SONY

Digital Video Camera Recorder

Mini **DV** Digital Video Cassette
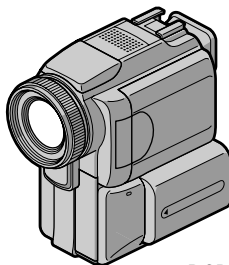
Operating Instructions

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-PC ————————— Model No. AC- —————————

Serial No. ————————— Serial No. —————————

DCR-PC120BT

Digital Handycam

Network Handycam

InfoLITHIUM ™ **M** SERIES

Cassette Memory

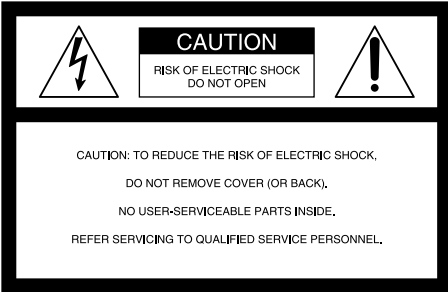MEMORY STICK ™

Bluetooth ™

DCR-PC115/PC120BT

©2001 Sony Corporation

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.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,

DO NOT REMOVE COVER (OR BACK).

NO USER-SERVICEABLE PARTS INSIDE.

REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

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.

CAUCTION

The use of optical instruments with this product will increase eye hazard. As the laser beam used in this Handycam is harmful to eyes, do not attempt to disassemble the cabinet.
Refer to servicing to qualified personnel only.

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

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

DISPOSAL OF LITHIUM ION BATTERY.
LITHIUM ION BATTERY.
DISPOSE OF PROPERLY.

You can return your unwanted lithium ion batteries to your nearest Sony Service Center or Factory Service Center.

Note: In some areas the disposal of lithium ion batteries in household or business trash may be prohibited.
For the Sony Service Center nearest you call 1-800-222-SONY (United States only).
For the Sony Factory Service Center nearest you call 416-499-SONY (Canada only).

Caution: Do not handle damaged or leaking lithium ion battery.

"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 OPERAION.
THIS CLASS B DIGITAL APPARATUS COMPLIES WITH CANADIAN ICES-003.

For the 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-PC120
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.

3

Main Features

Taking moving or still images, and playing them back
• Recording a moving picture on a tape (p. xx)
• Recording a still image on a tape (p. xx)
• Playing back a tape (p. xx)
• Recording still images on "Memory Stick"s (p. xx)
• Recording moving pictures on "Memory Stick"s (p. xx)
• Viewing a still image recorded on "Memory Stick"s (p. xx)
• Viewing a moving picture on "Memory Stick"s (p. xx)
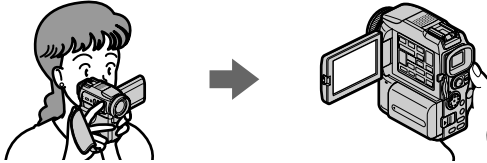
Capturing images on your computer
• Using with an analog video unit and your computer (p. xx)
• Viewing images recorded on "Memory Stick"s using the USB cable (p. xx)
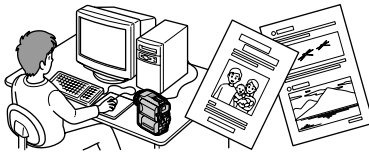
Accessing to the Internet via a Bluetooth equipped device (DCR-PC120BT only)
Accessing the Internet, sending/receiving your e-mail, and using the album on the Web (Only in North America and Japan). For details, refer to the Network Operating Instructions supplied with your camcorder. (p. xx)

Other uses
Functions to adjust exposure in the recording mode
• Back light (p. xx)
• NightShot/Super NightShot (p. xx)
• Recording images with the flash (p. xx, xx)
• PROGRAM AE (p. xx)
• Adjusting the exposure manually (p. xx)

Functions to give images more impact
• Digital zoom (p. xx) The default setting is set to OFF. (To zoom greater than 10×, select the digital zoom power in D ZOOM in the menu settings.)
• Fader (p. xx)
• Picture effect (p. xx)
• Digital effect (p. xx)
• Title (p. xx, xx)
• MEMORY MIX (p. xx)

Functions to give a natural appearance to your recordings
• Sports lesson (p. xx)
• Landscape (p. xx)
• Manual focus (p. xx)

Functions to use on recorded tapes
• END SEARCH/EDITSEARCH/Rec Review (p. xx)
• DATA CODE (p. xx)
• Tape PB ZOOM (p. xx)
• Zero set memory (p. xx, xx)
• Title search (p. xx)
• Digital program editing (p. xx, xx)
• HiFi SOUND (p. xx)

4

Checking supplied accessories

Make sure that the following accessories are supplied with your camcorder.
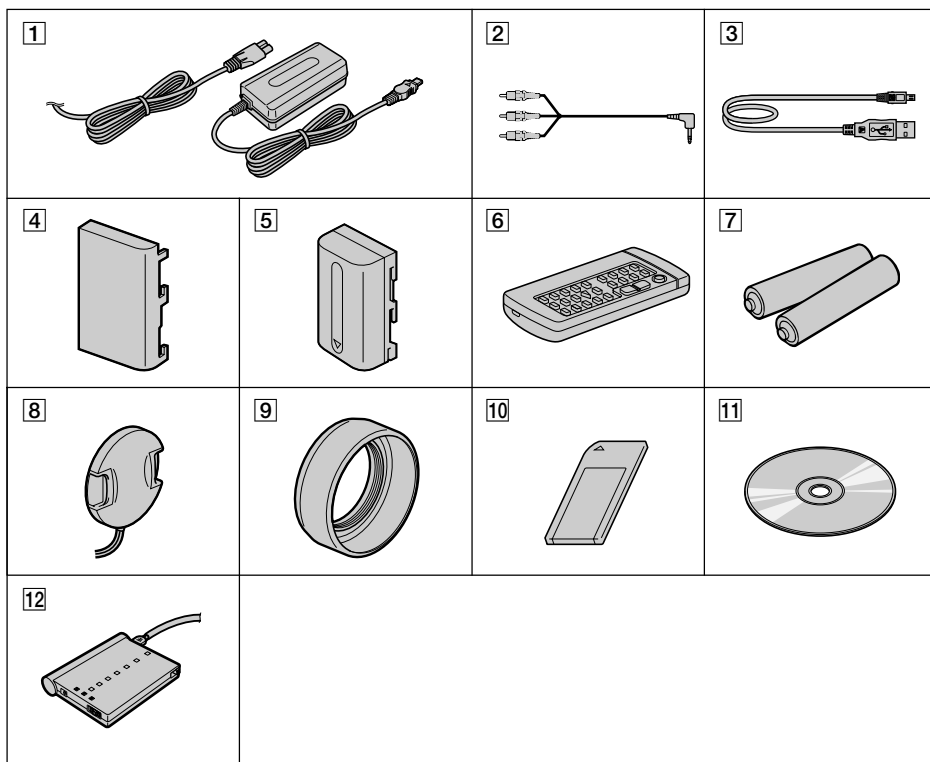
1 AC-L10A/L10B/L10C AC power adaptor (1), Power cord (1) (p. xx)

2 A/V connecting cable (1) (p. xx, xx)

3 USB cable (1) (p. xx)

4 Battery terminal cover (1) (p. xx)

5 NP-FM50 battery pack (1) (p. xx, xx)

6 Wireless Remote Commander (1) (p. xx)

7 Size AA (R6) battery for Remote Commander (2) (p. xx)

8 Lens cap (1) (p. xx)

9 Lens hood (1) (p. xx)

10 "Memory Stick" (1) (p. xx)

11 CD-ROM (SPVD-004 USB Driver) (1) (p. xx)

12 Bluetooth adaptor (BTA-NW1) * (1) (p. xx)

13 Bluetooth modem cord (MDM-5614G)*(1) (p.xx)

14 Bluetooth modem cable*(1) (p.xx)

15 AC power adapter (AC-PT1)*(1) (p.xx)

16 Alkarine AA dry batteries for Bluetooth Adaptor*(2) (p.xx)

*DCR-PC120BT only

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

Table of contents

Table of contents

Using the Network function

Troubleshooting

Additional Information

Quick Reference

Quick Start Guide

This chapter introduces you to the basic features of your camcorder. See the page in parentheses "( )" for more information.
Pull down the Holding Grip to hold your camcorder as illustrated.

Holding Grip

1 Connecting the power cord (p. xx)

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

Open the jack cover.

AC power adaptor (supplied)

Connect the plug with its ▲ mark facing up.
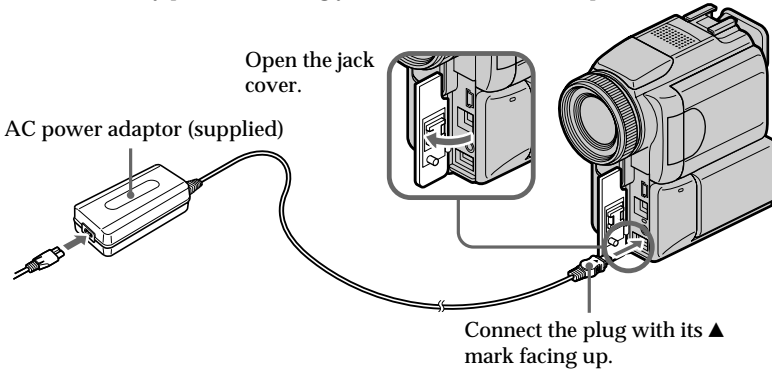
2 Inserting a cassette (p. xx)

1 Slide OPEN/ ▲ EJECT in the direction of the arrow and open the lid.
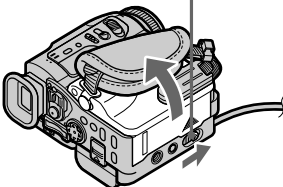
2 Push the middle portion of the back of the cassette to insert. Insert the cassette in a straight line deeply into the cassette compartment with the window facing out.
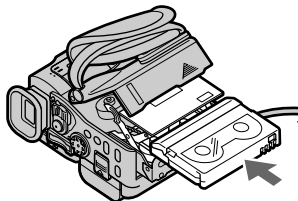
3 Close the cassette compartment by pressing the PUSH mark on the cassette compartment. After the cassette compartment goes down completely, close the lid until it clicks.

PUSH
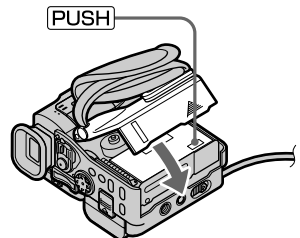
3 Recording a picture (p. xx)

❶ Remove the lens cap.

Viewing a picture with the viewfinder
Close the LCD panel, and pull out the viewfinder.

❸ Press OPEN to open the LCD panel.
The picture appears on the screen.
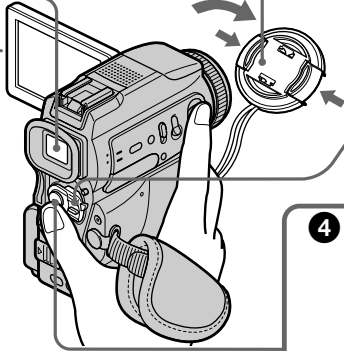
❷ Set the POWER switch to CAMERA while pressing the small green button.

POWER
VCR
(CHG) OFF
CAMERA
LOCK
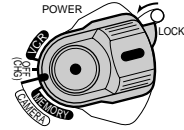
❹ Press START/STOP. Your camcorder starts recording. To stop recording, press START/STOP again.

POWER
VCR
(CHG) OFF
CAMERA
LOCK
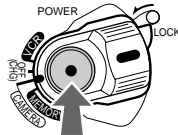
When you purchase your camcorder, the clock setting is set to off. If you want to record the date and time for a picture, set the clock setting before recording (p. xx).

4 Monitoring the playback picture on the LCD screen (p. xx)

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

POWER
VCR
(CHG) OFF
CAMERA
MEMORY
LOCK

❷ Press ◀◀ to rewind the tape.

```
REW
◀◀
```

❸ Press ▶ to start playback.

```
PLAY
▶
```
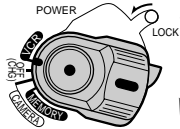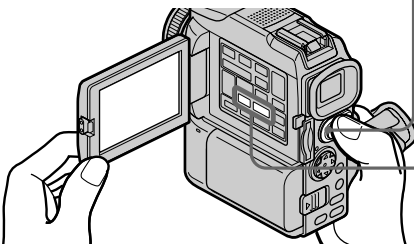
NOTE
Do not pick up your camcorder by holding the viewfinder, the flash, the LCD panel or the battery pack.
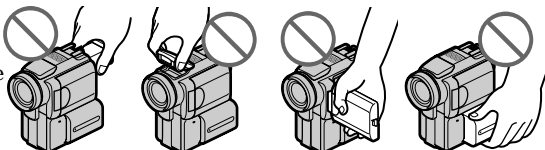
Using this manual

The instructions in this manual are for the two models listed in the table below. Before you start reading this manual and operating your camcorder, check the model number by looking at the bottom of your camcorder. (DCR-PC120BT is marked as DCR-PC120 on the bottom of this unit.) The DCR-PC120BT is the model used for illustration purposes. Otherwise, the model name is indicated in the illustrations. Any differences in operation are clearly indicated in the text, for example, "DCR-PC120BT only".

As you read through this manual, buttons and settings on your camcorder are shown in capital letters.
e.g. Set the POWER switch to CAMERA.
When you carry out an operation, you can hear a beep sound to indicate that the operation is being carried out.

Types of differences

DCR-	PC115	PC120BT
Bluetooth adaptor	—	●
Network	—	●

●   Provided
—   Not provided

Note on Cassette Memory

Your camcorder is based on the DV format. You can only use mini DV cassettes with your camcorder. We recommend that you use a tape with cassette memory ⊂‖‖.

The functions which require different operations depending on whether the tape has the cassette memory or not are:
– End search (p. xx)
– Date search (p. xx)
– Photo search (p. xx)
The functions you can operate only with the cassette memory are:
– Title search (p. xx)
– Superimposing a title (p. xx)
– Labeling a cassette (p. xx)
For details, see page xx.

CM only   You see this mark in the introduction of the features that are operated only with cassette memory.

Tapes with cassette memory are marked by ⊂‖‖ (Cassette Memory).

Note on TV color systems

TV color systems differ from country to country. 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 provision of the copyright laws.

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]

11
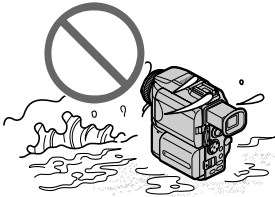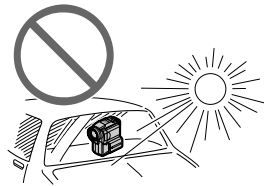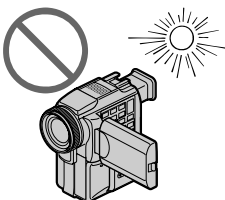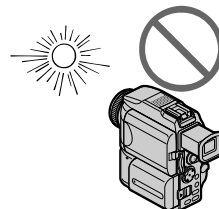
Step 1 Preparing the power supply

Installing the battery pack

(1) While sliding BATT RELEASE in the direction of the arrow ❶, slide the battery terminal cover in the direction of the arrow ❷.
(2) Insert the battery pack in the direction of the arrow until it clicks.
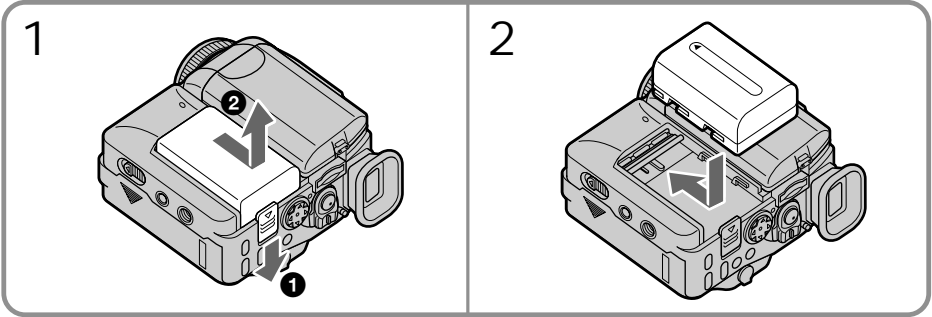
To remove the battery pack
The battery pack is removed in the same way as the battery terminal cover.
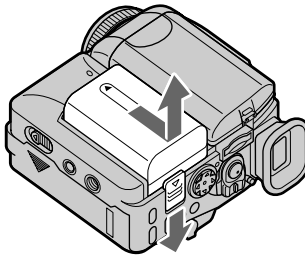
Note on the battery terminal cover
To protect the battery terminals, install the battery terminal cover after the battery pack is removed.

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 xxx for details of "InfoLITHIUM" battery pack.

(1) Open the jack cover and connect the AC power adaptor supplied with your camcorder to the DC IN jack with the plug's ▲ mark facing up.
(2) Connect the power cord to the AC power adaptor.
(3) Connect the power cord to the wall outlet.
(4) Set the POWER switch to OFF (CHG). The CHG lamp lights up when the charge begins. After the charge is completed, the CHG lamp goes out. (full charge)

Getting started

CHG lamp
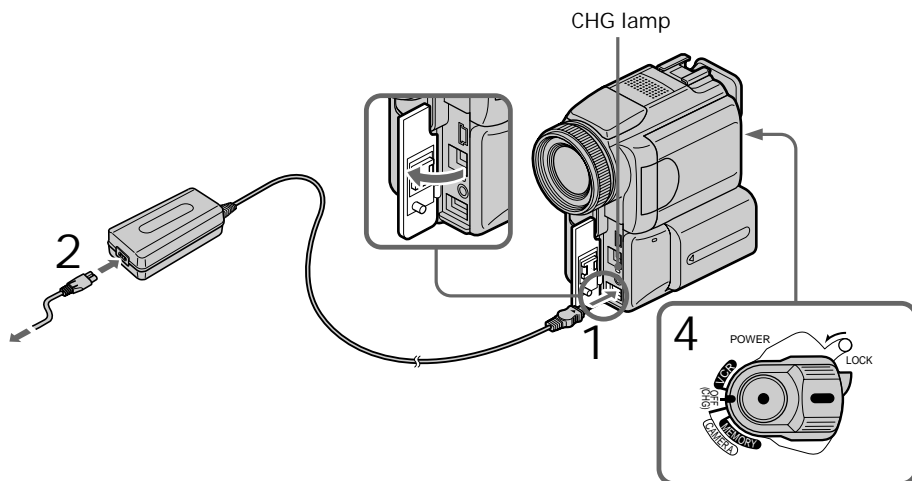
After charging the battery pack
Disconnect the AC power adaptor from the DC IN jack on your camcorder.

Note
Prevent metallic objects from coming into contact with the metal parts of the DC plug of the AC power adaptor. This may cause a short-circuit, damaging the AC power adaptor.

While charging the battery pack, the CHG lamp flashes in the following cases:
– The battery pack is not installed correctly.
– Something is wrong with the battery pack.

When you use the AC power adaptor
Place the AC power adaptor near a wall outlet. If any trouble occurs with this unit, disconnect the plug from a wall outlet as soon as possible to cut off the power.

Charging time

Battery pack	Full charge
NP-FM50 (supplied)	150
NP-FM70	240
NP-FM90	330
NP-FM91	360

The charging time may increase if the battery's temperature is extremely high or low because of the ambient temperature.
Approximate minutes at 25°C (77°F) to charge an empty battery pack

Recording time

Battery pack	Recording with the viewfinder		Recording with the LCD screen	
	Continuous*	Typical**	Continuous*	Typical**
NP-FM50 (supplied)	130	75	110	60
NP-FM70	270	155	230	130
NP-FM90	410	235	355	205
NP-FM91	475	275	410	235

Approximate minutes when you use a fully charged battery

* Approximate continuous recording time at 25°C (77°F). The battery life will be shorter if you use your camcorder in a cold environment.
** Approximate number of minutes when recording while 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 LCD screen	Playing time with LCD closed
NP-FM50 (supplied)	150	185
NP-FM70	310	385
NP-FM90	475	580
NP-FM91	550	670

Approximate minutes when you use a fully charged battery

Approximate 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 supply

If the power goes off although the battery remaining indicator indicates that the battery pack has enough power to operate
Charge the battery pack fully again so that the indication on the battery remaining indicator is correct.

Recommended charging temperature
We recommend charging the battery pack in an ambient temperature of between 10°C to 30°C (50°F to 86°F).

What is "InfoLITHIUM"?
The "InfoLITHIUM" is a lithium ion battery pack which can exchange data such as battery consumption with compatible electronic equipment. This unit is compatible with the "InfoLITHIUM" battery pack (M series). Your camcorder operates only with the "InfoLITHIUM" battery. "InfoLITHIUM" M series battery packs have the
ⓘ InfoLITHIUM Ⓜ mark.
"InfoLITHIUM" is a trademark of Sony Corporation.

Connecting to a wall outlet

When you use your camcorder for a long time, we recommend that you power it from a wall outlet using the AC power adaptor.

(1) Open the jack cover. Connect the AC power adaptor supplied with your camcorder to the DC IN jack on your camcorder with the plug's ▲ mark facing up.
(2) Connect the power cord to the AC power adaptor.
(3) Connect the power cord to a wall outlet.
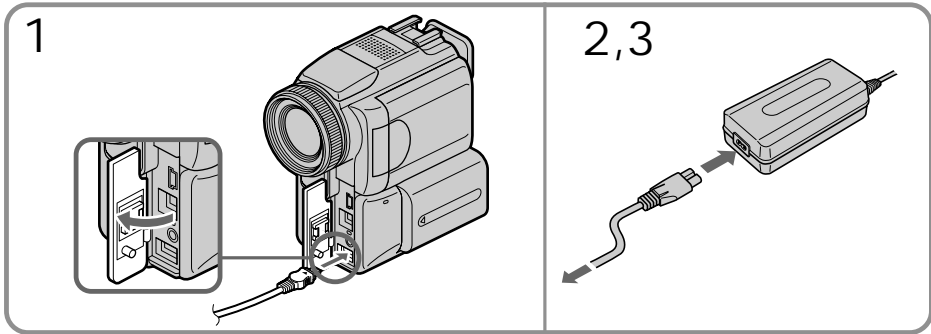
PRECAUTION
The set is not disconnected from the AC power source (house current) as long as it is connected to the wall outlet, even if the set itself has been turned off.

Notes
• The AC power adaptor can supply power even if the battery pack is attached to your camcorder.
• The DC IN jack has "source priority." This means that the battery pack cannot 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.

Using a car battery
Use Sony DC Adaptor/Charger (optional).
Refer to the operating instructions of the DC Adaptor/Charger for further information.

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Getting started

Step 2 Setting the date and time

Set the date and time settings when you use your camcorder for the first time. "CLOCK SET" will be displayed each time that you set the POWER switch to CAMERA or MEMORY unless you set the date and time settings.
If you do not use your camcorder for about three months, the date and time settings may be released (bars may appear) because the built-in rechargeable battery installed in your camcorder will have been discharged (p. xx).
Set the area, the summer time, year, month, day, hour and then the minute, in that order.

(1) Set the POWER switch to CAMERA or MEMORY, then press MENU to display the menu settings.
(2) Press ▲/▼ on the control button to select 🖾, then press ● or ▶.
(3) Press ▲/▼ on the control button to select CLOCK SET, then press ●or ▶.
(4) Press ▲/▼ on the control button to adjust the desired area (where you are), then press ●.
(5) Press ▲/▼ on the control button to select whether or not the time is summer time, then press ●.
    Select NO if the time is not summer time. Select YES if it is.
(6) Press ▲/▼ on the control button to adjust the desired year, then press ●.
    The year changes as follows:

$$1995 \leftarrow \cdots \rightarrow 2001 \leftarrow \cdots \rightarrow 2079$$
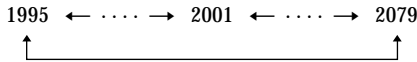
(7) Set the month, day and hour by pressing ▲/▼ on the control button and pressing ●.
(8) Set the minute by pressing ▲/▼ on the control button and pressing ● by the time signal. The clock starts to move.
(9) Press MENU to make the menu settings disappear.

Step 2 Setting the date and time

```
2
MANUAL SET
    PROGRAM AE
    P EFFECT
    D EFFECT
    WHT BAL
    AUTO SHTR

[MENU]:END
```
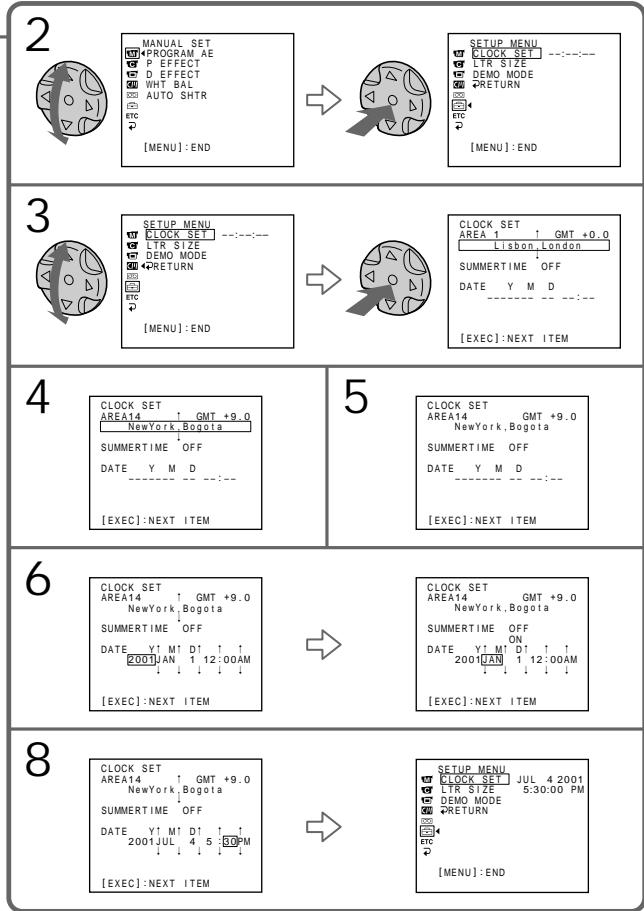
```
SETUP MENU
    CLOCK SET  --:--:--
    LTR SIZE
    DEMO MODE
    RETURN

[MENU]:END
```

```
3
SETUP MENU
    CLOCK SET  --:--:--
    LTR SIZE
    DEMO MODE
    RETURN

[MENU]:END
```

```
CLOCK SET
AREA 1      ↑    GMT +0.0
          Lisbon,London

SUMMERTIME  OFF

DATE   Y  M  D
       ------- -- --:--

[EXEC]:NEXT ITEM
```

MENU

```
4
CLOCK SET
AREA14      ↑    GMT +9.0
        NewYork,Bogota

SUMMERTIME  OFF

DATE   Y  M  D
       ------- -- --:--

[EXEC]:NEXT ITEM
```

```
5
CLOCK SET
AREA14           GMT +9.0
        NewYork,Bogota

SUMMERTIME  OFF

DATE   Y  M  D
       ------- -- --:--

[EXEC]:NEXT ITEM
```

```
6
CLOCK SET
AREA14      ↑    GMT +9.0
        NewYork,Bogota

SUMMERTIME  OFF

DATE   Y↑ M↑ D↑  ↑  ↑
       2001 JAN  1 12:00AM
         ↓  ↓  ↓  ↓  ↓

[EXEC]:NEXT ITEM
```

```
CLOCK SET
AREA14      ↑    GMT +9.0
        NewYork,Bogota

SUMMERTIME  OFF
            ON
DATE   Y↑ M↑ D↑  ↑  ↑
       2001 JAN  1 12:00AM
         ↓  ↓  ↓  ↓  ↓

[EXEC]:NEXT ITEM
```

```
8
CLOCK SET
AREA14      ↑    GMT +9.0
        NewYork,Bogota

SUMMERTIME  OFF

DATE   Y↑ M↑ D↑  ↑  ↑
       2001 JUL  4  5 30 PM
         ↓  ↓  ↓  ↓  ↓

[EXEC]:NEXT ITEM
```

```
SETUP MENU
    CLOCK SET   JUL  4 2001
    LTR SIZE        5:30:00 PM
    DEMO MODE
    RETURN

[MENU]:END
```

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

When using your camcorder abroad
Set the clock to the local time (p. xx).

Note on the time indicator
The internal clock of your camcorder operates on a 12-hour cycle.
• 12:00 AM stands for midnight.
• 12:00 PM stands for noon.

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Step 3 Inserting a cassette

(1) Install the power source.
(2) Slide OPEN/▲ EJECT in the direction of the arrow and open the lid.
   The cassette compartment automatically lifts up and opens.
(3) Push the middle portion of the back of the cassette to insert.
   Insert the cassette in a straight line deeply into the cassette compartment with the window facing out.
(4) Close the cassette compartment by pressing the PUSH mark on the cassette compartment. The cassette compartment automatically goes down.
(5) After the cassette compartment goes down completely, close the lid until it clicks.
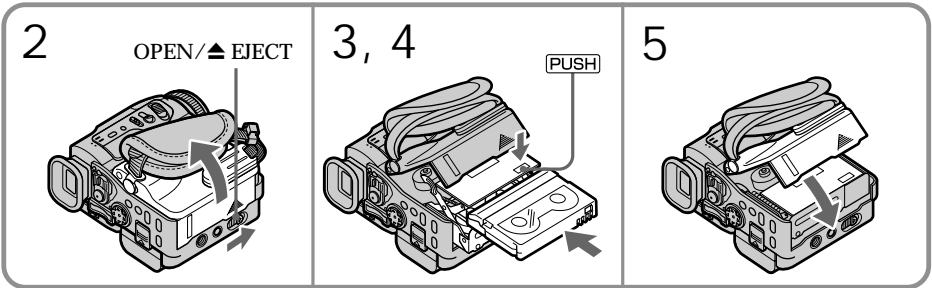
To eject a cassette
Follow the procedure above, and take out the cassette in step 3.

Notes
• Do not press the cassette compartment down forcibly. Doing so may cause a malfunction.
• The cassette compartment may not be closed when you press any part of the lid other than the PUSH mark.

When you use cassette with cassette memory
Read the instruction about cassette memory to use this function properly (p. xx).

To prevent accidental erasure
Slide the write-protect tab on the cassette to expose the red mark.
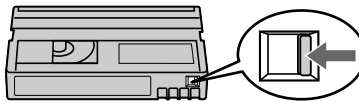
Recording a picture

Your camcorder automatically focuses for you.

(1) Remove the lens cap by pressing both knobs on its sides and pull the lens cap string to fix it.
(2) Install the power source and insert a cassette. See "Step 1" to "Step 3" for more information (p. xx to xx).
(3) Pull down the Holding Grip.
    Hold your camcorder firmly as illustrated.
(4) Set the POWER switch to CAMERA while pressing the small green button. Your camcorder is set to the standby mode.
(5) Press OPEN to open the LCD panel. The viewfinder automatically turns off.
(6) 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.

Microphone

Camera recording lamp

Recording – Basics
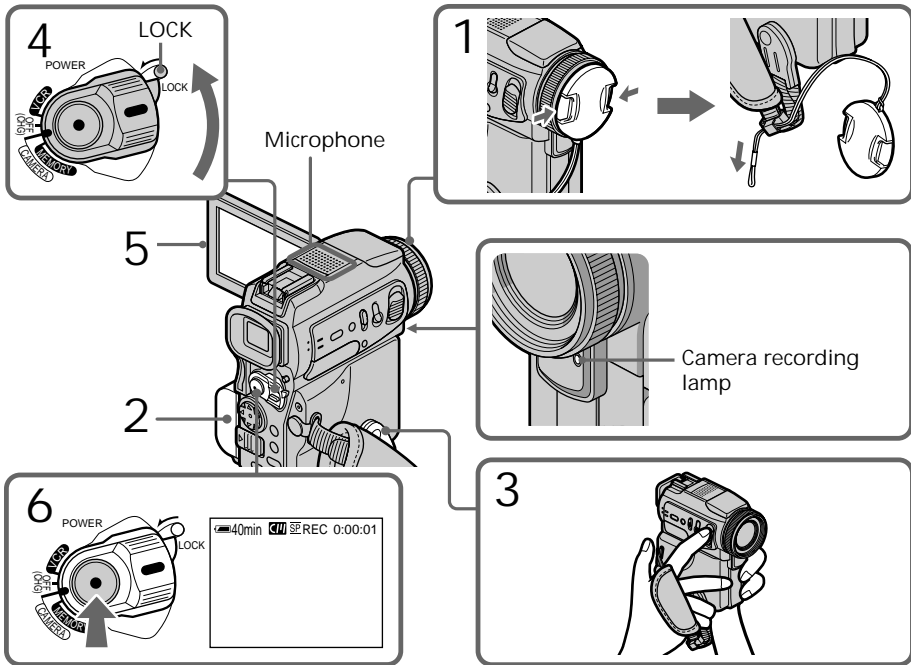
Notes
• Fasten the grip strap firmly.
• Do not touch the built-in microphone during recording.

Note on Recording mode
Your camcorder records and plays back in the SP (standard play) mode and in the LP (long play) mode. Select SP or LP in the menu settings. In the LP mode, you can record 1.5 times as long as in the SP mode.
When you record a tape in the LP mode on your camcorder, we recommend playing the tape on your camcorder.

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. LOCK switch is set to the right as a default setting.

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 mode and ones in the LP mode on one tape.
– When you change the battery pack, set the POWER switch to OFF (CHG).
– When you use a tape with cassette memory, however, you can make the transition smooth even after ejecting the cassette if you use the END SEARCH function (p. xx).

If you leave your camcorder in the standby mode for five minutes while the cassette is inserted
Your camcorder automatically turns off. This is to save battery power and to prevent battery and tape wear. To resume the standby mode, set the POWER switch to OFF (CHG), and to CAMERA again. However, your camcorder does not turn off automatically while the cassette is not inserted.

When you record in the SP and LP modes on one 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.

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

The battery use time when you record using the LCD screen
The battery time is slightly shorter than the shooting time using the viewfinder.

After recording

(1) Set the POWER switch to OFF (CHG).
(2) Close the LCD panel.
(3) Set the Holding Grip back to the previous position.
(4) Eject the cassette.
(5) Remove the battery pack.
(6) Attach the battery terminal cover.

Recording a picture

Adjusting the LCD screen

The LCD panel moves about 90 degrees to the viewfinder side and about 180 degrees to the lens side.
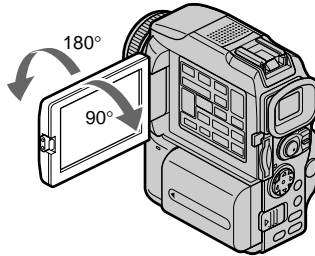
When closing the LCD panel, set it vertically, and swing it into the camcorder body.

Note
When using the LCD screen except in the mirror mode, the viewfinder automatically turns off (p. xx).

When you use the LCD screen outdoors in direct sunlight
The LCD screen may be difficult to see. If this happens, we recommend that you use the viewfinder.

When you adjust the angle of the LCD panel
Make sure if the LCD panel is opened up to 90 degrees.

Adjusting the brightness of the LCD screen

(1) Set the POWER switch to CAMERA, VCR or MEMORY. Press MENU, then select and decide upon LCD BRIGHT in 🔲 with the control button. The bar indicator appears.
(2) Press ◀/▶ on the control button to adjust the brightness of the LCD screen, then press ●.
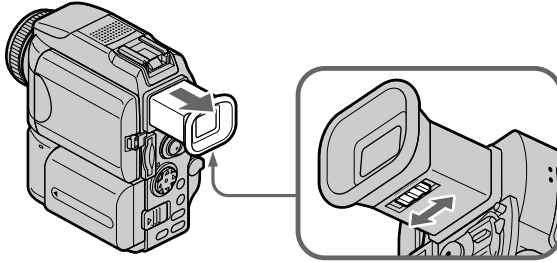

To darken	To lighten
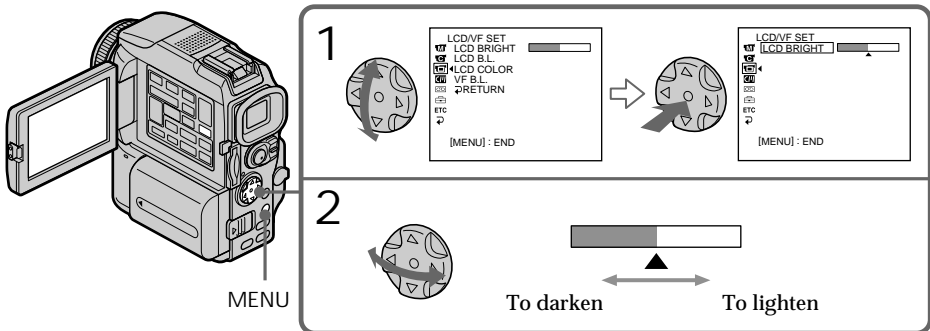
MENU

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

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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 indicators in the viewfinder come into sharp focus.

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

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

Attaching the supplied lens hood

To record fine pictures under strong light, we recommend attaching the lens hood. Also the lens cap can be attached even with the lens hood on.

Photocell Window
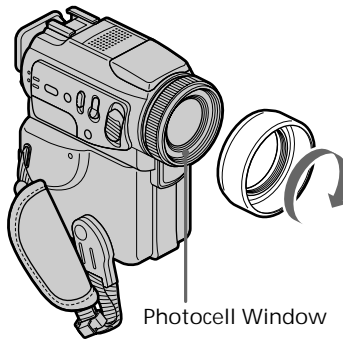
Notes
• When you use the Remote Commander and the lens hood, the Remote Commander may not function properly because the lens hood blocks the infrared rays from the Remote Commander. In such case, remove the lens hood from your camcorder.
• You cannot attach filters or other objects onto the lens hood. If you do so forcibly, you will no longer be able to remove filters or other objects from the lens hood.

When you use the filter (optional)
• The shadow of the lens hood may appear in the corners of the screen.
• The flash may not be adjusted correctly if the photocell window is covered.

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Recording a picture

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 function sparingly results in better-looking recordings.
"T" side: for telephoto (subject appears closer)
"W" side: for wide-angle (subject appears farther away)
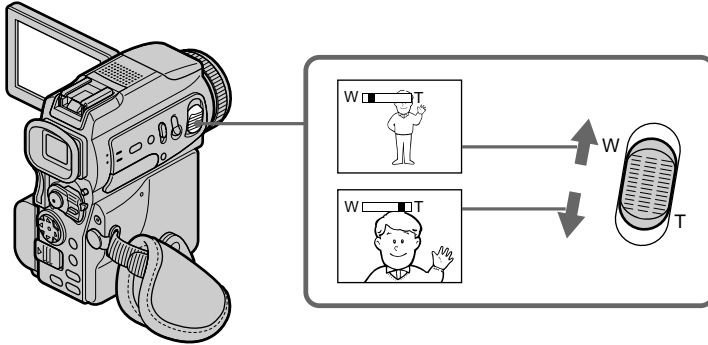
To use zoom greater than 10×

Zoom greater than 10× is performed digitally. To activate digital zoom, select the digital zoom power in D ZOOM in the menu settings (p. xx). The digital zoom function is set to OFF as a default setting (p. xx).

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.
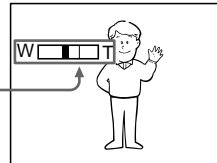
When you shoot close to a subject

If you cannot get 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 feet 5/8 inch) away from the lens surface in the telephoto position, or about 1 cm (about 1/2 inch) away in the wide-angle position.

Notes on digital zoom
• Digital zoom starts to function when zoom exceeds 10×.
• The picture quality deteriorates as you move the power zoom lever towards the "T" side.

When the POWER switch is set to MEMORY
You cannot use the digital zoom.

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Shooting with the Mirror Mode

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

Set the POWER switch to CAMERA or MEMORY.
Pull out the viewfinder and rotate the LCD screen 180 degrees.

The ☺ indicator appears in the viewfinder and on the LCD screen.
▐▐● appears in the standby mode, and ● appears in the recording mode. Some of other indicators appear mirror-reversed and others are not displayed.
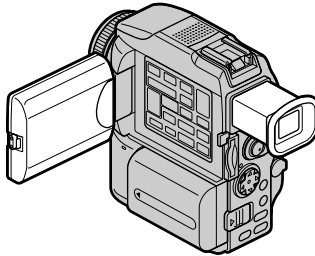
Picture in the mirror mode
The picture on the LCD screen is a mirror-image. However, the picture will be normal when recorded.

During recording in the mirror mode
ZERO SET MEMORY on the Remote Commander does not work.

Recording a picture

Indicators displayed in the recording mode

The indicators are not recorded on tapes.

Remaining battery time

Cassette memory
This appears when using a tape with cassette memory.

Recording mode

STBY/REC

`40min  [CM] [SP] REC  0:00:01`
`                      45min`

Time code/Tape counter

Remaining tape
This appears after you insert a cassette and record or play back for a while.

`JUL  4 2001        12:05:56 AM`

Time
The time is displayed about five seconds after the power is turned on.

Date
The date is displayed about five seconds after the power is turned on.

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 one 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) in CAMERA mode and "0:00:00:00" (hours : minutes : seconds : frames) in VCR mode. You cannot rewrite only the time code.

Remaining tape indicator
The indicator may not be displayed accurately depending on the tape.

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

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Shooting backlit subjects – BACK LIGHT

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

Set the POWER switch to CAMERA or MEMORY, press BACK LIGHT.
The ⊡ indicator appears on the screen. To cancel, press BACK LIGHT again.
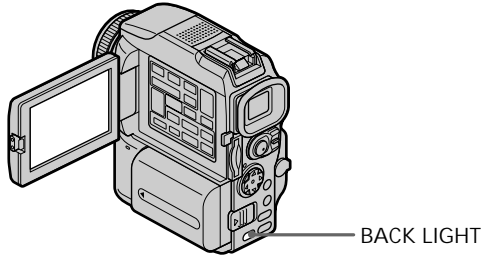
BACK LIGHT

If you press EXPOSURE when shooting backlit subjects
The backlight function will be canceled.

Shooting in the dark – NightShot/Super NightShot

The NightShot function enables you to shoot a subject in a dark place. For example, you can satisfactorily record the environment of nocturnal animals for observation when you use this function.

Set the POWER switch to CAMERA or MEMORY, slide NIGHTSHOT to ON.
⊙ and "NIGHTSHOT" indicators flash on the screen. To cancel the NightShot function, slide NIGHTSHOT to OFF.

SUPER NIGHTSHOT   NIGHTSHOT
OFF
ON

NightShot Light emitter
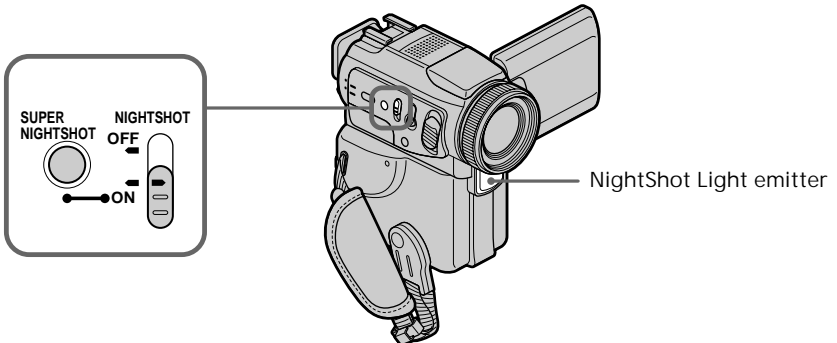
Using Super NightShot

The Super NightShot mode makes subjects more than 16 times brighter than those recorded in the NightShot mode.

(1) Set the POWER switch to CAMERA, slide NIGHTSHOT to ON. ◙ and "NIGHTSHOT" indicators flash on the screen.
(2) Press SUPER NIGHTSHOT. S◙ and "SUPER NIGHTSHOT" indicators flash on the screen.
    To cancel the Super NightShot mode, press SUPER NIGHTSHOT again.

Using the NightShot Light

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

Notes
• Do not use the NightShot function in bright places (ex. the outdoors in the daytime). This may cause your camcorder to malfunction.
• When you keep NIGHTSHOT set to ON in normal recording, the picture may be recorded in incorrect or unnatural colors.
• If focusing is difficult with the autofocus mode when using the NightShot function, focus manually.
• Do not cover the NightShot Light emitter when using the NightShot function.
• Detach the lens hood when you shoot with the NightShot Light since the lens hood may block the NightShot Light.

While using the NightShot function, you cannot use the following functions:
– Exposure
– PROGRAM AE
– White balance
– HOLOGRAM AF

While using the Super NightShot function
The shutter speed is automatically adjusted depending on the brightness. At that time, the moving picture may be slow down.

While using the Super NightShot function, you cannot use the following functions:
– Fader
– Digital effect
– PROGRAM AE
– Exposure
– White balance
– Recording with the flash
– HOLOGRAM AF

When the POWER switch is set to MEMORY
You cannot use the Super NightShot function.

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).

Self-timer recording

Recording with the self-timer starts in 10 seconds automatically. You can also use the Remote Commander for this operation.

(1) Press ⟳ (self-timer) in the standby mode. The ⟳ (self-timer) indicator appears on the screen.
(2) Press START/STOP.
Self-timer starts counting down from ten with a beep sound. In the last two seconds of the countdown, the beep sound gets faster, then recording starts automatically.
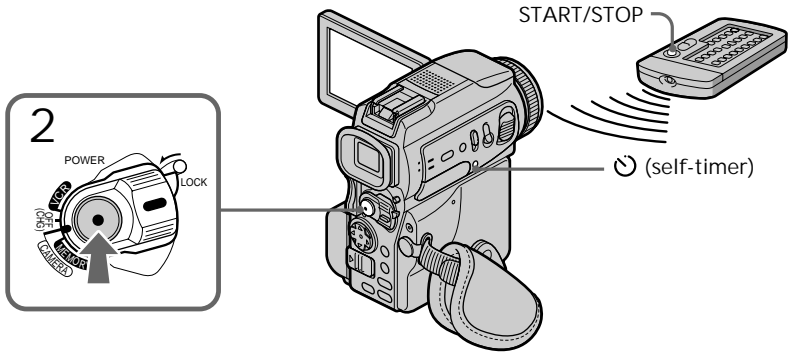
To stop the countdown
Press START/STOP.
To restart the countdown, press START/STOP again.

To record still images on tapes using the self-timer
Press PHOTO in step 2 (p. xx).

To cancel self-timer recording
Press ⟳ (self-timer) so that the ⟳ indicator disappears from the screen while your camcorder is in the standby mode.

Note
The self-timer recording mode is automatically canceled when:
– Self-timer recording is finished.
– The POWER switch is set to OFF (CHG) or VCR.

When the POWER switch is set to MEMORY
You can also record still images on "Memory Stick"s with the self-timer (p. xx).

Checking the recording
– END SEARCH / EDITSEARCH / Rec Review

You can use these buttons to check the recorded picture or shoot so that the transition between the last recorded scene and the next scene you record is smooth.
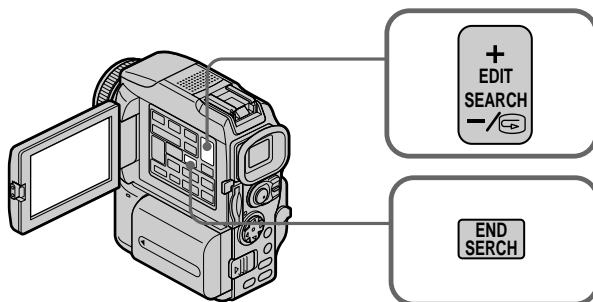
END SEARCH

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

Press END SEARCH in the standby mode.
The last five seconds of the recorded section are played back and your camcorder returns to the standby mode. You can monitor the sound from the speaker or headphones.

EDITSEARCH

You can search for the next recording start point.

Hold down the + · –/⊖ side of EDITSEARCH in the standby mode. The recorded section is played back.
  + : to go forward
  –/⊖: to go backward
Release EDITSEARCH to stop playback. If you press START/STOP, re-recording begins from the point you released EDITSEARCH. You cannot monitor the sound.

Rec Review

You can check the last recorded section.

Press the –/⊖ side of EDITSEARCH momentarily in the standby mode.
The section you have stopped most recently will be played back for a few seconds, and then your camcorder will return to the standby mode. You can monitor the sound from the speaker or headphones.

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

If a tape has a blank portion in the recorded portions
The end search function may not work correctly.

Playing back a tape

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

(1) Install the power source and insert the recorded tape.
(2) Set the POWER switch to VCR while pressing the small green button.
(3) Open the LCD panel while pressing OPEN.
(4) Press ◄◄ to rewind the tape.
(5) Press ► to start playback.
(6) To adjust the volume, press either of the two buttons on VOLUME.
    When you close the LCD panel, sound is muted.
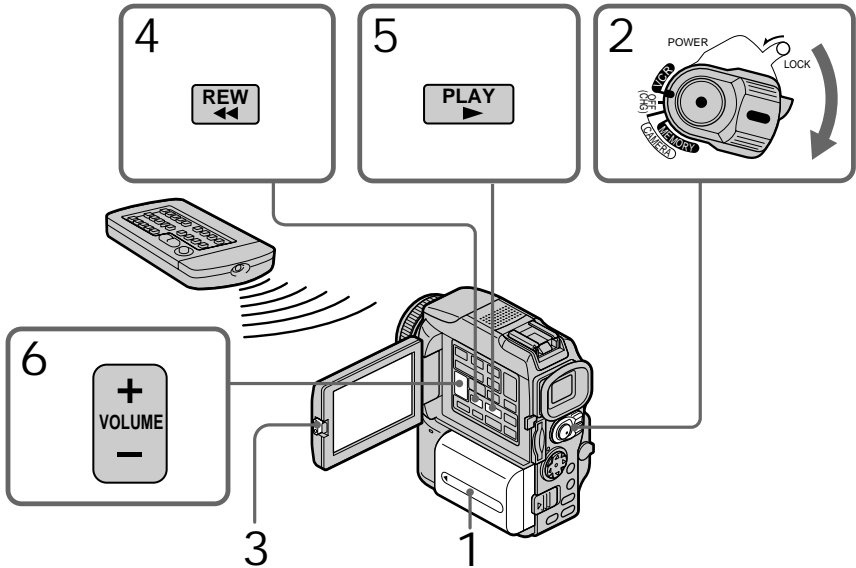
To stop playback
Press ■.

When monitoring on the LCD screen
You can turn the LCD panel over and move it back to the camcorder body with the LCD screen facing out.
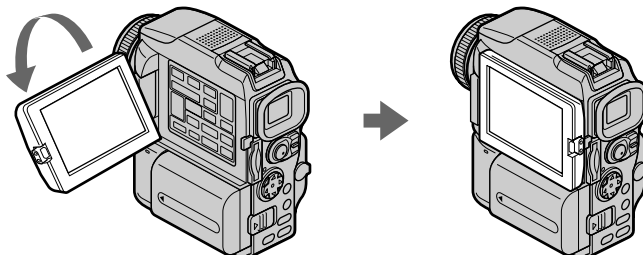
Playing back a tape

If you leave the power on for a long time
Your camcorder gets warm. This is not a malfunction.

When you open or close the LCD panel
Open or close the LCD panel vertically.

To display the screen indicators – Display function

Press DISPLAY. The indicators appear on the screen. To make the indicators disappear, press DISPLAY again.

DATA CODE — DISPLAY

DISPLAY
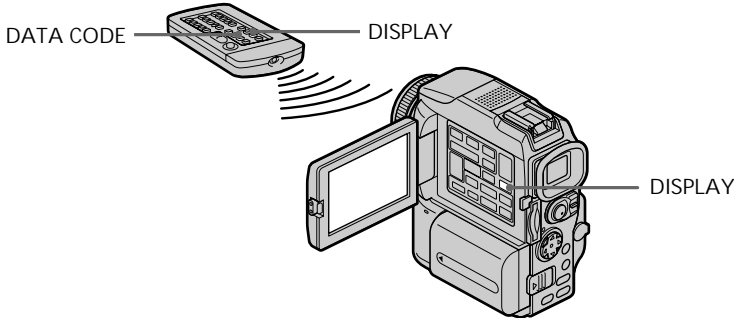
About date/time and various settings
Your camcorder automatically records not only images on the tape but also the recording data (date/time or various settings when recorded) (Data code). Use the Remote Commander for this operation.

① Set the POWER switch to VCR, then playback a tape.
② Press DATA CODE on the Remote Commander.
The display changes as follows:
date/time → various settings (SteadyShot, exposure, white balance, gain, shutter speed, aperture value) → no indicator

Date/time

40min	SP 0:00:23:01
JUL 4 2001	
12:05:56 AM	

Various settings

40min	SP 0:00:23:01 — [a]
	— [b]
	— [c]
AUTO	— [d]
60 AWB	— [e]
F1.8 9dB	— [f]
	— [g]
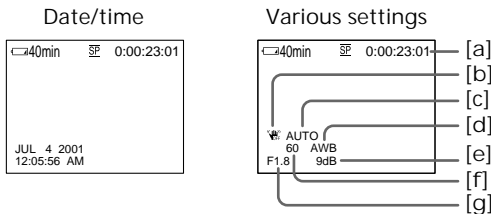
[a] **Tape counter**
[b] **SteadyShot off**
[c] **Exposure mode**
[d] **White balance**
[e] **Gain**
[f] **Shutter speed**
[g] **Aperture value**

Not to display various settings
Set DATA CODE to DATE in the menu settings (p. xx).
The display changes as follows when you press DATA CODE on the Remote Commander: date/time y no indicator

Various settings
Various settings is your camcorder's information when you have recorded. In the recording mode, the various settings will not be displayed.

When you use the data code function, 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 the TV, the data code appears on the TV screen.

Remaining battery time indicator during playback
The indicator indicates the approximate continuous playback time. The indicator may not be correct, depending on the conditions in which you are playing back. When you close the LCD panel and open it again, it takes about one minute for the correct remaining battery time to be displayed.

Various playback modes

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

To playback pause (view a still picture)
Press **II** during playback. To resume normal playback, press ► or **II**.

To advance the tape
Press ►► in the stop mode. To resume normal playback, press ►.

To rewind the tape
Press ◄◄ in the stop mode. To resume normal playback, press ►.

To change the playback direction
Press < on the Remote Commander during playback to reverse the playback direction. To resume normal playback, press ►.

To locate a scene monitoring the picture (picture search)
Keep pressing ◄◄ or ►► during playback. To resume normal playback, release the button.

To monitor the high-speed picture while advancing or rewinding the tape (skip scan)
Keep pressing ◄◄ while rewinding or ►► while advancing the tape. To resume rewinding or advancing, release the button.

To view the picture at slow speed (slow playback)
Press ▮► on the Remote Commander during playback. For slow playback in the reverse direction, press < , then press ▮► on the Remote Commander. To resume normal playback, press ►.

To view the picture at double speed
Press ×2 on the Remote Commander during playback. For double speed playback in the reverse direction, press < , then press ×2 on the Remote Commander. To resume normal playback, press ►.

To view the picture frame-by-frame

Press II► on the Remote Commander in the playback pause mode. For frame-by-frame playback in the reverse direction, press ◄II. To resume normal playback, press ►.

To search the last scene recorded (END SEARCH)

Press END SEARCH in the stop mode. The last five seconds of the recorded portion plays back and stops.

In the various playback modes
• Sound is muted.
• The previous picture may remain as a mosaic image during playback.

When the playback pause mode lasts for five minutes
Your camcorder automatically enters the stop mode. To resume playback, press ►.

Slow playback
The slow playback can be performed smoothly on your camcorder. However, this function does not work for an output signal through the ᵢ DV jack.

When you play back a tape in reverse
Horizontal noise may appear at the center, or the top and bottom of the screen. This is not a malfunction.

Playback – Basics

Viewing the recording on TV

Connect your camcorder to your TV with the A/V connecting cable supplied with your camcorder to watch the playback picture on the TV screen. You can operate the video control buttons in the same way as when you monitor playback pictures on the screen. When monitoring the playback picture on the TV screen, we recommend that you power your camcorder from a wall outlet using the AC power adaptor (p. xx). Refer to the operating instructions of your TV.

Open the jack cover. Connect your camcorder to the TV using the A/V connecting cable supplied with your camcorder. Then, set the TV/VCR selector on the TV to VCR.
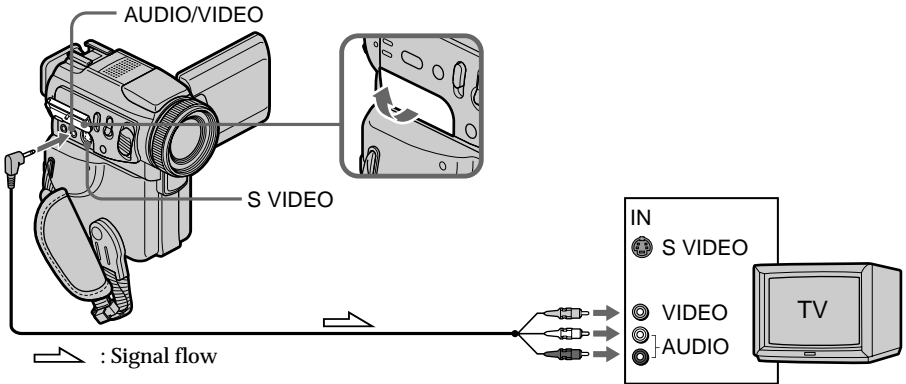
If your TV is already connected to a VCR

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

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 your TV has an S video jack
Pictures can be reproduced more faithfully by using an S video cable (optional). With this connection, you do not need to connect the yellow (video) plug of the A/V connecting cable. Connect the S video cable (optional) to the S video jacks on both your camcorder and the TV.
This connection produces higher quality DV format pictures.

To display the screen indicators on TV
Set DISPLAY to V-OUT/LCD in the menu settings (p. xx).
Then press DISPLAY on your camcorder. To turn off the screen indicators, press DISPLAY on your camcorder again.

Recording a still image on a tape
– Tape Photo recording

You can record an still image like a photograph.
You can record about 510 images in the SP mode and about 765 images in the LP mode on a 60-minute tape.
Besides the operation described here, your camcorder can record still images on "Memory Stick"s (p. xx).

(1) In the standby mode, 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.
The still image on the screen is recorded for about seven seconds. The sound during those seven seconds is also recorded.
The still image is displayed on the screen until recording is completed.
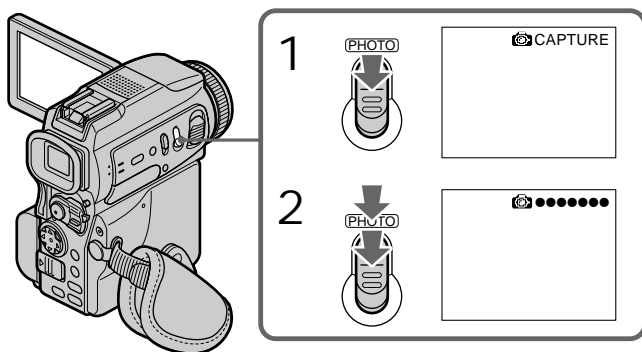
Notes
• During tape photo recording, you cannot change the mode or setting.
• When recording a still image, do not shake your camcorder. The image may fluctuate.
• You cannot use PHOTO during the following operations:
  – Fader
  – Digital effect

If you record a moving subject with tape photo recording function
When you play back the still image on other equipment, the image may fluctuate. This is not a malfunction.

To use the tape photo recording function using the Remote Commander
Press PHOTO on the Remote Commander. Your camcorder records an image on the screen immediately.

To use the tape photo recording function during normal CAMERA recording
You cannot check an image on the screen by pressing PHOTO lightly. Press PHOTO deeper. The still image is then recorded for about seven seconds, and your camcorder returns to the standby mode.

To record clear and less fluctuated still images
We recommend that you record on "Memory Stick"s.

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Recording images with the flash

The flash pops up automatically. The default setting is auto (no indicator). To change the flash mode, press the ⚡ (flash) repeatedly until the flash mode indicator appears on the screen.
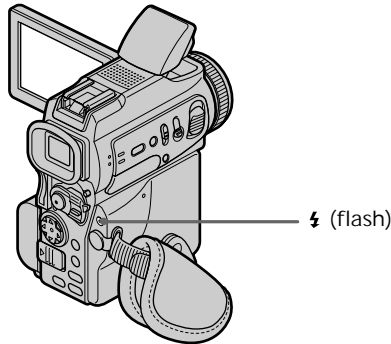
⚡ (flash)

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

    ⊙ → ⚡ → ⚡̶ → No indicator

⊙ Auto red-eye reduction: The flash fires before recording to reduce the red-eye phenomenon.

⚡ Forced flash: The flash fires regardless of the surrounding brightness.

⚡̶ No flash: The flash does not fire.

The flash is adjusted to the appropriate brightness through the photocell window for the flash. You can also change FLASH LVL to the desired brightness in the menu settings (p. xx). Try recording various images to find the most appropriate setting for FLASH LVL.

Notes
- Attaching the lens hood (supplied) or a conversion lens (optional) may block the light from the flash or cause lens shadow to appear.
- You cannot use an external flash (optional) and the built-in flash at the same time.
- ⊙ (auto red-eye reduction) may not produce the desired effect depending on individual 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 you record images with the flash, sound may not be recorded clearly.
- When recording with the flash, it takes longer to prepare for image capture. This is because your camcorder starts to charge power for firing after the flash pops up. Darken the surroundings by covering the lens part, and press PHOTO lightly so that your camcorder starts to charge power after the flash pops up.
- If it is not easy to focus on the subject automatically, for example, when recording in the dark, use the focal distance information (p. xx) for focusing manually.

When you record images with the flash
The possible shooting distance using the built-in flash is shorter than when you record on "Memory Stick"s.

When playing back images recorded with the flash on other equipment
These images may flicker.

If you leave your camcorder for five or more minutes after disconnecting the power source
Your camcorder returns to the default setting (auto).

You cannot shoot images with the flash during the following operations:
– **Low lux of PROGRAM AE**
– **Super NightShot**
– **Digital effect**
– **Fader**
– **Recording**

The flash does not fire even if you select auto (no indicator) and ● (auto red-eye reduction) during the following operations:
– **Exposure**
– **NightShot**
– **Spotlight of PROGRAM AE**
– **Sunset & moon of PROGRAM AE**
– **Landscape of PROGRAM AE**

When you use an external flash (optional) which does not have the auto red-eye reduction function
You cannot select the auto red-eye reduction.

Advanced Recording Operations

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Self-timer recording

You can record still images on tapes with the self-timer. You can also use the Remote Commander for this operation.

(1) Press ⟳ (self-timer) in the standby mode. The ⟳ (self-timer) indicator appears on the screen.
(2) Press PHOTO deeper.
    Self-timer starts counting down from 10 with a beep sound. In the last two seconds of the countdown, the beep sound gets faster, then recording starts automatically.

PHOTO

⟳ (self-timer)

2

PHOTO
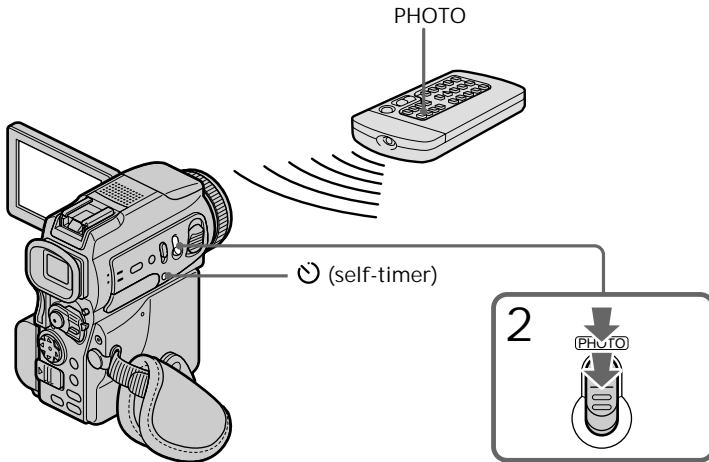
To cancel self-timer recording
Press ⟳ (self-timer) so that the ⟳ indicator disappears from the screen while your camcorder is in the standby mode. You cannot cancel the self-timer recording using the Remote Commander.

Note
The self-timer recording mode is automatically canceled when:
– Self-timer recording is finished.
– The POWER switch is set to OFF (CHG) or VCR.

Adjusting the white balance manually

You can manually adjust and set the white balance. This adjustment makes white subjects look white and allows more natural color balance. Normally white balance is automatically adjusted.

(1) Set the POWER switch to CAMERA or MEMORY. Press MENU, then select and decide upon WHT BAL in with the control button (p. xx).
(2) Select and decide upon the desired white balance mode with the control button.

HOLD :
Recording a single-colored subject or background

☀ OUTDOOR :
• Recording a sunset/sunrise, just after sunset, just before sunrise, neon signs, or fireworks
• Under a color matching fluorescent lamp

☼ INDOOR :
• Lighting condition changes quickly
• Too bright place such as photography studios
• Under sodium lamps or mercury lamps

```
1        MANUAL  SET
         PROGRAM AE
         P  EFFECT
         D  EFFECT
         WHT  BAL    ◄ AUTO
         AUTO SHTR     HOLD
         RETURN        OUTDOOR
                       INDOOR

         [MENU] : END
```
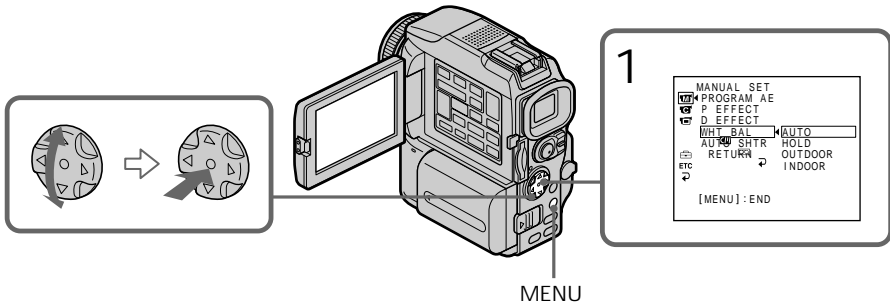
MENU

To return to the automatic white balance mode
Set WHT BAL to AUTO in the menu settings.

If the picture is being taken in a studio lit by TV lighting
We recommend that you record in the ☼ indoor mode.

When you record under fluorescent lighting
Use the automatic white balance or hold mode.
Your camcorder may not adjust the white balance correctly in the ☼ indoor mode.

In the automatic white balance mode
Point your camcorder at a white subject for about 10 seconds after setting the POWER switch to CAMERA to get a better adjustment when:
– You detach the battery for replacement.
– You bring your camcorder to the outdoors from the interior of a house holding the exposure, or vice versa.

In the hold white balance mode
Set the white balance to AUTO and reset to HOLD after a few seconds when:
– You change the PROGRAM AE mode.
– You bring your camcorder to the outdoors from the interior of a house, or vice versa.

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 16:9WIDE mode [a]. The picture during a playback on a normal TV [b] or on a wide-screen TV [c] is compressed in the widthwise direction. If you set the screen mode of the wide-screen TV to the full mode, you can watch pictures of normal images [d].
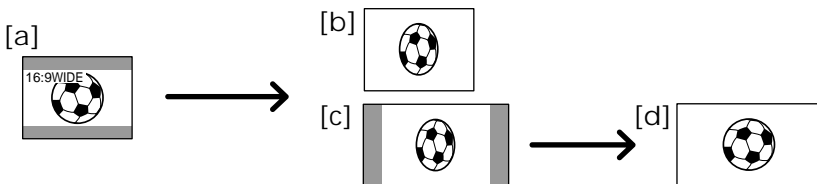
(1) In the standby mode, press MENU, then select and decide upon 16:9WIDE in ⬛ with the control button (p. xx).
(2) Select and decide upon ON with the control button.
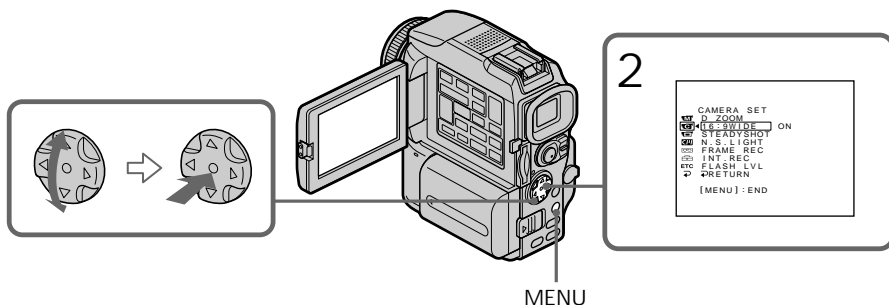
MENU

To cancel the wide mode
Set 16:9WIDE to OFF in the menu settings.

In the wide mode
You cannot select the following functions:
– OLD MOVIE
– BOUNCE

During recording
You cannot select or cancel the wide mode. When you cancel the wide mode, set your camcorder to the standby mode and then set 16:9WIDE to OFF in the menu settings.

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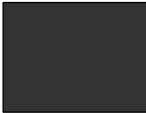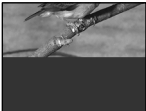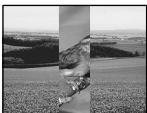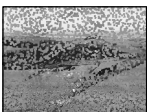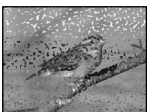
ID-2 system
The ID-2 system sends a copyright protection signal with ID-1 signals inserted between video signals when you connect your camcorder to other equipment using an A/V connecting cable.

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Using the fader function

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

[a]

STBY → REC

FADER

M. FADER
(mosaic)

BOUNCE[1][2]

OVERLAP[2]

WIPE[2]

DOT[2]

[b]

STBY → REC

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 the bounce function when D ZOOM is set to OFF in the menu settings.
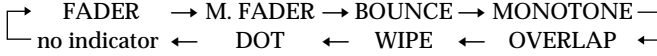[2] Fade in only.

(1) When fading in [a]
    In the standby mode, press FADER until the desired fader indicator flashes.
    When fading out [b]
    In the recording mode, press FADER until the desired fader indicator flashes.
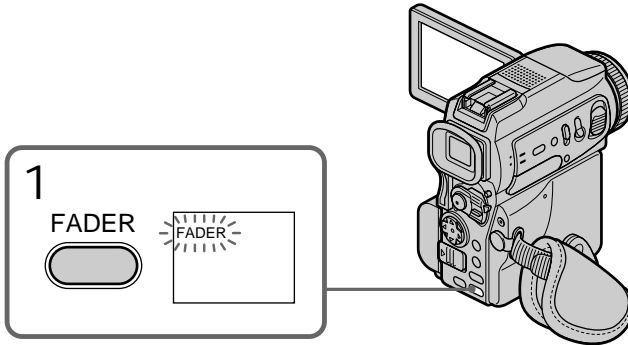   The indicator changes as follows:

    ┌→ FADER   → M. FADER → BOUNCE → MONOTONE ─┐
    └─ no indicator ←   DOT   ← WIPE ← OVERLAP ←┘

    The last selected fader mode is indicated first of all.
(2) Press START/STOP. The fader indicator stops flashing.
    After the fader in/out is carried out, your camcorder automatically returns to
    normal mode.

1
FADER [FADER]

To cancel the fader function
Before pressing START/STOP, press FADER until the indicator disappears.

Note
You cannot use the following functions while using the fader function. Also, you cannot
use the fader function while using the following functions:
– Digital effect
– Low lux of PROGRAM AE (Overlap, Wipe, or Dot function only) (The indicator
  flashes.)
– Super NightShot
– Tape photo recording
– Interval recording
– Cut recording

When you select OVERLAP, WIPE, or DOT
Your camcorder automatically stores the image recorded on a tape. As the image is
being stored, the indicators flash fast, and the playback picture disappears. At this
stage, the picture may not be recorded clearly, depending on the tape condition.

When you set the POWER switch to MEMORY
You cannot use the fader function.

While using the bounce function, you cannot use the following functions:
– Focus
– Zoom
– Picture effect
– Exposure

Note on the bounce function
The BOUNCE indicator does not appear in the following mode or functions:
– D ZOOM is activated in the menu settings
– Wide mode
– Picture effect
– PROGRAM AE

Advanced Recording Operations

43

Using special effects – Picture effect

You can digitally process images to obtain special effects like those in films or on TV.

NEG. ART [a] : The color and brightness of the picture are reversed.
SEPIA : The picture gets sepia.
B&W : The picture appears in monochrome (black-and-white).
SOLARIZE [b] : The light intensity is clearer, and the picture looks like an illustration.
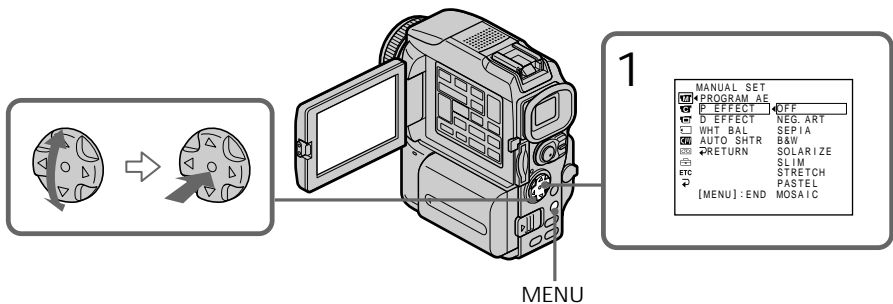SLIM [c] : The picture expands vertically.
STRETCH [d] : The picture expands horizontally.
PASTEL [e] : The contrast of the picture is emphasized, and the picture looks like an animated cartoon.
MOSAIC [f] : The picture gets mosaic-patterned.

| [a] | [b] | [c] | [d] | [e] | [f] |
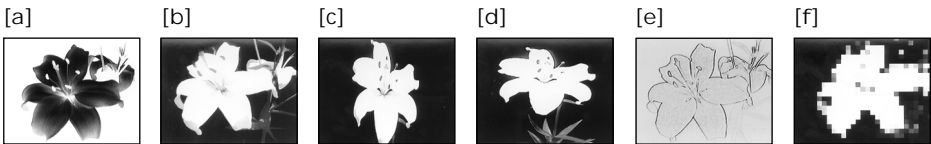
(1) Set the POWER switch to CAMERA. Press MENU, then select and decide upon P EFFECT in 🅼 with the control button (p. xx).
(2) Select and decide upon the desired picture effect mode with the control button.

```
1
        MANUAL SET
      ◄PROGRAM AE
      P EFFECT    ◄OFF
      D EFFECT     NEG. ART
      WHT BAL      SEPIA
      AUTO SHTR    B&W
      ⏎RETURN      SOLARIZE
                   SLIM
ETC                STRETCH
                   PASTEL
      [MENU]:END   MOSAIC
```

MENU

To cancel the picture effect function
Set P EFFECT to OFF in the menu settings.

While using the picture effect function
You cannot select OLD MOVIE mode with DIGITAL EFFECT.

When you set the POWER switch to OFF (CHG)
The picture effect is automatically canceled.

44

Using special effects – Digital effect

You can add special effects to recorded pictures using the various digital functions. The sound is recorded normally.

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 constant intervals.

LUMI. (LUMINANCEKEY)
You can swap a brighter area in a still picture with a moving picture.

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

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

OLD MOVIE
You can add an old movie type atmosphere to pictures. Your camcorder automatically sets the wide mode to ON and picture effect to SEPIA, and the appropriate shutter speed.

STILL

Still image   Moving picture

LUMI.

Still image   Moving picture
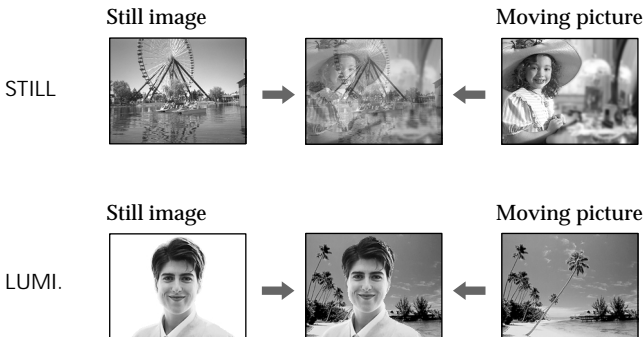
Using special effects – Digital effect

(1) Set the POWER switch to CAMERA. Press MENU, then select and decide upon D EFFECT in ⓜ with the control button (p. xx).

(2) Select and decide upon the desired digital effect mode with the control button. The bars appear. In the STILL or LUMI. mode, the still image is stored in memory.

(3) Adjust and dicide upon the effect with the control button.

Items to be adjusted

STILL	The rate of the still image you want to superimpose on the moving picture
FLASH	The interval of flash motion
LUMI.	The color scheme of the area in the still image which is to be swapped with a moving picture
TRAIL	The time until the incidental image vanishes
SLOW SHTR	Shutter speed. The larger the shutter speed number, the slower the shutter speed becomes.
OLD MOVIE	No adjustment necessary

The more bars there are on the screen, the stronger the digital effect. The bars appear in the following modes: STILL, FLASH, LUMI. and TRAIL.
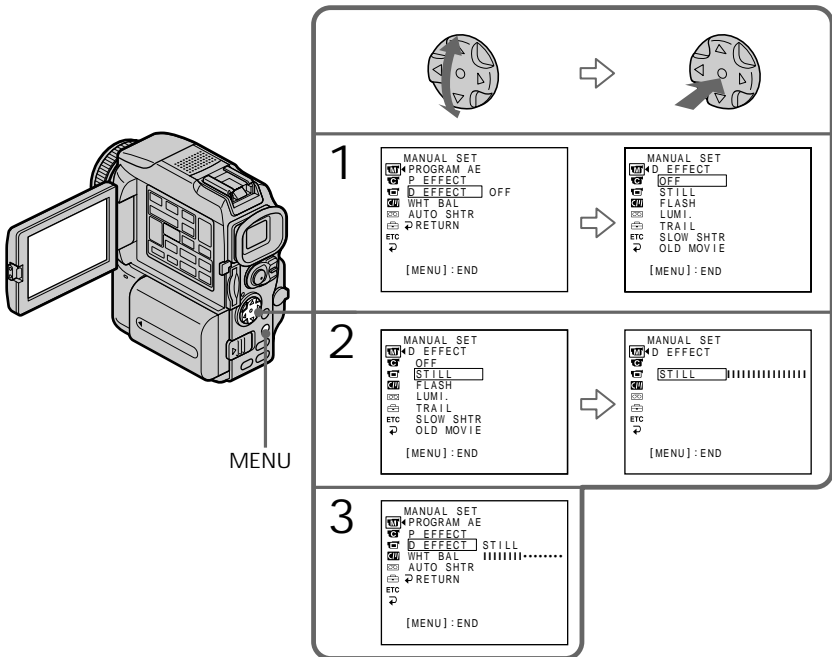
MENU

To cancel the digital effect function
Set D EFFECT to OFF in the menu settings.

46

Notes
• The following functions do not work during digital effect:
  – Fader
  – Low lux of PROGRAM AE (The indicator flashes.)
  – Tape photo recording
  – Super NightShot
• The PROGRAM AE function does not work in the slow shutter mode.
• The following functions do not work in the old movie mode:
  – Wide mode
  – Picture effect
  – PROGRAM AE

When you set the POWER switch to OFF (CHG)
The digital effect is automatically canceled.

When recording in the slow shutter mode
Auto focus may not be effective. Focus manually using a tripod.

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

Advanced Recording Operations

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Using the PROGRAM AE function

You can select PROGRAM AE (Auto Exposure) mode to suit your specific shooting requirements.

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

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

🏃 Sports lesson
This mode minimizes shake on fast-moving subjects such as in tennis or golf.

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

🌅 Sunset & moon
This mode allows you to maintain atmosphere when you are recording sunsets, general night views, fireworks displays and neon signs.

🏔 Landscape
This mode is for when you are recording distant subjects such as mountains, and prevents your camcorder from focusing on glass or metal mesh in windows when you are recording a subject behind glass or a screen.
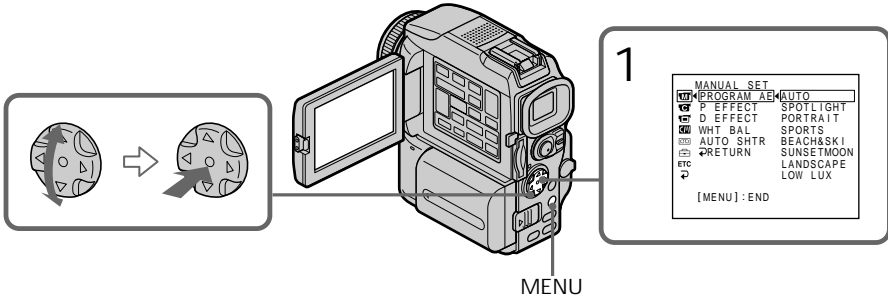
🕯 Low lux
This mode makes subjects brighter in insufficient light.

48

Using the PROGRAM AE function

(1) Set the POWER switch to CAMERA or MEMORY. Press MENU select and decide upon PROGRAM AE in 🎛 in the menu settings with the control button (p. xx).
(2) Select and decide upon the desired PROGRAM AE mode with the control button.


```
      MANUAL SET
🎛◄ PROGRAM AE ◄ AUTO
📷  P EFFECT      SPOTLIGHT
📺  D EFFECT      PORTRAIT
🎚  WHT BAL       SPORTS
📷  AUTO SHTR     BEACH&SKI
📁  ⮐RETURN       SUNSETMOON
ETC               LANDSCAPE
⮐                LOW LUX

   [MENU]:END
```

MENU

To cancel the PROGRAM AE function
Select PROGRAM AE to AUTO in the menu settings.

Notes
• Because your camcorder is set to focus only on subjects in the middle to far distance, you cannot take close-ups in the following modes:
  – Spotlight
  – Sports lesson
  – Beach & ski
• Your camcorder is set to focus only on distant subjects in the following modes:
  – Sunset & moon
  – Landscape
• The following functions do not work in the PROGRAM AE mode:
  – Slow shutter
  – Old movie
  – Bounce
• The following functions do not work in the low lux mode:
  – Digital effect
  – Overlap
  – Wipe
  – Dot
  – Recording with the flash
• When you set the POWER switch to MEMORY, the following modes do not work (The indicator flashes.):
  – Low lux
  – Sports lesson
• The PROGRAM AE function does not work in the following cases. (The indicator flashes.)
  – To set NIGHTSHOT to ON
  – To record images on a "Memory Stick" using the MEMORY MIX function.

49

While WHT BAL is set to AUTO in the menu settings
The white balance is adjusted even if the PROGRAM AE function is selected.

Even if the PROGRAM AE function is selected
You can adjust the exposure.

If you are recording under a discharge tube such as a fluorescent lamp, sodium lamp or mercury lamp
Flickering or changes in color may occur in the following modes. If this happens, turn the PROGRAM AE function off.
**– Soft portrait**
– Sports lesson

Adjusting the exposure manually

You can manually adjust and set the exposure. Normally exposure is automatically adjusted. Adjust the exposure manually in the following cases:
– The subject is backlit
– Bright subject and dark background
– To record dark pictures (e.g. night scenes) faithfully

(1) Set the POWER switch to CAMERA or MEMORY, press EXPOSURE.
    The exposure indicator appears.
(2) Push ◄/► on the control button to adjust the brightness.
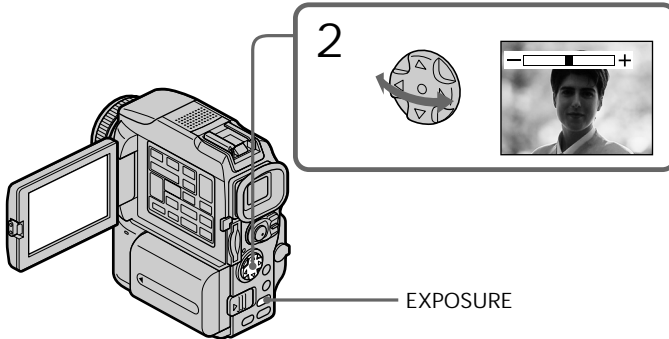
EXPOSURE

To return to the automatic exposure mode
Press EXPOSURE.

Note
When you adjust the exposure manually, the backlight function does not work.

Your camcorder automatically returns to the automatic exposure mode:
– If you change the PROGRAM AE mode.
– If you slide NIGHTSHOT to ON.

Focusing manually

You can gain better results by manually adjusting the focus in the following cases.
Normally, focus is automatically adjusted:
• The autofocus mode is not effective when shooting:
  – subjects through glass coated with water droplets
  – horizontal stripes
  – subjects with little contrast with backgrounds such as walls and sky
• When you want to change the focus from a subject in the foreground to a subject in the background.
• Shooting a stationary subject when using a tripod.
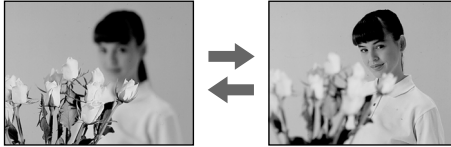
(1) Set the POWER switch to CAMERA or MEMORY, press FOCUS lightly. The ☞ indicator appears.
(2) Turn the focus ring to sharpen focus.
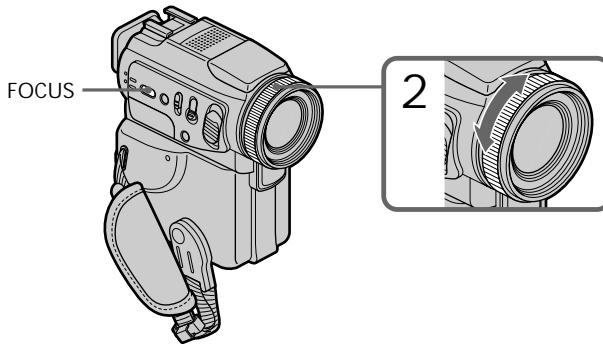
FOCUS

To return to the autofocus mode
Press FOCUS lightly to turn off the indicator.

To record distant subjects
When you press FOCUS down firmly, the lens focuses on and ▲ indicator appears. When you release FOCUS, your camcorder returns to the manual focus mode. Use this mode when your camcorder focuses on near objects even though you are trying to shoot a distant object.

Focusing manually

To focus precisely
It is easier to focus on the subject if you adjust the zoom to shoot at the "W" (wide-angle) 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 three 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 get a sharp focus.
– You cannot get correct information if you have attached a conversion lens to your camcorder.
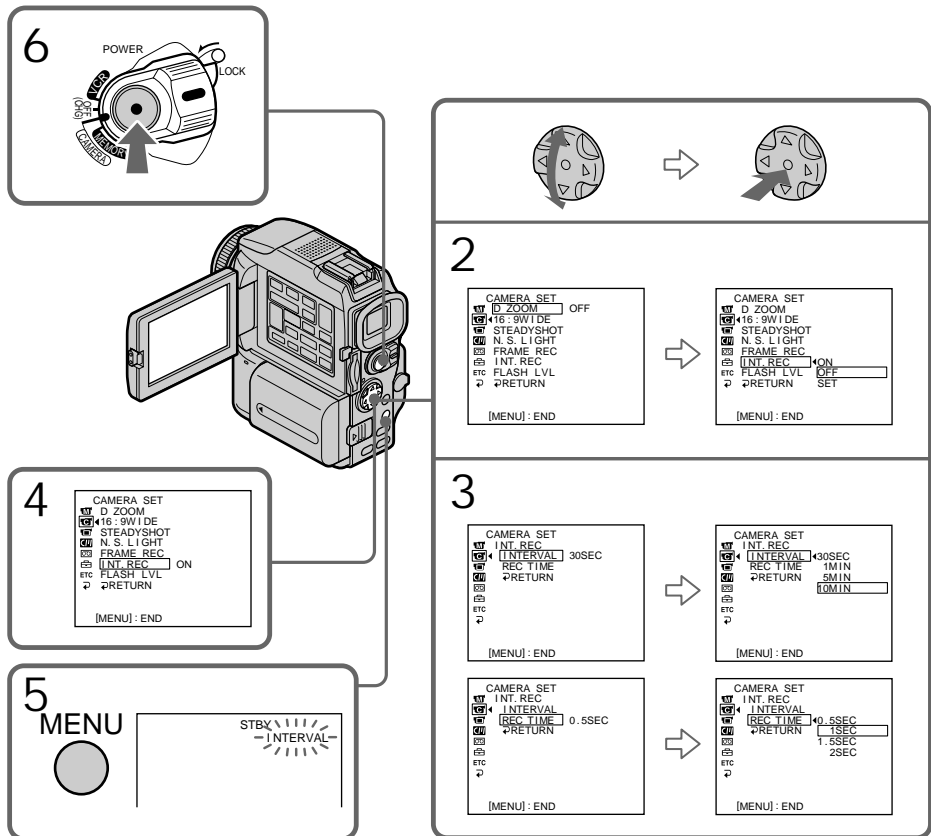
Advanced Recording Operations

Interval recording

You can make a time-lapse recording by setting the camcorder to automatically record and standby sequentially. You can achieve an excellent recording for flowering, emergence, etc., with this function.

Example

[a] REC TIME
[b] INTERVAL
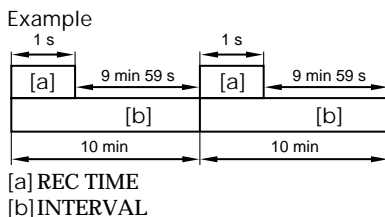
(1) In the standby mode, press MENU, then select and decide upon INT. REC in ⚙ with the control button (p. xx).
(2) Select and decide upon SET with the control button.
(3) Set INTERVAL and REC TIME.
   ① Select and decide upon INTERVAL with the control button.
   ② Select and decide upon the desired interval time with the control button.
      The time: 30SEC ←→ 1MIN ←→ 5MIN ←→ 10MIN
   ③ Select and decide upon REC TIME with the control button.
   ④ Select and decide upon the desired recording time with the control button.
      The time: 0.5SEC ←→ 1SEC ←→ 1.5SEC ←→ 2SEC
   ⑤ Select and decide upon ⮐ RETURN with the control button.
(4) Select and decide upon ON with the control button.
(5) Press MENU to erase the menu display. The INTERVAL indicator flashes.
(6) Press START/STOP to start interval recording. The INTERVAL indicator lights up.

Interval recording

6

POWER
VCR
OFF (CHG)
CAMERA
MEMORY
LOCK

2

CAMERA SET
D ZOOM   OFF
16 : 9WIDE
STEADYSHOT
N. S. LIGHT
FRAME REC
INT. REC
FLASH LVL
RETURN

[MENU] : END

⇨

CAMERA SET
D ZOOM
16 : 9WIDE
STEADYSHOT
N. S. LIGHT
FRAME REC
INT. REC   ON
FLASH LVL   OFF
RETURN   SET

[MENU] : END

4

CAMERA SET
D ZOOM
16 : 9WIDE
STEADYSHOT
N. S. LIGHT
FRAME REC
INT. REC   ON
FLASH LVL
RETURN

[MENU] : END

3

CAMERA SET
INT. REC
INTERVAL   30SEC
REC TIME
RETURN

[MENU] : END

⇨

CAMERA SET
INT. REC
INTERVAL   30SEC
REC TIME   1MIN
RETURN   5MIN
                10MIN

[MENU] : END

5
MENU

STBY
INTERVAL

CAMERA SET
INT. REC
INTERVAL
REC TIME   0.5SEC
RETURN

[MENU] : END

⇨

CAMERA SET
INT. REC
INTERVAL
REC TIME   0.5SEC
RETURN   1SEC
                1.5SEC
                2SEC

[MENU] : END

To cancel the interval recording
Perform either of the following:
– Set INT. REC to OFF in the menu settings.
– Set the POWER switch to other than CAMERA.

To perform normal recording during the interval recording
You can perform normal recording only once during INTERVAL.
Press START/STOP. The INTERVAL indicator flashes, and normal recording starts. To stop normal recording, press START/STOP again.

On recording time
There may be a discrepancy in recording time of up to +/– six frames from the selected time.

Frame by frame recording – Cut recording

You can make a recording with a stop-motion animated effect using cut recording. To create this effect, alternately move the subject a little and make a cut recording. We recommend that you use a tripod, and operate the camcorder using the Remote Commander after step 4.

(1) In the standby mode, press MENU, then select and decide upon FRAME REC in ⌦ with the control button (p. xx).
(2) Select and decide upon ON with the control button.
(3) Press MENU to erase the menu display.
The FRAME REC indicator lights up.
(4) Press START/STOP to start cut recording. The camcorder makes a recording for about six frames, and returns to recording standby.
(5) Move the subject, and repeat step 4.
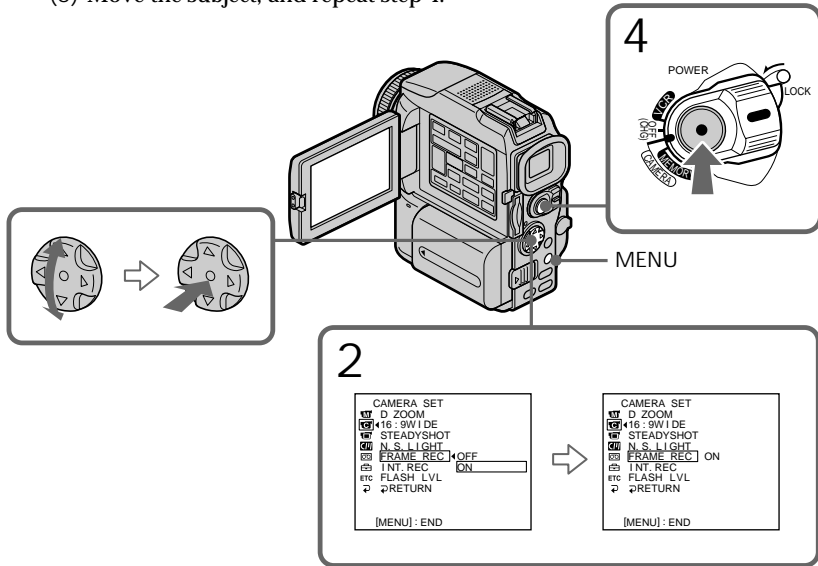
To cancel the cut recording
Perform either of the following:
– Set FRAME REC to OFF in the menu settings.
– Set the POWER switch to other than CAMERA.

Note
The proper remaining tape time is not indicated if you use this function continuously.

When using the cut recording function
The last recorded cut is longer than other cuts.

Playing back a tape with picture effects

During playback, you can process a scene using the picture effect functions: NEG. ART, SEPIA, B&W and SOLARIZE.

(1) In the playback or playback pause mode, press MENU, then select and decide upon P EFFECT in [G] with the control button (p. xx).
(2) Select and decide upon the desired mode with the control button.
   For details of each picture effect function, see page xx.
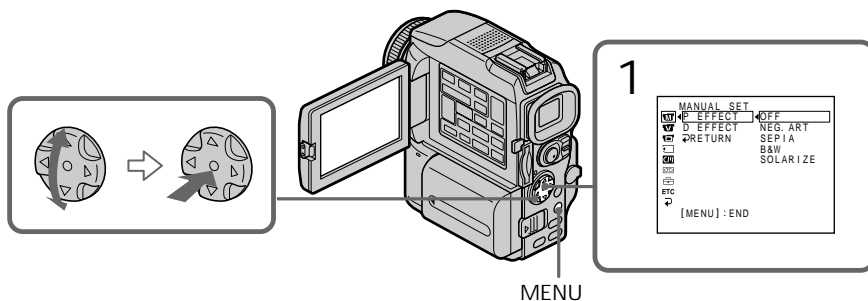

```
1
                MANUAL SET
         ▶ P EFFECT  ◀OFF
           D EFFECT    NEG. ART
         ▷ RETURN      SEPIA
                       B&W
                       SOLARIZE
  ETC
  ⏎
           [MENU]: END
```

MENU

To cancel the picture effect function
Set P EFFECT to OFF in the menu settings.

Notes
• You cannot process externally input scenes using the picture effect function.
• You cannot record images on a tape on your camcorder when you have processed the image using the picture effect function. However, you can record images on a "Memory Stick" (p. xxx, xxx), or on a VCR using your camcorder as a player.

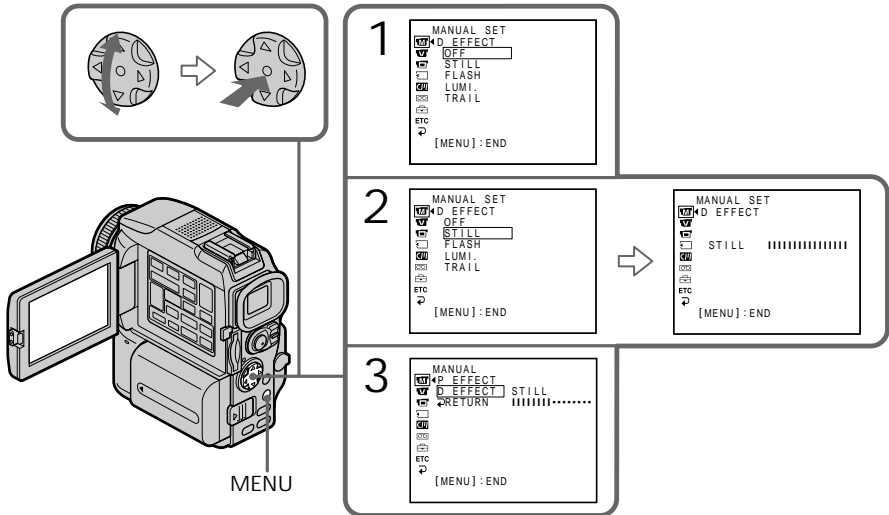Pictures processed by the picture effect function
Pictures processed by the picture effect function are not output through the ℹ DV jack.

When you set the POWER switch to OFF (CHG) or stop playing back
The picture effect function is automatically canceled.

Advanced Playback Operations

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Playing back a tape with digital effects

During playback, you can process a scene using the digital effect functions: STILL, FLASH, LUMI. and TRAIL.

(1) In the playback or playback pause mode, press MENU, then select and decide upon D EFFECT in 🎬 with the control button (p. xx).
(2) Select and decide upon the desired mode with the control button.
   The bars appear. In the STILL or LUMI. mode, the picture is captured and is stored in memory as a still image.
(3) Press ◄/► on the control button to adjust the effect with the control button.
   For details of each digital effect function, see page xx.

1
```
        MANUAL SET
🎬 ◄D EFFECT
🔲    OFF
📼    STILL
🔳    FLASH
🎬    LUMI.
🔲    TRAIL
ETC
↩
   [MENU]:END
```

2
```
        MANUAL SET
🎬 ◄D EFFECT
🔲    OFF
📼    STILL
🔳    FLASH
🎬    LUMI.
🔲    TRAIL
ETC
↩
   [MENU]:END
```
⇨
```
        MANUAL SET
🎬 ◄D EFFECT
🔲
📼
🎬    STILL   IIIIIIIIIIIIIII
🔲
ETC
↩
   [MENU]:END
```

3
```
        MANUAL
🎬 ◄P EFFECT
🔲   D EFFECT  STILL
📼   ➤RETURN  IIIIIIII········
🔳
🎬
🔲
ETC
↩
   [MENU]:END
```

MENU

To cancel the digital effect function
Set D EFFECT to OFF in the menu settings.

Notes
• You cannot process externally input scenes using the digital effect function.
• You cannot record images on a tape on your camcorder when you have processed the image using the digital effect function. However, you can record images on a "Memory Stick" (p. xxx, xxx), or on a VCR using your camcorder as a player.

Pictures processed by the digital effect function
Pictures processed by the digital effect function are not output through the 🎝 DV jack.

When you set the POWER switch to OFF (CHG) or stop playing back
The digital effect function is automatically canceled.

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# Enlarging images recorded on tapes – Tape PB ZOOM

You can enlarge playback images recorded on tapes. Besides the operation described here, your camcorder can enlarge still images recorded on "Memory Stick"s (p. xxx).

(1) In the playback or playback pause mode, press PB ZOOM on your camcorder.
    The center of the image is enlarged to twice its size.
(2) Press the control button to move the image.
    The image moves in the same direction as the control button setting.
(3) Adjust the zoom ratio by the power zoom lever.
    You can enlarge the image from 1.1 times up to five times its size.
      W: Decreases the zoom ratio.
      T: Increases the zoom ratio.

Advanced Playback Operations
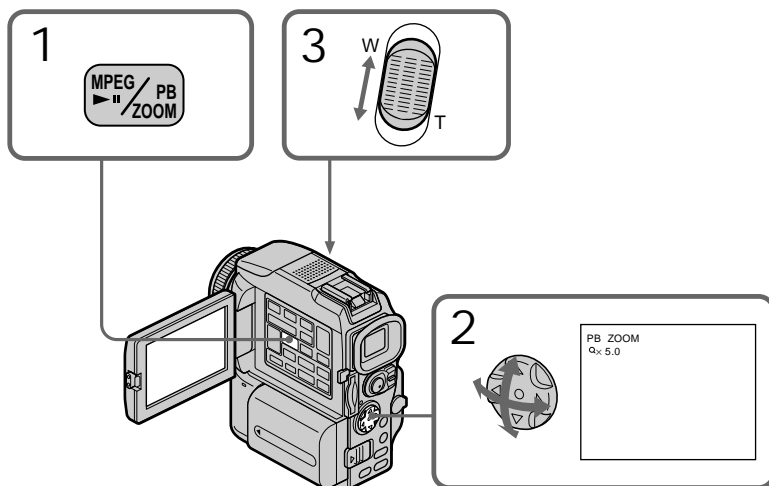
To cancel the PB ZOOM function
Press PB ZOOM.

Notes
• You cannot process externally input scenes using the PB ZOOM function with your camcorder.
• You cannot record images on a tape on your camcorder when you have processed the image using the tape PB ZOOM function. However, you can record images on a "Memory Stick" (p. xxx, xxx), or on a VCR using your camcorder as a player.

The PB ZOOM function is automatically canceled when you operate the following functions:
– Set the POWER switch to OFF (CHG).
– Stop playback.
– Display the menu settings.

Images in the PB ZOOM
Images in the PB ZOOM mode are not output through the ⁱ DV jack.

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Quickly locating a scene using the zero set memory function

Your camcorder goes forward or backward to automatically stop at a desired scene having a tape counter value of "0:00:00". Use the Remote Commander for this operation.

(1) In the playback mode, press DISPLAY.
(2) Press ZERO SET MEMORY at the point you want to locate later. The tape counter shows "0:00:00" and the ZERO SET MEMORY indicator flashes.
(3) Press ■ when you want to stop playback.
(4) Press ◄◄ to rewind the tape to the tape counter's zero point. The tape stops automatically when the tape counter reaches approximately zero. The ZERO SET MEMORY indicator disappears and the time code appears.
(5) Press ►. Playback starts from the counter's zero point.

DISPLAY — ZERO SET MEMORY

◄◄ — ►

■
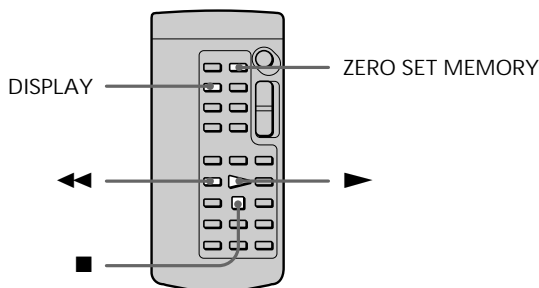
Notes
• When you press ZERO SET MEMORY before rewinding the tape, the zero set memory function will be canceled.
• There may be a discrepancy of several seconds from the time code.

If a tape has a blank portion in the recorded portions
The zero set memory function may not work correctly.

Searching the boundaries of recorded tape by title – Title search

CM only If you use a tape with cassette memory, you can search for the boundaries of recorded tape by title. Use the Remote Commander for this operation.

Before operation
Set CM SEARCH in [CM] to ON in the menu settings (p. xx). (The default setting is ON.)

(1) Set the POWER switch to VCR.
(2) Press SEARCH MODE on the Remote Commander repeatedly, until the TITLE SEARCH indicator appears.
    The indicator changes as follows:
    → TITLE SEARCH → DATE SEARCH → PHOTO SEARCH ¬
    └ no indicator ← ───────────── PHOTO SCAN ←
(3) 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.
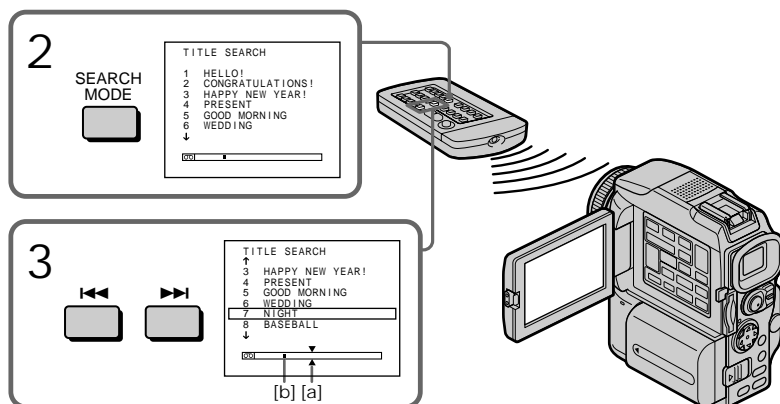
[a] **Actual point you are trying to search for**
[b] **Present point on the tape**

To stop searching
Press ■.

If you use a tape without cassette memory
You cannot superimpose or search a title.

If a tape has a blank portion between recorded portions
The title search function may not work correctly.

To superimpose a title
See page xx.

Advanced Playback Operations

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Searching a recording by date
– Date search

You can automatically search for the point where the recording date changes and start playback from that point (Date search). Use a tape with cassette memory for convenience. Use the Remote Commander for this operation.
Use this function to check where recording dates change or to edit the tape at each recording date.

### Searching for the date by using cassette memory

Before operation
• You can use this function only when playing back a tape with cassette memory.
• Set CM SEARCH in [CM] to ON in the menu settings (p. xx). (The default setting is ON).

(1) Set the POWER switch to VCR.
(2) Press SEARCH MODE on the Remote Commander repeatedly, until the DATE SEARCH indicator appears.
The indicator changes as follows:

TITLE SEARCH → DATE SEARCH → PHOTO SEARCH
no indicator ← PHOTO SCAN

(3) Press ◄◄ or ►► on the Remote Commander to select the date for playback. Your camcorder automatically starts playback at the beginning of the selected date.
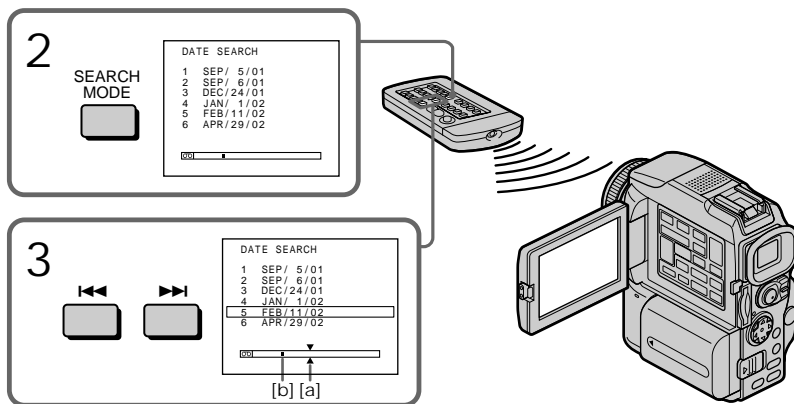
[a] Actual point you are trying to search for
[b] Present point on the tape

To stop searching
Press ■.

Searching a recording by date – Date search

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

If a tape has a blank portion between recorded portions
The date search function may not work correctly.

Cassette memory
The tape cassette memory can hold six recording date data. If you search the date among seven or more data, see "Searching for the date without using cassette memory" below.

Searching for the date without using cassette memory

(1) Set the POWER switch to VCR.
(2) Press MENU, then select and decide upon CM SEARCH in ▥ to OFF with the control button (p. xx).
(3) Press SEARCH MODE on the Remote Commander repeatedly until the DATE SEARCH indicator appears.
The indicator changes as follows:
┌→ DATE SEARCH → PHOTO SEARCH → PHOTO SCAN → no indicator ┐

(4) 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 stop searching
Press ■.

Searching for a photo
– Photo search/Photo scan

You can search for a still image you have recorded on a tape (photo search).
You can also search for still images one after another and display each image for
five seconds automatically regardless of cassette memory (photo scan). Use the Remote
Commander for these operations.
Use this function to check or edit still images.

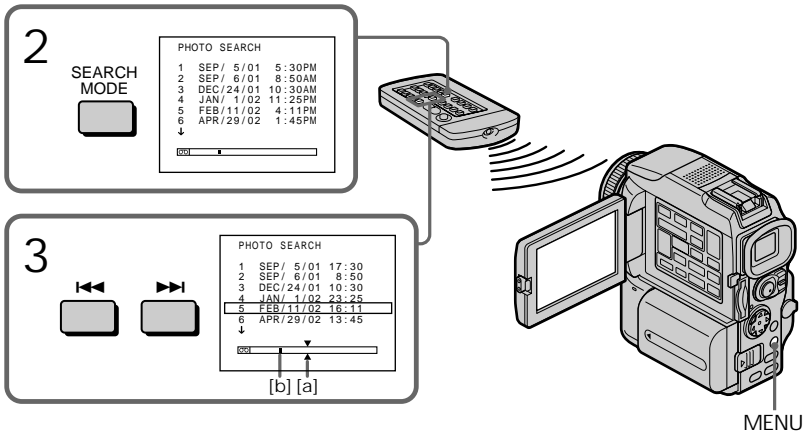## Searching for a photo by using cassette memory

Before operation
• You can use this function only when playing back a tape with cassette memory.
• Set CM SEARCH in ⬚ to ON in the menu settings (p. xx). (The default setting is
  ON.)

(1) Set the POWER switch to VCR.
(2) Press SEARCH MODE on the Remote Commander repeatedly, until the
    PHOTO SEARCH indicator appears.
    The indicator changes as follows:
    ┌→ TITLE SEARCH → DATE SEARCH → PHOTO SEARCH ┐
    └─ no indicator ←────────────── PHOTO SCAN ←┘
(3) Press ◄◄ or ►► on the Remote Commander to select the date for playback.
    Your camcorder automatically starts playback of the photo having the date
    that you selected.

[a] Actual point you are trying to search for
[b] Present point on the tape

To stop searching
Press ■.

Searching for a photo – Photo search/Photo scan

Searching for a photo without using cassette memory

(1) Set the POWER switch to VCR.
(2) Press MENU, then select and decide upon CM SEARCH in 🔲 to OFF with the control button (p. xx).
(3) Press SEARCH MODE on the Remote Commander repeatedly until the PHOTO SEARCH indicator appears.
The indicator changes as follows:
┌→ DATE SEARCH → PHOTO SEARCH → PHOTO SCAN → no indicator ┐

(4) Press ◄◄ or ►►l on the Remote Commander to select the photo for playback. Each time you press ◄◄ or ►►l, your camcorder searches for the previous or next photo.
Your camcorder automatically starts playback of the photo.

To stop searching
Press ■.

Advanced Playback Operations

Scanning photo

(1) Set the POWER switch to VCR.
(2) Press SEARCH MODE on the Remote Commander repeatedly until the PHOTO SCAN indicator appears.
The indicator changes as follows:
┌→ DATE SEARCH → PHOTO SEARCH → PHOTO SCAN → no indicator ┐

(3) Press ◄◄ or ►►l on the Remote Commander.
Each photo is played back for about five seconds automatically.
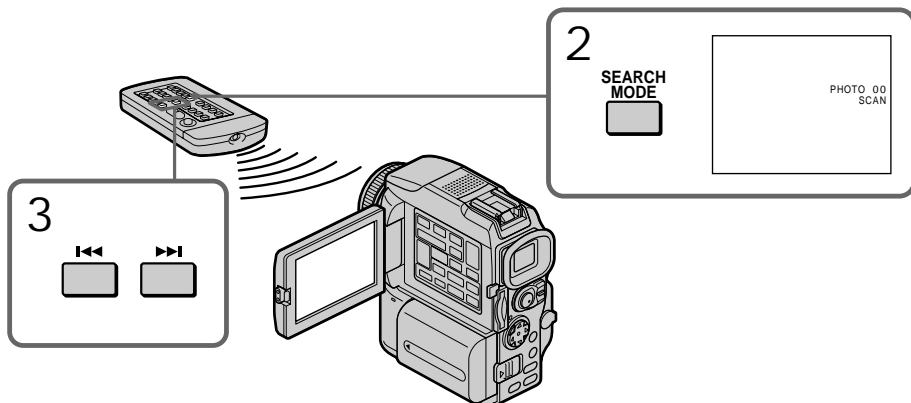
To stop scanning
Press ■.

If a tape has a blank portion between recorded portions
The photo search/photo scan function may not work correctly.

The available number of photos that can be searched using the cassette memory
The available number is up to 12 photos. However, you can search 13 photos or more using the scanning photo function.