

ORDER No.AD0201005C3

Service Manual

Portable MD Player



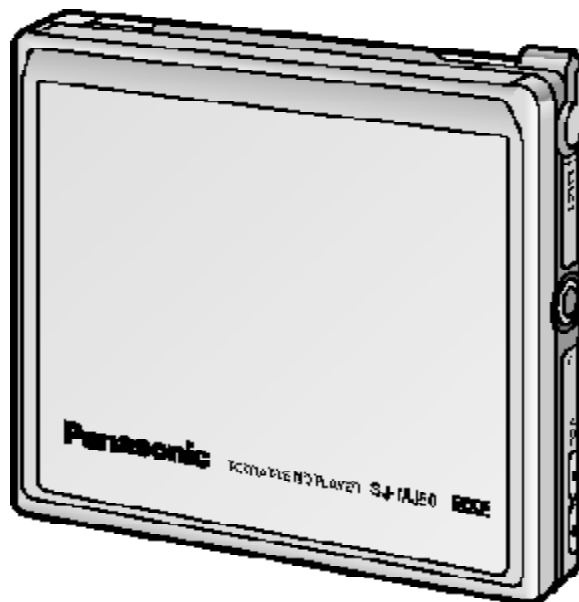
MDLP

SJ-MJ50GH

MD unit: RAE1619Z-M Mechanism Series

Colour

(S).....Silver Type



SPECIFICATIONS

Specifications

● **Audio**

System:	MiniDisc digital audio system
Laser:	Semiconductor laser (=780 nm)
Sampling frequency:	44.1 kHz
Coding:	Adaptive Transform Acoustic Coding (ATRAC/ATRAC3)
No. of channels:	2 (left and right, stereo) 1 (monaural)
Frequency response:	20 Hz~20 kHz (+0 dB, -6dB)
Wow and flutter:	Below measurable limit

● **General**

Headphone output level:	3.5 mW+3.5 mW/22 Ω
Speaker output level:	55 mW+55 mW/16 Ω
Speakers:	3.6 cm (16 Ω) x2
Power supply	
Rechargeable battery:	DC 1.2V (included rechargeable battery)
Battery:	DC 1.5V (One LR6, AA, UM-3 battery)

Dimensions (WxHxD)

Cabinet dimensions	79.9x72.7x13.7 mm
:	
incl.projecting parts	81.1x74.6x14.9 mm
:	

Weights:	97 g (with battery) 70 g (without battery)
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● **Play time**

[Approximate operating time in hours (in hold mode, at 25°C, on a flat, stable surface)]

Using earphones:

Battery type:	Play time (Normal/ LP2/ LP4)
Rechargeable:	29 hours/ 41 hours/ 48 hours
Panasonic alkaline:	55 hours/ 74 hours/ 93 hours

Both together: 87 hours/ 110 hours/ 113 hours

Using the speakers:

Battery type: Play time (Normal/ LP2/ LP4)

Rechargeable: 9.5 hours/ 9.5 hours/ 9.5 hours

Panasonic alkaline: 15 hours/ 15 hours/ 15 hours

Both together: 26 hours/ 26 hours/ 26 hours

[When the rechargeable battery (included) is fully recharged.]

● **AC adaptor and charger**

AC adaptor input: AC220 V, 50/60 Hz, 5W

AC adaptor output and Charger input: DC 3.5 V, 0.5A

Charger output: DC 2V, 0.5 A

Recharging time: About 3.5 hours

Notes:

- **The play time may be less depending on the operating conditions.**
- **Specifications are subject to charge without notice. Weight and dimensions are approximate.**

1

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

1. Accessories

- **Stereo earphones.....1 pc.
(L0BAB0000162)**

3

- **Wired remote control.....1 pc.**
(N2QCBD000020)
- **External battery case.....1 pc.**
(K3ZZ00200041)
- **Nickel-metal hydride rechargeable battery.....1 pc.**
(RFKFHFAZ01EM)
- **Soft case.....1 pc.**
(RFC0069-H)
- **Speaker/battery charger.....1 pc.**
(L0EAAB000002)
- **AC adaptor.....1 pc.**
(N0JCBD000001)

2. Precaution of Laser Diode

CAUTION:

This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.

Wave length: 780 nm

Maximum output radiation power from pickup: 100 μ

W/VDE

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

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

**CLASS 1
LASER PRODUCT**

LUOKAN 1 LASERLAITE KLASS 1 LASER APPARAT

DANGER	INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTÖNTÄ LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING	OSYNLIG LASERSTRÅLNING NÅR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.
ADVARSEL	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VORSICHT	UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.

3. Operating Instructions



4. Handling Precautions for MD Mechanism (Optical

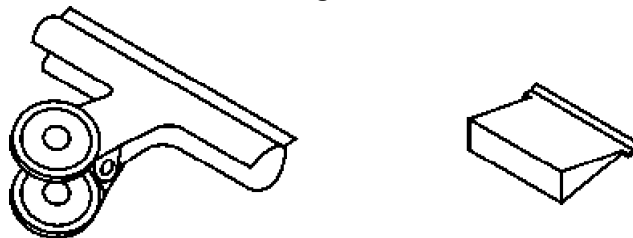
pickup)

The laser diode in the MD mechanism (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 traverse deck (optical pickup).

4.1. Handling the MD mechanism (optical pickup)

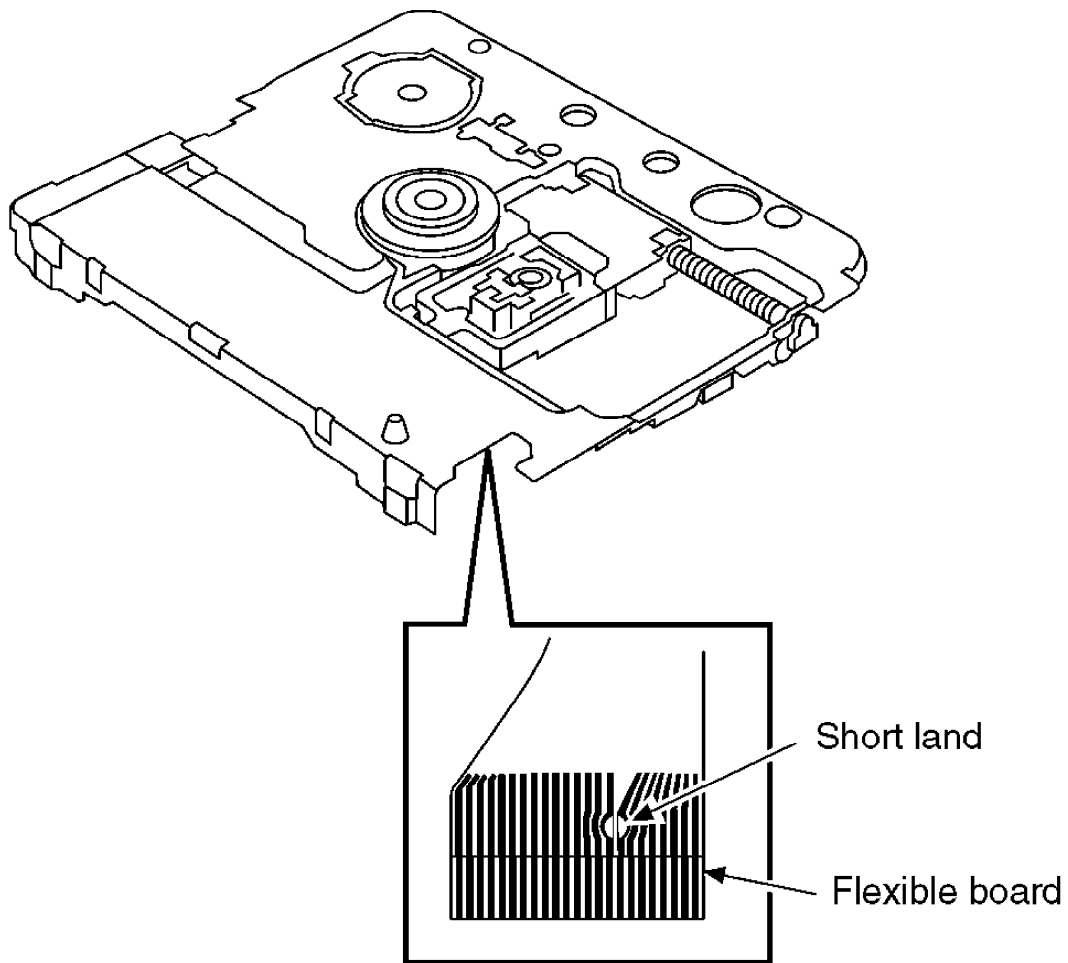
1. The MD mechanism (optical pickup) is an extremely high-precision construction and must not be subjected to impact, excessive vibration, or other types of rough handling.
2. In order to prevent static electricity damage to the laser diode, use a short pin or similar tool to short the optical pickup's flexible circuit boards after they have been disconnected from the main circuit board. (as shown in [Fig. 1](#))
3. Handle the flexible circuit boards with care; excessive force could cause them to be broken.
4. Do not turn the pre-set variable resistor (for adjustment of the laser power); it has been adjusted at the factory. (as shown in [Fig. 2](#))

Fig. 1



Clip or short-pin

Fig. 2



4.2. Grounding for electrostatic breakdown prevention

1. Human body grounding

Use the anti-static wrist strap to discharge the static electricity from your body. (as shown in [Fig. 3](#))

2. Work table grounding

Put a conductive material (sheet) or steel sheet on the area where the traverse deck (optical pickup) is placed, and ground the sheet. (as shown in [Fig. 4](#))

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 traverse deck (optical pickup).

Fig. 3

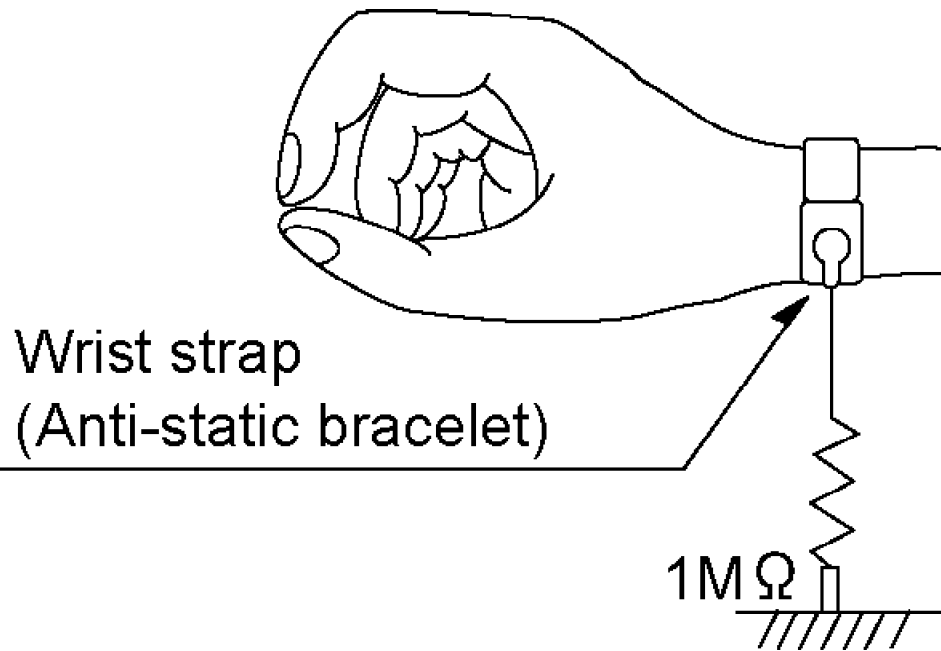
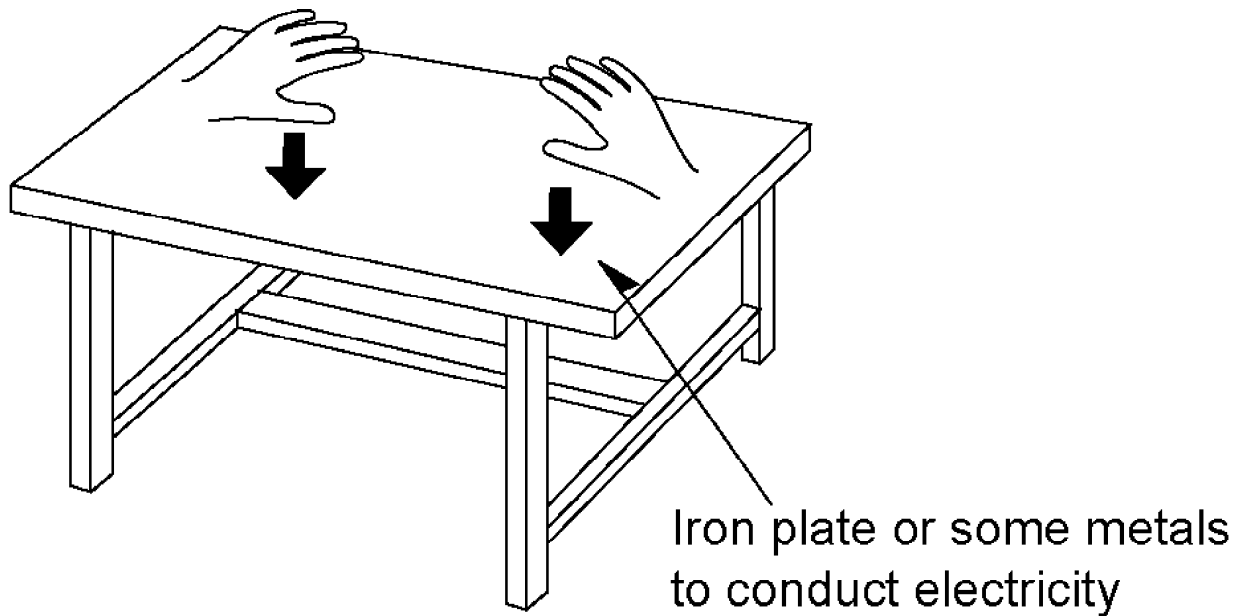


Fig. 4



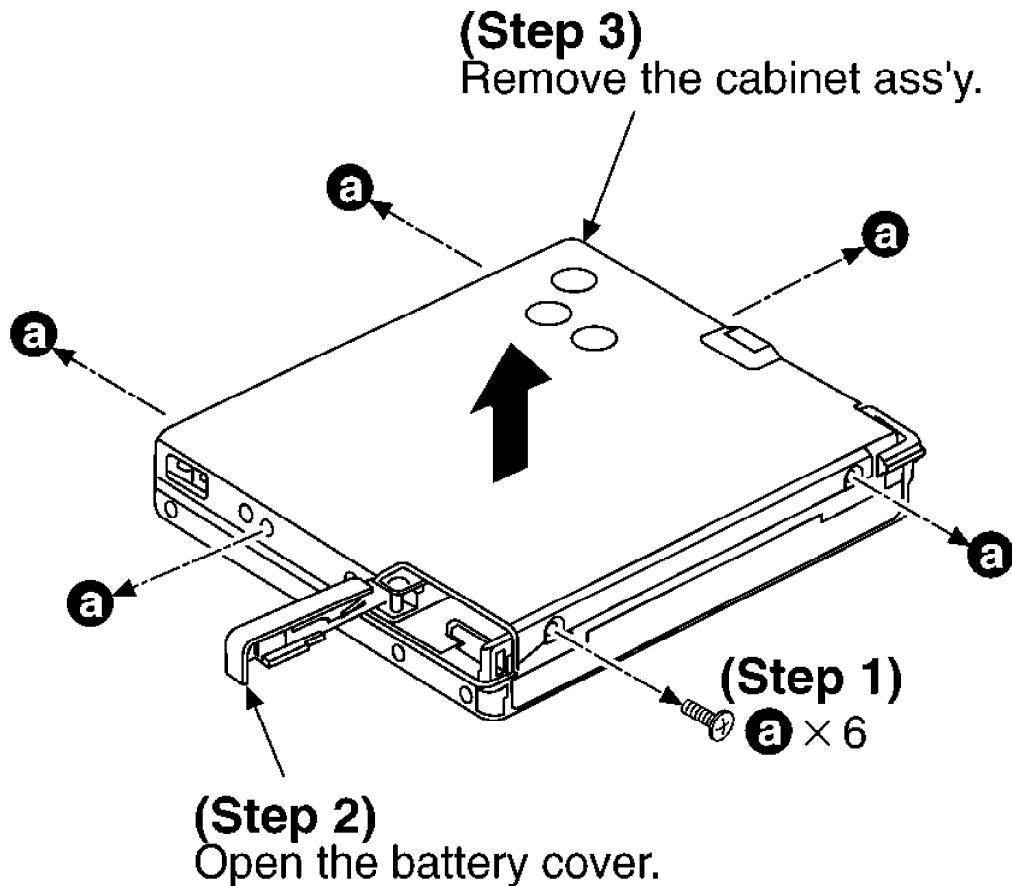
5. Operation Checks and Component Replacement Procedures

- This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
- For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when

required.

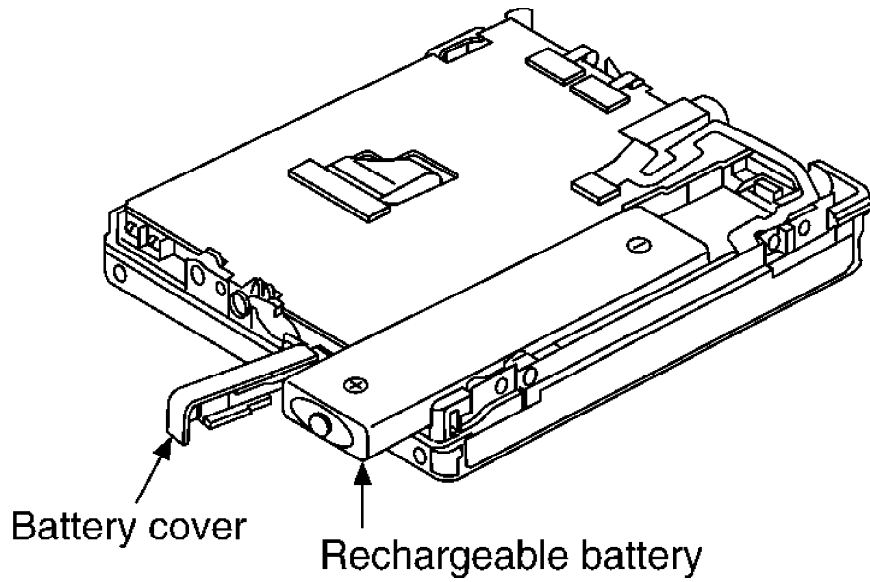
- After replacing the main components (optical pickup or traverse motor, etc.) of mechanism unit block, change to the adjust mode, and then perform the adjustments (Laser power, off-set, ROM/RAM).

5.1. Checking for the P.C.B.



(Step 4)

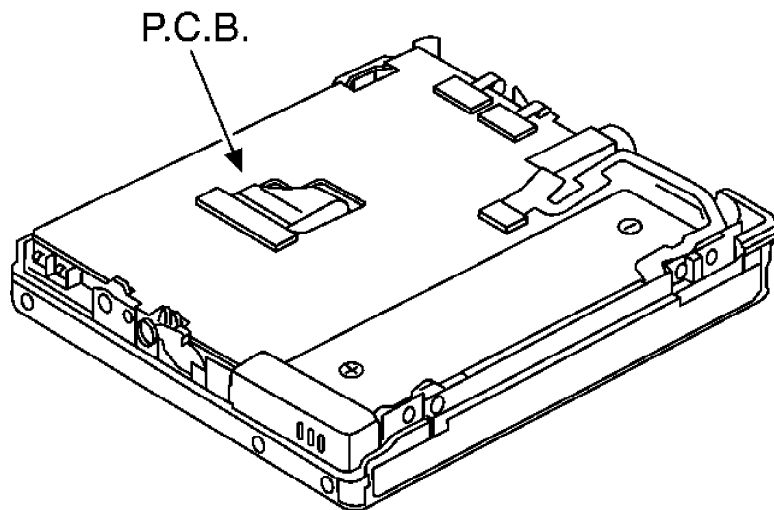
Store the rechargeable battery,
and then close the battery cover.



NOTE:

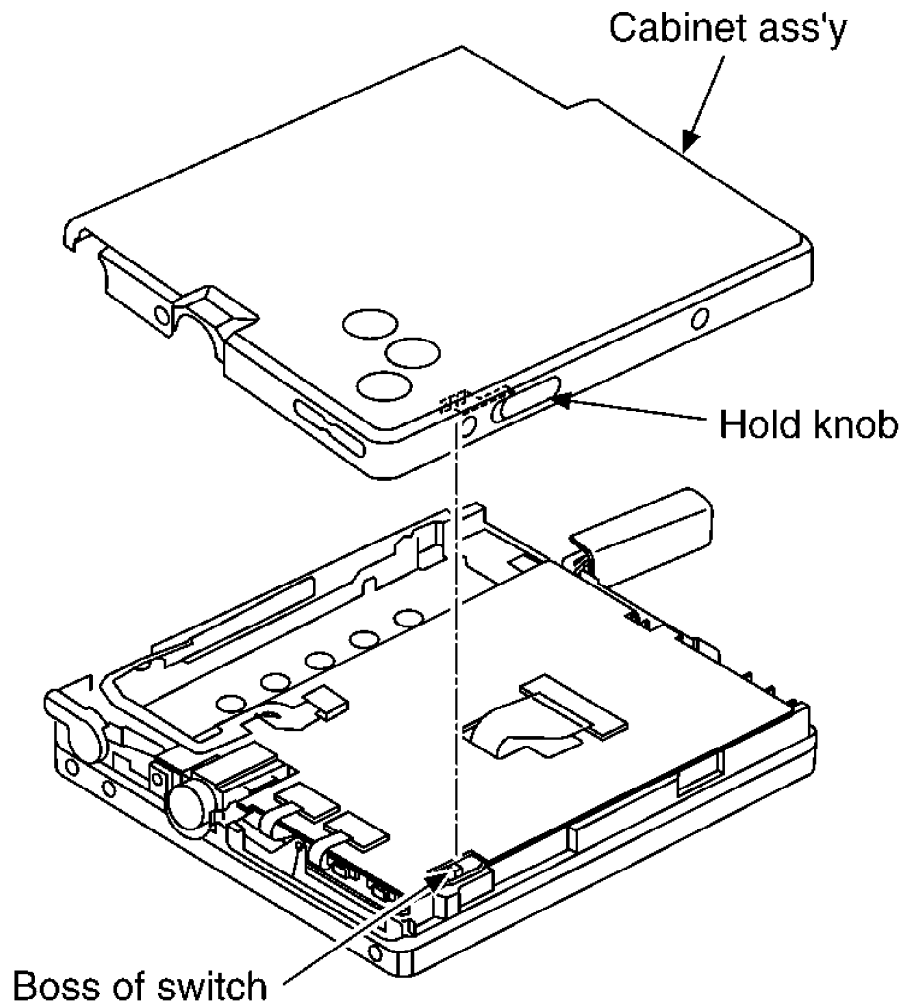
The rechargeable battery
should be recharged fully.

- Check the P.C.B. as shown below.



Notice for installation of the cabinet ass'y

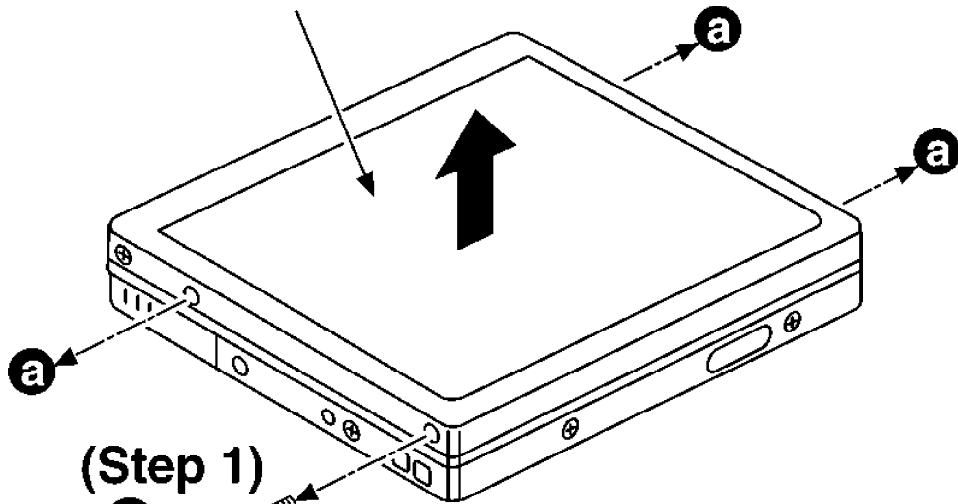
- Make sure the boss of switch are fit in the hold knob when assembling.



5.2. Replacement for the disc cover ass'y

(Step 2)

Remove the disc cover ass'y.



(Step 1)

a x 4

5.3. Replacement for the side cabinet ass'y

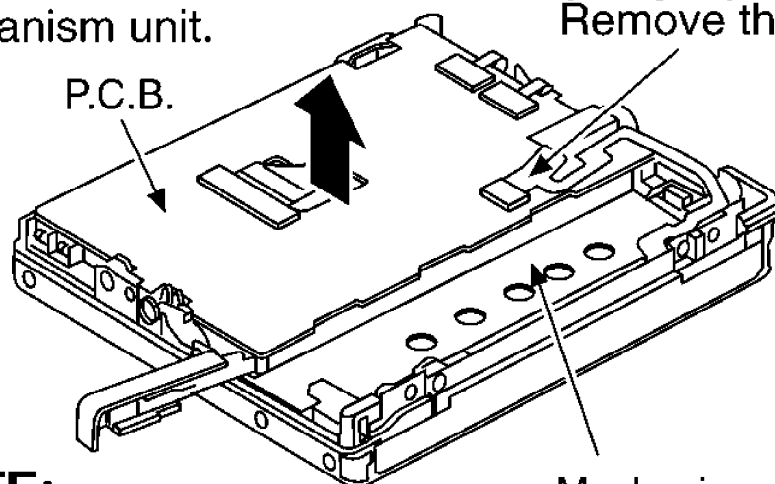
- Follow the (Step 1) - (Step 3) of item 5.1.

(Step 2)

Remove the P.C.B. and mechanism unit.

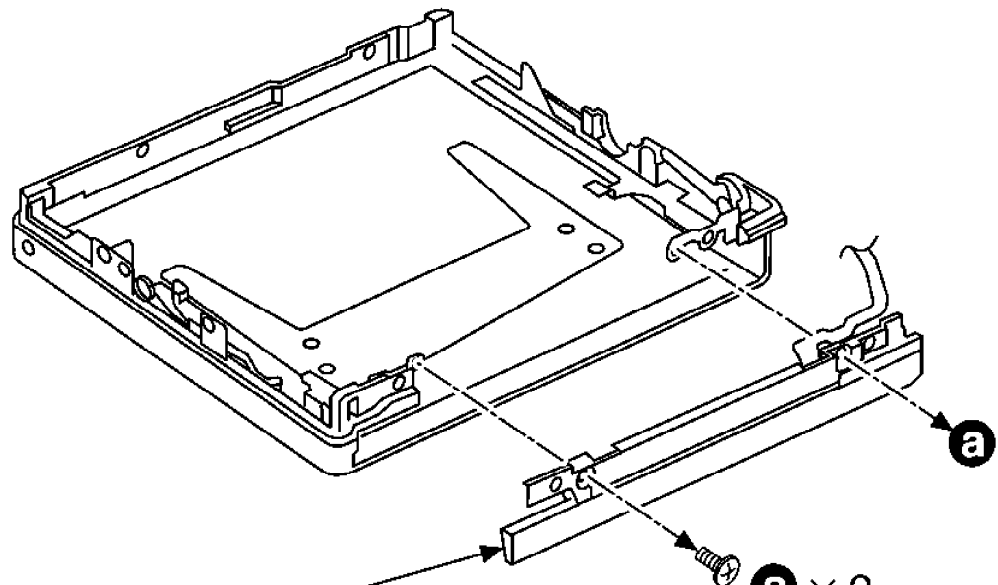
(Step 1)

Remove the FFC.



NOTE:

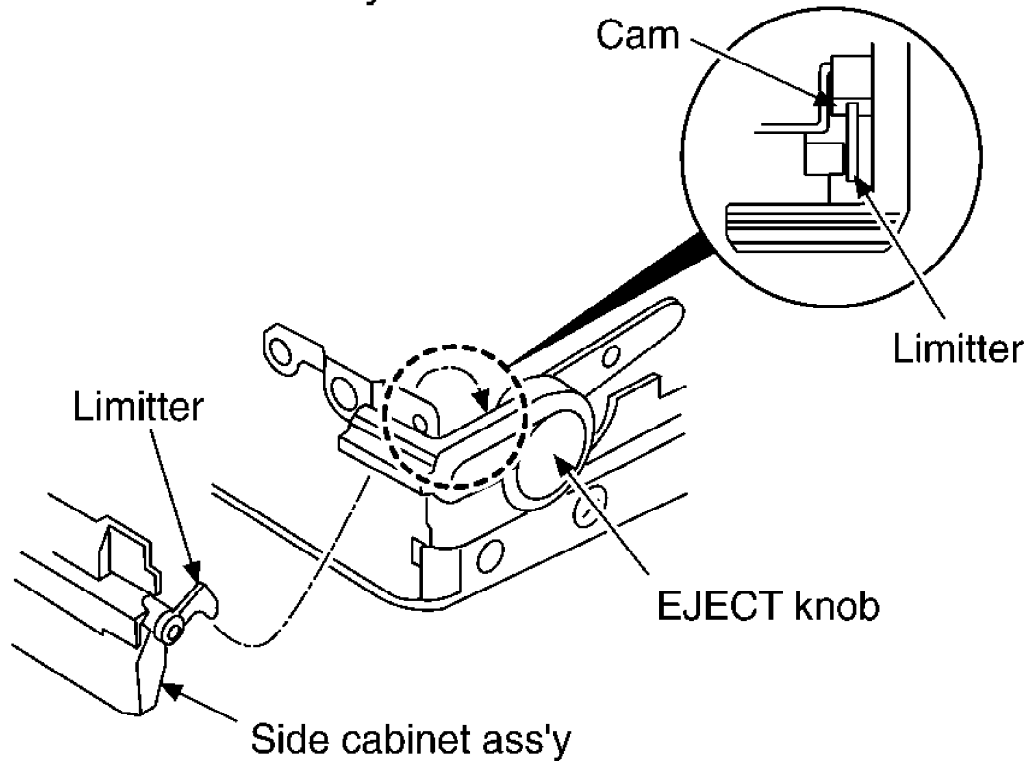
Locate the mechanism unit as the turn table is faced up.



(Step 4) Remove the side cabinet ass'y. **a x 2**
(Step 3)

Notice for installation of the side cabinet ass'y

- Make sure the limiter are fit in the cam when assembling the side cabinet ass'y.

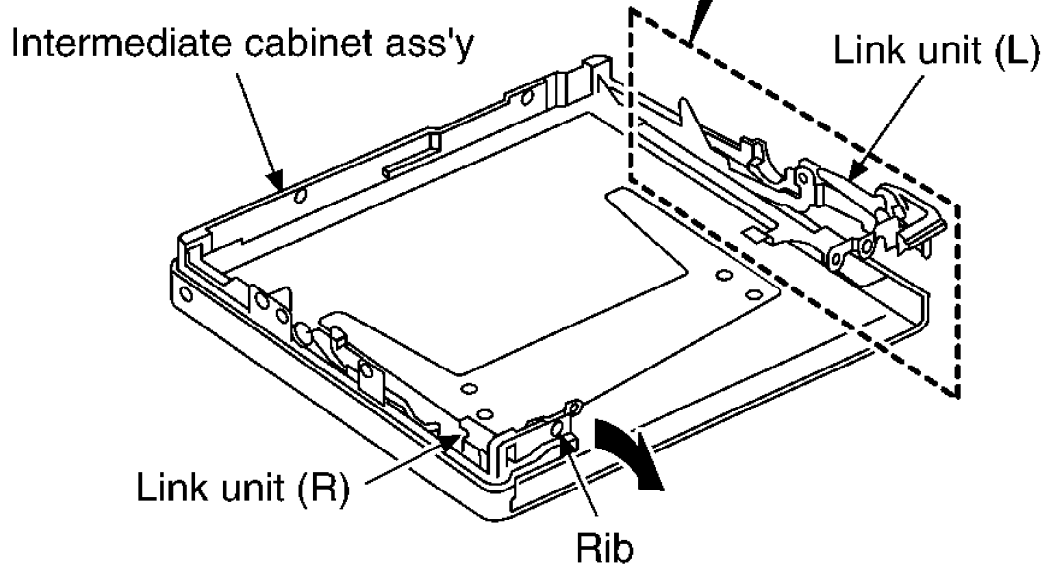
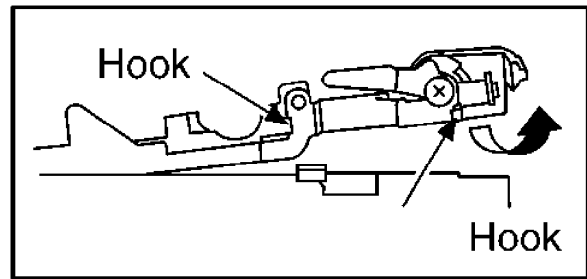


5.4. Replacement for the intermediate cabinet

- Follow the (Step 1) - (Step 3) of item 5.1.
- Follow the (Step 1) - (Step 4) of item 5.3.

(Step 1)

Release the 2 hooks of intermediate cabinet ass'y from link unit (L).

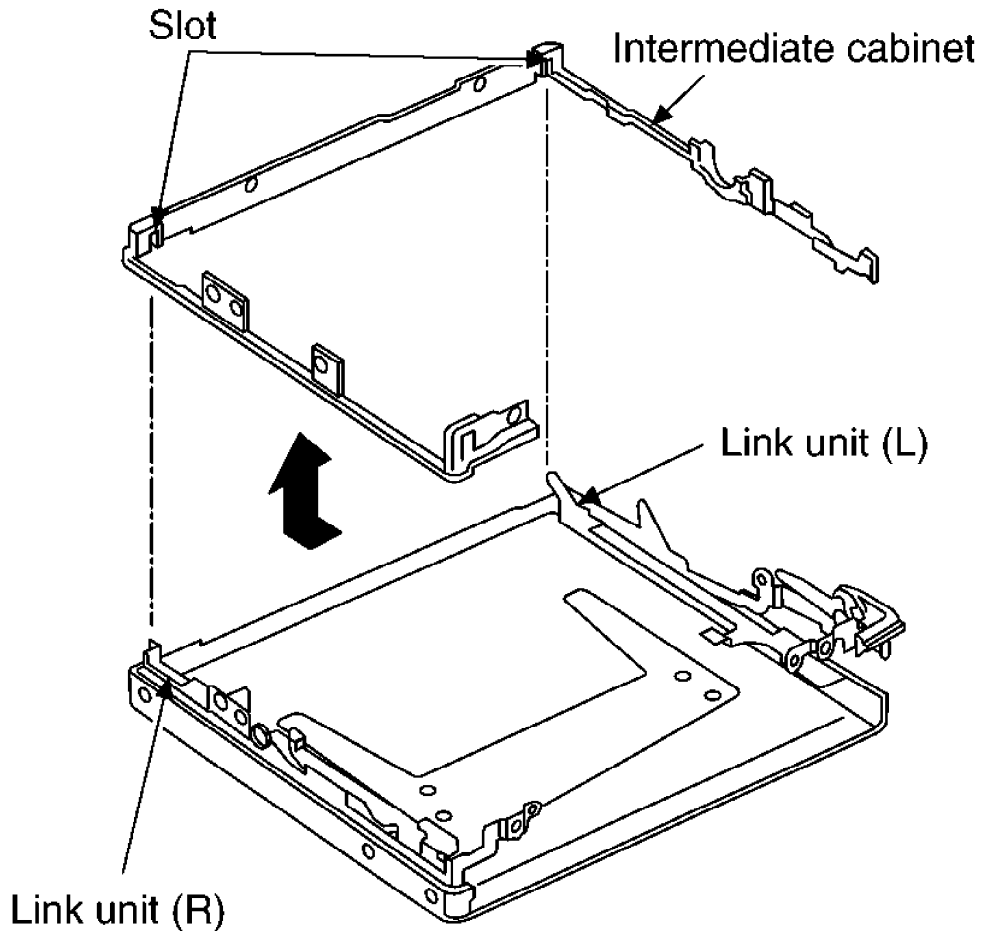


(Step 2)

Release the rib of intermediate cabinet ass'y from link unit (R).

(Step 3)

Move the intermediate cabinet to back side, and then remove the link unit (L), (R) from the slot of intermediate cabinet.

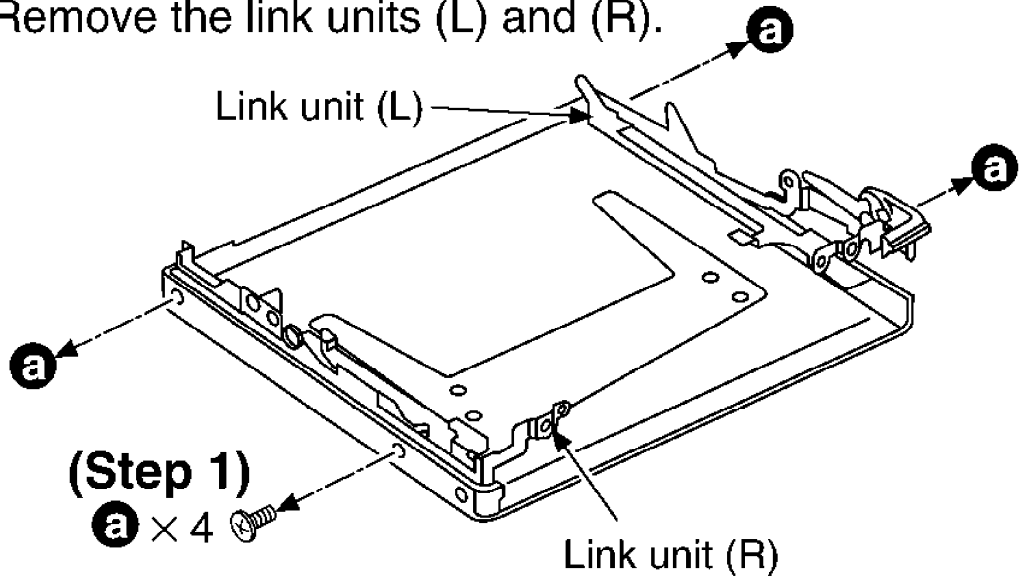


5.5. Replacement for the link unit (L), (R)

- Follow the (Step 1) - (Step 3) of item 5.1.
- Follow the (Step 1) - (Step 4) of item 5.3.
- Follow the (Step 1) - (Step 3) of item 5.4.

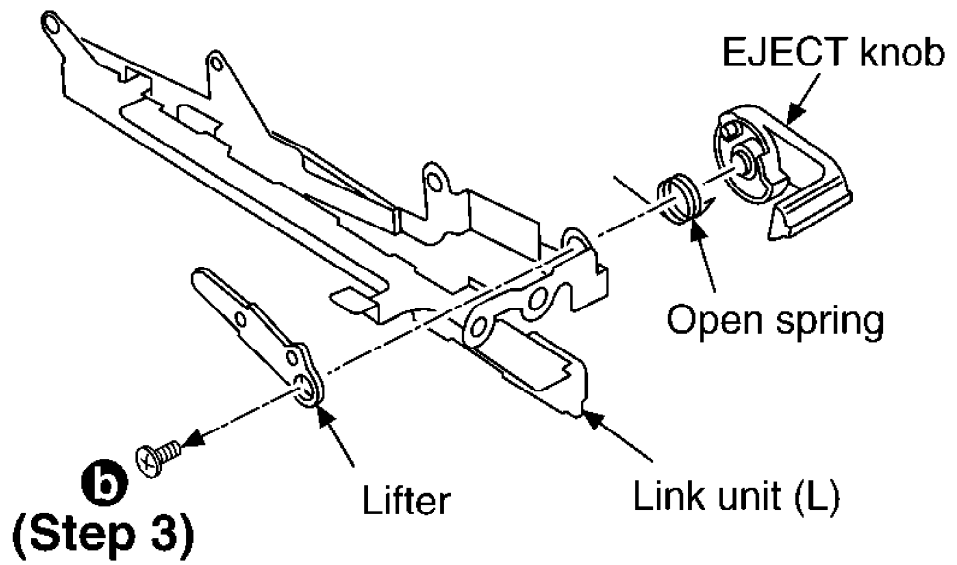
(Step 2)

Remove the link units (L) and (R).



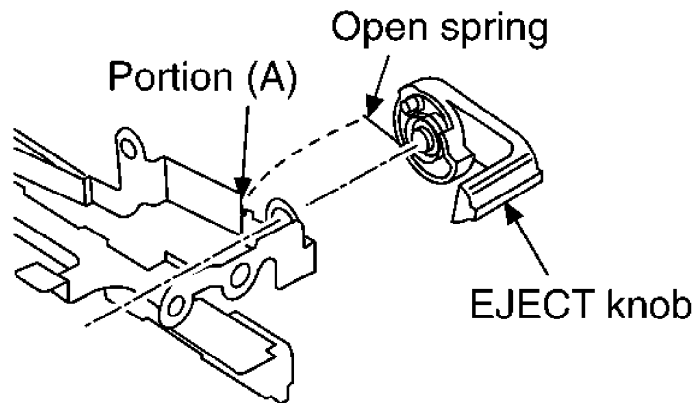
(Step 4)

The parts illustrated below will be free.

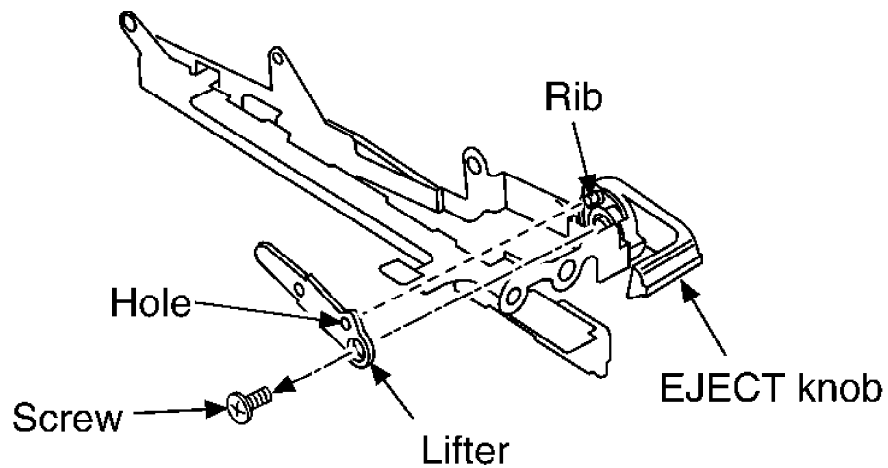


Notice for installation of the EJECT knob

1. Latch the open spring to the portion (A).

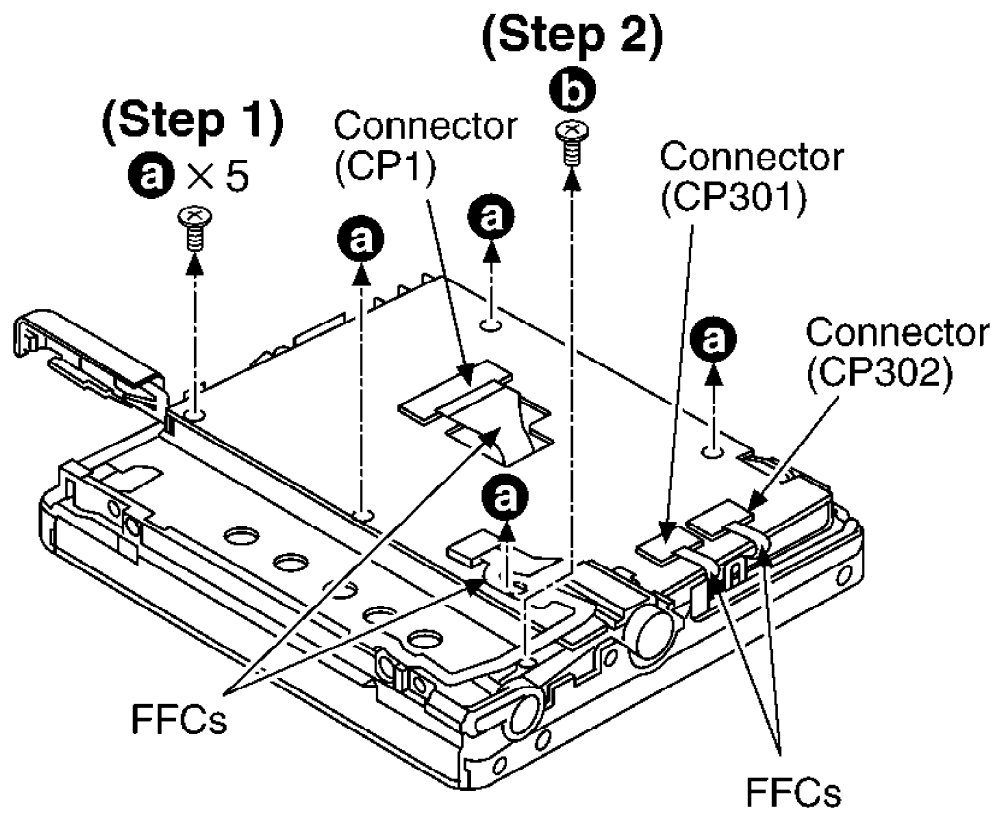


2. Put in the rib of EJECT knob to the hole of lifter, and then fix the screw.



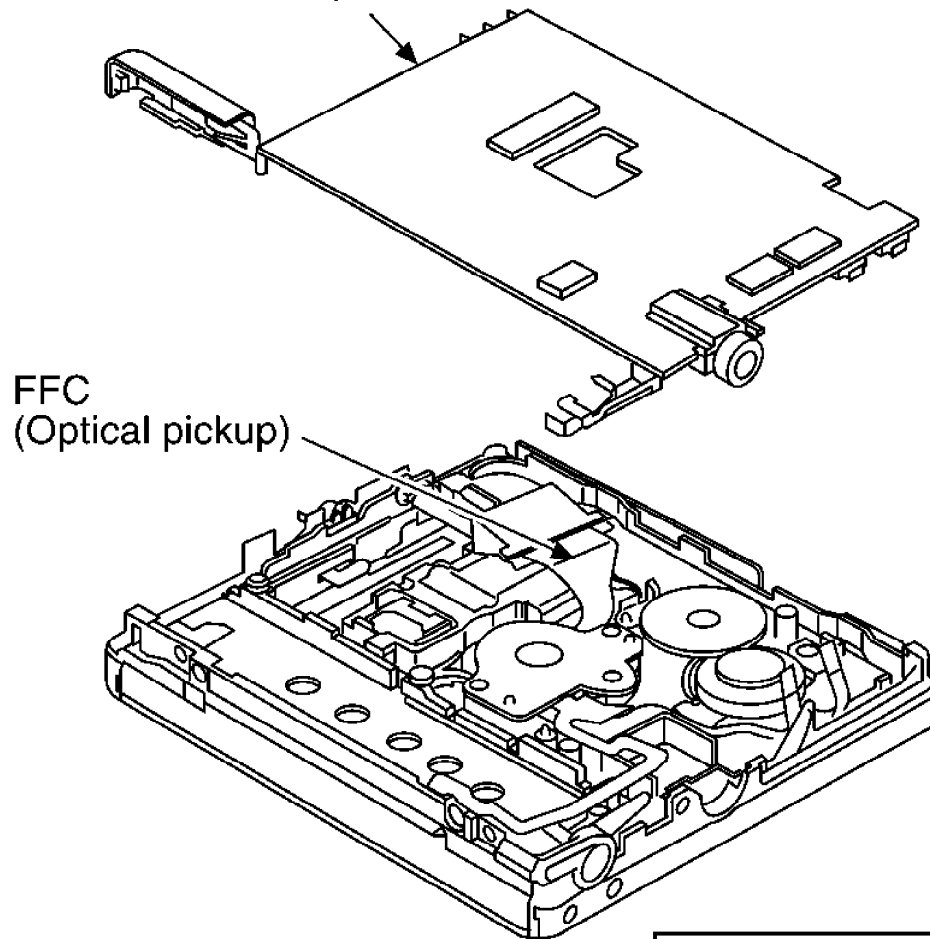
5.6. Replacement for the traverse motor

- Follow the (Step 1) - (Step 3) of item 5.1.

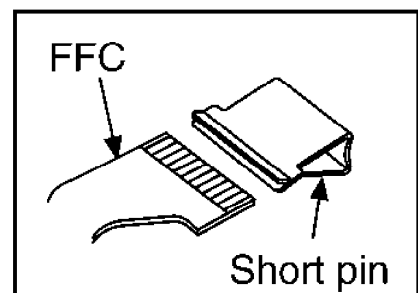


(Step 3)
Remove the FFC from the connector (4 points).

(Step 4)
Remove the P.C.B..

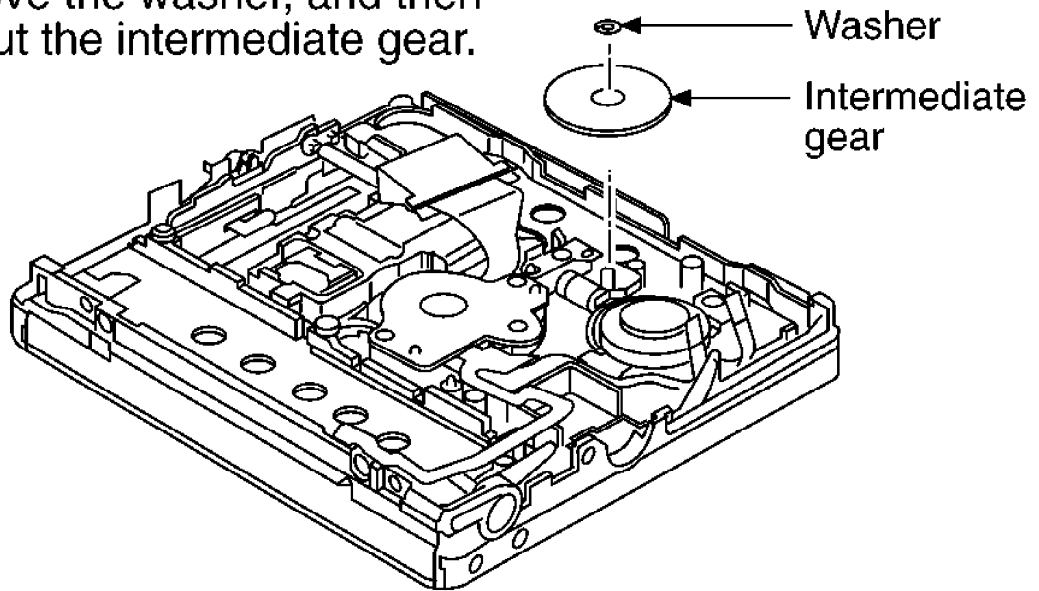


NOTE:
Insert a short pin into the traverse
unit FFC board.
(Refer to "Handling Precautions
for MD Mechanism (Optical pickup".))



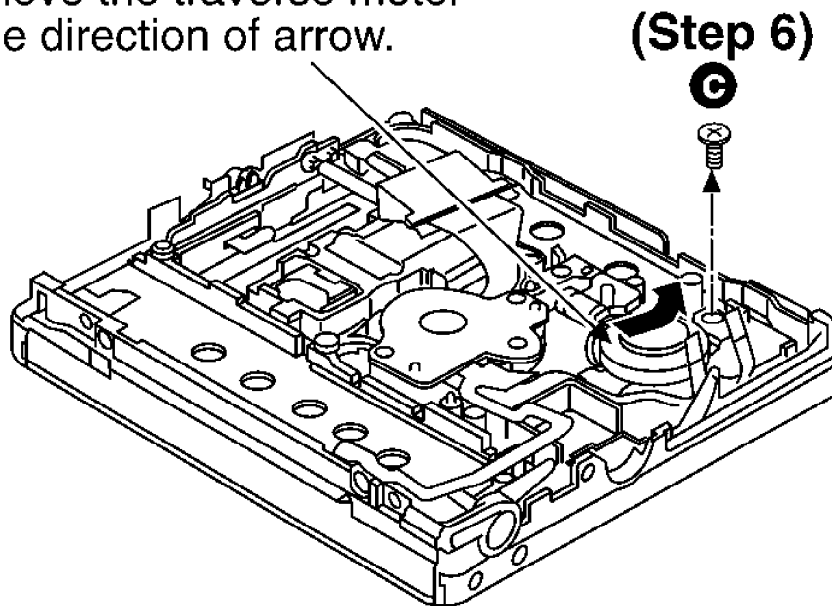
(Step 5)

Remove the washer, and then pull out the intermediate gear.



(Step 7)

Remove the traverse motor in the direction of arrow.



(Step 6)

5.7. Replacement for the optical pickup

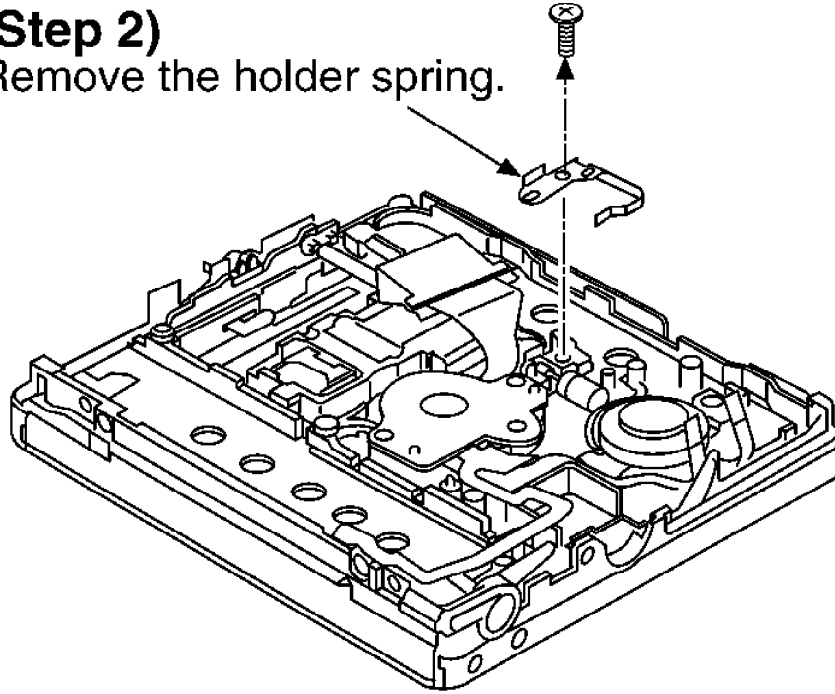
- Follow the (Step 1) - (Step 3) of item 5.1.
- Follow the (Step 1) - (Step 4) of item 5.6.

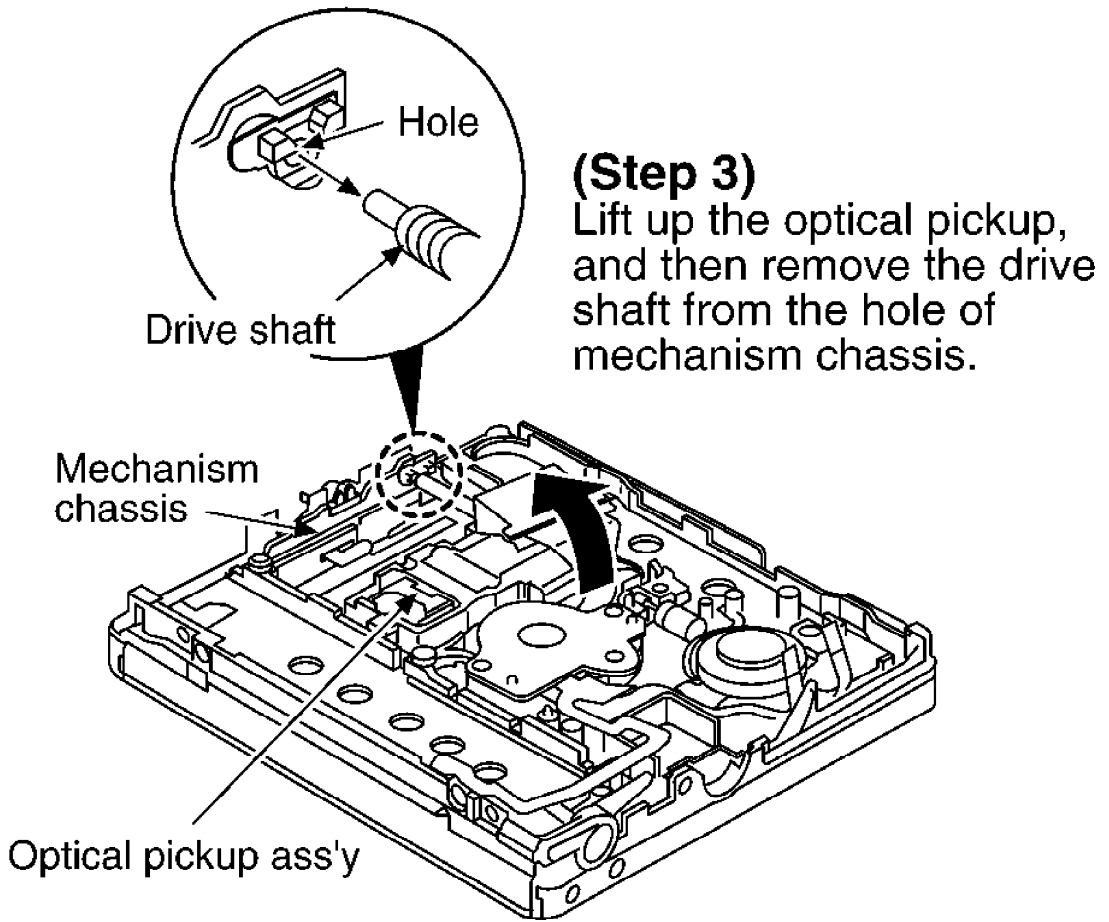
(Step 1)

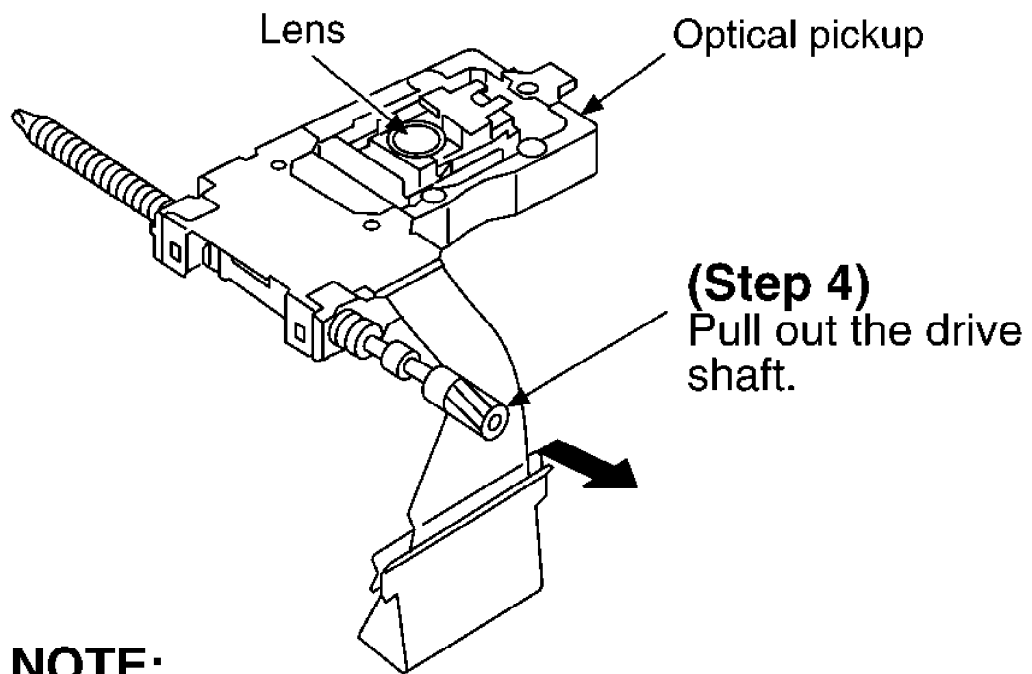
a

(Step 2)

Remove the holder spring.







NOTE:

1. Use care to prevent damage the optical pickup, due to the precision construction.
2. Do not touch the lens of the optical pickup.

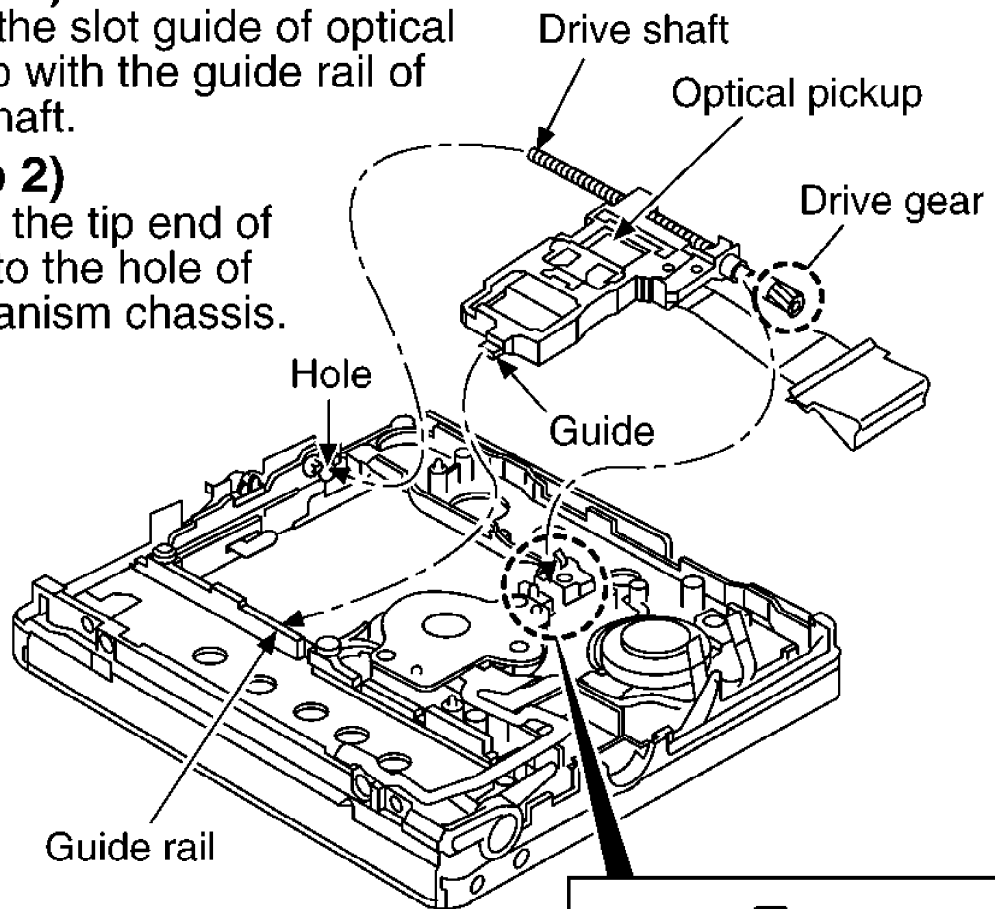
Installing the optical pickup

(Step 1)

Align the slot guide of optical pickup with the guide rail of sub shaft.

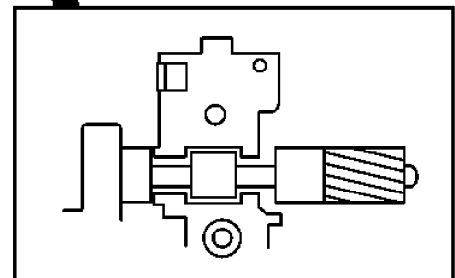
(Step 2)

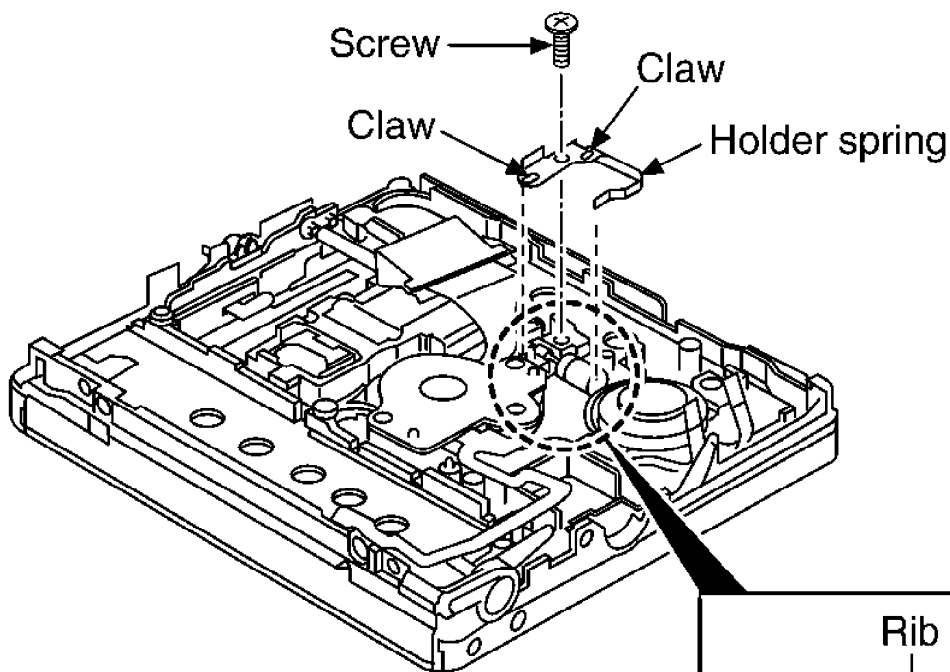
Install the tip end of shaft to the hole of mechanism chassis.



(Step 3)

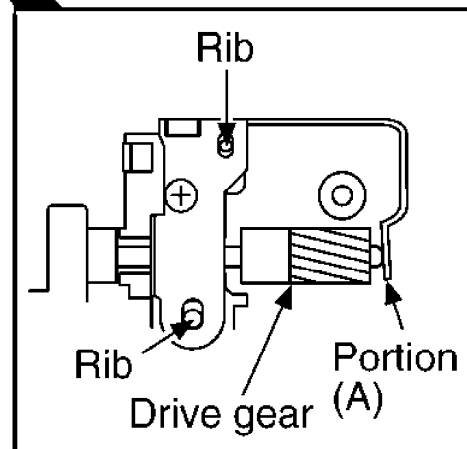
Install the drive gear ass'y to the mechanism chassis.





(Step 4)

Latch the claw of holder spring to the ribs, and then tighten the screw so that the portion (A) of holder spring interferes with the end of drive gear.



6. Measurements and Adjustments

Note:

After replacing the main components (optical pickup or traverse motor, etc.) of mechanism unit block, change to the adjust mode, and then perform the “Laser power adjustment”, “Off-set automatic adjustment” and “Playback-onlydisc/magneto-optical disc automatic adjustment”.

6.1. Instruments to prepare

1. Playback-only disc (Test disc RFKV0006)
2. Commercially available recordable disc (fully recorded with music) (magneto-optical disc)

3. Laser power meter (LE8010 or compatible meter)

4. Remote controller

6.2. Laser power adjustment, Off-set automatic adjustment, Playback-only disc/magneto-optical disc automatic adjustment magnet

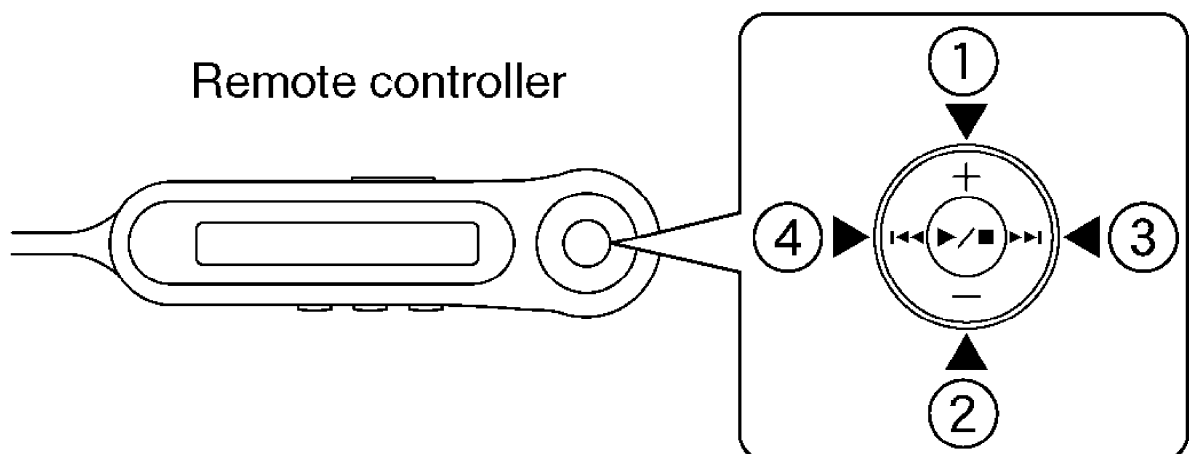
6.2.1. Enter the adjustment mode

Caution:

Place the unit on the insulation sheet with the disc cover side facing up.

1. Disassemble the unit so that only the mechanism unit and the printed circuit board are exposed.
(Refer to (Step1) of the main part replacement procedure “5.2. Replacement for the intermediate cabinet”).
2. Move the optical pickup to the innermost side and attach the disc cover.
3. Set the battery and connect the remote controller.
4. Turn off the power, and switch main unit’s HOLD switch off.
5. Press the VOL+(①), VOL-(②), ►► (③), and ◀◀ (④) keys on the remote controller within two seconds. (as shown in Fig. 5)

Fig. 5



6. When the adjustment mode is activated, “T0J ” will be displayed on the LCD of remote controller. After “T0J ” is displayed, select the desired adjustment item with the ►► button or ◀◀ button of the remote controller. (If it is not displayed, perform the procedures written above again.)

Adjustment mode	Display
Laser power adjustment	T0J
Off-set automatic adjustment	T1J
Magneto-optical disc automatic adjustment	T2J
Playback-only disc automatic adjustment	T3J
Jitter measurement (74minutes)	T4J
Jitter measurement (60 minutes)	T5J
Destination change	T6J
Off-set automatic adjustment value check	T7J
Magneto-optical disc automatic adjustment value check	T8J
Playback-only disc automatic adjustment value check	T9J
Error rate measurement (double velocity)	TAJ
ROM collection	TBJ
DRAM check	TCJ
Aging	TDJ
Tilt measurement	TEJ
PWB inspection	TFJ

*In the display of T0J ~ TFJ shown above, you must adjust T0J , T1J , T2J and T3J . You must perform the adjustment by observing the order T0J → T1J → T2J → T3J .

6.2.2. Laser Power Adjustment

Adjust each laser power: read power for reading (play).

6.2.2.1. Set the Unit to the Adjustment Mode

Cautions

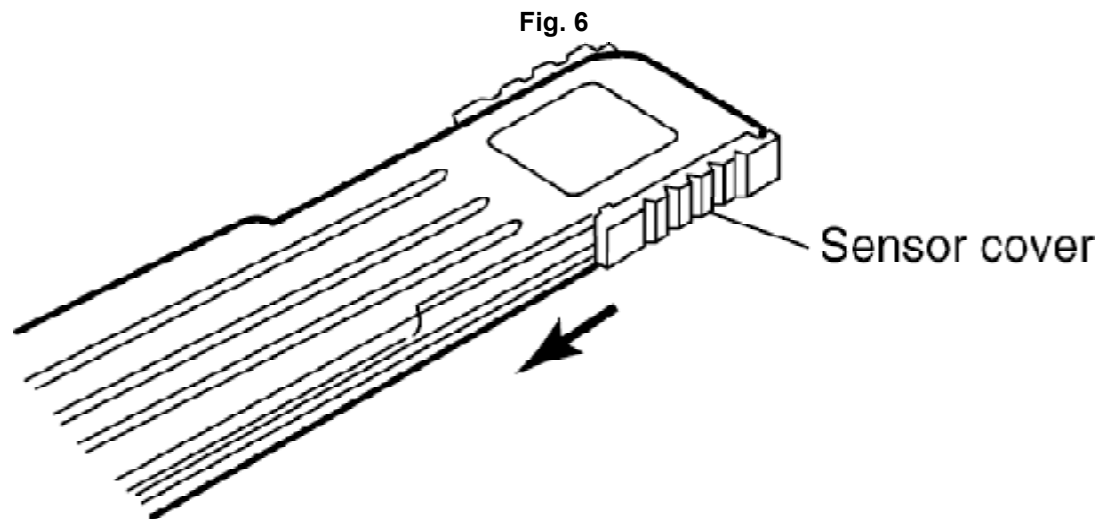
About handling the optical pickup and the magnetic head.

- ▀ The optical pickup is structured precisely; therefore, it is very fragile. Be careful not to touch it with the edge of the laser power meter. Do not touch the lens.
- ▀ The sensor of the laser power meter is a very fine part. Be careful not to touch it to the optical pickup lens.
- ▀ The focus point of the laser reaches to 356°F. Therefore, avoid adjusting using laser power for a long time because the sensor of the laser power meter may be burned.
- ▀ Do not set the unit to the laser power adjustment mode with the MD loaded. Doing so may result in damage to the MD.

- Laser diode in the optical pickup may be destroyed by the static electricity generated in your clothes or body. Be especially careful with the static electricity.

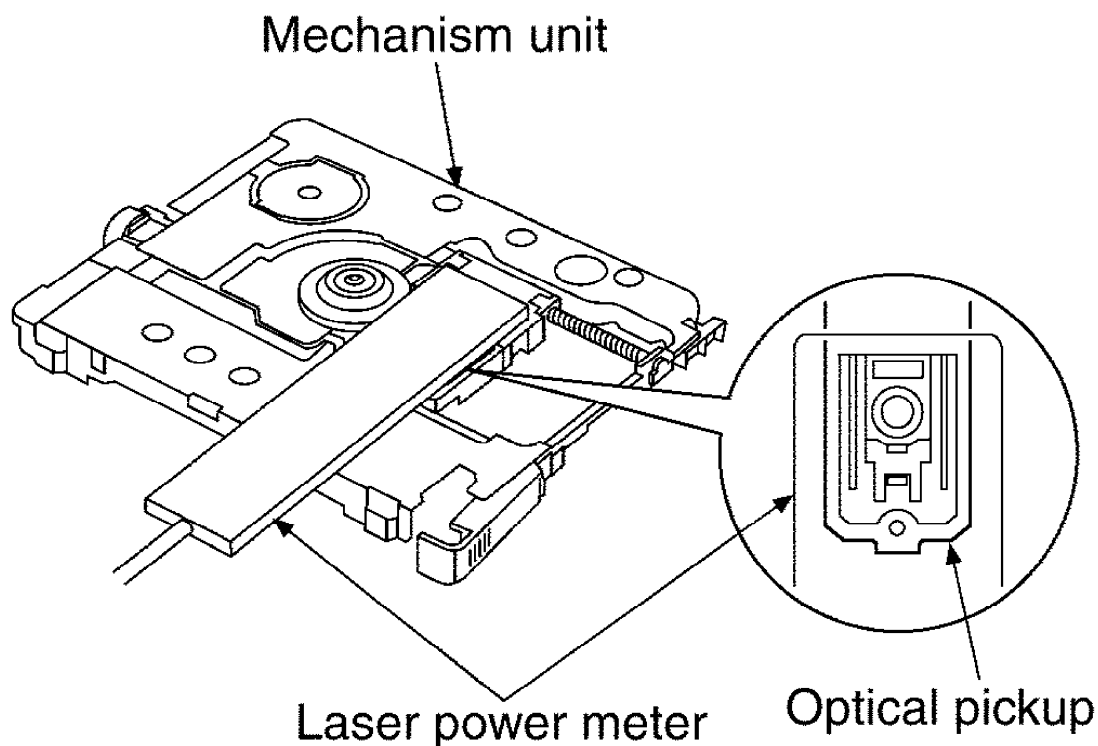
6.2.2.2. Adjustment Procedure









1. Uncover the laser power meter. (as shown in [Fig. 6](#))



2. Make "T0J" display on the LCD of remote controller and locate the sensor of the laser power meter at a position above the optical pickup (horizontally at a level of the disc position). (as shown in [Fig. 7](#))

Fig. 7



3. Press the  /  key of the remote controller (“T0J ” changes to “LD ” of the LCD).
4. Press the   key of the remote controller (“LD ” changes to “LP ” of the LCD).
5. Set the laser power at $600 \mu W \pm 10\%$ by using VOL+ and VOL- key of the remote controller.
[Specified range: $600 \mu W \pm 10\%$]
Caution:
Proceeding on to the subsequent adjustment procedure with the read power exceeding “over $660 \mu W$ ” will result in damage to the optical pickup.
6. Set the laser power with the   key of the remote controller (“LP ” changes to “LDOK ” in the LCD).
7. Press the  /  key of the remote controller (“LDOK ” changes to “T0J ” on the LDC).
8. Remove the laser power meter. Laser power adjustment is finished.

[REFERENCE]

<For use of MD cartridge type laser power meter>

We recommend you to use a sensor type laser power meter for laser power adjustment of this set.

But if available is a MD cartridge type only, follow the procedure below.

1. Disassemble the unit so that only the mechanism unit and the printed circuit board are exposed. (as shown in [Fig. 8](#))
2. Set the laser power meter cartridge. (as shown in [Fig. 8](#))
3. Set the battery and attach and secure the battery cover with a rubber band. (as shown in [Fig. 9](#))
4. Follow the steps for “6.2.1. Enter the adjustment mode”. (Subsequent procedures are the same as those for the sensor type.)

Fig. 8

MD cartridge of laser power meter

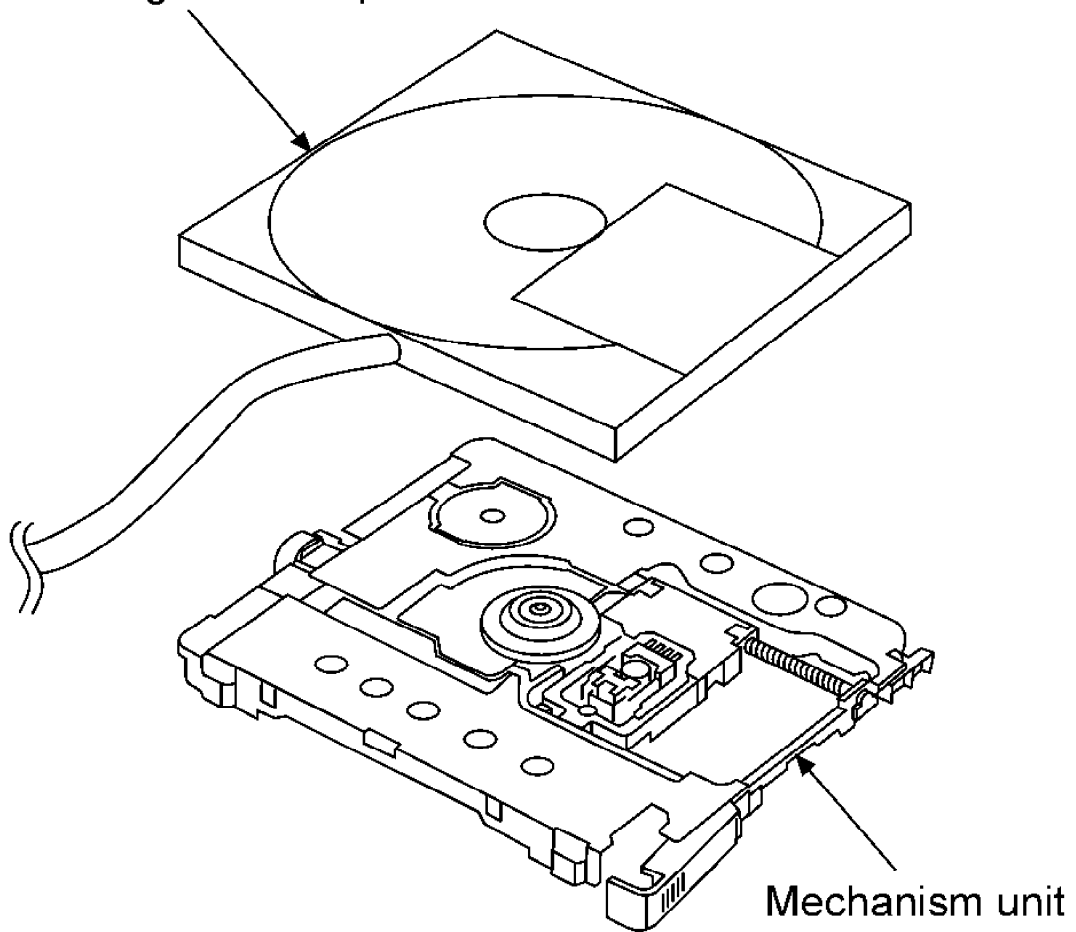
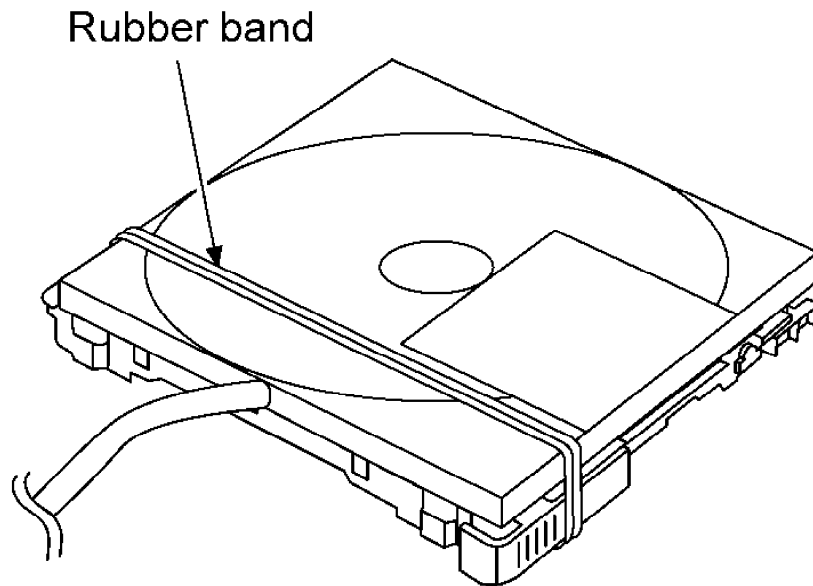








Fig. 9



6.2.3. Off-set automatic adjustment



1. Remove the mechanism unit from the disc cover. Then move the optical pickup to the center, and attach the mechanism unit again to the disc cover.
2. With "T1J" displayed, leave the disc cover open.
3. Pressing the  /  key on the remote controller will start adjustment.
4. During adjustment, "FADJ" is displayed on the LCD of the remote controller. If there is no abnormality, "FOK" will be displayed.
5. Pressing the  /  key while "FOK" is displayed will return to the "T1J" display mode.

6.2.4. Magneto-optical disc automatically adjustment



1. Have "T2J" indicated on display, and set the full-recorded magneto-optical disc. (Check to make sure the disc is properly seated.)
2. Press  /  key of the remote controller. The adjustment is started.
3. During adjustment, "AADJ" is displayed on the LCD of the remote controller. If there is no abnormality, "AOK" will be displayed.

Note:

If it is displayed "ANG", check "7. Troubleshooting Guide" in the order.



4. Press  /  key (“AOK ” or “ANG ” changes to “T2J ”).
5. After the adjustment is finished, remove the disc.

6.2.5. Playback-only disc automatic adjustment

1. Have “T3J ” indicated on display, set the playback-only disc.
(Check to make sure the disc is properly seated.)
2. Press  /  key of the remote controller. The adjustment is started.
3. During adjustment. “AADJ ” is displayed on the LCD of the remote controller.
If there is no abnormality, “AOK ” will be displayed.

Note:









If it is displayed “ONG ”, check “7. Troubleshooting Guide” in the order.




4. Press  /  key (“OOK ” or “ONG ” changes to “T3J ”).
5. After the adjustment is finished, remove the disc.

6.2.6. How to get out the adjustment mode

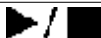


Remove the battery when you finish the adjustment.

6.3. Checking the main unit's keys

1. Set the battery and connect the remote controller.
2. Turn off the power, and switch main unit’s HOLD switch OFF.
3. Press the VOL+(①), VOL-(②),  (③), and  (④) keys on the remote controller within two seconds. (as shown in [Fig. 5](#))
4. When the unit enters the unit key check mode, the display shows “T KJP ”.
While “T KJP ” is displayed, press the  / , ,  and VOL(+, -) keys of the unit in the specified order and then switch off the HOLD switch.
*When the first  /  key is pressed, the display will change to “T ■ ■ ■ ”.

Main unit's keys	LCD display position and letters
	After the third key is pressed, the second digit displayed will change from " ■ " to "O".
	
	
VOL+	After the second key is pressed, the third digit displayed will change from " ■ " to "O".
VOL-	
HOLD OFF	The first digit displayed will change from " ■ " to "O".

- After all keys have been pressed and there is no abnormality, "T 000" will be displayed.
- Perform below voltage check about the keys come under if it is not displayed "T 000".

Main unit's keys	Check points	ON	OFF
HOLD	TP428	0V	2.2V
	IC201 48pin	0V	2.2V
	TP421	1.13V	2.2V
	TP421	1.69V	2.2V
VOL+	TP421	0V	2.2V
VOL-	TP421	0.58V	2.2V

Note:

Refer to "10. Printed Circuit Board Diagram" for the test points.

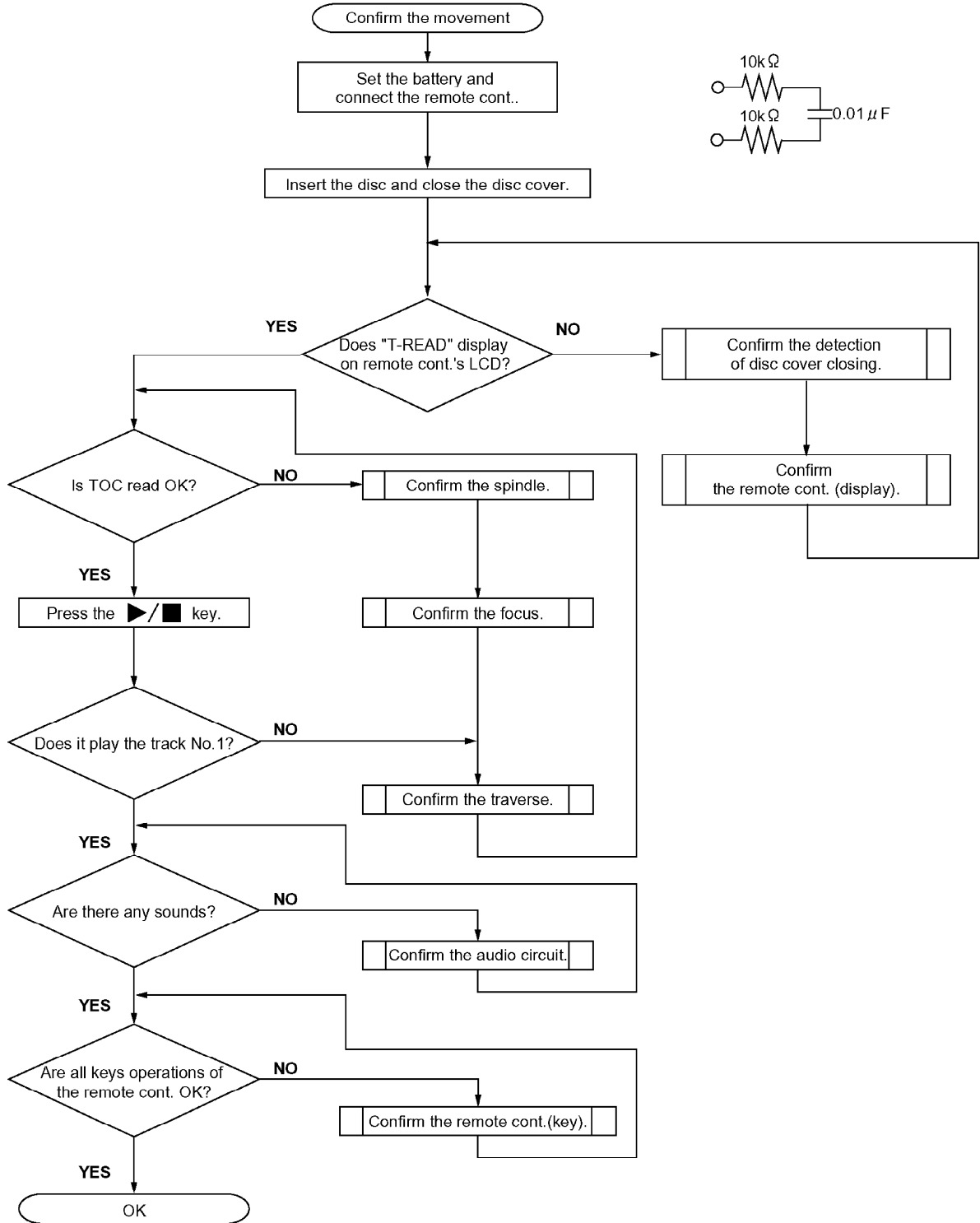
- Remove the battery when you exit from this mode.

7. Troubleshooting Guide

Overall flowchart

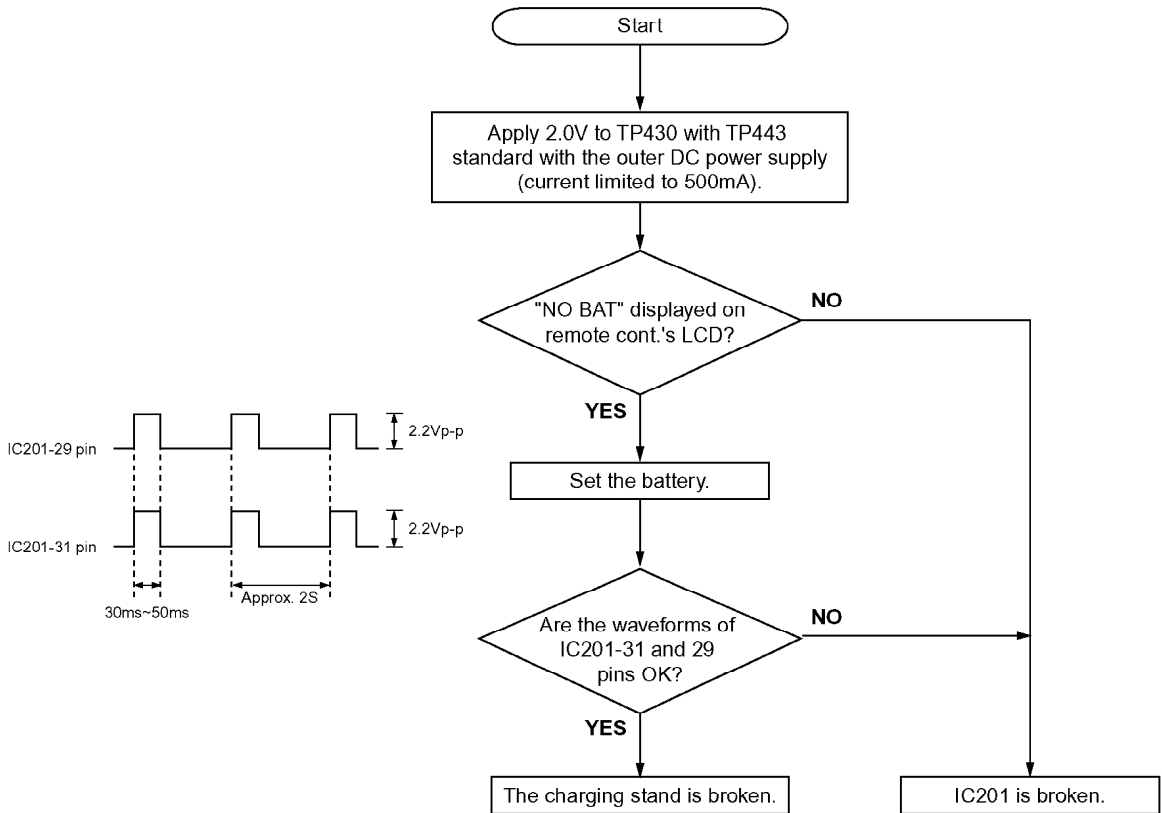
1. Confirmation of the Main unit and the remote controller.

Note: We mentioned "*Filter" beside the waveform about the points for necessary the filter when you check the waveforms. Check it with setting the band width of the meter about 5-10kHz or connecting the filter shown below.

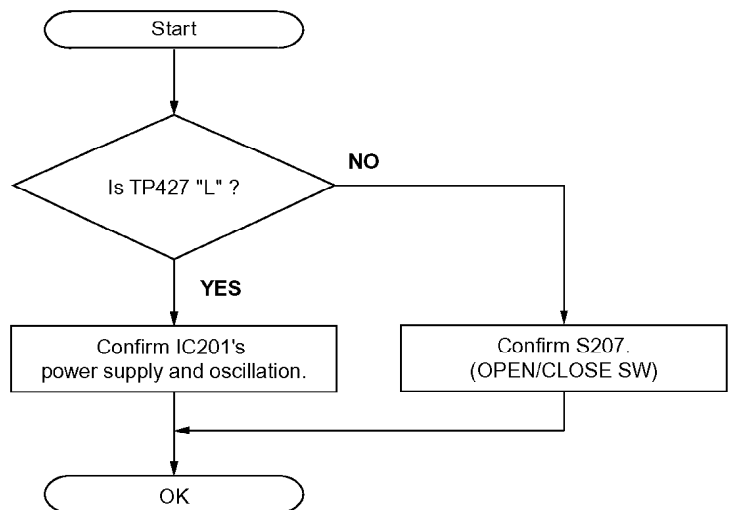


2. Confirmation of the main unit and the sound charger (Confirmation of the charging circuit.)

Note: DC power supply to be prepared.

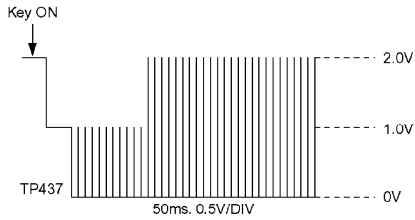


Confirm the detection of the disc cover closing.



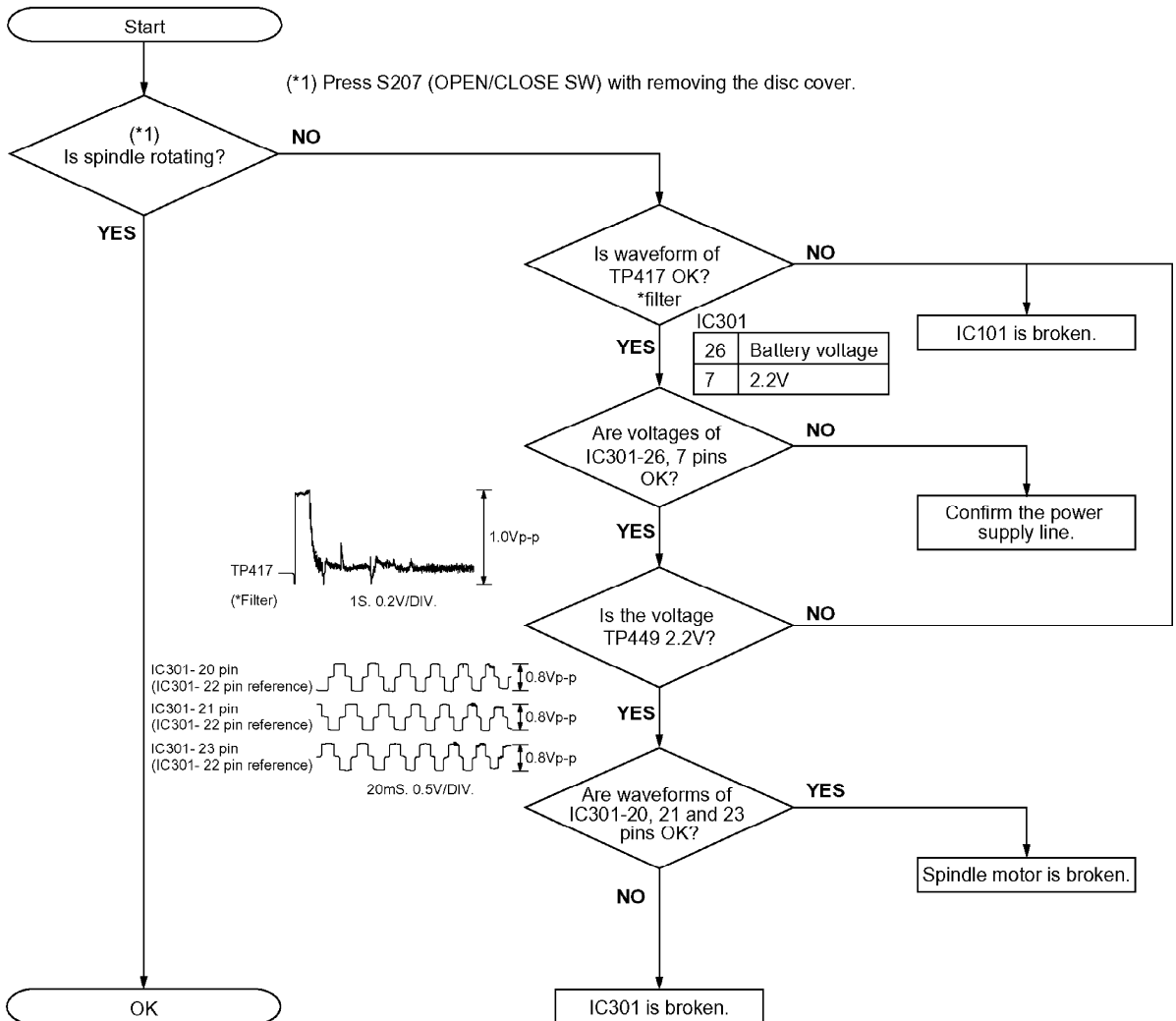
Confirm the remote controller(key)

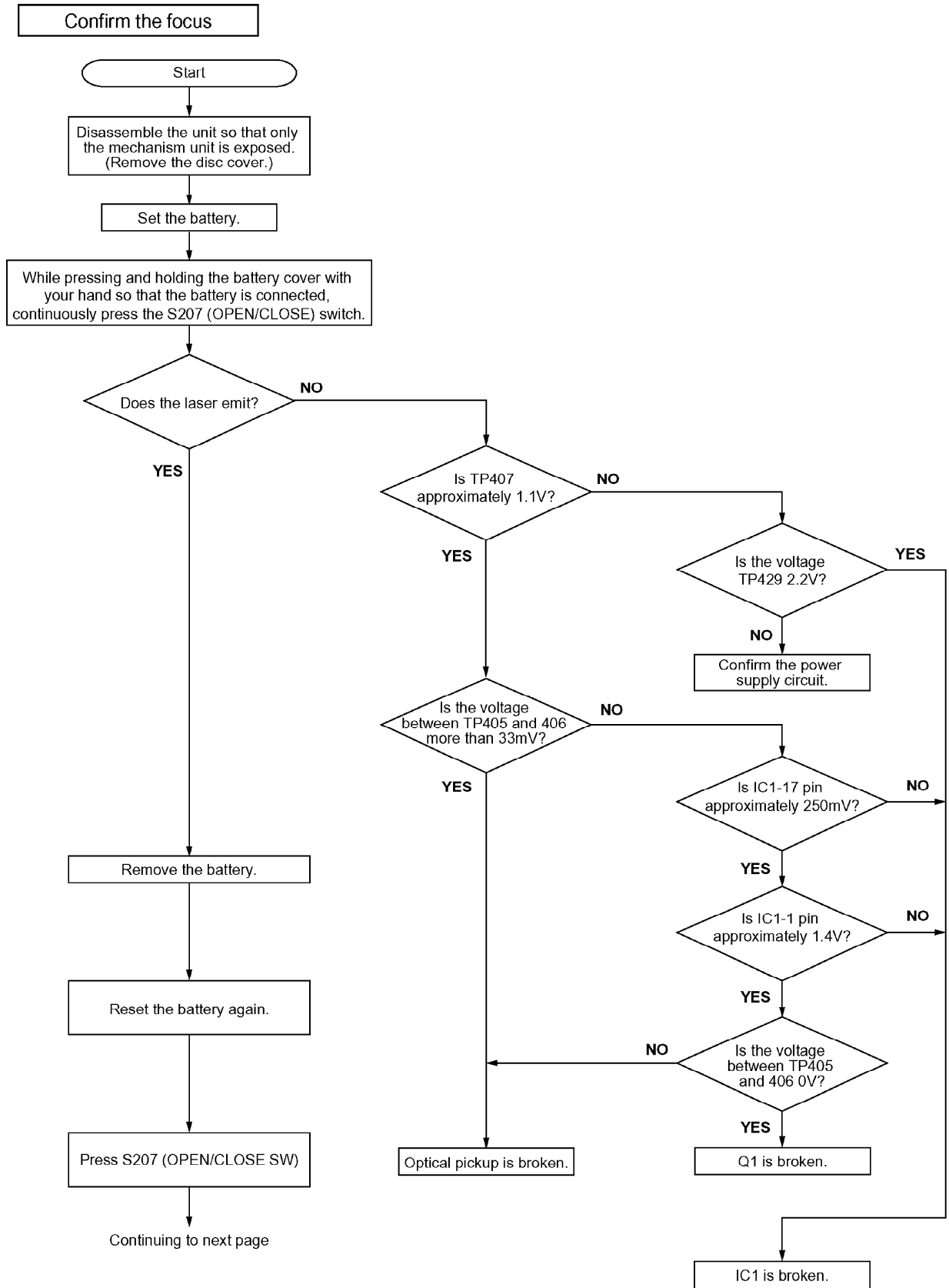
Confirm the waveform at TP437 and the voltage when the keys are pressed.



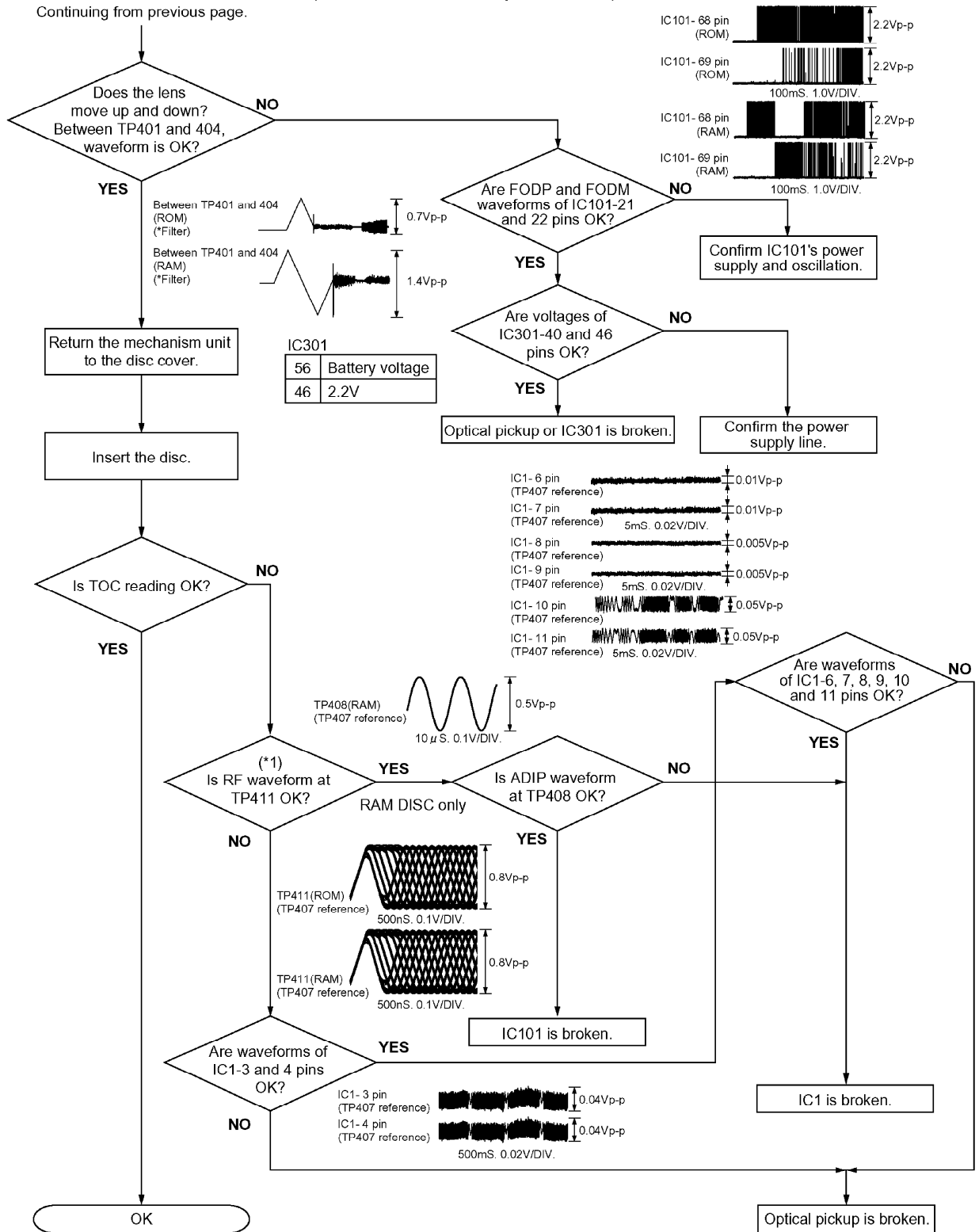
MAIN	VOLTAGE(V)	BOUNDARY VOLTAGE(V)
PLAY	0.150	0.172
VOL +	0.344	0.499
VOL -	0.653	0.759
EQ MODE	0.865	0.955
PLAY MODE	1.046	1.136
F-SKIP	1.226	1.326
DISPLAY	1.425	1.515
R-SKIP	1.606	1.702
(KEY-OFF)	1.799	1.900
HOLD	2.000	2.100
WITHOUT REMOTE CONT.	2.200	

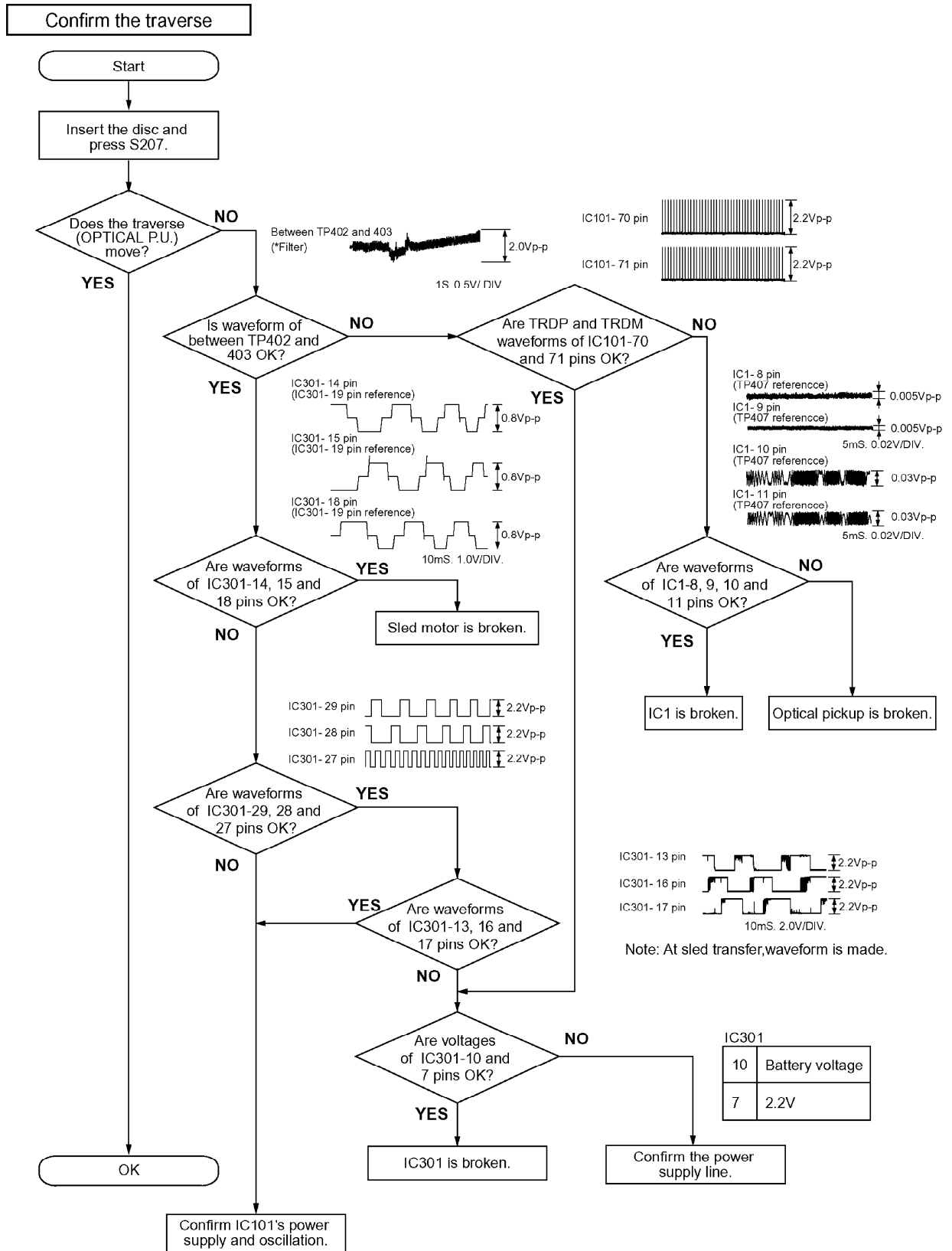
Confirm the spindle



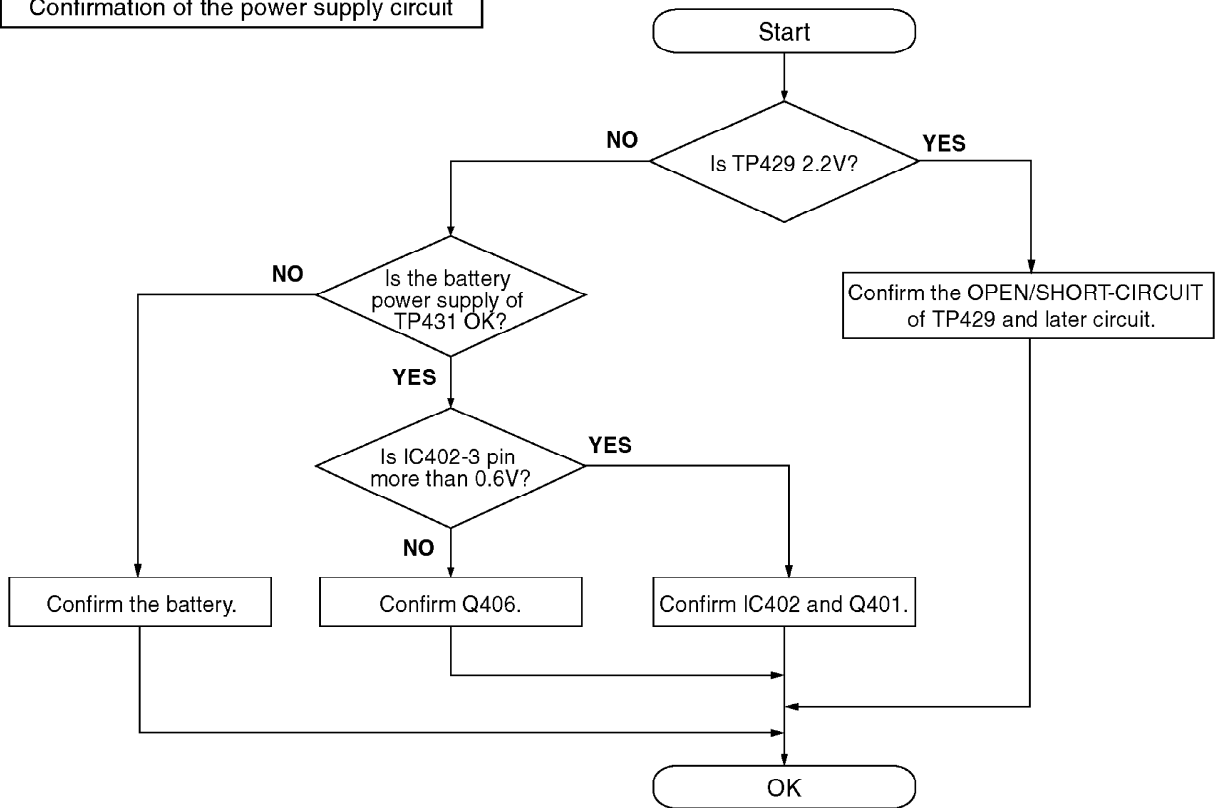


(*1) When checking the RF waveform, set to the adjustment mode and adjust it to the jitter measurement condition. Continuous waveform can be checked. (Refer to "6.2.1. Enter the adjustment mode")

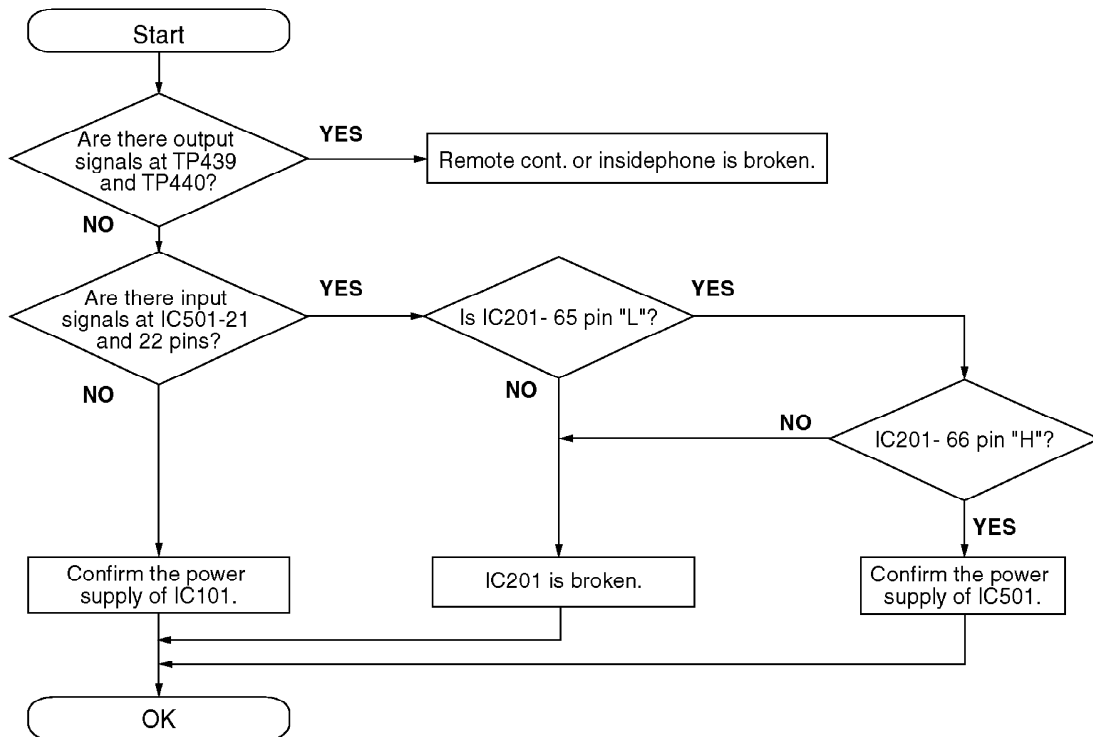




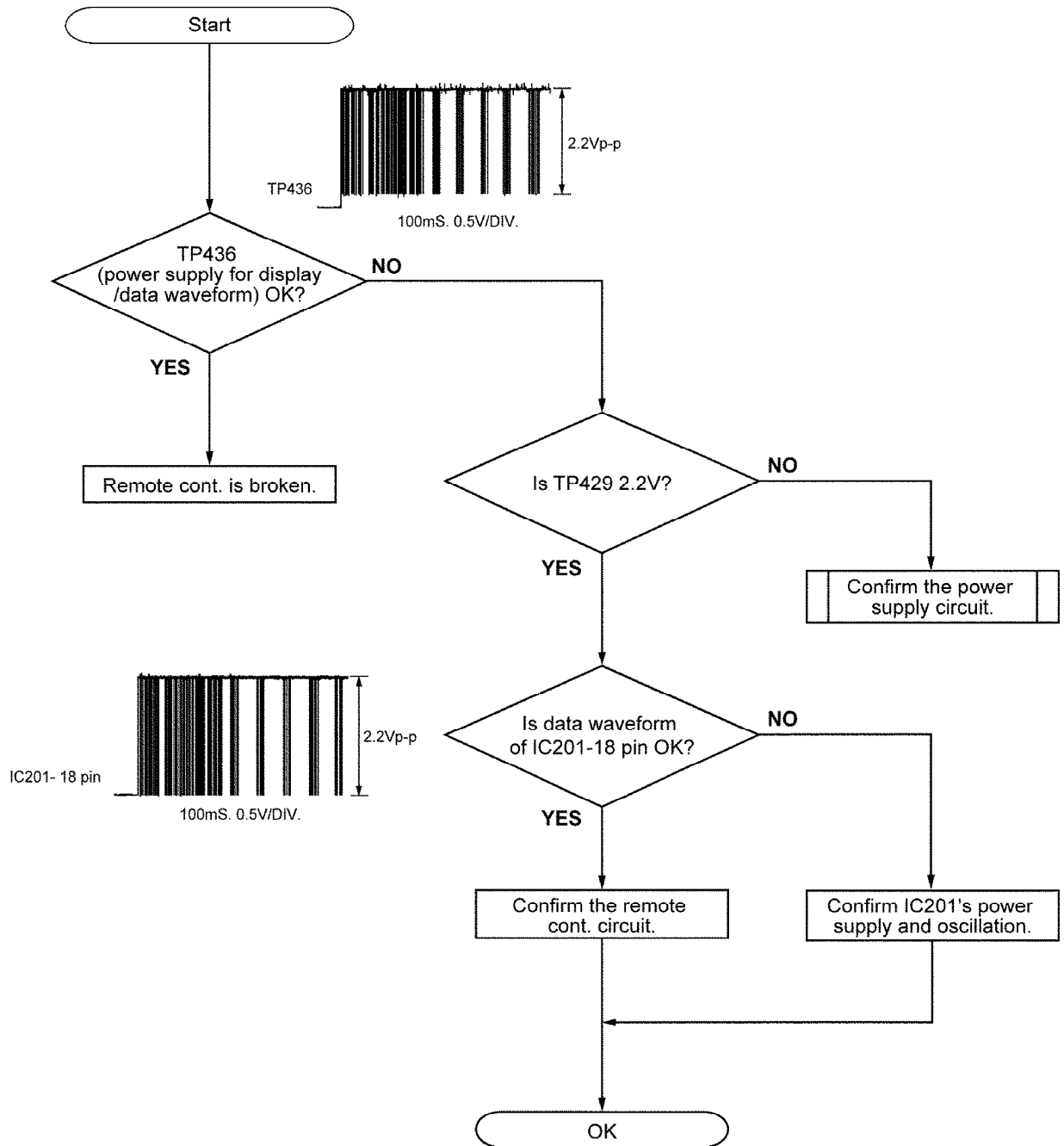
Confirmation of the power supply circuit



Confirmation of the audio circuit



Confirmation of the remote controller (Display)



8. Schematic Diagram Notes

8.1. Type Illustration of IC's, Transistors and Diodes



8.2. Schematic Diagram Notes

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

Notes:

- : Volume control switch (+)
S202
- : Cover open/close det. switch
S207
- : Hold switch in "OFF" position. (HOLD)
S208
- : Volume control switch (-)
SX201
- : Skip/search switch (▶▶|)
SX203
- : Skip/search switch (◀◀|)
SX204
- : Play/stop switch (▶ / ■)
SX206

- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

No mark: MD STOP

(): MD play [1kHz, L+R, 0dB]

Important safety notice:

Components identified by ⚠ mark have special characteristics important for safety.

Furthermore, special parts which have purpose of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.

Caution!

IC and LSI are sensitive to static electricity.

Secondary trouble can be prevented by taking care during repair.

Cover the parts boxes made of plastics with aluminum foil.

Ground the soldering iron.

Put a conductive mat on the work table.

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

Voltage and signal line

➡: Positive voltage line

⇨: Playback signal line

9. Schematic Diagram



10. Printed Circuit Board Diagram



11. Block Diagram



12. Terminal Function of IC's

12.1. IC1 (C1BB00000640): RF AMP

Pin No.	Mark	I/O Division	Function
1	PPIT	I	Pit/ Group select signal input terminal (H: Pit/ L: Group)
2	RVCC	I	Power supply terminal
3	RF1	I	RF 1 signal input terminal
4	RF2	I	RF 2 signal input terminal
5	VCC	I	Power supply terminal
6	F1	I	F 1 signal input terminal
7	F2	I	F 2 signal input terminal
8	A	I	A signal input terminal
9	B	I	B signal input terminal
10	C	I	C signal input terminal
11	D	I	D signal input terminal
12	GHSW	I	ROM/ RAM gain switching signal input terminal
13	BWCT	I	Wobble signal band pass filter switching input terminal
14	SETR	I	Band pass filter control input terminal
15	GND	—	GND terminal
16	LDD	O	APC output terminal
17	LDS	I	I/V converted laser quantity of light input terminal
18	LDREF	I	Laser control signal input terminal
19	VC	O	1/2VCC (reference voltage) output terminal
20	VR	I	1/2VCC (reference voltage) input terminal (connected to GND through capacitor)
21	WOO	O	Wobble signal output terminal
22	DD	O	D signal dark-side detection / amplified output terminal
23	CC	O	C signal dark-side detection / amplified output terminal
24	BB	O	B signal IV conversion output terminal
25	AA	O	A signal IV conversion output terminal
26	FF2	O	F2 signal IV conversion

Pin No.	Mark	I/O Division	Function
			output terminal
27	FF1	O	F1 signal IV conversion output terminal
28	RGND	—	GND terminal
29	BOTTOM	—	RF bottom signal output terminal (Not used, open)
30	PEAK	O	RF peak signal output terminal
31	HFL	O	Track detection signal output terminal
32	BHC	O	Connected to GND through capacitor
33	PHC	O	Connected to GND through capacitor
34	EQO	O	RF equalizer output terminal
35	EQI	I	RF equalizer input terminal
36	RFO	O	RF signal output terminal

12.2. IC101 (C1BB0000639): ATRAC ENCODER/DECORDER, SERVO SIGNAL PROCESSOR

Pin No.	Mark	I/O Division	Function
1	VDD	I	Power supply terminal
2	SLCO	O	HF signal slicing level output terminal
3	SLCISET	I	Slicing level adjustment bias resistor terminal
4	EFMIN	I	HF signal input terminal
5	TEST1	I	Test terminal
6	RESET B	I	System reset input terminal
7	HFL	I	Track detection signal input terminal
8	PDO	O	VCEC current charge pump output terminal
9	VCVDD	I	Power supply terminal for VCEC
10	FR	I	VCEC oscillation frequency bias resistor terminal

Pin No.	Mark	I/O Division	Function
11	ISET	I	VCEC current charge pump bias resistor terminal
12	VCVSS	—	GND terminal
13	AVDD1D	I	Power supply terminal
14	PEAK	I	Peak signal input terminal
15	FF1	I	Focus error signal input terminal
16	FF2	I	Focus error signal input terminal
17	AA	I	LNP error signal input terminal
18	BB	I	LNP error signal input terminal
19	CC	I	Tracking error signal input terminal
20	DD	I	Tracking error signal input terminal
21	AVDD1	I	Power supply terminal
22	AVSS1	—	GND terminal
23	ADIPWO	I	Wobble signal input terminal
24	NC	—	Not used, open
25	NC	—	Not used, open
26	NC	—	Not used, open
27	SIN	I	Connected to GND through reistor
28	SOUT	—	Not used, open
29	SCLK	—	Not used, open
30	VSS	—	Connected to GND
31	VDD	I	Power supply terminal
32	NC	—	Not used, open
33	LDREF	—	Laser power control signal output terminal (Not used, open)
34	NC	—	Not used, open
35	NC	—	Not used, open
36	NC	—	Not used, open
37	MRASB	—	DRAM data in/ output terminal (Not used, open)
38	MWEB	—	DRAM data in/ output terminal (Not used, open)

Pin No.	Mark	I/O Division	Function
39	VCC2	I	Power supply terminal
40	MD1	—	DRAM data in/ output terminal (Not used, open)
41	NC	—	Not used, open
42	MD0	—	DRAM data in/output terminal (Not used, open)
43	NC	—	Not used, open
44	PCK	—	Not used, open
45	VCC2	I	Power supply terminal
46	VSS	—	GND terminal
47	DEFECT	—	Not used, open
48	MD3	—	DRAM data in/ output terminal (Not used, open)
49	NC	—	Not used, open
50	MD2	—	DRAM data in/ output terminal (Not used, open)
51	NC	—	Not used, open
52	VSS	—	GND terminal
53	MCASB	—	DRAM data in/ output terminal (Not used, open)
54	MOEB	—	DRAM data in/ output terminal (Not used, open)
55	NC	—	Not used, open
56	NC	—	Not used, open
57	TEST3	I	Test terminal
58	SPPWMF	O	Spindle PMW output terminal
59	SPPWMR	O	Spindle PMW output terminal
60	VSS	—	GND terminal
61	VCC2	I	Power supply terminal
62	SLPWMF	O	Sled PMW output terminal
63	SLPWMR	O	Sled PMW output terminal
64	SLD0	O	Sled control signal output terminal

Pin No.	Mark	I/O Division	Function
65	SLD1	I	Sled control signal input terminal
66	SLD2	I	Sled control signal input terminal
67	SLD3	I	Sled control signal input terminal
68	FOPWMF	O	Focus PMW output terminal
69	FOPWMR	O	Focus PMW output terminal
70	TRPWMF	O	Tracking PMW output terminal
71	TRPWMR	O	Ttacking PMW output terminal
72	FG	I	Verocity puls signal input terminal
73	VP	—	CLV servo clock judgement output terminal (Not used, open)
74	FOK	O	Focus OK signal output terminal
75	FAST	—	FAST signal output terminal (Not used, open)
76	VDD	I	Power supply terminal
77	CL	I	CPU I/F data transfer clock input terminal
78	CE	I	CPU I/F chip enable signal input terminal
79	DI	I	CPU I/F data input terminal
80	DO	O	CPU I/F data output terminal
81	WRQB	O	CPU interrupt signal output terminal
82	INTB	O	CPU I/F interrupt signal output terminal
83	FSEQ	—	Frame synchronize detection signal output terminal (Not used, open)
84	F16M	O	Crystal oscillator output terminal (F=16.9344MHz)
85	AVDD	—	Power supply terminal of LPF for 1bit DAC

Pin No.	Mark	I/O Division	Function
86	OUTL	—	1bit DAC output terminal (Lch)
87	OUTR	—	1bit DAC output terminal (Rch)
88	AVSS	—	GND terminal of LPF for 1bit DAC
89	DDOUT	O	Power supply terminal
90	VSS	—	GND terminal
91	VCC2	I	Power supply terminal
92	XIN	I	16.9344MHz oscillate input terminal
93	XOUT	O	16.9344MHz oscillate output terminal
94	ENH	O	De-emphasis direction output terminal
95	LRCO	O	Lch/ Rch clock output terminal
96	DDATA	O	Voice extend data output terminal
97	BCO	O	Bit clock output terminal
98	MAD9	—	DRAM CAS signal output terminal (Not used, open)
99	NC	—	Not used, open
100	MAD8	—	DRAM address output terminal (Not used, open)
101	MAD7	—	DRAM address output terminal (Not used, open)
102	MAD6	—	DRAM address output terminal (Not used, open)
103	NC	—	DRAM address output terminal (Not used, open)
104	MAD5	—	DRAM address output terminal (Not used, open)
105	MAD4	—	DRAM address output terminal (Not used, open)
106	VSS	—	Connected to GND

Pin No.	Mark	I/O Division	Function
107	VCC2	I	Power supply terminal
108	MAD3	—	DRAM address output terminal (Not used, open)
109	MAD2	—	DRAM address output terminal (Not used, open)
110	MAD1	—	DRAM address output terminal (Not used, open)
111	MAD0	—	DRAM address output terminal (Not used, open)
112	MAD10	—	DRAM RAS signal output terminal (Not used, open)
113	NC	—	Not used, open
114	SMON3	I	Monitor signal output terminal (Not used, open)
115	SMON2	O	Monitor signal output terminal
116	SMON1	O	Monitor signal output terminal
117	SMON0	—	Monitor signal output terminal (Not used, open)
118	TEST2	I	Test terminal
119	SHOCK	O	CHOCK/ RFNG output terminal
120	VSS	—	Connected to GND

12.3. IC201 (MN101CF32GAF): SYSTEM CONTROL

Pin No.	Mark	I/O Division	Function
1	VREF-	—	Connected to GND
2	REM_KEY	I	Remote control key input terminal
3	KEYIN	I	Unit key input terminal
4	BATT	I	Battery voltage detection input terminal
5	—	—	Connected to GND
6	—	—	Connected to GND
7	—	—	Connected to GND
8	OUTC	—	Not used, open
9	VPP	—	Not used, open
10	VREF+	I	Power supply terminal
11	VDD	I	Power supply terminal
12	OSC2	O	System clock output terminal (F=6MHz)
13	OSC1	I	System clock input terminal (F=6MHz)
14	VSS	—	Connected to GND
15	XI	—	Sub clock input terminal (Not used, connected to GND)
16	XO	—	Sub clock output terminal (Not used, open)
17	MMOD	—	Memory mode switching input terminal (Not used, connected to GND)
18	REM_DATA	O	LCD driver data output terminal
19	LINK_IN	I	LINK serial data input terminal
20	—	—	Not used, open
21	—	—	Not used, open
22	—	—	Not used, open
23	—	—	Not used, open
24	BUZZER	O	Beep signal output terminal
25	RST	I	Reset signal input terminal
26	SETR	O	EQ frequency gain switching output terminal
27	—	—	Not used, open
28	BWCT	O	EQ frequency gain switching output terminal
29	CHARGE	O	Recharge control output

29	CHARGE	O	Recharge control output terminal
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Pin No.	Mark	I/O Division	Function
30	LD_PWM	O	Laser power controlling PWM output terminal
31	DCIN_WAKEUP	I	Charger starting detection signal input terminal
32	INTB	I	IC101 interrupt signal input terminal
33	WRQB	I	IC101 interrupt signal input terminal
34	OPEN_SW	I	Lid open/ close detection input terminal (H: Open/ L: Close)
35	—	—	Not used, open
36	SSDW	O	IC101 I/F write data output terminal
37	SSDR	I	IC101 I/F read data input terminal
38	SSCLK	O	IC101 I/F clock output terminal
39	SELAD	O	IC101 I/F address select output terminal
40	RESET B	O	IC101 I/F reset output terminal
41	ZDTCL	I	IC101 I/F monitor signal input terminal
42	ZDTCR	I	IC101 I/F monitor signal input terminal
43	—	—	Not used, open
44	BATT_SW	O	Battery control signal output terminal
45	—	—	Not used, open
46	—	—	Not used, open
47	—	—	Not used, open
48	PLAY_KEY	I	PLAY key starting input terminal
49	REM_WUP	I	Remote control key wake up input terminal
50	ELON	O	EL display control input terminal (L: Start)
51	—	—	Not used, open
52	FOK	I	Focus OK signal input terminal

Pin No.	Mark	I/O Division	Function
53	SHOCK	I	Signal detection signal/ sleep control signal input terminal
54	—	—	Not used, open
55	DATA_FLASH	—	Not used, open
56	CLK_FLASH	—	Not used, open
57	DRV_STBY	O	Driver IC standby output terminal
58	SP_STBY	O	Driver IC circuit spindle standby output terminal
59	PPIT	O	Pit/ Group select signal output terminal (H: Pit/ L: Group)
60	LSI_STATUS	—	Not used, open
61	ST_READ	—	Not used, open
62	GHSW	O	ROM/ RAM gain switching signal output terminal
63	LDON	—	Laser ON/ OFF switching signal output terminal (H: ON/ L: OFF) (Not used, open)
64	RFCONT	O	RF AMP power supply control output terminal
65	P.CONT	O	Power supply control output terminal (H: Power OFF/ L: Power ON)
66	MOD_CNT	O	Power supply switching IC control output terminal
67	MODEL 1	I	Model switching input terminal (1)
68	MODEL 2	I	Model switching input terminal (2)
69	DOCTOR	I	Process inspection mode input terminal (Connected to power supply through resistor)
70	HOLD	I	HOLD switch input terminal
71	MUTEA	O	Analog mute A output terminal

Pin No.	Mark	I/O Division	Function
72	MUTEB	O	Analog mute B output terminal
73	MUTE_MODE	I	Mute mode decision input terminal (Connect to GND)
74	EEP_DATA_I	I	EEP ROM data input terminal
75	EEP_DATA_O	O	EEP ROM data output terminal
76	EEP_CK	O	EEP ROM clock output terminal
77	EEP_CS	O	EEP ROM chip select output terminal
78	ADJ_OK	—	Not used, open
79	TEST_OUT	—	Not used, open
80	LED_CNT	O	LED control output terminal

12.4. IC301 (C0GBZ00009): FOCUS/TRACKING COIL/ TRAVERSE MOTOR DRIVE/ROTALY DETECTOR

Pin No.	Mark	I/O Division	Function
1	IN1R	I	H bridge (1) logic reverse output terminal
2	CP1	O	Charge pump gain puls output terminal
3	CPC1	I	Charge pump gain input terminal
4	CP2	O	Charge pump gain puls output terminal
5	CPC2	I	Charge pump gain input terminal
6	VG	O	Charge pump gain output terminal (Connected to GND through capacitor)
7	VCC	I	Small signal block power supply terminal
8	CLK	I	Reference clock signal input terminal
9	MODE	I	PWM frequency switching input terminal

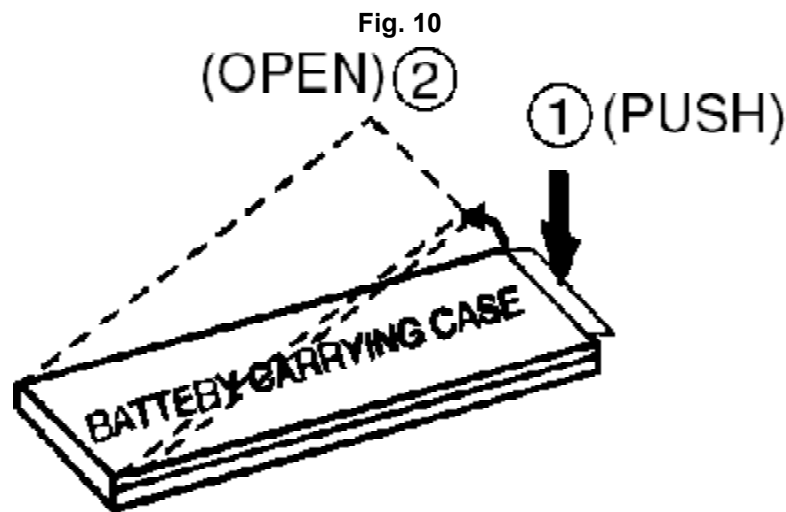
Pin No.	Mark	I/O Division	Function
10	VS	I	3-phase sled drive power supply terminal
11	BRK	I	Spindle motor block brake terminal
12	PGND4	—	GND terminal
13	SUCO	O	Sled driver block position detection comparator output terminal
14	SUO	O	3-phase sled (U) output terminal
15	SVO	O	3-phase sled (V) output terminal
16	SVCO	O	Sled driver block position detection comparator output terminal
17	SWCO	O	Sled driver block position detection comparator output terminal
18	SWO	O	3-phase sled (W) output terminal
19	SCOM	I	Sled driver block position detection comparator output terminal
20	WOUT	O	3-phase spindle (W) output terminal
21	VOUT	O	3-phase spindle (V) output terminal
22	COM	I	Spindle motor COM point connect input terminal
23	UOUT	O	3-phase spindle (U) output terminal
24	FG	O	FG pulse output terminal
25	RF	—	Output current detection input terminal (Connected to GND)
26	VS	I	Spindle motor drive power supply input terminal
27	S3	I	3-phase sled block logic input terminal
28	S2	I	3-phase sled block logic input terminal
29	S1	I	3-phase sled block logic input terminal

Pin No.	Mark	I/O Division	Function
30	PWM	I	PWM signal input terminal (H: Output TR ON)
31	GND	—	GND terminal
32	FIL	O	Spindle motor position detection comparator filter output terminal
33	COMIN	I	Spindle motor position detection comparator filter input terminal
34	VCOIN	I	VCO control voltage input terminal (Connected to GND through capacitor)
35	VCO	—	VCO oscillation output terminal (Connected to GND through capacitor)
36	RMAX	—	VCO highest frequency setting input terminal (Connected to GND through resistor)
37	IN2R	I	H bridge (2) logic reverse input terminal
38	IN2F	I	H bridge (2) logic forward input terminal
39	MUTE	I	H bridge 1,2 and 3-phase sled mute input terminal
40	VS2	I	H bridge (2) motor power supply input terminal
41	OUT2F	O	H bridge (2) forward output terminal
42	OUT2R	O	H bridge (2) reverse output terminal
43	PGND1	—	GND terminal
44	OUT1R	O	H bridge (1) reverse output terminal
45	OUT1F	O	H bridge (1) forward output terminal
46	VS1	I	H bridge (1) motor power supply input terminal
47	S/S	I	Spindle motor block start/stop input terminal (H: Start)

Pin No.	Mark	I/O Division	Function
48	IN1F	I	H bridge (1) logic forward input terminal

13. Caution in Use of Rechargeable Battery Ass'y

- Take Rechargeable Battery Ass'y out of Battery Carrying Case and use it.
- Be sure to carry Rechargeable Battery Carrying Case. If not, it may either heat or ignite by shorting with a metal. (as shown in [Fig. 10](#))



14. Supply of Rechargeable Battery Ass'y as Replacement Parts

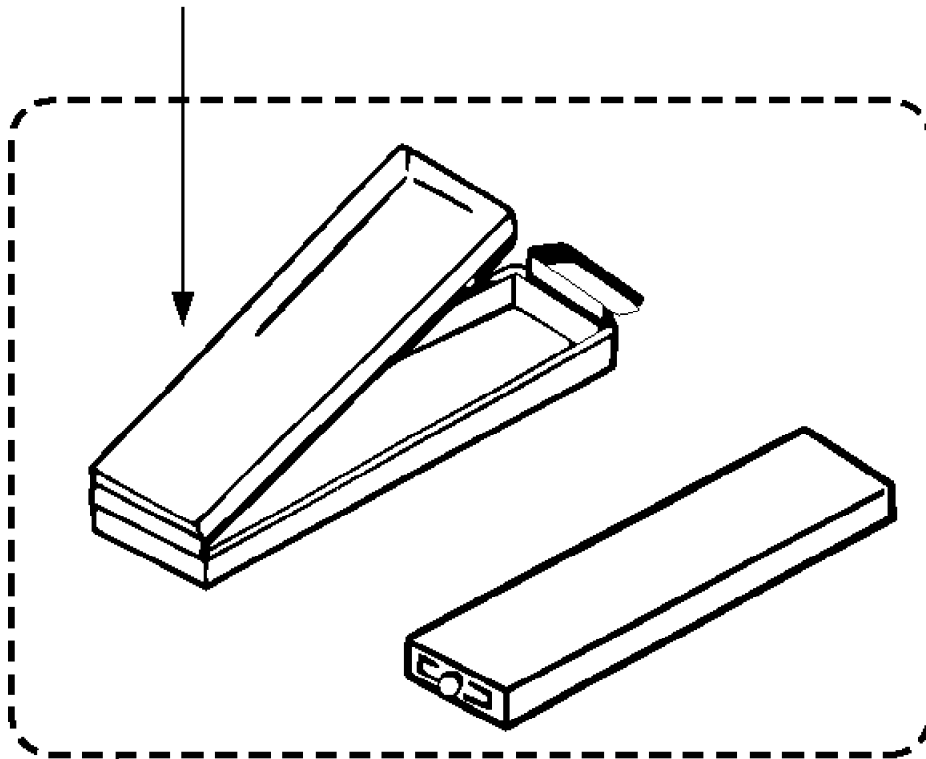
Please take note of the following points relating to Battery Carrying Case to be used for protection of Rechargeable Battery Ass'y from shorting. Replacement Parts:

- Rechargeable Battery Ass'y (RFKHFHAZ01EM) supplied will be provided with Battery Carrying Case (RFA0475-Q).
- No replacement parts will be supplied for Rechargeable Battery Ass'y without Battery Carrying Case.
- Replacement parts will be supplied for Battery Carrying Case (RFA0475-Q) without Rechargeable Battery Ass'y.
- To your customers, delivery Rechargeable Battery Ass'y together with Battery

Carrying Case to prevent shorting accidents that may occur when Rechargeable Battery Ass'y is carried about Battery Carrying Case. (as shown in [Fig. 11](#))

Fig. 11

Rechargeable Battery Case
(RFA0475-Q)



Rechargeable Battery with Carrying Case
(RFKFHFAZ01EM)

15. Replacement Parts List

Notes:

*Important safety notice:

Components identified by  mark have special characteristics important for safety.

*Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

*When replacing any of components, be sure to use only manufacture's

specified parts shown in the parts list.

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



***Capacity values are in microfarads (uF) 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)**

***The marking <RTL> indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.**

***"<IA>" mark in Remarks indicates languages of instruction manual.**

[<IA>: English/ Chinese]

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1	RDG0477	INTERMEDIATE GEAR	1	
2	RHD14078	SCREW	1	
3	RHW11011	WASHER	1	
4	RMC0392-2	HOLDER SPRING	1	
5	RXK0375	TRAVERSE UNIT	1	
5-1	BRL1A1CWB	TRAVERSE MOTOR	1	
5-2	RHD14074	SCREW	1	
5-3	RJC99038	RECHARGE.BATT.TERMINAL(-)	1	
5-4	RMX0156-1	STOPPER RUBBER	1	
5-5	XQN14+B2FC	SCREW	1	
6	RAF2000A-4M	OPTICAL PICKUP	1	
7	RXJ0025	DRIVE SHAFT	1	
8	RHD14067	SCREW	5	
9	RJC99039-1	RECHARGE.BATT.TERMINAL(+)	1	
10	RJR0195-2	BATTERY SHAFT	1	
11	RGK1448-K	INTERMEDIATE CABINET	1	
12	RHQ0083-S	SCREW	6	
13	RXQ0829	LINK UNIT(R)	1	
14	RXQ0830	LINK UNIT(L)	1	
14-1	RGU2040-S	EJECT KNOB	1	
15	RYF0612-S	DISC COVER	1	
16	RYK1157-K	SIDE CABINET ASS'Y	1	
17	RYK1156A-S	CABINET ASS'Y	1	
17-1	RGU2041-S	OPERATION BUTTON	1	
17-2	RGU2042-S	VOLUME BUTTON	1	
17-3	RGV0296-S	HOLD KNOB	1	
17-4	RMR1420-K	JACK PIECE	1	
18	RHD14076-S	SCREW	6	
19	RKK0156-S	BATTERY COVER	1	
A1	K3ZZ00200041	EXTERNAL BATTERY CASE	1	
A2	L0BAB0000162	STEREO EARPHONES	1	
A3	L0EAAB000002	SPEAKER/BATTERY CHARGER	1	
A4	N0JCB0000001	AC ADAPTOR	1	
A5	N2QCBD000020	WIRED REMOTE CONTROLLER	1	
A5-1	RFKY0010	REMOCON PANEL	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
A5-2	RFKY0004	REMOCON CLIP ASS'Y	1	
A6	RFKHFHAZ01EM	RECHARGE.BATT.ASS'Y	1	
A6-1	RFA0475-Q	RECHARGE.BATT.CASE	1	
A7	RFC0069-H	CARRYING CASE	1	
A8	RQT6378-G	INSTRUCTION MANUAL	1	<IA>
A9	RQCB0169	SERVICE CENTER LIST	1	
C1	ECUE1E332KBQ	25V 3300P	1	F1G1E332A059
C2	F1H0J1050013	6.3V 1U	1	
C3	F1H0J1050013	6.3V 1U	1	
C4	ECUV1A224KBV	10V 0.22U	1	F1H1A224A001
C5	RCST0GZ226RG	4V 22U	1	F3E0G226A002
C7	ECUV1A224KBV	10V 0.22U	1	F1H1A224A001
C8	ECUV1A224KBV	10V 0.22U	1	F1H1A224A001
C9	ECUE1C103KBQ	16V 0.01U	1	F1G1C103A044
C10	ECUE1H100DCQ	50V 10P	1	F1G1H100A420
C13	F1G1H2R0A424	50V 2P	1	
C20	F1J0J4750010	6.3V 4.7U	1	
C24	ECUE1C103KBQ	16V 0.01U	1	F1G1C103A044
C28	F1J0J4750010	6.3V 4.7U	1	
C101	ECUE1C103KBQ	16V 0.01U	1	F1G1C103A044
C102	ECUE1C103KBQ	16V 0.01U	1	F1G1C103A044
C103	F1H0J1050013	6.3V 1U	1	
C105	ECJ0EB1A104K	10V 0.1U	1	
C106	ECJ0EB1A104K	10V 0.1U	1	
C107	ECJ0EB1A104K	10V 0.1U	1	
C108	ECJ0EB1H102K	50V 1000P	1	
C113	ECJ0EB1A104K	10V 0.1U	1	
C115	ECJ0EB1A104K	10V 0.1U	1	
C116	ECUE1C822KBQ	16V 8200P	1	ECJ0EB1C822K
C117	ECJ0EB1H102K	50V 1000P	1	
C130	F1H0J1050013	6.3V 1U	1	
C201	ECUE1C103KBQ	16V 0.01U	1	F1G1C103A044
C202	ECUE1H101KBQ	50V 100P	1	
C203	F1J0J4750005	6.3V 4.7U	1	
C204	ECJ0EB1A104K	10V 0.1U	1	
C206	ECUE1H101KBQ	50V 100P	1	
C210	ECUE1C103KBQ	16V 0.01U	1	F1G1C103A044
C211	ECUVNJ474KBV	6.3V 0.47U	1	F1H0J474A002
C212	ECUE1C103KBQ	16V 0.01U	1	F1G1C103A044
C214	ECUV1A224KBV	10V 0.22U	1	F1H1A224A001
C215	ECUV1A224KBV	10V 0.22U	1	F1H1A224A001
C220	ECUE1H101KBQ	50V 100P	1	
C221	ECJ0EB1H102K	50V 1000P	1	
C304	ECUE1E332KBQ	25V 3300P	1	F1G1E332A059
C305	F1H0J2250003	6.3V 2.2U	1	
C306	F1G1H222A416	50V 2200P	1	
C307	F1J0J4750005	6.3V 4.7U	1	
C309	ECUV1A224KBV	10V 0.22U	1	F1H1A224A001
C310	ECUV1A224KBV	10V 0.22U	1	F1H1A224A001
C311	ECUV1A224KBV	10V 0.22U	1	F1H1A224A001
C330	F1H0J1050013	6.3V 1U	1	
C401	F3Z0G3360001	4V 33U	1	
C402	F1J0J4750010	6.3V 4.7U	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C403	F1G1H330A422	50V 33P	1	
C404	F3Z0G3360001	4V 33U	1	
C405	F3Z0J106A001	6.3V 10U	1	
C406	F1J0J4750010	6.3V 4.7U	1	
C407	F1J0J4750010	6.3V 4.7U	1	
C410	ECJ0EB1A104K	10V 0.1U	1	
C411	ECUE1C103KBQ	16V 0.01U	1	F1G1C103A044
C412	ECUE1C103KBQ	16V 0.01U	1	F1G1C103A044
C415	ECUE1C103KBQ	16V 0.01U	1	F1G1C103A044
C502	ECJ0EB1A104K	10V 0.1U	1	
C503	ECUVNJ474KBV	6.3V 0.47U	1	F1H0J474A002
C504	F1H0J1050013	6.3V 1U	1	
C505	F3E0G106A001	4V 10U	1	
C506	F1H0J1050013	6.3V 1U	1	
C507	RCST0EX227RE	2.5V 220U	1	F3G0E2270001
C508	RCST0EX227RE	2.5V 220U	1	F3G0E2270001
C509	F1J0J4750010	6.3V 4.7U	1	
C511	F1G1H331A416	50V 330P	1	
C512	F1G1H331A416	50V 330P	1	
C515	ECUV1A224KBV	10V 0.22U	1	F1H1A224A001
C516	ECUV1A224KBV	10V 0.22U	1	F1H1A224A001
C517	F1J0J4750010	6.3V 4.7U	1	
C523	F5A421040001	4V 0.1U	1	
C601	F1G1H221A416	50V 220P	1	
C602	F1G1H221A416	50V 220P	1	
C603	ECUE1H101KBQ	50V 100P	1	
C604	ECUE1H101KBQ	50V 100P	1	
C605	ECUE1H101KBQ	50V 100P	1	
C606	ECUE1H101KBQ	50V 100P	1	
C607	F3E0G106A001	4V 10U	1	
C608	ECJ0EB1A104K	10V 0.1U	1	
C609	F3E0G106A001	4V 10U	1	
CP1	RJS2A7121T	CONNECTOR(21P)	1	K1MN21B00028
CP201	K1MN06B00114	CONNECTOR(6P)	1	
CP301	RJS2A7104T	CONNECTOR(4P)	1	K1MN04A00014
CP302	RJS2A7104T	CONNECTOR(4P)	1	K1MN04A00014
CX413	F3F1A226A008	10V 22U	1	
D401	B0JCMB000001	DIODE	1	
D402	MA2YD2100L	DIODE	1	
D404	MA2Z74800L	DIODE	1	
D405	MA2Z74800L	DIODE	1	
D406	MA2YD2100L	DIODE	1	
DX403	MA2YD2100L	DIODE	1	
IC1	C1BB00000640	IC	1	
IC101	C1BB00000639	IC	1	
IC201	MN101C32GAF2	IC	1	
IC202	AK93C45BH-L	IC	1	C3EBCG000028
IC203	C0EBC0000032	IC	1	
IC301	C0GBZ0000009	IC	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
IC401	XC6367A151MR	IC	1	C0DBAFZ00012
IC402	C0DBAFZ00021	IC	1	
IC501	TA2131FL	IC	1	C1BB00000516
IC601	C0JBAF000439	IC	1	
IC602	NJU7015RTE1	IC	1	C0ABHA000012
ICX403	XC6372C501PR	IC	1	C0DBAHZ00001
JK501	RJJ36TA02-C	JACK,HEADPHONE	1	K2HC106E0003
L201	G1C100Z00011	COIL	1	
L401	G1C100Z00011	COIL	1	
L402	G1A330D00007	COIL	1	
L403	RLQP100MT-W	COIL	1	G1C100M00016
L406	ELJEA470KF	COIL	1	
L501	RLBV601V-W	CHIP BEADS	1	J0JCC0000059
L502	RLBV601V-W	CHIP BEADS	1	J0JCC0000059
LX405	ELJEA470KF	COIL	1	
P1	RPK1731	PACKING CASE	1	
P2	RPQ1272	PAD	1	
P3	RPF0257-1	BAG	1	
PCB1	REP3252A-M	MAIN P.C.B.ASS'Y	1	(RTL)
Q1	2SB1295-6-TB	TRANSISTOR	1	B1ADKB000001
Q5	XP152A12C0MR	TRANSISTOR	1	B1DHAC000002
Q201	2SD1819ASTX	TRANSISTOR	1	2SD1819ASL
Q202	B1ADNB000003	TRANSISTOR	1	
Q203	DTC114YETL	TRANSISTOR	1	B1GBCFJN0001
Q401	B1CFNC000001	TRANSISTOR	1	
Q402	XP152A12C0MR	TRANSISTOR	1	B1DHAC000002
Q403	XP152A12C0MR	TRANSISTOR	1	B1DHAC000002
Q404	B1CFNC000001	TRANSISTOR	1	
Q405	XP151A13A0MR	TRANSISTOR	1	B1DFBC000003
Q406	2SB1218ASTX	TRANSISTOR	1	2SB1218ASL
Q407	2SB1218ASTX	TRANSISTOR	1	2SB1218ASL
Q408	XP4601TX	TRANSISTOR	1	XP0460100L
R1	D1H411320001	11K	1	
R2	ERJ2GEJ471X	1/4W 470	1	ERJ2RMJ471X
R3	ERJ2GEJ391X	1/4W 390	1	ERJ2RMJ391X
R4	ERJ2GEJ104	1/4W 100K	1	ERJ2RMJ104X
R5	ERJ2GEJ1R0X	1/4W 1	1	ERJ2RMJ1R0X
R7	ERJ2GEJ223X	1/4W 22K	1	ERJ2RMJ223X
R8	ERJ2GEJ474X	1/4W 470K	1	ERJ2RMJ474X
R9	ERJ2GEJ823X	1/4W 82K	1	ERJ2RMJ823X
R101	ERJ2GEJ682X	1/4W 6.8K	1	ERJ2RMJ682X
R102	ERJ2GEJ222X	1/4W 2.2K	1	ERJ2RMJ222X
R103	ERJ2GEJ682X	1/4W 6.8K	1	ERJ2RMJ682X
R104	ERJ2GEJ473X	1/4W 47K	1	ERJ2RMJ473X
R106	ERJ2GEJ105	1/4W 1M	1	D0GA105JA001
R108	ERJ2GEJ153	1/4W 15K	1	ERJ2RMJ153X

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R109	ERJ2GEJ332X	1/4W 3.3K	1	ERJ2RMJ332X
R112	ERJ2GEJ224	1/4W 220K	1	ERJ2RMJ224X
R113	ERJ2GEJ103	1/4W 10K	1	ERJ2RMJ103X
R115	ERJ2GEJ393X	1/4W 39K	1	ERJ2RMJ393X
R116	ERJ2GEJ103	1/4W 10K	1	ERJ2RMJ103X
R117	ERJ2GEJ101	1/4W 100	1	ERJ2RMJ101X
R120	ERJ2GEJ473X	1/4W 47K	1	ERJ2RMJ473X
R201	ERJ2GEJ103	1/4W 10K	1	ERJ2RMJ103X
R202	ERJ2GEJ473X	1/4W 47K	1	ERJ2RMJ473X
R203	ERJ2GEJ221	1/4W 220	1	ERJ2RMJ221X
R204	ERJ2GEJ332X	1/4W 3.3K	1	ERJ2RMJ332X
R207	ERJ2GEJ471X	1/4W 470	1	ERJ2RMJ471X
R208	D1H422420001	220K	1	
R209	D1H410320002	10K	1	
R215	ERJ2GEJ223X	1/4W 22K	1	ERJ2RMJ223X
R216	D1H422420001	220K	1	
R218	ERJ2GED273X	1/4W 27K	1	ERJ2RHD273X
R219	ERJ2GEJ104	1/4W 100K	1	ERJ2RMJ104X
R221	D1H410320002	10K	1	
R222	ERJ2GEJ104	1/4W 100K	1	ERJ2RMJ104X
R223	ERJ2GEJ104	1/4W 100K	1	ERJ2RMJ104X
R301	ERJ2GEJ103	1/4W 10K	1	ERJ2RMJ103X
R302	ERJ2GEJ1R0X	1/4W 1	1	ERJ2RMJ1R0X
R303	ERJ2GEJ682X	1/4W 6.8K	1	ERJ2RMJ682X
R305	ERJ2GEJ393X	1/4W 39K	1	ERJ2RMJ393X
R401	ERJ2GEJ225X	1/4W 2.2M	1	ERJ2RMJ225X
R402	D1H447420001	470K	1	
R403	D1H447420001	470K	1	
R404	ERJ2GEJ274X	1/4W 270K	1	D0GA274JA001
R405	ERJ2GEJ105	1/4W 1M	1	D0GA105JA001
R406	D1H84744A024	470K	1	
R407	ERJ2GEJ103	1/4W 10K	1	ERJ2RMJ103X
R408	ERJ3GEYJ101V	1/16W 100	1	
R410	ERJ6GEY0R00V	1/10W 0	1	ERJ6GEY0R00Z
R412	ERJ2RKD684X	1/4W 680K	1	
R413	ERJ2RKD474X	1/4W 470K	1	
R504	D1H433320002	33K	1	
R506	ERJ3GEYJ106V	1/16W 10M	1	
R507	D1H410020002	10	1	
R509	ERJ2GEJ221	1/4W 220	1	ERJ2RMJ221X
R512	ERJ3GEYJ106V	1/16W 10M	1	
R601	D1H81034A024	10K	1	
R603	D1H84734A024	47K	1	
R605	ERJ2GEJ393X	1/4W 39K	1	ERJ2RMJ393X
R606	ERJ2GEJ393X	1/4W 39K	1	ERJ2RMJ393X
R607	D1H439320001	39K	1	
R609	D1H422320002	22K	1	
R610	ERJ2GEJ470	1/4W 47	1	ERJ2RMJ470X
R611	ERJ2GEJ471X	1/4W 470	1	ERJ2RMJ471X
RX205	ERJ2GEJ682X	1/4W 6.8K	1	ERJ2RMJ682X
RX206	ERJ2GEJ223X	1/4W 22K	1	ERJ2RMJ223X
RX214	ERJ2GEJ221	1/4W 220	1	ERJ2RMJ221X

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
S202	EVQPUL02K	SW,VOLUME(-)	1	
S207	RSH1A039-A	SW,OPEN/CLOSE DET.	1	K0L1BA000037
S208	RSS2A010-1A	SW,HOLD	1	K0D112B00071
SX201	EVQPUL02K	SW,VOLUME(+)	1	
SX203,04	RSG0051-P	SW,SKIP/SEARCH	2	
SX206	RSG0051-P	SW,PLAY/STOP	1	
X101	H2D169500019	OSCILLATOR	1	
X201	H2D400400010	OSCILLATOR	1	
Z401	RJH9212-1	CONNECTOR TERMINAL	1	K4BC02E00007
Z402	K4ZZ01000154	CONNECTOR	1	

16. Cabinet Parts Location



17. Packaging



18. Schematic Diagram for Printing with A4 size



H020200000 KA/AM

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