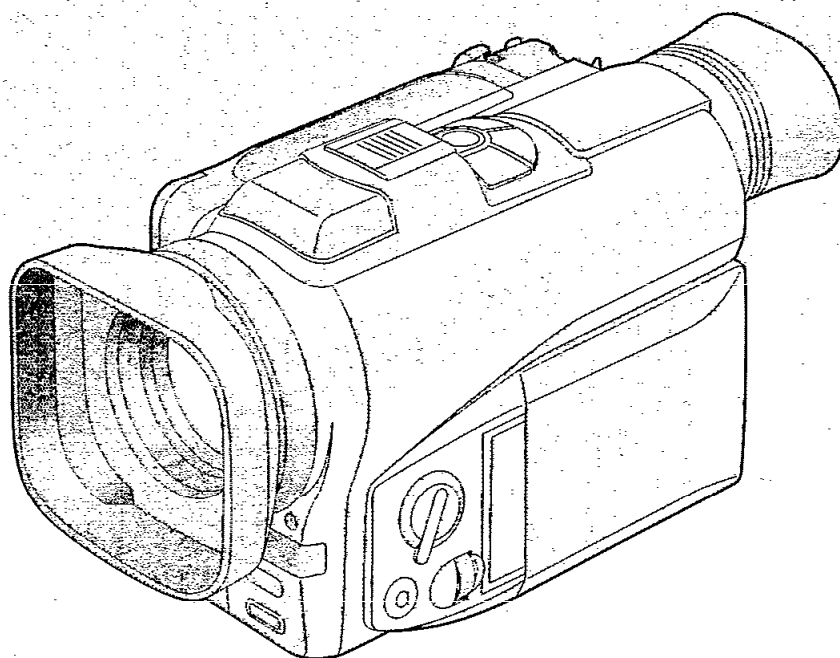


Panasonic

Digital Video Camera

NV-DA1B

Operating Instructions



Mini **DV** PAL

Before attempting to connect, operate or adjust this product, please read these instructions completely.

VQT7655

Basic
Operations

3~

Advanced
Operations

30~

Options/
Editing

54~

Miscellaneous/
Care of Unit

62~

Index

84~

Dear Customer, We would like to take this opportunity to thank you for purchasing this Panasonic Movie Camera.
Please read these Operating Instructions carefully and keep them handy for future reference.

Information for Your Safety

WARNING

To reduce the risk of fire or shock hazard and annoying interference, use only the recommended accessories and do not expose this equipment to rain or moisture.
Do not remove the cover (or back); there are no user serviceable parts inside.
Refer servicing to qualified service personnel.

Movie Camera

- The rating plate is on the bottom side of the Movie Camera.

AC Adaptor



- The rating plate is on the bottom side of the AC Adaptor.
- As this AC Adaptor gets hot during use, operate it in a well-ventilated place; do not use it in a tight enclosure.

Caution for AC Mains Lead

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three-pin mains plug for your safety and convenience.

A 5-ampere fuse is fitted in this plug. Should the fuse need to be replaced, please ensure that the replacement fuse has a rating of 5 amperes and it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover, you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover, the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local Panasonic Dealer.

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME, THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.

THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO A 13-AMPERE SOCKET.

If a new plug is to be fitted, please follow the wiring code described below.

If in any doubt, please consult a qualified electrician.

■ IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:


Blue: Neutral

Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

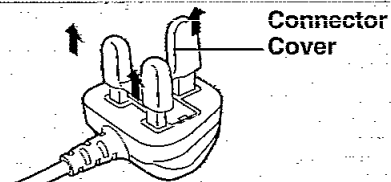
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol .

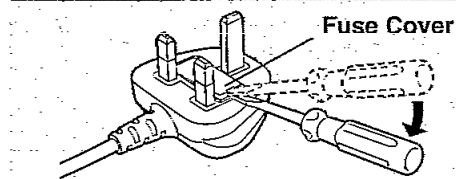
■ Before Use

Remove the Connector Cover as follows.

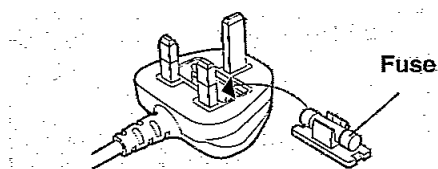


■ How to replace the Fuse

1. Remove the Fuse Cover with a screwdriver.



2. Replace the fuse and attach the Fuse Cover.



Contents—Basic Operations

Check List for the Standard Accessories	3
Controls and Functions	4
The 3 Types of Power Supply	6
1) Supplying Power from an AC Mains Socket	6
2) Supplying Power from the Cigarette Lighter Socket in a car	6
3) Supplying Power with the Battery	8
Inserting the Cassette	10
● LP Mode	11
Using the Viewfinder	12
Using the LCD Monitor	12
Recording (Filming)	14
Checking If the Picture Is Recorded	16
Recording Backlit Scenes	16
Recording Yourself	18
Focusing on the Subject Manually	18
Enlarging Your Subject or Widening the Recording Angle	20
Using the Movie Camera as a Digital Still Camera	20
Recording in the Cinema Mode	22
Recording with Minimised Camera Shake	22
Viewing the Just Recorded Scenes on the Movie Camera	24
● Adjusting the Volume	24
Searching for a Scene that You Want to Play Back	24
Playing Back in Slow Motion	26
Playing Back Still Pictures and Advancing Them One by One	26
Playing Back on a TV	28
After Use	28

Contents—Advanced Operations

Viewing Recorded Scenes During Recording Pause	30
Searching for the End of the Recorded Part on a Cassette	30
Searching for the Beginning of Recorded Scenes Marked with Index Signal	32
Starting to Record with Gradually Appearing Picture and Sound	34
Ending the Recording of a Scene with Gradually Disappearing Picture and Sound	34
Recording in Special Situations	36
Recording with Special Effects	38
Recording with Natural Colours	42
Adjusting the White Balance Manually	42
Adjusting the Shutter Speed Manually	44
Adjusting the Iris (F Number) Manually	44
Playing Back with Special Effects	46
Adding New Sound on a Recorded Cassette	48
Remote Controller	50

Contents—Options/Editing

Copying onto an S-VHS (or VHS) Cassette	54
Copying with the Help of an Editing Controller	56
Using the Movie Camera with a Video Printer	58
Using the Movie Camera with a Computer	60
Optional Accessories	61

Contents—Miscellaneous/Care of Unit

Using the Menu Screen	62
Menu Functions	64
Setting the Date and Time	68
Cautions for Use	70
Glossary	74
Indications on the LCD Monitor/in the Viewfinder	78
Specifications	81
Before Requesting Service (Problems & Solutions)	82
Index	84

Check List for the Standard Accessories

AC Adaptor Set



..... AC Adaptor (VSK0528)



..... AC Mains Cable (VJA0940)



..... DC Input Cable (VJA1088)



..... Battery Pack (VSB0393)

- When purchasing an additional AC Adaptor, order model number VW-AD7E.
- For purchasing additional Battery Packs, see the list of optional accessories on p. 61.



..... AV Cable (VJA1028)



..... S-Video Cable (VJA0658)



..... Headphone Conversion Adaptor (VFA0292)



..... 21-pin Adaptor (VFA0151)



..... Shoulder Strap (VFC2905)



..... Remote Controller (VEQ2141)



..... Button-Type Battery (CR2025)



..... Cleaning Tissue (VFC1792)

Basic Operations

Advanced Operations

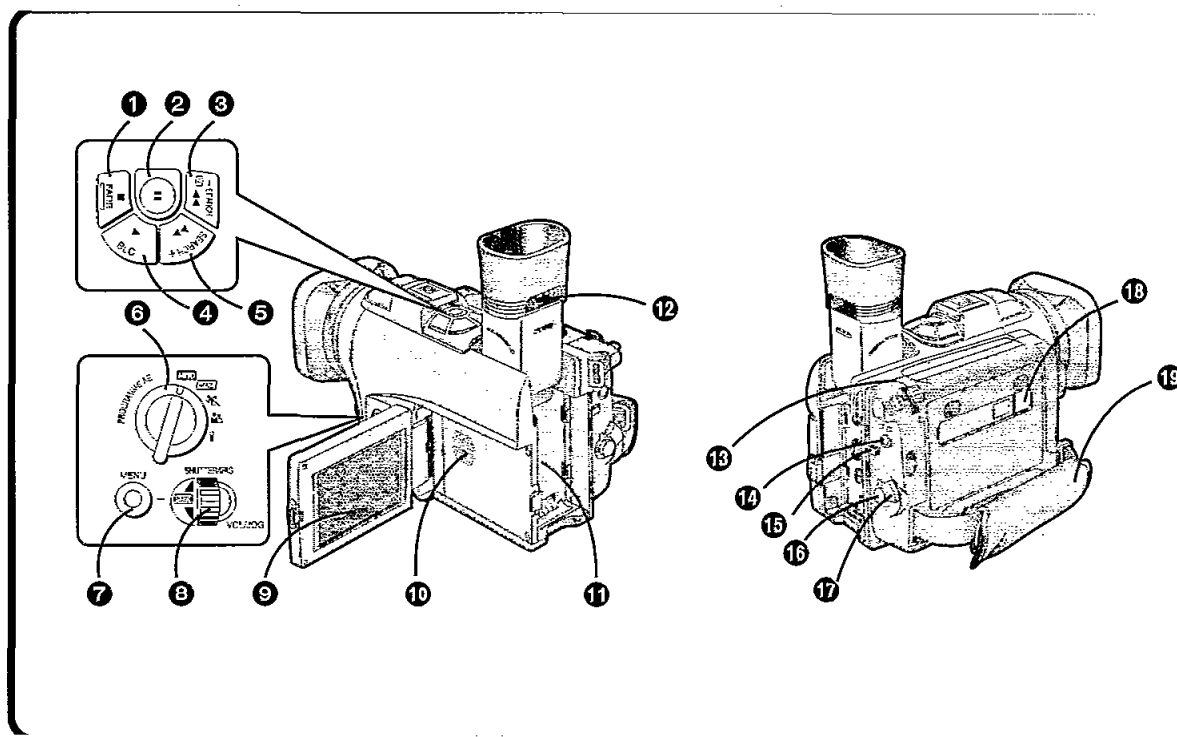
Options/Editing

Miscellaneous/
Care of Unit

Index

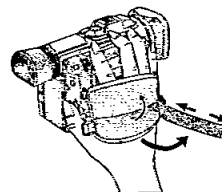
Controls and Functions

For more details, see the pages indicated in brackets.



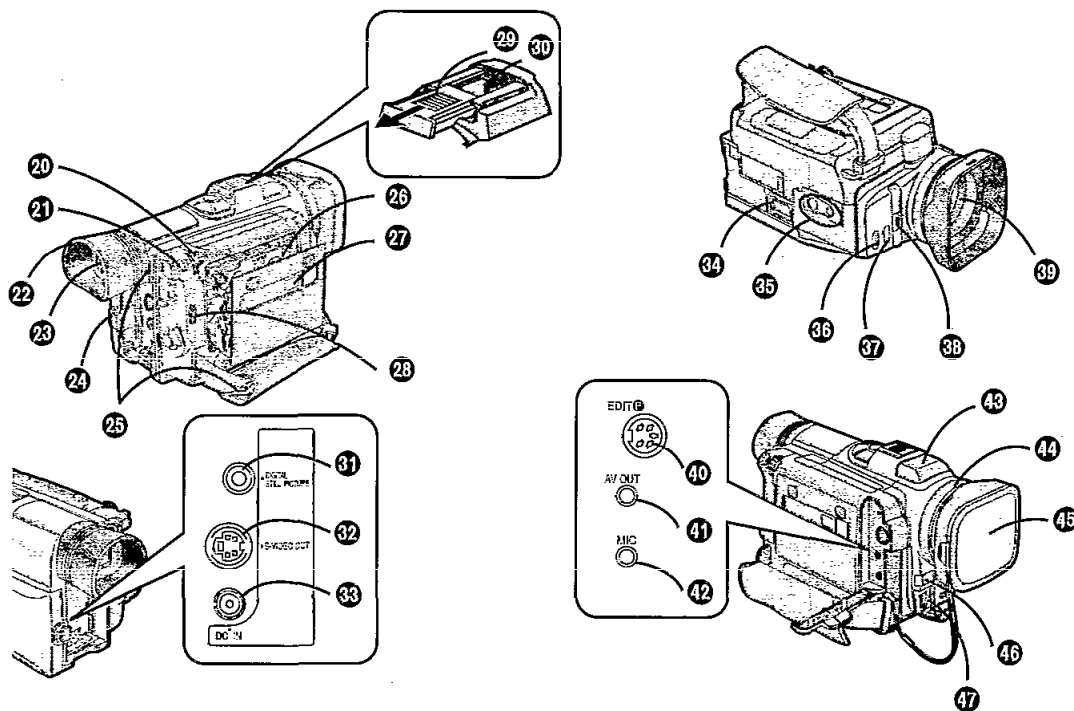
- ❶ Stop Button [■] (p. 24)/
Fade Button [FADE] (p. 34)
- ❷ Pause Button [II] (p. 26)
- ❸ Recording Check Button [Ⓢ] (p. 16)/
Rewind/Review Button [◀◀] (p. 24)/
Reverse Search Button [−SEARCH] (p. 30)
- ❹ Backlight Button [BLC] (p. 16)/
Play Button [▶] (p. 24)
- ❺ Fast Forward/Cue Button [▶▶] (p. 24)/
Forward Search Button [SEARCH+] (p. 30)
- ❻ Mode Selector Switch [PROGRAMME AE]
(p. 14, 18, 36, 42, 44)
- ❼ Menu Button [MENU] (p. 62)
- ❽ Multi-Function Dial [PUSH] (p. 24, 27, 44, 62)
- ❾ LCD Monitor (p. 12)
- ❿ Speaker (p. 24)
- ⓫ Battery Holder (p. 8)
- ⓬ Eyepiece Corrector Knob (p. 12)
- ⓭ Condensation Sensor Slot (p. 71)
Through this slot, the Movie Camera detects
condensation. Do not cover this slot with your
fingers, etc. and take care that it does not get
clogged with dirt.
- ⓮ VCR (Playback) Mode/Camera (Recording) Mode
Button (and Lamps) (p. 14, 24)
- ⓯ Battery Eject Button [BATTERY EJECT] (p. 9)

- ⓯ Recording Start/Stop Button (p. 14)
- ⓰ Power Switch [POWER] (p. 12, 14)
- ⓱ Cassette Compartment Lock Button [△ LOCK]
(p. 10)
- ⓲ Grip Belt
You can adjust the Grip Belt to the size of your
hand.



Open the Grip Belt
Cover and adjust
the length of the
Grip Belt.

- ⓳ Zoom Lever [W/T] (p. 20)
- ⓴ Photoshot Button [PHOTOSHOT] (p. 20)
- ⓵ Eyecup
- ⓶ Viewfinder (p. 12)
- ⓷ LCD Monitor Open Button [PUSH OPEN] (p. 12)
- ⓸ Shoulder Strap Holders (p. 73)
- ⓹ Cassette Compartment (p. 10)
- ⓺ Cassette Compartment Window (p. 10)
- ⓻ Cassette Eject Lever [▲ EJECT] (p. 10)

**29 Shoe Cover**

When using the Shoe, remove the Shoe Cover by sliding it in the direction of the arrow.

30 Accessory Shoe

To attach the Stereo Zoom Microphone (optional), etc.

31 Disital Still Picture Terminal

[DIGITAL STILL PICTURE] (p. 60)

32 S-Video Output Socket [S-VIDEO OUT]

(→ 28, 54, 56, 57, 58)

33 DC Input Socket [DC IN] (p. 6)**34 Support Leg (p. 24)****35 Tripod Receptacle**

To mount the Movie Camera on an optional tripod.

36 Focus Button [FOCUS] (p. 18)**37 White Balance Button [W.B] (p. 42)****38 Recording Lamp (p. 15)****39 Lens****40 Edit Socket [EDIT] (p. 56, 57, 58)****41 Audio-Video Output Socket [AV OUT]**

(p. 28, 54, 56, 57)

When a cable is connected to this socket, the Movie Camera's built-in speaker is turned off.

42 Microphone Socket [MIC]

To connect an external microphone or audio equipment. (Connecting to this socket deactivates the built-in microphone.)

Socket: M3-type

Impedance: Less than 4.7 kohm

Type: Stereo

(When connecting a mono microphone, no sound is recorded on the right channel.)

Sensitivity: Approx. -70 dBV

Power Source

for Microphone: Not available

43 Microphone (built-in, stereo)**44 Focus Ring (p. 18)****45 Lens Cap (p. 13, 29, 42)****46 White Balance Sensor (p. 75)/**

Remote Control Sensor (p. 52)

47 DV Terminal (i.LINK) [i]

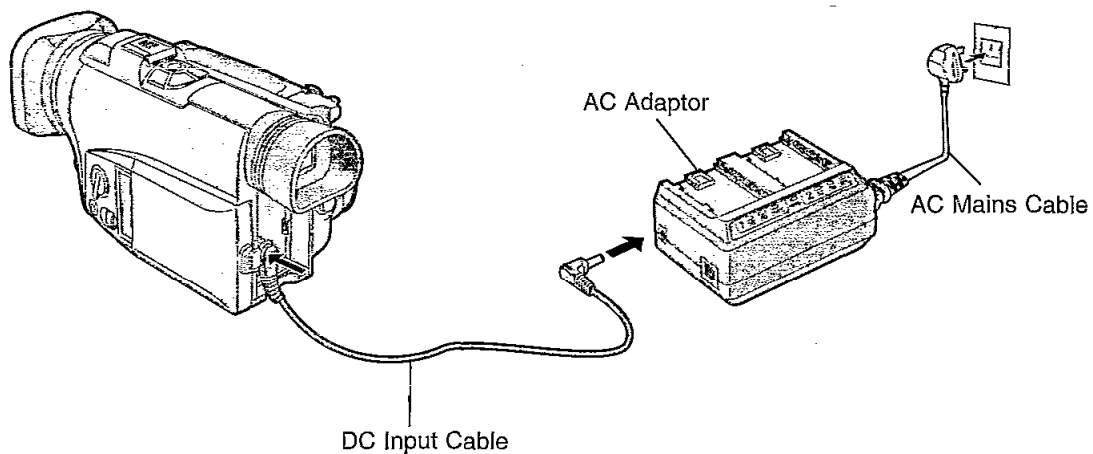
To output digital signals.

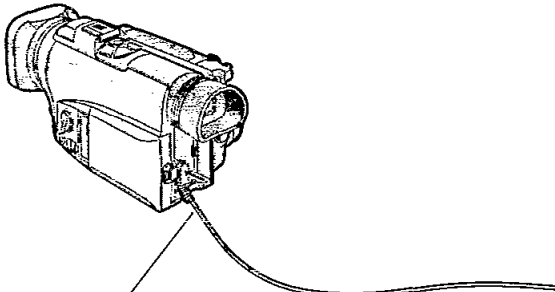
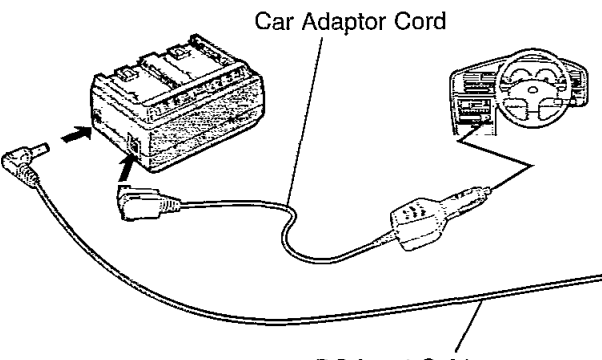
Connect it to digital video equipment.

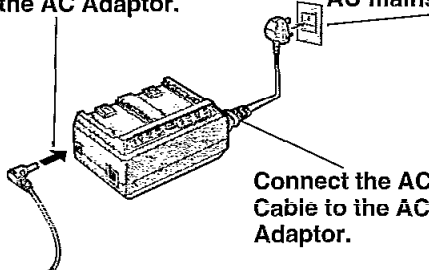
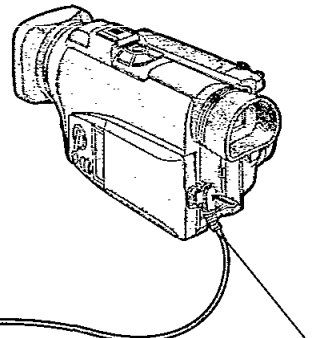
"i.LINK" is the name of the connector in accordance with the International Standard IEEE1394-1995.

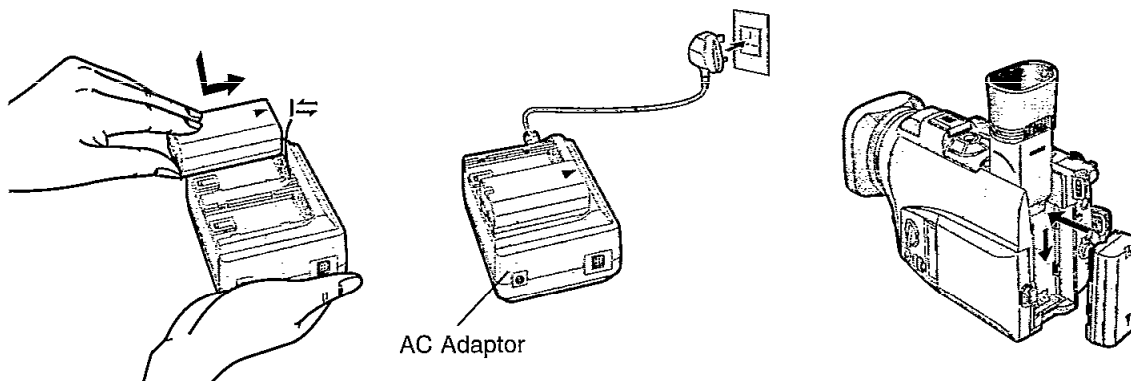
"i" is the logo marked on products conforming with the "i.LINK" specifications.

Inputting digital signals into this Movie Camera is not possible.



Title	Procedure
<p>The 3 Types of Power Supply</p> <ol style="list-style-type: none"> 1) AC Adaptor (supplied) to supply power from an AC mains socket 2) Car Adaptor Cord (optional) to supply power from a Cigarette Lighter Socket 3) Battery (supplied) (p. 8) <p>1) Supplying Power from an AC Mains Socket</p>	 <p>Connect the plug of the DC Input Cable to the [DC IN] Socket on the Movie Camera.</p>
<p>2) Supplying Power from the Cigarette Lighter Socket in a Car</p> <p>The use of the Car Adaptor Cord (VW-KA7E; optional) together with the AC Adaptor makes it possible to supply power to the Movie Camera in a car for recording and playback. It also allows charging the Movie Camera's Battery.</p>	<p>Start the engine and then plug the Car Battery Charger into the Cigarette Lighter Socket.</p>  <p>Car Adaptor Cord</p> <p>DC Input Cable</p>

	Remarks, etc.
<p>Connect the other plug of the DC Input Cable to the [DC OUT] Socket on the AC Adaptor.</p> <p>Connect the other end of the AC Mains Cable to an AC mains socket.</p> <p>Connect the AC Mains Cable to the AC Adaptor.</p> 	<ul style="list-style-type: none"> • Before disconnecting the AC Mains Cable, set the [POWER] Switch to [OFF]. • If you use the Movie Camera for a long time, it becomes warm. However, this is normal.
 <p>Connect the DC Input Cable.</p>	<ul style="list-style-type: none"> • After use, be sure to disconnect the Car Adaptor Cord from the Cigarette Lighter Socket. • Be sure to start the car engine before you connect the Car Adaptor Cord, otherwise the fuse may blow. • Also read the operating instructions of the Car Adaptor Cord.



Title	Procedure	
<p>3) Supplying Power with the Battery Before use, fully charge the Battery.</p> <div> <p>Do not connect the Movie Camera during charging.</p> </div> <p>Using the Charge Confirmation Marker You can use this marker to easily distinguish between charged and discharged Batteries. For example, slide the knob so that the red dot (●) is visible after the charging is completed.</p> <div> <p>Marker</p> <p>Battery</p> </div>	<p>1 Place the Battery on the AC Adaptor and slide it horizontally until it stops.</p>	<p>2 Connect the AC Mains Cable to the AC Adaptor and an AC mains socket.</p>
	<p>5 Slide the Viewfinder backward to its fully extended position and then tilt it upward.</p>	<p>6 Insert the Battery into the Battery Holder on the Movie Camera and slide it downward until it locks with a click.</p>

Charging Time and Maximum Time for Continuous Recording

Battery No.	Charging Time	Max. Continuous Recording Time
Supplied	60 min.	70 min. (60min.)
CGR-D120 (optional)	60 min.	70 min. (60min.)
CGP-D210 (optional)	110 min.	120 min. (105min.)
CGR-D220 (optional)	120 min.	150 min. (130min.)
CGP-D320 (optional)	195 min.	255 min. (220min.)
CGR-D815 (optional)	320 min.	480 min. (420min.)

(The times shown in the above chart are approximations. The figures in parentheses show the recording time when using the LCD Monitor.)

The times listed above for your information indicate the duration of recording performed at an ambient temperature of 20°C and 60% relative humidity. The charging time may be longer when you charge the Battery at higher or lower temperature.

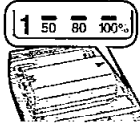
- During use and charging, the Battery becomes warm. The Movie Camera, too, becomes warm during use.
- When you repeatedly stop and restart recording, the recording time per Battery is shorter than listed above.
- If you do not use the Battery for a long time, please read "Precautions for Storage" (p. 72).

Remarks, etc.

3

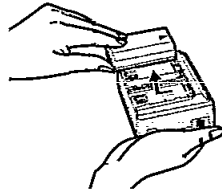
When all three Charge Lamps on the AC Adaptor are lit, charging is finished.

The Charge Lamps [50%], [80%] and [100%] flash and then remain lit one after another. These lamps indicate the approximate charging condition reached.



4

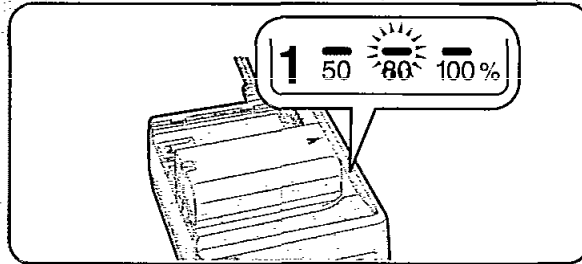
Remove the Battery by sliding it in the opposite direction of Step 1.



- Also disconnect the AC Mains Cable.

When the Charge Lamps Flash as Warning

If the ambient temperature is extremely low or extremely high, the Charge Lamps on the AC Adaptor flash. They also flash when some malfunction has occurred in the Battery or the AC Adaptor. For details, read "When the Charge Lamps on the AC Adaptor Flash as Warning" (p. 72).

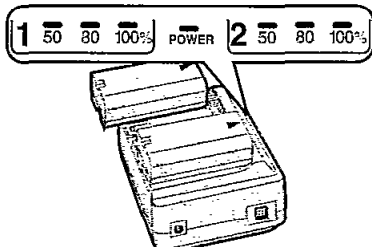


Charging Two Batteries

If you attach two Batteries to the AC Adaptor, they will be charged one after the other.

To charge, follow above Steps 1 - 3.

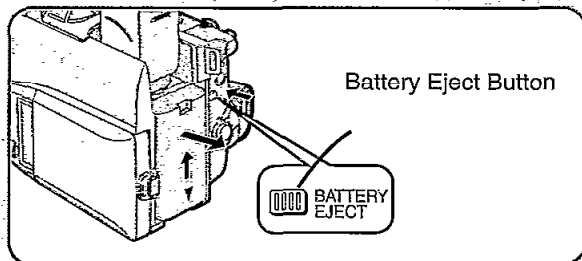
- Charging starts from Battery 1.
- At this time, the Charge Lamps for Battery 2 show the remaining charge in the Battery 2. (If the remaining charge is less than 50%, no Charge Lamp is lit.)

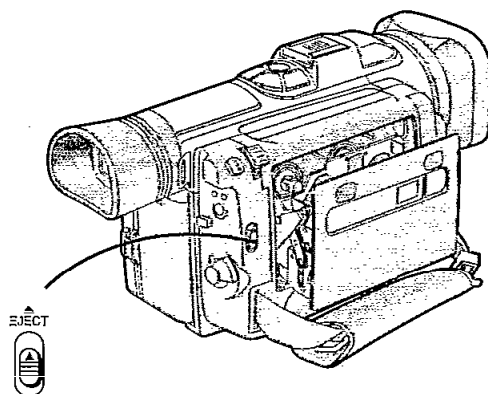


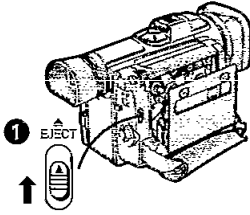
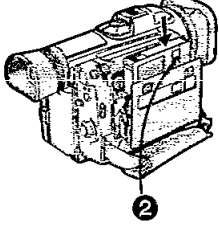
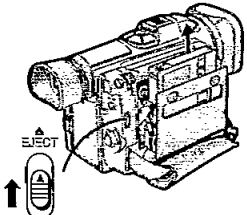
Removing the Battery from the Movie Camera

While pressing the [BATTERY EJECT] Button, slide the Battery upward to remove it.

- Be careful not to drop the Battery by accident.
- Before removing the Battery, set the [POWER] Switch to [OFF].





Title	Procedure	
Inserting the Cassette	<p>1 Slide the [▲ EJECT] Lever 1 upward to open the Cassette Compartment.</p> 	<p>2 Insert the cassette. Insert the cassette with its window in position 2.</p> 
	<p>Ejecting the Cassette</p> <ul style="list-style-type: none"> • If the Movie Camera is supplied with power, the eject function will operate without turning on the Movie Camera. 	

● LP Mode

The desired recording speed can be selected with [REC SPEED] on the [CAMERA MENU2] Menu.

If you select the LP Mode, the possible recording time is 1.5 times as long as in the SP Mode.

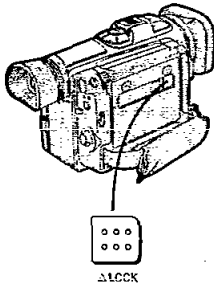
Recording in the LP mode does not deteriorate the picture quality. However, the playback picture may contain mosaic-like patterns and certain functions may be restricted.

- As the recording track width in the LP Mode is smaller than the head width, recording new sound onto an already recorded cassette (audio dubbing) (p. 48) is not possible.

- In the following cases, mosaic-like patterns may appear in the playback picture, or the picture may not be played back correctly:
 - When a cassette recorded in the LP Mode on this Movie Camera is played back on other digital video equipment.
 - When a cassette recorded in the LP Mode on other digital video equipment is played back on this Movie Camera.
 - When a cassette recorded in the LP Mode on this Movie Camera is played back on digital video equipment not featuring the LP Mode.
 - In the Slow Motion or Still Advance Playback Mode. (p. 26)
 - When using the Camera Search Function. (p. 30)

3

Close the Cassette Compartment and press the [△ LOCK] Button to lock the Cassette Compartment.



When opening or closing the Cassette Compartment, push down the Grip Belt so that it does not obstruct the opening and closing of the Cassette Compartment.

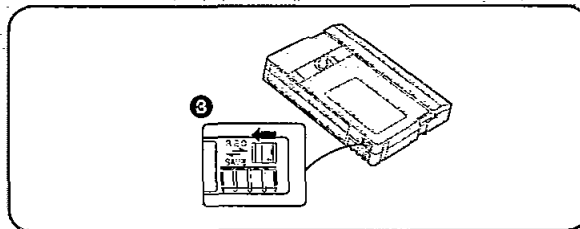
- Otherwise the Grip Belt may prevent the Cassette Compartment from opening completely, or it may get caught under the Cassette Compartment Cover and prevent it from closing properly.

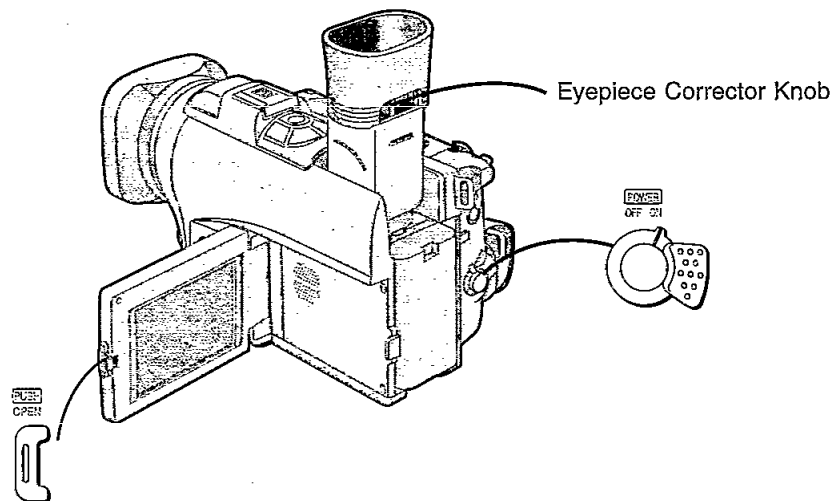
Remarks, etc.

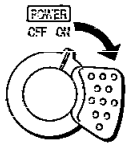
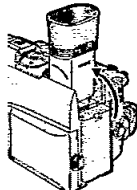
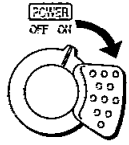
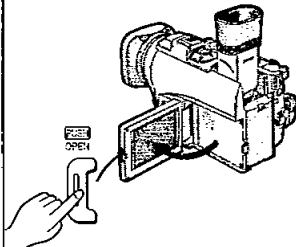
- When inserting the cassette, make sure it faces in the right direction and then push it in until it stops.
- When you insert a cassette onto which you have recorded before, use the Camera Search Function (p. 30) to search for the position from which you want to continue recording.
- When you insert a new cassette, rewind the tape to the beginning before starting to record.

Preventing Accidental Erasure of Recordings

Opening the cassette's erasure prevention slider ③ (sliding it in the direction of the [SAVE] arrow) prevents recording. To record again, close the erasure prevention slider (slide it in the direction of the [REC] arrow).





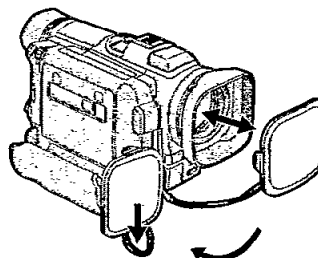
Title	Procedure	
<p>Using the Viewfinder</p> <p>Before using the Viewfinder, adjust it to your eyesight so that the indications in the Viewfinder are clear and easy to read.</p> <ul style="list-style-type: none"> •Due to limitations in production technology, there may be some tiny bright or dark spots on the Viewfinder, however, these are not recorded on the tape. 	<p>1</p> <p>Set the [POWER] Switch to [ON].</p> 	<p>2</p> <p>Slide the Viewfinder backward completely and then tilt it upward. The Viewfinder can be tilted upward by up to approximately 90°.</p> 
<p>Using the LCD Monitor</p> <p>It is also possible to record while viewing the picture on the opened LCD Monitor.</p> <p>Relationship between Viewfinder and LCD Monitor</p> <p>Opening the LCD Monitor turns off the Viewfinder. Closing the LCD Monitor turns the Viewfinder on again. However, turning the LCD Monitor forward also turns on the Viewfinder again. (p. 18)</p> <ul style="list-style-type: none"> •Due to limitations in production technology, there may be some tiny bright or dark spots on the LCD, however, these are not recorded on the tape. 	<p>1</p> <p>Set the [POWER] Switch to [ON].</p> 	<p>2</p> <p>Push the [PUSH OPEN] Button and turn out the LCD Monitor approximately 90° in the direction of the arrow. The Viewfinder turns off.</p> 

Handling the Lens Cap

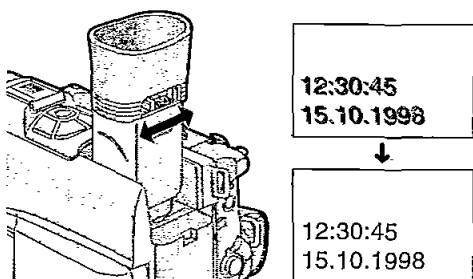
Before you start recording, remove the Lens Cap.

You can hook the removed Lens Cap onto the Grip Belt.

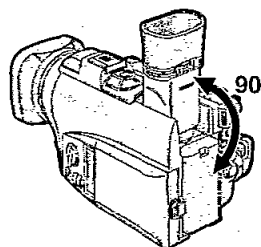
When not actually recording, always attach the Lens Cap to the Lens to protect it.

**Remarks, etc.****3****Adjust by sliding the Eyepiece Corrector Knob.**

It is also possible to adjust the brightness of the Viewfinder with the item [LCD/EVF SET] on the [CAMERA MENU3] Menu or [VCR MENU2] Menu.

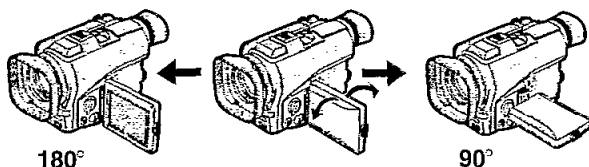


- The angle of the Viewfinder can be adjusted upward. However, be sure to slide the Viewfinder backward until it stops, before turning it upward.

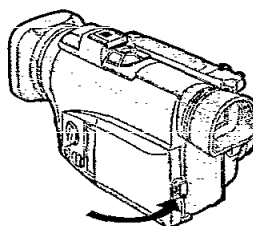
**3****Adjust the angle of the LCD Monitor according to the desired recording angle.**

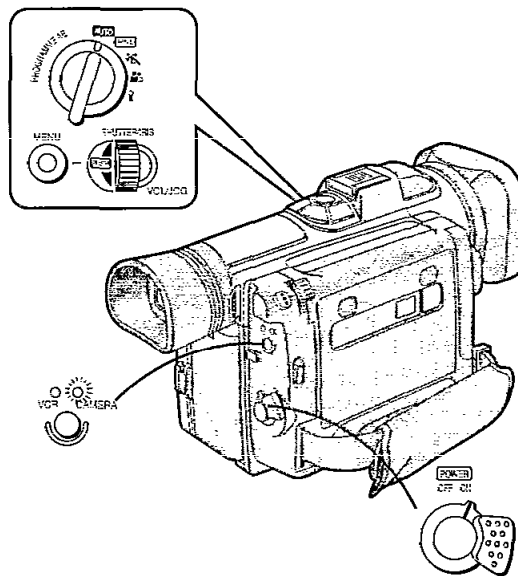
The LCD Monitor rotates upward a maximum of 180° and downward a maximum of 90° from its normal vertical position. Trying to forcefully rotate it beyond this range could seriously damage the Movie Camera.

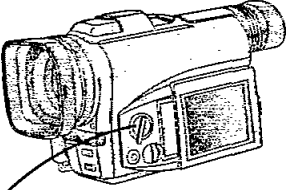
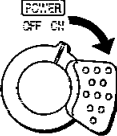

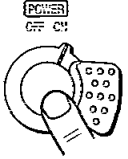


It is also possible to adjust the colour saturation and brightness of the LCD Monitor with the item [LCD/EVF SET] on the [CAMERA MENU3] Menu or [VCR MENU2] Menu.

**Closing the LCD Monitor**

Push the LCD Monitor close until the [PUSH OPEN] Button locks with a click.

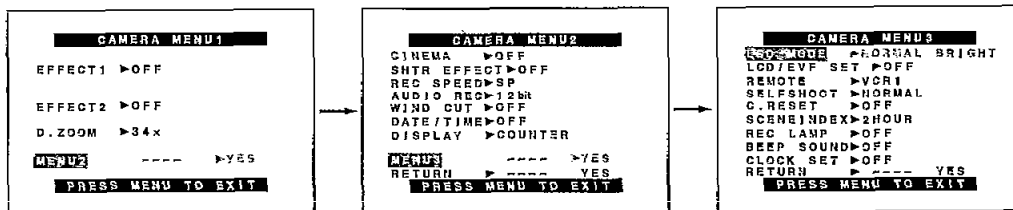




Title	Procedure	
<p>Recording (Filming)</p> <p>When the Mode Selector Switch is set to [AUTO], you can simply turn on the Movie Camera and press the Start/Stop Button to start recording, and the focus and white balance are adjusted automatically.</p> <ul style="list-style-type: none"> Depending on the light source and recording situation, correct automatic focusing and white balance adjustment may not be possible. In such cases, adjust them manually. <p>Focus: P. 18 White Balance: p. 42</p> <div>  <p>Mode Selector Switch</p> </div>	<p>1</p> <p>Set the [POWER] Switch to [ON]. The [CAMERA] Lamp lights.</p> <div>  <p>VCR CAMERA</p> </div> <div>  </div>	<p>2</p> <p>Press the Start/Stop Button. Recording starts. The [RECORD] Indication appears briefly and then changes to [REC].</p> <div>  </div> <div>  </div> <div>  </div>

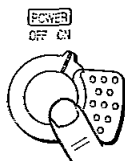
Selecting Other Menu Items (MENU2 / MENU3).

- 1 Press the [MENU] Button.
The [CAMERA MENU1] Menu appears.
- 2 Turn the [PUSH] Dial to select the [MENU2].
- 3 Press the [PUSH] Dial.
The [CAMERA MENU2] Menu appears.
- 4 Turn the [PUSH] Dial to select the [MENU3].
- 5 Press the [PUSH] Dial.
The [CAMERA MENU3] Menu appears.
- 6 Press the [MENU] Button to exit the Menu.



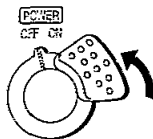
3

To pause recording:
Press the Start/Stop
Button again.
The [PAUSE] Indication
appears.



4

To finish recording:
Set the [POWER]
Switch to [OFF].



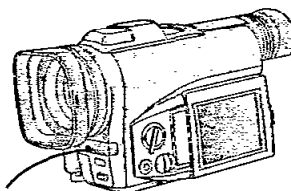
Remarks, etc.

- If you leave the Movie Camera in the Recording Pause Mode for more than 6 minutes, it automatically switches off to protect the tape and to conserve battery power. To resume recording from this condition, set the [POWER] Switch to [OFF] and then to [ON] again.

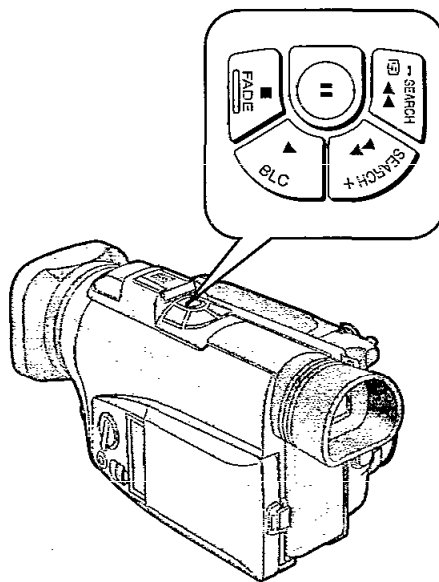
Recording Lamp (Tally Lamp)




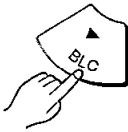
The Recording Lamp lights during recording to let the people in front of the Movie Camera know that recording is being performed.

If you set [REC LAMP] on the [CAMERA MENU3] Menu to [OFF], the Recording Lamp does not light.

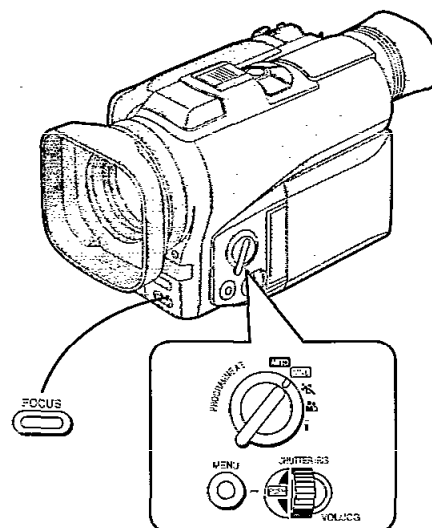
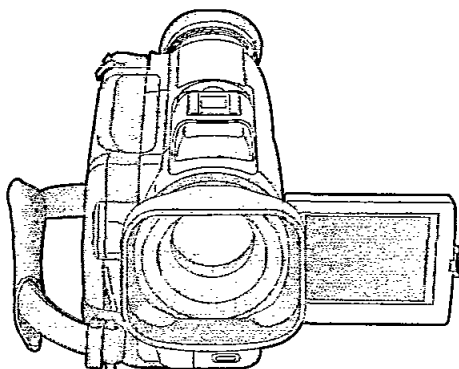


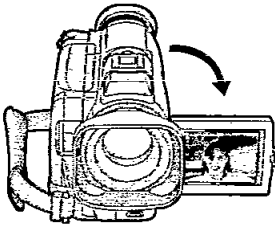

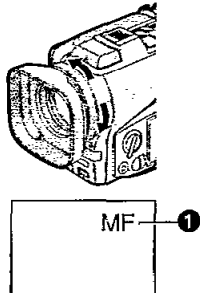
Recording Lamp



Title	Procedure
<p>Checking If the Picture Is Recorded (Recording Check) To play back the final few seconds of the last recorded scene in the Recording Pause Mode.</p>	<p>1 Press the Recording Check Button  1 briefly in the Recording Pause Mode. The [CHK] Indication 2 appears. After checking, the Movie Camera returns to the Recording Pause Mode.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div> <p>1</p>  </div> <div>  <p>2</p> </div> </div>
<p>Recording Backlit Scenes (Backlight Compensation) To prevent the backlit subject from being recorded very dark. (Backlight means that the light falls on the subject from behind, i.e. the subject is between the light source and the Movie Camera.)</p>	<p>1 Keep the Backlight Button [BLC] pressed. The backlight is being compensated as long as you keep the Button pressed, and the subject is recorded more brightly. (The picture brightens up as a whole.)</p> <div style="text-align: center; margin: 20px 0;">  </div> <p>Returning to Normal Recording Release the Backlight Button [BLC].</p>

	<i>Remarks, etc.</i>
	<ul style="list-style-type: none">•For Recording Check, the Movie Camera must be in the same mode (SP or LP) as used for recording, otherwise the playback picture is distorted.



Title	Procedure	
<p>Recording Yourself (Recording with the LCD Monitor Facing Forward)</p> <p>This makes it possible to record yourself while viewing the picture on the LCD Monitor or to show the persons in front of the Movie Camera the picture being recorded.</p>	<p>1</p> <p>Open the LCD Monitor and turn it so that it faces forward (lens side).</p> 	
<p>Focusing on the Subject Manually (Manual Focus)</p> <p>This makes it possible to adjust the focus manually for subjects and recording situations for which automatic focusing is not precise.</p>	<p>1</p> <p>Set the Mode Selector Switch to [MNL]. The [MNL] Indication appears.</p> 	<p>2</p> <p>Turning the Focus Ring makes the [MF] Indication (Manual Focus Mode) ❶ appear.</p> 

Mirror Mode

If you set [SELF SHOOT] on the [CAMERA MENU3] Menu to [MIRROR], the picture displayed on the LCD Monitor is reversed like a mirror-image. When recording yourself with the LCD Monitor facing forward, the picture as it is being recorded might look unusual.

We usually look at ourselves in the mirror and, although the image we see there is actually reversed right and left, it feels more natural because we are used to it. This Movie Camera features the Mirror Mode which displays the picture as a mirror-image. However, even if you have selected the Mirror Mode, the picture is recorded in the normal way.

Remarks, etc.

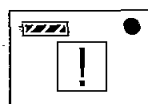
Opening the LCD Monitor automatically turns off the Viewfinder. However, when you turn the LCD Monitor forward, the picture also appears in the Viewfinder.

This lets you aim the Movie Camera and view the picture in the Viewfinder, while the persons in front of the Movie camera can check the picture on the LCD Monitor during recording.

• In the Mirror Mode, only the following indications are displayed.

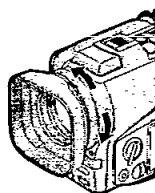
- : Recording
- : Recording Pause
- ▬▬▬: Remaining Battery Power

When the General Warning/Alarm Indication [!] appears, turn the LCD Monitor backward so that you can confirm the actual Warning/Alarm Indication.



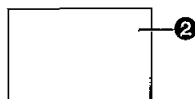
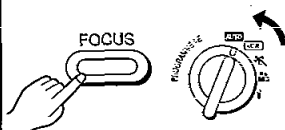
3

Turn the Focus Ring on the Lens to adjust the focus.



Returning to the Automatic Focusing Mode

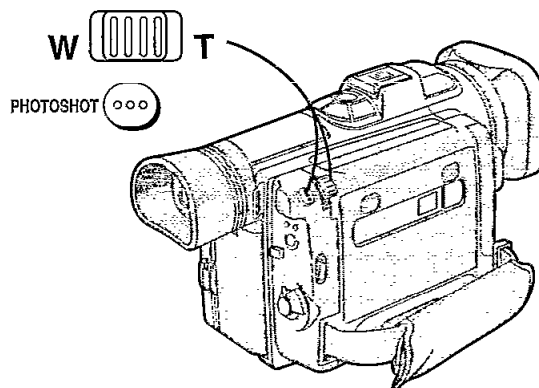
Press the [FOCUS] Button to make the [MF] Indication disappear ②. Or, set the Mode Selector Switch to [AUTO].


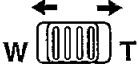
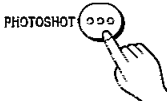



Hint for Manual Focus Adjustment

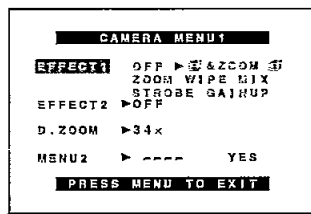
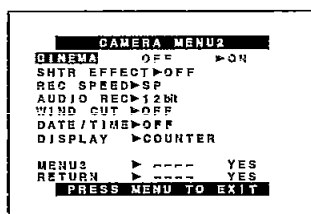
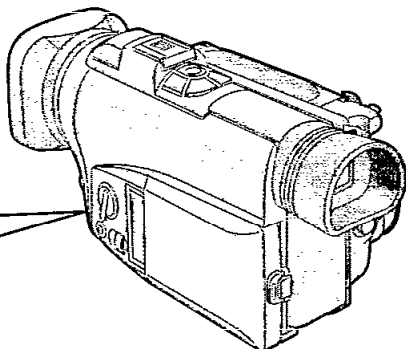
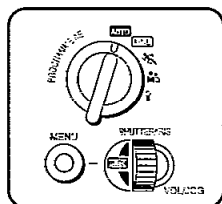
• If you adjust the focus in the wide-angle setting, the subject may go out of focus when you enlarge it. Therefore, enlarge the subject ③ before you adjust the focus, so that the picture remains focused when you zoom out ④.




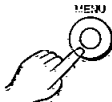





Title	Procedure
<p>Enlarging Your Subject or Widening the Recording Angle (Zooming In/Out)</p> <p>Recording close-ups of your subjects and recording wide-angle shots adds special effects to your videos.</p> 	<p>1</p> <p>To record a wider view (Zooming-out): Push the [W/T] Zoom Lever toward [W]. To enlarge your subject (Zooming-in): Push the [W/T] Zoom Lever toward [T].</p> <ul style="list-style-type: none"> •The Zoom Magnification Indication appears for a few seconds. 
<p>Using the Movie Camera as a Digital Still Camera (Photoshot)</p> <p>With this function, you can record still pictures with sound for approximately 7 seconds each. This function is convenient for example for pictures that you want to print on a Video Printer.</p>	<p>1</p> <p>Press the [PHOTOSHOT] Button. (This function can be used during recording, too.)</p> <p>The Movie Camera records a still picture for approximately 7 seconds and then switches over to the Recording Pause Mode.</p> <ul style="list-style-type: none"> •The image on the LCD Monitor or in the Viewfinder also stands still.  

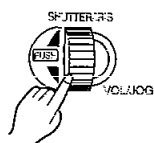
	Remarks, etc.
<p>Enlarging Your Subjects Even More (Digital Zooming)</p> <p>If you set [EFFECT1] on the [CAMERA MENU1] Menu to [ZOOM] or [ZOOM], it is possible to further enlarge the subject.</p> <p>For the item [D.ZOOM] on the [CAMERA MENU1] Menu, you can select either [34×] or [200×] as the maximum zoom magnification.</p> <p>The [D.ZOOM] Indication appears.</p> <ul style="list-style-type: none"> • 34×: Digital zooming up to 34×. • 200×: Digital zooming up to 200×. • Up to 17×, the zooming is done optically. • The higher the Digital Zoom Magnification is, the lower is the picture quality. 	<ul style="list-style-type: none"> • The further you push the [W/T] Zoom Lever toward [W] or [T], the faster the zooming speed becomes. • During recording, the zooming speed is lower than during recording pause. <p>■ Recording Extra Close-up Shots of Small Subjects (Macro Close-up Function)</p> <p>When the zoom magnification is 1×, the Movie Camera can focus on subjects down to a distance of approximately 5 mm between lens and subject. This allows recording very small subjects such as insects.</p> <ul style="list-style-type: none"> • When you have zoomed to the tele setting, precise focusing is only possible on subjects no closer than 1.5 metres.
<p>If you set [SHTR EFFECT] on the [CAMERA MENU2] Menu to [ON], the screen blinks briefly and a simulated shutter click sound can be heard when you press the [PHOTOSHOT] Button. This audiovisual effect is also recorded.</p> <p>Continuous Photoshot</p> <p>If you set [SHTR EFFECT] on the [CAMERA MENU2] Menu to [ON] and keep the [PHOTOSHOT] Button pressed (either in the Recording Pause Mode or during recording), the Movie Camera automatically records still pictures successively at intervals of approximately 0.7 second until you release the button.</p> <ul style="list-style-type: none"> • One more still picture may be recorded after you release the [PHOTOSHOT] Button. • As the still pictures recorded in the Continuous Photoshot Mode are not marked with photoshot index signals, they cannot be located by using the Photoshot Index Search Function and printed with the Auto Print Function. 	<ul style="list-style-type: none"> • With the still pictures that you have recorded in the Photoshot Mode, you can do the following: <ul style="list-style-type: none"> • Index Search (p. 32) (However, searching for the picture(s) recorded at the beginning of the tape may not be possible.) • Automatic printing (p. 59) • The visual shutter effect and click sound may occur with slight delay after recording of the still picture has started.) • The picture quality deteriorates slightly.



Title	Procedure	
<p>Recording in the Cinema Mode (Cinema Mode)</p> <p>This mode lets you record in the cinema-like wide-screen format.</p>	<p>1</p> <p>Select the [MENU2] on the [CAMERA MENU1] Menu. (p. 15)</p>  	<p>2</p> <p>Turn the [PUSH] Dial to select [CINEMA].</p> 
<p>Recording with Minimised Camera Shake (Super Image Stabilizer)</p> <p>In recording situations where shaking of the Movie Camera is likely to happen, for example when you have zoomed in on a distant subject or when you record while walking, you can use this function to stabilize the image.</p> <ul style="list-style-type: none"> • In case of very strong camera shake, it may not be possible to stabilize the picture. 	<p>1</p> <p>Press the [MENU] Button. The [CAMERA MENU1] appears.</p> 	<p>2</p> <p>Turn the [PUSH] Dial to select [EFFECT1].</p> 

3

Press the [PUSH] Dial to select [ON].
Black bars appear at the top and bottom on the screen.



4

Press the [MENU] Button to exit the Menu.



Remarks, etc.

- In the Cinema Mode, black bars appear at the top and bottom of the LCD Monitor and the Viewfinder Screen.

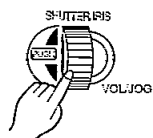


Cancelling the Cinema Mode

Set [CINEMA] on the [CAMERA MENU2] Menu to [OFF].

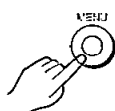
3

Press the [PUSH] Dial to select [ZOOM] or [ZOOM].



4

Press the [MENU] Button to exit the Menu.
The [ZOOM] Indication appears.



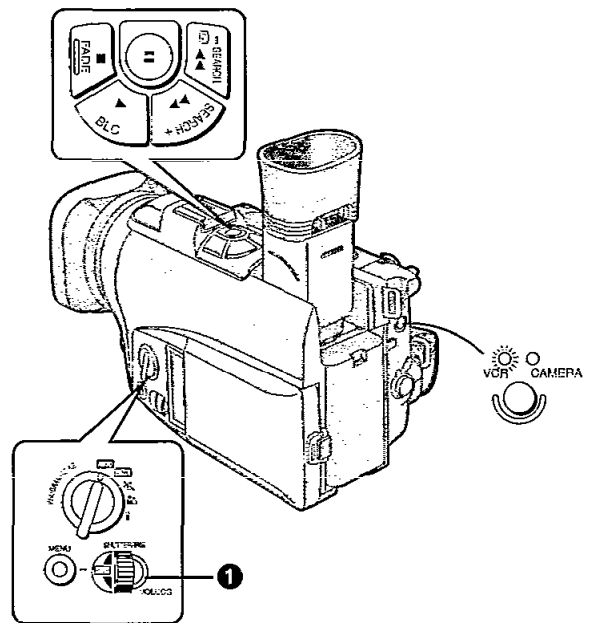
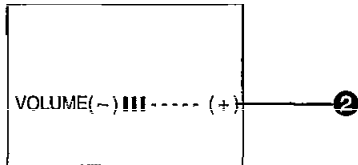
- In a dimly lit place, the Super Image Stabilizer Function may not work. In this case, the [ZOOM] Indication flashes.
- Under fluorescent lamps, the picture brightness may fluctuate and the colours may be unnatural.
- After-image distortion may occur.
- When you use a tripod, we recommend that you turn the Super Image Stabilizer Function off.

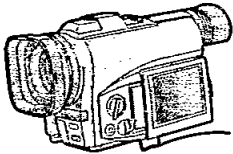
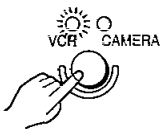


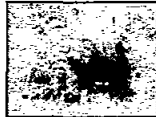

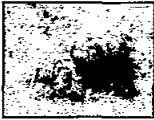
Cancelling the Super Image Stabilizer Function

Set [EFFECT1] on the [CAMERA MENU1] Menu to [OFF].

●Adjusting the Volume

Keep the [PUSH] Dial ① pressed until the [VOLUME] Indication ② appears. Then, turn the [PUSH] Dial to adjust the volume. After adjusting, press the [PUSH] Dial to make the [VOLUME] Indication disappear. To adjust the volume with the Remote Controller, press the [T] or [W] Button to make the [VOLUME] Indication appear. You can then increase the volume by pressing the [T] Button or decrease it by pressing the [W] Button. A few seconds after finishing the adjustment, the [VOLUME] Indication disappears.



Title	Procedure	
<p>Viewing the Just Recorded Scenes on the Movie Camera (Playback)</p> <p>You can play back recorded scenes right after recording.</p> <p>■ Using the Support Leg for Easy-to-View Playback</p> <p>Extending the Support Leg from the underside of the Movie Camera makes it easier to view the playback picture on the LCD Monitor.</p>  <p>Support Leg</p>	<p>1</p> <p>Press the [VCR/CAMERA] Button so that the [VCR] Lamp lights.</p> 	<p>2</p> <p>Press the Rewind Button [◀◀] to rewind the tape.</p> <ul style="list-style-type: none"> ● Rewind the tape to the point where the recording started. 
<p>Searching for a Scene that You Want to Play Back</p>	<p>Cue Playback</p> <p>Keep the Cue Button [▶▶] pressed during playback.</p>  	<p>Review Playback</p> <p>Keep the Review Button [◀◀] pressed during playback.</p>  

Search Lock Function

For longer Cue or Review Playback, press the Cue Button [▶▶] or the Review Button [◀◀] only briefly. As this locks the search function, you do not need to keep the button pressed for a long time.

- To resume normal playback, press the Play Button [▶].
- In Cue and Review Playback, pictures with fast-moving subjects may contain mosaic-like patterns.

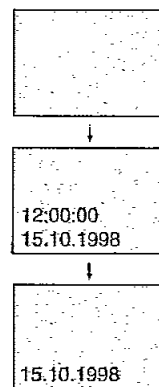
Hyper Check Function

- If you press the Fast-forward Button [▶▶] during fast-forwarding of the tape or the Rewind Button [◀◀] during rewinding of the tape, Cue Playback or Review Playback continues for as long as you keep the Button pressed.
- At the beginning and end of Cue Playback or Review Playback, some momentary picture distortion may occur.

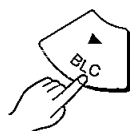
Making the Date/Time Indication Appear

This Movie Camera automatically records the date and time, however not directly in the picture but as part of the sub code (p. 76).

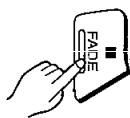
To make the Date/Time Indication appear, set [DATE/TIME] on the [CAMERA MENU2] Menu or [VCR MENU1] Menu to the desired setting.

**Remarks, etc.****3**

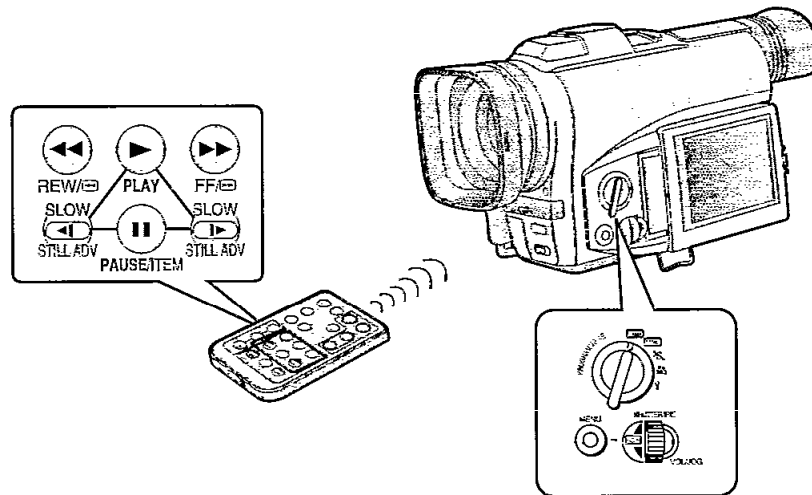
Press the Play Button [▶] to start playback.





**4**

To stop playback: Press the Stop Button [■].



- If the tape reaches the beginning during rewinding, it automatically stops.



Title	Procedure	
<p>Playing Back in Slow Motion (Slow Motion Playback)</p>	<p>1 Press the Play Button [▶].</p> 	<p>2 Press the Slow Motion/Still Advance Button [◀] or [▶] on the Remote Controller.</p> 
<p>Playing Back Still Pictures and Advancing Them One by One (Still Playback/Still Advance Playback) You can freeze the action during playback and advance the still pictures one by one.</p>	<p>1 Press the Play Button [▶].</p> 	<p>2 Press the Pause Button [⏸]. The playback picture stops in the Still Playback Mode.</p> 

Using the Jog Dial (Jog Playback)

By turning the Jog Dial ([PUSH] Dial) on the Movie Camera in the Still Playback Mode, you can advance the still pictures one by one in forward or reverse

forward



reverse

Remarks, etc.

Pressing the [◀] Button starts slow motion playback in reverse direction, and pressing the [▶] Button starts slow motion playback in forward direction.

Resuming Normal Playback
Press the Play Button [▶].
Playback continues with normal speed.



- During slow motion playback in reverse direction, the Time Code Indication may not be accurate.
- Scenes recorded in the SP Mode are played back at approximately 1/5th of the normal speed. Scenes recorded in the LP Mode are played back at approximately 1/3rd of the normal speed.

3

Press the Slow Motion/Still Advance Button [◀] or [▶] on the Remote Controller.

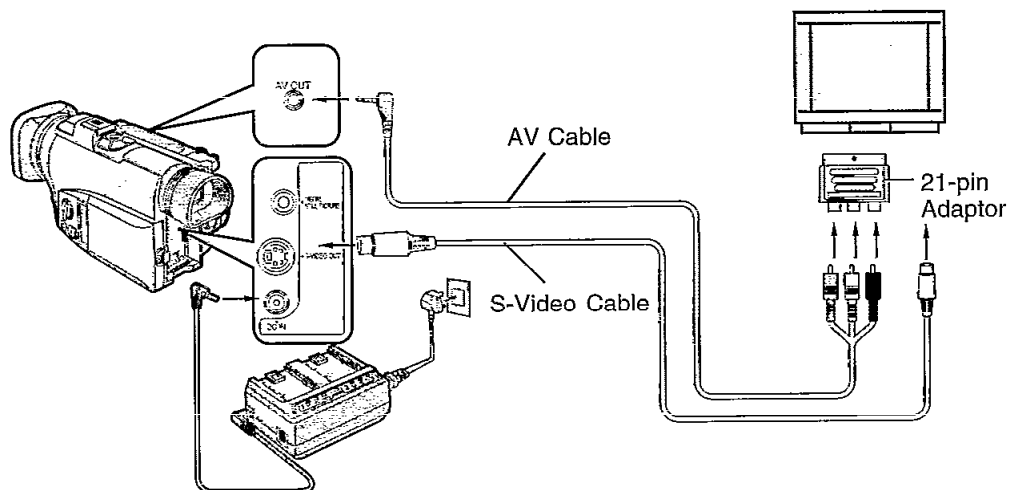


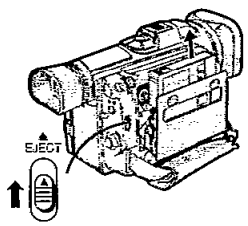
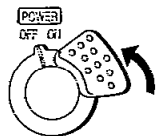
Resuming Normal Playback
Press the Play Button [▶].
Playback continues with normal speed.



Pressing the [◀] Button advances the still picture frame by frame in reverse direction. Pressing the [▶] Button advances the still picture frame by frame in forward direction.

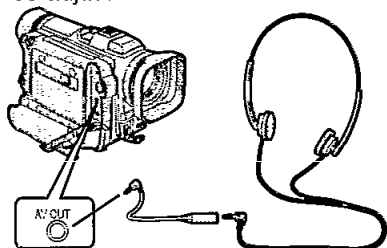
- Each press of the [◀] Button advances to the next still picture in reverse direction. Each press of the [▶] Button advances to the next still picture in forward direction. Keeping either button pressed continuously advances the still picture frame by frame until you release the button.
- If you leave the Movie Camera in the Still Playback Mode for more than 6 minutes, it switches over to the Stop Mode to protect the video heads against excessive wear.
- During Still Advance Playback, the Time Code Indication may not be accurate.



Title	Procedure	
<p>Playing Back on a TV</p> <p>By connecting the Movie Camera to a TV, you can watch playback of the recorded scenes on the TV screen.</p>	<p>1</p> <p>Connect the [AV OUT] Socket on the Movie Camera with the Video and Audio Input Sockets on the TV.</p> <p>Use the AV Cable and the 21-pin Adaptor to connect to the TV. If your TV is equipped with an S-Video Socket, also connect the S-Video Cable. When using the S-Video Cable to watch playback on the TV, use the AC Adaptor to supply power to the Movie Camera, as the S-Video Cable and the Battery cannot be connected at the same time.</p>	
<p>After Use</p>	<p>1</p> <p>Take out the cassette. (p. 10)</p> 	<p>2</p> <p>Set the [POWER] Switch to [OFF].</p> 

Listening to the Playback Sound via Headphones

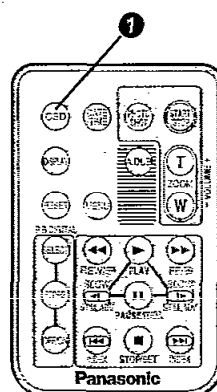
If you want to use headphones to listen to the playback sound, connect them to the supplied Headphone Conversion Adaptor and then connect the Headphone Conversion Adaptor to the [AV OUT] Socket on the Movie Camera. In this case, no sound (including beep and shutter click sounds) is reproduced from the Movie Camera's built-in speaker, and the volume of the playback sound cannot be adjusted.



Making the Indications Appear on the TV Screen

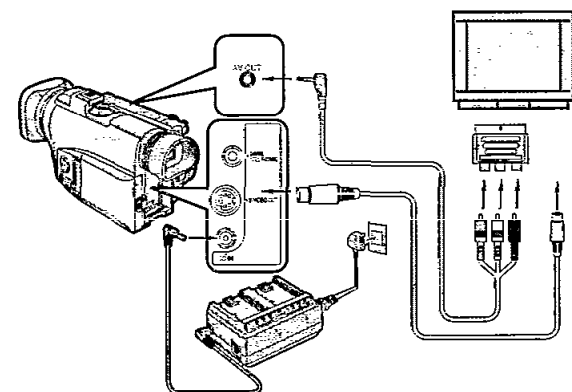
Press the [OSD] Button ① on the Remote Controller.

The On-Screen Indications also appear on the TV screen.



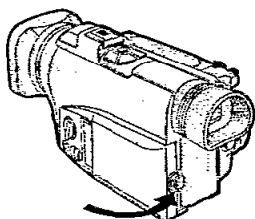
Remarks, etc.

- Before connecting, turn off both the Movie Camera and the TV.
- If a cassette recorded with copyright protection signal is played back, the screen becomes black. However, scenes recorded with this Movie Camera do not contain a copyright protection signal.



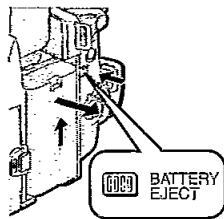
3

Close the LCD Monitor.



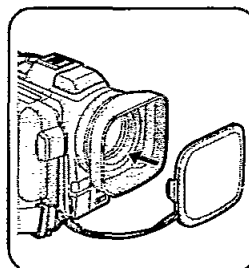
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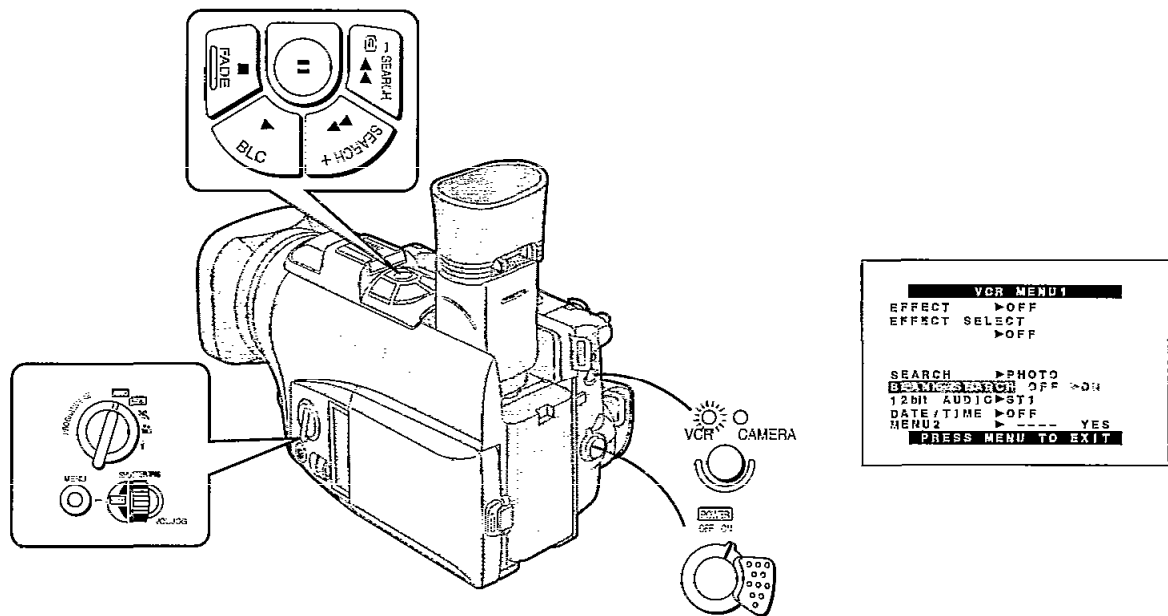
Remove the Battery and retract the Viewfinder. (p. 9)

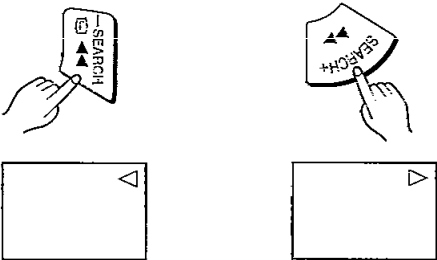
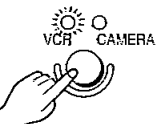
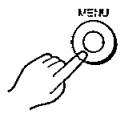


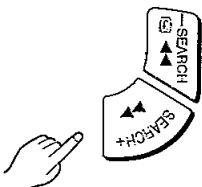

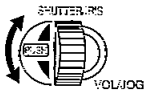
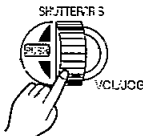
Attaching the Lens Cap

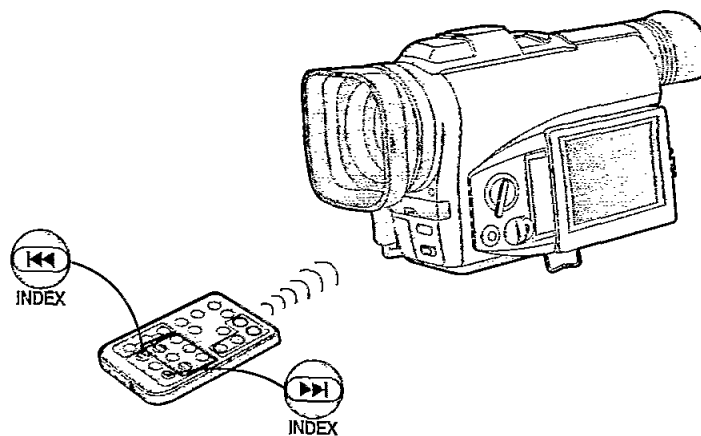
After use, attach the supplied Lens Cap to the Lens to protect it.


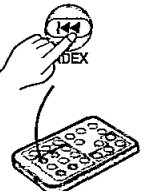
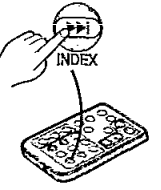
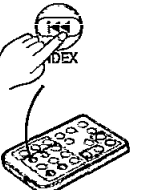




Title	Procedure	
<p>Viewing Recorded Scenes During Recording Pause (Camera Search)</p> <p>You can view recorded scenes when the Movie Camera is in the Recording Pause Mode. The Camera Search Function is convenient to search for a scene from which you want to start recording a new scene with smooth scene-to-scene transition.</p>	<p>1</p> <p>Keep the Reverse Search Button [–SEARCH] or the Forward Search Button [SEARCH+] pressed for more than 1 second. Pressing the [–SEARCH] Button plays back the picture in reverse direction. Pressing the [SEARCH+] Button plays back the picture in forward direction.</p> 	
<p>Searching for the End of the Recorded Part on a Cassette (Blank Search)</p> <p>With the Blank Search Function, you can quickly locate the end of the recorded part on a cassette (or a blank part between recordings).</p>	<p>1</p> <p>Press the [VCR/CAMERA] Button so that the [VCR] Lamp Lights.</p> 	<p>2</p> <p>Press the [MENU] Button. The [VCR MENU1] Menu appears.</p> 

		Remarks, etc.
<p>2</p> <p>Starting to Record from the Desired Position: Release the pressed Search Button.</p> <p>The Movie Camera is in the Recording Pause Mode.</p> 	<p>3</p> <p>Press the Start/Stop Button to start recording. The Movie Camera starts recording a new scene with smooth scene-to-scene transition.</p> 	<ul style="list-style-type: none"> • In the Camera Search Mode, the picture may contain mosaic-like patterns. However, this is a phenomenon particular to digital video and completely normal. • If the Recording Speed Mode (SP/LP) of the previous and the new recording are different, the playback picture may be distorted.
<p>3</p> <p>Turn the [PUSH] Dial to select [BLANK SEARCH].</p> 	<p>4</p> <p>Press the [PUSH] Dial to select [ON]. Approximately 1 second before the end of the last recorded scene, the Movie Camera switches over to the Still Playback Mode.</p> 	<ul style="list-style-type: none"> • If there is no blank part on a cassette, the Movie Camera stops at the end of the tape. • When the Blank Search has finished, you can press the [VCR/CAMERA] Button so that the [CAMERA] Lamp lights, and then start recording. The new scene is recorded with a smooth transition from the last to the new scene.



Title	Procedure	
<p>Searching for the Beginning of Recorded Scenes Marked with Index Signal (Index Search)</p> <p>■ Searching for Photoshot Pictures (Photoshot Index Search)</p> <ul style="list-style-type: none"> • Press the [VCR/CAMERA] Button on the Movie Camera so that the [VCR] Lamp lights. • Set [SEARCH] on the [VCR MENU1] Menu to [PHOTO]. 	<p>Photoshot Index Search in Forward Direction Press the Index Button [▶▶] on the Remote Controller.</p> 	<p>Photoshot Index Search in Reverse Direction Press the Index Button [◀◀] on the Remote Controller.</p> 
<p>■ Searching for the Beginning of Recorded Scenes (Scene Index Search)</p> <ul style="list-style-type: none"> • Press the [VCR/CAMERA] Button on the Movie Camera so that the [VCR] Lamp lights. • Set [SEARCH] on the [VCR MENU1] Menu to [SCENE]. 	<p>Scene Index Search in Forward Direction Press the Index Button [▶▶] on the Remote Controller.</p> 	<p>Scene Index Search in Reverse Direction Press the Index Button [◀◀] on the Remote Controller.</p> 

■ Index Search

To allow easy searching for desired scenes, this Movie Camera automatically records index signals during recording as follows:

① Photoshot Index Signal

To search for still pictures recorded in the Photoshot Mode (p. 20) and to use for automatic printing (p. 59).

A photoshot index signal is automatically recorded every time you record a still picture in the Photoshot Mode.

However, in the Continuous Photoshot Mode (p. 21), no photoshot index signals are recorded.

② Scene Index Signal

To search for the beginning of recorded scenes.

A scene index signal is automatically recorded in the following cases:

- When you start recording after inserting a cassette.
- According to the setting of [SCENEINDEX] on the [CAMERA MENU3] Menu:
 - [2HOUR]: An index signal is recorded when recording is restarted after a lapse of more than 2 hours.
 - [DAY]: An index signal is recorded when recording is restarted after the date has changed since the last recording.

(While an index signal is being recorded, the [INDEX] Indication flashes for a few seconds.)

INDEX

- At every press of the corresponding button, the tape is fast-forwarded or rewind to the next still picture recorded in the Photoshot Mode. After reaching the next still picture, the still picture is played back continually, however the sound only for approximately 4 seconds. (If you leave the Movie Camera in the Still Playback Mode for more than 6 minutes, it switches over to the Stop Mode to protect the video heads against excessive wear.)

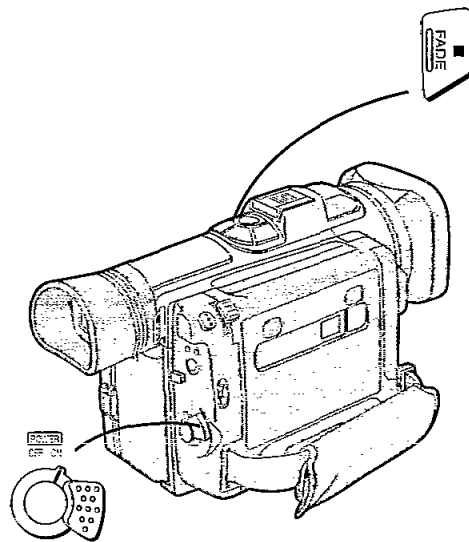
Remarks, etc.


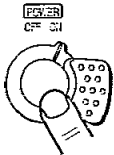
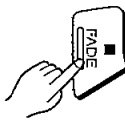

- The Photoshot Index Search may not work correctly for still pictures recorded near the beginning of the tape.
- As no photoshot index signals are recorded for still pictures recorded in the Continuous Photoshot Mode (p. 21), the Photoshot Index Search Function cannot be used to search for these still pictures.
- If you keep the [I<<<] or [I>>>] Button pressed for more than 2 seconds, the Intro Search Function is activated and it plays back all still pictures recorded in the Photoshot Mode on the cassette one after another for a few seconds each. (To cancel the Intro Search Function, press the Play Button [▶] or the Stop Button [■].)

- When you briefly press the corresponding button once, the [S1] Indication appears and the search for the next scene marked with an index signal starts. After the Scene Index Search has started, every time you press the button, the indication changes successively from [S2] to [S9], and the beginning of the scene corresponding to the selected number is located. After reaching the desired scene, playback starts automatically. (At a time, Scene Index Search in forward or reverse direction is possible up to the ninth scene marked with index signal from the present tape position.)

S3

- If the interval between two scene index signals is less than 1 minute, the Scene Index Search may not work correctly.
- The Scene Index Search may not work correctly for scenes recorded near the beginning of the tape.
- If you keep the [I<<<] or [I>>>] Button pressed for more than 2 seconds, the Intro Search Function is activated and it plays back the beginning of all scenes marked with an index signal on the cassette one after another for a few seconds each. (To cancel the Intro Search Function, press the Play Button [▶] or the Stop Button [■].)

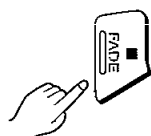
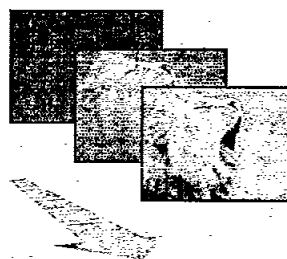


Title	Procedure	
<p>Starting to Record with Gradually Appearing Picture and Sound (Fading In)</p> <p>Fading-in lets you make the picture and sound appear gradually from a black screen at the beginning of a scene.</p>	<p>1</p> <p>With the Movie Camera in the Recording Pause Mode, keep the Fade Button [FADE] pressed. The picture gradually disappears.</p> 	<p>2</p> <p>When the picture has completely disappeared, press the Start/Stop Button to start recording.</p> 
<p>Ending the Recording of a Scene with Gradually Disappearing Picture and Sound (Fading Out)</p> <p>Fading-out lets you make the picture and sound disappear gradually into a black screen at the end of a scene.</p>	<p>1</p> <p>During recording, keep the Fade Button [FADE] pressed. The picture gradually disappears.</p> 	<p>2</p> <p>After the picture has completely disappeared, press the Start/Stop Button to stop recording. The Movie Camera is in the Recording Pause Mode.</p> 

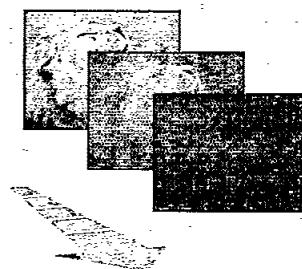
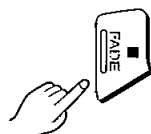
3

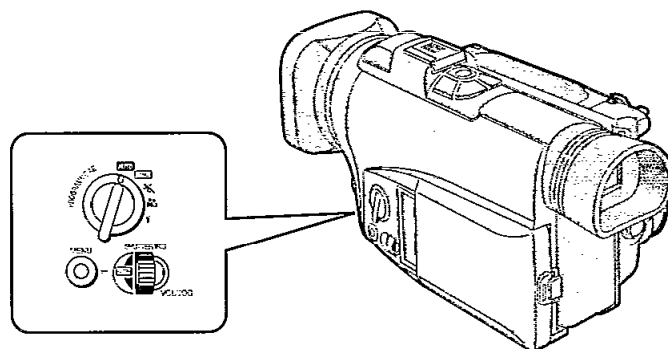
Approximately 3 seconds after the recording has started, release the Fade Button [FADE].













The picture gradually appears again.




*Remarks, etc.***3**

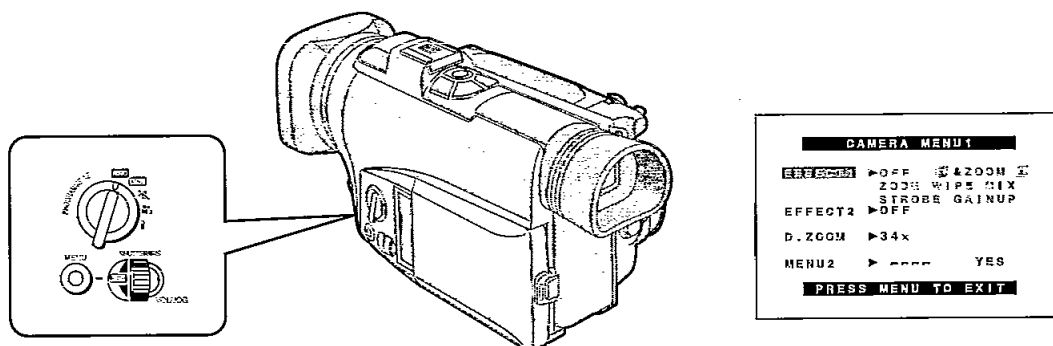
Release the Fade Button [FADE].

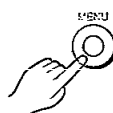





Title	Procedure
<p>Recording in Special Situations (Programme AE) This function lets you select Automatic Exposure settings optimized for special recording situations.</p>	<p>1 Set the Mode Selector Switch to the desired mode ([], [] or []).</p> <div> </div> <div> <p>[] Sports Mode To record scenes with fast-moving subjects such as sports scenes.</p> <p>[] Portrait Mode To make subjects stand out sharply from the background.</p> <p>[] Low Light Mode To record dark scenes more brightly</p> </div> <div> <p> Sports</p>  <p> Portrait</p>  <p> Low Light</p>  </div>

	<i>Remarks, etc.</i>
Cancelling the Programme AE Function Set the Mode Selector Switch to [AUTO].	Sports Mode <ul style="list-style-type: none"> •When playing back scenes recorded in the Sports Mode, you can enjoy slow motion and still playback of very sharp images with fine details. •Avoid recording under fluorescent, mercury-vapour or sodium lamps in this mode, as the colour and the brightness of the playback picture might fluctuate. •When recording subjects lit by strong lights or with much light reflection, the playback picture may contain vertical streaks of light. •When the scene is not sufficiently lit, the [] indication flashes. •When using this mode for recording indoors, the playback picture may flicker. •It is not possible to use the Sports Mode [] together with the Gain-up Mode [GAINUP].
	Portrait Mode <ul style="list-style-type: none"> •When using this mode for recording indoors, the playback picture may flicker. •It is not possible to use the Portrait Mode [] together with the Gain-up Mode [GAINUP]. Low Light Mode <ul style="list-style-type: none"> •It may not be possible to sufficiently brighten up extremely dark scenes.

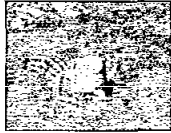


Title	Procedure
<p>Recording with Special Effects (Digital Effects)</p> <p>There are 8 different modes available for adding special digital picture effects.</p>	<div> <p>1</p> <p>Press the [MENU] Button. The [CAMERA MENU1] appears.</p>  </div> <div> <p>2</p> <p>Turn the [PUSH] Dial to select [EFFECT1] or [EFFECT2].</p>  </div> <div> <p>Digital Effects 1 [EFFECT1]</p> <ol style="list-style-type: none"> Wipe Mode [WIPE] It gradually replaces a picture of the last previously recorded scene with the picture of the new scene, like drawing the curtain. For details, (p. 40) Mix Mode [MIX] It gradually fades out the picture of the last previously recorded scene while fading in the picture of the new scene. For details, (p. 40) Strobe Mode [STROBE] It records the pictures with a stroboscope-like effect. Gain-up Mode [GAINUP] It electronically brightens up the picture. In this mode, adjust the focus manually. </div>

1



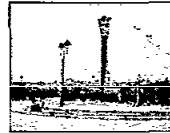
2



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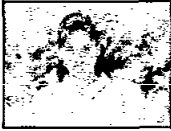
4



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7

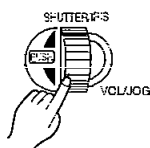


8



3

Press the [PUSH] Dial to select the desired digital effect.



4

Press the [MENU] Button to exit the Menu.

- The picture now has the selected digital effect. However, the effect of the Wipe Function and the Mix Function only become visible when actually recording in the respective mode. (p. 40)

Remarks, etc.

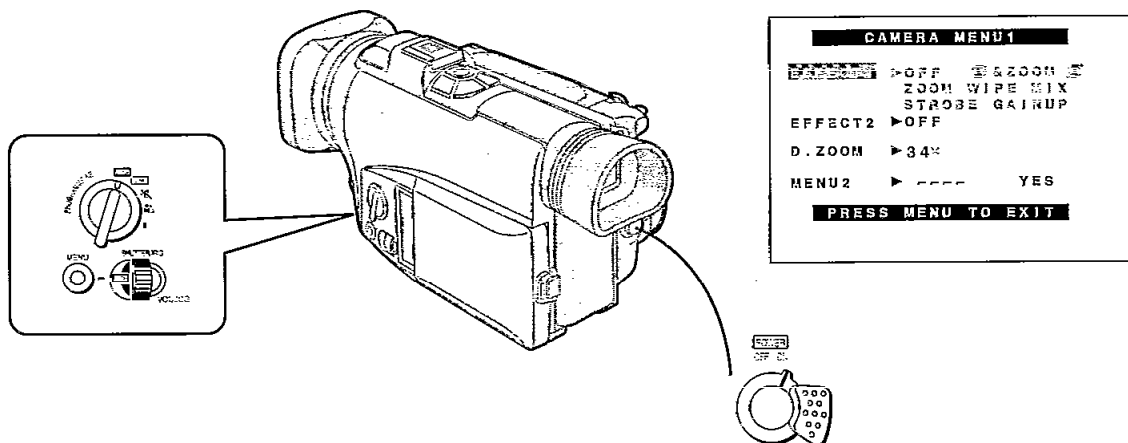
- If you have set [EFFECT1] on the [CAMERA MENU1] Menu to [GAINUP], you need to adjust the focus manually; however, adjusting the shutter speed and selecting a white balance mode are not possible.
- If you have set [EFFECT2] on the [CAMERA MENU1] Menu to [B/W] or [SEPIA], changing the selected white balance mode is not possible.
- It is not possible to use the Sports Mode [X] or the Portrait Mode [P] together with the Gain-up Mode [GAINUP].

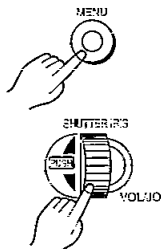
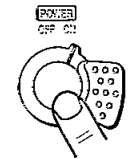
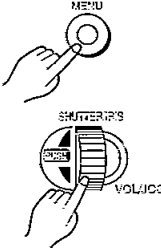
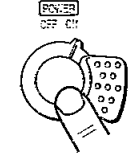
Cancelling the Digital Effect

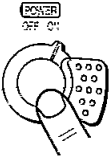
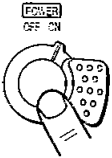

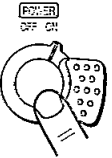
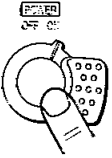
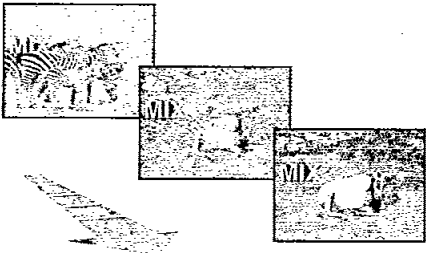
Set [EFFECT1] or [EFFECT2] on the [CAMERA MENU1] Menu to [OFF].

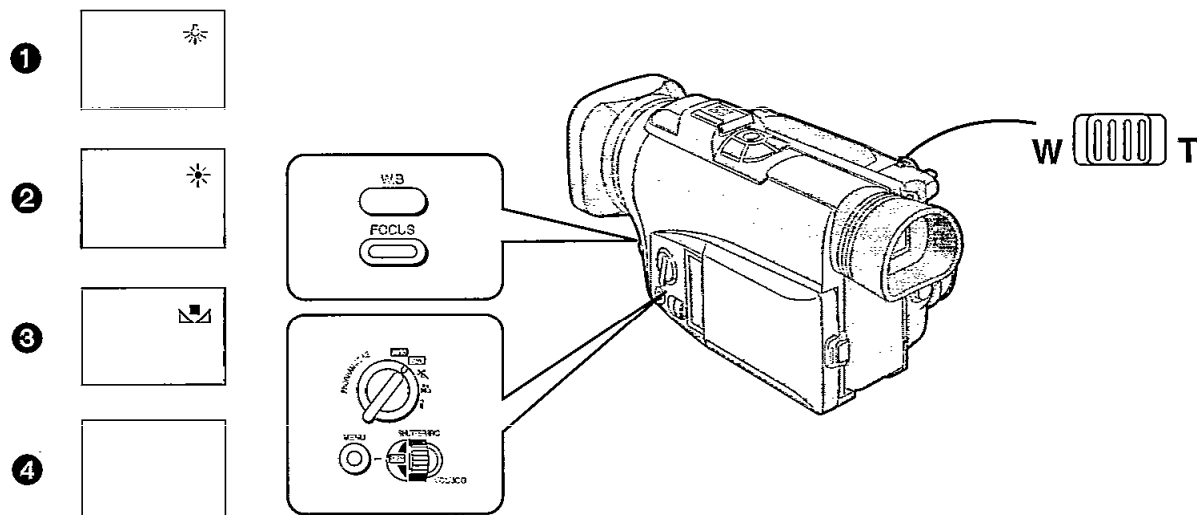
Digital Effects 2 [EFFECT2]

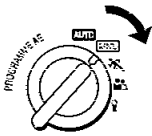

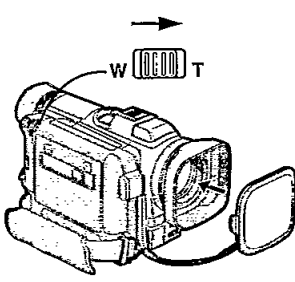
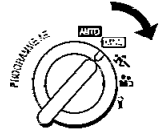
- ⑤ **Negative/Positive Mode [NEGA]**
The recorded pictures have reversed colours similar to photographic negatives.
- ⑥ **Sepia Mode [SEPIA]**
Scenes are recorded with a brown tint similar to the colour of old photographs.
- ⑦ **Black & White Mode [B/W]**
The picture is recorded in black and white.
- ⑧ **Solarisation Mode [SOLARI]**
The picture is recorded with an effect similar to a painting.



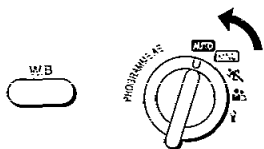
Title	Procedure	
<p>Recording with Special Effects (Digital Effects) (Continued)</p> <p>■ Wipe Mode It gradually replaces a still picture of the last recorded scene with the moving picture of the new scene, like drawing a curtain.</p>	<p>1 Set [EFFECT 1] on the [CAMERA MENU1] Menu to [WIPE] and exit the Menu. (p. 38) The [WIPE] Indication appears.</p> 	<p>2 Press the Start/Stop Button to start recording. The normal recording starts.</p> 
<p>■ Mix Mode It gradually fades out a still picture of the last recorded scene while fading in the moving picture of the new scene.</p>	<p>1 Set [EFFECT 1] on the [CAMERA MENU1] Menu to [MIX] and exit the Menu. (p. 38) The [MIX] Indication appears.</p> 	<p>2 Press the Start/Stop Button to start recording. The normal recording starts.</p> 

		Remarks, etc.
<p>3</p> <p>Press the Start/Stop Button to pause recording. The last picture is stored in memory. The [WIPE] Indication changes to [WIPE].</p> 	<p>4</p> <p>Press the Start/Stop Button to start recording again. The last picture of the previous scene is gradually replaced by the new scene.</p> 	
<p>3</p> <p>Press the Start/Stop Button to pause recording. The last picture is stored in memory. The [MIX] Indication changes to [MIX].</p> 	<p>4</p> <p>Press the Start/Stop Button to start recording again. The last picture gradually fades out while the new scene fades in.</p> 	



Title	Procedure	Procedure
<p>Recording with Natural Colours (White Balance)</p> <p>This Movie Camera automatically adjusts the white balance to ensure that the pictures are recorded with natural colours. For certain types of subjects and lighting conditions, however, this Auto White Balance Adjustment Mode may not be able to ensure natural colours (p. 75). In these cases, you can select either one of the 3 preset modes explained below (indoor, outdoor, or the last manually adjusted white balance setting), or you can manually adjust the white balance.</p> <p>The modes change in the following order:</p> <ul style="list-style-type: none"> ❶ Indoor Mode (recording under incandescent lamp) (☼) ❷ Outdoor Mode (☀) ❸ Last manually adjusted White Balance setting (□) ❹ Automatic White Balance Adjustment (no indication) 	<p>1</p> <p>Set the Mode Selector Switch to [MNL]. The [MNL] Indication appears.</p> 	<p>2</p> <p>Press the White Balance Button [W.B.] to select the desired mode (☼, ☀ or □).</p> 
<p>Adjusting the White Balance Manually</p> <p>Use the Manual White Balance Adjustment Mode for all types of lighting outside the range ❶ (p. 75), as the Auto White Balance Adjustment Mode can only ensure natural colours for the types of lighting within that range. For optimum results under almost any types of lighting, we recommend that you adjust the white balance manually for each new scene.</p>	<p>1</p> <p>Attach the Lens Cap and zoom in until the entire screen becomes white.</p> 	<p>2</p> <p>Set the Mode Selector Switch to [MNL]. The [MNL] Indication appears.</p> 

Returning to the Auto White Balance Adjustment Mode
Press the [W.B] Button repeatedly until none of the White Balance Mode Indications ([*], [*], [M]) are displayed any more. Or, set the Mode Selector Switch to [AUTO].



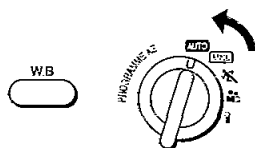
Remarks, etc.

- If you have set [EFFECT1] on the [CAMERA MENU1] Menu to [GAINUP] or you have set [EFFECT2] to [SEPIA] or [B/W], it is not possible to select a white balance mode.
- To change the white balance mode, the Movie Camera must be set within the optical zoom range (1× – 17×). If you try to adjust it in the digital zoom range, the [M] Indication flashes.

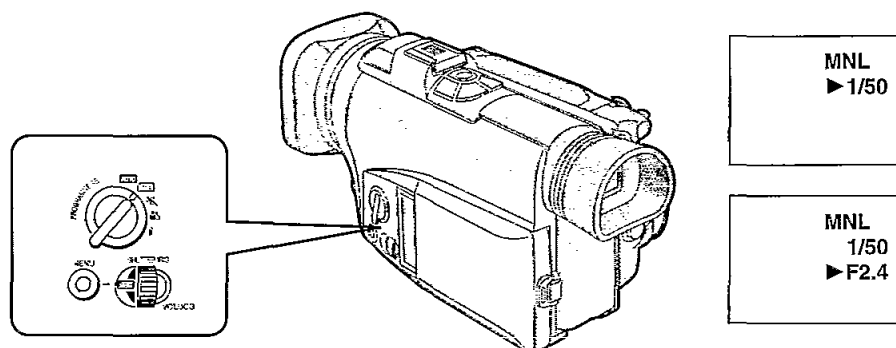
3
Keep the [W.B] Button pressed until the [M] Indication stops flashing and remains lit.

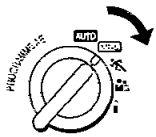

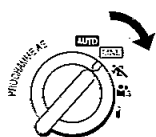
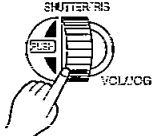


Returning to the Auto White Balance Adjustment Mode
Press the [W.B] Button repeatedly until the [M] Indication disappears. Or, set the Mode Selector Switch to [AUTO].

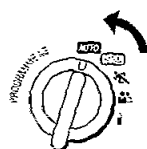


- The Manual White Balance Adjustment is now finished. If you want to use this setting again later on, for example after having used Automatic White Balance Adjustment, you can recall it by pressing the [W.B] Button 3 times. (In this case, the [M] Indication flashes.)
- When the [M] Indication remains flashing under weak illumination, the Manual White Balance Adjustment cannot be set manually.
- If you have set [EFFECT1] on the [CAMERA MENU1] Menu to [GAINUP], or you have set [EFFECT2] to [SEPIA] or [B/W], it is not possible to adjust the white balance.
- Adjusting the white balance is only possible when the Movie Camera is set within the optical zoom range (1× – 17×). If you try to adjust it in the digital zoom range, the [M] Indication flashes.



Title	Procedure	
<p>Adjusting the Shutter Speed Manually</p> <p>To achieve special creative effects or to cope with special lighting situations or fast-action scenes, you can adjust the shutter manually.</p>	<p>1</p> <p>Set the Mode Selector Switch to [MNL]. The [MNL] and the Shutter Speed Indications appear together.</p> 	<p>2</p> <p>Turn the [PUSH] Dial to adjust the shutter speed. You can change between the Shutter Speed Indication and the Iris (F Number) Indication by repeatedly pressing the [PUSH] Dial.</p> 
<p>Adjusting the Iris (F Number) Manually</p> <p>To achieve special creative effects or to cope with special lighting situations, you can adjust the iris (F number) manually.</p> <ul style="list-style-type: none"> Manually adjusting the shutter speed after performing manual iris adjustment changes the iris back to automatic adjustment. Therefore, if you want to adjust both the shutter speed and iris manually, be sure to adjust the shutter speed first. 	<p>1</p> <p>Set the Mode Selector Switch to [MNL]. The [MNL] and the Shutter Speed Indications appear together.</p> 	<p>2</p> <p>Press the [PUSH] Dial . The [▶F] Indication appears. You can change between the Iris (F Number) Indication and the Shutter Speed Indication by repeatedly pressing the [PUSH] Dial.</p> 

Returning to the Normal Shutter Speed
Set the Mode Selector Switch to [AUTO].



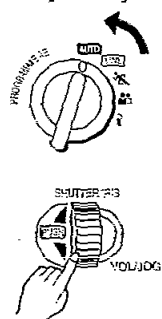
Remarks, etc.

Range of Shutter Speed Adjustment
1/50–1/4000s
The standard shutter speed is 1/50 s.
The nearer to [1/4000] a setting you select, the faster the shutter speed becomes.

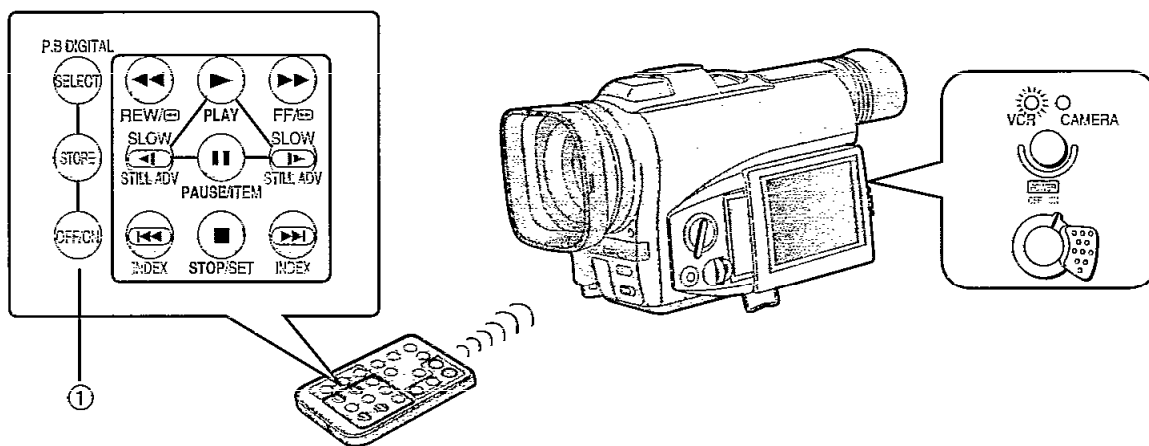
3
Turn the [PUSH] Dial to adjust the Iris.

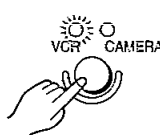
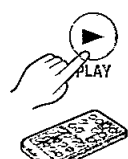
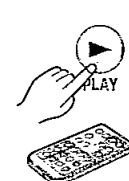



Returning to the Normal Iris Value (F Number)
Set the Mode Selector Switch to [AUTO] or press the [PUSH] Dial.



Range of Iris Adjustment
CLOSE (Closed)→F16....F1.7→OP(Opened)
+0 dB...OP+18 dB
The nearer to [CLOSE] a value you select, the darker the picture becomes.
The nearer to [OP+18dB] a value you select, the brighter the picture becomes.
The figures with +dB show the Gain-up value, if you increase the value too much, the picture quality deteriorates.



Title	Procedure	
<p>Playing Back with Special Effects (Playback Digital Effects)</p> <p>There are 7 different modes available for adding special digital picture effects to your recordings during playback. They are identical to the Digital Effects 1 and 2 (p. 38) that can be used during recording.</p> <ul style="list-style-type: none"> ① [WIPE] ② [MIX] ③ [STROBE] ④ [NEGA] ⑤ [SEPIA] ⑥ [B/W] ⑦ [SOLARI] 	<p>1 Press the [VCR/CAMERA] Button so that the [VCR] Lamp lights.</p> 	<p>2 Press the Play Button [▶].</p> 
<p>■ Wipe Function and Mix Function After having selected [WIPE] or [MIX] in Step 3.</p>	<p>1 Press the [▶] Button to start playback.</p> 	<p>2 Press the [STORE] Button at the moment that you want to store as still image in memory. The [WIPE] or [MIX] Indication appears and the picture is stored in memory.</p> 

3

Press the [SELECT] Button on the Remote Controller to select the desired digital effect.

- Repeatedly pressing the [SELECT] Button changes the selected digital effect in the order ① to ⑦.
- Selecting a digital effect is also possible by setting [EFFECT SELECT] on the [VCR MENU1] Menu to the desired effect.



3

Press the [OFF/ON] Button at the scene at which you want to use a Wipe or Mix effect. The scenes change with a Wipe or Mix effect.



Remarks, etc.

Suspending the Playback Digital Effect Temporarily

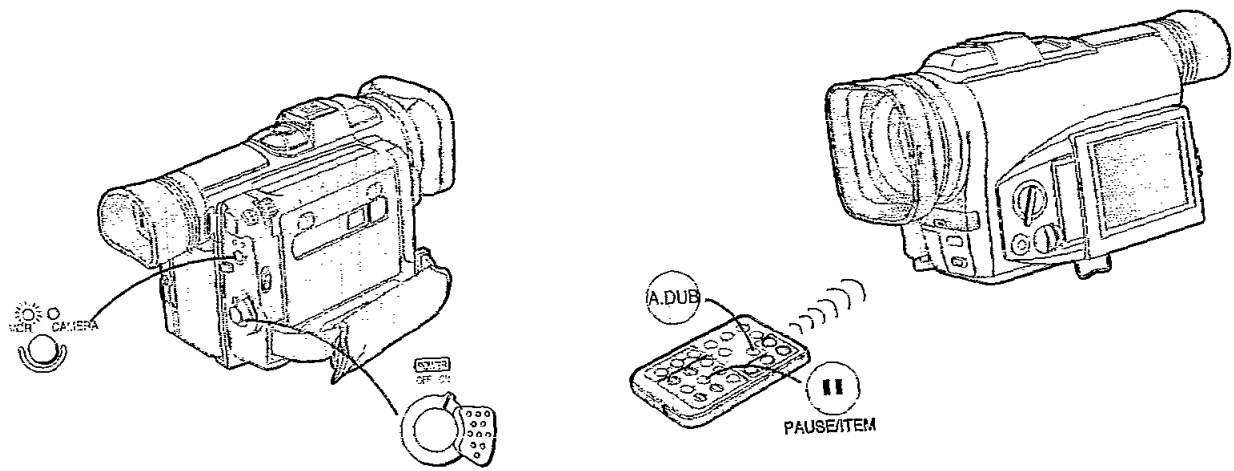
You can suspend and re-activate the digital effect by repeatedly pressing the [OFF/ON] Button ①. Suspending the digital effect is also possible by setting [EFFECT] on the [VCR MENU1] Menu to [OFF], and later to [ON] to re-activate it. When the digital effect is temporarily suspended, the indication of the selected effect flashes.

Cancelling the Digital Effect

Set [EFFECT SELECT] on the [VCR MENU1] Menu to [OFF].

- When you want to output the signal of the picture with a digital effect added during playback, use the [AV OUT] Sockets. This signal cannot be output from the DV Terminal (p. 5) or the Digital Still Picture Terminal (p. 5).

- Operating the Wipe Function and the Mix Function during playback is only possible with Remote Controller.
- It is not possible to add a Wipe or Mix effect during playback of an unrecorded part on the tape.
- If you press the [OFF/ON] Button while the Wipe or Mix is being performed, the effect is paused at that point. If you press the [OFF/ON] Button again, the effect resumes.



Title

Adding New Sound on a Recorded Cassette (Audio Dubbing)

You can add music or narration on a recorded cassette.

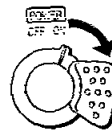
To perform audio dubbing, the Remote Controller is necessary.

- If [AUDIO REC] on the [CAMERA MENU2] Menu has been set to [16bit], performing audio dubbing erases the previously recorded sound. (If you intend to perform audio dubbing but also want to keep the original sound, be sure to set [AUDIO REC] to [12bit] before making the original recording.)
- It is not possible to perform audio dubbing onto recordings made in the LP Mode. (p. 11)

Procedure

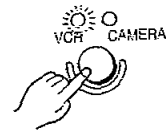
1

Insert the recorded cassette and set the [POWER] Switch to [ON].



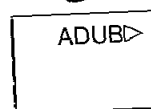
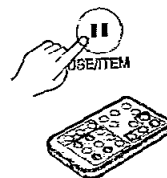
2

Press the [VCR/CAMERA] Button so that the [VCR] Lamp lights.



5

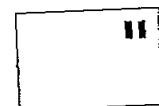
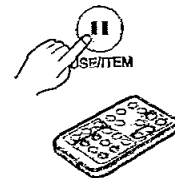
Press the Pause Button [II] on the Remote Controller to start audio dubbing.



Stopping Audio Dubbing

Press the Pause Button [II] on the Remote Controller.

The Movie Camera is again in the Still Playback Mode.



3

At the point which you want to insert the new sound, press the [II] Button to switch the Movie Camera over to the Still Playback Mode.

**4**

Press the [A.DUB] Button on the Remote Controller.



Remarks, etc.

Playing Back the Sound Recorded with Audio Dubbing

• Depending on the setting selected for [12bit AUDIO] on the [VCR MENU1] Menu, the sound added with audio dubbing and the original sound are played back as follows:

ST1: The original sound alone is played back.

ST2: The dubbed sound alone is played back.

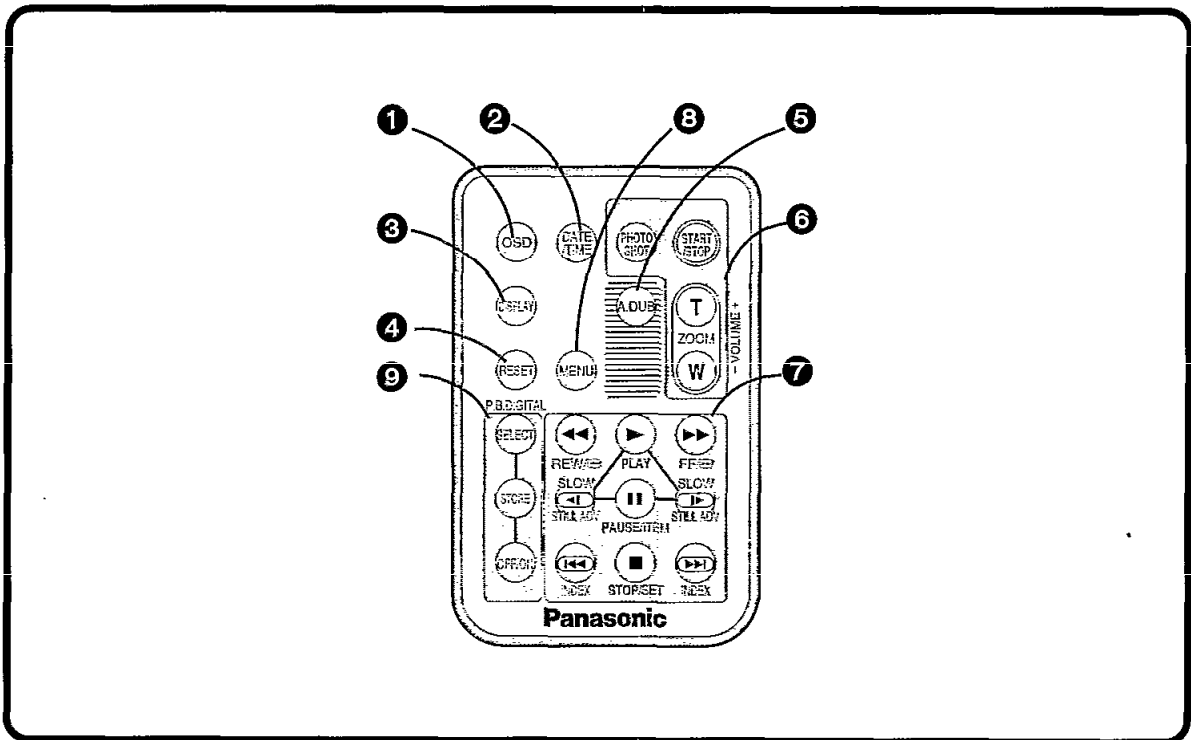
MIX: The original sound and the sound added with audio dubbing are played back together.

• Do not perform audio dubbing onto unrecorded parts of the tape. This could cause the playback picture and sound to be distorted.

• If you reset the Tape Counter to zero and turn on the Memory Stop Function (p. 77) at the point where you want the audio dubbing to end, the audio dubbing automatically stops when the tape reaches that point.

Remote Controller

Using the wireless Remote Controller supplied with the Movie Camera allows operating most of the Movie Camera's major functions from a distance.



■ Buttons on the Remote Controller

- 1 Indication Output Button [OSD]**
To display the function and operation indications on a connected TV. (p. 29)
- 2 Date and Time Button [DATE/TIME]**
To make the Date/Time indication appear or disappear in the picture during recording or playback. (p. 25)
- 3 Indication Shift Button [DISPLAY]**
To select the desired Counter Indication. (p. 79)
- 4 Reset Button [RESET]**
To reset the Tape Counter to zero. (p. 77)
- 5 Audio Dubbing Button [A.DUB]**
To perform audio dubbing. (p. 48)
- 6 Controls for Recording, Zoom/ Sound volume**
 - Photoshot Button [PHOTO SHOT]**
To record still pictures. (p. 20)
 - Recording Start/Stop Button [START/STOP]**
To start and pause recording. (p. 14)
 - Zoom/Sound Volume Buttons [ZOOM/VOLUME]**
CAMERA Mode: To zoom in and out. (p. 20)
VCR Mode: To adjust the volume of the playback sound. (p. 24)

7 Controls for Playback and Menu Settings

Rewind/Review Button [◀◀]

To start review playback (p. 24) if pressed during normal playback; and to rewind the tape if pressed in the Stop Mode.
Also to activate the Camera Search Function (p. 30) in reverse direction if kept pressed in the Recording Pause Mode. Pressing it briefly activates the Recording Check Function (p. 16).

Fast-forward/Cue Button [▶▶]

To start cue playback (p. 24) if pressed during normal playback; and to fast-forward the tape if pressed in the Stop Mode.
Also to activate the Camera Search Function (p. 30) in forward direction if kept pressed in the Recording Pause Mode.

Play Button [▶]

To start playback. (p. 24)

Slow Motion/Still Advance Button [◀1, ▶1]

To perform Slow Motion Playback if pressed in the Normal Playback Mode; and to perform Still Advance Playback if pressed in the Still Playback Mode. (p. 26)
(◀1: in reverse direction, ▶1: in forward direction)

Index Search Button [◀◀, ▶▶]

To search for recorded scenes marked with an index signal and for still images recorded in the Photoshot Mode. (p. 32)

(◀◀: in reverse direction, ▶▶: in forward direction)

Stop Button [■]

To stop the tape. (p. 24)

Pause Button [⏸]

To pause playback. The playback picture stands still. (p. 26, 48)

8 Menu Button [MENU]

Pressing the Menu Button [MENU] displays the Menu.

In this case, the functions of the following buttons are changed:

Pause Button→Item Button

To select items on the Menu.

Stop Button→Setting Button

To set the mode for the selected item.

9 Playback Digital Effects**Selection Button [SELECT]**

To select the desired digital effect for [EFFECT SELECT] on the [VCR MENU1] Menu. (p. 46)

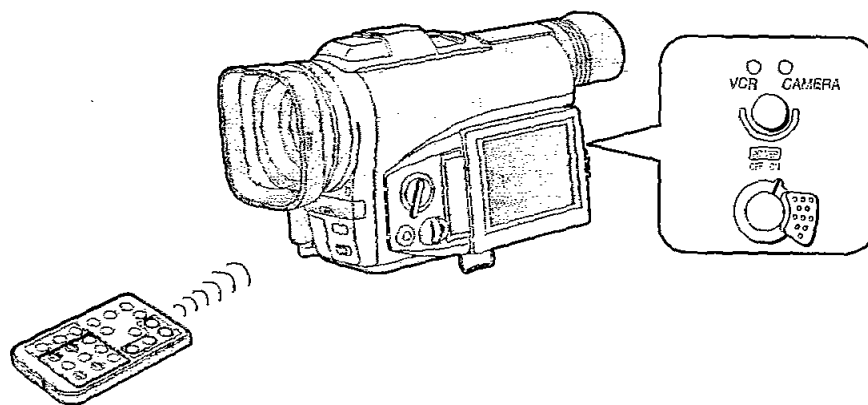
Store Button [STORE]

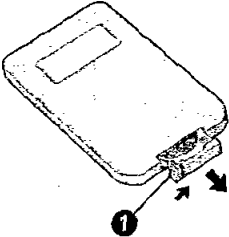
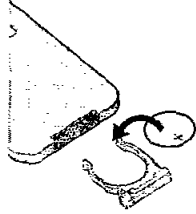
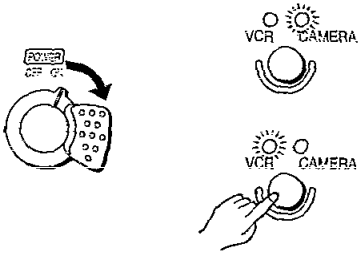
To store a still picture in memory for the Wipe or Mix Function. (p. 46)

Off/On Button [OFF/ON]

To suspend the selected digital mode or re-activate it. (p. 46)

To start a Wipe or Mix transition from the still picture stored in memory. (p. 46)



Title	Procedure	
<p>Remote Controller (Continued)</p> <p>■ Inserting the Button-type Battery Insert the supplied button-type battery before using the Remote Controller.</p> <ul style="list-style-type: none"> • When the button-type battery is exhausted, replace it with a new CR2025 battery. (The life of the battery is about 1 year. However, it depends on the frequency of use.) • Make sure you insert the battery with its poles correctly aligned (+ and -). • Keep the button-type battery out of the reach of children. 	<p>1 Pull out the Battery Holder while pressing the Stopper ❶.</p> 	<p>2 Insert the button-type battery with the stamped (+) mark facing upward.</p> 
<p>■ Using the Remote Controller</p>	<p>1 Set the [POWER] Switch on the Movie Camera to [ON].</p> <ul style="list-style-type: none"> • When the [CAMERA] Lamp lights, you can use the recording functions. • If you want to use the playback functions, press the [VCR/CAMERA] Button so that the [VCR] Lamp lights. 	

■ Selecting the Remote Controller Mode

When using two Movie Cameras at the same time, selecting different Remote Controller Modes makes it possible to operate them separately.

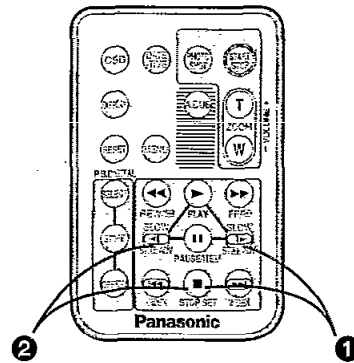
- If the Remote Controller Mode set on the Movie Camera and on its Remote Controller are not matched, the [REMOTE] Indication appears.
- Replacing the button-type battery in the Remote Controller automatically resets it to the [VCR1] Mode.
- Set [REMOTE] on the Menu to the desired Remote Controller Mode.

1 Press the [▶▶] Button and [■] Button simultaneously.

This selects the [VCR1] Mode.

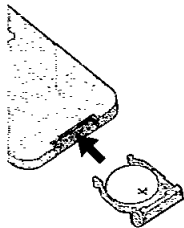
2 Press the [◀◀] Button and [■] Button simultaneously.

This selects the [VCR2] Mode.



3

Insert the Battery Holder into the Remote Controller.



Information for your safety

WARNING

"THE LITHIUM BATTERY IS A CRITICAL COMPONENT (TYPE NUMBER CR2025 MANUFACTURED BY PANASONIC).

IT MUST NEVER BE SUBJECTED TO EXCESSIVE HEAT OR DISCHARGE. IT MUST THEREFORE ONLY BE FITTED IN EQUIPMENT DESIGNED SPECIFICALLY FOR ITS USE.

REPLACEMENT BATTERIES MUST BE OF THE SAME TYPE AND MANUFACTURER.

THEY MUST BE FITTED IN THE SAME MANNER AND LOCATION AS THE ORIGINAL BATTERY, WITH THE CORRECT POLARITY CONNECTIONS OBSERVED.

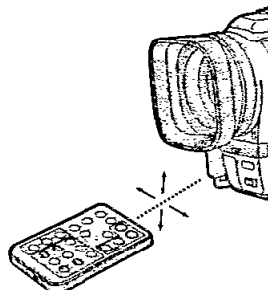
DO NOT ATTEMPT TO RE-CHARGE THE OLD BATTERY OR RE-USE IT FOR ANY OTHER PURPOSE. IT SHOULD BE DISPOSED OF IN WASTE PRODUCTS DESTINED FOR BURIAL RATHER THAN INCINERATION."

2

Aim the Remote Controller at the Remote Control Sensor on the Movie Camera and press the appropriate button.

Distance to the Movie Camera: Less than 5 metres.

Angle: Approximately 15° up, down, left and right from centre axis.



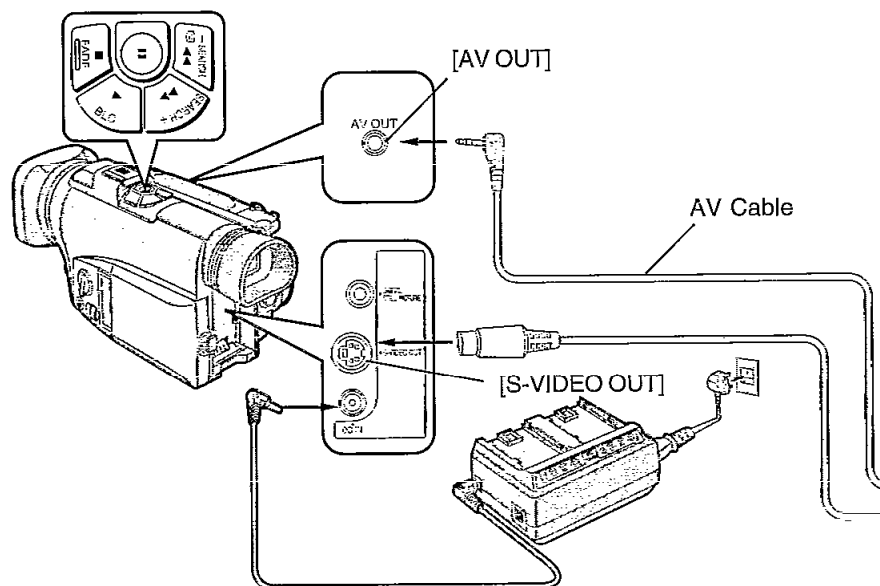
Remarks, etc.

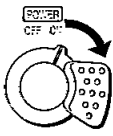
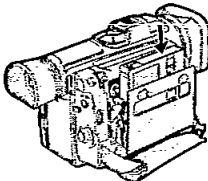
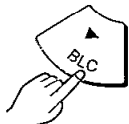

- The operative range described on the left is valid for using the Remote Controller indoors. When using it outdoors or under strong lights, it may not work correctly even within the above range.

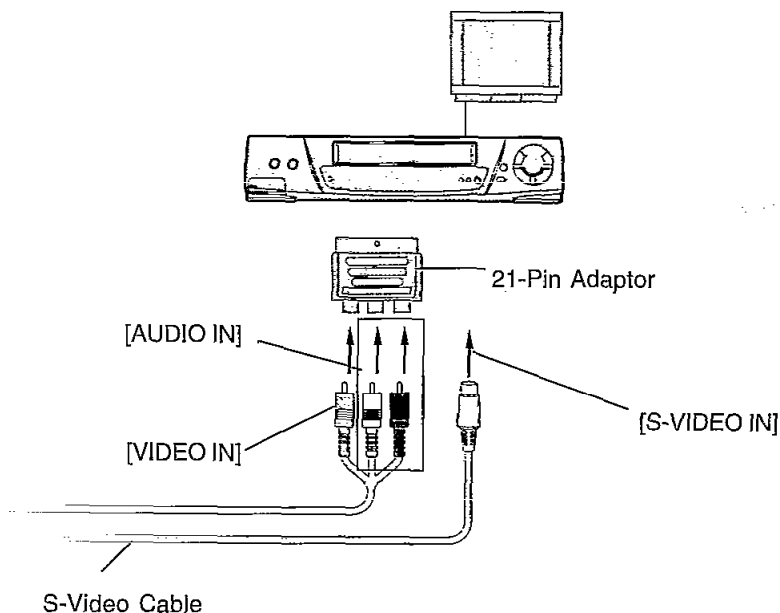
- Within a distance of about 1 metre, it is also possible to use the Remote Controller from the side (LCD Monitor side).

Setting to be Made on the Movie Camera:

Set [REMOTE] on the [CAMERA MENU3] Menu or on the [VCR MENU2] Menu to the desired Remote Controller Mode.

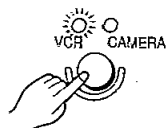


Title	Procedure	
<p>Copying onto an S-VHS (or VHS) Cassette (Dubbing)</p> <p>You can copy the picture and sound recorded on this Movie Camera onto an S-VHS or VHS cassette in a home video recorder.</p> <p>After making the connections shown above, perform the necessary operations.</p> <p>Before copying, be sure to press the [OSD] Button on the Remote Controller (p. 50) so that no indications are visible. Otherwise, the displayed tape counter and function indications are also copied.</p>	<p>1</p> <p>Movie Camera: Set the [POWER] Switch to [ON].</p> 	<p>2</p> <p>Movie Camera: Insert the recorded cassette.</p> 
	<p>5</p> <p>Movie Camera: Press the Play Button [▶] to start playback.</p> 	<p>6</p> <p>VCR: Start recording.</p> 



3

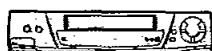
Movie Camera:
Press the [VCR/
CAMERA] Button so
that the [VCR] Lamp
lights.



4

VCR:
Insert an unrecorded
cassette with intact
eraser prevention tab.

- As some settings
(external input, tape
speed, etc.) on the
VCR are necessary,
please refer to your
VCR's operating
instructions.



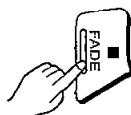
7

VCR:
Press the Pause or
Stop Button to stop
recording.



8

Movie Camera:
Press the Stop Button
[■] to stop playback.



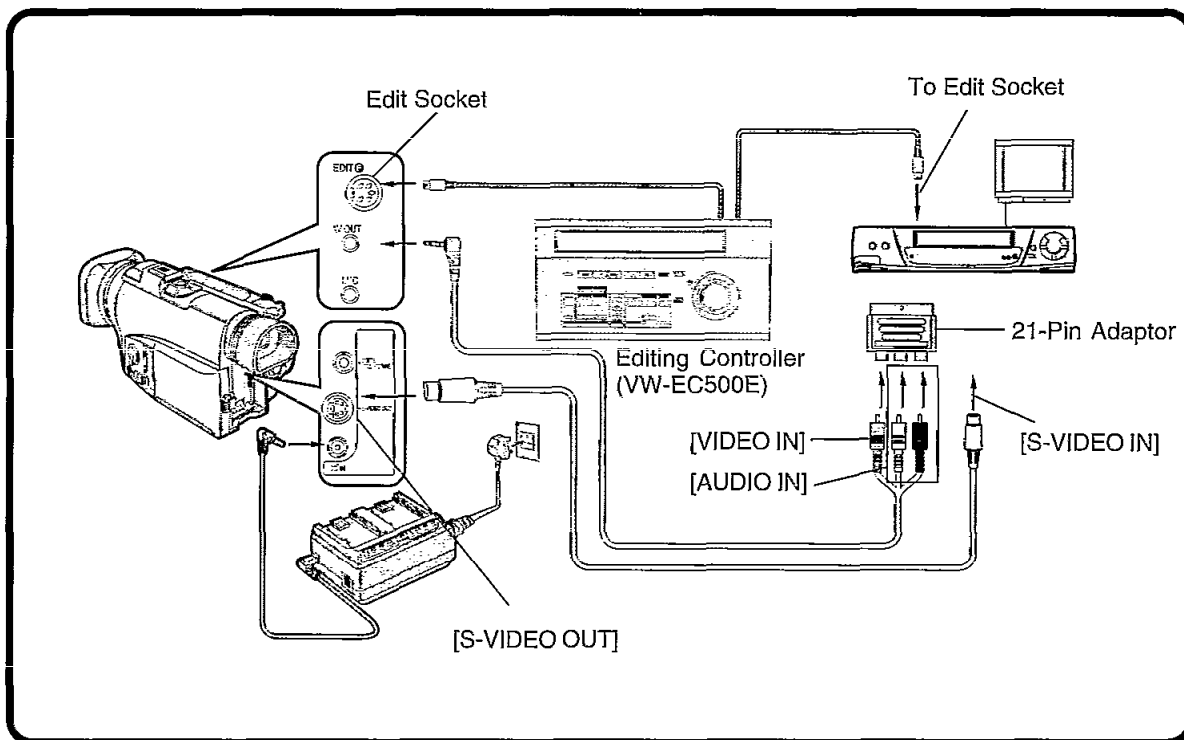
Remarks, etc.

Options/Editing

Copying with the Help of an Editing Controller

If you connect the Movie Camera to a Panasonic Editing Controller equipped with 5-pin Edit Socket, this Movie Camera's playback functions can be controlled from the Editing Controller.

When Connecting the Editing Controller VW-EC500E (optional)



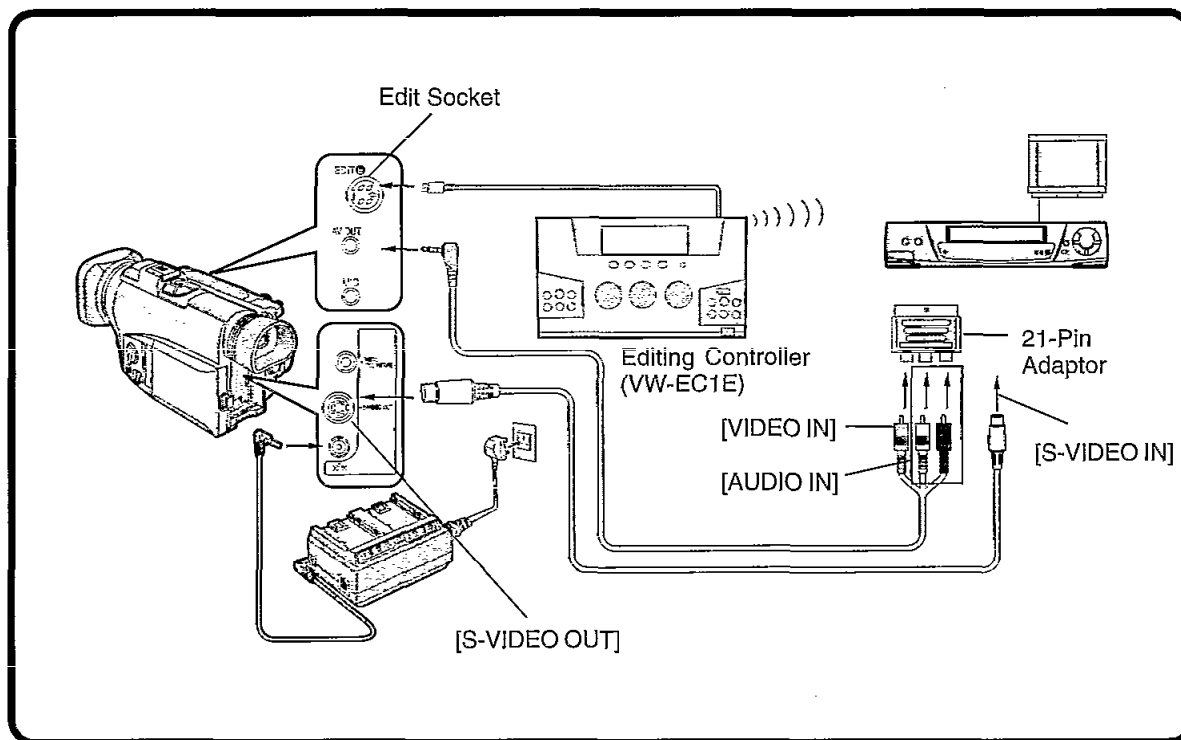
- A VCR equipped with 5-pin Edit Socket is necessary.
- When you connect the VW-EC500E to the Movie Camera, an adjustment on the VW-EC500E is necessary. For the operation of the Editing Controller, refer to its operating instructions.

When Editing with Time Code

Press the [DISPLAY] Button on the Remote Controller to make the Time Code appear.

- When the Time Code is displayed, the Time Code Signal is output from the Edit Socket.
- When the Counter Indication is displayed, the Linear Tape Counter Signal is output.

When Connecting the Editing Controller VW-EC1E (optional)

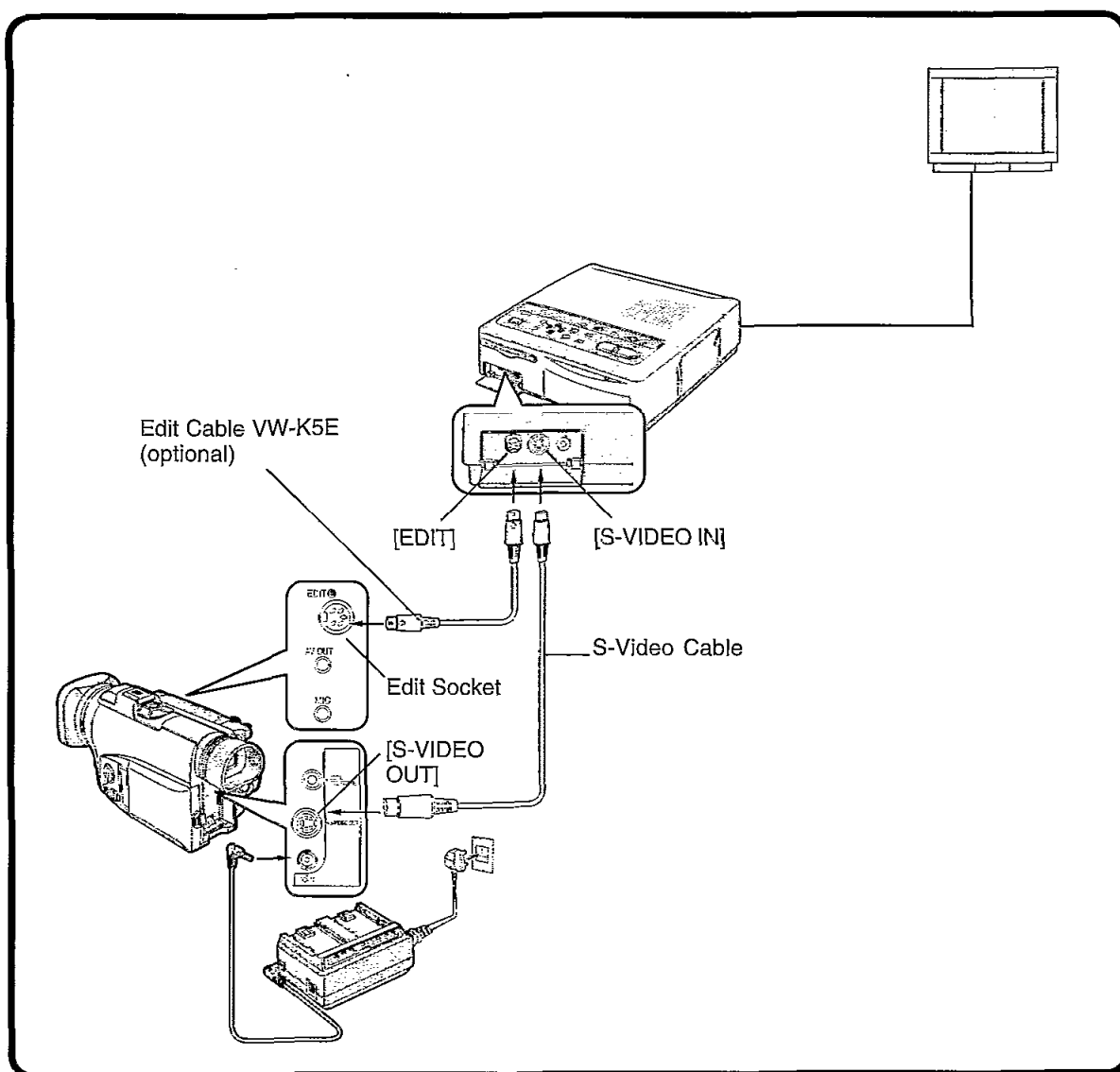


- When you use the Editing Controller VW-EC1E, it is not necessary to connect it to the Edit Socket on the VCR, as the VCR's operation is performed via infrared remote control. Therefore, editing is also possible onto VCRs not equipped with an Edit Socket.
- For the operation of the Editing Controller, refer to its operating instructions.

Using the Movie Camera with a Video Printer

If you connect the Movie Camera to a Video Printer, you can print still pictures from scenes recorded with the Movie Camera.

If you do not intend to use the Automatic Printing Function, connecting the Edit Cable is not necessary.



Movie Camera:

- 1** Set the [POWER] Switch to [ON] to turn the Movie Camera on.
- 2** Insert a recorded cassette and press the [VCR/CAMERA] Button so that the [VCR] Lamp lights.
- 5** Press the Play Button [▶].

Video Printer:

- 3** Turn the Video Printer on.
- 4** If the Video Printer is equipped with Super Image Stabilizer Function and/or Moving/Still Picture Mode, adjust them according to the picture being input.
- 6** Store the image in memory.
- 7** Start printing.

•For details about the operation of the Video Printer, read its operating instructions.

■ Using the Automatic Printing Function (Autoprint)

If you connect the Movie Camera to a Video Printer equipped with 5-pin Edit Socket, you can use the Autoprint Function to automatically print all still pictures recorded in the Photoshot Mode.

Video Printer:

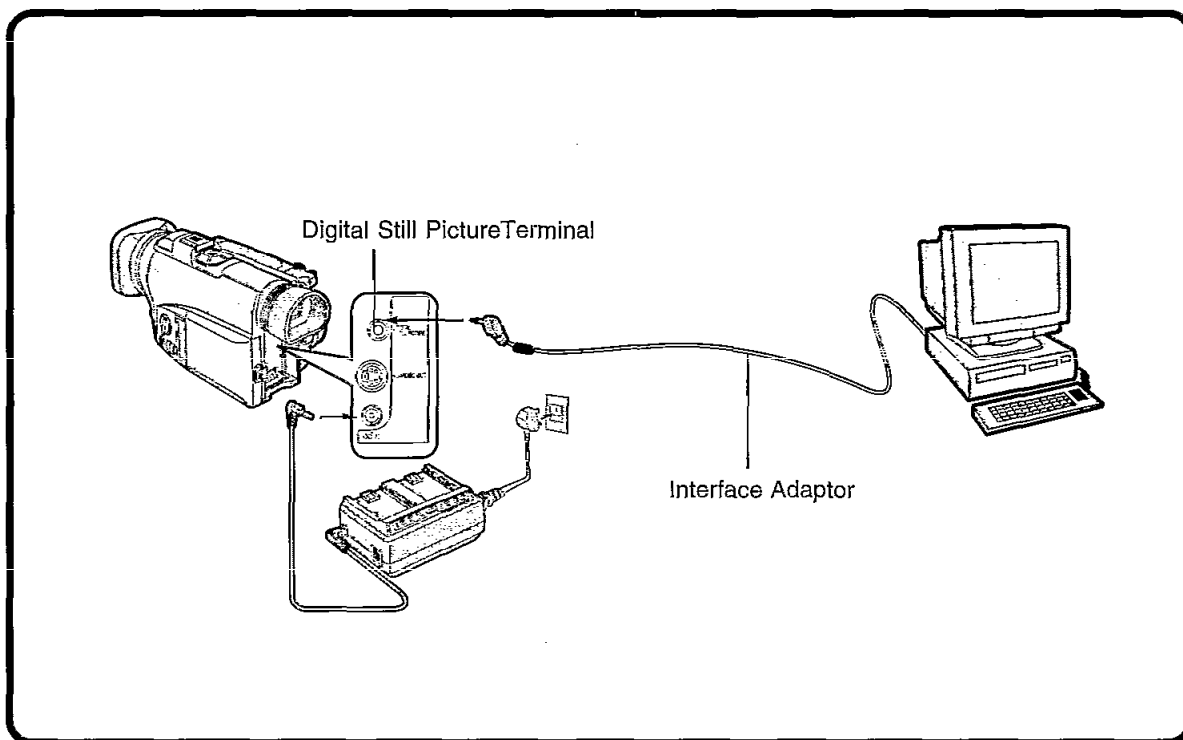
- 1** Turn the Video Printer on.
- 2** Make the necessary settings on the Video Printer according to the input signal.

Movie Camera:

- 3** Set the [POWER] Switch to [ON] to turn the Movie Camera on.
- 4** Press the [VCR/CAMERA] Button so that the [VCR] Lamp lights.
- 5** Search for the first still picture from which you want to start printing with the Autoprint Function.
If you want to print all still pictures recorded on the cassette, rewind the tape to its beginning.
- 6** Press the [MENU] Button.
- 7** Set [AUTOPRINT] on the [VCR MENU2] Menu to [ON].
Automatic printing starts.

- If you want to stop the automatic printing in the middle, press the Stop Button [■] on the Movie Camera.

- When the cooling function of the Video Printer activates and the printing speed slows down, automatic printing may stop. In this case set [AUTOPRINT] on the [VCR MENU2] Menu to [ON] again.
- If you replace the ink cassette or paper during printing, the same picture may be printed twice.
- If still pictures are recorded successively in the Photoshot Mode, some pictures may be skipped during printing.
- Before storing an image in memory on the Video Printer, press the [OSD] Button (p. 50) on the Remote Controller of the Movie Camera so that no indications appear in the picture. Otherwise, the Counter Indication and other function indications are also printed in the picture.
- In the following cases, some pictures may be skipped when printing with the Auto Print Function.
 - When you print still pictures recorded in the Photoshot Mode on a video camera of another brand.
 - If you turn the Movie Camera on and off several times (3 times or more) between recording two still pictures in the Photoshot Mode.
 - When you record a still picture in the Photoshot Mode on the same part of a cassette where a Photoshot picture was recorded before.
 - When you select a different recording speed (SP/LP) between the recording of two still pictures in the Photoshot Mode.
 - At the first Photoshot picture to be printed.



The Personal Computer Connection Kit VW-DTA1E (optional) for Digital Video Cameras makes it possible to connect the Movie Camera to a computer and transmit still video images to it.

Computer System Requirements





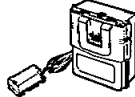
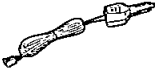




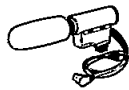


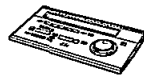





DV STUDIO can be installed in a PC/AT personal computer which can run Microsoft® Windows® 95.

Compatible machines:	Personal computer with 80486DX4 or higher CPU (Pentium™ or higher recommended)
Graphic card:	True Color (approx. 16.7 million colours) recommended (operation also possible even with 256 colours)
Installed memory:	16 MB or more (32 MB or more recommended)
Free hard disk space:	At least 10 MB
Disk drive:	CD-ROM drive
Serial port:	RS-232C (D-sub 9pin)
Other requirements:	Mouse

To connect the Movie Camera to the computer, use the special Interface Adaptor contained in the Personal Computer Connection Kit.

- Pictures that you intend to import into computer applications should be recorded in the SP Mode.
- When recording, take care that the Time Code is uninterrupted from the beginning of the tape.
- Windows® 95 is a trademark of Microsoft Corporation U.S.A.
- All other company and product names in the operating instructions are trademarks of their respective corporations.

Optional Accessories

Battery Pack CGR-D120 	Battery Pack CGP-D210 	Battery Pack CGR-D220 	Battery Pack CGP-D320 	Battery Pack CGR-D815 
Car Adaptor Cord VW-KA7E 	5-Pin Synchro Cord VW-K10E 	Wide Conversion Lens VW-LW4307WE 	Tele Conversion Lens VW-LT4314WE 	Filter Kit VW-LF43WE 
Stereo Zoom Microphone VW-VMS1E 	Shoe Adaptor VW-SK9E 	Tripod VZ-CT55E 	Editing Controller VW-EC500E 	Editing Controller VW-EC1E 
Video Titler VW-VT1B 	Personal Computer Connection Kit VW-DTA1E 	Edit Cable VW-K5E 	DV Cable VW-CD1E 	

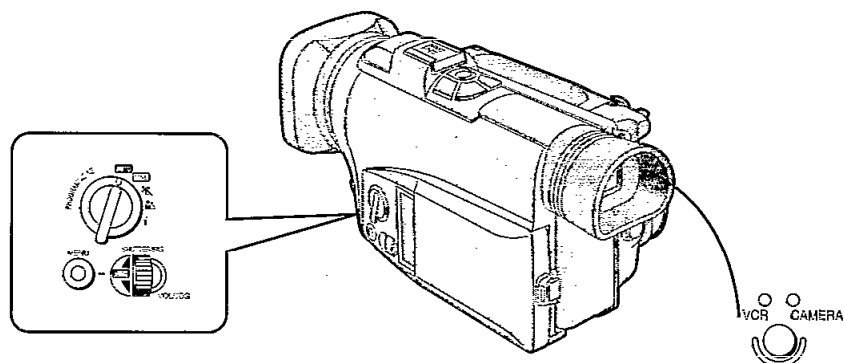
Notes:

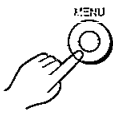


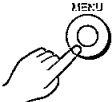
- Consult your dealer for details of other accessories not listed here.
- Some of the accessories listed above may not be available in some countries.

Options/Editing

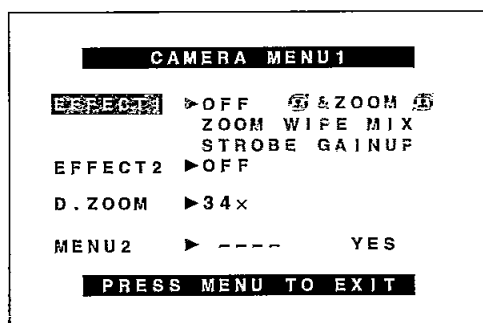
Charging Time and Maximum Time for Continuous Recording

Battery Pack No.	•	Charging Time	•	Max. Continuous Filming Time
CGR-D120 (optional)	•	60 min.	•	70 min. (60min.)
CGP-D210 (optional)	•	110 min.	•	120 min. (105min.)
CGR-D220 (optional)	•	120 min.	•	150 min. (130min.)
CGP-D320 (optional)	•	195 min.	•	255 min. (220min.)
CGR-D815 (optional)	•	320 min.	•	480 min. (420min.)

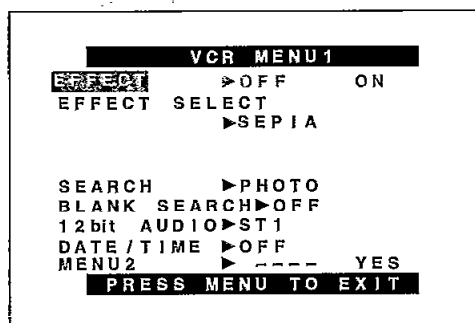


Title	Procedure	
<p>Using the Menu Screen</p> <p>This Movie Camera displays the settings of various functions in Menus to make it easy to select the desired functions and settings.</p>	<p>1</p> <p>Press the [MENU] Button. The Menu appears.</p> 	<p>2</p> <p>Turn the [PUSH] Dial to select the item to be set. Turning the [PUSH] Dial changes the highlighted item.</p> 
	<p>■ Displaying the Camera Mode Menu ①</p> <p>Press the [MENU] Button in the Recording Pause Mode.</p> <ul style="list-style-type: none"> • While the Menu is displayed, recording is not possible. • During recording, displaying the Menu is not possible.  	

① Camera Mode Menu

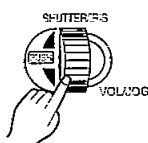


② VCR Mode Menu



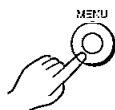
3

Press the [PUSH] Dial to set the selected item to the desired mode. Every press moves the cursor [▶] to the next mode.



■ Exiting the Menu

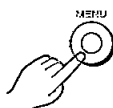
Press the [MENU] Button again.



■ Displaying the VCR Mode Menu ②

Press the [MENU] Button when the [VCR] Lamp is lit.

- While the Menu is displayed, playback is not possible.
- During playback, displaying the Menu is possible.



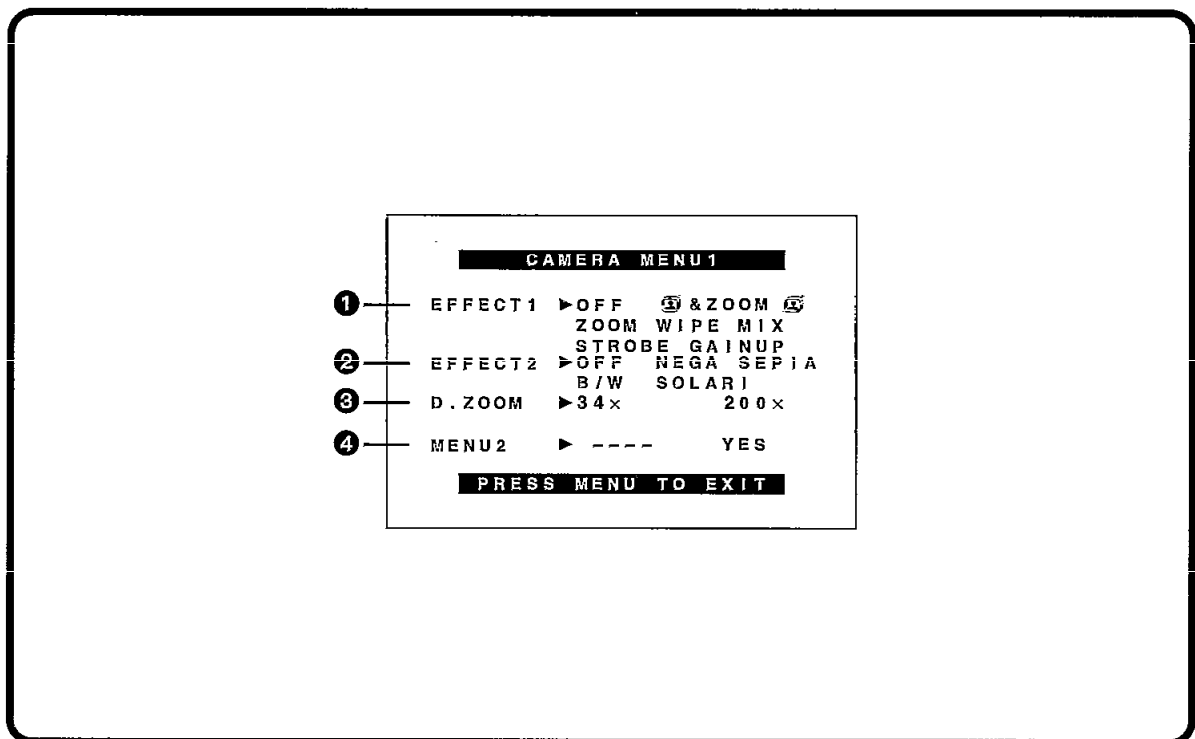
Remarks, etc.

Note About the Settings Made on the Menu

The settings you selected on the Menu are maintained when you turn the Movie Camera off. However, if you disconnect the power supply unit (Battery or AC Adaptor) from the Movie Camera before turning it off, the selected settings may not be maintained.

Menu Functions

Camera Mode Menu

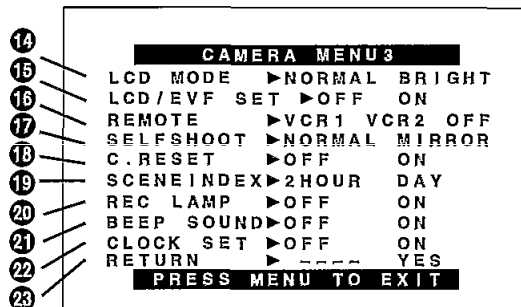
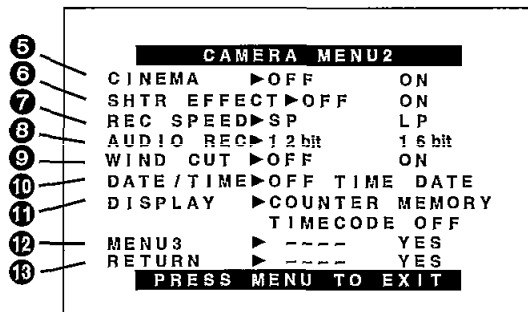


The illustrations of the menus are intended for explaining the functions; the actual menus look somewhat different.

Camera Mode Menu

[CAMERA MENU1]

- ❶ Digital Effects 1 [EFFECT1] (p. 38)
- ❷ Digital Effects 2 [EFFECT2] (p. 38)
- ❸ Digital Zoom [D.ZOOM] (p. 21)
- ❹ Advancing to Menu 2 [MENU2]
If you set [MENU2] to [YES], the Menu changes to the [CAMERA MENU2] Menu.



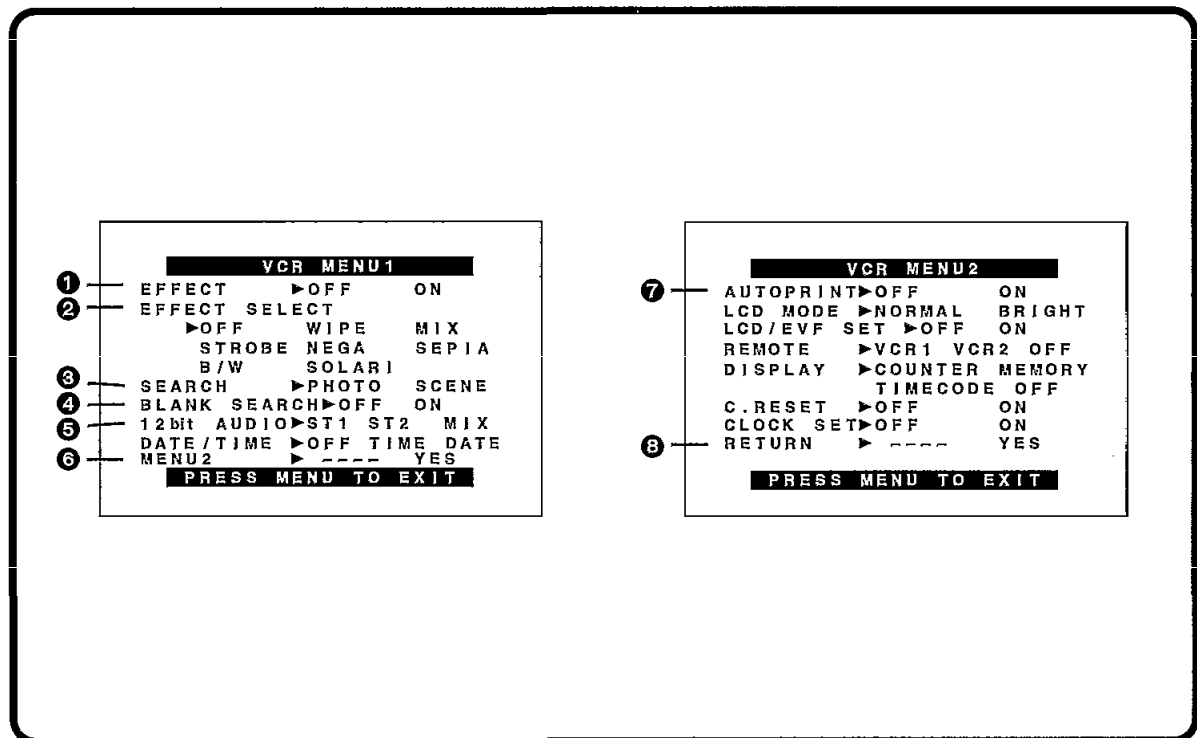
[CAMERA MENU2]

- 5 Cinema-like Format Recording [CINEMA] (p. 22)
- 6 Shutter Effect [SHTR EFFECT] (p. 21)
- 7 Recording Speed Mode [REC SPEED] (p. 11)
- 8 Audio Recording Mode [AUDIO REC] (p. 48)
- 9 Wind Noise Reduction [WIND CUT]
If you set [WIND CUT] to [ON], the noise of the wind hitting the Microphone is reduced. However, this also causes a slight deterioration of the sound reproduction in the bass range.
- 10 Date and Time Indication [DATE/TIME] (p. 25)
- 11 Counter Display Mode [DISPLAY] (p. 79)
- 12 Advancing to Menu 3 [MENU3]
If you set [MENU3] to [YES], the Menu changes to the [CAMERA MENU3] Menu.
- 13 Returning to the Previous Menu [RETURN]
If you set [RETURN] to [YES], the Menu changes back to the [CAMERA MENU1] Menu.

[CAMERA MENU3]

- 14 LCD Lighting Mode [LCD MODE] (p. 67)
- 15 LCD and Viewfinder Adjustment [LCD/EVF SET] (p. 67)
- 16 Remote Controller Mode [REMOTE] (p. 53)
- 17 Self-Recording [SELF SHOOT] (p. 19)
- 18 Counter Reset [C.RESET] (p. 77)
To reset the counter to zero. However, the Time Code cannot be reset.

- 19 Scene Index Mode [SCENEINDEX] (p. 32)
- 20 Recording Lamp [REC LAMP] (p. 15)
- 21 Beep Sound [BEEP SOUND]
If you set [BEEP SOUND] to [ON], a confirmation/alarm beep sound is emitted in the following cases:
 - When you turn on the Movie Camera.
 - When you start recording and pause recording.
 - When the tape reaches its end during recording, or when the tape has reached its end and you try to start recording.
 - When you try to start recording without having inserted a cassette.
 - When you insert a cassette with its erasure prevention slider set to [SAVE] and try to start recording.
 - When condensation has formed inside the Movie Camera.
- 22 Date and Time Setting [CLOCK SET] (p. 68)
- 23 Returning to the Previous Menu [RETURN]
If you set [RETURN] to [YES], the Menu changes back to the [CAMERA MENU2] Menu.

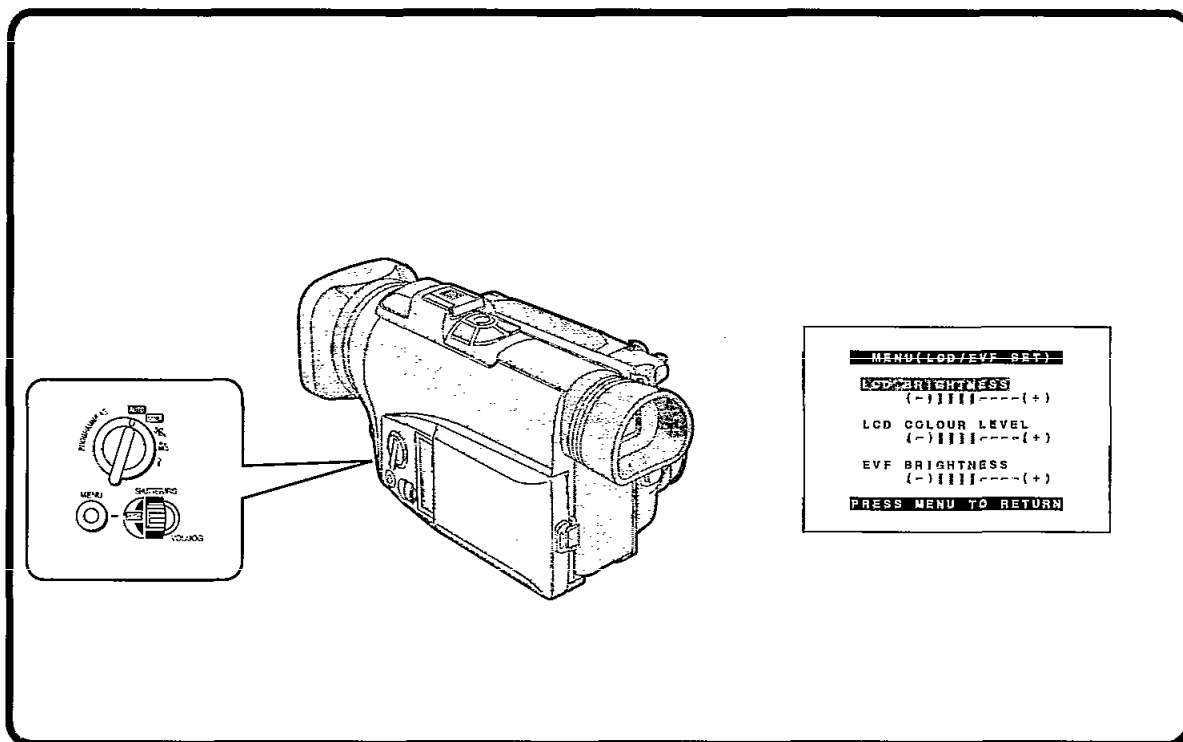


[VCR MENU1]

- ① Digital Effect On/Off [EFFECT] (p. 46)
- ② Digital Effect Selection [EFFECT SELECT] (p. 46)
- ③ Index Search Mode [SEARCH] (p. 32)
- ④ Blank Search [BLANK SEARCH] (p. 30)
- ⑤ Audio Output Mode [12bit AUDIO] (p. 49)
- ⑥ Advancing to Menu 2 [MENU2]
If you set [MENU2] to [YES], the Menu changes to the [VCR MENU2] Menu.

[VCR MENU2]

- ⑦ Automatic Printing [AUTOPRINT] (p. 59)
- ⑧ Returning to the Previous Menu [RETURN]
If you set [RETURN] to [YES], the Menu changes back to the [VCR MENU1] Menu.
- All other items on the VCR Mode Menus are the same as on the Camera Mode Menus.



Adjusting the Brightness and Colour Level of the LCD Monitor/Viewfinder

If you set [LCD/EVF SET] on the [CAMERA MENU3] Menu or [VCR MENU2] Menu to [ON], the following items are displayed:

LCD Brightness [LCD BRIGHTNESS]

To adjust the brightness of the picture on the LCD screen.

LCD Colour Level [LCD COLOUR LEVEL]

To adjust the colour saturation of the picture on the LCD screen.

Viewfinder Brightness [EVF BRIGHTNESS]

To adjust the brightness of the picture in the Viewfinder.

1 Press the [PUSH] Dial to select the item that you want to adjust.

2 Turn the [PUSH] Dial to increase or decrease the vertical bars of the Bar Indication.

The Bar Indication is divided into 8 steps. The more vertical bars are shown, the stronger is the brightness or colour saturation.

If you use the Remote Controller for this adjustment, press the [ITEM] Button and then adjust the brightness or colour saturation by pressing the [SET] Button. The bars gradually increase toward the right end, and then they decrease again.

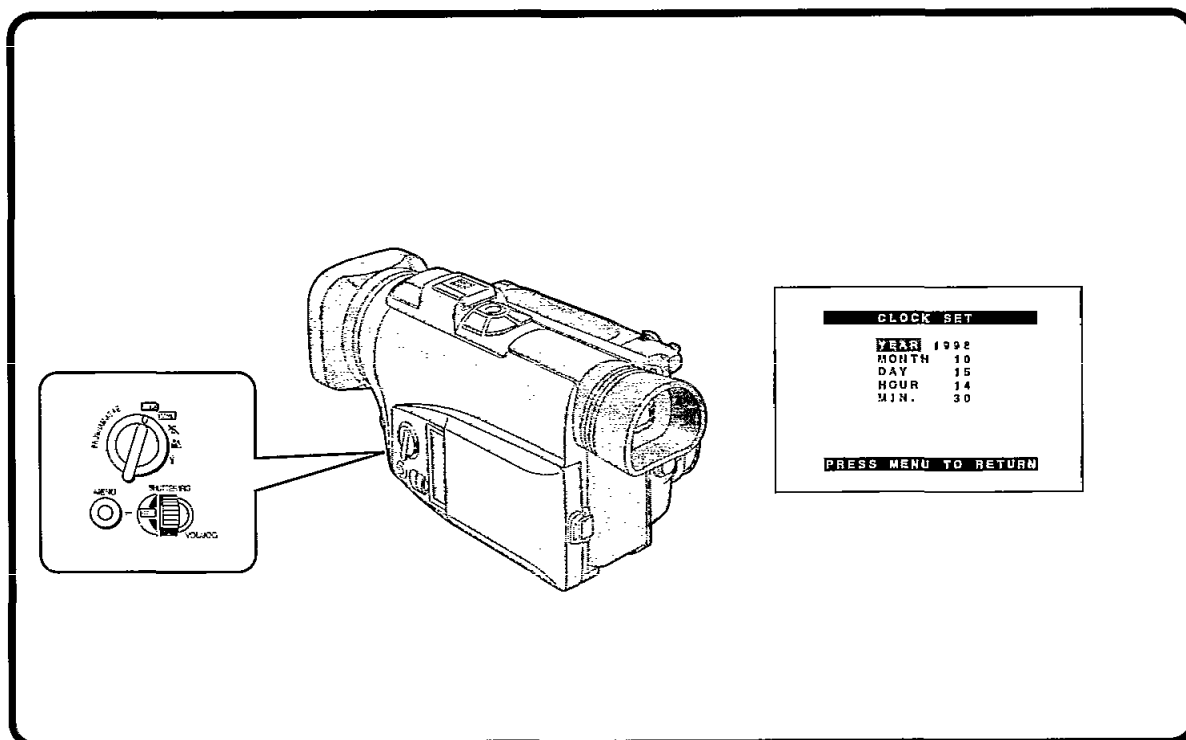
Increasing the Brightness of the LCD Monitor's Backlighting

Set [LCD MODE] either on the [CAMERA MENU3] Menu or [VCR MENU2] Menu to [BRIGHT].

•All adjustments explained on this page have no influence on the actually recorded picture.

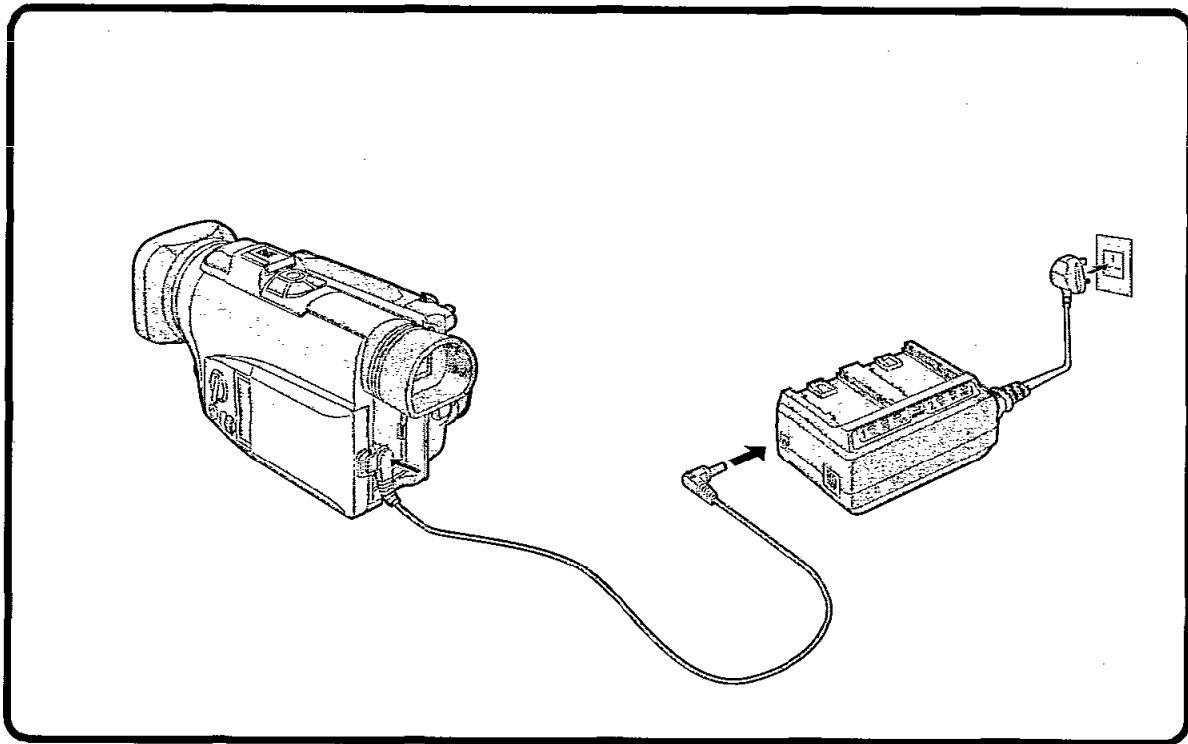
Setting the Date and Time

If you set [CLOCK SET] either on the [CAMERA MENU3] Menu or [VCR MENU2] Menu to [ON], the Menu shown below appears.



For example: To set the clock to 15th October 1998, 14:30.

- 1 Turn the [PUSH] Dial to set to [1998].
 - The years change in the following order:
1990→1991→...→2089→1990→...
- 2 Press the [PUSH] Dial to select [MONTH].
- 3 Turn the [PUSH] Dial to set to [10].
- 4 Press the [PUSH] Dial to select [DAY].
- 5 Turn the [PUSH] Dial to set to [15].
- 6 Press the [PUSH] Dial to select [HOUR].
- 7 Turn the [PUSH] Dial to set to [14].
- 8 Press the [PUSH] Dial to select [MIN.].
- 9 Turn the [PUSH] Dial to set to [30].
- 10 Press the [MENU] Button to finish the date and time setting.
The operation of the clock starts from [00] seconds.



Charging the Built-in Lithium Battery

The built-in lithium battery maintains the operation of the clock. When the [⏻] Indication appears, the built-in lithium battery is discharged. Charge the discharged battery in the following way and after charging is finished, set the date and time.

- 1** Connect the AC Adaptor to the Movie Camera and to an AC mains socket. (p. 6)
- 2** Leave the Movie Camera turned off.
- 3** Leave the Movie Camera in this condition for approximately 4 hours.
After charging for 4 hours, the built-in lithium battery can power the clock for approximately 3 months.

Information for your safety

WARNING

THE LITHIUM BATTERY IN THIS EQUIPMENT MUST ONLY BE REPLACED BY QUALIFIED PERSONNEL. WHEN NECESSARY, CONTACT YOUR LOCAL PANASONIC SUPPLIER.

Cautions for Use

Take care that no water enters the Movie Camera when using it in the rain and snow or on the beach.

- The Movie Camera and the cassette could become damaged. (It might not be repairable.)

Keep the Movie Camera away from magnetized equipment (TVs, video games, etc.).

- If you use the Movie Camera on or near a TV, the electromagnetic radiation may cause picture and sound distortion.
- Strong magnetic fields generated by speakers and large motors may damage the recordings on the tape and distort the picture.
- The electromagnetic radiation from micro-processors can adversely influence the Movie Camera and cause picture and sound distortion.
- If the Movie Camera is adversely influenced by magnetized equipment and does not work correctly, turn the Movie Camera off, remove the Battery or disconnect the AC Adaptor and attach the Battery or connect the AC Adaptor again. Then turn the Movie Camera on.

Do not use the Movie Camera near a radio transmitter or high-voltage power line.

- If you record near a radio transmitter or high-voltage power line, the recorded picture and sound may be adversely influenced.

Do not use the Movie Camera for surveillance and other industrial application.

- If the Movie Camera is being used for a long time, the inside temperature could rise excessively and this may cause malfunction.
- This Movie Camera is not designed for industrial use.

Take care that no sand and fine dust enters the Movie Camera when using it on a beach or similar places.

- Sand and dust could damage the Movie Camera and cassette. (Be careful when inserting and removing the cassette.)

Do not spray insecticide or volatile agents on the Movie Camera.

- Such agents could deform the body and cause the surface coating to peel off.
- Do not leave the Movie Camera in direct contact with rubber or plastic products for a long time.

Do not use benzine or thinner for cleaning.

- They could deform the body and cause the surface coating to peel off.
- Before cleaning, remove the Battery or unplug the AC Mains Cable from the AC mains socket.
- Wipe the Movie Camera with a soft, clean cloth. To remove persistent stains, wipe with a cloth moistened with mild detergent diluted with water, and then finish with a dry cloth.

After use, always take out the cassette and remove the Battery or unplug the AC Mains Cable from the AC mains socket.

- If you leave the cassette in the Movie Camera, the tape can become loosened and damaged.
- If you leave the battery attached to the Movie Camera for a long time, the voltage level may drop very low so that the Battery cannot be used any more even after charging.

■ Condensation

Determining Whether Condensation Has Formed Inside and Remedy for Condensation

If the Condensation Indication flashes after you turn on the Movie Camera, condensation has formed inside the Movie Camera. In this case, the Movie Camera automatically switches off after a few seconds.

Remedy as follows:

- 1 Take out the cassette.**
All other functions do not work. Depending on the amount of condensation, it may not be possible to take out the cassette. In this case, wait 2–3 hours before taking out the cassette.
- 2 Leave the Cassette Compartment open and wait for 2–3 hours.**
The required time depends on the amount of condensation and the ambient temperature.
- 3 After 2–3 hours, turn the Movie Camera on and check if the Condensation Indication is not displayed.**
Even if the Condensation Indication is no longer displayed, wait 1 more hour for added safety before using the Movie Camera again.

Pay Attention to Condensation Even Before the Condensation Indication Appears.

- As condensation forms gradually, the Condensation Indication may not appear for the first 10–15 minutes after condensation has formed inside.
- In an extremely cold place, the condensation could freeze and turn into frost. In such a case, it takes an additional 2–3 hours for the frost to first melt into condensation and then to be dissolved.

Remedy for a Fogged-up Lens

Set the [POWER] Switch to [OFF] and leave the Movie Camera in this condition for about 1 hour. When the lens has reached about the same temperature as its surroundings, it automatically clears up.

■ Video Head Clogging and Remedy

When the video heads (which contact the tape) are dirty, the playback picture contains mosaic-like patterns or the whole screen becomes black. If they become even more dirty, the recording performance deteriorates and in the worst case, recording may not be possible at all.

Causes of Dirty Video Heads

- A lot of dust in the air.
- High-temperature and high-humidity environment.
- Damaged tape.
- Long-time use.

Using the Mini-DV Format Digital Video Head Cleaner (VFK1451; Not Supplied)

- 1 Insert the Head Cleaner into the Movie Camera in the same way as a video cassette.
- 2 Press the Play Button [▶], and after approximately 20 seconds press the Stop Button [■]. (Do not rewind the tape.)
- 3 Take out the Head Cleaner. Insert a video cassette, perform recording and then play it back to check the picture.
- 4 If the picture is still not clear, repeat above operation steps 1 - 3. (Do not use the Head Cleaner more than 3 times in succession.)

Notes:

- Do not rewind the tape in the Head Cleaner after every use. Rewind it only after the tape has reached its end, and then use it again in the same way from the beginning.
- If the video heads again become clogged with dirt soon after cleaning, this might be caused by a damaged tape. In this case, stop using that cassette immediately.
- Be careful not to clean the video heads too much. (Too much cleaning could cause excessive wear to the video heads. If the video heads get worn, the picture is not played back clearly even after cleaning.)
- If using the Head Cleaner does not clear the video head clogging, the Movie Camera requires cleaning or repairing by a service centre.
Please consult with your dealer.
- This Video Head Cleaner (VFK1451) is available from Panasonic service centres.

Periodic Inspection

To ensure optimum picture quality, we recommend that you have worn-out parts such as video heads replaced after approximately 1000 hours of use. (However, this depends considerably on the conditions of use such as temperature, humidity and dust.)

Cautions for Use (cont.)

■ Optimum Use of the Battery

Special Characteristics of the Battery

This Battery is a rechargeable lithium-ion battery. Its ability to generate electric energy is based on an internal chemical reaction. This reaction is easily influenced by ambient temperature and humidity, and the useful operation time that the Battery can provide becomes shorter at high and low temperatures. When used in extremely cold surroundings, the Battery may only be able to provide approximately 5 minutes of operation time. If the Battery becomes extremely hot, a protection function is activated and prevents the use of the Battery for some time.

After Use, Always Remove the Battery.

Be sure to remove the Battery from the Movie Camera. (If it is attached to the Movie Camera, a small amount of electric current is consumed even if the Movie Camera is turned off.) Leaving the Battery attached to the Movie Camera for a very long time could cause it to become excessively discharged, so that it cannot be used any more even after charging.

Discarding a Battery That Has Become Unusable

- The usable life of the Battery is limited.
- Do not throw the Battery in a fire because it could explode.

Keep the Battery's Terminals Clean.

Be careful that the terminals do not get plugged up with dust, dirt or other substances. If you accidentally drop the Battery, confirm that the Battery itself and the terminals are not deformed. Attaching a deformed Battery to the Movie Camera or to the AC Adaptor could damage the Movie Camera or the AC Adaptor.

■ When the Charge Lamps on the AC Adaptor Flash as Warning

If the ambient temperature is extremely low or high, the Charge Lamps on the AC Adaptor flash. They also flash when some defect has occurred in the Battery or the AC Adaptor.

When the Charge Lamps Flash Slowly

The Battery is being charged, but charging takes longer than normally.

When Only the [80%] Charge Lamp Flashes

Charging is not possible. Remove the Battery once and wait a few minutes, and then re-attach it again for charging.

When the [50%] and [100%] Charge Lamps Flash Alternately, or When No Charge Lamps Light

Remove and then re-attach the Battery. Or, attach the Battery to the Movie Camera and perform playback (or some other operation) for 10 - 20 minutes. Then remove the Battery and attach it again to the AC Adaptor. If charging is still impossible, some malfunction has occurred in the Battery or the AC Adaptor. Please consult with your dealer.

■ Precautions for Storage

Before Storing the Movie Camera, Take out the Cassette and Remove the Battery.

Store all equipment in a dry place where the temperature remains relatively constant. (Recommended temperature is 15°C–25°C and recommended relative humidity is 40%–60%.)

Movie Camera

- Wrap it with a soft cloth to prevent dust from entering.

Battery

- Extremely low or high temperature shortens the Battery life.
- Storing it in places with oily smoke and a lot of dust could cause the terminals to get rusty, and this can result in a malfunction.
- **Do not allow metal objects (such as necklaces and hair pins) to touch the battery terminals. Short-circuiting may occur and generate heat, and touching it in this condition could inflict serious burns.**
- Store the Battery in discharged condition. If you store the Battery for a long time, we recommend that you charge it once a year and completely use up the charge before storing it again in discharged condition.
- If you use a large-capacity Battery (CGP-D320; optional) attached to the Movie Camera, viewing the picture in the Viewfinder from behind may not be practical. In this case, turn up the Viewfinder to an angle that allows comfortable viewing.

Cassette

- Rewind the tape to its beginning before storing. Leaving the cassette with the tape stopped halfway for more than 6 months (depending on the storing condition) loosens the tape. Be sure to rewind it to the beginning.
- Put the cassette in its case to store it. Dust, direct sunlight (ultraviolet rays) and humidity could damage the tape. Dust contains hard mineral particles and cassettes with dust damage the video heads and other parts of the Movie Camera. Make it a habit to always put the cassette back into its case.
- Completely wind the tape forward and then rewind it once every half year. Leaving the cassette for more than a year without winding/rewinding it may deform the cassette because of stretching and shrinking of the tape due to changes in temperature and humidity. Also, the tape may stick together.
- Do not place the cassette near strongly magnetized objects or equipment.
- The tape surface is coated with microscopic magnetic particles and they record signals. Such objects as magnetic necklaces and toys have stronger magnetic force than commonly thought, and this could erase the recorded contents and cause noise in picture and sound.

■ LCD Monitor / Viewfinder / Lens Hood

LCD Monitor

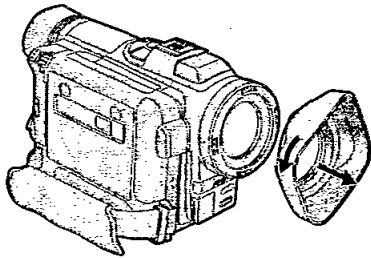
- In places where big changes in temperature occur, condensation may form on the LCD Monitor. Wipe it with a soft, dry cloth.
- When the Movie Camera is very cold when it is turned on, the picture on the LCD Monitor is initially a little darker than normal. However, as the internal temperature rises, the LCD Monitor regains its normal brightness.
- Extremely high precision technology is employed in producing the LCD Monitor. The result is more than 99.99% effective pixels with a mere 0.01% of the pixels inactive or always lit.

Viewfinder

- Extremely high precision technology is employed in producing the Viewfinder screen. The result is more than 99.99% active pixels, with a mere 0.01% of the pixels inactive or always lit.
- Do not leave the Viewfinder or the Lens aimed at the sun. This could seriously damage internal parts.

Lens Hood

- When you want to attach the Tele Conversion Lens (VW-LT4314WE, optional) or the Wide Conversion Lens (VW-LW4307WE, optional), be sure to first remove the Lens Hood by turning it counterclockwise.



- When you want to use a filter contained in the Filter Kit (VW-LF43WE; optional), do not remove the Lens Hood but screw the filter onto the Lens Hood.
- During recording with a filter or conversions lens attached, the four corners of the picture may become dark (vignetting effect), when you push the [W/T] Zoom Lever toward [W]. For details, please also read the operating instructions of the accessory being used.

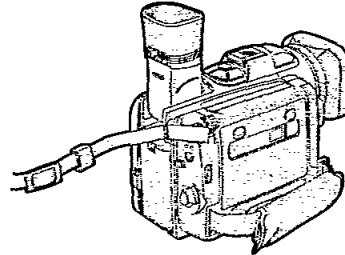
■ Repeat Playback

- If you keep the Playback Button [▶] pressed for more than 5 seconds, the Movie Camera switches over to the Repeat Playback Mode and the [R >] Indication appears. (To cancel the Repeat Playback Mode, set the [POWER] Switch to [OFF].)
- If a cassette recorded with copyright protection signal is played back, the screen becomes black.

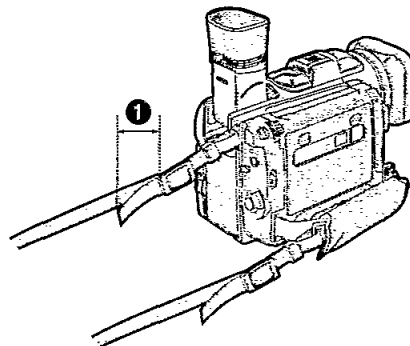
■ Attaching the Shoulder Strap

Before you go recording outside, we recommend that you attach the Shoulder Strap to prevent the Movie Camera from dropping accidentally.

- 1 Pull the end of the Shoulder Strap through the Shoulder Strap Holder on the Movie Camera.**



- 2 Fold the end of the Shoulder Strap back, pull it first through the loop and then the Shoulder Strap Length Adjuster.** Pull it out more than 2 cm ❶ from the Shoulder Strap Length Adjuster so that it cannot slip off.



Glossary

■ Focus

If you look at an object through a magnifying glass and move it closer or further away from your eye, you will reach a point where the object becomes clearly visible. Being focused or in focus means that the subject can be seen with optimum clarity and sharpness.

Human Eyes

Human eyes have lenses as well, and when we look at objects at different distances, the shape of these lenses changes automatically so that we can always see these objects clearly.

Movie Camera

The image of the subject enters the Movie Camera through the lens and is converted into an electric signal (video signal) for recording onto magnetic tape. The focus is adjusted either manually or automatically by moving a focusing lens.

Auto Focus Adjustment

The Auto Focus System automatically moves the internal focusing lens forward or backward and adjusts the focus so that the subject can be seen clearly.

The Auto Focus Adjustment has the following characteristics:

- It adjusts until the vertical contours of the subject are as sharp and clean as possible.
- It adjusts the focus on the subjects with strong contrast.
- It adjusts the focus on the subject in the centre of the LCD monitor or Viewfinder.

Unlike human eyes, the lens of the Movie Camera cannot instantaneously change the focus from a nearby to a distant subject and vice versa.

For the following subjects and recording situations, the Auto Focus system cannot provide precise adjustment. Use the Manual Focus Mode instead. (p. 18)

① Recording subjects with a part of it near the Movie Camera and another part far away from it

As the Auto Focus adjusts on the centre part of the image, it is often impossible to bring the nearby and distant parts of the subject into focus.

When you want to record a person with a distant mountain in the back, it is not possible to focus on both.

② Recording subjects behind glass covered with dirt or dust

As the focus is adjusted on the dirty glass, the subject behind the glass is out of focus. When recording a subject across a street on which cars are running, the focus may be adjusted on the cars.

③ Recording subjects in dark surroundings

As the amount of light information entering through the lens is greatly reduced, the Movie Camera cannot adjust the focus precisely.

④ Recording subjects surrounded by objects with shiny surfaces or much light reflection

As the Movie Camera adjusts the focus on objects with shiny surfaces or much light reflection, the subject may go out of focus. Therefore, when recording at a lake or the sea, evening scenes, fireworks, or under special types of lighting, the subject may be out of focus.

⑤ Recording fast-moving subjects

As the internal focusing lens is moved mechanically, it cannot follow fast-moving subjects without delay.

Therefore, subjects like children running back and forth may temporarily go out of focus.

⑥ Subjects with weak contrast

As the Movie Camera adjusts the focus based on vertical contours in the picture, subjects with little contrast such as a white wall may be out of focus.

■ White Balance Adjustment

While most recording with a Movie Camera is probably done outdoors under sunlight, video recording is also done very often under artificial light sources, both indoors and outdoors. However, each of these light sources gives the subject slightly different colours.

Human Eyes

Human eyes can easily adjust to different kinds of lighting and see an object with the same colours even under different lighting.

Movie Camera

Unlike human eyes, the Movie Camera does not have the innate ability to adapt to changes in lighting, and they influence the colours being recorded. Therefore, depending on the light source, the picture would be recorded with a bluish or reddish tint. To minimise the influence of the lighting on the colours of the subject, an adjustment called White Balance Adjustment is necessary.

White Balance Adjustment

The White Balance Adjustment determines the colour of the light and adjusts the colours so that white remains pure white. As white is the basic colour of the entire colour spectrum, if white is reproduced correctly, the other colours are correct and natural, too.

Auto White Balance Adjustment

This Movie Camera stores the optimum settings for several common light sources in memory. The Movie Camera judges the recording situation by determining the tint of the light received through the lens and by the White Balance Sensor (p. 5), and it selects the setting for the most similar tint. This function is called Auto White Balance Adjustment.

However, as the white balance settings for only a few light sources are stored in memory, the white balance is not correctly adjusted for other lighting conditions.

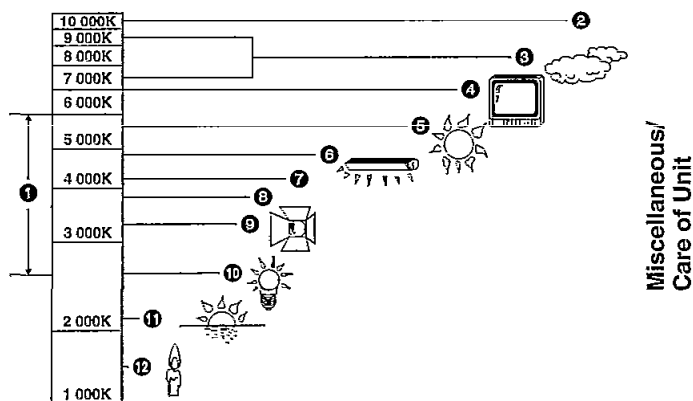
For the range of different types of lighting within which the Auto White Balance Function can provide precise adjustment, refer to the chart. For recording under lighting conditions outside this range, the Auto White Balance Function does not work correctly, and the recorded picture has a red or blue cast. However, the same also applies, if the subject is lit by more than one light source, even if these light sources are within this range.

■ Colour Temperature

Every light source has its own colour temperature measured in Kelvin (K). The higher the Kelvin value, the more bluish the light; the lower the value, the more reddish the light. The Kelvin value is related to the tint of the light, but not directly to its brightness.

The range ① indicated in the illustration below shows the light sources for which this Movie Camera can provide precise white balance adjustment and, therefore, natural colours in the recorded pictures, when using the Full Auto Mode. For light sources outside this range, adjust the white balance manually (p. 42). Also, additional lighting may be necessary.

- ① Control range of this Movie Camera's Auto White Balance Adjustment Mode
- ② Blue Sky
- ③ Cloudy sky (Rain)
- ④ TV screen
- ⑤ Sunlight
- ⑥ White fluorescent lamp
- ⑦ 2 hours after sunrise or before sunset
- ⑧ 1 hour after sunrise or before sunset
- ⑨ Halogen light bulb
- ⑩ Incandescent light bulb
- ⑪ Sunrise or sunset
- ⑫ Candlelight



Glossary (Cont.)

■ Digital Video System

In the digital video system, picture and sound are converted into digital signals and recorded onto the tape.

This completely digital recording allows recording and playback of picture and sound with minimum quality deterioration.

In addition, such data as Time code, Date and Time are also automatically recorded as digital signals.

Features

- Superior picture resolution
- Excellent signal-to-noise ratio
- Stable pictures
- Minimised quality deterioration in dubbing
- Minimised cross colour distortion
- PCM digital sound
- No picture deterioration in LP Mode
- 6.35 mm-wide tape
- Compact cassette with long recording time
- Minimised quality deterioration in editing
- Time Code editing

Compatibility with S-VHS or VHS Cassettes

As this Movie Camera uses a digital method for recording picture and sound, there is no compatibility with conventional S-VHS or VHS video equipment using analog recording methods.

In addition, the size and shape of the cassette are completely different.

Compatibility with Output Signals

As the video and audio signals output from the audio and video output sockets are analog—the same as in conventional video systems—you can connect this Movie Camera to your S-VHS or VHS VCR or TV for playback.

PCM Digital Sound

For recording of the sound, this Movie Camera offers the choice between two different PCM Audio Recording Modes.

- 16 bit, 48 kHz, 2 channels
- 12 bit, 32 kHz, 4 channels

The “16 bit, 48 kHz, 2 channels” Mode offers superior recording sound quality.

The “12 bit, 32 kHz, 4 channels” Mode lets you record the original sound in stereo on two channels and the dubbed sound in stereo on two separate channels.

Sub Code

The digital recording system offers the added capability of recording sub code containing various data.

The following data is recorded as sub code on this Movie Camera:

- Time code
- Recording date and time
- Index signals for locating still images recorded in the Photoshot Mode
- Index signals for locating the beginning of scenes marked with index signal

■ Time Code

Time Code signals are the data which indicated the time in hours, minutes, seconds and frames (25 frames/sec). Having this data included in the recording gives every single picture on the tape its own address.

- The time Code is automatically recorded as part of the sub code with every recording you make.
- When you insert a new (previously unrecorded) cassette, the Time Code automatically starts from zero. If you insert a recorded cassette, the Time Code continues where the time code of the last previous scene stopped. (In this case, the zero indication [0h00m00s00f] may appear after inserting the cassette, but when the recording starts, the Time Code records from the previous value.)
- You cannot reset the Time Code to zero.
- In playback modes other than the Normal Playback Mode, the Time Code may not be displayed (or not be correct).
- Unless the Time Code is recorded continuously from the beginning of the tape, precise editing may not be possible. To ensure that the Time Code is recorded without interruption, we recommend that you use the Camera Search Function (p. 30) or Blank Search Function (p. 30) before starting to record a new scene.

■ Memory Stop Function

The Memory Stop Function is convenient for the following operations.

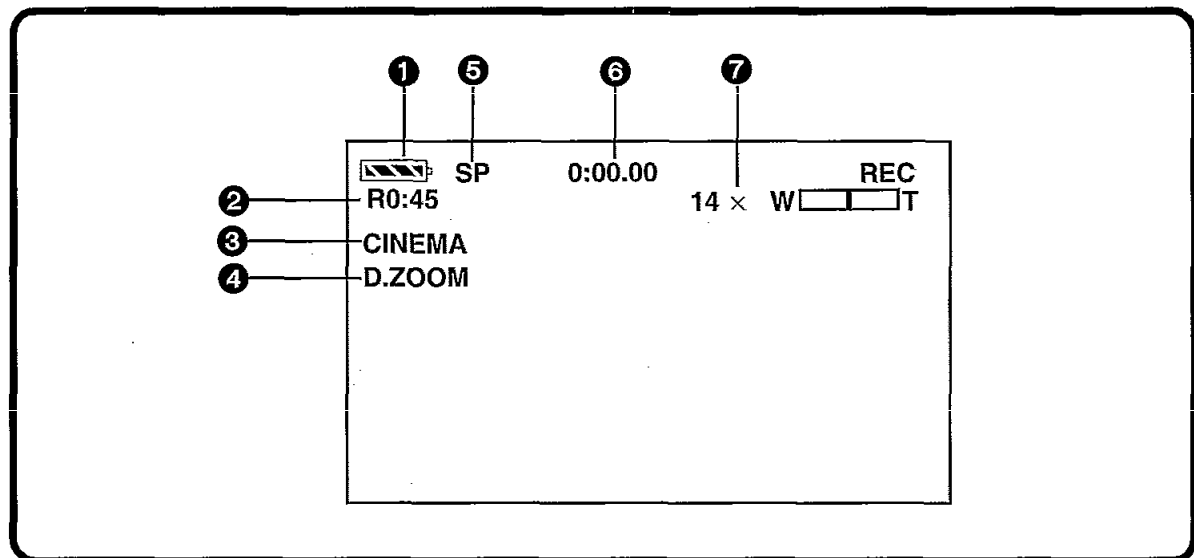
Rewinding or fast-forwarding the tape to a desired position

- 1** Reset the Tape Counter to zero at the tape position from which you want to play back later.
- 2** Set [DISPLAY] on the [CAMERA MENU2] Menu or [VCR MENU2] Menu to [MEMORY].
- 3** Start playback or recording.
- 4** After playback or recording is finished: Press the [VCR/CAMERA] Button so that the [VCR] Lamp lights.
- 5** Rewind the tape.
The tape automatically stops approximately at the position at which you reset the counter to zero.

Stopping the editing automatically in the audio dubbing

- 1** Reset the Tape Counter to zero at the tape position at which you want the editing to stop.
- 2** Set [DISPLAY] on the [CAMERA MENU2] Menu or [VCR MENU2] Menu to [MEMORY].
- 3** Play back a still picture at the point at which you want the audio dubbing to start.
- 4** Start the audio dubbing. (p. 48)
The audio dubbing automatically stops approximately at the position at which you reset the counter to zero.



Indications on the LCD Monitor/in the Viewfinder




① Remaining Battery Power

As the remaining battery power decreases, the indication changes as follows:



When the battery is completely discharged, the  () indication flashes.

(When you are using the AC Adaptor, the  indication may appear, however, this has no meaning in this case.)

② Remaining Tape Time

The remaining tape time is displayed in minutes. (When it becomes less than 3 minutes, the indication starts to flash.)

- If a recording lasts less than 15 seconds, the Remaining Tape Time cannot be displayed correctly.
- The displayed remaining tape time may be shorter than the actual remaining tape time.

③ Cinema Mode (p. 22)

When recording the Cinema Mode, this indication is displayed.

④ Digital Zoom (p. 21)

When the Digital Zoom function is activated, this indication is displayed.

Digital Effects (p. 38)

When a digital effect is activated, the corresponding indication is displayed.

⑤ Recording Speed Mode (p. 11)

The selected Recording Speed Mode is displayed.

SP: Standard Mode
LP: Long-play Mode

⑥ Tape Counter, Time Code (p. 79)

The Tape Counter, Memory Stop Function or Time Code Indication is displayed.

⑦ Zoom Magnification (p. 20)

When you push the [W/T] Zoom Lever up or down, the Zoom Magnification Indication and the Zoom Gauge are displayed.

Recording Mode (p. 14, 36, 42, 44)

AUTO: This appears when the Mode Selector Switch is set to [AUTO].
MNL: This appears when the Mode Selector Switch is set to [MNL].

Super Image Stabilizer (p. 22)



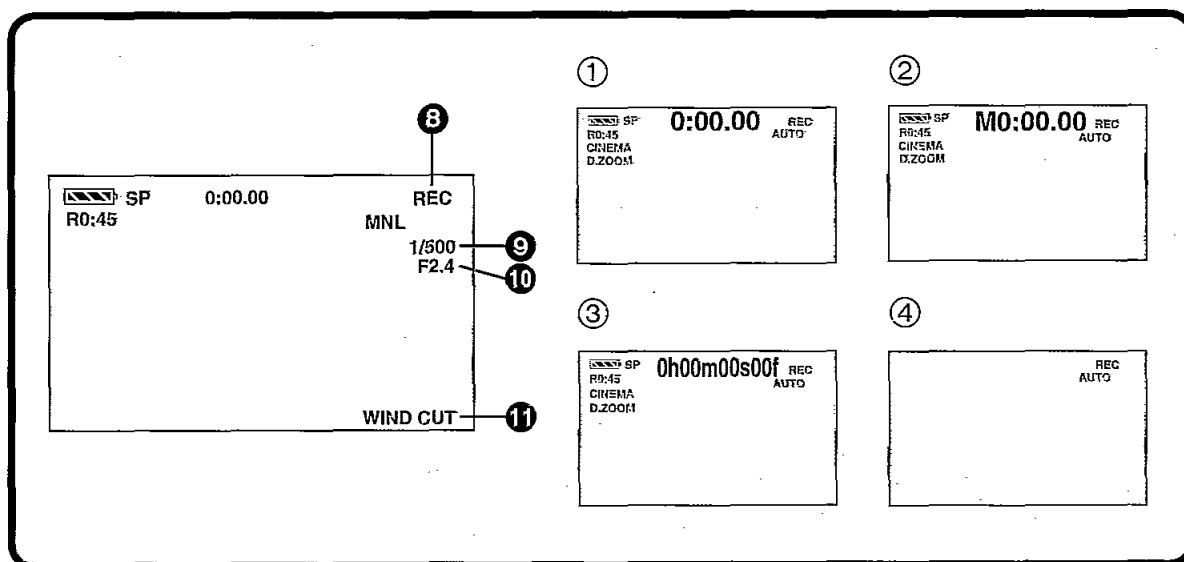
: When the Super Image Stabilizer Function is activated, this indication is displayed.

Audio Recording Mode (p. 48)

12bit/16bit: The indication of the Audio Recording Mode that was selected for recording is displayed during playback.

Automatic Printing (p. 59)

AUTOPRINT: This indication is displayed when the Auto Print Function is being used.



8 Tape Run Indications

- REC: Recording (p. 14)
 PAUSE: Recording Pause (p. 14)
 ▷: Playback (p. 24)/Camera Search in forward direction (p. 30)
 ◁: Camera Search in reverse direction (p. 30)
 II: Still playback (p. 26)
 ▷▷: Fast-forward/Cue playback (p. 24)
 ◁◁: Rewind/Review playback (p. 24)
 I▷/◁I: Slow Playback in forward direction/Slow Playback in reverse direction (p. 26)
 II▷/◁II: Still Advance playback in forward direction/Still Advance playback in reverse direction (p. 26)
 ▷▷I/◁◁I: Index Search in forward direction/Index Search in reverse direction (p. 32)
 CHK: Recording check (p. 16)
 A.DUB ▷: Audio dubbing (p. 48)
 A.DUB II: Audio dubbing pause (p. 48)
 PHOTO: Recording in the Photoshot Mode (p. 20)
 BLANK: Blank Search (p. 30)
 R ▷: Repeat playback (p. 73)

- When recording with the LCD Monitor facing forward using the Mirror Mode, only the Remaining Battery Power Indication, the Recording Indication [●] and the Recording Pause Indication [●II] are displayed.

9 Shutter Speed

When you manually adjust the shutter speed, this indication is displayed. (p. 44)

10 Iris Value (F Number)

When you manually adjust the iris, this indication is displayed. (p. 44)

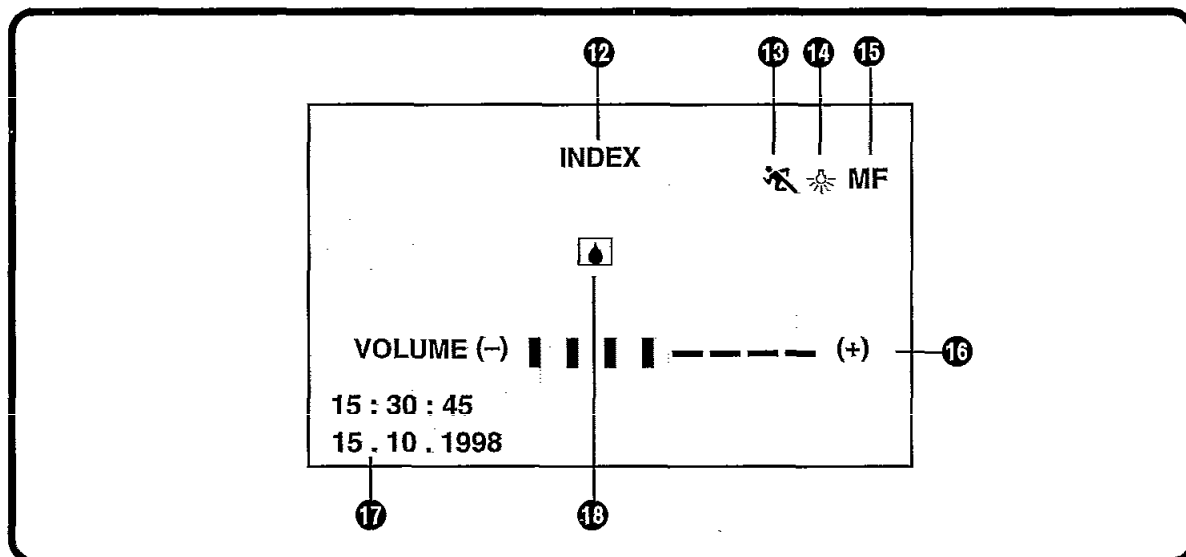
11 Wind Noise Reduction [WIND CUT]

If you set [WIND CUT] on the [CAMERA MENU2] Menu to [ON], the [WIND CUT] Indication is displayed.

Changing the Indications

By changing the setting for [DISPLAY] on the [CAMERA MENU2] Menu or [VCR MENU2] Menu, or by repeatedly pressing the [DISPLAY] Button on the Remote Controller (p. 50), the Counter Display Mode can be changed in the order shown in the above illustrations ① - ④.

- ① Tape Counter Indication
- ② Tape Counter Indication with activated Memory Stop Indication
- ③ Time Code Indication
- ④ No Indication
 (In this mode, only the Tape Run Indications, Warning/Alarm Indications, Date/Time Indications, Programme AE Mode Indications, Manual Focus Mode Indications, White Balance Mode Indications, and Zoom Magnification Indication can be displayed.)



12 Index (p. 33)

INDEX: The [INDEX] indication flashes for a few seconds while an index signal is being recorded.

Search Number (p. 33)

S1: The figure indicates which number of scene ahead from the present scene is to be played back.

13 Programme AE Mode (p. 36)

The Programme AE Function offers the following settings:

- : Sports Mode
- : Portrait Mode
- : Low Light Mode

14 White Balance Mode (p. 42)

The White Balance Mode offers the following possible settings:

- : Indoor Mode
(recording under incandescent lamp)
- : Outdoor Mode
- : Last manually adjusted White Balance setting

When the Movie Camera is in the Auto Mode, none of the above 3 indications are displayed.

15 Manual Focus (p. 18)

if you select the Manual Focus Mode, the [MF] Indication is displayed.

16 Sound Volume (p. 24)

Use this indication to adjust the volume of the playback sound from the built-in speaker. With the [VCR] Lamp lit, keep the [PUSH] Dial pressed until the [VOLUME] Indication appears. Then turn the [PUSH] Dial to adjust the volume.

17 Date and Time (p. 25)

The time is indicated in the 24-hour system.

18 Warning/Alarm

When any of the following indications lights or flashes, confirm the condition of the Movie Camera.

- : Condensation has occurred. (p. 71)
- : The erasure prevention slider of the inserted cassette is closed (set to [SAVE]). (p. 10)
- : No cassette is inserted. (p. 10)
- : The built-in battery is discharged. (p. 69)
- : The heads are dirty. (p. 71)
- END:** During recording, the tape has reached its end.
- REMOTE:** Wrong Remote Controller Mode is selected. (p. 53)
- PRINTER ERROR:** This indication is displayed if you set [AUTO PRINT] on the [VCR MENU2] Menu to [ON] when no printer is connected to the Movie Camera. (p. 59)

Specifications

Digital Video Camera

Information for your safety

Power Source:	DC 7.9/7.2V
Power Consumption:	Recording: 4.8 W (When using Viewfinder) 5.6 W (When using LCD Monitor)
Recording Format:	Mini DV (Consumer-use Digital Video SD Format)
Tape Used:	6.35 mm digital video tape
Recording/Playback Time:	SP: 60 min.;LP: 90 min. (with DVM60)
Video Recording System:	Digital Component
Television System:	CCIR: 625 lines, 50 fields PAL colour signal
Audio Recording System:	PCM Digital Recording: 16 bit (48 kHz/2ch), 12 bit (32 kHz/4ch)
Input Sensitivity/ Impedance	MIC IN (M3);-70dBV, 4.7 Kohm
Image Sensor:	1/3-inch CCD Image Sensor
Lens:	Auto Iris, F1.4, Focal Length; 3.9-66.3 mm, Macro (full range AF)
Filter Diameter:	43 mm
Zoom:	17:1 Power Zoom
Monitor:	2.5-inch LCD
Microphone:	Stereo
Speaker:	1 round speaker \varnothing 20 mm
Standard Illumination:	1,400 lx
Minimum Required Illumination:	1 lx (Digital Gain-up Mode)
Video Output Level:	1.0 Vp-p, 75 ohm
S-Video Output Level:	Y Output: 1.0 Vp-p, 75 ohm C Output: 0.3 Vp-p, 75 ohm
Audio Output Level:	316 mV, 600 ohm
Digital Still Picture:	Digital Still Picture Output, Control Signal Input/Output (Transfer rate: max. 115kbps)
Digital Interface:	DV Output Terminal (i.LINK, 4-pin)
Dimensions:	Approx. 81 (W)×106 (H)×205 (D) mm
Weight:	Approx. 710 g (without Battery) Approx. 790 g (with CGR-D120 and DVM60)
Operating Temperature:	0°C-40°C
Operating Humidity:	10%-80%

AC Adaptor

Information for your safety

Power Source:	AC 100-240 V, 50/60 Hz
Power Consumption:	20 W
DC Output:	DC 7.9 V, 9 W (Movie Camera Operation) DC 8.4 V, 1.2 A (Battery Charging)
Dimensions:	102 (W)×50 (H)×79 (D) mm
Weight:	Approx. 230g

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Miscellaneous/
Care of Unit

Before Requesting Service (Problems & Solutions)

Power Supply

P1: The Movie Camera does not turn on.

S1: Is the Battery or the AC Adaptor connected correctly? Confirm the connection. (p. 6, 8)

P2: The Movie Camera has turned off automatically.

S2: If you leave the Movie Camera in the Recording Pause Mode for more than 6 minutes, it automatically switches off to protect the tape and to conserve battery power. (p. 15)

P3: The Movie Camera quickly turns off.

S3-1: Is the Battery discharged? When the Remaining Battery Power Indication is flashing or the [] Indication is displayed, the Battery is discharged. Charge the Battery or attach a fully charged Battery. (p. 8, 78)

S3-2: Has condensation formed? If the Movie Camera is brought from a cold to a warm place, condensation may form inside. In this case, the Movie Camera automatically switches off and no operation can be performed except taking out the cassette. Wait until the Condensation Indication disappears. (p. 71)

Battery

P1: The Battery discharges quickly.

S1-1: Is the Battery fully charged? Charge it until all 3 Charge Lamps on the AC Adaptor light. (p. 8)

S1-2: Are you using the Battery in a place where the temperature is very low? The ambient temperature greatly influences the Battery's performance. Its operation time becomes shorter in a cold place. (p. 72)

S1-3: Has the Battery reached the end of its service life? The service life of the Battery is limited. It depends on the way the Battery is used, but when the operation time even after proper charging is too short for normal use, the service life of the Battery has reached its end.

P2: The Battery cannot be charged.

S2: If the DC Input Cable is connected to the AC Adaptor, charging is not possible. Disconnect the DC Input Cable.

Recording

Normal Recording

P1: Recording cannot be started even though the Movie Camera is supplied with power and the cassette is inserted correctly.

S1-1: Is the erasure prevention slider of the cassette open? If it is open (set to [SAVE]), recording is not possible. (p. 11)

S1-2: Has the tape reached its end? Insert a new cassette. (p. 10)

S1-3: Is the Movie camera turned on? (p. 14)

S1-4: Is the [VCR] Lamp lit? If it is lit, recording is not possible. (p. 24)

S1-5: Is the Condensation Indication [] displayed? When condensation has formed, no functions except taking out the cassette can be operated. Wait until the Condensation Indication disappears. (p. 71)

Other Recording

P1: The picture on the LCD Monitor/in the Viewfinder suddenly stands still for a few seconds.

S1-1: Did you press the [PHOTOSHOT] Button? If you press the [PHOTOSHOT] Button, a still picture is recorded for approximately 7 seconds. After approximately 7 seconds, the Movie Camera switched back to the Recording Pause Mode. (p. 20)

P2: The Auto Focus Function does not work.

S2-1: Is the Manual Focus Mode selected? If you select the Auto Focus Mode, the focus is adjusted automatically. (p. 18)

S2-2: Is the subject or recording situation suitable for the Auto Focus Mode? The Auto Focus Function does not work correctly for some kinds of subjects and recording situations. In this case, use the Manual Focus Mode to adjust the focus. (p. 74)

Editing

P1: Audio dubbing cannot be performed.

S1-1: Is the erasure prevention slider of the cassette open? If it is open (set to [SAVE]), editing is not possible. (p. 11)

S1-2: Are you trying to edit parts of the tape recorded in the LP Mode? As the tracks recorded in the LP Mode are narrower than the heads, audio dubbing is not possible. (p. 11)

Indications

P1: The Time Code becomes incorrect.

S1: In the Slow Motion Playback Mode in reverse direction, the counter of the Time Code Indication may not be stable, however, this is not a malfunction.

P2: The Remaining Tape Time Indication disappears.

S2: If you record a still picture in the Photoshot Mode, the Remaining Tape Time Indication may disappear temporarily. However, if you switch the Movie Camera over to the Normal Recording Mode, it appears again.

P3: The Remaining Tape Time Indication does not match the actual remaining tape time.

S3-1: If scenes of less than 15 seconds are recorded successively, the remaining tape time is not indicated correctly.

S3-2: The Remaining Tape Time Indication may show a remaining tape time that is 2–3 minutes shorter than the actual remaining tape time.

Playback (Picture)

P1: No playback picture is reproduced when pressing the Play Button [▶].

S1: Did you press the [VCR/CAMERA] Button so that the [VCR] Lamp lights? When the [VCR] Lamp is not lit, no playback functions can be operated. (p. 25)

P2: Mosaic-like patterns appear in the picture during Cue, Review or Slow Motion Playback.

S2: This phenomenon is a characteristic of the digital video system. This is not a malfunction. (p. 24)

P3: The Movie Camera is correctly connect to a TV, but no playback picture is reproduced.

S3: Did you select "Video Input" on the TV? Carefully read the operating instructions for your TV and select the channel that matches the input sockets used for connection.

P4: The playback picture is not reproduced clearly.

S4: Are the video heads on the Movie Camera dirty? If the video heads are dirty, the picture cannot be played back clearly. (p. 71)

Playback (Sound)

P1: No sound is played back from the Movie Camera's built-in speaker.

S1: Is the volume set too low? With the [VCR] Lamp lit, keep the [PUSH] Dial pressed until the [VOLUME] Indication appears. Then turn the [PUSH] Dial to adjust the volume. (p. 24)

P2: Different sounds are played back together.

S2: [12bit AUDIO] on the [VCR MENU1] Menu is set to [MIX]. Therefore, the original sound and the sound dubbed with audio dubbing are played back together. It is also possible to play them back individually. (p. 49)

P3: The original sound was erased by performing audio dubbing.

S3: If you perform audio dubbing on a recording made in the [16bit] Mode (p. 48), the original sound is erased. If you want to keep the original sound, be sure to select the [12bit] Mode for the original recording.

P4: No playback sound is reproduced.

S4: Are you playing back a cassette that was recorded with [AUDIO REC] on the [CAMERA MENU2] Menu set to [12bit]? In this case, make sure that [12bit AUDIO] on the [VCR MENU2] Menu is set to [ST1] (p. 49).

Others

P1: The cassette cannot be taken out.

S1-1: Is the Movie Camera supplied with power? Is the AC Adaptor correctly connected or the Battery correctly attached? To remove the cassette, the Movie Camera must be supplied with power, however, it is not necessary to set the [POWER] Switch to [ON].

S1-2: The attached Battery may be discharged. Replace it with a charged Battery.

P2: No operation except taking out the cassette can be performed.

S2: Is the Condensation Indication [] displayed? If condensation has formed inside the Movie Camera, it automatically switches off and prevents all operations except taking out the cassette. Wait until the Condensation Indication disappears. (p. 71)

P3: The Remote Controller does not work.

S3-1: Is the button-type battery in the Remote Controller exhausted? If the Remote Controller does not work when you use it near the Remote Controller Sensor on the Movie Camera, the button-type battery is exhausted. Replace it with a new battery. (p. 52)

S3-2: Is the correct Remote Controller Mode selected? If the Movie Camera's setting for [REMOTE] on the [CAMERA MENU3] Menu or [VCR MENU2] Menu and the mode selected on the Remote Controller are not matched, operating the Movie Camera with the Remote Controller is not possible and the [REMOTE] Indication is displayed. (p. 53)

Index

A

AC Adaptor (p. 6, 8)
AC Mains Socket (p. 6, 8)
Audio Dubbing (p. 48)
Auto Focus (p. 14, 74)
Automatic Printing Function (p. 59)
Automatic White Balance Adjustment (p. 75)

B

Backlight (p. 16)
Battery Eject Button (p. 9)
Before Requesting Service (p. 82)
Blank Search (p. 30)

C

Camera Search (p. 30)
Charge Confirmation Marker (p. 8)
Charge Lamp (p. 9)
Cinema Mode (p. 22)
Condensation (p. 71)
Colour Temperature (p. 75)
Cue Playback (p. 24)

D

Date/Time Indication (p. 25)
Date/Time Setting (p. 68)
DC Input Cable (p. 6)
Digital Effects (p. 38, 46)
Digital Zoom (p. 21)
Dubbing (p. 54)

E

Editing Controller (p. 56, 57)
[EDIT] Socket (p. 56, 57, 58, 59)
Erasure Prevention Slider (p. 11)
Eyepiece Corrector Knob (p. 12)

F

Fade (p. 34)
FF (Fast-Forward) (p. 24)
F Number (p. 44)

G/H

Gain Up (p. 38)
Grip Belt (p. 4)
Hyper Check Function (p. 25)

I

Index Signals (p. 33)
Iris (p. 44)

J

Jog Playback (p. 27)

L

LCD Monitor (p. 12, 78)
Lens Cap (p. 13, 29, 42)
Low Light Mode (p. 36)

M

Macro Close-up Function (p. 21)
Mains Cable (p. 6, 8)
Manual Focus (p. 18)
Memory Stop Function (p. 77)
Menu Screen (p. 62)
Microphone (p. 5)
Mix Mode (p. 40, 46)
Multi-Function Dial [PUSH]
(p. 24, 27, 44, 62)

O/P

Optional Accessories (p. 61)
PCM Digital Sound (p. 76)
Photoshot (p. 20)
Playing Back on a TV (p. 28)
Portrait Mode (p. 36)
Power Switch (p. 12, 14)
Problems & Solutions (p. 82)
Programme AE (p. 36)

R

Recording Check (p. 16)
Recording Lamp (p. 15)
Recording Pause Mode (p. 15)
Recording Start/Stop Button (p. 14)
Rec Speed (p. 11)
Remaining Tape Time (p. 78)
Remote Controller (p. 50–53)
Review Playback (p. 24)

S

Search Lock (p. 25)
Shutter Speed (p. 44)
Slow Motion playback (p. 26)
Sound Volume (p. 24)
SP/LP Mode (p. 11)
Sports Mode (p. 36)
Still Advance Playback (p. 26)
Strobe Mode (p. 38)
Sub Code (p. 76)
Super Image Stabilizer (p. 22)

T

Time Code (p. 77)

V

Video Head Clogging (p. 71)
Video Printer (p. 58)
Viewfinder (p. 12, 78)

W

White Balance (p. 42)
Wipe Mode (p. 40, 46)

Z

Zoom (p. 20)

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.



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B

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F0798G0 (2000 (A)
D



 3GKN		Door No. 4	 51
		Drop No. 0	
Customer: PCSUR CIA2			
Load: STRWE6			
Model: VQT7655		Qty: 1	
Assemble at: 01		10/11/90	

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