# JVC

SERVICE MANUAL

CD RECEIVER

KD-SH909R

Detachable
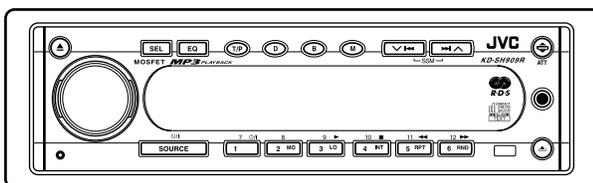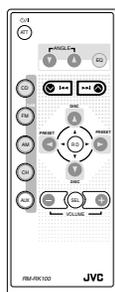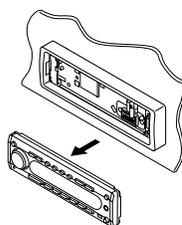
MP3
CD-RW
PLAYBACK

COMPACT
disc
DIGITAL AUDIO
TEXT

R·D·S

Area Suffix
E --------- Continental Europe
EX ------------ Central Europe

Contents

Safety precaution

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

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

Preventing static electricity

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

## 2.About the earth processing for the destruction prevention by static electricity
Static electricity in the work area can destroy the optical pickup (laser diode) in devices such as CD players. Be careful to use proper grounding in the area where repairs are being performed.

2-1 Ground the workbench
Ground the workbench by laying conductive material (such as a conductive sheet) or an iron plate over it before placing the traverse unit (optical pickup) on it.

2-2 Ground yourself
Use an anti-static wrist strap to release any static electricity built up in your body.

(caption)
Anti-static wrist strap

1MΩ

Conductive material
(conductive sheet) or iron plate
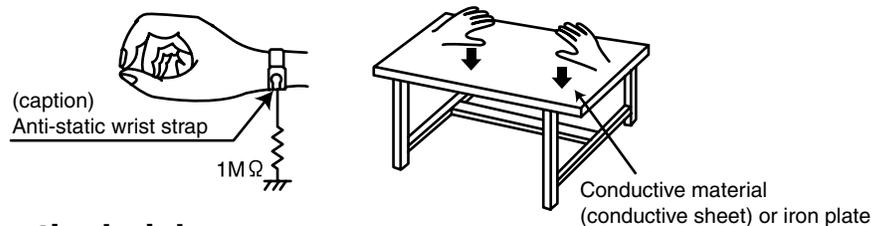
3. Handling the optical pickup
1. In order to maintain quality during transport and before installation, both sides of the laser diode on the replacement optical pickup are shorted. After replacement, return the shorted parts to their original condition. (Refer to the text.)

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 substrate.**

1.Solder is put up before the card wire is removed from connector on
  the CD substrate as shown in Figure.
  (When the wire is removed without putting up solder, the CD pick-up
   assembly might destroy.)
2.Please remove solder after connecting the card wire with
  when you install picking up in the substrate.

Damper bracket
CD mechanism ass'y
CD mechanism
control board
Front bracket

FD screw
Feed motor ass'y
Soldering
FD gear   Pickup unit
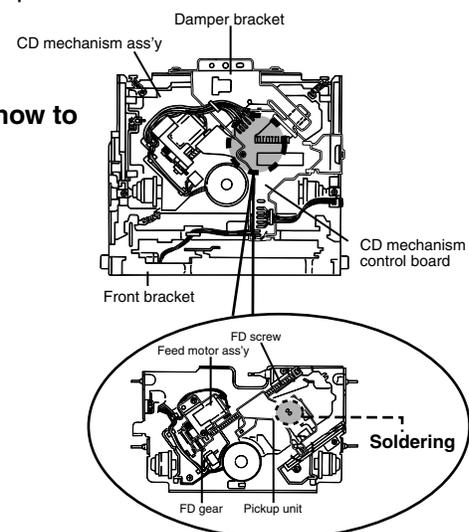
Disassembly method

■ Removing the front panel assembly
(See Fig.1)

1. Press the release button in the lower right part of the front panel assembly to unlock.

2. Remove the front panel assembly in the direction of the arrow.

Front panel assembly

Release button
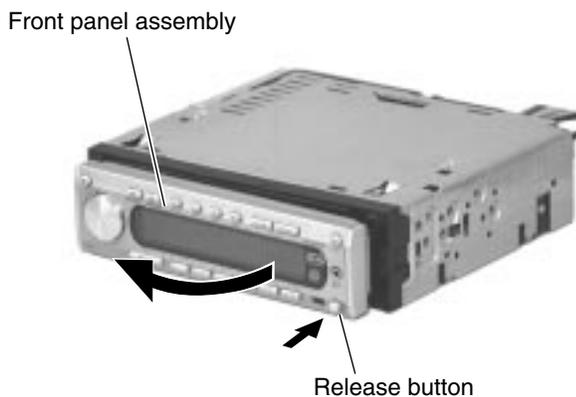
Fig.1

■ Removing the top chassis
(See Fig.2 to 6)

· Turn on power.

1. Press the eject button in the upper left part of the front panel assembly to move the assembly as shown in Fig.2 and turn off power.

2. Remove the two screws **A** on the upper side of the body.

Front panel assembly   Top chassis

Eject button

Fig.2

Top chassis

A   A

Front panel assembly
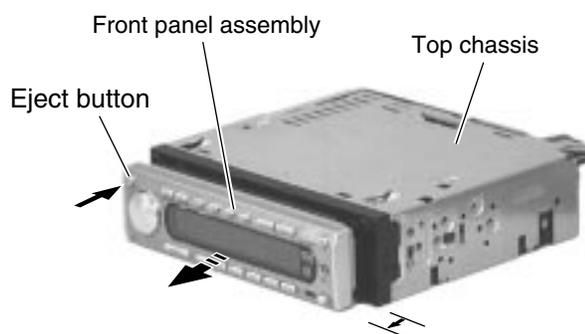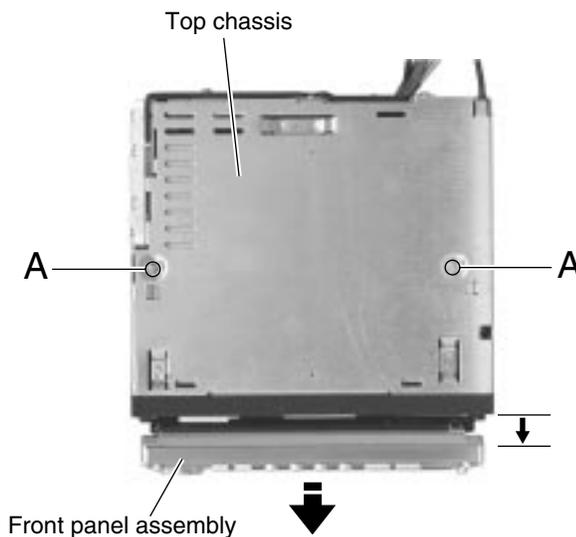
Fig.3

3. Remove the three screws **B** on both sides of the body.

4. Remove the screw **C** and the three screws **D** on the left side of the body.

5. Remove the two screws **E** and the screw **F** on the back of the body.

6. Move the top chassis upward and remove it with the CD mechanism assembly. The connector on the CD mechanism assembly is disconnected from connector CN601 on the main board.
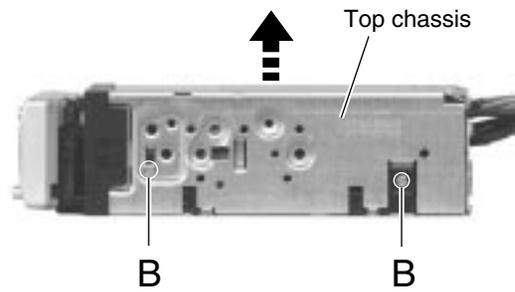
Fig.4
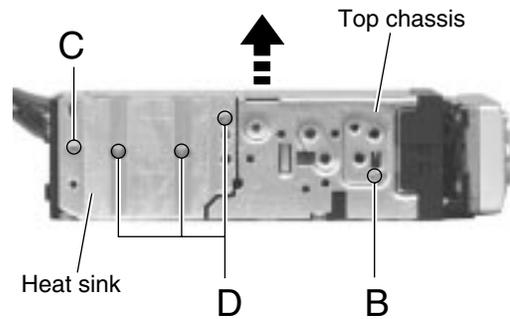
Fig.5
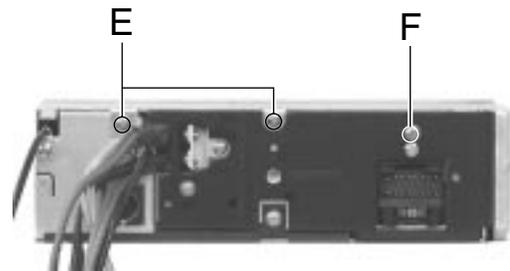
Fig.6

■ Removing the (A) board

(See Fig.7)

・ Prior to performing the following procedure, remove the top cover.

1. Disconnect the wire from connector CN601on the (A) board.

2. Remove the five screws **G** and the (A) board, releasing the joint **a** and **b**.
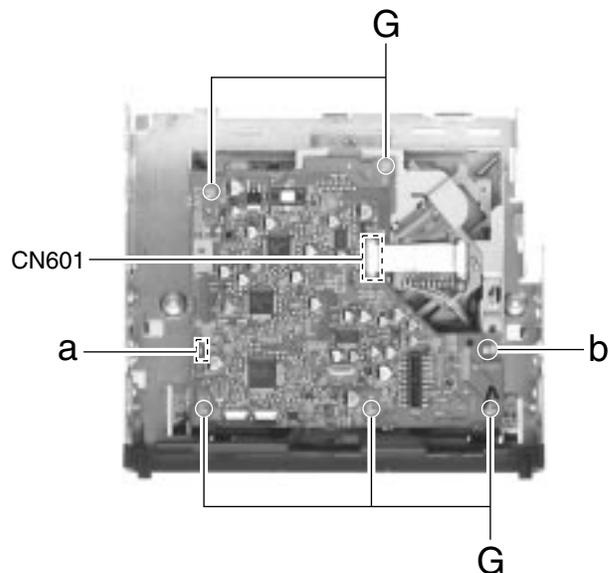
Fig.7

## ■Removing the CD mechanism assembly (See Fig.8)

・ Prior to performing the following procedure, remove the top chassis.

1. Remove the three screws **H** inside the top chassis and remove the CD mechanisma ssembly.
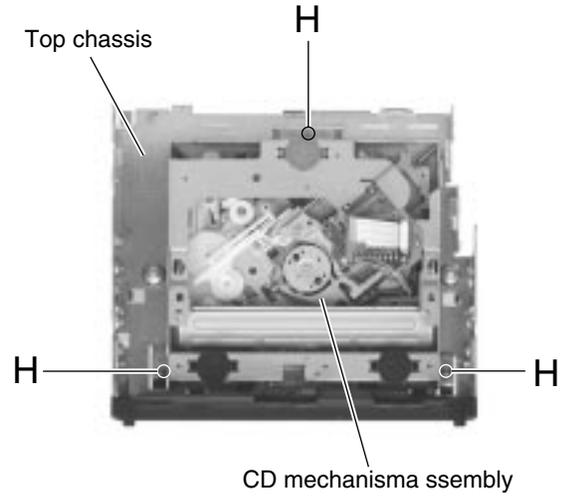
■Removing the motor assembly (See Fig.9 to 11)

・ Prior to performing the following procedure, remove the top chassis.

1. Disconnect the wire from connector CN703 on the main board.

2. Remove the motor bracket and the spring attached to the arm braket assembly (R).

3. Remove the two screws **I** attaching the motor bracket.

4. Remove the washer attaching the clutch assembly and pull out the clutch assembly from the shaft.

5. Remove the two screws **J** and the motor assembly from the motor bracket.

Top chassis

H

CD mechanisma ssembly

Fig.8

Spring   Motor braket

Motor assembly

Arm braket assembly (R)

Fig.9

Motor braket

Clutch assembly

Motor assembly

J

Washer

Fig.11

Main board

CN703

CN601

I

Motor braket

I
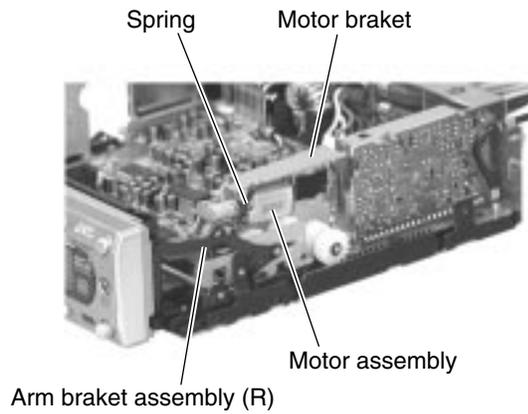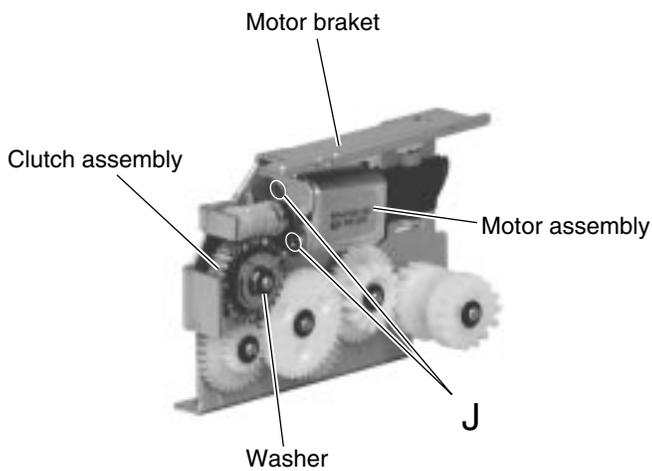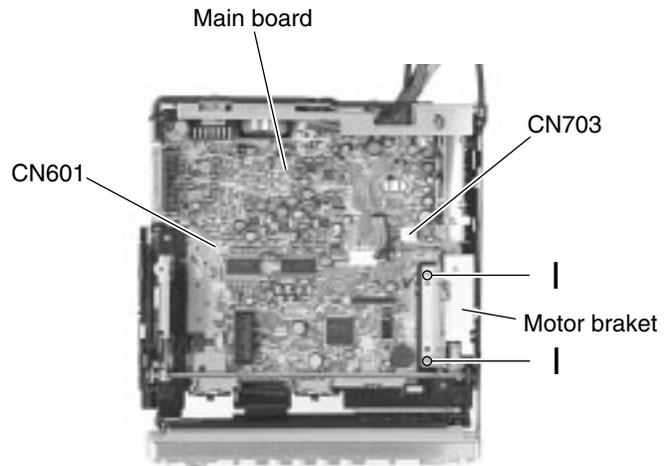
Fig.10

■Removing the main board
(See Fig.12 to 16)

· Prior to performing the following procedures, remove the top chassis and the motor bracket.

1. Disconnect the flexible wire from connector CN701 and CN702 on the main board respectively.

2. Move the front bracket backward until it stops.

3. Remove the four screws **K** attaching the arm brackets (L) and (R). Move the right and arm lefter brackets from the rod gear.

4. Remove the rod gear.

5. Remove the screw **M** attaching the rear panel to the bottom cover on the back of the body.
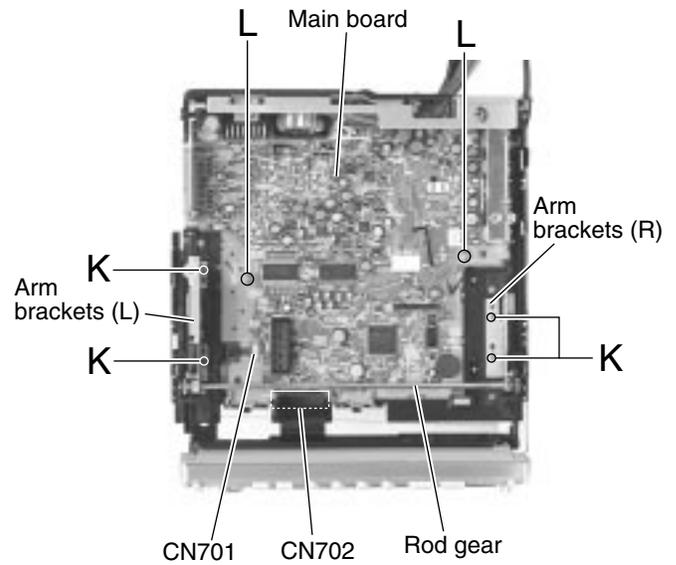
Fig.12
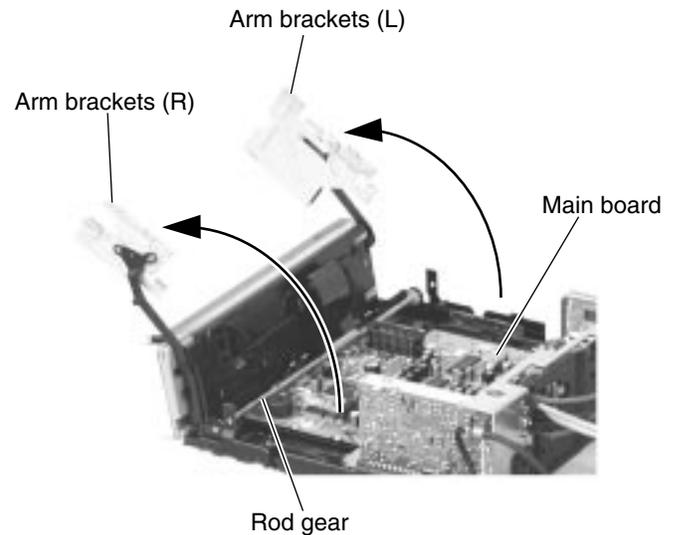
Fig.13
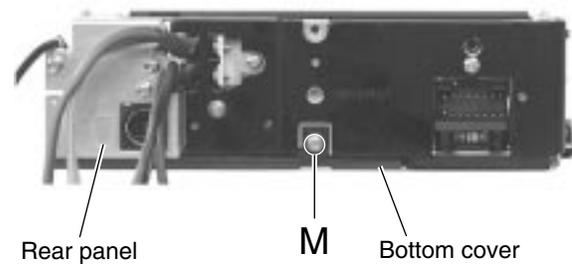
Fig.14

6. Remove the two screws **L** and move the main board backwards to release the two joints **c**. (The main board will be removed with the rear panel and the rear heat sink)

7. Remove the screw **N** and **Q** attaching the rear heat sink.

8. Remove the three screws **O** and the screw **P** attaching the rear panel. Remove the main board.
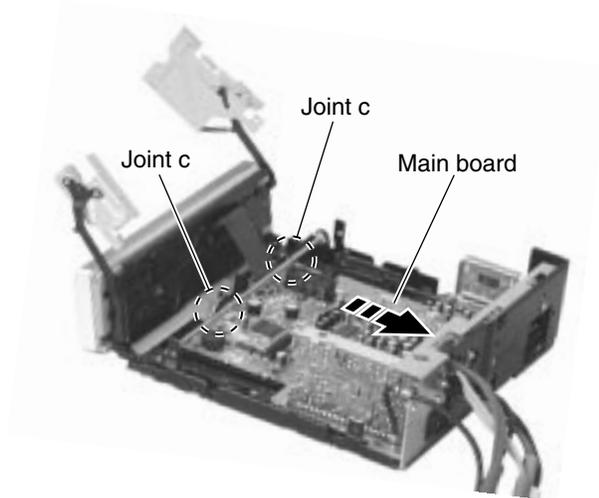
Fig.15
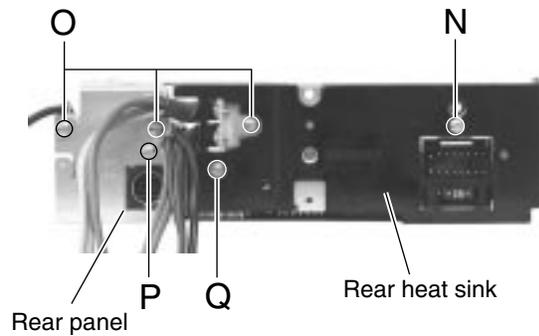
Fig.16

■ **Removing the lifter switch board**
(See Fig.17)

· Prior to performing the following procedures, remove the top chassis, the motor bracket and the main board.

1. Remove the two screws **R** attaching the lifter switch board.
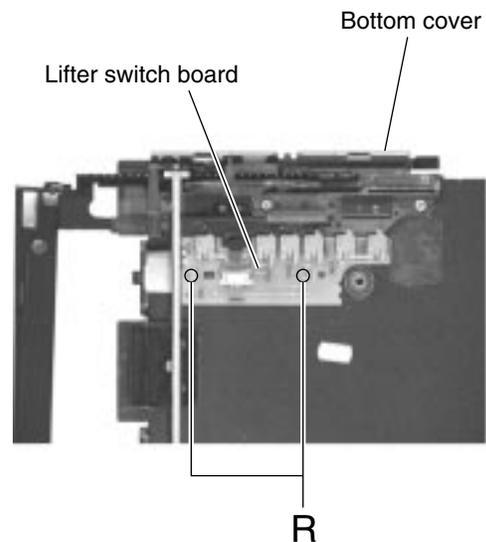
Fig.17

■Removing the lifter board
(See Fig.18 to 24)

・ Prior to performing the following procedure, remove the top chassis assembly and thefront panel assembly.

1. Disconnect the flexible wire from connector CN702 on the main board.

2. Remove the four screws **S** attaching the front bracket on both sides of the body.

3. Push the pin of the joint **d** on the front of the front bracket to release the lock lever.

Main board

CN702

Front bracket

Fig.18

Front bracket

S

Fig.19

Joint d

Lock lever

Front bracket

Fig.21

Front bracket

S
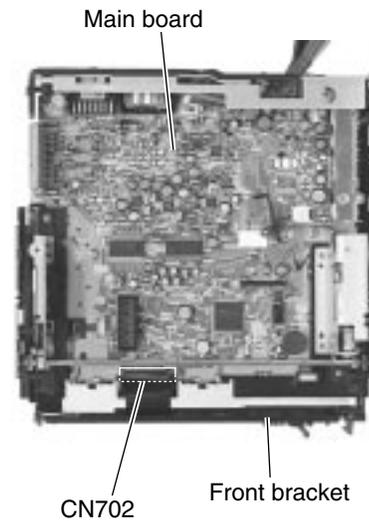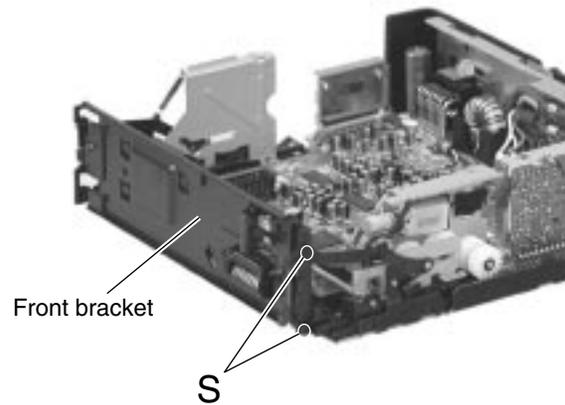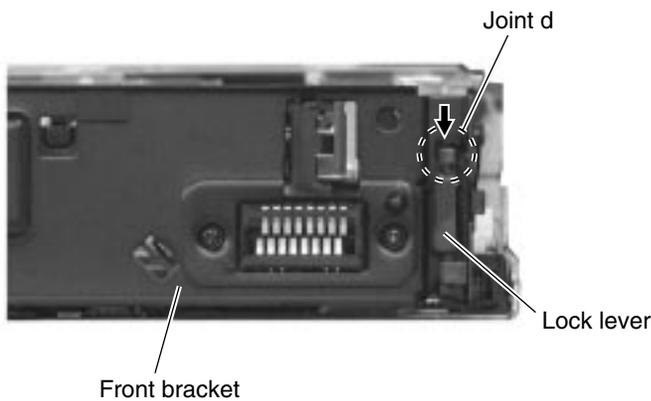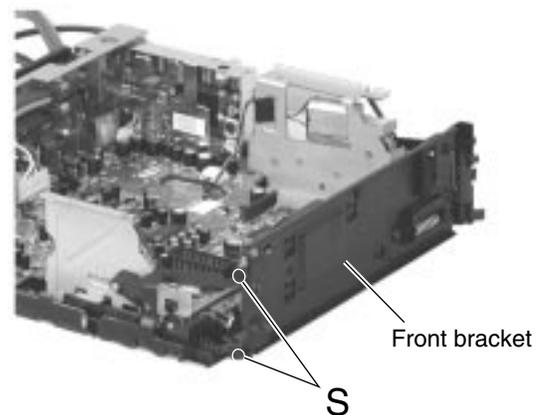
Fig.20

4. Remove the screw **T** attaching the lifter board cover in the rear of the front bracket.

5. Release the two joints **f** while pushing the front side. Move the lifter board cover inthe direction of the arrow and release the eight joints **e**.

6. Remove the two screws **U** attaching the lifter board on the front of the body.
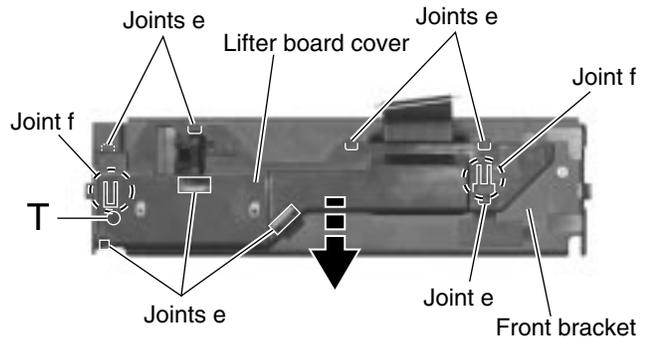
Fig.22
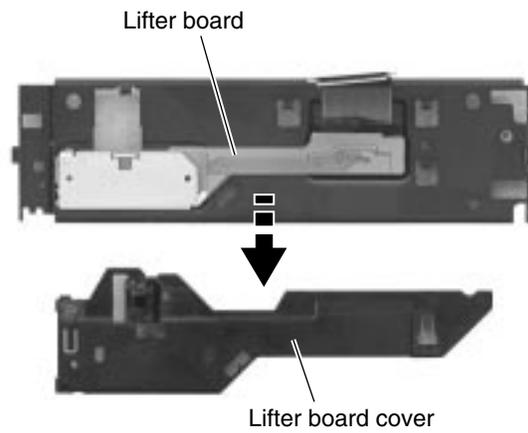
Fig.23
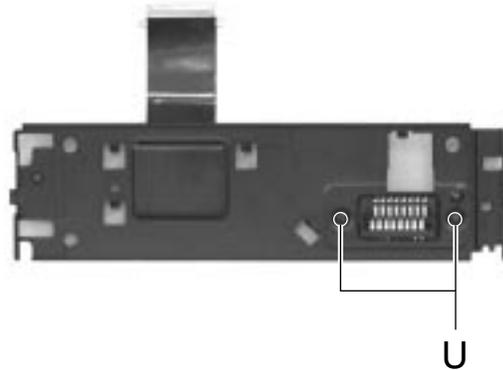
Fig.24

<Front panel assembly>

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

■Removing the front board
(See Fig.25 and 26)

1. Remove the four screws **V** attaching the rear panel to the front panel assembly.

2. Release the eleven joints **g** of the front panel and the rear panel.

3. Disconnect the wire from connector CN803 on the front board.

4. If necessary, unsolder the front board.
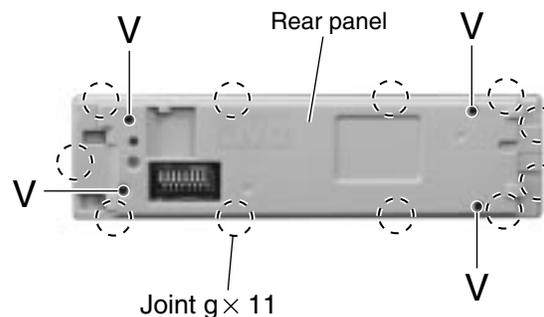
■Removing the volume board
(See Fig.26 and 27)

・ Prior to performing the following procedure, remove the rear panel.

1. Remove the four screws **W** attaching the volume board.

2. Disconnect the volume knob, ring lens and volume ring from the volume board.

3. If necessary, unsolder the volume board.
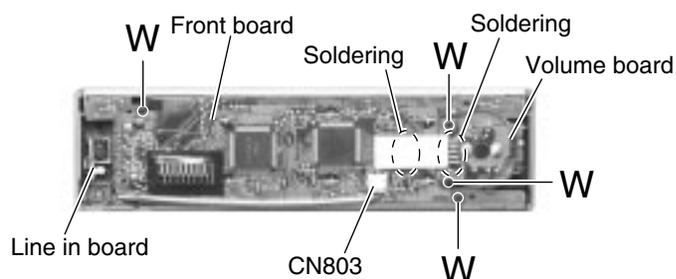
■Removing the line in board
(See Fig.26 and 28)

・ Prior to performing the following procedure, remove the rear panel.

1. Disconnect the wire from connector CN803 on the front board.

2. Pull out the line in board from the front panel assembly.

V   Rear panel   V

V

Joint g × 11

Fig.25

W   Front board   Soldering

Soldering   W   Volume board

W

Line in board   CN803   W

Fig.26

Volume board

Volume lens, Volume ring

Rng knob

Fig.27

Line in board

Fig.28

KD-SH909R
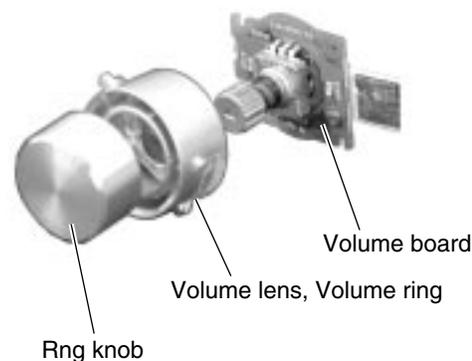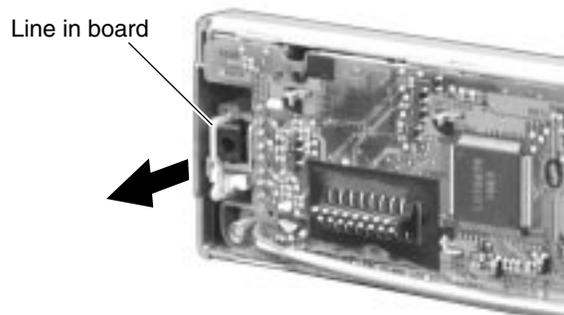
< CD mechanism section >
■ Removing the top cover
(See Fig.1 and 2)

1. Remove the two screws **A** on each side of the body.

2. Lift the front side of the top cover and move the cover backward to release the two joints **a**.
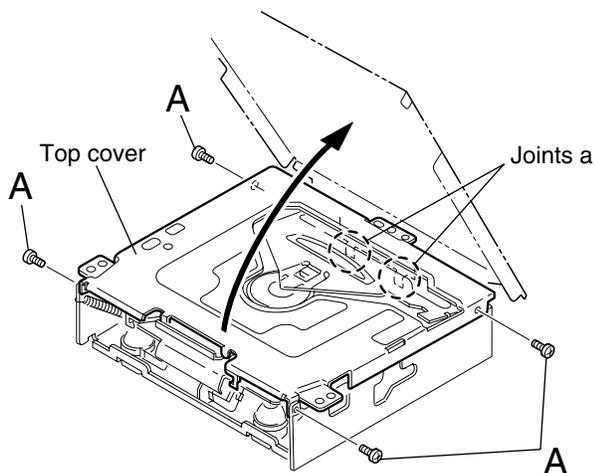
■ Removing the connector board
(See Fig.3 to 5)

CAUTION: Before disconnecting the flexible wire from the pickup, solder the short-circuit point on the pickup. No observance of this instruction may cause damage of the pickup.

1. Remove the screw **B** fixing the connector board.

2. Solder the short-circuit point on the connector board.

   Disconnect the flexible wire from the pickup.

3. Move the connector board in the direction of the arrow to release the two joints **b**.

4. Unsolder the wire on the connector board if necessary.
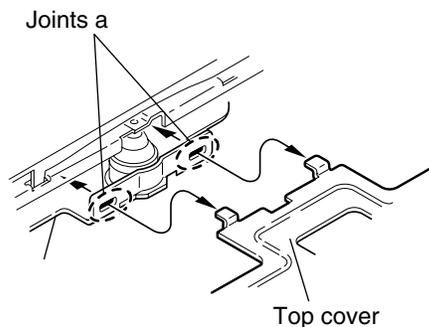
CAUTION: Unsolder the short-circuit point after reassembling.

Fig.1

Joints a

Top cover

Fig.2

B

Connector board

DET switch

Joints b   Short-circuit   Pickup

Fig.3

B

Connector board

Flexible wire

Frame

Fig.5

Short-circuit point (Soldering)

Flexible wire

Pickup
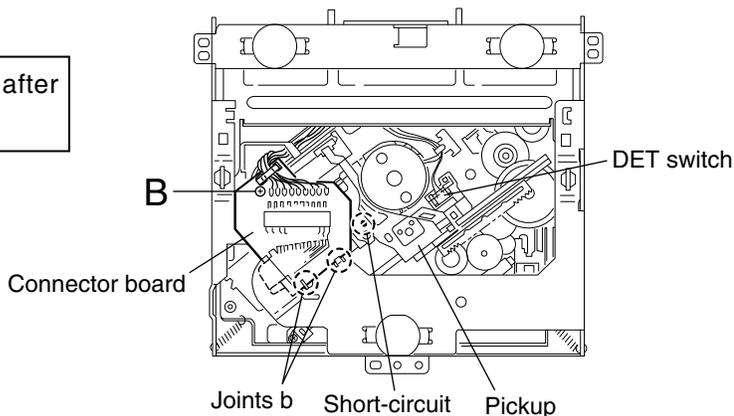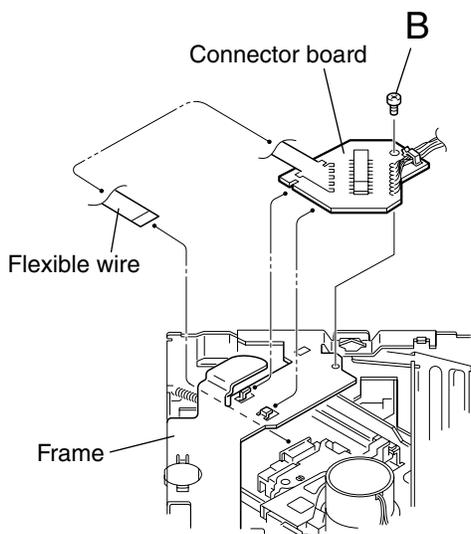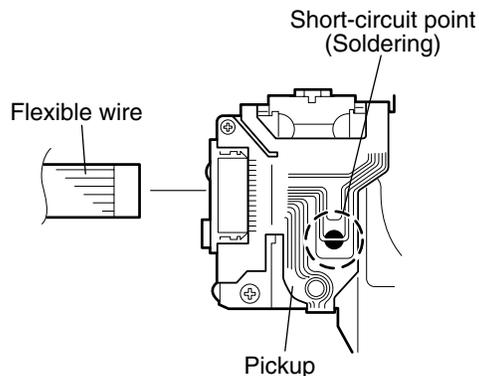
Fig.4

■Removing the DET switch
(See Fig.3 and 6)

1. Extend the two tabs **c** of the feed sw. holder and pull out the switch.

2. Unsolder the DET switch wire if necessary.
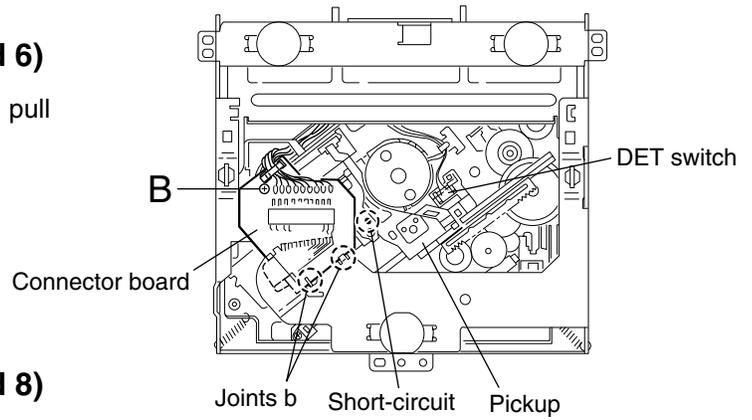
■Removing the chassis unit
(See Fig.7 and 8)

・ Prior to performing the following procedure, remove the top cover and the connector board.

1. Remove the two suspension springs (L) and (R) attaching the chassis unit to the frame.

CAUTION: The shape of the suspension spring (L) and (R) are different. Handle them with care.

CAUTION: When reassembling, make sure that the three shafts on the underside of the chassis unit are inserted to the dampers certainly.

Fig.3
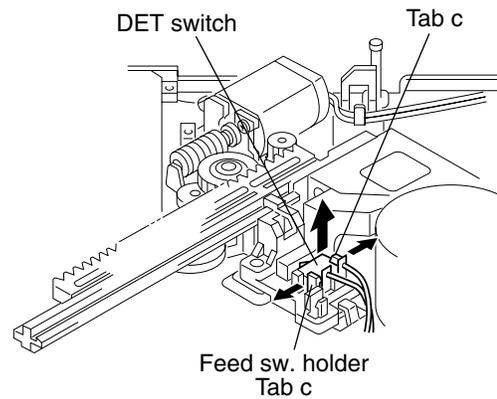
Fig.6
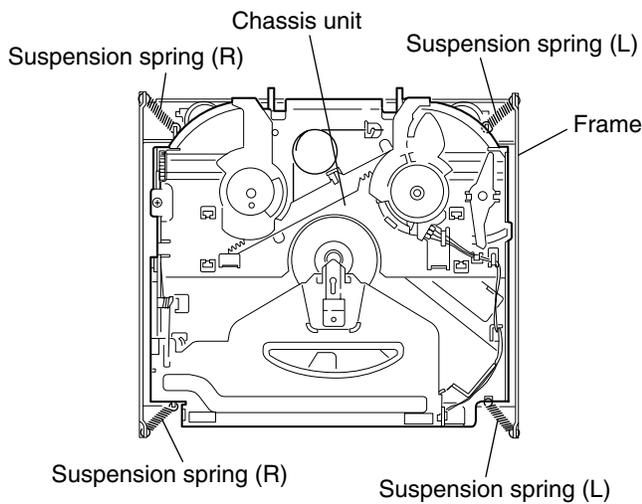
Fig.7
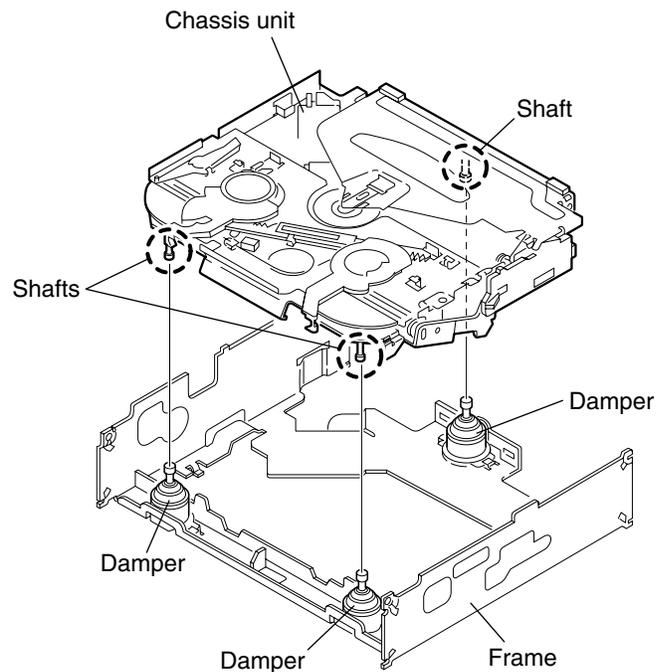
Fig.8

■Removing the clamper assembly (See Fig.9 and 10)

・ Prior to performing the following procedure, remove the top cover.

1. Remove the clamper arm spring.

2. Move the clamper assembly in the direction of the arrow to release the two joints **d**.
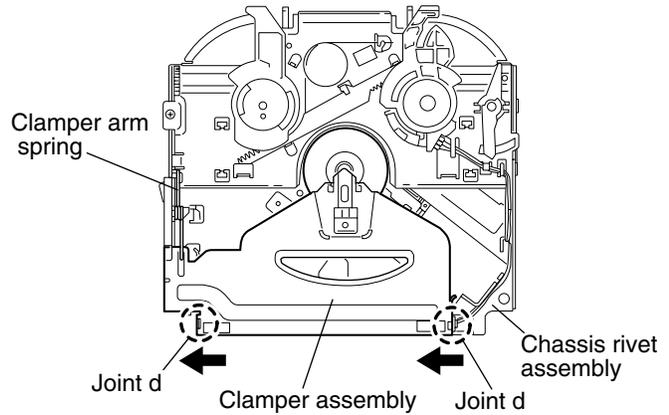
Fig.9

■Removing the loading / feed motor assembly (See Fig.11 and 12)

・ Prior to performing the following procedure, remove the top cover, the connector board and the chassis unit.

1. Remove the screw **C** and move the loading / feed motor assembly in the direction of the arrow to remove it from the chassis rivet assembly.

2. Disconnect the wire from the loading / feed motor assembly if necessary.

CAUTION: When reassembling, connect the wire from the loading / feed motor assembly to the flame as shown in Fig.11.
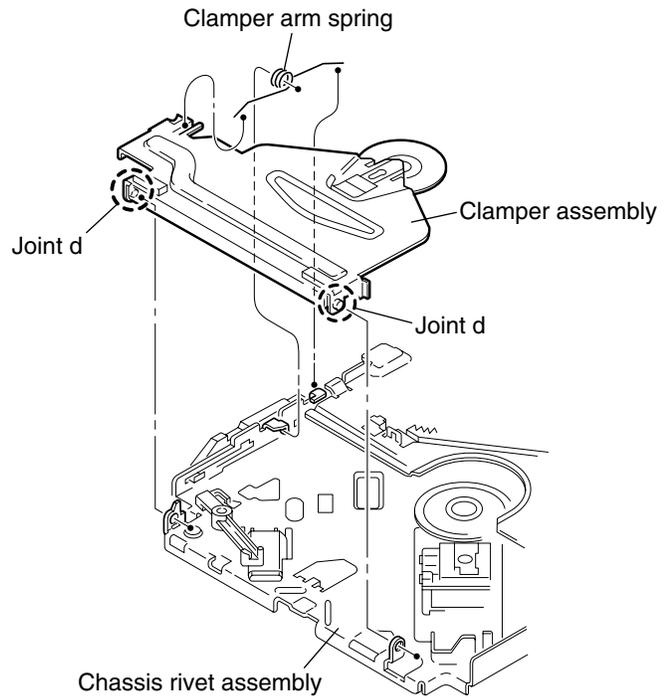
Fig.10

Loading / feed motor assembly
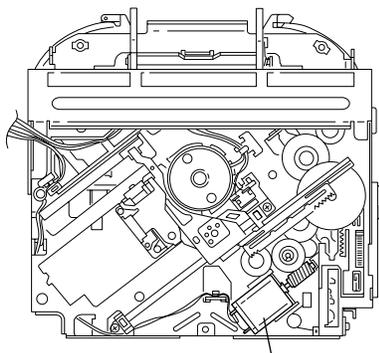
Fig.11

Loading / feed motor assembly
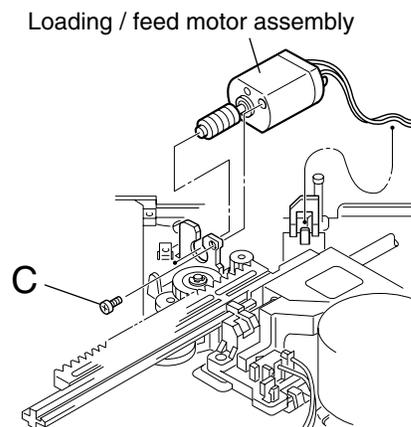
Fig.12

■Removing the pickup unit
(See Fig.13 to 17)

· Prior to performing the following procedure, remove the top cover, the connector board and the chassis unit.

1. Remove the screw **D** and pull out the pu. shaft holder from the shaft.

2. Remove the screw **E** attaching the feed sw. holder.

3. Move the part **e** of the pickup unit upward with the shaft and the feed sw. holder, then release the joint **f** of the feed sw. holder in the direction of the arrow. The joint **g** of the pickup unit and the feed rack is released, and the feed sw. holder comes off.

4. Remove the shaft from the pickup unit.

5. Remove the screw **F** attaching the feed rack to the pickup unit.

■Reattaching the pickup unit
(See Fig.13 to 16)

1. Reattach the feed rack to the pickup unit using the screw **F**.

2. Reattach the feed sw. holder to the feed rack while setting the joint tab **g** to the slot of the feed rack and setting the part **f** of the feed rack to the switch of the feed sw. holder correctly.

3. As the feed sw. holder is temporarily attached to the pickup unit, set to the gear of the joint **g** and to the bending part of the chassis (joint **h**) at a time.

> CAUTION: Make sure that the part **i** on the underside of the feed rack is certainly inserted to the slot **j** of the change lock lever.

4. Reattach the feed sw. holder using the screw **E**.

5. Reattach the shaft to the pickup unit. Reattach the pu. shaft holder to the shaft using the screw **D**.
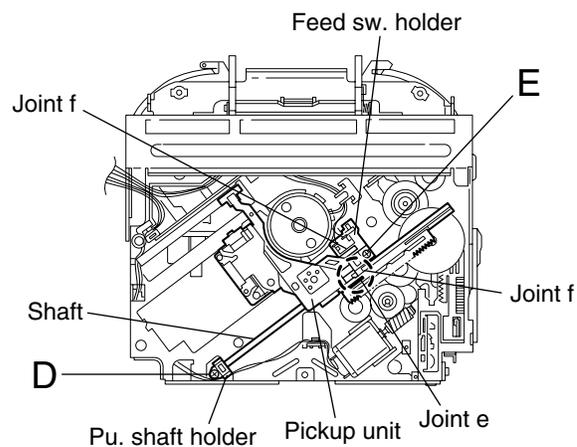
Fig.13
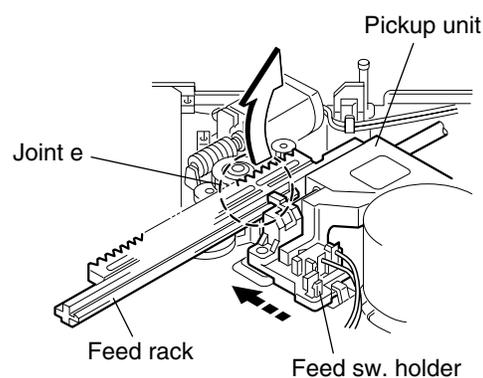
Fig.14
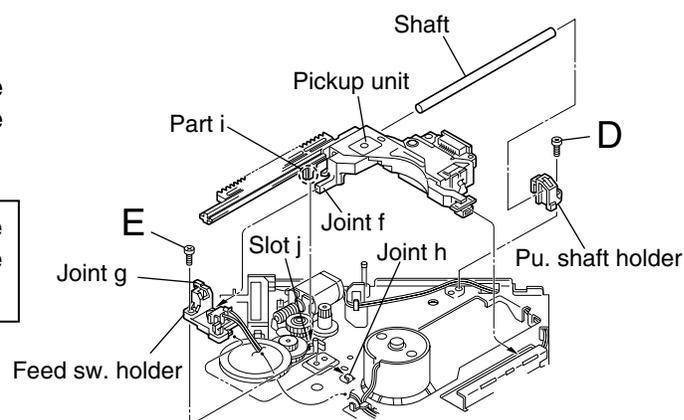
Fig.15
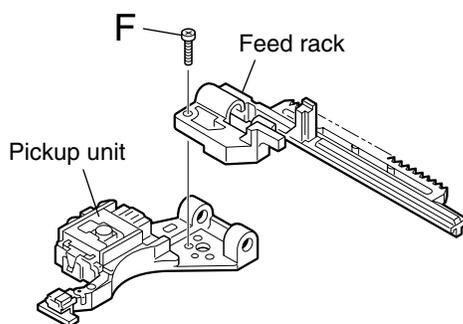
Fig.16
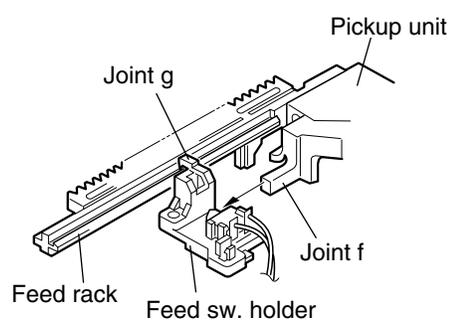
Fig.17

■Removing the trigger arm
(See Fig.18 and 19)

· Prior to performing the following procedure, remove the top cover, the connector board and the clamper unit.

1. Turn the trigger arm in the direction of the arrow to release the joint **k** and pull out upward.

> CAUTION: When reassembling, insert the part **l** and **m** of the trigger arm into the part **n** and **o** at the slot of the chassis rivet assembly respectively and join the joint **k** at a time.

Joint k

Trigger arm

Chassis rivet assembly

Fig.18

Trigger arm

Part n

Part o

Part l

Part m

Chassis rivet assembly
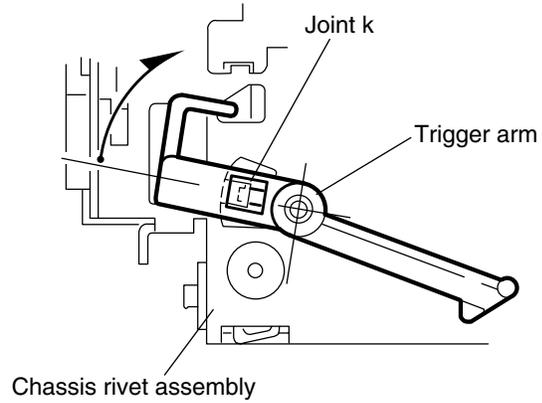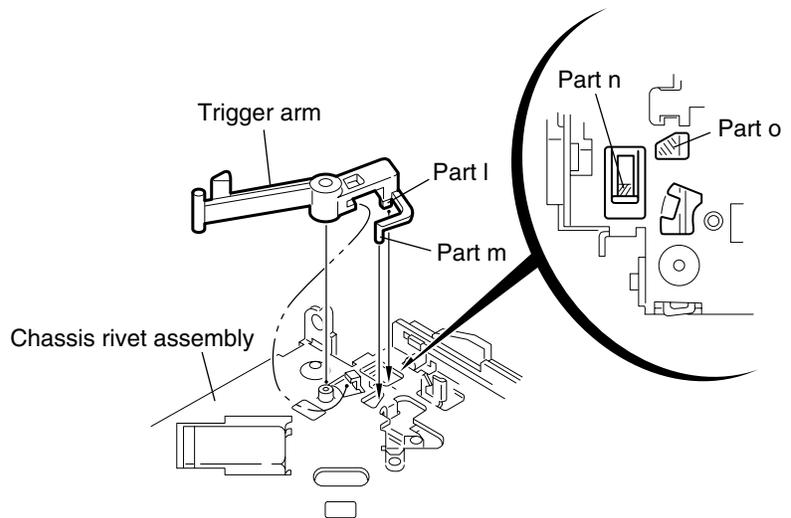
Fig.19

■Removing the top plate assembly
(See Fig.20)

· Prior to performing the following procedure, remove the top cover, the connector board, the chassis unit, and the clamper assembly.

1. Remove the screw **H**.

2. Move the top plate assembly in the direction of the arrow to release the two joints **p**.

3. Unsolder the wire marked **q** if necessary.

Top plate assembly

H

Joints p

q
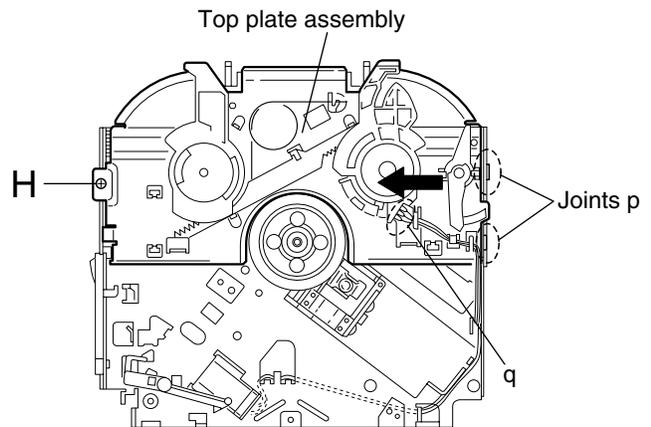
Fig.20

■Removing the select arm (L) / select lock arm (See Fig.21 and 22)

・ Prior to performing the following procedure, remove the top plate assembly.

1. Bring up the select arm (L) to release from the link plate (joint **r**) and turn in the direction of the arrow to release the joint **s**.

2. Unsolder the wire of the select arm (L) marked **q** if necessary.

3. Turn the select lock arm in the direction of the arrow to release the two joints **t**.

   The select lock arm spring comes off the select lock arm at the same time.
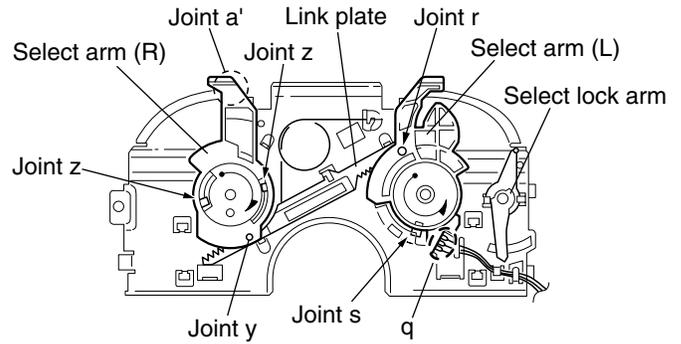
Fig.21

■Reassembling the select arm (L) / select lock arm (See Fig.23 to 25)

REFERENCE: Reverse the above removing procedure.

1. Reattach the select lock arm spring to the top plate and set the shorter end of the select lock arm spring to the hook **u** on the top plate.

2. Set the other longer end of the select lock arm spring to the boss **v** on the underside of the select lock arm, and join the select lock arm to the slots (joint **t**). Turn the select lock arm as shown in the figure.

3. Reattach the select arm (L) while setting the part **r** to the first peak of the link plate gear, and join the joint **s**.

   CAUTION: When reattaching the select arm (L), check if the points **w** and **x** are correctly fitted and if each part operates properly.
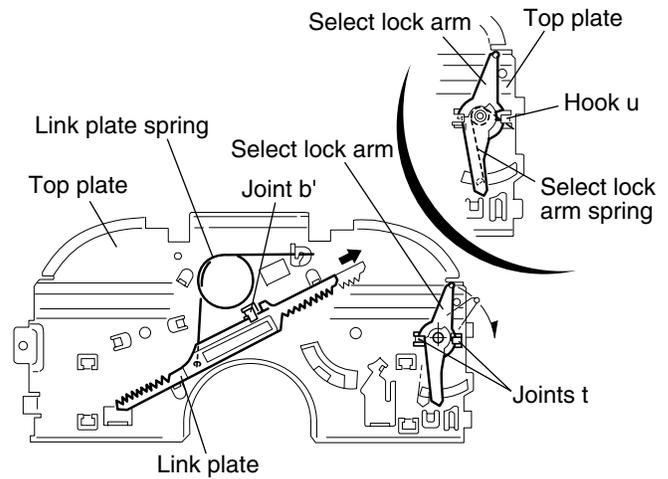
Fig.22
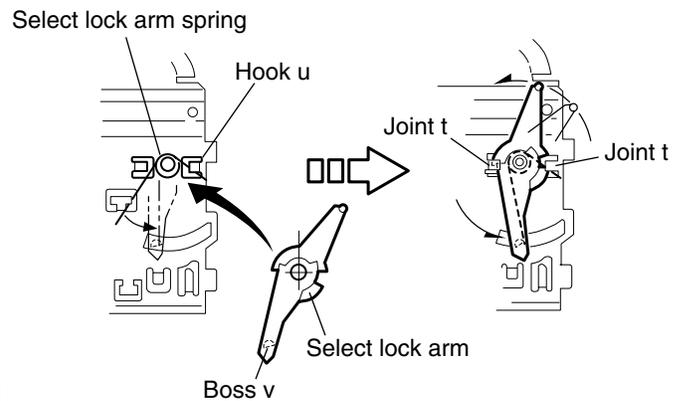
Fig.23
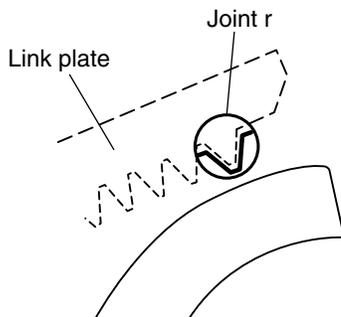
Fig.24
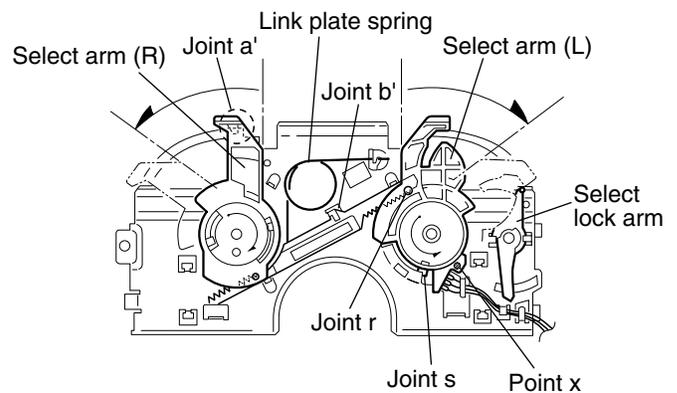
Fig.25

■Removing the select arm (R) / link plate
(See Fig.21 and 22)

· Prior to performing the following procedure, remove the top plate assembly.

1. Bring up the select arm (R) to release from the link plate (joint **y**) and turn as shown in the figure to release the two joints **z** and joint **a'**.

2. Move the link plate in the direction of the arrow to release the joint **b'**. Remove the link plate spring at the same time.
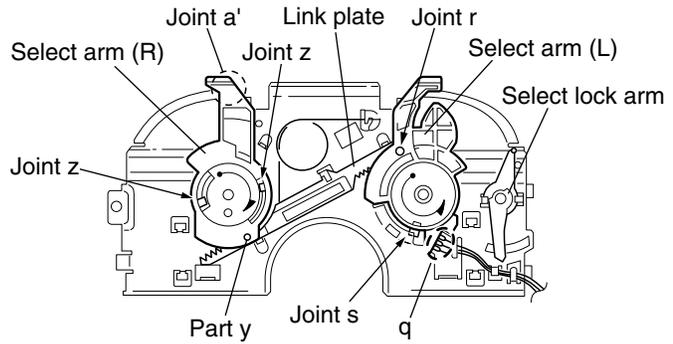
REFERENCE: Before removing the link plate, remove the select arm (L).

■Reattaching the Select arm (R) / link plate (See Fig.25 and 26)

REFERENCE: Reverse the above removing procedure.

1. Reattach the link plate spring.

2. Reattach the link plate to the link plate spring while joining them at joint **b'**.

3. Reattach the part **y** of the select arm (R) to the first peak of the link plate while joining the two joints **z** with the slots. Then turn the select arm (R) as shown in the figure. The top plate is joined to the joint **a'**.

CAUTION: When reattaching the select arm (R), check if the part **c'** is correctly fitted and if each part operates properly.

Fig.21
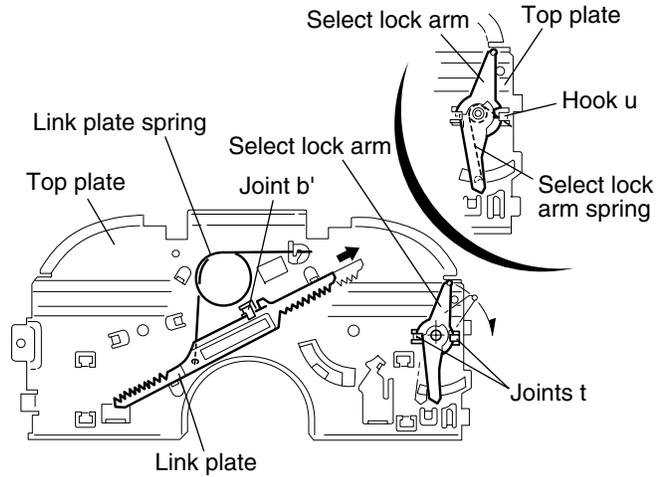
Fig.22
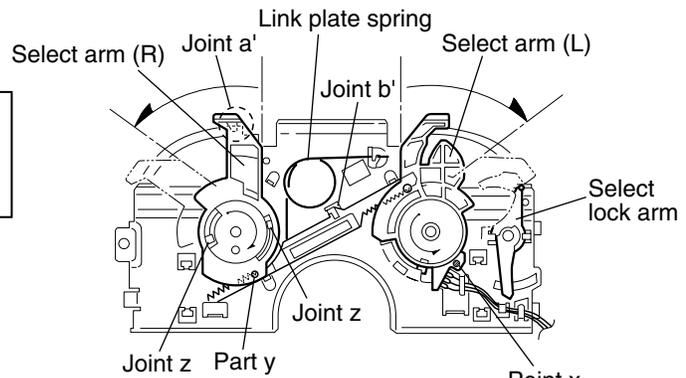
Fig.25
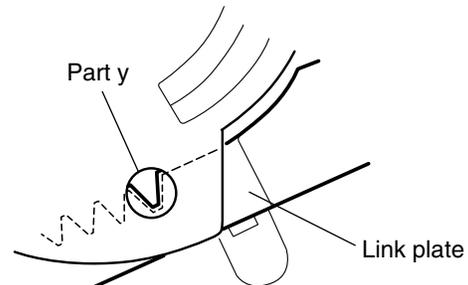
Fig.26

■Removing the loading roller assembly
(See Fig.27 to 29)

・ Prior to performing the following procedure, remove the clamper assembly and the top plate assembly.

1. Push inward the loading roller assembly on the gear side and detach it upward from the slot of the joint **d'** of the lock arm rivet assembly.

   Detach the loading roller assembly from the slot of the joint **e'** of the lock arm rivet assembly.

   The roller guide comes off the gear section of the loading roller assembly.

   Remove the roller guide and the washer from the shaft of the loading roller assembly.

2. Remove the screw **I** attaching the lock arm rivet assembly.

3. Push the shaft at the joint **f'** of the lock arm rivet assembly inward to release the lock arm rivet assembly from the slot of the slide plate. Extend the lock arm rivet assembly outward and release the joint **g'** from the boss of the chassis rivet assembly. The roller guide springs on both sides come off.

CAUTION: When reassembling, reattach the left and right roller guide springs to the lock arm rivet assembly before reattaching the lock arm rivet assembly to the chassis rivet assembly. Make sure to fit the part **h'** of the roller guide spring (L) inside of the roller guide (Refer to Fig.30).

Roller guide
Washer
Loading roller assembly
Roller guide
Joint e'
Roller guide spring
Roller guide spring
Joint d'
Loading roller assembly
Roller guide spring
Lock arm rivet assembly

Fig.27

Loading roller assembly
Roller guide spring
Loading roller assembly
Joint h'
Roller guide spring

Fig.28-1

Fig.28-2

Roller guide
Washer
Roller shaft assembly
Frame
Loading roller
Roller guide spring

Fig.30

Chassis rivet assembly
Boss
Slide plate
Roller guide spring
Lock arm rivet assembly
Part g'
Joint f'

Fig.29

■Removing the loading gear (5), (6) and (7) (See Fig.31 and 32)

・ Prior to performing the following procedure, remove the top cover, the chassis unit and the top plate assembly.

1. Remove the screw **J** attaching the loading gear bracket. The loading gear (6) and (7) come off the loading gear bracket.

2. Pull out the loading gear (5).

J   Loading gear bracket
Loading gear (6)
Loading gear (5)
Loading gear (3)

Fig.31

J
Loading gear bracket
Loading gear (6)
Loading gear (7)
Loading gear (5)
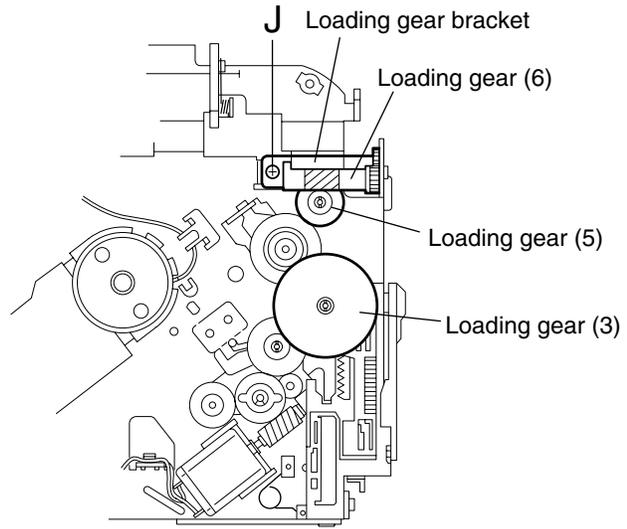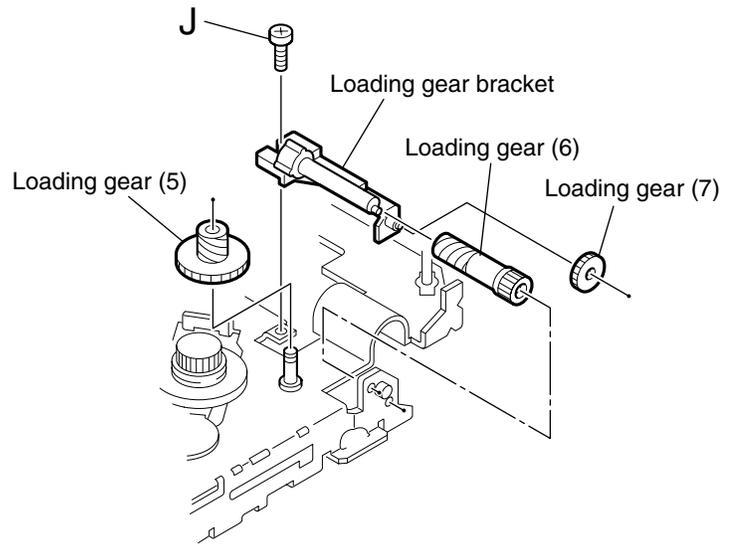
Fig.32

■Removing the gears (See Fig.33 to 36)

・ Prior to performing the following procedure, remove the top cover, the chassis unit, the top plate assembly and the pickup unit.

1. Pull out the feed gear.

2. Move the loading plate assembly in the direction of the arrow to release the slide plate from the two slots **j'** of the chassis rivet assembly.

3. Detach the loading plate assembly upward from the chassis rivet assembly while releasing the joint **k'**. Remove the slide hook and the loading plate spring from the loading plate assembly.

4. Pull out the loading gear (2) and remove the change lock lever.

5. Remove the E-washer and the washer attaching the changer gear (2).

6. The changer gear (2), the changer gear spring and the adjusting washer come off.

7. Remove the loading gear (1).

8. Move the hang plate rivet assembly in the direction of the arrow to release from the three shafts of the chassis rivet assembly upward.

9. Detach the loading gear plate rivet assembly from the shaft of the chassis rivet assembly upward while releasing the joint **l'**.

10. Pull out the loading gear (4).
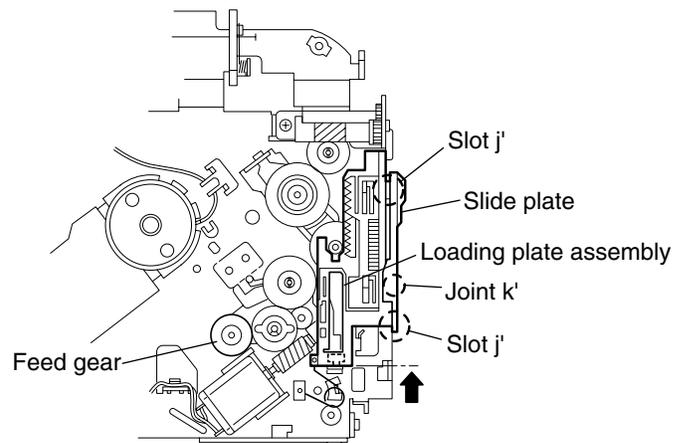
Fig.33
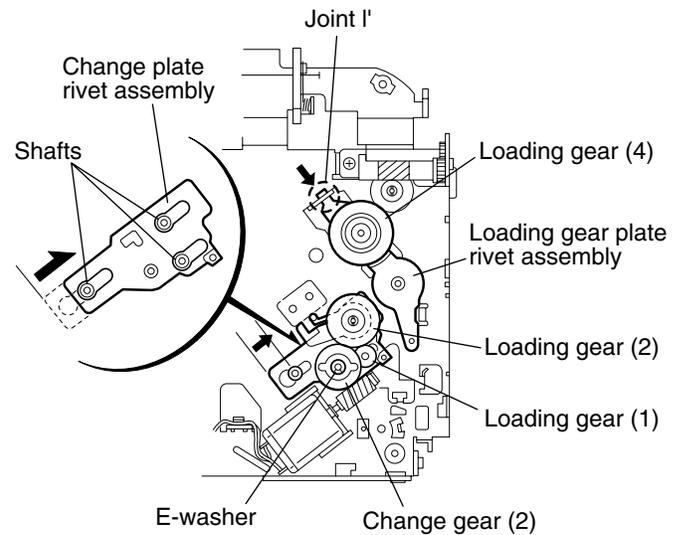
Fig.34
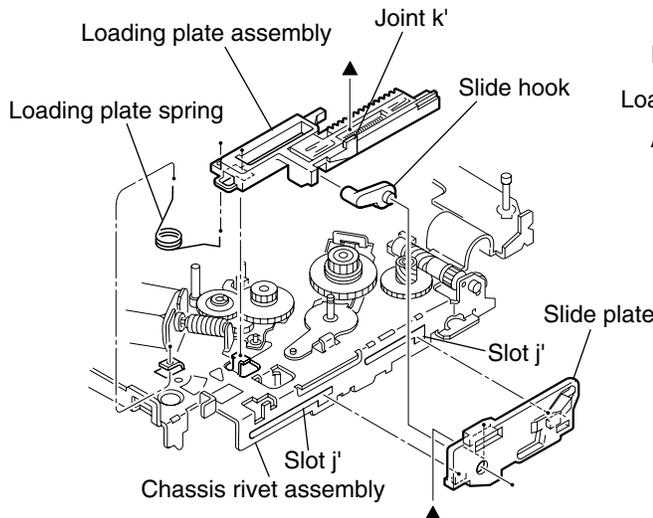
Fig.35
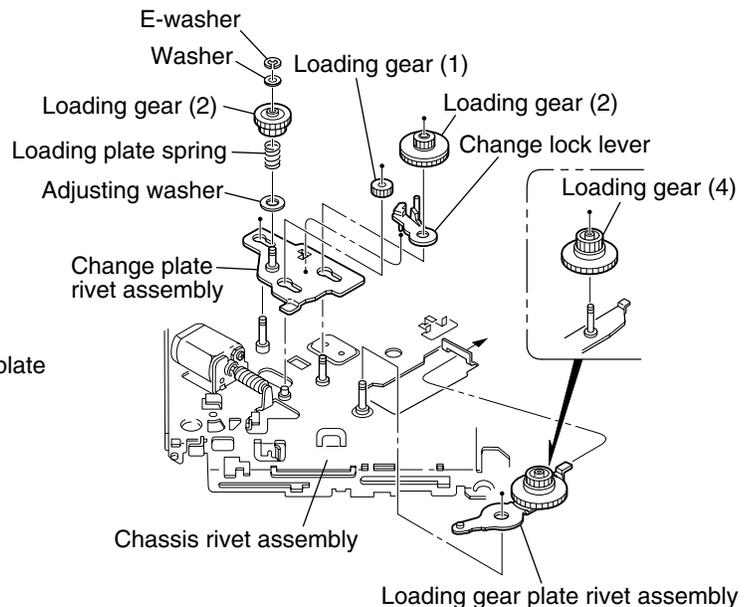
Fig.36

■Removing the turn table / spindle motor (See Fig.37 and 38)

・ Prior to performing the following procedure, remove the top cover, the connector assembly and the chassis / clamper assembly.

1. Remove the two screws **K** attaching the spindle motor assembly through the slot of the turn table on top of the body.

2. Unsolder the wire on the connector board if necessary.

K

Turn table

Fig.37

K

Turn table

Spindle motor
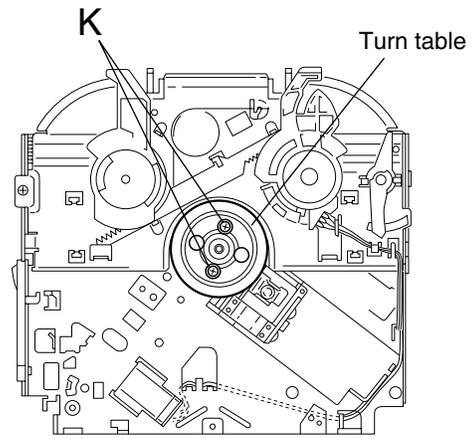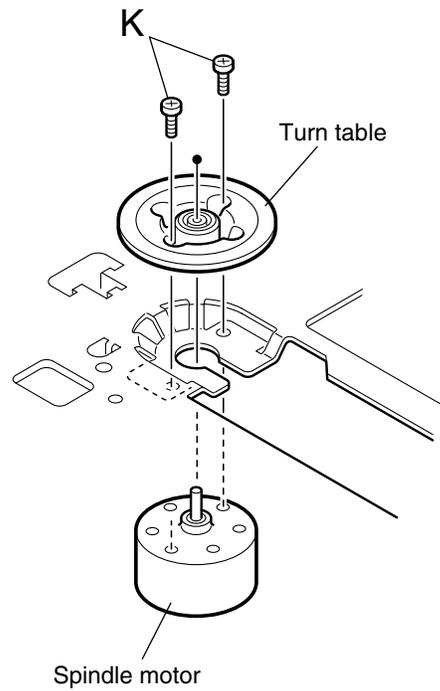
Fig.38

Adjustment method

■ Test instruments required adjustment
1.Digital oscilloscope (100MHz)
2.AM Standard signal generator
3.FM Standard signal generator
4.Stereo modulator
5.Electric voltmeter
6.Digital tester
7.Test disc(CTS-1000)
8.Extension cable for check
     EXTGS004-22P

■ Standard volume position
Balance and Bass & Treble volume : Indication "0"
Loudness : OFF

■ Frequency Band
FM   87.5kHz - 108.0 kHz

AM (MW) 522kHz - 16200kHz

(LW) 144kHZ - 279kHz

■ Dummy load
Exclusive dummy load should be used for AM, and FM.
For FM dummy load, there is a loss of 6dB between SSG output
and antenna input. The loss of 6dB need not be considered
since direct reading of figures are applied in this working
standard.

■ Standard measuring conditions
Power supply voltage DC 14.4V(11V to 16V allowance)
Load impedance   4Ω(4 Ω to 8 Ωallowance)
Line-out Level/Impedance
 : 2.0 V/20kΩ load(full scale)
Output impedance : 1kΩ

■ How to connect the extension cable for adjusting

CD Mechanism

Extension cables
EXTGS004-26P

CN701

Front panel ass'y

Flow of functional operation unit TOC read

```
                            ┌──────────────────┐
                            │    Power ON       │
                            │  Set Function CD  │
                            └──────────────────┘
                                     │
                                     ▼
                            ┌──────────────────┐
                            │  Disc inserted    │
                            └──────────────────┘
                                     │
                                     ▼
                            ┌──────────────────────────┐
                            │ Pickup feed to the inner  │
                            │          area             │
                            └──────────────────────────┘
                                     │  YES
                                     ▼
                            ┌──────────────────┐
                            │  Laser emitted    │
                            └──────────────────┘
```

• When the pickup correctly moves to the inner area of the disc

Microprocessor commands $83 $82 $81

FMO
TC94A14FA" 40"   3.3V
                                      Hi-Z
                                      0V

FEED MOTOR   6V
+TERMINAL   4V
IC561"4"   2V

REST SW   OFF
                                      ON

• When the laser diode correctly emits

Microprocessor commands $84

SEL
TC94A14FA"38"   3.3V
                                      0V

LD
CN501"15"   4V

                                      0V

• When correctly focused

FEO
TA2157" 15"   2.2V

Focus Servo Loop ON

```
            ┌───────────────┐
     ───────◄  Focus search  ►──────► ┌──────────┐
            └───────────────┘         │ "No disc" │
                    │  YES            │ display   │
                    ▼                 └──────────┘
            ┌──────────────┐
            │ Disc rotates  │
            └──────────────┘
                    │   RF signal eye-pattern
                    │   remains closed
                    ▼
            ┌─────────────────────┐
            │ Tracking loop closed │
            └─────────────────────┘
                    │   RF signal eye-pattern
                    │   opens
                    ▼
            ┌──────────────┐
            │  TOC read out │
            └──────────────┘
                    │
                    ▼
            ┌──────────────────────────┐
            │ Jump to the first track   │
            └──────────────────────────┘
                    │
                    ▼
            ┌──────────────┐
            │     Play      │
            └──────────────┘
```

• When the disc correctly rotates

Microprocessor commands $84 $86 $ A200

DMO
TC94A14FA"41"   3.3V
                                      2.2V
                                      0V

Spindle   6V
motor(-)   3.2
IC561"1"   2V

Acceleration   Rough   Servo CLV
               Servo

         0.5 Sec   0.5 Sec

Tracking Servo Loop ON

• RF signal

Rough Servo Mode

CLV Servo Mode
(Program Area)

CLV Servo Mode
(Lead-In Area;
Digital :0)

■Feed section

Is the voltage output at IC521 pin "40" 5V or 0V? — **NO** → Is the wiring for IC521 (56)~(64) correct? — **YES** → Is 3.3V present at IC561 pin "20"? — **NO** → Check CD 8V and 5V.

Is the voltage output at IC521 pin "40" 5V or 0V? — **YES** (down) → Is 4V present at both sides of the feed motor?

Is the wiring for IC521 (56)~(64) correct? — **NO** (down) → Is 6V or 2V present at IC561 "4" and "5"?

Is 3.3V present at IC561 pin "20"? — **YES** (down) → Check the vicinity of IC521.

Is 4V present at both sides of the feed motor? — **NO** → Is 6V or 2V present at IC561 "4" and "5"?

Is 4V present at both sides of the feed motor? — **YES** (down) → Check the feed motor.

Is 6V or 2V present at IC561 "4" and "5"? — **YES** → Check the feed motor connection wiring.

Is 6V or 2V present at IC561 "4" and "5"? — **NO** (down) → Check IC561.

■Focus section

When the lens is moving:

4V

Does the S-search waveform appear at IC561 pins "8" and "9"? — **NO** → Check the circuits in the vicinity of IC561 pins "8","9"and"15".

Check the circuits in the vicinity of IC561 pins "8","9"and"15". — **YES** (down) → Check the pickup and its connections

Does the S-search waveform appear at IC561 pins "8" and "9"? — **YES** → Check the pickup and its connections

■Spindle section

Is the disk rotated? — **NO** → Is 4V present at IC561 pins "6" and "7"? — **NO** → Is 4V present at IC521 pins "41" ? — **NO** → Check IC521 and IC501.

Is the disk rotated? — **YES** (down) → Does the RF signal appear at TP1?

Is 4V present at IC561 pins "6" and "7"? — **YES** (down) → Check the spindle motor and its wiring

Is 4V present at IC521 pins "41" ? — **YES** (down) → Check the vicinity of IC561.

Does the RF signal appear at TP1? — **YES** (down) → Is the RF waveform at TP1 distorted?

Does the RF signal appear at TP1? — **NO** → Check the circuits in the vicinity of IC501 "19"~"24" or the pickup

Is the RF waveform at TP1 distorted? — **NO** → Check the circuits in the vicinity of IC501 "19"~"24" or the pickup

Is the RF waveform at TP1 distorted? — **YES** (down) → Proceed to the Tracking section

■Tracking section

When the disc is rotated at first:

Approx. 1.2V

Is the tracking error signal output at IC501 "11"? — **YES** → Check the circuit in the vicinity of IC501 pins "2"~"12". — **YES** → Check the pickup and its connections

Is the tracking error signal output at IC501 "11"? — **YES** (down) → Check IC521.

Maintenance of laser pickup

(1) Cleaning the pickup lens
   Before you replace the pickup,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 patterrn) will be low.

```
          ╱─────────────╲         NO    ┌──────────────┐
         ╱   Is RF output  ╲──────────▶ │  Replace it.  │
         ╲  1.3 ± 0.4Vp-p? ╱            └──────────────┘
          ╲─────────────╱
                │
              YES
                │
                ▼
          ┌──────────┐
          │   O.K    │
          └──────────┘
```
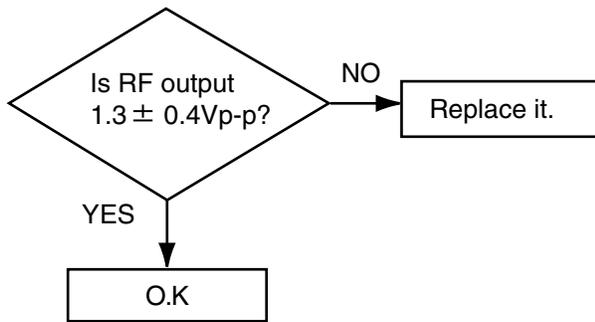
(3) Semi-fixed resistor on the APC PC board
   The semi-fixed resistor on the APC printed
   circuit board which is attached to the pickup
   is used to adjust the laser power.Since this
   adjustment should be performed to match the
   characteristics of the whole optical block,
   do not touch the 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

```
┌────────────────────────────────────────┐
│ Turn of the power switch and, disconnect the │
│ power cord.                              │
└────────────────────────────────────────┘
                    │
                    ▼
┌────────────────────────────────────────┐
│ Replace the pickup with a normal one.(Refer │
│ to "Pickup Removal" on the previous page) │
└────────────────────────────────────────┘
                    │
                    ▼
┌────────────────────────────────────────┐
│ Plug the power cord in, and turn the power on. │
│ At this time, check that the laser emits for │
│ about 3seconds and the objective lens moves │
│ up and down.                            │
│ Note: Do not observe the laser beam directly. │
└────────────────────────────────────────┘
                    │
                    ▼
          ┌──────────────────┐
          │   Play a disc.   │◀──────┐
          └──────────────────┘       │
                    │                 │
                    ▼                 │
          ┌──────────────────────┐    │
          │ Check the eye-pattern at TP1. │───┘
          └──────────────────────┘
                    │
                    ▼
          ┌──────────────────┐
          │     Finish.      │
          └──────────────────┘
```

Description of major ICs

■ BA3220FV-X (IC301,IC401) : Line out amp

1.Pin layout

14   8

3220

1   7

2.Block diagram

CL-   LGND   OUTL   OUTR   RGND   CR-   CR+
⑭   ⑬   ⑫   ⑪   ⑩   ⑨   ⑧

REFL   REFR

FILTER

①   ②   ③   ④   ⑤   ⑥   ⑦
CL+   Vcc   INL   NFL   FIL   NFR   INR
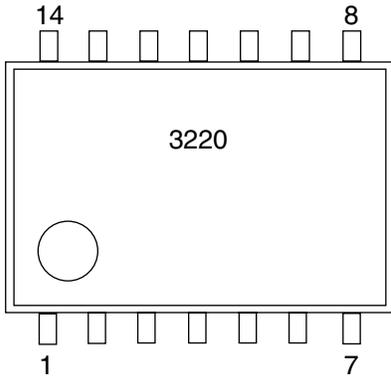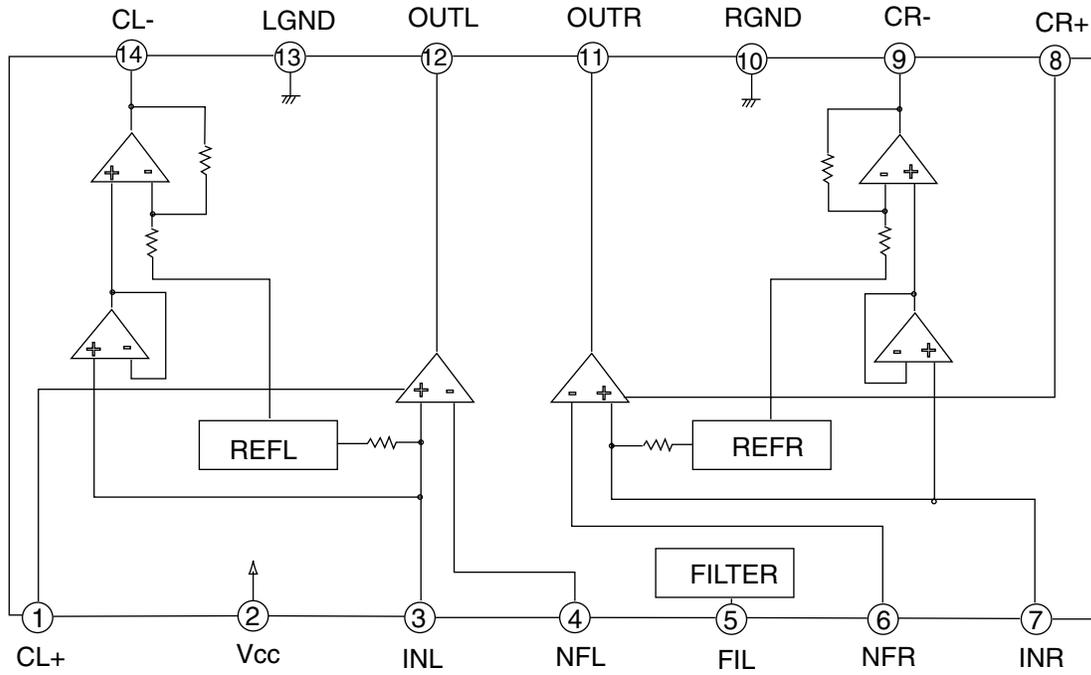
■ UPD784217AGC177 (IC701) : CPU

1. Pin layout

```
      75  ~  51
 76              50

 ~               ~

100             26
       1   ~  25
```
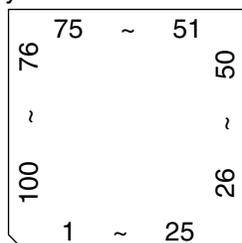
2. Pin function (1/2)

Pin No.	Symbol	I/O	Function
1〜5	NC	-	Non connect
6	CD-MUTE	O	CD MUTE
7	CD-REST	O	CD REST
8	ANT REM	O	Antenna remote output
9	VDD	-	5V connection
10	X2	-	Connect to X'tal for main clock
11	X1	-	Connect to X'tal for main clock
12	VSS	-	Connect to GND
13	XT2	-	Connect to X'tal for sub clock
14	XT1	-	Connect to X'tal for sub clock
15	RESET	I	Reset detection terminal
16	P.REQ	O	Mechanism power supply ON/OFF demand output ("L" on demand)
17	BUS-INT	I	J-BUS signal interrupt input
18	PS2	I	Power save 2
19	NC	-	Non connect
20	RDS-SCK	I	Clock input for RDS
21	RDS-DA	I	RDS data input
22	REMOCON	I	Remocon signal input
23	AVDD	I	5V connect
24	AVREF0	I	5V connect
25	SD/ST	I	Station detector, Stereo signal input
26	MRC DATA	I	MRC data input
27	KEY0	I	Key input 0
28	KEY1	-	Key input 1
29	TEMP	I	Temperature data input for contrast correction
30	LEVEL	-	Level meter input
31	SQ	I	S.quality level input
32	S.METER	I	S.meter level input
33	AVSS	-	Connect to GND
34	INLOCK	I	Lock detection output
35	NC	O	Non connect
36	AVREF	I/O	5V connect
37	BUS-SI	I	J-BUS data input
38	BUS-SO	O	J-BUS data output
39	BUS-SCK	O	J-BUS clock input/output
40	LCD-CE1	O	Chip enable 1 out put for LCD driver
41	LCD-DA	O	Data output for LCD driver
42	LCD-CL	O	Clock output to LCD driver
43	LCD-CE2	O	Chip enable 2 out put for LCD driver
44	BUZZER	O	Buzzer output
45	EPDAI	I	Communication data input 12C

2. Pin function (2/2)   UPD784217AGC177

Pin No.	Symbol	I/O	Function
46	EP-DAO	O	Communication data input of 12C
47	EPCLK	O	Communication data input of 12C
48	BUS-I/O	O	J-BUS I/O switching output
49	PM0	O	Panel close side motor control signal output
50	PM1	O	Panel open side motor control signal output
51	EQ-CLK	O	Equalizer clock
52	EQ-DA	O	Equalizer data
53	EQ-LA	O	Equalizer latch
54	STAGE	I	H:L: Initialization port
55	VCR CONT	O	VCR control signal output
56~61	PNL-SW1~6	I	Panel position detection switch 1 to 6 signal input
62	AFCK	O	AF clock output
63	SEEK/STOP	O	SEEK:H STOP:L
64	S.MUTE	O	Signal mute output
65	FM/AM	O	FM / AM select output
66	PLL-CE	O	PLL IC control CE output
67	PLL-DO	O	PLL IC control data output
68	PLL-CLK	O	PLL IC control clock output
69	PLL-DI	I	PLL IC control data input
70	TEL MUTE	I	Telephone mute signal detection input
71	AMP KILL	I	Amp off signal input
72	VSS	-	Connect to GND
73	DIMMER-IN	I	Dimmer detection input
74	PS1	I	Power save 1
75	POWER	O	Power ON / OFF select output
76	CD-ON	-	Non connect
77	MUTE	O	Mute output
78	W-LPF1	O	Sub woofer cut off frequency control output 1
79	W-LPF2	O	Sub woofer cut off frequency control output 2
80	W-MUTE	O	Sub woofer mute output
81	VDD	O	5V connect
82	VOL-DA	O	E. volume IC control data output
83	VOL-CLK	O	E. volume IC control clock data output
84	CF SEL	O	FM band area filter select signal output
85	PMKICK	O	Panel motor kick signal output
86	SELECT	-	Non connect
87	DIM-CONT	O	Dimmer control signal output
88	VOL-1	I	Rotary volume pulse
89	VOL-2	I	Rotary volume pulse signal input
90	J/U	I	Pull down
91	NC	-	Non connect
92	NC	-	Non connect
93	NC	-	Non connect
94	TEST	I/O	Connect to GND
95	NC	-	Non connect
96	NC	-	Non connect
97	NC	-	Non connect
98	NC	-	Non connect
99	DISCSEL	O	H: 8 cm disc non correspondence L: 8 cm disc correspondence
100	NC	-	Non connect

■ UPD784225GK-623 (IC501) : CPU

1.Pin layout
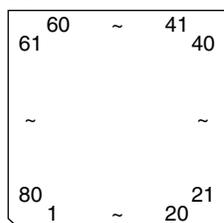
2.Pin functions (1/2)

Pin No.	Symbol	I/O	Function
1	TEMP IN	I	Temp. detection input terminal
2,3	-	-	No use
4	AVSS	-	Connect to GND
5	ADCONT	O	Output H level at power to on
6	-	-	-
7	AVREF1	-	Connect to 3.3V
8	EPROMDI	I	EEPROM data input terminal
9	EPROMDO	O	EEPROM data output terminal
10	EPROMCK	I/O	EEPROM clock signal input/output terminal
11	LCD CE	O	Chip enable output for LCD driver
12	LCD DA	O	Data output for LCD driver
13	LCD CK	O	Clock outout for LCD driver
14	BUS I/O	O	JVC BUS input/output control terminal (negative)
15	BUS I/O	O	JVC BUS input/output control terminal
16	BUS SI	I	JVC BUS data input terminal
17	BUS SO	O	JVC BUS data output terminal
18	BUS SCK	I/O	JVC BUS clock input/output terminal
19	BUSOUT	O	JVC BUS BUSOUT output terminal
20	CD ON	O	Power supply (3.3V) control for CD
21	CD REQ	O	CD mechanism power supply to on request signal output terminal
22	CD MUTE	O	CD mute signal output terminal
23	-	-	-
24	DSP RESET	O	CD DSP reset signal output terminal
25	CCE	O	CD DSP chip enable output terminal
26	BUCK	O	CD DSP data clock output terminal
27	BUS3	I/O	CD DSP data 3 input/output terminal
28	BUS2	I/O	CD DSP data 2 input/output terminal
29	BUS1	I/O	CD DSP data 1 input/output terminal
30	BUS0	I/O	CD DSP data 0 inout/output terminal
31	2X PLAY	O	RF frequency responce select output of 2xspeed playback
32	RW SEL	O	CD-RW select output terminal (RW:L)
33	VSS1	-	Connect to GND
34	LD	O	Loading signal output terminal
35	LD/FE	O	Loading/Feed select signal output terminal (H:LD,L:FE)
36	MP3 DI	I	CD MP3 data input terminal
37	MP3 DO	O	CD MP3 data output terminal
38	MP3 CK	O	Clock signal output terminal for CD MP3 data
39	MP3 RESET	O	CD MP3 reset signal output terminal
40	MP3 STB	O	CD MP3 standby signal output terminal (H:Standby)
41~43	-	-	-
44	DAC ML	O	DAC mode control latch output terminal
45	DAC MC	O	DAC mode control BCK output terminal
46	DAC MD	O	DAC mode control data output terminal

2.Pin functions (2/2)

Pin No.	Symbol	I/O	Function
47	DAC CS	O	DAC chip select terminal
48~51	-	-	No use
52	DISC SEL	I	8cm disc corespondance mode select terminal (respondance:L)
53	DAC SEL	I	DAC select mode input terminal
54	-	-	-
55	TEST MODE	I	LCD/AD key/Remocon invalid select mode input terminal L:invalid
56	MP3 SEL	I	MP3 select mode input terminal
57	8V DET	I	CD mechanism power supply detection terminal (L:8V on)
58	REST	I	CD mechanism rest switch input terminal
59	SW2	I	CD mechanism SW2 input terminal
60	RESET	I	Riset signal input terminal
61	SW1	I	CD mechanism SW1 input terminal
62	B.DET	I	Backup power supply detection input terminal (H:Stop mode)
63	P.DET	I	Main power off detection input terminal (H:HALT mode)
64	BUS INT	I	JVC BUS comunication start squeeze input terminal
65	MP3 REQ	I	CD MP3 request signal input terminal
66	-	-	-
67	VSS0	-	Connect to GND
68	VDD1	-	Connect to 3.3V
69	X2	O	Ocsillator (6MHz)
70	X1	I	Oscillator (6MHz)
71	VPP	-	Connec to GND
72	XT2	O	Open
73	XT1	I	Connect to GND
74	VDD0	-	Connect to 3.3V
75	AVDD	-	Connect to ADCONT
76	IOP	I	Pickup IOP measurment input terminal
77	KEY0	I	Key input 0 (8bit A/D input) terminal
78	KEY1	I	Key input 1 (8bit A/D input) terminal
79	KEY2	I	Key input 2 (8bit A/D input) terminal
80	KET3	I	Key input 3 (8bit A/D input) terminal

■ LA6579H-X (IC681) : 4-Channel bridge driver

1. Pin layout & Block diagram
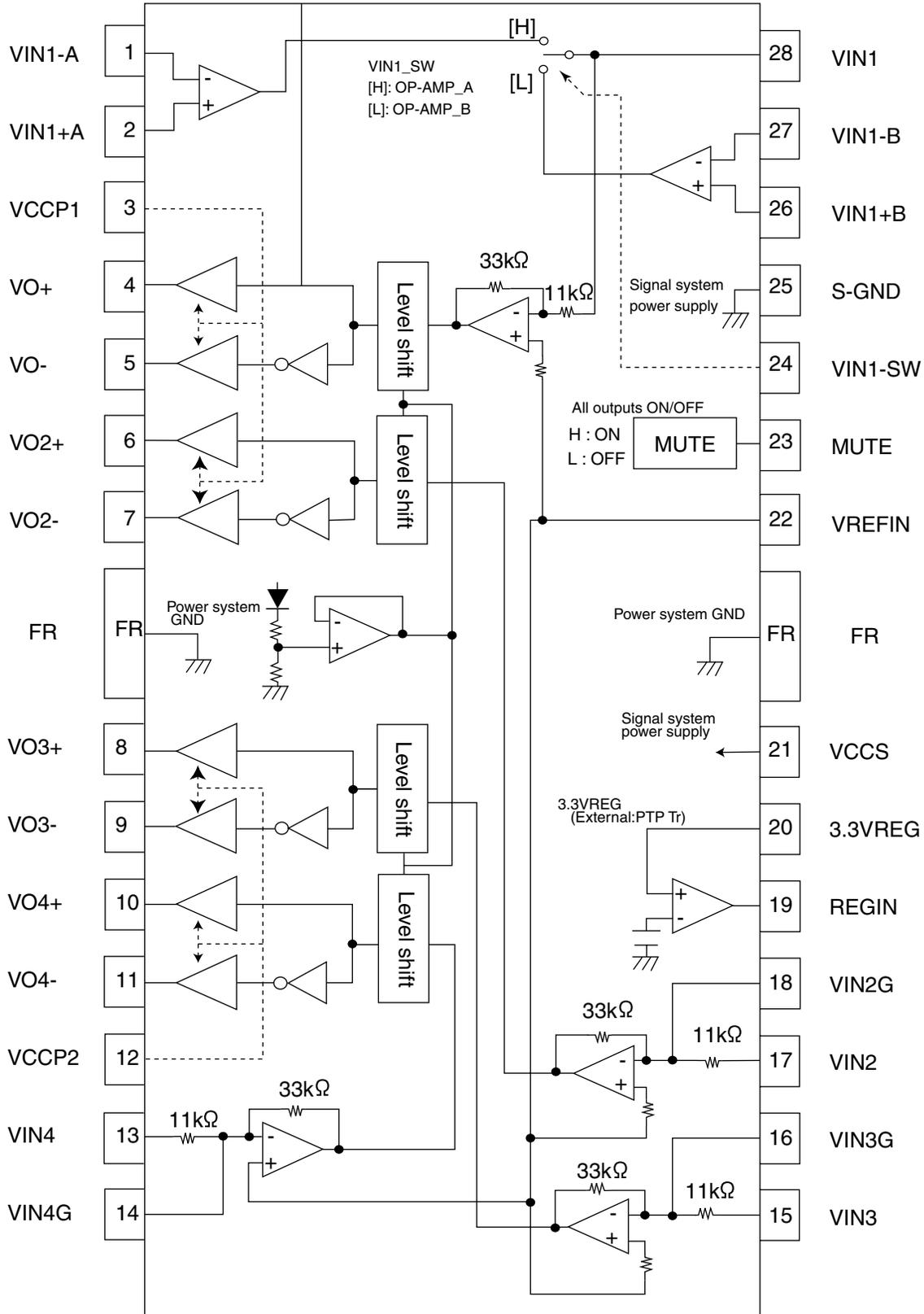
3.Pin function

Pin No.	Symbol	Function
1	VIN1-A	CH1 input AMP_inverted input
2	VIN1+A	CH1 input AMP_non-inverted input
3	VCCP1	CH1 and CH2 power stage power supply
4	VO1+	Output pin(+)for channel 1
5	VO1-	CH1 output pin (-) for channel 1
6	VO2+	Output pin(+)for channel 2
7	VO2-	Output pin(-)for channel 2
8	VO3+	Output pin(+)for channel 3
9	VO3-	Output pin(-)for channel 3
10	VO4+	Output pin(+)for channel 4
11	VO4-	Output pin(-)for channel 4
12	VCCP2	CH3 and CH4 power stage powr supply
13	VIN4	Input pin for channel 4
14	VIN4G	Input pin for channel 4(for gain adjustment)
15	VIN3	Input pin for channel 3
16	VIN3G	Input pin for channel 3(for gain adjustment)
17	VIN2	Input pin for channel 2
18	VIN2G	Input pin for channel 2(for gain adjustment)
19	REGIN	External PNP transistor, base connection
20	3.3VREG	3.3VREG output pin, external PNP transistor,collector connection
21	VCCS	Signal system GND
22	VREFIN	Reference voltage application pin
23	MUTE	Output ON/OFF pin
24	VIN1_SW	CH1 input OP AMP_changeover pin
25	S_GND	Signal system GND
26	VIN1+B	CH1 AMP_B non-inverted input pin
27	VIN1-B	CH1 AMP_B inverted input pin
28	VIN1	CH1 input pin, input OP_AMP output pin

■ IC-PST9333U-X (IC702) : Regulator

1. Pin layout
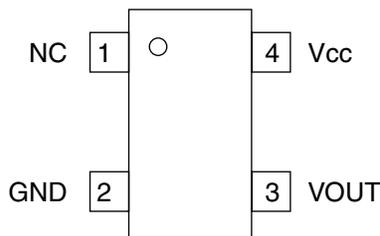
2. Block diagram
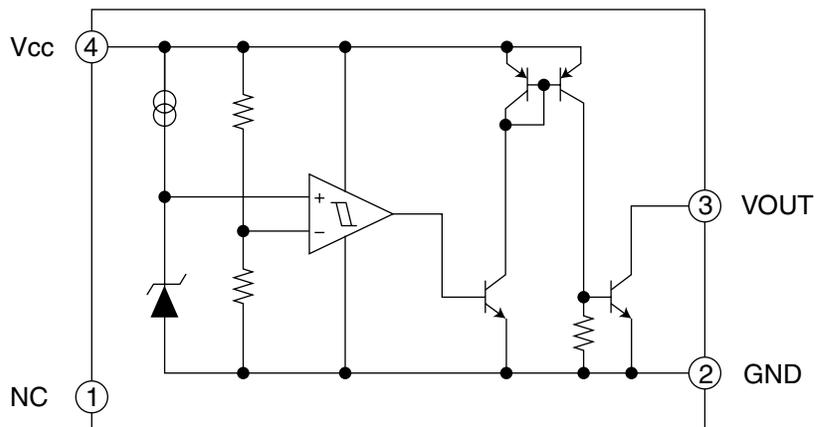
3. Pin function

Pin No.	Symbol	Function
1	NC	Non connect
2	GND	GND terminal
3	VOUT	Reset signal output terminal
4	Vcc	Vcc terminal/Voltage detect terminal

KD-SH909R

■ TA2157FN-X (IC601) : RF amp

1.Terminal layout
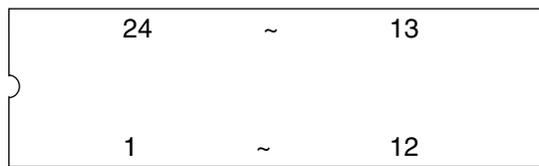
2.Block diagram
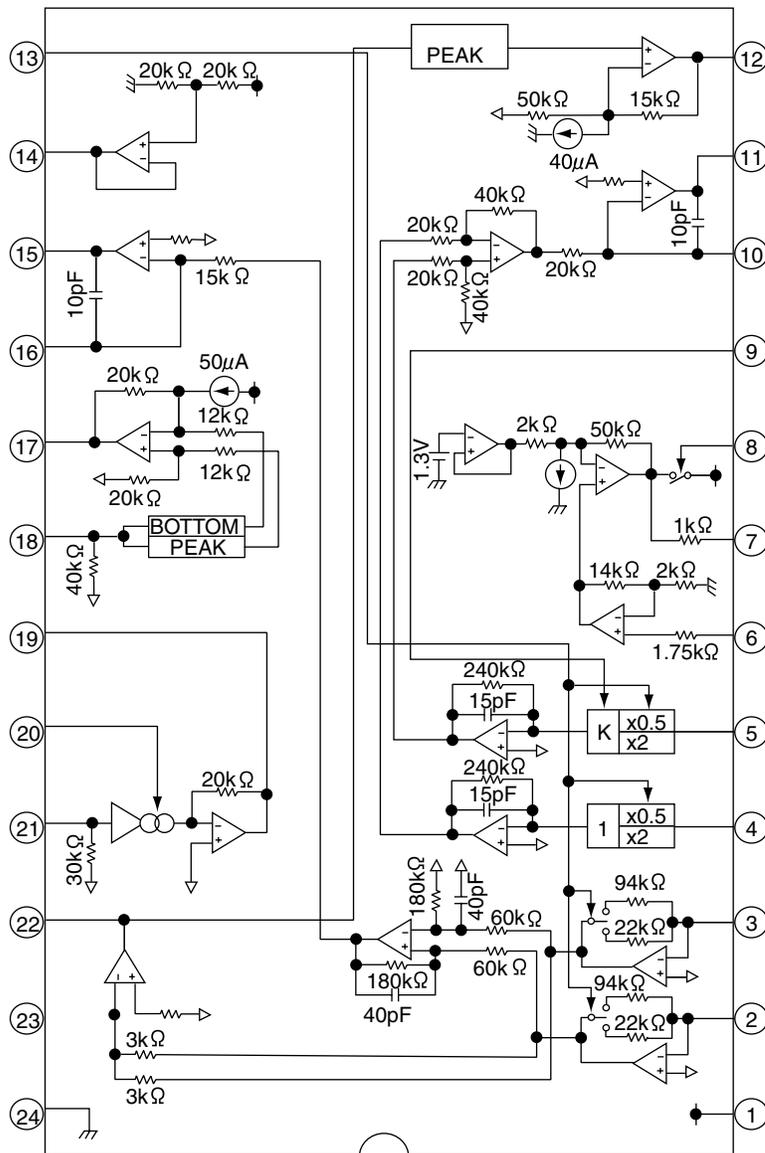
PIN VCTRLPIN	SEL (APC SW)	TEB (TE BAL)	RFGC (AGC Gian)	TEB (TE BAL)
VCC	APC ON	-50%	+12dB	Normal mode (0dB)
HiZ	APC ON	0%	+6dB	Normal mode (0dB)
GND	APC OFF (LDO=H)	+50%	0dB	CD-RW mode (+12dB)

3.Pin function

Pin No.	Symbol	I/O	Function
1	VCC	-	3.3V power supply pin
2	FNI	I	Main-beam amp input pin
3	FPI	I	Main-beam amp input pin
4	TPI	I	Sub-beam amp input pin
5	TNI	I	Sub-beam amp input pin
6	MDI	I	Monitor photo diode amp input pin
7	LDO	O	Laser diode amp output pin
8	SEL	I	APC circuit ON/OFF control signal, laser diode (LDO) control signal input or bottom/peak detection frequency change pin. <table><tr><td>SEL</td><td>APC circuit</td><td>LCD</td></tr><tr><td>GND</td><td>OFF</td><td>Connected VCC through 1kΩ resistor</td></tr><tr><td>Hiz</td><td>ON</td><td>Control signal output</td></tr><tr><td>VCC</td><td>ON</td><td>Control signal output</td></tr></table>
9	TEBC	I	Tracking error balance adjustment signal input pin Adjusts TE signal balance by ellminating carrier component from PWM signal (3-state output,PWM carrier = 88.2kHz) output from TC94A14F/FA TEBC pin using RC-LPF and inputting DC. TEBC input voltage:GND~VCC
10	TEN	I	Tracking error signal genaration amp negative-phase input pin
11	TEO	O	Tracking error signal generation amp output pin. Combining TEO signal RFRP signal with TC94A14F/FA configures tracking search system.
12	RFDC	O	RF signal peak detection output pin
13	GVSW	I	AGC/FE/TE amp gain change pin <table><tr><td>GVSW</td><td>Mode</td></tr><tr><td>GND</td><td>CD-RW</td></tr><tr><td>Hiz</td><td>Normal</td></tr><tr><td>VCC</td><td></td></tr></table>
14	VRO	O	Reference voltage (VRO) output pin ＊VRO=1/2VCC When VCC=3.3V
15	FEO	O	Focus error signal generation amp output pin
16	FEN	I	Focus error signal generation amp negative-phase input pin
17	RFRP	O	Signal amp output pin for track count Combining RFRP signal and TEO signal with TC94A14F/FA configures tracking search system.
18	RFRPIN	I	Signal generation amp input pin for track count
19	RFGO	O	RF signal amplitude adjustment amp output pin
20	RFGC	I	RF amplitude adjustment control signal input pin Adjusts RF signal amplitude by eliminating carrier component from PWM signal (3-state output,PWM carrier=88.2kHz)output fromTC94A14F/14FA RFGC pin using RC-LPF and inputting DC. ＊ RFGC input voltage:GND~VCC
21	AGCIN	I	RF signal amplitude adjustment amp input pin
22	RFO	O	RF signal generation amp output pin
23	RFN	I	RF signal generation amp input pin
24	GND	-	GND pin

■ TC94A14FA (IC621) : DSP & DAC

1.Terminal layout & block daiagram
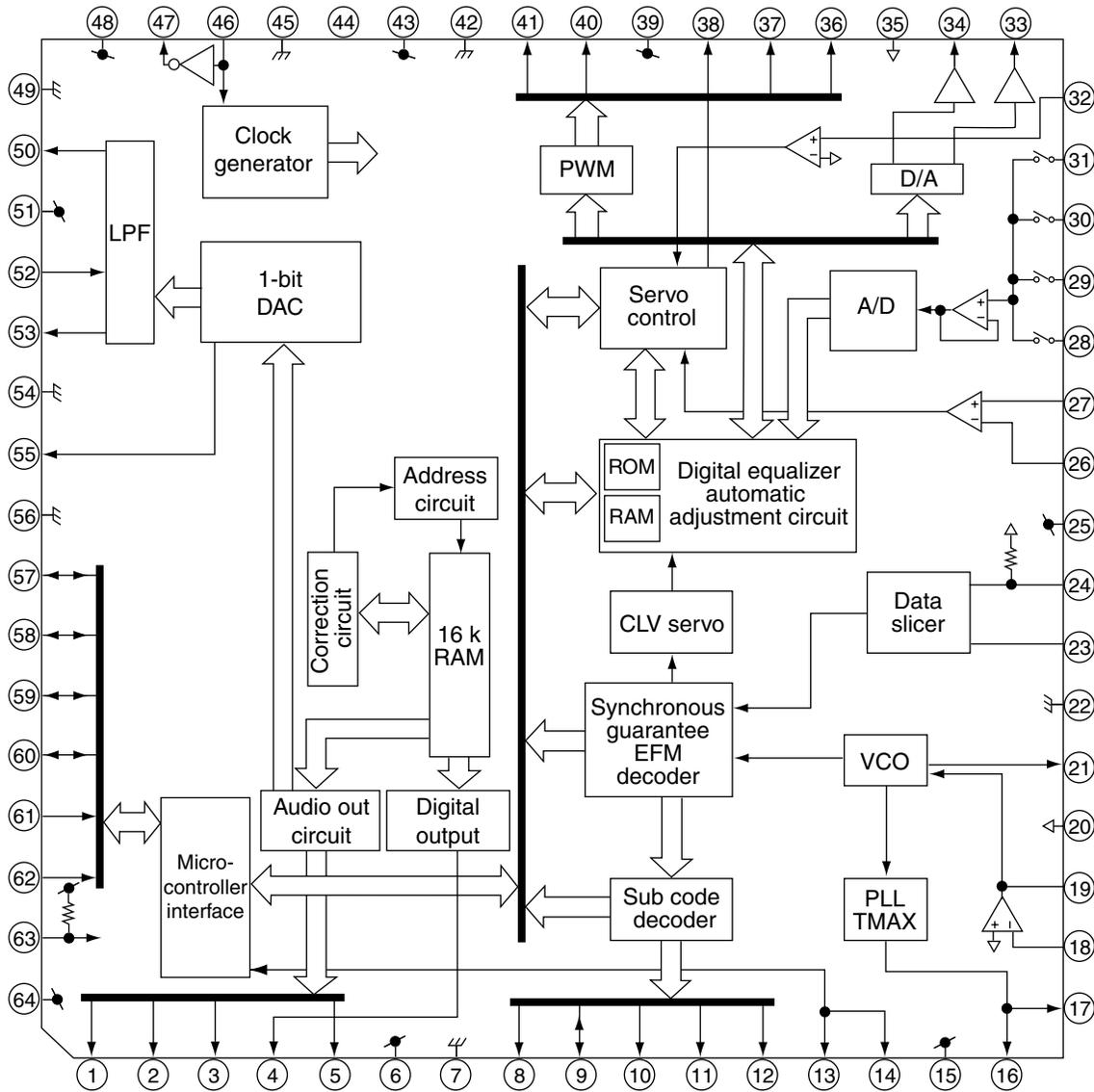
2.Pin function

Pin No	Symbol	I/O	Description
1	BCK	O	Bit clock output pin.32fs,48fs,or 64fs selectable by command.
2	LRCK	O	L/R channel clock output pin."L" for L channel and "H" for R channel. Output polarity can be inverted by command.
3	AOUT	O	Audio data output pin. MSB-first or LSB-first selectable by command.
4	DOUT	O	Digital data output pin.Outputs up to double-speed playback.
5	IPF	O	Correction flag output pin. When set to "H", AOUT output cannot be corrected by C2 correction processing.
6	V_{DD3}	-	Digital 3.3V power supply voltage pin.
7	V_{SS3}	-	Digital GND pin.
8	SBOK	O	Subcode Q data CRCC result output pin. "H" level when result is OK.
9	CLCK	O	Subcode P-W data read I/O pin. I/O polarity selectable by command.
10	DATA	O	Subcode P-W data output pin.
11	SFSY	O	Playback frame sync signal output pin.
12	SBSY	O	Subcode block sync signal output pin. "H" level at S1 when subcode sync is detected.
13	HSO	I/O	General-purpose input / output pins.
14	UHSO		Input port at reset.
15	PV_{DD3}	-	PLL-only 3.3V power supply voltage pin.

TC94A14FA

Pin No	Symbol	I/O	Description
16	PDO	O	EFM and PLCK phase difference signal output pin.
17	TMAX	O	TMAX detection result output pin.

TMAX Detection Result	TMAX Output
Longer than fixed period	"PV$_{DD3}$"
Within fixed period	"HiZ"
Shorter than fixed period	"AV$_{SS3}$"

Pin No	Symbol	I/O	Description
18	LPFN	I	Inverted input pin for PLL LPF amp.
19	LPFO	O	Output pin for PLL LPF amp.
20	PVREF	-	PLL-only VREF pin.
21	VCOF	O	VCO filter pin.
22	AVSS3	-	Analog GND pin.
23	SLCO	O	DAC output pin for data slice level generation.
24	RFI	I	RF signal input pin. Zin selectable by command.
25	AVDD3	-	Analog 3.3V power supply voltage pin.
26	RFCT	I	RFRP signal center level input pin.
27	RFZI	I	RFRP signal zero-cross input pin.
28	RFRP	I	RF ripple signal input pin.
29	FEI	I	Focus error signal input pin.
30	SBAD	I	Sub-beam adder signal input pin.
31	TEI	I	Tracking error input pin. Inputs when tracking servo is on.
32	TEZI	I	Tracking error signal zero-cross input pin.
33	FOO	O	Focus equalizer output pin.
34	TRO	O	Tracking equalizer output pin.
35	VREF	-	Analog reference power supply voltage pin.
36	RFGC	O	RF amplitude adjustment control signal output pin.
37	TEBC	O	Tracking balance control signal output pin.
38	SEL	O	APC circuit ON/OFF signal output pin. At laser on, high impedance with UHS="L", H output with UHS="H".
39	AVDD3	-	Analog 3.3V power supply voltage pin.
40	FMO	O	Feed equalizer output pin.
41	DMO	O	Disc equalizer output pin.
42	VSS3	-	Digital GND pin.
43	VDD3	-	Digital 3.3V power supply voltage pin.
44	TESIN	I	Test input pin. Normally, fixed to "L".
45	XVSS3	-	System clock oscillator GND pin.
46	XI	I	System clock oscillator input pin.
47	XO	O	System clock oscillator output pin.
48	XVDD3	-	System clock oscillator 3.3V power supply voltage pin.
49	DVSS3R	-	DA converter GND pin.
50	RO	O	R-channel data forward output pin.
51	DVDD3	-	DA converter 3.3V power supply pin.
52	DVR	-	Reference voltage pin.
53	LO	O	L-channel data forward output pin.
54	DVSS3L	-	DA converter GND pin.
55	ZDET	O	1 bit DA converter zero detection flag output pin.
56	VSS5	-	Microcontroller interface GND pin.
57	BUS0		
58	BUS1	I/O	Microcontroller interface data I/O pins.
59	BUS2		
60	BUS3		
61	BUCK	I	Microcontroller interface clock input pin.
62	/CCE	I	Microcontroller interface chip enable signal input pin. At "L", BUS0 to BUS3 are active.
63	/RST	I	Reset signal input pin. At reset, "L".
64	VDD5	-	Microcontroller interface 5V power supply pin.

KD-SH909R

■ TC94A02F-005 (IC652) : DSP
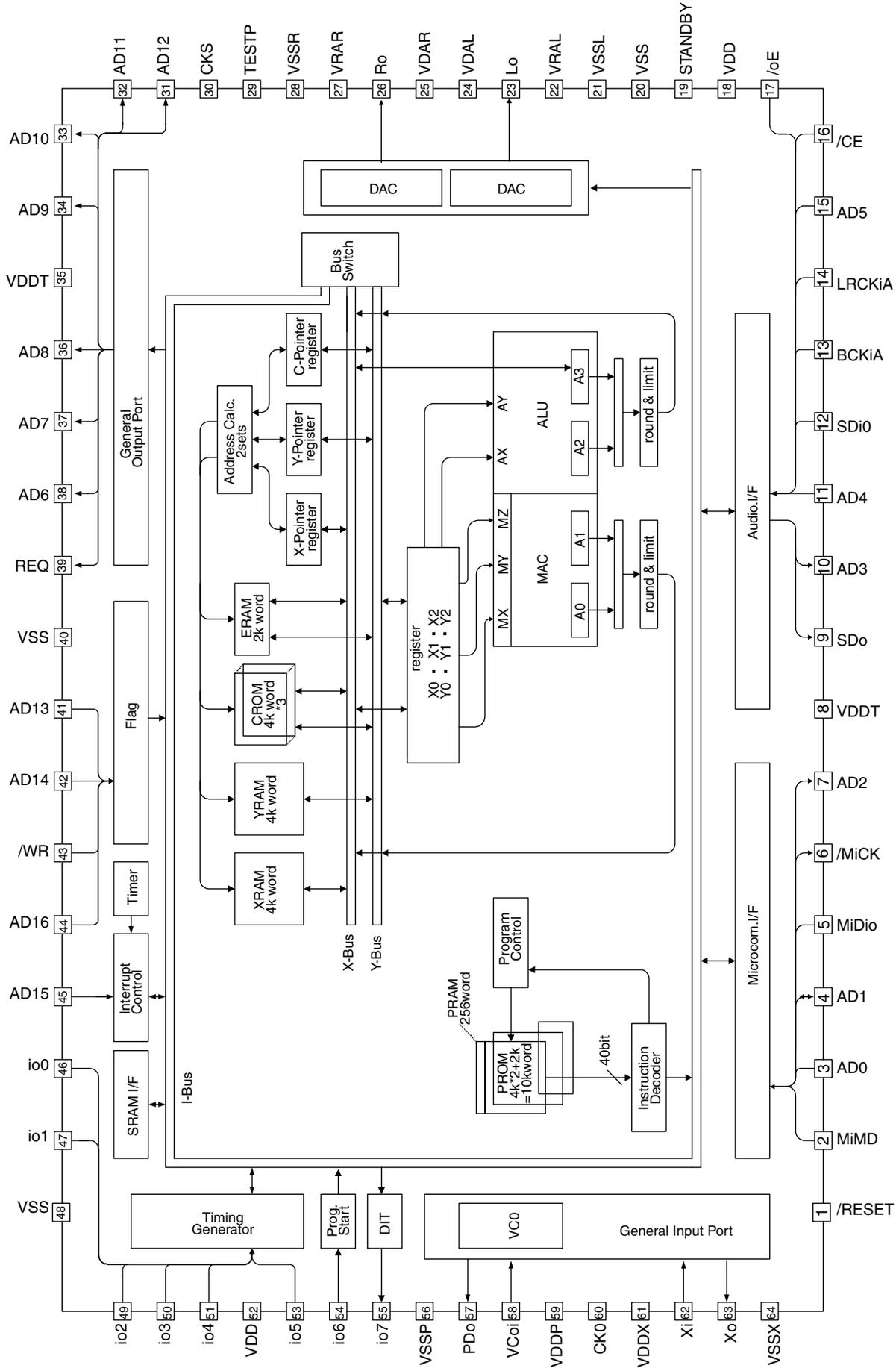
3.Pin function(1/2)

Pin No.	Symbol	I/O	Function
1	/RESET	I	Hard reset input terminal(H:Normal operation L: Reset)
2	MiMD	I	Micon I/F mode select input terminal
3	AD0	O	External SRAM address output 0 terminal
4	AD1	O	External SRAM address output 1 terminal
5	MiDio	I/O	Micon I/F data input/output terminal
6	/MiCK	I	Micon I/F clock input terminal
7	AD2	O	External SRAM address output 2 terminal
8	VDDT	-	Digital power supply (3.3V)
9	SDo	O	Data output terminal
10	AD3	O	External SRAM address output 3 terminal
11	AD4	O	External SRAM address output 4 terminal
12	SDi0	I	Data input terminal 0
13	BCKiA	I	Bit clock input terminal A
14	LRCKiA	I	LR clock input terminal A
15	AD5	O	External SRAM address output 5 terminal
16	CE	O	External SRAM chip enable terminal
17	OE	O	External SRAM output enable terminal
18	VDD	-	Digital power supply (2.5V)
19	STANBY	I	Standby mode control terminal
20	VSS	-	Digital GND
21	VSSL	-	DAC Lch GND
22	VRAL	-	DAC Lch reference voltage terminal
23	LO	O	DAC Lch output terminal
24	VDAL	-	DAC Rch power supply terminal(2.5V)
25	VDAR	-	DAC Lch power supply terminal(2.5V)
26	RO	O	DAC Rch output terminal
27	VRAR	-	DAC Rch reference voltage terminal
28	VSSR	-	DAC Rch GND
29	TESTP	I	Test terminal
30	CKS	I	VCO select terminal
31	AD12	O	External SRAM address output 12 terminal
32	AD11	O	External SRAM address output 11 terminal
33	AD10	O	External SRAM address output 10 terminal
34	AD9	O	External SRAM address output 9 terminal
35	VDDT	-	Digital power supply terminal (3.3V)
36	AD8	O	External SRAM address output 8 terminal
37	AD7	O	External SRAM address output 7 terminal
38	AD6	O	External SRAM address output 6 terminal
39	REQ	O	Squeeze request terminal to host
40	VSS	-	Digital GND
41	AD13	O	External SRAM address output 13 terminal
42	AD14	O	External SRAM address output 14 terminal
43	WR	O	External SRAM write signal
44	AD16	O	External SRAM address output 16 terminal
45	AD15	O	External SRAM address output 15 terminal
46	io0	I/O	External SRAM data input/output 0 terminal
47	io1	I/O	External SRAM data input/output 1 terminal
48	VSS	-	Digital GND
49	io2	I/O	External SRAM data input/output 2 terminal
50	io3	I/O	External SRAM data input/output 3 terminal

3.Pin function(2/2)

Pin No.	Symbol	I/O	Function
51	io4	I/O	External SRAM data input/output 4 terminal
52	VDD	-	Digital power supply (2.5V) terminal
53	io5	I/O	External SRAM data input/output 5 terminal
54	io6	I/O	External SRAM data input/output 6 terminal
55	io7	I/O	External SRAM data input/output 7 terminal
56	VSSP	-	VCO GND
57	Pdo	O	PLL phase error detection signal output terminal
58	Vcoi	I	VCO control voltage input terminal
59	VDDP	-	VCO power supply
60	Cko	O	16.934 MHz clock output terminal
61	VDDX	-	Power supply (2.5V) terminal for oscillator
62	Xi	I	Connection terminal for oscillator(input)
63	Xo	O	Connection terminal for oscillator(output)
64	VSSX	-	GND for oscillator

■ HD74HC126FP-X (IC771) : Buffer

1.Pin layout

1C	1	14 VU
1A	2	13 4C
1Y	3	12 4A
2C	4	11 4Y
2A	5	10 3C
2Y	6	9 3A
GND	7	8 3Y
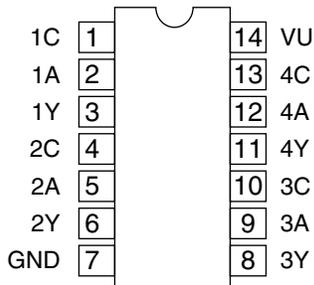
2.Pin function

Input		Output
C	A	Y
L	X	Z
H	L	H
H	H	L

Note) H:High level
L:Low level
X:Irrelevant
Z:Off(High-impedance)
State a 3-state input

3.Block diagram
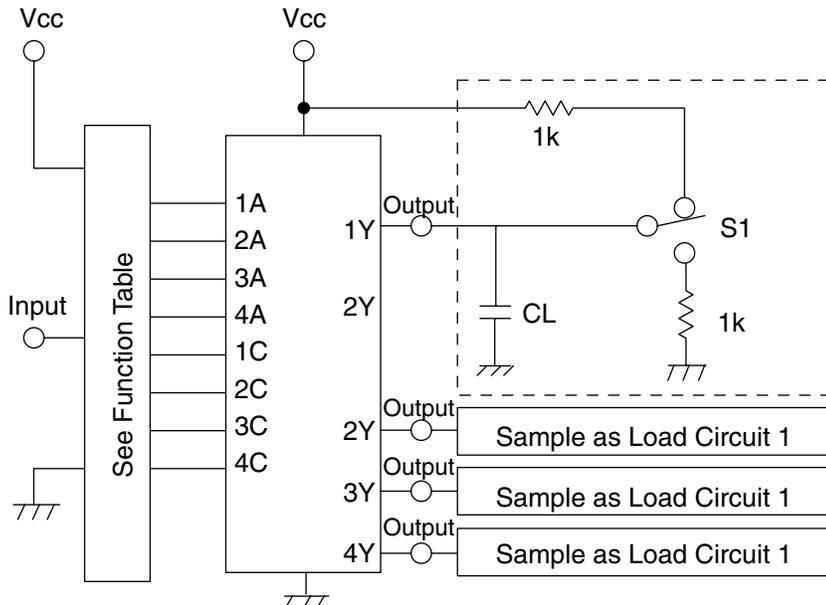
Note) CL includes probe and jig capacitance

■ BA6956AN (IC495) : Reversible motor driver

1.Block diagram
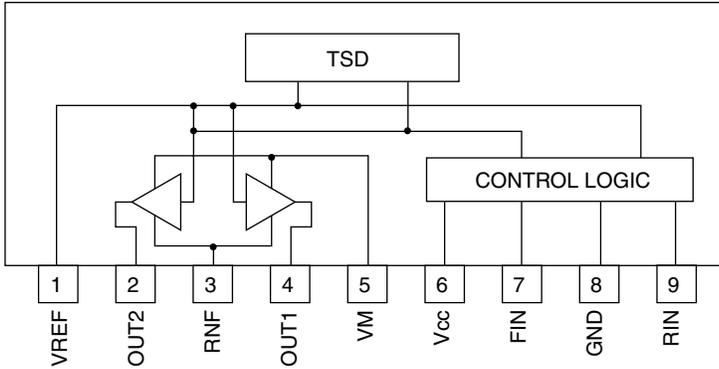
2. Pin function

Pin No.	Symbol	Function
1	VREF	Output high voltage level control terminal
2	OUT2	Output terminal for motor
3	RNF	GND of driver division
4	OUT1	Output terminal for motor
5	VM	Power supply for driver division
6	Vcc	Power supply for signal division
7	FIN	Input terminal for control logic
8	GND	GND
9	RIN	Input terminal for control logic

3. Truth table

FIN	RIN	OUT1	OUT2	MODE
H	L	H	L	Forward rotation mode
L	H	L	H	Reverse rotation mode
H	H	L	L	Break Mode
L	L	OPEN	OPEN	Stand-by mode

■ BU4066BCFV-X (IC322,IC351) : Quad analog switch

1. Pin layout & Block diagram
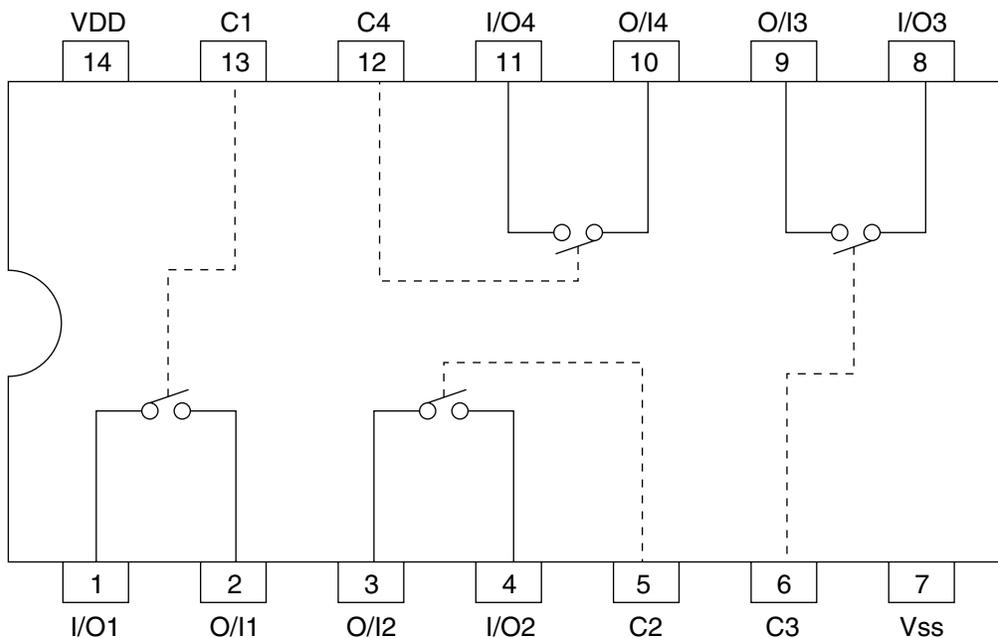
■ BR24C01AFV-W-X (IC502) : EEPROM

1.Pin layout
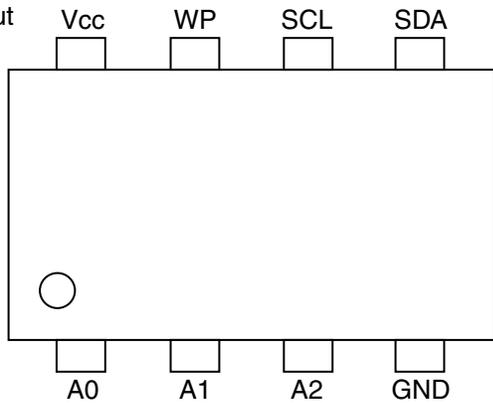
2.Block diagram
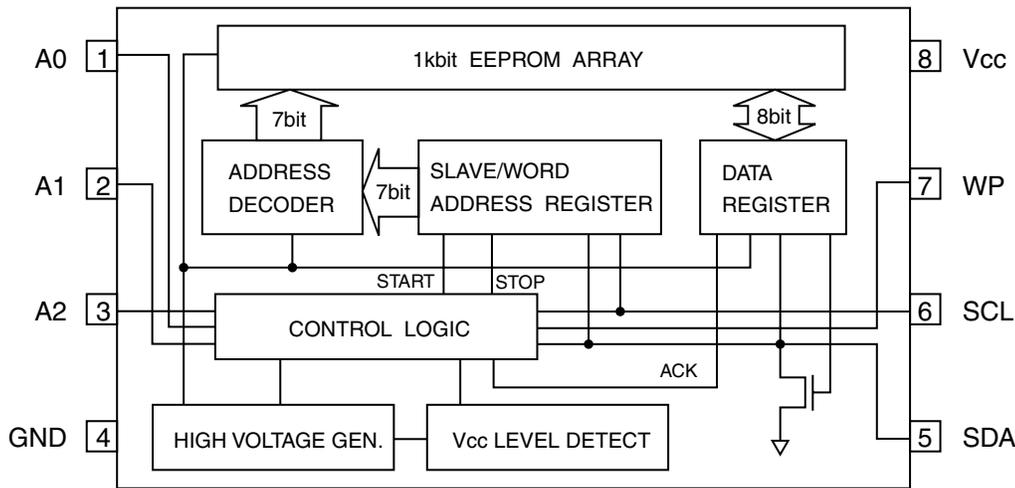
3.Pin function

Pin name	I/O	Function
Vcc	-	Power supply
GND	-	Ground (0v)
A0,A1,A2	IN	Slave address set
SCL	IN	Serial clock input
SDA	IN / OUT	Slave and word address, serial data input, serial data output *1
WP	IN	Write protect input

*1 An open drain output requires a pull-up resister.

■ HA13164A (IC961) : Regulator

1.Terminal layout
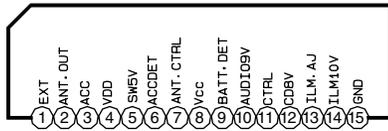
2.Block diagram
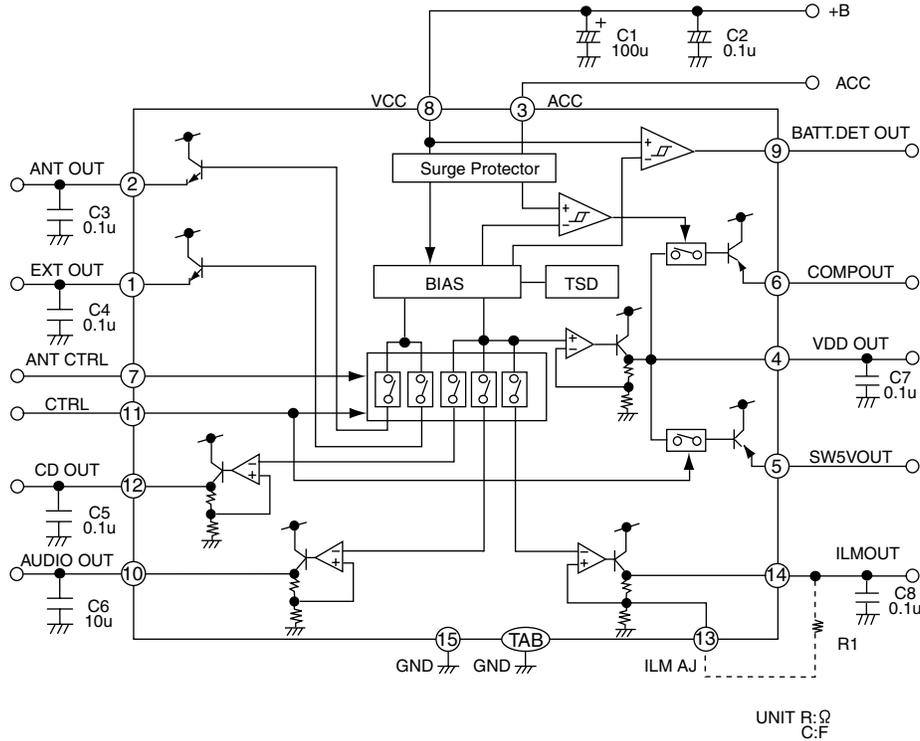
note1) TAB (header of IC)
connected to GND

3.Pin function

Pin No.	Symbol	Function
1	EXTOUT	Output voltage is VCC-1 V when M or H level applied to CTRL pin.
2	ANTOUT	Output voltage is VCC-1 V when M or H level to CTRL pin and H level to ANT-CTRL.
3	ACCIN	Connected to ACC.
4	VDDOUT	Regular 5.7V.
5	SW5VOUT	Output voltage is 5V when M or H level applied to CTRL pin.
6	COMPOUT	Output for ACC detector.
7	ANT CTRL	L:ANT output OFF , H:ANT output ON
8	VCC	Connected to VCC.
9	BATT DET	Low battery detect.
10	AUDIO OUT	Output voltage is 9V when M or H level applied to CTRL pin.
11	CTRL	L:BIAS OFF, M:BIAS ON, H:CD ON
12	CD OUT	Output voltage is 8V when H level applied to CTRL pin.
13	ILM AJ	Adjustment pin for ILM output voltage.
14	ILM OUT	Output voltage is 10V when M or H level applied to CTRL pin.
15	GND	Connected to GND.

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■ HD74HCT126T-X (IC503) : Buffer

1.Terminal layout
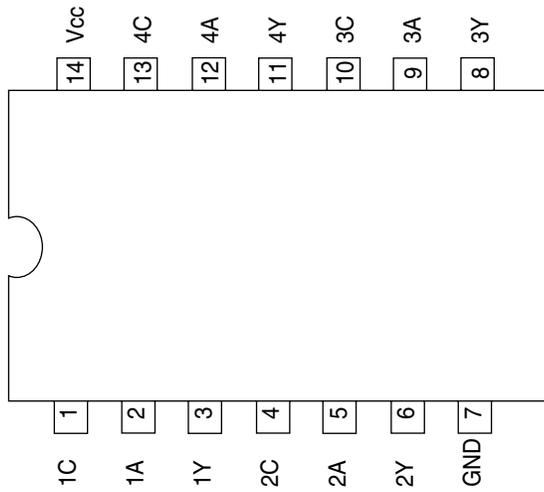
3.Pin function

INPUT		OUTPUT
C	A	Y
L	X	Z
H	L	L
H	H	H

H : High level
L : Low level
X : Irrelevant
Z : Off (Hhigh-impedance)state of a 3-stage output

2.Block diagram
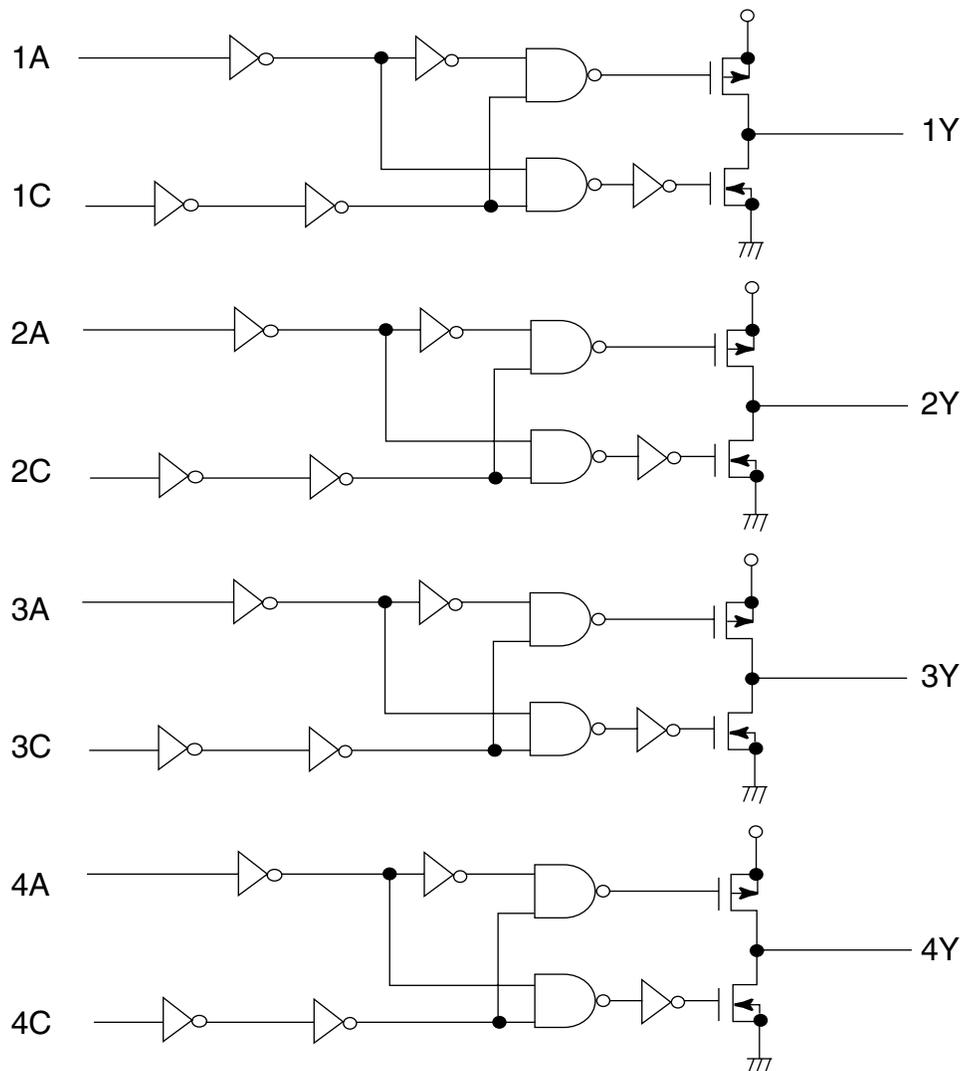
■ LC75878W (IC801,IC802) : LCD driver

1. Pin layout
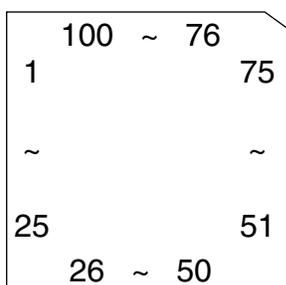
2. Block diagram
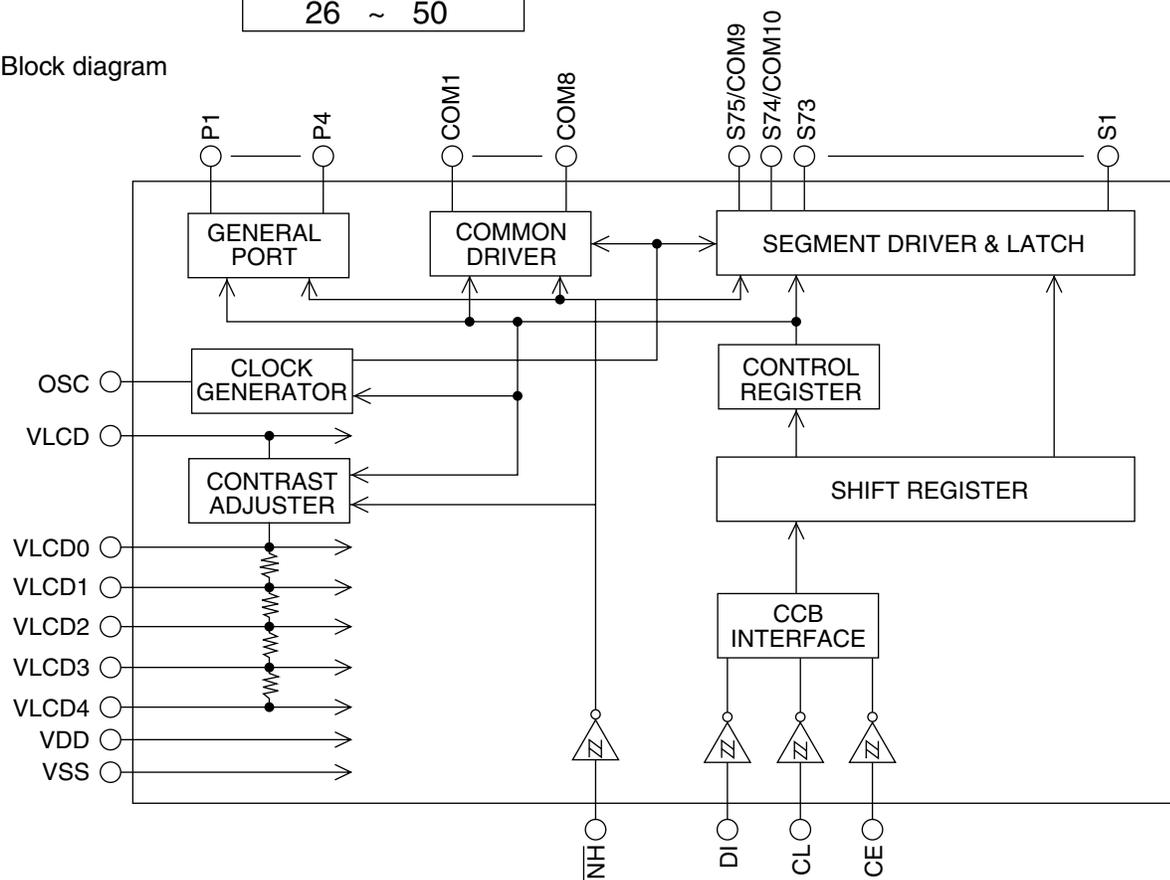
3. Pin function

No.	Symbol	I/O	Function
1~73	SEG1~SEG73	O	Segment driver output pin.
74	SEG74	O	Segment driver output pin.
75	SEG75	O	Segment driver output pin.
76~83	COM8~COM1	O	Common driver output pin.
84~87	P1~P4	O	General-purpose output pin.
88	VDD	-	Logic block power supply pin.
89	VLCD	-	LCD driver power supply pin.
90	VLCD0	O	LCD driver bias 4/4 voltage (H-level) power pin.
91	VLCD1	I	LCD driver bias 3/4 voltage (intermediate level) power pin.
92	VLCD2	I	LCD driver bias 2/4 voltage (intermediate level) power pin.
93	VLCD3	I	LCD driver bias 1/4 voltage (intermediate level) power pin.
94	VLCD4	I	LCD driver bias 0/4 voltage (L-level) power pin.
95	VSS	-	Power supply pin to connect to ground.
96	OSC	I/O	Oscillator pin.
97	LCD RESET	I	Display off, general-purpose output port "L" fixed input pin.
98	CE	I	Chip enable
99	CL	I	Synchronization clock
100	DI	I	Transfer data

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■ M62449FP-X (IC912) : Equalizer
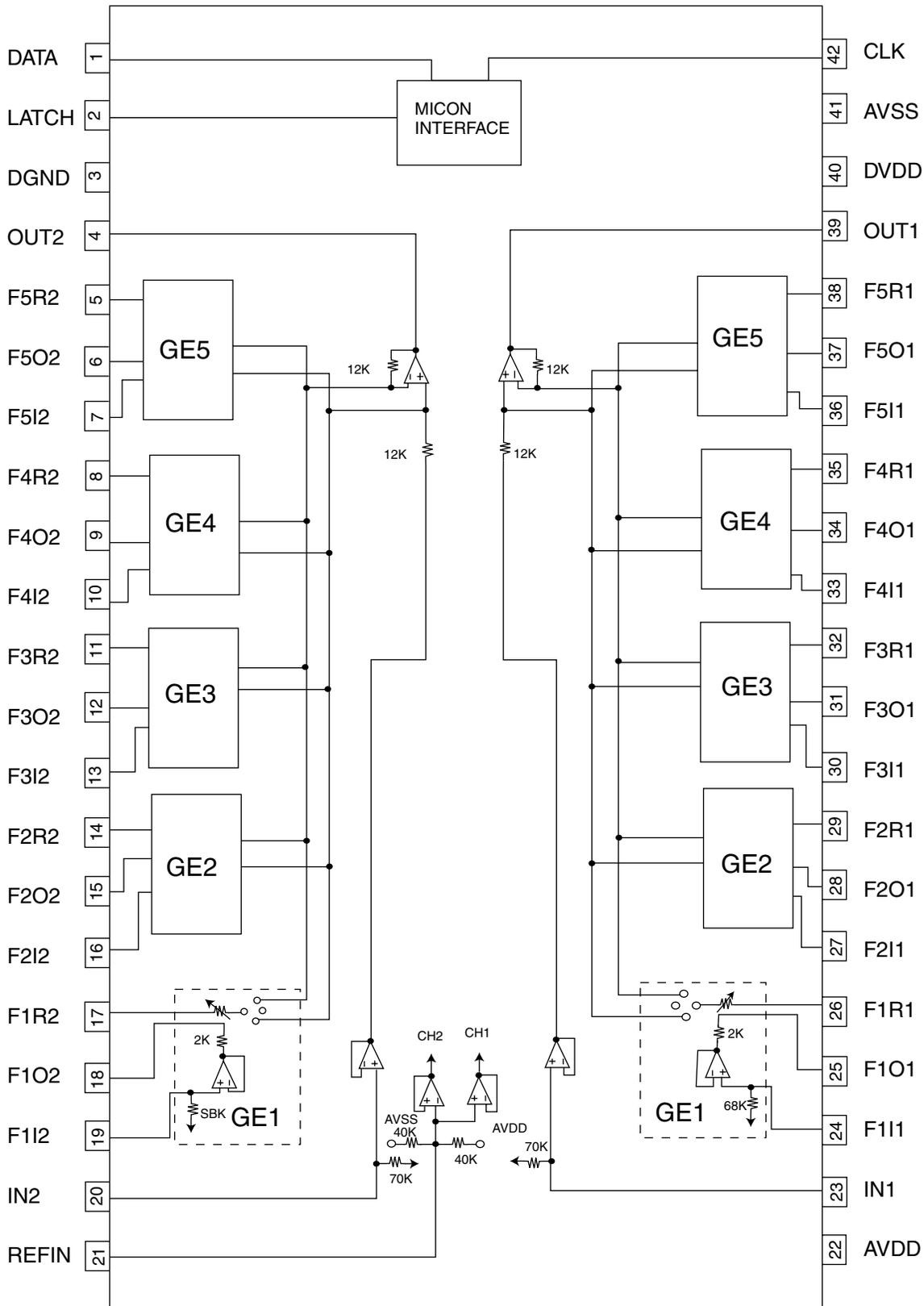
■ NJM4565V-X (IC171,IC323,IC572,IC951) : Dual ope amp

1.Terminal layout & Pin function

1 AOUTPUT
2 A-INPUT
3 A+INPUT
4 V⁻
5 B+INPUT
6 B-INPUT
7 B OUTPUT
8 V⁺
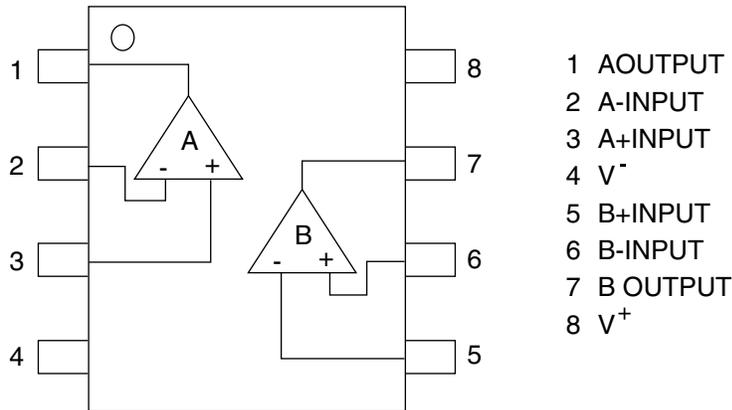
■ NJU7241F25-X (IC651) : Regulator

1.Pin layout

GND 1
VIN 2
VOUT 3
5 STB
4 NC
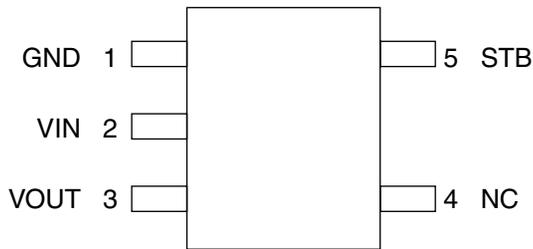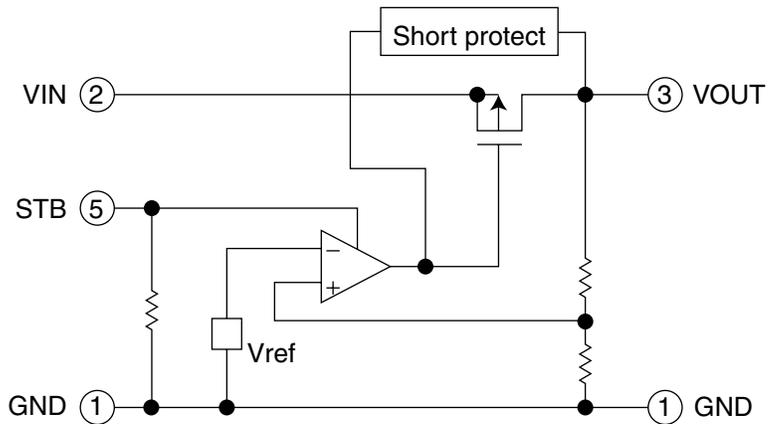
2.Block diagram

■ W24L010AJ-AS-X (IC653) : SRAM

1.Pin layout
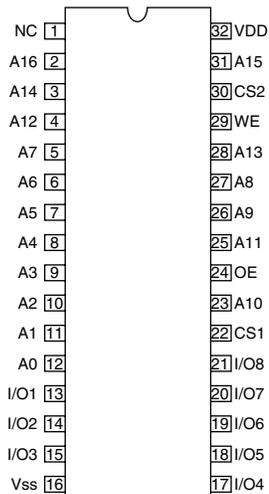
2.Block diagram
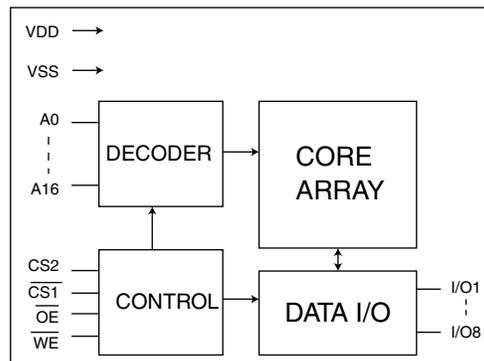
3.Pin functions

Symbol	Function
A0-A16	Address inputs
I/O1-I/O8	Data inpts/outputs
CS1,CS2	Chip select input
WE	Write enable input
OE	Output enable input
VDD	Power supply
VSS	Ground
NC	No connection

## ■ PCM1716E-X (IC571) : D/A converter

1. Pin layout
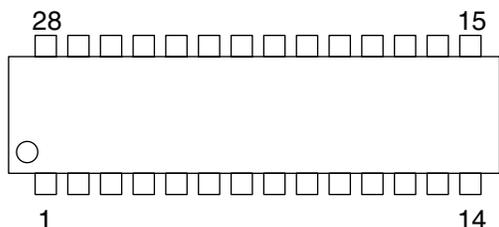
2. Block diagram
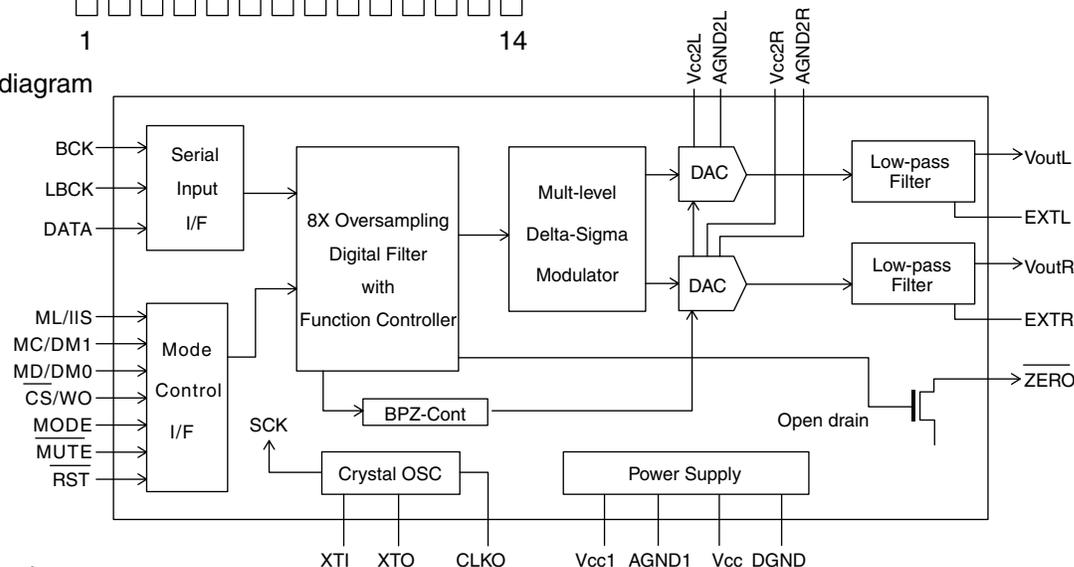
3. Pin function

| Pin No.	Symbol	I/O	Function
1	LRCK	I	LRCK clock input
2	DATA	I	Serial audio data input
3	BCK	I	Bit clock input for serial audio data
4	CLKO	O	Buffered output of system clock
5	XTI	I	Oscillator input / External clock input
6	XTO	O	Oscillator output
7	DGND	-	Digital ground
8	VDD	-	Digital power +5V
9	VDD2R	-	Analog power +5V
10	AGND2R	-	Analog ground
11	EXTR	O	Rch common pin of analog output amp
12	NC	-	Non connection
13	VOUTR	O	Rch analog voltage output of audio signal
14	AGND1	-	Analog ground
15	Vcc1	-	Analog power +5V
16	VOUTL	O	Lch analog voltage output of audio signal
17	NC	-	Non connection
18	EXTL	O	Lch common pin of analog output amp
19	AGND2L	-	Analog ground
20	Vcc2L	-	Analog power +5V
21	ZERO	O	Zero data flag
22	RST	I	Reset
23	CS/IWO	I	Chip select / Input format selection
24	MODE	I	Mode control select
25	MUTE	I	Mute control
26	MD/DM0	I	Mode control, Data / De-emphasis selection 1
27	MC/DM1	I	Mode control, BCK / De-emphasis selection 2
28	ML/IIS	I	Mode control, WDCK / Input format selection

## ■ RPM6938-SV4 (IC861) : Remote sensor

1.Block diagram
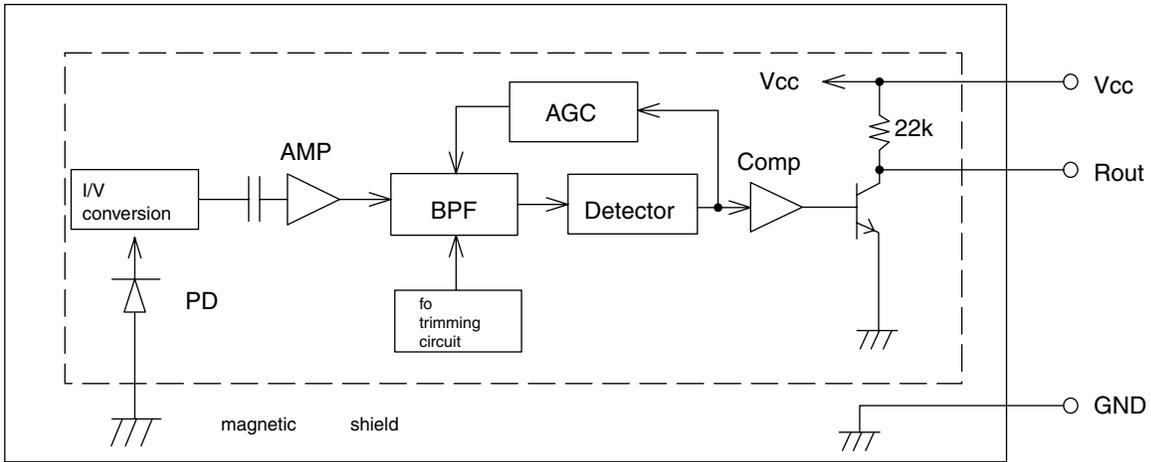
## ■ TDA7404D-X (IC911) : Carradio signal processor

1.Termnal layout
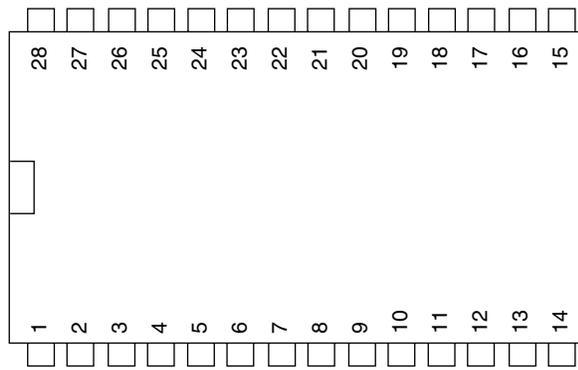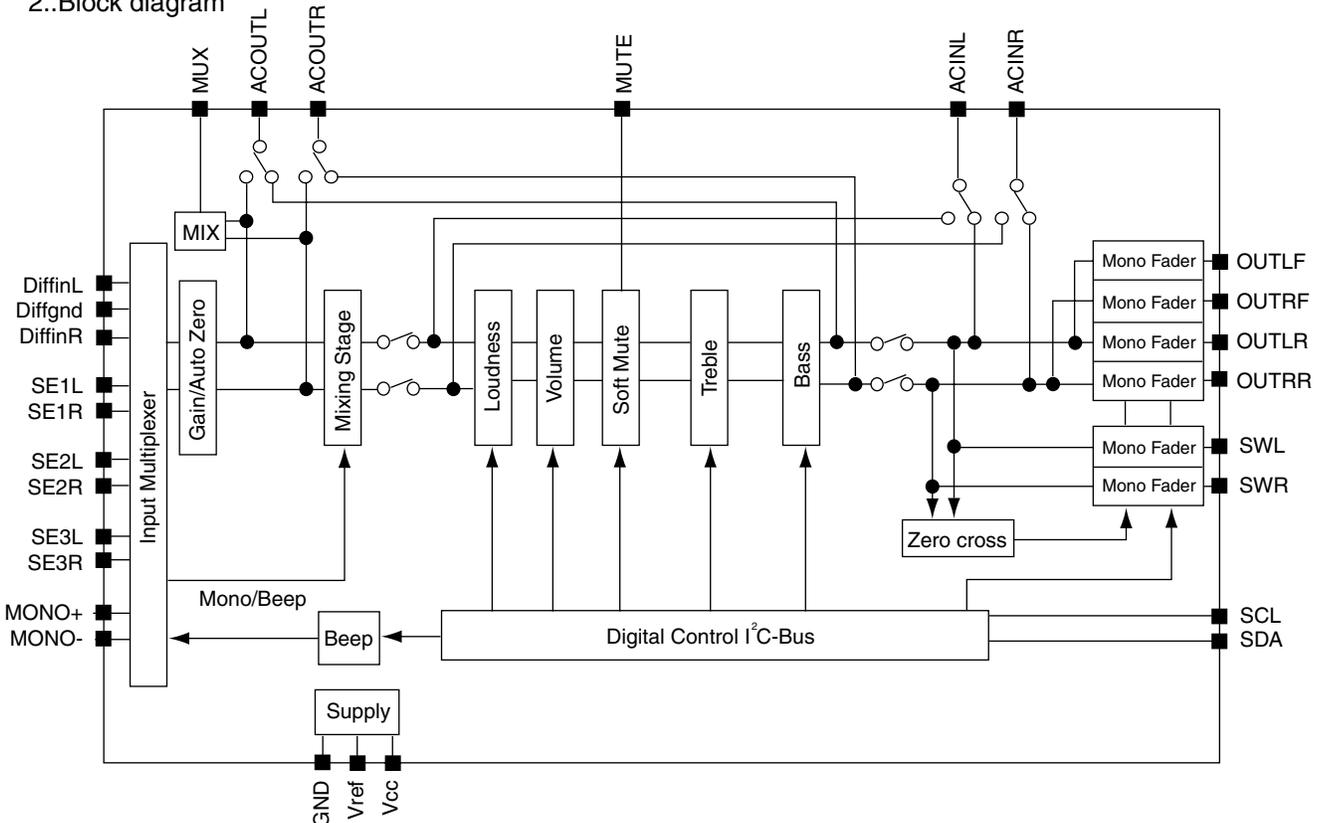
2..Block diagram

■ SAA6579T-X (IC51) : RDS

1.Pin layout

```
QUAL  [1]        [16] RDCL
RDDA  [2]        [15] T57
Vref  [3]        [14] OSCO
MUX   [4]        [13] OSCI
VODA  [5]        [12] VODD
VSSA  [6]        [11] VSSD
CIN   [7]        [10] TEST
SCOUT [8]        [9]  MODE
```
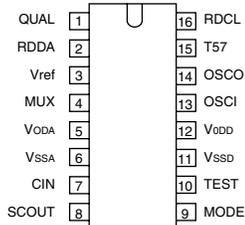
2.Block diagram
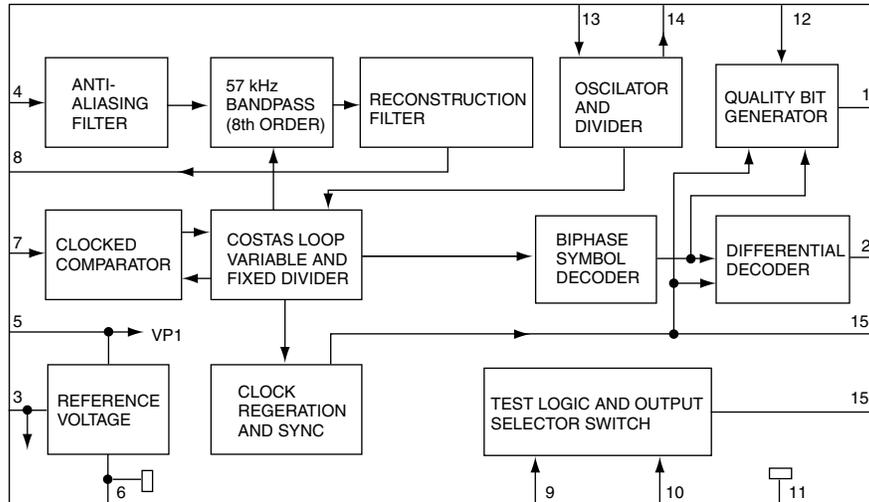
3.Pin function

Pin No.	Symbol	Function
1	QUAL	Quality indication output
2	RDDA	RDS data output
3	Vref	Reference voltage output (0.5VDDA)
4	MUX	Multiolex signal input
5	VDDA	+5V supply voltage for analog part
6	VSSA	Ground for analog part (0V)
7	CIN	Subcarrier input to comparator
8	SCOUT	Subcarrier output of reconstruction filter
9	MODE	Oscllator mode / test control input
10	TEST	Test enable input
11	VSSD	Ground for digital part (0V)
12	VDDD	+5V supply voltage for digital part
13	OSCI	Oscillator input
14	OSCO	Oscillator output
15	T57	57 kHz clock signal output
16	RDCL	RDS clock output

## ■ NJU7241F33-X (IC504) : Voltage regulator
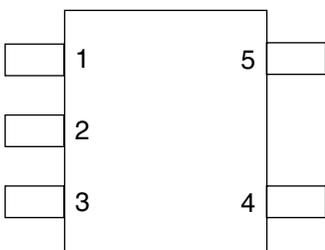
PIN FUNCTION
1. GND
2. VIN
3. VOUT
4. +NC
5. STB

■ TB2901H (IC941) : Power amp

1.Terminal layout

2.Block diagram

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