JVC

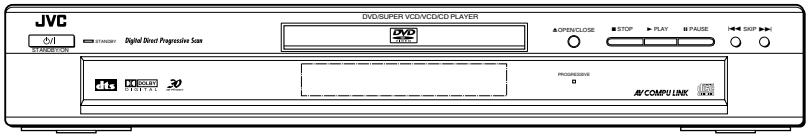
SERVICE MANUAL

DVD VIDEO PLAYER

XV-S500BK / XV-S502SL

Area Suffix

J ---------- U.S.A.
C ---------- Canada



Each difference point

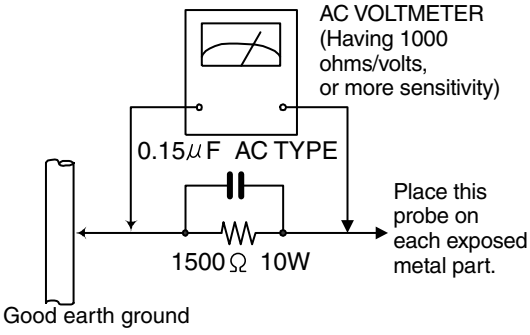
Model	Body color
XV-S500BK	Black
XV-S502SL	Silver

Contents

No.A0027
Feb. 2002

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 manufacturers 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 (⚠) 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 reassembling.
5. Leakage current check (Electrical shock hazard testing)
   After reassembling 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 1,500Ω 10W resistor paralleled by a 0.15μF AC-type capacitor between an exposed metal part and a known good earth ground.
     Measure the AC voltage across the resistor with the AC voltmeter.
     Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Voltage measured any must not exceed 0.75 V AC (r.m.s.). This corresponds to 0.5 mA AC (r.m.s.).



Warning

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

⚠ CAUTION

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

In regard with component parts appearing on the silk-screen printed side (parts side) of the PWB diagrams, the parts that are printed over with black such as the resistor (▬), diode (▮) and ICP (●) or identified by the "⚠" 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)

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

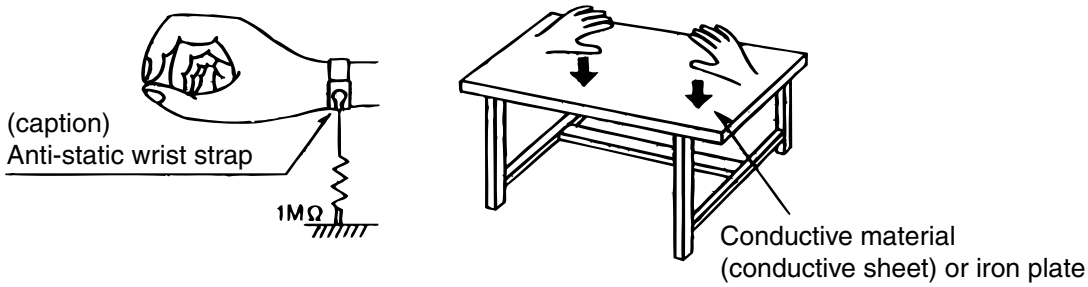
Static electricity in the work area can destroy the optical pickup (laser diode) in devices such as DVD players. Be careful to use proper grounding in the area where repairs are being performed.

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)

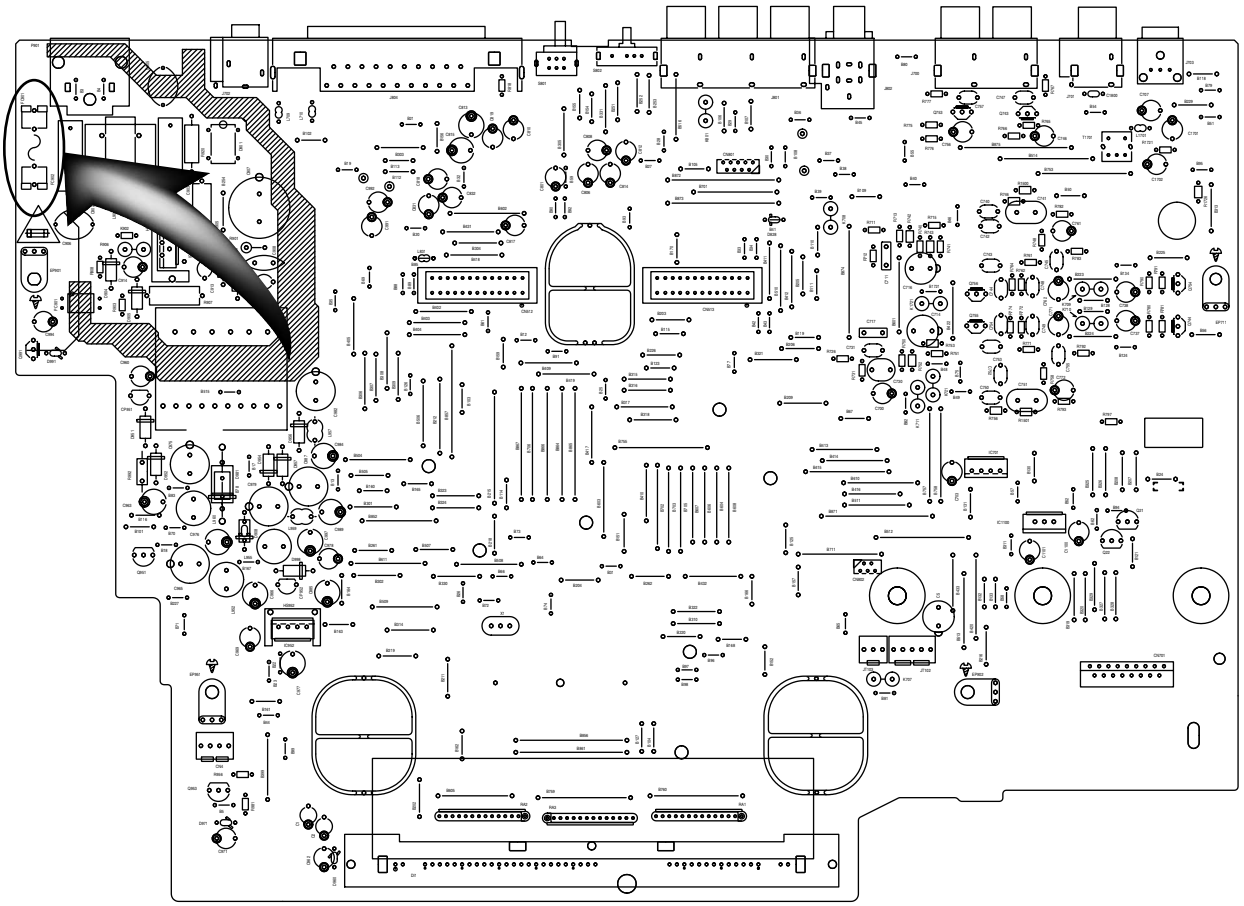
1. Do not subject the traverse unit (optical pickup) to strong shocks, as it is a sensitive, complex unit.

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

Importance Admistering point on the Safety



Full Fuse Replacement Marking	Marquage Pour Le Remplacement Complet De Fusible
Graphic symbol mark (This symbol means fast blow type fuse.)	Le symbole graphique (Ce symbole signifie fusible de type á fusion rapide.)
should be read as follows ;	doit être interprété comme suit ;
FUSE CAUTION	**PRECAUTIONS SUR LES FUSIBLES**
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATING OF FUSES ; **F901 : 1.6 A / 125 V**	**POUR UNE PROTECTION CONTINUE CONTRE DES RISQUES D'INCENDIE, REMPLACER SEULEMENT PAR UN FUSIBLE DU MEME TYPE ;** **F901 : 1.6 A / 125 V**

Precautions for Service

Handling of Traverse Unit and Laser Pickup

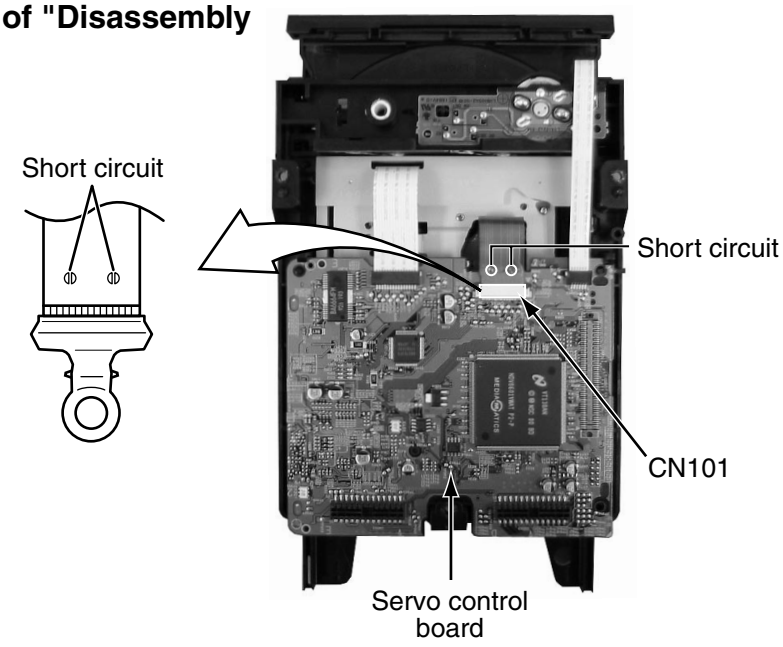
1. Do not touch any peripheral element of the pickup or the actuator.
2. The traverse unit and the pickup are precision devices and therefore must not be subjected to strong shock.
3. Do not use a tester to examine the laser diode. (The diode can easily be destroyed by the internal power supply of the tester.)
4. To replace the traverse unit, pull out the metal short pin for protection from charging.
5. When replacing the pickup, after mounting a new pickup, remove the solder on the short land which is provided at the center of the flexible wire to open the circuit.
6. Half-fixed resistors for laser power adjustment are adjusted in pairs at shipment to match the characteristics of the optical block.
   Do not change the setting of these half-fixed resistors for laser power adjustment.

Destruction of Traverse Unit and Laser Pickup by Static Electricity

Laser diodes are easily destroyed by static electricity charged on clothing or the human body. Before repairing peripheral elements of the traverse unit or pickup, be sure to take the following electrostatic protection:

1. Wear an antistatic wrist wrap.
2. With a conductive sheet or a steel plate on the workbench on which the traverse unit or the pick up is to be repaired, ground the sheet or the plate.
3. After removing the flexible wire from the connector (CN101), short-circuit the flexible wire by the metal clip.
4. Short-circuit the laser diode by soldering the land which is provided at the center of the flexible wire for the pickup. After completing the repair, remove the solder to open the circuit.

Please refer to "Fig.4" of "Disassembly method" for details.



Disassembly method

<Main body>

■ Removing the top cover (see Fig.1)

1.Remove the two screws **A** attaching the top cover on both sides of the body.

2.Remove the three screws **B** attaching the top cover on the back of the body.

3.Remove the top cover from the body by lifting the rear part of the top cover.

ATTENTION: Do not break the front panel tab fitted to the top cover.

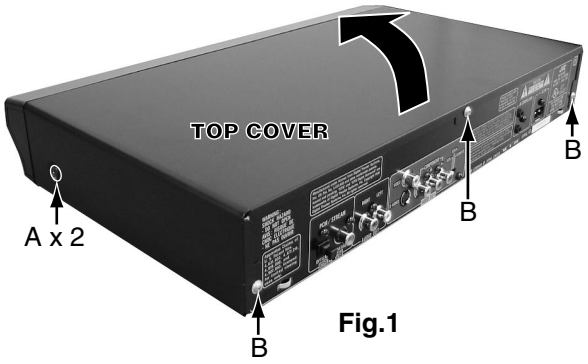


Fig.1

■ Removing the mechanism assembly (see Fig.2,3)

* Prior to performing the following procedure, remove the top cover.
* There is no need to remove the front panel assembly.

1.Remove the three screws **C** attaching the mechanism assembly on the bottom chassis.

2.Remove the two screws **F** attaching the lug wire and main board on the bottom chassis.

3.The servo control board is removed from the connector CN512 and CN513 connected with the main board respectively.

4.Remove the mechanism assembly by lifting the rear part of the mechanism assembly.

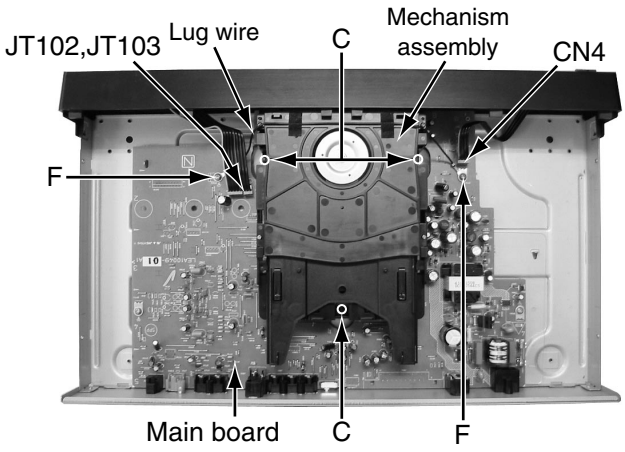


Fig.2

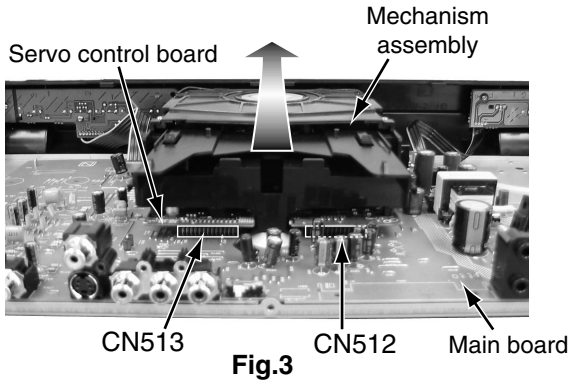


Fig.3

■ Removing the servo control board (see Fig.4)

* Prior to performing the following procedure, remove the top cover and mechanism assembly.

1.Disconnect the card wire from connector CN201 and CN202 on the servo control board respectively.

2.Disconnect the flexible wire from connector CN101 on the servo control board from pick-up.

< **ATTENTION** >
At this time, please extract the wire after short-circuited of two places on the wire in part **a** with solder.
Please remove the solder two places of part **a** after connecting the wire with CN101 when reassembling.

3.Two places in hook **b** are removed, the servo control board is lifted, and it is removed.

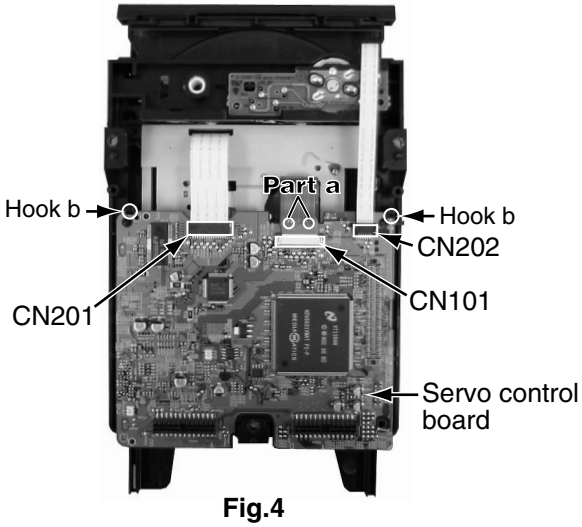


Fig.4

■ Removing the rear panel (see Fig.5)

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

1.Remove the nine screws **D** attaching the rear panel on the back of the body.

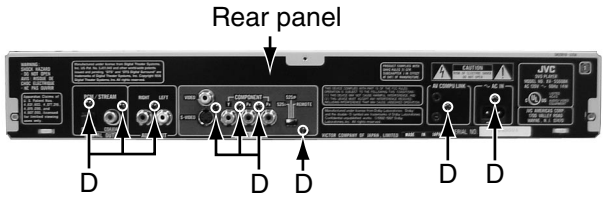


Fig.5

■ Removing the front panel assembly (see Fig.6,7)

* Prior to performing the following procedure, remove the top cover.
* There is no need to remove the mechanism assembly.

1.Remove the one screw **E** attaching the front panel assembly on the bottom chassis.

2.Disconnect the wire from JT102, JT103 and CN4 on the main board respectively.

3.Hook **c** and **d** are removed respectively, and the front panel assembly is removed.

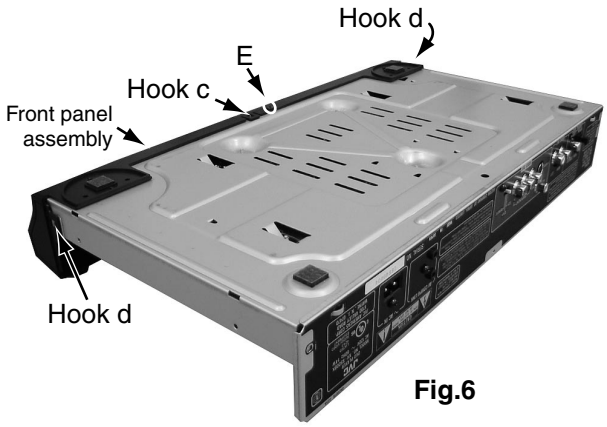


Fig.6

■ Removing the main board (see Fig.7)

* Prior to performing the following procedure, remove the top cover, mechanism assembly and rear panel.

1.Disconnect the wire from JT102, JT103 and CN4 on the main board respectively.

2.Remove the four screws **F** attaching the main board on the bottom chassis.

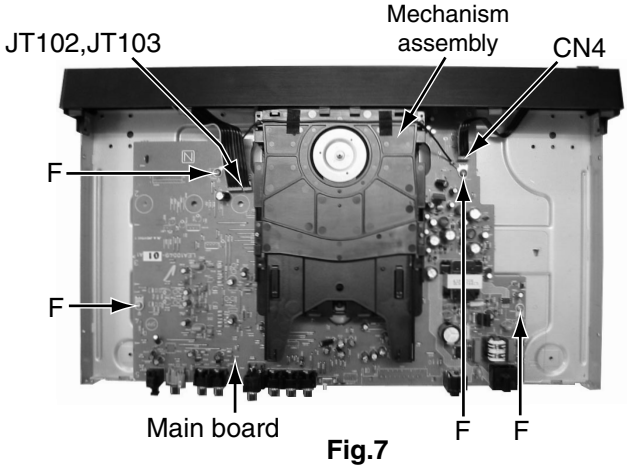


Fig.7

<Loading assembly section>

■Removing the clamper assembly (See Fig.1)

1. Remove the four screws **A** attaching the clamper assembly.

2. Move the clamper in the direction of the arrow to release the two joints **a** on both sides.

ATTENTION: When reattaching, fit the clamper to the two joints **a**.

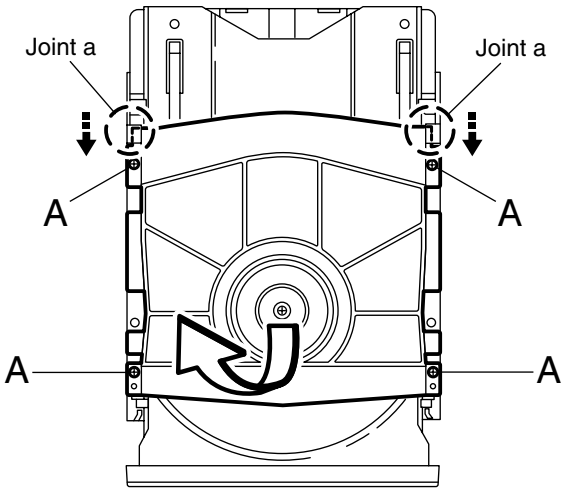


Fig.1

■Removing the tray (See Fig.2 and 3)

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

1. Push **b** of the slide cam into the slot on the left side of the loading base until it stops.

2. Draw out the tray toward the front.

ATTENTION: Before reattaching the tray, slide the part **c** of the slide cam to the right as shown in Fig.3.

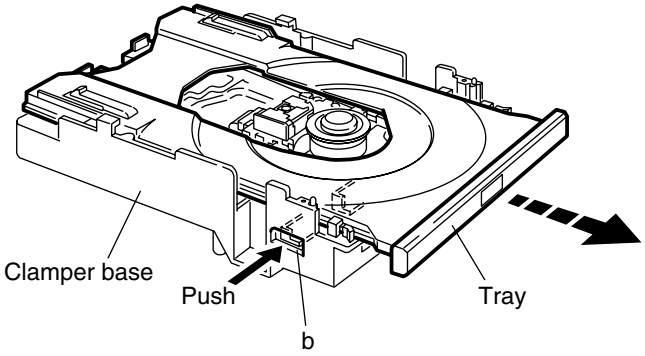


Fig.2

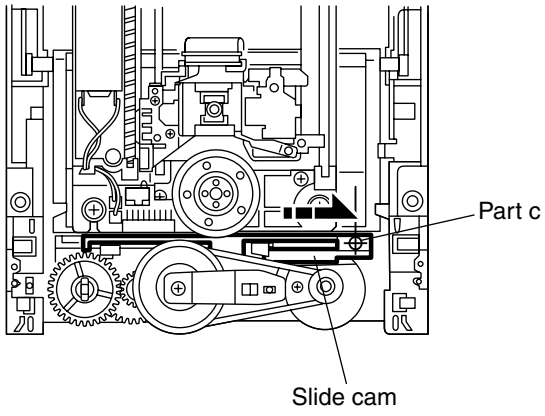


Fig.3

■ Removing the traverse mechanism assembly (See Fig.4 and 5)

- Prior to performing the following procedure, remove the clamper assembly and the tray.

1. Remove the four screws **B** attaching the traverse mechanism assembly.

ATTENTION: Before reattaching the traverse mechanism assembly, pass the card wire extending from the spindle motor board through the notch **d** of the elevator.

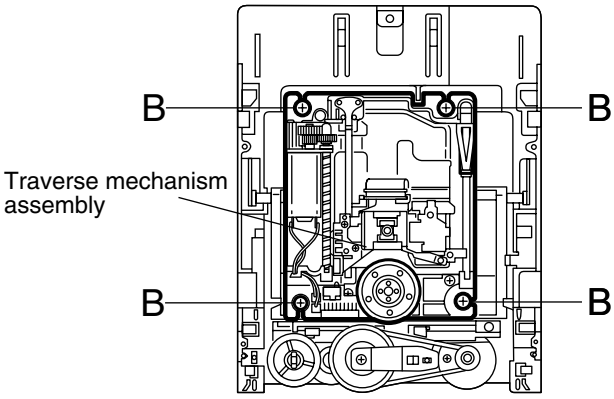


Fig.4

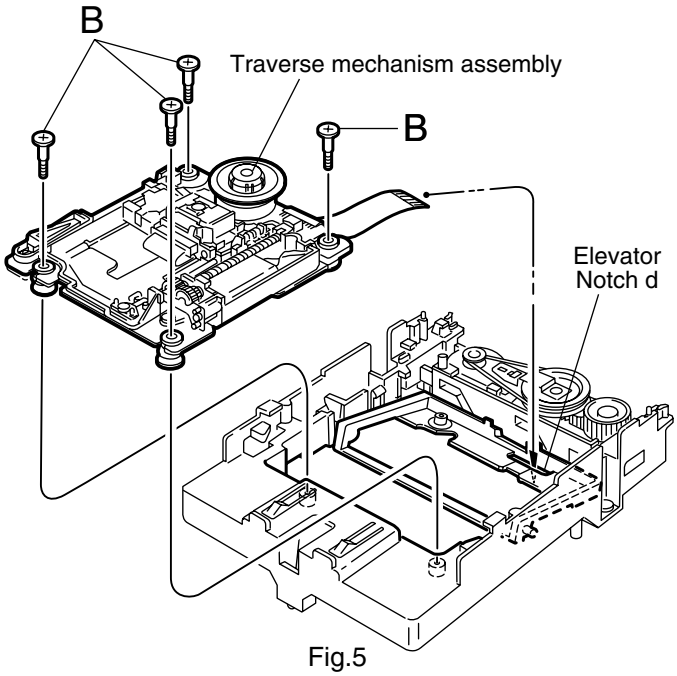


Fig.5

■ Removing the elevator (See Fig.6 and 7)

- Prior to performing the following procedure, remove the clamper assembly, the tray and the traverse mechanism assembly.

1. Extend each bar **e** inside of the loading base outward and detach the elevator shaft.

ATTENTION: When reattaching, first fit the two shafts on the front of the elevator to the slots **f** of the slide cam.

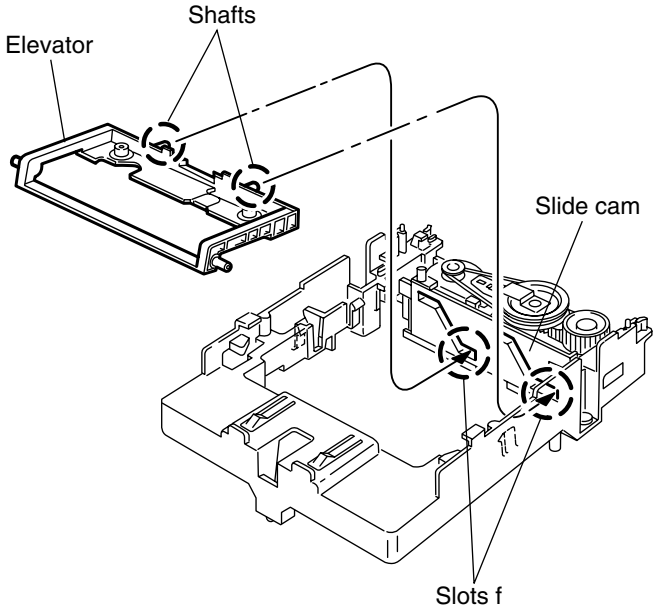


Fig.7

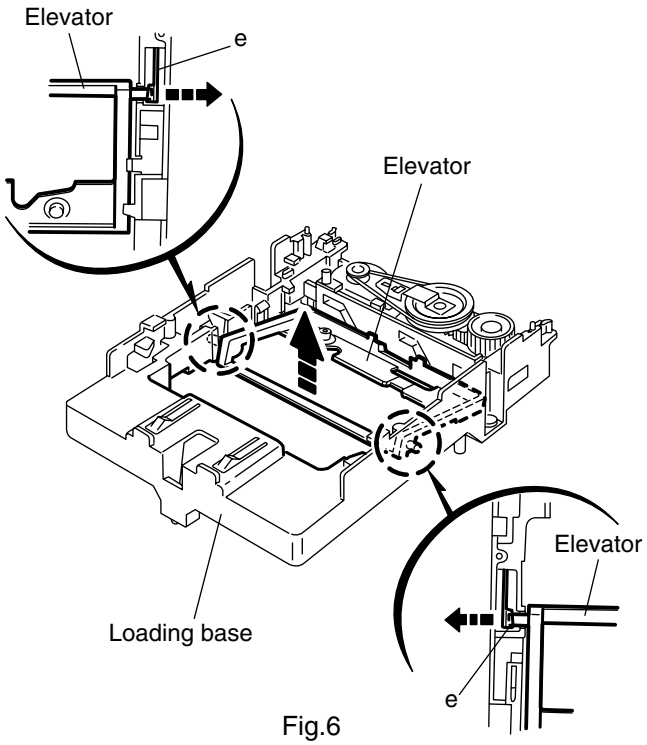


Fig.6

■Removing the motor assembly (See Fig.8 and 9)

- Prior to performing the following procedure, remove the clamper assembly, the tray, the traverse mechanism assembly and the elevator.

1. Remove the belt from the pulley.
2. Remove the screw **C** attaching the motor assembly.
3. Turn over the body and remove the screw **D** attaching the motor assembly.
4. Release the two tabs **g** retaining the motor board.

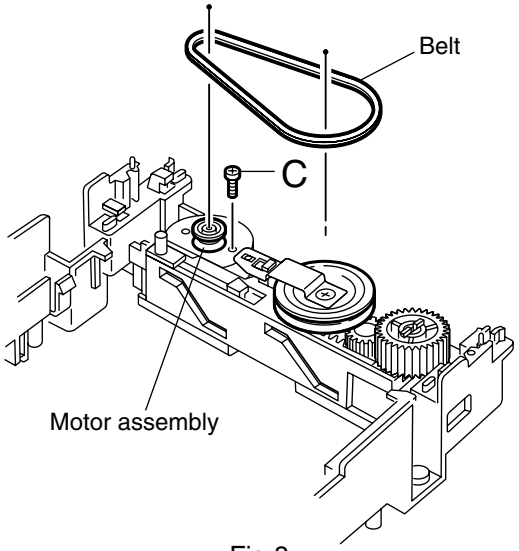


Fig.8

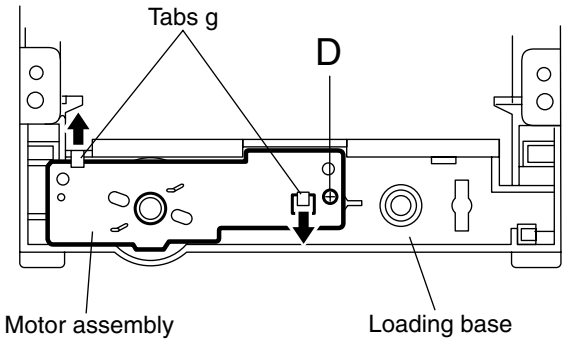


Fig.9

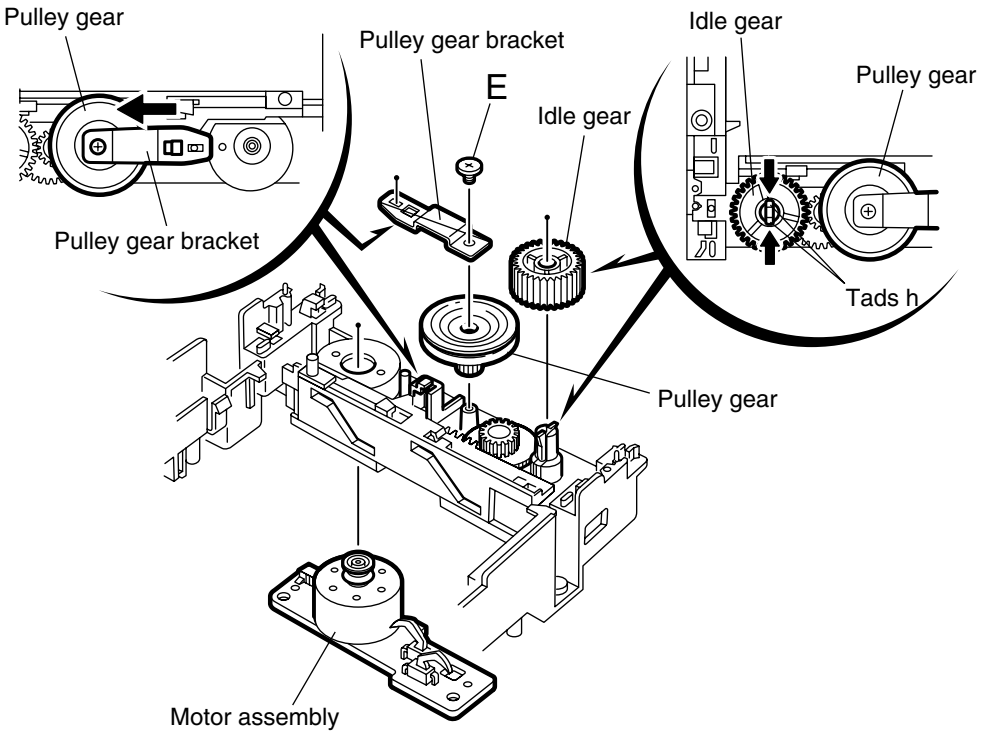


Fig.10

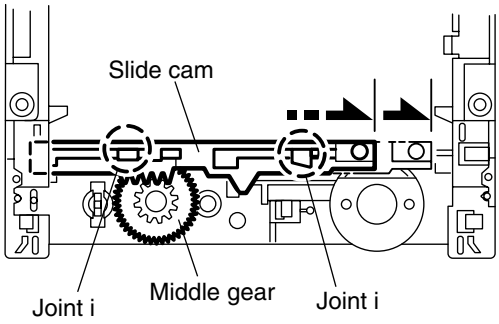


Fig.11

■ Removing the Idle gear / pulley gear / middle gear / slide cam (See Fig.10 to 12)

- Prior to performing the following procedure, remove the clamper assembly, the tray, the traverse mechanism assembly, the elevator and the motor assembly.

1. Press the two tabs **h** inward and pull out the idle gear.

2. Remove the screw **E** attaching the pulley gear bracket. Slide the pulley gear bracket in the direction of the arrow and pull out the pulley gear.

3. Slide the slide cam in the direction of the arrow to release the two joints **i** and remove upward.

4. Remove the middle gear.

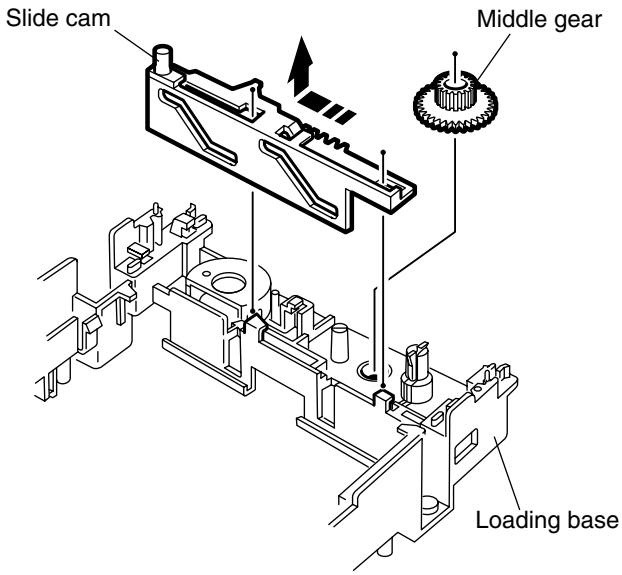


Fig.12

<Traverse mechanism assembly section>

■ Removing the feed motor assembly (See Fig.13)

1. Unsolder the two soldering **j** on the spindle motor board.

2. Remove the two screws **F** attaching the feed motor assembly.

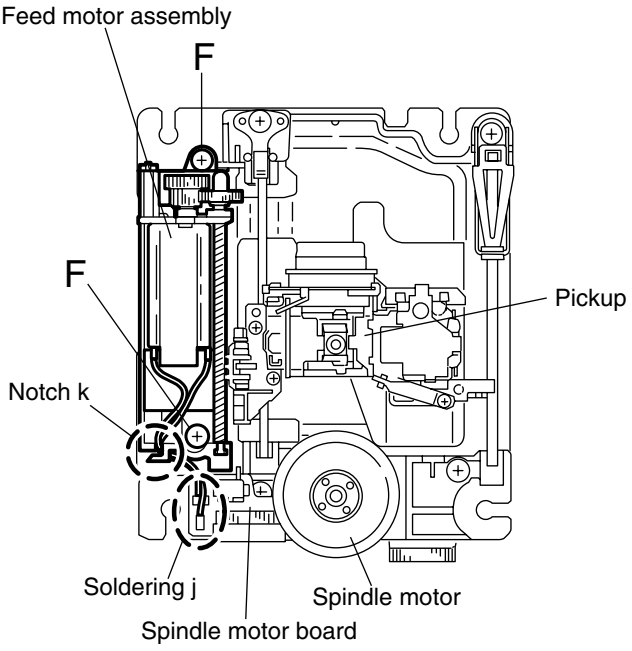


Fig.13

■ Removing the feed motor (See Fig.13 to 15)

・ Prior to performing the following procedure, remove the feed motor assembly.

1. Remove the screw **G** attaching the thrust spring.

ATTENTION: When reattaching the thrust spring, make sure that the thrust spring presses the feed gear (M) and the feed gear (E) reasonably.

2. Remove the feed gear (M).

3. Pull out the feed gear (E) and the lead screw.

4. Remove the two screws **H** attaching the feed motor.

ATTENTION: When reattaching, pass the two cables extending from the feed motor through the notch **k** of the feed holder as shown in Fig.13.

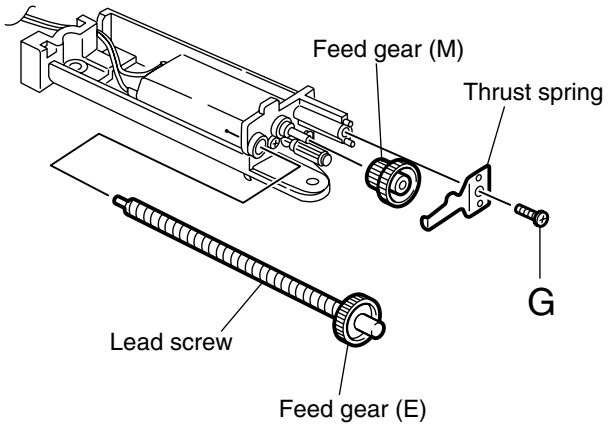


Fig.14

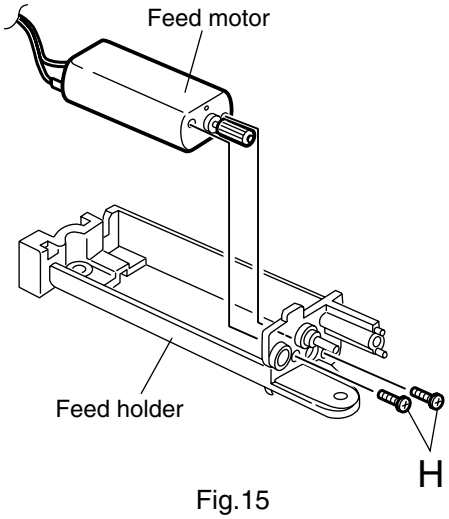


Fig.15

■ Removing the pickup (See Fig.16 and 17)

1. Remove the screw **I** attaching the T spring (S) and the shaft holder. Remove also the plate.

ATTENTION: When reattaching, make sure that the T spring (S) presses the shaft.

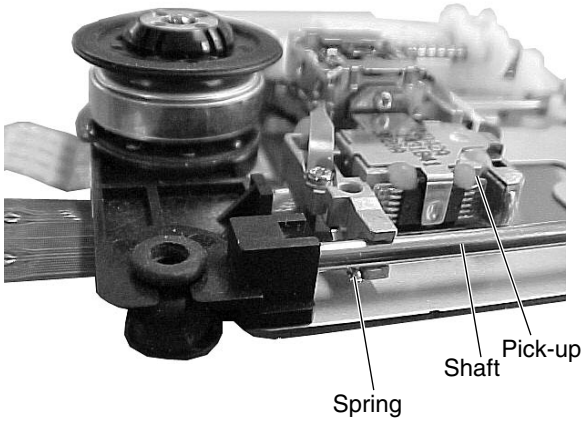
2. Pull out the part **l** of the shaft upward. Move the part **m** in the direction of the arrow and detach from the spindle base.

3. Disengage the joint **n** of the pickup and the shaft in the direction of the arrow.

4. Pull out the shaft from the pickup.

5. Remove the two screws **J** attaching the actuator.

6. Disengage the joint of the actuator and the lead spring. Pull out the lead spring.



The spring must be under the shaft when you install pick-up.

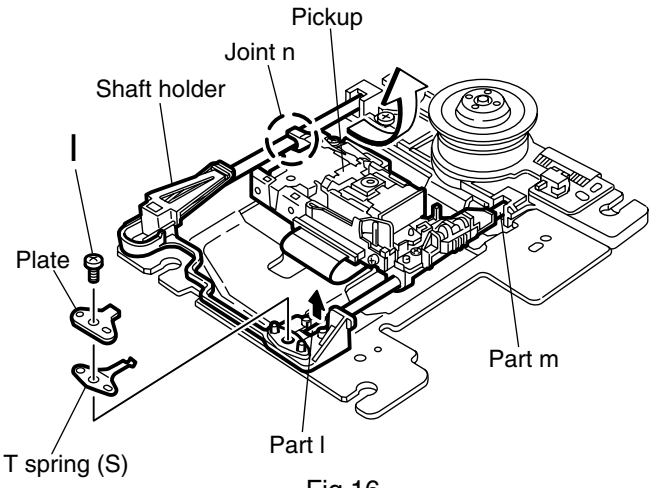


Fig.16

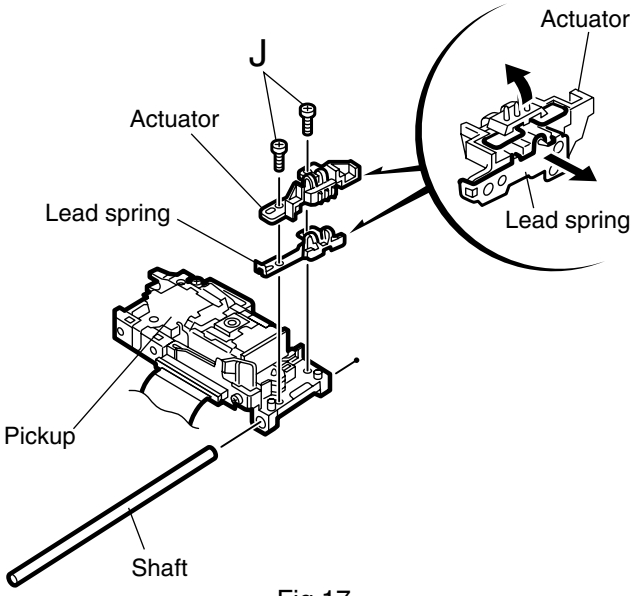


Fig.17

■ Removing the shaft holder / shaft (See Fig.18)

1. Remove the screw **K** attaching the shaft holder.

2. Remove the shaft.

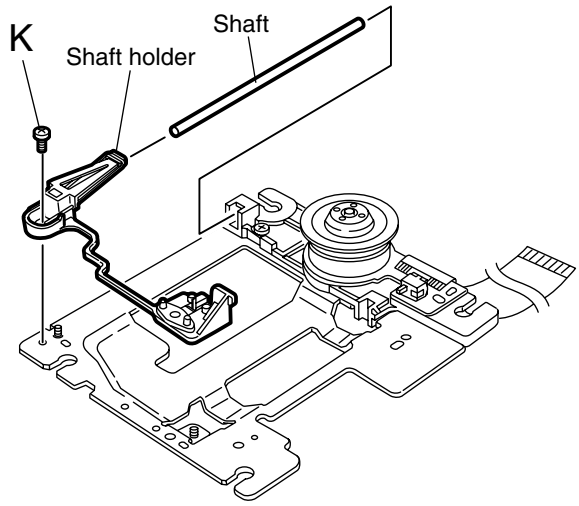


Fig.18

■Removing the spindle motor assembly (See Fig.19 to 21)

1. Remove the three screws **L** attaching the spindle motor on the bottom of the mechanism base.

ATTENTION:	When reattaching, pass the card wire extending from the spindle motor board through the notch of the spindle base.

2. Remove the three screws **M** attaching the spindle base.

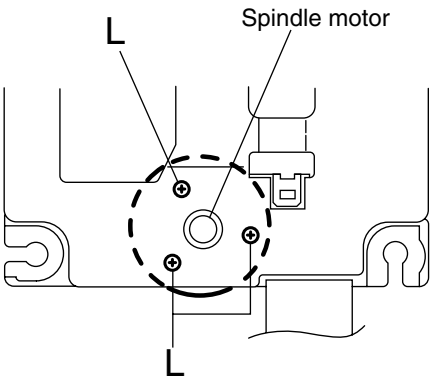


Fig.19

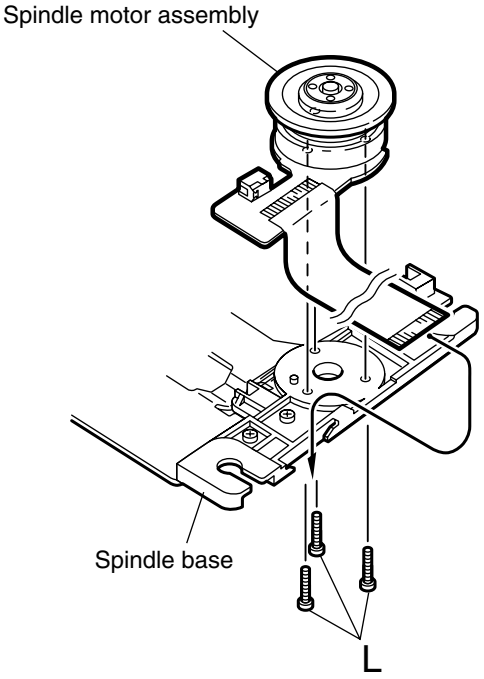


Fig.20

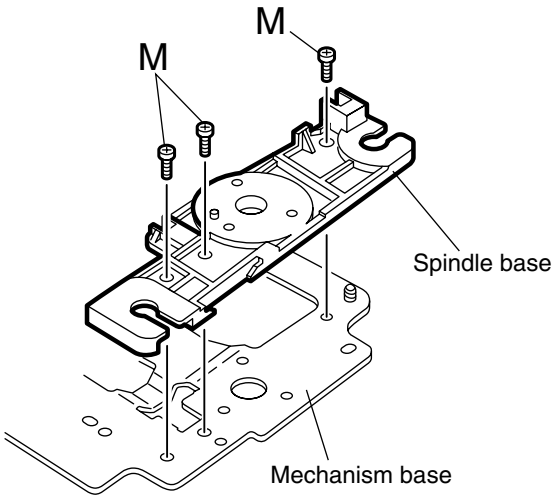


Fig.21

Adjustment method

(1) Test mode setting method

1) Take out the disc and close the tray.
2) Unplug the power plug.
3) Insert power plug into outlet while pressing both "PLAY" key and "STOP" key of the main body.
4) The player displays "TEST ＊＊ " on the FL display. "＊＊ " means the player version.
5) When the power supply is turned off, test mode is released.

The mode changes as follows whenever the "CHOICE" key of remote controller is pushed in test mode.

TEST_＊＊ ---------- Becomes test mode
↓
＊＊_＊＊_＊＊ ---------- Version of microcomputer
↓
FL display becomes all lighting --- Confirmation of FL display
↓
CHECK ---------- Check mode
↓
EXPERT ---------- Not use mode

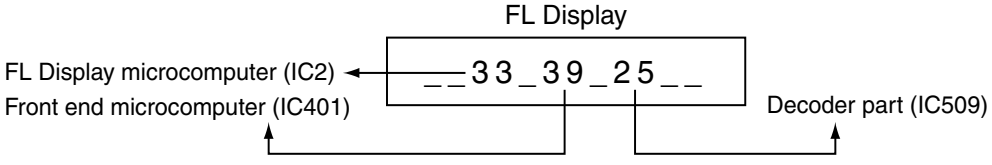
(2) Initialization method

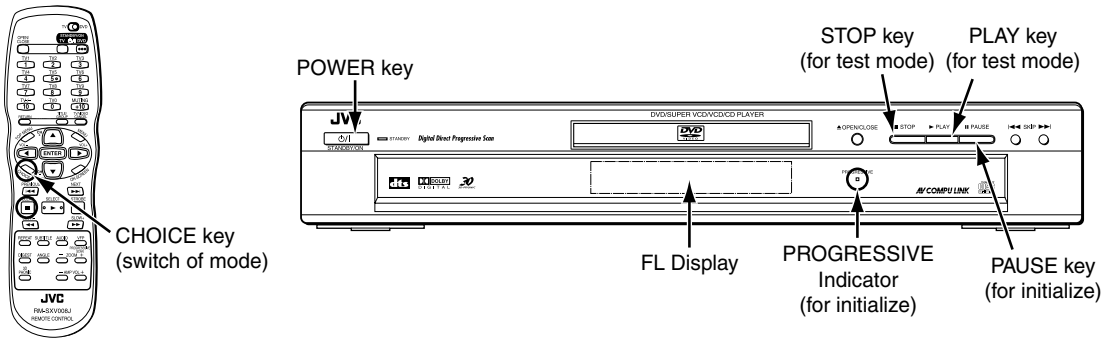
Please initialize according to the following procedures when microprocessor or pick-up is exchanged and when the up-grade is done.

1) Makes to test mode.
2) "PAUSE" key of the main body is pushed.
3) A green progressive indicator lights when about a few seconds pass. Then, it is initialization completion.
*Please make scan mode test mode in the state of interlaced scan mode.
(State of progressive indicator turning off)

(3) Method of displaying version of microcomputer

1) Makes to test mode and initializes
2) When "CHOICE" key of remote controller is pushed once, the figure is displayed on the FL display as follows.





(4) Display of current value of laser

1) Makes to test mode and initializes.
2) When "CHOICE" key of remote controller is pushed three times, It is displayed on the FL display, "CHECK".
3) Afterwards, the laser current value can be switched by pushing the key to remote controller without turning on the disc.

Remote controller "4" key --- Laser of CD
Remote controller "5" key --- Laser of DVD

FL Display (example)

0042 0000

Laser current value

As for the current value of the laser, the figure displayed on the FL display becomes a current value as it is by "mA" unit. becomes 42 mA if displayed as 42.

4) The laser output stops if the "STOP" key to remote controller is pushed.

It can be judged it is simply good if the displayed current value of the laser is smaller than that of the undermentioned value.
Moreover, there must be a deteriorated possibility and the pick-up must exchange the pick-up more than the undermentioned value.

Laser current value of CD ------ 49 mA or less
Laser current value of DVD ---- 64 mA or less

(5) Display of jitter value

1) Makes to test mode and initializes.
2) When "CHOICE" key of remote controller is pushed three times, It is displayed on the FL display, "CHECK".
3) The test disk (VT-501) is inserted, and the "PLAY" key to the main body is pushed.
4) The jitter value is displayed on the FL display as follows.

FL Display (example)

0042 1CB4

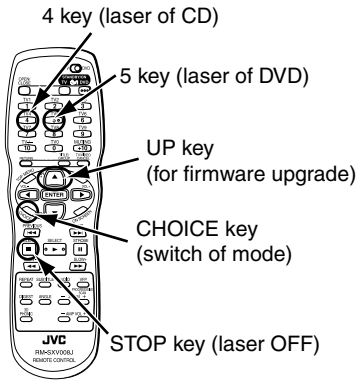
Jitter value

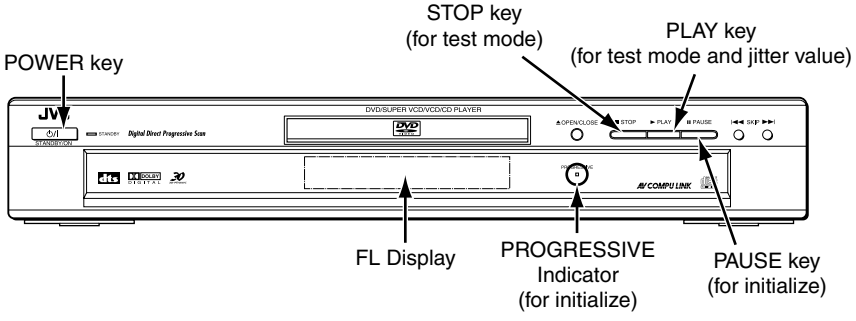
The jitter value is displayed by the hexadecimal number.

In the following cases, please "Flap adjustment of the pick-up guide shaft" referring to the following page.
Before using the TEST disc VT-501, careful check it if there is neither damage nor dirt on the read surface.

< In the following cases, please adjustment >

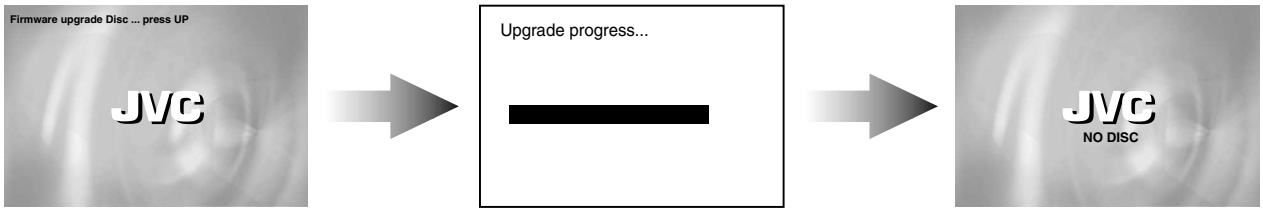
*** When you exchange the pick-up**
*** When you exchange the spindle motor**
*** When the reading accuracy of the signal is bad (There is a block noise in the screen etc..)**





(6) Upgrading of firmware

1) The power supply is turned on pushing the "POWER" key.
2) The up-grade disc is inserted.
3) When FL display of the main body changes from "READING" into "UPGRADE", cursor "UP" key (▲) of remote controller is pushed.
4) The up-grade starts if the entire screen becomes blue and it is displayed, "Upgrade progress".
5) The tray opens automatically, the up-grade disc is removed.
6) The up-grade ends if the tray closes automatically, and the screen returns to the normal screen.
7) Please confirm the version of the microcomputer after makes to test mode and initializes.



After inserting the up-grade disc　　Upgrading (blue screen)　　When up-grade is completed

The disc for the up-grade is usually one piece. The disc becomes two pieces according to the version. In that case, please note the undermentioned content.

* The up-grade is done by using the STEP1 disc according to "1)" and "4)" of the above-mentioned procedure.
* The tray opens automatically after a few seconds and exchange for the disc of STEP2, please.
* The tray closes automatically. There is only about five second time that the tray opens this time, and replace the disc quickly between those, please.

ATTENTION

- When the tray shuts with the STEP1 disc left for the tray
  The up-grade starts again and exchange for the STEP2 disc, please when the tray opens automatically.
- When the tray closes with there no disc in the tray
  Because the tray opens automatically, the disc of STEP2 is put on the tray.
  The power supply is turned off once pushing the "POWER" key.
  The up-grade starts when the "POWER" key is pushed afterwards.

* After the up-grade ends, the STEP2 disc is removed because the tray opens automatically.
* Afterwards, it is the same as 6),7) of the above-mentioned procedures.

(7) Display of region code

1) Makes to the stand-by state.
2) The "POWER" key is pushed while pushing the "BACK SKIP" key and the "FORWARD SKIP" key to the main body.
3) Region code is displayed on the FL display as follows.

FL Display

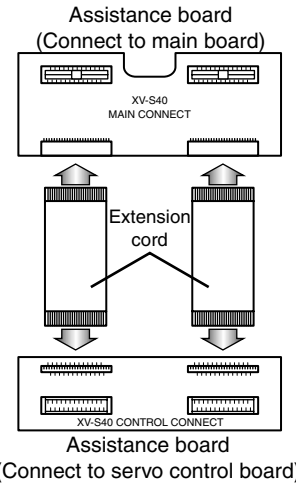
REGION__ ∗

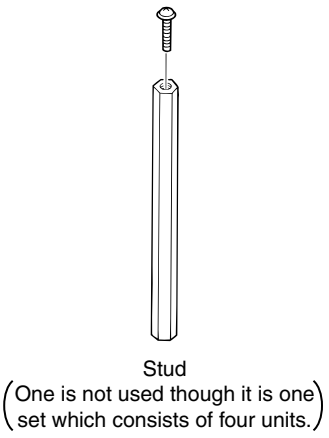
∗ = Region code

■ Flap adjustment of the pick-up guide shaft

<Tool list for adjustment>

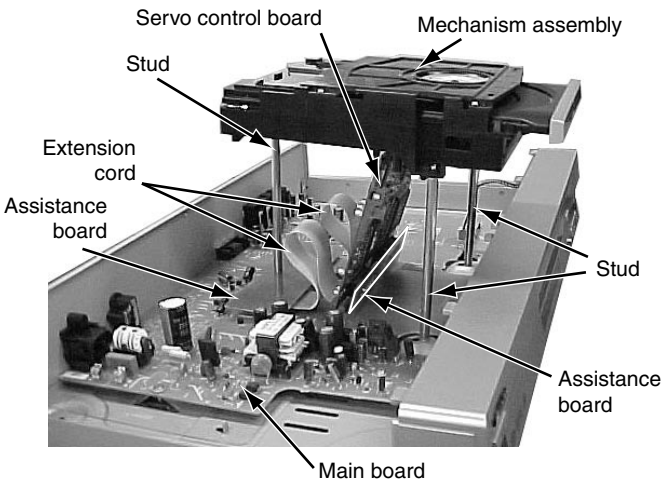
Stud (four pieces set)
Parts No. : JIGXVS40
Extension cord set (two cord and two board)
Parts No. : EXTXVS40CB
Hex wrench for adjustment
Off-the-shelf (1.3mm)
Test disc
VT-501 or VT-502

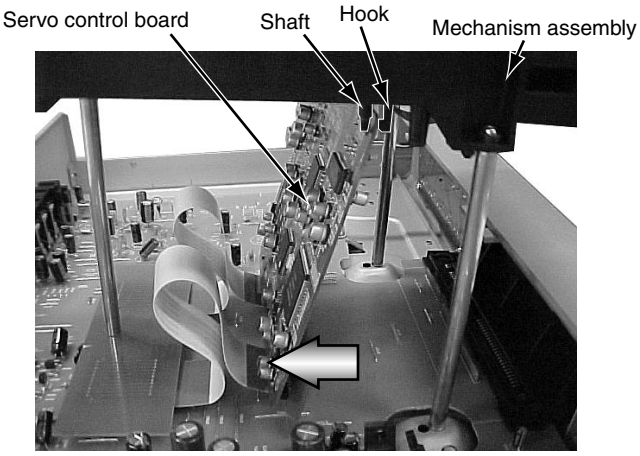




<Adjustment preparation>

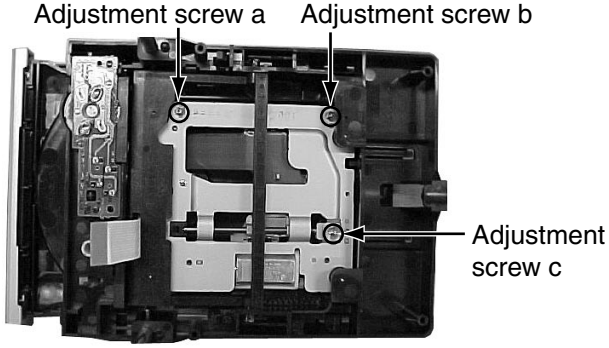
1. The mechanism assembly is made in the state from the main body from which is detached referring to the disassembly method.
2. Three studs are installed in the mechanism assembly respectively.
3. The servo control board is removed from the mechanism assembly, and puts into the state set up as shown in figure. (Each wire connected by the servo control board this time leaves the connection maintained.) Between shaft and hook of mechanism assembly of figure Board is put And, the board is inclined in the direction of the arrow on figure as much as possible.
4. The extension cord is inserted in the connector of the assistance board respectively. The main board is connected with the servo control board as shown in figure.





<Adjustment>

1. Puts into the state to display the jitter value on the FL display referring to "Display of the jitter value".
2. The adjustment screw under the traverse mechanism is turned with hex wrench, and matches so that the jitter value displayed on the FL display may become **maximum** value.



<POINT>

1. Turns in the forward or the opposite direction, and makes to the position where the jitter value is good the half rotation of adjustment screw a and b(180 degrees) respectively.
2. Afterwards, adjustment screw b and c are turned in the same way, and makes to the best position.

Attention when pick-up is exchanged

1.Flexible wire, pick-up spring, switch actuator, and lead spring are removed from an old pick-up (broken the one).

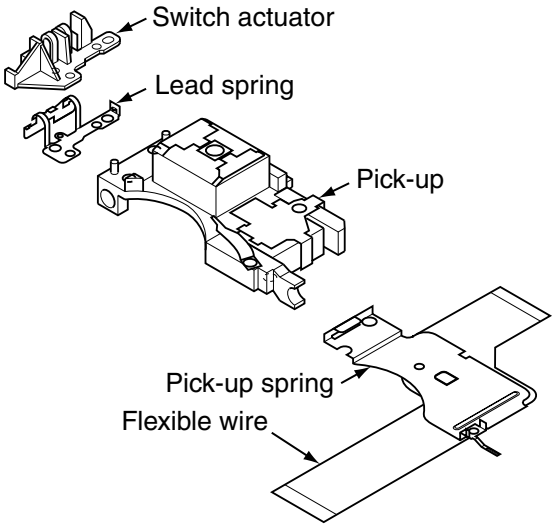
< Guide >
Flexible wire, pick-up spring and switch actuator, lead spring are removed without each decomposing while assembled.

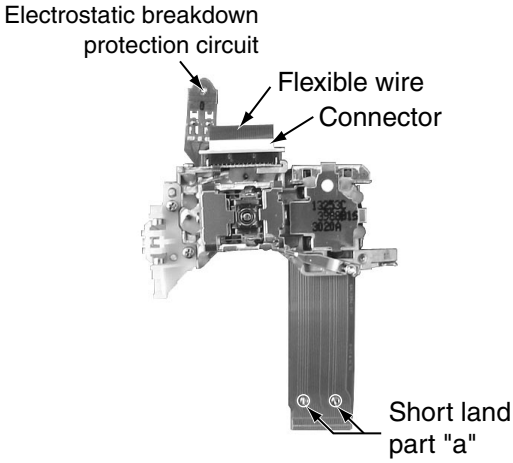
2.The above-mentioned parts are installed in a new pick-up (non-defective article).

3.A flexible wire is inserted in the connector which has taken side with the pick-up, and solder is put up to short land part "a" two places on a flexible wire.

4.The electrostatic breakdown protection circuit attached to the pick-up is cut.

< ATTENTION >
Please cut the electrostatic breakdown protection circuit attached to the pick-up after solder is put up to two places on a flexible wire short land part "a" of the insertion of a flexible wire this time in the connector without fail.
The procedure might be mistaken and if solder has not surely adhered to two places on a flexible wire short land part "a", the laser diode in the pick-up be destroyed again.



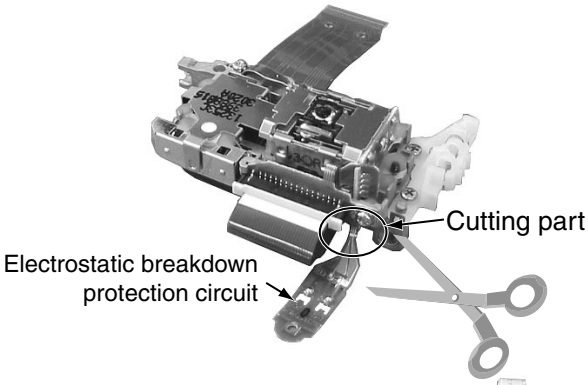


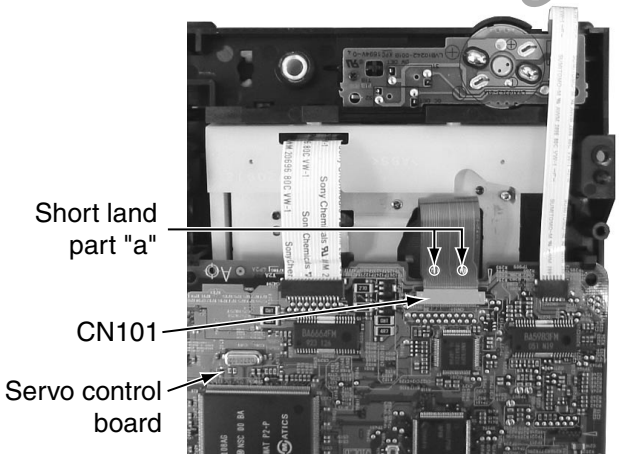
5.The pick-up is installed in the traverse mechanism.

6.A flexible wire is connected with connector CN101 on the servo control board by installing the traverse mechanism in the loading mechanism.

7.Solder in two places on a flexible wire in part "a" is removed.

< ATTENTION >
Please remove solder in two places in part "a" after connecting a flexible wire with connector CN101 on the servo control board without fail this time.
When the procedure is mistaken, the laser diode in the pick-up might be destroyed.
Please remove solder in two places in part "a" surely.





Confirm method of operation

Please confirm the operation of the undermentioned item after doing the repair and the upgrade of the firmware.

☐ **The EEPROM is initialized.**

Refer to the initialization method.

☐ **Opening picture check (Power ON)**

It should be display "JVC"

☐ **Muting working**

The noise must not be had to the performance beginning when you
push "PLAY" button or at ON/STANDBY.

☐ **FL Display**

The mark and the logo, etc. displayed by each operation must be displayed correctly.
FL Display should light correctly without any unevenness.

☐ **All Function button**

All function buttons should worked correctly with moderate click feeling.

☐ **Open and close movement of tray**

When press OPEN/CLOSE button the tray should move smoothly without any noise.

☐ **Remote controller unit working**

Check the correctly operation in use of remote controller unit.

☐ **Reading of TOC**

Be not long in the malfunction.

☐ **Search**

Both forward-searches and backward-searches should be able to be done.
Do not stop be searching or after the search.

☐ **Skip**

Both forward-skip and backward-skip should be able to be done.
Do not stop be after the skip.

☐ **Playback**

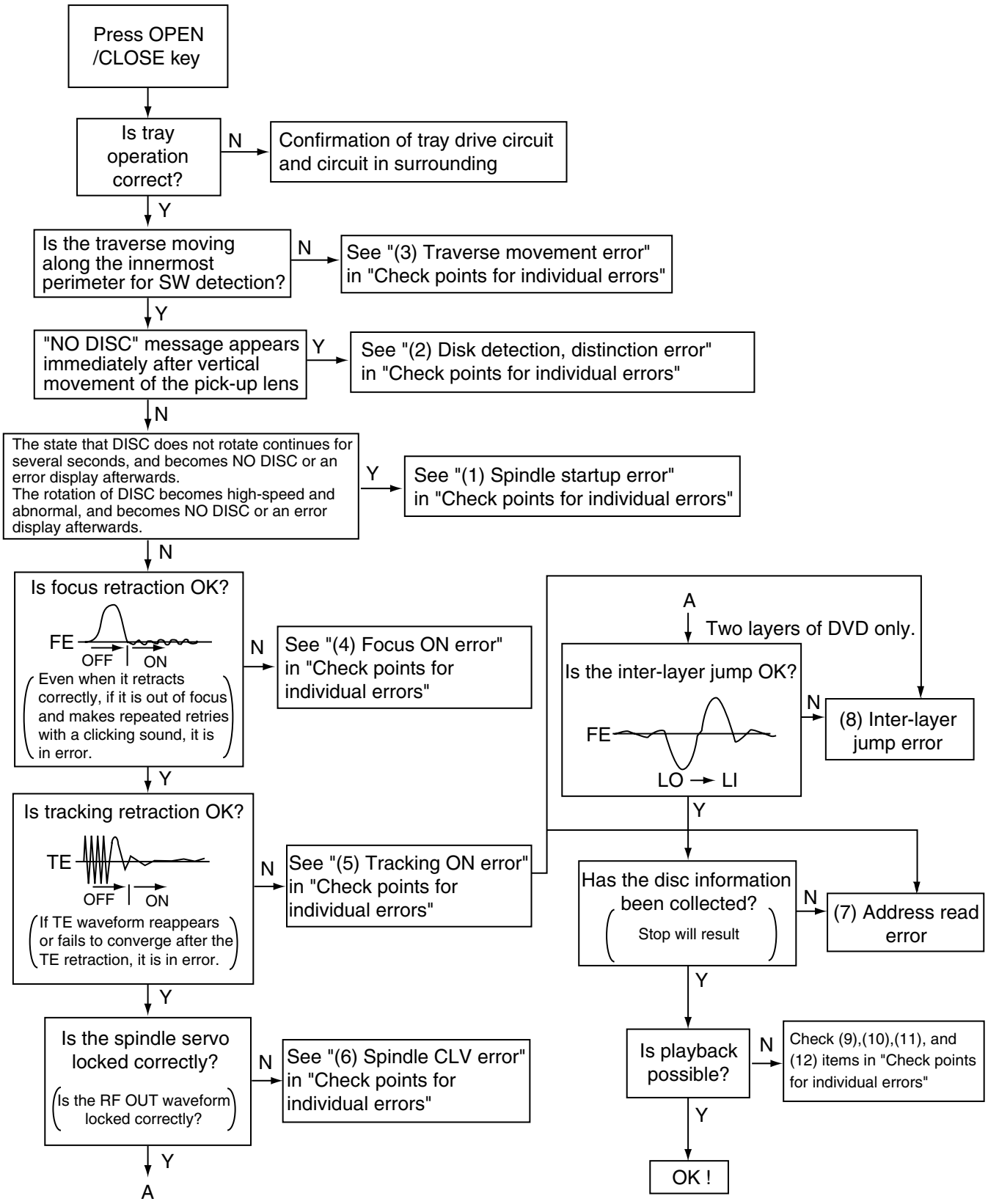
Do not find abnormality etc. of tone quality and the picture quality.

☐ **Most outside TITLE playback check**

Play VT-501 TITLE 59 CHAPTER 1 , check normal playback.

Troubleshooting

Servo volume



Check points for each error

(1) Spindle start error

1.Defective spindle motor

*Are there several ohms resistance between each pin of CN201 "5-6","6-7","5-7"?
(The power supply is turned off and measured.)

*Is the sign wave of about 100mVp-p in the voltage had from each terminal?
[CN201"9"(H1-),"10"(H1+),"11"(H2-),"12"(H2+),"13"(H3-),"14"(H3+)]

2.Defective spindle motor driver (IC251)

*Has motor drive voltage of a sine wave or a rectangular wave gone out to each terminal(SM1~3)
of CN201"5,6,7" and IC251"2,4,7"?

*Is FG pulse output from the terminal of IC251"24"(FG) according to the rotation of the motor?

*Is it "L(about 0.9V)" while terminal of IC251"15"(VH) is rotating the motor?

3.Has the control signal come from servo IC or the microcomputer?

*Is it "L" while the terminal of IC251"18"(SBRK) is operating?
Is it "H" while the terminal of IC251"23"(/SPMUTE) is operating?

*Is the control signal input to the terminal of IC251"22"(EC)?
(changes from VHALF voltage while the motor is working.)

*Is the VHALF voltage input to the terminal of IC251"21"(ECR)?

4.Is the FG signal input to the servo IC?

*Is FG pulse input to the terminal of IC301"69"(FG) according to the rotation of the motor?

(2) Disc Detection, Distinction error (no disc, no RFENV)

* Laser is defective.
* Front End Processor is defective (IC101).
* APC circuit is defective. --- Q101,Q102.
* Pattern is defective. --- Lines for CN101 - All patterns which relate to pick-up and patterns between IC101
* IC101 --- For signal from IC101 to IC301, is signal output from IC101 "20" (ASOUT) and
IC101 "41"(RFENV) and IC101 "22" (FEOUT)?

(3) Traverse movement NG

1.Defective traverse driver
*Has the voltage come between terminal of CN101 "1" and "2" ?

2.Defective BTL driver (IC201)
*Has the motor drive voltage gone out to IC201"17" or "18"?

3.Has the control signal come from servo IC or the microcomputer?
*Is it "H" while the terminal of IC201"9"(STBY1) ?
*TRSDRV Is the signal input? (IC301 "67")

4.TRVSW is the signal input from microcomputer? (IC401 "50")

(4) Focus ON NG

* Is FE output ? --- Pattern, IC101
* Is FODRV signal sent ? (R209) --- Pattern, IC301 "115"
* Is driving voltage sent ?
  IC201 "13", "14" --- If NG, pattern, driver, mechanical unit .
* Mechanical unit is defective.

(5) Tracking ON NG

* When the tracking loop cannot be drawn in, TE shape of waves does not settle.
* Mechanical unit is defective.
  Because the self adjustment cannot be normally adjusted, the thing which cannot be normally drawn in is thought.
* Periphery of driver (IC201)
  Constant or IC it self is defective.
* Servo IC (IC301)
  When improperly adjusted due to defective IC.

(6) Spindle CLV NG

* IC101 -- "35"(RF OUT), "30"(ARF-), "31(ARF+).
* Does not the input or the output of driver's spindle signal do the grip?
* Has the tracking been turned on?
* Spindle motor and driver is defective.
* Additionally, "IC101 and IC301" and "Mechanism is defective(jitter)", etc. are thought.

(7) Address read NG

* Besides, the undermentioned cause is thought though specific of the cause is difficult because various factors are thought.
  Mechanism is defective. (jitter)
  IC301, IC401.
  The disc is dirty or the wound has adhered.

(8) Between layers jump NG (double-layer disc only)

Mechanism defective
Defect of driver's IC(IC201)
Defect of servo control IC(IC301)

(9) Neither picture nor sound is output

1.It is not possible to search
*Has the tracking been turned on?
*To "(5) Tracking ON NG" in "Check points for each error" when the tracking is not normal.
*Is the feed operation normal?
To "(3) traverse movement NG" in "Check points for each error" when it is not normal.
Are not there caught of the feeding mechanism etc?

(10) Picture is distorted or abnormal sound occurs at intervals of several seconds.

Is the feed operation normal?
Are not there caught of the feeding mechanism etc?

(11) Others

The image is sometimes blocked, and the image stops.
The image is blocked when going to outer though it is normal in surroundings in the disk and the stopping symptom increases.

} There is a possibility with bad jitter value for such a symptom.

(12) CD During normal playback operation

a) Is TOC reading normal?
Displays total time for CD-DA.
Shifts to double-speed mode for V-CD.

↓ YES

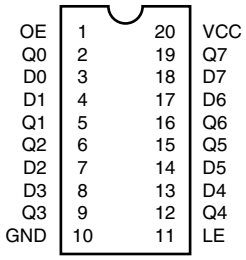
b)Playback possible? → NO

*--:-- is displayed during FL search.
According to [It is not possible to search] for DVD(9), check the feed and tracking systems.
*No sound is output although the time is displayed.(CA-DA)
DAC, etc, other than servo.
*The passage of time is not stable, or picture is abnormal.(V-CD)
*The wound of the disc and dirt are confirmed.

Description of major ICs

■ 74LCX373MTC-X(IC512,IC513)

1.Pin layout



2.Pin function

Symbol	Description
D0~D7	Data inputs
LE	Latch enable input
$\overline{OE}$	Output enable input
Q0~Q7	3-State latch outputs

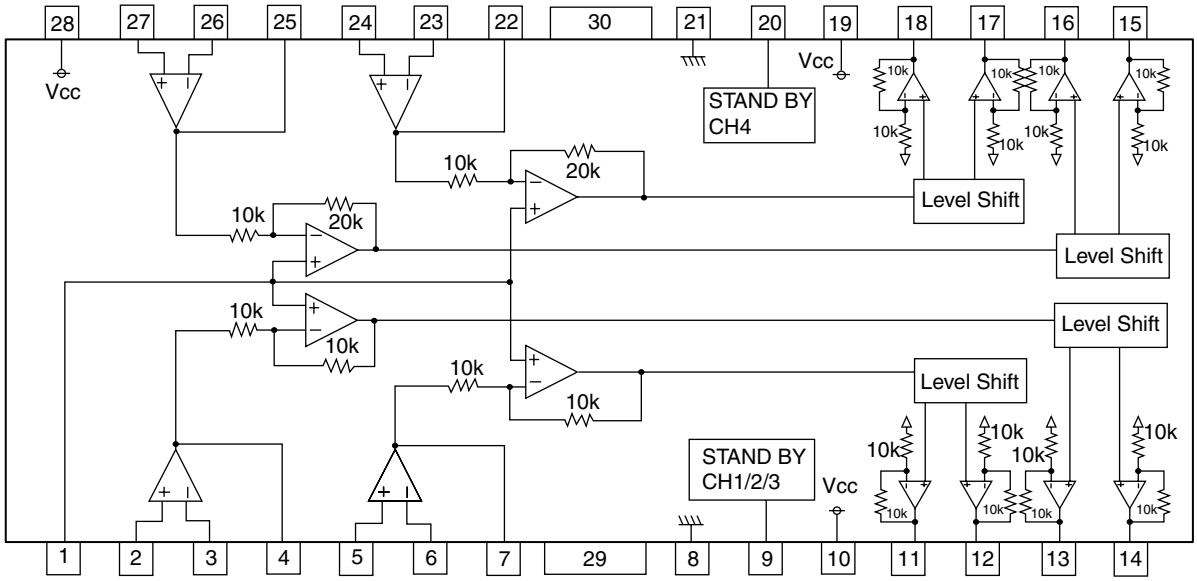
3.Truth table

INPUTS			OUTPUTS
LE	$\overline{OE}$	Dn	Qn
X	H	X	Z
H	L	L	L
H	L	H	H
L	L	X	Q0

H = HIGH Voltage level
L = LOW Voltage level
Z = High impedance
X = Immaterial
Q0 = Previous Q0 before HIGH to LOW transition of latch enable

■ BA5983FM-X (IC201) : 4CH Driver

1.Block diagram

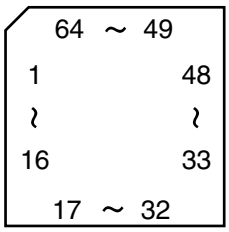


2.Pin function

Pin No.	Symbol	I/O	Description	Pin No.	Symbol	I/O	Description
1	BIAS IN	I	Input for Bias-amplifier	16	VO4(-)	O	Inverted output of CH4
2	OPIN1(+)	I	Non inverting input for CH1 OP-AMP	17	VO3(+)	O	Non inverted output of CH3
3	OPIN1(-)	I	Inverting input for CH1 OP-AMP	18	VO3(-)	O	Inverted output of CH3
4	OPOUT1	O	Output for CH1 OP-AMP	19	PowVcc2	-	Vcc for CH3/4 power block
5	OPIN2(+)	I	Non inverting input for CH2 OP-AMP	20	STBY2	I	Input for Ch4 stand by control
6	OPIN2(-)	I	Inverting input for CH2 OP-AMP	21	GND	-	Substrate ground
7	OPOUT2	O	Output for CH2 OP-AMP	22	OPOUT3	O	Output for CH3 OP-AMP
8	GND	-	Substrate ground	23	OPIN3(-)	I	Inverting input for CH3 OP-AMP
9	STBY1	I	Input for CH1/2/3 stand by control	24	OPIN3(+)	I	Non inverting input for CH3 OP-AMP
10	PowVcc1	-	Vcc for CH1/2 power block	25	OPOUT4	O	Output for CH4 OP-AMP
11	VO2(-)	O	Inverted output of CH2	26	OPIN4(-)	I	Inverting input for CH4 OP-AMP
12	VO2(+)	O	Non inverted output of CH2	27	OPIN4(+)	I	Non inverting input for CH4 OP-AMP
13	VO1(-)	O	Inverted output of CH1	28	PreVcc	-	Vcc for pre block
14	VO1(+)	O	Non inverted output of CH1	29		-	Connect to ground
15	VO4(+)	O	Non inverted output of CH4	30		-	Connect to ground

■ AN8703FH-V (IC101) : Frontend processor

1.Pin layout

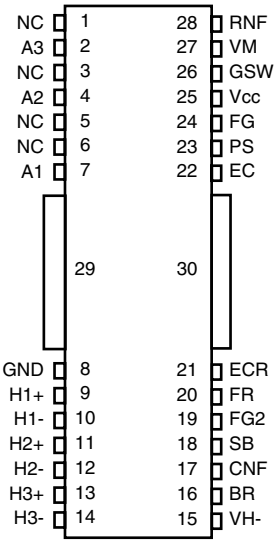


2.Pin function

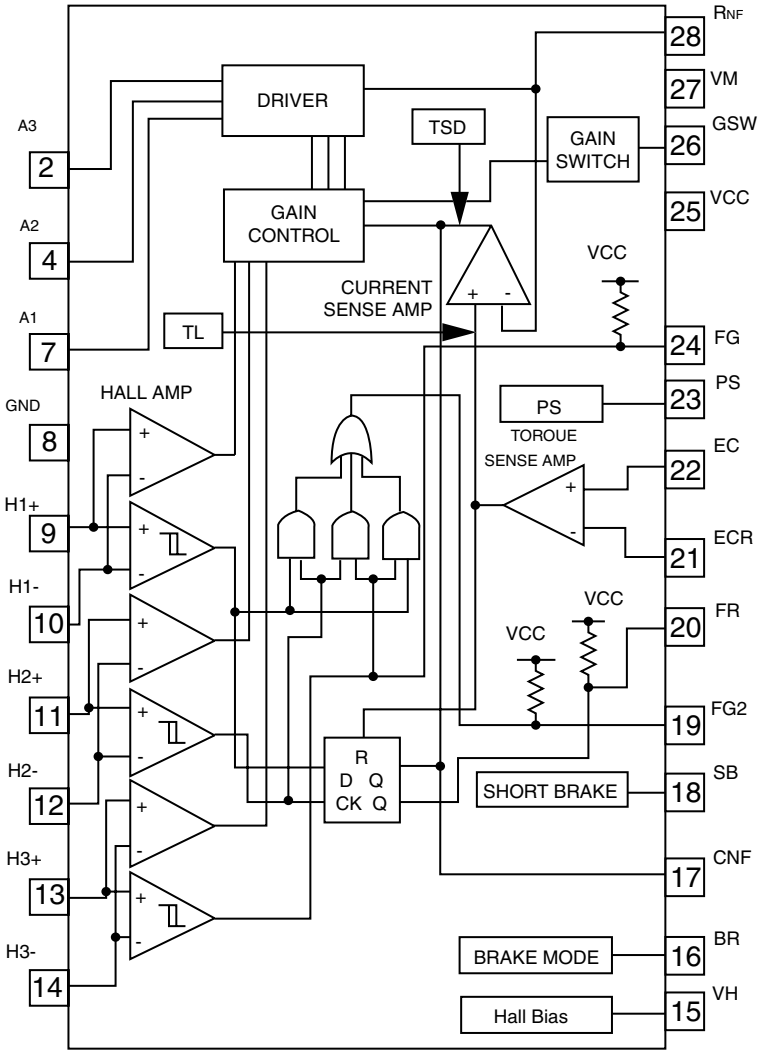
Pin No.	Symbol	I/O	Description	Pin No.	Symbol	I/O	Description
1	LPC1	I	Laser input terminal (DVD)	34	RFDIFO	-	Non connect
2	LPC01	O	Laser drive signal output terminal (DVD)	35	RFOUT	-	Connect to TP103
3	LPC2	I	Laser input terminal (CD)	36	VCC3	-	Power supply terminal 3.3V
4	LPC02	O	Laser drive signal output terminal (CD)	37	RFC	O	Filter for RF delay correction AMP.
5	VFOSHORT	I	VFOSHORT control terminal	38	DCRF	O	All addition amplifier capacitor terminal
6	TBAL	I	Tracking balance control terminal	39	OFTR	O	OFTR output terminal
7	FBAL	I	Focus balance control terminal	40	BDO	O	BDO output terminal
8	POFLT	O	Track detection threshold level terminal	41	RFENV	O	RF envelope output terminal
9	DTRD	I	Data slice part data read signal input terminal (For RAM)	42	BOTTOM	O	Bottom envelope detection filter terminal
				43	PEAK	O	Peak envelope detection filter terminal
10	IDGT	I	Data slice part address part gate signal input terminal(For RAM)	44	AGCG	O	AGC amplifier gain control terminal
				45	AGCO	O	AGC amplifier level control terminal
11	STANDBY	I	Standby mode control terminal	46	TESTSG	I	TEST signal input terminal
12	SEN	I	SEN(Serial data input terminal)	47	RFINP	I	RF signal positive input terminal
13	SCK	I	SCK(Serial data input terminal)	48	RFINN	I	RF signal negative input terminal
14	STDI	I	STDI(Serial data input terminal)	49	VIN5	I	Internal four-partition (CD) RF input 1
15	RSCL	I	Standard electric current terminal	50	VIN6	I	Internal four-partition (CD) RF input 2
16	JLINE	I	Electric current setting terminal of JLine	51	VIN7	-	Internal four-partition (CD) RF input 3
17	TEN	I	Reversing input terminal of tracking error output AMP.	52	VIN8	-	Internal four-partition (CD) RF input 4
18	TEOUT	O	Tracking error signal output terminal	53	VIN9	I	External two-partition (DVD) RF input 2
19	AGCBAL	I	Offset adjusting terminal 1	54	VIN10	I	External two-partition (DVD) RF input 1
20	ASOUT	O	Full adder signal output terminal	55	VCC1	-	Power supply terminal 5V
21	FEN	I	Focus error output amplifier reversing input terminal	56	VREF1	O	VREF1 voltage output terminal
22	FEOUT	O	Focus error signal output terminal	57	VIN1	I	Internal four-partition (DVD) RF input 1
23	AGCOFST	I	Offset adjusting terminal 2				
24	MON	-	Non connect	58	VIN2	I	Internal four-partition (DVD) RF input 2
25	AGCLVL	O	Output amplitude adjustment for DRC				
26	GND2	-	Connect to GND	59	VIN3	I	Internal four-partition (DVD) RF input 3
27	VREF2	O	VREF2 voltage output terminal				
28	VCC2	-	Power supply terminal 5V	60	VIN4	I	Internal four-partition (DVD) RF input 4
29	VHALF	O	VHALF voltage output terminal				
30	DFLTON	O	Reversing output terminal of filter AMP.	61	GND1	-	Connect to GND
31	DFLTOP	O	Filter AMP. output terminal	62	VIN11	I	3 beam sub input terminal 2 (CD)
32	DCFLT	I	Capacity connection terminal for filter output	63	VIN12	I	3 beam sub input terminal 1 (CD)
33	GND3	-	Connect to GND	64	HDTYPE	O	HD Type selection

■ BA6664FM-X (IC251) : 3Phase Motor Driver

1.Pin layout



2.Block diagram



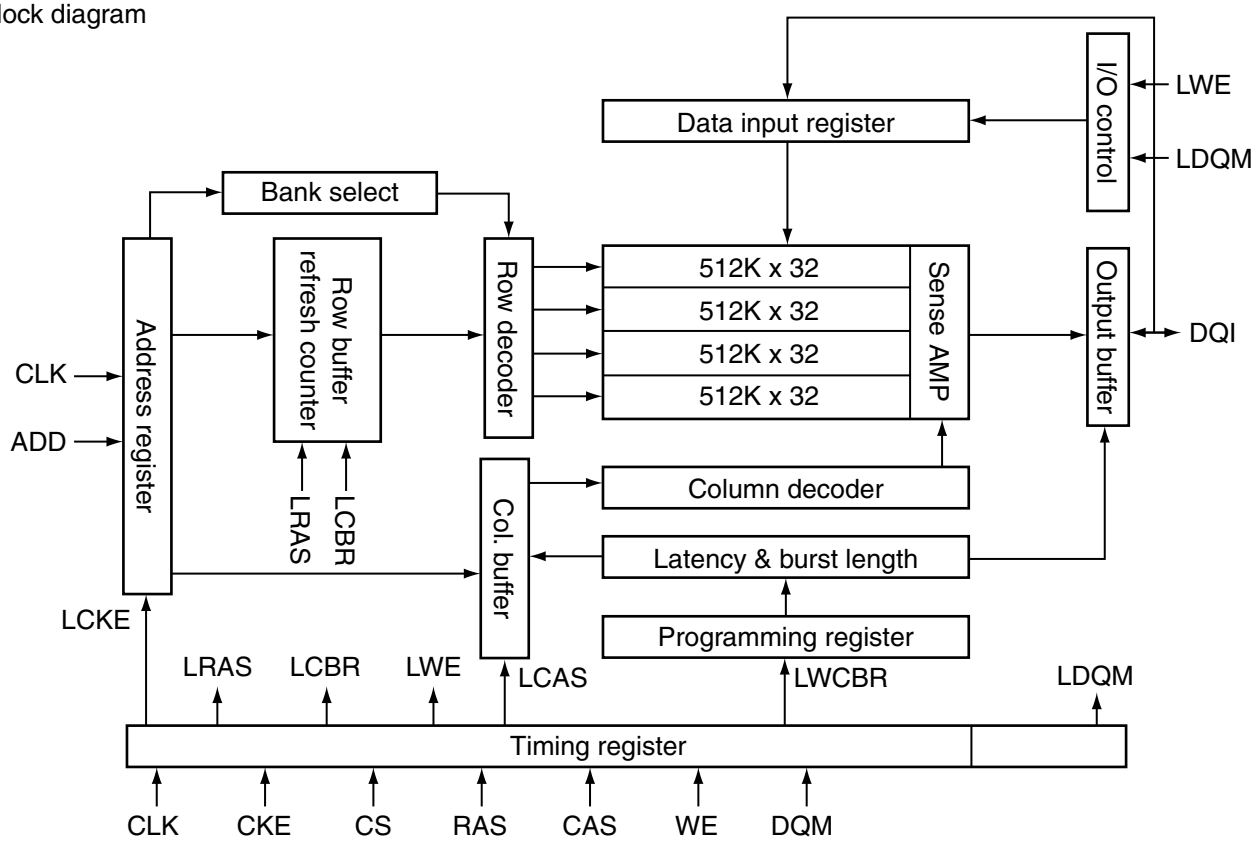
3.Pin function

BA6664FM-X

Pin No.	Symbol	I/O	Description
1	NC	-	Non connect
2	A3	O	Output 3 for spindle motor
3	NC	-	Non connect
4	A2	O	Output 2 for spindle motor
5	NC	-	Non connect
6	NC	-	Non connect
7	A1	O	Output 1 for spindle motor
8	GND	-	Connect to ground
9	H1+	I	Positive input for hall input AMP 1
10	H1-	I	Negative input for hall input AMP 2
11	H2+	I	Positive input for hall input AMP 2
12	H2-	I	Negative input for hall input AMP 2
13	H3+	I	Positive input for hall input AMP 3
14	H3-	I	Negative input for hall input AMP 3
15	VH	I	Hall bias terminal
16	BR	-	Non connect
17	CNF	-	Capacitor connection pin for phase compensation
18	SB	I	Short brake terminal
19	FG2	-	Non connect
20	FR	-	Non connect
21	ECR	I	Torque control standard voltage input terminal
22	EC	I	Torque control voltage input terminal
23	PS	O	Start/stop switch (power save terminal)
24	FG	O	FG signal output terminal
25	VCC	-	Power supply for signal division
26	GSW	O	Gain switch
27	VM	-	Power supply for driver division
28	RNF	O	Resistance connection pin for output current sense
29		-	Connect to ground
30		-	Connect to ground

■ K4S643232E-TC60(IC505):DRAM

1.Block diagram

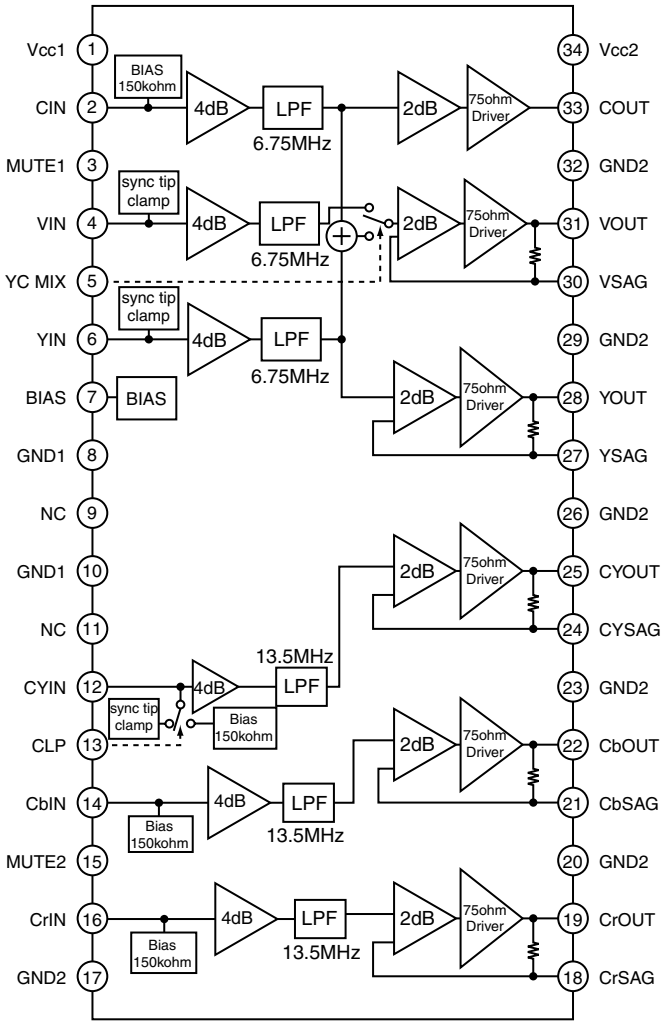


2.Pin function

Symbol	Description	Symbol	Description
CLK	System clock signal input	DQM0~3	Data input/output mask
CS	Chip select input	DQ0~31	Data input/output
CKE	Clock enable	VDD	Power supply terminal
A0~A10	Address	VSS	Connect to ground
BA0,1	Bank select address	VDDQ	Power supply terminal
RAS	Row address strobe	VSSQ	Connect to ground
CAS	Column address strobe	NC	Non connect
WE	Write enable		

■ MM1568AJ-X (IC801) : Video driver

1.Pin layout and block diagram

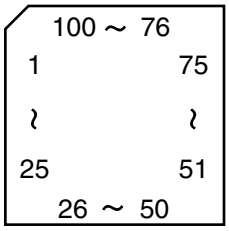


2.Pin function

Pin No.	Symbol	Function	Pin No.	Symbol	Function
1	VCC1	Power supply terminal	18	CROUTa	Signal output
2	CIN	Chrominance input terminal	19	CROUTb	SAG Correction
3	MUTE1	Using of MUTE and power saving	20	GND2	Connect to ground
4	VIN	Video input (composite)	21	CBOUTa	Signal output
5	YCMIX	Y/C Mix select	22	CBOUTb	SAG Correction
6	YIN	Video input (Y)	23	GND2	Connect to ground
7	BIAS	Bias terminal	24	CYOUTa	Signal output
8	GND1	Connect to ground	25	CYOUTb	SAG Correction
9	TRAP	Non connect	26	GND2	Connect to ground
10	GND1	Connect to ground	27	YOUTa	Signal output
11	NC	Non connect	28	YOUTb	SAG Correction
12	SYIN	Luminance input	29	GND2	Connect to ground
13	CLIP	Input clamp select	30	VOUTa	Signal output
14	CBIN	Component input	31	VOUTb	SAG Correction
15	MUTE2	Using of MUTE and power saving	32	GND2	Connect to ground
16	CRIN	Component input	33	COUT	Chrominance output
17	GND2	Connect to ground	34	VCC2	Power supply terminal

■ MN101C35DLE (IC2) : System controller

1.Pin layout



2.Pin function (1/2)

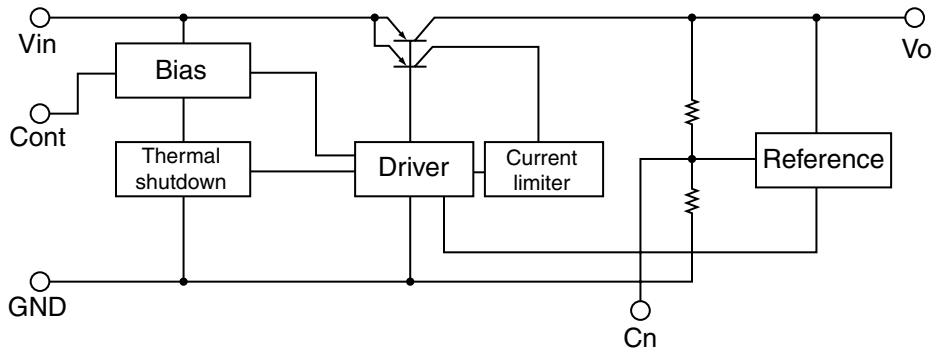
Pin No.	Symbol	I/O	Description
1	RS232COUT	-	Unused
2	RS232CIN	-	Unused
3~7	NC	-	Unused
8	VDD	-	Power supply terminal (+5V)
9	OSC2	O	Clock output terminal
10	OSC1	I	Clock input terminal
11	VSS	-	Connect to ground
12	XI	-	Connect to ground
13	XO	-	Non connect
14	MMOD	-	Connect to ground
15	VREF-	-	Connect to ground
16	POWERSW	I	Power switch input terminal
17	NC	-	Non connect
18	NC	I	Destination switch (Ver.E and other version are judged.)
19	PROINT	I	SCAN mode switch detection input from S802
20	KEY1	I	Operation switch detection input (S2,S3,S7)
21	KEY2	I	Operation switch detection input (S4~S6)
22	RGB	I	RGB switch detection input from S801
23	NTB	I	NTB switch detection input from S801
24	VREF+	-	Power supply terminal (+5V)
25	S500/SA600	I	Model switch detect (S500 or SA600 is distinguished.)
26	RESET	I	Reset input terminal
27	AVCO	O	AV Compulink output terminal
28	AVCI	I	AV Compulink input terminal
29	POWERON	O	Power ON signal output
30	TCLOSE	O	Tray close instruction output terminal
31	TOPEN	O	Tray open instruction output terminal
32	LMMUTE	O	LMMUTE signal output
33	SWOPEN	I	Tray open switch detection signal input terminal
34	SWUPDN	I	Elevator UP/DOWN switch detection signal input terminal
35	REMO	I	Remote controller signal input terminal
36	NC	-	Non connect
37	CS	I	Serial communications interrupt input
38	NC	-	Non connect
39	TXD	O	Serial communications data output
40	RXD	I	Serial communications data input
41	SCK	I	Serial communications clock input
42	INT	O	Serial communications interrupt output
43	NC	-	Non connect
44	RESET	O	LSI reset signal output
45	DISCSET	O	Mechanism state signal output
46	DISCSTP	I	Mechanism state signal input

2.Pin function (MN101C35DLE 2/2)

Pin No.	Symbol	I/O	Description
47	P67	O	Standby LED control signal output (RED)
48	P66	O	Standby LED control signal output (GREEN)
49	P65	O	Progressive LED control signal output (RED)
50	P64	O	Progressive LED control signal output (GREEN)
51	P63	-	Unused
52~64	P62~P70	O	FL Grid control signal output
65~88	P87~PB3	O	FL Segment control signal output
89~91	NC	-	Non connect
92	INT/PRG	-	Unused
93	MUTE	O	Audio muting control signal output
94~99	NC	-	Non connect
100	VPP	-	Power supply terminal for FL display

■ MM1565AF-X (IC951) : 500mA Regulator

1.Block diagram



2.Pin function

Pin No.	Symbol	Function
1	Vout	Output terminal
2	NC	Non connect
3	GND	Connect to ground
4	Cn	Noise decrease terminal
5	Cout	Control terminal
6	Sub	Substrate (Connect to ground)
7	Vin	Input terminal

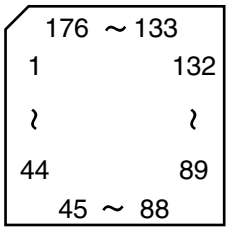
■ MN102L62GLF1 (IC401) : Unit CPU

Pin function

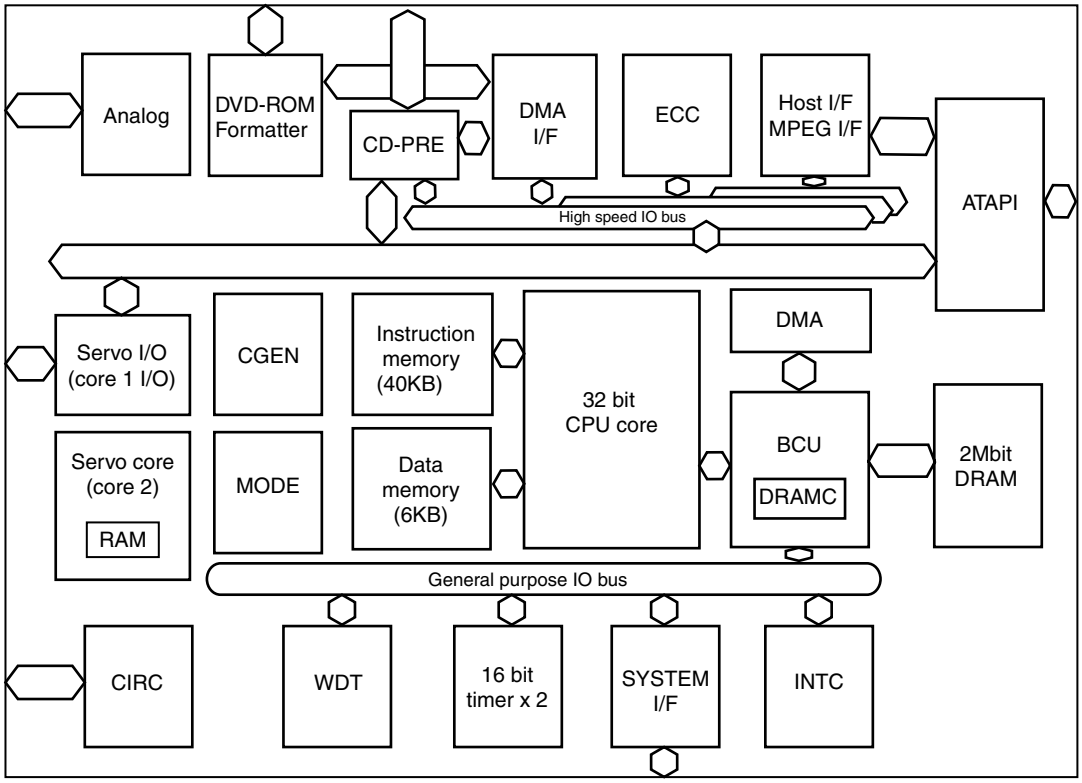
Pin No.	Symbol	I/O	Function	Pin No.	Symbol	I/O	Function
1	WAIT	I	Micon wait signal input	51	SWUPDN	-	Non connect
2	RE	O	Read enable	52	MECHA_H/V	-	Connect to ground
3	SPMUTE	O	Spindle muting output to IC251	53	DISCSET	I	Mechanism state signal input
4	WEN	O	Write enable	54	VDD	-	Power supply
5	LMMUTE	-	Non connect	55	FEPEN	O	Serial enable signal for FEP
6	CS1	O	Chip select for SODC	56	SLEEP	O	Standby signal for FEP
7	CS2	-	Non connect	57	BUSY	-	Non connect
8	HDTYPE	O	HD Type selection	58	REQ	O	Communication request
9	DRVMUTE	O	Driver mute	59	-	-	Connect to TP405
10	SBRK	O	Short brake terminal	60	-	-	Non connect
11	LSIRST	O	LSI reset	61	VSS	-	Ground
12	WORD	I	Bus selection input	62	EPCS	O	EEPROM chip select
13	A0	O	Address bus 0 for CPU	63	EPSK	O	EEPROM clock
14	A1	O	Address bus 1 for CPU	64	EPDI	I	EEPROM data input
15	A2	O	Address bus 2 for CPU	65	EPDO	O	EEPROM data output
16	A3	O	Address bus 3 for CPU	66	VDD	-	Power supply
17	VDD	-	Power supply	67	SCLKO	O	Communication clock
18	SYSCLK	-	Non connect	68	S2UDT	I	Communication input data
19	VSS	-	Ground	69	U2SDT	O	Communication output data
20	XI	-	Not use (Connect to vss)	70	CPSCK	O	Clock for ADSC serial
21	XO	-	Non connect	71	P74/SBI1	I	Not use (Pull down)
22	VDD	-	Power supply	72	SDOUT	O	ADSC serial data output
23	OSCI	I	Clock signal input(13.5MHz)	73	-	I	Not use (Pull up)
24	OSCO	O	Clock signal output(13.5MHz)	74	-	I	Not use (Pull up)
25	MODE	I	CPU Mode selection input	75	NMI	I	NMI Terminal
26	A4	O	Address bus 4 for CPU	76	ADSCIRQ	I	Interrupt input of ADSC
27	A5	O	Address bus 5 for CPU	77	ODCIRQ	I	Interrupt input of ODC
28	A6	O	Address bus 6 for CPU	78	DECIRQ	I	Interrupt input of ZIVA
29	A7	O	Address bus 7 for CPU	79	CSSIRQ	I	Not use (Pull down)
30	A8	O	Address bus 8 for CPU	80	ODCIRQ2	I	Interruption of system control
31	A9	O	Address bus 9 for CPU	81	ADSEP	I	Address data selection input
32	A10	O	Address bus 10 for CPU	82	RST	I	Reset input
33	A11	O	Address bus 11 for CPU	83	VDD	-	Power supply
34	VDD	-	Power supply	84	TEST1	I	Test signal 1 input
35	A12	O	Address bus 12 for CPU	85	TEST2	I	Test signal 2 input
36	A13	O	Address bus 13 for CPU	86	TEST3	I	Test signal 3 input
37	A14	O	Address bus 14 for CPU	87	TEST4	I	Test signal 4 input
38	A15	O	Address bus 15 for CPU	88	TEST5	I	Test signal 5 input
39	A16	O	Address bus 16 for CPU	89	TEST6	I	Test signal 6 input
40	A17	O	Address bus 17 for CPU	90	TEST7	I	Test signal 7 input
41	A18	-	Non connect	91	TEST8	I	Test signal 8 input
42	A19	-	Non connect	92	VSS	-	Ground
43	VSS	-	Ground	93	D0	I/O	Data bus 0 of CPU
44	A20	-	Non connect	94	D1	I/O	Data bus 1 of CPU
45	DISCSTP	O	Mechanism state signal output	95	D2	I/O	Data bus 2 of CPU
46	HUGUP	O	Connect to pick-up	96	D3	I/O	Data bus 3 of CPU
47	TCLOSE	-	Non connect	97	D4	I/O	Data bus 4 of CPU
48	WOBBLEF1L			98	D5	I/O	Data bus 5 of CPU
49	HFMON	O	HFM Control output to Q103	99	D6	I/O	Data bus 6 of CPU
50	TRVSW	I	Detection switch of traverse inside	100	D7	I/O	Data bus 7 of CPU

■ MN103S26EGA (IC301) : Super optical disc controller

1.Terminal layout



2.Block diagram



3.Pin function (1/4)

Pin No.	Symbol	I/O	Description
1,2	NINT0,1	O	Interruption of system control 0,1
3	VDD3	-	Power supply terminal for I/O(3.3V)
4	VSS	-	Connect to ground
5	NINT2	O	Interruption of system control 2
6	WAITDOC	O	Wait control of system control
7	NMPST	O	Reset of system control (Non connect)
8	DASPST	I	Setting of initial value of DASP signal
9~17	CPUADR17~9	I	System control address
18	VDD18	-	Power supply terminal for I/O (1.8V)
19	VSS	-	Connect to ground
20	DRAMVDD18	-	Power supply terminal for DRAM (1.8V)
21	DRAMVSS	-	Connect to ground for DRAM
22~30	CPUADR8~0	I	System control address
31	VDD3	-	Power supply terminal for I/O (3.3V)
32	VSS	-	Connect to ground
33	DRAMVDD3	-	Power supply terminal for DRAM (3.3V)
34	NCS	I	System control chip select
35	NWR	I	Writing system control

3.Pin function (MN103S26EGA : 2/4)

Pin No.	Symbol	I/O	Description
36	NRD	I	Read signal input from system controller
37~44	CPUDT7~0	I/O	System control data
45	CLKOUT1	-	Non connect
46	MMOD	I	Test mode switch signal
47	NRST	I	System reset
48	MSTPOL	I	Master terminal polarity switch input
49	SCLOCK	-	Non connect
50	SDATA	-	Non connect
51	OFTR	I	Off track signal input
52	BDO	I	Drop out signal input
53~56	PWM1~4	-	Non connect
57	VDD3	-	Power supply terminal for I/O (3.3V)
58	DRAMVDD18	-	Power supply terminal for DRAM (1.8V)
59	DRAMVSS	-	Connect to ground for DRAM
60	VSS	-	Connect to ground
61~64	PWM5~8	-	Non connect
65	TBAL	O	Tracking balance adjustment output
66	FBAL	O	Focus balance adjustment output
67	TRSDRV	O	Traverse drive output
68	SPDRV	O	Spindle drive output
69	FG	I	Motor FG input
70	TILTP	-	Non connect
71	TILT	-	Non connect
72	TILTN	-	Non connect
73	TX	O	Digital output signal (Non connect)
74	DTRD	-	Non connect
75	IDGT	-	Non connect
76	VDD18	-	Power supply terminal for I/O (1.8V)
77	VSS	-	Connect to ground
78	VDD3	-	Power supply terminal for I/O (3.3V)
79	OSCI1	I	Oscillation input 16.9MHz
80	OSCO1	O	Oscillation output 16.9MHz
81	VSS	-	Connect to ground
82	TSTSG	O	Calibration signal
83	VFOSHORT	O	VFO short output
84	JLINE	O	J-line setting output
85	AVSSD	-	Connect to ground for analog circuit
86	ROUT	-	Non connect
87	LOUT	-	Non connect
88	AVDD	-	Power supply terminal for analog circuit (3.3V)
89	VCOF	I	JFVCO control voltage
90	TRCRS	I	Input signal for track cross formation
91	CMPIN	-	Non connect
92	LPFOUT	-	Non connect
93	LPFIN	I	Pull-up to VHALF
94	AVSS	-	Connect to ground for analog circuit
95	HPFOUT	-	Non connect
96	FPFIN	I	HPF input
97	CSLFLT	I	Pull-up to VHALF
98	RFDIF	-	Non connect
99	AVDDC	-	Power supply terminal for analog circuit (3.3V)
100	PLFLT2	I	Connect to capacitor 2 for PLL

3.Pin function (MN103S26EGA : 3/4)

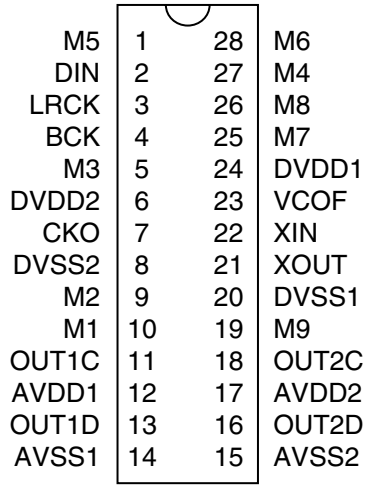
Pin No.	Symbol	I/O	Description
101	PLFLT1	I	Connect to capacitor 1 for PLL
102	AVSS	-	Connect to ground for analog circuit
103	RVI	I	Connect to resistor for VREF reference current source
104	VREFH	I	Reference voltage input (2.2V)
105	PLPG	-	Non connect
106	VHALF	I	Reference voltage input (1.65V)
107,108	DSLF2,1	I	Connect to capacitor 2,1 for DSL
109	AVDD	-	Power supply terminal for analog circuit (3.3V)
110	NARF	I	Equivalence RF-
111	ARF	I	Equivalence RF+
112	JITOUT	O	Output for jitter signal monitor
113	AVSS	-	Connect to ground for analog circuit
114	DAC0	O	Tracking drive output
115	DAC1	O	Focus drive output
116	AVDD	-	Power supply terminal for analog circuit (3.3V)
117	AD0	I	Focus error input
118	AD1	I	Phase difference/3 beams tracking error
119	AD2	I	AS : Full adder signal
120	AD3	I	RF envelope input
121	AD4	I	DVD laser current control terminal
122	AD5	I	
123	AD6	I	CD laser current control terminal
124	TECAPA	-	Non connect
125	VDD3	-	Power supply terminal for I/O (3.3V)
126	VSS	-	Connect to ground
127	MONI0	-	Connect to TP306
128	MONI1	-	Connect to TP307
129	MONI2	-	Connect to TP308
130	MONI3	-	Connect to TP309
131	NEJECT	I/O	Eject detection
132	NTRYCTL	I/O	Tray close detection
133	NDASP	I/O	ATAPI drive active / slave connect I/O
134	NCS3FX	I	ATAPI host chip select
135	NCS1FX	I	ATAPI host chip select
136,137	DA2,0	I/O	ATAPI host address 2,0
138	NPDIAG	I/O	ATAPI slave master diagnosis input
139	DA1	I/O	ATAPI host address 1
140	NIOCS16	-	Non connect
141	INTRQ	O	ATAPI host interruption output
142	NDMACK	I	ATAPI host DMA characteristic
143	VDD3	-	Power supply terminal I/O (3.3V)
144	VSS	-	Connect to ground
145	IORDY	-	NOn connect
146	NIORD	I/O	ATAPI host read
147	NIOWR	-	Non connect
148	DMARQ	-	Non connect
149	HDD15	I/O	ATAPI host data 15
150	HDD0	I/O	ATAPI host data 0
151	HDD14	I/O	ATAPI host data 14
152	VDD18	-	Power supply terminal for I/O (1.8V)
153	PO	I	Connect to ground
154	UATASEL	I	Connect to ground

3.Pin function (MN103S26EGA : 4/4)

Pin No.	Symbol	I/O	Description
155	VSS	-	Connect to ground
156	VDD3	-	Power supply terminal for I/O (3.3V)
157	HDD1	I/O	ATAPI host data 1
158	HDD13	I/O	ATAPI host data 13
159	HDD2	I/O	ATAPI host data 2
160	HDD12	I/O	ATAPI host data 12
161	HDD3	I/O	ATAPI host data 3
162	VDD3	-	Power supply terminal for I/O (3.3V)
163	VSS	-	Connect to ground
164	HDD11	I/O	ATAPI host data 11
165	HDD4	I/O	ATAPI host data 4
166	HDD10	I/O	ATAPI host data 10
167	HDD5	I/O	ATAPI host data 5
168	HDD9	I/O	ATAPI host data 9
169	VDD3	-	Power supply terminal for I/O (3.3V)
170	VSS	-	Connect to ground
171~173	HDD6~8	I/O	ATAPI host data 6~8
174	VDDH	-	Reference power supply for ATAPI (5.0V)
175	NRESET	I	ATAPI host reset input
176	MASTER	I	ATAPI master / slave select

■ MN35505-X (IC703) : DAC

1.Terminal layout

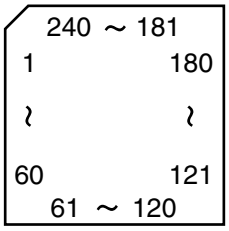


2. Pin function

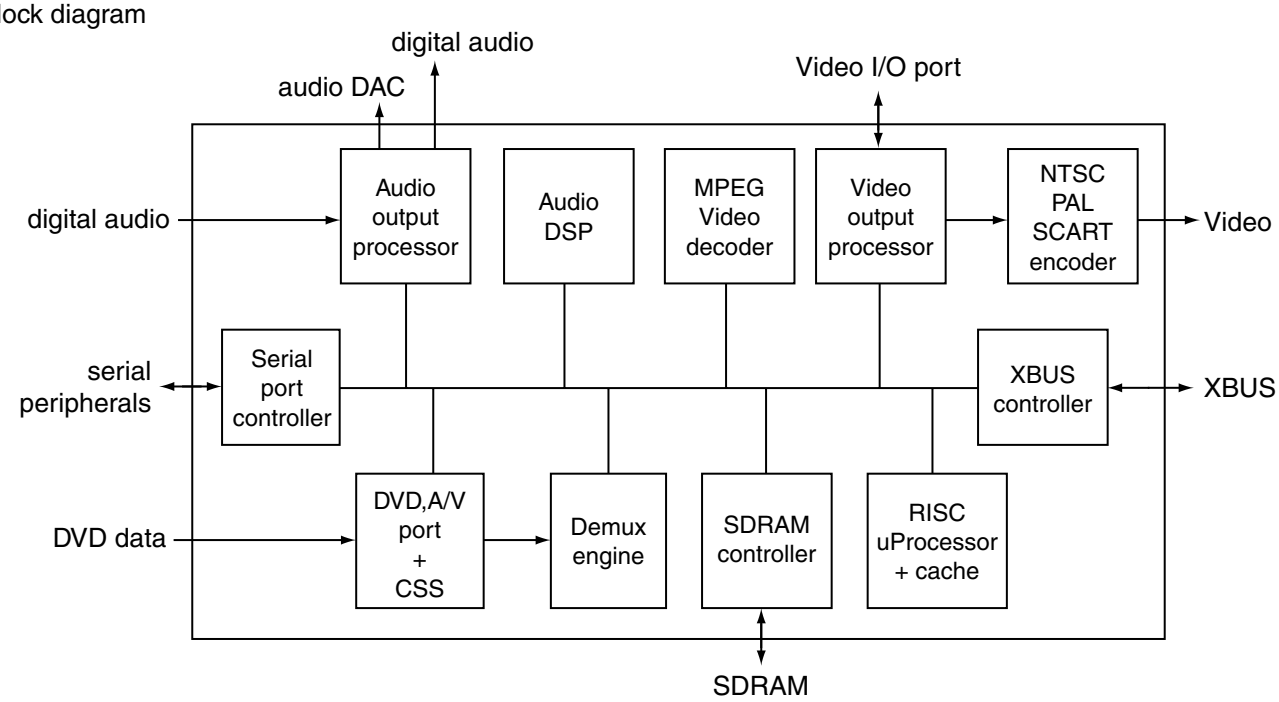
Pin No.	Symbol	I/O	Description
1	M5	I	Control signal for DAC
2	DIN	I	Digital data input
3	LRCK	I	L and R clock for DAC
4	BCK	I	Bit clock for DAC
5	M3	I	Control signal for DAC
6	DVDD2	-	Power supply terminal
7	CKO	-	Non connect
8	DVSS2	-	Connect to ground
9	M2	I	Control signal for DAC
10	M1	I	Control signal for DAC
11	OUT1C	O	Analog output 1
12	AVDD1	-	Power supply terminal
13	OUT1D	O	Analog output 1
14	AVSS1	-	Connect to ground
15	AVSS2	-	Connect to ground
16	OUT2D	O	Analog output 2
17	AVDD2	-	Power supply terminal
18	OUT2C	O	Analog output 2
19	M9	I	Control signal for DAC
20	DVSS1	-	Connect to ground
21	XOUT	-	Non connect
22	XIN	-	Non connect
23	VCOF	I	VCO Frequency
24	DVDD1	-	Power supply D+5V
25	M7	-	Connect to ground
26	M8	-	Connect to ground
27	M4	I	Control signal for DAC
28	M6	I	Clock for control signal

■ NDV8601VWA-BB(IC501):AV Decoder

1.Pin layout



2.Block diagram



3.Pin function (1/4)

Pin No.	Symbol	I/O	Description
1	VDDio	-	Power supply terminal 3.3V
2,3	MD10,11	I/O	SDRAM Data bus terminal
4	VDD	-	Power supply terminal 1.8V
5	MD12	I/O	SDRAM Data bus terminal
6	VSSio	-	Connect to ground
7~9	MD13~15	I/O	SDRAM Data bus terminal
10	VDDio	-	Power supply terminal 3.3V
11	DQM1	O	SDRAM Data byte enable
12,13	MA9,8	O	SDRAM Address bus terminal
14	VSSio	-	Connect to ground
15,16	MA7,6	O	SDRAM Address bus terminal
17	VSS	-	Connect to ground
18	MA5	O	SDRAM Address bus terminal
19	VDDio	-	Power supply terminal 3.3V
20,21	MA4,3	O	SDRAM Address bus terminal
22	MCLK	O	SDRAM Clock output
23	VSSio	-	Connect to ground
24	CKE	O	SDRAM Clock enable output
25,26	MA2,1	O	SDRAM Address bus terminal
27	VDDio	-	Power supply terminal 3.3V
28	MA0	O	SDRAM Address bus terminal
29	MA10	O	SDRAM Address bus terminal

3.Pin function (NDV8601VWA-BB 2/4)

Pin No.	Symbol	I/O	Description
30	MA11	-	Non connect
31	VSSio	-	Connect to ground
32,33	MA12,13	O	SDRAM Address bus, reserved for terminal compatibility with 64Mb SDRAM
34	VDD	-	Power supply terminal 1.8V
35	CS0	O	SDRAM Primary bank chip select
36	VDDio	-	Power supply terminal 3.3V
37	RAS	O	SDRAM Command bit
38	CAS	O	SDRAM Command bit
39	WE	O	SDRAM Command bit
40	VSSio	-	Connect to ground
41	DQM0	O	SDRAM Data byte enable
42	DQM2	O	SDRAM Data byte enable
43	MD16	I/O	SDRAM Data bus terminal
44	VDDio	-	Power supply terminal 3.3V
45,46	MD17,18	I/O	SDRAM Data bus terminal
47	VSS	-	Connect to ground
48	MD19	I/O	SDRAM Data bus terminal
49	VSSio	-	Connect to ground
50~52	MD20~22	I/O	SDRAM Data bus terminal
53	VDDio	-	Power supply terminal 3.3V
54~56	MD23~25	I/O	SDRAM Data bus terminal
57	VSSio	-	Connect to ground
58~61	MD26~29	I/O	SDRAM Data bus terminal
62	VDDio	-	Power supply terminal 3.3V
63,64	MD30,31	I/O	SDRAM Data bus terminal
65	DQM3	O	SDRAM Data byte enable
66	CS1	O	SDRAM Extension bank chip select
67	VSSD	-	Connect to ground
68	SPDIF	O	S/PDIF Digital audio output terminal
69	VSSio	-	Connect to ground
70	AIN	I	Digital audio input for digital micro; can be used as GPIO
71	AOUT3	O	Serial audio output data to audio DAC for left and right channels for down-mix
72	AOUT2	O	Serial audio output data to audio DAC for surround left and right channels
73	AOUT1	O	Serial audio output data to audio DAC for center and LFE channels
74	AOUT0	O	Serial audio output data to audio DAC for left and right channels
75	VDDio	-	Power supply terminal 3.3V
76	PCMCLK	O	Audio DAC PCM sampling clock frequency, common clock for DACs and ADC
77	VDD	-	Power supply terminal 1.8V
78	ACLK	O	Audio interface serial data clock, common clock for DACs and AD converter
79	LRCLK	O	Left / right channel clock, common clock for DACs and ADC
80	SRST	O	Active low RESET signal for peripheral reset
81	RSTP	I	RESET_Power : from system, used to reset frequency synthesizer and rest of chip
82	VSSio	-	Connect to ground
83	RXD1	I	UART1 Serial data input from external serial device, used for IR receiver
84	SSPIN1	I/O	SSP1 Data in or 16X clock for USART function in UART1
85	VSS	-	Connect to ground
86	SSPOUT1	I/O	SSP1 Data out or UART1 data-terminal-ready signal
87	SSPCLK1	I/O	SSP1 Clock or UART1 clear-to -send signal
88	SSPCLK0	I/O	SSP0 Clock or request-to-send function in UART1
89	VDD	-	Power supply terminal 1.8V
90	SSPIN0	I/O	SSP0 Data in or 16X clock for USART function in UART0

3.Pin function (NDV8601VWA-BB 3/4)

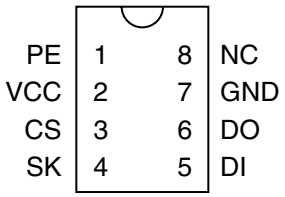
Pin No.	Symbol	I/O	Description
91	VDDio	-	Power supply terminal 3.3V
92	SSPOUT0	I/O	SSP0 Data out or UART0 data-terminal-ready signal
93	TXD0	I/O	UART0 Serial data output to an external serial device
94	RXD0	I	UART0 Serial data input from external serial device
95	CTS0	I/O	UART0 Clear-to-send signal
96	RTS0	I/O	UART0 Request-to-send signal
97	VSSio	-	Connect to ground
98	CXI	I	Crystal input terminal for on-chip oscillator or system input clock
99	CXO	O	Crystal output terminal for on-chip oscillator
100	OSCVSS	-	Connect to ground for oscillator
101	OSCVDD	-	Power supply terminal for oscillator 1.8V
102	MVCKVDD	-	Power supply terminal for main and video clock PLL 3.3V
103	SCEN	I	Scan chain test enable
104	MVCKVSS	-	Connect to ground for main and video clock PLL
105	ACLKVSS	-	Connect to ground for audio clock PLL
106	SCMD	I	Scan chain test mode
107	ACLKVDD	-	Power supply terminal for audio clock PLL 3.3V
108	VDDDAK	-	Power supply terminal for DAC digital 1.8V
109	VSSDAC	-	Connect to ground for DAC digital
110	Cr/R	O	Video signal output (Cr output : composite/component Red output)
111	IOM	O	Cascaded DAC differential output used to dump current into external resistor for power
112	C/Cb/B	O	Video signal output (Chrominance output for NTSC/PAL S-Video Cb output for component Blue output)
113	VAA3	-	Power supply terminal for DAC analog 3.3V
114	Y/G	O	Video signal output (Luminance for S-Video and component Green output)
115	VSSA	-	Connect to ground for DAC analog
116	VREF	-	Non connect
117	VAA	-	
118	CVBS/C	O	Video signal output (Composite video Chrominance output for S-Video)
119	RSET	O	Current setting resistor of output DACs
120	COMP	O	Compensation capacitor connection
121	VSS	-	Connect to ground
122	VCLK	-	Non connect
123	VSYNC	-	Non connect
124	HSYNC	-	Non connect
125	VDDio	-	Power supply terminal 3.3V
126~131	VI07~02	-	Non connect
132	VSSio	-	Connect to ground
133,134	VI01,00	-	Non connect
135	VDD	-	Power supply terminal 1.8V
136~139	AD31~28	I/O	Multiplexed address / data bus terminal
140	VDDio	-	Power supply terminal
141~144	AD27~24	I/O	Multiplexed address / data bus terminal
145	PWE3	I/O	Byte write enable for FLASH,EEPROM,SRAM or peripherals terminal
146	AD23	I/O	Multiplexed address / data bus terminal
147	VSSio	-	Connect to ground
148~153	AD22~17	I/O	Multiplexed address / data bus terminal
154	VDDio	-	Power supply terminal 3.3V
155	AD16	I/O	Multiplexed address / data bus terminal
156	PWE2	I/O	Byte write enable for FLASH,EEPROM,SRAM or peripherals terminal
157,158	AD15,14	I/O	Multiplexed address / data bus terminal
159	VDD	-	Power supply terminal 1.8V

3.Pin function (NDV8601VWA-BB 4/4)

Pin No.	Symbol	I/O	Description
160	SCLK	O	External bus clock used for programmable host peripherals
161	ACK	I/O	Programmable WAIT/ACK/RDY control
162	VSSio	-	Connect to ground
163~168	AD13~8	I/O	Multiplexed address / data bus terminal
169	VDDio	-	Power supply terminal 3.3V
170	PWE1	I/O	Byte write enable for FLASH,EEPROM,SRAM or peripherals terminal
171	VSS	-	Connect to ground
172~176	AD7~3	I/O	Multiplexed address / data bus terminal
177	VSSio	-	Connect to ground
178~180	AD2~0	I/O	Multiplexed address / data bus terminal
181	VDDio	-	Power supply terminal 3.3V
182	PWE0	I/O	Byte write enable for FLASH,EEPROM,SRAM or peripherals terminal
183	ALE	I/O	Address latch enable
184~187	LA0~3	I/O	Latched address 0~3
188	VSSio	-	Connect to ground
189	RD	I/O	Read terminal
190	LHLDA	O	Bus hold acknowledge in slave mode
191	LHLD	I	Bus hold request from external master in slave mode
192	VDD	-	Power supply terminal 1.8V
193	PCS0	O	Peripheral chip select 0, generally used for enabling the program store ROM/FLASH
194,195	XI01,02	I/O	Programmable general purpose external input/output
196	VDDio	-	Power supply terminal 3.3V
197~200	XI03~06	I/O	Programmable general purpose external input/output
201	VSS	-	Connect to ground
202,203	XI07,08	I/O	Programmable general purpose external input/output
204	VSSio	-	Connect to ground
205	XI09	I/O	Programmable general purpose external input/output
206~209	XID10~13	I/O	Programmable general purpose external input/output
210	VDDio	-	Power supply terminal 3.3V
211	XID14	I/O	Programmable general purpose external input/output
212	VDD	-	Power supply terminal 1.8V
213	DSYNC	I	DVD Parallel mode sector sync
214	DREQ	O	DVD Parallel mode data request
215	DCLK	I	Data sampling clock
216	DSTB	I	Parallel mode data valid, serial mode left/right clock
217	DVD0	I	DVD Drive parallel data port
218	VSSio	-	Connect to ground
219~223	DVD1~5	I	DVD Drive parallel data port
224	VDDio	-	Power supply terminal 3.3V
225,226	DVD6,7	I	DVD Drive parallel data port
227	MD0	I/O	SDRAM Data bus terminal
228	VSSio	-	Connect to ground
229	MD1	I/O	SDRAM Data bus terminal
230	VSS	-	Connect to ground
231,232	MD2,3	I/O	SDRAM Data bus terminal
233	VDDio	-	Power supply terminal 3.3V
234~236	MD4~6	I/O	SDRAM Data bus terminal
237	VSSio	-	Connect to ground
238~240	MD7~9	I/O	SDRAM Data bus terminal

■ S-93C66AFJ-X (IC451,IC510) : EEPROM

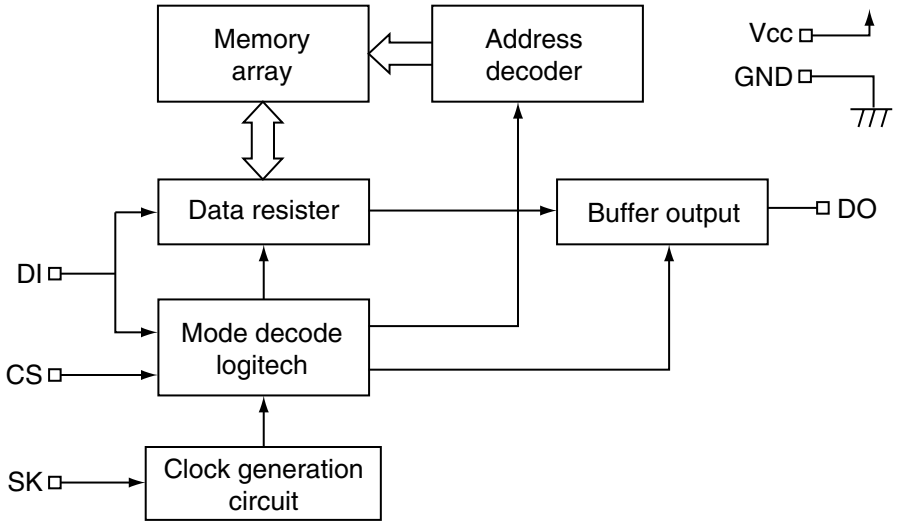
1.Pin layout



2.Pin function

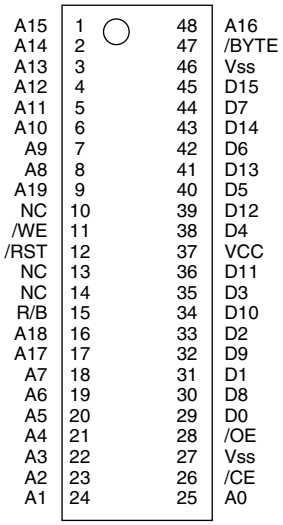
Pin No.	Symbol	I/O	Description
1	PE	-	Non connect
2	VCC	-	Power supply terminal
3	CS	I	Chip select input
4	SK	I	Serial clock input
5	DI	I	Serial data input
6	DO	O	Serial data output
7	GND	-	Connect to ground
8	NC	-	Non connect

3.Block diagram

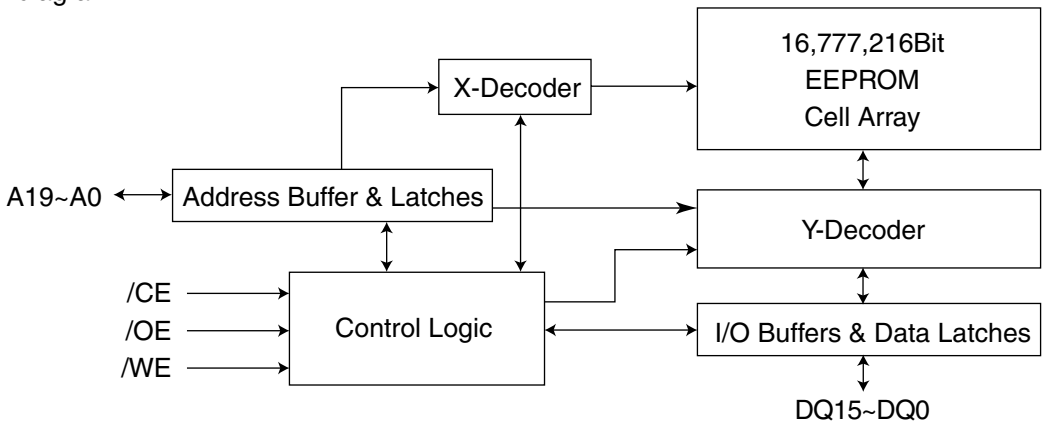


■ SST39VF160-7CEK (IC509) : 16M EEPROM

1. Pin layout



2. Block diagram

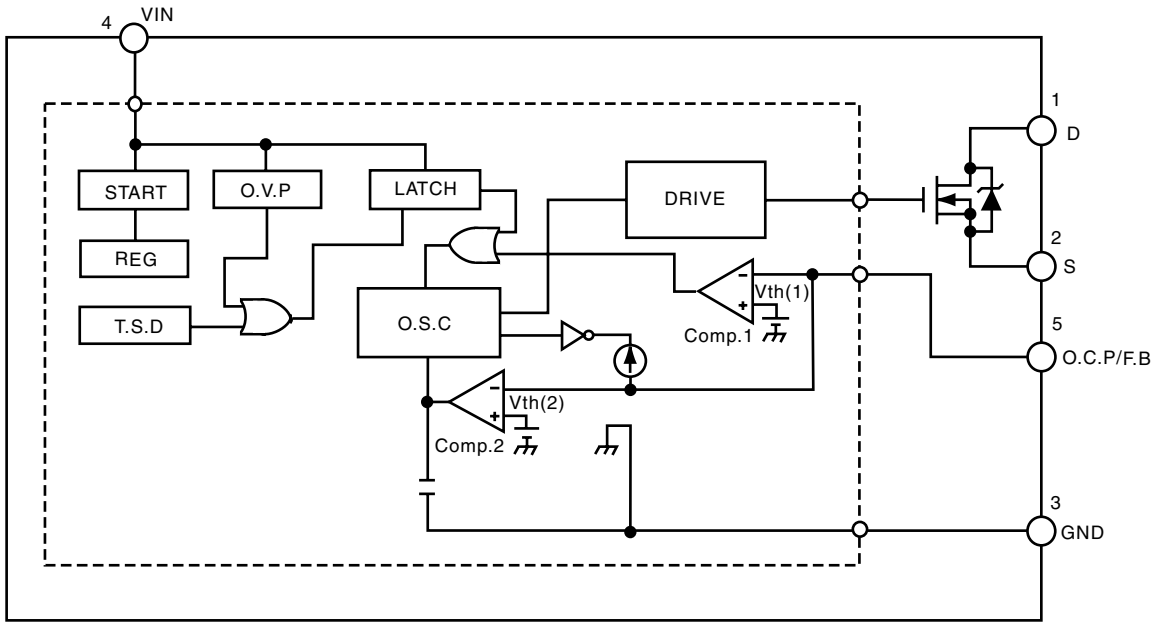


3. Pin function

Symbol	Pin name	Function
A19~A0	Address Inputs	To provide memory addresses. During sector erase A19~A11 address lines will select the sector. During block erase A19~A15 address lines will select the block.
DQ15~DQ0	Data Input/Output	To output data during read cycles and receive input data during write cycles. Data is internally latched during a write cycle. The outputs are in tri-state when /OE or /CE is high.
/CE	Chip Enable	To activate the device when /CE is low.
/OE	Output Enable	To gate the data output buffers.
/WE	Write Enable	To control the write operations.
VCC	Power Supply	To provide 3-volt supply (2.7V-3.6V).
Vss	Ground	
NC	No Connection	

■ STR-G6651-F8 (IC901) : Switch regulator

1.Block diagram

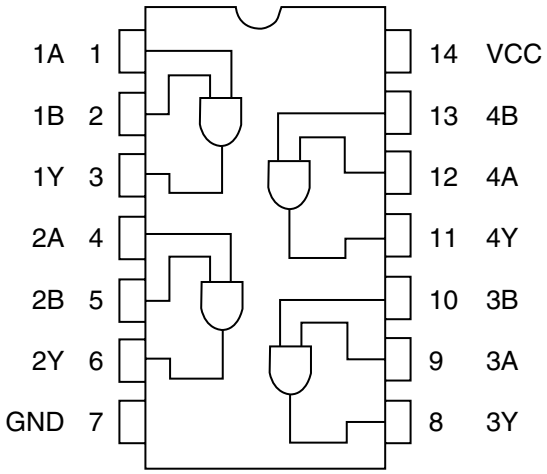


2.Pin function

Pin No.	Symbol	Description	Function
1	D	Drain terminal	MOS FET drain
2	S	Source terminal	MOS FET source
3	GND	Ground terminal	Ground
4	Vin	Power supply terminal	Input of power supply for control circuit
5	O.C.P/F.B	Over current / Feedback terminal	Input of over current detection signal and constant voltage control signal

■ TC74HC08AF-X(IC704) : 2-input and gate

1.Pin layout



(TOP VIEW)

2.Truth table

A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

Glossary of term and abbreviations (for AV Decoder section)

3D	3-dimension
A/V	1)audio/video 2)audio/visual
ac	alternating current
ACLK	audio serial-data (bit) clock
AD	multiplexed address / data bus
ADC	analog-to-digital converter
AIN	digital audio input
ALE	address latch enable
ANSI/SMPTE	American National Standards Institute / Society of Motion Pictures and Television Engineers
AOP	Audio Output Processor
AXCLK	test-mode audio-PLL clock output
baud	unit of signaling speed equal to one code element per second
Cb	blue color difference component (in accordance with the CCIR 601 specifications)
CCIR	Consultative Committee on International Radio
CD	compact disc
CD-DA	compact disc-digital audio
CMOS	Complementary Metal Oxide Semiconductor
CPU	Central Processing Unit
Cr	red color difference component (in accordance with the CCIR 601 specifications)
CSS	Content Scrambling System
CTS	Clear To Send
CVBS	Composite Video Blank and Sync
DAC	Digital-to-Analog Converter
dc	direct current
DEMUX	DEMUX Engine
DSP	Digital Signal Processing
DTS	Digital Theater System
DVD	Digital Versatile Disc
EAV	End Active Video
EAV/SAV	End Active Video / Start Active Video
EEI	Enable Error Interrupt
EEPROM	Electrically Erasable Programmable Read-Only Memory
FS	FIFO Status
GPIO	General Purpose Input/Output
HDCD	High Definition Compatible Digital
HDTV	High-Definition television
HSYNC	Horizontal sync
I/O	Input/Output
IEC	International Electrotechnical Commission
IOM	Current (I) Output Minus (complementary shared current path to Video DAC current paths)
IR	infrared
ITU	International Telecommunications Union
LA	Latched Address Bus
LCLK	oscillator clock (derived from internal crystal oscillator)
Lfe	Low-frequency effect
LRCLK	Left/Right clock
LSB	Least Significant Bit
Mb	Megabit
MB	Megabyte

MCLK primary or master clock
MHz Megahertz
MIPS Million Instructions Per Second
MmCPU Mediamatics CPU (synonym for internal RISC CPU)
MP3 Moving Picture Experts Group Layer-3 Audio (audio file format / extension)
MPEG1 audio A digital audio format mainly used in video CDs. It is based on the moving picture expert group (MPEG1) format, a data compression technology.
MPEG2 audio A digital audio format mainly used in Europe and Australia. It provides high quality, multi-channel audio of up to eight channels in the same was as Dolby Digital and DTS. It is based on the MPEG2 format, a data compression technology more improved than MPEG1
NOP No Operation
NTSC 1)National Television System Committee 2)Worldwide video standard in North America and Japan
NTSC-M Version of NTSC used in certain parts of the world (Brazil)
OSD On-screen display
PAL Phase alteration by line
PCM Pulse Code Modulation
PCMCLK PCM audio-data over-sampling clock
PCS 1)Picture Control and Size 2)Perpheral Chip Select
PLL Phase Lock Loop
PQFP Plastic Quad Flat Pack (Package)
PWM Pulse Width Modulator
r/w Read/Write access
RAM Random Access Memory
RGB Red-Green-Blue (color model)
RISC Reduced Instruction Set Computer
ROM Read-Only Memory
RXD Receive signal
RW Readable / Write able
SAV Start Active Video
SCART Syndicat des Constructeurs d'Appareils Radiorecepteurs et Televiseurs (connector used in Europe to connect many kinds of audiovisual equipment)
SCLK Secondary or slave clock
SDRAM Synchronous Dynamic Random Access Memory
S/PDIF Sony / Philips Digital Interface
S/PDIFCLK clock associated with the S/PDIF output
SRAM Static Random Access Memory
SSP Synchronous Serial Port
TXD transmit signal
UART Universal Asynchronous Receiver-transmitter
USART Universal Synchronous / Asynchronous Receiver / Transmitter
VGA Video Graphics Array
VIO Video Input / Output
VREF Voltage REFerence
Vref Vertical reference
VSSA quiet analog ground
VSYNC Vertical sync
XBUS External peripheral bus
XIO External Input / Output
Y Luminance component (in accordance with the CCIR 601 specifications)
YCbCr Luminance component, blue color difference component, red color difference component (in accordance with the CCIR 601 specifications)

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