

# JVC

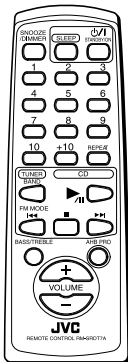
# SERVICE MANUAL

## CD PORTABLE SYSTEM

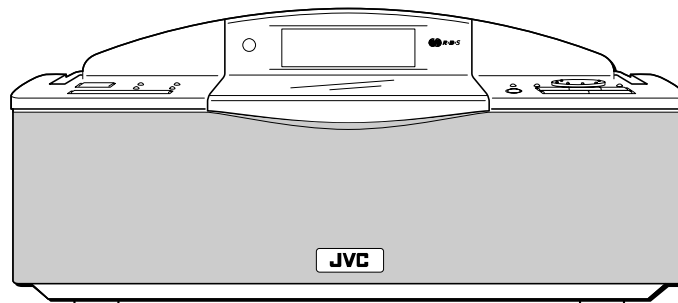
## RD-T70RBU RD-T50RLB

### Area suffix

B ----- U.K.  
E ----- Continental Europe  
EN ----- Northern Europe  
EV ----- Eastern Europe



[RD-T70RBU Only]



**COMPACT**  
**disc**  
DIGITAL AUDIO



### Comparison table

Item	RD-T50RLB	RD-T70RBU
AHB	Not used	Used
Back light (LCD)	Not used	Used
Remorte control	Not used	Used

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## Safety Precautions

1. This design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Services should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the product should not be made. Any design alterations of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacture of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the Parts List of Service Manual. Electrical components having such features are identified by shading on the schematics and by ( $\triangle$ ) on the Parts List in the Service Manual. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement parts shown in the Parts List of Service Manual may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.
5. Leakage current check (Electrical shock hazard testing)

After re-assembling the product, always perform an isolation check on the exposed metal parts of the product (antenna terminals, knobs, metal cabinet, screw heads, headphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

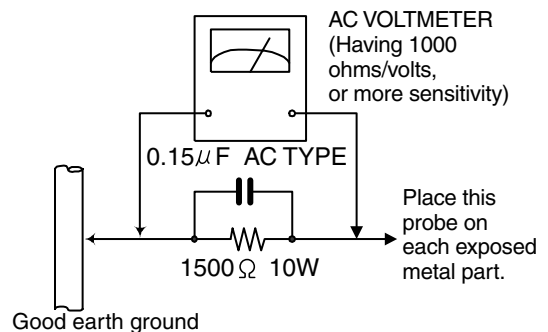
Do not use a line isolation transformer during this check.

- Plug the AC line cord directly into the AC outlet. Using a "Leakage Current Tester", measure the leakage current from each exposed metal parts of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground. Any leakage current must not exceed 0.5mA AC (r.m.s.).

- Alternate check method

Plug the AC line cord directly into the AC outlet. Use an AC voltmeter having, 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1,500  $\Omega$  10W resistor paralleled by a 0.15  $\mu$ F AC-type capacitor between an exposed metal part and a known good earth ground. Measure the AC voltage across the resistor with the AC voltmeter.

Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Voltage measured any must not exceed 0.75 V AC (r.m.s.). This corresponds to 0.5 mA AC (r.m.s.).



## Warning

1. This equipment has been designed and manufactured to meet international safety standards.
2. It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
3. Repairs must be made in accordance with the relevant safety standards.
4. It is essential that safety critical components are replaced by approved parts.
5. If mains voltage selector is provided, check setting for local voltage.


## CAUTION

**Burrs formed during molding may be left over on some parts of the chassis. Therefore, pay attention to such burrs in the case of preforming repair of this system.**

In regard with component parts appearing on the silk-screen printed side (parts side) of the PWB diagrams, the parts that are printed over with black such as the resistor ( $\blacksquare$ ), diode ( $\blacktriangle$ ) and ICP ( $\bullet$ ) or identified by the ( $\triangle$ ) mark nearby are critical for safety.


(This regulation does not correspond to J and C version.)

## **Safety precautions** (U.K only)

1. This design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits.
2. Any unauthorised design alterations or additions will void the manufacturer's guarantee ; furthermore the manufacturer cannot accept responsibility for personal injury or property damage resulting therefrom.
3. Essential safety critical components are identified by (  ) on the Parts List and by shading on the schematics, and must never be replaced by parts other than those listed in the manual. Please note however that many electrical and mechanical parts in the product have special safety related characteristics. These characteristics are often not evident from visual inspection. Parts other than specified by the manufacturer may not have the same safety characteristics as the recommended replacement parts shown in the Parts List of the Service Manual and may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.

## **Warning**

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 **CAUTION** Burrs formed during molding may be left over on some parts of the chassis. Therefore, pay attention to such burrs in the case of preforming repair of this system.

# Preventing static electricity

## 1. Grounding to prevent damage by static electricity

Electrostatic discharge (ESD), which occurs when static electricity stored in the body, fabric, etc. is discharged, can destroy the laser diode in the traverse unit (optical pickup). Take care to prevent this when performing repairs.

## 2. About the earth processing for the destruction prevention by static electricity

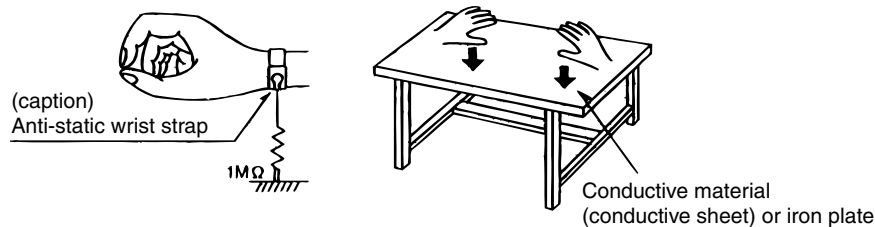
Static electricity in the work area can destroy the optical pickup (laser diode) in devices such as CD players. Be careful to use proper grounding in the area where repairs are being performed.

### 2-1 Ground the workbench

Ground the workbench by laying conductive material (such as a conductive sheet) or an iron plate over it before placing the traverse unit (optical pickup) on it.

### 2-2 Ground yourself

Use an anti-static wrist strap to release any static electricity built up in your body.



## 3. Handling the optical pickup

1. In order to maintain quality during transport and before installation, both sides of the laser diode on the replacement optical pickup are shorted. After replacement, return the shorted parts to their original condition. (Refer to the text.)
2. Do not use a tester to check the condition of the laser diode in the optical pickup. The tester's internal power source can easily destroy the laser diode.

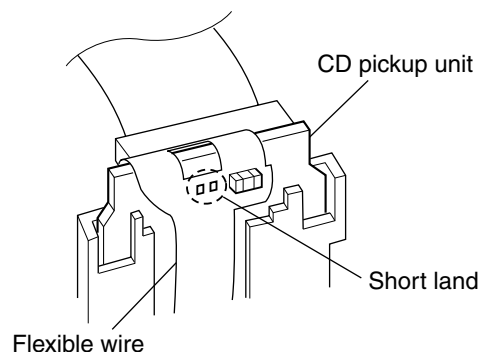
## 4. Handling the traverse unit (optical pickup)

1. Do not subject the traverse unit (optical pickup) to strong shocks, as it is a sensitive, complex unit.
2. Remove solder of the short land on the flexible wire after replacing the optical pickup. For specific details, refer to the replacement procedure in the text. Remove the anti-static pin when replacing the traverse unit. Be careful not to take too long a time when attaching it to the connector.
3. Handle the flexible wire carefully as it may break when subjected to strong force.
4. It is not possible to adjust the semi-fixed resistor that adjusts the laser power. Do not turn it.

## 5. Attention when traverse unit is decomposed

**\*Please refer to "Disassembly method" in the text for the CD pickup unit.**

- Apply solder to the short land before the flexible wire is disconnected from the connector on the CD pickup unit.  
(If the flexible wire is disconnected without applying solder, the CD pickup may be destroyed by static electricity.)
- In the assembly, be sure to remove solder from the short land after connecting the flexible wire.



# Important for laser products

## 1.CLASS 1 LASER PRODUCT

**2.DANGER :** Invisible laser radiation when open and interlock failed or defeated. Avoid direct exposure to beam.

**3.CAUTION :** There are no serviceable parts inside the Laser Unit. Do not disassemble the Laser Unit. Replace the complete Laser Unit if it malfunctions.

**4.CAUTION :** The compact disc player uses invisible laserradiation and is equipped with safety switches which prevent emission of radiation when the drawer is open and the safety interlocks have failed or are defeated. It is dangerous to defeat the safety switches.

**5.CAUTION :** If safety switches malfunction, the laser is able to function.

**6.CAUTION :** Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



**CAUTION** Please use enough caution not to see the beam directly or touch it in case of an adjustment or operation check.

**WARNING :** Osynlig laserstrålning när denna del är öppnad och spårren är urkopplad. Betrakta ej strålen.

**VARO :** Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.

**ADVARSEL :** Usynlig laserstrålning ved åbning , når sikkerhedsafbrydere er ude af funktion. Undgåudsættelse for stråling.

**ADVARSEL :** Usynlig laserstrålning ved åpning,når sikkerhetsbryteren er avslott. unngå utsettelse for stråling.

## REPRODUCTION AND POSITION OF LABELS

### WARNING LABEL

CLASS 1  
LASER PRODUCT

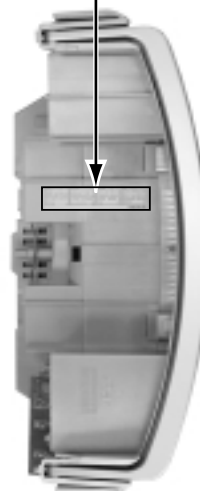


**DANGER:** Invisible laser radiation when open and interlock failed or defeated. AVOID DIRECT EXPOSURE TO BEAM. (e)

**ADVARSEL:** Usynlig laserstrålning ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgåudsættelse for stråling. (d)

**WARNING:** Osynlig laserstrålning når denna del är öppnad och spårren är urkopplad. Betrakta ej strålen. (s)

**VARO:** Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen. (f)



## Disassembly method

### <Main body section>

#### ■ Removing the front cabinet assembly and rear cabinet assembly

(See Figs.1 to 4)

1. Remove the two screws **A** and two screws **B** retaining the front cabinet and rear cabinet assemblies from the rear of the body.
2. Remove the battery door from the rear of the body, then remove the screw **C** retaining the front cabinet and rear cabinet assemblies.
3. Remove the two screws **D** retaining the CD door lens from the top of the body with a hexagonal wrench.

**[Caution]** · If the CD door cannot be opened, the screws **E** which are to be removed in step 4 will not be removable. In this case, it is necessary to remove the CD door lens.

4. Remove the two screws **E** retaining the front cabinet assembly from the top of the body.
5. Disconnect the wire from the connector CN301 on the main board, then remove the front cabinet assembly from the rear cabinet assembly.

(See Fig.4.)

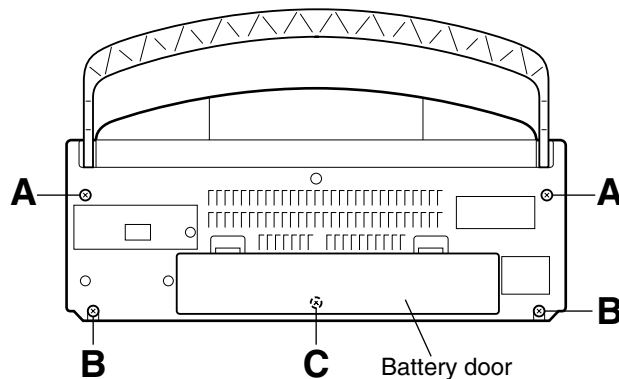


Fig.1

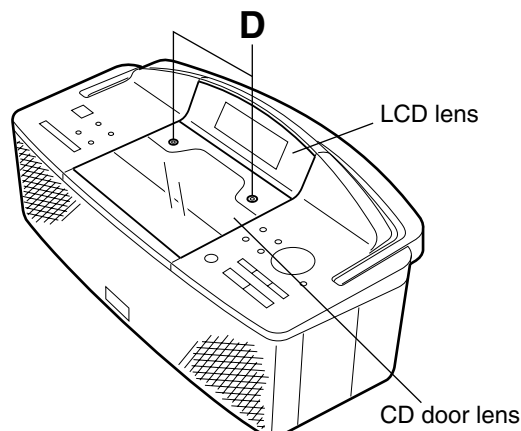


Fig.2

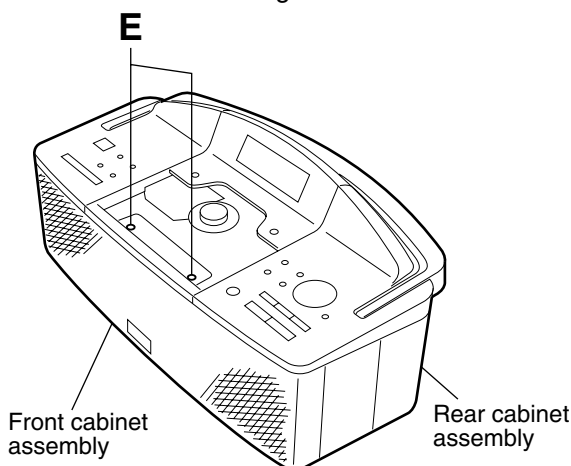


Fig.3

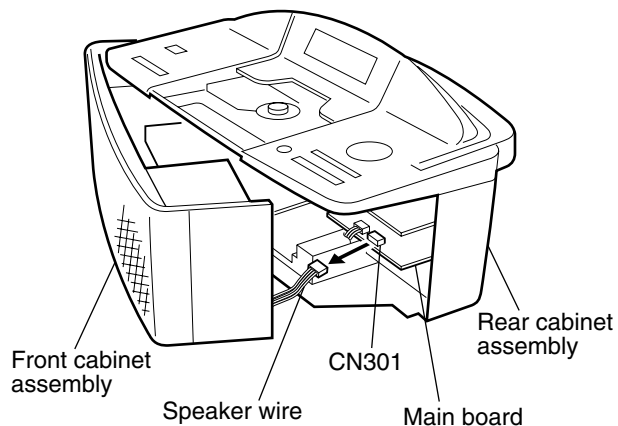


Fig.4

## <Front cabinet section>

- Prior to performing the following procedures, remove the front cabinet assembly from the rear cabinet assembly.

### ■ Remove the right and left speaker assemblies (See Figs.5 and 6)

1. Remove the six screws **F** retaining the speaker net from the inside of the front cabinet assembly.
2. Remove the tie band fixing the speaker wires.

**[Note]** · When installing the speaker assemblies, pass each speaker wire through the notches a to d at the bottom of the front cabinet before bundling the wire.

3. Remove the eight screws **G** retaining the right and left speaker assemblies from the outside of the front cabinet assembly.

## <Rear cabinet section>

- Prior to performing the following procedures, remove the front cabinet assembly from the rear cabinet assembly.

### ■ Removing the top cabinet assembly (See Figs.7 to 9)

1. Remove the screw **H** retaining the top cabinet assembly from the rear of the rear cabinet assembly.
2. Disconnect the wires from the connectors CN302 and CN303 on the main board at the front of the rear cabinet assembly. (See Fig.8.)
3. Loosen the screw **J** clamping the FM antenna wire.
4. Pull the top cabinet assembly slightly towards front and separate it from the rear cabinet assembly, then remove the FM antenna wire from the post pin on the main board and remove the top cabinet assembly.

**[Caution]** · When installing the top cabinet assembly, be sure to connect the FM antenna wire.

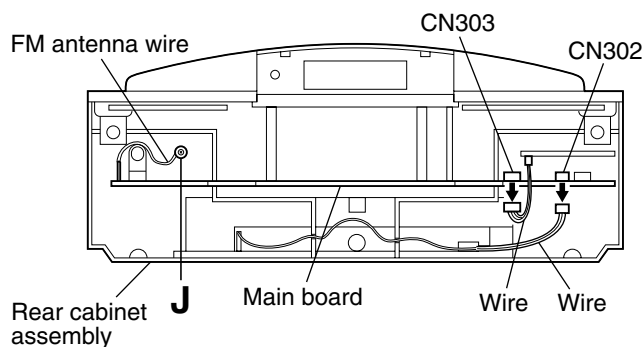


Fig.8

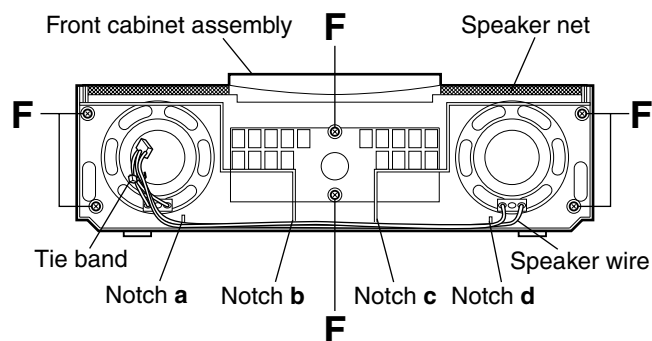


Fig.5

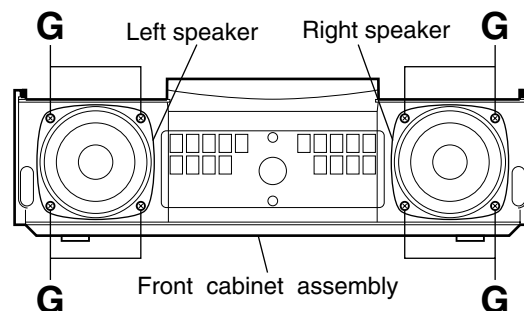


Fig.6

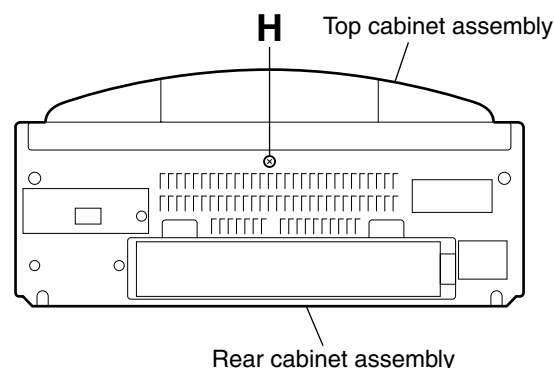


Fig.7

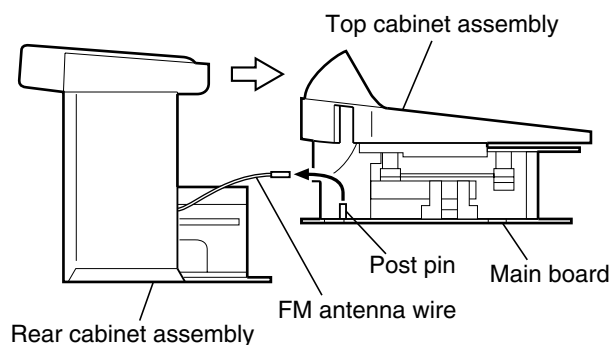


Fig.9

## ■ Removing the power supply board and transformer assembly (See Fig.10)

• Prior to performing the following procedures, remove the top cabinet assembly from the rear cabinet assembly.

1. Remove the two screws **K** retaining the power supply board.
2. Remove the two screws **L** retaining the transformer assembly.
3. Pull out the power supply board from notches **e** and **f** and remove it together with the transformer assembly.

**[Note]** · After assembly, apply a locking agent to the screw **L**.

## ■ Removing the battery board

(See Figs.11 and 12)

1. Disconnect the wire from the connector CN302 on the main board. (See Fig.11.)
2. Remove the solder **g** fixing the wire.
3. Lift the claw **j** on the bottom of the rear cabinet assembly slightly and remove the battery board by pulling it in the direction of the arrow.

**[Note]** · When installing the battery board, pass the wires through the notches **h** and **i** at the bottom of the rear cabinet.

## ■ Removing the handle (See Fig.13)

• Prior to performing the following procedures, remove the top cabinet assembly from the rear cabinet assembly.

1. Open hooks **k** and **m** on the left and right sides of the rear cabinet assembly and remove the handle by pulling it toward the rear.

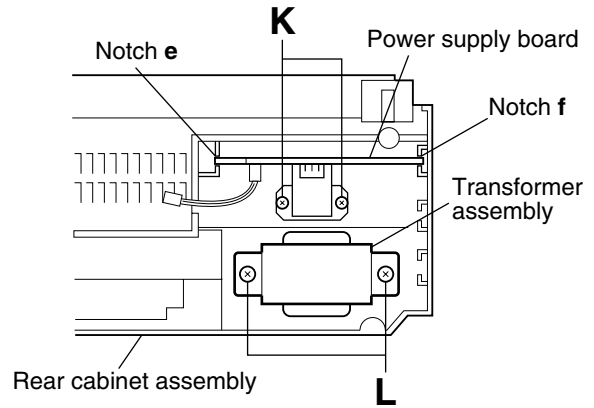


Fig.10

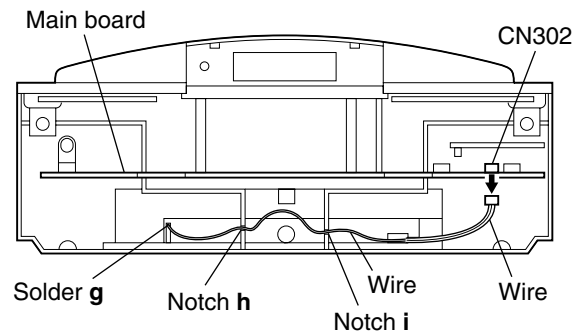


Fig.11

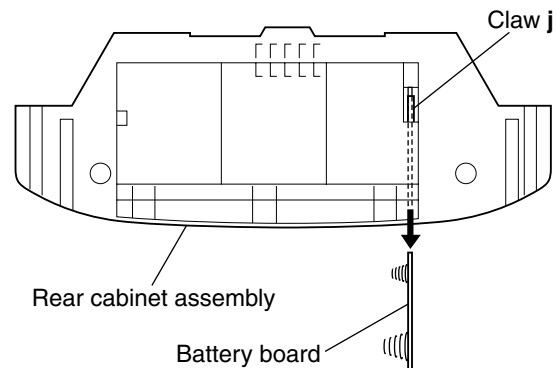


Fig.12

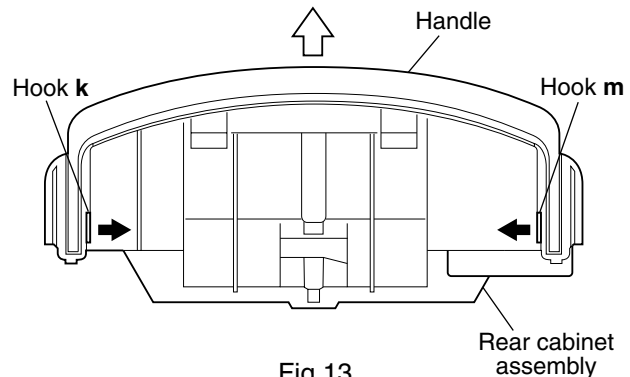


Fig.13



## <Top cabinet section>

**[Caution]** · When removing the board assembly, be careful not to scratch or damage the top cabinet or the CD door.

### ■ Removing the main board

(See Figs.14 to 16)

1. Remove the three screws **M** retaining the main board.
2. Disconnect the wire and card wires from the connectors CN708, CN801 and CN802 on the main board. (See Fig.14.)
3. Disconnect the wire from the connector CN804 on the key 2 board. (See Fig.14.)
4. Disconnect the wire from the connector CN714 on the door switch board. (See Fig.14.)
5. Disconnect the wire from the connector P011 on the CD mechanism board. (See Fig.14.)
6. Lift the main board slightly in the direction of the arrow and apply solder to short land section **n** on the CD pickup unit.

**[Caution]** · Be sure to apply solder in order to short land section **n** on the CD pickup unit before removing the wire from the CD pickup unit (see Fig. 16). If the card wire is removed without applying this solder, the CD pickup may be damaged.

7. After soldering, disconnect the card wire from the connector CN701 on the main board. (See Fig.15.)

**[Caution]** · After re-connecting the card wire, be sure to remove the solder from short land **n**.

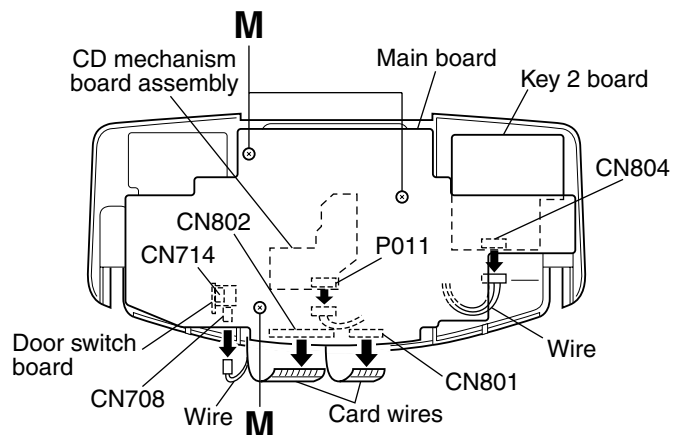


Fig.14

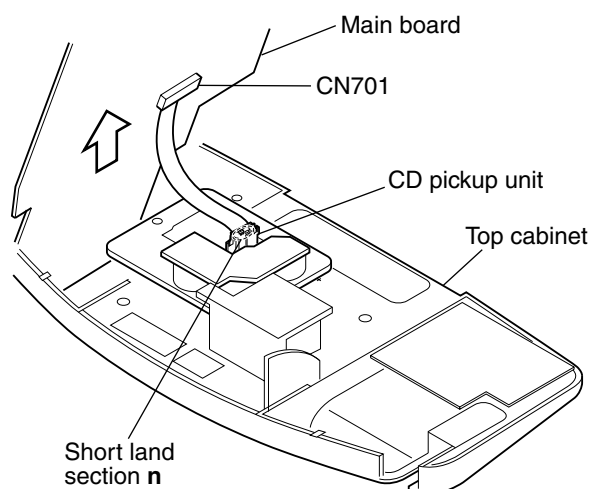


Fig.15

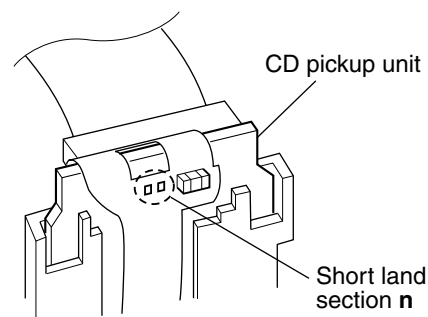


Fig.16

## ■ Removing the key 1 board

(See Fig.17)

1. Remove the four screws **N** retaining the key 1 board from the back side of the top cabinet assembly.

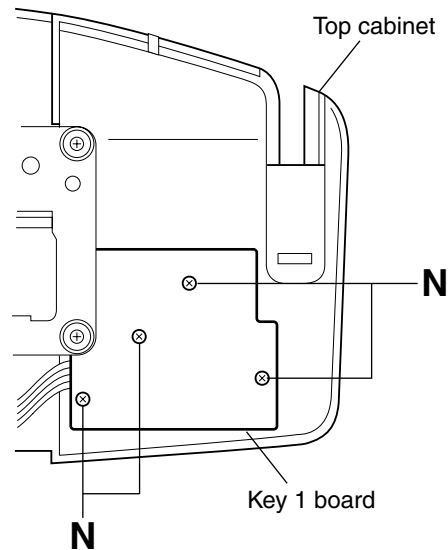


Fig.17

## ■ Removing the key 2 board and jog board

(See Figs.18 and 19)

1. Insert a thin tool such as the tip of a thin screwdriver into the hole **p** at the back of the top cabinet assembly and push out the jog knob toward the front of the top cabinet assembly.
2. Remove the five screws **P** retaining the key 2 board from the back side of the top cabinet assembly.
3. Remove the nut **Q** and washer retaining the shaft at the top of the top cabinet assembly.
4. Take out the key 2 board and the jog board together.

**[Note]** · Operation knobs are present below the key 2 board. Be sure to install these in their correct orientations when installing the key 2 board. (See Fig. 20.)

- In the assembly, apply a locking agent to the nut **Q**.

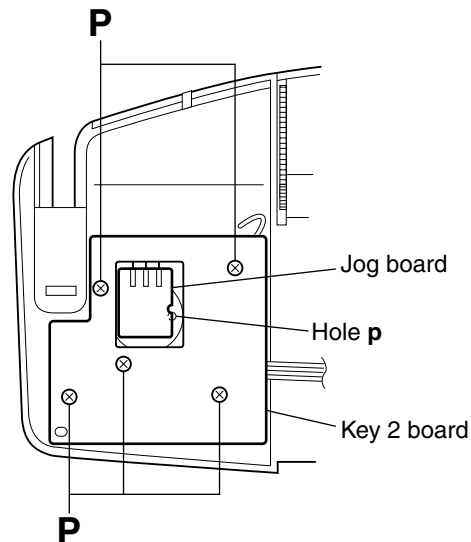


Fig.18

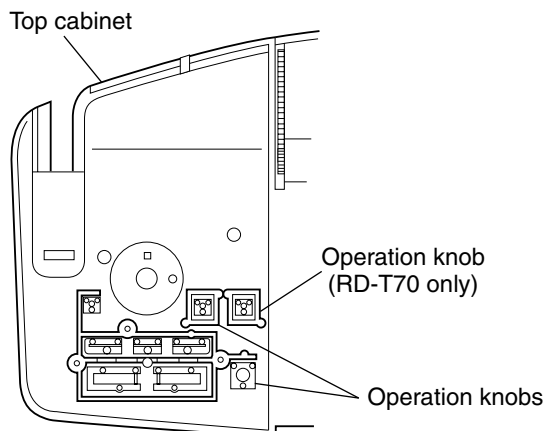


Fig.20

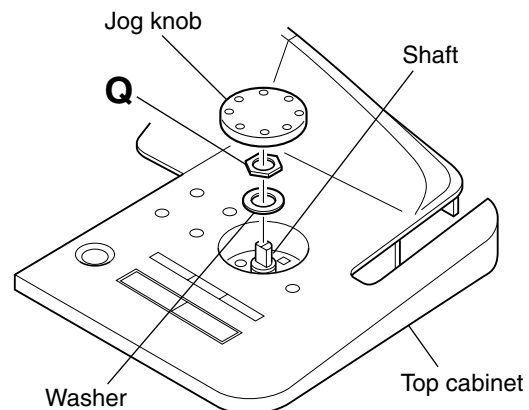


Fig.19

## ■ Removing the CD mechanism assembly (See Fig.21)

- Prior to performing the following procedures, remove the main board.

1. Remove the four screws **R** retaining the CD mechanism assembly.

**[Caution]** · When replacing the CD mechanism assembly, be sure not to mistake the positions of the red and green dampers. (See Fig.22)

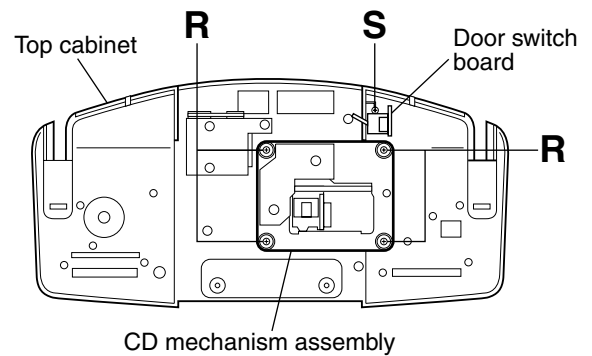


Fig.21

## ■ Removing the door switch board (See Fig.21)

- Prior to performing the following procedures, remove the main board.

1. Remove the screw **S** retaining the door switch board.

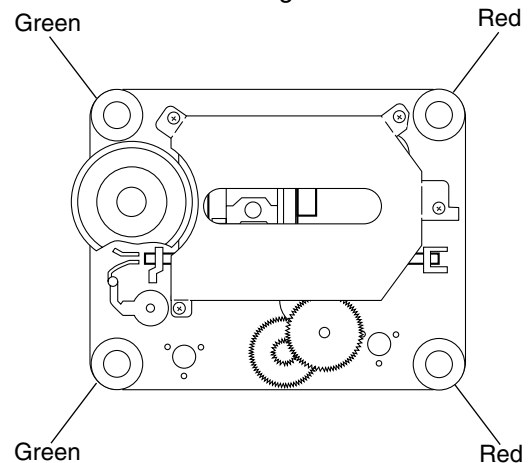


Fig.22

## ■ Replacing the loading belt and CD door motor (See Figs.23 and 24)

- Prior to performing the following procedures, remove the main board.

1. Remove the loading belt from the pulley of the CD door motor.
2. Remove the wire from the CD door motor by accessing it through notch **q** on the CD door motor holder.
3. Remove the three screws **T** retaining the CD door motor holder.
4. Remove the CD door motor.

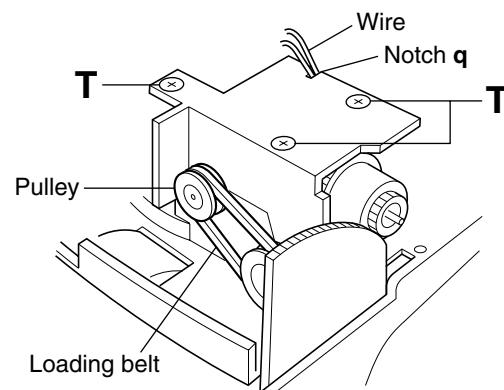


Fig.23

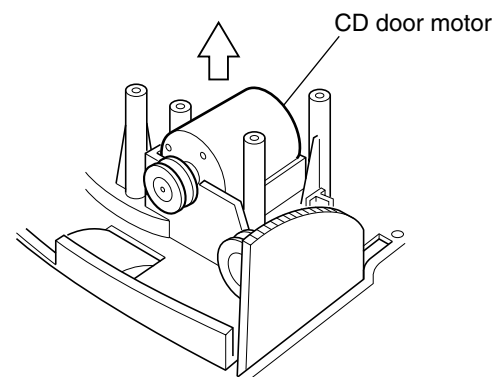


Fig.24

## ■ Removing the FL display board

(See Figs.25 to 27)

- Prior to performing the following procedures, remove the main board.

1. While keeping the sections **r** and **s** on the left and right sides of the top cabinet assembly in the direction of the arrow, remove the CD door from the top cabinet.
2. Remove the two screws **W** retaining the CD door cover.
3. Remove the two screws **X** retaining the FL display board.

**[Note]** • Before attaching the CD door cover, pass the card wires of the FL display board through the holes **t** and **u** on the CD door cover. (See Fig.26.)

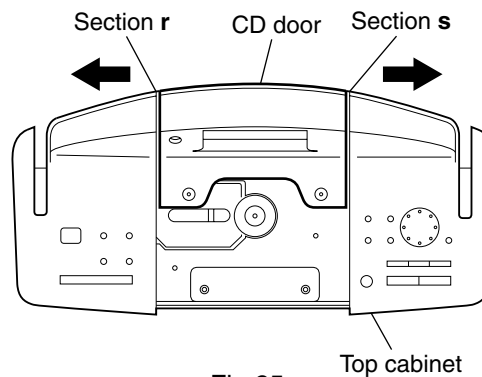


Fig.25

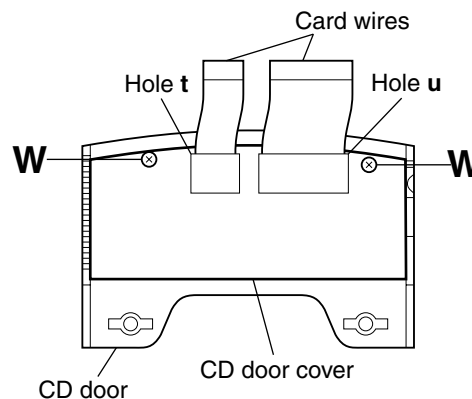


Fig.26

## <CD mechanism section>

### ■ Removing the CD pickup unit

(See Figs.28 and 29)

- Prior to performing the following procedures, remove the CD mechanism assembly.

1. Remove the four screws **Y** retaining the CD cover plate.
2. Widen the section **v**.
3. While keeping the section **v** wide open, push the section **w** in the direction of the arrow to remove the shaft, and then remove the CD pickup unit.

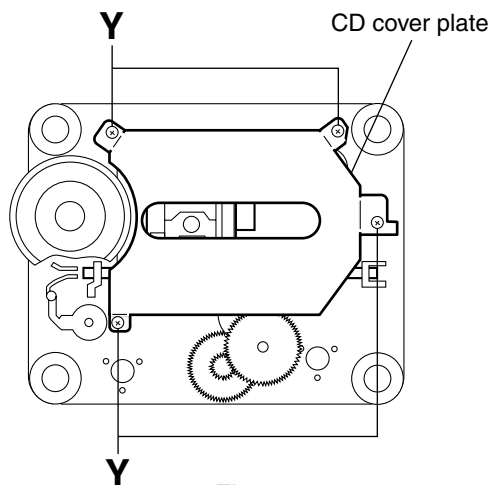


Fig.28

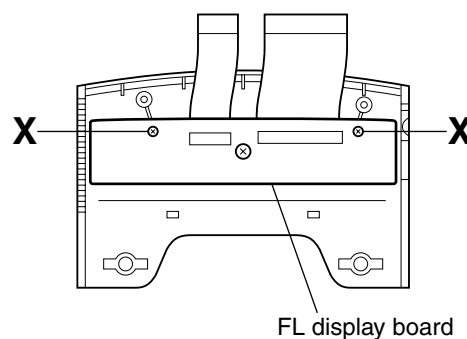


Fig.27

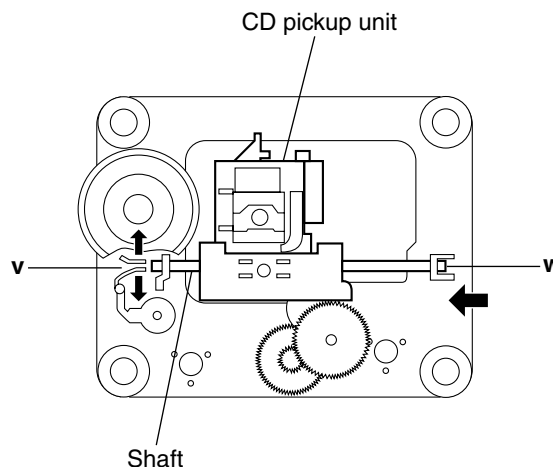


Fig.29

# Adjustment method

## Measurement instruments required for adjustment

1. Low frequency oscillator,  
This oscillator should have a capacity to output 0dB to 600ohm at an oscillation frequency of 50Hz-20kHz.
2. Signal generator
3. Electronic voltmeter

## Measurement conditions

Power supply voltage  
AC230V (50Hz)

## Radio input signal

AM modulation frequency : 400Hz  
Modulation factor : 30%  
FM modulation frequency : 400Hz  
Frequency displacement : 22.5kHz

## Frequency Range

FM	87.5MHz~108MHz
	65MHz~74MHz(EE version only)
MW	522kHz~1629kHz

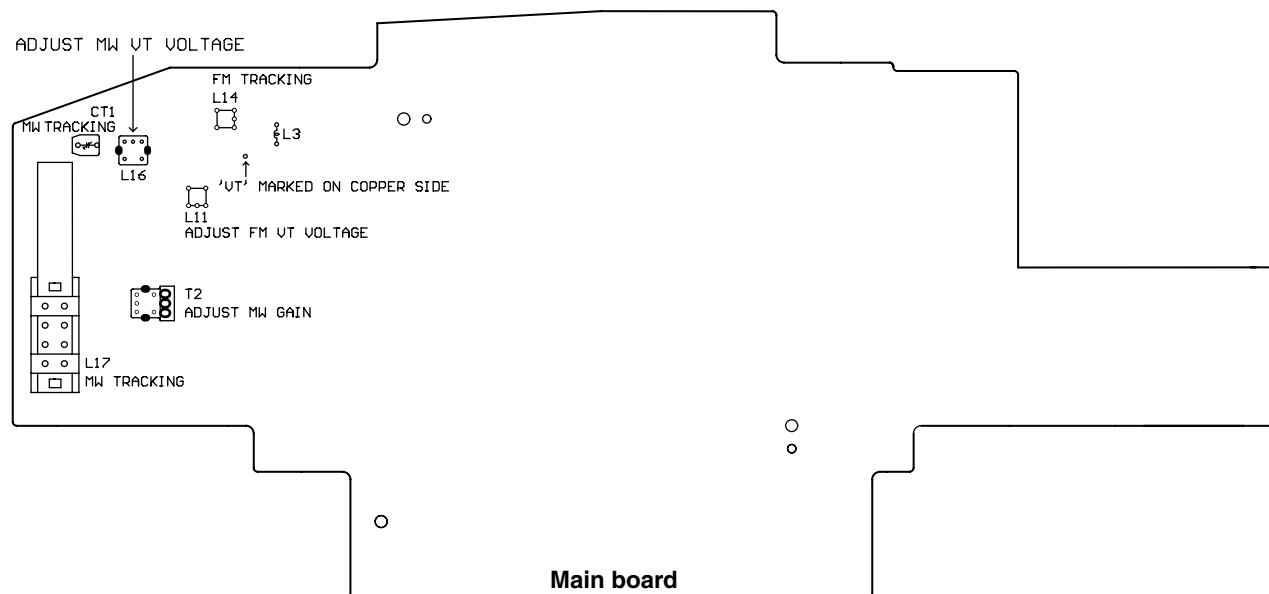
## Standard measurement positions of volume and switch

Power : Standby (Light STANDBY Indicator)  
AHB (Active Hyper Bass) : OFF [RD-T70R only]  
Main VOL. : 0 Minimum

## Precautions for measurement

1. Apply 30pF and 33kohm to the IF sweeper output side and 0.082 $\mu$ F and 100kohm in series to the sweeper input side.
2. The IF sweeper output level should be made as low as possible within the adjustable range.
3. Since the IF sweeper is a fixed device, there is no need to adjust this sweeper.
4. Since a ceramic oscillator is used, there is no need to perform any MPX adjustment.
5. Since a fixed coil is used, there is no need to adjust the FM tracking.
6. The input and output earth systems are separated. In case of simultaneously measuring the voltage in both of the input and output systems with an electronic voltmeter for two channels, therefore, the earth should be connected particularly.
7. In the case of BTL connection amplifier, the minus terminal of speaker is not for earthing. Therefore, be sure not to connect any other earth terminal to this terminal. This system is of an OTL system.

## ■ Arrangement of adjusting positions



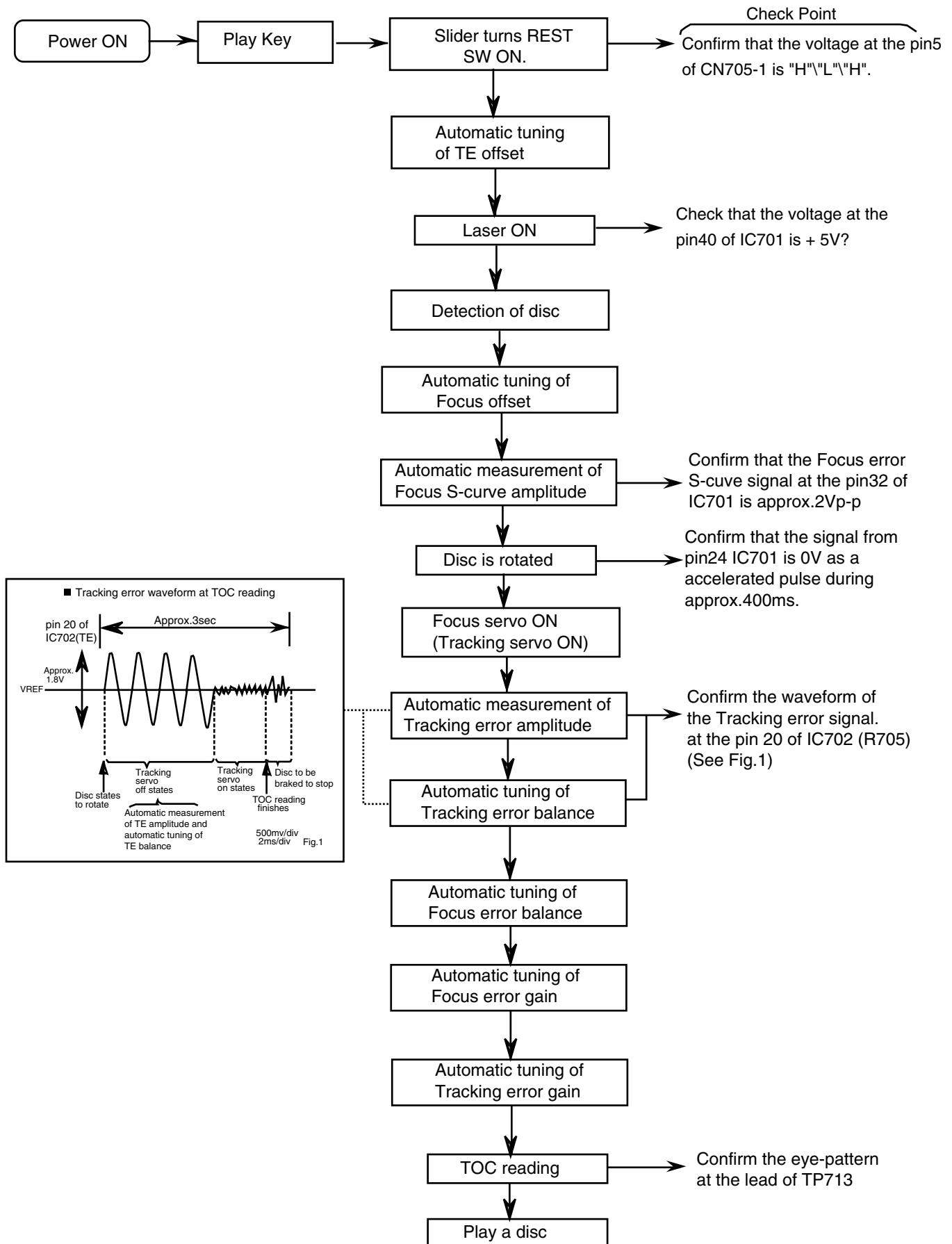
## ■ Tuner section

Items	Measurement conditions	Measurement method	Standard values	Adjusting positions
MW VT adjustment (Maximum frequency)	Input signal MW:1629kHz Measurement point : VT test point	1. Set the MW signal generator signal to 1629kHz and feed it to Loop Antenna. 2. Receiving the signal and adjust the MW OSC coil L16 obtain the VT is 4.4V +/- 0.1V.	V.T : 4.4V +/- 0.1V	MW OSC coil: L16 Adjust the OSC coil only when the MW coil block has been changed.
MW VT adjustment (Minimum frequency)	Input signal MW:522kHz Measurement point : VT test point	3. Set the MW signal generator signal to 522kHz and feed it to Loop Antenna. 4. Receiving the signal and confirm that VT is 1.2V +/- 0.2V.	V.T : 1.2V +/- 0.2V	
MW IFT adjustment	Input signal : 1404kHz	5. Change the receiving frequency to 1404kHz. 6. Adjust the MW IFT T2 obtain to maximum output.	Maximum output	MW IFT: T2 Adjust the IFT only when the IFT block has been changed.
MW tracking adjustment	Input signal : 621kHz Input signal : 1404kHz Input signal : 621kHz/1404kHz	7. Change the receiving frequency to 621kHz. 8. Adjust the antenna coil L17 obtain to maximum output. 9. Change the receiving frequency to 1404kHz. 10. Adjust the CT1 obtain to maximum output. 11. Repeat the above steps 7 to 10 of 621kHz and 1404kHz.	Maximum output Maximum output	Antenna coil: L17 CT1
FM VT adjustment (Maximum frequency)	Input signal :108MHz Measurement point : VT test point	1. Set the FM signal generator signal to 108MHz and receive the 108MHz. 2. Receiving the signal and adjust the FM OSC coil L11 obtain the VT is 4.0 +/- 0.1V.	VT: 4.0 +/- 0.1V	FM OSC coil: L11
FM VT adjustment (Minimum frequency)	Input signal MW:87.5MHz Measurement point : VT test point	3. Set the FM signal generator signal to 87.5MHz and receive the 87.5MHz. 4. Receiving the signal and confirm that VT is 1.75V +/- 0.2V.	VT:1.75 +/- 0.2V	
FM tracking adjustment	Input signal :98MHz	5. Change the receiving frequency to 98MHz. 6. Adjust the FM RF coil L14 obtain the maximum output.	Maximum output	FM RF coil: L14

**Note: 1. For adjusting, be sure to use a ceramic type driver.**

**2. The adjustment of CD section is not required.**

# Flow of functional operation until TOC read



## Maintenance of laser pickup

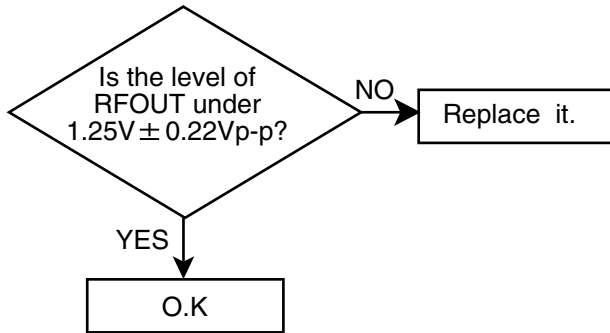
### (1) Cleaning the pick up lens

Before you replace the pick up, please try to clean the lens with a alcohol soaked cotton swab.

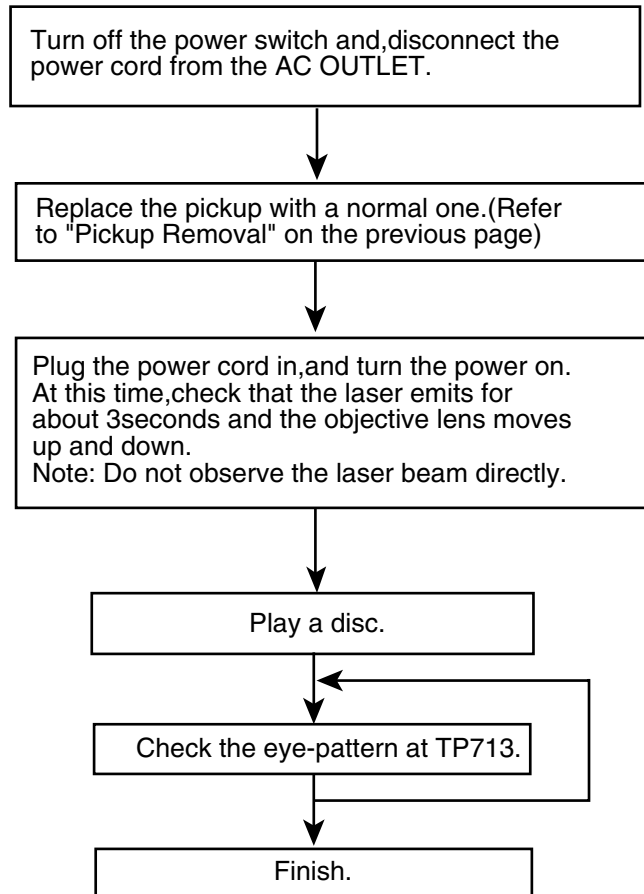
### (2) Life of the laser diode

When the life of the laser diode has expired, the following symptoms will appear.

1. The level of RF output (EFM output: amplitude of eye pattern) will below.



## Replacement of laser pickup



### (3) Semi-fixed resistor on the APC PC board

The semi-fixed resistor on the APC printed circuit board which is attached to the pickup is used to adjust the laser power.Since this adjustment should be performed to match the characteristics of the whole optical block, do not touch the semi-fixed resistor.

If the laser power is lower than the specified value,the laser diode is almost worn out, and the laser pickup should be replaced.

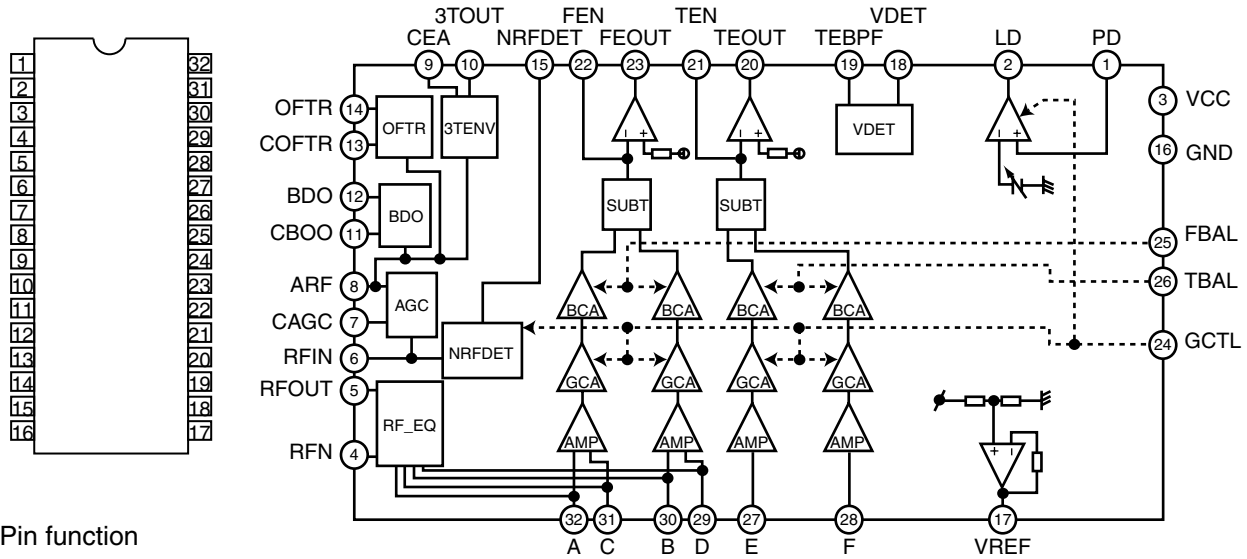
If the semi-fixed resistor would be adjusted when the pickup operates normally,the laser pickup may be damaged due to excessive current.



# Description of major ICs

## ■AN22000A (IC702) : RF & Servo amplifier

1. Terminal layout      2. Block diagram

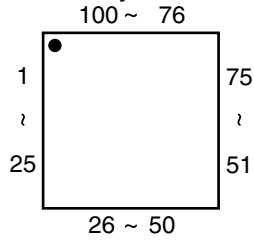


3. Pin function

Pin No.	Symbol	Function
1	PD	APC Amp. Input terminal
2	LD	APC Amp. Output terminal
3	VCC	Power supply terminal
4	RFN	RF addition Amp. Reversing input terminal
5	RFOUT	RF addition Amp. Output terminal
6	RFIN	AGC input terminal
7	CAGC	Terminal of connection of capacity of AGC loop filter.
8	ARF	AGC output terminal
9	CEA	Capacity connection terminal for HPF-Amp.
10	3TOUT	3TENV output terminal
11	CBOO	Capacity connection terminal for RF shade side envelope detection
12	BDO	BDO output terminal
13	COFTR	Capacity connection terminal for RF discernment side envelope detection
14	OFTR	OFTR output terminal
15	NRFDET	RFDET output terminal (Negative logic)
16	GND	Earth terminal
17	VREF	VREF output terminal (Not use)
18	VDET	VDET output terminal (Not use)
19	TEBPF	VDET input terminal
20	TEOUT	TE Amp. output terminal
21	TEN	TE Amp. reversing input terminal
22	FEN	FE Amp. reversing input terminal
23	FEOUT	FE Amp. output terminal
24	GCTL	Terminal GCTL & APC
25	FBAL	FBAL control terminal
26	TBAL	TBAL control terminal
27	E	Tracking signal input terminal 1
28	F	Tracking signal input terminal 2
29	D	Focus signal input terminal 4
30	B	Focus signal input terminal 2
31	C	Focus signal input terminal 3
32	A	Focus signal input terminal 1

## ■ MN101C38CYE (IC801) : System controller

### 1. Terminal layout



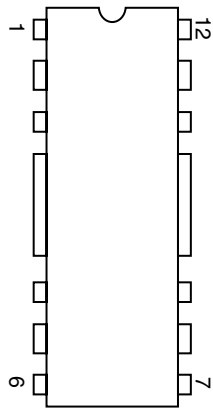
### 2. Pin function

Pin No.	Symbol	I/O	Function
1~4	COM 4~1	O	LCD common outputs
5~7	VLC 3~1	-	LCD power supply
8	VDD	-	Power supply
9	OSC2	O	Clock output (8MHz)
10	OSC1	I	Clock input (8MHz)
11	VSS	-	Ground
12	XI	I	Sub clock input (32.768kHz)
13	XO	O	Sub clock output (32.768kHz)
14	MMOD	I	Memory mode switch input
15	VREF-	-	-Power supply for A/D converter
16~18	KEY1~3	I	Control key signal input
19	SFTY	I	Safety check for power off
20, 21	VOL1, 2	I	Rotary digital encoder input
22	ACCHK	I	AC operate
23	PCHK	I	Power supply check
24	VREF+	I	+Power supply for A/D converter
25	VDAT	O	Common data, PLL & volume
26	SDI	I	PLL data input
27	VCK	O	Common CLK, PLL & volume
28	VCE	O	Common CE, PLL & volume
29	SUBQ	I	CD sub code data input
30	SQCK	O	CD sub code clock output
31	SHIFT	O	8MHz clock shift for FM receiving
32	NRST	I	Reset input
33	PCNT	O	Power ON/OFF control
34	FTU	O	Radio VDD switching control
35	FCD	O	CD 5V control
36	AHB	O	Active bass (RD-T70 only)
37	SMUTE	O	Signal muting by muting circuit
38	REM	I	Remote control signal input
39	BLKCK	I	CD sub code block clock 75Hz input
40	RDDI	I	RDS data from decoder IC (JC version: Not use)
41	INH	I	Inhibit input
42	RDCK	I	RDS clock from decoder IC (JC version: Not use)
43	AL2	O	Alarm 2 output
44~46	BUZ1~3	O	Buzzer signal
47	POWER	I	Power key input
48	RESERVE2	-	Not use
49	REST	I	Pickup rest position input
50	MDAT	O	CD common data output

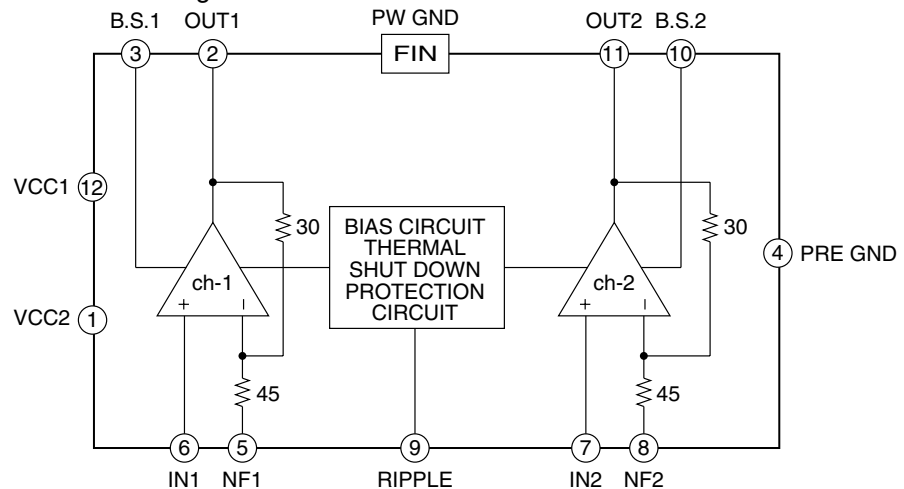
Pin No.	Symbol	I/O	Function
51	MLD	O	CD data latch output
52	MCLK	O	CD common clock output
53	RESERVE3	-	Not use
54	GVP	-	Not use
55	MOMU	O	Motor driver mute control
56	XRST	O	CD reset output
57	STAT	I	Status signal input
58	LED1	O	Power/standby LED
59	MPX	I	Stereo indicator I/P
60	OSW	I	Door open contact switch
61	CSW	I	Door close contact switch
62	LOAD	I	Door is locked signal
63	OCTL	O	Door open control
64	CCTL	O	Door close control
65	SCTL	O	Door speed down
66	BLIGHT	O	Backlight LED
67~100	SEG34~1	O	LCD segment output

### ■ TA8227P (IC302) : Power amplifier

#### 1. Terminal layout

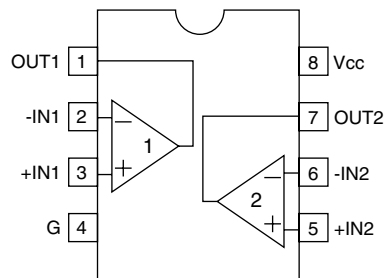


#### 2. Block diagram



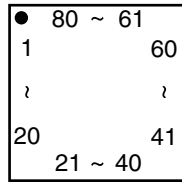
### ■ BA15218 (IC401) : Dual operational amplifier

#### 1. Terminal layout & Block diagram



## ■ MN662748RPMFA (IC701) : Digital servo & Digital signal processor

### 1. Terminal layout



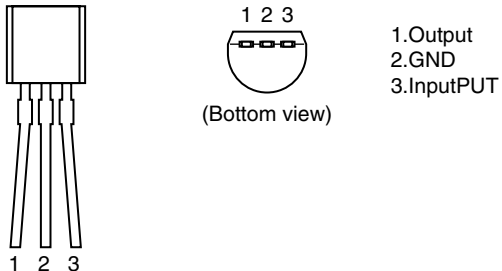
### 2. Pin function

Pin No.	Symbol	I/O	Function
1	BCLK	-	Not use
2	LRCK	-	Not use
3	SRDATA	-	Not use
4	DVDD1	-	Power supply for digital circuit
5	DVSS1	-	Ground for digital circuit
6	TX	-	Not use
7	MCLK	I	Micro computer command clock signal input
8	MDATA	I	Micro computer command data input
9	MLD	I	Micro computer command load signal input (L: Load)
10	SENSE	-	Not use, connect to TP716
11	FLOCK	-	Not use, connect to TP717
12	TLOCK	-	Not use, connect to TP718
13	BLKCK	O	Sub code block clock signal output
14	SQCK	I	External clock input for sub code Q register input
15	SUBQ	O	Sub code Q data output
16	DMUTE	I	Not use, connect to TP719
17	STAT	O	Status signal input
18	RST	I	Reset signal input (L: Reset)
19	SMCK	-	Not use
20	PMCK	-	Not use, connect to TP720
21	TRV	O	Traverse enforced output
22	TVD	O	Traverse drive output
23	PC	-	Not used
24	ECM	O	Spindle motor drive signal (Enforced mode output)
25	ECS	O	Spindle motor drive signal (Servo error signal output)
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive output
28	FOD	O	Focus drive output
29	VREF	I	Reference voltage for D/A output block
30	FBAL	O	Focus balance adjust signal output
31	TBAL	O	Tracking balance adjust signal output
32	FE	I	Focus error signal input (Analog input)
33	TE	I	Tracking error signal input (Analog input)
34	RFENV	I	RF envelope signal input (Analog input)
35	VDET	I	Vibration detect signal input (H:Detect)
36	OFT	I	Off track signal input (H:Off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detect signal input (L:Detect)
39	BDO	I	Drop out signal input (H:Drop out)
40	LDON	O	Laser on signal output (H:ON)

Pin No.	Symbol	I/O	Function
41	PLLF2	-	Not use
42	TOFS	-	Not use
43	WVEL	-	Not use
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	I	Bias pin for DSL
47	DSLIF	I/O	Loop filter pin for DSL
48	PLLF	I/O	Loop filter pin for PLL
49	VCOF	I/O	Loop filter pin for VCO
50	AVDD2	-	Power supply for analog circuit
51	AVSS2	-	Ground for analog circuit
52	EFM	-	Not use, connect to TP724
53	PCK	O	Clock output for PLL
54	VCOF2	I/O	Loop filter pin for Digital servo VCO
55	SUBC	-	Not use
56	SBCK	-	Not use
57	VSS	-	GND for crystal oscillation circuit
58	X1	I	Input for crystal oscillation circuit (f=16.9344MHz)
59	X2	O	Output for crystal oscillation circuit (f=16.9344MHz)
60	VDD	-	Power supply for crystal oscillation circuit
61	BYTCK/TRVSTP	-	Not use
62	CLDCK	O	Sub code frame clock signal output
63	FCLK	-	Not used
64	IPFLAG	O	Interpolation flag signal output, Connect to TP721
65	FLAG	O	Flag signal output, connect to TP722
66	CLVS	-	Not use
67	CRC	-	Not use
68	DEMPH	O	De-emphasis detect signal output, Connect to TP723
69	RESY	-	Not use
70	IOSEL	I	Mode select pin, Connect to DVDD1 (H fix)
71	/TEST	I	Test pin, Connect to DVDD1 (H fix)
72	AVDD1	-	Power supply for analog circuit
73	OUTL	O	L-channel audio output
74	AVSS1	-	Ground for analog circuit
75	OUTR	O	R-channel audio output
76	RSEL	I	RF signal polarity setting pin, connect to DVDD1 (H fix)
77	CSEL	I	Oscillation frequency setting pin, Connect to GND (L fix)
78	PSEL	I	IOSEL=H, Test pin, connect to GND (L fix)
79	MSEL	I	IOSEL=H, SMCK output, frequency select pin
80	SSEL	I	IOSEL=H, SMCK output, SUBQ output mode select pin

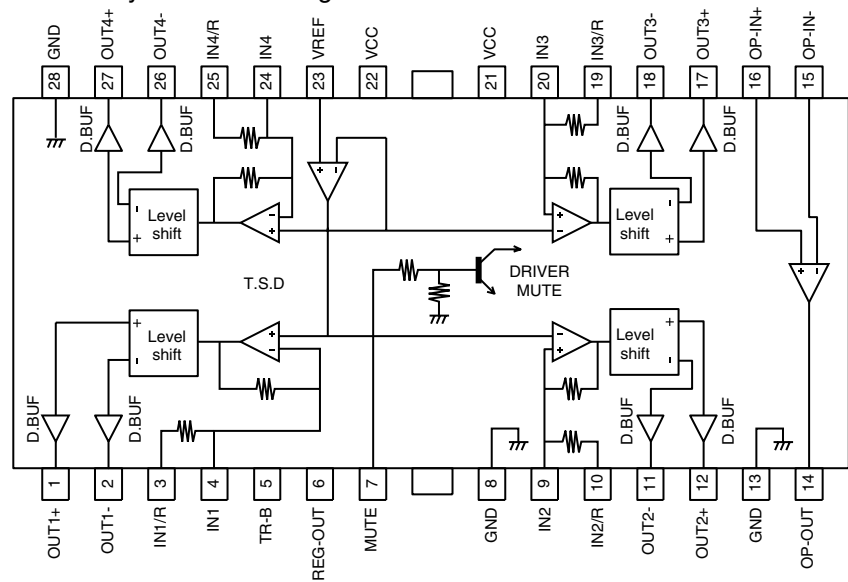
## ■ NJM2930L05 (IC802) : Regulator

### 1. Terminal layout



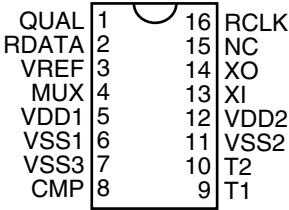
■ BA6897FP (IC703) : 4channel driver

1.Terminal layout & Block diagram

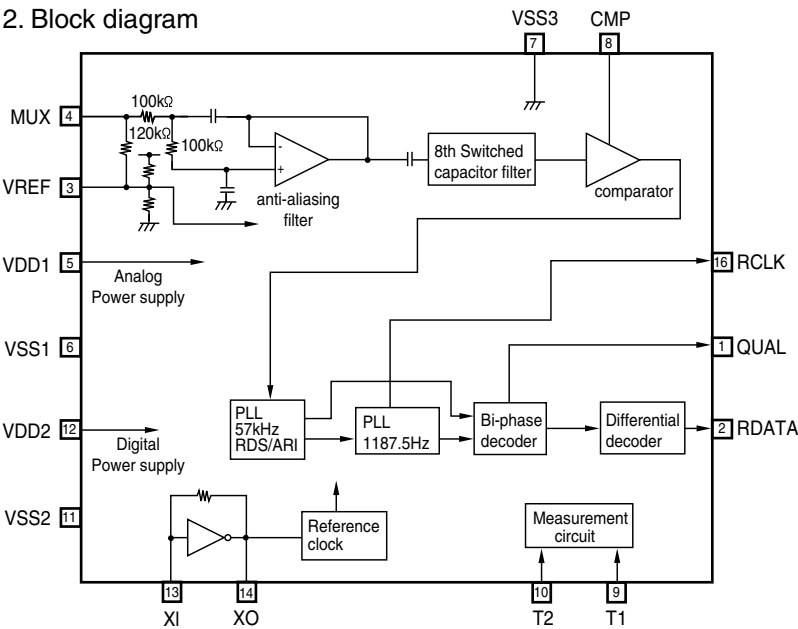


■ BU1923 (IC6) : RDS decoder

1. Terminal layout



2. Block diagram

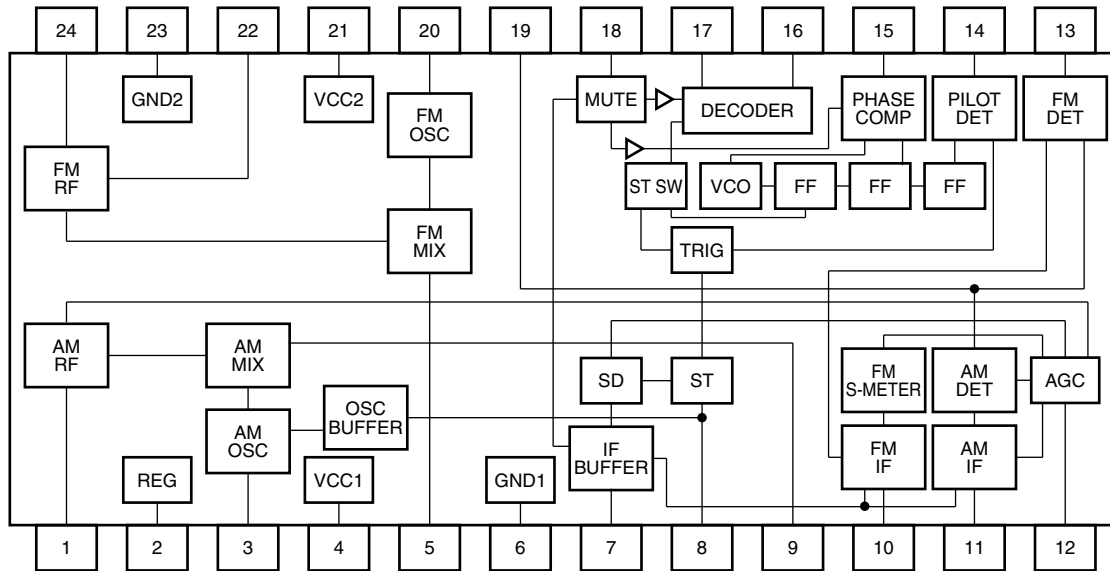


3. Pin function

Pin No.	Symbol	I/O	Function	Pin No.	Symbol	I/O	Function
1	QUAL	O	Demodulator quality, good data: Hi, bad data: Low	9,10	T1,T2	I	Test input, open or connected to ground
2	RDATA	O	Demodulator data	11	VSS2	-	Digital ground
3	VREF	-	Reference voltage, 1/2 VDD1	12	VDD2	-	Digital power supply
4	MUX	I	Composite signal input	13	XI	I	4.332MHz crystal oscillator input
5	VDD1	-	Analog power supply	14	XO	O	4.332MHz crystal oscillator output
6	VSS1	-	Analog ground	15	NC	-	Not used
7	VSS3	-	Analog ground	16	RCLK	O	1187.5Hz demodulator clock
8	CMP	I	Comparator input, C-junction				

## ■ LA1823 (IC5) : 1chip AM/FM, MPX tuner system

### 1. Terminal layout & Block diagram



### 2. Pin function

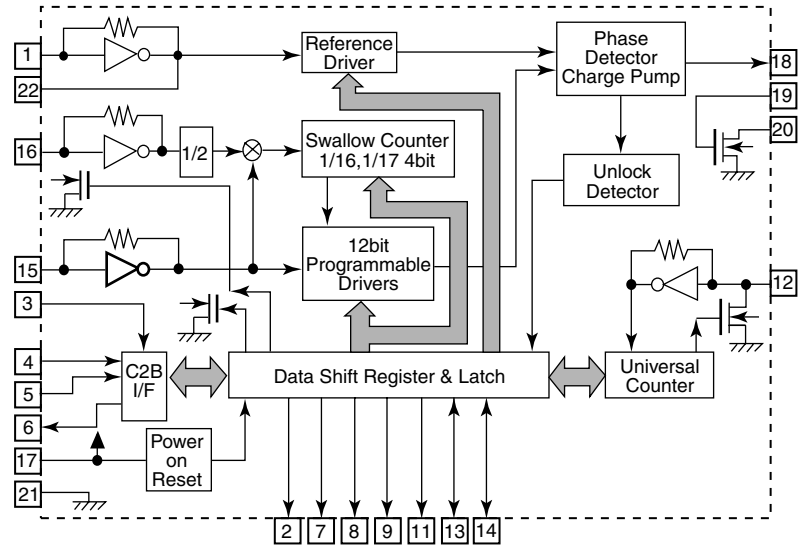
Pin No.	Symbol	I/O	Function
1	AM_RFIN	I	AMRF signal input
2	REG.	I	AMRF signal input
3	AM_OSC	-	AM local oscillation circuit
4	VCC_1	-	Power supply terminal
5	FM_MIXOUT	O	Output terminal for FM mixer
6	GND_1	-	Ground
7	IF_BUFFER	O	IF buffer output
8	ST_IND	O	Stereo indicator output
9	AM_MIXOUT	O	Output terminal for AM mixer
10	FM_IFIN	I	Input of FMIF signal
11	AM_IFIN	I	Input of AMIF signal
12	AGC	I	AGC voltage input terminal
13	FM_DET	O	FM detection signal output
14	ST/MON_SW	I	Stereo/Monaural switching signal input
15	AM/FM_SW	I	AM/FM switching signal input
16	L_OUT	O	Output L-channel
17	R_OUT	O	Output R-channel
18	MPX_IN	I	Multiplex signal input
19	DET_OUT	O	AM/FM detection output
20	FM_OSC	-	FM local oscillation circuit
21	VCC_2	-	Power supply terminal
22	FM_RFOUT	O	Output of FMRF signal
23	GND_2	-	Ground
24	FM_RFIN	I	Input of FMRF signal

■ LC72136 (IC4) : PLL frequency synthesizer

1. Terminal layout

XTI	1	22	XT
FM	2	21	GND
CE	3	20	LPFI
DI	4	19	LPFO
CLOCK	5	18	PD
DO	6	17	VCC
VCOSTOP	7	16	FMIN
AM/FM	8	15	AMIN
LW	9	14	NC
MW	10	13	IFCNT
SDIN	11	12	IFIN

2. Block diagram

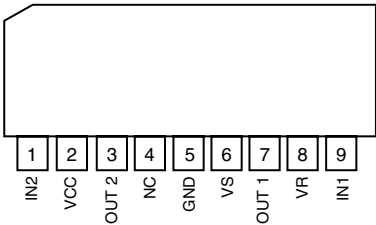


3. Pin function

Pin No.	Symbol	I/O	Function
1	XTI	I	X'tal oscillator connect (75kHz)
2	FM	O	LOW:FM mode
3	CE	I	When data output/input for 4pin(input) and 6pin(output): H
4	DI	I	Input for receive the serial data from controller
5	CLOCK	I	Sync signal input use
6	DO	O	Data output for Controller, Output port
7	VCOSTOP	O	"Low": MW mode
8	AM/FM	O	Open state after the power on reset
9	LW	-	Not use
10	MW	I	AM MW signal input
11	SDIN	I/O	Data input/output
12	IFIN	I	IF counter signal input
13	IFCNT	O	IF signal output
14	NC	-	Not use
15	AMIN	I	AM Local OSC signal input
16	FMIN	I	FM Local OSC signal input
17	VCC	-	Power supply(VDD=4.5-5.5V), When power ON:Reset circuit move
18	PD	O	PLL charge pump output(H: Local OSC frequency Height than Reference frequency. L: Low Agreement: Height impedance)
19	LPFO	O	Output for active low pass filter of PLL
20	LPFI	I	Input for active low pass filter of PLL
21	GND	-	Connect to GND
22	XT	I	X'tal oscillator (75KHz)

■ TA8409S (IC704) : Motor driver

1.Terminal Layout



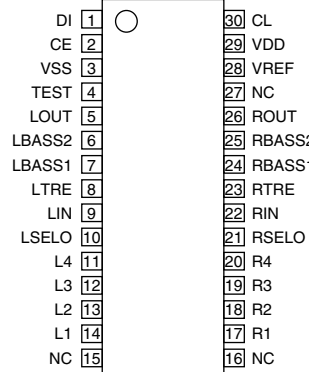
2.Truth table

INPUT		OUTPUT		MODE
IN1	IN2	OUT1	OUT2	
0	0	∞	∞	STOP
1	0	H	L	CW/CCW
0	1	L	H	CCW/CW
1	1	L	L	BRAKE

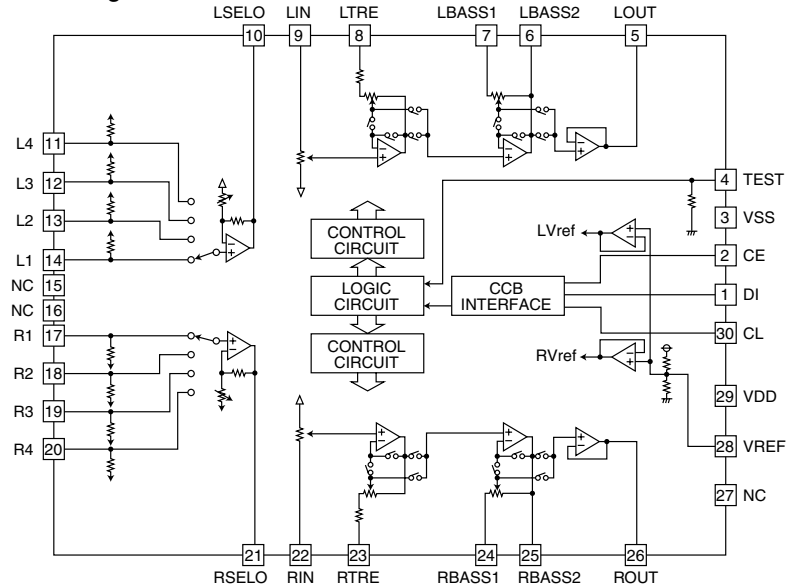


## ■ LC75342 (IC301) : E. volume

### 1. Terminal layout



### 2. Block diagram

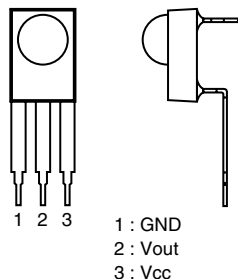


### 3. Pin function

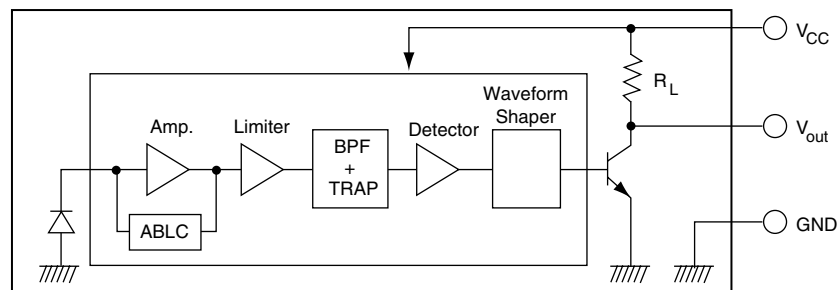
Pin No.	Symbol	Function	Pin No.	Symbol	Function
1	DI	Serial data and clock input for IC control	17	R1	Input signal connections
2	CE	Chip enable	18	R2	Input signal connections
3	VSS	GND	19	R3	Input signal connections
4	TEST	Electric volume connection for test	20	R4	Input signal connections, not use
5	LOUT	Volume control and equalizer input	21	RSELO	Input selector output
6	LBASS2	Connection for resistor and capacitor that from the bass band filter	22	RIN	Volume control and equalizer input
7	LBASS1		23	RTRE	Connection for capacitor that from the treble band filter
8	LTRE	Connection for capacitor that from the treble band filter	24	RBASS1	Connection for resistor and capacitor that from the bass band filter
9	LIN	Volume control and equalizer input	25	RBASS2	
10	LSELO	Input selector output	26	ROUT	Volume control and equalizer input
11	L4	Input signal connections, not use	27	NC	Not use
12	L3		28	VREF	Connection to the 0.5X VDD voltage generator circuit used as the analog signal ground
13	L2		29	VDD	Power supply
14	L1		30	CL	Serial data and clock input for IC control
15	NC	Not use			
16	NC	Not use			

## ■ SPS-445-1-E1 (IC803) : Remote control receiver

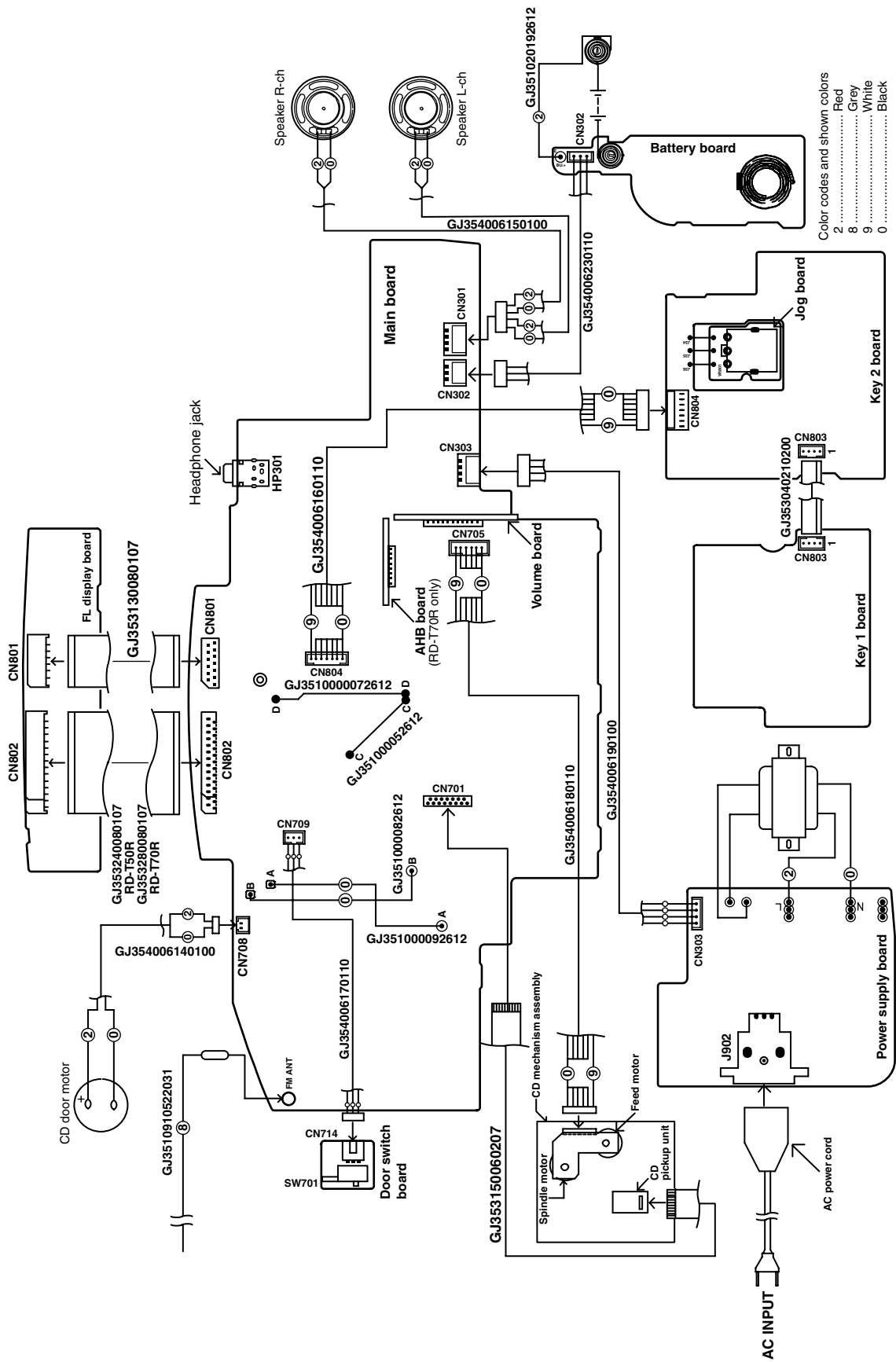
### 1. Terminal layout



### 2. Block diagram



# Wiring connection



**< M E M O >**



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