

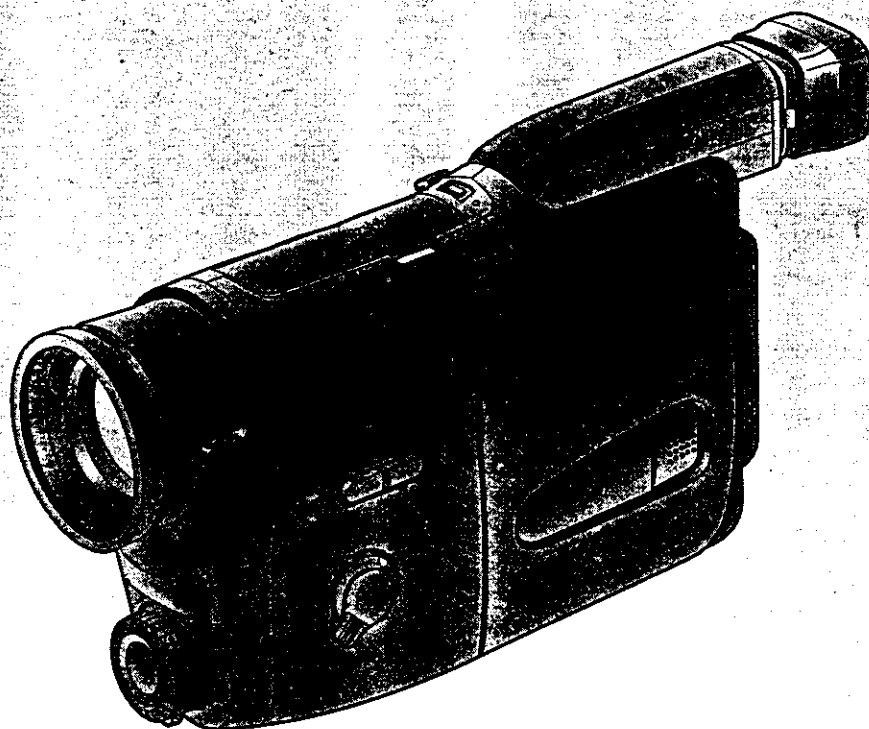
# Panasonic

VHS-C Movie Camera

NV-RX3A

NV-RX7A

Operating Instructions



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

VQT6534

Basic  
Operations

5~

Advanced  
Operations

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Options/  
Editing

52~

Miscellaneous/  
Care of Unit

56~

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## **Information for Your Safety**

### **IMPORTANT**

Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

### **WARNING**

**TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.**

#### **VHS-C Movie**

- 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.

## **FOR YOUR SAFETY**

### **■ DO NOT REMOVE THE OUTER COVER.**

To prevent electric shock, do not remove the cover. There are no user serviceable parts inside. Refer servicing to qualified service personnel.

**IF THE SUPPLY CORD OF THIS EQUIPMENT IS DAMAGED, IT MUST BE REPLACED BY THE SPECIAL CORD.**

### **CAUTION:**

**TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.**

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Basic Operations

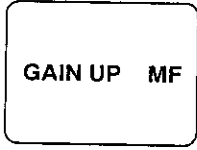
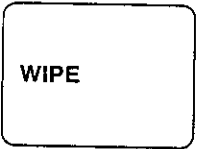
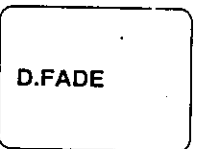
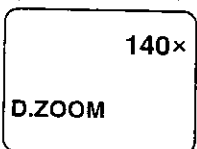
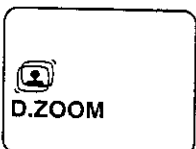
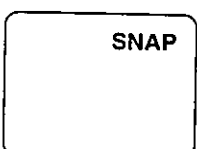
Advanced Operations

Options/Editing

Miscellaneous/Care of Unit

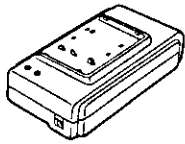
Index



	Item	Page	NV-RX3A	NV-RX7A
Switches, Sockets	[MIC] Socket	7	No	Yes
	[DIGITAL] Dial	43, 44, 46	No	Yes
	[SNAPSHOT REC] Button	46	No	Yes
Viewfinder Indication		42	No	Yes
		44	No	Yes
		46	No	Yes
		42	No	Yes
		44	No	Yes
		46	No	Yes

The explanations are mainly based on the model NV-RX7A. When functions and operations of the NV-RX3A are different from those of the NV-RX7A, explanatory notes are inserted in the relevant items or pages.

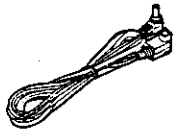
## AC Adaptor Set



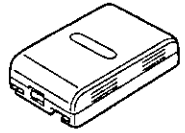
AC Adaptor



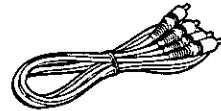
Mains Cable



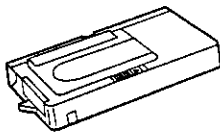
DC Input Cable



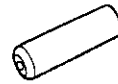
Battery Pack



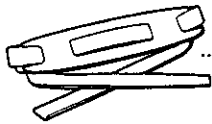
Audio/Video Cable



Cassette Adaptor



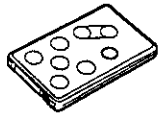
Battery



Shoulder Strap  
(NV-RX3A)



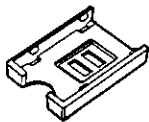
Shoulder Strap  
(NV-RX7A)



Remote Controller

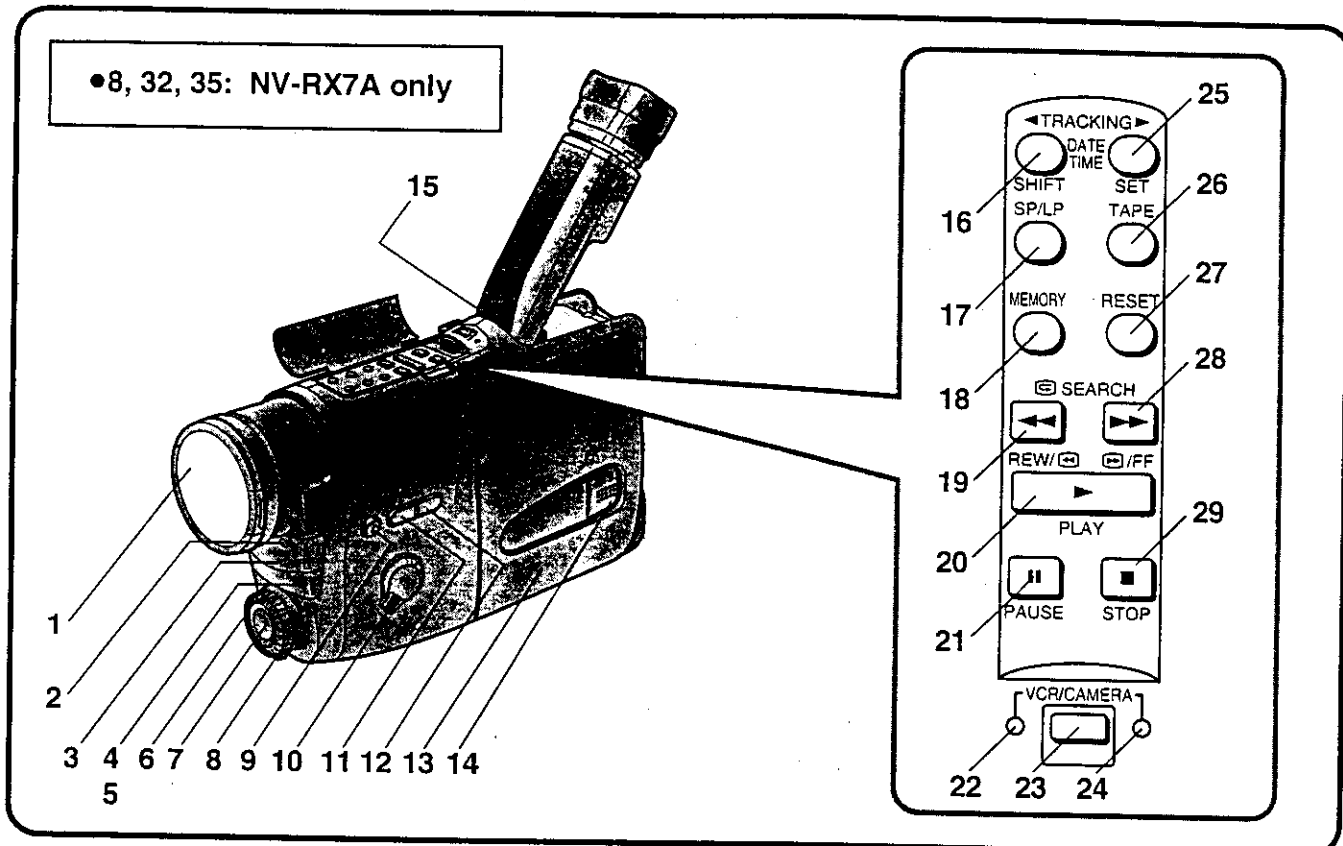


Button-Type  
Battery



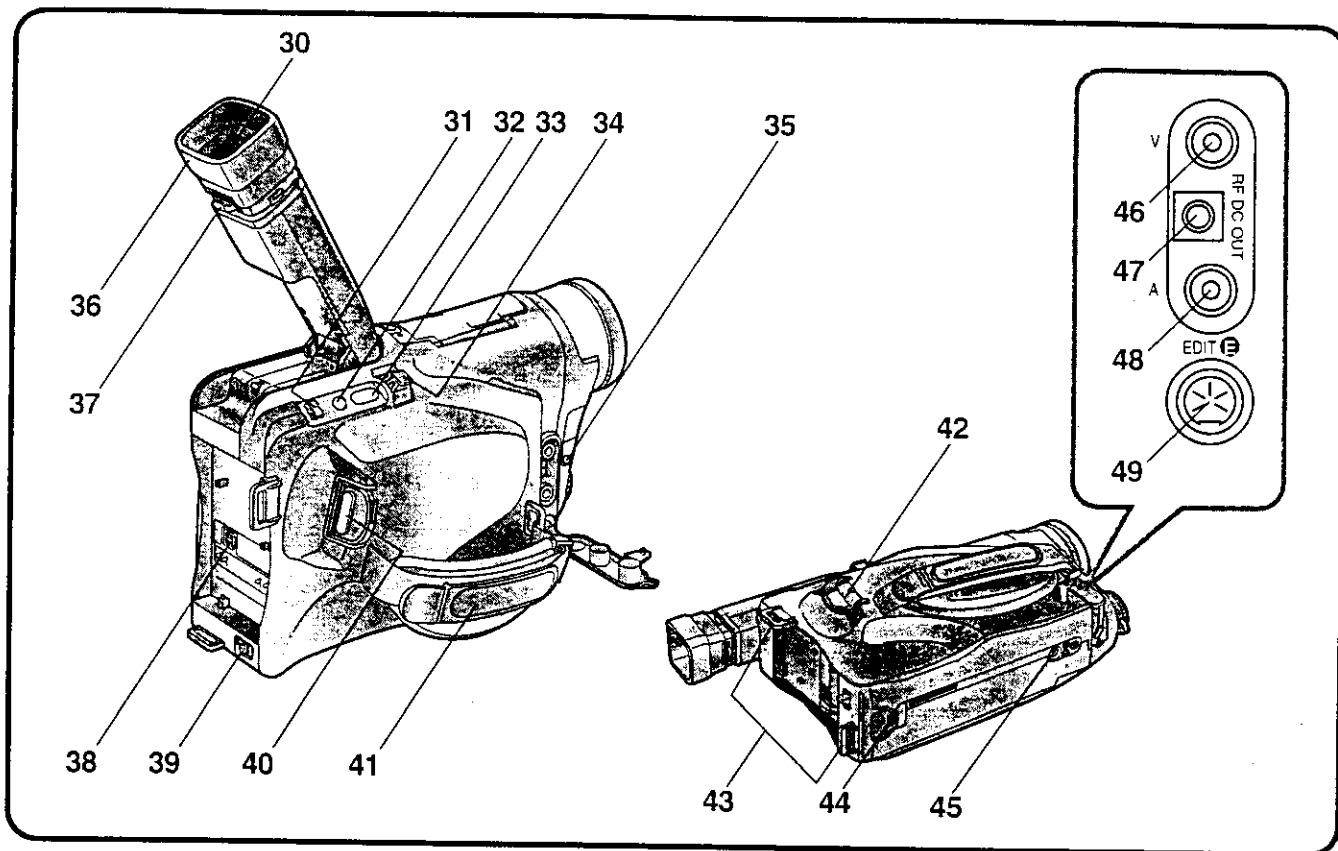
Remote Controller  
Holder

- When purchasing an additional AC Adaptor, order model number VW-AS4E.
- For purchasing additional Battery Packs, see the list of optional accessories on p. 54.



•8, 32, 35: NV-RX7A only

- |   |   |
|---|---|
| <p>1 Lens Cap (p. 14, 34, 56)</p> <p>2 Recording Indicating Lamp<br/>This Lamp lights during recording.</p> <p>3 Microphone</p> <p>4 White Balance Sensor (p. 34)</p> <p>5 Remote Control Receiver Window (p. 9)</p> <p>6 Focus Ring (p. 31)</p> <p>7 [FOCUS] Button (p. 30)</p> <p>8 [DIGITAL] Dial (p. 43, 44, 46)</p> <p>9 [FADE] Button (p. 40, 46)</p> <p>10 [AE] Selector (p. 19, 30, 34, 39)<br/>Use this selector to set the desired AE mode.</p> <p>11 [DATE/TIME] Button (p. 16)</p> <p>12 [W.B] Button (p. 35)</p> <p>13 Cassette Compartment Cover (p. 15)</p> <p>14 Cassette Compartment [LOCK] Button.<br/>(p. 15)</p> <p>15 Dew Sensor Slot<br/>Through this slot, the Movie Camera detects condensation. Take care not to let this slot gets clogged with dirt and not to cover it with your fingers, etc.</p> <p>16 [DATE/TIME/SHIFT • ◀ TRACKING] Button (p. 16, 49)<br/>Press this button to adjust the tracking in order to eliminate distortions in the playback picture, or press it to advance to the next item during the setting of the date and time.</p> | <p>17 [SP/LP] Button (p. 18)</p> <p>18 [MEMORY] Button (p. 20)</p> <p>19 [REW/◀] Button (p. 26, 48)<br/>Use this Button for:<br/>•Recording Review<br/>•Review<br/>•REW (Rewind)<br/>•Camera Search</p> <p>20 [PLAY] Button (p. 27)</p> <p>21 [PAUSE] Button (p. 27)</p> <p>22 "VCR" Indication Lamp (p. 26)</p> <p>23 [VCR/CAMERA] Button (p. 26)<br/>Press this Button to select the "VCR" Mode for playback or the "CAMERA" Mode for recording.</p> <p>24 "CAMERA" Indication Lamp (p. 18)</p> <p>25 [DATE/TIME/SET • TRACKING ▶] Button (p. 16, 49)<br/>Press this button to adjust the tracking in order to eliminate distortions in the playback picture, or press it to set the correct date and time.</p> <p>26 [TAPE] Button (p. 20)</p> <p>27 [RESET] Button (p. 20)</p> <p>28 [▶/FF] Button (p. 26, 49)<br/>Use this Button for:<br/>•Cue<br/>•FF (Fast-Forwarding)<br/>•Camera Search</p> <p>29 [STOP] Button (p. 27)</p> |
|---|---|

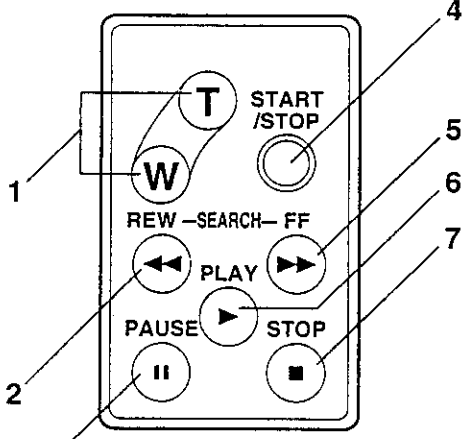


- 30 Viewfinder (p. 14, 22, 57)
- 31 [EJECT ▲] Lever (p. 14)
- 32 [SNAPSHOT REC] Button (p. 46)
- 33 [BACKLIGHT] Button (p. 40)
- 34 [W • T] Zoom Lever (p. 19)
- 35 [MIC] Socket  
To record sound with an external microphone, connect it to the [MIC] Socket. (Connecting an external microphone automatically disconnects the built-in microphone.) Ensure that the microphone conforms with the following requirements:
  - Connection Cable: M3-type plug
  - Impedance: less than 4.7 kohm
  - Type: Mono-type
  - Sensitivity: Approx. -70 dB
  - Microphone Power Source: A type that does not require a power source

- 36 Eyecup
- 37 Eyepiece Correction Adjuster (p. 15)
- 38 [DC IN] Socket (p. 10, 52)
- 39 [BATTERY EJECT ►] Lever (p. 13, 56)
- 40 Recording Start/Stop Button (Red) (p. 19)
- 41 Grip Belt (p. 56)
- 42 [POWER] ON/OFF Switch (p. 14)
- 43 Shoulder Strap Holders (p. 56)

- 44 [POWER SAVE] Switch (p. 50)  
Setting this switch to "ON" activates the Power Save Function.
- 45 Tripod Receptacle  
Attach a tripod (optional) to this receptacle.
- 46 [VIDEO OUT] Socket (p. 10, 52)
- 47 [RF DC OUT] Socket  
To play back via a TV Set without AV Input Socket, connect this Socket to the RF IN Socket of the TV Set using an RF Adaptor (optional).
- 48 [AUDIO OUT] Socket (p. 10, 52)
- 49 [EDIT] Socket (p. 53)

■ Controls and Functions



1 [W·T] Zoom Buttons (p. 19)

2 [REW] Button (p. 26, 48)

Use this Button for:

- Recording Review
- Review
- REW (Rewind)
- Camera Search

3 [PAUSE] Button (p. 27)

4 Recording Start/Stop Button (p. 19)

5 [FF] Button (p. 26, 49)

Use this Button for:

- Cue
- FF (Fast-Forwarding)
- Camera Search

6 [PLAY] Button (p. 27)

7 [STOP] Button (p. 27)

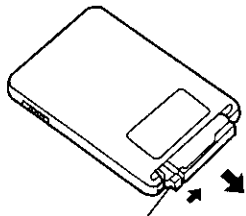
■ How to Insert the Button-Type Battery

1 Pull out the Battery Holder while pushing the stopper.

2 Turn the Battery Holder upside down and insert the Battery with the (+) mark facing downward until it locks with a click.

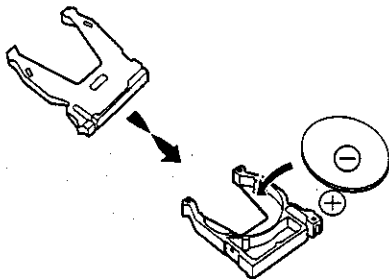
3 Insert the Battery Holder into the Remote Controller.

1

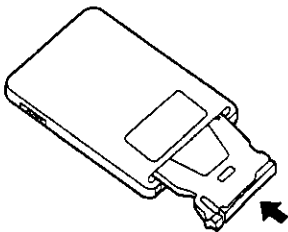


Stopper

2



3



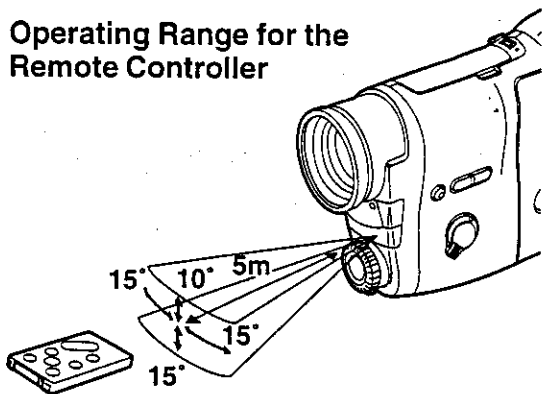
■ Replacing the Button-Type Battery

The life of the battery is about one year.

Replace the exhausted battery with a new CR2025 Battery.

Information for your safety

■ Operating Range for the Remote Controller



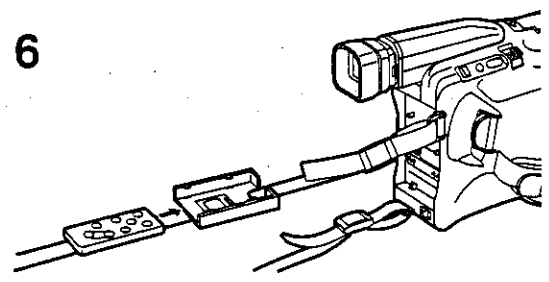
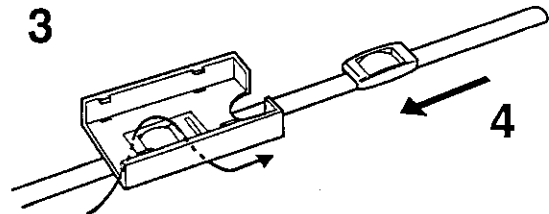
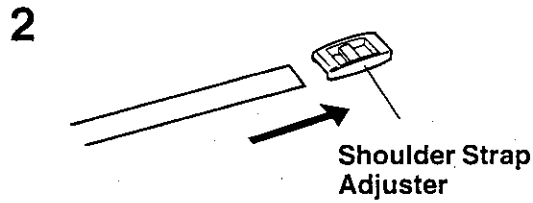
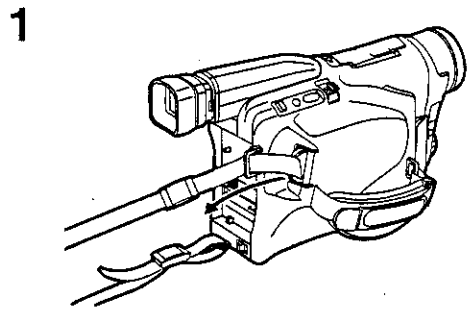
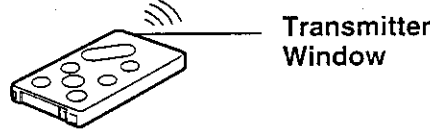
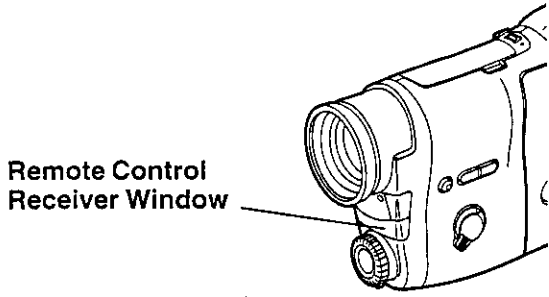
**WARNING**

"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".





When you want to take part in the action that you are recording, simply place the Movie Camera on a tripod and then start and pause recording as well as operate the zoom and other functions by pressing a button on the Remote Controller. Aim it at the Remote Control Receiver Window on the front of the Movie Camera and press the corresponding Button.

For details about the functions of the buttons on the Remote Controller, refer to the corresponding pages (listed on the left page). However, except on this page, the use of the Remote Controller is not explained in this manual.

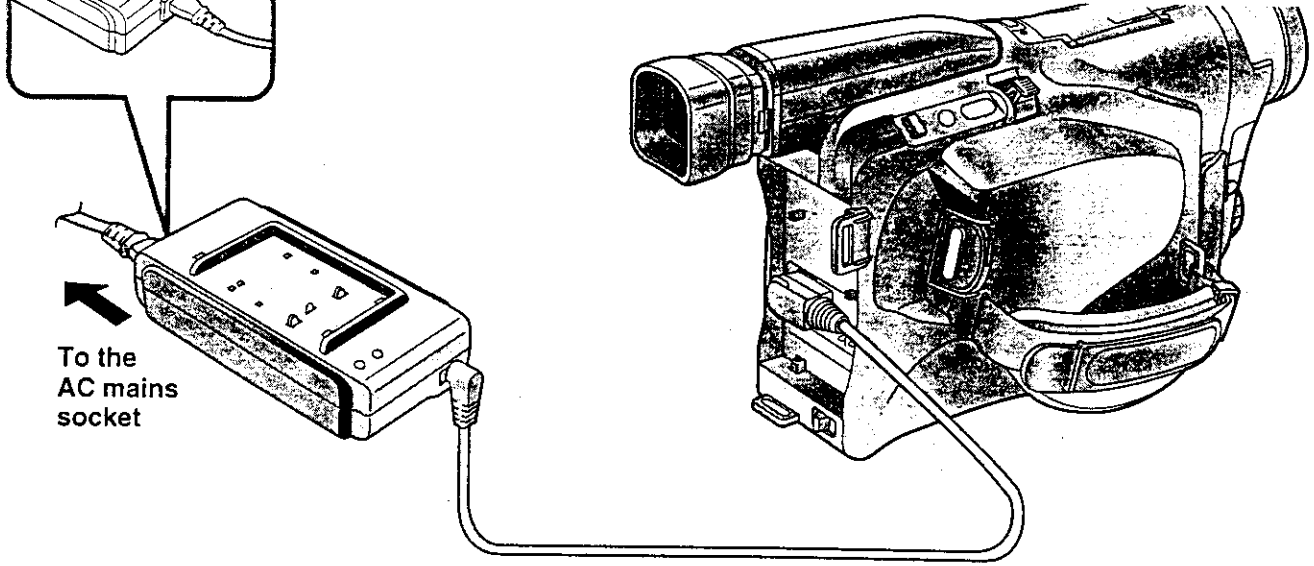
**Notes:**

- Do not cover the Transmitter Window on the Remote Controller with your hand, etc.
  - The Remote Controller may not operate correctly if it is used in direct sunlight, near fluorescent lamps or too close to the Movie Camera.
  - When using the Remote Controller outdoors, operating range may become shorter than 5 metres.
  - The zooming speed can not be changed.
  - To prevent inadvertent operation of other infra-red remote-controlled units, this Movie Camera needs to receive each infra-red command 3 times.
- For this reason, there is a slight delay between pressing the [W] or [T] Button on the Remote Controller and the actual operation of the mechanical zoom function on the Movie Camera.

■ **Using the Remote Controller Holder**

(To keep the Remote Controller handy when you go out recording)

- 1** Remove one end of the Shoulder Strap from the Movie Camera.
- 2** Remove the Shoulder Strap Adjuster.
- 3** Pull the Shoulder Strap in the direction of the arrow through the two slits on the back of the Remote Controller Holder.
- 4** Re-attach the Shoulder Strap Adjuster.
- 5** Re-attach the Shoulder Strap to the Movie Camera.  
(See "Attaching the Shoulder Strap" on p. 56.)
- 6** Insert the Remote Controller securely into the Holder.



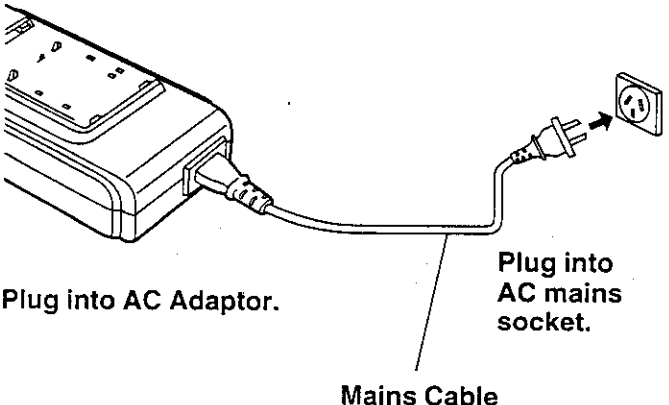
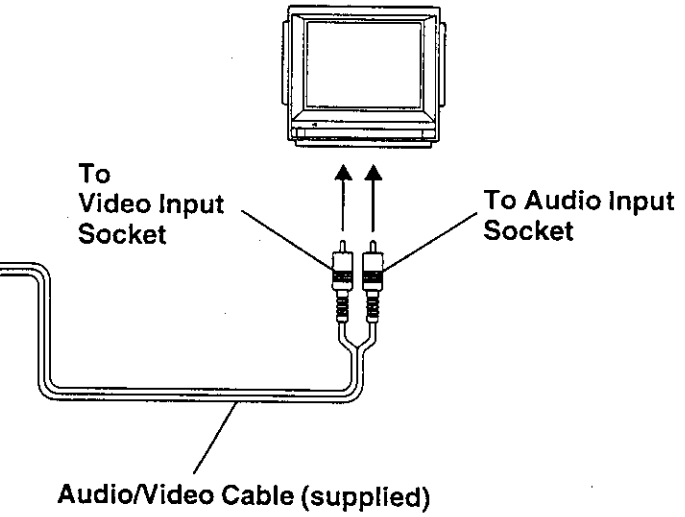
Title	Procedure
<p><b>Using the AC Adaptor as a Power Supply Unit</b></p> <p>If you want to use the Movie Camera with the Battery Pack, it is necessary to charge the Battery Pack first. (p. 12)</p>	<p><b>1</b></p> <p>[DC OUT] Socket</p> <p>[DC IN] Socket</p> <p>DC Input Cable</p>
<p><b>Watching the Picture on a TV Set (Using the Audio/Video Cable)</b></p> <p>Connect after turning off the Movie Camera and the TV Set.</p>	<p>Video</p> <p>Audio</p> <p>Connect the Movie Camera to the TV set.</p>

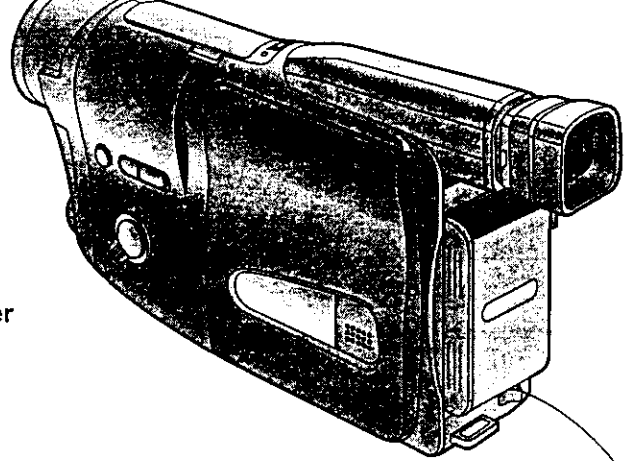
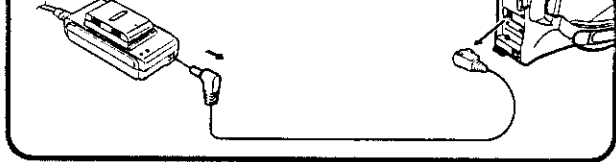
### ■ Cautions for Use

- This AC Adaptor works on any mains supply voltage between 100 and 240 V, and any frequency between 50 and 60 Hz. For use in other countries, an adaptor plug may be necessary.
- Do not handle the AC Adaptor with wet hands.

### ■ Caution for Cleaning

Before cleaning the AC Adaptor, make sure that it is disconnected from the AC mains socket.

	<i>Remarks, etc.</i>
<p><b>2</b></p>  <p>Plug into AC Adaptor.</p> <p>Mains Cable</p> <p>Plug into AC mains socket.</p>	<ul style="list-style-type: none"> <li>• When the AC Adaptor is used to supply the Movie Camera with power, remove the Battery Pack from the AC Adaptor as it cannot charge the Battery Pack and provide power simultaneously.</li> <li>• Do not use the AC Adaptor for any purposes other than supplying the unit with power or charging the Battery Pack.</li> <li>• When listening to a radio while the AC Adaptor is in operation, the radio reception may be distorted. In this case, move the radio further away from the AC Adaptor or move the adaptor away from the Radio.</li> <li>• When not using the AC Adaptor, unplug its mains cable from the AC mains socket. To unplug, pull it by the plug, not by the cable.</li> </ul>
<p>(not supplied)</p>  <p>To Video Input Socket</p> <p>To Audio Input Socket</p> <p>Audio/Video Cable (supplied)</p>	<ul style="list-style-type: none"> <li>• If your TV set is not equipped with an AV Input Socket, the RF Adaptor (optional) is necessary. For its connection, read the operating instructions of the RF Adaptor (VW-RF7E).</li> <li>• Be sure to turn the Movie Camera off before connecting the RF Adaptor.</li> </ul>



BATTERY EJECT ▶

[POWER] Lamp

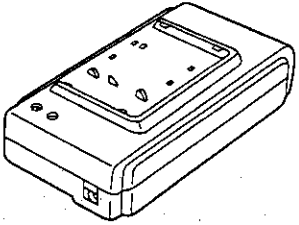
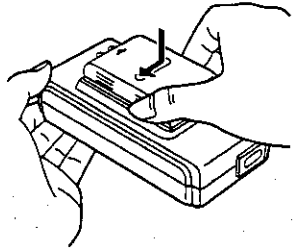
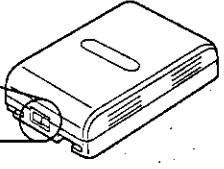
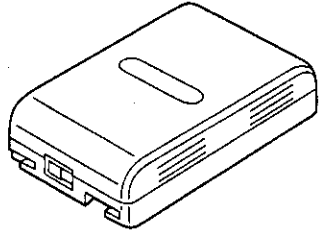
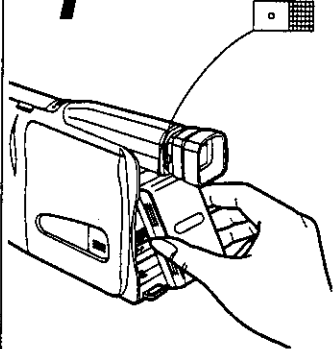
Confirmation Marker

[CHARGE] Lamp

On: During charging.

Off: Charging is finished.

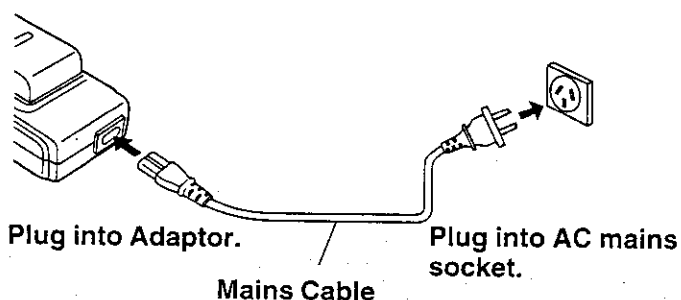
(For maximum charge, continue charging for 2 hours after the [CHARGE] Lamp has gone off.)

Title	Procedure	
<p><b>Charging the Battery Pack</b></p> <ul style="list-style-type: none"> <li>• Be sure to insert the mains plug completely into the correct socket.</li> <li>• Do not connect the DC Input Cable to the AC Adaptor otherwise the Battery Pack cannot be charged.</li> <li>• Ni-MH (Nickel-Metal-Hydride) Battery Packs (VW-VBH10E and VW-VBH20E) may not perform very well in cold conditions (e.g. the snow).</li> <li>• Never remove the Battery Pack during recording or playback, because the tape would remain in contact with the video heads and this could cause damage to the heads and tape.</li> </ul>		<p><b>1</b></p>  <p>Attach the Battery Pack.</p>
<p><b>Attaching the Charged Battery Pack</b></p> <div data-bbox="140 1456 295 1579"> </div> <p>If an exhausted Battery Pack is attached, the "☀" Indication in the Viewfinder flashes, when you turn the Movie Camera on.</p> <p><b>Charge Confirmation Marker</b> Use this marker to distinguish between charged and discharged Battery Packs. For example, slide the Button so that the dot is visible after charging is completed.</p> <div data-bbox="199 1780 327 1915"> </div> 		<p><b>1</b></p>  <p>Attach the Battery Pack with its Charge Confirmation Marker facing upward.</p>

- If you want to improve the charge of a Battery Pack whose operation time has become too short for practical use or which has been stored for a long time, continue charging for 24 hours even after the [CHARGE] Lamp on the AC Adaptor goes out. (If this does not result in an operation time close to that shown in the table, the service life of this Battery Pack has reached its end. Replace it with a new one.)
- To prevent leakage, excessive rise in temperature and explosion, be sure to observe the following points:
  - 1) Use only the specified AC Adaptor or Car Battery Charger to charge the Battery Pack.
  - 2) Do not store or carry the Battery Pack with any metal objects that may accidentally short across the terminals.

- Do not charge the Battery Pack again when it is already fully charged.
  - During use on the Movie Camera and during charging, the Battery Pack may become warm. This is normal.
  - Do not leave the Battery Pack in the Movie Camera While it is in storage.
- 3) Do not heat the Battery Pack or throw it into a fire.
  - 4) Do not apply solder to the Battery Pack and do not disassemble or reconstruct it.

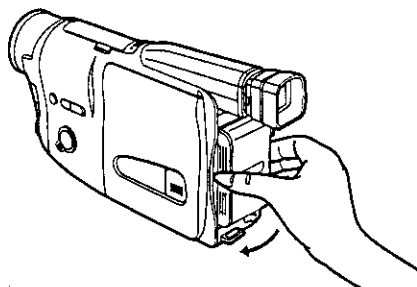
2



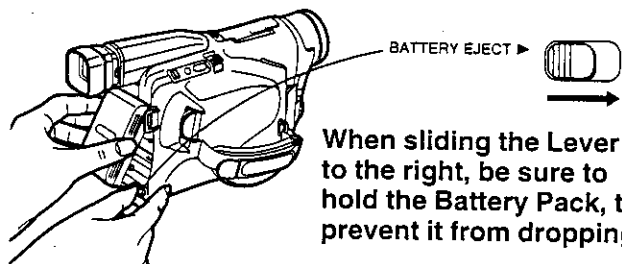
### ■ Removing the Battery Pack

Slide it in the opposite direction to step 1.

2




### ■ Removing the Battery Pack

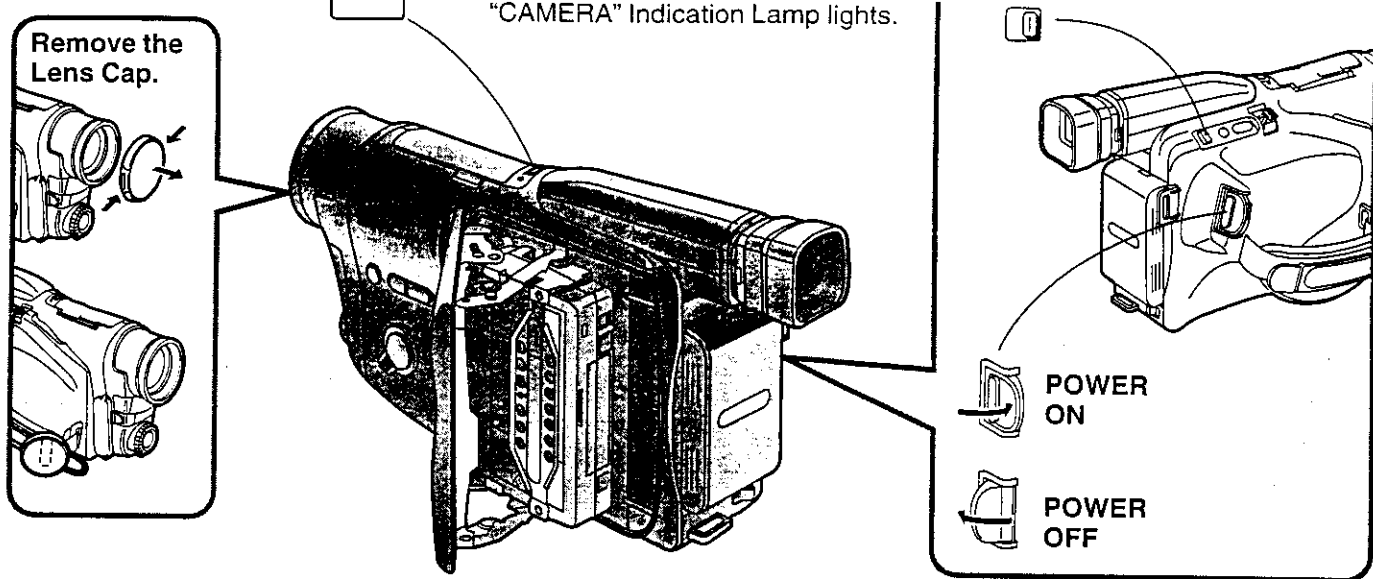


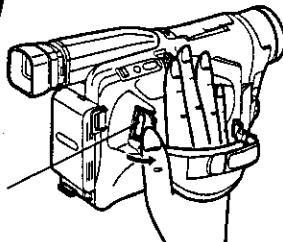
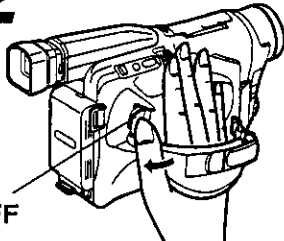
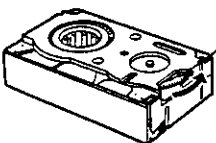

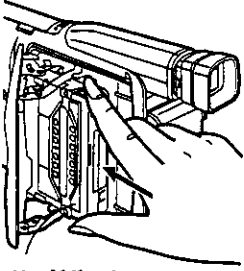
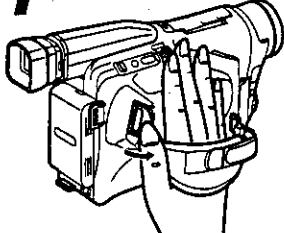
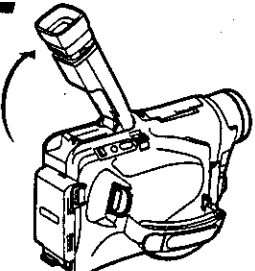
### Remarks, etc.

Battery Pack No.	Charging Time	Max. Continuous Recording Time	
		NV-RX3A	NV-RX7A
Supplied	60 min.	50 min.	40 min.
VW-VBS10E	65 min.	55 min.	45 min.
VW-VBS20E	130 min.	110 min.	90 min.
VW-VBH10E	80 min.	65 min.	55 min.
VW-VBH20E	160 min.	130 min.	110 min.

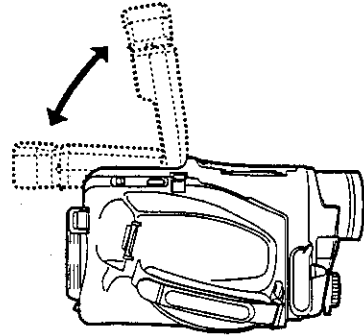
(The times shown in the above chart are approximations.)

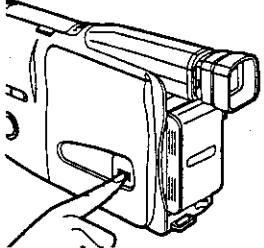
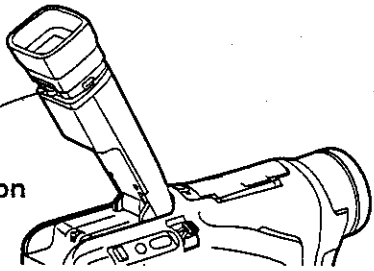
- The Battery Pack must be discharged in the Movie Camera so that the "  " Indication starts to flash indicating an exhausted Battery Pack. Do not charge the Battery Pack if it is not discharged, because to do so would shorten the recording time that it can provide.
- The figures in the table above are based on an ambient temperature of 25°C.
- The use of the zoom and other functions increase the power consumption, so that the actual recording time per Battery Pack is 30%–50% less than for continuous recording.
- Charge the Battery Pack at a room temperature between 10° and 35°C. The Battery Pack's ability to generate electric energy is based on a chemical reaction. Because this reaction can take place better at high temperature, the maximum recording time may be considerably shorter when recording at low temperature.
- If the Movie Camera has turned off automatically because the Battery Pack has become exhausted, remove the Battery Pack before connecting the DC Input Cable of the AC Adaptor to the Movie Camera to continue recording, otherwise the Movie Camera cannot be turned on.

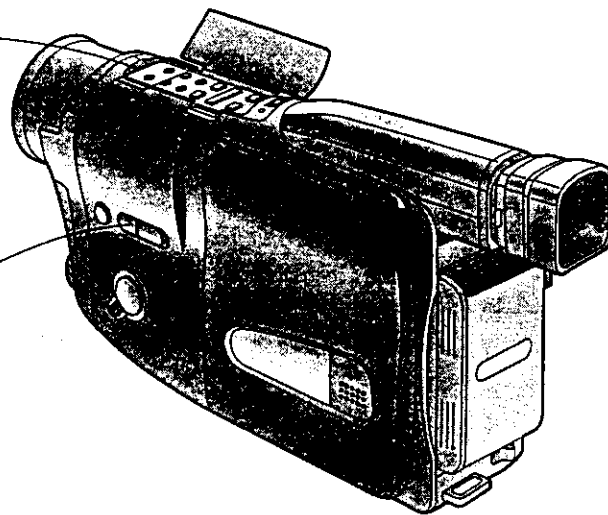


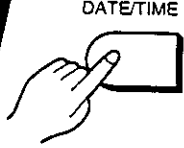

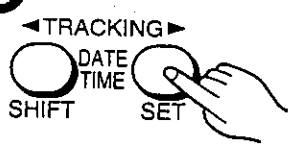



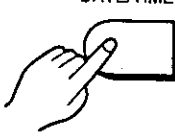
Title	Procedure	
<p><b>Powering the Movie Camera ON/OFF</b></p>	<p><b>1</b></p>  <p>ON</p> <p>Turn the [POWER] ON/OFF Switch out.</p>	<p><b>2</b></p>  <p>OFF</p> <p>Turn the [POWER] ON/OFF Switch in.</p>
<p><b>Inserting a Video Cassette</b></p> <p>Before inserting the video cassette, make sure that the tape is tight. If it is loose, turn the cog wheel in the direction of the arrow to tighten it.</p>  <p>Cog Wheel</p>	<p><b>1</b></p> <p>EJECT ▲</p>  <p>←</p> <p>Slide the [EJECT ▲] Lever to the left.</p>	<p><b>2</b></p>  <p>Cassette Window</p> <p>Insert the Video Cassette.</p>
<p><b>Adjusting the Viewfinder</b></p>	<p><b>1</b></p>  <p>Turn the [POWER] ON/OFF switch out.</p>	<p><b>2</b></p>  <p>Turn up the Viewfinder.</p>

- The tilting range of the Viewfinder is 75°.
- To return the Viewfinder to its original horizontal position, turn it all the way down until it locks with a click.



		Remarks, etc.
		When you turn on the Movie Camera while a video cassette is already inside, it is automatically put in the Recording Pause Mode. (p. 19).
<p><b>3</b></p>  <p>Close the Cassette Compartment Cover by pressing the [LOCK] Button.</p>		<p>■ <b>Ejecting the Video Cassette</b></p> <p>After you have stopped recording, slide the [EJECT ▲] Lever to the left. The Cassette Compartment Cover opens after a few seconds and you can then take out the video cassette.</p> <ul style="list-style-type: none"> <li>•It is not possible to take out the video cassette during recording.</li> <li>•Do not repeatedly insert and take out the video cassette. This could cause the tape to become loose and damaged.</li> </ul>
<p><b>3</b></p>  <p>Eyepiece Correction Adjuster</p> <p>Look into the Viewfinder and slide the Adjuster until the indications in the Viewfinder are clear and easy to read.</p>		<ul style="list-style-type: none"> <li>•Do not hold the Movie Camera by the Viewfinder or apply any pressure on it.</li> <li>•Never aim the Movie Camera with its Viewfinder or Lens directly at the sun; this could damage internal parts of the unit.</li> </ul>



Title	Procedure	
<p><b>Setting the Date and Time</b></p> <p>Before setting, attach the charged Battery Pack or connect the AC Adaptor to the Movie Camera and turn the Movie Camera on.</p> <p>For example: To set the clock to October 15, 1996, 12:30...</p>	<p><b>1</b></p>  <p>Press the [DATE/TIME] Button.</p>	<p><b>2</b></p>  <p>Press until the "Year" portion flashes.</p>
	<p><b>5</b></p>  <p>Press to set to "10".</p>	<p><b>6</b></p>  <p>Press to make the "Day" portion flash.</p>
	<p><b>9</b></p>  <p>Press to set to "12".</p>	<p><b>10</b></p>  <p>Press to make the "Minute" portion flash.</p>
<p><b>Inserting and Deleting the Date and Time</b></p> <p>The Date and Time Indications can be inserted and deleted during recording as well as in the Recording Pause Mode.</p>	 <p>To insert or delete the Date and Time (or Date only) Indication, press this button repeatedly. The indications appear and disappear in the order shown on the right.</p>	



A built-in rechargeable lithium battery inside the Movie Camera maintains the operation of the built-in clock when the Movie Camera is not in operation. Whenever the Movie Camera is in operation, it automatically recharges this battery. However, if you don't use the Movie Camera for a very long time, the lithium battery can become exhausted.

In this case, the "⊗" Indication in the Viewfinder flashes.

If the "⊗" Indication in the Viewfinder flashes for approx. 10 seconds when you turn the Movie Camera on, the lithium battery is exhausted and must be charged it as follows.

- 1 Connect the Movie Camera (with power off condition) to the AC Adaptor and wait for approx. 4 hours (NV-RX7A) or 8 hours (NV-RX3A).

**NV-RX3A only:**

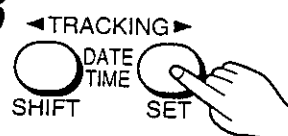





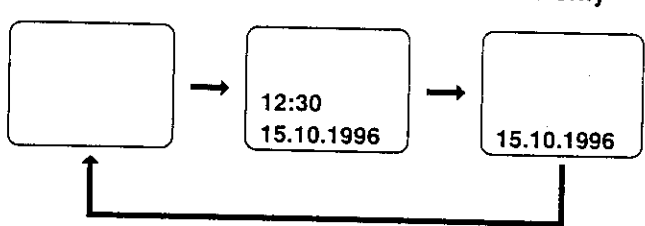
- After charging the lithium battery, the "⊗" Indication still flashes to remind you to set the date and time as explained below.

- After charging the lithium battery in this way, it can maintain the operation of the clock for approx. three months.

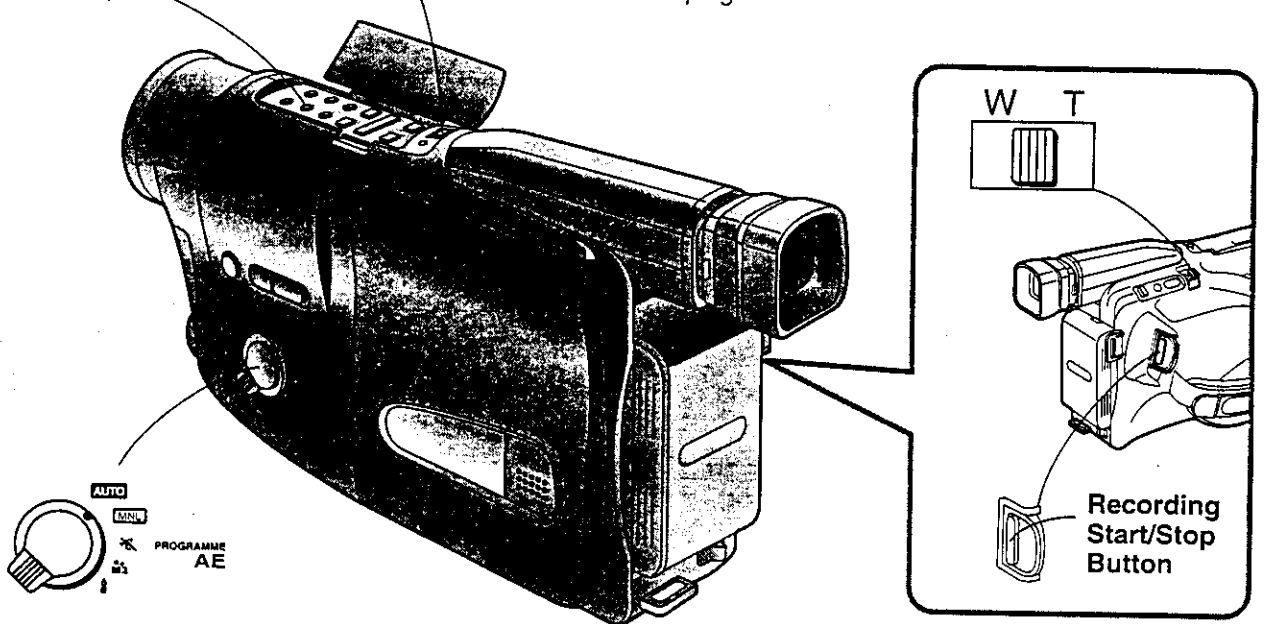
Information for your safety

**WARNING**

THE LITHIUM BATTERY IN THIS UNIT MUST ONLY BE REPLACED BY QUALIFIED PERSONNEL. IF THIS IS NECESSARY, CONTACT THE PANASONIC CUSTOMER CARE CENTRE ON 132600 FOR YOUR NEAREST AUTHORISED SERVICE CENTRE.

		Remarks, etc.
<p><b>3</b></p>  <p>Press to set to "1996".</p>	<p><b>4</b></p>  <p>Press to make the "Month" portion flash.</p>	<p>■ <b>Changing the Figures of the Date/Time Indication</b></p> <p>You can change the Date/Time Indication in the order shown below by pressing the [SET] Button repeatedly.</p> <p>Year;            1990→1991→ ..... 2089→1990→...</p> <p>Month;          1→2→ ..... →12→1→...</p> <p>Day;            1→2→ ..... →31→1→...</p> <p>Hour;           0→1→ ..... →23→0→...</p> <p>Minute;        00→01→ ..... →59→00→...</p> <ul style="list-style-type: none"> <li>• If you want to change the figures more quickly, keep the [SET] Button pressed.</li> <li>• If you make a mistake during setting, start again from the beginning.</li> </ul>
<p><b>7</b></p>  <p>Press to set to "15".</p>	<p><b>8</b></p>  <p>Press to make the "Hour" portion flash.</p>	
<p><b>11</b></p>  <p>Press to set to "30".</p>	<p><b>12</b></p>  <p>Press to start the clock.</p>	
<p>No indication      Date and Time      Date only</p> 		

Movie Camera Set-Up complete, now ready to use.



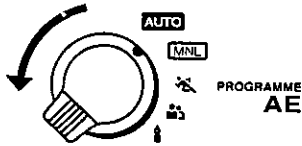
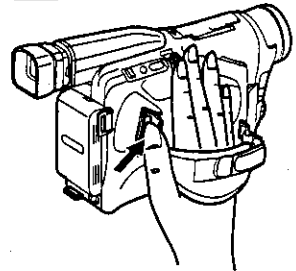
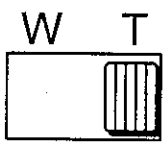
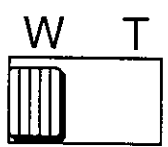
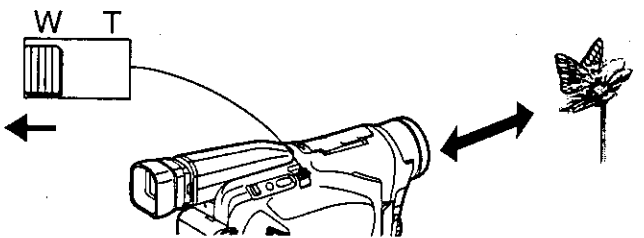
Title	Viewfinder
<h3 data-bbox="191 683 574 739">Starting Recording</h3> <div data-bbox="303 772 718 907"> </div> <ul data-bbox="183 929 845 1209" style="list-style-type: none"> <li>• Press the [SP/LP] Button to select the “SP” or “LP” Indication in the Viewfinder. “SP” means Standard Play. Recording is possible for the time indicated on the video cassette. “LP” means Long Play. Recording is possible for approximately double the time indicated on the video cassette.</li> <li>• Selecting the recording speed is only possible in the Recording Pause Mode.</li> </ul>	<div data-bbox="909 739 1548 940"> </div> <p data-bbox="885 974 1564 1097">For the detailed explanations for each indication in the Viewfinder, see p. 22. Shown above is a typical example of the indications visible when recording in the Auto Mode.</p>
<h3 data-bbox="183 1310 774 1456">Making the Subject Larger or Smaller During Recording (Zooming)</h3> <p data-bbox="175 1478 782 1579">Zooming is also possible in the Recording Pause Mode, so you can select the desired zoom setting before you start recording.</p> <ul data-bbox="175 1601 821 1724" style="list-style-type: none"> <li>• In the maximum tele setting (14x), the minimum recording distance is 1.5 m. If you want to approach the subject closer, see p. 19 “Using the Macro Close-up Function”.</li> </ul>	<div data-bbox="877 1344 1556 1668"> </div> <ul data-bbox="877 1713 1492 1848" style="list-style-type: none"> <li>• The approximate selected zoom magnification is indicated in the Viewfinder.</li> <li>• The zoom range extends from the wide-angle setting of the lens (1x) to the tele setting (14x).</li> </ul>

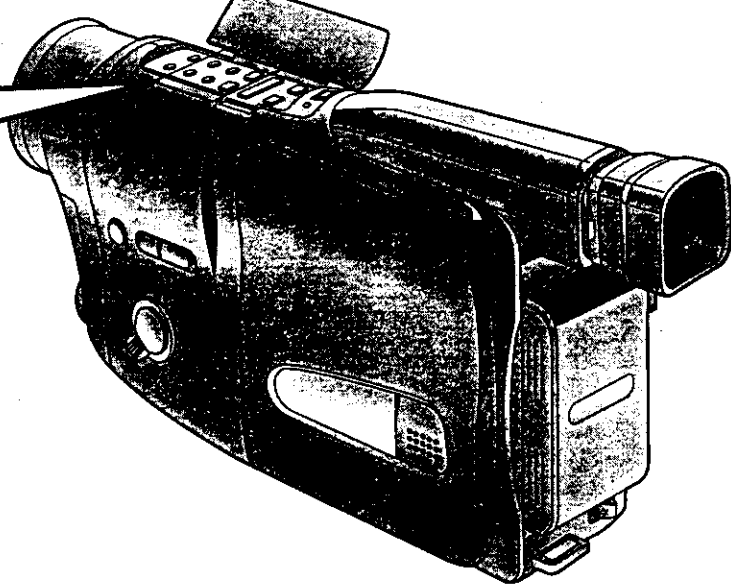
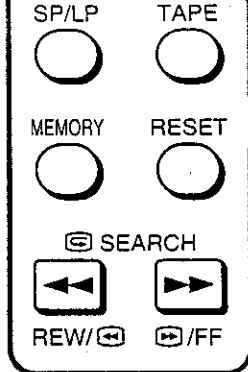


Many VHS VCRs feature the Index Search and Intro Scan Functions that make it easy to locate the beginning of scenes marked with index signals. This Movie Camera automatically records an index signal in the following cases:

- When recording is started for the first time after attaching the Battery Pack.
- When recording is restarted after exchanging the Video Cassette or after pressing the [VCR/CAMERA] Button.

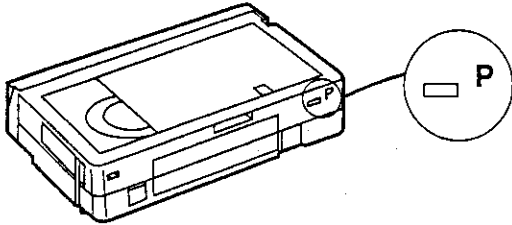
The "INDEX" Indication flashes briefly in the Viewfinder while the Movie Camera records an index signal.

Procedure		Remarks, etc.
<p><b>1</b></p>  <p>Confirm that the [AE] Selector is set to "AUTO".</p>	<p><b>2</b></p>  <p>Press the Recording Start/Stop Button.</p>	<p>■ <b>To Stop (Pause) the Recording:</b> Press the Recording Start/Stop Button. The "PAUSE" Indication appears in the Viewfinder.</p> <ul style="list-style-type: none"> <li>• 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. If you want to resume recording from this condition, turn the [POWER] ON/OFF Switch in (the Movie Camera switches off) and then turn it out again.</li> </ul> <p>■ <b>To Finish Recording:</b> Turn the [POWER] ON/OFF Switch in. (The Movie Camera switches off.)</p>
<p><b>1</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>■ <b>Zooming In</b></p>  <p>"T" means Tele.</p> </div> <div style="text-align: center;"> <p>■ <b>Zooming Out</b></p>  <p>"W" means Wide.</p> </div> </div> <p>• The zooming speed varies depending on how far you push the [W•T] Zoom Lever towards "W" or "T". (The further you push it, the faster the zooming speed becomes.)</p>		<p>■ <b>Using the Macro Close-up Function</b> After keeping the [W•T] Zoom Lever pressed toward "W" to zoom to the maximum wide-angle setting, the subject can be focussed down to a minimum distance of only 5 mm between lens and subject.</p> <ul style="list-style-type: none"> <li>• As the depth of field is very small in this mode, even slight camera movements can cause the subject to go out of focus. Therefore, it is recommended to use a tripod (optional).</li> <li>• If you want to record pictures in a photo album or a similar situation with insufficient lighting, use a Video DC Light (optional).</li> </ul> 

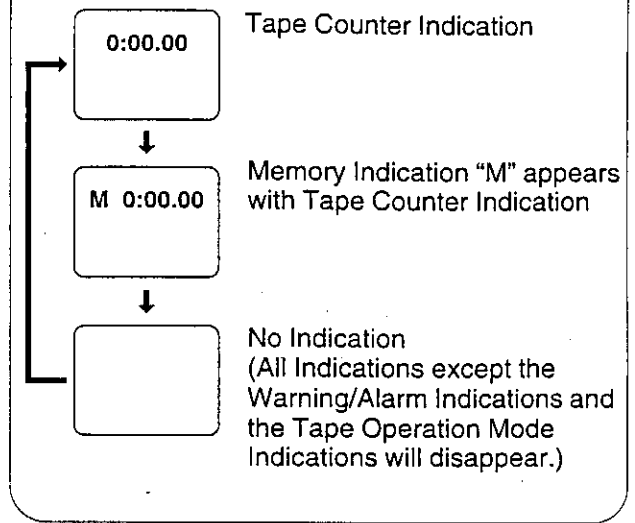


Title	Viewfinder	Procedure
<p><b>Using the Tape Counter Indication</b></p> <p>The Tape Counter in the Viewfinder shows the elapsed recording or playback time in hours, minutes and seconds.</p> <p>To make it easy to keep track of the elapsed recording time, reset the Tape Counter to "0:00.00" by pressing the [RESET] Button.</p>		<p><b>1</b></p> <p>■ To Reset the Tape Counter:</p>
<p><b>Using the Memory Function</b></p> <p>When the Tape Counter is reset to "0:00.00" at the beginning of the desired scene and the Memory Indication "M" is turned on, the tape will stop automatically at the "0:00.00" position when rewinding or fast-forwarding it.</p>		<p><b>1</b></p> <p>■ To Make the "M" Indication Appear:</p>
<p><b>Confirming the Remaining Tape Time</b></p> <ul style="list-style-type: none"> <li>• During recording or playback, the Remaining Tape Time is automatically displayed in the Viewfinder.</li> <li>• In this Movie Camera, 60-minute Video Cassette (EC60) can also be used.</li> </ul>		<p><b>1</b></p> <p>Select the Tape Length Indication ("30", "45" or "60") that matches the Video Cassette being used.</p>

**Video Cassette**



When using a video cassette bearing the "P" mark or an S-VHS-C video cassette, the Remaining Tape Counter Indication may not be very precise.

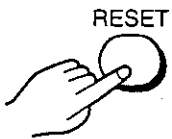


**Remarks, etc.**

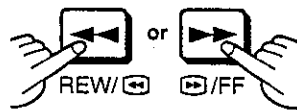
- If you playback a tape on which no recording has ever been made, the Tape Counter Indication does not change.
- If you take out the Cassette or remove the Battery Pack, the Tape Counter automatically resets to "0:00.00".
- If you rewind the tape further than the tape counter position "0:00.00", the minus sign "-" appears in front of the Tape Counter Indication.

**2**

**■ To Reset the Tape Counter:**



**3**



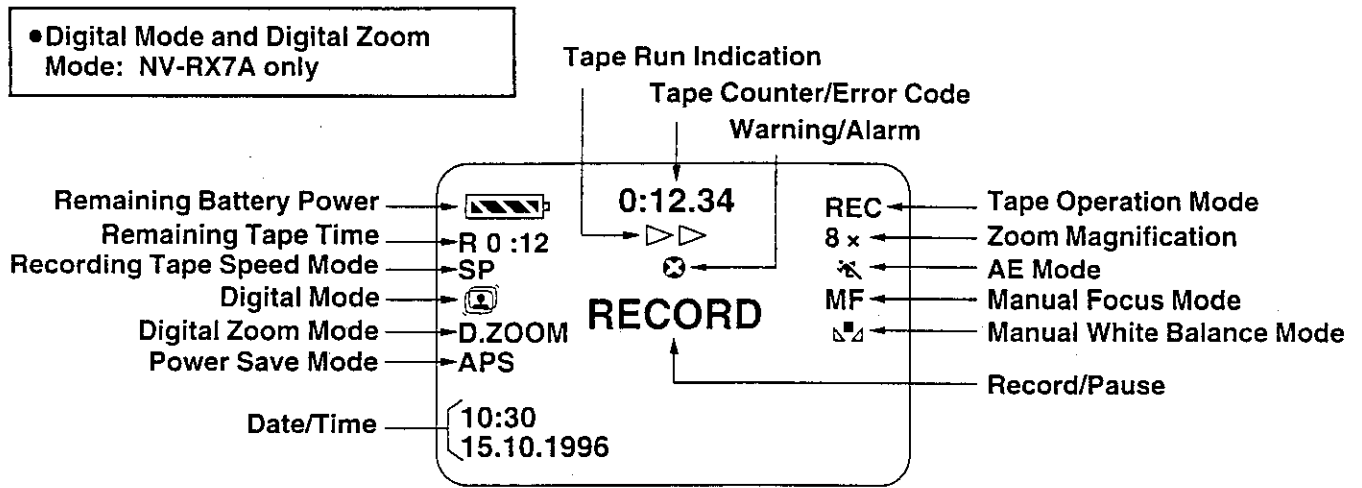
**■ To Check the Tape Length of the Video Cassette Being Used while the Remaining Tape Time is Displayed:**



The Tape Length Indication "30", "45" or "60" is displayed for approx. 2 seconds, and then the Remaining Tape Time Indication will again appear instead of it.


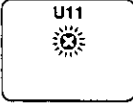
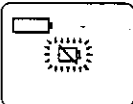

- If you start recording or playback, the "R" Indication flashes for a few seconds in the Viewfinder, while the Movie Camera calculates the Remaining Tape Time.
- When the Remaining Tape Time becomes less than 2 minutes, the Indication "R" and the Remaining Tape Time start to flash.
- This function is only meant as a guide. The Remaining Tape Time Indication is subject to imprecision due to either customer error (such as incorrectly selected Tape Length) or stretching of the tape.

The following indications are displayed in the Viewfinder to inform you about the condition of the Movie Camera.

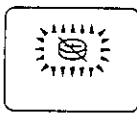
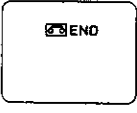



● The illustrations in the following explanations show only the indication(s) pertaining to the corresponding explanation.

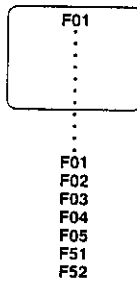
### 1 Warning/Alarm Indications

Viewfinder	Condition	Page
	<p><b>Condensation</b> Condensation has formed inside the Movie Camera. Wait until the "U10/☀" Indication disappears.</p>	61
	<p><b>Video Head Clogging</b> Dirt, dust and particles of the tape coating have accumulated on the video heads. Have the heads cleaned by qualified Service Personnel.</p>	61
	<p><b>Remaining Battery Power</b> The 4 segments of the Remaining Battery Power Indication "☰" begin to disappear one after another as the power of the Battery Pack weakens. When only the last segment remains, the "☐" Indication starts to flash in the centre of the Viewfinder. When the last segment has disappeared, the "CAMERA" Indication Lamp flashes for a few seconds, and then the Movie Camera automatically switches itself off. Replace the exhausted Battery Pack with a fully charged one.</p>	12
	<p><b>Tape</b> When no Video Cassette is inserted or when the tab of the inserted Video Cassette is broken out, this indication flashes. Insert a Video Cassette with intact tab.</p>	14, 57


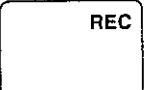
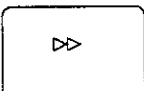
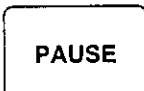
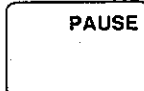
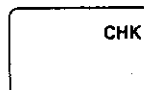
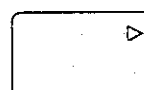
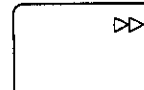
1 Warning/Alarm Indications (cont.)

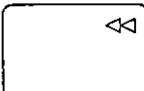


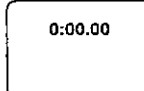
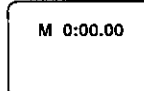
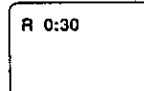
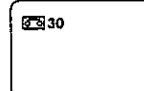
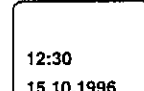


Viewfinder	Condition	Page
	<p><b>Built-in Lithium Battery</b> The Built-in Lithium Battery is exhausted. Recharge it.</p>	17
	<p><b>End of the Tape</b> When the tape has reached its end, this indication appears. Insert a new Video Cassette.</p>	—
	<p><b>Anti-Ground-Recording</b> When the Movie Camera is tilted downwards more than about 70° from its normal horizontal position during recording (with the [POWER SAVE] Switch set to "ON"), the Movie Camera automatically switches over to the Recording Pause Mode. If the Movie Camera is then returned to its normal horizontal recording position, the "CHK" Indication will flash in the Viewfinder.</p>	51

2 Error Code Indications

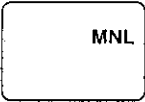
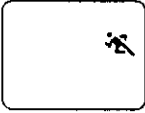
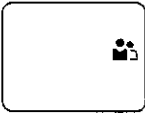

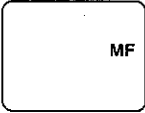
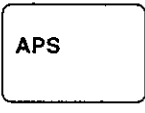

Viewfinder	Condition	Page								
	<p><b>Error Code</b> When the "F. ." Indication appears in the Viewfinder, some malfunction has occurred. If the indicated error code is between "F01" and "F05", the Movie Camera will turn itself off automatically one minute after the "CAMERA" Lamp has started to flash. (When the indication is "F51" or "F52", the Movie Camera will not turn off automatically.) In this case, write down the error code and tell it to the service personnel.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">F01: Locked Take-up Reel</td> <td style="width: 50%;">F05: Locked Head Cylinder</td> </tr> <tr> <td>F02: Locked Supply Reel</td> <td>F51: Locked Focus Motor</td> </tr> <tr> <td>F03: Locked Unloading Mechanism</td> <td>F52: Locked Zoom Motor</td> </tr> <tr> <td>F04: Locked Loading Mechanism</td> <td></td> </tr> </table>	F01: Locked Take-up Reel	F05: Locked Head Cylinder	F02: Locked Supply Reel	F51: Locked Focus Motor	F03: Locked Unloading Mechanism	F52: Locked Zoom Motor	F04: Locked Loading Mechanism		—
F01: Locked Take-up Reel	F05: Locked Head Cylinder									
F02: Locked Supply Reel	F51: Locked Focus Motor									
F03: Locked Unloading Mechanism	F52: Locked Zoom Motor									
F04: Locked Loading Mechanism										

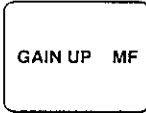
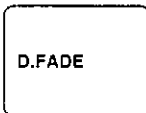



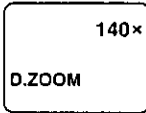
### 3 Recording/Playback Indications

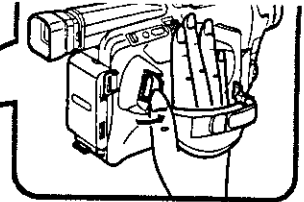
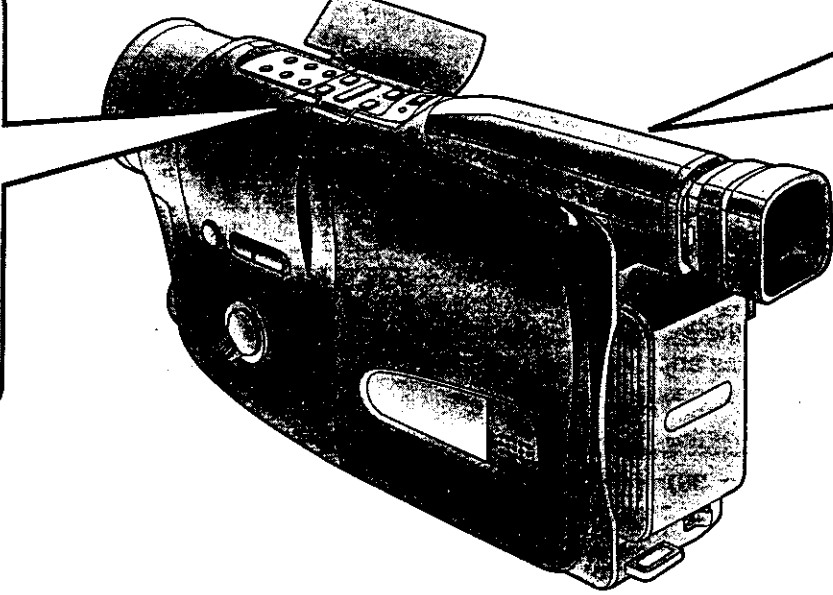
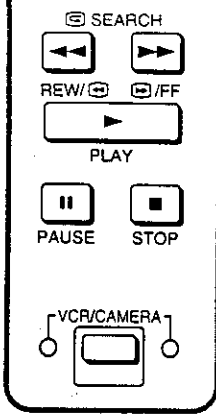
Viewfinder	Condition
	<b>Recording Mode (large indication) (p. 18)</b> When the Recording Start/Stop Button is pressed from the Recording Pause Mode, this indication is displayed for approx. 1 second.
	<b>Recording Mode (small indication) (p. 18)</b> This indication appears approx. 1 second after you start recording and remains displayed until you stop recording. "REC" means Recording.
	<b>Tape Run Indication (p. 18)</b>
	<b>Recording Pause Mode (large indication) (p. 19)</b> When the Recording Start/Stop Button is pressed from the Recording Mode, this indication is displayed for approx. 1 second.
	<b>Recording Pause Mode (small indication) (p. 19)</b> This indication appears approx. 1 second after you pause the recording and remains displayed until you restart the recording, change over to the VCR Mode or turn the Movie Camera off.
	<b>Recording Review Mode (p. 48)</b> This indication is displayed while the last 2–3 seconds of the last recorded scene are being played back. "CHK" means Check.
	<b>Playback/Search Mode (p. 27, 49)</b>
	<b>Fast Forward/Cue Mode (p. 26)</b>

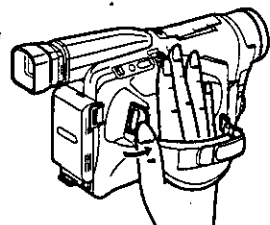
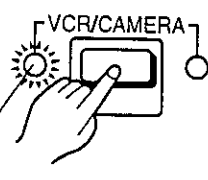
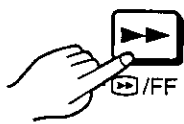

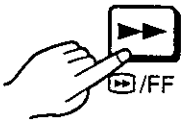

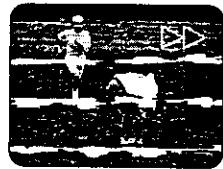

Viewfinder	Condition
	<b>Rewind/Review/Camera Search Mode (p. 26, 48)</b>
	<b>Still Playback Mode (p. 27)</b>
	<b>Recording Speed Indication (p. 18)</b> SP: means Standard Play. LP: means Long Play. The mode can be selected with the [SP/LP] Button.
	<b>Tape Counter (p. 20)</b>
	<b>Tape Counter with activated Memory Function (p. 20)</b> "M" means Memory.
	<b>Remaining Tape Time (p. 20)</b> "R" means Remaining.
	<b>Tape Length (p. 20)</b> The Tape Length indication should be matched to the inserted Video Cassette (EC30, EC45 or EC60) to ensure correct indication of the remaining tape time.
	<b>Date and Time (p. 17)</b>
	<b>Zoom Magnification (p. 18)</b> When zooming in on a subject, the indicated zoom magnification value increases.
	<b>Manual White Balance Adjustment Mode (p. 35)</b>


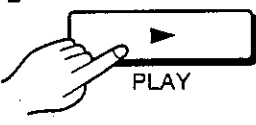





Viewfinder	Condition
	<b>Manual Recording Mode (p. 30, 34)</b> This indication is displayed when you select the Manual Recording Mode with the [AE] Selector. In this mode, you need to adjust the focus and the white balance adjustment manually. "MNL" means Manual.
	<b>Sports Mode (p. 38)</b> This indication is displayed when you select the Sports Mode with the [AE] Selector.
	<b>Portrait Mode (p. 38)</b> This indication is displayed when you select the Portrait Mode with the [AE] Selector.
	<b>Low Light Mode (p. 38)</b> This indication is displayed when you select the Low Light Mode with the [AE] Selector.
	<b>Manual focus Mode (p. 30)</b> "MF" means Manual Focus.
	<b>Power Save Mode (p. 50)</b> This indication is displayed when the [POWER SAVE] Switch is set to "ON".
	<b>Index (p. 19)</b> While this indication is flashing, an index signal is being recorded.

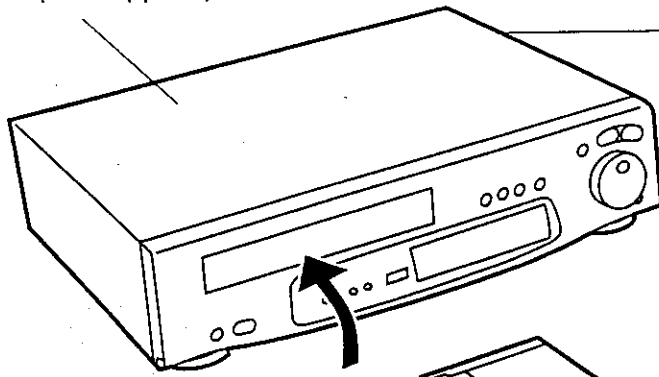
Viewfinder	Condition
	<b>Digital Gain-up Mode (p. 42)</b> When the sensitivity is increased, the "GAIN UP" Indication appears.
	<b>Digital Fade Mode (p. 46)</b>
	<b>Digital Wipe Mode (p. 44)</b> The " <b>WIPE</b> " Indication is displayed when a still picture is in the digital memory.
	<b>Snapshot Mode (p. 46)</b>
	<b>Super Image Stabilizer Mode (p. 44)</b> The "D.ZOOM" Indication appears, too.
	<b>Digital Zoom Mode (p. 42)</b> "D.ZOOM" Indication appears and Zoom magnification extended to 140x.



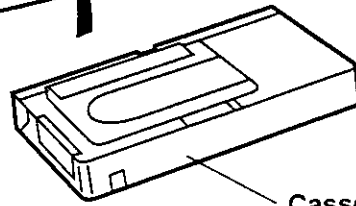
Title	Procedure	
<p><b>Playing Back on the Viewfinder or a TV</b></p> <p>[To Play Back Via a TV Set]</p> <p>1. Connect the Movie Camera to a TV set. (p. 10)</p> <p>2. Follow steps 1~4 on the right.</p>	<p><b>1</b></p>  <p>Turn the [POWER] ON/OFF Switch out.</p>	<p><b>2</b></p>  <p>The "VCR" Indication Lamp lights up.</p>
<p><b>Rewinding or Fast-Forwarding the Tape</b></p> <p>Perform these operations with the Movie Camera in the VCR Stop Mode ("VCR" Indication Lamp is lit).</p>	<p>■ For Fast-Forwarding:</p> 	<p>■ For Rewinding:</p> 
<p><b>Using the Cue, Review and Still Playback Functions During Normal Playback</b></p>	<p>■ For Cue Playback:</p>  <p>Keep pressed.</p>	<p>■ For Review Playback:</p>  <p>Keep pressed.</p>
	<p>Cue Playback Mode</p> 	<p>Review Playback Mode</p> 

		Remarks, etc.
<p><b>3</b></p>  <p>REW/⏮</p> <p>The tape stops automatically when it reaches the beginning.</p>	<p><b>4</b></p>  <p>PLAY</p>	<ul style="list-style-type: none"> <li>• If you reach the end of the tape during playback, the tape rewinds automatically.</li> </ul> <p>■ <b>To Stop the Playback</b> Press the [STOP] Button.</p>
		<ul style="list-style-type: none"> <li>• If you reach the end of the tape during Fast-Forwarding, the tape rewinds automatically.</li> <li>• If you reach the beginning of the tape during Rewinding, the tape stops automatically.</li> </ul>
<p>■ <b>For Still Playback:</b></p>  <p>PAUSE</p>	<p>■ <b>To Return to Normal Playback:</b></p>  <p>PAUSE</p>	<ul style="list-style-type: none"> <li>• The sound is played back only during normal playback.</li> <li>• In the Cue, Review and Still Playback Modes, horizontal noise bars appear in the picture, or the picture may become black and white or distorted. However, this is normal and not a malfunction.</li> <li>• The horizontal noise bars have a different pattern in the SP mode and LP mode. The illustrations on the left show the noise bar patterns of the LP mode.</li> </ul>
<p>Still Playback Mode</p> 		<ul style="list-style-type: none"> <li>• If the Movie Camera is left in the Still Playback Mode for about 6 minutes, it will switch over to the Stop Mode to protect the tape and the video heads.</li> </ul>

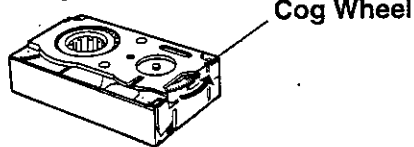
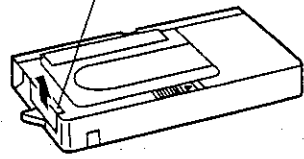
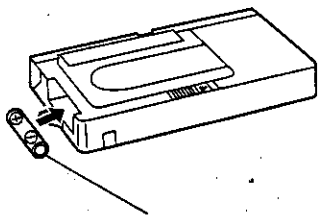
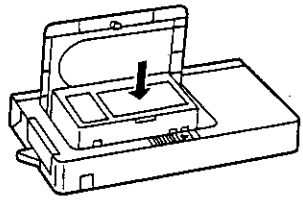
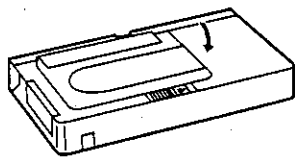
VCR (not supplied)



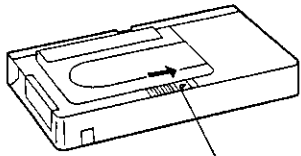
TV Set (not supplied)



Cassette Adaptor (supplied)

Title	Procedure	
<p><b>Playing Back on a VCR, Using the Supplied Cassette Adaptor</b></p> <p>■ Tighten the Tape</p>  <p>Cog Wheel</p> <p>Before inserting a Video Cassette, check that the tape is tight. If it is loose, tighten it by turning the cog wheel in the direction of the arrow.</p>	<p><b>1</b></p> <p>Battery Compartment Cover</p>  <p>Remove the Battery Compartment Cover.</p>	<p><b>2</b></p>  <p>Supplied Battery (R6)</p> <p>Insert the Battery (R6).</p>
	<p><b>5</b></p>  <p>Insert the recorded video cassette.</p>	<p><b>6</b></p>  <p>Close the Top Cover.</p>

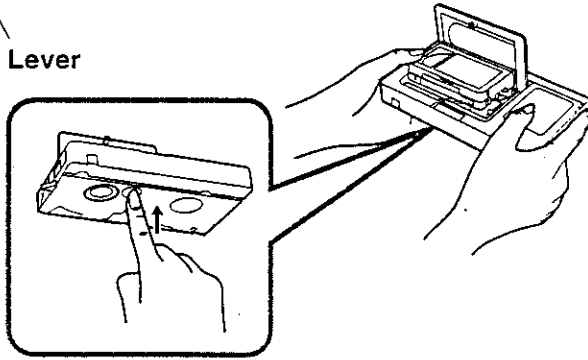
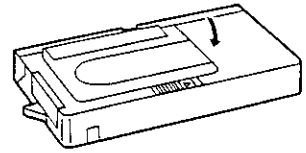
**1** Slide the Open Lever.

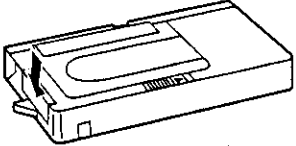
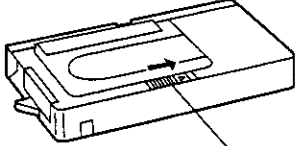
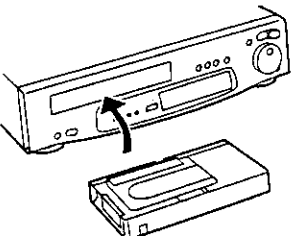
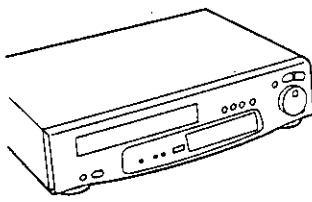


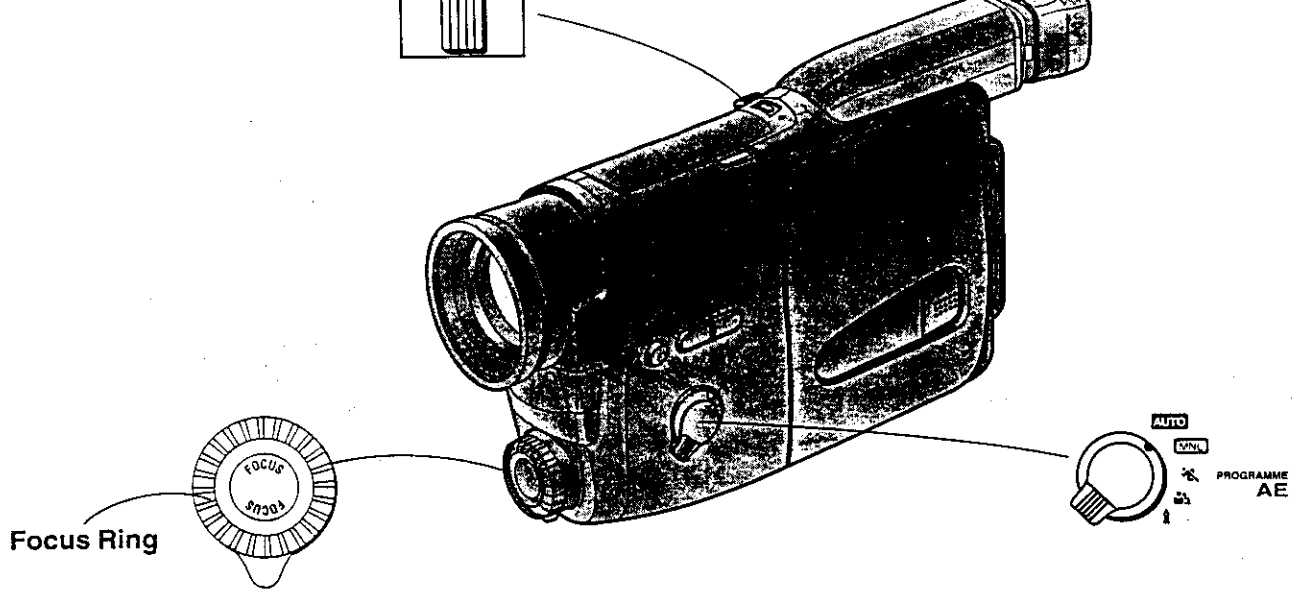
Open Lever

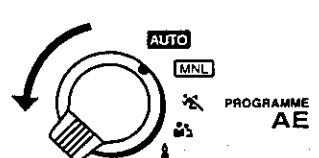
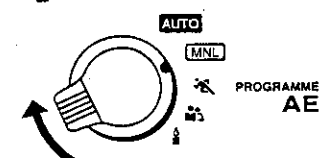
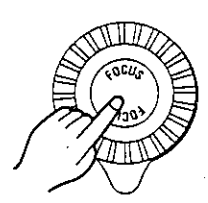
**2** Push out the Video Cassette from the bottom of the Cassette Adaptor and remove the Video Cassette.

**3** Close the Top Cover.



		<i>Remarks, etc.</i>
<p><b>3</b></p>  <p>Re-attach the Battery Compartment Cover.</p>	<p><b>4</b></p>  <p>Open Lever</p> <p>Slide the Open Lever.</p>	<ul style="list-style-type: none"> <li>• If you want to get optimum picture quality, it may be necessary to adjust the tracking control on the VCR.</li> <li>• Never insert the Cassette Adaptor into a VCR unless it is loaded with a video cassette.</li> <li>• Do not insert the Cassette Adaptor into a VCR and take it out again without running the tape, because this could loosen the tape.</li> <li>• When you load the Video Cassette into the Cassette Adaptor or remove it, be careful not to touch the tape.</li> <li>• After use, take the Video Cassette out from the Cassette Adaptor.</li> </ul>
<p><b>7</b></p>  <p>Insert the Cassette Adaptor into the VCR.</p>	<p><b>8</b></p>  <p>Operate the VCR.</p>	

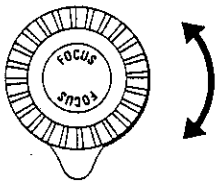


Title	Procedure	
<p><b>Recording in the Auto Focus Mode</b></p> <p>When the [AE] Selector is set to "AUTO", the Movie Camera will automatically focus precisely on almost any subject located on the centre of the Viewfinder. "AE" means Auto Exposure.</p> <ul style="list-style-type: none"> <li>•When [AE] Selector is set to a position other than "AUTO" and the "MF" Indication is displayed in the Viewfinder, press the [FOCUS] Button to make the "MF" Indication disappear.</li> </ul>	<p><b>1</b></p> 	
<p><b>Recording in the Manual Focus Mode</b></p>	<p><b>1</b></p>  <p>The "MNL" Indication appears in the Viewfinder. (It is also possible to set the [AE] Selector to one of the other positions, except "AUTO".)</p>	<p><b>2</b></p>  <p>The "MF" Indication appears in the Viewfinder.</p>

*Remarks, etc.*

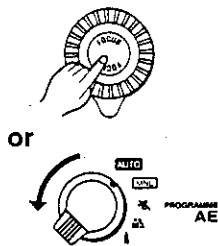
- For detailed explanations about focusing, see p. 32 and 33.

**3**



Turn the Focus Ring until the subject is in focus.

■ **To Cancel the Manual Focus Mode:**



Press the [FOCUS] Button to make the "MF" Indication disappear. Or reset the [AE] Selector to "AUTO".

■ **Hints for Manual Focus Adjustment**

- To ensure that the subject remains precisely focussed at any zoom setting, first zoom in on the subject (push Zoom Lever toward "T") until it fills the Viewfinder ①. After adjusting the focus, zoom out (push Zoom Lever toward "W") to frame the subject as desired ②.

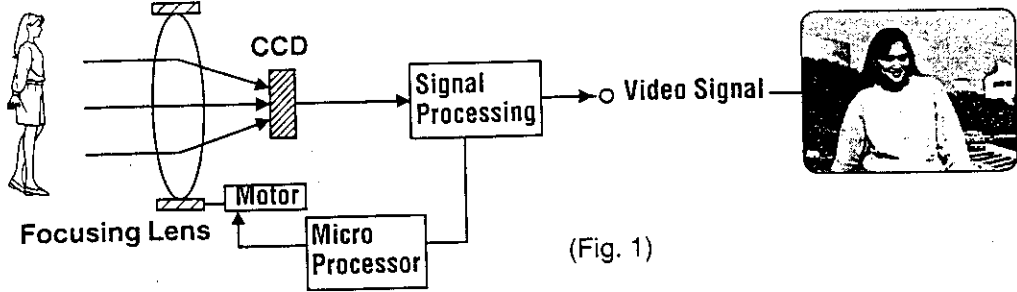
①



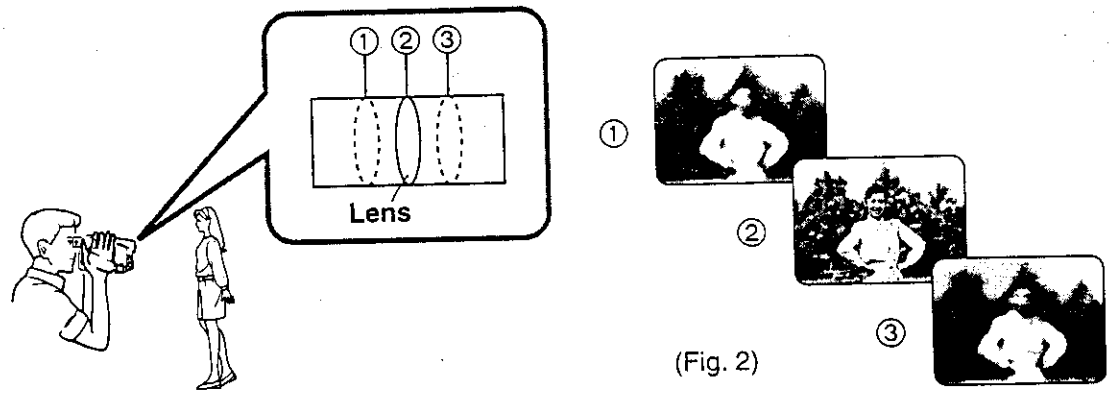
②



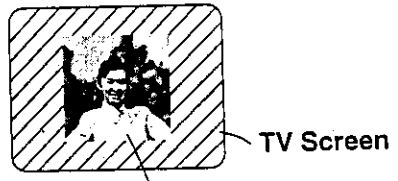
- If you adjust the focus in the wide-angle setting, the subject may go out of focus when you later zoom in on the subject.



(Fig. 1)



(Fig. 2)



TV Screen

(Fig. 3)

Image area on which the Auto Focus Mode adjusts the focus.

**■ Focusing**

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, and when you move it past that point, it will become blurred again. Being focused or in focus means that the subject is seen with optimum clarity and sharpness. The distance between the lens and the point where the rays of light come together is called "focal distance" or "focal length" and it depends on the size and shape of the lens.

**● In 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.

**● In the Movie Camera**

The image of the subject enters the Movie Camera through the lens and is converted into an electrical signal (video signal) for recording onto magnetic tape. In the Movie Camera, the "Auto Focus" system automatically adjusts the focal distance by moving the focusing lens forward or backward.



- 1) **Infrared Focusing:** The recording distance is calculated and adjusted based on the time it takes for an infrared signal emitted from the front of the Movie Camera to be bounced off the subject and received back by a sensor on the Movie Camera.
- 2) **Camera-Internal Electronic Focusing:** The focus is adjusted based exclusively on the image received by the Movie Camera and the resulting picture signal.

This Panasonic Movie Camera employs the Internal Electronic Focusing Method.

- As shown in Fig. 1 on the left page, when you aim the Movie Camera at the subject you want to record, the microprocessor moves the lens little by little based on the information about vertical contours of the subject in the picture signal. At the point where the vertical contours of the subject become sharpest, it judges that the subject is in focus and stops the lens. (See Fig. 2.)

- **Special Characteristics of the Movie Camera's Automatic Focus Adjustment Mode**

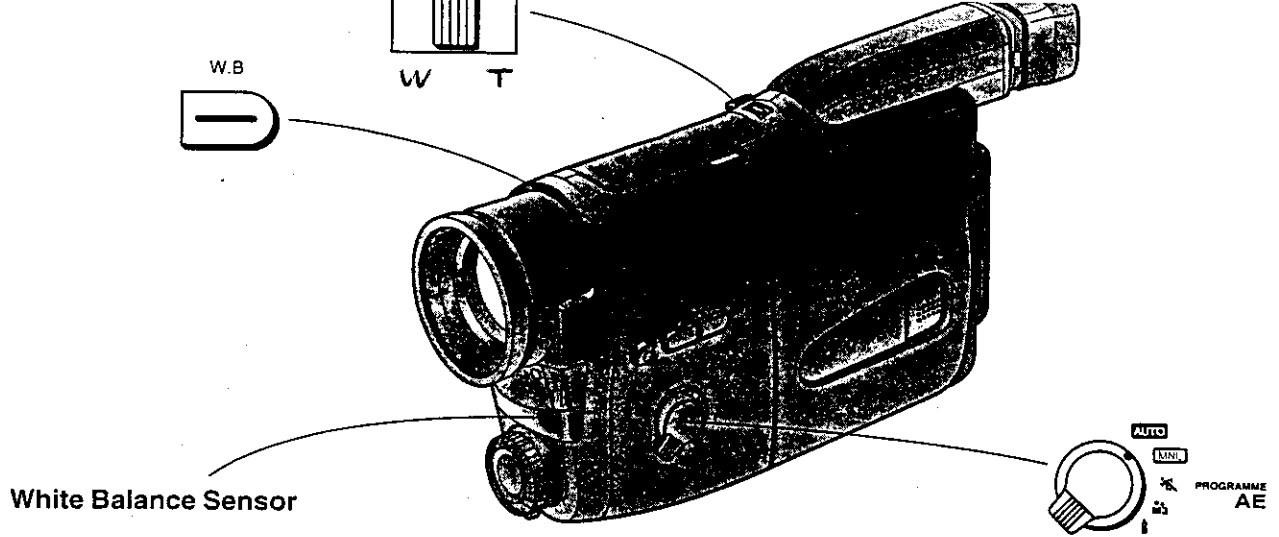
- (A) It adjusts the focus for sharpest vertical lines.
- (B) It adjusts the focus on parts of the subject with strong contrast.
- (C) It adjusts the focus only on the centre part of the picture on the viewfinder screen. (The area where the subject is in focus is much smaller than the TV screen, as shown in the Fig. 3.)

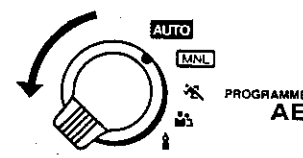
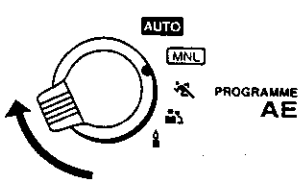
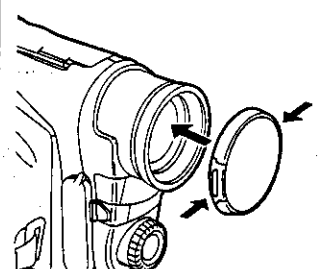
Unlike the human eyes, however, the Movie Camera's Auto Focus System cannot change the focus from a distant to a close subject without any delay. Therefore, use the Manual Focus Mode when you are going to record the following types of subjects or in the following kinds of places:

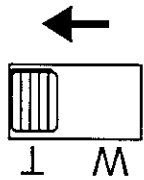
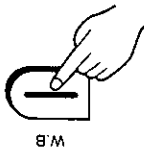
<p><b>Subjects with Shiny Surfaces or Much Light Reflection</b> As the Movie Camera adjusts the focus on the objects with shiny surfaces or much light reflection, the subject may go out of focus.</p> <ul style="list-style-type: none"> <li>● The subject may be out of focus when it is recorded at the seaside in the evening, under firework illumination or when special kinds of lights are used.</li> </ul>	<p><b>Fast-moving Subjects</b> As the lens is moved mechanically, it cannot follow fast-moving subjects without delay.</p> <ul style="list-style-type: none"> <li>● Subjects like a quickly and abruptly moving children may temporarily go out of focus.</li> </ul>	<p><b>Subjects with Weak Contrast</b> As the Movie Camera adjusts the focus based on vertical contours in the picture, subjects with little contrast may be out of focus.</p> <ul style="list-style-type: none"> <li>● When recording a flat white wall, for example, the Movie Camera has no information by which it can adjust the focus correctly.</li> </ul>
<p><b>Subjects with a Part of It Near the Movie Camera and Another Part Far Away from It</b> As the focus is adjusted on the centre part of the image, it is difficult to bring the distant part of the subject in focus.</p> <ul style="list-style-type: none"> <li>● When you want to record a person with a distant mountain behind, it is not possible to focus on both.</li> </ul>	<p><b>Subjects Behind Moving Objects</b> As the focus is adjusted on the person or object that passes between the Movie Camera and the subject, the subject temporarily go out of focus.</p> <ul style="list-style-type: none"> <li>● When recording a subject across a street on which cars are running, the subjects may go in and out of focus.</li> </ul>	<p><b>Subjects with Dark Surfaces</b> If the amount of light entering the lens is greatly reduced, the Movie Camera has very little information by which to adjust the focus.</p> <ul style="list-style-type: none"> <li>● When recording persons in dark surroundings, precise focusing may not be possible.</li> </ul>

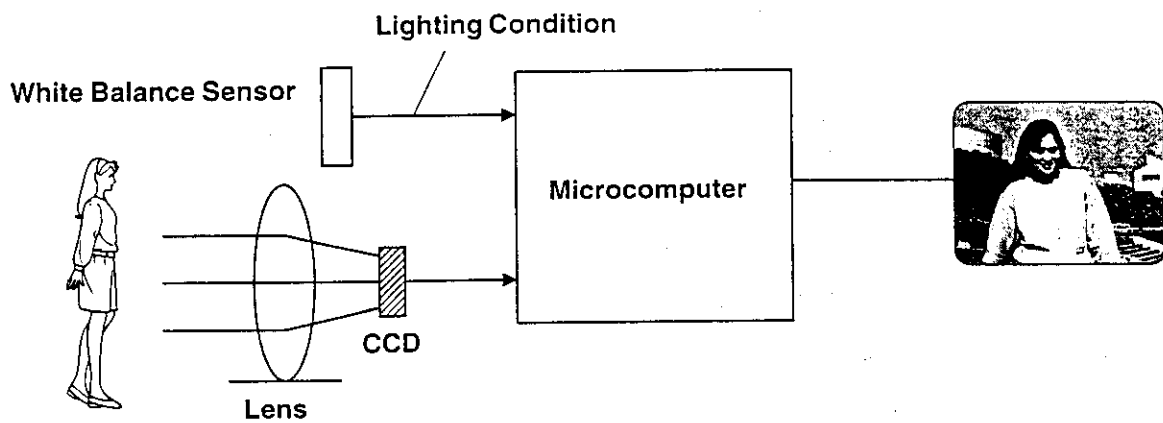
- Precise focusing may also not be possible for subjects that have no vertical contours or are behind glass covered with dirt, dust or water droplets.
- Finger print marks on lens may cause focus not to operate clearly. When at wide angle the Movie Camera may attempt to focus onto the finger prints (treating them as a MACRO Subject). Check and clean the lens correctly.
- If recording in a moving vehicle focus accuracy may be impaired due to the following:
  - a) Dirt or water droplets on the car windows and recording through glass may change the focus point
  - b) Scenery changing too quickly, no time for the Movie Camera to adjust focus
  - c) Distance between subject and Movie Camera always changing

We suggest you use Manual Focus. Please refer to p. 30 and 31 "Recording in Manual Focus Mode" in your operating instructions.



Title	Procedure	
<p><b>Recording with Automatic White Balance Adjustment</b></p> <p>When the [AE] Selector is set to "AUTO", it is possible to record pictures with natural colours under almost any recording condition.</p> <ul style="list-style-type: none"> <li>When the [AE] Selector is set to a position other than "AUTO" and the "MNL" Indication is displayed in the Viewfinder, press the [W.B] Button to make the "MNL" Indication disappear.</li> </ul>	<p><b>1</b></p> 	
<p><b>Recording with Manual White Balance Adjustment</b></p> <p>If there is only one light source: Follow the operation steps 1~4 on the right.</p> <p><b>Note:</b> If there are several light sources or if the illumination is weak: In operation step 2, instead of attaching the Lens Cap, point the Movie Camera at a pure white subject.</p> <ul style="list-style-type: none"> <li>If you want to record under weak illumination, precise Manual White Balance Adjustment may not be possible. In this case, record in the "AUTO" Mode.</li> </ul>	<p><b>1</b></p>  <p>The "MNL" Indication appears in the Viewfinder. (It is also possible to set the [AE] Selector to one of the other positions, except "AUTO".)</p>	<p><b>2</b></p>  <p>Attach the Lens Cap and point the Movie Camera at subject. or Point the Movie Camera at a pure white subject.</p>

<p><b>Remarks, etc.</b></p> <ul style="list-style-type: none"> <li>• For detailed explanations about the white balance, see p. 36 and 37.</li> <li>• Be careful not to cover the White Balance sensor for the Automatic White Balance Adjustment with your hand, etc. during recording.</li> </ul>	
<ul style="list-style-type: none"> <li>• If you want to momentarily use an additional light source with low colour temperature (e.g. halogen lamp) while recording a subject with high colour temperature (e.g. blue sky or TV screen), unnatural colours will result.</li> <li>• The manually adjusted white balance setting is maintained until you adjust it anew or reset the [AE] Selector to "AUTO". However, to ensure optimum colour reproduction, it is recommended to adjust the white balance for each new scene, like the professionals do. This is because even slight changes in the lighting that are not noticeable to the human eye could give the picture a reddish or bluish cast.</li> </ul> <p><b>■ To Cancel the Manual White Balance Adjustment</b></p> <p>Press the [W.B] Button to make the "WB" indication disappear. Or reset the [AE] Selector to "AUTO".</p>	<p><b>3</b></p> <p>Keep pushed until the Viewfinder becomes completely white.</p> 
<p><b>4</b></p> <p>Press for more than 1 second (until "WB" indication stops flashing).</p> 	<p><b>■ To Cancel the Manual White Balance Adjustment</b></p> <p>Press the [W.B] Button to make the "WB" indication disappear. Or reset the [AE] Selector to "AUTO".</p>



## ■ White Balance

In addition to sunlight, there are various kinds of electric lights in use today, such as incandescent lamps, fluorescent lamps, etc. The colour of the subject differs depending on the light that falls on it.

### ● Human Eyes

can easily adjust to different kinds of lighting and recognize an object as having the same colour, even under different light.

### ● Movie Cameras

do not have such an adaptability. Therefore, if the subject were recorded without any colour adjustment, the lighting would influence the colouring of the reproduced picture, giving it a bluish or reddish tint. To prevent this, an adjustment called "White Balance Adjustment" needs to be performed on the Movie Camera, either automatically or manually.

## ■ White Balance Adjustment

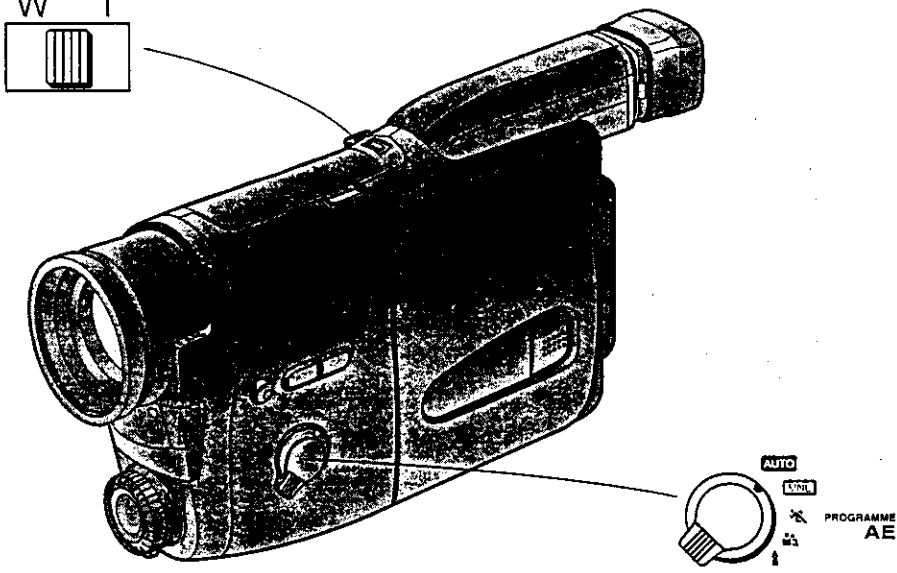
This adjusts the Movie Camera to pure white under different lighting conditions. After white is set, the Movie Camera can compensate for the colour in the lighting and adjust the other colours accordingly. As white is the combination of all colours (light), if white colour is correctly adjusted, recording scenes with natural colours is possible under almost any lighting condition.

## ■ Automatic White Balance Adjustment

To provide natural colours in the most common lighting situations, this Movie Camera has optimum settings for these conditions stored in memory. It determines the colour of the light entering through the lens as well as through the White Balance Sensor window and selects the matching colour setting from among the stored settings. This function is called "Automatic White Balance Adjustment".

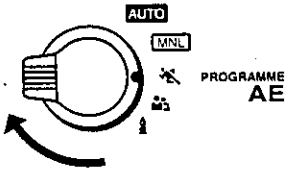
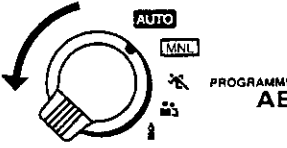
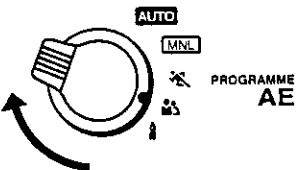
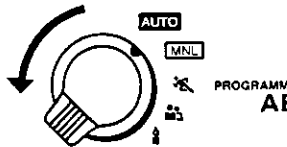
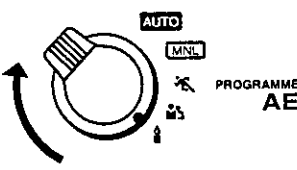
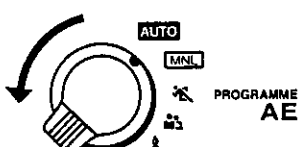
However, as the optimum settings of only several types of light sources are stored in memory, the Automatic White Balance Adjustment does not work with sufficient precision in all conditions.

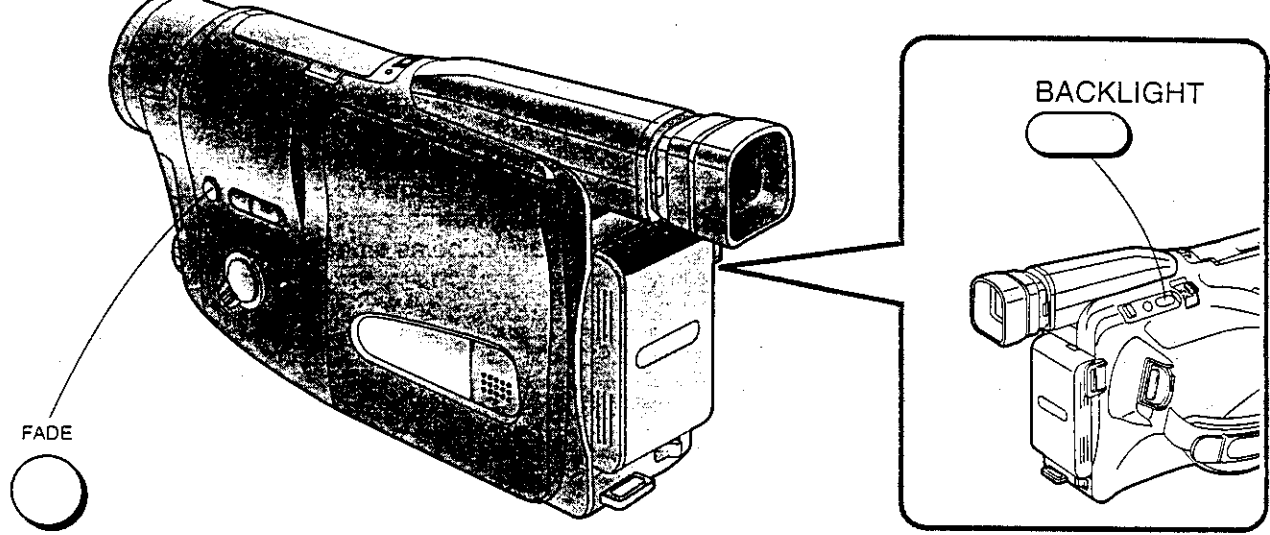
In some cases, the Manual White Balance Adjustment should be used.




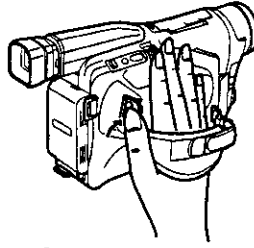

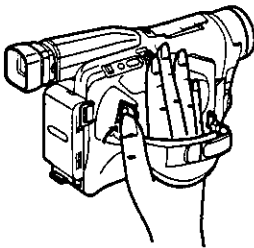

Title	Viewfinder
<p><b>Recording Fast-Moving Subjects</b></p> <p>■ <b>Using the Sports Mode</b>            Use this function to record sports and other fast-action scenes, if you want to play back these scenes in a VCR using still and slow motion playback for motion analysis. This provides sharp picture contours and enhanced detail.</p>	
<p><b>Making Subjects Stand out Sharply from the Background</b></p> <p>■ <b>Using the Portrait Mode</b>            In the Portrait Mode, the iris is automatically set to the maximum aperture for a very small depth-of-field. This gives you a sharply focused subject in the centre of the picture with a blurred background and foreground.</p>	
<p><b>Recording Dark Scenes More Brightly</b></p> <p>■ <b>Using the Low Light Mode</b>            The Low Light Mode lets you brighten up the picture when recording under dim lighting, for example outdoor scenes at dusk, scenes under party lighting or indoor scenes under weak room lighting.</p>	

- The subject must be brightly lit by sunlight or other strong light and contain little shadow.
- If you want to record under fluorescent, mercury-vapour or sodium lamps, some flickering may be noticeable.
- The picture may become slightly darker, and during normal playback, the picture movement may not be as smooth as usual.

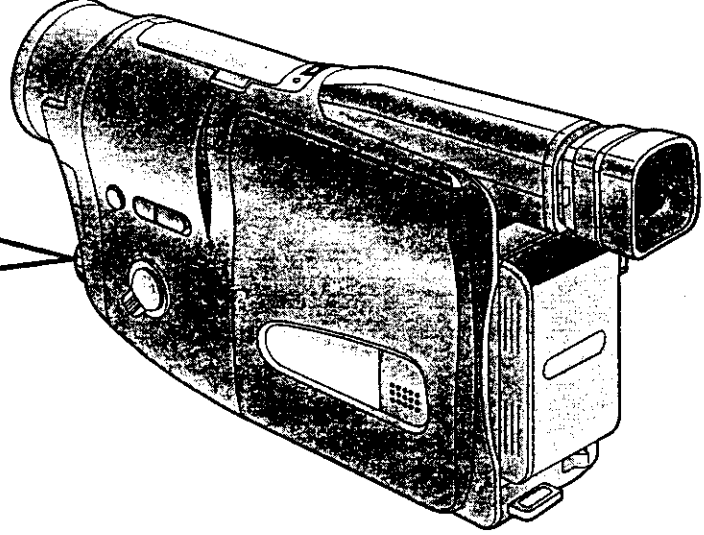
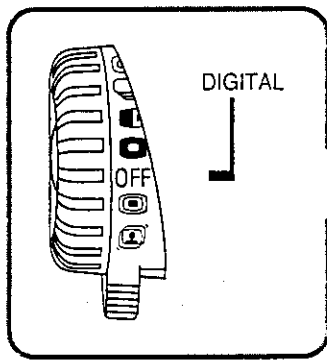
<i>Procedure</i>		<i>Remarks, etc.</i>
<p><b>1</b></p> 	<p>To Return to the Normal Recording Mode:</p> 	<ul style="list-style-type: none"> <li>• The shutter speed is automatically adjusted (between 1/50 s and 1/500 s) according to the brightness of the scene.</li> <li>• If you record under weak lighting, the "⚡" indication flashes to warn you that the Sports Mode may not be effective.</li> </ul>
<p><b>1</b></p> 	<p>To Return to the Normal Recording Mode:</p> 	<ul style="list-style-type: none"> <li>• If you want to increase the blurring of the background and foreground, zoom in on the subject.</li> </ul>
<p><b>1</b></p> 	<p>To Return to the Normal Recording Mode:</p> 	<ul style="list-style-type: none"> <li>• If you use this mode for recording outdoors in daylight, the result will be almost the same as when recording in the normal recording mode.</li> <li>• There will be a distinct increase in picture noise in low lit areas when using the Low Light Mode. This is normal.</li> </ul>



Title	Viewfinder	Procedure
<p><b>Recording Backlit Scenes</b></p> <p>When you record a subject that has a strong light source behind it, for example a person with the sun behind it, the face is in the shade and appears too dark. In such a case, you can brighten up the subject by keeping the [BACKLIGHT] Button pressed during recording.</p>		<p><b>1</b></p> <p>BACKLIGHT</p> <p>Keep pressed.</p>
<p><b>Fading In the Picture and Sound</b></p> <p>At the beginning of a movie, etc. fading in is often used. For example, after recording the title, starting the first scene with the Fade-in Function is very effective.</p>		<p><b>1</b></p> <p>FADE</p> <p>Keep pressed while in the Recording Pause Mode.</p>
<p><b>Fading Out the Picture and Sound</b></p> <p>Fading out is used to create a soft ending or (together with fade-in) for a soft transition from one scene to the next.</p>		<p><b>1</b></p> <p>FADE</p> <p>Press during recording at the point where you wish to fade out.</p>

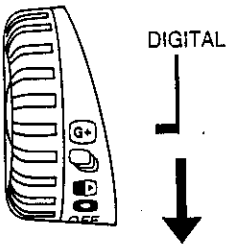
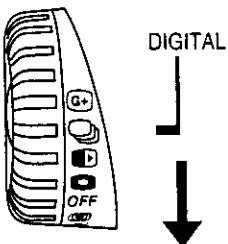
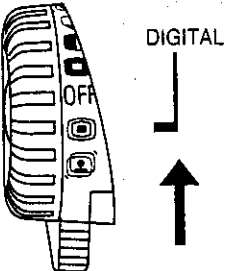
		<i>Remarks, etc.</i>
<p><b>2</b></p> <p>■ To Cancel this Function</p> <p>BACKLIGHT</p>  <p>Release the Button.</p>		<ul style="list-style-type: none"> <li>• If you record a deep blue sky, it may appear whitish in the playback picture.</li> <li>• If you record a subject with the sun striking at an acute angle, star-shaped light reflections may be recorded in the picture.</li> <li>• If you record a subject with very strong backlight or with a very bright background, e.g. a person indoors in front of a window, it may not be possible to sufficiently brighten up the subject.</li> <li>• In some cases when the backlit feature is used, the subject may look clear but now the background may look overexposed (too bright). This is normal and not a malfunction of the unit.</li> </ul>
<p><b>2</b></p>  <p>Press after the picture in the Viewfinder has disappeared.</p>	<p><b>3</b></p> <p>FADE</p>  <p>Release after approx. 3 seconds.</p>	
<p><b>2</b></p>  <p>Press after the picture in the Viewfinder has disappeared.</p>	<p><b>3</b></p> <p>FADE</p>  <p>Release.</p>	

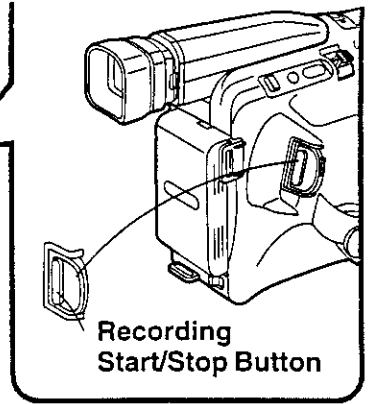
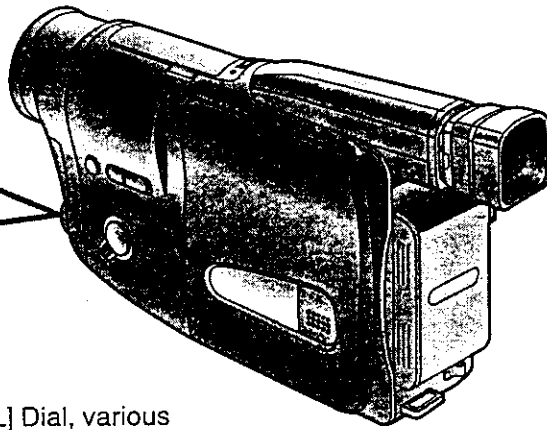
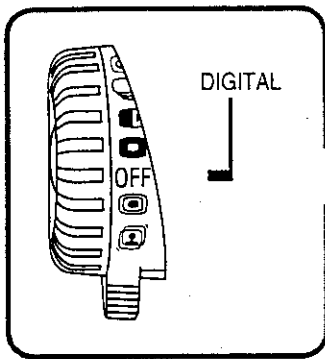




- Simply by turning this [DIGITAL] Dial, various digital effects can be obtained. When it is set to "OFF", the Digital Recording Mode is cancelled.

Title	Viewfinder
<p><b>Digital Gain-up Function (NV-RX7A only)</b></p> <p>This function makes it possible to record dark scenes more brightly.</p>	
<p><b>Digital Strobe Function (NV-RX7A only)</b></p> <p>This function makes it possible to continuously record still pictures of about 1/4 sec. duration.</p>	
<p><b>Digital Zoom Function (NV-RX7A only)</b></p> <p>The zoom magnification range is extended to 140X.</p> <ul style="list-style-type: none"> <li>• After selecting the Digital Zoom Mode on the Movie Camera, digital zooming can also be operated with the Remote Controller.</li> </ul>	

Procedure	Remarks, etc.
<p><b>1</b></p> 	<ul style="list-style-type: none"> <li>• When using this function, some after-image distortion may occur.</li> <li>• The focus must be adjusted manually since the Movie Camera is automatically switched to the Manual Focus Mode.</li> <li>• The Sports Mode or the Portrait Mode will be cancelled automatically.</li> </ul>
<p><b>1</b></p> 	<ul style="list-style-type: none"> <li>• Since the strobe pictures are recorded from the digital image memory, the picture quality may be slightly inferior to that of normally recorded pictures.</li> <li>• When recording under fluorescent lamps, the brightness of the picture may fluctuate.</li> </ul>
<p><b>1</b></p> 	<ul style="list-style-type: none"> <li>• When the "D.ZOOM" Indication is displayed in the Viewfinder, the subject can be enlarged up to 140 times.</li> <li>• The zooming speed varies depending on how far the [W•T] Zoom Lever is pushed toward "W" or "T". (The further it is pushed towards either "W" or "T", the faster the zooming speed becomes.)</li> </ul>

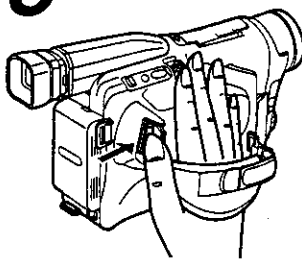
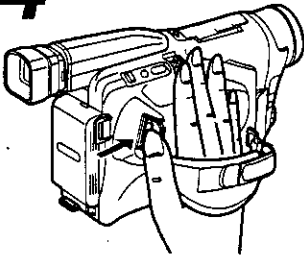


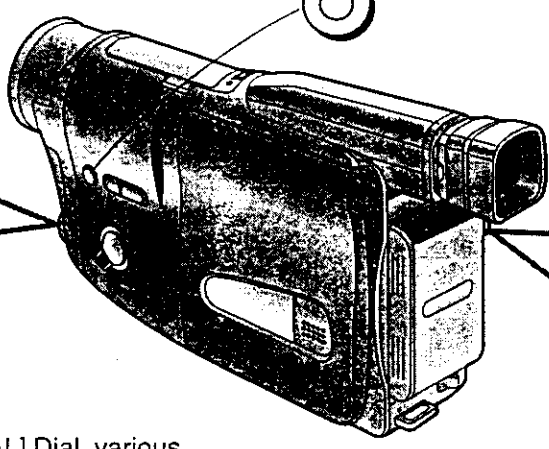
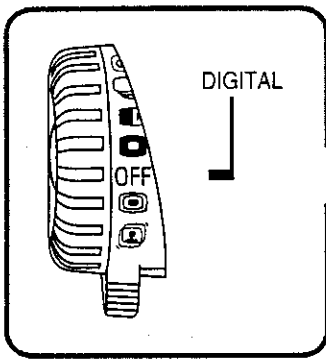
- Simply by turning this [DIGITAL] Dial, various digital effects can be obtained. When it is set to "OFF", the Digital Recording Mode is cancelled.

Title	Procedure	
<p><b>Digital Wipe Function</b> (NV-RX7A only)</p> <p>This function makes it possible to achieve a smooth transition from the last recorded scene to the next scene. When starting to record the new scene, a still picture of the last scene appears, and it is then changed over to the moving picture of the new scene with Digital Wipe (like opening a curtain).</p> <div data-bbox="236 1086 639 1216" data-label="Image"> </div>	<p><b>1</b></p> <div data-bbox="914 869 1147 1115" data-label="Image"> </div> <ul style="list-style-type: none"> <li>• The "WIPE" Indication appears in the Viewfinder.</li> </ul>	<p><b>2</b></p> <div data-bbox="1219 817 1533 1106" data-label="Image"> </div> <p><b>Press.</b></p> <ul style="list-style-type: none"> <li>• The Recording Starts.</li> </ul>
<p><b>Super Image Stabilizer Function</b> (NV-RX7A only)</p> <p>This function compensates for possible shaking of the handheld Movie Camera.</p> <div data-bbox="244 1664 644 1798" data-label="Image"> </div>	<p><b>1</b></p> <div data-bbox="914 1496 1150 1765" data-label="Image"> </div>	

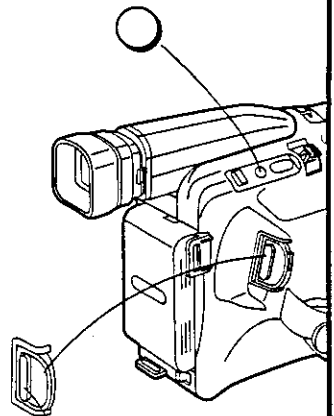
- When you use the Super Image Stabilizer Function in the Auto Mode, the shutter speed is automatically adjusted between 1/50s and 1/125s.
- When you cancel the Super Image Stabilizer Function in the Manual Mode, the shutter speed is also reset to 1/50s. However, when cancelling the Super Image Stabilizer Function after recording in the Sports or Portrait Mode, the shutter speed is not reset to 1/50s.

- If you record the following kind of subjects, the picture stabilizing effect may not be sufficient:
- A subject with horizontal or vertical stripes
  - A flat subject
  - A dark subject  
(The Super Image Stabilizer Indication "Ⓜ" flashes in the Viewfinder.)  
Increase the amount of light.
  - A subject under many fluorescent lamps
  - A fast-moving subject
  - A subject with a flat background

		<i>Remarks, etc.</i>
<p><b>3</b></p>  <p><b>Press.</b></p> <ul style="list-style-type: none"> <li>• The "WIPE" Indication appears. The last picture of the last recorded scene is kept in the memory.</li> </ul>	<p><b>4</b></p>  <p><b>Press.</b></p> <ul style="list-style-type: none"> <li>• The picture (from the memory) appears as still picture. It is then gradually replaced from right to left by the moving picture of the new scene.</li> </ul>	<ul style="list-style-type: none"> <li>• Since the still picture is recorded from the digital image memory, the picture quality becomes slightly inferior to that of normally recorded pictures.</li> <li>• Performing Recording Review or pressing the [VCR/CAMERA] Button does not erase the picture in the digital image memory.</li> <li>• The still picture in the memory will be lost if the Movie Camera is turned off or if the [DIGITAL] Dial is set to "OFF" or to a mode other than Digital Wipe Function.</li> </ul>
		<ul style="list-style-type: none"> <li>• This function is especially practical for the following recording situations:               <ol style="list-style-type: none"> <li>1. Zooming in on a distant subject.</li> <li>2. Recording while walking.</li> <li>3. Recording from inside a moving car.</li> </ol> </li> <li>• The "D.ZOOM" Indication appears, too.</li> </ul>

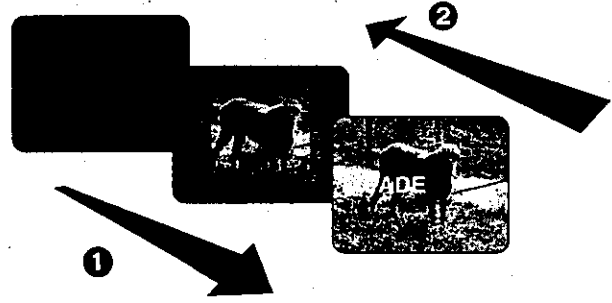
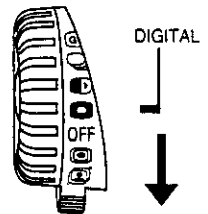

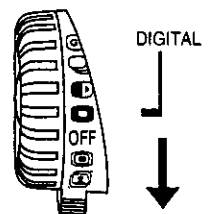





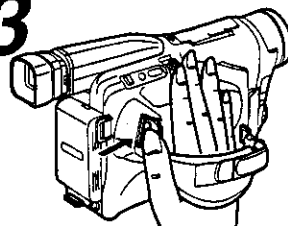
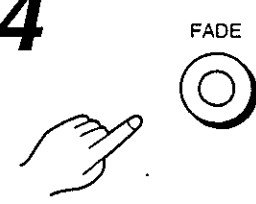
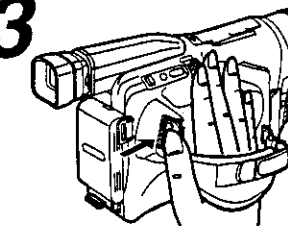
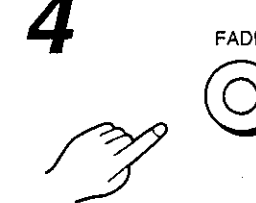
SNAPSHOT REC

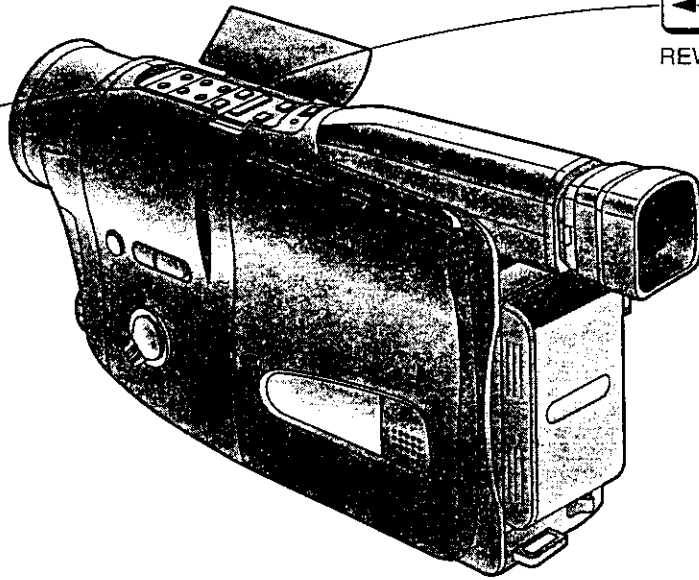




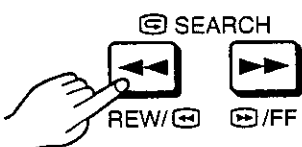
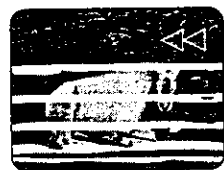
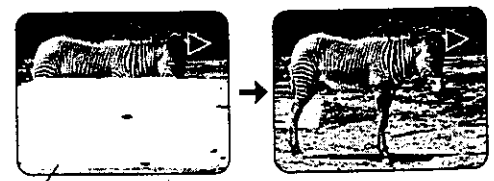
Recording Start/Stop Button

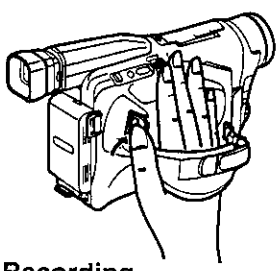

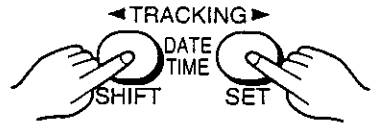
• Simply by turning this [DIGITAL] Dial, various digital effects can be obtained. When it is set to "OFF", the Digital Recording Mode is cancelled.

Title	Procedure	
<p><b>Digital Fade Function (NV-RX7A only)</b></p> <p>Fading in from black with the Digital Fade Function is a very interesting way to give groups of scenes a uniform beginning, for example by using it to start each day's action inserting scenes that do not fit into the film's natural time sequence. The sound is also gradually faded in and faded out together with the picture.</p> 	<p><b>1</b></p>  <p>•The "D.FADE" Indication appears in the Viewfinder.</p>	<p><b>2</b></p> <p>■ How to Fade in ①</p> <p>FADE</p>  <p>Keep pressed while in the Recording Pause Mode.</p>
	<p><b>1</b></p>  <p>•The "D.FADE" Indication appears in the Viewfinder.</p>	<p><b>2</b></p> <p>■ How to Fade out ②</p> <p>FADE</p>  <p>Press during recording at the point where you wish to fade out.</p>
<p><b>Recording a Still Picture for 5 Seconds (Snapshot) (NV-RX7A only)</b></p> <p>Recording a still picture for approx. 5 seconds can be performed by pressing a single button in the Recording Pause Mode.</p> <p>(When using this function repeatedly, wait at least 2 to 3 seconds before pressing this Button again.)</p>	 <p>•The picture in the Viewfinder stands still, too.</p>	<p><b>1</b></p> <p>SNAPSHOT REC</p>  <p>Press while in the Recording Pause Mode.</p>

		Remarks, etc.
<p><b>3</b></p>  <p>Press after the picture in the Viewfinder has disappeared.</p>	<p><b>4</b></p>  <p>Release after approx. 3 seconds.</p>	
<p><b>3</b></p>  <p>Press after the picture in the Viewfinder has disappeared.</p>	<p><b>4</b></p>  <p>Release.</p>	
		<ul style="list-style-type: none"> <li>● Since the still picture is recorded from the image memory, the picture quality may be slightly inferior to that of normally recorded pictures.</li> <li>● To prevent picture distortion, do not move or shake the Movie Camera during still picture recording.</li> <li>● While the Digital Wipe Function is activated, this function cannot be operated.</li> <li>● If the Viewfinder has been turned off by the Auto Power Save Function, the Snapshot Function cannot be activated.</li> </ul>

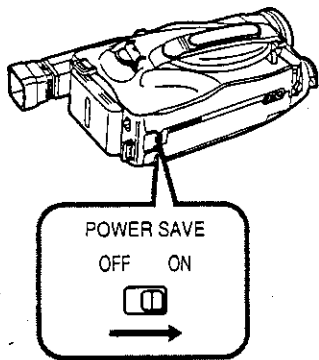


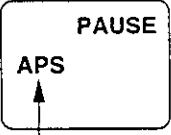
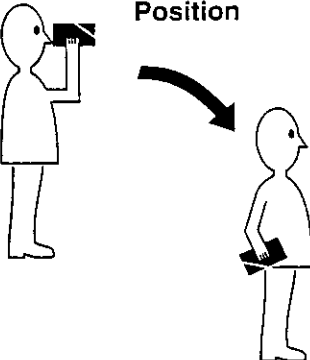


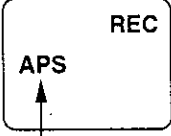
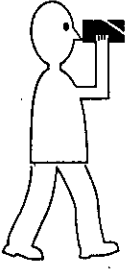
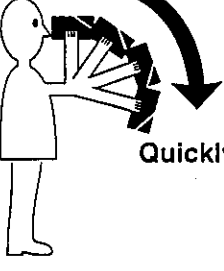


Title	Procedure
<p><b>Checking the End of a Recorded Scene</b></p> <p>For occasionally important scenes, use this check function during recording to confirm that the recording has been performed correctly.</p>	<p><b>1</b></p>   <p>Press while in the Recording Pause Mode.</p>
<p><b>Locating a Point Where You Wish to Add a New Scene (Camera Search Function)</b></p> <p>Record the individual scene a little longer than actually required. You can then rewind the tape and determine the exact point where you wish to join the next scene. When the [SEARCH] Button is then released, the Movie Camera returns to the Recording Pause Mode.</p>	<p>■ Reverse direction</p>   <p>Keep pressed while in the Recording Pause Mode.</p>
<p><b>Eliminating Picture Distortions by Adjusting the Tracking</b></p> <p>When playing back a recorded tape, especially a tape recorded on another Movie Camera, horizontal bands of white noise may appear in the picture. If this occurs, you can eliminate them by adjusting the tracking.</p>	 <p>White noise bands</p>

	<i>Remarks, etc.</i>
<p><b>2</b> To start the recording Again:</p>  <p>Press the Recording Start/Stop Button.</p>	<ul style="list-style-type: none"> <li>• The final 2 seconds of the last recorded scene will be played back in the Viewfinder and then the Movie Camera returns to the Recording Pause Mode.</li> </ul>
<p>■ Forward direction</p>  <p>Keep pressed while in the Recording Pause Mode.</p>	<ul style="list-style-type: none"> <li>• If you keep pressing [REW/◀] Button: The Indication "◀◀" appears in the Viewfinder. The scene is played back in reverse direction at 3 times normal speed in the SP Mode and 6 times in the LP Mode.</li> <li>• If you keep pressing [▶/FF] Button: The Indication "▶" appears in the Viewfinder. The scene is played back in forward direction at normal speed.</li> </ul>
<p><b>1</b></p>  <p>Press both the [◀ TRACKING] and [TRACKING ▶] Buttons simultaneously.</p>	<ul style="list-style-type: none"> <li>• If you press both buttons simultaneously but the picture quality does not improve, adjust by pressing the [◀ TRACKING] or [TRACKING ▶] Button individually. (It may not be possible to remove the noise bands completely.)</li> </ul>

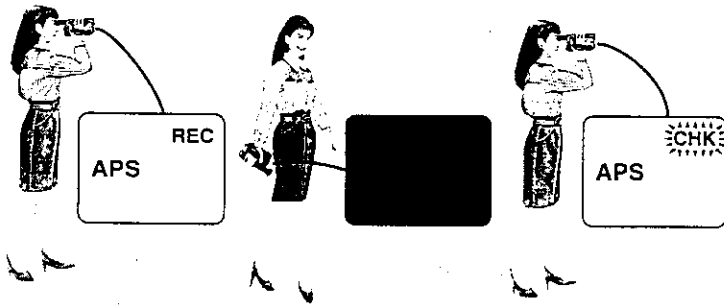


# 1 Auto Power Save (in the Recording Pause Mode)



	Movie Camera Mode	Becomes Activated:	Conditions of Movie Camera
<b>1</b> Auto Power Save Function	<b>During Recording Pause</b>  Viewfinder  The "APS" Indication is displayed.	<b>Horizontal Position</b>  <ul style="list-style-type: none"> <li>• More than about 70°</li> <li>• More than a few seconds</li> </ul> Activated  • When the Movie Camera is tilted downwards by more than about 70° from the normal horizontal recording position for more than a few seconds.	  <ul style="list-style-type: none"> <li>• Video and Audio will be faded during this mode so no picture or sound will be present.</li> <li>• Viewfinder: OFF</li> <li>• Auto Focus: OFF</li> <li>• Zoom Motor: OFF</li> <li>• VCR Indication: Flashes (Green)</li> </ul> 
<b>2</b> Anti-Ground-Recording Function	<b>During Recording</b>  Viewfinder  The "APS" Indication is displayed.	<b>Horizontal Position</b> 1)  2)  Quickly  <ul style="list-style-type: none"> <li>• More than about 70°</li> <li>• More than a few seconds</li> </ul> Activated  • When tilting the Movie Camera downwards by more than about 70° from the normal horizontal recording position for more than a few seconds, and: 1) Walking with the Movie Camera held in the hand or; 2) tilting the Movie Camera quickly in the case of not walking.	  <ul style="list-style-type: none"> <li>• Video and Audio will be faded during this mode so no picture or sound will be present.</li> <li>• Viewfinder: OFF</li> <li>• Auto Focus: OFF</li> <li>• Zoom Motor: OFF</li> <li>• Recording Mode</li> </ul> Recording Pause Mode <ul style="list-style-type: none"> <li>• VCR Indication: Flashes (Green)</li> </ul> 

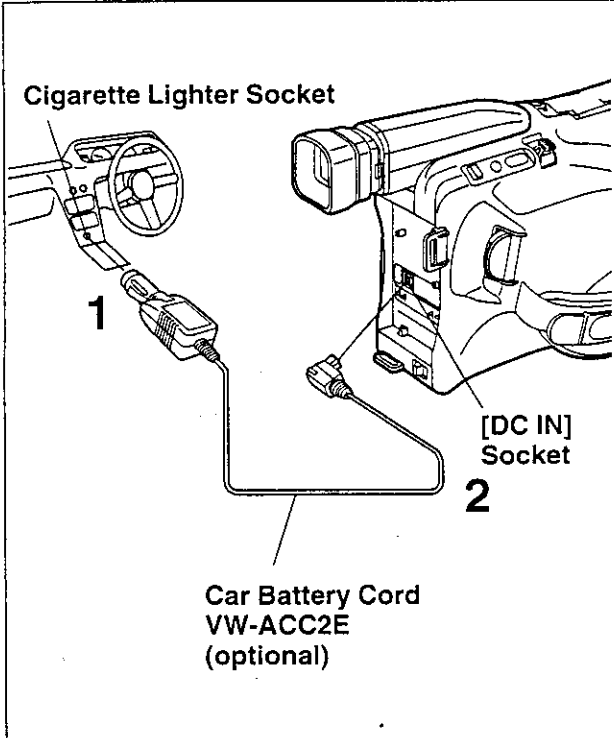
2 Anti-Ground-Recording (in the Recording Mode):



The Anti-Ground recording function is meant as a guide or Indication that irregular recording has occurred. It is up to the user to reposition the tape so as to remove the undesired section of the recording. The Movie Camera only switches the unit to Recording Pause/Power Save Mode, and when the user begins to operate the unit again, the "CHK" Indication appear in the top right hand corner of the Viewfinder.

Result	To Resume Recording	Operating Restrictions
<ul style="list-style-type: none"> <li>● <b>Saving Power</b> Your Battery Pack lasts longer for actual recording.</li> <li>● <b>Preventing Lengthy Recording of the Ground</b> Even if you unintentionally press the Recording Start/ Stop Button when you hold the Movie Camera facing downwards after finishing the recording of a scene, the Movie Camera prevents recording.</li> </ul>	<p><b>Horizontal Position</b></p> <ul style="list-style-type: none"> <li>● When you return the Movie Camera to an approximately horizontal position, it automatically resets to the Recording Pause Mode, and you can start recording again by pressing the Recording Start/ Stop Button.</li> </ul>	
<ul style="list-style-type: none"> <li>● <b>Saving Power</b> Your Battery Pack lasts longer for actual recording.</li> <li>● <b>Preventing Lengthy Recording of the Ground</b> The Movie Camera automatically switches over to the Recording Pause Mode to stop the unintentional recording.</li> </ul>	<p><b>Horizontal Position</b></p> <ul style="list-style-type: none"> <li>● If you return the Movie Camera to an approximately horizontal position, the "CHK" (=Check) Indication flashes in the Viewfinder. This warns you that since the recording may have continued for several seconds, you should rewind the tape a little using the Camera Search Function (p. 48) to locate the end of the last desired scene, before you start recording again.</li> </ul>	<ul style="list-style-type: none"> <li>● If you slowly turn the Movie Camera downwards during recording, the Anti-Ground-Recording Function does not become activated.</li> </ul> <ul style="list-style-type: none"> <li>● The Anti-Ground-Recording Function is not intended to replace the manual stopping of recording.</li> </ul>

**Note:** When you change locations between scenes or when not planning to record for a longer period time, it is recommended to turn off the Movie Camera with the [POWER] ON/OFF Switch.

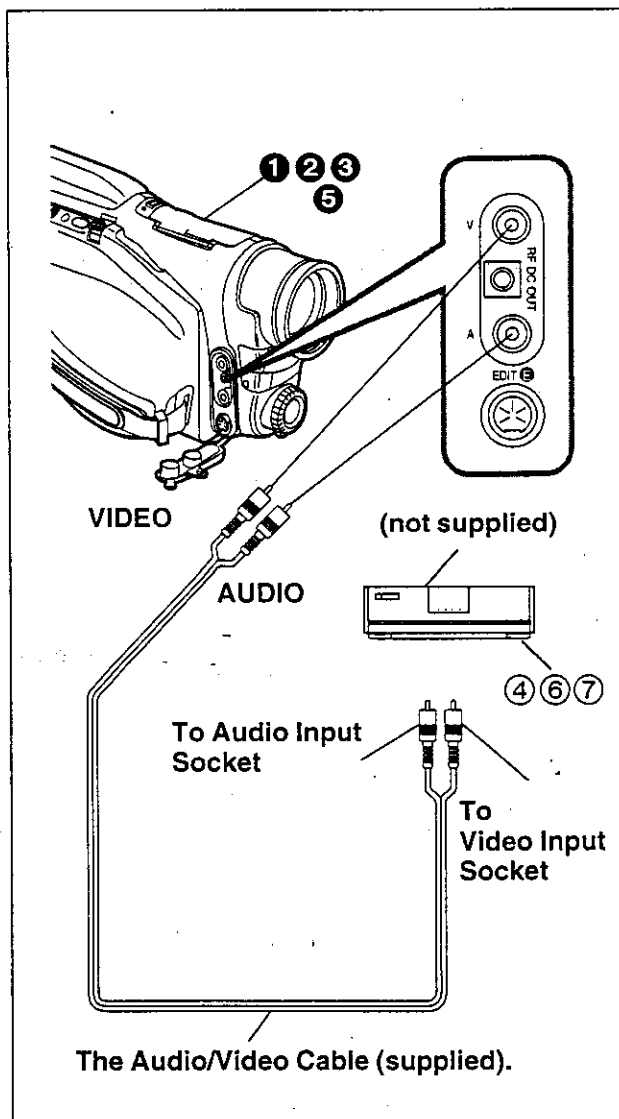


**Notes:**

1. The Car Battery Cord can only be used with 12 V DC negative-grounded vehicles.
2. Do not start the car engine while the Movie Camera is being powered by the car battery.
3. If the voltage drops suddenly e.g. because the car air-conditioner is turned on, the Movie Camera is automatically turned off to protect it. Wait about 10 seconds before turning it on again.
4. Some cars, RVs and campervans use 24 V. Please confirm with vendor that your vehicle uses 12 V before using the Car Battery Cord. If used on 24 V, damage may occur and is not covered by the warranty.

- 1** Start the engine and then plug the Car Battery Cord into the Cigarette Lighter Socket.
- 2** Connect the other end of the cord to the [DC IN] Socket on the Movie Camera.

**Editing a Previously Recorded Tape**



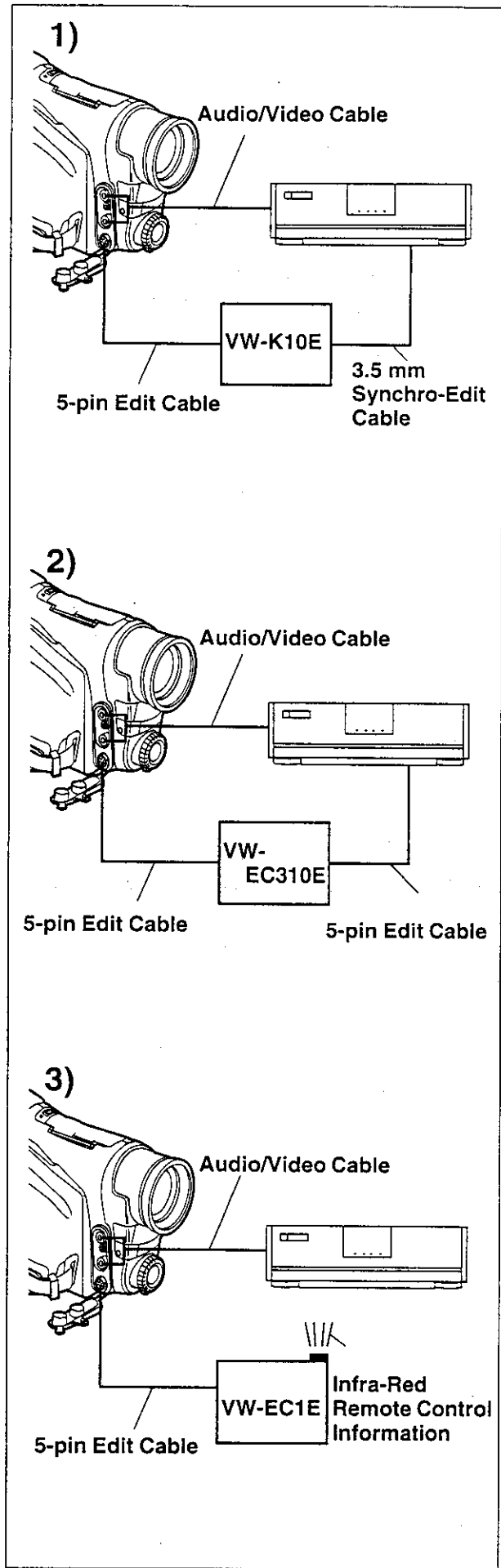
Connect the Movie Camera to the VCR using the Supplied Audio/Video Cable.

**■ Operations**

Playback Unit (Movie Camera): **1 2 3 5**

Recording Unit (VCR): **4 6 7**

- 1** Insert the recorded video cassette for playback into the Movie Camera.
- 2** Play back the tape and locate the end of the scene that you want to dub, and note the tape counter position.
- 3** Rewind the tape and locate the beginning of the scene that you want to dub.
- 4** Insert the video cassette for recording into the VCR and put it in the Recording Pause Mode. Also read the Operating Instructions of the VCR. The picture quality deteriorates slightly in the dubbing process, however, this can be minimized by selecting the standard recording speed (SP Mode) on the VCR.
- 5** Start the playback.
- 6** Press the Pause/Still Button to start recording.
- 7** As soon as the Tape Counter Indication on the Movie Camera reaches the position noted in step **2**: Press the Pause/Still Button to put the VCR in the recording pause mode, thus finishing the dubbing.
- 8** For all additional scenes that you want to dub, follow the above steps **2** to **7**.

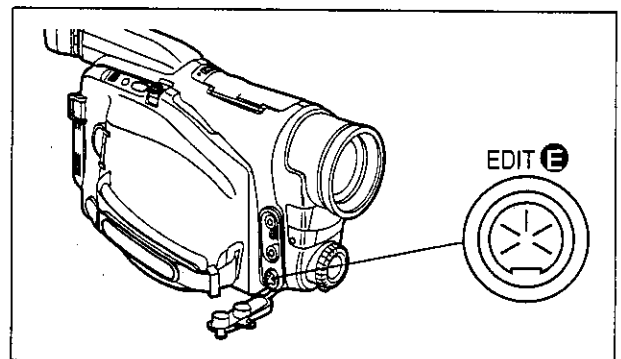





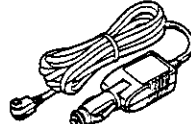
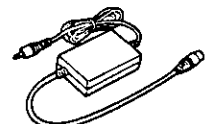
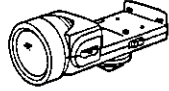
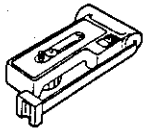



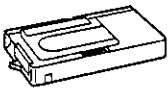
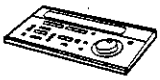


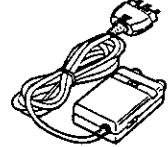
■ [EDIT] Socket

By connecting a Panasonic Editing Controller (optional) to this socket as well as to a Panasonic VCR equipped with Edit Socket, highly precise and speedy editing becomes possible. The following types of Editing Controller can be used with this Movie Camera.

- 1) Connecting the Movie Camera to a Panasonic VCR equipped with synchro-edit socket (3.5 mm stereo jack) as the recording unit, using the 5-pin Synchro Cord VW-K10E (optional).
  - This is a single event edit controlling system. Therefore, the user needs to know the start and end points of the scene to be edited and needs to start and stop the editing manually.
- 2) Connecting the Movie Camera to a Panasonic VCR equipped with 5-pin edit socket as the recording unit, using the Editing Controller VW-EC310E (optional).
  - This Editing Controller can be programmed for automatic editing of up to 8 scenes.
  - When using this Editing Controller, be sure to edit with the "Standard-Speed Mode".
- 3) Connecting the Movie Camera to any brand of VCR equipped with Infra-Red Remote Controller as the recording unit, using the Editing Controller VW-EC1E (optional).
  - This Editing Controller can be programmed for automatic editing of up to 4 scenes.

**Note:**  
The full instructions as written in the Operating Instructions of the Editing Controllers and the 5-pin Synchro Cord must be followed or the edit function may not operate correctly. This may not be a fault of the Movie Camera.



Battery Pack VW-VBS10E VW-VBH10E 	Battery Pack VW-VBS20E VW-VBH20E 	Car Battery Charger VW-KBC2E 	Car Battery Cord VW-ACC2E 	5-Pin Synchro Cord VW-K10E 
Video DC Light VZ-LDCS13E  The Shoe Adaptor (VW-SK9E; optional) is necessary.	Shoe Adaptor VW-SK9E 	Filter Kit VW-LF43E 	Standard Tripod VZ-CT55E 	Deluxe Tripod VZ-CT75E 
Cassette Adaptor VW-TCA7E 	Editing Controller VW-EC310E 	Editing Controller VW-EC1E 	Video Titler VW-VT1A 	RF Adaptor VW-RF7E 

**Notes:**

- Consult your dealer for details of other accessories not listed here.
- Some of these accessories may not be available in Australia. Please check with your retailer.

**■ Charging Time and Maximum Time for Continuous Recording**

Battery Pack No.	Charging Time	Max. Continuous Recording Time	
		NV-RX3A	NV-RX7A
VW-VBS10E	65 min.	55 min.	45 min.
VW-VBS20E	130 min.	110 min.	90 min.
VW-VBH10E	80 min.	65 min.	55 min.
VW-VBH20E	160 min.	130 min.	110 min.

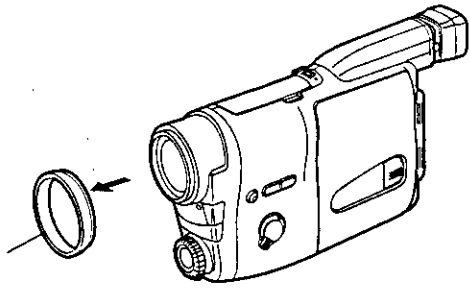
(The times shown in the above chart are approximations.)

**■ Video DC Light (VZ-LDCS13E)**

This Video DC Light is recommended for recording in a dark room as well as for recording photographs and pictures with the Macro Close-up function (p. 19). To attach the Video DC Light (VZ-LDCS13E) to the Movie Camera, the Shoe Adaptor (VW-SK9E) is necessary.

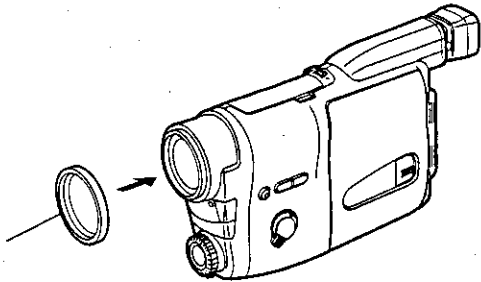
1

Lens Hood



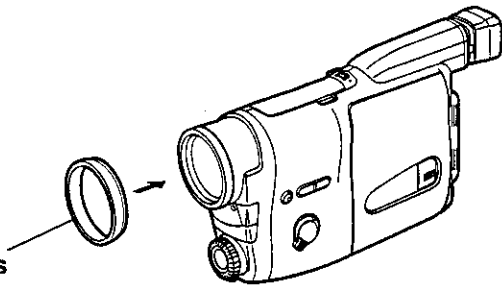
2

Filter

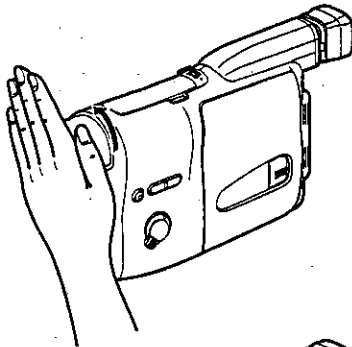


3

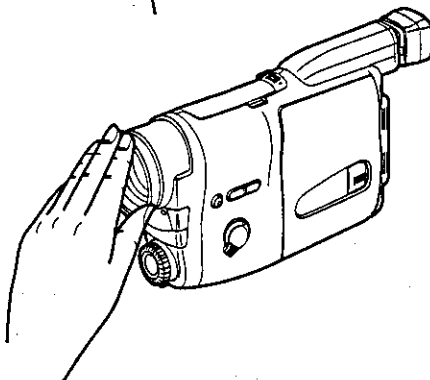
Lens Hood



Correct



Wrong



Before attaching an optional filter, first remove the Lens Hood from the Movie Camera.

- 1 Remove the Lens Hood.
- 2 Attach the filter.
- 3 Attach the Lens Hood again.

**Note:**

To remove the Lens Hood, press with the palm of your hand against it and turn in the direction of the arrow.

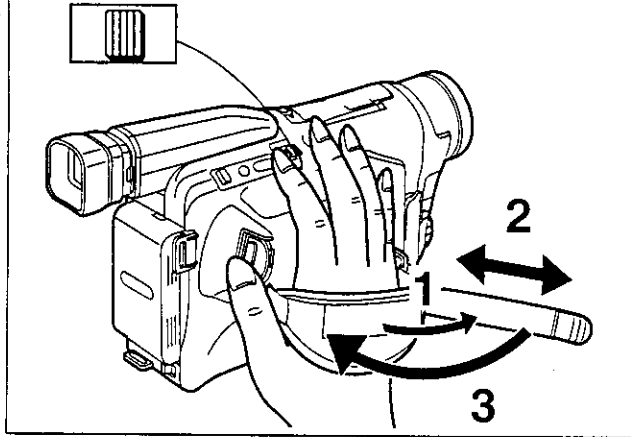
•**Filter Kit (VW-LF43E)**

The Filter Kit (VW-LF43E) contains an ND Filter and an MC Protector.

The ND Filter is recommended for recording in extremely bright places, e.g. on a beach or ski slope.

It prevents the picture from becoming whitish, yet without changing the colours. (When recording with the ND Filter attached, the Manual White Balance Adjustment Mode should be used, since the Auto White Balance Adjustment Mode would not work precisely.)

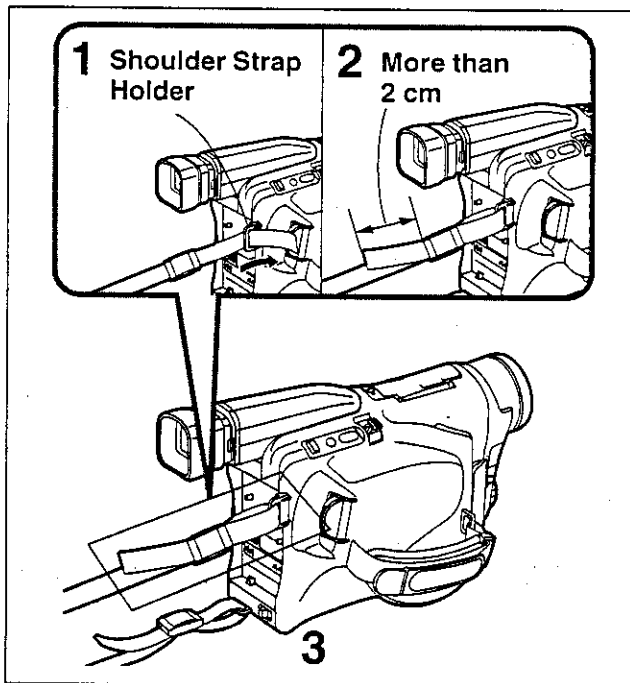
The MC Protector is used for protecting the lens and it can be used for virtually any kind of recording.



Adjust the Grip Belt so that you can press the Recording Start/Stop Button with the thumb, and the [W·T] Zoom Lever with the index finger.

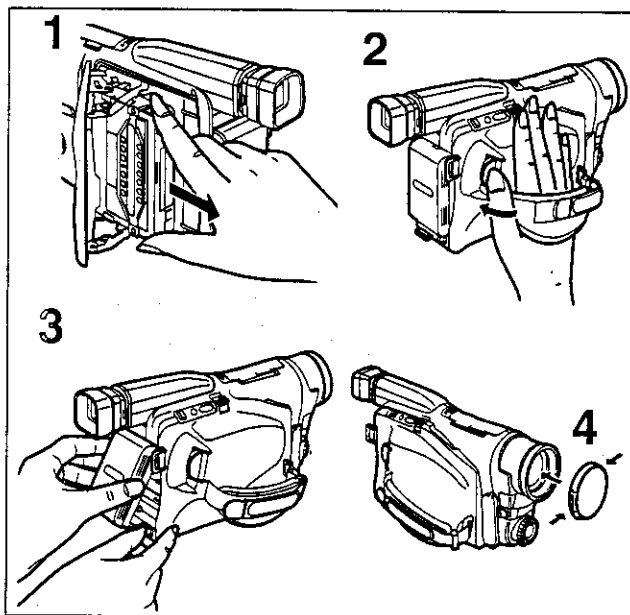
- 1 Unfasten the velcro tape closure.
- 2 Adjust the length to the size of your hand.
- 3 Fasten the velcro tape closure.

### Attaching the Shoulder Strap



- 1 Pull the end of the Shoulder Strap through the Shoulder Strap Holder.
- 2 Securely attach the end of the Shoulder Strap. (More than 2 cm)
- 3 Attach the other end of the Strap in the same way.

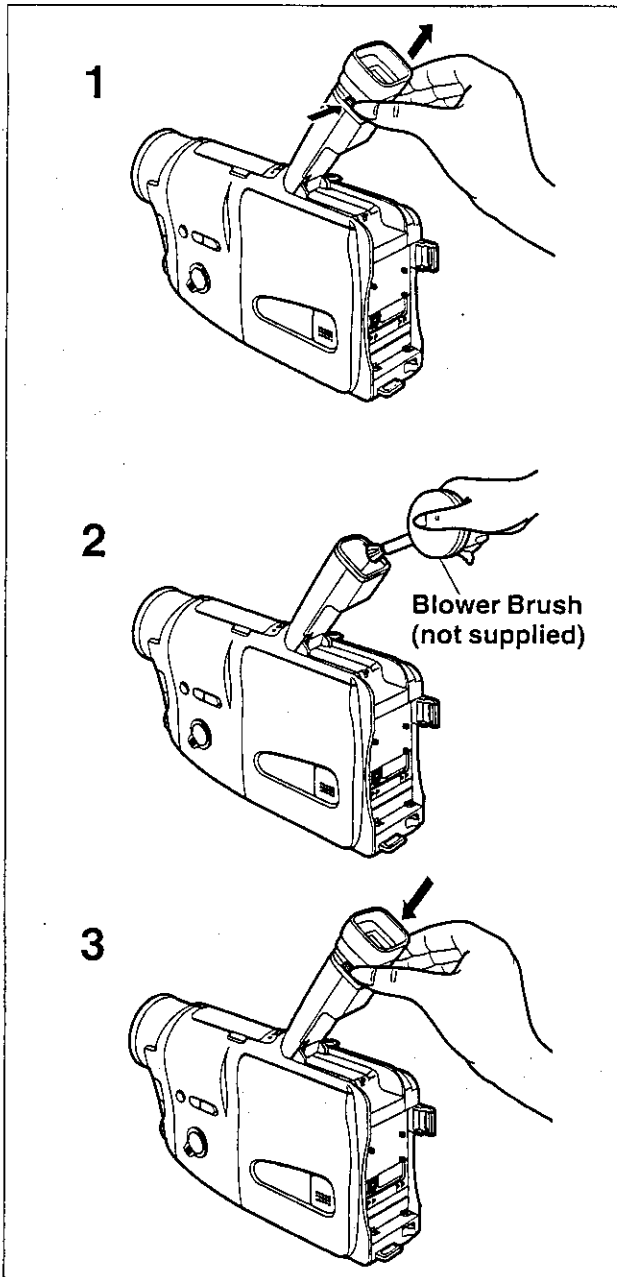
### Storage



- 1 Slide the [EJECT ▲] Lever and remove the Video Cassette.
- 2 Turn the [POWER] ON/OFF Switch in. (The Movie Camera is switched off.)
- 3 Slide the [BATTERY EJECT ►] Lever to the right and remove the Battery Pack.
- 4 Attach the Lens Cap.

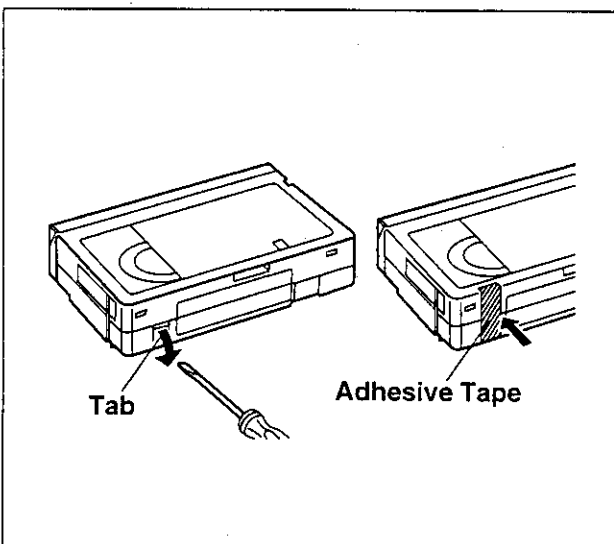
**Note:**

Remove the Battery Pack from the Movie Camera after use and keep it in a cool place. If the Battery Pack remains attached to the Movie Camera, a small amount of current flows to the Movie Camera, even if the [POWER] ON/OFF Switch is turned in, and this reduces the charge of the Battery Pack.



- 1** Push the Buttons on the both sides of the Viewfinder and remove it in the direction of the arrow.
- 2** Remove dust with a blower brush (not supplied).
- 3** Re-attach the Viewfinder.

### Preventing Accidental Erasure of Recordings



When recording on a previously recorded tape, the previously recorded contents will be erased and replaced by the new recording. An important recording can be protected against accidental erasure by breaking off the tab. If the tab is removed, recording on this Video Cassette is no longer possible.

■ **To protect important recordings against accidental erasure:**

Break off the tab with a screwdriver in the direction of the arrow.

■ **Recording onto a Video Cassette with a Missing safety tab:**

Cover the hole firmly with two layers of Adhesive Tape.



When you record in the Auto Mode, the Movie Camera always keeps the white balance adjusted to the surrounding illumination. However, when you record in the Manual Mode, it is recommended to frequently adjust the white balance—preferably for each new scene, like the professionals do it. This is because even slight changes in the lighting (that are not noticeable to the human eye) or changes in position of the Movie Camera could give the picture a reddish or bluish cast. In general, the colours tend to become reddish when recording indoors, and under a clear, blue sky they become bluish.

### ■ Outdoors

Choose a Movie Camera position with the sun in your back, so that the sunlight falls evenly on the subject and makes for a beautiful picture. See the table below and on the p. 34~37 to decide whether to record in the Auto or Manual White Balance Adjustment, and whether a Filter Kit (VW-LF43E; optional) or a Video DC Light (VZ-LDCS13E; optional) is necessary to obtain brilliant pictures with vivid colours.

### ■ Indoors

It is possible to record indoors under fluorescent, halogen, tungsten or even candlelight. However, note that the brighter the subject is lit, the more vivid a picture will be obtained. Therefore, it is recommended to brighten up the scene with additional lighting, such as a Video DC Light (VZ-LDCS13E; optional) or a spot light. However, if you want to capture the special mood of a dimly lit indoor (or outdoor) scene, recording is possible in the Low Light Mode under weak lighting down to only 0.5 lx (NV-RX3A) or 0.7 lx (NV-RX7A).

In Low Light Mode the picture quality may be noisy. This is normal and not a malfunction of the unit.

When using a Video DC light or a spotlight there are some points to keep in mind:


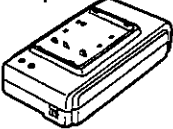

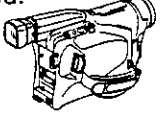
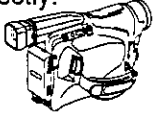
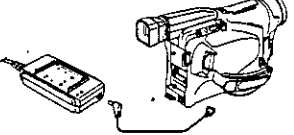
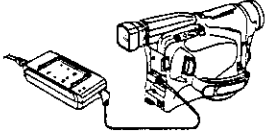
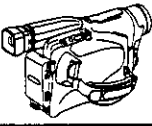
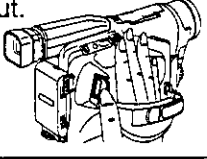


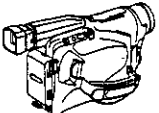
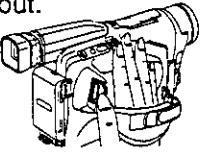
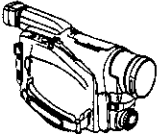
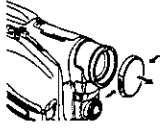
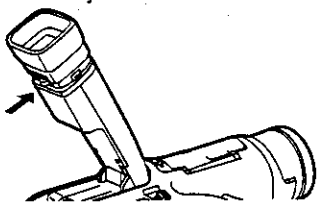
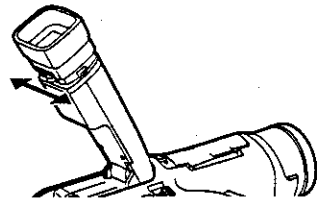
- 1 The Video DC light is only effective for up to 3 meters in general use.
- 2 In Close-up recording, for example Photographs, be sure to check for hot spot reflections and shadowing.

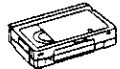
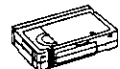








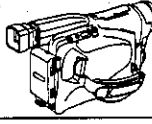



## Standard Values of Brightness

The values shown in this table are rough approximations for general reference.

**Lux:** Unit of illumination (the larger the figure, the brighter the light source)

Lux	Place or Type of lighting	To obtain Pictures with Vivid Colours
100,000	<ul style="list-style-type: none"> <li>● Snow-covered mountains</li> <li>● Mid-summer beach</li> <li>● Sunlight at noon, clear sky (100,000 lx)</li> </ul>	An ND Filter (contained in Filter Kit VW-LF43E; optional) is recommended to dampen the excessive light and obtain stronger colours.
10,000	<ul style="list-style-type: none"> <li>● Sunlight at 10 AM, clear sky (65,000 lx)</li> <li>● Sunlight at 3 PM, clear sky (35,000 lx)</li> <li>● Sunlight at noon, cloudy sky (32,000 lx)</li> <li>● Sunlight at 10 AM, cloudy sky (25,000 lx)</li> </ul>	Range for recording without need for a Filter Kit (VW-LF43E; optional) or additional lighting.
1,000	<ul style="list-style-type: none"> <li>● Sunlight one hour after sunrise, cloudy sky (2,000 lx)</li> <li>● Sunlight one hour before sunrise, clear sky (1,000 lx)</li> </ul>	
500	<ul style="list-style-type: none"> <li>● Inside a department store, bright office (500–700 lx)</li> </ul>	
100	<ul style="list-style-type: none"> <li>● Street light (50–100 lx)</li> </ul>	Additional lighting is recommended for most types of lighting in this range to obtain pictures with vivid colours.
20	<ul style="list-style-type: none"> <li>● Candle-light at 20 cm distance (10–15 lx)</li> </ul>	Additional lighting is necessary to obtain satisfactory picture quality.

Item	Symptom	Cause	Action	Reference page
<b>Power</b>   	<ul style="list-style-type: none"> <li>• Movie Camera does not turn on.</li> </ul>	<ul style="list-style-type: none"> <li>• Not attached.</li> </ul> 	<ul style="list-style-type: none"> <li>• Attach it correctly.</li> </ul> 	12
		<ul style="list-style-type: none"> <li>• Not charged.</li> </ul>	<ul style="list-style-type: none"> <li>• Charge it.</li> </ul>	12
	<ul style="list-style-type: none"> <li>• Movie Camera turns off too soon.</li> </ul>	<ul style="list-style-type: none"> <li>• Exhausted.</li> </ul>	<ul style="list-style-type: none"> <li>• Use a fully charge one.</li> </ul>	12
		<ul style="list-style-type: none"> <li>• Recording was paused for more than 6 minutes.</li> </ul>	<ul style="list-style-type: none"> <li>• Turn the [POWER] ON/OFF Switch in to turn off the Movie Camera, and then turn it out again to turn on the Movie Camera.</li> </ul>	19
	<ul style="list-style-type: none"> <li>• Movie Camera does not turn on.</li> </ul>	<ul style="list-style-type: none"> <li>• Not connected.</li> </ul> 	<ul style="list-style-type: none"> <li>• Connect it correctly.</li> </ul> 	10
	<ul style="list-style-type: none"> <li>• Movie Camera does not turn on.</li> </ul>	<ul style="list-style-type: none"> <li>• [POWER] ON/OFF Switch is not turned out.</li> </ul> 	<ul style="list-style-type: none"> <li>• Turn it out.</li> </ul> 	14
<ul style="list-style-type: none"> <li>• Movie Camera turns off too soon.</li> </ul>	<ul style="list-style-type: none"> <li>• Condensation has formed inside.</li> </ul> 	<ul style="list-style-type: none"> <li>• Wait several hours.</li> </ul>	61	
<b>Recording</b> 	<ul style="list-style-type: none"> <li>• No picture in the Viewfinder.</li> </ul>	<ul style="list-style-type: none"> <li>• [POWER] ON/OFF Switch is not turned out.</li> </ul> 	<ul style="list-style-type: none"> <li>• Turn it out.</li> </ul> 	14
		<ul style="list-style-type: none"> <li>• Lens Cap is attached.</li> </ul> 	<ul style="list-style-type: none"> <li>• Remove it.</li> </ul> 	14
		<ul style="list-style-type: none"> <li>• Power Save Function has been activated.</li> </ul>	<ul style="list-style-type: none"> <li>• Hold the Movie Camera in horizontal position.</li> </ul>	50
	<ul style="list-style-type: none"> <li>• Indications in the Viewfinder are not clear.</li> </ul>	<ul style="list-style-type: none"> <li>• Eyepiece Corrector is not adjusted.</li> </ul> 	<ul style="list-style-type: none"> <li>• Adjust it.</li> </ul> 	14
		<ul style="list-style-type: none"> <li>• Viewfinder is dirty.</li> </ul>	<ul style="list-style-type: none"> <li>• Clean it.</li> </ul>	57

Item	Symptom	Cause	Action	Reference page
Recording	<ul style="list-style-type: none"> <li>Recording cannot be started.</li> </ul>	<ul style="list-style-type: none"> <li>The erasure prevention tab of the inserted cassette is broken off. </li> </ul>	<ul style="list-style-type: none"> <li>Cover the tab hole with adhesive tape. </li> </ul>	57
		<ul style="list-style-type: none"> <li>No cassette is inserted. </li> </ul>	<ul style="list-style-type: none"> <li>Insert a cassette with intact erasure prevention tab.</li> </ul>	14
		<ul style="list-style-type: none"> <li>Tape has reached its end. </li> </ul>	<ul style="list-style-type: none"> <li>Insert a new one.</li> </ul>	14
	<ul style="list-style-type: none"> <li>Some noise from the zoom operation is picked up.</li> </ul>	<ul style="list-style-type: none"> <li>The surroundings are very quiet.</li> </ul>	<ul style="list-style-type: none"> <li>It is not a malfunction.</li> </ul>	—
	<ul style="list-style-type: none"> <li>Date and time cannot be recorded.</li> </ul>	<ul style="list-style-type: none"> <li>Date and time are not set. </li> </ul>	<ul style="list-style-type: none"> <li>Set the date and time. </li> </ul>	16
	<ul style="list-style-type: none"> <li>Date and time are not displayed in the Viewfinder. </li> </ul>	<ul style="list-style-type: none"> <li>[DATE/TIME] Button was not pressed. </li> </ul>	<ul style="list-style-type: none"> <li>Press the [DATE/TIME] Button. </li> </ul>	16
<ul style="list-style-type: none"> <li>Built-in Lithium Battery is exhausted.</li> </ul>		<ul style="list-style-type: none"> <li>Recharge the Built-in Lithium Battery.</li> </ul>	17	
<ul style="list-style-type: none"> <li>"U11/⊗" appears in the Viewfinder.</li> </ul>		<ul style="list-style-type: none"> <li>The video heads are dirty.</li> </ul>	<ul style="list-style-type: none"> <li>Return the Movie Camera to a qualified service personnel.</li> </ul>	61
Playback (picture)	<ul style="list-style-type: none"> <li>No picture. </li> </ul>	<ul style="list-style-type: none"> <li>[POWER] ON/OFF Switch is not turned out. </li> </ul>	<ul style="list-style-type: none"> <li>Turn the switch out and press the [VCR/CAMERA] Button so that the "VCR" Indication Lamp lights up.</li> </ul>	26
		<ul style="list-style-type: none"> <li>Not connected or incorrectly connected to TV set.</li> </ul>	<ul style="list-style-type: none"> <li>Connect correctly.</li> </ul>	10
		<ul style="list-style-type: none"> <li>Wrong channel is selected on TV set.</li> </ul>	<ul style="list-style-type: none"> <li>Select the correct channel.</li> </ul>	—
	<ul style="list-style-type: none"> <li>Picture is distorted or not in colour. </li> </ul>	<ul style="list-style-type: none"> <li>Tracking is not adjusted.</li> </ul>	<ul style="list-style-type: none"> <li>Adjust the tracking. </li> </ul>	49
<ul style="list-style-type: none"> <li>Picture contains noise bars. </li> </ul>	<ul style="list-style-type: none"> <li>Cue, Review or Still Playback is activated.</li> </ul>	<ul style="list-style-type: none"> <li>It is not a malfunction.</li> </ul>	27	
Others	<ul style="list-style-type: none"> <li>Operation with the Remote Controller is not possible.</li> </ul>	<ul style="list-style-type: none"> <li>Remote Controller's battery is exhausted.</li> </ul>	<ul style="list-style-type: none"> <li>Replace it with a new one (CR2025).</li> </ul>	8
		<ul style="list-style-type: none"> <li>Battery is not inserted correctly.</li> </ul>	<ul style="list-style-type: none"> <li>Insert the battery with its poles correctly aligned.</li> </ul>	8

In case of abnormal operation of this unit (e.g. if it emits smoke or some unusual smell), immediately stop the operation and consult qualified service personnel.

### ■ Cautions for Use of the Movie Camera

- When a thunderstorm approaches, stop using it. (If the AC Adaptor is being used, disconnect it from the AC Mains Socket.)
- Do not aim the Lens at the sun. (This could damage internal parts of the Movie Camera.)
- Do not use it in the water or in places where water or some other liquid could splash on it. (If it is accidentally dropped into water while the AC Adaptor is being used, disconnect it from the AC Mains Socket.)
- Do not use it with the cassette compartment facing down. (This could cause uneven winding of the tape.)
- Do not insert or remove the video cassette in dusty places.
- Do not use the Viewfinder as a carrying handle when transporting the Movie Camera.
- Do not disassemble or reconstruct it.
- Do not subject it to strong vibrations or shocks. Handle it with care to prevent accidentally dropping it.
- Do not insert any foreign objects into the Movie Camera nor spill water into it.
- Do not use it in areas with strong electric fields. (This could negatively influence the picture quality.)
- Do not operate it near a TV set or a radio. (This could distort the picture and sound reception.)
- Do not use it in places with steam or oily smoke.
- When unplugging the mains cable, pull it by the plug, not by the cable.

### ■ Cautions for Cleaning the Movie Camera

- Do not use benzine, thinner or other chemicals for cleaning, because they could change the colour and damage the surface of the camera body.
- When using a chemically treated cloth for cleaning, carefully follow the instructions for its use.
- Wipe the Movie Camera with a clean, dry cloth. Never use cleaning fluid or other chemicals.
- Clean the lens only with a blower brush (used for photo cameras) or special lens cleaning tissue (used for glasses and cameras).

### ■ Cautions for Storage

- Do not store this Movie Camera in the following places.  
Places exposed to direct sunlight.  
Places with high temperature and high humidity (e.g. in a closed car or in a bathroom).  
Near heaters.
- Do not leave it in direct contact with rubber or plastic products for a long time.
- Keep it out of reach of children.

### ■ Cautions for Transport

- When not actually recording, carry it in a specially designed Carrying Case.
- Keep the packing materials. When transporting it in the future, pack it in the same way as you purchased it.

### ■ Cautions for the Video Head Clogging

When the "U 11/⊗" flashes, consult qualified service personnel.

It is not recommended to use head cleaning tapes in this Movie Camera, because they may cause damage or the tape may become stuck. The removal of head cleaning tape is not covered by warranty.

## Condensation

If Condensation Has Formed Inside the Movie Camera, Recording is Not Possible.

### ■ Symptoms of Condensation

- If the following symptoms occur, condensation has formed inside the Movie Camera.
  - ① The Condensation Indication in the Viewfinder flashes.  
(After this indication flashes for a few seconds, the Movie Camera will automatically turn itself off again.)
  - ② When turning on the Movie Camera, it turns itself off.  
(However, the Movie Camera also turns itself off when the Battery Pack is exhausted.)

### ■ Remedy

- Wait a few hours before operating the Movie Camera again.  
(The actual time depends on the surrounding conditions.)
- Turn on the Movie Camera.
- Confirm that the Condensation Indication is not displayed any more.
- For added safety, wait about 1 more hour.

### ■ Remarks about Condensation

- Condensation can form if the Movie Camera is suddenly brought from cold surroundings to a place where it is hot or humid.
- Since condensation forms gradually, there may already be some condensation inside the Movie Camera even before the Condensation Indication begins to flash.
- In an extremely cold place, condensation may freeze and turn into frost. As the Movie Camera cannot detect frost, the Condensation Indication does not appear until the frost melts.

### ■ Precautions against Condensation

When moving it from a very cold place to a very warm place, keep it in a tightly closed plastic bag or similar to prevent condensation from forming.

**A**

AC Adaptor (p. 10, 12)  
 AC Mains Socket (p. 11, 13)  
 [AE] Selector (p. 19, 30, 34, 39)  
 Anti-Ground-Recording Function (p. 50)  
 [AUDIO OUT] Socket (p. 10, 52)  
 Auto Focus Mode (p. 30)  
 Automatic White Balance Adjustment (p. 34)  
 Auto Mode (p. 19)  
 Auto Power Save Function (p. 50)

**B**

[BACKLIGHT] Button (p. 40)  
 [BATTERY EJECT ►] Lever (p. 13, 56)  
 Battery Pack (p. 12)  
 Before Requesting Service (p. 59)  
 Built-in Lithium Battery (p. 17)

**C**

“CAMERA” Indication Lamp (p. 18)  
 Camera Search Function (p. 48)  
 Car Battery Cord (p. 52)  
 Cassette Adaptor (p. 28)  
 [CHARGE] Lamp (p. 12)  
 “CHK” Indication (p. 48, 51)  
 Condensation (p. 61)  
 Cue Playback (p. 26)

**D**

[DATE/TIME] Button (p. 16)  
 Date/Time Setting (p. 16)  
 [DC IN] Socket (p. 10, 52)  
 [DIGITAL] Dial (p. 43, 44, 46)  
 Digital Fade Mode (p. 46)  
 Digital Gain-up Mode (p. 42)  
 Digital Strobe Mode (p. 42)  
 Digital Wipe Mode (p. 44)  
 Digital Zoom Magnification (p. 42)  
 Digital Zoom Mode (p. 42)

**E**

[EDIT] Socket (p. 53)  
 [EJECT ▲] Lever (p. 14)  
 Error Code (p. 23)  
 Eyepiece Correction Adjuster (p. 15)

**F**

[FADE] Button (p. 40, 46)  
 FF (Fast-Forward) (p. 26)  
 [FOCUS] Button (p. 30)  
 Focus Ring (p. 30)

**G**

Grip Belt (p. 56)

**H**

Head Clogging (p. 61)

**I**

Index signal (p. 19)

**L**

Lens Cap (p. 14, 34, 56)  
 Low Light Mode (p. 38)

**M**

Manual Focus Mode (p. 30)  
 Manual White Balance Adjustment (p. 34)  
 Max. Recording Time with Battery Pack (p. 13, 54)  
 [MEMORY] Button (p. 20)  
 [MIC] Socket (p. 7)

**O**

Optional Accessories (p. 54)

**P**

[PAUSE] Button (p. 27)  
 [PLAY] Button (p. 27)  
 Portrait Mode (p. 38)  
 [POWER] ON/OFF Switch (p. 14)  
 [POWER SAVE] Switch (p. 50)

**R**

Recording Start/Stop Button (p. 19)  
 Remaining Tape Time (p. 20)  
 Remote Controller (p. 8)  
 Remote Control Receiver Window (p. 9)  
 [RESET] Button (p. 20)  
 Review Playback (p. 26)  
 REW (Rewind) (p. 26)  
 [RF DC OUT] Socket (p. 7)

**S**

Shoulder Strap Holders (p. 56)  
 [SNAPSHOT REC] Button (p. 46)  
 [SP/LP] Button (p. 18)  
 Sports Mode (p. 38)  
 Standard Accessories (p. 5)  
 Still Playback (p. 27)  
 [STOP] Button (p. 27)  
 Super Image Stabilizer Mode (p. 44)

**T**

[TAPE] Button (p. 20)  
 Tape Counter (p. 20)  
 Tape Length (p. 20)  
 Tracking Adjustment (p. 48)  
 Tripod Receptacle (p. 7)

**V**

[VCR/CAMERA] Button (p. 26)  
 "VCR" Indication Lamp (p. 26)  
 [VIDEO OUT] Socket (p. 10, 52)  
 Viewfinder (p. 14, 22, 57)

**W**

Warning/Alarm Indications (p. 22)  
 [W.B] Button (p. 35)  
 White Balance Sensor (p. 34)  
 [W•T] Zoom Lever (p. 19)

**Z**

Zoom (p. 18)  
 Zoom Magnification (p. 18)

## VHS-C Movie Camera

Information for your safety

<b>Power Source:</b>	4.8 V (Battery Pack) 6.0 V (AC Adaptor)
<b>Power Consumption:</b>	6.1 W (Battery Pack Operation)

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

<b>Tape Format:</b>	VHS-C tape
<b>Recording/Playback Time:</b>	SP; 1 hour with EC60 LP; 2 hours with EC60

### VIDEO

<b>Television System:</b>	CCIR; 625 lines, 50 fields PAL colour signal
<b>Output Level:</b>	VIDEO OUT (PHONO); 1.0 Vp-p, 75 ohm terminated

### AUDIO

<b>Output Level/Impedance:</b>	AUDIO OUT (PHONO); -6 dBV (47 kohm loaded)/ less than 1 kohm
<b>Audio Track:</b>	1 track (Normal-Monaural)
<b>Image Sensor:</b>	1/4-inch CCD Image Sensor
<b>Lens:</b>	14:1 Wide-angle Power Zoom Lens F1.4 Focal Length; 3.9-54.6 mm Digital AI Auto Focus/ Auto Iris Filter Diameter; 43 mm
<b>Viewfinder:</b>	0.5-inch Colour LCD Viewfinder
<b>Standard Illumination:</b>	1,400 lx
<b>Minimum Required Illumination:</b>	0.5 lx (Low Light Mode)
<b>Operating Temperature:</b>	0°C-40°C
<b>Operating Humidity:</b>	10%-80%
<b>Weight:</b>	Approx. 760 g (without Battery Pack).
<b>Dimensions:</b>	Approx. 74 (W)×139 (H)× 268 (D) mm

## AC Adaptor

Information for your safety

<b>Power Source:</b>	AC 100-240 V, 50-60 Hz
<b>Power Consumption:</b>	25 W
<b>DC Output:</b>	DC 6.0 V, 8.5 W (Movie Camera Operation) DC 4.8 V, 1.2 A (Battery Pack Charging)

- The rating plate is on the bottom side of the AC Adaptor

<b>Weight:</b>	Approx. 210 g (without Battery Pack)
<b>Dimensions:</b>	Approx. 72 (W)×39 (H)× 143 (D) mm

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

## VHS-C Movie Camera

Information for your safety

**Power Source:** 4.8 V (Battery Pack)  
6.0 V (AC Adaptor)

**Power Consumption:** 7.0 W (Battery Pack Operation)

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

**Tape Format:** VHS-C tape

**Recording/Playback Time:** SP; 1 hour with EC60  
LP; 2 hours with EC60

## VIDEO

**Television System:** CCIR; 625 lines, 50 fields  
PAL colour signal

**Output Level:** VIDEO OUT (PHONO);  
1.0 Vp-p, 75 ohm terminated

## AUDIO

**Output Level/Impedance:** AUDIO OUT (PHONO);  
-6 dBV (47 kohm loaded)/  
less than 1 kohm

**Input Sensitivity/Impedance:** MIC IN (M3); -70 dBV/  
4.7 kohm or more  
unbalanced

**Audio Track:** 1 track (Normal-Monaural)

**Image Sensor:** 1/3-inch CCD Image Sensor

**Lens:** 14:1 Wide-angle  
Power Zoom Lens  
F1.4  
Focal Length;  
3.9-54.6 mm  
Digital AI Auto Focus/  
Auto Iris  
Filter Diameter; 43 mm

**Viewfinder:** 0.5-inch Colour LCD  
Viewfinder

**Standard Illumination:** 1,400 lx

**Minimum Required Illumination:** 0.7 lx (Low Light Mode)

**Operating Temperature:** 0°C-40°C

**Operating Humidity:** 10%-80%

**Weight:** Approx. 770 g  
(without Battery Pack)

**Dimensions:** Approx. 74 (W)×139 (H)×  
268 (D) mm

## AC Adaptor

Information for your safety

**Power Source:** AC 100-240 V,  
50-60 Hz

**Power Consumption:** 25 W

**DC Output:** DC 6.0 V, 8.5 W  
(Movie Camera Operation)  
DC 4.8 V, 1.2 A  
(Battery Pack Charging)

•The rating plate is on the bottom side of the AC Adaptor

**Weight:** Approx. 210 g  
(without Battery Pack)

**Dimensions:** Approx. 72 (W)×39 (H)×  
143 (D) mm

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