

Digital HD Videocassette Recorder

Operating Instructions

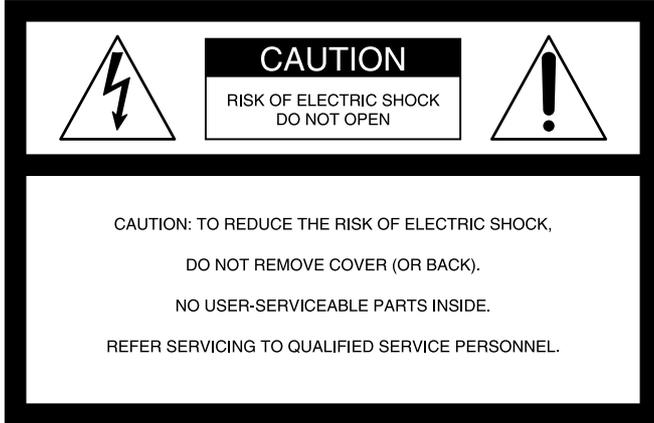
HDV
HDV 1080i **DVCAM**[™] Mini **DV** Digital Video Cassette **InfoLITHIUM**[™] **L**
SERIES

HVR-M10U/M10N/M10E/M10P

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Owner's record

The model number is located at the front of the unit and the serial number on the left. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. HVR-

Serial No. _____

Model No. AC-L15A

Serial No. _____

For customers in the U.S.A.

HVR-M10U only

If you have any questions about this product, you may call: Sony's Business Information Center (BIC) at 1-800-686-SONY (7669)

***or Write to: Sony Customer Information Services Center
6900-29 Daniels Parkway, PMB 330 Fort
Myers, Florida 33912***

Declaration of Conformity

Trade Name: SONY
Model: HVR-M10U
Responsible Party: Sony Electronics Inc.
Address: 16450 W. Bernardo Dr, San Diego, CA 92127 U.S.A.
Telephone Number: 858-942-2230

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

NOTE:

This equipment has been tested and found to comply with the limits for Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

NOTICE FOR CUSTOMERS IN THE UNITED KINGDOM

HVR-M10E only

A moulded plug complying with BS1363 is fitted to this equipment for your safety and convenience.

Should the fuse in the plug supplied need to be replaced, a fuse of the same rating as the supplied one and approved by ASTA or BSI to BS1362 (i.e., marked with  or  mark) must be used.

If the plug supplied with this equipment has a detachable fuse cover, be sure to attach the fuse cover after you change the fuse. Never use the plug without the fuse cover. If you should lose the fuse cover, please contact your nearest Sony service station.

For the customers in Europe

HVR-M10E only

This product with the CE marking complies with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European standards:

- EN60065 :Product Safety (Supplied AC Adapter only)
- EN55103-1 :Electromagnetic Interference (Emission)
- EN55103-2 :Electromagnetic Susceptibility (Immunity)

This product is intended for use in the following Electromagnetic Environment(s):

E1 (residential), E2 (commercial and light industrial), E3 (urban outdoors) and E4 (controlled EMC environment ex. TV studio).

ATTENTION

The electromagnetic fields at the specific frequencies may influence the picture and sound of this unit.

Applicable only to ports interfacing with cables whose total length according to the manufacturer's functional specification may exceed 1 m.

For the customers in the Nederland

Voor de klanten in Nederland

Dit apparaat bevat een vast ingebouwde batterij die niet vervangen hoeft te worden tijdens de levensduur van het apparaat.

Raadpleeg uw leverancier indien de batterij toch vervangen moet worden.

De batterij mag alleen vervangen worden door vakbekwaam servicepersoneel.

Gooi de batterij niet weg maar lever deze in als klein chemisch afval (KCA).

Lever het apparaat aan het einde van de levensduur in voor recycling, de batterij zal dan op correcte wijze verwerkt worden.



Caution

Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws. Also, use of this recorder with cable television transmission may require authorization from the cable television transmission and/or program owner.

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Overview

Features

The HVR-M10U/M10N/M10E/M10P is a digital HD videocassette recorder supporting HDV format. Offering the DVCAM/DV format, this unit produces stable, superior picture quality by digital processing and separating image signals into color difference signals and a luminance signal (component video). This unit provides the i.LINK (Ⓜ HDV/DV) jack, the COMPONENT OUT jacks, the S VIDEO IN/OUT jacks, the composite IN/OUT jacks, and the AUDIO IN/OUT jacks. These jacks allow you to connect other equipment like non-linear editors. Additionally, it comes with a 3.5-type color LCD (liquid crystal display) monitor, you can easily check your recorded images, menus, and the audio level meters.

The main features of this unit are described below.

HDV format

The unit can perform HDV (High-Definition Digital Video) recording and playback on a DV format video cassette.

The compression system of HDV format is the MPEG2 system adopted in the high-definition broadcasting and the Blu-ray Disk System.

The unit adopts the 1080 scanning lines (interlace) (1080i)/1440 × 1080 pixels format of the HDV specifications. The recording bit rate is approximately 25 Mbps. This unit is equipped with an i.LINK digital interface and can be digitally connected with HDV-compatible televisions or personal computers.

DVCAM/DV format

DVCAM is based on the consumer DV format, which uses the 4:1:1 component digital format (60i) or the 4:2:0 format (50i), and provides a 1/4-inch digital recording format for professional use. This unit provides both DVCAM format recording/playback and DV format in SP mode recording/playback.

For details, see “Compatibility of HDV, DVCAM and DV Format” on page 68.

Compatible with both 1080/60i (NTSC) and 1080/50i (PAL) systems

The unit is compatible with 50i and 60i systems. You can switch these input signals using the menu setting (p. 53). This compatibility allows you to record (download) or play back (upload) both 50i and 60i formatted signals with your VCR, personal computer, or other equipment.

However, the unit cannot convert the color system of the signals.

The unit set in 60i system has a field frequency of 59.94Hz.

High definition downconvert function

When you want to playback a tape recorded in the HDV format, you can downconvert any images to output them. This function allows you to preview recorded-images on a regular monitor. Also, you can select an aspect ratio from the SQUEEZE, LETTER BOX, or EDGE CROP (side cut).

16:9 Built-in color LCD monitor

The unit has a 3.5-type color LCD (liquid crystal display) monitor that lets you verify images on the spot. You can see the setup menus, audio levels, and system statuses. Menus and data can be superimposed over the picture being displayed.

Multiple input/output interfaces

The **i** HDV/DV jack, COMPONENT OUT jacks (output only), S VIDEO jacks and VIDEO jacks and AUDIO jacks are equipped on the unit and enable the connection with various devices.

A variety of buttons and switches for VCR operations

This unit provides a variety of buttons for VCR operations, such as the INPUT SELECT switch, the AUDIO REC LEVEL (VOL), the PHONE LEVEL control knob, and the STATUS CHECK button.

Time code and user bits

On this unit, you can use time code and user bits. Using the menu, these can be set easily.

Screen Language Setting

You can select the language.
The default setting is indicated in English.
See page 52 to change the screen language.

Compatible with InfoLITHIUM series

InfoLITHIUM (L series) batteries allow you to use a DC power supply.
InfoLITHIUM batteries are lithium batteries to communicate with compatible equipment. They display how much battery power has been remained.

Compact size allowing vertical installation

The compact size of the unit allows installation in a vertical position and saves space. During non-linear editing, you can install the unit in a vertical position next to the personal computer and save working space.

Fan-less design

To provide noise-free operation, this unit has been designed without using an exhaust fan.

Easy maintenance functions

- **Self-diagnostics/alarm functions:** The system automatically detects an invalid operation, an invalid connection or a malfunction, and displays a description, a cause and a recovery method on the LCD monitor and outputs the data as analog video signals.
- **Digital hours meter:** A digital hours meter counts four types of time data—operating time, drum rotation time, tape running time, and tape threading/unthreading. The digital hours data are indicated on the menu.

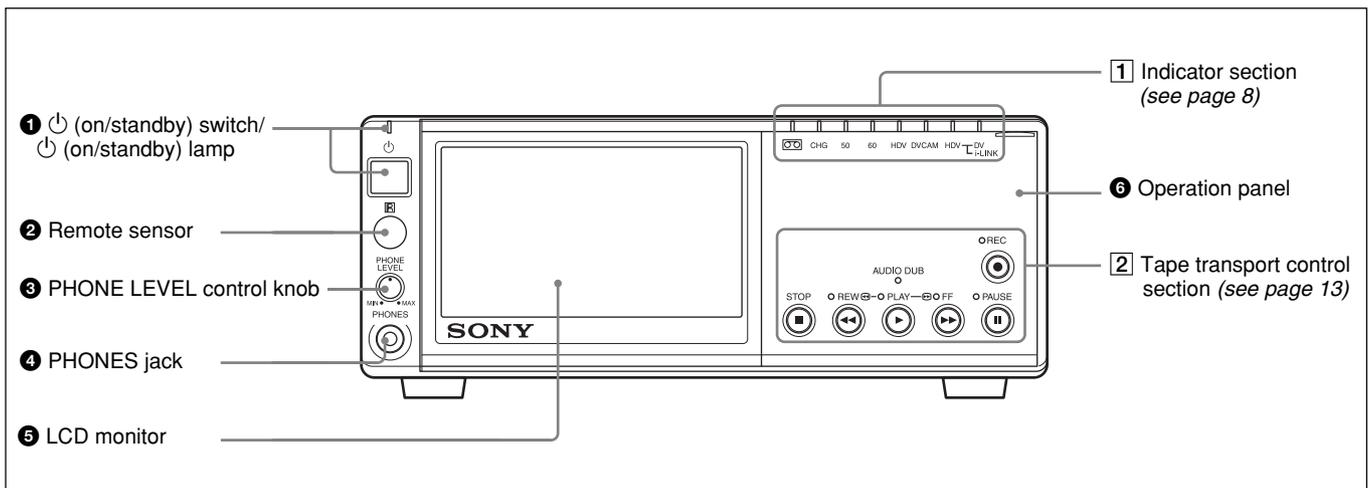
.....
DVCAM and Mini DV are trademarks of Sony Corporation.

HDV is a trademark of Sony Corporation and Victor Company of Japan Ltd.

All other product names mentioned here may be the trademarks or registered trademarks of their respective companies. “™” and “®” are not mentioned in each case in this manual.

Location and Function of Parts

Front Panel



1 (on/standby) switch/ (on/standby) lamp
Press this switch to turn the unit on. The on/standby lamp lights up in green.

2 Remote sensor

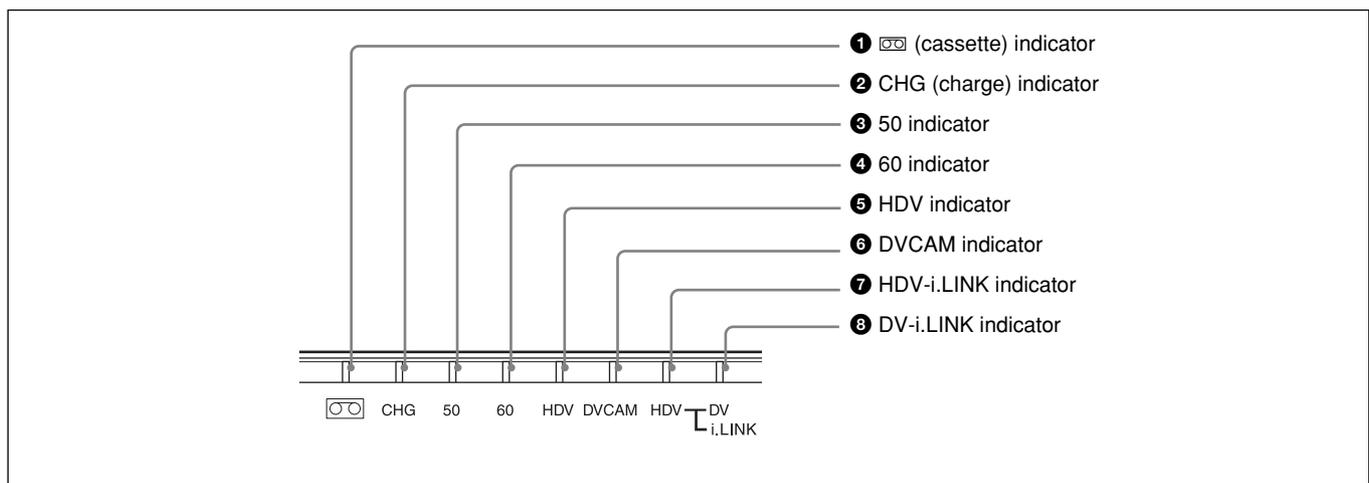
3 PHONE LEVEL control knob
Controls the volume of the headphones connected into the PHONES jack **4**.

4 PHONES jack
Connect stereo headphones for monitoring sounds during the recording or playback. The audio signal you want to monitor can be selected in [AUDIO MONI] on the [AUDIO SET] menu. (p. 47)

5 LCD (Liquid Crystal Display) monitor
Displays the playback or EE¹⁾ pictures. Also, superimposed time data, status information, menus, audio level meters, etc. are displayed.

6 Operation panel

1 Indicator section



1) “EE” stands for “Electric to Electric.” In EE mode, the video and audio signals input to the VCR’s recording circuitry do not pass through any magnetic conversion circuits but output via electric circuits only. This mode is used to check the input signals and adjust input levels. The pictures output in EE mode are referred to as EE pictures.

1  (cassette) indicator

Lights up when a digital video cassette is loaded. Does not light up while the cassette compartment opens or the cassette is not loaded.

This indicator flashes while a cassette is being removed.

For details, see “Inserting/Ejecting Cassettes” on page 22.

2 CHG (charge) indicator

Lights up while charging the battery pack (not supplied) attached to the rear of the unit. When the  (on/standby) switch is standby and the battery pack is attached, the unit will automatically enter charging mode.

When the battery pack is fully charged, the indicator turns off.

For details, see “Using the optional battery” on page 65.

3 50 indicator

Lights up when:

- During EE mode or recording when [50i/60i SEL] on the [OTHERS] menu is set to 50i.
- 50i or PAL formatted video signals are input to the  HDV/DV jack.
- A tape that has 50i or PAL formatted video signals is being played back.

4 60 indicator

Lights up when:

- During EE mode or recording when [50i/60i SEL] on the [OTHERS] menu is set to 60i.
- 60i or NTSC formatted video signals are input to the  HDV/DV jack.
- A tape that has 60i or NTSC formatted video signals is being played back.

5 HDV indicator

Lights up when the unit is in the following operating status.

- When a tape recorded in the HDV format is being played back.
- When HDV formatted video signals are input through the i.LINK interface.
- When [VCR HDV/DV] on the [IN/OUT REC] menu is set to [HDV].*

*This indicator lights up when there is no input signal, [VCR HDV/DV] is set to [AUTO], and the immediately preceding signal input was recorded in HDV format.

6 DVCAM indicator

Lights up when the unit is in the following operating status.

- When a tape recorded in the DVCAM format is being played back.
- When [ REC MODE] on the [IN/OUT REC] menu is set to [DVCAM].

Note

Neither the HDV indicator nor the DVCAM indicator lights up when a tape recorded in the DV format is being played back.

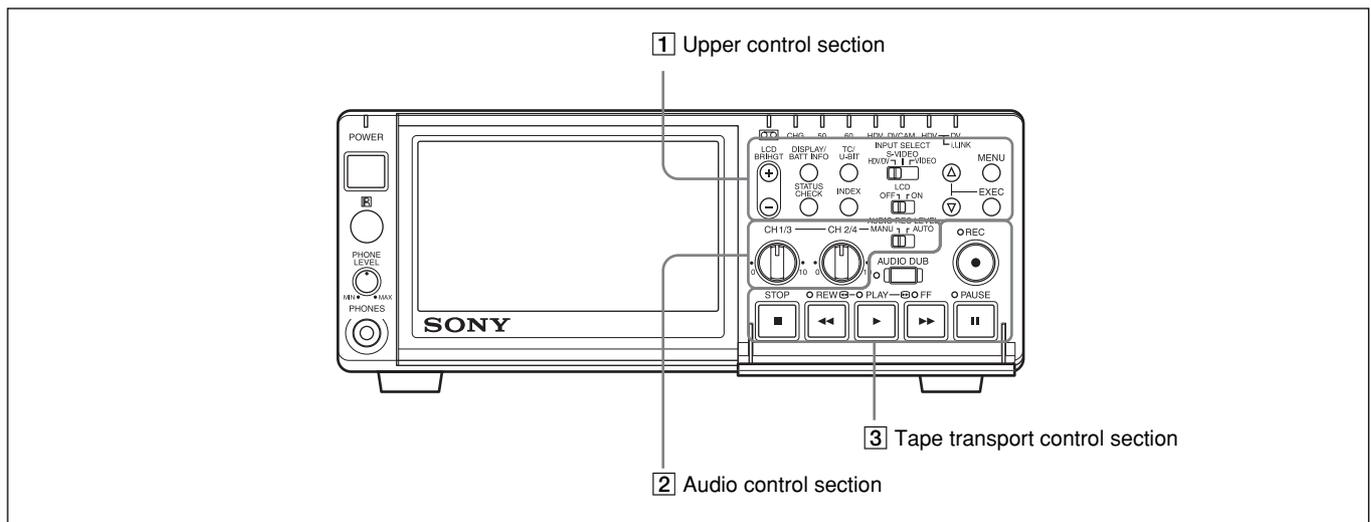
7 HDV-i.LINK indicator

Lights up when HDV formatted video signals are input/output through the i.LINK interface.

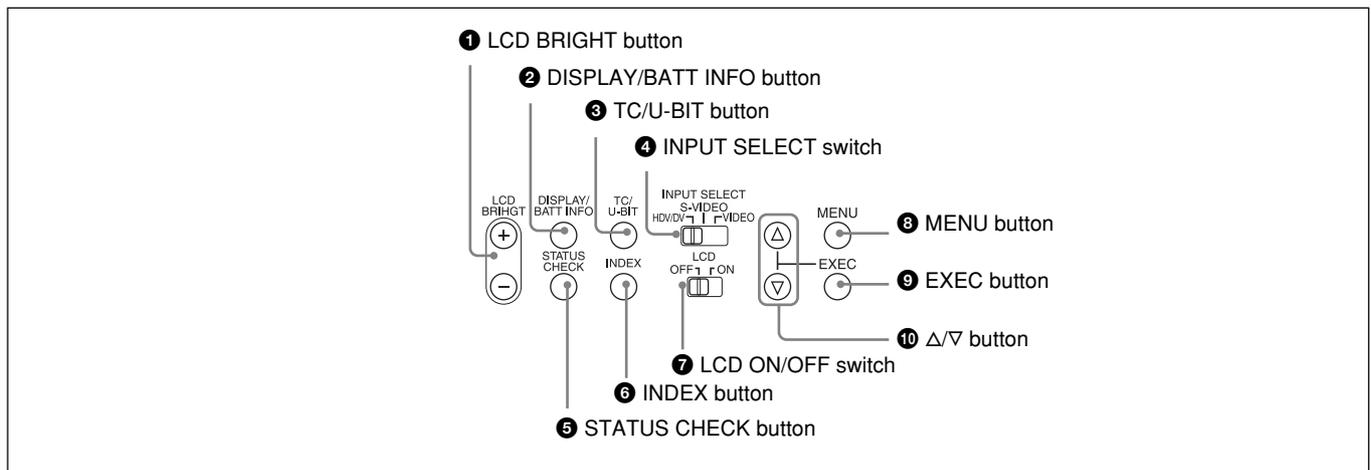
8 DV-i.LINK indicator

Lights up when DVCAM/DV (SP mode) formatted signals are input/output through the i.LINK interface.

Section behind the Operation Panel



1 Upper control section



1 LCD BRIGHT (+/-) button

Adjust the brightness of the LCD panel.
 +: Brightens.
 -: Dims.

2 DISPLAY/BATT INFO button

Superimposes data items such as the time code upon pictures.
 If you keep pressing this button while the unit is turned off and the battery pack is attached, charge level of the battery pack and the remaining time that you can playback will be displayed. (p. 65)

3 TC/U-BIT button

Displays time data. Every time you press this button the time code or the user bits are displayed alternately. (p. 40)

4 INPUT SELECT switch

You can select HDV/DV, S VIDEO, or VIDEO to input signals.
 The type of selected signal is displayed on the Data screen on the LCD monitor on the front panel.
 When HDV/DV is selected, input the signal you selected in [VCR HDV/DV] on the [IN/OUT REC] menu. (p. 48)

Notes

- If you change this selector, the screen may momentarily become bright or noise may appear. This noise will be recorded.
- Do not change this switch setting during recording. If you change the setting of this switch during recording, the recorded image will be interrupted for several seconds. Recording will restart after the internal circuit is switched. During this time, no image is recorded. Also, the unit may mistakenly recognize a copyright protected signals that has been input.

5 STATUS CHECK button

Press this button to check the audio setting and output setting information (*see page 20*). When you press the Δ/∇ button, you can switch the screens between audio information and output information.

6 INDEX button

Press this button during recording to mark an index. If you mark an index at the scene you want to search for, you can easily find the scene later.

For details on index, see "Recording Functions" on page 34.

7 LCD ON/OFF switch

Press this switch to turn the LCD monitor ON and OFF.

8 MENU button

Press this button to display the menus.

For details of the menu, see "Operating the Menus" on page 45.

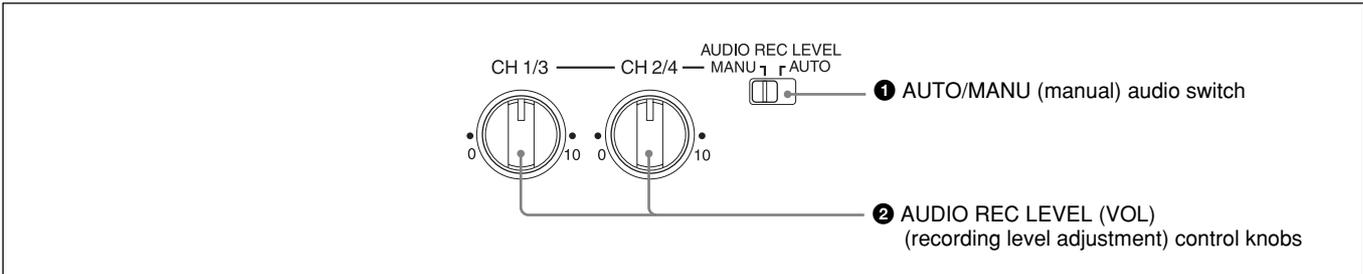
9 EXEC (execute) button

Press this button to change the setting on the menu items.

10 Δ/∇ buttons

Press these buttons to move around in the menu or status check items, or select the menu and items.

2 Audio control section



1 AUTO/MANU (manual) audio switch

Switches the audio recording level adjustment mode.

AUTO: The recording level is automatically adjusted in accordance with an input audio.

MANU: Enables the AUDIO REC LEVEL control knobs.

* When this switch is set to MANU, CH1/3 and CH2/4 control knobs are both set to manual mode.

Notes

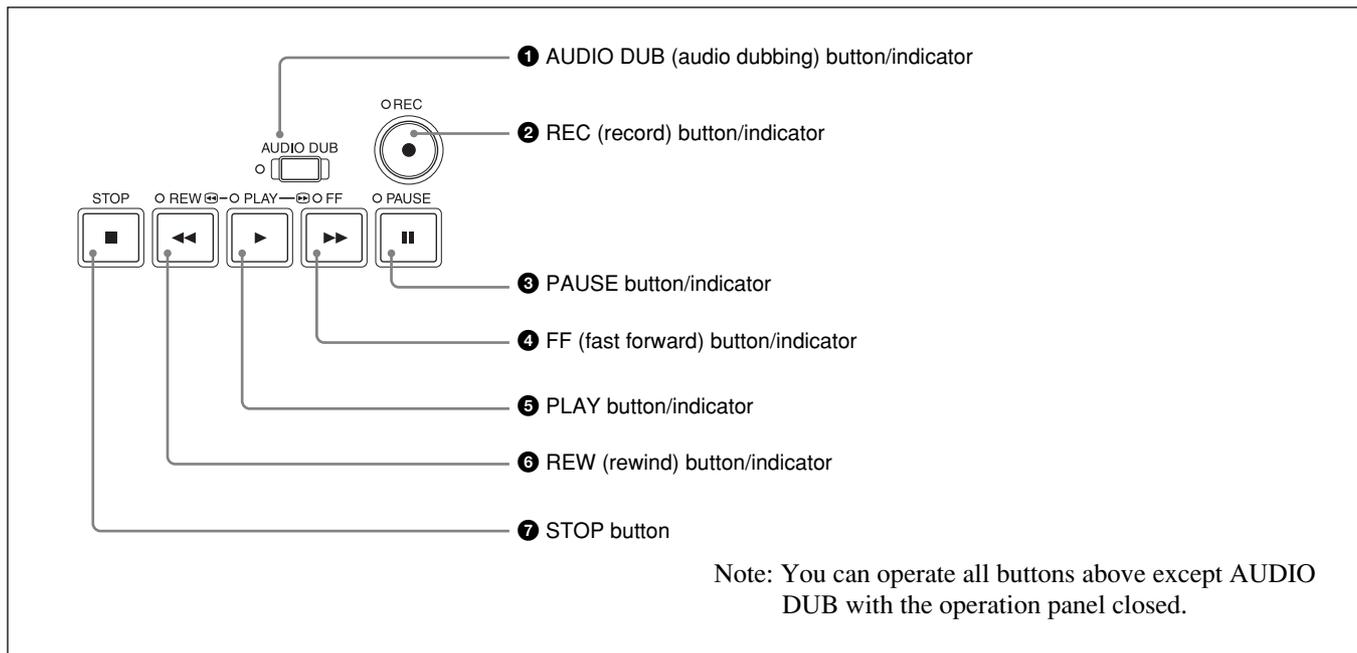
- When i.LINK signals are input to the unit, the sound recorded retains the signal level input, regardless of the setting of this switch. You cannot adjust the audio level with AUDIO REC LEVEL control knobs.
- If you input a sound whose level exceeds the acceptable range, the recorded sound will be distorted.

2 AUDIO REC LEVEL (VOL) (recording level adjustment) control knobs

When intending to perform normal recording, by using these knobs, adjust the levels of the analog audio signals input to the unit (channel 1 and 2). When intending to perform audio dubbing, using these knobs, adjust the levels of channel 3 and 4.

These knobs are enabled only when the AUTO/MANU (manual) audio switch is set to MANU.

3 Tape transport control section



1 AUDIO DUB (audio dubbing) button/indicator

Use this button to dub sounds. The indicator lights up while sounds are being dubbed.

For details on audio dubbing, see “Audio Dubbing” on page 43.

2 REC (record) button/indicator

When you press the PLAY button while holding this button down, the PLAY and REC indicators light up and recording begins.

Note

You can record in the HDV/DVCAM and the DV formats in SP mode.

LP mode is not supported.

3 PAUSE button/indicator

When you press this button during recording, playing, or audio dubbing, the current operation goes into the pause mode. Pressing this button again resumes the operation. The indicator lights up while the unit is in the pause mode.

4 FF (fast forward) button/indicator

When you press this button, the indicator lights up and the tape is fast forwarded. During fast forward, the picture does not appear on the monitor.

To locate a scene while monitoring the picture, hold this button down during fast forward, playback or in the playback pause mode.

5 PLAY button/indicator

When you press this button, the indicator lights and playback begins.

Notes

- If the unit is playing a portion of a tape where the recording formats are switched between HDV, DVCAM, and DV or where the format of the system signals are changed between 50i and 60i, the picture and sound will be distorted on such a portion.
- You can play back a tape recorded in the HDV/DVCAM/DV format in SP mode. LP mode is not supported.

6 REW (rewind) button/indicator

When you press this button, the indicator lights and the tape starts rewinding. During the rewind, the picture does not appear on the monitor.

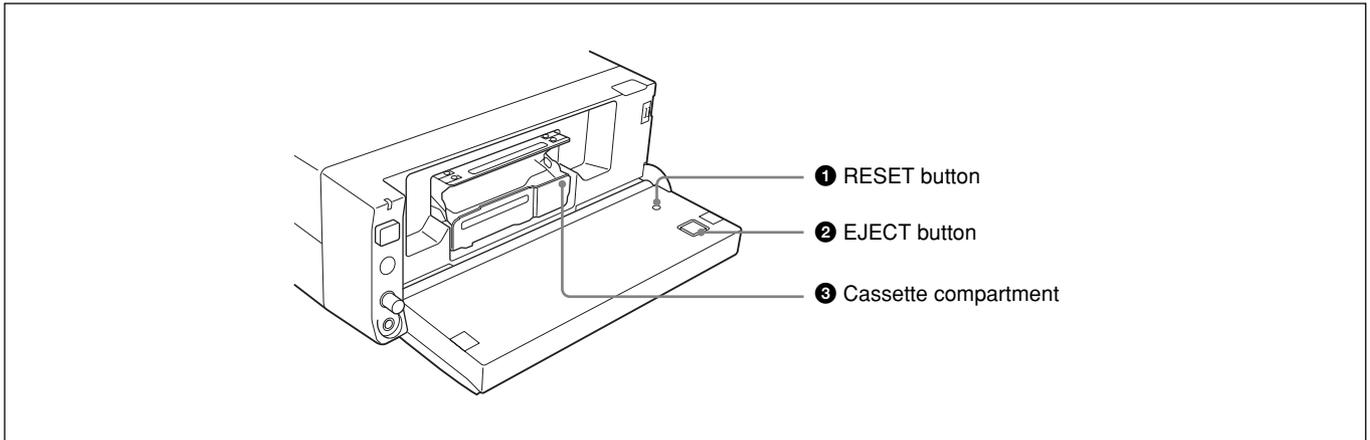
To locate a scene while monitoring the picture, hold this button down during rewind, playback or in the playback pause mode.

7 STOP button

Press this button to stop the current tape transport operation.

Location and Function of Parts

Inside of the Front Panel



❶ RESET button

Press this button to clear all settings including the date and time. Use the tip of a ball-point pen or similar tool to press this button.

❷ EJECT (cassette eject) button

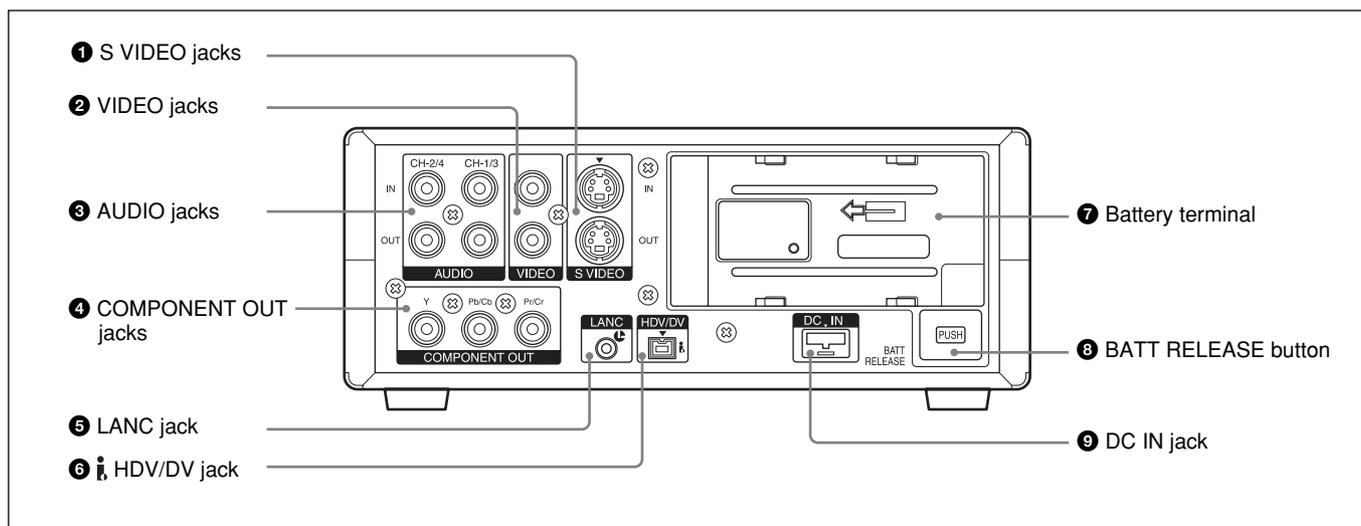
Press this button to insert or remove a cassette. When you press this button, the cassette tray comes up automatically. Place the cassette in this tray and press down **PUSH**. After the cassette tray is retracted automatically, close the front panel.

❸ Cassette compartment

Insert a cassette.

For details of cassettes that can be used, see “Notes on Power Supply and Video Cassettes” on page 21.

Rear Panel



1 S VIDEO jacks

To connect a device equipped with an S-video jack, use the S VIDEO jack on the unit. If you use the S VIDEO jack, you can input/output high-quality video with less signal deterioration than the standard VIDEO jack.

Text data such as the time code, menus, and alarm messages are superimposed on an external monitor connected to the S VIDEO jack (*p. 19*).

2 VIDEO jacks

Use to input and output analog video signals.

Text data is superimposed on a monitor in the same way as a S VIDEO jack connection (*p. 19*).

3 AUDIO jacks

Use to input and output analog audio signals. During normal recording, sounds are recorded onto channels 1 and 2. During audio dubbing, sounds are dubbed onto channels 3 and 4.

Note

In the audio dubbing mode, the CH1/3 and CH2/4 jacks function as the channel 3 and channel 4 input jacks, respectively.

4 COMPONENT OUT (output) jacks

Use to output component signals.

To connect a device equipped with the component video input connector, use the COMPONENT OUT jack on the unit. If you use the COMPONENT OUT jack, you can output high-quality video with even less signal deterioration than the S VIDEO jack.

You can set the output video format by using [COMPONENT] on the [IN/OUT REC] menu. Text data is superimposed on a monitor in the same way as a S VIDEO jack connection (*p. 19*).

Notes

- The output level of the COMPONENT OUT jack is as follows:
Y: 1 Vp-p (480i NTSC/576i PAL: 0.3 V sync negative)
Pb/Cb, Pr/Cr: 700 mVp-p (100% color bar), output impedance 75 Ω (ohms)
You might need to change output signals. This depends on the device you connect.
- The COMPONENT OUT jacks of this unit are optimized for high-definition (HD) video output. Therefore, the EE pictures of NTSC (480i) and PAL (576i) are converted into simple video signals. When you use EE pictures, note the following restrictions on dubbing to another equipment and displaying on a monitor television. These restrictions apply when you output NTSC (480i) and PAL (576i) signals from the COMPONENT OUT jacks.
 - Since the effective display range of the luminance signal and chrominance signal is different, a portion consisting only of the chrominance signal exists in the underscan video portion.
 - Since the jitter (jitter of entire screen) of input video signals is absorbed, the video signal is forcibly reset in the underscan portion. You can see this process in the underscan portion using an underscan monitor.

(Continued)

- The output level of the luminance signal is different from the specified value.

The above symptom is not a malfunction. This condition will not affect images to be recorded on a tape. The specified video signals are output from the S VIDEO or VIDEO OUT jacks even in EE mode.

When you use this unit to input HDV signals from the i.LINK jack and down-convert them to NTSC (480i) or PAL (576i) signals, the specified video signals are output.

- If you want to output video signals to the VIDEO, S VIDEO, or COMPONENT OUT jack without text data, select the [OTHERS] menu, [DISP OUTPUT], then [LCD PANEL] (default setting). Or press the DISPLAY/BATT INFO button on the unit, the DATA CODE and SEARCH SELECT button on the Remote Commander to clear the text data on the monitor screen depending on the displayed items.
- During EE mode or recording, the subcarrier of the color signal to be output from this unit is not synchronized with the horizontal sync signal. The color of the picture or the horizontal sync signal may be distorted depending on the type of monitor connected to the unit.
- The unit only can accept standard video signals. If you input the types of video signals shown below, recorded picture and sound may be distorted.
 - Signals from some home game machines
 - Blue background screen or gray background screen from a consumer VCR
 - Pictures played at a speed other than normal by a VCR that does not have the TBC (Time Base Corrector)
 - Video signals in which the sync signals are distorted
 - Signals from a defective cassette (tape or recording condition is bad) played by an analog VCR that does not have TBC

5 LANC jack

Use when controlling the tape transport operation of the unit using a device that has a LANC¹⁾ jack.

Notes

- The LANC jack on the unit has only LANC-S functions. The unit has no LANC-M functions. A device that is set to LANC-S mode cannot be connected to this unit. Either this, the unit or the other device may not operate properly.

1) LANC (Local Application Control bus system):
Bidirectional interface used to control a consumer VCR

- If the device you connect to this unit has a SHUTTLE A/B switching function and a LANC-M function, set the device to the SHUTTLE A mode for processing HDV signals and set it to the SHUTTLE B mode for processing DVCAM/DV (SP mode) signals.
- The LANC connection transmits signals such as control signals, time code, time counter data, and status data.
- Jacks labeled CONTROL L have the same function as LANC jacks.
- When using this unit as a player, set the LANC mode on the recorder to M. A device that does not have an M / S switching function cannot be used to control this unit.
- You cannot use LANC to perform power control.
- You may have some difficulties when you edit using an HDV formatted tape.
Refer to the "Notes" in "Editing (Connecting with a Personal Computer)" on page 39.

6 i.LINK HDV/DV jack (4-pin)

Used to input/output the digital signal that complies with the i.LINK standard. Use when a device connected to the unit has an i.LINK jack. If you connect the unit and another device using i.LINK HDV/DV jacks, you can minimize deterioration of picture quality during recording, dubbing, or capturing still pictures, all by means of digital signal processing. For details, refer to the instruction manual of the external device.

Note

This jack can accept only HDV/DV/DVCAM signals. For details, see "About i.LINK" on page 72.

7 Battery terminal

For details on batteries, see "Preparing the Power Supply" on page 22.

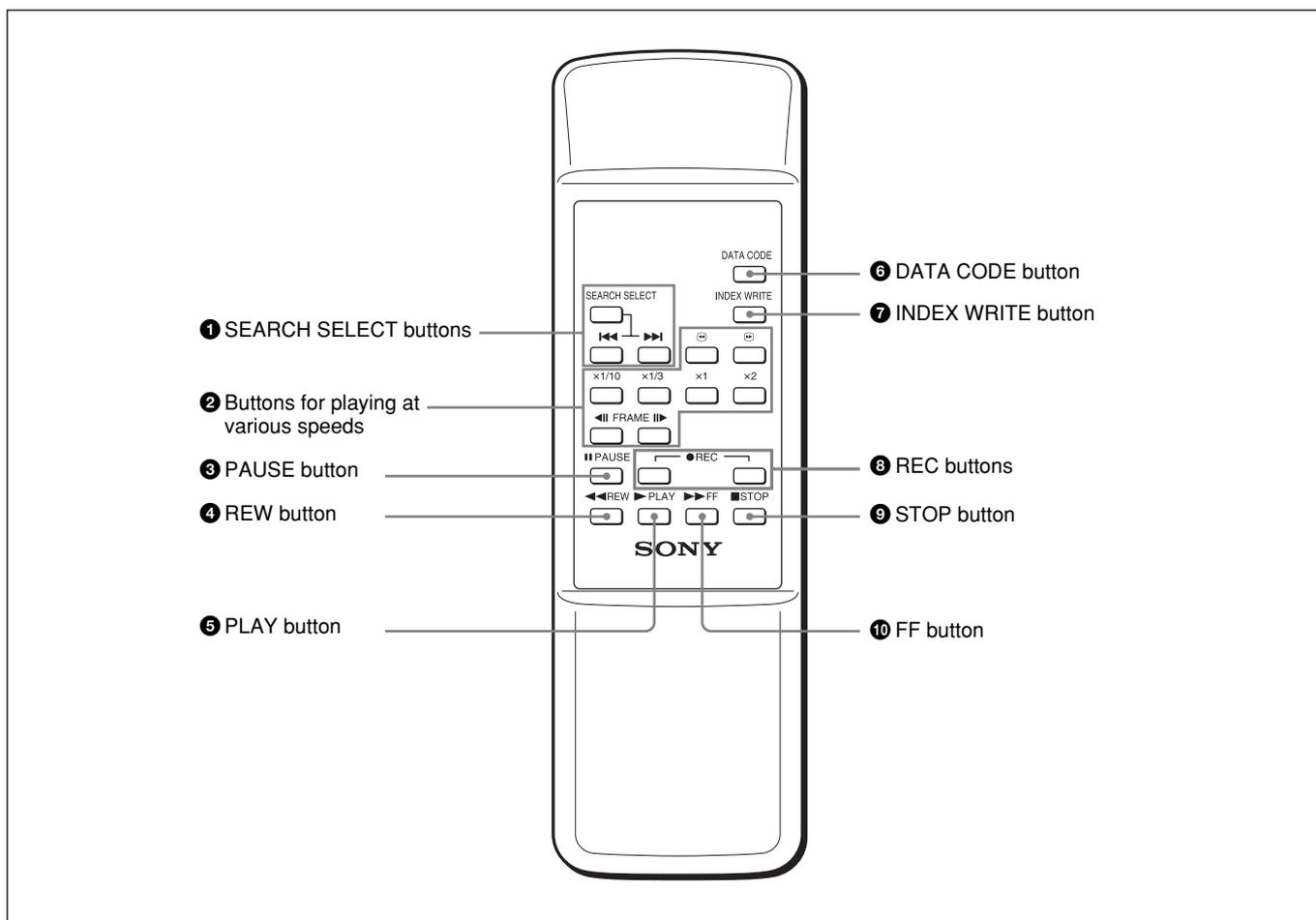
8 BATT RELEASE (battery release) button

Press this button to eject and remove a battery.

9 DC IN jack

Connects to an AC outlet using the supplied AC adaptor and power cord.

Supplied Remote Commander



1 SEARCH SELECT buttons

Press these buttons to search for scenes using the search function.

For details on the search function, see “Searching using the search function” on page 30.

2 Buttons for playing at various speeds

You can play back a tape at normal speed or at a speed other than normal with these buttons.

For details, see “Playing at various speeds” on page 28.

3 PAUSE button

4 REW (rewind) button

5 PLAY button

6 DATA CODE button

Press this button to display the data codes (recording date/time, camera data).

For details on data codes, see “Displaying information (data codes) recorded on a tape” on page 27.

7 INDEX WRITE button

Press this button during the recording to mark an index.

For details on an index, see “Marking an index” on page 34.

8 REC (record) buttons

When you press both these buttons at the same time, the REC indicator and PLAY indicator on the front panel light and recording begins.

9 STOP button

10 FF (fast forward) button

(Continued)

Location and Function of Parts

Notes

- The command mode of the supplied Remote commander is set to VTR4. You cannot change this setting.
- Set [REMOTE CTRL] on the [OTHERS] menu to [ON] to enable the Remote Commander to control the unit.
- In addition to the Remote Commander supplied with the unit, the unit accepts signals from any Sony Remote Commander whose command mode is set to VTR4. If you want to disable the control from any Remote Commander, set [REMOTE CTRL] on the [OTHERS] menu to [OFF].

Notes on batteries

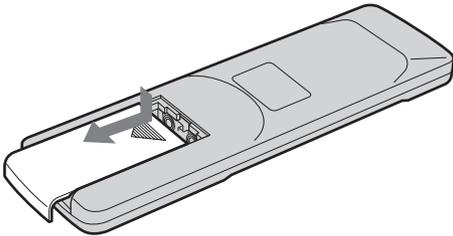
- Make sure that the battery orientation is correct when inserting batteries.
- Do not mix an old battery with a new one, or mix different types of batteries.
- If you do not intend to use the Remote Commander for a long time, remove the batteries to avoid damage from battery leakage. If the batteries have leaked, remove them, wipe the battery compartment dry and replace the batteries with new ones.

To remove the batteries

Remove the lid as step 1 and take out the batteries.

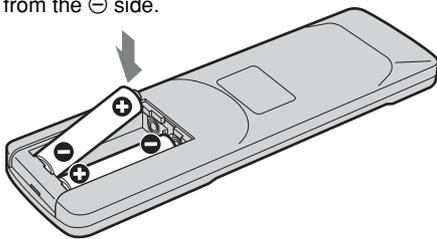
Battery installation

- 1 Push and slide the lid to open.

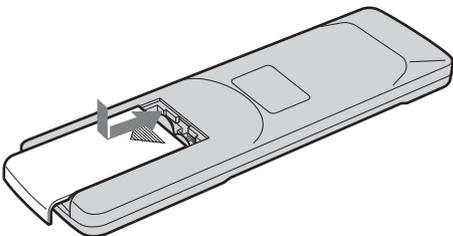


- 2 Install two size AA (R6) batteries (supplied) with the correct polarity.

Be sure to install the battery from the ⊖ side.



- 3 Replace the lid.



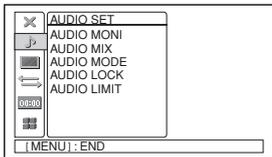
Displaying Various Data

This unit can display various superimposed text data on the built-in LCD monitor and also an external monitor connected to the unit. To display text data on an external monitor, set [DISP OUTPUT] on the [OTHERS] menu to [V-OUT/PANEL]. You can turn ON/OFF various text data display by pressing the DISPLAY/BATT INFO button.

Menu screen

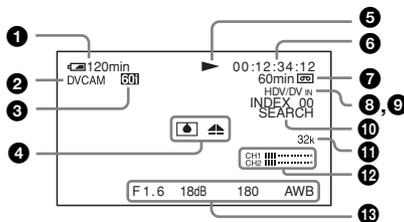
Press the MENU button to display the menu screen. You can change or confirm the menu item settings on this screen.

For details on the menu, see “Chapter 4 Adjusting and Setting Through Menus” on page 45.



Data screen

You can display the data screen by pressing the DISPLAY/BATT INFO button when the unit is turned on. You can confirm important information for normal recording or playback, such as time code or remaining tape time, on the screen.



Note

The text data superimposed on an external monitor connected to the VIDEO, S VIDEO, or COMPONENT OUT jack is the same as those superimposed on the LCD monitor. If you set [COMPONENT] on the [IN/OUT REC] menu to [1080i/480i]* for the output from COMPONENT OUT jack during HDV playback, only the tape transport mode indicator and time counter are displayed as text data.

* When [50i/60i SEL] is set to 60i. This setting value is [1080i/576i] when [50i/60i SEL] is set to 50i.

1 Remaining battery

When you use this unit with a battery, the battery remaining time is displayed. This information may not be displayed correctly depending on the operating status and the environment.

2 Format indicator

[HDV1080i], [DVCAM], or [DV SP] are displayed.

3 50i/60i indicator

4 Alarm indicator

Displays an alarm indicator.

For details on alarm indicators, see “Warning indicators and messages” on page 59.

5 Tape transport mode indicator

Displays the tape transport mode.

6 Time code or user bits indicator

Every time you press the TC/U-BIT button, the time code or user bits are displayed alternately.

TC : [00:00:00:00] or [00:00.00:00]

In the drop frame mode, a period (.) is displayed between the minute value and second value.

U-BIT : [00 00 00 00]

Note

When you playback a tape without setting a time code or user bit record, or without setting a time code recorded in different formats, the unit cannot display them correctly.

7 Remaining tape time indicator

Displays the remaining tape time.

For details, see “[REMAINING]” on page 52.

Note

When you insert a cassette in which the tape has been rewound to the beginning, this indicator will not show the remaining tape time. The remaining tape time is displayed after the tape runs for a while.

8 INPUT SELECT indicator

Changes according to the position of the INPUT SELECT switch. ([HDV/DV IN], [S VIDEO IN] or [VIDEO IN])

9 (Index) indicator

Displays [] when an index has been marked.

(Continued)

Displaying Various Data

10 Search indicator

Displays the search mode when you search for scenes using the Remote Commander.

For details on the search function, see “Searching using the search function” on page 30.

11 Audio mode indicator

In the recording mode, displays 32k when you select [FS32K] for [AUDIO MODE] on the [AUDIO SET] menu. When you select [FS48K], 48k is displayed. During playback or audio dubbing, displays the audio mode recorded on the tape. During the i.LINK input, displays the audio mode of the signal input to the HDV/DV jack.

Notes

- The audio mode will not be displayed when [VCR HDV/DV] on the [IN/OUT REC] menu is set to [HDV].
- Signals other than the HDV/DVCAM lock mode will become non-standard audio and NS32k/NS48k is displayed during playback or when the signal is input from the HDV/DV jack.

12 Audio level meters

They are displayed when the AUTO/MANU audio switch is set to MANU.

Notes

- The audio level meters will not be displayed when the INPUT SELECT switch is set to HDV/DV.
- When [AUDIO MIX] is set to [CH3, CH4] in the [AUDIO SET] menu, the audio level meters will display CH3 on the CH1 indicator and CH4 on the CH2 indicator.

13 Date/time and camera data indicator

When you press the DATA CODE button of the Remote Commander, you can switch the display between recording date/time and camera data.

For details on the date/time and camera data indicator, see “Displaying information (data codes) recorded on a tape” on page 27.

STATUS CHECK screen

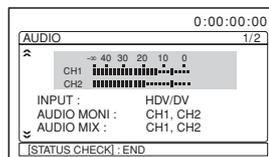
You can confirm the setting values of the following items by pressing the STATUS CHECK button.

- [AUDIO] settings such as [AUDIO MONI] and [AUDIO MIX]
- [OUTPUT] settings such as [VCR HDV/DV], [COMPONENT], [i.LINK CONV] and [DOWN CONVERT]

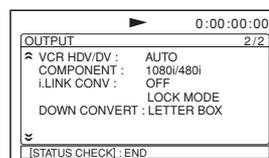
Every time you press the Δ/∇ button, you can switch the display between audio-related settings and output-related settings.

Press the STATUS CHECK button again to make the status check screen off.

[AUDIO] screen



[OUTPUT] screen



Notes

- The information items displayed on the [AUDIO] screen during playback on this unit are different from those displayed while video signals are input through the i.LINK interface.
- The audio level meters will display the output signal level during playback and input signal level during recording.
- When [AUDIO MIX] is set to [CH3, CH4] in the [AUDIO SET] menu, the audio level meters will display CH3 on the CH1 indicator and CH4 on the CH2 indicator.

Playback and Recording

Notes on Power Supply and Video Cassettes

Usable cassettes

We recommend you to use a digital master cassette (PHDVM-63DM) and a Mini-DV/DVCAM cassette for recording in the HDV/DV format.

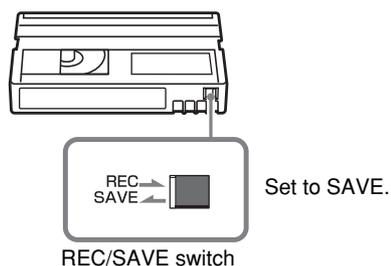
We recommend you to use a Mini-DVCAM cassette, or digital master cassette (PHDVM-63DM) for recording in the DVCAM format.

Cassette memory

Some Mini-DV and Mini-DVCAM cassettes have the cassette memory **C/I** mark. This unit, however, does not support cassette memory.

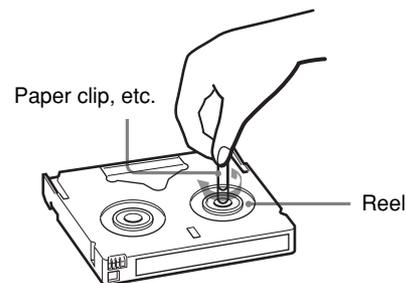
To save a recording

To prevent accidental erasure of a recording, slide in the REC/SAVE switch on the cassette so that the red portion becomes visible. To record on a tape, slide out the switch so that the red portion is hidden.



Checking the tape for slack

Using a paper clip or a similar object, turn the reel gently in the direction shown by the arrow. If the reel does not move, there is no slack.



Notes on Power Supply and Video Cassettes

Preparing the Power Supply

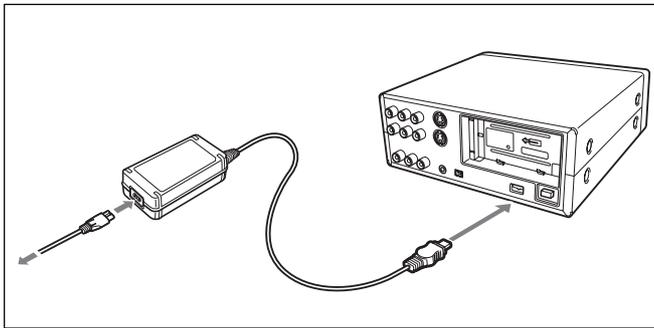
Connect the power cord (supplied) to the AC adaptor and the DC plug of the AC adaptor to the DC IN jack on this unit. Next, connect the power plug to an AC outlet. When you disconnect the power cord, be sure to unplug the power cord from the AC outlet first.

PRECAUTION

Even if this unit is turned off, AC power (house current) is still supplied to it while connected to the wall outlet via the AC adapter.

Notes

- Never short-circuit the DC plug of the AC adaptor or battery terminal with a metal object. A short circuit can damage the unit.
- Use a nearby wall outlet when using the AC Adaptor. Disconnect the AC Adaptor from the wall outlet immediately if any malfunction occurs.
- Do not use the AC Adaptor placed in a narrow space, such as between a wall and furniture.



The [CLOCK SET] screen appears when you turn on the unit for the first time.

Refer to page 52 on how to set the date and time.

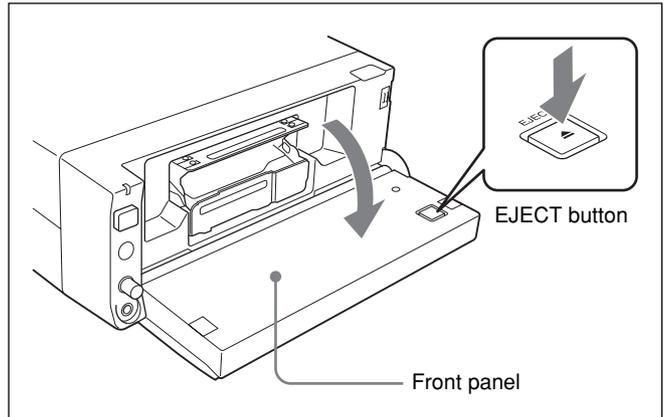
Inserting/Ejecting Cassettes

To insert a cassette

Notes

- Do not insert the cassette forcibly. The unit may be damaged.
- Do not eject/load the cassette in a place subject to light. The internal sensor of the unit may operate incorrectly if too much light falls on the unit.

1 Open the front panel.



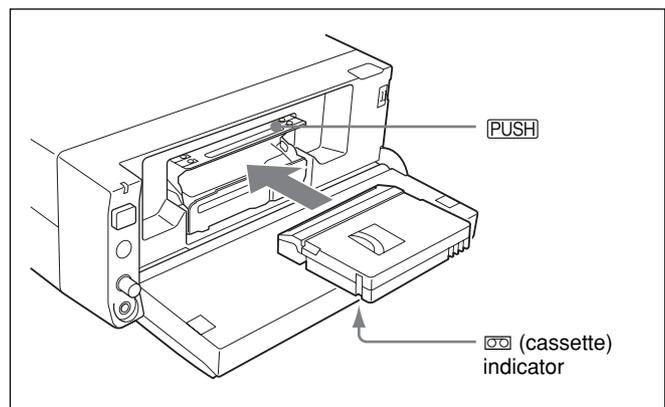
2 Press the EJECT button while the AC adaptor or battery is attached to the unit.

The cassette tray will come out automatically.

3 After checking the tape for slack, hold the cassette so that the tape window is facing upward, then insert it into the unit.

Note

If the cassette does not load or is loaded only halfway, eject it once, then insert it again. In such a case, if you insert the cassette forcibly, the cassette may not be loaded properly or malfunctions may occur.



4 Press **PUSH**. After the cassette tray is automatically retracted, close the front panel. Confirm that the **(cassette) indicator** is lit.

Removing the cassette

- 1 Open the front panel.
- 2 Press the EJECT button while the AC adaptor or battery is attached to the unit.

The cassette tray will come out automatically.

- 3 Remove the cassette and press **[PUSH]**.

The cassette tray is automatically retracted.

- 4 Close the front panel.

Notes on Playback/Recording

No compensation for contents of the recording

Contents of the recording cannot be compensated for if recording or playback is not successful due to a malfunction of the unit, video tape, etc.

Copyright precautions

Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the copyright laws.

On recording

You cannot record any software having copyright protection signals on this unit. If you start recording protected video and audio signals, a warning appears on the monitor screen and the unit stops recording. During recording, do not change the INPUT SELECT switch setting. If you do so, the unit may mistakenly recognize that a copyright control signal has been input.

On playback

When you play back software having copyright protected signals on this unit, you may not be able to copy it onto other equipment.

Limitations caused by differences in format

The unit can record and play back tapes recorded in HDV1080i/DVCAM format. It can also record and play back tapes recorded in DV format (SP mode). However, due to differences in format, you may not be able to play back or edit some tapes affected by recording conditions of the tape (e.g., a tape originally recorded in DV format is dubbed in DVCAM format). You can play back for HDV 720/30p format, while you cannot output the video signals from **[i]** HDV/DV jack.

For details, see "Compatibility of HDV, DVCAM and DV Format" on page 68.

If a tape has both a portion recorded in the HDV/DVCAM format and one recorded in the DV format (SP mode), the following limitations are applied when you play back the tape with this unit:

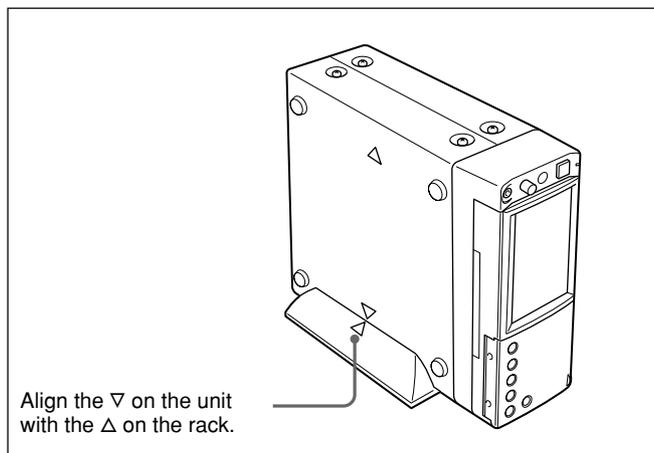
- The image may be distorted and noise may occur at the point where the recording format changes on the tape.
- The tape transport control buttons may be disabled until the tape speed is stabilized.

Note on playback on other equipment

A tape recorded in the HDV format cannot be played back with the devices not compatible with the HDV 1080i format. We recommend confirming the contents of the tape by playing back the tape before playing back it on another video equipment.

Installing the Unit Vertically

Put the unit into the supplied rack as illustrated below. You can install it either standing on its left side or on its right side.



Notes

- Be sure to use the supplied rack. Without the rack, the unit may topple over and may be damaged or may cause injury.
- Install the unit on a flat place.
- When inserting a cassette, hold the unit until it is loaded into the unit. Otherwise the cassette may fall out and the tape may be damaged.

For details on inserting a cassette, see “Notes on Power Supply and Video Cassettes” on page 21.

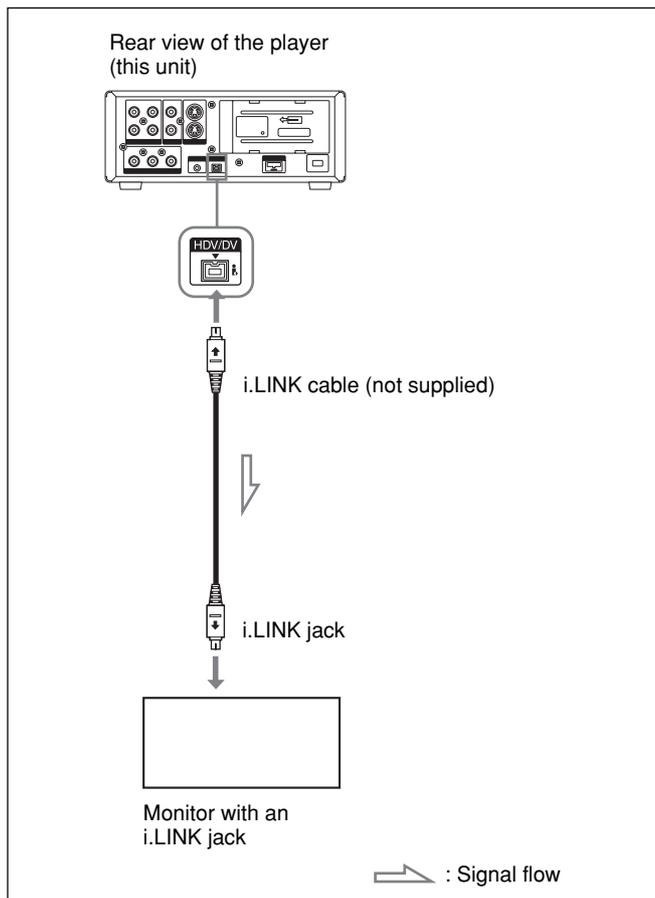
Playback

This section describes the connections and settings for the playback and functions such as playback at various speeds and searching for a specific scene on a recorded tape.

Connections for Playback

Connecting the unit to a monitor with an i.LINK jack

The video and audio signals are sent with hardly any degradation, enabling high-quality playback.

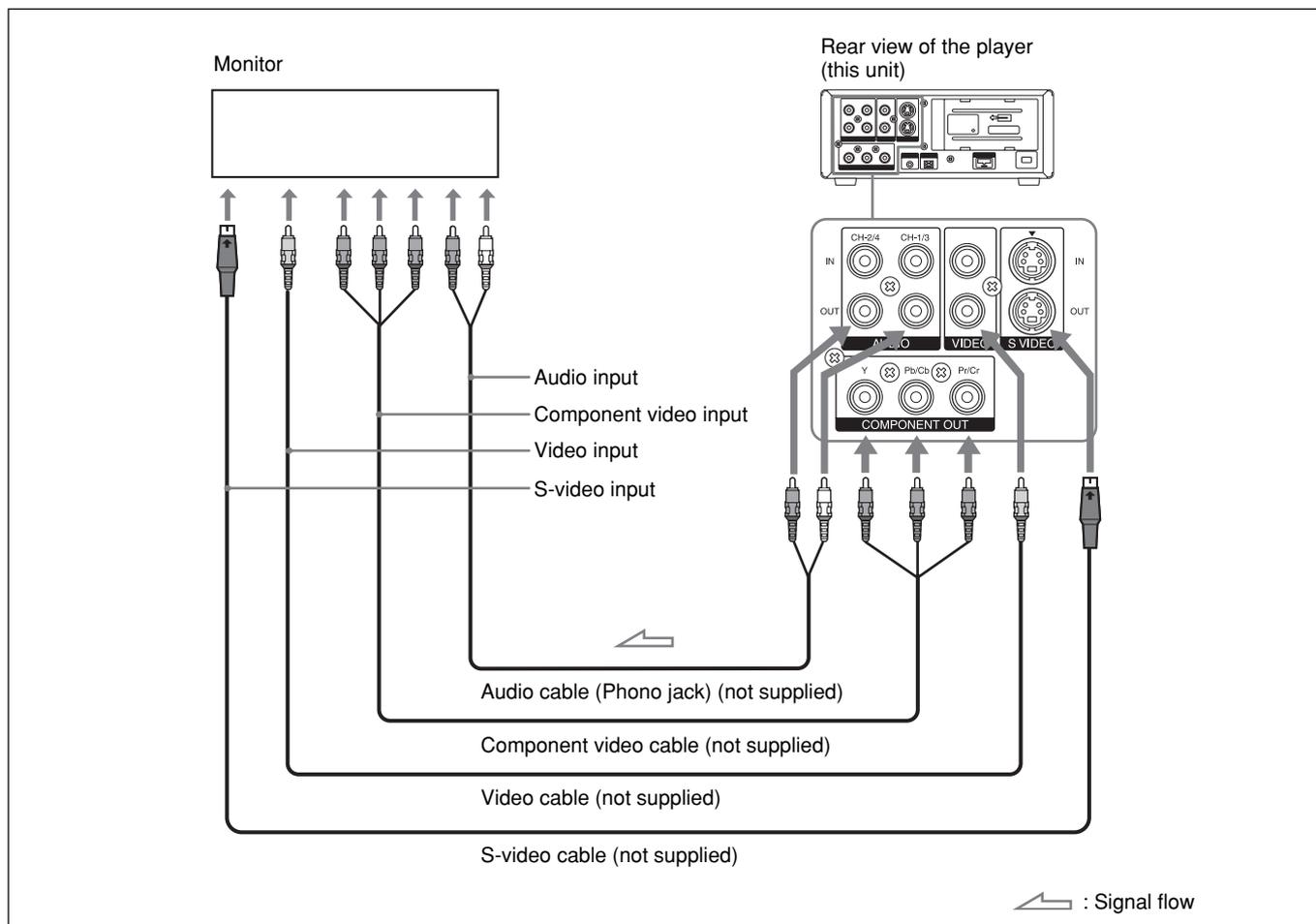


Notes

- Be sure that you set [VCR HDV/DV] on the [IN/OUT REC] menu to [AUTO] (default setting) before connecting the video equipment to this unit with the i.LINK cable.
If you change the setting after connecting the i.LINK cable, the video equipment may not be able to recognize the video signal correctly (*see page 48*).
- To connect the unit to a monitor equipped with an i.LINK jack, you may need to set the monitor so that it recognizes this unit.
For details, refer to your monitor's instruction manual.
- When the i.LINK cable is connected, the unit cannot output video or audio separately.
- If you connect the input connectors of this unit to the output connectors of a monitor, a humming noise may be generated or the image may be distorted. If these phenomena occur, use the INPUT SELECT switch to select a signal that is not being input or disconnect the cables.
- The monitor you want to connect to the unit using the i.LINK cable must be HDV or DV format compatible. To play back a tape recorded in the HDV mode on a DV-compatible monitor, set [i.LINK CONV] on the [IN/OUT REC] menu to [ON] before connecting the unit with the i.LINK cable. For details, refer to your monitor's instruction manual.
- Some general consumer television sets are provided with a function to control equipment connected with the i.LINK cable. Such a function, however, may not work with this unit.

Connecting the unit to a monitor without an i.LINK jack

You can connect this unit to video monitor without an i.LINK jack. Use this unit as follows.



Notes

- To playback the picture recorded in the HDV format when you connect the monitor using a component video cable, set [COMPONENT] on the [IN/OUT REC] menu according to your monitor (p. 49). When the picture recorded in the DVCAM/DV format is play back, only a picture with a quality equivalent with the DVCAM/DV format is output regardless of the [COMPONENT] setting.
- The output level of the COMPONENT OUT jack is as follows:
 Y: 1 Vp-p (480i NTSC/576i PAL: 0.3 V sync negative)
 Pb/Cb, Pr/Cr: 700 mVp-p (100% color bar), output impedance 75 Ω (ohms)
 To connect the unit to the other equipment, conversion may be required in some cases.

- There are some restrictions on using EE pictures output from the COMPONENT OUT jack of the unit. Refer to ④ COMPONENT OUT (OUTPUT) jack in "Location and Function of Parts" on page 15.
- If you connect the input connectors of this unit to the output connectors of a monitor, a humming noise may be generated or the image may be distorted. If these phenomena occur, use the INPUT SELECT switch to select a signal that is not being input or disconnect the cables.
- You cannot output the DVCAM/DV formatted signals including copyright control signals through the COMPONENT OUT jacks.
- This unit cannot output images recorded in the DVCAM/DV format after up-converting the tape to HDV.

Settings for Playback

Preparation on this unit

Notes

- Text information such as the date and camera data are superimposed on the analog video output. If you want to record video signals without text data, carry out the following operations.

- Select the [OTHERS] menu, [DISP OUTPUT], then [LCD PANEL]. (default setting)
- Depending on the displayed items, press the DISPLAY/BATT INFO on the unit, DATA CODE or SEARCH SELECT button on the Remote Commander to clear the text data on the monitor screen.

For details on text data, see “Displaying Various Data” on page 19.

- To view a tape recorded in the HDV format by connecting the unit to a monitor set that has a 4:3 aspect ratio, set [DOWN CONVERT] on the [IN/OUT REC] menu to the desired mode. (p. 49)

- 1 Power on the monitor, then set the monitor’s input switch according to the signals input.

- 2 Turn this unit on.

Playback Procedures

- 1 Insert a cassette and confirm that, confirm that the  (cassette) indicator is lit.

- 2 Press the PLAY button on this unit.

This unit starts playback.

To stop playback

Press the STOP button on this unit.

To pause playback

Press the PAUSE button on this unit.

Notes

- If the unit is playing a portion of a tape where the recording format changes between HDV, DVCAM, and DV, the picture and sound will be distorted on such portions.
- You cannot play back an image recorded in the DV (LP) mode using this unit.
- If the unit is playing a tape recorded with mixed video signals of the 60i system and 50i system, the picture and sound will be distorted on a portion of a tape where the recording system changes.
- Set [50i/60i SEL] in the [OTHER] menu to adjust the video signal format recorded on a tape. If the video signal format does not match, the unit cannot output video signals correctly.
- When you play back a tape recorded in the HDV format, no video is output from the  HDV/DV jack in the pause status.
- To output audio from a headphone, set [AUDIO MONI] of the [AUDIO SET] menu.

Playback Functions

Displaying information (data codes) recorded on a tape

If you record on a tape using a Sony digital camcorder (DSR-200/200P, 200A/200AP, PD100/PD100P, PD100A/PD100AP, PD150/PD150P, PD170/PD170P, 250/250P, etc.) or digital HD video camera recorder (HVR-Z1U/Z1N/Z1E/Z1P), the recording information (data codes) will be recorded on the tape.

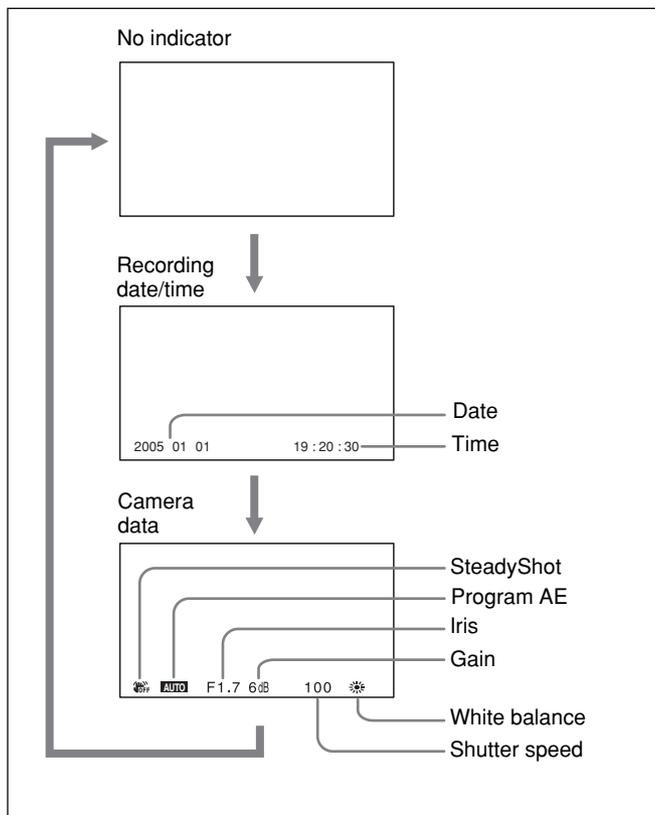
The data codes consist of recording date/time and camera data (the shutter speed, SteadyShot, iris, white balance, program AE mode, gain, date and time). You can check these data items during playback on this unit.

Press the DATA CODE button on the Remote Commander during playback.

Each time you press the DATA CODE button, the display changes in sequence as follows:

no data code → recording date/time → camera data
→ no data code

(Continued)



Playing at various speeds

You can enjoy playback functions using the Remote Commander.

DVCAM/DV formatted tape

Playback options	Operation
Play at 1/10 of normal speed	Press \times 1/10 button during playback.
Play at 1/3 of normal speed	Press \times 1/3 button during playback.
Play at normal speed	Press \times 1 button during playback.
Play at twice the normal speed	Press \times 2 button during playback.
Play frame by frame	Press FRAME \leftarrow III/III \rightarrow buttons during pause. If you keep pressing one of these buttons, playback continues, frame by frame.
Fast forward the tape while monitoring pictures	Press the \oplus button during normal playback or when playing at various speeds.
Rewind the tape while monitoring pictures	Press the \ominus button during normal playback or when playing at various speeds.

Turning off the camera data

Set [DATA CODE] on the [OTHERS] menu to [DATE]. (p. 52).

Each time you press the DATA CODE button, the display changes in the sequence as follows:
 recording date/time \rightarrow no data code ...

Notes

- If the data codes were not recorded, “- -” appears instead.
- This unit cannot record camera data. Camera data items show the settings of a tape recorded by a digital camcorder (DSR-200/200P, 200A/200AP, PD100/PD100P, PD100A/PD100AP, PD150/PD150P, PD170/PD170P, 250/250P, etc.) or digital HD video camera recorder (HVR-Z1U/Z1N/Z1E/Z1P).
- Some of the camera data items displayed by this unit are different from those shown on the digital camcorder and digital HD video camera recorder.

HDV formatted tape

Button	Operation speed	Panel/analog output		i.LINK output	
		Forward direction	Reverse direction	Forward direction	Reverse direction
× 1/10	One-tenth of normal speed	⊙	—*	—	—*
× 1/3	One-fifth of normal speed	⊙	—*	—	—*
× 1	Playback at normal speed	⊙	○	⊙	○
× 2	Playback at normal speed	—*	—*	—*	—*
FRAME ◀ / ▶	Frame-by-frame forward scanning	⊙	—*	—	—*
⏪/⏩	8× speed	○	○	○	○

* The output will be the same as that of ×1.

⊙ : Play at normal speed.

○ : A search simple image is output. (Rough image)

— : No playback takes place.

To change playback direction

Press the FRAME ◀|||/|||▶ buttons during normal playback or when playing at various speeds. To play back in the forward direction, press the |||▶ button; in the backward direction, press the ◀||| button.

Notes

- When the command mode of a Sony device / remote commander is set to VTR4;
 - if you press the ×1/3 button on the supplied Remote Commander while pointing it toward a Sony device other than this unit, the playback speed may turn to 1/5 of normal speed.
 - when you playback a tape in the DVCAM/DV format and press the ×1/5 button on a remote commander while pointing it toward this unit, the playback speed will turn to 1/3 of normal speed.
- If the unit keeps playing at 1/10 of normal speed in forward or reverse for more than 1 minute, the unit will begin to play back forward at normal speed.
- The sound of a tape is not output while being played at various speeds.

Playback

Searching using the search function

This unit can immediately access the following signals recorded on a tape.

- Searching for the beginnings of the recordings:
Index search
- Searching for a point on the tape where the recorded date changes: Date search

To search for scenes, use the supplied Remote Commander.

- 1 Press the SEARCH SELECT button on the Remote Commander to select the search type.

The search type will change in the order of Index search → Date search → (No indication).

When selecting INDEX SEARCH



(The search screens are displayed only on the Data screen.)

- 2 Press the ◀◀ or ▶▶ button repeatedly to locate the scene you want.

Each time you press the ◀◀ or ▶▶ button, the unit searches for the previous or next search point. When a search point is located, its number is indicated on the monitor screen.

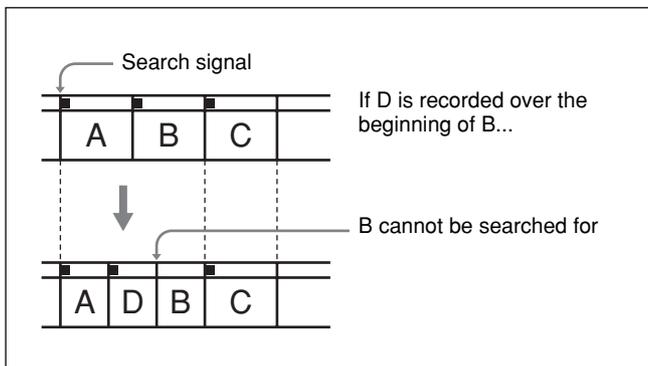
The unit starts searching backwards or forwards until the number comes to zero, then plays back the scene.

How signals are recorded

There are four different signal types, one for each search method; index, title, date and photo signals. This unit can record either index signals and date signals on a tape.

Notes

- If you record another program over the beginning of the search signals, you will not be able to locate the original program.



- The interval of a date or index must be 2 minutes or more. If the interval is short, the search signals may not be detected correctly.
- If non-recorded portions are included in the middle of a tape, signal search may not be performed correctly.
- You cannot add search signals after recording.
- When recording on this unit, signals for Index search do not have information on the day of the week.
- This unit does not support cassette memory.
- Searching may not be done correctly if the tapes were not recorded on Sony-brand digital video equipment.

Using the Unit as a Videocassette Recorder

This section describes the connections, settings and operations necessary to perform recording on this unit. The same settings and operations apply whether you are using the unit for dubbing.

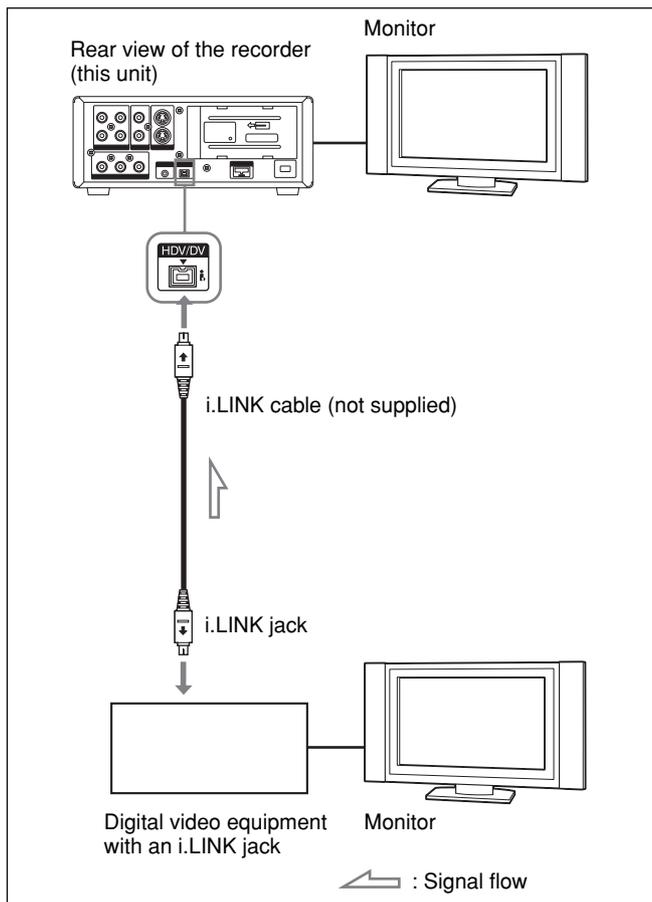
Notes

- For connection of the editing controller and its peripheral devices, refer to the instruction manual of the editing controller and that of the editing software you use.
- Edit functions are specified by the editing software. For details on the editing methods used, refer to the instruction manual of the editing software.

Connections for Recording

To digital video equipment with an i.LINK jack

The video and audio signals are sent with hardly any degradation, enabling high-quality recording. The signal flow is automatically detected so you do not need to make separate connections for input and output.



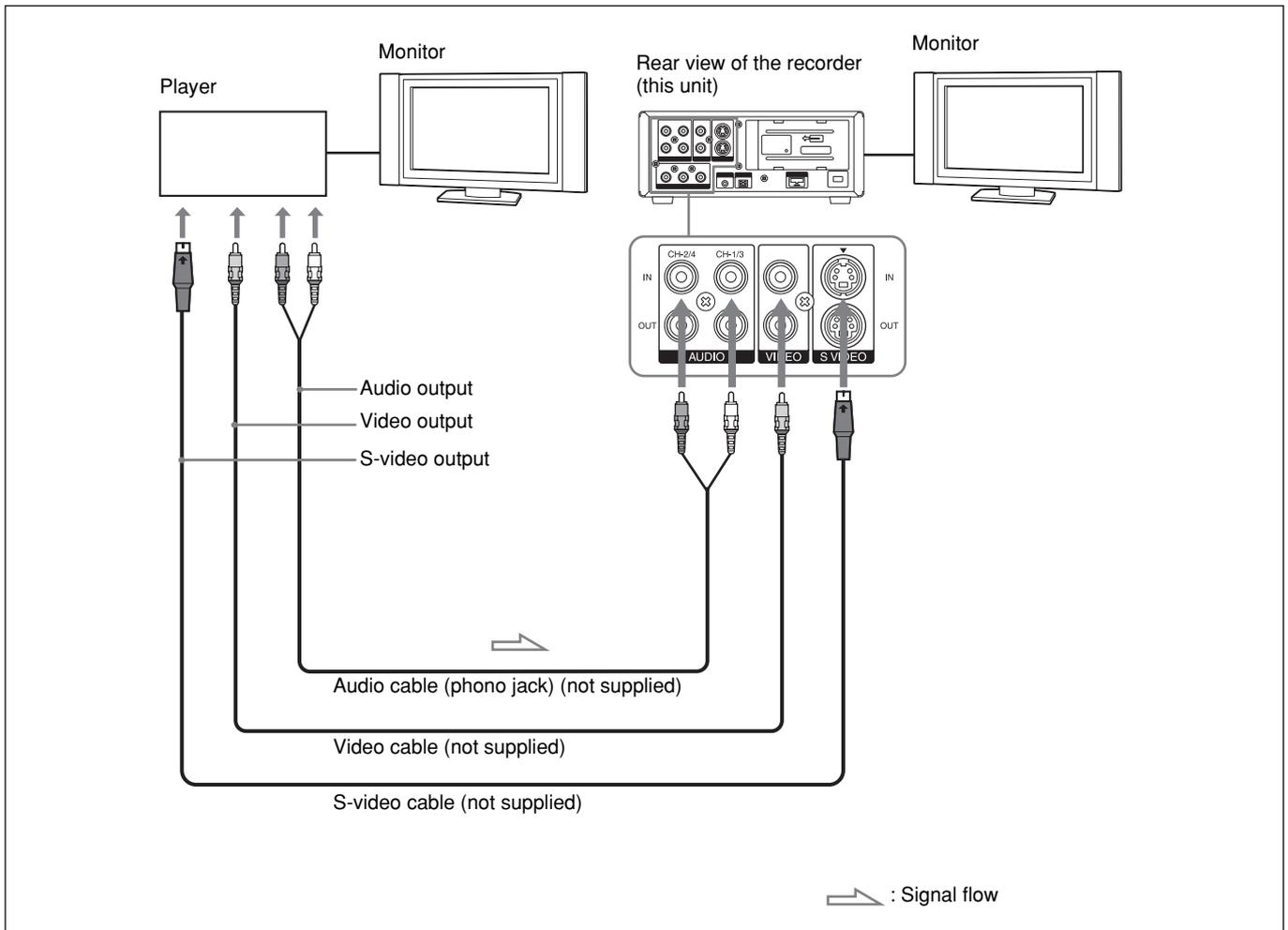
Notes

- When you record video from an HDV-compatible equipment, set [VCR HDV/DV] on the [IN/OUT REC] menu to [AUTO]. To record video from a DVCAM/DV equipment, set [VCR HDV/DV] on the [IN/OUT REC] menu to [AUTO] or [DV] before connecting the i.LINK cable (p. 48).
If you change the setting after connecting the i.LINK cable, the video equipment may not be able to recognize the video signals correctly.
- This unit cannot input a copy-controlled program via the HDV/DV jack.
- With the HDV/DV connection, the sound is recorded in the same audio recording mode as that of the source tape. To record in a different audio recording mode from the source tape, connect as shown in “To video equipment without an i.LINK jack” on page 32.
- With the HDV/DV connection, data codes (recording date/time, camera data) recorded on the source tape are transmitted to the recorder (this unit). As a result, when you play back a recorded tape on this unit and press the DATA CODE button on the Remote Commander, the same data codes as those recorded on the source tape are displayed on the monitor screen.
- If you record an image that is in playback pause status, the image may be grainy.
- The unit cannot record video or audio separately.
- If you restart recording after a pause or stop, the images recorded before and after restarting operation will not be continuous.
- If you connect the output connectors of this unit to the input connectors of a player or that of a monitor, a humming noise may be generated or the image may be distorted. If these phenomena occur, use the INPUT SELECT switch to select a signal that is not being input or disconnect the cables.
- This unit cannot record MPEG2 signals except HDV 1080i signals.
- There are some restrictions when you use EE pictures output from the COMPONENT OUT jack of the unit. Refer to **4** COMPONENT OUT (OUTPUT) jack in “Location and Function of Parts” on page 15.
- If you record HDV format signals directly, to input from the HDV/DV jack, the connection between the signals will pause for a few seconds.

Using the Unit as a Videocassette Recorder

To video equipment without an i.LINK jack

You can connect this unit to video equipment without an i.LINK jack. Use this unit as a recorder as follows.



Connect either an S-video cable or a video cable.

Notes

- If you connect the output connectors of this unit to the input connectors of the player, a humming noise may be generated or the image may be distorted. If these phenomena occur, set the INPUT SELECT switch to a position where a signal is not currently being input, or disconnect the cables.
- Distorted signals (e.g., when played back at a speed other than normal) may not be recorded or may be distorted.
- When you input video signals of the 4:3 aspect ratio to the unit, black bands appear on the left and right side of the screen on the unit.

- When you connect only the AUDIO IN jack when the HDV indicator is lit, no audio is input. You must connect the VIDEO IN jack at the same time or set [VCR HDV/DV] on the [IN/OUT REC] menu to [DV].

Settings for Recording

Preparation on the recorder (this unit)

Notes

- Before recording, set the date and time on the unit so that the recording time can be written into the search signal. You can set the date and time by setting [CLOCK SET] on the [OTHERS] menu. (p. 52)
- Editing may not be possible with a signal that is copyright protected.
- During a recording, the tape transport control buttons (except STOP and PAUSE) are disabled to prevent the tape running mode from being changed by an incorrect operation.

1 Turn the power on the monitor, then set the monitor's input according to the input signals.

2 Set up the player to play back a tape.
For details, refer to the instruction manual of the player.

3 When the player is connected to the IN jacks on this unit, set [50i/60i SEL] on the [OTHERS] menu according to the input signals.

When you input 60i system signals, set [50i/60i SEL] to 60i. When you input 50i system signals, set [50i/60i SEL] to 50i. (p. 53)

Notes

- Do not change [50i/60i SEL] setting during recording.
- If the color system of the input signals is different from that of the [50i/60i SEL] setting, picture will be blanked.
- When the signals are input through the i.LINK interface, the unit detects the color system of the input signal automatically. You do not need to change the [50i/60i SEL] setting. When the [50i/60i SEL] is set to 50i, however, the time code generated by the unit while recording in DVCAM format changes to the non-drop frame mode. Even if a 60i system signal is input to the i.LINK jack, the time code generated by the unit is the non-drop frame mode regardless of the [TC FORMAT] setting on the [TC/UB SET] menu. If you intend to set the unit to generate the time code in the drop frame mode, set [50i/60i SEL] to 60i.

4 Turn this unit on.

5 Select an input signal by switching the INPUT SELECT switch on this unit.

HDV/DV: to record input signals from the **i** HDV/DV jack

S VIDEO: to record input signals from the S VIDEO jack in INPUT

VIDEO: to record input signals from the VIDEO jack in INPUT

You need to adjust [VCR HDV/DV] (p.48) and [REC MODE] (p.49) in the [IN/OUT REC] menu to your desirable recording format.

To record DV (SP mode) signals, set the audio lock mode using [AUDIO LOCK] on the [AUDIO SET] menu (p. 47).

Note

Do not change the selector setting during recording. If you change the setting of this switch during the recording, the recording will stop for several seconds. Recording will restart after the internal circuit is switched. During this time, no image is recorded.

6 Select the audio mode. (With a **i** HDV/DV connection, skip this step.)

Select the desired mode by setting [AUDIO MODE] on the [AUDIO SET] menu. (p. 47)

FS32K: Switches the audio mode to the four channel mode

FS48K: switches the audio mode to the two channel mode

Note

When signals are input from the **i** HDV/DV jack, the audio mode that is input is selected.

If you intend to dub audio after recording, see page 42.

7 Select the recording level adjustment mode using the AUTO/MANU (manual) audio switch.

If MANU mode is selected, set [AUDIO LIMIT] of the [AUDIO SET] menu (p. 47).

(Continued)

Using the Unit as a Videocassette Recorder

Notes

- You cannot adjust the recording level if you record signals input via the  HDV/DV jack.
- When you connect to device without an i.LINK jack, the audio mode is set to FS32K(4-channel mode). Sound will be recorded on channel 1 and 2.

- 8 If necessary, adjust the audio recording level by turning the AUDIO REC LEVEL control knobs.

You can adjust the recording level with the AUDIO REC LEVEL control knobs if you have selected MANU in step 7. While looking at the STATUS CHECK screen, turn the AUDIO REC LEVEL control knobs to adjust the recording level. Adjust the audio recording level so that it does not exceed 0 dB when the audio signal is at its maximum. If the recording level exceeds 0 dB, the recorded sound will be distorted.

Notes

- In the DVCAM format, there are two audio modes, with either two channels at FS48K or four channels at FS32K. It is not possible to select other modes (for example with two channels at FS32K).
- During recording, you cannot change the audio mode.
- If you intend to dub audio after recording, select the DVCAM format, then set [AUDIO MODE] on the [AUDIO SET] menu to [FS32K] (4-channel mode) before recording. (p. 47)

Recording Procedures

This section describes the procedures used to record signals sent from another VCR to this unit. For details on the operation when the unit is connected to a personal computer via the  HDV/DV jack, refer to “Editing (Connecting with a Personal Computer)” (p. 38).

- 1 Insert a cassette and confirm that the  (cassette) indicator is lit.

- 2 Press the playback button on the player.

The player starts playback.

- 3 On this unit, press the PLAY button while holding the REC button down.

Note

When the unit records HDV format images, it will take a while until recording starts. This delay, however, is not an error. ([STBY] will flash until recording starts.)

To stop recording

Press the STOP button on this unit.

To pause recording

Press the PAUSE button on this unit.

Note

You cannot record to upconvert NTSC or PAL signals to the HDV format.

Recording Functions

Marking an index

By pressing the INDEX button on the unit or the INDEX WRITE button on the Remote Commander during recording, you can mark an index signal at any place on the tape. The index signal is inserted for seven seconds. If you mark an index at the scene you want to search for, you can easily find the scene later. While the index is being marked, the  indicator appears for about seven seconds on the Data screen (see page 19).

Notes

- You cannot mark a new index while the  indicator is being displayed.
- If you record on a portion of the tape where an index has been marked, the index will be erased. You cannot delete just an index while keeping the image or sound.
- You cannot mark an index during playback or audio dubbing operations. The INDEX button and the INDEX WRITE button are disabled in these operations.

To use an index during playback

See “Searching using the search function” on page 30.

Dubbing/Editing

Dubbing to another equipment

This section describes the connections and settings necessary to perform dubbing on other equipment, using this unit as a video player.

Connections for Dubbing

Notes

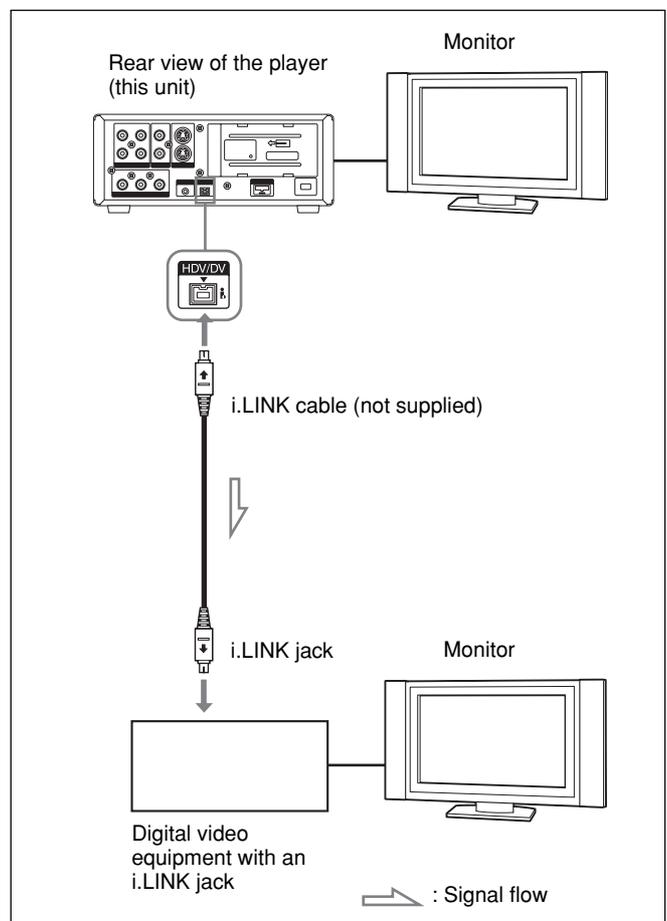
- For connection of the editing controller and its peripheral devices, refer to the instruction manual of the editing controller and that of the editing software you use.
- Edit functions are specified by the editing software. For details on the editing methods, refer to the instruction manual of the editing software.
- You cannot use the DSR-25/45-equipped duplicate function to dub a tape recorded in HDV/DV format via the i.LINK connection. Use the procedure in this chapter to perform dubbing.

To digital video equipment with an i.LINK jack

Connect this unit to the recorder as shown below using an i.LINK cable.

The signal flow is automatically detected so you do not need to make separate connections for input and output. Also, connecting the unit to an editing controller via **i** HDV/DV jacks, you can configure a digital non-linear editing system.

For connections of the editing controller and this unit, refer to the editing controller instruction manual.



Before dubbing, you must set the format in which you want to output signals. Perform the [VCR HDV/DV] (p. 48) and [i.LINK CONV] (p. 49) settings of the [IN/OUT REC] menu.

For details, refer to “Compatibility of HDV, DVCAM, and DV Formats” (p. 68).

(Continued)

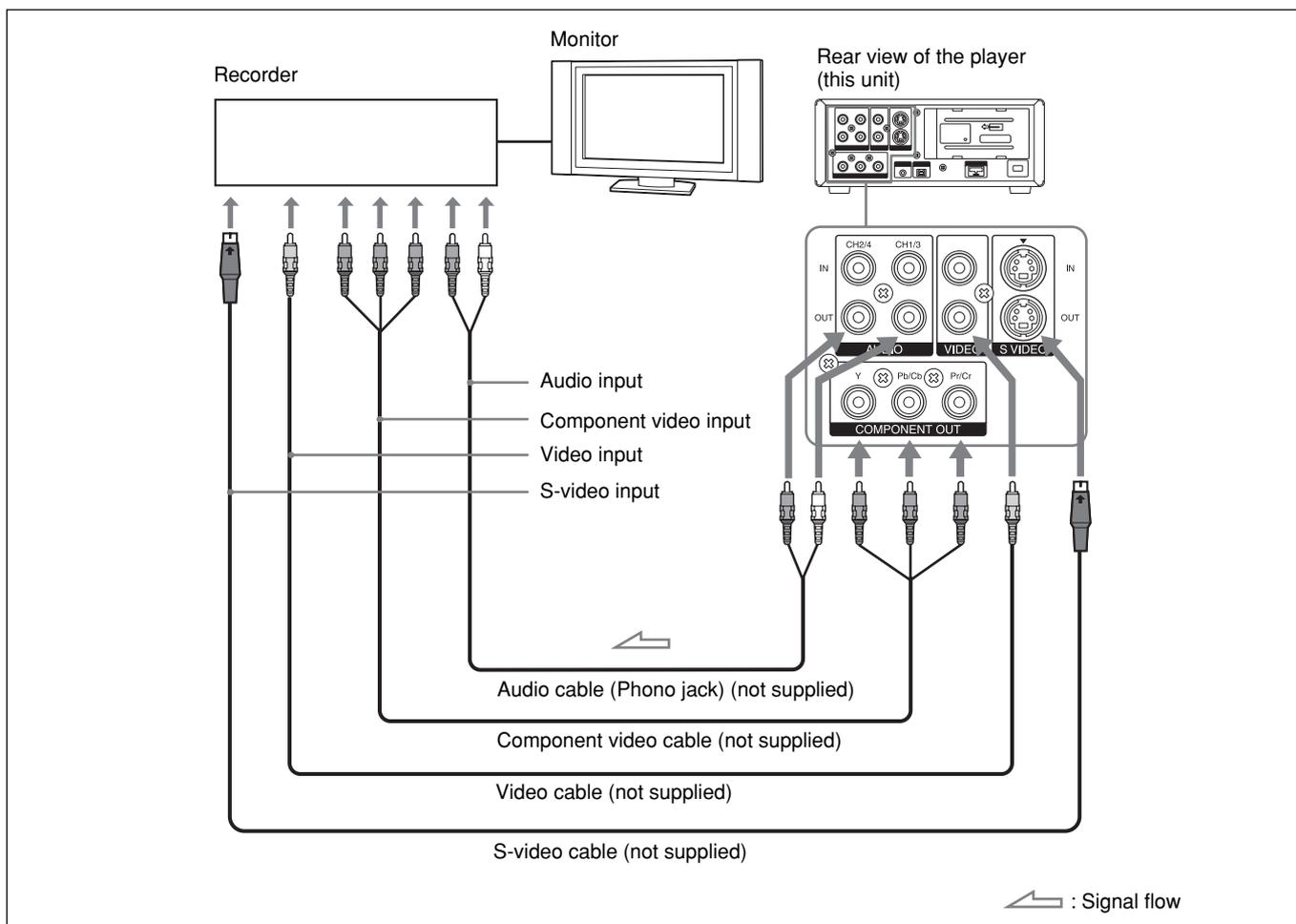
Dubbing to another equipment

Notes

- If you output pictures in the playback pause mode when connected with an i.LINK cable, recorded images may appear grainy.
- When video signals in the HDV format is played back, you cannot output pictures in the playback pause mode or played back at various speeds other than normal via the  HDV/DV jack.
- When connected with an i.LINK cable, you cannot output only pictures or sounds separately.

To video equipment without an i.LINK jack

When connecting this unit to a recorder without an i.LINK jack, connect the two devices as shown below. Set [COMPONENT] and [DOWN CONVERT] (p. 49) corresponded to the signals you wish to output.



Notes

- Refer also to the Notes on page 26.
- The audio output signal will comply with the setting of [AUDIO MIX] of the [AUDIO SET] menu.

Dubbing procedures

- 1 Prepare this unit.

Refer to "Preparation on this unit" on page 27.

- 2 Prepare the recorder.

If the recorder has an input selector switch, select an input.

For details, refer to your recorder's instruction manual.

- 3 Start playback on this unit and start recording on the recorder.

For details, refer to the instruction manual of the recorder.

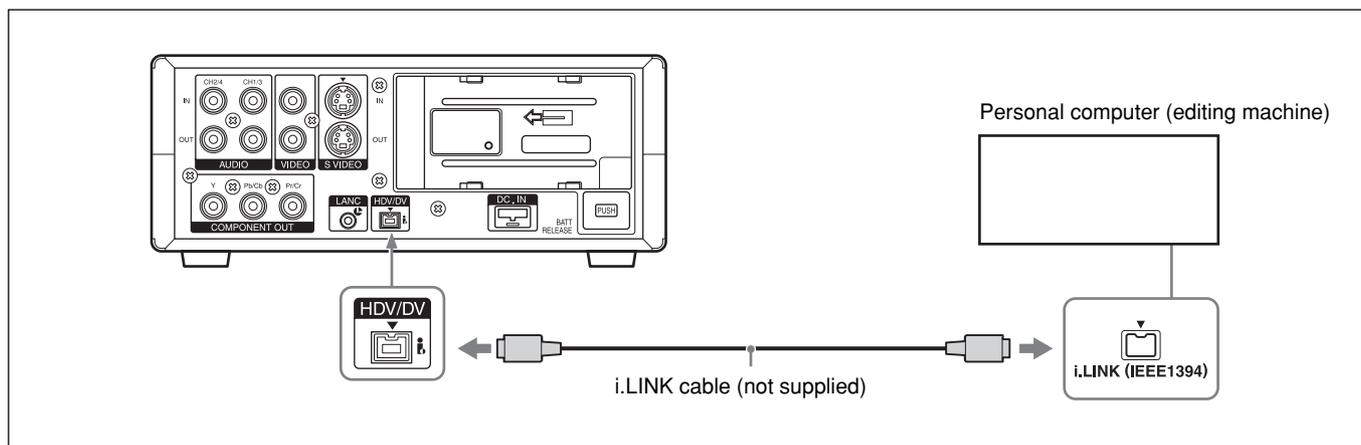
- 4 When dubbing is finished, stop recording on the recorder, and then stop playback of this unit.

Editing (Connecting with a Personal Computer)

You can set up an editing system by connecting this unit to a personal computer (editor) using the i.LINK jack on the unit.

- For details about the connecting method of peripheral equipment for the editing machine, refer to the supplied instruction manual of your editing machine.
- The editing functions you can use depend on the editing software. For details about editing methods, refer to the instruction manual of your editing software.

Connecting the Unit to a Personal Computer



Notes

- When you connect with the i.LINK cable, confirm the direction of the jack. If you forcibly insert the jack, the terminal may be damaged or cause the unit to malfunction.
- Always connect the i.LINK cable to a personal computer (editing machine) first and then connect it to the unit. If you connect the i.LINK cable to this unit first, it may cause the unit to malfunction because of static electricity.
- Before connecting the i.LINK cable, set [VCR HDV/DV] and [i.LINK CONV] in the [IN/OUT REC] menu. If you perform the settings after connecting the cable, the personal computer (editing machine) may not recognize the unit correctly or may hang up.
- If you input or output signals in a format that cannot be processed by the personal computer (editing machine), the personal computer (editing machine) may not recognize the unit correctly or may hang up.
- When this unit outputs an analog signal input from the  HDV/DV jack to a personal computer in the EE mode, the S VIDEO signal or VIDEO signal selected by the INPUT SELECT switch will be output. To output only the playback image from this unit through the  HDV/DV jack, switch the INPUT SELECT switch to HDV/DV.
- There are some restrictions when you use EE pictures output from the COMPONENT OUT jack of the unit. Refer to **4** COMPONENT OUT (OUTPUT) jack in “Location and Function of Parts” on page 15.

Preparations

Loading images from a tape to a personal computer (editing machine)

- When you want to load a tape recorded in the HDV format into an editing machine in the HDV format, set [VCR HDV/DV] to [AUTO] or [HDV] (p. 48) and then set [i.LINK CONV] to [OFF] (p. 49).
- When you want to load a tape recorded in the DVCAM/DV format into an editing machine in the DVCAM/DV format, set [VCR HDV/DV] to [AUTO] or [HDV] (p. 48).
- When you want to load a tape recorded in the HDV format into an editing machine in the DV format, set [VCR HDV/DV] to [DV] (p. 48) and then set [i.LINK CONV] to [DV] (p. 49).

Notes

- The operation may not work with some of your editing machine software. Before using the software, confirm that it is compatible with this unit.
- This unit cannot load a tape recorded in the DVCAM/DV format into an editing machine after up-converting this tape into the HDV format.
- If you use a tape recorded both in HDV and DVCAM (DV) formats when [VCR HDV/DV] is set to [AUTO], the personal computer (editing machine) may not be able to recognize the unit or you may not be able to edit the tape correctly.
- There are restrictions on the video output when you play back a tape recorded in the HDV format at various speeds. Refer to the table for “HDV formatted tape” in “Playing at various speeds” (page 29).
- When you use a tape that was down-converted from HDV to DV, some conventional DVCAM/DV editing software may not be able to perform the time code search or this operation could result in an error.
- When you directly record HDV signals that are input through the i.LINK, a connecting portion between scenes on the tape will be displayed as a still picture for approximately 1 second. We recommend performing digital nonlinear editing for such signals.

- This unit is equipped with a function to down-convert HDV signals to DV signals and output the signals to the i.LINK jack. Some software may not be able to edit this down-converted DV signal correctly. If this happens, use the following procedure to dub a tape and then edit the dubbed tape.

Creating a DVCAM compatible tape

Use the menu of this unit to set [i.LINK CONV] to [ON] and [LOCK MODE] (p. 49) and then perform DVCAM recording using a recording device that accepts the DVCAM format.

Creating a general consumer DV compatible tape

Use the menu of this unit to set [i.LINK CONV] to [ON] and [UNLOCK MODE] (p. 49) and perform DV recording using a recording device that accepts the DV format.

Some editing software can correctly edit even a tape created in [LOCK MODE]. In that case, select the [LOCK MODE] if required.

Loading the images of a personal computer (editing machine) to this unit

- To load images in the HDV format, set [VCR HDV/DV] to [HDV] (p. 48).
- To load images in the DVCAM (DV) format, set [VCR HDV/DV] to [DV] (page 48).

Setting the Time Code and User Bits

This unit can set, display, record and play back the time code and user bits.

Notes

- When the HDV formatted signals are recorded from the **i** HDV/DV jack on this unit, a user bit is copied. However, this bit cannot be preset (the user bit is displayed as “-- -- -- --”). The time code is set in accordance with the [TC MAKE] setting. You cannot copy the time code of a source tape.
- When images recorded in the DVCAM/DV format are input from the **i** HDV/DV jack, you can preset a user bit time code on this unit. However, you cannot copy the user bit and time code of a source tape.
- For a tape recorded both in HDV and DVCAM/DV formats, the time code may become garbled at a connecting portion between scenes on the tape.
- If you play back an HDV tape without signals recorded, the time cord may become disordered.
- The time code cannot be reset on this unit from a remote controller equipped with a counter reset function.

Using the Internal Time Code Generator

You can set the initial time code value generated by the internal time code generator. In addition, you can set the user bits to record data such as the date, time, scene number, reel number, or other useful information. The time data settings are set by using the menu.

For details on the menu, see “Chapter 4 Adjusting and Setting Through Menus” on page 45.

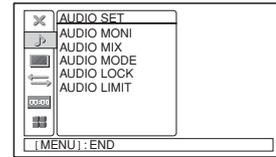
To set the initial time code value

This section describes how to set the time code’s initial value.

Note

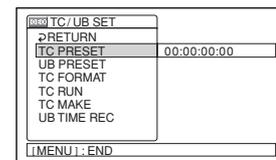
To set the initial time code value, you need to set [TC MAKE] on the [TC/UB SET] menu to [PRESET] beforehand. (p. 51)

- 1 Press the MENU button to display the menu.

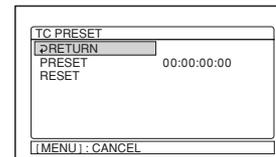


(You can set [TC FORMAT] only when [50i/60i SEL] on the [OTHERS] menu is set to 60i.)

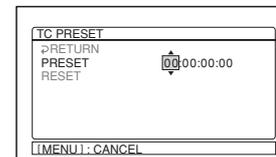
- 2 Press the Δ/∇ buttons to select [TC/UB SET], then press the EXEC button.



- 3 Press the Δ/∇ buttons to select [TC PRESET], then press the EXEC button.



- 4 Press the Δ/∇ buttons to select [PRESET], then press the EXEC button.



- 5 Set the first two digits. Press the Δ/∇ buttons to select the number, then press the EXEC button.

- 6 Repeat step 5 to set the other digits.

- 7 Press the Δ/∇ buttons to select [OK], then press the EXEC button.

The time code value is set.

- 8 Press the Δ/∇ buttons to select [OK], then press the EXEC button.

The menu display returns to that of step 2.

To cancel the time code setting

Select [CANCEL] in step 7, then press the EXEC button.

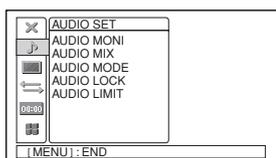
To reset the time code

Select [RESET] in step 4, then press the EXEC button.

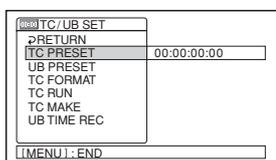
To set the value of the user bits

You can set the user bits as eight-digit hexadecimal values (base 16) to have the date, time, scene number, and other information inserted into the time code track.

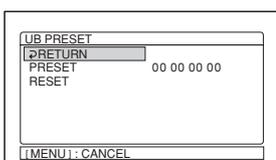
1 Press the MENU button to display the menu.



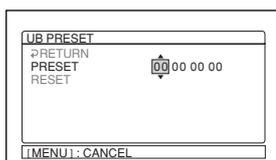
2 Press the Δ/∇ buttons to select [TC/UB SET], then press the EXEC button.



3 Press the Δ/∇ buttons to select [UB PRESET], then press the EXEC button.



4 Press the Δ/∇ buttons to select [PRESET], then press the EXEC button.



5 Set the first two digits. Press the Δ/∇ buttons to select the number, then press the EXEC button.

6 Repeat step 5 to set the other digits.

7 Press the Δ/∇ buttons to select [OK], then press the EXEC button.

The user bits are set.

8 Press the Δ/∇ buttons to select [OK], then press the EXEC button.

The menu display returns to that of step 2.

To cancel the user bits setting

Select [CANCEL] in step 7, then press the EXEC button.

To reset the user bits

Select [RESET] in step 4, then press the EXEC button.

To set the user bit to the real time clock

Select the [TC/UB SET] menu, [UB TIME REC], then [ON].

Note

The user bit time display is recorded at three-frame intervals for a tape recorded in the HDV1080i format.

To set the time code when the recording starts

Set [TC MAKE] on the [TC/UB SET] menu to select the time code to be recorded when recording starts.

REGENERATE: The time code value is set to continue the time code from the time code already recorded on the tape. If you start recording from a blank portion of the tape, the time code starts from 00:00:00:00.

PRESET: The time code starts from the value set in [TC PRESET] on the [TC/UB SET] menu.

Setting the Time Code and User Bits

To set the advancement mode

Set [TC RUN] on the [TC/UB SET] menu to switch the advancement mode (counting up).

REC RUN: Time code advances only while recording.

FREE RUN: Time code advances even when the unit is not recording and the time indicator is paused.

Notes

- If you set the advancement mode to [FREE RUN], the time code will be updated by the internal clock while the unit's power is off. The time code may have been delayed or advanced somewhat if you turn on the unit power again, play back a tape, or set the INPUT SELECT switch to HDV/DV.
- Available only when [PRESET] is set to [TC MAKE].

To set the frame mode (For 60i only)

Set [TC FORMAT] on the [TC/UB SET] menu to switch the frame mode.

AUTO: Automatically sets the mode in accordance with the loaded tape.

If nothing is recorded on the tape, the mode is set to the non-drop frame mode. If the unit cannot read the frame mode correctly from the tape, the unit will use the mode that was set in the last position it was able to read correctly on the tape. If you remove the cassette, the mode of the last position it was able to read correctly is cleared and the mode is set to the non-drop frame mode. If [TC MAKE] is set to [PRESET], the mode is also set to the non-drop frame mode.

DF: Selects the drop frame mode.

NDF: Selects the non-drop frame mode.

Note

When you set [50i/60i SEL] on the [OTHERS] menu to 50i, this unit uses the 50i system specification. Therefore, the time code generated by the unit during recording in the DVCAM format is that of the non-drop frame mode. Even if a 60i system signal is input to the  HDV/DV jack, the time code generated by the unit is the non-drop frame mode regardless of the [TC FORMAT] setting. If you intend to set the unit to generate the time code in the drop frame mode, set [50i/60i SEL] to 60i.

Audio Dubbing

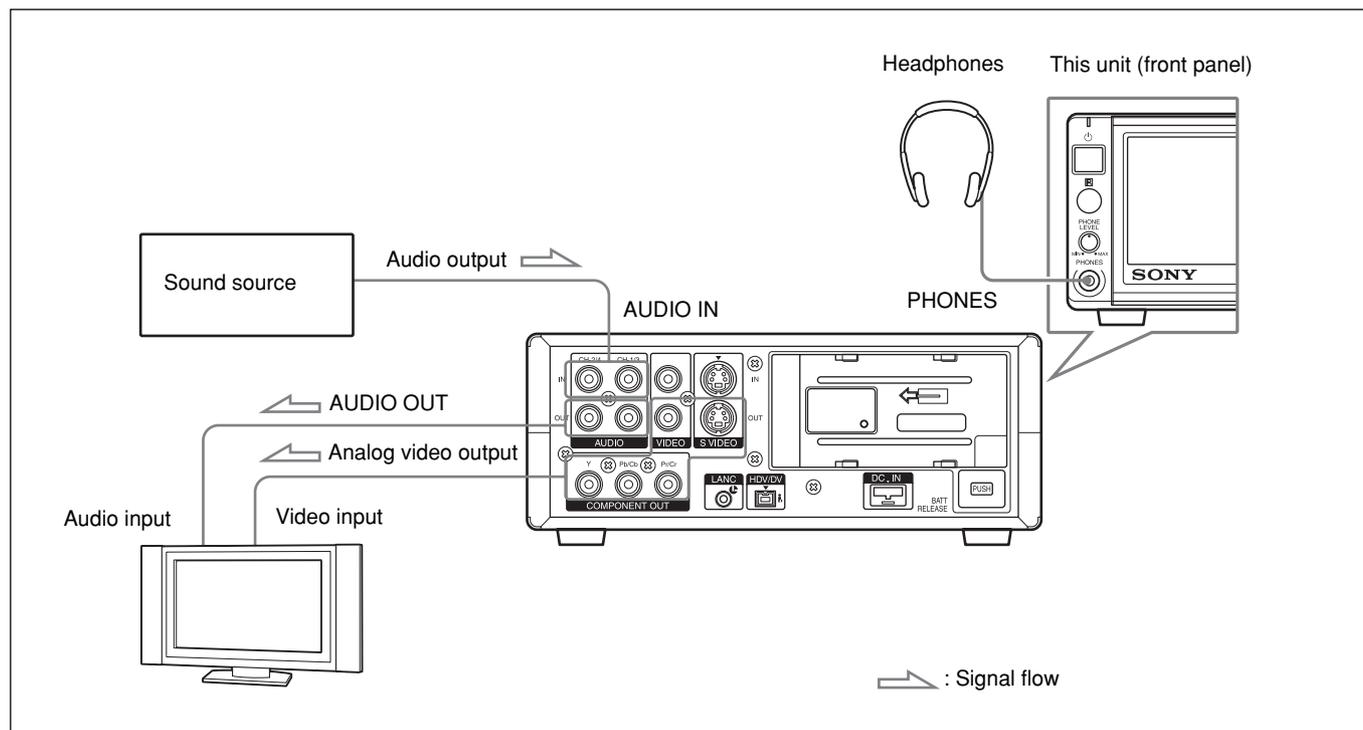
You can record just sound on a recorded tape.
(Audio dubbing)

Notes

- You can dub the sound onto a DVCAM-formatted tape (recorded) in the 32 kHz audio mode (4-channel/12 bits). You cannot dub sound recorded in 48 kHz (2-channel/16 bits) audio mode on a tape or a tape recorded in nonstandard audio.
- If the audio mode of the recorded tape is 32 kHz, you can dub the sound regardless of the [AUDIO MODE] setting on the [AUDIO SET] menu. (p. 47)
- The sound is dubbed only onto channels 3/4. You cannot dub the sound onto either of them or channels 1/2.

Connection of external devices

The following shows an example of a basic connection for audio dubbing.



Dubbing sound

- 1 Connect the unit and the sound source using a phono jack cable (not supplied).
- 2 Set the INPUT SELECT switch to S VIDEO or VIDEO.
- 3 Play back the tape inserted in this unit.
- 4 At the point you want to start dubbing, press the PAUSE button to turn the unit to the playback pause mode.
- 5 While holding the AUDIO DUB button down, press the PLAY button to turn the unit to the audio dubbing pause mode.

●|| lights on the screen.

- 6 Select the recording level adjustment mode using the AUTO/MANU (manual) audio switch.

If the MANU mode is selected, set [AUDIO LIMIT] of the [AUDIO SET] menu (*p. 47*).

- 7 Adjust the recording level by turning the AUDIO REC LEVEL control knobs.

You can adjust the recording level with the AUDIO REC LEVEL control knobs if you have selected MANU in step 6. While looking at the audio level meters on the LCD monitor, turn the AUDIO REC LEVEL control knobs and adjust the recording level. Adjust the audio recording level so that the recording level does not exceed 0 dB when the audio signal is at its maximum. If the recording level exceeds 0 dB, the sound will be distorted.

- 8 Press the PAUSE button.

● indicator lights on the screen and audio dubbing starts.

To pause audio dubbing

Press the PAUSE button.

Pressing the PAUSE button again resumes audio dubbing.

To stop audio dubbing

Press the STOP button.

To output the sound you want

Select the sound to be output from the AUDIO jack or headphone jack.

Set the [AUDIO MIX] on the [AUDIO SET] menu as follows:

CH1, CH2: Outputs the sound recorded on channels 1/2 on the tape.

MIX: Outputs the synthesized sound of channels 1/3 and channels 2/4.

CH3, CH4: Outputs the sound recorded on channels 3/4 on the tape.

The indicator of the audio level meters will display according to the above-settings.

Notes

- You can monitor the sound on the tape while dubbing the sound. However, there are some delays between the sound being recorded and the sound being played. When you play back the tape after audio dubbing, you might hear the dubbed sound later than the sound monitored during audio dubbing.
- You cannot dub sound in the following.
 - On a tape recorded in the HDV format
 - When the INPUT SELECT switch is set to HDV/DV
 - Tape recorded with [DV].
 - Tape recorded with [FS48K].
 - On a blank portion of the tape
 - The REC/SAVE switch on the cassette is set to SAVE to prevent accidental erasure of a recording.
 - Tape recorded in nonstandard audio.

Adjusting and Setting Through Menus

Operating the Menu

The unit allows you to set various parameters in the menus.

Note

Do not pull out the power cord plug (battery or AC adaptor power cord) while operating the menus or adjusting the brightness of the LCD monitor. Otherwise, the settings of the menu may be changed accidentally.

Displaying the menu

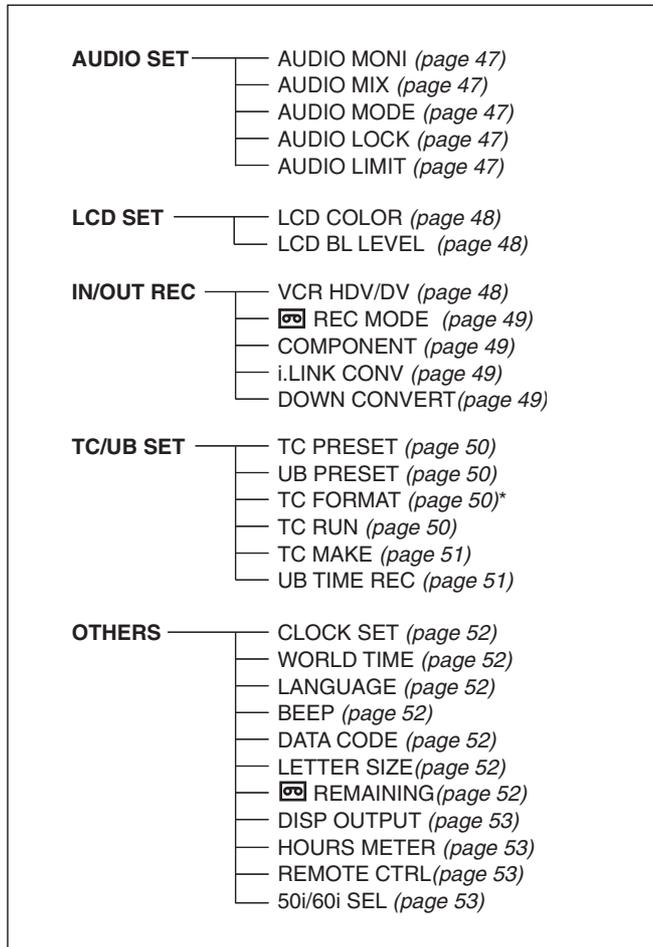
- 1** Press the MENU button.
- 2** Pressing the Δ/∇ buttons, select the menu icon you want to change, then press the EXEC button.
- 3** Pressing the Δ/∇ buttons, select the submenu you want to change, then press the EXEC button.
- 4** Pressing the Δ/∇ buttons, change the setting.
- 5** Press the EXEC button to return to the submenu.
- 6** Repeat steps **1** to **5**, as needed.

To return to the previous menu level, press the Δ/∇ buttons and select [↩RETURN].

Operating the Menus

Menu Organization

The menu of this unit consists of the following menus and submenus.



* available only when you use a 60i formatted signal

Menu Contents

Initial settings are indicated with rectangles.

AUDIO SET menu

Icon/Menu	Submenu	Setting
AUDIO SET	AUDIO MONI (page 27)	<p>Set the audio to be output from the headphones.</p> <p>CH1,CH2 : Outputs CH1 and CH2 audio to the L/R channel of the headphones.</p> <p>CH1 : Outputs CH1 audio to the L/R channel of the headphones</p> <p>CH2 : Outputs CH2 audio to the L/R channel of the headphones</p> <p>CH1+CH2 : Synthesizes the audio of CH1 and CH2 and outputs them to the L/R channel of the headphones.</p> <p>Note</p> <p>When [AUDIO MIX] is set to [CH3, CH4], the CH1 and CH2 portions are replaced with CH3 and CH4, respectively. When it is set to [MIX], CH1 and CH2 are replaced with CH1/3 synthesis sound and CH2/4 synthesis sound, respectively.</p>
	AUDIO MIX (page 44)	<p>Select the audio to be output from the AUDIO jack or headphone jack during the 4-channel mode.</p> <p>CH1,CH2 : Outputs only channels 1 and 2 audio recorded on a tape.</p> <p>MIX : Outputs the synthesized audio of channels 1 and 3 and channels 2 and 4. (Each signal level will be 50% (-6 db).)</p> <p>CH3,CH4 : Outputs only channels 3 and 4 audio only.</p> <p>Notes</p> <ul style="list-style-type: none"> You cannot set this menu for a tape recorded using the FS48K audio mode of the [AUDIO MODE] menu. You cannot set this menu during HDV recording. The indicator of the audio level meter will display according to the above-settings.
	AUDIO MODE (page 33)	<p>Selects the audio mode.</p> <p>FS32K : Switches the audio mode to the four channel mode (12-bit mode).</p> <p>FS48K : Switches the audio mode to the two channel stereo mode (16-bit mode). (This setting records the sound in all audio ranges, providing a high-quality sound recording.)</p> <p>Notes</p> <ul style="list-style-type: none"> When signals are input via the , HDV/DV jack, the audio mode of the signals to be recorded is the same as that of the input signals. Recording is performed automatically using the [FS48K] mode during HDV recording. You cannot change the setting of this item during recording. Noise may occur at the instant you switch the audio mode. If you intend to the dub sound on the tape recorded in the DVCAM format, set to [FS32K].
	AUDIO LOCK	<p>UNLOCK MODE : Independently records the sampling clocks of audio and video. This mode applies to a consumer DV tape.</p> <p>LOCK MODE : Synchronizes the sampling clocks of the audio and video for recording. This setting is effective for digital processing and performing a clean splice during the audio editing process.</p> <p>Notes</p> <ul style="list-style-type: none"> You can set this menu when recording in the DV format (SP mode) only. This menu is automatically fixed to [LOCK MODE] for the HDV/DVCAM format. During the i.LINK input, the same setting as that of an input signal is selected regardless of this setting.
AUDIO LIMIT	<p>OFF : Disables the function for preventing audio crackling.</p> <p>ON : Enables the function for preventing audio crackling.</p> <p>Note</p> <p>This menu is valid only when the AUTO/MANU (manual) audio switch is set to MANU. When AUTO is selected, this menu is automatically set to [ON].</p>	

Operating the Menus

LCD SET menu

Icon/Menu	Submenu	Setting
 LCD SET	LCD COLOR	Adjusts the color density of the liquid crystal display when you press the Δ/∇ buttons. This setting will not affect the video to be recorded. <div style="text-align: center;">  </div>
	LCD BL LEVEL	Adjusts the brightness of the LCD screen backlight. This setting will not affect the video to be recorded. NORMAL : Normal setting (normal brightness) BRIGHT : Select this when you feel the LCD screen to be dim. Notes <ul style="list-style-type: none"> You can set this menu only when the battery is used. When the unit is connected to the AC outlet, [BRIGHT] is automatically selected.

IN/OUT REC menu

Icon/Menu	Submenu	Setting
 IN/OUT REC	VCR HDV/DV (page 25, 31, 32, 35, 38, 39)	Normally, set this menu to [AUTO]. Select this menu when you want to limit the output format during tape playback or limit the signals to be input or output from the \mathbb{I} HDV/DV jack. This setting will affect the LCD monitor output and analog output. AUTO : Automatically switches signals to HDV format or DVCAM/DV format during tape playback. When the i.LINK cable is connected, the signals in the HDV format or DVCAM/DV format is switched automatically and signals from the \mathbb{I} HDV/DV jack are input or output for recording/playback. HDV : Outputs signals of portions recorded in HDV format during tape playback. When the i.LINK cable is connected, only the signals in the HDV format from the \mathbb{I} HDV/DV jack are input or output for recording/playback. Also select this setting when the unit is connected to the i.LINK cable to a personal computer that supports the HDV format (see page 25, 32). DV : Outputs signals of portions recorded in DVCAM/DV format during tape playback. When the i.LINK cable is connected, only the signals in the DVCAM/DV format from the \mathbb{I} HDV/DV jack are input or output for recording/playback. Also select this setting when the unit is connected to the i.LINK cable to a personal computer that supports the DV format (see page 31, 32, 39). Notes <ul style="list-style-type: none"> Before changing the setting, be sure to disconnect the i.LINK cable. If an i.LINK cable is connected when you change the setting, the video equipment may not be able to recognize the signal correctly. If you select [AUTO], the screen turns off temporarily when HDV signals are switched to DVCAM/DV. The video and audio also stops. If [HDV→DV CONV] is set to [ON] and [AUDIO LOCK] of [i.LINK CONV] is set to [LOCK MODE], the following signals are output. <ul style="list-style-type: none"> When you set to [AUTO], an HDV signal is converted to an audio-locked DV signal; a DV signal is output as it is. When you set to [HDV], an HDV signal is converted to an audio-locked DV signal; a DV signal is not output. When you set to [DV], a DV signal is output as it is; an HDV signal is not output. If [HDV→DV CONV] is set to [ON] and [AUDIO LOCK] of [i.LINK CONV] is set to [UNLOCK MODE], the following signals are output. <ul style="list-style-type: none"> When you set to [AUTO], an HDV signal is converted to an audio-unlocked DV signal; a DV signal is output as it is. When you set to [HDV], an HDV signal is converted to an audio-unlocked DV signal; a DV signal is not output. When you set to [DV], a DV signal is output as it is; an HDV signal is not output.

Icon/Menu	Submenu	Setting
⇌ IN/OUT REC	REC MODE	<p>Switches the recording mode between DVCAM and DV (SP mode only).</p> <p>DVCAM : Records in DVCAM format. DV SP : Records in DV format (SP mode).</p> <p>Note You cannot change the setting during recording.</p>
	COMPONENT (page 15, 26)	<p>Select the mode of the video output from the COMPONENT OUT jacks in accordance with the equipment to be connected.</p> <p>Select [480i], [480p/480i] or [1080i/480i] when [50i/60i SEL] on the [OTHERS] menu is set to 60i. Select [576i], [576p/576i] or [1080i/576i] when [50i/60i SEL] on the [OTHERS] menu is set to 50i.</p> <p>Note When [480p/480i] or [576p/576i] is selected during your playback of HDV images, you cannot output signals from S VIDEO or VIDEO OUT jacks. Also, when [HDV→DV CONV] of [i.LINK CONV] is set to [ON], HDV images are not output from i.LINK HDV/DV jack either.</p>
	i.LINK CONV (page 25, 35, 38, 39)	<p>This setting is valid when [VCR HDV/DV] is set to [AUTO] or [HDV].</p> <p>HDV→DV CONV OFF : Select to output the signals from the i.LINK HDV/DV jack in accordance with the [VCR HDV/DV] setting. ON : Select to output the signals in the DV format the i.LINK HDV/DV jack.</p> <p>AUDIO LOCK The setting is effect only when [HDV→DV CONV] is set to [ON]. LOCK MODE : Signals which sampling clock for audio and that for video are synchronized are output from the i.LINK HDV/DV jack. UNLOCK MODE : Signals which sampling clock for audio is separate from that of video are output from the i.LINK HDV/DV jack.</p> <p>Notes</p> <ul style="list-style-type: none"> • Refer to setting of [VCR HDV/DV] on input through the i.LINK jack. • Before changing the setting, be sure to disconnect the i.LINK cable. If an i.LINK cable is connected when you change the setting, the video equipment may not be able to recognize the signal correctly. • You cannot convert an image in HDV format into the DVCAM format.
	DOWN CONVERT	<p>Set the video signal output format for playing back a tape recorded in the HDV format or through i.LINK input.</p> <p>This menu is valid for the following outputs.</p> <ul style="list-style-type: none"> – COMPONENT OUT (during 480i and 576i signal output) – S VIDEO OUT – VIDEO OUT – i.LINK output (when [HDV→DV CONV] of [i.LINK CONV] is set to [ON]) <p>SQUEEZE : This mode maintains the vertical screen size while compressing the horizontal screen size. The video display is vertically long. LETTER BOX : This mode compresses both horizontal and vertical screen sizes to play back the video without losing the vertical and horizontal size ratio. EDGE CROP : This mode maintains the vertical screen size and cuts off the left and right sides for playback.</p> <p>Note This setting is invalid for DVCAM/DV signals recorded in wide mode.</p>

Operating the Menus

TC/UB SET menu

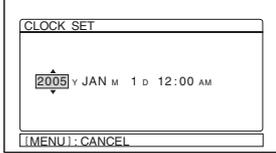
Icon/Menu	Submenu	Setting
00:00 TC/UB SET	TC PRESET (page 40)	Resets/Sets the time code value. PRESET : Sets the time code value. RESET : Resets the time code value to 00:00:00:00. Note To set the initial time code value, you need to set [TC MAKE] to [PRESET] first. If [TC MAKE] has been set to [REGENERATE], you cannot change the time code using this item.
	UB PRESET (page 41)	Resets/Sets the user bits value. PRESET : Sets the user bits value. (You can set the user bits as eight-digit hexadecimal values (0 to 9, A to F) (base 16) to have the date, time, scene number, and other information inserted into the user bits.) RESET : Resets the user bits value to 00 00 00 00.
	TC FORMAT (page 42)	Selects the recording mode of the time code. AUTO : Automatically sets the mode in accordance with the mode already set on a cassette tape. (If nothing is recorded on the tape, the non-drop frame mode is set. If this unit cannot correctly read the frame mode on the tape, it will use the frame mode that was set in the last position on the tape that the unit can read correctly. If you remove the cassette, the mode of the last position that the unit was able to read correctly is cleared and the non-drop frame mode is set when recording is restarted from the same position. The non-drop frame mode is set also if [TC MAKE] is set to [PRESET].) DF : Selects the drop frame mode. NDF : Selects the non-drop frame mode. Note When the [50i/60i SEL] is set to 50i, the unit operates as a 50i specification model. Therefore, the time code generated by the unit while recording in the DVCAM format changes to the non-drop frame mode. Even if a 60i system signal is input to the i HDV/DV jack when the [50i/60i SEL] is set to 50i, the time code generated by this unit is in the non-drop frame mode regardless of the [TC FORMAT] setting. If you intend to set the unit so that it generates the time code in the drop frame mode, set [50i/60i SEL] to 60i. As a result, the [TC FORMAT] setting will return to the status before the [50i/60i SEL] menu was set to 50i.
	TC RUN (page 42)	Selects the advancement mode (counting up). REC RUN : Time code value advances only while recording. FREE RUN : Time code value advances even when the unit is not recording. Notes <ul style="list-style-type: none"> • If you set the advancement mode to [FREE RUN], the time code will be updated by the internal clock when the power is off. Therefore, when you turn on the unit again, the time code may have been delayed or advanced somewhat. • If the internal backup battery is exhausted, the time code of the [FREE RUN] setting is initialized. • Available only when [PRESET] is selected in [TC MAKE].

Icon/Menu	Submenu	Setting
00:00 TC/UB SET	TC MAKE (page 41)	<p>Selects the time code when you start recording.</p> <p>REGENERATE : The time code value is set to continuous time code from the one already recorded on the tape. If no time code is recorded on the tape, it starts from 00:00:00:00.</p> <p>PRESET : The time code starts from the value set in [TC PRESET] on the [TC/UB SET] menu.</p>
	UB TIME REC	<p>OFF : The time is not recorded as a user bit code.</p> <p>ON : The time is recorded as a user bit code.</p> <p>Note You cannot adjust [UB TIME REC] without setting [CLOCK SET].</p>

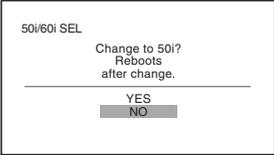


Operating the Menus

OTHERS menu

Icon/Menu	Submenu	Setting
 OTHERS	CLOCK SET (page 33)	<p>1 Press the Δ/∇ buttons to set the year, then press the EXEC button.</p>  <p>2 Press the Δ/∇ buttons to set the month, day, hour and minute in the same way as step 1, then press the EXEC button.</p> <p>Notes</p> <ul style="list-style-type: none"> • 12:00 AM stands for midnight and 12:00 PM stands for noon when [50i/60i SEL] is set to 60i. • If you do not use the unit for three months or more, the built-in rechargeable battery will be completely discharged, and the settings of the day and the time may be cleared from the memory. In this case, charge the built-in rechargeable battery and set the clock again. (p. 64)
	WORLD TIME	You can adjust the time difference when using your unit abroad. Set the time difference by pressing the Δ/∇ buttons. The clock will be adjusted in accordance with the time difference. If you set the time difference to 0, the clock returns to the originally set time.
	LANGUAGE	<p>You can select or change the language used for on-screen display.</p> <p>For HVR-M10U: You can select from English, Simplified English or Canadian-French.</p> <p>For HVR-M10N: You can select from English, Simplified English, Latin American Spanish, Brazilian-Portuguese, Traditional-Chinese or Korean.</p> <p>For HVR-M10E: You can select from German, Greek, English, Simplified English, Spanish, French, Italian, Dutch, Portuguese, Russian, Arabic or Persian.</p> <p>For HVR-M10P: You can select from English, Simplified English, Simplified-Chinese or Traditional-Chinese.</p>
	BEEP	<p>Selects whether or not the unit beeps.</p> <p>ON : Enables the beep. OFF : Disables the beep.</p>
	DATA CODE (page 27)	<p>DATE/CAM : Displays the date/time or camera data when you press the DATA CODE button of the Remote Commander.</p> <p>DATE : Displays the date/time when you press the DATA CODE button of the Remote Commander.</p>
	LETTER SIZE	<p>Changes the font size of the menu line at the cursor.</p> <p>NORMAL : Normal size 2x : Double height size</p>
	 REMAINING	<p>AUTO : The remaining tape time is displayed for 8 seconds under the following conditions.</p> <ul style="list-style-type: none"> – If the remaining tape time is determined when you turn on power while a cassette is loaded in the unit. – When you press the ► PLAY button or DISPLAY/BATT INFO button. <p>ON : Always displays the remaining tape time.</p>

OTHERS menu

Icon/Menu	Submenu	Setting
OTHERS	DISP OUTPUT <i>(page 19)</i>	LCD PANEL : Displays information such as the time code on the LCD monitor. V-OUT/PANEL : Displays information such as the time code on the LCD monitor of this unit and an external monitor.
	HOURS METER	<i>Refer to page 63 for details.</i>
	REMOTE CTRL <i>(page 18)</i>	ON : Uses the supplied wireless Remote Commander. OFF : Does not use the Remote Commander. This setting will prevent accidental operation caused by a remote control unit of another equipment.
	50i/60i SEL <i>(page 33)</i>	Switches to the 1080/60i (NTSC) or the 1080/50i (PAL). 1 Press the Δ/∇ buttons to select the setting, then press the EXEC button.  2 Press the Δ/∇ buttons to select [YES], then press the EXEC button.

Maintenance

Troubleshooting

Please check the following before contacting your Sony dealer.

General Operation Troubles

Symptom	Cause/Remedy
A menu item is not available.	<ul style="list-style-type: none"> • There are menus that cannot be used depending on the [RECORD] REC MODE] setting on the [IN/OUT REC] menu and the [TC MAKE] setting on the [TC/UB SET] menu. You may not be able to set some menu items depending on the status of this unit. → For details, refer to the relevant page of each menu item. • Some menu items are only available when the tape is inactive. • There are some menus you cannot use without setting the clock. • Some menu items are not available when the REC/SAVE switch on the cassette inside the unit has been set to SAVE. → Set the switch to REC.
Some menu item settings change accidentally.	<ul style="list-style-type: none"> • You have pulled out the power cord during a menu operation or LCD monitor brightness adjustment. → Adjust the menu again. To prevent this incident recurring, do not pull out the plug while adjusting the menu or the brightness of the LCD monitor.
The supplied wireless Remote Commander does not work.	<ul style="list-style-type: none"> → Set [REMOTE CTRL] on the [OTHERS] menu to [ON].

Batteries/Power sources

Symptom	Cause/Remedy
The power cannot be turned on.	<ul style="list-style-type: none"> • The power cord of the AC adaptor is disconnected. → Connect the AC power cord. • The battery is discharged or nearly discharged, or not correctly installed. → Install a charged battery.
The unit will not operate even if the power has been turned on.	<ul style="list-style-type: none"> • Moisture condensation has occurred (p. 63). • The cassette is not inserted straight. → Eject and reinsert it straight. → Disconnect the power supply (battery or AC adaptor) and then reconnect it after about 1 minute. If the unit does not operate even after you reconnect the power, use a sharp-tipped ballpoint pen or similar tool to press the RESET button. When you press the RESET button, all settings including the date and time are cleared.
The CHG (charge) lamp does not light while the battery is charging.	<ul style="list-style-type: none"> → Correctly reinstall the battery. • The battery is already fully charged.
The CHG (charge) lamp is flashing while the battery is charging.	<ul style="list-style-type: none"> → Correctly reinstall the battery. If the lamp continues to flash even after reinstalling the battery, remove the power cord from the AC outlet and contact Sony Customer Service. The battery is probably faulty.
The battery is expended quickly.	<ul style="list-style-type: none"> • The ambient temperature is extremely low or charging is insufficient. This is not a malfunction. → Fully recharge the battery. If the battery is expended quickly even after recharging, the battery life is over. Replace the battery with a new one.
The remaining battery power is not displayed correctly.	<ul style="list-style-type: none"> • The battery has been used in extremely high or low temperatures for long hours, or charging is insufficient. This is not a malfunction. → Fully recharge the battery. If the battery is expended quickly even after recharging, the battery life is over. Replace the battery with a new one. • The remaining battery power may not be displayed correctly during some operating conditions and environment.
There is enough remaining battery power but the power turns off immediately.	<ul style="list-style-type: none"> • The remaining battery power indication is faulty or the battery is not charged properly. → Fully recharge the battery. The remaining battery power will be displayed correctly.
The unit does not operate properly when the AC adaptor is used.	<ul style="list-style-type: none"> → Turn off the power and remove the power cord from the AC outlet and then reconnect the power cord.

Troubleshooting

Cassette tapes

Symptom	Cause/Remedy
A cassette tape cannot be removed.	<ul style="list-style-type: none">→ Check whether the power supply (battery or AC adaptor) is connected properly.→ Remove the battery and reinstall it.→ Install a charged battery.
The cassette tape is not ejected when you press the EJECT button.	<ul style="list-style-type: none">• Moisture condensation has occurred in the unit (p. 63).
The cassette memory data and title are not displayed when using a cassette tape with the cassette memory function.	<ul style="list-style-type: none">• This unit does not support the cassette memory function and therefore such data is not displayed.
The remaining tape time is not displayed.	<ul style="list-style-type: none">→ To always display the remaining tape time, set [REMAINING] on the [OTHERS] menu to [ON].



Playback

Symptom	Cause/Remedy
Cannot playback.	→ If a tape has reached its end, rewind the tape.
Cannot playback in reverse at various speeds.	• This unit cannot play back a tape recorded in the HDV format in the reverse direction at various speeds. (p. 28)
Horizontal lines are displayed on an image or the image is blurred or not displayed.	→ The video heads are dirty. Clean the video heads using the supplied cleaning cassette. • A damaged tape is loaded. → Remove the cassette and insert another one. • You have tried to make the unit play back a tape recorded in the LP mode of the DV format. → This unit can play back only tapes recorded in the HDV, DVCAM format or in the SP mode of the DV format. A tape recorded in the LP mode of the DV format cannot be played back on this unit.
The audio is noisy.	• A damaged tape is loaded. → Remove the cassette and insert another one. → The video heads are dirty. Clean the video heads using the supplied cleaning cassette. • You have tried to make the unit play back a tape recorded in the LP mode of the DV format. → This unit can play back only tapes recorded in the HDV, DVCAM format or in the SP mode of the DV format. A tape recorded in the LP mode of the DV format cannot be played back on this unit.
Cannot perform a date search and index search.	• There is a portion with no recording at the beginning or in the middle of a tape. This is not a malfunction.
The time code is not reset to "00:00:00:00" after rewinding a tape to the recording starting point.	→ The time code is not displayed correctly at the starting point of recording. This condition, however, is not a malfunction. When you restart playback, the time code and images are displayed correctly from the starting point.
A user bit is not displayed correctly during fast-forward/rewind.	→ When input video signals without a user bit are recorded while HDV is input to i.LINK, the user bit will not be displayed correctly. Either "-- -- -- --" or "00 00 00 00" is displayed during playback and fast-forward/rewind, respectively.
"-- -- --" appears.	• The tape being played back was recorded without setting the date and time. • The tape portion being played back has no recording. • If there is a scratch or noise on the tape, the data code cannot be read.
Although the component video cable is connected properly to a television set or monitor to play back a tape, no image or audio is output.	→ Use the correct setting for [COMPONENT] on the [IN/OUT REC] menu in accordance with the equipment to be connected. • No audio is output from the COMPONENT OUT jacks. → Connect also an audio cable.
When you connect the unit to a 4:3 television set, the displayed image appears flattened.	→ When you watch a tape recorded in the HDV format on a 4:3 television set, set [DOWN CONVERT] on the [IN/OUT REC] menu correctly before playback. → DVCAM/DV tape images recorded in wide mode are not displayed correctly. Use a widescreen-compatible monitor.
After playing at 1/10 of normal speed in forward or reverse for more than 1 minute, normal playback forward starts.	• To protect a tape, the unit is set to start normal playback after playing at 1/10 of normal speed in forward or reverse for more than 1 minute. → Play back the tape at 1/3 of normal speed.
The pause mode of playback, recording, or audio dubbing is released automatically.	• To protect the tape and the video heads, the unit goes into the stop mode after the pause mode of recording, audio dubbing, or duplicating continues for more than about 3 minutes.

(Continued)

Troubleshooting

Symptom	Cause/Remedy
The unit does not function as part of a digital non-linear editing system.	<ul style="list-style-type: none"> • The INPUT SELECT switch is set to a setting other than HDV/DV. → Set it to HDV/DV. • The editing controller or the editing software is not compatible with this unit. → Refer to the instruction manuals of the controller or the software and consult their manufacturers.
Although the i.LINK cable is connected, the image from an external equipment is not displayed.	<ul style="list-style-type: none"> • Disconnect and then reconnect the i.LINK cable correctly.
No image is displayed even though the video cable is connected correctly.	→ There are output restrictions for some [COMPONENT] settings of the [IN/OUT REC] menu. <i>For details, see page 49.</i>
The image loses color or is distorted when you play back the tape on a television set or monitor connected to the unit.	<ul style="list-style-type: none"> → Connect this unit to a television set or monitor that is compatible with its [50i/60i SEL] format. → Set [50i/60i SEL] in the [OTHERS] menu, according to the signal-format.
2/2-ST is displayed on the screen.	<ul style="list-style-type: none"> • This icon is displayed when a tape recorded using a four-channel microphone of another equipment is being played back. This unit does not support four-channel microphone recording.

Recording/Dubbing

Symptom	Cause/Remedy
No picture via the  HDV/DV jack.	<ul style="list-style-type: none"> → Reconnect the i.LINK cable (not supplied). • The INPUT SELECT switch is set to a position other than HDV/DV. → Set the switch to HDV/DV. → Set [VCR HDV/DV] on the [IN/OUT REC] menu correctly.
Audio dubbing cannot be done. Audio dubbing is interrupted.	<ul style="list-style-type: none"> • You are trying to dub the sound onto an HDV or DV-formatted tape. → Sounds can be dubbed only onto a DVCAM-formatted tape (recorded) in the 32 kHz audio mode (4-channel). If the unit detects the following, audio dubbing will automatically abort, an alarm message will be superimposed on the LCD monitor and on an external monitor. <ul style="list-style-type: none"> – A blank portion – A section recorded in other than 32 kHz audio mode (4-channel) – A portion recorded in other than DVCAM format – A tape displayed as NS. • You have tried to dub the sound onto channels 1/2. → Only channels 3/4 can be used for dubbing. You cannot dub the sound onto channels 1/2.
Cannot hear the dubbed audio.	→ Set [AUDIO MIX] on the [AUDIO SET] menu to [MIX] or [CH3, CH4].
If an i.LINK cable is connected when you edit the dubbing, the monitor does not display any image.	→ Use the correct setting for [VCR HDV/DV] on the [IN/OUT REC] menu in accordance with the equipment to be connected.

Warning indicators and messages

Self-diagnosis display/Warning Indicators

The following alarm indicators may appear on the LCD monitor or an external monitor. For further information about each symptom and recovery method, see the relevant page indicated in the parentheses.

Message/Alarm Indicator	Cause/Corrective Action
C:□□:□□/E: □□:□□ (Self-diagnosis display)	<p>If an error still recurs after you retry the corrective actions several times, contact Sony Customer Service or your place of purchase.</p> <p>C:04:□□ → A battery other than the “InfoLITHIUM” Battery is being used. Use the optional “InfoLITHIUM” Battery (page 67).</p> <p>C:21:□□ → Condensation has occurred. Remove the cassette and insert it again after approximately 1 hour (page 63).</p> <p>C:22:□□ → The video head is dirty. Use a cleaning cassette to clean the head (page 62).</p> <p>C:31:□□/C:32:□□ → Symptoms other than the above are occurring. Insert a cassette again and retry the operation. Do not take this action, however, if there is negligible condensation in the unit (page 63). → Unplug the power cord, plug it in again, and then retry the operation. → Replace the tape.</p>
 (Battery level warning)	<ul style="list-style-type: none"> • The remaining battery power is low. • Even if there is approximately 5 to 10 minutes of battery power remaining, this alarm indicator may flash under some operating conditions or environment or because of the battery pack being used.
 (Moisture condensation warning)*	<p>→ Remove the cassette, unplug the power cord, and leave the unit for approximately 1 hour with the front panel left open (page 63).</p>
 (Warning indicator pertaining to the tape)	<p>The icon flashes slowly.</p> <ul style="list-style-type: none"> • The remaining tape time is less than 5 minutes. • No cassette is inserted in the unit.* • The REC/SAVE switch on the cassette is set to SAVE to prevent accidental erasure of a recording (page 21). <p>The icon flashes rapidly.</p> <ul style="list-style-type: none"> • The tape has reached its end.*
 (Eject cassette warning)*	<p>The icon flashes slowly.</p> <ul style="list-style-type: none"> • The REC/SAVE switch on the cassette is set to SAVE to prevent accidental erasure of a recording (page 21). <p>The icon flashes rapidly.</p> <ul style="list-style-type: none"> • Condensation has occurred (page 63). • The self-diagnostics message is displayed (page 59).

* An alarm beep will be emitted when an alarm indicator or message is displayed (page 52).

Warning indicators and messages

Alarm Messages

The following alarm messages will appear together with the alarm indicators. Take corrective action according to the displayed message.

Item	Message	Cause/Corrective Action
Battery	Use the "InfoLITHIUM" battery pack.	→ See page 67.
	Battery level is low.	→ See page 67.
	Old battery. Use a new one.	—
	▲ Re-attach the power source.	—
Moisture condensation	☒ ▲ Moisture condensation. Eject the cassette.	→ See page 63 for details.
	☒ Moisture condensation. Turn off for 1H.	→ See page 63 for details.
Cassette/Tape	☒ Insert a cassette.	→ See page 22.
	▲ Reinsert the cassette.	• Check for damage on a tape or other irregularities.
	☒ ▲ The tape is locked -check the tab.	→ See page 21.
	☒ The tape has reached the end.	—
Others	Cannot record due to copyright protection.	—
	Cannot add audio on the blank portion of a tape.	→ See page 43.
	HDV recorded tape. Cannot add audio.	→ See page 43.
	Not recorded in DVCAM mode. Cannot add audio.	→ See page 43.
	Cannot add audio.	→ See page 43.
	Change to correct tape format.	• This is an unsupported format and cannot be played back.
	No output image in "VCR HDV/DV". Change format.	→ Stop playback or signal input, or change the [VCR HDV/DV] setting (page 48).
	☒ Dirty video head. Use a cleaning cassette."	→ See page 61.

Notes on the Videocassette Recorder

Do not use the unit in a place subject to direct sunlight or heat sources

If you do, its cabinet, mechanical parts, etc., may be damaged.

Do not use the unit in an extremely hot place

If the unit is left in a car parked with the windows closed (especially in summer), its cabinet, mechanical parts, etc., may be damaged or it may not work correctly.

If the unit is brought directly from a cold to a warm location

Moisture may condense inside the unit and cause damage to the video heads and tape. If you use the unit in a place subject to direct cold currents from an air conditioner, moisture may also condense inside the unit.

Do not place a heavy object on the unit

The cabinet, mechanical parts, etc., may be damaged, or the unit may not work correctly.

Do not handle the unit roughly

Avoid rough handling or mechanical shock to the unit.

To avoid damaging the cabinet's finish

Plastic is often used for the surface finishing of the unit. Do not spray a volatile solvent such as an insecticide toward the cabinet or place rubber or vinyl products on the cabinet for a long time. If you do, the finish of the cabinet may be damaged or the coating may come off.

Do not clean the cabinet with thinner or benzene

The cabinet may be damaged or its coating may come off. When you use a chemical-impregnated cloth, use it according to its directions.

Clean the cabinet with a soft dry cloth

When the cabinet is very dirty, clean it with a soft dry cloth lightly moistened with a mild detergent solution and finish it with a dry cloth.

Do not put magnetic objects close to the unit
Magnetic fields may damage the recording.

To prevent electromagnetic interference caused by radio communication equipment such as cellular phones, transceivers, etc.

The use of the radio communication equipment such as cellular phones or transceivers near the unit may cause a malfunction and can affect the audio/video signals. Cellular phones or transceivers near the unit should be switched off.

Do not use the unit in an area exposed to radiation

A malfunction may occur.

Checking the video heads every 1000 hours

A VCR is a high-precision piece of equipment that records and plays back the picture recorded on a magnetic tape. In particular, the video heads and other mechanical parts may become dirty or worn. To maintain a clean picture, we recommend maintenance every 1000 hours, even though the conditions of use may differ depending on temperature, humidity, dust, etc.

About connecting other equipment

When you connect this unit to another equipment or a personal computer using an i.LINK cable, confirm the direction of the jack. If you forcibly insert the jack, the terminal may be damaged or cause the unit to malfunction.

Cleaning of the Video Heads

With clogged video heads, the unit cannot record properly. Clean the video heads to prevent noise on the recorded picture or audio. For cleaning, use the supplied cleaning cassette.

Before recording an important event

The unit cannot record properly with the clogged video heads. To ensure normal recording and clear pictures and sound, clean the video heads before recording an important event.

Notes on Use

Every 50 hours

If you repeat the tape transport operation, the video heads will become dirty and coated with fine dirt or dust. Clean the heads every 50 hours.

After using a tape prone to clog the heads

After using such a tape causes the symptoms illustrated below, clean the heads.

When the symptoms caused by clogged video heads appear

Even if you clean the heads periodically, clogging of the heads may occur anyway. Clean the heads when:

- mosaic-pattern noise appears on the playback picture.
- the playback picture freezes.
- a part of the playback picture does not move.
- playback pictures do not appear.
- playback audio is interrupted.
- “ Dirty video head. Use a cleaning cassette.” will appear during recording.

Symptoms caused by contaminated video heads



Normal picture



If a mosaic-pattern noise as seen in these pictures appear on the screen or if the entire screen turns black, use the cleaning cassette.



To use the cleaning cassette

Refer to your cleaning cassette's instruction manual.

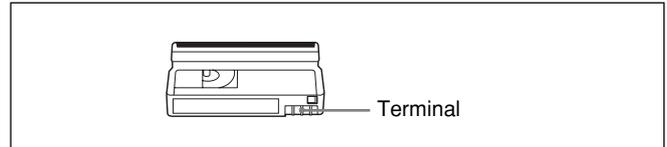
Cleaning cassettes are replaceable. After using the supplied cleaning cassette for the specified number of times, buy a cleaning cassette for replacement.

After prolonged use, the video heads may become worn out. If optimum picture quality is not restored even after you have cleaned the video heads with the cleaning cassette, the video heads may have worn out. In that case, you have to replace the video heads with new ones. Please consult your Sony dealer.

Notes on the Video Cassettes

Cleaning the terminal

If the gold-plated terminals of a cassette become dirty, or dirt accumulates on the terminals, the correct remaining tape time may not be displayed. Clean the terminal with a swab once every ten times you eject a cassette.



When affixing a label to the cassette

Be sure to affix a label only on the correct location so as not to cause malfunction of the unit.

After using a cassette

After use, please be sure to rewind the tape completely (to prevent picture and sound distortion). Return it to its case and store it in an upright position.

Notes on the LCD Screen

The LCD screen is manufactured using high-precision technology. The ratio of effective pixels is 99.99% or more. However, there may be some tiny black points and/or bright points (red, blue, green or white) that constantly appear on the LCD screen. These points do not affect the recorded picture in any way.

Do not place this unit with the LCD screen pointing toward the sun. Otherwise, the unit may be damaged.

To clean the LCD screen

To remove dirt or to clean fingerprints from the LCD screen, use an LCD cleaning kit (not supplied). When you use the LCD cleaning kit, do not pour the cleaning liquid directly on the LCD. Always soak the liquid in cleaning paper and wipe the LCD with this paper.

About Moisture Condensation

If the unit or cassette is brought directly from a cold to a warm location, moisture may condense inside or outside the unit or tape. If you use the tape or video heads in this condition, the tape may adhere to the head drum, and the video heads or the tape may be damaged, or a malfunction may occur.

When condensation occurs, the alarm messages “  Moisture condensation. Eject the cassette” or “ Moisture condensation. Turn off for 1H.” will appear.

Moisture condensation is likely to occur under the following conditions:

- The unit or cassette is brought from the cold outdoors to a warm indoor location.
- The unit or cassette is brought from the air-conditioned indoors to the hot outdoors.
- The unit is used in a place subject to cold currents from an air conditioner.

When bringing the unit or cassette from a cold place to a warm place or vice versa, put it in a plastic bag and seal the bag tightly. After bringing it into the new place, leave the bag on for more than one hour, and remove the bag when the air temperature inside it has reached the temperature surrounding it.

If moisture condensation occurred

If moisture condensation occurs
Remove the cassette immediately. While the alarm indicator is displayed, you cannot operate the unit except to press the EJECT button.

Turn off the power and leave the front panel open until the condensation disappears (approximately 1 hour). If the alarm message does not appear when you turn on the unit, and if  or  does not flash when you insert a cassette and press the video operation button, you can use the unit again.

If there is negligible condensation in the unit, this condensation may not be detected. In that case, the cassette may not be ejected for approximately 10 seconds after you open the front panel. This is not a malfunction. Do not close the front panel until the cassette is ejected.

Digital Hours Meter

The digital hours meter keeps cumulative counts of the total operation time, the head drum rotation time, the tape running time and the number of unthreading operations. These counts can be displayed on the menu. Use them as guidelines for scheduling maintenance.

In general, consult your Sony dealer about necessary periodic maintenance checks.

The digital hours meter has the following four display modes and you can check them in [HOURS METER] of the [OTHERS] menu (*See page 53*).

• OPERATION mode

The cumulative total hours of operating time is displayed in 10-hour increments.

• DRUM RUN mode

The cumulative total hours of drum rotation with tape threaded is displayed in 10-hour increments.

• TAPE RUN mode

The cumulative total hours of tape running time is displayed in 10-hour increments.

• THREADING mode

The cumulative number of tape unthreading operations is displayed in 10-operation increments.

About the Built-in Rechargeable Battery

This unit is provided with a rechargeable battery that retains the date/time and various settings regardless of power-on and power-off. The rechargeable battery is charged as long as this unit is operated. If the period of operating this unit is short, the battery discharges gradually and if it is not used at all for approximately 3 months, the battery will discharge completely. If that case, charge the battery and then start using the unit. If you do not need to record the date and time when the rechargeable battery is not fully charged, you can use the unit in this state.

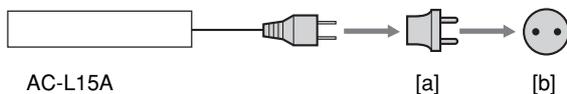
Charging the rechargeable battery

Connect the unit to an AC output using the AC adaptor or install the optional charged battery, turn off the unit, and leave it in this condition for 24 hours.

Using your Videocassette Recorder abroad

You can use your Videocassette Recorder in any country/region using the AC Adaptor supplied with your Videocassette Recorder within 100 V to 240 V AC, 50/60 Hz.

Use a commercially available AC plug adaptor [a], if necessary, depending on the design of the wall outlet [b].



Simple setting of the clock tune difference

You can easily set the clock to the local time by setting a time difference when using your unit abroad. Select [WORLD TIME] on the [OTHERS] menu, then set the time difference (*See page 52*).

Appendix

Using the optional battery

Charging the optional battery

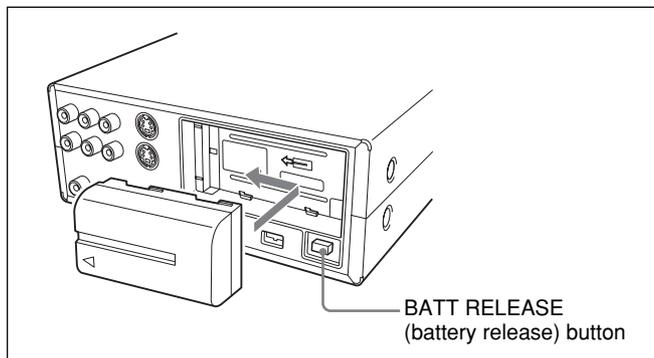
Attach the optional “InfoLITHIUM” Battery (L series) to the unit and charge the battery.

“InfoLITHIUM” L series battery packs have the

InfoLITHIUM **L** mark.

“InfoLITHIUM” is a trademark of Sony Corporation.

- 1 Attach the battery with the power turned off.



- 2 Connect the power cord and AC adaptor using the procedure in “Preparing the Power Supply”. The CHG (charge) lamp will light and charging starts.

CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacture.

Note

The battery cannot be charged while the power is ON.

When charging is completed

The CHG (charge) lamp turns off (full charge).

Unplug the AC adaptor from the DC IN jack.

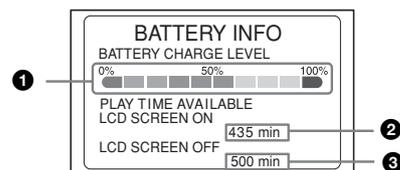
To remove the battery pack

Slide the battery pack out while pressing the BATT RELEASE button.

Checking the remaining battery power – BATTERY INFO

You can check the battery charge level and the time available for playback with this charge level by pressing the DISPLAY/BATT INFO button during charging or while the unit is turned off.

The battery information is displayed for approximately 7 seconds. If you press and hold the DISPLAY/BATT INFO button, the battery information is displayed for approximately 20 seconds.



- 1 BATTERY CHARGE LEVEL: Approximate remaining battery power
- 2 Remaining playback time when the LCD ON/OFF switch is turned on
- 3 Remaining playback time when the LCD ON/OFF switch is turned off

Charging time

The approximate times (in minutes) required for recharging an empty battery at the temperature of 25°C (recommended temperature: 10 to 30°C are indicated below).

Battery model name	Full charging time
NP-F570	145
NP-F770	230
NP-F970	310

Note

NP-F330/F530/500/510/710 cannot be used for this unit.

Time available for recording

The approximate recording times (in minutes) of a fully charged battery at the temperature of 25°C are indicated below.

Battery model name	HDV recording time	DVCAM/DV recording time
NP-F570	150	170
	175	200
NP-F770	310	355
	360	415
NP-F970	465	530
	545	630

Upper: when LCD Panel is ON

Bottom: when LCD Panel is OFF

NP-F550/F730/F750/F960 can be also used besides the above batteries. After fully charging the battery, test it before actual recording.

The time available for recording varies depending on the recording environment.

You can check the time available for recording by pressing the DISPLAY/BATT INFO button.

Time available for playback

The approximate times (in minutes) available for playback when a fully charge battery is used for playback at the temperature of 25°C are indicated below.

Battery model name	HDV playback time	DVCAM/DV playback time
NP-F570	140	160
	160	190
NP-F770	290	335
	335	390
NP-F970	435	500
	500	595

Upper: when LCD Panel is ON

Bottom: when LCD Panel is OFF

Notes

- The values listed above are based on a 60i signal. If you switch to 50i signal in the [50i/60i SEL] setting, the values may appear slightly different.
- Even when you unplug the power cord from the AC outlet, the battery cannot supply power if the AC adaptor is connected to the DC IN jack of this unit.
- If you use the battery in a low-temperature environment, the recording and playback times will be shortened.
- The CHG (charge) lamp may flash or correct BATTERY INFO may not be displayed under the following conditions.
 - The battery is not correctly attached to the unit.
 - The battery is faulty.
 - The battery is expended. (BATTERY INFO indication only)
- When you switch the power supply from AC adaptor to battery, the AC power supply is temporarily shut down and the unit will start up again using the battery once you insert the pack, even if you have not removed the DC IN jack yet.

About the “InfoLITHIUM” battery pack

This unit can be used with the “InfoLITHIUM” battery pack (L series). Your videocassette recorder can operate only with an “InfoLITHIUM” battery pack. “InfoLITHIUM” L series battery packs have the



What is the “InfoLITHIUM” battery pack?

The “InfoLITHIUM” battery pack is a lithium-ion battery pack with a function for communicating operating conditions between your videocassette recorder and an optional AC adaptor/charger. The “InfoLITHIUM” battery pack calculates power consumption according to the operating conditions of your videocassette recorder, and displays the remaining battery time in minutes. When it is recharged with an AC adaptor/charger (optional) the remaining battery time and charging time appear.

To charge the battery pack

- Be sure to charge the battery pack before you start using your videocassette recorder.
- We recommend charging the battery pack in an ambient temperature of between 10 °C and 30 °C (50 °F and 86 °F) until the CHG (charge) indicator turns off. If you charge the battery pack outside of this temperature range, it may not charge properly.
- After charging is completed, either disconnect the AC adaptor from the DC IN jack on your videocassette recorder, or remove the battery pack.

To use the battery pack efficiently

- Battery pack performance will be reduced when the ambient temperature is below 10 °C (50 °F), so the length of time you can use the battery pack becomes shorter. In that case, put the battery pack in a pocket or a similar place to keep it warm and insert it in your videocassette recorder right before you start using it so that you can use it for a longer time.
- Frequent use of the LCD screen or frequent playback, fast forward or rewind discharges the battery pack faster. We recommend using a large capacity battery pack: NP-F770/F970 (optional).
- Do not expose the battery pack to water. The battery pack is not water resistant.

About the remaining battery time indicator

- If the power turns off even when the remaining battery time indicator is showing that the battery pack has enough power to operate, fully charge the battery pack once more. The remaining battery time should be indicated correctly. Note, however, that the indicator display may not be restored if the battery is used in high temperatures for a long time, left in a fully charge state, or is used frequently. The remaining battery time indicator is a guide to the approximate recording time.
- In some operating conditions or ambient temperature and environment the  mark for low battery will start flashing even if there are still 5 to 10 minutes of battery time remaining.

About storage of the battery pack

- If you do not intend to use the battery pack for a long time, fully charge the pack about once a year and use it with your videocassette recorder until it is completely discharged in order to maintain the battery in peak condition. To store the battery pack, remove it from your videocassette recorder and keep it in a cool, dry place.
- To completely discharge the battery pack on your videocassette recorder, leave the power on without inserting a cassette until the power drains off.

About battery life

- The battery life is limited. The battery capacity drops in degrees as you continue to use it and as time passes. When the charged battery time becomes considerably shorter, most likely the battery pack has reached the end of its life. Please buy a new battery pack.
- The battery life varies depending on how it is stored and the operating conditions and environment for each battery pack.

.....
“InfoLITHIUM” is a trademark of Sony Corporation.

Compatibility of HDV, DVCAM, and DV Formats

The HDV format is a HD VCR format based on the DV format of the globally widespread general consumer digital VCR system. This format has the newly defined data recording specifications for HD signals compressed by MPEG2. It applies the same cassette, tape speed, and track pitch as the DV format. The differences, compatibility, and restrictions in editing of the HDV1080i, DVCAM, and DV formats are explained below.

Main differences between HDV1080i, DVCAM, and DV Formats

Specification	HDV1080i	DVCAM	DV (SP)
Track pitch	10 μm	15 μm	10 μm
Audio sampling frequency	16 bit: 48 kHz	12 bit: 32 kHz 16 bit: 48 kHz	12 bit: 32 kHz 16 bit: 48 kHz, 44.1 kHz, 48 kHz ²⁾
Audio recording mode ¹⁾	Lock mode	Lock mode	Unlock mode ³⁾
Time code	Drop frame mode (NTSC only) No user bits ⁴⁾	NTSC: SMPTE time code (DF/NDF, including user bits) PAL: EBU time code (including user bits)	Drop frame mode (NTSC only) No user bits ⁴⁾

- 1) There are two modes for audio signal recording: Lock mode and Unlock mode. In the Lock mode, the sampling frequencies of audio and video are synchronized. In the Unlock mode, adopted by the consumer DV format, the two sampling frequencies are independent. The Lock mode maintains high compatibility with higher formats and offers better digital processing and smooth transition than the Unlock mode when you edit audio.
- 2) This unit cannot record in DV format with 16 bit - 32 kHz or 44.1 kHz.
- 3) This unit has been upgraded with a function for switching between Lock mode and Unlock mode.
- 4) This unit has been upgraded with a function to enable DF/NDF setting for NTSC and user bit setting for NTSC and PAL.

Playback compatibility

The relationship between playback tape format and player is summarized in the table below.

Playback tape format	DV format model	DVCAM format model	HDV1080i format model (This unit)
DV	Playback is possible. (Some equipment cannot play a tape recorded in the LP mode.)	Only playback of a tape recorded in SP mode is possible. Some equipment can play a tape recorded in the LP mode.	Only playback of a tape recorded in SP mode is possible. Some equipment can play a tape recorded in the LP mode. (This unit can play back a DV-formatted tape in SP mode only.)
DVCAM	Playback may be possible on some models.	Cassette compatibility	Cassette compatibility
HDV	No playback is possible.	No playback is possible.	Cassette compatibility ¹⁾

- 1) You can play back for HDV 720/30p format, but you cannot output the video signals from  HDV/DV jack.

Cassette compatibility

A DV format cassette tape can be used for HDV. The recording bit rate and recording track pitch on a tape of the HDV1080i system used for HVR-Z1U/Z1N/Z1E/Z1P/M10U/M10N/M10E/M10P are about 25Mbps and 10µm, respectively. The specifications are the same as that of home use DV (SP) tapes. The recording time on an HDV tape is also the same as that of DV (SP).

The track pitch is 15µm, which is 1.5 times of HDV/DV (SP). Therefore, the recording time using DVCAM recording on a same tape will be two-thirds of the time available when HDV/DV (SP) recording is used.

Dubbing with S VIDEO or VIDEO jacks

When you use this unit as a recorder to perform dubbing between this unit and another equipment connected with S VIDEO or VIDEO jacks, the format to be used for recording is set in accordance with the [☑ REC MODE] setting of the [IN/OUT REC] menu if the signal to be input from S VIDEO or VIDEO jacks is in DVCAM or DV format.

For details, see the following table.

Playback and editing of a tape may be restricted for some dubbing methods. Read the “Limitations on editing” (p. 71) before dubbing a tape.

Recording tapes used when this unit serves as a recorder

Input signal format	Menu item		Recording tape format (AUDIO MODE)
	☑ REC MODE	AUDIO LOCK	
DVCAM or DV	DVCAM	—	DVCAM (LOCK MODE)
	DV SP	LOCK MODE	DV (LOCK MODE)
		UNLOCK MODE	DV (UNLOCK MODE)

—: Setting independent

Dubbing with the HDV/DV jack

When you perform dubbing between this unit and digital video equipment connected with the i.LINK cable using this unit as a player, the **i** HDV/DV jack output format is determined in accordance with the playback tape format and menu setting of this unit.

If you use this unit as a recorder, the format of a tape used for recording is determined in accordance with the **i** HDV/DV jack input format and menu setting of this unit. For details, check the following table.

Playback and editing using this tape may be limited for some dubbing methods. Before dubbing, read the “Limitations on editing” (p. 71).

(Continued)

Compatibility of HDV, DVCAM, and DV Formats

i.LINK output when this unit is used as a player

Playback tape format	Menu item			i.LINK output format (AUDIO MODE)
	VCR HDV/DV	i.LINK CONV		
		HDV→DV CONV	AUDIO LOCK	
HDV	AUTO	OFF	—	HDV (LOCK MODE)
		ON	LOCK MODE	DV (LOCK MODE)
			UNLOCK MODE	DV (UNLOCK MODE)
	HDV	OFF	—	HDV (LOCK MODE)
		ON	LOCK MODE	DV (LOCK MODE)
			UNLOCK MODE	DV (UNLOCK MODE)
DV	—	—	No output	
DVCAM	AUTO	—	—	DVCAM (Complies with playback tape)
	HDV	—	—	No output
	DV	—	—	DVCAM (Complies with playback tape)
DV	AUTO	—	—	DV (Complies with playback tape)
	HDV	—	—	No output
	DV	—	—	DV (Complies with playback tape)

Note

If copyright protection signals are recorded on a cassette to be played on this unit, recording may be prevented when you attempt recording images from this unit to another connected equipment.

Recording tape when this unit is used as a recorder

i.LINK input format	Menu item		Recording tape format (AUDIO MODE)
	VCR HDV/DV	 REC MODE ¹⁾	
HDV	AUTO	—	HDV (LOCK MODE)
	HDV	—	HDV (LOCK MODE)
	DV	—	No recording
DVCAM	AUTO	DVCAM	DVCAM (Complies with input signals)
		DV SP	DV (Complies with input signals)
	HDV	—	No recording
	DV	DVCAM	DVCAM (Complies with input signals)
		DV SP	DV (Complies with input signals)
DV	AUTO	DVCAM	DVCAM ²⁾ (Complies with input signals)
		DV SP	DV (Complies with input signals)
	HDV	—	No recording
	DV	DVCAM	DVCAM ²⁾ (Complies with input signals)
		DV SP	DV (Complies with input signals)

- 1) When this unit is used as a recorder, the recording format is determined by the  REC MODE] setting on the [IN/OUT REC] menu if the input signal format is DVCAM or DV.
- 2) If you dub a DV-formatted tape when this unit is set for DVCAM and used as a recorder, the time code of the copied tape will be partially inaccurate (note, however, that this does not affect editing accuracy except in special cases).

Notes

- If you use the tapes described in 2) above for editing, you may encounter function limitations regardless of the player and recorder formats.
- Some DV video equipment may be able to playback a DVCAM-formatted tape. Even if the tape is played back, the contents cannot be guaranteed. If you use a proper DVCAM-formatted tape for playback, a DVCAM-formatted tape with a partially inaccurate time code may be created.
- You cannot use this unit to record video and audio recorded with copyright protection signals. If you try to record such a video or audio, the message “Cannot record due to copyright protection.” will appear on the LCD monitor.

Limitations on editing

During editing, you will encounter limitations according to the format differences on a tape dubbed or edited using the  HDV/DV jack.

For details, refer to “Editing (Connecting with a Personal Computer)” of Chapter 3, “Dubbing/Editing.”



About i.LINK

The HDV/DV jack provided on this unit is an i.LINK-compliant jack. This section describes the i.LINK standard and its features.

What is i.LINK?

i.LINK is a digital serial interface for sending and receiving digital video, digital audio, and other data between this unit and other equipment equipped with an i.LINK terminal. You can also control other equipment using i.LINK.

i.LINK-compatible equipment can be connected using an i.LINK cable. Possible applications are operations and data exchange with various digital AV equipment. When two or more i.LINK-compatible equipment are connected to this unit, operations and data exchange are possible with equipment directly connected to this unit and also with equipment connected to this unit via other equipment.

Note, however, that the method of operation may vary depending on the characteristics and specifications of the equipment to be connected. Also, there are cases where operations and data exchange may not be possible even if the connection is made.

Note

- Normally, only one equipment can be connected to this unit using the i.LINK cable. When you connect this unit to HDV/DVCAM (DV)-compliant equipment that allows multiple connections, refer to the operating instructions of the equipment to be connected.
- i.LINK is an easy-to-remember term for the IEEE 1394 proposed by Sony, and is a trademark approved by many corporations in Japan and overseas.
- IEEE 1394 is an international standard standardized by the Institute of Electrical and Electronics Engineers.

About the i.LINK baud rate

The maximum baud rate of i.LINK varies depending on the equipment. There are three types.

S100 (Approximately 100 Mbps*)

S200 (Approximately 200 Mbps)

S400 (Approximately 400 Mbps)

The baud rate is listed under “Specifications” in the operating instructions of individual equipment. It may be indicated near the i.LINK interface on some equipment.

The baud rate may vary from the indicated value when the unit is connected to equipment with a different maximum baud rate.

*What is Mbps?

Mbps stands for “megabits per second,” or the volume of data that can be sent or received in 1 second. For example, a baud rate of 100 Mbps means that 100 megabits of data can be sent in 1 second.

To use the i.LINK functions of this unit

For details on how to perform dubbing when this unit is connected to other video equipment that has an i.LINK jack, *see page 31, 35.*

This unit can also be connected to other i.LINK-compatible equipment made by Sony (e.g. a VAIO series personal computer) as well as video equipment. This unit may not be able to operate with some i.LINK video equipment such as digital televisions, DVD recorders/players, and MICROMV recorders/players even if they are equipped with the i.LINK jack. Before connecting to another equipment, confirm whether this equipment is HDV/DVCAM (DV) compatible. For details about precautions on connections and whether or not software applications compatible with this unit are available, refer to the operating instructions of the equipment to be connected.

Note

- Always connect the i.LINK cable to a personal computer first and then connect it to the unit. If you connect the i.LINK cable to this unit first, it may cause the unit to malfunction because of static electricity.
- When you connect this unit to equipment equipped with a 6-pin type i.LINK jack, connect the cable to the 6-pin type i.LINK jack first.
- When you connect this unit to equipment equipped with a 6-pin type i.LINK jack using the i.LINK cable, power off the equipment and remove the power cord from the AC outlet before connecting (or disconnecting) the i.LINK cable. If the i.LINK cable is connected (or disconnected) while the equipment power cord is connected to the AC outlet, a high-voltage current (8 to 40 V) output from the i.LINK jack of the equipment will flow into this unit and damage it.

About the required i.LINK cable

Use a Sony i.LINK cable.

i.LINK and  are trademarks of Sony Corporation.

Specifications

System

Video recording format (HDV)	Rotating dual-head helical scan
Video recording format (DVCAM (DV))	Rotating dual-head helical scan
Audio recording format (HDV)	Rotating dual heads MPEG-1 Audio Layer2 16-bit 48 KHz (stereo) Transfer rate 384 kbps
Audio recording format (DVCAM (DV))	Rotating dual heads 12-bit Fs 32K (Channel 1/2 Channel 3/4) 16-bit Fs 48K (Channel 1/2)
Video signal	NTSC color, EIA standard system, 1080/60i PAL color, CCIR standard system, 1080/50i
Usable cassettes	Mini-DVCAM cassettes marked  Mini-DV cassettes marked 
Tape speed (HDV)	Approx. 18.81 mm/s
Tape speed (DVCAM)	Approx. 28.218 mm/s
Tape speed (DV)	SP: Approx. 18.812 mm/s
Recording/playback time (HDV)	Approx. 63 min (using PHDVM-63DM)
Recording/playback time (DVCAM)	Approx. 41 min (using PHDVM-63DM)
Recording/playback time (DV)	SP: Approx. 63 min (using PHDVM-63DM)
Fast-forward/rewind time	Approx. 2 min 40 s (using PHDVM-63DM)

AUDIO jacks

IN	Pin jack Impedance: Minimum 47 k Ω (kilo ohms), unbalanced Maximum input level: 4 Vrms
OUT	Pin jack Impedance: Maximum 1 k Ω (kilo ohms) Output level: 2 Vrms (full bit) (47 k Ω (kilo ohms), unbalanced)

VIDEO jacks

IN/OUT	Pin jack, 1 Vp-p (75 Ω (ohms), unbalanced, sync negative)
--------	--

S VIDEO jacks

IN/OUT	Mini DIN 4-pin Luminance signal: 1 Vp-p (75 Ω (ohms), unbalanced, sync negative) Chrominance signal: 0.286 Vp-p (60i/NTSC) (75 Ω (ohms), unbalanced, sync negative) 0.3 Vp-p (50i/PAL) (75 Ω (ohms), unbalanced, sync negative)
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COMPONENT OUT jacks

Y: 1 Vp-p (480i NTSC/576i PAL: with 0.3 V sync negative) Pb/Cb, Pr/Cr: 700 mVp-p (100% color bar), output impedance 75 Ω (ohms)

HDV/DV jack

i.LINK (IEEE1394, 4-pin connector S400)

PHONES

Stereo minijack (ϕ 3.5), 8 Ω (ohms) loading
--

Remote control

LANC	Stereo mini-minijack (ϕ 2.5)
------	------------------------------------

LCD screen

Picture	8.8 cm (3.5 type)
Total dot number	250 000 dots 1 120 (Horizontal) \times 224 (Vertical)

General

Peak inrush current	Hot switching inrush current, measured in accordance with European standard EN55103-1 : 4.64 A (230 V)
Power requirements	8.4 V (DC IN jack) 7.2 V (Battery jack input)

(Continued)

Specifications

Power consumption (when using a battery)
 when LCD is used
 HDV playback 6.5 W
 DVCAM/DV playback 5.7 W
 when LCD is not used
 HDV playback 5.7 W
 DVCAM/DV playback 4.9 W

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

Storage temperature
 -20 °C to 60 °C
 (-4 °F to 140 °F)

AC adaptor AC-L15A

Power requirements
 100 – 240 V AC, 50/60 Hz

Current consumption
 0.35 – 0.18 A

Power consumption
 18 W

Output voltage
 DC OUT: 8.4 V *

Operating temperature
 0 °C to 40 °C (32 °F to 104 °F)

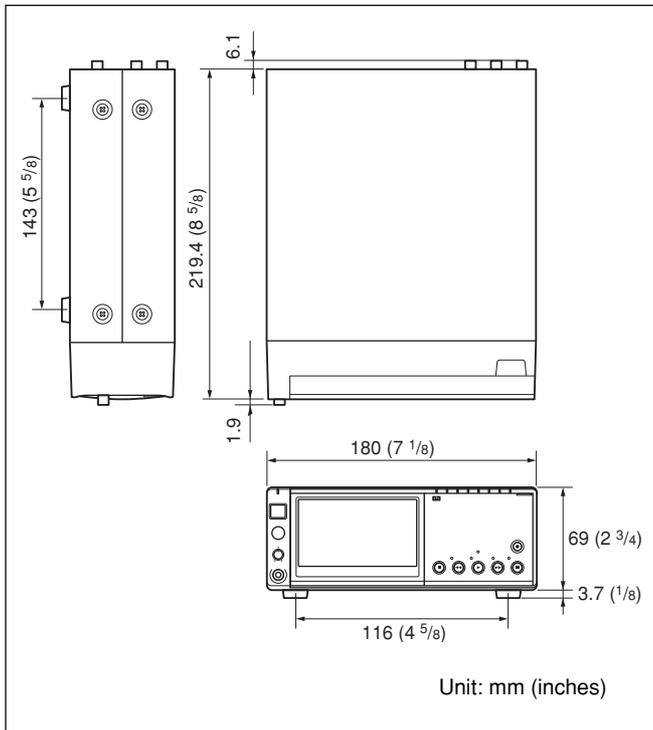
Storage temperature
 -20 °C to 60 °C (-4 °F to 140 °F)

Dimensions (approx.)
 56 × 31 × 100 mm
 (2 1/4 × 1 1/4 × 4 in.) (w/h/d)
 excluding projecting parts

Mass (approx.)
 190 g (6 3/4 oz)
 excluding power cord

*See the label on the AC adaptor for other specifications.

Design and specifications are subject to change without notice.



Dimensions Approx. 180 × 72.7 × 219.4 mm
 (7 1/8 × 2 7/8 × 8 3/4 inches)
 (w/h/d, including projecting parts
 and controls)

Mass Approx. 1.8 kg (3 lb. 15 1/2 oz.)

- Supplied accessories
- Remote Commander (1)
 - AC adaptor (1)
 - Power cord (1)
 - Stand (1)
 - Size AA batteries (2)
 - Cleaning cassette (1)
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