

Digital Video Camera Recorder^{Mini DV} Digital Video Cassette

Operating Instructions

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

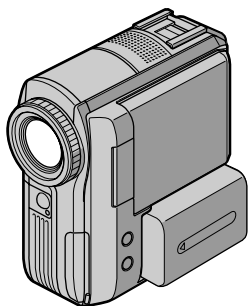
Owner's Record

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. **DCR-PC105**

Model No. **AC-**_____

Serial No. _____ Serial No. _____



Digital Handycam



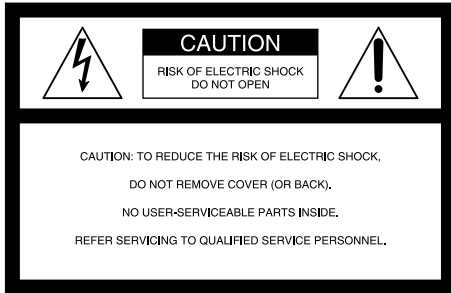
DCR-PC105

Welcome!

Congratulations on your purchase of this Sony Handycam. With your Handycam, you can capture life's precious moments with superior picture and sound quality. Your Handycam is loaded with advanced features, but at the same time it is very easy to use. You will soon be producing home video that you can enjoy for years to come.

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.

Notice

If static electricity or electromagnetism causes data transfer to discontinue midway (fail), restart the application or disconnect and connect the USB cable again.

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

CAUTION

TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

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.

"Memory Stick"

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.

This Class B digital apparatus complies with Canadian ICES-003.

For customers in the U.S.A.

If you have any questions about this product, you may call:

Sony Customer Information Center 1-800-222-SONY (7669)

The number below is for the FCC related matters only.

Regulatory Information

Declaration of Conformity

Trade Name: SONY
Model No.: DCR-PC105
Responsible Party: Sony Electronics Inc.
Address: 680 Kinderkamack
Road, Oradell,
NJ07649 U.S.A.
Telephone No.: 201-930-6972

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

CAUTION

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

Note:

This equipment has been tested and found to comply with the limits for 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 into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

Main Features

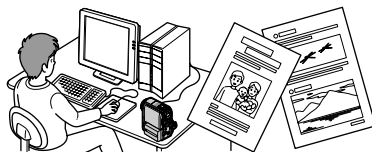
Recording moving pictures or still images, and playing them back



- Recording moving pictures on tape (p. 28)
- Playing back a tape (p. 42)
- Recording still images on a "Memory Stick" (p. 49, 120)
- Recording moving pictures on a "Memory Stick" (p. 133)
- Viewing still images recorded on a "Memory Stick" (p. 144)
- Viewing moving pictures recorded on a "Memory Stick" (p. 147)

- Viewing moving pictures recorded on a tape using the USB cable (p. 173)
- Viewing images recorded on a "Memory Stick" using the USB cable (p. 181, 186)
- Capturing images on a computer from your camcorder using the USB cable (p. 175, 176)
- Converting an analog signal into digital to capture images onto the computer (p. 187)
- DVD video creating with VAIO (p. 189)

Capturing images on the computer



Other uses

Functions for adjusting exposure during recording

- Back light function (p. 36)
- NightShot/Super NightShot/Color Slow Shutter (p. 37)
- PROGRAM AE (p. 64)
- Manual exposure (p. 66)
- Flexible Spot Meter (p. 67)
- Recording images with the flash (p. 124)

Functions for giving images more impact

- Digital zoom (p. 35)
The default setting is OFF. (To zoom greater than 10×, select the digital zoom power in D ZOOM in the menu settings.)
- Fader (p. 57)
- Picture effect (p. 60, 76)
- Digital effect (p. 61, 77)
- Title (p. 106)
- MEMORY MIX (p. 128)

Functions for giving a natural appearance to your recordings

- PROGRAM AE (p. 64)
 - SPORTS
 - LANDSCAPE
- Manual focus (p. 68)
- Spot Focus (p. 70)

Functions for using after recording

- End search/Edit search/Rec Review (p. 40)
- Data code (p. 44)
- Tape PB ZOOM (p. 78)/Memory PB ZOOM (p. 151)
- Zero set memory (p. 80)
- Title search (p. 81)
- Digital program editing (p. 87, 139)

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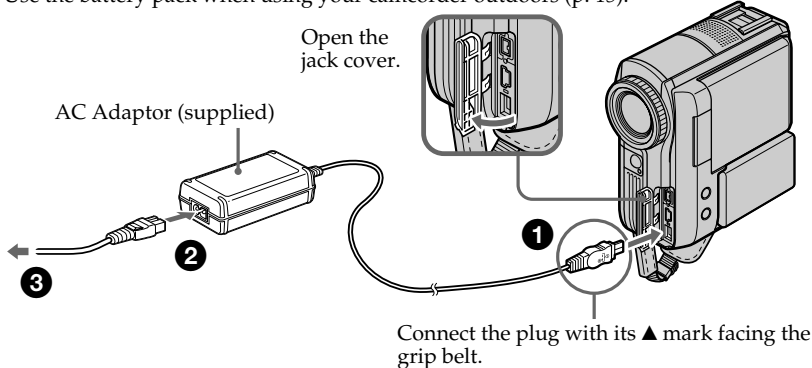
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Quick Start Guide – Recording on tape

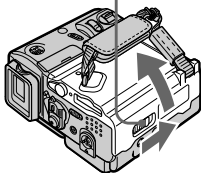
1 Connecting the power cord

Use the battery pack when using your camcorder outdoors (p. 15).

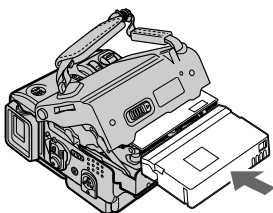


2 Inserting the cassette

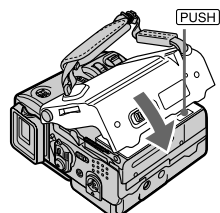
- 1 Slide OPEN/▲EJECT ▲ in the direction of the arrow and open the lid.



- 2 Push the center of the cassette back to insert the cassette. Insert the cassette straight as far as possible into the cassette compartment with the window facing up.



- 3 Close the cassette compartment by pressing **PUSH** on the cassette compartment. After the cassette compartment goes down completely, close the lid until it clicks.



To eject the cassette

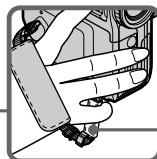
Follow the procedures above, and take out the cassette after the cassette compartment opens completely in step ②.

Note

Do not press the cassette compartment down forcibly. Doing so may cause a malfunction.

How to hold your camcorder

Hold the camcorder, putting your wrist through the belt and your fingers lightly on the finger rest (p. 21).



Finger rest

3

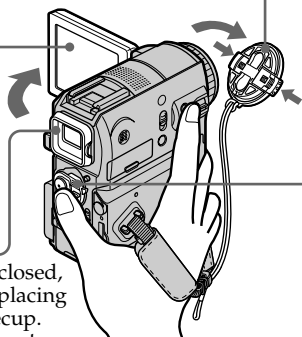
Recording a picture on the tape (p. 28)

- 1 Remove the lens cap.

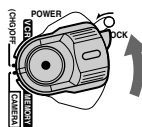
- 3 Press OPEN to open the LCD panel. The picture appears on the screen.

Viewfinder

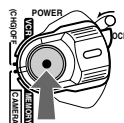
When the LCD panel is closed, pull out the viewfinder placing your eye against the eyecup. Adjust the viewfinder lens to your eyesight (p. 34).



- 2 Set the POWER switch to CAMERA while pressing the small green button.



- 4 Press START/STOP. Your camcorder starts recording. To stop recording, press START/STOP again.

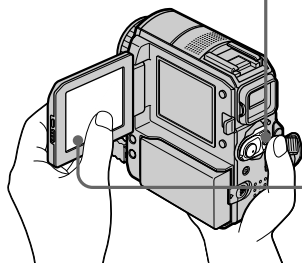
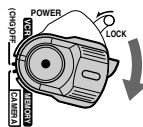


When you purchase your camcorder, the clock is not set up yet. If you want to record the date and time for a picture, set the clock before recording (p. 23).

4

Monitoring the playback picture on the LCD screen (p. 42)

- 1 Set the POWER switch to VCR while pressing the small green button.



- 2 Press of the touch panel to rewind the tape.



- 3 Press of the touch panel to start playback.



Note

When using the touch panel, press operation buttons lightly with your finger supporting the LCD panel from the back side of it. Do not press the LCD screen with sharp objects such as a pen.

Do not pick up your camcorder by the parts illustrated.



Viewfinder



LCD panel



Battery pack

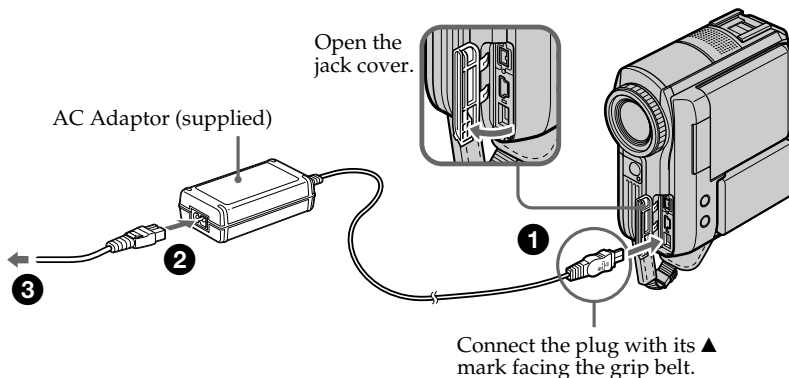


Flash

Quick Start Guide – Recording on a “Memory Stick”

1 Connecting the power cord

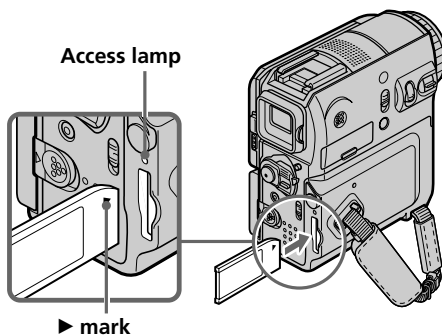
Use the battery pack when using your camcorder outdoors (p. 15).



2 Inserting a “Memory Stick”

Insert a “Memory Stick” in the “Memory Stick” slot as far as it can go with the ► mark facing the grip belt as illustrated.

To remove the “Memory Stick,” press the “Memory Stick” once lightly.

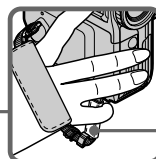


While the access lamp is lit or flashing

Do not shake or strike your camcorder because your camcorder is reading the data from the “Memory Stick” or recording data on the “Memory Stick.” Do not turn the power off, remove the “Memory Stick” or remove the battery pack. Otherwise, image data breakdown may occur.

How to hold your camcorder

Hold the camcorder, putting your wrist through the belt and your fingers lightly on the finger rest (p. 21).



Finger rest

3 Recording still images on the "Memory Stick" (p. 120)

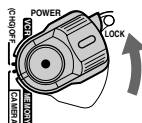
- 1 Remove the lens cap.

- 3 Press OPEN to open the LCD panel. The picture appears on the screen.

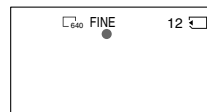
Viewfinder

When the LCD panel is closed, pull out the viewfinder placing your eye against the eyecup. Adjust the viewfinder lens to your eyesight (p. 34).

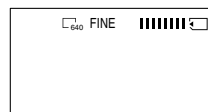
- 2 Set the POWER switch to MEMORY while pressing the small green button. Make sure that the LOCK switch is set to the right (unlock) position.



- 4 Press PHOTO lightly. You can record when the green ● stops flashing and remains lit.

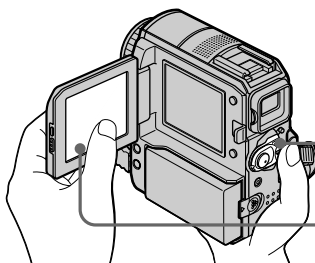


- 5 Press PHOTO deeper. The image displayed when you press PHOTO deeply is recorded on the "Memory Stick."

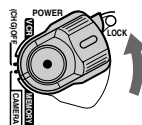


When you purchase your camcorder, the clock is not set up yet. If you want to record the date and time for a picture, set the clock before recording (p. 23).

4 Monitoring a still image on the LCD screen (p. 144)



- 1 Set the POWER switch to MEMORY while pressing the small green button. Make sure that the LOCK switch is set to the right (unlock) position.



- 2 Press PLAY. The last recorded image is displayed.

PLAY

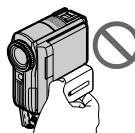
Do not pick up your camcorder by the parts illustrated.



Viewfinder



LCD panel



Battery pack

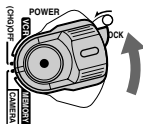


Flash

Using this manual

As you read through this manual, buttons and settings on your camcorder are shown in capital letters.

In sections from “Advanced Recording Operations” onward, position of the POWER switch is shown by the icons below.



(VCR) : Set the POWER switch to VCR.

(CAMERA) : Set the POWER switch to CAMERA.

(MEMORY) : Set the POWER switch to MEMORY.

All operations you carry out are indicated by a beep.

Note on Cassette Memory

Your camcorder is based on the DV format. You can use only mini DV cassettes with your camcorder. We recommend that you use a cassette with Cassette Memory **CM**.

Cassettes with Cassette Memory have the **CM** (Cassette Memory) mark.

Note on TV color systems

TV color systems differ depending on the country or region. To view your recordings on a TV, you need an NTSC system-based TV.

Copyright precautions

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

Note on connecting other equipment

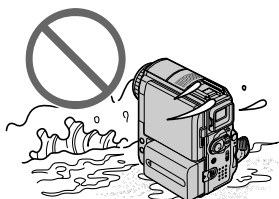
When you connect your camcorder to other video equipment or a computer using the USB cable or i.LINK cable, observe the shape of the jack.
If you insert the plug forcibly, the jack may get damaged and it may result in a malfunction of your camcorder.

Precautions on camcorder care

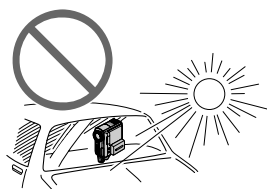
Lens and LCD screen/finder (on mounted models only)

- The LCD screen and the finder 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 constantly appear on the LCD screen and the finder. These points are normal in the manufacturing process and do not affect the recording in any way.
- Do not let your camcorder get wet. Keep your camcorder away from rain and sea water. Letting your camcorder get wet may cause your camcorder to malfunction. Sometimes this malfunction cannot be repaired **[a]**.
- Never leave your camcorder exposed to temperatures above 60°C (140°F), such as in a car parked in the sun or under direct sunlight **[b]**.
- Be careful when placing the camera near a window or outdoors. Exposing the LCD screen, the finder or the lens to direct sunlight for long periods may cause malfunctions **[c]**.
- Do not directly shoot the sun. Doing so might cause your camcorder to malfunction. Take pictures of the sun in low light conditions such as dusk **[d]**.

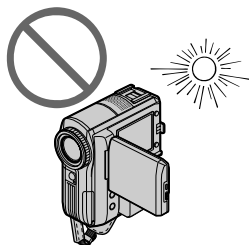
[a]



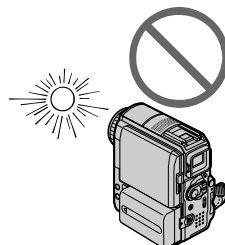
[b]



[c]

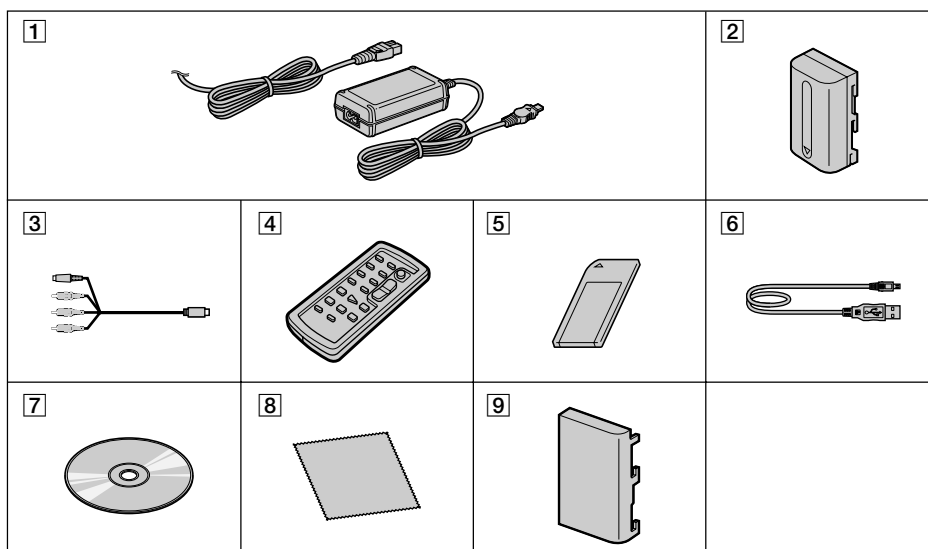


[d]



Checking the supplied accessories

Make sure that the following accessories are supplied with your camcorder.



1 AC-L15A/L15B AC Adaptor, Power cord (p. 16)

2 NP-FM30 rechargeable battery pack* (p. 15)

3 A/V connecting cable (p. 47)

4 Wireless Remote Commander (p. 234)
(A button type lithium battery is built in.)

5 "Memory Stick" (p. 112)

6 USB cable (p. 160)

7 CD-ROM (SPVD-010 USB Driver) (p. 164)

8 Cleaning cloth (p. 222)

9 Battery terminal cover (p. 15)

* The rechargeable battery pack (NP-FM30) supplied with your camcorder is not for sale.

Contents of the recording cannot be compensated if recording or playback is not made due to a malfunction of the camcorder, storage media, etc.

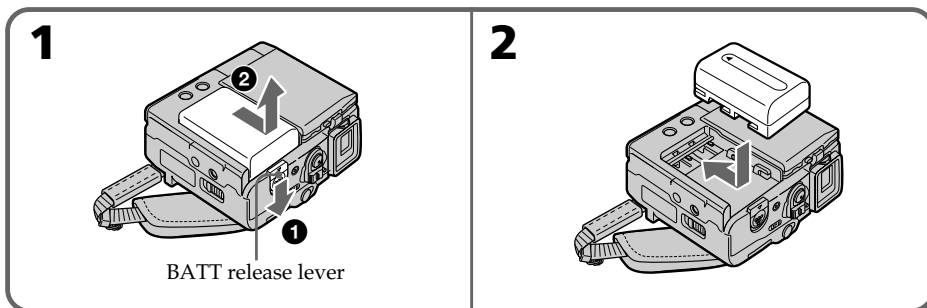
Step 1 Preparing the power source

Installing the battery pack

Be sure to set the POWER switch to OFF (CHG) when replacing the battery pack.

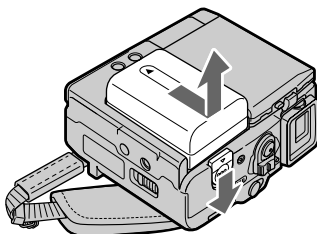
- (1) While sliding the BATT (battery) release lever in the direction of the arrow ①, slide the battery terminal cover in the direction of the arrow ②.
- (2) Slide the battery pack down until it clicks.

Getting Started



To remove the battery pack

Remove the battery pack while sliding the BATT (battery) release lever.



Step 1 Preparing the power source

Charging the battery pack

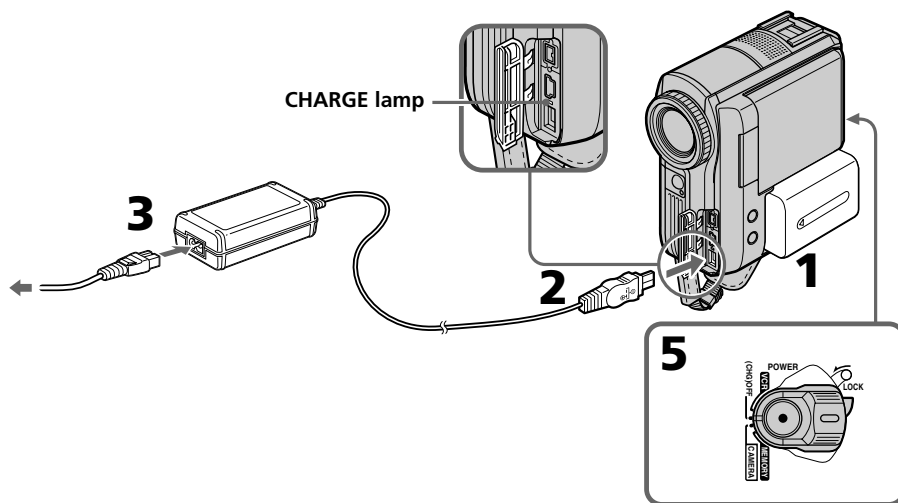
Use the battery pack after charging it for your camcorder.

Your camcorder operates only with the **"InfoLITHIUM" battery pack (M series)**.

See page 216 for details of "InfoLITHIUM" battery pack.

- (1) Install the battery pack on your camcorder.
- (2) Connect the AC Adaptor supplied with your camcorder to the DC IN jack with the ▲ mark on the DC plug facing the grip belt.
- (3) Connect the power cord to the AC Adaptor.
- (4) Connect the power cord to a wall outlet.
- (5) Set the POWER switch to OFF (CHG).

The CHARGE lamp lights up when charging begins. After charging is completed, the CHARGE lamp goes out (full charge).



After charging the battery pack

Disconnect the AC Adaptor from the DC IN jack on your camcorder.

Step 1 Preparing the power source

Notes

- Prevent metallic objects from coming into contact with the metal parts of the DC plug of the AC Adaptor. This may cause a short-circuit and damage the AC Adaptor.
- Your camcorder will be less balanced when placed on the table etc., with the battery pack NP-FM91/QM91/QM91D installed.

When you use the AC Adaptor

Place the AC Adaptor near a wall outlet. While using the AC Adaptor, if any trouble occurs with this unit, disconnect the plug from a wall outlet as soon as possible to cut off the power.

While charging the battery pack, the battery CHARGE lamp flashes in the following cases:

- The battery pack is not installed correctly.
- Something is wrong with the battery pack.

PRECAUTION

The set is not disconnected from the AC power source (house current) as long as it is connected to the wall outlet, even if the set itself has been turned off.

Charging time

Battery pack	Full charge
NP-FM30 (supplied)	145
NP-FM50	150
NP-FM70	240
NP-QM71/QM71D	260
NP-FM91/QM91/QM91D	360

Approximate minutes at 25°C (77°F) to charge an empty battery pack.

The charging time may increase if the battery's temperature is extremely high or low because of the ambient temperature.

Step 1 Preparing the power source

Recording time

Battery pack	Recording with the viewfinder		Recording with the LCD screen			
			Backlighting on		Backlighting off	
	Continuous	Typical*	Continuous	Typical*	Continuous	Typical*
NP-FM30 (supplied)	95	50	80	45	90	50
NP-FM50	155	90	130	70	150	85
NP-FM70	320	190	270	155	310	185
NP-QM71/QM71D	375	220	315	180	365	215
NP-FM91/QM91/QM91D	565	330	475	280	550	325

Approximate minutes when you use a fully charged battery pack

* Approximate recording time when you repeat recording start/stop, zooming and turning the power on/off. The actual battery life may be shorter.

Playing time

Battery pack	Playing time on the LCD screen	Playing time with the LCD panel closed
NP-FM30 (supplied)	110	135
NP-FM50	180	220
NP-FM70	370	450
NP-QM71/QM71D	430	530
NP-FM91/QM91/QM91D	645	785

Approximate minutes when you use a fully charged battery pack

Note

Approximate recording time and continuous playing time at 25°C (77°F). The battery life will be shorter if you use your camcorder in a cold environment.

Step 1 Preparing the power source

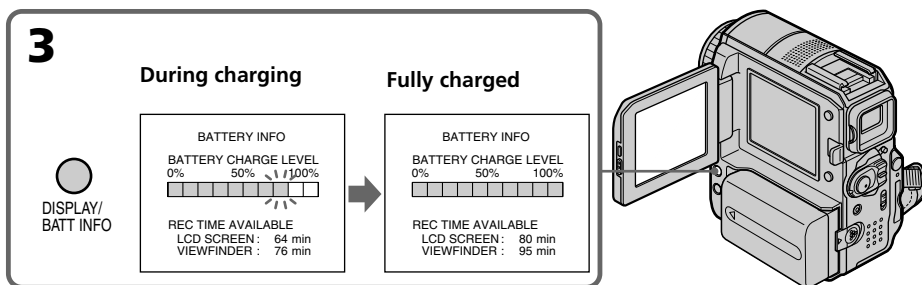
Checking status of the battery pack – Battery Info

- (1) Set the POWER switch to OFF (CHG).
- (2) Press OPEN to open the LCD panel.
- (3) Press DISPLAY/BATT INFO.

The battery charge level (the percentage of remaining battery time) and remaining battery time when using the LCD screen or viewfinder are displayed for about 7 seconds.

If you keep pressing DISPLAY/BATT INFO, the indicators will be displayed for about 20 seconds.

The time displayed is the available recording time when the LCD BACKLIGHT switch is set to ON.



Note

The BATTERY INFO indicator may not appear in the following cases:

- The battery pack is not installed.
- Something is wrong with the battery pack.
- The battery pack is fully discharged.

Battery Info

The number displayed as Battery Info is the approximate recording time.

While the remaining battery time is being calculated

“CALCULATING BATTERY INFO ...” is displayed.

Step 1 Preparing the power source

Using your camcorder on house current

Connect the AC Adaptor in the same way as you would when charging the battery pack (p. 16).

Connecting to a wall outlet

- The AC Adaptor can supply power from a wall outlet even if the battery pack is attached to your camcorder.
- The DC IN jack has “source priority.” This means that the battery pack will not supply any power if the power cord is connected to the DC IN jack, even when the power cord is not plugged into a wall outlet.

Step 2 Adjusting the grip belt

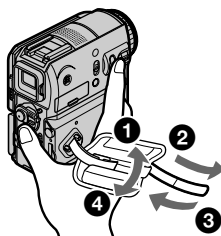
The grip belt supplied with your camcorder can be used as an ordinary grip belt or a wrist strap.

Using as a grip belt

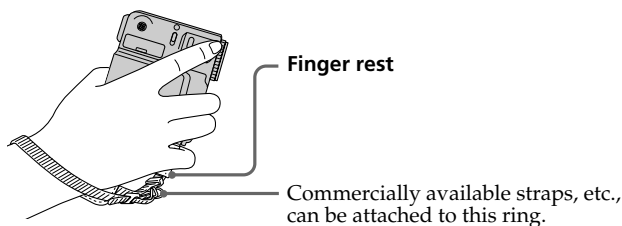
Put your hand through the grip belt.

Fasten the grip belt firmly.

If the grip belt hangs out too far, tuck it in the hand pad.



Using the grip belt as a wrist strap



- (1) Open the hand pad. Unfasten the belt from the clasp and pull out the belt from the hand pad.
- (2) Pull out the belt from the strap ring and feed the belt through the clasp again.
- (3) Feed the belt through the belt adjuster and close the hand pad.

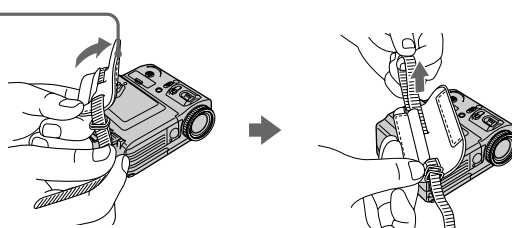
Notes

- Hold the camcorder, putting your wrist through the belt and your fingers lightly on the finger rest.
- The hand pad can be removed from the belt.

Step 2 Adjusting the grip belt

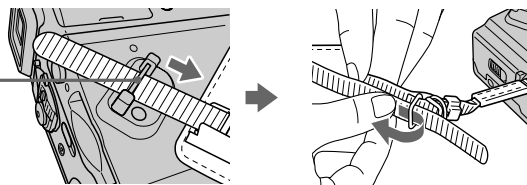
1

Hand pad



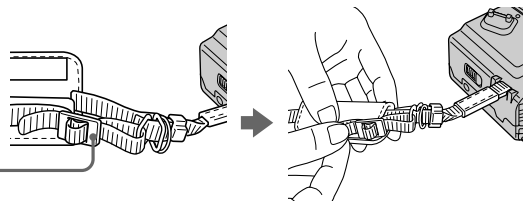
2

Strap ring



3

Belt adjuster




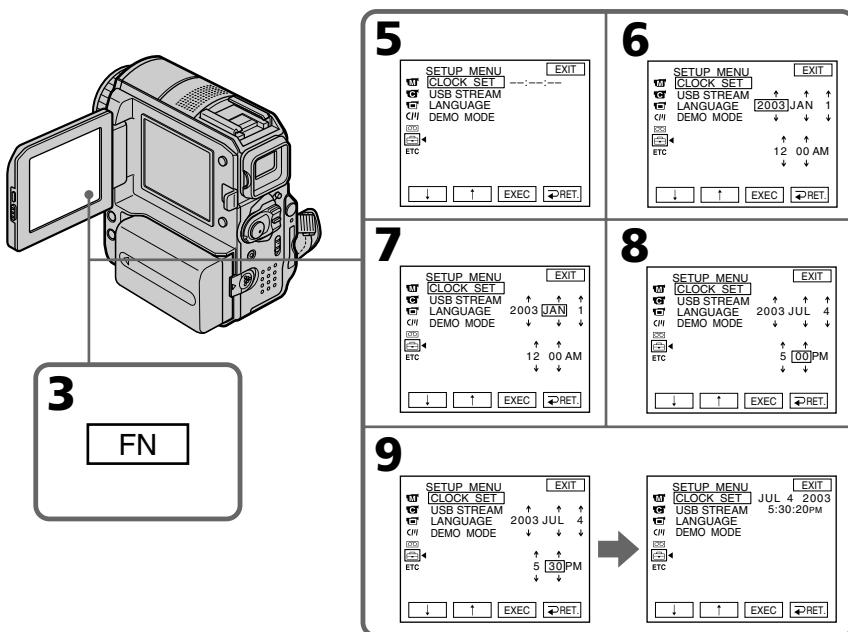
Step 3 Setting the date and time

Set the date and time when you use your camcorder for the first time. The "CLOCK SET" indicator will appear each time you set the POWER switch to CAMERA or MEMORY unless you set the date and time.

If you do not set the date and time, "--- -- ---" and "--:--:--" are recorded on a tape or a "Memory Stick" as the data code.

If you do not use your camcorder for **about 3 months**, the date and time settings may be unset (bars may appear) because the built-in rechargeable battery installed in your camcorder will have been discharged (p. 223). In this case, charge the built-in rechargeable battery, then set the year, the month, the day, the hour and the minute.

- (1) Set the POWER switch to CAMERA or MEMORY.
- (2) Press OPEN to open the LCD panel.
- (3) Press FN (Function) to display PAGE1 (p. 25).
- (4) Press MENU to display the menu.
- (5) Press ↓/↑ to select , then press EXEC.
- (6) Press ↓/↑ to select CLOCK SET, then press EXEC.
- (7) Press ↓/↑ to select the desired year, then press EXEC.
- (8) Set the month, day and hour with the same procedure as step 7.
- (9) Press ↓/↑ to set the minute, then press EXEC by the time signal. The clock starts.



Step 3 Setting the date and time

To return to FN (Function)

Press EXIT.

Note on the time indicator

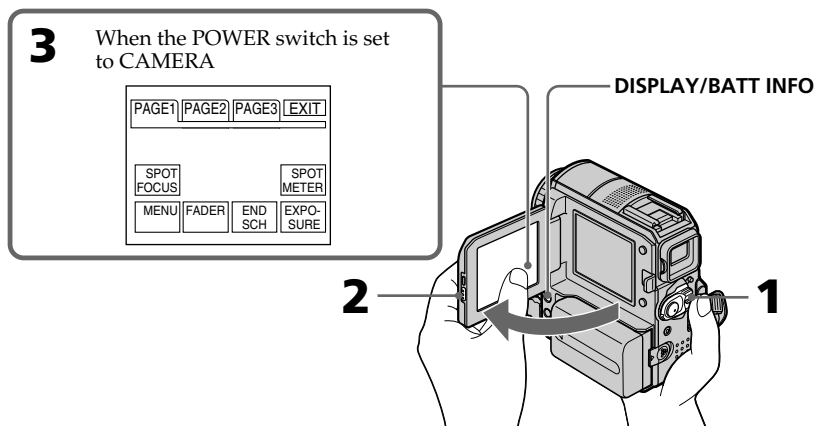
The internal clock of your camcorder uses a 12-hour cycle.

- 12:00 AM stands for midnight.
- 12:00 PM stands for noon.

Step 4 Using the touch panel

Your camcorder has operation buttons on the LCD screen.
Touch the LCD screen directly with your finger to operate each function.


- (1) Set the POWER switch to CAMERA for recording, VCR for playback, or MEMORY to use a “Memory Stick.”
- (2) Press OPEN to open the LCD panel.
- (3) Press FN. Operation buttons on PAGE1 are displayed on the LCD screen.
If FN is not on the LCD screen, touch the LCD screen lightly to make it appear.
You can control the display with DISPLAY/BATT INFO on your camcorder.
- (4) Press PAGE2/PAGE3 to display PAGE2/PAGE3. Operation buttons on PAGE2/PAGE3 are displayed on the LCD screen.
- (5) Press the desired operation item. See relevant pages of this manual for each function.



To return to FN


Press EXIT.

To execute settings

Press  OK. The display returns to PAGE1/PAGE2/PAGE3.

Step 4 Using the touch panel

To cancel settings

Press  OFF. The display returns to PAGE1/PAGE2/PAGE3.

To make screen indicators disappear

Press DISPLAY/BATT INFO.

Operation buttons on each display

When the POWER switch is set to CAMERA

PAGE1	SPOT FOCUS, SPOT METER, MENU, FADER, END SCH, EXPOSURE
PAGE2	SELFTIMER, DIG EFFT, LCD BRT, VOL, MEM MIX
PAGE3	SUPER NS, COLOR SLW S

When the POWER switch is set to VCR

PAGE1	MENU, LCD BRT, VOL, END SCH
PAGE2	PB ZOOM, DIG EFFT, BURN DVD, DATA CODE
PAGE3	V SPD PLAY, A DUB CTRL, REC CTRL

When the POWER switch is set to MEMORY

During memory camera

PAGE1	SPOT FOCUS, SPOT METER, MENU, PLAY, PB FOLDR, EXPOSURE
PAGE2	SELFTIMER, PLAY, MEM MIX
PAGE3	LCD BRT, PLAY, VOL

During memory playback

PAGE1	MENU, CAM, PB FOLDR, DEL
PAGE2	PB ZOOM, CAM, RESIZE, DATA CODE
PAGE3	LCD BRT, CAM, VOL

Step 4 Using the touch panel

Notes

- When using the touch panel, press operation buttons lightly with your finger supporting the LCD panel from the back side of it.
- Do not press the LCD screen with sharp objects such as a pen.
- Do not press the LCD screen too hard.
- Do not touch the LCD screen with wet hands.

When executing each item

A green bar appears above the item.

If any items are not available

The color of the items changes to gray.

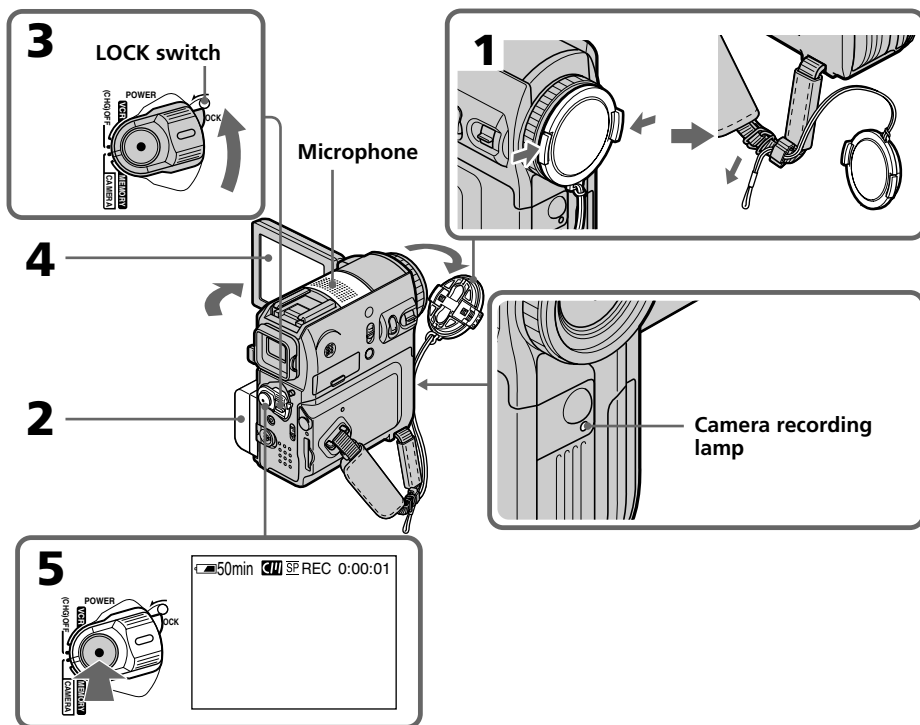
When using the viewfinder

You can also operate with the touch panel (p.74).


Recording a picture

Perform Step 1 (p. 15) to Step 3 (p. 23) in advance.

- (1) Remove the lens cap and pull the lens cap string to fix it.
- (2) Prepare the power source (p. 15) and insert a cassette (p. 8).
- (3) Set the POWER switch to CAMERA while pressing the small green button. This sets your camcorder to standby.
- (4) Press OPEN to open the LCD panel. The picture appears on the screen.
- (5) Press START/STOP. Your camcorder starts recording. The REC indicator appears. The camera recording lamp located on the front of your camcorder lights up. To stop recording, press START/STOP again.



Note on recording mode

Your camcorder records and plays back in the SP (standard play) mode or in the LP (long play) mode. Select SP or LP in  in the menu settings (p. 198). In the LP mode, you can record **1.5 times** as long as in the SP mode.

When you record the tape in the LP mode on your camcorder, we recommend playing back the tape on your camcorder.

To enable smooth transition

Transition between the last scene you recorded and the next scene is smooth as long as you do not eject the cassette even if you turn off your camcorder.

However, check the following:

- Do not mix recordings in the SP and LP modes (p. 198) on the same tape.
- When you change the battery pack, set the POWER switch to OFF (CHG).

During recording

Do not touch the built-in microphone.

If you leave your camcorder in standby for 5 minutes while the cassette is inserted

Your camcorder automatically turns off. This is to save battery power and to prevent battery pack and tape wear. To return to standby, set the POWER switch to OFF (CHG) and then back to CAMERA. However, your camcorder does not turn off automatically while the cassette is not inserted.

When you record in the SP and LP modes on the same tape or you record in the LP mode

- The transition between scenes may not be smooth.
- The playback picture may be distorted or the time code may not be written properly between scenes.

Note on the LOCK switch

When you slide the LOCK switch to the left, the POWER switch can no longer be set to MEMORY accidentally. The LOCK switch is set to the right as the default setting.

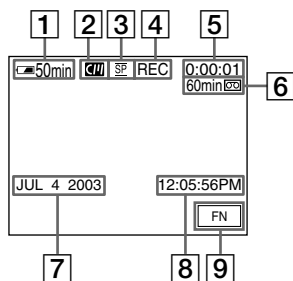
Self-timer recording

If you record with the self-timer, your camcorder automatically starts recording on a tape after counting down for about 10 seconds, see page 51 for details.

Recording a picture

Indicators displayed during recording

Indicators are not recorded on the tape.



1 Remaining battery time

2 Cassette Memory

This appears when using a cassette with Cassette Memory.

3 Recording mode

4 STBY/REC

5 Time code

6 Remaining tape

This appears after you insert the cassette (p. 198).

7 Date

The date appears about 5 seconds after the power is turned on.

8 Time

The time appears about 5 seconds after the power is turned on.

9 FN button

Press this button to display operation buttons on the LCD screen.

Recording a picture

Remaining battery time indicator during recording

The remaining battery time indicator roughly indicates the continuous recording time. The indicator may not be correct, depending on the conditions in which you are recording. When you close the LCD panel and open it again, it takes about 1 minute for the correct remaining battery time in minutes to be displayed.

Time code

The time code indicates the recording or playback time, “0:00:00” (hours : minutes : seconds) during recording and “0:00:00:00” (hours : minutes : seconds : frames) during playback.

You cannot rewrite only the time code later.

Recording data

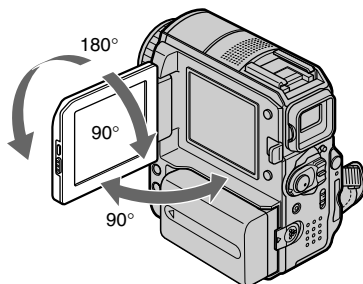
The recording data (date/time or various settings when recorded) are not displayed during recording. However, they are recorded automatically on the tape. To display the recording data, press DATA CODE during playback (p. 44).

After recording

- (1) Set the POWER switch to OFF (CHG).
- (2) Close the LCD panel.
- (3) Eject the cassette.
- (4) Remove the power source.

Adjusting the LCD screen

When you adjust the LCD panel, make sure that the LCD panel is opened up to 90 degrees.



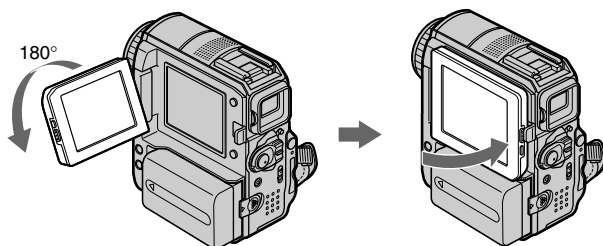
Note

When using the LCD screen except in the mirror mode, the viewfinder automatically turns off.

Recording a picture

When monitoring on the LCD screen

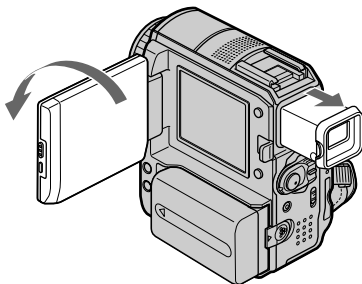
You can turn the LCD panel over and move it back to your camcorder body with the LCD screen facing out.



Shooting with the mirror mode

This feature allows the camera subject to view him- or herself on the LCD screen. The subject can use this feature to check his or her own image on the LCD screen while you look at the subject in the viewfinder.

Pull out the viewfinder and rotate the LCD panel 180 degrees.

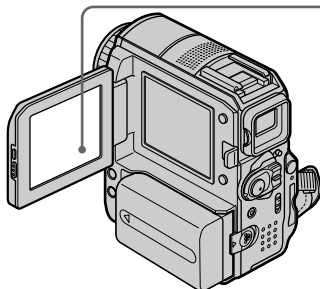


Picture in the mirror mode

The picture on the LCD screen is a mirror-image. However, the picture will be normal when recorded.

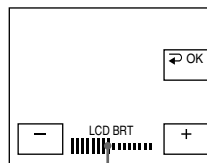
Adjusting the brightness of the LCD screen

- (1) When the POWER switch is set to CAMERA, press FN and select PAGE2.
When the POWER switch is set to VCR, press FN to display PAGE1.
When the POWER switch is set to MEMORY, press FN and select PAGE3.
- (2) Press LCD BRT. The screen to adjust the brightness of the LCD screen appears.
- (3) Adjust the brightness of the LCD screen using – (to dim)/+ (to brighten).
- (4) Press \Rightarrow OK to return to PAGE1/PAGE2/PAGE3 in step 1.



2,3

LCD
BRT



The bar indicator

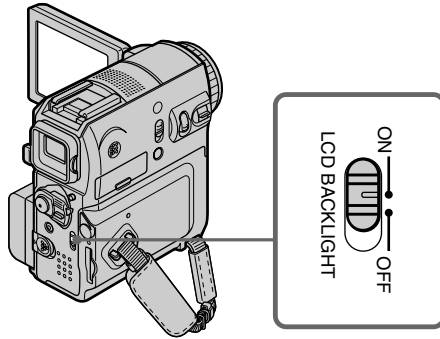
To return to FN

Press EXIT.

Recording a picture

Adjusting the LCD screen backlight

When using your camcorder outdoors in strong sunlight, the battery life can be improved by setting the LCD BACKLIGHT switch to OFF. When using your camcorder indoors, set the LCD BACKLIGHT switch to ON. (The default setting is ON.)



LCD screen backlight

You can change the brightness of the backlight when using the battery pack. Select LCD B.L. in  in the menu settings (p. 194).

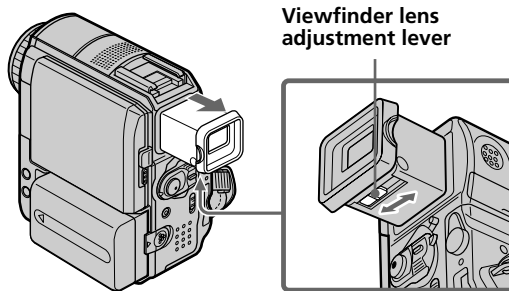
Even if you adjust the LCD screen using LCD BRT, LCD B.L. or the LCD BACKLIGHT switch

The recorded picture will not be affected.

Adjusting the viewfinder


If you record pictures with the LCD panel closed, check the picture with the viewfinder. Adjust the viewfinder lens to your eyesight so that the images in the viewfinder come into sharp focus.

Pull out the viewfinder and move the viewfinder lens adjustment lever.



Recording a picture

Viewfinder backlight

You can change the brightness of the backlight when using the battery pack. Select VF B.L. in  in the menu settings (p. 194).

Even if you adjust VF B.L.

The recorded picture will not be affected.

Shooting using the viewfinder is recommended when:

- You cannot see the picture clearly on the LCD screen.
- Battery consumption is a concern.

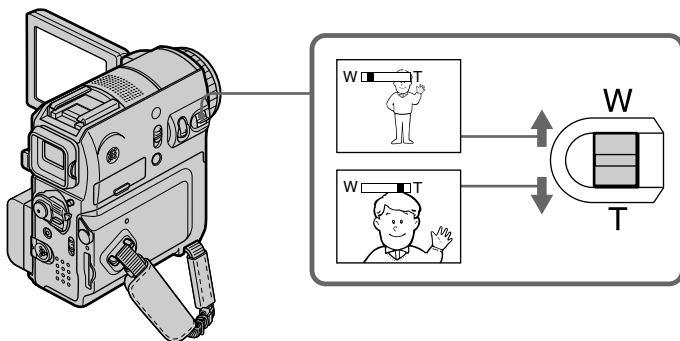
Using the zoom feature

Move the power zoom lever a little for a slower zoom. Move it further for a faster zoom.


Using the zoom sparingly results in better-looking recordings.

W: Wide-angle (subject appears farther away)

T: Telephoto (subject appears closer)

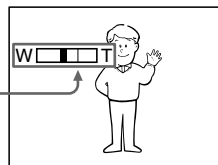


To use zoom greater than 10×

Zoom greater than 10× is performed digitally. Digital zoom can be set to 20× or 120×. To activate digital zoom, select the digital zoom power in D ZOOM in  in the menu settings (p. 193). Digital zoom is set to OFF as a default setting. Because the picture is processed digitally, the picture quality deteriorates.

The right side of the bar shows the digital zooming zone.

The digital zooming zone appears when you select the digital zoom power in the menu settings.



Recording a picture

When you shoot close to a subject

If you cannot achieve a sharp focus, move the power zoom lever to the “W” side until the focus is sharp. You can shoot a subject that is at least about 80 cm (about 2 5/8 feet) away from the lens surface in the telephoto position, or about 1 cm (about 1/2 inch) away in the wide-angle position.

When the POWER switch is set to MEMORY

You cannot use the digital zoom.

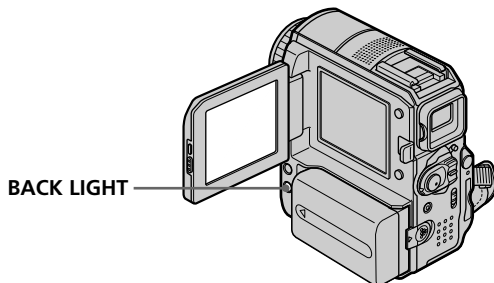
Shooting backlit subjects – Back light function

When you shoot a subject with the light source behind the subject or a subject with a light background, use the back light function.

(1) Set the POWER switch to CAMERA or MEMORY.

(2) Press BACK LIGHT.

The  indicator appears on the screen.



To cancel the back light function

Press BACK LIGHT again.

When shooting backlit subjects

If you press MANUAL of EXPOSURE (p. 66) or SPOT METER (p. 67), the back light function will be canceled.


Shooting in the dark – NightShot/Super NightShot/Color Slow Shutter

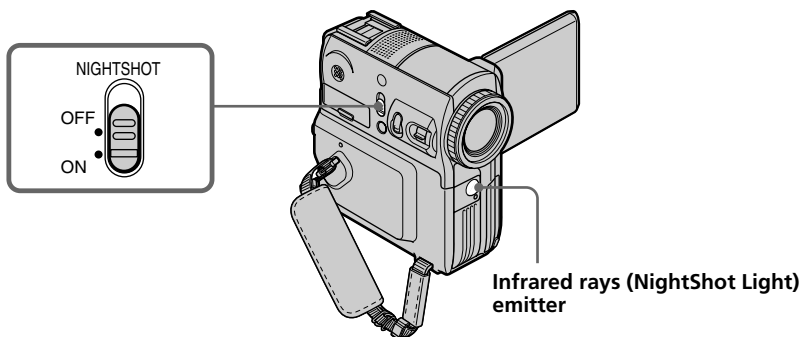
Using NightShot

NightShot enables you to shoot a subject in the night or in a dark place.

Note that if you record with NightShot, the picture may be recorded in incorrect or unnatural colors.

- (1) Set the POWER switch to CAMERA or MEMORY.
- (2) Slide NIGHTSHOT to ON.

The  and "NIGHTSHOT" indicators flash on the screen.





To cancel NightShot

Slide NIGHTSHOT to OFF.

Using Super NightShot

Super NightShot makes subjects up to 16 times brighter than those recorded in NightShot.


- (1) Set the POWER switch to CAMERA.
- (2) Slide NIGHTSHOT to ON.
The  and "NIGHTSHOT" indicators flash on the screen.
- (3) Press FN and select PAGE3.
- (4) Press SUPER NS.
The  indicator lights up on the screen.
- (5) Press EXIT to return to FN.

Recording a picture

To cancel Super NightShot

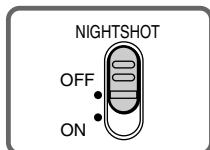
Press SUPER NS again to make the S indicator disappear. To cancel NightShot, slide NIGHTSHOT to OFF.


Using the NightShot Light

The picture will be clearer with the NightShot Light on. To enable the NightShot Light, set N.S. LIGHT in  to ON in the menu settings (p. 193). (The default setting is ON.)


Using Color Slow Shutter

Color Slow Shutter enables you to record color images in a dim place.



- (1) Set the POWER switch to CAMERA.
- (2) Slide NIGHTSHOT to OFF.
- (3) Press FN and select PAGE3.
- (4) Press COLOR SLW S.
The  indicator lights up on the screen.
- (5) Press EXIT to return to FN.

To cancel Color Slow Shutter

Press COLOR SLW S to make the  indicator disappear.

Notes

- Do not use NightShot in bright places (e.g., the outdoors in the daytime). Doing so may cause a malfunction.
- If focusing is difficult during recording with NightShot, focus manually.
- Do not cover the infrared rays emitter with your fingers during recording with NightShot.
- If a conversion lens (optional) is attached, it may block the infrared rays.

While using NightShot, you cannot use the following functions:

- White balance
- PROGRAM AE (the indicator flashes.)
- Manual exposure
- Flexible Spot Meter

While using Super NightShot or Color Slow Shutter

The shutter speed is automatically adjusted to the brightness, and the motion of the picture may slow down.

While using Super NightShot, you cannot use the following functions:

- White balance
- Fader
- Digital effect
- PROGRAM AE
- Manual exposure
- Flexible Spot Meter
- Recording with the flash

When the POWER switch is set to MEMORY

You cannot use the following functions:

- Super NightShot
- Color Slow Shutter

NightShot Light

NightShot Light rays are infrared and so are invisible. The maximum shooting distance using the NightShot Light is about 3 m (10 feet).

While using Color Slow Shutter, you cannot use the following functions:

- Fader
- Digital effect
- PROGRAM AE
- Manual exposure
- Flexible Spot Meter
- Recording with the flash

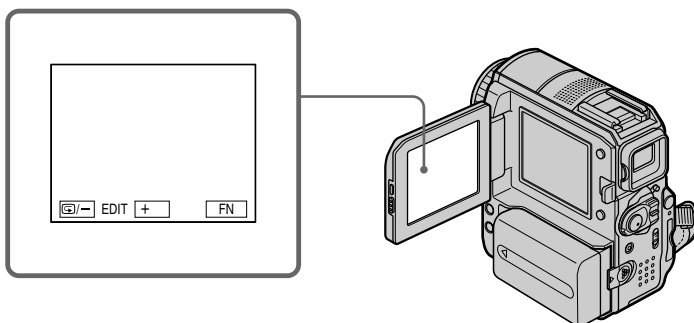
In total darkness

Color Slow Shutter may not work normally.

Checking recordings

– End search/Edit search/Rec Review

You can use these buttons to check the recorded picture or to locate the recording end point for making the transition between the last recorded scene and the next scene you record smooth.



End search

You can go to the end of the recorded section after you record.

- (1) Set the POWER switch to CAMERA.
- (2) Press FN to display PAGE1.
- (3) Press END SCH.

The last 5 seconds of the recorded section are played back and your camcorder returns to standby.

To return to FN

Press EXIT.

To cancel end search

Press END SCH again.

End search

When you use a cassette without Cassette Memory, end search does not work once you eject the cassette after you have recorded on the tape. If you use a cassette with Cassette Memory, end search works even after you eject the cassette.






Checking recordings – End search/Edit search/Rec Review

If the tape has a blank portion between recorded portions

End search may not work correctly.



Edit search

You can search for the next recording start point. You cannot monitor the sound.

- (1) Set the POWER switch to CAMERA.
- (2) Press FN to display PAGE1.
- (3) Press MENU.
- (4) Select EDITSEARCH in , then press EXEC (p. 193).
- (5) Select ON, then press EXIT.
- (6) Hold down /- or +. The recorded portion is played back.
Release /- or + to stop playback. If you press START/STOP, recording begins from the point you released /- or +.
/- : To go backward
+ : To go forward




Rec Review

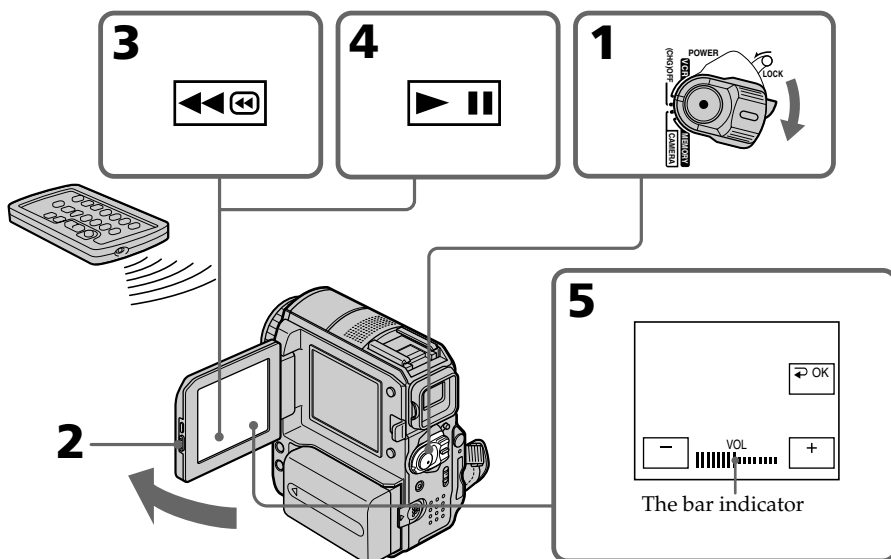
You can check the last recorded section.

- (1) Set the POWER switch to CAMERA.
- (2) Press FN to display PAGE1.
- (3) Press MENU.
- (4) Select EDITSEARCH in , then press EXEC (p. 193).
- (5) Select ON, then press EXIT.
- (6) Press /- momentarily.
The section you have stopped most recently will be played back for a few seconds, and then your camcorder will return to standby.

Playing back a tape

You can monitor a tape recording on the LCD screen. If you close the LCD panel, you can monitor the playback picture in the viewfinder. You can also control playback using the Remote Commander supplied with your camcorder.

- (1) Set the POWER switch to VCR while pressing the small green button.
- (2) Press OPEN to open the LCD panel.
- (3) Press  to rewind the tape.
- (4) Press  to start playback.
- (5) Adjust the volume following the steps below.
 - ① Press FN to display PAGE1.
 - ② Press VOL. The screen to adjust volume appears.
 - ③ Press – (to turn down the volume)/+ (to turn up the volume).
 - ④ Press  OK to return to PAGE1.



Playing back a tape


To return to FN

Press EXIT.


To stop playback

Press .


To rewind the tape

Press  during playback stop.

To fastforward the tape

Press  during playback stop.

To view a still image (playback pause)

Press  during playback. To resume playback, press  again. If the playback pause lasts more than 5 minutes, the camcorder automatically stops.

If you leave the power on for a long time

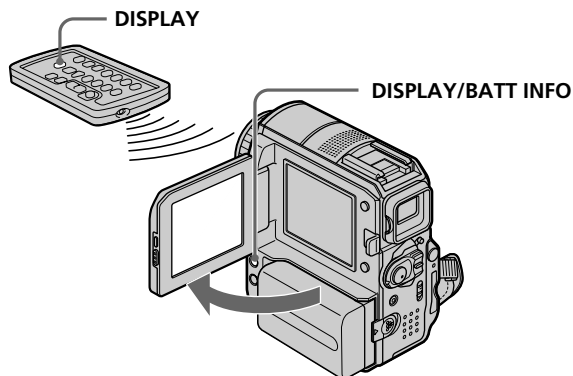
Your camcorder gets warm. This is not a malfunction.

To display the screen indicators – Display function

Press DISPLAY/BATT INFO on your camcorder, or DISPLAY on the Remote Commander supplied with your camcorder.

The indicators disappear from the screen.

To make the indicators reappear, press DISPLAY/BATT INFO or DISPLAY on the Remote Commander again.



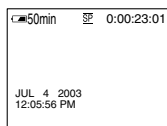
Playing back a tape

To display date/time and various settings

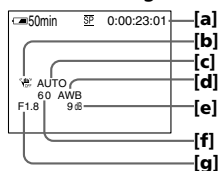
Your camcorder automatically records not only images on the tape but also the recording data (date/time or various settings when recorded) (**Data code**). Follow the steps below to display the data code using the touch panel .

- (1) Set the POWER switch to VCR, then play back the tape.
- (2) During playback, press FN and select PAGE2 (p. 25).
- (3) Press DATA CODE.
- (4) Select CAM DATA or DATE DATA, then press \Rightarrow OK.
- (5) Press EXIT.

Date/time



Various settings



- [a] Time code
- [b] SteadyShot off
- [c] Exposure
- [d] White balance
- [e] Gain
- [f] Shutter speed
- [g] Aperture value

To not display date/time or the various data

Select \Rightarrow OFF in step 4.

Various settings

Various settings show your camcorder's recording information at the time of recording. During tape recording, the various settings will not be displayed.

When you use data code, bars (-- --) appear if:

- A blank portion of the tape is being played back.
- The tape is unreadable due to tape damage or noise.
- The tape was recorded by a camcorder without the date and time set.

Data code

When you connect your camcorder to a TV, the data code also appears on the TV screen.

When the POWER switch is set to OFF (CHG)

The BATTERY INFO indicator will not appear, even if you press DISPLAY on the Remote Commander.


Various playback modes

To operate video control buttons, set the POWER switch to VCR.



Using the touch panel

- (1) Press FN and select PAGE3.
- (2) Press V SPD PLAY to display video control buttons.



To change the playback direction

Press  during playback to reverse the playback direction.*¹⁾




To locate a scene while monitoring the picture (picture search)

Keep pressing  or  during playback. To resume normal playback, release the button.




To monitor the high-speed picture while fastforwarding or rewinding the tape (skip scan)

Keep pressing  while fastforwarding or  while rewinding the tape. To resume fastforwarding or rewinding, release the button.


To view the picture at slow speed (slow playback)


Press  during playback. For slow playback in the reverse direction, press , then press .*¹⁾

To view the picture at double speed

Press  during playback. For double speed playback in the reverse direction, press , then press .*¹⁾

To view the picture frame-by-frame


Press  during playback pause.*²⁾

For frame-by-frame playback in the reverse direction, press .*²⁾

To search for the last scene recorded (END SEARCH)

Press END SCH on PAGE1 during stop. The last 5 seconds of the recorded section are played back then your camcorder stops.

*¹⁾ Press  to pause playback. Press  again to resume normal playback.









*²⁾ Press  to resume normal playback.

Playing back a tape







Video control buttons

Marks on your camcorder are different from those on the Remote Commander supplied with your camcorder.

On your camcorder:

-  To play back or pause the tape
-  To stop the tape
-  To rewind the tape
-  To fastforward the tape
-  To play back the tape slowly
-  To forward one frame at a time
-  To rewind one frame at a time
-  To play back the tape at double speed

On the Remote Commander:

-  To play back the tape
-  To pause the tape
-  To stop the tape
-  To rewind the tape
-  To fastforward the tape
-  To play back the tape slowly


In the various playback modes

- Sound is muted.
- The previous picture may remain as a mosaic image during playback.

When you play back the tape in reverse

Horizontal noise may appear in the center, or the top and bottom of the screen. This is not a malfunction.

Slow playback

Slow playback can be performed smoothly on your camcorder. However, this function does not work for an output signal from the  DV Interface.

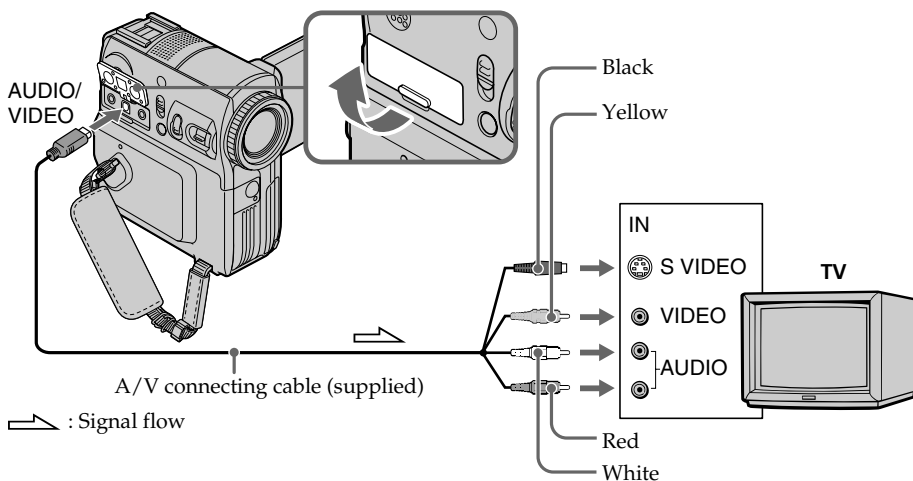
Viewing a recording on TV

Connect your camcorder to a TV with the A/V connecting cable supplied with your camcorder to watch the playback pictures on the TV screen. You can operate the playback control buttons in the same way as when you view playback pictures on the LCD screen.

When viewing the playback picture on the TV screen, we recommend that you power your camcorder from a wall outlet using the AC Adaptor. Refer to the operating instructions of your TV.

Open the jack cover. Connect your camcorder to the TV with the A/V connecting cable. Then, set the TV/VCR selector on the TV to VCR to be able to view images from your camcorder.

The supplied A/V connecting cable is equipped with an S video plug and a video plug. Use either the S video plug or the video plug depending on the TV.



If your TV is already connected to the VCR

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

Viewing a recording on TV

If your TV or VCR is a monaural type

Connect the yellow plug of the A/V connecting cable to the video input jack and the white or the red plug to the audio input jack on the VCR or the TV.

If you connect the white plug, the sound is L (left) signal. If you connect the red plug, the sound is R (right) signal.


If the equipment to be connected has an S video jack

Pictures can be reproduced more faithfully by using an S video jack. With this connection, you do not need to connect the yellow (video) plug of the A/V connecting cable. However, you need to connect the red and white (audio) plugs.

Connect the S video plug to the S video jack on the TV or the VCR.

This connection produces higher quality DV format pictures.

To display the screen indicators on TV

Set DISPLAY in  to V-OUT/LCD in the menu settings (p. 200). To make the screen indicators disappear, press DISPLAY/BATT INFO on your camcorder.

Recording still images on a “Memory Stick” during tape recording standby or tape recording

Insert a “Memory Stick” before operation.

During tape recording standby

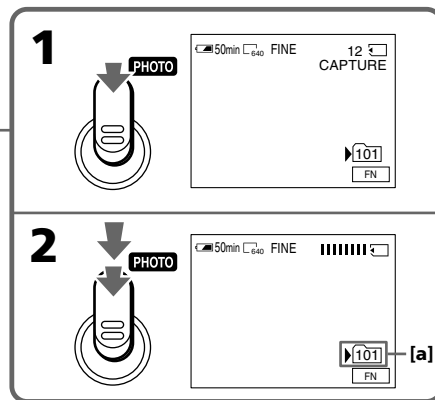
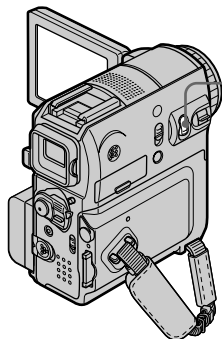
The POWER switch should be set to **(CAMERA)**.

- (1) Keep pressing PHOTO lightly until a still image appears. The CAPTURE indicator appears. Recording does not start yet. To change the still image, release PHOTO, select a still image again, and then press and hold PHOTO lightly.

- (2) Press PHOTO deeper.

Recording is complete when the bar scroll indicator disappears.

The image displayed on the screen when you pressed PHOTO deeper will be recorded in the folder on the “Memory Stick” (p. 142).



[a] Current recording folder

Recording still images on a “Memory Stick” during tape recording standby or tape recording

During tape recording

The POWER switch should be set to **CAMERA**.

Press PHOTO deeper.

The image displayed on the screen when you pressed PHOTO deeper will be recorded on the “Memory Stick.”

Recording on the “Memory Stick” is complete when the bar scroll indicator disappears.

Note

You cannot record still images on a “Memory Stick” while using the following functions (The  indicator flashes):

- End search
- Wide mode
- While fading in with BOUNCE
- MEMORY MIX

“Memory Stick”

See page 112 for details.

Still images

- The image size will be 640 × 480.
- If the POWER switch is set to CAMERA, image quality cannot be changed. Images will be recorded with image quality as set when the POWER switch is set to MEMORY. (The default setting is FINE.)
To record images with higher image quality, use of memory photo recording is recommended (p. 120).

Recording with the flash

During recording standby, you can record still images on the “Memory Stick” with the flash. See page 124 for details.

When you press PHOTO on the Remote Commander

Your camcorder immediately records the image that is on the screen when you press the button.

To record still images on the “Memory Stick” during tape recording

You cannot check an image on the screen by pressing PHOTO lightly.

During and after recording still images on the “Memory Stick”

Your camcorder continues recording on the tape.

Title

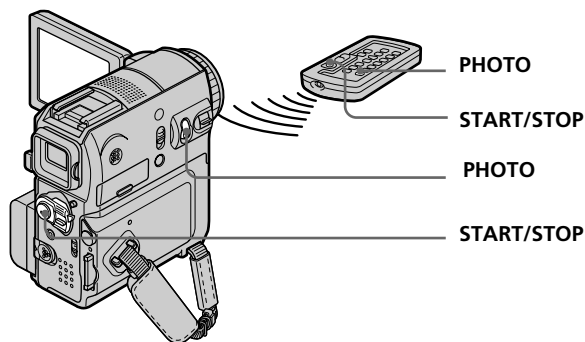
You cannot record titles.

Self-timer recording

During recording standby, you can record still images on the “Memory Stick” with the self-timer. See page 52 for details.


Self-timer recording

You can record still images and moving pictures with the self-timer.
You can also use the Remote Commander for this operation.



Recording moving pictures on a tape

The POWER switch should be set to **CAMERA**.
Operate by touching the panel.

- (1) During standby, press FN and select PAGE2.
- (2) Press SELFTIMER.
The  (self-timer) indicator appears on the screen.
- (3) Press EXIT to return to FN.
- (4) Press START/STOP.

The self-timer starts counting down from about 10 seconds with a beep. In the last 2 seconds, the beep gets faster, and then the recording starts automatically.

Self-timer recording

Recording still images on a “Memory Stick” during recording standby

The POWER switch should be set to **CAMERA**.
Operate by touching the panel.

(1) Follow steps 1 to 3 in “Recording moving pictures on a tape” (p. 51).


(2) Press PHOTO deeply.

The self-timer starts counting down from about 10 seconds with a beep. In the last 2 seconds, the beep gets faster, and then your camcorder records still images automatically.

To stop the countdown for recording on a tape

Press START/STOP. To restart the countdown, press START/STOP again.

To cancel the self-timer

During standby, press SELFTIMER on the LCD screen to make the  (self-timer) indicator disappear from the screen. You cannot cancel the self-timer using the Remote Commander.

Notes

- When self-timer recording is finished, the self-timer is automatically canceled.
- You can record with the self-timer only during recording standby.

When the POWER switch is set to MEMORY

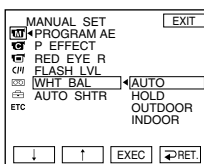
You can also record still images on a “Memory Stick” with the self-timer (p. 135).

Adjusting the white balance manually

Normally white balance is automatically adjusted.

The POWER switch should be set to **CAMERA** or **MEMORY**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select WHT BAL in **TM**, then press EXEC (p. 192).



- (4) Select the desired mode, then press EXEC.

HOLD:

When recording a single-colored subject or background

OUTDOOR (☀):

- When recording a sunset/sunrise, just after sunset, just before sunrise, neon signs, or fireworks
- Under daylight fluorescent lamps

INDOOR (☾):

- When lighting conditions change quickly
- In too bright places such as photography studios
- Under sodium lamps or mercury lamps

To return to FN

Press EXIT.

To return to the automatic white balance

Set WHT BAL to AUTO in the menu settings.

Adjusting the white balance manually

If the picture is being taken in a studio lit by TV lighting

We recommend that you record in the INDOOR mode.

If you record under fluorescent lighting

Select AUTO or HOLD.

Your camcorder may not adjust the white balance correctly in the INDOOR mode.

If you did the following in the AUTO mode:

- You remove the battery pack for replacement.
- You bring your camcorder from indoors to outdoors holding the exposure, or vice versa.

Point your camcorder at the white subject for about 10 seconds after setting the POWER switch to CAMERA to get better adjustment.

If you did the following in the HOLD mode:

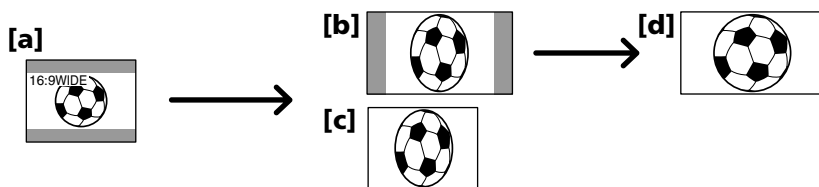
- You change the mode of PROGRAM AE.
- You bring your camcorder from indoors to outdoors, or vice versa.

Set WHT BAL to AUTO and reset to HOLD after a few seconds.

Using the wide mode

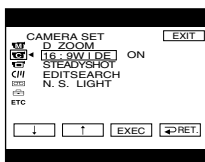
You can record a 16:9 wide picture to watch on the 16:9 wide-screen TV (16:9WIDE). Black bands appear on the screen during recording in the 16:9WIDE mode **[a]**. The picture during playing back in the 4:3 mode on a wide-screen TV **[b]** or a normal TV **[c]*** are compressed widthwise. If you set the screen mode of the wide-screen TV to the full mode, you can watch normal ratio pictures **[d]**. If the zoom lever is set to the W (wide) side, the recording angle will become wider than that of the usual tape recording.

* The picture played back in the wide mode on a normal TV appears the same as the picture played back in the wide mode on your camcorder **[a]**.



The POWER switch should be set to **(CAMERA)**.
Operate by touching the panel.

- (1) During recording standby, press FN to display PAGE1.
- (2) Press MENU.
- (3) Select 16:9WIDE in **[G]**, then press EXEC (p. 193).
- (4) Select ON, then press EXEC.



To return to FN

Press EXIT.

To cancel the wide mode

Set 16:9WIDE to OFF in the menu settings.

Using the wide mode

Notes

- In the wide mode, you cannot use the following functions:
 - Recording on a “Memory Stick” during tape recording or tape recording standby
 - BOUNCE
 - OLD MOVIE
- Pictures recorded on the tape in wide mode cannot be returned to normal ratio.

Pictures on a TV screen

Pictures recorded in the 16:9WIDE mode automatically appear on the TV screen at full size when:

- You connect your camcorder to a TV that is compatible with the video ID (ID-1/ID-2) system.
- You connect your camcorder to the S video jack on the TV.

ID-1 system

The ID-1 system sends aspect ratio information (16:9, 4:3, or letter box) with video signals. If you connect a TV compatible with the ID-1 system, the screen size is automatically selected.

ID-2 system

The ID-2 system sends a copyright protection signal with ID-1 signals inserted between video signals when you connect your camcorder to other equipment using the A/V connecting cable.

In the wide mode









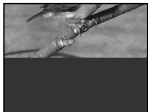
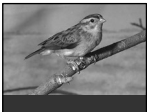
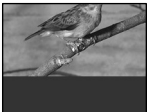










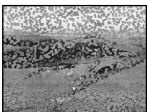
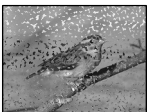

If the zoom lever is set to the W (wide) side, the recording angle will become wider than normal recording.

Using the fader function

You can fade in or out to give your recording a more professional appearance.

[a]

STBY
REC

NORM. FADER (normal)				
MOSC. FADER (mosaic)				
BOUNCE *1) *2)				
OVERLAP *2)				
WIPE *2)				
DOT *2)				


[b]

STBY
REC

Advanced Recording Operations

MONOTONE

When fading in, the picture gradually changes from black-and-white to color.
When fading out, the picture gradually changes from color to black-and-white.

*1) You can use BOUNCE when D ZOOM in  is set to OFF in the menu settings.

*2) You can fade in only.

Using the fader function

The POWER switch should be set to **CAMERA**.
Operate by touching the panel.

(1) When fading in [a]

Press FN to display PAGE1 during recording standby.

When fading out [b]

Press FN to display PAGE1 during recording.

(2) Press FADER. The screen to select the fader mode appears.

(3) Press the desired mode.

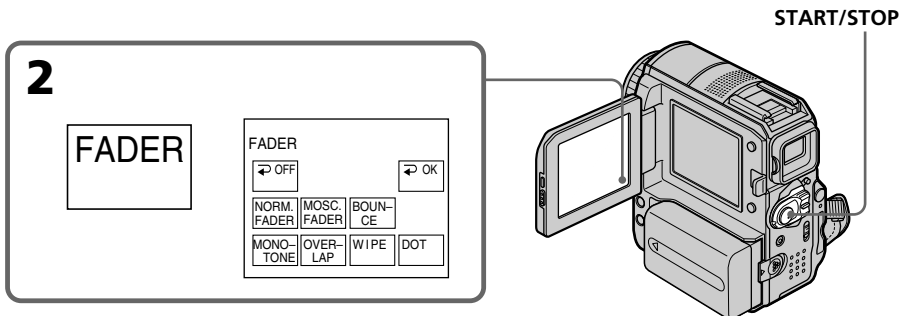
(4) Press OK to return to PAGE1.

(5) Press EXIT to return to FN.

The fader indicator you selected flashes.

(6) Press START/STOP.

After the fade in/out is carried out, your camcorder automatically returns to the normal mode.



To cancel the fader function

Before pressing START/STOP, press OFF on the FADER screen to return to PAGE1.

Note

You cannot use the following functions while using fader. Also, you cannot use fader while using the following functions:

- Super NightShot
- Color Slow Shutter
- Digital effect
- Interval Recording
- Frame recording
- Recording with the flash

When you select OVERLAP, WIPE or DOT during recording

Your camcorder stores the image recorded when your camcorder was set to standby, and sets itself ready for fade in.

During BOUNCE is on, you cannot use the following functions:

- Zoom
- Picture effect
- Manual exposure
- Flexible Spot Meter
- Manual focus
- PROGRAM AE
- Recording on a “Memory Stick”

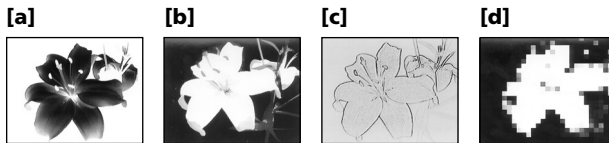
Note on the BOUNCE mode

You cannot select BOUNCE in the following:

- D ZOOM is activated in the menu settings
- Wide mode
- Picture effect
- PROGRAM AE

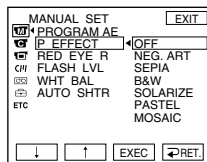
Using special effects – Picture effect

- NEG. ART [a]:** The color and brightness of the picture are reversed.
SEPIA: The picture is sepia.
B&W: The picture is monochrome (black-and-white).
SOLARIZE [b]: The picture looks like an illustration with strong contrast.
PASTEL [c]: The picture looks like a pale pastel drawing.
MOSAIC [d]: The picture is mosaic.



The POWER switch should be set to **CAMERA**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select P EFFECT in **[M]**, then press EXEC (p. 192).



- (4) Select the desired mode, then press EXEC.

To return to FN

Press EXIT.

To cancel picture effect

Set P EFFECT to OFF in the menu settings.

Note

While using picture effect, you cannot use following functions:

- BOUNCE
- OLD MOVIE

Using special effects – Digital effect

SLOW SHTR (slow shutter)

You can slow down the shutter speed. The SLOW SHTR mode is good for recording dark pictures more brightly.

OLD MOVIE

You can add an old movie type atmosphere to pictures. Your camcorder automatically changes the screen format to wide and the color to sepia, and sets the appropriate shutter speed.

STILL

You can record a still image so that it is superimposed on a moving picture.

FLASH (flash motion)

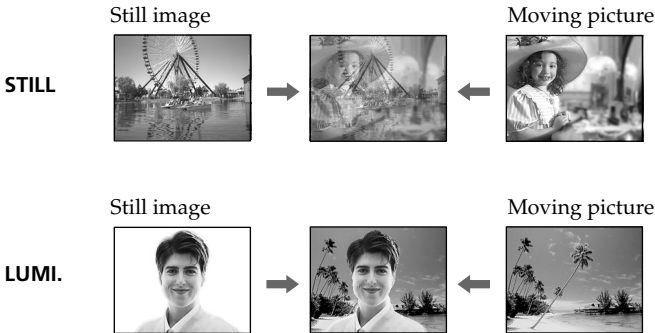
You can record still images successively at regular intervals.

LUMI. (luminance key)

You can swap the brighter area in a still image with a moving picture.

TRAIL

You can record a picture so that an incidental image like a trail is left.



Using special effects – Digital effect

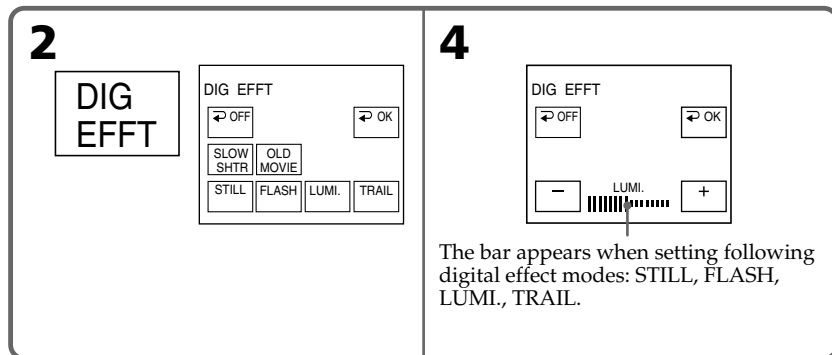
The POWER switch should be set to **CAMERA**.
Operate by touching the panel.

- (1) Press FN, then select PAGE2.
- (2) Press DIG EFFT. The screen to select a digital effect is displayed.
- (3) Press the desired mode. When you select STILL or LUMI., the still image is stored in memory.
- (4) Press – (to decrease the effect)/+ (to increase the effect) to adjust the effect.

Items to adjust

SLOW SHTR	Shutter speed. The larger the shutter speed number, the slower the shutter speed.
OLD MOVIE	No items need to be adjusted.
STILL	The degree of the still image you want to superimpose on the moving picture
FLASH	The interval of flash motion
LUMI.	The brightness of the area in the still image which is to be swapped with a moving picture
TRAIL	The vanishing time of the incidental image

- (5) Press ↻ OK to return to PAGE2.



To return to FN

Press EXIT.

To cancel digital effect

Press  OFF on the DIG EFFT screen to return to PAGE2.

Shutter speed

Shutter speed number	Shutter speed
SLOW SHTR 1	1/30
SLOW SHTR 2	1/15
SLOW SHTR 3	1/8
SLOW SHTR 4	1/4

Notes

- While using digital effect, you cannot use the following functions:
 - Super NightShot
 - Color Slow Shutter
 - Fader
 - Recording with the flash
- PROGRAM AE does not work in the SLOW SHTR mode.
- The following functions do not work in the OLD MOVIE mode:
 - Wide mode
 - Picture effect
 - PROGRAM AE

When recording in the SLOW SHTR mode

Autofocus may not be effective. Focus manually using a tripod.

Using PROGRAM AE

SPOTLIGHT^{*1)}

This mode prevents people's faces, for example, from appearing excessively white when shooting subjects lit by strong light in the theater.

PORTRAIT (soft portrait)

This mode brings out the subject while creating a soft background for subjects such as people or flowers.

SPORTS (sports lesson)^{*1)}

This mode minimizes camera-shake on fast-moving subjects, such as in tennis or golf.

BEACH&SKI^{*1)}

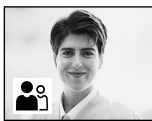
This mode prevents people's faces from appearing dark in strong light or reflected light, such as at a beach in midsummer or on a ski slope.

SUNSETMOON (sunset & moon)^{*2)}

This mode allows you to maintain atmosphere when you record sunsets, general night views, fireworks displays and neon signs.

LANDSCAPE^{*2)}

This mode is for when you record distant subjects such as mountains. Also it prevents your camcorder from focusing on glass or metal mesh in windows when you record a subject behind glass or a screen.



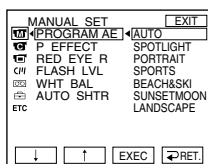
^{*1)} Your camcorder focuses only on subjects in the middle to far distance.

^{*2)} Your camcorder focuses only on distant subject.

Using PROGRAM AE

The POWER switch should be set to **CAMERA** or **MEMORY**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select PROGRAM AE in **MANUAL SET**, then press EXEC (p. 192).



- (4) Select the desired mode, then press EXEC.

To return to FN

Press EXIT.

To cancel PROGRAM AE

Set PROGRAM AE to AUTO in the menu settings.

Notes

- The following functions do not work in PROGRAM AE:
 - Color Slow Shutter
 - BOUNCE
 - SLOW SHTR
 - OLD MOVIE
 - Spot Focus
- PROGRAM AE does not work in the following cases (The indicator flashes.):
 - NIGHTSHOT is set to ON.
 - To record images on a “Memory Stick” using the MEMORY MIX.
- When you set the POWER switch to MEMORY, the SPORTS mode does not work. (The indicator flashes.)

Adjusting the exposure manually

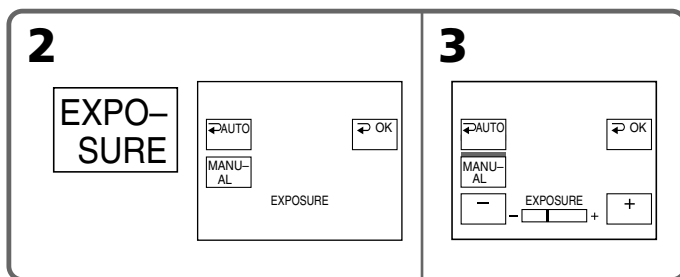
We recommend that you adjust the exposure manually in the following cases:

- When fine-adjusting backlight compensation
- When the subject is too bright against the background
- When recording dark pictures (e.g., night scenes) faithfully

The POWER switch should be set to **CAMERA** or **MEMORY**.

Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press EXPOSURE. The screen to adjust the exposure appears.
- (3) Press MANUAL.
- (4) Adjust the exposure using – (to dim) / + (to brighten).
- (5) Press \rightarrow OK to return to PAGE1.



To return to FN

Press EXIT.

To return to the automatic exposure

Press \rightarrow AUTO on the EXPOSURE screen to return to PAGE1.

Note

When you adjust the exposure manually, the following functions do not work:

- Back light function
- Color Slow Shutter

Using spot light-metering function

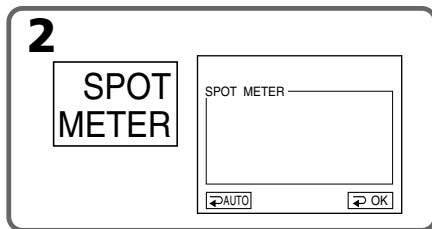
– Flexible Spot Meter

This function adjusts the exposure to the brightness of the point you want to focus on. Use Flexible Spot Meter in the following cases:

- The subject is backlit.
- When there is strong contrast between the subject and background such as with a subject that is on stage and lit by a spotlight.

The POWER switch should be set to **(CAMERA)** or **(MEMORY)**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press SPOT METER. The SPOT METER screen appears.
- (3) Press the desired area in the frame.
The SPOT METER indicator flashes on the screen. The exposure is adjusted to the brightness of the point you selected.
- (4) Press \rightarrow OK to return to PAGE1. The EXPOSURE setting changes to the manual mode (p. 66).



To return to FN

Press EXIT.

To return to the automatic exposure

Press \rightarrow AUTO on the SPOT METER screen to return to PAGE1.

Note

The following functions do not work during Flexible Spot Meter:

- Back light function
- Color Slow Shutter
- Spot Focus


Focusing manually

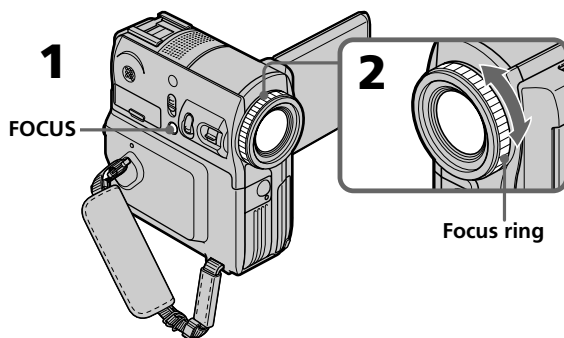
You can gain better results by manually adjusting the focus in the following cases. Normally, focus is adjusted automatically.

- The autofocus mode is not effective when shooting:
 - Subjects through glass covered with water droplets
 - Horizontal stripes
 - Subjects with little contrast with backgrounds such as walls or the sky
- Shooting a stationary subject when using a tripod
- When you want to change the focus from a subject in the foreground to a subject in the background






The POWER switch should be set to **CAMERA** or **MEMORY**.

- (1) Press FOCUS. The  indicator appears.
- (2) Turn the focus ring to sharpen focus.



To return to the autofocus mode

Press FOCUS to turn off ,  or  indicator.



To focus precisely

It is easier to focus on the subject if you adjust the zoom to shoot at the “W” (wide-angle) position after focusing at the “T” (telephoto) position.

When you shoot close to the subject

Focus at the end of the “W” (wide-angle) position.

changes as follows:

-  when recording a distant subject
-  when the subject is too close to focus on

Focal distance information is displayed for about 3 seconds on the screen in the following cases:

- When switching the focus adjustment mode from autofocus to manual
- When turning the focus ring


Focal distance information

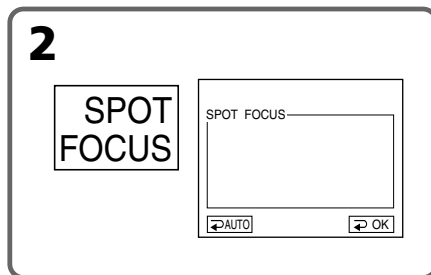
- This information aids focusing if it is not easy to focus on the subject, for example, when recording in the dark. Use this information as a rough guide to achieve a sharp focus.
- Correct information will not be received if you have attached a conversion lens (optional) to your camcorder.

Using spot focus function – Spot Focus

The focus is adjusted to the point you selected.

The POWER switch should be set to **CAMERA** or **MEMORY**.
Operate by touching the panel.


- (1) Press FN to display PAGE1.
- (2) Press SPOT FOCUS. The SPOT FOCUS screen appears.
- (3) Press the desired area in the frame.
The SPOT FOCUS indicator flashes on the screen. The focus of the point you selected is adjusted.
- (4) Press  OK to return to PAGE1. The FOCUS setting changes to the manual mode (p. 68).



To return to FN

Press EXIT.

To return to the autofocus

On the SPOT FOCUS screen, press  AUTO to return to PAGE1.

Notes

- Spot Focus does not work while PROGRAM AE is on.
- The back light function does not work during Spot Focus.

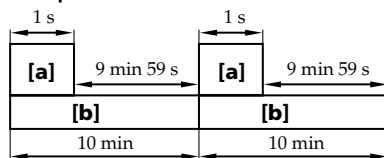
Focal distance information

It is not displayed on the screen.

Interval Recording

You can make time-lapse recordings by setting your camcorder to automatically record and standby sequentially. You can achieve excellent recordings of flowering, insects emerging, etc., with this function.

Example




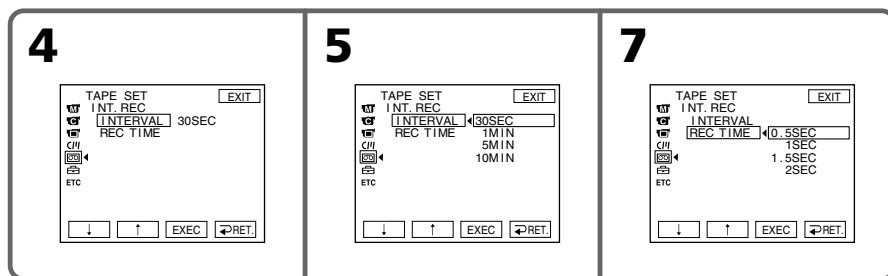
[a] REC TIME

[b] INTERVAL

There may be a discrepancy in recording time of up to ± 6 frames from the selected time.

The POWER switch should be set to **CAMERA**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select INT. REC in , then press EXEC.
- (4) Select SET, then press EXEC.
- (5) Select INTERVAL, then press EXEC.
- (6) Select the desired interval time, then press EXEC.
The time: 30SEC \leftrightarrow 1MIN \leftrightarrow 5MIN \leftrightarrow 10MIN
- (7) Select REC TIME, then press EXEC.



Interval Recording

- (8) Select the desired recording time, then press EXEC.
The time: 0.5SEC ↔ 1SEC ↔ 1.5SEC ↔ 2SEC
- (9) Press ↵ RET.
- (10) Set INT. REC to ON, then press EXEC.
- (11) Press EXIT to return to FN.
The INTERVAL TAPE indicator flashes on the screen.
- (12) Press START/STOP to start Interval Recording.
The INTERVAL TAPE indicator lights up during Interval Recording.

To cancel Interval Recording


Set INT. REC to OFF in the menu settings.

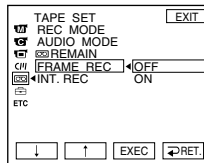
Frame by frame recording

– Frame recording

You can make a recording with a stop-motion animated effect using frame recording. To create this effect, alternately move the subject a little and make a frame recording. We recommend that you use a tripod, and operate your camcorder using the Remote Commander to avoid camera-shake after step 5.

The POWER switch should be set to **CAMERA**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select FRAME REC in , then press EXEC (p. 198).



- (4) Select ON, then press EXEC.
- (5) Press EXIT to return to FN.
The FRAME REC indicator lights up.
- (6) Press START/STOP to start frame recording. Your camcorder makes a recording for about 6 frames, and returns to recording standby.
- (7) Move the subject, and repeat step 6.

To cancel frame recording

Set FRAME REC to OFF in the menu settings.

Note

The proper remaining tape time is not indicated if you use frame recording continuously.





When using frame recording

The last recorded frame cut is longer than the other frame cuts.

Using the viewfinder

Turn the LCD panel over and fold it back into the camcorder body with the LCD screen facing out. You can operate camera brightness and fader on the touch panel using the viewfinder.

The POWER switch should be set to **CAMERA** or **MEMORY**.
Operate by touching the panel.

- (1) Turn the LCD panel over and move it back to your camcorder body with the LCD screen facing out, then pull out the viewfinder.
- (2) Press  OFF. The PANEL OFF indicator appears on the screen.
- (3) Press OK. The LCD screen is turned off.
- (4) Looking in the viewfinder, press the LCD screen. EXPOSURE,  OK,  ON and FADER (only when the POWER switch is set to CAMERA) appear.
- (5) Press the LCD screen and select the desired item, then press  OK.

EXPOSURE:

Adjust the exposure by pressing -/+.

FADER:

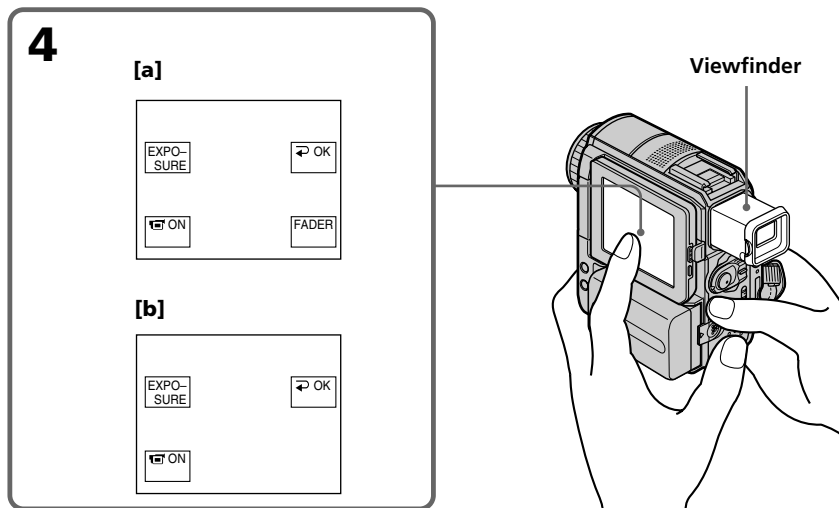
Press FADER until the desired fader mode appears.

The indicator changes as follows:

FADER	→	M. FADER	→	BOUNCE	→	MONOTONE
↑						↓
(no indicator)	←	DOT	←	WIPE	←	OVERLAP

 ON:

The LCD screen lights up.



[a] When the POWER switch is set to CAMERA

[b] When the POWER switch is set to MEMORY

To make the buttons on the LCD screen disappear

Press OK.

Note

When the POWER switch is set to VCR or during memory playback, you cannot operate with the touch panel using the viewfinder.

To operate items that do not appear

Set the LCD panel and the viewfinder back to the previous position. Operate the items using the LCD screen.

Available recording time

Available recording time with the installed battery pack in this case is the same as with only the viewfinder (p. 18).


Playing back a tape with picture effect

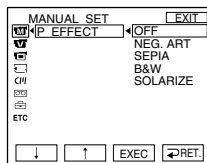
The POWER switch should be set to (VCR).

Operate by touching the panel.

(1) During playback or playback pause, press FN to display PAGE1.

(2) Press MENU.

(3) Select P EFFECT in , then press EXEC.



(4) Select the desired mode, then press EXEC.

You can use NEG. ART, SEPIA, B&W and SOLARIZE.

See page 60 for details of the each effect.

To return to FN

Press EXIT.


To cancel picture effect

Set P EFFECT to OFF in the menu settings.

Notes

- You cannot process externally input scenes using picture effect.
- You cannot record images on the tape on your camcorder while you are processing the image using picture effect. Record images on a “Memory Stick” (p. 126, 137), or on a VCR using your camcorder as a player.

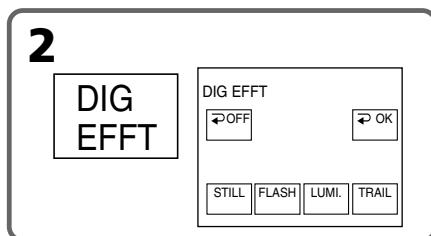
Pictures processed by picture effect

These pictures are not output through the  DV Interface.

Playing back a tape with digital effect

The POWER switch should be set to (VCR).
Operate by touching the panel.

- (1) During playback or playback pause, press FN and select PAGE2.
- (2) Press DIG EFFT. The screen to select a digital effect is displayed.



- (3) Select the desired mode. You can use STILL, FLASH, LUMI. and TRAIL.
When you select STILL or LUMI., the picture that you select the mode for is stored in memory as a still image. See page 61 for details of the each effect.
- (4) Press -/+ to adjust the effect.
- (5) Press ↗ OK to return to PAGE2.

To return to FN

Press EXIT.

To cancel digital effect

Press ↗ OFF to return to PAGE2.

Notes

- You cannot process externally input scenes using digital effect.
- You cannot record images on the tape on your camcorder while you are processing the image using digital effect. Record images on a “Memory Stick” (p. 126, 137), or on a VCR using your camcorder as a player.

Pictures processed by digital effect

These pictures are not output through the i DV Interface.

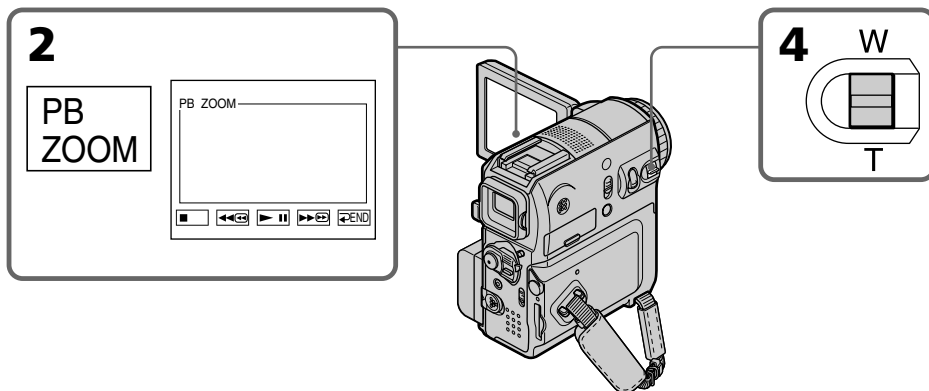
Enlarging images recorded on tape

- Tape PB ZOOM

Besides the operation described here, your camcorder can enlarge still images recorded on a "Memory Stick" (p. 151).

The POWER switch should be set to **(VCR)**.
Operate by touching the panel.

- (1) During playback or playback pause, press FN and select PAGE2.
- (2) Press PB ZOOM. The PB ZOOM screen appears.
- (3) Press the area you want to enlarge in the frame.
The area you pressed moves to the center of the screen, and the playback image is enlarged to about twice the size. If you press another area, the area moves to the center of the screen.
- (4) Adjust the zoom ratio by the power zoom lever.
You can select the zoom ratio from approximately 1.1 times up to 5 times its size.
W: To decrease the zoom ratio
T: To increase the zoom ratio



To cancel tape PB ZOOM


Press **↶ END**.

Enlarging images recorded on tape – Tape PB ZOOM

Notes

- You cannot process externally input scenes using tape PB ZOOM with your camcorder.
- You cannot record images on the tape in your camcorder while you are processing the image using tape PB ZOOM. However, you can record images on a “Memory Stick” (p. 126) or on a VCR using your camcorder as a player.
- You cannot record moving pictures on the “Memory Stick” on your camcorder when you have processed the picture using tape PB ZOOM.

Images enlarged by tape PB ZOOM

These images are not output through the  DV Interface.

During tape PB ZOOM

If you press DISPLAY/BATT INFO, the frame on the PB ZOOM screen disappears. If the frame is not displayed, you cannot move the part you pressed to the center of the screen.

Edge of the image

The edge of the image can be enlarged but cannot be displayed at the center of the screen.

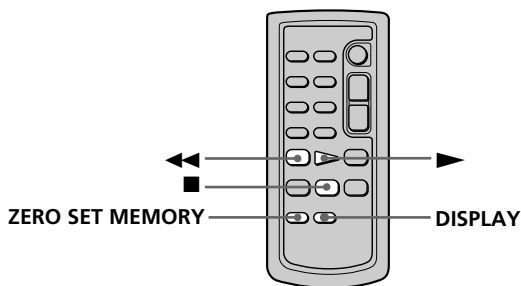
Quickly locating a scene

– Zero set memory

Your camcorder automatically searches for the desired scene that occurs at “0:00:00” on the tape counter. Use the Remote Commander for this operation.

The POWER switch should be set to (VCR).

- (1) During playback, press ZERO SET MEMORY on the Remote Commander at the point you want to locate later. The tape counter shows “0:00:00” and starts counting. The ZERO SET MEMORY indicator flashes. If the indicators do not appear, press DISPLAY.
- (2) Press ■ when you want to stop playback.
- (3) Press ◀◀ to rewind the tape to the tape counter’s zero point. The tape stops automatically when the tape counter reaches about zero.
- (4) Press ▶▶. Playback starts from the counter’s zero point. The indication changes from the tape counter to the time code and the zero set memory function is canceled.



Notes

- When you press ZERO SET MEMORY before rewinding the tape, the zero set memory function will be canceled.
- There may be a discrepancy of several seconds between the time code and the tape counter.
- The ZERO SET MEMORY indicator disappears when you press FN.

If the tape has a blank portion in the recorded sections

The zero set memory function may not work correctly.

Searching for a recording by title


- Title search

Use a cassette with Cassette Memory for this operation.

Use the Remote Commander for this operation.

Before operation

Set CM SEARCH in  to ON in the menu settings. (The default setting is ON.)



The POWER switch should be set to .

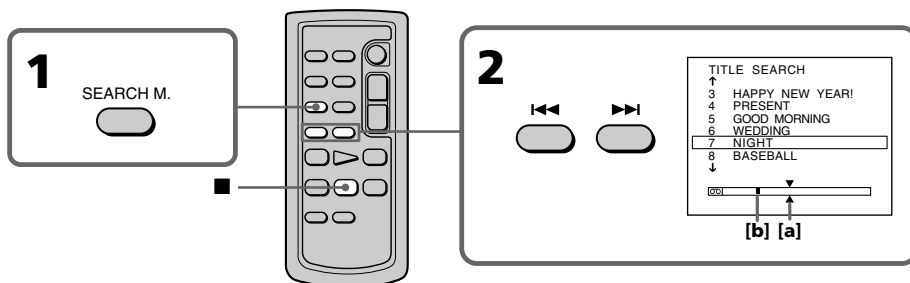
- (1) Press SEARCH M. on the Remote Commander repeatedly, until the TITLE SEARCH indicator appears.

The title search screen appears.

The indicator changes as follows:

TITLE SEARCH → DATE SEARCH
↑ (no indicator) ↓

- (2) Press  or  on the Remote Commander to select the title for playback.
Your camcorder automatically starts playback of the scene having the title that you selected.



[a] Actual point you are trying to search for

[b] Present point on the tape

To cancel searching

Press  on the Remote Commander.

If the tape has a blank portion between recorded portions

Title search may not work correctly.

To superimpose a title

See page 106.

Searching for a recording by date

- Date search

Date search using Cassette Memory searches for a recording by recording date.
Date search without using Cassette Memory searches for the point where the recording date changes.
Use the Remote Commander for this operation.

Searching for the date by using Cassette Memory

Before operation

- You can use this function only when playing back the cassette with Cassette Memory.
- Set CM SEARCH in **[CM]** to ON in the menu settings. (The default setting is ON.)

The POWER switch should be set to **(VCR)**.

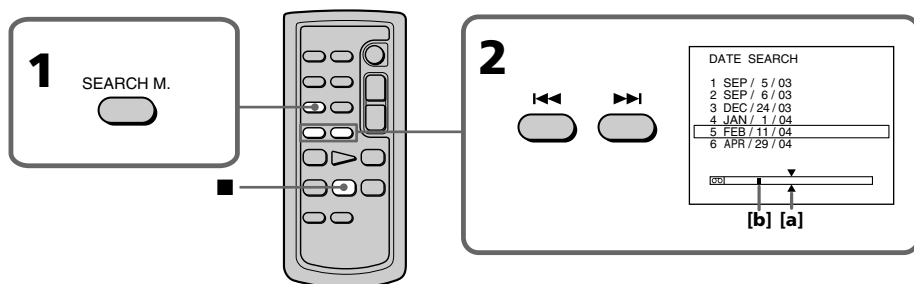
- (1) Press **SEARCH M.** on the Remote Commander repeatedly, until the **DATE SEARCH** indicator appears.

The date search screen appears.

The indicator changes as follows:

TITLE SEARCH → DATE SEARCH
↑ (no indicator) ↓

- (2) Press **◀◀** or **▶▶** on the Remote Commander to select the date for playback.
Your camcorder automatically starts playback of the scene having the date you selected.



[a] Actual point you are trying to search for

[b] Present point on the tape

To cancel searching

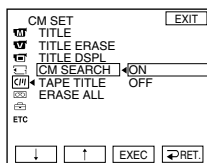
Press **■** on the Remote Commander.

Searching for a recording by date – Date search

Searching for the date without using Cassette Memory

The POWER switch should be set to **(VCR)**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select CM SEARCH in **(C/M)**, then press EXEC.



- (4) Select OFF, then press EXEC.
- (5) Press SEARCH M. on the Remote Commander repeatedly, until the DATE SEARCH indicator appears.
- (6) Press **◀◀** on the Remote Commander to search for the previous date or press **▶▶** on the Remote Commander to search for the next date. Your camcorder automatically starts playback at the point where the date changes. Each time you press **◀◀** or **▶▶**, your camcorder searches for the previous or next date.

To cancel searching

Press **■** on the Remote Commander or **■** on your camcorder.

Note

If one day's recording is less than 2 minutes, your camcorder may not accurately find the point where the recording date changes.

If the tape has a blank portion between recorded portions

Date search may not work correctly.

Cassette Memory

The cassette with Cassette Memory can hold 6 recording date data. If you search the date among 7 or more data, see "Searching for the date without using Cassette Memory."

Dubbing a tape

You can dub or edit on the VCR connected to your camcorder using your camcorder as a player.

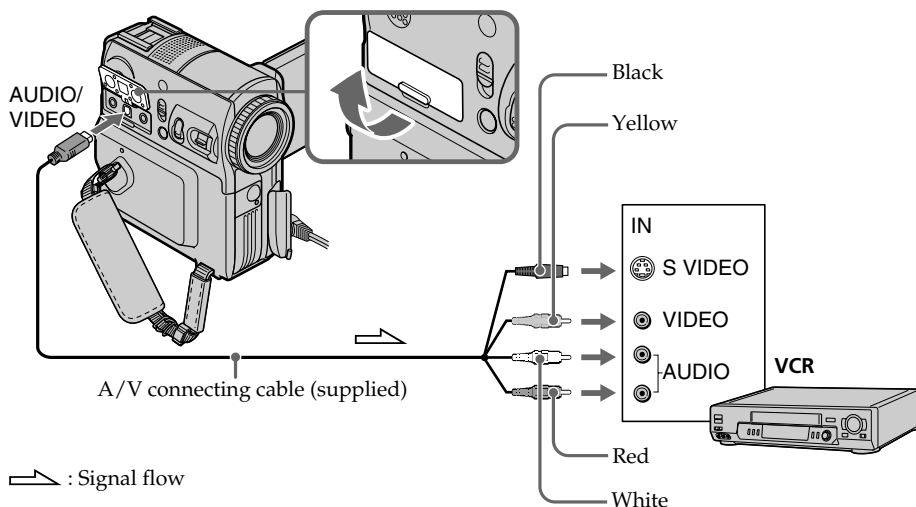
You can connect either the A/V connecting cable (supplied) or i.LINK cable (optional). If you connect with the i.LINK cable (optional), video and audio signals are transmitted in digital form for high-quality editing.

Connecting

With the A/V connecting cable

You can edit on VCRs that support the following systems

8 mm **8**, Hi8 **Hi8**, Digital8 **D8**, VHS **VHS**, S-VHS **SVHS**, VHSC **VHSC**, S-VHSC **SVHSC**, Betamax **B**, ED Betamax **ED Beta**, mini DV **Mini DV**, DV **DV** or MICRO MV **MICRO MV**



When using the A/V connecting cable

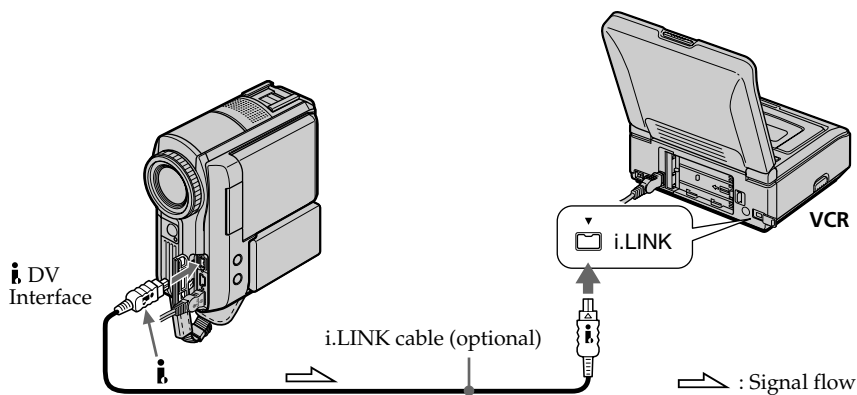
The supplied A/V connecting cable is equipped with an S video plug and a video plug. Use either the S video plug or the video plug depending on the VCR. See page 48 for details of the S video jack.

If your VCR is a monaural type

Connect the yellow plug of the A/V connecting cable to the video input jack and the white or the red plug to the audio input jack on the VCR. When the white plug is connected, the left channel audio is output, and when the red plug is connected, the right channel audio is output.

Dubbing a tape

With the i.LINK cable



Editing

About i.LINK

See page 218 for details.

Pictures processed by picture effect, digital effect or PB ZOOM

These are not output through the **i DV Interface**.

When using the i.LINK cable

Recording of only the picture or sound cannot be done.

Dubbing a tape

Dubbing

With the A/V connecting cable

- Set DISPLAY in **[ETC]** to LCD in the menu settings. (The default setting is LCD.)
- When the search indicator is displayed, press SEARCH M. on the Remote Commander to make the search indicator disappear.
- If you want to copy the data code, press DATA CODE to make the data code appear (p. 44).
- If you want to copy the title, set TITLE DSPL to ON in **[CIII]** in the menu settings. (The default setting is ON.)

With the i.LINK cable

Titles, screen indicators, Cassette Memory contents, and “Memory Stick” index screen lettering cannot be recorded.

The POWER switch should be set to **(VCR)**.

- (1) Insert a blank tape (or the tape you want to record over) into the VCR, and insert the recorded tape into your camcorder.
- (2) Prepare the VCR for recording. If the VCR has an input selector, set it to input mode.
Refer to the operating instructions of the VCR.
- (3) Play back the recorded tape on your camcorder.
- (4) Start recording on the VCR.
Refer to the operating instructions of your VCR.

When you have finished dubbing the tape

Press the stop button on the VCR, then press **[■]** on your camcorder.

If you record a paused playback picture

- The recorded picture becomes rough with the **i** DV Interface.
- The picture may jitter when you play back the picture using other video equipment.

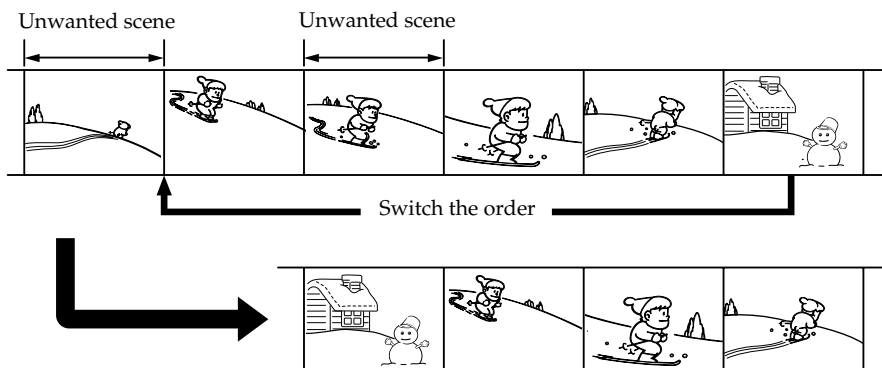
Dubbing only desired scenes

– Digital program editing (on tape)

You can duplicate selected scenes (programs) for editing onto the tape without operating the VCR.

Scenes can be selected by frame. You can set up to 20 programs.

Your camcorder can dub on the "Memory Stick." See page 139 for details.



Before operating Digital program editing on the tape recorded on other equipment

Step 1 Connecting to the VCR.

Step 2 Setting the VCR to operate (p. 88).

Step 3 Adjusting the synchronization of the VCR (p. 92).

When you dub using the same VCR again, you can skip steps 2 and 3.

Using Digital program editing on the tape recorded on other equipment

Operation 1 Making a program (p. 94).

Operation 2 Performing Digital program editing (Dubbing the tape) (p. 96).

Note

When editing digital video, the operation signals to the VCR cannot be sent with LANC jack.

Step 1: Connecting to the VCR

You can connect either the A/V connecting cable or the i.LINK cable (p. 84, 85).

Step 2: Setting the VCR to operate

When you are connecting the camcorder and VCR using the A/V connecting cable, the signal is emitted from the infrared rays emitter of your camcorder to the remote sensor on the VCR to control the VCR.

The POWER switch should be set to **(VCR)**.

Operate by touching the panel.

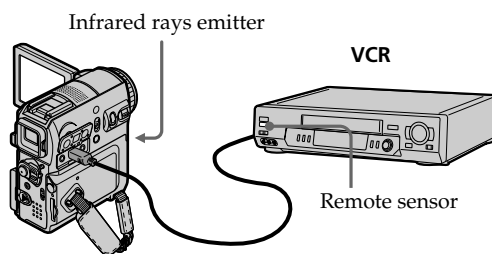
- (1) Turn the power of the connected VCR on. If the VCR has an input selector, set it to input mode.
- (2) Press FN to display PAGE1.
- (3) Press MENU.
- (4) Select VIDEO EDIT in **[ETC]**, then press EXEC.
- (5) Select TAPE, then press EXEC.
- (6) Press EDIT SET.
- (7) Select CONTROL, then press EXEC.
- (8) When connecting with the A/V connecting cable, select IR, then press EXEC. When connecting with the i.LINK cable, select i.LINK, press EXEC, then go to "Step 3: Adjusting the synchronization of the VCR" on page 92.
- (9) Select IR SETUP, then press EXEC.
- (10) Select the IR SETUP code of your VCR, then press EXEC. Check the code in "About the IR SETUP code" (p. 91).
- (11) Select PAUSEMODE, then press EXEC.
- (12) Select the mode to cancel record pause on the VCR, then press EXEC. The correct button depends on your VCR. Refer to the operating instructions of your VCR.

Dubbing only desired scenes – Digital program editing (on tape)

<p>4</p>	<p>5</p>	<p>6</p>
<p>7</p>	<p>9</p>	<p>11</p>
<p>12</p>		

Editing

- (13)** Locate the infrared rays emitter of your camcorder and face it towards the remote sensor of the VCR about 30 cm (12 in.) apart.



- (14)** Insert a recordable tape into the VCR, then set the VCR to record pause.

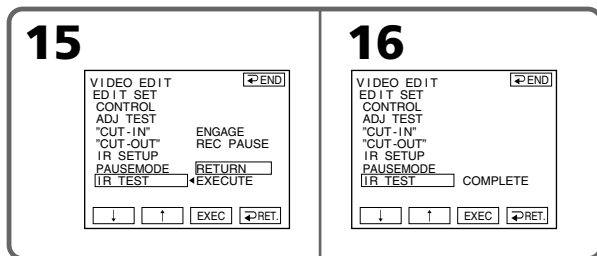
Dubbing only desired scenes – Digital program editing (on tape)

(15) Select IR TEST, then press EXEC.

(16) Select EXECUTE, then press EXEC.

If the VCR starts recording, the setting is correct.

When finished, the indicator changes to COMPLETE.



Note

When you connect with the i.LINK cable, you may not be able to operate the dubbing function correctly, depending on the VCR.

Set CONTROL to IR in the menu settings of your camcorder.

Dubbing only desired scenes – Digital program editing (on tape)

About the IR SETUP code

The IR SETUP code is stored in the memory of your camcorder. Be sure to set the correct code, depending on your VCR. Default setting is code number 3.

Brand	IR SETUP code
Sony	1, 2, 3, 4, 5, 6
Admiral (M. Wards)	89
Aiwa	47, 54, 80
Akai	49, 51
Audio Dynamic	21, 35
Bell&Howell (M. Wards)	36
Broksonic	21, 70, 82
Canon	77, 78
Citizen	47
Craig	47, 73
Curtis Mathis	8, 77, 80
Daewoo	26, 40, 77
DBX	21, 33, 35
Dimensia	8
Emerson	26, 48, 59, 70, 80, 81, 82
Fisher	36, 37, 44, 45
Funai	80
General Electric	8, 32*, 77, 94*, 101
Goldstar/LG	47
GO VIDEO	71
Hitachi	8, 42, 78
HQ	40
Instant Replay	77, 78
JC Penny	8, 21, 33, 35, 36, 42, 77
JVC	12, 13, 14, 21, 33, 35
Kenwood	21, 33, 35, 47
LXI (Sears)	36, 37, 42, 44, 45, 47, 49, 80
Magnavox	17, 77, 78, 83
Marantz	21, 33, 35
Marta	47
Memorex	37, 77
Minolta	8, 42

Brand	IR SETUP code
Mitsubishi/MGA	22, 23, 24, 28, 29
Multitech	23, 32, 80
NEC	21, 33, 35
Olympic	77, 78
Optimus	22
Orion	60
Panasonic	16, 17, 77, 78
Pentax	8, 42
Philco	26, 70, 77, 78
Philips	47, 77, 78, 83
Pioneer	78
Quasar	6, 16, 17, 77, 78
RCA/PROSCAN	7, 8, 16, 40, 41, 42, 77, 78, 78*, 83, 101
Realistic	22, 36, 37, 77, 80, 88
Sansui	21
Singer	73
Samsung	24, 24*, 32, 32*, 41, 94, 94*
Sanyo	26, 36, 37, 47
Scott	22, 23, 24, 28, 32, 37, 40, 41
Sharp	88, 89
Shintom	73
Signature 2000	80, 89
Sylvania	77, 78, 80, 83
Symphonic	80
Tashiro	47
Tatung	21, 33, 35
Teac	21, 33, 35, 80
Technics	77, 78
Toshiba	7, 40, 49
Wards	37, 47, 88, 89, 95
Yamaha	21, 33, 35, 36
Zenith	95

* TV/VCR component

Note on the IR SETUP code

Digital program editing is not possible if the VCR does not support IR SETUP codes.

Dubbing only desired scenes – Digital program editing (on tape)

When the VCR does not operate correctly

- After checking the code in “About the IR SETUP code” (p. 91), set the IR SETUP or the PAUSEMODE again.
- Place your camcorder at least 30 cm (12 in.) away from the VCR.
- Refer to the operating instructions of your VCR.

Step 3: Adjusting the synchronization of the VCR

You can adjust the synchronization of your camcorder and the VCR.

Prepare a pen and paper for notes.

Before operation, eject the cassette from your camcorder (if inserted).

The POWER switch should be set to **VCR**.

Operate by touching the panel.

- (1) Insert a recordable cassette into the VCR, then set the VCR to record pause. When you select i.LINK in CONTROL, you do not need to set the VCR to record pause.
- (2) Select ADJ TEST, then press EXEC.
- (3) Select EXECUTE, then press EXEC.
IN and OUT are recorded on an image for 5 times each to calculate the numerical values for adjusting the synchronization.
The EXECUTING indicator flashes on the screen. When finished, the indicator changes to COMPLETE.
- (4) Rewind the tape in the VCR, then start slow playback.
5 IN numbers and corresponding OUT numbers are displayed.
Take a note of the opening numerical value of each IN and the closing numerical value of each OUT.
- (5) Calculate the average of 5 opening numerical values of 5 IN, and the average of 5 closing numerical values of each OUT.
- (6) Select “CUT-IN,” then press EXEC.
- (7) Select the average numerical value of IN, then press EXEC.
The calculated start position for recording is set.
- (8) Select “CUT-OUT,” then press EXEC.
- (9) Select the average numerical value of OUT, then press EXEC.
The calculated stop position for recording is set.

Dubbing only desired scenes – Digital program editing (on tape)

(10) Press \rightarrow RET. to execute.

2 	3
6 	8

To return to FN

Press \rightarrow END to return to PAGE1, then press EXIT.

Notes

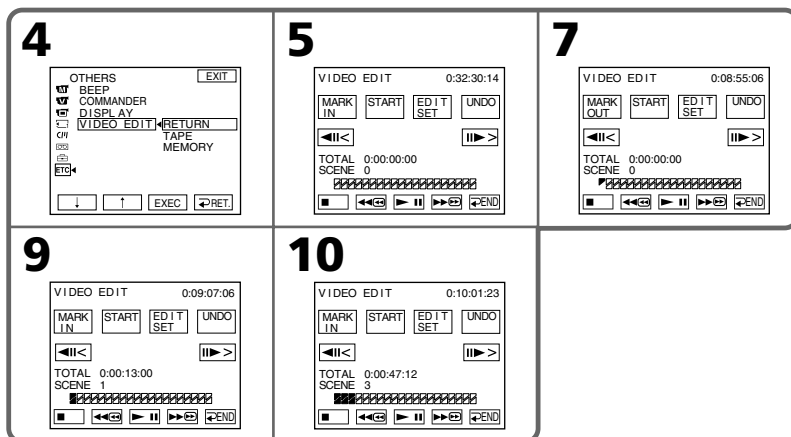
- The image to adjust the synchronization is recorded for about 50 seconds.
- If you start recording from the very beginning of the tape, the first few seconds of the tape may not be recorded properly. Be sure to allow about 10 seconds' lead before starting the recording.
- When the recording unit cannot be operated properly by the i.LINK cable, leave the connection as it is, and make the A/V connecting cable settings (p. 88). Video and audio are sent by digital signals.

Dubbing only desired scenes – Digital program editing (on tape)

Operation 1: Making a Program

The POWER switch should be set to (VCR).
Operate by touching the panel.

- (1) Insert the cassette for playback into your camcorder, then insert the tape for recording into the VCR.
- (2) Press FN to display PAGE1.
- (3) Press MENU.
- (4) Select VIDEO EDIT in **ETC**, then press EXEC.
- (5) Select TAPE, then press EXEC.
- (6) Search for the beginning of the first scene you want to insert using the video control buttons on the screen, then pause playback. You can fine-adjust one frame at a time with **◀|||<** / **|||>**.
- (7) Press MARK IN on the screen.
The IN point of the first program is set, and the upper part of the program mark changes to light blue.
- (8) Search for the end of the first scene you want to insert using the video control buttons on the screen, then pause playback. You can fine-adjust one frame at a time with **◀|||<** / **|||>**.
- (9) Press MARK OUT on the screen.
The OUT point of the first program is set, then the lower part of the program mark changes to light blue.
- (10) Repeat steps 6 to 9.
You can set up to 20 programs.



To finish making programs

Press  END.

The program is stored in memory until the tape is ejected.

Note

You cannot operate recording during Digital program editing.

On a blank portion of the tape

You cannot set IN or OUT.

If there is a blank portion between the IN point and the OUT point on the tape

The total time may not be displayed correctly.

To erase the program you have set

Erase OUT mark first, then IN mark of the last set program.

- (1) Press UNDO.
- (2) Press ERASE 1 MARK. The last set program mark flashes, and the DELETE ? indicator appears.
- (3) Press EXEC. The last set program is deleted.

To cancel erasing

Press CANCEL in step 3.

To erase all programs

- (1) Follow steps 2 to 5 on page 94.
- (2) Press UNDO.
- (3) Press ERASE ALL. All the set program marks flash, then the DELETE ? indicator appears.
- (4) Press EXEC. All the set programs are deleted.

To cancel erasing all programs

Press CANCEL in step 4.

Dubbing only desired scenes – Digital program editing (on tape)

Operation 2: Performing Digital program editing (Dubbing the tape)

The POWER switch should be set to **(VCR)**.
Operate by touching the panel.

- (1) When you use a digital video camera recorder, set its power switch to VCR/VTR.
- (2) Make sure your camcorder and the VCR are connected, and that the VCR is set to record pause.
When you use the i.LINK cable, you do not need to set the VCR to record pause.
- (3) Press FN to display PAGE1.
- (4) Press MENU.
- (5) Select VIDEO EDIT in **(ETC)**, then press EXEC.
- (6) Select TAPE, then press EXEC.
- (7) Press START.
- (8) Press EXEC.
Your camcorder searches for the beginning of the first program, then start dubbing.
The program mark flashes.
The SEARCH indicator appears during searching, and the EDITING indicator appears during editing on the screen.
When the dubbing ends, your camcorder and the VCR automatically stop.

To cancel dubbing during editing

Press CANCEL.

To end Digital program editing

Your camcorder stops when the dubbing is complete. Then the display returns to VIDEO EDIT in the menu settings.

Press **↶** END to end the video edit function.

When the program has not been set

You cannot press START.

You cannot record on the VCR in the following cases:

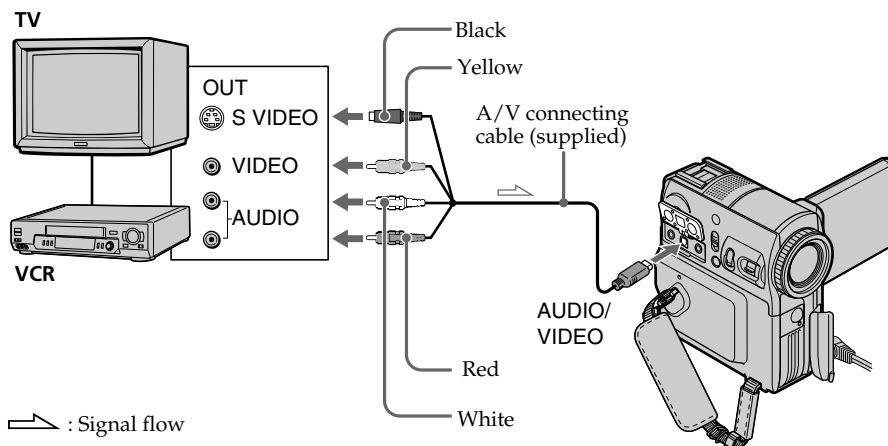
Indicator	Cause
No indicator	<ul style="list-style-type: none">• The write-protect tab on the cassette is set to lock.• The IR SETUP code is not correct. (When IR is selected.)• The button to cancel record pause is not correct. (When IR is selected.)
CHECK "i.LINK" & REC STATUS	<ul style="list-style-type: none">• i.LINK is selected but the i.LINK cable is not connected.• The power of the connected VCR is not turned on. (When i.LINK is selected.)

Recording video or TV programs

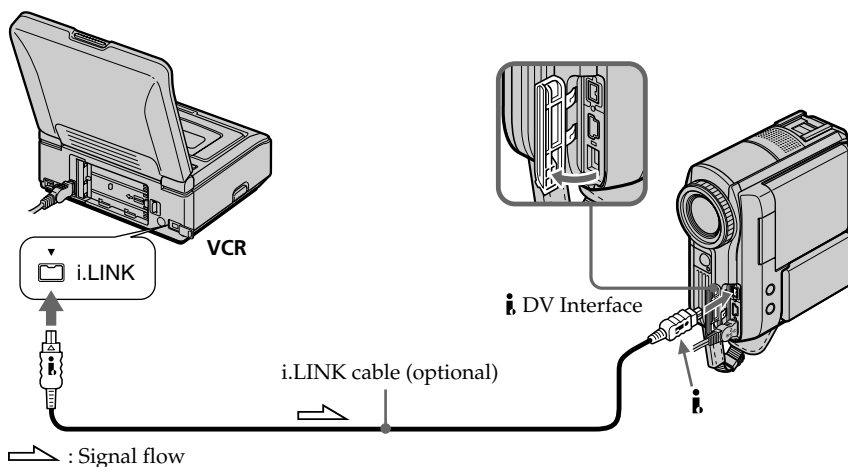
You can record the tape from another VCR or a TV program from a TV that has video/audio outputs. Use your camcorder as a recorder. You can connect either the A/V connecting cable (supplied) or i.LINK cable (optional). If you connect with the i.LINK cable (optional), video and audio signals are transmitted in digital form for high-quality editing.

Connecting a VCR or TV

With the A/V connecting cable



With the i.LINK cable



Recording video or TV programs

If your TV or VCR is a monaural type

Connect the yellow plug of the A/V connecting cable to the video output jack and the white or red plug to the audio output jack on the VCR or the TV. When the white plug is connected, the left channel audio is output, and when the red plug is connected, the right channel audio is output.

When using the i.LINK cable

- Before recording, make sure if the DV IN indicator appears on the screen. The DV IN indicator may appear on both equipment.
- Recording of only the picture or sound cannot be done.

Selecting a video jack

The supplied A/V connecting cable is equipped with an S video plug and a video plug. Change the setting for the jack depending on the VCR or the TV. The default setting is VIDEO.

See page 48 for details of the S video jack.

The POWER switch should be set to **(VCR)**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select VIDEOINPUT in **[M]**, then press EXEC.
- (4) To use the video jack, select VIDEO, or to use the S video jack, select S VIDEO, then press EXEC.

To return to FN

Press EXIT.

Recording video or TV programs

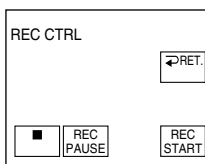
Dubbing

Before operation

Set DISPLAY in **ETC** to LCD in the menu settings when using the A/V connecting cable.
(The default setting is LCD.)

The POWER switch should be set to **VCR**.
Operate by touching the panel.

- (1) Insert a blank tape (or a tape you want to record over) into your camcorder. If you are recording a tape from the VCR, insert the recorded tape into the VCR.
- (2) Press FN and select PAGE3.
- (3) Press REC CTRL.



- (4) Press REC PAUSE.
- (5) Press **▶** on the VCR to start playback if you record a tape from a VCR. Select a TV program if you record from a TV. The picture from playback side appears on the LCD screen or in the viewfinder.
- (6) Press REC START at the scene where you want to start recording from.

To finish dubbing

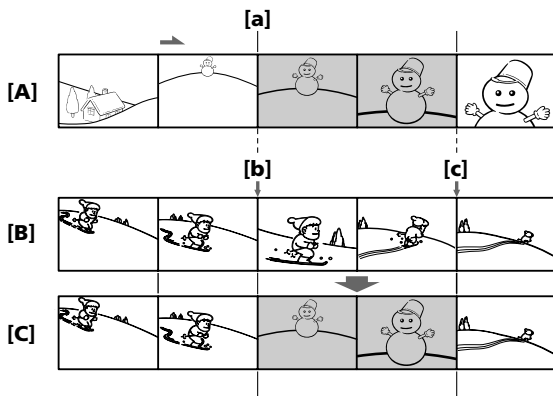
Press **■** on your camcorder, then press the stop button on the VCR.

Inserting a scene from a VCR

– Insert editing

You can insert a new scene with sound from a VCR onto your originally recorded tape by specifying the insert start and end points. Use the Remote Commander for this operation.

Connections and preparations are the same as on page 97 and 98. Insert a cassette containing the desired scene to insert into the VCR.



[A] The tape that contains the scene to be superimposed

[B] The tape before editing

[C] The tape after editing

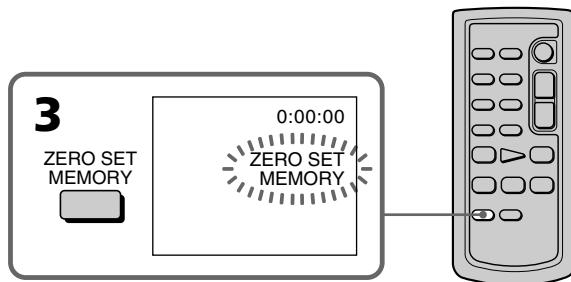
The POWER switch should be set to **(VCR)**.

Operate by touching the panel.

- (1)** On the VCR, locate just before the insert start point **[a]**, then set the VCR to playback pause.
- (2)** On your camcorder, locate the insert end point **[c]**, then set it to playback pause.
- (3)** Press ZERO SET MEMORY on the Remote Commander. The ZERO SET MEMORY indicator flashes and the end point of the insert is stored in memory. The tape counter shows "0:00:00."

Inserting a scene from a VCR – Insert editing

- (4) On your camcorder, locate the insert start point [b].
- (5) Press FN and select PAGE3.
- (6) Press REC CTRL.
- (7) Press REC PAUSE.
- (8) First press **II** on the VCR, and after a few seconds press REC START on your camcorder to start inserting the new scene with sound.
Inserting automatically stops near the zero point on the tape counter and the zero set memory function is canceled.



Editing


To change the insert end point

Press ZERO SET MEMORY on the Remote Commander again after step 3 to erase the ZERO SET MEMORY indicator and begin from step 2.

Note

Pictures and sound recorded on the portion between the insert start and end points will be erased when you insert the new scene.

To insert a scene without setting the insert end point

Skip steps 2 and 3. Press **II** on the Remote Commander or  on your camcorder when you want to stop inserting.

Audio dubbing

You can record additional audio to the original sound on a tape by connecting audio equipment or a microphone. If you connect suitable audio equipment, you can add sound to your tape already recorded in the 12-bit mode by specifying starting and ending points. The original sound will not be erased.

You cannot perform audio dubbing:

- On a tape recorded in the 16-bit mode
- On a tape recorded in the LP mode
- When an i.LINK cable is connected
- On blank portions of a tape
- When the write-protect tab of a cassette is set to SAVE

Preparing for audio dubbing

You can record additional audio in the following ways:

- Dubbing with the built-in microphone
- Connecting the microphone (optional) to the MIC jack
- Connecting the microphone (optional) to the intelligent accessory shoe
- Connecting the A/V connecting cable to the AUDIO/VIDEO jack

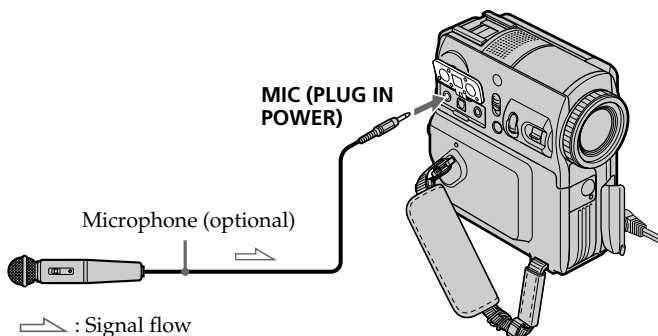
The audio input to be recorded will take precedence over others in the following order:

- MIC jack
- Intelligent accessory shoe
- AUDIO/VIDEO jack
- Built-in microphone

Dubbing with the built-in microphone

No connection is necessary. (If no external microphone is connected, audio recording will be performed automatically by the built-in microphone.)

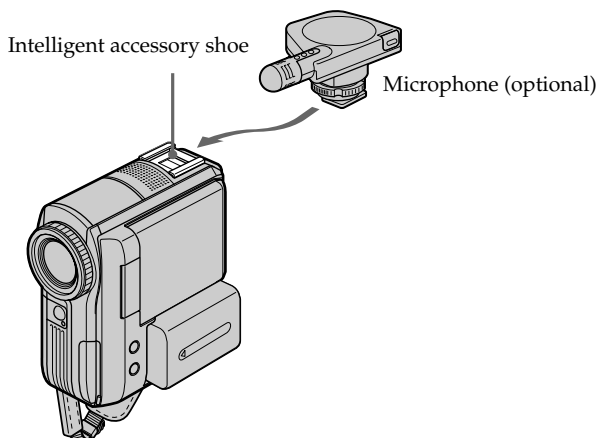
Connecting the microphone (optional) to the MIC jack



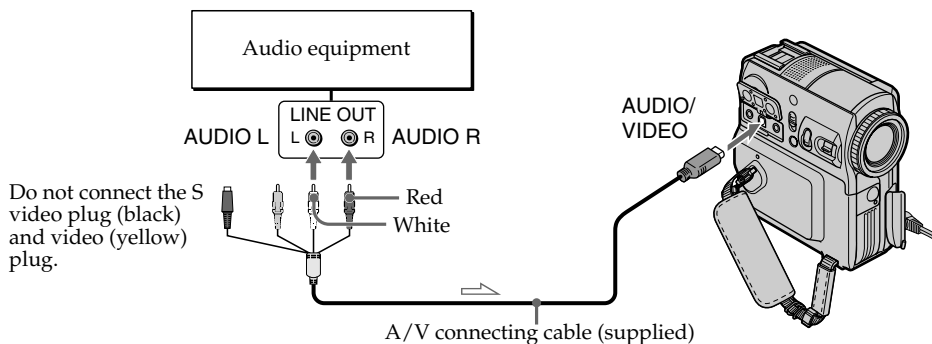
You can check the recorded picture and sound by connecting the AUDIO/VIDEO jack to a TV.

The recorded sound is not output from the speaker. Check the sound by using the headphones or TV.

Connecting the microphone (optional) to the intelligent accessory shoe



Connecting the A/V connecting cable to the AUDIO/VIDEO jack



➡ : Signal flow

Note

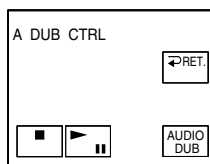
When dubbing with the AUDIO/VIDEO jack or the built-in microphone, pictures are not output through the AUDIO/VIDEO jack. Check the recorded picture on the screen or the viewfinder. You can check the recorded sound by using headphones.

Adding audio to a recorded tape

Choose a connection mentioned on pages 102 to 103, and connect audio equipment or microphone to your camcorder. Then follow the procedure below.

The POWER switch should be set to **(VCR)**.
Operate by touching the panel.

- (1) Insert the recorded tape into your camcorder.
- (2) Locate the recording start point. Press **▶||** to start playing back. To pause playback, press **▶||** at the recording start point.
- (3) Press FN and select PAGE3.
- (4) Press A DUB CTRL.
The A DUB CTRL screen appears.



- (5) Press AUDIO DUB. The green **●||** indicator appears on the screen.
- (6) Press **▶||** on your camcorder and at the same time start playing back the audio you want to record.
The new sound is recorded in stereo 2 (ST2) during playback. While recording the new sound, the red **●** indicator appears on the screen.
- (7) Press **■** on your camcorder at the point where you want to stop recording.

To add new sound to previously recorded sections more precisely

During playback, press ZERO SET MEMORY on the Remote Commander at the point where you want to stop recording new sound.

Follow steps 2 to 7. Recording automatically stops at the point where ZERO SET MEMORY was pressed.

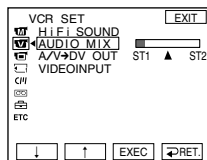
We recommend that you usually add new sound on a tape recorded only with your camcorder

If you add new sound on the tape recorded with another camcorder (including another DCR-PC105), the sound quality may deteriorate.

Monitoring the new recorded sound

The POWER switch should be set to **(VCR)**.
Operate by touching the panel.

- (1) Play back the tape on which you added audio.
- (2) Press FN to display PAGE1.
- (3) Press MENU.
- (4) Select AUDIO MIX in **[V]**, then press EXEC.



- (5) Press **↓/↑** to adjust the balance between the original sound (ST1) and the new sound (ST2), then press EXEC.

About 5 minutes after you disconnect the power source or remove the battery pack, the setting of AUDIO MIX returns to the original sound (ST1) only. The default setting is original sound only.

Superimposing a title on a cassette with Cassette Memory



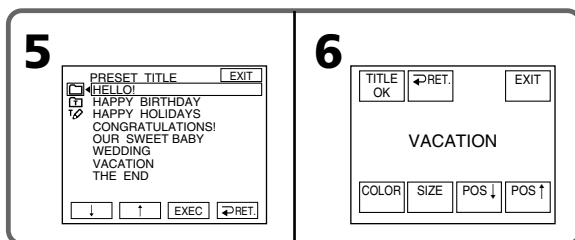
A cassette can have up to about 20 titles, if a title consists of 5 characters. However, if the Cassette Memory is full with date and cassette label data, the cassette can have only up to about 11 titles of 5 characters each.

Cassette Memory capacity is as follows:

- 6 date data (maximum)
- 1 cassette label (maximum)

The POWER switch should be set to **CAMERA** or **VCR**.
Operate by touching the panel.


- (1) Insert a cassette with Cassette Memory.
- (2) During standby, recording, playback or playback pause, press FN to display PAGE1.
- (3) Press MENU.
- (4) Select TITLE in **[C/M]**, then press EXEC.
- (5) Select **[]**, then press EXEC.
- (6) Select the desired title, then press EXEC. The title appears on the screen.
- (7) If necessary, change the color, size, or position by pressing COLOR, SIZE, POS ↓ or POS ↑.



- (8) Press TITLE OK.
- (9) Press SAVE TITLE.
During playback, playback pause or recording:
The TITLE SAVE indicator appears on the screen for about 5 seconds and the title is set.
During recording standby:
The TITLE indicator appears. When you press START/STOP to start recording, the TITLE SAVE indicator appears on the screen for about 5 seconds and the title is set.

Superimposing a title on a cassette with Cassette Memory

To use the custom title

If you want to use the custom title, select  in step 5.

The titles superimposed with your camcorder

- They appear only by DV ^{Mini} DV format video equipment with index titler function.
- The point you superimposed the title may be detected as an index signal when searching for a recording with other video equipment.

To not display title

Set TITLE DSPL to OFF in the menu settings.

Title setting

- The title color changes as follows:



- The title size changes as follows:

SMALL ↔ LARGE

You cannot input 13 characters or more in LARGE size.

- The title position

If you select the title size SMALL, you have 9 choices for the title position.

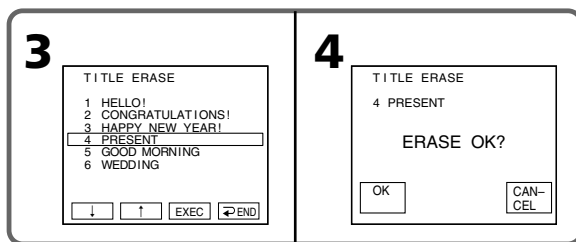
If you select the title size LARGE, you have 8 choices for the title position.

Superimposing a title on a cassette with Cassette Memory

Erasing a title

The POWER switch should be set to **(CAMERA)** or **(VCR)**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select TITLEERASE in **[C/M]**, then press EXEC. The title erase screen appears.
- (4) Select the title you want to erase, then press EXEC.
The ERASE OK? indicator appears.
- (5) Make sure the title is the one you want to erase, then press OK.
The ERASING indicator flashes on the screen.
When the title has erased, the COMPLETE indicator appears.



To return to FN

Press EXIT.

To cancel erasing

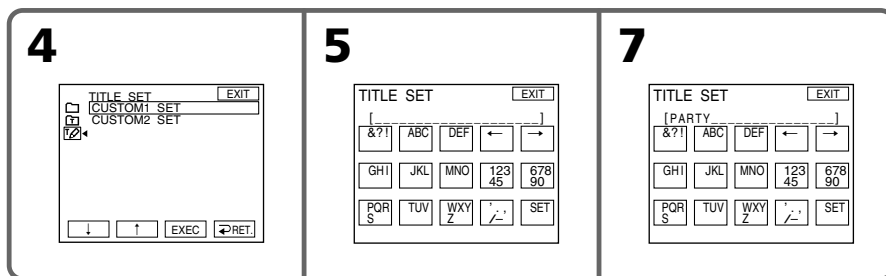
Press CANCEL in step 5.

Making your own titles

You can make up to 2 titles and store them in the memory of your camcorder. Each title can have up to 20 characters.

The POWER switch should be set to **(CAMERA)** or **(VCR)**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select TITLE in **[MENU]**, then press EXEC.
- (4) Select **[TITLE]**, then press EXEC.
- (5) Select CUSTOM1 SET or CUSTOM2 SET, then press EXEC.
- (6) Select the desired character. Repeat pressing a key to select the desired character on the key.
- (7) Press **→** to move the cursor to select the next character. Repeat the same procedure as steps 6 and 7 to complete your title.
- (8) Press SET. The title is stored in memory.



To return to FN

Press EXIT.

To change the title you have stored

In step 5, select CUSTOM1 SET or CUSTOM2 SET, depending on which title you want to change, then press EXEC and enter the new title.

If it takes 5 minutes or longer to enter characters during tape recording standby with the cassette inserted in your camcorder

The power automatically goes off. The characters you have entered remain stored in memory. Set the POWER switch to OFF (CHG) once and then to CAMERA again, then start again from step 1.

We recommend setting the POWER switch to VCR or removing the cassette so that your camcorder does not automatically turn off while you are entering title characters.

To erase the character

Press **←**. The last character is erased.

To enter a space

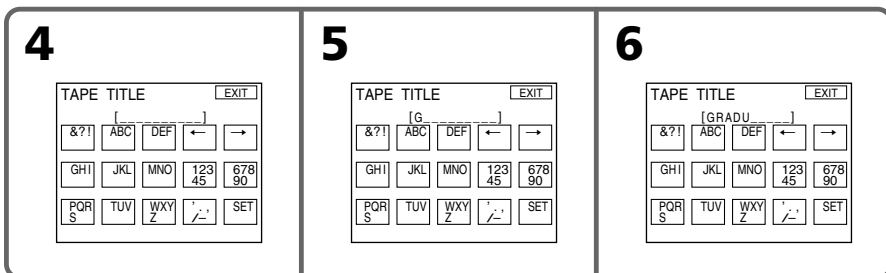
Press **→**.

Labeling a cassette with Cassette Memory

The label can consist of up to 10 characters and is stored in Cassette Memory. When you set the POWER switch to CAMERA and insert a labeled cassette, or when you set the POWER switch to VCR, the label is displayed for about 5 seconds.

The POWER switch should be set to **CAMERA** or **VCR**.
Operate by touching the panel.

- (1) Insert a cassette with Cassette Memory you want to label.
- (2) Press FN to display PAGE1.
- (3) Press MENU.
- (4) Select TAPE TITLE in **[MENU]**, then press EXEC. The screen to label a cassette appears.
- (5) Select the desired character. Repeat pressing a key to select the desired character on the key.
- (6) Press **→** to move the cursor to select the next character. Repeat the same procedure as steps 5 and 6 to complete the label.
- (7) Press SET. The label is stored in memory.



To return to FN

Press EXIT.

To erase the label you have made

Erase the label by selecting **←** in step 5, then press SET.

To change the label you have made

Insert the cassette to change the label, and operate in the same way to make a new label.

If you have superimposed titles in the cassette

When the label appears, up to 4 titles also appear.

To erase the character

Press **←**. The last character is erased.

To enter a space

Press **→**.

Erasing all the data in Cassette Memory

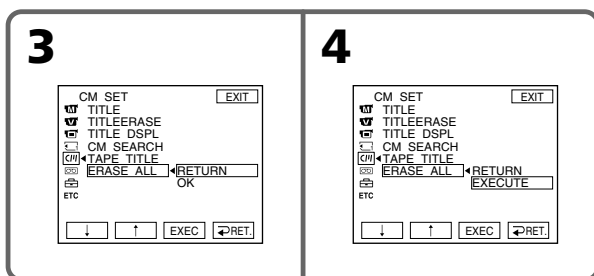
The following data saved in Cassette Memory can be completely erased at a time:

- Date data
- Title data
- Cassette label

The POWER switch should be set to **CAMERA** or **VCR**.

Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select ERASE ALL in **[CM]**, then press EXEC.
- (4) Select OK, then press EXEC.
The OK indicator changes to EXECUTE.
- (5) Select EXECUTE, then press EXEC. The ERASING indicator flashes on the screen. Once erasing is complete, the COMPLETE indicator appears.



To return to FN

Press EXIT.

To cancel erasing

Select RETURN in step 5, then press EXEC.

Using a “Memory Stick” – Introduction

The “Memory Stick” is a new light and small recording media which, despite the size, can store more data than a floppy disk.

You can use the “Memory Stick” as an external recording media that can be attached or removed as well as exchanging data between the units.

There are two types of “Memory Stick”: an ordinary “Memory Stick” and a “MagicGate Memory Stick” that are equipped with the MagicGate copyright protection technology. You can use both types of “Memory Stick” with your camcorder.

However, because your camcorder does not support the MagicGate standards, data recorded with your camcorder is not subject to MagicGate^{*1)} copyright protection. You can also use the “Memory Stick Duo” and “Memory Stick PRO” with your camcorder.

“Memory Stick”	Recording/Playback
Memory Stick (Memory Stick Duo ^{*2)})	○
MagicGate Memory Stick (MagicGate Memory Stick Duo ^{*2)})	○ ^{*3)}
Memory Stick PRO	○ ^{*3)}

^{*1)} MagicGate is copyright protection technology that uses encryption technology.

^{*2)} When you use a “Memory Stick Duo” or “MagicGate Memory Stick Duo,” a dedicated adaptor may be needed depending on the type of the device.

^{*3)} The camcorder cannot record or play back the data that need the MagicGate function.

Trouble-free operation for all Memory Stick media is not guaranteed.

File format for still images: Exif ^{*4)} Ver.2.2

^{*4)} Exif is a file format for still images, established by the Japan Electronics and Information Technology Industries Association (JEITA). Files in this format can have additional information such as your camcorder’s setting information at the time of recording.

Still image (JPEG)

Your camcorder compresses and records image data in JPEG (Joint Photographic Experts Group) format. The file extension is .JPG.

Moving picture (MPEG)

Your camcorder compresses and records picture data in MPEG (Moving Picture Experts Group) format. The file extension is .MPG.

Typical image data file name

Still image

101-0001: This file name appears on the screen of your camcorder.

DSC00001.JPG: This file name appears on the display of a connected computer.

Moving picture

MOV00001: This file name appears on the screen of your camcorder.

MOV00001.MPG: This file name appears on the display of a connected computer.

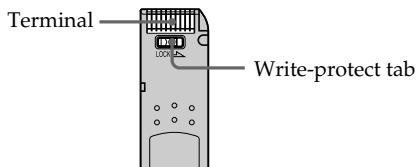
Using a “Memory Stick” – Introduction

To prevent accidental erasure of images

Slide the write-protect tab on the “Memory Stick” to LOCK.

The position and shape of the write-protect tab may be different depending on the model.

Rear side of the “Memory Stick”



Notes on the “Memory Stick”

Stick the label on the labeling position.

Do not attach any other material than the supplied label on the labeling position.

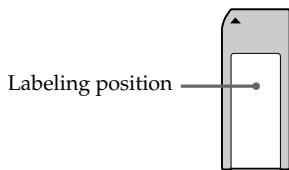


Image data may be damaged in the following cases (Damaged image data will not be compensated.):

- You remove the “Memory Stick” or turn the power off when data is being read or recorded from/to the “Memory Stick” (the access lamp is lit or flashing).
- You use a “Memory Stick” in a location subject to the effects of static electricity or electrical noise.

We recommend backing up important data on the hard disk of a computer.

On handling

- When you carry or store a “Memory Stick,” put it in its case.
- Avoid touching the metal terminals with fingers or metal objects.
- Do not bend, drop or apply strong shock to a “Memory Stick.”
- Do not disassemble or modify a “Memory Stick.”
- Do not let a “Memory Stick” get wet.

On location for use

Do not use or keep a “Memory Stick” in locations that are:

- Extremely hot, such as in a car parked in the sun or under the scorching sun
- Under direct sunlight
- Very humid or subject to corrosive substances

Using a “Memory Stick” – Introduction

On “Memory Stick Duo” (optional)

- Make sure to insert a “Memory Stick Duo” into a “Memory Stick Duo” Adaptor when using the “Memory Stick Duo” with your camcorder.
- Insert the “Memory Stick Duo” in the correct direction when inserting it into the “Memory Stick Duo” Adaptor.
- Insert the “Memory Stick Duo” Adaptor in the correct direction when inserting it into your camcorder. Inserting it in the wrong direction may damage your camcorder.
- Do not insert a “Memory Stick Duo” into a “Memory Stick” compatible unit without inserting it into a “Memory Stick Duo” Adaptor first. Doing so may cause a malfunction of the unit.

On “Memory Stick PRO”


“Memory Stick PRO” with a capacity of up to 1 GB is guaranteed to be operational on this camcorder.

A “Memory Stick” formatted by a computer

A “Memory Stick” formatted by Windows OS or Macintosh OS is not guaranteed to be compatible with your camcorder.

Notes on image data compatibility

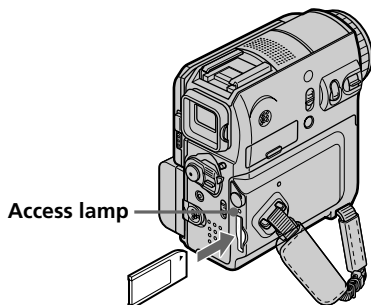
- Image data files recorded on the “Memory Stick” by your camcorder conform with the Design Rule for Camera File Systems universal standard established by the JEITA (Japan Electronics and Information Technology Industries Association).
On your camcorder, you cannot play back still images recorded on other equipment (DCR-TRV890E/TRV900/TRV900E or DSC-D700/D770) that does not conform to this universal standard. (These models are not sold in some areas.)
- If you cannot use a “Memory Stick” that otherwise can be used with other equipment, format it with your camcorder (p. 196). Note that formatting will erase all information on the “Memory Stick.”
- You may not be able to play back images recorded using your camcorder, on other equipment.
- You may not be able to play back the following images with your camcorder:
 - image data modified on a computer
 - image data shot with other equipment

-
- The “Memory Stick,”  and “MagicGate Memory Stick” are trademarks of Sony Corporation.
 - “Memory Stick Duo” and **MEMORY STICK DUO** are trademarks of Sony Corporation.
 - “Memory Stick PRO” and **MEMORY STICK PRO** are trademarks of Sony Corporation.
 - “MagicGate” and **MAGICGATE** are trademarks of Sony Corporation.
 - 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.

Using a “Memory Stick” – Introduction

Inserting the “Memory Stick”

Insert a “Memory Stick” in the “Memory Stick” slot as far as it can go with the ► mark facing the grip belt as illustrated.



Removing the “Memory Stick”

Press the “Memory Stick” once lightly.

Notes

- If you insert the “Memory Stick” forcibly in the wrong direction, the “Memory Stick” slot may be damaged.
- Do not insert anything other than a “Memory Stick” into the “Memory Stick” slot. Doing so may cause a malfunction.

While the access lamp is lit or flashing

Do not shake or strike your camcorder because your camcorder is reading the data from the “Memory Stick” or recording the data on the “Memory Stick.” Do not turn the power off, remove the “Memory Stick” or remove the battery pack. Otherwise, image data breakdown may occur.

If “ MEMORY STICK ERROR” appears


Reinsert the “Memory Stick” a few times. The “Memory Stick” may be damaged if the indicator still appears. If this occurs, use another “Memory Stick.”

Selecting image quality and size

Selecting still image quality

The default setting is FINE.

The POWER switch should be set to **(MEMORY)** or **(VCR)**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select STILL SET in , then press EXEC.
- (4) Select QUALITY, then press EXEC.
- (5) Select the desired image quality, then press EXEC.

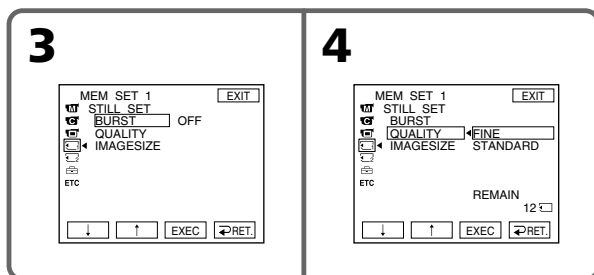


Image quality settings

Setting	Meaning
FINE (FINE)	Use this mode when you want to record high quality images. Fine images are compressed to about 1/4.
STANDARD (STD)	This is the standard image quality. Standard images are compressed to about 1/10.

To return to FN


Press EXIT.

Selecting image quality and size



Selecting the still image size

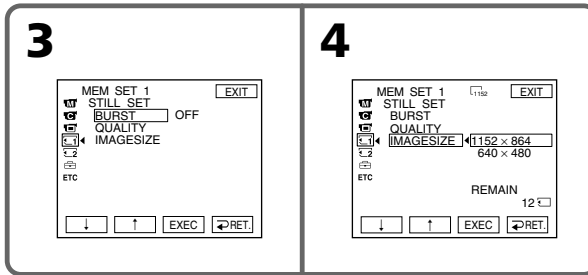
You can select either image size 1152 × 864 or 640 × 480 (When the POWER switch is set to CAMERA or VCR, the image size is automatically set to 640 × 480.)
The default setting is 1152 × 864.

The POWER switch should be set to **MEMORY**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select STILL SET in , then press EXEC.
- (4) Select IMAGESIZE, then press EXEC.
- (5) Select the desired image size, then press EXEC.

The indicator changes as follows:

 ↔ 



Memory capacity of still images

Recorded images are compressed in JPEG format before being stored in memory. The memory capacity of still images varies depending on the selected image quality mode and image size. Details are shown in the table below.

1152 × 864 image size

Image quality	Memory capacity
FINE	About 500 kB
STANDARD	About 200 kB

640 × 480 image size


Image quality	Memory capacity
FINE	About 150 kB
STANDARD	About 60 kB

Selecting image quality and size

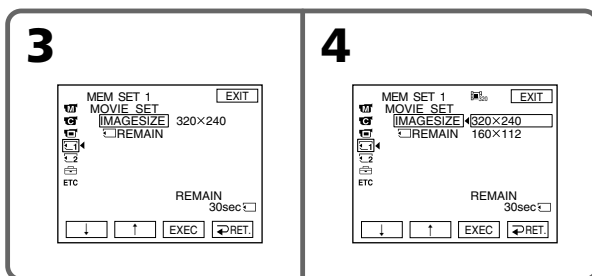
Selecting the moving picture size

You can select either picture size 320×240 or 160×112 .
The default setting is 320×240 .

The POWER switch should be set to **MEMORY** or **VCR**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select MOVIE SET in , then press EXEC.
- (4) Select IMAGESIZE, then press EXEC.
- (5) Select the desired image size, then press EXEC.

The indicator changes as follows:







Selecting image quality and size

Approximate number of still images and time of moving pictures recordable on a "Memory Stick"



The number of still images and the time you can record moving pictures vary depending on which image quality mode you select and the complexity of the subject.

Still images

Type of "Memory Stick"	FINE		STANDARD	
	1152 × 864 	640 × 480 	1152 × 864 	640 × 480 
8 MB (supplied)	15	50	37	120
16 MB	30	96	74	240
32 MB	61	190	150	485
64 MB	120	390	300	980
128 MB	245	780	600	1970
256 MB (MSX-256)	445	1400	1000	3550
512 MB (MSX-512)	900	2850	2050	7200
1 GB (MSX-1G)	1800	5900	4200	14500

(unit: image)

Moving pictures

Type of "Memory Stick"	Image size	
	320 × 240 	160 × 112 
8 MB (supplied)	1 min 20 s	5 min 20 s
16 MB	2 min 40 s	10 min 40 s
32 MB	5 min 20 s	21 min 20 s
64 MB	10 min 40 s	42 min 40 s
128 MB	21 min 20 s	1 h 25 min 20 s
256 MB (MSX-256)	42 min 40 s	2 h 50 min 40 s
512 MB (MSX-512)	1 h 25 min 20 s	5 h 41 min 20 s
1 GB (MSX-1G)	2 h 50 min 40 s	11 h 22 min 40 s

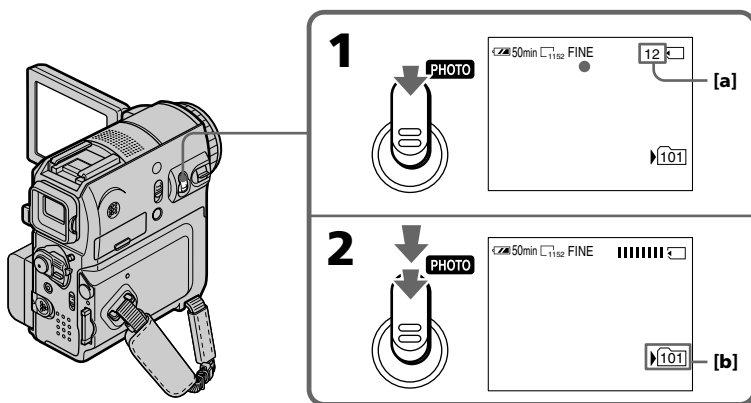
(h, min, s: hour, minute, second)

The table shows the approximate number of still images and time you can record moving pictures on a "Memory Stick" formatted with your camcorder.

Recording a still image on a “Memory Stick” – Memory photo recording

The POWER switch should be set to **(MEMORY)**.

- (1) Keep pressing PHOTO lightly and check the image. The green ● indicator stops flashing, then lights up. The brightness of the image and the focus are adjusted and fixed while your camcorder targets at the center of the image. Recording does not start yet.
- (2) Press PHOTO deeper.
Recording is complete when the bar scroll indicator disappears.
The image displayed on the screen when you pressed PHOTO deeper will be recorded on the “Memory Stick.”



[a] Approximate number of images recordable on a “Memory Stick”*

[b] Current recording folder

* Depending on the image quality setting and the complexity of the subject, the indication of the remaining number of recordable still images may not change even after you record an image.

If the remaining number is 10,000 or more, the “>9999” indicator appears.

Recording a still image on a "Memory Stick" – Memory photo recording

You can record still images on a "Memory Stick" during tape recording or tape recording standby

See page 49 for details.

When the POWER switch is set to MEMORY

The following functions do not work:

- Digital zoom
- Super NightShot
- Color Slow Shutter
- Wide mode
- Fader
- Picture effect
- Digital effect
- SPORTS of PROGRAM AE
(The indicator flashes.)
- Title
- SteadyShot

During recording

You cannot turn off the power or press PHOTO.

When you press PHOTO on the Remote Commander

Your camcorder immediately records the image that is on the screen when you press the button.

When you press PHOTO lightly in step 1

The image momentarily flickers. This is not a malfunction.

Recording data

The recording data (date/time or various settings when recorded) does not appear during recording. However, they are recorded automatically onto a "Memory Stick." To display the recording data, press DATA CODE during playback.

If you record still images when the POWER switch is set to MEMORY

The angle of view is slightly larger compared with the angle of view when the POWER switch is set to CAMERA.

Recording a still image on a “Memory Stick” – Memory photo recording

Recording images continuously

You can record still images continuously. Before recording, select the desired mode described below in the menu settings.

NORMAL [a] ()

Your camcorder shoots up to 4 still images in 1152 × 864 size or 13 still images in 640 × 480 size at about 0.5 sec intervals.

EXP BRKTG [b] ()

Your camcorder automatically shoots 3 images at about 0.5 sec intervals at different exposures.


[a]

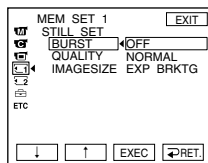


[b]



The POWER switch should be set to **(MEMORY)**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select STILL SET in , then press EXEC.
- (4) Select BURST, then press EXEC.



- (5) Select the desired mode, then press EXEC.
- (6) Press EXIT to make the menu display disappear.
- (7) Press PHOTO deeply.

Recording a still image on a “Memory Stick” – Memory photo recording

The number of still images in continuous shooting

The number of still images you can shoot continuously varies depending on the image size and the remaining capacity of the “Memory Stick.”

During continuous recording of images

The flash does not work.

When shooting with the self-timer or the Remote Commander

Your camcorder automatically records up to the maximum number of still images.

If remaining capacity on the “Memory Stick” is less than for 3 images

EXP BRKTG does not work. “ FULL” appears when you press PHOTO.

The effect of EXP BRKTG

The effect of EXP BRKTG may not appear clearly on the LCD screen.

We recommend viewing images on TV or the computer to realize the effect.

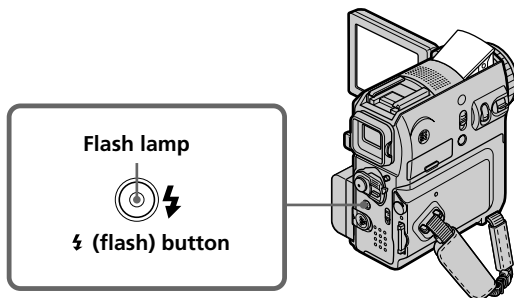
When selecting NORMAL

Recording continues up to the maximum number of still images while pressing PHOTO deeply.

Recording a still image on a “Memory Stick” – Memory photo recording

Recording images with the flash

In a dark place, the flash automatically pops up to strobe. The default setting is auto (no indicator). To change the flash mode, press **⚡** (flash) repeatedly until the flash mode indicator appears on the screen. You cannot use this function for recording moving pictures.



The POWER switch should be set to **MEMORY** or **CAMERA**.

Each press of **⚡** (flash) changes the indicator as follows:

→ **⚡** → **⚡** → AUTO (No indicator)

When you set RED EYE R in **TM** to ON in the menu settings, the indicator changes as follows:

→ **⚡** → **⚡** → **⚡** → **⚡**

⚡ Forced flash:

The flash fires regardless of the surrounding brightness.

⚡ Auto red-eye reduction:

The flash fires before recording to reduce red-eye.

⚡ Forced red-eye reduction:

The flash fires before recording to reduce red-eye, regardless of the surrounding brightness.

⚡ No flash:

The flash does not fire.

The amount of flash is automatically adjusted to the appropriate brightness. You can also change FLASH LVL to the desired brightness in **TM** in the menu settings. When HIGH is selected, “**⚡** +” appears in the screen. When LOW is selected, “**⚡** -” appears. Try recording various images to find the most appropriate setting for FLASH LVL.

Recording a still image on a "Memory Stick" – Memory photo recording

Notes

- Wipe the flash surface clean before use.
Dirt on the flash may be darkened or stuck to the surface by the heat from flashing and this may reduce the amount of light emitted.
- The recommended shooting distance using the built-in flash is 0.3 m to 2.5 m (31/32 feet to 8 1/3 feet).
- A conversion lens (optional) causes lens shadow to appear.
- You cannot use an external flash (optional) and the built-in flash at the same time.
- Auto red-eye reduction (👁) and forced red-eye reduction (👁🔍) may not produce the desired effect depending on individual subject differences, the distance to the subject, the subject not looking at the pre-recording flash or other conditions.
- The flash effect cannot be obtained easily when you use forced flash in a bright location.
- When recording with the flash, it takes longer to prepare for image capture. This is because your camcorder starts to charge the flash, after it pops up.
- The flash charge lamp flashes while the flash is being charged. After charging is completed, the flash charge lamp lights up.
- When it is difficult to focus on the subject, for example in poor light, focus manually using the focal distance information (p. 69).

The flash does not fire even if you select auto or 👁 (auto red-eye reduction) during the following operations:

- NightShot
- SPOTLIGHT of PROGRAM AE
- SUNSETMOON of PROGRAM AE
- LANDSCAPE of PROGRAM AE
- Manual exposure
- Flexible Spot Meter

During recording images continuously

The flash does not work.

Recording an image from a tape as a still image

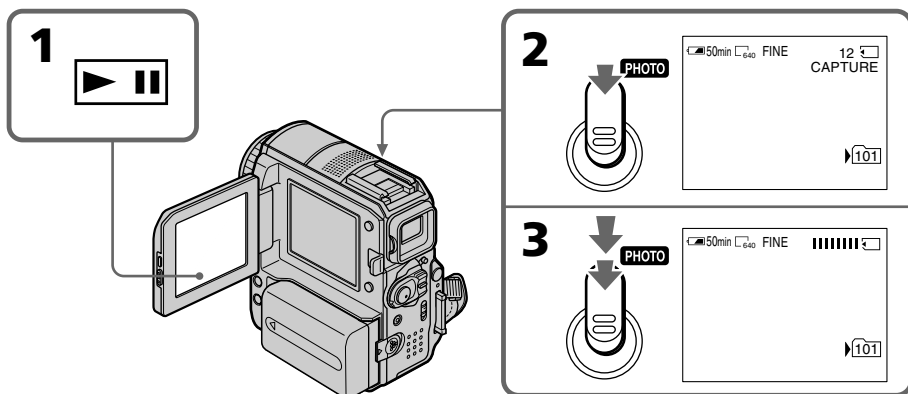
Your camcorder can record moving picture data as a still image on a "Memory Stick." Image size is automatically set to 640×480 .

Before operation

Insert the "Memory Stick" and the recorded tape into your camcorder.

The POWER switch should be set to **(VCR)**.
Operate by touching the panel.

- (1) Press . The picture recorded on the tape is played back.
- (2) Keep pressing PHOTO lightly and check the image. The picture from the tape freezes and the CAPTURE indicator appears on the screen. Recording does not start yet.
To change the still image, release PHOTO, select a still image again, and then press and hold PHOTO lightly.
- (3) Press PHOTO deeper. Recording is complete when the bar scroll indicator disappears. The image displayed on the screen when you pressed PHOTO deeper will be recorded on the "Memory Stick."



Sound recorded on the tape

You cannot record audio from the tape.

Title

You cannot record the titles.

Recording date/time

The date/time when it is recorded on the "Memory Stick" is recorded. Various settings are not recorded.

When you press PHOTO on the Remote Commander

Your camcorder immediately records the image that is on the screen when you press the button.

Recording an image from a tape as a still image

Recording a still image from other equipment

You can use either A/V connecting cable or i.LINK cable. See page 97 for the connection.

When connecting with the A/V connecting cable, set DISPLAY in **ETC** to LCD in the menu settings. (The default setting is LCD.)

Also, select the video jack for connection (p. 98).

The POWER switch should be set to **VCR**.

- (1)** Play back the recorded tape on the VCR, or turn the TV on to see a desired program.

The image of the other equipment is displayed on the LCD screen or in the viewfinder.

- (2)** At the point where you want to record, follow steps 2 and 3 on page 126.

Note

If the tape is in poor condition due to being used repeatedly for dubbing and so on, your camcorder may not be able to record the image, or the recorded image may appear jagged.

Superimposing a still image in a “Memory Stick” on an image – MEMORY MIX

You can superimpose a still image you have recorded on a “Memory Stick” on top of the moving picture you are recording. **You cannot superimpose a still image on an image which has already been recorded.**

You can record superimposed images on the tape or the “Memory Stick.” (However, you can record only superimposed still images on the “Memory Stick.”)

M. CHROM (Memory Chroma key)

You can swap only the blue area of a still image such as an illustration or a frame with a moving picture.

M. LUMI (Memory Luminance key)

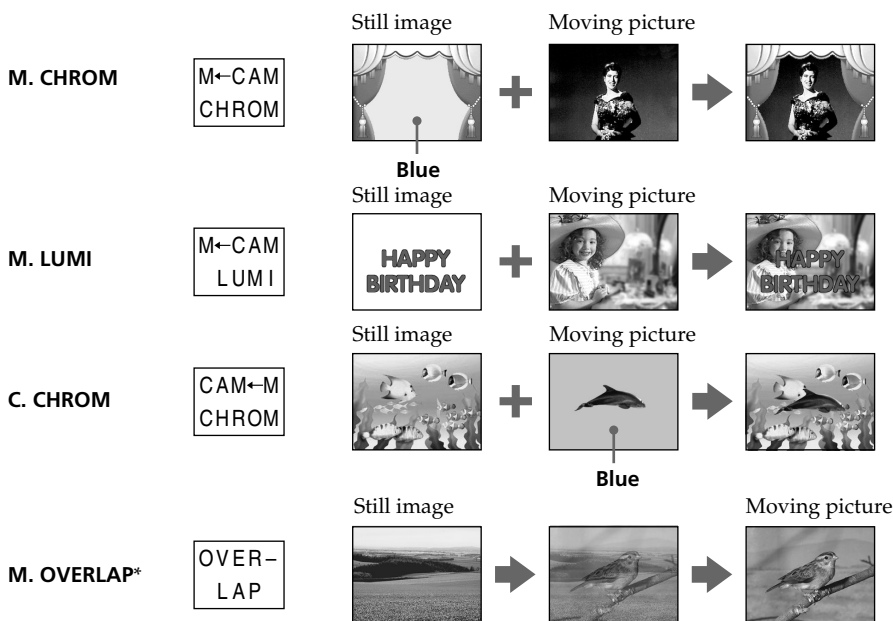
You can swap the brighter area of a still image (such as a handwritten illustration or a title) with a moving picture. To use this function, we recommend recording a title on a “Memory Stick” before a trip or event.

C. CHROM (Camera Chroma key)

You can superimpose a moving picture on top of a still image such as an image which can be used as background. Shoot the subject against a blue background. Only the blue area of the moving picture will be swapped with a still image.

M. OVERLAP (Memory Overlap)

You can make a moving picture you are recording with your camcorder fade in on top of a still image recorded on a “Memory Stick.” You can select M. OVERLAP only when the POWER switch is set to CAMERA.



* You can select M. OVERLAP only when the POWER switch is set to CAMERA.

Superimposing a still image in a “Memory Stick” on an image – MEMORY MIX

The “Memory Stick” supplied with your camcorder is already stored with 20 images:

- For M. CHROM: 18 images (such as a frame) 101-0001 to 101-0018
- For C. CHROM: 2 images (such as a background) 101-0019 to 101-0020

Sample images

Sample images are protected (p. 154).

Notes

- You cannot use MEMORY MIX for moving pictures recorded on a “Memory Stick.”
- When the overlapping still image has a large amount of white, the thumbnail image of the picture may not be clear.
- When recording in the mirror mode (p. 32), the image on the LCD screen does not appear as a mirror-image.

Image data modified on a computer or recorded with other equipment

You may not be able to play modified images back with your camcorder.

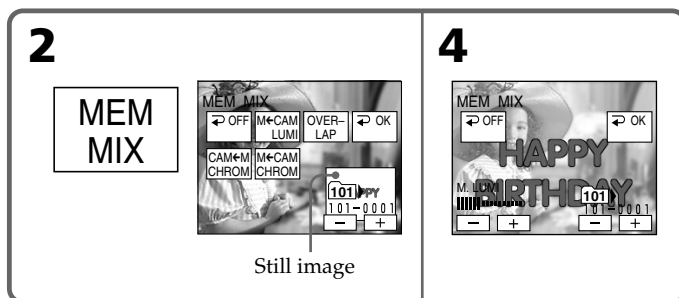
Recording a superimposed image to the tape

Before operation


- Insert the “Memory Stick” containing the still images into your camcorder.
- Insert the tape for recording into your camcorder.

The POWER switch should be set to **CAMERA**.
Operate by touching the panel.

- (1) Press FN and select PAGE2.
- (2) Press MEM MIX. The image recorded on the “Memory Stick” appears in the lower right corner of the screen.
- (3) Press – (to see the previous image) / + (to see the next image) in the lower right corner of the screen to select the still image that you want to superimpose.
- (4) Press the desired mode. The still image overlaps with the moving picture during recording standby.
You cannot reselect the mode.
Press \rightarrow OFF to return to PAGE2.



Superimposing a still image in a "Memory Stick" on an image - MEMORY MIX

- (5) Press -/+ in the lower left corner of the screen to adjust the effect, then press  OK to return to PAGE2.

M. CHROM

The degree of the blue area in the still image which is to be swapped with a moving picture

M. LUMI

The brightness of the area in the still image which is to be swapped with a moving picture

C. CHROM

The degree of the blue area in the moving picture which is to be swapped with a still image

M. OVERLAP

No adjustment necessary

(You can select M. OVERLAP only when the POWER switch is set to CAMERA.)


- (6) Press EXIT to return to FN.

- (7) Press START/STOP to start recording.

To change the still image to be superimposed

Press -/+ in the lower right corner before step 5.

To cancel MEMORY MIX

Press  OFF to return to PAGE2.

When you select M. OVERLAP

You cannot change the still image.

During recording

You cannot reselect the mode.

Superimposing a still image in a “Memory Stick” on an image – MEMORY MIX

Recording a superimposed image to the “Memory Stick” as a still image

Before operation

Insert the “Memory Stick” containing the still images into your camcorder.
Image size of still images is automatically set to 640 × 480.


The POWER switch should be set to **MEMORY**.
Operate by touching the panel.

(1) Follow steps 1 to 6 on page 129 and 130.

(2) Press PHOTO deeply to start recording.

Recording is complete when the bar scroll indicator disappears. The image displayed on the screen when you pressed PHOTO deeply will be recorded on the “Memory Stick.”

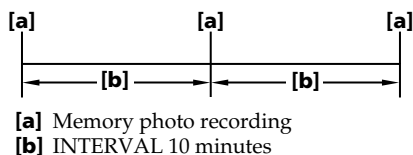
To cancel MEMORY MIX

Press  OFF to return to PAGE2.



Interval Photo Recording

You can carry out a time-lapse recording by setting the camcorder to automatically record still images.

Example



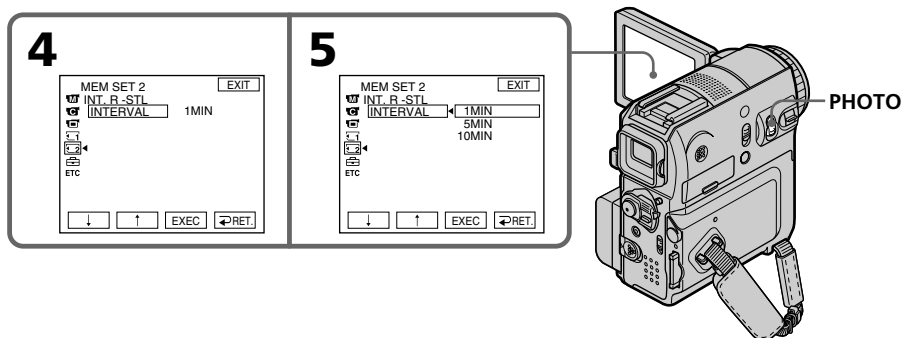
The POWER switch should be set to **MEMORY**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
 - (2) Press MENU.
 - (3) Select INT. R-STL in , then press EXEC.
 - (4) Select SET, then press EXEC.
 - (5) Select INTERVAL, then press EXEC.
 - (6) Select the desired interval time, then press EXEC.
 - (7) Press  RET.
 - (8) Set INT. R-STL to ON, then press EXEC.
 - (9) Press EXEC to return to FN.
- The INTERVAL MEM STILL indicator flashes on the screen.

- (10) Press PHOTO deeply.

Interval Photo Recording starts.

The INTERVAL MEM STILL indicator lights up on the screen during Interval Photo Recording.



To cancel Interval Photo Recording

Set INT. R-STL to OFF in the menu settings.

Recording a moving picture on a “Memory Stick” – MPEG MOVIE recording

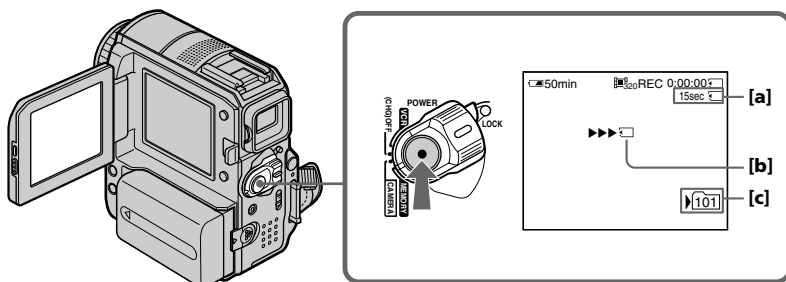
The picture and sound are recorded up to the full capacity of the “Memory Stick” (MPEG MOVIE EX).

The POWER switch should be set to **MEMORY**.

Press START/STOP.

Your camcorder starts recording. The camera recording lamp located on the front of your camcorder lights up. To stop recording, press START/STOP again.

The picture and sound are recorded up to the capacity of the “Memory Stick.” See page 119 for details of recording time.



[a] Available recording time on the “Memory Stick”

[b] This indicator appears for about 5 seconds after you press START/STOP. This indicator is not recorded.

[c] Current recording folder

Note

Sound is recorded in monaural.

When the POWER switch is set to MEMORY

The following functions do not work:

- Digital zoom
- Super NightShot
- Color Slow Shutter
- Wide mode
- Fader
- Picture effect
- Digital effect
- SPORTS of PROGRAM AE (The indicator flashes.)
- Title
- SteadyShot

Recording a moving picture on a “Memory Stick” – MPEG MOVIE recording

When using an external flash (optional)

Turn the power of the external flash off when recording moving pictures on the “Memory Stick.” Otherwise, the charging sound of the flash may be recorded.

Recording date/time

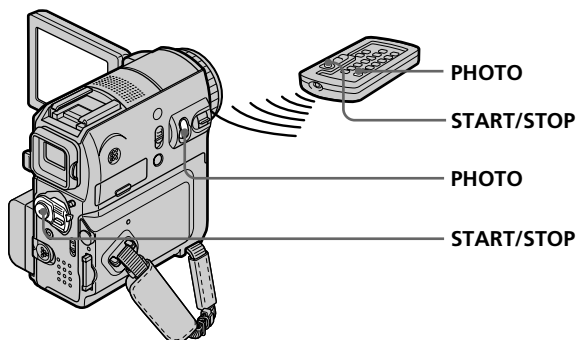
The date/time do not appear during recording. However, they are automatically recorded onto the “Memory Stick.” To display the recording date/time, press DATA CODE during playback. Various settings cannot be recorded (p. 44).

Self-timer recording

You can record moving pictures on the “Memory Stick” with the self-timer. See page 135 for details.


Self-timer recording

You can record still images and moving pictures on the "Memory Stick" with the self-timer. You can also use the Remote Commander for this operation.



Recording still images

The POWER switch should be set to **MEMORY**.
Operate by touching the panel.

- (1) Press FN and select PAGE2.
- (2) Press SELFTIMER.
The  (self-timer) indicator appears on the screen.
- (3) Press EXIT to return to FN.
- (4) Press PHOTO deeply.

The self-timer starts counting down from about 10 seconds with a beep. In the last 2 seconds of the countdown, the beep gets faster, and then your camcorder records still images automatically.

Self-timer recording

Recording moving pictures

The POWER switch should be set to **MEMORY**.
Operate by touching the panel.

(1) Follow steps 1 to 3 in “Recording still images” (p. 135).


(2) Press START/STOP.

The self-timer starts counting down from about 10 seconds with a beep. In the last 2 seconds of the countdown, the beep gets faster, and then recording starts automatically.

To stop the countdown for recording moving picture

Press START/STOP. To restart the countdown, press START/STOP again.

To cancel the self-timer

During standby, press SELFTIMER on the LCD screen to make the  (self-timer) indicator disappear from the screen. You cannot cancel the self-timer using the Remote Commander.

When self-timer recording is finished

The self-timer is automatically canceled.

Recording a picture from a tape as a moving picture

Your camcorder can read moving picture data recorded on a tape and record it as a moving picture on a “Memory Stick.”

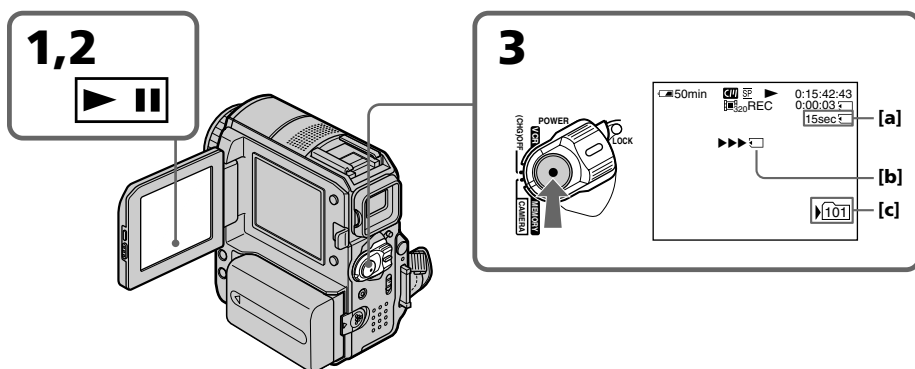
Before operation

Insert the recorded cassette and a “Memory Stick” into your camcorder.

The POWER switch should be set to **(VCR)**.

Operate by touching the panel.

- (1) Press . The picture recorded on the tape is played back.
- (2) Press again to pause playback at the scene where you want to start recording from.
- (3) Press START/STOP. Images and sound are recorded on the “Memory Stick.”
To stop recording, press START/STOP again. See page 119 for details on recording time.



“Memory Stick” Operations

[a] Available recording time on the “Memory Stick”

[b] This indicator appears for about 5 seconds after you press START/STOP. This indicator is not recorded.

[c] Current recording folder

Notes

- Sound recorded in 48 kHz is converted to one in 32 kHz when recording images from the tape to the “Memory Stick.”
- Sound recorded in stereo is converted to monaural sound when recording from the tape.

Recording a picture from a tape as a moving picture

Titles

You cannot record the titles.

If the "AUDIO ERROR" indicator appears


Sound that cannot be recorded by your camcorder has been recorded. Connect the A/V connecting cable to input images played back on an external device (p. 97).

Data code recorded on the tape


Instead of the date/time when the picture was recorded on the tape, the date/time when the picture is recorded on the "Memory Stick" (transferred from the tape) is recorded on the "Memory Stick." The various settings that may be saved on the tape are not recorded.

Recording a moving picture from other equipment

You can use either A/V connecting cable or i.LINK cable. See page 97 for the connection.

When connecting with the A/V connecting cable, set DISPLAY in  to LCD in the menu settings. (The default setting is LCD.)

Also, select the video jack for connection (p. 98).

The POWER switch should be set to .

- (1) Play back the recorded tape on the VCR, or turn the TV on to see the desired program.

The image of the other equipment is displayed on the LCD screen or in the viewfinder.

- (2) At the starting point of the picture you want to record, press START/STOP.

Note

Your camcorder may stop recording the image, or the recorded image may appear jagged:

- If the tape has the blank portion
- If the tape is in poor condition due to being used repeatedly for dubbing
- If the input signal is cut off during recording

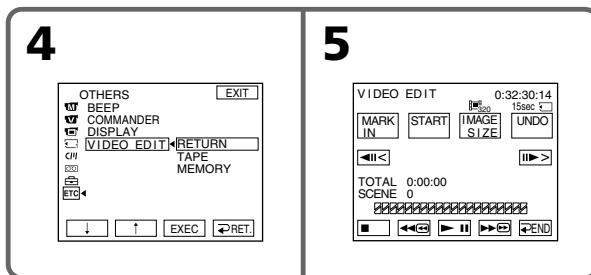
Recording edited pictures from a tape as a moving picture – Digital program editing (on a “Memory Stick”)

You can duplicate selected scenes (programs) for editing onto a “Memory Stick.”

Making the program

The POWER switch should be set to (VCR).
Operate by touching the panel.

- (1) Insert the cassette for playback, and the “Memory Stick” for recording into your camcorder.
- (2) Press FN to display PAGE1.
- (3) Press MENU.
- (4) Select VIDEO EDIT in **[ETC]**, then press EXEC.
- (5) Select MEMORY, then press EXEC.
- (6) Repeat pressing IMAGESIZE to select the desired size. The image size changes when you press IMAGESIZE.
- (7) Follow steps 6 to 10 on page 94.



“Memory Stick” Operations

To erase the program you have set

- (1) Perform the above steps 2 to 5.
- (2) Perform steps 1 to 3 on page 95.

To erase all programs

- (1) Perform the above steps 2 to 5.
- (2) Perform steps 2 to 4 on page 95.

Recording edited pictures from a tape as a moving picture – Digital program editing (on a “Memory Stick”)

Notes

- You cannot dub the titles, display indicators, or the contents of Cassette Memory.
- You cannot operate recording during the Digital program editing on the “Memory Stick.”

On a blank portion of the tape

You cannot set IN or OUT on a blank portion of the tape.

If there is a blank portion between IN and OUT on the tape

The total time may not appear correctly.

While making a program

If you eject the cassette, the NOT READY indicator appears on the screen. The program will be erased.

Performing the program (Dubbing onto a “Memory Stick”)

The POWER switch should be set to **(VCR)**.

Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select VIDEO EDIT in **(ETC)**, then press EXEC.
- (4) Select MEMORY, then press EXEC.
- (5) Press START.
- (6) Press EXEC.

Your camcorder searches for the beginning of the first program, then starts dubbing.

The program mark flashes.

The SEARCH indicator appears during searching, the EDITING indicator appears during writing of data on your camcorder, and the REC indicator appears during dubbing on the screen.

When the dubbing ends, your camcorder automatically stops.

To stop dubbing

Press CANCEL.

The program you made is recorded on the “Memory Stick” up to the place where you pressed CANCEL.

To end Digital program editing

Your camcorder stops when the dubbing ends. Then the display returns to VIDEO EDIT in the menu settings.

Press **↶** END to end Digital program editing.

Recording edited pictures from a tape as a moving picture – Digital program editing (on a “Memory Stick”)

Note

Your camcorder may stop recording the image, or the recorded image may appear jagged:

- If the tape has the blank portion
- If the tape is in poor condition due to being used repeatedly for dubbing

Dubbing cannot be carried out in the following cases:

- The program to operate Digital program editing has not been made.
- A “Memory Stick” is not inserted.
- The write-protect tab on the “Memory Stick” is set to LOCK.

When the available recording time of the “Memory Stick” is not enough

The LOW MEMORY indicator appears on the screen. However, you can record pictures up to the time indicated.

When the program has not been set

You cannot press START.

Changing the recording folder

You can create folders on a “Memory Stick.”

You can group images by selecting a folder for each recording, for convenient later reference.


The default setting is the “101MSDCF” folder in which images are recorded.

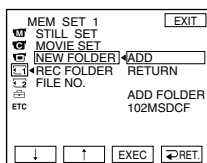
You can create folders up to “999MSDCF.”

Creating a new folder

The POWER switch should be set to **(MEMORY)**.

Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select NEW FOLDER in , then press EXEC. The new folder number is displayed.



- (4) Select ADD, then press EXEC. A new folder is created. The numeric part of the folder name is one larger than that of the last created folder. The created folder is automatically set to the recording folder.

To return to FN

Press EXIT.


To cancel creating a new folder

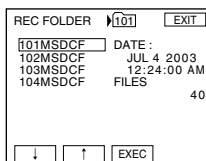
Select RETURN in step 4, then press EXEC.

Changing the recording folder

Selecting the recording folder

The POWER switch should be set to **MEMORY**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select REC FOLDER in , then press EXEC.



- (4) Press ↓/↑ to select a folder you want to record images in, then press EXEC.

To return to FN

Press EXIT.

Notes

- Up to 9,999 image files can be recorded in each folder. When a folder is full, a new folder is automatically created.
- Once a folder is created, it cannot be deleted with your camcorder.
- As the number of folders increases, the number of recordable images in the “Memory Stick” decreases.

Viewing a still image

– Memory photo playback

You can view the still images recorded on the “Memory Stick.” Furthermore, you can view 6 images including moving pictures at a time arranged in the same order they are in the “Memory Stick” by selecting the index screen. You can also use the Remote Commander for this operation.

The POWER switch should be set to **MEMORY**.
Operate by touching the panel.

- (1) Press PLAY. The last recorded image is displayed.
- (2) Press – (to see the previous image)/+ (to see the next image) on your camcorder to select the desired still image.

To stop memory photo playback

Press CAM.

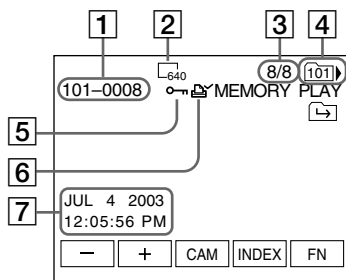
When no file is in the folder

The “NO FILE AVAILABLE” indicator appears.

Viewing a still image – Memory photo playback

Screen indicators during still image playback

To make screen indicators disappear, press DISPLAY/BATT INFO.



- 1 Data file name
- 2 Image size
- 3 Image number/Total number of recorded images in the current playback folder
- 4 Playback folder
- 5 Protect mark
- 6 Print mark
- 7 Recording date/time/Various settings

Recording data

To display the recording data (date/time or various settings when recorded), press DATA CODE during playback (p. 44).

Notes on the file name

- The folder number may not appear and only the file number may appear if the structure of the folder does not conform to the DCF standard.
- The file name flashes on the screen if the file is corrupted or the file is unreadable.

When the “Memory Stick” contains multiple folders

The following icons appear on the screen on the first or last images in a folder.

- ◀: You can move to the previous folder.
- ▶: You can move to the next folder.
- ◀▶: You can move to both the previous and the next folders.

Viewing a still image – Memory photo playback

Playing back 6 recorded images at a time (index screen)

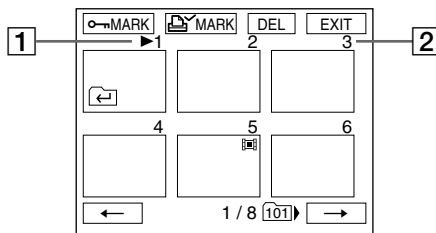
This function is especially useful when searching for a particular image.

Press INDEX to display the index screen.

A red ► mark appears above the image that was being displayed before the change to the index screen mode.

← : To display the previous 6 images

→ : To display the next 6 images



1 ► mark

2 Image serial number in the current playback folder on the “Memory Stick”

To return to FN

Press EXIT.

To return to the normal playback screen (single screen)

Press the image you want to display.

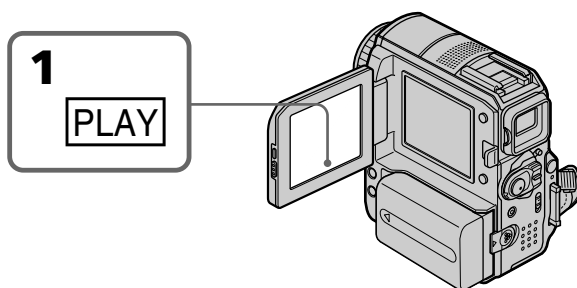
Viewing a moving picture

– MPEG MOVIE playback

You can view the moving pictures recorded in the “Memory Stick.”

The POWER switch should be set to **(MEMORY)**.
Operate by touching the panel.

- (1) Press PLAY. The last recorded image appears.
- (2) Press – (to see the previous picture)/+ (to see the next picture) to select the desired moving pictures.
- (3) Press MPEG ► || to start playback.
- (4) Adjust the volume following the steps below.
 - ① Press FN and select PAGE3.
 - ② Press VOL. The screen to adjust the volume appears.
 - ③ Press – (to turn down the volume)/+ (to turn up the volume) to adjust the volume.
 - ④ Press ↵ OK to return to PAGE3.



To stop MPEG MOVIE playback

Press MPEG ► ||.

When no file is in the folder

The “NO FILE AVAILABLE” indicator appears.

Viewing a moving picture – MPEG MOVIE playback

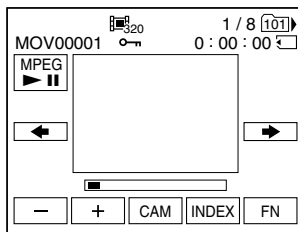
Playing back a picture from a particular segment

Moving pictures recorded on a “Memory Stick” can be divided into up to 60 parts. You can select a part and begin playback from that point. The number of parts varies according to recording time. If a recording is too short, it cannot be divided.

The POWER switch should be set to **MEMORY**.

Operate by touching the panel.

- (1) Follow steps 1 and 2 on the previous page.
- (2) Press ◀ (to see previous part) / ▶ (to see next part) to select the point where you want to play back.



- (3) Follow steps 3 and 4 on the previous page.

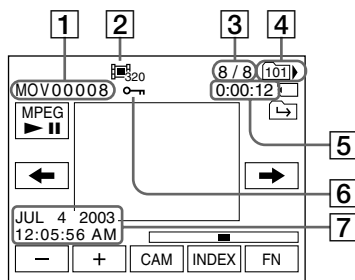
To stop MPEG MOVIE playback

Press MPEG ▶ II.

Viewing a moving picture – MPEG MOVIE playback

Screen indicators during moving picture playback

To make screen indicators appear or disappear, press DISPLAY/BATT INFO.



- 1 Data file name
- 2 Image size
- 3 Picture number/Total number of recorded pictures in the current playback folder
- 4 Playback folder
- 5 Memory playback time
- 6 Protect mark
- 7 Recording date/time (Various settings appear as "-- --".)

Recording date/time

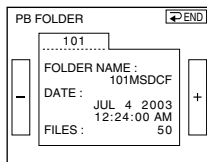
To display the recording date/time, press DATA CODE during playback (p. 44).

Choosing a playback folder

Select the folder to be played back. The currently selected folder name appears in the top right-hand corner of the screen.

The POWER switch should be set to **MEMORY**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press PB FOLDR.
- (3) Press -/+ to select the folder number you want to play back, then press
↩ END to return to PAGE1.



- : To select the previous folder

+ : To select the next folder

- (4) Press EXIT to play back the image.

Note

Your camcorder does not recognize folders created or renamed using the computer.

Current playback folder

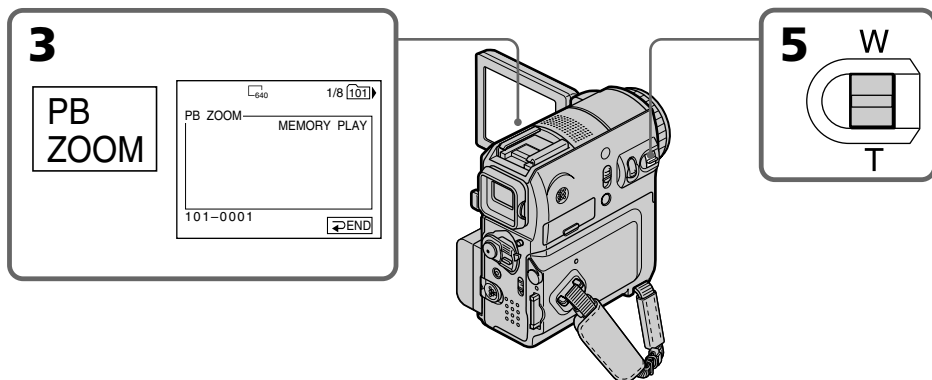
The current playback folder is valid until the next recording is made. Once you record an image, the current recording folder becomes the current playback folder.

Enlarging a still image recorded on a "Memory Stick" – Memory PB ZOOM

You can enlarge the still images.

The POWER switch should be set to **MEMORY**.
Operate by touching the panel.

- (1) Play back the image to enlarge.
- (2) Press FN and select PAGE2.
- (3) Press PB ZOOM. The PB ZOOM screen appears.
- (4) Press the area you want to enlarge in the frame.
The area you pressed moves to the center of the screen, and the playback image is enlarged to about twice the size. If you press another area, the area moves to the center of the screen.
- (5) Adjust the zoom ratio by the power zoom lever.
You can select the image from approximately 1.1 times up to 5 times its size.
W: To decrease the zoom ratio
T: To increase the zoom ratio



"Memory Stick" Operations

To cancel memory PB ZOOM

Press  END.

Enlarging a still image recorded on a “Memory Stick” – Memory PB ZOOM

Memory PB ZOOM is canceled when you press the following buttons on the Remote Commander:

- MEMORY PLAY
- MEMORY INDEX
- MEMORY –/+

During memory PB ZOOM

If you press DISPLAY/BATT INFO, the frame on the memory PB ZOOM screen disappears. You cannot move the part you pressed to the center of the screen.

Edge of the image

The edge of the image can be enlarged but cannot be displayed at the center of the screen.

Moving pictures recorded on the “Memory Stick”

Memory PB ZOOM does not work.

To record the images processed by Memory PB ZOOM on the “Memory Stick”


Press PHOTO when the image is being displayed. The image size automatically becomes 640 × 480.

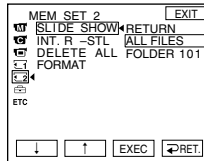
Playing back images continuously

– Slide show

You can display all images on the “Memory Stick” or in the selected folder using slide show.

The POWER switch should be set to **(MEMORY)**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select SLIDE SHOW in , then press EXEC.



- (4) Select ALL FILES or FOLDER □□□*, then press EXEC.
ALL FILES: To play back all of the images in the “Memory Stick”
FOLDER □□□*: To play back the images in the folder selected in the PB
FOLDR setting
* The folder name appears in □□□.
- (5) Press START. Your camcorder plays back the images recorded on the “Memory Stick” in sequence. When all images are played back, slide show automatically stops and returns to the first image.


To cancel slide show

Press  END.

To pause slide show

Press PAUSE.

To return to FN

Press  END to return to PAGE1, then press EXIT.

To start slide show from a particular image



Select the desired image using -/+ buttons before step 5.

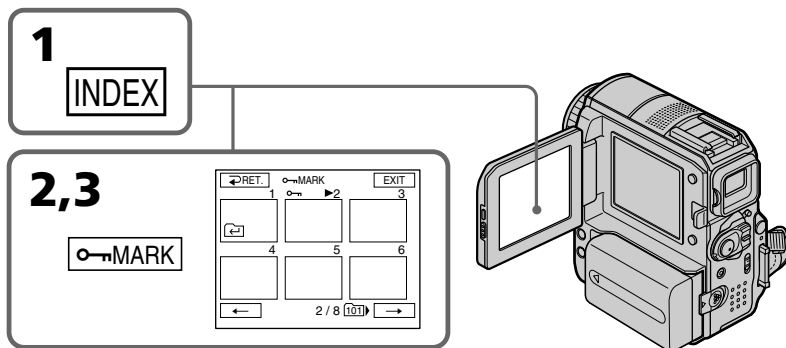
Preventing accidental erasure

– Image protection

To prevent accidental erasure of important images, you can protect selected images.

The POWER switch should be set to (MEMORY).
Operate by touching the panel.


- (1) Press INDEX.
- (2) Press  MARK. The screen to protect the image appears.
- (3) Press the image you want to protect. The  indicator appears above the protected image.



To return to FN

Press EXIT.

To cancel image protection

Press the image you want to cancel image protection for in step 3 again.
The  indicator disappears from the image.

Note

Formatting erases all information on a “Memory Stick,” including protected image data.
Check the contents of the “Memory Stick” before formatting.

If the write-protect tab on the “Memory Stick” is set to LOCK

You cannot protect an image or vice versa.

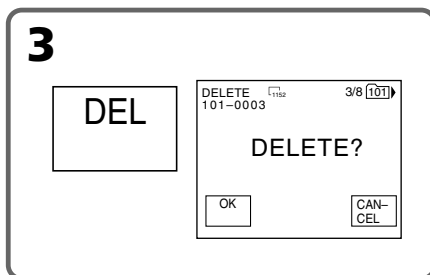
Deleting images – DELETE

You can delete all images or selected images.

Deleting selected images

The POWER switch should be set to **MEMORY**.
Operate by touching the panel.

- (1) Play back the image you want to delete.
- (2) Press FN to display PAGE1.
- (3) Press DEL. The DELETE? indicator appears on the screen.
- (4) Press OK. The selected image is deleted.



To return to FN

Press EXIT.

To cancel deleting an image

Press CANCEL in step 4.

Notes

- To delete a protected image, first cancel image protection.
- Once you delete an image, you cannot restore it. Check the images to delete carefully before deleting them.

If the write-protect tab on the “Memory Stick” is set to LOCK

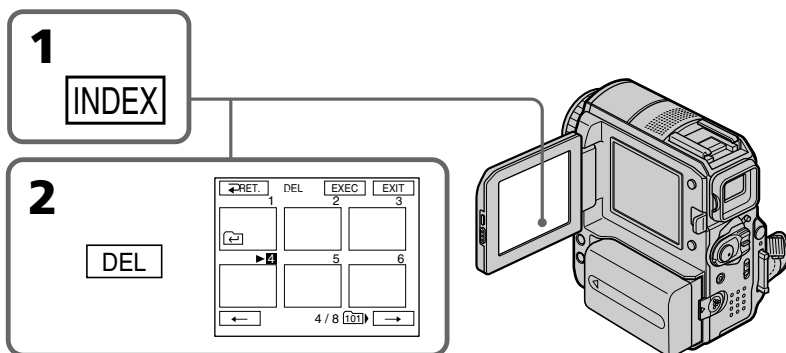
You cannot delete images.

Deleting images – DELETE

Deleting selected images on the index screen

The POWER switch should be set to **(MEMORY)**.
Operate by touching the panel.

- (1) Press INDEX.
- (2) Press DEL. Then press the image you want to delete. The number of the selected image is highlighted.
- (3) Press EXEC. The DELETE? indicator appears on the screen.
- (4) Press OK. The selected images are deleted.



To return to FN

Press EXIT.

To cancel deleting an image

Press CANCEL in step 4.

The maximum number of images you can select in one session


You can select up to 100 images to be deleted.

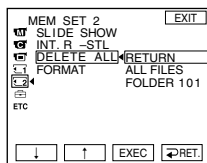
Deleting images – DELETE

Deleting all the images

You can delete all unprotected images in a “Memory Stick.”

The POWER switch should be set to **MEMORY**.
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select DELETE ALL in , then press EXEC.



- (4) Select ALL FILES or FOLDER ☐☐☐*, then press EXEC.
 - ALL FILES : To delete all of the images in the “Memory Stick”
 - FOLDER ☐☐☐* : To delete the images in the folder selected in the PB FOLDR setting
 - * The folder name appears in ☐☐☐.
- (5) Select OK, then press EXEC.
 - OK changes to EXECUTE.
- (6) Select EXECUTE, then press EXEC.
 - The DELETING indicator appears, then flashes on the screen.
 - When all the unprotected images have been deleted, the COMPLETE indicator appears.

To return to FN

Press EXIT.

To cancel deleting all the images in the “Memory Stick”

Select RETURN in step 5, then press EXEC.

While the DELETING indicator is displayed

Do not turn the POWER switch or press any buttons.



Even if all images are deleted

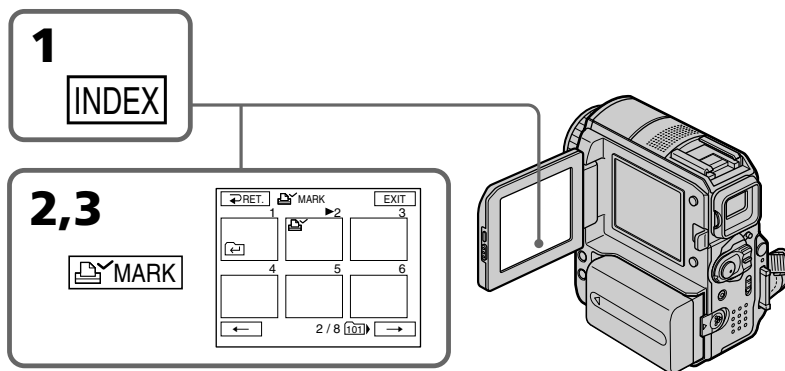
The folders are not deleted.

Writing a print mark – Print mark

The print mark function is useful for printing out still images later. However, you cannot specify the number of printing.
Your camcorder conforms with the DPOF (Digital Print Order Format) standard for specifying the still images to print out.

The POWER switch should be set to **MEMORY**.
Operate by touching the panel.


- (1) Press INDEX.
- (2) Press  MARK. The screen to write a print mark appears.
- (3) Press the image you want to write a print mark. The  appears on the selected image.




To return to FN

Press EXIT.

To erase the print marks

Press the image you want to erase the print mark in step 3 again. The  disappears from the image.

If the write-protect tab on the “Memory Stick” is set to LOCK

You cannot write or erase  on still images.

Moving pictures

You cannot write  on moving pictures.

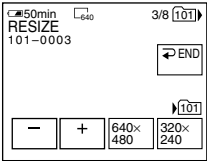
Changing the image size – Resize

After recording, you can change the image size of recorded still images to 640 × 480 or 320 × 240. Resizing is useful when you want to save the image in a smaller size such as when you want to attach it to an e-mail message. The original image is retained even after resizing.

The POWER switch should be set to **MEMORY**.
Operate by touching the panel.

- (1) During memory playback, press FN and select PAGE2.
- (2) Press RESIZE.

The RESIZE screen appears.



- (3) Press 640 × 480 or 320 × 240.

The resized image is recorded as the newest file in the selected folder to record.

To change still images

Press -/+ before step 3.

To return to FN

Press END to return to PAGE2, then press EXIT.

Notes

- You cannot resize the picture recorded with MPEG MOVIE recording.
- You may not be able to resize the picture recorded on other camcorder.
- You cannot select image quality (FINE or STANDARD) when resizing.
- Resizing may increase the memory capacity, depending on the image size.

Memory capacity when resizing

Image size	Memory capacity
640 × 480	About 150 kB
320 × 240	About 16 kB

Viewing images with a computer

– Introduction

There are following ways of connecting your camcorder to a computer to view images saved on the “Memory Stick” or recorded on the tape on a computer.

To view images on a computer which has a “Memory Stick” slot, first remove the “Memory Stick” from your camcorder and then insert it into your computer’s “Memory Stick” slot.

	Camcorder Connection jack	Connection cable	Computer Environment requirements	Reference pages	
				For Windows Users	For Macintosh Users
Tape image/live from your camcorder	USB jack	USB cable (supplied)	USB port, editing software	163 – 172 173 – 180	–
	DV Interface	i.LINK cable (optional)	DV port, editing software	161 187 – 188 189 – 190	–
“Memory Stick” image	USB jack	USB cable (supplied)	USB port, editing software	163 – 172 181 – 183	184 – 185 186

When connecting to a computer with the USB port, complete installation of the USB driver before connecting your camcorder to the computer. If you connect your camcorder to the computer first, you will not be able to install the USB driver correctly.

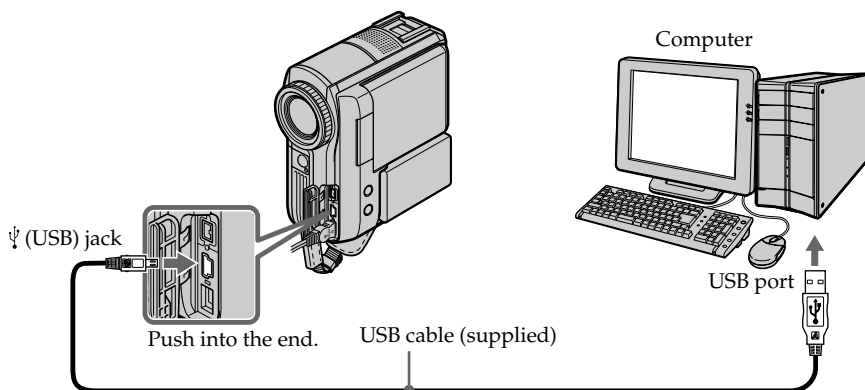
For details of the computer’s ports and editing software, contact the computer manufacturer.

You can use the supplied “ImageMixer Ver.1.5 for Sony” as editing software.

Viewing pictures recorded on the tape

When connecting to a computer with the USB port

See page 163 for details.

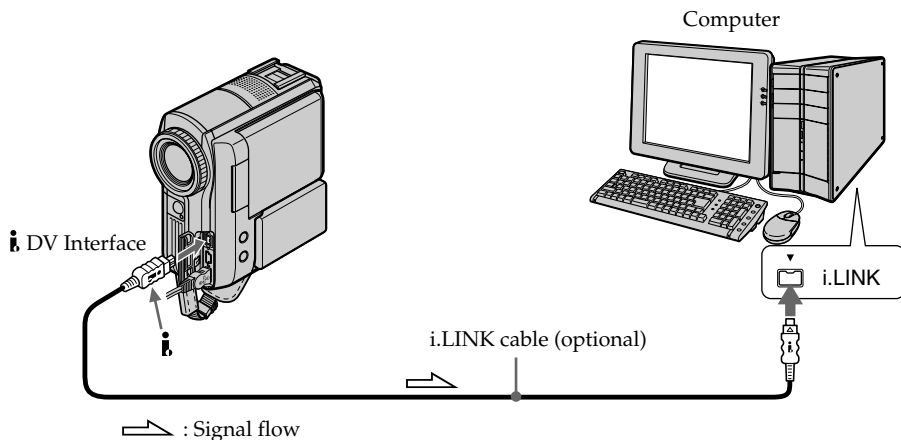


Viewing images with a computer – Introduction

When connecting to a computer with the DV port


The computer must have a DV port and editing software installed that can read video signals.

You can use the supplied “ImageMixer Ver.1.5 for Sony” as editing software.



Capturing images with “ImageMixer Ver.1.5 for Sony”

(1) Perform steps 8 and 9 on page 173.

(2) Click  in step 10 on page 174.

Refer to the on-line help of “ImageMixer Ver.1.5 for Sony” for details.

Notes

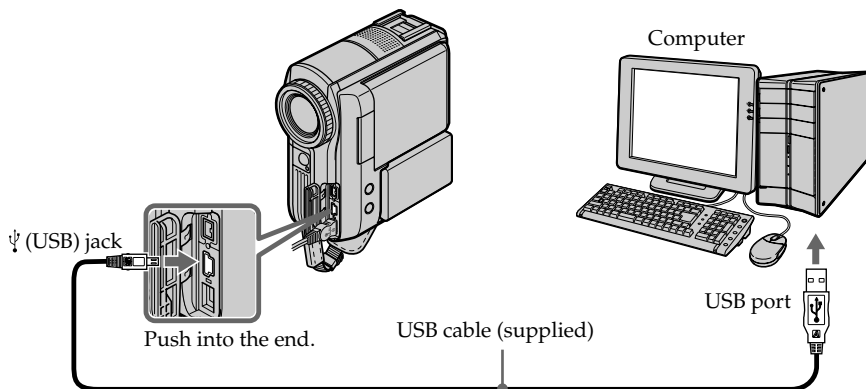
- Editing software (supplied with your computer) can be used. For operation details, refer to the operation manual, or the on-line help of the software.
- “ImageMixer Ver.1.5 for Sony” operations are almost the same for both the i.LINK connection and the USB connection.

Viewing images with a computer – Introduction

Viewing images recorded on the “Memory Stick”

When connecting to a computer with the USB port

See page 163 when using Windows and page 184 when using Macintosh.



You can also use a “Memory Stick” Reader/Writer (optional).

When connecting to a computer without the USB port

Use an optional floppy disk adaptor for “Memory Stick” or a PC card adaptor for “Memory Stick.”

When purchasing an accessory, check its catalog beforehand for the recommended operating environment.

Notes on using your computer

“Memory Stick”

- “Memory Stick” operations on your camcorder cannot be assured if a “Memory Stick” formatted on your computer is used on your camcorder, or if a “Memory Stick” in your camcorder was formatted from your computer when the USB cable was connected.
- Do not compress the data on the “Memory Stick.” Compressed files cannot be played back on your camcorder.

Software

- Depending on your application software, the file size may increase when you open a still image file.
- When you load an image modified using retouching software from your computer to your camcorder or when you directly modify the image on your camcorder, the image format will differ so a file error indicator may appear and you may be unable to open the file.

Communications with your computer

Communications between your camcorder and your computer may not recover after recovering from Suspend, Resume, or Sleep.

Connecting your camcorder to a computer using the USB cable (For Windows users)

Complete installation of the USB driver before connecting your camcorder to a computer. If you connect your camcorder to a computer first, you will not be able to install the USB driver correctly.

When connecting to a computer with the USB port

You must **install a USB driver** onto the computer to connect your camcorder to the computer's USB port. The USB driver can be found on the CD-ROM supplied, along with the application software required for viewing images.

If you connect your camcorder and a computer using the USB cable, you can view pictures live from your camcorder and pictures recorded on the tape on the computer (USB Streaming function).

Furthermore, if you download pictures from your camcorder to the computer, you can process or edit them in image processing software and append them to e-mail. You can view images recorded on the "Memory Stick" on a computer.

System requirements when connecting with the USB cable and viewing tape pictures on a computer

OS:

Microsoft Windows 98SE, Windows Me, Windows 2000 Professional, Windows XP Home Edition or Windows XP Professional

Standard installation is required.

However, operation is not assured if the above environment is an upgraded OS.

You cannot hear sound if your computer is running Windows 98, but you can read still images.

CPU:

Minimum 500 MHz Intel Pentium III or faster (800 MHz or faster recommended)

Application:

DirectX 8.0a or later

Sound system:

16 bit stereo sound card and stereo speakers

Memory:

64 MB or more

Hard disk:

Available memory required for installation:

at least 250 MB

Available hard disk memory recommended:

at least 1 GB (depending on the size of the image files edited)

Display:

4 MB VRAM video card, Minimum 800 × 600 dot High-color (16 bit color, 65,000 colors), Direct Draw display driver capability (At 800 × 600 dot or less, 256 colors and less, this product will not operate correctly.)

Others:

This product is based on DirectX technology, so it is necessary to install DirectX.

To create a Video CD, a CD-R drive is needed.

The USB port must be provided as standard.

You cannot use this function in the Macintosh environment.

Connecting your camcorder to a computer using the USB cable (For Windows users)

System requirements when connecting with USB cable and viewing the “Memory Stick” images on a computer

OS:

Microsoft Windows 98, Windows 98SE, Windows Me, Windows 2000 Professional, Windows XP Home Edition or Windows XP Professional
Standard installation is required.

However, operation is not assured if the above environment is an upgraded OS.

CPU:

MMX Pentium 200 MHz or faster

Display:

Minimum 800 × 600 dot High-color (16 bit color, 65,000 colors) (At 800 × 600 dot or less, 256 colors or less, the screen for installing USB driver is not displayed.)

Others:

The USB port must be provided as standard. Windows Media Player must be installed (to play back moving pictures).

Notes

- Operations are not guaranteed for the Windows environment if you connect 2 or more USB equipment to a single computer at the same time, or when using a hub.
- Some equipment may not operate depending on the type of USB equipment that is used simultaneously.
- Operations are not guaranteed for all the recommended computer environments mentioned above.
- Windows and Windows Media are registered trademarks of Microsoft Corporation in the United States and/or other countries.
- Pentium is a trademark or registered trademark of Intel Corporation.
- All other product names mentioned herein may be the trademarks or registered trademarks of their respective companies. Furthermore, “™” and “®” are not mentioned in each case in this manual.

Installing the USB driver

Start the following operation without connecting the USB cable to the computer.

Connect the USB cable according to “Making the computer recognize your camcorder.”

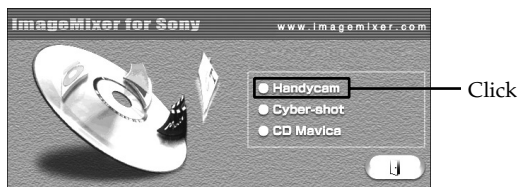
If you are using Windows 2000, log in with permission of administrators.

If you are using Windows XP, log in with permission of computer administrators.

- (1)** Turn on a computer and allow Windows to load.
Or, if Windows OS is already running, close all active applications.
- (2)** Insert the supplied CD-ROM in the CD-ROM drive of the computer. The application software starts up.
If the screen does not appear, double-click “My Computer” and then “ImageMixer” (CD-ROM Drive).

Connecting your camcorder to a computer using the USB cable (For Windows users)

- (3) Select “Handycam” on the screen.



The title screen appears.

- (4) Move the cursor to “USB Driver” and click. This starts USB driver installation.



- (5) Follow the on-screen messages to install the USB driver.
(6) Remove the CD-ROM, then restart the computer and follow the on-screen messages.

Notes

- If you connect the USB cable before USB driver installation is complete, the USB driver will not be properly registered. Carry out installation again following the on-screen messages.
- The title screen is not displayed if the screen size of the computer is set to less than 800 × 600 dots and 256 colors or less. See pages 163 and 164 about the recommended computer environment.

Connecting your camcorder to a computer using the USB cable (For Windows users)

Installing Image Transfer

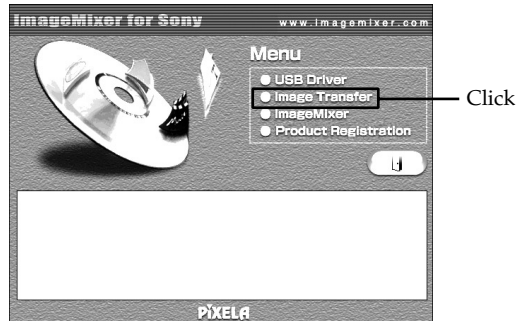
Make sure USB driver installation is complete.

This function enables image data recorded on the “Memory Stick” to be automatically transferred (copied) to your computer.

If you are using Windows 2000, log in with permission of administrators.

If you are using Windows XP, log in with permission of computer administrators.

- (1) Turn on your computer and allow Windows to load.
Or, if Windows OS is already running, close all active applications.
- (2) Insert the supplied CD-ROM in the CD-ROM drive of the computer. The application software starts up.
- (3) Select “Handycam” on the screen.
The title screen appears.
- (4) Move the cursor to “Image Transfer” and click.



The Install Wizard program starts up and the “Choose Setup Language” screen appears.

- (5) Select the language for installation.
- (6) Follow the on-screen messages. The installation screen disappears when installation is complete.

Connecting your camcorder to a computer using the USB cable (For Windows users)

Installing ImageMixer

Make sure USB driver installation is complete.

“ImageMixer Ver.1.5 for Sony” is an application that can capture or edit images, or create video CDs.

To install and use this software in Windows 2000, you must be authorized as administrators. For Windows XP, you must be authorized as computer administrators.

- (1) Turn on a computer and allow Windows to load.
Or, if Windows OS is already running, close all active applications.
- (2) Insert the supplied CD-ROM into the CD-ROM drive of the computer.
The application software starts up.
- (3) Select “Handycam” on the screen.
The title screen appears.
- (4) Move the cursor to “ImageMixer” and click.



Viewing Images with your Computer

The Install Wizard program starts up and the “Choose Setup Language” screen appears.

- (5) Select the language for installation.
- (6) Follow the on-screen messages.
The installation screen disappears when installation is complete.
- (7) **Windows 2000 and Windows XP only:**
Follow the on-screen message to install the WinASPI.
- (8) If DirectX 8.0a or later is not installed on the computer, continue installation after installing ImageMixer.
Follow the on-screen messages to install DirectX 8.0a. After installation is complete, restart the computer.

Connecting your camcorder to a computer using the USB cable (For Windows users)

MEMORY MIX Album

Once "ImageMixer" is installed, the MEMORY MIX album is created in "Album" of "ImageMixer" and sample images are stored in there.

Those sample images can be transferred from the MEMORY MIX album to a "Memory Stick" so that they can be used in MEMORY MIX (p. 128).

For details on the operation procedure, refer to the on-line help.

Replacing WinASPI



To use the ImageMixer CD writing function, you need to install WinASPI. If a different writing application was already installed, its writing function may not work correctly. If that happens, reinstall the original application and replace WinASPI. Note that the ImageMixer CD writing function may not work properly.

Making the computer recognize your camcorder

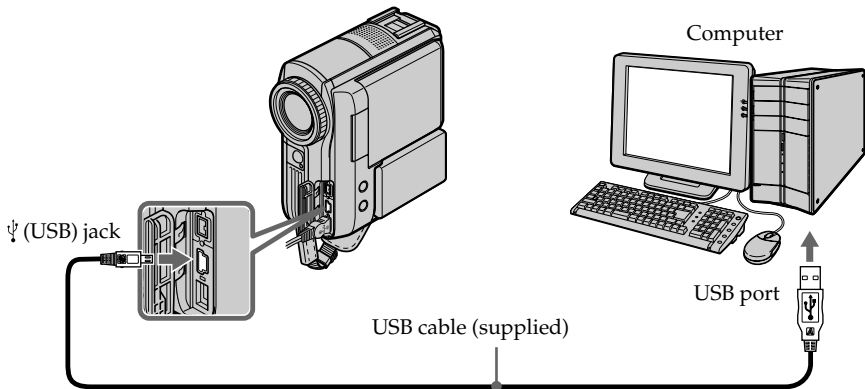
If you are using Windows 2000, log in with permission of administrators.

If you are using Windows XP, log in with permission of computer administrators.

Viewing pictures recorded on the tape

- (1) Connect the AC Adaptor to your camcorder.
- (2) Set the POWER switch to **(VCR)**.
- (3) Press FN to display PAGE1.
- (4) Press MENU to display the menu.
- (5) Select USB STREAM in , then press EXEC.
- (6) Select ON, then press EXEC.
- (7) Connect the  (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.

The computer recognizes your camcorder, and the Windows Add Hardware Wizard starts.



Connecting your camcorder to a computer using the USB cable (For Windows users)

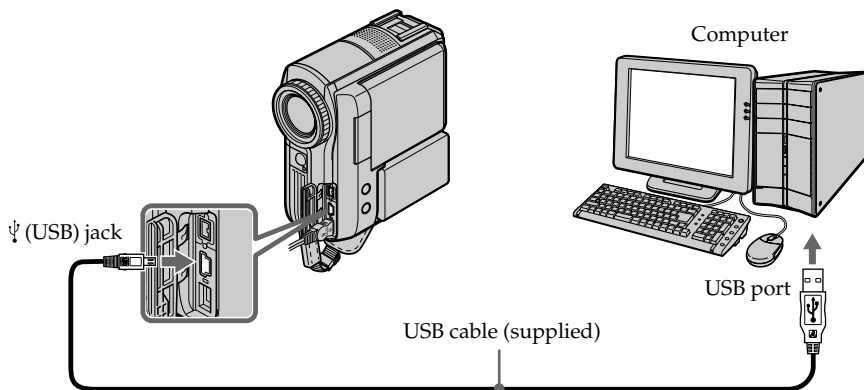
- (8) Follow the on-screen messages so that the Add Hardware Wizard recognizes that the USB drivers have been installed. Be sure to allow the installation to complete without interrupting it.

For Windows 2000 and Windows XP users

When the dialog box to confirm the digital signature appears, select “Yes” for Windows 2000 users, or “Continue Anyway” for Windows XP users.

Viewing images recorded on the “Memory Stick”

- (1) Insert the “Memory Stick” into your camcorder.
 - (2) Connect the AC Adaptor, then set the POWER switch to **MEMORY**.
 - (3) Connect the Ψ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
- The USB MODE indicator appears on the LCD screen of your camcorder. The computer recognizes your camcorder, and the Add Hardware Wizard starts.



- (4) Follow the on-screen messages so that the Add Hardware Wizard recognizes that the USB drivers have been installed. Be sure to allow the installation to complete without interrupting it.

You cannot install the USB driver if the “Memory Stick” is not in your camcorder

Be sure to insert the “Memory Stick” into your camcorder before installing the USB driver.

Connecting your camcorder to a computer using the USB cable (For Windows users)

If you cannot install the USB driver

The USB driver has been registered incorrectly as the computer was connected to your camcorder before installation of the USB driver was complete. Follow the procedure below to correctly install the USB driver.

Viewing pictures recorded on the tape

Step 1: Uninstall the incorrect USB driver

- ① Turn on the computer and allow Windows to load.
- ② Connect the AC Adaptor and set the POWER switch to **(VCR)**.
- ③ Connect the USB port on the computer to the Ψ (USB) jack on your camcorder using the USB cable supplied.
- ④ Open the computer's "Device Manager."

Windows XP:

Select "Start" → "Control Panel" → "System" → "Hardware", and click the "Device Manager" button.

If there is no "System" inside "Pick a category" after clicking "Control Panel," click "Switch to classic view" instead.

Windows 2000:

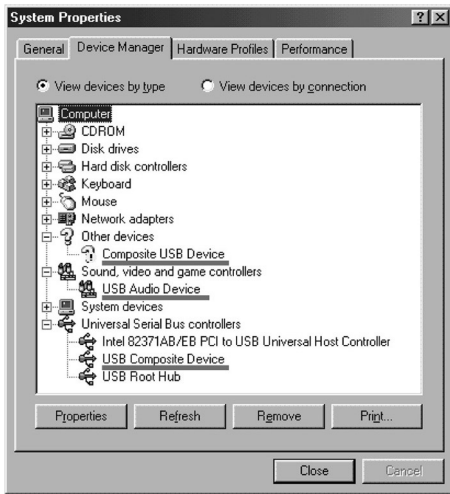
Select "My Computer" → "Control Panel" → "System" → "Hardware" tab, and click the "Device Manager" button.

Windows 98SE/Windows Me:

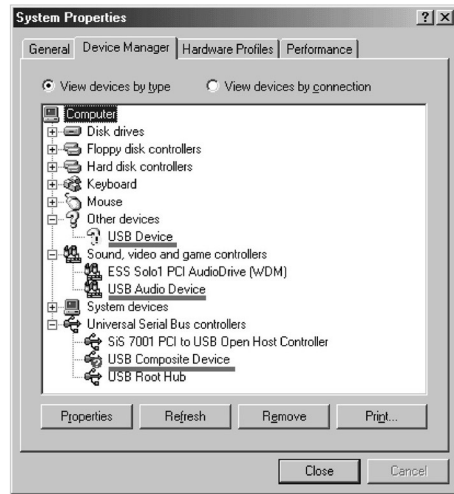
Select "My Computer" → "Control Panel" → "System," and click "Device Manager."

Connecting your camcorder to a computer using the USB cable (For Windows users)

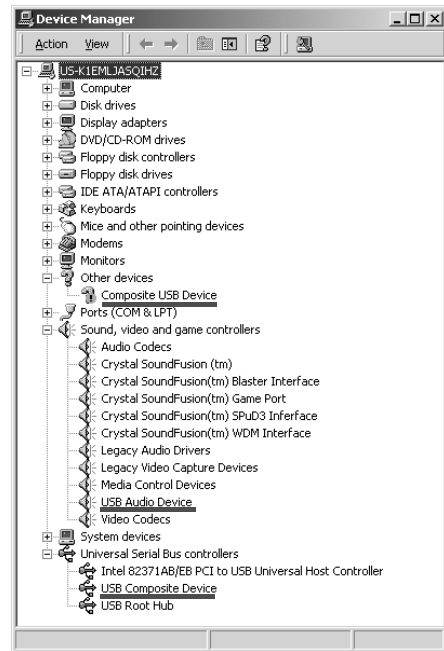
- ⑤ Select and delete the underlined devices below.



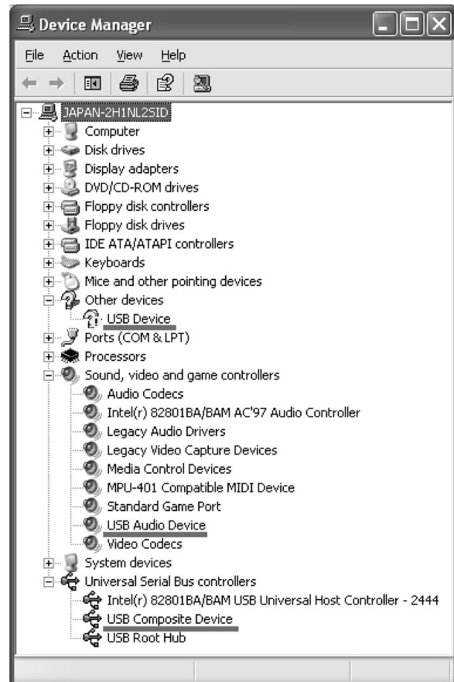
Windows 98SE



Windows Me



Windows 2000



Windows XP

Connecting your camcorder to a computer using the USB cable (For Windows users)

- ⑥ Set the POWER switch to OFF (CHG) on your camcorder, then disconnect the USB cable.
- ⑦ Restart the computer.

Step 2: Install the USB driver on the supplied CD-ROM

Follow the entire procedure in "Installing the USB driver" on page 164.

Viewing images recorded on the "Memory Stick"

Step 1: Uninstall the incorrect USB driver

- ① Turn on the computer and allow Windows to load.
- ② Insert the "Memory Stick" into your camcorder.
- ③ Connect the AC Adaptor and set the POWER switch to **(MEMORY)**.
- ④ Connect the USB port on the computer to the Ψ (USB) jack on your camcorder using the USB cable supplied.
- ⑤ Open the computer's "Device Manager."

Windows XP:

Select "Start" → "Control Panel" → "System" → "Hardware" tab and click the "Device Manager" button.

If there is no "System" inside "Pick a category" after clicking "Control Panel," click "Switch to classic view" instead.

Windows 2000:

Select "My Computer" → "Control Panel" → "System" → "Hardware," and click the "Device Manager" button.

Other OS:

Select "My Computer" → "Control Panel" → "System," and click "Device Manager."

- ⑥ Select "Other devices."
- Select the device prefixed with the "?" mark and delete.
e.g., (?)Sony Handycam
- ⑦ Set the POWER switch to OFF (CHG) on your camcorder, then disconnect the USB cable.
- ⑧ Restart the computer.

Step 2: Install the USB driver on the supplied CD-ROM

Follow the entire procedure in "Installing the USB driver" on page 164.

Viewing pictures recorded on a tape on a computer – USB Streaming (For Windows users)



Capturing images with “ImageMixer Ver.1.5 for Sony”

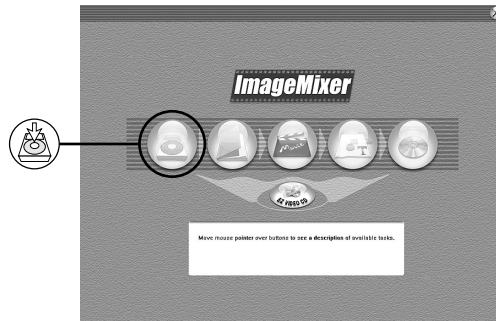
You need to install the USB driver and ImageMixer to view pictures recorded on the tape on a computer (p. 164, 167).

If you are using Windows 2000, log in with permission of Power Users or administrators.

If you are using Windows XP, log in with permission of computer administrators.

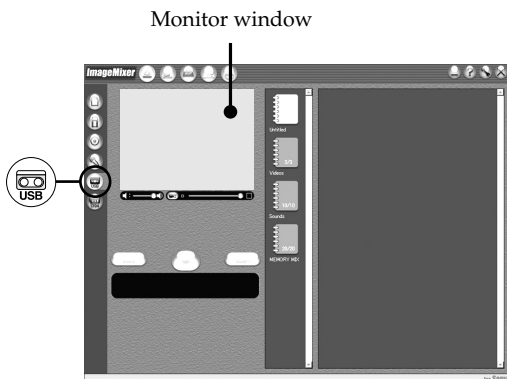
Viewing pictures recorded on the tape

- (1) Turn on the computer and allow Windows to load.
- (2) Connect the AC Adaptor, then insert the cassette into your camcorder.
- (3) Set the POWER switch to (VCR).
- (4) Press FN to display PAGE1.
- (5) Press MENU to display the menu.
- (6) Select USB STREAM in , then press EXEC (p. 199).
- (7) Select ON, then press EXEC.
- (8) Select “Start” → “Programs” → “PIXELA” → “ImageMixer” → “ImageMixer Ver.1.5 for Sony.”
The “ImageMixer Ver.1.5 for Sony” startup screen appears on the computer.
The title screen appears.
- (9) Click  on the screen.

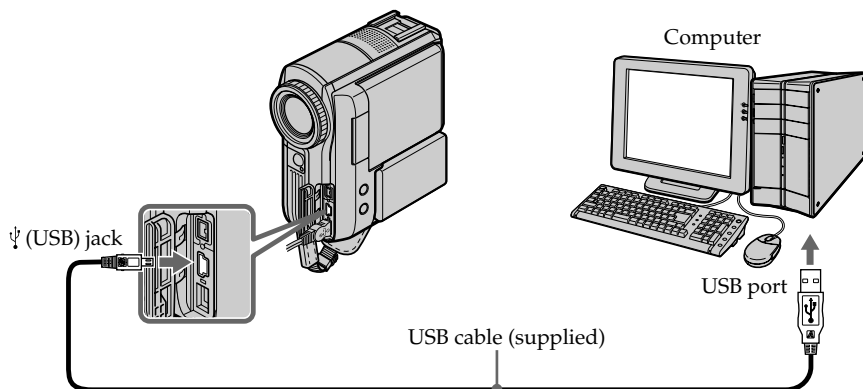


Viewing pictures recorded on a tape on a computer – USB Streaming (For Windows users)


(10) Click .



(11) Connect the Ψ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.

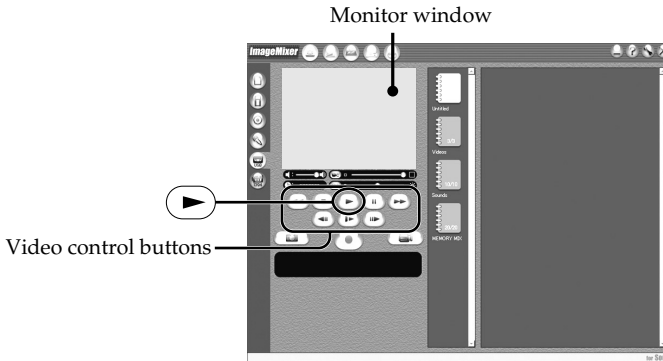


Viewing pictures recorded on a tape on a computer – USB Streaming (For Windows users)

- (12) Click  to start playback.

You can control video operations with the buttons on the screen.

The picture from the tape appears on the monitor window on the computer.

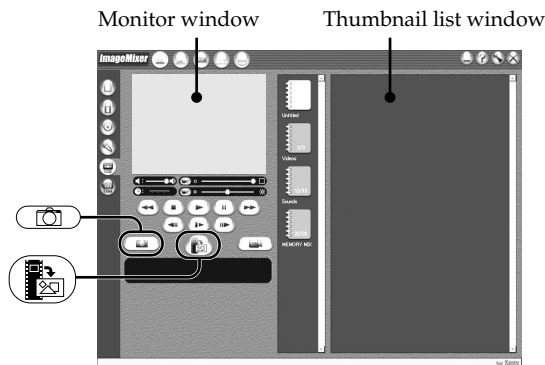




Viewing pictures live from your camcorder

- (1) Follow steps 1 and 2 on page 173.
(2) Set the POWER switch to CAMERA.
(3) Follow steps 4 to 11 on pages 173 and 174.

The picture from your camcorder appears on the monitor window on the computer.

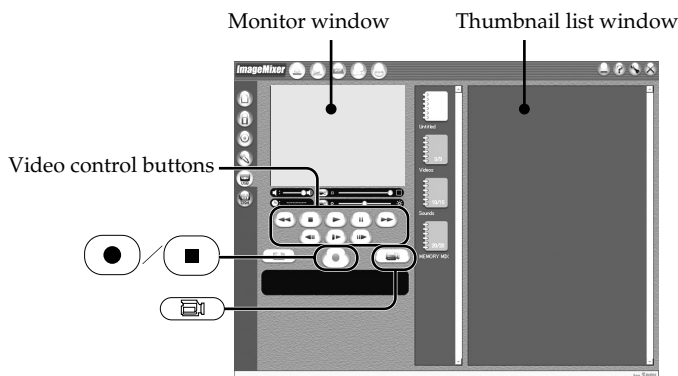
Capturing still images









- (1) Click  .
(2) Looking at the monitor window, move the cursor to  and click it at the point you want to capture.
The still image on the screen is captured.
Captured images appear in the thumbnail list window.

Viewing pictures recorded on a tape on a computer – USB Streaming (For Windows users)


Capturing moving pictures



- (1) Click .
- (2) Click the album in which you want to capture the movie.
- (3) Click  to start playback.
- (4) Looking at the monitor window, click  at the first scene of the movie you want to capture.  changes to .
- (5) Looking at the monitor window, click  at the last scene you want to capture.

The moving picture is captured. The captured images appear in the thumbnail list window.

To close "ImageMixer"

Click  in the upper right corner of the screen.

Viewing pictures recorded on a tape on a computer

– USB Streaming (For Windows users)

Notes

- When you view images on a computer with the USB connection, the following may occur. This is not a malfunction.
 - The image shakes up and down.
 - Some images are not displayed correctly due to noise, etc.
 - Some images are displayed with a cracking noise.
 - Images of different color systems to that of your camcorder are not displayed correctly.
- When your camcorder is in standby with a cassette inserted, it turns off automatically after 5 minutes.
- We recommend setting DEMO MODE to OFF in the menu settings when your camcorder is in standby, and no cassette is inserted.
- Indicators on the screen of your camcorder do not appear on images that are captured into the computer.
- If you capture a fast moving picture, the preview window may not move smoothly. You can make the picture move more smoothly by shifting the upper right slider on the bottom of the monitor window to the left, although this deteriorates the picture quality.
- You cannot carry out any “Memory Stick” operations during USB Streaming.

If image data cannot be transferred by the USB connection

The USB driver has been registered incorrectly as the computer was connected to your camcorder before installation of the USB driver was complete. Reinstall the USB driver following the procedure on page 170.

If any trouble occurs

Close all running applications, then restart the computer.

Carry out the following operations after quitting the application:



- Disconnect the USB cable.
- Turn the POWER switch to another position on your camcorder.

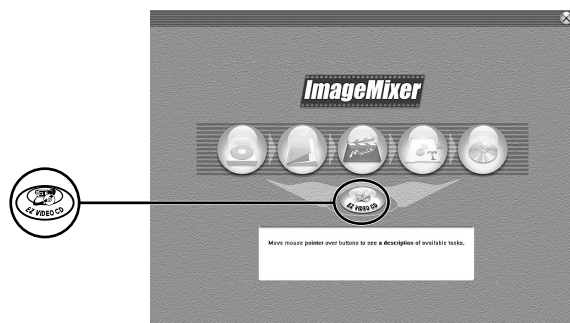
Viewing pictures recorded on a tape on a computer – USB Streaming (For Windows users)

Making Video CDs – Easy Video CD

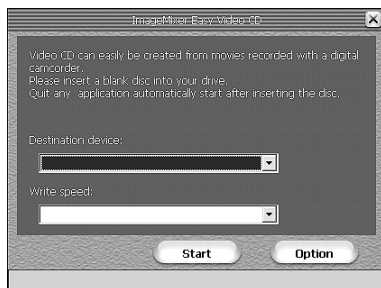
This function makes it simple to create a video CD by capturing images recorded on a tape or images live from your camcorder.

Capturing images recorded on a tape onto a CD-R

- (1) Follow steps 1 to 8 on page 173.
- (2) Press  after choosing the point on the tape from which you want to capture images onto the CD-R.
- (3) Click .



- (4) Connect the Ψ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
- (5) Insert a new CD-R in the CD-R drive of the computer.
- (6) Click “Start.”



The tape is automatically played back. Easy Video CD automatically begins to capture images onto the CD-R to create a Video CD.

- (7) After the “Video CD successfully created.” message appears, click “Quit.”

Capturing images live from your camcorder onto a CD-R

Before operation

Eject the cassette. If you leave your camcorder in standby for 5 minutes while the cassette is inserted, your camcorder automatically turns off.

- (1) Follow steps 1 and 2 on page 173.
- (2) Set the POWER switch to **(CAMERA)** on your camcorder.
- (3) Follow steps 4 to 8 on page 173.
- (4) Follow steps 3 to 7 in “Capturing images recorded on a tape onto a CD-R” on page 178.

Notes

- A computer equipped with a CD-R drive is required.
- Do not press the buttons on your camcorder while creating a Video CD. If you press **[]**, only images up to that point are captured onto the Video CD and Easy Video CD is closed.
- Once a disc has been created, you cannot add images to it.
- Select a hard disk with sufficient memory (at least 6 GB) from the “Option” screen as a location for the “Location of work folder.”
- CD-RWs cannot be used.

Playing back Video CDs

You can use a DVD player or a computer with a DVD drive to play back the Video CDs you create.

To play back Video CDs on a computer, you need to have Video CD software installed.

You can play back Video CDs with Windows Media Player. However, you cannot use menu functions such as capturing function. You also may not be able to play back Video CDs in certain computer environment such as OS or hardware.

- (1) Start up Windows Media Player.

Windows XP:

Select “Start” → “All Programs” → “Accessory” → “Entertainment,” and click “Windows Media Player.”

Other OS:

Select “Start” → “Programs” → “Accessory” → “Entertainment,” and click “Windows Media Player.”

- (2) Select “My computer” → “CD-R,” and click “MPEGAV” folder, then drag and drop the “□□□*.DAT” moving picture file onto the Media Player screen.
The moving picture will be played back.

* The file name is displayed in the □□□.

Viewing pictures recorded on a tape on a computer – USB Streaming (For Windows users)

Created Video CDs


The maximum recording time is about 1 hour. Capturing is divided into segments of about 10 minutes (about 4 GB) due to the specifications of the AVI capturing format. As a result, recording includes segment links about every 10 minutes, at which point images are skipped for several seconds.

Seeing the on-line help (operating instructions) of ImageMixer

An “ImageMixer Ver.1.5 for Sony” on-line help site is available where you can find the detailed information about “ImageMixer Ver.1.5 for Sony.”

- (1) Click the (?) located in the upper-right corner of the screen.
The ImageMixer’s Manual screen appears.
- (2) You can find the information you need from the list of contents.

To close on-line help

Click  in the upper right corner of the screen.

If you have any questions about ImageMixer

“ImageMixer Ver.1.5 for Sony” is the product of PIXELA corporation. For details, refer to the operating instructions of the CD-ROM supplied with your camcorder.

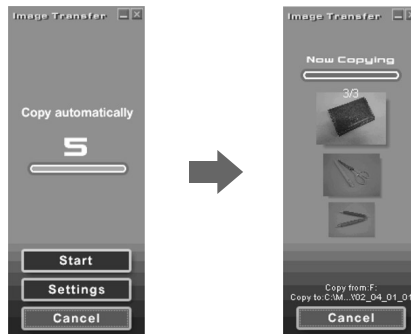
Viewing images recorded on a “Memory Stick” on a computer (For Windows users)

The image data recorded on the “Memory Stick” is automatically transferred (copied) to a computer with Image Transfer. You can view images with ImageMixer.

Before operation

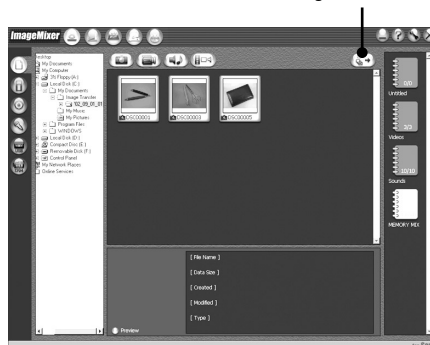
You need to install the USB driver, Image Transfer and ImageMixer to view the “Memory Stick” images on a computer.

- (1) Turn on your computer and allow Windows to load.
- (2) Insert the “Memory Stick” into your camcorder, then connect the AC Adaptor to your camcorder.
- (3) Set the POWER switch to **MEMORY**.
- (4) Connect the Ψ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
- (5) Image Transfer automatically starts up and the transfer of image data begins.



- (6) ImageMixer automatically starts up, enabling you to view the copied image.

Import button



- (7) Select an album and the image, then click the import button. The image is added in your album. You can edit the image.

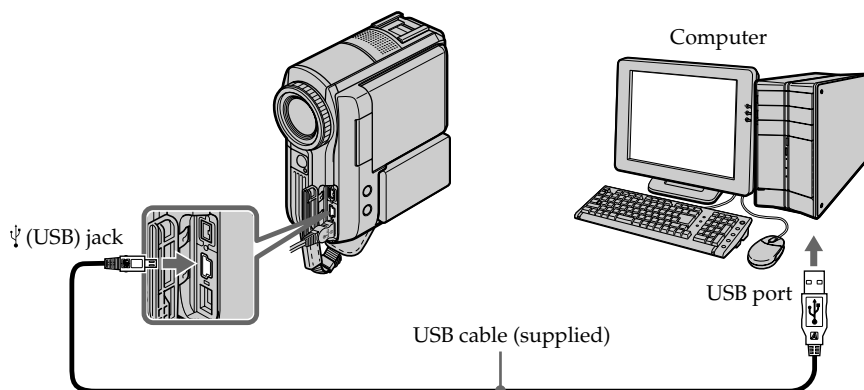
Viewing images recorded on a “Memory Stick” on a computer (For Windows users)

Viewing images without Image Transfer

Before operation

- You need to install the USB driver to view the “Memory Stick” images on a computer (p. 164).
- An application such as Windows Media Player must be installed to play back moving pictures in Windows environment.

- (1) Turn on the computer and allow Windows to load.
 - (2) Insert the “Memory Stick” into your camcorder, then connect the AC Adaptor to your camcorder.
 - (3) Set the POWER switch to **MEMORY**.
 - (4) Connect the Ψ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
- The USB MODE indicator appears on the screen of your camcorder.



- (5) Open “My Computer” on Windows and double-click the newly recognized drive (e.g., “Removable Disk (F:)”).
The folders inside the “Memory Stick” appear.
- (6) Double-click a desired image file from the folder in this order.
“DCIM” folder → “□□□MSDCF” folder*¹⁾ → Image file*²⁾
See “Image file storage destinations and image files” (p. 183), for the detailed folder and file name.

*¹⁾ □□□ stands for any number within the range from 101 to 999.

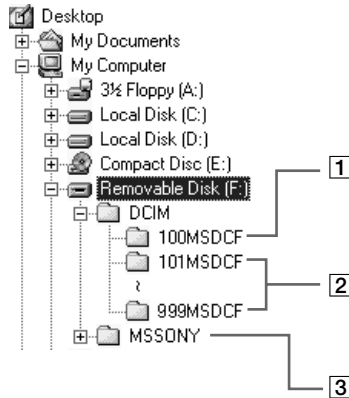
*²⁾ Copying a file to the hard disk of the computer before viewing it is recommended. If you play back the file directly from the “Memory Stick,” the image and sound may break off.

Viewing images recorded on a “Memory Stick” on a computer (For Windows users)

Image file storage destinations and image files

Image files recorded with your camcorder are grouped in the folders in the “Memory Stick.” The meanings of the file names are as follows. □□□□ stands for any number within the range from 0001 to 9999.

Example: For Windows Me users
(The drive recognizing your camcorder is [F:].)



- 1 Folder containing image files recorded using other camcorders without the folder creation function (for playback only)
- 2 Folder containing image files recorded with your camcorder. When no new folders have been created, this is only “101MSDCF.”
- 3 Folder containing moving picture data recorded using other camcorders without the folder creation function (for playback only)

Folder	File	Meaning
101MSDCF (up to 999MSDCF)	DSC0□□□□.JPG	Still image file
	MOV0□□□□.MPG	Moving picture file

Disconnect the USB cable and remove the “Memory Stick” or set the POWER switch to OFF (CHG)

For Windows 2000, Windows Me, or Windows XP users

- (1) Move the cursor to “Unplug or Eject Hardware” on the Task Tray and click to cancel the applicable drive.
- (2) After the “Safe to remove” message appears, disconnect the USB cable and remove the “Memory Stick” or set the POWER switch to OFF (CHG).

Connecting your camcorder to a computer using the USB cable (For Macintosh users)

When connecting to a computer with the USB cable

You must **install a USB driver** onto a computer to connect your camcorder to the computer's USB port. The USB driver can be found on the CD-ROM supplied, along with the application software required for viewing images.

System requirements

Mac OS 8.5.1/8.6/9.0/9.1/9.2 or Mac OS X (v10.0/v10.1/v10.2) standard installation is required.

However, note that the update to Mac OS 9.0/9.1 should be used for the following models:

- iMac with the Mac OS 8.6 standard installation and a slot loading type CD-ROM drive
- iBook or Power Mac G4 with the Mac OS 8.6 standard installation

The USB port must be provided as standard.

QuickTime 3.0 or later must be installed to play back moving pictures.

Notes

- Operations are not guaranteed for the Macintosh environment if you connect 2 or more USB equipment to a single computer at the same time, or when using a hub.
- Some equipment may not operate depending on the type of USB equipment that is used simultaneously.
- Operations are not guaranteed for all the recommended computer environments mentioned above.
- Macintosh, iMac, iBook, Power Mac, Mac OS and QuickTime are trademarks of Apple Computer Inc.
- 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.

Installing the USB driver

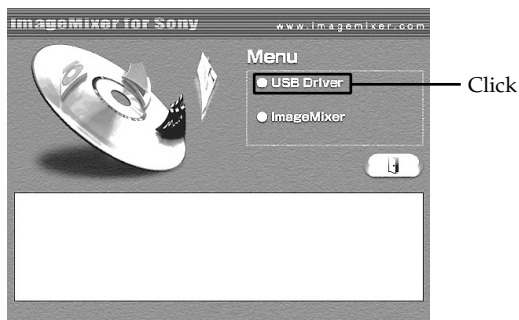
Do not connect the USB cable to a computer before installation of the USB driver is complete.

For Mac OS 8.5.1/8.6/9.0 users

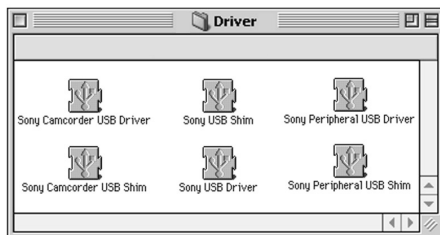
- (1) Turn on the computer and allow the Mac OS to load. Or, if Mac OS is already running, close all active applications.
- (2) Insert the supplied CD-ROM in the CD-ROM drive of the computer.
The application software screen appears.
- (3) Select “Handycam” on the screen.
The title screen appears.

Connecting your camcorder to a computer using the USB cable (For Macintosh users)

- (4) Click the “USB Driver” to open the folder containing the 6 files related to “Driver.”



- (5) Select the following 2 files, and drag and drop them into the System Folder.
- Sony Camcorder USB Driver
 - Sony Camcorder USB Shim



- (6) When the message appears, click “OK.”
The USB driver is installed on the computer.
- (7) Remove the CD-ROM from the computer.
- (8) Restart the computer.

For Mac OS 9.1/9.2/Mac OS X (v10.0/v10.1/v10.2)

The USB driver need not be installed. Your camcorder is automatically recognized as a drive just by connecting your Mac using the USB cable.

Viewing images recorded on a “Memory Stick” on a computer (For Macintosh users)

Viewing images

Before operation

- You need to install the USB driver to view the “Memory Stick” images on a computer (p. 164).
- QuickTime 3.0 or later must be installed to play back moving pictures.

- (1) Turn on the computer and allow Mac OS to load.
- (2) Insert the “Memory Stick” into your camcorder, then connect the AC Adaptor to your camcorder.
- (3) Set the POWER switch to **(MEMORY)**.
- (4) Connect the Ψ (USB) jack on your camcorder to the USB port on the computer using the supplied USB cable.
The USB MODE indicator appears on the screen of your camcorder.
- (5) Double-click the “Memory Stick” icon on the desktop.
The folders inside the “Memory Stick” are displayed.
- (6) Double-click the desired image file from the folder in this order.
“DCIM” folder → “□□□MSDCF” folder^{*1)} → Image file^{*2)}

^{*1)} □□□ stands for any number within the range from 101 to 999.

^{*2)} Copying a file to the hard disk of the computer before viewing it is recommended. If you play back the file directly from the “Memory Stick,” the image and sound may break off.

Disconnect the USB cable and remove the “Memory Stick” or set the POWER switch to OFF (CHG)

- (1) Close all running applications.
Make sure that the “Memory Stick” access lamp of your camcorder is not lit.
- (2) Drag the “Memory Stick” icon into the “Trash.” Alternatively, select the “Memory Stick” icon by clicking it, then select “Eject disk” from the “Special” menu at the top left of the screen.
- (3) Disconnect the USB cable and remove the “Memory Stick” or set the POWER switch to OFF (CHG).

For Mac OS X (v10.0) users

Shut down the computer, then disconnect the USB cable and remove the “Memory Stick” or set the POWER switch to OFF (CHG).

Capturing images from an analog video unit on a computer – Signal convert function

You can capture images and sound from an analog video unit on the computer which has a DV port by transmitting data via your camcorder. The supplied A/V connecting cable is equipped with an S video plug and a video plug. Change the setting for the jack depending on the VCR. See page 48 for details about the S video jack.

Before operation

Set DISPLAY in **ETC** to LCD in the menu settings. (The default setting is LCD.)

The POWER switch should be set to **VCR**.

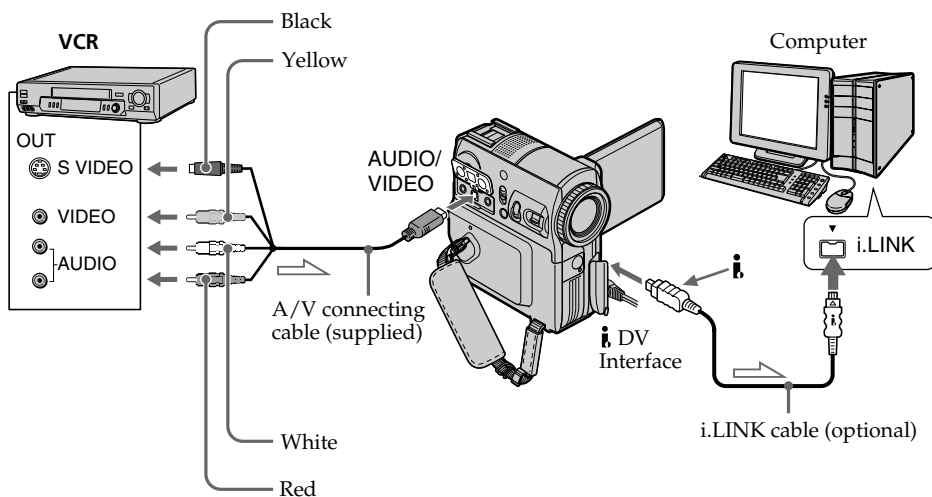
Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU.
- (3) Select VIDEOINPUT in **VIEW**, then press EXEC.
- (4) To use the video jack, select VIDEO, or to use the S video jack, select S VIDEO, then press EXEC. The default setting is VIDEO.
- (5) Select A/V → DV OUT in **VIEW**, then press EXEC.
- (6) Select ON, then press EXEC.
- (7) Start playback on the analog video unit.
- (8) Start capturing procedures on the computer.

The operation procedures depend on the computer and the software which you use.

For details on how to capture images, refer to the operating instructions of the computer and software.

Viewing Images with your Computer



Capturing images from an analog video unit on a computer – Signal convert function

After capturing images and sound

Stop capturing procedures on the computer, and stop playback on the analog video unit.

Notes

- You need the software and computer that support the exchange of digital video signals.
- Depending on the condition of the analog video signals, the computer may not be able to output images correctly when you convert video signals into digital video signals via your camcorder. Depending on the analog video unit, the image may contain noise or incorrect colors.
- You cannot record or capture video output via your camcorder when the video tapes include copyright protection signals.

If the computer has a USB port

You can connect using a USB cable, but images may not be transferred smoothly.

Copying images to DVD with VAIO

By connecting your camcorder to a Sony VAIO series personal computer*, it is easy to copy images recorded on a tape onto a DVD. Rewinding of the tape, capturing of images and DVD burning are all done automatically.

Use an i.LINK cable (optional) for the connection. Because it takes several hours to create a DVD, powering your camcorder from the AC outlet using the supplied AC Adaptor is recommended.

* The computer must be equipped with a DVD-R drive and "Click to DVD" (Sony original software) Ver.1.2 or later must be installed. For details, refer to the on-line help of "Click to DVD Automatic Mode." This function can only be used with Sony VAIO series personal computers. Furthermore, this function cannot be used with some Sony VAIO models, in some countries or regions. For details of compatible models of computer or system requirements, refer to the following websites:

– the U.S.A.

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

– Canada

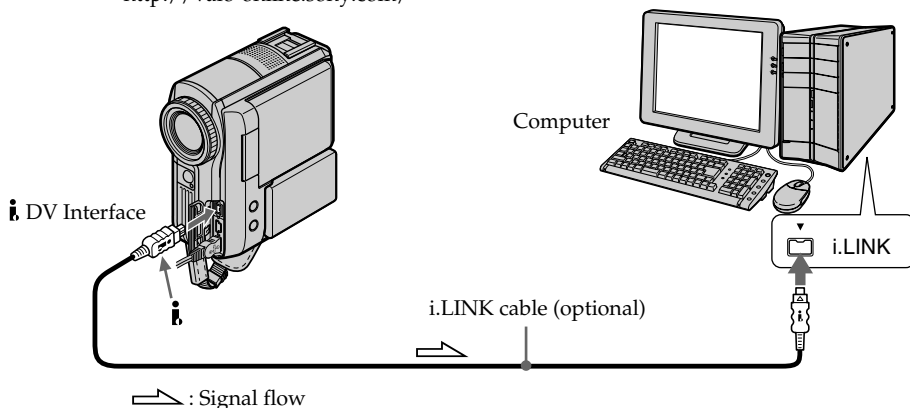
<http://www.sonymstyle.ca/>

– Latin America

<http://vaio-online.sony.com/>

– Asia

<http://vaio-online.sony.com/>



Viewing Images with your Computer

Before operation

Turn on the computer and configure it for connection to your camcorder. If any applications using the i.LINK connection are running, close them.

The POWER switch should be set to **(VCR)**.

Operate by touching the panel.

- (1) Insert a recorded tape into your camcorder.
- (2) Connect your camcorder to the computer with the i.LINK cable.
- (3) Press FN and select PAGE2.
- (4) Press BURN DVD. "Click to DVD" starts automatically on the computer.
- (5) Insert a DVD into the DVD drive of the computer.

Copying images to DVD with VAIO

- (6) Press EXEC on the touch panel of your camcorder.

Do not disconnect the i.LINK cable or set the POWER switch to OFF (CHG) until capturing of images has completed.

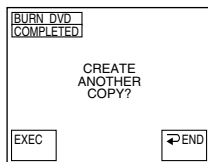
The operating status of the computer appears in the screen of your camcorder.

CAPTURING: Images on the tape are being captured.

CONVERTING: Captured images are being converted to DVD format.

WRITING: Converted images are being burned to the DVD.

Completion screen



To burn the same images to another DVD, insert another DVD into the DVD drive of the computer, then press EXEC.

If you press EXEC before inserting another DVD, the disk tray will open automatically.

To cancel creating a DVD

Press CANCEL after step 4. Alternatively, press CANCEL in step 6, then press CANCEL.

While WRITING and FINALIZING DVD are displayed, the computer will not cancel creating a DVD.

To exit the DVD creating function

Press END on the completion screen in step 6. The disk tray opens automatically.

In the following cases, the computer will cancel capturing of images and the DVD will be created with images that have been currently captured. Refer to the on-line help of "Click to DVD Automatic Mode."

- A blank portion of over 10 seconds on the tape is detected.
- A recording date older than the previous image is detected.
- A change of image ratio (from normal to wide, or vice versa) is detected.

Even if you disconnect the i.LINK cable or set the POWER switch to OFF (CHG) while CONVERTING or WRITING is displayed

The computer continues creating a DVD.

If you use a DVD-RW that already has data stored

RECORDED DISC DELETE AND OVERWRITE? appears. If you press EXEC, the existing data is erased and new data will be recorded.

The DVD creating function cannot be operated from your camcorder in the following cases:

- While the tape is running.
- While images are being recorded on a "Memory Stick."
- Set A/V → DV OUT in to ON in the menu settings.
- When "Click to DVD" has been started on the computer.

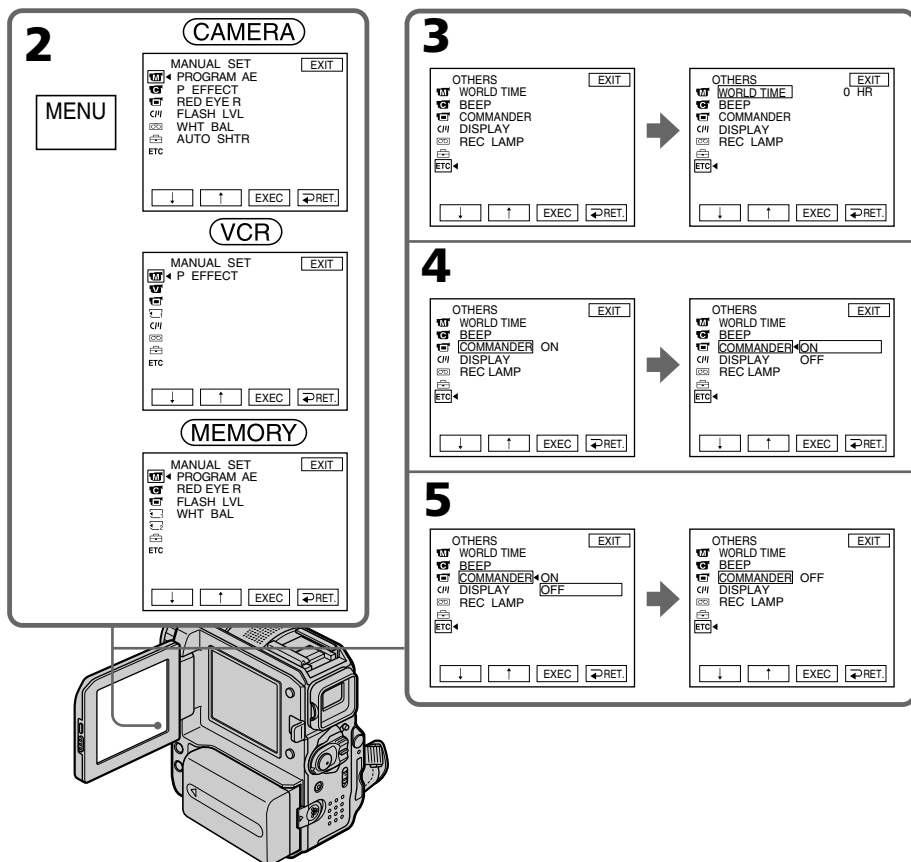
Changing the menu settings

To change the mode settings in the menu settings, select the menu items with \downarrow/\uparrow . The default settings can be partially changed. First, select the icon, then the menu item and the mode.

The POWER switch should be set to **(CAMERA)**, **(VCR)** or **(MEMORY)**. Operate by touching the panel.

- (1) Press FN to display PAGE1.
- (2) Press MENU to display the menu.
- (3) Press \downarrow/\uparrow to select the desired icon, then press EXEC.
- (4) Press \downarrow/\uparrow to select the desired item, then press EXEC.
- (5) Press \downarrow/\uparrow to select the desired setting, then press EXEC.
- (6) Repeat steps 3 to 5 if you want to change other items. Press \rightarrow RET. to return to step 3.

For details, see “Selecting the mode setting of each item” (p. 192).



Changing the menu settings

To return to FN













Press EXIT.

Menu items are displayed as the following icons:

	MANUAL SET
	CAMERA SET
	VCR SET
	LCD/VF SET
	MEM SET 1
	MEM SET 2
	CM SET
	TAPE SET
	SETUP MENU
	OTHERS

Selecting the mode setting of each item ● is the default setting.

Menu items differ depending on the position of the POWER switch.
The screen shows only the items you can operate at the moment.

Icon/item	Mode	Meaning	POWER switch
 MANUAL SET			
PROGRAM AE	—	To suit your specific shooting requirement (p. 64)	 
P EFFECT	—	To add special effects like those in movies or on the TV to images (p. 60, 76)	 
RED EYE R	● OFF	Red-eye reduction does not function	
	ON	Preliminary flash before recording prevents red-eye	
FLASH LVL	HIGH	To make the flash level higher than normal	
	● NORMAL	To use the normal setting	
	LOW	To make the flash level lower than normal	
WHT BAL	—	To adjust the white balance (p. 53)	 
AUTO SHTR	● ON	To automatically activate the electronic shutter when shooting in bright conditions	
	OFF	Not to activate the electronic shutter even when shooting in bright conditions	




Note on RED EYE R and FLASH LVL

You cannot adjust RED EYE R and FLASH LVL if the external flash (optional) is not compatible.

Note on the electronic shutter

The electronic shutter is the function of adjusting the shutter speed electronically.


Changing the menu settings

Icon/item	Mode	Meaning	POWER switch
 CAMERA SET			
D ZOOM	● OFF	To deactivate the digital zoom. Up to 10× zoom is carried out.	(CAMERA)
	20×	To activate the digital zoom. More than 10× to 20× zoom is performed digitally (p. 35).	
	120×	To activate the digital zoom. More than 10× to 120× zoom is performed digitally.	
16:9WIDE	● OFF	To not record a 16:9 wide picture	(CAMERA)
	ON	To record a 16:9 wide picture (p. 55)	
STEADYSHOT	● ON	To compensate for camera-shake	(CAMERA)
	OFF	To cancel SteadyShot. Natural pictures are produced when shooting a stationary subject with a tripod.	
EDITSEARCH	● OFF	Not to display  / - · + on the LCD screen	(CAMERA)
	ON	To display  / - · + on the LCD screen (p. 41)	
N.S. LIGHT	● ON	To use the NightShot Light (p. 38)	(CAMERA)
	OFF	To cancel the NightShot Light	(MEMORY)

Notes on SteadyShot


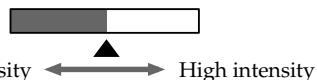
- SteadyShot may not correct excessive camera-shake.
- Attachment of a conversion lens (optional) may interfere with the SteadyShot function.

If you cancel SteadyShot

The  (SteadyShot off) indicator appears. Your camcorder prevents excessive compensation for camera-shake.

(continued on the following page)

Changing the menu settings

Icon/item	Mode	Meaning	POWER switch
VCR SET			
HiFi SOUND	● STEREO	To play back a stereo tape or dual sound track tape with main and sub sound (p. 214)	(VCR)
	1	To play back a stereo tape with the left sound or dual sound track tape with main sound	
	2	To play back a stereo tape with the right sound or dual sound track tape with sub sound	
AUDIO MIX	—	To adjust the balance between stereo 1 and stereo 2 (p. 105)	(VCR)
			
A/V → DV OUT	● OFF	To output digital images and sound in analog format using your camcorder	(VCR)
	ON	To output analog images and sound in digital format using your camcorder (p. 187)	
VIDEOINPUT	● VIDEO	To use the video plug of the A/V connecting cable when recording from a player	(VCR)
	S VIDEO	To use the S video plug of the A/V connecting cable when recording from a player	
LCD/VF SET			
LCD B.L.	● BRT NORMAL	To set the brightness on the LCD screen normal	(VCR)
	BRIGHT	To brighten the LCD screen	(CAMERA) (MEMORY)
LCD COLOR	—	To adjust the color on the LCD screen with ↓/↑	(VCR)
			(CAMERA) (MEMORY)
VF B.L.	● BRT NORMAL	To set the brightness on the viewfinder screen to normal	(VCR)
	BRIGHT	To brighten the viewfinder screen	(CAMERA) (MEMORY)



Notes on LCD B.L. and VF B.L.

- When you select BRIGHT, battery life is reduced by about 10 percent during recording.
- When you use power sources other than the battery pack, BRIGHT is automatically selected.

Even if you adjust LCD B.L., LCD COLOR and VF B.L.

The recorded picture will not be affected.


Changing the menu settings

Icon/item	Mode	Meaning	POWER switch
 MEM SET 1			
STILL SET			
BURST	● OFF	Not to record continuously	(MEMORY)
	NORMAL	To record from 4 to 13 images continuously (p. 122)	
	EXP BRKTG	To record 3 images continuously with different exposure	
QUALITY	● FINE	To record still images in the fine image quality mode (p. 116)	(VCR) (MEMORY)
	STANDARD	To record still images in the standard image quality mode	
IMAGESIZE	● 1152 × 864	To record still images in 1152 × 864 size (p. 117)	(MEMORY)
	640 × 480	To record still images in 640 × 480 size	
MOVIE SET			
IMAGESIZE	● 320 × 240	To record moving pictures in 320 × 240 size (p. 118)	(VCR) (MEMORY)
	160 × 112	To record moving pictures in 160 × 112 size	
 REMAIN	● AUTO	To display the remaining capacity of the “Memory Stick” in the following cases: <ul style="list-style-type: none"> For 5 seconds after setting the POWER switch to MEMORY or VCR and inserting the “Memory Stick” When the remaining capacity of the “Memory Stick” is less than 2 minutes after setting the POWER switch to MEMORY For 5 seconds from the start of moving picture recording For 5 seconds after completing moving picture recording 	(VCR) (MEMORY)
	ON	To always display the remaining capacity of the “Memory Stick”	
NEW FOLDER	● ADD	To create a new folder (p. 142)	(MEMORY)
	RETURN	To cancel creating a new folder	
REC FOLDER	—	To choose a recording folder (p. 143)	(MEMORY)
FILE NO.	● SERIES	To assign numbers to files in sequence even if the “Memory Stick” is changed. However, the file number sequence is reset when a new folder is created or the recording folder is changed.	(VCR) (MEMORY)
	RESET	To reset the file numbering each time the “Memory Stick” is changed	

When you select image quality

The number of images you can shoot in the currently selected image quality appears on the screen.

Changing the menu settings












Icon/item	Mode	Meaning	POWER switch
 MEM SET 2			
SLIDE SHOW	RETURN	To cancel slide show	(MEMORY)
	● ALL FILES	To play back all the images on the "Memory Stick" continuously	
	FOLDER □□□*	To play back all the images in the selected playback folder continuously	
INT. R -STL	ON	To activate Interval Photo Recording (p. 132)	(MEMORY)
	● OFF	To deactivate Interval Photo Recording	
	SET	To set INTERVAL for Interval Photo Recording	
DELETE ALL	● RETURN	To cancel deleting all the image	(MEMORY)
	ALL FILES	To delete all the unprotected images (p. 157)	
	FOLDER □□□*	To delete all the images in the selected playback folder	
FORMAT	● RETURN	To cancel formatting	(MEMORY)
	OK	To format the inserted "Memory Stick." Formatting erases all information on the "Memory Stick." Check the contents of the "Memory Stick" before formatting. 1. Select FORMAT, then press EXEC. 2. Select OK, then press EXEC. 3. After the EXECUTE indicator appears, press EXEC. The FORMATTING indicator flashes during formatting. The COMPLETE indicator appears when formatting is complete.	

* The folder name is displayed in the □□□.

Notes on formatting




- Do not do any of the following while the FORMATTING indicator appears:
 - Turn the POWER switch to another position.
 - Operate buttons.
 - Remove the "Memory Stick."
- The "Memory Stick" has been formatted at factory. Formatting with your camcorder is not required.
- You cannot format the "Memory Stick" if the write-protect tab on the "Memory Stick" is set to LOCK.
- Format the "Memory Stick" if the "FORMAT ERROR" indicator appears.
- Formatting erases sample images on the supplied "Memory Stick."
- Formatting erases protected image data on the "Memory Stick."
- Formatting erases created folders.

Changing the menu settings

Icon/item	Mode	Meaning	POWER switch
 CM SET			
TITLE	—	To superimpose a title or make your own title (p. 106, 109)	 
TITLEERASE	—	To erase the title you have superimposed (p. 108)	 
TITLE DSPL	● ON	To display the title you have superimposed	
	OFF	To not display the title (p. 107)	
CM SEARCH	● ON	To search using Cassette Memory (p. 81, 82)	
	OFF	To search without using Cassette Memory (p. 83)	
TAPE TITLE	—	To label the cassette (p. 110)	 
ERASE ALL	● RETURN	To cancel erasing all the data	
	OK	To erase all the data in Cassette Memory (p. 111)	

(continued on the following page)

Changing the menu settings

Icon/item	Mode	Meaning	POWER switch
 TAPE SET			
REC MODE	● SP	To record in the SP (Standard Play) mode	(VCR)
	LP	To increase the recording time to 1.5 times the SP mode	(CAMERA)
AUDIO MODE	● 12BIT	To record in the 12-bit mode (2 stereo sounds)	(VCR)
	16BIT	To record in the 16-bit mode (1 stereo sound with high quality)	(CAMERA)
 REMAIN	● AUTO	To display the remaining tape. • For about 8 seconds after setting the POWER switch to VCR or CAMERA and inserting a cassette, then your camcorder calculates the remaining amount of tape • For about 8 seconds after  is pressed	(VCR) (CAMERA)
	ON	To always display the remaining tape indicator	
FRAME REC	● OFF	To deactivate frame recording	(CAMERA)
	ON	To activate frame recording (p. 73)	
INT. REC	ON	To activate Interval Recording (p. 71)	(CAMERA)
	● OFF	To deactivate Interval Recording	
	SET	To set INTERVAL and REC TIME for Interval Recording	










Notes on the LP mode

- When you record the tape in the LP mode on your camcorder, we recommend playing back the tape on your camcorder. When you play back the tape on another camcorder or VCRs, noise may occur in pictures or sound.
- When you record in the LP mode, we recommend using a Sony Excellence/Master mini DV cassette so that you can get the most out of your camcorder.
- You cannot make audio dubbing on the tape recorded in the LP mode. Use the SP mode for the tape to be audio dubbed.
- When you record in the SP and LP modes on one tape or you record some scenes in the LP mode, the playback picture may be distorted or the time code may not be written properly between scenes.

Notes on AUDIO MODE

- You cannot dub audio sound when AUDIO MODE is set to 16BIT.
- When playing back the tape recorded in the 16-bit mode, you cannot adjust the balance of AUDIO MIX.

Changing the menu settings

Icon/item	Mode	Meaning	POWER switch
 SETUP MENU			
CLOCK SET	—	To set the date or time (p. 23)	 
USB STREAM	● OFF	To deactivate the USB Streaming function	
	ON	To activate the USB Streaming function	
LANGUAGE	● ENGLISH	To display the information indicators in English	
	FRANÇAIS	To display the information indicators in French	
	ESPAÑOL	To display the information indicators in Spanish	
	PORTUGUÊS	To display the information indicators in Portuguese	
	中文	To display the information indicators in Chinese	
	한국어	To display the information indicators in Korean	
DEMO MODE	● ON	To make the demonstration appear	
	OFF	To cancel the demonstration mode	

Notes on DEMO MODE

- You cannot select DEMO MODE when the cassette or the “Memory Stick” is inserted in your camcorder.
- When NIGHTSHOT is slid to ON, the “NIGHTSHOT” indicator appears on the screen and you cannot select DEMO MODE in the menu settings.
- If you press the touch panel during the demonstration, the demonstration stops for a while, then it starts again after about 10 minutes.
- DEMO MODE is set to STBY (Standby) at the default setting and the demonstration starts about 10 minutes after you have set the POWER switch to CAMERA without the cassette and the “Memory Stick” inserted.
To cancel the demonstration, insert a cassette or a “Memory Stick,” set the POWER switch to anything other than CAMERA, or set DEMO MODE to OFF in the menu settings. To set to STBY (Standby) again, leave the DEMO MODE at ON in the menu settings, set the POWER switch OFF (CHG), then back to CAMERA.

(continued on the following page)

Changing the menu settings

Icon/item	Mode	Meaning	POWER switch
ETC OTHERS			
WORLD TIME	—	To set the clock to the local time. Press ↓/↑ to set a time difference. The clock changes by the time difference you set here. If you set the time difference to 0, the clock returns to the originally set time.	(CAMERA) (MEMORY)
BEEP	● MELODY	To output the melody when you start/stop recording or when an unusual condition occurs on your camcorder	(VCR) (CAMERA) (MEMORY)
	NORMAL	To output the beep instead of the melody	
	OFF	To cancel melody, the beep sound and shutter sound	
COMMANDER	● ON	To activate the Remote Commander supplied with your camcorder	(VCR) (CAMERA) (MEMORY)
	OFF	To deactivate the Remote Commander to avoid erroneous remote control operation caused by other VCR's remote control	
DISPLAY	● LCD	To show the display on the LCD screen and viewfinder	(VCR) (CAMERA) (MEMORY)
	V-OUT/LCD	To show the display on the TV screen, LCD screen and viewfinder	
REC LAMP	● ON	To light up the camera recording lamp at the front of your camcorder	(CAMERA) (MEMORY)
	OFF	To turn the camera recording lamp off so that the person is not aware of the recording	
VIDEO EDIT	● RETURN	To cancel Digital program editing	(VCR)
	TAPE	To make programs and perform Digital program editing on the tape (p. 87)	
	MEMORY	To make programs and perform Digital program editing on the "Memory Stick" (p. 139)	

Note

If you press DISPLAY/BATT INFO with DISPLAY set to V-OUT/LCD in the menu settings, the picture from a TV or VCR will not appear on the LCD screen even when your camcorder is connected to the output jacks on the TV or VCR.

When recording a close subject

When REC LAMP is set to ON, the red camera recording lamp on the front of your camcorder may reflect on the subject if it is close. In this case, we recommend you set REC LAMP to OFF.

After 5 minutes of removing the power source


The PROGRAM AE, FLASH LVL, AUDIO MIX, WHT BAL, HiFi SOUND and COMMANDER items are returned to their default settings.

Other menu items are held in memory even when the power source is removed.

Types of trouble and how to correct trouble



If you run into any problem using your camcorder, use the following table to troubleshoot the problem. If the problem persists, disconnect the power source and contact your Sony dealer. If “C:□□:□□” appears on the screen, the self-diagnosis display function has been activated. See page 209.

During recording

Symptom	Cause and/or Corrective Actions
START/STOP does not operate.	<ul style="list-style-type: none"> • The POWER switch is not set to CAMERA. → Set it to CAMERA (p. 28). • Your camcorder automatically turns off to prevent the battery pack from running out and to protect the tape when your camcorder has been in recording standby for more than 5 minutes. → Set the POWER switch to OFF (CHG) and then to CAMERA. • The tape has run out. → Rewind the tape or insert a new one (p. 8, 42). • The write-protect tab is set to SAVE. → Use a new cassette or slide the tab (p. 215). • The tape is stuck to the drum (moisture condensation). → Remove the cassette and leave your camcorder for at least 1 hour to acclimatize (p. 221).
The power goes off.	<ul style="list-style-type: none"> • Your camcorder automatically turns off to prevent the battery pack from running out and to protect the tape when your camcorder has been in recording standby for more than 5 minutes. → Set the POWER switch to OFF (CHG) and then to CAMERA. • The battery pack is dead or nearly dead. → Install a fully charged battery pack.
The picture in the viewfinder is not clear.	<ul style="list-style-type: none"> • The viewfinder is not extended. → Pull out the viewfinder (p. 34). • The viewfinder lens is not adjusted. → Adjust the viewfinder lens (p. 34).
SteadyShot does not work.	<ul style="list-style-type: none"> • STEADYSHOT is set to OFF in  in the menu settings. → Set it to ON (p. 193).
The autofocus function does not work.	<ul style="list-style-type: none"> • Manual focus is set. → Press FOCUS to enable the autofocus (p. 68). • Shooting conditions are not suitable for autofocus. → Adjust to focus manually (p. 68).
The picture does not appear in the viewfinder.	<ul style="list-style-type: none"> • The LCD panel is open. → Close the LCD panel.

(continued on the following page)

Types of trouble and how to correct trouble

Symptom	Cause and/or Corrective Actions
A vertical band appears when you shoot a subject such as lights or a candle flame against a dark background.	<ul style="list-style-type: none"> The contrast between the subject and background is too high. This is not a malfunction.
A vertical band appears when you shoot a very bright subject.	<ul style="list-style-type: none"> The smear phenomenon is occurring. This is not a malfunction.
Some tiny spots in white, red, blue or green appear on the screen.	<ul style="list-style-type: none"> SLOW SHTR, Super NightShot or Color Slow Shutter is activated. This is not a malfunction.
An unknown picture appears on the screen.	<ul style="list-style-type: none"> If 10 minutes passes after you set the POWER switch to CAMERA or DEMO MODE is set to ON in the menu settings without a cassette or a "Memory Stick" inserted, your camcorder automatically starts the demonstration. <ul style="list-style-type: none"> → Insert a cassette or a "Memory Stick" or press the LCD screen. The demonstration stops. You can also set DEMO MODE to OFF in the menu settings (p. 199).
The picture is recorded in incorrect or unnatural colors.	<ul style="list-style-type: none"> NIGHTSHOT is set to ON. <ul style="list-style-type: none"> → Slide it to OFF (p. 37).
Picture appears too bright, and the subject does not appear on the screen.	<ul style="list-style-type: none"> NIGHTSHOT is set to ON in a bright place. <ul style="list-style-type: none"> → Slide it to OFF (p. 37). The back light function is active. <ul style="list-style-type: none"> → Deactivate it (p. 36).
The screen is so dark that the image cannot be seen.	<ul style="list-style-type: none"> The LCD BACKLIGHT switch is set to OFF. <ul style="list-style-type: none"> → Set it to ON (p. 34).
The click of the shutter does not sound.	<ul style="list-style-type: none"> BEEP is set to OFF in  in the menu settings. <ul style="list-style-type: none"> → Set it to MELODY or NORMAL (p. 200).
Black bands appear when you record a TV screen or computer screen.	<ul style="list-style-type: none"> → Set STEADYSHOT to OFF in  in the menu settings (p. 193).
An external flash (optional) does not work.	<ul style="list-style-type: none"> The power of the external flash (optional) is off or the power source is not installed. <ul style="list-style-type: none"> → Turn on the external flash (optional) or install the power source. Two or more external flashes (optional) are attached. <ul style="list-style-type: none"> → Only one external flash (optional) can be attached.
Flickering or changes in color occurs.	<ul style="list-style-type: none"> PORTRAIT or SPORTS of PROGRAM AE is on when recording in light from a discharge tube such as a fluorescent lamp, sodium lamp or mercury lamp. <ul style="list-style-type: none"> → Set PROGRAM AE to AUTO in the menu settings (p. 64).

Types of trouble and how to correct trouble





During playback

Symptom	Cause and/or Corrective Actions
Playback is not possible.	<ul style="list-style-type: none"> The tape has run out. → Rewind the tape (p. 42).
There are horizontal lines on the picture or the playback picture is not clear or does not appear.	<ul style="list-style-type: none"> The video head may be dirty. → Clean the head using the cleaning cassette (optional) (p. 222).
No sound or only a low sound is heard when playing back the tape.	<ul style="list-style-type: none"> The stereo tape is played back with HiFi SOUND set to 2 in [V] in the menu settings. → Set HiFi SOUND to STEREO (p. 194). Volume is turned to minimum. → Turn up the volume (p. 42). AUDIO MIX is set to the ST2 side in [V] in the menu settings. → Adjust AUDIO MIX (p. 194).
The sound breaks off.	<ul style="list-style-type: none"> The video head may be dirty. → Clean the head using a cleaning cassette (optional) (p. 222).
Date search by selecting the date from the screen does not work.	<ul style="list-style-type: none"> The cassette has no Cassette Memory. → Use a cassette with Cassette Memory (p. 82). CM SEARCH is set to OFF in [M] in the menu settings. → Set it to ON (p. 197). The tape has a blank portion in the beginning or middle (p. 83).
Title search does not work.	<ul style="list-style-type: none"> The cassette has no Cassette Memory. → Use a cassette with Cassette Memory (p. 81). CM SEARCH is set to OFF in [M] in the menu settings. → Set it to ON (p. 197). There is no title in the tape. → Superimpose the titles (p. 106). The tape has a blank portion in the recorded portion (p. 81).
New sound added to the recorded tape is not heard.	<ul style="list-style-type: none"> AUDIO MIX is set to the ST1 side in [V] in the menu settings. → Adjust AUDIO MIX (p. 194).
The title is not displayed.	<ul style="list-style-type: none"> TITLE DSPL is set to OFF in [M] in the menu settings. → Set it to ON (p. 197).
Picture is distorted and PAL appears on the screen.	<ul style="list-style-type: none"> The TV color system recorded on the tape is different from that of the TV.

(continued on the following page)

Types of trouble and how to correct trouble

During recording and playback

Symptom	Cause and/or Corrective Actions
The power does not turn on.	<ul style="list-style-type: none"> The battery pack is not installed, or is dead or nearly dead. → Install a charged battery pack (p. 15, 16). The AC Adaptor is not connected to a wall outlet. → Connect the AC Adaptor to a wall outlet (p. 16).
End search does not work.	<ul style="list-style-type: none"> The cassette was ejected after recording when using a cassette without Cassette Memory (p.40). You have not recorded on the new cassette yet (p. 40).
End search does not work correctly.	<ul style="list-style-type: none"> The tape has a blank portion in the beginning or middle (p. 41).
The battery pack is quickly discharged.	<ul style="list-style-type: none"> The temperature of the environment is too low. The battery pack is not fully charged. → Charge the battery pack fully again (p. 16). The battery pack is completely dead, and cannot be recharged. → Replace with a new battery pack (p. 217).
The remaining battery time indicator does not indicate the correct time.	<ul style="list-style-type: none"> You have used the battery pack in an extremely hot or cold environment for a long time. The battery pack is completely dead, and cannot be recharged. → Replace with a new battery pack (p. 217). The battery pack is dead or nearly dead. → Install a fully charged battery pack (p. 15, 16). A deviation has occurred in the remaining battery time indicator. → Charge the battery pack fully again so that the indication on the remaining battery time indicator is correct (p. 16).
The power goes off although the remaining battery time indicator indicates that the battery pack has enough power to operate.	<ul style="list-style-type: none"> A deviation has occurred in the remaining battery time indicator. → Charge the battery pack fully again so that the indication on the remaining battery time indicator is correct (p. 16). → Use a charged battery pack (p. 15, 16).
The cassette cannot be ejected from the compartment.	<ul style="list-style-type: none"> The power source is disconnected. → Connect it firmly (p. 15, 16). The battery pack is dead. → Use a charged battery pack (p. 15, 16).
The  and  indicators flash and no functions except for cassette ejection work.	<ul style="list-style-type: none"> Moisture condensation has occurred. → Remove the cassette and leave your camcorder for at least 1 hour to acclimatize (p. 221).
The  indicator does not appear when using the cassette with Cassette Memory.	<ul style="list-style-type: none"> The gold-plated connector of the tape is dirty or dusty. → Clean the gold-plated connector (p. 215).
The remaining tape indicator is not displayed.	<ul style="list-style-type: none"> REMAIN is set to AUTO in the menu settings. → Set it to ON to always display the remaining tape indicator (p. 198).

Types of trouble and how to correct trouble

When operating using the “Memory Stick”

Symptom	Cause and/or Corrective Actions
The “Memory Stick” does not function.	<ul style="list-style-type: none">• The POWER switch is not set to MEMORY. → Set it to MEMORY (p. 11).• The “Memory Stick” is not inserted. → Insert the “Memory Stick” (p. 10).
Recording does not function.	<ul style="list-style-type: none">• The “Memory Stick” has already been recorded to its full capacity. → Delete unnecessary images and record again (p. 155).• The “Memory Stick” formatted incorrectly is inserted. → Format the “Memory Stick” using your camcorder or use another “Memory Stick” (p. 114, 196).• The write-protect tab on the “Memory Stick” is set to LOCK. → Release the lock (p. 113).• Your camcorder can play back the 100MSDCF folder but cannot record any images in it.
The image cannot be deleted.	<ul style="list-style-type: none">• The image is protected. → Cancel image protection (p. 154).• The write-protect tab on the “Memory Stick” is set to LOCK. → Release the lock (p. 113).• You tried to delete more than 100 images in one session. → You can select up to 100 images on the INDEX screen in one session (p. 156).
You cannot format the “Memory Stick.”	<ul style="list-style-type: none">• The write-protect tab on the “Memory Stick” is set to LOCK. → Release the lock (p. 113).
Deleting all the images cannot be carried out.	<ul style="list-style-type: none">• The write-protect tab on the “Memory Stick” is set to LOCK. → Release the lock (p. 113).
You cannot protect the image.	<ul style="list-style-type: none">• The write-protect tab on the “Memory Stick” is set to LOCK. → Release the lock (p. 113).• The index screen is not displayed. → Press INDEX to display the index screen, then protect the image (p. 154).

(continued on the following page)

Types of trouble and how to correct trouble

Symptom	Cause and/or Corrective Actions
You cannot write a print mark on a still image.	<ul style="list-style-type: none">• The write-protect tab on the “Memory Stick” is set to LOCK. → Release the lock (p. 113).• The index screen is not displayed. → Press INDEX to display the index screen, then write a print mark (p. 158).• You are trying to write a print mark on a moving picture. → Print marks cannot be written to a moving picture.• A print mark is written on 999 files. → A print mark can only be written on up to 999 files.
You cannot resize an image.	<ul style="list-style-type: none">• Images recorded using other cameras may not be resized (p. 159).
You cannot play back images in actual size.	<ul style="list-style-type: none">• You may not be able to play back images recorded by other equipment in actual size. This is not a malfunction.
You cannot play back image data.	<ul style="list-style-type: none">• Folders/files renamed or images processed with the computer may not be played back.• If you record images with any other equipment, the images may not be played back normally on your camcorder.

Types of trouble and how to correct trouble

Others

Symptom	Cause and/or Corrective Actions
A title is not recorded.	<ul style="list-style-type: none"> • The cassette has no Cassette Memory. → Use the cassette with Cassette Memory (p. 106). • The Cassette Memory is full. → Erase unnecessary title (p. 108). • The cassette is set to prevent accidental erasure. → Slide the write-protect tab to REC (p. 215). • You tried to superimpose a title on a blank portion of the tape. → Superimpose the title to the recorded portion (p. 106).
A cassette label is not recorded.	<ul style="list-style-type: none"> • The cassette has no Cassette Memory. → Use the cassette with Cassette Memory (p. 110). • The Cassette Memory is full. → Erase unnecessary data (p. 111). • The tape is set to prevent accidental erasure. → Slide the write-protect tab to REC (p. 215).
Digital program editing to the tape does not function.	<ul style="list-style-type: none"> • The input selector on the VCR is not set correctly. → Set the selector correctly, then check the connection between the VCR and your camcorder (p. 88). • Your camcorder is connected to DV equipment of other than Sony using the i.LINK cable. → Set it to IR (p. 88). • Setting a program on a blank portion of the tape is attempted. → Set the program again on a recorded portion (p. 94). • The synchronization of your camcorder and the VCR is not adjusted. → Adjust the synchronization of the VCR (p. 92). • The IR SETUP code is not correct. → Set the correct code (p. 91).
Digital program editing to the "Memory Stick" does not function.	<ul style="list-style-type: none"> • Setting a program on a blank portion of the tape is attempted. → Set the program again on a recorded portion (p. 139).
The Remote Commander supplied with your camcorder does not work.	<ul style="list-style-type: none"> • COMMANDER is set to OFF in [ETC] in the menu settings. → Set it to ON (p. 200). • Something is blocking the infrared rays. → Remove the obstacle. • The button type lithium battery is inserted in the battery holder with the +/– polarities not matching the +/– marks. → Insert the button type lithium battery with the correct polarity (p. 235). • The button type lithium battery is dead. → Insert new one (p. 235).
The picture from a TV or VCR does not appear even when your camcorder is connected to the outputs on the TV or VCR.	<ul style="list-style-type: none"> • DISPLAY is set to V-OUT/LCD in [ETC] in the menu settings. → Set it to LCD (p. 200). • VIDEOINPUT is not set correctly in the menu settings. → Set it correctly (p. 98, 187).

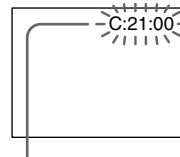
Types of trouble and how to correct trouble

Symptom	Cause and/or Corrective Actions
You cannot dub with the A/V connecting cable.	<ul style="list-style-type: none"> • VIDEOINPUT is not set correctly in the menu settings. → Set it correctly (p. 194).
The melody or beep sounds for 5 seconds.	<ul style="list-style-type: none"> • Moisture condensation has occurred. → Remove the cassette and leave your camcorder for at least 1 hour to acclimatize (p. 221). • Some troubles have occurred in your camcorder. → Remove the cassette and insert it again, then operate your camcorder.
No function works though the power is on.	<ul style="list-style-type: none"> → Disconnect the AC Adaptor from a wall outlet or remove the battery pack, then reconnect the AC Adaptor or the battery pack in about 1 minute. Turn the power on. If the functions still do not work, press the RESET button using a sharp-pointed object. (If you press the RESET, all the settings including the date and time return to the default.) (p. 15, 16, 230)
When you set the POWER switch to VCR or OFF (CHG), if you move your camcorder, you may hear a clattering sound from inside your camcorder.	<ul style="list-style-type: none"> • This is because some functions use a linear mechanism. This is not a malfunction.
While charging the battery pack, the CHARGE lamp does not light up.	<ul style="list-style-type: none"> • Charging has completed. • The battery pack is not properly installed. → Install it properly (p. 15).
You cannot charge the battery pack.	<ul style="list-style-type: none"> • The POWER switch is not set to OFF (CHG). → Set it to OFF (CHG) (p. 16).
While charging the battery pack, the CHARGE lamp flashes.	<ul style="list-style-type: none"> • The battery pack is not properly installed. → Install it properly (p. 15). • Something is wrong with the battery pack. → If the problem persists, unplug the AC Adaptor immediately and contact your Sony dealer or local authorized Sony service facility.
The buttons do not appear on the touch panel.	<ul style="list-style-type: none"> • DISPLAY/BATT INFO is pressed. → Press the LCD screen lightly. → Press DISPLAY/BATT INFO on your camcorder or DISPLAY on the Remote Commander (p. 25, 43).
The buttons on the LCD screen do not work.	<ul style="list-style-type: none"> → Adjust the screen (CALIBRATION) (p. 224).
Image data cannot be transferred to your computer by the USB connection.	<ul style="list-style-type: none"> • The USB cable was connected before installation of the USB driver was complete. → Uninstall the incorrect USB driver and reinstall the USB driver (p. 164, 170). • USB STREAM is set to OFF in the menu settings. → Set it to ON (p. 199).
The cassette cannot be ejected even if the cassette lid is open.	<ul style="list-style-type: none"> • Moisture has started to condense in your camcorder (p. 221).
The cassette cannot be ejected.	<ul style="list-style-type: none"> → Remove the battery pack, then install it again (p. 15).

Self-diagnosis display

Your camcorder has a self-diagnosis display function. This function displays the current condition of your camcorder as a 5-digit code (a combination of a letter and numbers) on the LCD screen or viewfinder. If a 5-digit code appears, check the following code chart. The last 2 digits (indicated by □□) will differ depending on the state of your camcorder.

LCD screen or Viewfinder



Self-diagnosis display

- C:□□:□□
You can service your camcorder yourself.
- E:□□:□□
Contact your Sony dealer or local authorized Sony service facility.

5-digit display	Cause and/or Corrective Actions
C:04:□□	<ul style="list-style-type: none"> • You are using a battery pack that is not an "InfoLITHIUM" battery pack. → Use an "InfoLITHIUM" battery pack (p. 16, 216).
C:21:□□	<ul style="list-style-type: none"> • Moisture condensation has occurred. → Eject the cassette and leave your camcorder for at least 1 hour to acclimatize (p. 221).
C:22:□□	<ul style="list-style-type: none"> • The video heads are dirty. → Clean the heads using the cleaning cassette (optional) (p. 222).
C:31:□□ C:32:□□	<ul style="list-style-type: none"> • A malfunction other than the above that you can service has occurred. → Eject the cassette and insert it again, then operate your camcorder. Do not perform this operation if moisture starts to condense (p. 221). → Disconnect the power cord of the AC Adaptor or remove the battery pack. After reconnecting the power source, operate your camcorder. → Replace the cassette.
E:20:□□ E:61:□□ E:62:□□ E:91:□□	<ul style="list-style-type: none"> • A malfunction that you cannot service has occurred. → Contact your Sony dealer or local authorized Sony service facility and inform them of the 5-digit code. (e.g., E:61:10)

If you are unable to rectify the problem even if you try corrective actions a few times, contact your Sony dealer or local authorized Sony service facility.

Warning indicators

If indicators appear on the screen, check the following:
See the page in parentheses “()” for details.

101-0001 Warning indicator as to file


Slow flashing:

- The file is corrupted.
- The file is unreadable.
- You are trying to carry out MEMORY MIX on moving pictures (p. 129).

C:21:00 Self-diagnosis display (p. 209)

The battery pack is dead or nearly dead

Slow flashing:

- The battery pack is nearly dead.
Depending on operational, environmental or battery conditions the  indicator may flash, even if there are approximately 5 to 10 minutes remaining.

Moisture condensation has occurred*

Fast flashing:

- Eject the cassette, set the POWER switch to OFF (CHG), and leave it for about 1 hour with the cassette lid open (p. 221).

Warning indicator for Cassette

Memory*

Slow flashing:

- The cassette without Cassette Memory is inserted (p. 213).

Warning indicator for a “Memory Stick”

Slow flashing:

- No “Memory Stick” is inserted.

Fast flashing:

- The image cannot be recorded on the “Memory Stick.”*

Warning indicator for “Memory Stick” formatting*

Fast flashing:

- The “Memory Stick” data is corrupted (p. 115).
- The “Memory Stick” is not formatted correctly (p. 196).

Warning indicator for incompatible “Memory Stick”*

Slow flashing:

- An incompatible “Memory Stick” is inserted.

Warning indicator for a tape

Slow flashing:

- The tape is near the end.
- No cassette is inserted.*
- The write-protect tab of the cassette is set to SAVE (p. 215).*

Fast flashing:

- The tape has run out.*

You need to eject the cassette*

Slow flashing:

- The write-protect tab on the cassette is set to SAVE (p. 215).

Fast flashing:

- Moisture condensation has occurred (p. 221).
- The tape has run out.
- The self-diagnosis display function is activated (p. 209).

The image is protected*

Slow flashing:

- The image is protected (p. 154).

Warning indicator for the built-in flash or the external flash (optional)

Slow flashing:

- During charging

Fast flashing:

- The self-diagnosis display function is activated (p. 209).*
- There is something wrong with the built-in flash or the external flash (optional).

Warning indicator for still image recording




















Slow flashing:

- The still image cannot be recorded on the “Memory Stick” (p. 50).

* You hear the melody or beep sound.

Warning messages

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





- | | |
|---|---|
| • CLOCK SET | Set the date and time (p. 23). |
| • FOR “InfoLITHIUM”
BATTERY ONLY | Use an “InfoLITHIUM” battery pack (p. 16, 216). |
| •  CLEANING CASSETTE | The video heads are dirty (p. 222).
The  indicator and “  CLEANING CASSETTE” message appear one after another on the screen. |
| • COPY INHIBIT | You tried to record a picture that has a copyright control signal (p. 214). ^{*1)} |
| •  FULL | Erase unnecessary data (p. 111). ^{*1)} |
| •  16BIT | AUDIO MODE is set to 16BIT. ^{*1)} You cannot dub new sound (p. 198). |
| •  REC MODE | REC MODE is set to LP. Or, the tape has been recorded based on different TV color system from that of your camcorder. ^{*1)} You cannot dub new sound (p. 198). |
| •  TAPE | There is no recorded portion on the tape. ^{*1)} You cannot dub new sound. |
| •  “i.LINK” CABLE | i.LINK cable is connected. ^{*1)} You cannot dub new sound (p. 102). |
| •  FULL | The “Memory Stick” is full (p. 123). ^{*1)} |
| •   | The write-protect tab on the “Memory Stick” is set to LOCK (p. 113). ^{*1)} |
| •  NO FILE | No image is recorded or recognized on the “Memory Stick.” ^{*1)} |
| •  NO MEMORY STICK | No “Memory Stick” is inserted. ^{*1)} |
| •  AUDIO ERROR | You are trying to record an image with sound that cannot be recorded by your camcorder on the “Memory Stick” (p. 138). ^{*1)} |
| •  MEMORY STICK ERROR | The “Memory Stick” data is corrupted. ^{*1)} |
| •  FORMAT ERROR | The “Memory Stick” is not recognized (p. 114). ^{*1)}
Check the format. |
| •  PLAY ERROR | The image is distorted and cannot be played back. ^{*1)*2)} |
| •  REC ERROR | Turn the power off once, then on again. ^{*1)} |
| •  INCOMPATIBLE
MEMORY STICK | The “Memory Stick” inserted is not compatible with your camcorder. ^{*1)} |

^{*1)} You hear the melody or beep sound.

^{*2)} Reinsert the “Memory Stick” and play back.

(continued on the following page)













Warning messages

- READ-ONLY MEMORY STICK A read-only "Memory Stick" is inserted.*
-   TAPE END The tape has reached its end.*
-  NO TAPE Insert a cassette.*
- DELETING You press PHOTO on your camcorder while deleting data in the "Memory Stick."*
- FORMATTING You pressed PHOTO on your camcorder while formatting the "Memory Stick."*
-  NOW CHARGING Charging the built-in flash or an external flash (optional) does not work correctly.*
- FOLDER NO. FULL You have reached the maximum number of folders that can be created on a "Memory Stick."*
- USB STREAMING ON GOING USB Streaming is being performed.


* You hear the melody or beep sound.

Usable cassettes

Selecting cassette types

You can use the mini DV  cassette only.* You cannot use any other 8 mm , Hi8 , Digital8 , VHS , VHSC , S-VHS , S-VHSC , Betamax , ED Betamax , DV  or MICRO MV  cassette.

* There are two types of mini DV cassettes: with Cassette Memory and without Cassette Memory.

Cassettes with Cassette Memory have  (Cassette Memory) mark.

We recommend that you use cassettes with Cassette Memory.

IC memory is mounted on this type of cassette. Your camcorder can read and write data such as dates of recording or titles, etc. to this memory.

The functions using the Cassette Memory require successive signals recorded on the tape. If the tape has a blank portion at the beginning or between recorded portions, titles may not be displayed properly or the search functions may not work properly. Perform the following to prevent a blank portion from being created on the tape.



Press END SCH to go to the end of the recorded portion before you begin the next recording if you operate the following:

- You have ejected the cassette during recording.
- You have played back the tape.
- You have used edit search.

If there is a blank portion or discontinuous signal on the tape, re-record from the beginning to the end of the tape as described above.

The same result may occur when you record using a digital video camera recorder without the Cassette Memory function on a tape recorded by one with the Cassette Memory function.

4K mark on the cassette

The memory capacity of the tape marked with  4K is 4k bits. Your camcorder can accommodate up to 16k bits. 16k bits tapes are marked with  16K.



This is the Mini DV mark.



This is the Cassette Memory mark.

These are trademarks.

Usable cassettes

Copyright signal

When you play back

If the tape you play back on your camcorder contains copyright signals, you cannot copy it with another video camera connected to your camcorder.

When you record

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

The COPY INHIBIT indicator appears on the 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


12-bit mode:

The original sound can be recorded in stereo 1, and the new sound in stereo 2 in 32 kHz. The balance between stereo 1 and stereo 2 can be adjusted by selecting AUDIO MIX in the menu settings during playback. Both sounds can be played back.

16-bit mode:

A new sound cannot be recorded but the original sound can be recorded in high quality. Moreover, it can also play back sound recorded in 32 kHz, 44.1 kHz or 48 kHz. When playing back a tape recorded in the 16-bit mode, the 16BIT indicator appears on the screen.

When you play back a dual sound track tape

When you play back a dual sound track tape recorded on a stereo system, set HiFi SOUND in  to the desired mode in the menu settings (p. 194).

Sound from speaker

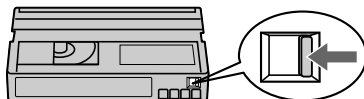
You cannot record dual sound programs on your camcorder.

HiFi Sound Mode	Playing back the stereo tape	Playing back the dual sound track tape
STEREO	Stereo	Main sound and sub sound
1	L channel	Main sound
2	R channel	Sub sound

Notes on the cassette

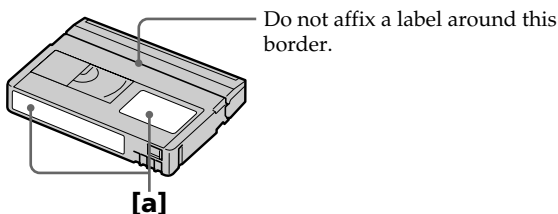
To prevent accidental erasure

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



When affixing a label on the cassette

Be sure to affix a label only on the locations as illustrated below [a] so as not to cause malfunction of your camcorder.



After using the cassette

Rewind the tape to the beginning, put the cassette in its case, and store it in an upright position.

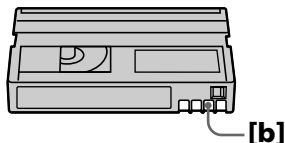
When the Cassette Memory function does not work

Reinsert the cassette. The gold-plated connector of a mini DV cassette may be dirty or dusty.

Cleaning the gold-plated connector

If the gold-plated connector on a cassette is dirty or dusty, the remaining tape indicator sometimes does not appear correctly, and you may not be able to operate functions using Cassette Memory.

Clean up the gold-plated connector with a cotton-wool swab, about every 10 times you eject the cassette. [b]



About the “InfoLITHIUM” battery pack

This unit is compatible with the “InfoLITHIUM” battery pack (M series). Your camcorder operates only with the “InfoLITHIUM” battery pack. “InfoLITHIUM” M series battery packs have the  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 an optional 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 (optional), the remaining battery time and charging time appear.

Charging 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 goes out. If you charge the battery outside of this temperature range, you may not be able to efficiently charge the battery pack.
- After charging is complete, either disconnect the cable from the DC IN jack on your camcorder or remove the battery pack.

Effective use of the battery pack

- Battery pack performance decreases in 10°C (50°F) or below surroundings. So, the time that the battery pack can be used becomes shorter. We recommend the following to use the battery pack longer:
 - Put the battery pack in a pocket to warm it up, and insert it in your camcorder immediately before you start taking shots.
 - Use the large capacity battery pack (NP-FM70/QM71/QM71D/FM91/QM91/QM91D, optional).
- Frequently using the LCD screen or frequently operating playback, fast forward or rewind wears out the battery pack faster. We recommend using the large capacity battery pack (NP-FM70/QM71/QM71D/FM91/QM91/QM91D, optional).
- Be certain to set the POWER switch to OFF (CHG) when not taking shots or playing back on your camcorder. The battery pack is also consumed when your camcorder is in tape recording standby or playback pause.
- Have spare battery packs handy for 2 or 3 times the expected recording time, and make trial recordings before taking the actual recording.
- Do not expose the battery pack to water. The battery pack is not water resistant.

About the “InfoLITHIUM” battery pack

Remaining battery time indicator

- If the power goes off although the remaining battery time indicator indicates that the battery pack has enough power to operate, charge the battery pack fully again so that the indication on the remaining battery time indicator is correct. Note, however, that the correct battery indication sometimes will not be restored if it is used in high temperatures for a long time or left in a fully charged state, or the battery pack is frequently used. Regard the remaining battery time indication as the approximate shooting time.
- The  mark indicating little remaining battery time sometimes flashes depending on the operating conditions or ambient temperature and environment even if the remaining battery time is about 5 to 10 minutes.

How to store the battery pack

- If the battery pack is not used for a long time, do the following once a year to maintain proper function.
 1. Fully charge the battery pack.
 2. Discharge on your electronic equipment.
 3. Remove the battery pack from the equipment and store it in a dry, cool place.
- To use the battery pack up on your camcorder, leave your camcorder in tape recording standby until the power goes off without a cassette inserted.

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, operating conditions, and the environment for each battery pack.

Disposal of the battery pack

Certain countries or regions may regulate disposal of the battery pack used to power this product. Please consult with your local authority.

“InfoLITHIUM” is a trademark of Sony Corporation.

About i.LINK

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

What is i.LINK?

i.LINK is a digital serial interface for handling digital video, digital audio and other data in two directions between equipment having the i.LINK jack, and for controlling other equipment.

i.LINK-compatible equipment can be connected by a single i.LINK cable. Possible applications are operations and data transactions with various digital AV equipment. When two or more i.LINK-compatible equipment are connected to this unit in a daisy chain, operations and data transactions are possible with not only the equipment that this unit is connected to but also with other devices via the directly connected equipment.

Note, however, that the method of operation sometimes varies according to the characteristics and specifications of the equipment to be connected, and that operations and data transactions are sometimes not possible on some connected equipment.

Note

Normally, only one piece of equipment can be connected to this unit by the i.LINK cable. When connecting this unit to i.LINK-compatible equipment having two or more DV Interfaces, refer to the operating instructions of the equipment to be connected.

About the name "i.LINK"

i.LINK is a more familiar term for IEEE 1394 data transport bus proposed by Sony, and is a trademark approved by many corporations.

IEEE 1394 is an international standard standardized by the Institute of Electrical and Electronics Engineers.

i.LINK baud rate

i.LINK's maximum baud rate varies according to the equipment. Three maximum baud rates are defined:

S100 (approx. 100 Mbps*)

S200 (approx. 200 Mbps)

S400 (approx. 400 Mbps)

The baud rate is listed under "Specifications" in the operating instructions of each equipment. It is also indicated near the i.LINK on some equipment.

The maximum baud rate of equipment on which it is not indicated such as this unit is "S100."

When units are connected to equipment having a different maximum baud rate, the baud rate sometimes differs from the indicated baud rate.

*What is Mbps?

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

i.LINK functions on this unit

For details on how to dub when this unit is connected to other video equipment having DV Interface, see page 85 and 97.

This unit can also be connected to other i.LINK (DV Interface) compatible non-video equipment made by Sony (e.g., VAIO series personal computer).


Before connecting this unit to your computer, make sure that application software supported by this unit is already installed on your computer.

Some video equipment such as digital TV, DVD, MICRO MV may not be compatible with the DV Interface even if they have an i.LINK jack. Make sure that the equipment is compatible with the DV Interface before connecting.

For details on precautions when connecting this unit, also refer to the operating instructions for the equipment to be connected.

Required i.LINK cable

Use the Sony i.LINK 4-pin-to-4-pin cable (during DV dubbing).

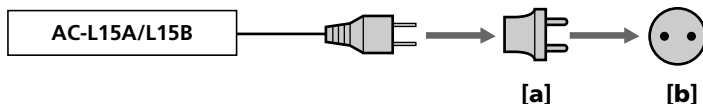
i.LINK and  are trademarks.

Using your camcorder abroad

Using your camcorder abroad

You can use your camcorder in any country or region with the AC Adaptor 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]**.



Your camcorder is an NTSC system based camcorder. If you want to view the playback picture on a TV, it must be an NTSC system based TV with AUDIO/VIDEO input jack. The following shows TV color systems used overseas.

NTSC system

Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

PAL system

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 system

Brazil

PAL-N system

Argentina, Paraguay, Uruguay

SECAM system



Bulgaria, France, Guiana, Iran, Iraq, Monaco, Russia, Ukraine, etc.

Simple setting of clock by time difference



You can easily set the clock to the local time by setting a time difference. Select WORLD TIME in the menu settings. See page 200 for details.

Maintenance information and precautions

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 condition, 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, the beep sounds and the  indicator flashes. When the  indicator flashes at the same time, the cassette is inserted in your camcorder. If moisture condenses on the lens, the indicator will not appear.

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 the  or  indicator 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 about 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 hot place as follows:

- You bring your camcorder from a ski slope into a place warmed up by a heating device.
- You bring your camcorder from an air-conditioned car or room into a hot place outside.
- You use your camcorder after a squall or a shower.
- You use your camcorder in a place of high temperature or humidity.




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 tightly seal it. Remove the bag when the air temperature inside the plastic bag has reached the surrounding temperature (after about 1 hour).

Maintenance information

Cleaning the video head

To ensure normal recording, clear pictures and sound, clean the video head. The video head may be dirty when:

- Mosaic-pattern noise appears on the playback picture.
- Playback pictures do not move.
- Playback pictures do not appear or the sound breaks off.
- The  indicator and “ CLEANING CASSETTE” message appear one after another or the  indicator flashes on the screen during recording.

If the above problem, **[a]**, **[b]** or **[c]** occurs, clean the video heads for 10 seconds with the Sony DVM-12CLD cleaning cassette (optional). Check the picture and if the above problem persists, repeat cleaning.

[a]



[b]



[c]



If the video heads become very dirty, the entire screen becomes blue **[c]**.

Note on the video head

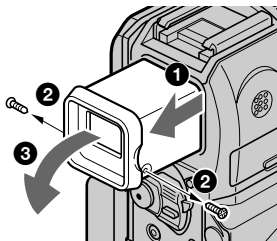
The video head suffers from wear after long use. If you cannot obtain a clear image even after using a cleaning cassette, it might be because the video head is worn. Please contact your Sony dealer or local authorized Sony service facility to have the video head replaced.

Cleaning the LCD screen

If fingerprints or dust make the LCD screen dirty, we recommend using the cleaning cloth (supplied) to clean the LCD screen. If you use the LCD Cleaning Kit (optional), do not apply the cleaning liquid directly to the LCD screen. Clean the LCD screen with cleaning paper moistened with the liquid.

Removing dust from inside the viewfinder

- (1) Pull out the viewfinder in the direction of the arrow ①.
Remove the two screws in the direction of the arrow ② with a screwdriver (optional).
Remove the eyecup in the direction of the arrow ③.



- (2) Remove dust from inside the eyecup and viewfinder with a commercially available blower.
- (3) In the reverse way of (1), attach the eyecup.

Caution

Do not remove any other screws. You may remove only the screws for removing the eyecup.

Notes

- Do not drop or bend the eyecup shaft.
- Be careful when handling the eyecup.

Charging the built-in rechargeable battery

Your camcorder has a built-in rechargeable battery so that the date, time and other settings are retained even when the POWER switch is set to OFF (CHG). The built-in rechargeable battery is always charged as long as you are using your camcorder. The battery, however, will get discharged gradually if you do not use your camcorder. It will be completely discharged in **about 3 months** if you do not use your camcorder at all. Even if the built-in rechargeable battery is not charged, it will not affect your camcorder operation. To retain the date and time, etc., charge the battery if the battery is discharged.

Charging the built-in rechargeable battery

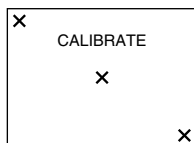
- Connect your camcorder to the house current using the AC Adaptor supplied with your camcorder, and leave your camcorder with the POWER switch set to OFF (CHG) for more than 24 hours.
- Or install the fully charged rechargeable battery pack on your camcorder, and leave your camcorder with the POWER switch set to OFF (CHG) for more than 24 hours.

Maintenance information and precautions

Adjusting the LCD screen (CALIBRATION)

The buttons on the touch panel may not work correctly. If this happens, follow the procedure below.

- (1) Set the POWER switch to OFF (CHG).
- (2) Set the POWER switch to VCR while pressing DISPLAY/BATT INFO on your camcorder, then keep pressing DISPLAY/BATT INFO until "CALIBRATE" appears.
- (3) Touch **X** displayed on the screen using an object such as the corner of a "Memory Stick."
The position of **X** changes.



Notes

- If you fail to press the right spot, redo step 3.
- You cannot calibrate the LCD screen when the screen is rotated 180 degrees and facing outwards.

Precautions

Camcorder operation

- Operate your camcorder on DC 7.2 V (battery pack) or DC 8.4 V (AC Adaptor).
- For DC or AC operation, use the accessories recommended in this operating instructions.
- If any solid object or liquid get inside the casing, unplug your camcorder and have it checked by a Sony dealer before operating it any further.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the POWER switch setting to OFF (CHG) 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.
- Keep your camcorder away from strong magnetic fields or mechanical vibration.
- Do not press the LCD screen with a sharp object.
- 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.

On handling a tape

- Do not insert anything into the small holes on the rear of the cassette. These holes are used to sense the type and thickness of the tape and if the recording tab is in or out.
- Do not open the tape protect cover or touch the tape.
- Avoid touching or damaging the terminals. To remove dust, clean the terminals with a soft cloth.

Camcorder care

- Eject the tape, periodically turn on the power, operate the CAMERA and VCR sections and play back the tape for about 3 minutes if your camcorder is not to be used for a long time.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on the lens, remove them with a soft cloth.
- Clean your camcorder body with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.
- Do not let sand get into your camcorder. When you use your camcorder on a sandy beach or in a dusty place, protect it from the sand or dust. Sand or dust may cause your camcorder to malfunction, and sometimes this malfunction cannot be repaired.

AC Adaptor

- Unplug the unit from a wall outlet when you are not using the unit for a long time. To disconnect the power cord, pull it out by the plug. Never pull the power cord itself.
- Do not operate the unit with a damaged cord or if the unit has been dropped or damaged.
- Do not bend the power cord forcibly, or place a heavy object on it. This may damage the cord and cause fire or electrical shock.
- Prevent metallic objects from coming into contact with the metal parts of the connecting section. If this happens, a short may occur and the unit may be damaged.
- Always keep metal contacts clean.
- Do not disassemble the unit.
- Do not apply mechanical shock or drop the unit.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment. AM receivers and video equipment disturb AM reception and video operation.
- The unit becomes warm during use. This is not a malfunction.
- Do not place the unit in locations that are:
 - Extremely hot or cold
 - Dusty or dirty
 - Very humid
 - Vibrating

About care and storage of the lens

- Wipe the surface of the lens clean with a soft cloth in the following instance:
 - When there are fingerprints on the lens surface
 - In hot or humid locations
 - When the lens is used in environments such as the seaside
- Store the lens in a well-ventilated location subject to little dirt or dust.

To prevent mold from occurring, periodically perform the above.

We recommend turning on and operating your camcorder about once per month to keep your camcorder in an optimum state for a long time.

Rechargeable battery pack

- Use only the specified charger or video equipment with the charging function.
- To prevent an accidental short circuit, do not allow metal objects to come into contact with the battery terminals.
- Keep the rechargeable battery pack away from fire.
- Never expose the rechargeable battery pack to temperatures above 60°C (140°F), such as in a car parked in the sun or under direct sunlight.
- Store the rechargeable battery pack in a cool, dry place.
- Do not expose the rechargeable battery pack to any mechanical shock.
- Do not disassemble nor modify the rechargeable battery pack.
- Install the rechargeable battery pack in the video equipment securely.
- Charging while some capacity remains does not affect the original battery capacity.

Notes on the button type lithium battery

- Keep the Remote Commander and button type lithium battery out of the reach of children to prevent them swallowing the battery.
If swallowed, consult a doctor immediately.
- Do not disassemble, heat, or short-circuit button type lithium battery. Also, do not throw it into fire. This may cause the battery to rupture.

If the battery is leaking

- Wipe off the liquid in the battery compartment carefully before replacing the battery.
- If you touch the liquid, wash it off with water.
- If the liquid gets into your eyes, wash your eyes with a lot of water and then consult a doctor.

If any problem occurs, unplug your camcorder and contact your nearest Sony dealer.

Specifications

Video camera recorder

System

Video recording system

2 rotary heads

Helical scanning system

Mini DV Format (SD Specification of Consumer-Use Digital VCR)

Audio recording system

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

Usable cassette

Mini DV cassette with the  mark printed

Tape speed

SP: Approx. 18.81 mm/s

LP: Approx. 12.56 mm/s

Recording/playback time (using cassette DVM60)

SP: 1 hour

LP: 1.5 hours

Fastforward/rewind time (using cassette DVM60)

Approx. 2 min. and 40 seconds

Viewfinder

Electric viewfinder (Color)

Image device

3.8 mm (1/4.7 type)

CCD (Charge Coupled Device)

Gross: Approx. 1 070 000 pixels

Effective (still):

Approx. 1 000 000 pixels

Effective (moving):

Approx. 690 000 pixels

Lens

Carl Zeiss

Combined power zoom lens

Filter diameter: 30 mm (1 3/16 in.)

10× (Optical), 120× (Digital)

F = 1.8 – 2.0

Focal length

3.7 – 37 mm (5/32 – 1 1/2 in.)

When converted to a 35 mm still camera

In CAMERA mode:

50 – 500 mm (2 – 19 3/4 in.)

In MEMORY mode:

42 – 420 mm (1 11/16 – 16 5/8 in.)

Color temperature

Auto, HOLD, INDOOR (3 200 K),

OUTDOOR (5 800 K)

Minimum illumination

7 lx (lux) (F 1.8)

0 lx (lux) (in the NightShot mode)*

* Objects unable to be seen due to the dark can be shot with infrared lighting.

Input/Output connectors

Audio/Video jack

10-pin connector

Input/output auto switch

Video signal: 1 Vp-p, 75 Ω, unbalanced

Luminance signal: 1 Vp-p, 75 Ω, unbalanced

Chrominance signal: 0.286 Vp-p, 75 Ω, unbalanced

Audio signal: 327 mV, (at output impedance more than 47 kΩ)

Input impedance with more than 47 kΩ

Output impedance with less than 2.2 kΩ

DV jack

4-pin connector

Headphone jack

Stereo minijack (ø 3.5 mm)

LANC jack

Stereo mini-minijack (ø 2.5 mm)

USB jack

mini-B

MIC jack

Minijack, 0.388 mV low

impedance with DC 2.5 to 3.0 V, output impedance 6.8 kΩ

(ø 3.5 mm)

Stereo type

LCD screen

Picture

6.2 cm (2.5 type)

Total dot number

211 200 (960 × 220)

General

Power requirements

DC 7.2 V (battery pack)

DC 8.4 V (AC Adaptor)

Average power consumption (when using the battery pack)

During camera recording using

LCD

3.8 W

Viewfinder

3.2 W

Operating temperature

0°C to 40°C (32°F to 104°F)

Storage temperature

–20°C to +60°C

(–4°F to +140°F)

Dimensions (approx.)

51 × 104 × 97 mm

(2 × 4 1/8 × 3 7/8 in.) (w/h/d)

Mass (approx.)

460 g (1 lb)

main unit only

550 g (1 lb 4 oz)

including the rechargeable battery pack NP-FM30 (not for sale), cassette DVM60

Supplied accessories

See page 14.

Specifications

AC Adaptor AC-L15A/L15B

Power requirements

AC 100 – 240 V, 50/60 Hz

Current consumption

0.35 – 0.18 A

Power consumption

18 W

Output voltage

DC OUT: 8.4 V, 1.5 A

Operating temperature

0°C to 40°C (32°F to 104°F)

Storage temperature

–20°C to +60°C

(–4°F to +140°F)

Dimensions (approx.)

56 × 31 × 100 mm

(2 1/4 × 1 1/4 × 4 in.) (w/h/d)

excluding projecting parts

Mass (approx.)

190 g (6.7 oz)

excluding the power cord

“Memory Stick”

Memory

Flash memory

8MB: MSA-8A

Operating voltage

DC 2.7 – 3.6 V

Power consumption

Approx. 45 mA during operation mode

Approx. 130 µA during tape recording standby

Dimensions (approx.)

50 × 2.8 × 21.5 mm

(2 × 1/8 × 7/8 in.) (w/h/d)

Mass (approx.)

4 g (0.14 oz)

Design and specifications are subject to change without notice.

Rechargeable battery pack NP-FM30

Maximum output voltage

DC 8.4 V

Output voltage

DC 7.2 V

Capacity

5.0 Wh (700 mAh)

Dimensions (approx.)

38.2 × 20.5 × 55.6 mm

(1 9/16 × 13/16 × 2 1/4 in.)

(w/h/d)

Mass (approx.)

65 g (2.3 oz)

Operating temperature

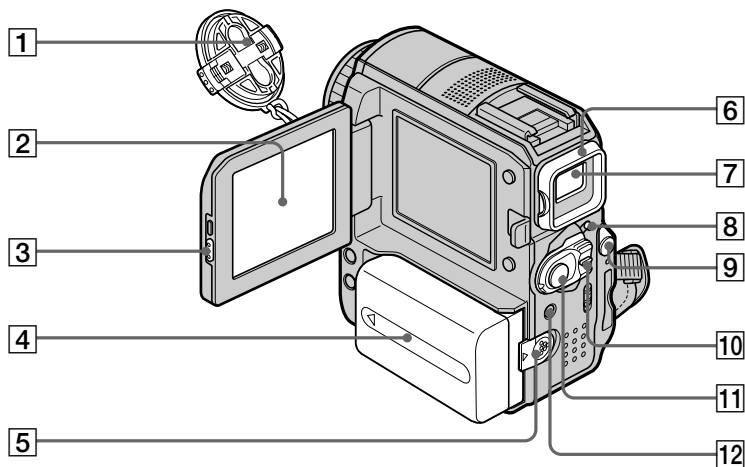
0°C to 40°C (32°F to 104°F)

Type

Lithium ion

Identifying parts and controls

Camcorder



1 Lens cap (p. 28)

2 LCD/Touch panel screen (p. 25)

3 OPEN button (p. 9)


4 Battery pack/Battery terminal cover (p. 15)

5 BATT release lever (p. 15)

6 Eyecup (p. 223)

7 Viewfinder (p. 34)

8 LOCK switch (p. 29)

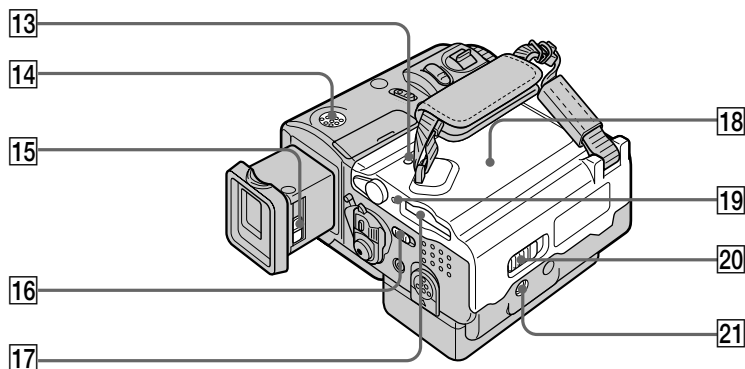
9  (headphones) jack (green)
When you use headphones, the speaker on your camcorder is muted.

10 POWER switch (p. 28)

11 START/STOP button (p. 28)

12 Flash lamp/  (flash) button (p. 124)

Identifying parts and controls



13 RESET button (p. 208)

If you press RESET, all the settings including the date and time return to the default.

14 Speaker

15 Viewfinder lens adjustment lever
(p. 34)

16 LCD BACKLIGHT switch (p. 34)

17 "Memory Stick" slot (p. 10, 115)

18 Cassette lid (p. 8)

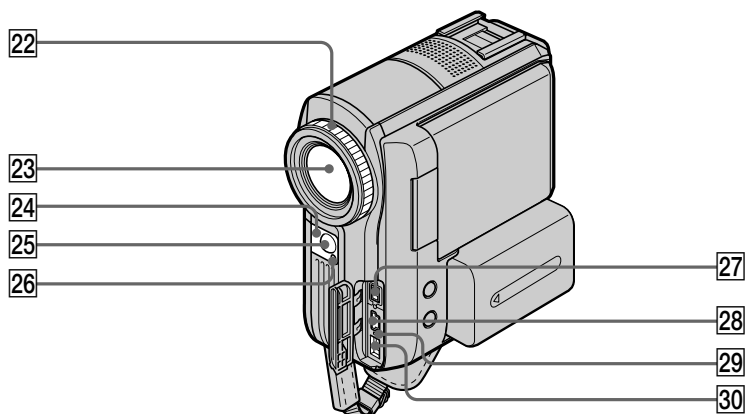
19 Access lamp (p. 115)

20 OPEN/EJECT lever (p. 8)

21 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.

Identifying parts and controls



22 Focus ring (p. 68)

23 Lens

24 Remote sensor

25 Infrared rays (NightShot Light) emitter (p. 37, 89)

26 Camera recording lamp (p. 28)

27 DV Interface (p. 85, 97, 187, 189)
The DV Interface is i.LINK compatible.

28 USB jack (p. 160)

29 CHARGE lamp (p. 16)

30 DC IN jack (p. 16)

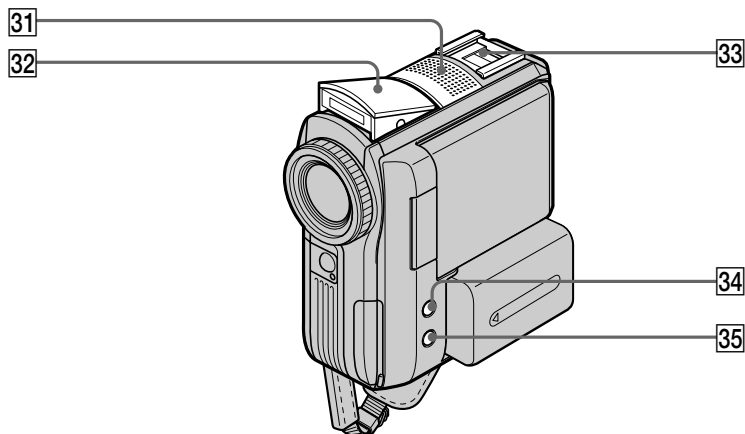
Note on the Carl Zeiss lens

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 camera and offers a quality as the Carl Zeiss lens.

* MTF stands for Modulation Transfer Function.

The value number indicates the amount of light of a subject coming into the lens.

Identifying parts and controls



31 Microphone (p. 28)

32 Flash (p. 124)

33 Intelligent accessory shoe (p. 103)

34 DISPLAY/BATT INFO button (p. 19, 43)

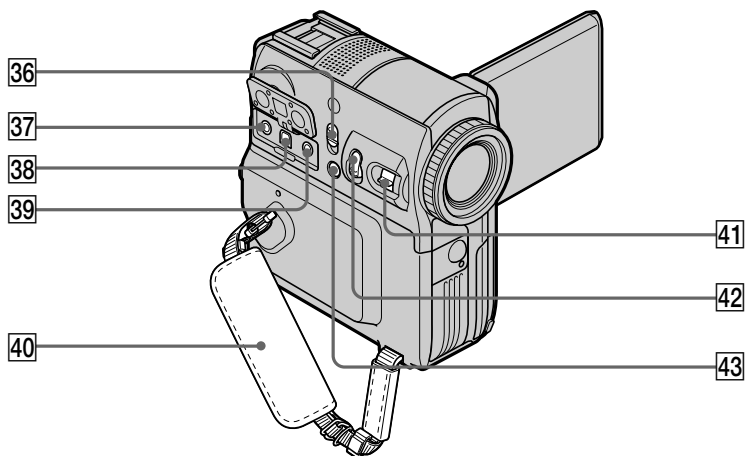
35 BACK LIGHT button (p. 36)



Notes on the intelligent accessory shoe

- The intelligent accessory shoe supplies power to optional accessories such as a video light or microphone.
- The intelligent accessory shoe is linked to the POWER switch, allowing you to turn the power supplied by the shoe on and off. Refer to the operating instructions of the accessory for details.
- The intelligent accessory shoe has a safety device for fixing the installed accessory securely. 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 the accessory and pull it off.



Identifying parts and controls



36 NIGHTSHOT switch (p. 37)

37 MIC jack (PLUG IN POWER) (red)
Connect an external microphone (optional). This jack also accepts a “plug-in-power” microphone. When the external microphone is connected, it takes precedence.

38 AUDIO/VIDEO jack (p. 47, 84, 97, 187)

39  (LANC) jack (blue)
LANC stands for Local Application Control Bus System. The  control jack is used for controlling the tape transport of video equipment and other peripherals connected to the video equipment. This jack has the same function as the jack indicated as CONTROL L or REMOTE.

40 Grip belt (p. 8, 21)

41 Power zoom lever (p. 35, 78)

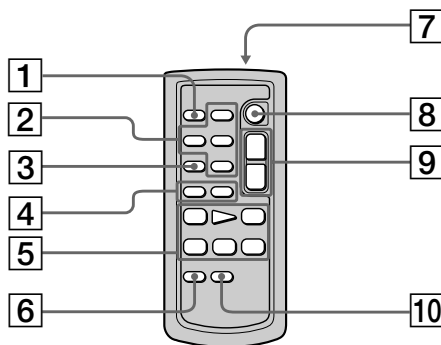
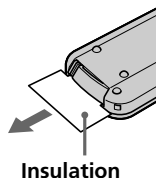
42 PHOTO button (p. 11, 49, 120, 135)

43 FOCUS button (p. 68)

Identifying parts and controls

Remote Commander

A button type lithium battery is already installed in the Remote Commander at the factory. To avoid flattening the battery, the insulation is inserted. Before operation, remove the insulation.



1 PHOTO button (p. 51, 120, 135)

2 Memory Control buttons (p. 144)

3 SEARCH M. button (p. 81, 82)

4 I◀/▶I buttons (p. 81, 82)

5 Video control buttons (p. 46)

6 ZERO SET MEMORY button (p. 80)

7 Transmitter

Point toward the remote sensor to control your camcorder after turning it on.

8 START/STOP button (p. 28)

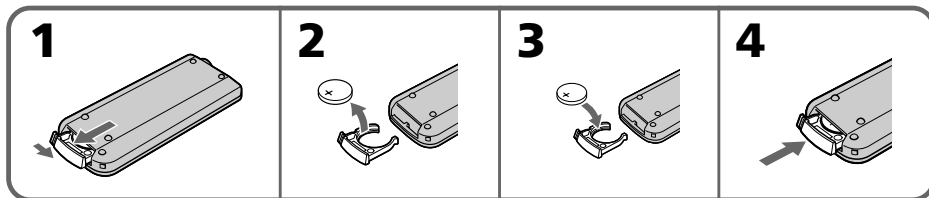
9 Power zoom button (p. 35)

10 DISPLAY button (p. 43)

Identifying parts and controls

Replacing the button type lithium battery

- (1) Pull out the battery holder while pushing the tab on the holder.
- (2) Take out the button type lithium battery from the holder.
- (3) Put a new battery into the holder with its + side facing upward.
- (4) Insert the holder into the Remote Commander until it clicks.



WARNING

Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

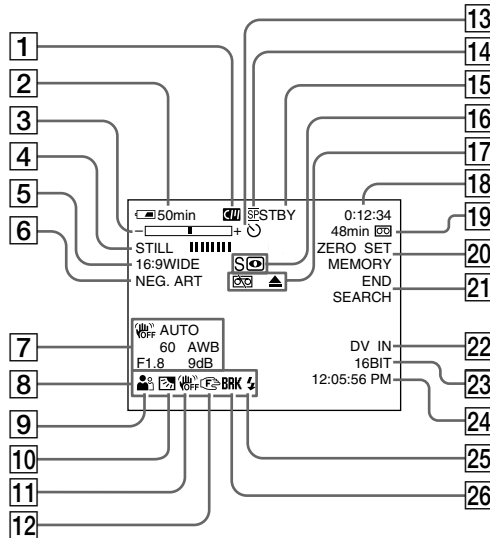
Notes on the Remote Commander

- When the lithium battery becomes weak, the operating distance of the Remote Commander may shorten, or the Remote Commander may not function properly. In this case, replace the battery with a Sony CR2025 lithium battery. Use of another battery may present a risk of fire or explosion.
- A button type lithium battery (CR2025) is already installed in the Remote Commander. Do not use any batteries other than CR2025.
- Point the remote sensor away from strong light sources such as direct sunlight or overhead lighting. Otherwise, the Remote Commander may not function properly.
- Your camcorder works in the Commander mode VTR 2. Commander modes 1, 2 and 3 are used to distinguish your camcorder from other Sony VCRs to avoid erroneous remote control operation. If you use another Sony VCR in the Commander mode VTR 2, we recommend changing the Commander mode or covering the sensor of the VCR with black paper.

Identifying parts and controls

Operation indicators

LCD screen and Viewfinder



- 1** Cassette Memory (p. 12, 213)
- 2** Remaining battery time (p. 30)
- 3** Zoom (p. 35)/Exposure (p. 66)/
Data file name (p. 145)/
- 4** Digital effect (p. 61, 77)/
MEMORY MIX (p. 128)/
Fader (p. 57)
- 5** 16:9WIDE (p. 55)
- 6** Picture effect (p. 60, 76)
- 7** Data code (p. 44)
- 8** Volume (p. 42)/Date (p. 30)
- 9** PROGRAM AE (p. 64)
- 10** Back light (p. 36)
- 11** SteadyShot off (p. 193)
- 12** Manual focus (p. 68)
- 13** Self-timer (p. 51, 135)
- 14** Recording mode (p. 198)
- 15** STBY/REC (p. 30)/
Video control mode (p. 45)/
Image size (p. 117)/
Image quality (p. 116)
- 16** NIGHTSHOT (p. 37)/
SUPER NIGHTSHOT (p. 37)/
COLOR SLOW SHUTTER (p. 38)
- 17** Warning (p. 210)
- 18** Time code (p. 30)/
Tape counter (p. 80)/
Self-diagnosis (p. 209)/
Memory photo recording (p. 120)/
Image number (p. 145)/
Playback folder (p. 145)
- 19** Remaining tape (p. 30)/
Memory photo playback (p. 144)
- 20** ZERO SET MEMORY (p. 80)/
Interval recording (p. 71)/
Interval Photo recording (p. 132)/
Frame recording (p. 73)
- 21** END SEARCH (p. 40)
- 22** A/V → DV (p. 187)/DV IN
- 23** Audio mode (p. 198)/
Recording folder (p. 142)
- 24** Time (p. 30)
- 25** Flash (p. 124)
This indicator appears only when the
built-in flash or the external flash
(optional) is in use.
- 26** Continuous photo recording (p. 122)

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