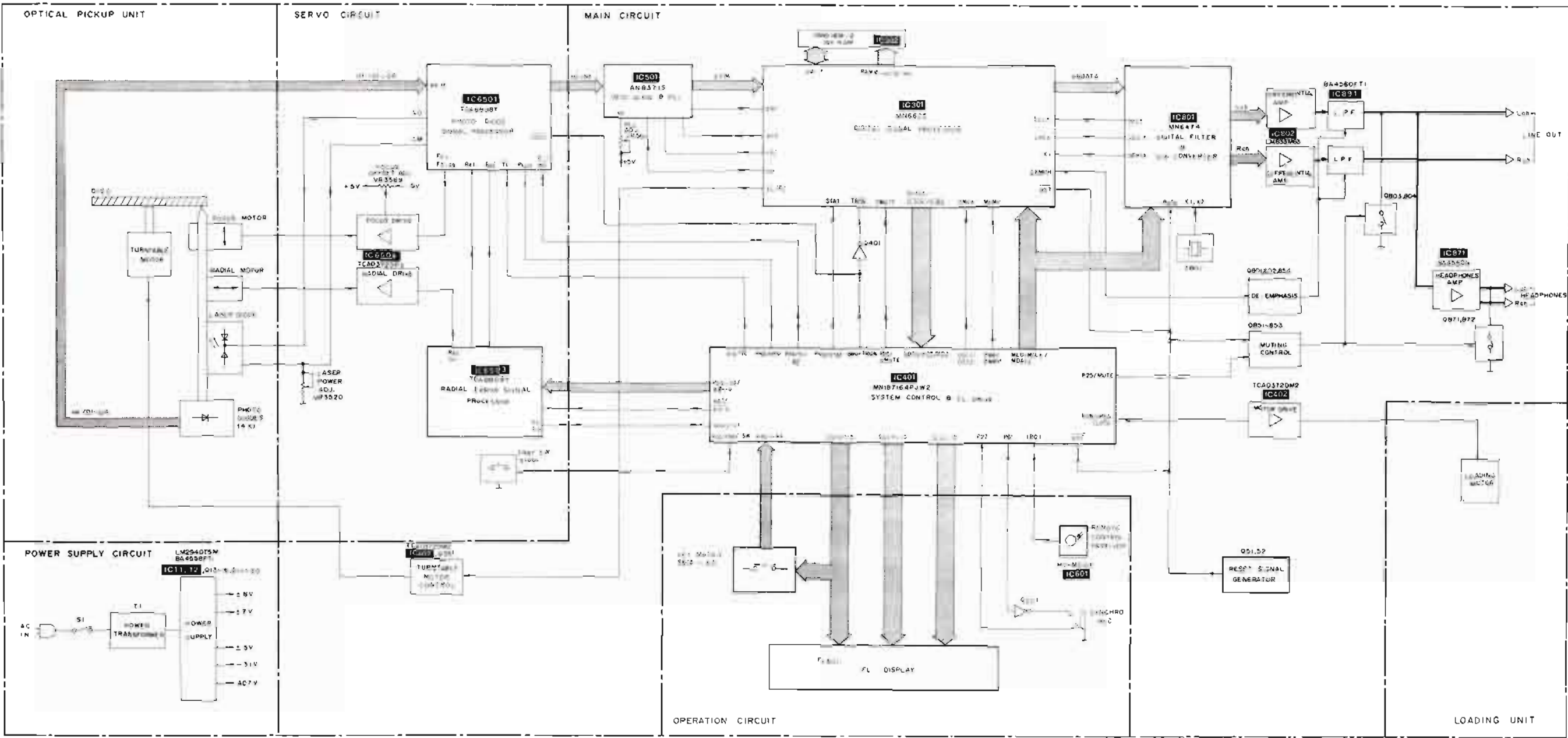
	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	15	12	9	6	3	edit	a	a	a	a	a	a	a	a	▶
b	(15)	(12)	(9)	(6)	(3)	→	b	b	b	b	b	b	b	b	■
c	(15)	(12)	(9)	(6)	(3)	→	c	c	c	c	c	c	c	c	random
d	16	13	10	7	4	1	d	d	d	d	d	d	d	d	T.fade
e	(16)	(13)	(10)	(7)	(4)	(1)	e	e	e	e	e	e	e	e	↺
f	(16)	(13)	(10)	(7)	(4)	(1)	f	f	f	f	f	f	f	f	A-
g	-	14	11	8	5	2	g	g	g	g	g	g	g	g	B
h	-	(14)	(11)	(8)	(5)	(2)	PGM	-	NO.	-	-	-	-	-	▶
i	-	(14)	(11)	(8)	(5)	(2)	link	-	-	A.cue	level	-	-	-	>

Pin connection

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

Note 1.)NP.....No pin.
2.)F1,P2.....Filament
3.)1G~15G.....Grid

BLOCK DIAGRAM



RAD out : Current output of integrated (Re2 — Re1) input currents.
B0 ~ B3: : Control bits for radial circuit.
D0DS : Drop out detector suppression.
D1 ~ D4 : Photodiode currents.
FE : Focus error signal.
FE lag : Focus error signal for LAG network.
HF : HF output for DEMOD.
HFD : HF detector output for DEMOD.
(PLLH) :
HFin : HF current input.
LM : Laser monitor diode input.
LO : Laser amplifier current output.
Re1 : Radial error signal 1 (summation of amplified currents D3 and D4).
Re2 : Radial error signal 2 (summation of amplified currents D1 and D2).

RE dig (IROO/XI) : Radial error digital.
RE lag : Radial error signal for LAG network.
Si/RD : On/off control for laser supply and focus circuit.
TL : Track loss signal.
Div4 : Radial error digital divided by four.
HF/RF : Data.
DO : Drop-out detection signal (Active High).
SRF : Sliced RF signal.
EFM : Modulation data.
PCK : PLL extract clock (4.2336MHz).
FPC : PLL frequency comparison signal.
STAT : Status command for CRC etc.
DMUTE : Data mute command.
MDATA : Mode control data.
MLO : Load command for mode control data (Active Low).

P40~44 : Key return signal.
DGT0~15 : Key scan signal and FL digit signal.
SEG0~8 : FL segment signal.
MCLK : Data clock for MDATA.
SUBQ : Sub-code Q data.
CLDCK : Data frame clock (7.35KHz).
BLKCK : Sub-code Q data block clock (75 Hz).
RST (RSTB) : Reset command (Active Low).
TRON : Tracking servo ON command (Active Low).
EC : Turntable motor drive signal.
PC : Turntable motor ON command (Active Low).
SMCK : System clock (4.2336MHz).
OSC1/OSC2 :
OE : Read out enable.
WE : Write enable.

LRCK (LRCLK) : L/R data discrimination clock (88.2KHz).
SRDATA : Serial data output (MSB first).
SCLK (SRCK) : Serial bit clock (2.82MHz).
MEMPH (EMPH) : Deemphasis command (Active High).
P27/P61 : Synchro rec control.
IRQ1 : Remote control signal.
384fs (X1) : 384fs (116.9344MHz) signal.
DEMPH : De-emphasis ON signal.
TX : Digital signal output.
D0~7 : 16K RAM data.
RAM0~10 : 16K RAM address signal.
P25 (MUTE) : Muting control signal.
P26 : Loading motor control signal (OPEN/CLOSE).

Note)
•————→ Audio signal.

SCHEMATIC DIAGRAM

(Parts list on pages 34 ~ 36, 42, 43.)

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

Notes:

- S1 : Power switch in "on" position.
- S613 : Play (▶PLAY) switch.
- S614 : Skip (◀) switch.
- S615 : Search (◀◀) switch.
- S616 : Program (PROGRAM) switch.
- S617 : Link (LINK) switch.
- S618 : Auto cue (A CUE) switch.
- S619 : Stop (■ STOP) switch.
- S620 : Skip (▶) switch.
- S621 : Search (▶▶) switch.
- S622 : Recall (RECALL) switch.
- S623 : Tape side select (SIDE A/B) switch.
- S624 : Random (RANDOM) switch.
- S625 : Time, Fade (T. FADE) switch.
- S626 : Disc holder open/close (▲ OPEN/CLOSE) switch.
- S627 : Pause (|| PAUSE) switch.
- S628 : Repeat (REPEAT) switch.
- S629 : Clear (CLEAR) switch.
- S630 : Edit (EDIT) switch.
- S631 : Time mode select (TIME MODE) switch.
- S1001 : Tray (OPEN/CLOSE) switch.

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

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

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

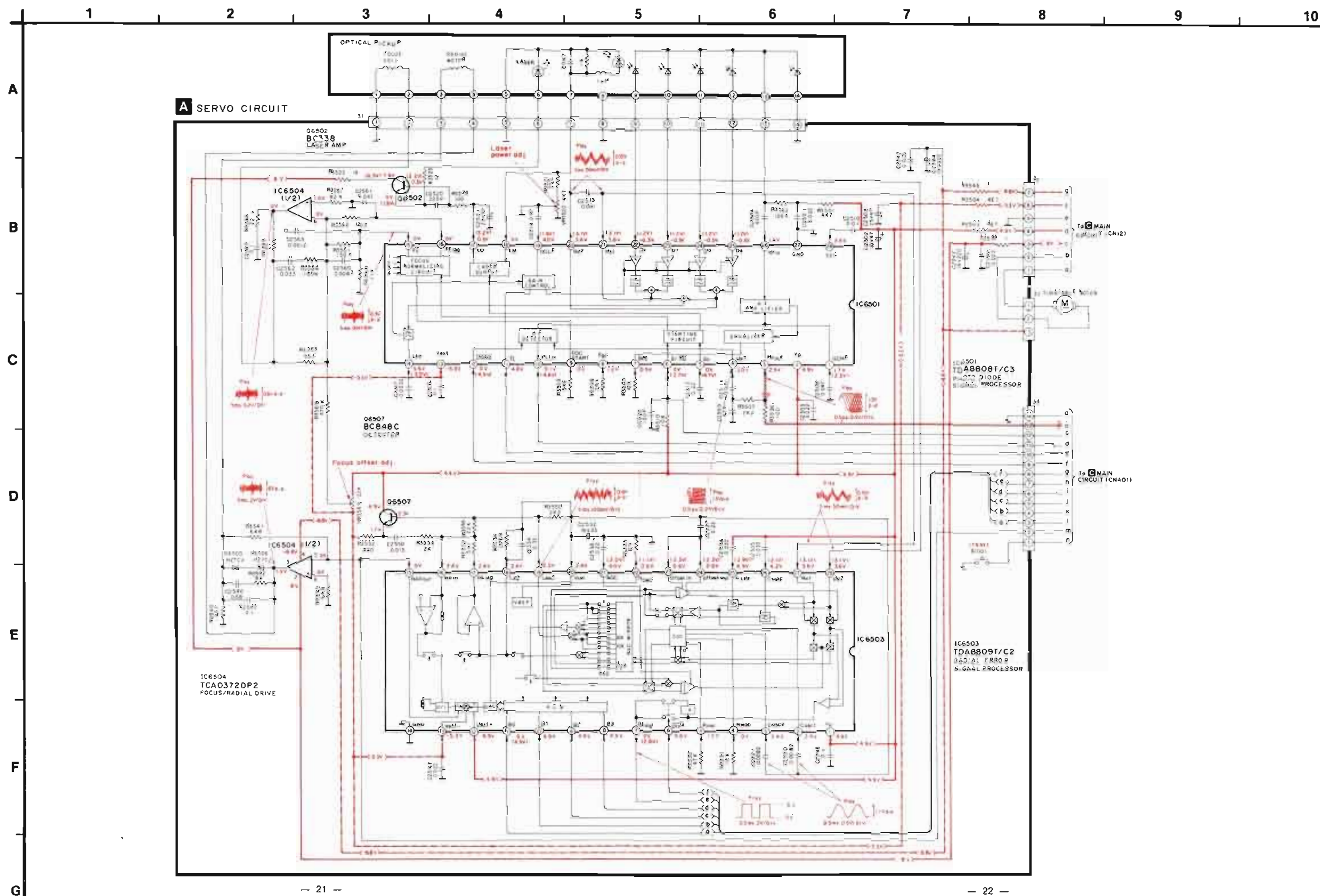
• Important safety notice:
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

• Positive voltage lines and negative voltage lines.

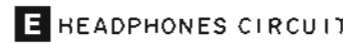
Audio signal lines.

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.



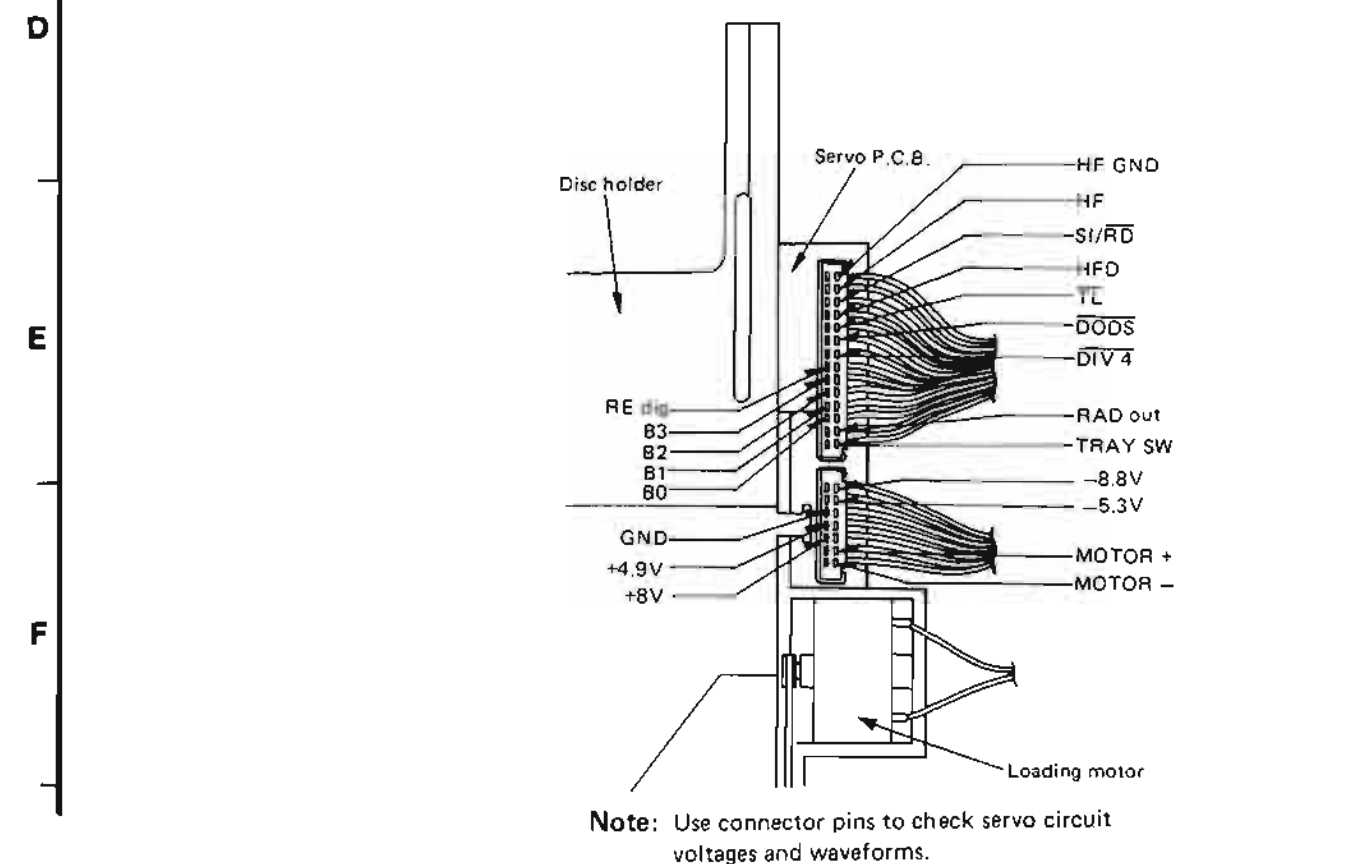
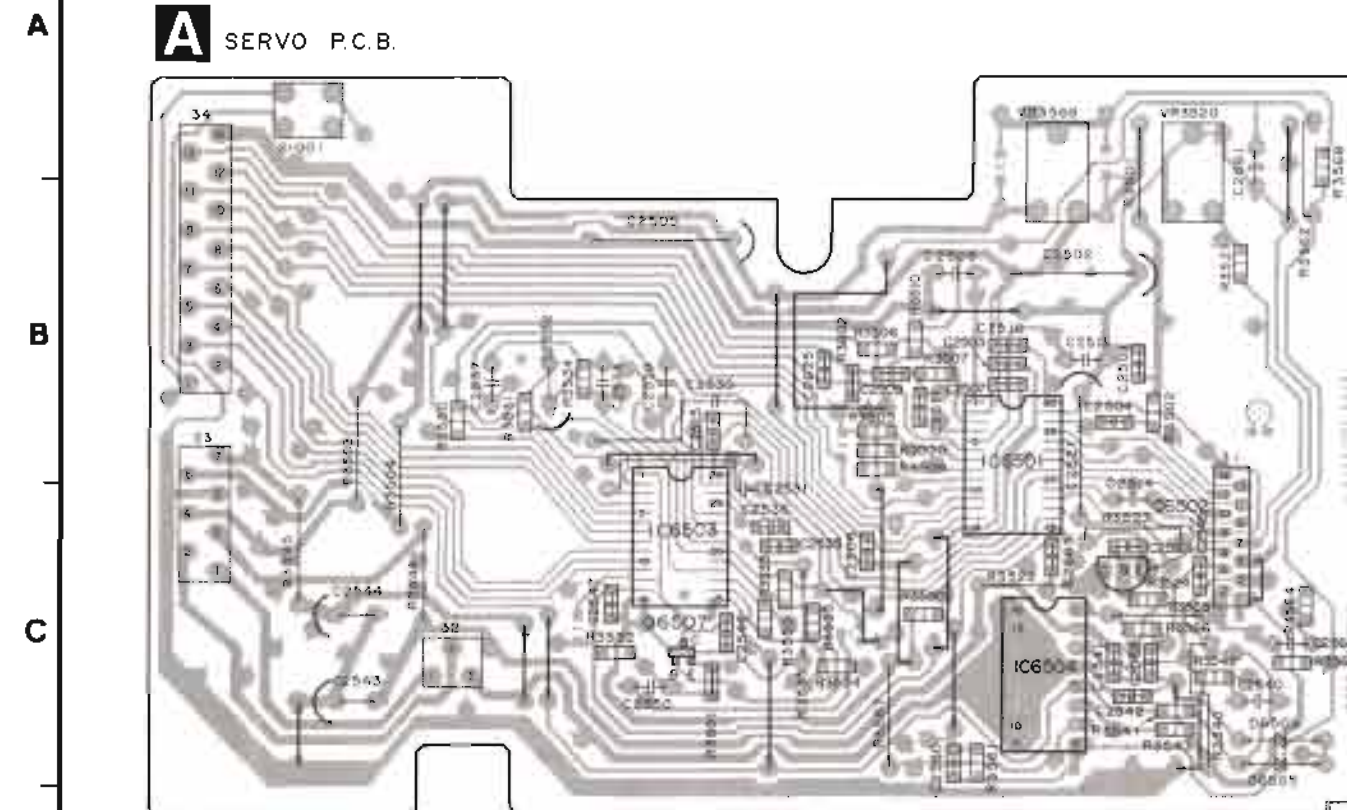
D POWER SUPPLY CIRCUIT FOR (E,EG) AREAS



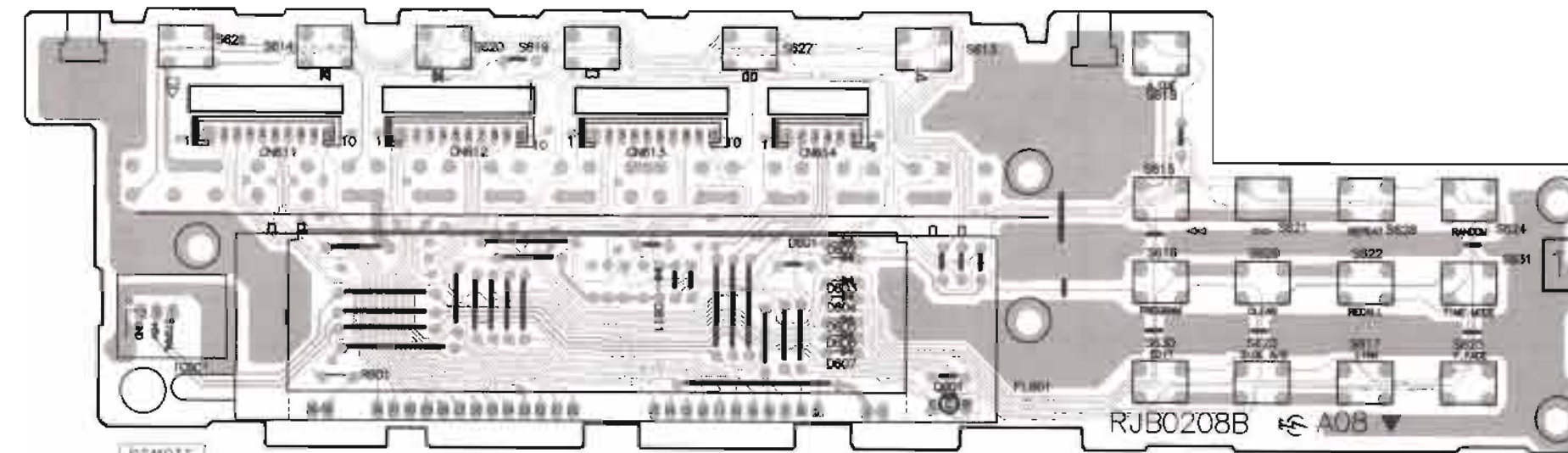
■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

 BA4560N 8 Pin		 LM2940T5M
 LMB33M63 8 Pin BA4558FT1 8 Pin BA4560FT1 24 Pin AN5371S 24 Pin	 UM6116M-2 24 Pin 4822 209 73234 (TDA8808T) 28 Pin 4822 209 73235 (TDA8809T) 28 Pin	
 4822 209 72587 (TCA0372) 16 Pin TCA0372DM2 16 Pin	 SRUN15T	
 MN6474 42 Pin MN6625 64 Pin MN187164PJW2 64 Pin	 4822 130 44121 (BC338) 3 Pin	
 DTA124ESTP	 2SA1309QRSTA , 2SD1450RSTTA , 2SC3311QRSTA	
 DTC124ESTP	 2SB1238QSTV6 , 2SB1240QRTV6	 1SS254TA , 1SR139-200TA
 MA4330MTA , MA4062HTA , MA4039MTA	 5322 130 42136 (BC848C)	

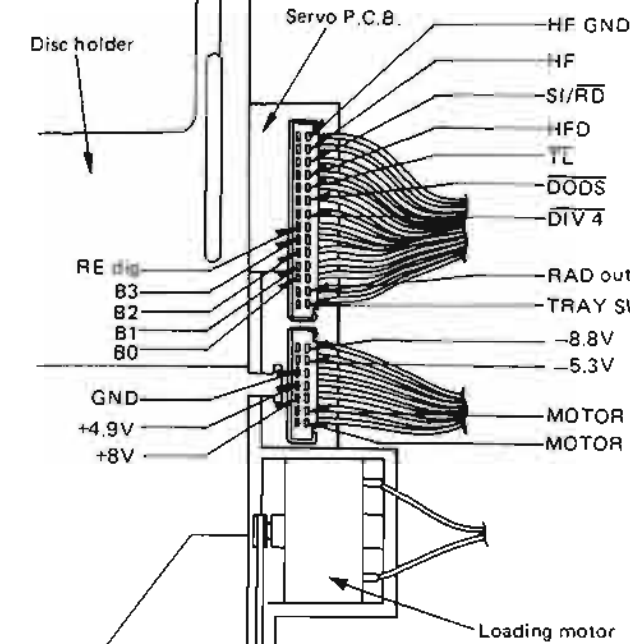
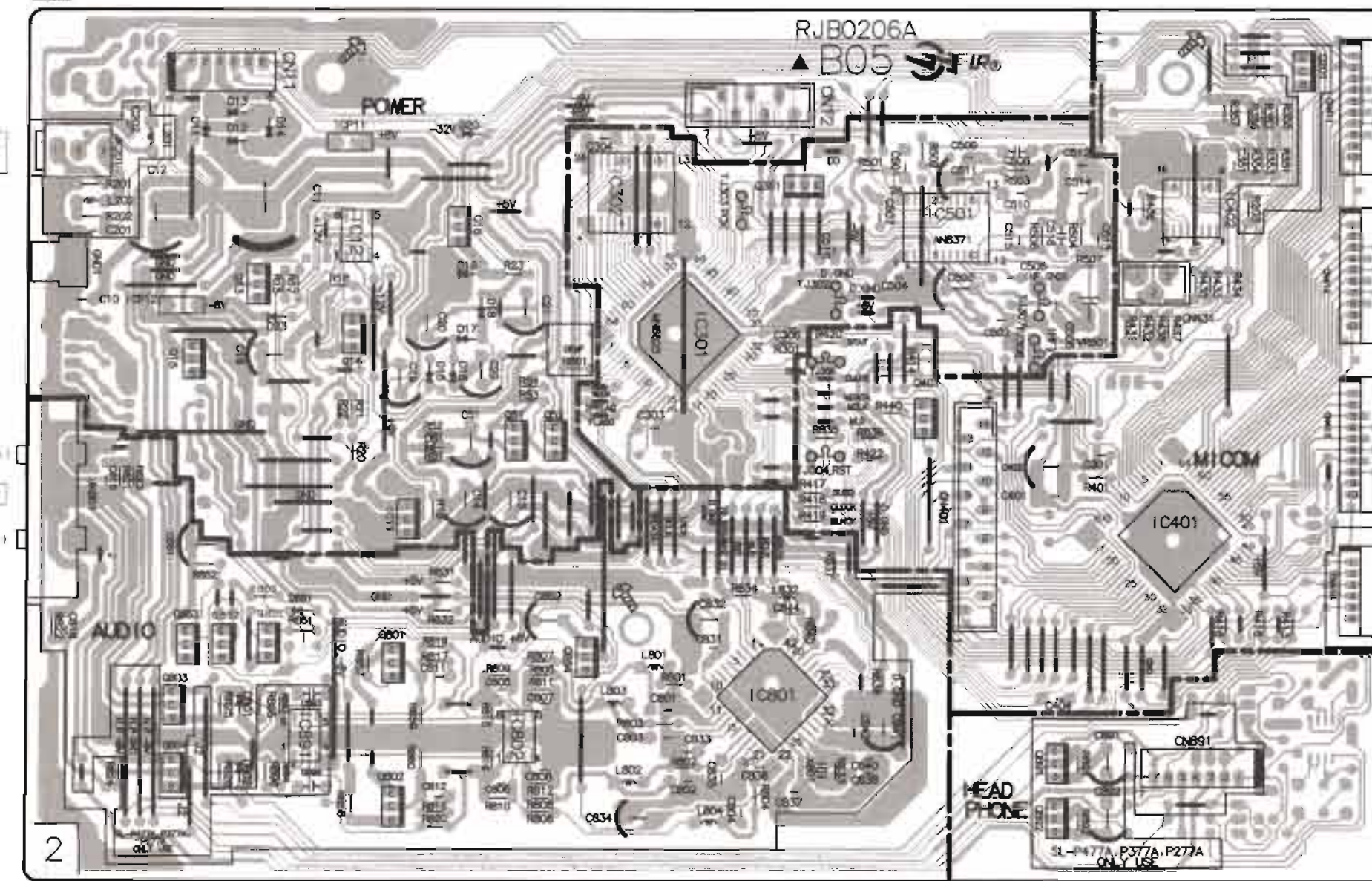
■ PRINTED CIRCUIT BOARDS



B OPERATION P.C.B.

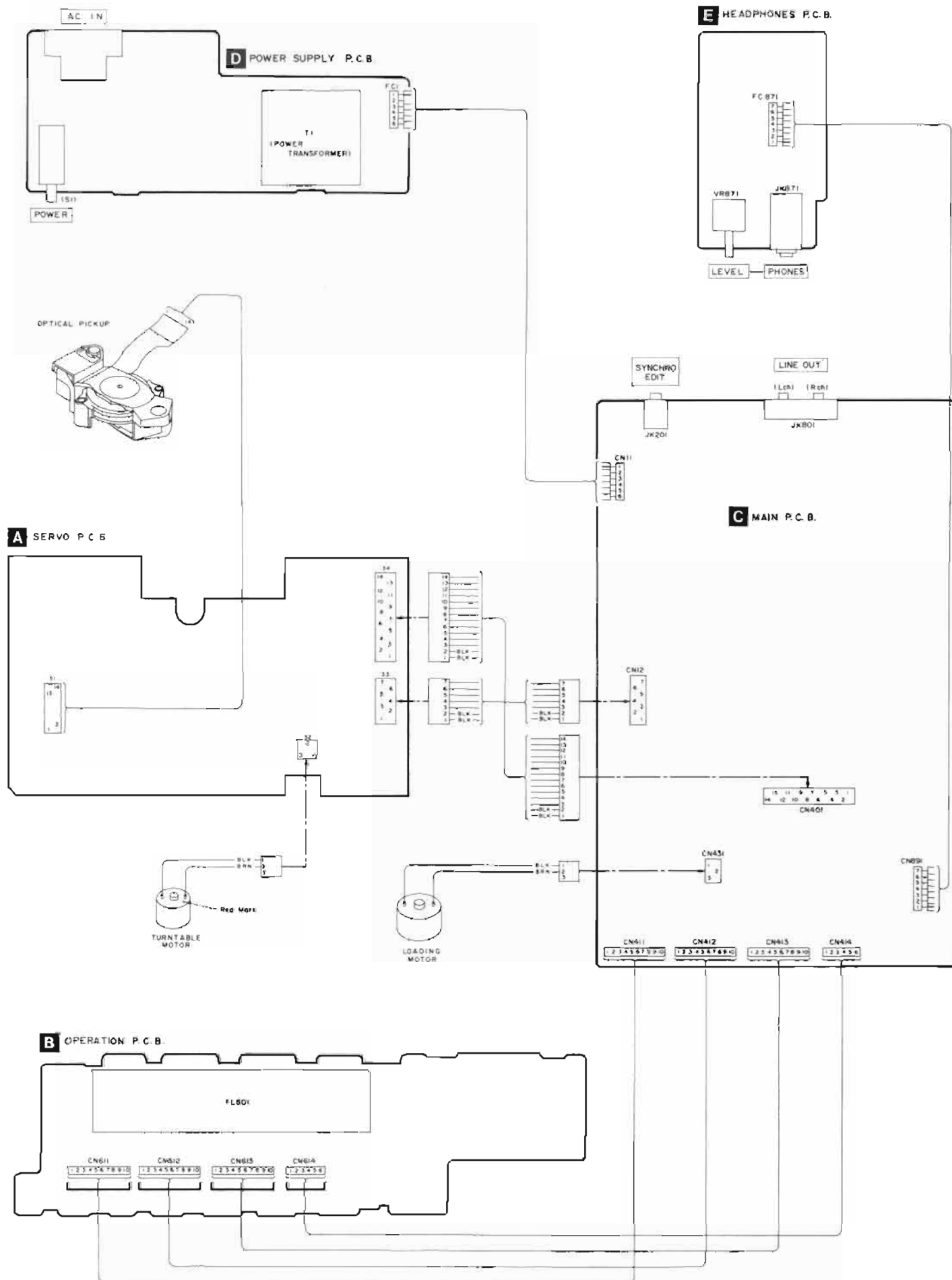


C MAIN P.C.B.



Note: Use connector pins to check servo circuit voltages and waveforms.

■ WIRING CONNECTION DIAGRAM



■ REPLACEMENT PARTS LIST

Notes : • Important safety notice:

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

• The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.) Parts without these indications can be used for all areas.

• Remote Control Ass'y: Supply period for three years from termination of production.

• Δ Indicates in Remarks columns parts that are supplied by MBV.

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

* ACHTUNG: Die Lasereinheit nicht zerlegen

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

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)		Q892	2SA1309QSTA	TRANSISTOR	
						DIODE(S)	
IC11	LM2940TSM	IC, REGULATOR		D11	1SR139-200TA	DIODE	Δ
IC12	BA4558FT1	IC, STABILIZER		D12	1SR139-200TA	DIODE	Δ
IC301	MN6625	IC, DIGITAL SIGNAL PROCESSOR		D13	1SR139-200TA	DIODE	Δ
IC302	UM6116M-2	IC, 16K RAM		D14	1SR139-200TA	DIODE	Δ
IC401	MN187164PJW2	IC, SYSTEM CONTROL&FL DRIVE		D15	1SR139-200TA	DIODE	Δ
IC402	TCA0372DM2	IC, MOTOR DRIVE		D16	1SR139-200TA	DIODE	Δ
IC501	AN8371S	IC, DATA SLICE&PLL		D17	1SR139-200TA	DIODE	Δ
IC601	HC-M010E	IC, REMOTE CONTROL RECEIVER		D18	1SR139-200TA	DIODE	Δ
IC801	MN6474	IC, DIGITAL FILTER&D/A CONV.		D19	MA4330MTA	DIODE	
IC802	LM833M63	IC, DIFFERENTIAL AMP		D20	MA4062HTA	DIODE	
IC871	BA4560N	IC, HEADPHONES AMP		D23	1SR139-200TA	DIODE	
IC891	BA4560FT1	IC, L. P. F.		D51	MA4039MTA	DIODE	
ICP1	CUW212HR5R	IC, PROTECTOR	(E, EG) Δ	D601	1SS254TA	DIODE	
ICP1	SRUN38T	IC, PROTECTOR	(EB) Δ	D602	1SS254TA	DIODE	
ICP2	CUW212HR5R	IC, PROTECTOR	(E, EG) Δ	D603	1SS254TA	DIODE	
ICP2	SRUN38T	IC, PROTECTOR	(EB) Δ	D604	1SS254TA	DIODE	
ICP11	SRUN15T	IC, PROTECTOR	Δ	D605	1SS254TA	DIODE	
ICP12	SRUN15T	IC, PROTECTOR	Δ	D606	1SS254TA	DIODE	
		TRANSISTOR(S)		D607	1SS254TA	DIODE	
				D611	1SS254TA	DIODE	
Q13	2SB1240QRTV6	TRANSISTOR		D801	1SS254TA	DIODE	
Q14	2SC3311QRSTA	TRANSISTOR		D802	1SS254TA	DIODE	
Q15	2SA1309QSTA	TRANSISTOR		D851	1SR139-200TA	DIODE	
Q16	2SB1238QSTV6	TRANSISTOR				VARIABLE RESISTOR(S)	
Q51	2SC3311QRSTA	TRANSISTOR					
Q52	2SC3311QRSTA	TRANSISTOR		VR501	EVNDXAA00R13	V. R. PLL ADJ.	
Q201	DTC124ESTP	TRANSISTOR		VR871	EVJCB0F02A14	V. R. HEADPHONES LEVEL	
Q351	DTA124EST	TRANSISTOR				COIL(S)	
Q401	DTA124EST	TRANSISTOR					
Q601	DTC124ESTP	TRANSISTOR		L201	ELEV3R3KA	COIL	
Q801	2SC3311QRSTA	TRANSISTOR		L202	ELEV3R3KA	COIL	
Q802	2SC3311QRSTA	TRANSISTOR		L801	ELEV561KA	COIL	
Q803	2SD1450RSTTA	TRANSISTOR		L802	ELEV561KA	COIL	
Q804	2SD1450RSTTA	TRANSISTOR		L803	ELEV561KA	COIL	
Q851	DTA114ESTP	TRANSISTOR		L804	ELEV561KA	COIL	
Q852	2SC3311QRSTA	TRANSISTOR		L832	ELEPK4R7KA	COIL	
Q853	DTA114ESTP	TRANSISTOR		L871	ELEV3R3KA	COIL	
Q854	DTA124EST	TRANSISTOR		L872	ELEV3R3KA	COIL	
Q871	2SD1450RSTTA	TRANSISTOR		L873	ELEV3R3KA	COIL	
Q872	2SD1450RSTTA	TRANSISTOR					
Q891	2SC3311QRSTA	TRANSISTOR					

Ref. No.	Part No.	Part Name & Description	Remarks
L874	ELEPK4R7KA	COIL	
		TRANSFORMER (S)	
T1	ETP48JG61CN	POWER TRANSFORMER	(E, EG)△ (MB)
T1	ETP48JG71BN	POWER TRANSFORMER	(EB)△ (MB)
		OSCILLATOR (S)	
X801	SVQ49U338S	OSCILLATOR	
		DISPLAY TUBE	
FL601	RSL0040-F	DISPLAY TUBE	
		SWITCH (ES)	
S1	ESB8249V	SW. POWER	△
S613	EVQB005R	SW. PLAY	
S614	EVQB005R	SW. SKIP (R)	
S615	EVQB005R	SW. SEARCH (R)	
S616	EVQB005R	SW. PROGRAM	
S617	EVQB005R	SW. LINK	
S618	EVQB005R	SW. AUTO CUE	
S619	EVQB005R	SW. STOP	
S620	EVQB005R	SW. SKIP (F)	
S621	EVQB005R	SW. SEARCH (F)	
S622	EVQB005R	SW. RECALL	
S623	EVQB005R	SW. SIDE A/B	
S624	EVQB005R	SW. RANDOM	
S625	EVQB005R	SW. T. FADE	
S626	EVQB005R	SW. OPEN/CLOSE	
S627	EVQB005R	SW. PAUSE	
S628	EVQB005R	SW. REPEAT	
S629	EVQB005R	SW. CLEAR	
S630	EVQB005R	SW. EDIT	
S631	EVQB005R	SW. TIME MODE	
		CONNECTOR (S) AND SOCKET (S)	
CN11	SJT0643-V	CONNECTOR (6P)	
CN12	RJT001HD07	CONNECTOR (7P)	(MB)
CN401	RJT001HD14	CONNECTOR (14P)	(MB)
CN411	RJU003KD10M1	SOCKET (10P)	
CN412	RJU003KD10M1	SOCKET (10P)	
CN413	RJU003KD10M1	SOCKET (10P)	
CN414	RJU003KD06M1	SOCKET (6P)	
CN431	RJT001HD03	CONNECTOR (3P)	(MB)
CN611	RJT003KD10M	SOCKET (10P)	
CN612	RJT003KD10M	SOCKET (10P)	
CN613	RJT003KD10M	SOCKET (10P)	
CN614	RJT003KD06M	SOCKET (6P)	

Ref. No.	Part No.	Part Name & Description	Remarks
		<SERVO P.C.B.>	
		INTEGRATED CIRCUITS	
IC6501	482220973234	I. C. PHOTO DIODE S. P.	(MB)
IC6503	482220973235	I. C. RADIAL ERROR S. P.	(MB)
IC6504	482220972587	I. C. FOCUS/RADIAL DRIVE	(MB)
		TRANSISTORS	
Q6502	482213044121	TRANSISTOR	(MB)
Q6507	532213042136	TRANSISTOR	(MB)
		DIODES	
D6505	482213081101	DIODE	(MB)
D6506	482213081101	DIODE	(MB)
		VARIABLE RESISTORS	
VR3520	482210110685	V. R. LASER POWER ADJ.	(MB)
VR3569	482210020522	V. R. FOCUS OFFSET ADJ.	(MB)
		SWITCH	
S1001	482227612523	SW. TRAY	(MB)

Notes :

- Important safety notice:
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
- The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.) Parts without these indications can be used for all areas.
- Remote Control Ass'y:
Supply period for three years from termination of production.
- MB Indicates in Remarks columns parts that are supplied by MBV.
- "(K)" mark parts are used for black type only.
- "(S)" mark parts are used for silver type only.

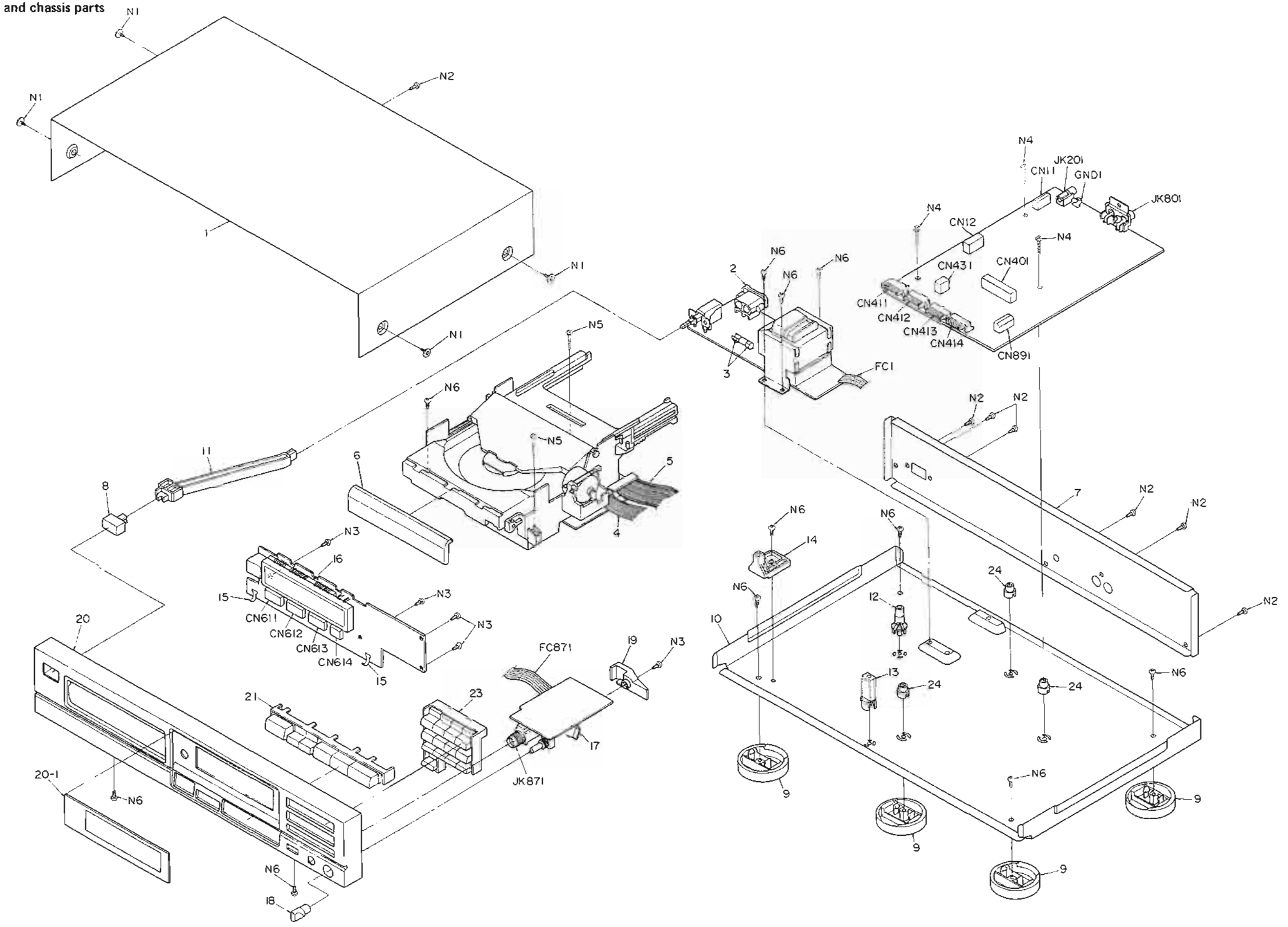
Parts other than "(K)" and "(S)" marked are used for all color types.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS				PACKING MATERIAL	
1	RKMD098-K	TOP CASE	(K) (MB)	P1	RPQ0344	PACKING CASE	(K) (MB)
1	RKMD098-S	TOP CASE	(S) (MB)	P1	RPQ0345	PACKING CASE	(S) (MB)
2	SJS9236	AC INLET	△	P2	RPN0239A	CUSHION (T)	(MB)
3	SJT390	FUSE HOLDER	△	P3	RPN0239B	CUSHION (B)	(MB)
4	REX0007	CONNECTOR ASS'Y (7P)	(MB)	P4	RMR0024	LOCK SHAFT	(MB)
5	REX0008	CONNECTOR ASS'Y (14P)	(MB)	P5	XZB60X60A01	PROTECTION BAG (UNIT)	
6	RGKD197-K	TRAY ORNAMENT	(K)	P6	XZB23X35C03	PROTECTION BAG (F. B.)	
6	RGKD197-S	TRAY ORNAMENT	(S)	P7	XZB26X17C03	PROTECTION BAG (CORD)	
7	RGD067A-B	REAR PANEL	(E, EG) (MB)			ACCESSORIES	
7	RFKIP277AEBK	REAR PANEL ASS'Y	(EB) (MB)	A1	RFKSP277AE	INSTRUCTION MANUAL ASS'Y	(E) (MB)
8	RGU0030	POWER BUTTON	(K)	A1	RQT0276-B	INSTRUCTION MANUAL	(EB) (MB)
8	RGU0030-S	POWER BUTTON	(S)	A1	RQT0277-D	INSTRUCTION MANUAL	(EG) (MB)
9	RKA0040B	FOOT	(MB)	A2	RQAD013	GUARANTEE CARD	
10	RMRD077	CHASSIS	(MB)	A3	RQC80169	SERVICE SHOP LIST	
11	RMDU051	POWER SW HOD	(MB)	A4	SJA187	POWER CORD	(E, EG) △
12	RMR0020	SPACER (A)	(MB)	A4	SJA193	POWER CORD	(EB) △
13	RMR0021	SPACER (B)	(MB)	A5	SJP2249-3	PIN CORD	
14	RMH0022	SPACER (C)	(MB)	A6	RQCA0059	CAUTION (LOCK SHAFT)	(MB)
15	SUSD144	EARTH CONTACT		A7	EUR64796	REMOTE CONTROL UNIT	(K) (MB)
16	SJWD139-1	VFD HOLDER	(MB)	A7	EUR64797	REMOTE CONTROL UNIT	(S) (MB)
17	RMCH063	HEADPHONES EARTH	(MB)	A8	UR64EC804	BATTERY COVER	(K)
18	RGW0048	BUTTON, H. P. VOLUME	(K)	A8	UR64EC804A	BATTERY COVER	(S)
18	RGW0048-S	BUTTON, H. P. VOLUME	(S)			LOADING UNIT PARTS	
19	RMRD234	H. P. P. C. B. FIXER	(MB)	101	482244450603	TRAY	(MB)
20	RFKGP277AE-K	FRONT PANEL ASS'Y	(K) (MB)	102	482232550176	GROMMET, CABLE	(MB)
20	RFKGP277AE-S	FRONT PANEL ASS'Y	(S) (MB)	103	482232550177	GROMMET, CABLE	(MB)
20-1	RKMD077	WINDOW	(MB)	104	482246692251	PLATE	(MB)
21	RGU0277-K	MAIN KNOB	(K)	106	482235810115	BELT, DRIVING	(MB)
21	RGU0277-S	MAIN KNOB	(S)	107	482252232359	WHEEL, GEAR	(MB)
23	RGU0279-K	SUB KEY KNOB	(K)	108	482253251518	RING, RUBBER	(MB)
23	RGU0279-S	SUB KEY KNOB	(S)	109	482240261081	GUIDE	(MB)
24	SHE185-2	P. C. B. SUPPORTER		111	482240261132	GUIDE	(MB)
		SCREWS		112	482252890138	ROLLER	(MB)
N1	SNE2129-1	SCREW	(K)	113	482249251902	SPRING, COMPRES.	(MB)
N1	SNE2129	SCREW	(S)	114	482246661587	FOAM	(MB)
N2	XTBS3-8JF21	SCREW		116	482240261107	LEVER	(MB)
N3	XTBS26-10J	SCREW		117	482249263659	SPRING, BLADE	(MB)
N4	XTB3-16JF2	SCREW		118	482244460568	LID	(MB)
N5	XTB3-35JF2	SCREW					
N6	XTB3-8JFZ	SCREW					

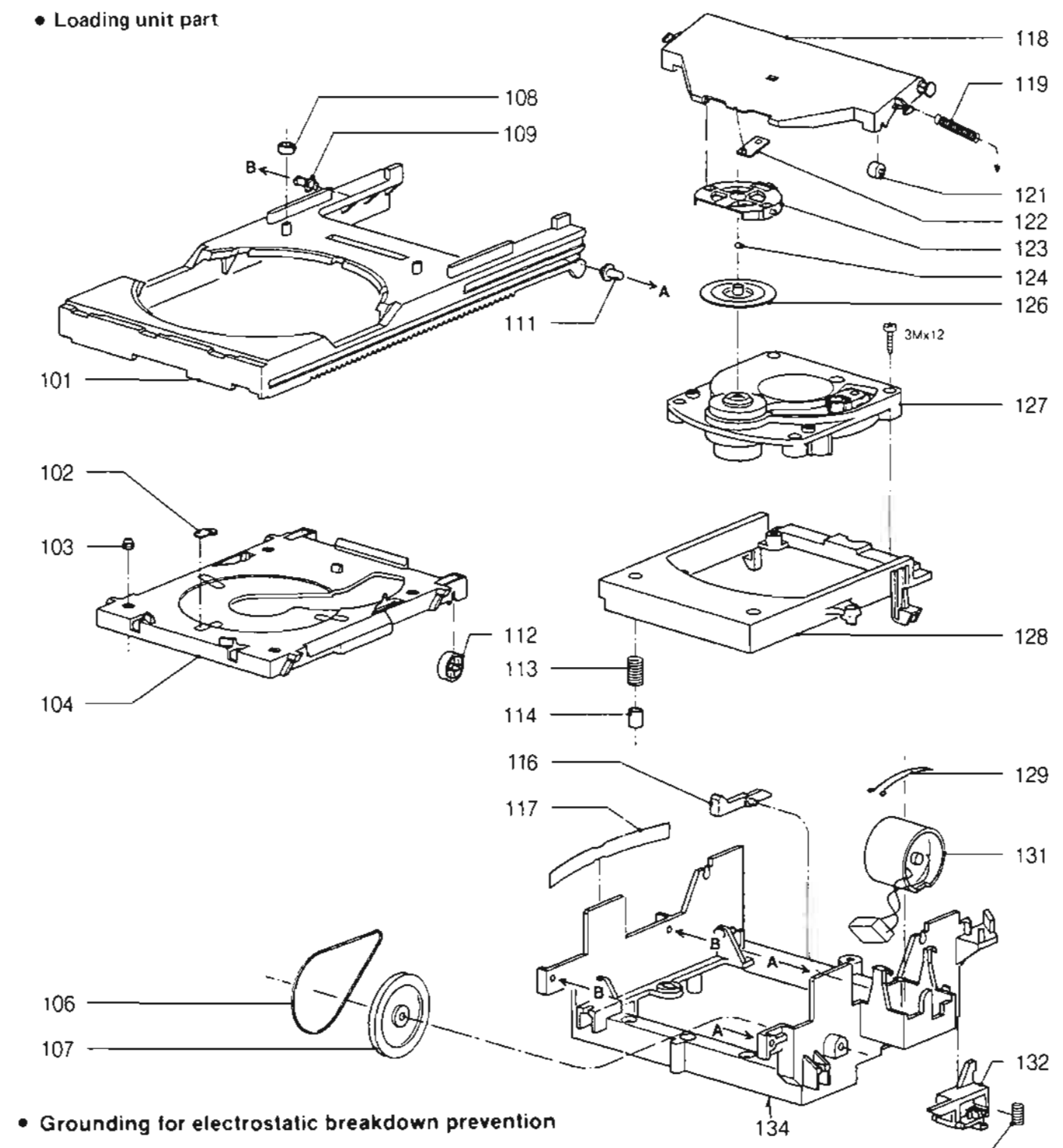
Ref. No.	Part No.	Part Name & Description	Remarks
119	482249232083	SPRING, TENSION	(MB)
121	482252890639	ROLLER	(MB)
122	482246692257	PLATE	(MB)
123	482240261207	HOLDER	(MB)
124	482252940177	BALL	(MB)
125	482253080503	RING, PRESSURE	(MB)
127	482269130209	OPTICAL PICKUP UNIT	(MB)
128	482240261196	SUPPORT	(MB)
129	482249263746	SPRING, CLAMPING	(MB)
131	482236120998	MOTOR	(MB)
132	482240250244	BRACKET	(MB)
133	482249251935	SPRING, COMPRES.	(MB)
134	482246450715	CHASSIS	(MB)

EXPLODED VIEWS

• Cabinet and chassis parts

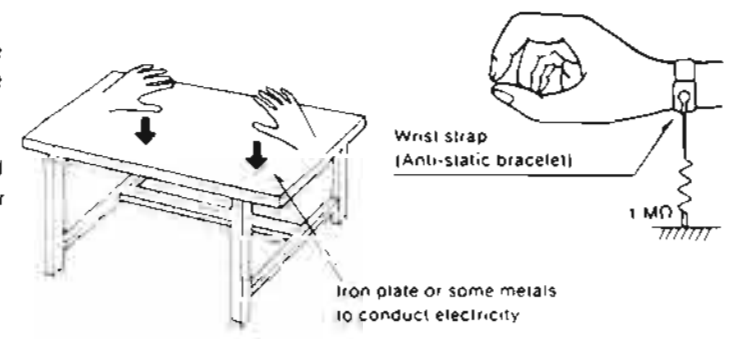


• Loading unit part



• 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



RESISTORS AND CAPACITORS

Notes : • Important safety notice:
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
• [MB] Indicates in Remarks column parts that are supplied by MBV.
• Capacity value are in microfarads (μ F) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
• Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM) . 1M=1,000k (OHM)

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
			R562	ERDS2J562T	1/4W 5.6K	R873	ERDS2J123T	1/4W 12K
			R563	ERDS2J474T	1/4W 470K	R874	ERDS2J123T	1/4W 12K
			R564	ERDS2J101T	1/4W 100	R875	ERDS2J104T	1/4W 100K
			R566	ERDS2J333T	1/4W 33K	R876	ERDS2J104T	1/4W 100K
			R567	ERDS2J102T	1/4W 1K	R885	ERDS2J222T	1/4W 2.2K
			R601	ERDS2J120T	1/4W 12	R886	ERDS2J222T	1/4W 2.2K
			R801	ERDS2J150T	1/4W 15	R887	ERDS2J160T	1/4W 60
			R802	ERDS2J150T	1/4W 15	R888	ERDS2J160T	1/4W 60
			R803	ERDS2J150T	1/4W 15	R889	ERDS2J472T	1/4W 4.7K
			R804	ERDS2J150T	1/4W 15	R890	ERDS2J472T	1/4W 4.7K
			R805	ERDS2J433T	1/4W 43K	R891	ERDS2J102T	1/4W 1K
			R806	ERDS2J433T	1/4W 43K	R892	ERDS2J102T	1/4W 1K
			R807	ERDS2J433T	1/4W 43K	R893	ERDS2J472T	1/4W 4.7K
			R808	ERDS2J433T	1/4W 43K	R894	ERDS2J472T	1/4W 4.7K
			R809	ERDS2J563T	1/4W 56K	R895	ERDS2J471T	1/4W 470
			R810	ERDS2J563T	1/4W 56K	R896	ERDS2J471T	1/4W 470
			R811	ERDS2J563T	1/4W 56K			
			R812	ERDS2J563T	1/4W 56K			CAPACITORS
			R815	ERDS2J472T	1/4W 4.7K			
			R816	ERDS2J472T	1/4W 4.7K	C1	ECRMC103P2	400V 0.01 μ Δ
			R817	ERDS2J161T	1/4W 150	C2	ECFR1H103H3	50V 0.01 μ Δ
			R818	ERDS2J151T	1/4W 150	C3	ECFR1H103H3	50V 0.01 μ Δ
			R819	ERDS2J471T	1/4W 470	C10	ECFR1E104Z5	25V 0.1 μ
			R820	ERDS2J471T	1/4W 470	C11	ECFA1C1022E	16V 2200 μ
			R821	ERDS2J473T	1/4W 47K	C12	ECFA1C1022E	16V 2200 μ
			R822	ERDS2J473T	1/4W 47K	C14	ECFA1J470B	6.3V 470
			R823	ERDS2J333T	1/4W 330	C15	ECFA1J470B	6.3V 470
			R824	ERDS2J333T	1/4W 330	C18	ECFA1CK101	16V 100 μ
			R825	ERDS2J102T	1/4W 1K	C19	ECFA1C1031B	16V 330 μ
			R826	ERDS2J102T	1/4W 1K	C20	ECFA1C1031B	16V 330 μ
			R831	ERDS2J221T	1/4W 220	C21	ECFA1V101B	35V 100 μ
			R832	ERDS2J221T	1/4W 220	C22	ECFA1V101B	35V 100 μ
			R833	ERDS2J472T	1/4W 4.7K	C51	ECFA1K220B	6.3V 220
			R834	ERDS2J561T	1/4W 560	C201	ECBT1C103NS5	16V 0.01 μ
			R835	ERDS2J472T	1/4W 4.7K	C202	ECBT1C103NS5	16V 0.01 μ
			R836	ERDS2J472T	1/4W 4.7K	C301	ECBT1C103NS5	16V 0.01 μ
			R837	ERDS2J100T	1/4W 10	C303	ECFR1E104Z5	25V 0.1 μ
			R838	ERDS2J100T	1/4W 10	C304	ECFR1E104Z5	25V 0.1 μ
			R840	ERDS2J101T	1/4W 100	C306	ECBT1H270J5	50V 27P
			R851	ERDS2J471T	1/4W 470	C351	ECBT1H102K85	50V 1000P
			R852	ERDS2J472T	1/4W 4.7K	C401	ECFR1E104Z5	25V 0.1 μ
			R853	ERDS2J681T	1/4W 680	C402	ECFA1J470B	6.3V 470
			R857	ERDS2J222T	1/4W 2.2K	C404	ECFR1E104Z5	25V 0.1 μ
			R858	ERDS2J222T	1/4W 2.2K	C501	ECQMLH104K3	50V 0.1 μ
			R859	ERDS2J105T	1/4W 1M	C502	ECFR1E104Z5	25V 0.1 μ
			R860	ERDS2J105T	1/4W 1M	C503	ECFA1CK100B	16V 100 μ
			R861	ERDS2J472T	1/4W 4.7K	C504	ECFR1E104Z5	25V 0.1 μ
			R871	ERDS2J473T	1/4W 47K	C505	ECFR1E104Z5	25V 0.1 μ
			R872	ERDS2J473T	1/4W 47K	C506	ECBT1H105J5	50V 15P

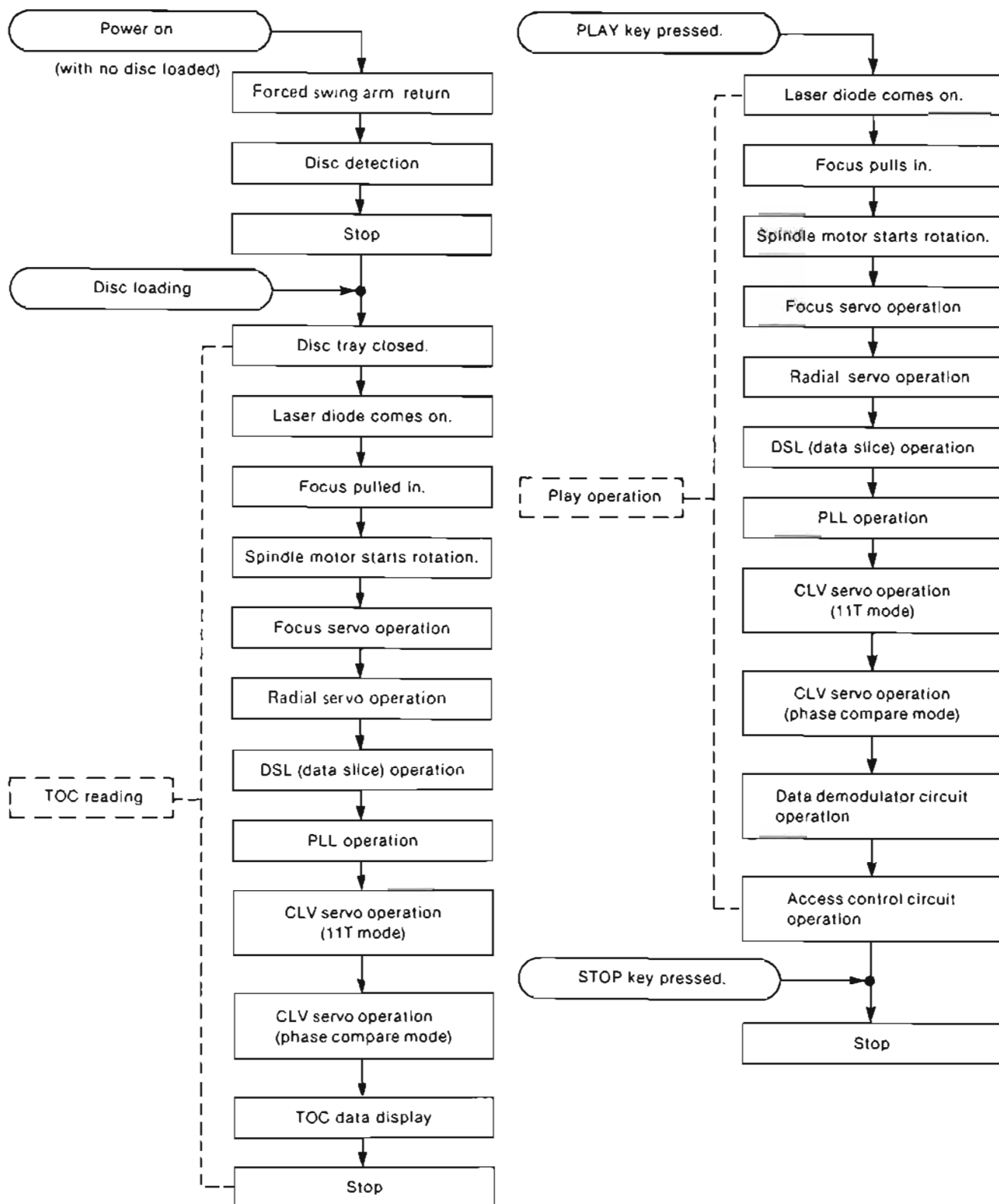
PACKING

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
C507	ECBT1H102K85	50V 1000P	C894	ECFA1CKN220B	16V 220	C2504	482212231727	50 470P [MB]
C508	ECFA1CKN100B	16V 100				C2505	482212422027	25 47 [MB]
C509	ECBT1H470J5	50V 47P			<SERVO P.C.B.>	C2506	482212231104	50 100NF [MB]
C510	ECQMLH104K3	50V 0.1 μ			RESISTORS	C2507	482212231644	50 0.0022 [MB]
C511	ECFA1H8A17B	30V 0.47 μ				C2508	532212142661	100 0.047 [MB]
C512	ECBT1H681K85	50V 680P	R3501	482211652426	1/2 4K7 [MB]	C2509	482212231772	50 47P [MB]
C513	ECBT1H681K85	50V 680P	R3502	482211190214	1/8 100K [MB]	C2510	482212232442	50 0.01 [MB]
C514	ECQV1H474J23	50V 0.47 μ	R3503	482211130498	1/3 487 [MB]	C2511	482212231746	50 0.001 [MB]
C515	ECQMLH103K3	50V 0.015 μ	R3504	482211130496	1/3 487 [MB]	C2513	482212142345	50 0.22 [MB]
C516	ECFA1V8N222B	25V 2.2 μ	R3505	482211190253	1/8 12K [MB]	C2514	482212151252	100 0.47 [MB]
C518	ECBT1H561K85	50V 560P	R3506	532211190091	1/8 100 [MB]	C2515	482212231746	50 0.001 [MB]
C801	ECQV1H683J23	50V 0.68 μ	R3507	482211190240	1/8 2K2 [MB]	C2520	482212231965	50 220P [MB]
C802	ECQV1H683J23	50V 0.68 μ	R3508	482211190512	1/8 24K [MB]	C2521	482212422027	2.5 47 [MB]
C803	ECQV1H683J23	50V 0.68 μ	R3509	482211190572	1/8 56K [MB]	C2530	482212151321	50 0.0082 [MB]
C804	ECQV1H683J23	50V 0.68 μ	R3510	482211190249	1/8 10K [MB]	C2531	482212151321	50 0.0082 [MB]
C805	ECBT1H151K8Y	50V 150P	R3521	482211190178	1/8 220 [MB]	C2532	482212440272	16 33 [MB]
C806	ECBT1H151K8Y	50V 150P	R3522	482211130515	1/3 18 [MB]	C2534	532212142661	50 0.33 [MB]
C807	ECBT1H151K8Y	50V 150P	R3523	482211130511	1/3 12 [MB]	C2535	532212231848	50 0.033 [MB]
C808	ECBT1H151K8Y	50V 150P	R3524	532211190091	1/8 100 [MB]	C2536	532212231848	50 0.033 [MB]
C811	ECQV1H683J23	50V 0.68 μ	R3530	482211190543	1/8 47K [MB]	C2537	482212142345	50 0.22 [MB]
C812	ECQV1H683J23	50V 0.68 μ	R3531	482211190344	1/8 15K [MB]	C2538	482212142245	50 0.22 [MB]
C813	ECBT1H102K85	50V 1000P	R3533	532211190268	1/8 5K [MB]	C2540	482212441583	50 0.68 [MB]
C816	ECBT1H102K85	50V 1000P	R3534	482211190197	1/8 220K [MB]	C2541	482212233147	50 0.022 [MB]
C817	ECFR1E104Z5	25V 0.1 μ	R3535	482211653061	3/5 12K [MB]	C2542	482212233147	50 0.022 [MB]
C818	ECFR1E104Z5	25V 0.1 μ	R3540	482211652858	3/5 4K7 [MB]	C2543	482212440196	16 220 [MB]
C819	ECFA1J470B	6.3V 330 μ	R3541	482211190544	1/8 68K [MB]	C2544	482212440196	16 220 μ [MB]
C820	ECFR1E104Z5	25V 0.1 μ	R3542	482211190134	1/8 82 [MB]	C2545	482212233104	50 0.1 [MB]
C821	ECFA1J470B	6.3V 330 μ	R3543	482211190544	1/8 68K [MB]	C2546	482212233104	50 0.1 [MB]
C822	ECFR1E104Z5	25V 0.1 μ	R3544	482211130483	1/3 1 [MB]	C2547	482212233147	50 0.022 [MB]
C823	ECFR1E104Z5	25V 0.1 μ	R3545	482211130483	1/3 1 [MB]	C2550	482212151049	50 0.015 [MB]
C824	ECFR1E104Z5	25V 0.1 μ	R3550	482211190240	1/8 2K2 [MB]	C2560	482212231784	50 0.0047 [MB]
C825	ECBT1H270J5	50V 27P	R3552	482211190171	1/8 820 [MB]	C2561	482212151252	100 0.047 [MB]
C826	ECFA1J470B	6.3V 470 μ	R3554	482211690421	1/10 2K [MB]	C2562	532212142661	50 0.033 [MB]
C827	ECFA1J470B	6.3V 470 μ	R3555	482211190251	1/8 22K [MB]	C2563	482212233104	50 100NF [MB]
C828	ECFA1J470B	6.3V 470 μ	R3560	482211191494	1/8 11K [MB]	C2565	482212232808	50 0.0012 [MB]
C829	ECFA1J470B	6.3V 470 μ	R3561	482211690417	1/10 150K [MB]	C2625	482212231785	50 100P [MB]
C830	ECFA1J470B	6.3V 470 μ	R3562	482211652845	3/5 120K [MB]			
C831	ECFA1J470B	6.3V 470 μ	R3563	482211190573	1/8 56K [MB]			
C832	ECFA1J470B	6.3V 470 μ	R3564	482211191495	1/8 160K [MB]			
C833	ECFA1J470B	6.3V 470 μ	R3565	482211652354	1/2 27 [MB]			
C834	ECFA1J470B	6.3V 470 μ	R3566	482211190186	1/8 22 [MB]			
C835	ECFA1J470B	6.3V 470 μ	R3567	482211652478	1/2 82K [MB]			
C836	ECBT1C103NS5	16V 0.01 μ	R3568	482211190161	1/8 470K [MB]			
C837	ECBT1C103NS5	16V 0.01 μ	R3801	482211190183	OE [MB]			
C838	ECBT1C103NS5	16V 0.01 μ	R3802	482211190163	OE [MB]			
C839	ECBT1C103NS5	16V 0.01 μ						
C840	ECBT1C103NS5	16V 0.01 μ						
C841	ECBT1C103NS5	16V 0.01 μ						
C842	ECBT1C103NS5	16V 0.01 μ						
C843	ECBT1C103NS5	16V 0.01 μ						
C844	ECBT1C103NS5	16V 0.01 μ						
C845	ECBT1C103NS5	16V 0.01 μ						
C846	ECBT1C103NS5	16V 0.01 μ						
C847	ECBT1C103NS5	16V 0.01 μ						
C848	ECBT1C103NS5	16V 0.01 μ						
C849	ECBT1C103NS5	16V 0.01 μ						
C850	ECBT1C103NS5	16V 0.01 μ						
C851	ECBT1C103NS5	16V 0.01 μ						
C852	ECBT1C103NS5	16V 0.01 μ						
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C854	ECBT1C103NS5	16V 0.01 μ						
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C856	ECBT1C103NS5	16V 0.01 μ						
C857	ECBT1C103NS5	16V 0.01 μ						
C858	ECBT1C103NS5	16V 0.01 μ						
C859	ECBT1C103NS5	16V 0.01 μ						
C860	ECBT1C103NS5	16V 0.01 μ						
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C862	ECBT1C103NS5	16V 0.01 μ						
C863	ECBT1C103NS5	16V 0.01 μ						
C864	ECBT1C103NS5	16V 0.01 μ						
C865	ECBT1C103NS5	16V 0.01 μ						
C866	ECBT1C103NS5	16V 0.01 μ						
C867	ECBT1C103NS5	16V 0.01 μ						
C868	ECBT1C103NS5	16V 0.01 μ						
C869	ECBT1C103NS5	16V 0.01 μ						
C870	ECBT1C103NS5	16V 0.01 μ						
C871	ECBT1C103NS5	16V 0.01 μ						
C872	ECBT1C103NS5	16V 0.01 μ						
C873	ECBT1C103NS5	16V 0.01 μ						
C874	ECQMLH103K3	50V 0.01 μ						
C875	ECBT1C103NS5	16V 0.01 μ						
C876	ECBT1C103NS5	16V 0.01 μ						
C877	ECBT1C103NS5	16V 0.01 μ						
C878	ECBT1C103NS5	16V 0.01 μ						
C879	ECBT1C103NS5	16V 0.01 μ						
C881	ECFA1AN101XB	10V 100 μ			CAPACITORS			
C882	ECFA1AN101XB	10V 100 μ						
C891	ECFA1CK101	16V 100 μ	C2501	482212233147	50 0.022 [MB]			
C892	ECFA1CK101	16V 100 μ	C2502	482212422027	10 47 [MB]			
C893	ECFA1CKN220B	16V 220	C2503	482212233147	50 0.022 [MB]			

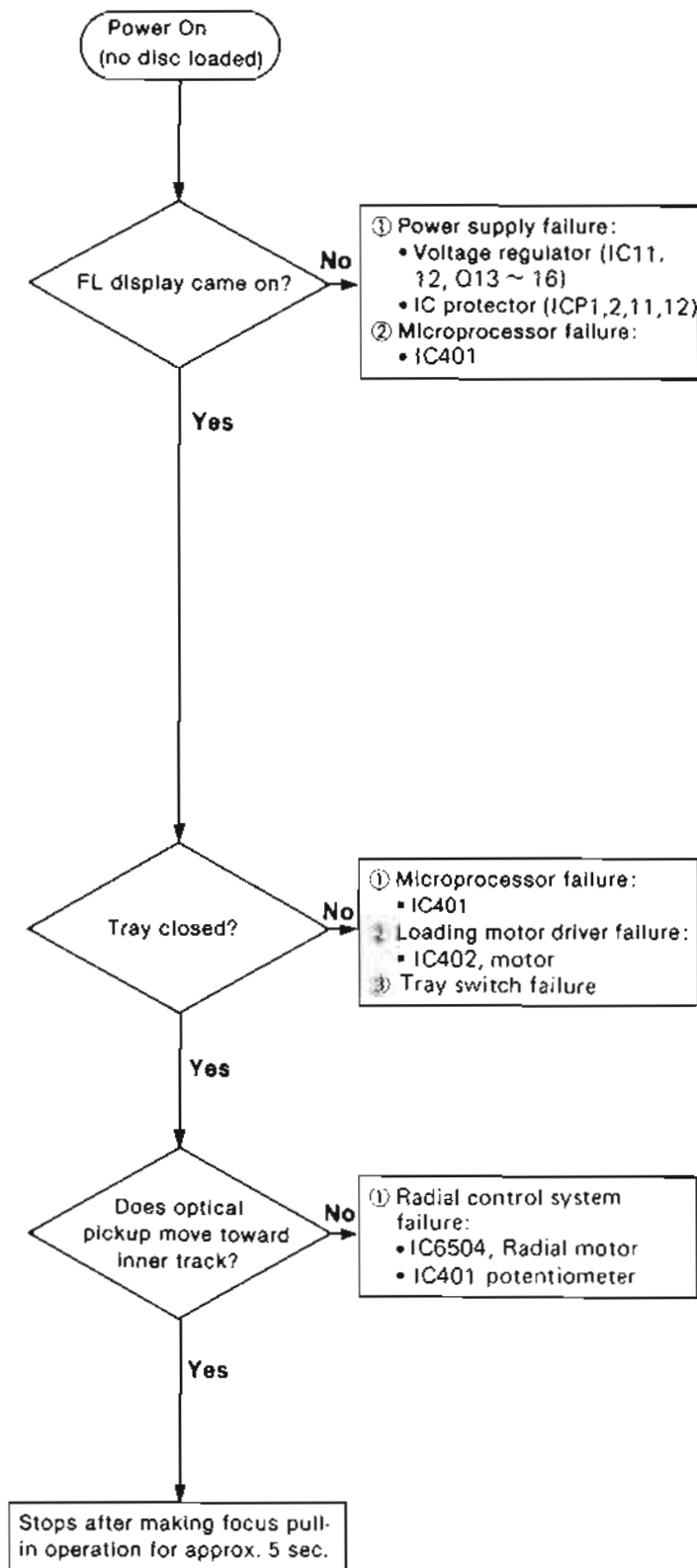
■ TROUBLESHOOTING GUIDE

SL-P277A Operation Sequence Check Sheet

Play Operation Sequence



(Operation Sequence Just After Power On)



(TOC Read Operation-PLAY Operation)

