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

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

Manufactured under license from Dolby Laboratories. "Dolby" and the double-D symbol are trademarks of Dolby Laboratories.

"DTS" and "DTS Digital Out" are trademarks of Digital Theater Systems Inc.
## COMPARISON OF MODELS

### VTR Section

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

### DVD Section

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

←: Same as on left
<table>
<thead>
<tr>
<th>VIDEO</th>
<th>PAL Disc NTSC Out</th>
<th>---</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Out Mode NTSC/PAL/PAL60</td>
<td>O / --- / ---</td>
<td>←</td>
</tr>
<tr>
<td>S-Video / Component / Composite</td>
<td>O / O / O</td>
<td>←</td>
</tr>
<tr>
<td>Video D/A Converter</td>
<td>10bit</td>
<td>←</td>
</tr>
<tr>
<td>Black Level Select</td>
<td>O</td>
<td>←</td>
</tr>
<tr>
<td>Picture Control</td>
<td>---</td>
<td>←</td>
</tr>
<tr>
<td>Progressive Out</td>
<td>O</td>
<td>---</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AUDIO</th>
<th>Audio D/A Converter</th>
<th>192kHz / 24bit</th>
<th>96kHz / 24bit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Audio Out Optical / Coaxial</td>
<td>--- / O</td>
<td>O / O</td>
<td>←</td>
</tr>
<tr>
<td>Dolby Digital 5.1 ch Decode</td>
<td>---</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>DTS Digital Out</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Virtual Surround</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Dynamic Range Compression (Dolby Digital)</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>DVD Audio</td>
<td>---</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Power on sound</td>
<td>---</td>
<td>←</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRICK PLAY</th>
<th>Search Speed (DVD: 2, 8, 30, 60/ VCD: 2, 8, 30/CD: 16)</th>
<th>2 to 60 (FORWARD/REWIND)</th>
<th>2 to 128 (FORWARD/REWIND)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slow Speed</td>
<td>1/16, 1/8, 1/2 (FORWARD only)</td>
<td>1/8, 1/4, 1/2 (FORWARD only)</td>
<td></td>
</tr>
<tr>
<td>IP Search (Smooth 2x Play)</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>2x Play with Audio</td>
<td>---</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Step Forward / Reverse</td>
<td>O / ---</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Still Picture Select (Frame/Field)</td>
<td>Auto Only</td>
<td>O</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FEATURES</th>
<th>Disc Navigation</th>
<th>---</th>
<th>O (DV-P315U) --- (DV-P313U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVD Zoom x2 / x4 / x16</td>
<td>O / O / ---</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Program and Random Play of DVD / VCD</td>
<td>---</td>
<td>O / O</td>
<td>←</td>
</tr>
<tr>
<td>A-B Repeat</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Repeat</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Last Play</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Closed Caption for NTSC DVD</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Front Panel Display Dimmer</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Screen Saver</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Auto Power Off</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REMOTE CONTROL</th>
<th>Jog Shuttle on Remote</th>
<th>---</th>
<th>←</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV Control</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACCESSORY</th>
<th>Remote Controller</th>
<th>O</th>
<th>←</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>AV Cable</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>S Cable</td>
<td>---</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>AC Socket</td>
<td>---</td>
<td>←</td>
<td></td>
</tr>
<tr>
<td>Warranty Card</td>
<td>O</td>
<td>←</td>
<td></td>
</tr>
</tbody>
</table>
LASER BEAM SAFETY PRECAUTIONS

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

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

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.

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 continually 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

<table>
<thead>
<tr>
<th>AC Line Voltage</th>
<th>Clearance Distance ((d)(d'))</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 V</td>
<td>(\geq 3.2\text{mm (0.126 inches)})</td>
</tr>
</tbody>
</table>

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

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.

Table 2: Leakage current ratings for selected areas

<table>
<thead>
<tr>
<th>AC Line Voltage</th>
<th>Load (Z)</th>
<th>Leakage Current ((i))</th>
<th>Earth Ground ((B)) to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 V</td>
<td>0.15(\mu)F CAP. &amp; 1.5k(\Omega) RES. Connected in parallel</td>
<td>(\leq 0.5)mA Peak</td>
<td>Exposed accessible parts</td>
</tr>
</tbody>
</table>

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)

(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.
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)

(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)

(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)

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.

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)
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.

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.
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.
OPERATING CONTROLS AND FUNCTIONS

FRONT PANEL

REMOTE CONTROL

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. ✔/✔ POWER/STANDBY Button
   Press to turn the power on and off.
8. ✔/✔ 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.

VCR operation Buttons : Blue
DVD operation Buttons : Yellow
Common operation Buttons : White
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. ◎/1 (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 to watch TV (changing channels at the TV) or view Disc playback or menus.

38. RETURN Button  
- Use when making settings while watching the display on a TV screen.

39. VCR/TV Button  
- Use to watch TV (changing channels at the TV) or view Disc playback or menus.

40. DVD Button  
- Press to select DVD mode for 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 cannot 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 reselect 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.
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.
### DISPLAYS DURING OPERATION

<table>
<thead>
<tr>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power on</td>
<td>Power on</td>
</tr>
<tr>
<td>No disc inserted</td>
<td>No disc inserted</td>
</tr>
<tr>
<td>Tray open</td>
<td>Tray open</td>
</tr>
<tr>
<td>Tray closed</td>
<td>Tray closed</td>
</tr>
<tr>
<td>Loading the Disc</td>
<td>Loading the Disc</td>
</tr>
<tr>
<td>Power off</td>
<td>Power off</td>
</tr>
</tbody>
</table>

### LOADING THE BATTERIES

1. Open the battery compartment cover.

![Open Battery Compartment](image)

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

![Insert Batteries](image)

3. Close the cover.

![Close Battery Compartment](image)

**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.

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.

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Appearance</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reading...</td>
<td>Sending files into the memory</td>
</tr>
<tr>
<td>2</td>
<td>Erasing...</td>
<td>Erasing previous version data</td>
</tr>
<tr>
<td>3</td>
<td>Programming...</td>
<td>Writing new version data</td>
</tr>
</tbody>
</table>

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)

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.
FLOW CHART NO.1
The power cannot be turned on.(1)

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

Is normal state restored when once unplugged power cord is plugged again after several seconds.  
- Yes
  - Replace IC601.
- No
  - Check each rectifying circuit of secondary circuit.

Is the EV 5V line voltage normal?  
- Yes
  - Replace IC601.
- No
  - Check each rectifying circuit of secondary circuit.

Is the voltage of EV 12V, EV -30V and filament voltage normal?  
- Yes
  - Replace IC601.
- 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
  - Replace IC601.
- No
  - Check each component and if poor replace.

Is the supply voltage of 3.3V fed to Q2021?  
- Yes
  - Is the supply voltage of 5V fed to pin(3) of IC2001?  
    - Yes
      - Check the line between the remote control receiver and the pin(125) of IC601.
    - No
      - Check the SW2008 and POWER button line.
- No
  - Check the SW2008 and POWER button line.

Is the "H" signal inputted at base of Q2021, when the POWER button activated on the DVD?  
- Yes
  - Is the "H" signal inputted at base of Q2021, when the POWER button activated on the remote control unit?  
    - Yes
      - 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?  
          - Yes
            - Replace IC601.
          - No
            - Replace IC601.
        - No
          - Replace IC601.
    - No
      - Check each component and if poor replace.
- No
  - Check each component and if poor replace.

FLOW CHART NO.3
The fuse blows out.

Is there leaking or short-circuited primary component?  
- Yes
  - Check for short-circuiting of rectifying diode and circuit in each rectifying circuit of secondary side.
- No
  - Replace IC601.
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 → Check the signal lines of FIP DA, FIP CK, FIP CS of 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?
        - Yes → Check that the fluorescent display tube is free from damages such as crack.
        No → Check or replace IC2001 and IC601.
    - No → Check the fluorescent display tube and its periphery?
      - 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

No operation is possible from the infrared remote control.

- Operation is possible from the DVD, but no operation is possible from the infrared remote control?
  - Yes: Replace the remote control receiver or replace the remote control transmitter is necessary.
  - No: Replace the remote control receiver.

- Is 5V voltage supplied to the pin(3) terminal of remote control receiver?
  - Yes: Check the line between the remote control receiver and the pin(125) of IC601.
  - No: Check EV 5V line.

- Is the "L" pulse sent out pin(1) terminal of receiver when the infrared remote control is activated?
  - Yes: Replace IC601.
  - No: Replace the remote control receiver.

- Is pulse signal supplied to the pin(125) of IC601? (Although SEARCH(1), SEARCH(+), PLAY, STILL/PAUSE, STOP, POWER and OPEN/CLOSE button.)
  - Yes: Yes
  - No: No

FLOW CHART NO.9

PON 12V is not outputted.

- Is 12V voltage supplied at collector of Q1002?
  - Yes: Check the Q1002 periphery circuit.
  - No: Check the secondary circuit, AT 12V and the periphery circuit of Q1005 and Q1006.

- Is voltage of 12V sent out from the emitter of Q1002.
  - Yes: Check for load circuit short-circuiting or leak.
  - No: Check the Q1002 periphery circuit.

- Check the Q1002 periphery circuit.
  - Yes: Check the secondary circuit, AT 12V and the periphery circuit of Q1005 and Q1006.
  - No: Check each component and if poor the replace.

- Does the P-CON switch circuit operate normally? (Q1005, Q1006, D1036, etc.)
  - Yes: Are the "H" pulse inputted into Q1002.
  - No: Check or replace Q1005, Q1006.

- Are the "H" pulse inputted into Q1002.
  - Yes: Replace Q1002.
  - No: Check or replace Q1005, Q1006.
FLOW CHART NO.10

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

Is 5V voltage supplied at collector of Q1004?
- Yes → Check the AT 5V line.
- No → Check for load circuit short-circuiting or leak.

Is voltage of 5V sent out from the collector of Q1004?
- Yes → Check the Q1004 periphery circuit.
- No → Check or replace Q1004, D1046.

Is the "H" pulse inputted into the base of Q1004?
- Yes → Replace Q1004.
- No → Check the AT 5V line.

FLOW CHART NO.11

EV -19V is not outputted.

Is -19V voltage supplied at the cathode of D1003?
- Yes → Check the AT -24V line.
- No → Check for load circuit short-circuiting or leak.

Is voltage of -24V sent out from the anode of D1003?
- Yes → Replace D1003.
- No → Check the D1003 periphery circuit.

FLOW CHART NO.12

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

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

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.

Does the P-CON switch circuit operate normally? (Q1005, Q1006, etc.)
- Yes → Replace Q1011.
- No → Check each component and if poor the replace.

Are the "H" pulse inputted into base of Q1011?
- Yes → Check or replace Q1005, Q1006, Q1049.
- No → Replace Q1011.
FLOW CHART NO.13
PON 1.8V is not outputted. (PC 3.3V(1), (2) is possible)

Is 5V voltage supplied at pin(1) of IC1002? Yes
Is voltage of 1.8V sent out from the pin(2) of IC1002?
No
Check the IC1002 periphery circuit.
Yes
Replace IC1002.

FLOW CHART NO.14
The disc tray cannot be opened and closed.
(For remote control is possible.)

Is 0V voltage supplied at pin(25) of CN1001 when the OPEN/CLOSE button is activated on the DVD? No
Check the SW2014 and OPEN/CLOSE KEY line.
Yes
See FLOW CHART NO. 15. <The disc tray cannot be opened and closed.>

FLOW CHART NO.15
The disc tray cannot be opened and closed.

Is the signal from the pins(200, 201) of IC601 inputted into the pins(1, 2) of IC401? No
Check the TFWD/TREV signal line between IC401 and IC601.
Yes
Replace IC401.

Is loading motor drive voltage output from the pins(9, 10) of IC401? No
Is 9V voltage applied to the pins (7, 8, 20) of IC401?
No
Check PC 8V line.
Yes
Check the line between the IC401 and the loading motor.

Is the loading motor drive voltage applied to the terminal of loading motor? No
Check for mechanism and gear engagement and breakage.
Yes

FLOW CHART NO.16
The [No Disc] indication. (In case of focus error)

Is FE signal outputted to the pin(22) of IC101 when the disc is set? No
Replace IC101.
Yes
Is there input signal on the pins(57~60) of IC101.
No
Check the connection of optical pickup cable.
Yes
If it is normal, replace the optical pickup.

Is FE signal inputted into the pin(117) of IC201?
No
Check or replace IC201.
Yes
Check the line between the IC101 and IC201.
FLOW CHART NO.17
The [No Disc] indication. (In case focus servo does not function.)

Is the focus control signal outputted to the pin(115) of IC201?

Yes

No

Check the periphery circuit of pins(57, 78, 88, 99, 109, 116, 125, 143, 156, 162) of IC201 and power source. If it is normal, replace IC201.

Is the focus control signal from the pin(115) of IC201 inputted into the pin(6) of IC401.

Yes

No

Check the focus control signal (DA0) line between the IC201 and IC401.

Check EV 9V line.

Is the focus control drive voltage outputted from the pins(11, 12) of IC401.

Yes

No

Is 8V voltage applied to the pins(7, 8, 20) of IC401.

Yes

No

Replace IC401.

Is the focus control drive voltage applied to the terminal of focus actuator?

Yes

No

Check the line between the IC401 and the focus actuator.

Check the connection of optical pickup cable. If it is normal, replace the optical pickup.

FLOW CHART NO.18
The [No Disc] indication. (When the laser beam does not light.)

Is the Q101 and Q102(LD POWER ON) drive signal(LDCOI and LDCOZ) outputted to the pins(2, 4) of IC101. (Checking of symptom.)

Yes

No

Check the line between the pins(2, 4) of IC101 and the base of Q101 through Q102.

Is 5V voltage applied to the emitter of Q101 and Q102.

Yes

No

Check the A 5V line.

Is the 5V voltage supplied to the pin(12)(DVD) and pin(20)(CD) of pickup terminal?

Yes

No

Check the line between the Q101, Q102 and pickup terminal.

Check the connection of optical pickup cable. If it is normal, replace the optical pickup.

FLOW CHART NO.19
Both picture and sound do not operate normally.

Set the disc on the disc tray.

Yes

No

Check the loading switch.

Is it possible to hold normally the disc with the check?

Yes

No

Check for contamination of objective lens of optical pickup.

Is the level of RF signal which is outputted from pin(35) of IC101, normal?

Yes

No

Replace the main PWB unit.

Yes

No

Replace the optical pickup unit.

Check the video amplifier unit and the audio amplifier unit. (IC1402, IC1201)

Yes
FLOW CHART NO.20

Picture do not operate normally.

Set the disc on the disc tray.

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.)

Yes → 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

Are the video signals shown above input into each pins of IC1402?
- IC1402 4PIN CVBS
- IC1402 6PIN S-Y
- IC1402 2PIN S-C

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

No → Check or replace IC1402?

Yes → Check the peripheral circuit of JK1403 from the pin (30) of IC1402.

Are the video signals outputted to each pins of IC1402?
- IC1402 30PIN CVBS
- IC1402 27PIN S-Y
- IC1402 33PIN S-C

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

Yes → Check the peripheral circuit of JK1401 from the pin (33) of IC1402.

Are the video signals outputted to the specific output terminal?
- Are the composite video signals outputted to the VIDEO OUT terminal (JK1403)?
- Are the luminance signals outputted to the S-OUT terminal (JK1401)?
- Are the chroma signals outputted to the S-OUT terminal (JK1401)?
FLOW CHART NO.21

Picture do not operate normally.

Set the disc on the disc tray.

Yes

Are the analog audio interface signals outputted to each pins of main unit connector CN701?

CN701 13PIN FL
CN701 15PIN FR

No

Check the main unit. (IC601 periphery circuit.)

Yes

Are the analog audio interface signals inputted to each pins of IC1201.

IC1201 2PIN FL
IC1201 6PIN FR

No

Check the line between each pins of main unit connector CN701 and each pins of IC1201.

CN701 13PIN → IC1201 2PIN FL
CN701 15PIN → IC1201 6PIN FR

Yes

Check or replace IC1201?

No

Check the main unit. (IC601 periphery circuit.)

Yes

Are the system control interface signals outputted to each pins of main unit connector CN701?

CN701 16PIN /AMUTE
CN701 14PIN /ZFR
CN701 12PIN /ZFL

No

Check the line between each pins of main unit connector CN701 and each pins of Q1203 and Q1204.

CN701 16PIN → Q1203, Q1204 BASE /AMUTE
CN701 14PIN → Q1204 BASE /ZFR
CN701 12PIN → Q1203 BASE /ZFL

Yes

Check or replace Q1203 and Q1204?

No

Check the peripheral circuit of AUDIO DAC (IC801), AUDIO AMP (IC1201) and audio mute (Q1201, Q1202, Q1203 and Q1204) circuit.

Are the system control interface signals inputted to each pins of Q1203 and Q1204.

Q1203 BASE /ZFL
Q1204 BASE /ZFR
Q1203, Q1204 BASE /AMUTE

No

Are the audio signals outputted to the specific output terminal?

Are the audio signals outputted to the L/R OUT terminal (JK1201)?
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.

![Disassembly Flowchart Diagram]

2. Disassembly Method

<table>
<thead>
<tr>
<th>ID/LOC. No.</th>
<th>PART</th>
<th>REMOVAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1] Top Cover</td>
<td>D1 7(S-1)</td>
<td>REMOVE/*UNHOOK/UNLOCK/RELEASE/UNPLUG/DESOLDER</td>
</tr>
<tr>
<td>[2] Front Assembly</td>
<td>D2 *CN505, *2(L-1), Tray Panel, *7(L-2)</td>
<td>1-1 1-2 1-3 1-4 1-5 1-6 1-7</td>
</tr>
<tr>
<td>[3] Top Bracket</td>
<td>D2 4(S-2)</td>
<td>-</td>
</tr>
<tr>
<td>[4] Jack CBA</td>
<td>D3 3(S-3)</td>
<td>-</td>
</tr>
<tr>
<td>[5] DVD Mecha Assembly</td>
<td>D4 3(S-4), *CN501, *CN701</td>
<td>-</td>
</tr>
</tbody>
</table>

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.
Short the three short lands by soldering

View for B

OR

View for C

Short the three short lands by soldering

View for A
Fig. D8

Lead connections of Deck Assembly and Main CBA
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.

<table>
<thead>
<tr>
<th>STEP/LOC. No.</th>
<th>STARTING No.</th>
<th>PART</th>
<th>REMOVAL INSTALLATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>REMOVAL</strong> <strong>INSTALLATION</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Fig. No.</strong> <strong>REMOVE/UNHOOK/ UNLOCK/RELEASE/ UNPLUG/DESOLDER</strong></td>
</tr>
<tr>
<td>[1] [1]</td>
<td>[1]</td>
<td>Guide Holder A</td>
<td>T</td>
</tr>
<tr>
<td>[2] [1]</td>
<td>[1]</td>
<td>Cassette Holder Assembly</td>
<td>T</td>
</tr>
<tr>
<td>[7] [7]</td>
<td>[7]</td>
<td>Cylinder Assembly</td>
<td>T</td>
</tr>
<tr>
<td>[8] [8]</td>
<td>[8]</td>
<td>Loading Motor Assembly</td>
<td>T</td>
</tr>
<tr>
<td>[9] [9]</td>
<td>[9]</td>
<td>AC Head Assembly</td>
<td>T</td>
</tr>
<tr>
<td>[13] [12]</td>
<td>[12]</td>
<td>Pinch Arm (A) Assembly</td>
<td>T</td>
</tr>
<tr>
<td>[14] [14]</td>
<td>[14]</td>
<td>FE Head</td>
<td>T</td>
</tr>
<tr>
<td>[16] [2]</td>
<td>[16]</td>
<td>Slider Shaft</td>
<td>T</td>
</tr>
<tr>
<td>[17] [16]</td>
<td>[16]</td>
<td>C Drive Lever L</td>
<td>T</td>
</tr>
<tr>
<td>[18] [16]</td>
<td>[16]</td>
<td>C Drive Lever R</td>
<td>T</td>
</tr>
<tr>
<td>[19] [7],[10]</td>
<td>[7],[10]</td>
<td>Capstan Motor</td>
<td>B</td>
</tr>
<tr>
<td>[20] [20]</td>
<td>[20]</td>
<td>Clutch Assembly</td>
<td>B</td>
</tr>
<tr>
<td>[22] [22]</td>
<td>[22]</td>
<td>Cam Holder F</td>
<td>B</td>
</tr>
<tr>
<td>[23] [23]</td>
<td>[23]</td>
<td>Cam Gear (B)</td>
<td>B</td>
</tr>
<tr>
<td>[26] [22]</td>
<td>[22]</td>
<td>Worm Holder</td>
<td>B</td>
</tr>
<tr>
<td>[27] [26]</td>
<td>[26]</td>
<td>Pulley Assembly</td>
<td>B</td>
</tr>
<tr>
<td>[28] [25],[26]</td>
<td>[25],[26]</td>
<td>Cam Gear (A)</td>
<td>B</td>
</tr>
<tr>
<td>[29] [25]</td>
<td>[25]</td>
<td>Idler Assembly</td>
<td>B</td>
</tr>
<tr>
<td>[31] [25]</td>
<td>[25]</td>
<td>Loading Arm S (B) Assembly</td>
<td>B</td>
</tr>
<tr>
<td>[32] [31]</td>
<td>[31]</td>
<td>Loading Arm T (B) Assembly</td>
<td>B</td>
</tr>
<tr>
<td>STEP LOC. No.</td>
<td>START-ING No.</td>
<td>PART</td>
<td>Fig. No.</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------</td>
<td>-----------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>[33]</td>
<td>[2],[25]</td>
<td>M Brake T Assembly</td>
<td>T</td>
</tr>
<tr>
<td>[34]</td>
<td>[2],[25]</td>
<td>M Brake S Assembly</td>
<td>T</td>
</tr>
<tr>
<td>[35]</td>
<td>[34]</td>
<td>Tension Lever Sub Assembly</td>
<td>T</td>
</tr>
<tr>
<td>[36]</td>
<td>[35]</td>
<td>T Lever Holder</td>
<td>T</td>
</tr>
<tr>
<td>[37]</td>
<td>[33]</td>
<td>M Gear</td>
<td>T</td>
</tr>
<tr>
<td>[38]</td>
<td>[2],[15]</td>
<td>Sensor Gear</td>
<td>T</td>
</tr>
<tr>
<td>[39]</td>
<td>[33]</td>
<td>Reel T</td>
<td>T</td>
</tr>
<tr>
<td>[40]</td>
<td>[35]</td>
<td>Reel S</td>
<td>T</td>
</tr>
<tr>
<td>[41]</td>
<td>[31],[35]</td>
<td>Moving Guide S Preparation</td>
<td>T</td>
</tr>
<tr>
<td>[42]</td>
<td>[32]</td>
<td>Moving Guide T Preparation</td>
<td>T</td>
</tr>
<tr>
<td>[43]</td>
<td>[19]</td>
<td>TG Post Assembly</td>
<td>T</td>
</tr>
<tr>
<td>[44]</td>
<td>[19],[28]</td>
<td>Rack Assembly</td>
<td>R</td>
</tr>
<tr>
<td>[45]</td>
<td>[44]</td>
<td>F Door Opener</td>
<td>R</td>
</tr>
<tr>
<td><em>[46]</em></td>
<td>[46]</td>
<td>Cleaner Lever Assembly</td>
<td>T</td>
</tr>
<tr>
<td><em>[47]</em></td>
<td>[46]</td>
<td>CL Post</td>
<td>T</td>
</tr>
</tbody>
</table>

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

When reassembling [28], meet the first groove on [28] to the first tooth on [44] as shown.
Refer to the Alignment Section, Page 2-3-1.

Fig. DM15

Fig. DM16

Fig. DM17

Fig. DM18

Slide
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

**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.

**Alignment [a]**
Tape Guide Assembly
Measurement of the screw must be as specified in 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.

![Diagram](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) | VR501 (Switching Point) | PLAY (SP) | -----
TP302 (RF-SW) | MAIN CBA | -----
GND | -----

Tape Measurement Equipment Spec.
MH-1 Oscilloscope 6.5H±1H (412.7μs±60μs)

Connections of Measurement Equipment

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.
How To Use The Fixtures And Tape

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Name</th>
<th>Part No.</th>
<th>Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alignment Tape</td>
<td>7099046</td>
<td>● Head Switching Point</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>● Tape Interchangeability Alignment</td>
</tr>
<tr>
<td>2</td>
<td>Special Driver</td>
<td>7099028</td>
<td>● Guide Roller</td>
</tr>
</tbody>
</table>
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.
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. Loading (Use a blank tape.)
2. Adjust the height of the Guide Rollers (Supply side and take-up side). (Use a blank tape.) (pg. 2-6-3) 
3. Check to see that the tape is not creasing and that there is no slack on the supply and take-up side Guide Rollers. (Use a blank tape.)
4. Adjust the X Value for maximum envelope. (pg. 2-6-3) (Use Alignment Tape.)
5. Adjust the envelope. (pg. 2-6-4)
6. Check the envelope.
7. Adjust the Audio Section. (Azimuth Alignment) (pg. 2-6-4)
8. Check the audio output.
9. Check the following:
   - 1. X Value (pg. 2-6-3)
   - 2. Envelope (pg. 2-6-4)
10. Do the final tape-traveling test to see that the tape runs normally in play mode without creasing or slacking.

Completion

Adjust the X value and envelope. 1-B, 1-C

OK

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.)
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.)

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)

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)
## STANDARD MAINTENANCE

### Service Schedule of Components

#### 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

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h: Hours  ☒: Check  ☀: Change
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.
See Electrical Parts List for parts with this mark. Some Ref. Numbers are not in sequence.

* 2B7: These parts are supplied as a DECK PEDESTAL Kit only.
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).

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Note: Some Ref. Numbers are not in sequence.
# REPLACEMENT PARTS LIST

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<td>CONNECTOR (10P)</td>
<td>FH1001</td>
<td>TE11084</td>
<td>FUSE HOLDER</td>
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<tr>
<td>CN1001</td>
<td>TE15101</td>
<td>CONNECTOR (26P)</td>
<td>FH1002</td>
<td>TE11084</td>
<td>FUSE HOLDER</td>
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<tr>
<td>CN1601</td>
<td>TE15111</td>
<td>CONNECTOR (18P)</td>
<td>FL2001</td>
<td>TE14801</td>
<td>VFD 20L289005SAN</td>
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<tr>
<td>CN2001</td>
<td>TE15161</td>
<td>CONNECTOR (10P)</td>
<td>GP1001</td>
<td>TJ13894</td>
<td>GPR1R1G3.100D</td>
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<tr>
<td>CN2002</td>
<td>TE15121</td>
<td>CONNECTOR (10P)</td>
<td>JK751</td>
<td>TE15131</td>
<td>JACK</td>
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<td></td>
<td></td>
<td></td>
<td>JK752</td>
<td>TE15132</td>
<td>JACK</td>
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<td></td>
<td></td>
<td>JK753</td>
<td>TE15181</td>
<td>JACK (YELLOW)</td>
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<td></td>
<td>JK754</td>
<td>TE15182</td>
<td>JACK (WHITE)</td>
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<tr>
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<td>JK755</td>
<td>TE15183</td>
<td>JACK (RED)</td>
</tr>
<tr>
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<td>JK756</td>
<td>TE15133</td>
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</tr>
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<td>JK1202</td>
<td>TE15134</td>
<td>JACK (BLACK)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>JK1401</td>
<td>TE14821</td>
<td>JACK</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>JK1403</td>
<td>TE15135</td>
<td>JACK</td>
</tr>
</tbody>
</table>
### 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 characteristics are identified in this manual and its supplements; electrical components having such features are identified by the mark "▲" in the schematic diagram and the parts list. Before replacing any of these components, 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

<table>
<thead>
<tr>
<th>Mark</th>
<th>Capacity change rate</th>
<th>Standard temperature</th>
<th>Temperature range</th>
</tr>
</thead>
<tbody>
<tr>
<td>(B)</td>
<td>±10%</td>
<td>20°C</td>
<td>-25~+85°C</td>
</tr>
<tr>
<td>(F)</td>
<td>+30 - 80%</td>
<td>20°C</td>
<td>-25~+85°C</td>
</tr>
<tr>
<td>(SR)</td>
<td>±15%</td>
<td>20°C</td>
<td>-25~+85°C</td>
</tr>
<tr>
<td>(Z)</td>
<td>+30 - 80%</td>
<td>20°C</td>
<td>-10~+70°C</td>
</tr>
</tbody>
</table>

Capacitors and transistors are represented by the following symbols.

### 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 specified.

### 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

<table>
<thead>
<tr>
<th>Item</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>No indication.........................Ω &lt;br&gt; K............................................kΩ &lt;br&gt; M..........................................MΩ</td>
</tr>
<tr>
<td>Power capacitance</td>
<td>No indication.........1/4W,1/6W &lt;br&gt;All capacitances other than the above are indicated in schematic diagrams.</td>
</tr>
</tbody>
</table>

#### Capacitors

<table>
<thead>
<tr>
<th>Item</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>No indication.........................μF &lt;br&gt; P..............................................pF</td>
</tr>
<tr>
<td>Dielectric strength</td>
<td>No indication.........................50V &lt;br&gt;All dielectric strengths other than 50V are indicated in schematic diagrams.</td>
</tr>
</tbody>
</table>

#### Coils

<table>
<thead>
<tr>
<th>Item</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>μ..............................................μH &lt;br&gt; m..........................................mH</td>
</tr>
</tbody>
</table>
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.

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:**

   ![Schematic Diagram](image1)

   Indicates that the voltage is not consistent here.
   Unit: Volts

7. **How to read converged lines**

   ![Line Diagram](image2)

8. **Test Point Information**

   ![Test Point Symbols](image3)

   - 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.
Note:
When it is necessary to replace one or more of the following Diodes, all three should be replaced: D588, D589, D656.
There are two types of tuner unit (TU701): A and B. These types are compatible, and there is no problem when using either. However, 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:

<table>
<thead>
<tr>
<th></th>
<th>TYPE A</th>
<th>TYPE B</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS17421</td>
<td></td>
<td>TS17431</td>
</tr>
</tbody>
</table>

Note: NU: Not Used
NOTE:
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

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.

CAUTION
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'INCENDIE 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.”
Main 4/5 Schematic Diagram
NOTE:
Input
CD: 1kHz PLAY
(WF4~WF6)
DVD: POWER ON (STOP) MODE
(WF1~WF3)
Note:
When it is necessary to replace one or more of the following Diodes, all four should be replaced: D652, D653, D654, D655.

Switches are K5M0614B or SKGSAF001A.
NOTE:
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

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:
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 risques d’incendie, utiliser que des fusible de meme type.

Risk of fire—replace fuse as marked.

“This symbol means fast operating fuse.”

“Ce symbole représente un fusible à fusion rapide.”
NOTE:
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

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.

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 RISQUES D'INCENDIE 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.”
DVD Main 4/4 Schematic 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.
Hi-Fi Audio Block Diagram

IC451 (MTS/ SAP/ Hi-Fi AUDIO PROCESS/ Hi-Fi HEAD AMP)

SIF

TO AUDIO BLOCK DIAGRAM

A-IN (R)-R
A-IN (L)-R
N-A-OUT
A-IN (R)-F
A-IN (L)-F

Hi-Fi Audio Block Diagram

MAIN CBA

CN251

TO SERVO SYSTEM CONTROL BLOCK DIAGRAM

Hi-Fi A(R)
Hi-Fi COM
Hi-Fi A(L)

Hi-Fi Audio (R) HEAD

Hi-Fi Audio (L) HEAD

SERIAL-DATA
SERIAL-CLK

Hi-Fi-CS

MODE: SP/REC

TO SERVO SYSTEM CONTROL BLOCK DIAGRAM

SERIAL-DATA
SERIAL-CLK

Hi-Fi-CS

TO SERVO SYSTEM CONTROL BLOCK DIAGRAM

SERIAL-DATA
SERIAL-CLK

Hi-Fi-CS

TO SERVO SYSTEM CONTROL BLOCK DIAGRAM

SERIAL-DATA
SERIAL-CLK

Hi-Fi-CS
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 RISQUES D'INCENDIE UTILISEZ SEULEMENT DES FUSIBLES DE MEME TYPE.
RISK OF FIRE: REPLACE FUSE AS MARKED.
- "This symbol means fast operating fuse."
- "Ce symbole represents 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.

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 RISQUES D'INCENDIE UTILISEZ SEULEMENT DES FUSIBLES DE MEME TYPE.
RISK OF FIRE: REPLACE FUSE AS MARKED.
- "This symbol means fast operating fuse."
- "Ce symbole represents 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.
IC301 (FRONT END PROCESSOR)
IC601 (DVD HOST PROCESSOR)

FROM/TO RF SIGNAL PROCESS BLOCK DIAGRAM
FROM/TO DVD SIGNAL PROCESS BLOCK DIAGRAM

DVD MAIN CBA UNIT

MAIN CBA
FUNCTION CBA
DVD Signal Process Block Diagram

IC201 (DVD SIGNAL PROCESS)

FROM/TO RF SIGNAL PROCESS/SERVO BLOCK DIAGRAM

FROM/TO DVD SYSTEM CONTROL BLOCK DIAGRAM

DVD MAIN CBA UNIT

DATA/VIDEO/AUDIO SIGNAL

TO DVD VIDEO BLOCK DIAGRAM

OSCI1
OSCO1

CPU

ADDRESS BUS

DATA BUS

CPUADR0
CPUADR17

CPU

DATA SLICER

DVD DEMODULATOR

MEMORY MANAGER

VIDEO/AUDIO INTERFACE

DVD DECODER

MEMORY MANAGER

CPU INTERFACE

OSCI1
OSCO1

ARF
NARF

TESTSG

FROM/TO RF SIGNAL PROCESS/SERVO BLOCK DIAGRAM

FROM/TO DVD SYSTEM CONTROL BLOCK DIAGRAM

XG01
(16.9344MHz)
DVD Audio Block Diagram

- **IC801 (AUDIO DAC)**
- **Serial Port**
- **4X/8X Oversampling Digital Filter / Function Controller**
- **Enhanced Multi-Level Delta-Sigma Modulator**
- **DAC**
- **LPF+AMP**
- **System Clock**
- **Zero Detect**
- **Serial Control**

- **CN701**
- **CN1601**
- **Q1201**
- **Q1202**
- **Q1203**
- **Q1204**
- **Q1351**

- **DATA (AUDIO) SIGNAL**
- **AUDIO SIGNAL**

- **SPDIF**
- **PCM-BCK**
- **PCM-DATA0**
- **PCM-LRCLK**
- **PCM-SCLK**
- **A-MUTE**

- **DVD MAIN CBA UNIT**

- **FROM DVD VIDEO BLOCK DIAGRAM**
  - **ADAC-MD**
  - **ADAC-MC**
  - **ADAC-ME**

- **MAIN CBA**
  - **+3.3V**

- **TO AUDIO BLOCK DIAGRAM <VCR SECTION>**
  - **SPDIF**
  - **A-MUTE**
  - **Q1201**
  - **Q1202**
  - **Q1204**
SYSTEM CONTROL TIMING CHARTS

[ VCR Section ]

Mode SW : LD-SW

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

Note:

Stop (A) = Loading
Stop (B) = Unloading

Note:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Loading Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>EJ</td>
<td>Eject</td>
</tr>
<tr>
<td>CL</td>
<td>Eject ~ REW Reel</td>
</tr>
<tr>
<td>SB</td>
<td>REW Reel ~ Stop(B)</td>
</tr>
<tr>
<td>TL</td>
<td>Stop(B) ~ Brake Cancel</td>
</tr>
<tr>
<td>FB</td>
<td>Brake Cancel</td>
</tr>
<tr>
<td>SF</td>
<td>~ Stop(A)</td>
</tr>
<tr>
<td>AU</td>
<td>Stop(A) ~ Play / REC</td>
</tr>
<tr>
<td>AL</td>
<td>Play / REC ~ Still / Slow</td>
</tr>
<tr>
<td>SS</td>
<td>Still / Slow ~ Capstan Reversal</td>
</tr>
<tr>
<td>GC</td>
<td>Capstan Reversal ~ RS (REW Search)</td>
</tr>
<tr>
<td>RS</td>
<td>RS (REW Search)</td>
</tr>
</tbody>
</table>
The first rise of RF-SW after a rise in F-AD signal

Acceleration Detection (T1)

Reversal Limit Value

Stop detection (T2)

Slow Tracking Value

Reversal Limit Value

Fig. 1
The first rise of RF-SW after a rise in F-AD signal

Stop detection (T2)

Acceleration Detection (T1)

Slow Tracking Value

Reversal Limit Value

Fig. 2
1. EJECT (POWER OFF) -> CASSETTE IN (POWER ON) -> STOP(B) -> STOP(A) -> PLAY -> RS -> FS -> PLAY -> STILL -> PLAY -> STOP(A)
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

- Eject key on
- Tray close
- Disc Rotation
- Play
- Tray open

- LSW2
  - 0V
  - +5V
  - +6V

- LSW1
  - +5V

- LM-
  - 0V
  - +6V

- LM+
  - 0V
  - +2V

- I/o (TL123)
  - 0V
  - +5V

- SP (TP122)
  - 0V
  - +2V

- Tv (TL122)
  - 0V

- Eject key on
  - 0V
  - +6V

- 4.4s
- 2.0s
- 1.2s
- 1.7s
- 700ms

[ DVD Section ]
IC PIN FUNCTION DESCRIPTIONS

[ VCR Section ]

IC501( SERVO / SYSTEM CONTROL IC )

“H” ≥ 4.5V, “L” ≤ 1.0V

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>IN/OUT</th>
<th>Signal Name</th>
<th>Function</th>
<th>Active Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 IN</td>
<td>REMO-CON-IN</td>
<td>Remote Control Sensor</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>2 OUT</td>
<td>TV/VCR</td>
<td>RF Conv. ON/OFF Signal (TV=“L”/ VCR=“H”)</td>
<td>H/L</td>
<td></td>
</tr>
<tr>
<td>3 -</td>
<td>N.U.</td>
<td>Not Used</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>4 OUT</td>
<td>DVD-POWER</td>
<td>DVD Power Control Signal</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>5 -</td>
<td>N.U.</td>
<td>Not Used</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>6 -</td>
<td>N.U.</td>
<td>Not Used</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>7 OUT</td>
<td>INSEL/ST-SL</td>
<td>Input Selector Control Signal (EE/Rec)/Still/Slow (Playback)</td>
<td>H/Hi-z/L</td>
<td></td>
</tr>
<tr>
<td>8 OUT</td>
<td>HiFi-CS</td>
<td>HiFi IC Chip Select</td>
<td>H</td>
<td></td>
</tr>
<tr>
<td>9 IN/OUT</td>
<td>I2C BUS-DATA</td>
<td>I2C BUS Data Input/Output</td>
<td>H/L</td>
<td></td>
</tr>
<tr>
<td>10 OUT</td>
<td>I2C BUS-CLK</td>
<td>I2C BUS Clock Output</td>
<td>H/L</td>
<td></td>
</tr>
<tr>
<td>11 OUT</td>
<td>SERIAL-CLK</td>
<td>Serial IC Control Clock Output</td>
<td>H/L</td>
<td></td>
</tr>
<tr>
<td>12 OUT</td>
<td>SERIAL-DATA</td>
<td>Serial IC Control Data Output</td>
<td>H/L</td>
<td></td>
</tr>
<tr>
<td>13 OUT</td>
<td>A-MUTE</td>
<td>Audio Mute Control Signal (Mute = “H”)</td>
<td>H</td>
<td></td>
</tr>
<tr>
<td>14 IN</td>
<td>H-A-COMP</td>
<td>Head Amp Coparator Signal</td>
<td>H/L</td>
<td></td>
</tr>
<tr>
<td>15 OUT</td>
<td>C-ROTA</td>
<td>Color Phase Rotary Changeover Signal</td>
<td>H/L</td>
<td></td>
</tr>
<tr>
<td>16 OUT</td>
<td>H-A-SW</td>
<td>Video Head Amp Switching Pulse</td>
<td>H/L</td>
<td></td>
</tr>
<tr>
<td>17 OUT</td>
<td>RF-SW</td>
<td>Video Head Switching Pulse</td>
<td>H/L</td>
<td></td>
</tr>
<tr>
<td>18 OUT</td>
<td>HiFi-H-SW</td>
<td>HiFi Audio Head Switching Pulse</td>
<td>H/L</td>
<td></td>
</tr>
<tr>
<td>19 OUT</td>
<td>REC-CTL (+)</td>
<td>Record Control Signal (+)</td>
<td>H/L</td>
<td></td>
</tr>
<tr>
<td>20 OUT</td>
<td>REC-CTL (-)</td>
<td>Record Control Signal (-)</td>
<td>H/L</td>
<td></td>
</tr>
<tr>
<td>21 IN</td>
<td>C-SYNC</td>
<td>Composite Synchronized Pulse</td>
<td>PULSE</td>
<td></td>
</tr>
<tr>
<td>22 -</td>
<td>GND</td>
<td>GND</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>23 -</td>
<td>N.U.</td>
<td>Not Used</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>24 -</td>
<td>OSDVss</td>
<td>OSDVss</td>
<td>-</td>
<td></td>
</tr>
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<td>25 IN</td>
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<td>31 OUT</td>
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**Notes:**
Abbreviation for Active Level:
- **PWM** ---- Pulse Wide Modulation
- **A/D** ---- Analog - Digital Converter
## [ DVD Section ]

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

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LEAD IDENTIFICATIONS

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