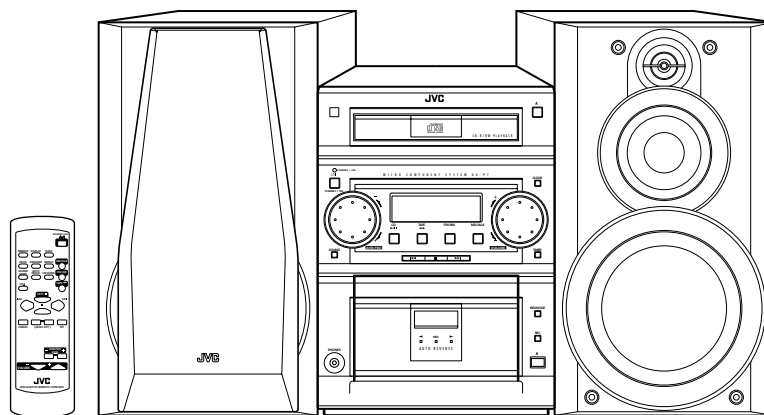


# JVC

# SERVICE MANUAL

## MICRO COMPONENT SYSTEM

### UX-P7



SP-UXP7

CA-UXP7

SP-UXP7



#### Area Suffix

|    |       |              |
|----|-------|--------------|
| A  | ..... | Australia    |
| UF | ..... | China        |
| UP | ..... | Korea        |
| US | ..... | Singapore    |
| UW | ..... | South Africa |
| UY | ..... | Argentina    |

#### Contents

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## Safety Precautions

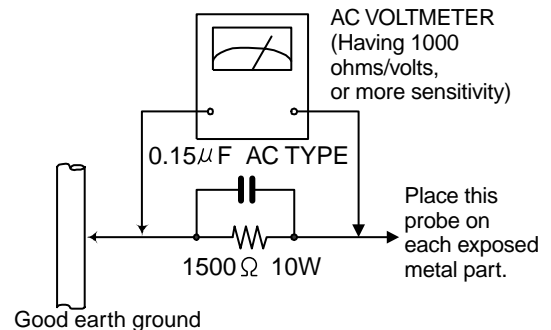
1. This design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the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


When replacing them, be sure to use the parts of the same type and rating as specified by the manufacturer. (Except the 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**

1. Service should be performed by qualified personnel only.
2. This equipment has been designed and manufactured to meet international safety standards.
3. It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
4. Repairs must be made in accordance with the relevant safety standards.
5. It is essential that safety critical components are replaced by approved parts.
6. 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.

## Preventing 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.

### 1.1. Grounding to prevent damage by static electricity

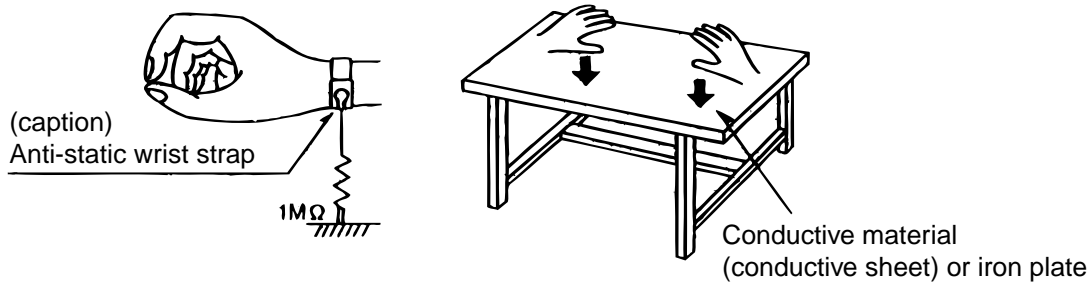
Static electricity in the work area can destroy the optical pickup (laser diode) in devices such as DVD players. Be careful to use proper grounding in the area where repairs are being performed.

#### 1.1.1. Ground the workbench

1. 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.

#### 1.1.2. Ground yourself

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



#### 1.1.3. 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.

### 1.2. 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.

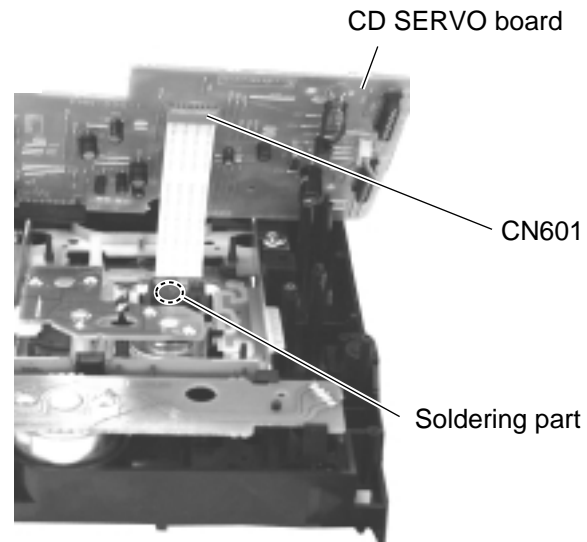
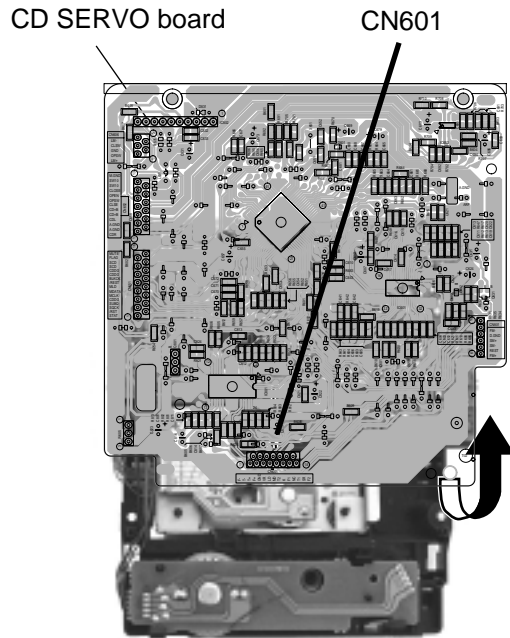
3. Handle the flexible cable carefully as it may break when subjected to strong force.

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

### 1.3. Cautions on removing the CD traverse unit

\* For removing the CD traverse unit in detail, refer to the "Adjustment Method" section of this manual.

1. Before disconnecting the flexible wire from the connector CN601 on the CD SERVO board, solder the part shown in the figure below.  
(Note: If the flexible wire is disconnected from the CN601 without presoldering, it may cause breakdown of the CD pickup assembly.)
2. When reassembling the CD traverse unit, be sure to remove the solder from the soldered part after reconnecting the flexible wire to the CN601.



# Important for laser products

**1.CLASS 1 LASER PRODUCT**

**2.DANGER :** Invisible laser radiation when open and inter lock 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 laserstråling 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 laserstråling ved åbning , når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

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

## REPRODUCTION AND POSITION OF LABELS



**WARNING LABEL**

CLASS 1  
LASER PRODUCT

# Disassembly method

## <Main body>

### ■ Removing the metal cover

(See Fig.1 and 2)

1. Remove the six screws **A** on the back of the body.
2. Remove the two screws **B** on the side of the body.
3. Pull both sides of the metal cover outward and lift the rear part of the cover.

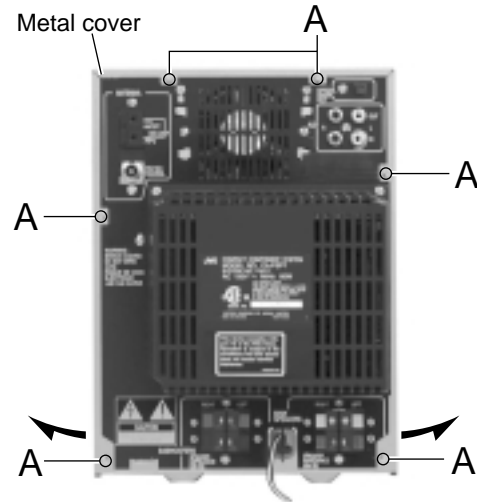


Fig.1

### ■ Removing the rear cover (See Fig.3)

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

1. Remove the two screws **C** on the back of the body.

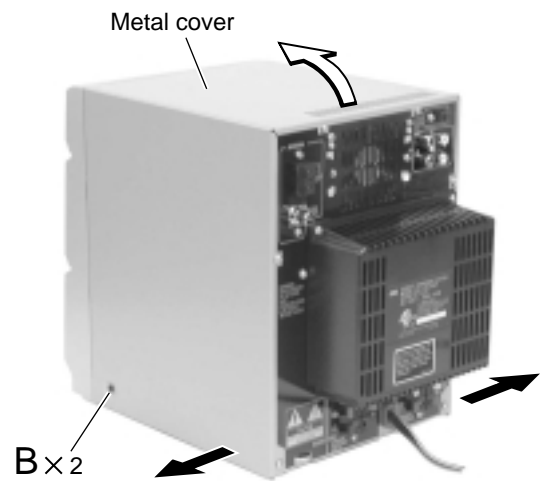


Fig.2

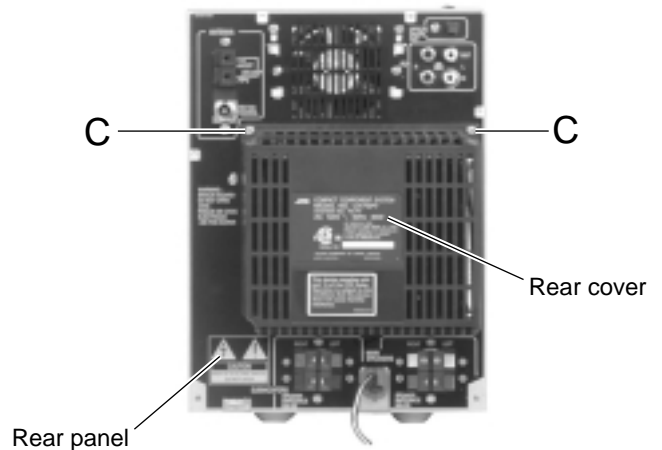


Fig.3

**■ Removing the tuner board**  
**(See Fig.4 and 5)**

- Prior to performing the following procedure, remove the metal cover.
1. Disconnect the card wire from connector CN1 on the tuner board.
  2. Remove the screw **D** on the right side of the body.
  3. Remove the two screws **E** on the rear panel.

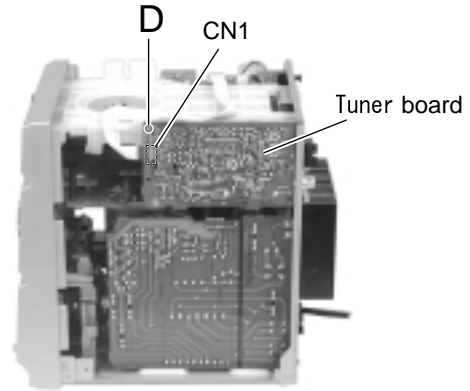


Fig.4

**■ Removing the CD mechanism assembly**  
**(See Fig.6 to 8)**

- Prior to performing the following procedure, remove the metal cover and the rear cover.
1. Disconnect the card wires from connector CN903, CN904 and the wire from CN905 on the main board on the upper side of the body.
  2. Remove the screw **D** attaching the tuner board and the CD mechanism on the right side of the body.
  3. Remove the two screws **F** attaching the rear panel and the CD mechanism on the back of the body.
  4. Move the rear part of the CD mechanism assembly upwards to disengage the two joints **a** and release from the rear panel.

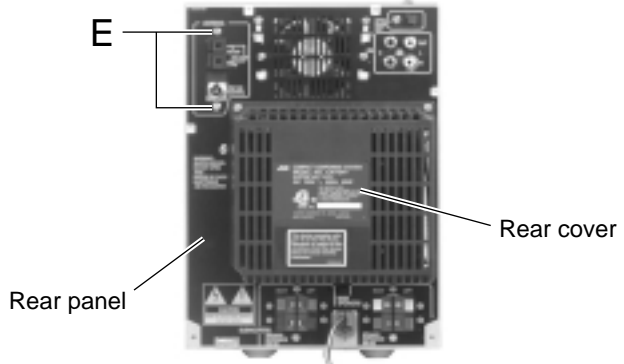


Fig.5

Pull the front panel toward the front and move the rear part of the CD mechanism assembly upwards. Then pull out the CD mechanism assembly from the front panel backward.

REFERENCE: To remove the CD mechanism assembly efficiently, disconnect the card wire connecting the tuner board with the main board in advance.

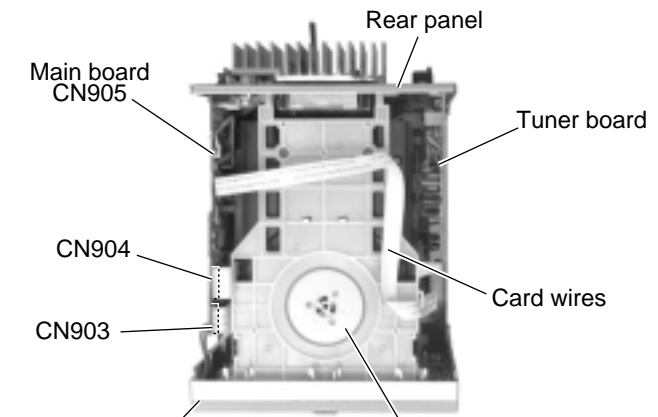


Fig.6

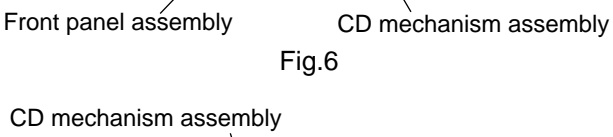


Fig.7



**Remove the rear panel (See Fig.8 to 11)**

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

1. Remove the nine screws **G** attaching the rear panel.
2. Disconnect the wire from connector CN908 and the card wire from CN902 on the main board.
3. Disengage the lower two joints **b** on each side of the rear panel using a screwdriver and remove the rear panel backward (The tuner board and the fan will be also detached. Remove them as needed).

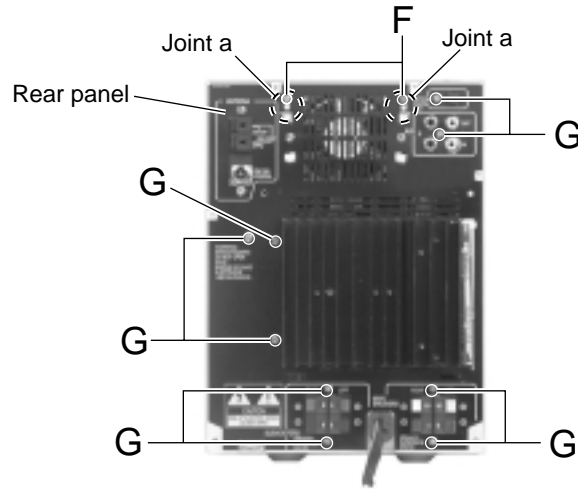


Fig.8

**Removing the fan (See Fig.9 and 12)**

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

1. Disconnect the wire from connector CN908 on the main board.
2. Remove the two screws **H** on the back of the body.
3. Move the fan upwards to disengage the four joints **c** and release from the rear panel.

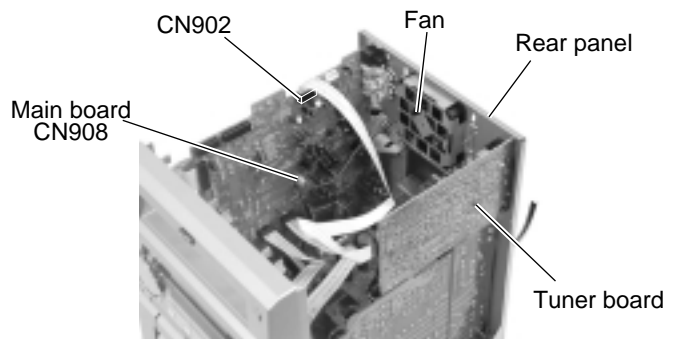


Fig.9

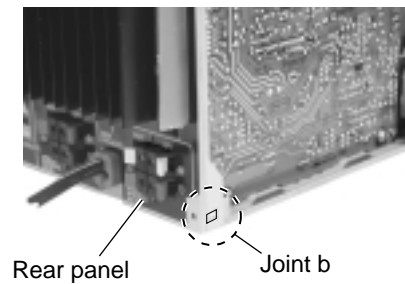


Fig.10

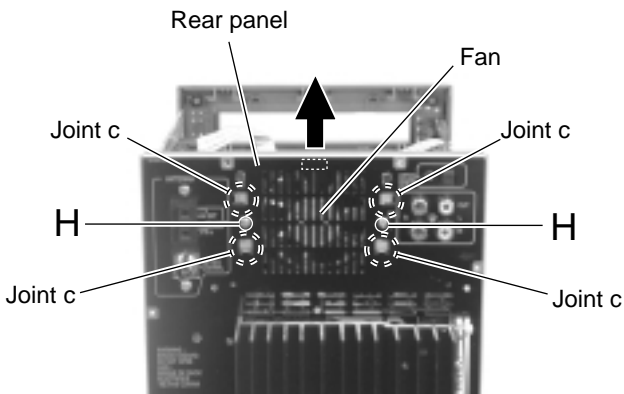


Fig.12

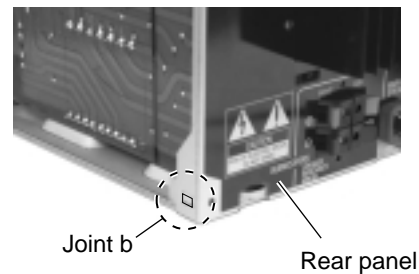


Fig.11

**■ Removing the power amplifier board / power amplifier sub board / main board / heat sink (See Fig.13 to 21)**

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

1. Disconnect the card wire from connector CN900, CN901, CN933 and CN931 on the main board respectively.
2. Disconnect the wire from connector CN950 and CN951 on the power supply board.
3. Remove the two screws **I** on the right side of the body.
4. Move the boards and heat sink assembly upwards and disengage the joint **d** and the two joints **e** to release the power amplifier board and the main board from the chassis (Refer to Fig.15 and 16).

Move the rear part of the board and heat sink assembly to the right side.

**CAUTION:** The wire extending from the lower side of the main board is still connected with the body (Refer to Fig.17).

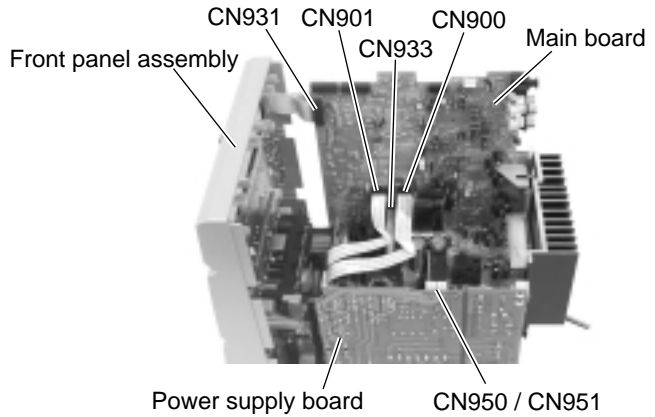


Fig.13

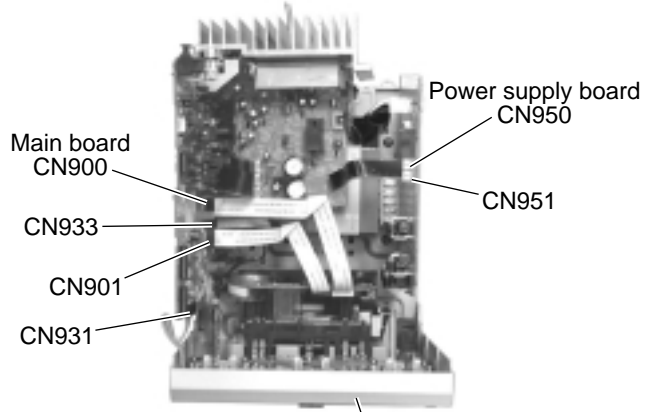


Fig.14

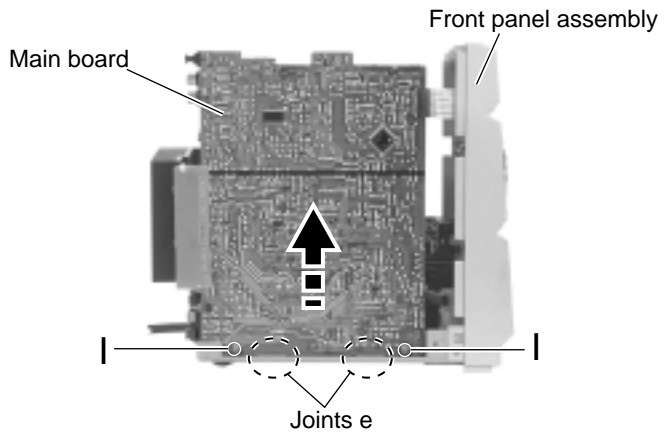


Fig.15

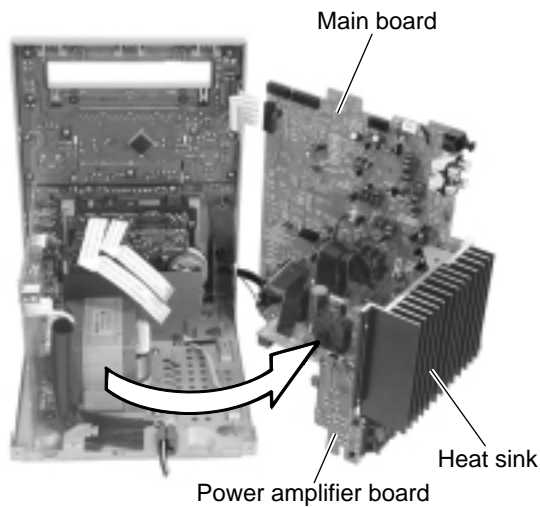


Fig.17

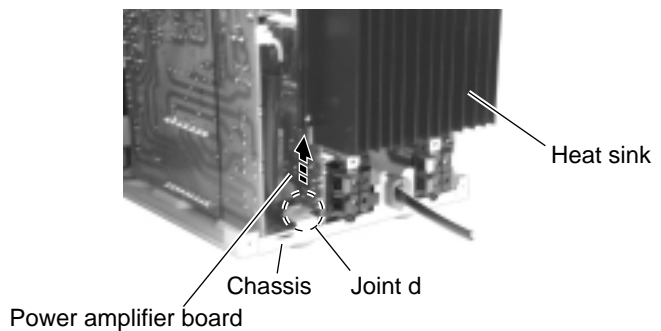


Fig.16

5. Disconnect the wire from connector CN906 and W950 on the lower side of the main board (Refer to Fig.18).

**●Removing the power amplifier board  
(See Fig.19 and 21)**

6. Disconnect the power amplifier board from connector CN941 on the power amplifier sub board.

**●Removing the power amplifier sub board (See Fig.19 to 21)**

7. Disconnect the two wires from connector CN944, CN945, CN946 and CN947 on the power amplifier sub board.

8. Remove the two screws **J** attaching the power amplifier sub board and the heat sink.

**●Removing the main board  
(See Fig.19 to 21)**

9. Disconnect the wires from connector CN944, CN945, CN946 and CN947 on the power amplifier sub board.

10. Remove the two screws **K** attaching the main board and the heat sink.

REFERENCE: The power amplifier board, the power amplifier sub board, the main board and the heat sink can be removed respectively.

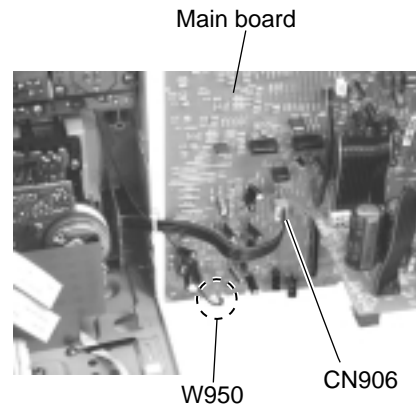


Fig.18

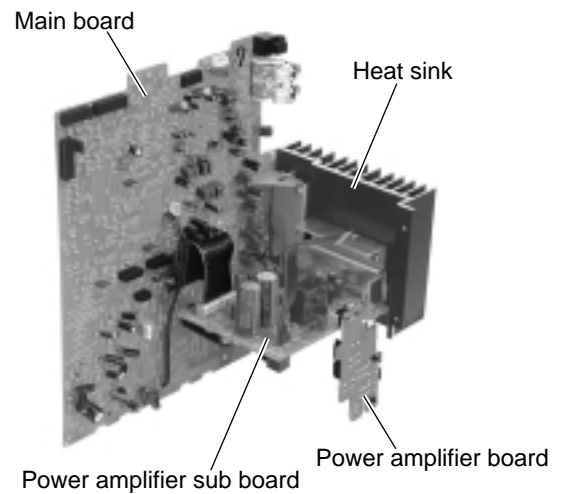


Fig.19

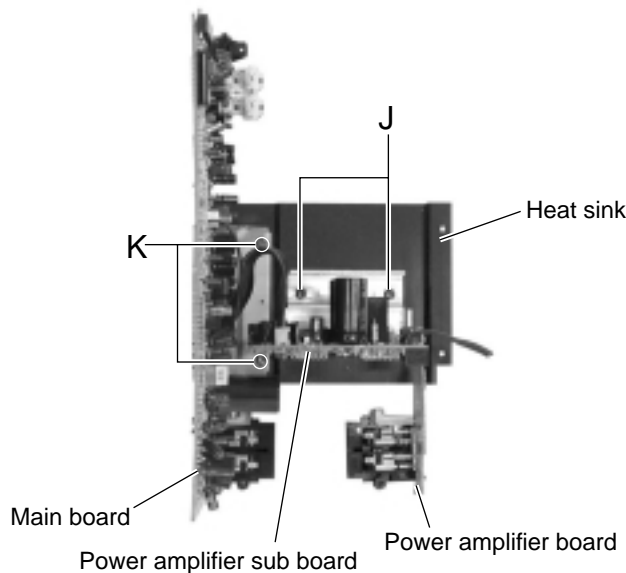


Fig.21

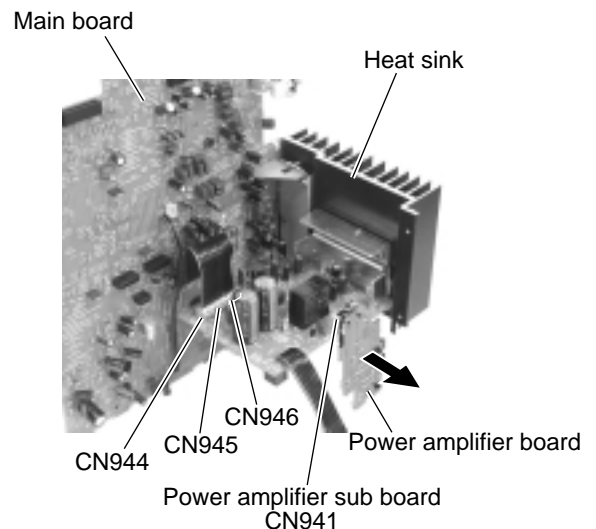


Fig.20

**■Removing the power transformer assembly (See Fig.22 and 23)**

- Prior to performing the following procedure, remove the metal cover, the rear cover, the CD mechanism assembly and the rear panel.
- Remove the assembly consisting of the power amplifier board, the power amplifier sub board and the main board from the chassis incompletely (Refer to Fig.17).

1. Remove the cord stopper upwards on the back of the body.
2. Disconnect the power cord from connector J1000 on the board of the power transformer assembly.
3. Remove the four screws **L** attaching the power transformer assembly.

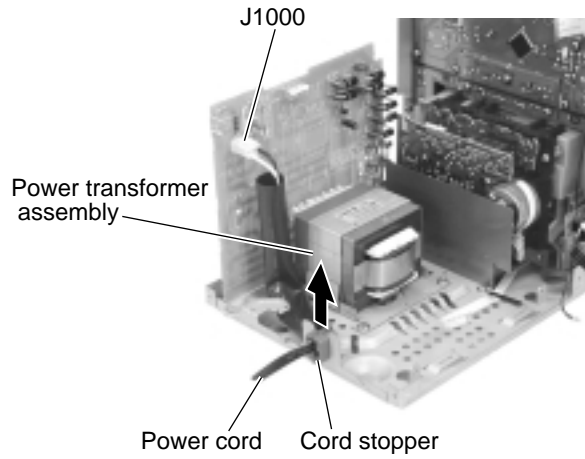


Fig.22

**■Removing the front panel assembly (See Fig.24 and 25)**

- Prior to performing the following procedure, remove the metal cover, the rear cover, the CD mechanism assembly and the rear panel.
- Remove the assembly consisting of the power amplifier board, the power amplifier sub board and the main board (Refer to Fig.17 and 18).

1. Remove the two screws **M** on each lower side of the body.
2. Disengage the two joints **f** on each lower side of the body using a screwdriver and pull out the front panel assembly toward the front.

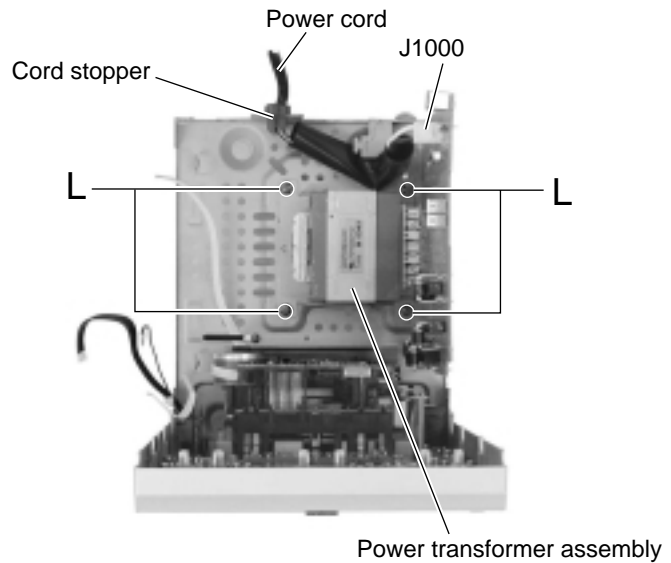


Fig.23

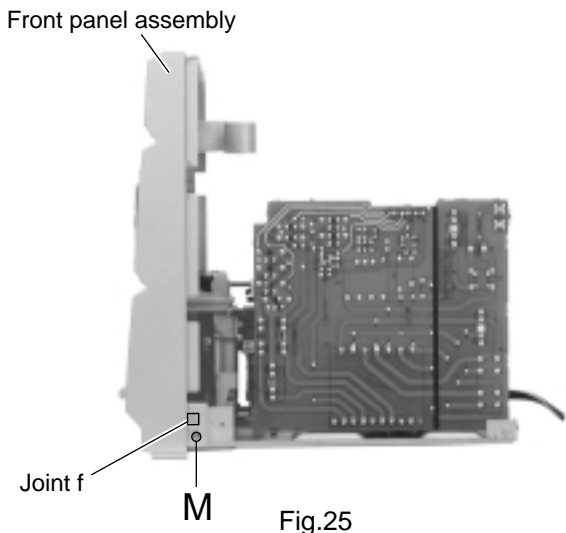


Fig.25

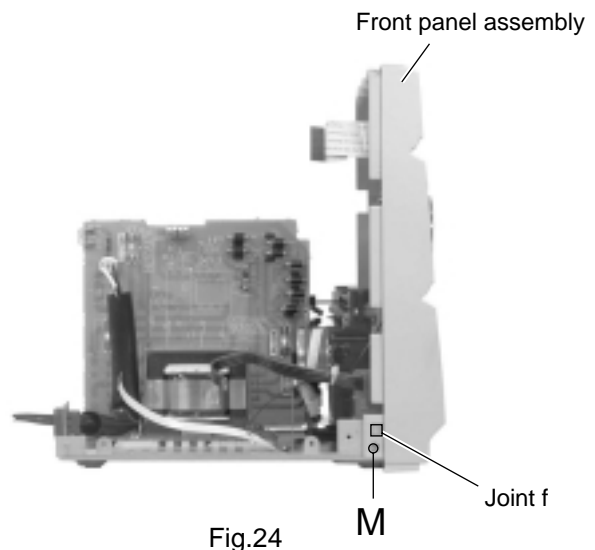


Fig.24

**■Removing the display board / switch board (See Fig.26 to 28)**

• Prior to performing the following procedure, remove the front panel assembly.

1. Pull out the AHB PRO knob and the VOLUME knob on the front panel.
2. Remove the fifteen screws **N** on the back of the front panel and remove the display board with the switch board.
3. Remove the screw **O** attaching the switch board to the LCD holder.
4. If necessary, unsolder the wire connected to connector FW931 on the display board and FW931 on the switch board.
5. If necessary, remove the band bundling the wire extending from the headphone board and display board.

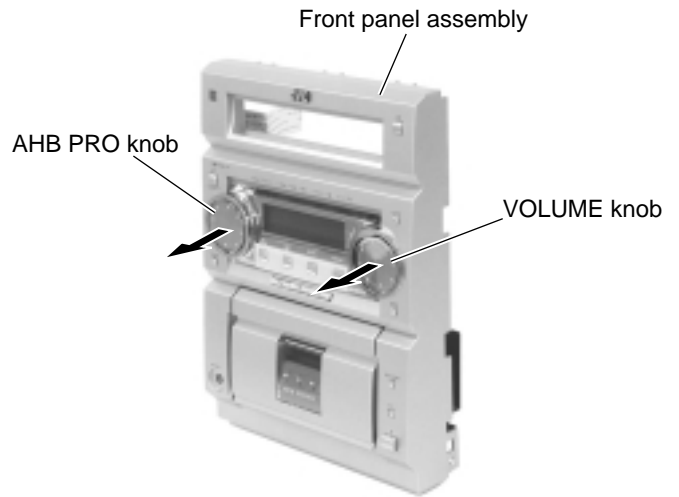


Fig.26

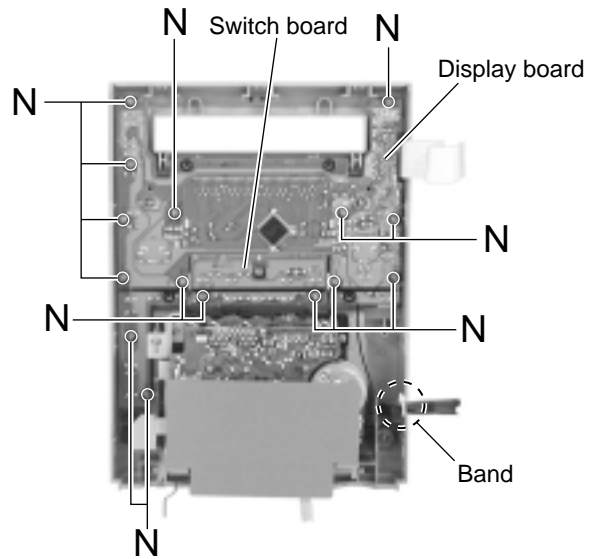


Fig.27

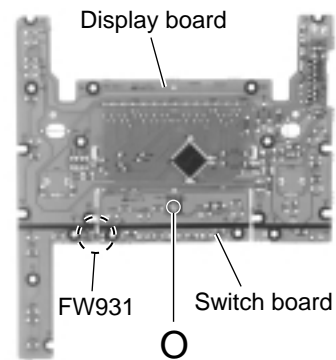


Fig.28

**■ Removing the headphone board**  
**(See Fig.29)**

• Prior to performing the following procedure, remove the front panel assembly.

1. Remove the screw **P** on the back of the front panel.
2. If necessary, remove the band bundling the wire extending from the headphone board and the display board.

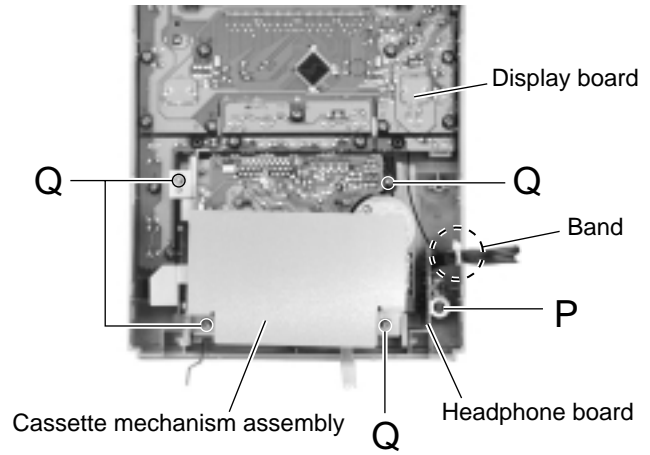


Fig.29

**■ Removing the cassette mechanism assembly (See Fig.29 and 30)**

• Prior to performing the following procedure, remove the front panel assembly.

1. Press the EJECT button on the front panel to open the cassette door.
2. Remove the four screws **Q** on the back of the front panel.

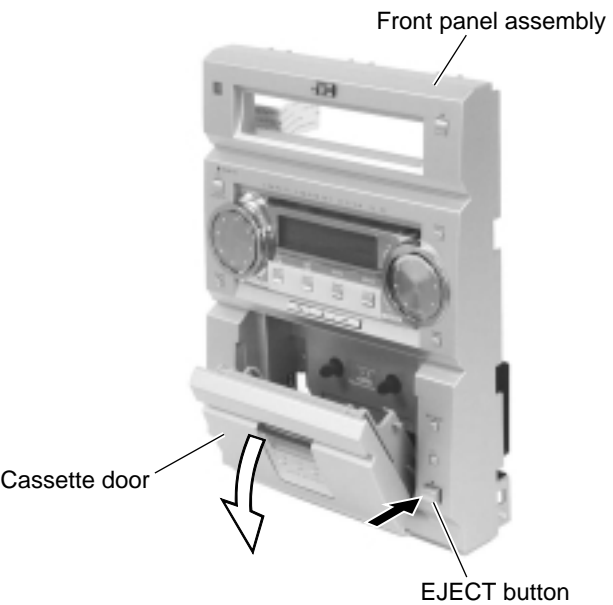


Fig.30

**■ Removing the LED board**  
**(See Fig.30 to 32)**

• Prior to performing the following procedure, remove the front panel assembly.

1. Press the EJECT button on the front panel to open the cassette door.
2. Remove the cassette holder in the direction of the arrow.
3. Release the two joint hooks **g** engaging the LED board with the cassette door.

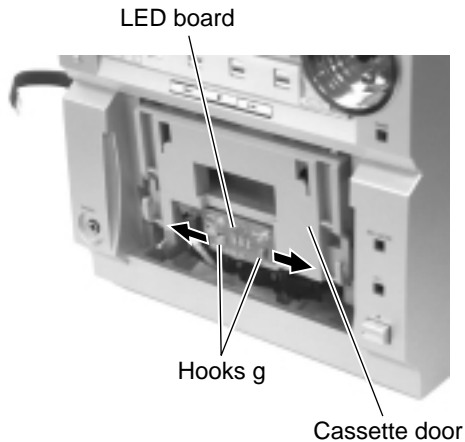


Fig.32

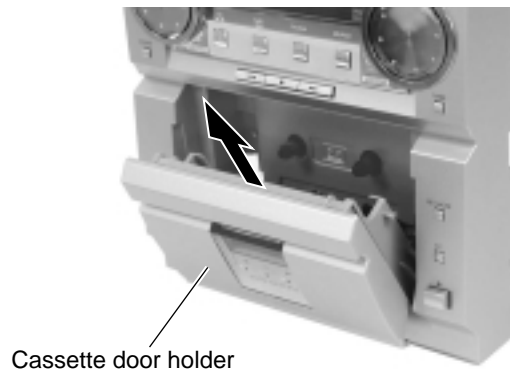


Fig.31

# Main adjustment

## ■ 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  
VT703L : 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  
: AC230V (50Hz)---B/E/EE/EN  
: AC110/127V/230V(50/60Hz)  
: UB/UF/US/UX/U

Reference output : Speaker : 0.775V/4 Ω  
: Headphone : 0.077V/32 Ω

Reference frequency and  
input level ----- 1kHz, AUX : -8dBs  
MIX MIC: -54dBs (UB/UF/US/UX/U)  
Input for confirming recording and playback  
characteristics ----- AUX : -28dBs  
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

B/E/EN version  
FM Band cover: 87.5~108MHz  
MW Band cover: 522~1,629kHz  
LW Band cover: 144~288kHz

EE version  
FM Band cover: 65~74MHz, 87.5~108MHz  
MW Band cover: 522~1,629kHz  
LW Band cover: 144~288kHz

UB/UF/US/UX/U version  
FM Band cover: 87.5~108MHz  
MW Band cover: 531~1,602kHz, 530~1,710kHz  
SW Band cover: SW1 2.3~6.995MHz  
: SW2 7~21.85MHz

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

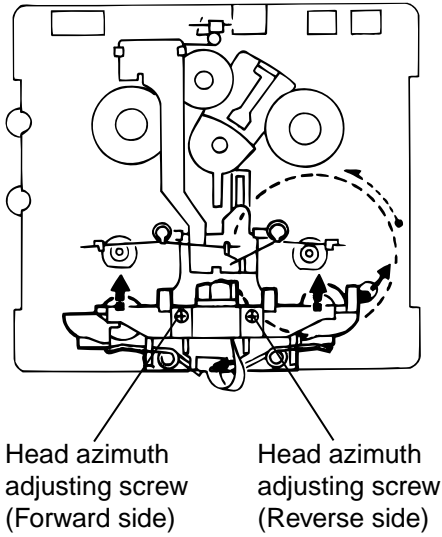
Function switch ----- to Tape  
Beat cut switch ----- to Cut  
Super Bass/Active hyper Bass ----- to OFF  
Bass Treble ----- to Center  
Adjustment of main volume to reference output  
VOL : 28

## Precautions for measurement

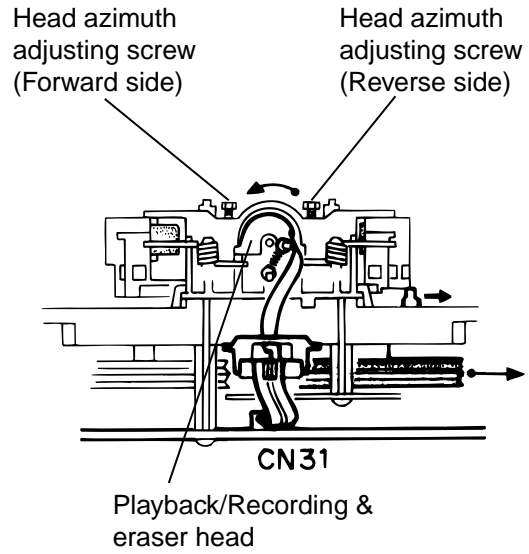
1. Apply 30pF and 33kΩ to the IF sweeper output side and 0.082 μ F and 100kΩ in series to the sweeper input side.
2. The IF sweeper output level should be made as low as possible within the adjustable range.
3. Since the IF sweeper is a fixed device, there is no need to adjust this sweeper.
4. Since 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>>

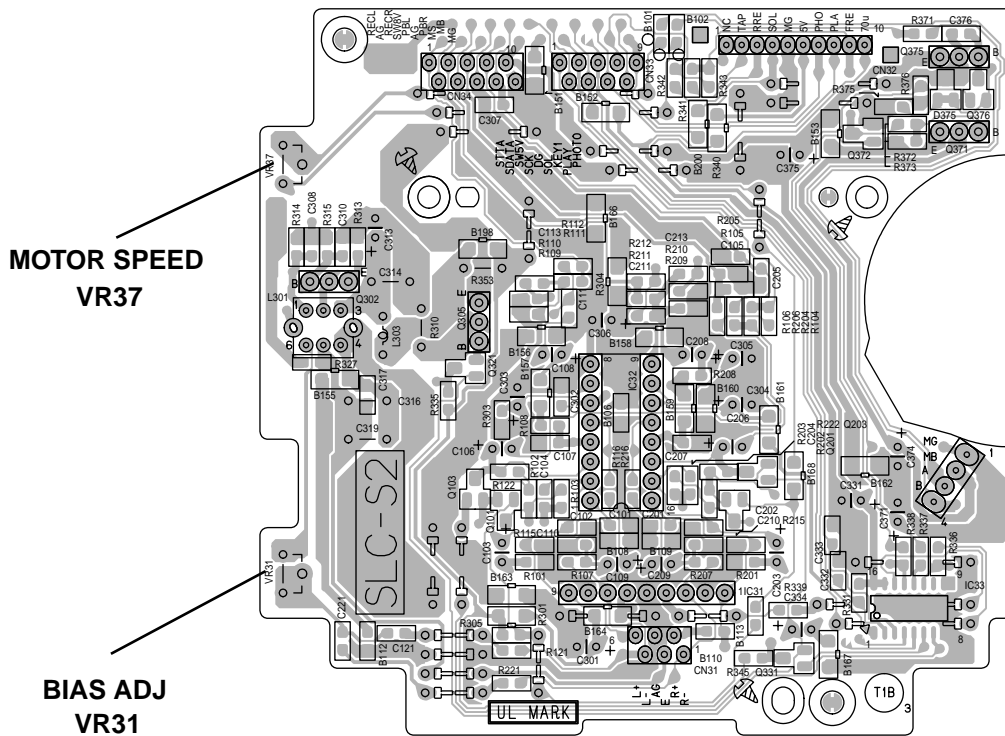
Cassette mechanism section



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 : VTT703L (8kHz)<br>Measurement output terminal : Speaker terminal Speaker R (Load resistance: 4Ω)<br>: Headphone terminal | 1 Playback the test tape VTT703L (8kHz)<br>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.<br>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)<br>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)<br>Measurement output terminal : Speaker terminal Speaker R (Load resistance: 4 Ω)<br>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)<br>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) |                     |

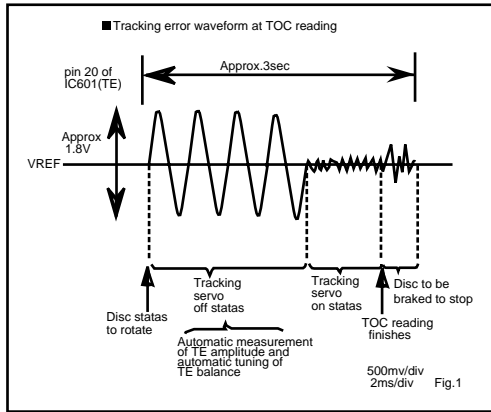
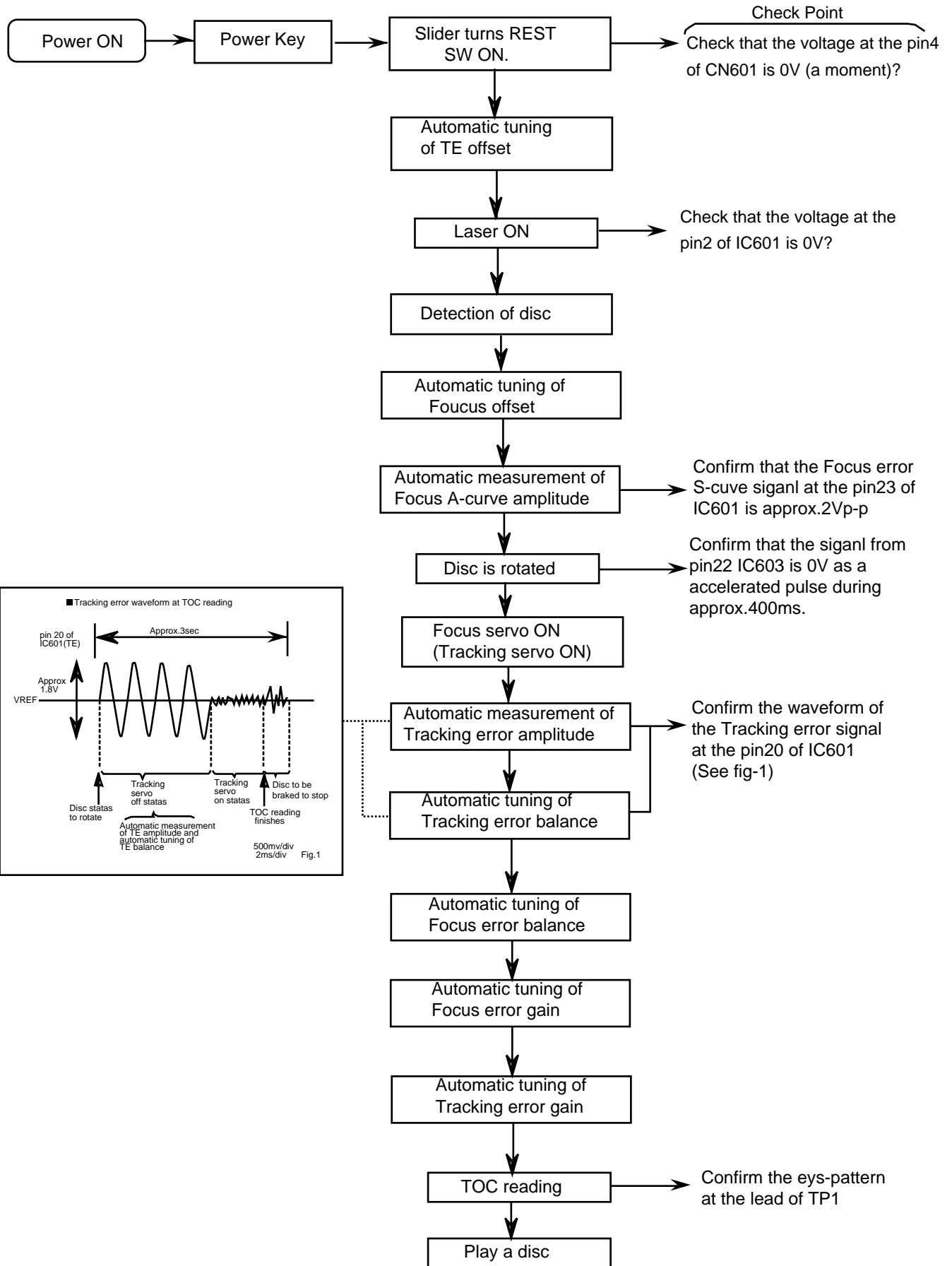
### ■ Electrical Performance

| Items  | Measurement conditions   | Measurement method   | Standard Values  | Adjusting positions |
|--|--|--|--|---------------------|
| Adjustment of recording bias current (Reference Value)         | <ul style="list-style-type: none"> <li>▪ Mode: Forward or reverse mode</li> <li>▪ Recording mode</li> <li>▪ Test tape : AC-514 to TYPE II and AC-225 to TYPE I</li> </ul> Measurement output terminal : Both recording and headphone terminals | <ol style="list-style-type: none"> <li>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.</li> <li>2 After connecting 100 <math>\Omega</math> in series to the recorder head, measure the bias current with a valve voltmeter at both of the terminals.</li> <li>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 <math>\mu</math> A (TYPE I) and 4.20 <math>\mu</math> A (TYPE II).</li> </ol> | AC-225 : 4.20 $\mu$ A<br>AC-514 : 4.0 $\mu$ A            | VR31                |
| Adjustment of recording and playback frequency characteristics | Reference frequency : 1kHz and 10kHz (REF.: -20dB)<br>Test tape : AC-514 to TYPE II<br>Measurement input terminal : OSC IN   | <ol style="list-style-type: none"> <li>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.</li> <li>2 While repetitively inputting the reference frequency signal of 1kHz and 10kHz from OSC IN, record and playback the tape.</li> <li>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 <math>\pm</math> 2dB.</li> </ol>   | Output deviation between 1kHz and 10kHz : -1dB $\pm$ 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"> <li>▪ Test tape : TYPE II (AC-514)</li> <li>▪ Measurement terminal : BIAS TP on P.C. board</li> </ul>  | <ol style="list-style-type: none"> <li>1 While changing over to and from BIAS 1 and 2, confirm that the frequency is changed.</li> <li>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.</li> <li>3 Confirm that the BIAS TP frequency on the P.C. board is 100kHz <math>\pm</math> 6kHz.</li> </ol>                                  | 100 kHz $\pm$ 6 kHz                |                     |
| Eraser current (Reference value) | Forward or reverse <ul style="list-style-type: none"> <li>▪ Recording mode</li> <li>▪ Test tape : AC-514 to TYPE II and AC-225 to TYPE I</li> </ul> Measurement terminal : Both of the eraser head terminals | <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> </ol> | TYPE II : 120 mA<br>TYPE I : 75 mA |                     |

# Flow of functional operation until TOC read (CD)



## Maintenance of laser pickup

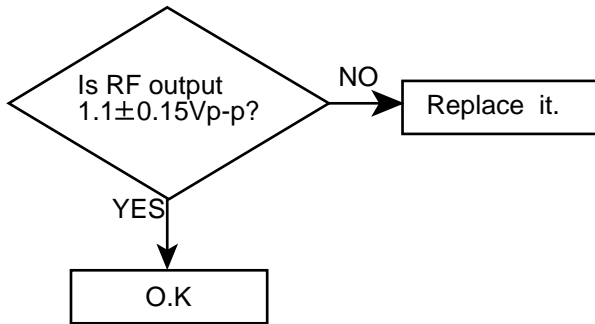
(1) Cleaning the pick up lens

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

(2) Life of the laser diode (Fig.1)

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.



(Fig.1)

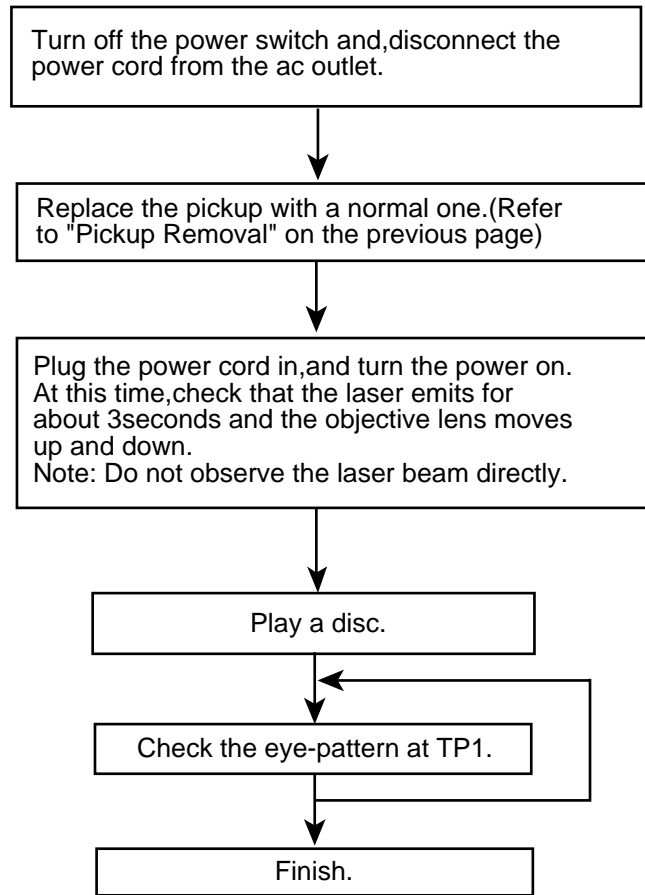
(3) Semi-fixed resistor on the APC PC board

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.

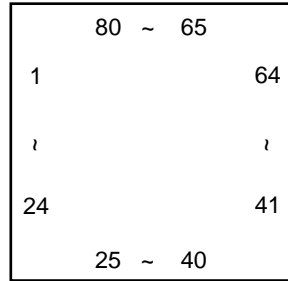
## Replacement of laser pickup



# Description of major ICs

## ■ UPD780058 (IC931 ) : Main micon

### 1. Pin layout



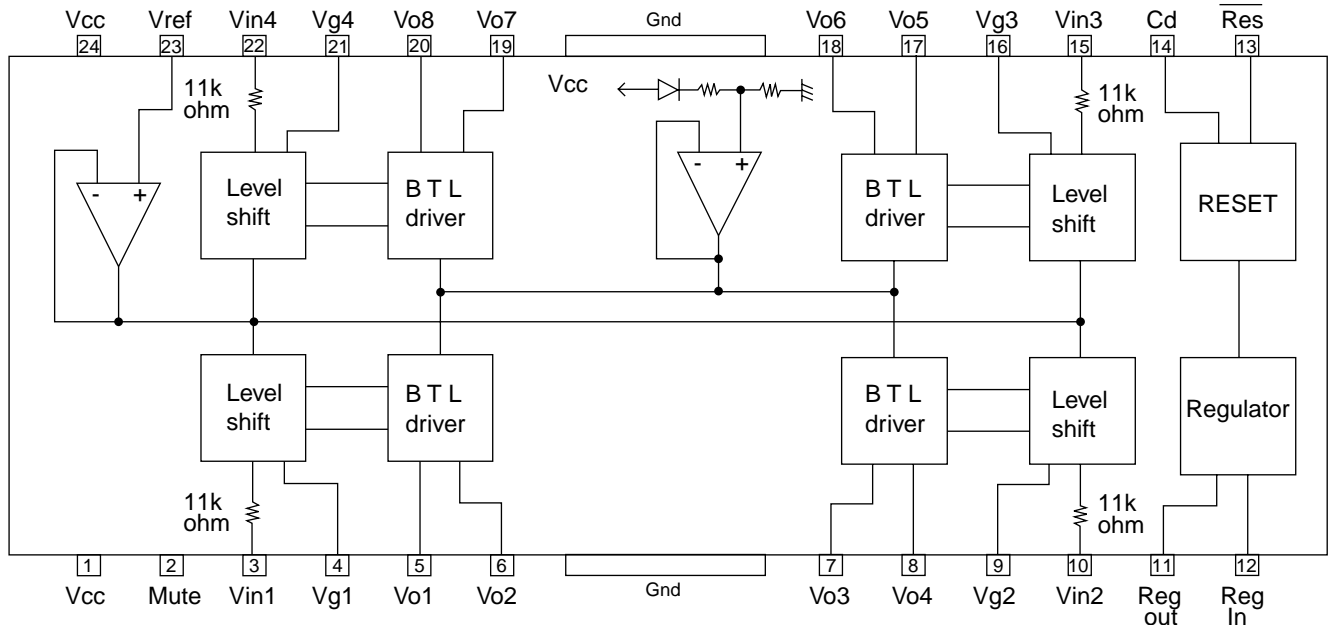
### 2. Pin function

| Pin No. | Port                                | Name     | I/O | Function                          | Function       |
|---------|-------------------------------------|----------|-----|-----------------------------------|----------------|
| 1       | P15/AN15                            | SAFETY0  | I   | Irregular voltage detection 0     | Safety         |
| 2       | P16/AN16                            | DOOR_RST | I   | REST/CLOSE switch detect port     | Door           |
| 3       | P17/AN17                            | CDSAFETY | I   | CD safety voltage detect port     | Safety         |
| 4       | AVss                                |          |     |                                   |                |
| 5       | P130/ANO0                           | EQSW     | O   | CD speed control                  | CD             |
| 6       | P131/ANO1                           | GCTRL    | O   | CD Gain Control                   | CD             |
| 7       | AVREF1                              |          |     |                                   |                |
| 8       | P70/SI2/RxD0                        | QRIN     | I   | Q-code data input port            | CD             |
| 9       | P71/SO2/TxD0                        |          |     |                                   |                |
| 10      | P72/ $\overline{\text{SCK2}}$ /ASCK | SQCK     | O   | Q-code serial clock               | CD             |
| 11      | P20/SI1                             | STAT     | I   | CD status input port              | CD             |
| 12      | P21/SO1                             | MDATA    | O   | CD data input port                | CD             |
| 13      | P22/ $\overline{\text{SCK1}}$       | MCLK     | O   | CD data clock                     | CD             |
| 14      | P23/STB/TxD1                        | _XRST    | O   | CD reset                          | CD             |
| 15      | P24/BUSY/RxD1                       | MLD      | O   | CD command ready signal           | CD             |
| 16      | P25/SI0/SB0                         | MUTE     | O   | BTL mute control port             | CD             |
| 17      | P26/SO0/SB1                         | SDATA    | O   | Serial Date (Tuner PLL/Tape IC)   | Tuner/Tape     |
| 18      | P27/ $\overline{\text{SCK0}}$       | SCK      | O   | Serial Clock (Tuner PLL/Tape IC)  | Tuner/Tape     |
| 19      | P40/AD0                             |          |     |                                   |                |
| 20      | P41/AD1                             | CLOSE    | I   | Door close switch input port      | Door           |
| 21      | P42/AD2                             | OPEN     | I   | Door poen switch input port       | Door           |
| 22      | P43/AD3                             | F_CD     | O   | CD Function ("H"=CD)              | CD             |
| 23      | P44/AD4                             |          |     |                                   |                |
| 24      | P45/AD5                             | _AHB1    | O   | Subwoofer Amp AHB control         | Sound (P7only) |
| 25      | P46/AD6                             | VOLCE    | O   | Volumn Chip Enable                | Sound          |
| 26      | P47/AD7                             |          |     |                                   |                |
| 27      | P50/A8                              | _F_AUX   |     |                                   | AUX            |
| 28      | P51/A9                              | _PBMUTE  | O   | Tape play mute ("L"=mute)         | Tape           |
| 29      | P52/A10                             | _SMUTE   | O   | System mute                       | Sound          |
| 30      | P53/A11                             | SPKMUTE  | O   | Speaker mute                      | Sound          |
| 31      | P54/A12                             | _AHB     | O   | Active Hyper Bass On/off ("L"=ON) | Sound          |
| 32      | P55/A13                             | P_OUT    | O   | Power On/off ("H"=Power On)       | AMP            |
| 33      | Vss1                                |          |     |                                   |                |
| 34      | P56/A14                             | PROTR    | O   | Protector                         | Safety         |
| 35      | P57/A15                             | MODEL1   | I   | MODEL 0: P3/P5; 1: P7             |                |
| 36      | P60                                 | MODEL2   | I   | MODEL2 0: P3; 1: P5               |                |
| 37      | P61                                 |          |     |                                   |                |
| 38      | P62                                 |          |     |                                   |                |

| Pin No. | Port           | Name    | I/O | Function                                | Function        |
|---------|----------------|---------|-----|---|-----------------|
| 39      | P63            |         |     |   |                 |
| 40      | P64/RD         | LEDRV   | O   | Lite LED indicate Reverse               | LED             |
| 41      | P65/WR         | LED_REC | O   | Lite LED indicate REC                   | LED             |
| 42      | P66/WAIT       | LEDFR   | O   | Lite LED indicate Forward               | LED             |
| 43      | P67/ASTB       | STTA    | O   | Tape IC Strobe                          | Tape            |
| 44      | P30/TO0        | LCDAT   | O   | LCD data                                | LCD             |
| 45      | P31/TO1        | LMODE   | O   | LCD date mode control                   | LCD             |
| 46      | P32/TO2        | LCDCK   | O   | LCD clock                               | LCD             |
| 47      | P33/TI1        |         |     |   |                 |
| 48      | P34/TI2        | REEL    | I   | Tape End Detection                      | Tape            |
| 49      | P35/PCL        | INH_    | O   | LCD Driver inhibit ("L" at end of tran) | LCD             |
| 50      | P36/BUZ        | LCDCE   | O   | LCD driver chip enable                  | LCD             |
| 51      | P37            | DIMCTL  | O   | LCD DIM Control                         | LED             |
| 52      | P120/RTP0      | VOLP    | I   | Volumn Plus                             | Sound           |
| 53      | P121/RTP1      | LEDCTL  | O   | Power Standby LED control               | LED             |
| 54      | P122/RTP2      | BASM    | I   | Bass Minus                              | Sound (P7 only) |
| 55      | P123/RTP3      | VOLM    | I   | Volumn Minus                            | Sound           |
| 56      | P124/RTP4      | BASP    | I   | Bass plus                               | Sound (P7 only) |
| 57      | P125/RTP5      | PERIOD  | O   | Tuner PLL Strode                        | Tuner           |
| 58      | P126/RTP6      | F_TU    | O   | Tuner Function ("H"=TUNER)              | Tuner           |
| 59      | P127/RTP7      | BUP     | O   | Back up power detect ("H"=BACKUP)       | Backup          |
| 60      | RESET          |         |     |   |                 |
| 61      | P00/INTP0/TI00 | _REM    | I   | Remote control input                    | Remote con      |
| 62      | P01/INTP1/TI01 | RDCK    | I   | RDS clock                               | Tuner           |
| 63      | P02/INTP2      | _MPX    | I   | FM Stereo Detection ("L"=STEREO)        | Tuner           |
| 64      | P03/INTP3      |         |     |   |                 |
| 65      | P04/INTP4      | BCTL    | O   | Switched 5V controller ("H"=5Vüf off)   | AMP             |
| 66      | P05/INTP5      | BLKCK   | I   | Block clock input port                  | CD              |
| 67      | Vss0           |         |     |   |                 |
| 68      | VDD1           |         |     |   |                 |
| 69      | X2             |         |     |   |                 |
| 70      | X1             |         |     |   |                 |
| 71      | IC (VPP)       |         |     |   |                 |
| 72      | XT2            |         |     |   |                 |
| 73      | XT1/P07        |         |     |   |                 |
| 74      | VDD0           |         |     |   |                 |
| 75      | AVREF0         |         |     |   |                 |
| 76      | P10/ANI0       | SAFETY1 | I   | Irregular voltage detection 1           | Safety          |
| 77      | P11/ANI1       | TAPE0   | I   | Tape Switch 0                           | Tape            |
| 78      | P12/ANI2       | TAPE1   | I   | Tape Switch 1                           | Tape            |
| 79      | P13/ANI3       | KEY1    | I   | Unit Key input 1                        | Key             |
| 80      | P14/ANI4       | KEY2    | I   | Unit Key input 0                        | Key             |

■ LA6541 (IC801) : Focus & Spindle & Feed & Tracking BTL driver

1. Pin Layout & block diagram

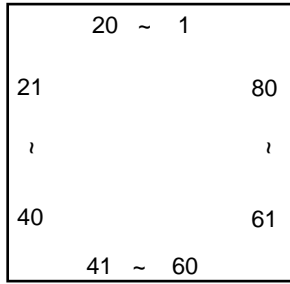


2. Pin function

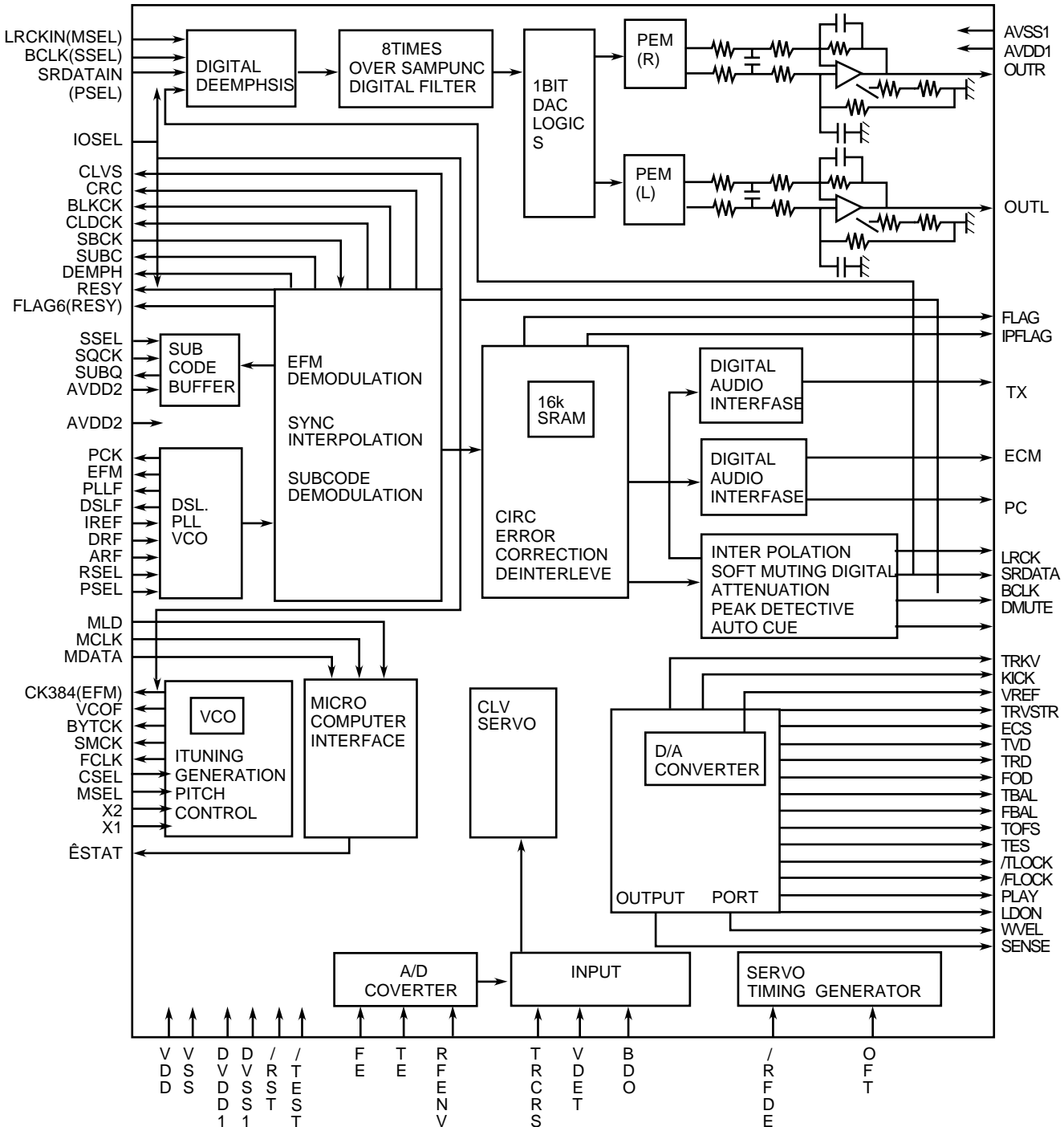
| Pin No. | Symbol  | Function   |
|---------|---------|--|
| 1       | Vcc     | Power supply (Shorted to pin 24)                                       |
| 2       | Mute    | All BTL amplifier outputs ON/OFF                                       |
| 3       | Vin1    | BTL AMP 1 input pin  |
| 4       | Vg1     | BTL AMP 1 input pin (For gain adjustment)                              |
| 5       | Vo1     | BTL AMP 1 input pin (Non inverting side)                               |
| 6       | Vo2     | BTL AMP 1 input pin (Inverting side)                                   |
| 7       | Vo3     | BTL AMP 2 input pin (Inverting side)                                   |
| 8       | Vo4     | BTL AMP 2 input pin (Non inverting side)                               |
| 9       | Vg2     | BTL AMP 2 input pin (For gain adjustment)                              |
| 10      | Vin2    | BTL AMP 2 input pin  |
| 11      | Reg Out | External transistor collector (PNP) connection. 5V power supply output |
| 12      | Reg In  | External transistor (PNP) base connection                              |
| 13      | Res     | Reset output   |
| 14      | Cd      | Reset output delay time setting (Capacitor connected externally)       |
| 15      | Vin3    | BTL AMP 3 input pin  |
| 16      | Vg3     | BTL AMP 3 input pin (For gain adjustment)                              |
| 17      | Vo5     | BTL AMP 3 output pin (Non inverting side)                              |
| 18      | Vo6     | BTL AMP 3 output pin (Inverting side)                                  |
| 19      | Vo7     | BTL AMP 4 output pin (Inverting side)                                  |
| 20      | Vo8     | BTL AMP 4 output pin (Non inverting side)                              |
| 21      | Vg4     | BTL AMP 4 output pin (For gain adjustment)                             |
| 22      | Vin4    | BTL AMP 4 output pin   |
| 23      | Vref    | Level shift circuit's reference voltage application                    |
| 24      | Vcc     | Power supply (Shorted to pin 1)  |

■ MN662748RPM (IC651) : Digital servo & digital signal processor

1. Pin layout



2. Block diagram



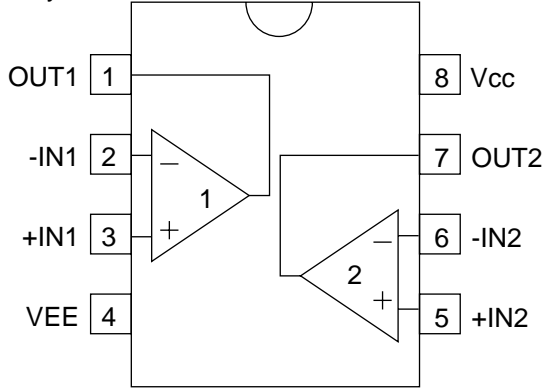


## 3. Pin function

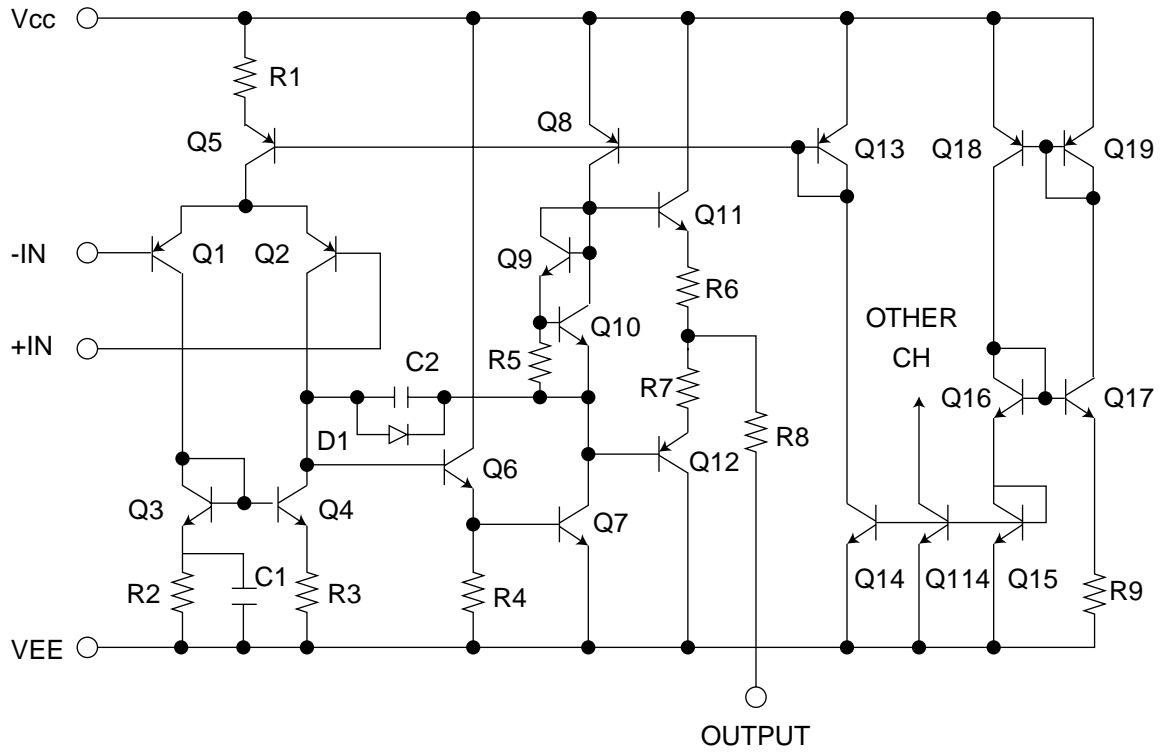
| Pin No. | Symbol | I/O | Function   | Pin No. | Symbol | I/O | Function   |
|---------|--------|-----|--|---------|--------|-----|--|
| 1       | BCLK   | O   | Not used   | 41      | TES    | O   | Tracking error shunt signal output (H:shunt)     |
| 2       | LRCK   | O   | Not used   | 42      | PLAY   | —   | Not used   |
| 3       | SRDATA | O   | Not used   | 43      | WVEL   | —   | Not used   |
| 4       | DVDD1  | —   | Power supply (Digital)   | 44      | ARF    | I   | RF signal input                                  |
| 5       | DVSS1  | —   | Connected to GND   | 45      | IREF   | I   | Reference current input pin                      |
| 6       | TX     | O   | Digital audio interface output   | 46      | DRF    | I   | Bias pin for DSL                                 |
| 7       | MCLK   | I   | CPU command clock signal input<br>(Data is latched at signal's rising point) | 47      | DSLFL  | I/O | Loop filter pin for DSL                          |
| 8       | MDATA  | I   | CPU command data input   | 48      | PLLFL  | I/O | Loop filter pin for PLL                          |
| 9       | MLD    | I   | CPU command load signal input  | 49      | VCOF   | —   | Not used   |
| 10      | SENSE  | O   | Sense signal output  | 50      | AVDD2  | —   | Power supply (Analog)                            |
| 11      | FLOCK  | O   | Focus lock signal output Active :Low   | 51      | AVSS2  | —   | Connected to GND (Analog)                        |
| 12      | TLOCK  | O   | Tracking lock signal output Active :Low                                      | 52      | EFM    | —   | Not used   |
| 13      | BLKCK  | O   | sub-code/block/clock signal output   | 53      | PCK    | —   | Not used   |
| 14      | SQCK   | I   | Outside clock for sub-code Q register input                                  | 54      | PDO    | —   | Not used   |
| 15      | SUBQ   | O   | Sub-code Q -code output  | 55      | SUBC   | —   | Not used   |
| 16      | DMUTE  | —   | Connected to GND   | 56      | SBCK   | —   | Not used   |
| 17      | STATUS | O   | Status signal<br>(CRC,CUE,CLVS,TTSTOP,ECLV,SQOK)                             | 57      | VSS    | —   | Connected to GND (for X'tal oscillation circuit) |
| 18      | RST    | I   | Reset signal input (L:Reset)   | 58      | XI     | I   | Input of 16.9344MHz X'tal oscillation circuit    |
| 19      | SMCK   | —   | Not used   | 59      | X2     | O   | Output of X'tal oscillation circuit              |
| 20      | PMCK   | —   | Not used   | 60      | VDD    | —   | Power supply (for X'tal oscillation circuit)     |
| 21      | TRV    | O   | Traverse enforced output   | 61      | BYTCK  | —   | Not used   |
| 22      | TVD    | O   | Traverse drive output  | 62      | CLDCK  | —   | Not used   |
| 23      | PC     | —   | Not used   | 63      | FLAG   | —   | Not used   |
| 24      | ECM    | O   | Spindle motor drive signal (Enforced mode output) 3-State                    | 64      | IPPLAG | —   | Not used   |
| 25      | ECS    | O   | Spindle motor drive signal (Servo error signal output)                       | 65      | FLAG   | —   | Not used   |
| 26      | KICK   | O   | Kick pulse output  | 66      | CLVS   | —   | Not used   |
| 27      | TRD    | O   | Tracking drive output  | 67      | CRC    | —   | Not used   |
| 28      | FOD    | O   | Focus drive output   | 68      | DEMPH  | —   | Not used   |
| 29      | VREF   | I   | Reference voltage input pin for D/A output block (TVD,FOD,FBA,TBAL)          | 69      | RESY   | —   | Not used   |
| 30      | FBAL   | O   | Focus Balance adjust signal output   | 70      | IOSEL  | —   | pull up  |
| 31      | TBAL   | O   | Tracking Balance adjust signal output  | 71      | TEST   | —   | pull up  |
| 32      | FE     | I   | Focus error signal input (Analog input)                                      | 72      | AVDD1  | —   | Power supply (Digital)                           |
| 33      | TE     | I   | Tracking error signal input (Analog input)                                   | 73      | OUT L  | O   | Lch audio output                                 |
| 34      | RF ENV | I   | RF envelope signal input (Analog input)                                      | 74      | AVSS1  | —   | Connected to GND                                 |
| 35      | VDET   | I   | Vibration detect signal input (H:detect)                                     | 75      | OUT R  | O   | Rch audio output                                 |
| 36      | OFT    | I   | Off track signal input (H:off track)   | 76      | RSEL   | —   | pull up  |
| 37      | TRCRS  | I   | Track cross signal input   | 77      | CSEL   | —   | Connected to GND                                 |
| 38      | RFDET  | I   | RF detect signal input (L:detect)  | 78      | PSEL   | —   | Connected to GND                                 |
| 39      | BDO    | I   | BDO input pin (L:detect)   | 79      | MSEL   | —   | Connected to GND                                 |
| 40      | LDON   | O   | Laser ON signal output (H:on)  | 80      | SSEL   | —   | Pull up  |

■BA15218F-XE (IC904) : Dual operation amplifier

1. Pin layout

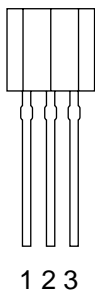


2. Block diagram

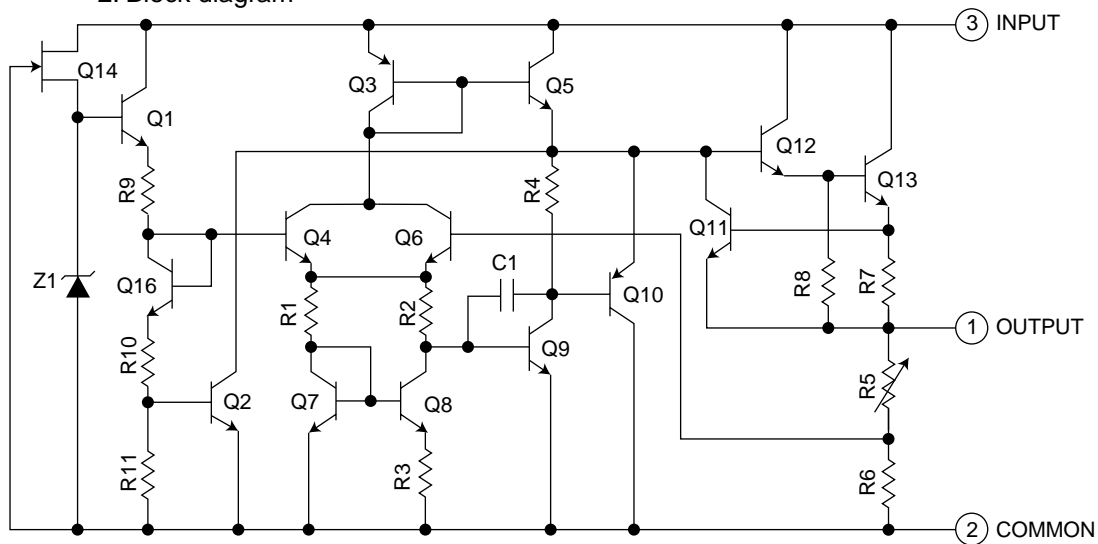


■ KIA78S06P-T (IC933) : Regulator

1. Pin layout

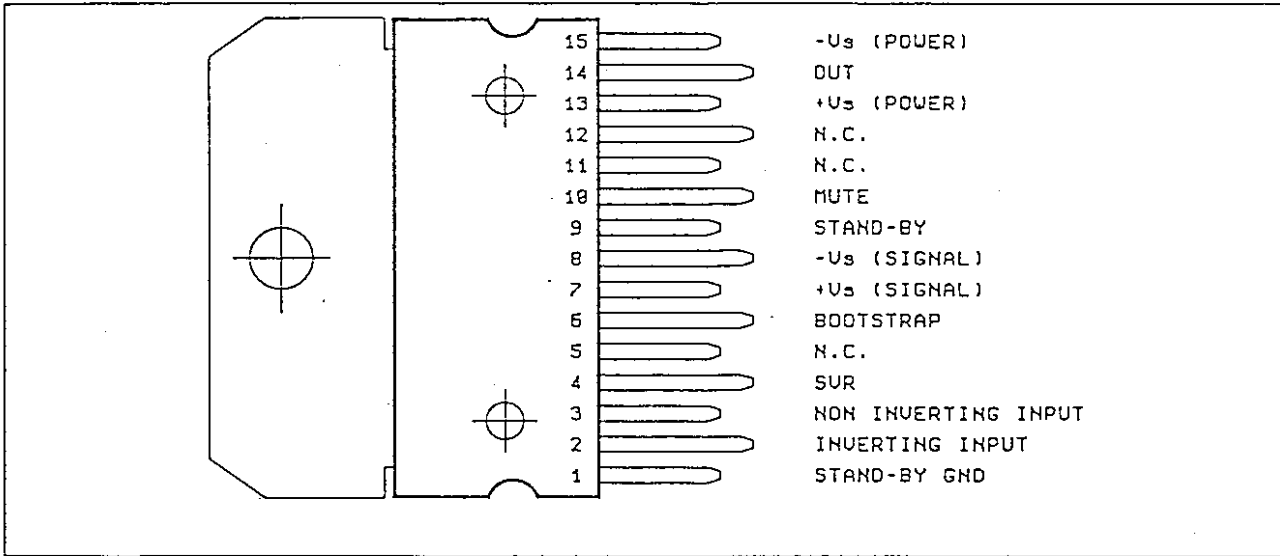


2. Block diagram

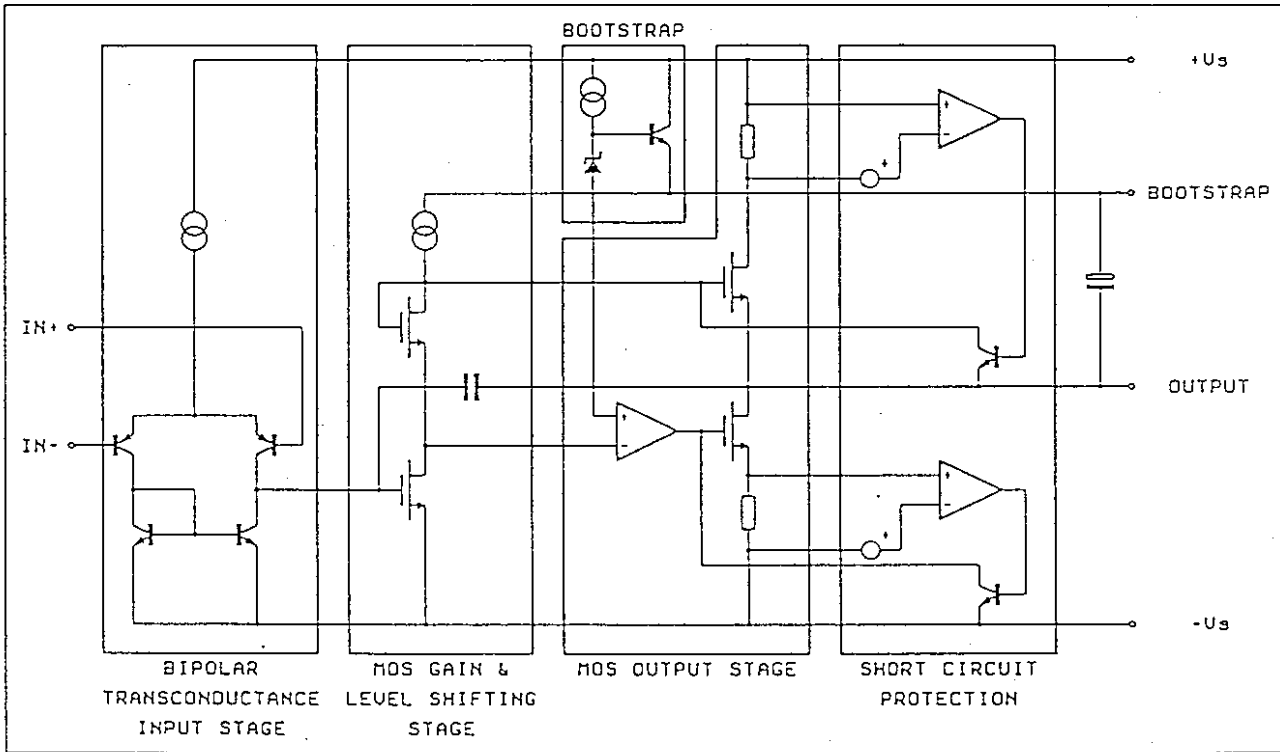


■ TDA7294 (IC940, IC941) : Power amp

1. Pin layout

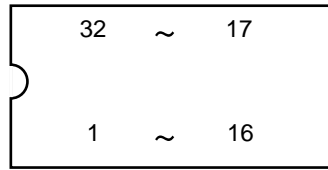


2. Block diagram

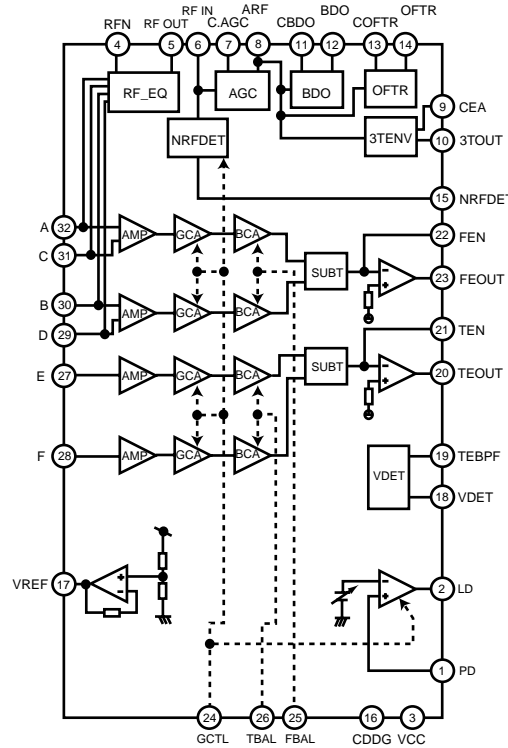


# AN22000A(IC601):RF & SERVO AMP

## 1. Pin layout



## 2. Block

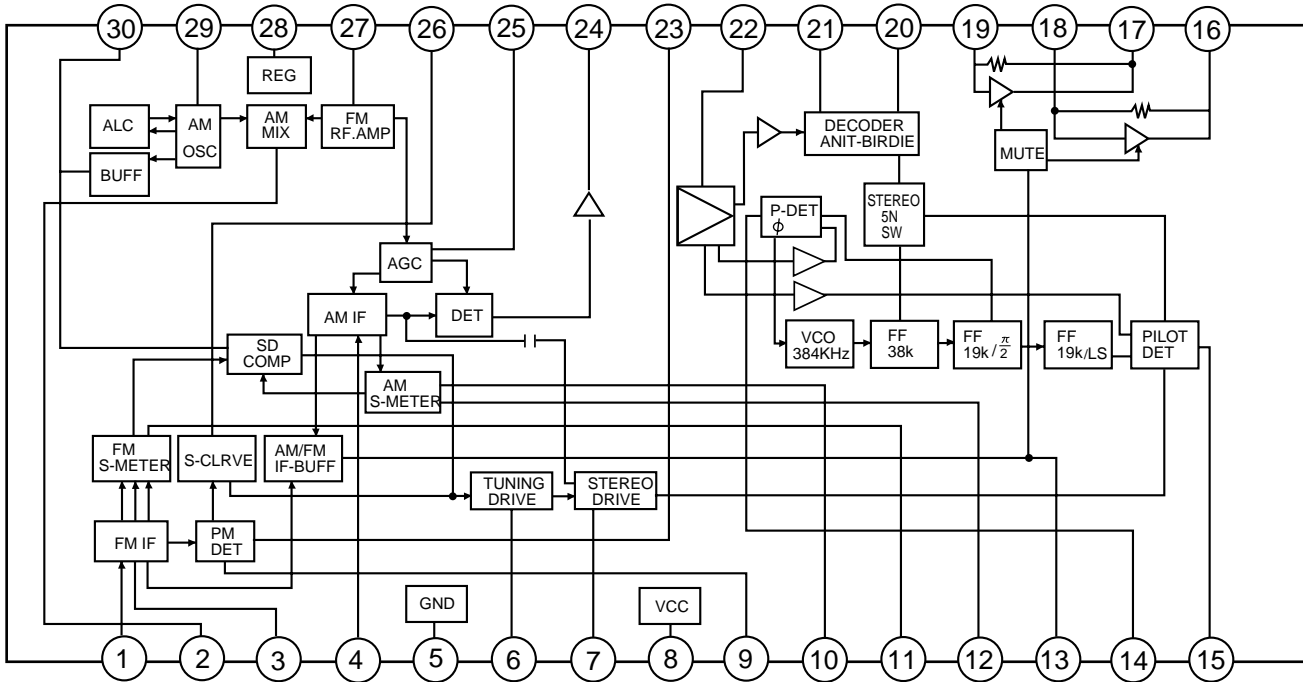


## 3. Function

| Pin No. | Symbol | Function  | Pin No. | Symbol | Function                         |
|---------|--------|---|---------|--------|----------------------------------|
| 1       | PD     | APC Amp. Input terminal   | 16      | CDDG   | Earth terminal                   |
| 2       | LD     | APC Amp. Output terminal  | 17      | VREF   | VREF output terminal             |
| 3       | VCC    | Power supply terminal   | 18      | VDET   | VDET output terminal             |
| 4       | RFN    | RF addition Amp. Reversing input terminal                               | 19      | TEBPF  | VDET input terminal              |
| 5       | RF OUT | RF addition Amp. Output terminal  | 20      | TEOUT  | TE Amp. output terminal          |
| 6       | RF IN  | AGC input terminal  | 21      | TEN    | TE Amp. reversing input terminal |
| 7       | C.AGC  | Terminal of connection of capacity of AGC loop filter.                  | 22      | FEN    | FE Amp. reversing input terminal |
| 8       | ARF    | AGC output terminal   | 23      | FEOUT  | FE Amp. output terminal          |
| 9       | CEA    | Capacity connection terminal for HPF-Amp.                               | 24      | GCTL   | Terminal GCTL & APC              |
| 10      | 3TOUT  | 3TENV output terminal   | 25      | FBAL   | FBAL control terminal            |
| 11      | CBDO   | Capacity connection terminal for RF shade side envelope detection       | 26      | TBAL   | TBAL control terminal            |
| 12      | BDO    | BDO output terminal   | 27      | E      | Tracking signal input terminal 1 |
| 13      | COFTR  | Capacity connection terminal for RF discernment side envelope detection | 28      | F      | Tracking signal input terminal 2 |
| 14      | OFTR   | OFTR output terminal  | 29      | D      | Focus signal input terminal 4    |
| 15      | NRFDET | NRFDET output terminal  | 30      | B      | Focus signal input terminal 2    |
|         |        |   | 31      | C      | Focus signal input terminal 3    |
|         |        |   | 32      | A      | Focus signal input terminal 1    |

■ LA1838 (IC1): FM AM IF AMP&detector, FM MPX decoder

1. Block Diagram



2. Pin Function

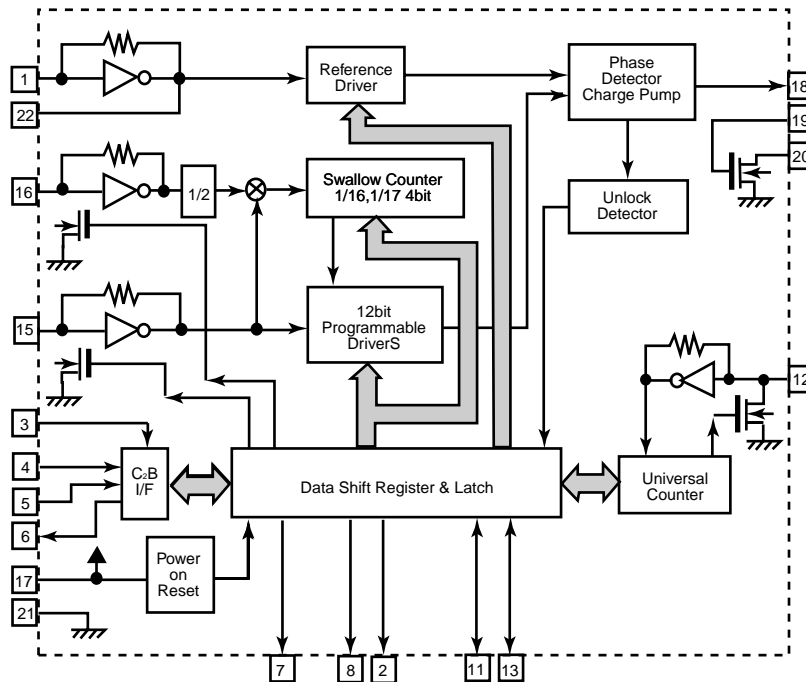
| Pin No. | Symbol  | I/O | Function  | Pin No. | Symbol     | I/O | Function   |
|---------|---------|-----|---|---------|------------|-----|--|
| 1       | FM IN   | I   | This is an input terminal of FM IF signal.  | 16      | L OUT      | O   | Left channel signal output.  |
| 2       | AM MIX  | O   | This is an out put terminal for AM mixer.   | 17      | R OUT      | O   | Right channel signal output.   |
| 3       | FM IF   | I   | Bypass of FM IF   | 18      | L IN       | I   | Input terminal of the left channel post AMP.   |
| 4       | AM IF   | I   | Input of AM IF Signal.  | 19      | R IN       | I   | Input terminal of the right channel post AMP.  |
| 5       | GND     | -   | This is the device ground terminal.   | 20      | RO         | O   | Mpx Right channel signal output.   |
| 6       | TUNED   | O   | When the set is tuning, this terminal becomes "L".  | 21      | LO         | O   | Mpx Left channel signal output.  |
| 7       | STEREO  | O   | Stereo indicator output. Stereo "L", Mono: "H"  | 22      | IF IN      | I   | Mpx input terminal   |
| 8       | VCC     | -   | This is the power supply terminal.  | 23      | FM OUT     | O   | FM detection output.   |
| 9       | FM DET  | -   | FM detect transformer.  | 24      | AM DET     | O   | AM detection output.   |
| 10      | AM SD   | -   | This is a terminal of AM ceramic filter.  | 25      | AM AGC     | I   | This is an AGC voltage input terminal for AM   |
| 11      | FM VSM  | O   | Adjust FM SD sensitivity.   | 26      | AFC        | -   | This is an output terminal of voltage for FM-AFC.  |
| 12      | AM VSM  | O   | Adjust AM SD sensitivity.   | 27      | AM RF      | I   | AM RF signal input.  |
| 13      | MUTE    | I/O | When the signal of IF REQ of IC121( LC72131) appear, the signal of FM/AM IF output. //Muting control input. | 28      | REG        | O   | Register value between pin 26 and pin28 desides the frequency width of the input signal. |
| 14      | FM/AM   | I   | Change over the FM/AM input. "H" :FM, "L" : AM  | 29      | AM OSC     | -   | This is a terminal of AM Local oscillation circuit.                                      |
| 15      | MONO/ST | O   | Stereo : "H", Mono: "L"   | 30      | OSC BUFFER | O   | AM Local oscillation Signal output.  |

■ LC72136N (IC2) : PLL frequency synthesizer

1. Pin layout

|           |    |    |        |
|-----------|----|----|--------|
| XT        | 1  | 22 | XT     |
| FM/AM     | 2  | 21 | GND    |
| CE        | 3  | 20 | LPFOUT |
| DI        | 4  | 19 | LPFIN  |
| CLOCK     | 5  | 18 | PD     |
| DO        | 6  | 17 | VCC    |
| FM/ST/VCO | 7  | 16 | FMIN   |
| AM/FM     | 8  | 15 | AMIN   |
|           | 9  | 14 |        |
|           | 10 | 13 | IFCONT |
| SDIN      | 11 | 12 | IFIN   |

2. Block diagram

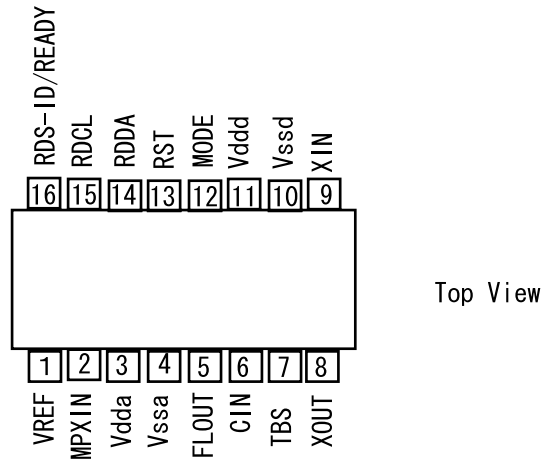


3. Pin function

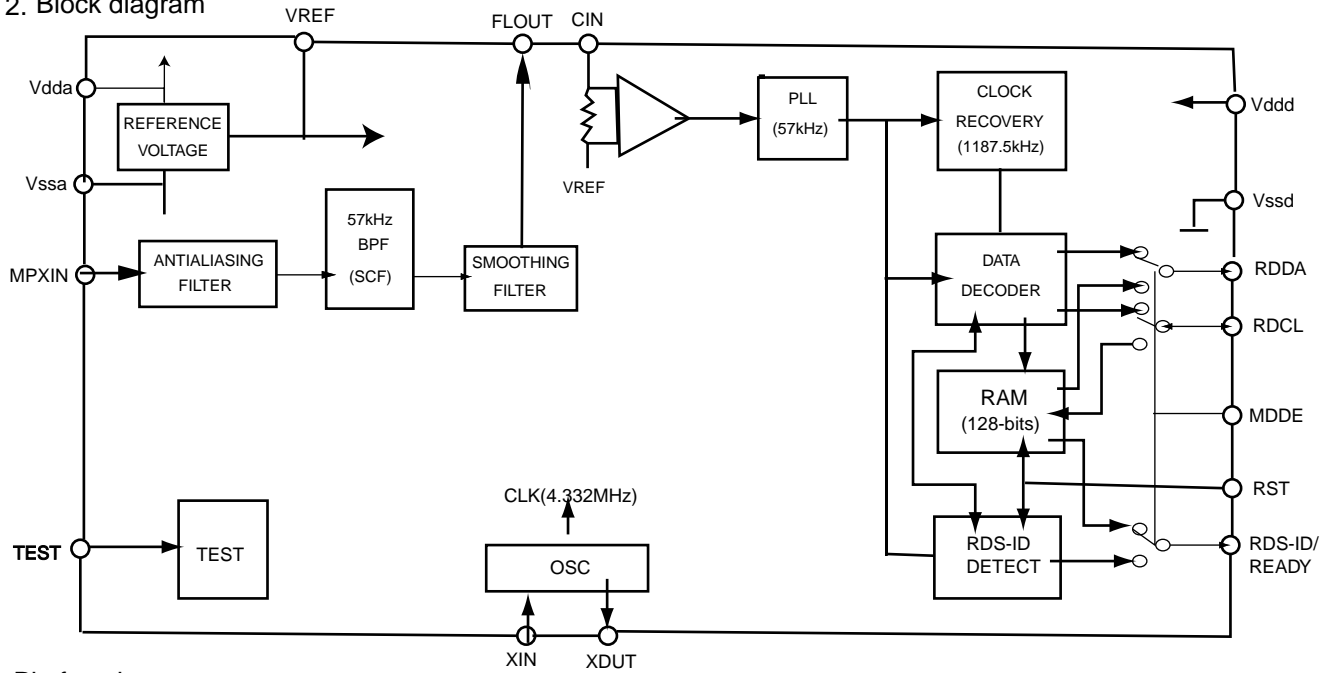
| Pin No. | Symbol    | I/O | Function   | Pin No. | Symbol | I/O | Function   |
|---------|-----------|-----|--|---------|--------|-----|--|
| 1       | XT        | I   | X'tal oscillator connect (75kHz)                           | 12      | IFIN   | I   | IF counter signal input  |
| 2       | FM/AM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

■ LC72723(IC3):RDS

1. Pin Assignment



2. Block diagram



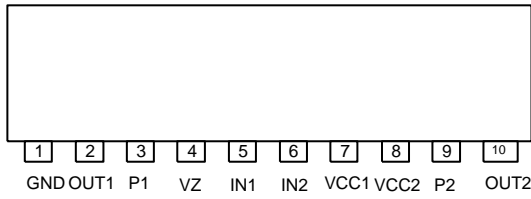
3. Pin functions

| Pin No. | Symbol          | I/O | Function  |
|---------|-----------------|-----|---|
| 1       | VREF            | O   | Reference voltage output ( $V_{dda}/2$ )                    |
| 2       | MPXIN           | I   | Baseband (multiplexed) signal input                         |
| 3       | Vdda            | —   | Analog power supply (+5V)                                   |
| 4       | Vssa            | —   | Analog ground   |
| 5       | FLOUT           | O   | Subcarrier input (filter output)                            |
| 6       | CIN             | I   | Subcarrier input (comparator input)                         |
| 7       | TEST            | I   | Test input  |
| 8       | XOUT            | O   | Crystal oscillator output (4.332MHz)                        |
| 9       | XIN             | I   | Crystal oscillator input (external reference input)         |
| 10      | Vssd            | —   | Digital ground  |
| 11      | Vddd            | —   | Digital power supply  |
| 12      | MODE            | I   | Read mode setting (0:master,1:slave)                        |
| 13      | RST             | I   | RDS-ID/RAM reset (positive polarity)                        |
| 14      | RDDA            | O   | RDS data output   |
| 15      | RDCL            | I/O | RDS clock output (master mode)/RDS clock input (slave mode) |
| 16      | RDS-ID<br>READY | O   | RDS-ID/READY output (negative polarity)                     |



■ **LB1641 (IC802) : DC Motor driver**

1. Pin layout



2. Pin function

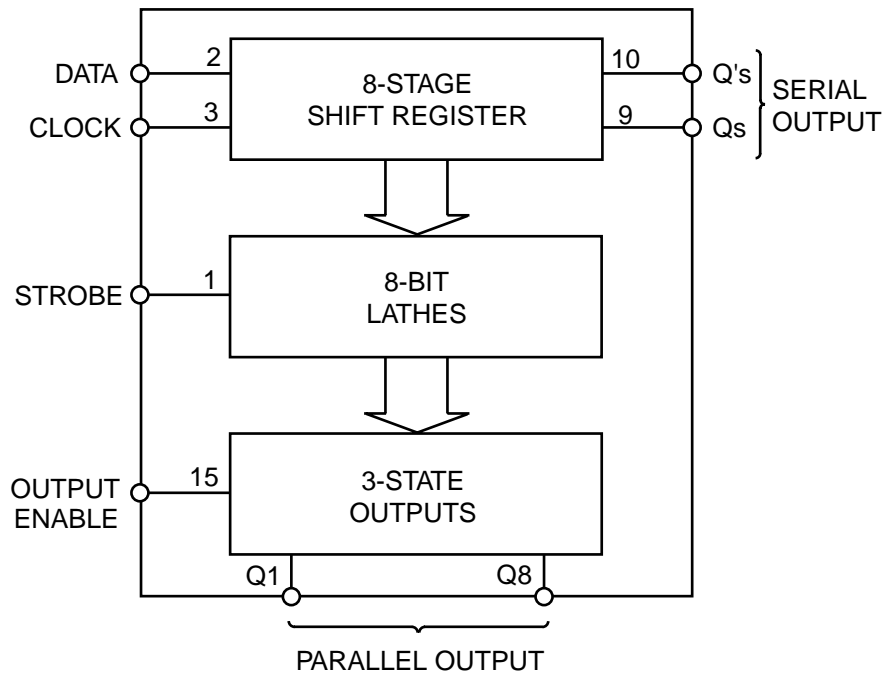
| Input |     | Output |      | Mode              |
|-------|-----|--------|------|-------------------|
| IN1   | IN2 | OUT1   | OUT2 |                   |
| 0     | 0   | 0      | 0    | Brake             |
| 1     | 0   | 1      | 0    | CLOCKWISE         |
| 0     | 1   | 0      | 1    | COUNTER-CLOCKWISE |
| 1     | 1   | 0      | 0    | Brake             |

■ **BU4094BC(IC33):Serial to parallel port extension**

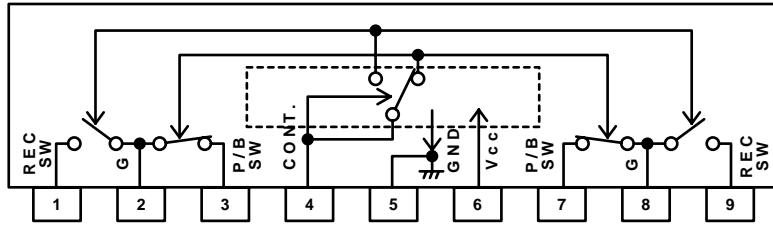
1. Pin layout

|        |   |    |               |
|--------|---|----|---------------|
| STROBE | 1 | 16 | Vdd           |
| DATA   | 2 | 15 | OUTPUT ENABLE |
| CLOCK  | 3 | 14 | Q5            |
| Q1     | 4 | 13 | Q6            |
| Q2     | 5 | 12 | Q7            |
| Q3     | 6 | 11 | Q8            |
| Q4     | 7 | 10 | Q's           |
| Vss    | 8 | 9  | Qs            |

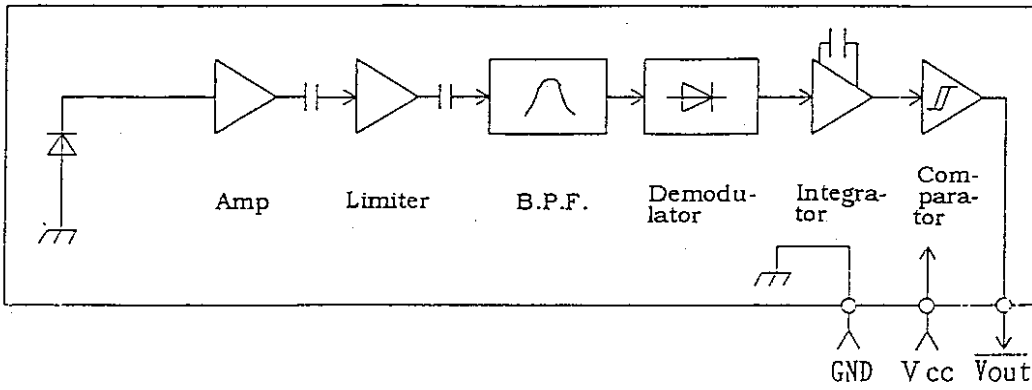
2. Block diagram



■ BA3126N(IC31) : R/P Switch

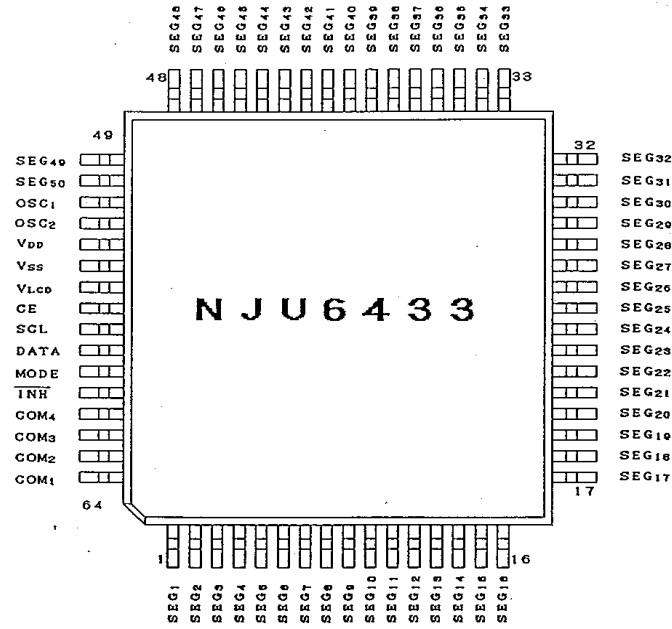


■ GP1U26X (IC933)

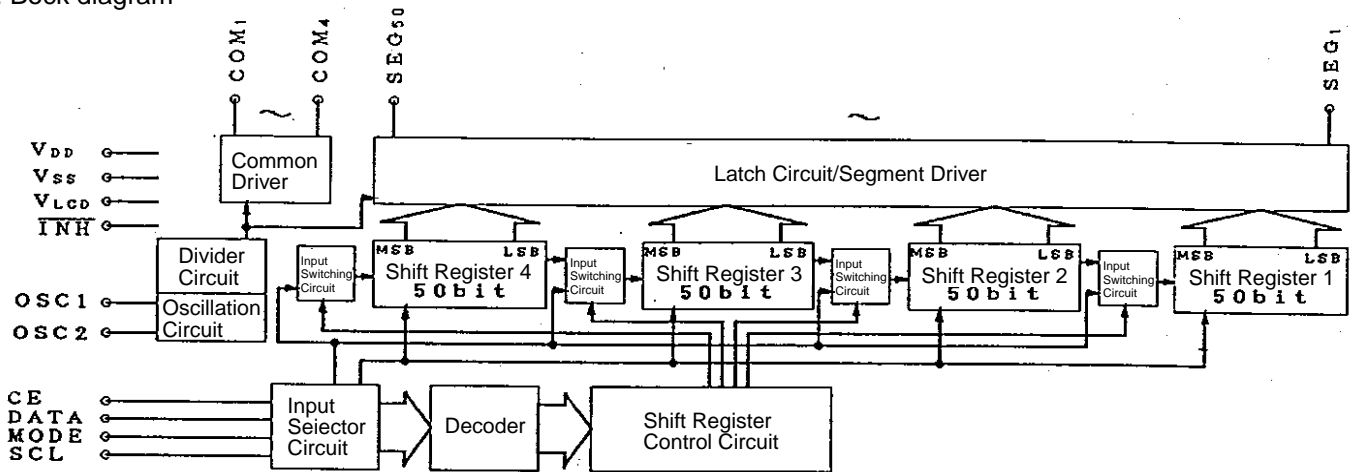


■ NJU6433FG1 (IC934)

1. Pin layout



2. Block diagram

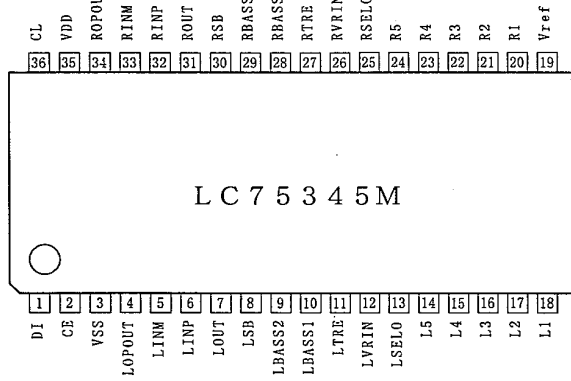


3. Pin function

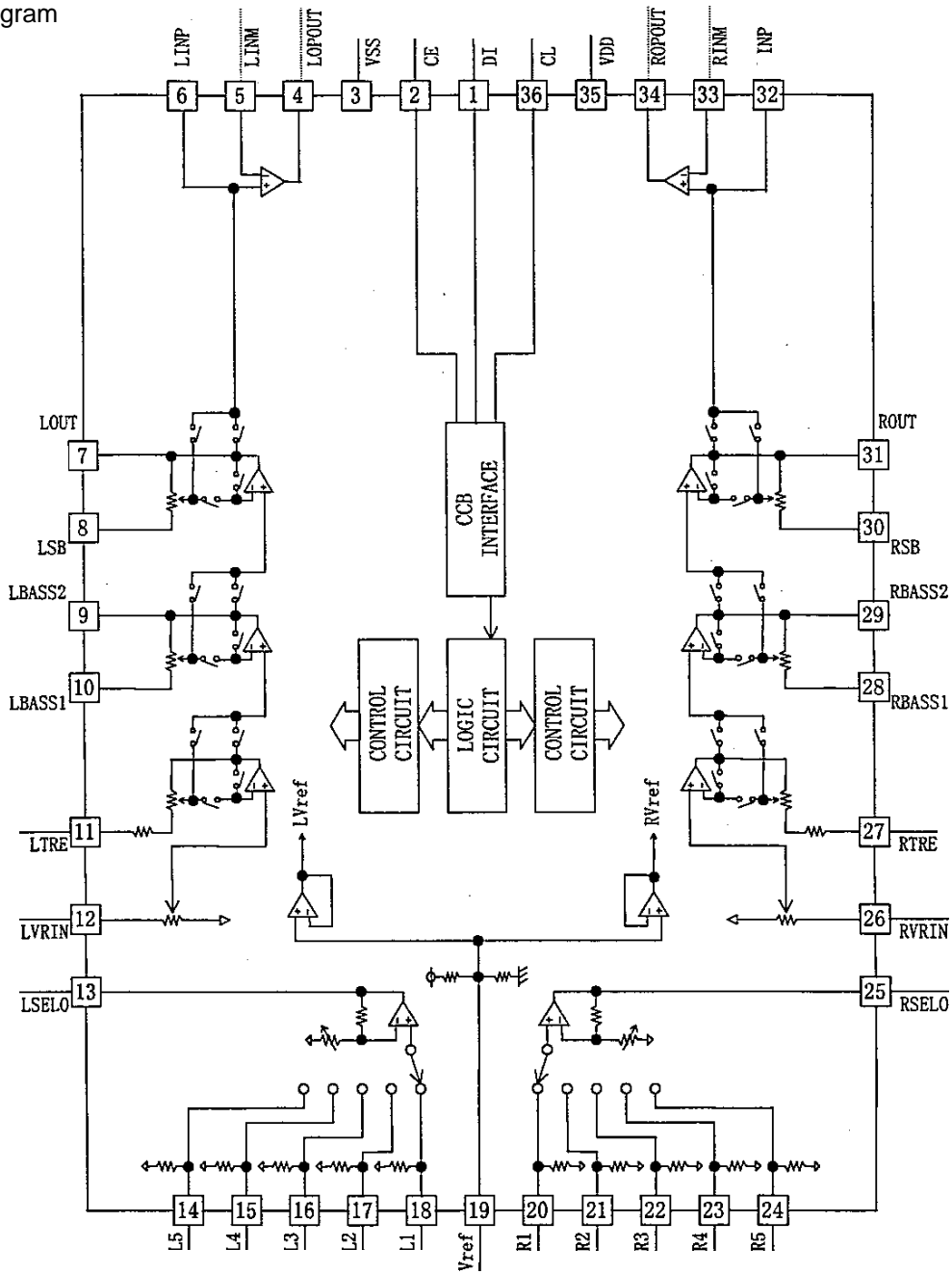
| Pin No. | Symbol            | Pin No. | Symbol            | Pin No. | Symbol            | Pin No. | Symbol            |
|---------|-------------------|---------|-------------------|---------|-------------------|---------|-------------------|
| 1       | SEG <sub>1</sub>  | 17      | SEG <sub>17</sub> | 33      | SEG <sub>33</sub> | 49      | SEG <sub>49</sub> |
| 2       | SEG <sub>2</sub>  | 18      | SEG <sub>18</sub> | 34      | SEG <sub>34</sub> | 50      | SEG <sub>50</sub> |
| 3       | SEG <sub>3</sub>  | 19      | SEG <sub>19</sub> | 35      | SEG <sub>35</sub> | 51      | OSC <sub>1</sub>  |
| 4       | SEG <sub>4</sub>  | 20      | SEG <sub>20</sub> | 36      | SEG <sub>36</sub> | 52      | OSC <sub>2</sub>  |
| 5       | SEG <sub>5</sub>  | 21      | SEG <sub>21</sub> | 37      | SEG <sub>37</sub> | 53      | V <sub>DD</sub>   |
| 6       | SEG <sub>6</sub>  | 22      | SEG <sub>22</sub> | 38      | SEG <sub>38</sub> | 54      | V <sub>SS</sub>   |
| 7       | SEG <sub>7</sub>  | 23      | SEG <sub>23</sub> | 39      | SEG <sub>39</sub> | 55      | V <sub>LCD</sub>  |
| 8       | SEG <sub>8</sub>  | 24      | SEG <sub>24</sub> | 40      | SEG <sub>40</sub> | 56      | CE                |
| 9       | SEG <sub>9</sub>  | 25      | SEG <sub>25</sub> | 41      | SEG <sub>41</sub> | 57      | SCL               |
| 10      | SEG <sub>10</sub> | 26      | SEG <sub>26</sub> | 42      | SEG <sub>42</sub> | 58      | DATA              |
| 11      | SEG <sub>11</sub> | 27      | SEG <sub>27</sub> | 43      | SEG <sub>43</sub> | 59      | MODE              |
| 12      | SEG <sub>12</sub> | 28      | SEG <sub>28</sub> | 44      | SEG <sub>44</sub> | 60      | INH               |
| 13      | SEG <sub>13</sub> | 29      | SEG <sub>29</sub> | 45      | SEG <sub>45</sub> | 61      | COM <sub>4</sub>  |
| 14      | SEG <sub>14</sub> | 30      | SEG <sub>30</sub> | 46      | SEG <sub>46</sub> | 62      | COM <sub>3</sub>  |
| 15      | SEG <sub>15</sub> | 31      | SEG <sub>31</sub> | 47      | SEG <sub>47</sub> | 63      | COM <sub>2</sub>  |
| 16      | SEG <sub>16</sub> | 32      | SEG <sub>32</sub> | 48      | SEG <sub>48</sub> | 64      | COM <sub>1</sub>  |

■ LC75345M (IC901)

1. Pin layout



2. Block Diagram



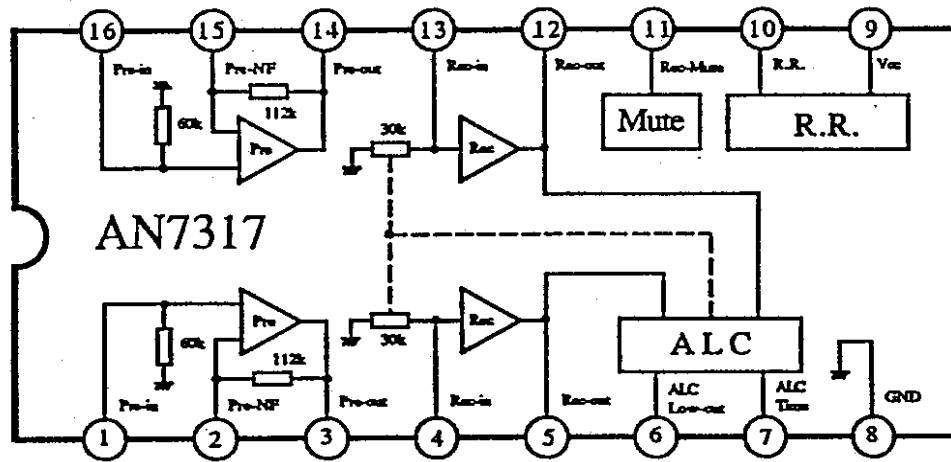
## 3. Descriptions

| Pin name | Pin No. | Descriptions  |
|----------|---------|---|
| L1       | 18      | Input signal pin  |
| L2       | 17      |   |
| L3       | 16      |   |
| L4       | 15      |   |
| L5       | 14      |   |
| R1       | 20      |   |
| R2       | 21      |   |
| R3       | 22      |   |
| R4       | 23      |   |
| R5       | 24      |   |
| LSEL0    | 13      | Input selector output pin.  |
| RSEL0    | 25      |   |
| LBASS1   | 10      | Capacitor and resistor connection pins comprising filters for bass and super-bass band. |
| LBASS2   | 9       |   |
| RBASS1   | 28      |   |
| RBASS2   | 29      |   |
| LSB      | 8       |   |
| RSB      | 30      |   |
| LOUT     | 7       | ATT + equalizer output pin/capacitor connection pin comprising filter for super-bass    |
| ROUT     | 31      |   |
| LVRIN    | 12      | Volume input pin  |
| RVRIN    | 26      |   |
| LTRE     | 11      | Capacitor connection pin comprising treble band filter.                                 |
| RTRE     | 27      |   |

| Pin name         | Pin No. | Descriptions  |
|------------------|---------|---|
| Vref             | 19      | 0.5 × VDD voltage generation block for analog ground.<br>Capacitor of several 10 μF to be connected between Vref and AWSS (VSS) as a counter-measure against power ripple.        |
| VSS              | 3       | Ground pin  |
| VDD              | 35      | Supply pin  |
| CE               | 2       | Chip enable pin.<br>Data written into an internal latch in a timing of [H] → [L].<br>Each analog switch is activated.<br>Data transfer enabled at [H] level.                      |
| DI<br>CL         | 1<br>36 | Serial data and clock input pin for control.  |
| LINP<br>RINP     | 6<br>32 | Non-inverted input pin of general-purpose operation amplifier.<br>Keep this pin open when not used.   |
| LINM<br>RINM     | 5<br>33 | Non-inverted input pin of general-purpose operation amplifier.<br>Connect to L (R) OPOUT pin when not used.<br>(Connect between pins 5 and 4)<br>(Connect between pins 33 and 34) |
| LOPOUT<br>ROPOUT | 4<br>34 | Output pin of general-purpose operation amplifier.<br>Connect to L (R) INN pin when not used.<br>(Connect between pins 5 and 4)<br>(Connect between pins 33 and 34)               |

■ AN7317 (IC32) : PB/REC amp

Block Diagram

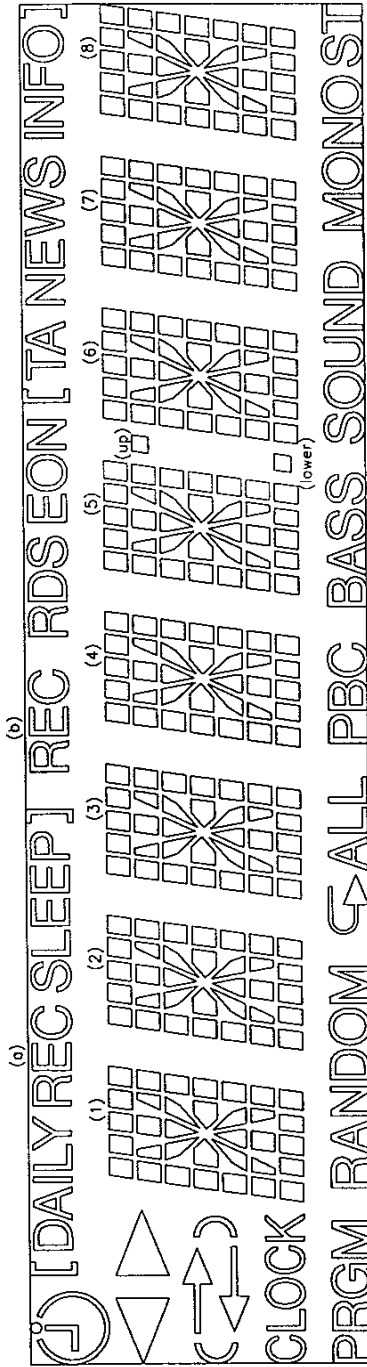
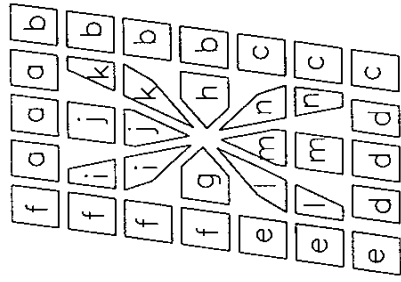


Pin Descriptions

| Pin No. | Pin Descriptions                               |
|---------|--|
| 1       | Channel 1 Playback Amplifier Input             |
| 2       | Channel 1 Playback Amplifier Negative Feedback |
| 3       | Channel 1 Playback Amplifier Output            |
| 4       | Channel 1 Record Amplifier Input               |
| 5       | Channel 1 Record Amplifier Output              |
| 6       | ALC Low-Cut                                    |
| 7       | ALC Time                                       |
| 8       | Ground   |
| 9       | Vcc  |
| 10      | Ripple Filter                                  |
| 11      | Record - Amplifier Mute                        |
| 12      | Channel 2 Record Amplifier Output              |
| 13      | Channel 2 Record Amplifier Input               |
| 14      | Channel 2 Playback Amplifier Output            |
| 15      | Channel 2 Playback Amplifier Negative Feedback |
| 16      | Channel 2 Playback Amplifier Input             |

# Internal connection of display

■ QLD0160-001 (D1934)



|         |   |      |      |           |   |                   |           |             |                 |             |         |         |         |         |         |         |         |         |             |             |             |         |             |             |         |         |                 |                 |             |                 |                 |         |                 |                 |         |                 |                 |         |    |    |
|---------|---|------|------|-----------|---|-------------------|-----------|-------------|-----------------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|-------------|-------------|-------------|---------|-------------|-------------|---------|---------|-----------------|-----------------|-------------|-----------------|-----------------|---------|-----------------|-----------------|---------|-----------------|-----------------|---------|----|----|
| PIN NO. | 1 | 2    | 3    | 4         | 5 | 6                 | 7         | 8           | 9               | 10          | 11      | 12      | 13      | 14      | 15      | 16      | 17      | 18      | 19          | 20          | 21          | 22      | 23          | 24          | 25      | 26      | 27              | 28              | 29          | 30              | 31              | 32      | 33              | 34              | 35      | 36              | 37              | 38      | 39 | 40 |
|         |   | COM0 |      |           |   | 1 (over)<br>right | clock     | 1 l 1 m 1 d | 1 e 1 g 1 n     | 1 c 2 e 2 g | 2 l 2 m | 2 n 2 c | 2 j 2 h | 2 i     | 2 k 2 b | 2 a     | 3 l 3 m | 3 i 3 j | 3 n 3 c     | 3 e 3 g 3 h | 3 a 3 k 3 b | 4 l 4 m | 4 n 4 c     | 4 g 4 e 4 i | 4 h 4 j | 4 a 4 b | 5 d 5 m         | 5 n 5 c 5 e 5 g | 5 a 5 k 5 b | 6 d 6 m         | 6 n 6 c 6 e 6 g | 6 a 6 b | 7 l 7 m         | 7 n 7 c 7 e 7 g | 7 a 7 b | 8 l 8 m         | 8 n 8 c 8 e 8 g | 8 a 8 b |    |    |
|         |   | COM1 |      |           |   | PRGM              |           | 1 e 1 g 1 n | 1 c 2 e 2 g     | 2 l 2 m     | 2 n 2 c | 2 j 2 h | 2 i     | 2 k 2 b | 2 a     | 3 l 3 m | 3 i 3 j | 3 n 3 c | 3 e 3 g 3 h | 3 a 3 k 3 b | 4 l 4 m     | 4 n 4 c | 4 g 4 e 4 i | 4 h 4 j     | 4 a 4 b | 5 d 5 m | 5 n 5 c 5 e 5 g | 5 a 5 k 5 b     | 6 d 6 m     | 6 n 6 c 6 e 6 g | 6 a 6 b         | 7 l 7 m | 7 n 7 c 7 e 7 g | 7 a 7 b         | 8 l 8 m | 8 n 8 c 8 e 8 g | 8 a 8 b         |         |    |    |
|         |   |      | COM2 |           |   | (up)              |           | 1 e 1 g 1 n | 1 c 2 e 2 g     | 2 l 2 m     | 2 n 2 c | 2 j 2 h | 2 i     | 2 k 2 b | 2 a     | 3 l 3 m | 3 i 3 j | 3 n 3 c | 3 e 3 g 3 h | 3 a 3 k 3 b | 4 l 4 m     | 4 n 4 c | 4 g 4 e 4 i | 4 h 4 j     | 4 a 4 b | 5 d 5 m | 5 n 5 c 5 e 5 g | 5 a 5 k 5 b     | 6 d 6 m     | 6 n 6 c 6 e 6 g | 6 a 6 b         | 7 l 7 m | 7 n 7 c 7 e 7 g | 7 a 7 b         | 8 l 8 m | 8 n 8 c 8 e 8 g | 8 a 8 b         |         |    |    |
|         |   |      |      | COM3 INFO |   |                   | DAILY REC | 1 a 1 k     | 1 b 1 e 1 g 1 n | 1 c 2 e 2 g | 2 l 2 m | 2 n 2 c | 2 j 2 h | 2 i     | 2 k 2 b | 2 a     | 3 l 3 m | 3 i 3 j | 3 n 3 c     | 3 e 3 g 3 h | 3 a 3 k 3 b | 4 l 4 m | 4 n 4 c     | 4 g 4 e 4 i | 4 h 4 j | 4 a 4 b | 5 d 5 m         | 5 n 5 c 5 e 5 g | 5 a 5 k 5 b | 6 d 6 m         | 6 n 6 c 6 e 6 g | 6 a 6 b | 7 l 7 m         | 7 n 7 c 7 e 7 g | 7 a 7 b | 8 l 8 m         | 8 n 8 c 8 e 8 g | 8 a 8 b |    |    |



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