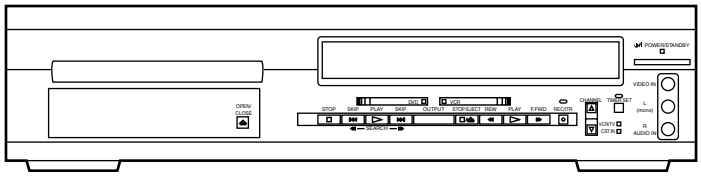
# HITACHI

TK | No. 9206E

# SERVICE MANUAL

# DV-PF2U



VHS

This video deck is VHS type video recorder. For proper operation, only the VHS type cassette must be used.

DVD VIDEO

COMPACT disc DIGITAL AUDIO

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

## DVD PLAYER & VIDEO CASSETTE RECORDER

April 2002 Digital Media Division, Tokai

# CONTENTS

# CHAPTER 1 GENERAL INFORMATION

## SPECIFICATIONS

| | |
|---|---|
| Product type: | DVD player with Video Cassette Recorder |
| Discs & Tapes: | DVD video<br>Audio CD<br>VHS Video Cassette tape |
| Converter output: | VHF Channel 3 or 4. |
| Power source: | 120 V AC +/- 10%, 60 Hz +/- 0.5% |
| Power consumption: | 25 W (standby: 7.2 W) |
| Operating temperature: | 5˚C to 40˚C |
| Dimensions: | W 17-1/8” (435 mm)<br>H 4” (99 mm)<br>D 10-1/2” (266 mm) |
| Weight: | 8.8 lbs (4 kg) |

# COMPARISON OF MODELS

## VTR Section

←: Same as on left

| ITEM | | DV-PF2U | VT-FX665A/FX665AC |
|---|---|---|---|
| VIDEO | Video Format | VHS | ← |
| | Y/C Separation | Comb Filter | ← |
| | YNR (Luminance Noise Reduction) Circuit | ○ | ← |
| | New Synchronise Circuit | × | ← |
| | Picture Control | × | ← |
| INPUT/ OUTPUT | Video/Audio Input (Rear) | 1/1 (IN1) | ← |
| | Video/Audio Input (Front) | 1/1 (IN2) | ← |
| | Video/Audio Output (Rear) | 1/1 (OUT1) | ← |
| OTHER | Remote Controller | DV-RMPF2 | VT-RMF1 |
| | Stereo CM Skip Feature | × | ○ |
| | Auto Clock Feature | × | ○ |
| | Number of Timer Programming | 7 Program/year | ← |
| | Self Diagnosis Funtion | ○ (4 Modes) | ← |
| | Back-up Time | 30 s | ← |
| | SQPB | ○ | ← |
| | Surge Absorber | ○ | ← |
| | Auto Power Off Feature | ○ | ← |
| | Local Broadcast Setting | ○ | ← |
| | Multi Search Feature | ○ (Index, Time Search) | ← |
| MECHANISM | Search Speed | SP: X5<br>LP: X5/X9<br>EP: X5/X15 | SP: X5<br>EP: X5/X15 |
| | FF/REW Time (T-120 Tape) | FF: approx. 4 min, REW: approx. 4 min | ← |
| | Head Composition | DA4+Hi-Fi<br>SP: 2[49/58 μm]<br>EP: 2[21/21 μm]<br>Hi-Fi Audio: 2[28/28 μm] | ← |
| | Video Head Material | SP: Ferrite<br>EP: Ferrite<br>Hi-Fi Audio: Ferrite | ← |
| | VISS | ○ (Index Search) | ○ |

## DVD Section

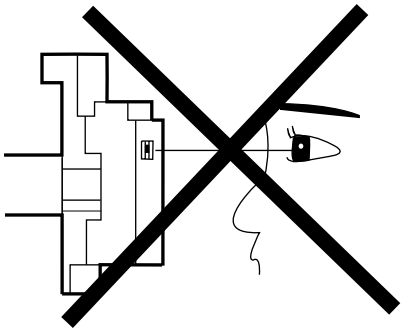
←: Same as on left

| ITEM | | DV-PF2U | DV-P315U/P313U |
|---|---|---|---|
| GENERAL | Drive Speed | 1x | ← |
| | Laser | 2 | 1 |
| | DVD/VCD/SVCD/CD-DA | O / --- / --- / O | O / O / O / O |
| | CD-R/CD-RW/DVD-R (Video Format) | O / O / O | --- / --- / --- |
| | DVD-RAM (VR Format) | --- | ← |
| | MP3 | O | --- |
| | OSD languages | 3 (English, French, Spanish) | ← |
| | Jog Shuttle on Front | --- | ← |
| | Headphone Jack / Volume | ---/--- | ← |

| | | | |
|---|---|---|---|
| VIDEO | PAL Disc NTSC Out | --- | ← |
| | Video Out Mode NTSC/PAL/PAL60 | O / --- / --- | ← |
| | S-Video / Component / Composite | O / O / O | ← |
| | Video D/A Converter | 10bit | ← |
| | Black Level Select | O | ← |
| | Picture Control | --- | ← |
| | Progressive Out | O | --- |
| AUDIO | Audio D/A Converter | 192kHz / 24bit | 96kHz / 24bit |
| | Digital Audio Out Optical / Coaxial | --- / O | O / O |
| | Dolby Digital 5.1 ch Decode | --- | ← |
| | DTS Digital Out | O | ← |
| | Virtual Surround | O | ← |
| | Dynamic Range Compression (Dolby Digital) | O | ← |
| | DVD Audio | --- | ← |
| | Power on sound | --- | ← |
| TRICK PLAY | Search Speed (DVD: 2, 8, 30, 60/ VCD: 2, 8, 30/CD: 16) | 2 to 60 (FORWARD/REWIND) | 2 to 128 (FORWARD/REWIND) |
| | Slow Speed | 1/16, 1/8, 1/2 (FORWARD only) | 1/8, 1/4, 1/2 (FORWARD only) |
| | IP Search (Smooth 2x Play) | O | ← |
| | 2x Play with Audio | --- | ← |
| | Step Forward / Reverse | O / --- | ← |
| | Still Picture Select (Frame/Field) | Auto Only | O |
| FEATURES | Disc Navigation | --- | O (DV-P315U)<br>--- (DV-P313U) |
| | DVD Zoom x2 / x4 / x16 | O / O / --- | ← |
| | Program and Random Play of DVD / VCD | --- | O / O |
| | A-B Repeat | O | ← |
| | Repeat | O | ← |
| | Last Play | O | ← |
| | Closed Caption for NTSC DVD | O | ← |
| | Front Panel Display Dimmer | O | ← |
| | Screen Saver | O | ← |
| | Auto Power Off | O | ← |
| REMOTE CONTROL | Jog Shuttle on Remote | --- | ← |
| | TV Control | O | --- |
| ACCESSORY | Remote Controller | O | ← |
| | Battery | O | ← |
| | AV Cable | O | ← |
| | S Cable | --- | ← |
| | AC Socket | --- | ← |
| | Warranty Card | O | ← |

# LASER BEAM SAFETY PRECAUTIONS

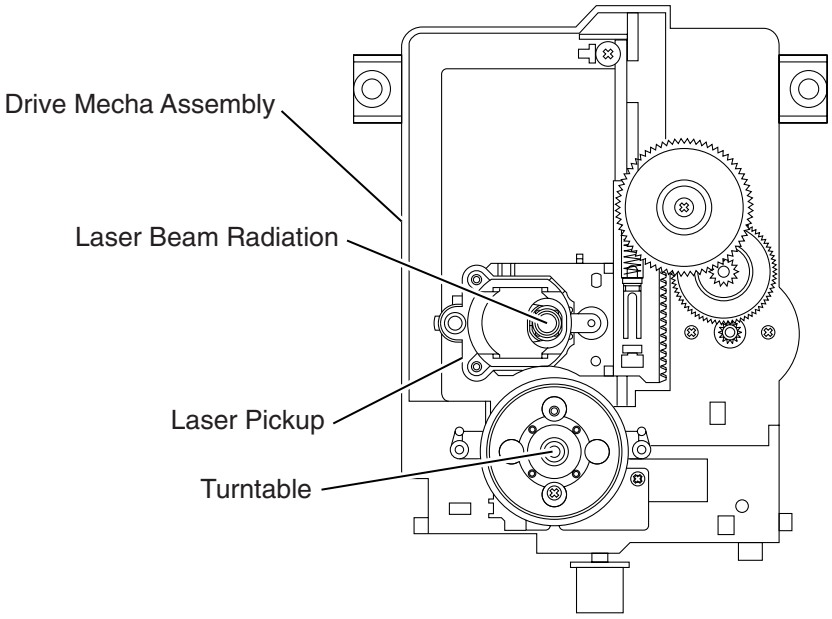
This DVD player uses a pickup that emits a laser beam.



**Do not look directly at the laser beam coming from the pickup or allow it to strike against your skin.**

The laser beam is emitted from the location shown in the figure. When checking the laser diode, be sure to keep your eyes at least 30cm away from the pickup lens when the diode is turned on. Do not look directly at the laser beam.

**Caution:** Use of controls and adjustments, or doing procedures other than those specified herein, may result in hazardous radiation exposure.





**Location: Inside Top of DVD mechanism.**

# IMPORTANT SAFETY PRECAUTIONS

## Product Safety Notice

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by a ⚠ on schematics and in parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards. The Product's Safety is under review continuously and new instructions are issued whenever appropriate. Prior to shipment from the factory, our products are carefully inspected to confirm with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced**.**

## Precautions during Servicing

**A.** Parts identified by the ⚠ symbol are critical for safety. Replace only with part number specified.

**B.** In addition to safety, other parts and assemblies are specified for conformance with regulations applying to spurious radiation. These must also be replaced only with specified replacements.
Examples: RF converters, RF cables, noise blocking capacitors, and noise blocking filters, etc.

**C.** Use specified internal wiring. Note especially:

1)Wires covered with PVC tubing

2)Double insulated wires

3)High voltage leads

**D.** Use specified insulating materials for hazardous live parts. Note especially:

1)Insulation tape

2)PVC tubing

3)Spacers

4)Insulators for transistors

**E.** When replacing AC primary side components (transformers, power cord, etc.), wrap ends of wires securely about the terminals before soldering.

**F.** Observe that the wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).

**G.** Check that replaced wires do not contact sharp edges or pointed parts.

**H.** When a power cord has been replaced, check that 5 - 6 kg of force in any direction will not loosen it.

**I.** Also check areas surrounding repaired locations.

**J.** Be careful that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

**K.** Crimp type wire connector
The power transformer uses crimp type connectors which connect the power cord and the primary side of the transformer. When replacing the transformer, follow these steps carefully and precisely to prevent shock hazards.
Replacement procedure

1)Remove the old connector by cutting the wires at a point close to the connector.
**Important:** Do not re-use a connector. (Discard it.)

2)Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

3)Align the lengths of the wires to be connected. Insert the wires fully into the connector.

4)Use a crimping tool to crimp the metal sleeve at its center. Be sure to crimp fully to the complete closure of the tool.

**L.** When connecting or disconnecting the internal connectors, first, disconnect the AC plug from the AC outlet.

# Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts, and wires have been returned to their original positions. Afterwards, do the following tests and confirm the specified values to verify compliance with safety standards.

## 1. Clearance Distance

When replacing primary circuit components, confirm specified clearance distance (d) and (d') between soldered terminals, and between terminals and surrounding metallic parts. (See Fig. 1)

**Table 1 : Ratings for selected area**

| AC Line Voltage | Clearance Distance (d) (d') |
|---|---|
| 120 V | ≥ 3.2mm (0.126 inches) |

**Note:** This table is unofficial and for reference only. Be sure to confirm the precise values.

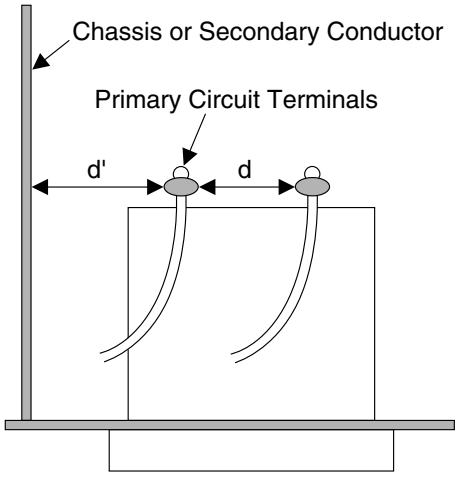



**Fig. 1**

## 2. Leakage Current Test

Confirm the specified (or lower) leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.) is lower than or equal to the specified value in the table below.

**Measuring Method (Power ON) :**

Insert load Z between B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across the terminals of load Z. See Fig. 2 and the following table.

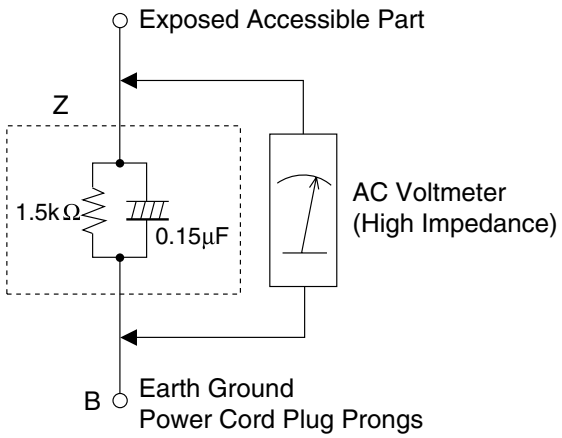



**Fig. 2**

**Table 2: Leakage current ratings for selected areas**

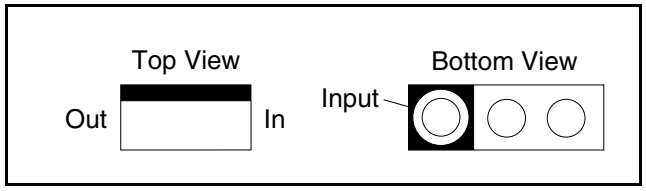
| AC Line Voltage | Load Z | Leakage Current (i) | Earth Ground (B) to: |
|---|---|---|---|
| 120 V | 0.15μF CAP. & 1.5kΩ RES. Connected in parallel | i≤0.5mA Peak | Exposed accessible parts |

**Note:** This table is unofficial and for reference only. Be sure to confirm the precise values.

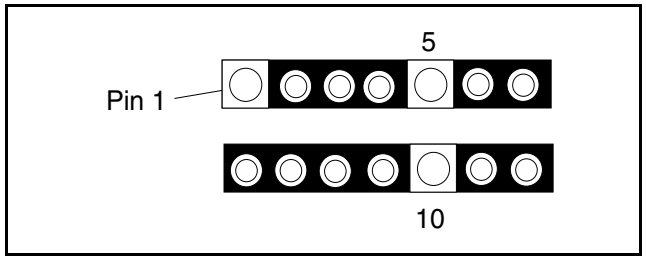
# STANDARD NOTES FOR SERVICING

## Circuit Board Indications

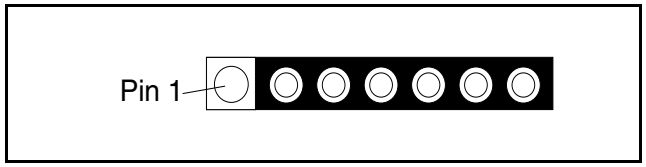
a. The output pin of the 3 pin Regulator ICs is indicated as shown.




b. For other ICs, pin 1 and every fifth pin are indicated as shown.

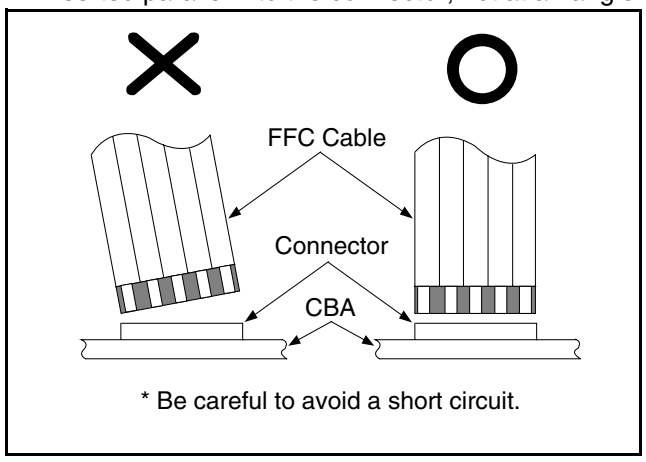



c. The 1st pin of every male connector is indicated as shown.




## Instructions for Connectors

1. When you connect or disconnect the FFC (Flexible Foil Connector) cable, be sure to first disconnect the AC cord.
2. FFC (Flexible Foil Connector) cable should be inserted parallel into the connector, not at an angle.




## How to Remove / Install Flat Pack-IC

### 1. Removal

**With Hot-Air Flat Pack-IC Desoldering Machine:**.

(1) Prepare the hot-air flat pack-IC desoldering machine, then apply hot air to the Flat Pack-IC (about 5 to 6 seconds). (Fig. S-1-1)

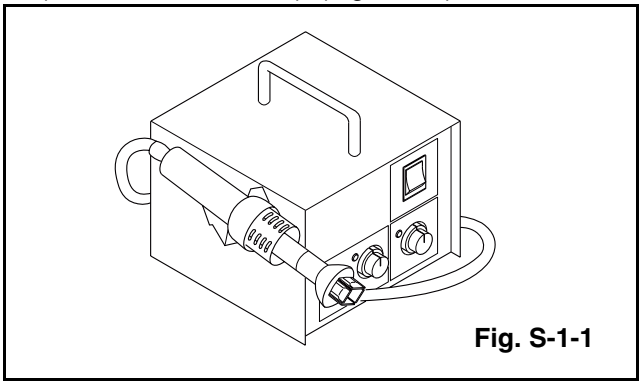


**Fig. S-1-1**

(2) Remove the flat pack-IC with tweezers while applying the hot air.

(3) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)

(4) Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

### Caution:

1. Do not supply hot air to the chip parts around the flat pack-IC for over 6 seconds because damage to the chip parts may occur. Put masking tape around the flat pack-IC to protect other parts from damage. (Fig. S-1-2)
2. The flat pack-IC on the CBA is affixed with glue, so be careful not to break or damage the foil of each pin or the solder lands under the IC when removing it.

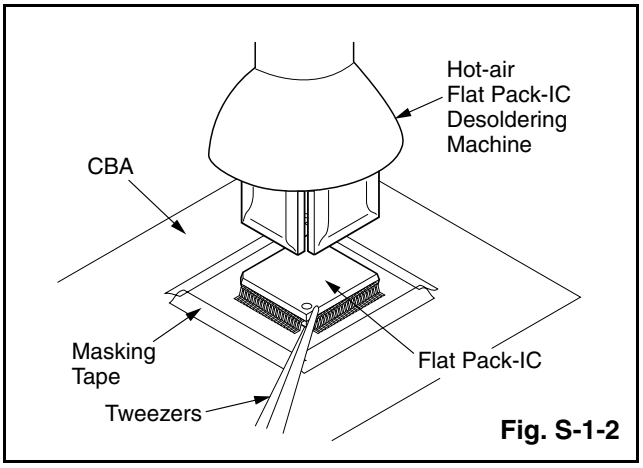



**Fig. S-1-2**

**With Soldering Iron:**

(1) Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)

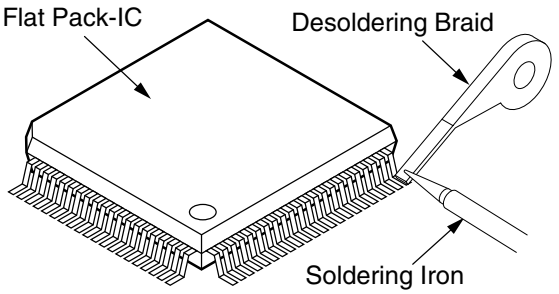



**Fig. S-1-3**

(2) Lift each lead of the flat pack-IC upward one by one, using a sharp pin or wire to which solder will not adhere (iron wire). When heating the pins, use a fine tip soldering iron or a hot air desoldering machine. (Fig. S-1-4)

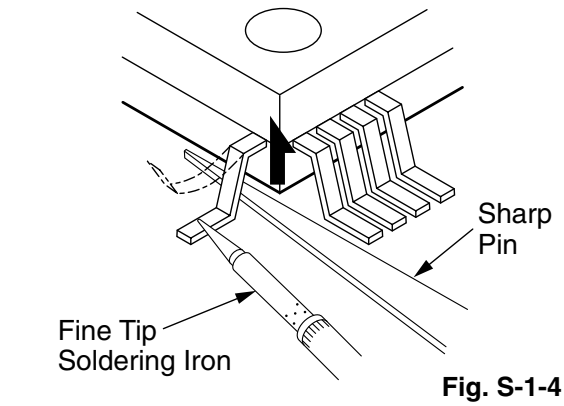



**Fig. S-1-4**

(3) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)

(4) Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

**With Iron Wire:**

(1) Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)

(2) Affix the wire to a workbench or solid mounting point, as shown in Fig. S-1-5.

(3) While heating the pins using a fine tip soldering iron or hot air blower, pull up the wire as the solder melts so as to lift the IC leads from the CBA contact pads as shown in Fig. S-1-5

(4) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)

(5) Release the flat pack-IC from the CBA using tweezers. (Fig. S-1-6)

**Note:**

When using a soldering iron, care must be taken to ensure that the flat pack-IC is not being held by glue. When the flat pack-IC is removed from the CBA, handle it gently because it may be damaged if force is applied.

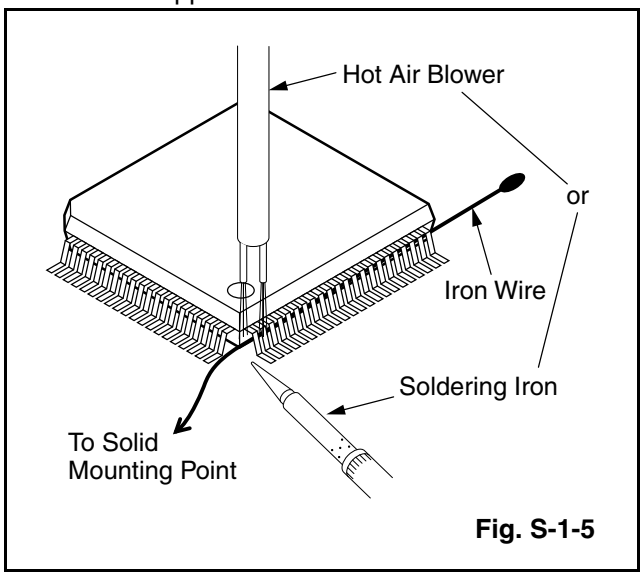



**Fig. S-1-5**

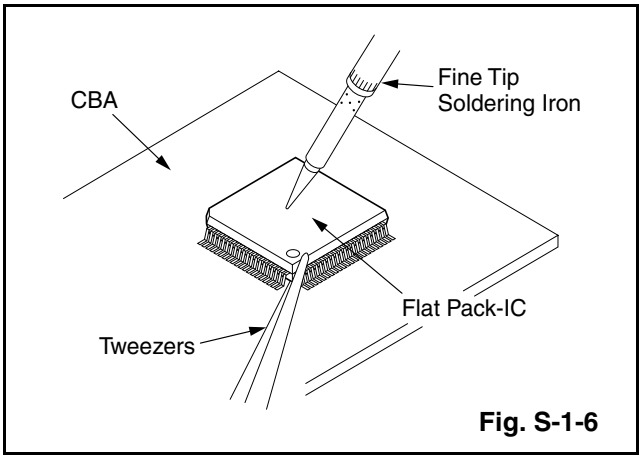



**Fig. S-1-6**

## 2. Installation

(1) Using desoldering braid, remove the solder from the foil of each pin of the flat pack-IC on the CBA so you can install a replacement flat pack-IC more easily.

(2) The "●" mark on the flat pack-IC indicates pin 1. (See Fig. S-1-7.) Be sure this mark matches the 1 on the PCB when positioning for installation. Then presolder the four corners of the flat pack-IC. (See Fig. S-1-8.)

(3) Solder all pins of the flat pack-IC. Be sure that none of the pins have solder bridges.

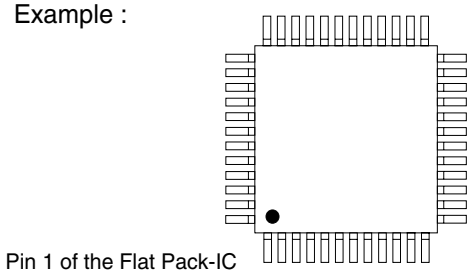



**Fig. S-1-7**

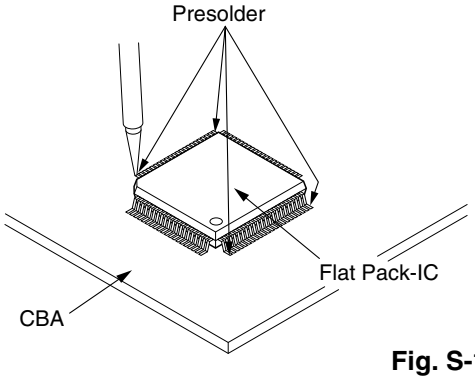



**Fig. S-1-8**

# Instructions for Handling Semi-conductors

Electrostatic breakdown of the semi-conductors may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

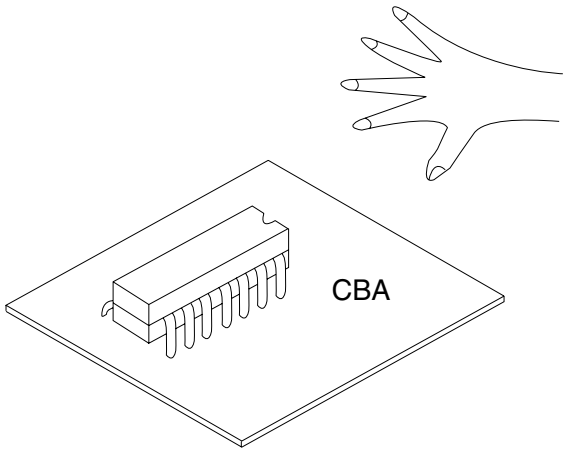
## 1. Ground for Human Body

Be sure to wear a grounding band (1MΩ) that is properly grounded to remove any static electricity that may be charged on the body.

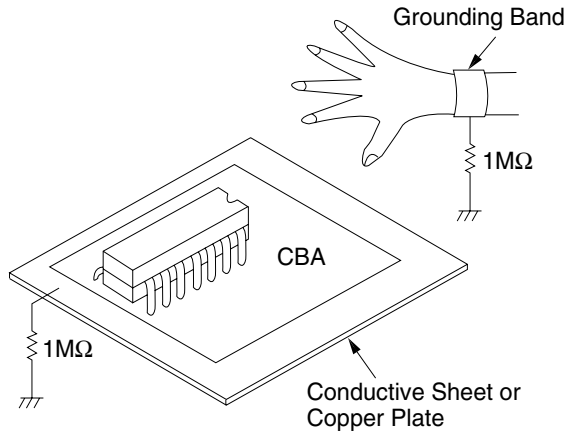
## 2. Ground for Workbench

(1) Be sure to place a conductive sheet or copper plate with proper grounding (1MΩ) on the workbench or other surface, where the semi-conductors are to be placed. Because the static electricity charge on clothing will not escape through the body grounding band, be careful to avoid contacting semi-conductors with your clothing.

**< Incorrect >**




**< Correct >**



# PREPARATION FOR SERVICING

## How to Enter the Service Mode

About Optical Sensors

**Caution:**

An optical sensor system is used for the Tape Start and End Sensors on this equipment. Carefully read and follow the instructions below. Otherwise the unit may operate erratically.

**What to do for preparation**

Insert a tape into the Deck Mechanism Assembly and press the PLAY button. The tape will be loaded into the Deck Mechanism Assembly. Make sure the power is on, TP502 (SENSOR INHIBITION) to GND. This will stop the function of Tape Start Sensor, Tape End Sensor and Reel Sensors. (If these TPs are connected before plugging in the unit, the function of the sensors will stay valid.) See Fig. 1.

**Note:** Because the Tape End Sensors are inactive, do not run a tape all the way to the start or the end of the tape to avoid tape damage.

About REC-Safety Switch

**Caution:**

The REC-Safety Switch is directly mounted on the Main CBA. When the Deck Mechanism Assembly is removed from the Main CBA for servicing, this switch does not work automatically.

**What to do for preparation**

In order to record, press the Rec button while pushing REC-SAFETY SW on the Main CBA. See Fig. 1.

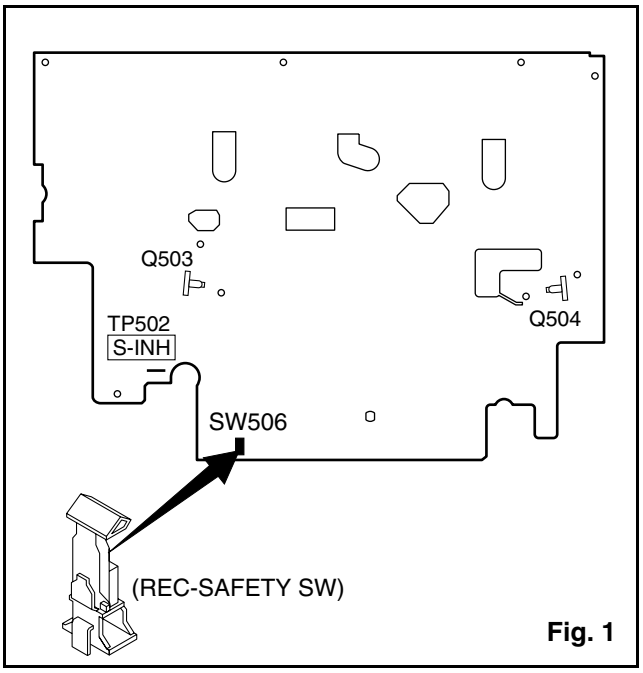
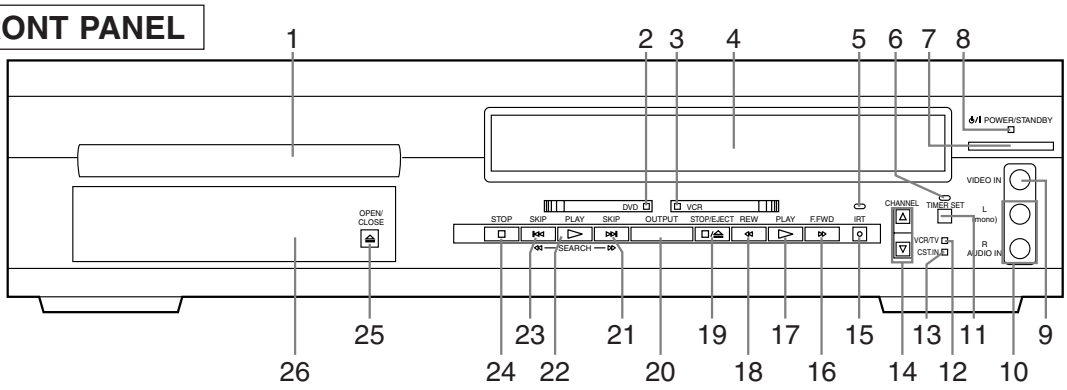


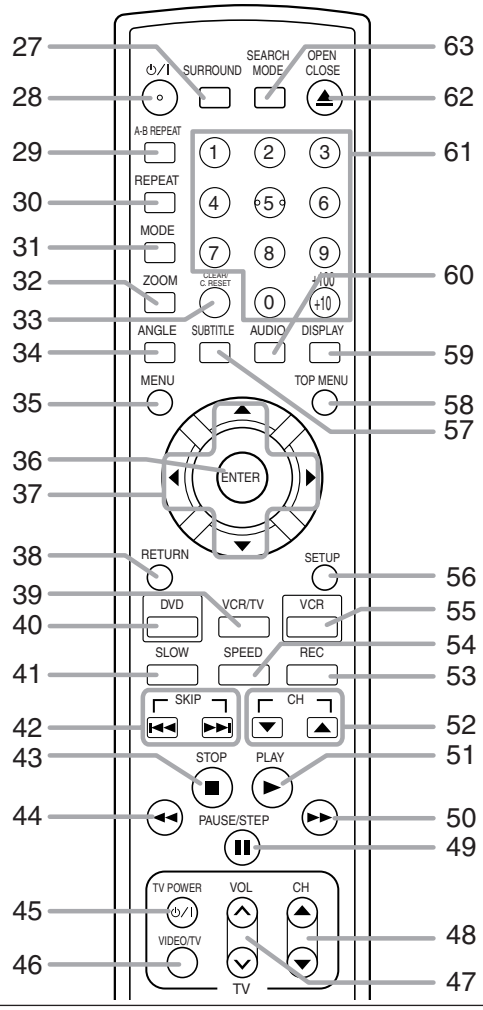

**Fig. 1**

# OPERATING CONTROLS AND FUNCTIONS

## FRONT PANEL




## REMOTE CONTROL




**VCR operation Buttons :** Blue
**DVD operation Buttons :** Yellow
**Common operation Buttons :** White

1. **Disc loading tray**
2. **DVD OPERATION Light (Green)**
   This light appears when the DVD output mode is selected. You can only watch DVDs when the green DVD OUTPUT Light is on. To make the green DVD OUTPUT light come on, press the DVD Button on the remote control or the OUTPUT Button on the front panel.
3. **VCR OPERATION Light (Green)**
   This light appears when the VCR output mode is selected. You can only watch tapes when the green VCR OUTPUT light is on. To make the green VCR OUTPUT light come on, the VCR Button on the remote control or the OUTPUT Button on the front panel.
4. **CASSETTE COMPARTMENT**
5. **IRT Light**
   Lights up during recording.
6. **TIMER SET Light**
   This light glows when the DVD/VCR is in standby mode or off for a timer recording or during a One-Touch Recording. It flashes if the TIMER SET Button is pressed for a timer recording, but there is no tape in the DVD/VCR. It flashes when all timer recordings or Instant Recording Timer are finished.
7. **⏻/I POWER/STANDBY Button**
   Press to turn the power on and off.
8. **⏻/I POWER/STANDBY Light**
   Lights up when the power is on.
9. **VIDEO In Jack**
   Connect a video cable coming from the video out jack of a camcorder, another VCR, or a video source (laser disc player, etc.) here.
10. **AUDIO In Jacks**
    Connect audio cables coming from the audio out jacks of a camcorder, another VCR, or an audio source here.
11. **TIMER SET Button**
    Press to put the DVD/VCR into standby mode for a timer recording.
12. **VCR/TV Light**
    Lights up when the DVD/VCR is in the VCR position, and goes off when it is in the TV position.
13. **CST. IN Light**
    Lights up when a cassette is in the DVD/VCR.
14. **CHANNEL Buttons**
    In VCR mode, press to change TV channels on the DVD/VCR; press to adjust the tracking during normal or slow motion playback; press to remove vertical jitter in a Still picture.
15. **IRT Button (VCR)**
    Press once to start a recording. Press repeatedly to start a Instant Recording Timer.

16. **F.FWD Button (VCR)**
Press to rapidly advance the tape, or view the picture rapidly in forward during playback. (Forward Search). When setting program (For example:setting clock or timer program), press to determine your selection and proceed to the next step you want to input. Press to determine the setting modes from the on screen menu. Press to add or delete channel numbers during channel preset.

17. **PLAY Button (VCR)**
Press to begin playback. Press to enter digits when setting program (For example: setting clock or timer program). Press to select the setting modes from the on screen menu.

18. **REW Button (VCR)**
Press to rewind the tape, or to view the picture rapidly in reverse during the playback mode (Rewind Search). Press to cancel a setting of timer program. Press to correct digits when setting program (For example: setting clock or timer program). Press to add or delete channel numbers during channel preset.

19. **STOP/EJECT Button (VCR)**
- **EJECT Button**
Press to remove the tape from the VCR.
- **STOP Button**
Press to stop the tape motion. Press to enter digits when setting program (For example:setting clock or timer program). Press to select the setting modes from the on screen menu.

20. **OUTPUT Button**
Press to select DVD mode or VCR mode.
- You can switch the output mode either by pressing the OUTPUT Button on the front panel, or by pressing the DVD or VCR Button on the remote control. However, **if you press the OUTPUT Button on the front panel first, you need to re-select the corresponding mode by pressing the DVD or the VCR Button on the remote control.**

21. **SKIP/SEARCH(▶▶|/ ►►) Button (DVD)**
Plays back from the beginning of the next chapter or track. Hold down to fast forward playback.

22. **PLAY Button (DVD)**
Starts playback of the disc contents.

23. **SKIP/SEARCH(|◀◀/ ◄◄) Button (DVD)**
Plays back from the beginning of the current chapter or track. Hold down to fast reverse playback.

24. **STOP Button (DVD)**
Stops operation of the disc.

25. **OPEN/CLOSE Button**
Press to insert discs into or remove them from the tray.

26. **Display, Remote Sensor Window**

27. **SURROUND Button**

28. **⏻/| (POWER/STANDBY) Button**
Press to turn the power on and off.

29. **A-B REPEAT Button**
Repeats playback of a selected section.

30. **REPEAT Button**
Repeats playback of the current disc, title, chapter or track.

31. **MODE Button**
Activates program playback or random playback mode when playing CDs or MP3. Sets Black level or SRS TruSurround.

32. **ZOOM Button**
Enlarges part of a DVD-reproduced image.

33. **CLEAR/C.RESET Button**
- **DVD mode**
Press to reset the setting.
- **VCR mode**
Press to reset the counter. Press to exit from the MENU screen.

34. **ANGLE Button**
Press to change the camera angle to see the sequence being played back from a different angle.

35. **MENU Button**
- **DVD mode**
Press to display the menu of the Disc.
- **VCR mode**
Press to access the VCR menu.

36. **ENTER Button**
Press to accept a setting.

37. **Arrow Buttons**
Use when making settings while watching the display on a TV screen.

38. **RETURN Button**
Returns to the previous operation.

39. **VCR/TV Button**
Use to select VCR or TV position. If the VCR/TV light appears on the front of the DVD/VCR, it is in VCR position (in either VCR or DVD mode). If the VCR/TV light doesn't appear on the front of the DVD/VCR, it is in TV position.
- **VCR Position**
When the green VCR OUTPUT light appears on the front of the DVD/VCR, use the VCR to watch a tape, watch a TV program while recording it, or watch a TV broadcast using the CHANNEL or Number Buttons to change channels at the DVD/VCR.
When the green DVD OUTPUT light appears on the front of the DVD/VCR, use the DVD/VCR to view Disc playback or menus.
- **TV Position**
Use to watch TV (changing channels at the TV) or watch one program while recording another.

40. **DVD Button**
Press to select DVD mode for the remote control.
- You can switch the OUTPUT mode either by pressing the OUTPUT Button on the front panel, or by pressing the DVD or the VCR Button on the remote control. However, **if you press the OUTPUT Button on the front panel first, you need to re-select the corresponding mode by pressing the DVD or the VCR Button on the remote control.**

41. **SLOW Button**
During tape playback, press to view the video tape in slow motion. Press again to resume normal playback. This Button does not affect DVD playback.

42. **SKIP Buttons**
- **DVD mode**
Press to skip Chapters or Tracks.

43. **Stop Button**
- **DVD mode**
Stops operation of the disc.
- **VCR mode**
Press to stop the tape motion. Press to enter digits when setting program (For example: setting clock or timer program). Press to select the setting modes from the on screen menu.

**44. ◄◄ Button**

● **DVD mode**

Press to view the DVD picture in fast reverse motion or to reverse playback of an Audio CD.

● **VCR mode**

Press to rewind the tape, or to view the picture rapidly in reverse during the playback mode (Rewind Search). Press to cancel a setting of timer program. Press to correct digits when setting program (For example: setting clock or timer program). Press to add or delete channel numbers during channel preset.

**45. TV POWER Button**

**46. VIDEO/TV Button**

**47. VOL Buttons**

**48. CH Buttons**

**49. PAUSE/STEP Button**

● **DVD mode**

Press to pause Disc playback. Press repeatedly to advance the DVD picture step by step (or one frame at a time).

● **VCR mode**

While recording, press to temporarily stop the recording (pause). Press a second time to resume normal recording. You can not pause a One-Touch Recording. Or, press during tape playback to freeze the picture. Press to advance the picture one frame at a time during still mode.

**50. ►► Button**

● **DVD mode**

Press to fast forward the Disc. Press the Pause Button, then press the FWD Button to begin slow motion playback. Press the FWD Button repeatedly to change the forward speed of slow motion.

● **VCR mode**

Press to rapidly advance the tape, or view the picture rapidly in forward during playback (Forward Search). When setting program (For example: setting clock or timer program), press to determine your selection and proceed to the next step you want to input. Press to determine the setting modes from the on screen menu. Press to add or delete channel numbers during channel preset.

**51. PLAY Button**

● **DVD mode**

Press to begin playback.

● **VCR mode**

Press to begin playback. Press to enter digits when setting program (For example: setting clock or timer program). Press to select the setting modes from the on screen menu.

**52. CH Buttons**

Press to change TV channels on the DVD/VCR.

**53. REC Button**

Press once to start a recording.

**54. SPEED Button**

Press to select the VCR's recording speed (SP or SLP)

**55. VCR Button**

Press to select VCR mode for the remote control.

● You can switch the OUTPUT mode either by pressing the OUTPUT Button on the front panel, or by pressing the DVD or the VCR Button on the remote control. However, **if you press the OUTPUT Button on the front panel first, you need to re-select the corresponding mode by pressing the DVD or the VCR Button on the remote control.**

**56. SETUP Button**

Press to enter the setup mode.

**57. SUBTITLE Button**

Press to select the desired subtitle language.

**58. TOP MENU Button**

**59. DISPLAY Button**

● **DVD mode**

Press to access or remove the display screen during DVD or Audio CD playback.

● **VCR mode**

Press to access or remove the VCR's on-screen status display.

**60. AUDIO Button**

Press to select a desired audio language or sound mode.

**61. Number Buttons**

● **DVD mode**

Press to directly select a Track (Audio CD) for playback.

Press to program Tracks (Audio CD) for playback.

● **VCR mode**

Press to select TV channels on the DVD/VCR.

To select channels, enter channel numbers as a two-digit number for the quickest results. For example, to select channel 6, press 0 then 6.

**+100 Button:**

If you want to select channels 100 and above, press this Button first, then press the last two digits. For example, to select channel 125, press +100 Button first, then press 2 and 5.

**62. OPEN/CLOSE Button**

Press to insert discs into or remove them from the tray.

**63. SEARCH MODE Button**

● **DVD mode**

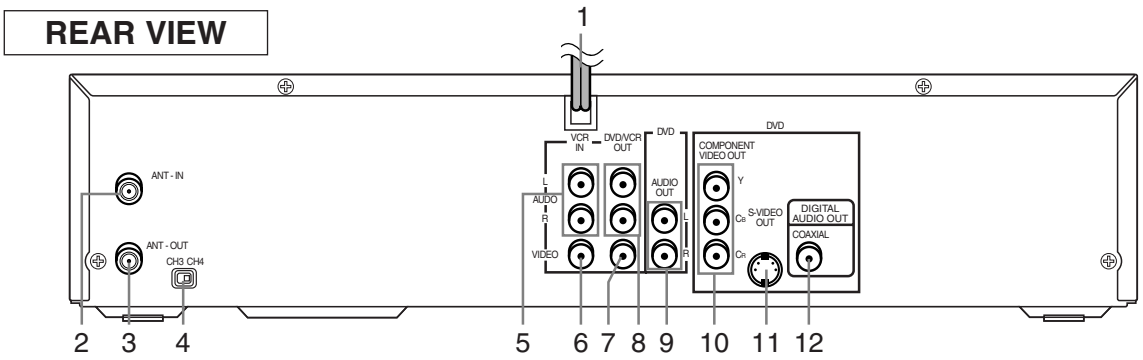
Press to access or remove the Search display, which allows you to go directly to a specific Title/Chapter/Track/Time.

● **VCR mode**

Press to perform a Time Search or an Index Search.

# DESCRIPTION-REAR PANEL

## REAR VIEW




1. **AC POWER CORD**
   Connect to a standard AC outlet to supply power to the DVD/VCR.
2. **ANT-IN (Antenna In) Jack**
   Connect your antenna, Cable Box, or Direct Broadcast System.
3. **ANT-OUT (Antenna Out) Jack**
   Use the supplied RF coaxial cable to connect this jack to the ANTENNA IN Jack on your TV.
4. **CH3/CH4 SWITCH**
   Set to channel 3 or 4 to use your TV with your DVD/VCR.
5. **ANALOG AUDIO IN JACKS (VCR only)**
   Connect audio cables coming from the audio out jacks of a camcorder, another VCR, or an audio source here.
6. **VIDEO IN JACK (VCR only)**
   Connect a cable coming from the video out jack of a camcorder, another VCR, or an audio-visual source (laser disc player, video disc player, etc.) here.
7. **VIDEO OUT JACK (DVD/VCR)**
   Connect the yellow video cable (supplied) here and to the TV's Video In jack.
8. **ANALOG AUDIO OUT JACKS (DVD/VCR)**
   Connect the supplied audio cables here and to the Audio In jacks of a television or other audio equipment.
9. **ANALOG AUDIO OUT JACKS (DVD only)**
   Connect the supplied audio cables here and to the Audio In jacks of a television or other audio equipment.
10. **COMPONENT VIDEO OUT JACKS (DVD only)**
    Connect optional component video cables here and to the component Video In jacks of a television.
11. **S-VIDEO OUT JACK (DVD only)**
    Connect an optional S-Video cable here and to the S-Video In jack of a television.
12. **DIGITAL AUDIO OUT JACK (DVD only)**
    Connect an optional coaxial digital audio cable here and to the Coaxial Digital Audio In jack of a decoder or audio receiver.

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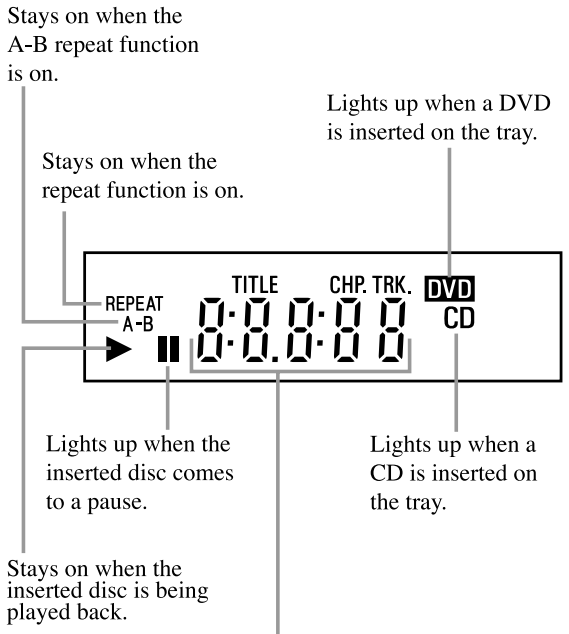
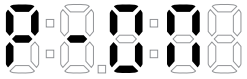
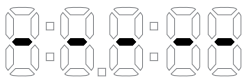
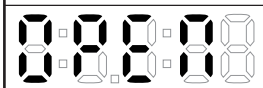
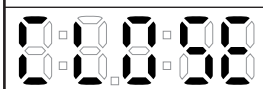
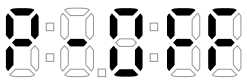
**"DTS" and "DTS Digital Out" are trademarks of Digital Theater Systems, Inc.**

## DISPLAY

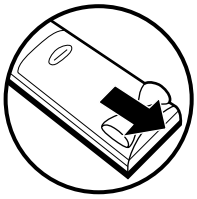



## DISPLAYS DURING OPERATION

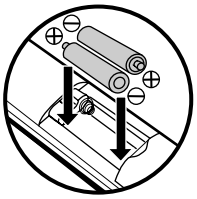
| | |
|---|---|
|  | Power on |
|  | No disc inserted |
|  | Tray open |
|  | Tray closed |
|  | Loading the Disc |
|  | Power off |

## LOADING THE BATTERIES

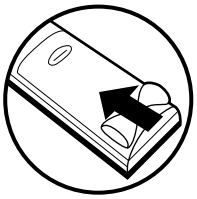
1. Open the battery compartment cover.



2. Insert two AA batteries, with each one oriented correctly.



3. Close the cover.



**Notes**

- Do not mix alkaline and manganese batteries.
- Do not mix old and new batteries.

# FIRMWARE RENEWAL MODE

## HOW TO UPDATE THE FIRMWARE VERSION

1. Turn the power on and remove the disc on the tray.
2. To put the DVD player into version up mode, press [9], [8], [7], [6], and [SEARCH MODE] buttons on the remote control unit in that order. The tray will open automatically.
   Fig. a appears on the screen and Fig. b appears on the VFD.

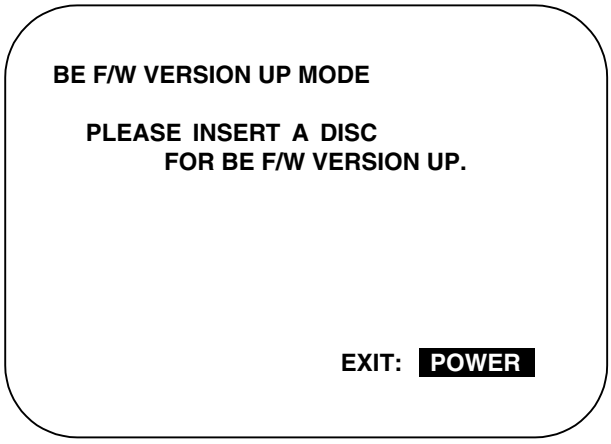



Fig. a Version Up Mode Screen

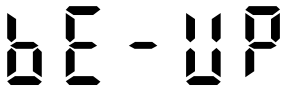



Fig. b VFD in Version Up Mode

   The DVD player can also enter the version up mode with the tray open. In this case, Fig. a will be shown on the screen while the tray is open.

3. Load the disc for version up. (For closing the tray, only the "OPEN/CLOSE" button is available.)
4. The DVD player enters the F/W version up mode automatically. Fig. c appears on the screen and Fig. d appears on the VFD.

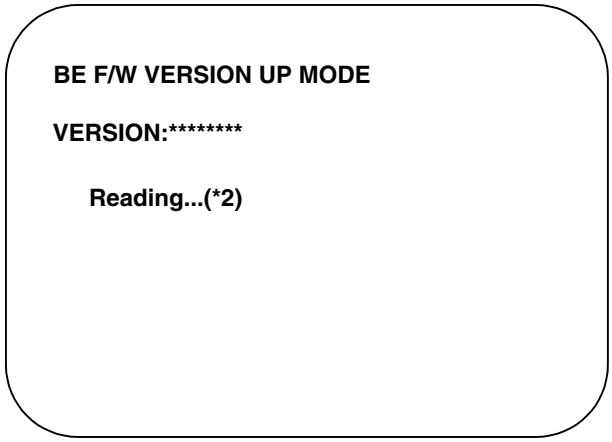



Fig. c Programming Mode Screen


Fig. d VFD in Programming Mode (Example)

   The appearance shown in (*2) of Fig. c is described as follows:

| No. | Appearance | State |
|---|---|---|
| 1 | Reading... | Sending files into the memory |
| 2 | Erasing... | Erasing previous version data |
| 3 | Programming... | Writing new version data |

5. After programming is finished, the tray opens automatically. Fig. e appears on the screen and the checksum in (*3) of Fig. e appears on the VFD. (Fig. f)

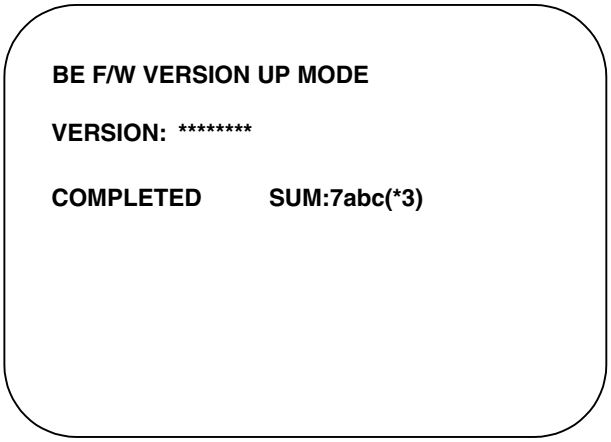



Fig. e Completed Program Mode Screen


Fig. f VFD upon Finishing the Programing Mode (Example)

   At this time, no buttons are available.

6. For tray opening, plug the AC cord into the AC outlet.
7. Turn the power on by pressing the power button and the tray will close.

## HOW TO VERIFY THE FIRMWARE VERSION

1. After making sure that no disc is in unit, turn the power on.
2. Press [1], [2], [3], [4], and [DISPLAY] buttons on the remote control unit in that order. The B/E version appears on the VFD, and the F/E and B/E versions appear on TV screen.

# TROUBLESHOOTING

**FLOW CHART NO.1**

The power cannot be turned on.(1)

Is the fuse normal?
- No → Replace the fuse.
  - No → See FLOW CHART No.3 <The fuse blows out.>
- Yes ↓

Is normal state restored when once unplugged power cord is plugged again after several seconds.
- No → Check for lead or shor-circuiting of primary circuit component? (Q1001, Q1003, D1001, D1002, D1004, D1005, D1011, T1001, C1003, C1005, etc.)
- Yes ↓

Is the EV 5V line voltage normal?
- No → Check for lead or shor-circuiting of primary circuit component? (Q1001, Q1003, D1001, D1002, D1004, D1005, D1011, T1001, C1003, C1005, etc.)
- Yes ↓

Is the voltage of EV 12V, EV -30V and filament voltage normal?
- No → Check each rectifying circuit of secondary circuit.

**FLOW CHART NO.2**

The power cannot be turned on.(2)

Does the change from STANDBY LED indicate turn-off?
- Yes → The STANDBY LED indicate is flashing after 0.5 sec.
- Yes ↓

Is the supply voltage of 3.3V fed to Q2021?
- No → Check the EV 3.3V line.
- Yes ↓

Is the supply voltage of 5V fed to pin(3) of IC2001?
- No → Check the IC2001.
- Yes ↓

Is the "H" signal inputted at base of Q2021, when the POWER button activated on the DVD?
- No → Check the SW2008 and POWER button line.
- Yes ↓

Is the "H" signal inputted at base of Q2021, when the POWER button activated on the remote control unit?
- No → Check the line between the remote control receiver and the pin(125) of IC601.
- Yes ↓

Replace IC601.

The STANDBY LED indicate is flashing after 0.5 sec.

Yes (below, confirmed operating at LED turn-off of 0.5 sec. interval.)

Are the "P-CON-H" pulse outputted from the Pin(207) of IC601?
- No → Replace IC601.
- Yes ↓

Is the P-CON switch circuit operated normally? (Q1002, Q1005, Q1006, IC1002, D1036, D1046)
- No → Check each component and if poor the replace.

**FLOW CHART NO.3**

The fuse blows out.

Is there leaking or short-circuited primary component?

Check for short-circuiting of rectifying diode and circuit in each rectifying circuit of secondary side.

**FLOW CHART NO.4**

When the output voltage fluctuates.

↓

Does the secondary side photo coupler circuit operate normally? — No → Check the circuit and replace the parts. (IC1001, IC1006, D1048, D1015, etc.)

↓ Yes

Does the primary side photo coupler circuit operate normally? — No → Check the circuit and replace the parts. (IC1001, IC1012, D1024, etc.)

↓ Yes

Replace IC1001.

**FLOW CHART NO.5**

When buzz is heard from the vicinity of power circuit.

↓

Check for short-circuiting of rectifying diode and circuit in each rectifying circuit of secondary side. (D1003, D1030, D1008, D1009, D1013, D1016, Q1002, IC1002, Q1007, Q1010, Q1011, Q1014, Q1004, etc.)

**FLOW CHART NO.6**

The fluorescent display tube does not light.

↓

Is the supply voltage of 5V fed to pin(6) and pin(24) of IC2001? — No → Check the EV 5V line.

↓ Yes

Is the supply voltage of -24V fed to pin(15) of IC2001? — No → Check the -FL -24V line.

↓ Yes

Is there 500kHz oscillation at pin(26) of IC2001? — No → Check R2001, IC2001 and their periphery.

↓ Yes

Check the signal lines of FIP DA, FIP CK, FIP CS of IC2001 and IC601? — No → Check or replace IC2001 and IC601.

↓ Yes

Are the filament voltage applied between (1), (2) and (38), (39) of the fluorescent display tube? Also negative voltage applied between these pins and GND? — No → Check the power circuit, D1017, Q2023, Q2024 and Q2025.

↓ Yes

Check the fluorescent display tube and its periphery? — No → Check that the fluorescent display tube is free from damages such as crack.

**FLOW CHART NO.7**

The key operation is disabled.

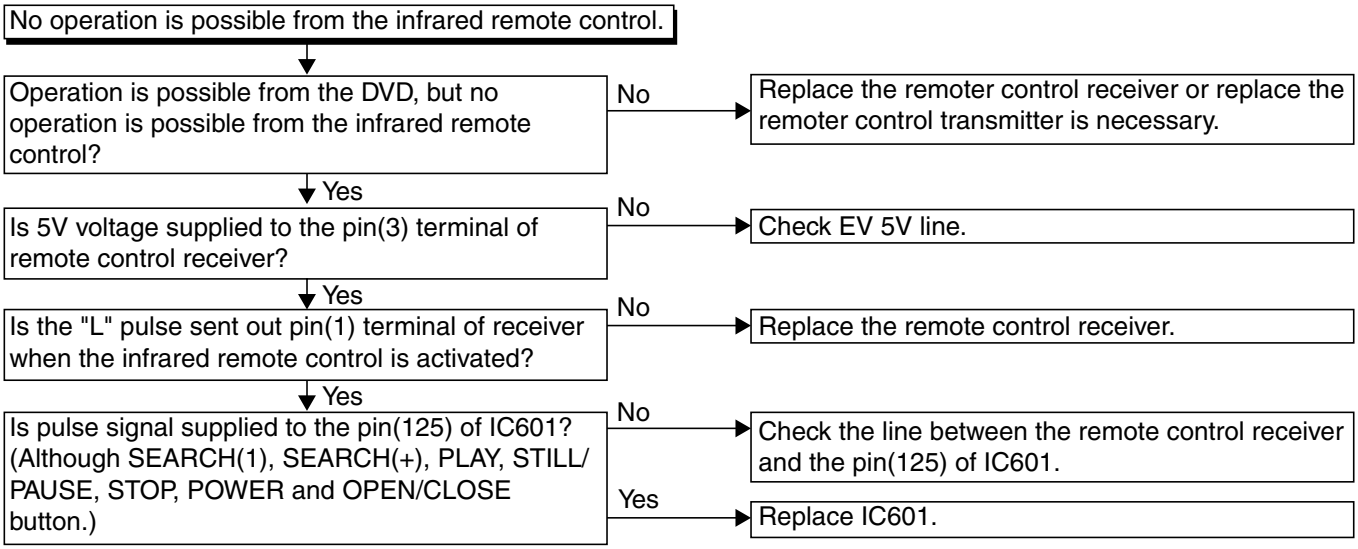
↓

Is key switch contact and installation state normal? — No → Replace key switch.

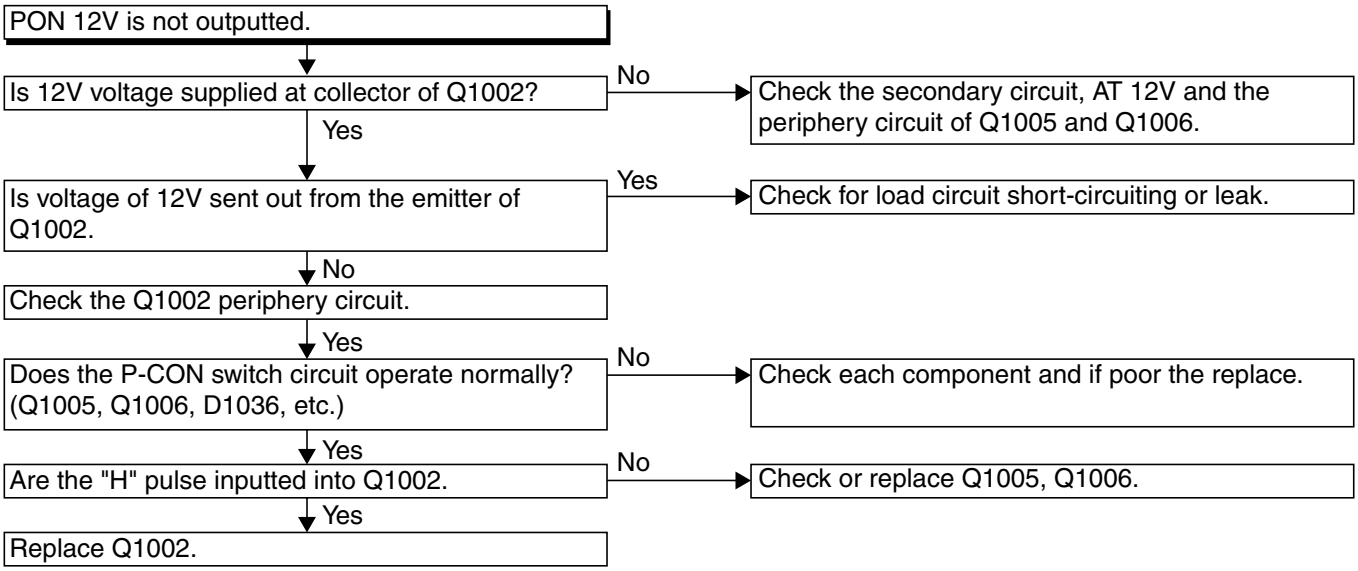
↓ Yes

Is the control voltage normally into the pins(3), (4), (7), (8), (9), (10) of IC2001?

**FLOW CHART NO.8**




**FLOW CHART NO.9**



**FLOW CHART NO.10**

PON 5V is not outputted. (PON 12V is possible.)

↓

Is 5V voltage supplied at collector of Q1004? — No → Check the AT 5V line.

↓ Yes

Is voltage of 5V sent out from the collector of Q1004? — Yes → Check for load circuit short-circuiting or leak.

↓ No

Check the Q1004 periphery circuit.

↓ Yes

Is the "H" pulse inputted into the base of Q1004? — No → Check or replace Q1004, D1046.

↓ Yes

Replace Q1004.

**FLOW CHART NO.11**

EV -19V is not outputted.

↓

Is -19V voltage supplied at the cathode of D1003? — No → Check the AT -24V line.

↓ Yes

Is voltage of -24V sent out from the anode of D1003? — Yes → Check for load circuit short-circuiting or leak.

↓ No

Check the D1003 periphery circuit.

↓ Yes

Replace D1003.

**FLOW CHART NO.12**

PON 3.3V(1), (2) is not outputted.

↓

Is 4V voltage supplied at emitter of Q1011? — No → Check the secondary circuit, AT 4V line.

↓ Yes

Is voltage of 3.3V sent out from collector of Q1011? — Yes → Check for load circuit short-circuiting or leak.

↓ No

Check the Q1011 periphery circuit.

↓ Yes

Does the P-CON switch circuit operate normally? (Q1005, Q1006, etc.) — No → Check each component and if poor the replace.

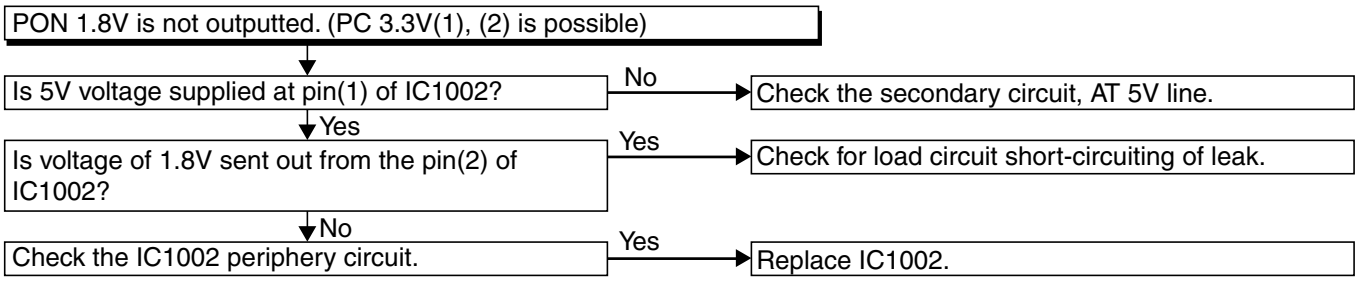
↓ Yes

Are the "H" pulse inputted into base of Q1011? — No → Check or replace Q1005, Q1006, Q1049.

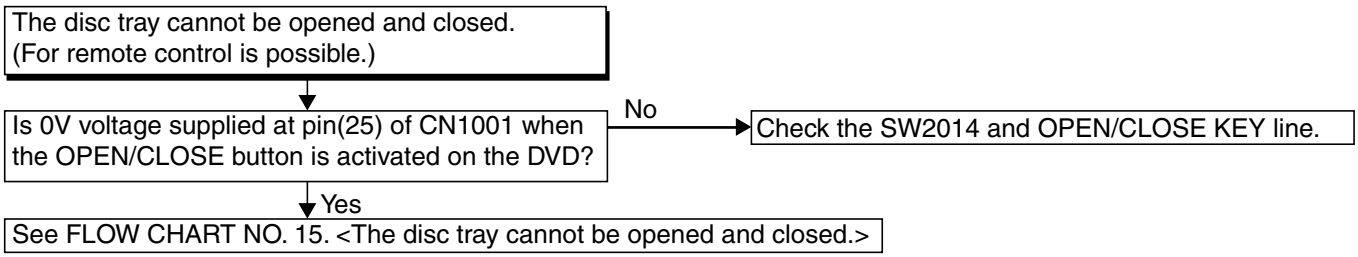
↓ Yes

Replace Q1011.

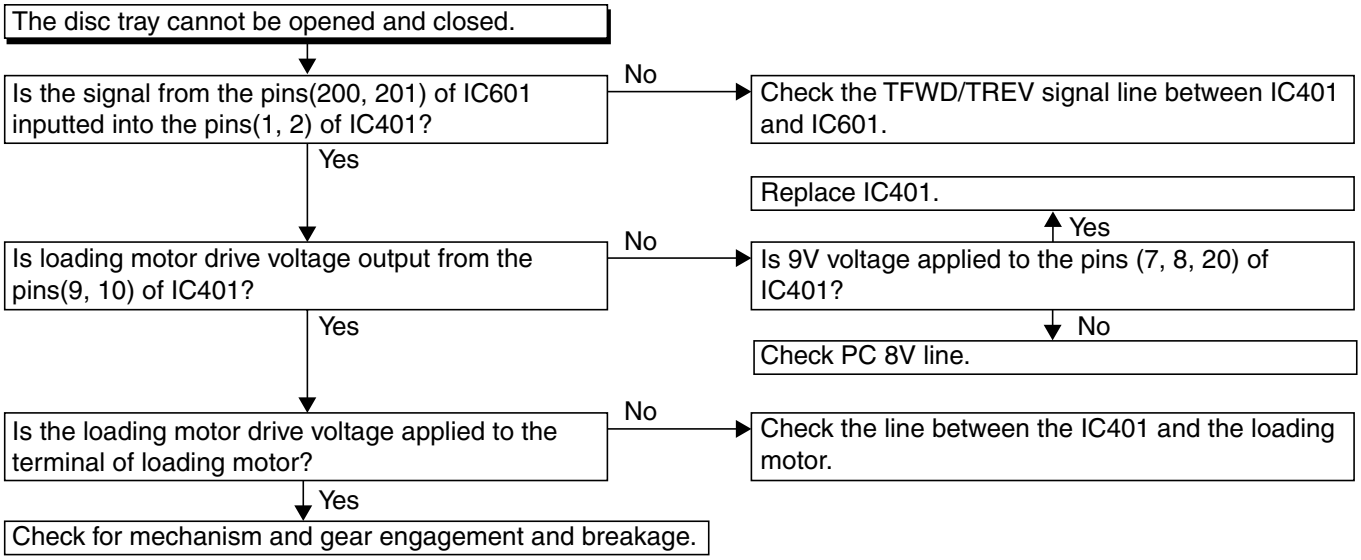
**FLOW CHART NO.13**



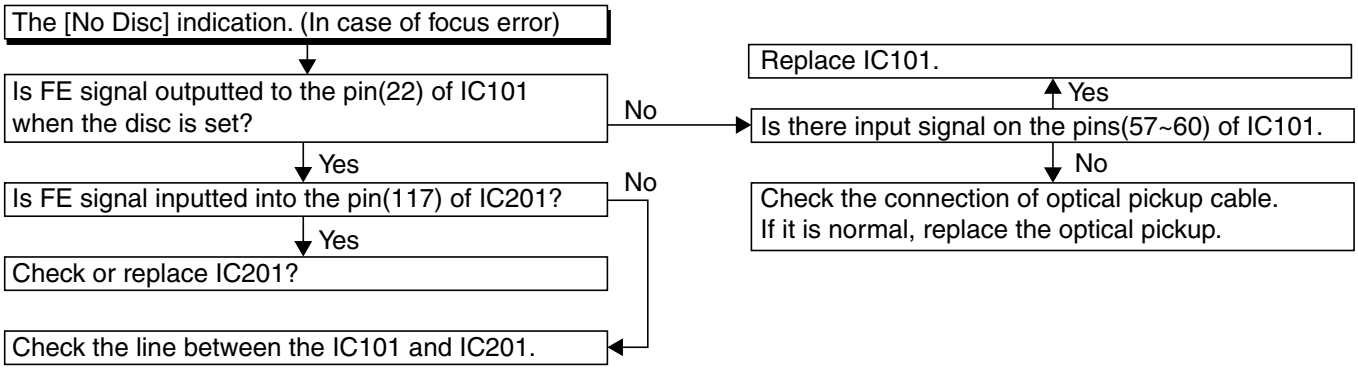

**FLOW CHART NO.14**



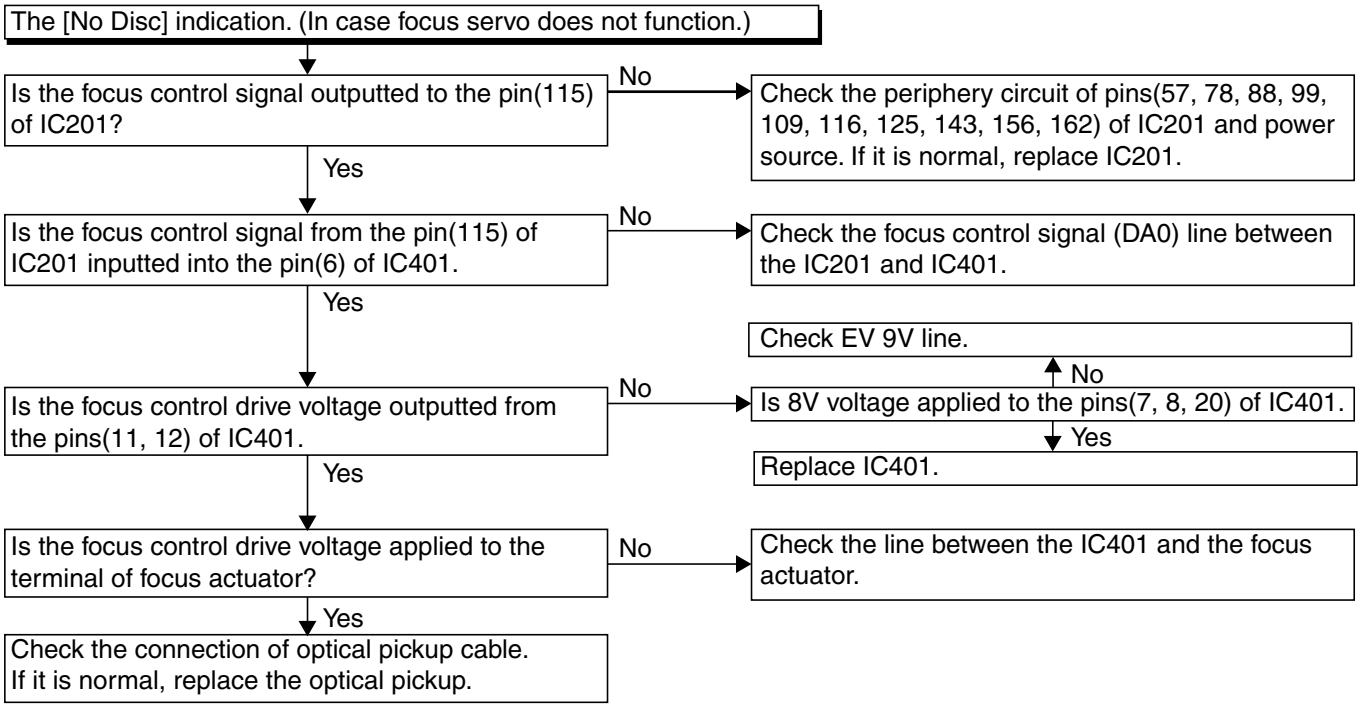

**FLOW CHART NO.15**



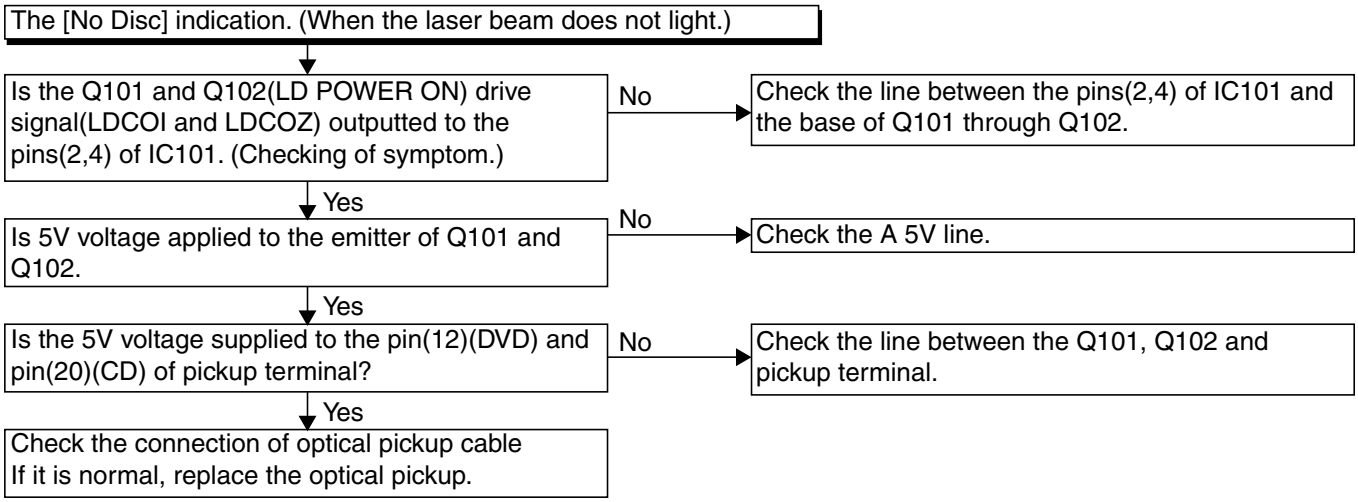

**FLOW CHART NO.16**



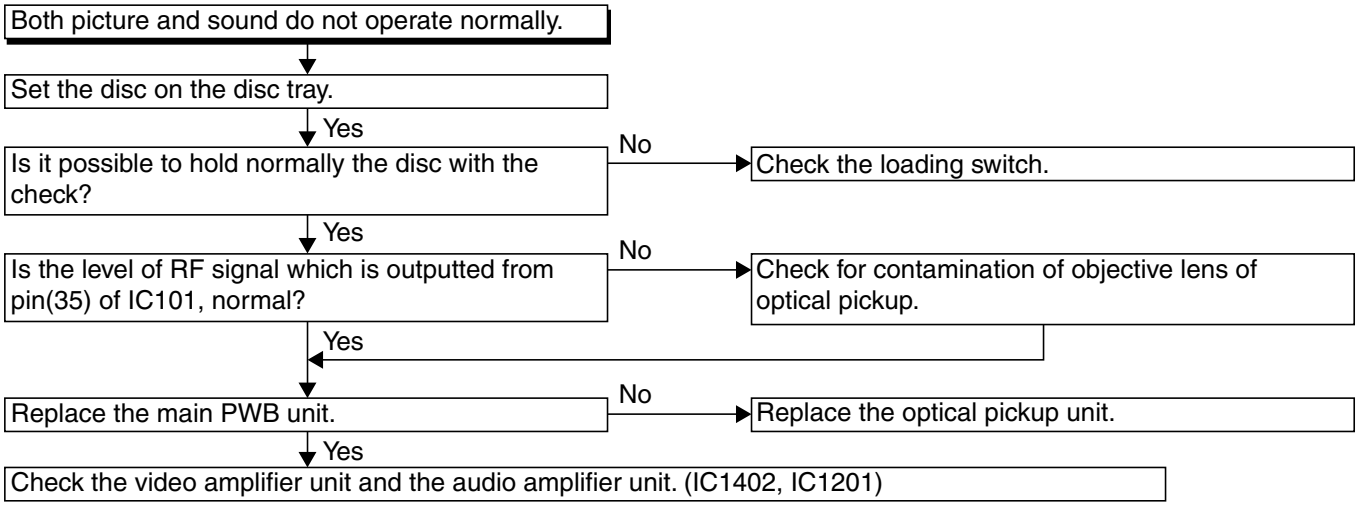
**FLOW CHART NO.17**




**FLOW CHART NO.18**




**FLOW CHART NO.19**



**FLOW CHART NO.20**

Picture do not operate normally.

↓

Set the disc on the disc tray.

↓ Yes

Are the video signals outputted to each pins of main unit connector CN701?

CN701 7PIN CVBS
CN701 5PIN S-Y
CN701 6PIN S-C

No → Check the main unit. (IC601 periphery circuit.)

↓

Are the video signals shown above input into each pins of IC1402?

IC1402 4PIN CVBS
IC1402 6PIN S-Y
IC1402 2PIN S-C

No → Check the line between each pins of main unit connector CN701 and each pins of IC1402.

CN701 7PIN → IC1402 4PIN CVBS
CN701 5PIN → IC1402 6PIN S-Y
CN701 9PIN → IC1402 2PIN S-C

↓ Yes

Are the video signals outputted to each pins of IC1402?

IC1402 30PIN CVBS
IC1402 27PIN S-Y
IC1402 33PIN S-C

No → Is 5V voltage applied to the pin(1, 3, 5, 34) of IC1402?

↓ Yes

Check or replace IC1402?

↓ Yes

Are the video signals outputted to the specific output terminal?

Are the composite video signals outputted to the VIDEO OUT terminal (JK1403)?

No → Check the peripheral circuit of JK1403 from the pin (30) of IC1402.

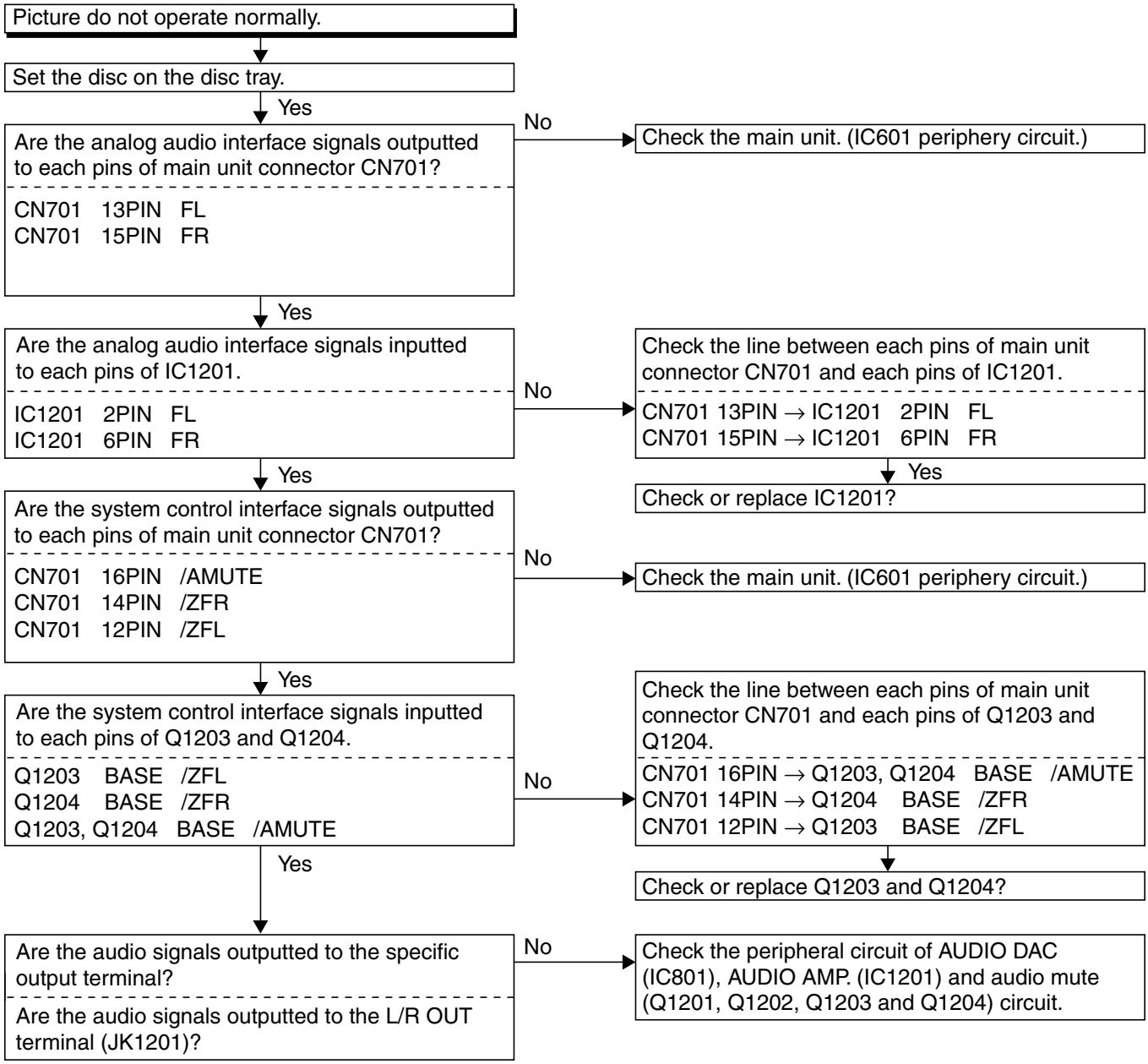
Are the luminance signals outputted to the S-OUT terminal (JK1401)?

No → Check the peripheral circuit of JK1401 from the pin (27) of IC1402.

Are the chroma signals outputted to the S-OUT terminal (JK1401)?

No → Check the peripheral circuit of JK1401 from the pin (33) of IC1402.

**FLOW CHART NO.21**

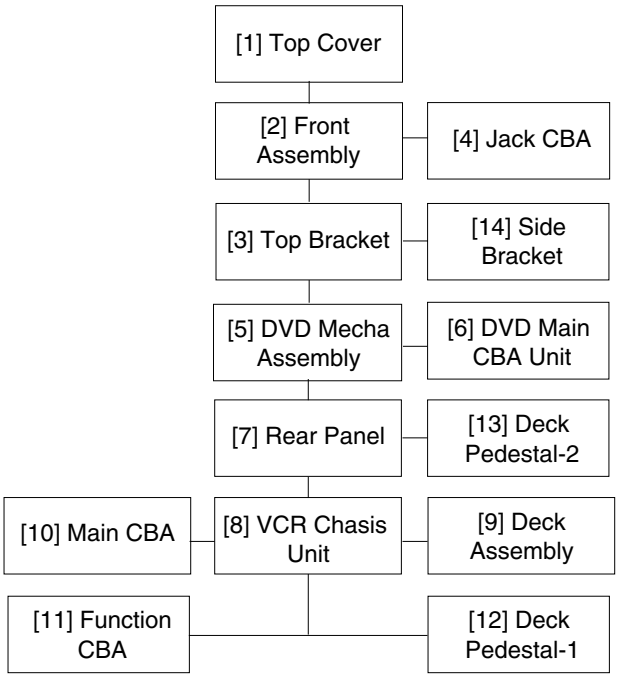


# CHAPTER 2 DISASSEMBLY AND ADJUSTMENT

# CABINET DISASSEMBLY INSTRUCTIONS

## 1. Disassembly Flowchart

This flowchart indicates the disassembly steps to gain access to item(s) to be serviced. When reassembling, follow the steps in reverse order. Bend, route, and dress the cables as they were originally.




## 2. Disassembly Method

| ID/ LOC. No. | PART | REMOVAL | | |
|---|---|---|---|---|
| | | Fig. No. | REMOVE/*UNHOOK/ UNLOCK/RELEASE/ UNPLUG/DESOLDER | Note |
| [1] | Top Cover | D1 | 7(S-1) | - |
| [2] | Front Assembly | D2 | *CN505, *2(L-1), Tray Panel, *7(L-2) | 1-1<br>1-2<br>1-3<br>1-4<br>1-5<br>1-6<br>1-7 |
| [3] | Top Bracket | D2 | 4(S-2) | - |
| [4] | Jack CBA | D3 | 3(S-3) | - |
| [5] | DVD Mecha Assembly | D4 | 3(S-4), *CN501, *CN701 | - |
| [6] | DVD Main CBA Unit | D5 | 3(S-5), *CN101, *CN401 | 2<br>2-1<br>2-2<br>2-3<br>3 |
| [7] | Rear Panel | D6 | 5(S-6), 3(S-7) | - |
| [8] | VCR Chassis Unit | D7 | 5(S-8), 6(S-9) | - |
| [9] | Deck Assembly | D8 | Desolder, 2(S-10) | 4,5 |
| [10] | Main CBA | D8 | ---------- | - |
| [11] | Function CBA | D8 | Desolder | - |
| [12] | Deck Pedestal-1 | D9 | 6(S-11) | - |
| [13] | Deck Pedestal-2 | D9 | (S-12) | - |
| [14] | Side Bracket | D9 | (S-13) | - |
| ↓ (1) | ↓ (2) | ↓ (3) | ↓ (4) | ↓ (5) |

**Note:**

(1): Identification (location) No. of parts in the figures

(2): Name of the part

(3): Figure Number for reference

(4): Identification of parts to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.
P=Spring, L=Locking Tab, S=Screw, CN=Connector
*=Unhook, Unlock, Release, Unplug, or Desolder
e.g. 2(S-2) = two Screws (S-2),
2(L-2) = two Locking Tabs (L-2)

(5): Refer to “Reference Notes.”

## Reference Notes

CAUTION 1: Locking Tabs (L-1) and (L-2) are fragile. Be careful not to break them.

1-1. Connect the wall plug to an AC outlet and press the OPEN/CLOSE button to open the Tray.

1-2. Remove the Tray Panel by releasing two Locking Tabs (L-1).

1-3. Press the OPEN/CLOSE button again to close the Tray.

1-4. Press the POWER button to turn the power off.

1-5. Unplug an AC cord.

1-6. Disconnect connector CN505.

1-7. Release seven Locking Tabs (L-2) (to do this, first release five Locking Tabs (A) at the side and top, and then release two Locking Tabs (B) at the bottom.)

CAUTION 2: Electrostatic breakdown of the laser diode in the optical system block may occur as a potential difference caused by electrostatic charge accumulated on cloth, human body etc., during unpacking or repair work.

To avoid damage of pickup follow next procedures.

2-1. Slide the pickup unit as shown in Fig. D5.

2-2. Short the three short lands of FPC cable with solder before removing the FFC cable (CN101) from it. If you disconnect the FFC cable (CN101), the laser diode of pickup will be destroyed. (Fig. D5)

2-3. Disconnect Connector (CN401). Remove three Screws (S-5) and lift the DVD Main CBA Unit. (Fig. D5)

CAUTION 3: When reassembling, confirm the FFC cable (CN101) is connected completely. Then remove the solder from the three short lands of FPC cable. (Fig. D5)

4. When reassembling, solder wire jumpers as shown in Fig. D8.

5. Before installing the Deck Assembly, be sure to place the pin of LD-SW on Main CBA as shown in Fig. D8. Then, install the Deck Assembly while aligning the hole of Cam Gear with the pin of LD-SW, the shaft of Cam Gear with the hole of LD-SW as shown in Fig. D8.

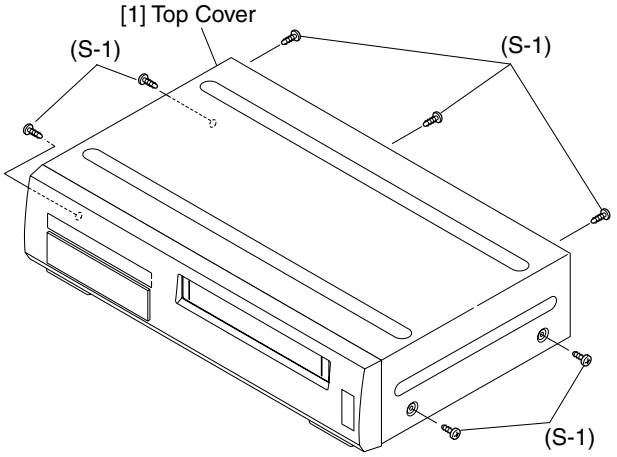


Fig. D1

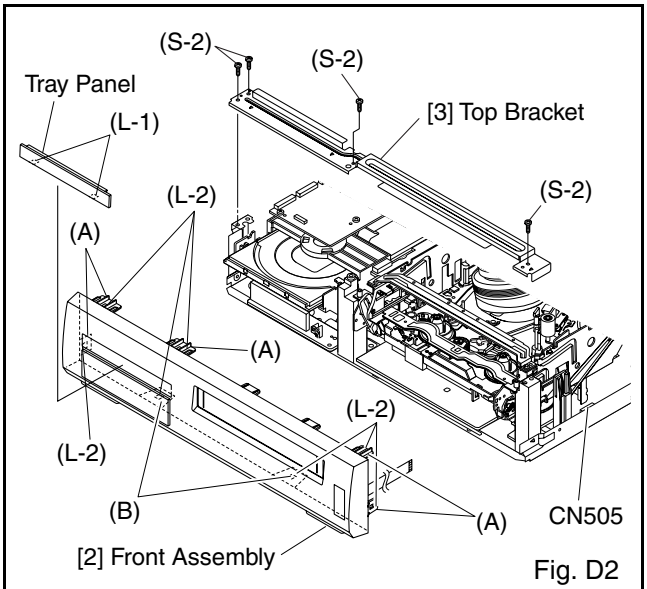


Fig. D2

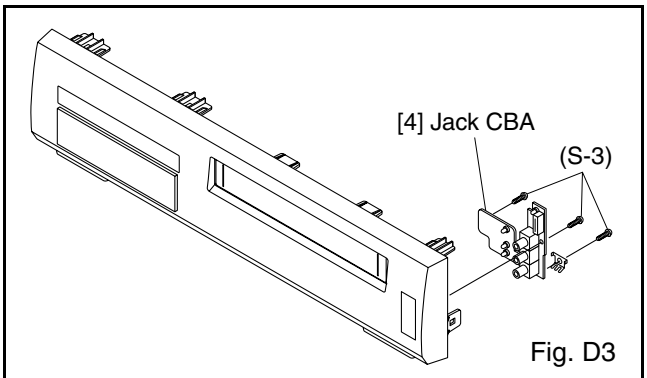


Fig. D3

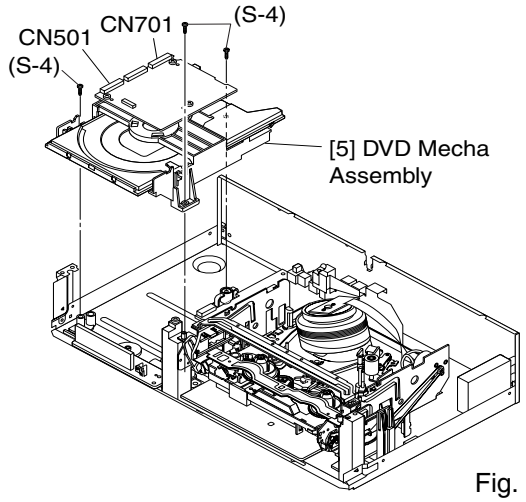



Fig. D4

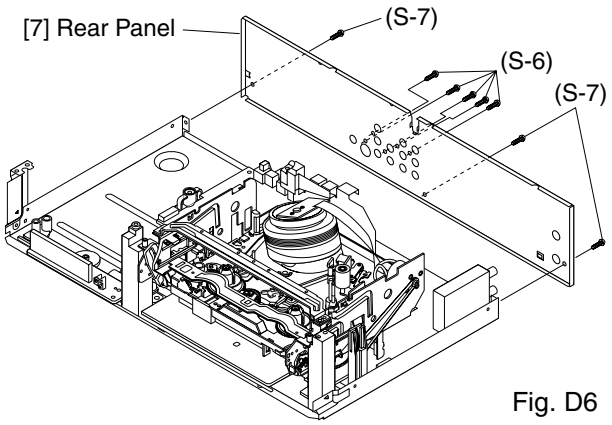
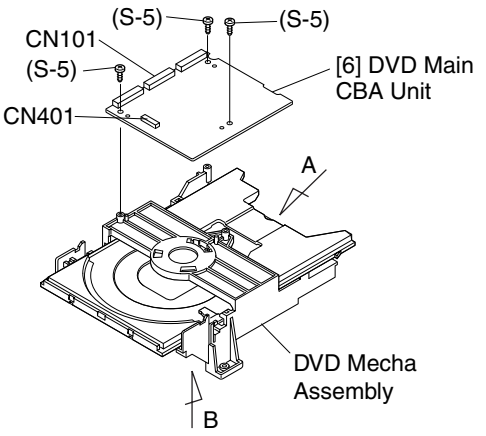
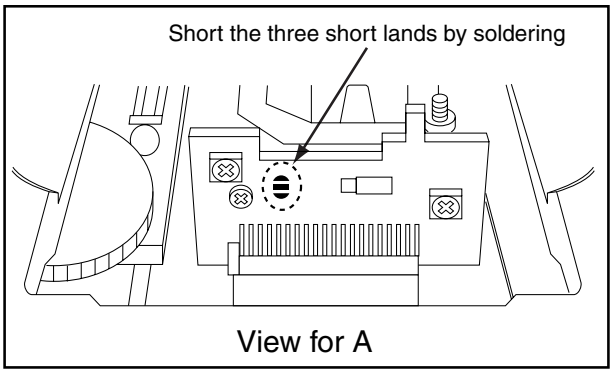



Fig. D6




OR

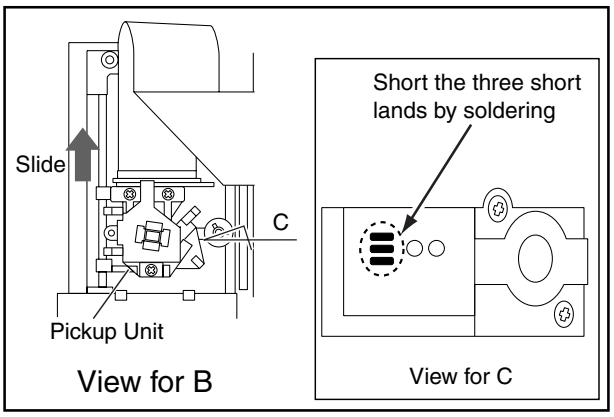
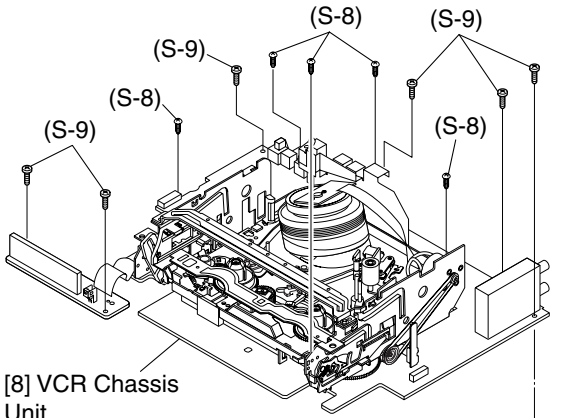



Fig. D5



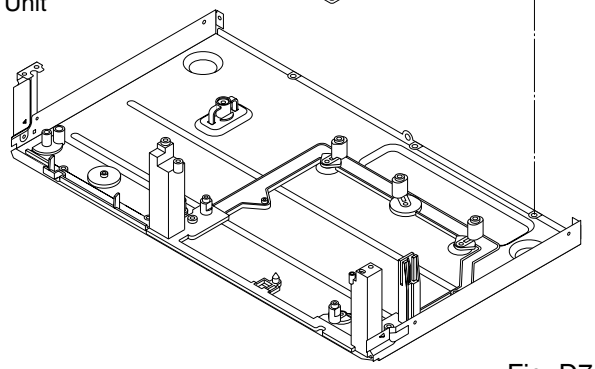
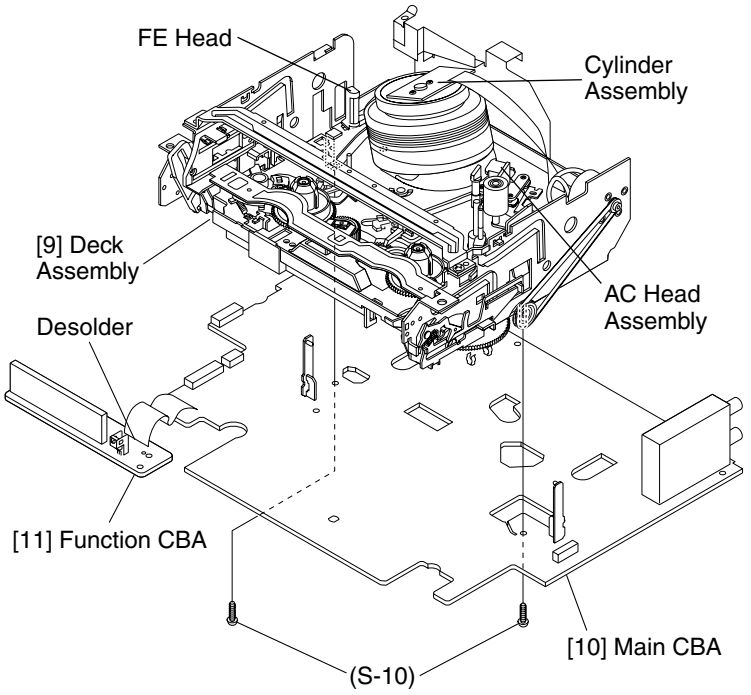
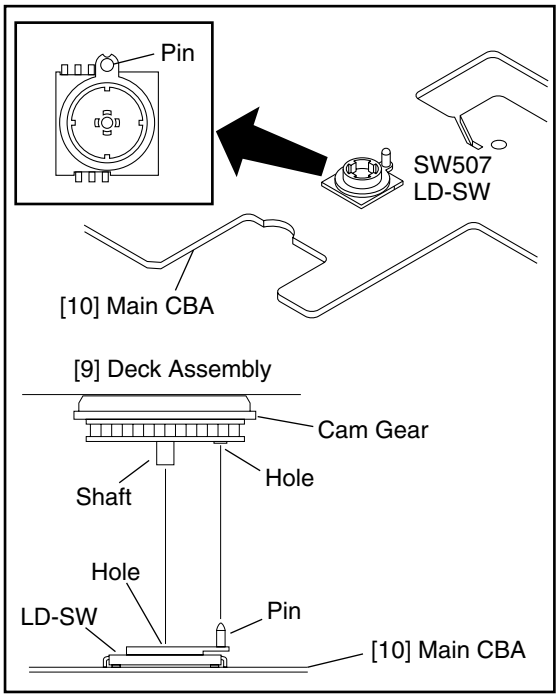
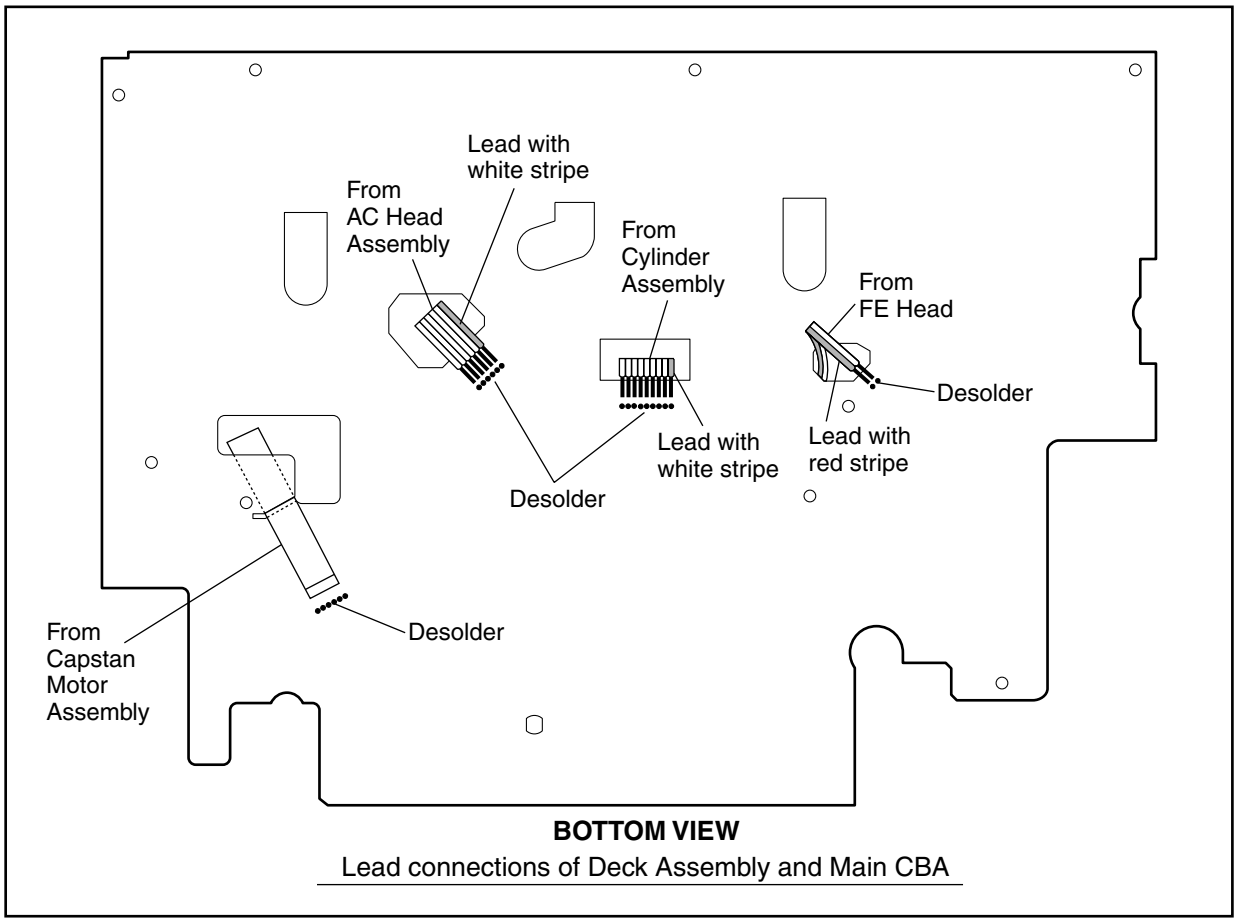



Fig. D7




**BOTTOM VIEW**

Lead connections of Deck Assembly and Main CBA

Fig. D8

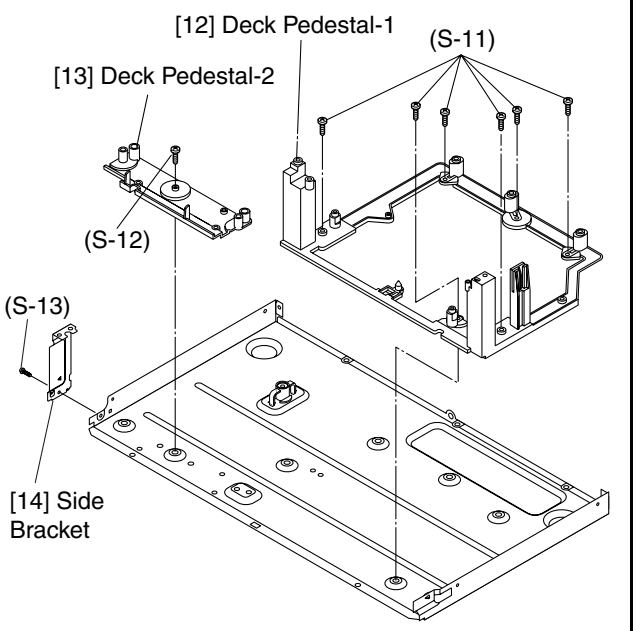
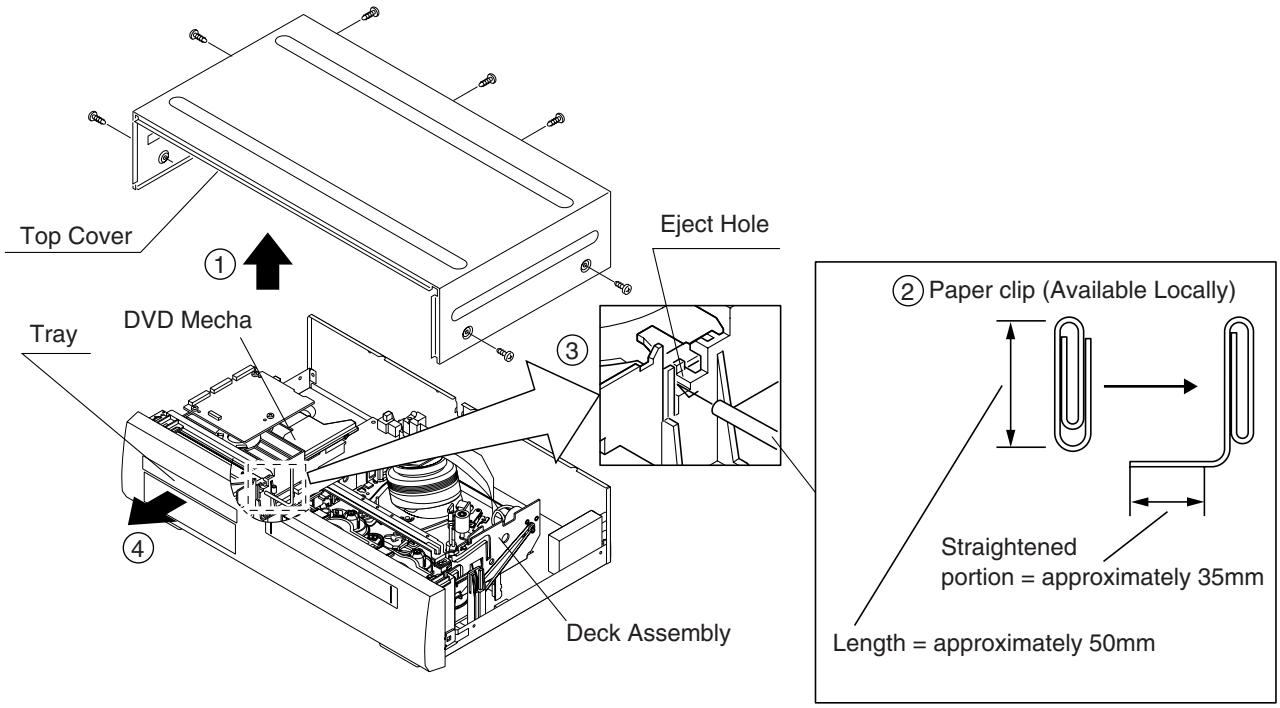



Fig. D9

## HOW TO MANUAL EJECT

1. Remove the Top Case.
2. Make a tool from a paper clip, etc., (length = approximately 50 mm, maximum diameter = approximately 3 mm) as shown below.
3. Insert the tool into the manual eject hole on the DVD Mecha. Then, push it until the tray is ejected.



# DISASSEMBLY/ASSEMBLY PROCEDURES OF DECK MECHANISM

Before following the procedures described below, be sure to remove the deck assembly from the cabinet. (Refer to CABINET DISASSEMBLY INSTRUCTIONS on page 2-1-1.)
All the following procedures, including those for adjustment and replacement of parts, should be done in Eject mode; see the positions of [41] and [42] in Fig.DM1 on page 2-2-3. When reassembling, follow the steps in reverse order.

| STEP /LOC. No. | START-ING No. | PART | | REMOVAL | | INSTALLATION |
|---|---|---|---|---|---|---|
| | | | | Fig. No. | REMOVE/*UNHOOK/ UNLOCK/RELEASE/ UNPLUG/DESOLDER | ADJUSTMENT CONDITION |
| [1] | [1] | Guide Holder A | T | DM3 | 2(S-1) | |
| [2] | [1] | Cassette Holder Assembly | T | DM4 | | |
| [3] | [2] | Slider L | T | DM5 | (S-2) | |
| [4] | [2] | Slider R | T | DM5 | (S-3) | |
| [5] | [4] | Lock Lever | T | DM5 | (S-4),*(P-1) | |
| [6] | [2] | C Plate | T | DM5 | | |
| [7] | [7] | Cylinder Assembly | T | DM1,DM6 | Desolder, 3(S-5) | |
| [8] | [8] | Loading Motor Assembly | T | DM1,DM7 | Desolder, LDG Belt, 2(S-6) | |
| [9] | [9] | AC Head Assembly | T | DM1,DM7 | (S-7) | |
| [10] | [2] | Tape Guide Assembly | T | DM1,DM8 | *(P-2) | |
| [11] | [10] | Door Opener B | T | DM1,DM8 | *(L-1),*(L-2) | |
| [12] | [11] | Pinch Arm (B) | T | DM1,DM8 | *(P-3) | |
| [13] | [12] | Pinch Arm (A) Assembly | T | DM1,DM8 | | |
| [14] | [14] | FE Head | T | DM1,DM9 | (S-8) | |
| [15] | [15] | Prism | T | DM1,DM9 | (S-9) | |
| [16] | [2] | Slider Shaft | T | DM10 | (S-10),*(L-3) | |
| [17] | [16] | C Drive Lever L | T | DM10 | | |
| [18] | [16] | C Drive Lever R | T | DM10 | | |
| [19] | [7],[10] | Capstan Motor | B | DM2,DM11 | 3(S-11), Cap Belt | |
| [20] | [20] | Clutch Assembly | B | DM2,DM12 | (C-1) | |
| [21] | [20] | FF Arm | B | DM2,DM12 | | |
| [22] | [22] | Cam Holder F | B | DM2,DM13 | (C-2) | |
| [23] | [23] | Cam Gear (B) | B | DM2,DM13 | (C-3),*(P-4) | |
| [24] | [24] | Mode Gear | B | DM2,DM14 | (C-4) | |
| [25] | [20],[23], [24] | Mode Lever | B | DM2,DM14 | (C-5), *(L-4) | |
| [26] | [22] | Worm Holder | B | DM2,DM14 | (S-12) | |
| [27] | [26] | Pully Assembly | B | DM2,DM14 | | |
| [28] | [25],[26] | Cam Gear (A) | B | DM2,DM14 | | |
| [29] | [25] | Idler Assembly | B | DM1,DM15 | *(L-5) | |
| [30] | [25] | BT Arm | B | DM2,DM15 | *(P-5) | |
| [31] | [25] | Loading Arm S (B) Assembly | B | DM2,DM15 | | (+)Refer to Alignment Sec.Pg.2-3-1 |
| [32] | [31] | Loading Arm T (B) Assembly | B | DM2,DM15 | | (+)Refer to Alignment Sec.Pg.2-3-1 |

| STEP /LOC. No. | START-ING No. | PART | | REMOVAL | | INSTALLATION |
|---|---|---|---|---|---|---|
| | | | | Fig. No. | REMOVE/*UNHOOK/ UNLOCK/RELEASE/ UNPLUG/DESOLDER | ADJUSTMENT CONDITION |
| [33] | [2],[25] | M Brake T Assembly | T | DM1,DM16 | *(P-6) | |
| [34] | [2],[25] | M Brake S Assembly | T | DM1,DM16 | *(P-7) | |
| [35] | [34] | Tension Lever Sub Assembly | T | DM1,DM16 | | |
| [36] | [35] | T Lever Holder | T | DM1,DM16 | *(L-6) | |
| [37] | [33] | M Gear | T | DM1,DM16 | (C-6) | |
| [38] | [2],[15] | Sensor Gear | T | DM1,DM16 | (C-7) | |
| [39] | [33] | Reel T | T | DM1,DM16 | | |
| [40] | [35] | Reel S | T | DM1,DM16 | | |
| [41] | [31],[35] | Moving Guide S Preparation | T | DM1,DM17 | | |
| [42] | [32] | Moving Guide T Preparation | T | DM1,DM17 | | |
| [43] | [19] | TG Post Assembly | T | DM1,DM17 | *(L-7) | |
| [44] | [19],[28] | Rack Assembly | R | DM18 | | (+)Refer to Alignment Sec.Pg.2-3-2 |
| [45] | [44] | F Door Opener | R | DM18 | | |
| *[46] | [46] | Cleaner Lever Assembly | T | DM1,DM6 | | Type A |
| | | | | | *(L-8) | Type B |
| *[47] | [46] | CL Post | T | DM6 | *(L-9) | Type A |
| ↓ (1) | ↓ (2) | ↓ (3) | ↓ (4) | ↓ (5) | ↓ (6) | ↓ (7) |

(1): Follow steps in sequence. When reassembling, follow the steps in reverse order.
These numbers are also used as Identification (location) No. of parts in the figures.

(2): Indicates the part to start disassembling with in order to disassemble the part in column (1).

(3): Name of the part

(4): Location of the part: T=Top B=Bottom R=Right L=Left

(5): Figure Number

(6): Identification of parts to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.
P=Spring, W=Washer, C=Cut Washer, S=Screw, *=Unhook, Unlock, Release, Unplug, or Desolder
e.g., 2(L-2) = two Locking Tabs (L-2).

(7): Adjustment Information for Installation
(+):Refer to Deck Exploded Views for lubrication.

.

* In case of some models, the Cleaner Lever Assembly is not used.

## Top View

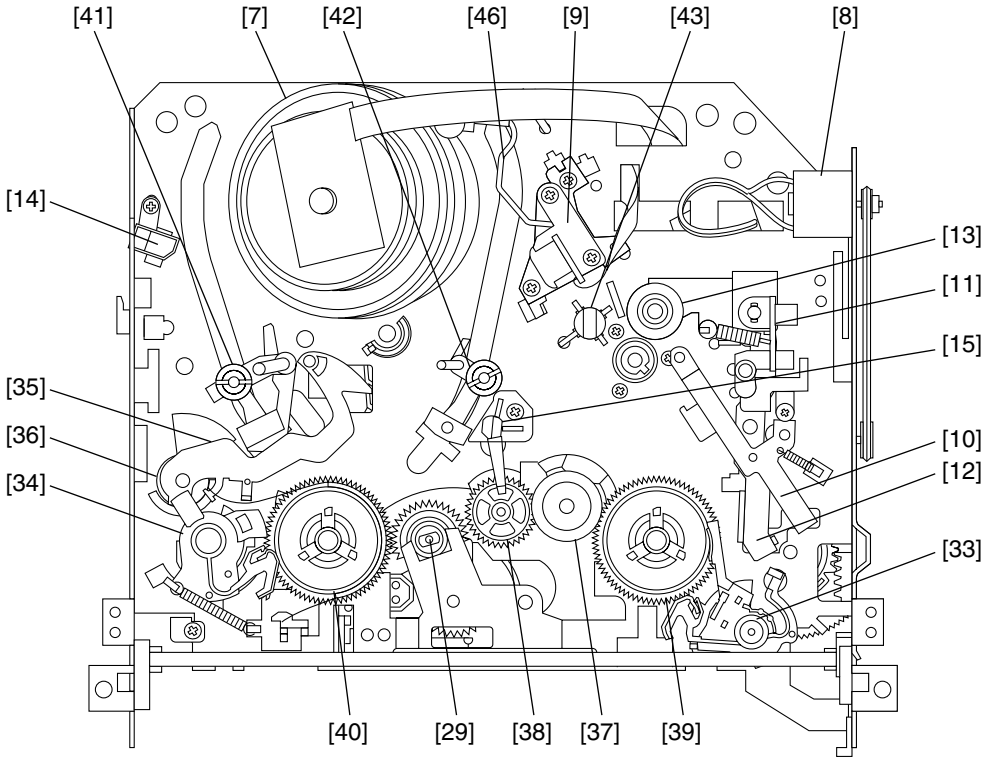



**Fig. DM1**

## Bottom View

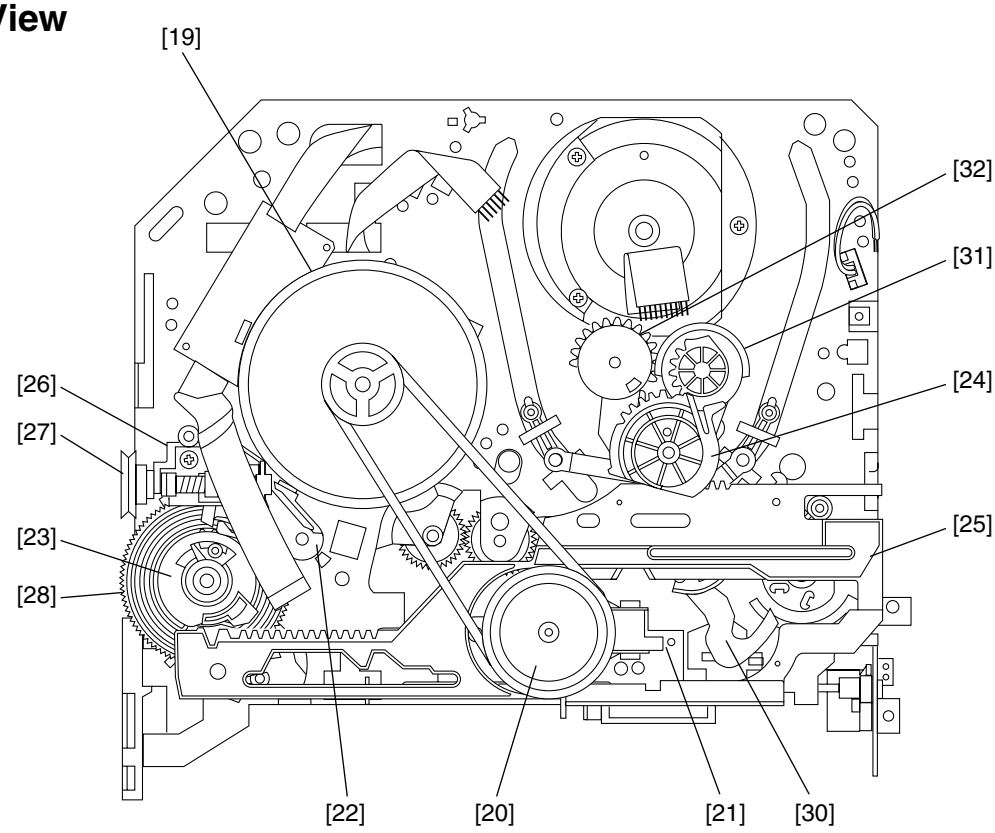



**Fig. DM2**

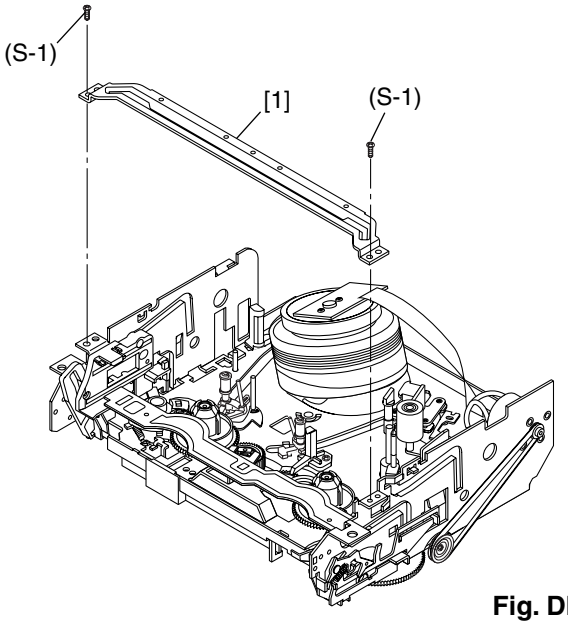



**Fig. DM3**

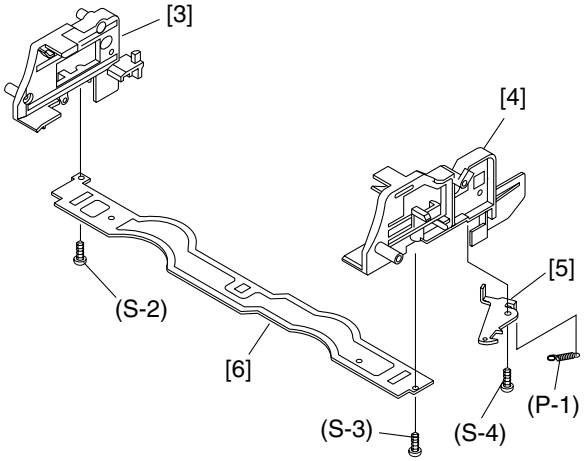
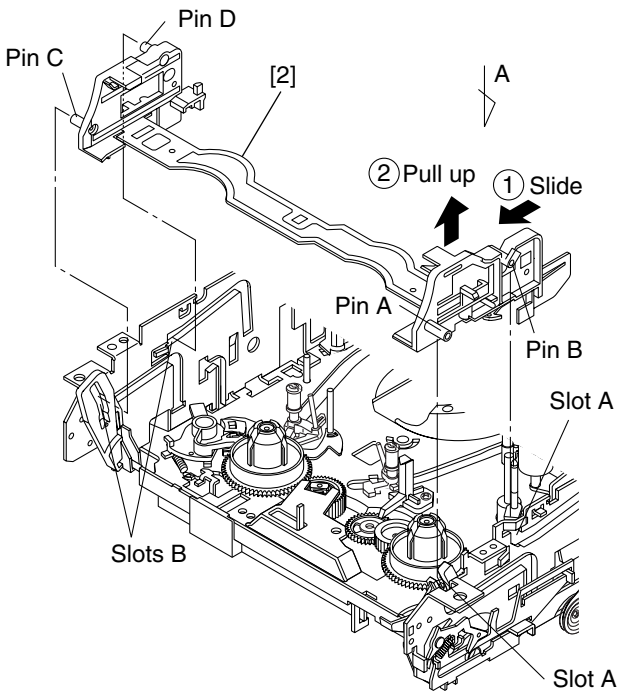



**Fig. DM5**




First, while pushing the locking tab as shown in the right, slide and pull up the right side on [2] to release Pin A and Pin B from the slots A.
Then, remove Pin C and Pin D on [2] from the slots B as shown.

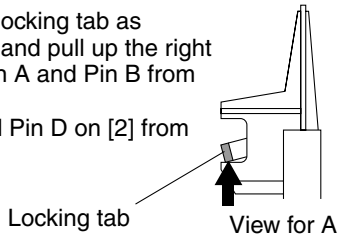
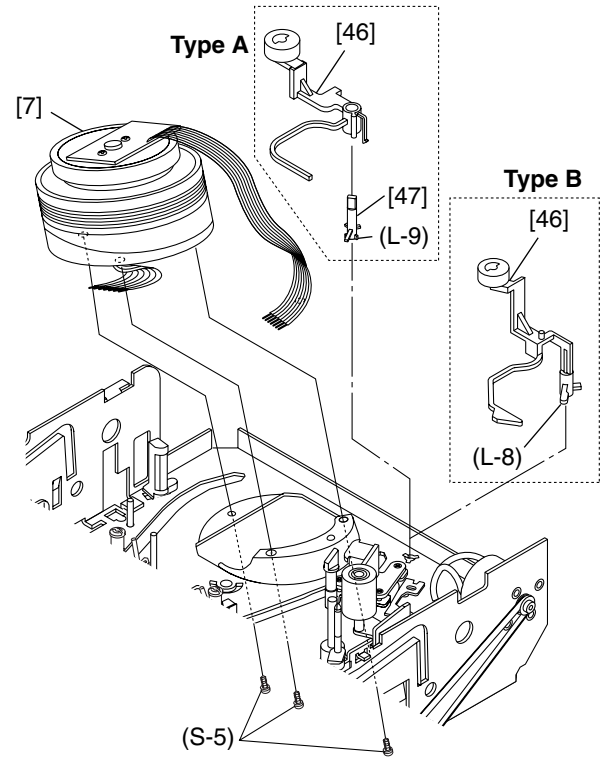



**Fig. DM4**



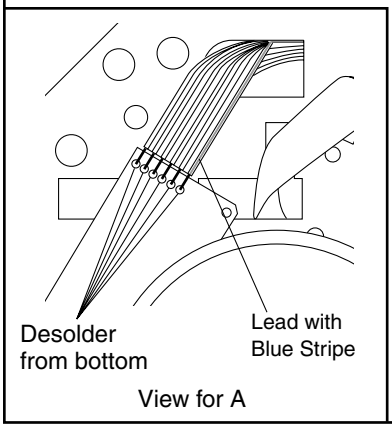




**Fig. DM6**

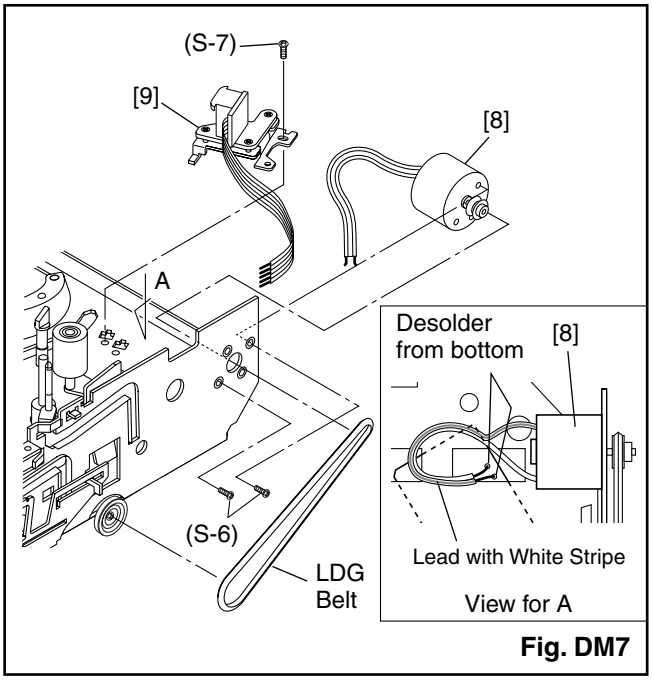



**Fig. DM7**

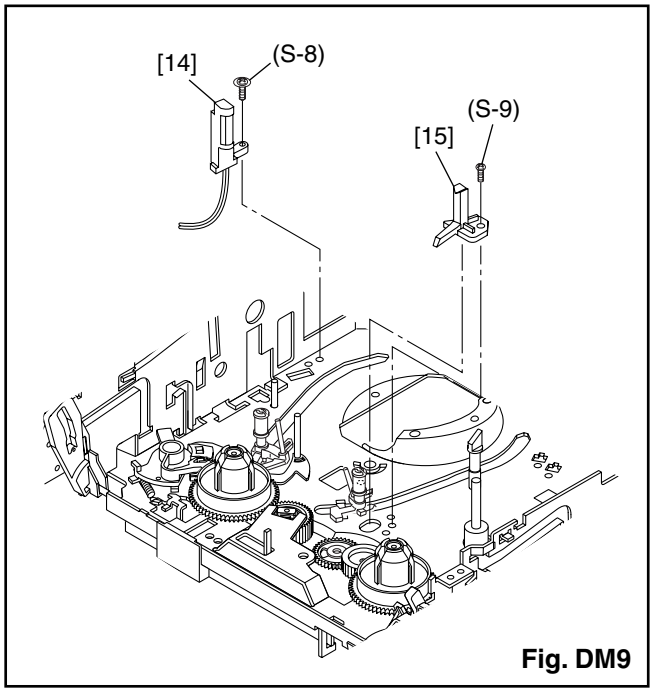
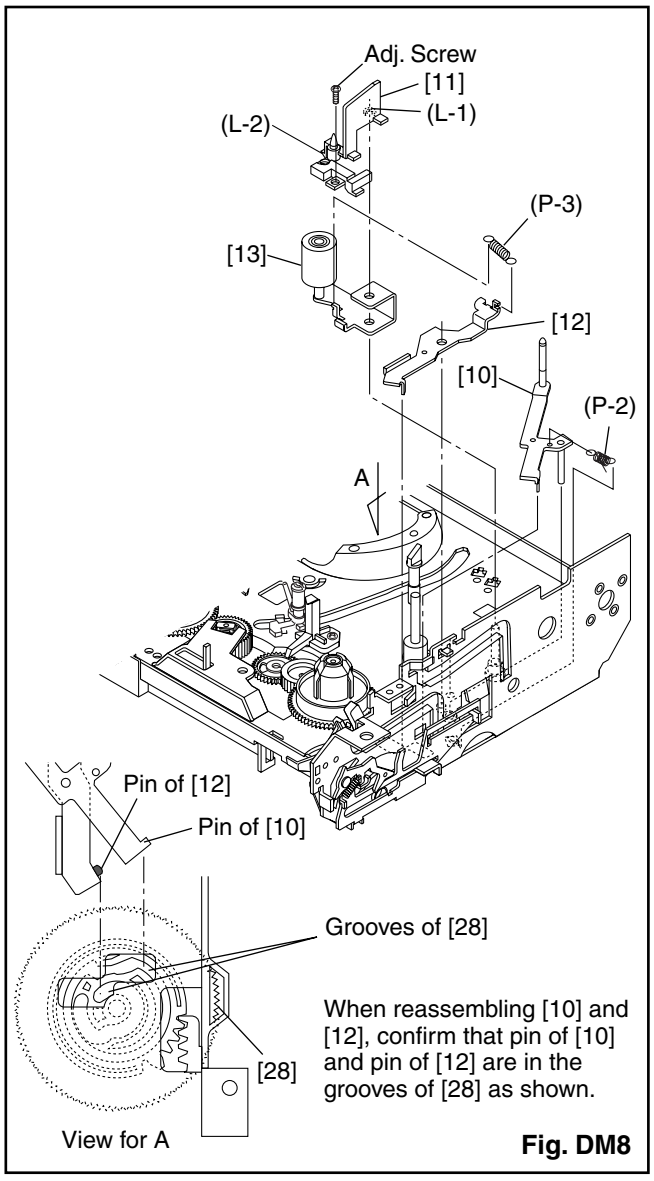



**Fig. DM9**




When reassembling [10] and [12], confirm that pin of [10] and pin of [12] are in the grooves of [28] as shown.

**Fig. DM8**

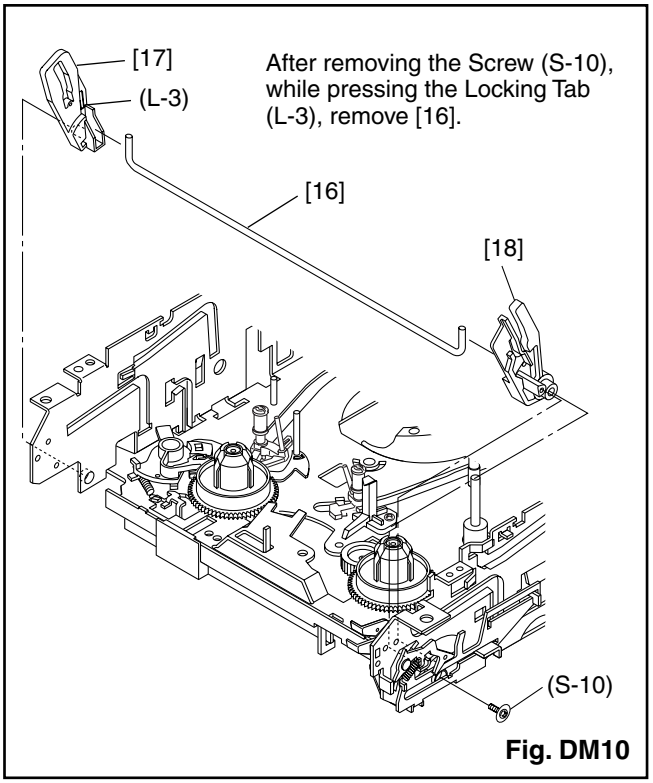



**Fig. DM10**

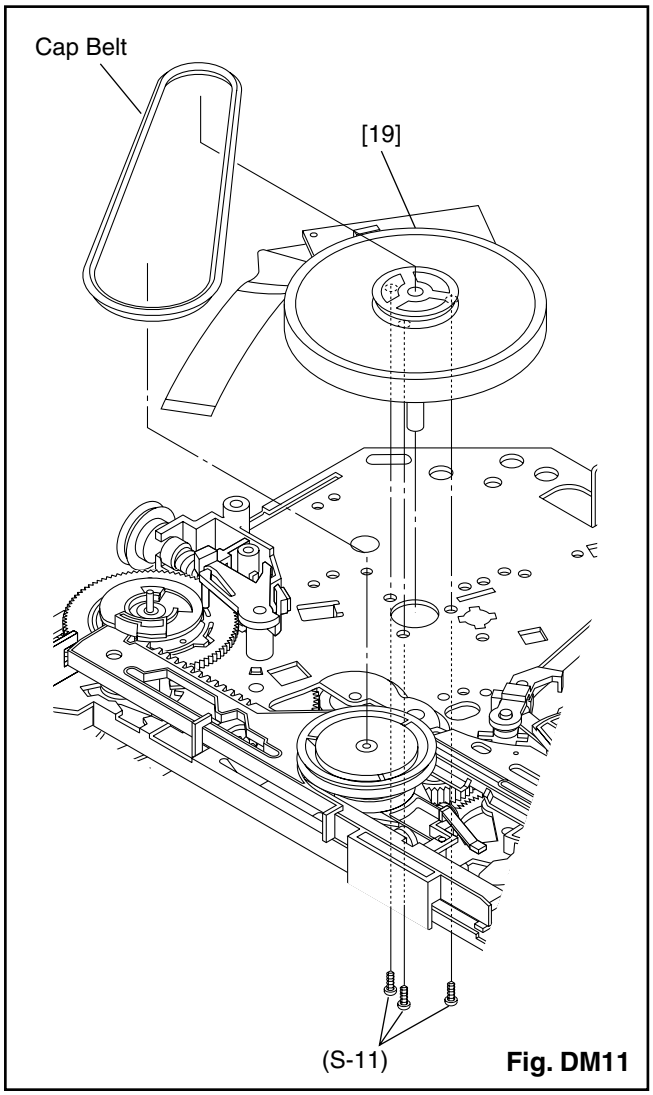



**Fig. DM11**

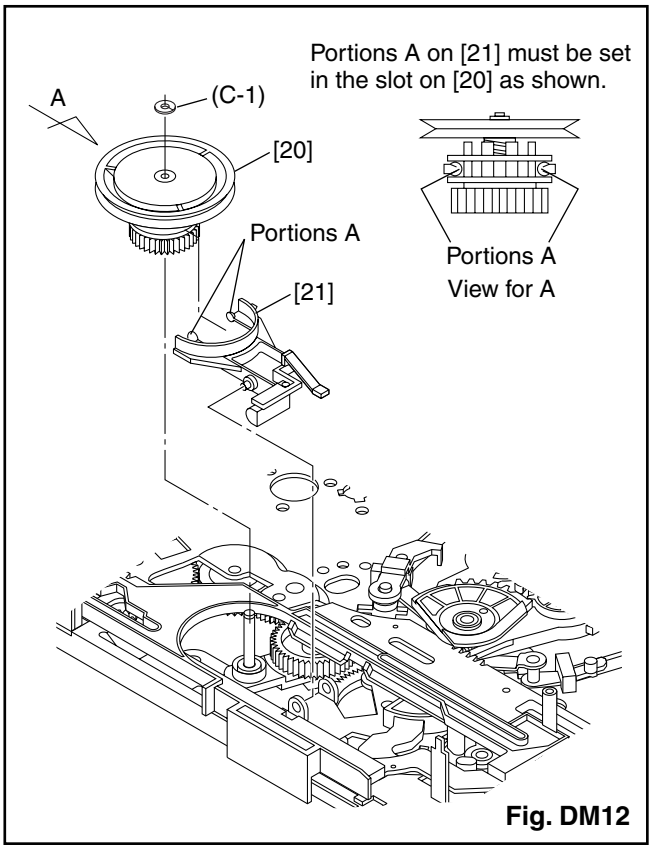
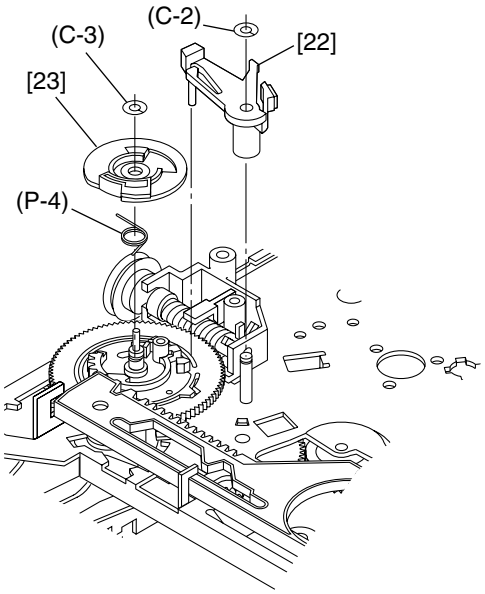
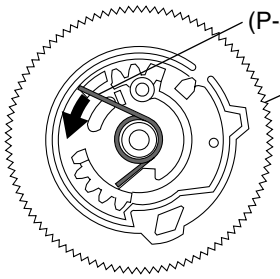


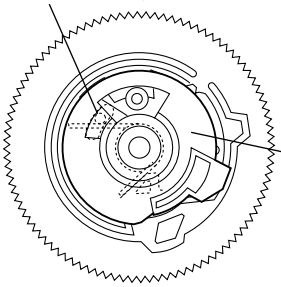

**Fig. DM12**



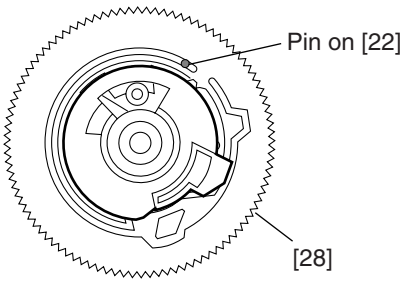




Pin on bottom of [23]

When installing [23], install the spring (P-4) to [28] as shown in the left figure, and then install [23] while pressing the spring (P-4) to the direction of the arrow in the left figure and confirming that the position of the spring (P-4) is placed as shown in the left figure.

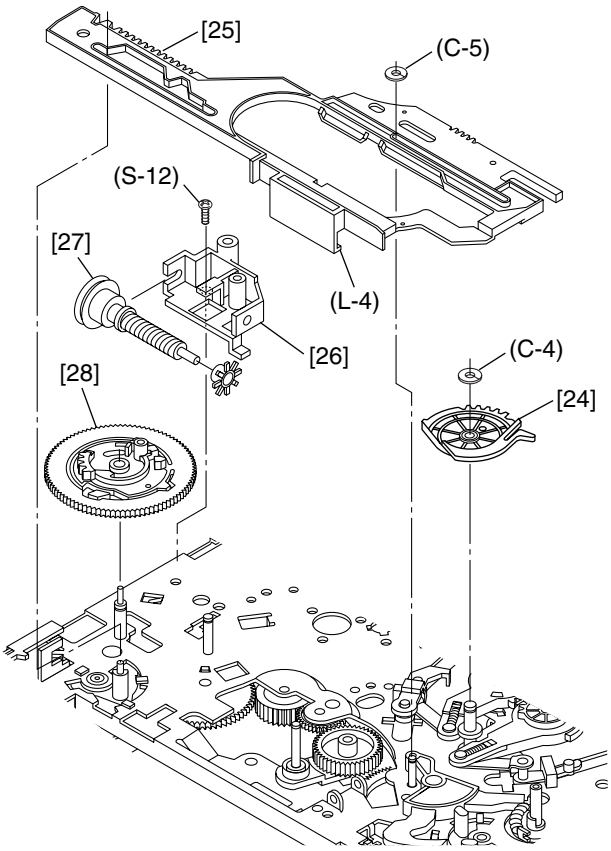



Top View

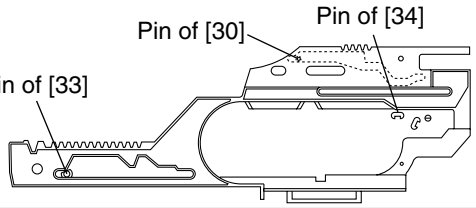


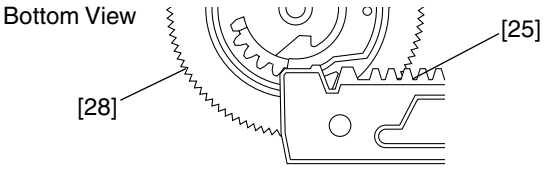

Position of pin on [22]

**Fig. DM13**

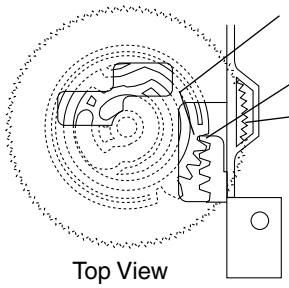



Position of Mode Lever when installed




Align [25] and [28] as shown.




When reassembling [28], meet the first groove on [28] to the first tooth on [44] as shown.

Top View

**Fig. DM14**

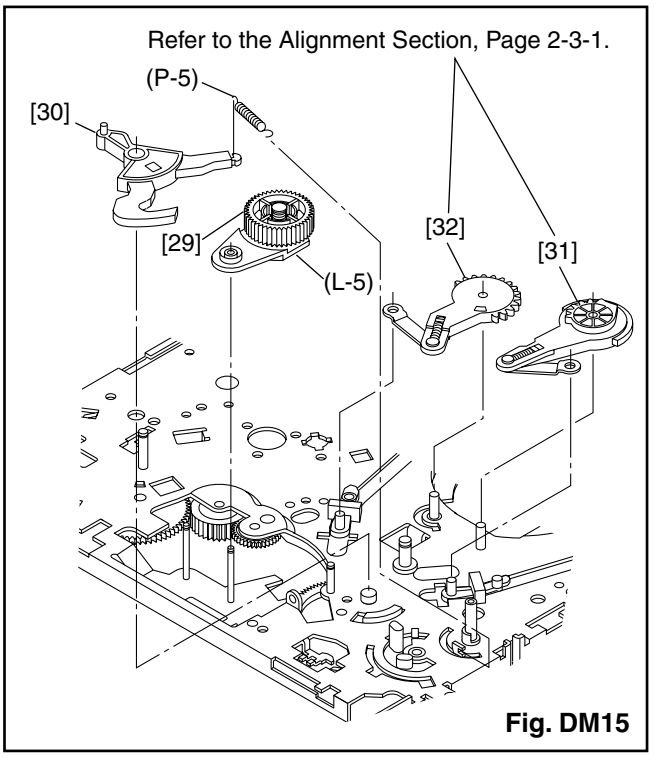



**Fig. DM15**

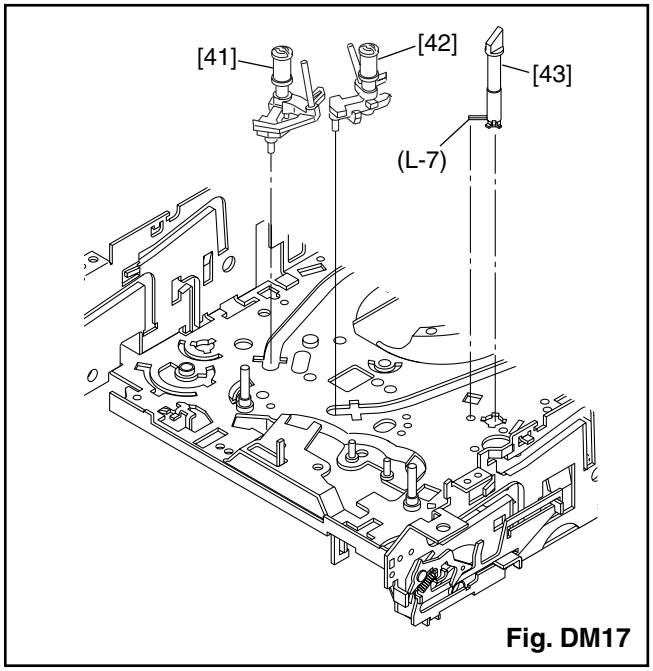



**Fig. DM17**

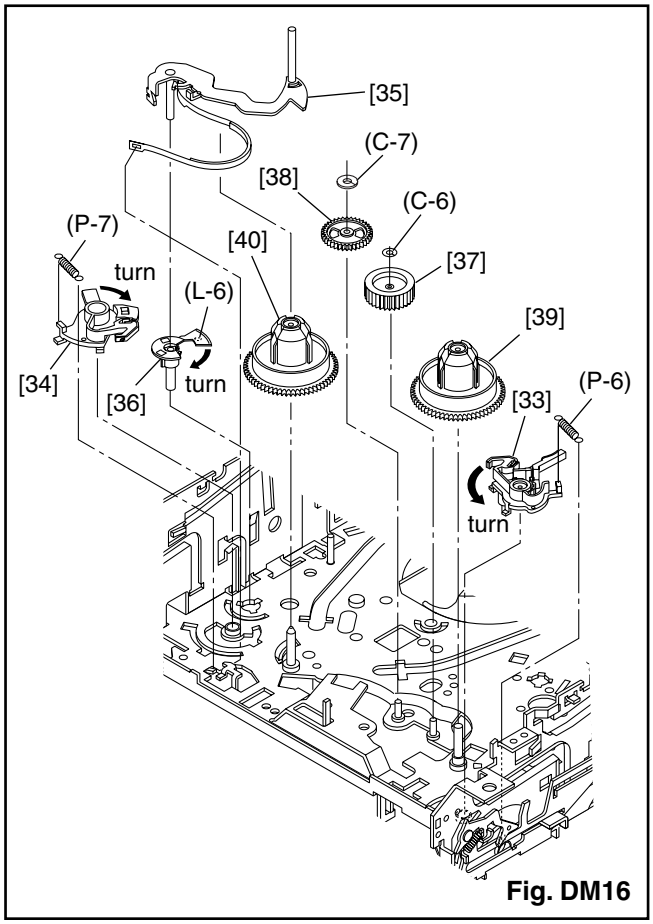



**Fig. DM16**

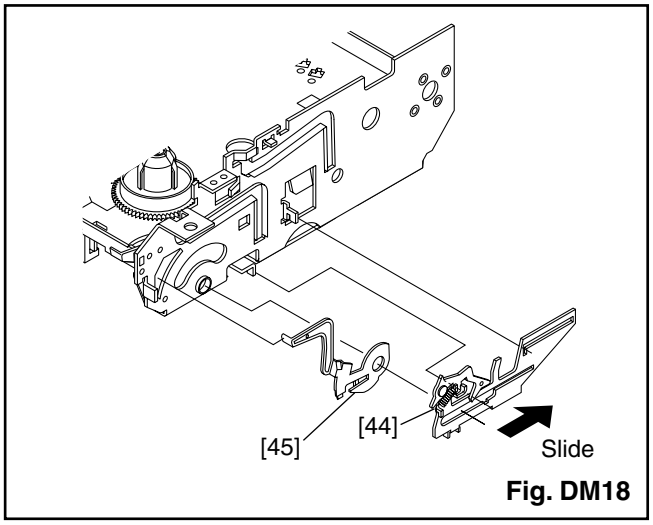



**Fig. DM18**

# ALIGNMENT PROCEDURES OF MECHANISM

The following procedures describe how to align the individual gears and levers that make up the tape loading/unloading mechanism. Since information about the state of the mechanism is provided to the System Control Circuit only through the Mode Switch, it is essential that the correct relationship between individual gears and levers be maintained.

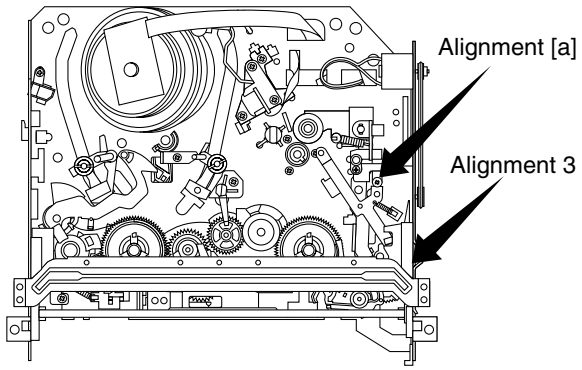
**All alignments are to be performed with the mechanism in Eject mode,** in the sequence given. Each procedure assumes that all previous procedures have been completed.

**IMPORTANT:**

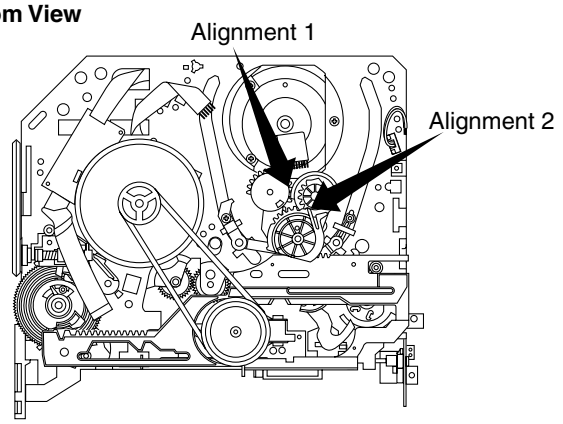
If any one of these alignments is not performed properly, even if off by only one tooth, the unit will unload or stop and it may result in damage to the mechanical or electrical parts.

## Alignment points in Eject Position

**Top View**




**Bottom View**




Alignment [a] can be done independently of any other alignment.

**Fig. AL1**

Alignment 1

## Loading Arm, S and T Assembly

Install Loading Arm S and T Assembly so that their triangle marks point to each other as shown in Fig. AL2.

Alignment 2

## Mode Gear

Keeping the two triangles pointing at each other, install the Loading Arm T Assembly so that the last tooth of the gear meets the most inside teeth of the Mode Gear. See Fig. AL2.

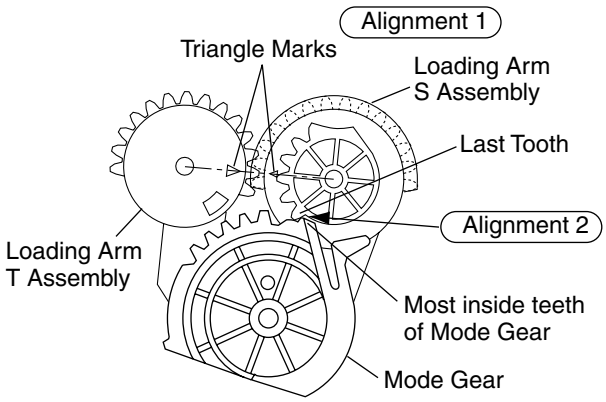



**Fig. AL2**

Alignment [a]

## Tape Guide Assembly

Measurement of the screw must be as specified in Fig. AL3.

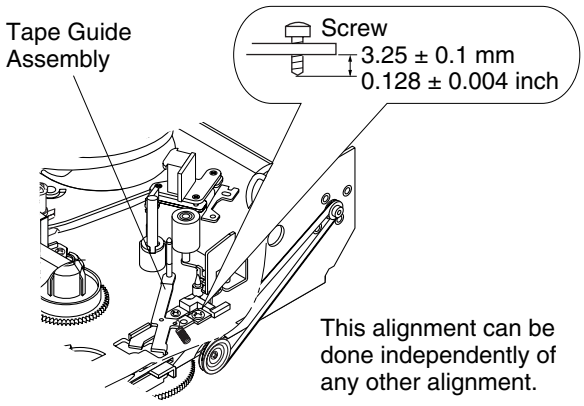



**Fig. AL3**

Alignment 3

## Cam Gear (A), Rack Assembly

Install the Rack Assembly so that the first tooth on the gear of the Rack Assembly meets the first groove on the Cam Gear (A) as shown in Fig. AL4.

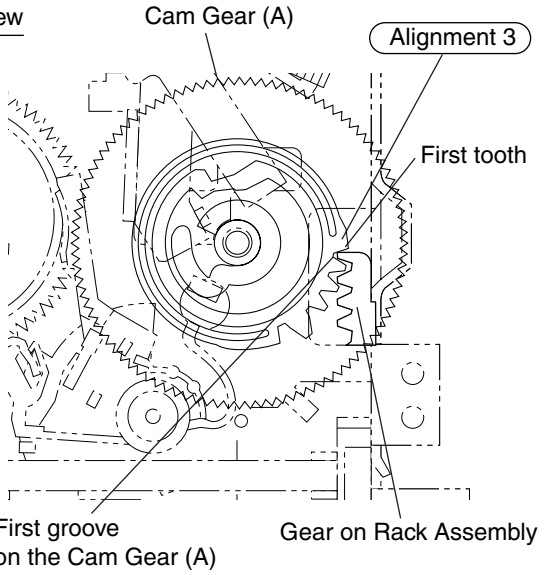



**Fig. AL4**

# ELECTRICAL ADJUSTMENT INSTRUCTIONS

**General Note: "CBA" is an abbreviation for "Circuit Board Assembly."**

**NOTE:**

1. Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to do these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.
2. To perform these alignment / confirmation procedures, make sure that the tracking control is set in the center position: Press either "▼" or "▲" button on the remote control unit first, then the "PLAY" button (Front Panel only).

## Test Equipment Required

1. Oscilloscope: Dual-trace with 10:1 probe,
   V-Range: 0.001~50V/Div.,
   F-Range: DC~AC-20MHz
2. Alignment Tape (MH-1)

## Head Switching Position Adjustment

**Purpose:**

To determine the Head Switching point during playback.

**Symptom of Misadjustment:**

May cause Head Switching noise or vertical jitter in the picture.

| Test point | Adj.Point | Mode | Input |
|---|---|---|---|
| TP751(V-OUT)<br>TP302(RF-SW)<br>GND | VR501<br>(Switching Point)<br>(MAIN CBA) | PLAY<br>(SP) | ----- |
| **Tape** | **Measurement Equipment** | **Spec.** | |
| MH-1 | Oscilloscope | 6.5H±1H<br>(412.7μs±60μs) | |

**Connections of Measurement Equipment**

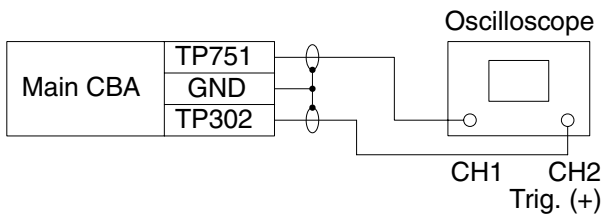
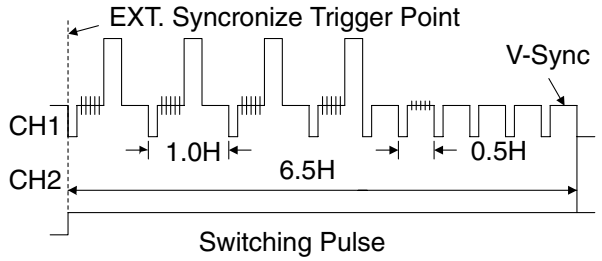



**Figure 1**

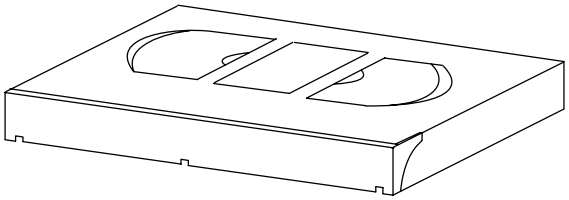



**Reference Notes:**

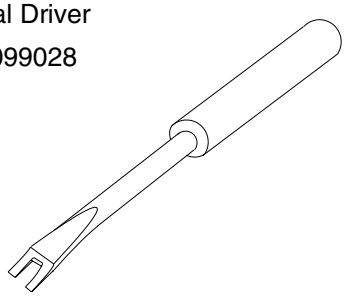
Play back the Alignment tape and adjust VR501 so that the V-sync front edge of the CH1 video output waveform is at the 6.5H(412.7μs) delayed position from the rising edge of the CH2 head switching pulse waveform.

# FIXTURE AND TAPE FOR ADJUSTMENT

1. Alignment Tape
   No. 7099046 (MH-1)



2. Special Driver
   No. 7099028



## How To Use The Fixtures And Tape

| Item No. | Name | Part No. | Adjustment |
|---|---|---|---|
| 1 | Alignment Tape | 7099046 | ● Head Switching Point<br>● Tape Interchangeability Alignment |
| 2 | Special Driver | 7099028 | ● Guide Roller |

# MECHANICAL ALIGNMENT PROCEDURES

Explanation of alignment for the tape to correctly run starts on the next page. Refer to the information below on this page if a tape gets stuck, for example, in the mechanism due to some electrical trouble of the unit.

## Service Information

**A.** Method for Manual Tape Loading/Unloading

To load a cassette tape manually:

1. Disconnect the AC plug.
2. Remove the Top Case and Front Assembly.
3. Insert a cassette tape. Though the tape will not be automatically loaded, make sure that the cassette tape is all the way in at the inlet of the Cassette Holder. To confirm this, lightly push the cassette tape further in and see if the tape comes back out, by a spring motion, just as much as you have pushed in.
4. Turn the LDG Belt in the appropriate direction shown in Fig. M1 for a minute or two to complete this task.

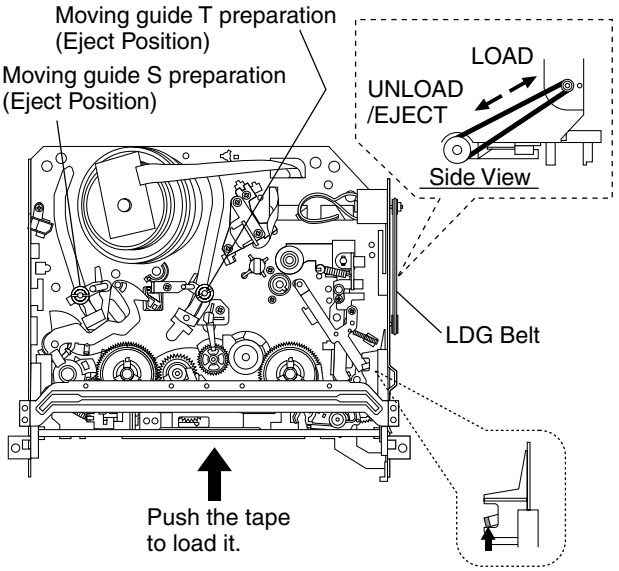
To unload a cassette tape manually:

1. Disconnect the AC plug.
2. Remove the Top Case and Front Assembly.
3. Make sure that the Moving guide preparations are in the Eject Position.
4. Turn the LDG Belt in the appropriate direction shown in Fig. M1 until the Moving guide preparations come to the Eject Position. Stop turning when the preparations begin clicking or can not be moved further. However, the tape will be left wound around the cylinder.
5. Turn the LDG Belt in the appropriate direction continuously, and the cassette tape will be ejected. Allow a minute or two to complete this task.

**B.** Method to place the Cassette Holder in the tape-loaded position without a cassette tape

1. Disconnect the AC Plug.
2. Remove the Top Case and Front Assembly.
3. Turn the LDG Belt in the appropriate direction shown in Fig. M1. Release the locking tabs shown in Fig. M1 and continue turning the LDG Belt until the Cassette Holder comes to the tape-loaded position. Allow a minute or two to complete this task.

**Top View**




Push the locking tab gently to unlock when loading without a cassette.

**Fig. M1**

**Bottom View**

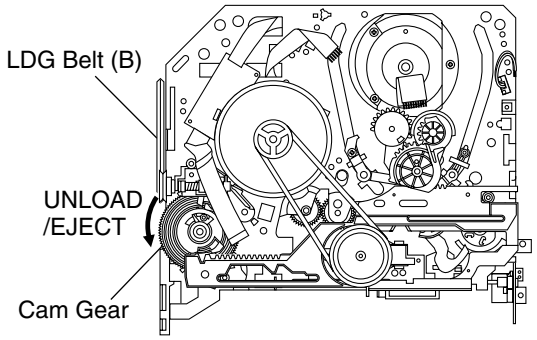



**Fig. M2**

# 1.Tape Interchangeability Alignment

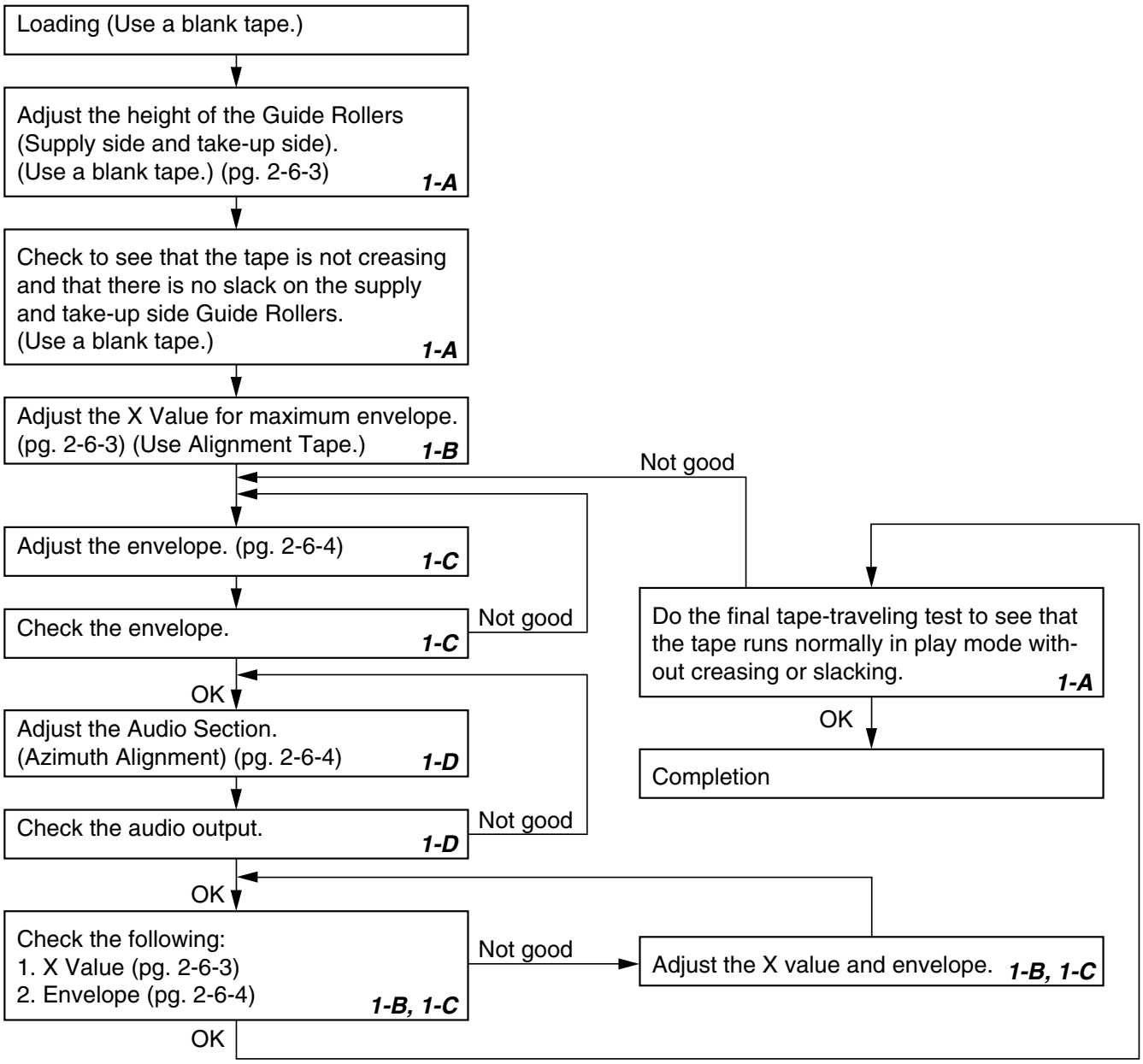
Note:
To do these alignment procedures, make sure that the Tracking Control Circuit is set to the center position every time a tape is loaded or unloaded. (Refer to page 2-6-4, procedure 1-C, step 2.)

**Equipment required:**

Dual Trace Oscilloscope
VHS Alignment Tape (MH-1)
Guide Roller Adj. Screwdriver
X-Value Adj. Screwdriver

Note: Before starting this Mechanical Alignment, do all Electrical Adjustment procedures.

**Flowchart of Alignment for tape traveling**



## 1-A. Preliminary/Final Checking and Alignment of Tape Path

**Purpose:**

To make sure that the tape path is well stabilized.

**Symptom of Misalignment:**

If the tape path is unstable, the tape will be damaged.

**Note:** Do not use an Alignment Tape for this procedure. If the unit is not correctly aligned, the tape may be damaged.

1. Play back a blank cassette tape and check to see that the tape runs without creasing at Guide Rollers [2] and [3], and at points A and B on the lead surface. (Refer to Fig M3 and M4.)
2. If creasing is apparent, align the height of the guide rollers by turning the top of Guide Rollers [2] and [3] with a Guide Roller Adj. Screwdriver. (Refer to Fig. M3 and M5.)

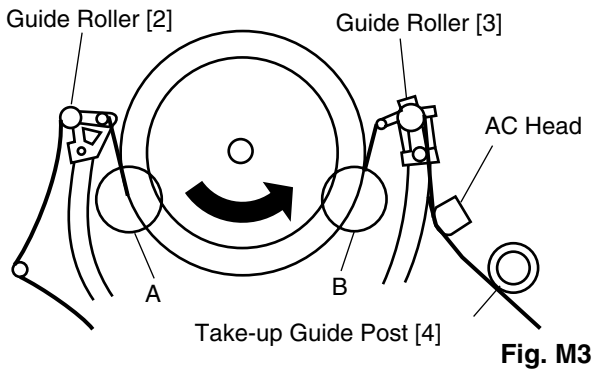


**Fig. M3**

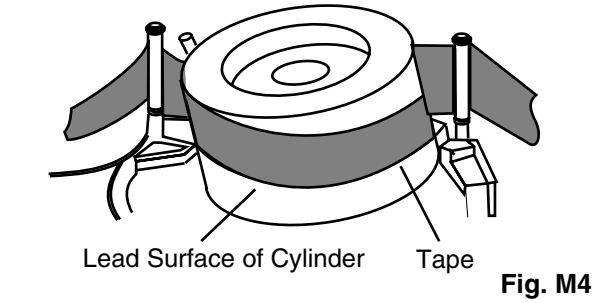


**Fig. M4**

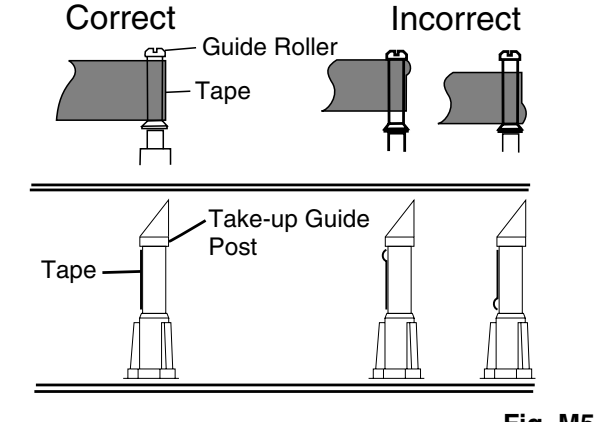


**Fig. M5**

3. Check to see that the tape runs without creasing at Take-up Guide Post [4] or without snaking between Guide Roller [3] and AC Head. (Fig. M3 and M5)
4. If creasing or snaking is apparent, adjust the Tilt Adj. Screw of the AC Head. (Fig. M6)

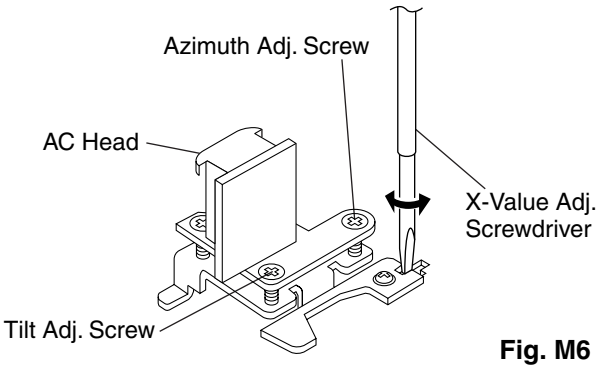


**Fig. M6**

## 1-B. X Value Alignment

**Purpose:**

To align the Horizontal Position of the Audio/Control/Erase Head.

**Symptom of Misalignment:**

If the Horizontal Position of the Audio/Control/Erase Head is not properly aligned, maximum envelope cannot be obtained at the Neutral position of the Tracking Control Circuit.

1. Connect the oscilloscope to TP301 (C-PB) and TP303 (CTL) on the Main CBA. Use TP302 (RF-SW) as a trigger.
2. Play back the Gray Scale of the Alignment Tape (MH-1) and confirm that the PB FM signal is present.
3. Set the Tracking Control Circuit to the center position by pressing CH UP button then " PLAY " button on the unit. (Refer to note on bottom of page 2-6-4.)
4. Use the X-Value Adj. Screwdriver so that the PB FM signal at TP301 (C-PB) is maximum. (Fig. M6)
5. Press CH UP button on the unit until the CTL waveform has shifted by approx. +2msec. Make sure that the envelope is simply attenuated (shrinks in height) during this process so that you will know the envelope has been at its peak.

6. Press CH DOWN button on the unit until the CTL waveform has shifted from its original position (not the position achieved in step 5, but the position of CTL waveform in step 4) by approximately -2msec. Make sure that the envelope is simply attenuated (shrinks in height) once CTL waveform passes its original position and is further brought in the minus direction.
7. Set the Tracking Control Circuit to the center position by pressing CH UP button and then " PLAY " button.

## 1-C. Checking/Adjustment of Envelope Waveform

**Purpose:**

To achieve a satisfactory picture and precise tracking.

**Symptom of Misalignment:**

If the envelope output is poor, noise will appear in the picture. The tracking will then lose precision and the playback picture will be distorted by any slight variation of the Tracking Control Circuit.

1. Connect the oscilloscope to TP301 (C-PB) on the Main CBA. Use TP302 (RF-SW) as a trigger.
2. Play back the Gray Scale on the Alignment Tape (MH-1). Set the Tracking Control Circuit to the center position by pressing CH UP button and then " PLAY " button on the unit. Adjust the height of Guide Rollers [2] and [3] (Fig. M3, Page 2-6-3) watching the oscilloscope display so that the envelope becomes as flat as possible. To do this adjustment, turn the top of the Guide Roller with the Guide Roller Adj. Screwdriver.
3. If the envelope is as shown in Fig. M7, adjust the height of Guide Roller [2] (Refer to Fig. M3) so that the waveform looks like the one shown in Fig. M9.
4. If the envelope is as shown in Fig. M8, adjust the height of Guide Roller [3] (Refer to Fig. M3) so that the waveform looks like the one shown in Fig. M9.
5. When Guide Rollers [2] and [3] (Refer to Fig.M3) are aligned properly, there is no envelope drop either at the beginning or end of track as shown in Fig. M9.

Note: Upon completion of the adjustment of Guide Rollers [2] and [3] (Refer to Fig. M3), check the X Value by pushing the CH UP or DOWN buttons alternately, to check the symmetry of the envelope. Check the number of pushes to ensure center position. The number of pushes CH UP button to achieve 1/2 level of envelope should match the number of pushes CH DOWN button from center. If required, redo the "X Value Alignment."

## 1-D. Azimuth Alignment of Audio/Control/ Erase Head

**Purpose:**

To correct the Azimuth alignment so that the Audio/ Control/Erase Head meets tape tracks properly.

**Symptom of Misalignment:**

If the position of the Audio/Control/Erase Head is not properly aligned, the Audio S/N Ratio or Frequency Response will be poor.

1. Connect the oscilloscope to the audio output jack on the rear side of the deck.
2. Play back the alignment tape (MH-1) and confirm that the audio signal output level is 8kHz.
3. Adjust Azimuth Adj. Screw so that the output level on the AC Voltmeter or the waveform on the oscilloscope is at maximum. (Fig. M6)

Dropping envelope level at the beginning of track.

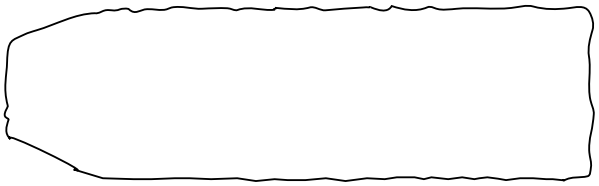


**Fig. M7**

Dropping envelope level at the end of track.

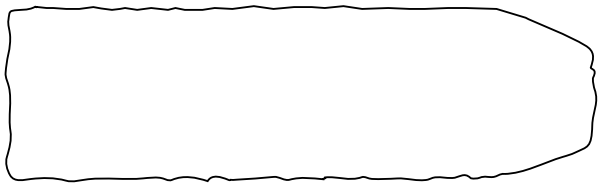


**Fig. M8**

Envelope is adjusted properly. (No envelope drop)

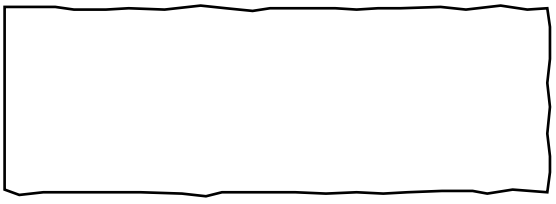


**Fig. M9**

# STANDARD MAINTENANCE

## Service Schedule of Components

h: Hours ❍: Check ●: Change

| Deck | | Periodic Service Schedule | | | |
|---|---|---|---|---|---|
| **Ref.No.** | **Part Name** | **1,000 h** | **2,000 h** | **3,000 h** | **4,000 h** |
| B2 | Cylinder Assembly | ❍ | ● | ❍ | ● |
| B3 | Loading Motor Assembly | | | ● | |
| B8 | Pulley Assembly | | ● | | ● |
| B27 | Tension Lever Sub Assembly | | ● | | ● |
| B31 | AC Head Assembly | | | ● | |
| B573,B574 | Reel S, Reel T | | | ● | |
| B37 | Capstan Motor | | ● | | ● |
| B52 | Cap Belt | | ● | | ● |
| *B73 | FE Head | | | ● | |
| B133 | Idler Assembly | | ● | | ● |
| B410 | Pinch Arm (A) Assembly | | ● | | ● |
| B414 | M Brake S Assembly | | ● | | ● |
| B416 | M Brake T Assembly | | ● | | ● |
| B525 | LDG Belt | | ● | | ● |

**Notes:**

1. Clean all parts for the tape transport (Upper Drum with Video Head / Pinch Roller / Audio Control Head / Full Erase Head) using 90% Isopropyl Alcohol.
2. After cleaning the parts, do all DECK ADJUSTMENTS.
3. For the reference numbers listed above, refer to Deck Exploded Views.

   * B73 ------ Recording Model only

# Cleaning

## Cleaning of Video Head

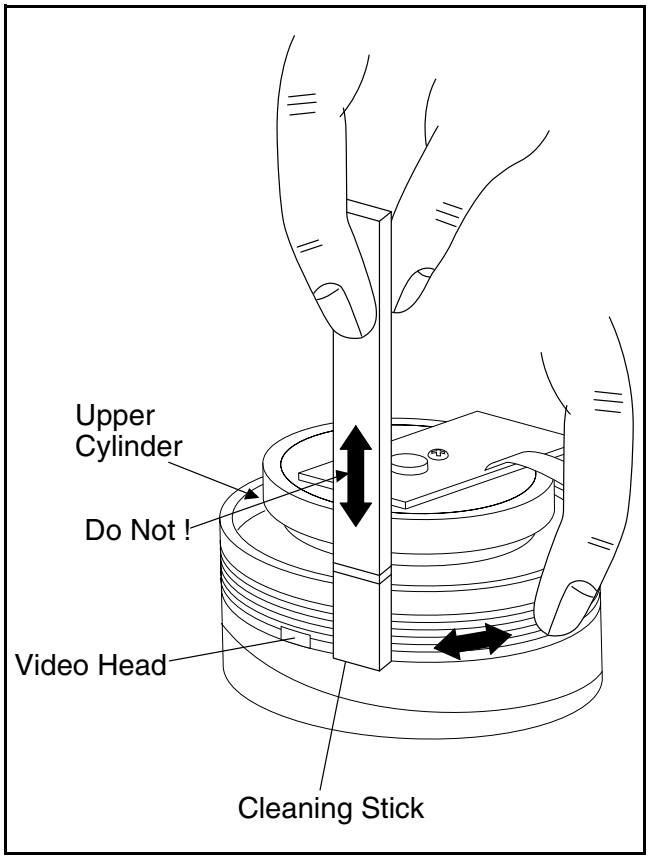
Clean the head with a head cleaning stick or chamois cloth.

**Procedure**

1. Remove the top cabinet.
2. Put on a glove (thin type) to avoid touching the upper and lower drum with your bare hand.
3. Put a few drops of 90% Isopropyl alcohol on the head cleaning stick or on the chamois cloth and, by slightly pressing it against the head tip, turn the upper drum to the right and to the left.

**Notes:**

1. The video head surface is made of very hard material, but since it is very thin, avoid cleaning it vertically.
2. Wait for the cleaned part to dry thoroughly before operating the unit.
3. Do not reuse a stained head cleaning stick or a stained chamois cloth.




## Cleaning of Audio Control Head

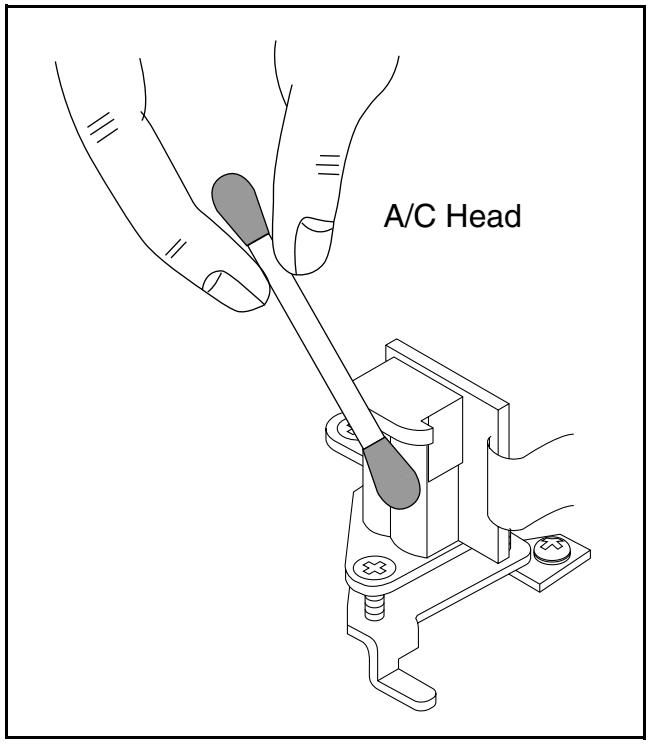
Clean the head with  a cotton swab.

**Procedure**

1. Remove the top cabinet.
2. Dip the cotton swab in 90% isopropyl alcohol and clean the audio control head. Be careful not to damage the upper drum and other tape running parts.

**Notes:**

1. Avoid cleaning the audio control head vertically.
2. Wait for the cleaned part to dry thoroughly before operating the unit or damage may occur.



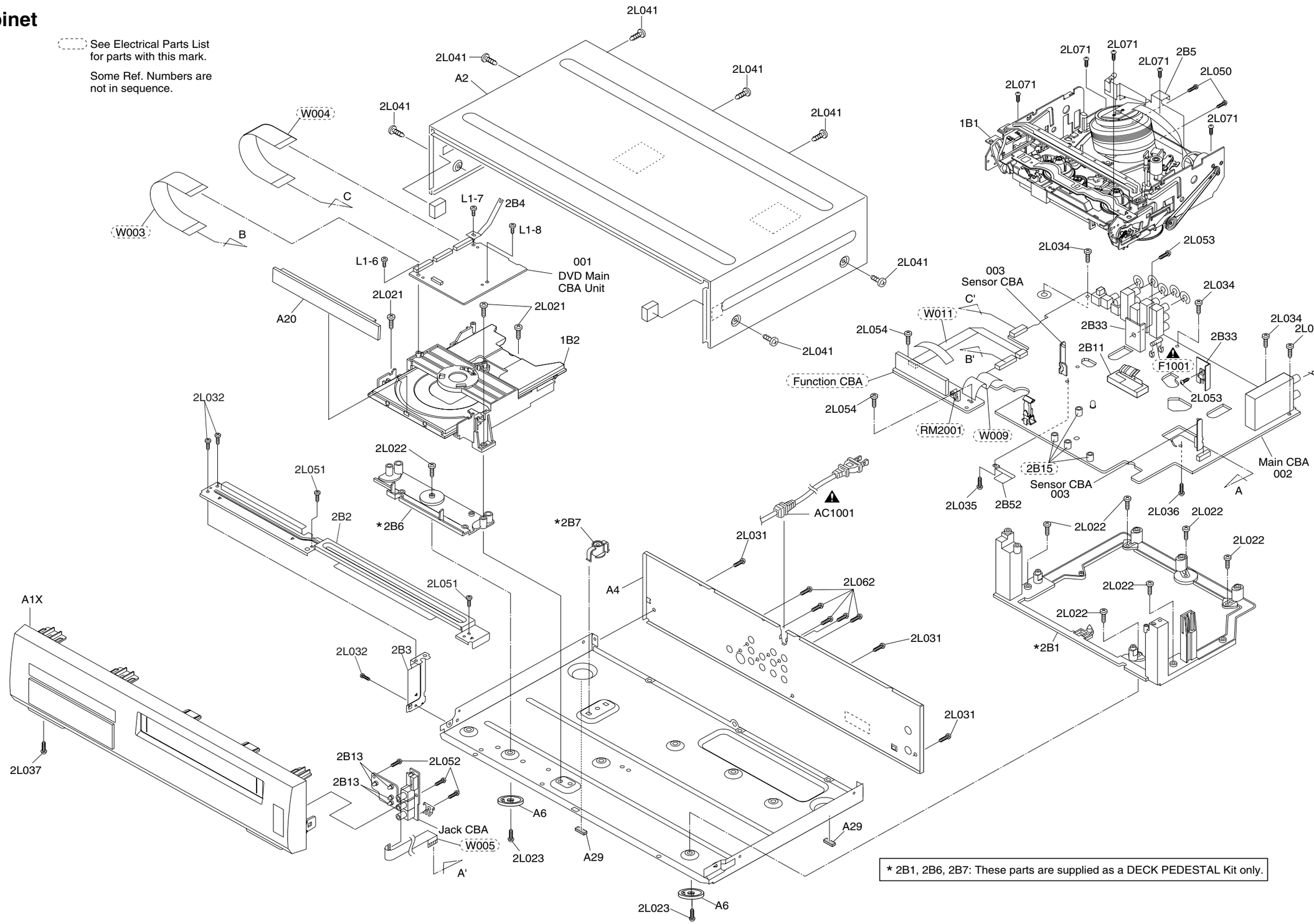
# CHAPTER 3 EXPLODED VIEWS AND PARTS LIST

## EXPLODED VIEWS

### Cabinet

See Electrical Parts List for parts with this mark.

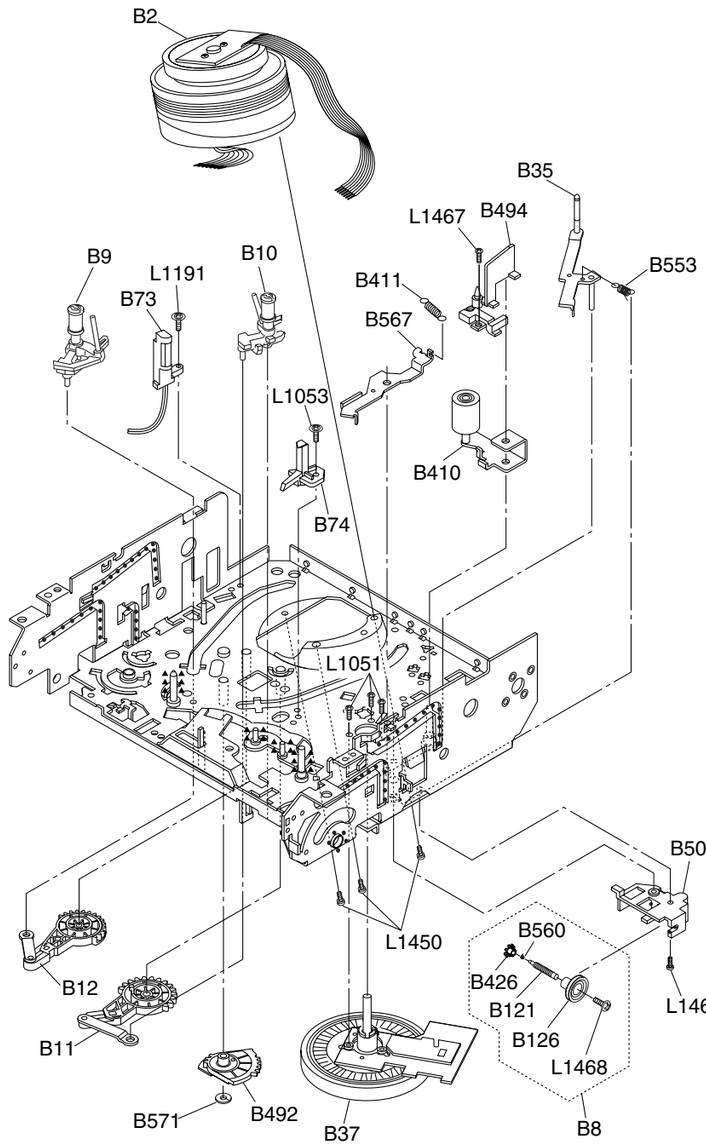
Some Ref. Numbers are not in sequence.

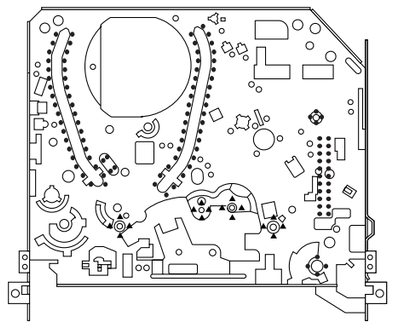



* 2B1, 2B6, 2B7: These parts are supplied as a DECK PEDESTAL Kit only.

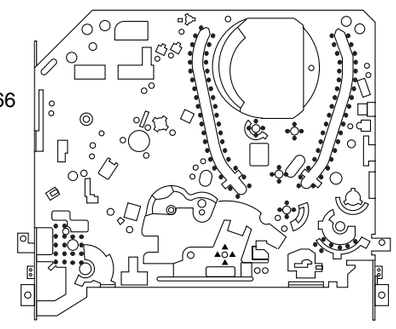
## Deck Mechanism View 1

| Mark | Description |
|---|---|
| ●●●●● | Floil G-374G (Blue grease) |
| ▲▲▲▲▲ | SLIDUS OIL #150 |



Chassis Assembly
Top View (Lubricating Point)

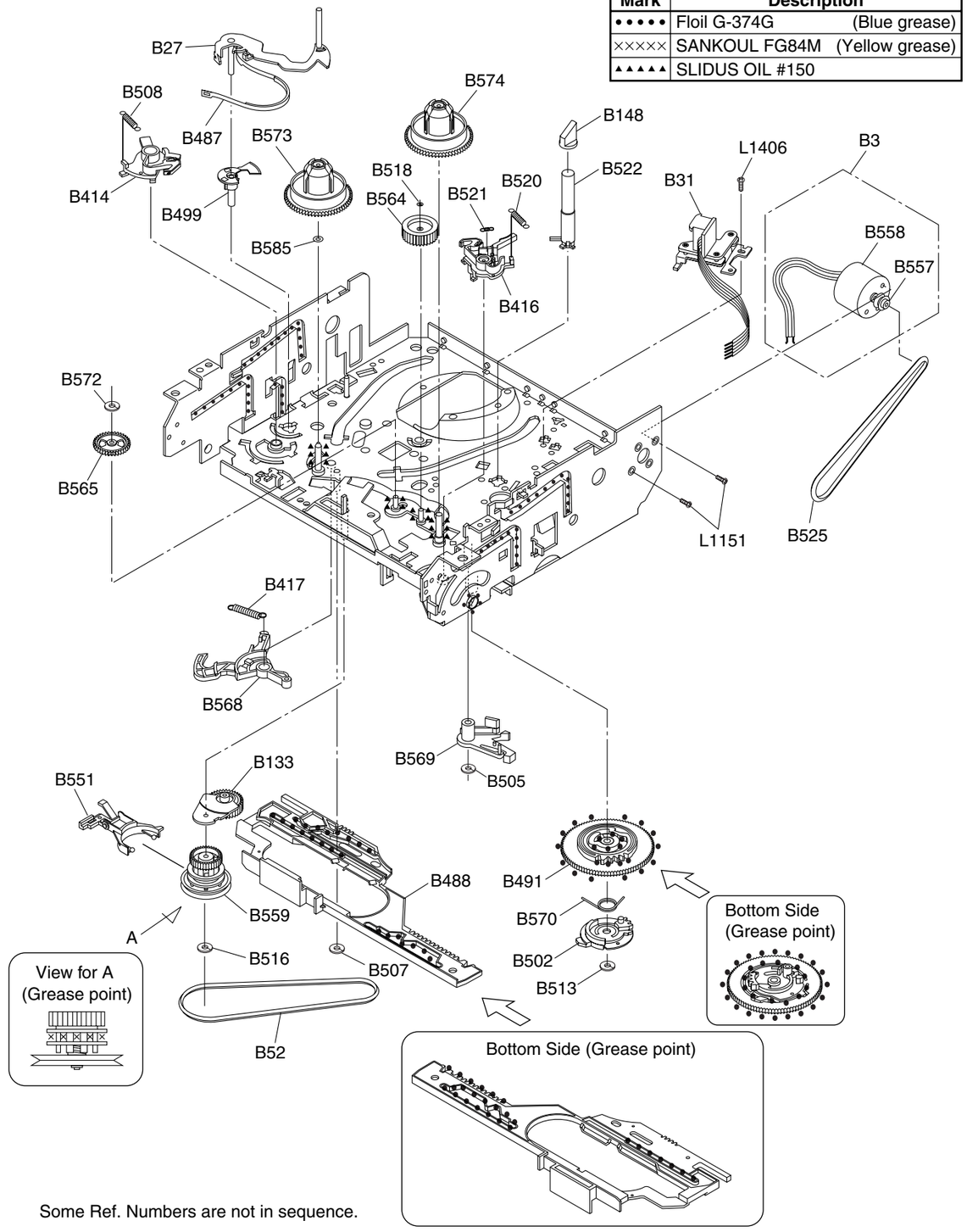


Chassis Assembly
Bottom View (Lubricating Point)

Some Ref. Numbers are not in sequence.

## Deck Mechanism View 2

| Mark | Description |
|---|---|
| ●●●●● | Floil G-374G (Blue grease) |
| ××××× | SANKOUL FG84M (Yellow grease) |
| ▲▲▲▲▲ | SLIDUS OIL #150 |



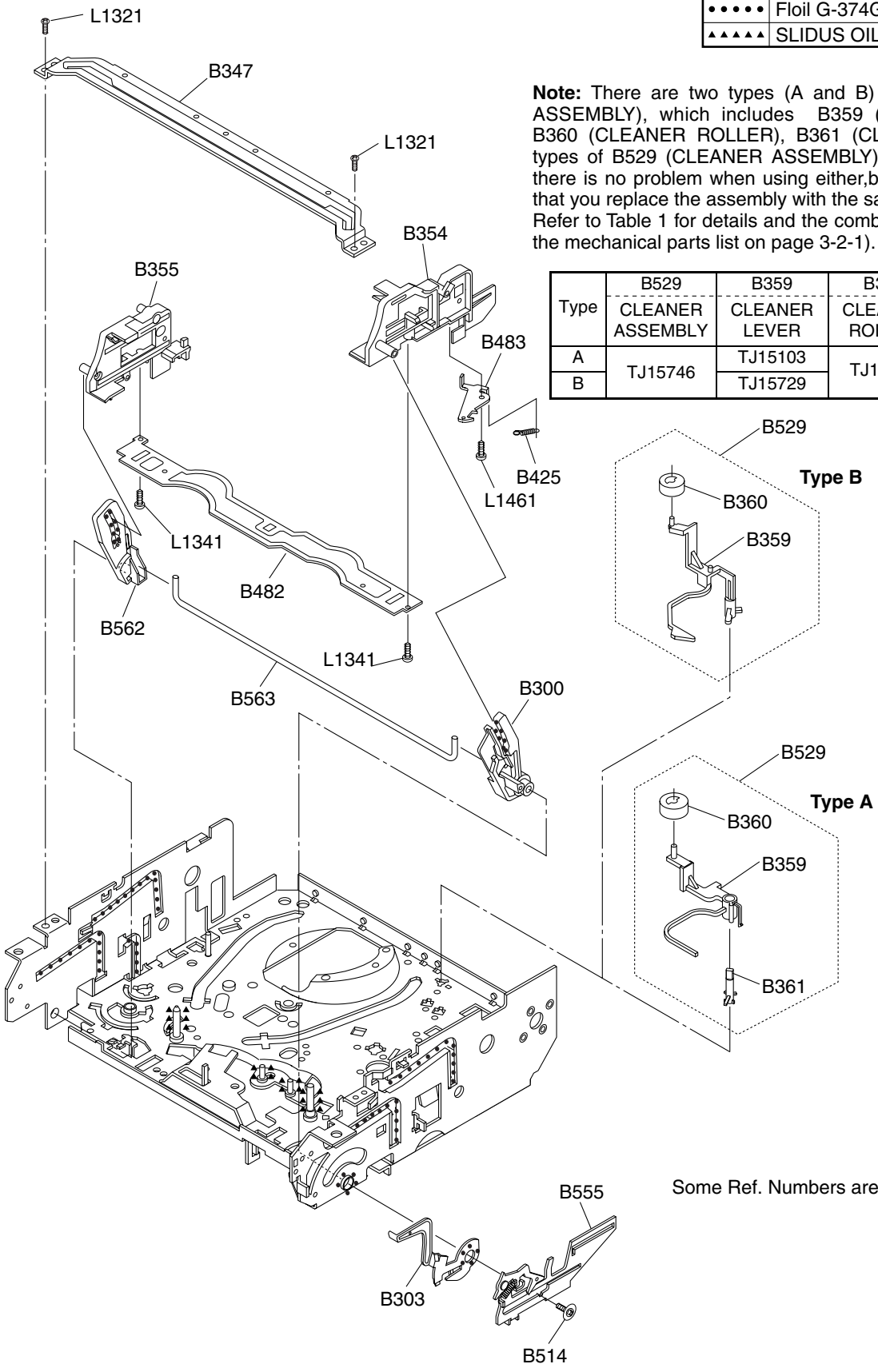

Some Ref. Numbers are not in sequence.

# Deck Mechanism View 3

| Mark | Description |
|---|---|
| • • • • • | Floil G-374G (Blue grease) |
| ▲ ▲ ▲ ▲ ▲ | SLIDUS OIL #150 |

**Note:** There are two types (A and B) of B529 (CLEANER ASSEMBLY), which includes B359 (CLEANER LEVER), B360 (CLEANER ROLLER), B361 (CL POST), etc. These types of B529 (CLEANER ASSEMBLY) are compatible, and there is no problem when using either,but it is recommended that you replace the assembly with the same type if possible. Refer to Table 1 for details and the combination, (also, refer to the mechanical parts list on page 3-2-1).

| Type | B529 CLEANER ASSEMBLY | B359 CLEANER LEVER | B360 CLEANER ROLLER | B361 CL POST |
|---|---|---|---|---|
| A | TJ15746 | TJ15103 | TJ15104 | TJ15105 |
| B | | TJ15729 | | NOT Used |




Some Ref. Numbers are not in sequence.

# REPLACEMENT PARTS LIST

## Mechanical Parts List

| SYMBOL-NO | P-NO | DESCRIPTION |
|---|---|---|
| | | **MECHANISM SECTION** |
| A1X | TS17311 | FRONT ASSEMBLY |
| A2 | TJ15941 | TOP COVER |
| A4 | TJ15942 | PANEL, REAR |
| A6 | TS17312 | INSULATOR ASSEMBLY |
| A20 | TS17313 | TRAY ASSEMBLY |
| A29 | TJ15943 | FOOT |
| ⚠ AC1001! | TE14761 | AC CORD |
| 1B1 | TS17314 | DECK ASSEMBLY |
| 1B2 | TS17315 | DVD LODER ASSEMBLY |
| 2B1 | TJ15944 | DECK PEDESTAL |
| 2B2 | TJ15945 | TOP BRACKET |
| 2B3 | TJ15946 | SIDE BRACKET |
| 2B5 | TJ15947 | SHEILD, CYLINDER |
| 2B6 | TJ15944 | DECK PEDESTAL |
| 2B7 | TJ15944 | DECK PEDESTAL |
| 2B11 | TS17391 | SHIELD ASSEMBLY |
| 2B13 | TE13012 | BUSH, LED(E) |
| 2B15 | TJ15122 | BUSH, LED(F) |
| 2B33 | TJ15971 | HEATSINK |
| 2L021 | TJ15951 | SCREW |
| 2L022 | TJ15952 | SCREW (3X8) |
| 2L031 | TJ10176 | SCREW (M3X6) |
| 2L032 | TJ10176 | SCREW (M3X6) |
| 2L034 | TJ10176 | SCREW (M3X6) |
| 2L035 | TJ15953 | SCREW (M3X8) |
| 2L036 | TJ15954 | SCREW (M3X8) |
| 2L037 | TJ10176 | SCREW (M3X6) |
| 2L041 | TJ15891 | SCREW (M3X5) |
| 2L050 | TJ15955 | SCREW (M3X5) |
| 2L051 | TJ10177 | SCREW (3X8) |
| 2L052 | TJ10177 | SCREW (3X8) |
| 2L053 | TJ15956 | SCREW (3X8) |
| 2L054 | TJ10177 | SCREW (3X8) |
| 2L062 | TJ15892 | SCREW (M3X8) |
| 2L071 | TJ10119 | SCREW (M3X10) |
| B2 | TS17441 | CYLINDER ASSEMBLY |
| B3 | TS17442 | LOADING MOTOR ASSEMBLY |
| B8 | TS17443 | PULLEY ASSEMBLY |
| B9 | TJ15152 | MOVING GUIDE (S) |
| B10 | TJ15153 | MOVING GUIDE (T) |
| B11 | TS17444 | LOADING ARM (T) ASSEMBLY |
| B12 | TS17445 | LOADING ARM (S) ASSEMBLY |
| B27 | TS17446 | TENSION LEVER SUB ASSEMBLY |
| B31 | TS17447 | AC HEAD |
| B35 | TS17448 | TAPE GUIDE |
| B37 | TJ15981 | CAPSTAN MOTOR |
| B52 | TJ15161 | CAP BELT |
| B73 | TS17499 | FE HEAD |
| B74 | TJ15163 | PRISM |
| B121 | TJ15982 | WORM |
| B126 | TJ15983 | PULLEY |
| B133 | TJ15168 | IDLER ASSEMBLY |
| B148 | TJ15984 | TG CAP |
| B300 | TJ15985 | CASSETTE DRIVE LEVER (R) |
| B303 | TJ15986 | DOOR OPENER |
| B347 | TJ15987 | GUIDE HOLDER (A) |
| B354 | TJ15988 | SLIDER (R) |
| B355 | TJ15989 | SLIDER (L) |
| B359 | TJ15103 | CLEANER LEVER [Type A] |
| B359 | TJ15729 | CLEANER LEVER [Type B] |
| B360 | TJ15104 | CLEANER ROLLER |
| B361 | TJ15105 | CL POST [Type A] |
| B410 | TS17451 | PINCH ARM (A) ASSEMBLY |
| B411 | TJ15181 | PINCH SPRING |
| B414 | TS17452 | BRAKE (S) ASSEMBLY |
| B416 | TS17453 | BRAKE (T) ASSEMBLY |
| B417 | TJ15991 | TENSION SPRING |
| B425 | TJ15185 | LOCK LEVER SPRING |
| B426 | TJ15186 | KICK PULLEY |
| B482 | TJ15992 | CASSETTE PLATE |
| B483 | TJ15292 | LOCK LEVER |
| B487 | TJ15293 | BAND BRAKE |
| B488 | TJ15993 | MODE LEVER |
| B491 | TJ15994 | CAM GEAR(A) |
| B492 | TJ15995 | MODE GEAR |
| B494 | TJ15996 | DOOR OPENER (B) |
| B499 | TJ15196 | LEVER HOLDER (T) |
| B501 | TJ15997 | WORM HOLDER |
| B502 | TJ15198 | CAM GEAR(B) |
| B505 | TJ15998 | WASHER |
| B507 | TJ14034 | WASHER |
| B508 | TJ15199 | BRAKE SPRING (S) |
| B513 | TJ15201 | WASHER |
| B514 | TJ15999 | SCREW RACK |
| B516 | TJ14034 | WASHER |
| B518 | TJ15203 | WASHER |
| B520 | TJ15204 | BRAKE SPRING (T) |
| B521 | TJ15209 | SOFT SPRING |
| B522 | TS17454 | TG POST |
| B525 | TJ16001 | LDG BELT |
| B529 | TJ15746 | CLEANER ASSEMBLY |
| B551 | TJ16002 | FF ARM |
| B553 | TJ16003 | REV SPRING |
| B555 | TS17456 | RACK ASSEMBLY |
| B557 | TJ15215 | MOTOR PULLEY |
| B558 | TS16004 | LOADING MOTOR |
| B559 | TS17457 | CLUTCH ASSEMBLY |
| B560 | TJ15303 | KICK SPRING |

| SYMBOL-NO | P-NO | DESCRIPTION |
|---|---|---|
| B562 | TJ15221 | CASSETTE DRIVE LEVER (L) |
| B563 | TJ15222 | SLIDER SHAFT |
| B564 | TJ15223 | GEAR (M) |
| B565 | TJ16005 | SENSOR GEAR |
| B567 | TJ15226 | PINCH ARM (B) |
| B568 | TJ15304 | BT ARM |
| B569 | TJ16006 | CAM HOLDER |
| B570 | TJ15229 | CAM RACK SPRING |
| B571 | TJ10229 | WASHER |
| B572 | TJ15203 | WASHER |
| B573 | TJ16007 | REEL (S) |
| B574 | TJ16008 | REEL (T) |
| B585 | TJ16009 | WASHER |
| L1051 | TJ14055 | SCREW (M2.6X6) |
| L1053 | TJ15313 | SCREW (M2.6X8) |
| L1151 | TJ15236 | SCREW (M2.6X4) |
| L1191 | TJ15313 | SCREW (M2.6X8) |
| L1321 | TJ10176 | SCREW (M3X6) |
| L1341 | TE13298 | SCREW (M2.6X6) |
| L1406 | TJ15238 | SCREW |
| L1407 | TJ15957 | SCREW (M2.6X10) |
| L1450 | TE12971 | SCREW (M2.6X5) |
| L1461 | TJ14061 | SCREW (M2.6X6) |
| L1466 | TJ14066 | SCREW (M2.6X6) |
| L1467 | TJ15958 | SCREW (M2.6X5) |
| L1468 | TJ15959 | SCREW (M1.7X12) |
| 001 | TS17361 | DVD MAIN CBA UNIT |
| 002 | TS17371 | MCV CBA |
| 003 | TS17381 | SENSOR CBA |

**ACCESSORIES**

| | | |
|---|---|---|
| X1 | TS16905 | REMOTE CONTROL UNIT |
| X3 | 5857952 | RF CABLE |
| X5 | TE14751 | AV CORD |

| SYMBOL-NO | P-NO | DESCRIPTION |
|---|---|---|

# Electrica Parts List

**Note:** Although some parts in the schematic diagrams have different names from those in the parts list, there is no problem in replacing parts.

| SYMBOL-NO | P-NO | DESCRIPTION |
|---|---|---|
| | | **RESISTOR** |
| VR501 | TJ13934 | CARBON P.O.T. 100K OHM B |
| | | **SEMI-CONDUCTORS** |
| D013 | TC10791 | RECTIFIER DIODE BA157 |
| D015 | TJ15128 | RECTIFIER DIODE FR202 |
| D016 | TJ14082 | SCHOTTKY BARRIER DIODE SB340 |
| D018 | TC10604 | ZENER DIODE MTZJT-779.1C |
| D052 | TJ13919 | ZENER DIODE MTZJT-7710B |
| D054 | TJ15129 | RECTIFIER DIODE RL151 |
| D055 | TC10112 | SWITCHING DIODE 1SS133(T-77) |
| D057 | TJ13896 | ZENER DIODE MTZJT-775.1C |
| D071 | TC10752 | RECTIFIER DIODE 1N4005 |
| D301 | TC10112 | SWITCHING DIODE 1SS133(T-77) |
| D302 | TC10112 | SWITCHING DIODE 1SS133(T-77) |
| D303 | TC10112 | SWITCHING DIODE 1SS133(T-77) |
| D501 | TC10112 | SWITCHING DIODE 1SS133(T-77) |
| D555 | TJ13898 | LED SIR-563ST3F P |
| D588 | TC12491 | LED(GREEN) 204-10GD/S957 |
| D589 | TC12491 | LED(GREEN) 204-10GD/S957 |
| D652 | TC12491 | LED(GREEN) 204-10GD/S957 |
| D653 | TC12491 | LED(GREEN) 204-10GD/S957 |
| D654 | TJ15414 | LED(RED) 204HD/E |
| D655 | TJ15414 | LED(RED) 204HD/E |
| D656 | TJ15414 | LED(RED) 204HD/E |
| D701 | TC10607 | ZENER DIODE MTZJT-7733D |
| D702 | TJ14691 | ZENER DIODE MTZJT-778.2A |
| D1001 | TC10752 | RECTIFIER DIODE 1N4005 |
| D1002 | TC10752 | RECTIFIER DIODE 1N4005 |
| D1003 | TC10752 | RECTIFIER DIODE 1N4005 |
| D1004 | TC10752 | RECTIFIER DIODE 1N4005 |
| D1007 | TC12471 | ZENER DIODE DZ-39BSBT265 |
| D1008 | TJ14082 | SCHOTTKY BARRIER DIODE SB340 |
| D1009 | TJ15128 | RECTIFIER DIODE FR202 |
| D1010 | TC10791 | RECTIFIER DIODE BA157 |
| D1011 | TE13211 | RECTIFIER DIODE BA158 |
| D1012 | TC10112 | SWITCHING DIODE 1SS133(T-77) |
| D1015 | TC12191 | ZENER DIODE DZ-6.8BSBT265 |
| D1016 | TJ15333 | RECTIFIER DIODE FR101 |
| D1017 | TJ13897 | ZENER DIODE MTZJT-7722B |
| D1018 | TC10112 | SWITCHING DIODE 1SS133(T-77) |
| D1022 | TC10112 | SWITCHING DIODE 1SS133(T-77) |
| D1024 | TC10112 | SWITCHING DIODE 1SS133(T-77) |
| D1025 | TC10112 | SWITCHING DIODE 1SS133(T-77) |
| D1030 | TC10757 | FAST RECOVERY DIODE ERB32-01 |
| D1036 | TC12201 | ZENER DIODE DZ-13BSBT265 |
| D1048 | TC12481 | ZENER DIODE DZ-15BSBT265 |
| D1049 | TC10112 | SWITCHING DIODE 1SS133(T-77) |
| D2001 | TC10754 | SWITCHING DIODE 1N4148M |
| D2003 | TC10754 | SWITCHING DIODE 1N4148M |
| D2004 | TC10754 | SWITCHING DIODE 1N4148M |
| D2005 | TC10752 | RECTIFIER DIODE 1N4005 |
| D2006 | TC10752 | RECTIFIER DIODE 1N4005 |
| D2007 | TC10752 | RECTIFIER DIODE 1N4005 |
| IC301 | TJ15132 | IC LA71091M |
| IC451 | TC12511 | IC LA72655M |
| IC501 | TC12521 | IC M37768M6A-1C8GP |
| IC751 | TC12531 | IC TC4053BF(N) |
| ⚠ IC1001 | TE13224 | PHOTOCOUPLER LTV-817B-F |
| ⚠ IC1002 | TC12231 | IC PQ018EF01SZ |
| IC1003 | TC12241 | IC KIA431-AT |
| ⚠ IC1004 | TC12541 | IC KIA78R33PI |
| IC1006 | TC12241 | IC KIA431-AT |
| IC1201 | TC12251 | IC KIA4558P |
| IC1402 | TC12271 | IC MM1567AJ |
| IC2001 | TC12281 | IC PT6315-S(-TP) |
| Q052 | TJ13923 | TRANSISTOR KRC103M |
| Q055 | TE13235 | TRANSISTOR KTC3203(Y) |
| Q056 | TE13235 | TRANSISTOR KTC3203(Y) |
| Q060 | TJ13923 | TRANSISTOR KRA103M |
| Q301 | TC10784 | TRANSISTOR KTA1266(GR) |
| Q302 | TC10783 | TRANSISTOR KTC3193(Y) |
| Q303 | TC10783 | TRANSISTOR KTC3193(Y) |
| Q391 | TC10784 | TRANSISTOR KTA1266(GR) |
| Q421 | TC10784 | TRANSISTOR KTA1266(GR) |
| Q422 | TE13235 | TRANSISTOR KTC3203(Y) |
| Q423 | TJ13924 | TRANSISTOR 2SC536NF-NPA-AT |
| Q424 | TJ13924 | TRANSISTOR 2SC536NF-NPA-AT |
| Q425 | TJ13923 | TRANSISTOR KRA103M |
| Q501 | TE13243 | TRANSISTOR KTC3199(BL) |
| Q503 | TJ15141 | PHOTO TRANSISTOR PT204-6B-12 |
| Q504 | TJ15141 | PHOTO TRANSISTOR PT204-6B-12 |
| Q506 | TJ15141 | PHOTO TRANSISTOR PT204-6B-12 |
| Q760 | TJ13923 | TRANSISTOR KRC103M |
| Q762 | TC10778 | TRANSISTOR KTC3199(Y) |
| Q763 | TC10778 | TRANSISTOR KTC3199(Y) |
| Q1001 | TC12551 | TRANSISTOR 2SK2662 |
| Q1002 | TE13243 | TRANSISTOR KTC3199(BL) |
| Q1003 | TC10778 | TRANSISTOR KTC3199(Y) |
| Q1004 | TC12561 | TRANSISTOR KTC3202(Y) |
| Q1005 | TC12311 | TRANSISTOR KRC110M-AT |
| Q1006 | TC12411 | TRANSISTOR KRA110M |
| Q1007 | TC12301 | TRANSISTOR KTC3205(Y) |
| Q1008 | TC10778 | TRANSISTOR KTC3199(Y) |
| Q1011 | TC12321 | TRANSISTOR KTA1273(Y) |
| Q1015 | TJ13923 | TRANSISTOR KRC103M |
| Q1201 | TC10778 | TRANSISTOR KTC3199(Y) |
| Q1202 | TC10778 | TRANSISTOR KTC3199(Y) |
| Q1203 | TC10784 | TRANSISTOR KTA1266(GR) |

| | SYMBOL-NO | P-NO | DESCRIPTION |
|---|---|---|---|
| | Q1204 | TC10784 | TRANSISTOR KTA1266(GR) |
| | Q1351 | TC10778 | TRANSISTOR KTC3199(Y) |
| | Q2022 | TC10784 | TRANSISTOR KTA1266(GR) |
| | | | **TRANSFORMER** |
| ⚠ | T001 | TA14551 | PULSE TRANS CSA-SW0091D |
| | | | **COILS** |
| | L009 | TJ13909 | CHOKE COIL 47UH |
| | L251 | 5121289 | INDUCTOR 22UH |
| | L301 | TA12561 | INDUCTOR 100UH |
| | L303 | TJ15137 | INDUCTOR 220UH |
| | L304 | TJ13909 | CHOKE COIL 47UH |
| | L421 | TJ13915 | INDUCTOR 47UH |
| | L502 | TA12561 | INDUCTOR 100UH |
| | L503 | TJ13909 | CHOKE COIL 47UH |
| | L701 | TA12563 | INDUCTOR 4.7UH |
| | L851 | TJ15138 | INDUCTOR 1.8UH |
| | L852 | 5121289 | INDUCTOR 22UH |
| | L853 | TA12562 | INDUCTOR 12UH |
| ⚠ | L1001 | TA14541 | LINE FILTER 27MH |
| | L1004 | TA12575 | BEAD CORE |
| | L1007 | TJ13909 | CHOKE COIL 47UH |
| | L1008 | TJ13909 | CHOKE COIL 47UH |
| | L1009 | TJ13909 | CHOKE COIL 47UH |
| | L1251 | TA14481 | INDUCTOR 0.47UH |
| | L1521 | TJ13909 | CHOKE COIL 47UH |
| | L2001 | TA12561 | INDUCTOR 100UH |
| | | | **CRYSTALS** |
| | X301 | TJ15145 | CRYSTAL 3.58MHZ |
| | X502 | TJ15146 | CRYSTAL 32.8KHZ |
| | | | **MISCELLANEOUS** |
| | CN505 | TE15091 | CONNECTOR(10P) |
| | CN651 | TE15171 | CONNECTOR(10P) |
| | CN1001 | TE15101 | CONNECTOR(26P) |
| | CN1601 | TE15111 | CONNECTOR(18P) |
| | CN2001 | TE15161 | CONNECTOR(10P) |
| | CN2002 | TE15121 | CONNECTOR(10P) |
| ⚠ | F1001 | TE13223 | FUSE 1A/250V |
| | FH1001 | TE11084 | FUSE HOLDER |
| | FH1002 | TE11084 | FUSE HOLDER |
| | FL2001 | TE14801 | V.F.D. 20U29100SAN |
| ⚠ | GP1001 | TJ13894 | GAP. FNR-G3.10D |
| | JK751 | TE15131 | JACK |
| | JK752 | TE15132 | JACK |
| | JK753 | TE15181 | JACK(YELLOW) |
| | JK754 | TE15182 | JACK(WHITE) |
| | JK755 | TE15183 | JACK(RED) |
| | JK756 | TE15133 | JACK |
| | JK1202 | TE15134 | JACK(BLACK) |
| | JK1401 | TE14821 | JACK |
| | JK1403 | TE15135 | JACK |

| | SYMBOL-NO | P-NO | DESCRIPTION |
|---|---|---|---|
| | RM2001 | TC12331 | REMOTE RECEIVER PIC-37043LU |
| ⚠ | SA001 | TC10891 | SURGE ABSORBER PVR-10D471KB |
| | SW506 | TE15141 | LEAF SWITCH |
| | SW507 | TJ15142 | ROTARY MODE SWITCH |
| | SW521 | TE11957 | TACT SWITCH |
| | SW522 | TE11957 | TACT SWITCH |
| | SW523 | TE11957 | TACT SWITCH |
| | SW524 | TE11957 | TACT SWITCH |
| | SW525 | TE11957 | TACT SWITCH |
| | SW526 | TE11957 | TACT SWITCH |
| | SW651 | TE11957 | TACT SWITCH |
| | SW652 | TE11957 | TACT SWITCH |
| | SW654 | TE11957 | TACT SWITCH |
| | SW655 | TE11957 | TACT SWITCH |
| | SW701 | TE11942 | SLIDE SWITC |
| | SW2011 | TE11957 | TACT SWITCH |
| | SW2012 | TE11957 | TACT SWITCH |
| | SW2014 | TE11957 | TACT SWITCH |
| | SW2016 | TE11957 | TACT SWITCH |
| | SW2017 | TE11957 | TACT SWITCH |
| | TU701 | TS17421 | TUNER UNIT VD045AS [Type A] |
| | TU701 | TS17431 | TUNER UNIT TMZH2-001A [Type B] |
| | W003 | TE15151 | CABLE (26P) |
| | W004 | TE15152 | CABLE (18P) |
| | W005 | TE15153 | CABLE (10P) |
| | W009 | TE15155 | WIRE (10P) |
| | W011 | TE15154 | CABLE (10P) |
| | W022 | TE15156 | WIRE |
| | W023 | TE15157 | WIRE |

# CHAPTER 4 SCHEMATIC AND BLOCK DIAGRAMS/CBA'S

# SCHEMATIC DIAGRAMS / CBA'S AND TEST POINTS

## Standard Notes

## WARNING

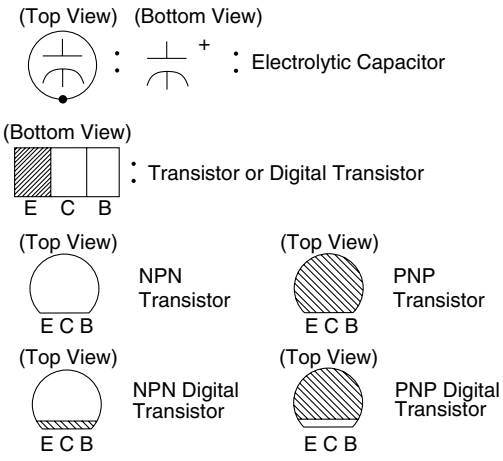
Many electrical and mechanical parts in this chassis have special characteristics. These characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety char-acteristics are identified in this manual and its supple-ments; electrical components having such features are identified by the mark " ⚠ " in the schematic diagram and the parts list. Before replacing any of these compo-nents, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

### Capacitor Temperature Markings

| Mark | Capacity change rate | Standard temperature | Temperature range |
|---|---|---|---|
| (B) | ±10% | 20°C | -25~+85°C |
| (F) | +30 - 80% | 20°C | -25~+85°C |
| (SR) | ±15% | 20°C | -25~+85°C |
| (Z) | +30 - 80% | 20°C | -10~+70°C |

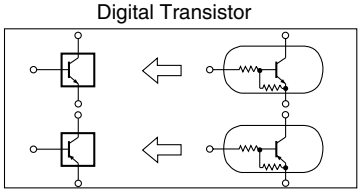
Capacitors and transistors are represented by the following symbols.

CBA Symbols




Schematic Diagram Symbols

Digital Transistor



## Notes:

1. Do not use the part number shown on these drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since these drawings were prepared.
2. All voltages are DC voltages unless otherwise speci-fied.

## Values in schematic diagrams

The values, dielectric strength ( power capacitance ) and tolerances of the resistors ( excluding variable resistors ) and capacitors are indicated in the schematic diagrams using abbreviations.

**[ Resistors ]**

| Item | Indication |
|---|---|
| Value | No indication.....Ω<br>K.....kΩ<br>M.....MΩ |
| Power capacitance | No indication.....1/4W,1/6W<br>All capacitances other than the above are indicated in schematic diagrams. |

**[ Capacitors ]**

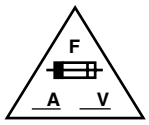
| Item | Indication |
|---|---|
| Value | No indication.....μF<br>P.....pF |
| Dielectric strength | No indication.....50V<br>All dielectric strengths other than 50V are indicated in schematic diagrams. |

**[ Coils ]**

| Item | Indication |
|---|---|
| Value | μ.....μH<br>m.....mH |

**LIST OF CAUTION, NOTES, AND SYMBOLS USED IN THE SCHEMATIC DIAGRAMS ON THE FOLLOWING PAGES:**

1. **CAUTION:**




FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQES D'INCELE N'UTILISER QUE DES FUSIBLE DE MEMO TYPE.
RISK OF FIRE-REPLACE FUSE AS MARKED.

This symbol means fast operating fuse.
Ce symbole reprèsente un fusible à fusion rapide.

2. **CAUTION:**

Fixed Voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F001) is blown, first check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

3. **Note:**

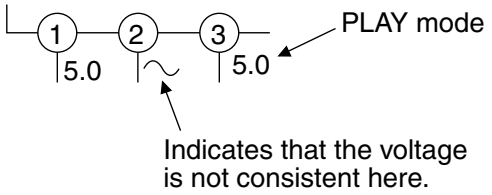
(1) Do not use the part number shown on the drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since the drawings were prepared.
(2) To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.

4. Wire Connectors

(1) Prefix symbol "CN" means "connector" (can disconnect and reconnect).
(2) Prefix symbol "CL" means "wire-solder holes of the PCB" (wire is soldered directly).

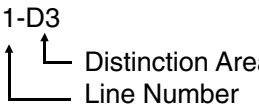
5. Mode: SP

6. Voltage indications for PLAY modes on the schematics are as shown below:



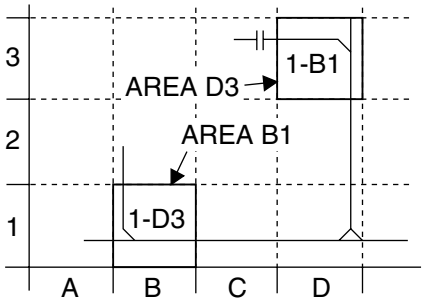

Unit: Volts

7. How to read converged lines




Examples:

1. "1-D3" means that line number "1" goes to area "D3".
2. "1-B1" means that line number "1" goes to area "B1".




8. Test Point Information

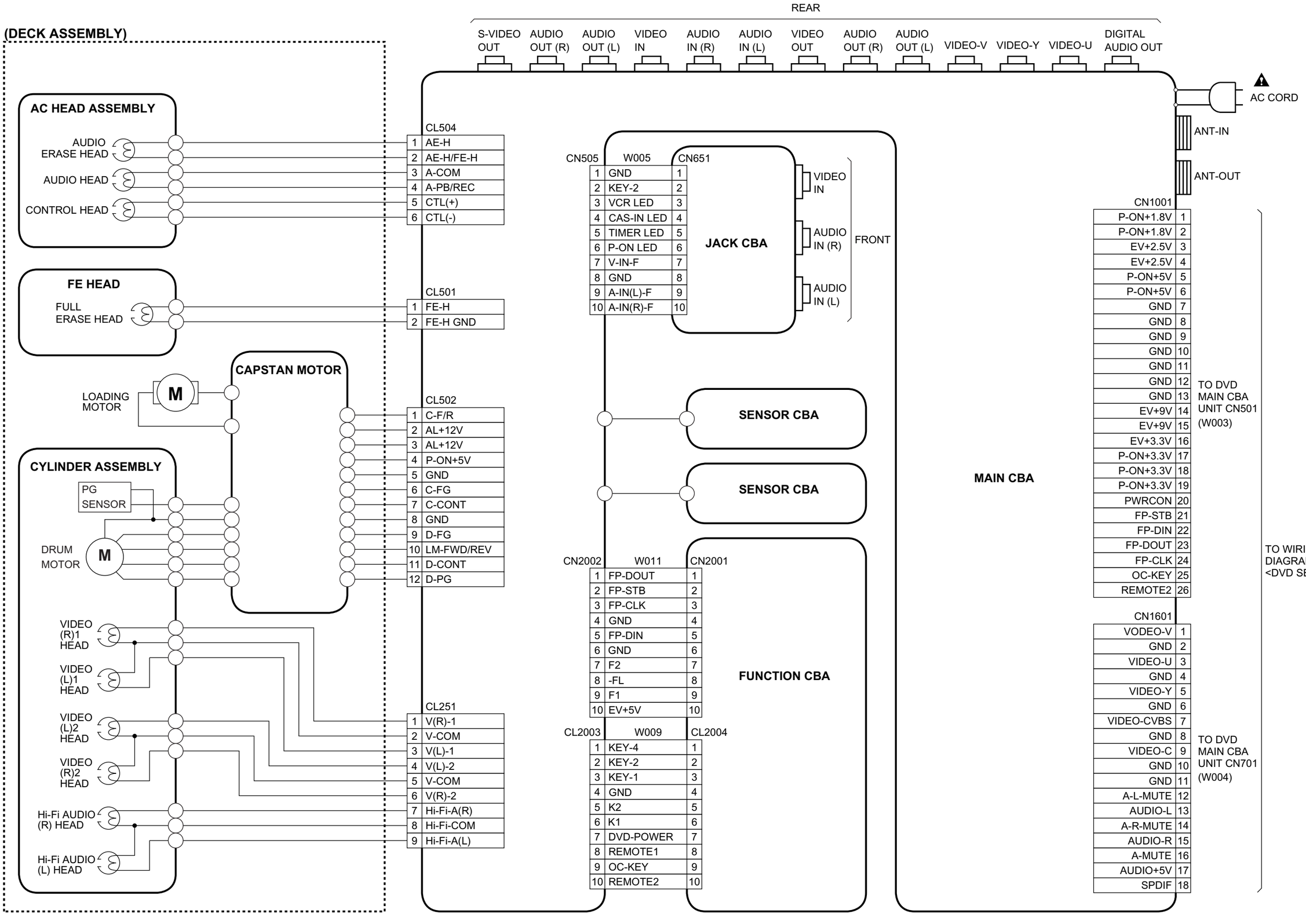
 : Indicates a test point with a jumper wire across a hole in the PCB.

 : Used to indicate a test point with a component lead on foil side.

 : Used to indicate a test point with no test pin.

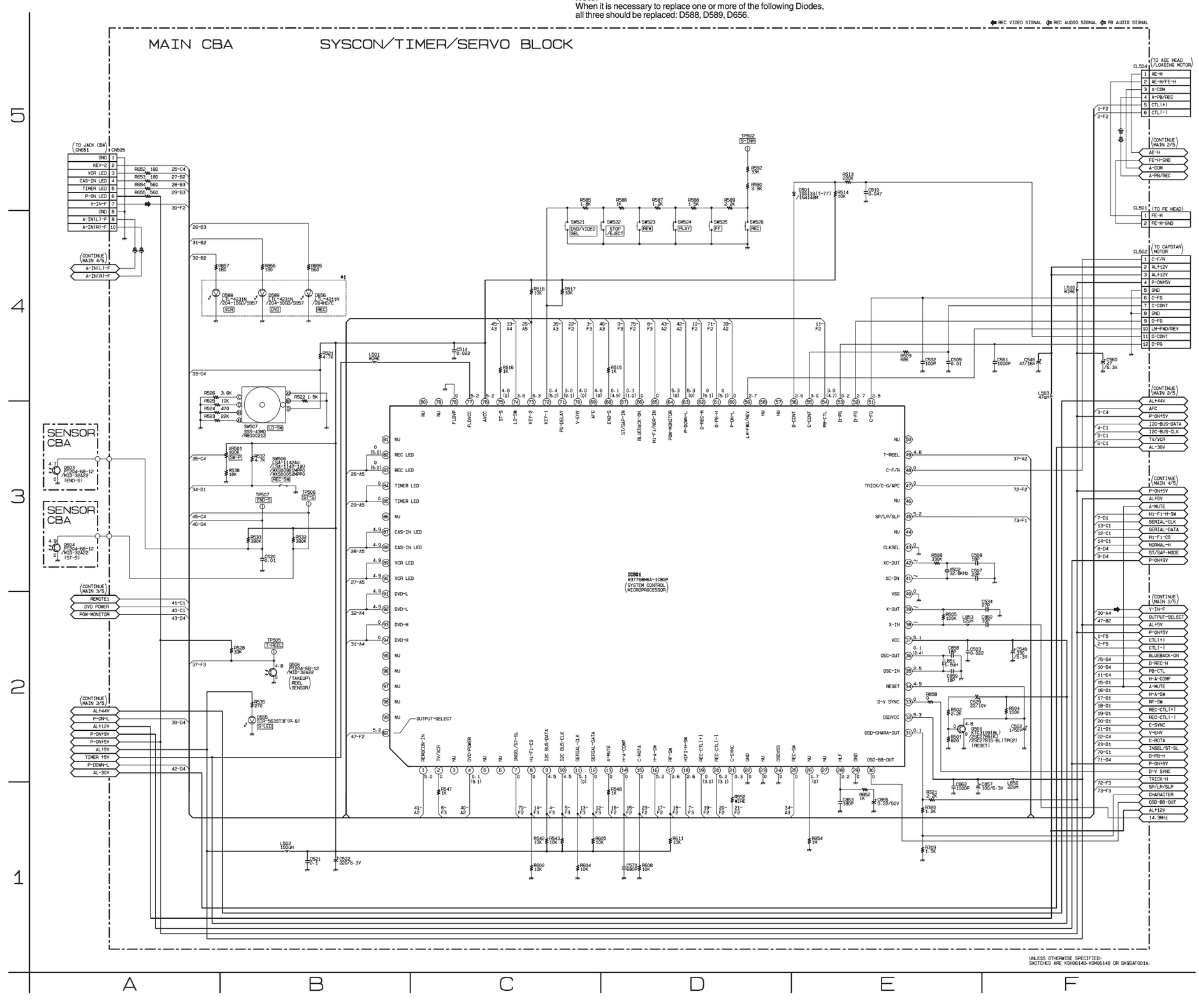
 : Used to indicate a test point with a test pin.

# VCR SECTION
## Wiring Diagram

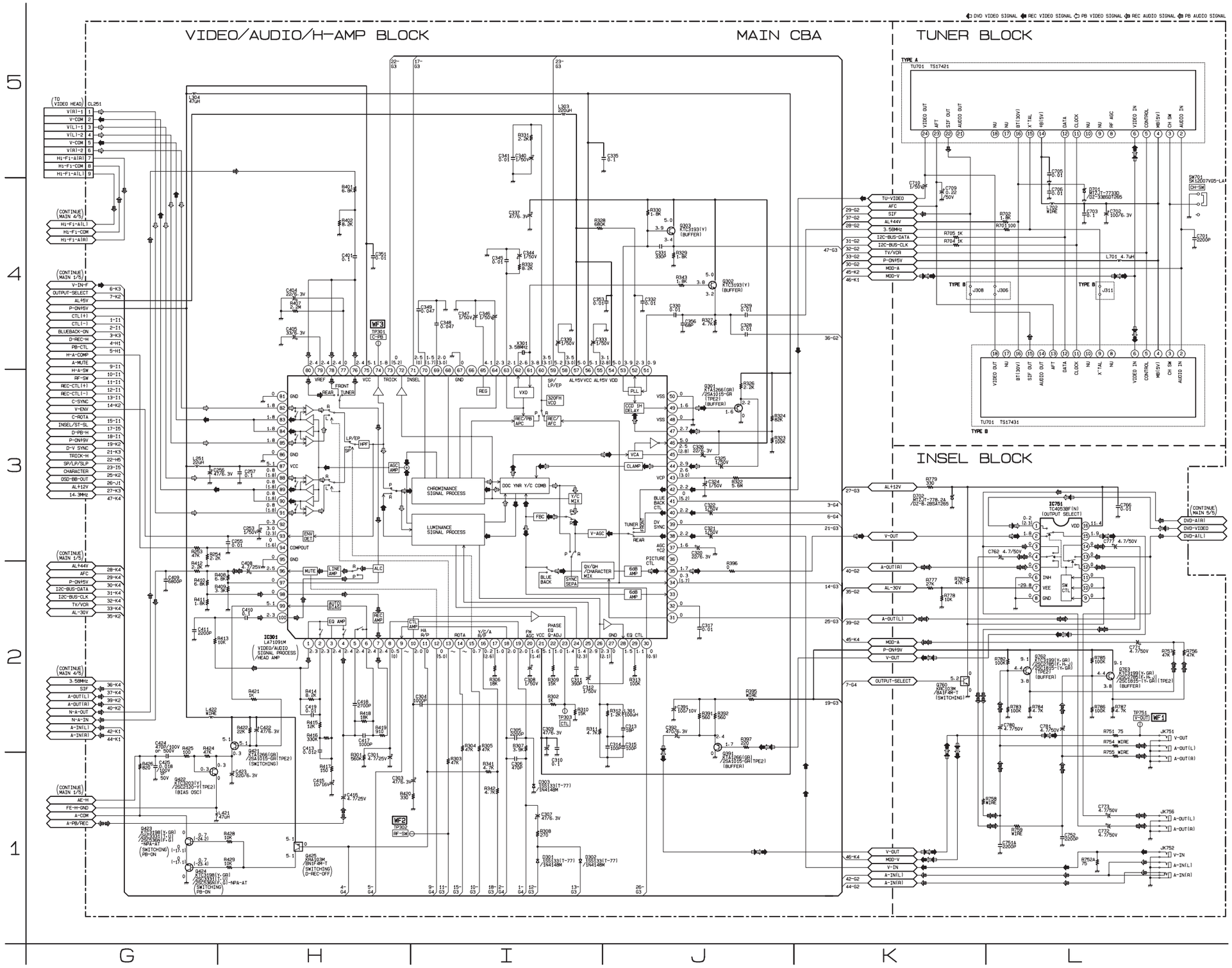


# Main 1/5 Schematic Diagram

**★1 Note:**
When it is necessary to replace one or more of the following Diodes, all three should be replaced: D588, D589, D656.



# Main 2/5 Schematic Diagram



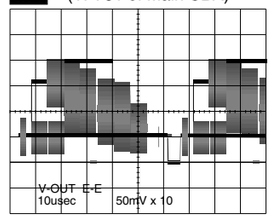

**★2 Note:**
There are two types of tuner unit (TU701) : A and B.
These types are compatible, and there is no problem when using either, but it is recommended that you replace the unit with the same type if possible.
The following table shows the differences between types A and B:

| | TU701 | J306 | J308 | J311 |
|---|---|---|---|---|
| TYPE A | TS17421 | NU | NU | NU |
| TYPE B | TS17431 | WIRE | WIRE | WIRE |

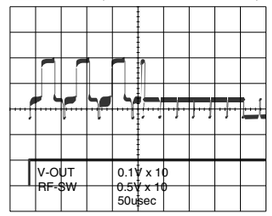
NU: Not Used

## WAVEFORMS

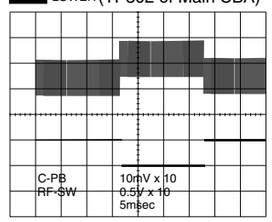
**WF1** (TP751 of Main CBA)




**WF1** UPPER (TP751 of Main CBA)
**WF2** LOWER (TP302 of Main CBA)




**WF5** UPPER (TP301 of Main CBA)
**WF2** LOWER (TP302 of Main CBA)



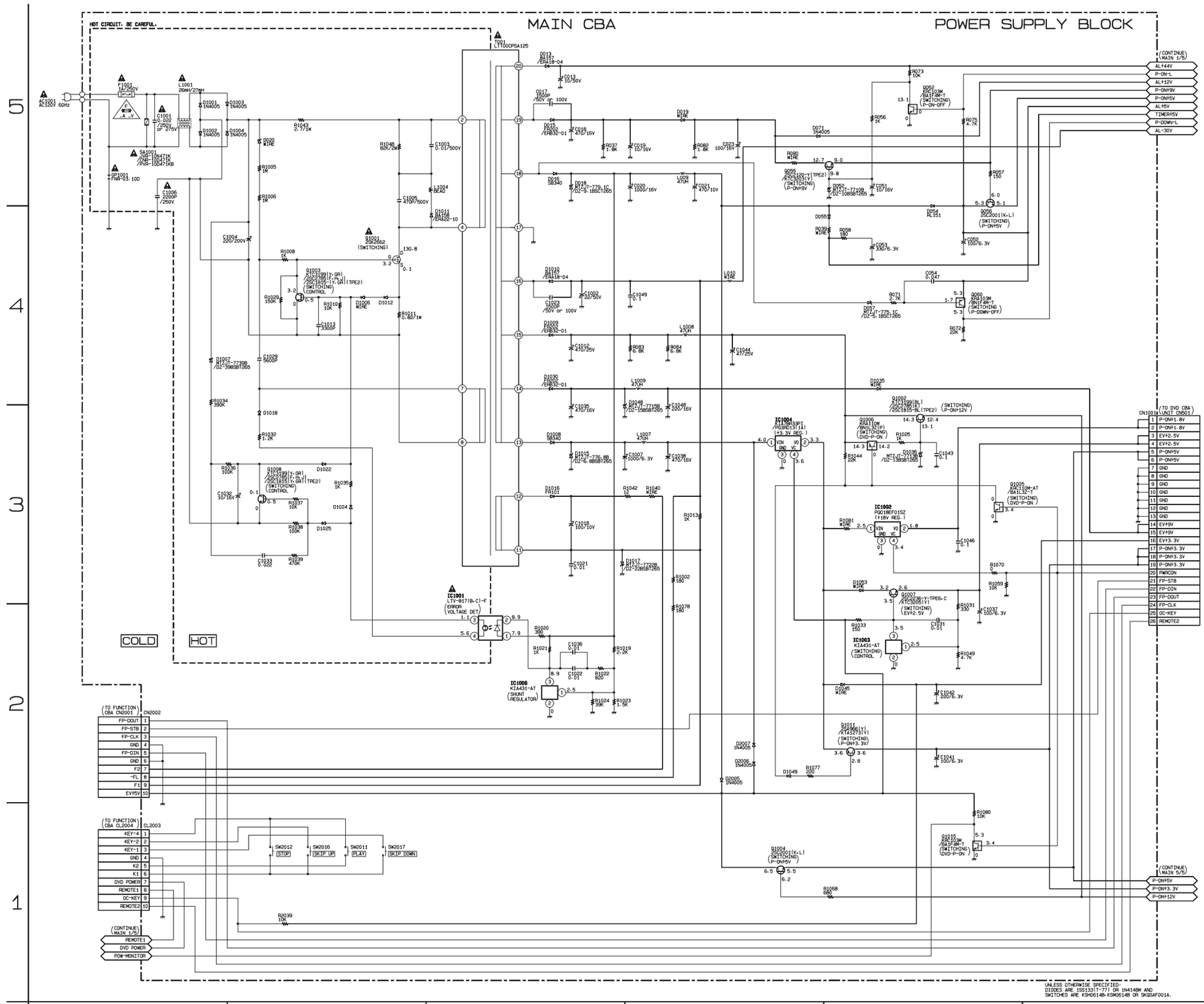
# Main 3/5 Schematic Diagram

**CAUTION!**
Fixed voltage ( or Auto voltage selectable ) power supply circuit is used in this unit.
If Main Fuse (F001) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

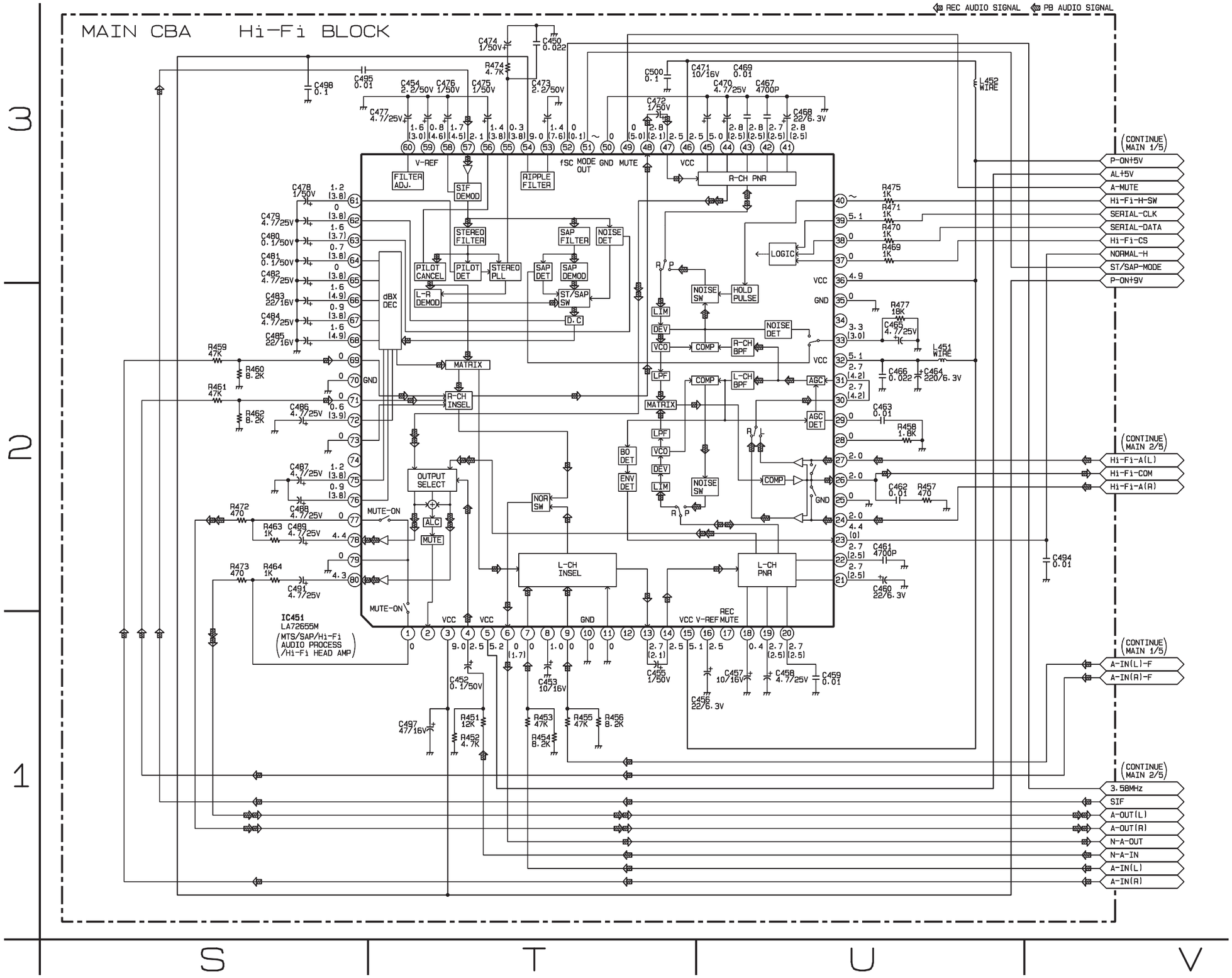
NOTE :
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

**CAUTION**
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.
ATTENTION : POUR UNE PROTECTION CONTINUE LES RISQES D'INCELE N'UTILISER QUE DES FUSIBLE DE MEMO TYPE.
**RISK OF FIRE**-REPLACE FUSE AS MARKED.

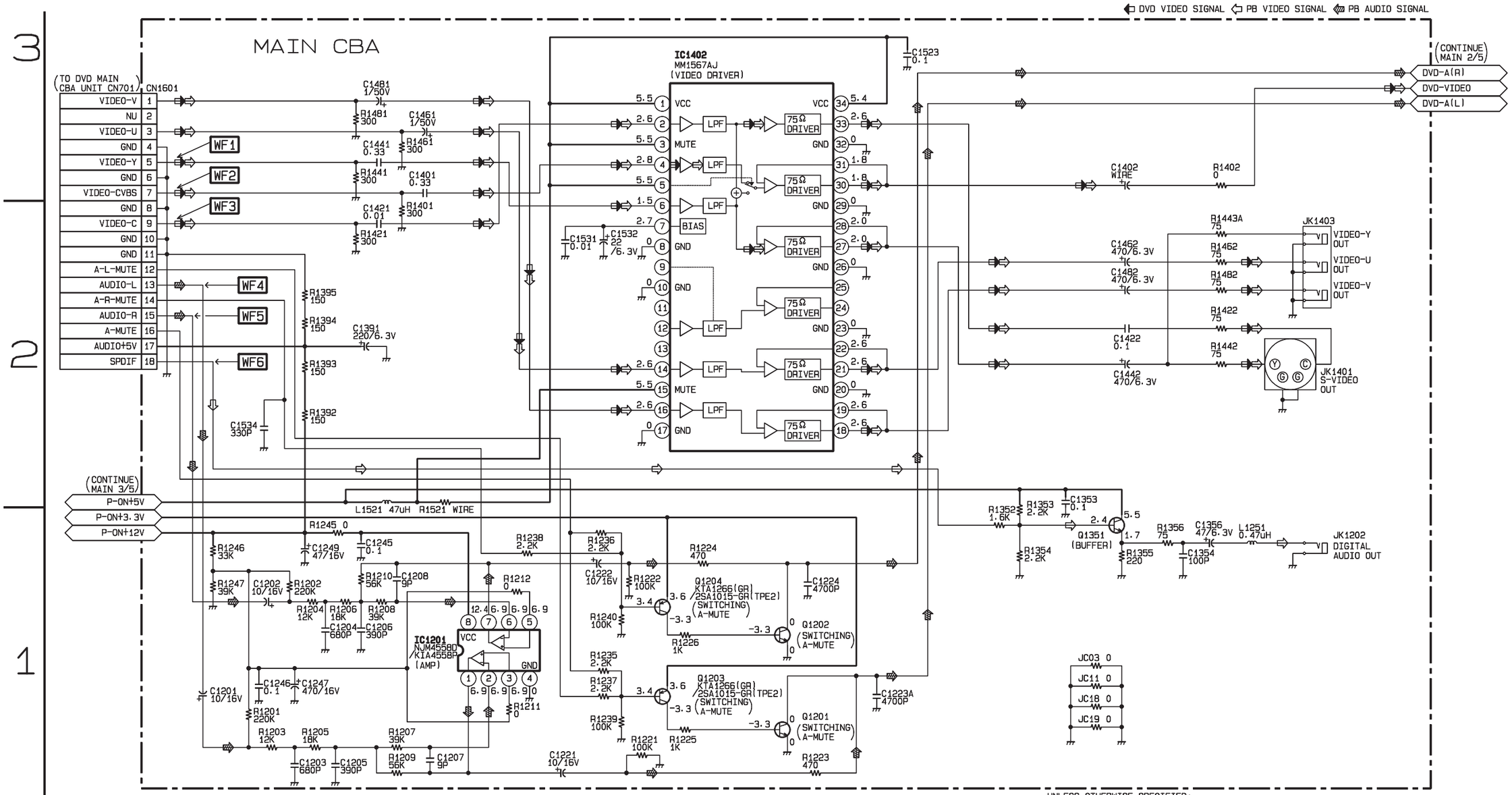
"This symbol means fast operating fuse."
"Ce symbole reprèsente un fusible à fusion rapide."



## Main 4/5 Schematic Diagram

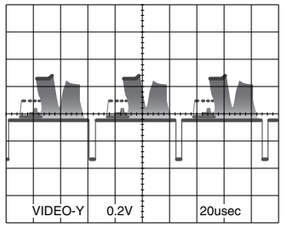


# Main 5/5 Schematic Diagram

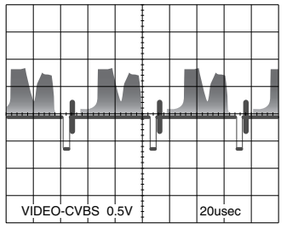


# Waveforms

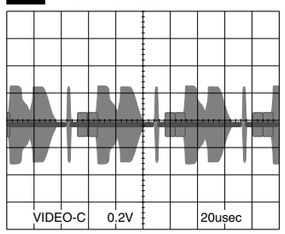
**WF1** Pin 5 of CN1601



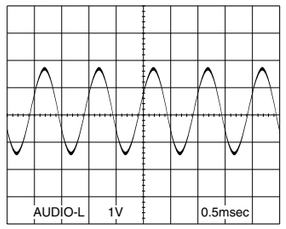

**WF2** Pin 7 of CN1601



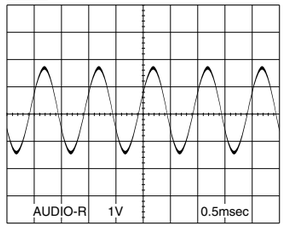

**WF3** Pin 9 of CN1601



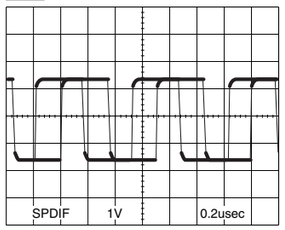

**WF4** Pin 13 of CN1601




**WF5** Pin 15 of CN1601

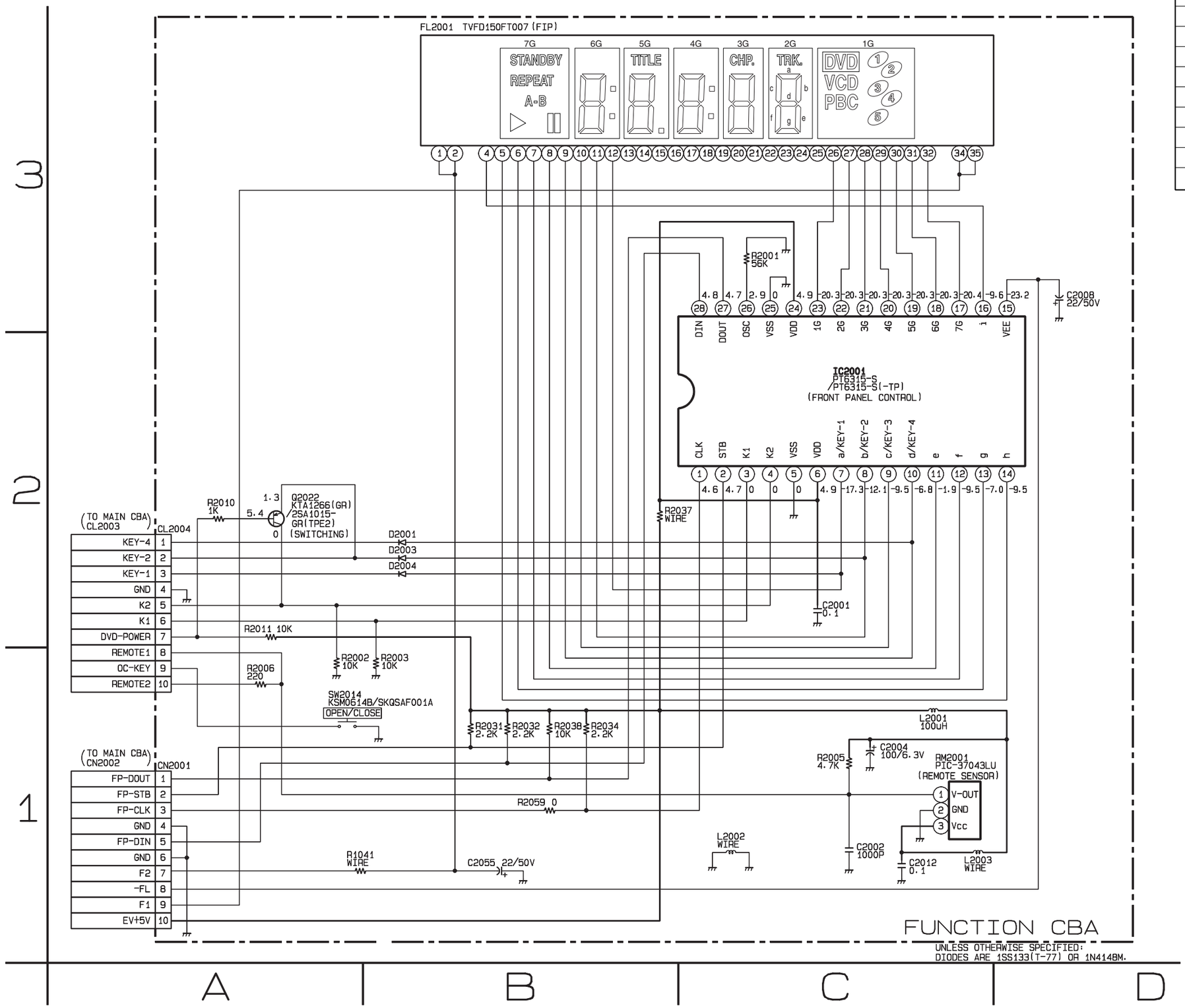



**WF6** Pin 18 of CN1601




**NOTE:**
Input
CD: 1kHz PLAY
(WF4~WF6)
DVD: POWER ON (STOP) MODE
(WF1~WF3)

## Function Schematic Diagram

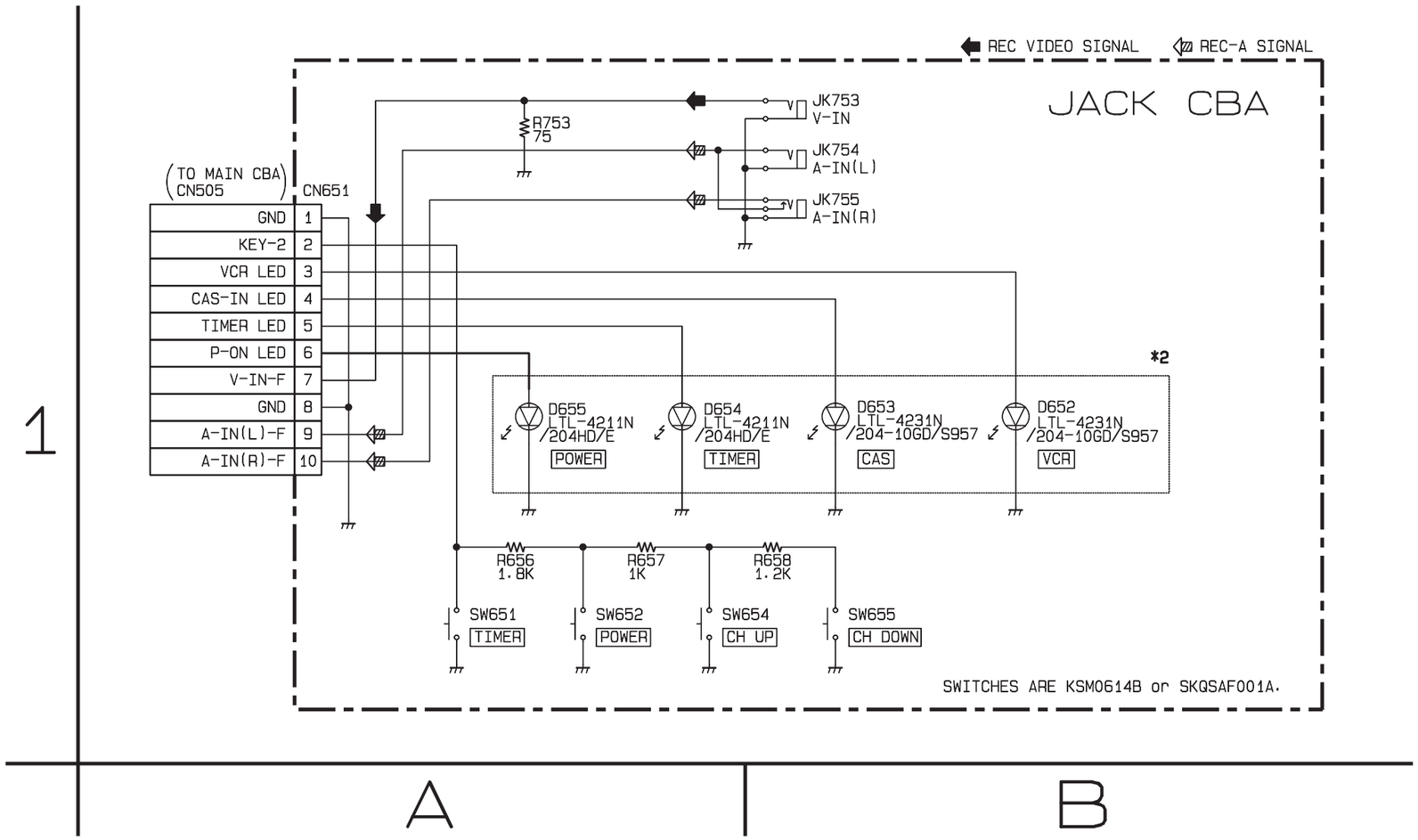



FL2001 MATRIX CHART

| | 7G | 6G | 5G | 4G | 3G | 2G | 1G |
|---|---|---|---|---|---|---|---|
| a | STANDBY | a | a | a | a | a | 1 |
| b | REPEAT | b | b | b | b | b | 2 |
| c | A | c | c | c | c | c | 3 |
| d | B | d | d | d | d | d | 4 |
| e | ▷ | e | e | e | e | e | 5 |
| f | ▯▯ | f | f | f | f | f | DVD |
| g | —— | g | g | g | g | g | PBC |
| h | —— | ▫ | TITLE | ▫ | CHP. | TRK. | CD |
| i | —— | —— | ▫ | —— | —— | —— | V |

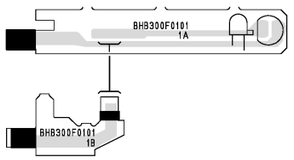
# Jack Schematic Diagram

*2 **Note:**
When it is necessary to replace one or more of the following Diodes, all four should be replaced: D652, D653, D654, D655.



# Main CBA Top View

## Sensor CBA Top View




**CAUTION !**
Fixed voltage ( or Auto voltage selectable ) power supply circuit is used in this unit.
If Main Fuse (F001) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

NOTE :
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

**BECAUSE A HOT CHASSIS GROUND IS PRESENT IN THE POWER SUPPLY CIRCUIT , AN ISOLATION TRANSFORMER MUST BE USED. ALSO , IN ORDER TO HAVE THE ABILITY TO INCREASE THE INPUT SLOWLY , WHEN TROUBLESHOOTING THIS TYPE POWER SUPPLY CIRCUIT , A VARIABLE ISOLATION TRANSFORMER IS REQUIRED.**

**CAUTION**
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE FUSE.
ATTENTION : POUR UNE PROTECTION CONTINUE LES RISQES D'INCELE N'UTILISER QUE DES FUSIBLE DE MEMO TYPE.
**RISK OF FIRE**-REPLACE FUSE AS MARKED.

"This symbol means fast operating fuse."
"Ce symbole représente un fusible à fusion rapide."

**WF1**
**TP751**
**V-OUT**

**TP303**
**CTL**

**WF5**
**TP301**
**C-PB**

**WF2**
**TP302**
**RF-SW**

**TP502**
**S-INH**

**VR501**
**SW-P**

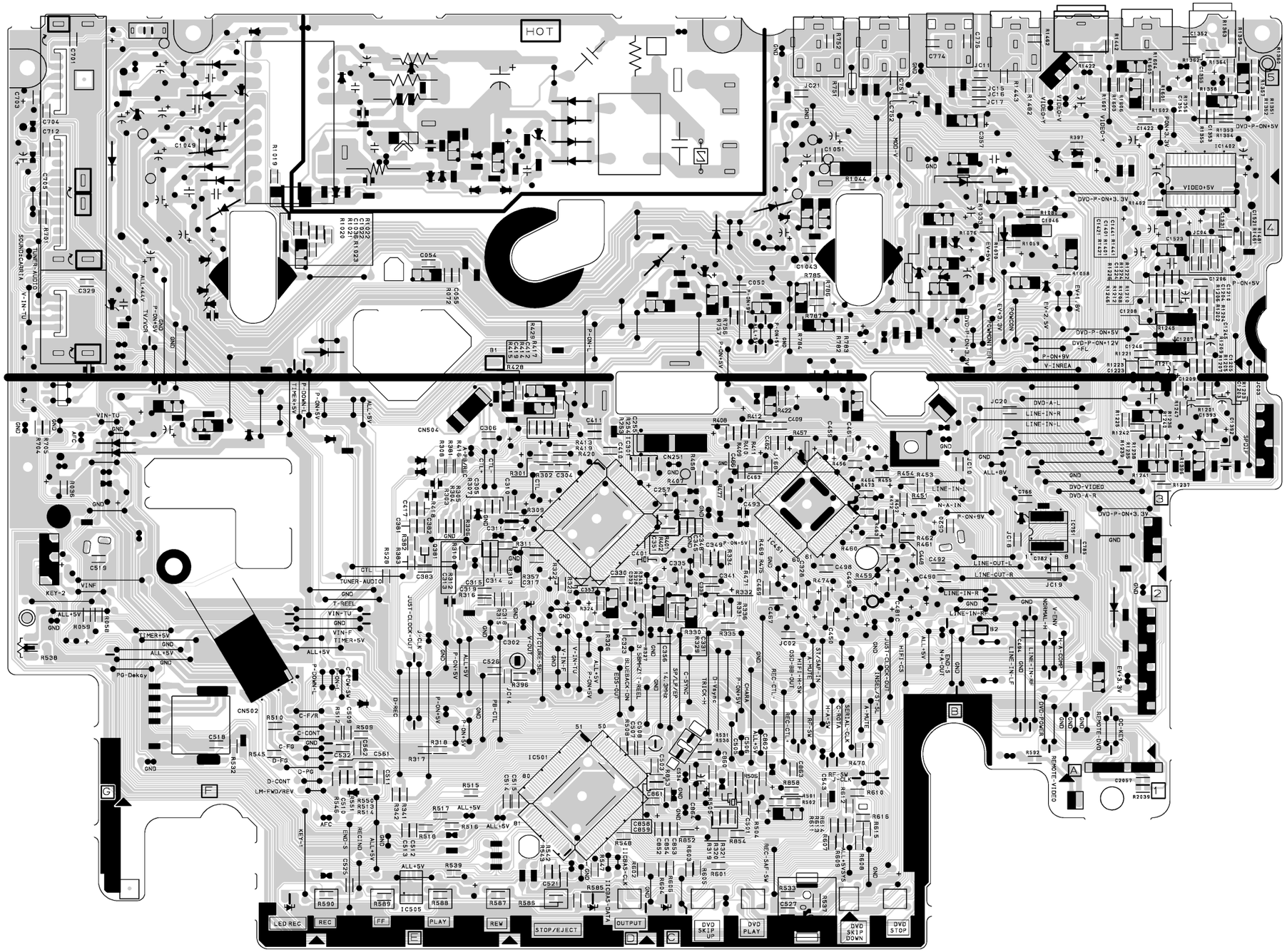
# Main CBA Bottom View

**CAUTION !**
Fixed voltage ( or Auto voltage selectable ) power supply circuit is used in this unit.
If Main Fuse (F001) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

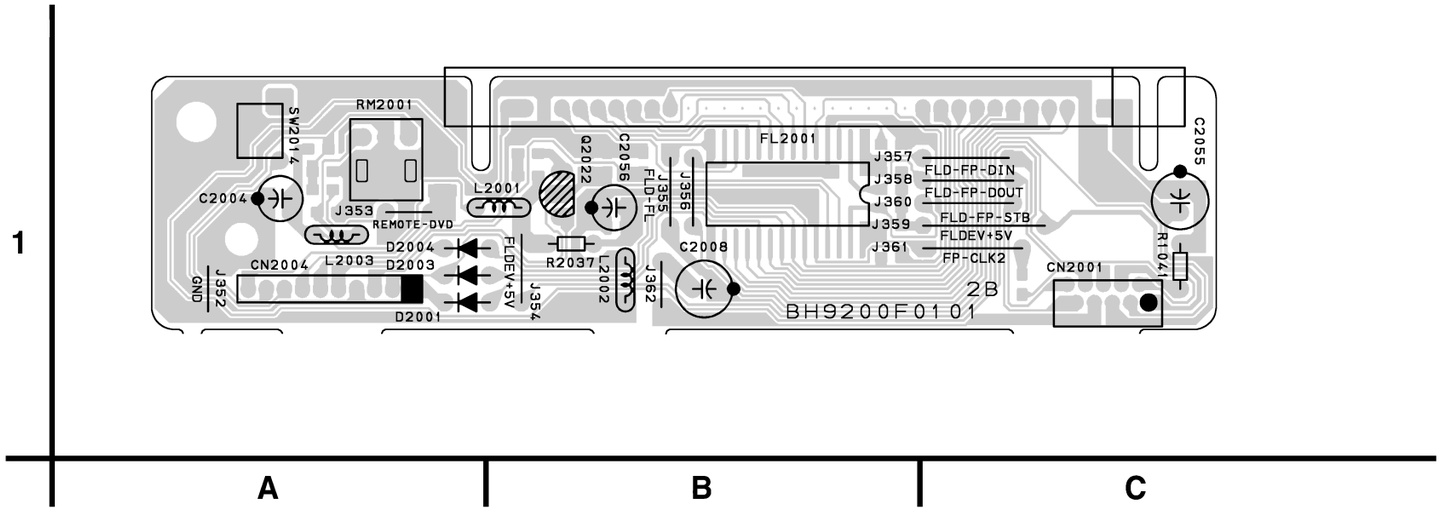
NOTE :
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

**BECAUSE A HOT CHASSIS GROUND IS PRESENT IN THE POWER SUPPLY CIRCUIT , AN ISOLATION TRANSFORMER MUST BE USED. ALSO , IN ORDER TO HAVE THE ABILITY TO INCREASE THE INPUT SLOWLY , WHEN TROUBLESHOOTING THIS TYPE POWER SUPPLY CIRCUIT , A VARIABLE ISOLATION TRANSFORMER IS REQUIRED.**

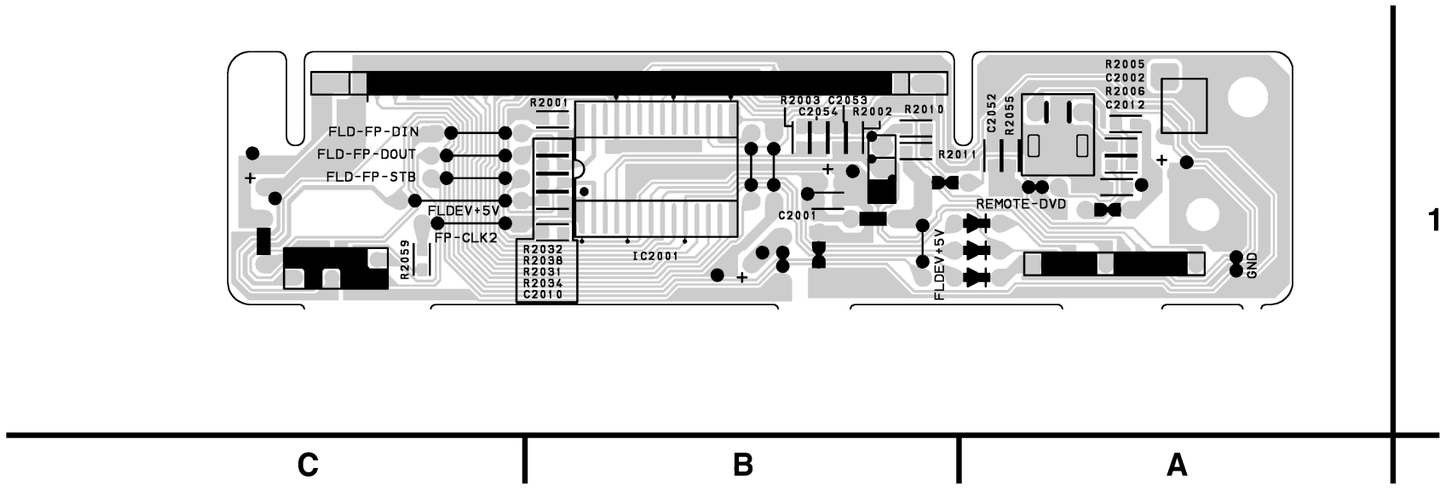
**CAUTION**
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.
ATTENTION : POUR UNE PROTECTION CONTINUE LES RISQES D'INCELE N'UTILISER QUE DES FUSIBLE DE MEMO TYPE.
**RISK OF FIRE**-REPLACE FUSE AS MARKED.
"This symbol means fast operating fuse."
"Ce symbole représente un fusible à fusion rapide."



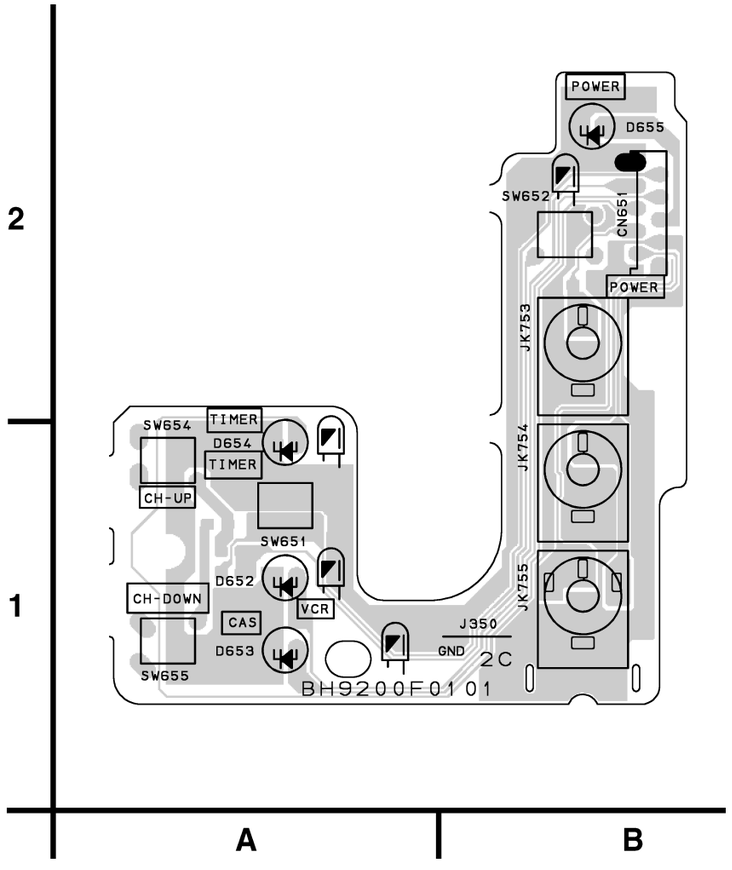
## Function CBA Top View



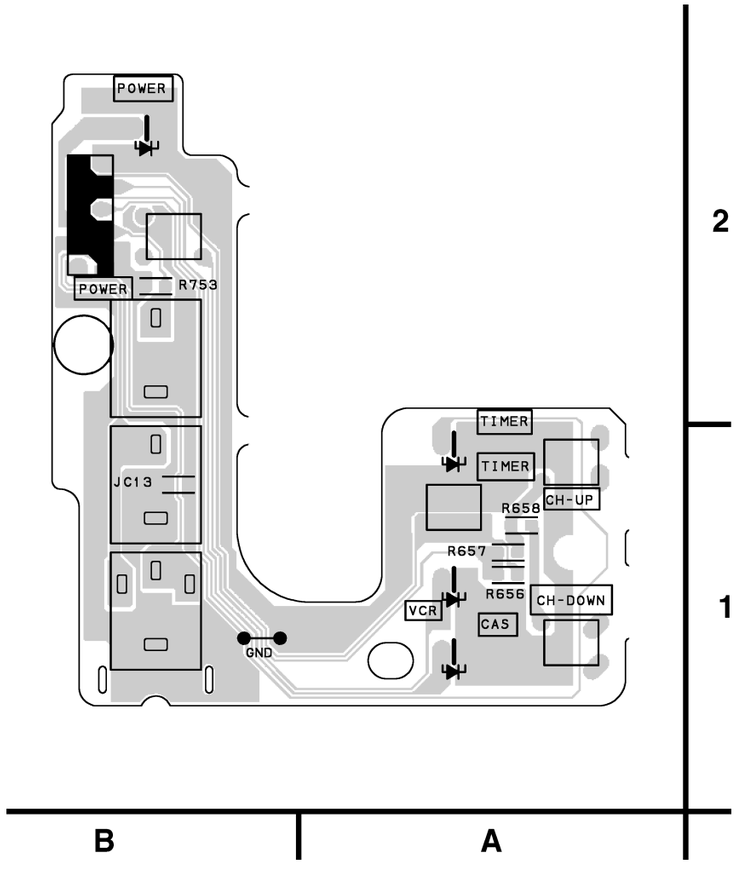

## Function CBA Bottom View



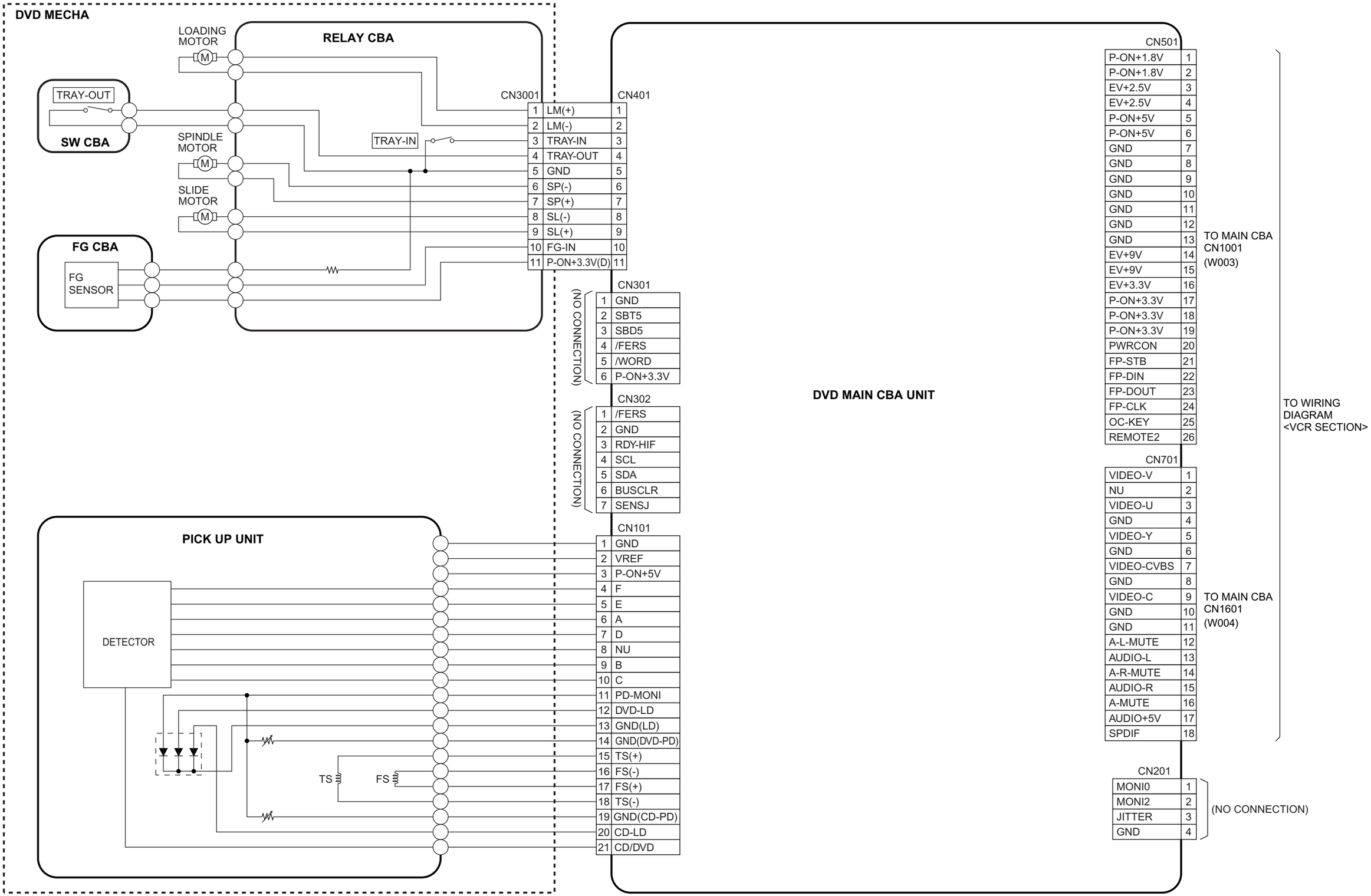
## Jack CBA Top View



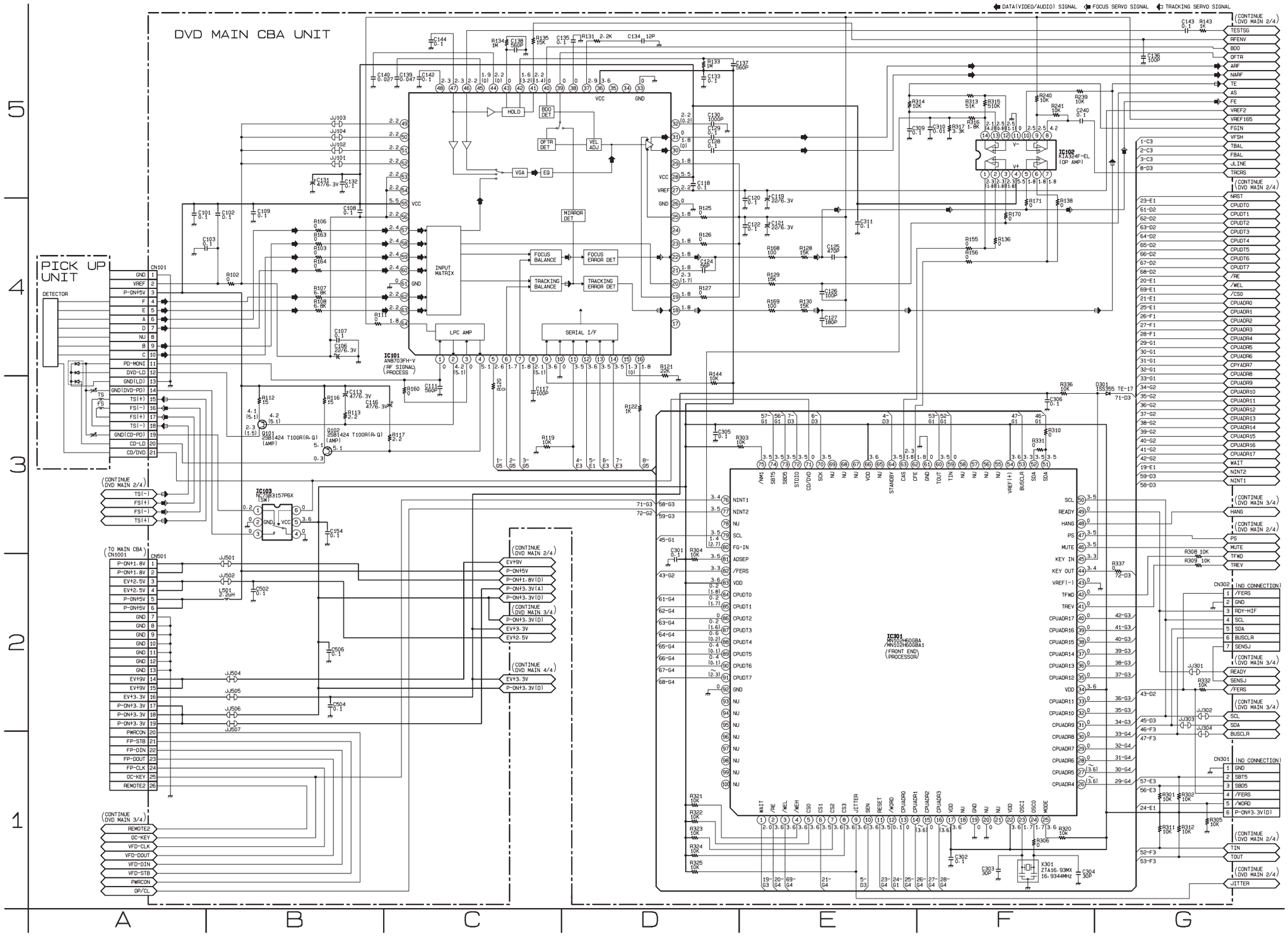

## Jack CBA Bottom View



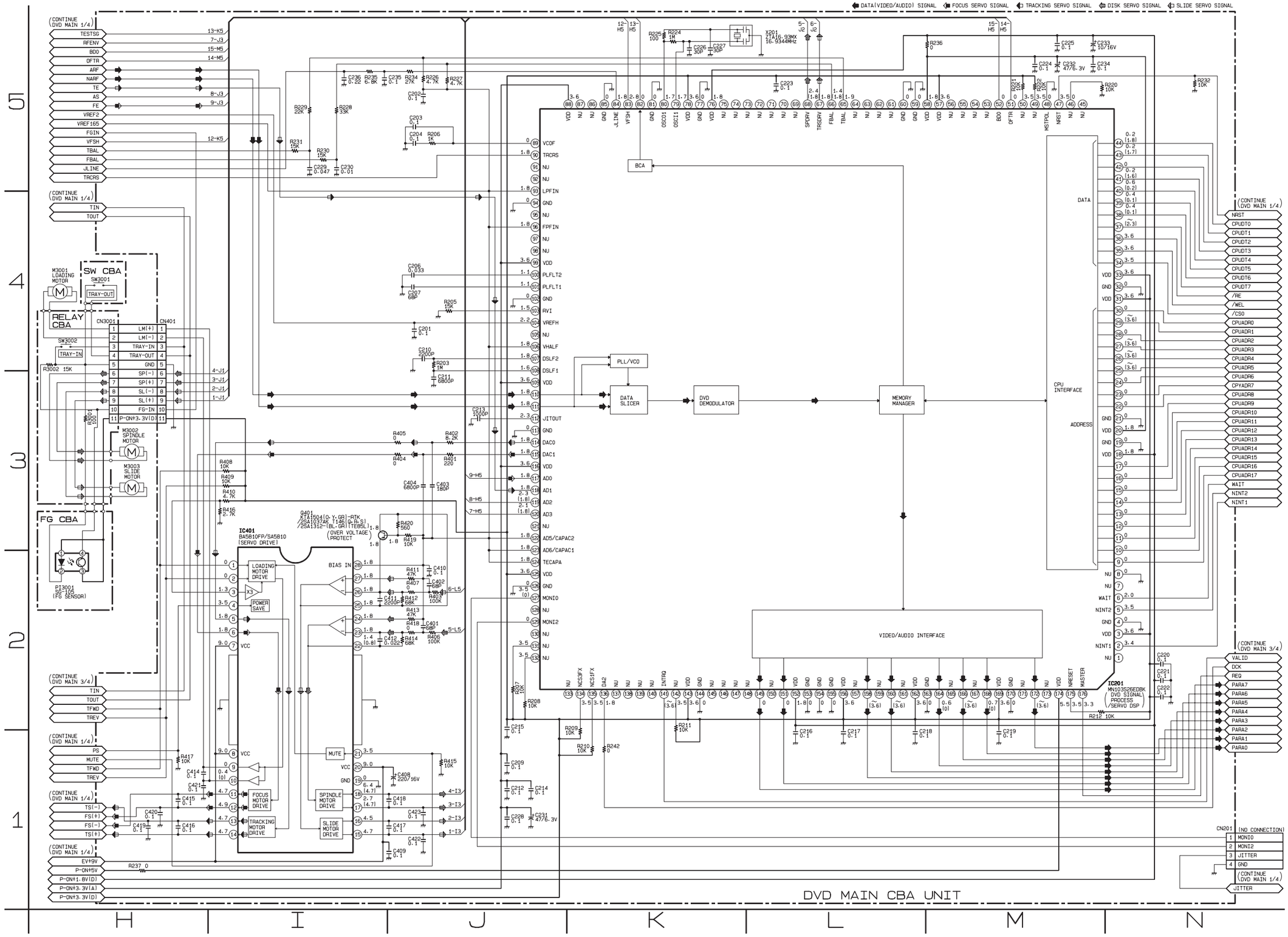
# DVD SECTION
## Wiring Diagram



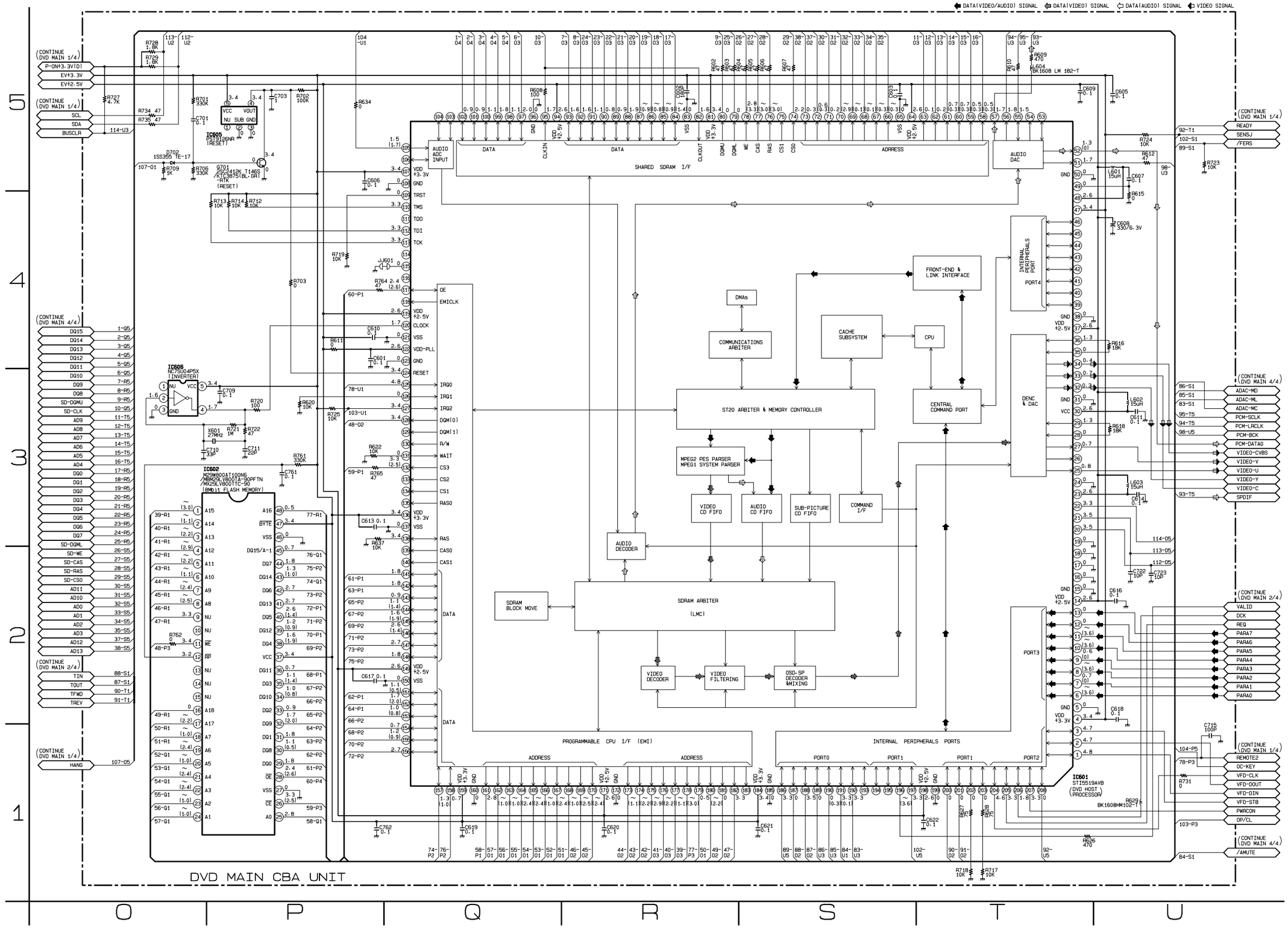
# DVD Main 1/4 Schematic Diagram



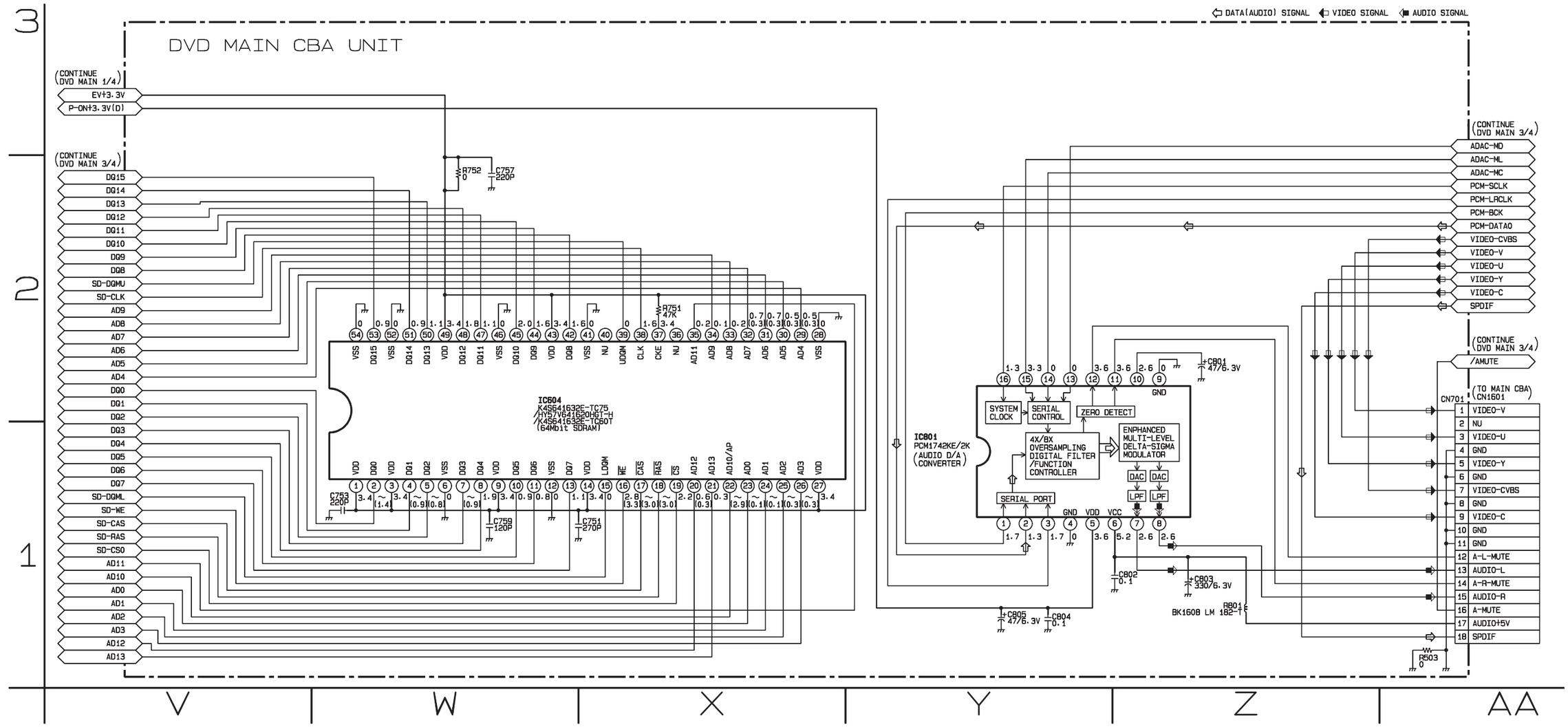
# DVD Main 2/4 Schematic Diagram



# DVD Main 3/4 Schematic Diagram

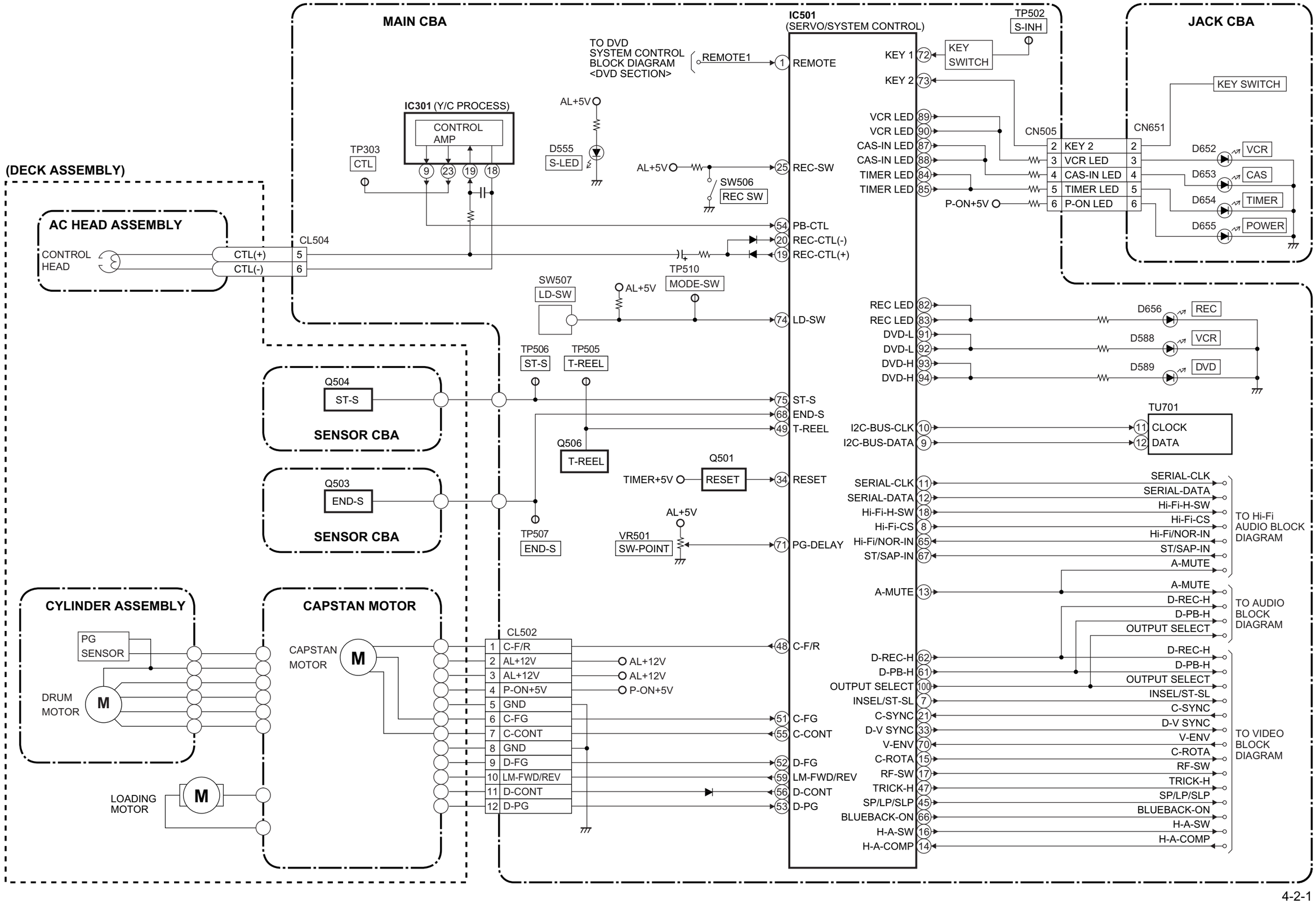


# DVD Main 4/4 Schematic Diagram



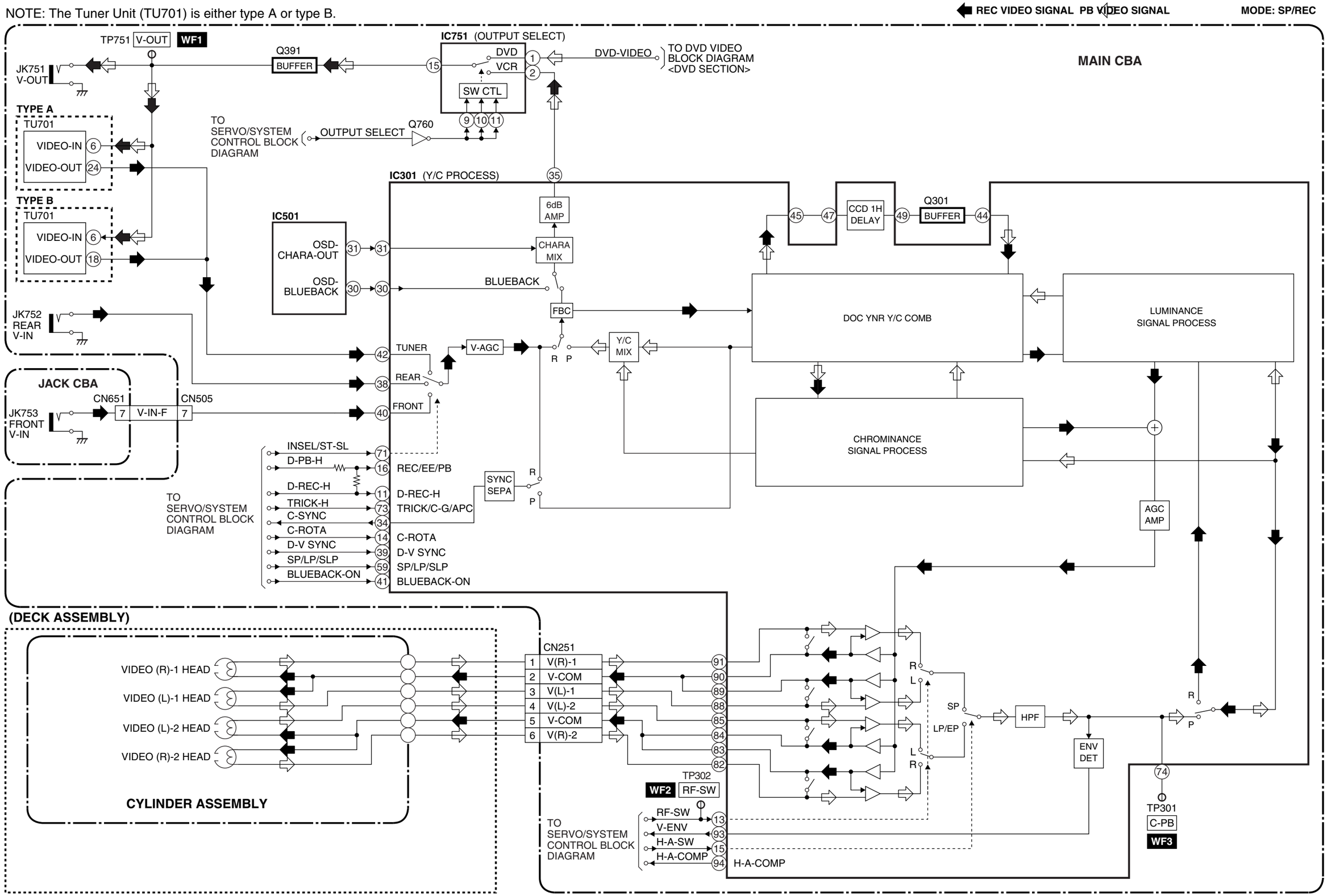
# BLOCK DIAGRAMS < VCR SECTION >

## Servo/System Control Block Diagram



# Video Block Diagram

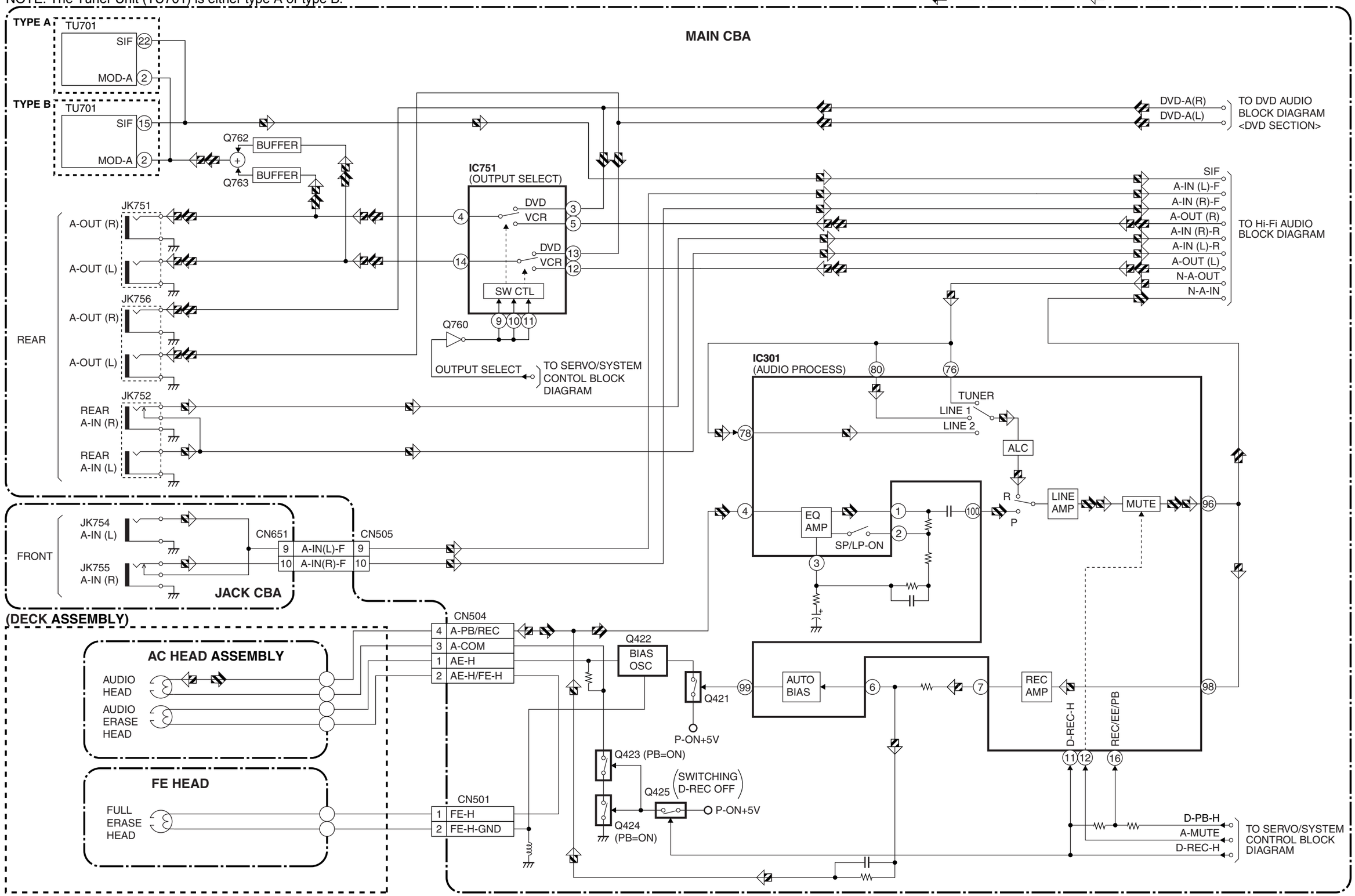
NOTE: The Tuner Unit (TU701) is either type A or type B.



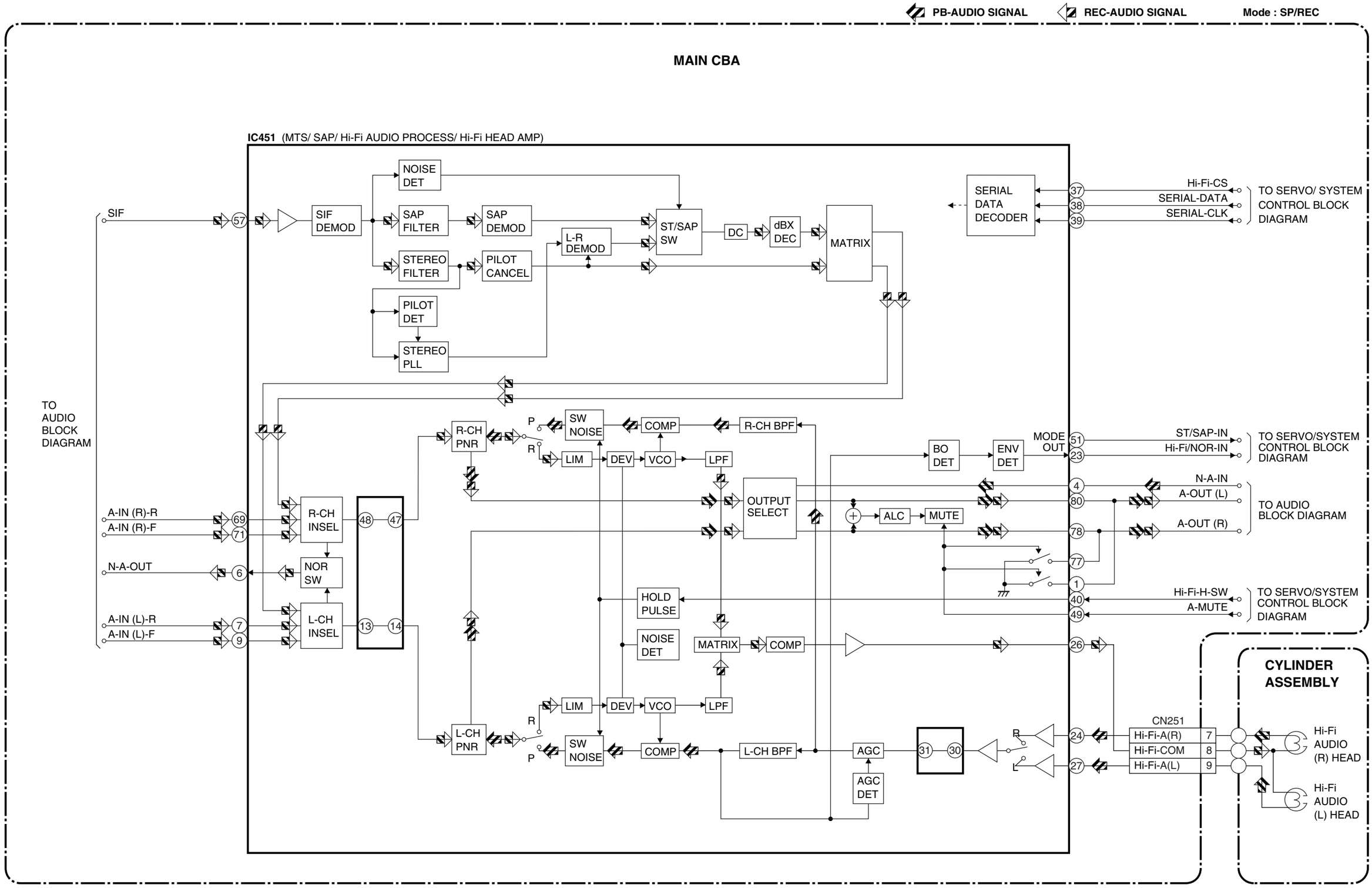
# Audio Block Diagram

NOTE: The Tuner Unit (TU701) is either type A or type B.

PB-AUDIO SIGNAL  REC-AUDIO SIGNAL  Mode : SP/REC



# Hi-Fi Audio Block Diagram



# Power Supply Block Diagram

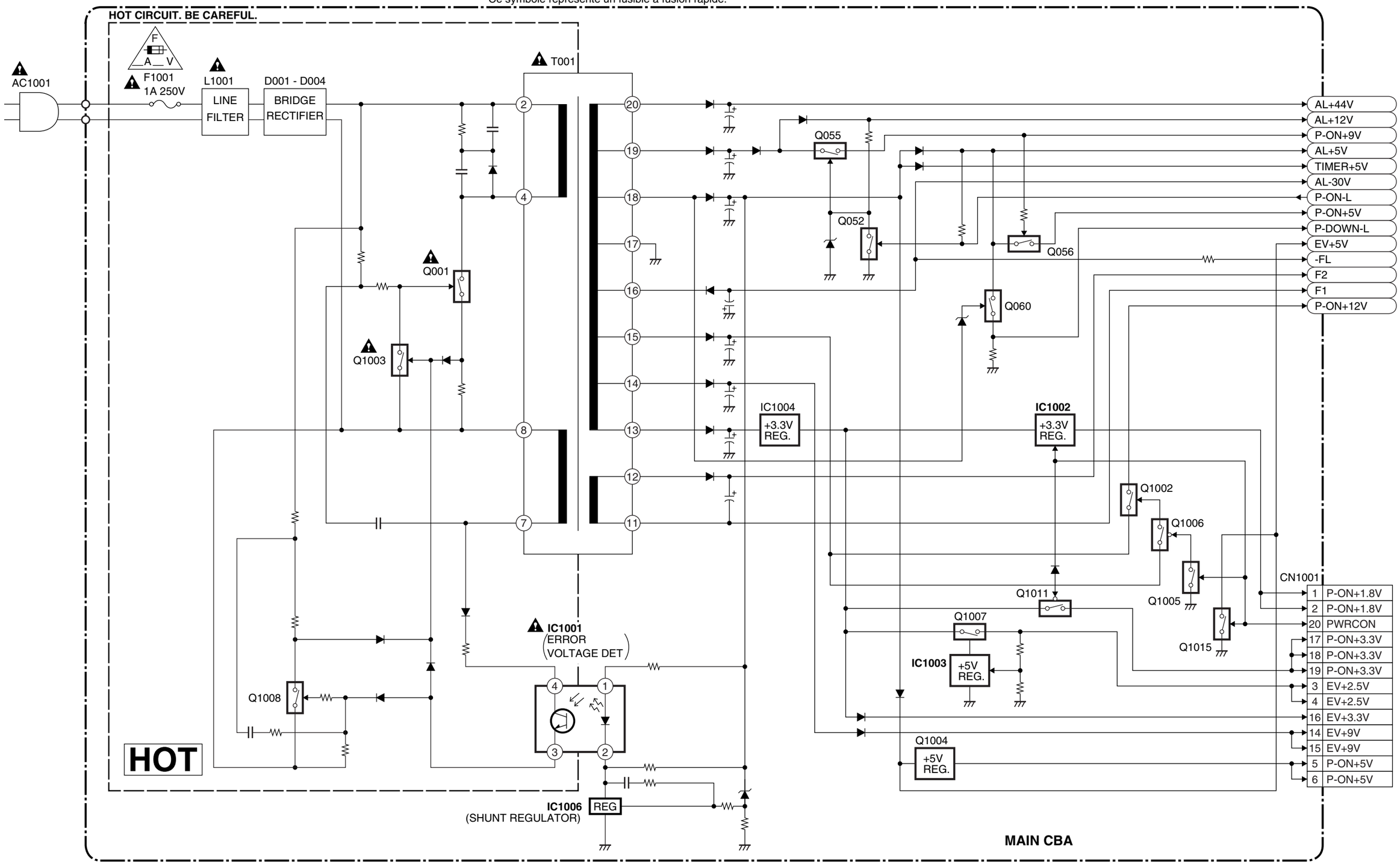
NOTE :
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

**CAUTION**
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.
ATTENTION : POUR UNE PROTECTION CONTINUE LES RISQES D'INCELE N'UTILISER QUE DES FUSIBLE DE MEMO TYPE.
**RISK OF FIRE** -REPLACE FUSE AS MARKED.
"This symbol means fast operating fuse."
"Ce symbole représente un fusible à fusion rapide."

**CAUTION !**

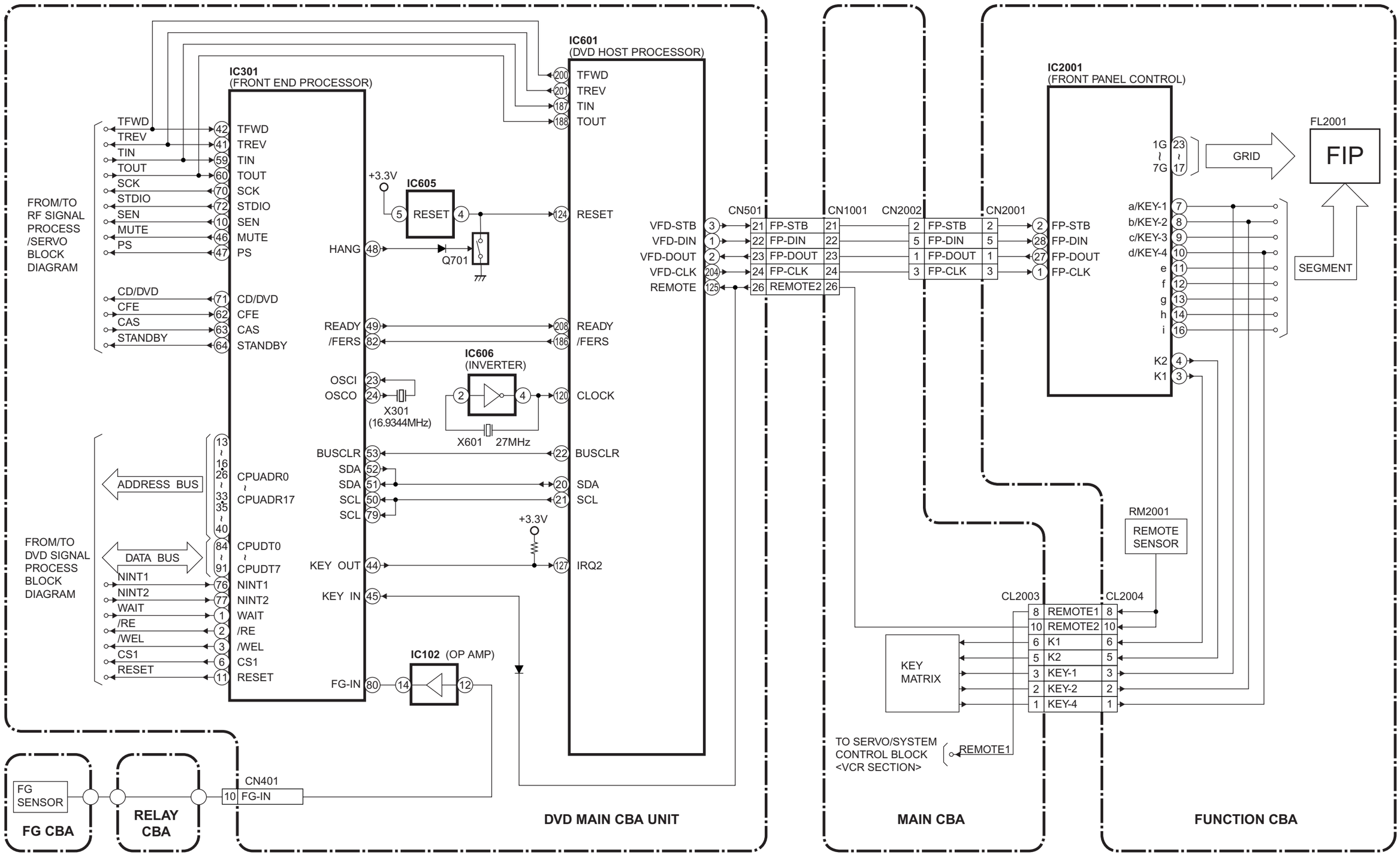
If Main Fuse (F001) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

Fixed voltage power supply circuit is used in this unit.

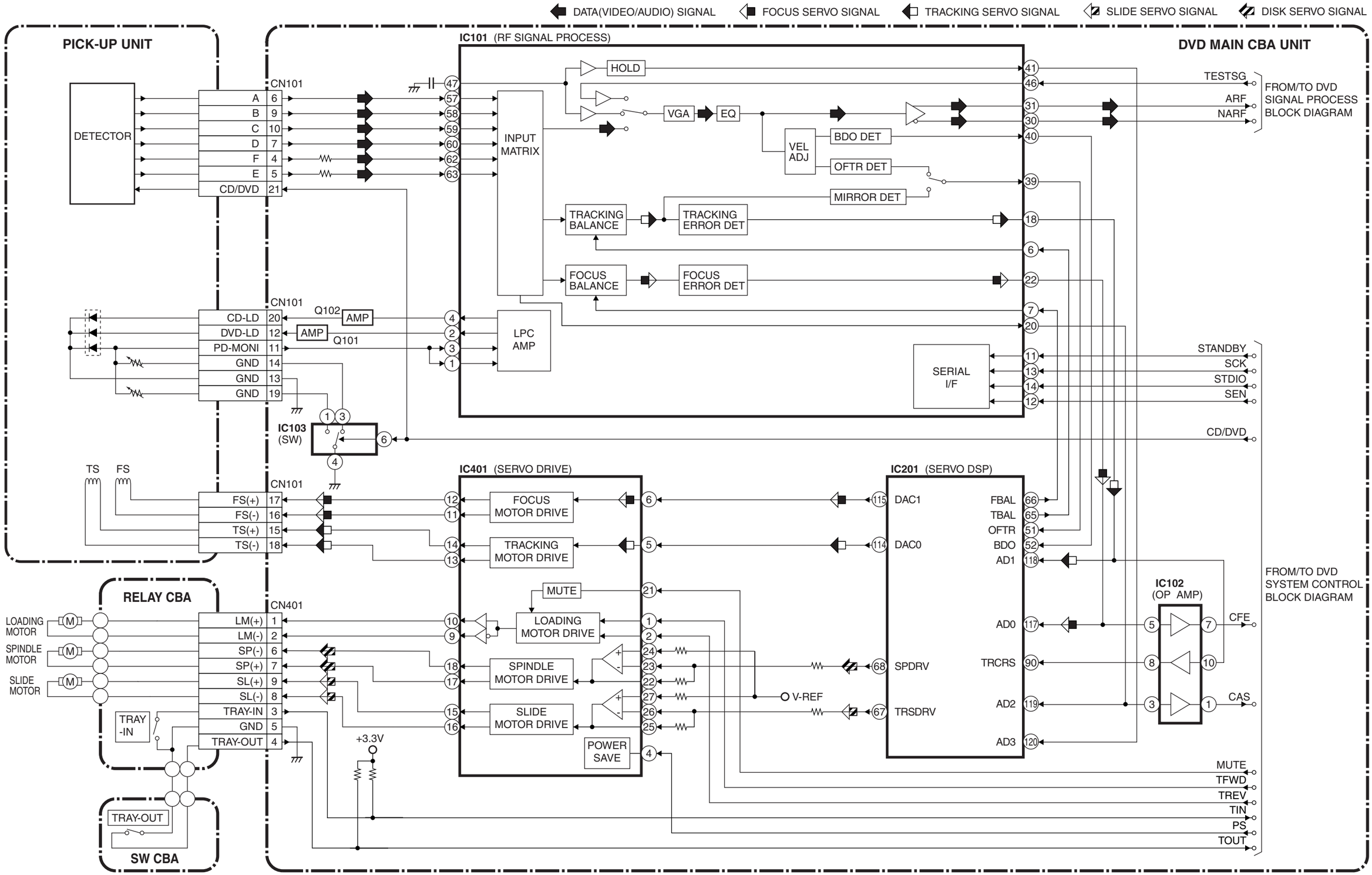


# BLOCK DIAGRAMS < DVD SECTION >

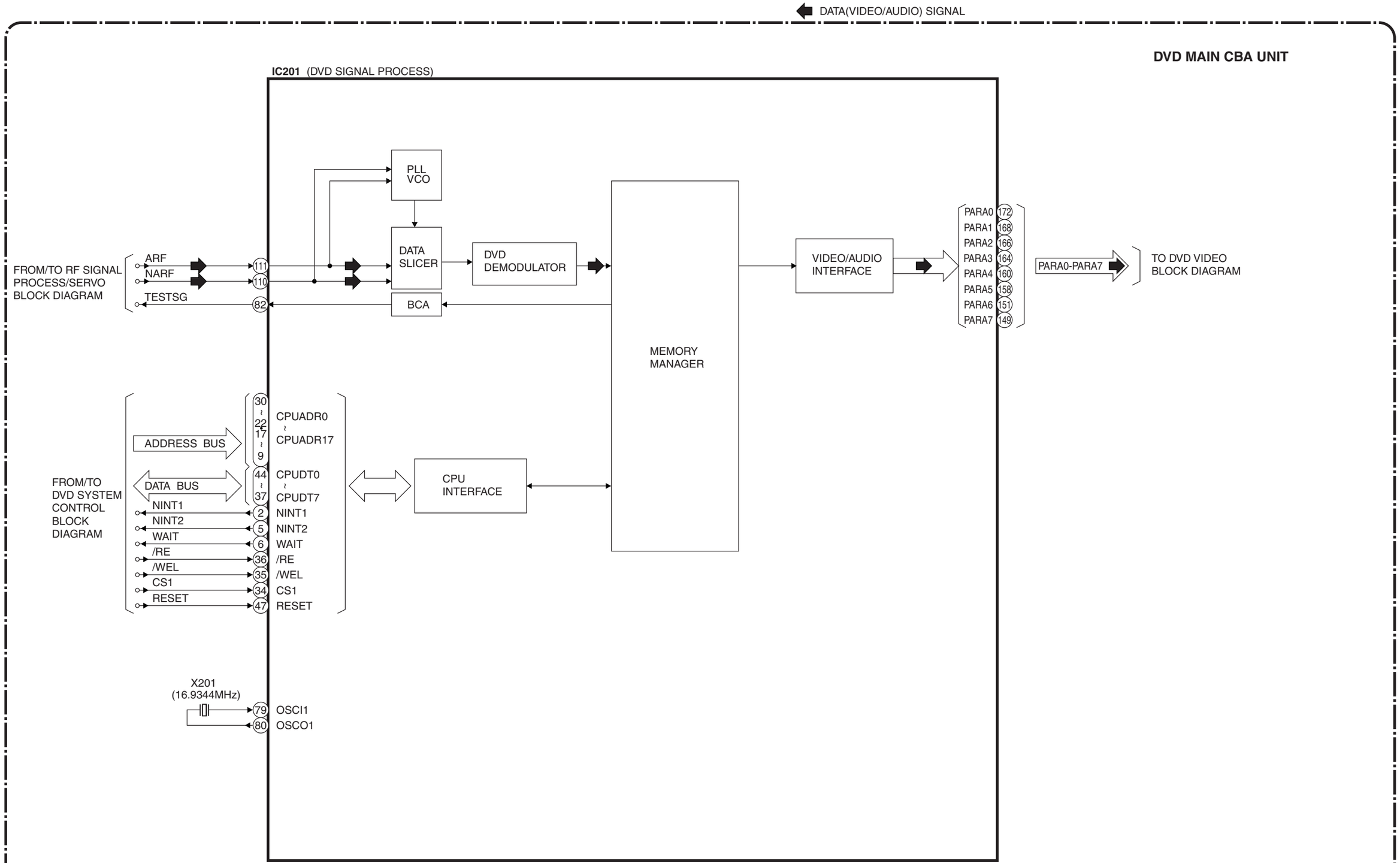
## DVD System Control Block Diagram



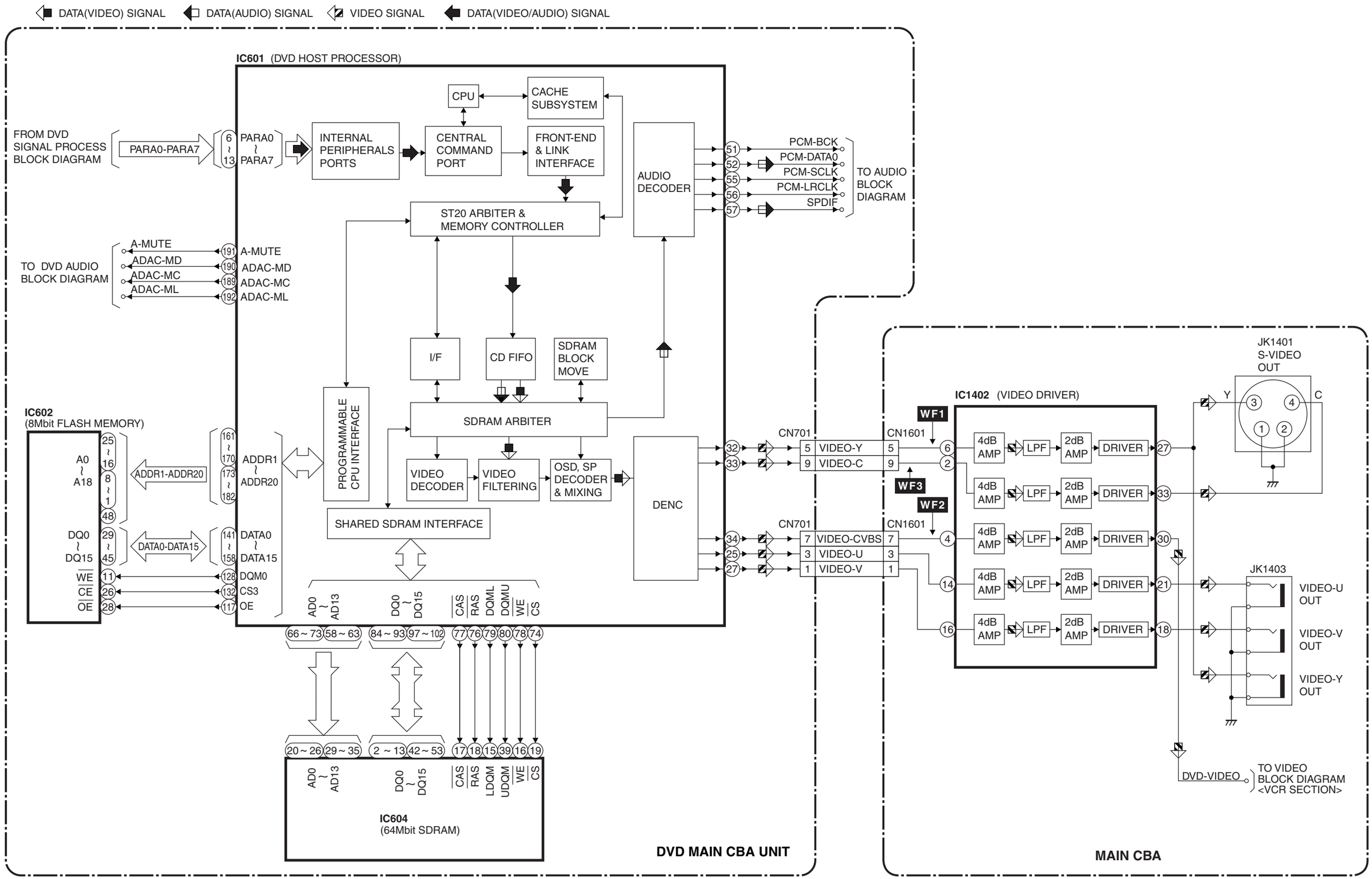
# RF Signal Process/Servo Block Diagram



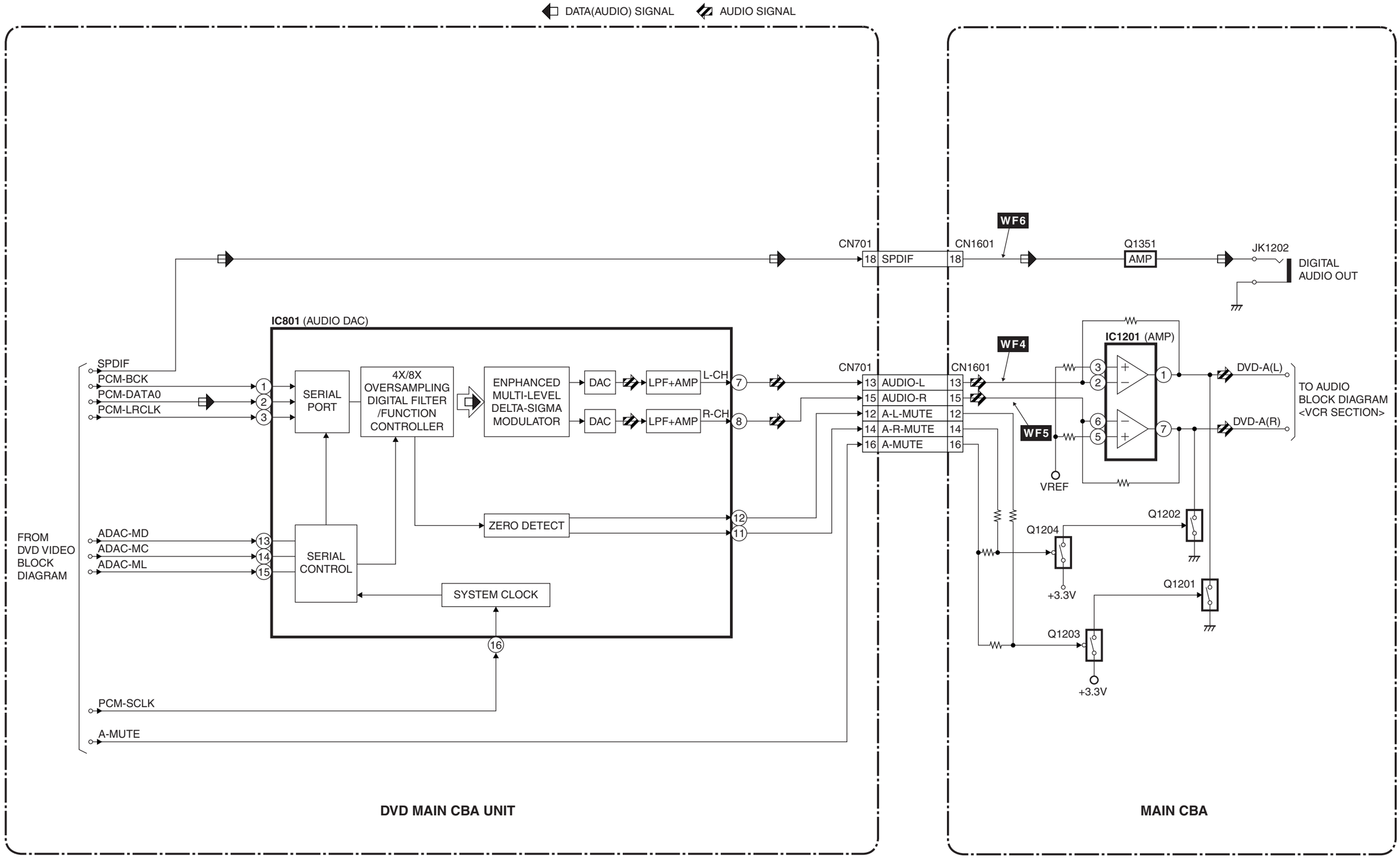
## DVD Signal Process Block Diagram



# DVD Video Block Diagram



# DVD Audio Block Diagram



# SYSTEM CONTROL TIMING CHARTS

## [ VCR Section ]

## Mode SW : LD-SW

| LD-SW Position detection A/D Input voltage Limit (Calculated voltage) | Symbol |
|---|---|
| 3.76V~4.50V (4.12V) | EJ |
| 4.51V~5.00V (5.00V) | CL |
| 0.00V~0.25V (0.00V) | SB |
| 1.06V~1.50V (1.21V) | TL |
| 0.66V~1.05V (0.91V) | FB |
| 1.99V~2.60V (2.17V) | SF |
| 1.51V~1.98V (1.80V) | AU |
| 3.20V~3.75V (3.40V) | AL |
| 0.26V~0.65V (0.44V) | SS |
| 4.51V~5.00V (5.00V) | GC |
| 2.61V~3.19V (2.97V) | RS |

**Note:**

**Note :**

EJ ⟶ RS: Loading FWD (LM-FWD “H”, LM-REV “L”)

RS ⟶ EJ: Loading REV (LM-FWD “L”, LM-REV “H”)

Stop (A) = Loading

Stop (B) = Unloading

**Note :**

| Symbol | Loading Status |
|---|---|
| EJ | Eject |
| CL | Eject ~ REW Reel |
| SB | REW Reel ~ Stop(B) |
| TL | Stop(B) ~ Brake Cancel |
| FB | Brake Cancel |
| SF | ~ Stop(A) |
| AU | Stop(A) ~ Play / REC |
| AL | Play / REC ~ Still / Slow |
| SS | Still / Slow ~ Capstan Reversal |
| GC | Capstan Reversal ~ RS (REW Search) |
| RS | RS (REW Search) |

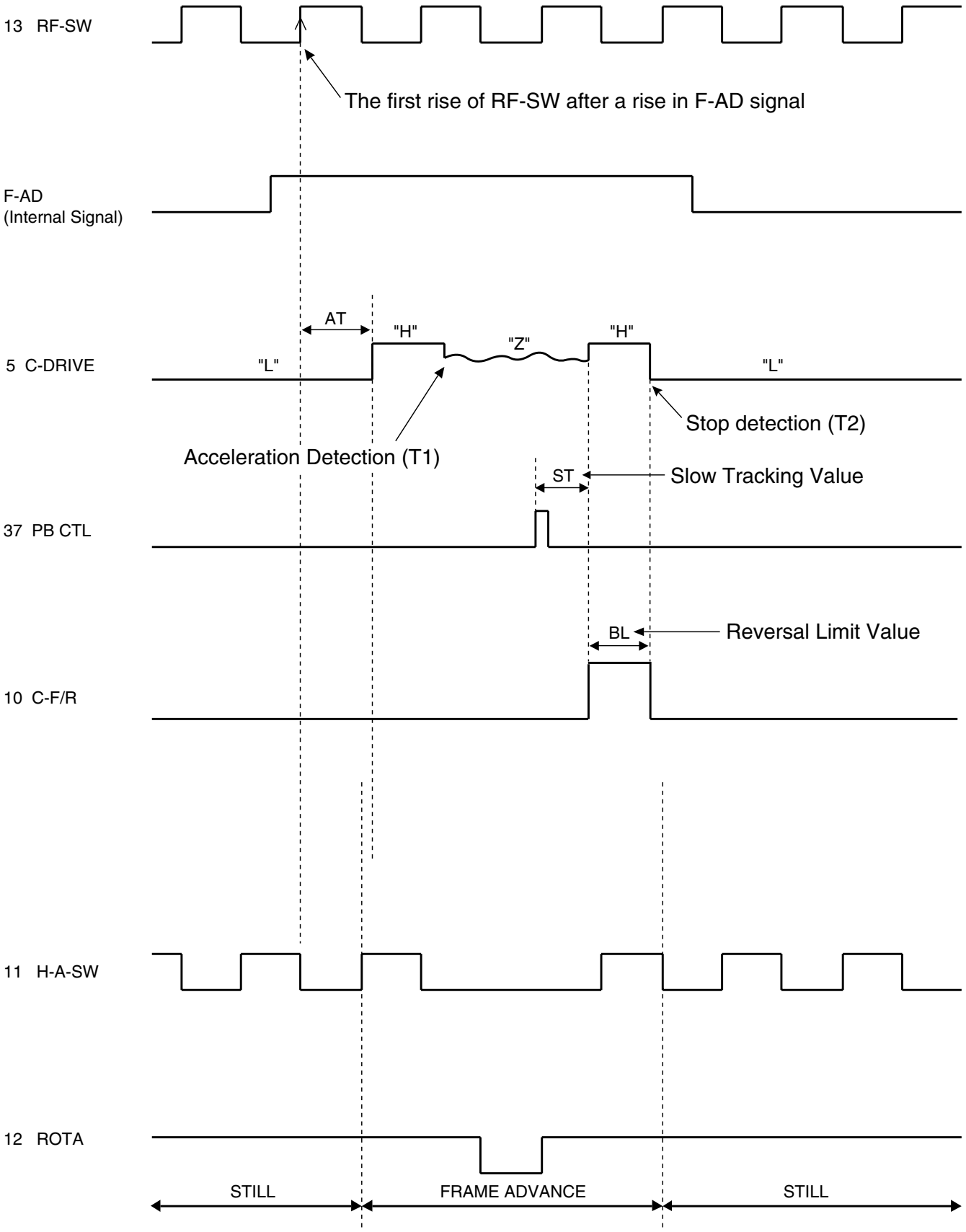

13 RF-SW
The first rise of RF-SW after a rise in F-AD signal
F-AD
(Internal Signal)
AT
"H"
"Z"
"H"
5 C-DRIVE
"L"
"L"
Stop detection (T2)
Acceleration Detection (T1)
ST
Slow Tracking Value
37 PB CTL
BL
Reversal Limit Value
10 C-F/R
11 H-A-SW
12 ROTA
STILL
FRAME ADVANCE
STILL

**Fig. 1**

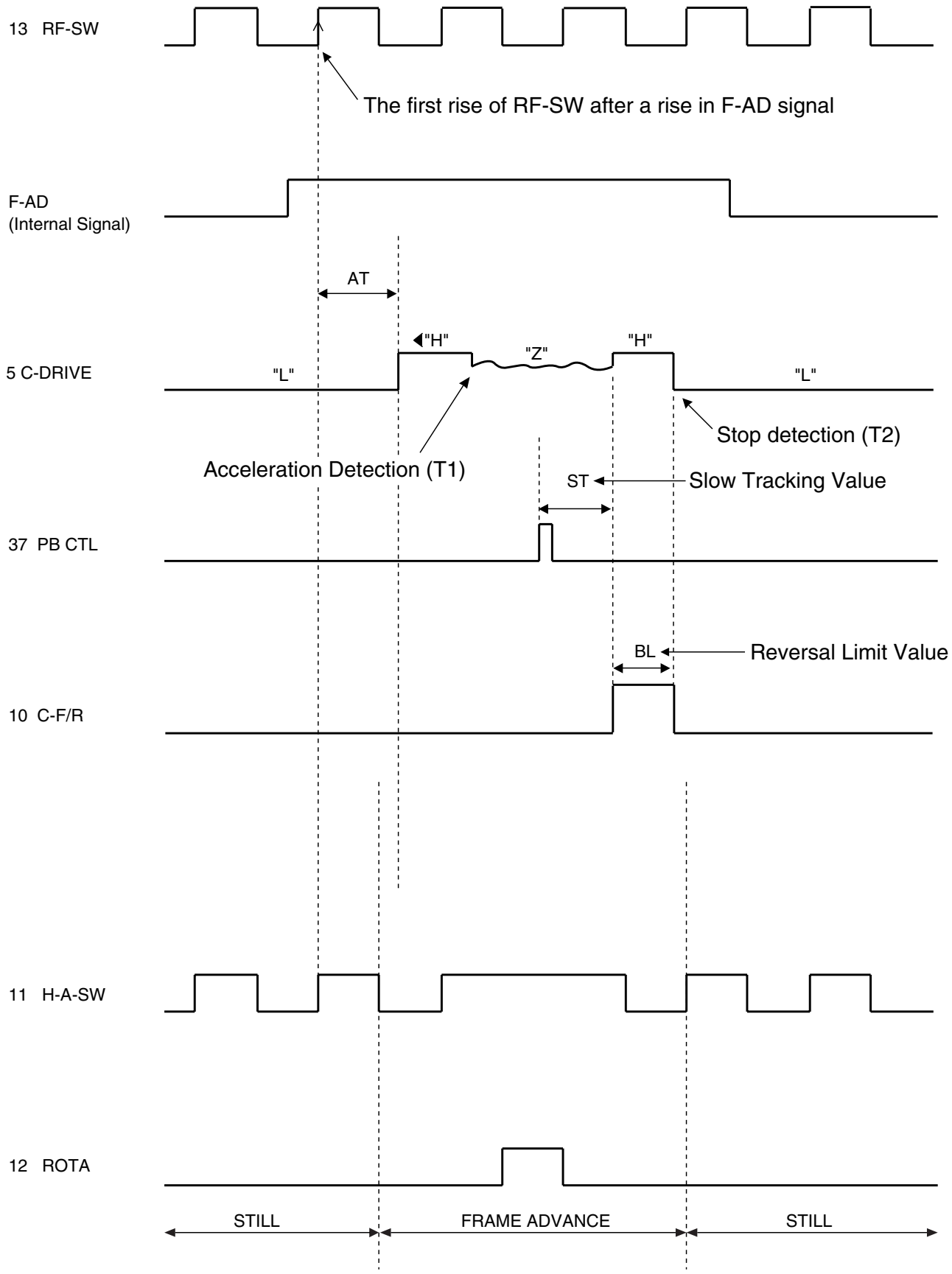

13 RF-SW
The first rise of RF-SW after a rise in F-AD signal
F-AD
(Internal Signal)
AT
"H"
"Z"
"H"
5 C-DRIVE
"L"
"L"
Stop detection (T2)
Acceleration Detection (T1)
ST
Slow Tracking Value
37 PB CTL
BL
Reversal Limit Value
10 C-F/R
11 H-A-SW
12 ROTA
STILL
FRAME ADVANCE
STILL

**Fig. 2**

**1. EJECT (POWER OFF) -> CASSETTE IN (POWER ON) -> STOP(B) -> STOP(A) -> PLAY -> RS -> FS -> PLAY -> STILL -> PLAY -> STOP(A)**

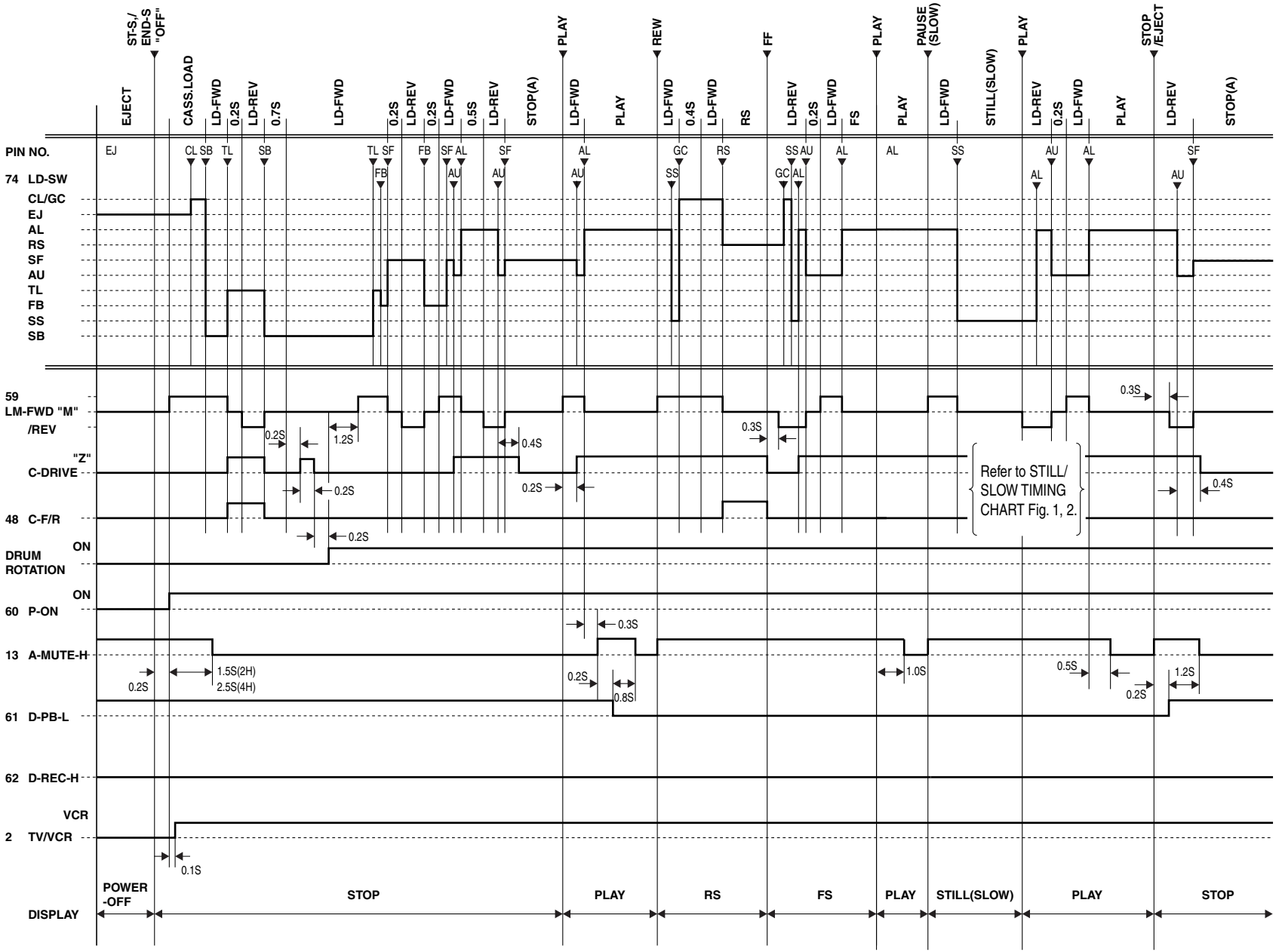



Fig. 3

**2. STOP(A) -> FF -> STOP(A) -> REW -> STOP(A) -> REC -> PAUSE -> PAUSE or REC -> STOP(A) -> EJECT**

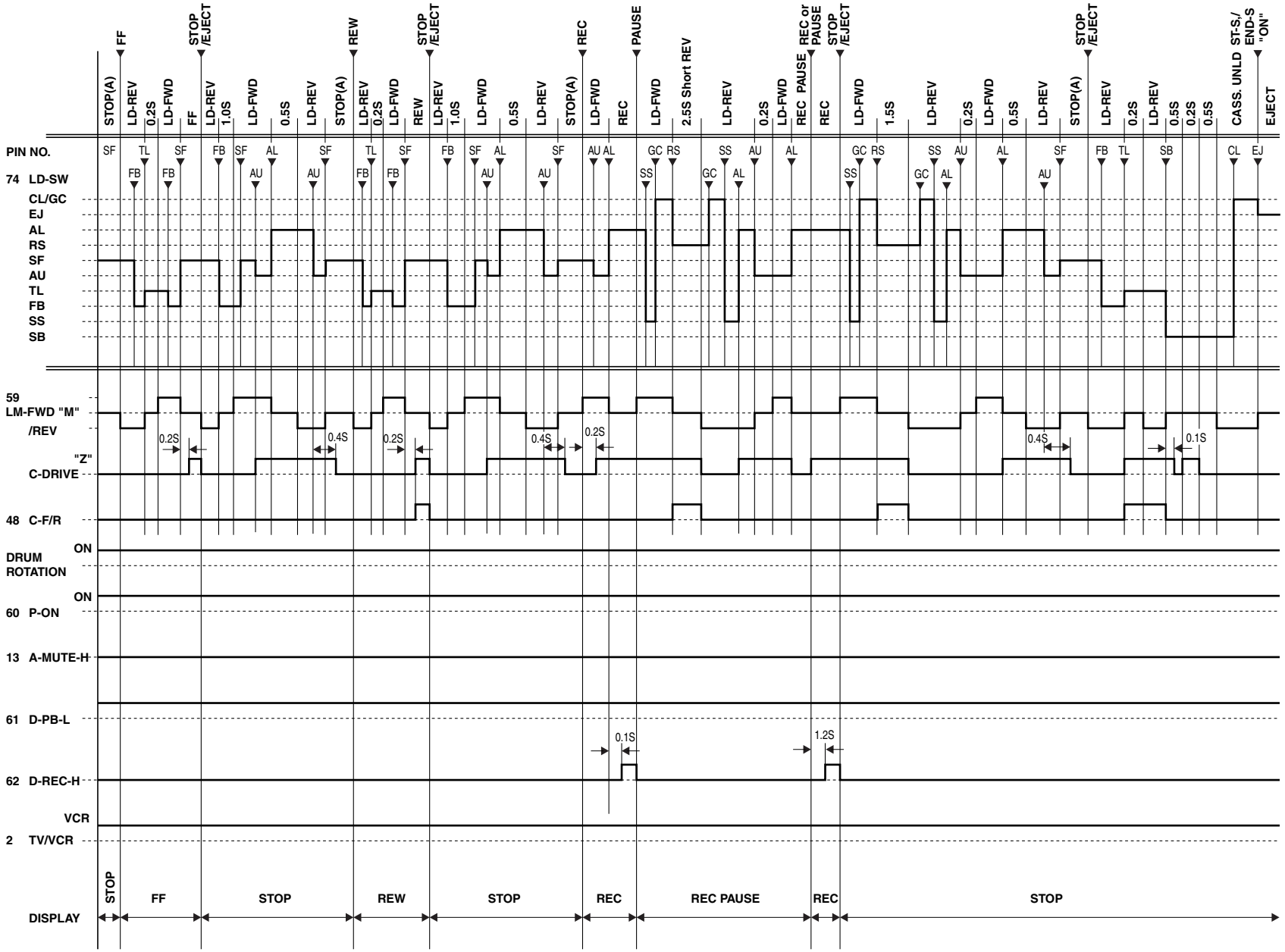
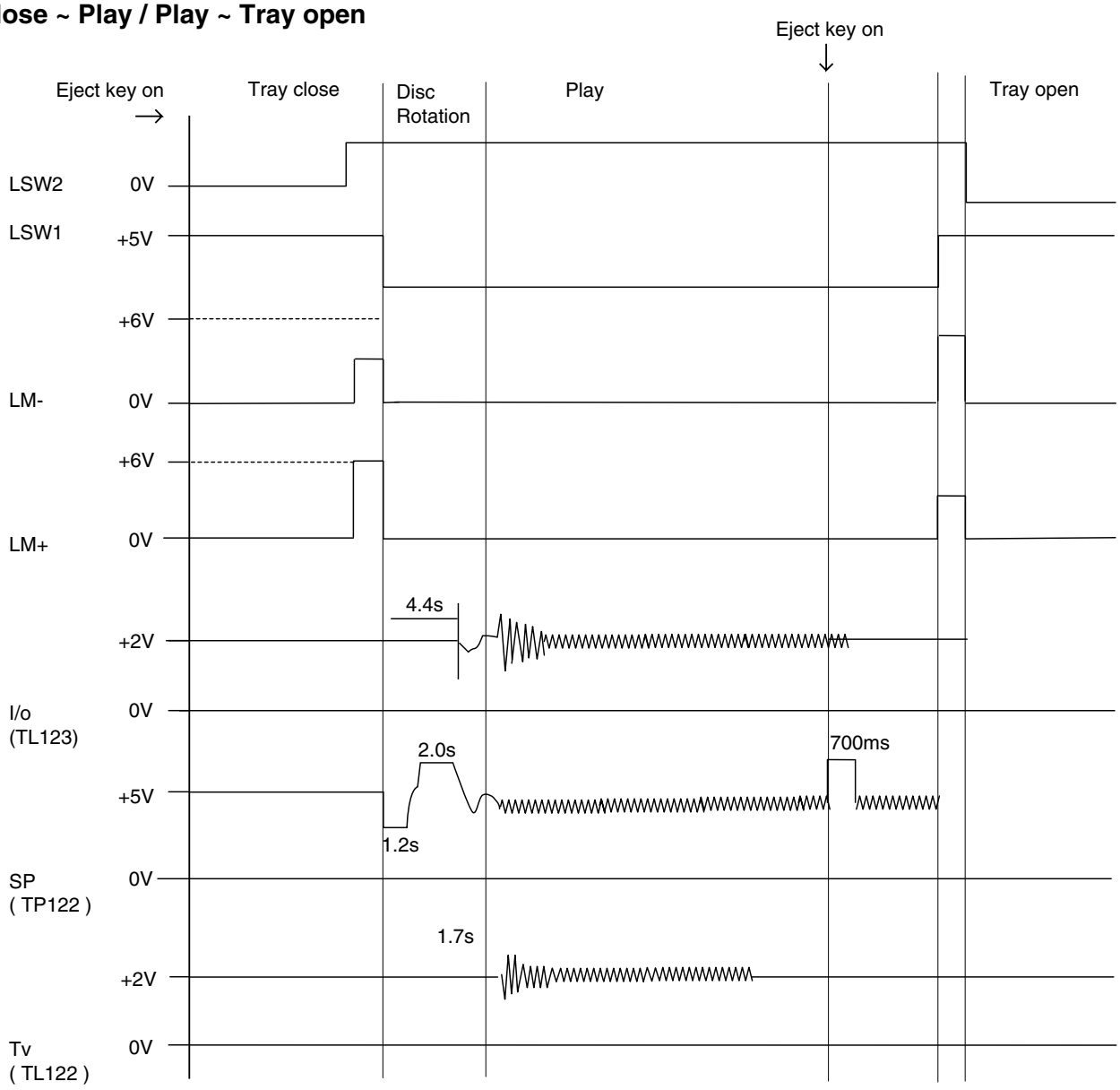



Fig. 4

### Tray close ~ Play / Play ~ Tray open



# IC PIN FUNCTION DESCRIPTIONS

## [ VCR Section ]

### IC501( SERVO / SYSTEM CONTROL IC )

**"H" ≥ 4.5V, "L" ≤ 1.0V**

| Pin No. | IN/ OUT | Signal Name | Function | Active Level |
|---|---|---|---|---|
| 1 | IN | REMO-CON-IN | Remote Control Sensor | L |
| 2 | OUT | TV/VCR | RF Conv. ON/OFF Signal (TV="L"/ VCR="H") | H/L |
| 3 | - | N.U. | Not Used | - |
| 4 | OUT | DVD-POWER | DVD Power Control Signal | L |
| 5 | - | N.U. | Not Used | - |
| 6 | - | N.U. | Not Used | - |
| 7 | OUT | INSEL/ ST-SL | Input Selector Control Signal (EE/Rec)/Still/Slow (Playback) | H/Hi-z /L |
| 8 | OUT | HiFi-CS | HiFi IC Chip Select | H |
| 9 | IN/ OUT | $I^2C$ BUS-DATA | $I^2C$ BUS Data Input/ Output | H/L |
| 10 | OUT | $I^2C$ BUS-CLK | $I^2C$ BUS Clock Output | H/L |
| 11 | OUT | SERIAL-CLK | Serial IC Control Clock Output | H/L |
| 12 | OUT | SERIAL-DATA | Serial IC Control Data Output | H/L |
| 13 | OUT | A-MUTE | Audio Mute Control Signal (Mute = "H") | H |
| 14 | IN | H-A-COMP | Head Amp Coparator Signal | H/L |
| 15 | OUT | C-ROTA | Color Phase Rotary Changeover SIgnal | H/L |
| 16 | OUT | H-A-SW | Video Head Amp Switching Pulse | H/L |
| 17 | OUT | RF-SW | Video Head Switching Pulse | H/L |
| 18 | OUT | HiFi-H-SW | HiFi Audio Head Switching Pulse | H/L |
| 19 | OUT | REC-CTL (+) | Record Control Signal (+) | H/L |
| 20 | OUT | REC-CTL (-) | Record Control Signal (-) | H/L |
| 21 | IN | C-SYNC | Composite Synchronized Pulse | PULSE |
| 22 | - | GND | GND | - |
| 23 | - | N.U. | Not Used | - |
| 24 | - | OSDVss | OSDVss | - |
| 25 | IN | REC-SW | Recoding Safety SW Detect (With Record tab="L"/ With out Record tab="H") | H/L |
| 26 | IN | C-VIDEO-IN | Composite Video Signal Input (Slicer) | - |
| 27 | IN | VHOLD | Condenser Connected Terminal (Slicer) | - |
| 28 | - | HLF | LPF Connected Terminal (Slicer) | - |
| 29 | - | GND | GND | - |
| 30 | OUT | OSD- BB-OUT | Composite Video Signal Output (Blue Back) | - |
| 31 | OUT | OSD-CHARA-OUT | Character Output (Superimposed) | - |
| 32 | - | OSDVcc | OSDVcc | - |
| 33 | OUT | D-V SYNC | Dummy V-sync Output | H/Hi-z |
| 34 | IN | RESET | System Reset Signal (Reset="L") | L |
| 35 | IN | $OSC_{IN}$ | Clock Input for letter size | - |
| 36 | OUT | $OSC_{OUT}$ | Clock Output for letter size | - |
| 37 | - | Vcc | Vcc | - |
| 38 | IN | X-IN | Main Clock Input 14.31818 MHz | - |
| 39 | OUT | X-OUT | Main Clock Output | - |
| 40 | - | Vss | Vss(GND) | - |
| 41 | IN | XC-IN | Sub Clock 32 kHz | - |
| 42 | OUT | XC-OUT | Sub Clock 32 kHz | - |
| 43 | IN | CLKSEL | Clock Select (GND) | L |
| 44 | - | N.U. | Not Used | - |
| 45 | OUT | SP/LP/ SLP | Top Speed Select Siganl (SP="L"/ LP="Z"/SLP="H") | H/Z/L |
| 46 | - | N.U. | Not Used | - |
| 47 | OUT | TRICK/C-G/APC | Special Playback/ Copy Guard/APC Control Signal | H/Z/L |
| 48 | OUT | C-F/R | Capstan Motor FWD/ REV Control Signal (FWD="L"/REV="H") | H/L |
| 49 | IN | T-REEL | Take Up Reel Rotation Signal | PULSE |
| 50 | - | N.U. | Not Used | - |
| 51 | IN | C-FG | Capstan Motor Rotation Detection Pulse | PULSE |
| 52 | IN | D-FG | Drum Motor Rotation Detection Pulse | PULSE |
| 53 | IN | D-PG | Drum Motor Pulse Generator | PULSE |

| Pin No. | IN/ OUT | Signal Name | Function | Active Level |
|---|---|---|---|---|
| 54 | IN | PB-CTL | Playback Control Signal | PULSE |
| 55 | OUT | C-CONT | Capstan Motor Control Signal | PWM |
| 56 | OUT | D-CONT | Drum Motor Control Signal | PWM |
| 57 | - | N.U. | Not Used | - |
| 58 | - | N.U. | Not Used | - |
| 59 | OUT | LM-FWD/ REV | Loading Motor FWD/ REV Outpit | H/Z/L |
| 60 | OUT | P-ON-L | Power On Signal to Low | L |
| 61 | OUT | D-PB-L | Playback Instruction Signal (Playback=”L”) | L |
| 62 | OUT | D-REC-H | Delayed Record Signal | H |
| 63 | IN | P-DOWN -L | Power Voltage Down Detector Signal | L |
| 64 | - | POW-MONITOR | DVD Power Monitor Signal (P-off="H", P-on="L") | H/L |
| 65 | IN | Hi-Fi/ NOR-IN | Audio Mode Input HiFi=”L”/ Normal=”H” | H/L |
| 66 | OUT | BLUE BACK-ON | Blueback Control Signal | H |
| 67 | IN | ST/SAP-IN | Tuner Stereo/Sap Detector Siganl Input | A/D |
| 68 | IN | END-S | Tape End Position Detect Signal | A/D |
| 69 | IN | AFC | Automatic Frequency Control Signal | A/D |
| 70 | IN | V-ENV | Video Envelope Comparator Signal | A/D |
| 71 | IN | PG-DELAY | Video Head Switching Pulse Signal Adjusted Voltage | A/D |
| 72 | IN | KEY-1 | A/D Key Data Signal 1 | A/D |
| 73 | IN | KEY-2 | A/D Key Data Signal 2 | A/D |
| 74 | IN | LD-SW | Deck Mode Position Detector Signal | A/D |
| 75 | IN | ST-S | Tape Start Position Detector Signal | A/D |
| 76 | - | AVcc | A/D Converter Power Input/ Standard Voltage Input | - |
| 77 | - | FLDVCC | FLDVcc | - |
| 78 | - | FLDVP | GND | - |
| 79 | - | N.U. | Not Used | - |
| 80 | - | N.U. | Not Used | - |
| 81 | - | N.U. | Not Used | - |
| 82 | OUT | REC LED | “REC” LED Signal Output | H/L |
| 83 | OUT | REC LED | “REC” LED Signal Output | H/L |
| 84 | OUT | TIMER LED | “TIMER” LED Signal Output | H/L |
| 85 | OUT | TIMER LED | “TIMER” LED Signal Output | H/L |
| 86 | - | N.U. | Not Used | - |
| 87 | OUT | CAS- IN LED | “CASSETTE” LED Signal Output | H/L |
| 88 | OUT | CAS- IN LED | “CASSETTE” LED Signal Output | H/L |
| 89 | OUT | VCR LED | VCR/TV Mode LED Indicate | H/L |
| 90 | OUT | VCR LED | VCR/TV Mode LED Indicate | H/L |
| 91 | OUT | DVD-L | VCR Mode LED Indicator | H |
| 92 | OUT | DVD-L | VCR Mode LED Indicator | H |
| 93 | OUT | DVD-H | Output Switching Signal DVD Mode LED Indicator | H |
| 94 | OUT | DVD-H | Output Switching Signal DVD Mode LED Indicator | H |
| 95 | - | N.U. | Not Used | - |
| 96 | - | N.U. | Not Used | - |
| 97 | - | N.U. | Not Used | - |
| 98 | - | N.U. | Not Used | - |
| 99 | - | N.U. | Not Used | - |
| 100 | OUT | OUTPUT SELECT | Output Select | H/L |

**Notes:**

Abbreviation for Active Level:

PWM -----Pulse Wide Modulation

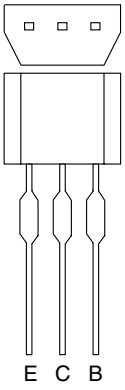
A/D--------Analog - Digital Converter

# [ DVD Section ]

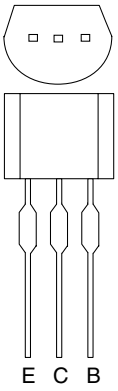
## IC2001 [ PT6315-S / PT6315-S ]

| Pin No. | In/Out | Signal Name | Name Function |
|---|---|---|---|
| 1 | In | CLK | Clock Input |
| 2 | In | STB | Serial Interface Strobe |
| 3 | In | K1 | Key Data 1 Input |
| 4 | In | K2 | Key Data 2 Input |
| 5 | - | VSS | GND |
| 6 | - | VDD | Power Supply |
| 7 | Out | a / KEY-1 | Segment Output / Key Souce-1 |
| 8 | Out | b / Key-2 | Segment Output / Key Souce-2 |
| 9 | Out | c / Key-3 | Segment Output / Key Souce-3 |
| 10 | Out | d / Key-4 | Segment Output/ Key Souce-4 |
| 11 | Out | e | Segment Output |
| 12 | In | f | |
| 13 | In | g | |
| 14 | Out | h | |
| 15 | - | VEE | Pull Down Level |
| 16 | Out | i | Segment Output |
| 17 | Out | 7G | Grid Output |
| 18 | | 6G | |
| 19 | | 5G | |
| 20 | | 4G | |
| 21 | | 3G | |
| 22 | | 2G | |
| 23 | | 1G | |
| 24 | - | VDD | Power Supply |
| 25 | - | VSS | GND |
| 26 | In | OSC | Oscillator Input |
| 27 | Out | DOUT | Serial Data Output |
| 28 | In | DIN | Serial Data Input |

# LEAD IDENTIFICATIONS

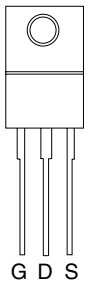



BN1F4M-T
BA1F4M-T
KTA1266(GR)
KTC3193(Y)
KTC3199(Y,GR,BL)
2SC2785(J.H.F.K)
2SA1015-GR(TPE2)
KTC3198(Y,GR)
KRC103M
KRA103M
2SA966(Y)
2SC2236-Y-TPE6,C

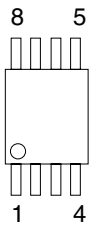



2SC1815-BL(TPE2)
2SC1815-Y(TPE2)
2SC1815-GR(TPE2)
2SC3331(T,U)
2SC2120-Y(TPE2)
KTC3203(Y)
KTC3202(Y)
KRC110M-AT
BA1L3Z-T
KTC3205 (Y)
BN1L3Z(P)
KRA110M
KTA1273(Y)

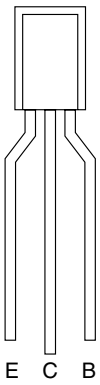
2SK2662
KIA78R33PI
PQ3RD13(1A)



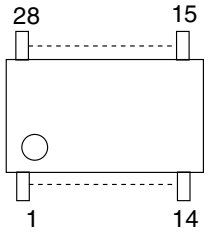

NJM4558D
KIA4558P




2SC536NF(NG)-NPA-AT

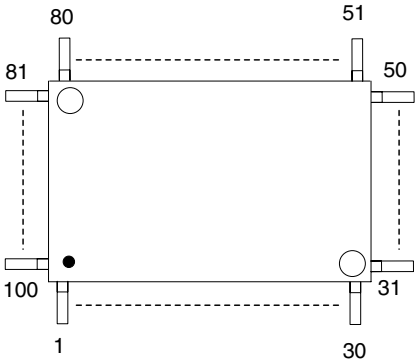



PT6315-S
PT6315-S(-TP)

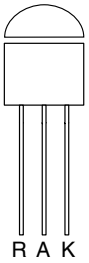



LTV-817(B.C)-F

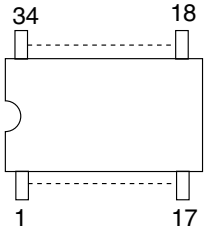

QSZAA0RMB116
LA71091M



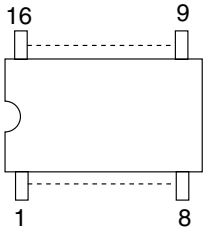

KIA431-AT



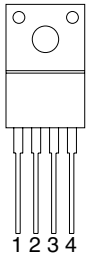

MM1567AJ



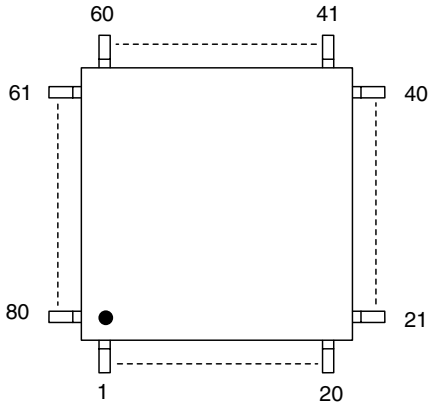

TC4053BF(N)



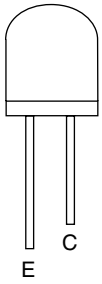

PQ018EF01SZ




LA72655M




MID-32A22
PT204-6B-12




**Note:**
A: Anode
K: Cathode
E: Emitter
C: Collector
B: Base
R: Reference
S: Source
G: Gate
D: Drain

DV-PF2U

HITACHI

DV-PF2U

DV-PF2U TK No. 9206E Digital Media Division, Tokai