VCR Mechanism Error Codes

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

DVD PLAYER & VIDEO CASSETTE RECORDER

February 2003  Digital Media Division, Tokai
## CONTENTS

### 1 CAUTIONS FOR SAFETY IN PERFORMING REPAIR

1-1 LASER BEAM SAFETY PRECAUTIONS .......................... 1-1
1-2 IMPORTANT SAFETY PRECAUTIONS ............................. 1-2
1-2-1 Product Safety Notice ....................................... 1-2
1-2-2 Precautions during Servicing ............................... 1-2
1-2-3 Safety Check after Servicing ............................... 1-3
1-3 STANDARD NOTES FOR SERVICING .......................... 1-4
1-3-1 Circuit Board Indications ................................... 1-4
1-3-2 Instructions for Connectors ................................. 1-4
1-3-3 How to Remove/Install Flat Pack-IC ....................... 1-4
1-3-4 Instructions for Handling Semi-conductors ............... 1-6

### 2 GENERAL INFORMATION

2-1 SPECIFICATIONS .............................................. 2-1
2-2 COMPARISON OF MODELS ...................................... 2-2
2-2-1 General ..................................................... 2-2
2-2-2 VCR Section ............................................... 2-2
2-2-3 DVD Section ................................................ 2-3
2-3 OPERATING CONTROLS AND FUNCTIONS ...................... 2-4

### 3 MAINTENANCE AND INSPECTION

3-1 TROUBLESHOOTING ............................................ 3-1
3-1-1 Power Supply Section ...................................... 3-1
3-1-2 DVD Section ............................................... 3-4
3-1-3 VCR Section ................................................ 3-8
3-2 FIRMWARE RENEWAL MODE .................................... 3-15
3-2-1 How to Update the Firmware Version .................... 3-15
3-2-2 How to Verify the Firmware Version .................... 3-16
3-3 STANDARD MAINTENANCE .................................... 3-17
3-3-1 Service Schedule of Components ......................... 3-17
3-3-2 Cleaning .................................................... 3-18

### 4 ADJUSTMENT

4-1 PREPARATION FOR SERVICING ................................ 4-1
4-1-1 How to Enter the Service Mode ............................ 4-1
4-2 FIXTURE AND TAPE FOR ADJUSTMENT ................. 4-2
4-2-1 How to Use The Fixtures .................................. 4-2
4-3 ELECTRICAL ADJUSTMENT INSTRUCTIONS ................. 4-3
4-3-1 Test Equipment Required ................................ 4-3
4-3-2 Head Switching Position Adjustment .................... 4-3
4-4 MECHANICAL ALIGNMENT PROCEDURES ..................... 4-4
4-4-1 Service Information ....................................... 4-4
4-4-2 Tape Interchangeability Alignment ..................... 4-5
4-4-3 1-A. Preliminary/Final Checking and Alignment of Tape Path ........................................... 4-6
4-4-4 1-B. X Value Alignment .................................... 4-6
4-4-5 1-C. Checking/Adjustment of Envelope Waveform .......... 4-7
4-4-6 1-D. Azimuth Alignment of Audio-Control/Erase Head ..................................................... 4-7

### 5 DISASSEMBLY

5-1 CABINET DISASSEMBLY INSTRUCTIONS .................... 5-1
5-1-1 Disassembly Flowchart .................................... 5-1
5-1-2 Disassembly Method ....................................... 5-1
5-2 DISASSEMBLY/ASSEMBLY PROCEDURES OF DECK MECHANISM ............................................ 5-6
5-3 ALIGNMENT PROCEDURES OF MECHANISM .................. 5-14

### 6 EXPLODED VIEWS AND PARTS LIST

6-1 EXPLODED VIEWS .............................................. 6-1
6-1-1 Cabinet Section ........................................... 6-1
6-1-2 Deck Mechanism View 1 Section ......................... 6-2
6-1-3 Deck Mechanism View 2 Section ......................... 6-2
6-1-4 Deck Mechanism View 3 Section ......................... 6-3
6-2 REPLACEMENT PARTS LIST ................................. 6-4
6-2-1 Mechanical Parts List .................................... 6-4
6-2-2 Electrical Parts List ..................................... 6-6

### SCHEMATIC AND BLOCK DIAGRAMS/CBA’S

1 SCHEMATIC DIAGRAMS/CBA’S AND TEST POINTS ........... 1
2 WIRING DIAGRAMS ............................................... 3
2-1 VCR Section .................................................. 3
2-2 DVD Section .................................................. 4
3 SCHEMATIC DIAGRAMS ......................................... 5
3-1 Main 1/8 Schematic Diagram .............................. 5
3-2 Main 2/8 & Sensor Schematic Diagrams .............. 6
3-3 Main 3/8 Schematic Diagram .............................. 7
3-4 Main 4/8 Schematic Diagram .............................. 8
3-5 Main 5/8 Schematic Diagram .............................. 9
3-6 Main 6/8 Schematic Diagram ............................. 10
3-7 Main 7/8 & OPEN/CLOSE Schematic Diagrams .... 11
3-8 Main 8/8 Schematic Diagram ............................. 12
3-9 Power Supply & Junction Schematic Diagrams .......... 13
3-10 Function Schematic Diagram ............................. 14
3-11 DVD Main 1/3 Schematic Diagram ..................... 15
3-12 DVD Main 2/3 Schematic Diagram ..................... 16
3-13 DVD Main 3/3 Schematic Diagram ..................... 18
4 WAVEFORMS ................................................... 19
5 CIRCUIT BOARD DIAGRAMS .................................. 20
5-1 Main CBA Top View & Sensor CBA Top View .......... 20
5-2 Main CBA Bottom View .................................... 21
5-3 Function CBA Top/Bottom View & DVD OPEN/CLOSE CBA Top/Bottom View ................................. 22
5-4 Power Supply CBA Top/Bottom View .................... 23
6 BLOCK DIAGRAMS .............................................. 24
6-1 Servo/System Control Block Diagram ................... 24
6-2 Video Block Diagram ....................................... 25
6-3 Audio Block Diagram ...................................... 26
6-4 Hi-Fi Audio Block Diagram ................................ 27
6-5 Power Supply Block Diagram ............................. 28
6-6 DVD System Control/Servo Block Diagram ........... 29
6-7 Digital Signal Process Block Diagram ................... 30
6-8 DVD System/Video Block Diagram ....................... 31
7 SYSTEM CONTROL TIMING CHARTS ......................... 32
8 IC PIN FUNCTION DESCRIPTIONS ......................... 37
9 LEAD IDENTIFICATIONS ...................................... 40

### 8 IC PIN FUNCTION DESCRIPTIONS

8-1 POWER SUPPLY SECTION .................................. 1
8-2 VCR SECTION ................................................ 3
8-3 DVD SECTION ................................................ 4

### 6 EXPLODED VIEWS AND PARTS LIST

6-1 CABINET DISASSEMBLY AND VIEW .......................... 6-1
6-1-1 Cabinet Section ........................................... 6-1
6-1-2 Deck Mechanism View 1 Section ......................... 6-2
6-1-3 Deck Mechanism View 2 Section ......................... 6-2
6-1-4 Deck Mechanism View 3 Section ......................... 6-3
6-2 REPLACEMENT PARTS LIST ................................. 6-4
6-2-1 Mechanical Parts List .................................... 6-4
6-2-2 Electrical Parts List ..................................... 6-6
1-1 LASER BEAM SAFETY PRECAUTIONS

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

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.
1-2 IMPORTANT SAFETY PRECAUTIONS

1-2-1 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.

1-2-2 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.
   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.
1-2-3 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>
<thead>
<tr>
<th>AC Line Voltage</th>
<th>Clearance Distance (d) (d’)</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 V</td>
<td>≥ 3.2mm (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>
<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>0.15μF CAP &amp; 1.5kΩ RES. Connected in parallel</td>
<td>≤0.5mA 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.
1-3 STANDARD NOTES FOR SERVICING

1-3-1 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.

1-3-2 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.

1-3-3 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)

(1) 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.
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.

1-3-4 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

(4) 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.
Product type: DVD/VCR Combo (DVD player with Video Cassette Recorder)

Discs: DVD video
      Audio CD
      Video Cassette tape

Converter output: VHF Channel 3 or 4.

Power source: 120 V AC +/- 10%, 60 Hz +/- 0.5%

Power consumption: 24 W (standby: 7.0 W)

Operating temperature: 41°F(5°C) to 104°F(40°C)

Dimensions: W 17-1/8” (435 mm)
             H 3-7/8” (99 mm)
             D 8-5/8” (218 mm)

Weight: 8.1 lbs (3.7 kg)

* Designs and specifications are subject to change without notice.
## 2-2 COMPARISON OF MODELS

### 2-2-1 General

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DV-PF73U/PF73U(C)/PF33U</th>
<th>DV-PF2U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensional</td>
<td>435(W) x 99(H) x 218(D)mm</td>
<td>435(W) x 99(H) x 266(D)mm</td>
</tr>
<tr>
<td>Weight</td>
<td>3.7kg</td>
<td>4.0kg</td>
</tr>
<tr>
<td>Tray Panel</td>
<td>Clear</td>
<td></td>
</tr>
<tr>
<td>Color Front/Button</td>
<td>Silver/Silver (DV-PF73U/PF73U(C))</td>
<td>Black/Silver (DV-PF33U)</td>
</tr>
<tr>
<td>Hot Stamp</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Remote Controller Model Name</td>
<td>DV-RMPF73U (DV-PF73U/PF73U(C))</td>
<td>DV-RMPF33U (DV-PF33U)</td>
</tr>
<tr>
<td>Jog Shuttle on Remote</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>TV Control</td>
<td>O (DV-PF73U/PF73U(C)) --- (DV-PF33U)</td>
<td>O</td>
</tr>
</tbody>
</table>

### 2-2-2 VCR Section

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DV-PF73U/PF73U(C)/PF33U</th>
<th>DV-PF2U</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>O</td>
<td>---</td>
</tr>
<tr>
<td>New Synchronize 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>Stereo CM Skip Feature</td>
<td>×</td>
<td>O</td>
</tr>
<tr>
<td>Auto Clock Feature</td>
<td>×</td>
<td>O</td>
</tr>
<tr>
<td>Number of Timer Programming</td>
<td>8 Program/year</td>
<td>7 Program/year</td>
</tr>
<tr>
<td>Self Diagnosis Function</td>
<td>O (4 Modes)</td>
<td>---</td>
</tr>
<tr>
<td>Back-up Time</td>
<td>30 s</td>
<td>60 s</td>
</tr>
<tr>
<td>SQPB</td>
<td>×</td>
<td>O</td>
</tr>
<tr>
<td>Surge Absorber</td>
<td>O</td>
<td>---</td>
</tr>
<tr>
<td>Auto Power Off Feature</td>
<td>O</td>
<td>---</td>
</tr>
<tr>
<td>Local Broadcast Setting</td>
<td>O</td>
<td>---</td>
</tr>
<tr>
<td>Multi Search Feature</td>
<td>O (Index, Time Search)</td>
<td>---</td>
</tr>
<tr>
<td>Search Speed</td>
<td>SP: X5</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>LP: X5/X9</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>EP: X5/X15</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</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>SP: 2[49/58 [mu]m]</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Hi-Fi Audio: 2[28/28 [mu]m]</td>
<td>---</td>
</tr>
<tr>
<td>Video Head Material</td>
<td>SP: Ferrite</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>EP: Ferrite</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Hi-Fi Audio: Ferrite</td>
<td></td>
</tr>
<tr>
<td>VISS</td>
<td>O (Index Search)</td>
<td>---</td>
</tr>
</tbody>
</table>
## 2-2-3 DVD Section

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DV-PF73U/PF73U(C)/PF33U</th>
<th>DV-PF2U</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GENERAL</strong></td>
<td></td>
<td></td>
</tr>
<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>←</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>
<tr>
<td><strong>VIDEO</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAL Disc NTSC Out</td>
<td>---</td>
<td>←</td>
</tr>
<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>
<tr>
<td><strong>AUDIO</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audio D/A Converter</td>
<td>192kHz / 24bit</td>
<td>←</td>
</tr>
<tr>
<td>Digital Audio Out Optical / Coaxial</td>
<td>--- / O</td>
<td>O / O</td>
</tr>
<tr>
<td>Dolby Digital 5.1 ch Decode</td>
<td>---</td>
<td>←</td>
</tr>
<tr>
<td>DTS Digital Out</td>
<td>---</td>
<td>O</td>
</tr>
<tr>
<td>Virtual Surround</td>
<td>O</td>
<td>←</td>
</tr>
<tr>
<td>Dynamic Range Compression (Dolby Digital)</td>
<td>O</td>
<td>←</td>
</tr>
<tr>
<td>DVD Audio</td>
<td>---</td>
<td>←</td>
</tr>
<tr>
<td>Power on sound</td>
<td>---</td>
<td>←</td>
</tr>
<tr>
<td><strong>TRICK PLAY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Search Speed</td>
<td>2 to 100 (FORWARD/REWIND) (DVD: 2, 8, 50, 100/CD: 16)</td>
<td>2 to 60 (FORWARD/REWIND) (DVD: 2, 8, 30, 60/CD: 16)</td>
</tr>
<tr>
<td>Slow Speed</td>
<td>1/16, 1/8, 1/2 (FORWARD/REWIND)</td>
<td>1/16, 1/8, 1/2 (FORWARD only)</td>
</tr>
<tr>
<td>IP Search (Smooth 2x Play)</td>
<td>O</td>
<td>←</td>
</tr>
<tr>
<td>2x Play with Audio</td>
<td>---</td>
<td>←</td>
</tr>
<tr>
<td>Step Forward / Reverse</td>
<td>O / O</td>
<td>O / ---</td>
</tr>
<tr>
<td>Still Picture Select (Frame/Field)</td>
<td>Auto Only</td>
<td>←</td>
</tr>
<tr>
<td><strong>FEATURES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disc Navigation</td>
<td>O (DV-PF73U/PF73U(C)) (DV-PF33U)</td>
<td>←</td>
</tr>
<tr>
<td>DVD Zoom x2 / x4</td>
<td>O / O</td>
<td>←</td>
</tr>
<tr>
<td>Program and Random Play of DVD / VCD</td>
<td>---</td>
<td>O / O</td>
</tr>
<tr>
<td>A-B Repeat</td>
<td>O</td>
<td>←</td>
</tr>
<tr>
<td>Repeat</td>
<td>O</td>
<td>←</td>
</tr>
<tr>
<td>Last Play</td>
<td>O</td>
<td>←</td>
</tr>
<tr>
<td>Closed Caption for NTSC DVD</td>
<td>O</td>
<td>←</td>
</tr>
<tr>
<td>Front Panel Display Dimmer</td>
<td>O</td>
<td>←</td>
</tr>
<tr>
<td>Screen Saver</td>
<td>O</td>
<td>←</td>
</tr>
<tr>
<td>Auto Power Off</td>
<td>O</td>
<td>←</td>
</tr>
</tbody>
</table>
1. Disc loading tray
2. OPEN/CLOSE Button
   - Press to insert discs into or remove them from the tray.
3. CASSETTE COMPARTMENT
4. POWER Light
   - Lights up when the power is on.
5. POWER/STANDBY Button
   - Press to turn the power on and off.
6. CHANNEL Buttons
   - In VCR mode, press to change TV channels on the VCR;
   - press to adjust the tracking during normal or slow motion
   - playback; press to remove vertical jitter in a Still picture.
7. PLAY Button (VCR)
   - Press to begin playback.
8. STOP/EJECT Button (VCR)
   - Press to remove the tape from the VCR.
9. AUDIO In Jacks
   - Connect audio cables coming from the audio output jacks of
   - a camcorder, another VCR, or an audio source here.
10. VIDEO In Jack
    - Connect a video cable coming from the video output jack of
    - a camcorder, another VCR, or a video source (laser disc
    - player, camcorder, etc.) here.
11. F.FWD Button (VCR)
    - Press to rapidly advance the tape, or view the picture rapidly
    - in forward during playback. (Forward Search).
12. REW Button (VCR)
    - Press to rewind the tape, or to view the picture rapidly in
    - reverse during the playback mode (Rewind Search).
13. REC/IRT Button
    - Press once to start a recording. Press repeatedly to start a
    - Instant Recording Timer.
14. REC Light
    - Lights up during recording.
15. TIMER Light
    - This light glows when the DVD/VCR is in standby mode
    - or off for a timer recording or during a Instant Recording
    - Timer. It flashes if TIMER 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.
16. VCR OUTPUT 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, VCR on
    - the remote control or OUTPUT on the front panel.
17. OUTPUT Button
    - Press to select DVD mode or VCR mode.
    - You can switch the output mode either by pressing
    - OUTPUT on the front panel, or by pressing DVD or
    - VCR on the remote control. However, if you press
    - OUTPUT on the front panel first, you need to re-
    - select the corresponding mode by pressing DVD or
    - VCR on the remote control.
18. DVD OUTPUT 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 DVD on the remote control or OUTPUT on the front
    - panel.
19. Display, Remote Sensor Window
20. PLAY Button (DVD)
    - Press to begin playback.
21. STOP Button (DVD)
    - Stops operation of the disc.
22. SURROUND Button
    - Press to activate the 3D sound.
23. O//I(POWER/STANDBY) Button
    - Press to turn the power on and off.
    - (As to the indication of the Operate switch, “I” shows ON
    - and “O//I” shows electrical power stand-by.)
24. A-B REPEAT Button
    - Repeats playback of a selected section.
25. REPEAT Button
    - Repeats playback of the current disc, title, chapter or track.
26. MODE Button
    - Activates program playback or random playback mode
    - when playing CDs or MP3. Sets Black level and virtual
    - surround.
27. ZOOM Button
    - Enlarges part of a DVD-reproduced image.
28. **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.
29. **ANGLE Button**
   Press to change the camera angle to see the sequence being played back from a different angle.
30. **SUBTITLE Button**
   Press to select the desired subtitle language.
31. **MENU Button**
   - **DVD mode**: Press to display the menu of the Disc.
   - **VCR mode**: Press to access the VCR menu.
32. **Arrow Buttons**
   - **DVD mode**: Move the cursor and determines its position.
   - **VCR mode**: Move the cursor and determines its position.
   - **Buttons**: 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.
33. **ENTER Button**
   Press to accept a setting.
34. **RETURN Button**
   Returns to the previous operation.
35. **VCR/TV Button**
   Use to select VCR or TV position. This DVD/VCR does not have VCR/TV light. If noise appears on your TV when you turn on DVD/VCR (VCR mode), press this button.
   - **VCR Position**: To view playback, to monitor video recordings or to watch TV using the VCR tuner.
   - **TV Position**: To watch TV or to view one program while recording another.
36. **DISC NAVIGATION Button**
   Use to DISC NAVIGATION function.
37. **PAUSE/STEP Button**
   - **DVD mode**: Press to exclusively control the TV volume.
   - **VCR mode**: Press to exclusively control the TV volume.
38. **PLAY Button**
   - **DVD mode**: Press to begin playback.
   - **VCR mode**: Press to begin playback.
39. **STOP Button**
   - **DVD mode**: Press to stop the disc motion.
   - **VCR mode**: Press to stop the tape motion.
40. **PAUSE 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).
41. **TV POWER Button**
   To exclusively turn ON/OFF the TV.
42. **VIDEO/TX Button**
   Press to select the external input mode or TV mode of the TV.
43. **VOL ▲/▼ Buttons**
   Press to exclusively control the TV channels.
44. **VOL CH ▲/▼ Buttons**
   Press to exclusively control the TV channels.
45. **TOP MENU Button**
   Press to call up the title menu.
46. ** SETUP Button**
   Press to enter the setup mode.
47. **DISC NAVIGATION Button**
   Press to display the first scenes of each chapter of the title being played.
48. **TOP MENU Button**
   Press to call up the title menu.
49. **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.
50. **AUDIO Button**
   Press to select a desired audio language or sound mode.
57. **Number Buttons**
   - **DVD mode**
     Press to directly select a Track (Audio CD) for playback.
   - **VCR mode**
     Press to select TV channels on the 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.

58. **OPEN/CLOSE Button**
   Press to open or close the disc loading tray.

### Notes
- To use the remote control to operate the DVD/VCR and its features, press DVD on the remote control before pressing other DVD. Verify that the green DVD OUTPUT Light is on.
- To use the remote control to operate the VCR and its features, press VCR on the remote control before pressing other VCR. Verify that the green VCR OUTPUT Light is on.

## DISPLAY

### DVD
- Stays on when the A-B repeat function is on.
- Stays on when the repeat function is on.
- Stays on when the repeat track function is on.
- Lights up when a DVD is inserted into the tray.
- Lights up when a CD is inserted into the tray.
- Displays how long a current title or track has been played back. When a chapter or track has switched, the number of the a title, chapter or track is displayed.

### VCR
- Stays on during playback when the repeat function is on.
- Lights up when the playback is in a still or in a slow mode.
- Works as a tape counter (hour, minute only). Also displays a channel number, tape speed remaining time for IRT and current time.

## DISPLAYS DURING OPERATION

<table>
<thead>
<tr>
<th></th>
<th>DVD menu</th>
<th>VCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>No disc inserted or playing</td>
<td><img src="image1.png" alt="Display Illustration" /></td>
<td><img src="image2.png" alt="Display Illustration" /></td>
</tr>
<tr>
<td>DVD menu</td>
<td><img src="image3.png" alt="Display Illustration" /></td>
<td><img src="image4.png" alt="Display Illustration" /></td>
</tr>
<tr>
<td>Tray open</td>
<td><img src="image5.png" alt="Display Illustration" /></td>
<td><img src="image6.png" alt="Display Illustration" /></td>
</tr>
<tr>
<td>Tray closed</td>
<td><img src="image7.png" alt="Display Illustration" /></td>
<td><img src="image8.png" alt="Display Illustration" /></td>
</tr>
<tr>
<td>Loading the Disc</td>
<td><img src="image9.png" alt="Display Illustration" /></td>
<td><img src="image10.png" alt="Display Illustration" /></td>
</tr>
</tbody>
</table>
1. **ANT-IN (Antenna In) Jack**
   - Connect your antenna, Cable Box, or Direct Broadcast System.

2. **DVD/VCR AUDIO OUT Jacks**
   - Connect the supplied audio cables here and to the Audio In jacks of a television or other audio equipment.

3. **AUDIO IN Jacks (VCR only)**
   - Connect audio cables coming from the audio out jacks of a camcorder, another VCR, or an audio source here.

4. **AC Power Cord**
   - Connect to a standard AC outlet to supply power to the DVD/VCR.

5. **COMPONENT VIDEO OUT Jacks (DVD only)**
   - Connect optional component video cables here and to the component Video In jacks of a television.

6. **COAXIAL 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.

7. **DVD AUDIO OUT Jacks (DVD only)**
   - Connect the supplied audio cables here and to the Audio In jacks of a television or other audio equipment (DVD only).

8. **S-VIDEO OUT Jack (DVD only)**
   - Connect an optional S-Video cable here and to the S-Video In jack of a television.

9. **INTERLACE/PROGRESSIVE SCAN SELECTOR**
   - To select interlace or progressive scanning.

10. **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.

11. **DVD/VCR VIDEO OUT Jack**
    - Connect the yellow video cable (supplied) here and to the TV’s Video In jack.
    - If you select P(PROGRESSIVE) in INTERLACE/PROGRESSIVE SCAN SELECTOR, DVD video signal is not output to your TV.

12. **ANT-OUT (Antenna Out) Jack**
    - Use the supplied RF coaxial cable to connect this jack to the ANTENNA IN Jack on your TV.

**CAUTION:**
- Be sure to turn off the DVD/VCR and equipment to be connected before connecting.
- Read through the operation manual for the equipment to be connected.
- Be sure that the colors of the jacks and plugs match up when using VIDEO/AUDIO cables.
- Be sure to keep the DVD/VCR connection cables separate from the TV antenna cable when you install the DVD/VCR, because it may cause electrical interference when you are watching television programs.
1. Disc loading tray
2. OPEN/CLOSE Button
   Press to insert discs into or remove them from the tray.
3. CASSETTE COMPARTMENT
4. POWER Light
   Lights up when the power is on.
5. POWER/STANDBY Button
   Press to turn the power on and off.
6. CHANNEL Buttons
   In VCR mode, press to change TV channels on the VCR;
   press to adjust the tracking during normal or slow motion
   playback; press to remove vertical jitter in a Still picture.
7. PLAY Button (VCR)
   Press to begin playback.
8. STEP/EJECT Button (VCR)
   EJECT Button
   Press to remove the tape from the VCR.
9. STOP Button
   Press to stop the tape motion.
10. AUDIO In Jacks
    Connect audio cables coming from the audio out jacks of a
    camcorder, another VCR, or an audio source here.
11. 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, camcorder, etc.) here.
12. REW Button (VCR)
    Press to rewind the tape, or to view the picture rapidly
    in reverse during the playback mode (Rewind Search).
13. REC/IRT Button
    Press once to start a recording. Press repeatedly to start a
    Instant Recording Timer.
14. REC Light
    Lights up during recording.
15. TIMER Light
    This light glows when the DVD/VCR is in standby mode
    or off for a timer recording or during a Instant Recording
    Timer. It flashes if TIMER 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.
16. VCR OUTPUT 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, VCR on the remote control or OUTPUT on the front
    panel.
17. OUTPUT Button
    Press to select DVD mode or VCR mode.
18. DVD OUTPUT 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 DVD on the remote control or OUTPUT on the
    front panel.
19. Display, Remote Sensor Window
20. PLAY Button (DVD)
    Press to begin playback.
21. STOP Button (DVD)
    Stops operation of the disc.
22. SURROUND Button
    Press to activate the 3D sound.
23. POWER/STANDBY Button
    Press to turn the power on and off.
    (As to the indication of the Operate switch, “I” shows ON
    and “O/f” shows electrical power stand-by.)
24. Number Buttons
    DVD mode
    Press to directly select a Track (Audio CD) for playback.
    VCR mode
    Press to select TV channels on the 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.
25. **DISPLAY 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 view or remove the display screen during DVD or Audio CD playback.

26. **TV Button**
    Press to exclusively control the TV.

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

28. **◄/► Button**
    - **DVD mode**
      Press to play the DVD picture in fast reverse motion or to reverse playback of an Audio CD.
    - **VCR mode**
      Press to play the tape, or to view the picture rapidly in reverse during the playback mode (Rewind Search).

29. **STOP Button**
    - **DVD mode**
      Press to stop the disc motion.
    - **VCR mode**
      Press to stop the tape motion.

30. **REC Button**
    Press once to start a recording.

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

32. **TOP MENU Button**
    Press to call up the title menu.

33. **SETUP Button**
    Press to enter the setup mode.

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

35. **MODE Button**
    Activates program playback or random playback mode when playing CDs or MP3. Sets Black level and virtual surround.

36. **SUBTITLE Button**
    Press to select the desired subtitle language.

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

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

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

40. **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.

41. **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.

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

43. **TV CH ▼/▲ Buttons**
    Press to exclusively control the TV channels.

44. **VOL ▼/▲ Buttons**
    Press to exclusively control the TV volume.

45. **◄/► Buttons**
    Move the cursor and determines its position.

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

47. **VIDEO/TV Button**
    Press to select the external input mode or TV mode of the TV.

48. **PAUSE/STEP Button**
    Press to pause playback. Press repeatedly to change the forward speed during tape playback (Forward Search).

49. **PAUSE/STEP/STOP Button**
    Press to stop Disc playback. Press repeatedly to advance the DVD picture step by step (or one frame at a time).

50. **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.

51. **VCR-TV Button**
    Use to select VCR or TV position. This DVD/VCR does not have VCR/Tv light. If noise appears on your TV when you turn on DVD/VCR/VCR mode, press this button.
**VCR Position**
To view playback, to monitor video recordings or to watch TV using the VCR tuner.

**TV Position**
To watch TV or to view one program while recording another.

52. **SKIP/CH Buttons**
- **DVD mode**
  Press to skip Chapters or Tracks.
- **VCR mode**
  Press to change TV channels on the VCR.

53. **OPEN/CLOSE Button**
Press to open or close the disc loading tray.

54. **EJECT Button**
Press to eject the video cassette from the VCR.

55. **AUDIO Button**
Press to select a desired audio language or sound mode.

---

**Displays during Operation**

<table>
<thead>
<tr>
<th>DVD</th>
<th>VCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>No disc inserted or playing DVD menu</td>
<td>Works as a tape counter (hour, minute only). Also displays a channel number, tape speed, remaining time for IRT and current time.</td>
</tr>
<tr>
<td>Tray open</td>
<td>Lights up when the playback is in a still or in a slow mode.</td>
</tr>
<tr>
<td>Tray closed</td>
<td>Stays on when the inserted cassette is being played back.</td>
</tr>
<tr>
<td>Loading the Disc</td>
<td>Lights up when a CD is inserted into the tray.</td>
</tr>
<tr>
<td>Stays on when the inserted disc comes to a pause.</td>
<td>Displays how long a current title or track has been played back. When a chapter or track has switched, the number of the a title, chapter or track is displayed.</td>
</tr>
<tr>
<td>Stays on when the A-B repeat function is on.</td>
<td>Stays on during playback when the repeat function is on.</td>
</tr>
<tr>
<td>Stays on when repeat track function is on.</td>
<td>Lights up when a DVD is inserted into the tray.</td>
</tr>
<tr>
<td>Stays on when repeat chapter function is on.</td>
<td>Stays on when the inserted disc is being played back.</td>
</tr>
<tr>
<td>Stays on when repeat title function is on.</td>
<td>Stays on when the inserted disc is being played back.</td>
</tr>
</tbody>
</table>

**Notes**
- To use the remote control to operate the DVD/VCR and its features, press DVD on the remote control before pressing other DVD. Verify that the green DVD OUTPUT Light is on.
- To use the remote control to operate the VCR and its features, press VCR on the remote control before pressing other VCR. Verify that the green VCR OUTPUT Light is on.

Caution: Do not touch the inner pins of the jacks on the rear panel. Electrostatic discharge may cause permanent damage to the DVD/VCR.
1. **ANT-IN (Antenna In) Jack**
   Connect your antenna, Cable Box, or Direct Broadcast System.

2. **DVD/VCR AUDIO OUT Jacks**
   Connect the supplied audio cables here and to the Audio In jacks of a television or other audio equipment.

3. **AUDIO IN Jacks (VCR only)**
   Connect audio cables coming from the audio out jacks of a camcorder, another VCR, or an audio source here.

4. **AC Power Cord**
   Connect to a standard AC outlet to supply power to the DVD/VCR.

5. **COMPONENT VIDEO OUT Jacks (DVD only)**
   Connect optional component video cables here and to the component Video In jacks of a television.

6. **COAXIAL 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.

7. **DVD AUDIO OUT Jacks (DVD only)**
   Connect the supplied audio cables here and to the Audio In jacks of a television or other audio equipment (DVD only).

8. **S-VIDEO OUT Jack (DVD only)**
   Connect an optional S-Video cable here and to the S-Video In jack of a television.

9. **INTERLACE/PROGRESSIVE SCAN SELECTOR**
   to select interlace or progressive scanning.

10. **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.

11. **DVD/VCR VIDEO OUT Jack**
    Connect the yellow video cable (supplied) here and to the TV’s Video In jack.
    If you select P(ROGRESSIVE) in INTERLACE/PROGRESSIVE SCAN SELECTOR, DVD video signal is not output to your TV.

12. **ANT-OUT (Antenna Out) Jack**
    Use the supplied RF coaxial cable to connect this jack to the ANTENNA IN Jack on your TV.

**CAUTION:**
- Be sure to turn off the DVD/VCR and equipment to be connected before connecting.
- Read through the operation manual for the equipment to be connected.
- Be sure that the colors of the jacks and plugs match up when using VIDEO/AUDIO cables.
- Be sure to keep the DVD/VCR connection cables separate from the TV antenna cable when you install the DVD/VCR, because it may cause electrical interference when you are watching television programs.
3-1 TROUBLESHOOTING

Troubleshooting is how to service for the specifying malfunction or poor parts. Detect malfunction or poor parts and service as the following charts.

3-1-1 Power Supply Section

FLOW CHART NO.1

The power cannot be turned on.

Is the fuse normal?

Yes

No

See FLOW CHART No.2 <The fuse blows out.>

Is normal state restored when once unplugged power cord is plugged again after several seconds.

Yes

No

Check for lead or short-circuiting of primary circuit component and service it if defective.

Is the AL+5V line voltage normal?

Yes

No

Check each rectifying circuit of secondary circuit and service it if defective.

FLOW CHART NO.2

The fuse blows out.

Check the presence that the primary component is leaking or shorted and service it if defective.

Check the presence that the rectifying diode or circuit is shorted in each rectifying circuit of secondary side and service it if defective.

After servicing, replace the fuse.

FLOW CHART NO.3

When the output voltage fluctuates.

Does the secondary side photo coupler circuit operate normally?

Yes

No

Check the circuit and service it if defective.

Check the circuit and service it if defective.

(FIC1001, D1012, D1024)

FLOW CHART NO.4

When buzz sound can be heard in the vicinity of power circuit.

Check if there is short circuit on the rectifying diode and the circuit in each rectifying circuit of secondary side and service it if defective.

(D013, D015, D016, D1008, D1010, D1016, D1020, IC1002, IC1004, Q055, Q056, Q057, Q1004, Q1006, Q1011)

FLOW CHART NO.5

-FL is not outputted.

Is the supply voltage of -24V fed to the anode of D1010?

Yes

No

Check for load circuit short-circuiting or leak, and service it if defective.

Check D1010 and their periphery, and service it if defective.
FLOW CHART NO.6
P-ON+5V is not outputted. (P-ON+9V is outputted normally.)

- Is 5V voltage supplied to the collector of Q056? No → Check D016, D018, C020, C021, and their periphery, and service it if defective.
- Is the "H" pulse inputted into the base of Q056? No → Check Q056, R057 and their periphery, and service it if defective.
- Replace Q056.

- Is the "L" pulse (approximately 0V) outputted to the collector of Q1005? Yes → Check D1015, D1019, C018 and their periphery, and service it if defective.
- Replace IC1005.

FLOW CHART NO.8
P-ON+12V is not outputted.

- Is 12V voltage supplied to the emitter of Q1006? No → Check D1015, D1019, C018 and their periphery, and service it if defective.
- Is the "L" pulse (approximately 0V) outputted to the collector of Q1005? No → Check Q1005 and PWRCON line, and service it if defective.
- Replace Q1006.

FLOW CHART NO.9
P-ON+3.3V is not outputted. (EV+3.3V is outputted normally.)

- Is the "H" pulse (approximately 5V) inputted into the base of Q1011? No → See FLOW CHART NO.8. <P-ON+12V is not outputted. >
- Replace Q1011.

FLOW CHART NO.10
EV 1.5V is not outputted.

- Is approximately 2.35V voltage supplied to Pin(1) of IC1002? No → Check D1020, C1014, C1015, and their periphery, and service it if defective.
- Replace IC1002.
The fluorescent display tube does not light up.

Is 3.3V voltage supplied to Pin(6, 24) of IC571? 
- Yes: Replace the fluorescent display tube.
- No: Check the EV+3.3V line and service it if defective.

Is approximately -24V to -28V voltage supplied to Pin(15) of IC571? 
- Yes: Replace the fluorescent display tube.
- No: Check the -FL (-28V) line and service it if defective.

Is there approximately 500kHz oscillation to Pin(26) of IC571? 
- Yes: Replace the fluorescent display tube.
- No: Check R572, IC571 and their periphery, and service it if defective.

Are the filament voltage applied between (1, 2) and (34, 35) of the fluorescent display tube? Also negative voltage applied between these pins and GND? 
- Yes: Replace the fluorescent display tube.
- No: Check the power circuit, D1016, D1017, R1042, C1018 and their periphery, and service it if defective.
3-1-2 DVD Section

FLOW CHART NO.1
The key operation is not functioning.

Are the contact point and the installation state of the key switches (SW2001-2003) normal?

No
Re-install the key switches (SW2001, SW2002, SW2003) correctly or replace the poor switch.

Yes

When pressing each key switches (SW2001, SW2002, SW2003), do the voltage of each pin of CN2001 (shown below) change to "L" (0V) from "H" (3.3V)?
- SW2001 → CN2001 4PIN
- SW2002 → CN2001 2PIN
- SW2003 → CN2001 1PIN

No
Check the key switches (SW2001, SW2002, SW2003) and their periphery, and service it if detective.

Yes
Replace DVD Main CBA.

FLOW CHART NO.2
No DVD operation is possible from the remote control unit. (Operation is possible from the unit.)

Is 5V voltage supplied to Pin(3) terminal of the RM2001 (remote control receiver)?

No
Check AL+5V line, and service it if detective.

Yes

Is the "L" pulse sent out from Pin(1) terminal of the RM2001 (remote control receiver) when the remote control unit is activated?

No
Replace the RM2001 (remote control receiver). Replace remote control unit if needed.

Yes

Is the "L" pulse signal supplied to Pin(22) of CN1001?

No
Check the line between the RM2001 (remote control receiver) and Pin(22) of CN1001, and service it if detective.

Yes
Replace the DVD Main CBA.

FLOW CHART NO.3
The disc tray cannot be opened and closed. (It can be done using the remote control unit.)

Does the voltage of Pin(4) on CN2001 become 0V when pressing "OPEN/CLOSE" button on the unit?

No
Replace the "OPEN/CLOSE" button (SW2001).

Yes
Refer to “FLOW CHAR NO.4” <The disc tray cannot be opened and closed.>

FLOW CHART NO.4
The disc tray cannot be opened and closed.

Replace the DVD Main CBA.

No improvement can be found.

No
Original DVD Main CBA is poor.

Yes
Replace the DVD Mechanism.
FLOW CHART NO.5
The [No Disc] indication. (In case of focus error)

Replace the DVD Main CBA.

No improvement can be found. Yes

Original DVD Main CBA is poor.

Replace the DVD Mechanism.

FLOW CHART NO.6
The [No Disc] indication. (In case focus servo does not function.)

Replace the DVD Main CBA.

No improvement can be found. Yes

Original DVD Main CBA is poor.

Replace the DVD Mechanism.

FLOW CHART NO.7
The [No Disc] indication. (When the laser beam does not light.)

Replace the DVD Main CBA.

No improvement can be found. Yes

Original DVD Main CBA is poor.

Replace the DVD Mechanism.

FLOW CHART NO.8
Both picture and sound do not operate normally.

Replace the DVD Main CBA.

No improvement can be found. Yes

Original DVD Main CBA is poor.

Replace the DVD Mechanism.
FLOW CHART NO.9

Picture does not appear normally.

Set the disc on the disc tray, and playback.

Are the video signals outputted to each pin of CN1601 on the Main CBA?
- CN1601 7PIN  S-Y
- CN1601 9PIN  S-C
- CN1601 5PIN  Cb
- CN1601 3PIN  Cr

Replace the DVD Main CBA or the DVD Mecha.

Are the video signals shown above inputted into each pin of IC1402?
- IC1402 6PIN  S-Y
- IC1402 2PIN  S-C
- IC1402 9PIN  Cb
- IC1402 11PIN Cr

Check the line between each pin of CN1601 and each pin of IC1402 on the Main CBA, and service it if detective.
- CN1601 7PIN  IC1402 6PIN  S-Y
- CN1601 9PIN  IC1402 2PIN  S-C
- CN1601 5PIN  IC1402 9PIN  Cb
- CN1601 3PIN  IC1402 11PIN Cr

Check P-ON+5V line and service it if detective.

Is 5V voltage applied to the Pin(1, 24) of IC1402?

Replace IC1402?

Are the video signals outputted to each pin of IC1402?
- IC1402 21PIN  CVBS
- IC1402 18PIN  S-Y
- IC1402 23PIN  S-C
- IC1402 15PIN  Cb
- IC1402 13PIN  Cr

Check the line between Q760 and OUTPUT SELECT, and service it if detective.

Are the "H" pulse inputted into Pins(9,10,11) of IC1401?

Check the periphery of JK1401 from Pin (18) of IC1402 and service it if detective.

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

Check the periphery of JK1401 from Pin (23) of IC1402 and service it if detective.

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

Check the periphery of JK1403 from Pins (13, 15, 18) of IC1402 and service it if detective.

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

Are the composite video signals outputted to Pin(15) of IC751?

Check the line between Pin(15) of IC751 and JK751 and service it if detective.

Are the composite video signals outputted to Pin(15) of IC751?

Check the line between Pins(9,10,11) of IC751?
Audio is not outputted.

Set the disc on the disc tray, and playback.

Are the analog audio signals outputted to each pin of CN1601 on Main CBA?
- CN1601 13PIN AUDIO-L
- CN1601 15PIN AUDIO-R

Yes

Are the analog audio signals inputted to each pin of IC1201?
- IC1201 2PIN AUDIO-L
- IC1201 6PIN AUDIO-R

Yes

Is the "H" level mute signals outputted to CN1601 on the Main CBA?
- CN1601 12PIN A-MUTE, DVD A-MUTE
- CN1601 16PIN A-R-MUTE, DVD A-R-MUTE
- CN1601 14PIN A-L-MUTE, DVD A-L-MUTE

No

Replace the DVD Main CBA or the DVD Mecha.

Yes

Check each line between each pin of CN1601 and each pin of IC1201 on Main CBA, and service it if detective.

CN1601 13PIN → IC1201 2PIN AUDIO-L
CN1601 15PIN → IC1201 6PIN AUDIO-R

Replace the DVD Main CBA or the DVD Mecha.

No

Replace IC1201.

Are the audio signals outputted to the specific output terminal?

Are the audio signals outputted to the L/R OUT terminal (JK756)?

Are the audio signals outputted to the L/R OUT terminal (JK751)?

No

Check the periphery between Pins(1,7) of IC1201 and JK756, and service it if detective.

Replace IC751.

Yes

Check the line between Pin(4,14) of IC751 and JK751, and their periphery, and service it if detective.

Are the "L" pulse inputted into Pins(9,10,11) of IC751?

Yes

Check the line between Q760 and OUTPUT SELECT, and service it if detective.

No

Replace IC751.
3-1-3 VCR Section

FLOW CHART NO.1

The key operation is not functioning.

Are the contact point and the installation state of the key switches normal?

Yes

No

Re-install some key switches correctly or replace some key switches.

Is the control voltage normally inputted into Pins(66,67) of IC501?

Yes

No

Check the key switches and their periphery, and service it if detective.

Replace IC501.

FLOW CHART NO.2

No DVD operation is possible from the remote control unit. (Operation is possible from the unit.)

Is 5V voltage supplied to the Pin(3) terminal of the RM2001 (remote control receiver)?

No

Check AL+5V line and service it if detective.

Yes

Is the "L" pulse sent out from Pin(1) terminal of the RM2001 (remote control receiver) when the remote control unit is activated?

No

Replace the RM2001 (remote control receiver). Or replace remote control unit.

Yes

Is the "L" pulse signal supplied to the Pin(1) of IC501?

No

Check the line between the RM2001 (remote control receiver) and the Pin(5) of IC501, and service it if detective.

Yes

Replace IC501.

Terminal voltage of IC501-66,67

<table>
<thead>
<tr>
<th>Terminal Voltage (V)</th>
<th>KEY-1</th>
<th>KEY-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.30</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>3.60</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>2.90</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>2.39</td>
<td>CH DOWN</td>
<td>S-INH</td>
</tr>
<tr>
<td>1.98</td>
<td>CH UP</td>
<td>FF</td>
</tr>
<tr>
<td>1.61</td>
<td>PLAY</td>
<td>REW</td>
</tr>
<tr>
<td>1.27</td>
<td>STOP/EJECT</td>
<td>-----</td>
</tr>
<tr>
<td>0.92</td>
<td>POWER</td>
<td>-----</td>
</tr>
<tr>
<td>0.51</td>
<td>REC</td>
<td>DVD/VCR SELECT</td>
</tr>
</tbody>
</table>

S-INH

FF

REW

DVD/VCR SELECT
FLOW CHART NO.3
Cassette tape can not be loaded.

When loading a cassette tape, on Pin(69) of IC501, does the "L" pulse switch to the "H" pulse?

No

Yes

Check the line between the start sensor and Pin(69) of IC501, and service it if detective.

Replace the Capstan Motor Unit.

Replace the Loading Motor Unit.

When loading a cassette tape, is the specified voltage (approximately 13V) outputted to the terminal of the Loading Motor Unit?

Yes

No

Replace IC501.

FLOW CHART NO.4
Cassette tape is ejected right after the loading.

When loading a cassette tape, on Pin(69) of IC501, does the "L" pulse switch to the "H" pulse?

No

Yes

Check the line between the start sensor and Pin(69) of IC501, and service it if detective.

Check the line between the end sensor and Pin(62) of IC501, and service it if detective.

Replace the Capstan Motor Unit.

Replace the Loading Motor Unit.

When loading a cassette tape, does the LD-SW operate normally?

Yes

No

Check the line between the LD-SW(SW512) and Pin(68) of IC501, and service it if detective.

Check the line between the Takeup Reel sensor and Pin(3) of IC501, and service it if detective.

Check the line between the start sensor and Pin(69) of IC501, and service it if detective.

Check the line between the end sensor and Pin(62) of IC501, and service it if detective.

Check the line between the LD-SW(SW512) and Pin(68) of IC501, and service it if detective.

Check the line between the Takeup Reel sensor and Pin(3) of IC501, and service it if detective.

Replace IC501.

Replace the Capstan Motor Unit.

Replace the Loading Motor Unit.

FLOW CHART NO.5
Cassette tape can not be ejected.

When pressing the eject button, does the Capstan Motor start rotating?

No

Yes

Refer to "FLOW CHART NO.6 " <The Capstan Motor does not rotate>.

Check the Reel Disc or Reel Drive Unit, and service it if detective.

Check the line between the Takeup Reel sensor and Pin(3) of IC501, and service it if detective.

Replace IC501.

While the Capstan Motor is rotating, is the Takeup Reel rotating?

Yes

No

Check the line between the Takeup Reel sensor and Pin(3) of IC501, and service it if detective.

While the Takeup Reel is rotating, is the reel pulse signal inputted to Pin(3) of IC501?

No

Yes

Replace IC501.

Check the Cassette Cam or Cassette Gear, etc, and service it if detective.

While the reel pulse signal is inputting, is "L" pulse inputted to Pin(21) of IC501?

No

Yes

Replace the Capstan Motor unit.

Replace the Loading Motor unit.

Is the specified voltage (approximately 13V) outputted to the terminal of the Lading Motor Unit?

No

Yes

Replace the Capstan Motor unit.

Replace the Loading Motor unit.
FLOW CHART NO.6
Capstan Motor does not rotate.

- Is 5V voltage supplied to Pin(2) of CL502? No → Check the P-ON+5V line and service it if detective.
- Is over approximately 2.6V voltage supplied to Pin(5) of CL502? No → Check the line between Pin(5) of CL502 and Pin(28) of IC501, and service it if detective.
- Is 12V voltage supplied to Pins(1,11) of CL502? No → Check the AL+12V line and service it if detective.
- Replace the Capstan Motor Unit.

FLOW CHART NO.7
Drum Motor does not rotate.

- Is 5V voltage supplied to Pin(2) of CL502? No → Check the P-ON+5V line and service it if detective.
- Is over approximately 2.6V voltage supplied to Pin(8) of CL502? No → Check the line between Pin(8) of CL502 and Pin(29) of IC501, and service it if detective.
- Is 12V voltage supplied at Pin(1,11) of CL502? No → Check the AL+12V line and service it if detective.
- Replace the Capstan Motor Unit or Cylinder Assembly.

FLOW CHART NO.8
Drum Motor rotates only for a few seconds.

- Is the drum PG/FG signal inputted to Pin(47) of IC501? No → Replace the Capstan Motor Unit or the Cylinder Assembly.
- Is the RF-SW signal outputted to Pin(18) of IC501? No → Replace IC501.
- Is 12V voltage supplied Pin(1,11) of CL502? No → Check the AL+12V line and service it if detective.
- Replace the Capstan Motor Unit or the Cylinder Assembly.

FLOW CHART NO.9
RF-SW signal is not outputted.

- Is the Drum Motor rotating? No → Refer to “FLOW CHART NO.7” <Drum Motor does not rotate> and “FLOW CHART NO.8” <Drum Motor rotates only for a few seconds>.
- Is the drum PG/FG signal inputted to Pin(47) of IC501? No → Replace the Capstan Motor Unit or the Cylinder Assembly.
FLOW CHART NO.10

Video E-E does not appear.

Is the Video signal inputted to Pins(38,40,42) of IC301?
   No 1) In the external input mode
      ■ Check the line between the video input terminal (rear) and Pin(38) of IC301, and service it if detective.
      ■ Check the line between the video input terminal (front) and Pin(40) of IC301, and service it if detective.
   Yes 2) In the U/V tuner mode
        ■ Check the line between Pin(18) of the U/V tuner and Pin(42) of IC301, and service it if detective.

Is the C-SYNC signal outputted to Pin(34) of IC301?
   Yes Is the C-SYNC signal inputted to Pin(41) of IC501?
      No Check the line between Pin(34) of IC301 and Pin(41) of IC501, and service it if detective.
      Yes Replace IC301.

   No Is 5V voltage supplied to Pin(21) of IC301?
      No Check the P-ON+5V line and service it if detective.
      Yes Is voltage with each inputted signal supplied to Pin(71) of IC301?
         No Check the line between Pin(71) of IC301 and Pin(16) of IC501, and service it if detective.
         Yes Check the line between Pin(35) of IC301 and Pin(1) of IC751, and service it if detective.

   Yes Is the video signal inputted into Pin(1) of IC751?
   No Is the video signal outputted to Pin(15) of IC751?
      Yes Is the video signal outputted to the emitter of Q391?
         No Check the line between Pin(15) of IC751 and Q391, and service it if detective.
         Yes When only Line signal is not outputted...
              check the line between the emitter of Q391 and the video output terminal (JK751), and service it if detective.
              When only RF signal is not outputted...
              check the tuner (TU701), and the line between the emitter of Q391 and Pin(6) of the tuner, and service it if detective.
      No Is approximately 6.8V voltage supplied to Pin(16) of IC751, or approximately -8V voltage supplied to Pin(7) of IC751?
         Yes Is the "H" pulse inputted into Pin(9) of IC751?
            No Check Q760 and the OUTPUT-SELECT line, and service it if detective.
            Yes Replace IC751.
Hi-Fi E-E audio does not operate normally.

Check the peripheral circuit of the front input terminal and service it if detective.

Is each signal supplied to each pin of IC451 as below?

Front input terminal
L-ch Pin(9) R-ch Pin(71)
Rear input terminal Pin(7) Pin(69)
Tuner audio signal Pin(57)

Is the SIF signal outputted from Pin(15) of the tuner?

Is the 5V voltage supplied to Pins(5,15,32,36,46) of IC451, or the 9V voltage supplied to Pins(3,54) of IC451?

Is the serial data and the clock signal supplied to Pins(37,38) of IC451?

Is the sub carrier signal (3.58 MHz) inputted to Pin(51) of IC451?

Is the audio signal outputted to Pins(78,80) of IC451?

Check the line between Pin(57) of IC451 and Pin(15) of tuner, and service it if detective.

Check the line between Pins(37,38) of IC451 and Pins(12,13) of IC501, and service it if detective.

Check the line between Pin(49) of IC451 and Pin(7) of IC501, and service it if detective.

Check the line between the emitter of Q302 and Pin(51) of IC451, and service it if detective.

Check the line between Pins(78,80) of IC451 and Pins(3,13) of IC751, and service it if detective.

Is approximately 6.8V voltage supplied to Pin(16) of IC751, or approximately -8V voltage supplied to Pin(7) of IC751?

Is the "H" pulse inputted into the Pins(9,10,11) of IC751?

Check Q760 and the OUTPUT SELECT line, and service it if detective.

Replace IC451.

Replace IC751.
FLOW CHART NO.12
Hi-Fi audio can not be recorded normally. (E-E mode is normal.)

- Yes: Replace IC451.
- No:
  - Yes: Replace the Cylinder Assembly.
  - No: Service the line between Pin(8) of CL253 and Pin(26) of IC451.

FLOW CHART NO.13
Hi-Fi audio can not be playbacked normally. (Hi-Fi E-E mode is normal.)

- Yes: Replace IC451.
- No:
  - Yes: Replace AC head.
  - No:
    - Yes: Replace IC301.
    - No: Replace CL504 and the connected cable.

FLOW CHART NO.14
Hi-Fi audio can not be recorded normally in the linear audio mode. (E-E mode is normal.)

- Yes: Replace IC301.
- No:
  - Yes: Replace IC451.
  - No: Check the Hi-Fi-H-SW line between Pin(39) of IC451 and Pin(25) of IC501, and service it if detective.

- Yes: Check the line between Pin(6) of IC451 and Pin(76,78,80) of IC301, and service it if detective.
- No:
  - Yes: Check the Bias oscillation circuit (Q421, Q422, Q423, Q424, Q425) and service it if detective.
  - No: Replace IC301.
Hi-Fi audio can not be playbacked normally in the linear audio mode. (E-E mode is normal.)

- **Is the audio signal supplied to Pin(100) of IC301?**
  - Yes
  - No

- **Are the CL504, the connected cable and the parts on periphery of playback amplifier normal?**
  - Yes
  - No

- **Is there no dirt on the surface of AC head?**
  - Yes
  - No

- **Is the height of AC head appropriate?**
  - Yes
  - No

- **Is the audio signal outputted to Pin(96) of IC301?**
  - Yes
  - No

  - Check the line between Pin(96) of IC301 and Pin(4) of IC451, and service it if detective.
  - Replace IC301.

- **Service and replace poor parts.**

- **Clean the surface of AC head.**

- **Readjust the height of the AC head.**

- **Replace the AC head.**
3-2 FIRMWARE RENEWAL MODE

3-2-1 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.
   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.
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)
   At this time, no buttons are available.

6. Unplug the AC cord from the AC outlet. Then plug it again.
7. Turn the power on by pressing the power button and the tray will close.
8. Press [1], [2], [3], [4], and [DISPLAY] buttons on the remote control unit in that order.
   Fig. g appears on the screen.

   Fig. h appears on the screen.
10. To finish this mode, press [POWER] button.

**3-2-2 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.
3. Turn the power off to reset the unit.

**Note:**
If the firmware has been changed, etc., we will use Service News, etc. to report on how to obtain new firmware data and create an upgraded disc.
# 3-3 STANDARD MAINTENANCE

## 3-3-1 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

<table>
<thead>
<tr>
<th>Ref.No.</th>
<th>Part Name</th>
<th>1,000 h</th>
<th>2,000 h</th>
<th>3,000 h</th>
<th>4,000 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2</td>
<td>Cylinder Assembly</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td>B3</td>
<td>Loading Motor Assembly</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B8</td>
<td>Pulley Assembly</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B587</td>
<td>Tension Lever Assembly</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B31</td>
<td>AC Head Assembly</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B573,B574</td>
<td>Reel (SP)(D2), Reel (TU)(D2)</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B37</td>
<td>Capstan Motor</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B52</td>
<td>Cap Belt</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*B73</td>
<td>FE Head</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B133,B134</td>
<td>Idler Gear, Idler Arm</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B410</td>
<td>Pinch Arm Assembly</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B414</td>
<td>M Brake (SP) Assembly</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B416</td>
<td>M Brake (TU) Assembly</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B525</td>
<td>LDG Belt</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B569 (2 head only)</td>
<td>Cam Holder (F)</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B593 (4 head, 4 head HiFi only)</td>
<td>Cam Holder (F) Assembly</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3-3-2 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.
4-1 PREPARATION FOR SERVICING

4-1-1 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.

Fig. 1
4-2 FIXTURE AND TAPE FOR ADJUSTMENT

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

2. Guide Roller Adj. Screwdriver
   No. 7099028

3. Flat Screwdriver
   (Purchase Locally)

4-2-1 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>Guide Roller Adj. Screwdriver</td>
<td>7099028</td>
<td>● Guide Roller</td>
</tr>
<tr>
<td>3</td>
<td>Flat Screwdriver</td>
<td>Purchase Locally</td>
<td>● X Value Alignment</td>
</tr>
</tbody>
</table>
4-3 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 "CHANNEL ▼" or "CHANNEL ▲" button on the front panel first, then the "PLAY" button on the front panel.

4-3-1 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)

4-3-2 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.

<table>
<thead>
<tr>
<th>Test point</th>
<th>Adj.Point</th>
<th>Mode</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP751(V-OUT)</td>
<td>VR501</td>
<td>PLAY</td>
<td>-----</td>
</tr>
<tr>
<td>TP302(RF-SW)</td>
<td>(Switching Point)</td>
<td>(SP)</td>
<td></td>
</tr>
<tr>
<td>GND</td>
<td>(MAIN CBA)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tape</th>
<th>Measurement Equipment</th>
<th>Spec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MH-1</td>
<td>Oscilloscope</td>
<td>6.5H±1H (412.7μs±60μs)</td>
</tr>
</tbody>
</table>

Connections of Measurement Equipment

![Diagram](image)
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.

4-4-1 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.

![Fig. M1](image1)

![Fig. M2](image2)
4-4-2 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 4-7, procedure 1-C, step 2.)

Equipment required:
- Dual Trace Oscilloscope
- VHS Alignment Tape (MH-1)
- Guide Roller Adj. Screwdriver
- Flat Screwdriver (Purchase Locally)

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

Flowchart of Alignment for tape traveling

1-A
Adjust the height of the Guide Rollers (Supply side and take-up side). (Use a blank tape.)

1-A
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.)

1-B
Adjust the X Value for maximum envelope. (Page 4-6) (Use Alignment Tape.)

1-C
Adjust the envelope. (Page 4-7)

1-C
Check the envelope. Not good

1-D
Adjust the Audio Section. (Azimuth Alignment) (Page 4-7)

1-D
Check the audio output. Not good

1-B, 1-C
Check the following:
1. X Value (Page 4-6)
2. Envelope (Page 4-7)

1-A
Do the final tape-traveling test to see that the tape runs normally in play mode without creasing or slacking.

OK
Completion

OK
Adjust the X value and envelope. 1-B, 1-C
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. Playback 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 TP513 (CTL) on the Main CBA. Use TP302 (RF-SW) as a trigger.
2. Playback 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 4-7.)
4. Use the Flat 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. +2ms. 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 -2ms. 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. Playback 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 4-6) 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. Playback 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)
**5-1 CABINET DISASSEMBLY INSTRUCTIONS**

### 5-1-1 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]

### 5-1-2 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</td>
<td>7(S-1)</td>
</tr>
<tr>
<td>[2] Front Assembly</td>
<td>D2</td>
<td>(S-3), *7(L-1)</td>
</tr>
<tr>
<td>[3] Top Bracket</td>
<td>D2</td>
<td>4(S-2)</td>
</tr>
<tr>
<td>[5] DVD Main CBA</td>
<td>D4</td>
<td>2(S-5), *CN201, *CN301</td>
</tr>
<tr>
<td>[6] Rear Unit</td>
<td>D5</td>
<td>5(S-6), 4(S-7), CN1005</td>
</tr>
<tr>
<td>[8] PCB Bracket</td>
<td>D6</td>
<td>3(S-9)</td>
</tr>
<tr>
<td>[9] Rear Panel</td>
<td>D6</td>
<td>⎯─ ⎯─</td>
</tr>
<tr>
<td>[10] VCR Chassis Unit</td>
<td>D7</td>
<td>5(S-10), 4(S-11)</td>
</tr>
<tr>
<td>[11] Deck Assembly</td>
<td>D8</td>
<td>Desolder, 2(S-12)</td>
</tr>
<tr>
<td>[12] Main CBA</td>
<td>D8</td>
<td>⎯─</td>
</tr>
<tr>
<td>[13] DVD OPEN/CLOSE CBA</td>
<td>D8</td>
<td>⎯─</td>
</tr>
<tr>
<td>[14] Function CBA</td>
<td>D8</td>
<td>⎯─</td>
</tr>
<tr>
<td>[15] Deck Pedestal</td>
<td>D9</td>
<td>7(S-13)</td>
</tr>
<tr>
<td>[16] Side Bracket</td>
<td>D9</td>
<td>(S-14)</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) are fragile. Be careful not to break them.

1-1. Remove Screw (S-3).
1-2. Release seven Locking Tabs (L-1) (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. D4.
2-2. Short the three short lands of FPC cable with solder before removing the FFC cable (CN301) from it. If you disconnect the FFC cable (CN301), the laser diode of pickup will be destroyed. (Fig. D4)
2-3. Disconnect Connector (CN201). Remove two Screws (S-5) and lift the DVD Main CBA. (Fig. D4)

CAUTION 3: When reassembling, confirm the FFC cable (CN301) is connected completely. Then remove the solder from the three short lands of FPC cable. (Fig. D4)

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

CAUTION 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.
View for A

Short the three short lands by soldering

View for B

Fig. D4

Fig. D5

Fig. D6

Fig. D7
[Fig. D8]

- **[11] Deck Assembly**
- **[12] Main CBA**
- **[13] DVD OPEN/CLOSE CBA**
- **[14] Function CBA**

**Desolder**
- Lead with blue stripe

**Lead connections of Deck Assembly and Main CBA**

*Fig. D8*
To Remove the Disc Manually

1. Remove the Top Cover.
2. Rotate this roulette in the direction of the arrow as shown below.
## 5-2 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 5-1.)

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 5-8. 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>
<th>REMOVAL/UNHOOK/UNLOCK/RELEASE/UNPLUG/DESOLDER</th>
<th>ADJUSTMENT CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1] [1]</td>
<td></td>
<td>Guide Holder A</td>
<td>T</td>
<td>DM3</td>
<td>2(S-1)</td>
</tr>
<tr>
<td>[2] [1]</td>
<td></td>
<td>Cassette Holder Assembly</td>
<td>T</td>
<td>DM4</td>
<td></td>
</tr>
<tr>
<td>[3] [2]</td>
<td></td>
<td>Slider (SP)</td>
<td>T</td>
<td>DM5</td>
<td>*(L-1)</td>
</tr>
<tr>
<td>[5] [4]</td>
<td></td>
<td>Lock Lever</td>
<td>T</td>
<td>DM5</td>
<td><em>(L-3),</em>(P-1)</td>
</tr>
<tr>
<td>[7] [7]</td>
<td></td>
<td>Cylinder Assembly</td>
<td>T</td>
<td>DM1,DM6</td>
<td>Desolder, 3(S-2)</td>
</tr>
<tr>
<td>[8] [8]</td>
<td></td>
<td>Loading Motor Assembly</td>
<td>T</td>
<td>DM1,DM7</td>
<td>Desolder, LDG Belt, 2(S-3)</td>
</tr>
<tr>
<td>[9] [9]</td>
<td></td>
<td>AC Head Assembly</td>
<td>T</td>
<td>DM1,DM7</td>
<td>(S-4)</td>
</tr>
<tr>
<td>[12] [11]</td>
<td></td>
<td>Pinch Arm (B)</td>
<td>T</td>
<td>DM1,DM8</td>
<td>*(P-3)</td>
</tr>
<tr>
<td>[13] [12]</td>
<td></td>
<td>Pinch Arm Assembly</td>
<td>T</td>
<td>DM1,DM8</td>
<td></td>
</tr>
<tr>
<td>[14] [14]</td>
<td></td>
<td>FE Head Assembly</td>
<td>T</td>
<td>DM1,DM9</td>
<td>(S-5)</td>
</tr>
<tr>
<td>[15] [15]</td>
<td></td>
<td>Prism</td>
<td>T</td>
<td>DM1,DM9</td>
<td>(S-6)</td>
</tr>
<tr>
<td>[16] [2].[15]</td>
<td></td>
<td>Sensor Gear</td>
<td>T</td>
<td>DM1,DM15</td>
<td></td>
</tr>
<tr>
<td>[17] [2]</td>
<td></td>
<td>Slider Shaft</td>
<td>T</td>
<td>DM10</td>
<td>*(L-5)</td>
</tr>
<tr>
<td>[18] [17]</td>
<td></td>
<td>C Drive Lever (SP)</td>
<td>T</td>
<td>DM10</td>
<td></td>
</tr>
<tr>
<td>[19] [17]</td>
<td></td>
<td>C Drive Lever (TU)</td>
<td>T</td>
<td>DM10</td>
<td>(S-7),*(P-4)</td>
</tr>
<tr>
<td>[20] [7],[8], [10]</td>
<td></td>
<td>Capstan Motor</td>
<td>B</td>
<td>DM2,DM11</td>
<td>3(S-8), Cap Belt</td>
</tr>
<tr>
<td>[21] [21]</td>
<td></td>
<td>Clutch Assembly</td>
<td>B</td>
<td>DM2,DM12</td>
<td>(C-1)</td>
</tr>
<tr>
<td>[22] [22]</td>
<td></td>
<td>Cam Holder (F) Assembly</td>
<td>B</td>
<td>DM2,DM12</td>
<td>*(L-6)</td>
</tr>
<tr>
<td>[23] [23]</td>
<td></td>
<td>Cam Gear (B)</td>
<td>B</td>
<td>DM2,DM12</td>
<td>(C-4)*(P-5)</td>
</tr>
<tr>
<td>[26] [22]</td>
<td></td>
<td>Worm Holder</td>
<td>B</td>
<td>DM2,DM13</td>
<td>(S-9),<em>(L-9),</em>(L-10)</td>
</tr>
<tr>
<td>[27] [26]</td>
<td></td>
<td>Pulley Assembly</td>
<td>B</td>
<td>DM2,DM13</td>
<td></td>
</tr>
<tr>
<td>[28] [25],[26]</td>
<td></td>
<td>Cam Gear (A)</td>
<td>B</td>
<td>DM2,DM13</td>
<td></td>
</tr>
<tr>
<td>[29] [25]</td>
<td></td>
<td>Idler Gear</td>
<td>B</td>
<td>DM1,DM14</td>
<td></td>
</tr>
<tr>
<td>[30] [29]</td>
<td></td>
<td>Idler Arm</td>
<td>B</td>
<td>DM1,DM14</td>
<td>*(L-11)</td>
</tr>
<tr>
<td>[31] [25]</td>
<td></td>
<td>BT Arm</td>
<td>B</td>
<td>DM2,DM14</td>
<td>*(P-6)</td>
</tr>
<tr>
<td>[32] [25]</td>
<td></td>
<td>Loading Arm (SP) Assembly</td>
<td>B</td>
<td>DM2,DM14</td>
<td>(+)Refer to Alignment Sec. Page 5-14</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.
First, while pushing the locking tab as shown at 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 groove of [28] as shown.
When installing [23], install the spring (P-5) to [28] as shown in the left figure, and then install [23] while pressing the spring (P-5) to the direction of the arrow in the left figure and confirming that the position of the spring (P-5) is placed as shown in the left figure.

Pin on bottom of [23]

Top View

Position of pin on [22]
When reassembling [28], align the first groove on [28] to the first tooth on [44] as shown.

Align [25] and [28] as shown.

Position of Mode Lever when installed

Pin of [31]

Pin of [35]

Pin of [34]

Bottom View

First groove on [28]

First tooth on [44]

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

Refer to the Alignment Section, Page 5-14.
5-3 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 (SP) and (TU) Assembly
Install Loading Arm (SP) and (TU) 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 (TU) Assembly so that the last tooth of the gear meets the most inside teeth of the Mode Gear. See Fig. AL2.

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. AL3.
Mark | Description
--- | ---
icionar | Floil G-684G or Multemp MH-D (Blue grease)
**** | SLIDUS OIL #150

Mark Description

Floil G-684G or Multemp MH-D (Blue grease)
SLIDUS OIL #150
### 6-2 REPLACEMENT PARTS LIST

#### 6-2-1 Mechanical Parts List

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## 6-2-2 Electrical 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.

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<th>SYMBOL-NO</th>
<th>P-NO</th>
<th>DESCRIPTION</th>
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<tr>
<td>SA1001</td>
<td>TC10891</td>
<td>SURGE ABSORBER</td>
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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

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

Capacitors and transistors are represented by the following symbols.

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.

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<tr>
<td>Power capacitance</td>
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<td>All capacitances other than the above are indicated in schematic diagrams.</td>
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Schematic Diagram Symbols

Digital Transistor

CBA Symbols

(Top View) (Bottom View)

Electrolytic Capacitor

Transistor or Digital Transistor

NPN Transistor

PNP Transistor

NPN Digital Transistor

PNP Digital Transistor
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 (F1001) is blown, first check to see that all components in the power supply circuit are not defec- tive 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. Voltage indications for PLAY and REC modes on the schematics are as shown below:

6. How to read converged lines
   1-D3
   Distinction Area
   Line Number
   (1 to 3 digits)
   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".

7. 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.
3-2 Main 2/8 & Sensor Schematic Diagrams

Note:
When it is necessary to replace one or more of the following Diodes, all four should be replaced: D564, D565, D566, D567.
3-3 Main 3/8 Schematic Diagram
3-4 Main 4/8 Schematic Diagram
3-7 Main 7/8 & DVD OPEN/ CLOSE Schematic Diagrams
CAUTION!
Fixed voltage ( or Auto voltage selectable ) power supply circuit is used in this unit. If Main Fuse (F1001) 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 RISQUES D'INCENDIE N'UTILISER QUE 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."

ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'INCELE N'UTILISER QUE DES FUSIBLE DE MEME TYPE.
RISK OF FIRE: REPLACE Fuse AS MARKED.

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

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

"This symbol means fast operating fuse."
"Ce symbole represents un fusible à fusion rapide."
3-10 Function Schematic Diagram

Note:
When it is necessary to replace one or more of the following Diodes, all one should be replaced: D561.

*1 Schematic Diagram
3-11 DVD Main 1/3 Schematic Diagram
### IC101 VOLTAGE CHART

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<th>PIN.NO</th>
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*Note: The table represents voltage levels at various pins for IC101 components.*
3-13 DVD Main 3/3 Schematic Diagram
4 WAVEFORMS

---

**WF1** (TP751 of Main CBA)

---

**WF2** LOWER (TP302 of Main CBA)

---

**WF3** UPPER (TP301 of Main CBA)

---

**WF4** Pin 7 of CN1601

---

**WF5** Pin 9 of CN1601

---

**WF6** Pin 21 of IC1402

---

**WF7** Pin 13 of CN1601

---

**WF8** Pin 15 of CN1601

---

**WF9** Pin 18 of CN1601

---

**NOTE:**

Input

CD: 1kHz PLAY (WF7~WF9)

DVD: POWER ON (STOP) MODE (WF4~WF6)
Sensor CBA Top View
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!
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F1001) 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 même type.

RISK OF FIRE: Replace fuse as marked.

“Ce symbole représente un fusible à fusion rapide.”

“This symbol means fast operating fuse.”

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 MEME TYPE.

RISK OF FIRE: REPLACE FUSE AS MARKED.

“Ce symbole représente un fusible à fusion rapide.”

“This symbol means fast operating fuse.”

A fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.

If Main Fuse (F1001) 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.
6-2 Video Block Diagram
MAIN CBA

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

FROM/DVD AUDIO BLOCK <DVD SECTION>

FROM TO AUDIO BLOCK

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

FROM/TO SERVO/SYSTEM CONTROL BLOCK

FROM SERVO/SYSTEM CONTROL BLOCK

FROM DVD AUDIO BLOCK

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

CL253

Hi-Fi-H-SW
A-MUTE-H
NORMAL-H

TO SERVO/SYSTEM CONTROL BLOCK

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

CYLINDER ASSEMBLY

Hi-Fi AUDIO (R) HEAD
Hi-Fi AUDIO (L) HEAD

Hi-Fi-H-SW
A-MUTE-H
NORMAL-H

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

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

Hi-Fi-A(R)
6-5 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’INCELLE UTILISER QUE DES FUSEABLE DE MEMO 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.

**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.
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For continued protection against fire hazard, replace only with the same type fuse.

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7 SYSTEM CONTROL TIMING CHARTS
[VCR Section]

Mode SW : LD-SW

<table>
<thead>
<tr>
<th>LD-SW Position detection</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/D Input voltage Limit</td>
<td></td>
</tr>
<tr>
<td>(Calculated voltage)</td>
<td></td>
</tr>
<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>SM</td>
</tr>
<tr>
<td>3.20V~3.75V (3.40V)</td>
<td>AU</td>
</tr>
<tr>
<td>0.26V~0.65V (0.44V)</td>
<td>AL</td>
</tr>
<tr>
<td>4.51V~5.00V (5.00V)</td>
<td>SS</td>
</tr>
<tr>
<td>2.61V~3.19V (2.97V)</td>
<td>RS</td>
</tr>
</tbody>
</table>

Note:
EJ ➔ RS: Loading FWD (LM-FWD/REV "H")
RS ➔ EJ: Loading REV (LM-FWD/REV "L")
Stop (A) ➔ Loading
Stop (B) ➔ Unloading

Still/Slow Control
Frame Advance Timing Chart

1) SP Mode

20ms

F-AD

(Lock Internal Signal)

C-DRIVE

AT "L" "H" "Z" "H"

PB CTL

Stop detection (T2)

Slow Tracking Value

Reversal Limit Value

27 C-F/R

STILL FRAME ADVANCE STILL

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

79 H-A-SW

78 ROTA

Fig. 1
2) LP/SLP Mode

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

F-AD
(Internal Signal)

C-DRIVE

PB CTL

C-F/R

H-A-SW

ROTA

Acceleration Detection (T1)

Slow Tracking Value

Stop detection (T2)

Reversal Limit Value

20ms

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
[ DVD Section ]

Tray Close – Play / Play – Tray Open

- **Tray OUT (TL220)**
  - 3.3V
  - 0V

- **Tray IN (TL221)**
  - 3.3V
  - 0V

- **Sled Drive (TP303)**
  - 1.65V
  - 0V

- **Disc Drive (TP301)**
  - 1.65V
  - 0V

- **Focus Drive (TP304)**
  - 1.65V
  - 0V

- **Tracking Drive (TP302)**
  - 1.65V
  - 0V
# 8 IC PIN FUNCTION DESCRIPTIONS

## [ VCR Section ]

**IC501( SERVO / SYSTEM CONTROL IC )**

\[ \text{“H”} \geq 4.5\text{V}, \text{“L”} \leq 1.0\text{V} \]

<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</td>
<td>IN</td>
<td>P-DOWN-L</td>
<td>Power Voltage Down Detector Signal</td>
<td>L</td>
</tr>
<tr>
<td>2</td>
<td>IN</td>
<td>REC-SAF-SW</td>
<td>Recording Safety SW Detect (With Record tab = “L”/With out Record tab = “H”)</td>
<td>H/L</td>
</tr>
<tr>
<td>3</td>
<td>IN</td>
<td>T-REEL</td>
<td>Take Up Reel Rotation Signal</td>
<td>PULSE</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>N.U.</td>
<td>Not Used</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>IN</td>
<td>REMOTE-VIDEO</td>
<td>Remote Control Sensor</td>
<td>L</td>
</tr>
<tr>
<td>6</td>
<td>OUT</td>
<td>DISPLAY-CLK</td>
<td>7seg. Driver IC Clock Control Output Signal</td>
<td>H/L</td>
</tr>
<tr>
<td>7</td>
<td>OUT</td>
<td>A-MUTE-H</td>
<td>Audio Mute Control Signal (Mute = “H”)</td>
<td>H</td>
</tr>
<tr>
<td>8</td>
<td>OUT</td>
<td>DISPLAY-DATA</td>
<td>7seg. Driver IC Data Control Output Signal</td>
<td>H/L</td>
</tr>
<tr>
<td>9</td>
<td>OUT</td>
<td>DISPLAY-ENA</td>
<td>7seg. Driver IC Enable Control Output Signal</td>
<td>L</td>
</tr>
<tr>
<td>10</td>
<td>-</td>
<td>N.U.</td>
<td>Not Used</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>OUT</td>
<td>TRICK-H</td>
<td>Special Playback “H”</td>
<td>H/Z/L</td>
</tr>
<tr>
<td>12</td>
<td>IN/OUT</td>
<td>IIC-BUS-SDA</td>
<td>IIC BUS Control Data</td>
<td>H/L</td>
</tr>
<tr>
<td>13</td>
<td>OUT</td>
<td>IIC-BUS-SCL</td>
<td>IIC BUS Control Clock</td>
<td>H/L</td>
</tr>
<tr>
<td>14</td>
<td>OUT</td>
<td>SP/LP/SLP</td>
<td>Top Speed Select Signal (SP=&quot;L&quot;/LP=&quot;Z&quot;/SLP=&quot;H&quot;)</td>
<td>H/Z/L</td>
</tr>
<tr>
<td>15</td>
<td>-</td>
<td>N.U.</td>
<td>Not Used</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>OUT</td>
<td>INSEL/ST-SL</td>
<td>Input Selector Control Signal (EE/REC)/Still/Slow (Playback)</td>
<td>H/Hi-z/L</td>
</tr>
<tr>
<td>17</td>
<td>OUT</td>
<td>PICTURE-SEL</td>
<td>Picture Control Signal</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>OUT</td>
<td>RF-SW</td>
<td>Video Head Switching Pulse</td>
<td>H/L</td>
</tr>
<tr>
<td>19</td>
<td>OUT</td>
<td>D-V SYNC</td>
<td>Dummy V-sync Output</td>
<td>H/Hi-z</td>
</tr>
<tr>
<td>20</td>
<td>IN</td>
<td>RESET</td>
<td>System Reset Signal (Reset=&quot;L&quot;)</td>
<td>L</td>
</tr>
<tr>
<td>21</td>
<td>OUT</td>
<td>LM-FWD/REV</td>
<td>Loading Motor FWD/REV Output</td>
<td>H/Z/L</td>
</tr>
<tr>
<td>22</td>
<td>OUT</td>
<td>P-ON-L</td>
<td>Power On Signal to Low</td>
<td>L</td>
</tr>
<tr>
<td>23</td>
<td>OUT</td>
<td>D-PB-L</td>
<td>Playback Instruction Signal</td>
<td>L</td>
</tr>
<tr>
<td>24</td>
<td>OUT</td>
<td>D-REC-H</td>
<td>Delayed Record Signal</td>
<td>H</td>
</tr>
<tr>
<td>25</td>
<td>OUT</td>
<td>HiFi-H-SW</td>
<td>HiFi Audio Head Switching Pulse</td>
<td>H/L</td>
</tr>
<tr>
<td>26</td>
<td>OUT</td>
<td>DVD-POWER</td>
<td>DVD Power Control Signal</td>
<td>H</td>
</tr>
<tr>
<td>27</td>
<td>OUT</td>
<td>C-F/R</td>
<td>Capstan Motor FWD/REV Control Signal (FWD=&quot;L&quot;/REV=&quot;H&quot;)</td>
<td>H/L</td>
</tr>
<tr>
<td>28</td>
<td>OUT</td>
<td>C-CONT</td>
<td>Capstan Motor Control Signal</td>
<td>PWM</td>
</tr>
<tr>
<td>29</td>
<td>OUT</td>
<td>D-CONT</td>
<td>Drum Motor Control Signal</td>
<td>PWM</td>
</tr>
<tr>
<td>30</td>
<td>-</td>
<td>N.U.</td>
<td>Not Used</td>
<td>-</td>
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<tr>
<td>31</td>
<td>-</td>
<td>VDD</td>
<td>VDD</td>
<td>-</td>
</tr>
<tr>
<td>32</td>
<td>OUT</td>
<td>OSCO</td>
<td>Main Clock Output 14.31818MHz</td>
<td>-</td>
</tr>
<tr>
<td>33</td>
<td>IN</td>
<td>OSCI</td>
<td>Main Clock Input 14.31818MHz</td>
<td>-</td>
</tr>
<tr>
<td>34</td>
<td>-</td>
<td>VSS</td>
<td>VSS</td>
<td>-</td>
</tr>
<tr>
<td>35</td>
<td>IN</td>
<td>XI</td>
<td>Sub Clock Input 32.768 MHz</td>
<td>-</td>
</tr>
<tr>
<td>36</td>
<td>OUT</td>
<td>XO</td>
<td>Sub Clock Output 32.768 MHz</td>
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<td>57</td>
<td>IN/OUT</td>
<td>CTL (-)</td>
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<td>59</td>
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<td>DVD Power Monitor Signal (P-off=&quot;L&quot;, P-on=&quot;H&quot;)</td>
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<td>RF Conv. Output Channel Switching Signal 3ch=&quot;Hi-z&quot;, 4ch=&quot;L&quot;</td>
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<td>RF Conv. ON/OFF Signal (TV=&quot;L&quot;/VCR=&quot;H&quot;)</td>
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<td>C-ROTA</td>
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<td>79</td>
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<td>H-A-SW</td>
<td>Video Head Amp Switching Pulse</td>
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<td>80</td>
<td>IN</td>
<td>H-A-COMP</td>
<td>Head Amp Comparator Signal</td>
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Notes:
Abbreviation for Active Level:
PWM -----Pulse Wide Modulation
A/D-------Analog - Digital Converter
### IC571 [ PT6313-S-TP ]

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<td>28</td>
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9 LEAD IDENTIFICATIONS

- BN1F4M-T
- BA1F4M-T
- KTA1266(GR)
- KTC3193(Y)
- KTC3199(Y,GR,BL)
- 2SC2785(J,H,F,K)
- KRC103M
- KRA103M
- 2SA1175(J,H,F)
- KTA1267(Y)
- KTA1267(GR)

- 2SC1815-BL(TPE2)
- 2SC1815-Y(TPE2)
- 2SC1815-GR(TPE2)
- 2SC2120-Y(TPE2)
- KTC3203(Y)
- 2SA1015-GR(TPE2)
- KTC3198(Y,GR)
- 2SC2001(K)
- 2SC2001(L)

- 2SK3543
- NJM4558D

- KIA431-AT
- KIA431A-AT
- TL431A-TA

- PT6313-S-TP
- LTV-817(B,C)-F

- MM1622XJBE

- TC4053BF(N)
- BU4053BCF

- PQ070XF01SZ

Note:
- A: Anode
- K: Cathode
- E: Emitter
- C: Collector
- B: Base
- R: Reference
- S: Source
- G: Gate
- D: Drain
How to cancel "error code"
Power -off and power on again

Error1  Reel rotation is abnormal
Check the Reel pulse by Oscilloscope
Test point TP505
Cause: missing Reel pulse for the following time
PB/REC : SP 5second,EP 14 second,FF/REW 4 seconds
Check on D555/Q506 -Pulse entered? If so, check the Capstan Motor.

Capstan motor abnormal:
C-FG pulse does not entered for one second, error 1 indicates.

Check C-FG pulse on IC501 49 pin.
Check the voltage IC501 1 pin.
Check the voltage IC501 2 pin.

Error 2  Tape loading is abnormal
Mechanism will not be normal position over 7 seconds
error 2 indicates.

Error 3  Cassette loading is abnormal
Over the the following time, error 3 indicates.
Cassette in :3 seconds
Cassette out (Eject):5 seconds
Check MK-12 mechanism and replace the faulty parts.

Error4  Drum motor rotation is abnormal
When Cassette in and Drum motor is rotating,
D-PFD pulse does not enter over 1 second.
error 4 indicates.
Check the pulse at IC 501 47 pin
Check the mechanism and replace Main micon (IC501)