SERVICE MANUAL

US Model



DX-13A MECHANISM

Refer to the SERVICE MANUAL of VHS MECHANI-**CAL ADJUSTMENT MANUAL VII for MECHANICAL** ADJUSTMENTS. (9-921-790-11)

SPECIFICATIONS

System

[DVD recorder section]

Laser

Semiconductor laser

Audio recording format

Dolby Digital

Video recording format

MPEG Video

[VCR section]

Format

VHS NTSC standard

Video recording system

Rotary head helical scanning FM system

Video heads

Double azimuth four heads

Video signal

NTSC color, EIA standards

Tape speed

SP: $33.35 \text{ mm/s} (1^3/8 \text{ inches/s})$ EP: 11.12 mm/s (⁷/16 inches/s) LP: 16.67 mm/s (11/16 inches/s), playback only

Maximum recording/playback time

8 hrs. in EP mode (with T-160 tape)

Rewind time

Approx. 2 min (with T-120 tape)

[Timer section]

Clock

Ouartz locked

Timer indication

12-hour cycle

Timer setting

12 programs in total (max.)

Inputs and outputs

47 kilohms

LINE 1 IN and LINE 2 IN

VIDEO IN, phono jack (1 each) Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative AUDIO IN, phono jacks (2 each) Input level: 327 mVrms Input impedance: more than

LINE 2 IN

S VIDEO, 4-pin, mini-DIN jack Y: 1.0 Vp-p, unbalanced, sync negative C: 0.286 Vp-p, load impedance 75 ohms DV IN, 4-pin jack, i.LINK S100

LINE OUT

VIDEO OUT, phono jack (1) Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative AUDIO OUT, phono jacks (2) Standard output: 327 mVrms Load impedance: 47 kilohms

Output impedance: less than 10 kilohms

DIGITAL AUDIO OUT

OPTICAL, Optical output jack -18 dBm (wave length: 660 nm) COAXIAL, phono jack

Output signal: 0.5 Vp-p, 75 ohms

COMPONENT VIDEO OUT (Y, PB, PR)

Y: 1.0 Vp-p/PB, Pr: 0.7 Vp-p, 75 ohms

— Continued on next page —

VIDEO CASSETTE RECORDER/ **DVD RECORDER**

















S VIDEO OUT

4-pin, mini-DIN jack

Y: 1.0 Vp-p, unbalanced, sync negative C: 0.286 Vp-p, load impedance 75 ohms

SET TOP BOX CONTROL

Mini jack

HDMI

HDMI 19 pin-Standard Connector

General

Power requirements

120 V AC, 60 Hz

Power consumption

31 W

Power back-up

Back-up duration: 30 min

Operating temperature

5°C to 35°C (41°F to 95°F)

Storage temperature

-20°C to 60°C (-4°F to 140°F)

Operating humidity

25% to 80%

Dimensions including projecting parts and controls (w/h/d)

Approx. $430 \times 82 \times 332 \text{ mm}$

(Approx. $17 \times 3^{1}/4 \times 13^{1}/8$ inches)

Mass

Approx. 4.7 kg (Approx. 10.4 lbs)

Supplied accessories

Remote commander (remote) (1)

Size AA (R6) batteries (2)

Audio/video cord (1)

Set top box controller (1)

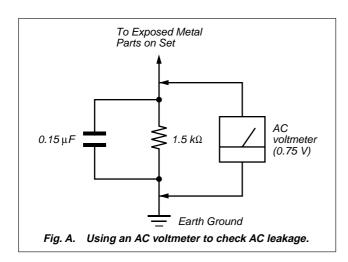
HDMI cord (1)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

- Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
- 2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
- Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
- Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
- 5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
- 6. Check the B+ voltage to see it is at the values specified.
- Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.



WARNING!!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 25 cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK \triangle OR DOTTED LINE WITH MARK \triangle ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

- A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
- A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
- 3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

Unleaded solder

Boards requiring use of unleaded solder are printed with the leadfree mark (LF) indicating the solder contains no lead.

(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)

4-

: LEAD FREE MARK

Unleaded solder has the following characteristics.

 Unleaded solder melts at a temperature about 40°C higher than ordinary solder.

Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.

Soldering irons using a temperature regulator should be set to about 350°C .

Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!

• Strong viscosity

Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.

• Usable with ordinary solder

It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

CAUTION:

The use of optical instrument with this product will increase eye hazard.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

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PRECAUTIONS

1 SAFETY PRECAUTIONS

- Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:
- (1) Be sure that no built-in protective devices are defective or have been defeated during servicing.
 - (1)Protective shields are provided to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience.

 (2)When reinstalling the chassis and/or other assembly in the
 - (2)When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, nonmetallic control knobs, insulating fish papers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning.
- (2) Be sure that there are no cabinet openings through which adults or children might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, excessively wide cabinet ventilation slots, and an improperly fitted and/or incorrectly secured cabinet back cover.
- (3) Leakage Current Hot Check-With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1270 (40.7). With the instrument's AC switch first in the ON position and then in the OFF position, measure from a known earth ground (metal water pipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinets, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis.

Any current measured must not exceed 0.5mA. Reverse the instrument power cord plug in the outlet and repeat the test. See Fig. 1

Any measurements not within the limits specified herein indicate a potential shock hazard that must be eliminated before returning the instrument to the customer.

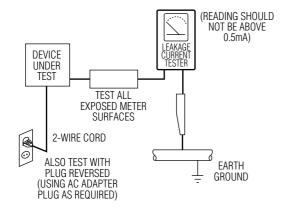


Fig. 1 AC Leakage Test

(4) Insulation Resistance Test Cold Check-(1) Unplug the power supply cord and connect a jumper wire between the two prongs of the plug. (2) Turn on the power switch of the instrument. (3) Measure the resistance with an ohmmeter between the jumpered AC plug and all exposed metallic cabinet parts on the instrument, such as screwheads, antenna, control shafts, handle brackets, etc. When an exposed metallic part has a return path to the chassis, the reading should be between 1 and 5.2 megohm. When there is no return path to the chassis, the reading must be infinite. If the reading is not within the limits specified, there is the possibility of a shock hazard, and the instrument must be repared and rechecked before it is returned to the customer. See Fig. 2.

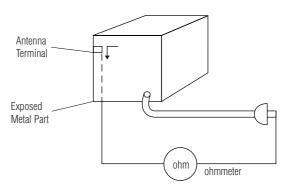


Fig. 2 Insulation Resistance Test

- Read and comply with all caution and safety related notes on or inside the cabinet, or on the chassis.
- 3) Design Alteration Warning-Do not alter or add to the mechanical or electrical design of this instrument. Design alterations and additions, including but not limited to, circuit modifications and the addition of items such as auxiliary audio output connections, might alter the safety characteristics of this instrument and create a hazard to the user. Any design alterations or additions will make you, the servicer, responsible for personal injury or property damage resulting therefrom.
- 4) Observe original lead dress. Take extra care to assure correct lead dress in the following areas:
 - (1) near sharp edges, (2) near thermally hot parts (be sure that leads and components do not touch thermally hot parts), (3) the AC supply, (4) high voltage, and (5) antenna wiring. Always inspect in all areas for pinched, out-of-place, or frayed wiring, Do not change spacing between a component and the printed-circuit board. Check the AC power cord for damage.
- Components, parts, and/or wiring that appear to have overheated or that are otherwise damaged should be replaced with components, parts and/ or wiring that meet original specifications.

Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

6) 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 shading, an (小) or a (小) on schematics and 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. Product safety is under review continuously and new instructions are issued whenever appropriate.

2 SERVICING PRECAUTIONS

CAUTION: Before servicing units covered by this service manual and its supplements, read and follow the Safety Precautions section of this manual.

Note: If unforseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions. Remember: Safety First.

2-1 General Servicing Precautions

- (1) a. Always unplug the instrument's AC power cord from the AC power source before (1) re-moving or reinstalling any component, circuit board, module or any other instrument assembly, (2) disconnecting any instrument electrical plug or other electrical connection, (3) connecting a test substitute in parallel with an electrolytic capacitor in the instrument.
 - b. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.
 - c. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
 - d. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

Note: Refer to the Safety Precautions section ground lead last.

- (2) The service precautions are indicated or printed on the cabinet, chassis or components. When servicing, follow the printed or indicated service precautions and service materials.
- (3) The components used in the unit have a specified flame resistance and dielectric strength.
 - When replacing components, use components which have the same ratings. Components identified by shading, by (\bigwedge) or by (\bigwedge) in the circuit diagram are important for safety or for the characteristics of the unit. Always replace them with the exact replacement components.
- (4) An insulation tube or tape is sometimes used and some components are raised above the printed wiring board for safety. The internal wiring is sometimes clamped to prevent contact with heating components. Install such elements as they were.
- (5) After servicing, always check that the removed screws, components, and wiring have been installed correctly and that the portion around the serviced part has not been damaged and so on. Further, check the insulation between the blades of the attachment plug and accessible conductive parts.

2-2 Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power ON. Connect the insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (see note) should be more than 1 Megohm.

Note: Accessible conductive parts include metal panels, input terminals, earphone jacks, etc.

3 ESD PRECAUTIONS

Electrostatically Sensitive Devices (ESD)

Some semiconductor (solid state) devices can be damaged easily by static electricity.

Such components commonly are called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

- (1) Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
- (2) After removing an electrical assembly equipped with ESD devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
- (3) Use only a grounded-tip soldering iron to solder or unsolder ESD devices.
- (4) Use only an anti-static solder removal devices. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESD devices.
- (5) Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESD devices.
- (6) Do not remove a replacement ESD device from its protective package until immediately before your are ready to install it. (Most replacement ESD devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive materials).
- (7) Immediately before removing the protective materials from the leads of a replacement ESD device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

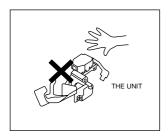
(8) Minimize bodily motions when handling unpackaged replacement ESD devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ESD device).

4 HANDLING THE OPTICAL PICK-UP

The laser diode in the optical pick up may suffer electrostatic breakdown because of potential static electricity from clothing and your body.

The following method is recommended.

- (1) Place a conductive sheet on the work bench (The black sheet used for wrapping repair parts.)
- (2) Place the set on the conductive sheet so that the chassis is grounded to the sheet.
- (3) Place your hands on the conductive sheet (This gives them the same ground as the sheet.)
- (4) Remove the optical pick up block
- (5) Perform work on top of the conductive sheet. Be careful not to let your clothes or any other static sources to touch the unit.
- Be sure to put on a wrist strap grounded to the sheet.
- ♦ Be sure to lay a conductive sheet made of copper etc. Which is grounded to the table.



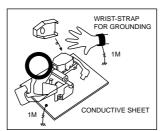


Fig.3

- (6) Short the short terminal on the PCB, which is inside the Pick-Up ASS'Y, before replacing the Pick-Up. (The short terminal is shorted when the Pick-Up Ass'y is being lifted or moved.)
- (7) After replacing the Pick-up, open the short terminal on the PCB.

5 Reset operation after IC104 was replaced

Be sure to perform the reset by the method described below, if the IC104 (FLASH MEMORY) used on the DVD Main board was replaced.

Resetting method

- 1. Enter the Adjustment mode, and press two times the "1" button on the remote commander.
 - (For an entering method of Adjustment mode, see 6-1. VCR Adjustment.)
 - The tray will automatically open and the version information will be displayed on the TV screen.
- 2. Turn the power off.

1. GENERAL

This section is extracted from instruction manual. (3-096-487-11)

About this manual

- Instructions in this manual describe the controls on the remote. You can also use the controls on the recorder if they have the same or similar names as those on the
- remote.

 The on-screen display illustrations used in this manual may not match the graphics displayed on your TV
- The explanations regarding discs in this manual refer to discs created on this recorder. The explanations do not apply to discs that are created on other recorders and played back on this recorder.

Icon	Meaning		
+RW	Functions available for DVD+RWs		
-RWvR	Functions available for DVD-RWs in VR (Video Recording) mode		
-RW _{Video}	Functions available for DVD-RWs in video mode		
+R	Functions available for DVD+Rs		
-Rvr	Functions available for DVD-Rs in VR (Video Recording) mode		
-Rvideo	Functions available for DVD-Rs in video mode		
DVD	Functions available for DVD VIDEOs		
RAM	Functions available for DVD-RAMs		
VCD	Functions available for VIDEO CDs or CD-Rs/CD-RWs in video CD format		
CD	Functions available for music CDs or CD-Rs/CD-RWs in music CD format		
DATA CD	Functions available for DATA CDs (CD-ROMs/CD-Rs/CD-RWs containing MP3* audio tracks or JPEG image files)		
(DATA DVD)	Functions available for DATA DVDs (DVD-ROMs/DVD-RWs/ DVD-RWs/DVD+Rs/DVD-Rs containing MP3* audio tracks or JPEG image files)		
VHS	Functions available for VHS VIDEOs		

^{*} MP3 (MPEG1 Audio Layer 3) is a standard format defined by ISO/MPEG which compresses audio dat

What is a Video Cassette Recorder/DVD Recorder?

This is a DVD recorder with built-in VHS video deck, and allows recording/playback of DVD discs and VHS tapes. DVD editing is also possible.

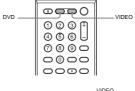
Recording and timer recording

Record TV programs on a DVD or VHS tape, either manually or using the timer. You need to connect a tuner such as a cable box to this



Easy selection between DVD and

Simply press the DVD or VIDEO button to select the media format you want to use.





One Touch Dubbing - DVD ←→ VHS

Dub in either direction between a DVD disc and VHS tape with the simple press of a button. Note that copy-protected signals will not be



Control your cable box or satellite receiver - Set top box control

Connect the supplied set top box controller to have the recorder change the channel of your cable box or satellite receiver (page 12).



4

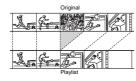
Quick access to recorded titles -Title List

Display the Title List to view all titles on a disc and select a title for playback or editing.



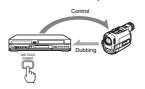
Creating your own program - Playlist

Record a program on a DVD-RW (VR mode) or DVD-R (VR mode), then erase, move or add scenes as you like without changing the original contents.



One Touch Dubbing - DV/D8 Dubbing

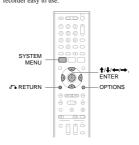
Connect your digital video camera to the DV IN jack and press the ONE-TOUCH DUBBING button to dub a DV/D8 format tape over to a disc



How to Use the On-Screen Menus

8

The following three displays are mainly used to operate this recorder. Once you become familiar with the basic operations, you will find the recorder easy to use.



System Menu

em Menu appears when you press SYSTEM MENU, and provides entries to all of the recorder's main functions, such as timer recording and setup.

Select an option by pressing

All and ENTER.



1 🗣 "Title List"

Title List (Original)

2 4 "Timer" sed to set a new timer recording for a disc or VHS tape, as well as change or cancel the timer recordings you set.

Displays the list of the disc contents, including the recording information and movie thumbnail image, which allows you to select a title to play or edit.

10:10 AM Length Edit 01:29:03 > 00:31:23 > 01:59:00 > 00:58:56 >

3 ≯ "Edit" Used to create or edit a Playlist (unfinalized DVD-RWs (VR mode)/DVD-Rs (VR mode)

4 * "Dubbing"
Used to dub from a disc to a VHS tape and vice versa, and also dub from a DV/D8 format tape to a disc.

5 "Disc Setting" Used to rename, protect, format, or finalize a disc, or erase all titles on the disc. Also, displays the disc information.

6 Setup"
Displays the "Setup" display for setting up the recorder to suit your preferences.

Operation restrictions

	Possible Simultaneous Operations			
Current Operation	VCR Playback	VCR Recording	DVD Playback	DVD Recording
Playing a VHS tape*!		No	No	Yes
Recording on a VHS tape	No	_	Yes	Yes*3
Playing a DVD*2	No	Yes	_	No
Recording on a DVD	Yes	Yes*3	No	_

- When pressing DVD, VCR playback stops.
 When pressing VIDEO, DVD playback stops.
 Only for timer recording. You can also record from LINE1 and LINE2 at the same time

Sub-menu

The sub-menu appears when you select an item from a list menu (e.g., a title from the Title List menu), and press ENTER. The sub-menu displays options applicable only to the selected item. The displayed options differ depending on the situation and disc type.

Select an option by pressing ↑/↓ and ENTER.

Title List (Origin	10:10 AM	
1/4	No. Title	Length Edit
s/dr	01 LINE 1	Play
- X	02 LINE 1	Title Erase
A	03 LINE 1	Chapter Erase
	04 LINE 1	Protect
LINE 1		Title Name
		A-B Erase
08:00 PM 6 LP		Divide Title

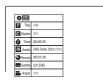
OPTIONS

The OPTIONS menu appears when you press OPTIONS. You can search for a title/chapter/ track, check the playing and remaining time, or change settings for audio/angle/subtitle. The displayed options differ depending on the media

type.

Press ↑/↓ to select an option, press ←/−
select the desired item, and press ENTER.

Example: When you press OPTIONS while a DVD VIDEO is playing.



Selectable options

Selectable options on the System Menu differ depending on the media type, disc condition, and operating status

Example: When a disc or a VHS tape is stopped.

Туре	Selectab	le option	
+RW	6 6	•	9 🛳
-RWvR	Q Q	A°1 • €	©
-RW _{Video}	G *1 Q	•	9 🛳
+R	Q *1 Q	•	9 ,∗1 ⊕
-Rvr	G Q	A°1 ◆	9 *1
-R _{Video}	Q *1 Q	•	9 ,*1 ⊕
DVD	Q	•	a
RAM	Q Q	•	a
VCD	Q	•	a
CD	Q	ı	a
DATA CD	Q	1	8
DATA DVD	Q	ı	&
VHS	Q	• •	¹² a

To return to the previous display Press 6 RETURN

Notes

- The OPTIONS menu may not appear during DVD
- recording.

 The System Menu does not appear when recording on a DVD, or dubbing from VHS tape to a DVD.

 You cannot use the DVD or VIDEO buttons with the System Menu turned on.

okups and Setting

Hooking Up the Recorder

Follow steps 1 to 7 to hook up and adjust the

Notes

- Plug cords securely to prevent unwanted noise.
 See the instructions supplied with the components to be
- connected.

 You cannot connect this recorder to a TV that does not have a video input jack.

 Be sure to disconnect the power cord of each component before connecting. Do not connect the power cord until you reach "Connecting the Power Cord" on page 20.

Step 1: Unpacking

Check that you have the following items:

• Audio/video cord
(phono plug × 3 ↔ phono plug × 3) (1)

• Remote commander (remote) (1)

- · Set top box controller (1)
- Size AA (R6) batteries (2)
- HDMI cord (1)

Step 2: Connecting the Cable Box/Satellite **Receiver (Tuner)**

This recorder does not include a TV tuner. To record TV programs on this recorder, you need to connect the recorder to a tuner that has audio/ video output jacks.

If you have been using your VCR connected to an antenna, connect this recorder to your VCR using an audio/video cord. In this way, you will be able to record TV programs.

You cannot record on this recorder if you have: a cable box or satellite receiver without audio/

- a cable box or satellite receiver without audio/ video outputs.
- cable with no cable box.
- antenna only (no cable TV).
In the cases above, contact your cable service or satellite service company to see if they can provide you with a compatible cable box or satellite receiver.

Using the cable box/satellite receiver control function

This function allows the recorder to control a cable box or satellite receiver via the supplied set top box controller. You can also use the recorder's remote control to change channels on the cable box/satellite receiver whenever the cable box/ satellite receiver and the recorder are turned on To use the cable box/satellite receiver control

- To use the cable box/satellite receiver control function, you need to:

 Check the brand code of your cable box/satellite receiver. See "Cable Box/Satellite Receiver Brand Code" (page 121).

 Connect the set top box controller (page 13).

 Set the brand code number and the recorder's input that is connected to the cable box/satellite receiver (page 23).

input that is connected to the cable box/satell receiver (page 23).

After setting up the cable box/satellite receiver control, check that the recorder can correctly control the cable box or satellite receiver (page 26).

11

12

Connecting a cable box/satellite receiver and set top box controller

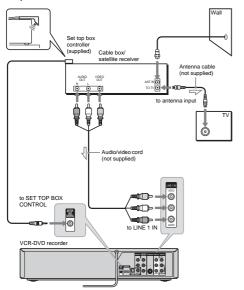
Connect the LINE IN jacks using an audio/video cord.

With this hookup, you can record any channel on the cable box or satellite receiver. Be sure that the cable box or satellite receiver is turned on. This connection is necessary to use the Synchro-Rec function

(pages 51 and 80).

To watch cable or satellite programs, you need to match the input source on the recorder (L1) to the input jack connected to the cable box or satellite receiver (LINE 1 IN).

Place the set top box controller near the remote sensor on the cable box/satellite receiver.



About AV path through

This recorder automatically sends the input signal from the LINE 1 IN jacks to the LINE OUT VIDEO/

AUDIO jacks without turning itself on.

When you connect a cable box or satellite receiver to the LINE 1 IN jacks and your TV to the LINE OUT
(VIDEO/AUDIO LR) jacks (qage 15), you can watch programs from a cable box or satellite receiver on
the TV even when the recorder is turned off.

- Synchro-Recording does not work with some tuners. For details, see the tuner's operating instructions.

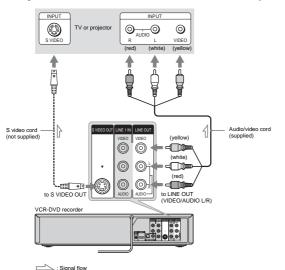
 AV path through function does not work for:
 Input signals from the LINE 2 IN jacks.
 Output signals to S VIDEO OUT, COMPONENT VIDEO OUT, or HDMI OUT jacks.

s and Settings

^{*1} Unfinalized disc only *2 With a disc inserted

Step 3: Connecting to Your TV

Connect the supplied audio/video cord to the LINE OUT (VIDEO/AUDIO L/R) jacks of the recorder. To enjoy higher quality images, connect an S video cord (not supplied) instead of the yellow (video) plug When using this connection, be sure to connect the audio cord to the LINE OUT (AUDIO L/R) jacks.



When playing "wide screen" images Some recorded images may not fit your TV screen. To change the picture size, see page 96.

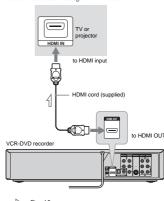
Notes

- Do not connect to the S VIDEO OUT and yellow LINE OUT (VIDEO) jacks at the same time.
 During DVD recording, you cannot watch VHS pictures by pressing VIDEO, as the S VIDEO OUT jack will output DVD video signals only.
 Do not connect your TV's addio output jacks to the LINE IN (AUDIO L/R) jacks at the same time. This will cause unwanted noise to come from your TV's speakers.

If your TV has an HDMI input jack

Connect the HDMI* OUT jack using a certified HDMI cord (supplied). You will enjoy high quality picture and sound. The HDMI indicator lights up on the front panel when the recorder outputs signals through the HDMI OUT jack.

Be sure to turn off the recorder before connecting an HDMI cord.



* This DVD recorder incorporates High-Definition Multimedia Interface (HDMI $^{\text{TM}}$) technology

HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC.

eet the HDMI OUT jack to DVI jacks that are not HDCP compliant (e.g., DVI jacks on PC displays).
ording, you cannot watch VHS pictures by pressing VIDEO, as the HDMI OUT jack will output During DVD recording, you can DVD video signals only.

→continued 15

Hookups and Settings

and Settings

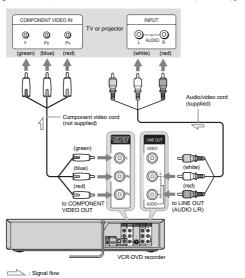
16

If your TV has component video input jacks

Connect the COMPONENT VIDEO OUT jacks using a component video cord (not supplied) or three video cords (not supplied) of the same kind and length. You will enjoy accurate color reproduction and high quality images.

If your TV accepts progressive 480p format signals, you must use this connection and then set "Progressive" of "Video" to "On" in the "Setup" display (page 97).

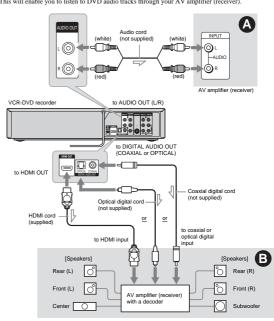
When using this connection, be sure to connect the audio cord to the LINE OUT (AUDIO L/R) jacks.



During DVD recording, you cannot watch VHS pictures by pressing VIDEO, as the COMPONENT VIDEO OUT jacks will output DVD video signals only.

Step 4: Connecting to Your AV Amplifier (Receiver)

Select one of the following patterns **3** or **3**, according to the input jack on your AV amplifier (receiver). This will enable you to listen to DVD audio tracks through your AV amplifier (receiver).



: Signal flow

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♠ Connecting to audio L/R jacks

This connection uses a stereo amplifier's (receiver's) two front speakers for sound

You can enjoy the surround function that create You can enjoy unle surround unlection lina creates virtual speakers from two stereo speakers. Select "Surround1," "Surround2," or "Surround3" in "Surround" of "Audio" setup (page 99).

Surround



and 2





Note

Make sure that your listening position is between and at an equal distance from your speakers, and that the speakers are located in similar surroundings.

Connecting to a digital audio input jack

Use this connection if your AV amplifier (receiver) has a Dolby*1 Digital or DTS*2 decoder and a digital input jack. You can enjoy the surround effect of Dolby Digital (5.1ch) or DTS



and Settings

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

 *2 "DTS" and "DTS Digital Out" are trademarks of DTS,

🌣 Hints

- For correct speaker location, see the operating instructions supplied with the connected components

 During VHS playback, the DIGITAL AUDIO OUT jacks can also output digital audio signals.

Notes

- Notes

 During DVD recording, the DIGITAL AUDIO OUT jacks or HDMI OUT jack output DVD audio signals only. You cannot have TVHS sound by pressing VIDEO. After you have completed the connection, make the appropriate settings under "Audio Connection Setup" in Easy Setup (page 23). Otherwise, no sound or a loud noise will come from your speakers. With a coaxial or optical digital connection, you cannot use the virtual surround effects of this recorder.

 When outputing from the DIGITAL AUDIO OUT jacks, you cannot switch the bilingual sounds on a DVD-RW (VR mode) or DVD-R (VR mode) by pressing AUDIO.

 When you connect the recorder to an AV amplifier (receiver) using an HDMI cord, you will need to do one of the following:

 Connect the AV amplifier (receiver) to the TV with

- of the following:

 Connect the AV amplifier (receiver) to the TV with an HDMI cord.

 Connect the AV amplifier (receiver) to the TV with an HDMI cord.

 Connect the recorder to the TV with a video cord other than HDMI cord (component video cord, S VIDEO cord, or audio/video cord).

Step 5: Connecting the **Power Cord**

Plug the recorder and TV power cords into an AC outlet. After you connect the power cord, **you** must wait for a short while before operating the recorder. You can operate the recorder only after the front panel display lights up and the recorder enters standby mode. If you connect additional equipment to this recorder (nage 27), be sure to connect the power recorder (page 27), be sure to connect the power cord only after all connections are complete.



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s and Settings

20

Step 6: Preparing the Remote

You can control the recorder using the supplied

remote. Insert two size AA (R6) batteries by matching the \oplus and \ominus ends on the batteries to the markings inside the battery compartment. Be sure to close the battery cover properly. When using the remote, point it at the remote sensor 📳 on the recorder.



Notes

- Notes

 If the supplied remote interferes your other Sony DVD recorder or player, change the command mode number for this recorder (page 22).

 Use the hatteries correctly to avoid possible leakage and corrosion. Do not touch the liquid with bare hands should leakage occur. Observe the following:

 —Do not use a new battery with an old battery, or batteries of different manufacturers.

 —Do not attempt to recharge the batteries.

 —If you do not intend to use the remote for an extended period of time, remove the batteries.

 —If battery leakage occurs, whipe out any liquid inside the battery compartment, and insert new batteries.

 Do not expose the remote sensor (marked gia on the front panel) to strong light, such as direct sunlight or lighting apparatus. The recorder may not respond to the remote.
- remote.

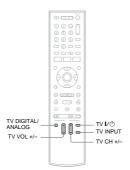
 With normal use, the batteries should last about three to six months.

 Do not leave the remote in an extremely hot or humid
- place.
 Do not drop any foreign object into the remote casing, particularly when replacing the batteries.

Controlling a Sony TV with the remote

You can use this remote to operate your Sony TV.

Depending on the TV, some or all of the buttons below may not work for the TV.



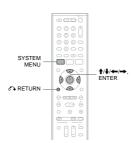
The remote performs the following:

Press	То
TV I∕Ů	Turn your TV on or off
TV VOL +/-	Adjust the volume of your TV
TV CH +/-	Select the channel on your TV
TV INPUT	Switch your TV's input source
TV DIGITAL/ ANALOG	Select the broadcast on your TV that can switch between digital and analog

If you have a Sony DVD player or more than one Sony DVD recorder

If the supplied remote interferes with your other Sony DVD recorder or player, set the command Sony DVD recorder or player, set the command mode number for this recorder and the supplied remote to one that differs from the other Sony DVD recorder or player, after you have completed "Step 7: Easy Setup."

The default command mode setting for this recorder and the supplied remote is DVD 3.



- 1 Check that Easy Setup (page 23) has been finished. If Easy Setup has not been finished, first perform Easy Setup.
- 2 Press SYSTEM MENU. The System Menu appe
- 3 Select "Setup," and press ENTER.

No Dinc Sets	ip.	10:10 AM
Q Title List	Clock Set	
Timer	Video	
Ø Edit	Audio	
	Features	
Dubbing Dubbing	Options	
O Disc Setting	Easy Setup	
Setup		

4 Select "Options," and press ENTER.

No Disc Opt	No Disc Options 10:10 AM					
Title List	Language					
Timer	Parental					
Ø Edt	Front Display	: Auto				
-1	Command Mode	: DVD 3				
Dubbing	Factory Setting					
Q Disc Setting						
Setup						

5 Select "Command Mode," and press

No Disc Opt	No Disc Options					
Title List	Language Parental Front Display	: Auto				
A PEdit	Command Mode	: DVD 1				
Dubbing	Factory Setting	DVD 2				
Ch Disc Setting	, , , , , ,	√DVD 3				

- 6 Select a command mode ("DVD 1," "DVD 2," or "DVD 3"), and press ENTER.
- 7 Set the command mode for the remote so it matches the command mode for the recorder you set above.

Follow the steps below to set the command mode on the remote.

- 1 Hold down ENTER.
- ② While holding down ENTER, enter the command mode code number using the number buttons

Command Mode	Code number			
DVD1	number button 1			
DVD2	number button 2			
DVD3	number button 3			

(3) Hold down both the number buttons and ENTER at the same time for more than three seconds.

To return to the previous display Press RETURN

To check the command mode for the recorder

Press (stop) on the recorder when the recorder is turned off. The command mode for the recorder appears in the front panel display.

If the command mode for the recorder has not been changed, set the command mode for the remote to the default setting of DVD3. If the command mode for the remote is changed to DVD1 or DVD2, you will be unable to operate

Step 7: Easy Setup

Follow the steps below to make the minimum number of basic adjustments for using the recorder. If you do not complete Easy Setup, it will appear each time you turn on your recorder. Settings are made in the following order.

OSD Language Setup

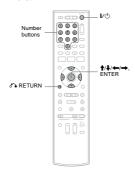
Cable Box/Sat. Control Setup

Clock Setup

1 TV Type Setup

Audio Connection Setup

Finished!



- 1 Turn on the TV.
- 2 Press I/U.

The recorder turns on.

3 Switch the input selector on your TV so that the signal from the recorder appears on your TV screen.

your 1v screen.
"Initial setting necessary to operate the DVD recorder will be made. You can change them later using setup." appears.
If this message does not appear, select "Easy Setup." in the "Setup" display to run Easy Setup." Setup Canal 100.

Setup (page 104).

4 Press ENTER.

and

Settings

The setup display for selecting the language used in the on-screen display appears.



5 Select a language, and press ENTER. The setup display for cable box/satellite receiver control appears.



6 Select whether or not you use the cable box/satellite receiver control, and press

If you want to use the cable box/satellite receiver control (page 12), select "Yes." If not, select "No," then go to step 10.

7 Press the number buttons to enter the brand code of your cable box/satellite receiver.

See "Cable Box/Satellite Receiver Brand Code" (page 121).



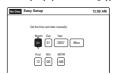
• To re-enter the code number, select "Cancel" and return to step 6.

8 Select "OK," and press ENTER.



Select the recorder's audio/video input ("Line1" or "Line2") that is connected to the cable box/satellite receiver, and press

The setup display for clock setting appears.



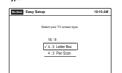
10Press ↑/↓ to set the month and press →.

DIFFESS 7/4 to Set Ine month and press → .
Set the day, year, hour, minutes, and AM/PM
in the same way, then press ENTER. The day
of the week is set automatically.
The setup display for selecting the picture size
of the connected TV appears.

→continued 23

Hookups and

11 Select the setting that matches your TV



"16:9": For wide-screen TVs or standard TVs

16.9. Froi wide-screen I vs or saincand I vs with a wide screen mode.

"4.3 Letter Box": For standard TVs. Displays "wide screen" pictures with bands on the upper and lower sections of the screen.

"4.5 Pan Scan": For standard TVs. Automatically displays "wide screen" pictures on the entire screen and cuts off the sections that do not fit. sections that do not fit.
For details, see "Video Settings (Video)" on

page 96. 12 Press ENTER.

The setup display for selecting the type of Dolby Digital signal appears.



13 Select the type of Dolby Digital signal you want to send to your amplifier (receiver).

If your AV amplifier (receiver) has a Dolby Digital decoder, select "Dolby Digital." Otherwise, select "D-PCM."

14 Press ENTER.

The setup display for selecting the type of DTS signal appears.



15 Select whether or not you want to send a DTS signal to your amplifier (receiver),

If your AV amplifier (receiver) has a DTS decoder, select "On." Otherwise, select "Off."

16 Press ENTER when "Finish" appears.

Easy Setup is finished. All connections are setup operations are complete.

If you use the cable box/satellite receiver control, check that the control works correctly (page 26).



To return to the previous display Press & RETURN

🌣 Hint

If you want to run Easy Setup again, select "Easy Setup" in the "Setup" display (page 104).

To record TV programs using the timer, you must set the

Checking the cable box/satellite receiver control setting

- 1 Turn on the recorder and the cable box/ satellite receiver.
- 2 Point the recorder's remote at the recorder (not at the cable box/satellite receiver).
- 3 Press CH +/- and check that the channel changes on the cable box/satellite receiver
- 4 Press the number buttons and check that the channel changes on the cable box/ satellite receiver window.

If you cannot get the recorder to control your cable box/satellite receiver

Check the settings at "Set Top Box Control" in "Features" setup (page 101).
Check the connection and place the set top box controller near the cable box/satellite receiver

(page 12). If your cable box or satellite receiver still does not operate with this recorder, contact your cable or satellite company to see if they can provide you with a compatible cable box or satellite receiver.

To fix the set top box controller to your cable box/satellite receiver

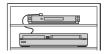
Once you have confirmed that the set top box controller controls your cable box or satellite receiver, affix it in place.

Attach the supplied double-sided tape to the set top box controller.

Remove the backings on the double-sided



2 Affix it so that the set top box controller is near the remote control sensor on your cable box/satellite receiver.



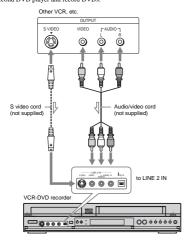
Connecting Another VCR or Similar Device

After disconnecting the recorder's power cord from an AC outlet, connect the other VCR or similar recording device to the LINE IN jacks of this recorder. See also the instruction manual supplied with the connected equipment.

If you connect equipment that has a timer function, you can use the Synchro Rec function (pages 51 and 80). In this case, connect the equipment to the LINE 1 IN jacks (page 13).

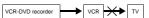
Connecting to the LINE 2 IN jacks on the front panel

Connect other VCR or similar device to the LINE 2 IN jacks of this recorder. If the equipment has an S video jack, you can use an S video cord (not supplied) instead of the yellow (video) plug of the audio/video cord. Do not connect to the S VIDEO and yellow VIDEO jacks at the same time. You can connect a second DVD player and record DVDs.



- ♥ Hints
 When the connected equipment outputs only monaural sound, connect an audio cord to the white LINE IN AUDIO L (mono) jack.
 To record from connected equipment, select an input source (LINE1 or LINE2) to match the jack you connected to (pages 54 and 83).

- Do not connect more than one type of video cord between the recorder and your TV at the same time.
 Pictures containing copy protection signals that prohibit any copying cannot be recorded. You cannot dub from DVD VIDEOs to this recorder.
 Do not connect the output jack of this recorder to another equipment's input jack with the other equipment's output jack connected to the input jack of this recorder. Roise (feethods, may result.
 If you pass the recorder signals via the VCR, you may not receive a clear image on your TV screen.





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Quick Guide to Disc Type

Recordable and Playable Discs

Disc Type		Disc Logo	Icon used in this manual	Formatting (new discs)	Compatibility with other DVD players (finalizing)
DVD+RW		RW DVD+ReWritable	+RW	Automatically formatted	Playable on DVD+RW compatible players (automatically finalized)
DVD-	VR mode	DVD	-RWvR	Format in VR mode*2 (page 47)	Playable only on VR mode compatible players (finalization unnecessary) (page 88)
RW	Video mode	RW 2	-RWvideo	Format in Video mode*2 (page 47)	Playable on most DVD players (finalization necessary) (page 88)
DVD+R DVD+R DL		DVD-R	+R	Automatically formatted	Playable on DVD+R compatible players (finalization necessary) (page 88)
DVD-	VR mode	DVD	-Rvr	Format in VR mode using the "Disc Setting" display (page 67)	Playable only on DVD-R VR mode compatible players (finalization necessary) (page 88)
R	Video mode	R R4.7	-Rvideo	Automatically formatted in Video mode	Playable on most DVD players (finalization necessary) (page 88)

Usable disc versions (as of December 2006)

- Usable disc versions (as of December 200b)

 8x-speed or slower DVD+RWs

 6x-speed or slower DVD-RWs (Ver.1.1, Ver.1.2 with CPRM*1)

 16x-speed or slower DVD+Rs

 16x-speed or slower DVD-Rs (Ver.2.0, Ver.2.1 with CPRM)

 8x-speed or slower DVD+R DL (Double Layer) discs*6

"DVD+RW," "DVD-RW," "DVD+R," "DVD+R DL," and "DVD-R" logos are trademarks.

Hookups and Settings

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Recording	Features	Editing Features					
Rewrite (page 67)	Auto Chapter (page 49)	Change Title Name (page 60)	Erase Title/ Chapter (page 57)	A-B Erase (page 58)	Divide Title (page 59)	Playlist (page 61)	
Yes	Yes	Yes	Yes/No*3	Yes	Yes	No	
Yes	Yes	Yes	Yes/Yes*4	Yes	Yes	Yes	
Yes	Yes	Yes	Yes/No*3	No	No	No	
No	Yes	Yes	Yes/No*5	No	No	No	
No	Yes	Yes	Yes/Yes*5	Yes	Yes	Yes	
No	Yes	Yes	Yes/No*5	No	No	No	

^{*1} CPRM (Content Protection for Recordable Media) is a coding technology that protects copyrights for

12 cm/8 cm discs

Disc Type		12	cm	8 cm		
		Playback	Recording	Playback	Recording	
DVD+RW		Yes	Yes	Yes	No	
DVD-RW	VR mode	Yes	Yes	Yes	No	
DVD-RVV	Video mode	Yes	Yes	Yes	No	
DVD-R	VR mode	Yes	Yes	_	_	
DVD-K	Video mode	Yes	Yes	Yes	No	
DVD+R		Yes	Yes	_	_	

Discs that cannot be recorded on

- 8 cm discs DVD-RAMs

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Quick Guide to Disc Types

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Playable Discs

Disc Type	Disc Logo	Icon Used in This Manual	Characteristics
DVD VIDEO	VIDEO	DVD	Discs such as movies that can be purchased or rented
DVD-RAM	_	RAM	DVD-RAMs recorded by another recording device. 12 cm discs without cartridges, or removable from their cartridges can be played.
VIDEO CD	OISC DISTALVOED	VCD	VIDEO CDs or CD-Rs/CD-RWs in VIDEO CD format (with PBC function)
CD	COMPACT CISC DIGITAL AUDIO	CD	Music CDs or CD-Rs/CD-RWs in music CD format that can be purchased
DATA CD	Recordable ReWritable	(DATA CD)	CD-ROMs/CD-Rs/CD-RWs created on a PC or similar device in music format, or MP3 or JPEG format that conforms to ISO9660* Level 1/ Level 2
DATA DVD	_	DATA DVD	DVD-ROMs/DVD+RWs/DVD-RWs/DVD+Rs/ DVD-Rs in MP3 or JPEG format conforming to Universal Disk Format (UDF)
8 cm DVD+RW/ DVD-RW/DVD-R	_	_	8 cm DVD+RWs, DVD-RWs, and DVD-Rs recorded with a DVD video camera (Still images recorded with a DVD video camera cannot be played.)

"DVD VIDEO" and "CD" logos are trademarks

* A logical format of files and folders on DATA-CDs, defined by ISO (International Organization for Standardization).

Discs that cannot be played

- CD-ROMs/CD-Rs/CD-RWs that are not recorded in music CD or Video CD format, or do not contain MP3 audio tracks or JPEG image
- tiles.

 Data part of CD-Extras

 DVD-ROMs that are not recorded in DVD Video format, or do not contain MP3 audio tracks or JPEG image files.

 DVD Audio discs

- DVD Audio discs
 HD layer on Super Audio CDs
 DVD VIDEOs with a different region code
- A disc recorded in a color system other than NTSC, such as PAL or SECAM

Note on playback operations of DVD VIDEOs/ VIDEO CDs

Some playback operations of DVD VIDEOs/ VIDEO CDs may be intentionally set by software VIDEO CDs may be intentionary set by software producers. Since this recorder plays DVD VIDEOs/VIDEO CDs according to the disc contents the software producers designed, some playback features may not be available. Also, see the instructions supplied with the DVD VIDEOs/VIDEO CDs.

Note on DualDiscs

NOTE ON DUBLIDES:
A DualDisc is a two sided disc product which mates DVD recorded material on one side with digital audio material on the other side. However, since the audio material side does not conform to the Compact Disc (CD) standard, playback on this product is not guaranteed.

Region code (DVD VIDEO only)

Your recorder has a region code printed on the rear of the unit and will only play DVD VIDEOs (playback only) labeled with identical region codes. This system is used to protect copyrights. DVD VIDEOs labeled will also play on this recorder.

recorder.

If you try to play any other DVD VIDEO, a If you try to piay any other DVD VIDEO, a message will appear on the TV screen to indicate that the disc is not playable. Depending on the DVD VIDEO, no region code indication may be labeled even though playing the DVD VIDEO is prohibited by area restrictions.



Music discs encoded with copyright protection technologies

This product is designed to playback discs that Ints product is designed to playback discs that conform to the Compact Disc (CD) standard. Recently, various music discs encoded with copyright protection technologies are being marketed by some record companies. Please be aware that among those discs, there are some that do not conform to the CD standard and may not be clustly be designed. playable by this product.

Note on DVD+RWs/DVD+Rs, DVD-RWs/DVD-Rs, or CD-RWs/CD-Rs recorded on other equipment

Some DVD+RWs/DVD+Rs, DVD-RWs/DVD-Some DVD+KWS/DVD-KS, DVD-KWS/DVD-KR, or CD-RWS/CD-Rs cannot be played on this recorder due to the recording quality or physical condition of the disc, or the characteristics of the recording device and authoring software. The disc will not play if it has not been correctly finalized. For more information, see the operating instructions for the recording device.

Notes

- Notes

 You cannot mix VR mode and Video mode on the same DVD-RW or DVD-R. To change the DVD-RW's format, reformat the disc (page 67). Note that a disc's contents will be erased after reformatting.

 You cannot shorten the time required for recording even with high-speed discs. Also, you cannot record on the disc if the disc is not 1x speed compatible.

 It is recommended that you use discs with "For Video" printed on their packaging.

 You cannot add new recordings to DVD-RWs (Video mode), DVD+Rs, or DVD-Rs (Video mode) recorded on other equipment.

 You may not be able to further record on a DVD+RW recorded on other equipment. Note that recording on such discs may cause the recorder to rewrite the DVD menu.

- menu.

 If the disc contains PC data unrecognizable by this
- recorder, the data may be erased

→continued 33

a coding technology that protects copyrigms for images.

*2 Unused DVD-RWs are automatically formatted according to the setting of "Format DVD-RW" in "Features" setup (tage 101).

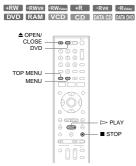
*3 Erasing titles only frees up disc space if you erase the last title.

*4 Erasing titles or chapters frees up disc space.

*5 When using DVD-R DL (Double Layer) discs, see the instructions supplied with the discs.

DVD Playback

Playing Discs



- 1 Press DVD to operate the DVD recorder.



Wait until "LOAD" disappears from the front panel display

4 Press ⊳ PLAY.

To stop playback

Press ■ STOP

- You can play DATA CDs or DATA DVDs with MP3 audio tracks or JPEG image files (pages 41 or 42).
 If you insert a DVD VIDEO, VIDEO CD, or CD,
- playback starts automatically depending on the disc When playing a DVD+RW, DVD-RW, DVD+R,
- DVD-R, and DVD-RAM, you can select the title from the Title List menu (page 39).

 When using a DVD-RAM with a cartridge, remove the disc from the cartridge.

Notes

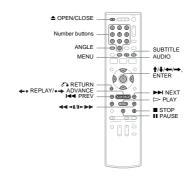
- To play a disc recorded with other equipment on this recorder, finalize the disc on the recording equipment
- first.
 For simultaneous VHS and DVD operation, see page 9.

Using the DVD's Menu

+RW -RWvideo +R -Rvideo DVD

When you play a DVD VIDEO, or a finalized DVD+RW, DVD-RW (Video mode), DVD+R, or DVD-R (Video mode), you can display the disc's menu by pressing TOP MENU or MENU.

Playback Options



Button	Operation	Disc
▲ OPEN/CLOSE	Stops playing and opens the disc tray.	All discs
AUDIO	Selects one of the audio tracks recorded on the disc when pressed repeatedly. RWWs SWR: Selects the main or sub sound. DVD: Selects the audio source. VCD: Selects stereo or monaural audio tracks.	-RWVR -RVR DVD
SUBTITLE	Selects a subtitle language when pressed repeatedly.	DVD
ANGLE	Selects an angle when pressed repeatedly. If various angles (multi-angles) for a scene are recorded on the disc, " papears in the front panel display.	DVD
◆• REPLAY/ •→ ADVANCE	Replays or briefly fast forwards a scene when pressed during playback. Goes to the previous or next frame when pressed during pause mode.	+RW -RWVR -RWvideo +R -RVR -Rvideo DVD RAM
I◀ PREV/ NEXT ▶	Goes to the beginning of the current or next title/ chapter/scene/track and starts playback when pressed during playback. Goes to the beginning of the previous title/chapter/ scene/track when I TREV is pressed within three seconds after starting a title/chapter/scene/track.	All discs

35

36

Button	Operation	Disc
(fast reverse/fast forward)	Fast reverses or fast forwards the disc when pressed during playback. Search speed changes with each press: fast reverse fast forward FR1 ← → FF1 * FR2 * 2 ← ← → → FF3 * 3 FR3 * 3 ← ← → → → → → → → → → → → → → → → → →	All discs 1 FFI with sound (Scan Audio) is available for DVDs with Dolby Digital soundtracks. 2 FR2 and FF2 are not available for MP3. 3 FR3 and FF3 are only available for DVDs and VIDEO CDs.
◄◄4/ ▶▶) (slow)	Plays in slow motion when pressed in pause mode. Playback speed changes with each press: reverse slow motion reverse slow motion 13 ← → 31 ← 12 ← ← → → 21 ► 11 ← ← ← → → 11 ►	+RW -RWVR -RWvideo +R -RVR -Rvideo DVD RAM VCD * Playback direction only
II PAUSE	Pauses playback. If you pause playback for more than five minutes, playback starts automatically.	All discs

To resume normal playback after playing at various speeds, press > PLAY

- You can change playback options, such as subtitle, audio track, angle, etc., using the OPTIONS menu (page 11).

 During playback or new.
- (page 11).

 During playback or pause mode, the recorder's ◄◄/

 ▶ buttons and the remote's ◄◄ PREV/▶NEXT ▶► buttons and the remote's ¼◀ PREV №►NEXT buttons work the same way (page 36). Hold the buttons down during playback to fast forward or fast reverse. In pause mode, you can play in slow motion. Three speeds are available, depending on the duration of the press. See "DVD Audio'Subtite Language" on page 120 for the meaning of the language abbreviation.

- If you pause playback of a CD, or DATA CD/DATA
 DVD containing MP3 audio tracks, playback will not
 start until you press ▷ PLAY or PAUSE.
 Sound will be interrupted during Scan Audio
 (page 38).

Notes on playing DTS soundtracks on a CD

When playing DTS-encoded CDs, excessive noise will be heard from the analog stereo jacks. To avoid possible damage to the audio system, the consumer should take proper precautions when the analog stereo jacks of the recorder are connected to an amplification system. To enjoy DTS Digital Surround™ playback, an external 5.1-channel decoder system must be connected to the digital jack of the recorder.

Notes on playing DVDs with a DTS soundtrack

"Degtal Out" - "DIS" to "On" of "Audio" in the "Setup" display (page 98).

If you connect the recorder to audio equipment without a DTS decoder, do not set "DTS" to "On" in "Audio" setup. A loud noise (or no sound) may come out from the speakers, which might disturb your ears or cause damage to the speakers.

Playing quickly with sound (Scan Audio) (DVDs with Dolby Digital soundtracks only)

You can play quickly with dialog or sound during FF1 fast-forward of a DVD with Dolby Digital soundtracks. Simply press ▶▶ during playback.

To turn off the Scan Audio function, set "Scan Audio" of "Audio" to "Off" in the "Setup" display (page 99).

Sound will be interrupted during Scan Audio.

Playing VIDEO CDs with PBC **functions**

VCD

PBC (Playback Control) allows you to play VIDEO CDs interactively using a menu on your

TV screen.
When you start playing a VIDEO CD with PBC functions, a menu appears.
Select an item using the number buttons and press ENTER. Then follow the instructions in the menu (press ▷ PLAY when "Press SELECT" appears).

Operations differ depending on the disc. See the instructions supplied with the disc.

To cancel PBC Playback
Press MENU to display "Menu: Off." To use the
PBC functions, press MENU again to display
"Menu:On."

Resuming playback from the point where you stopped the disc (Resume Play)

Press ► PLAY again after stopping a disc to resume playback from the same point.

To start from the beginning, press ■ STOP twice, and press ► PLAY.

The point where you stopped playing is cleared

- you open the disc tray.
- you play another title
- you switch the Title List menu to original or Playlist (DVD-RW (VR mode)/DVD-R (VR le)/DVD-RAM only).

- you edit the title after stopping playback. - you make a recording.

Playing restricted DVDs (Parental Control)

DVD

If you play a restricted DVD, a message appears asking whether you want to override the

- Select "OK" and press ENTER.
 The display for entering your password appears.
- Enter your four digit password using the number buttons.
 The recorder starts playback.

To register or change the password, see "Parental (DVD VIDEOs only)" on page 103.

Locking the recorder (Child Lock)

You can lock all of the buttons on the recorder so that the settings are not canceled by mistake.



With the recorder turned on and stopped, hold with the recorder tunled on and stopped, noted down ■ (stop) on the recorder for more than ten seconds. The recorder turns off and "CHIL.D LOCK" appears in the front panel display. The ⊘ indicator remains lit if there is a timer setting. The recorder will not work except for timer recordings.

To unlock the recorder, hold down ■ on the recorder until "CHILD LOCK" disappears from the front panel display. The recorder is unlocked

To stop timer recording while the recorder is locked, press ■ twice. The recording stops and the recorder is unlocked.

The recorder will be unlocked when you stop timer recording by pressing

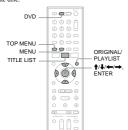
you insert a tape

continued 37

Playing a Title From the **Title List**

+RW -RWVR -RWvideo +R -RVR -Rvideo RAM

The Title List menu displays the program titles on



- 1 Press DVD to operate the DVD recorder.
- 2 Place a disc on the disc tray.
- 3 Press TITLE LIST.

Example: DVD-RW (VR mode)



- 1 Disc type:
 - Displays a disc type.

 Also displays the title type (original or Playlist) for DVD-RWs (VR mode),

 DVD-Rs (VR mode), and DVD-RAMs.
- 2 Movie thumbnail image
- 3 Title information:
- Displays the title number, title name, recording date, and recording mode.

 "
 " " indicates a protected title, while "
 " " indicates unprotected.
- 4 Clock

4 Select the title, and press ENTER.

The sub-menu appears

5 Select "Play," and press ENTER.

About the Title List for DVD-RWs (VR mode) and DVD-Rs (VR mode)

You can switch the Title List to show an original

or Playlist.
While the Title List menu is turned on, press
ORIGINAL/PLAYLIST repeatedly to select
either "Title List (Original)" or "Playlist."
For details, see "Edit options for DVD-Rw (VR
mode)/DVD-Rs (VR mode)" on page 56.

To turn off the Title List

♥ HintYou can also switch the Title List of DVD-RAMs to show an original or Playlist.

Notes

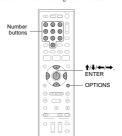
- The Title List does not appear for DVD-RWs (Video mode), DVD-Rs, or DVD-Rs (Video mode) that have been finalized. To view a title, press TOP MENU or MENU (page 35).

 The Title List may not appear for discs created on other DVD recorders.
- - ters that cannot be displayed are replaced with "*."

Searching for a Title/ Chapter/Track, etc.

+RW -RWVR -RWvideo +R -RVR -RVideo DVD RAM VCD

You can search a DVD by title or chapter, and VIDEO CD by track or scene. As titles and tracks are assigned individual numbers on the disc, select the title or track by entering its number. You can also search for a scene using the time code.



1 Press OPTIONS during playback

The OPTIONS menu appe

2 Select a search method.

"Title" (for DVDs)

"Chapter" (for DVDs)

"Track" (for VIDEO CDs with PBC function

off)
"Time" (for DVDs/VIDEO CDs with PBC function off): Searches for a starting point using the time code.

3 Press ★/♣/←/→ to select the number of the title, chapter, track, etc., you want, or press the number buttons to enter the time

For example: "Time'

To find a scene at 2 hours, 5 minutes, and 20 seconds, enter "20520."

seconds, enter 2030.

If you make a mistake, wait a moment until the display returns to the elapsed playing time display, then select another number.

4 Press ENTER. The recorder starts playback from the selected To turn off the display, press OPTIONS.

Notes

- Depending on the disc, you may not be able to use the OPTIONS menu to search for a title/chapter/track, or enter the time code for a playback point.
 When playing a Playlist title, you may not be able to search for a scene using the time code.

39

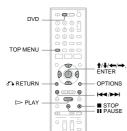
40

DVD Playbac

Playing MP3 Audio Tracks and JPEG Image Files

DATA CD DATA DVD

You can play DATA CDs (CD-ROMs/CD-Rs/ CD-RWs)/DATA DVDs (DVD-ROMs/ DVD+RWs/DVD-RWs/DVD+Rs/DVD-Rs) that in MP3 audio tracks or JPEG image files



Playing MP3 audio tracks

You can play MP3 audio tracks on DATA CDs or DATA DVDs.

- 1 Press DVD to operate the DVD recorder.
- 2 Place a DATA CD/DATA DVD on the disc

When you insert a DATA CD/DATA DVD containing MP3 audio tracks and JPEG image files, the display for selecting a media type appears. When you select "Mix," you can enjoy a slide show with sound (page 43).



If you insert a DATA CD/DATA DVD containing only MP3 audio tracks, the "Music" display appears. Go to step 4.

3 Select "Music," and press ENTER. The "Music" display appears.

4 Select an album, and press ENTER.

O co Music		10:10	AM
	(■) Surround	:0#	
4)		Stop 00:0	0:00
MP3_001	Prev Directory		^
D 0/9	D 01-Track1.mp3		
	D 02-Track2.mp3		
	D 03-Track3.mp3		
	D 04-Track4.mp3		
	D 05-Track5.mp3		~

5 Select a track, and press ENTER.

Playback starts from the selected track. When a track or album is being played, the title is shown in a box.

To stop playback Press STOP.

To pause playback Press II PAUSE

To restart playback, press ► PLAY or PAUSE.

To return to the previous display Press o RETURN

To switch between MP3 audio tracks and JPEG image files

Press ■ STOP, and press TOP MENU.

When playback of all the MP3 audio tracks within the album finishes, the recorder stops.

Playing JPEG image files

You can play JPEG image files on DATA CDs or DATA DVDs

1 Press DVD to operate the DVD recorder.

2 Place a DATA CD/DATA DVD on the disc

When you insert a DATA CD/DATA DVD ontaining MP3 audio tracks and PPEG image files, the display for selecting a media type appears. When you select "Mix," you can enjoy a slide show with sound (page 43).



If you insert a DATA CD/DATA DVD containing only JPEG image files, the "Photo" display appears. Go to step 4.

3 Select "Photo," and press ENTER. The "Photo" display appears

4 Select a folder, and press ENTER.

Directory information



5 Select an image file, and press ENTER. The selected image is displayed over the

entire screen.

The following menu icons appear in the upper part of the screen.

Returns to the "Photo" display.

Starts the slide show (page 42).

To display the previous or next page, press I◄◄/▶►I.

image files

Notes

"Ç" HintYou can also start the slide show by pressing ► PLAY in step 5 above.

Press ←/→ to select "♠," and press

LISTLE.
The "Slideshow Speed" menu appears.
""" Slow
""" O"": Normal
""" Fast

2 Press ←/→ to select the desired play speed, and press ENTER.
The slide show starts from the selected image.
To stop playing, press ■ STOP.

Press — to select " , and press ENTER. Each time you press ENTER, the image turns clockwise by 90°.

To zoom in an image

Press ←/→ to select "④," and press ENTER.

Press -7 = 0 select -3, and press Extended Each time you press ENTER, the magnification changes as follows: $2x \rightarrow 4x \rightarrow 2x \rightarrow \text{normal}$

To switch between MP3 audio tracks and JPEG

To return to the previous display

Press ■ STOP, and press TOP MENU.

Press RETURN.

To rotate the selected image

To play the slide show

ENTER.

Notes

You cannot volue ↑ ♦ → to move the image within the screen while zooming.
Slide show can play in only one direction.
You cannot rotate or zoom during slide show.
If you select " ■ ** in the rotated image display, the images in the "Photo" display will not be rotated

continued 41

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Enjoying a slide show with sound

When a disc contains both MP3 audio tracks and JPEG image files, you can enjoy a slide show with

- 1 Press DVD to operate the DVD recorder.
- 2 Insert a DATA CD/DATA DVD containing both the MP3 audio tracks and JPEG image

The display for selecting a media type appears



- 3 Select "Mix," and press ENTER. The "Music" display appears
- 4 Select an album, and press ENTER.
- 5 Select a track, and press ENTER.
 - Playback starts from the selected track, and the display asks for confirmation.
- 6 Select "Yes," and press ENTER. The "Photo" display appears.
- $\boldsymbol{7}$ Select the folder you want to view, and press ENTER.
- 8 Press > PLAY to start the slide show. The "Slideshow Speed" menu appears
- Press ←/→ to select the slide show speed, and press ENTER.

To stop the slide show

- When playing JPEG images, you can also use the on-screen menu. For details, see "Playing JPEG image files" (page 42).
 The slide show is played repeatedly until MP3
- playback stops.

*1 Also appears in stop mode with Resume Play activated (page 38).

*2 Title type (original or Playlist) for DVD-RWs (VR mode)/DVD-Rs (VR mode)/DVD-RAMs.

Viewing information on the front

You can view the information on the front panel

The displays differ depending on the disc type or

panel display

playing status.

Clock

Input source

Cur

Clock

Press TIME/TEXT repeatedly.

Example: When playing a DVD Playing time of the current title

Current title number and current chapte

4

Example: When a DVD is stopped

rent title and chapter number

Remaining disc space

Current track number

Example: When playing a CD Playing time of the current track

ID IDPM

About MP3 audio tracks and JPEG image files

MP3 is audio compression technology that satisfies the ISO/IEC MPEG regulations. JPEG is image compression technology. You can play back DATA CDs (CD-ROMs/CD-Rs/CD-RWs) or DATA DVDs (DVD-ROMs/ DVD+RWs/DVD-RWs/DVD+Rs/DVD-Rs) rded in MP3 (MPEG1 Audio Layer 3) and

recorded in Mr. 3 (Mr. 3) (Mr.

See the instructions supplied with the disc drives and the recording software (not supplied) for details on the recording format.

Note

The recorder may not be able to play some DATA CDs or DATA DVDs created in the Packet Write format.

MP3 audio tracks or JPEG image files that the recorder can play

The recorder can play the following tracks and

- illes:

 MP3 (MPEGI Audio Layer 3) audio tracks.

 MP3 audio tracks with the extension ".MP3."

 PPEG image files with the extension "JPEG" or

🌣 Hints

- If you add numbers (01, 02, 03, etc.) to the front of the
- File names, the files will be played in that order.
 Since a disc with many trees takes longer to start playback, it is recommended that you create albums with no more than two trees.

- Some DATA CDs or DATA DVDs cannot be played on this recorder depending on file format. Only one session of a multi-session DATA DVD can
- be played back.
- Only alphabet and numbers can be used for album or

- Only alphabet and numbers can be used for album or track names. Anything else is displayed as an asterisk.
 The recorder will play any data with the extension "MP3," even if they are not in MP3 format. Playing such data may generate a loud noise which could damage your speaker system.
 The recorder does not conform to audio tracks in MP3PRO format.
 The recorder does not conform to audio tracks within a single album. The recorder may not recognize some dises depending on the recording device used for recording or the dise condition.
 The recorder an play MP3 audio tracks recorded in the following sampling frequencies: 32 kHz, 44.1 kHz, 48 kHz.
- 48 kHz.

- 48 HIz.

 1 D3 tags cannot be displayed.

 1 J3 tags cannot be displayed.

 1 J4 ou add the extension "JPG" or "JPEG" to data not in JPEG format, a message appears indicating that the format is not supported.

 Depending on the disc or the size of image files, playback may take some time to start.

 The recorder can recognize up to 999 JPEG image files within a single folder. The recorder may not recognize some discs depending on the recording device used for recording or the disc condition.

 Progressive and lossless compression JPEG image files are not supported.
- not supported.
- are not supported.

 The image size that the recorder can display is limited to width 32 7680 pixels by height 32 8192 pixels.

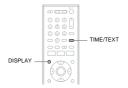
 JPEG image files that conform to the DCF* image file
- format are not supported.

 "Design rule for Camera File system": Image standa for digital cameras regulated by JEITA (Japan Electronics and Information Technology Industries Association).

Displaying the Playing Time and Play Information

+RW -RWVR -RWvideo +R -RVR -Rvideo DVD RAM VCD CD DATA CD DATA DVD

You can check disc information, such as playing time, recording mode, and remaining disc



Press DISPLAY.

The information display appears.

Each time you press the button, the display changes as follows:

Disc and tape information/date and time

Disc information only

No display



◆ DVD

- 1 Playing status
- 2 Playing time
- 3 Recording mode
- 4 Remaining disc space (in stop mode)
 Remaining time of the current title (during playback*1)
- 5 Input source*2
- 6 Date and time

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Before Recording

Before you start recording...

DVD Recording

- This recorder can record on various disc types Select the disc type according to your needs
- (page 30). Check that the disc has enough available space
- Check that the disc has enough available space for the recording (page 44), For DVD+RWs or DVD-RWs, you can free up disc space by erasing titles (page 57).

 Check that the recorder is connected to a tuner such as a cable box or satellite receiver (page 12). See also the tuner's instruction manual.

To play a disc recorded with this recorder on other equipment, finalize the disc (page 88).

Notes

- Timer recordings will start with or without the recorder turned on. The recorder automatically turns off after a recording has finished.
 This recorder records at ×1 speed.

Recording mode

Like the SP or EP recording mode of VCRs, this recorder has eight different recording modes. Select a recording mode according to the time and picture quality you need. For example, if picture quality is your top priority, select "HQ" (high quality). If recording time is your priority, "SLP" can be a possible choice.

Press REC MODE repeatedly to switch the recording modes.

I want to record with the best possible picture quality, so I'll select HQ.



Recording mode and recording time

The following table is an approximate guide for the recording time on a single DVD (4.7 GB).

Approximate recording time (minute)
60
90
120
150
180
240
360
480

The appr

The approximate recording time for DVD+R DL (Double Layer) discs is as follows:

HQ: 1 hour 48 minutes HSP: 2 hours 42 minutes SP: 3 hours 37 minutes

LSP: 4 hours 31 minutes ESP: 5 hours 25 minutes

LP: 7 hours 14 minutes EP: 10 hours 51 minutes SLP: 14 hours 28 minutes

- NOTES
 When in a recording mode other than HQ, the recorder compresses the audiovideo data before recording. Since the compression rate needs to decrease for fast-moving images or if picture noise is present, recorded data size increases, and available recording time becomes shorter. When recording such pictures, a recording mode offering longer recording time is recommended.
- Situations below may cause inaccuracies with the recording time.
- Recording fast-moving or images containing picture

- Recording last-moving or mings extended in size.
 Recording a program with poor reception, or a program or video source of low picture quality.
 Recording on a disc that has already been edited.
 Recording only a still picture or just sound. Since the recording mode for recorded titles is calculated after sampling the recorded data during playback, it may be displayed differently from the mode you selected when recording. However, the actual recording itself is correctly made in the selected mode.

DVD Playba

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Recording main and sub sounds

Nectoraling main and sun sounds
You can record the different soundtracks on a
DVD-RW (VR mode) or DVD-R (VR mode) from
equipment connected to the LINE 1 IN or LINE 2
IN jacks. When playing the disc, you can select
main or sub sound by pressing the AUDIO button.
Set "Line Audio Input" in "Audio" setup to
"Main/Sub" in the Setup Display (page 100).
When recording on other discs, select either sound
track with the connected equipment before
recording.

Unrecordable pictures

Pictures with copy protection cannot be recorded on this recorder. Recording stops when a copy guard signal is detected.

Copy control signals	Recordable discs		
Copy-Free	+RW -RWVR -RWvideo +R -RVR -RVideo		
Copy-Once	-RWVR Ver.1.1, Ver.1.2 with CPRM* -RVR Ver.2.0, Ver.2.1 with CPRM*		
Copy-Never	None		

* The recorded disc can be played only on CPRM compatible equipment (page 30).

Formatting a new disc

New, unformatted discs are automatically formatted when first inserted in the recorder For DVD-RWs/DVD-Rs, you can select a

- For DVD-RWs/DVD-Rs, you can select a recording format (VR mode or Video mode) according to your needs (page 30). Unused DVD-RWs are automatically formatted according to the setting of "Format DVD-RW" in "Features" setup (page 101). Unused DVD-Rs are automatically formatted in Video mode. To format in VR mode, change the recording format using the "Disc Settline".
- recording format using the "Disc Setting" display (page 67).

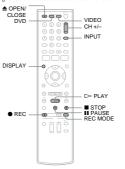
Notes

- You cannot mix VR mode and Video mode on the same DVD-RW or DVD-R.
 You can change the recording format on DVD-RWs by reformatting foage 67).
 You cannot change the recording format on used DVD-Rs
- The recorder records on new DVD-Rs in Video mode unless you first format the discs in VR mode

DVD Recording From Connected Equipment Without the Timer

+RW -RWVR -RWvideo +R -RVR -RVideo

You can record TV programs on the recorder through the connec ed cable box/satellite receiver



DVD

- Turn on the recorder and the connected cable box/satellite receiver.
- Press DVD to operate the DVD recorder.
- 3 Press ■ OPEN/CLOSE, and place a recordable disc on the disc trav.



Wait until "LOAD" disappears from the front

panel display.
Unused discs are automatically formatted. For the DVD-RW/DVD-R's recording format (VR mode or Video mode), see "Formatting a new disc" on page 47.

→continued 47

DVD

5 Press CH +/- or INPUT repeatedly to select the channel or input source you want to record.

- When using the cable box/satellite rece control, select the channel by pressing CH +/- on this recorder's remote. The recorder's input is switched to the connected input (LINE1 or LINE2). You can also use
- input (LINE1 or LINE2). You can also use the number buttons.

 When not using the cable box/satellite receiver control, select the connected input (LINE1 or LINE2) by pressing INPUT, and then select the channel on the cable box/satellite receiver's side.

Press REC MODE repeatedly to select the

recording mode.
The display changes on the TV screen as

$$\begin{array}{ccc} \mathsf{HQ} \to \mathsf{HSP} \to \mathsf{SP} \to \mathsf{LSP} \\ \uparrow & & \downarrow \\ \mathsf{SLP} \leftarrow \mathsf{EP} \leftarrow \mathsf{LP} \leftarrow \mathsf{ESP} \end{array}$$

For details about the recording mode, see page 46

7 Press ● REC.

Recording starts.

Recording continues until you stop the recording or the disc is full.

Leave the cable box/satellite receiver turn
on and do not change the channel you are atellite receiver turned

To stop recording

Press STOP.

Note that it may take a few seconds for the recorder to stop recording.

To pause recording

Press II PAUSE. To restart recording, press II PAUSE again

To watch a VHS tape while recording

Press VIDEO to operate the VCR, insert a tape, then press № PLAY.

- To play a disc recorded with this recorder on other equipment, finalize the disc (page 88).
 You can turn off the TV during recording.

1 Press DVD to operate the DVD recorder. 2 Press • REC repeatedly to set the duration.

You cannot change the recording mode during To cannot change the recording indee during recording or recording pause.

If there is a power failure, the program you are recording may be erased.

You cannot change the input source during recording.

Recording using the Quick Timer

You can set the recorder to record in 30-minute

(One-touch Timer Recording)

Each press increases the time by 30 minutes, up to eight hours*.

ay not start immediately after
REC is

"O" and "OTR" light up, and the remaining recording time appears in the front panel display.

When the time counter reaches "0:00." the recorder stops recording and turns off.

* 14 hours 30 minutes for DVD+R DL (Double Layer)

To cancel the Quick Timer

Press
REC repeatedly until the counter appears in the front panel display. The recorder returns to normal recording mode.

To stop recording

Press STOP twice.

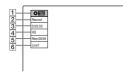
Note that it may take a few seconds for the recorder to stop recording.

Checking the disc status while recording

You can check the recording information such as recording time or disc type

Press DISPLAY during recording

The information display appears.
Press the button repeatedly to change the display (page 44)



- 1 Disc type
- 2 Recording status
- 3 Recording time
- 4 Recording mode 5 Remaining disc space
- 6 Input source

ou can view the information also in the front panel display. Press TIME/TEXT repeatedly to change the display. Note that TIME/TEXT does not work during One-touch Timer Recording.

Creating chapters in a title

The recorder will automatically divide a recording The recorder will automatically divide a recording (a title) into chapters by inserting chapter marks at 5 or 15-minute intervals during recording. Select the interval, "5 Min" (default) or "15 Min" in "DVD Auto Chapter" of "Features" in the "Setup" display (page 100).

If you do not want to divide titles, select "Off."

DVD Timer Recording From Connected Equipment

+RW -RWVR -RWvideo +R -RVR -RVideo

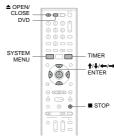
You can set the timer for a total of 12 programs together with DVD and VCR timer recording, up to one month in advance.

Note that the maximum continuous recording time for a single title is 12 hours. Contents beyond this time will not be recorded.

If you record from connected equipment that has a timer function, you can use the Synchro Rec function (page 51).

Note

ur cable box or satellite receiver Do not operate your came took obefore or during a timer recording accurate recording of a program er recording. This may prevent the



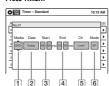
- 1 Press DVD to operate the DVD recorder.
- recordable disc on the disc trav.



Wait until "LOAD" disappears from the front panel display.

Unused discs are automatically formatted. For the DVD-RW/DVD-R's recording format (VR mode or Video mode), see "Formatting a new disc" on page 47.

4 Press TIMER.



5 Select an item using ←/→ and adjust using **↑**/**↓**.

- 1 "Media": Select "DVD."
- 2 "Date": Sets the date using To record the same program every day or the same day every week, press . The item changes as follows: Today ←→ Sun-Sat (Sunday to Saturday) → Mon-Sat (Monday to Saturday) ← Mon-Fri (Monday to Saturday) ↔ Sun (every Sunday) ↔ Mon (every Monday) ↔ ... ↔ Sat (every Saturday) ↔ 1 month later ↔ ... ↔ Today
- 3 "Start": Sets the start time.
- 4 "End": Sets the stop time.
- 5 "Ch": Selects the channel or input source.

 • When using the cable box/satellite

 - When using the cable box/satellite receiver control, select the channel.
 When not using the cable box/satellite receiver control, select the input, LINE1 or LINE2. Select the channel on the connected cable box/satellite receiver's side before the timer recording starts.
- 6 "Mode": Selects the recording mode (page 46).

To use the Rec Mode Adjust function (page 51), select "AUTO."

If you make a mistake, select the item and change the setting.

6 Press ENTER.

The Timer List menu (page 53) appears.
The ② indicator lights up in the front panel display, and the recorder is ready to start

- recording.

 If the ② indicator flashes in the front panel display, check that a recordable disc is inserted and that there is enough disc space for the recording. If timer settings overlap, a message appears.
- To change or cancel a timer recording, select "Edit" from the Timer List (page 53).

7 Press SYSTEM MENU to turn off the menu.

There is no need to turn off the recorder before the timer recording starts. Leave the cable box/satellite receiver turned on and do not change the channel selected on the cable box/satellite receiver until the

To stop recording

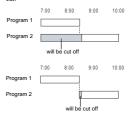
Press STOP twice.

Note that it may take a few seconds for the recorder to stop recording

recorder finishes the timer recording

If timer settings overlap

If timer settings overlap
The program that starts first has priority and the
second program starts recording only after the first
program has finished. If the programs start at the
same time, the program listed first in the menu has
priority. If the end time of one setting and the start
time of another timer setting is the same, the
beginning of the program that starts later will be
cut.



To change or cancel timer recording

See "Changing or Canceling DVD Timer Settings (Timer List)" on page 53.

To use the Rec Mode Adjust function

If the remaining disc space is not enough for the current recording, the recorder automatically adjusts the recording mode. Select "AUTO" for "Mode" when setting the timer.

- W Hints
 You can play the recorded program by selecting the program title in the Title List menu.
 When the start time and the channel or inputs ource to be recorded are the same but the "Media" setting differs, the program is recorded to both the DVD disc and the VHS tape.
 You can also turn on the timer programming menu from the System Menu. Press SYSTEM MENU to select "Timer," and select "Timer-Standard."

Notes

- Even when correctly set, the program may not be recorded if another recording is underway, or other prioritized timer setting overlaps. Before the timer recording starts, "TIMER REC"

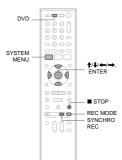
- Bettore the timer recording starts, "TIMER REC' flashes in the front panel display.
 The recorder automatically turns off when a timer recording finishes, even if the recording started with the recorder turned on.
 The recorder does not record programs with Copy-Never signals. Such recordings stop after a few seconds.

Recording From Connected Equipment With a Timer (Synchro Rec)

+RW -RWVR -RWvideo +R -RVR -Rvideo

You can set the recorder to automatically record You can set the recorder to automatically record programs from connected equipment that has a timer function (such as a satellite tuner). Connect the equipment to the LINE 1 IN jacks on the rear of the recorder (page 13). When the connected equipment turns on, the

recorder starts recording a program from the LINE 1 IN jacks.



- 1 Press DVD to operate the DVD recorder.
- 2 Insert a recordable disc.
- 3 Select the line input audio.

Set "Line Audio Input" of "Audio" setup to "Stereo" or "Main/Sub" in the "Setup" display (page 100).

4 Press REC MODE repeatedly to select the recording mode.

The display changes on the TV screen as follows:

$$HQ \rightarrow HSP \rightarrow SP \rightarrow LSP$$
 \uparrow
 $SLP \leftarrow EP \leftarrow LP \leftarrow ESP$

For details about the recording mode, see

- 5 Press SYSTEM MENU while the recorder is in stop mode.
- 6 Select "Setup," and press ENTER.
- Select "Features," and press ENTER.
- $\boldsymbol{8}$ Select "Synchro Recording," and press
- **9** Select "to DVD," and press ENTER.
- 10 Press SYSTEM MENU to turn off the menu.
- 11 Set the timer on the connected equipment to the time you want to record, and turn it

12 Press SYNCHRO REC.

The SYNCHRO REC indicator lights up on the front panel and the recorder stands by for Synchro-Rec.

The recorder starts recording when a signal is when the connected equipment.
When the connected equipment turns off, the recording stops and the recorder turns off.

Press STOP twice.

To cancel a Synchro-Rec function

Press SYNCHRO REC before recording starts. The SYNCHRO REC indicator on the recorder

If you press SYNCHRO REC during Synchro-Rec, the recording stops, the SYNCHRO REC indicator turns off, and the recorder turns off.

If the timer settings of a Synchro-Recording and another timer recording overlap

Regardless of whether or not the program is a Synchro-Rec program, the program that starts first has priority. The recorder starts recording the second program about ten seconds after the first program has finished. If the end time of one setting and the start time of another timer setting is the same, the beginning of the program that starts later will be cut.



- The recorder starts recording only after detecting the video signal from the connected equipment. The beginning of the program may not be recorded regardless of whether or not the recorder's power is on
- regardless of whenes who have a common or off.

 To use the connected equipment during Synchro-Rec standby, cancel the standby mode by pressing SYNCHRO REC. To return to standby mode again, be sure to turn off the equipment and press SYNCHRO REC, before Synchro-Rec starts.

 The Synchro-Rec function does not work with some tuners. For details, see the tuner's operating instructions.
- After a recording has finished, the recorder enters the Synchro-Rec standby mode until the SYNCHRO REC indicator turns off.
- indicator turns off.

 If Synchro-Rec starts with the recorder turned on, the recorder will turn off when the recording ends.

 The recorder does not record programs with Copy-Never signals. Such recordings stop after a few seconds.

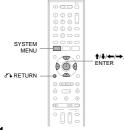
→continued 51

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Changing or Canceling DVD **Timer Settings (Timer List)**



You can change or cancel timer settings using the Timer List menu



- 1 Press SYSTEM MENU.
- The System Menu appears
- 2 Select "Timer," and press ENTER. 3 Select "Timer List," and press ENTER.

III (SEC	10:10	AM				
No. Media	Date	Start	End	Ch	Mode	Edit
01 DVD	04/15	09:00PM	10:00PM	Line1	500	•
02 DVD	04/30	09:15PM	09:45PM	Line1	SP.	•
03	/					•
04	/					•
05	/					•
06						•

Timer information displays the recording date, time, recording mode, etc.

If there are more than six timer settings, press

↓ to display the next page.

4 Select the timer setting you want to change or cancel, and press ENTER.

	ner List				10:10	AM
No. Media	Date	Start	End	Ch	Mode	Edit
01 DVD	04/15	09:00PM	10:00PM	Line1	Edt	þ
02 DVD	04/30	09:15PM	09:45PM	Line1	Erase	•
03	-d-	:-			_	•
04	/				-	•
05	-d-	:-			-	•
06					_	1

5 Select one of the options, and press ENTER. "Edit": Changes the timer setting.

Select an item using ←/→ and adjust using

↑/↓. Press ENTER



"Erase": Erases the timer setting. Select "OK" and press ENTER when asked for confirmation.



6 Press SYSTEM MENU to turn off the Timer

To return to the previous display Press o RETURN

Notes

Even when correctly set, the program may not be recorded if another recording is underway, or other prioritized timer setting overlaps. For priority, see page 50.

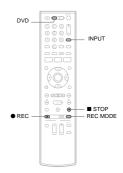
- · You cannot change the timer settings for a recording currently underway.

 • The Timer List displays both the DVD recorder and VCR timer settings.

Recording From Another VCR or Similar Device



You can record from a connected VCR or similar You can record from a connected V.A. or similar device. For connecting details, see "Connecting Another VCR or Similar Device" on page 27. Use the DV IN jack on the front panel if the equipment has a DV/D8 output jack (i.LINK jack). To record from a digital video camera connected to the DV IN jack, see page 90.



- 1 Press DVD to operate the DVD recorder.
- 2 Insert a recordable disc.
- 3 Press INPUT repeatedly to select an input source according to the connection you made.

The front panel display changes as follows:



4 Press REC MODE repeatedly to select the recording mode.

The display changes on the TV screen as follows:

$$\begin{array}{ccc} \mathsf{HQ} \to \mathsf{HSP} \to \mathsf{SP} \to \mathsf{LSP} \\ \uparrow & & \downarrow \\ \mathsf{SLP} \leftarrow \mathsf{EP} \leftarrow \mathsf{LP} \leftarrow \mathsf{ESP} \end{array}$$

For details about the recording mode, see page 46.

5 Select the line input audio.

Set "Line Audio Input" of "Audio" setup to "Stereo" or "Main/Sub" in the "Setup" display (page 100).

6 Insert the source tape into the connected equipment and set to playback pause.

7 Press • REC on this recorder and the pause or play button on the connected equipment at the same time.

Recording starts.
To stop recording, press ■ STOP on this

- A video game image may not be recorded clearly.
 The recorder does not record programs with Copy Never signals. Such recordings stop after a few seconds.
- seconds.

 During recording or recording pause, you cannot change the recording mode.

 You cannot change the input source during recording.

DVD Editing

Before Editing

This recorder offers various edit options for various disc types. Before you edit, check the disc type in the front panel display, and select the option available for your disc (page 30).

Notes

DVD

- You may lose the edited contents if you remove the disc or a timer recording starts while editing.
 You cannot edit recordings on DVD-RWs (Video mode), DVD+Rs, or DVD-Rs (Video mode) recorded on other DVD equipmen

Edit options for DVD+RWs/DVD-RWs (Video mode)/DVD+Rs/DVD-Rs (Video mode)

+RW -RWvideo +R -Rvideo

You can perform simple edits. Since Video mode You can perform simple edits. Since Video mode titles are actual recordings on the disc, you cannot undo any edits you make. The edit functions available for Video mode titles are:

- Renaming a title (page 60).

- Erasing a title (page 57).

- Setting protection against erasure (DVD+RWs only) (page 57).
- Erasing a section of a title (A-B Erase)
- (DVD+RWs only) (page 58).

 Dividing a title (DVD+RWs only) (page 59).

Notes

- Once the disc is finalized, you cannot edit or record on the disc (except for DVD+RWs).
 If a message appears and indicates that the disc's control information is full, erase unnecessary titles.

Edit options for DVD-RWs (VR mode)/ DVD-Rs (VR mode)

-RWvR -RvR

You can enjoy advanced edit functions. First you have two options for a DVD-RW (VR mode) and DVD-R (VR mode): editing either the original recording (called the "original"), or the playback information created from the original (called a "Playlist"). Since each is different in nature and offers different merits, read the following and select the one that better suits your needs

To edit original titles

Edits made to the original titles are final. If you plan to retain an unaltered original recording, create and edit a Playlist (see below). The edit runctions available for original titles are:

Renaming a title (page 60).

Erasing a chapter (page 58).

Setting restortion account of the country of the co

- ire (page 57). Setting protection against erasure (page 57).
 Erasing a section of a title (A-B Erase) (page 58).
- -Dividing a title (page 59).

To create and edit Playlist titles

A Playlist is a group of Playlist titles created from the original title for editing purposes. When you create a Playlist, only the control information necessary for playback, such as the playback order, is stored on the disc. Since the original titles are left unaltered. Playlist titles can be re-edited. If you erase an original title used in a Playlist, that Playlist is also erased.

Example: You have recorded the fin matches of a soccer tournament on a DVD-RW (VR mode). You want to create a digest with the goal scenes and other highlights, but you also want to keep the original recording.



55

56

In this case, you can compile highlight scenes as a Playlist title. You can even rearrange the scene order within the Playlist title. See "Editing a order within the Playlist title. See "Editing a Playlist" on page 63.
The advanced edit functions available for Playlist titles are:
- Renaming a title (page 60).
- Erasing a title (page 60).
- Erasing a title (page 57).
- Erasing a tapter (page 58).
- Erasing a section of a title (A-B Erase) (page 58).
- Editing a Playlist scene (page 63).
- Dividing a title (page 59).
- Dividing a title (page 59).
- Combining titles (page 64).

" Hint You can switch the Ti While the Title List m t

switch the Title List to show original or Playlist.
Title List menu is turned on, press ORIGINAL

re Title List menu PLAYLIST repeatedly.

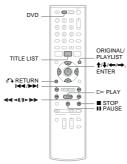
Notes

- You cannot protect Playlist titles.
 If a message appears and indicates that the disc's control information is full, rease unnecessary titles.
 You cannot create or edit Playlist titles on a finalized disc. When you want to edit or record on the DVD-RW (VR mode) again, unfinalize the disc (page 88).

Editing a Title

+RW -RWVR -RWvideo +R -RVR -Rvideo

This section explains the basic edit functions. Note that editing is irreversible. To edit a DVD-RW (VR mode) or DVD-R (VR mode) without changing the original recordings, create a Playlist title (page 61).



1 Press DVD to operate the DVD recorder.

2 Press TITLE LIST.

When editing a DVD-RW (VR mode) or DVD-R (VR mode), press ORIGINAL/ PLAYLIST to switch to the "Title List (Original)," if necessary.



3 Select a title, and press ENTER.

4 Select an option, and press ENTER.

Select an uption, and press entre.
You can select from the following:
"Title Erase": Erases the selected title. Select
"OK" when asked for confirmation.
"Chapter Erase" 1: Allows you to select a
chapter in the title and erase it (see below).
"Protect" 2: Protects the title. Select "On"
when the Bretating disable appears "A" when the Protection display appears. "\(\frac{1}{12}\) appears for the protected title. To cancel the protection, select "Off." \(\frac{1}{12}\) " changes to

"Title Name": Allows you to rename the title (page 60).
"A-B Erase" Erases a section of the title

(see below).
"Divide Title"*2: Divides a title into two (page 59).

*1 DVD-RWs (VR mode) and DVD-Rs (VR mode)

 *2 DVD+RWs, DVD-RWs (VR mode), and DVD-R (VR mode) only

About freeing up disc space

- Erasing titles, chapters, or scenes:

 frees up disc space on a DVD-RW (VR mode).

 frees up disc space on a DVD+RW/DVD-RW (Video mode) only when you erase the last title or chapter.
- -cannot free up disc space on a DVD+R/DVD+R DL/DVD-R.

☆ Hint You can also rename a disc (page 67).

Notes

- When editing a DVD-RW (Video mode), DVD+R, or DVD-R, finish all editing before finalizing the disc.
 You cannot edit a finalized disc.
 You cannot erase protected titles or erase chapters from a protected title.
- a protected title
- If you erase an original title used in a Playlist, that Playlist is also erased.

Erasing a chapter (Chapter Erase)

-RWVR -RVR

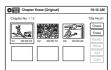
You can select a chapter within a title and erase it. Note that erasing chapters from original titles cannot be undone.

1 Press TITLE LIST.

Press ORIGINAL/PLAYLIST to switch to the "Title List (Original)," if necessary.

2 Select a title, and press ENTER.

The sub-menu appears. 3 Select "Chapter Erase," and press ENTER. The display for erasing chapters appear



4 Select the chapter you want to erase, and press ENTER.

"Check" is selected. To preview the chapter, press ENTER. When playback finishes or when you press or RETURN, the display returns to "Chapter Erase (Original)."

5 Select "Erase," and press ENTER.

The display asks for confirmat

6 Select "OK," and press ENTER.

The selected chapter is erased from the title To erase other chapters, repeat from step 4.

W Hint You can also erase chapters from a Playlist title (page 63).

Note

If you erase an original title used in a Playlist, that Playlist is also erased.

Erasing a section of a title (A-B Erase)

+RW -RWVR -RVR

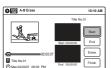
You can select a section (scene) within a title and erase it. Note that erasing scenes from original titles cannot be undone.

1 Press TITLE LIST.
When editing a DVD-RW (VR mode) or
DVD-R (VR mode), press ORIGINAL/
PLAYLIST to switch to the "Title List
(Original)," if necessary.

2 Select a title, and press ENTER. The sub-menu appears.

3 Select "A-B Erase," and press ENTER.

The display for setting point A and B apper "Start" is selected.

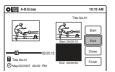


4 Press ENTER at the start point of the

section to be erased (point A).

You can use ▷ PLAY, ◄◄◄(/▮▶▶▶,

◄◄/▶▶, ■ STOP, and ▮ PAUSE to find the point. "End" is selected.



5 Press ENTER at the end point of the section (point B).

"Erase" is selected.

To reset the start or end point, select "Start" or
"End" and repeat from step 4 or 5.

6 Press ENTER.

The display asks for confirmation

7 Select "OK," and press ENTER.

The scene is erased.
To continue, repeat from step 4.
To finish, select "Finish," and press ENTER.

- A chapter mark is inserted after the scene was erased. The chapter mark divides the title into separate chapter on either side of the mark.
- You can also erase a section of a Playlist title (page 63).

Notes

- Images or sound may be momentarily interrupted at the point where you erase a section of a title.
 Sections shorter than five seconds may not be erased.
 The start and end points of a title may be different from
- The total playing time of the title does not change even if a scene was erased.

 If you erase an original title used in a Playlist, that Playlist is also erased.

Dividing a title into two (Divide Title)

+RW -RWVR -RVR

You can divide a title into two. Note that dividing original titles cannot be undone.

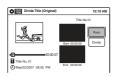
1 Press TITLE LIST.

When editing a DVD-RW (VR mode) or DVD-R (VR mode), press ORIGINAL/PLAYLIST to switch to the "Title List (Original)," if necessary.

2 Select a title, and press ENTER.

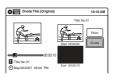
3 Select "Divide Title," and press ENTER.

The display for setting the dividing point appears.
"Point" is selected.



4 Press ENTER at the point where you want to divide the title.

You can use ▷ PLAY, ◄◀◀▮/▮▸▶▶, ▮◀◀/▶▶▶. ■ STOP, and ▮ PAUSE to find the point.
"Divide" is selected.



5 Press ENTER.

The display asks for confirmation.
To reset the dividing point, select "No" and press ENTER, then repeat from step 4.

6 Select "Yes," and press ENTER.

The display asks whether to rename the title To use the same name as before, select "No" and press ENTER to finish.

7 Select "Yes," and press ENTER.

The "Title Name" display appears

8 Follow steps 5 to 7 of "Changing the Name of a Title" (page 60) to complete

renaming.
The divided title appears in the Title List with the new name.

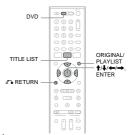
"C Hints

- You can also divide a Playlist title (page 63).
 If the dividing point is set too close to the begin the title, the title cannot be divided.

Changing the Name of a Title

+RW -RWVR -RWvideo +R -RVR -Rvideo

You can enter a title name of up to 32 characters Since the displayed number of characters is limited, their appearance in menus such as Title List may be different. When the display for entering characters appears, follow the steps



1 Press DVD to operate the DVD recorder.

2 Press TITLE LIST.

When editing a DVD-RW (VR mode) or DVD-R (VR mode), press ORIGINAL/PLAYLIST to switch to the "Title List (Original)," if necessary

3 Select a title, and press ENTER. The sub-menu appears

Select "Title Name," and press ENTER.

The "Title Name" display appears
Cursor Input row



→continued 59

DVD Editing

60

5 Select the character you want to enter using $\uparrow/\downarrow/\longleftarrow/\Longrightarrow$, and press ENTER.

The selected character appears in the input

You can only enter characters and symbols that are displayed.

- To change the cursor position, select the input row using ↑, and press ←/→.
 To erase a character, select either of the following setting buttons and press ENTER. "Backspace": Erases the character to the left of the cursor. "Delete": Erases the character at the cursor
- position.
 "Clear": Erases all the characters in the input
- To insert a space, move the cursor to the desired position, select "Space," and press
- ENTER To insert a character, move the cursor to the
- desired position, select the character, and press ENTER. 6 Repeat step 5 to enter the remaining characters.

To return to the Title List without renaming the title, press & RETURN.

7 Select "Finish," and press ENTER.

You can also rename a disc (page 67). Follow steps 5 to 7 above when the "Disc Name" display appears.

Creating a Playlist

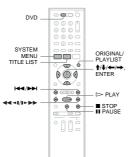
-RWVR -RVR

Playlist titles allow you to edit without changing Thy a the same of the original recordings (see "Edit options for DVD-RWs (VR mode)/DVD-Rs (VR mode)" on page 56). You can create a Playlist title by combining up to 99 sections (scenes) from original titles

- NOUS

 If you crase an original title used in a Playlist, that
 Playlist is also crased.

 You cannot create or edit Playlist titles on a finalized
 disc. When you want to edit or record on the DVD-RW
 (VR mode) again, unfinalize the disc (page 88).



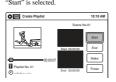
- 1 Press DVD to operate the DVD recorder.
- 2 Press SYSTEM MENU while the recorder is in stop mode.



3 Select "Edit," and press ENTER.

O BBB Ed	t	10:10 AM
Title List	Create Playlist	
Timer	Edit Playlist	
₽ Edit		
Dubbing		
C Disc Setting		
A Setup	1	

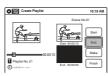
4 Select "Create Playlist," and press ENTER. The display for creating a Playlist appears. "Start" is selected.



5 Press ENTER at the start point.

You can use ➤ PLAY, ◄◄◄/▮►▶►, ◄◄/▶►, ■ STOP, and ■ PAUSE to find

the point. "End" is selected.



6 Press ENTER at the end point.

"Make" is selected.

To reset the start or end point, select "Start" or "End" and repeat step 5 or 6.

7 Press ENTER.

The selected section is captured as a scene. To continue, repeat from step 5.

8 When you finish capturing scenes, select "Finish" and press ENTER.

Playing a Playlist title

- 1 Press TITLE LIST.
- 2 Press ORIGINAL/PLAYLIST to switch to the "Playlist" Title List.
- 3 Select a Playlist title, and press ENTER. The sub-menu appears.
- 4 Select "Play," and press ENTER.

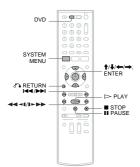
en a Playlist title is created, the start and end points will become chapter marks, and each scene will become a chapter.

- The picture may pause when an edited scene is played. The start and end points in a title may be different from what you have set.

Editing a Playlist

-RWVR -RVR

You can edit Playlist titles or scenes within them, without changing the actual recordings



- 1 Press DVD to operate the DVD recorder.
- 2 Press SYSTEM MENU while the recorder is

O Title	List (Original)	10:10 AN
Title List	Press ENTER :	
% Edit	Title Menu for DVD Title List.	
Dubbing		
Ch Disc Setting		
⊕ Setup		

3 Select "Edit," and press ENTER.



4 Select "Edit Playlist," and press ENTER. The "Playlist" Title List appears



- 5 Select a Playlist title, and press ENTER.
- Select an option, and press ENTER. Select from the following options. For details, see the pages in parentheses.

"Title Erase": Erases the title. Select "OK" when asked for confirmation.
"Chapter Erase": Allows you to select

chapters in the Playlist title to erase (page 58). "Title Name": Allows you to rename the title

(page 60).

"A-B Erase": Allows you to select sections in the title to erase (page 58).

"Edit Seene": Allows you to re-edit scenes in the Playlist title. Go to step 7.

"Divide Title": Divides the title in two at a

desired point (page 59).
"Combine Titles": Allows you to combine wo titles into one (page 64).

7 Select "Edit Scene," and press ENTER. The display for editing scenes appears



"Check": Allows you to preview a scene. Starts playback of the selected scene when Natrs playback of the selected scene when you press ENTER. The display returns to the "Edit Scene" display when the playback finishes or when you press of RETURN. "Erase": Erases a scene (page 64). "Modify": Allows you to change the start and end point of a scene (page 64).

⇒continued 63

DVD Editing

"Move": Allows you to change scene order (page 65).
"Add": Allows you to add other scenes before

a selected scene (page 65). "Copy": Allows you to copy a scene

(page 66). To return to the previous display Press & RETURN.

To turn off the display Press SYSTEM MENU

"Ç" HintThe Resume Play function will work for scene playback. ■

Note

ate or edit Playlist titles on a finaliza disc. When you want to edit or record on the DVD-RW (VR mode) again, unfinalize the disc (page 88).

Combining two titles into one (Combine Titles)

-RWVP -RVP

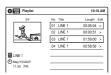
You can select a Playlist title and combine it with another Playlist title.

- 1 Follow steps 1 to 5 of "Editing a Playlist" (page 63) to select a Playlist title. The sub-menu appears.
- 2 Select "Combine Titles," and press ENTER

The next title below is also selected.



3 Select a Playlist title to be combined.



4 Press ENTER.

The display asks for confirmation.

Select "Yes," and press ENTER. The display asks whether to rename the title. To use the same name as before, select "No" and press ENTER to finish.

6 Select "Yes," and press ENTER. The "Title Name" display appears

Follow steps 5 to 7 of "Changing the Name of a Title" (page 60) to complete renaming.

The two Playlist titles become one Playlist title with the new name

Erasing a scene (Erase)

-RWVR -RVR

ou can erase a selected scene

1 Follow steps 1 to 7 of "Editing a Playlist" (page 63). The "Edit Scene" display appears.

- Select the scene you want to erase, and press ENTER.
- 3 Select "Erase," and press ENTER. The display asks for confirmation.
- 4 Select "OK," and press ENTER. The selected scene is erased.
 To erase other scenes, repeat from step 2.

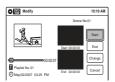
Modifying a scene (Modify)

-RWvR -RvR

You can change the start and end point of the selected scene

1 Follow steps 1 to 7 of "Editing a Playlist" (page 63). The "Edit Scene" display appears

- 2 Select the scene you want to modify, and press ENTER.
- 3 Select "Modify," and press ENTER. "Start" is selected



4 Press ENTER at the start point. You can use ▷ PLAY, ◄◄◄/▮►▶►, ▮◄◄/▶►, ■ STOP, and ▮ PAUSE to find

the point. "End" is selected.



5 Press ENTER at the end point.

"Change" is selected.

To reset the start or end point, select "Start" or "End" and repeat step 4 or 5.

6 Press ENTER.

The display returns to the "Edit Scene"

The display returns to the East Scene display.

The re-selected section is captured as a scene To modify other scenes, repeat from step 2.

To cancel modifying

Select "Cancel," and press ENTER.

The start and end point of a scene may be different from what you have set.

Moving a scene (Move)

-RWVR -RVR

You can change the scene order within the Playlist

1 Follow steps 1 to 7 of "Editing a Playlist" (page 63). The "Edit Scene" display appears.

2 Select the scene you want to move, and press ENTER.

3 Select "Move," and press ENTER.



4 Select a new location using \leftarrow / \rightarrow , and press ENTER.

The selected scene moves to the new location To move other scenes, repeat from step 2.



Adding a scene (Add)

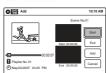
-RWVR -RVR

You can add a scene before the selected scene

1 Follow steps 1 to 7 of "Editing a Playlist" (page 63).
The "Edit Scene" display appears.

2 Select the location where you want to add,

and press ENTER. A new scene will be added before the selected 3 Select "Add," and press ENTER. Start" is selected.



4 Press ENTER at the start point

You can use ► PLAY, ◄◄◄¶/▮►▶►, ▮◄◄/▶►I. ■ STOP, and ▮ PAUSE to find the point. "End" is selected.



5 Press ENTER at the end point.

"Add" is selected.
To reset the start or end point, select "Start" or "End" and repeat step 4 or 5.

6 Press ENTER.

The display returns to the "Edit Scene" display.
The selected section is added before the scene

selected in step 2.

To add other scenes, repeat from step 2.

To cancel adding Select "Cancel," and press ENTER.

Note

The start and end point of a scene may be different from what you have set.

Copying a scene (Copy)

-RWVR -RVR

You can copy and add a selected scene.

1 Follow steps 1 to 7 of "Editing a Playlist" (page 63).
The "Edit Scene" display appears.

2 Select the scene you want to copy, and press ENTER.

3 Select "Copy," and press ENTER.



4 Select a location to copy to using ◀ and press ENTER.

The scene is copied to the selected location To copy other scenes, repeat from step 2.



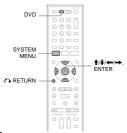
continued 65

Formatting/Renaming/ **Protecting a Disc**

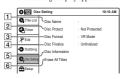
+RW -RWVR -RWvideo +R -RVR -RVideo

The "Disc Setting" display allows you to check the disc information or change the disc name.

Depending on the disc type, you can also format or set protection.



- 1 Press DVD to operate the DVD recorder.
- 2 Press SYSTEM MENU while the recorder is in stop mode.
- 3 Select "Disc Setting," and press ENTER. The "Disc Setting" display appears.



4 Select an option, and press ENTER.

Playing a VHS Tape

VHS

DISPLAY

CLEAR

2 Insert a tape.

3 Press ⊳ PLAY.

1 Press VIDEO to operate the VCR.

Playback starts automatically if you insert a tape with its safety tab removed.

The front panel display shows the playing time.
When the tape reaches the end, it will rewind

1 "Disc Name": Allows you to rename a

For details on how to enter characters, see page 60.

- [2] "Disc Protect" (DVD+RWs/DVD-RWs (VR mode)/DVD-Rs (VR mode) only): Protects all titles on the disc when "Protected" is selected. To cancel the protection, select "Not Protected."
- 3 "Disc Format" (DVD+RWs/DVD-RWs/DVD-Rs only): Erases all contents of the disc, including protected titles, and makes a blank disc (except DVD-Rs).
 For DVD-RWs, select a recording format ("VR Mode" or "Video Mode") according to your needs. To format unused DVD-Rs in VR mode, select "VR Mode" and then "OK."
- 4 "Disc Finalize": Finalizes a disc. See page 88 for details.
- 5 "Disc Information": Displays the following information.
 - Disc name
 - Disc tame
 Disc type (and recording format for a DVD-RW (VR mode)/DVD-R (VR mode))
 Total number of titles

- Protect setting
 The oldest and most recent recording
- The total available recording time in

O Disc Information		10:10 AM		
Disc Name	Disc 1			
Media	DVD-RW	П	Format	VR Mode
Title No.	Original 6 / Play	/list 1		
Protected	Not Protected	Not Protected		
Date	4/05/2007 ~ 4/3	0/200	7	
Remainder	HQ:0H:57M LSP:2H:23M EP:5H:46M	ESP	: 2H 52M	

6 "Erase All Titles" (DVD+RWs/DVD-RWs/DVD-Rs (VR mode) only): Erases all titles on the disc (except protected titles). Select "OK" when asked for confirmation.
For DVD-RWs (VR mode)/DVD-Rs (VR mode), Playlist titles created with protected titles are also erased. To return to the previous display Press ♂ RETURN.

* · · · · · · ·

 * You can set protection for individual titles (page 57).
 * By reformatting, you can change the recording format on DVD-RWs, or record again on DVD-RWs (Video mode) that have been finalized.

Notes

N

- You can label a disc using up to 32 characters; however, the name may not display on other DVD
- equipment.
 You cannot label an unused DVD-R (Video mode)
- You cannot label an unused DVD-R (Video mode) disc. Label the disc after you first record on it. You cannot mix VR mode and Video mode on the same DVD-RW or DVD-R.
- You cannot change the recording format on used DVD-

The recorder records on new DVD-Rs in Video mode unless you first format the discs in VR mode (page 47)

⇒continued 67

68

To stop playback

To eject the tane Press OPEN/CLOSE.

To turn off the power while rewinding (Rewind

Fress I/d while the tape is rewinding. The power will turn off but the tape will keep rewinding until it reaches the end.

To use the time counter

Press CLEAR at the point where you want to find later. The counter in the front panel display resets to "0:00:00."

to 0:00:00.

To search for the 0:00:00 point automatically, see page 72.

To display the counter on the TV screen, press DISPLAY.

I/U VIDEO TRACKING +/-

- ID- PI AY

— ■ STOP

1

- During playback, the VCR automatically detects the recording system (S-VHS/VHS) and the recording mode (SP or EP) from the tape. LP mode recordings made on other equipment will play, but picture quality is not guaranteed.
 The counter resets to "0.00:00" whenever a tape is reinserted.
 The counter resets to "0.00:00" whenever a top orition with no recording.
 The counter resets to "0.00:00" after ten hours, and starts recounting.
 When playback does not start even if you insert a tape with its safety tab removed, set "VCR Function" "Auto Play" of "Features" to "On" in the "Setup" display (page 101).

 If you switch to the VCR while playing a disc, DVD playback stops. During playback, the VCR automatically detects the

- If you switch to the VLA WILLD PHIAP OF THE PLANES AS OF SEASONS.
 The VCR does not record in S-VHS format, but will play S-VHS tages by automatically detecting the format, but picture quality will be lower than usual S-VHS. Image may be unclear if playback options such as slow-motion, etc., are used.
 Playback of S-VHS tages recorded in EP (3x) mode is now moranteed.

- The VCR is not compatible with the PAL or SECAM color system. Only NTSC tapes can be played.

 For simultaneous VHS and DVD operation, see page 9.

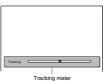
Adjusting the picture (tracking)

You can manually adjust tracking if the recording quality is too poor to be remedied by the VCR's automatic tracking (a tracking meter appears during the automatic tracking).

Press TRACKING +/-.

The tracking meter appears.

Press TRACKING +/- repeatedly until the distortion disappears.



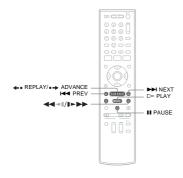
To resume automatic tracking

Press TRACKING + and TRACKING - on the recorder at the same time for more than ten seconds. Or, eject the tape and reinsert it.

ç

ntinued 69

Playback Options



Button	Operation
(fast reverse/fast forward)	Fast reverses or fast forwards when pressed during stop mode. When you hold down during fast reverse or fast forward, you can view the picture. Plays at high speed when briefly pressed during playback. When you hold down the button during playback, the high-speed play continues until you release the button.
(slow)	Plays in slow motion when pressed in pause mode.
•→ ADVANCE	Advances one frame for each press in pause mode. Fast forwards the current scene for 30 seconds when pressed during playback.*
←• REPLAY	Replays the previous scene when pressed during playback.*2
PREV/ NEXT ►►	Press during playback. Playback speed changes with each press: $-\times7 \leftrightarrow -\times5 \leftrightarrow -\times3 \leftrightarrow PAUSE \leftrightarrow SLOW \leftrightarrow PLAY \leftrightarrow \times2 \leftrightarrow \times3 \leftrightarrow \times5 \leftrightarrow \times7$
■ PAUSE	Pauses playback. If you pause playback for more than five minutes, playback starts automatically.

Notes

**1 Can be pressed up to four times to forward about two minutes. **2 For 10 seconds in SP or LP mode/for 15 seconds in EP mode.

To resume normal playback, press > PLAY.

Searching Using Various Functions

VHS

The VCR automatically marks the tape with an index signal at the point where each recording

begins. You can easily find a specific point using various search functions.

During DVD recording, you cannot use VCR search functions.



- 1 Press VIDEO to operate the VCR.
- 2 Press OPTIONS.
- 3 Select a search method from the OPTIONS menu, and press ENTER.



"Go To Zero": Searches for the 0:00:00 point

To reset the counter to 0:00:00, press CLEAR.



"End Search": Searches for the beginning of a blank space. If no blank space is found, the tape will reach the end.



"Forward Intro Scan": Searches for an index mark and plays back for about five seconds at that point.

Press IP—PLAY to view that program. If you do not press IP—PLAY, the VCR automatically searches for the next index mark, or until it reaches the end of the tape.



- Notes

 The VCR may not recognize the end of a blank space depending on its length.

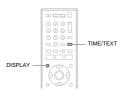
 No index signal is marked if you pause a recording and then keep recording the same program. To mark an index, press STOP or change the input source once during recording pause.

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VCR Playback

Displaying the Playing Time and Play Information

You can check playback information, such as elapsed or remaining time, recording mode, etc., on the TV screen.



Press DISPLAY during playback.

The information display appears.

Each time you press the button, the display



- 2 Time counter (elapsed time)
- 3 Recording mode
- 4 Remaining tape length
- 1 Playing status

- 5 Input source
- 6 Date and time

Viewing information on the front panel display

You can view the information on the front panel display.

The sound is muted during playback at various speeds.
 The picture may show noise during high-speed reverse play.

Press TIME/TEXT repeatedly. The displays differ depending on the status

Example: When playing a tape



Example: When a tape is in stop mode Clock



Selecting the Sound During Playback

VHS

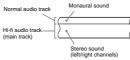


Press AUDIO repeatedly during playback.

To listen to	On-screen display	Front panel display
Stereo	Hi-Fi	STEREO
Left channel	Left	STEREO
Right channel	Right	STEREO
Monaural sound on the normal audio track	Mono	STEREO*

* No indicator appears in the front panel display when you play a tape without Hi-fi recording.

The VCR records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto



- To play a tape in stereo, you must use the A/V
- connections.

 When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO setting.

VCR Playback

How sound is recorded on a video tape

the normal audio track along the edge of the tape

Before Recording

Before you start recording..

- . This VCR records in VHS format, not S-VHS
- Check that the tape is longer than the recording time (page 73).
 Check that the recorder is connected to a tuner
- such as a cable box or satellite receiver (page 12). See also the tuner's instruction

Notes

- Timer recordings will start with or without the recorder turned on. Once started, the recorder cannot be turned off. The recorder automatically turns off after a recording has finished.
- recording has finished.

 This recorder has the copy guard function. Programs that contain a Copy-Never copy guard signal cannot be correctly recorded on the VCR.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on the tape again, cover the tab hole with adhesive tape.



Recording mode

"EP" (Extended Play) and "SP" (Standard Play) is available for recording mode (tape speed). "EP" provides recording time three times as long as "SP." However, "SP" produces better picture and audio quality.

Maximum recording time

Tape Lei	ngth S	P	EP
T-120	2	hrs	6 hrs
T-160	2	hrs 40 mins	8 hrs
T-180	3	hrs	9 hrs

"O" and "OTR" light up, and the remaining recording time appears in the front panel display.

When the time counter reaches "0:00," the

recorder stops recording and turns off.

To cancel the Quick Timer

Press • REC repeatedly until the counter appears in the front panel display. The recorder returns to normal recording mode.

To stop recording

Checking the remaining tape length

You can check recording information, such as remaining tape length or recording mode, etc

Press DISPLAY while recording.

The information display appears.

Press the button repeatedly to change the display (page 73).



- 1 Recording status
- 2 Time counter
- 3 Recording mode
- 4 Remaining tape length
- 5 Input source

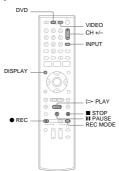
To check the remaining tape length, set "VCR Function" - "Tape Length" of "Features" in the "Setup" display correctly (page 101).

Ÿ HintYou can view the information also in the front panel display. Press TIME/TEXT repeatedly to change the display. Note that TIME/TEXT does not work during One-touch Timer Recording.

Tapes recorded in EP (×3) mode by this VCR cannot be played back on VHS video decks with SP mode only. Noise may appear in the image when tapes recorded in EP (×3) mode by this VCR are played back on other VHS video decks with EP mode.

VCR Recording From Connected Equipment Without the Timer

You can record TV programs on the recorder through the connected cable box/satellite receiver



- 1 Turn on the recorder and the connected cable box/satellite receiver.
- 2 Press VIDEO to operate the VCR. 3 Insert a tape with its safety tab in place.
- 4 Press CH +/- or INPUT repeatedly to select the channel or input source you want to
 - When using the cable box/satellite receiver when using the canoe box/satenite receiver control, select the channel by pressing CH +/- on this recorder's remote. The recorder's input is switched to the connected input (LINE1 or LINE2). You can also use the number buttons.

 When not using the cable box/satellite receiver control, select the connected input

(LINE1 or LINE2) by pressing INPUT, and then select the channel on the cable box/ satellite receiver's side.

Press REC MODE repeatedly to select the recording mode, "SP" or "EP." For details about the recording mode, see

page 75.

Press • REC.

"REC" appears in the front panel display, and recording starts.

Leave the cable box/satellite receiver turned on and do not change the channel you are recording.

To stop recording Press ■ STOP.

To pause recording

Press II PAUSE.

To restart recording, press # PAUSE again.

If you pause recording for more than five minutes, recording stops automatically.

To watch a DVD while recording

Press DVD to operate the DVD recorder, insert a disc, and press PLAY.

- ion displayed on the TV screen will not be recorded on the tape.

 • You can turn off the TV during recording.

Notes

- nnot change the recording mode or input source
- while recording.

 If you insert a tape with its safety tab removed, the tape is ejected when you press

 REC.

Recording using the Quick Timer (One-touch Timer Recording)

You can set the recorder to record in 30-minute increments.

- 1 Press VIDEO to operate the VCR.
- 2 Press REC repeatedly to set the duration.

Each press increases the time by 30 minutes, up to six hours.

 \rightarrow 0:30 \rightarrow 1:00 \rightarrow 5:30 \rightarrow 6:00 \rightarrow (Normal recording)

75

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3 Press TIMER.

VCR Today 09:00 PM 10:00 PM Line1 SP 1 2 3 4 5 6

Select an item using ←/→ and adjust using **↑**/**↓**.

- 1 "Media": Select "VCR."
- 2 "Date": Sets the date using 1. To record the same program every day or the same day every week, press

 To retord the same program every day or the same day every week, press

 Today

 Sun-Sat (Sunday to Saturday)

 Mon-Fri (Monday to Fiday)

 Mon-Fri (Monday to Fiday)

 Mon (every Monday)

 Mon (every Monday)

 Mon (Sat (every Saturday)

 Monday)

 Monday

 Monday \longleftrightarrow ... \longleftrightarrow Sat (every Saturday) \longleftrightarrow 1 month later \longleftrightarrow ... \longleftrightarrow Today
- 3 "Start": Sets the start time.
- 4 "End": Sets the stop time.
- 5 "Ch": Selects the channel or input source.

 • When using the cable box/satellite

 - When using the cable box/satellite receiver control, select the channel.
 When not using the cable box/satellite receiver control, select the input, LINE1 or LINE2. Select the channel on the connected cable box/satellite receiver's side before the timer recording starts.
- 6 "Mode": Selects the recording mode; "SP" or "EP." To use the Rec Mode Adjust function (page 79), select "AUTO."

If you make a mistake, select the item and change the setting.

5 Press ENTER.

The Timer List menu (page 81) appears. The ② indicator lights up in the front panel display, and the recorder is ready to start recording.

- The remaining tape length may not be indicated accurately for short tapes such as T-20 or T-30, or tapes recorded in LP mode.

 After DISPLAY is pressed, it may take one minute for the remaining tape length to appear.

VCR Recording

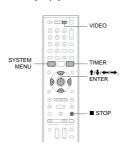
VCR Timer Recording From Connected Equipment

You can set the timer for a total of 12 programs

You can set the timer for a total of 12 programs together with DVD and VCR timer recording, up to one month in advance. If you record from connected equipment that has a timer function, you can use the Synchro Rec function (page 80).

Note

Do not operate your cable box or satellite receiver just before or during a timer recording. This may prevent the accurate recording of a program.



1 Press VIDEO to operate the VCR. 2 Insert a tape with its safety tab in place.



- If the ② indicator flashes in the front panel display, check that a tape with its safety tab in place is inserted.
 If timer settings overlap, a message appears.
- To change or cancel a timer recording, select "Edit" from the Timer List (page 81).

6 Press SYSTEM MENU to turn off the menu.

There is no need to turn off the recorder before the timer recording starts.

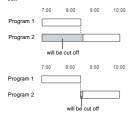
Leave the cable box/satellite receiver turned

on and do not change the channel selected on the cable box/satellite receiver until the recorder finishes the timer recording.

Press STOP twice

If timer settings overlap

The program that starts first has priority and the second program starts recording only after the first program has finished. If the programs start at the same time, the program listed first in the menu has priority. If the end time of one setting and the start time of another timer setting is the same, the beginning of the program that starts later will be cut.



To change or cancel timer recording

See "Changing or Canceling VCR Timer Settings (Timer List)" on page 81.

To use the Rec Mode Adjust function

10 use the HeE mode Adjust function if the remaining tape length is too short for the current recording, the VCR automatically changes the recording mode from SP to EP. When setting the timer, select "AUTO" in "Mode," and check that the "Tape Length" setting is correct for the inserted tape ("VCR Function" -

"Tape Length" of "Features" in the "Setup" display (page 101)).

- Q* Hints
 When the start time and the channel or input source to be recorded are the same but the "Media" setting differs, the program is recorded to both the DVD disc and the VHS tape.
 You can also turn on the Timer programming men from the System Menu. Press SYSTEM MENU to select "Timer," and select "Timer-Standard."

- Even when correctly set, the program may not be recorded if another recording is underway, or other prioritized timer setting overlaps. You cannot record on a tape with its safety tab

- removed.

 Before the timer recording starts, "TIMER REC"
 flashes in the front panel display.

 The recorder automatically turns off when a timer recording finishes, even if the recording started with the recorder turned on.

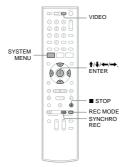
Recording From Connected Equipment With a Timer (Synchro Rec)

VHS

You can set the recorder to automatically record You can set the recorder to automatically record programs from connected equipment that has a timer function (such as a satellite tuner). Connect the equipment to the LINE 1 IN jacks on the rear of the recorder (page 13).

When the connected equipment turns on, the recorder starts recording a program from the LINE LINE inches.

1 IN jacks.



- 1 Press VIDEO to operate the VCR.
- 2 Insert a tape with its safety tab in place. 3 Press REC MODE repeatedly to select the
- recording mode, "SP" or "EP."
- Press SYSTEM MENU while the recorder is
- **5** Select "Setup," and press ENTER.
- 6 Select "Features," and press ENTER. The "Features" setup appears.
- 7 Select "Synchro Recording," and press ENTER.

8 Select "to VIDEO," and press ENTER.

9 Press SYSTEM MENU to turn off the menu.

10 Set the timer on the connected equipment to the time of the program you want to record, and turn it off.

11 Press SYNCHRO REC

The SYNCHRO REC indicator lights up on the front panel and the recorder stands by for Synchro-Rec.

The recorder starts recording when a signal is received from the connected equipment.
When the connected equipment turns off, the recording stops and the recorder turns off.

To stop recording

Press STOP twice

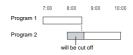
To cancel Synchro-Rec function

Press SYNCHRO REC before recording starts.
The SYNCHRO REC indicator on the recorder turns off.

If you press SYNCHRO REC during Synchro Rec, the recording stops, the SYNCHRO REC indicator turns off, and the recorder turns off.

If the timer settings of a Synchro-Recording and another timer recording overlap

and another timer recording overlap
Regardless of whether or not the program is a
Synchro-Rec program, the program that starts first
has priority and the second program starts
recording only after the first program has finished.
If the end time of one setting and the start time of
another timer setting is the same, the beginning of
the program that starts leave will be cur. the program that starts later will be cut



· You cannot change the timer settings for a recording

currently underway.

The Timer List displays both the DVD recorder and VCR timer settings.

79

VCR Recor

VCR Recording

80

- The recorder starts recording only after detectin video signal from the connected equipment. The beginning of the program may not be recorded regardless of whether or not the recorder's power of the recorder's power of the recorder's power of the recorder's power or the recorder or the recorder's power or the recorder or the recorder or the recorder's power or the recorder or the
- regardless of whether or not the recorder's power is on or off.

 To use the connected equipment during Synchro-Rec standby, cancel the standby mode by pressing SYNCHRO REC. To return to standby mode again, be
- STINCHRO REC. 10 return to standard mode again, to sure to turn off the equipment and press SYNCHRO REC, before Synchro-Rec starts.

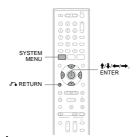
 The Synchro-Rec function does not work with some tuners. For details, see the tuner's operating
- instructions.

 After a recording has finished, the recorder enters the Synchro-Rec standby mode until the SYNCHRO REC indicator turns off.

 You cannot record on a tape with its safety tab removed.
- If Synchro-Rec starts with the recorder turned on, the recorder will turn off when the recording ends.

Changing or Canceling VCR Timer Settings (Timer List)

You can change or cancel timer settings using the Timer List menu



1 Press SYSTEM MENU. The System Menu appears

2 Select "Timer," and press ENTER.

3 Select "Timer List," and press ENTER.



Timer information displays the recording date, time, recording mode, etc.

If there are more than six timer settings, press

to display the next page.

Select the timer setting you want to change or cancel, and press ENTER.

Vite Tin	ner List				10:10	AM
No. Media	Date	Start	End	Ch	Mode	Edit
01 VCR	04/15	09:00PM	10:00PM	Line1	Edt	Þ
02 VCR	04/30	09:15PM	09:45PM	Line1	Erasa	Þ
03	/					•
04	/					٠
05	/					۰
os	/					•

${\bf 5} \ \ {\bf Select \ one \ of \ the \ options, \ and \ press}$ ENTER. "Edit": Changes the timer setting. Select an item using ←/→ and adjust using ↑/♦. Press ENTER.



"Erase": Erases the timer setting. Select "OK" and press ENTER when asked for confirmation.



6 Press SYSTEM MENU to turn off the Timer

To return to the previous display

Press RETURN.

Notes

Even when correctly set, the program may not be recorded if another recording is underway, or other prioritized timer setting overlaps. For priority, see page 79.

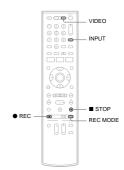
continued 81

82

Recording From Another VCR or Similar Device

VHS

You can record from a connected VCR or similar device. For connection details, see "Connecting Another VCR or Similar Device" on page 27.



- 1 Press VIDEO to operate the VCR.
- 2 Insert a tape with its safety tab in place.
- Press INPUT repeatedly to select the input source (LINE1 or LINE2) according to the connection you made.
- Press REC MODE repeatedly to select the recording mode, "SP" or "ÉP.
- Insert the source tape into the connected equipment and set to playback pause.
- 6 Press REC on this recorder and the pause or play button on the connected equipment at the same time.

Recording starts.

To stop recording, press ■ STOP on this recorder

- removed.
- During recording or recording pause, you cannot
- change the recording mode. You cannot change the input source during recording.

VCR Recording

83

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Dubbing (TAPE ↔ DVD)

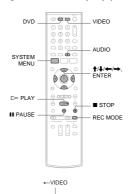
Dubbing From a VHS Tape to a DVD

+RW -RWVR -RWvideo +R -RVR -Rvideo

You can easily record (dub) a VHS tape to a disc Before dubbing, make the necessary audio settings on the VCR.

♦How titles and chapters are created

♦How tilles and chapters are created
The recorder takes each recording on the VHS tape
and automatically divides them into titles as they
are dubbed to a disc. These titles are then further
divided into chapters at either 5 or 15-minute
intervals, according to the "DVD Auto Chapter"
setting of "Features" in the "Setup" display.



1 Press DVD and insert a recordable disc. To select the recording mode, press REC MODE repeatedly (see page 46).

Insert a source VHS tane.

3 Press VIDEO to operate the VCR.

Start playing the VHS tape, and then press
■ STOP or II PAUSE at the point where you want to start dubbing.

To select VCR sound, press AUDIO during playback (see page 74)

Press ← VIDEO on the recorder.

Dubbing starts.

To stop dubbing

Press STOP.

Note that it may take a few seconds for the recorder to stop dubbing.

To play discs recorded with this recorder on

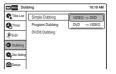
other DVD equipment Finalize the disc (see page 88).

To dub using the on-screen menu

- 1 After step 4 above, press SYSTEM MENU.
- Select "Dubbing" from the System Menu, and press ENTER.



Select "Simple Dubbing," and press ENTER.



4 Select "VIDEO → DVD," and press ENTER.

Select "Yes," and press ENTER Dubbing starts.

- A black (no signal) screen at the end of the dubbed disc is not a malfunction. This screen is recorded if a time discrepancy exists between the disc and tape when the
- recording is stopped.

 When dubbing a VHS tape to a DVD, the VHS tape counter value may differ slightly from the DVD
- recording time.

 VCR playback sound is output during dubbing

Notes

- WOIGE

 using a non-recordable DVD.

 using a non-recordable DVD.

 using VHS software with copy guard functions.

 Dubbing stops when:

 the VHS tape reaches the end and stops.

 the VHS video deck or the DVD deck is stopped.
- the disc remaining time runs out.
 The System Menu, OPTIONS menu, and information display are not displayed during dubbing.
 Copyrights
- Recordings made from VHS tapes and other
- Recordings made Irom VHS tapes and other copyrighted material are solely for individual enjoyment, and other unauthorized use is prohibited under copyright law.
 Unauthorized editing of copyrighted material is prohibited under copyright law.

Dubbing From a DVD to a VHS Tape

+RW -RWVR -RWVideo +R -RVR -Rvideo DVD RAM VHS

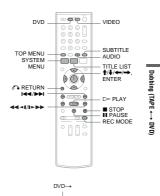
You can record (dub) a DVD title to a VHS tape.

You can record (duto) a DVD true to a VHS tape. Note that when you record copy-protected software to a tape, picture may appear disrupted when you play back the tape.

You can also select titles or scenes and dub them all at once. See "Dubbing selected titles and scenes (Program Dubbing)" on page 86.

Before dubbing, make the necessary audio settings on the DVD recorder.

on the DVD recorder.



1 Press VIDEO and insert a VHS tape with its safety tab in place.

To select the recording mode, SP or EP, press REC MODE repeatedly (see page 75).

continued 85

Insert a source disc.

3 Press DVD to operate the DVD recorder.

4 Press TOP MENU or TITLE LIST to select a title.

5 Start playing the DVD, and then press ■ STOP or ■ PAUSE at the point where you want to start dubbing.

To select DVD sound, language, or subtitle, press AUDIO or SUBTITLE during playback (see page 36).

6 Press DVD \rightarrow on the recorder.

Dubbing starts.

To stop dubbing

Press STOP.

Note that it may take a few seconds for the recorder to stop dubbing.

To dub using the on-screen menu

- 1 After step 5 above, press SYSTEM MENU.
- Select "Dubbing" from the System Menu, and press ENTER



3 Select "Simple Dubbing," and press ENTER



Select "DVD → VIDEO," and press ENTER The display asks for confirmation

Select "Yes," and press ENTER. Dubbing starts.

If the disc's menu appears when DVD playback finishes, press ■ STOP to stop

dubbing. Otherwise the disc's menu is recorded until the tape reaches its end.

ss of the playback picture may differ from

Y mints
Y mints
The brightness of the playback picture may differ fron normal DVD playback picture.
The DVD playback ime may differ slightly from the VHS tape counter value.
The sound being played back (main, sub, etc.) is the dubbed sound.

- Dubbing stops when:

 the DVD is played back to the end and stops.

 the DVD deck or the VHS video deck is stopped.

 the tape remaining time runs out.

 The System Menu, OPTIONS menu, and information display are not displayed during dubbing.
- display are not displayed unring unorong.

 Copyrights

 Recordings made from discs and other copyrighted material are solely for individual enjoyment, and other unauthorized use is prohibited under copyright law.

 Unauthorized editing of copyrighted material is prohibited under copyright law.

Dubbing selected titles and scenes (Program Dubbing)

You can select titles or scenes from a DVD, and dub the contents to a VHS tape all at once.

1 Press VIDEO and insert a VHS tape with its safety tab in place.

To select the recording mode, SP or EP, press REC MODE repeatedly (see page 75). 2 Press DVD and insert a source disc.

To select DVD sound, language, or subtitle, press AUDIO or SUBTITLE during playback (see page 36).

3 Press SYSTEM MENU. The System Menu appears

4 Select "Dubbing," and press ENTER.



5 Select "Program Dubbing," and press ENTER.



Select "Create Dubbing List," and press ENTER.

If you have performed Program Dubbing before, the display asks for confirmation. To continue, select "Yes" and press ENTER. The display for selecting titles appears.

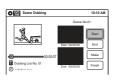


7 Select the title you want to dub, and press ENTER.

ENIER.
The sub-menu appears.
To dub the entire title, select "Title Dubbing" and press ENTER. The Program Dubbing List appears with the selected title. Go to step 13.
To select a scene to dub, go to step 8.

8 Select "Scene Dubbing," and press

The display for setting a scene appears "Start" is selected.



9 Press ENTER at the start point.

You can use ▷ PLAY, ◄◄◄/▮►▶►, ▮◄◄/▶►, ■ STOP, and ▮ PAUSE to find

"End" is selected



10 Press ENTER at the end point.

"Make" is selected.

To reset the start or end point, select "Start" or "End" and repeat from step 9 or 10.

11 Press ENTER.

ue, repeat from step 9.

12 Select "Finish," and press ENTER.

The Program Dubbing List appears with the selected scene.



13 Select an option and press ENTER, if necessary.

To add other titles or scenes, select "Addition" and press ENTER, and repeat from step 7. To cancel the selected title or scene, select "Erase" and press ENTER. When asked for confirmation, select "OK" and press ENTER. To view the selected title or scene, select "Check" and press ENTER.
To cancel dubbing, press RETURN.

14 Select "Dubbing," and press ENTER. Dubbing starts.

To stop dubbing

Press STOP

Note that it may take a few seconds for the recorder to stop dubbing

Ö Hints

- The brightness of the playback picture may differ from The brightness of the playback picture may differ from normal DVD playback picture.
 The DVD playback time may differ slightly from the VHS tape counter value.
 The sound being played back (main, sub, etc.) is the dubbed sound.

Notes

- Dubbing stops when:

 the DVD is played back to the end and stops.

 the DVD dock or the VHS video deck is stopped.

 the tape remaining time runs out.

 the System Menu, OPTIONS menu, and information display are not displayed during dubbing.

 Copyrights

 Recordings made from discs and other copyrighted material are solely for individual enjoyment, and other unauthorized use is prohibited under copyright law.
- Unauthorized editing of copyrighted material is
- prohibited under copyright law.

 Once you eject the disc, the Program Dubbing List is erased.

Finalizing a Disc (Preparing a Disc for Playback on Other Equipment)

+RW -RWVR -RWvideo +R -RVR -Rvideo

Finalizing is necessary in order to play discs recorded with this recorder on other DVD

recorace with this recorace on other DVD equipment.
When you finalize a DVD+RW/DVD-RW (Video mode);DVD+R/DVD-R (Video mode), a DVD menu will be automatically created, which can be displayed on other DVD equipment.
Before finalizing, check the differences between the disc types in the table below.

Differences between the disc types

Discs are automatically finalized when removed from the recorder. If you want to record on it again, reformat the disc (page 67). Note however, that reformatting a disc erases all its contents.

Finalizing is unnecessary when playing a Finalizing is unnecessary when playing a discs on VR format compatible equipment. Even if your other DVD equipment is VR format compatible, you may need to finalize the disc, especially if the recording time is short. After finalizing, you cannot edit or record on the disc. If you want to edit or record on it again, unfinalize or reformat the disc (page 67). Note however, that reformatting a disc erases all its contents.

Finalizing is necessary in order to play on equipment other than this recorder. After finalizing, you cannot edit or record on the disc. If you want to edit or record on it again, unfinalize or reformat the disc (page 67). Note however, that reformatting a disc erases all its contents. -RWvideo contents.

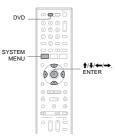
> Finalizing is necessary in order to play rmanzing is necessary in other to play on equipment other than this recorder. The finalized discs can be played on other VR mode compatible players. After finalizing, you cannot further edit or record on the disc.

+R Finalizing is necessary in order to play on equipment other than this recorder.
-Rutes After finalizing, you cannot further edit or record on the disc.

→continued 87

(TAPE ↑

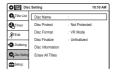
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- 1 Press DVD to operate the DVD recorder.
- 2 Insert a disc.
- 3 Press SYSTEM MENU while the recorder is in stop mode.

The System Menu appears

4 Select "Disc Setting," and press ENTER. The "Disc Setting" display appears.



5 Select "Disc Finalize," and press ENTER. The display asks for confirmation



6 Select "Finalize," and press ENTER. The display asks for confirmation again



7 Select "OK," and press ENTER.

Press SYSTEM MENU

To unfinalize a DVD-RW (VR mode)

If you cannot record or edit on a DVD-RW (VR mode) that has been finalized, unfinalize the disc by selecting "Unfinalize" in step 6 above.

- Ç Hints

 You can check whether the disc has been finalized or not. If you cannot select "Finalize" in step 6 above, the disc has already been finalized.

 To check the disc information, select "Disc Information" in the "Disc Setting" display and press ENTER. See page 67 for details.

- Depending on the condition of the disc, the recording, or the DVD equipment, discs may not play even if the discs are finalized. The recorder may not be able to finalize a disc if it was recorded on another recorder.

DV/D8 Dubbing (DV/D8 → DVD)

Before DV/D8 Dubbing

This section explains dubbing with a digital video rins section explains duroning with a digital video camera via the DV IN jack on the front panel. If you want to dub by way of the LINE IN jacks, see "Recording From Another VCR or Similar Device" on page 54.

To record from the DV IN jack

The DV IN Jack on this recorder conforms to the i.L.INK standard. You can connect any other equipment that has an i.L.INK (DV) jack, and record digital signals.

Follow the instructions in "Connecting a Digital Video Camera to the DV IN Jack," and then move on the baseful one of dubling the record of the property of

on to the section on dubbing. For more information about i.LINK, see "About i.LINK" on page 113.

V HINT

If you plan to do additional editing on a disc after the initial dub, use the DV IN jack and record on a DVD-RW (VR mode) or DVD-R (VR mode). Note that crasing unwanted scenes does not free up disc space for DVD-Rs (VR mode).

Connecting a Digital Video Camera to the DV IN Jack

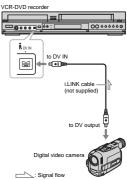
ou can connect a digital video camera to the DV You can connect a digital video camera to the DV IN jack on the recorder to record or edit from a DV/D8 format tape. Operation is straightforward because the DVD recorder will fast forward and newind the tape for you – you do not need to operate your digital video camera. Do the following to start using the "DV/D8 Edit" functions of this recorder.

See the instruction manual supplied with the digital video camera as well before connecting.

Notes

- The DV IN jack is for input only. It will not output
- The DV IN Jack is for input only, it will not output signals.
 You cannot use the DV IN Jack when:
 —your digital video camera does not work with this recorder. Connect the camera to the LINE IN Jack and follow the instructions of "Recording From Another VCR or Similar Device" on page 54.
 —the input signal is not in DVC-SD format. Do not connect a MICROMY format digital video camera own if it has no 11 INK inch.
- even if it has an i.LINK jack.
 the images on the tape contain copy protection signals, which limit recording.

Hookups



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(TAPE ↑

Dubbing From a DV/D8 Format Tape to a DVD

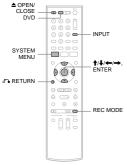
+RW -RWVR -RWVideo +R -RVR -RVideo

You can record a DV/D8 format tape onto a disc. The recorder controls the digital video camera. The recorder controls the digital video camera. You can fast forward, rewind, play in slow motion, and stop the tape to select the scenes using the on-screen menu.

To simply dub the entire contents of a DV/D8 format tape (One Touch Dubbing), see page 93.

• How titles and chapters are created

The dubbed contents on the disc become one title, and the title is then divided into chapters at either 5 or 15-minute intervals, according to the "DVD Auto Chapter" setting of "Features" in the "Setup" display.



- Press DVD to operate the DVD recorder.



3 Press ■ OPEN/CLOSE to close the disc

tray. Wait until "LOAD" disappears from the front

panel display.
Unused discs are automatically formatted. For the DVD-RW/DVD-R's recording format (VR mode or Video mode), see "Formatting a new disc" on page 47.

Insert the source DV/D8 format tape into your digital video camera. For the recorder to record or edit, your digital

video camera must be set to video playback

- 5 Press INPUT repeatedly to select "DV."
- 6 Press REC MODE repeatedly to select the recording mode.
 For details about the recording mode, see

page 46.

7 Press SYSTEM MENU while the recorder is in stop mode. The System Menu appears.

8 Select "Setup," and press ENTER.



9 Select "Audio," and press ENTER



10 Select "DV/D8 Audio Input," and press ENTER.



"Stereo 1": Records original sound only. Normally select this when dubbing a DV

format tape.
"Stereo 2": Records additional audio only. "Mix": Records original and additional

a second audio channel when recording with your digital video camera. For the details, see page 100.

11 Select an option, and press ENTER.

12 Press 🔊 RETURN twice.

13 Select "Dubbing," and press ENTER.

O細 Dub	bing	10:10 AM
(A)Title List	Simple Dubbing	
Timer	Program Dubbing	
ØEdt .	DV/D8 Dubbing	
Dubbing		
Q Disc Setting		
€ Setup		

14 Select "DV/D8 Dubbing," and press ENTER.



15 Select "DV/D8 Simple Dubbing," and press ENTER.

The following display appears.

→continued 91 92

DV/D8 Dubbing (DV/D8 →

DV Tape Mode 44 II II I+ 0> ++ 0

If "DV" or "DV Camera Mode" is displayed in DV of DV Camera Mode," check that the digital video camera is correctly connected and its power turned on, and that its mode is set for dubbing.

16 Find the dubbing start point on the tape,

and stop or pause playback.

Press ←→ to select ← , ■, ■, ▶, ▷, or

→ on the TV screen and press ENTER to find the point, and stop or pause with ■ or ■.

17 Press → to select ● on the TV screen, and press ENTER. Dubbing starts

To stop recording

Select ■ on the TV screen, and press ENTER.

Note that it may take a few seconds for the recorder to stop recording.

To turn off the display for DV/D8 dubbing Press INPUT.

If "DV Camera Mode" appears on the screen, you can use

on the TV screen to record the camera image directly

- If you want to play the disc on other DVD equipment, finalize the disc (page 88).

- finalize the disc (page 88).

 You cannot connect more than one piece of digital video equipment to the recorder.

 You cannot record the date, time, or contents of a DV/ B8 format tape tonto the disc.

 If you record from a DV/D8 format tape with a soundtrack that is recorded in multiple sampling frequencies (48 kHz, 441. kHz, or 32 kHz), no sound, or an unnatural sound will be output when playing back the sampling frequency switch point on the disc.

 The recorded picture may be momentarily affected if
- The recorded picture may be momentarily affected in the picture size of the source image changes, or if there is nothing recorded on the tape.
 Noise may occur when you switch the audio sampling mode (48 kHz/16 bits → 32 kHz/12 bits).

Dubbing an entire DV/D8 format tape to a DVD (One Touch Dubbing)

+RW -RWVR -RWvideo +R -RVR -Rvideo

You can record the entire contents of a DV/D8 format tape onto a disc with a single press of the ONE-TOUCH DUBBING button. The recorder controls the digital video camera for the whole process, and completes the recording.



Follow steps 1 to 11 of "Dubbing From a DV/D8 Format Tape to a DVD" (page 91), and press SYSTEM MENU to turn off the display.

2 Press ONE-TOUCH DUBBING on the recorder. The recorder rewinds the tape in the digital

video camera and then starts recording the tape contents from the beginning.

When playback of the tape stops, One Touch Dubbing ends automatically.

To stop recording

Press (stop).

Note that it may take a few seconds for the recorder to stop recording.

Q* Hint
You can also perform One Touch Dubbing when you
select "DV/D8 One Touch Dubbing" and press ENTER
in step 15 of "Dubbing From a DV/D8 Format Tape to a
DVD" on page 91. Follow the instructions appearing on
the TV screen.

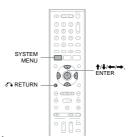
Settings and Adjustr

Using the Setup Displays

By using the setup displays, you can make various by using the setup displays, you can make various adjustments to items such as picture and sound, as well as select a language for the subtitles.

The setup displays are used in the following way.

Playback settings stored on the disc take priority over the setup display settings, and not all of the functions described may work.



1 Press SYSTEM MENU while the recorder is in stop mode. The System Menu appears

O Title	List (Original)	10:10 AM
Title List	Press ENTER :	
PEdit	Title Menu for DVD Title List.	
Dubbing		
O _p Disc Setting		
Setup		

2 Select "Setup," and press ENTER.

The "Setup" display appears

No Disc Set	up	10:10 AM
(A) Title List	Clock Set	
Timer	Video	
\$0 Edit	Audio	
71	Features	
Dubbing	Options	
Q Disc Setting	Easy Setup	
Setup		

3 Select "Clock Set," "Video," "Audio," "Features," "Options," or "Easy Setup," and press ENTER.

The selected setup display appears. Example: "Video" setup

O N Vide	10	10:10 AM
R Title List	TV Type	: 4:3 Letter Box
Timer	HDMI Resolution	: Auto
\$0 Edit	Video (HDMI)	: Y Cb Cr
4	Black Level	: On
Dubbing Dubbing	Picture Control	: Standard
C Disc Setting	Progressive	: Off
Setup		

4 Select the item you want to set up, and press ENTER.

Available options for the item appear. Example: "TV Type"

O W Vide	10	10:10 AN
(Title List	TV Type	: 16:9
Timer	HDMI Resolution	√ 4:3 Letter Box
\$PEdit	Video (HDMI)	4:3 Pan Scan
1	Black Level	: On
Dubbing	Picture Control	: Standard
O _p Disc Setting	Progressive	: Off
Setup		

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DV/D8 Dubbing

(DV/D8

Some items display a dialog box that requires additional settings.

Example: When "Parental" in "Options'

setup is selected.



5 Select an option, and press ENTER. The currently selected option is displayed next to the setup item. Example: When "16:9" is set.

O Pilo	•		10:10 AM
Title List	TV Type	: 16:9	
Timer	HDMI Resolution	: Auto	
\$PEdit	Video (HDMI)	: Y Cb Cr	
4	Black Level	: On	
Dubbing	Picture Control	: Standard	
C Disc Setting	Progressive	: Off	
Setup			

To return to the previous display Press & RETURN.

To turn off the display Press SYSTEM MENU

Clock Setting (Clock Set)

The "Clock Set" setup allows you to make clock settings for the recorder.

- 1 Press SYSTEM MENU while the recorder is in stop mode.
- 2 Select "Setup," and press ENTER.
- 3 Select "Clock Set," and press ENTER. The clock setting display appears.



4 Press ↑/♣ to set the month, and press Set the day, year, hour, minutes, and AM/PM in sequence. Press ←/→ to select the item to be set, then press \uparrow/\downarrow to set the item. The day of the week is set automatically.

5 Press ENTER to start the clock

Video Settings (Video)

The "Video" setup allows you to adjust items related to the image, such as size and color. Choose the settings according to the type of TV, tuner, or decoder connected to the recorder.

- 1 Press SYSTEM MENU while the recorder is
- 2 Select "Setup," and press ENTER.
- $\boldsymbol{3}$ Select "Video," and press ENTER.

The "Video" setup appears with the following options. The default settings are underlined.



TV Type

Selects the aspect ratio of the connected TV (4:3 standard or wide).

16:9	Select this when connecting to a wide-screen TV or TV with a wide mode function.
4:3 Letter Box	Select this when connecting to a 4:3 screen TV. Displays a wide picture with bands on the upper and lower portions of the screen.
4:3 Pan Scan	Select this when connecting to a 4:3 screen TV. Automatically displays a wide picture on the entire screen and cuts off the portions that do not fit.

16:9



4:3 Letter Box



4:3 Pan Scan



Depending on the disc, "4:3 Letter Box" may be selected automatically instead of "4:3 Pan Scan" or vice versa.

HDMI Resolution

Robin the Subului

Selects the type of video signals output from the HDMI OUT jack. When you select "Auto" (default), the recorder outputs video signals of the highest resolution acceptable for your TV. If the picture is not clear, unnatural or not to your satisfaction, try another option that suits the disc satisfaction, try another option that suits the disc and your TV/projector, etc. For details, refer also to the instruction manual supplied with the TV/ projector, etc. The setting is effective only when you connect a HDMI equipped TV to the HDMI OUT jack.

Auto	Normally, select this.
1920×1080i	Sends 1920×1080i video signals.
1280×720P	Sends 1280×720p video signals.
720×480P	Sends 720×480p video signals.
Video (UDMI)	

Selects the type of output from the HDMI OUT

The setting is effective only when you connect a

HDMI equipped I v to the HDMI OUT Jack.	
Y Cb Cr	Normally, select this when connecting to an HDMI device.
	Gives brighter colors and deeper black. Select this if colors are weak.

95 96

Black Level

Selects the black level (setup level) for the video signals output from the LINE OUT jacks

signals output from the LINE OUT Jacks (page 15).
This setting is not effective when the recorder outputs progressive signals.

	0
<u>On</u>	Raises the standard black level. Select this when the picture appears too dark.
Off	Sets the black level of the output signal to the standard level.

Picture Control

Selects the picture control for the video signal output from the LINE OUT jacks (page 15). You can adjust the video signal of DVD or VIDEO CD (with PBC function off) from the recorder to obtain the picture quality you want. Select the setting that best suits the program you

are watching.	
Dynamic 1	Produces a bold dynamic picture by increasing the picture contrast and the color.
Dynamic 2	Produces a more dynamic picture than "Dynamic 1" by further increasing the picture contrast and the color.
Standard	Displays a standard picture (function turned off).
Cinema 1	White colors become brighter and black colors become richer, and the color contrast is increased.
Cinema 2	Enhances details in dark areas by increasing the black level.
Personal	Adjusts "Contrast," "Brightness," "Color," and "Hue" using ♠/♣/ ←/→.

" Hint When you watch a movie, "Cinema 1" or "Cinema 2" is

If your TV accepts progressive (480p) format signals, you will enjoy accurate color reproduction and high quality image.

Connect your TV to the COMPONENT VIDEO OUT jacks (page 17).

On	Sets the recorder to output progressive signals.
Off	Outputs video signals in interlace format.

Notes

If you select progressive signals when you connect the recorder to a TV that cannot accept the signal in progressive format, the image quality will deteriorate. In this case, set "Progressive" to "Off." Or, press DVD in stop mode to operate the DVD recorder, and then hold down II PAUSE on the recorder for five seconds or more.

When you connect your TV using an HDMI cable, the
 "Progressive" setting is set to "On."

The "Audio" setup allows you to adjust the sound according to the playback and connection

- 1 Press SYSTEM MENU while the recorder is in stop mode.
- 2 Select "Setup," and press ENTER.

Audio Settings (Audio)

3 Select "Audio," and press ENTER.

The "Audio" setup appears with the following options. The default settings are underlined.

O Audio	10:10 AM
Title List Digital Out	
Timer Downmix	: Dolby Surround
SP Edit Audio DRC	: Standard
Audio (HDMI)	: Auto
Dubbing Scan Audio	: On
O Disc Setting Surround	: Off
Setup DV/D8 Audio Input	: Stereo 1
Line Audio Irout	Steren

The following setup items switch the method of outputting audio signals when you connect a component such as an amplifier (receiver) to the DIGITAL AUDIO OUT (OPTICAL or

COAXIAL/HDMI OUT jack.
For connection details, see "Connecting to Y
AV Amplifier (Receiver)" on page 18.
Press ENTER, and select "Dolby Digital" or "DTS.



If you connect a component that does not accept the selected audio signal, a loud noise (or no sound) will come out from the speakers, and may affect your ears or cause speaker damage.

◆ Dolby Digital (DVDs only)

selects the type of Dolby Digital signal.		
D-PCM	Select this when the recorder is connected to an audio component lacking a built-in Dolby Digital decoder. You can select whether the signals conform to Dolby Surround or not by making adjustments to the "Downmix" item in "Audio" setup (page 99).	
Dolby Digital	Select this when the recorder is connected to an audio component with a built-in Dolby Digital decoder.	

If the HDMI OUT jack is connected to equipment not compatible with Dolby Digital signals, D-PCM signals will be automatically output, even when "Dolby Digital" is selected.

♦ DTS (DVD VIDEOs only)

selects whether of not to output B 15 signals		
On	Select this when the recorder is connected to an audio component with a built-in DTS decoder.	
Off	Select this when the recorder is connected to an audio component without a built-in DTS decoder.	

Note

If the HDMI OUT jack is connected to equipment not compatible with DTS signals, no signal will be output, regardless of the "DTS" setting.

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Settings and Adjustments

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Downmix (DVDs only)

Switches the method for mixing down to two channels when you play a DVD which has rear channels when you play a DVD which has rear sound elements (channels) or is recorded in Dolby Digital format. For details on the rear signal components, see "O Connecting to audio L/R jacks" on page 19. This function affects the output of the following jacks:

—LINE OUT (AUDIO L/R) jacks

AUDIO L/R Jin jacks

- AUDIO OUT L/R jacks DIGITAL AUDIO OUT (OPTICAL or COAXIAL)/HDMI OUT jack when "Dolby Digital" is set to "D-PCM" (page 98).

Dolby Surround	Normally select this position. Multi-channel audio signals are output to two channels for enjoying surround sounds.
Normal	Multi-channel audio signals are downmixed to two channels for use with your stereo.

To enjoy the surround effect of Dolby Digital, turn off the surround settings of this recorder (page 99).

Audio DRC (Dynamic Range Control) (DVDs

only)

Makes the sound clear when the volume is turned down when playing a DVD that conforms to "Audio DRC." This affects the output from the following jacks:

- LINE OUT (AUDIO L/R) jacks
- AUDIO OUT L/R jacks
- DIGITAL AUDIO OUT (OPTICAL or COAXIAL)/HDMI OUT jack only when "Dolby Digital" is set to "D-PCM" (page 98).

Standard	Normally select this position.
TV Mode	Makes low sounds clear even if you turn the volume down.
Wide Range	Gives you the feeling of being at a live performance.

Audio (HDMI) (DVD VIDEOs only)

Selects the output method from the HDMI OUT

Auto	Normally, select this. Outputs audio signals according to the "Dolby Digital" or "DTS" settings (page 98).
PCM	Converts Dolby Digital or DTS to PCM.

Scan Audio (DVDs only)

countitude (2120 cm)	
<u>On</u>	Outputs audio signals during FF1 fast-forward of a DVD disc with Dolby Digital soundtracks.
Off	No sound is output during FF1 fast-forward.

Note

nterrupted during Scan Audio

Surround

Turns on the surround function to create virtual rear speakers from a stereo TV or two separate front speakers (page 19).

Off	No surround effect
Surround1	Creates one set of virtual surround speakers
Surround2	Creates two sets of virtual surround speakers
Surround3	Creates three sets of virtual surround speakers

- When the playback signal does not contain a signal for the surround speakers, the surround effects will be difficult to hear.
- When you select one of the surround modes, turn off the surround settings of the connected TV or amplifier (receiver).

DV/D8 Audio Input

Stereo 1	Records original sound only. Normally select this when dubbing a DV format tape.
Stereo 2	Records additional audio only.
Mix	Records both original and additional sounds.

Select "Stereo 2" or "Mix" if you have added a second audio channel when recording with your digital video

Line Audio Input

When recording from equipment connected to the LINE 1 IN or LINE 2 IN jacks to a DVD disc in this recorder, select line input audio.

Stereo	Records stereo sound only.
Main/Sub	Records the two different soundtracks on DVD-RWs (VR mode)/DVD-Rs (VR mode). You can select either soundtrack when playing back the disc.

2 Hint When recording on a disc other than DVD-RWs (VR node)/DVD-Rs (VR mode), select either sound track with the connected equipment before recording.

Recording, Set Top Box Control, and VCR Settings (Features)

The "Features" setup allows you to make various settings for recording, playback, and the set top box control function.

- 1 Press SYSTEM MENU while the recorder is in stop mode.
- Select "Setup," and press ENTER.
- Select "Features," and press ENTER.

The "Features" setup appears with the following options. The default settings are underlined.

O Feat	ures		10:10 AM
Title List	DVD Auto Chapter	: 5 Min	
Timer	Format DVD-RW	: VR	
SPEdit .	VCR Function		
/1	Synchro Recording	: to DVD	
Dubbing Dubbing	Set Top Bax Control		
O Disc Setting			
⊞ Setup			

DVD Auto Chapter

Automatically divides a recording (a title) into chapters by inserting chapter markings at specified intervals. The markings are inserted while the recording is being made.

Off	No chapter mark is inserted.
5 Min	Inserts chapter marks at approximately 5 minute intervals.
15 Min	Inserts chapter marks at approximately 15 minute intervals.

Actual intervals may differ depending on the size of the recording. The selected setting should be regarded as an approximate chapter interval.

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and Adjustments

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Format DVD-RW (DVD-RWs only)

Selects the recording format for an unused DVD-RW, when first inserted.

<u>VR</u>	Automatically formats the disc in VR mode.
Video	Automatically formats the disc in Video mode.

Press ENTER and select "Tape Length," "Auto Play," or "Auto Repeat."

◆ Tape Length

<u>T120</u>	For T-120 or shorter length tapes.
T160	For T-160 length tapes.
T180	For T-180 or longer length tapes.

◆ Auto Play

<u>On</u>	Starts playback automatically, when you insert a tape with its safety tab removed.
Off	Turns off the function. You need to press ▷ PLAY to start playback, even if you insert a tape with its safety tab removed.

♦ Auto Repeat

On	Plays back a tape repeatedly. The VCR rewinds the tape to the beginning and restarts playback automatically.
Off	Turns off the function.

Synchro Recording

to DVD	Sets the recorder to record programs from connected equipment that has a timer function (such as a satellite tuner) to a DVD disc.
to VIDEO	Sets the recorder to record programs from connected equipment that has a timer function (such as a satellite tuner) to a VHS tape.

Set Top Box Control

You can control your cable box/satellite receiver using the supplied set top box controller. See "Step 7: Easy Setup" for details. Press ENTER, and select "On" or "Off."

On	Turns on the cable box/satellite receiver control function. See "Using the cable box/satellite receiver control function" (page 12).
Off	Turns off the cable box/satellite receiver control function. Select this if you do not want to use the supplied set top box controller.

When "Set Top Box Control" is set to "On," you can make the following settings. Note that when you change "Set Top Box Control" to "On" or "Off," all timer recording settings will be canceled.

◆ Brand Code See "Cable Box/Satellite Receiver Brand Code"

(page 121) for the brand code for your cable box or satellite receiver, and enter the code using the number buttons and ENTER. **◆** Connections

Selects the connection you used for your cable box or satellite receiver. Select the connection from "Line1" or "Line2."

♦ Ch. Digit lock

Allows you to select whether to fix the digits for your cable box or satellite receiver.

Off	Select this when your cable box or satellite receiver only accepts a three or more digit channel number. Normally select this.
Lock to 2 digits	Select this only when your cable box or satellite receiver only accepts a two digit channel number.

♦ Mode for SET button
Select "Mode 1" or "Mode 2" if your cable box or Select Mode 1 or Mode 2 it your cane box or satellite receiver requires pressing an ENTER button or a SET button etc., after entering the channel number. If "Mode 1" does not work, try "Mode 2." If your cable box or satellite receiver does not respond to either setting, contact the manufacturer of the cable box or satellite receiver.

Off	No code is sent when SET is pressed. Normally select this.
Mode 1	Sends the channel number you entered.
Mode 2	Sends the channel number you entered.

Language, Parental Control **Settings/Factory Settings** (Options)

The "Options" setup allows you to set up other

- 1 Press SYSTEM MENU while the recorder is in stop mode.
- 2 Select "Setup," and press ENTER.
- 3 Select "Options," and press ENTER. The "Options" setup appears with the following options. The default settings are underlined.

ons		10:10 AM
Language		
Parental		
Front Display	: Auto	
Command Mode	: DVD 3	
Factory Setting		
	Language Parental Front Display Command Mode	Language Parental Front Display : Auto Command Mode : DVD 3

Language

♦ OSD (On-Screen Display)

Switches the display language on the screen.

◆ Disc Menu (DVD VIDEOs only)
Switches the language for the DVD menu.

◆ Audio (DVD VIDEOs only)

Switches the language of the soundtrack.
When you select "Original," the language given priority in the disc is selected.

◆ Subtitle (DVD VIDEOs only)

Switches the language of the subtitles recorded on

the disc.

When you select "Auto," the subtitle language changes according to the language you selected for the soundtrack. See page 120 for an explanation of the language abbreviations.

If you select a language in "Disc Menu," "Subtitle," or "Audio" that is not recorded on the DVD VIDEO, one of the recorded languages will be automatically selected.

and Adjustments

Parental (DVD VIDEOs only)
Playback of some DVD VIDEOs can be limited according to a predetermined level, such as the age of the users. Scenes may be blocked or replaced with different scenes.

- After step 3 above, select "Parental," and press ENTER.
 - press ENTER.
 If you have not entered a password, the display for registering a new password

Enter a 4-digit password using the number buttons

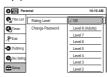


The display for confirming the password appears.
Re-enter the password.



· When you have already registered a password, the display for entering the password appears.
Enter a 4-digit password using the number

O∰ Er 2 Select "Rating Level," and press ENTER. The selection items for "Rating Level" are displayed.



The lower the value, the stricter the limitation.

- 3 Select the level, and press ENTER. The Parental setting is compl
- To cancel the Parental setting for the disc, set "Rating Level" to "Off" in step 3.
 To change the password, select "Change Password" in step 2, and press ENTER. When the display for registering a password appears, enter a new four-digit password using the number buttons.

♥ HintIf you enter a wrong number, press ← or CLEAR and re-

Notes

- If you forget your password, select "Factory Setting" of "Options" in the "Setup" display.
 Playback of discs without the Parental Control function
- cannot be limited on this recorder
- Depending on the disc, you may be asked to change the Parental Control level while playing the disc. In this case, enter your password, then change the level.

Front Display

Adjusts the lighting of the front panel display

Auto	Adjusts to low lighting when power is off.
Bright	Maintains bright lighting when power is off.
Dimmer	Maintains low lighting regardless of whether power is on or off.
Off	Turns off the lighting when power is off. Maintains the lighting when power is on.

Command Mode

Changes the command mode of this recorder if other DVD equipment is assigned the same command mode. Be sure to match the command mode of the supplied remote to the setting made here. For details, see "If you have a Sony DVD player or more than one Sony DVD recorder" or page 22.

DVD 1	Select this if the default command mode conflicts with other DVD equipment.
DVD 2	Select this if the default command mode conflicts with other DVD equipment.
DVD 3	The default command mode of the recorder.

Factory Setting

Allows you to return the setup settings to their default settings. Note that all of your previous settings will be lost.

- 1 After step 3 on page 102, select "Factory Setting," and press ENTER.
- Select "Start," and press ENTER. The setup settings return to their default settings.
- Press ENTER when "Finish" appears. The power automatically turns off and then on again, and the recorder is reset to the factory When the "Easy Setup" display appears, follow the instructions for Easy Setup (page 23) from step 4.

Easy Setup (Resetting the Recorder)

Select this to run the Easy Setup program

- 1 Press SYSTEM MENU while the recorder is in stop mode.
- Select "Setup." and press ENTER.
- 3 Select "Easy Setup," and press ENTER.



- 4 Select "Start," and press ENTER.
- 5 Follow the instructions for Easy Setup (page 23) from step 5.

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Troubleshooting

If you experience any of the following difficulties If you experience any of the fortowing difficulties while using the recorder, use this troubleshooting guide to help remedy the problem before requesting repairs. Should any problem persist, consult your nearest Sony dealer.

Power

The power does not turn on.

→ Check that the AC power cord is connected securely.

Picture

There is no picture.

- Indee is no picture.

 Re-connect all connecting cords securely.

 The connecting cords are damaged.

 Check the connection to your TV (page 12).

 Switch the input selector on your TV (such as to "VIDEO") so that the signal from the recorder appears on the TV screen.

Picture noise appears.

- Check the connection to your TV (page 12) and switch the input selector on your TV so that the signal from the recorder appears on the TV
- ⇒ ff the picture output signal from your recorder passes through your VCR to get to your TV, or if you are connected to a combination TV/VIDEO you are connected to a commination IV/UDEO player, the copy-protection signal applied to some DVD programs could affect picture quality. If you still experience this problem even when you connect your recorder directly to your TV, try connecting your recorder to your TV's S VIDEO input.
- You have set the recorder to progressive format To in nave set the recorder to progressive format even though your TV cannot accept the progressive signal. In this case, set "Progressive" to "Off" in "Video" setup (page 97), or press DVD in stop mode to operate the DVD recorder and then hold down II PAUSE on the recorder for five seconds or more.
 ⇒ Even if your TV is compatible with progressive format/(48/bi) signals, the image may be affected.
- format (480p) signals, the image may be affected when you set the recorder to progressive format. In this case, set "Progressive" to "Off" in "Video" setup (page 97), or press DVD in stop

operate the DVD recorder and then hold down II PAUSE on the recorder for five seconds

There is no picture or the picture noise appears when connected to the DV IN jack.

→ Try the following: ①Turn the recorder off and on again. ②Turn the connected equipment off and on again. ③Disconnect and then connect the i.LINK cable again.

There is no picture or the picture noise appears

- There is no picture or the picture noise appears when connected to the HDM IOT jack.
 → Try the following: ①Turn the recorder off and on again. ②Turn the connected equipment off and on again. ③Disconnect and then connect the HDM cord again.
 → If the HDM IOUT jack is used for video output, changing the "HDM Pascolution" setting in the
- changing the "HDMI Resolution" setting in the changing the "HDMI Resolution" setting in the "Video" setup may solve the problem (page 96). Connect the TV and the recorder using a video jack other than the HDMI OUT, and switch the TV's input to the connected video input so that you can see the on-screen displays. Change the "HDMI Resolution" setting in the "Video" setup, and switch the TV's inner best to HDMI If the and switch the TV's input back to HDMI. If the picture still does not appear, repeat the steps and try other options.
- The recorder is connected to an input device that is not HDCP compliant (page 16).

The channel on the cable hox/satellite receiver has been changed.

→ The set top box controller is connected and "Set Top Box Control" is set to "On." Check the "Set Top Box Control" settings in "Features" setup

The picture from equipment connected to the recorder's input jack does not appear on the

→ If the equipment is connected to the LINE 1 IN If the equipment is connected to the LINE 1 N jack, select "LINE1" in the front panel display by pressing INPUT.

If the equipment is connected to the LINE 2 IN jacks, select "LINE2" in the front panel display by pressing INPUT.

The playback picture or TV program from the equipment connected through the recorder is

→ If the playback picture output from a DVD If the playback picture output from a DVD player, VCR, or tuner goes through your recorder before reaching your TV, the copy-protection signal applied to some programs could affect picture quality. Disconnect the playback equipment in question and connect it directly to your TV.

The picture does not fill the screen

Set "TV Type" in "Video" setup to fit the aspect ratio of your TV (page 96).

The picture does not fill the screen, even though the aspect ratio is set in "TV Type" in

"Video" setup.

→ The aspect ratio of the disc is fixed on your DVD.

Sound

There is no sound.

- There is no sound.

 → Re-connect all connections securely.

 → The input source setting on the amplifier or the connection to the amplifier is incorrect.

 → The recorder is in reverse play, fast-forward, slow motion, or pause mode.

 → If the audio signal does not come through the DIGITAL AUDIO OUT (OPTICAL or COAYIAL) jack check the "Audio" setup. COAXIAL) jack, check the "Audio" setup settings (page 98).

No sound is output from the HDMI OUT jack.

- Try the following: ①Turn the recorder off and on again. ②Turn the connected equipment off and on again. ③Disconnect and then connect the HDMI cord as
- → The HDMI OUT jack is connected to a DVI device (DVI jacks do not accept audio signals).
 → The equipment connected to the HDMI OUT jack does not conform to the audio signal format.

When playing a CD with DTS soundtracks, noise will come from the LINE OUT (AUDIO L/R) or AUDIO OUT L/R jacks (page 37).

The sound volume is low.

The sound volume is low on some DVDs The sound volume may improve if you set "Audio DRC" in "Audio" setup to "Wide

An alternate audio track cannot be recorded or played.

- If you have connected an AV amplifier to the DIGITAL AUDIO OUT (OPTICAL or DIGITAL AUDIO OUT (OPTICAL or COASIAL) jack and wan to change the audio track for a DVD-RW (VR mode) DVD-R (VR mode) during playback, set "Dolby Digital" in "Audio" setup to "D-PCM" (page 98).
 When recording to a disc other than DVD-RWs (VR mode)/DVD-Rs (VR mode), set "Line "Audio" in "the Life" in "the Life"
- Audio Input" in "Audio" setup to "Stereo.'

DVD Playback

- The disc does not play.

 → The disc is upside down. Insert the disc with the labeled side facing up.

 → The disc is not correctly inserted.

 → Moisture has condensed inside the recorder.

 Remove the disc and leave the recorder turned on for the label on how with the preferred to the label. for about half an hour until the moisture evaporates.
- If the disc was recorded on another recorder, the recorder cannot play the disc if it was not finalized (page 88).

The disc does not start playback from the

- Resume play was activated (page 38).
- You have inserted a disc whose Title menu or DVD menu automatically appears on the TV screen when it is first inserted. Use the menu to start playback.

The recorder starts playing the disc

automatically.

→ The DVD VIDEO features an auto playback

Playback stops automatically.

If the disc has an auto pause signal, the recorder stops playback at the auto pause signal.

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Some functions such as Stop, Search, or Slowmotion Play cannot be performed.

- Depending on the disc, you may not be able to do some of the operations above. See the instruction manual supplied with the disc.

 While the recorder is reading disc information, playback operations will not work.

The language for the soundtrack cannot be changed.

- → Multilingual tracks are not recorded on the disc
- being played.

 The DVD VIDEO prohibits the changing of the
- language for the soundtrack.

 Try changing the language using the DVD VIDEO's menu.

The subtitle language cannot be changed or turned off.

- → Multilingual subtitles are not recorded on the DVD VIDEO
- The DVD VIDEO prohibits changing of the
- subtitles.

 Try changing the subtitle using the DVD
- VIDEO's menu. The subtitles cannot be changed for the titles recorded on this recorder.

The angles cannot be changed.

- Wilti-angles are not recorded on the DVD VIDEO being played.
 You are trying to change the angles when "does not appear in the front panel display" The DVD VIDEO prohibits changing angles
- → The DVD VIDEO prohibits changing angres.
 → Try changing the angle using the DVD VIDEO's
- The angles cannot be changed for the titles recorded on this recorder.

The MP3 audio track cannot be played.

- The DATA CD is not recorded in the MP3 format that conforms to ISO9660 Level 1/
- → The MP3 audio track does not have the extension MP3
- → The data is not formatted in MP3 even though it has the extension ".MP3."
 The data is not MPEG1 Audio Layer 3 data
- The recorder cannot play audio tracks in MP3PRO format.

When playing a disc containing JPEG image files, "Photo" is selected (page 41).

- The JPEG image file cannot be played.

 → The DATA CD is not recorded in a JPEG for that conforms to ISO9660 Level 1/Level 2.
- The JPEG image file does not have the extensi ".JPG" or ".JPEG."
- → The data is not formatted in JPEG even though it has the extension "JPG" or "IPEG."

 The length or width of the image is more than 4,720 dots.
- When playing a disc containing MP3 audic tracks, "Music" is selected (page 42).

The title of the MP3 audio album/track or JPEG image folder/file is not correctly displayed.

The recorder can only display numbers an alphabet. Other characters are displayed as

DVD Recording/Timer recording/ **Editing**

The channel cannot be changed from the channel you are recording.

Set the TV's input source to "TV.

Recording does not start immediately after REC is pressed.

Operate the recorder only after "LOAD,"
"FORMAT," or "INF WRITE" disappears from
the front panel display.

Nothing was recorded even though the timer

- setting is set correctly.

 → There was a power failure during recording.
 → Disconnect the AC power cord from the AC outlet, and connect it again.
- The program contains copy protection signals
- that restrict copying.

 The program that starts first has priority and the The program that starts first has proorly and the second program starts recording only after the first program has finished. If the programs start at the same time, the program listed first in the menu has priority (page 50).
 There is no DVD inserted in the recorder.
 There is not enough disc space for the recording.
 The connected cable box/satellite receiver was furned off.

- turned off The set top box controller was incorrectly connected (page 12).

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VCR Playback

The playback picture does not appear on the TV

→ Make sure the TV is set to the channel for the VCR.

The picture is not clear.

- Adjust the tracking by the TRACKING +/-
- button.
 The video heads are dirty (see page 111). Clean
 the video heads using a Sony video head cleaning
 cassette. If a Sony cleaning cassette is not
 available in your area, have the heads cleaned at vour nearest Sony dealer (a standard service fee your nearest Sony dealer (a standard service fee will be charged). Do not use a commercially available liquid type cleaning cassette, as it may damage the video heads. The video heads may have to be replaced. Consult your local Sony dealer for more
- information
- → The tape is defective

The picture rolls vertically during picture

Adjust the vertical hold control on the TV or

The picture has no sound.

- → The tape is defective.
 → Check the audio cord connection.

A tape cannot be inserted.

Check that a tape is not already in the tape

VCR Recording

The channel cannot be changed from the one you are recording. → Set the TV's input source to "TV."

No TV program appears on the TV screen.

Make sure the TV is set to the channel for the VCR If a monitor is used, set it to video input,

The tape starts playing as soon as it is

The safety tab has been removed. To record on this tape, cover the tab hole.

The tape is ejected when ● REC is pressed. Check that the safety tab has not l

Nothing happens when ● REC is pressed.

VCR Timer recording The timer does not operate.

- Inter timer does not operate.

 Check that the clock is correctly set.

 Make sure a tape has been inserted.

 Check that the safety tab has not been removed.

 Make sure tape is not at its end.

 Make sure a program has been set for timer
- recording. → Make sure the timer settings are set for a future
- Check that the cable box is turned or
- "--:--" appears in the front panel display if the recorder is disconnected from the wall outlet for more than 30 minutes. Reset the clock and timer Turn the power off and unplug the AC power
- → The program that starts first has priority and the
- are program that starts into has priority and un-second program starts recording only after the first program has finished. If the programs star at the same time, the program listed first in the menu has priority (page 79).

The @ indicator flashes after timer recording is

Check that the safety tab has not been remo

The SYNCHRO REC indicator flashes after Synchro-Recording is set. → Check that the safety tab has not been removed.

Display

Menus or displays do not appear on the screen.

While the recorder is reading disc information the System Menu, OPTIONS menu, or information display will not appear.

"--:--" appears in the front panel display.

→ Set the clock again (page 95).

The @ indicator is flashing.

 → The disc does not have any space for recording
 → Insert a recordable disc or a tape with its safety tab in place inside the recorder.

The recording mode indication is incorrect.

Since the recording mode for recorded titles is Since the recording mode for recorded titles is calculated after sampling the recorded data during playback, it may be displayed differently from the mode you selected when recording. However, the actual recording itself is correctly made in the selected mode.

Remote control

The remote does not function

- The remote is too far from the recorder
- Turn on the recorder.
 The remote is not pointed at the remote sensor on the recorder.
 Different command modes are set for the
- recorder and remote. Set the same command mode (page 22).

Other Sony equipment responds to the remote.

The same command mode is set for both the Sony DVD equipment. Set a different comm mode for the recorder (page 22).

Others

The recorder does not operate properly.

- Restart the recorder. Press down I/ () on the recorder for more than ten seconds until "SONY
- recorder for more than ten seconds until "NONY DVD" appears in the front panel display. When static electricity, etc., causes the recorder to operate abnormally, turn off the recorder and wait until the clock appears in the front panel display. Then, unplug the recorder and after leaving it off for a while, plug it in again.

The disc tray does not open after you press

It may take a few seconds for the disc tray to open after you have recorded or edited a disc. This is because the recorder is adding disc data to

"Cannot record because of high temperature." appears on the TV screen.

→ The settings in "Set Top Box Control" in "Features" setup have been changed (page 101).

Recording does not stop immediately after

disc data before recording can stop

→ It will take a few seconds for the recorder to input

Timer recording is not complete or did not start

There was a power failure during recording.

→ The recorder's internal clock stopped due to a power failure that lasted for more than 30

→ The channel or input changed from the one you are recording.
→ The program that starts first has priority and the second program starts recording only after the first program has finished. If the programs start at the same time, the program listed first in the menu has priority (page 50).

→ There is not enough disc space for the recording.

The ② indicator flashes after timer recording is

→ The disc does not have any space for recording.
 → The disc has 99 or more titles, which prevents

The SYNCHRO REC indicator flashes after Synchro-Recording is set.

→ Insert a recordable disc (page 30).

→ Insert a disc with enough space for the recordin

→ The disc has 99 or more titles, which prevents

Contents previously recorded were erased. Data that has been recorded on a DVD with a PC will be erased from the disc when the disc is

Insert a recordable disc (page 30).

further recording.

The disc is protected (page 67).

further recording.

The disc is protected (page 67).

minutes. Reset the clock (page 95). → The channel or input changed from the one you

■ STOP is pressed.

puars on the I v screen.

Check that the vent on the rear of the recorder is not blocked. Then, turn off the recorder, wait until the clock appears in the front panel display, and disconnect the AC power cord. Leave the recorder off for a while, then re-connect the power cord, and press I'(¹) on the recorder.

"CHILD LOCK" appears in the front panel

display.

→ The recorder is locked. Cancel the Child Lock (page 38).

Control by AV mouse is not possible.

The Set Top Box Control function does not

Notes About This Recorder

On adjusting volume

Do not turn up the volume while listening to a section with very low level inputs or no audio signals. If you do, the speakers may be damaged when a peak level section is played.

Clean the cabinet, panel, and controls with a soft cloth slightly moistened with a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or

On cleaning discs, disc/lens cleaners Do not use cleaning discs or disc/lens cleaners (including wet or spray types). These may cause the apparatus to malfunction.

On replacement of parts

In the event that this unit is repaired, repaired parts may be collected for reuse or recycling purposes.

Notes about the discs

To keep the disc clean, handle the disc by its edge. Do not touch the surface. Dust, fingerprints, or scratches on the disc may cause it to malfunction.





- · Do not expose the disc to direct sunlight or heat both expose the distribution the assources such as hot air ducts, or leave it in a car parked in direct sunlight as the temperature may rise considerably inside the car.
 After playing, store the disc in its case.
- Clean the disc with a cleaning cloth. Wipe the disc from the center out.



- commercially available disc/lens cleaners, or anti-static spray intended for vinyl LPs.
- . Do not use the following discs

continued 109 110

- A disc that has a non-standard shape (e.g.,

- A disc that has a non-standard shape (e.g. card, heart).
 A disc with a label or sticker on it.
 A disc that has cellophane tape or sticker adhesive on it.

Symptoms caused by contaminated video







When the video heads are dirty, the picture is distorted or the tape cannot be played. Clean the video heads using a Sony video head cleaning cassette. If a Sony cleaning cassette is not available in your area, have the heads cleaned at your nearest Sony dealer (a standard service fee will be charged). Do not use a commercially available liquid type cleaning cassette, as it may damage the video heads.

About i.LINK

The DV IN jack on this recorder is an i.LINK-compliant DV IN jack. This section describes t i.LINK standard and its features.

What is i.LINK?

What is LLINK?

LLINK is a digital serial interface for handling digital video, digital audio and other data in two directions between equipment having the i.LINK jack, and for controlling other equipment.

i.LINK-compatible pieces of equipment can be connected by a single i.LINK cable. Possible productions of the production of the pr applications are operations and data transactions with various digital AV equipment. When two or more i.LINK-compatible equipment are connected to this recorder in a daisy chain connected to this recorder in a daisy chain, operations and data transactions are possible with not only the equipment that this recorder is connected to but also with other devices via the directly connected equipment.

Note, however, that the method of operation Note, however, that the method of operation sometimes varies according to the characteristics and specifications of the equipment to be connected, and that operations and data transactions are sometimes not possible on some connected equipment.

Note

Normally, only one piece of equipment can be connected to this recorder by the i.LINK cable (DV connecting cable). When connecting the secorder to i.LINK-compatible equipment having two or more i.LINK jacks (DV jacks), see the instruction manual of the equipment to be connected.

About the name "i.LINK"

i.LINK is a more familiar term for IEEE 1394 data transport bus proposed by SONY, and is a trademark approved by many corporations. IEEE 1394 is an international standard standardized by the Institute of Electrical and Electronics Engineers.

i.LINK baud rate

i.LINK's maximum baud rate varies according to the equipment. Three maximum baud rates are defined:

S100 (approx. 100 Mbps*) S200 (approx. 200 Mbps) S400 (approx. 400 Mbps)

The baud rate is listed under "Specifications" in the instruction manual of each equipment. It is also indicated near the i.LINK jack on some equipment.

equipment.

The maximum baud rate of equipment on which it is not indicated such as this unit is "S100."

When units are connected to equipment having a different maximum baud rate, the baud rate sometimes differs from the indicated baud rate.

What is Mbps?
Mbps stands for megabits per second, or the amount of data that can be sent or received in one second. For example, a board rate of 100 Mbps means that 100 megabits of data can be sent in one second.

i.LINK functions on this recorder

For details on how to dub when this recorder is connected to other video equipment having DV

connected to other video equipment having DV jacks, see page 90.

The DV jack on this recorder can only input DVC-SD signals. It cannot output signals. The DV jack will not accept MICROMV signals from equipment such as a MICROMV digital video camera with an iLINK jack. For further precautions, see the notes on page 90. For details on precautions when connecting this recorder, also see the instruction manuals for the equipment to be connected.

Required i.LINK cable

Use the Sony i.LINK 4-pin-to-4-pin cable (during DV/D8 dubbing).

i.LINK and i. are trademarks.

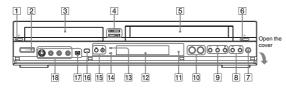
→continued 111

Guide to Parts and Controls

For more information, see the pages in parentheses.

Front panel

Buttons on the recorder have the same function as the buttons on the remote if they have the same or



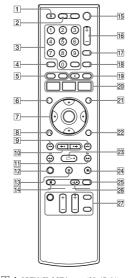
- $\boxed{1} \triangleq (\text{open/close}) \text{ button } (35, 47, 91)$
- 2 1/0 (on/standby) switch (23)
- 3 Disc tray (35, 47, 91)
- **4** DVD → button (85) ← VIDEO button (84) 5 Tape compartment (69, 76)
- **6** \(\text{eject} \) button (69)
- 7 REC (record) button (47, 76)
- (37) (rewind/fast-forward) buttons
- 9 > (play) button (35, 69)
 - II (pause) button (36, 47, 71, 76)
 - (stop) button (35, 47, 69, 76)

- 10 SELECT DVD/VIDEO buttons (35, 47, 69,
- 11 🖫 (remote sensor) (21)
- 12 Front panel display (45, 73) 13 HDMI indicator (16)
- 14 SYNCHRO REC indicator (51, 80) 15 CHANNEL/TRACKING +/- buttons*1*2
- (47, 70, 76)
- 16 ONE-TOUCH DUBBING button (93)
- 17 DV IN jack (90)
- 18 LINE 2 IN (S VIDEO/VIDEO/AUDIO L (MONO)/R) jacks (27)
- *1 The CHANNEL/TRACKING + button has a tactile
- dot. Use the tactile dot as a reference.

 *2 The CHANNEL +/- buttons are used for channel selection when the set top box control is turned on (page 12).

Remote

For DVD functions



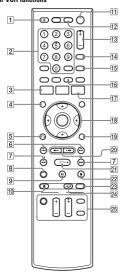
- **1 △** OPEN/CLOSE button (35, 47, 91)
- 2 DVD button (35, 47)
- 3 Number buttons*1 (36) SET button (102)
- 4 ANGLE button (36)
- 5 TOP MENU button (35) MENU button (35)
- 6 DISPLAY button (44)
- **7 ↑**/**↓**/**←**/**→**/ENTER button (23)
- 8 & RETURN button (23)

- 9 ► PREV (previous)/► NEXT buttons (36)
- 10 ←• REPLAY/•→ ADVANCE buttons (36)
- 11 **◄◄◄**/**▶►►** (search) buttons (36)
- 12 CLEAR button (103)
- 13 II PAUSE button (47) 14 ● REC (record) button (47)
- 15 1/((on/standby) switch (23)
- 16 CH (channel) +/- button*1*2 (12, 47)
- 17 INPUT button (47, 54, 91)
- 18 TIME/TEXT button (45)
- 19 AUDIO button*1 (36) SUBTITLE button (36)
- 20 SYSTEM MENU button (10) TITLE LIST button (39, 57) TIMER button (49)
- 21 ORIGINAL/PLAYLIST button (39, 57)
- 22 OPTIONS button (40)
- 23 > PLAY button*1 (35)
- **24** STOP button (35, 47) 25 REC MODE button (47, 91)
- 26 SYNCHRO REC button (51)

- | 27 TV buttons I/♥ (on/standby) switch (21) INPUT button (21) CH (channel) +/- button *1 (21) VOL (volume) +/- button (21)
 - DIGITAL/ANALOG button (21)
- *1 Number 5, AUDIO, CH +, and ▷ PLAY buttons have a tactile dot. Use the tactile dot as a reference
- *2 The CH +/- button are used for channel selection when the set top box control is turned on (page 12).

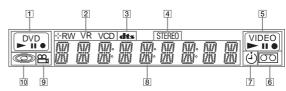
continued 115 114

For VCR functions



- 2 Number buttons*1 (76) SET button (102)
- 3 SYSTEM MENU button (10)
- 4 DISPLAY button (73)
- 5 RETURN button (23)
- 6 I◀◀ PREV (previous)/▶► NEXT buttons (71)
- 7 **◄◄**■/**▶▶** (search) buttons (71)
- 8 CLEAR button (69)
- 9 II PAUSE button (71, 76)
- 10 REC (record) button (76)
- 11 I/ (on/standby) switch (23)
- 12 VIDEO button (69, 76)
- 13 CH (channel)/TRACKING +/- button*1*2 (12, 70, 76)
- 14 INPUT button (76)
- 15 TIME/TEXT button (73)
- **16** AUDIO button*¹ (74)
- 17 TIMER button (78)
- 18 **↑**/**↓**/**←**/**→**/ENTER button (23)
- 19 OPTIONS button (72)
- 20 ←• REPLAY/•→ ADVANCE buttons (71)
- 21 > PLAY button*1 (69)
- 22 STOP button (69, 76)
- 23 REC MODE button (76)
- 24 SYNCHRO REC button (80)
- 25 TV buttons
- *1 Number 5, AUDIO, CH +, and ▷ PLAY buttons have a tactile dot. Use the tactile dot as a reference
- The CH +/- button are used for channel selection when the set top box control is turned on (page 12).

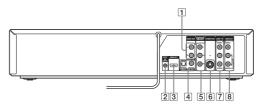
Front panel display



- 1 DVD playing/recording status
- 2 Disc type/recording format
- 3 Audio signal indicators
- 4 STEREO indicator (74)
- 5 VIDEO playing/recording status
- 6 Tape indicator
- 7 Timer indicator
- 8 Displays the following (45, 73):
- Playing time/remaining time
 Current title/chapter/track/index number
 Recording time/recording mode

- 9 (angle) indicator (36)
- 10 Disc indicator

Rear panel



- 1 AUDIO OUT L/R jacks (18)
- 2 SET TOP BOX CONTROL jack (13)
- 3 HDMI OUT jack (16)
- 4 DIGITAL AUDIO OUT (COAXIAL/ OPTICAL) jacks (18)
- 5 COMPONENT VIDEO OUT (Y, PB, PR) jacks (17)
- 6 S VIDEO OUT jack (15)
- 7 LINE 1 IN (VIDEO/AUDIO L/R) jacks
- 8 LINE OUT (VIDEO/AUDIO L/R) jacks

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Glossary

Chapter (page 40)

Sections of a picture or a music feature that are smaller than titles. A title is composed of several chapters. Depending on the disc, no chapters may be recorded.

Copy protection signals (page 47)
Copy restriction set by copyright owners, etc.
These signals are included in some software or TV programs and restrict recording on this recorder.

Dolby Digital (page 98)

Digital audio compression technology developed by Dolby Laboratories. This technology conforms to multi-channel surround sound. The rear channel is stereo and there is a discrete subwoofer channel in this format. Dolby Digital provides the same discrete channels of high quality digital audio found in "Dolby Digital" theater surround sound systems. Good channel separation is realized because all of the channel data is recorded discretely, and little deterioration occurs be all channel data processing is digital.

DTS (page 98)

Digital audio compression technology by DTS, Inc. This technology conforms to multi-channel surround sound. The rear channel is stereo and there is a discrete subwoofer channel in this format. DTS provides the same discrete channels

format. DTS provides the same discrete channels of high quality digital audio.

Good channel separation is realized because all of the channel data is recorded discretely, and little deterioration occurs because all channel data processing is digital.

DVD+RW (page 30)

A DVD+RW (read "plus RW") is a recordable and rewritable disc. DVD+RWs use a recording format that is comparable to the DVD VIDEO

DVD-RW (page 30)

A DVD-RW is a recordable and rewritable disc that is the same size as a DVD VIDEO. The DVD-RW has two different modes: VR mode and Video mode. DVDs created in Video mode have the same format as a DVD VIDEO, while discs created in VR (Video Recording) mode allow the contents to be programmed or edited.

DVD+R (page 30)

A DVD+R (read "plus R") is a recordable disc that is the same size as a DVD VIDEO. Contents can be recorded only once to a DVD+R, and will have the same format as a DVD VIDEO.

DVD-R (page 30)

A DVD-R is a recordable disc that is the same size as a DVD VIDEO. Contents can be recorded only once to a DVD-R. The DVD-R has two different modes: VR mode and Video mode. DVDs created Notes and video mode have the same format as a DVD VIDEO, while discs created in VR (Video Recording) mode allow the contents to be programmed or edited.

DVD VIDEO (page 33)

A disc that contains up to eight hours of movi pictures on a disc the same diameter as a CD. The data capacity of a single-layer and single-sided DVD is 4.7 GB (Giga Byte), which is 7 saded DVD is 4.7 GB (Giga Byte), which is 7 times that of a CD. The data capacity of a double-layer and single-sided DVD is 8.5 GB, a single-layer and double-sided DVD is 9.4 GB, and double-layer and double-sided DVD is 17 GB. The picture data uses the MPEG 2 format, which is a worldwide standard of digital compression is a worrowine standard or digital compression technology. The picture data is compressed to about 1/40 (average) of its original size. The DVD also uses a variable rate coding technology that changes the data to be allocated according to the status of the picture. Audio information is recorded in a multi-channel format, such as Dolby Digital allowing wort to gainer, a more real audio. Digital, allowing you to enjoy a more real audio

Furthermore, various advanced functions such as the multi-angle, multilingual, and Parental Control functions are provided on the DVD.

HDMI (High-Definition Multimedia Interface)

(page 16)
HDMI is an interface that supports both video and audio on a single digital connection. The HDMI connection carries standard to high definition video signals and multi-channel audio signals to AV components such as HDMI equipped TVs, in digital form without degradation.
The HDMI specification supports HDCP (Highbandwidth Digital Connents Protection), a copy protection technology that incorporates coding technology for digital video signals.

Interlace format

Interlace format shows every other line of an image as a single "field" and is the standard mage as a single refer and its the standard method for displaying images on television. The even number field shows the even numbered lines of an image, and the odd numbered field shows the odd numbered lines of an image.

Original (page 56)

Titles actually recorded on a DVD-RW (VR mode) or DVD-R (VR mode). Erasing original titles frees up disc space on DVD-RWs.

Playlist (page 56)

Playback information created from the actual Playback information created from the actual recordings on a DVD-Rw (VR mode) or DVD-R (VR mode). A Playlist leaves the original titles as they are, and contains only the information needed to control playback. A Playlist title takes up very little disc space.

Progressive format (page 97)

Progressive format (page 97)
Compared to the Interlace format that alternately
shows every other line of an image (field) to create
one frame, the Progressive format shows the entire
image at once as a single frame. This means that
while the Interlace format can show 30 frames/50
fields in one second, the Progressive format can
show 60 frames in one second. The overall picture
quality increases and still images, text, and
horizontal lines appear sharper.

Title (page 40)

st section of a picture or music feature on a DVD, movie, etc., in video software, or the entire album in audio software.

Track (page 40)

a music feature on a CD (the length of a song).

118 119 When you play a DVD VIDEO, the language of the selected audio track or subtitle is abbreviated as follows. See page 102 to change the audio track or subtitle.

Abbreviation	Language
ARA	Arabic
BUL	Bulgarian
CHI	Chinese
CRO	Croatian
CZE	Czech
DAN	Danish
DEU	German
ENG	English
ESP	Spanish
FIN	Finish
FRA	French
GRE	Greek
HUN	Hungarian
IDN	Indonesian
IND	Hindi
ISL	Icelandic
ITA	Italian
IWR	Hebrew
JPN	Japanese
KOR	Korean
MAL	Malay
NLD	Dutch
NOR	Norwegian
POL	Polish
POR	Portuguese
RUS	Russian
SVE	Swedish
THA	Thai

Abbreviation	Language
TUR	Turkish
VIE	Vietnamese
ZAF	Afrikaans

Cable Box/Satellite Receiver Brand Code

When you want to use the set top box control function, find the brand code number of your cable box/satellite receiver from the list and enter it in step 7 of Easy Setup (page 23).

If more than one code number is listed, try entering them one at a time until you find the one that works with your cable box/satellite receiver.

Cable box brand	Code number
3M	0033
ABC	0003, 0007, 0011, 0017, 0008, 0014, 0001, 0013, 0206, 0047, 0237, 0033
Accuphase	0003, 0007, 0013, 0047, 0001, 0011, 0017, 0014, 0206
Acom	1102, 0237
Action	0237
Active	0237, 1102
Aim	0015
Allegro	0315, 0153
Amark	0008, 0277, 0144, 0056
American	0060
Americast	0899
Antronix	0207, 0022
Anvision	0211, 0111
Apache	0770
Arbatron	0014, 0011, 0003, 0476
Archer	0153, 0022, 0207, 0039, 0797, 0237, 0260
ASE	1080
Auna	1269
BBT	0267
BCC	0276
Belcor	0056, 0022
Bell & Howell	0014
Bell Atlantic	0641
Bell South	0899
Bestlink	0303

Cable box brand	Code number
Betavue	0022
British Telecom	0003
BVS	0641
Cable Healthcare	0769, 0058
Cable Star	0056
Cabletenna	0022, 0039
Cableview	0022
Century	0153, 0618, 0008, 0315
Citation	0017
Citizen	0153, 0315, 0078, 0242
Clearmaster	0883
ClearMax	0883, 1247
Colour Voice	0031, 0025
Comband	0233, 0232
Comtec	0274
Comtronics	0060, 0040
Comtronics Eagle	0040, 0060
Contec	0019
Coolmax	0883
Curtis Mathes	0015, 0242
Dae Ryung Eagle	0008
Daeryung	0008, 0877, 0477, 0277, 1877
Diamond	0035
Digeo	1476
Digi	0637
Director	0476
Dumont	0637
Eagle Comtronics	0060, 0028
Eastern	0002, 0274, 0418
Electricord	0078
Emerson	0797, 0303, 0015, 0014
Everquest	0040, 0015
Focus	0400
Fosgate	0276
Fujitsu	0246
Funai	0248, 0019
FutureVision	0649
	-

→continued 121

1	20	

Cable box brand	Code number
Garrard	0153
Gateway	0764
GC Electronics	0207, 0056, 0330, 0016, 0040, 0077, 0030
GE	0232, 0233, 0144, 0021
Gemini	0015, 0070, 0057, 0242, 0014, 0797, 0013, 0400
General Instrument	0476, 0011, 0014, 0098, 0810, 0024, 0003, 0015, 0276
GHZ	0078
Gibraltar	0003
Global	1327
GMI	0069, 0057, 0015, 0797
GoldStar	0144, 0040
Goodmind	0770, 0797
Gradiente	1136
Hamlin	0020, 0009, 0034, 0259, 0015, 0273, 0206
Healthway Interactive	0058, 1020, 1015, 0769
Hitachi	0011, 0154, 0009, 0008, 0003, 0033, 0014, 0255
Houston Tracker	0011
Hwalin	0303
Hytek	0007
IBM	0670
IEEC	1018
Interbuy	0274
IPC Guest Services	0893
Jasco	0315, 0153, 0015
Jebsee	0014, 0400
Jerrold	0003, 0014, 0276, 0011, 0012, 0020, 0024, 0015, 0047, 0098, 0476, 0031, 0029, 0111, 0032, 0054, 0810, 0028
Kuang Yu	0024
Leon	0069, 0015
LG	0040, 0144
Linsay	0440
Macom	0033

0812 0797, 0027, 0032, 0334, 0069
0797, 0027, 0032, 0334,
0618, 0153
0000
0003
0476, 0276, 1476, 0810, 1376, 1254, 0400, 1106
0156, 0078, 0063, 0203
0069, 0015, 1018, 0303
0012
1117
0274
0764, 1316, 1315, 1314
0770
0671, 0314
0277, 0008
0277
0618, 0277, 0017, 0008
0156, 0070, 0203, 0063, 0400, 0012, 0618, 0022, 0637, 0010, 0044
0007, 0019, 0303, 0248, 0017
0015
0371
0021
0237
0843
0107, 0021, 0144, 0008, 0124, 0307, 0000, 0040
0637
0000, 0525, 0008
0637, 0000
0025, 0031, 0290, 0027, 0030, 0153, 0060, 0242, 0028, 0334, 0211, 0029, 0259, 0307, 0652, 0013, 0069, 0649, 0255, 0305, 0032, 0111, 0317
0144, 0023, 0533, 1877, 0877, 0260

Cable box brand	Code number
Popular Mechanics	0400
Prelude	0770
Prism	0012, 0013, 0059
Protelcon	0786
Pulsar	0000, 0040
Quasar	0000
Quest	0144, 0020
R Line	0040
RadioShack	0883, 0015, 0315, 0303, 0797
Rampage	0255
Ranger	1247
RCA	0021, 0060, 0797, 0047, 1256, 0843
Realistic	0207, 0153
Recoton	0153, 0400
Regal	0259, 0020, 0273, 0279, 0276
Regency	0002, 0020, 0682
Rembrandt	0070, 0153, 0040, 0022, 0011
RK	0304, 0306, 0479
Runco	0000
Samsung	0040, 0144, 0023, 0003, 0070, 0000
Sasktel	1737
Scientific Atlanta	0008, 0277, 0017, 0006, 0237, 0025, 0477, 0207, 0877, 0003, 0012, 0000, 0021, 1877
Seam	0510
Sears	0510
Sejin	1265
Siemens	0246
Sigma	0019
Signal	0040, 0015, 0011, 0035
Signature	0011
SkyCable	0112
Skygiant	1091
SL Marx	0040

Cable box brand	Code number
Sony	1006
Spectradyne	0769, 0058
Spectravision	0058
Sprucer	0021, 0307, 0010, 0144
Standard Components	0203, 0096, 0155
Starcom	0003, 0015, 0047, 0014, 0098, 0305
Stargate	0015, 0040, 0770, 0865, 0797, 0305, 0014
Starquest	0015
StarSight	0542, 0422
Stealth	0274
Stellar One	0807
Storm	1018, 0637
Suena Madritel	1230
Supercable	0276
Supermax	0883
Sylvania	0001
Tandy	0258
Tatung	0097
Teac	1018
Technics	0029
Teknika	0146
Teleavia	0040
TeleCaption	0221
Teleview	0063, 0040
Texscan	0001, 0096, 0010
TFC	0310
Thomson	1256
Timeless	0418, 0274, 0040
Tocom	0012, 0013, 0029, 0019, 0059, 0017
Torx	0003
Toshiba	0000
Trans PX	0303, 0276, 0153, 0315
Trinity	1248
Tristar	0883

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Satellite receiver brand	Code number
AlphaStar	0772
Atlantic Telephone	1333
Bell ExpressVu	0775
Century	0856
Chaparral	0216
Crossdigital	1109
DirecTV	0749, 0566, 0392, 1749, 0099, 1109, 1076, 1442, 1856, 0247, 1142, 1639, 0724, 0639, 0819
Dish Network System	0775, 1005, 1170
Dishpro	0775, 1005
Echostar	0775, 1170, 1005
Expressvu	0775
Galaxis	0863
GE	0566
General Instrument	0361, 0869, 0627
GOI	0775
Gradiente	0856
Hitachi	0819, 0749
Houston Tracker	0775
HTS	0775
Hughes Network Systems	0749, 1749, 1442, 1142
Humax	1176, 1359, 1048, 0863, 0283
Innova	0099
Jerrold	0361, 0036, 0627
JVC	0775, 1170
Magnavox	0722, 0724
McIntosh	0869
Memorex	0724
Mitsubishi	0749
Motorola	0869
NEC	1270, 0496, 0499, 0507, 0508
Netsat	0099
Next Level	0869
Optimus	0724

Satellite receiver brand	Code number
Paysat	0724
Philips	1076, 0099, 1142, 0724, 0722, 0749, 1442, 1749, 0856, 0775
Primestar	0361, 0627, 0869
Proscan	0392, 0566
QNS	1367
RadioShack	0869
RCA	0566, 0392, 0143, 0855
Samsung	1109, 1276
Sky	0856, 0099, 1856
Sony	0639, 1639
Star Choice	0869
Star Trak	0869, 0772
Thomson	0566, 0392
Tivo	1142, 1442
Toshiba	0790, 0749, 1749, 1285
UEC	1333, 1358
Uniden	0724, 0722
Video Cipher II Plus	0361
Zenith	0856, 1856

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TV COMM

TV Guide

TV86

Uniden

Unika

United Artist

United Cable Universal

US Electronics V2

Verizon

Videoway

Vidtech

Viewstar

Vision

Wiso

Zentek

Visionetics

Vortex View

WaveMaster

Viewmaste

VideoWorks

Code number

0015

1476

0007 0003, 0014, 0011, 0276

0883

0246

0124

0244

0883

1264

0883

0565

0078

0250, 0000

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2. DISASSEMBLY AND REASSEMBLY

2-1 CABINET AND PCB

2-1-1 Cabinet Top Removal

REMOVE 1 SCREW 3 Lift up the Cabinet Top in the direction of arrow REMOVE REMOVE 8 SCREWS REMOVE 1 SCREW

Fig. 2-1 Cabinet Top Removal

2-1-2 Bottom Cover Removal

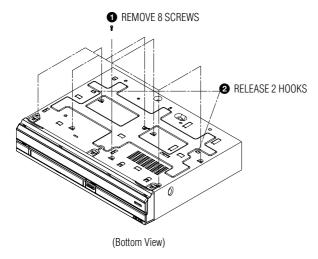


Fig. 2-2 Bottom Cover Removal

2-1-3 Ass'y Front Panel Removal



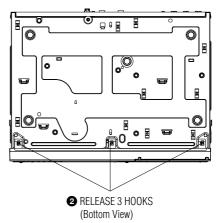


Fig. 2-3 Ass'y Front Panel Removal

2-1-4 Function PCB Removal

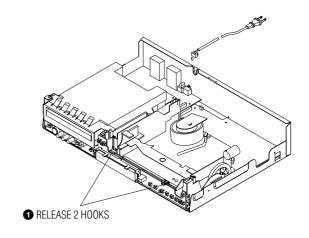


Fig. 2-4 Function PCB Removal

2-1-5 Chassis Removal

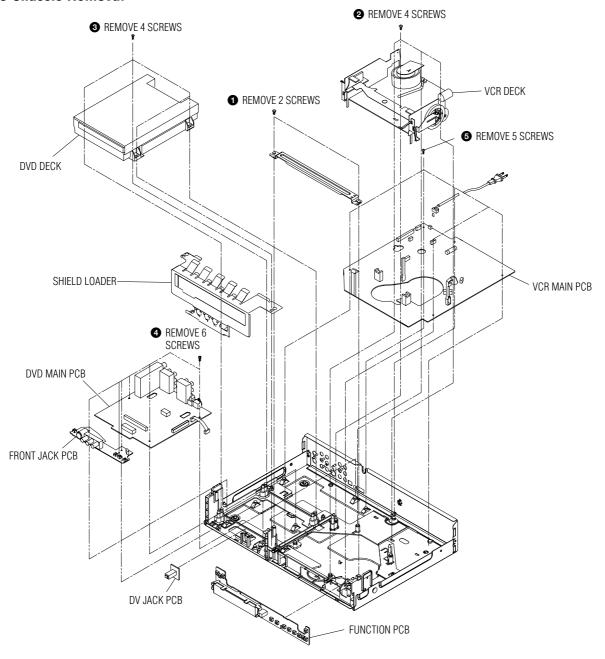


Fig. 2-5 Chassis Removal

2-1-6 VCR Main PCB Removal



Fig. 2-6 VCR Main PCB Removal

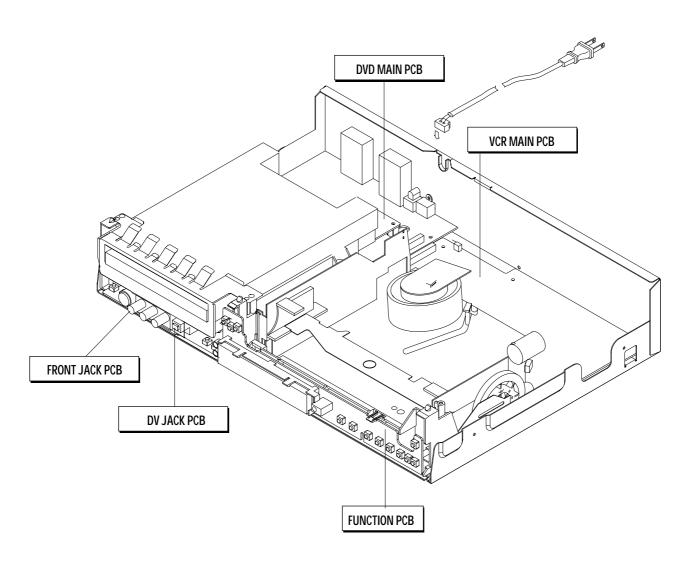


Fig. 2-7 Circuit Board Locations

2-3 VCR DECK PARTS LOCATIONS

2-3-1 Top View

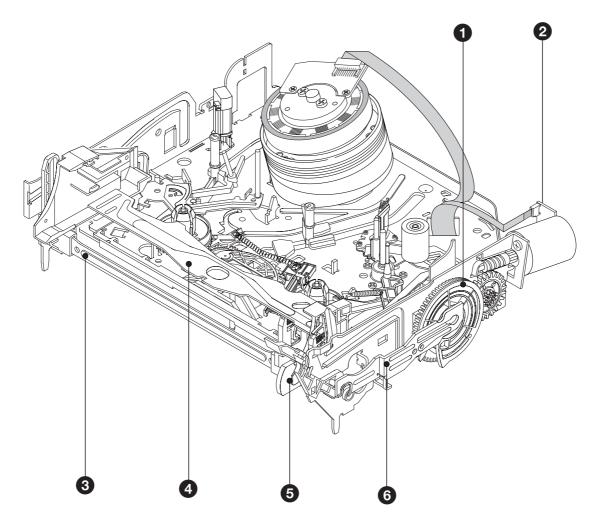


Fig. 2-8 Top parts Location-1

- GEAR FL CAMASS'Y MOTOR LOADING
- **3** ASS'Y LEVER ARM
- 4 ASS'Y HOLDER CASSETTE
 5 LEVER FL DOOR
 6 SLIDER FL DRIVE

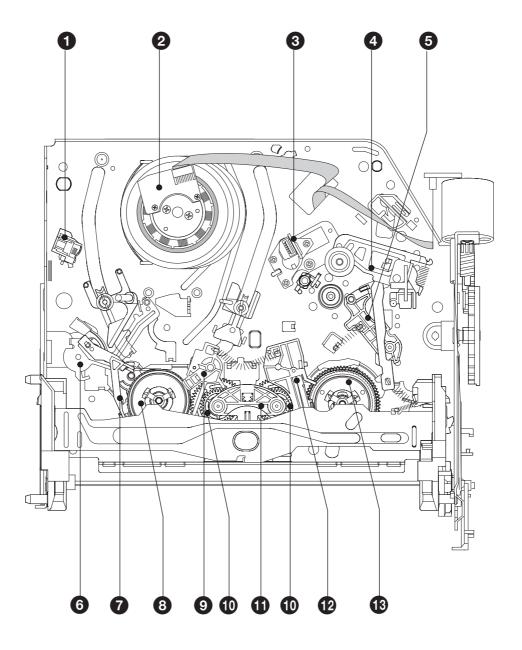


Fig. 2-9 Top Parts Location-2

- 1 FE HEAD
- 2 ASS'Y CYLINDER
- 3 ASS'Y ACE HEAD
- 4 ASS'Y LEVER UNIT PINCH
- **5** ASS'Y LEVER #9 GUIDE
- 6 ASS'Y LEVER TENSION
- **7** ASS'Y BAND BRAKE

- **8** DISK S REEL
- 9 ASS'Y LEVER S BRAKE
- **10** GEAR IDLE
- 1 LEVER IDLE
- ASS'Y LEVER T BRAKE
- **13** DISK T REEL

2-3-2 Bottom View

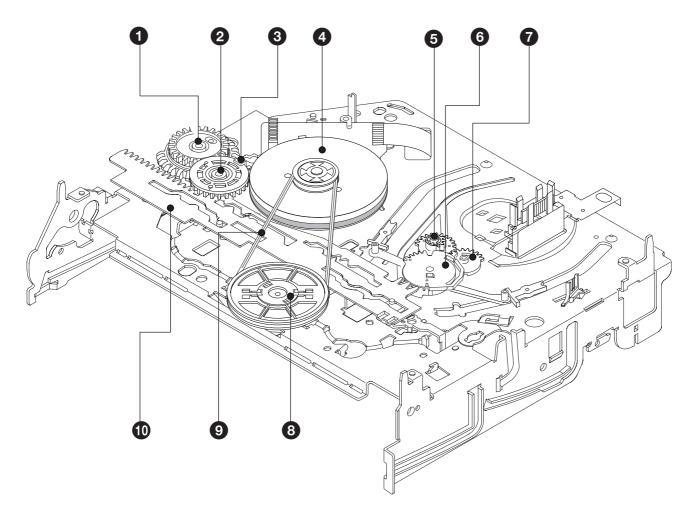


Fig. 2-10 Bottom Parts Location

- **1** GEAR JOINT 1
- **2** GEAR JOINT 2
- **3** BRAKET GEAR
- 4 ASS'Y MOTOR CAPSTAN
- **5** ASS'Y LEVER T LOAD
- **6** GEAR LOADING DRIVE
- 7 ASS'Y LEVER S LOAD
- **8** ASS'Y CLUTCH
- 9 BELT PULLEY
- **10** SLIDER CAM

2-4 VCR DECK

2-4-1 Ass'y Holder Cassette Removal

- 1) Pull the Ass'y Holder Cassette 1 to the eject position.
- 2) Pull the Ass'y Holder Cassette ① as grasping the Ass'y Holder Cassette ① and Lever Lock ② in the same time to release hooking from Main Base until the Boss [A] of Ass'y Holder Cassette ① is taken out from the Rail [B].
- 3) Lift the Ass'y Holder Cassette ①, in this time, you have to grasp the Lever Lock ② Continuously until the Ass'y Holder Cassette ① is taken out completely.

Note: Be sure to insert Lever Lock **2** in the direction of "A" to prevent separation and breakage of the Lever Lock **2** at disassembling and reassembling.

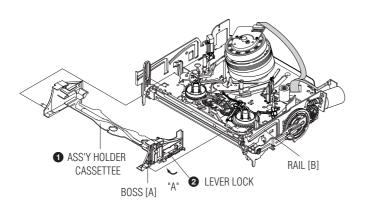


Fig. 2-11 Ass'y Holder Cassette Removal

2-4-2 Ass'y Lever Arm Removal

- 1) Push the hole "A" in the direction of arrow "B" use the pin.(about Dia. 2.5)
- 2) Pull out the Ass'y Lever Arm 1 from the Boss of Main Base.
- 3) Remove the Ass'y Lever Arm 1 in the direction of arrow "C".

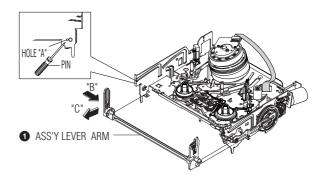


Fig. 2-12 Ass'y Lever Arm Removal

2-4-3 Lever FL Door Removal

1) Release the Lever FL Door ② and Remove the Slider FL Drive ① in the direction of arrow "A".

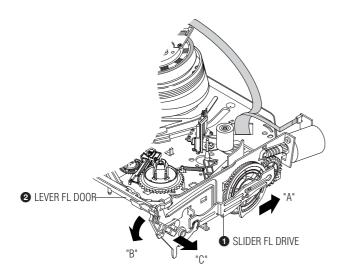


Fig. 2-13 Lever FL Door Removal

2-4-4 Slider FL Drive, Gear FL Cam Removal

- 1) Pull the Slider FL Drive 1 to the front direction.
- 2) Remove the Slider FL Drive 1 in the direction of arrow. (Refer to Fig. 2-14)
- 3) Remove the Gear FL cam **2**.

Note: When reinstalling be sure to reassemble Slider FL drive **1** after you insert the Boss of Lever ARM-R in Groove of Slider FL drive **1**.

Assembly: Align the Gear FL Cam **2** with the Gear worm wheel Post as shown drawing. (Refer to Timing point)

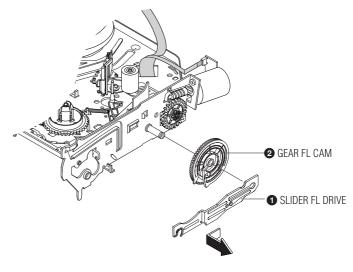


Fig. 2-14 Slider FL Drive Removal

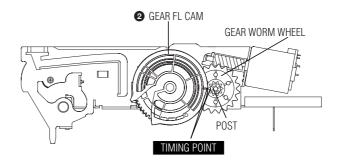


Fig. 2-15 Gear FL Cam, Gear Worm

2-4-5 Gear Worm Wheel Removal

1) Remove the Gear Worm Wheel **1**.

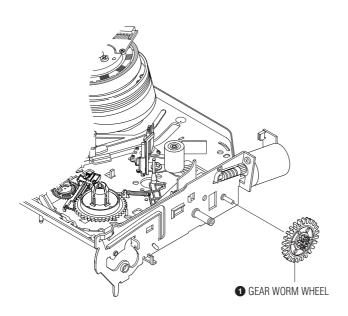


Fig. 2-16 Gear Worm Wheel Removal

2-4-6 Cable Flat Removal

1) Remove the Drum connecting part of Cable Flat **1** from Connector Wafer **2**, **3**.

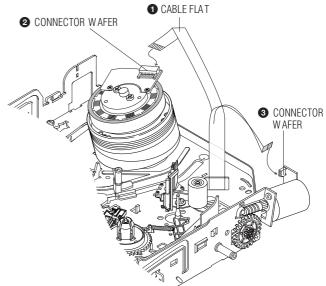


Fig. 2-17 Cable Flat Removal

2-4-7 Ass'y Motor Loading Removal

- 1) Remove the Screw **1**.
- 2) Remove the Ass'y Motor Loading **2**.

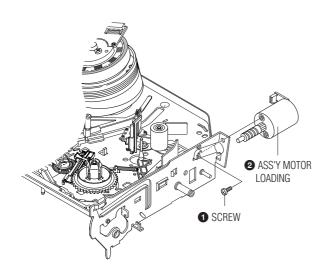


Fig.2-18 Ass'y Motor Loading Removal

2-4-8 Bracket Gear, Gear Joint 2, 1 Removal

- 1) Remove the Screw **1**.
- 2) Remove the Bracket Gear 2.
- 3) Remove the Gear Joint 2 3.
- 4) Remove the Gear Joint 1 4.

Assembly:

- 1) Be sure to align dot mark of Gear Joint 1 1 with dot mark of Gear Joint 2 2 as shown Fig 2-20. (Refer to Timing point 1)
- 2) Confirm the Timing Point 2 of the Gear Joint 2 2 and Slider Cam 3.

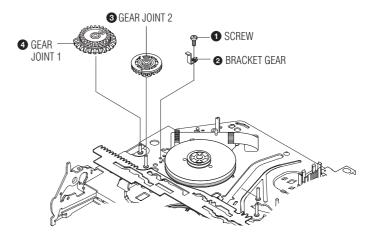


Fig. 2-19 Bracket Gear, Gear Joint 1, 2 Removal

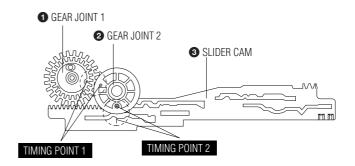


Fig. 2-20 Gear Joint 1, 2 Assembly

2-4-9 Gear Loading Drive, Slider Cam, Ass'y Lever Load S, T Removal

- 1) Remove the Belt Pulley. (Refer to Fig. 2-38)
- 2) Remove the Gear Loading Drive **1** after releasing Hook [A] in the direction arrow as shown in detail drawing.
- 3) Remove the Slider Cam 2.
- 4) Remove the Ass'y Lever Load S 3 & Ass'y Lever Load T 4.

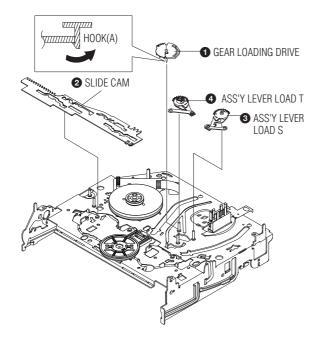


Fig. 2-21 Gear Loading Drive, Slider Cam, Ass'y Lever T, S Load Removal

2-4-10 Gear Loading Drive, Slider Cam, Ass'y Lever Load S, T Assembly

- 2) Insert the Pin A, B, C, D into the Slider Cam 3 hole,
- 3) Be sure to align dot of Ass'y Lever Load T ① and dot of Gear Loading Drive ③, (Refer to Timing Point 2).
- 4) Aline dot of Gear Loading drive **4** with mark of Slider Cam **3** as shown in drawing (Refer to Timing Point 3).

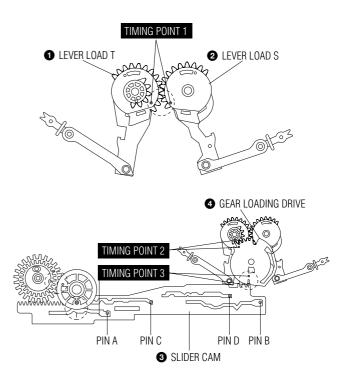


Fig. 2-22 Gear Loading Drive, Slider Cam, Ass'y Lever Load S, T Assembly

2-4-11 Lever Pinch Drive, Lever Tension Drive Removal

1) Remove the Lever Pinch Drive **1**, Lever Tension Drive **2**.

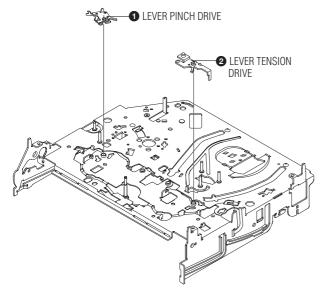


Fig. 2-23 Lever Pinch Drive, Lever Tension Drive Removal

2-4-12 Ass'y Lever Tension, Ass'y Band Brake Removal

- 1) Remove the Ass'y Lever Brake S (Refer to Fig 2-25).
- 2) Remove the Spring Tension Lever **1**.
- 3) Rotate stopper of Main Base in the direction of arrow "A".
- 4) Lift the Ass'y Lever Tension **2** & Ass'y Band brake **3**.

Note:

- 1) When replacing the Ass'y Lever Tension **2**, be sure to apply Grease on the post,
- 2) Take care not to touch stain on the felt side, and not to be folder and broken Ass'y Band brake
- 3) After Ass'y Lever Tension seated, Rotate stopper of Main Base to the Mark[B].

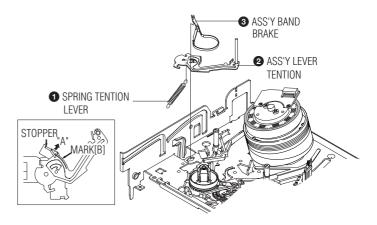


Fig. 2-24 Ass'y Lever Tension, Ass'y Band Brake Removal

2-4-13 Ass'y Lever Brake S, T Removal

- 1) Release the Hook [A] and the Hook [B], [C] in the direction of arrow as shown in Fig 2-25.
- 2) Lift the Ass'y Lever S, T Brake **1**, **2** with spring brake **3**.

Assembly:

- 1) Assembly the Ass'y Lever S Brake **1** on the Main Base.
- 2) Assembly the Ass'y Lever T Brake 2 with spring brake 3.

Note: Take extreme care not to be folded and transformed Spring Brake at removing or reinstalling.

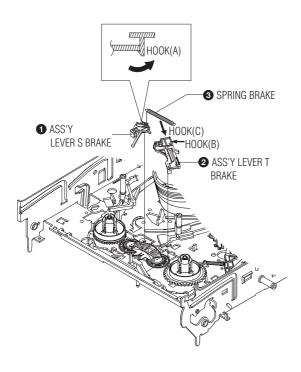


Fig. 2-25 Ass'y Lever Brake S, T Removal

2-4-14 Ass'y Gear Idle Removal

- 1) Push the Lever Idle 1 in the direction of arrow "A", "B".
- 2) Lift the Lever Idle **1**.

Assembly:

- 1) Apply oil in two Bosses of Lever Idle **1**.
- 2) Assemble the Gear Idle **2** with the Lever Idle **1**.

Note: When replacing the Gear Idle ②, be sure to add oil in the boss of Lever Idle ①.

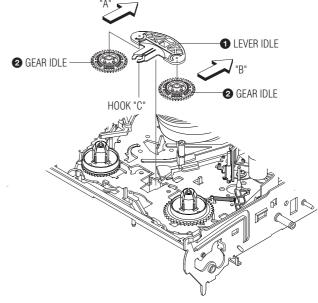


Fig. 2-26 Ass'y Gear Idle Removal

2-4-15 Disk S, T Reel Removal

1) Lift the Disk S, T Reel **1**, **2**.

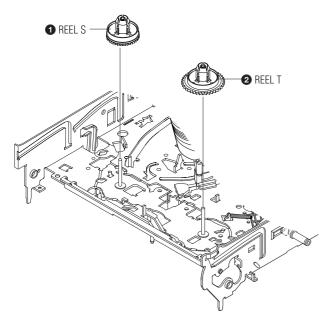


Fig. 2-27 Disk S, T Reel Removal

2-4-16 Ass'y Holder Clutch Removal

- 1) Remove the Washer Slit 1.
- 2) Lift the Ass'y Holder Clutch 2.

Note: When you reinstall Ass'y Holder Clutch.

- 1) Check the condition of spring as shown in detail A.
- 2) Don't push Ass'y Holder Clutch down with excessive force Just insert Holder Clutch Ass'y into post center with dead force and Rotate it smoothly.

Be sure to confirm that spring is in the slit of Ass'y Gear Center as shown in detail B.

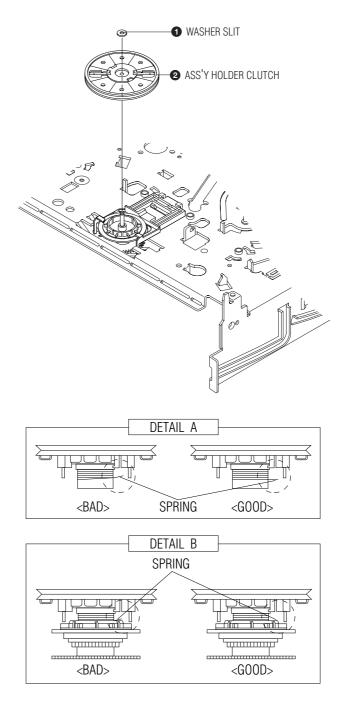


Fig. 2-28 Ass'y Holder Clutch Removal

2-4-17 Ass'y Lever Up Down, Ass'y Gear Center Removal

- 1) Remove the 2 hooks in the direction of arrow as shown Fig. 2-29 and lift the Ass'y Lever Up Down ①.
- 2) Lift the Ass'y Gear Center 2.

Assembly:

- 1) Insert the Ass'y Lever Up Down 1 in the rectangular holes on Main Base as shown in Fig 2-30.
- 2) Lift the Ass'y Lever Up Down **1** about 35°. (Refer to Fig 2-30)
- 3) Insert Ring of the Ass'y Gear Center 2 in the Guide of the Ass'y Lever Up Down 1.
- 4) Insert the Ass'y Gear Center **2** in the post on Main Base.
- 5) Push down the Ass'y Lever Up Down 1 for locking of the Hook.

Note:

- 1) Take care not to separate and sentence does not mark sense.
- 2) Be sure to confirm that Ring of the Ass'y Gear Center ② is in the Guide of the Ass'y Lever Up Down ① after finishing assembly of Ass'y Lever Up Down ① and Ass'y Gear Center ②.

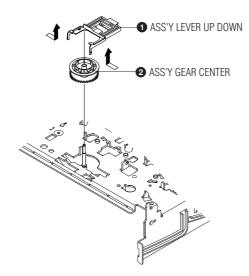


Fig. 2-29 Ass'y Lever Up Down Removal

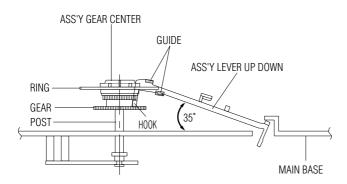


Fig. 2-30 Ass'y Lever Up Down Removal

2-4-18 Guide Cassette Door Removal

- 1) Lift the Hook [A].
- 2) Rotate the Guide Cassette Door 1 in the direction of arrow.

Note: After reinstalling the Guide Cassette Door **1** sure the Hook [A].

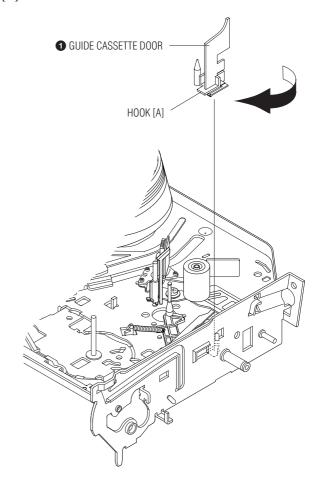


Fig. 2-31 Guide Cassette Door Removal

2-4-19 Ass'y Lever Unit Pinch, Plate Joint, Spring Pinch Drive Removal

- 1) Lift the Ass'y Lever Unit Pinch 1.
- 2) Remove the Plate Joint **2** from Lever Pinch Drive.
- 3) Remove the Spring Pinch Drive **3**.

Note:

- 1) Take extreme care not to touch the grease on the Roller Pinch.
- 2) When reinstalling, be sure to apply grease on the post pinch roller

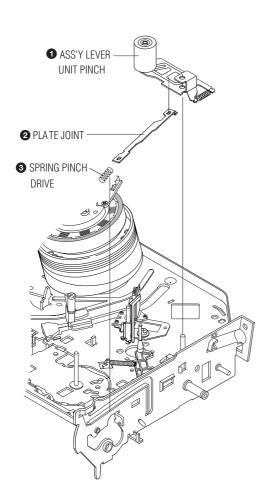


Fig. 2-32 Ass'y Lever Unit Pinch, Plate Joint, Spring Pinch Drive Removal

2-4-20 Ass'y Lever #9 Guide Removal

- 1) Remove the Spring #9 Guide 1.
- 2) Lift the Ass'y Lever #9 Guide **2** in the direction of arrow "A".

Note:

- 1) Take extreme care not to get grease on the tape Guide Post.
- 2) After reinstalling, check the bottom side of the Post #9 Guide to the top side of Main Base.

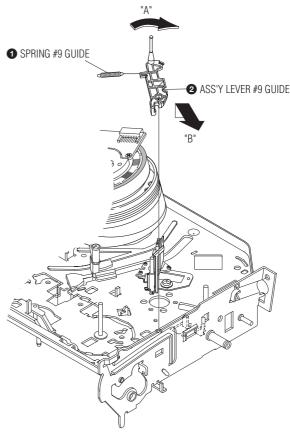


Fig. 2-33 Ass'y Lever #9 Guide Removal

2-4-21 FE Head Removal

1) Remove the FE Head **1** in the direction of arrow to lift up.

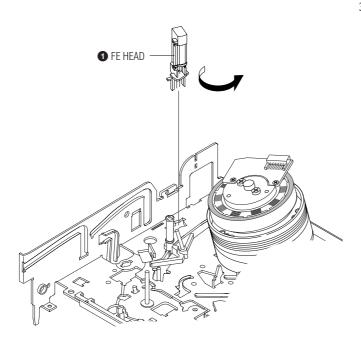


Fig. 2-34 FE Head Removal

2-4-22 Ass'y ACE Head Removal

- 1) Pull out the FPC from connector of Ass'y ACE Head **2**.
- 2) Remove the screw **1**.
- 3) Lift the Ass'y ACE Head **2**.

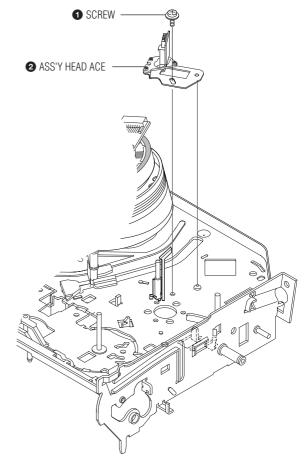


Fig. 2-35 Ass'y ACE Head Removal

2-4-23 Ass'y Slider S, T Removal

1) Move the Ass'y Slider S, T **1**, **2** to slot, and then lift it to remove. (Refer to arrow)

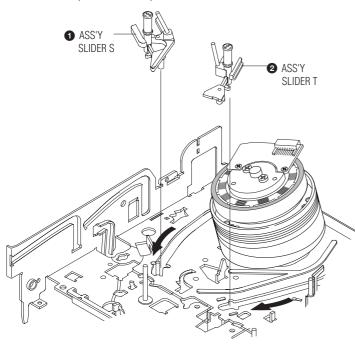


Fig. 2-36 Ass'y Slider S, T Removal

2-4-24 Plate Ground Deck, Ass'y Cylinder Removal

- 1) Remove the 3 Screws **1**.
- 2) Lift the Plate Ground Deck **2**.
- 3) Lift the Ass'y Cylinder 3.

Assembly:

- 1) Match the 3 holes in the bottom of Ass'y Cylinder 3 to the 3 holes of Main Base as attending not to drop or knock the Ass'y Cylinder 3.
- 2) Tighten the 1 Screw 1.
- 3) Match the Plate Ground Deck **2** to the Hole of Base Main.
- 4) Tighten the other 2 Screws **1**.

Note:

- Take care not to touch the Ass'y Cylinder 3 and the tape guide post at reinstalling.
- 2) When reinstalling, Don't push down too much on Screw Driver.

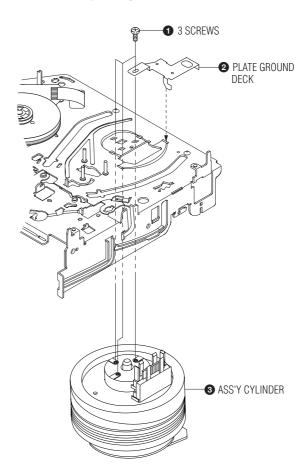


Fig. 2-37 Plate Ground Deck, Ass'y Cylinder Removal

2-4-25 Hook Capstan, Belt Pulley Removal

- 1) Remove the Hook Capstan **1** after realeasing Hook in the direction arrow as shown in detail drawing.
- 2) Remove the Belt Pulley **2**.

Note: Take extreme care not to get grease on Belt Pulley **2** at assembling or reassembling.

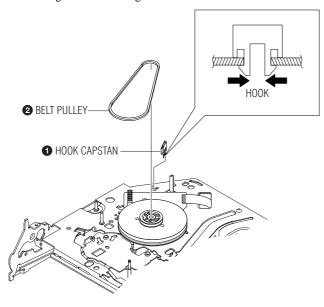


Fig. 2-38 Belt Pulley Removal

2-4-26 Ass'y Motor Capstan Removal

- 1) Remove the 3 Screws 1.
- 2) Remove the Ass'y Motor Capstan 2.

Assembly:

- Match the 3 holes of Ass'y Motor Capstan 2 to the 3 holes of Main Base. Be careful not to drop or knock the Ass'y Motor Capstan 2.
- 2) Tighten the 3 Screws 1 in the direction of arrow as shown detail drawing.

Note: After tightening screws, check if there is gap between the head of screws and the top side of Main Base. There should have no gap between the head of screws and the top side of Main Base. After reinstalling, adjusting the tape transport system again.

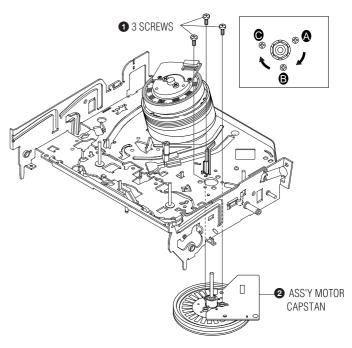


Fig. 2-39 Ass'y Motor Capstan Removal

2-4-27 Ass'y Post #8 Guide Removal

1) Rotate the Ass'y Post #8 Guide **1** in the direction of arrow to lift up.

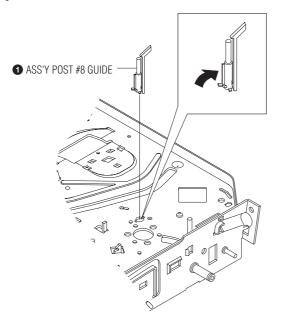


Fig. 2-40 Ass'y Post #8 Guide Removal

2-4-28 Ass'y Level Head Cleaner Removal

- 1) Release the Hook **1**.
- 2) Lift the Ass'y Lever Head Cleaner 2.

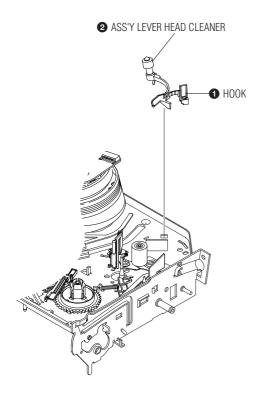


Fig. 2-41 Ass'y Lever Head Cleaner Removal

2-4-29 How to Eject the Cassette Tape (If the tape is stuck in the unit)

1) Turn the Gear worm **1** clockwise with screw driver.(Refer to arrow)

(Other method: Remove the Screw of Ass'y Motor Load, Separate the Ass'y Motor Load)

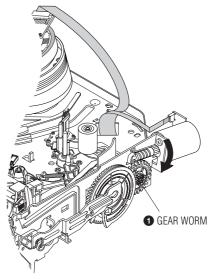


Fig. 2-42

2) When Slider S,T are approched in the position of unloading, rotate holder Clutch counterclockwise after inserting screw driver in the hole of frame's bottom in order to wind the unwinded tape.

(Refer to Fig.2-43)

(If you rotate Gear Worm ① continuously when tape is in state of unwinding, you may cause a tape contamination by grease and tape damage.

Be sure to wind the unwinded tape in the state of set horizently.)

 Rotate Gear Worm 1 clockwise using screw driver again up to the state of eject mode and then pick out the tape. (Refer to Fig. 2-42)

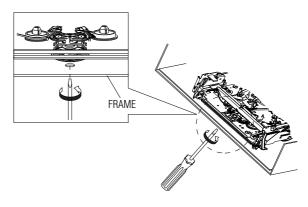


Fig. 2-43

2-5 THE TABLE OF CLEANING, LUBRICATION AND REPLACEMENT TIME ABOUT PRINCIPAL PARTS

- 1) The replacement time of parts is not life of parts.
- 2) The table 2-1 is that the VCR Set is in normal condition (normal temperature, normal humidity).

 The checking period may be changed owing to the condition of use, runtime and environmental conditions.
- 3) Life of the Cylinder Ass'y is depend on the condition of use.
- 4) See exploded view for location of each parts.

<Table 2-1>

						abie 2-1>	, 					
*	Parts Name			Remark								
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	Helliaik
T A P E P A	POST TENSION	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	To clean the parts, use patch and alcohol (solvent). After cleaning, use the video tape after alcohol is gone away completely. We recommend to use oil [EP-50] or solvent. One or two drops of oil should be applied after cleaning with alcohol. Periodic time of applying oil (Apply oil after cleaning) The excessive applying oil may be the cause of malfunction.
	SLANT POST S, T	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	#8 GUIDE SHAFT	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	CAPSTAN SHAFT	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	#9 GUIDE POST	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	#3 GUIDE POST	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	GUIDE ROLLER S, T	Δ	Δ	Δ	0	0	0	0	0	0	0	
	CYLINDER ASS'Y	Δ	0	0	0	0	0	0	0	0	0	
Н	FE HEAD	Δ	Δ	Δ	0	0	0	0	0	0	0	
S	ACE HEAD	Δ	0	0	0	0	0	0	0	0	0	
S	PINCH ROLLER	Δ	0	0	0	0	0	0	0	0	0	
T	POST REEL S, T		*		*		•		•		♦	
E M	SLEEVE TENSION		•		*		*		•		*	
'''	POST CENTER		•		*		*		•		•	
	LEVER IDLE BOSS (2Point)		•		*		*		•		•	
D S Y S Y S T I E G M	CAPSTAN MOTOR PULLEY	Δ	Δ	Δ	Δ	Δ	0	0	0	0	0	
	BELT PULLEY				0	0	0	0	0	0	0	
	HOLDER CLUTCH ASS'Y	Δ	0	0	0	0	0	0	0	0	0	
	GEAR CENTER ASS'Y		0	0	0	0	0	0	0	0	0	
	GEAR IDLE (2Point)		0	0	0	0	0	0	0	0	0	
	LOADING MOTOR		0	0	0	0	0	0	0	0	0	
B R A K E	BAND BRAKE ASS'Y		0	0	0	0	0	0	0	0	0	
	BRAKE T ASS'Y		0	0	0	0	0	0	0	0	0	

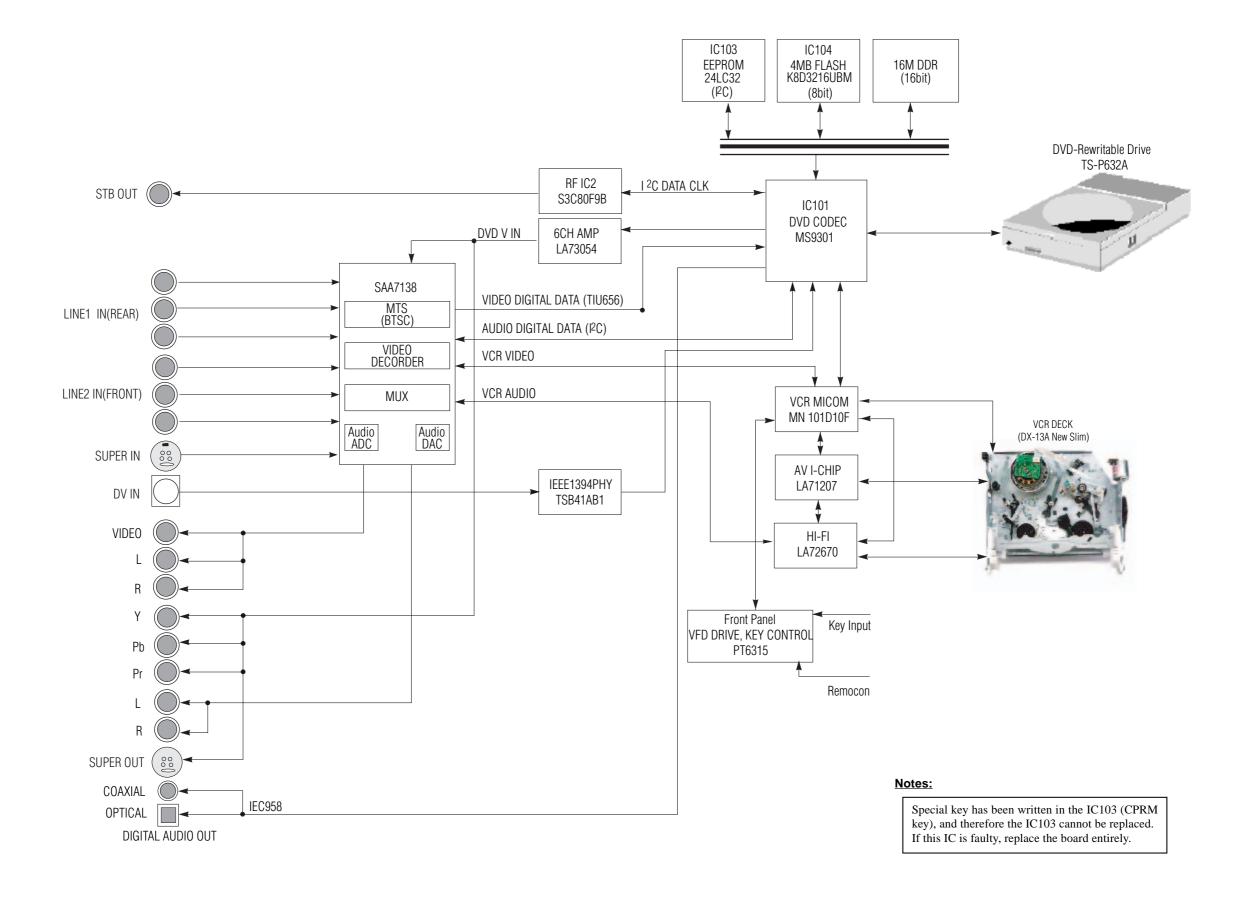
 Δ : Cleaning

0 : Check and replacement in necessary

◆ : Add Oil

<u>MEMO</u>

3. Block Diagram



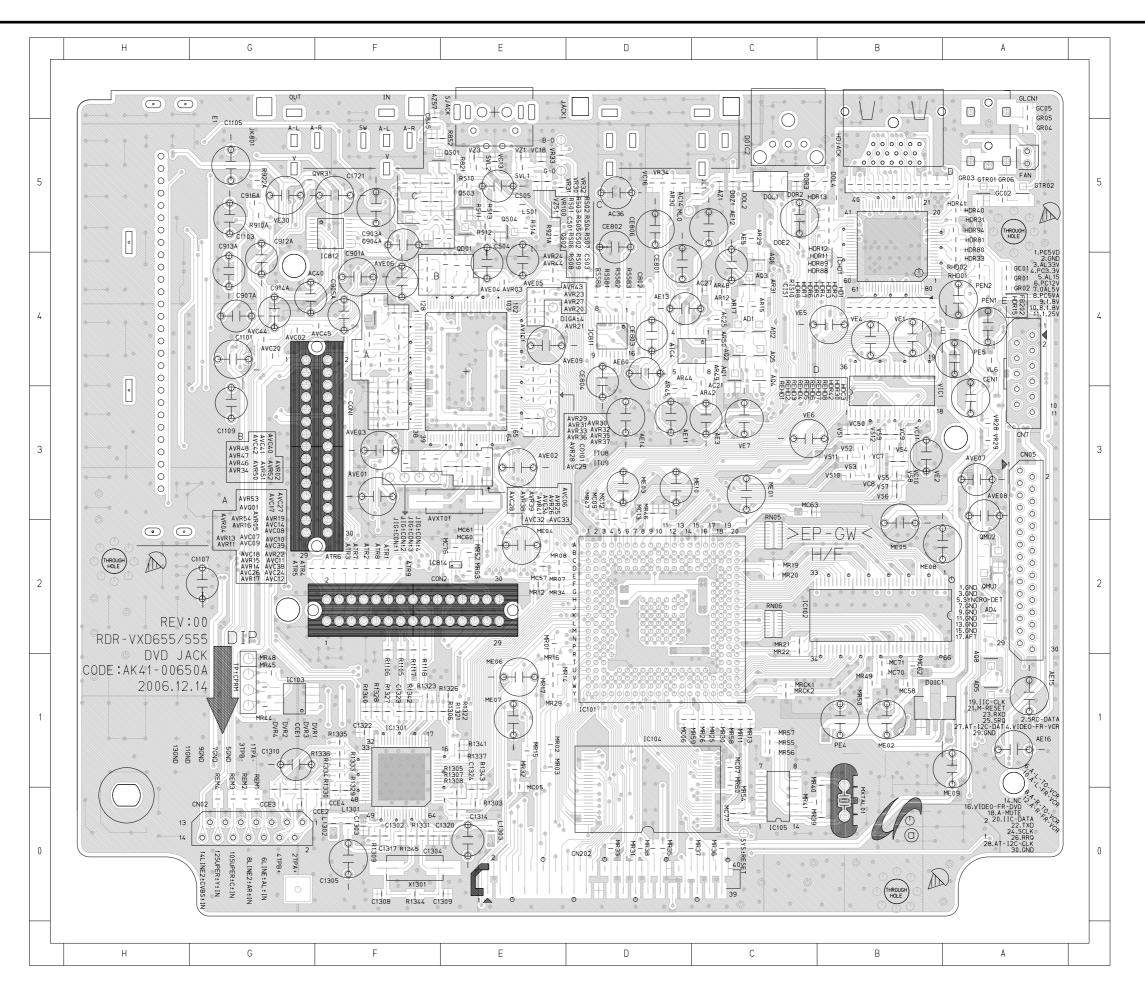
<u>MEMO</u>

4. PCB Diagrams

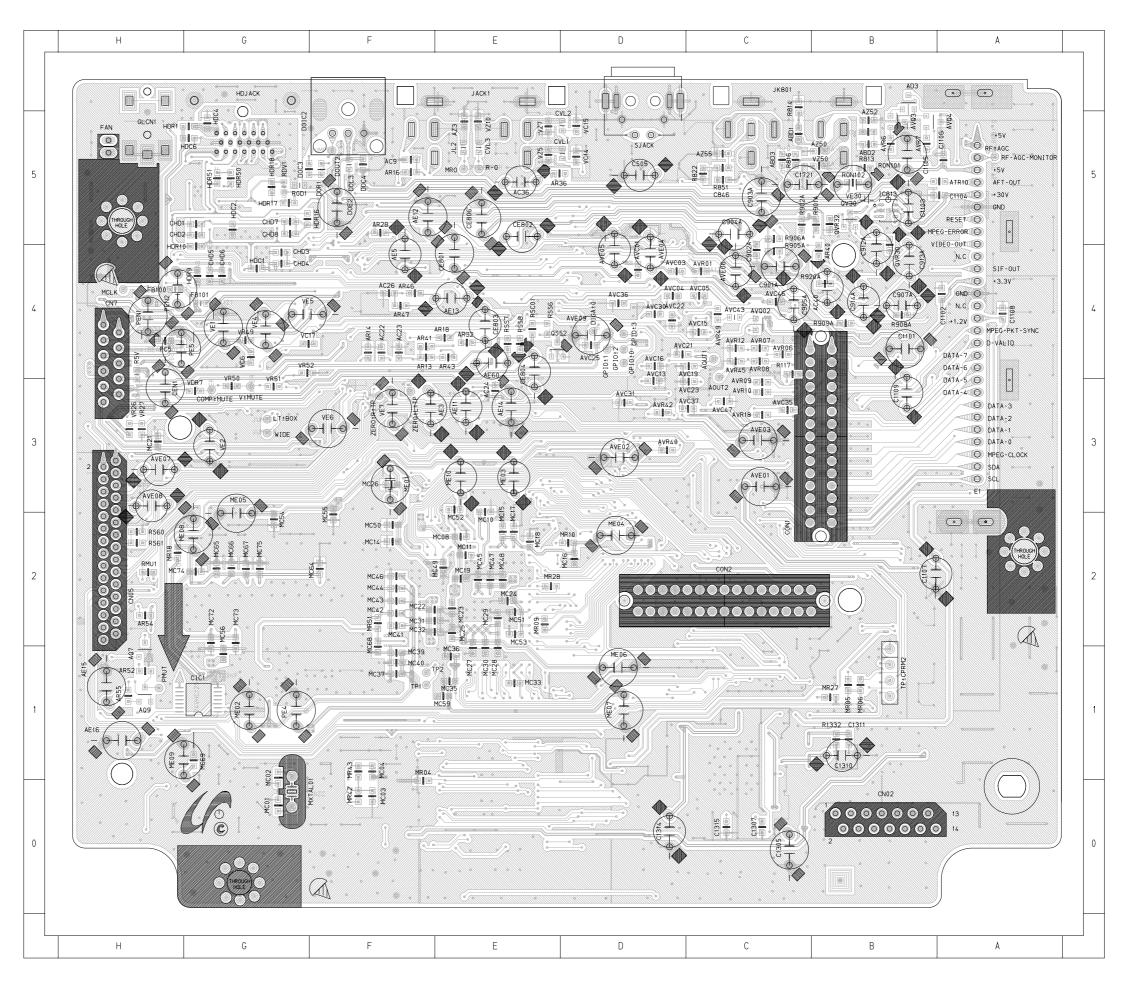
4-1	DVD Main PCB	4-3
4-2	VCR Main PCB	4-7
4-3	Function PCB	4-11
4-4	Front Jack PCB	4-13
4-5	DV Jack PCB	4-15

4-1 4-2

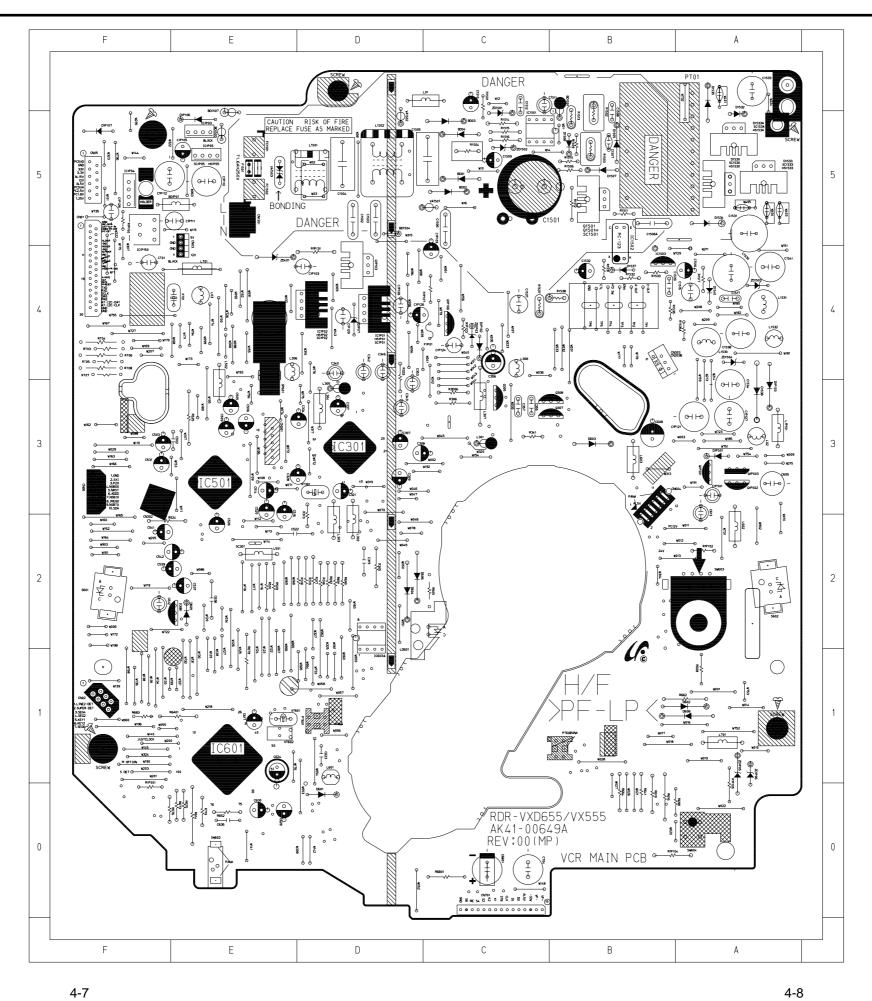
COMPONENT SIDE



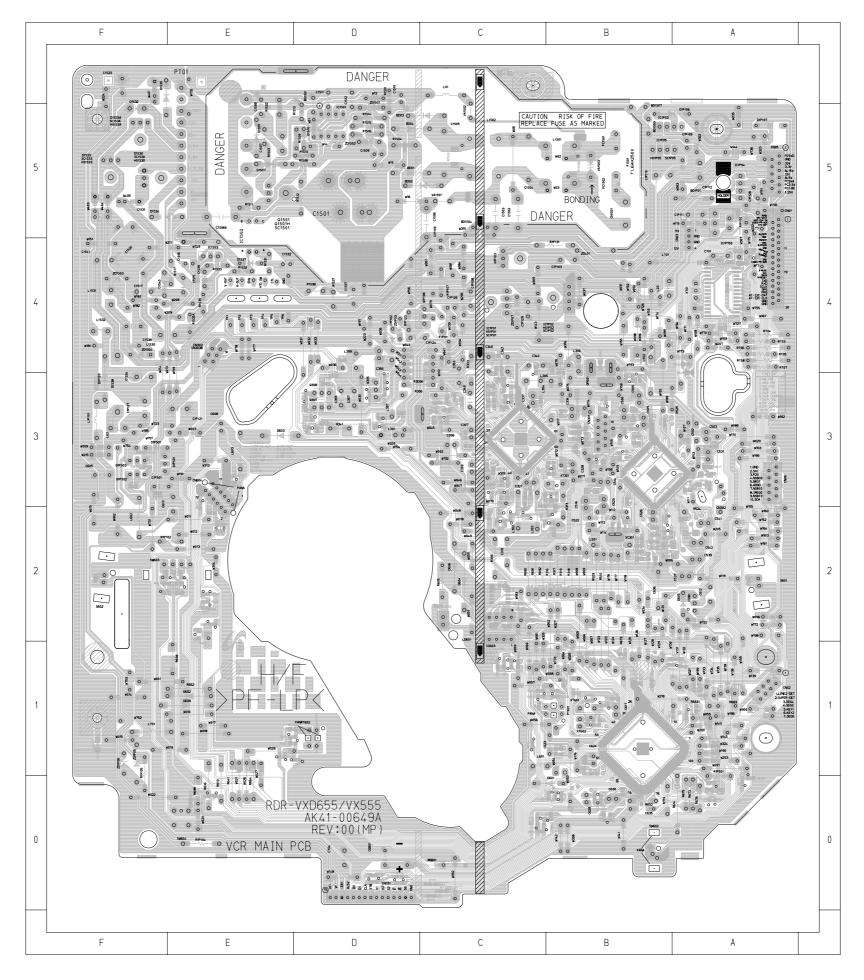
CONDUCTOR SIDE



COMPONENT SIDE

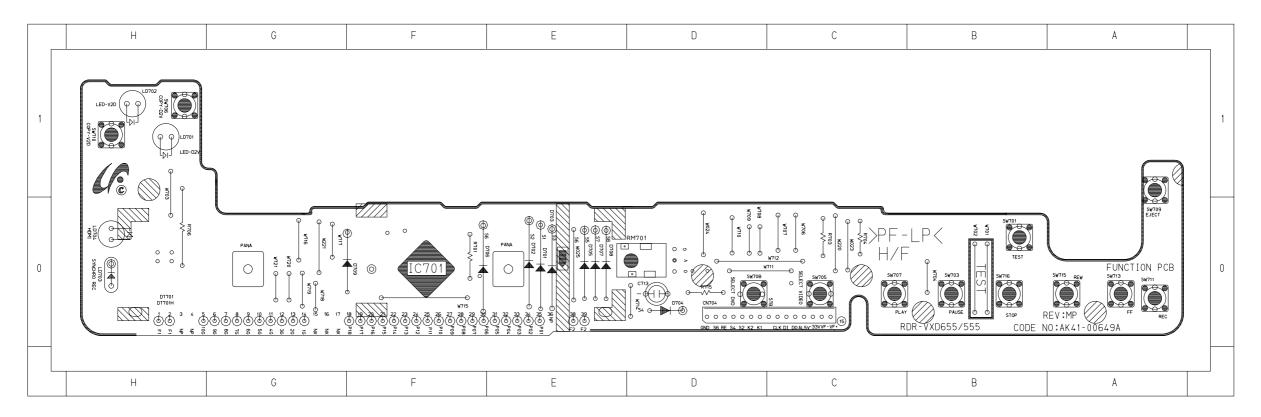


CONDUCTOR SIDE

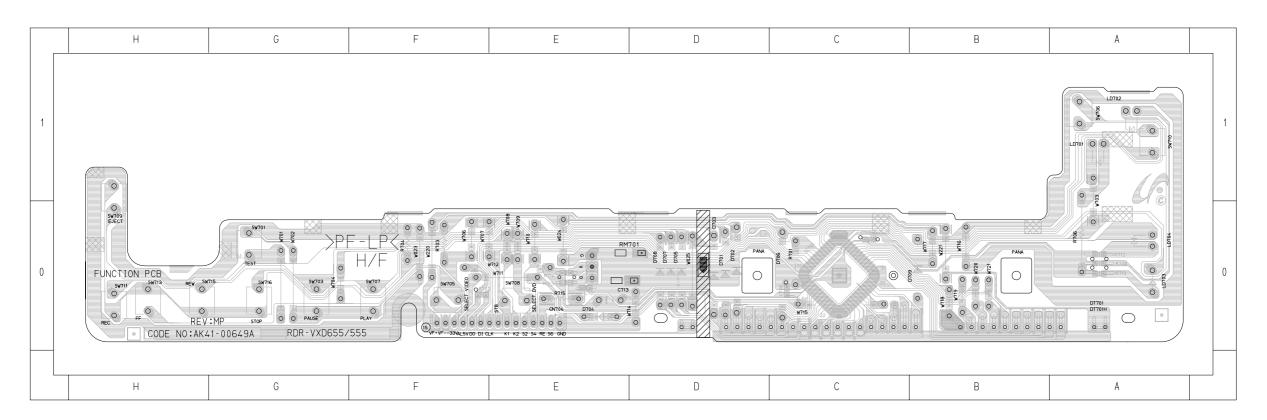


4-3 Function PCB

COMPONENT SIDE

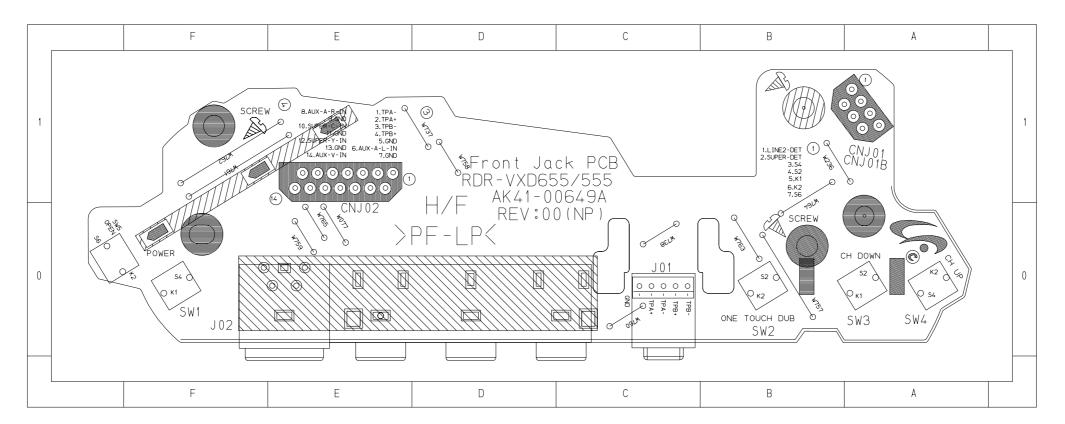


COMPONENT SIDE

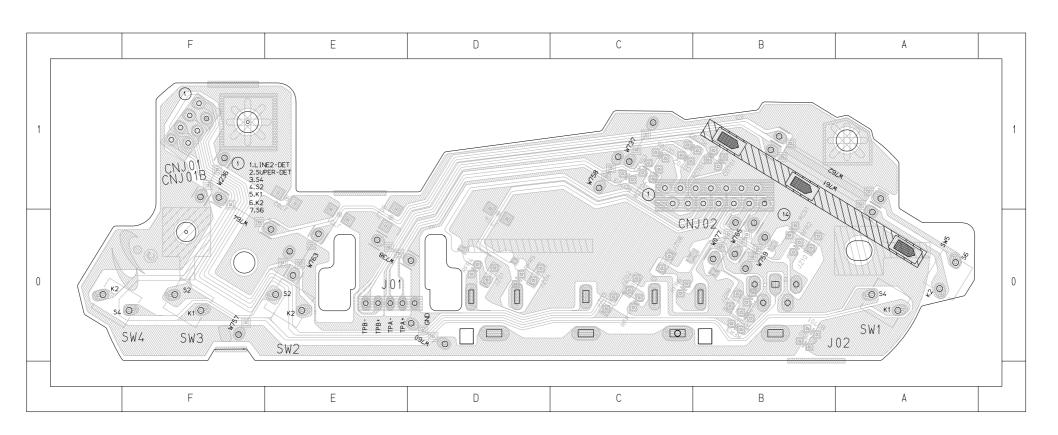


4-11 4-12

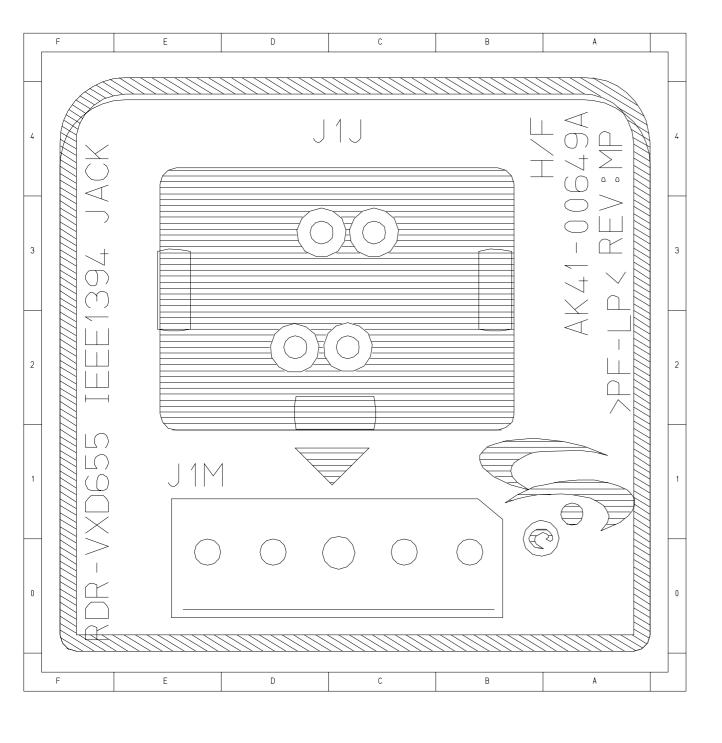
COMPONENT SIDE

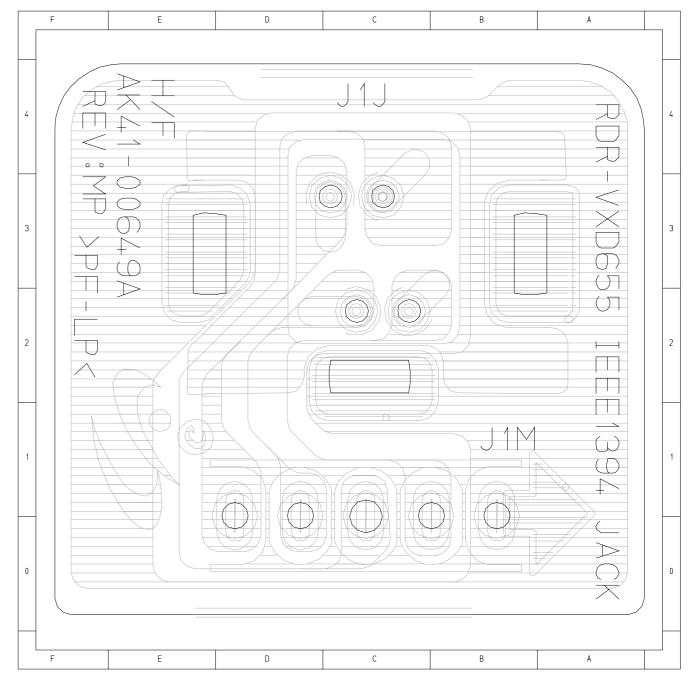


CONDUCTOR SIDE



COMPONENT SIDE COMPONENT SIDE





4-15 4-16E

5. Schematic Diagrams

5-1	S.M.P.S (VCR Main PCB)	5-3
5-2	Power (VCR Main PCB)	5-5
5-3	Logic (VCR Main PCB)	5-7
5-4	A/V (VCR Main PCB)	5-9
5-5	Hi-Fi (VCR Main PCB)	5-11
5-6	MPEG Decoder (DVD Main PCB)	5-13
5-7	A/V Decoder (DVD Main PCB)	5-15
5-8	In Out (DVD Main PCB)	5-17
5-9	DV & HDMI (DVD Main PCB)	5-19
5-10	Front Timer (Front Jack PCB)/DV Jack (DV Jack PCB)	5-21
5-11	Function (Function PCB)	5-23

Note

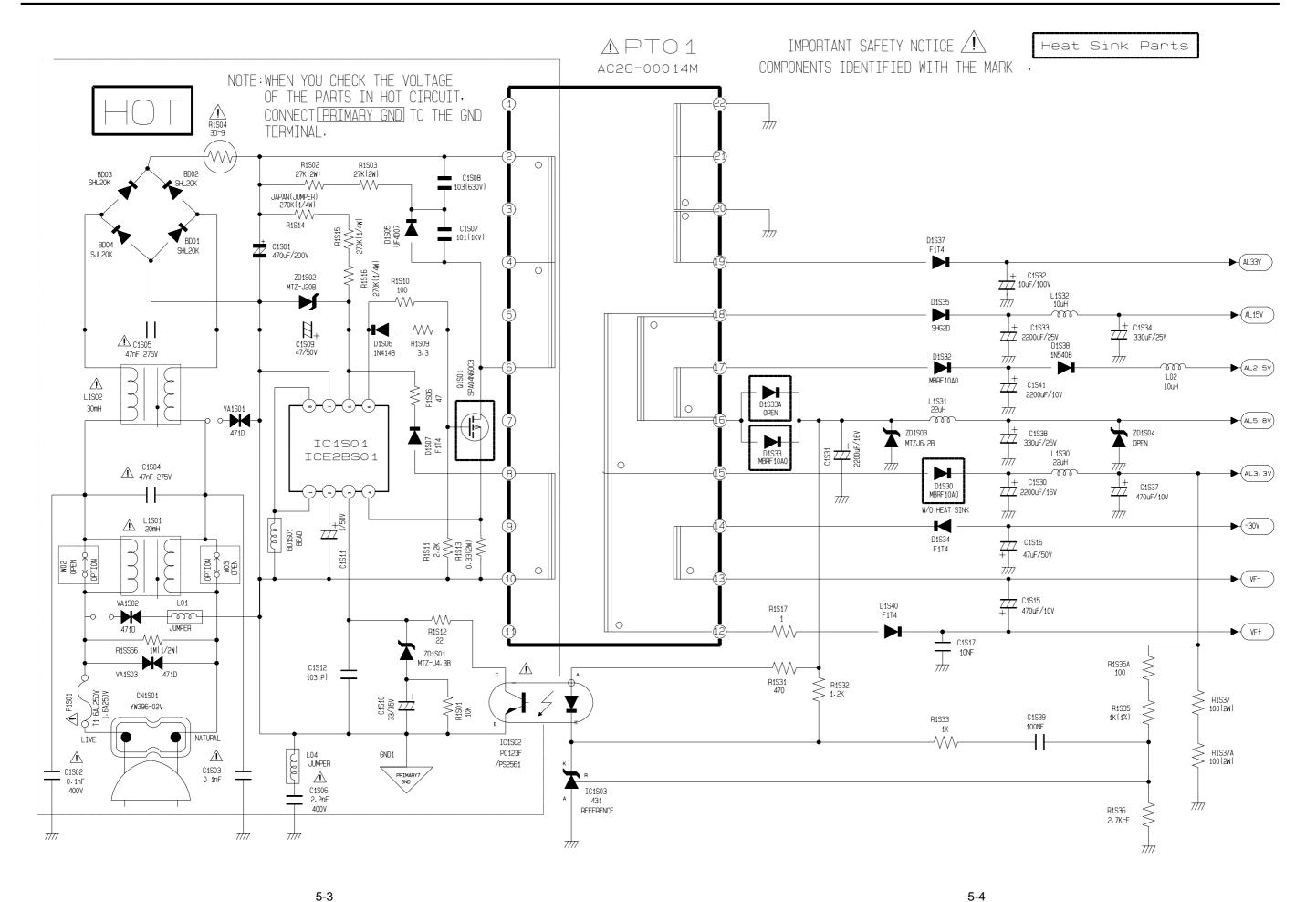
For schematic Diagram - Resistors are in ohms, 1/8W unless otherwise noted.

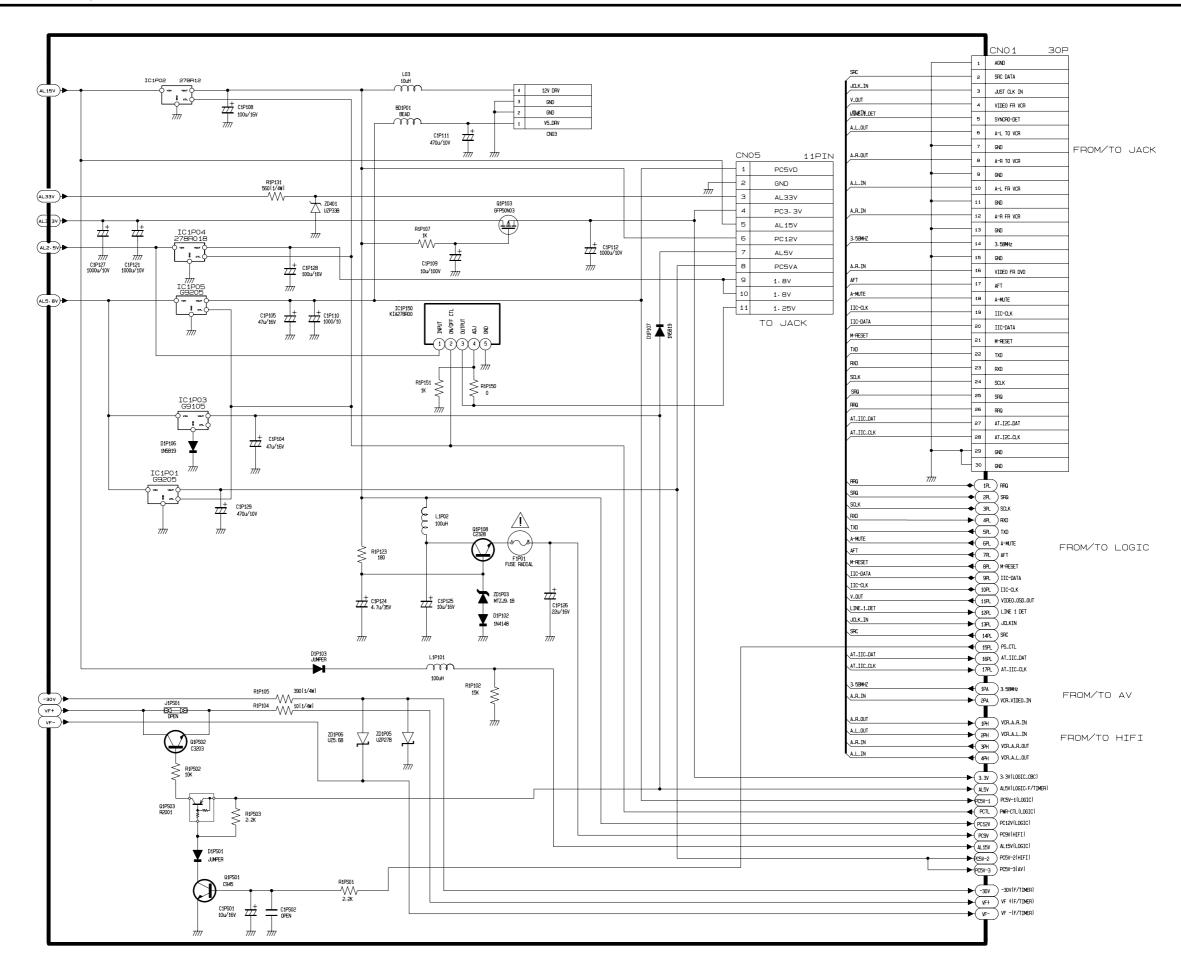
Most semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "electrostatically sensitive (ES) devices" section of this service manual.

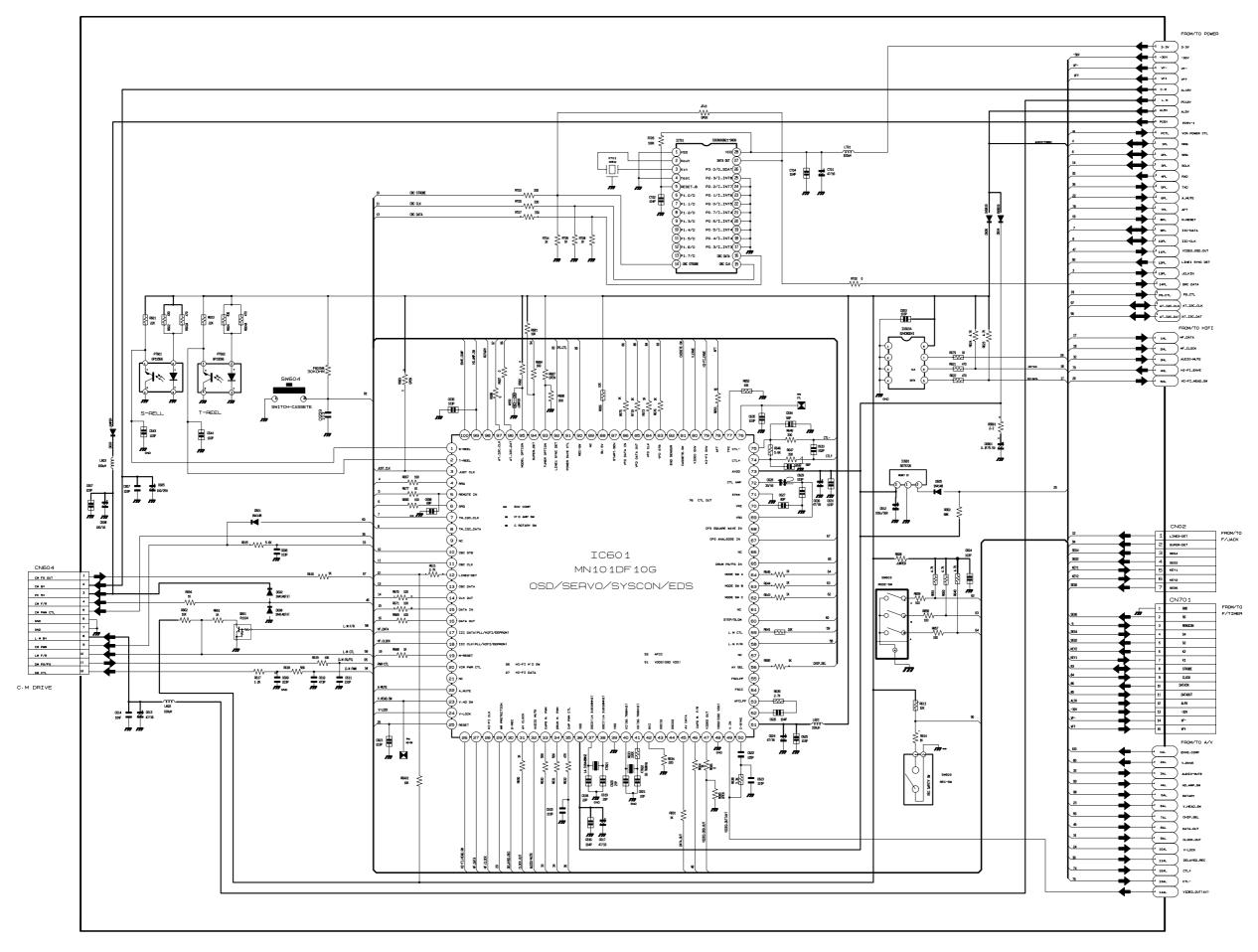
Important safety notices:

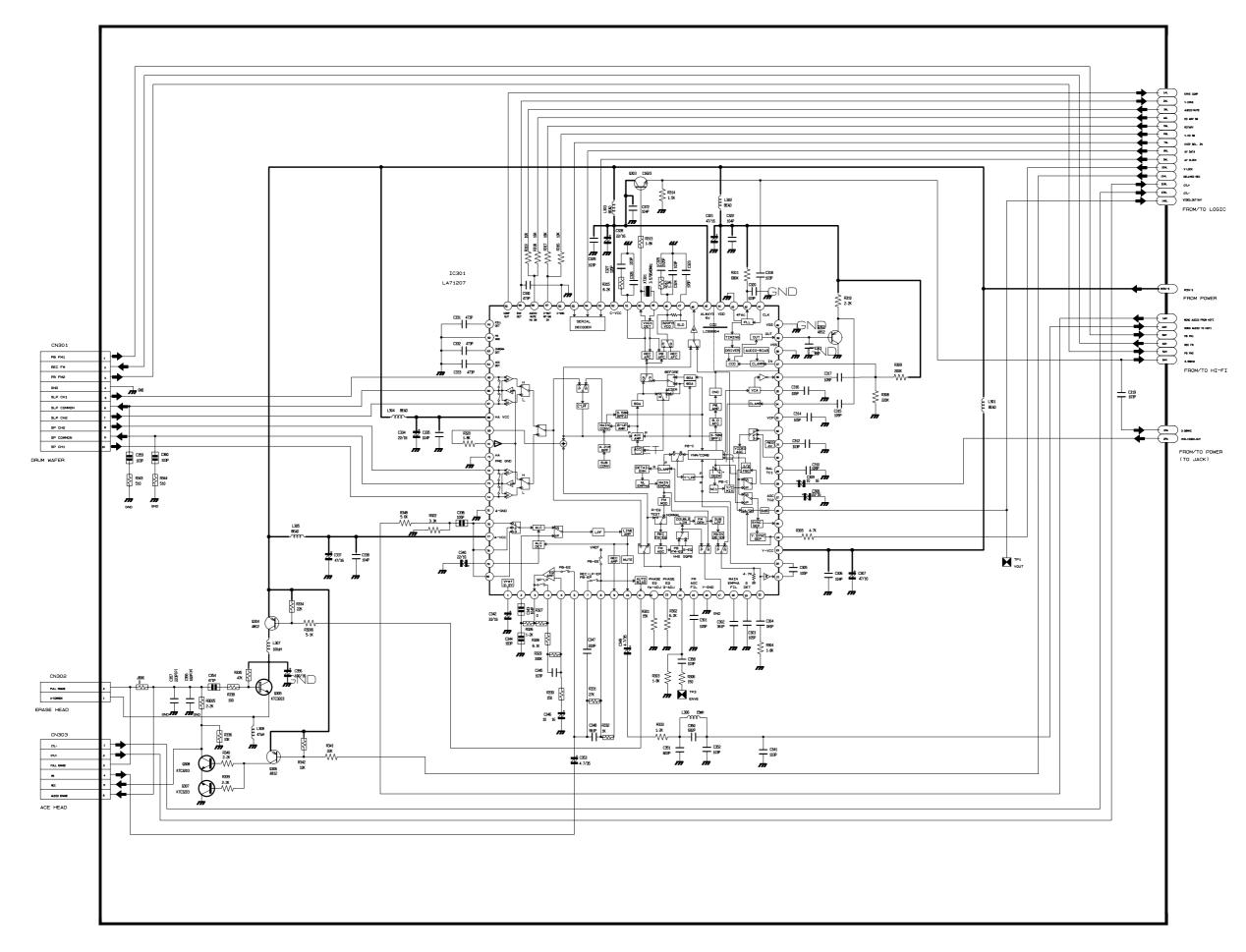
Components identified with the mark 🛆 have the special characteristics for safety. When replacing any of these components. Use only the same type.

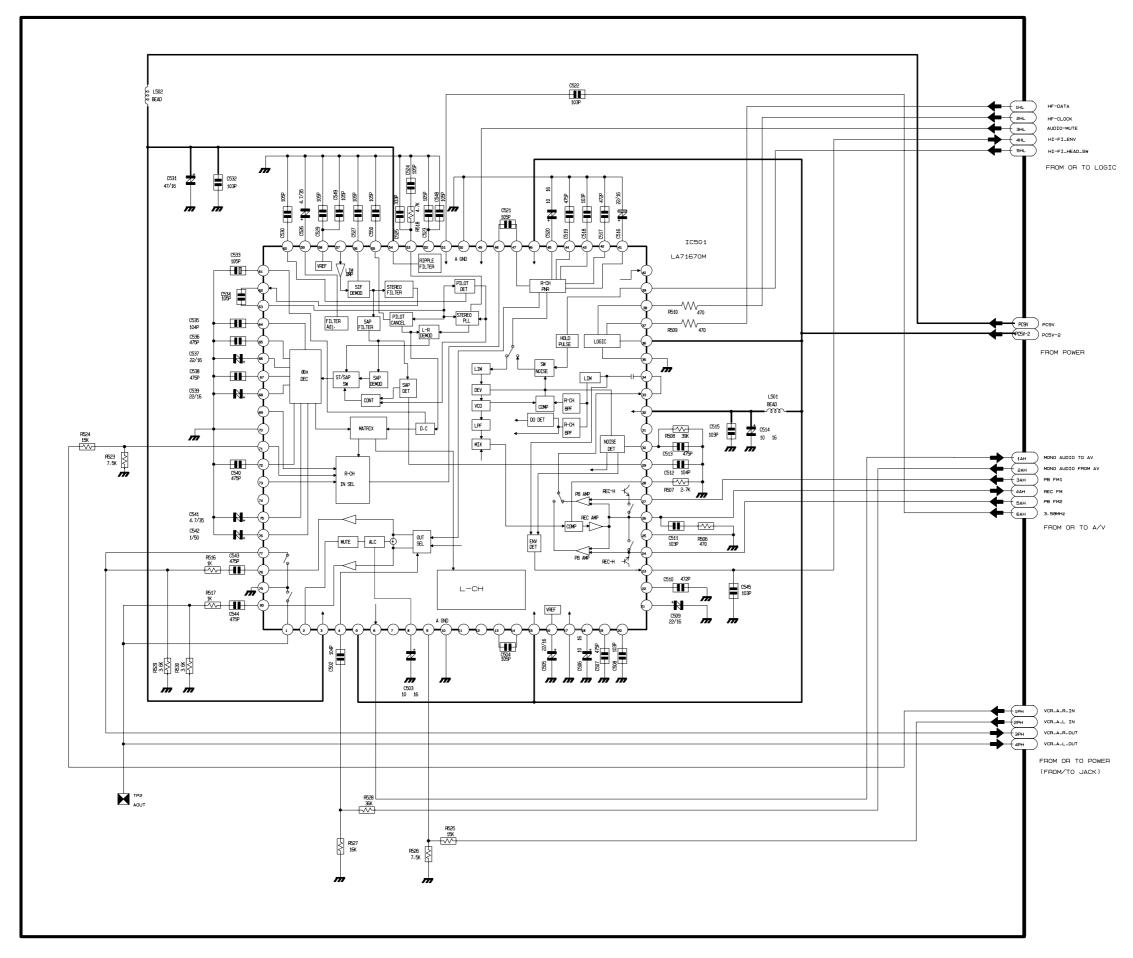
5-2 5-1



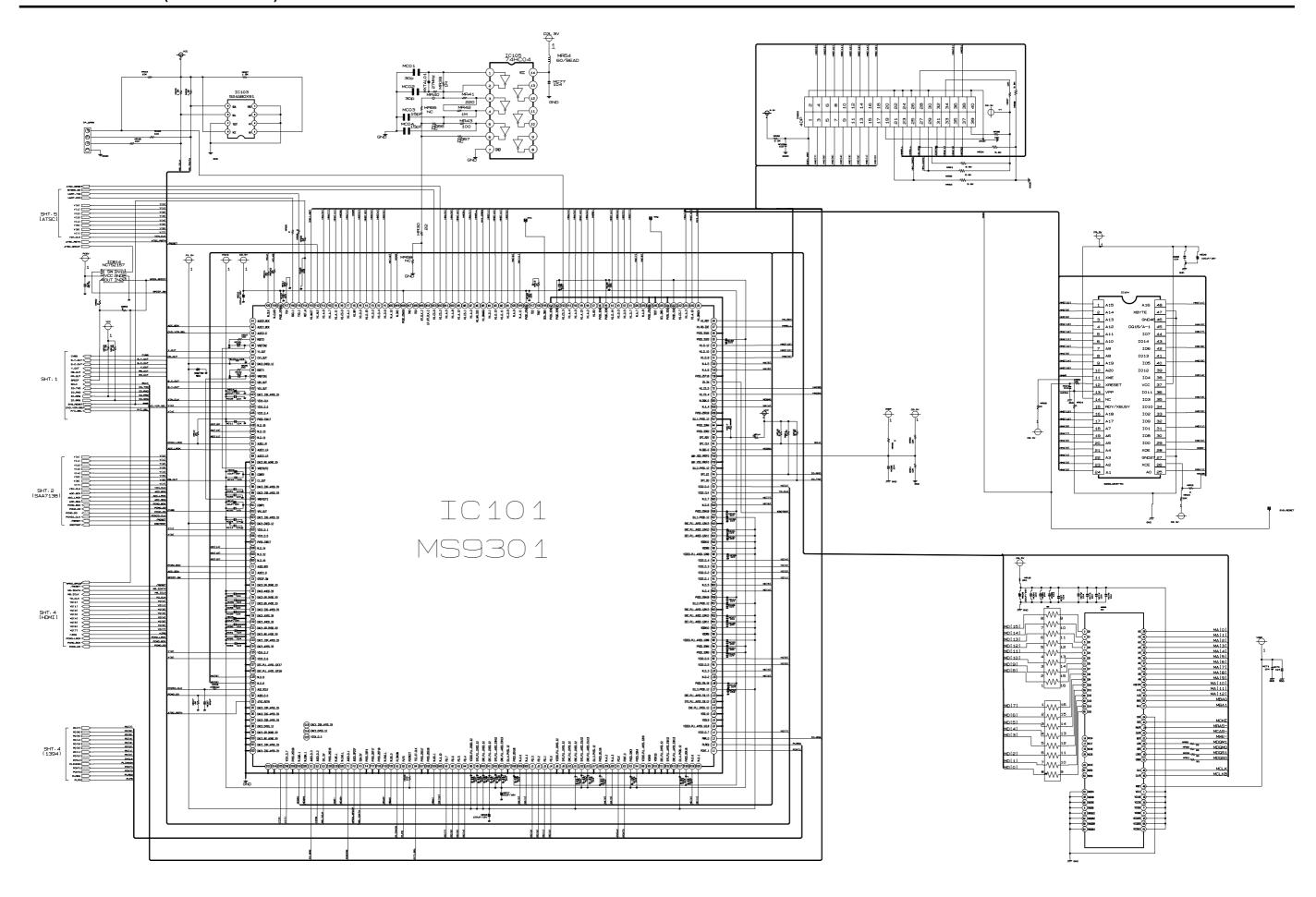




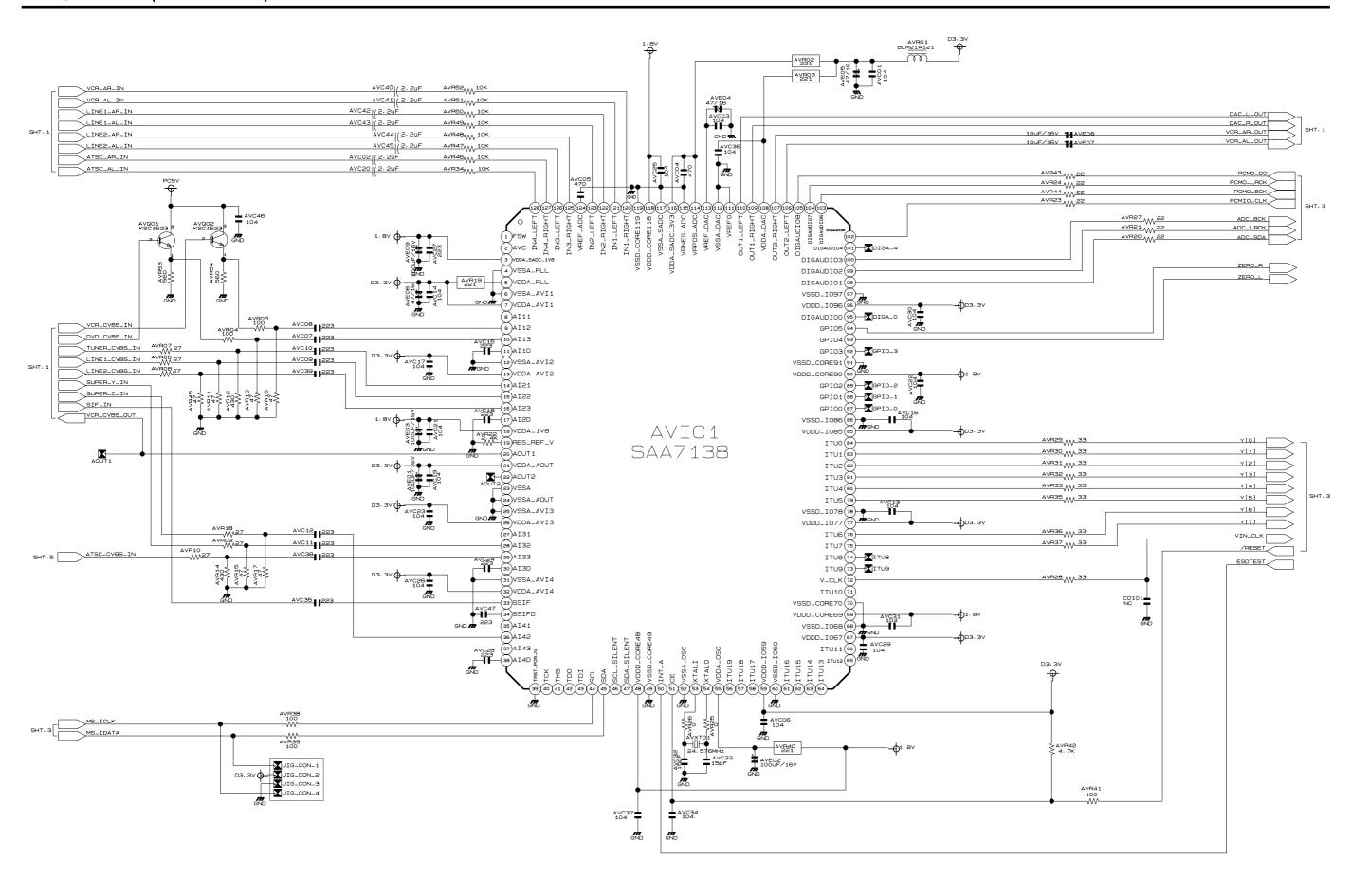


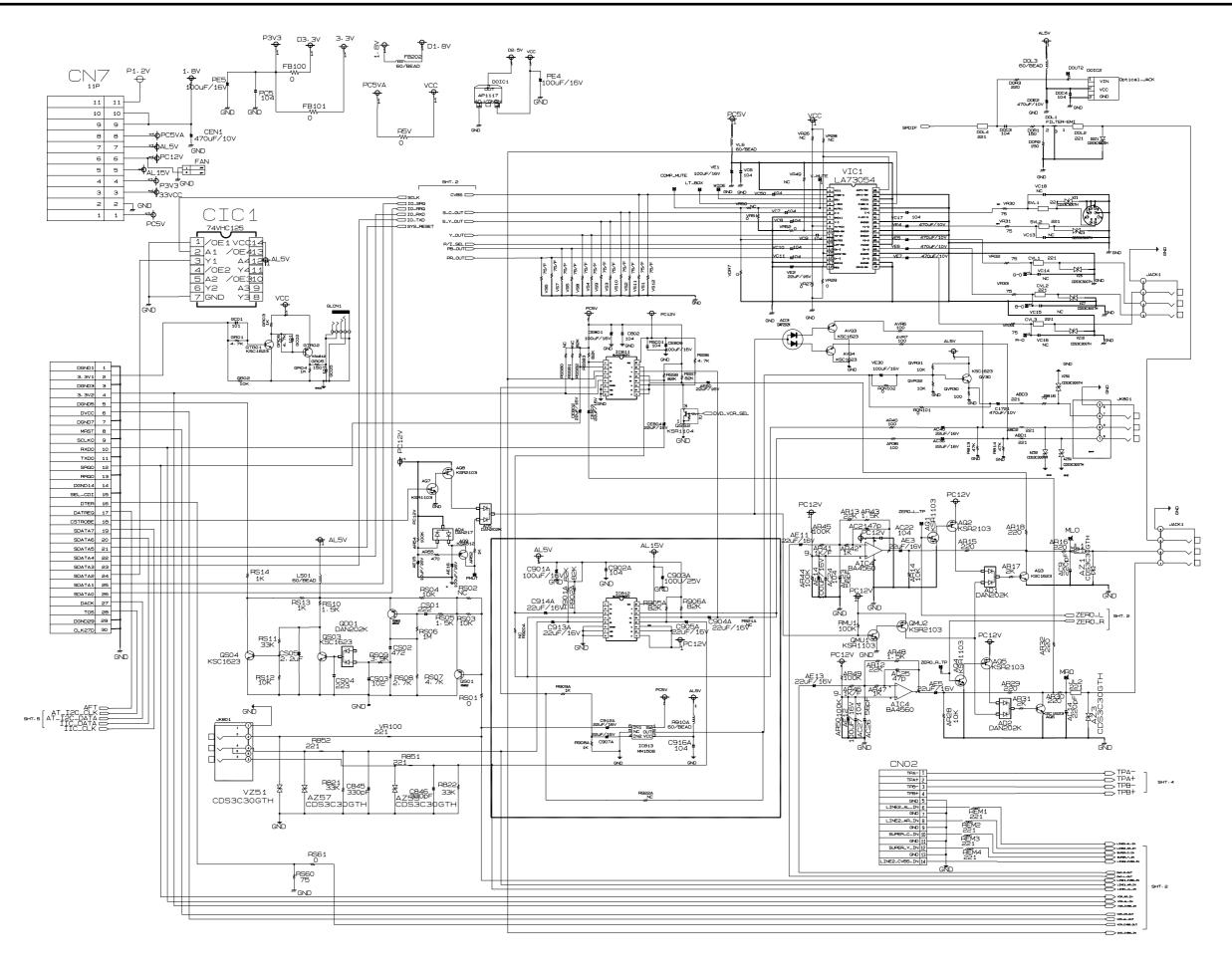


5-11 5-12



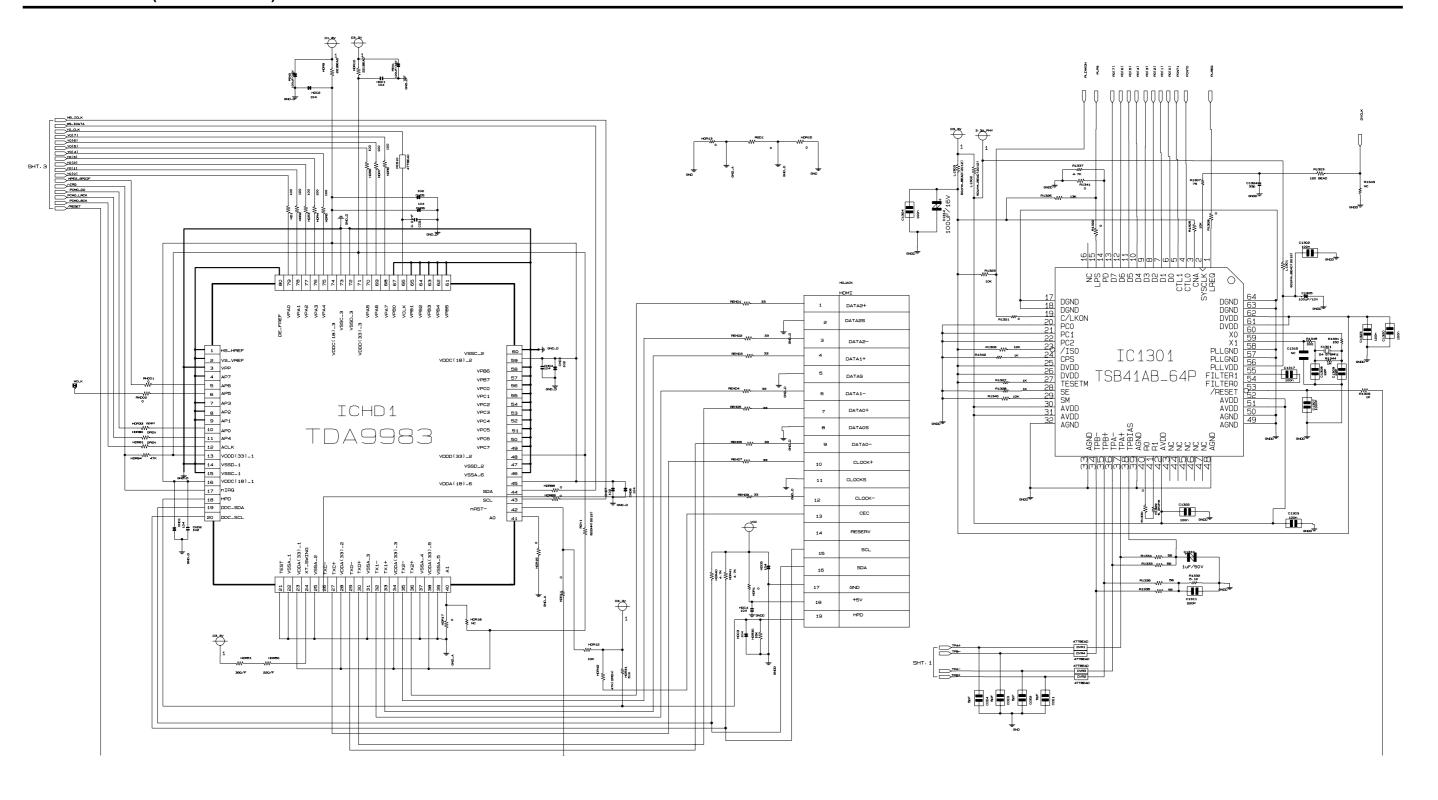
5-7 A/V Decoder (DVD Main PCB)

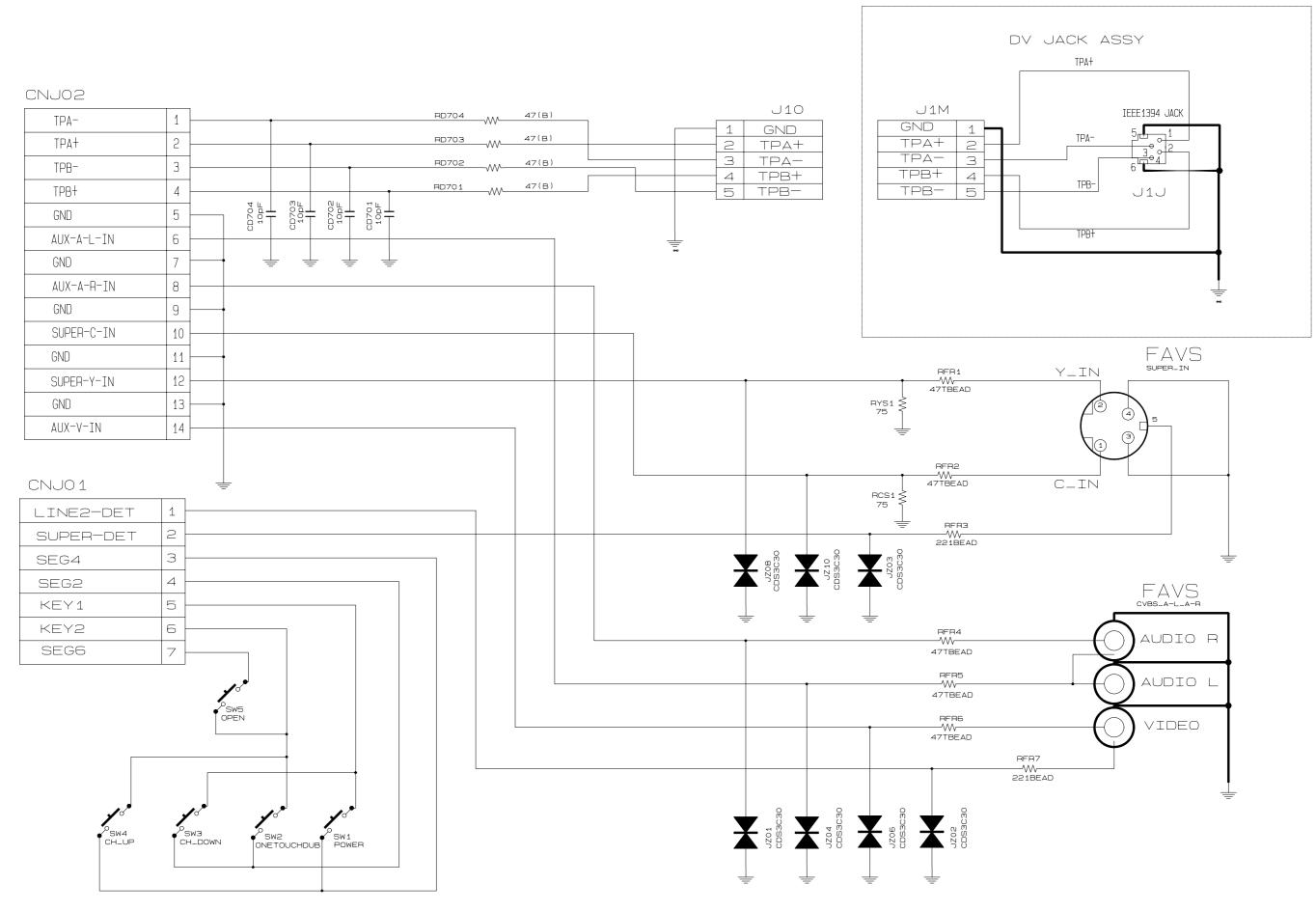




5-17 5-18

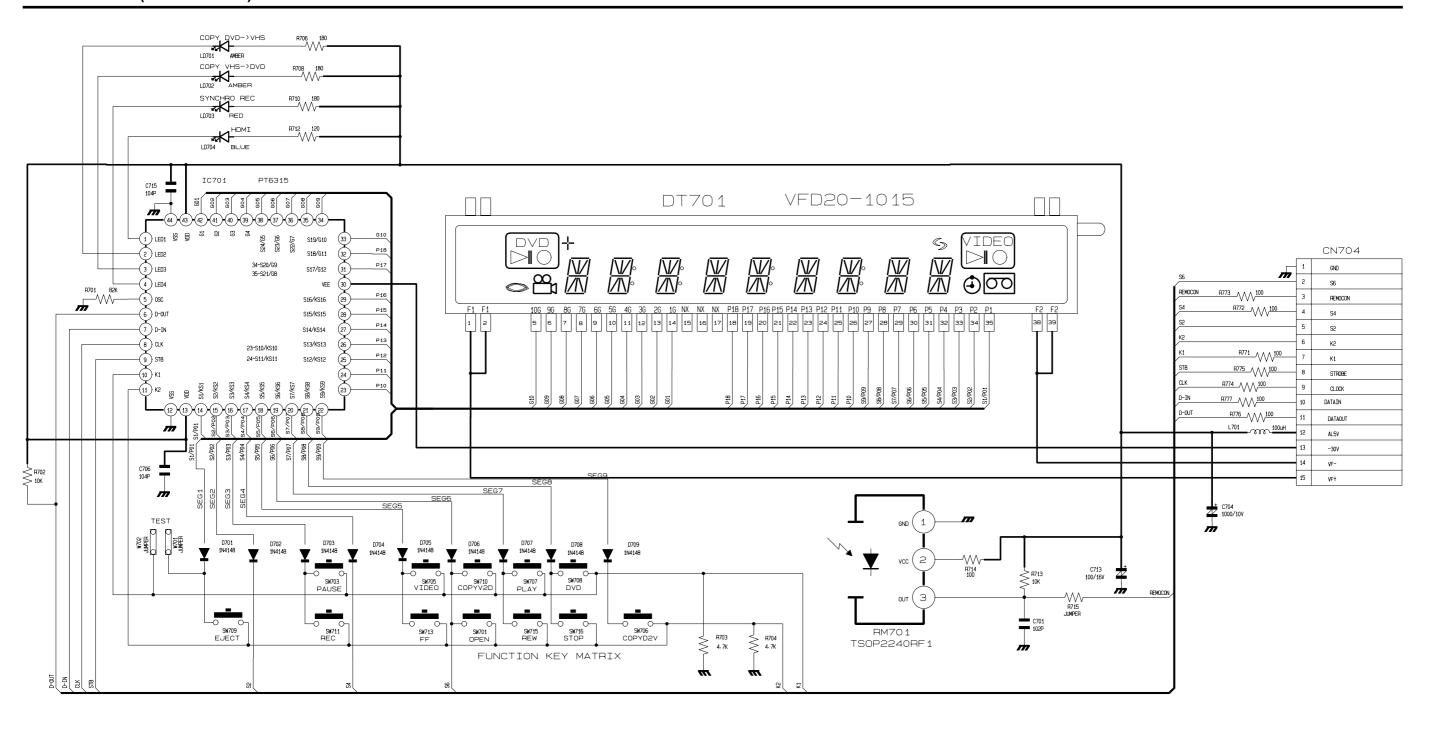
5-9 DV & HDMI (DVD Main PCB)





5-21 5-22

5-11 Function (Function PCB)



5-23 5-24E

6. ALIGNMENT AND ADJUSTMENTS

6-1 VCR ADJUSTMENT

6-1-1 Reference

- 1) X-Point (Tracking center) adjustment, "Head switching adjustment" can be adjusted with remote control.
- 2) When replacing the VCR Main PCB Micom (IC601) and NVRAM (IC603A: EEPROM) be sure to adjust the "Head switching adjustment".
- 3) When replacing the cylinder ass'y, be sure to adjust the "X-Point" and "Head switching adjustment".
- 4) How to adjust.
 - Intermittently short-circuit the Test Point on Function PCB with pincers to the adjustment mode.
 - If the corresponding adjustment button is pressed, the adjustment is performed automatically.
 - When the adjustment is completed, be sure to turn the power off.

6-1-1(a) Location of adjustment button of remote control

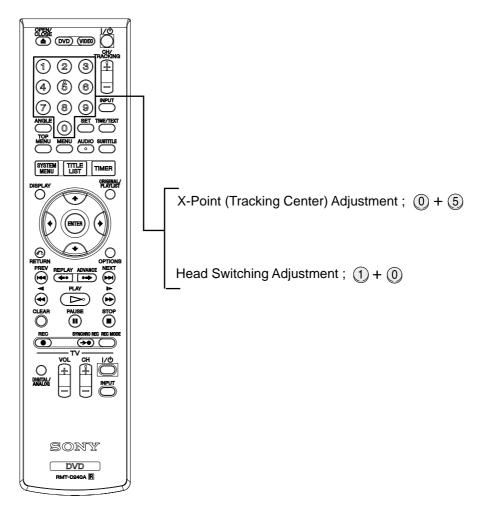


Fig. 6-1

6-1-1(b) TEST location for adjustment mode setting

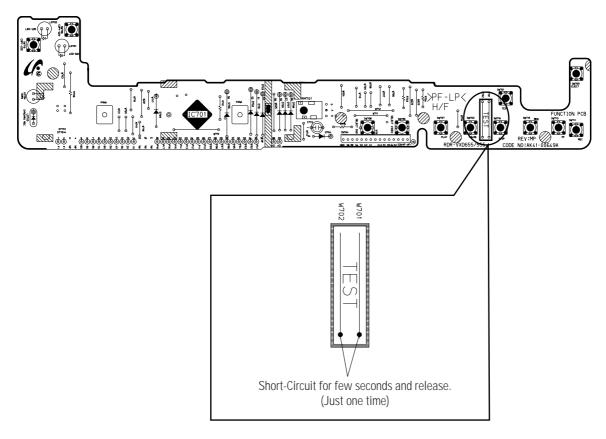


Fig. 6-2 Function PCB (Top View)

6-1-2 Head Switching Point Adjustment

- 1) Playback the alignment tape.
- 2) Intermittently short-circuit the two Test Points on Function PCB while setting the adjustment mode. (See Fig. 6-2)
- 3) Press the "1, 0" buttons; remote control adjustment operates automatically. (See Fig. 6-1)

6-2 VCR MECHANICAL ADJUSTMENT

6-2-1 Tape Transport System and Adjustment Locations

The tape transport system has been adjusted precisely in the factory. Alignment is not necessary except for the following:

- 1) Noise observed on the screen.
- 2) Tape damage.
- 3) Parts replacement in the tape transport system.

Lower flange height of tape guide is used as the reference for the transport adjustment.

To maintain the height of the tape guide and prevent damage, do not apply excessive force onto the main base.

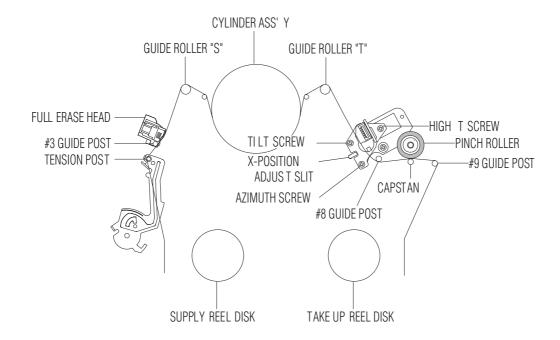


Fig. 6-3 Location of Tape Transport Adjustment

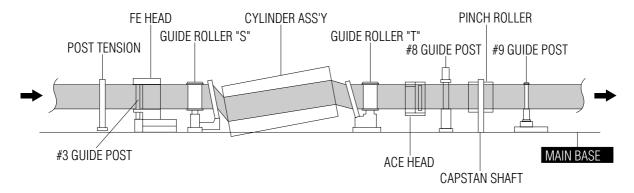


Fig. 6-4 Tape Travel Diagram

6-2-2 Tape Transport System Adjustment

When parts are replaced, perform the required adjustments by referring to procedures for the tape transport system. If there are any changes to the tape path, first run a T-120 tape and make sure excessive tape wrinkle does not occur at the tape guides.

- ♦ If tape wrinkle is observed at the guide roller S, T, turn the guide roller S, T until wrinkle disappears.
- ♦ If the tape wrinkle is still observed at the tape guide, perform the tilt adjustment of the ACE head.

(1) ACE Head Assembly Adjustment

a. ACE HEAD HEIGHT ADJUSTMENT

- 1) Run the alignment tape (Color bar) in the playback mode.
- 2) Observe surface of the audio head using a dental mirror.
- 3) Turn screw (C) clockwise or counterclockwise until the gap of lower tape edge and the lower edge of the control head is about 0.25mm. (Refer to Fig. 6-5 and 6-6)

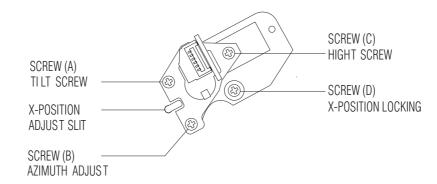


Fig. 6-5 Location of ACE Head Adjustment Screw

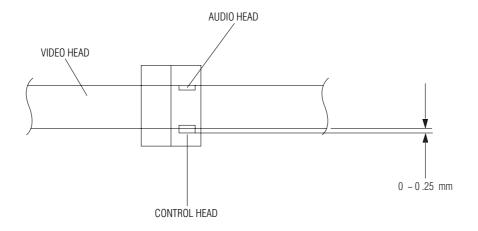


Fig. 6-6 ACE Head Height Adjustment

b. ACE HEAD TILT ADJUSTMENT

- 1) Playback a blank tape and observe the position of the tape at the lower flange of tape guide.
- 2) Confirm that there is no curl or wrinkle at the lower flange of tape guide as shown in Fig. 6-7 (B).
- 3) If a curl or wrinkle of the tape occurs, slightly turn the screw (A) tilt adjust on the ACE head ass'y.
- 4) Reconfirm the ACE head height.

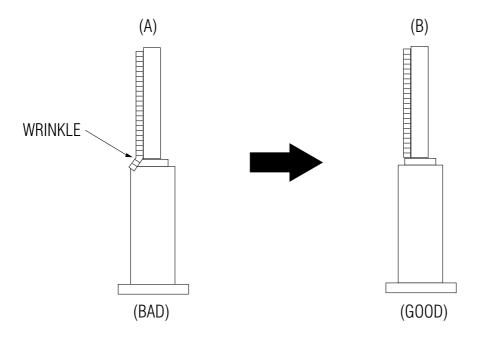


Fig. 6-7 Tape Guide Check

c. AUDIO AZIMUTH ADJUSTMENT

- 1) Load alignment tape (Mono scope) and playback the 7KHz signal.
- 2) Connect channel-1 scope probe to audio output.
- 3) Adjust screw (B) to achieve maximum audio level. (See Fig. 6-5)

d. ACE HEAD POSITION (X-POINT) ADJUSTMENT

- 1) Playback the alignment tape (Color bar)
- 2) Intermittently short-circuit the two Test Points on Function Timer PCB. (See Fig. 6-2)
- 3) Press the "0, 5" remote control buttons, then adjustment is operates automatically. (See Fig. 6-1)
- 4) Connect the CH-1 probe to "Envelope" the CH-2 probe to "H'D switching pulse" and then trigger to CH-1.
- 5) Insert the (-) driver into the X-Point adjustment hole and adjust it so that envelope waveform is maximum.

Test point: TP2 (Audio Output)
TP3 (Envelope)
TP4 (H'D S/W -Trigger)
TP5 (Control Pulse)

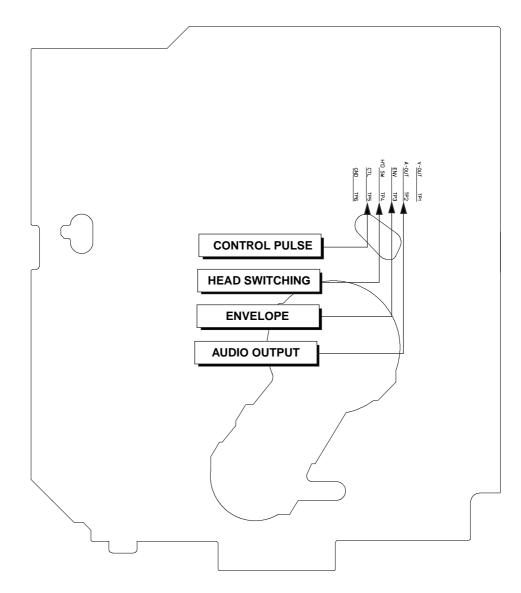


Fig. 6-8 Location of Test point (VCR Main PCB-Top View)

(2) Linearity adjustment (Guide roller S,T adjustment)

- 1) Playback the Mono Scope alignment tape (SP mode).
- 2) Observe the video envelope signal on an oscilloscope (triggered by the video switching pulse).
- 3) Make sure the video envelope waveform (at its minimum) meets the specification shown in Fig. 6-9. If it does not, adjust as follows:

Note:

- a=Maximum output of the video RF envelope.
- b=Minimum output of the video RF envelope at the entrance side.
- c=Minimum output of the video RF envelope at the center point.
- d=Maximum output of the video RF envelope at the exit side.
- 4) If the section A in Fig. 6-10 does not meet the specification, adjust the guide roller S up or down.
- 5) If the section B in Fig. 6-10 does not meet the specification, adjust the guide roller T up or down.

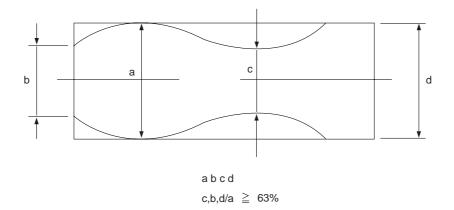


Fig. 6-9 Envelope Waveform Adjustment

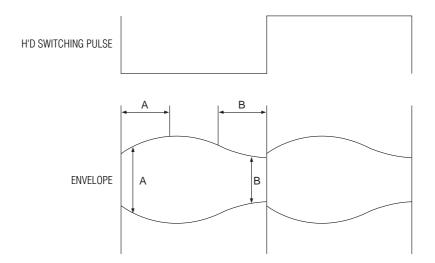


Fig. 6-10 Adjustment Points

- 6) Play back the Mono Scope alignment tape (SP mode).
- 7) Connect an oscilloscope CH-1 to the "Envelope" and CH-2 to the "H'D SW Pulse" for triggering.
- 8) Turn the guide roller heads with a flat head (driver to obtain a flat video RF envelope as shown in Fig. 6-11.

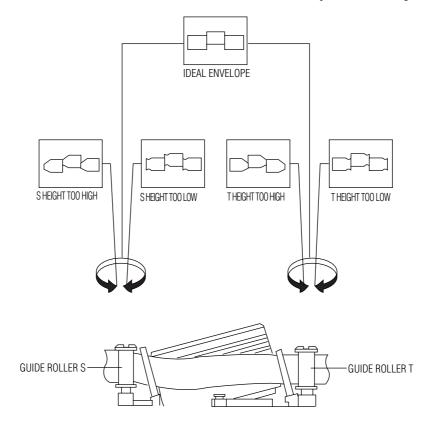


Fig. 6-11 Guide Roller S, T Height Adjustment

(3) Check Transitional Operation from RPS to Play

Check transition from RPS mode to play mode: Using a pre-recorded SP tape, make sure the entry side of envelope comes to an appropriate steady state within 3 seconds (as shown in Fig. 6-12).

If the envelope waveform does not reach specified peak-to peak amplitude within 3 seconds, adjust as follows:

- 1) Make sure there is no gap between the supply roller lower flange and the tape. If there is a gap, adjust the supply guide roller again.
- 2) Change operation mode from the RPS to the play mode (again) and make sure the entry side of envelope rises within 3 second.

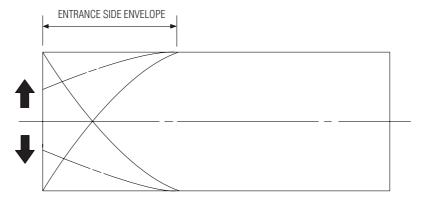


Fig. 6-12 Video Envelope Rising when Operation mode Changes from RPS to Play Mode

(4) Envelope Check

1) Make recordings on T-120 (E-120) and T-160 (E-180) tape.

Make sure the playback output envelope meets the specification as shown in Fig. 6-13.

2) Play back a self recorded tape (recording made on the unit using with T-120 (E-120).

The video envelope should meet the specification as shown in Fig. 6-13.

In SP mode, (A) should equal (B).

If the head gap is wide, upper cylinder should be checked.

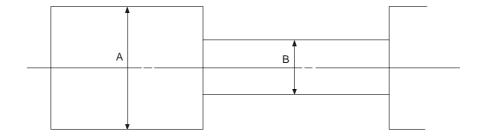


Fig. 6-13 Envelope Input and Output Level

(5) Tape Wrinkle Check

- 1) Run the T-160 (E-180) tape in the playback, FPS, RPS and Pause modes and observe tape wrinkle at each guide.
- 2) If excessive tape wrinkle is observed, perform the following adjustments in Playback mode:
- ◆ Tape wrinkle at the guide roller S, T section : Linearity adjustment.
- ◆ Tape wrinkle at tape guide flange : ACE head assembly coarse adjustment.

6-2-3 Reel Torque

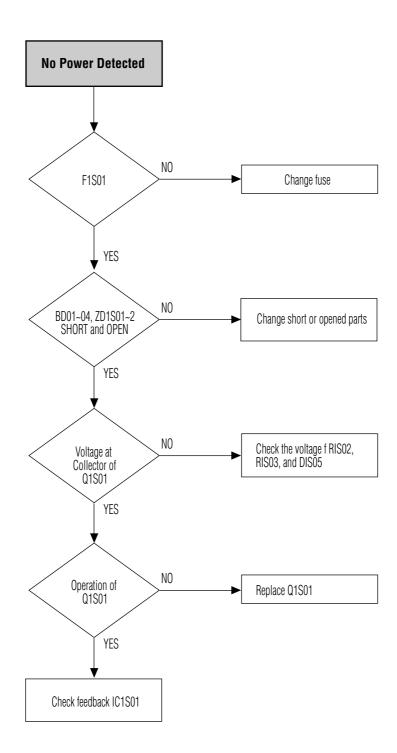
- 1) The rotation of the capstan motor causes the holder clutch ass'y to rotate through the belt pulley.
- 2) The spring wrap PLAY/REV of holder clutch ass'y drives the disk reel S, T through gear idler by rotation of gear center ass'y.
- 3) Brake is operated by slider cam at FF/REW mode.
- 4) Transportation of accurate driving force is done by gears. (Gear Center Ass'y)

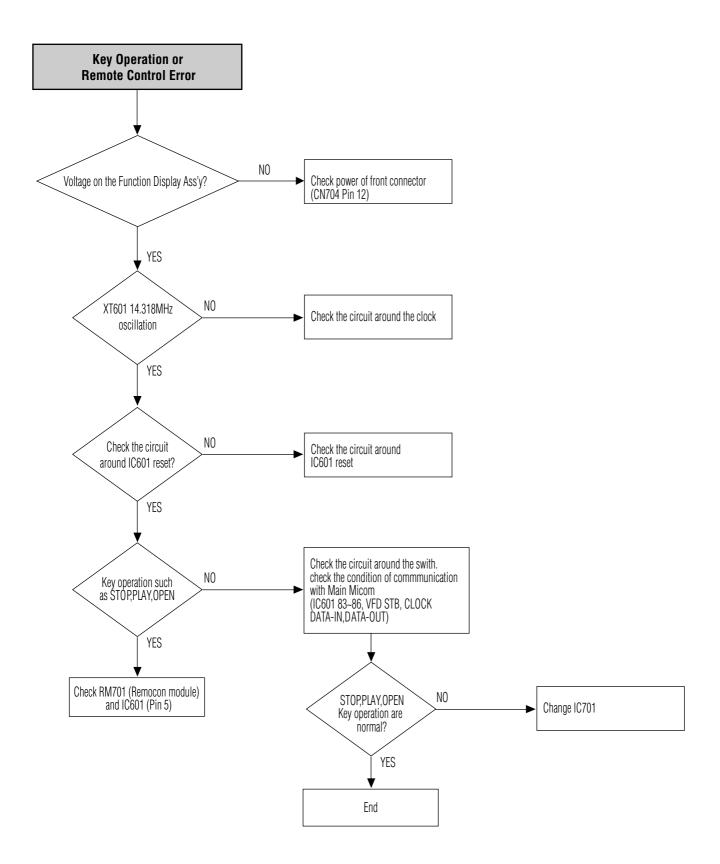
Note: If the spec. does not meet the followings specifications, replace the holder clutch ass'y and then recheck.

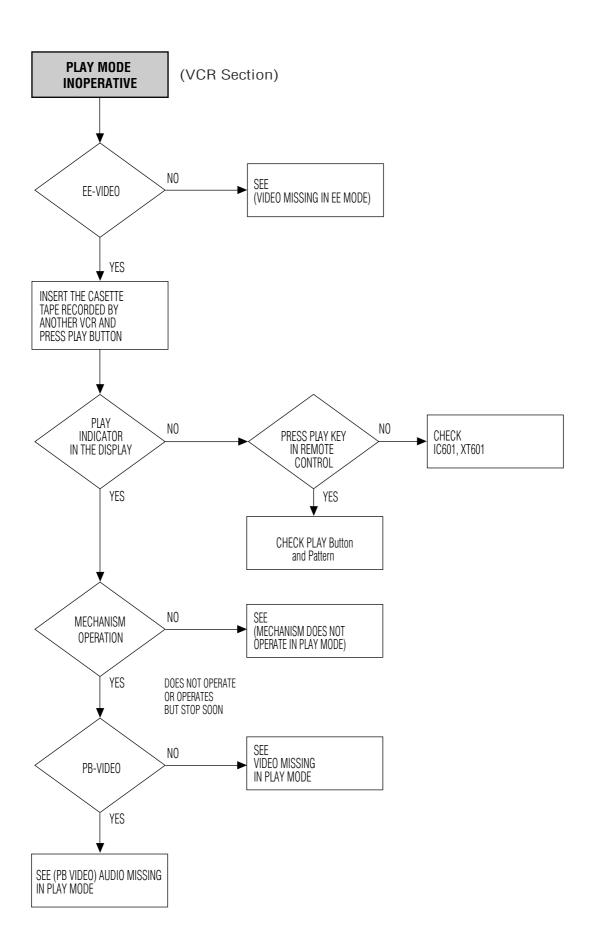
< Table 6-1 >

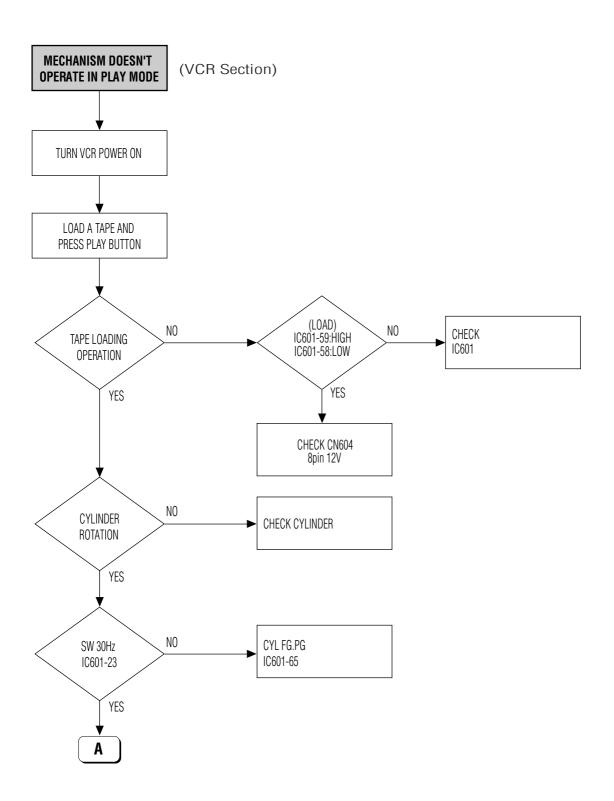
MODE	TORQUE g/cm	GAUGE
PB	42 ± 11	Cassette Torquemeter
RPS	145 ± 30	Cassette Torquemeter

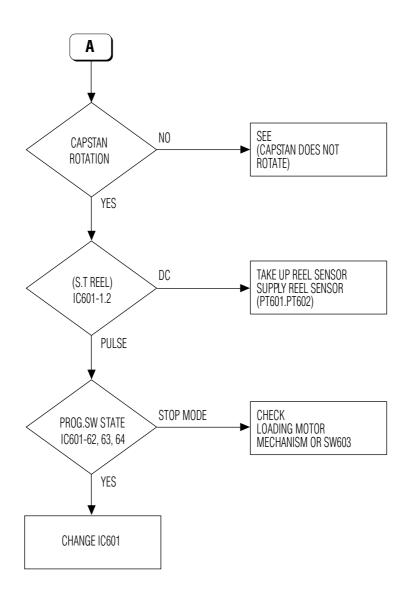
7. TROUBLESHOOTING

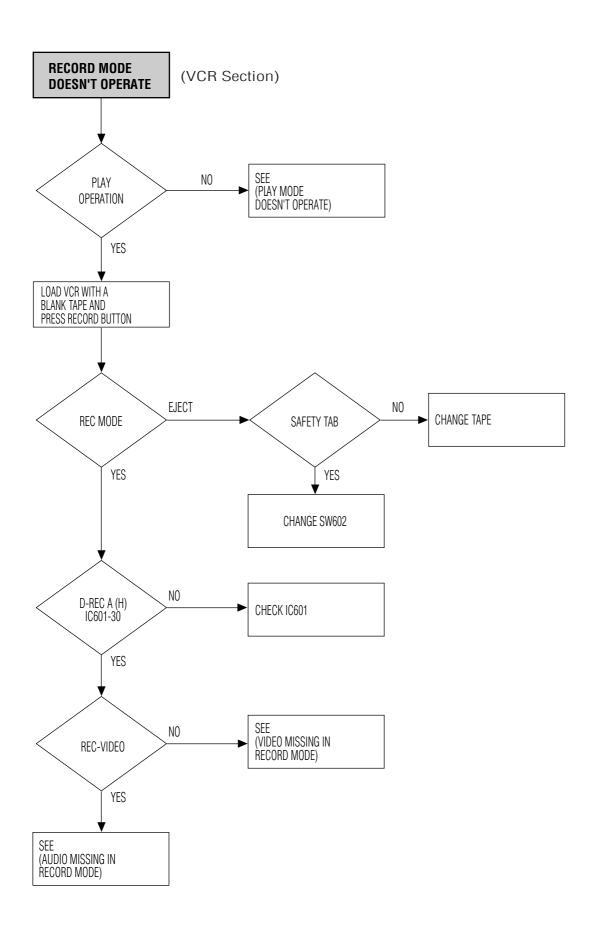


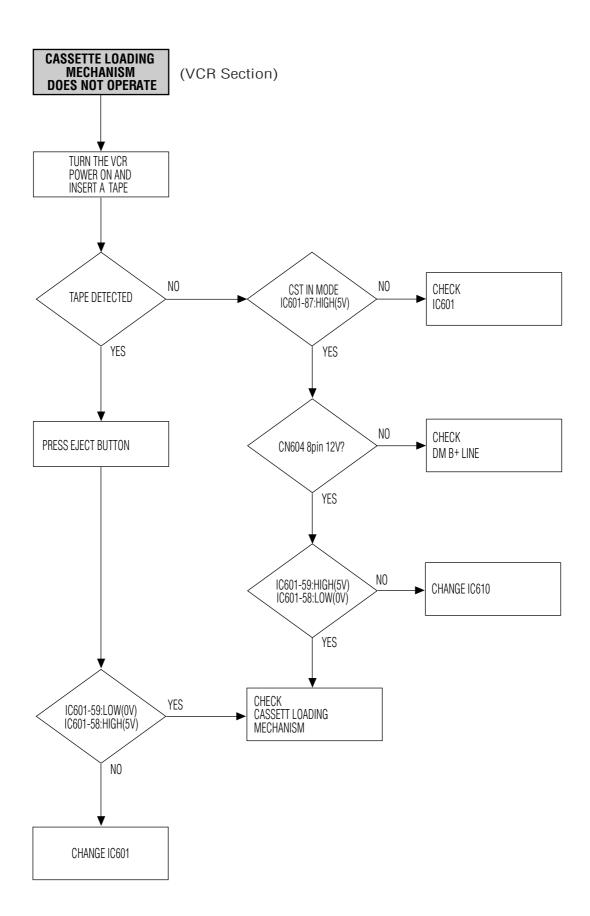


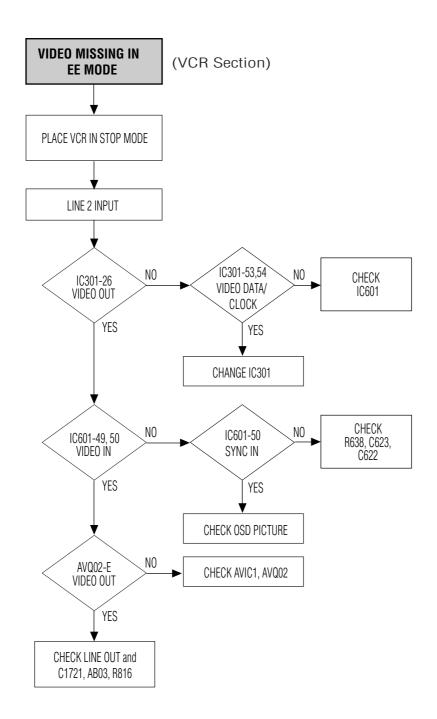


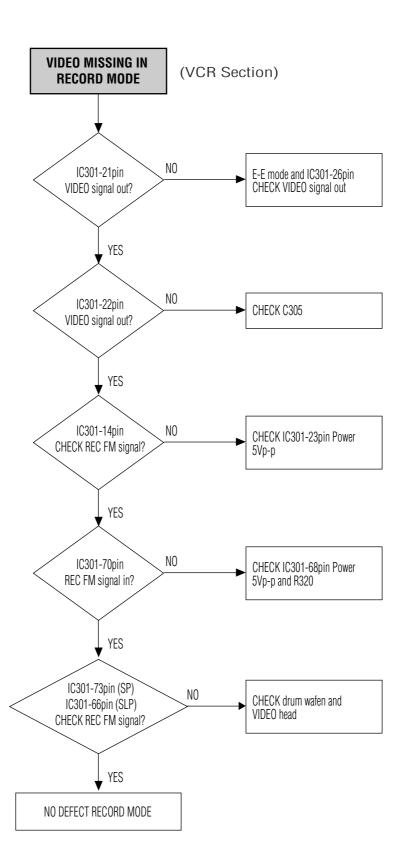


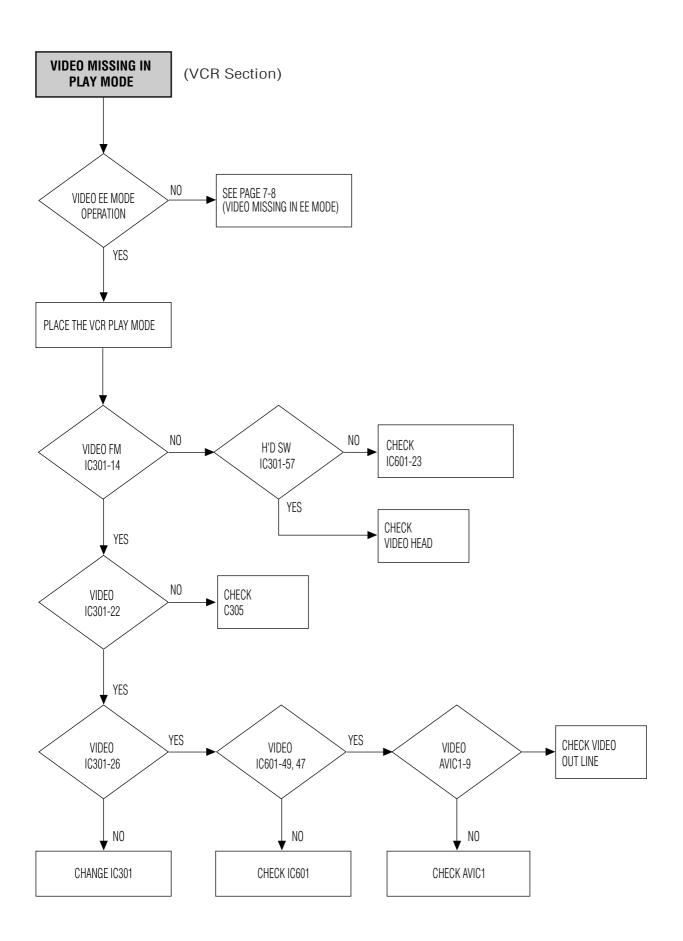


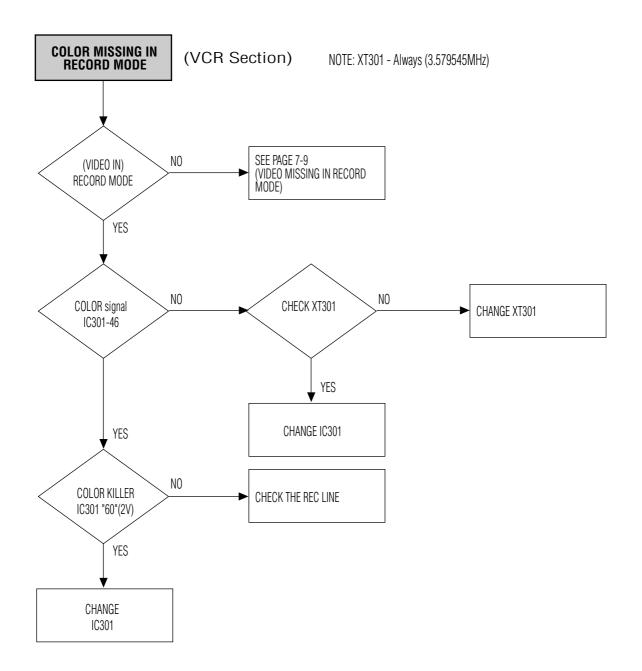


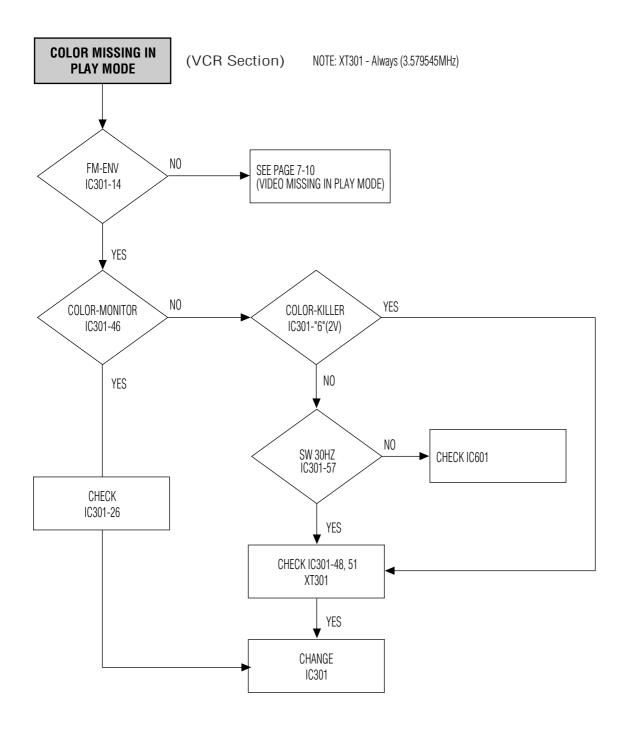


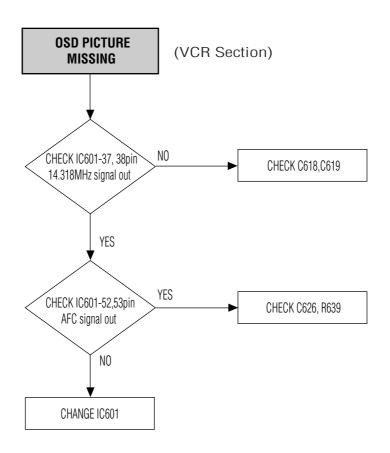


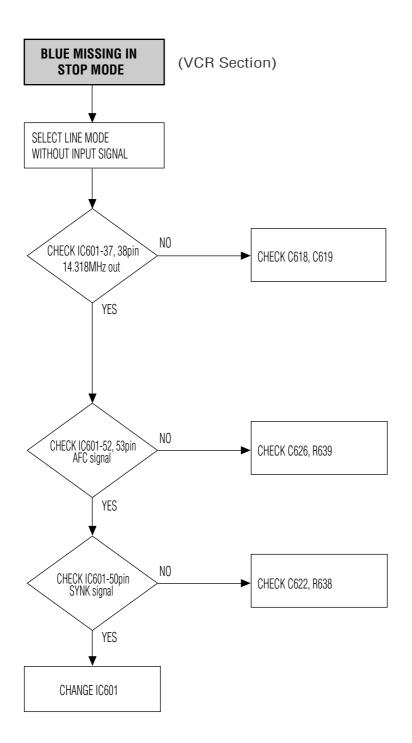


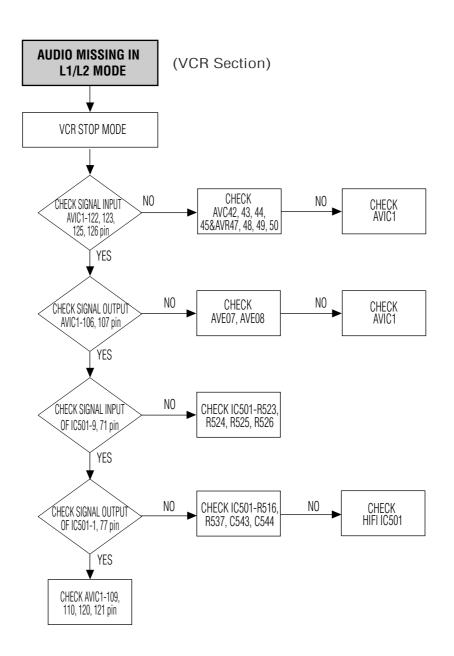


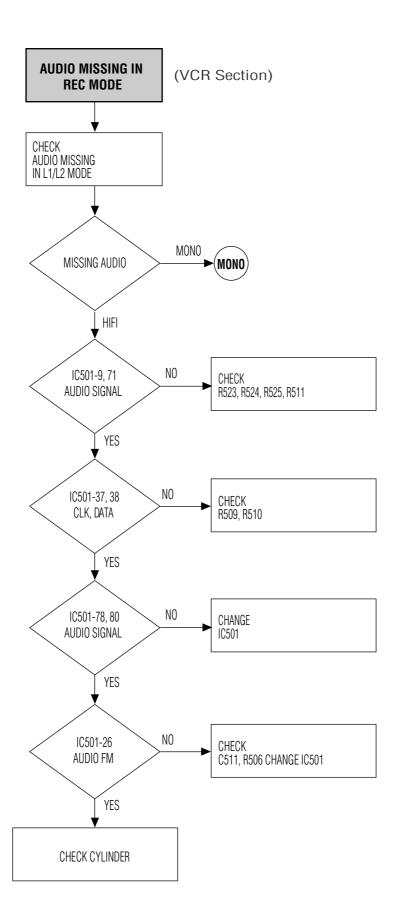


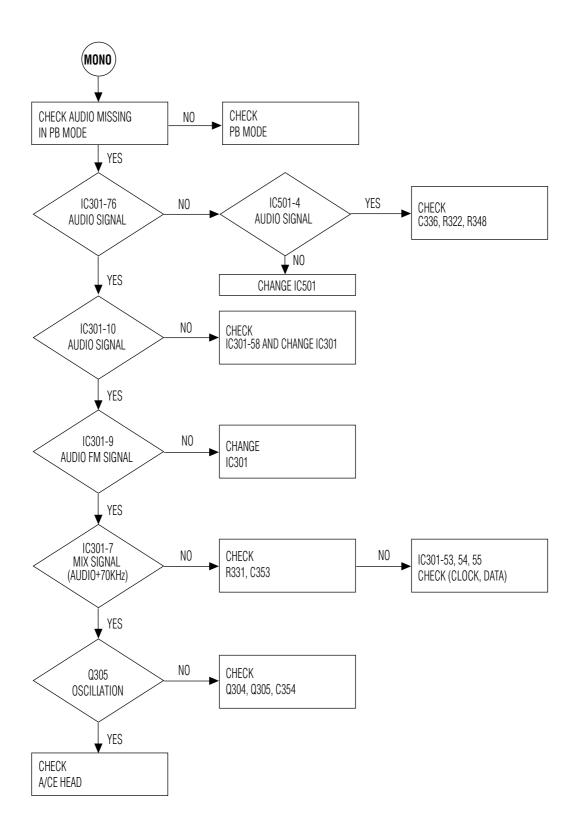


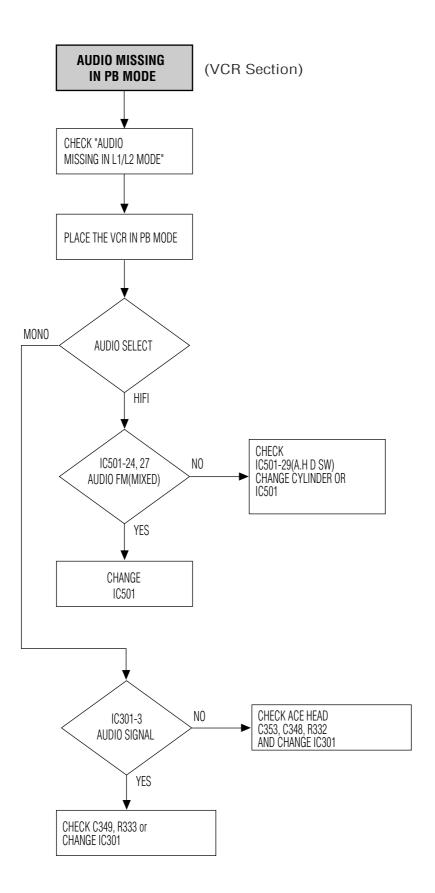


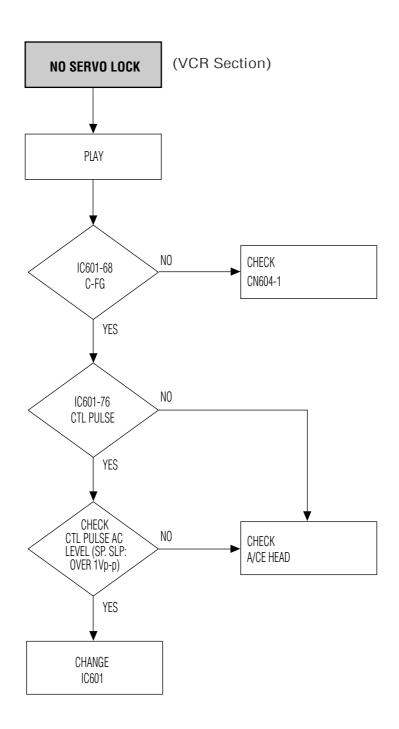


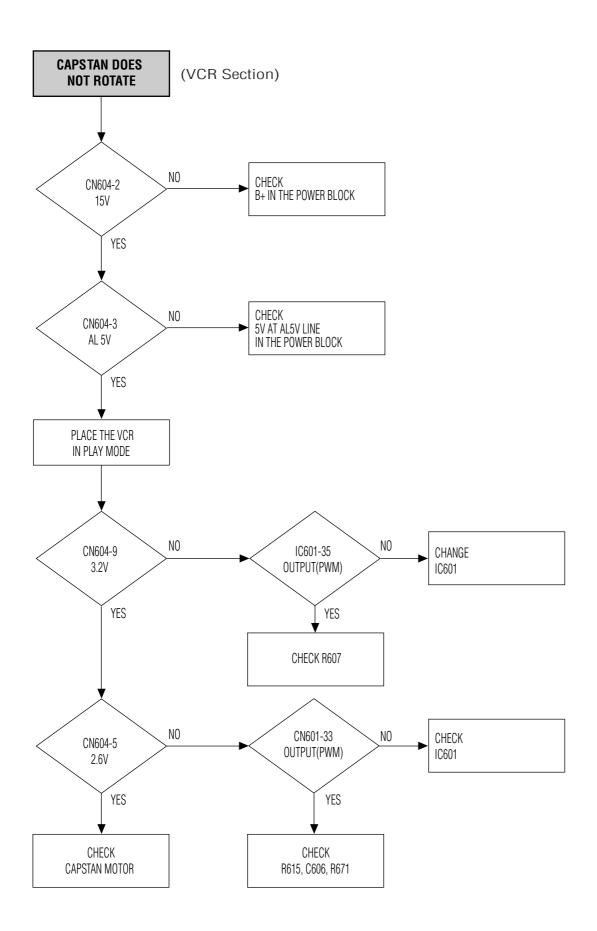


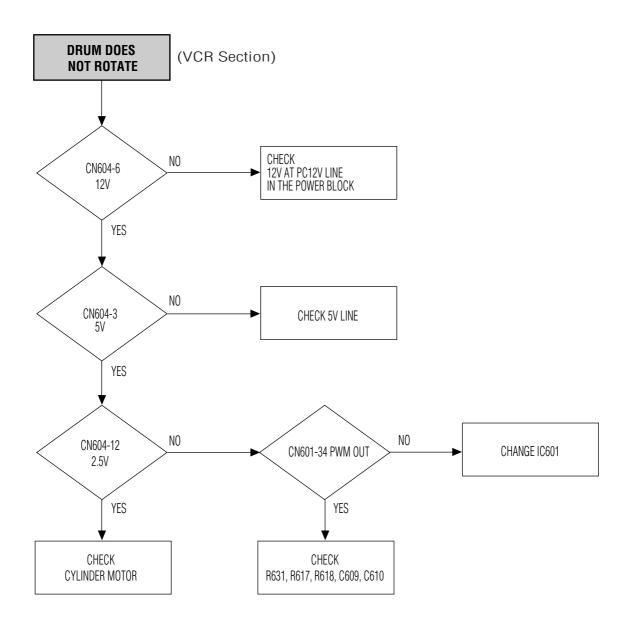


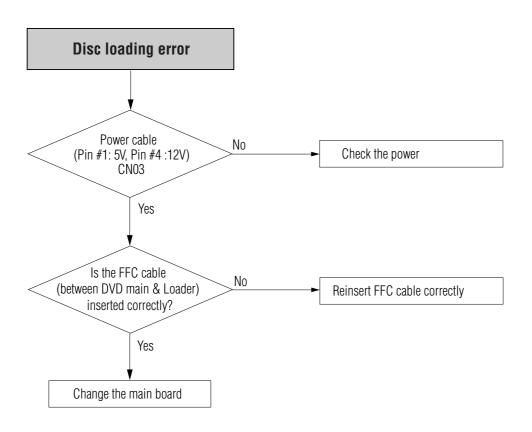


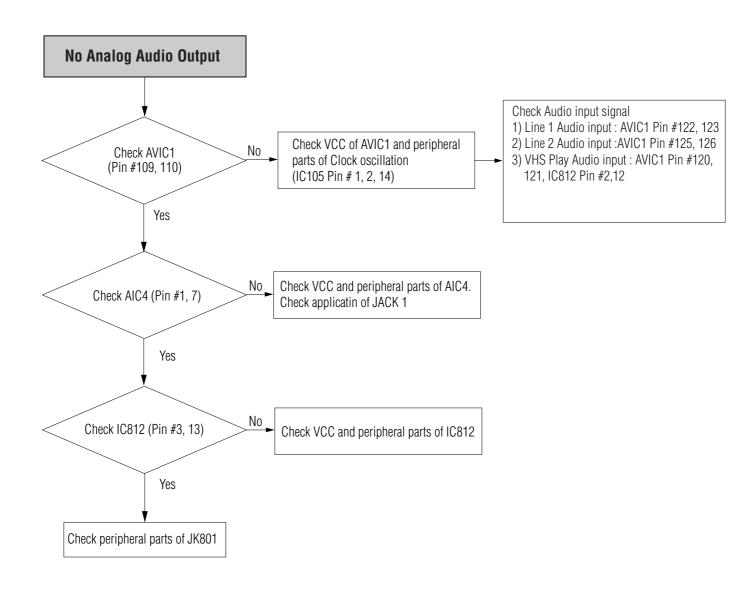


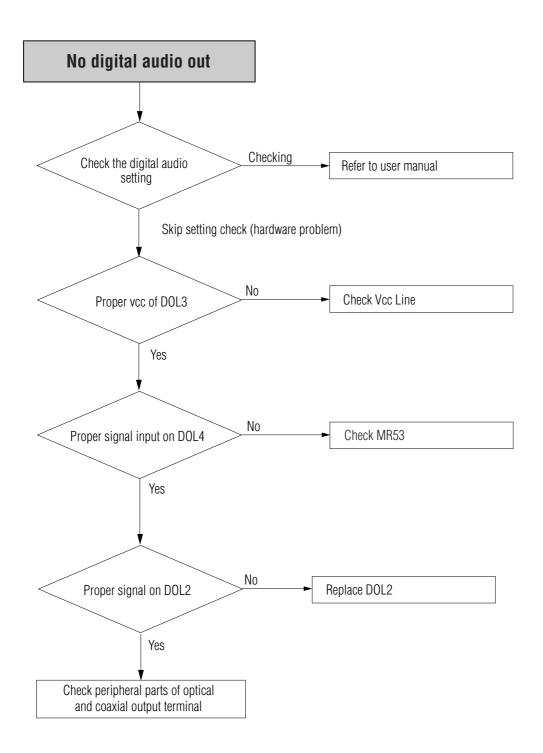


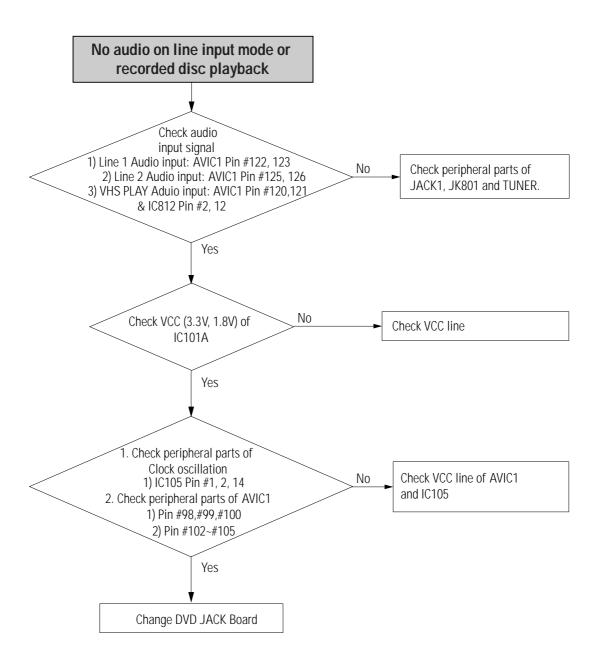


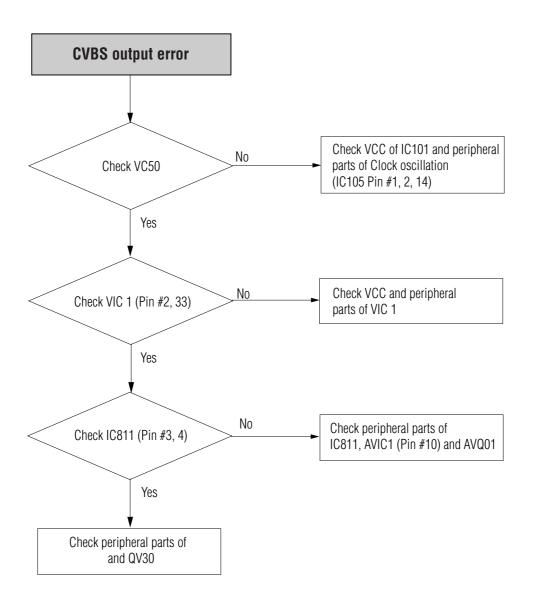


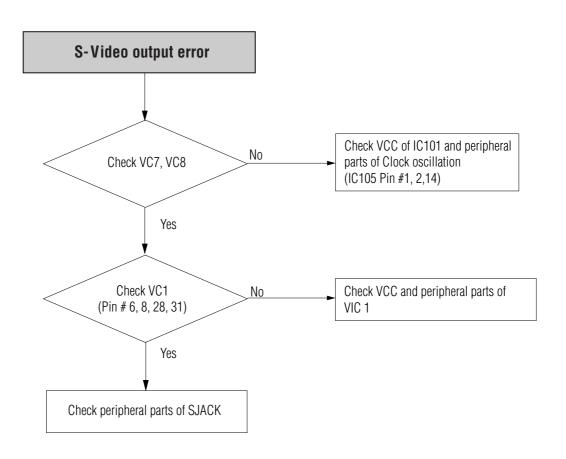


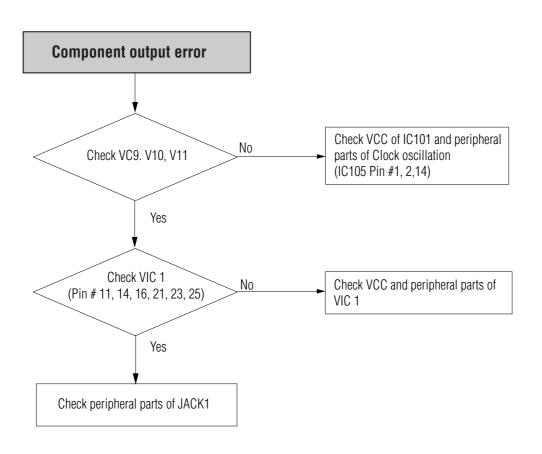


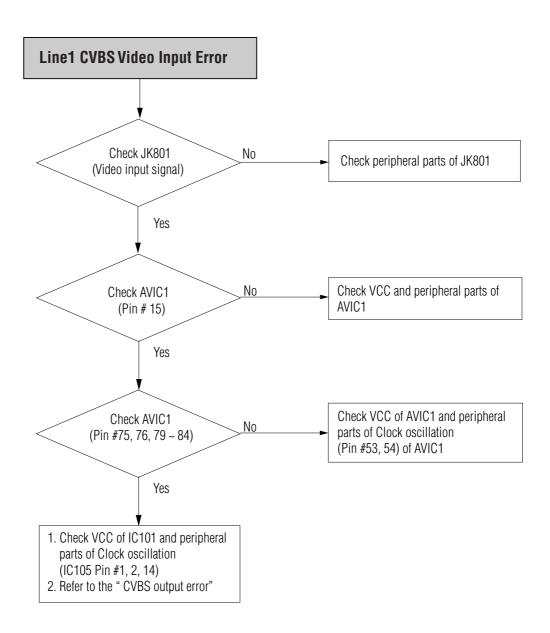


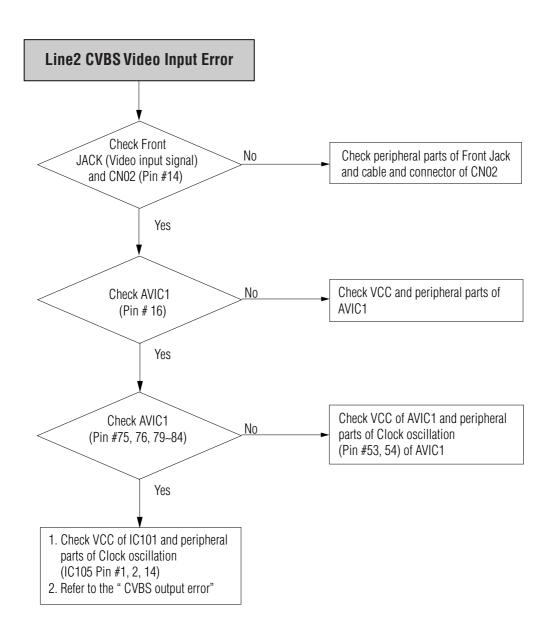


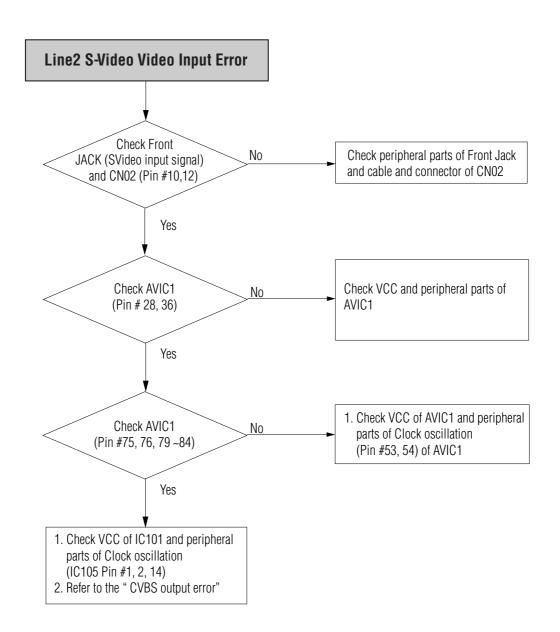


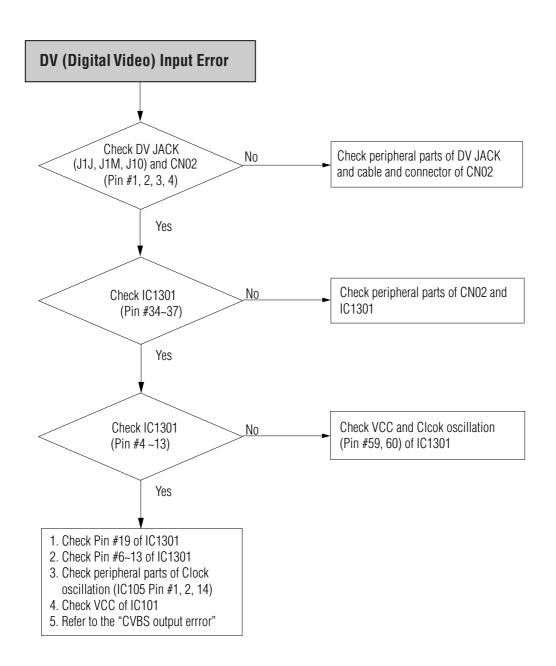












8. REPAIR PARTS LIST

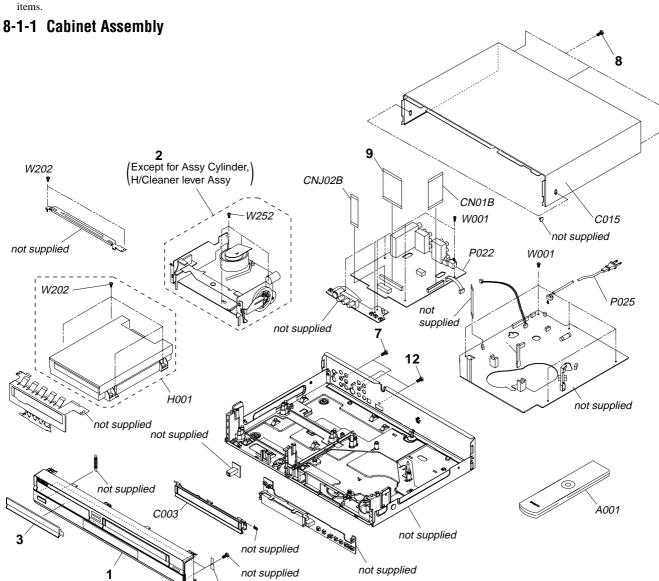
8-1	Exploded Views	8-2
8-1-1	Cabinet Assembly	8-2
8-1-2	VCR Deck Section (Top Side)	8-3
8-1-3	VCR Deck Section (Bottom Side)	8-4
8-2	Electrical Parts List	8-5

8-1 EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

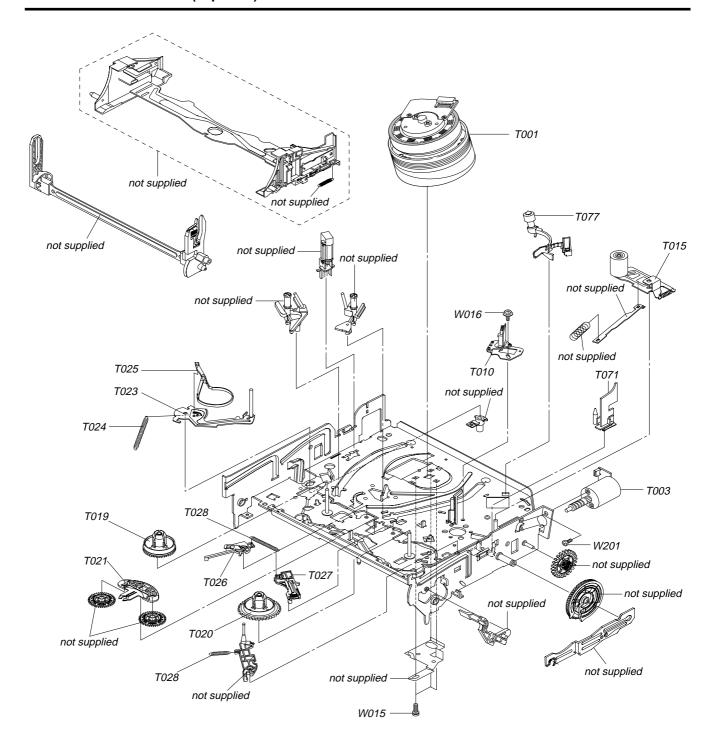
The components identified by mark \triangle or dotted line with mark \triangle are critical for safety. Replace only with part number specified.



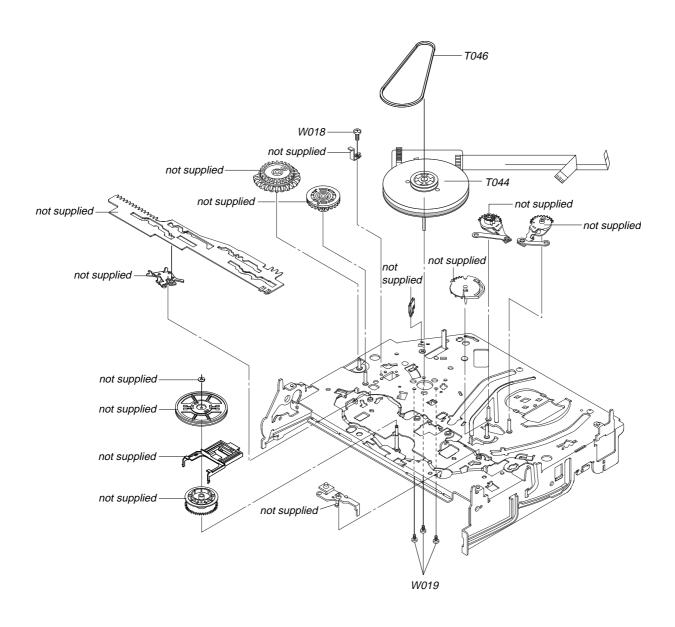
Ref. No.	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>	Ref. No.	Part No.	<u>Description</u>	<u>Remarks</u>
1	9-885-113-50	ASSY CABINET FRONT		CN01B	9-885-112-93	CABLE-FLAT; 80MM, 30P, 1MM	
2	9-885-101-19	ASSY DECK		CNJ02B	9-885-112-94	CABLE-FLAT; 200MM, 14P, 1.25MM	Л
3	9-885-111-30	DOOR TRAY		H001	9-885-111-31	ASSY LOADER; TS-P632A	
7	9-885-069-88	SCREW-TAPTITE ZPC (WHT)		P022	9-885-111-36	ASSY PWB MAIN DVD	
8	9-885-069-84	SCREW-TAPTITE BLK SWCH101		⚠ P025	1-824-674-11	POWER CORD EP2 SPT-2	
9	9-885-102-43	CABLE-FLAT;30V, 80C, 360MM, 40P	•	W001	9-885-079-18	SCREW-TAPTITE	
12	9-885-084-32	SCREW-TAPTITE		W202	9-885-069-85	SCREW-TAPTITE ZPC (YEL) SWR	
A001	9-885-112-11	REMOCON ASSY; RDR-VX555		W252	3-075-262-01	SCREW BH 4X12	
C003	9-885-111-29	DOOR CASSETTE					
C015	9-885-111-27	CABINET TOP					

not supplied

8-1-2 VCR Deck Section (Top Side)



Ref. No.	Part No.	Description	<u>Remarks</u>	Ref. No.	Part No.	Description	<u>Remarks</u>
T001	9-885-101-30	ASSY CYLINDER 6HD		* T026	9-885-108-18	ASSY LEVER BRAKE S	
T003	1-796-434-11	LOADING ASSY, MOTOR		T027	9-885-101-24	ASSY LEVER BRAKE T	
T010	9-885-101-27	ASSY ACE HEAD		T028	3-067-786-01	SPRING-BRAKE	
T015	9-885-101-25	ASSY UNIT PINCH		T071	9-885-101-28	GUIDE CASSETTE DOOR	
T019	9-885-101-23	REEL S		T077	9-885-101-18	ASSY HEAD CLEANER	
T020	9-885-101-22	REEL T		W015	9-885-069-89	SCREW-MACHINE ZPC (YEL)	
T021	9-885-112-31	LEVER IDLE		W016	9-885-069-90	SCREW-TAPTITE ZPC (YEL)	
T023	9-885-101-21	ASSY LEVER TENSION		W201	9-885-069-81	SCREW-MACHINE ZPC (YEL)	
T024	3-067-782-01	SPRING-TENSION LEVER					
T025	9-885-101-20	ASSY BAND BRAKE					



Ref. No.	Part No.	Description	<u>Remarks</u>	Ref. No.	Part No.	Description	<u>Remarks</u>
T044	9-885-101-26	MOTOR CAPSTAN		W018	9-885-069-87	SCREW-TAPTITE PH ZPC (YEL)	
T046	3-067-790-01	BELT-PULLEY		W019	9-885-069-82	SCREW-TAPTITE ZPC (YEL) SW	

8-2 ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS

All resistors are in ohms. METAL: metal-film resistor

METAL OXIDE: Metal Oxide-film resistor

F: nonflammable

Not all of the parts are listed.

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS In each case, u: μ , for example: uA...: $\mu A...$, uPA..., $\mu PA...$, uPB... , $\mu PB...$, uPC... , $\mu PC...$, $uPD...,\,\mu PD...$
- CAPACITORS: uF: μF
- COILS uH: μ H

When indicating parts by reference number, please include the board name.

The components identified by mark $ext{$\Lambda$}$ or dotted line with mark \triangle are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	<u>Remarks</u>
		DV JACK BOARD *********	
		(This DV JACK BOARD is include	ed in VCR MAIN BOARD.)
		< JACK >	
J1J	9-885-084-29	JACK-IEEE1394 4P/1C (DV IN)	
		< CONNECTOR >	
* J1M	9-885-108-67	JACK-IEEE1394 5P	
		DVD MAIN BOARD ************	
	9-885-111-36	ASSY PWB MAIN DVD	

		< BEAD/CORE >	
ABD1 ABD2 ABD3 AVR02 AVR03	1-400-316-11 1-400-316-11 1-400-316-11 1-400-316-11 1-400-316-11	CORE-FERRITE BEAD CORE-FERRITE BEAD CORE-FERRITE BEAD CORE-FERRITE BEAD CORE-FERRITE BEAD	220ohm 220ohm 220ohm 220ohm 220ohm
AVR19 AVR40 DVR1 DVR2 DVR3	1-400-316-11 1-400-316-11 9-885-083-84 9-885-083-84 9-885-083-84	CORE-FERRITE BEAD CORE-FERRITE BEAD BEAD-SMD 470hm BEAD-SMD 470hm BEAD-SMD 470hm	220ohm 220ohm
DVR4 HDR9 HDR10 MR08 MR18	9-885-083-84 1-400-316-11 1-400-316-11 9-885-083-84 1-400-316-11	BEAD-SMD 47ohm CORE-FERRITE BEAD CORE-FERRITE BEAD BEAD-SMD 47ohm CORE-FERRITE BEAD	220ohm 220ohm 220ohm
R851 R852 REM1 REM2 REM3	1-400-316-11 1-400-316-11 1-400-316-11 1-400-316-11 1-400-316-11	CORE-FERRITE BEAD CORE-FERRITE BEAD CORE-FERRITE BEAD CORE-FERRITE BEAD CORE-FERRITE BEAD	220ohm 220ohm 220ohm 220ohm 220ohm
REM4 RIS10 VR100	1-400-316-11 9-885-083-84 1-400-316-11	CORE-FERRITE BEAD BEAD-SMD 470hm CORE-FERRITE BEAD	220ohm 220ohm

^{*} HDJACK 9-885-108-17 CONNECTOR-HDMI (HDMI OUT)

Ref. No.	Part No.	<u>Description</u>		<u>Remarks</u>				
		< DIODE >						
AD1 AD2 * AZ1 * AZ3 * AZ50	9-885-070-27 9-885-070-27 9-885-102-51 9-885-102-51 9-885-102-51	DIODE DIODE DIODE DIODE DIODE	DAN202K DAN202K CDS3C30GTH CDS3C30GTH CDS3C30GTH					
* AZ52 * AZ55 * AZ57 * DOZ1 QD01	9-885-102-51 9-885-102-51 9-885-102-51 9-885-102-51 9-885-070-27	DIODE DIODE DIODE DIODE DIODE	CDS3C30GTH CDS3C30GTH CDS3C30GTH CDS3C30GTH DAN202K					
* VZ1 * VZ3 * VZ5 * VZ7 * VZ10	9-885-102-51 9-885-102-51 9-885-102-51 9-885-102-51	DIODE DIODE DIODE DIODE DIODE	CDS3C30GTH CDS3C30GTH CDS3C30GTH CDS3C30GTH CDS3C30GTH					
* VZ50 * VZ51	9-885-102-51 9-885-102-51	DIODE DIODE	CDS3C30GTH CDS3C30GTH					
		< IC >						
AIC4 AVIC1 CIC1 IC102 IC103	9-885-070-53 9-885-111-37 9-885-079-21 9-885-111-38	IC 4560 (OP AMP) IC SAA7138HL (VIDEO DECODER) IC 74VHC125 (CMOS LOGIC) IC K4H561638 (DRAM) IC (CPRM key) (Refer to Note 1)						
Note 1:	Note 1: Special key has been written in the IC103 (CPRM key), and therefore the IC103 cannot be replaced. If this IC is faulty, replace the board entirely.							

If this IC is faulty, replace the board entirely.

Note 2:	Perform the reset whenever the IC104 was replaced (See page
	10).

ı	C104	9-885-111-39	IC ASSY-MEMORY (FLASH) (Refer to Note 2)
- 1	C105	1-805-039-11	IC M74HCU04 (CMOS LOGIC)
- 1	C811	9-885-036-96	IC BU4053BCFV (CMOS LOGIC)
- 1	C812	9-885-036-96	IC BU4053BCFV (CMOS LOGIC)
- 1	C813	9-885-106-72	IC (AUDIO PROCESSOR)
- 1	C1301	9-885-070-64	IC TSB41AB1-PAP (DATA COMM/GEN)
ĤΙ	CHD1		IC TDA9983 (VIDEO PROCESS)
١	/IC1	9-885-037-03	IC LA73054 (VIDEO)

The components identified by mark ⊕ contain confidential information.

Strictly follow the instructions whenever the components are repaired and/or replaced.

DVD MAIN FRONT JACK FUNCTION

Ref. No.	Part No.	Description		<u>Remarks</u>	Ref. No.	Part No.	Description		<u>Remarks</u>
		< TRANSISTOR >					< SWITCH >		
A O 1	0.005.070.04	TDANICICTOD			C/A/4	0.005.000.77	CMITCH TACT (DOWED)	
AQ1		TRANSISTOR	VCD0400		SW1		SWITCH-TACT (I	,	
AQ2		TRANSISTOR	KSR2103		SW2		SWITCH-TACT (
AQ3		TRANSISTOR	KSC1623-	L	SW3		SWITCH-TACT (
AQ4		TRANSISTOR	VCD0400		SW4		SWITCH-TACT (
AQ5	9-885-070-37	TRANSISTOR	KSR2103		SW5	9-885-069-77	SWITCH-TACT (UPEN)	
AQ6		TRANSISTOR	KSC1623-				FUNCTION BOAF		
AVQ01		TRANSISTOR	KSC1623-				********		1: VOD
AVQ02		TRANSISTOR	KSC1623-				(This FUNCTION	BOARD is include	
GTR01 GTR02		TRANSISTOR	KSC1623- KSC1623-					IVI	AIN BOARD.)
GINUZ	9-000-070-30	TRANSISTOR	K301023-	·L			< DIODE >		
QMU1	9-885-070-34	TRANSISTOR					(3.032)		
QMU2	9-885-070-37	TRANSISTOR	KSR2103		D701	9-885-111-32	DIODE	1N4148	
QS01	9-885-070-29	TRANSISTOR	KSA812		D702	9-885-111-32	DIODE	1N4148	
QS02	9-885-070-29	TRANSISTOR	KSA812		D703	9-885-111-32	DIODE	1N4148	
QS03	9-885-070-30	TRANSISTOR	KSC1623-	L	D704	9-885-111-32	DIODE	1N4148	
					D705	9-885-111-32	DIODE	1N4148	
QS04		TRANSISTOR	KSC1623-	L					
QSS2	9-885-043-26	TRANSISTOR	KSR1104		D706	9-885-111-32		1N4148	
					D707	9-885-111-32		1N4148	
		< FILTER >			D708	9-885-111-32	-	1N4148	
DOL1	0-885-060-75	FILTER-EMI SMD	1		D709	9-885-111-32	DIODE	1N4148	
DOLI	9-003-009-73	TILILIN-LIVII SIVID	'				< COIL >		
		< VIBRATOR >							
N N/TO4	0.005.070.70	ODVOTAL OND (04.5701411.		L701	1-400-074-11	INDUCTOR	100uH	
		CRYSTAL-SMD (2					AVED DICDLAY	_	
X1301		CRYSTAL (27MH: CRYSTAL-SMD (2)			< VFD DISPLAY	>	
		,	,		DT701	9-885-070-01	VFD DISPLAY H	NV-10SM40	
		FRONT JACK BOA	N D D				< IC >		
		******					(10)		
		(This FRONT JAC	K BOARD is	included in VCR	IC701	9-885-070-48	IC PT6315 (VFD))	
				MAIN BOARD.)			1.50		
		< CONNECTOR >					< LED >		
		(001111201011)			LD701	1-805-289-11	LED (COPY DVD	-> VHS)	
CNJ01	1-815-689-11	CONNECTOR FPC	7P				LED (COPY VHS		
					LD703	9-885-076-83	LED (SYNCHRO	REC)	
		< DIODE >			LD704	9-885-079-26	LED (HDMI)		
* JZ01	9-885-102-51	DIODE	CDS3C30	GTH			< REMOCON MC)DUI F >	
* JZ02	9-885-102-51	DIODE	CDS3C30	GTH					
* JZ03	9-885-102-51		CDS3C30		RM701	9-885-069-95	MODULE REMO	CON TSOP2240RF	1
* JZ04 * JZ06	9-885-102-51 9-885-102-51		CDS3C300				< SWITCH >		
* JZ06	9-885-102-51	DIODE	CD23C30	alH			< SWITCH >		
* JZ08	9-885-102-51	DIODE	CDS3C30	GTH	SW703	9-885-069-77	SWITCH-TACT (I	PAUSE)	
					SW705	9-885-069-77	SWITCH-TACT (VIDEO)	
		< COIL/FERRITE	BEAD >					COPY DVD -> VHS)
_							SWITCH-TACT (I		
RD701	9-885-083-84		47ohm		SW708	9-885-069-77	SWITCH-TACT (I	UVD)	
RD702	9-885-083-84		47ohm		014:705	0.005.000.5	OM/ITO: =: 0= ::	E IEOT\	
RD703	9-885-083-84		47ohm				SWITCH-TACT (I		`
RD704	9-885-083-84		47ohm					COPY VHS -> DVD)
RFR1	9-885-083-84	DEAD-9MD	47ohm				SWITCH-TACT (I SWITCH-TACT (I		
RFR2	9-885-083-84	BEAD-SMD	47ohm				SWITCH-TACT (I		
RFR3	1-400-316-11			220ohm	34/13	3 000-009-11	OWITOH-IMOT (I	·- • • /	
RFR4	9-885-083-84		47ohm		SW716	9-885-069-77	SWITCH-TACT (S	STOP)	
RFR5	9-885-083-84		470hm		044710	3 330 000 11	Julion Indi (
RFR6	9-885-083-84		470hm						
RFR7	1-400-316-11	CORE-FERRITE B	EAD	220ohm					

VCR MAIN

Ref. No.	Part No.	<u>Description</u>		<u>Remarks</u>	Ref. No.	Part No.	<u>Description</u>		<u>Remarks</u>
		VCR MAIN BOARD	_				< COIL/FERRITE E	BEAD >	
	FUNCTION	(DV JACK BOARD BOARD are include			BD1S01	1-400-086-11 1-400-085-11 1-400-085-11	INDUCTOR	70uH 70uH	
		SCREW-TAPTITE			BD1S04 L02	1-400-085-11 1-424-828-11		70uH 10uH	
		< CAPACITOR >			L03 L301	1-424-828-11 1-400-085-11		10uH 70uH	
C319	1-100-020-11		10000PF		L302	1-400-086-11	FERRITE CORE		
C502 C522	1-165-563-11 1-100-020-11		0.1uF 10000PF		L303 L304		FERRITE CORE FERRITE CORE		
C635	1-100-020-11	CONDENSER	10000PF						
C636	1-100-020-11	CONDENSER	10000PF		L305 L306	1-400-085-11	INDUCTOR INDUCTOR-RADIA	70uH	
△ C1S02	1-100-358-11	CONDENSER CER	AMIC DISC	100PF	L307	1-400-074-11		100uH	
△ C1S03	1-100-358-11	CONDENSER CER	AMIC DISC		L501	1-400-086-11	FERRITE CORE		
⚠ C1S04 ⚠ C1S05		CONDENSER FILM CONDENSER FILM		47nF 47nF	L502	1-400-086-11	FERRITE CORE		
C1S07	1-165-990-11		100PF	47111	L601	1-400-082-11	INDUCTOR RA	100uH	
					L602	1-400-074-11		100uH	
C1S08		CONDENSER FILM		10000PF	L603	1-400-074-11		100uH	
C1S12 C1S39		CONDENSER FILM CONDENSER FILM		10000PF 0.1uF	L1P101 L1S30	1-400-074-11	COIL CHOKE DR	100uH CHOKE (8*6)	
01000	1 100 300 11	CONDENCENTIEN	,,	0.101	21000				
		< CONNECTOR $>$			L1S31		COIL CHOKE DR		
CN02	1 015 600 11	CONNECTOR FPC	7D		L1S32 LT01	1-424-828-11 1-400-074-11		10uH 100uH	
CN301		CONNECTOR FPC			LIUI	1-400-074-11	INDOCTOR	Toouri	
CN303	1-815-688-11	CONNECTOR FPC	6PSN				< FUSE >		
		< FLAT CABLE >			Δ F1P01 Δ F1S01	1-576-729-11 1-576-526-11	FUSE-RADIAL LEAFUSE (1.6A/250V)	` ,	
CN303B	9-885-069-80	CABLE-FLAT					< FUSE CLIP >	,	
		< DIODE >			F04004	4 570 507 44			
* BD01	9-885-103-76	DIODE	SHL20K			1-576-527-11 1-576-527-11			
* BD02	9-885-103-76	DIODE	SHL20K						
* BD03	9-885-103-76		SHL20K				< IC/PHOTO COUI	PLER >	
* BD04 D601	9-885-103-76 9-885-111-32		SHL20K 1N4148		IC301	9-885-070-58	IC LA71207 (VIDE	FO PROCESS)	
200.	0 000 111 02	5.051			IC501		IC LA72670M (SI		OR)
* D604	9-885-103-77		1N5819		IC601		IC MN101D10G-C	, ,	
D605 * D606	9-885-111-32 9-885-103-77		1N4148 1N5819		IC1P01		IC G9105 (POSI. I IC (SWITCH VOL.	,	
	9-885-111-32		1N4148		101702	9-000-004-20	IC (SWITCH VOL.	neu)	
	9-885-103-77		1N5819				IC G9105 (POSI. I		
: D4D407	0 005 400 77	DIODE	4 N E 0 4 0				IC KIA278R018PI		G)
* D1P107 D1S05	9-885-103-77 9-885-070-13		1N5819 UF4007			9-885-108-63	IC G9205 (POSI. I IC KIA278R000P5	,	-G)
D1806	9-885-111-32		1N4148			9-885-037-01		,	-u)
	9-885-070-16		F1T4				,	•	
D1S30	9-885-076-80	DIODE	MBRF10A0)		9-885-070-43 1-804-445-11	PHOTO-COUPLER	}	
D1S32	9-885-076-80	DIODE	MBRF10A0)			IC AT24C04N-10S	SU-2.7 (EEPROM)	ı
D1S33	9-885-076-80		MBRF10A0		IC6B1	1-804-773-11		, ,	
D1S34	9-885-070-16		F1T4		ICT01	9-885-111-35	IC S3C80G9B21-9	SN99 (CBC)	
D1S35 * D1S38	9-885-070-15		SHG2D				LINE BUTED		
* D1000	9-885-102-60	DIODE	1N5408				< LINE FILTER >		
D1S40	9-885-070-16		F1T4		 ∆L1S01		LINE FILTER 20m		
	9-885-070-21		MTZJ9		 ∆L1S02	1-424-830-11	LINE FILTER 30m	Н	
	9-885-070-18 9-885-070-17		UZP27B UZ5.6BM				< TRANSFORMER	2 >	
	9-885-070-17	DIODE	MTZJ4				· ITANOI UNIVIER	. /	
					▲ PT01	9-885-102-62	TRANS SWITCHIN	NG EER3534	
	9-885-036-94		MTZJ20B	,					
ZD1903	8-719-109-93	חוחחב	RD6.2ESB2	<u> </u>		onents identifie re critical for saf	d by mark $ riangle$ or do etv.	otted line with	
						nly with part nu			

VCR MAIN

Ref. No.	Part No.	<u>Description</u> < PHOTO INTERR	UPTER >	<u>Remarks</u>
PT601 PT602	9-885-106-66 9-885-106-66	PHOTO-INTERRUPTER (S-REEL) PHOTO-INTERRUPTER (T-REEL)		
		< TRANSISTOR >		
Q302 Q303 Q304 Q305 Q306		TRANSISTOR TRANSISTOR TRANSISTOR	KSA812 KSC1623-L KSA812 KTC3203-Y KSA812	
	9-885-070-33 9-885-070-33 9-885-043-26 9-885-070-38 9-885-070-31	TRANSISTOR TRANSISTOR	KTC3203-Y KTC3203-Y KSR1104 FQP33N10 KSC2328A-Y	
Q1PS02 Q1PS03	9-885-070-32 9-885-070-33 9-885-070-36 9-885-036-95	TRANSISTOR	KSC945 KTC3203-Y KSR2001	
		< REGISTOR >		
R1S13	1-245-575-11	R-METAL OXIDE		
		< THERMISTOR >		
 ∆ R1S04	9-885-101-36	THERMISTOR-NT	C	
		< SWITCH >		
	9-885-101-37 9-885-061-06 9-885-104-29	SWITCH REC (RE SWITCH MODE (I SWITCH DETECTO		SETTE)
		< VARISTOR >		
VA1S02	9-885-070-65 9-885-070-65 9-885-108-15	VARISTOR		
		< VIBRATOR >		
XT01 XT301 XT601 XT602	1-795-604-11 1-795-603-11 9-885-070-67 1-795-332-11	RESONATOR CER VIBRATOR CRYS' CRYSTAL-UNIT (1 VIBRATOR CRYS'	TAL (3.6MHz) 14.31818MHz)	
		MISCELLANEOUS		
0	0 005 100 40	CADI E EL AT-201/		.
9 <u>↑</u> P025	9-885-102-43 1-824-674-11	POWER CORD EP	80C, 360MM, 40F 22 SPT-2	
		ACCESSORIES		

ACCESSORIES ********

3-096-487-11 MANUAL, INSTRUCTION (ENGLISH) 9-885-102-44 CBF CABLE-MONO PLUG TO LED 9-885-113-51 CBF SIGNAL

The components identified by mark \triangle or dotted line with mark \triangle are critical for safety. Replace only with part number specified.

RDR-VX525

REVISION HISTORY

Clicking the version allows you to jump to the revised page.

Also, clicking the version at the upper right on the revised page allows you to jump to the next revised page.

Ver. Date		Description of Revision			
1.0	2007.04	New			