

Hard Disk Recording Unit

Operating Instructions

Owner's record

The model number and the serial number are located at the name plate on the left of the unit. 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. _____

FOR
HDV / DVCAM / DV

HVR-DR60

WARNING

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

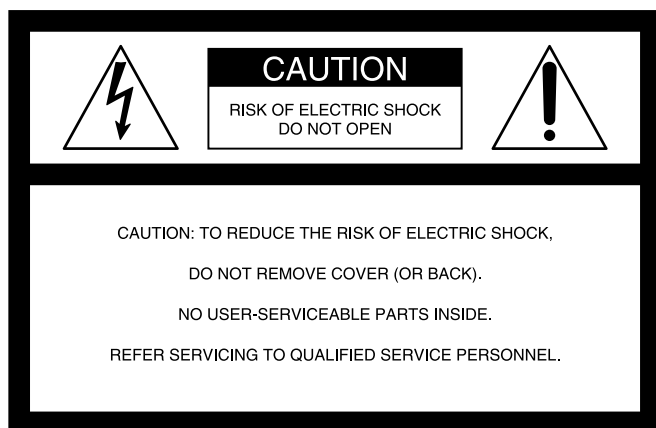
CAUTION

Replace the battery with the specified type only. Otherwise, fire or injury may result.

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 Adaptor.

For the customers in the U.S.A.



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.

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

Declaration of Conformity

Trade Name: SONY
Model: HVR-DR60
Responsible Party: Sony Electronics Inc.
Address: 16530 Via Esprillo, 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.

The supplied interface cable must be used with the equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

For the customers in Europe

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

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

- 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.

This product has been tested and found to comply with EMC regulations when the cable connected to the i.LINK jack does not exceed 1 m in length. Please connect a cable that does not exceed 1 m to the i.LINK jack.

Disposal of Waste Electrical and Electronic Equipment for business use (Applicable in the European Union and other European countries with separate collection systems)

This symbol on the product or on its packaging indicates that this product shall not be treated as household waste. Instead it shall be handed over to the applicable take-back scheme for the recycling of electrical and electronic equipment.



By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this product, please contact your local Sony office or visit Sony Europe's web site for business customers:

<http://www.sonybiz.net/environment>


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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- Macintosh is a trademark of Apple Computer, Inc. in the U.S. and other countries.
- Pentium is a trademark or registered trademark of Intel Corporation.

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

Notes on the License

ANY USE OF THIS PRODUCT OTHER THAN CONSUMER PERSONAL USE IN ANY MANNER THAT COMPLIES WITH THE MPEG-2 STANDARD FOR ENCODING VIDEO INFORMATION FOR PACKAGED MEDIA IS EXPRESSLY PROHIBITED WITHOUT A LICENSE UNDER APPLICABLE PATENTS IN THE MPEG-2 PATENT PORTFOLIO, WHICH LICENSE IS AVAILABLE FROM MPEG LA, L.L.C., 250 STEELE STREET, SUITE 300, DENVER, COLORADO 80206.

Overview

Features

- **Long recording time, small and light body**

The 1.8-inch internal HDD provides a large 60 GB capacity. Although the HVR-DR60 only weighs about 230 g, it enables about 4.5 hours of recording of an HDV/DVCAM/DV stream.

Using the supplied shoe adaptor lets you mount the drive onto an HVR-V1U/V1N/V1E/V1P, where it will not affect the mobility of the camcorder. Using high capacity InfoLITHIUM L series battery packs, the HVR-DR60 operating time for continuous recording is approximately 18 hours.

- **Two types of operating mode**

The HVR-DR60 offers two types of operating mode, VIDEO mode and COMPUTER mode.

VIDEO mode

VIDEO mode is for recording an HDV/DVCAM/DV stream via the i.LINK jack on a camcorder. When connecting to a camcorder that has an external REC control function, you can control this unit from the camcorder using "SYNCHRO mode," in which video and audio material is recorded simultaneously to the HVR-DR60 and tape*. When connecting to a camcorder that does not have an external REC control function, you can select "FOLLOW mode," in which HVR-DR60 regularly checks the status of the camcorder and follows the camcorder operation.

COMPUTER mode

In COMPUTER mode, the HVR-DR60 is recognized as a standard external drive when connected to a computer via an i.LINK cable. The HVR-DR60 enables efficient operation with a transfer speed three times faster than real time.

- **HDD smart protection**

The "HDD smart protection" function has three components: a shock absorber, which uses shock absorbing material to envelope the HDD and protect it from physical shock; a 3G sensor, which automatically retracts the recording head when it detects gravitational acceleration exceeding a certain level; and a buffer memory, which continues recording to the memory for up to 14 seconds when the recording head is retracted. This function protects recorded video and audio data from the impact of a drop of up to about 100 cm.

- **Useful function with the HVR-V1U/V1N/V1E/V1P**

The combination of this unit and the HVR-V1U/V1N/V1E/V1P offers more useful functions.

Tapeless external REC control

When used with this unit, the HVR-V1U/V1N/V1E/V1P can output the record command without a tape, so the unit is synchronized to the REC/STOP operation of the HVR-V1U/V1N/V1E/V1P enabling video to be recorded on the unit only.

Displaying the operational status of this unit on the HVR-V1U/V1N/V1E/V1P LCD screen

You can check the current condition of this unit and its operational status (remaining recording time, battery level, recording format etc.) on the LCD screen of the HVR-V1U/V1N/V1E/V1P. Not having to check the unit itself means you can concentrate more on what you are shooting.

Supported models

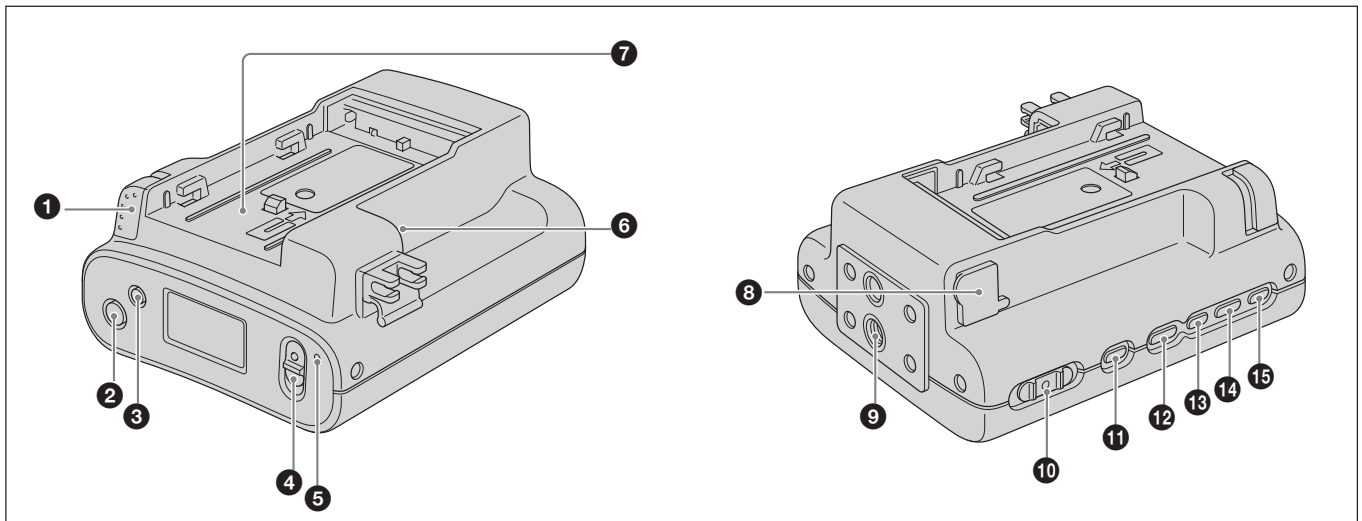
The HVR-DR60 can be used connected to the camcorder/VTR.

For details of supported models, refer to the supplied "Guide to supported models and their functions."

* The recording starting point of this unit has an approximately 0.5-second delay in DV recording.

Names of parts

Hard Disk Recording Unit



1 BATT RELEASE button

Remove the battery pack from this unit by pressing the BATT RELEASE button.

2 STOP button

Return to the VIDEO mode screen.
Stop recording or playback.
When a menu is selected, cancel it by pressing the STOP button.

3 MENU/LCD BACK LIGHT button

Display the menu screen on the LCD screen.
Press the MENU/LCD BACK LIGHT button long enough for the backlight of the LCD screen to come on or off.

4 REC switch

Start recording by sliding the REC switch.

5 REC lamp/Access lamp

REC lamp/Access lamp comes on during recording in VIDEO mode.
REC lamp/Access lamp blinks while accessing the computer in COMPUTER mode.

6 HDV/DV jack (6-pin)

Connect to a camcorder, computer etc. using the i.LINK cable.

7 Battery slot

8 DC IN jack

Connect the power supply from an AC adaptor, etc.

9 Screw holes

You can use the supplied shoe adaptor to attach this unit to a camcorder with a cold shoe or directly to a tripod.

10 POWER switch

Turn the power of this unit on or off.
Slide the POWER switch back and forth to select VIDEO, COMPUTER or OFF.

11 CAM LINK button

Switch to CAM LINK [ON] (FOLLOW/SYNCHRO) to record video in conjunction with the recording operation of the camcorder, or to CAM LINK [OFF] to record with this unit alone.

* Default setting is CAM LINK [ON].

12 REPEAT button

This changes the auto repeat mode.

Each time you press the button, the mode changes as follows.

REPEAT1 (Repeatedly plays back the selected folder only)/ ALL REPEAT (Repeatedly plays back all folders)/ OFF

13 PREVIOUS/REW button

Go back to the previous folder by pressing this button during standby.

Press this button to stop playback and restart playback from the beginning of the current file.

Keep this button pressed down during playback to play the current file backwards at triple the normal speed.
When the menu screen is displayed on the LCD screen, press this button to move the cursor.

14 PLAY/EXEC button

Play recorded files by pressing this button.

Pause playback by pressing this button.

When the menu screen is displayed on the LCD screen, press this button to execute the selected menu item.

15 NEXT/FF button

Go to the next folder by pressing this button during standby.

Press this button to stop playback and restart playback from the beginning of the next file.

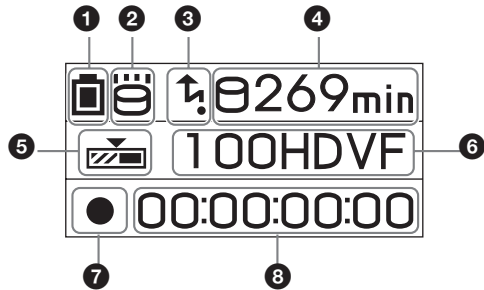
Keep this button pressed down during playback to play the current file forwards at triple the normal speed.

When the menu screen is displayed on the LCD screen, press this button to move the cursor.

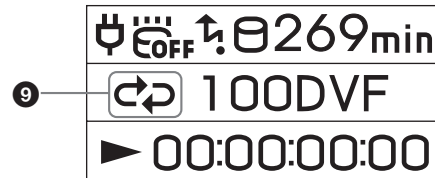
LCD screen display

VIDEO mode

During recording





During playback



1 Power supply display

Display the power supply icons.

-  Battery pack in use
Display the remaining battery capacity.
-  AC adapter connected

2 Drop detection mode display (3G sensor)

Display the operating state of the drop detection.

3G sensor ON

No icon Drop detection is not operating.

 blinking Drop detection is operating.

3G sensor OFF

 (Menu setting) lit Drop detection function is set to OFF.


3 CAM LINK mode display

When the CAM LINK is set to ON, this icon is on.

When the CAM LINK is set to OFF, this icon is off.

4 Remaining hard disk capacity display

Display the remaining recording time (in minutes).

 starts blinking in the following situations.

- When the remaining recording time is less than 5 minutes
- When the folder number is 999
- When using in a high temperature environment

5 Cache recording mode display

Display the operating state of the cache recording mode during recording.

When the cache recording mode is set to ON, this icon is on.

When the cache recording mode is set to OFF, this icon is off.

6 Folder name display

Display the folder name in which the recording/playback data is saved.

7 Status display

Display the status with an icon.

- Power is on and playback/recording is stopped
- Recording
- ▶ Playback
- ▮▮ Pausing playback
- ▶▶ Go to next file/fast-forward
- ◀◀ Back to the previous file/rewind

8 TC (time code) display

Display the time code.

9 Repeat mode display

Display the repeat status during playback.

 REPEAT 1

 REPEAT ALL

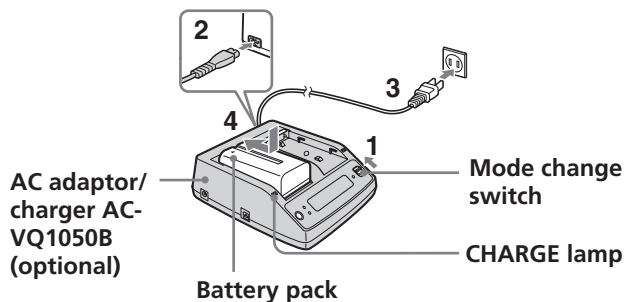
Getting prepared

Preparing the power supply

To charge the battery pack

When using an InfoLITHIUM battery pack (L-series, optional) as the power supply for this unit, charge the battery back as follows before use.

When charging the battery pack, refer to the operating instructions supplied with the AC adaptor/charger (optional).



- 1 Set the mode change switch of the AC adaptor/charger to CHARGE.

Note

You cannot charge when the mode change switch is set to VCR/CAMERA.

- 2 Connect the AC power cord to the AC adaptor/charger.
- 3 Connect the AC power cord to a wall outlet.
- 4 When installing the battery pack, press it down while sliding it in the direction of the arrow.
Charging begins and the CHARGE lamp on the AC adaptor/charger comes on.
When charging is completed, all of the segments of the battery life indicator appear in the display window (normal charge).
The CHARGE lamp goes off, but if you continue charging until the "FULL" battery life indicator appears, the battery capacity will be slightly longer (full charge).
- 5 When charging is completed, remove the battery pack from the AC adaptor/charger.

Notes

- This unit can be used with an InfoLITHIUM battery pack (L-series), but does not support the battery info function.
- This unit cannot be used to charge the battery pack installed.

Remaining battery time indication in the AC adaptor/charger display window

This indication is provided by data communications between the AC adaptor/charger and the InfoLITHIUM battery pack. This unit does not have a data communications function, so the displayed time may differ from the actual remaining time. This is not a malfunction.

Charging time

Charging times for a completely exhausted InfoLITHIUM battery pack (NP-F570, NP-F770, NP-F970) are as follows.

Battery pack	Time for full charge	(Time for normal charge)
NP-F570	Approx. 145 minutes	(Approx. 85 minutes)
NP-F770	Approx. 230 minutes	(Approx. 170 minutes)
NP-F970	Approx. 310 minutes	(Approx. 250 minutes)

Operating times for continuous recording

Operating times for continuous recording using an InfoLITHIUM battery pack (NP-F570, NP-F770, NP-F970) are as follows.

Battery pack	Operating time from full charge	(Operating time from normal charge)
NP-F570	Approx. 330 minutes	(Approx. 300 minutes)
NP-F770	Approx. 750 minutes	(Approx. 680 minutes)
NP-F970	Approx. 1,080 minutes	(Approx. 970 minutes)

Battery pack

Before changing the battery pack, slide the POWER switch to OFF (CHG).

Charging/recording/playback time

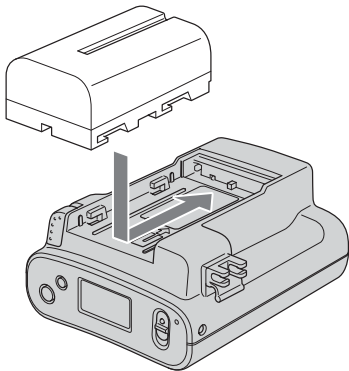
- Times measured with the camcorder at 25°C (77°F) (Recommended range is 10°C to 30°C (50°F to 86°F)).
- Recording and playback times are shorter at lower temperatures.
- Recording and playback times are shorter depending on the conditions of use of this unit.
- Except for the NP-F570/F770/F970, operating time is not ensured.

AC adaptor/charger

Do not short-circuit the DC plug of the AC adaptor/charger or battery terminal with any metallic objects. This may cause a malfunction.

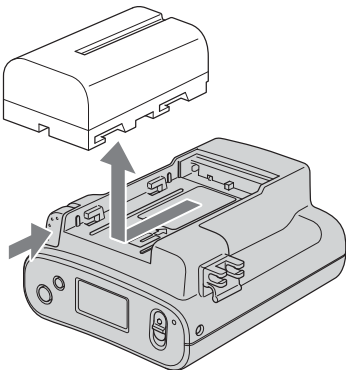
To install the battery pack to this unit

Slide the battery pack in the direction of the ◀ mark on the battery pack.



To remove the battery pack from this unit

Press the BATT RELEASE button of this unit and slide the battery pack in the direction of the arrow.



To connect this unit to a wall outlet

For prolonged operation, such as playing the recorded images, you can operate this unit from a domestic wall outlet without worrying about battery life.

- 1 Set the mode change switch of the AC adaptor/charger to VCR/CAMERA.

Note

When the mode change switch is set to CHARGE, there is no power supply.

- 2 Connect the DK cable to the DC IN jack on this unit.
- 3 Connect the DK cable to the AC adaptor/charger.
- 4 With the power cord, connect the AC adaptor/charger to a wall outlet.

Note

You can leave the battery pack installed while operating from AC power. The power supply to the DC IN jack has priority.



To use the AC adaptor/charger from a vehicle power supply

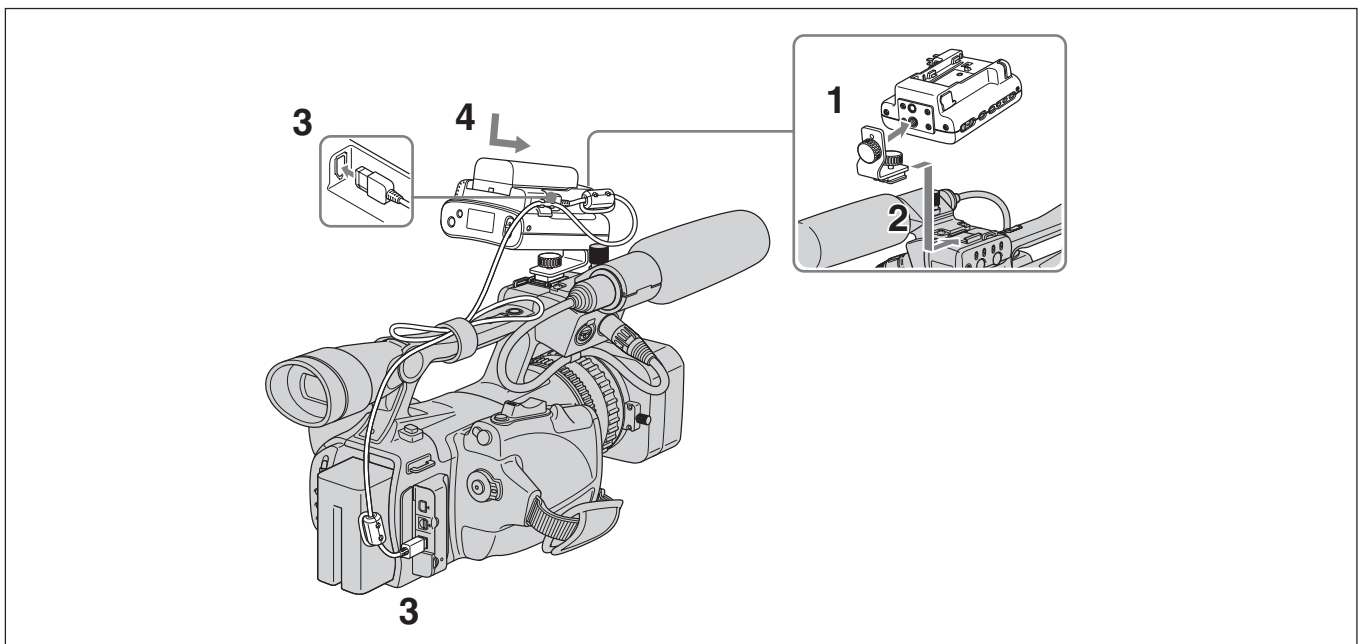
For details, refer to the operating instructions supplied with the AC adaptor/charger.

Using in VIDEO mode

Connecting this unit to a camcorder

As an example, the following steps and illustration show how to connect this unit to an HVR-V1U/V1N/V1E/V1P digital HD camcorder.

- 1 Attach the supplied shoe adaptor to this unit.
- 2 Attach this unit to the accessory shoe of the HVR-V1U/V1N/V1E/V1P.
- 3 Connect the supplied i.LINK cable to the  HDV/DV jack on this unit and the  HDV/DV jack on the HVR-V1U/V1N/V1E/V1P.
- 4 Attach an optional battery pack (NP-F570/F770/F970) to this unit.



Menu settings

Check the individual settings and change them if necessary. For details, see page 11.

- 1 Display the menu screen on the LCD screen by pressing the MENU button.
- 2 Select the desired setting by pressing the PREVIOUS/REW button or the NEXT/FF button and press the PLAY/EXEC button.
- 3 Select the desired item by pressing the PREVIOUS/REW button or the NEXT/FF button and press the PLAY/EXEC button.
- 4 Return to the VIDEO mode screen by pressing the STOP button.

Note

You cannot record or play back movies while the menu screen is displayed on the LCD screen. Also, you cannot change to the menu screen on the LCD screen during recording or playback.

Menu organization

i.LINK MODE	AUTO
	HDV
	DV
CAM LINK SEL	FOLLOW
	SYNCHRO
CACHE REC	OFF
	ON
DELETE	LAST SHOT
	ALL
	FORMAT
TC FORMAT	AUTO
	NDF
	DF
DV FILE TYPE	AVI
	RAW DV
SLEEP MODE	OFF
	ON
3G SENSOR	ON
	OFF
ALL RESET	

* Boldface settings are default settings.

1 i.LINK MODE

- **AUTO** Automatically switches to the camcorder recording/playback format.
- **HDV** Records or plays back HDV format only.
- **DV** Records or plays back DVCAM (DV) format only.

When connecting to the PC, make sure to specify HDV or DV.

When there is no file, "No File" is displayed on this unit.

2 CAM LINK SEL

When CAM LINK is set to [ON], select the type of camcorder-linked operation.

- **FOLLOW** Use this setting when connecting to a camcorder that has no "external REC control" function. The unit follows the camcorder operation.
- **SYNCHRO** Use this setting when connecting to a camcorder that has an "external REC control" function. The unit operates simultaneously with the camcorder.

3 CACHE REC

You can set the cache recording mode to ON or OFF.

- **ON** Cache recording is enabled.
- **OFF** Cache recording is disabled.

4 DELETE

You can delete recorded data or format this unit.

- **LAST SHOT** Delete the most recently recorded folder.
- **ALL** Deletes all folders recorded on this unit.
Data in the user area is not deleted.
- **FORMAT** Returns the hard disk to its default state.
Data in the user area is deleted.

5 TC FORMAT

Follows the DF/NDF of the time code from the camcorder connected to this unit.

- **AUTO** Follow the time code format of the camcorder.
- **NDF** Record the time code in NDF format.
- **DF** Record the time code in DF format.

Note

The default [AUTO] setting is NDF. If time code information from the camcorder is not obtained, this unit is set to the most recent recording setting.

6 DV FILE TYPE

Changes the DV recording format.

- AVI Records video in AVI format.
- RAW DV ... Records video in DV format.

7 SLEEP MODE

You can set the sleep mode to ON or OFF.

- ON Sleep mode is set to ON.
- OFF Sleep mode is set to OFF.

When SLEEP MODE is set to [ON], if the i.LINK cable is disconnected and nothing is displayed for 5 minutes or more, this unit automatically switches to SLEEP status.

To return to normal status, reconnect the i.LINK cable to this unit or turn the POWER switch off and then back on.

Note

In SLEEP MODE, this unit is not completely switched off but continues to run using low power consumption.

8 3G SENSOR

You can set the drop sensor to ON or OFF.

- ON The 3G sensor of this unit tries to detect any drop, and protects the hard disk if it detects a drop. In this case, the icon will blink.
- OFF The 3G sensor does not operate so drop detection is not performed.

Use this setting for recording in conditions of continuous dropping such as on a roller coaster or during sky diving.

Notes

- If a constant vibration is applied to this unit, recording may stop. Recording data is therefore not guaranteed.
- When 3G SENSOR is set to OFF, the recording head is not retracted. This may lead to damage.
- The 3G SENSOR is always set to ON when the power is turned on.
- If the drop detection continues for more than about 14 seconds, recording is stopped.

9 ALL RESET

Restores all default settings.

Recording images from the camcorder to this unit

Images recorded by the camcorder can be recorded onto this unit.

Recording images (POWER switch at the VIDEO side)

The different methods of recording are as follows:

- Recording video simultaneously on this unit and a camcorder
- Recording video on this unit while changing the tape of the camcorder
- Recording video from this unit
- Operating cache recording

- Recording video simultaneously on this unit and a camcorder
 - Connecting to a camcorder with an “external REC control” function (SYNCHRO mode)

When connected to a camcorder that has an external REC control function, this unit can be controlled by the camcorder to record video data simultaneously to the camcorder recording on tape.

- The recording starting point of this unit has an approximately 0.5-second delay in DV recording. When recording the image included the recording starting point of the camcorder, use the cache recording mode.
- Files recorded by this unit include several frames after the recording stopping point on the tape.



- 1 Press the CAM LINK button of this unit and set it to ON.
 - 2 Set the [CAM LINK SEL] setting of this unit to [SYNCHRO].
 - 3 Set the [EXT REC CTRL] setting of the camcorder to [SYNCHRONOUS].
 - 4 Connect the camcorder to this unit via an i.LINK cable.
 - 5 Press the REC START/STOP button of the camcorder to start recording.
- The above Step 3 is for the HVR-V1U/V1N/V1E/V1P only. For details on another camcorder you want to connect to this unit, refer to the operating instructions supplied with that camcorder.
 - For details on the types of camcorder that have an “external REC control” function and on motion detection, refer to the “Guide to supported models and their functions” supplied with this unit.
- Connecting to a camcorder without an “external REC control” function (FOLLOW mode)

When connected to a camcorder that has no external REC control function, this unit regularly checks the status of the camcorder and follows its recording operation.



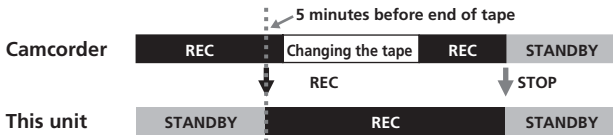
- 1 Press the CAM LINK button of this unit and set it to ON.
- 2 Set the [CAM LINK SEL] setting of this unit to [FOLLOW].
- 3 Connect the camcorder to this unit via an i.LINK cable.
- 4 Press the REC START/STOP button of the camcorder to start recording.

Note

- This unit may lag up to two seconds behind the tape recording/stopping point of the camcorder.
- For details on camcorders that have been tested in FOLLOW mode, refer to “Guide to supported models and their functions” supplied with this unit.

Recording video on this unit while changing the tape of the camcorder

When connected to a camcorder that has an external REC control function, you can record video on this unit only while changing the tape or the camcorder.



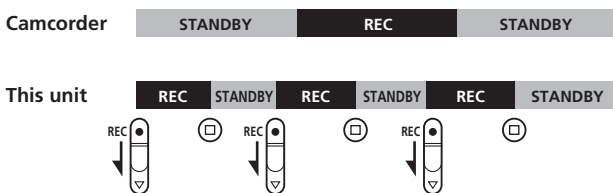
- 1 Press the **CAM LINK** button of this unit and set it to **ON**.
- 2 Set the **[CAM LINK SEL]** setting of this unit to **[SYNCHRO]**.
- 3 Set the **[EXT REC CTRL]** setting of the camcorder to **[RELAY]**.
- 4 Connect the camcorder to this unit via an **i.LINK** cable.
- 5 Press the **REC START/STOP** button of the camcorder to start recording.
 - When the remaining time of the tape is less than 5 minutes, the camcorder sends a command to this unit to start recording.
 - The recording by this unit can be stopped from the camcorder after changing the tape or by pressing the **STOP** button of this unit.
 - The noise of the tape change is recorded.
 - The above Step 3 is for the HVR-V1U/V1N/V1E/V1P only. For details on another camcorder you want to connect to this unit, refer to the operating instructions supplied with that camcorder.
 - For details on camcorders that have an external REC control function and on motion detection, refer to the "Guide to supported models and their functions" supplied with this unit.

Notes

- During **RELAY** recording, the cache recording cannot be operated.
- A 0 KB file is created, but the file cannot be opened because the file does not have a video data. Do not delete the 0 KB file on your computer. If you do, the data in the same folder cannot be played back.
- When changing the tape, the audio may mute on some models of the camcorder. At the recorded part, only video is recorded.

Recording video from this unit

You can use this unit to start or stop recording a video input signal from an i.LINK without linked operation to a device connected via i.LINK.



- 1 Press the **CAM LINK** button of this unit and set it to **OFF**.
- 2 Slide the **REC** switch to start recording.

Cache recording mode

The most recent approximately maximum 14 seconds of video and audio captured by the camcorder are held in a buffer memory and automatically recorded on the hard disk when the recording button is pressed. During this operation, the time code of this unit is recorded.

To set the cache recording ON or OFF

Select **CACHE REC** on the menu screen and select the desired setting **ON** or **OFF**.

- When **CAM LINK [ON]** is set, the data in the buffer memory and the data recorded after starting recording are recorded as separate files (in the same folder). In this case, the time code of this unit is saved in the file recorded by cache recording, and the time code of the camcorder is saved in the file after cache recording.
- When you start recording by sliding the **REC** switch, the data in the buffer memory and the data recorded after starting recording are recorded as the same file. In this case, the time code of this unit is saved in the file.

Notes

- If the **i.LINK** cable is disconnected or the power of the connecting device turned off during recording, recording stops but the data recorded until that point is recorded.
- If the power of this unit is turned off by battery exhaustion or mistakenly sliding the **POWER** switch, the data recorded until the power off is detected is recorded on this unit.
- If the battery pack is removed or the jack of the AC adaptor disconnected during recording, the folder information at the moment the power goes off may not be written correctly.
- The **i.LINK** output stream is cut for about 0.5 seconds when **HDV** recording to the camcorder starts, so when that video is recorded onto this unit, it is in the cut form.
- The interval recording operation of the camcorder is not timed, so operations are not guaranteed.
- Do not switch the audio mode of the camcorder while recording. Depending on the PC application, there may not be any audio.

Playback the image recorded on this unit

To play back video data recorded on this unit, you need to connect this unit to a playback device via an i.LINK cable.

Playback (POWER switch to VIDEO)

The playback method is as follows.

- Standard playback
- Trick playback
- Repeat playback

To select the playback format

Select **i.LINK MODE** on the menu screen and select the desired setting, **AUTO**, **HDV** or **DV**.

For details on selecting the menu, see page 10.

- **AUTO**
Automatically switch the HDV/DV format signal during playback.
- **HDV**
Only play back the part recorded in HDV format.
- **DV**
Only play back the part recorded in DVCAM (DV) format.

Standard playback

In this mode, the recorded file in this unit is output to the i.LINK depending on the type of file.

To play back normally

Display the desired folder name on the LCD screen by pressing **◀◀** or **▶▶**.

Play back the image by pressing the **▷** button on this unit.

- When you pause during playback with this unit, no stream is output.
- During playback, the screen may become momentarily blue or frozen for about 0.5 second at the transition between scenes (when switching files).

Trick playback

When the playback file is output to i.LINK, the file is played at triple the normal speed.

To play back at triple the normal speed

Keep pressing the **◀◀** or **▶▶** button during playback.

To play back in the forward direction, hold the **▶▶** button down. To play back in the backward direction, hold the **◀◀** button down.

- If you continue pressing the fast forward/rewind button during playback, it takes a few seconds to change the playback speed.

Repeat playback

This unit can automatically repeat playback of all or one folder in this unit.

To set repeat mode

Display **↻1** or **↻** on the LCD screen by pressing the REPEAT button on this unit.

- **↻1 REPEAT 1**
The recorded image in the desired folder is repeatedly playback.
- **↻ ALL REPEAT**
ALL REPEAT plays back all recorded images in this unit to the last folder then goes back to the first folder and repeats playback.
- **OFF**
Start playback from the desired folder and stop it after playback of the last folder.



Useful functions in combination with HVR- V1U/V1N/V1E/V1P

Tapeless external REC control

You can start or stop recording video data on this unit by pressing the REC START/STOP button of the HVR-V1U/V1N/V1E/V1P without a tape in the HVR-V1U/V1N/V1E/V1P.

Set the EXT REC CTRL setting of the HVR-V1U/V1N/V1E/V1P as follows.

- REC CTL MODE SYNCHRONOUS or RELAY
- STBY COMMAND Desired setting
- * For details, refer to the operating instructions for the external REC control of the HVR-V1U/V1N/V1E/V1P.

Set this unit as follows

- CAM LINK SEL SYNCHRO
- Press the CAM LINK button to set to CAM LINK [ON].

You can record the time code of the HVR-V1U/V1N/V1E/V1P without a tape in the HVR-V1U/V1N/V1E/V1P.

If you want to record video using the time code of the HVR- V1U/V1N/V1E/V1P, set the time code setting of the HVR- V1U/V1N/V1E/V1P as follows.

Time code value always advances.

- TC MAKE PRESET
- TC RUN FREE RUN

Time code value only advances during recording.

- TC MAKE PRESET
- TC RUN REC RUN

In combination with the time code settings of the HVR-V1U/V1N/V1E/V1P, this unit operates as follows.

TC MAKE	TC RUN	Time code of this unit with a tape in the HVR-V1U/V1N/V1E/V1P	Time code of this unit without a tape in the HVR-V1U/V1N/V1E/V1P
REGENERATE	—	When starting recording on a tape, video is recorded using the time code of the tape base. If the time code of the tape base can not be read, the time code starts from 00:00:00:00.	The internal time code of this unit runs automatically.
PRESET	REC RUN	When starting recording on a tape or this unit, the time code value advances from the preset time code of the HVR-V1U/V1N/V1E/V1P.	When starting recording on this unit, the time code value advances from the preset time code of the HVR-V1U/V1N/V1E/V1P.
	FREE RUN	The preset time code value advances constantly and data is recorded using the data code.	The preset time code value advances constantly and data is recorded using the data code.

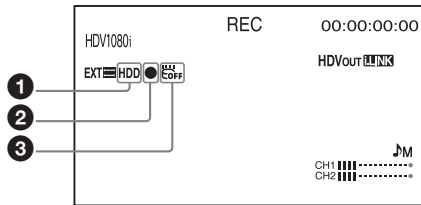
- If you want to use REC RUN with a tape in the HVR-V1U/V1N/V1E/V1P, set the REC CTL MODE of the HVR-V1U/V1N/V1E/V1P to [SYNCHRONOUS], set the CAM LINK SEL of this unit to [SYNCHRO].

Display the operational status of this unit on the HVR-V1U/V1N/V1E/V1P LCD screen

CAMERA mode

– Indicators

- The following information can be displayed on the LCD screen of the HVR-V1U/V1N/V1E/V1P.



① HDD connecting status

This icon is displayed when connecting this unit to the HVR-V1U/V1N/V1E/V1P.

This icon blinks when an error occurs in this unit.

② HDD mode

The same icon as the mode icon of this unit is displayed.


HDD mode	Mode icon
STANDBY	■
REC	●

③ 3G sensor status

The following icon is displayed depending on the status of the 3G sensor of this unit.

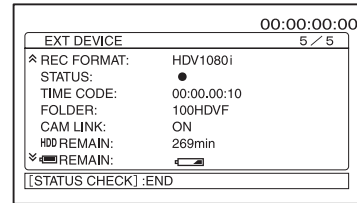
When drop detection is not operating: Icon is off.

During drop detection:  icon blinks.

When drop detection function is OFF:  icon is displayed.

– Status check indicator

- The following information can be displayed on the status check indicator (CAMERA mode) of the HVR-V1U/V1N/V1E/V1P.



REC FORMAT

Displays the recording format of this unit.

STATUS

Displays the status (recording, playback etc.)

TIME CODE

Displays the time code during recording.

FOLDER

Displays the folder name during recording.

CAM LINK

Displays the CAM LINK status of this unit. (When CAM LINK [OFF] is set, you cannot record from the HVR-V1U/V1N/V1E/V1P.)

HDD REMAIN

Displays the HDD remaining recording time.

REMAIN

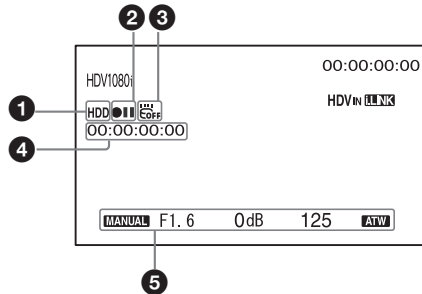
Displays the battery level.

(When connected to an AC adaptor/charger, "AC" is displayed.)

VCR mode

– Indicators

- The following information can be displayed on the LCD screen of the HVR-V1U/V1N/V1E/V1P.



1 HDD connecting status

This icon is displayed when this unit is connected to the HVR-V1U/V1N/V1E/V1P.
This icon blinks when an error occurs in this unit.

2 HDD mode


The same icon as the mode icon of this unit is displayed.


HDD mode	Mode icon
STANDBY	■
PLAY	▶
FF	▶▶
REW	◀◀
PLAY PAUSE	▶
REC	●

3 3G sensor status

The following icon is displayed depending on the status of the 3G sensor of this unit.

When drop detection is not operating: Icon is off.

During drop detection:  icon blinks.

When drop detection function is OFF:  icon is displayed.

4 Time code of the playback signal of this unit

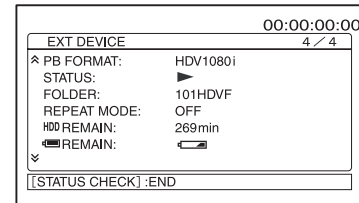
This time code is displayed during playback of a video recorded by this unit.

5 Data code

This data code is displayed during playback of a video recorded by this unit.

– Status check indicator

- The following information can be displayed on the status check indicator (VCR mode) of the HVR-V1U/V1N/V1E/V1P.



PB FORMAT

Displays the playback format of this unit.

STATUS

Displays the status (recording, playback etc.)

FOLDER

Displays the folder name during playback.

REPEAT MODE

Displays the playback mode. ("1" means "repeat 1 folder," "ALL" means "repeat all folders.")

HDD REMAIN

Displays the HDD remaining recording time.

REMAIN

Displays the battery level.

(When this unit is connected to an AC adaptor/charger, "AC" is displayed.)

Using in COMPUTER mode

Connecting to a computer

You can transfer recorded images on this unit as a file in HDV or DV format to a nonlinear editing system or computer.

1 Attach the AC adaptor to this unit.

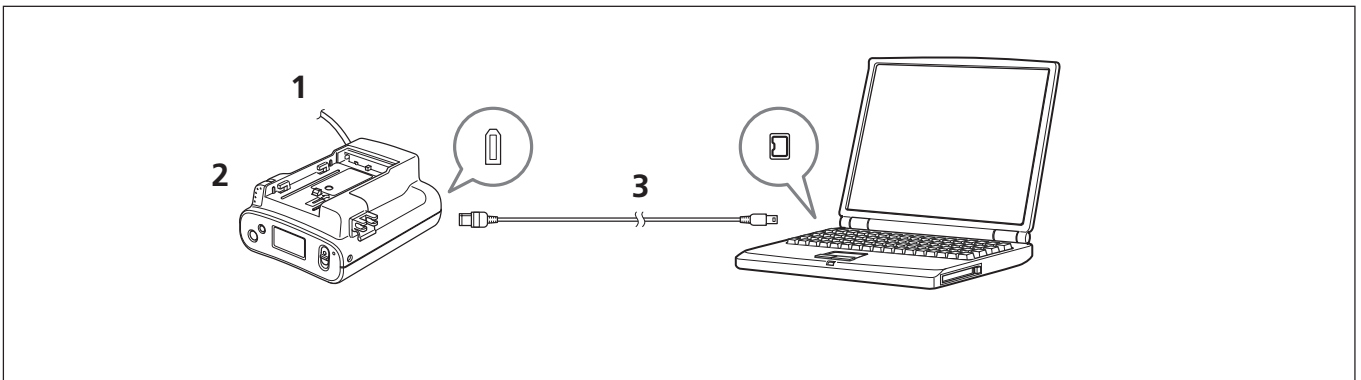
For extended use, using the AC adaptor is recommended. This unit can still be operated even with the battery pack attached.

2 Slide the POWER switch of this unit to COMPUTER.

3 Connect this unit to the computer via the supplied i.LINK cable.

Note

This unit cannot receive power from the computer.



When this unit is set to COMPUTER mode, the following screen is displayed on the LCD screen.



Computer requirements

For Windows users

- OS: Windows 2000 Professional (Service Pack 4 or later)/ Windows XP Home Edition (Service Pack 2 or later)/ Windows XP Professional (Service Pack 2 or later) Standard installation is required. Operation is not assured if the above OS has been upgraded.
- CPU: MMX Pentium 200MHz or faster

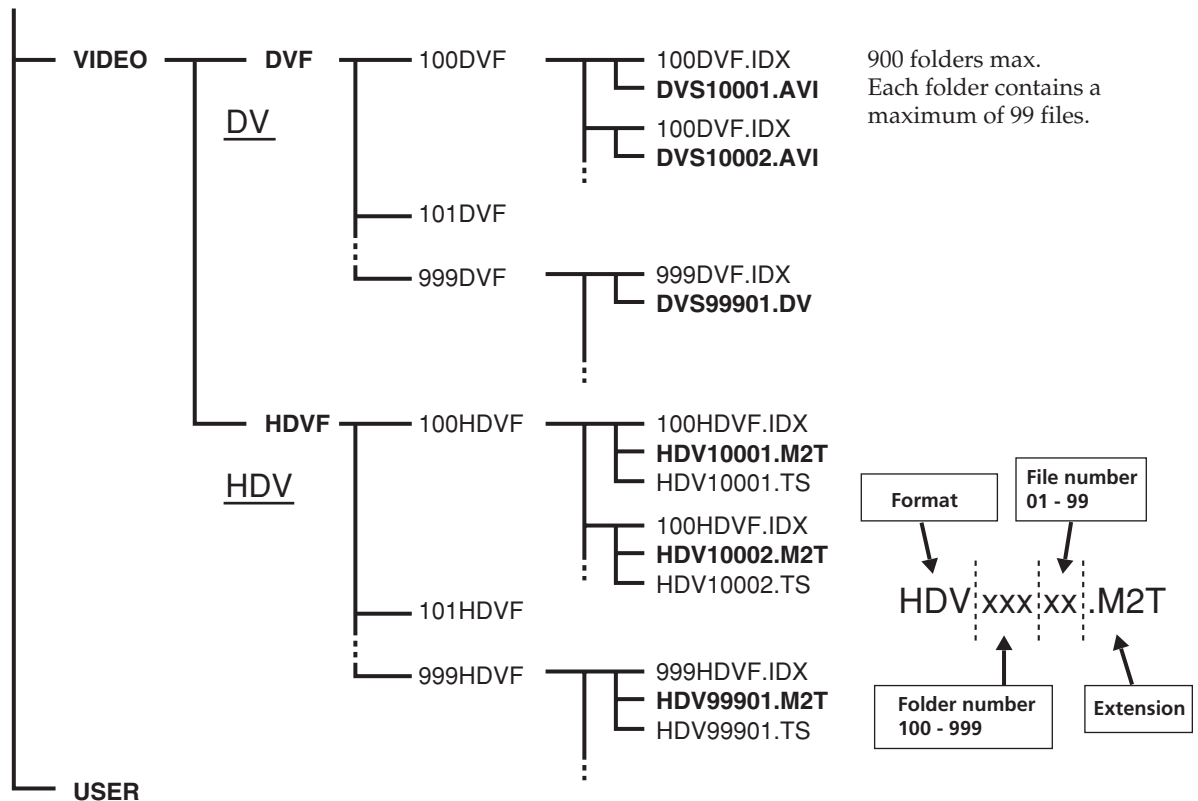
For Macintosh users

- OS: Mac OS X (v10.3 or later)

Folder saving format

Folder organization

The file/folder organization on the HDD of this unit is as follows.



When cache recording, a file of maximum 14 seconds is created at the top of the folder.

Files

The maximum file size is 4 GB. If a file size exceeds 4 GB, that file is automatically divided.

The last number of a new file name is automatically moved up one. When the last number of a file name exceeds 99, a new folder is automatically created and the new file is saved in that folder.

There is a restriction where recording is not possible for approximately the first 7 seconds at the beginning of a new file.

HDVxxxxx.M2T

Data recorded in HDV format
When playback, HDV compatible playback software is needed.

HDVxxxxx.TS

Ancillary data for the data recorded in HDV format
This data is needed for playback with this unit.
After this data is copied to a computer, it is not needed.

DVSxxxxx.AVI

DV format data recorded when DV FILE TYPE is set to AVI

DVSxxxxx.DV

DV format data recorded when DV FILE TYPE is set to RAW DV
For playback on Windows, Raw DV compatible playback software is needed.

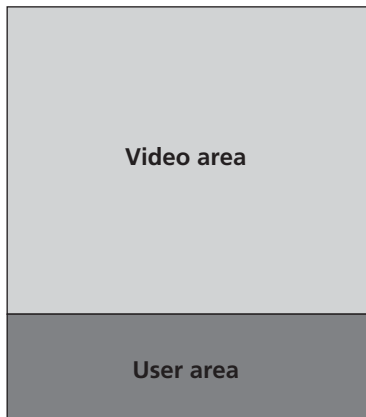
xxxHDVF.IDV or xxxDVF.IDX

Information files of recording data in folders
(number of files, number of frames, starting time code, etc.)

Notes

- A new file will be created in the same folder when a point where the time code is discontinued is detected.
- During HDV recording, a new file will be created at the recording starting point of the tape.
- Segmented files recorded from HDV stream
Some computer applications cannot play back the transitions between segmented files properly. If this happens, join the files using the "M2T File Connection Tool"(*).
* Available soon from the Sony support page

HDD organization



Video area

- Up to 4.5 hours of video data can be recorded.
- Do not save the file.
- Do not transfer data from a computer to this unit in COMPUTER mode.

Press the CAM LINK button of this unit to set it to [ON] and set the CAM LINK SEL setting of the menu to [SYNCHRO]. Set the i.LINK MODE setting of the menu to [HDV] when writing back the data in HDV format. Set the i.LINK MODE setting of the menu to [DV] when writing back the data in DV format.

- Even if you delete or move files in COMPUTER mode, the capacity of the HDD is not increased.
Delete data using this unit or format this unit.

User area

You can use up to about 1 GB of data freely in the user area.

Notes

- Due to the limitations of Windows, this unit may not be detected when normal computer operation is restored after standby or hibernation. For this reason, hibernation is not supported by this unit.
- Due to the specifications of Mac OS X, to disconnect this unit from a Mac with Mac OS X and connect it again, perform the following steps.
- Do not use defragmentation on your computer.

To use a partition again

- 1** To use all the partitions of this unit, restart the computer or use Disk Utility. To use Disk Utility, follow the steps.
- 2** Start Disk Utility (/Applications/Utilities/).
- 3** Click the triangle mark on the left of the hard disk icon to display the hard disk volume and partition name.
- 4** Select one of the two grayed out partition names ("VIDEO" or "USER"). You do not need to select multiple grayed out partition names.
- 5** Select [Mount] from the [Option] menu. The selected name "VIDEO" or "USER" is displayed on the desktop again. (If it is still unmounted, select [Unmount] and then select [Mount] again.)
- 6** Exit Disk Utility.

Trouble shooting

Please check the following before contacting your Sony dealer.

Note in case of repairs

- Some kinds of repair work may require that the hard disk be formatted or replaced. In either case, all data on the hard disk will be deleted. Back-up your data from the hard disk before sending it for repairs. Sony does not guarantee against data being deleted during repair work.
- During repair work, Sony may perform a minimal check of the data on a hard disk in order to verify improvements or the occurrence of defective symptoms. However, Sony never copies or saves the data.

Power sources

Symptom	Cause/Remedy
The camcorder gets warm.	<ul style="list-style-type: none"> • This unit may get warmer while you use it. This is not a malfunction.
The remaining battery time indicator does not indicate the correct time.	<ul style="list-style-type: none"> • The ambient temperature is too high or too low, or the battery pack has not been charged enough. This is not a malfunction. → Fully charge the battery pack again. If the problem persists, the battery pack may be worn out. Replace it with a new one (p. 8). • The indicated time may not be correct in certain circumstances.
The battery pack discharges too quickly.	<ul style="list-style-type: none"> • The ambient temperature is too high or too low, or the battery pack has not been charged enough. This is not a malfunction. → Fully charge the battery pack again. If the problem persists, the battery pack may be worn out. Replace it with a new one (p. 8).

Recording

Symptom	Cause/Remedy
Sliding the REC switch does not record images.	<ul style="list-style-type: none"> • The POWER switch is set to COMPUTER. → Slide the POWER switch to VIDEO (p. 6). • This unit is recording the image you have just shot. → Leave this unit for a while and then slide the REC switch. • This unit is full. → Delete unrequired images. → Format this unit by selecting DELETE and then FORMAT. • The temperature of this unit is extremely high. → Turn off this unit and leave it for a while in a cool place. • The temperature of this unit is extremely low. → Leave this unit for a while with the POWER switch turned on. If you still cannot operate this unit, turn it off and move it to a warm place. Leave this unit there for a while and then turn it back on. • The folder number shows 999 and the file number shows 9999. → Delete unrequired images (p. 11) or format this unit by selecting DELETE and then FORMAT. • You may be unable to record images during drop detection.

Symptom	Cause/Remedy
The ACCESS lamp remains on even when you stop recording.	<ul style="list-style-type: none"> • This unit is recording the image you just shot. → Do not remove the AC adaptor or the battery pack while the lamp is turned on.
Recording stops.	<ul style="list-style-type: none"> • The temperature of this unit is extremely high. → Turn off this unit and leave it for a while in a cool place. • The temperature of this unit is extremely low. → Turn off the unit and take it to a warm place. Leave it there for a while and then turn it back on. • The maximum continuous recordable time is approximately 4,5 hours. • If you keep applying vibration to this unit, recording may stop. • Fragmentation has occurred. → Format this unit by selecting DELETE and then FORMAT.

Connecting a computer

Symptom	Cause/Remedy
An error message appears when you place the supplied CD-ROM in your computer.	<p>→ Set the computer display as follows:</p> <ul style="list-style-type: none"> - 1024 × 768 dots or more, high color (16 bits, 65,000 colors) or more.
The image or sound on this unit cannot be played back correctly.	<ul style="list-style-type: none"> • Depending on the computer you are using, the played back image or sound may stop temporarily, but this does not affect the images or sound copied to your computer. • Playback software is not installed on your computer. → Install playback software on your computer.
The extension of a file is not displayed on your computer.	<p>→ To display the extension, follow the steps below.</p> <ol style="list-style-type: none"> ① In the window folder, click [Tools] → [Folder option...] → [View] tab. ② Under Advanced Settings, uncheck [Hide file extensions for known file types]. ③ Click [OK].

Warning indicators

Self-diagnosis display

When an error occurs the following warning indicators may appear on the LCD screen.

Message	Cause/Corrective Action
A:□□:□□/I:□□:□□/M:□□:□□/ X:□□:□□/□:□□:□□ (Self-diagnosis display)	<p>If an error recurs after you repeat corrective action several times, contact Sony Customer Service or the place of purchase.</p> <p>A:11:□□</p> <ul style="list-style-type: none"> • Cannot read or write to the HDD. → Turn this unit off and then back on. <p>A:19:□□</p> <ul style="list-style-type: none"> • Internal error has occurred. → Turn this unit off and then back on. <p>I:11:□□</p> <ul style="list-style-type: none"> • i.LINK communication error has occurred. → Turn this unit off and then back on. <p>I:92:□□</p> <ul style="list-style-type: none"> • Internal error has occurred. → Turn this unit off and then back on. <p>M:11:□□</p> <ul style="list-style-type: none"> • The recorded image cannot be manipulated. → Turn this unit off and then back on. <p>X:□□:□□</p> <ul style="list-style-type: none"> • Internal error has occurred. → Turn this unit off and then back on. <p>F:12:□□</p> <ul style="list-style-type: none"> • There is a conflict in the HDD logic structure. → Format this unit by selecting DELETE and then FORMAT. If you still cannot operate the unit, contact Sony Customer Service. <p>F:29:□□</p> <ul style="list-style-type: none"> • There is an internal malfunction. → Contact Sony Customer Service.

Notes on using the hard disk drive

Save all your recorded image data

- In the case of your image data being damaged, save all your recorded images. It is recommended that you use this unit or your computer to save the image data on a tape or DVD etc.
- It is recommended that you save your image data periodically after recording.

Do not apply shock or vibration to this unit

- The hard disk of this unit may not be recognized, or recording or playback may become disabled.
- In particular, do not apply shock during recording or playback.
After recording, do not apply vibration or shock to this unit while the ACCESS lamp is lit.

Drop detection

This unit has a drop detection function in order to protect the internal hard disk from shock by dropping. If the unit is dropped or enters a non-gravity state, a blocking noise to protect this unit may also be recorded. If the drop detection repeatedly detects dropping, recording/playback may be stopped.

Notes on battery pack/AC adaptor

- Avoid the following while the ACCESS lamp is lit. Failure to do so may cause malfunction.
 - Removing the battery pack
 - Removing the AC adaptor (while charging with the AC adaptor)
- Always turn off the POWER switch before removing the battery pack or the AC adaptor.

Note on operational temperature

If the temperature of this unit becomes extremely high or extremely low, recording or playback may be disabled in order to protect the unit. In such a case, a message appears on the LCD screen.

Note on using this unit at altitude

Do not turn on this unit in a low-pressure environment (at an altitude of 3,000 m (9,800 feet) or more).
Doing so may damage the hard disk drive of this unit.


Note on disposal/transfer

Even if you format this unit, the data may not be completely deleted from the hard disk. Before transferring this unit to another person, it is recommended that you make it difficult to recover data by, for example, recording all black images on this unit with the lens of the camcorder covered. Before throwing this unit away, it is recommended that you destroy the actual body in order to prevent data recovery from the hard disk.

If you cannot record or play back images, format this unit (FORMAT)

Repeated recording and deleting of images over a long period of time can cause file fragmentation leading to incorrect recording or saving of images.

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.

Notes

- Normally, only one device can be connected to this unit using 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 this 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 i.LINK functions of this unit




For details on how to record data when this unit is connected to a camcorder that has an i.LINK jack, see page 10.

This unit can also be connected to Sony i.LINK-compatible devices other than camcorders (e.g. VAIO computers).

This unit may not be compatible with certain i.LINK video devices such as digital televisions, DVD recorders/players and MICROMV recorders/players even if they are equipped with an i.LINK jack. Before connecting to another device, confirm whether it is HDV/DVCAM (DV) compatible.

For precautions on connecting and the availability of compatible software applications, refer to the operating instructions of the device to be connected.

Notes

- When connecting an i.LINK cable to this unit or a computer, check the direction of the jack. Forcibly inserting the jack may damage the terminal or cause a malfunction. Align the  mark on the i.LINK cable with the  mark next to the  HDV/DV jack before inserting the i.LINK cable.
- Always connect the i.LINK cable to the computer first and then to this unit. Connecting the i.LINK cable to this unit first may cause this unit to malfunction because of static electricity.
- When using an i.LINK cable to connect this unit to a device equipped with an i.LINK jack, switch off the device 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 power cord of the device is connected to the AC outlet, a high-voltage current (8 to 40 V) output from the i.LINK jack of the device will flow into this unit and damage it.
- Before changing the HDV/DV format etc. of the camcorder, disconnect the i.LINK cable. After connecting the i.LINK cable, the video signal may not be recognized correctly.

Required i.LINK cable

Use a Sony i.LINK cable.

i.LINK and  are trademarks of Sony Corporation.

Specifications

System

File system	FAT32
Hard disk	60 GB The capacity is the value when 1 GB equals 1 billion bytes. The actual usable capacity may be slightly less because administrative files etc. are included.
File format	HDV recording MPEG-2TS (.m2t) DVCAM/DV recording AVI-Type1 (.AVI) RAW DV (.DV)
Input signal	
HDV recording/playback	Video: MPEG-2TS Audio: MPEG1 Audio Layer2 Stereo
DVCAM/DV recording/playback	Video: DV embedded Audio: PCM digital (12/16 bit, 32k, 48k)
Recording/playback time	Approx. 270 minutes

General

Power requirement	DC 7.2 V (battery pack) DC 8.4 V (AC adaptor)
Power consumption	2.7 W
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Storage temperature	-20 °C to +60 °C (-4 °F to +140 °F)
Operating humidity	20 % (20 °C) to 90 % (35 °C) (no condensation)
Operating altitude	Maximum 3,000 m (9,843 feet)
Dimensions	Approx. 81 × 45 × 100 mm (w × h × d) (3 1/4 × 1 3/4 × 4 in.)
Mass	Approx. 230 g (8 oz.)
Input/output jack	i.LINK (IEEE1394 6-pin connector S400)
Included items	i.LINK cable (6-pin – 4-pin) 70 cm (1) Operating Instructions (1) Guide to supported models and their functions(1) CD-ROM manual (1) Shoe adaptor (1)
Optional accessories	AC adaptor/charger AC-VQ1050B Battery pack NP-F570/F770/F970

Design and specifications are subject to change without notice.

Precautions

On use and care

- Do not use or store this unit and accessories in the following locations.
 - Anywhere extremely hot or cold. Never leave them exposed to temperatures above 60 °C (140 °F), such as under direct sunlight, near heaters or in a car parked in the sun. They may malfunction or become deformed.
 - Near strong magnetic fields or mechanical vibration. This unit may malfunction.
 - Near strong radio waves or radiation. This unit may not be able to record properly.
 - Near AM receivers and video equipment. Noise may occur.
 - On a sandy beach or anywhere dusty. If sand or dust gets in this unit, it may malfunction. Sometimes this malfunction cannot be repaired.
 - Near windows or outdoors, where the LCD screen may be exposed to direct sunlight. This damages the LCD screen.
 - Anywhere very humid.
- Operate this unit on DC 7.2 V (battery pack) or DC 8.4 V (AC Adaptor).
- For DC or AC operation, use the accessories recommended in these operating instructions.
- Do not let this unit get wet, for example, from rain or sea water. If this unit gets wet, it may malfunction. Sometimes this malfunction cannot be repaired.
- If any solid object or liquid gets inside the casing, unplug this unit and have it checked by a Sony dealer before operating it any further.
- Avoid rough handling, disassembling, modifying, physical shock, or impact such as hammering, dropping or stepping on this unit.
- Keep the POWER switch setting to OFF when you are not using this unit.
- Do not wrap this unit with a towel, for example, and operate it. Doing so might cause heat to build up inside.
- When disconnecting the mains lead, pull it by the plug and not the lead.
- Do not damage the mains lead such as by placing anything heavy on it.
- Keep metal contacts clean.
- If the battery electrolytic liquid has leaked,
 - consult your local authorized Sony service facility.
 - wash off any liquid that may have contacted your skin.
 - if any liquid gets in your eyes, wash with plenty of water and consult a doctor.

■ When not using this unit for a long time

- Use up the battery pack completely before storing it.

LCD screen

- Do not exert excessive pressure on the LCD screen, as it may cause damage.
- If this unit is used in a cold place, a residual image may appear on the LCD screen. This is not a malfunction.
- While using this unit, the back of the LCD screen may heat up. This is not a malfunction.

■ To clean the LCD screen

If fingerprints or dust make the LCD screen dirty, it is recommended you use a soft cloth to clean it. When you use the LCD Cleaning Kit (optional), do not apply the cleaning liquid directly to the LCD screen. Use cleaning paper moistened with the liquid.

On handling the casing

- If the casing is soiled, clean this unit body with a soft cloth lightly moistened with water, and then wipe the casing with a dry soft cloth.
- Avoid the following to avoid damage to the finish.
 - Using chemicals such as thinner, benzene, alcohol, chemical cloths, repellent, insecticide and sunscreen.
 - Handling with above substances on your hands.
 - Leaving the casing in contact with rubber or vinyl objects for a long period of time.

Note on use at high altitude

- Do not switch on this unit in a place which is at low pressure (3,000 m or more above sea-level). Doing so may damage the unit.

Getting the best performance from the battery pack

- If the ambient temperature is low, the battery pack performance deteriorates, reducing the operating time. To maximize the operating time, the following techniques are recommended.
 - Keep the battery pack warm in a pocket, and load it into the unit immediately before shooting.
- During recording or playback, power off whenever this unit is not operating.
- Have enough batteries pack ready to last two or three times the expected shooting duration, and test shoot with them before the session.
- The battery pack is not waterproof. Be careful not to allow it to get wet.

Indication of remaining battery pack capacity

If the battery pack fails even though the indication suggests there is adequate capacity, fully recharge the battery pack. This will correct the remaining capacity indication. However, if the battery pack is used for a long time at high temperature, is left fully charged, or has been very heavily used, the indication may not be correctly restored. In this case, use the indication time as a rough guideline to estimate the remaining capacity.

Battery pack storage

- If the battery pack is not used for a long time, to maintain its performance, it should be fully charged and then fully discharged with this unit about once a year. Remove the battery pack from this unit, and store in a cool dry place.
- To fully discharge the battery pack with this unit, leave it powered on until the battery pack is exhausted.

Battery pack lifetime

- The battery pack has a limited lifetime. As it is repeatedly used over a long time interval, the capacity gradually reduces. When the operating time is much less than the original value, it is time to replace the battery pack.
- The lifetime varies from one individual battery pack to another, depending on the pattern of use, and how it has been stored.

Additional information on this product and answers to frequently asked questions can be found at our Customer Support Website.

<http://www.sony.net/>