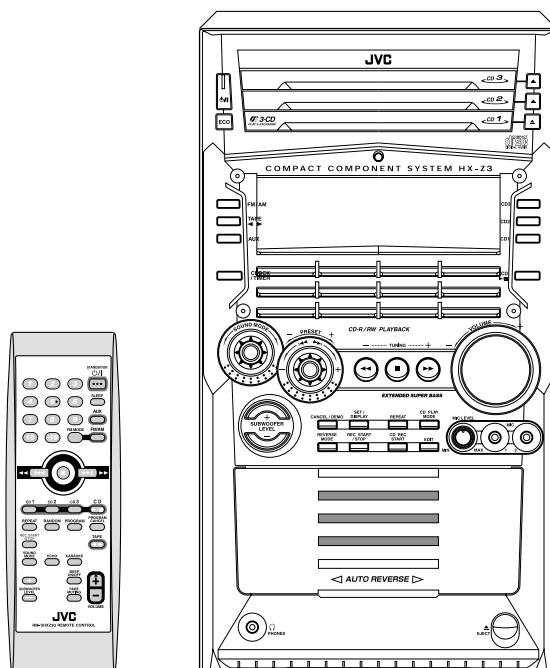


JVC

SERVICE MANUAL

COMPACT COMPONENT SYSTEM

HX-Z3



COMPACT
disc
DIGITAL AUDIO

Area Suffix

UW ----- Brazil, Mexico, Peru

Contents

| | | | |
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Safety Precautions

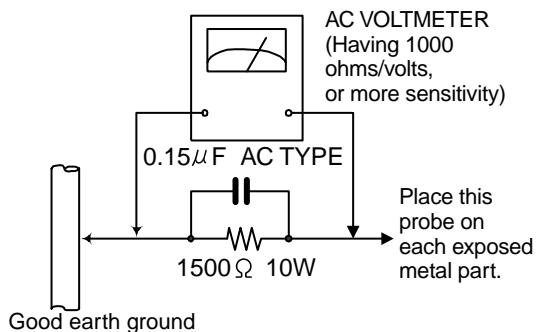
1. This design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the 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 $0.15\ \mu\text{F}$ 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 performing 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 (\blacksquare) and ICP (\bullet) or identified by the " \triangle " mark nearby are critical for safety.

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

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

In the equipment which uses optical pick-up (laser diode), optical pick-up is destroyed by the static electricity of the work environment.

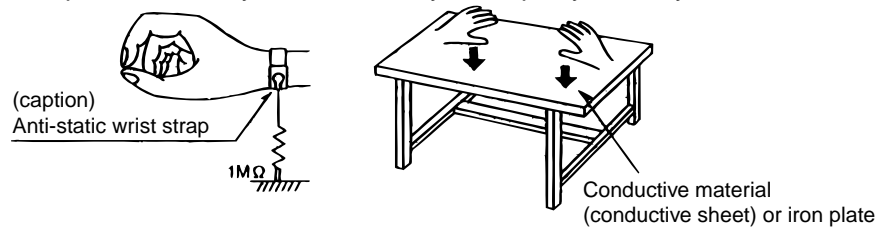
Be careful to use proper grounding in the area where repairs are being performed.

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. Cut off the shorted part of the flexible cable using nippers, etc. 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.

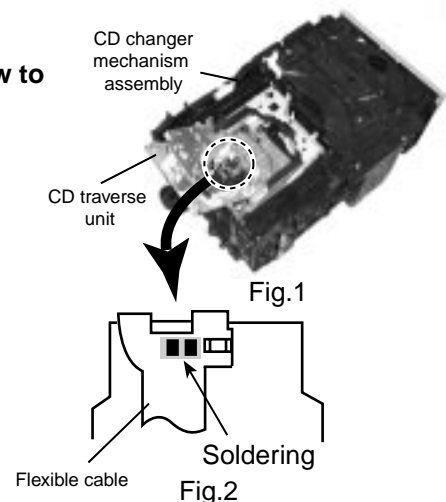
3. Handle the flexible cable carefully as it may break when subjected to strong force.

4. It is not possible to adjust the semi-fixed resistor that adjusts the laser power. Do not turn it

Attention when traverse unit is decomposed

***Please refer to "Disassembly method" in the text for pick-up and how to detach the CD traverse mechanism.**

1. Remove the disk stopper and T. bracket on the CD changer mechanism assembly.
2. Disconnect the harness from connector on the CD motor board.
3. CD traverse unit is put up as shown in Fig.1.
4. Solder is put up before the card wire is removed from connector CN601 on the CD servo control board as shown in Fig. 2.
(When the wire is removed without putting up solder, the CD pick-up assembly might destroy.)
5. Please remove solder after connecting the card wire with CN601 when you install picking up in the substrate.



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 är denna del är öppnad och spårren är urkopplad. Betrakta ej strålen.

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

ADVARSEL : Usynlig laserstrålning ved åbning , når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse 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**



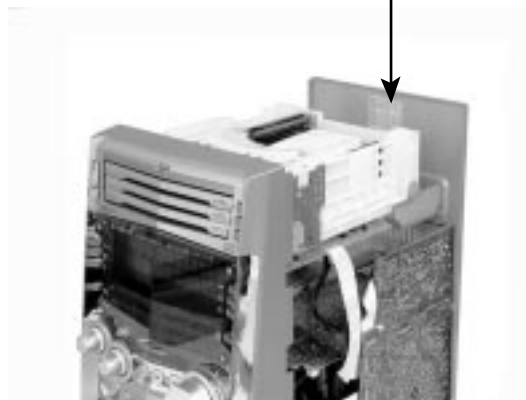
CAUTION : Invisible laser radiation when open and interlock failed or defeated. AVOID DIRECT EXPOSURE TO BEAM. (e)

WARNING : Osynlig laserstrålning nr denna del r ppnad och sprren r urkopplad. Betrakta ej strlen. (s)

ADVARSEL : Usynlig laserstrlning ved bning, nr sikkerhedsafbrydere er ude af funktion. Undgdust-telse for strling. (d)

VARO : Avattaessa ja suojalukitus ohitettaessa olet alltiina nkymtt-mlle lasersteilylle. Al katso

E406507-001



Disassembly method

<Main board>

■ Removing the metal cover

(See Fig.1 ~ 3)

1. Remove the six screws **A** on the back of the body.
2. Remove the screw **B** on each side of the body.
3. Remove the metal cover from the body by lifting the rear part of the cover.

CAUTION: Do not break the front panel tab fitted to the metal cover.

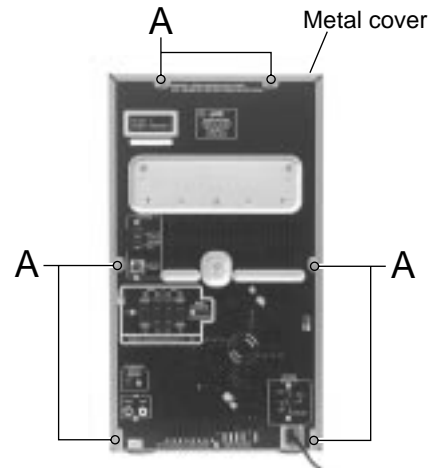


Fig.1

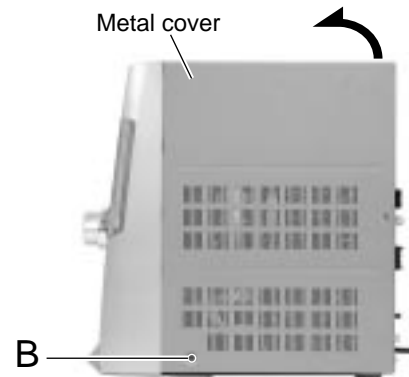


Fig.2

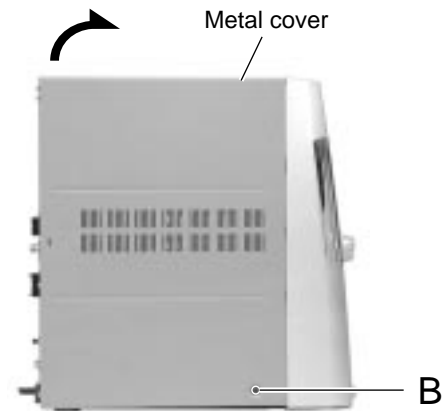


Fig.3

■ Removing the CD changer mechanism assembly

(See Fig.4, 5)

- Prior to performing the following procedure, remove the metal cover.
1. Disconnect the card wire from connector CN151 and CN651 on the CD servo control board on the right bottom of the CD changer mechanism assembly.
 2. Remove the four screws **C** attaching the CD changer mechanism assembly on top of the body.
 3. Remove the CD changer mechanism assembly while lifting the rear part.

CAUTION: Do not damage the CD fitting when removing the CD changer mechanism assembly.

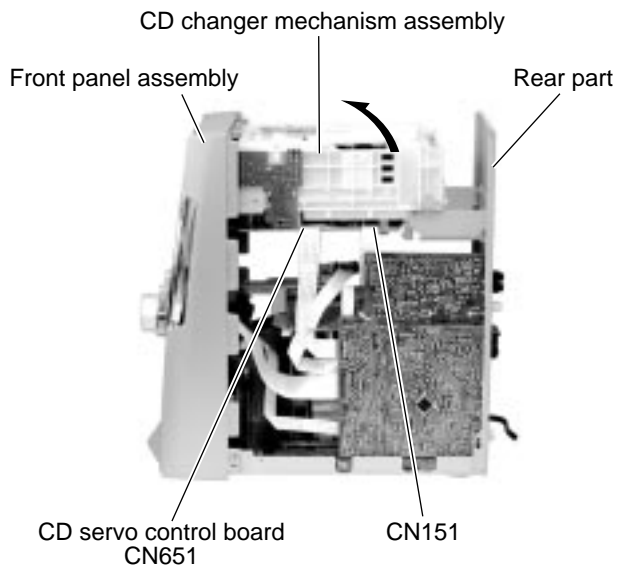


Fig.4

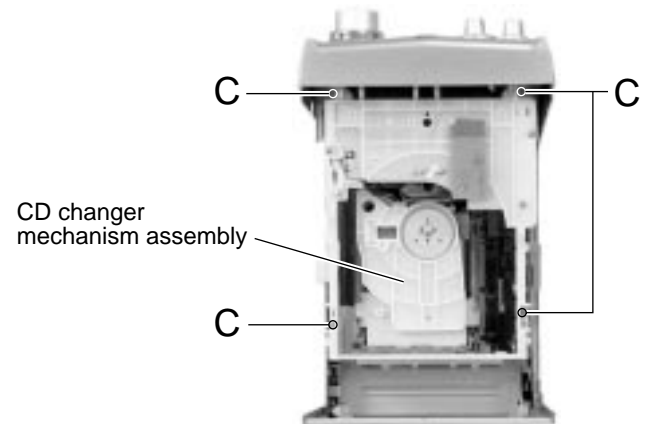


Fig.5

■ Removing the front panel assembly
(See Fig.6 ~ 9)

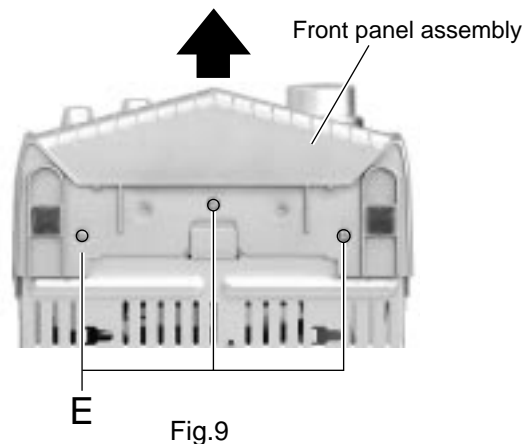
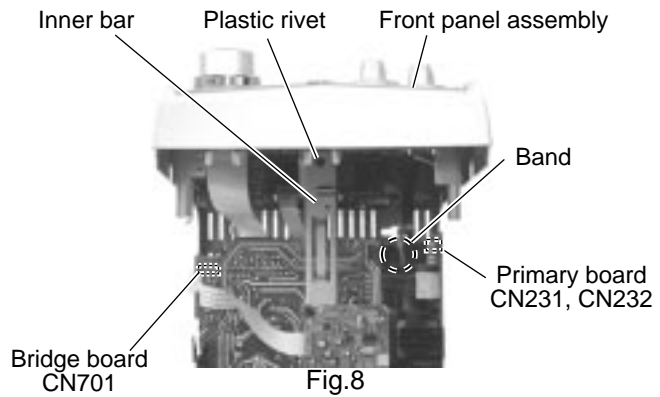
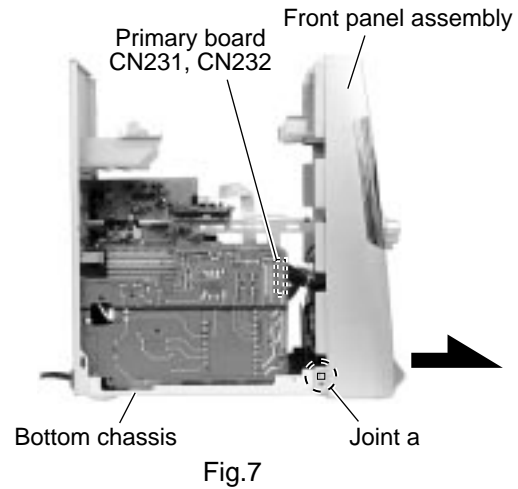
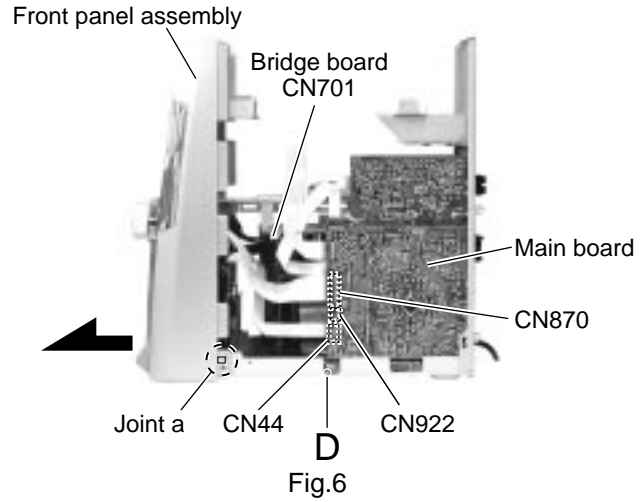
• Prior to performing the following procedure, remove the metal cover and the CD changer mechanism assembly.

1. Disconnect the card wires from connector CN44 and CN870 on the main board on the right side of the body. Remove the screw **D** attaching the wire from extending from the underside of the front panel assembly.
2. Disconnect the wire from connector CN701 on the bridge board.
3. Cut the tie band.
4. Disconnect the wires from connector CN231 and CN232 on the primary board on the left side of the body and remove the band fixing the wire.
5. Remove the plastic rivet attaching the inner bar in the center of the front panel assembly.

REFERENCE: Keep the plastic rivet for reuse.

6. Remove the three screws **E** attaching the front panel assembly at the bottom of the body.
7. Release the two joints **a** on the lower left and right sides of the front panel assembly using a screwdriver, and remove the front panel assembly toward the front.

REFERENCE: Front panel need to be tilt a little bit as release from bottom chassis.



■ Removing the antenna board (See Fig.10, 11)

- Prior to performing the following procedure, remove the metal cover.

REFERENCE: There is no need to remove the CD changer mechanism assembly.

1. Disconnect the card wire from connector CN1 on the antenna board on the right side of the body.
2. Remove the band attaching the antenna board.
3. Remove the two screws **F** on the rear panel on the back of the body.

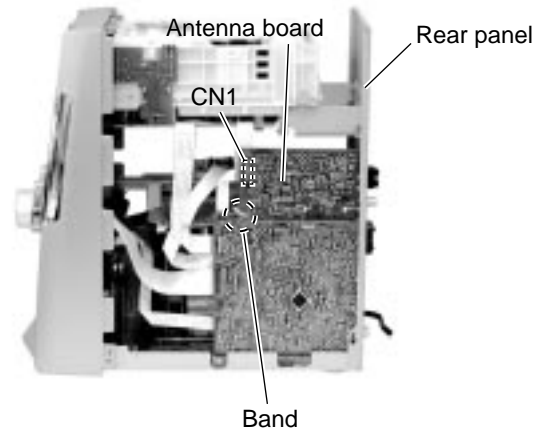


Fig.10

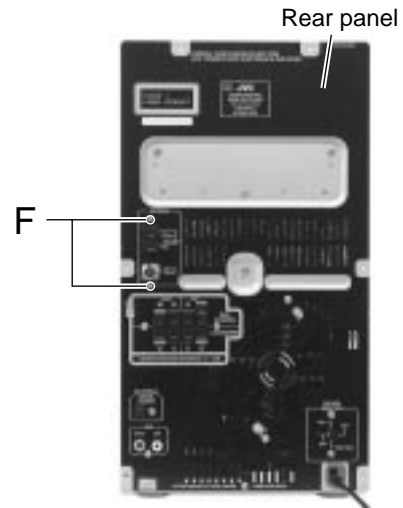


Fig.11

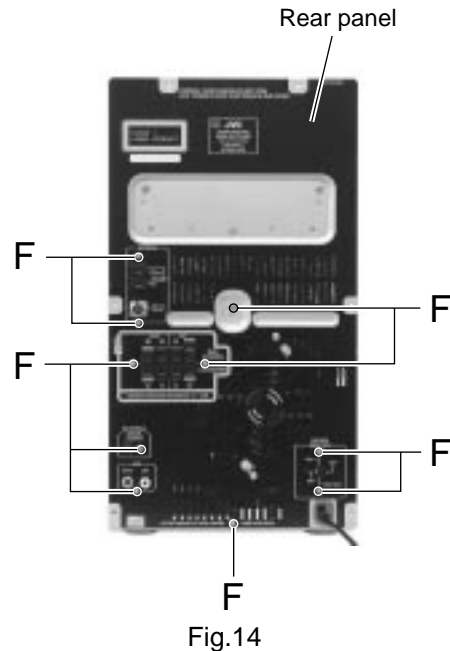
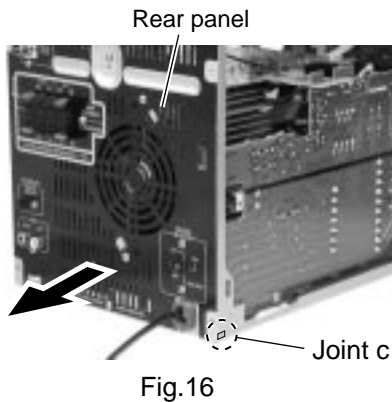
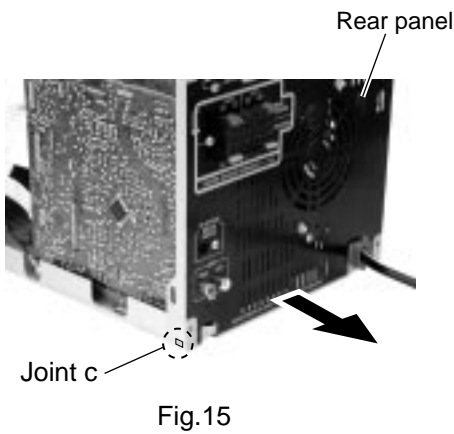
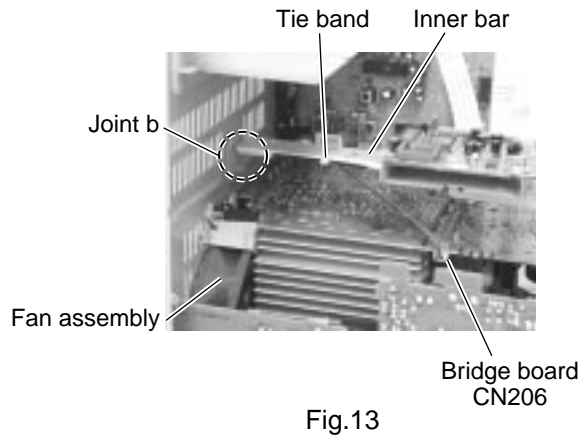
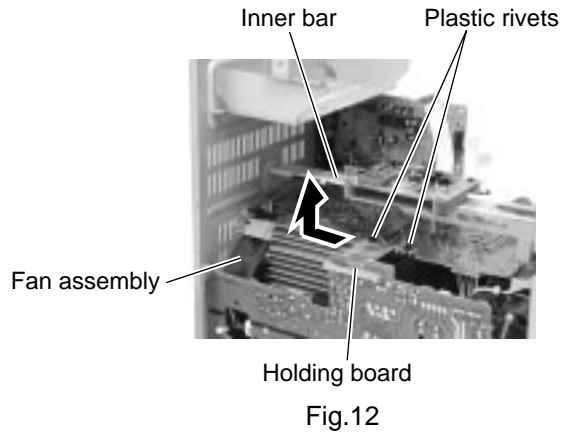
■ Removing the rear panel

(See Fig.12 ~ 16)

· Prior to performing the following procedure, remove the metal cover and the CD changer mechanism assembly.

1. Remove holding board by remove two plastic rivets and then slide out the holding board as shown in fig. 12.
2. Disconnect fan wire from connector CN206 on the bridge board.
3. Cut off the tie band that tied fan wire on inner bar.
4. Remove ten screws **F** from rear panel.
5. Detach joint **b** to release rear panel from inner bar.
6. Release joints **c** which on right bottom and left bottom of rear panel. The joint can be release by pull outward the side of rear panel.

REFERENCE: Fan assembly will come off with rear panel.



■ Removing the T.flux board
(See Fig.17, 18)

• Prior to performing the following procedure, remove the metal cover and the CD changer mechanism assembly .

1. Disconnect the card wire from connector CN102 on the T.flux board.
2. Remove the two plastic rivets attaching the T.flux board.
3. Remove the T.flux board from the bracket which is located on the inner bar.(two joints y)

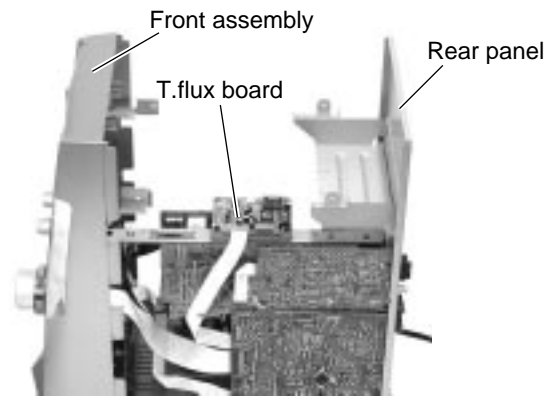


Fig.17

■ Removing the fan assembly
(See Fig.19, 20)

• Prior to performing the following procedure, remove the metal cover, the CD changer mechanism assembly and the rear panel.

1. Remove two screws **G** on the rear panel.
2. Rotate fan assembly in clockwise direction to release fan assembly from rear panel (joints **d**).

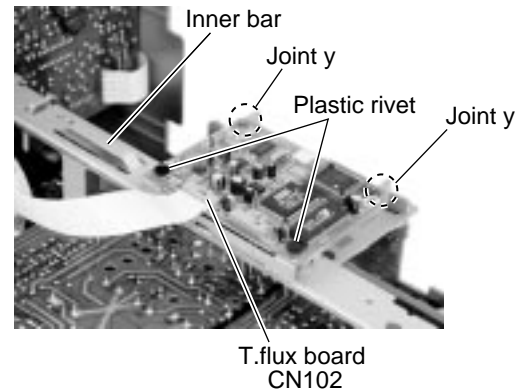


Fig.18

■ Removing the main board (See Fig.21)

• Prior to performing the following procedure, remove the metal cover, the CD changer mechanism assembly, the antenna board and the rear panel.

1. Disconnect the card wires from connector CN44,CN504,CN870 and CN922 on the main board.
2. Remove the screw **D** attaching the main board.
3. Disconnect connector CN217 and CN311 on the main board outward and release from the base chassis (joint **e**) upward.

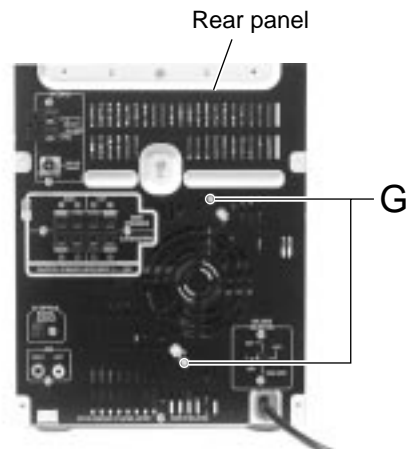


Fig.19

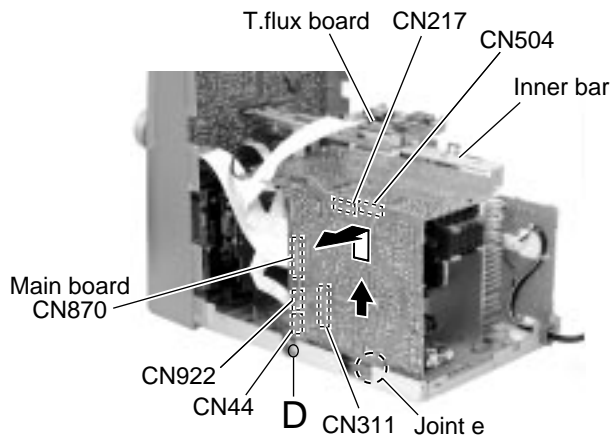


Fig.21

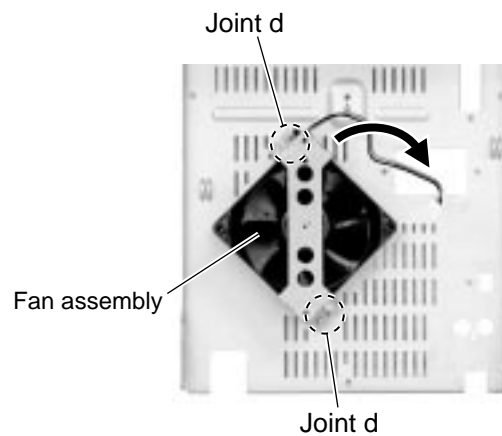


Fig.20

■ Removing the bridge board / regulator board / heat sink (See Fig.22 ~ 27)

• Prior to performing the following procedure, remove the metal cover, the CD changer mechanism assembly, the rear panel, the antenna board and main board.

1. Remove the plastic rivet attaching the stay inner bar and remove the screw **H** on the bridge board.
2. Move the inner bar forward and upward to release from the front section (joint **f**) and from the bridge board (two joints **g**) respectively.
3. Remove the two plastic rivets setting the holding board fixing the bridge board and the primary board. Move the bracket board in the direction of the arrow.
4. Disconnect the wire from connector CN212, CN213 and CN214 on the primary board respectively and remove the band attaching the wires.
5. Disconnect the wire from connector CN701 on the bridge board.
6. Remove the two screws **I** attaching the heat sink bracket and move the heat sink in the direction of the arrow to release from the base chassis (two joints **i**). The bridge board and the regulator board come off with the heat sink.

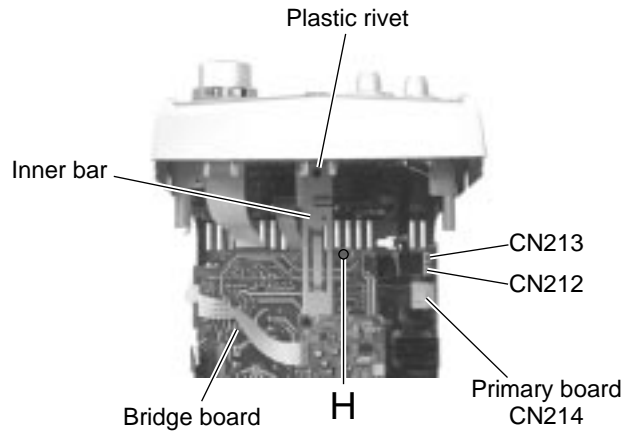


Fig.22

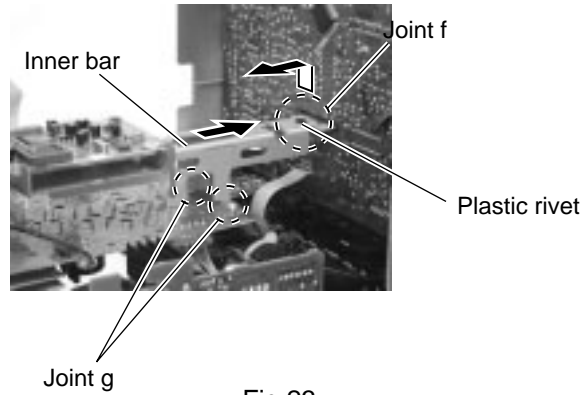


Fig.23

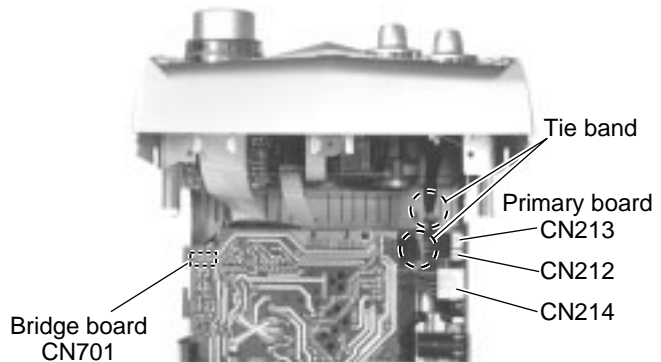


Fig.24

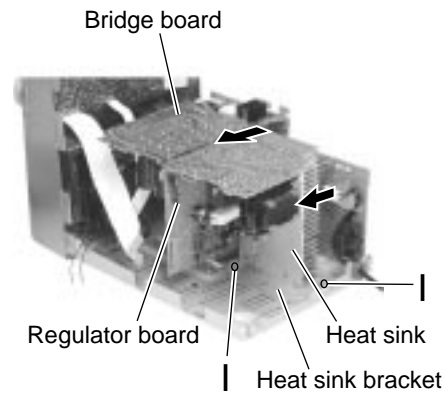


Fig.25

6. Remove the two screws **J** attaching the heat sink bracket.
7. Remove the two screws **M**, detach bridge board from regulator board by disconnect connector CN205.
8. Remove the two screws **K** and two screws **L** to detach regulator board from heat sink.

CAUTION: As assembly back the regulator board and bridge board to heat sink. Regulator board must be assembly to heat sink first and screws **K** and **L** must be screwed before bridge board attach to regulator board.

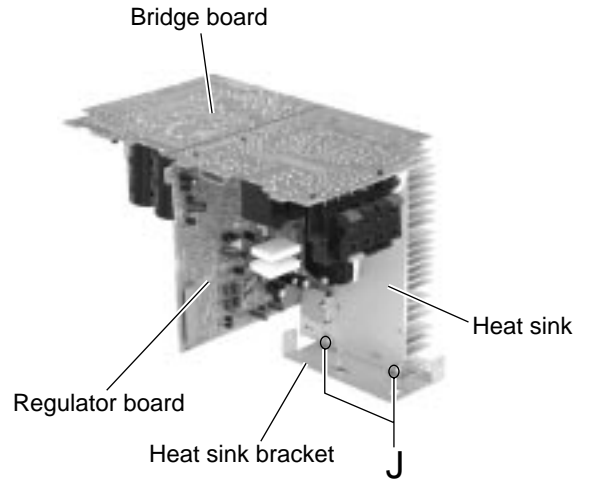


Fig.26

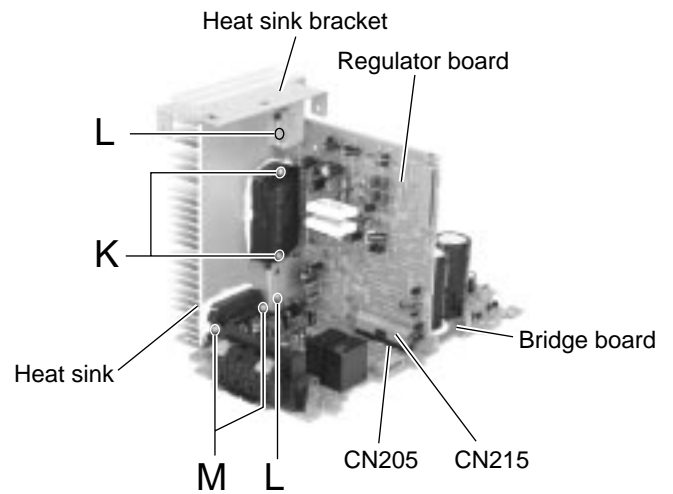


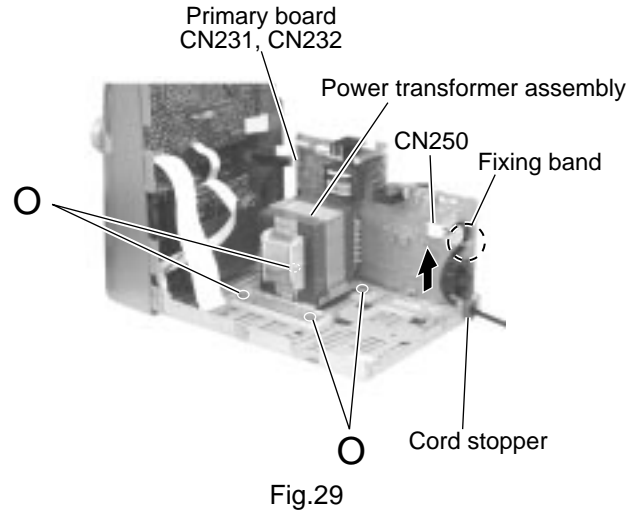
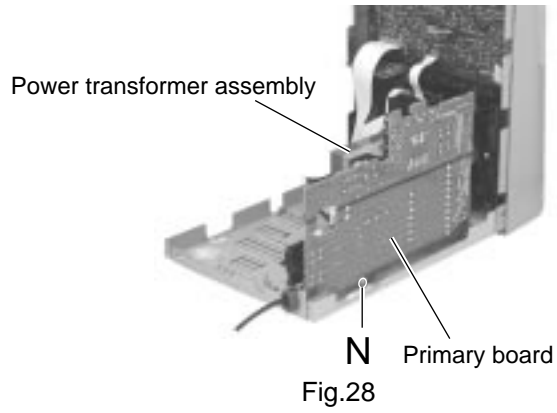
Fig.27

■ Removing the power transformer assembly (See Fig.28, 29)

· Prior to performing the following procedure, remove the metal cover, the CD changer mechanism assembly, the rear panel, the main board and the bridge board / regulator board.

1. Remove the screw **N** attaching the primary board.
2. Disconnect the wire from connector CN231 and CN232 on the primary board.
3. Remove the four screws **O** attaching the power transformer assembly.
4. Cut the tie band and detach power cord from primary board.

REFERENCE: When disconnecting the power cord from connector CN250 on the primary board, remove the fixing band.

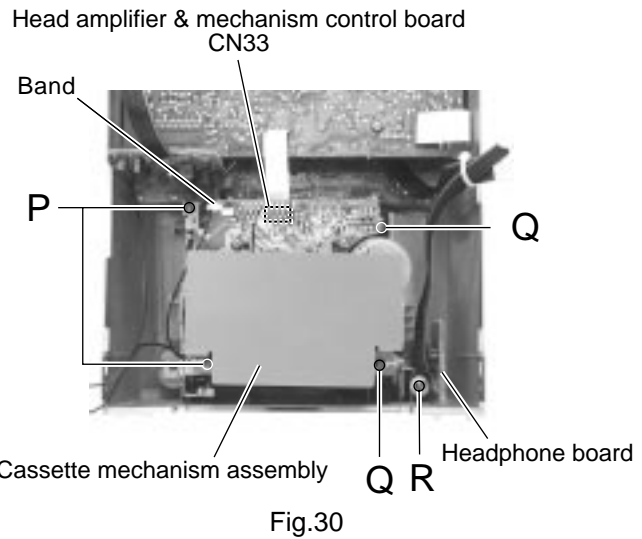


<Front panel assembly>

· Prior to performing the following procedure, remove the metal cover, the CD changer mechanism assembly and the front panel assembly.

■ Removing the cassette mechanism assembly (See Fig.30)

1. Disconnect the card wire from connector CN33 on the head amplifier & mechanism control board.
2. Remove the two screws **P**, and the two screws **Q** attaching the cassette mechanism assembly.
3. Cut the band.

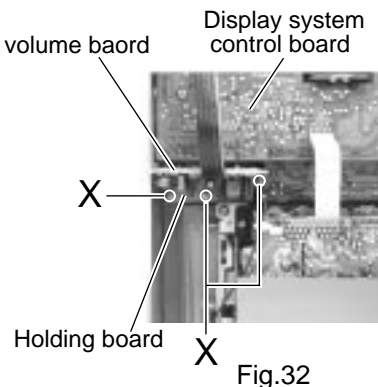
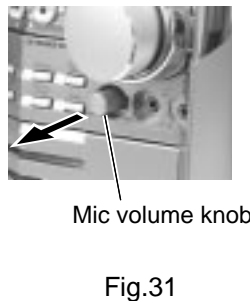


■ Removing the headphone board (See Fig.30)

1. Remove the screw **Q** attaching the wire extending from the headphone board.
2. Remove the screw **R** and pull out the headphone board backward.

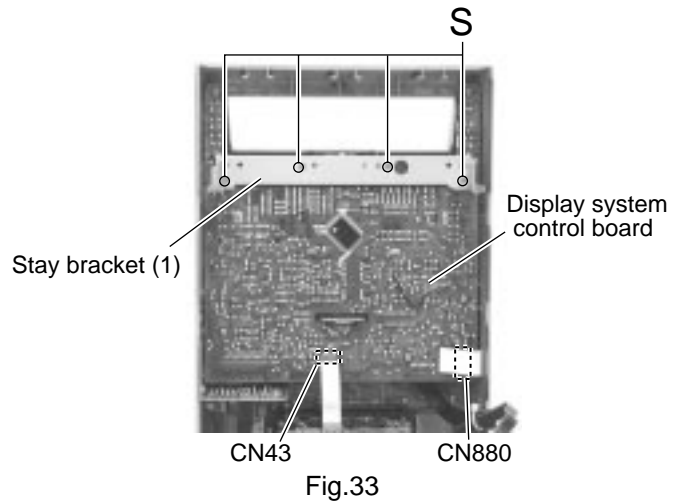
■ Removing the mic volume board (See fig.31,32)

1. Pull out the mic volume knob toward the front.
2. Remove the three screws **X** attaching the holding board.
3. Remove the holding board from mic volume board.



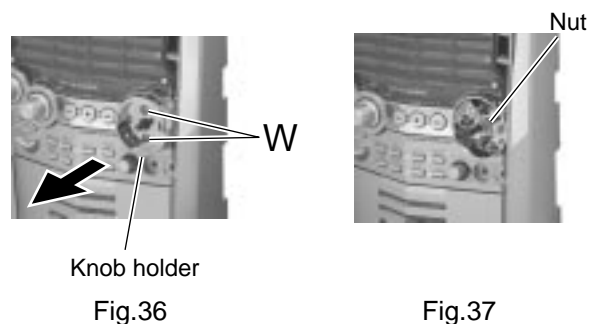
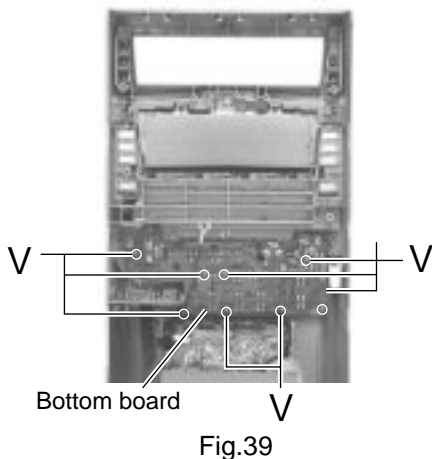
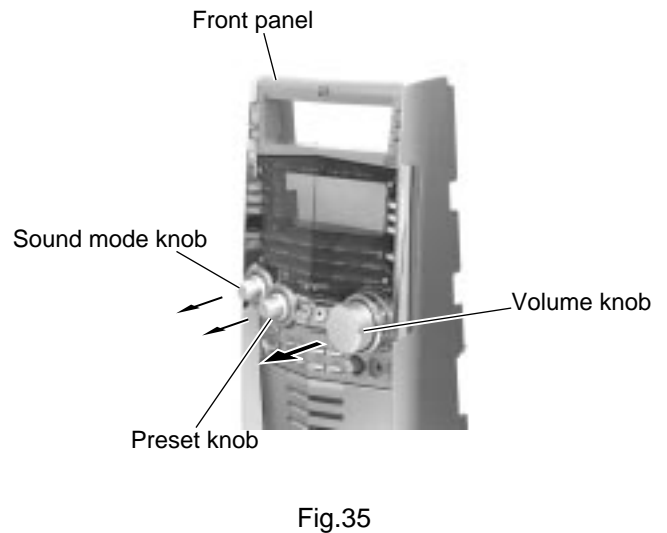
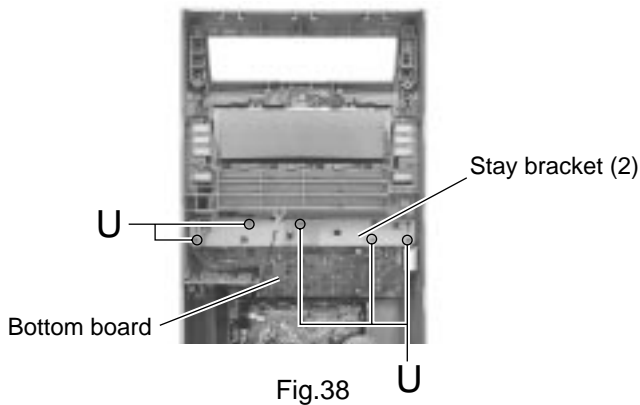
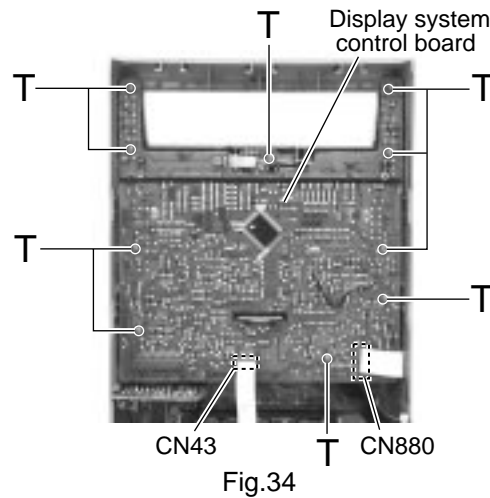
■ Removing the display system control board
(See Fig.33,34)

1. Remove the four screws **S** attaching the stay bracket (1).
2. Disconnect the card wires from connector CN43 and CN880 on the display system control board.
3. Remove the ten screws **T** attaching the display system control board.



■ Removing the bottom board
(See Fig.33 ~ 37)

- Prior to performing the following procedure, remove the display system control board.
1. Pull out preset knob, sound mode knob on the front panel toward the front.
 2. Pull out the volume knob encorder and remove the two screws **W** attaching the knob holder. Remove the nut from the front panel.
 3. Remove the five screws **U** attaching the stay bracket (2).
 4. Remove the eight screws **V** attaching the bottom board.



<CD Changer Mechanism Type:VC3section>

- Remove the CD changer mechanism assembly.

■ Removing the CD Servo control board (See Fig.1)

- From bottom side the CD changer mechanism assembly, remove the four screws **A** retaining the CD servo control board.
- Absorb the four soldered positions **a** of the right and left motors with a soldering absorber.
- Pull out the earth wire on the CD changer mechanism assembly.
- Disconnect the connector CN854 on the CD servo control board.
- Disconnect the card wire CN601 and the connector CN801 on the CD servo control board.

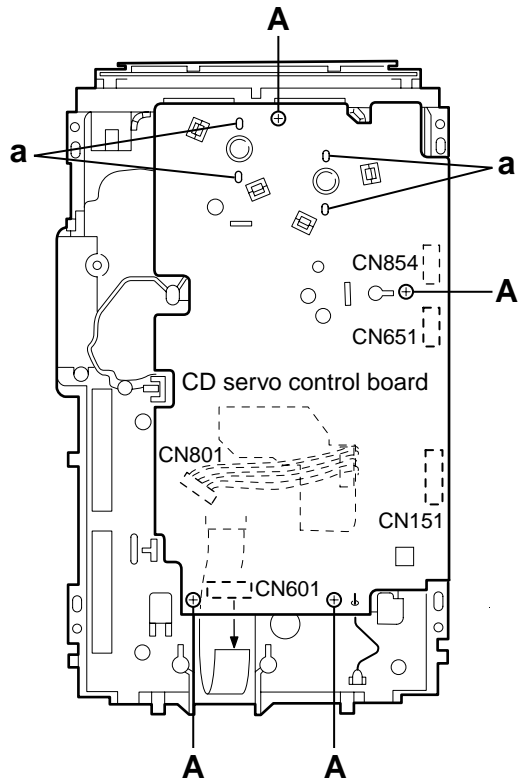


Fig.1

■ Removing the CD tray assembly (See Fig.2~9)

- Remove the CD servo control board.
- Remove the screw **B** retaining the lod stopper.
- From the T.bracket section **b** and clamber base section **c**, remove both of the edges fixing the rod.
- Remove the three screws **C** retaining the T.bracket.
- Remove the screw **D** retaining the clamber assembly.
- From the left side face of the chassis assembly, remove the one screw **E** retaining both of the return spring and lock lever.
- By removing the pawl at the section **d** fixing the return spring, dismount the return spring.
- Remove the three lock levers.

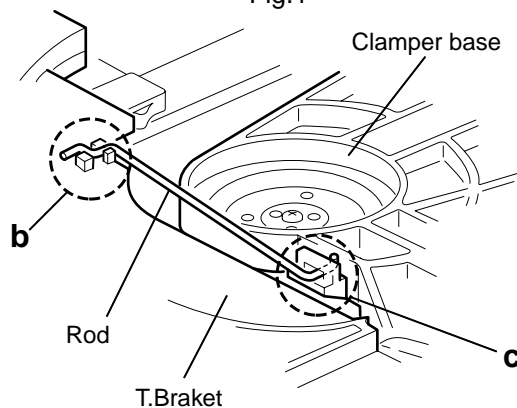
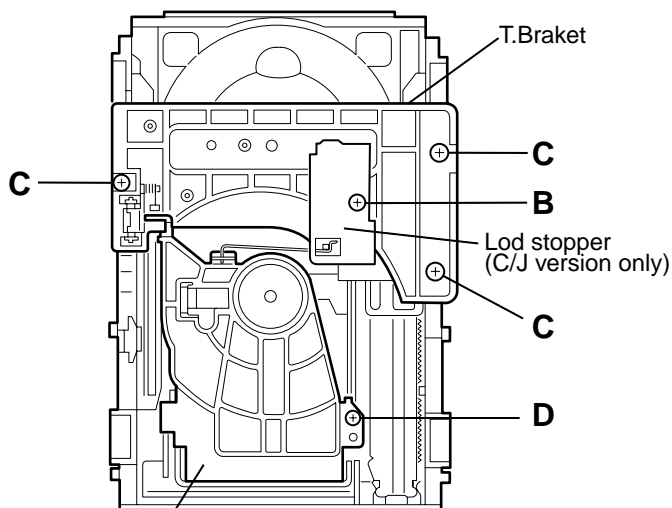


Fig.2



Clamber assembly Fig.3

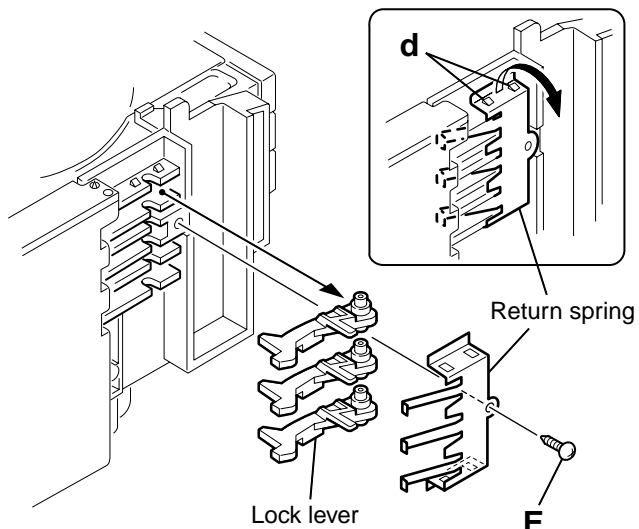


Fig.4

9. Check whether the lifter unit stopper has been caught into the hole at the section **e** of CD tray assembly as shown in Fig.5.

10. Make sure that the driver unit elevator is positioned as shown in Fig.6 from to the second or fifth hole on the left side face of the CD changer mechanism assembly.

CAUTION: In case the driver unit elevator is not at above position, set the elevator to the position as shown in Fig.7 by manually turning the pulley gear as shown in Fig.8.

11. Manually turn the motor pulley in the clockwise direction until the lifter unit stopper is lowered from the section **e** of CD tray assembly.

12. Pull out all of the three stages of CD tray assembly in the arrow direction **f** until these stages stop

13. At the position where the CD tray assembly has stopped, pull out the CD tray assembly while pressing the two pawls **g** and **g'** on the back side of CD tray assembly. In this case, it is easy to pull out the assembly when it is pulled out first from the stage CD tray assembly.

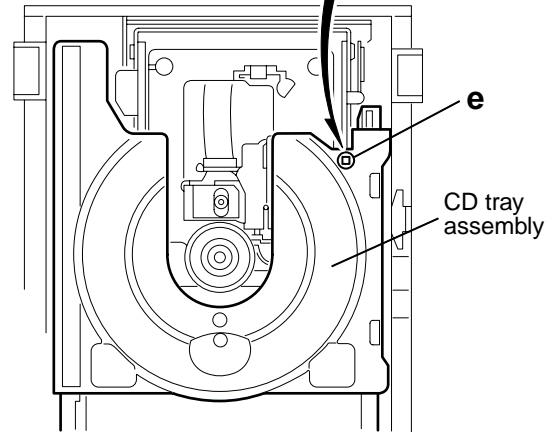
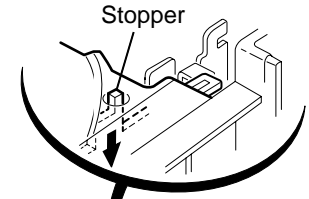


Fig.5

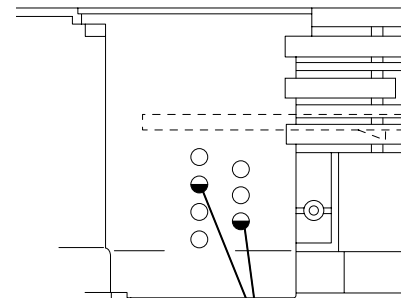


Fig.7

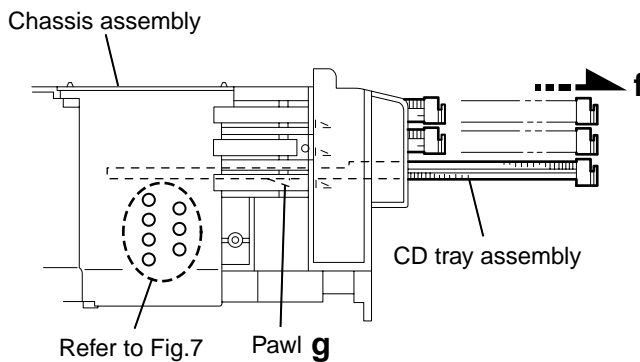


Fig.6

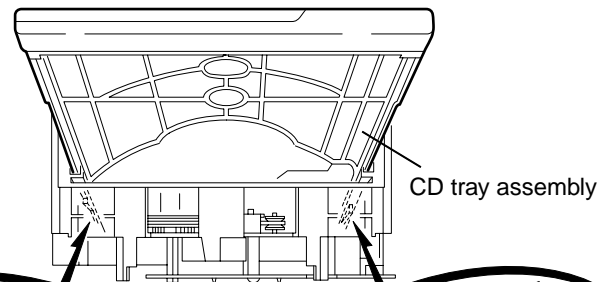


Fig.9

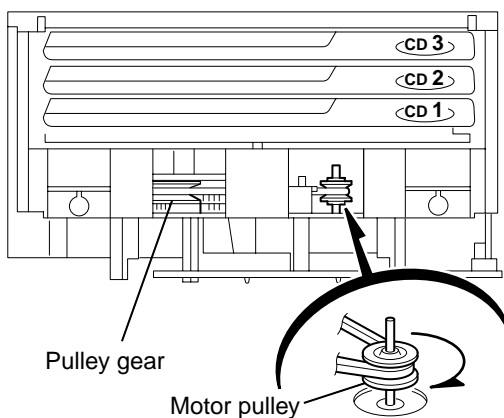


Fig.8

Removing the CD loading mechanism assembly(See Fig.10)

1. While turning the cams R1 and R2 assembly in the arrow direction **h** ,align the shaft **i** of the CD loading mechanism assembly to the position shown in Fig.10.
2. Remove the four screws **F** retaining the CD loading mechanism assembly.

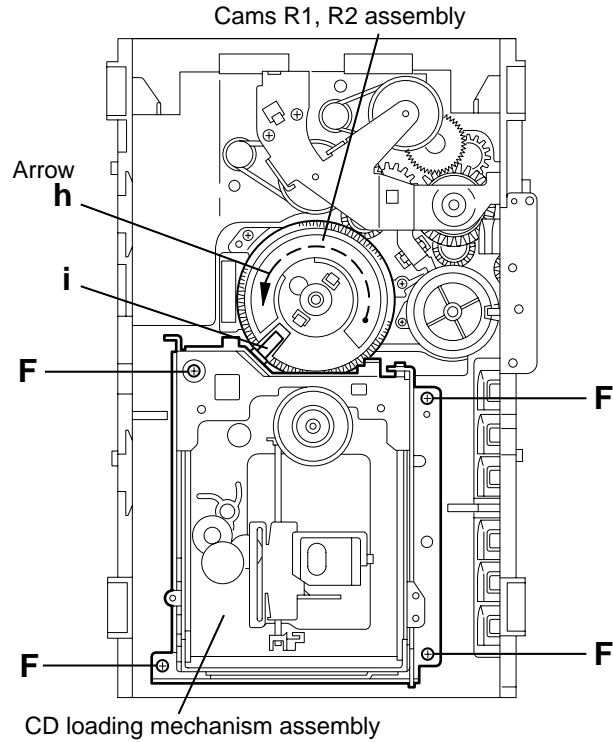


Fig.10

Removing the CD traverse mechanism (See Fig.11 and 12)

1. For dismantling only the CD traverse mechanism without removing the CD loading mechanism assembly, align the shaft **j** of the CD loading mechanism assembly to the position shown Fig.11 while turning the cam R1 and R2 assembly in the arrow direction **k** .
2. By raising the CD loading mechanism assembly in the arrow direction **l** , remove the assembly from the lifter unit

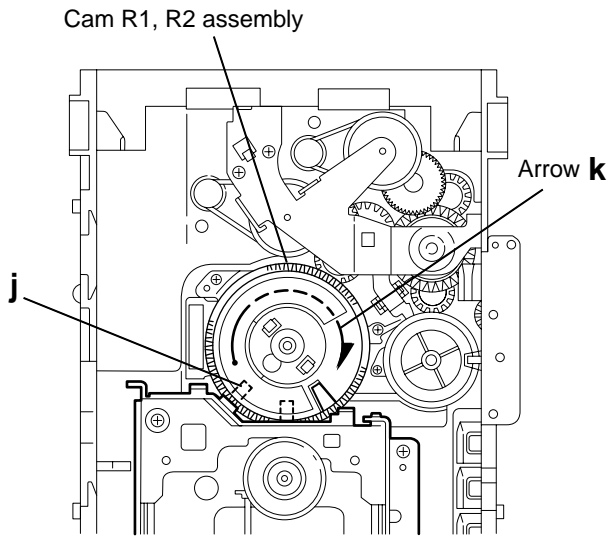


Fig.11

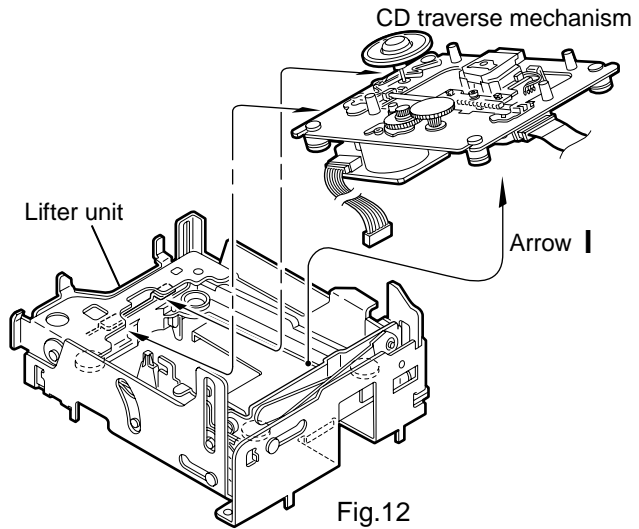


Fig.12

Removing the CD pick unit (See Fig.13)

1. Move the cam gear in the arrow direction **m** . Then, the CD pickup unit will be moved in the arrow direction **n** .
2. According to the above step, shift the CD pickup unit to the center position.
3. While pressing the stopper retaining the shaft in the arrow direction **o** , pull out the shaft in the arrow direction **p** .
4. After dismantling the shaft from the CD pickup unit, remove the CD pickup unit

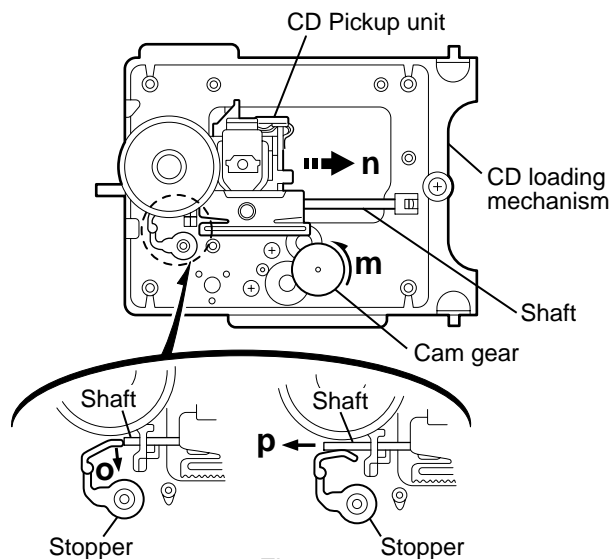


Fig.13

■ Removing the tray select switch board (See Fig.14)

1. Remove the two screws **G** retaining the tray select switch board.
2. Disconnect the tray select switch board from connector CN854 on the CD servo control board.

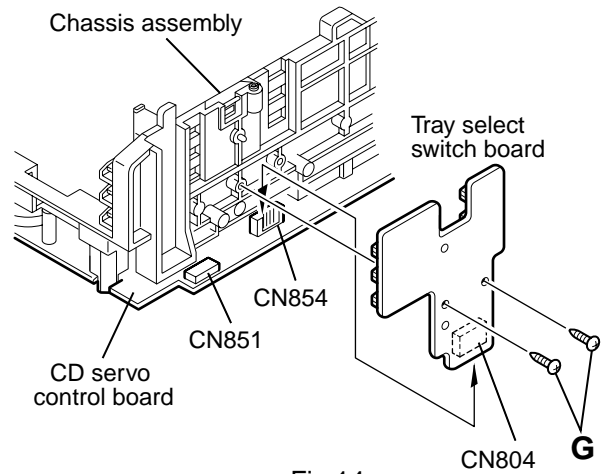


Fig.14

■ Removing the cam unit (See Fig.15 ~17)

- Remove the CD loading mechanism assembly.
1. While turning the cam gear **q**, align the Paul **r** position of the drive unit to the notch position on the cam gear **q**.
 2. Pull out the drive unit and cylinder gear.
 3. While turning the cam gear **q**, align the Paul **s** position of the select lever to the notch position on the cam gear **q**.
 4. Remove the four screws **H** retaining the cam unit (cam gear **q** and cams R1/R2 assembly).

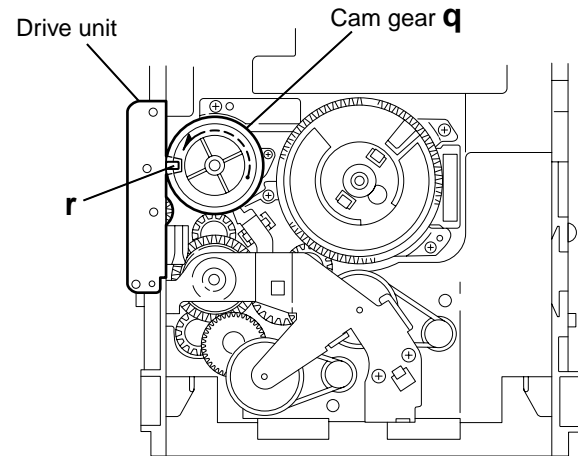


Fig.15

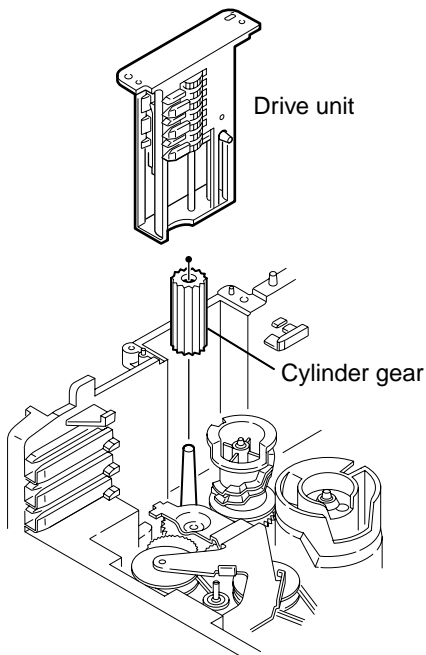


Fig.16

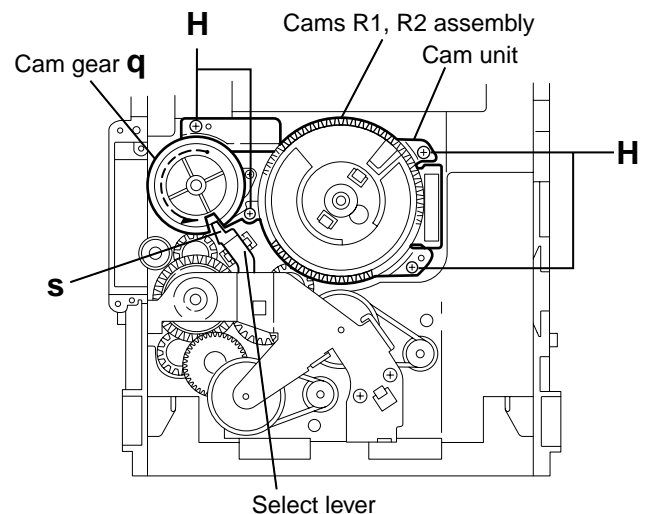


Fig.17

**■ Removing the actuator motor and belt
(See Fig.18~21)**

1. Remove the two screws **I** retaining the gear bracket.
2. While pressing the pawl **t** fixing the gear bracket in the arrow direction, remove the gear bracket.
3. From the notch **u** section on the chassis assembly fixing the edge of gear bracket, remove and take out the gear bracket.
4. Remove the belts respectively from the right and left actuator motor pulleys and pulley gears.
5. After turning over the chassis assembly, remove the actuator motor while spreading the four pawls **v** fixing the right and left actuator motors in the arrow direction.

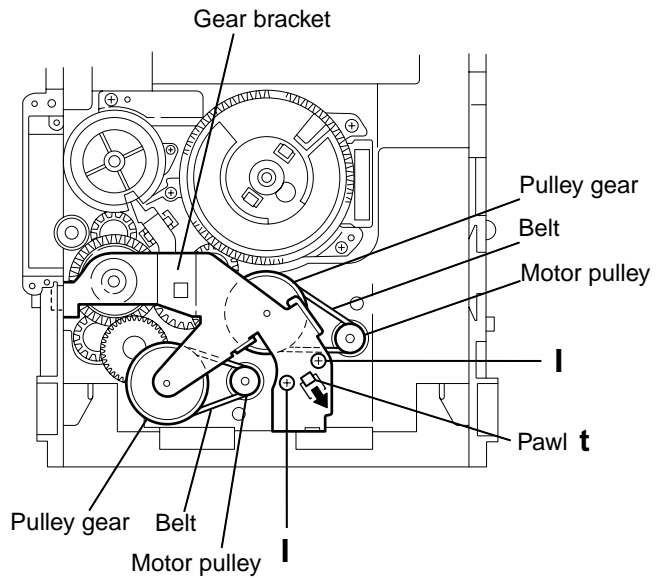


Fig.18

ATTENTION: When the chassis assembly is turned over under the conditions wherein the gear bracket and belt have been removed, then the pulley gear as well as the gear, etc. constituting the gear unit can possibly be separated to pieces. In such a case, assemble these parts by referring to the assembly and configuration diagram in Fig. 21.

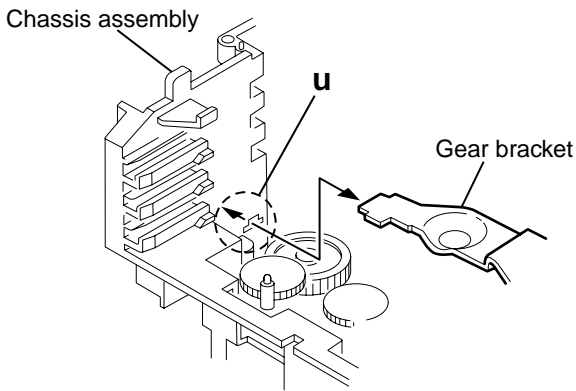


Fig.19

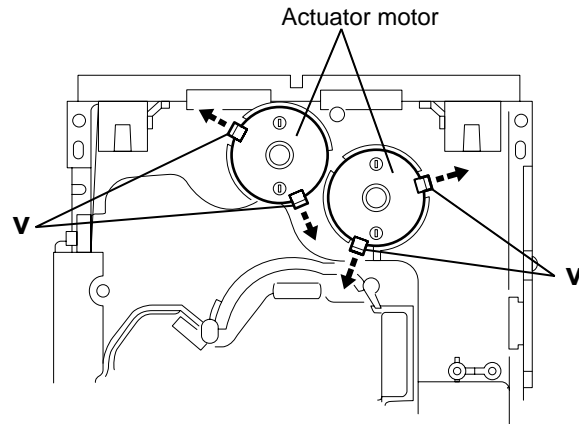


Fig.20

Assembly and Configuration Diagram

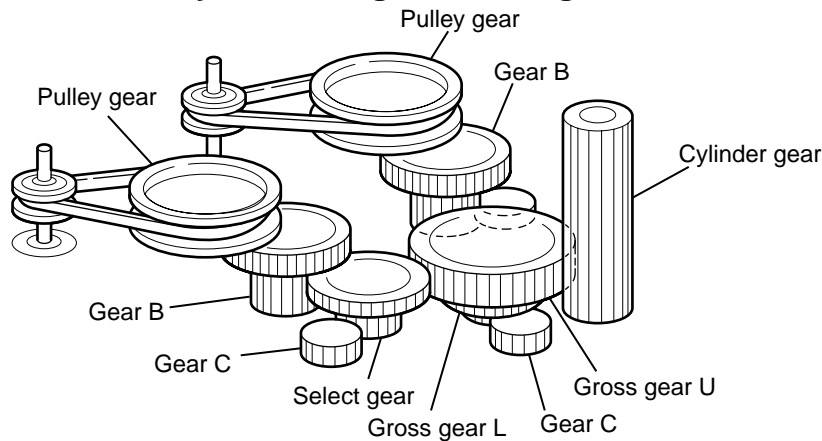


Fig.21

■ Removing the cams R1/R2 assembly and cam gear q(See Fig.22)

1. Remove the slit washer fixing the cams R1 and R2 assembly.
2. By removing the two pawls **w** fixing the cam R1, separate R2 from R1.
3. Remove the slit washer fixing the cam gear **q**.
4. Pull out the cam gear **q** from the C.G. base assembly.

■ Removing the C.G. base assembly (See Fig.22 and 23)

1. Remove the three screws **J** retaining the C.G. base assembly.

CAUTION: To reassemble the cylinder gear, etc.with the cam unit (cam gear and cans R1/R2 assembly), gear unit and drive unit, align the position of the pawl **x** on the drive unit to that of the notch on the cam gear **q**. Then, make sure that the gear unit is engaged by turning the cam gear **q**.

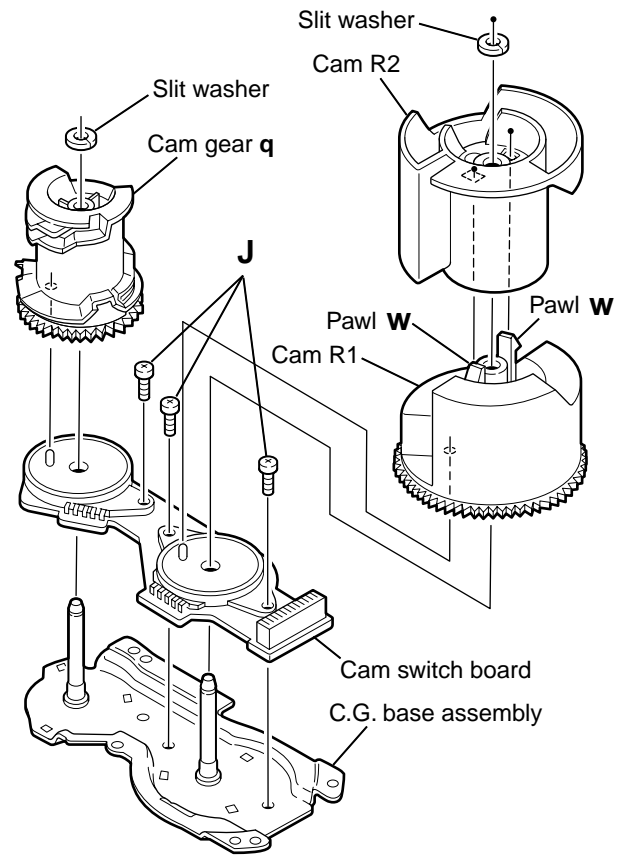


Fig.22

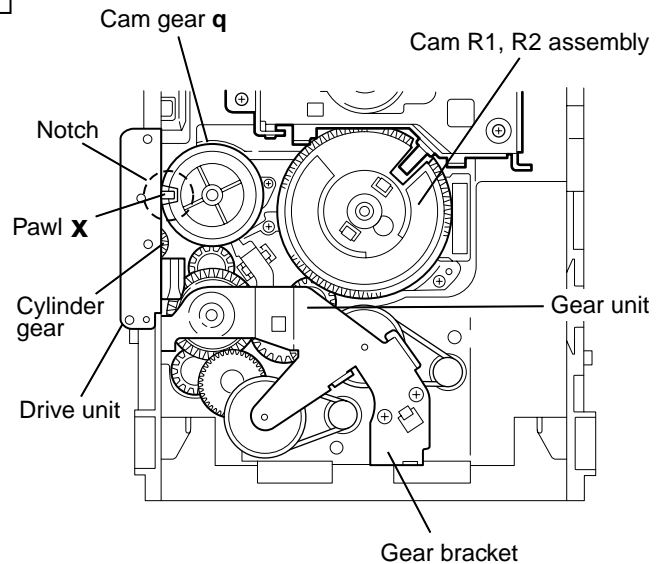


Fig.23

■ Removing the Pickup unit
(See Fig.24 and 25)

1. Turn the cam gear in the direction of the arrow to move the pickup unit toward the center.
2. Extend the guide shaft stopper in the direction of the arrow, move the guide shaft and pull out as shown in the figure.
3. Pull out the pickup unit from the joint a.

CAUTION: When reassembling, attach the pickup unit to the chassis base firmly at the joint a.

4. Release the four joint b on the back on the pickup unit to remove the CD rack.

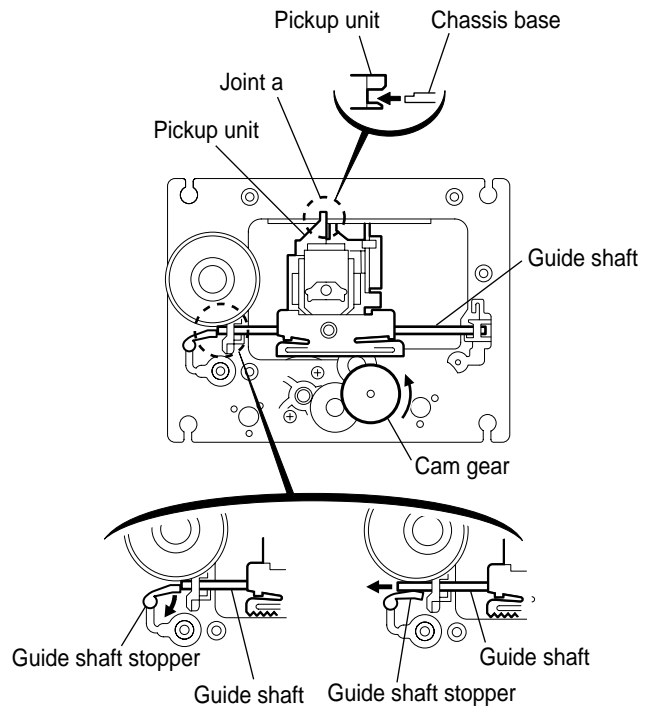


Fig.24

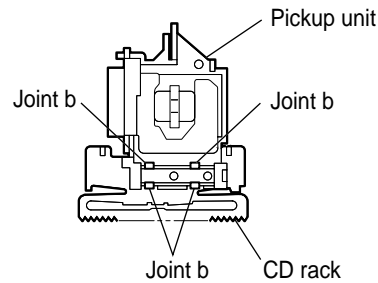


Fig.25

■ Removing the CD mechanism board
(See Fig.26)

1. On the back of the CD mechanism assembly, unsolder the four soldering c attaching the CD mechanism board, the spindle motor and the feed motor.
2. Removing the screw A.

■ Removing the Spindle motor/Feed motor
(See Fig.27)

• Prior to performing the following procedure, remove the CD mechanism board.

1. From the top side of the CD mechanism assembly, remove the two screws B and two screws C attaching the spindle motor and the feed motor respectively.

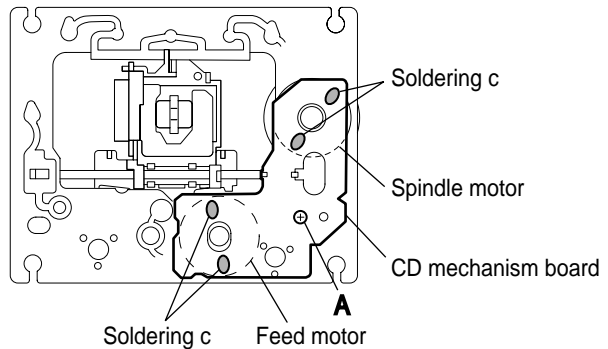


Fig.26

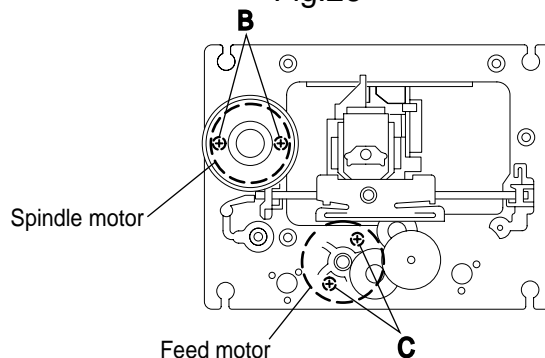


Fig.27

Adjustment method

■ Measurement Instruments Required for Adjustment

1. Low frequency oscillator
This oscillator should have a capacity to output 0dBs to 600 Ω at an oscillation frequency of 50Hz-20kHz.
2. Attenuator impedance : 600 Ω
3. Electronic voltmeter
4. Distortion meter
5. Frequency counter
6. Wow & flutter meter
7. Test tape
VTT703L : Head azimuth
VT712 : Tape speed and running unevenness (3kHz)
VT724 : Reference level (1kHz)
8. Blank tape
TYPE I : AC-225
TYPE II : AC-514
9. Torque gauge : For play and back tension
FWD(TW2111A), REV(TW2121a) and
FF/REW(TW2231A)
10. Test disc: CTS-1000

■ Measurement conditions

Power supply voltage
AC120V (60Hz) : Ver.J,C
Reference output : Speaker : 0.775V/4 Ω
: Headphone : 0.077V/32 Ω

Reference frequency and
input level ----- 1kHz, AUX : -8dBs
Measurement output terminal ----- at Speaker J3002
※ Load resistance ----- 4 Ω

● Radio Input signal

AM frequency ----- 400Hz
AM modulation ----- 30%
FM frequency ----- 400Hz
FM frequency deviation ----- 22.5kHz

● Tuner section

FM Band cover: 87.5~108.0MHz
AM Band cover: 531~1,710kHz(9kHz step)
530~1,710kHz(10kHz step)

Voltage applied to tuner ----- +B : DC5.7V
VT : DC 12V

Reference measurement
output ----- 26.1mV(0.28V)/3 Ω
Input positions ----- AM : Standard loop antenna
FM : TP1 (hot) and TP2 (GND)

● Standard measurement position of volume

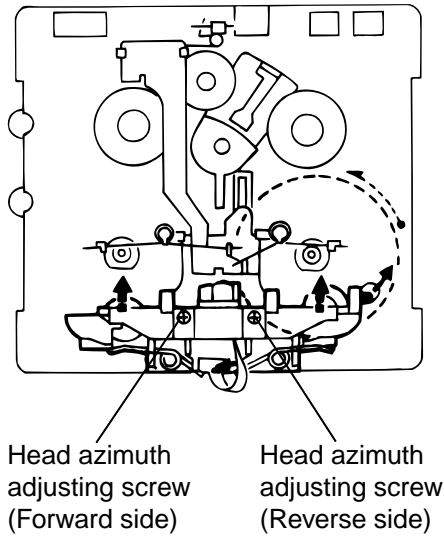
Function switch ----- to Tape
Beat cut switch ----- to Cut
Super Bass/Active hyper Bass ----- to OFF
Bass Treble ----- to Center
Adjustment of main volume to reference output
VOL : 28

Precautions for measurement

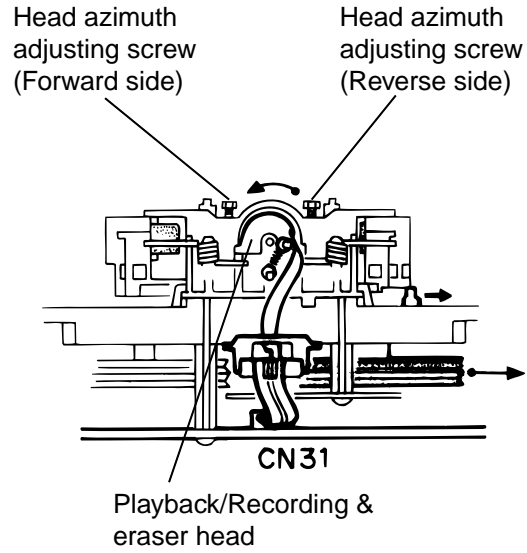
1. Apply 30pF and 33k Ω to the IF sweeper output side and 0.082 μ F and 100k Ω in series to the sweeper input side.
2. The IF sweeper output level should be made as low as possible within the adjustable range.
3. Since the IF sweeper is a fixed device, there is no need to adjust this sweeper.
4. Since a ceramic oscillator is used, there is no need to perform any MIX 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 carefully.
7. In the case of BTL connection amp., 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 BTL system.
8. For connecting a dummy resistor when measuring the output, use the wire with a greater code size.
9. Whenever any mixed tape is used, use the band pass filter (DV-12).

<<Arrangement of Adjusting Position>>

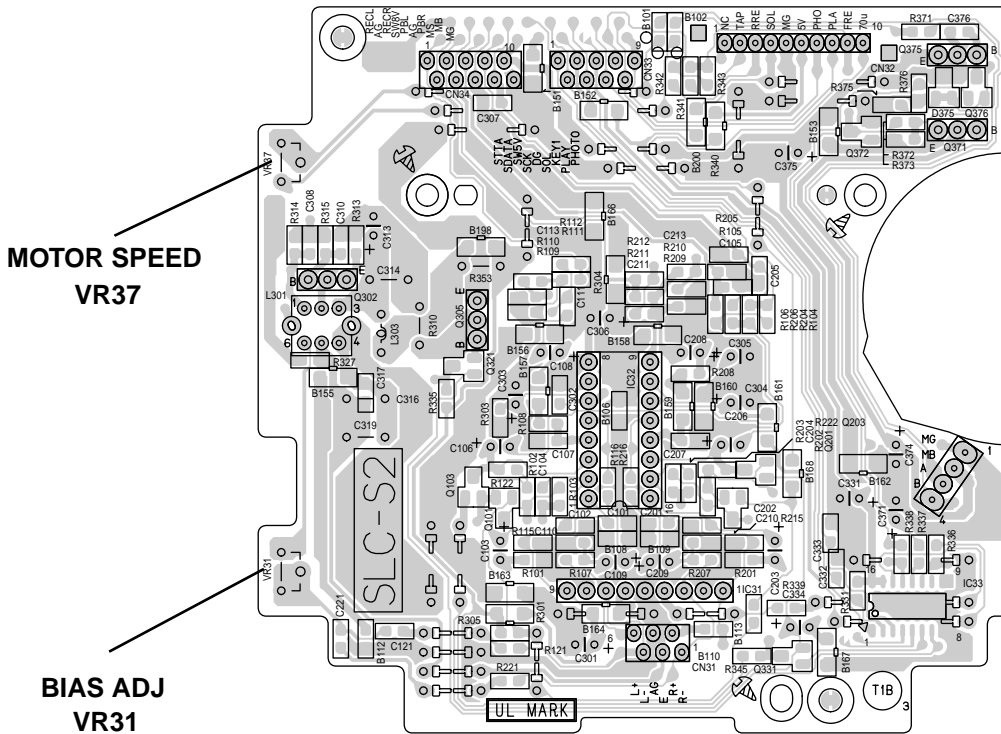
Cassette mechanism section



Cassette mechanism section (Back side)



Cassette AMP board



■ Tape Recorder Section

| Items | Measurement conditions | Measurement method | Standard Values | Adjusting positions |
|----------------------------|--|--|--------------------------------------|--|
| Confirmation of head angle | Test tape : VT703L (8kHz) Measurement output terminal : Speaker terminal Speaker R (Load resistance: 4Ω) : Headphone terminal | 1 Playback the test tape VT703L (8kHz) 2 With the recording & playback mechanism, adjust the head azimuth screw so that the forward and reverse output levels become maximum. After adjustment, lock the head azimuth at least by half turn. 3 In either case, this adjustment should be performed in both the forward and reverse directions with the head azimuth screw. | Maximum output | Adjust the head azimuth screw only when the head has been changed. |
| Confirmation of tape speed | Test tape : VT712 (3kHz) Measurement output terminal : Headphone terminal | Adjust VR37 so that the frequency counter reading becomes 2,940~3,090Hz ± when playing back the test tape VT712 (3kHz) with playback and recording mechanism after ending forward winding of the tape. | Tape speed of deck : 2,940 ~ 3,090Hz | VR37 |

■ Reference Values for Confirmation Items

| Items | Measurement conditions | Measurement method | Standard Values | Adjusting positions |
|--|--|--|----------------------|---------------------|
| Difference between the forward and reverse speed | Test tape : VT712 (3kHz) Measurement output terminal : Speaker terminal Speaker R (Load resistance: 4Ω) Measurement output terminal : Headphone | When the test tape VT712 (3kHz) has been played back with the recording and playback mechanism at the beginning of forward winding, the frequency counter reading of the difference between both of the mechanism should be 6.0Hz or less. | 6.0Hz or less | Head azimuth screw |
| Wow & flutter | Test tape : VT712 (3kHz) Measurement output terminal : Headphone terminal | When the test tape VT712 (3kHz) has been played back with the recording and playback mechanism at the beginning of forward winding, the frequency counter reading of wow & flutter should be 0.25% or less (WRMS). | 0.25% or less (WRMS) | |

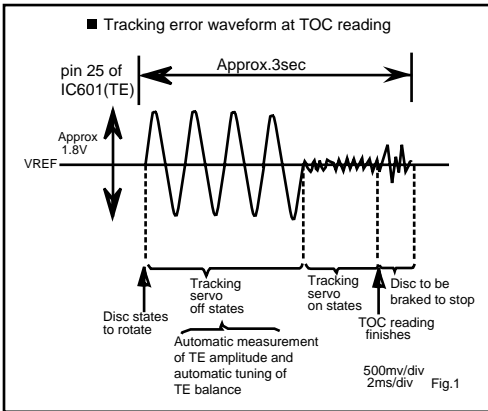
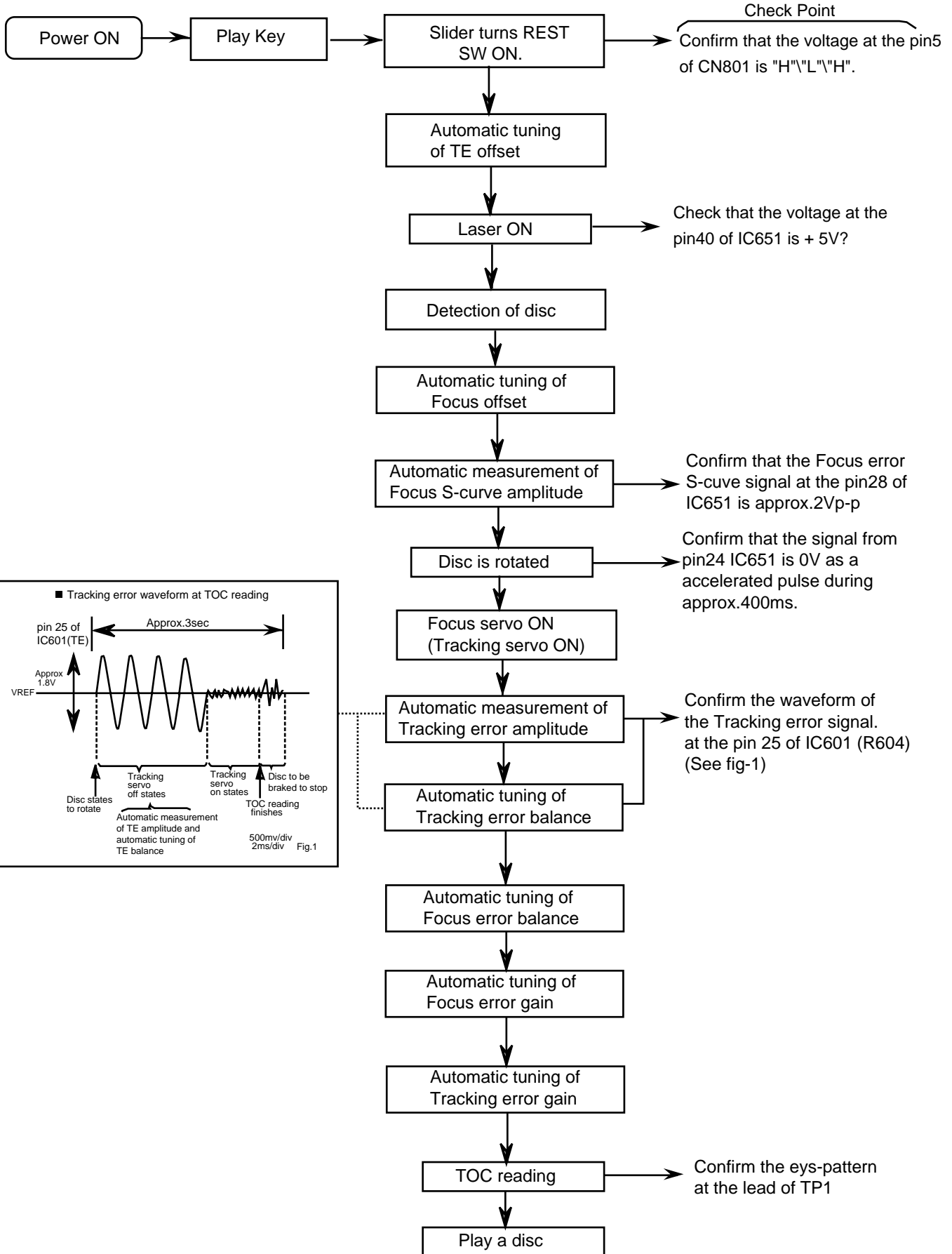
■ Electrical Performance

| Items | Measurement conditions | Measurement method | Standard Values | Adjusting positions |
|--|--|---|--|---------------------|
| Adjustment of recording bias current (Reference Value) | <ul style="list-style-type: none"> • Mode: Forward or reverse mode • Recording mode • Test tape : AC-514 to TYPE II and AC-225 to TYPE I Measurement output terminal : Both recording and headphone terminals | <ol style="list-style-type: none"> 1 With the recording and playback mechanism, load the test tapes (AC-514 to TYPE II and AC-225 to TYPE I), and set the mechanism to the recording and pausing condition in advance. 2 After connecting 100Ω in series to the recorder head, measure the bias current with a valve voltmeter at both of the terminals. 3 After resetting the [PAUSE] mode, start recording. At this time, adjust VR31 for Lch and VR32 for Rch so that the recording bias current values become 4.0 μA (TYPE I) and 4.20 μA (TYPE II). | AC-225 : 4.20 μA AC-514 : 4.0 μA | VR31 |
| Adjustment of recording and playback frequency characteristics | Reference frequency : 1kHz and 10kHz (REF.: -20dB) Test tape : AC-514 to TYPE II Measurement input terminal : OSC IN | <ol style="list-style-type: none"> 1 With the recording and playback mechanism, load the test tapes (AC-514 to TYPE II), and set the mechanism to the recording and pausing condition in advance. 2 While repetitively inputting the reference frequency signal of 1kHz and 10kHz from OSC IN, record and playback the tape. 3 While recording and playback the test tape in TYPE II , adjust VR31 for Lch and VR32 for Rch so that the output deviation between 1kHz and 10kHz becomes -1dB±2dB. | Output deviation between 1kHz and 10kHz : -1dB±2dB | VR31 |

■ Reference Values for Electrical Function Confirmation Items

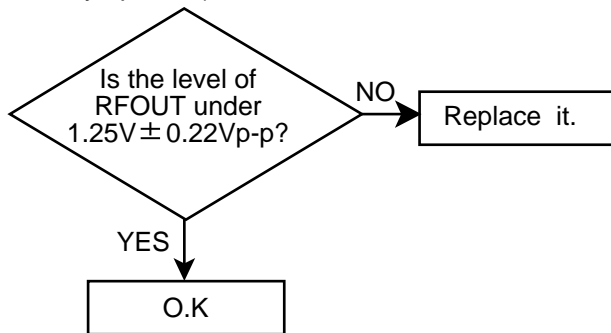
| Items | Measurement conditions | Measurement method | Standard Values | Adjusting positions |
|----------------------------------|--|--|------------------------------------|---------------------|
| Recording bias frequency | Forward or reverse <ul style="list-style-type: none"> • Test tape : TYPE II (AC-514) • Measurement terminal : BIAS TP on P.C. board | <ol style="list-style-type: none"> 1 While changing over to and from BIAS 1 and 2, confirm that the frequency is changed. 2 With the recording and playback mechanism, load the test tape. (AC-514 to TYPE II), and set the mechanism to the recording and pausing condition in advance. 3 Confirm that the BIAS TP frequency on the P.C. board is 100kHz ± 6kHz. | 100 kHz ± 6 kHz | |
| Eraser current (Reference value) | Forward or reverse <ul style="list-style-type: none"> • Recording mode • Test tape : AC-514 to TYPE II and AC-225 to TYPE I Measurement terminal : Both of the eraser head terminals | <ol style="list-style-type: none"> 1 While recording and playback mechanism, load the test tapes (AC-514 to TYPE II and AC-225 to TYPE I), and set the mechanism to the recording and pausing conditions in advance. 2 After setting to the recording conditions, connect 1W in series to the eraser head on the recording and playback mechanism side, and measure the eraser current from both of the eraser terminals. | TYPE II : 120 mA TYPE I : 75 mA | |

Flow of functional operation until TOC read

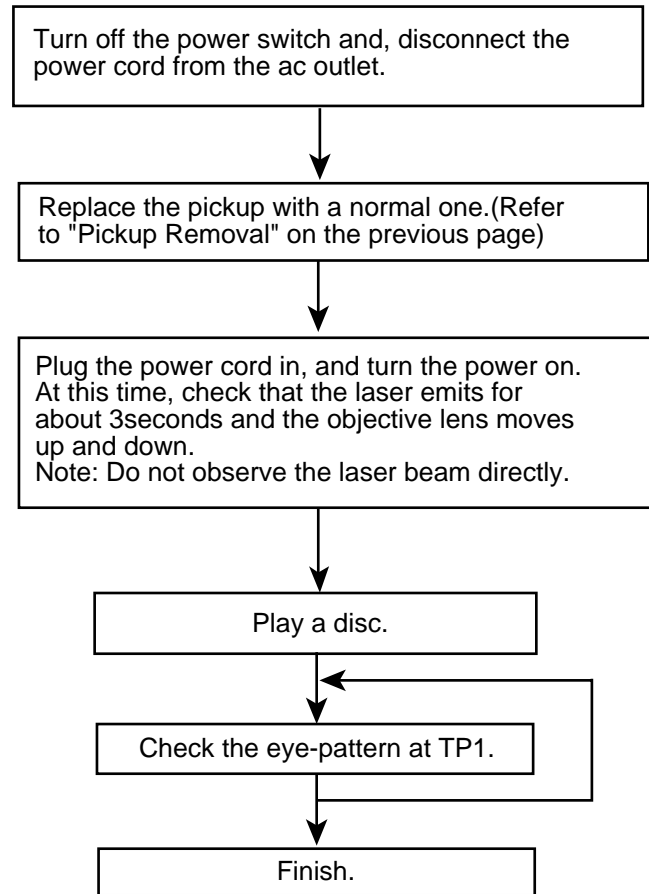


Maintenance of laser pickup

- (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.

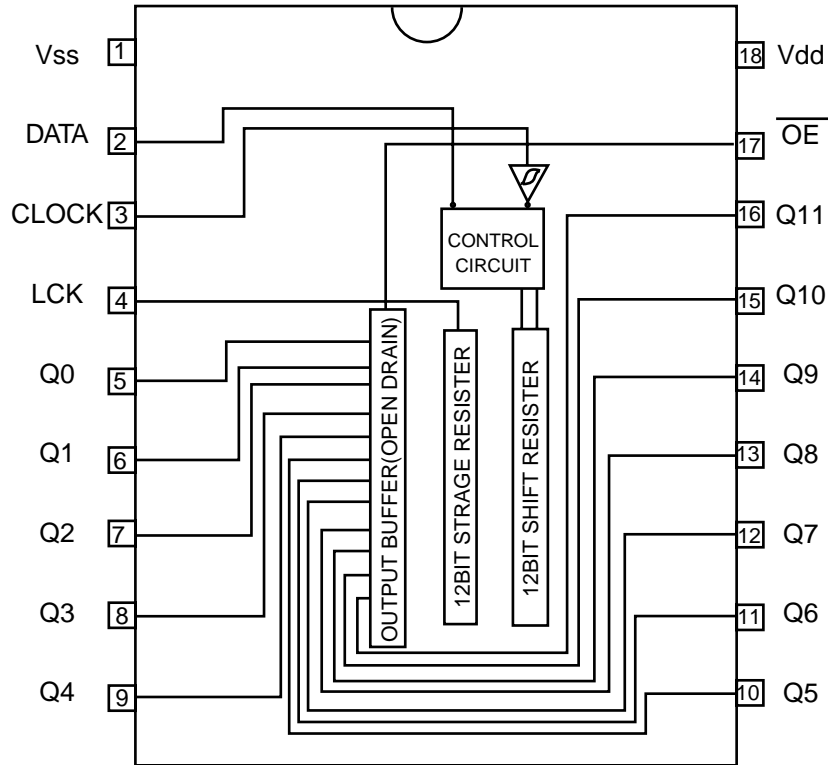
If the laser power is lower than the specified value, the laser diode is almost worn out, and the laser pickup should be replaced.

If the semi-fixed resistor is adjusted while the pickup is functioning normally, the laser pickup may be damaged due to excessive current.

Description of major ICs

■ BU2092(IC811): EXT IC

1. Terminal Layout

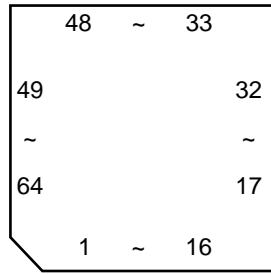


2.Pin Function

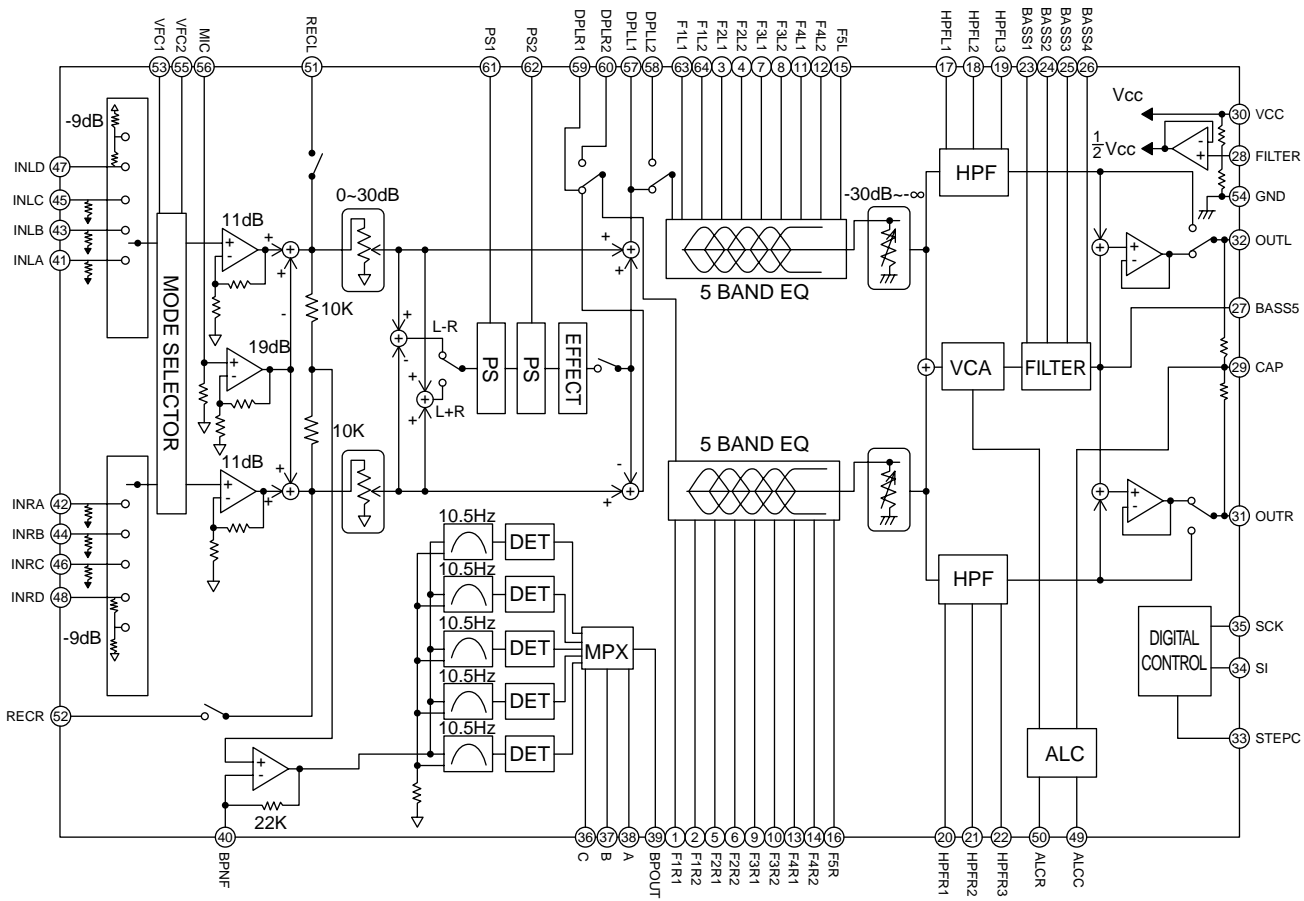
| Pin No. | Symbol | I/O | Function | | | | | | |
|------------|------------------------|-----|---|------------|---|---|--------|----|-----|
| 1 | Vss | - | Connect to GND | | | | | | |
| 2 | DATA | I | Serial Data input | | | | | | |
| 3 | CLOCK | I | Shift Clock of Data | | | | | | |
| 4 | LCK | I | Latch Clock of Data | | | | | | |
| 5~16 | Q0~Q11 | O | Parallel Data Output <table border="1" style="margin-left: 20px;"> <tr> <td>Latch Data</td> <td>L</td> <td>H</td> </tr> <tr> <td>OUTPUT</td> <td>ON</td> <td>OFF</td> </tr> </table> | Latch Data | L | H | OUTPUT | ON | OFF |
| Latch Data | L | H | | | | | | | |
| OUTPUT | ON | OFF | | | | | | | |
| 17 | $\overline{\text{OE}}$ | I | Output Enable | | | | | | |
| 18 | Vdd | - | Power Supply | | | | | | |

■ BH3874AKS2 (IC434) : Volume

1. Pin layout



2. Block diagram

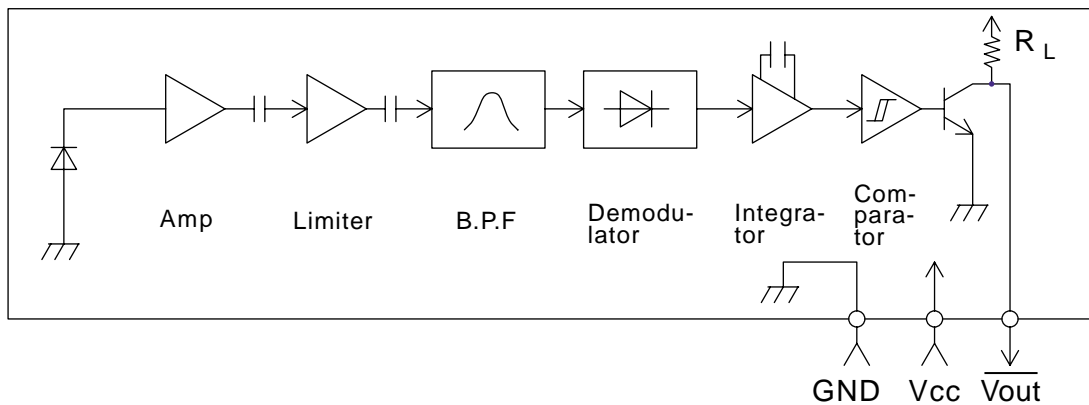


3. Pin function

| Pin NO. | Name | Function | Pin NO. | Name | Function |
|---------|--------|---|---------|-------|-------------------------------------|
| 1 | F1R1 | Rch GREQ f1 filter setting pin | 34 | SI | Serial data larch receiving pin |
| 2 | F1R2 | Rch GREQ f1 filter setting pin | 35 | SCK | Serial clock receiving pin |
| 3 | F2L1 | Lch GREQ f2 filter setting pin | 36 | C | Parallel data receiving pin |
| 4 | F2L2 | Lch GREQ f2 filter setting pin | 37 | B | Parallel data receiving pin |
| 5 | F2R1 | Rch GREQ f2 filter setting pin | 38 | A | Parallel data receiving pin |
| 6 | F2R2 | Rch GREQ f2 filter setting pin | 39 | BPOUT | Output pin for spectrum analyzer |
| 7 | F3L1 | Lch GREQ f3 filter setting pin | 40 | BPNF | Spectrum analyzer level setting pin |
| 8 | F3L2 | Lch GREQ f3 filter setting pin | 41 | INLA | Lch input pin A |
| 9 | F3R1 | Rch GREQ f3 filter setting pin | 42 | INRA | Rch input pin A |
| 10 | F3R2 | Rch GREQ f3 filter setting pin | 43 | INLB | Lch input pin B |
| 11 | F4L1 | Lch GREQ f4 filter setting pin | 44 | INRB | Rch input pin B |
| 12 | F4L2 | Lch GREQ f4 filter setting pin | 45 | INLC | Lch input pin C |
| 13 | F4R1 | Rch GREQ f4 filter setting pin | 46 | INRC | Rch input pin C |
| 14 | F4R2 | Rch GREQ f4 filter setting pin | 47 | INLD | Lch input pin D |
| 15 | F5L | Lch GREQ f5 filter setting pin | 48 | INRD | Rch input pin D |
| 16 | F5R | Rch GREQ f5 filter setting pin | 49 | ALCC | Time constant of ALC setting pin |
| 17 | HPFL1 | Lch high-pass filter setting pin | 50 | ALCR | ALC level setting pin |
| 18 | HPFL2 | Lch high-pass filter setting pin | 51 | RECL | Lch RECOUT output pin |
| 19 | HPFL3 | Lch high-pass filter setting pin | 52 | RECR | Rch RECOUT output pin |
| 20 | HPFR1 | Rch high-pass filter setting pin | 53 | VFC1 | Vocal fade filter setting pin |
| 21 | HPFR2 | Rch high-pass filter setting pin | 54 | GND | Ground pin |
| 22 | HPFR3 | Rch high-pass filter setting pin | 55 | VFC2 | Vocal fade filter setting pin |
| 23 | BASS1 | Dynamic bass filter setting pin | 56 | MIC | Input pin for microphone |
| 24 | BASS2 | Dynamic bass filter setting pin | 57 | DP1L1 | Lch output pin for DPL |
| 25 | BASS3 | Dynamic bass filter setting pin | 58 | DP1L2 | Lch input pin for DPL |
| 26 | BASS4 | Dynamic bass filter setting pin | 59 | DP1R1 | Rch output pin for DPL |
| 27 | BASS5 | Biamp output pin | 60 | DP1R2 | Rch input pin for DPL |
| 28 | FILTER | VCC/2 pin | 61 | PS1 | Surround setting pin |
| 29 | CAP | ALC trap frequency setting pin | 62 | PS2 | Surround setting pin |
| 30 | VCC | Power supply pin | 63 | F1L1 | Lch GREQ f1 filter setting pin |
| 31 | OUTR | Rch output pin | 64 | F1L2 | Lch GREQ f1 filter setting pin |
| 32 | OUTL | Lch output pin | | | |
| 33 | STPEPC | Time conatant attachment for switching shook protection | | | |

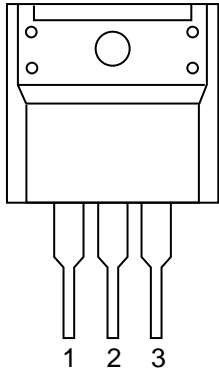
■ GP1UM271XK (IC951) : Remote control Sensor

1. Block diagram



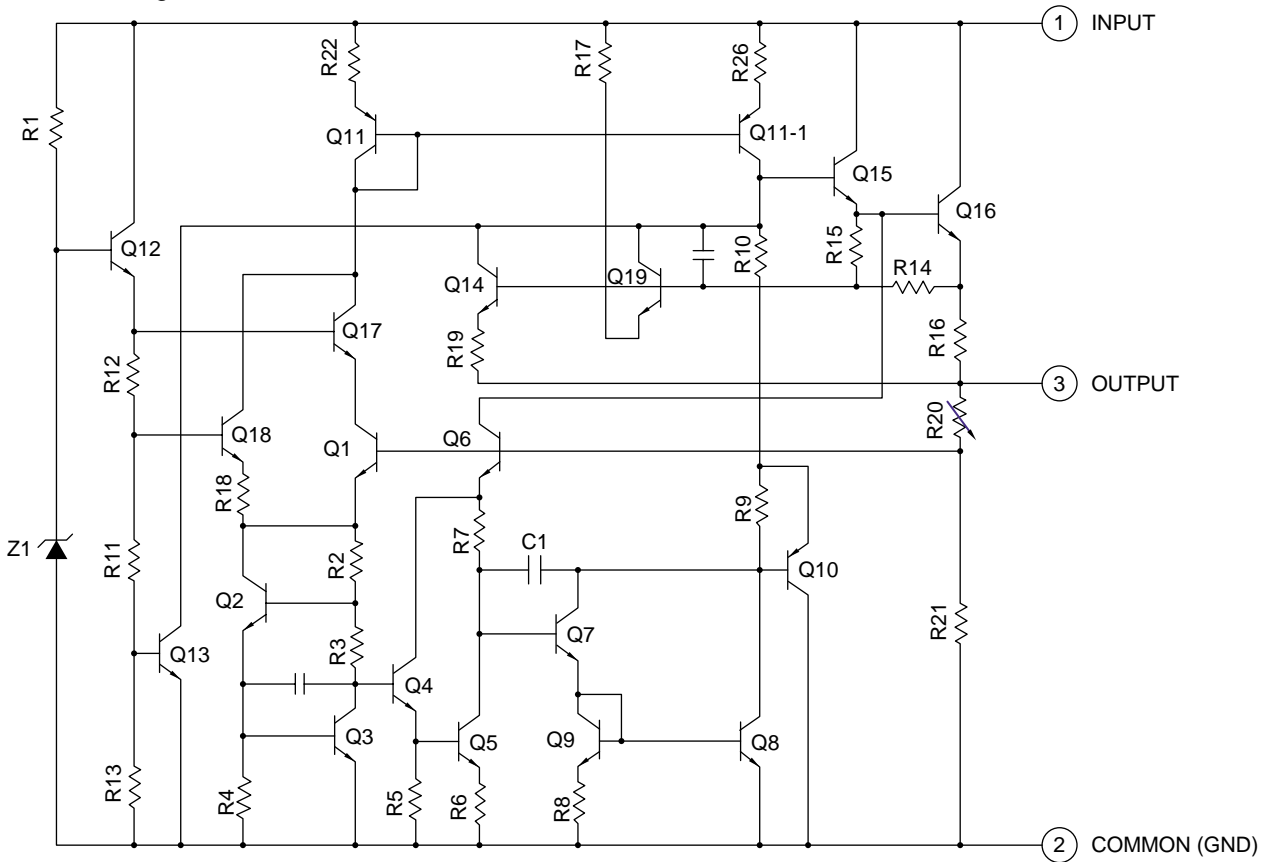
■ KIA7808API (IC303) : Regulator

1. Pin layout



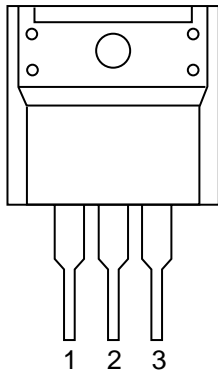
- 1.VCC
- 2.GND
- 3.OUTPUT

2.Block diagram



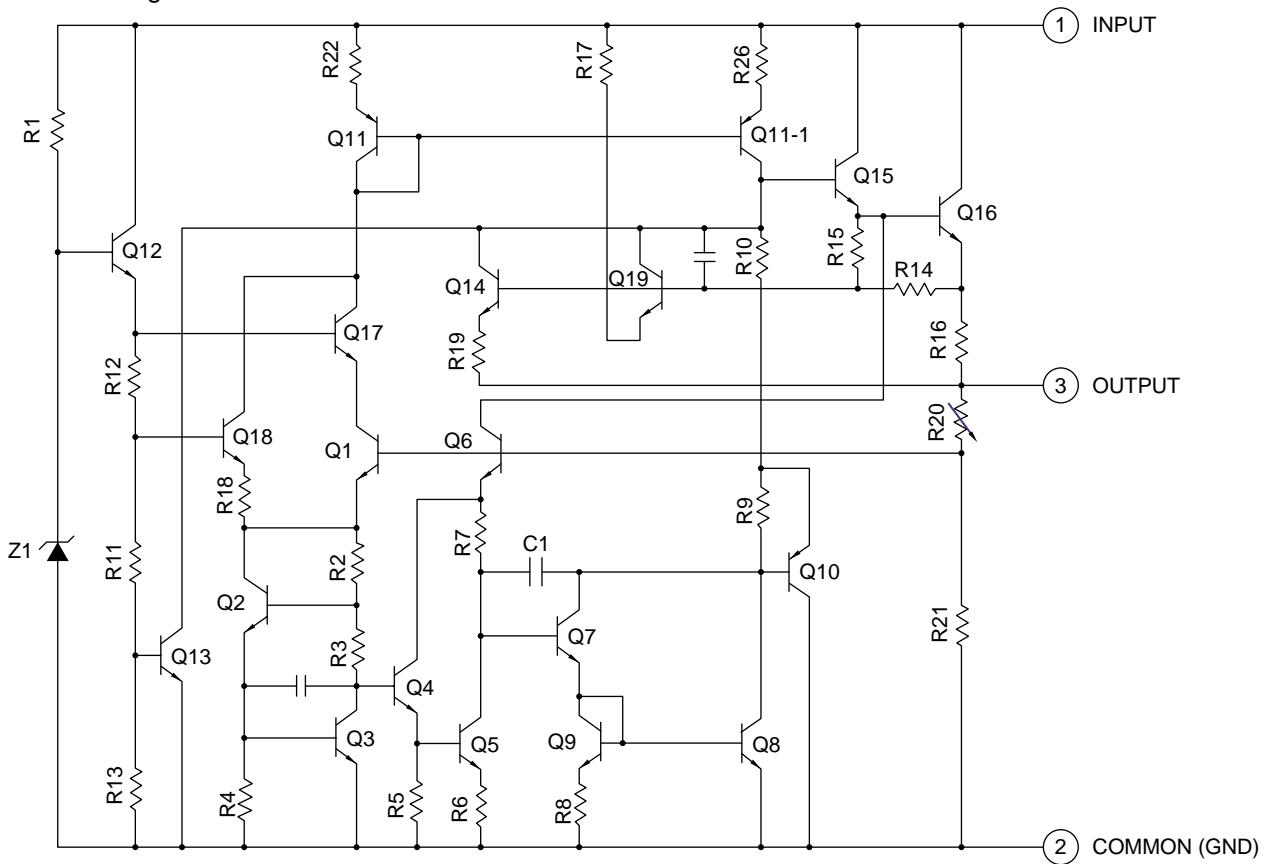
■ KIA7812API (IC240) : Regulator

1. Pin layout



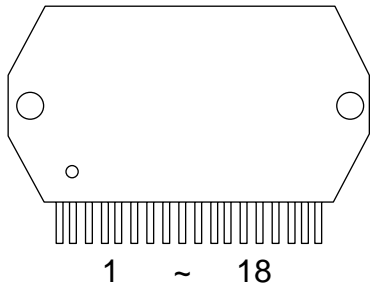
- 1.VCC
- 2.GND
- 3.OUTPUT

2.Block diagram

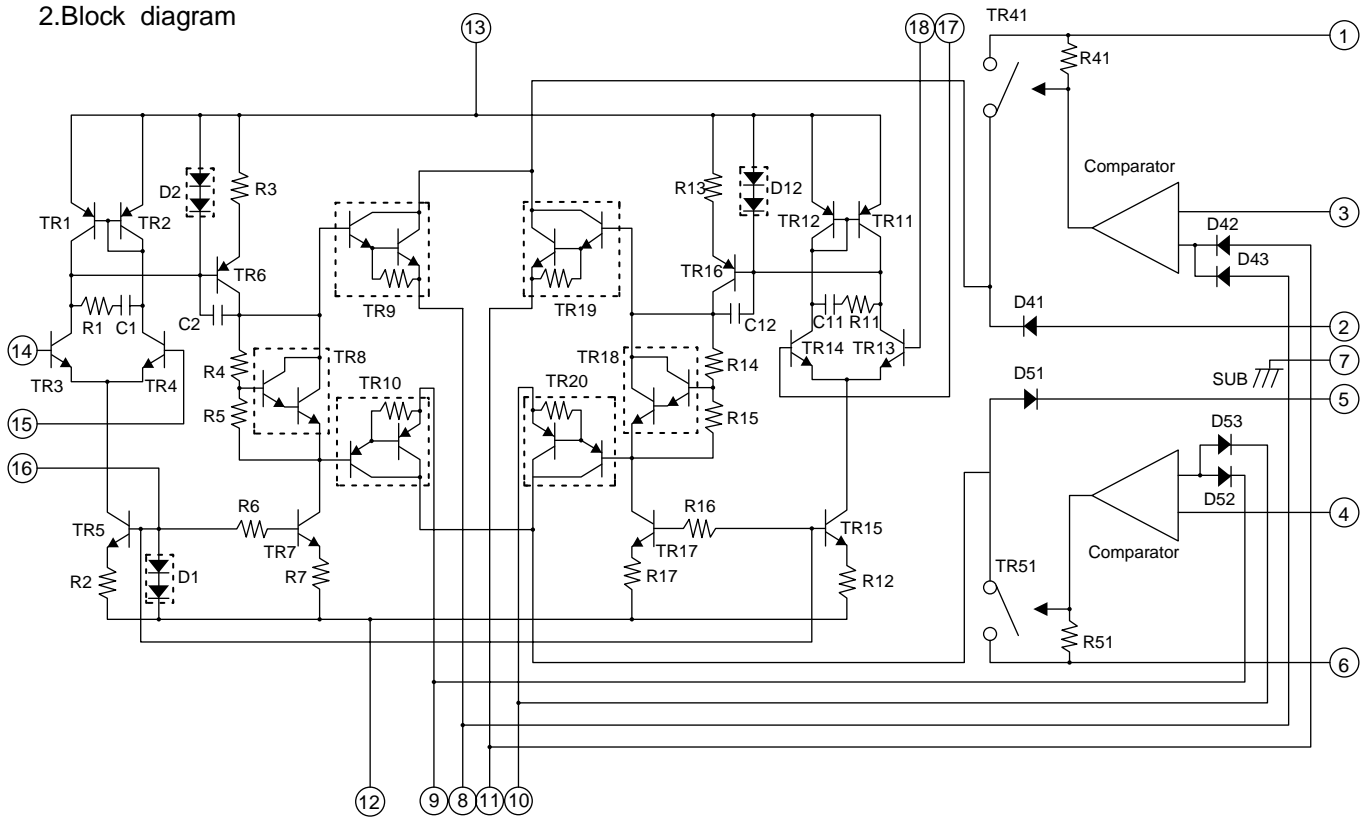


■ STK412-020 (IC701) : SW power IC

1.Pin layout

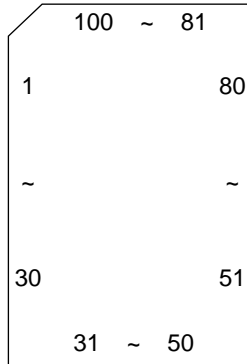


2.Block diagram



■ UPD784975AGF305 (IC810) : Main micon

1. Pin layout

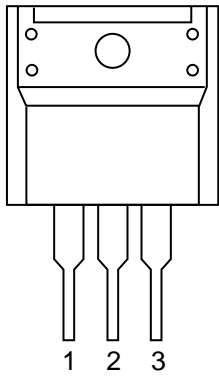


2. Pin function

| Pin NO. | Name | I/O | Function | Pin NO. | Name | I/O | Function |
|---------|----------|-----|--|---------|---------|-----|-------------------------------|
| 1 | AVDD | - | AD VDD, same as VDD1 | 36 | SPI A | I/O | SPI A data |
| 2 | SPIDTI | I | SPI analog input | 37 | SPI B | I/O | SPI B data |
| 3 | MSI | I | Music scan input | 38 | SPI C | I/O | SPI C data |
| 4 | MPX | I | Tuner stereo indicator | 39 | PBMUTE | I/O | Playback mute |
| 5 | H/P | I | SW vol IC btw bi-amp & dyn & off relay | 40 | VSS0 | - | GND |
| 6 | KEY1 | I | Key 1 input | 41 | VDD0 | - | Power supply |
| 7 | KEY2 | I | Key 2 input | 42 | RESET | I | Micom reset |
| 8 | KEY3 | I | Key 3 input | 43 | INH | I/O | Back-up mode detect |
| 9 | VOL- | I | Volume decrease | 44 | LATCH | I/O | Latch for vol IC |
| 10 | VOL+ | I | Volume increase | 45 | VOLDA | I/O | Volume data |
| 11 | SLCPLAY | I | SLC detect play | 46 | VOLCK | I/O | Volume clock |
| 12 | SLCKEY | I | SLC key input | 47 | RELAY | I/O | Relay out |
| 13 | PHOTO | I | SLC photo | 48 | POUT | I/O | Power on |
| 14 | AVSS | - | AD VDD, same as VSS1 | 49 | ECON | I/O | Ecology mode |
| 15 | VSS1 | - | GND | 50 | PRT | I/O | Protector in |
| 16 | X1 | I | Oscillation | 51 | AUXMUTE | O | Auxmute |
| 17 | X2 | - | Oscillation | 52 | TUCE | O | Tuner chip enable |
| 18 | VDD1 | - | Powersupply | 53 | NC | O | Available pin |
| 19 | ICVPP | - | Connect to VSS1 | 54 | NC | O | Available pin |
| 20 | VC3RESET | I/O | VC3 reset | 55 | EXTDA | O | External IC data |
| 21 | MSTAT | I/O | VC3 status input | 56 | EXTCK | O | External IC clock |
| 22 | KCMND | I/O | VC3 KCMND(serial data) | 57 | EXTCE | O | External IC strobe |
| 23 | RDSDA | I/O | RDS data | 58 | OEEXT | O | Output enable for external IC |
| 24 | RDSCK | INT | RDS clock | 59 | VOLLED | I/O | Volume led |
| 25 | BUZZER | I/O | Buzzer on | 60 | FSEARCH | I/O | Forward skip |
| 26 | REMIN | INT | Remocon input | 61 | RSEARCH | I/O | Reverse skip |
| 27 | SMUTE | I/O | System mute | 62~78 | S21~S5 | I/O | FL segment |
| 28 | SLCCE | I/O | SLC chip enable | 79 | VDD2 | - | Power supply |
| 29 | CK | I/O | SLC / tuner clock | 80 | VLOAD | I/O | Negative power supply(-30V) |
| 30 | DATAOUT | I/O | SLC / tuner data out | 81~84 | S4~S1 | I/O | FL segment |
| 31 | DATAIN | I/O | Tuner data in | 85~100 | G16~G1 | I/O | FL display grid |
| 32 | SM- | I/O | Soundmode reverse | | | | |
| 33 | SM+ | I/O | Soundmode forward | | | | |
| 34 | ECHO1 | I/O | Echo 1 data | | | | |
| 35 | ECHO2 | I/O | Echo 2 data | | | | |

■ KIA7805API (IC360) : Regulator

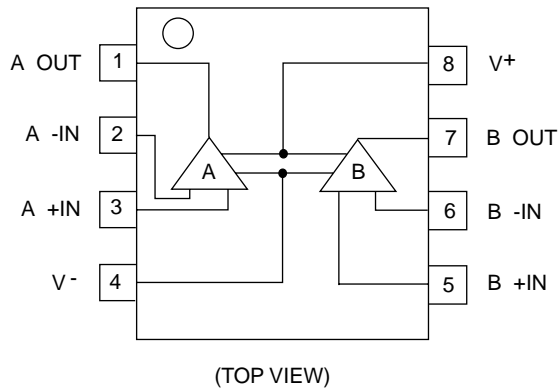
1. Terminal layout



- 1.VCC
- 2.GND
- 3.OUTPUT

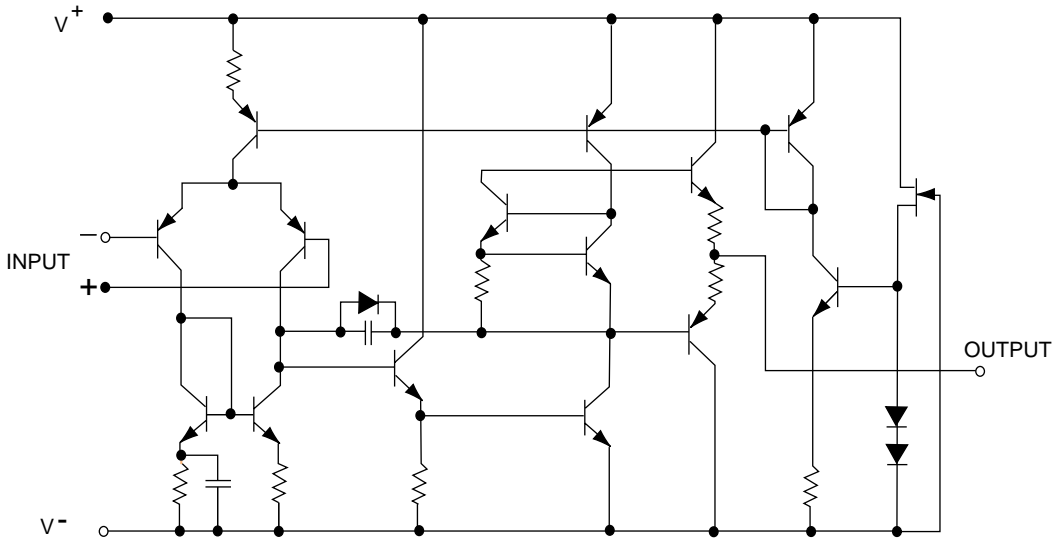
■ NJM4580D (IC501,IC502,IC571) : Input amp, AHB control

1.Terminal layout



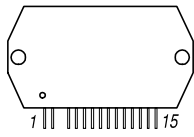
(TOP VIEW)

2.Block diagram

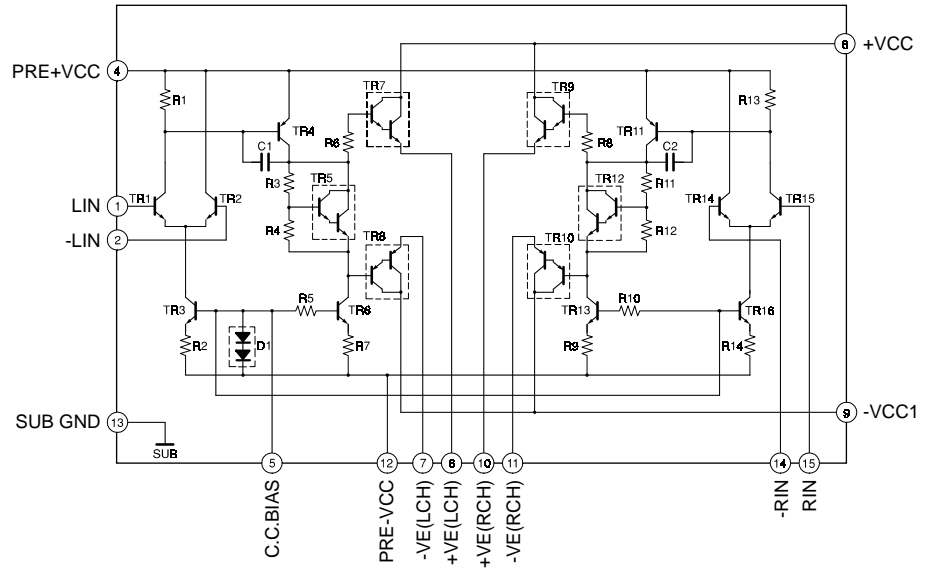


■ STK402-070 (IC602) : Main power IC

1. Terminal layout



2. Block diagram





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