SONY

2-514-606-**11**(1)

Digital HD Video Camera Recorder

HVR-Z1U/Z1N

Digital HD Video Camera Recorder

Operating Instructions

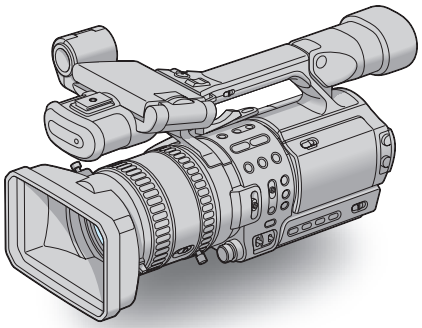
Before operating the unit, please read this manual thoroughly, and retain it for future reference.

HDV 1080i

DVCAM™

Mini DV Digital Video Cassette

InfoLITHIUM™ L SERIES



HVR-Z1U/Z1N

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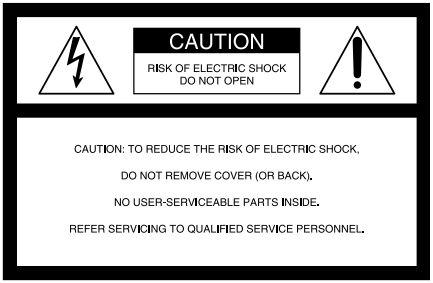
Read this first

WARNING

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



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.

For customers in the U.S.A. and CANADA

HVR-Z1U only
RECYCLING LITHIUM-ION BATTERIES

Lithium-Ion batteries are recyclable.
You can help preserve our environment by returning your used rechargeable batteries to the collection and recycling location nearest you. For more information regarding recycling of rechargeable batteries, call toll free 1-800-822-8837, or visit http://www.rbrc.org/

Caution: Do not handle damaged or leaking Lithium-Ion batteries.

For customers in the U.S.A.

If you have any questions about this product, you may call:
Sony Customer Information Center 1-800-686-SONY (7669)
The number below is for the FCC related matters only.
Regulatory Information

Declaration of Conformity

Trade Name: SONY
Model No.: HVR-Z1U
Responsible Party: Sony Electronics Inc.
Address: 16450 W. Bernardo Dr, San Diego, CA 92127 U.S.A.
Telephone No.: 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.

Owner's Record

The model and serial numbers are located on the bottom. 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-_____

Serial No._____

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 a 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 to an outlet on a circuit different from that into which the receiver is connected.
  – Consult the dealer or an experienced radio/TV technician for help.
  The interface cable supplied 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.

Notes on use

Your camcorder is capable of recording in HDV, DVCAM, and DV formats.
When recording in HDV/DV format, it is recommended to use mini DV cassettes.
When recording in DVCAM format, it is recommended to use mini DVCAM cassettes.

The HDV standards

- Digital high-definition (HD) video signals are recorded and played back on a DV format cassette.
- HDV signals are compressed in MPEG2 format, which is adopted in BS (broadcast satellite) digital and terrestrial digital HDTV broadcastings and in Blu-ray disc recorders.

Tip

- Your camcorder adopts the HDV1080i specification, which utilizes 1080 effective scanning lines, within the HDV standards, and records pictures at the image bit rate of about 25 Mbps. The i.LINK Interface is adopted as the digital interface enabling a digital connection with TVs and personal computers compatible with the HDV format.

Recording

- Before starting to record, test the recording function to make sure the picture and sound are recorded without any problems.
- Compensation for the contents of recordings cannot be provided, even if recording or playback is not possible due to a malfunction of the camcorder, storage media, etc.
- TV color systems differ depending on the country/region. To view your recordings on a TV, you need an NTSC system-based TV.
- Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the copyright laws.

The LCD panel, viewfinder, and lens

- The LCD screen and the viewfinder are manufactured using extremely high-precision technology, so over 99.99% of the pixels are operational for effective use.
  However, there may be some tiny black points and/or bright points (white, red, blue, or green in color) that appear constantly on the LCD screen and the viewfinder.
  These points are normal results of the manufacturing process and do not affect the recording in any way.
- Exposing the LCD screen, the viewfinder, or the lens to direct sunlight for long periods of time may cause

➡*continued*

malfunctions. Be careful when placing the camera near a window or outdoors.
- Do not aim at the sun. Doing so might cause your camcorder to malfunction. Take pictures of the sun only in low light conditions, such as at dusk.

Playing back HDV tapes on other devices

A tape recorded in the HDV format cannot be played back on a device that is not compatible with the HDV format.
Check the contents of tapes by playing them back on this camcorder prior to playing them back on other devices.

Connecting other devices

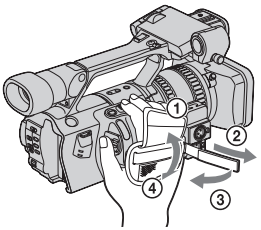
Before connecting your camcorder to other device such as a VCR or a computer with an i.LINK cable, be sure to insert the connector plug in the proper direction. If you insert the connector plug forcibly in the wrong direction, the terminal may be damaged, or this may cause a malfunction of your camcorder.

Using this manual

- The images of the LCD screen and the viewfinder used on this manual are captured using a digital still camera, and thus may appear different from what you see.
- The illustrations of the screen are those of when [50i/60i SEL] on the (OTHERS) menu is set to 60i.

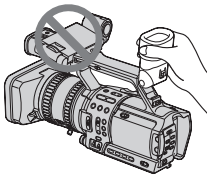
Using the camcorder

- To ensure a good grip, fasten the grip belt as shown in the following illustration.

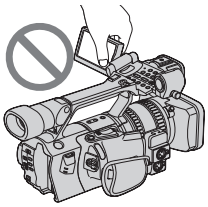


- You can change the language to be used for screen display on your camcorder (p. 19).

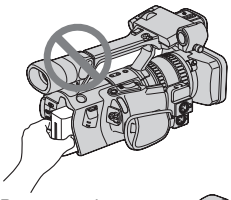
- Do not hold the camcorder by the following parts.



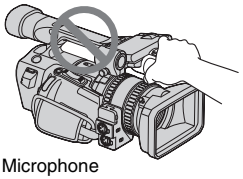
Viewfinder



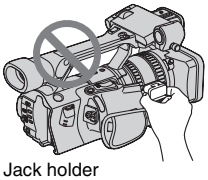
LCD panel



Battery pack



Microphone



Jack holder

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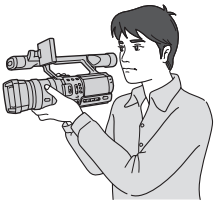
Note on the icons used in this manual

HDV1080i	Features available for the HDV format only.
DVCAM	Features available for the DVCAM format only.
DV SP	Features available for the DV SP format only.
50i	Features available only when [50i/60i SEL] of the menu is set to [50i].
60i	Features available only when [50i/60i SEL] of the menu is set to [60i].



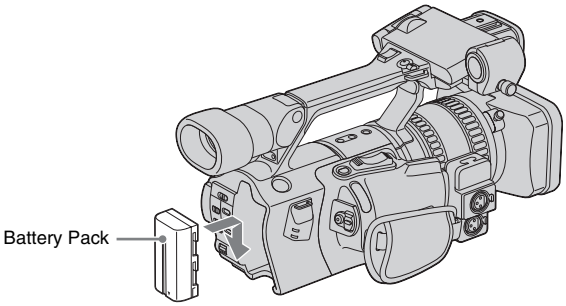
Quick Start Guide

Recording movies

1 Attach the charged battery pack to the camcorder.

To charge the battery, see page 11.

Press the battery pack and slide it down.

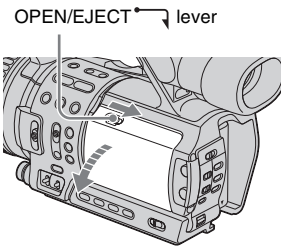


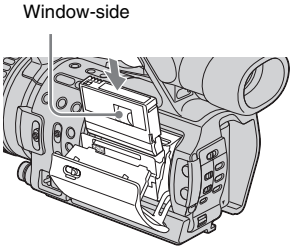
2 Insert a cassette into the camcorder.

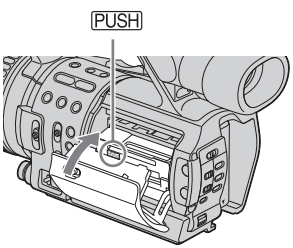
❶ Slide the OPEN/EJECT lever in the direction of the arrow to open the lid.
The cassette compartment comes out automatically.

❷ Insert the cassette with its window-side facing out, then push the center of the back of the cassette.

❸ Press PUSH on the cassette compartment.
Close the cassette lid after the cassette compartment slides back in by itself.







3 Start recording while checking the subject on the LCD screen.

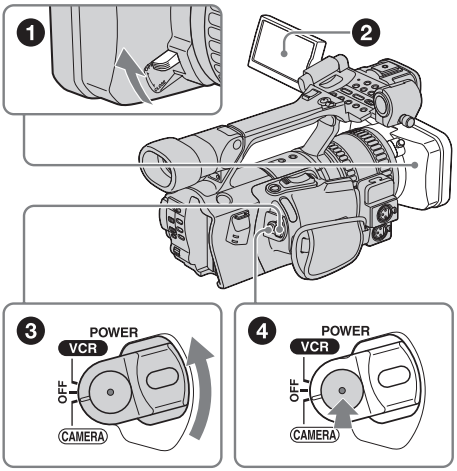
The date and time is not set up in the default setting. To set the date and time, see page 16.
The pictures are recorded in the HDV format in the default setting. To record in the DVCAM or DV format, see page 20.

❶ **Open the hood shutter.**

❷ **Open the LCD panel and adjust the angle.**

❸ **While pressing the green button, set the POWER switch to CAMERA.**

❹ **Press REC START/STOP.**
Recording starts. To change to standby mode, press REC START/STOP again.



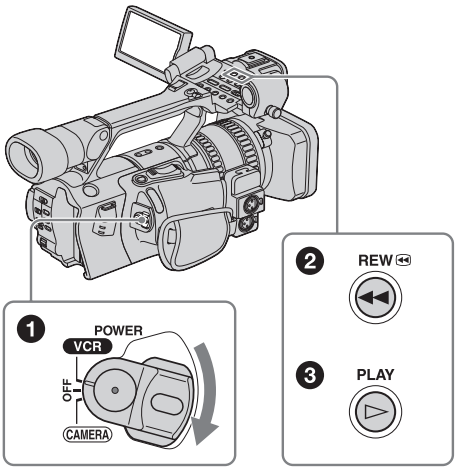
4 View the recorded picture on the LCD screen.

❶ **While pressing the green button, set the POWER switch to VCR.**

❷ **Press ◄◄ (rewind).**

❸ **Press ► (play) to start the playback.**
To stop, press ■ (stop).

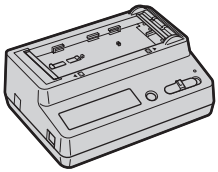
To turn off the power, set the POWER switch to OFF.



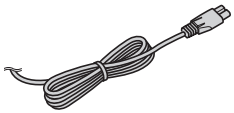
Step 1: Checking supplied items

Make sure you have following items supplied with your camcorder.
The number in parentheses indicates the number of that item supplied.

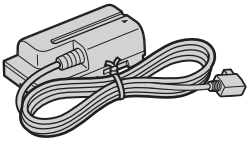
AC Adaptor/charger (1)



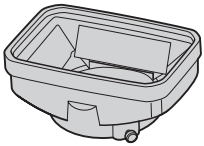
Power cord (1)



Connecting cord (DK-415) (1)



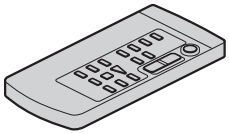
Lens hood (1)
This is attached to your camcorder.



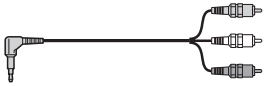
Note
- If you attach an optical filter (optional) or so, remove the lens hood.

Large eyecup (1)
To attach it to your camcorder, see page 16.

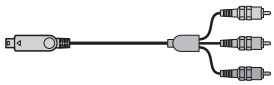
Wireless Remote Commander (1)



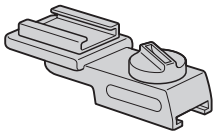
A/V connecting cable (1)



Component video cable (1)



Shoe adaptor (1)
To attach it to your camcorder, see page 130.



Rechargeable battery pack NP-F570 (1)

Size AA (R6) batteries (2)
To insert the batteries in the Remote Commander, see page 131.

Cleaning cassette (1)

Shoulder strap (1)
To attach it to your camcorder, see page 126.

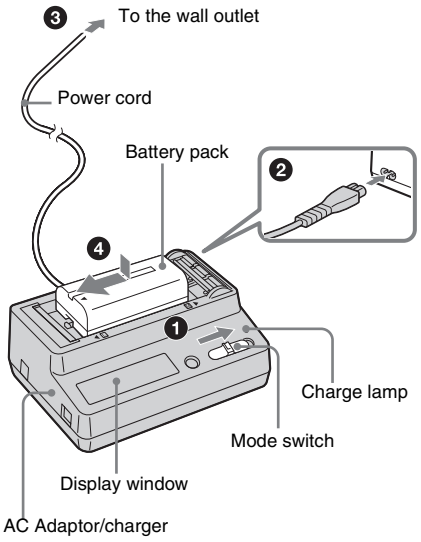
Operating Instructions (This manual) (1)

Step 2: Charging the battery pack

You can charge the battery by attaching the **"InfoLITHIUM" battery pack (L series)** to the AC Adaptor/charger.

Note

- You cannot use batteries other than the "InfoLITHIUM" battery pack (L series) (p. 117).
- Do not short-circuit the DC plug of the AC Adaptor/charger with any metallic objects. This may cause a malfunction.
- Use a nearby wall outlet when using the AC Adaptor/charger. Disconnect the AC Adaptor/charger from the wall outlet immediately if any malfunction occurs.



1 Set the mode switch to CHARGE.

2 Connect the power cord to the AC Adaptor/charger.

3 Connect the power cord to the wall outlet.

4 While pressing the battery back down, slide it in the direction of the arrow.

The charge lamp lights up and charging starts.

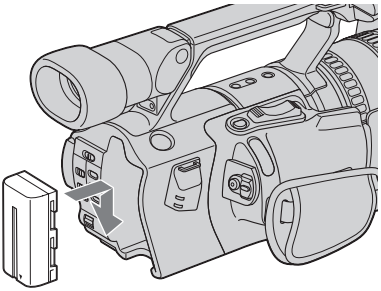
When the battery was successfully charged

The battery mark on the display window will light up in the shape of a full battery ( ) that indicates that the battery has been sufficiently charged for use.

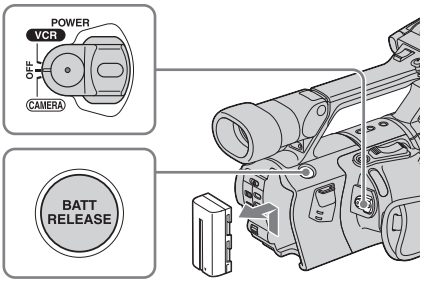
If you continue charging until the CHARGE lamp turns off and FULL appears on the display window, the battery has now been fully charged and can be used for a little longer period. Remove the battery pack from the AC Adaptor/charger.

To attach the battery pack to the camcorder

Press the battery pack and slide it down.



To remove the battery pack

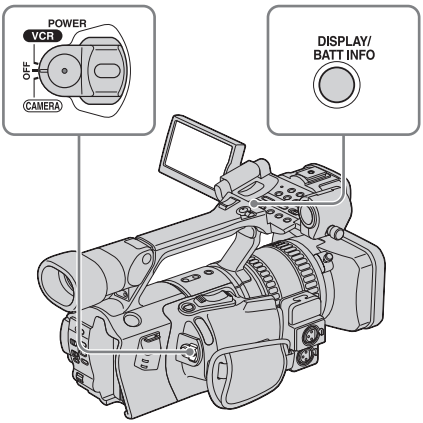


1 Set the POWER switch to OFF.

continued

2 Press BATT RELEASE and slide the battery pack up.

To check the remaining battery – Battery Info

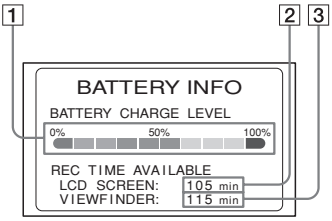


You can check the battery's current charge level and its current remaining recording time when the power is turned off. The remaining recording time in the selected recording format appears.

1 Set the POWER switch to OFF.

2 Open the LCD panel and adjust the angle.

3 Press DISPLAY/BATT INFO.
The battery information appears for about 7 seconds.
Keep the button pressed to view it for about 20 seconds.



1 Battery charge level: Displays approximate remaining amount of power left in the battery pack.

2 Possible recording time using the LCD panel.

3 Possible recording time using the viewfinder.

Charging time

Approximate number of minutes required when you fully charge a fully discharged battery pack using the supplied AC Adaptor/charger at 25°C (77°F). (10 – 30°C (50 – 86°F) recommended.)

Battery pack	Full charge (Practical charge)
NP-F570 (supplied)	145 (85)
NP-F770	230 (170)
NP-F970	310 (250)

Note

- NP-F330/F530/500/510/710 battery packs cannot be used with your camcorder.

Recording time

Approximate number of minutes available when you use a fully charged battery pack at 25°C (77°F).

Recording in the HDV format

Battery pack	Continuous recording time	Typical recording time
NP-F570 (supplied)	105 115 115	55 60 60
NP-F770	220 245 235	120 120 120
NP-F970	335 370 360	185 190 190

Recording in the DVCAM/DV SP format

Battery pack	Continuous recording time	Typical recording time
NP-F570 (supplied)	110 125 120	60 60 60
NP-F770	235 255 250	130 130 130

Battery pack	Continuous recording time	Typical recording time
NP-F970	355	195
	385	200
	380	200

- The top figures show an approximate number of minutes when the LCD BACKLIGHT switch is set to ON, and [VF POWER] is set to [OFF].
- The middle figures show an approximate number of minutes when the LCD BACKLIGHT switch is set to OFF, and [VF POWER] is set to [OFF].
- The bottom figures show an approximate number of minutes when recording with the viewfinder.
- "Typical recording time" means an approximate number of minutes that you can record using external microphones 1 and 2, and you repeatedly start/stop recording, move the POWER switch to change the power mode, and zoom. The actual battery life may be shorter.

Tip

- You can also use NP-F550/F730/F750/F960 battery packs. After charging these battery packs, make a trial recording with them before an actual recording to see the recording time. The recording time varies depending on the environment where the camcorder is used. Press DISPLAY/BATT INFO to display the recording time on the screen.

Playing time

Approximate number of minutes available when you use a fully charged battery pack at 25°C (77°F).

HDV format pictures

Battery pack	LCD panel opened*	LCD panel closed
NP-F570 (supplied)	155	175
NP-F770	325	365
NP-F970	485	550

DVCAM/DV SP format pictures

Battery pack	LCD panel opened*	LCD panel closed
NP-F570 (supplied)	175	200
NP-F770	365	410
NP-F970	550	625

* With the LCD BACKLIGHT switch set to ON.

Note

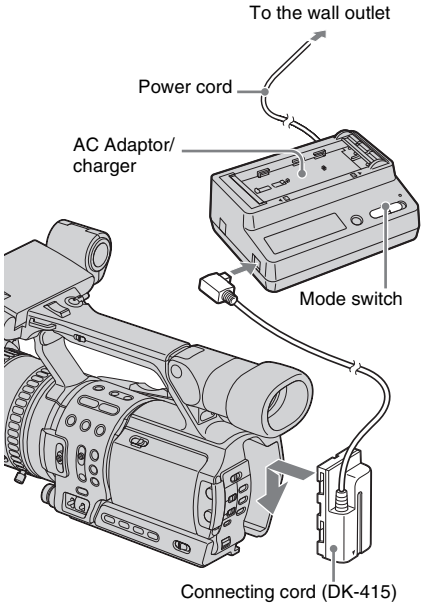
- Figures are those of 60 Hz. They may be slightly longer at 50 Hz.
- The recording and playback time will be shorter when you use your camcorder in low temperature.
- The battery life will be slightly shorter when you use both of the LCD panel and the viewfinder than when you use only the LCD panel.
- The battery information will not be correctly displayed when the battery pack is discharged.

Using an outside power source

You can use the AC Adaptor/charger as the power source when you do not want the battery to run out.

PRECAUTION

Even if your camcorder is turned off, AC power (house current) is still supplied to it while connected to the wall outlet via the AC Adaptor/charger.



➡*continued*

1 **Set the mode switch to VCR/CAMERA.**

No power will be supplied if the mode switch is set to CHARGE.

2 **Attach the connecting cord (DK-415) to the camcorder.**

Press the attaching part of the connecting cord (DK-415), and slide it down.

3 **Connect the connecting cord (DK-415) to the AC Adaptor/charger.**

4 **Connect the power cord to the AC Adaptor/charger.**

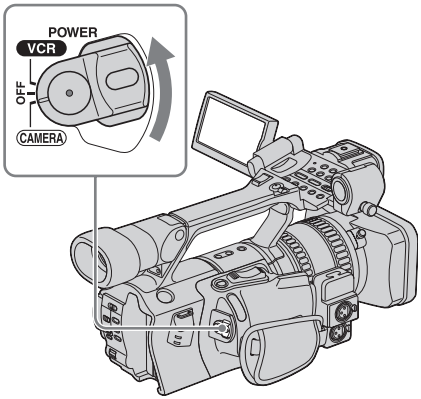
5 **Connect the power cord to the wall outlet.**

Step 3: Turning the power on

You need to set the POWER switch to the respective power mode to record or play back pictures.
When using this camcorder for the first time, the [CLOCK SET] screen appears (p. 16).

While pressing the green button, set the POWER switch.

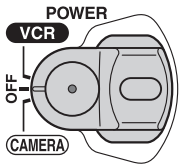
The power turns on.



- CAMERA: To record pictures.
- VCR: To play or edit pictures.

To turn off the power

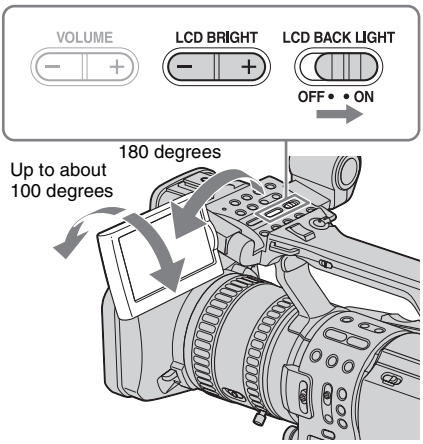
Set the POWER switch to OFF.



Step 4: Adjusting the LCD panel and viewfinder

Adjusting the LCD panel

You can adjust the angle and brightness of the LCD panel to meet various recording situations.
Even when there are obstructions between you and the subject, you can check the subject on the LCD screen during recording by adjusting the angle of the LCD panel.



Open the LCD panel 180 degrees, then rotate it to the desired position.

To adjust the brightness of the LCD screen

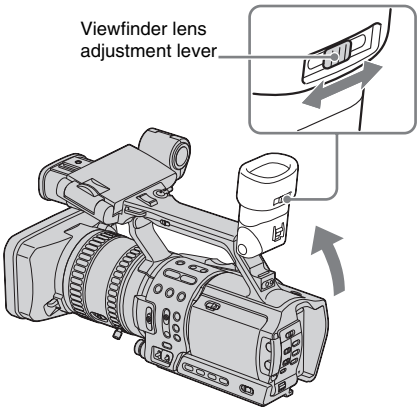
Adjust the brightness by pressing LCD BRIGHT – or +.

Tip

- If you rotate the LCD panel until it faces down, you can close and restore the LCD panel to the original position with the LCD screen facing out.
- If you are using the battery pack for power source, you can select the brightness by setting [LCD BL LEVEL] on the [LCD/VF SET] menu (p. 68).
- When you use your camcorder in bright conditions using the battery pack, set the LCD BACKLIGHT switch to OFF (appears). This position saves battery power.
- Even if you change the brightness of the LCD panel, the brightness of recorded pictures is not affected.

Adjusting the viewfinder

You can view images using the viewfinder when you close the LCD panel. Use the viewfinder when the battery is running out, or when the screen is hard to see.



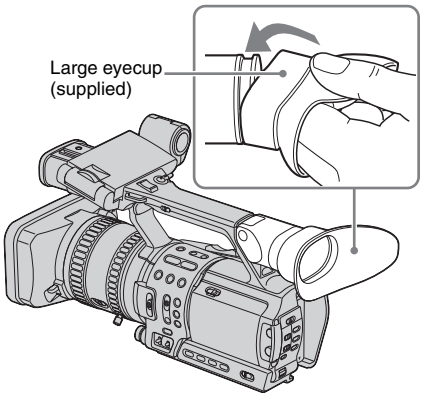
1 Lift up the viewfinder.

2 Adjust the viewfinder lens adjustment lever until the picture is clear.

When the picture in the viewfinder is hard to see

If you cannot see the picture in the viewfinder clearly under bright circumstances, use the supplied large eyecup.

To attach the large eyecup, stretch it a little and align it with the groove of the viewfinder, then slide it up to the end. You can attach the large eyecup facing either the right or left side.



Tip

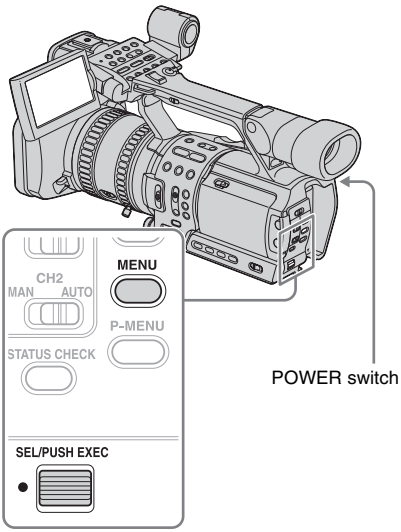
- To select the brightness of the viewfinder backlight when you are using the battery pack, select the (LCD/VF SET) menu, then [VF B.LIGHT] (p. 68).
- To display the picture on both the LCD panel and the viewfinder during recording, select the (LCD/VF SET) menu, [VF POWER], then [ON] (p. 69).
- To display the picture in black and white on the viewfinder, select the (LCD/VF SET) menu, [VF COLOR], then [OFF] (p. 69).

Step 5: Setting the date and time

Set the date and time when using this camcorder for the first time. If you do not set the date and time, the [CLOCK SET] screen appears every time you turn on your camcorder.

Note

- If you do not use your camcorder for about **3 months**, the built-in rechargeable battery gets discharged and the date and time settings may be cleared from the memory. In that case, charge the rechargeable battery (p. 122) and then set the date and time again.

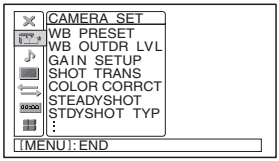


1 **Turn on your camcorder (p. 14).**

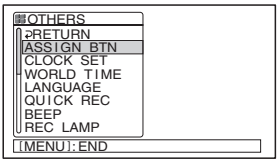
2 **Open the LCD panel and adjust the angle.**

Proceed to step 6 when you set the clock for the first time.

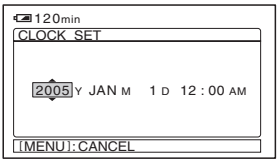
3 Press MENU.



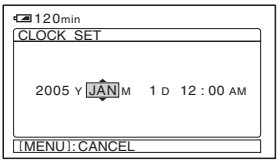
4 Select the (OTHERS) menu by turning the SEL/PUSH EXEC dial, then press the dial.



5 Select [CLOCK SET] by turning the SEL/PUSH EXEC dial, then press the dial.



6 Set [Y] (year) by turning the SEL/PUSH EXEC dial, then press the dial.



You can set any year up to the year 2079.

7 Set [M] (month), [D] (day), hour and minute in the same way as was done in step 6, then press the dial.

When [50i/60i SEL] on the (OTHERS) menu is set to 60i, the clock is displayed in 12-hour display: 12:00:00AM is midnight and 12:00:00PM is midday.

When [50i/60i SEL] on the (OTHERS) menu is set to 50i, the clock is displayed in 24-hour display.

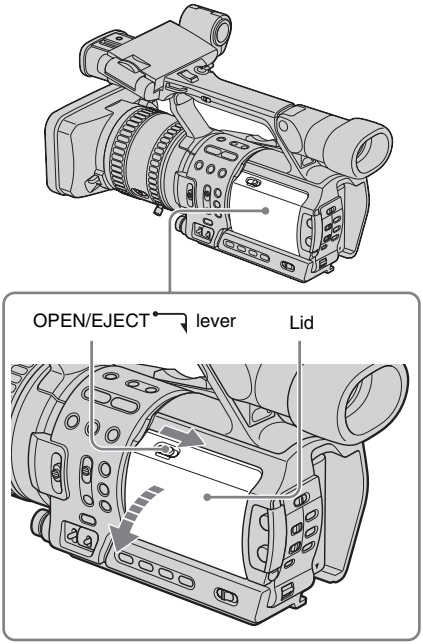
Step 6: Inserting a cassette tape

For the information about the type of cassette you can use with your camcorder, and details on these cassettes (such as write-protection, etc.), see page 114.

Note

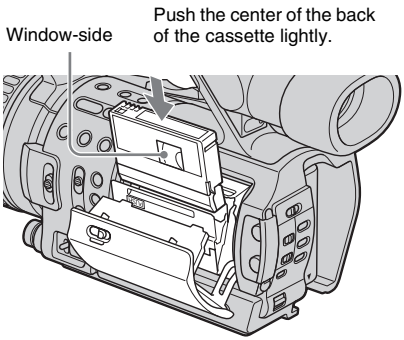
- Do not force the cassette into the compartment. This may cause a malfunction of your camcorder.

1 Slide the OPEN/EJECT lever in the direction of the arrow and open the lid.



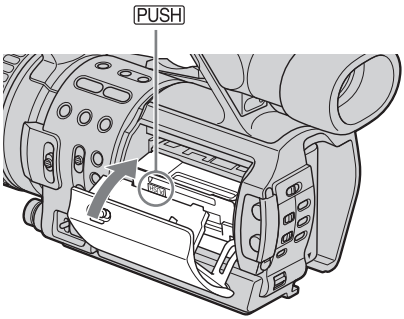
The cassette compartment automatically comes out and opens up.

2 Insert a cassette with its window-side facing out.



3 Press PUSH on the cassette compartment.

The cassette compartment automatically slides back in.



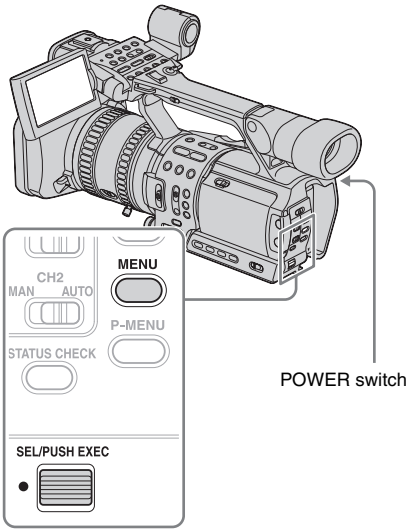
4 Close the lid.

To eject the cassette

1. **Slide the OPEN/EJECT lever in the direction of the arrow and open the lid.** The cassette compartment automatically comes out.
2. **Take out the cassette, then press PUSH.** The cassette compartment automatically slides back in.
3. **Close the lid.**

Step 7: Setting the screen language

You can select the language to be used on the LCD screen.

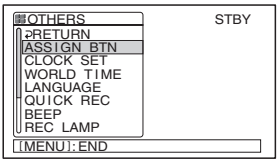


1 **Turn on your camcorder.**

2 **Open the LCD panel and adjust the angle.**

3 **Press MENU.**

4 **Select the (OTHERS) menu by turning the SEL/PUSH EXEC dial, then press the dial.**



5 **Select [LANGUAGE] by turning the SEL/PUSH EXEC dial, then press the dial.**

6 **Select the desired language by turning the SEL/PUSH EXEC dial, then press the dial.**

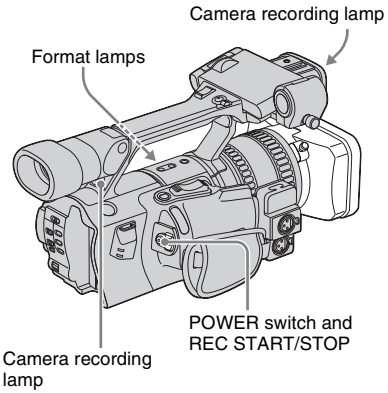
7 **Press MENU to hide the menu screen.**

Tip

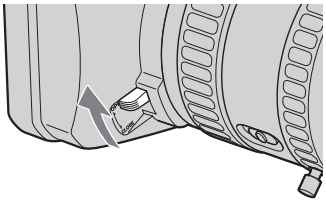
- Your camcorder offers [ENG [SIMP]] (simplified English) for when you cannot find your native tongue among the options.

Recording movies

You can record movies in HDV, DVCAM, and DV formats, in addition to either 50i or 60i system.
Before recording, follow steps 1 to 7 in “Getting started” (p. 10 - p. 19).
Movies will be recorded along with stereo sound.



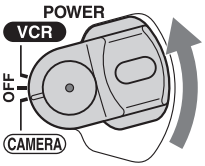
1 Open the shutter of the lens hood.



2 Open the LCD panel and adjust the angle.

3 While pressing the green button, set the POWER switch to CAMERA.

HDV1080i appears on the LCD screen.
The HDV format lamp lights up and your camcorder is set to recording standby after a while.
Your camcorder is set to record using the 1080/60i specification of the HDV format in the default setting.
To record using the 1080/50i specification (PAL system), see “To record using the 1080/50i specification (PAL system)” below.
To record in the DVCAM/DV format, see “To record in the DVCAM/DV format” below.



4 Press REC START/STOP.

Recording starts. [REC] appears on the LCD screen and the Camera recording lamps light up.
Press REC START/STOP again to stop recording.

To record using the 1080/50i specification (PAL system)

Change the setting of [50i/60i SEL] on the (OTHERS) menu (p. 82).
Recording in DVCAM/DV will be done also using the 50i (PAL) system.

To record in the DVCAM/DV format

To record in the DVCAM format

On the (IN/OUT REC) menu, set [REC FORMAT] to [DV], and [REC MODE] to [DVCAM] (p. 71).
When the menu screen is turned off, DVCAM appears on the LCD screen, the DVCAM format lamp lights up, and your camcorder is set to recording standby.

To record in the DV format

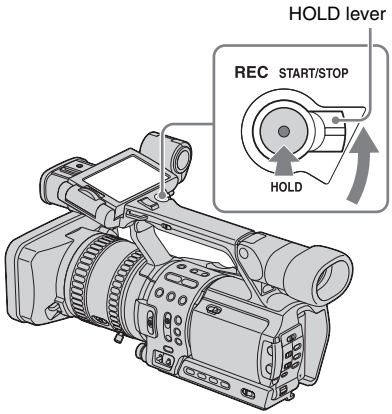
On the (IN/OUT REC) menu, set [REC FORMAT] to [DV], and [REC MODE] to [DV SP] (p. 71).
When the menu screen is turned off, DV SP appears on the LCD screen, the DVCAM format lamp lights up, and your camcorder is set to recording standby.

To turn the power off

Set the POWER switch to OFF.

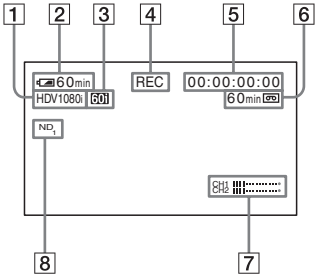
To record from a low-angle

Use the REC START/STOP button on the handle after releasing the HOLD lever.
To view the picture during recording, face the LCD panel or the viewfinder upward, or face the LCD screen down, then close and restore the LCD panel to the original position with the LCD screen facing out.



Indicators displayed during recording

The indicators will not be recorded on the tape. The camera settings data (p. 51) will not be displayed during recording.



1 **Recording format (HDV1080i, DVCAM, or DV SP)**

2 **Remaining battery**
The indicated time may not be correct, depending on the environment where you are using your camcorder. When you open or close the LCD panel, it takes about 1 minute to display the correct remaining battery time.

3 **50i/60i system indicator (p. 82)**

4 **Recording status ([STBY] (standby) or [REC] (recording))**

5 **Time code or user bits**
The time code of this camcorder can be preset. You can reset or preset the time code even during recording (p. 101).

6 **Recording capacity of the tape (p. 80)**

7 **Microphone volume level (p. 37)**

8 **ND filter**
If [ND1] or [ND2] flashes on the screen, activate the ND filter (p. 30).

Note

- Before changing the battery pack, set the POWER switch to OFF.
- When the camcorder is left in recording standby for more than about 3 minutes, your camcorder exits the recording standby mode (the drum stops rotating) to prevent tape wear and battery loss. Since the power does not turn off, you can restart recording by pressing REC START/STOP again. It takes some time to restart recording, but this not a malfunction. When recording in the HDV format, you can shorten the time until recording starts by setting [QUICK REC] on the (OTHERS) menu to [ON] (p. 78).

continued

However, the transition from the last recorded scene may not be smooth.
- The following functions may not work correctly with a tape recorded in the HDV, DVCAM, and DV formats mixed:
  – Date search
  – Index search

Tip

- You can record the color bars on a tape. If you record movies including the color bars, you can adjust the color while observing the color bars when you are viewing the pictures on a TV or monitor. To display the color bars, press BARS. Press BARS again to hide the color bars. There are 2 types of color bar. You can select either one in [BARS TYPE] on the (CAMERA SET) menu (p. 62).
- To ensure smooth transition on a tape from the last recorded scene to the next, note the following.
  – Do not remove the cassette. (The picture will start recording again without an obvious break even if you turn the power off).
  – Do not record pictures in the HDV, DVCAM, and DV formats on the same tape.
  – Do not record pictures in the system of 50i and 60i on the same tape.
- You can superimpose the time and date on the picture by setting [DATE REC] on the (OTHERS) menu (p. 81). The time and date are always displayed on the screen during recording.
- The recording time, date, and the camera settings data are recorded automatically on the tape without being displayed on the screen. You can view this information during playback by pressing DATA CODE (p. 51).
- To display the time data, press TC/U-BIT (p. 103).
- To attach an external microphone (optional), see page (p. 38).

Usable cassettes

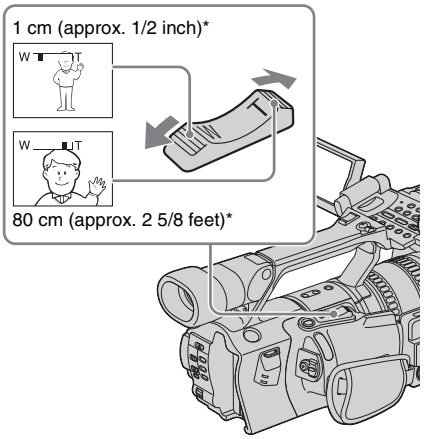
When recording in HDV/DV format, it is recommended that you use mini DV cassettes.
When recording in DVCAM format, it is recommended that you use mini DVCAM cassettes.

Note

- The transition from the last recorded scene to the next may not be smooth with the [DV SP] setting.
- You cannot record in the LP mode of the DV format.
- If you use a mini DV cassette when [REC MODE] is set to [DVCAM], the possible recording time will be 1/3 shorter than that indicated on the tape.

Using zoom

Zoom levers are mounted on the camera itself and on the handle.
Occasional use of the zoom is effective, but use it sparingly for the best results.



* The minimum distance required between your camcorder and the subject to get a sharp focus with that side of the lever.

1 Set the ZOOM switch to LEVER/ REMOTE.

2 Press the power zoom lever slightly for a slower zoom. Press it further for a faster zoom.

To record a wider range of view

Press the W side of the power zoom lever. The subject appears farther away (Wide angle).

To record a closer view

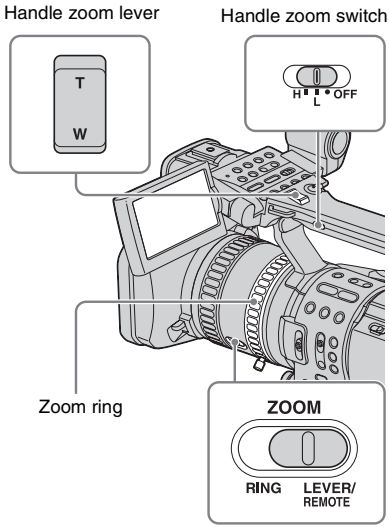
Press the T side of the power zoom lever. The subject appears closer (Telephoto).

Tip

- You can display the zoomed position with a number or a bar display. Select [BAR] or [NUMBER] in [ZOOM DISPLAY] on the (OTHERS) menu (p. 80). The zoom position is displayed with a bar display in the default setting.

Using the handle zoom

You can adjust the zoom speed with the handle zoom switch when using the handle zoom lever.



1 Set the ZOOM switch to LEVER/ REMOTE.

2 Set the handle zoom switch to H (high) or L (low).

You can set the zoom speed of H or L of the handle zoom lever in [HANDLE ZOOM] on the (CAMERA SET) menu. In the default setting, [H] is set to 6, and [L] is set to 3 (p. 62).

3 Press the handle zoom lever to zoom in or out.

Note

- You cannot adjust the zoom speed by pressing the handle zoom lever. Change the zoom speed by setting [HANDLE ZOOM] (p. 62).
- You cannot use the handle zoom lever when the handle zoom switch is set to OFF.
- You cannot change the zoom speed of the power zoom lever on the camera itself by switching the handle zoom switch.

Using the zoom ring

You can zoom at the desired speed. Fine adjustment is also possible.

1 Set the ZOOM switch to RING.

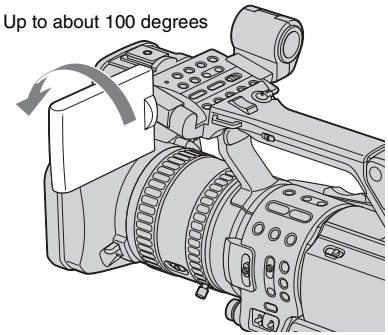
2 Rotate the zoom ring to zoom.

Note

- Rotate the zoom ring at an appropriate speed. Zooming may not be able to catch up the rotating speed of the ring if it is rotated too fast.
- When you zoom using the Remote Commander, set the ZOOM switch to LEVER/REMOTE.
- Zoomed position and picture angle change when the ZOOM switch is switched from LEVER/REMOTE to RING.
- If you rotate the zoom ring fast, motor noise will become louder as the zoom motor rotates at high speeds. If the motor noise is so loud that can be recorded, use the zoom lever or the Remote Commander.

Recording in mirror mode

You can turn the LCD panel towards the subject so that you and your subject can share the image being recorded. You can also utilize this function when recording yourself, or to keep the attention of small children attracted to the camcorder while you record them.



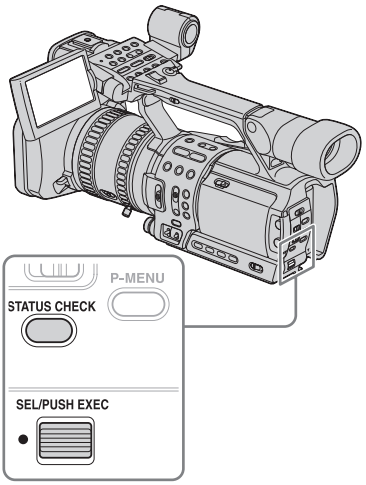
Open the LCD panel 180 degrees, then rotate it towards the subject until it clicks.

A mirror-image of the subject appears on the LCD screen, but the picture will be normal when recorded.

Displaying the recording setup information – Status check

You can check the setup value of the following items in the standby mode or during recording.

- Audio setup such as microphone volume level (p. 37)
- Output setup ([COMPONENT], [i.LINK CONV], and [DOWN CONVERT] settings) (p. 73)
- Functions assigned to the ASSIGN buttons (p. 86)
- CAMERA setting
- Picture profile setup (p. 34)



1 **Press STATUS CHECK.**

2 **Turn the SEL/PUSH EXEC dial to display the desired item.**

Each time you turn the dial, the items appear in the following order:
AUDIO → OUTPUT → ASSIGN → CAMERA → PICT. PROFILE

To turn off the display of the recording setup information

Press STATUS CHECK.

Note

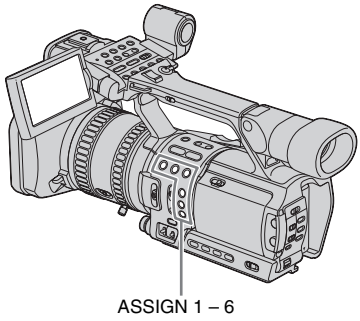
- Information of the picture profile setup does not appear when it is set to [OFF].

Adjusting the exposure

The exposure is adjusted automatically in the default setting.
If you want to record brighter or darker pictures than those of the auto exposure adjustment, use the manual adjustment function (p. 28), or customize the picture quality by using the PICTURE PROFILE function (p. 34).

Adjusting the exposure for backlit subjects

When your subject has its back to the sun or other light, you can adjust the exposure to prevent the subject from becoming shadowed.
Assign the BACK LIGHT function to one of the ASSIGN buttons in advance. See page 86 for details on how to assign a function.



Press the ASSIGN button assigned to the BACK LIGHT function.

appears.
To cancel the back light function, press the button again.

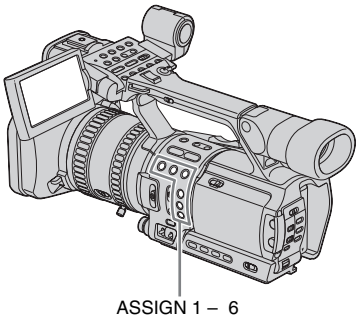
➡ *continued*

Note

- The back light function is canceled when you press the ASSIGN button assigned to SPOTLIGHT.
- You cannot use the back light function if 2 or more items out of iris, gain, and shutter speed are adjusted manually.

Recording the subject lit by strong light – SPOTLIGHT

When the subject is lit by strong light, such as in a theater, use the spotlight function to prevent people's faces from appearing excessively white.
Assign the SPOTLIGHT function to one of the ASSIGN buttons in advance. See page 86 for details on how to assign a function.



During recording or in the standby mode, press the ASSIGN button assigned to the SPOTLIGHT function.

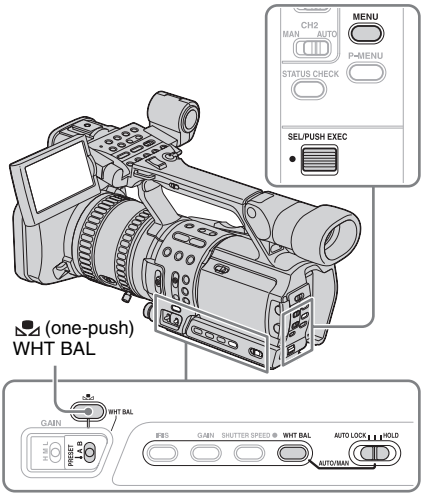
appears.
To cancel the spotlight function, press the button again.

Note

- The spotlight function is canceled when you press the ASSIGN button assigned to BACK LIGHT.
- You cannot use the spotlight function if 2 or more items out of iris, gain, and shutter speed are adjusted manually.

Adjusting the white balance

You can adjust the white balance according to the light of the recording environment. The white balance adjustment data for 2 different recording conditions can be set up and memorized separately in memory A and B. During recording, you can recall the setup data from the memory with the WHT BAL (white balance) switch. The setup data will be retained for about 3 months as long as it is not readjusted even if the power is disconnected.



1 During recording or in the standby mode, set the AUTO LOCK switch to the center position to release the auto lock mode.

2 Press WHT BAL.

3 Set the WHT BAL switch to A or B.

4 Shoot a white subject such as a piece of paper filling the entire screen under

the same lighting condition as that of the subject.

5 Press (one-push) WHT BAL.

A or B flashes quickly.
When the white balance is adjusted, A or B lights up and the adjustment data is memorized.

To recall adjustment data from the memory

1 During recording or in the standby mode, set the AUTO LOCK switch to the center position to release the auto lock mode.

2 Set the WHT BAL switch to A or B.

3 Press WHT BAL.
The white balance is set to the recalled adjustment.

Note

- Avoid subjecting your camcorder to mechanical shock while A or B is flashing.
- If A or B does not change from flashing to lit steadily, your camcorder is unable to set up the white balance. In this case, use the preset or automatic white balance.

To use the preset white balance

Your camcorder has the preset white balance values for indoor recording and outdoor recording. In addition, you can adjust the color temperature ranging in ±7 steps from 5800K for outdoor recording (p. 58). A step is equivalent to about 500K.

1 During recording or in the standby mode, set the AUTO LOCK switch to the center position to release the auto lock mode.

2 Press MENU.

3 Select the (CAMERA SET) menu by turning the SEL/PUSH EXEC dial, then press the dial.

4 Select [WB PRESET] by turning the SEL/PUSH EXEC dial, then press the dial.

5 Select the desired item by turning the SEL/PUSH EXEC dial, then press the dial.

Item	Recording scene
[OUTDOOR] ( )	• general night views, neon signs, or fireworks • sunset, sunrise • under daylight fluorescent lamps
[INDOOR] ( )	• at party or in studios where lighting conditions change quickly • under video lamps such as those in a studio, under sodium lamps, mercury lamps, or warm white fluorescent lamps

It is set to [OUTDOOR] in the default setting.

6 Press MENU to hide the menu screen.

7 Set the WHT BAL switch to PRESET.

8 Press WHT BAL.
The white balance is set to the selected setting.

Tip

- When [OUTDOOR] is selected, you can adjust the white balance value for outdoor recording in [WB OUTDR LVL] on the (CAMERA SET) menu (p. 58). You can assign this function to one of the ASSIGN buttons (p. 86).

To restore the automatic white balance

Press WHT BAL, or set the AUTO LOCK switch to AUTO LOCK.

Note

- If you set the AUTO LOCK switch to AUTO LOCK, other manually adjusted items (iris, gain, shutter speed) also become temporarily automatic.

Recording using manual adjustments

You can manually adjust the iris, gain, etc. according to the brightness of the recording scene or in order to obtain desired effects. Adjust the iris, gain, shutter speed, and white balance after setting the AUTO LOCK switch to the center position to release the auto lock mode.
Depending on the position of the AUTO LOCK switch, you can hold or release the settings of these functions.

Position	Purpose
AUTO LOCK	To adjust automatically.
Center (to release the auto lock mode)	To adjust manually.
HOLD	Select this position after adjusting the settings manually to retain them.

See page 26 for details on how to adjust the white balance.

Note

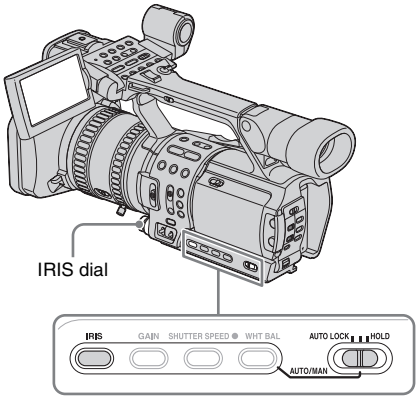
- If you want to set the exposure intentionally to other than a proper level, adjust the iris, gain, and shutter speed manually.
- If you adjust only one of either iris, shutter speed, or gain manually, you can record with iris priority, shutter speed priority, or gain priority, respectively.

Tip

- To adjust the brightness of pictures, set all of the iris, gain, and shutter speed to the manual adjustment mode, then rotate the iris dial.

Adjusting the iris

You can manually adjust the light volume entering the lens.
As the iris is opened (smaller aperture values), the light volume increases. The range of focus narrows and only the subject appears in sharp focus.
As the iris is closed (larger aperture values), the light volume decreases and the range of focus widens.



1 During recording or in the standby mode, set the AUTO LOCK switch to the center position to release the auto lock mode.

2 Press IRIS.

The current aperture value (F) appears.

3 Rotate the IRIS dial to a desired aperture value.

The aperture value (F) varies from F1.6 to F11, and Close, and the corresponding value appears.

To restore automatic adjustment

Press IRIS, or set the AUTO LOCK switch to AUTO LOCK.

Note

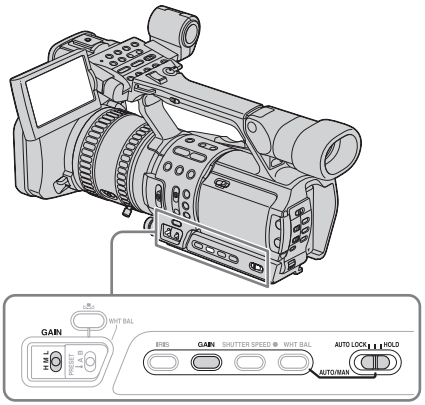
- If you set the AUTO LOCK switch to AUTO LOCK, other manually adjusted items (gain, shutter speed, white balance) also become temporarily automatic.
- As you shift the zoom from W (wide) to T (telephoto), the aperture value varies from F1.6 to F2.8.

Tip

- You can select the rotation direction of the iris dial with [IRIS DIAL] on the (OTHERS) menu (p. 79).
- The iris has an important effect on the "depth of field," that is, the focused range. An open iris makes the depth of field shallower (shorter focused range), and a closed iris makes the depth of field deeper (longer focused range). Use the iris effectively according to your purpose of recording.

Adjusting the gain

Adjust the gain manually when shooting blackish or dark objects if you do not want the AGC (auto gain control) to be activated.



1 During recording or in the standby mode, set the AUTO LOCK switch to the center position to release the auto lock mode.

2 Press GAIN.

The current gain value appears.

3 Set the GAIN switch to the desired position.

3 gain levels (H, M, L) are available.
You can set the value for the respective positions with [GAIN SETUP] on the (CAMERA SET) menu (p. 58).
The default settings for each position are 18 dB (H), 9 dB (M) and 0 dB (L).
The larger the number, the greater the gain.

To restore automatic adjustment

Press GAIN, or set the AUTO LOCK switch to AUTO LOCK.

Note

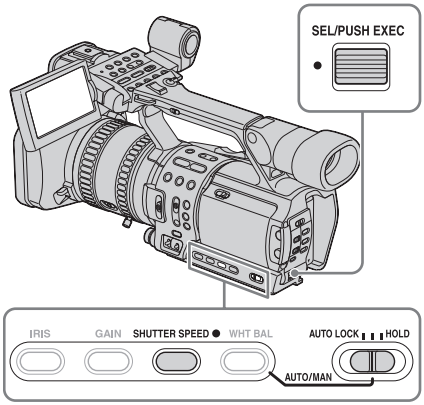
- If you set the AUTO LOCK switch to AUTO LOCK, other manually adjusted items (iris, shutter speed, white balance) also become temporarily automatic.

Tip

- You can increase the gain level up to about 36 dB by using Hyper-gain (p. 87).

Adjusting the shutter speed

You can manually adjust and fix the shutter speed for your convenience. Depending on the shutter speed, you can make the subject look still, or on the contrary, emphasize the fluidity of movement.



1 During recording or in the standby mode, set the AUTO LOCK switch to the center position to release the auto lock mode.

2 Press SHUTTER SPEED.

3 Adjust the shutter speed by turning the SEL/PUSH EXEC dial.

When 60i is selected in [50i/60i SEL] on the (OTHERS) menu, you can select a shutter speed between 1/4 second and 1/10000 second.
When 50i is selected in [50i/60i SEL], you can select a shutter speed between 1/3 second and 1/10000 second.
The selected shutter speed appears on the screen. For example, if you select 1/100 second, [100] appears. The larger the number that appears on the screen, the faster the shutter speed. The smaller the number that appears on the screen, the slower the shutter speed.

To restore automatic adjustment

Press SHUTTER SPEED, or set the AUTO LOCK switch to AUTO LOCK.

Note

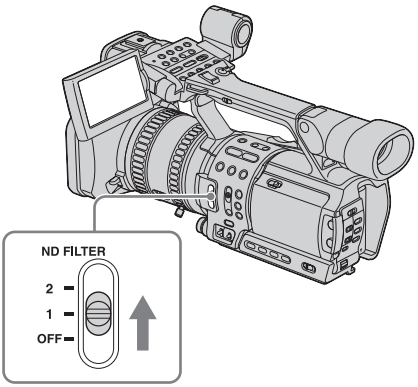
- If you set the AUTO LOCK switch to AUTO LOCK, other manually adjusted items (iris, gain, white balance) also become temporarily automatic.

Tip

- It is difficult to focus automatically at a lower shutter speed. Manual focusing with your camcorder attached to a tripod is recommended.
- The picture may flicker or change colors under fluorescent lamps, sodium lamps, or mercury lamps.

Adjusting the volume of light – ND FILTER

You can record the subject clearly by using the ND filter when the recording environment is too bright.
There are 2 levels of ND filter setting. ND filter 1 reduces the volume of light to about 1/6, and ND filter 2 to about 1/32.



If [ND1] or [ND2] flashes in the standby mode, set the ND FILTER switch to the respective position.

If [ND1] flashes
Set the ND FILTER switch to 1 to turn on [ND1].

If [ND2] flashes
Set the ND FILTER switch to 2 to turn on [ND2].

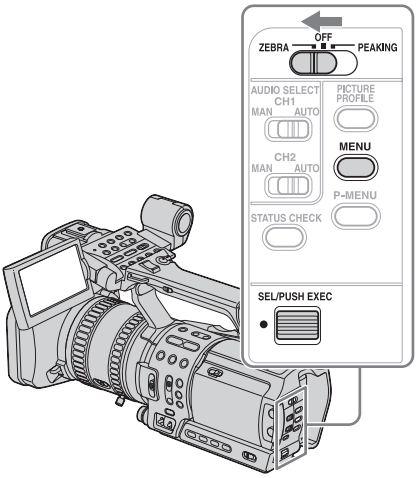
If [ND OFF] flashes
Set the ND FILTER switch to OFF to turn off the indicator.

Note
- If you move the ND FILTER switch during recording, the picture and sound may be distorted.
- If you adjust the iris manually, no ND filter indicator will appear even if the ND filter should be activated.

Tip
- If you close the iris extensively when recording a bright subject, diffraction may occur, resulting in a fuzzy focus. (This is a common phenomenon with video cameras.) The ND filter suppresses this phenomenon and gives better recording results.

Displaying the zebra pattern to adjust the brightness

If there is a part of the screen where brightness is over a certain level, the part may appear excessively white when played back. By displaying the zebra pattern on such a part, you can be reminded to adjust the brightness before recording.
Select the brightness level to display the zebra pattern in the menu setting.



1 **During recording or in the standby mode, press MENU.**

2 **Select the (CAMERA SET) menu by turning the SEL/PUSH EXEC dial, then press the dial.**

3 **Select [ZEBRA LEVEL] by turning the SEL/PUSH EXEC dial, then press the dial.**

➡ *continued*

4 Select the desired level by turning the SEL/PUSH EXEC dial, then press the dial.

Select a value from [70] to [100] or [100+]. If you select [70], the zebra pattern appears at the part of 70±5 % of the brilliance signal.
If you select [100+], the zebra pattern appears at all areas of the brilliance signal over 100 %.
The default setting is [100+].

5 Press MENU to hide the menu screen.

6 Set the ZEBRA/PEAKING switch to ZEBRA.

The zebra pattern will appear.

To hide the zebra pattern

Set the ZEBRA/PEAKING switch to OFF.

Note

- The zebra pattern is not recorded on the tape.
- You cannot use the zebra pattern when the peaking function is activated (p. 34).

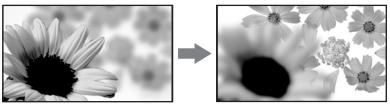
Adjusting the focus

The focus is adjusted automatically in the default setting.

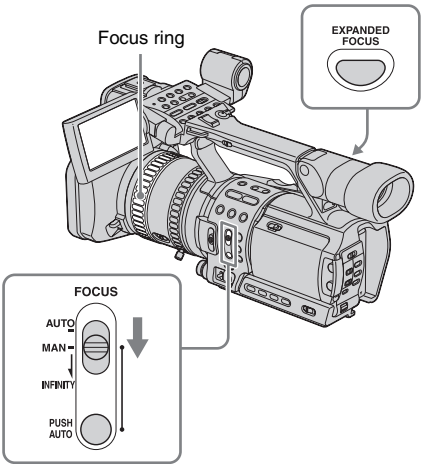
Adjusting the focus manually

You can adjust the focus manually according to the recording conditions.
Use this function in the following cases.

– To record a subject behind a window covered with raindrops.
– To record horizontal stripes.
– To record a subject with little contrast between the subject and its background.
– When you want to focus on a subject in the background.



– To record a stationary subject using a tripod.



1 During recording or in the standby mode, set the FOCUS switch to MAN (manual).

Ⓕ appears.

2 Rotate the focus ring and adjust the focus.

Ⓕ changes to ▲ when the focus cannot be adjusted any farther. Ⓕ changes to 👤 when the focus cannot be adjusted any closer.

Tips for focusing manually

- It is easier to focus on the subject when you use the zoom function. Move the power zoom lever towards T (telephoto) to adjust the focus, and then, towards W (wide angle) to adjust the zoom for recording.
- When you want to record a close-up image of a subject, move the power zoom lever towards W (wide angle) to fully magnify the image, then adjust the focus.

To focus on a distant subject

Record the subject with the FOCUS switch slid down to INFINITY.

▲ appears.

If you release the switch, it returns to automatic focusing.

Use this function to record a distant subject when a close subject is focused using automatic focusing.

To use the expanded focus

Press EXPANDED FOCUS.

[EXPANDED FOCUS] appears and the center of the screen is magnified by about 2 times. It will be easier to confirm the focus setting during manual focusing. The screen returns to the original size after about 5 seconds.

As long as the focus ring is rotated, the image remains magnified. The image returns to the original size in about 2 seconds after you release the ring, or when you press REC START/STOP.

To adjust the focus automatically

Set the FOCUS switch to AUTO.

To focus automatically temporarily

Record the subject with PUSH AUTO pressed. If you release the button, the setting returns to manual focusing.

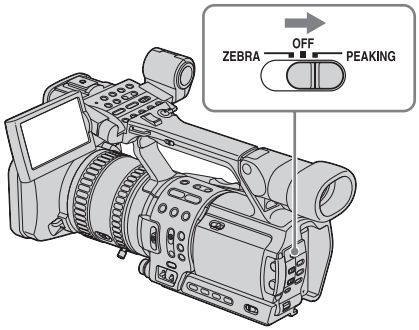
Use this function to shift the focus from one subject to another. The scenes will transition smoothly.

Tip

- The focal distance information (for when it is dark and hard to adjust the focus) appears for about 3 seconds in the following cases. (It will not be displayed correctly if you are using a conversion lens (optional).)
  – When the focus mode is switched from automatic to manual.
  – When you rotate the focus ring.
- If [EXP. FOCUS] on the (OTHERS) menu is set to [MANUAL OFF], the screen will remain expanded even a certain time have passed after you press EXPANDED FOCUS. The image returns to the original size when you press REC START/STOP.
- When [AF ASSIST] on the (CAMERA) menu is set to [ON], you can focus manually by rotating the focus ring during auto focusing (p. 61).

Enhancing the outline to focus – PEAKING

You can enhance the outline of the image on the screen for easier focusing.



During recording or in standby mode, set the ZEBRA/PEAKING switch to PEAKING.

To cancel peaking

Set the ZEBRA/PEAKING switch to OFF.

Note

- The peaking is not recorded on the tape.
- You cannot use the peaking function when the zebra pattern is activated (p. 31).

Tip

- For easier focusing, use peaking together with the expanded focus.
- You can change peaking color and level in [PEAKING] on the (CAMERA SET) menu (p. 60).

Customizing the picture quality – PICTURE PROFILE

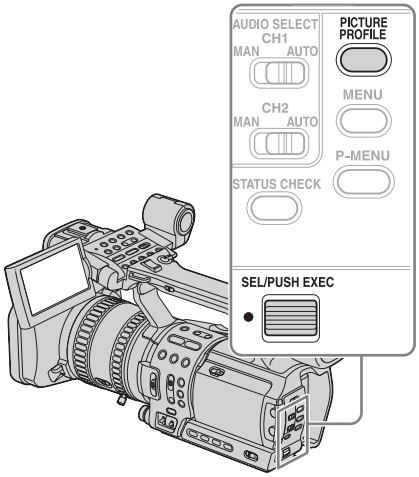
You can customize the picture quality by adjusting the color intensity, brightness, white balance, etc. You can set 6 different picture quality settings depending on the recording time of day, the weather, or the camera person, and store them in the memory.

Connect your camcorder to a TV or monitor, and adjust the picture quality while observing the picture on the TV or monitor screen.

At the default setting, [PP1] through [PP6] are registered with picture quality settings for the following recording conditions.

Picture profile number	Recording condition
PP1	Appropriate setting to record in the HDV format
PP2	Appropriate setting to record in the DVCAM (DV) format
PP3	Appropriate setting to record people
PP4	Appropriate setting to record film-like pictures
PP5	Appropriate setting to record sunset
PP6	Appropriate setting to record in black and white

You can change the above default settings at your convenience.



1 **In the standby mode, press PICTURE PROFILE.**

2 **Select a picture profile number by turning the SEL/PUSH EXEC dial, then press the dial.**

[PP1] through [PP6] are available.

3 **Select [SETTING] by turning the SEL/PUSH EXEC dial, then press the dial.**

4 **Select an item to be adjusted by turning the SEL/PUSH EXEC dial, then press the dial.**

5 **Adjust the picture quality by turning the SEL/PUSH EXEC dial, then press the dial.**

Item	Adjustment
[COLOR LEVEL]	–7 (low) to +7 (high) –8: black and white
[COLOR PHASE]	–7 (greenish) to +7 (reddish)
[SHARP-NESS]	0 (softer) to 15 (clearer)
[SKINTONE DTL]	To make wrinkles less noticeable by suppressing the outlines on the part in skin color to be enhanced. [OFF]: No adjustment [TYPE1] (the color range recognized as a skin color is narrow) to [TYPE3] (the color range recognized as a skin color is wide)
[SKINTONE LVL]	Sets the enhancement level of the edge of the part in skin color for setting [SKINTONE DTL]. [HIGH] (to enhance strongly) to [LOW] (to enhance weakly)
[AE SHIFT]	–7 (darker) to +7 (lighter)
[AGC LIMIT]	Select the upper limit for the auto gain control (AGC) ([OFF], 12dB, 6dB, 0dB). [OFF] is 18dB.
[AT IRIS LMT]	Select the highest aperture value for the automatic adjustment (F11, F6.8, F4).
[WB SHIFT]	–7 (to make white parts bluish) to +7 (to make white parts reddish)
[ATW SENS]	To set the auto white balance operation under a reddish light source such as an incandescent lamp or candle, or under a blueish light source such as in outdoor shade. [HIGH] (reddishness or blueishness is reduced) to [LOW] (reddishness or blueishness is increased) [ATW SENS] is not effective under a clear sky or the sun.
[BLACK STRTCH]	[ON]: To raise the γ curve characteristics of the dark part so that the gradation of the dark part is reproduced better.

➡*continued*

Item	Adjustment
[CINEMA-TONE γ]	[OFF]: Normal recording [TYPE1]: A better tone scale than the standard video gamma reproduces natural intermediate colors between a skin color and neutral colors. A skin color will look lively when recorded with this setting. Further, the reproduction of extremely precise description of highlighted parts provides depth in pictures. [TYPE2]: In addition to the features of [TYPE1], this setting is capable of extremely precise description of the entire exposure zone from shadowed parts to highlighted parts, which enables reproduction of a deeper black.
[CINE-FRAME]	When [50i/60i SEL] is set to 60i [OFF]: Normal recording [CINEFRAME 30]: Pictures are recorded with a cinema-like atmosphere. This produces the feeling of smoothness better than [CINEFRAME 24]. [CINEFRAME 24]: Pictures are recorded with the atmosphere of 24 frames per second adopted by film recording. When [50i/60i SEL] is set to 50i [OFF]: Normal recording [CINEFRAME 25]: Pictures are recorded with a cinema-like atmosphere.
[COPY]	To copy a picture profile setting to other picture profiles.
[RESET]	To restore the default setting of the picture profile.

6 Repeat steps 4 and 5 to adjust other items.

7 Select [↩ RETURN] by turning the SEL/PUSH EXEC dial, then press the dial.

8 Select [OK] by turning the SEL/PUSH EXEC dial, then press the dial.
A picture profile indicator appears.

To cancel the picture profile recording
Select [OFF] in step 2, then press the SEL/PUSH EXEC dial.

To check the picture profile settings
During recording or in the standby mode, press STATUS CHECK (p. 24).

To copy the picture profile setting to other picture profiles
1. **Press PICTURE PROFILE.**
2. **Select the number of the picture profile to be copied from by turning the SEL/PUSH EXEC dial, then press the dial.**
3. **Select [SETTING] by turning the SEL/PUSH EXEC dial, then press the dial.**
4. **Select [COPY] by turning the SEL/PUSH EXEC dial, then press the dial.**
5. **Select the number of the picture profile to be copied to by turning the SEL/PUSH EXEC dial, then press the dial.**
6. **Select [YES] by turning the SEL/PUSH EXEC dial, then press the dial.**
   If you decide not to copy the settings, select [NO].
7. **Press PICTURE PROFILE.**

To reset the picture profile settings
You can reset the picture profile settings by picture profile number. You cannot reset all picture profile settings at once.

1. **Press PICTURE PROFILE.**
2. **Select the number of the picture profile to be reset by turning the SEL/PUSH EXEC dial, then press the dial.**
3. **Select [SETTING] by turning the SEL/PUSH EXEC dial, then press the dial.**
4. **Select [RESET] by turning the SEL/PUSH EXEC dial, then press the dial.**
5. **Select [YES] by turning the SEL/PUSH EXEC dial, then press the dial.**

If you decide not to reset the picture profile, select [NO].

6 Press PICTURE PROFILE.

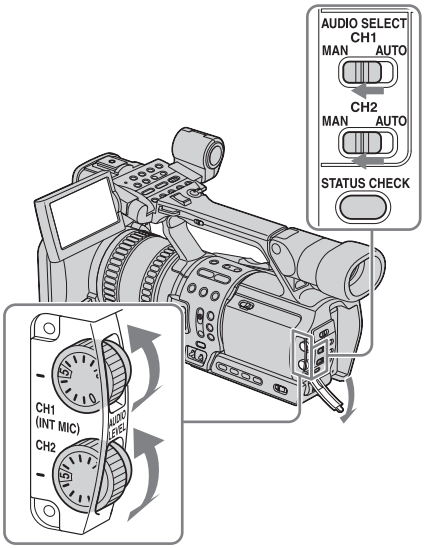
Note

- If you select [TYPE3] in [SKINTONE DTL], the effect may also be applied to a color that is not a skin color.
- When [SKINTONE DTL] is set to [OFF], [SKINTONE LVL] setting will not be effective, and the edge of the part of skin color will be enhanced at the strongest level.
- If you adjust all of the iris, shutter speed and gain manually, you cannot obtain the effect of [AE SHIFT].
- If you adjust the iris manually, you cannot obtain the effect of [AT IRIS LMT].
- If the object is so bright that the aperture value set in [AT IRIS LMT] is not appropriate, the shutter speed may reach:
  – up to 1/2000 when [50i/60i SEL] on the (OTHERS) menu is set to 60i.
  – up to 1/1750 when [50i/60i SEL] on the (OTHERS) menu is set to 50i.
- If you adjust the gain manually, you cannot obtain the effect of [AGC LIMIT].
- If you select [CINEFRAME 24] when the shutter speed is slower than 1/30, the shutter speed is automatically set to 1/60. 60i
- If you select [CINEFRAME 30] when the shutter speed is slower than 1/15, the shutter speed is automatically set to 1/30. 60i
- If you select [CINEFRAME 25] when the shutter speed is slower than 1/12, the shutter speed is automatically set to 1/25. 50i
- If you change the setting of [50i/60i SEL] on the (OTHERS) menu, [CINEFRAME] is set to [OFF] for PP1 through PP6.

Customizing the sound

Adjusting the audio recording level – Microphone volume level

You can adjust the microphone volume while recording. Checking the volume with headphones is recommended.
If you input external audio sources, you can adjust the recording level of channel 1 and channel 2 separately.
(To adjust the volume of the internal microphone, operate the AUDIO SELECT CH1 switch and the CH1 dial. The recording level of channel 1 and channel 2 are adjusted in unison.)



1 Set the AUDIO SELECT switch of the channel to be adjusted (CH1 or CH2) to MAN.

To adjust the internal microphone, set the CH1 switch to MAN.

➡*continued*

The audio level meter appears.

2 During recording or in the standby mode, adjust the volume of the microphone by turning the AUDIO LEVEL dial.

Adjust the microphone level of channel 1 by turning the CH1 dial, and that of channel 2 by turning the CH2 dial.
Adjust the internal microphone volume by turning the CH1 dial.

To restore automatic adjustment

Set the AUDIO SELECT switch of the manually adjusted channels to AUTO.

Note

- You cannot adjust the volume of audio input via the AUDIO/VIDEO jack or the HDV/DV jack.

Tip

- To check the audio setting information in greater detail, press STATUS CHECK (p. 24). You can also check the microphone volume during automatic adjustment.
- When using an external microphone, set [MIC SELECT] on the (AUDIO SET) menu to [XLR] (p. 65).
- To link the audio level of channel 1 and channel 2 when using external microphones, select the (AUDIO SET) menu, [XLR SET], [XLR AGC LINK], then [LINKED] (p. 66). Make sure that the AUDIO SELECT switches, CH1 and CH2, are both set to AUTO.

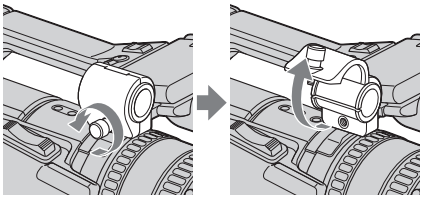
Connecting external audio sources

Connect an external microphone and/or audio device to the INPUT1/INPUT2 connectors.

To attach an external microphone

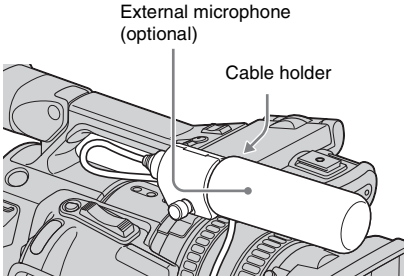
Only a microphone of 21 mm in diameter can be attached.

1 Loosen the microphone holder screw, and open the cover.



2 Place the microphone in the microphone holder, close the cover, and tighten the screw.

Hook the microphone cable on the cable holder.

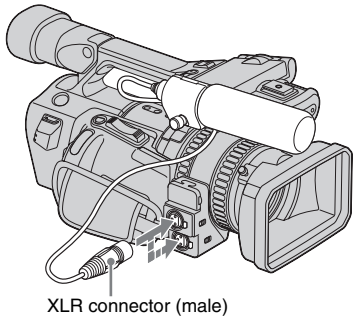


Note

- If the microphone part of the attached external microphone is long, it may obstruct the light of a video light, etc. attached to the shoe adaptor.

To connect the cable of the microphone or audio device

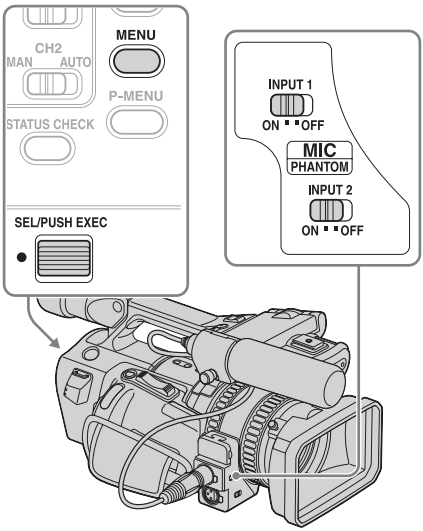
Align the pins of the plug to the INPUT1 or INPUT2 connectors, and connect them securely.



XLR connector (male)

Selecting the recording channel

The following settings are required to record the audio source connected to the INPUT1 or INPUT2 connector.



1 **In the standby mode, press MENU.**

2 **Select the (AUDIO SET) menu by turning the SEL/PUSH EXEC dial, then press the dial.**

3 **Select [MIC SELECT] by turning the SEL/PUSH EXEC dial, then press the dial.**

4 **Select [XLR] by turning the SEL/PUSH EXEC dial, then press the dial.**

5 **Select [XLR SET] by turning the SEL/PUSH EXEC dial, then press the dial.**

6 **Select [XLR CH SET] by turning the SEL/PUSH EXEC dial, then press the dial.**

7 **Select a channel by turning the SEL/PUSH EXEC dial, then press the dial.**

Connector	XLR CH SET	Recorded channel
INPUT1	CH1	Channel 1
	CH1, CH2	Channel 1 Channel 2
INPUT2	CH1	Channel 2
	CH1, CH2	None

8 **Set [INPUT1 LEVEL] or [INPUT2 LEVEL], and the PHANTOM switch for each connector.**

Source	Connector	Menu	PHANTOM switch
Microphone	INPUT1	[INPUT1 LEVEL] – [MIC]	ON
	INPUT2	[INPUT2 LEVEL] – [MIC]	ON

➡ *continued*

Source	Connector	Menu	PHANTOM switch
Audio device	INPUT1	[INPUT1 LEVEL] – [LINE]	OFF
	INPUT2	[INPUT2 LEVEL] – [LINE]	OFF

9 Press MENU to hide the menu screen.

Note

- When you use an external microphone, make sure that the wind screen will not be included in the picture using [ALLSCAN MODE] (p. 87).
- If you connect a device other than PHANTOM compatible devices, set the PHANTOM switch to OFF. Otherwise, the connected device may be damaged.

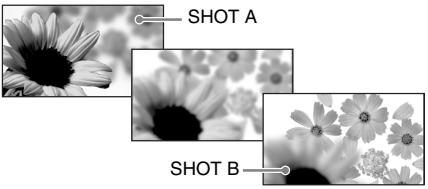
Tip

- To avoid the noise caused by strong wind, set [INPUT1 WIND] or [INPUT2 WIND] to [ON], according to the connector the external device is connected to (p. 67).
- It is recommended that you set [MIC NR] to [OFF] (p. 65) when:
  - you use the microphone at a distance from the camcorder.
  - you set [XLR CH SEL] to [CH1], and input sound only from the INPUT1 connector.
  - you set [INPUT1 LEVEL]/[INPUT2 LEVEL] to [LINE].

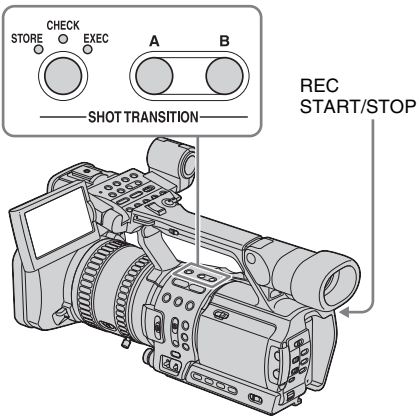
Recording a picture using various features

Developing scenes smoothly – Shot transition

You can register the settings of focus, zoom, iris, gain, shutter speed, and white balance, and then change the recording setting from the current one to the registered one, resulting in a smooth transition of scenes (Shot transition).
For example, you can shift the focus from closer objects to farther objects, or change the depth of field by adjusting the iris. In addition, you can develop scenes under different recording conditions smoothly. If you register the manual adjustment function of the white balance, the scenes will develop smoothly between objects indoor and those outdoor.
Use a tripod to avoid camera-shake.



Set the transition curve and duration using [SHOT TRANS] on the (CAMERA SET) menu. You can use a timer to start the shot transition (p. 59).



Step 1: Store the settings

1 **Press STORE/CHECK/EXEC repeatedly to turn on the STORE lamp.**

2 **Adjust the desired items manually.**
To adjust the camera setup items such as iris manually, set the AUTO LOCK switch to the center position to release the auto lock mode. See pages 26 to 30 for details on adjustment.

3 **Press a button (A or B) to select the storage location.**
The setting is stored in the selected button. The settings are called Shot A and Shot B respectively.

Note
- If you set the POWER switch to OFF, the settings stored in Shot A and B are deleted.

Step 2: Check the stored settings (Shot)

1 **Press STORE/CHECK/EXEC repeatedly to turn on the CHECK lamp.**

2 **Press the button (A or B) in which the setting was stored.**
The selected setting will take effect on the picture on the screen. The focus, zoom, and so on, are automatically adjusted as stored in the setting.

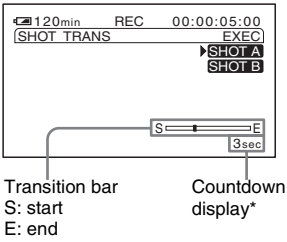
Note
- You cannot check the transition time, curve set, and start timer using [SHOT TRANS] on the (CAMERA SET) menu.

Recording using the Shot transition function

1 **Press STORE/CHECK/EXEC repeatedly to turn on the EXEC lamp.**

2 **Press REC START/STOP.**

3 **Press the button (A or B) in which the desired setting was stored.**
Pictures will be recorded with the settings that were changed automatically from the current ones to the stored ones.



*Appears when the start timer is activated.

Note
- You cannot zoom, focus, or adjust manually while checking or activating the Shot transition.
- When you change [SHOT TRANS] on the (CAMERA SET) menu, turn off the STORE/CHECK/EXEC lamp by pressing the button.
- You cannot return from the stored Shot A or B settings to previous settings after you activate the Shot transition during recording.
- If you press the following buttons during the shot transition operation, the operation is canceled:
  – PICTURE PROFILE
  – MENU
  – P-MENU
  – EXPANDED FOCUS
  – STATUS CHECK

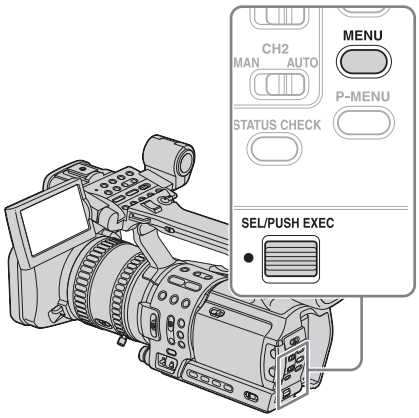
Tip
- You can record using both settings by making them change either from Shot A to Shot B or from Shot B to Shot A. For example, to change from Shot A to Shot B, turn on the CHECK lamp and press A followed by REC START/STOP, then turn on the EXEC lamp and press B.
- You can rehearse the shot transition by pressing the button (A or B), in which the desired setting was stored, before pressing REC START/STOP in step 2.

To cancel the operation

Press STORE/CHECK/EXEC repeatedly until the STORE/CHECK/EXEC lamps are all turned off.

Revising a specific color – Color Correction

You can select and revise up to 2 specific colors of objects, such as leaves and sky, that will be recorded in your favorite color tone.



1 **During recording or in the standby mode, press MENU.**

2 **Select the (CAMERA SET) menu by turning the SEL/PUSH EXEC dial, then press the dial.**

3 **Select [COLOR CORRCT] by turning the SEL/PUSH EXEC dial, then press the dial.**

4 **Select [TYPE] by turning the SEL/PUSH EXEC dial, then press the dial.**

5 **Select a revision type by turning the SEL/PUSH EXEC dial, then press the dial.**

[OFF]
Normal recording.

[COLOR REVISN]
Revises the color that has been set in the memory.
You cannot revise the color that is not included in the memory (the part is displayed in black and white as set in [COLOR EXTRCT]).

[COLOR EXTRCT]
Displays only the parts set in the memory in color, and displays other parts in black and white.
You can use this not only as an effect, but also for checking a color when you set the memory.

appears.

6 **Select [MEMORY SEL] by turning the SEL/PUSH EXEC dial, then press the dial.**

[1] (the default setting)
Only memory 1 is effective.

[2]
Only memory 2 is effective.

[1&2]
Both memories 1 and 2 are effective.

7 **Select [MEM1 COLOR] or [MEM2 COLOR] by turning the SEL/PUSH EXEC dial, then press the dial.**

8 **Adjust [PHASE], [RANGE], and [SATURATION] while referring to "To specify a color" (p. 43).**

9 **Select [MEM1 REVISN] or [MEM2 REVISN] by turning the SEL/PUSH EXEC dial, then press the dial.**

10 Adjust the color tone.

Increasing [R] makes the selected color reddish, and decreasing [R] makes it less reddish (as cyan increases).
Increasing [B] makes the selected color blueish, and decreasing [B] makes it less blueish (as yellow increases).
No adjustment will be made at 0.

11 Select [OK] by turning the SEL/PUSH EXEC dial, then press the dial.

12 Press MENU to hide the menu screen.

To cancel the operation

Select [OFF] in step 5.

Note

- If the selected color range is too narrow, the color revision may not be visible.
- In the [COLOR EXTRCT] setting, only the colors of the effective memory are applied.
- In the [COLOR REVISN] setting, the color of the memory that is set to be ineffective will neither be applied nor revised.

Tip

- If you set both memories to the same setting, the revision effect will be doubled.
- The Color Correction setting will be retained even if the power is turned off. However, if you want to revise colors influenced by time of a day, weather, location, etc., it is recommended that you revise them just before recording.
- If you change the setting of the white balance value, [WB SHIFT] of PICTURE PROFILE, [SATURATION], and [PHASE], color range and phase adjusted will change. If the above settings have changed from when you set the Color Correction, check the Color Correction setting before recording.
- When the white balance is adjusted automatically, the white balance setting may vary automatically depending on the object. To use the Color Correction effectively, adjust the white balance manually.

To specify a color

Option	Select
PHASE	Color phase from 0 through 31. 0 (violet) - 8 (red) - 16 (yellow) - 24 (green) - 31 (blue) In the default setting, memory 1 is set to 19, memory 2 to 8.
RANGE	Range of color phase from 0 though 31. 0: No color is selected. 1: Narrow range (single color) - 31: Wide range (The other colors of similar color phase are also selected.) In the default setting, memory 1 is set to 13, memory 2 to 8.
SATURATION	Color saturation from 0 through 31. 0: Colors from deep to light are all selected - 31: Only deep colors are selected. In the default setting, memory 1 is set to 0, memory 2 to 15.

A recommended way to specify a color

1 Select [COLOR EXTRCT] to change colors to black and white, except the target color.

You will easily recognize the selected range.

2 Set [RANGE] to 4 or 5 to make a memory of a single color.

3 Set [SATURATION] to 0 to select very light colors.

4 Set [PHASE] so that a color is applied to the target object.

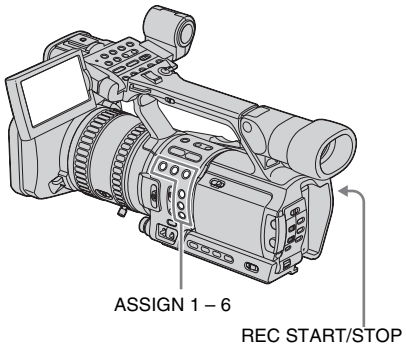
5 Set [RANGE] so that the desired range of the picture can be previewed in the selected color.

6 If you do not need the light colored part, set [SATURATION] so that colors are applied only to the desired part.

7 To use the setting as a revised color, select [OK], go back to [TYPE] and change the setting from [COLOR EXTRCT] to [COLOR REVISN].

Fading in and out of a scene – FADER

You can add the following effects to currently recording pictures.
Assign the FADER function to one of the ASSIGN buttons in advance. See page 86 for details on how to assign a function.



[BLACK FADER]

[WHITE FADER]

1 Press the ASSIGN button assigned to the FADER function in the standby mode (to fade in) or during recording (to fade out).

Each time you press the button, the indicator changes as follows:
[BLACK FADER] → [WHITE FADER] → no display

2 Press REC START/STOP.

The FADER indicator stops flashing and disappears when the fade is complete.

To cancel the operation

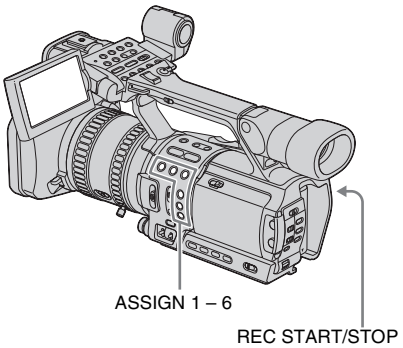
Press the ASSIGN button assigned to the FADER function repeatedly until the FADER indicators disappear.

Note

- You cannot use the FADER function together with [FRAME REC] (Frame recording). DVCAM DV SP

Recording an index signal at the beginning of recording

If you make an index for a scene, you can easily search for the scene later (p. 56).
The index function will make it easier to check the transition of recording or edit your pictures using index signals.
Assign the index function to one of the ASSIGN buttons in advance. See page 86 to assign a function.



Press the ASSIGN button assigned to the index function.

When pressed during recording

appears for about 7 seconds and an index signal is recorded.

When pressed in the standby mode

flashes.

After you press REC START/STOP to start recording, appears for about 7 seconds and an index signal is recorded.

To cancel the operation

Before starting to record, press the ASSIGN button assigned to the index function again.

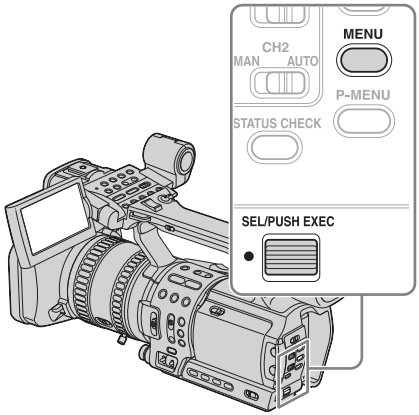
Note

- You cannot record an index signal on a recorded tape afterward.

Recording on a device connected via an i.LINK cable – External REC Control

By connecting the camcorder to an HDV/DVCAM/DV compatible device (digital HD video camera recorder, digital video camera recorder, hard disc recorder, etc.) with an i.LINK cable, recording can be performed on this camcorder and on the connected device simultaneously, or relayed from the camcorder to the connected device when the tape in the camcorder comes nearly to the end.

Refer also to the instruction manuals supplied with the devices to be connected.



1 Connect the camcorder and the device using an i.LINK cable (p. 89).

2 Set the POWER switch to CAMERA.

3 Press MENU.

➡ *continued*

4 **Select the (IN/OUT REC) menu by turning the SEL/PUSH EXEC dial, then press the dial.**

5 **Select [EXT REC CTRL] by turning the SEL/PUSH EXEC dial, then press the dial.**

6 **Select [REC CTL MODE] by turning the SEL/PUSH EXEC dial, then press the dial.**

7 **Select a recording control mode by turning the SEL/PUSH EXEC dial, then press the dial.**

[OFF]
The connected device does not record.

[SYNCHRONOUS]
The connected device is linked to the camcorder, and therefore records the picture, sound, and time code simultaneously with the camcorder. (EXT is displayed.)

[RELAY]
When the tape in the camcorder has almost run out, recording of the picture, sound, and time code is relayed to the connected device and the remainder of the recording is saved there. (EXT is displayed.)

8 **Select [STBY COMMAND] by turning the SEL/PUSH EXEC dial, then press the dial.**

9 **Select the state of the connected device in the recording stop mode by turning the SEL/PUSH EXEC dial, then press the dial.**

[REC PAUSE]
When the camcorder stops recording, the connected device pauses recording.

[STOP]
When the camcorder stops recording, the connected device stops recording.

10 **Press REC START/STOP to start recording.**

11 **Press MENU to hide the menu screen.**

To stop recording

Press REC START/STOP again.

Note

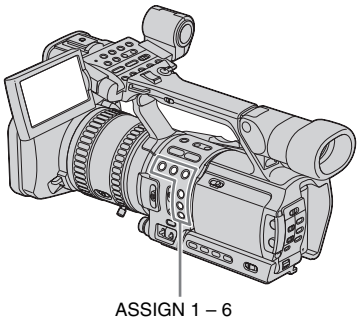
- When [REC FORMAT] is set to [HDV1080i], and [HDV→DV CONV] in [i.LINK CONV] to [ON], pictures at the very beginning of recording will be distorted and flow to the connected device via the i.LINK cable. When you shoot pictures on this camcorder, it is recommended that you start with scenes that will not be used in the final cut.
- You cannot control the connected device during frame recording.
- When the camcorder is unable to communicate with the connected device, EXT and EXT are not displayed.

Tip

- To replace the tape on this camcorder while keeping the connected device in the recording mode, continue shooting until it stops automatically at the end of tape. Then replace the tape.

Reviewing the most recently recorded scenes – Rec Review

You can view a few seconds of the scene recorded just before you stopped the tape. Assign the Rec Review function to one of the ASSIGN buttons in advance. See page 86 to assign a function.

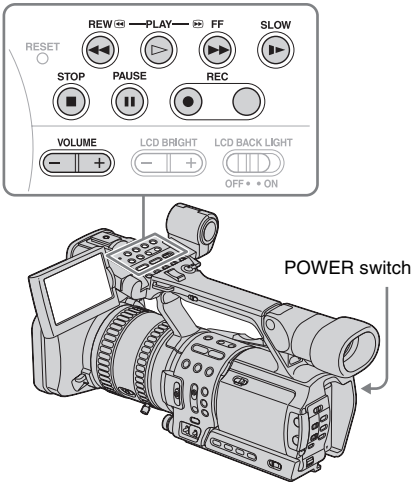


In the standby mode, press the ASSIGN button assigned to the Rec Review function.

The last few seconds of the most recently recorded scene are played back. Then, your camcorder is set to the standby mode.

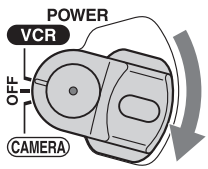
Viewing movies

Make sure you have a recorded cassette inserted into your camcorder.
Some of the operations are possible using the Remote Commander.
When you want to play back recordings on your TV, see page 52.
When playing back the tape, select the ⇆ (IN/OUT REC) menu, [VCR HDV/DV], then [AUTO] (the default setting).



1 **Open the LCD panel and adjust the angle.**

2 **While pressing the green button, set the POWER switch to VCR.**



3 **Press ◄◄ (rewind) to go to the point you want to view.**

4 **Press ► (play) to start playback.**

To adjust the volume

Adjust the volume by pressing VOLUME – (decrease) / + (increase).

To stop playback

Press ■ (stop).

To pause

Press ❚❚ (pause) during playback.
Press ► (play) or ❚❚ (pause) again to restart the playback.
Playback stops automatically when the pause mode continues for more than 3 minutes.

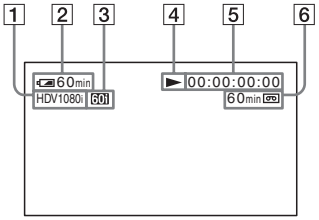
To fast forward or rewind

Press ►► (fast forward) or ◄◄ (rewind) in stop mode.

To review movies on the viewfinder

Close the LCD panel. Then, adjust the viewfinder angle.

Indicators displayed during tape playback



1 **Format of the playback signal (HDV1080i/ DVCAM/DV SP)**
2 **Remaining battery**
3 **50i/60i system indicator (p. 82)**
4 **Tape transport indicator**
5 **Time code or user bits**
6 **Recording capacity of the tape**

Note

- Due to the difference in the synchronization, the picture and sound will disappear momentarily where the system switches between 60i and 50i.
- Tapes recorded in the HDV format cannot be played back on video cameras using the DVCAM/DV format or mini-DVCAM (DV) players.
- DV format tapes are played back on your camcorder only if they are recorded in the SP mode (DV SP appears on the screen). Tapes recorded in the LP mode are not played back.
- Time code and user bits are not displayed correctly unless time code and user bits are recorded on the tape, or the recorded time code is compatible with your camcorder.

Tip

- To display the picture on both the LCD panel and the viewfinder, select the (LCD/VF SET) menu, [VF POWER], then [ON] (p. 69).

Playing back in various modes

To fast forward or rewind during playback – Picture search

Keep on pressing ▶▶ (fast forward) or ◀◀ (rewind) during playback.
To resume normal playback, release the button.

To view the picture while fast forwarding or rewinding – Skip scan

Keep on pressing ▶▶ (fast forward) or ◀◀ (rewind) while fast forwarding or rewinding the tape.
To resume fast forwarding or rewinding, release the button.

To play back in various modes

You will not hear the recorded sound. Also, you may see mosaic-like images of the previously played picture remaining on the screen.

To	Press
change the playback direction*	< (reverse) on the Remote Commander during playback.
play back slowly	▮► (slow) during playback. To reverse direction DVCAM DV SP ❶ Press < (reverse) on the Remote Commander. ❷ ▮► (slow).
play back 2 times faster (double speed) DVCAM DV SP	×2 (double speed) on the Remote Commander during playback. To reverse direction ❶ Press < (reverse) on the Remote Commander. ❷ ×2 (double speed) on the Remote Commander.
play back frame by frame	II► (frame) on the Remote Commander during playback pause. To reverse direction, press ◄II (frame) on the Remote Commander during playback pause. DVCAM DV SP

To return to the normal playback mode, press ► (play).

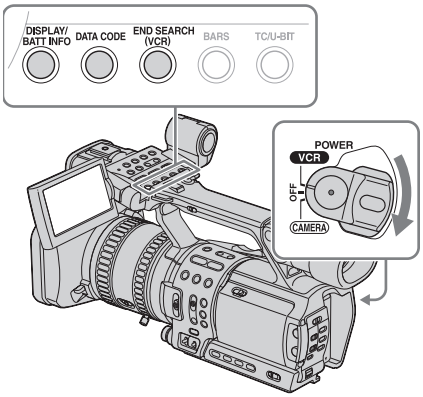
* Horizontal lines may appear at the top, bottom, or in the center of the screen. This is not a malfunction.

Note

- Pictures in the HDV format are not output from the i.LINK HDV/DV jack when they are paused or played back in other than normal playback mode.
- Pictures in the HDV format may appear distorted during:
  – Picture search
  – Reverse playback

Various playback functions

You can locate the end of the last recording, or display the date of recording and camera settings data.



Searching for the last scene of the most recent recording – END SEARCH

This function is handy when you have played back the tape, for example, but want to start recording right after the most recently recorded scene. The END SEARCH function will not work once you eject the cassette after you have recorded on the tape.

1 **Set the POWER switch to VCR.**

2 **Press END SEARCH (VCR).**
The last scene of the most recent recording is played back for about 5 seconds.

To cancel the operation

Press END SEARCH (VCR).

Note

- The END SEARCH function will not work correctly when there is a blank section between recorded sections on the tape.

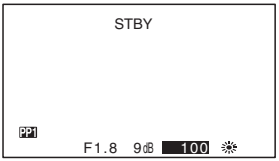
Displaying the screen indicators

You can display the time code and other information together with the pictures on the screen.

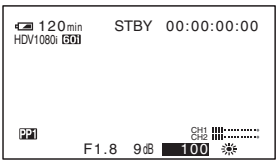
Press DISPLAY/BATT INFO.

The indicator switches as follows as you press the button:
(no display) → (display)
When the POWER switch is set to CAMERA, the indicator switches as follows:
(simple display) → (no display) → (detailed display)

Simple display



Detailed display



Tip

- You can display the screen indicators during playback on a TV. Select the (OTHERS) menu, [DISP OUTPUT], then [V-OUT/PANEL] (p. 80). However, only playback mode indicators and tape counter appear when playing back a tape recorded in the HDV format, and [COMPONENT] on the (IN/OUT REC) menu is set to [1080i/480i]*.

* When [50i/60i SEL] is set to 60i. In case of 50i, this item is [1080i/576i].

Displaying the date/time and camera settings data – Data code

During playback, you can view the date/time data and the camera settings data that are automatically recorded while recording pictures on a tape.

1 **Set the POWER switch to VCR.**

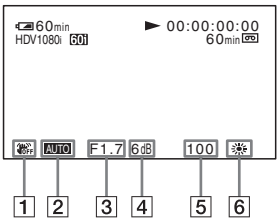
2 **Press DATA CODE on the camcorder or Remote Commander during playback or playback pause.**

Each time you press the button, the indicators appear in turn as follows: Date/time → Camera settings data → (no display)

Camera settings data display

In the date/time data display, the date and time is displayed in the same area.

If you record the picture without setting the clock, [--- -- ----] and [--:--:--] will appear.



1 **SteadyShot off**

2 **Exposure**

3 **Aperture value**

If you manually adjust the aperture value to the maximum, CLOSE appears.

4 **Gain**

5 **Shutter speed**

6 **White balance**

PWB appears when pictures recorded by using the shot transition function are played back.

To hide the camera settings data

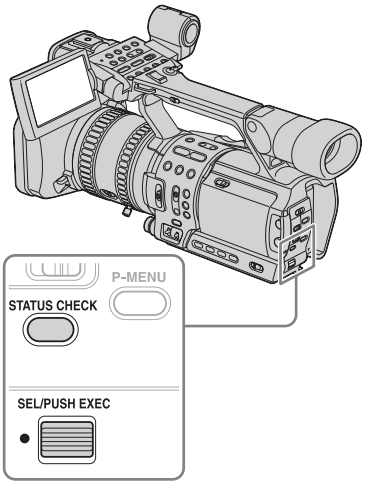
Select the (OTHERS) menu, [DATA CODE], then [DATE] (p. 80).

Each time you press DATA CODE, the date/time indicator turns on and off.

Displaying the video information – Status check

You can check the setup value of the following items.

- Audio setup such as audio mix (p. 64)
- Output signal setup ([VCR HDV/DV], etc.) (p. 70)
- Functions assigned to the ASSIGN buttons (p. 86)



1 **Press STATUS CHECK.**

2 **Turn the SEL/PUSH EXEC dial to display the desired item.**

Each time you turn the dial, the items appear in the following order:
AUIDO → OUTPUT → ASSIGN

To turn off the video information

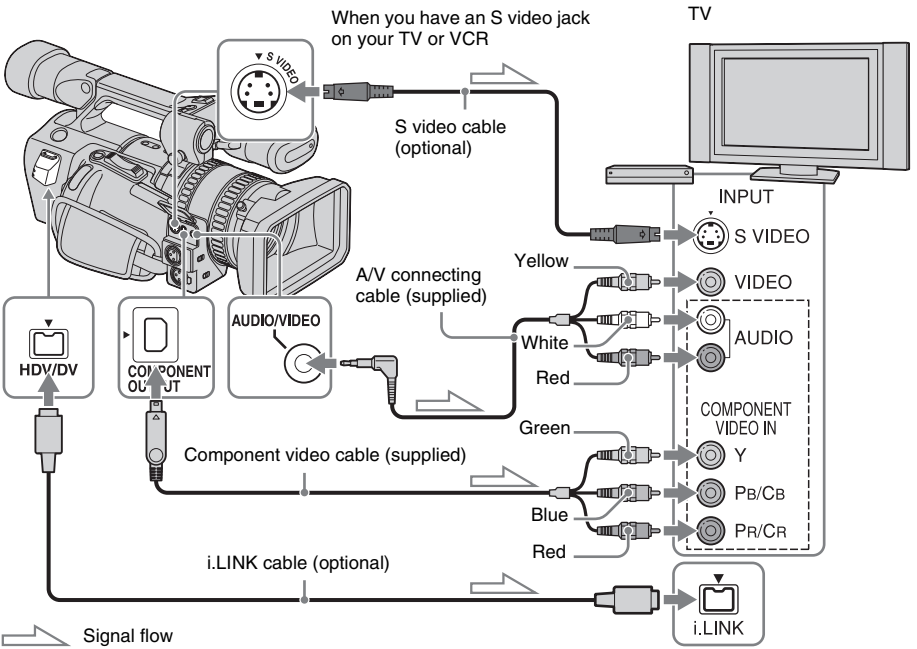
Press STATUS CHECK.

Playing the picture on a TV

TV connections differ depending on the type of TV.

Connect your camcorder to the wall outlet using the supplied connecting cable (DK-415) and AC Adaptor/charger for the power supply (p. 13).
Refer also to the instruction manuals supplied with the devices to be connected.
To copy to another tape, see page 89.

Viewing the picture on a high definition TV



Connect your camcorder and your TV using either cables described below.

To connect the TV using an i.LINK cable

This connection is recommended when your TV is compatible with HDV/DV and has an i.LINK jack.

- Before connecting the i.LINK cable, select the (IN/OUT REC) menu, [VCR HDV/DV], then [AUTO] (the default setting).
- In case of this connection, the TV needs to be set so that it recognizes that the camcorder is connected. Refer to the operating manual supplied with the TV for the details.

To connect the TV using the component video cable

- To view the picture recorded in the HDV format, set [COMPONENT] on the (IN/OUT REC) menu according to your TV (p. 73). When the picture recorded in the

DVCAM (DV) format is played back, an equivalent picture with DVCAM (DV) format is output regardless of [COMPONENT] setting.
- Only video signals are output from the COMPONENT OUTPUT jack. To output audio signals, connect the white and red plugs of the A/V connecting cable to the audio input jack of your TV.

To connect the TV using the A/V connecting cable

When there is an S video jack on the device to be connected, connect it with your camcorder by the S video jacks using an S video cable (optional) instead of the yellow video plug of the A/V connecting cable (supplied). This connection produces pictures more faithfully on the TV connected. The audio will not be output when you connect with the S video cable alone.

Note

- Be sure that you set [VCR HDV/DV] before connecting the i.LINK cable. Otherwise, the TV might not be able to recognize the video signal correctly.
- Pictures in the DVCAM (DV) format are not output from the COMPONENT OUTPUT jack, if copyright protection signals are recorded in the pictures.

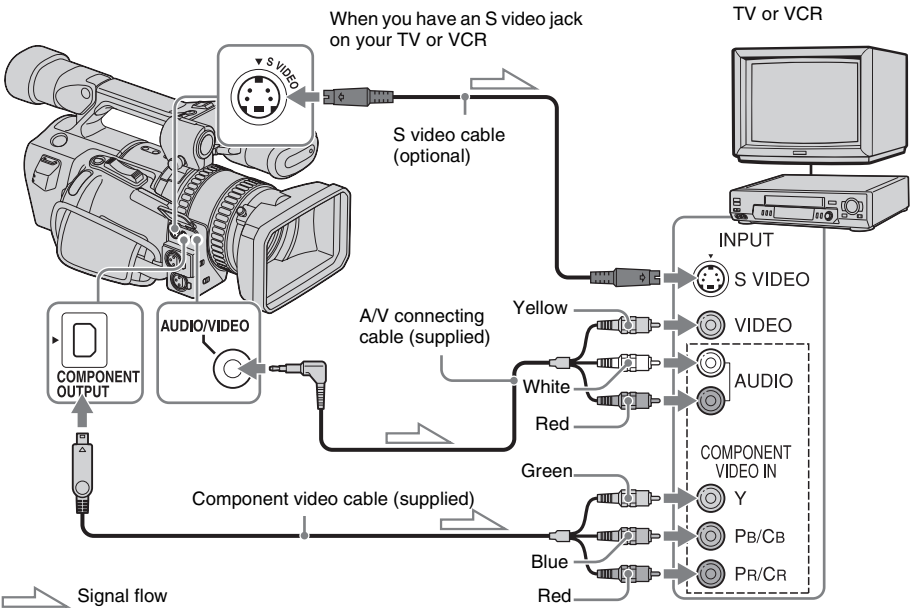
Tip

- If you connect your camcorder to your TV using more than one type of cables to output the pictures via analog jacks, the output signals have priority in the following order:
  COMPONENT OUTPUT jack → S VIDEO jack → AUDIO/VIDEO jack
- See page 119 for details on i.LINK.

When your TV is connected to a VCR

Connect your camcorder to the LINE IN input on the VCR using the A/V connecting cable. Set the input selector on the VCR to LINE.

Viewing the picture on a 16:9 TV or a 4:3 TV



Connect your camcorder and your TV or VCR using either cables described below.

To connect the TV using the component video cable

This connection is recommended when your TV has COMPONENT VIDEO jacks.

- To view the picture recorded in the HDV format, set [COMPONENT] on the (IN/OUT REC) menu according to your TV (p. 73). When a picture recorded in the DVCAM (DV) format is played back, an equivalent picture with DVCAM (DV) format is output regardless of [COMPONENT] setting.
- Only video signals are output from the COMPONENT OUTPUT jack. To output audio signals, connect the white and red plugs of the A/V connecting cable to the audio input jack of your TV or VCR.

To connect the TV using the A/V connecting cable

When there is an S video jack on the device to be connected, connect it with your camcorder by the S video jacks using an S video cable (optional) instead of the yellow video plug of the A/V connecting cable (supplied). Use an S video cable to produce high resolution pictures. The audio will not be output when you connect with the S video cable alone.

To view the picture on a 4:3 TV

- To view the picture recorded in the HDV format, select the (IN/OUT REC) menu, [DOWN CONVERT], then a desired mode (p. 74).
- To view the picture recorded in the DVCAM (DV) format, select the (IN/OUT REC)

menu, [DV WIDE REC], then [OFF] before recording (p. 72).

When your TV is connected to a VCR

Connect your camcorder to the LINE IN input on the VCR using the A/V connecting cable. Set the input selector on the VCR to LINE.

When your TV is monaural (When your TV has only one audio input jack)

Connect the yellow plug of the A/V connecting cable to the video input jack and connect the white or the red plug to the audio input jack of your TV or VCR.
When you want to play the sound in monaural mode, use a connecting cable (optional) for that purpose.

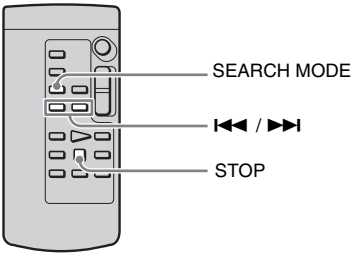
Note

- Pictures in the DVCAM (DV) format are not output from the COMPONENT OUTPUT jack, if copyright protection signals are recorded in the pictures.

Locating a scene on a tape for playback

Searching for a scene by date of recording – Date search

You can locate the point where the recording date changes.



1 Set the POWER switch to VCR.

2 Press SEARCH MODE on the Remote Commander repeatedly to select [DATE SEARCH].

3 Press I◄◄ (previous)/►►I (next) on the Remote Commander to select a recording date.

You can select the previous or the next date of the present point on the tape.
Playback starts automatically from the point where the date changes.

To cancel the operation

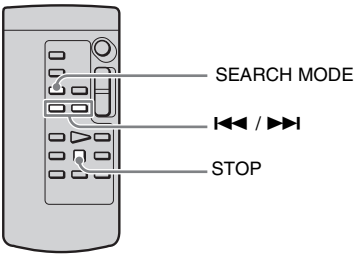
Press STOP on the Remote Commander.

Note

- If 1 day's recording is less than 2 minutes, your camcorder may not accurately find the point where the recording date changes.
- The Date search will not function correctly when there is a blank section between recorded sections on the tape.

Searching for a recording start point – Index search

You can locate the point where an index signal is recorded (p. 44).



1 Set the POWER switch to VCR.

2 Press SEARCH MODE on the Remote Commander repeatedly to select [INDEX SEARCH].

3 Press I◄◄ (previous)/►►I (next) on the Remote Commander to select an index point.

You can select the previous or the next index signal of the present point on the tape. Playback starts automatically from the point where the index signal is recorded.

To cancel the operation

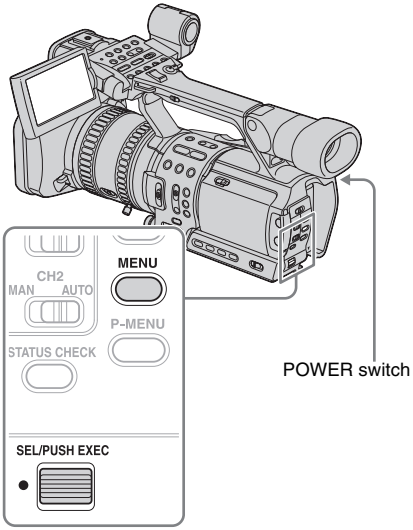
Press STOP on the Remote Commander.

Note

- If 1 day's recording is less than 2 minutes, your camcorder may not accurately find the index point.
- The Index search will not function correctly when there is a blank section between recorded sections on the tape.

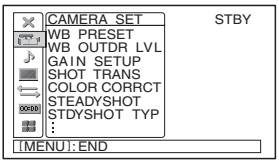
Selecting menu items

You can change various settings or make detailed adjustments using the menu items displayed on the screen.



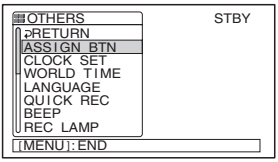
1 Turn on the power (p. 14).

2 Press MENU to display the menu index screen.



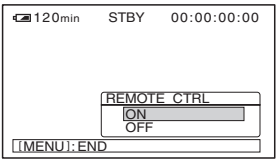
3 Select the icon of the desired menu by turning the SEL/PUSH EXEC dial, then press the dial.

- CAMERA SET (p. 58)
- AUDIO SET (p. 64)
- LCD/VF SET (p. 68)
- IN/OUT REC (p. 70)
- TC/UB SET (p. 76)
- OTHERS (p. 78)

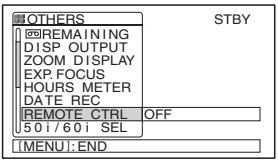


4 Select the desired item by turning the SEL/PUSH EXEC dial, then press the dial.

The available menu items vary depending on the power mode of your camcorder. Unavailable items will be grayed out.



5 Select the desired setting by turning the SEL/PUSH EXEC dial, then press the dial.



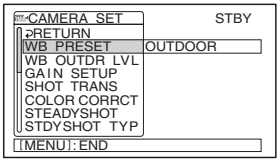
6 Press MENU to hide the menu screen.

To return to the previous screen, select [RETURN].

Using the (CAMERA SET) menu

– STDYSHOT TYP/FRAME REC, etc.

You can select the items listed below on the CAMERA SET menu. For details on how to select items, see “Selecting menu items” (p. 57).
The default settings are marked with ▷. The indicators in parentheses appear when the setting is selected. The settings you can adjust vary depending on the power mode of your camcorder. The screen shows the items you can operate at the moment. Unavailable items will be grayed out.



WB PRESET

Select to use the preset white balance. See page 27 for details.

WB OUTDR LVL

When [OUTDOOR] is selected for the preset white balance, you can select the white balance value for outdoor recording by turning the SEL/PUSH EXEC dial. Levels from –7 (bluish) through +7 (reddish) are available. It is set to 0 (standard) in the default setting.

GAIN SETUP

Select the adjustment value for each position (H, M, and L) of the GAIN switch (p. 29).

1. **Select [H], [M], or [L] by turning the SEL/PUSH EXEC dial, then press the dial.**
2. **Select an adjustment value by turning the SEL/PUSH EXEC dial, then press the dial.**
   0dB, 3dB, 6dB, 9dB, 12dB, 15dB, and 18dB are available. The larger the number, the greater the gain.
3. **Select [OK] by turning the SEL/PUSH EXEC dial, then press the dial.**
4. **Press MENU to hide the menu screen.**

SHOT TRANS

Select this setting to set the transition duration, time, and start timer. See page 40 for details on using the shot transition function.

Note

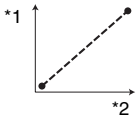
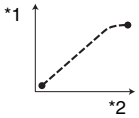
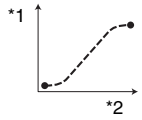
- Before setting [SHOT TRANS], turn off all of the STORE/CHECK/EXEC lamps by pressing the button repeatedly (p. 40).

TRANS TIME

Select the time that takes to make a transition from the current setting to the selected setting.
Duration from [2.0 sec] through [15.0 sec] are available. It is set to [4.0 sec] in the default setting.

TRANS CURVE

Select the transition curve.
The figures below show the transition curve of each mode.
*1: parameter level
*2: transition of time

LINEAR	Select to make the transition linearly.	
▷SOFT STOP	Select to make the transition slowly at the end.	
SOFT TRANS	Select to make the transition slowly at the beginning and end, and linearly in between.	

START TIMER

▷OFF	Select to start the shot transition immediately.
5 sec	Select to start the shot transition after 5 seconds.
10 sec	Select to start the shot transition after 10 seconds.
20 sec	Select to start the shot transition after 20 seconds.

➡*continued*

COLOR CORRCT

Select this setting to revise a specific color to be recorded as you desire. See page 42 for details on using the Color Correction function.

STEADYSHOT

▷ON	Select to activate the SteadyShot function. You can select the type of the SteadyShot function in [STDYSHOT TYP].
OFF ( )	Select to deactivate the SteadyShot function. Select when recording using a tripod. More natural pictures are produced. You can also deactivate the SteadyShot function by using the ASSIGN button assigned to the SteadyShot function (p. 86).

Note

- The SteadyShot function does not work well when a wide conversion lens other than VCL-HG0872 (optional) is attached to your camcorder.
- When using VCL-HG0872, select [WIDE CONV.] in [STDYSHOT TYP] below.

STDYSHOT TYP

You can select the type of the SteadyShot function that compensates for camera-shake. To release the SteadyShot function, select [OFF] in [STEADYSHOT] or use the ASSIGN button assigned to the SteadyShot function (p. 86).

HARD	Select to activate the SteadyShot function with stronger effect. This mode is not recommended for recording with camera panning technique.
▷STANDARD	Select to activate the standard SteadyShot function.
SOFT	Select to activate the SteadyShot function so that it leaves a slight unsteadiness on the picture so the picture looks natural.
WIDE CONV.	Select when a wide conversion lens (optional) is attached. This mode is the most effective with Sony VCL-HG0872 wide conversion lens.

PEAKING

You can change the outline color and level for peaking.

COLOR	[WHITE], [RED], [YELLOW] are available for the outline color. It is set to [WHITE] in the default setting.
LEVEL	[HIGH], [MIDDLE], [LOW] are available for the outline level. It is set to [MIDDLE] in the default setting.

AF ASSIST

▷OFF	Select to record in the standard recording mode.
ON	Select to focus manually by rotating the focus ring during auto focusing.

AE RESPONSE

Select the speed used to adjust the exposure automatically in accordance with the brightness of the subject. [FAST], [MIDDLE], and [SLOW] are available. It is set to [FAST] in the default setting.

MARKER

▷OFF	Select when you do not want to display the marker on the screen.
ON	Select to display the marker you select in [MARKER SEL] on the screen. You can assign this function to one of the ASSIGN buttons (p. 86).

Note

- The center marker and its position do not affect the adjustment, setting, or recording in any way.

MARKER SEL

You can select the type of marker to be displayed on the screen when [MARKER] is set to [ON]. Select whether each type is to be displayed or not by selecting [ON] or [OFF] in [MARKER]. You can display more than a marker at the same time.

CENTER	Select to display the marker at the center of the screen. (It is set to [ON] in the default setting.)	
4:3	Select to display the frame indicating the 4:3 aspect ratio.	
SAFETY ZONE	Select to display the frame indicating the range that can be received by a standard TV for domestic use (80%).	

Note

- Marker [4:3] is not displayed when recording in DV 4:3 mode.
- Markers are displayed only on the LCD panel and viewfinder. They are not output from the jacks.
- Screen indicators are not output from the analog jacks when a marker is displayed.

Tip

- You can display all markers together by selecting [ON] in [MARKER].

➡*continued*

FLCKR REDUCE 60i

▷ON	Select to record under normal conditions. Flickering of the screen under a light source such as fluorescent lamps will be reduced.
OFF	Select when you do not want to reduce flickering of the screen.

Note

- You cannot select this item when [50i/60i SEL] on the (OTHERS) menu is set to 50i. It is always set to [OFF].

HANDLE ZOOM

Select this item to set the zoom speed of position H and L of the handle zoom switch (p. 23).

1. **Select [H] or [L] by turning the SEL/PUSH EXEC dial, then press the dial.**
2. **Select a zoom speed by turning the SEL/PUSH EXEC dial, then press the dial.**
   Speeds 1 through 8 are available. The larger the number, the faster the zoom speed.
3. **Select [OK] by turning the SEL/PUSH EXEC dial, then press the dial.**
4. **Press MENU to hide the menu screen.**

ZEBRA LEVEL

See page 31 for details.

BARS TYPE

2 types of color bar, one of which appears when you press BARS, are available. You can display the color bar also by using the ASSIGN button (p. 86).

▷TYPE1	The following color bar appears.
TYPE2	The following color bar appears.

SETUP 60i DVCAM DV SP

▷0%	Select to record in the system at the 0% setup level.
7.5%	Select to record in the system at the 7.5% setup level.

Note

- When [50i/60i SEL] in the (OTHERS) menu is set to 50i, this item is set to [0%] automatically.

FRAME REC DVCAM DV SP

You can record pictures with a stop-motion animated effect by alternately recording a few frames and then moving the subject a little. Operate your camcorder using the Remote Commander to prevent camera shake.

▷OFF	Select to record in the standard recording mode.
ON ( )	Select to record pictures using the FRAME REC function. **1 Select [ON], then press the dial.** **2 Press MENU to hide the menu screen.** **3 Press REC START/STOP.** A picture* is recorded, and your camcorder enters the standby mode. **4 Move the subject and repeat step 3.**

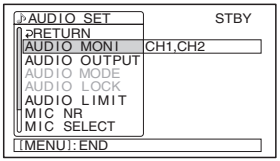
* A picture consists of 6 frames when [50i/60i SEL] is set to 60i, and 5 frames when it is set to 50i.

Note

- When you use frame recording continuously, the remaining tape time will not be indicated correctly.
- The last scene will be longer than other scenes.
- You cannot record index signals during frame recording.

Using the ♪ (AUDIO SET) menu – INT MIC SET/XLR SET, etc.

You can select the items listed below on the AUDIO SET menu. For details on how to select items, see “Selecting menu items” (p. 57). The default settings are marked with ▷. The indicators in parentheses appear when the setting is selected. The settings you can adjust vary depending on the power mode of your camcorder. The screen shows the items you can operate at the moment. Unavailable items will be grayed out.



AUDIO MONI

You can check the sound from headphones or the camcorder speaker by selecting either of them.

▷CH1,CH2	Select to listen to the CH1 and CH2 sounds separately in the L and R channels. However, you will hear the CH1 and CH2 sounds mixed from your camcorder speaker.
CH1	Select to listen to the CH1 sound in channels L and R.
CH2	Select to listen to the CH2 sound in channels L and R.
CH1+CH2	Select to listen to the CH1 and CH2 sounds synthesized in channels L and R.

AUDIO MIX DVCAM DV SP

You can select the sound to be output when playing back a tape on which sounds were added afterwards (p. 98).

▷CH1,CH2	Select to output only the originally recorded sound (CH1, CH2).
MIX	Select to synthesize and output the originally recorded sound (CH1, CH2) and the sound added afterwards (CH3, CH4).
CH3,CH4	Select to output only the sound (CH3, CH4) added afterwards.

Note

- You cannot select this item when playing back a tape recorded with [AUDIO MODE] set to [FS48K].

AUDIO OUTPUT

You can select the audio output level to speakers, etc.

1Vrms	Select to set the audio output level to 1 Vrms/FS.
▷2Vrms	Select to set the audio output level to 2 Vrms/FS.

AUDIO MODE DVCAM DV SP

▷FS32K (32k)	Select to record in 12-bit mode (2 stereo sounds) in DVCAM/DV SP format.
FS48K (48k)	Select to record in 16-bit mode (1 stereo sound with high quality) in DVCAM/DV SP format.

Note

- You can add sound only on a tape recorded in Fs32K mode in DVCAM format. You cannot add sound on a tape recorded in Fs48K mode.
- [FS48K] is selected automatically in the HDV format.

AUDIO LOCK DV SP

▷UNLOCK MODE	Select to record the sampling clock for audio and video separately. This mode is adopted by the DV format for consumer models.
LOCK MODE	Select to record the sampling clock of audio and that of video synchronized. This mode is advantageous for digital processing during audio editing, or for making smooth transition of scenes.

Note

- This item is automatically set to [LOCK MODE] in the DVCAM/HDV format.

AUDIO LIMIT

▷OFF	Select when you do not want to use the audio limiter function that prevents the sound from being distorted.
ON	Select to use the audio limiter function.

Note

- This setting is valid when the AUDIO SELECT switch is set to MAN.

MIC NR

▷ON	Select to reduce noise from the microphone.
OFF	Select to deactivate this function.

MIC SELECT

▷INTERNAL MIC	Select to use the internal microphone.
XLR	Select to use an external microphone (p. 38).

➡ *continued*

INT MIC SET

You can set the wind noise reduction and the sensitivity for the external microphone.

INT MIC SENS

▷NORMAL	The standard setting.
HIGH	Use this setting to record a quiet sound. When a loud sound is recorded with this setting, the sound may be distorted. Make a trial recording in advance.

INT MIC WIND

▷OFF	Select when you want to record the sound as it is without reducing the noise caused by wind.
AUTO	Select to reduce the noise caused by wind.

XLR SET

XLR CH SEL

You can select the input signal from an external microphone, and the channel to be recorded.

▷CH1	Select to record the input signal from the INPUT1 connector to channel 1, and that from the INPUT2 connector to channel 2.
CH1, CH2	Select to record the input signal from the INPUT1 connector to channels 1 and 2.

XLR AGC LINK

You can select whether the AGC (Auto Gain Control) of channel 1 is linked with or separated from channel 2 when using an external microphone.

▷SEPARATE	Select to record the sound in channel 1 separately from that in channel 2 (AGC separated).
LINKED	Select to record the sound in channel 1 and that in channel 2 as a set, like stereo sound (AGC linked). [appears on the status check display.

Note

- The [LINKED] setting is valid only when the AUDIO SELECT switches of both channels are set to AUTO, and the same item is selected for [INPUT1 LEVEL] and [INPUT2 LEVEL].

INPUT1 LEVEL

Select the input signal from the INPUT1 connector, either from a microphone or an audio device.

▷MIC	Select to input an audio signal from a microphone connected to the INPUT1 connector. MIC appears on the status check display.
LINE	Select to input an audio signal from an audio device connected to the INPUT1 connector. LINE appears on the status check display.

INPUT1 TRIM

You can select the level of input signal from the INPUT1 connector. This setting is effective only when [INPUT1 LEVEL] is set to [MIC].
-18 dB, -12 dB, -6 dB, 0 dB, +6 dB, +12 dB are available. It is set to 0 dB in the default setting.

INPUT1 WIND

This setting is effective only when [INPUT1 LEVEL] is set to [MIC].

▷OFF	Select when you want to record the sound from the INPUT1 connector as it is, without reducing the noise caused by wind.
ON	Select to reduce the noise caused by wind. appears on the status check display.

INPUT2 LEVEL

Select the input signal from the INPUT2 connector, either from a microphone or an audio device.

▷MIC	Select to input an audio signal from a microphone connected to the INPUT2 connector. MIC appears on the status check display.
LINE	Select to input an audio signal from an audio device connected to the INPUT2 connector. LINE appears on the status check display.

INPUT2 TRIM

You can select the level of input signal from the INPUT2 connector. This setting is effective only when [INPUT2 LEVEL] is set to [MIC].
-18 dB, -12 dB, -6 dB, 0 dB, +6 dB, +12 dB are available. It is set to 0 dB in the default setting.

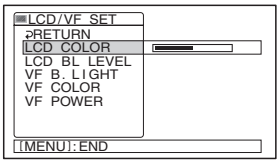
INPUT2 WIND

This setting is effective only when [INPUT2 LEVEL] is set to [MIC].

▷OFF	Select when you want to record the sound from the INPUT2 connector as it is without reducing the noise caused by wind.
ON	Select to reduce the noise caused by wind. appears on the status check display.

Using the (LCD/VF SET) menu – LCD COLOR, etc.

You can select the items listed below on the LCD/VF SET menu. For details on how to select items, see “Selecting menu items” (p. 57).
The default settings are marked with ▷. The settings you can adjust vary depending on the power mode of your camcorder. The screen shows the items you can operate at the moment. Unavailable items will be grayed out.



LCD COLOR

Turn the SEL/PUSH EXEC dial to adjust the color on the LCD screen. The recorded picture will not be affected by this setting.

LCD BL LEVEL

You can adjust the brightness of the LCD screen’s backlight. The recorded picture will not be affected by this setting.

▷NORMAL	Standard brightness.
BRIGHT	Select to brighten the LCD screen.

Note

- When you connect your camcorder to outside power sources, [BRIGHT] is automatically selected for this setting.

VF B.LIGHT

You can adjust the brightness of the viewfinder. The recorded picture will not be affected by this setting.

▷NORMAL	Standard brightness.
BRIGHT	Select to brighten the viewfinder screen.

Note

- When you connect your camcorder to outside power sources, [BRIGHT] is automatically selected for this setting.

VF COLOR

▷ON	Select to display pictures in the viewfinder in color.
OFF	Select to display pictures in the viewfinder in black and white.

VF POWER

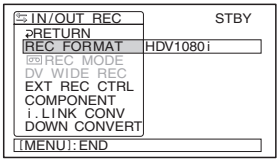
▷AUTO	Select when you do not want to display pictures on the viewfinder when the LCD panel is open.
ON	Select to display pictures on the viewfinder even when the LCD panel is open.

Note

• If you select [ON], the battery life will become a little shorter.

Using the ⇆ (IN/OUT REC) menu – REC FORMAT/ DOWN CONVERT, etc.

You can select the items listed below on the IN/OUT REC menu. For details on how to select these items, see “Selecting menu items” (p. 57). The default settings are marked with ▷. The indicators in parentheses appear when the setting is selected. The settings you can adjust vary depending on the power mode of your camcorder. The screen shows the items you can operate at the moment. Unavailable items will be grayed out.



VCR HDV/DV

Select the playback signal. Normally select [AUTO].
When the camcorder is connected to another device using an i.LINK cable, select the signal to be input/output from the i HDV/DV jack. The selected signal is recorded or played back.

▷AUTO	• Select this to play back signals by switching the format between HDV and DVCAM (DV) automatically. • For an i.LINK connection, select this to record/play back signals input/output from the i HDV/DV jack by switching the format between HDV and DVCAM (DV) automatically.
HDV	• Select this to play back the signals in the HDV format only. • For an i.LINK connection, select this to record/play back the input/output signals in the HDV format only. Select this when connecting the camcorder to a computer, etc. (p. 96).
DV	• Select this to play back the signals in the DVCAM (DV) format only. • For an i.LINK connection, select this to record/play back the input/output signals in the DVCAM (DV) format only. Select this when connecting the camcorder to a computer, etc. (p. 96).

Note

- Disconnect the i.LINK cable before setting [VCR HDV/DV]. Otherwise, the connected TV may not be able to recognize the video signal from this camcorder.
- When [AUTO] is selected and the signal switches between HDV and DV, the picture and sound disappear temporarily.
- When [HDV→DV CONV] is set to [ON], and [AUDIO LOCK] to [LOCK MODE] in [i.LINK CONV], pictures are output as follows:
  - at [AUTO], an HDV signal is converted to an audio-locked DV signal; a DV signal is output as it is.
  - at [HDV], an HDV signal is converted to an audio-locked DV signal; a DV signal is not output.
  - at [DV], a DV signal is output as it is; an HDV signal is not output.
- When [HDV→DV CONV] is set to [ON], and [AUDIO LOCK] to [UNLOCK MODE] in [i.LINK CONV], pictures are output as follows:
  - at [AUTO], an HDV signal is converted to an audio-unlocked DV signal; a DV signal is output as it is.

– at [HDV], an HDV signal is converted to an audio-unlocked DV signal; a DV signal is not output.
– at [DV], a DV signal is output as it is; an HDV signal is not output.
• An HDV signal cannot be converted to a DVCAM signal.

REC FORMAT

Selects a recording format when the POWER switch is set at CAMERA. The format lamp of the selected format will light up during recording.

▷HDV1080i (HDV1080i)	Select to record using the HDV1080i specification.
DV (DVCAM DV SP)	Select to record in the DVCAM/DV format. In addition, you need to set [REC MODE] below.

Tip

• When you output the picture during recording simultaneously to a connected device using an i.LINK cable, also set [i.LINK CONV] accordingly (p. 73).

REC MODE DVCAM DV SP

This setting is valid only when [REC FORMAT] is set to [DV].

▷DVCAM (DVCAM)	Select to record in the DVCAM format on the tape.
DV SP (DV SP)	Select to record in the SP mode of the DV format when you want to record for a long time on the tape.

Note

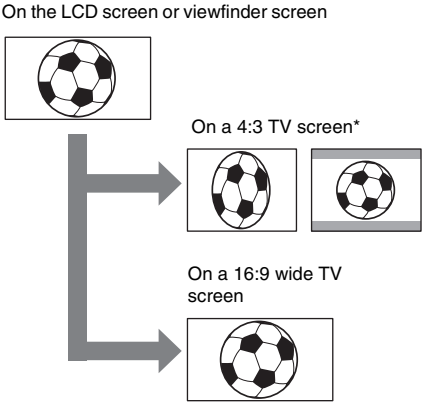
• You cannot add sound on a tape recorded in the DV SP mode.
• If you record in the DV SP mode, a mosaic-like disturbance of picture may appear or sound may be interrupted when you play back the tape on other camcorders or VCRs.
• When you mix recordings in the DVCAM mode and in the DV SP mode on one tape, the playback picture may be distorted or the time code may not be continued properly between the scenes.

➡continued

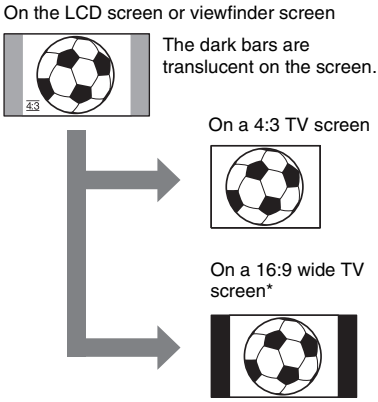
DV WIDE REC DVCAM DV SP

You can display pictures recorded in the DVCAM (DV) format on the entire TV screen by setting this item at the time of recording. Refer to the operating instructions supplied with your TV as well.

▷ON — Select to view the recorded pictures on a 16:9 wide TV screen.



OFF (4:3) — Select to view the recorded pictures on a 4:3 TV screen.



* The playback picture may look different depending on the TV connected.

EXT REC CTRL

See page 45 for details.

COMPONENT

When [50i/60i SEL] is set to 60i

480i	Select when connecting your camcorder to a TV that is compatible with 480i.
480p/480i	Select when connecting your camcorder to a TV that is compatible with 480p.
▷1080i/480i	Select when connecting your camcorder to a TV that is compatible with 1080i.

When [50i/60i SEL] is set to 50i

576i	Select when connecting your camcorder to a TV that is compatible with 576i.
576p/576i	Select when connecting your camcorder to a TV that is compatible with 576p.
▷1080i/576i	Select when connecting your camcorder to a TV that is compatible with 1080i.

Note

- If you set [HDV→DV CONV] in [i.LINK CONV] to [ON] when [576p/576i] or [480p/480i] is selected, no video signals will be output from HDV/DV jack.

i.LINK CONV

When the POWER switch is set to CAMERA, this setting is effective only when [HDV1080i] is selected in [REC FORMAT].
When the POWER switch is set to VCR, this setting is effective only when [AUTO] or [HDV] is selected in [VCR HDV/DV].

HDV→DV CONV

▷OFF	Select to output the signals from the HDV/DV jack in accordance with the [REC FORMAT] and [VCR HDV/DV] settings.
ON	Select to output the signals in the DV format from the HDV/DV jack.

AUDIO LOCK

This setting is effective 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 HDV/DV jack.
UNLOCK MODE	Signals which sampling clock for audio is separate from that of video are output from the HDV/DV jack.

Note

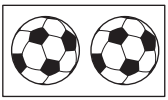
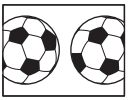
- See [VCR HDV/DV] for information about an input signal via an i.LINK connection.

continued

• Disconnect the i.LINK cable before setting [i.LINK CONV]. Otherwise, the connected video device may not be able to recognize the video signal from this camcorder.

DOWN CONVERT

Select the picture format to be output when you play back the tape recorded in the HDV specification.
This setting is effective for the following output:
- COMPONENT OUTPUT (at 480p/480i and 576p/576i)
- S VIDEO
- AUDIO/VIDEO
- i.LINK (when [HDV→DV CONV] is set to [ON] in [i.LINK CONV])

▷SQUEEZE	Select to output signals to a 16:9 wide TV or a TV compatible with 16:9 wide mode. Pictures will appear as follows: On a 16:9 wide TV  On a TV compatible with 16:9 wide mode
LETTER BOX	Select to output signals to a TV that is not compatible with 16:9 wide mode. Pictures will appear as follows: On a 4:3 standard TV
EDGE CROP	Select to display the center of the picture in 4:3 aspect ratio by cropping the both sides of the picture. Pictures will appear as follows: On a 4:3 standard TV 

Tip

• When you view pictures that were recorded in the DVCAM (DV) format with [DV WIDE REC] set to [ON] on a 4:3 standard TV, pictures may appear as they are in height, but are compressed in width depending on the TV. If you view the recorded pictures on such type of 4:3 standard TV, set [DV WIDE REC] to [OFF] before recording.

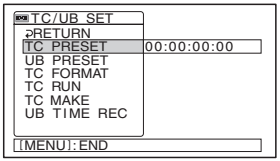
A/V → DV OUT DVCAM DV SP

You can connect a digital device and an analog device to your camcorder and convert the signal transmitted from the connected devices to the appropriate signal on your camcorder.

▷OFF	Select when you are not using the Signal conversion function.
ON (A/V▷DV)	To output analog images and sound in digital format using your camcorder. The analog signal input to the AUDIO/VIDEO jack of your camcorder will be converted and output from the i.LINK Interface of your camcorder. For details, see page 104.

Using the 00:00 (TC/UB SET) menu – TC MAKE, etc.

You can select the items listed below on the TC/UB SET menu. For details on how to select these items, see “Selecting menu items” (p. 57). The default settings are marked with ▷. The indicators in parentheses appear when the setting is selected. The settings you can adjust vary depending on the power mode of your camcorder. The screen shows the items you can operate at the moment. Unavailable items will be grayed out.



TC PRESET

You can preset or reset the time code (p. 101).

UB PRESET

You can preset or reset the user bits (p. 102).

TC FORMAT 60i

You can select the frame mode.

▷AUTO	Select to set the frame mode automatically in accordance with the inserted cassette.
DF	Select to set the frame mode to the drop frame mode.
NDF	Select to set the frame mode to the non-drop frame mode.

Note

- When [50i/60i SEL] on the (OTHERS) menu is set to 50i, the non-drop frame mode is selected automatically.

TC RUN

You can select how the time code advances.

▷REC RUN	Time code value advances only while recording. Select this when making the time code continuous at backspace editing.
FREE RUN	Time code value advances freely regardless of the camcorder’s current operation mode. Select this when adjusting the discrepancy between time code value and real time.

TC MAKE

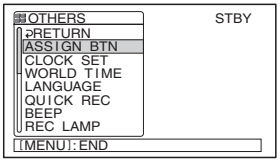
▷REGENERATE	Select to make the time code continuous at backspace editing. Regardless of the [TC RUN] setting, the running mode is automatically set to [REC RUN].
PRESET	Select when you do not want to make the time code continuous at backspace editing.

UB TIME REC

▷OFF	Select when you do not want to set the user bits to the real time clock.
ON	Select to set the user bits to the real time clock.

Using the (OTHERS) menu – CLOCK SET/WORLD TIME, etc.

You can select the items listed below on the OTHERS menu. For details on how to select these items, see “Selecting menu items” (p. 57). The default settings are marked with ▷. The indicators in parentheses appear when the setting is selected. The settings you can adjust vary depending on the power mode of your camcorder. The screen shows the items you can operate at the moment. Unavailable items will be grayed out.



ASSIGN BTN

You can assign functions to the ASSIGN buttons (p. 86).

CLOCK SET

You can set the date and time (p. 16).

WORLD TIME

You can adjust the time difference when using your camcorder abroad. Set the time difference by turning the SEL/PUSH EXEC dial, 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

You can select or change the language used for the on-screen display (p. 19).
For HVR-Z1U:
You can select from English, Simplified English, or Canadian-French.
For HVR-Z1N:
You can select from English, Simplified English, Latin American Spanish, Brazilian-Portuguese, Traditional-Chinese, or Korean.

QUICK REC HDV1080i

When the camcorder is left in recording standby for more than about 3 minutes, your camcorder exits the recording standby mode (the drum stops rotating) to prevent tape wear and battery loss. Since the power does not turn off, you can restart recording by pressing REC START/STOP again.

▷OFF	It takes some time to restart recording from the state that the drum has stopped rotating, but the transition from the last recorded scene is smooth.

ON	The time shortens slightly until recording restarts from the state that the drum has stopped rotating, but the transition from the last recorded scene may not be smooth. Select this when you do not want to miss a recording chance.

BEEP

MELODY	Select to play a melody when you start/stop recording, or when an unusual condition occurs on your camcorder.
▷NORMAL	Select to sound a beep instead of the melody.
OFF	Select to cancel the melody and the beep sound.

REC LAMP

▷ON	Select to turn on the camera recording lamps on the front and rear of your camcorder during recording.
OFF	Select this setting in the following recording situations. The camera recording lamps on the front and rear will not light up during recording. • When you do not want the subject to be nervous about being recorded. • When you are recording close to the subject. • When the subject reflects the light of the recording lamp.

FORMAT LAMP

▷ON	Select to turn on the format lamp. The lamp of the format that is selected in [REC FORMAT] lights up when the POWER switch is set to CAMERA. The lamp of the format that is selected in [VCR HDV/DV] lights up when the POWER switch is set to VCR.
OFF	Select when you do not want to turn on the format lamp. The i.LINK lamp also does not light up.

Note

• The format lamp lights up according to the format of the playback or of an input signal from another device when [VCR HDV/DV] on the (IN/OUT REC) menu is set to [AUTO].

IRIS DIAL

You can select the rotation direction of the iris dial to open or close the iris.

▷NORMAL	Select to rotate clockwise when looked at from the lens side to close the iris and decrease the light volume.
OPPOSITE	Select to rotate counter clockwise when looked at from the lens side to close the iris and decrease the light volume.

➡*continued*

DATA CODE

Select the item to be displayed when you press DATA CODE (p. 51).

▷DATE/CAM	Select to display the date and time, or the camera settings data during playback.
DATE	Select to display the date and time during playback.

LETTER SIZE

▷NORMAL	Select to display the menu screen at normal size.
2x	Select to display the selected menu item at double the normal height.

REMAINING

▷AUTO	Select to display the remaining tape indicator for about 8 seconds: • After you set the POWER switch to CAMERA or VCR with a cassette inserted, and your camcorder calculates the remaining amount of tape. • After you press ► (play) or DISPLAY/BATT INFO.
ON	Select to always display the remaining tape indicator.

DISP OUTPUT

▷LCD PANEL	Select to show indicators such as the time code on the LCD screen and in the viewfinder.
V-OUT/PANEL	Select to show indicators such as the time code on the TV screen, LCD screen, and in the viewfinder.

Note

- You cannot input a signal to your camcorder if you press DISPLAY/BATT INFO or the ASSIGN button assigned to the DISPLAY function while [V-OUT/PANEL] is selected.

ZOOM DISPLAY

▷BAR	Select to indicate the zoomed position using the bar display.
NUMBER	Select to indicate the zoomed position using numbers (0 through 99).

EXP. FOCUS

▷AUTO OFF	Select to release the expanded focus automatically after a certain time (p. 33).
MANUAL OFF	Select to keep the expended focus even after a certain time. To release the expanded focus, press EXPANDED FOCUS again.

HOURS METER

The cumulative operation time of your camcorder will be displayed with the total hours of operation, drum rotation, tape running, or the total number of tape unthreading operations.

OPERATION	Displays the total hours of operation in 10-hour increments.
DRUM RUN	Displays the total hours of drum rotation in 10-hour increments.
TAPE RUN	Displays the total hours of tape running in 10-hour increments.
THREADING	Displays the total number of tape unthreading operations in 10-operation increments.

DATE REC

▷OFF	Select when you do not want to superimpose the date and time on the pictures.
ON	Select to superimpose the date and time directly on the pictures when recording.

Note

- Even though the date/time indication on the screen is affected by the signal of zebra or peaking, it is recorded without influenced by zebra or peaking.

REMOTE CTRL

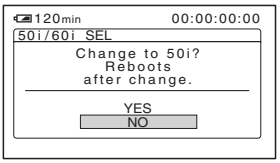
▷ON	Select when using the Remote Commander supplied with your camcorder.
OFF	Select to deactivate the Remote Commander to prevent your camcorder from responding to a command sent by another VCR remote control unit.

➡*continued*

50i/60i SEL

You can switch the system, 1080/60i (NTSC system) or 1080/50i (PAL system), used by your camcorder to record. It is set to 60i in the default setting.

1 Select [YES] by turning the SEL/PUSH EXEC dial, then press the dial.



2 Select [YES] again by turning the SEL/PUSH EXEC dial, then press the dial.

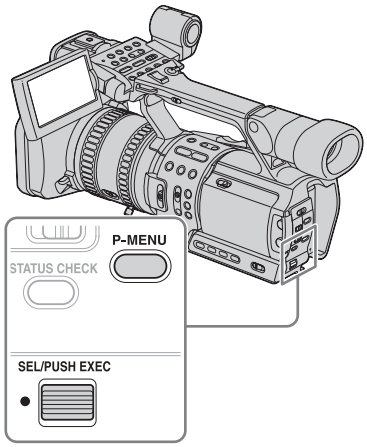
The screen goes off, the system is switched.

Tip

• You can switch to 50i (PAL) system also when recording in the DVCAM (DV) format.

Customizing Personal Menu

The available items vary depending on the power mode of your camcorder.
Unavailable items will be grayed out.
You can add frequently used menu items to Personal Menu, or sort them in the order you like (customizing). You can customize the Personal Menu for each power mode of your camcorder.



1 **Press P-MENU.**

2 **Select the desired item by turning the SEL/PUSH EXEC dial, then press the dial.**

3 **Select the desired setting by turning the SEL/PUSH EXEC dial, then press the dial.**

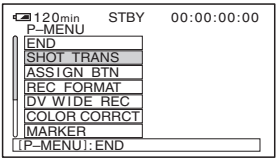
Adding a menu – Add

You can add frequently used menu items to Personal Menu for easier and faster access.

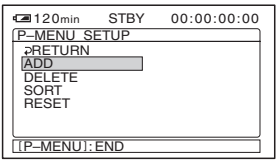
Note

- You can add up to 28 menu items each for the CAMERA and VCR modes. If you want to add more, you must delete a less important menu item before adding a new menu item (p. 84).

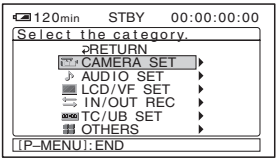
1 **Press P-MENU.**



2 **Select [P-MENU SETUP] by turning the SEL/PUSH EXEC dial, then press the dial.**

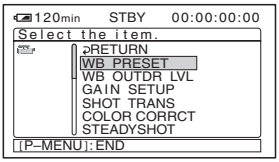


3 **Select [ADD] by turning the SEL/PUSH EXEC dial, then press the dial.**



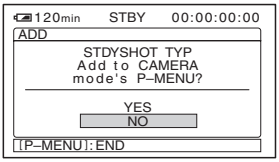
➡ *continued*

4 **Select a menu category by turning the SEL/PUSH EXEC dial, then press the dial.**



5 **Select a menu item by turning the SEL/PUSH EXEC dial, then press the dial.**

The available items vary depending on the power mode of the camcorder.
Only the available items are displayed.



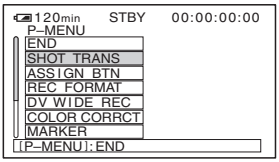
6 **Select [YES] by turning the SEL/PUSH EXEC dial, then press the dial.**

The menu is added to the end of the list.

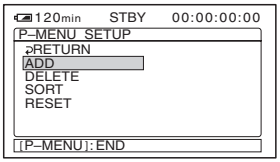
7 **Press P-MENU.**

Deleting menu – Delete

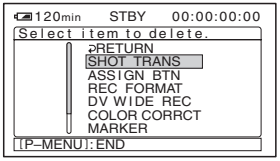
1 **Press P-MENU.**



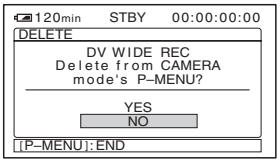
2 **Select [P-MENU SETUP] by turning the SEL/PUSH EXEC dial, then press the dial.**



3 **Select [DELETE] by turning the SEL/PUSH EXEC dial, then press the dial.**



4 **Select the item that you want to delete by turning the SEL/PUSH EXEC dial, then press the dial.**



5 **Select [YES] by turning the SEL/PUSH EXEC dial, then press the dial.**

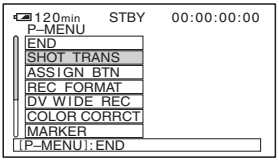
The selected menu is deleted from Personal Menu.

6 **Press P-MENU.**

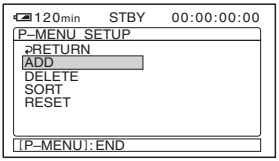
Arranging the order of menus displayed on Personal Menu – Sort

You can sort the menus added to Personal Menu in the desired order.

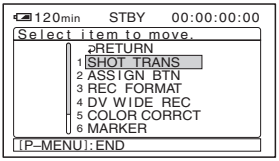
1 **Press P-MENU.**



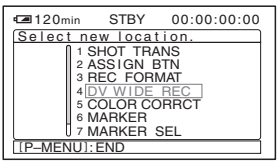
2 **Select [P-MENU SETUP] by turning the SEL/PUSH EXEC dial, then press the dial.**



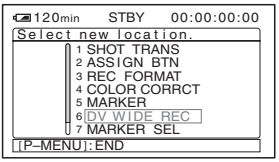
3 **Select [SORT] by turning the SEL/PUSH EXEC dial, then press the dial.**



4 **Select the menu item you want to move by turning the SEL/PUSH EXEC dial, then press the dial.**



5 **Move the menu item to the desired place by turning the SEL/PUSH EXEC dial.**



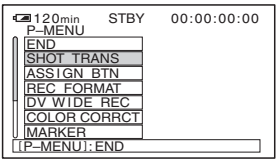
6 **Press the SEL/PUSH EXEC dial.**
To sort more items, repeat steps 4 to 6.

7 **Press P-MENU.**

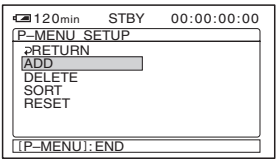
Initializing the settings – Reset

You can initialize Personal Menu to the default settings after adding or deleting menus.

1 **Press P-MENU.**

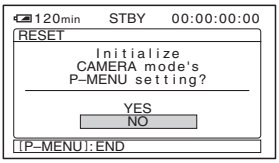


2 **Select [P-MENU SETUP] by turning the SEL/PUSH EXEC dial, then press the dial.**

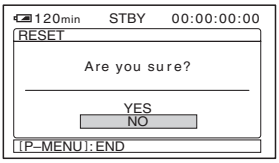


➡*continued*

3 **Select [RESET] by turning the SEL/PUSH EXEC dial, then press the dial.**



4 **Select [YES] by turning the SEL/PUSH EXEC dial, then press the dial.**



5 **Select [YES] by turning the SEL/PUSH EXEC dial, then press the dial.**

The Personal Menu settings return to the default settings.
To cancel initialization, select [NO].

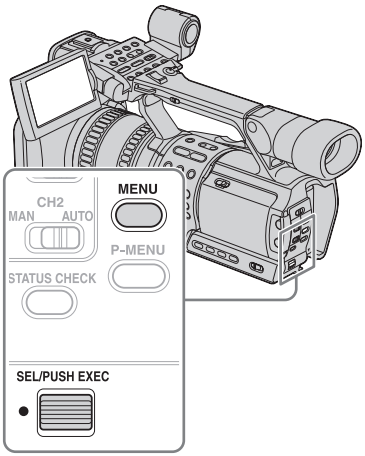
6 **Press P-MENU.**

Assigning the functions

Depending on the functions, you need to assign them to the ASSIGN buttons to use them. You can assign single function to each ASSIGN 1 through 6 button.

Functions you can assign to the ASSIGN buttons

- [FADER] (p. 44)
- [BACK LIGHT] (p. 25)
- [SPOTLIGHT] (p. 26)
- [AE OVERRIDE] (p. 87)
- [WB OUTDR LVL +] (p. 58)
- [WB OUTDR LVL –] (p. 58)
- [HYPER GAIN] (p. 87)
- [MARKER] (p. 61)
- [ALLSCAN MODE] (p. 87)
- [STEADYSHOT] (p. 60)
- [INDEX MARK] (p. 44)
- [AUDIO DUB] (p. 99) DVCAM
- [REC REVIEW] (p. 47)
- [DISPLAY] (p. 50)
- [BARS] (p. 22)



1 **Press MENU.**

2 **Select the (OTHERS) menu by turning SEL/PUSH EXEC dial, then press the dial.**

3 **Select [ASSIGN BTN] by turning SEL/PUSH EXEC dial, then press the dial.**

4 **Select the number of the ASSIGN button you want to assign the function by turning SEL/PUSH EXEC dial, then press the dial.**

[ASSIGN1] through [ASSIGN6] are available. [------] is displayed at the number that no function is assigned.

5 **Select the function to be assigned by turning SEL/PUSH EXEC dial, then press the dial.**

6 **Select [OK] by turning SEL/PUSH EXEC dial, then press the dial.**

7 **Press MENU to hide the menu.**

Using the hyper gain function

During recording or in the recording standby mode, press the ASSIGN button assigned to [HYPER GAIN]. The gain will be increased to 36 dB. To restore the previous setting, press the button again.
When shooting a very dark subject, you can make it visible by using the hyper gain.

Note

- When this function is activated, the following functions do not operate:
  – [AE SHIFT] of the PICTURE PROFILE function
  – [AE OVERRIDE]
  – [BACK LIGHT]
  – [SPOTLIGHT]
  – Gain adjustment
- When this function is activated, the picture quality will deteriorate.
- If you use this function when the shutter speed is slower than 1/15, the shutter speed is automatically set to 1/30. 60i
- If you use this function when the shutter speed is slower than 1/12, the shutter speed is automatically set to 1/25. 50i

Tip

- It is recommended that you focus manually.

Using the AE override function

Press the ASSIGN button assigned to [AE OVERRIDE] and rotate the iris dial. You can adjust the brightness by overriding the AE shift value temporarily. When this function is activated, OVERRIDE appears on the screen.

Note

- The AE override function is released when iris is adjusted manually.

Tip

- The highest/lowest value used by AE overriding depends on the AE shift value. The value varies ranging within ±7 of the total value of AE shift and AE override.

Displaying the marker

Press the ASSIGN button assigned to [MARKER] to display the marker on the screen. You can select the type of marker in [MARKER SEL] on the (CAMERA SET) menu (p. 61).

Displaying the entire picture frame HDV1080i

You can check the area surrounding the picture frame. This is not possible on standard TV screens. You can do this by pressing the ASSIGN button assigned to

➡*continued*

[ALLSCAN MODE]. During the simple allscan display, a black frame appears around the screen. Press the button again to restore the previous screen mode.

Note

- When this function is activated, pictures are output in the interlace letter box format from the COMPONENT OUTPUT and i.LINK jacks except for the HDV signals.

Tip

- When you press the ASSIGN button assigned to [STEADYSHOT], the SteadyShot function is released and appears on the LCD screen. To activate the SteadyShot function, press the same button again. You can select the effect level of the SteadyShot function using [STDYSHOT TYP] on the (CAMERA SET) menu (p. 60).
- There are independent buttons for DISPLAY and BARS. However, you can assign them also to the ASSIGN buttons at your convenience. You can use both buttons.

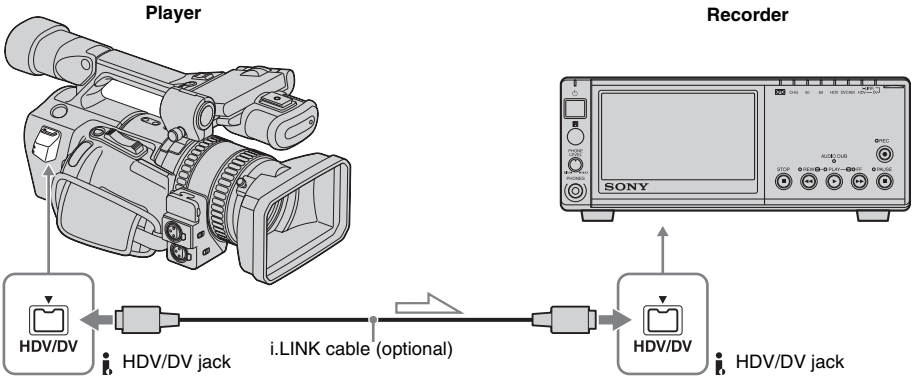
Dubbing to another tape

You can copy a picture played back on your camcorder to other recording devices (such as VCRs).
Connect your camcorder to a VCR as shown in the following illustration.

Connecting a VCR

To dub to an HDV compatible device

Connect your camcorder to an HDV compatible device using an i.LINK cable (optional).



To select the video format to be dubbed

The video format to be dubbed depends on the settings of [VCR HDV/DV] and [i.LINK CONV] on the ⇆ (IN/OUT REC) menu. Before setting these menu items, disconnect the i.LINK cable.

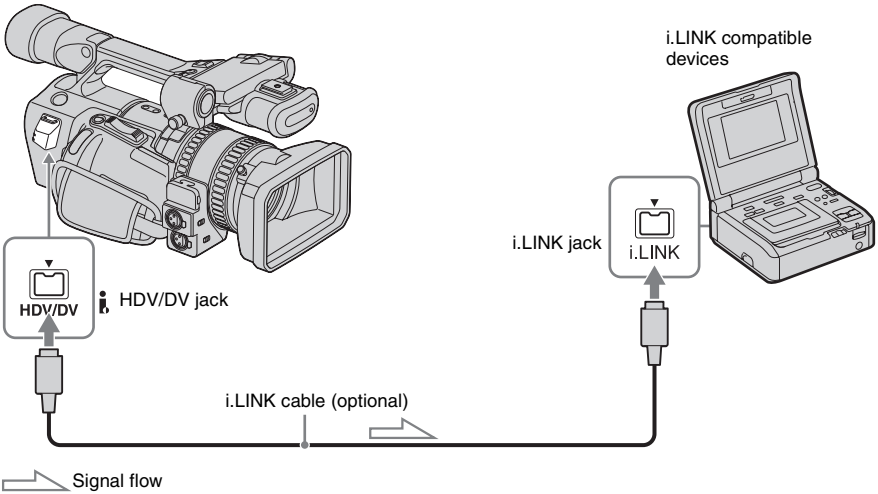
- Pictures will be dubbed in the recorded format when [VCR HDV/DV] is set to [AUTO], and [HDV→DV CONV] to [OFF] in [i.LINK CONV].
- Only pictures in the selected format will be dubbed when [VCR HDV/DV] is set to [HDV] or [DV]. Other pictures will be dubbed as blank portions, so neither picture nor sound will be dubbed.

Note

- If you change the settings of [VCR HDV/DV] and [i.LINK CONV] with the i.LINK cable connected, the video device may not be able to recognize the video signal from the camcorder at the time of dubbing.
- When [VCR HDV/DV] is set to [AUTO] and the signal switches between HDV and DV, the picture and sound disappear temporarily.
- When the recorder is an HVR-Z1U/Z1N, set [VCR HDV/DV] on the ⇆ (IN/OUT REC) menu to [AUTO] on the recording HVR-Z1U/Z1N (p. 93).

To dub to a DVCAM (DV) device

Connect your camcorder to a VCR using an i.LINK cable (optional).



To select the video format to be dubbed

The video format to be dubbed depends on the settings of [VCR HDV/DV] (p. 70) and [i.LINK CONV] (p. 73) on the (IN/OUT REC) menu. Before setting these menu items, disconnect the i.LINK cable.

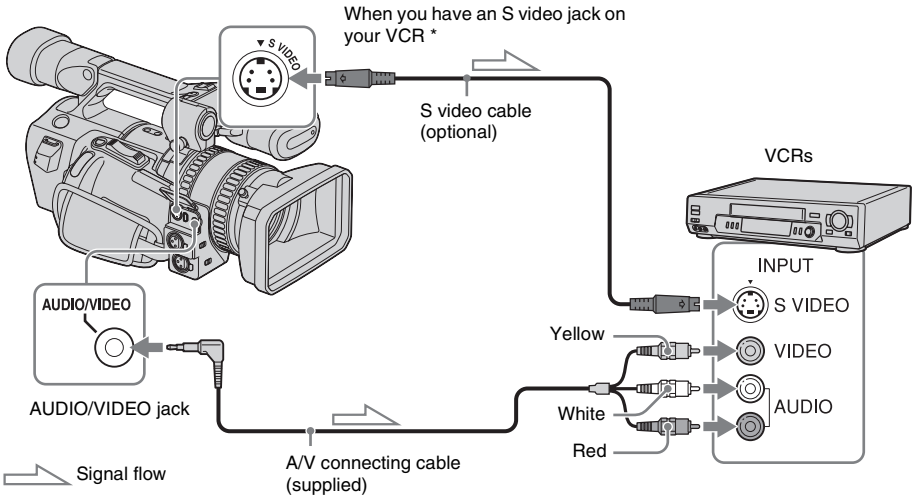
- When [VCR HDV/DV] is set to [AUTO], [HDV→DV CONV] to [ON], and [AUDIO LOCK] to [LOCK MODE] in [i.LINK CONV], HDV pictures are dubbed as audio-locked signals, and DV pictures are dubbed as they are, disregarding the [AUDIO LOCK] setting.
- When [VCR HDV/DV] is set to [AUTO], [HDV→DV CONV] to [ON], and [AUDIO LOCK] to [UNLOCK MODE] in [i.LINK CONV], HDV pictures are dubbed as audio-unlocked signals, and DV pictures are dubbed as they are, disregarding the [AUDIO LOCK] setting.
- If the tape was recorded with the HDV and DVCAM (DV) formats mixed, set [VCR HDV/DV] to [DV] to dub only pictures in the DVCAM (DV) format. Pictures in the HDV format will be dubbed as blank portions, so neither picture nor sound will be dubbed.

Note

- If you change the settings of [VCR HDV/DV] and [i.LINK CONV] with the i.LINK cable connected, the video device may not be able to recognize the video signal from the camcorder at the time of dubbing.
- If [HDV→DV CONV] is set to [OFF] in [i.LINK CONV] while [VCR HDV/DV] is set to [AUTO], pictures recorded in the HDV mode will be recorded as blank portions, so neither picture nor sound will be recorded.
- When [VCR HDV/DV] is set to [HDV], the connected DVCAM (DV) device cannot recognize pictures, so pictures will be dubbed as blank portions.
- When [VCR HDV/DV] is set to [AUTO] and the signal switches between HDV and DVCAM (DV), the picture and sound disappear temporarily.

To dub to an AV device

Connect your camcorder to a VCR using the A/V connecting cable (supplied).



* When there is an S video jack on the device to be connected, connect an S video cable (optional) to that jack instead of using the yellow video plug of the A/V connecting cable (supplied). This connection produces higher quality DVCAM (DV) format pictures. The audio will not be output if you connect with the S video cable alone.

Note

- Select the (OTHERS) menu, [DISP OUTPUT], then [LCD PANEL] (the default setting) (p. 80).
- When you connect your camcorder to a monaural device, connect the yellow plug of the A/V connecting cable to the video jack, and the red or the white plug to the audio jack on the VCR or the TV.

Tip

- To record the date/time and camera settings data, first have them displayed on screen (p. 51).

Dubbing to another tape

1 Connect the recording device to your camcorder (p. 89).

2 Prepare the recording device.

- Insert a cassette for recording.
- If the recording device has an input selector, set it to the input mode.

3 Prepare your camcorder for playback.

- Insert the recorded cassette.
- Set the POWER switch to VCR.

4 Start the playback on your camcorder, and record it on the VCR.

Refer to the operating instructions supplied with your VCR for details.

5 When the dubbing is finished, stop your camcorder and the VCR.

Note

- When you use an i.LINK cable, the recorded picture becomes rough when a picture is paused on your camcorder while recording it to a VCR.
- Pictures recorded in the HDV format are not output from the i HDV/DV jack during playback pause or in playback modes other than normal playback.
- When you use an i.LINK cable, you cannot record the picture and sound separately.

Tip

- The i.LINK lamp, HDV or DV, on the i HDV/DV jack holder will light up and indicate the format of the output signal when you use an i.LINK cable.
- When you use an i.LINK cable, the video and sound signals are transmitted digitally, producing high quality pictures.

Recording pictures from a VCR or TV

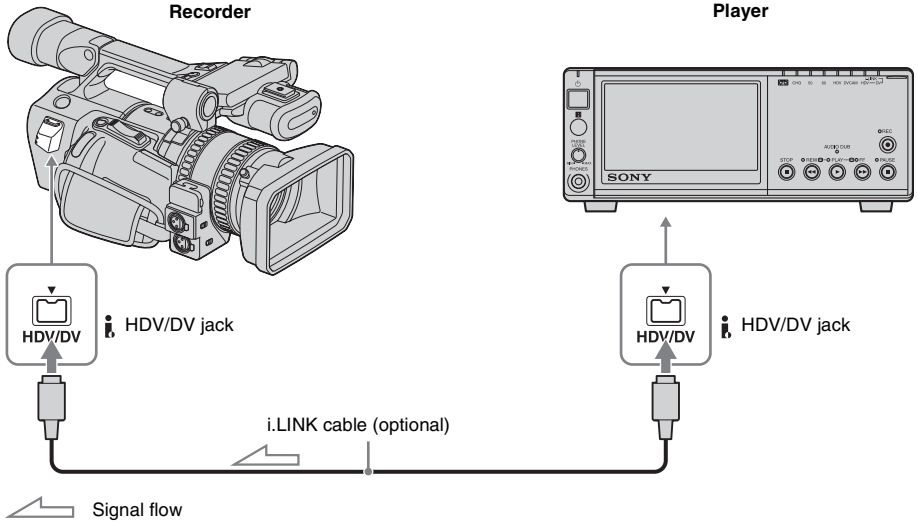
You can record pictures or TV programs from a VCR or TV on a tape inserted in your camcorder.

Connecting a VCR or TV

To record from an HDV compatible device

You can record and edit pictures from an HDV compatible VCR. Use your camcorder as a recorder and connect it to an HDV compatible device using an i.LINK cable (optional).

On this camcorder (recorder), select the (IN/OUT REC) menu, [VCR HDV/DV], then [AUTO] (p. 70) before connecting.



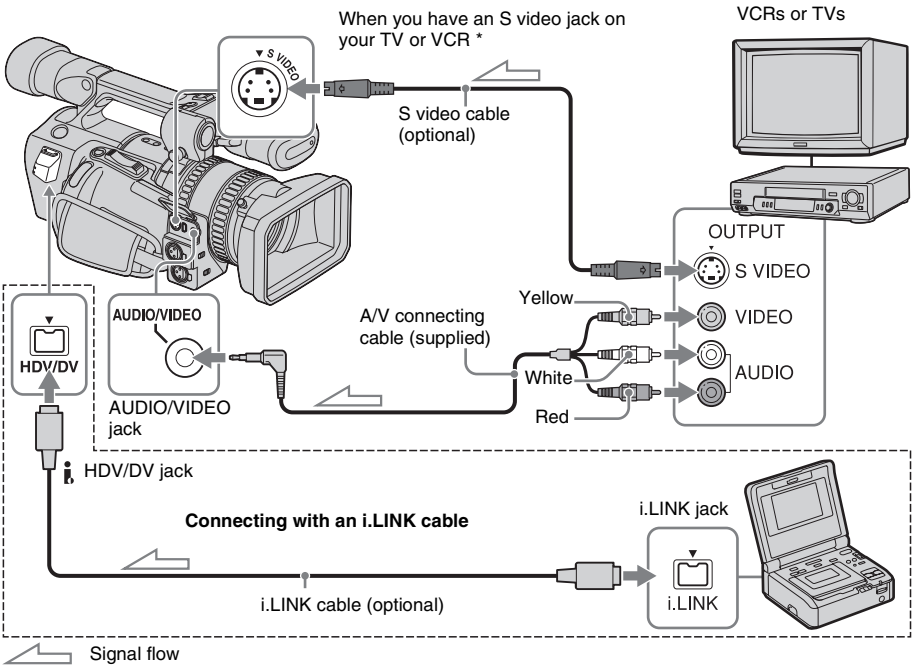
Note

- In case of digital broadcasting, you may not be allowed to record some programs for copyright reasons (p. 114).

To record from a DVCAM (DV)/AV device

You can record and edit pictures or TV programs from a VCR or TV. Use your camcorder as a recorder and connect it to a VCR using the A/V connecting cable (supplied). You can connect a DVCAM (DV) compatible device also using an i.LINK cable (optional).

When you use an i.LINK cable to connect a DVCAM (DV) compatible device, select the (IN/OUT REC) menu, [VCR HDV/DV], then [DV] or [AUTO] (p. 70) before connecting.



* When there is an S video jack on the device to be connected, connect an S video cable (optional) to that jack instead of using the yellow video plug of the A/V connecting cable (supplied). This connection produces higher quality DVCAM (DV) format pictures. The audio will not be output if you connect with the S video cable alone.

Note

- You can record pictures from DVCAM (DV)/AV devices only in the DV format.
- When you use the A/V connecting cable (supplied), select the (OTHERS) menu, [DISP OUTPUT], then [LCD PANEL] (the default setting) (p. 80).
- When you connect your camcorder to a monaural device, connect the yellow plug of the A/V connecting cable to the video jack, and the red or the white plug to the audio jack on the VCR or the TV. Only the sound from the connected plug is recorded.
- When a 4:3 video signal is input, it appears with black bands on the right and left sides on the screen of your camcorder.

Tip

- If the recording device has an i.LINK jack, it is recommended to connect it using an i.LINK cable (optional).

Recording movies

Insert a cassette for recording in your camcorder before the following operations.

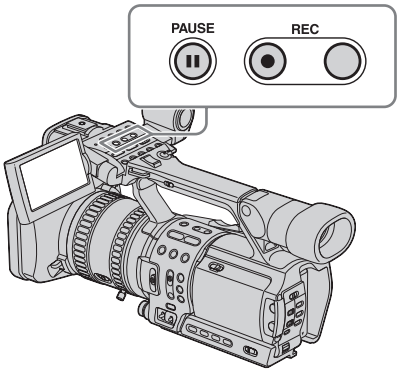
1 Connect your TV or VCR to your camcorder as a playback device (p. 93, 94).

2 If you are recording from a VCR, insert a cassette.

3 Set the POWER switch to VCR.

4 Set your camcorder to recording pause.

While pressing ❚❚ (pause), press both ● REC (record) buttons simultaneously.



5 Start playing the cassette on your VCR, or select a TV program.

The picture played on the connected device appears on the LCD screen of your camcorder.

6 Press ❚❚ (pause) again at the point you want to start recording.

7 Press ■ (stop) to stop recording.

Note

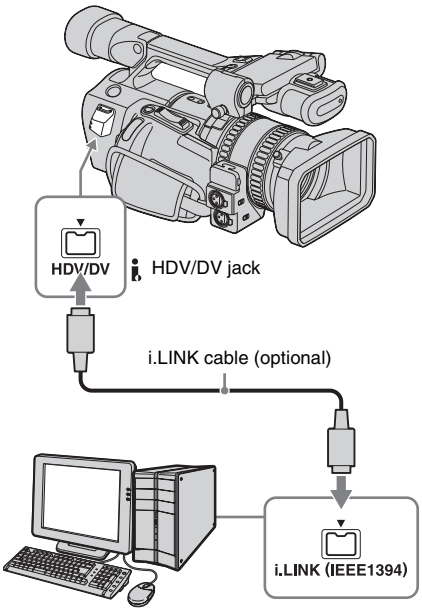
- When you use an i.LINK cable, the recorded picture becomes rough when a picture is paused on your VCR.
- When you use an i.LINK cable, you cannot record the picture and sound separately.
- When you use an i.LINK cable, if you pause or stop the recording and restart it, the picture may not be recorded smoothly.

Tip

- The i.LINK lamp, HDV or DV, on the i HDV/DV jack holder will light up and indicate the format of the input signal when you use an i.LINK cable.
- When you use an i.LINK cable, the video and sound signals are transmitted digitally, producing high quality pictures.
- When you use an i.LINK cable, HDV/DVIN appears during recording. This indicator may appear on the screen of the playback device, however they will not be recorded.
- Index signals are automatically recorded on the tape during recording. You can also record index signals at the desired positions during recording by pressing the ASSIGN button assigned to the index function (p. 44).

Connecting to a computer

To use your camcorder by connecting it to a computer using an i.LINK cable, the computer must have an i.LINK interface, and application software to read video signals must be installed on the computer.
Refer to the manual supplied with the application software for the system requirements of the computer.



Connecting the computer

- Before connecting your camcorder to the computer with an i.LINK cable, be sure to insert the connector plug in the proper direction. If you insert the connector plug forcibly in the wrong direction, the terminal may be damaged, or this may cause a malfunction of your camcorder.
- Connect the i.LINK cable to the computer first, then to your camcorder. Connecting in the opposite order may cause static electricity to build up, resulting in a malfunction of your camcorder.
- Be sure to set [VCR HDV/DV] and [i.LINK CONV] on the (IN/OUT REC) menu before connecting the i.LINK cable. If you connect the i.LINK cable first, the computer may hang up or may not recognize the signal from your camcorder.

Note

- Connect a computer that can handle the signal of the format indicated by the i.LINK lamps. If you connect a computer that cannot handle the signal, the computer may hang up or may not recognize the signal from your camcorder.
- Disconnect the i.LINK cable before resetting [REC FORMAT] when the POWER switch is set to CAMERA. Otherwise, the computer may hang up.

Tip

- The i.LINK lamp, HDV or DV, on the HDV/DV jack holder will light up and indicate the format of the input signal when you use an i.LINK cable.

To import pictures on a tape to the computer

- To scan pictures recorded in the HDV format on the tape in the HDV format, set [VCR HDV/DV] to [HDV] (p. 70) and [HDV→DV CONV] to [OFF] in [i.LINK CONV](p. 73).
- To scan pictures recorded in the DVCAM (DV) format on the tape in the DVCAM (DV) format, set [VCR HDV/DV] to [DV] (p. 70).
- To scan pictures recorded in the HDV format on the tape in the audio-locked DV format, set [HDV→DV CONV] to [ON] and [AUDIO LOCK] to [LOCK MODE] in [i.LINK CONV] (p. 73).
- To scan pictures recorded in the HDV format on the tape in the audio-unlocked DV format, set [HDV→DV CONV] to [ON] and

[AUDIO LOCK] to [UNLOCK MODE] in [i.LINK CONV] (p. 73).

Note

- Pictures may not be imported correctly depending on the application software of the computer.
- You cannot import pictures recorded in the DVCAM (DV) format in the HDV format.

To import pictures from the computer to your camcorder

In the HDV format

Set [VCR HDV/DV] to [HDV] (p. 70) and [HDV→DV CONV] to [OFF] in [i.LINK CONV] (p. 73).

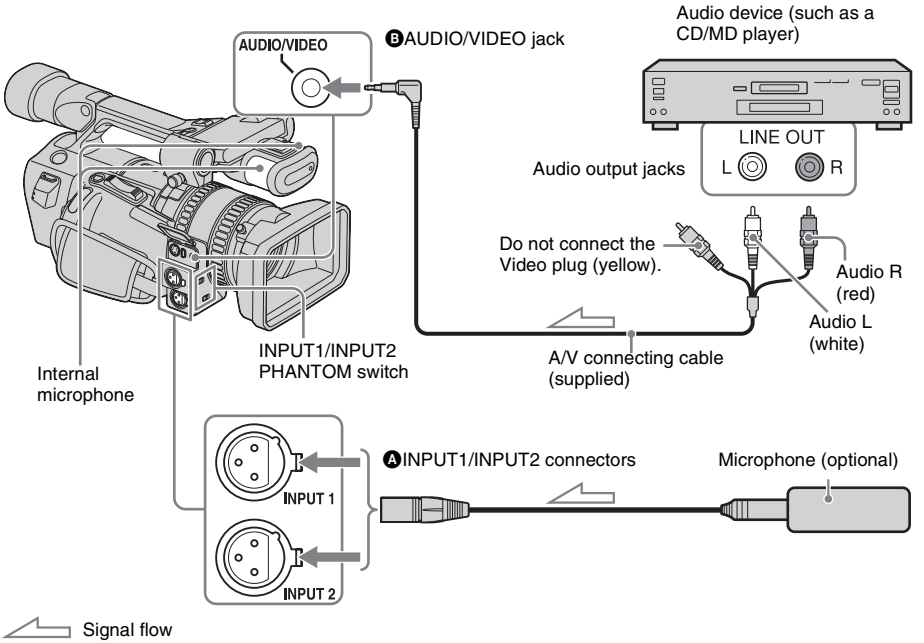
In the DVCAM (DV) format

Set [VCR HDV/DV] to [DV] (p. 70).

Dubbing sound to a recorded tape DVCAM

You can record additional audio to the original sound on a tape recorded in the DVCAM format and the FS32K audio mode.

Preparing for audio dubbing



1 Input audio in one of the following ways.

- Using the internal microphone (no connection required).
- Connecting a microphone or an audio device (optional) to the INPUT1/INPUT2 connectors. (A)
- Connecting an audio device (optional) to the AUDIO/VIDEO jack. (B)

2 Select the ♪ (AUDIO SET) menu, [MIC SELECT], then [XLR] (p. 65).

To use the internal microphone, select [INTERNAL MIC].

3 When using the INPUT1/INPUT2 connectors, set the menu items in accordance with the connector and the connected device.

To use a microphone

- When the microphone is connected to the INPUT1 connector, set [INPUT1 LEVEL] to [MIC].

- When the microphone is connected to the INPUT2 connector, set [INPUT2 LEVEL] to [MIC].
- If the microphone is powered through its cable, set the INPUT1/INPUT2 PHANTOM switch to ON.

To use an audio device

- When the audio device is connected to the INPUT1 connector, set [INPUT1 LEVEL] to [LINE], and set the INPUT1 PHANTOM switch to OFF.
- When the audio device is connected to the INPUT2 connector, set [INPUT2 LEVEL] to [LINE], and set the INPUT2 PHANTOM switch to OFF.

The channel on which the audio is recorded

The audio input from each jack/connector is recorded in channel 3 or 4 as follows:

Input	[XLR CH SEL]	Recorded audio	
		Channel 3	Channel 4
AUDIO/ VIDEO	–	CH1	CH2
INTERNAL MIC	–	CH1	CH2
INPUT 1/2	CH1	INPUT1	INPUT2
	CH1, CH2	INPUT1	INPUT1
INPUT1	CH1	INPUT1	–
	CH1, CH2	INPUT1	INPUT1
INPUT2	CH1	–	INPUT2
	CH1, CH2	–	–

Note

- When you use the AUDIO/VIDEO jack to record additional sound, the picture will not be output from the AUDIO/VIDEO jack. Check the picture on the LCD screen or the viewfinder, and the sound on the headphones.
- You cannot record additional audio:
  - When the tape is recorded in the HDV format.
  - When the tape is recorded with [REC MODE] set to [DV SP].
  - When the tape is recorded with [AUDIO MODE] set to [FS48K].
  - When your camcorder is connected using an i.LINK cable.
  - On blank sections of the tape.
  - When the write-protect tab of the cassette is set to SAVE.
  - 50i/60i setting on the camcorder is different from that of the tape.
- When you use an external microphone (optional) to record additional audio, you can check the picture on the LCD screen of the camcorder or by connecting your camcorder to a TV using the component video cable. Check the sound by using headphones.
- If you add audio to a tape recorded on another device with a 4-ch microphone, audio system data may be rewritten.

Recording sound

Assign the audio dubbing function to one of the ASSIGN buttons in advance. See page 86 for details on how to assign a function.

1 Insert a recorded cassette into your camcorder.

2 Set the POWER switch to VCR.

3 Press ► (play) to play the tape.

4 Press II (pause) at the point where you want to start recording the sound.

The playback pauses.

5 Press the ASSIGN button assigned to audio dubbing.

The ⊖ II mark appears on the LCD screen.

6 Press II (pause) and start playing back the audio you want to record at the same time.

The ⊖ mark remains on the LCD screen while sound is recorded.
The new sound is recorded in channels 3 and 4.

➡*continued*

7 **Press ■ (stop) when you want to stop recording.**

Note

- You can only record additional audio on a tape recorded on your camcorder. The sound may deteriorate when you dub audio on a tape recorded on other camcorders (including other HVR-Z1U/Z1N camcorders).

Tip

- You can adjust the recording volume of additional audio manually.

Checking and adjusting the recorded sound

1 **Play back the tape on which you have recorded audio following the procedures in "Recording sound" (p. 99).**

2 **Press MENU.**

3 **Select the ♪ (AUDIO SET) menu by turning the SEL/PUSH EXEC dial, then press the dial.**

4 **Select [AUDIO MIX] by turning the SEL/PUSH EXEC dial, then press the dial.**

5 **Turn the SEL/PUSH EXEC dial to select the sound to be output, then press the dial.**

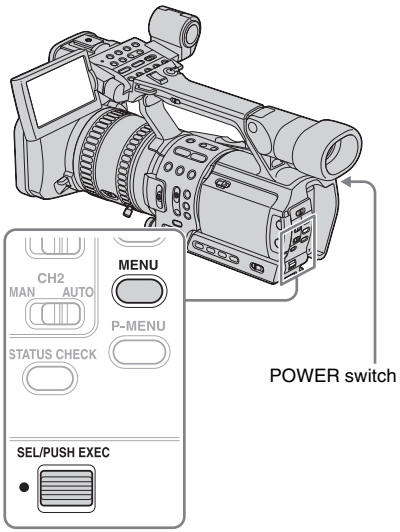
Setting	To
MIX	synthesize the original sound (CH1, CH2) with the added sound (CH3, CH4) to be output
CH3, CH4	output the added sound (CH3, CH4) only

6 **Press MENU to hide the menu screen.**

Setting time values

Your camcorder uses 2 types of time values: time code values and user bits.

Setting the time code value



1 **Set the POWER switch to VCR or CAMERA.**

2 **Press MENU.**

3 **Select the 00:00 (TC/UB SET) menu by turning the SEL/PUSH EXEC dial, then press the dial.**

4 **Select [TC MAKE] by turning the SEL/PUSH EXEC dial, then press the dial.**

5 **Select [PRESET] by turning the SEL/PUSH EXEC dial, then press the dial.**

6 **Set the time code value.**

1 Select [TC PRESET] by turning the SEL/PUSH EXEC dial, then press the dial.
2 Select [PRESET] by turning the SEL/PUSH EXEC dial, then press the dial.
3 Select the first 2 digits by turning the SEL/PUSH EXEC dial, then press the dial.
Set a time code between 00:00:00:00 and 23:59:59:29.
4 Repeat step 3 to set up the other digits.
5 Select [OK] by turning the SEL/PUSH EXEC dial, then press the dial.

7 **Select the frame mode.** 60i

1 Select [TC FORMAT] by turning the SEL/PUSH EXEC dial, then press the dial.
2 Select the frame mode by turning the SEL/PUSH EXEC dial, then press the dial.

Setting	To
AUTO	set the mode automatically in accordance with the inserted cassette
DF	select the drop frame mode
NDF	select the non-drop frame mode

8 **Select the running mode.**

1 Select [TC RUN] by turning the SEL/PUSH EXEC dial, then press the dial.
2 Select the running mode by turning the SEL/PUSH EXEC dial, then press the dial.

Setting	To
REC RUN	advance the time code value only while recording. Select this when making the time cord continuous at backspace editing.

➡ *continued*

Setting	To
FREE RUN	advance the time code freely regardless of the camcorder's current operation mode. The time code starts running once this setting is selected.

9 Press MENU to hide the menu screen.

To cancel the time code setting

Select [CANCEL] in step 5 in step 6, or press TC RESET on the Remote Commander.
In case of operating the Remote Commander, make sure that the time code is 00:00:00:00, and then set [REMOTE CTRL] to [OFF].

To reset the time code

Select [RESET] in step 2 in step 6.

Drop frame mode

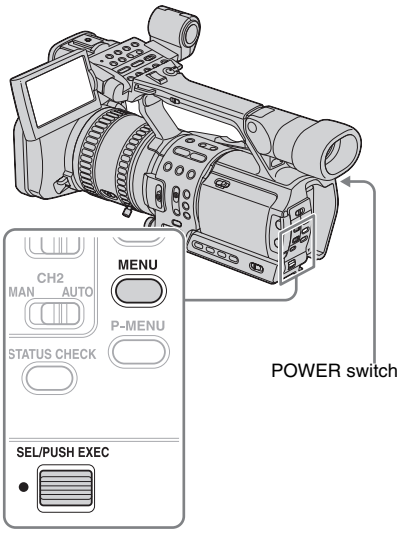
In the NTSC standard, the time code value is based on 30 frames per second, but the exact video frame frequency is in fact 29.97 frames per second. Consequently the time code value will deviate from the real time when recording for long time.
Drop frame mode corrects for this by skipping 2 frame counts at the beginning of every minute which is not a multiple of 10.
In non-drop frame mode, however, no frame counts are omitted, and there is a gradual deviation of the time code from the real time.

Note

- In case of the i.LINK connection, if you start recording when there is no video input signal, the time code may not continue correctly.
- If you record HDV and DVCAM (DV) mixed, the time code may be initialized at the backspace editing.
- If you play back the tape recorded in HDV and DVCAM (DV) mixed, the time code may not match the picture at the backspace editing.
- If you set [TC MAKE] to [REGENERATE] in the menu, [TC RUN] is automatically set to [REC RUN].
- When [50i/60i SEL] on the (OTHERS) menu is set to 50i, the non-drop frame mode is selected automatically. You cannot change the frame mode.
- When recording in the HDV format, discrepancy of 3 frames at the maximum may occur.
- If you set [TC MAKE] to [REGENERATE], TC PRESET on the Remote Commander does not work.

Setting the user bits value

Shooting information (date, time, scene number, etc.) can be superimposed on a tape using up to 8 hexadecimal digit.



1 Set the POWER switch to VCR or CAMERA.

2 Press MENU.

3 Select the 00:00 (TC/UB SET) menu by turning the SEL/PUSH EXEC dial, then press the dial.

4 Select [UB PRESET] by turning the SEL/PUSH EXEC dial, then press the dial.

5 **Select [PRESET] by turning the SEL/PUSH EXEC dial, then press the dial.**

6 **Select the first 2 digits by turning the SEL/PUSH EXEC dial, then press the dial.**

7 **Repeat step 6 to set up the other digits.**

8 **Select [OK] by turning the SEL/PUSH EXEC dial, then press the dial.**

9 **Press MENU to hide the menu screen.**

To cancel the user bits setting

Select [CANCEL] in step 8.

To reset the user bits

Select [RESET] in step 5.

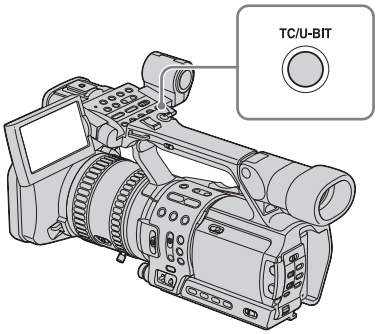
To set the user bits to the real time clock

Select the 00:00 (TC/UB SET) menu, [UB TIME REC], then [ON].

Note

- User-bit values appear at every 3 frames for the tape recorded in the HDV format.
- When you input HDV format signal via i.LINK connection, the user-bits are copied, however, they are not regenerated.

Switching the time value



Press TC/U-BIT.

Each time you press the button, the time value changes between the time code and user bits.
TC: 00:00:00:00 or 00:00.00:00
U-BIT: 00 00 00 00

Note

- The time code and user bits cannot be displayed properly if the tape does not have time code and/or user bits recordings or if the time code was recorded using a non-compatible method.
- When you input HDV format signal via i.LINK connection, the user-bits of the input video are written on this camera, however, they are not displayed during dubbing.

Connecting an analog VCR to the computer via your camcorder

DVCAM DV SP

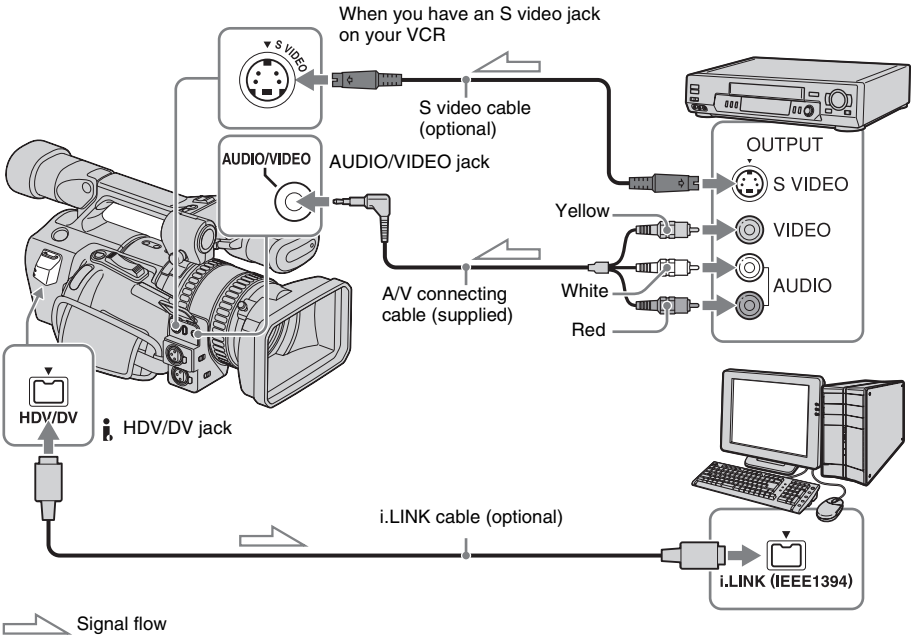
– Signal conversion function

Connect an analog video device to your camcorder using the A/V connecting cable (supplied), and a digital device such as a computer to your camcorder using an i.LINK cable (optional). Your camcorder converts the analog video signal from the VCR to a digital signal and transmits it to the computer to be dubbed.

To use the signal conversion function, application software to import video signals must be installed on the computer.

Connecting a computer

Refer to the manual supplied with the application software for the system requirements of the computer.



Note

- Select the (OTHERS) menu, [DISP OUTPUT], then [LCD PANEL] (the default setting) (p. 80). cable connected, the computer may hang up or may
- Before connecting the i.LINK cable, select the (IN/OUT REC) menu, [VCR HDV/DV], then [DV] (p. 70). If you do this operation with the i.LINK not recognize this camcorder.

Importing a picture to the computer

1 Turn on the analog device.

2 Set the POWER switch to VCR.

Connect your camcorder to the wall outlet using the supplied connecting cable (DK-415) and AC Adaptor/charger for the power supply.

3 Press MENU.

4 Select the (IN/OUT REC) menu by turning the SEL/PUSH EXEC dial, then press the dial.

5 Select [A/V → DV OUT] by turning the SEL/PUSH EXEC dial, then press the dial.

6 Select [ON] by turning the SEL/PUSH EXEC dial, then press the dial.

7 Press MENU to hide the menu screen.

8 Start playback on the analog device.

9 Start importing on the computer.

Refer to the manual supplied with the program software or its on-line help for details.

After importing the picture and sound

Stop importing on the computer, and stop playback on the analog device.

Note

- Your camcorder may not be able to output the signal to the computer correctly depending on the video signal input to your camcorder.
- You cannot import pictures that have been recorded using a copyright protection signal to a computer via your camcorder.
- Analog signals are not output from the COMPONENT OUTPUT jack.

Troubleshooting

If you run into any problem using your camcorder, use the following table to troubleshoot the problem. If the problem persists, remove the power source and contact your Sony dealer.

If "C:□□:□□" is displayed on the LCD screen or the viewfinder, the self-diagnosis display function is activated. See page 111 for details.

Overall operations

Symptom	Cause and/or Corrective Actions
The power does not turn on.	• The battery pack is discharged, running low, or not attached to the camcorder. →Attach a charged battery pack to the camcorder (p. 11). →Plug the AC Adaptor /charger to the wall outlet (p. 13). • The mode switch on the AC Adaptor/charger is set to CHARGE. →Set it to VCR/CAMERA (p. 13).
The camcorder does not operate even when the power is set to on.	→Disconnect the AC Adaptor/charger from the wall outlet or remove the battery pack, then reconnect it after about 1 minute. If the functions still do not work, press the RESET button using a sharp-pointed object. If you press the RESET button, all settings including the clock setting (except the Personal Menu and Picture Profile settings) are reset.
A clattering noise is heard when the camcorder is handled with the POWER switch set to OFF or VCR.	• This is because some lens functions on the camcorder use a linear mechanism. This is not a malfunction.
The supplied Remote Commander does not function.	→Set [REMOTE CTRL] on the (OTHERS) menu to [ON] (p. 81). →Insert batteries into the battery compartment with the + – polarities correctly matching the + – marks. If this still does not solve the problem, insert new batteries since the batteries are dead (p. 131). →Remove any obstructions between the Remote Commander and the remote sensor.
The camcorder gets warm.	• This is because the power has been turned on for a long time. This is not a malfunction.

Batteries/Power sources

Symptom	Cause and/or Corrective Actions
The battery pack is quickly discharged.	• The temperature of the environment is too low, or the battery pack has not been charged enough. This is not a malfunction. →Fully charge the battery again. If the problem persists, replace the battery pack with a new one. It may be damaged (p. 11, 118).

Symptom	Cause and/or Corrective Actions
The remaining battery time indicator does not indicate the correct time.	• The temperature of the environment is too high or too low, or the battery pack has not been charged enough. This is not a malfunction. →Fully charge the battery again. If the problem persists, replace the battery pack with a new one. It may be damaged (p. 11, 118).
The power turns off frequently although the remaining battery indicator indicates that the battery pack has enough power to operate.	• A problem has occurred in the remaining battery time indicator, or the battery pack has not been charged enough. →Fully charge the battery again to correct the indication (p. 11).
A problem occurs when the camcorder is connected to the AC Adaptor/charger.	→Turn off the power, and disconnect the AC Adaptor/charger from the wall outlet. Then, connect it again.

Cassette tapes

Symptom	Cause and/or Corrective Actions
Cassette cannot be ejected from the compartment.	→Make sure the power source (battery pack or AC Adaptor/charger) is connected correctly (p. 11). →Remove the battery pack from the camcorder, then attach it again (p. 11). →Attach a charged battery pack to the camcorder (p. 11).
Cassette is not ejected even when the cassette lid is open.	→Moisture condensation is starting in your camcorder (p. 120).
The Cassette Memory indicator does not appear while using a cassette with Cassette Memory.	→Since your camcorder is not compatible with the Cassette Memory, no indicator appears.
The remaining tape indicator is not displayed.	→Set [REMAINING] to [ON] on the (OTHERS) menu to always display the remaining tape indicator (p. 80).

LCD screen/viewfinder

Symptom	Cause and/or Corrective Actions
An unknown language appears on the screen.	→See page 19.
An unknown indicator appears on the screen.	→Refer to the indicator list (p. 132).
The picture in the viewfinder is not clear.	→Use the viewfinder lens adjustment lever to adjust the lens (p. 15).
The picture in the viewfinder has disappeared.	→Close the LCD panel. The picture is not displayed in the viewfinder when the LCD panel is open (p. 15). When [VF POWER] is set to [ON], pictures appear on both the LCD panel and the viewfinder (p. 69).

Recording

Symptom	Cause and/or Corrective Actions
The tape does not start when you press REC START/STOP.	→Set the POWER switch to CAMERA (p. 14). →The tape has reached the end. Rewind it, or insert a new cassette. →Set the write-protect tab to REC or insert a new cassette (p. 114). →The tape is stuck to the drum due to moisture condensation. Remove the cassette and leave your camcorder for at least 1 hour, then re-insert the cassette (p. 120).
The tape does not start when you press REC START/STOP on the handle.	→Release the HOLD lever (p. 21).
The power abruptly turns off.	→Charge the battery pack (p. 11).
The zoom does not function.	→Set the ZOOM switch correctly (p. 22). →When using the zoom lever on the Remote Commander, set the ZOOM switch to LEVER/REMOTE (p. 23).
The handle zoom does not work.	→Set the handle zoom switch to H or L (p. 23).
The SteadyShot does not function.	→Press the ASSIGN button assigned to the SteadyShot (p. 86). →Set [STEADYSHOT] to [ON] on the (CAMERA SET) menu (p. 60).
The auto focus does not function.	→Set the FOCUS switch to AUTO to enable auto focus (p. 32). →The recording conditions are not suitable for auto focus. Adjust the focus manually (p. 32).
The focus is set to auto, but the focus shifts as the focus ring rotates.	• Even during auto focusing, you can focus manually by rotating the focus ring (p. 33).
A vertical band appears when recording candlelight or electric light in the dark.	• This occurs when the contrast between the subject and the background is too high. This is not a malfunction.
A vertical band appears when recording a bright subject.	• This phenomenon is called the smear effect. This is not a malfunction.
Tiny spots in white appear on the screen.	• The spots appear at a slower shutter speed. This is not a malfunction.
Oblique stripes appear on the screen.	→Set the ZEBRA/PEAKING switch to OFF (p. 31).
Picture appears too bright on the screen, and the subject does not appear on the screen.	→Cancel the back light function (p. 25).

Playback

Symptom	Cause and/or Corrective Actions
Cannot play back.	→If the tape has reached the end, rewind the tape (p. 48).
Cannot play back in reverse direction.	→Reverse playback is not possible with the tape recorded in the HDV format.
Horizontal lines appear on the picture. The displayed pictures are not clear or do not appear.	→Clean the head using the cleaning cassette (p. 121).
Fine patterns flicker, diagonal lines look jagged.	→Adjust [SHARPNESS] to the – (soften) side in the PICTURE PROFILE function (p. 34).
No sound or only a low sound is heard.	→Turn up the volume (p. 48). →On the (AUDIO SET) menu, set [AUDIO MIX] to [MIX] (p. 64). →When you are using an S VIDEO cable or a component video cable, make sure the red and white plugs of the A/V connecting cable are connected as well (p. 52).
The sound breaks off.	→Clean the head using the cleaning cassette (p. 121).
The date search and index search do not work.	• There is a blank section at the beginning or in the middle of the tape. This is not a malfunction.
The time code does not return to 00:00:00:00 even if the tape was rewound to the beginning of recording.	• The time code at the beginning of recording may not appear correctly, however, this is not a malfunction. If you start playback, both time code and picture are displayed correctly from the beginning.
User-bits are not displayed correctly during fast-forward and rewinding.	• User-bits are not displayed correctly if the video signal is HDV without user-bits recorded and dubbed via i.LINK connection. [-- -- -- --] appears during playback, and [00 00 00 00] during fast-forward/rewinding.
"---" is displayed on the screen.	• The tape you are playing was recorded without setting the date and time. • A blank section on the tape is being played. • The data code on a tape with a scratch or noise cannot be read.
END SEARCH does not work.	• The POWER switch is set to CAMERA. • The cassette was ejected after recording (p. 50). • The cassette is new and has nothing recorded.
END SEARCH does not work correctly.	• There is a blank section at the beginning or in the middle of the tape. This is not a malfunction.
No picture appears during END SEARCH or Rec Review.	• The tape was recorded in both HDV and DVCAM (DV) formats. This is not a malfunction.
Cannot view the picture or hear the sound on the TV connected with the component video cable.	→Set [COMPONENT] on the (IN/OUT REC) menu according to the requirements of the connected device (p. 73). →When you are using the component video cable, make sure the red and white plugs of the A/V connecting cable are connected (p. 52).

Symptom	Cause and/or Corrective Actions
The picture appears distorted on the 4:3 TV.	• This happens when viewing a picture recorded in the 16:9 wide mode on a 4:3 TV. →To play back the picture, set [DOWN CONVERT] on the (IN/OUT REC) menu (p. 74). →Before recording, set [DV WIDE REC] on the (IN/OUT REC) menu to [OFF] (p. 72).
Noises appear and 50i is displayed on the screen.	• On the (OTHERS) menu, change the [50i/60i SEL] setting to 50i and playback the tape (p. 82).
2/2-ST appears on the LCD screen.	• This appears when you play back a tape recorded on other recording devices using a 4-channel microphone. This camcorder does not comply with the 4-channel microphone recording standard.

Dubbing

Symptom	Cause and/or Corrective Actions
Pictures from connected devices are not displayed on the LCD screen or the viewfinder.	→Set [DISP OUTPUT] to [LCD PANEL] on the (OTHERS) menu (p. 80).
Cannot dub correctly using the A/V connecting cable. DVCAM DV SP	→Set [DISP OUTPUT] to [LCD PANEL] on the (OTHERS) menu (p. 80).
When connected using an i.LINK cable, no picture appears on the monitor screen during dubbing.	→Set [VCR HDV/DV] on the (IN/OUT REC) menu according to the requirements of the connected device (p. 70).
New sound added to a recorded tape is not heard. DVCAM DV SP	→In the (AUDIO SET) menu, set [AUDIO MIX] to [MIX] or [CH3,CH4] (p. 100).
Pictures disappears for a moment when you press EXPANDED FOCUS.	• If you press EXPANDED FOCUS during recording in the DVCAM (DV) format while transferring pictures to the connected device, pictures disappear when switching from the normal size to the expanded size.

Warning indicators and messages

Self-diagnosis display/Warning indicators

If indicators appear on the LCD screen or in the viewfinder, check the following. See the page in parentheses for details.

Indication	Cause and/or Corrective Actions
C:□□:□□/E:□□:□□ (Self-diagnosis display)	Some symptoms can be fixed by yourself. If the problem persists even after you tried a couple of times, contact your Sony dealer or local authorized Sony service facility. **C:04:□□** →A battery pack that is not an "InfoLITHIUM" battery pack is being used. Use an "InfoLITHIUM" battery pack (p. 118). **C:21:□□** →Moisture condensation has occurred. Remove the cassette and leave your camcorder for at least 1 hour, then re-insert the cassette (p. 120). **C:22:□□** →Clean the head using the cleaning cassette (p. 121). **C:31□□ / C:32□□** →Symptoms that are not described above have occurred. Remove and insert the cassette, then operate your camcorder again. Do not perform this procedure if moisture starts to condense (p. 120). →Remove the power source. Reconnect it again and operate your camcorder again. →Change the tape. **E:61:□□ / E:62:□□** →Contact your Sony dealer or local authorized Sony service facility. Inform them of the 5-digit code, which starts from "E."
(Battery level warning)	• The battery pack is nearly used up. • Depending on the operating, environmental, or battery conditions, the indicator may flash, even if there are approximately 5 to 10 minutes remaining.
(Moisture condensation warning)*	→Eject the cassette, set the POWER switch to OFF, and leave it for about 1 hour with the cassette lid open (p. 120).
(Warning indicator pertaining to the tape)	**Slow flashing:** • There is less than 5 minutes remaining on the tape. • No cassette is inserted.* • The write-protect tab on the cassette is set to lock (p. 114).* **Fast flashing:** • The tape has run out.*
⏏ (Eject cassette warning)*	**Slow flashing:** • The write-protect tab on the cassette is set to lock (p. 114). **Fast flashing:** • Moisture condensation has occurred (p. 120). • The self-diagnosis display code is displayed (p. 111).

* You hear a melody or beep sound when the warning indicators appear on the screen.

Warning messages

If messages appear on the screen, check the following. See the page in parentheses for details.

Subjects	Indications	Corrective Actions/ References
Battery	Use the “InfoLITHIUM” battery pack.	→See page 117.
	Battery level is low.	→Charge the battery (p. 11).
	Old battery. Use a new one.	→See page 118.
	⏏ Re-attach the power source.	–
Moisture condensation	💧 ⏏ Moisture condensation. Eject the cassette.	→See page 120.
	💧 Moisture condensation. Turn off for 1H.	→See page 120.
Cassette/Tape	📼 Insert a cassette.	→See page 18.
	⏏ Reinsert the cassette.	→The cassette might be damaged, etc.
	📼 ⏏ The tape is locked - check the tab.	→See page 114.
	📼 The tape has reached the end.	–
Others	Cannot record due to copyright protection.	–
	Cannot add audio. Disconnect the i.LINK cable.	→See page 98.
	Not recorded in DVCAM mode. Cannot add audio.	→See page 98.
	Cannot add audio on the blank portion of a tape.	→See page 98.
	HDV recorded tape. Cannot add audio.	→See page 98.
	Cannot add audio.	→See page 98
	No registered value set in SHOT-A.	→Register a setting in A (p. 40).
	No registered value set in SHOT-B.	→Register a setting in B (p. 40).
	Change to correct tape format.	→The pictures cannot be played back because of an incompatible format.
	No output image in “VCR HDV/DV”. Change format.	→Stop inputting the playback signal, or reset [VCR HDV/DV] (p. 70).
	Already added to CAMERA mode’s P-MENU.	–
	Already added to VCR mode’s P-MENU.	–
	⊗ 📼 Dirty video head. Use a cleaning cassette.	→See page 121.

Using your camcorder abroad

Power supply

You can use your camcorder in any country/regions using the AC Adaptor/charger supplied with your camcorder within AC 100 V to 240 V, 50/60 Hz.
Use a commercially available AC plug adaptor [a], if necessary, depending on the design of the wall outlet [b].

On TV color systems DVCAM DV SP

Your camcorder is an NTSC system-based camcorder. If you want to view the playback picture recorded in the DV format on a TV, it must be an NTSC system-based TV (see following list) with the AUDIO/VIDEO input jack.

System	Used in
NTSC	Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Guyana, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.
PAL	Australia, Austria, Belgium, China, Czech Republic, Denmark, Finland, Germany, Holland, Hong Kong, Hungary, Italy, Kuwait, Malaysia, New Zealand, Norway, Poland, Portugal, Singapore, Slovak Republic, Spain, Sweden, Switzerland, Thailand, United Kingdom, etc.
PAL - M	Brazil
PAL - N	Argentina, Paraguay, Uruguay
SECAM	Bulgaria, France, Guiana, Iran, Iraq, Monaco, Russia, Ukraine, etc.

On HDV compatible TVs HDV1080i

An HDV compatible TV with the component input jack is required to view playback pictures recorded in the HDV format. See the table below.
It is recommended to use an i.LINK cable to connect these TVs.

Sony TV models
KD-34XBR960, KD-36XS955, KD-34XS955, KD-30XS955
KDE-55XBR950, KDE-50XS955, KDE-42XS955, KDE-37XS955
KDF-60WE655, KDF-55WE655, KDF-50WE655, KDF-42WE655, KDF-60XS655, KDF-55XS655
KDP-57WS655, KDP-51WS655
KE-42M1
KE-MX42K1, KE-MX42N1, KE-MX32K1, KE-MX32N1, KE-P42M1
KF-50WE620, KF-42WE620
KLV-32M1, KLV-23M1
KP-57WS520, KP-51WS520, KP-46WT520
KV-36HS420, KV-34HS420, KV-32HS420, KV-30HS420, KV-27HS420
KV-DX32K9H, KV-DX32K90B, KV-DX32K90L
KV-HR36N90, KV-HR36K90, KV-HR32K90, KV-HR34N90, KV-HR29N90
KV-HZ34N90, KV-HZ29N90, etc.

As of 1st October, 2004

Note

- Some models are not available depending on the country or region.

Simple setting of the clock by time difference

You can easily set the clock to the local time by setting a time difference when using your camcorder abroad. Select [WORLD TIME] on the (OTHERS) menu, then set the time difference (p. 78).

HDV format and recording/playback

Your camcorder is capable of recording in the HDV, DVCAM, and DV formats.
It is recommended to use a cassette with the Mini DV mark to record in the HDV/DV format.
It is recommended to use a cassette with the DVCAM mark to record in the DVCAM format.

What is the HDV (HDV) format?

The HDV format is a video format developed to record and play back digital high definition (HD) video signals on a DV cassette.
Your camcorder adopts the Interlace mode with 1080 effective scan lines of screen ruling (1080i, number of pixels 1440 × 1080 dots).
The video bit rate for recording is about 25 Mbps.
i.LINK is adopted for the digital interface, enabling a digital connection with an HDV compatible TV or computer.

Playback

- Your camcorder can play back pictures in the DVCAM (DV) format and HDV1080i specification.
- Your camcorder can play back a picture recorded in the 720/30p system of the HDV format but cannot output it from the i HDV/DV jack.

Copyright signal

When you play back

If the cassette you play back on your camcorder contains copyright signals, you cannot copy it to a tape in another video device connected to your camcorder.

When you record

You cannot record software on your camcorder that contains copyright control signals for copyright protection of software.

[Cannot record due to copyright protection.] appears on the LCD screen, or on the TV screen if you try to record such software.

Your camcorder does not record copyright control signals on the tape when it records.

Audio mode

The DVCAM format has 2 audio modes.

Fs32K (12-bit) mode

The original sound can be recorded in channels 1 and 2, and the new sound in channels 3 and 4 in 32 kHz. The balance between channels 1/2 and channels 3/4 can be adjusted by selecting [AUDIO MIX] in the menu settings during playback and audio dubbing. If you select [MIX], the sounds of channel 1/2 and channel 3/4 are synthesized to be output.

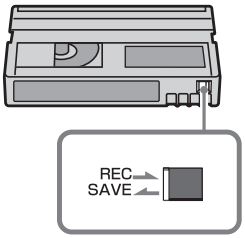
Fs48K (16-bit) mode

A new sound cannot be recorded but the original sound can be recorded in high quality using 2 channels. The audio mode can be indicated on the LCD screen or in the viewfinder.
You may not add a sound on a DVCAM formatted-tape which does not comply with the condition of the DVCAM format as described on page 116 or when you recorded on a DV-formatted tape. In this case, “NS” appears on the LCD screen or in the viewfinder.

Notes on cassette tapes

To prevent accidental erasure

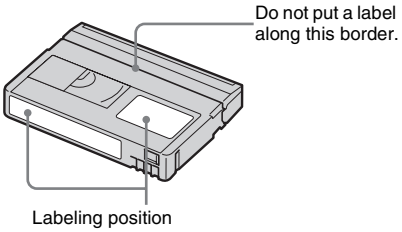
Slide the write-protect tab on the cassette to set to SAVE.



REC: The cassette can be recorded.
SAVE: The cassette cannot be recorded (write-protected).

When labeling the cassette

Be sure to place the label only on the locations as shown in the following illustration so as not to cause malfunction of your camcorder.

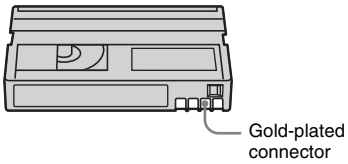


After using the cassette

Rewind the tape to the beginning to avoid distortion of the picture or the sound. The cassette should then be put in its case, and stored in an upright position.

When cleaning the gold-plated connector

Generally, clean the gold-plated connector on a cassette with a cotton-wool swab after every 10 times it has been ejected.
If the gold-plated connector on the cassette is dirty or dusty, the remaining tape indicator may not be indicated correctly.



Note

- Your camcorder is not compatible with Cassette Memory.

Mini DV Digital Video Cassette and DVCAM are trademarks.

HDV and HDV are trademarks of Sony Corporation and Victor Company of Japan Ltd.

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

Compatibility of the DVCAM and DV formats

The DVCAM format was developed as a more reliable and higher-end format than the consumer DV format. Explained here are the differences, compatibility, and limitations on editing for the DVCAM and DV formats.

Differences between the DVCAM and DV formats

Specification	DVCAM	DV
Track pitch	15 µm	10 µm
Audio sampling frequency	12 bit: 32 kHz 16 bit: 48 kHz	12 bit: 32 kHz 16 bit: 32 kHz, 44.1 kHz, 48 kHz
Audio recording mode*	Lock mode	Unlock mode
Time code	Drop frame system or Non-drop frame system (SMPTE time code)	Drop frame system only

* There are 2 modes for audio recording, lock mode and unlock mode. In lock mode, the sampling frequencies of audio and video are synchronized. In unlock mode, which the consumer DV format adopts, the 2 sampling frequencies are independent. Therefore, lock mode is more effective than unlock mode in digital processing and smooth transition during audio editing.

Mini DVCAM and mini DV cassettes

The recording format of the picture is defined according to the recorder's format as described below.

Recorder's format	Cassette's format	Recording format
DVCAM	DVCAM DV	DVCAM
DV	DVCAM DV	DV

- This camcorder complies with the DVCAM format. Though mini DV cassettes can be used for recording, we recommend you use mini DVCAM cassettes to get the most out of the high reliability of the DVCAM format.
- The recording time of mini DV cassettes is 1/3 shorter than that indicated on mini DV cassettes when recorded in the DVCAM format.

Compatibility on playback

Tape	On DV video equipment	On DVCAM video equipment
DV-formatted	Can be played back	Can be played back only when recorded in SP mode
DVCAM-formatted	Can be played back on some equipment	Can be played back

Compatibility on editing using DV jacks

When this camcorder is connected to other digital video equipment using an i.LINK cable, the recording format of edited tapes is defined according to the source tape and the recorder's format as described below. Playback or editing using the edited tape may be limited depending on dubbing operation. Start dubbing after reading "Limitations on editing" (p. 117).

Source tape	Player's format	Recorder's format	Recording format
DV-formatted (SP mode only)	DVCAM	DVCAM DV	DVCAM[1)] DV

Source tape	Player's format	Recorder's format	Recording format
DV-formatted	DV	DVCAM DV	DVCAM[1] DV
DVCAM-formatted[2]	DVCAM	DVCAM DV	DVCAM DV
DVCAM-formatted[2]	DV[3]	DVCAM	DVCAM (Compatibility depends on models.)
		DV	DV

1)When using mini DVCAM video equipment to perform DV dubbing of a tape recorded in DV format, the tape produced will be in the DVCAM format which the time code format will be partly misadjusted. (There will be no effect on the recorded picture except in certain cases.)

2)If the tape that is to be dubbed is in the DVCAM format as in 1), the tape produced will be in the DVCAM format and the time code format will be partly misadjusted.

3)Some mini DV video equipment may be able to play back a DVCAM-formatted tape. Even if the tape is played back, quality of the playback cannot be guaranteed. The time code format will be partly misadjusted.

Note

- If you use tapes as in 1) to 3) above for editing, the functions may be limited regardless of the format of players and recorders.

Limitations on editing

You may find the following limitations when editing a tape produced by dubbing or editing using the i.LINK HDV/DV jack:

- Due to the difference in track pitch, you cannot record or edit on DV-formatted tapes using mini DVCAM video equipment.
- Depending on the DVCAM video equipment used, you may not be able to edit DVCAM-formatted tapes if the audio recording mode is unlock mode. In this case, dub using audio/video jacks.

About the "InfoLITHIUM" battery pack

This unit is compatible with the "InfoLITHIUM" battery pack (L series). Your camcorder operates only with the "InfoLITHIUM" battery pack.
"InfoLITHIUM" L series battery packs have the InfoLITHIUM L mark.

What is the "InfoLITHIUM" battery pack?

The "InfoLITHIUM" battery pack is a lithium-ion battery pack that has functions for communicating information related to operating conditions between your camcorder and AC Adaptor/charger.
The "InfoLITHIUM" battery pack calculates the power consumption according to the operating conditions of your camcorder, and displays the remaining battery time in minutes. With an AC Adaptor/charger, 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 camcorder.
- We recommend charging the battery pack in an ambient temperature of between 10°C to 30°C (50°F to 86°F) until the CHARGE lamp turns off. If you charge the battery pack outside of this temperature range, you may not be able to charge it efficiently.
- After charging is complete, remove the battery pack.

To use the battery pack effectively

- Battery pack performance decreases when the surrounding temperature is 10°C (50°F) or below, and the length of time you can use the battery pack becomes shorter. In that case, do one of the following to use the battery pack for a longer time.
  - Put the battery pack in a pocket to warm it up, and insert it in your camcorder right before you start taking shots.

➡ *continued*

– Use a large capacity battery pack: NP-F770/F970 (optional).

- Frequent use of the LCD screen or a frequent playback, fast forward or rewind operation wears out the battery pack faster. We recommend using a large capacity battery pack: NP-F770/F970 (optional).
- Be sure to set the POWER switch to OFF when not recording or playing back on your camcorder. The battery pack is also consumed when your camcorder is in recording standby or playback pause.
- Have spare battery packs ready for 2 or 3 times the expected recording time, and make trial recordings before making the actual recording.
- Do not expose the battery pack to water. The battery pack is not water resistant.

About remaining battery time indicator

- When the power goes off even though the remaining battery time indicator indicates that the battery pack has enough power to operate, charge the battery pack fully again. The indication on the remaining battery time will be indicated correctly. Note, however, that the battery indication will not be restored if it is used in high temperatures for a long time, or if left in a fully charged state, or when the battery pack is frequently used.
  Use the remaining battery time indication as a guide to the approximate shooting time.
- The mark that indicates low battery flashes even if there are still 5 to 10 minutes of battery time remaining, depending on the operating conditions or ambient temperature and environment.

About storage of the battery pack

- If the battery pack is not used for a long time, fully charge the battery pack and use it on your camcorder once a year to maintain the proper function.
  To store the battery pack, remove it from your camcorder and put it in a dry, cool place.
- To discharge the battery pack on your camcorder completely, eject a cassette and leave your camcorder in tape recording standby until the power goes off.

About battery life

- The battery life is limited. Battery capacity drops little by little as you use it more and more, and as time passes. When the available battery time is shortened considerably, a probable cause is that 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.

About i.LINK

The i.LINK Interface on this unit is an i.LINK-compliant Interface. This section describes the i.LINK standard and its features.

What is i.LINK?

i.LINK is a digital serial interface for transferring digital video, digital audio, and other data to other i.LINK-compatible device. You can also control other device using the i.LINK.

i.LINK-compatible device can be connected using an i.LINK cable. Possible applications are operations and data transactions with various digital AV devices.

When 2 or more i.LINK-compatible device are connected to this unit in a daisy chain, operations and data transactions are possible with not only the device that this unit is connected to but also with other devices via the directly connected device.

Note, however, that the method of operation sometimes varies according to the characteristics and specifications of the device to be connected. Also, operations and data transactions may not be possible on some connected device.

Note

- Normally, only one device can be connected to this unit with the i.LINK cable. When connecting this unit to an HDV/DV compatible device having two or more i.LINK Interfaces, refer to the operating instructions of the device to be connected.

Tip

- i.LINK is a more familiar term for the IEEE 1394 data transport bus proposed by Sony, and is a trademark approved by many corporations.
- IEEE 1394 is an international standard standardized by the Institute of Electrical and Electronics Engineers.

About i.LINK Baud rate

i.LINK's maximum baud rate varies according to the device. There are 3 types.

S100 (approx. 100Mbps*)
S200 (approx. 200Mbps)
S400 (approx. 400Mbps)

The baud rate is listed under "Specifications" in the operating instructions of each piece of device. It is also indicated near the i.LINK interface on some device.

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

* What is Mbps?
Mbps stands for "megabits per second," or the amount 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 on this unit

For details on how to dub when this unit is connected to other video device having a i.LINK Interface, see page 89.

This unit can also be connected to other i.LINK compatible device made by Sony (e.g. a VAIO series personal computer) as well as to video device.

Some i.LINK compatible video device such as Digital Televisions, DVD recorders/players, and MICROMV recorders/players are not compatible with this unit. Before connecting to other device, be sure to confirm whether the device is compatible with HDV/DVCAM (DV) or not.

For details on precautions and compatible application software, refer also to the operating instructions for the device to be connected.

About the required i.LINK cable

Use the Sony i.LINK 4-pin-to-4-pin cable (during HDV/DV dubbing).

i.LINK and ⁞ are trademarks of Sony Corporation.

Maintenance and precautions

On use and care

- Do not use or store the camcorder 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. The camcorder may malfunction.
  - Near strong radio waves or radiation. The camcorder may not be able to record properly.
  - Near AM receivers and video equipment. Noise may occur.
  - Sandy beach or anywhere dusty. If sand or dust gets in your camcorder, it may malfunction. Sometimes this malfunction cannot be repaired.
  - Near windows or outdoors, where the LCD screen, the viewfinder, or the lens may be exposed to direct sunlight. This damages the inside of the viewfinder or the LCD screen.
  - Anywhere very humid.
- Operate your camcorder on DC 7.2 V (battery pack) or DC 8.4 V (AC Adaptor/charger).
- For DC or AC operation, use the accessories recommended in these operating instructions.
- Do not let your camcorder get wet, for example, from rain or sea water. If your camcorder gets wet, it may malfunction. Sometimes this malfunction cannot be repaired.
- If any solid object or liquid gets inside the casing, unplug your camcorder and have it checked by a Sony dealer before operating it any further.
- Avoid rough handling, disassembling, modifying, or mechanical shock. Be particularly careful of the lens.
- Keep the POWER switch set to OFF when you are not using your camcorder.
- Do not wrap your camcorder with a towel, for example, and operate it. Doing so might cause heat to build up inside.
- When disconnecting the power cord, pull by the plug and not the cord.
- Do not damage the power cord such as by placing anything heavy on it.
- Keep metal contacts clean.
- Keep the Remote Commander and battery out of children's reach. If the battery is accidentally swallowed, consult a doctor immediately.
- 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 your camcorder for a long time

Occasionally turn it on and let it run such as by playing back tapes for about 3 minutes.

Moisture condensation

If your camcorder is brought directly from a cold place to a warm place, moisture may condense inside your camcorder, on the surface of the tape, or on the lens. In this state, the tape may stick to the head drum and be damaged or your camcorder may not operate correctly. If there is moisture inside your camcorder, [Moisture condensation. Eject the cassette] or [Moisture condensation. Turn off for 1H.] appears. The indicator will not appear when the moisture condenses on the lens.

If moisture condensation has occurred

None of the functions except cassette ejection will work. Eject the cassette, turn off your camcorder, and leave it for about 1 hour with the cassette lid open. Your camcorder can be used again if or does not appear when the power is turned on again.

If moisture starts to condense, your camcorder sometimes cannot detect condensation. If this happens, the cassette is sometimes not ejected for 10 seconds after the cassette lid is opened. This is not a malfunction. Do not close the cassette lid until the cassette is ejected.

Note on moisture condensation

Moisture may condense when you bring your camcorder from a cold place into a warm place (or vice versa) or when you use your camcorder in a humid place as shown below.

- When you bring your camcorder from a ski slope into a place warmed up by a heating device.
- When you bring your camcorder from an air-conditioned car or room into a hot place outside.
- When you use your camcorder after a squall or a shower.
- When you use your camcorder in a hot and humid place.

How to prevent moisture condensation

When you bring your camcorder from a cold place into a warm place, put your camcorder in a plastic bag and seal it tightly. Remove the bag when the air temperature inside the plastic bag has reached the surrounding temperature (after about 1 hour).

Video head

- When the video head becomes dirty, you cannot record pictures normally, or distorted picture or sound is played back.
- If the following problem occurs, clean the video heads for 10 seconds with the cleaning cassette.
  - Mosaic-pattern noise appears on the playback picture or the screen is displayed in blue.

  - Playback pictures do not move.
  - A part of playback pictures does not move.
  - Playback pictures do not appear or the sound breaks off.
  - [Dirty video head. Use a cleaning cassette.] appears on the screen during recording.
- The video head suffers from wear after long use. If you cannot obtain a clear image even after using a cleaning cassette, it might be because the video head is worn. Please contact your Sony dealer or local authorized Sony service facility to have the video head replaced.

LCD screen

- Do not add excessive pressure on the LCD screen, as it may cause damage.
- If your camcorder is used in a cold place, a residual image may appear on the LCD screen. This is not a malfunction.
- While using your camcorder, 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 to use an LCD cleaning cloth (optional) 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.

Cleaning the casing

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

About care and storage of the lens

- Wipe the surface of the lens clean with a soft cloth in the following instances:
  - When there are fingerprints on the lens surface.
  - In hot or humid locations
  - When the lens is exposed to salty air such as at the seaside.
- Store in a well-ventilated location subject to little dirt or dust.
- To prevent molds periodically clean the lens as described above.

➡ *continued*

It is recommended you operate your camcorder about once a month to keep it in an optimum state for a long time.

To charge the pre-installed battery

Your camcorder has a pre-installed battery to retain the date, time, and other settings even when the POWER switch is set to OFF. The pre-installed battery is always charged while you are using your camcorder but it will get discharged gradually if you do not use your camcorder. The battery will be fully discharged in about 3 months if you do not use your camcorder at all. However, even if the pre-installed battery is not charged, the camcorder operation will not be affected if you are not recording the date.

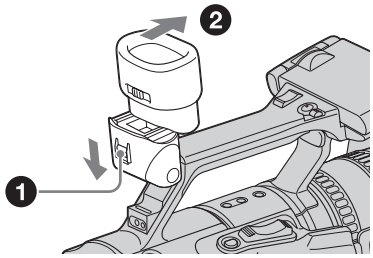
Procedures

Connect your camcorder to a wall outlet using the supplied AC Adaptor/charger, and leave it with the POWER switch set to OFF for more than 24 hours.

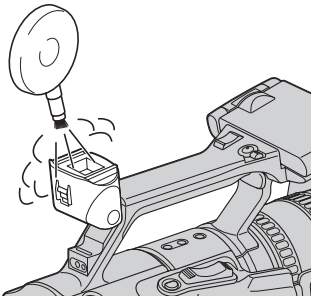
Removing dust from inside the viewfinder

1 Remove the viewfinder.

While sliding the viewfinder release lever down ❶, slide and remove the viewfinder ❷.



2 Remove dust from inside the viewfinder and the part shown below with a blower.



Specification

System

Video recording system (HDV)
2 rotary heads, Helical scanning system
Video recording system (DVCAM (DV))
2 rotary heads, Helical scanning system
Audio recording system (HDV)
Rotary heads, MPEG-1 Audio Layer2
Quantization: 16 bits (Fs 48 kHz, stereo)
Transfer rate: 384 kbps
Audio recording system (DVCAM (DV))
Rotary heads, PCM system
Quantization: 12 bits (Fs 32 kHz, stereo 1, stereo 2), 16 bits (Fs 48 kHz, stereo)
Video signal
NTSC color, EIA standards, 1080/60i specification
PAL color, CCIR standards, 1080/50i specification
Usable cassette
Mini DV cassette with the DVCAM mark printed
Mini DV cassette with the Mini DV mark printed
Tape speed (HDV)
Approx. 18.812 mm/s
Tape speed (DVCAM)
Approx. 28.218 mm/s
Tape speed (DV)
SP: Approx. 18.812 mm/s
Recording/playback time (HDV)
63 min (using a PHDVM-63DM cassette)
Recording/playback time (DVCAM)
41 min (using a PHDVM-63DM cassette)
Recording/playback time (DV SP)
SP: 63 min (using a PHDVM-63DM cassette)
Fast forward/rewind time
Approx. 2 min 40 s (using a PHDVM-63DM cassette)
Viewfinder
Electric viewfinder (color)
Image device
6 mm (1/3 type) 3CCD (Charge Coupled Device)
Gross: Approx. 1 120 000 pixels
Effective: Approx. 1 070 000 pixels
Lens
Carl Zeiss Vario-Sonnar T*
Combined power zoom lens
Filter diameter: 72 mm (2 7/8 in.)
12 × (Optical)
F = 1.6 ~ 2.8
Focal length
4.5 - 54 mm (3/16 - 2 1/4 in.)
When converted to a 35 mm still camera
32.5 - 390 mm (1 5/16 - 15 3/8 in.)
(40 - 480 mm (1 5/8 - 19 in.) in 4:3 TV mode)
Color temperature
[AUTO], [ONE-PUSH A/B], [INDOOR] (3 200 K), [OUTDOOR] (5 800 K±7 steps)
Minimum illumination
3 lx (lux) (F 1.6)

Input/Output connectors

Audio/Video input/output
Video signal: 1 Vp-p, 75 Ω (ohms), unbalanced, sync negative
Audio signal: 327 mV (at load impedance 47 kΩ (kilohms)), Input impedance more than 47 kΩ (kilohms), Output impedance less than 2.2 kΩ (kilohms)
S VIDEO input/output
Luminance signal: 1 Vp-p, 75 Ω (ohms), unbalanced
Chrominance signal: 0.286 Vp-p (at Burst/NTSC), 0.3 Vp-p (at Burst/PAL), 75 Ω (ohms), unbalanced
COMPONENT OUTPUT jack
Y: 1 Vp-p (0.3 V sync negative)
PB/PR (CB/CR): 525 mVp-p (75 % color-bar), Input impedance 75 Ω (ohms)
Headphones jack
Stereo minijack (Ø 3.5 mm)
LANC jack
Stereo mini-minijack (Ø 2.5 mm)
INOUT1/INPUT2 connectors
XLR 3-pin, female,
-60 dBu: 3 kΩ
+40 dBu: 10.8 kΩ
(0 dBu = 0.775 Vrms)
i HDV/DV jack
i.LINK Interface (IEEE1394, 4-pin connector S400)

LCD screen

Picture
8.8 cm (3.5 type)
Total dot number
250 000 (1 120 × 224)

➡ continued

General

Power requirements

DC 7.2 V (battery pack)

Average power consumption (when using the battery pack, and external microphones)

During camera recording using the viewfinder with normal brightness:
HDV recording 8.0 W at 60 Hz operation*
DVCAM (DV) recording 7.6 W at 60 Hz operation*
During camera recording using the LCD with normal brightness:
HDV recording 8.5 W at 60 Hz operation*
DVCAM (DV) recording 8.1 W at 60 Hz operation*

* Power consumption at 50 Hz operation will be slightly lower.

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.)

163 × 194 × 365 mm (6 1/2 × 7 3/4 × 14 3/8 in.) (w/h/d)

Mass (Approx.)

2.1 kg (4 lb 10 oz) main unit only
2.2 kg (4 lb 14 oz) including the NP-F570 rechargeable battery pack, PHDVM-63DM cassette and lens hood.

Supplied accessories

See page 10.

AC Adaptor/charger AC-VQ850

Power requirements

AC 100 - 240 V, 50/60 Hz, 12/24 V DC (only for negative grounded cars)

Current consumption

0.35 - 0.18 A

Power consumption

25 W
Charged mode:
35 VA (100 V AC), 50 VA (240 V AC)
Operating mode:
40 VA (100 V AC), 50 VA (240 V AC)

Output voltage

DC 8.4 V, 2.0 A in operating mode
Battery charge terminal:
8.4 V, 1.4 A in charge mode

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.)

136 × 48 × 90 mm (5 1/3 × 1 10/16 × 3 1/2 in.) (w/h/d) excluding the projecting parts

Mass (approx.)

280 g (9.9 oz) excluding the power cord

Rechargeable battery pack (NP-F570)

Maximum output voltage

DC 8.4 V

Output voltage

DC 7.2 V

Capacity

15.8 Wh (2 200 mAh)

Dimensions (approx.)

38.4 × 20.6 × 70.8 mm
(1 9/16 × 13/16 × 2 7/8 in.) (w/h/d)

Mass (approx.)

100 g (3.5 oz)

Operating temperature

0° C to 40° C (32° F to 104° F)

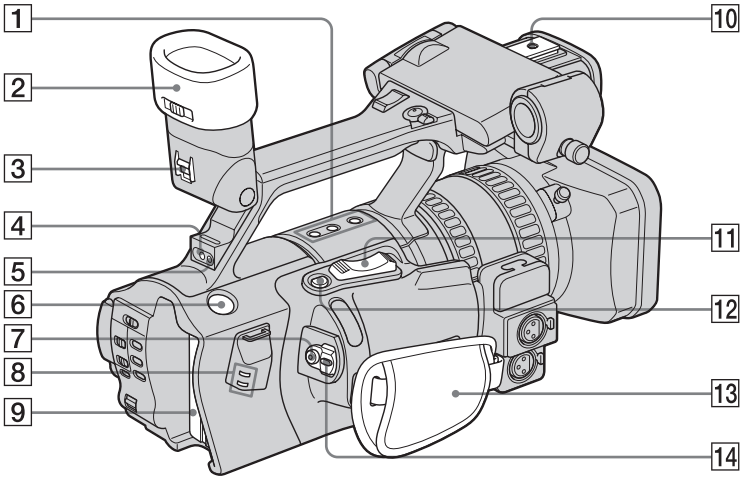
Type

Lithium ion

Design and specifications are subject to change without notice.

Identifying parts and controls

Camcorder



1 **SHOT TRANSITION operation buttons (p. 40)**

2 **Eyecup (p. 16)**

3 **Viewfinder release lever (p. 122)**

4 **Rear remote sensor**

5 **Rear camera recording lamp (p. 20)**

6 **BATT RELEASE (battery release) button (p. 11)**

7 **REC START/STOP button (p. 20)**

8 **i.LINK lamps (p. 92, 95)**
Lights up when handling an i.LINK signal.

9 **Battery pack (p. 11)**

10 **Shoe adaptor attaching part (p. 130)**

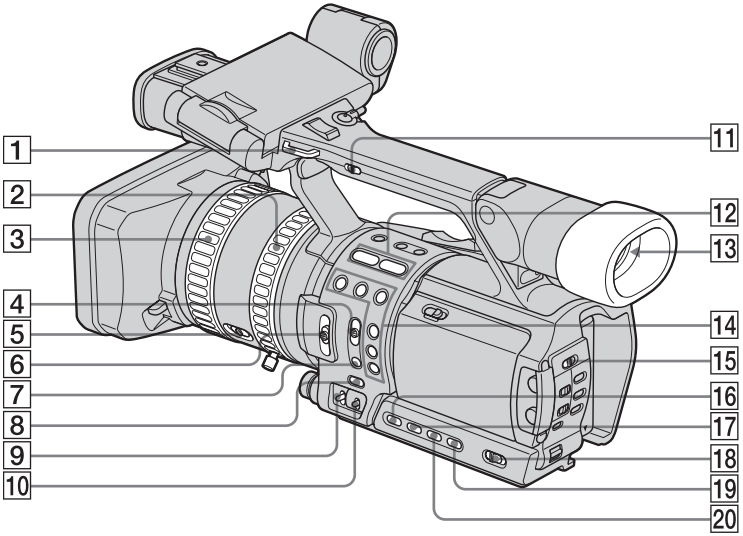
11 **Power zoom lever (p. 22)**

12 **EXPANDED FOCUS button (p. 33)**

13 **Grip belt (p. 4)**

14 **POWER switch (p. 14)**

➡ *continued*



1 **Hook for the shoulder strap**

2 **Zoom ring (p. 23)**

3 **Focus ring (p. 32)**

4 **FOCUS switch (AUTO/MAN (manual)/ INFINITY) (p. 32)**

5 **ZOOM switch (p. 22)**

6 **ND FILTER switch (1/2/OFF) (p. 30)**

7 **PUSH AUTO button (p. 33)**

8 **WHT BAL (One-push white balance) button (p. 26)**

9 **GAIN switch (H/M/L) (p. 29)**

10 **WHT BAL (white balance) switch (A/B/ PRESET) (p. 26)**

11 **Handle zoom switch (H/L/OFF) (p. 23)**

12 **Format lamps (p. 20)**

13 **Viewfinder (p. 3, 15)**

14 **ASSIGN buttons (1 – 6)* (p. 86)**

15 **ZEBRA/PEAKING switch (p. 31, 34)**

16 **IRIS button (p. 28)**

17 **GAIN button* (p. 29)**

18 **AUTO LOCK switch (p. 26, 28, 30)**

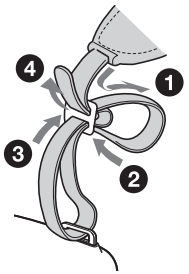
19 **WHT BAL (white balance) button (p. 26)**

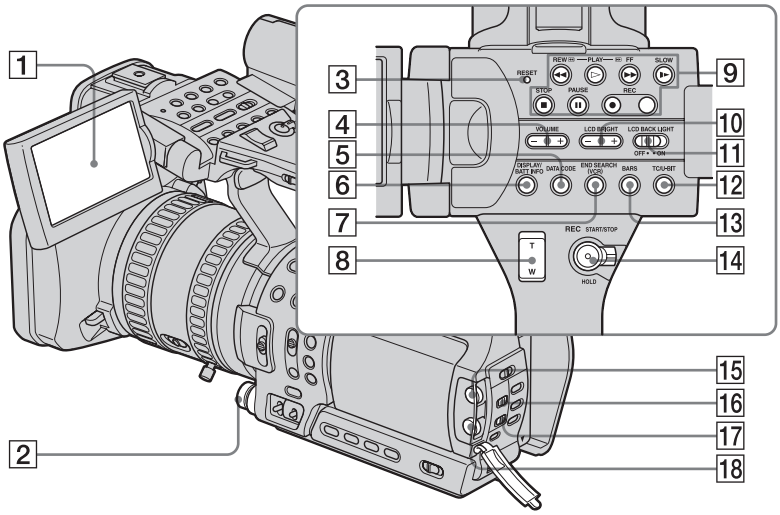
20 **SHUTTER SPEED button (p. 30)**

* The GAIN, ASSIGN 2/5 buttons have a raised tactile dot. Use it to identify the location of the buttons.

To attach the shoulder strap

Attach the shoulder strap supplied with your camcorder to the hooks for the shoulder strap.





1 **LCD screen (p. 3, 15)**

2 **IRIS dial (p. 28)**

3 **RESET button**
If you press RESET, all settings including the clock setting (except the Personal Menu and Picture Profile settings) return to the default.

4 **VOLUME –/+ buttons* (p. 48)**

5 **DATA CODE button (p. 51)**

6 **DISPLAY/BATT INFO button (p. 12, 50)**

7 **END SEARCH (VCR) button (p. 50)**

8 **Handle zoom lever (p. 23)**

9 **Video control buttons (Rewind, Playback*, Fast-forward, Pause, Stop, Slow, Record) (p. 48)**

10 **LCD BRIGHT –/+ buttons (p. 15)**

11 **LCD BACKLIGHT switch (p. 15)**

12 **TC/U-BIT button (p. 103)**

13 **BARS button (p. 22)**

14 **REC START/STOP button and HOLD lever (p. 21)**

15 **AUDIO LEVEL CH1 dial (p. 37)**

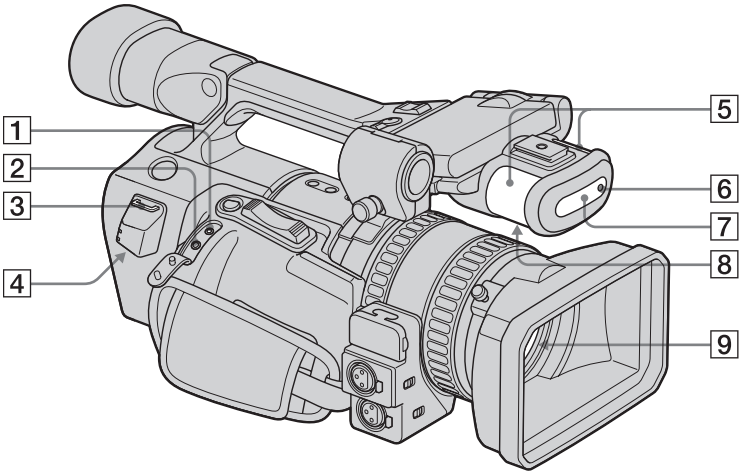
16 **AUDIO SELECT CH1 switch (p. 37)**

17 **AUDIO SELECT CH2 switch (p. 37)**

18 **AUDIO LEVEL CH2 dial (p. 37)**

* The VOLUME + and PLAY buttons have a raised tactile dot. Use it to identify the location of the buttons.

➡ *continued*



1 **LANC jack (blue)**
The LANC control jack is used for controlling the tape transport of video device and peripherals connected to it.

2 **(headphones) jack**
When you use headphones, the speaker on your camcorder is silent.

3 **Hook for the shoulder strap (p. 126)**

4 **HDV/DV jack (p. 52, 89, 90, 93, 94, 96)**

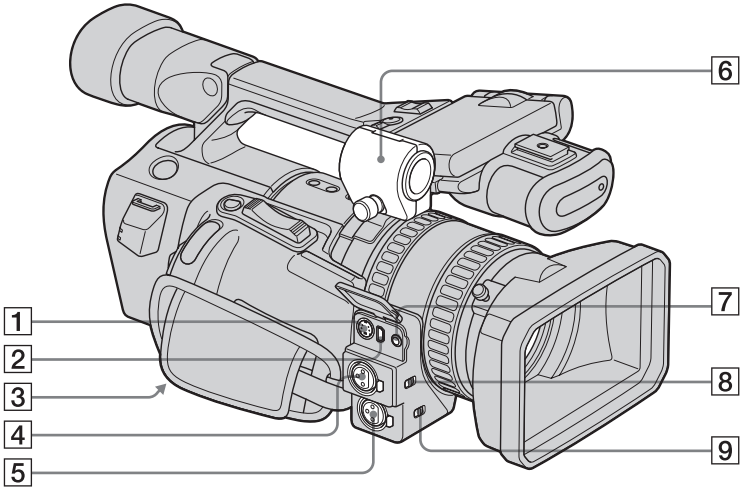
5 **Microphone (p. 98)**

6 **Front camera recording lamp (p. 20)**

7 **Front remote sensor**

8 **Speaker**

9 **Lens (Carl Zeiss Lens)**
Your camcorder is equipped with a Carl Zeiss lens which can reproduce fine images. The lens for your camcorder was developed jointly by Carl Zeiss, in Germany, and Sony Corporation. It adopts the MTF measurement system for video cameras and offers a quality as fine as a Carl Zeiss lens. The lens for your camcorder is also T*-coated to suppress unwanted reflection and faithfully reproduce colors.
MTF stands for Modulation Transfer Function.The value number indicates the amount of light from a subject coming into the lens.



1 **S VIDEO jack (p. 52, 54, 91, 94)**

2 **COMPONENT OUTPUT jack (p. 52, 54)**

3 **Tripod receptacle**
Make sure that the length of the tripod screw is less than 5.5 mm (7/32 inch). Otherwise, you cannot attach the tripod securely, and the screw may damage your camcorder.

4 **INPUT1 connector (XLR) (p. 38, 98)**

5 **INPUT2 connector (XLR) (p. 38, 98)**

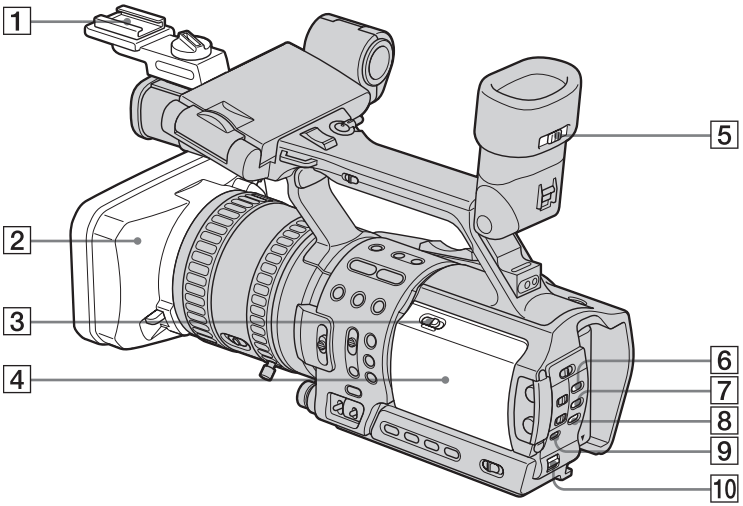
6 **Microphone holder (p. 38)**

7 **AUDIO/VIDEO jack (p. 52, 54, 91, 94, 98)**

8 **INPUT 1 PHANTOM power switch (p. 39)**

9 **INPUT 2 PHANTOM power switch (p. 39)**

➡ *continued*



1 **Shoe adaptor**
To connect an accessory, press down and push it to the end, and then tighten the screw. To remove an accessory, loosen the screw, and then press down and pull out the accessory.
When you attach the shoe adaptor, be careful not to damage the LCD panel.

2 **Lens hood (p. 20)**

3 **OPEN/EJECT ⏏ lever (p. 18)**

4 **Cassette compartment lid (p. 18)**

5 **Viewfinder lens adjustment lever (p. 15)**

6 **PICTURE PROFILE button (p. 34)**

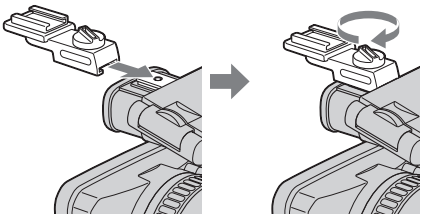
7 **MENU button (p. 57)**

8 **P-MENU button (p. 83)**

9 **STATUS CHECK button (p. 24, 51)**

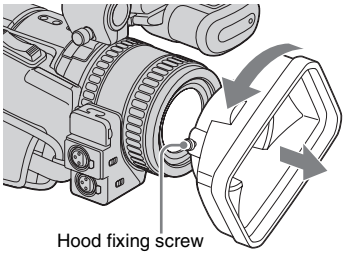
10 **SEL/PUSH EXEC dial (p. 57)**

To attach the shoe adaptor



To remove the lens hood

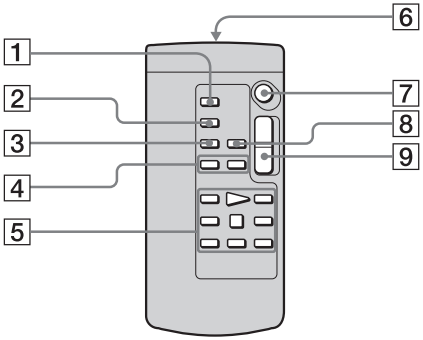
Loosen the lens hood fixing screw, then turn the lens hood in the direction of the arrow.



To attach the lens hood

Align the marks on the lens hood to those on the camcorder, and turn the lens hood in the opposite direction of the arrow in the figure above. Tighten the lens hood fixing screw.

Remote Commander



1 **TC RESET button (p. 102)**

2 **DISPLAY button (p. 50)**

3 **SEARCH MODE button (p. 55)**

4 **I◄◄ /►►I buttons (p. 55)**

5 **Video control buttons (Rewind, Playback, Fast-forward, Pause, Stop, Frame, Slow, ×2) (p. 48)**

6 **Transmitter**
After turning on your camcorder, point towards the remote sensor to control your camcorder.

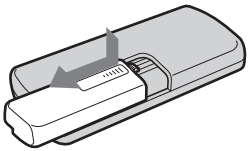
7 **REC START/STOP button (p. 20)**

8 **DATA CODE button (p. 51)**

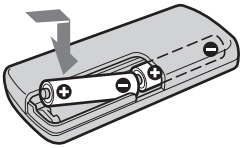
9 **Power zoom button (p. 22)**

To insert the batteries

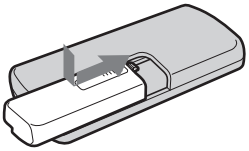
1 **Press and pull out the cover of the battery compartment.**



2 **Insert 2 size AA (R6) batteries by matching the + and – on the batteries to the + and – in the battery compartment.**



3 **Replace the cover back until it clicks.**



Notes on the Remote Commander

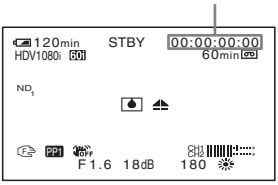
- Point the remote sensor away from strong light sources such as direct sunlight or overhead lighting. Otherwise, the Remote Commander may not function properly.
- The Remote Commander may not function properly when the remote sensor is obstructed with a conversion lens (optional).
- When you are operating with the Remote Commander supplied with your camcorder, your VCR may also operate. In that case, select a commander mode other than VTR 2 for your VCR, or cover the sensor of your VCR with black paper.

Indicators for the LCD screen and viewfinder

Following indicators will appear on the LCD screen and viewfinder to indicate the state of your camcorder.

Example: Indicators in the CAMERA mode

Time code/user bit (p. 21)/Tape counter (p. 50)/Self-diagnosis (p. 111)



Indicators	Meanings
120min	Remaining battery (p. 21)
HDV1080i, DVCAM	Recording format (p. 20)
STBY/REC	Recording standby/ recording mode
ND_1, ND_2, ND_{OFF}	ND filter (p. 30)
4:3	4:3 TV mode (p. 47)
32k, 48k	Audio mode (p. 65, 114)*
60min	Remaining tape (p. 21)
	Frame recording (p. 63)*
A/V▸DV	Output analog images and sound in digital format (p. 75)*
50i, 60i	50i/60i system (p. 82)
HDV/DVIN	HDV input/DV input (p. 95)
	Warning (p. 111)
	Manual focus (p. 32)
	BACK LIGHT (p. 25)
	SPOTLIGHT (p. 26)
	Preset white balance (p. 27)
A, B	One-push white balance (p. 26)
CLOSE	Iris closed (p. 28)
	SteadyShot off (p. 60, 86)

Indicators	Meanings
	LCD backlight off (p. 16)
PP1 through PP6	Picture Profile (p. 34)
	Index recording (p. 44)
	Color Correction (p. 42)
EXT, EXT	External rec control (p. 45)
HYPER	Hyper gain (p. 87)
OVERRIDE	AE override (p. 87)
2/2-ST	4-channel microphone recording standard (p. 110)*

* Appears only for the pictures in the DV format.

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