Panasonic

Operating Instructions

VHS C
PAL

Hi-Fi
STEREO

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

VQT5581

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

Information for Your Safety

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.

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

FOR YOUR SAFETY
■ DO NOT REMOVE THE OUTER COVER.
To prevent electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

Caution for AC mains lead

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three-pin mains plug for your safety and convenience.
A 5-ampere fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amperes and it is approved by ASTA or BSI to BS1362.
Check for the ASTA mark ⟐ or the BSI mark ♡ on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover, the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local Panasonic Dealer.

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt, please consult a qualified electrician.

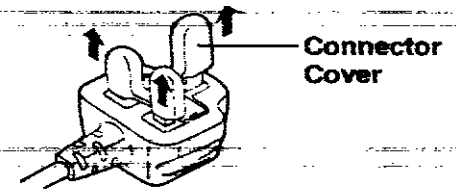
■ IMPORTANT
The wires in this mains lead are coloured in accordance with the following code:
Blue: Neutral
Brown: Live
As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

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

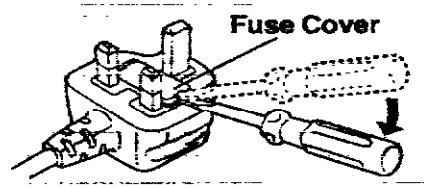
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

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

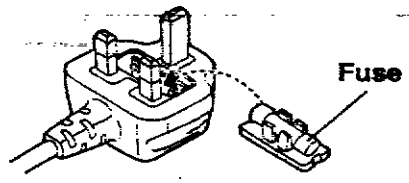
■ Before use
Remove the Connector Cover as follows.



■ How to replace the Fuse
1. Remove the Fuse Cover with a screwdriver.



2. Replace the fuse and attach the Fuse Cover.



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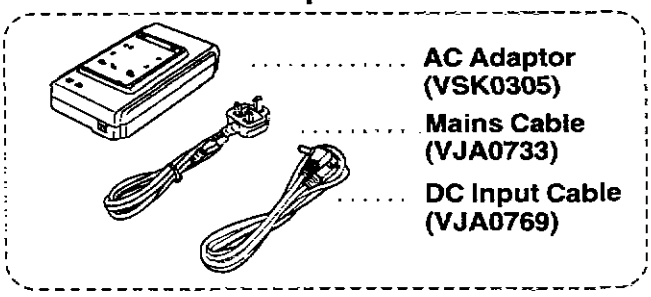
Check List for the Standard Accessories

AC Adaptor Set

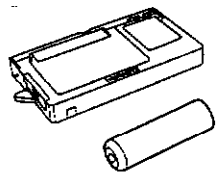


AC Adaptor (VSK0305)

Mains Cable (VJA0733)

DC Input Cable (VJA0769)

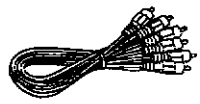
Battery Pack (VSB0200)



Cassette Adaptor (VW-TCA7E)

Battery (R6)

Shoulder Strap (VFC1620)



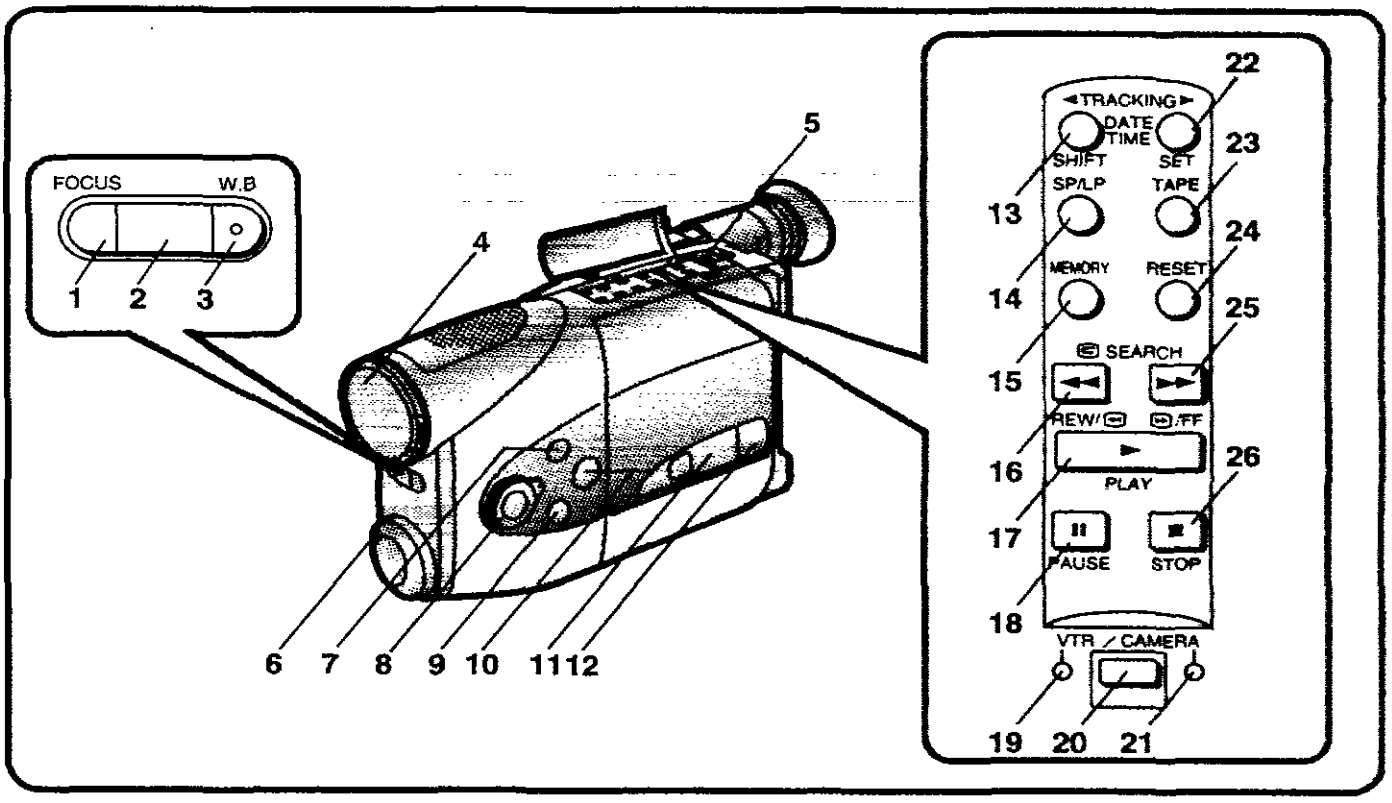
Audio/Video Cable (VJA0788)

21 pin Adaptor (VFA0151)

- When purchasing an additional AC Adaptor, order model number VW-AS4E.
- For Purchasing additional Battery Packs, see the list of optional accessories on p. 43.

Controls and Functions

For more details, see the pages indicated in brackets.



1 **[FOCUS] Button (p. 26)**

2 **Infra-Red Sensor (p. 28)**

3 **[W.B] Button (p. 29)**
Manual White Balance Button

4 **Lens Cap (p. 8, 28)**

5 **[EJECT] Lever (p. 8)**

6 **Focus Ring (p. 26)**

7 **[BACKLIGHT] Button (p. 34)**

8 **[AE] Dial (p. 13, 26, 28, 32)**
Use this dial to select the desired AE mode.

9 **[DATE/TIME] Button (p. 10)**

10 **[FADE] Button (p. 34)**

11 **Cassette Compartment**

12 **Cassette Compartment [LOCK] Button (p. 9)**

13 **[DATE/TIME/SHIFT • TRACKING] Button (p. 10, 36)**
Press this button to adjust the tracking, or to advance to the next item during the setting of the date and time.

14 **[SP/LP] Button (p. 12)**

15 **[MEMORY] Button (p. 14)**

16 **[REW/] Button (p. 20, 36)**
Use this Button:
- Rec Check
- Review
- REW (Rewind)
- Camera Search

17 **[PLAY] Button (p. 21)**

18 **[PAUSE] Button (p. 21)**

19 ***"VTR" Indication Lamp (p. 20)***

20 **[VTR/CAMERA] Button (p. 20)**
Press this Button to select the "VTR" Mode or the "CAMERA" Mode.

21 **"CAMERA" Indication Lamp (p. 12)**

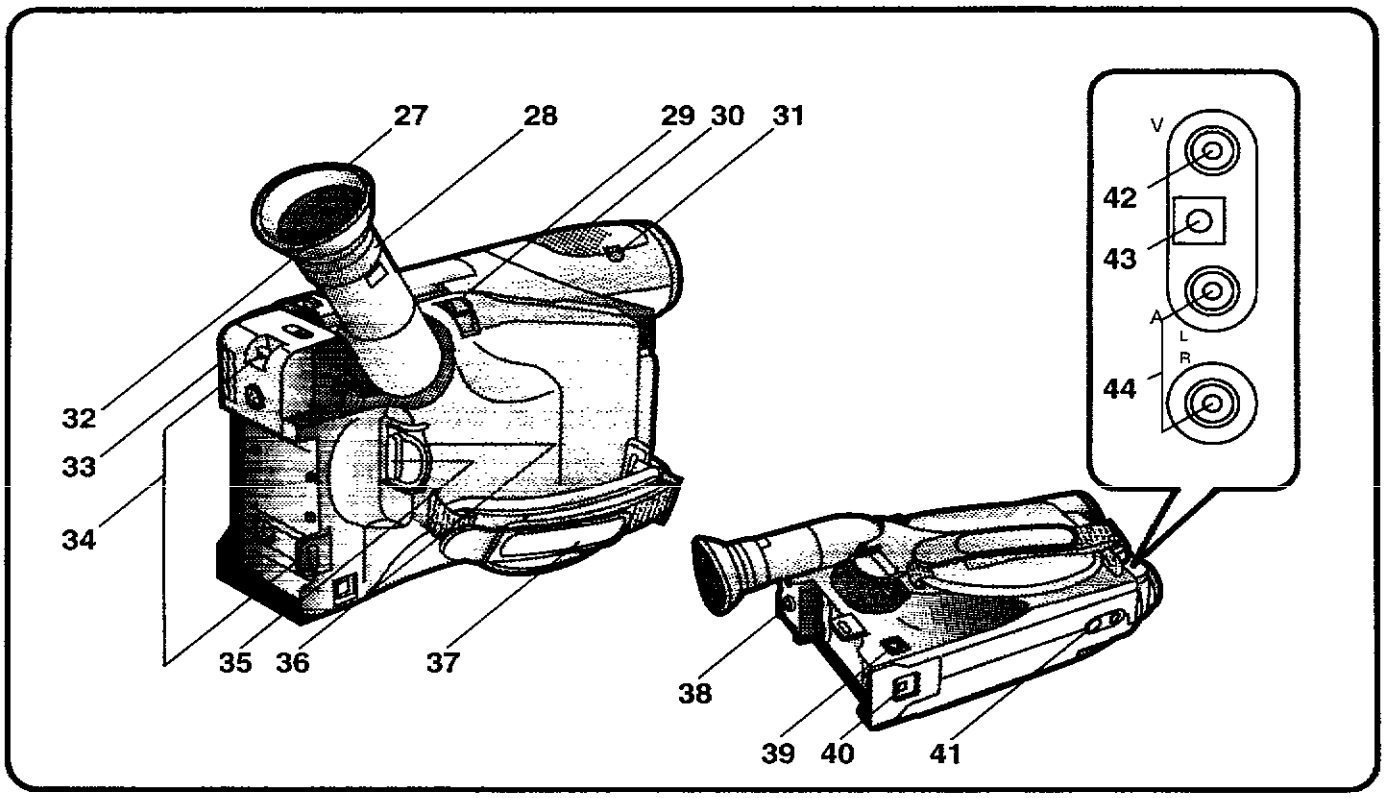
22 **[DATE/TIME/SET • TRACKING] Button (p. 10, 36)**
Press this Button to adjust the tracking, or to set the correct date and time.

23 **[TAPE] Button (p. 14)**

24 **[RESET] Button (p. 14)**

25 **[/FF] Button (p. 20, 37)**
Use this Button:
- Cue
- FF (Fast-Forwarding)
- Camera Search

26 **[STOP] Button (p. 21)**



27 Eyecup (p. 45)

28 Eyepiece Corrector Ring (p. 9)

29 [W • T] Zoom Lever (p. 12)

30 Microphone

31 [MIC] Socket
To record sound with an external microphone (optional), 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: Stereo-type
  (If a mono-type microphone is connected, no sound will be recorded on the right channel).
- Sensitivity: Approx. −70 dB
- Power Source: Type that does not require a power source

32 Viewfinder (p. 16)

33 [BATT. EJECT] Button (p. 25)

34 Shoulder Strap Holders (p. 44)

35 Record Start/Stop Button (Red) (p. 12)

36 Power ON/OFF Switch [OPERATE] (p. 8)

37 Grip Belt (p. 44)

38 [EDIT] Socket (p. 42)

39 [DC IN] Socket (p. 6)

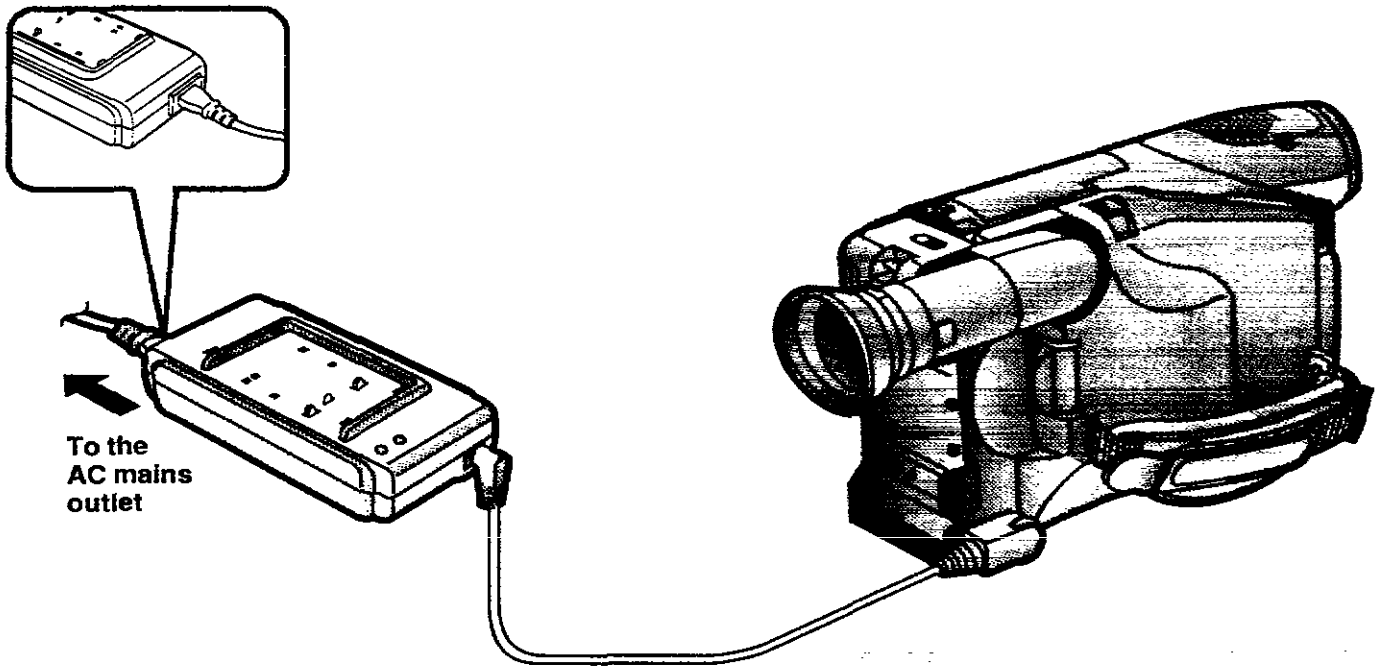
40 [POWER SAVE] Switch (p. 38)
When this Switch is set to "ON", the Power Save Function will be activated.

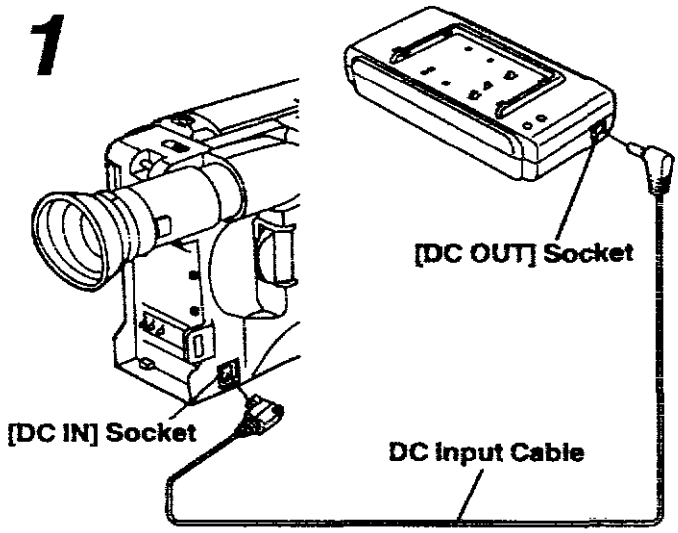
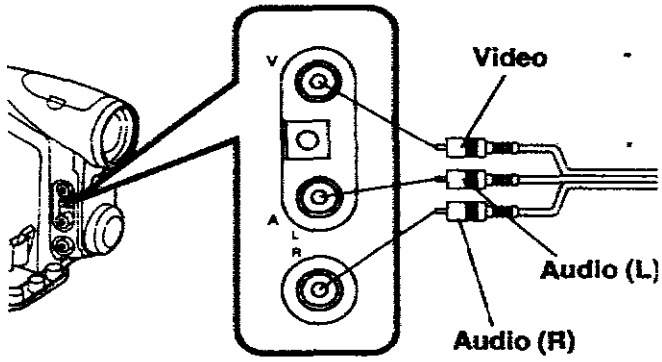
41 Tripod Receptacle
Attach a Tripod (optional) to this Receptacle.

42 [VIDEO OUT] Socket (p. 6)

43 [RF DC OUT] Socket
To playback 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).

44 [AUDIO OUT] Sockets (p. 6)



Title	Procedure
Using the AC Adaptor as Power Supply Unit To use the Movie Camera with the Battery Pack, it is necessary to charge the Battery Pack first. (p. 24)	**1** 
Watching Picture on a TV set (Using the Audio/Video Cable) Connect after turning off the Movie Camera and the TV Set.	**1**  **Connect the Movie Camera to the TV set.**

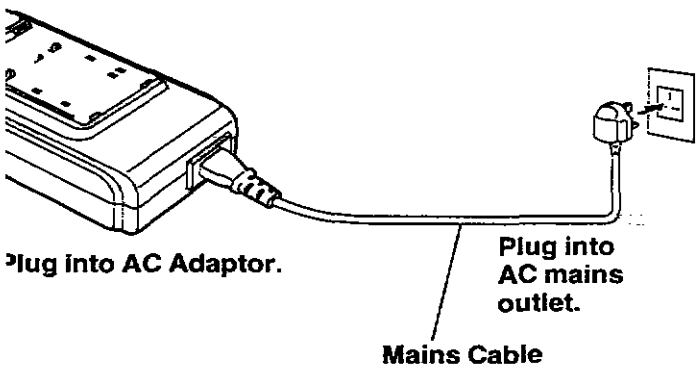
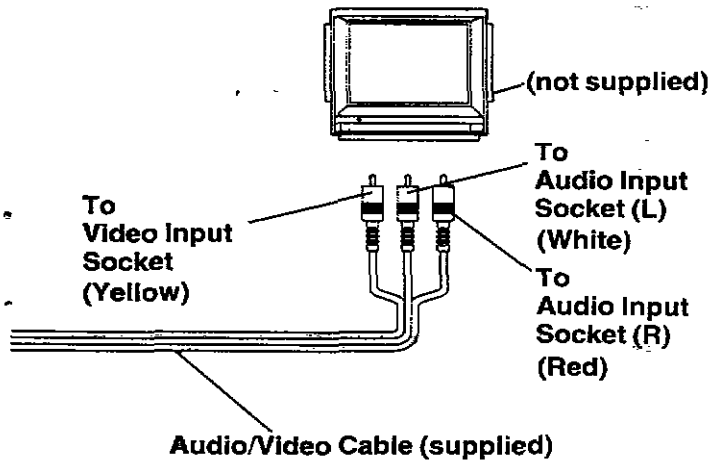
Cautions for the AC Adaptor

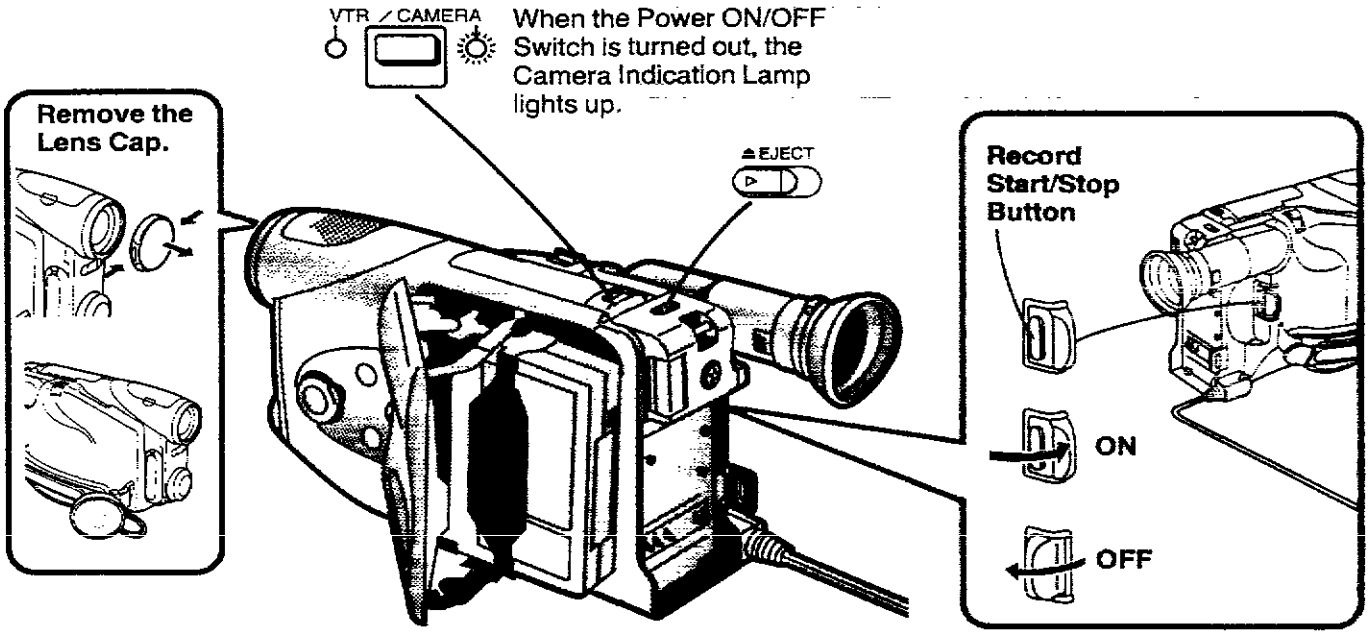
■ Cautions for Use

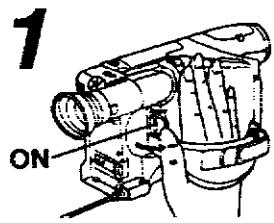
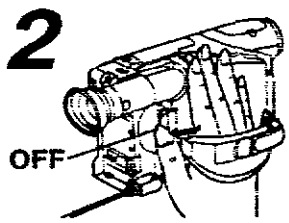
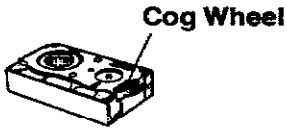
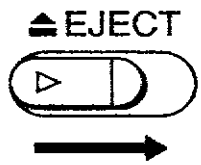
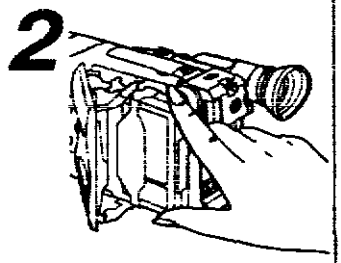
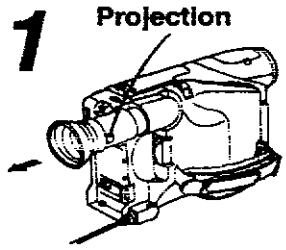
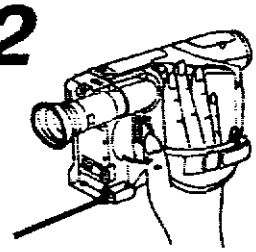
- Before connecting the AC Adaptor to an AC mains socket confirm that the voltage and frequency on the rating plate match the local AC mains voltage and frequency. (The AC Adaptor can be used within a voltage range of AC 100 V–240 V, and a frequency of 50 or 60 Hz.)
- Do not handle the AC Adaptor with wet hands.

■ Caution for Cleaning

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

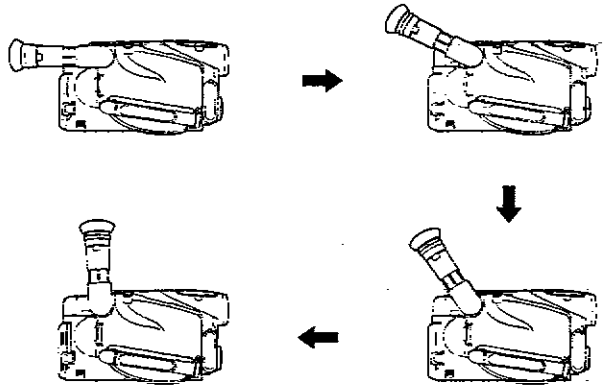
	Remarks, etc.
2 	• When the AC Adaptor is used to supply the Movie Camera with power, remove the Battery Pack from the AC Adaptor as it cannot charge the Battery Pack and provide power simultaneously. • Do not use the AC Adaptor for any purposes other than supplying the unit with power or charging the Battery Pack. • When listening to a radio while the AC Adaptor is in operation, the radio reception may be distorted. In this case, move the radio farther away from the AC Adaptor. • When not using the AC Adaptor, unplug its mains cable. When unplugging the mains cable, pull it by the plug, not by the cable.
	• 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). • When connecting the Movie Camera to a TV set with a 21 pin Scart Terminal, see p. 40.

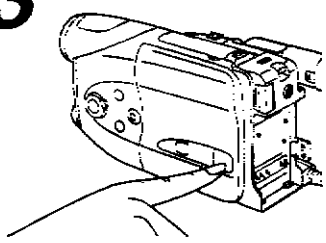
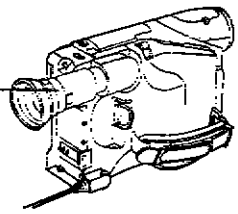


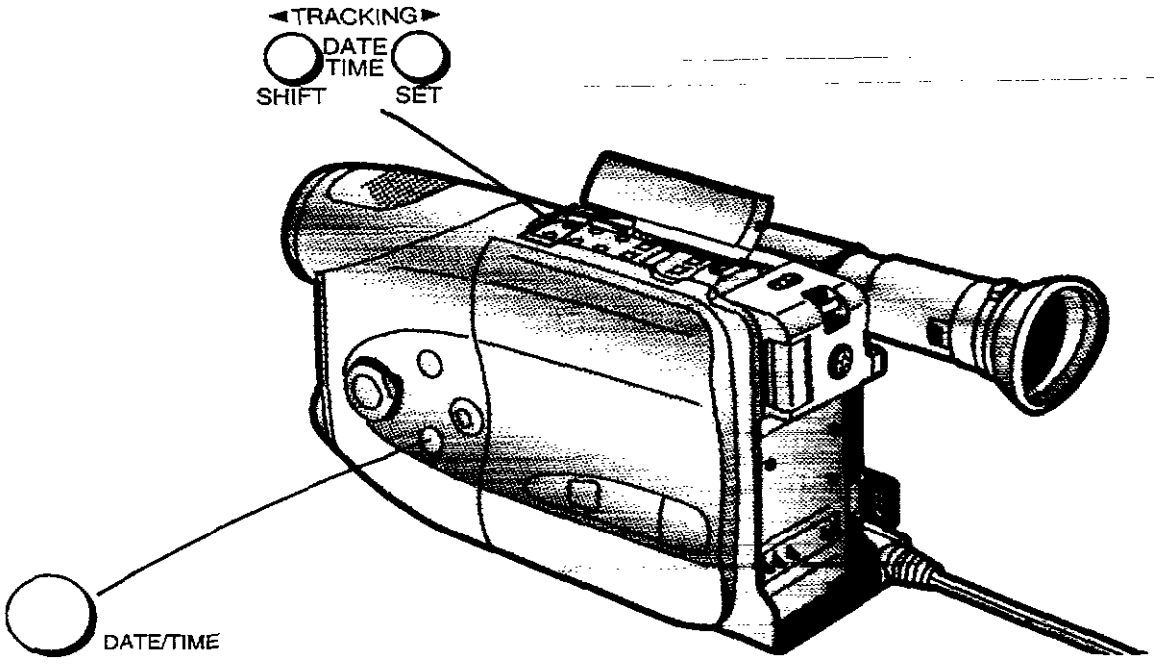
Title	Procedure	
To Power Movie Camera ON/OFF	**1**  **Turn Power ON/OFF Switch out.**	**2**  **Turn Power ON/OFF Switch in.**
Inserting the Video Cassette Before inserting the video cassette, make sure that the tape is tight. If it is loose, turn the cog wheel in the direction of the arrow to tighten it. 	**1**  **Slide the [EJECT] Lever.**	**2**  **Insert the video cassette.**
Adjusting the Viewfinder Grasp Projections on either side of the Viewfinder (see Fig. *1*) and extend to fully locked position.	**1**  **Extend to fully locked position.**	**2**  **Turn Power ON/OFF switch out**

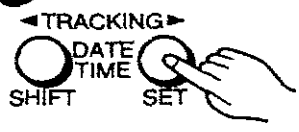
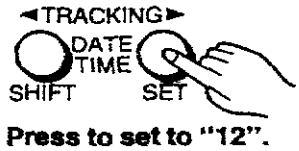
Adjusting the Angle of the Viewfinder

The tilting range if the Viewfinder is 90° (4 potions are marked by click stops).



		Remarks, etc.
		●When turning on the Movie Camera while a video cassette is already inside, it will automatically be put in the Filming Pause Mode. (p. 13)
3  **Push the [LOCK] Button.**		**■ Ejecting the Video Cassette** Slide the [EJECT] Lever and pull out the Video Cassette. Close the Cassette Compartment Cover by pressing the [LOCK] Button. ●It is not possible to take out the video cassette during filming. ●Do not repeatedly insert and take out the video cassette. This could cause the tape to become loose and damaged.
3 **Eyepiece Corrector Ring**  **While looking into the Viewfinder, turn the Corrector Ring until the Indications in the Viewfinder can be seen most clearly.**		●When extending the Viewfinder, do not grasp it by the Eyecup, because the Eyecup could become detached from the Viewfinder. ●Do not apply any pressure on the Viewfinder except when extending or retracting it. ●Be sure to retract the Viewfinder after filming.



Title	Procedure	
Setting the Date and Time Before setting, attach the charged Battery Pack or connect the AC Adaptor to the Movie Camera and turn the Movie Camera on. **For example:** To set the clock to October 15, 1994, 12:30...	**1** **Press the [DATE/TIME] Button.**	**2** **Keep pressed to make the "Year" portion flash.**
	5  **Press to set to "10".**	**6** **Press to make the "Day" portion flash.**
	9  **Press to set to "12".**	**10** **Press to make the "Minute" portion flash.**
Inserting and Deleting the Date and Time The Date and Time Indications can be inserted and deleted during filming as well as in the Filming Pause Mode.	 By pressing this button repeatedly, the Date/Time Indication in the Viewfinder can be changed in the following order. Select the desired indication.	

The Built-in Lithium Battery

A built-in rechargeable lithium battery maintains the operation of the built-in clock when the Movie Camera is turned off. When the Movie Camera is in operation, this battery is recharged automatically. However, if the Movie Camera is not used for a very long time, the lithium battery can become exhausted. In this case, the Indication " " in the Viewfinder flashes and the date and time return to the initial Indication "1. 1. 1990".

If the Indication " " in the Viewfinder flashes for approx. 10 seconds when turning the Movie Camera on the lithium battery needs to be recharged as follows:

1 **Connect the Movie Camera to the AC Adaptor.**

2 **Switch on the Movie Camera.**

3 **Take out the Video Cassette and wait for approx. 4 hours.**
- After the lithium battery has been charged for approx. 4 hours, it can maintain the operation of the clock for approx. three months.

Information for your safety

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

3

Press to set to "1994".

4

Press to make the "Month" portion flash.

7

Press to set to "15".

8

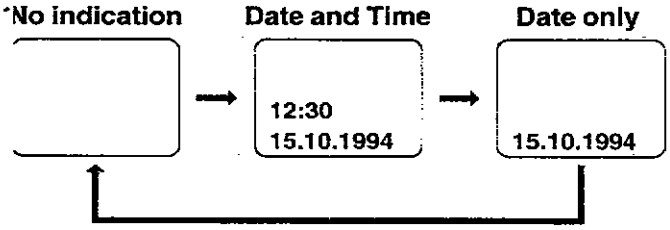
Press to make the "Hour" portion flash.

11

Press to set to "30".

12

Press to start the clock.



Remarks, etc.

■ Changing the Figures of the Date/Time Indication

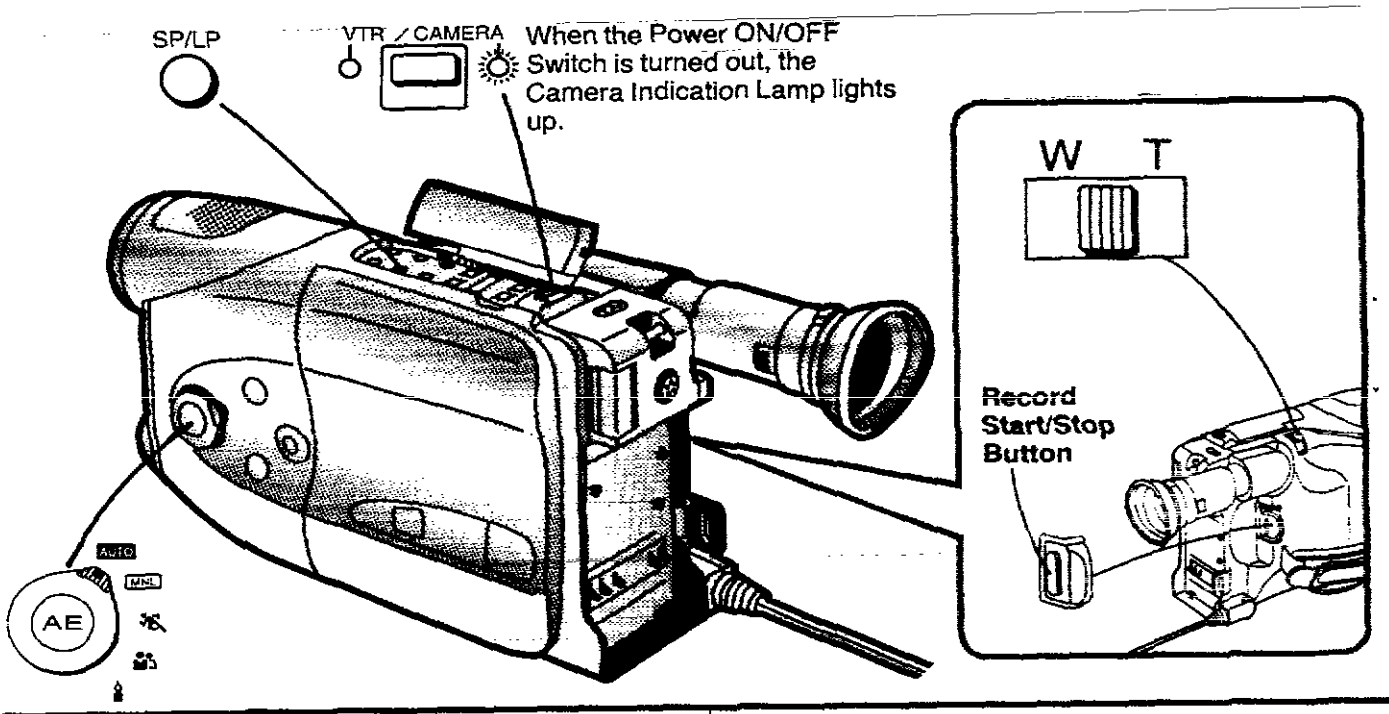
By pressing the [SET] Button repeatedly, the Date/Time Indication can be changed in the following order.

For example:

Year:	**1990**→1991→ .....2089→**1990**→...
Month:	**1**→2→ .....→12→**1**→...
Day:	**1**→2→ .....→31→**1**→...
Hour:	**0**→1→ .....→23→**0**→...
Minute:	**00**→01→.....→59→**00**→...

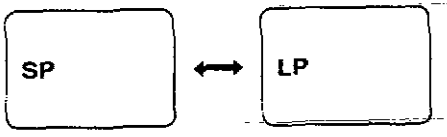
- When the [SET] Button is kept pressed, the figures change more quickly.
- If you make a mistake during setting, start again from the beginning.

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

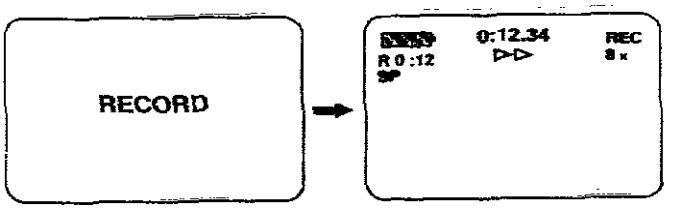


Title	Viewfinder

Starting Filming (Recording)



- Press the [SP/LP] Button, the indication in the Viewfinder changes.
  "SP" means Standard Play.
  Filming is possible for the time indicated on the video cassette.
  "LP" means Long Play.
  Filming is possible for approximately double the time indicated on the video cassette.
- Selection of the recording speed is only possible in the Filming Pause Mode.

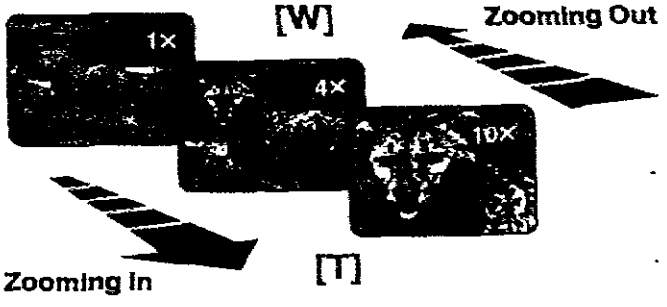


For the detailed explanations for each indication in the Viewfinder, see p. 16. Shown above is a typical example of the indications visible when filming in the Auto Mode.

Making the Subject Larger or Smaller During Filming

This Function also operates in the Filming Pause Mode.

- The zoom range extends from 1× to 10×.
- In the maximum tele setting, the focus can be adjusted only for subjects at a distance of more than 1.5 m from the lens.

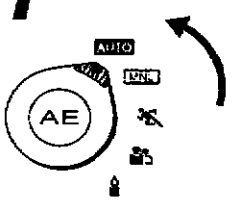
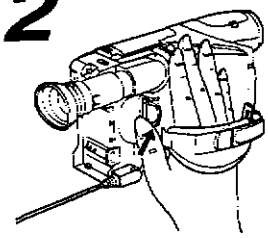
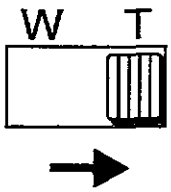
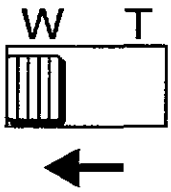
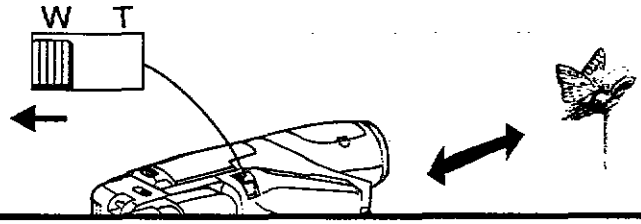


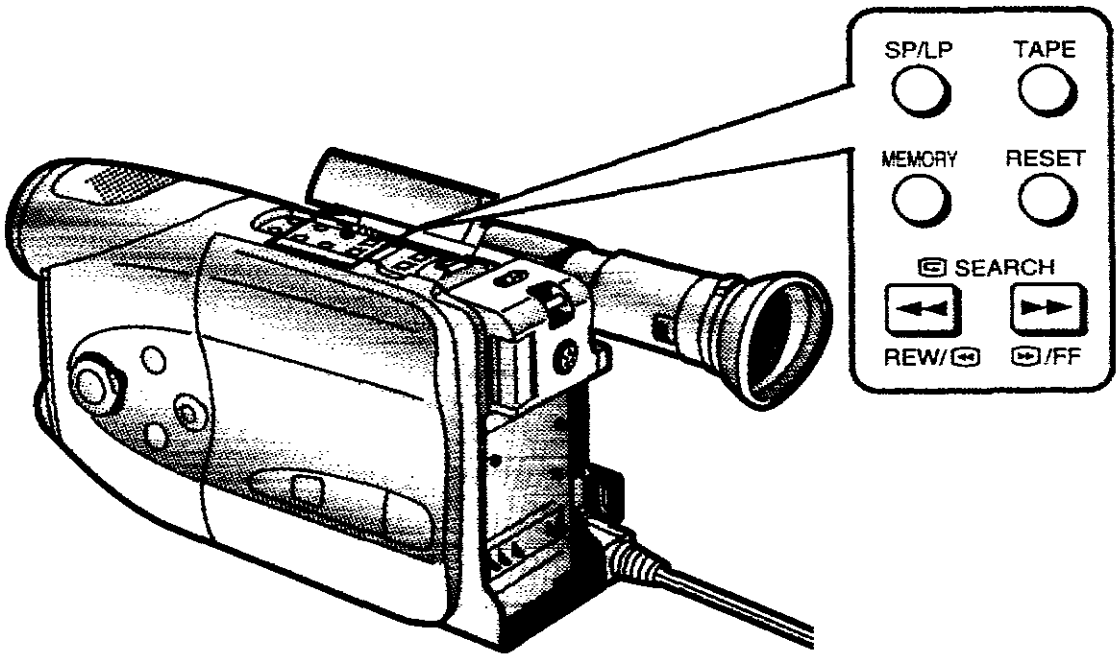
- The Zoom Magnification Indication in the Viewfinder changes.

Index Signals (VISS)

The "INDEX" Indication appears briefly in the Viewfinder while an index signal is being recorded. The index signals make possible the use of the VHS Index Search or Intro Scan Function when playing back the tape on a VTR equipped with these functions.
An index signal is recorded automatically in the following cases:

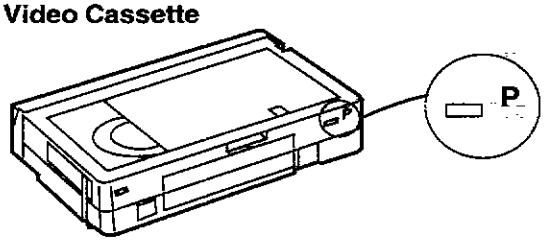
- When recording is started for the first time after attaching the Battery Pack.
- When recording is restarted after exchanging the cassette or after pressing the [VTR/CAMERA] Button.

Procedure		Remarks, etc.
1  **Confirm that the [AE] Dial is set to "AUTO".**	**2**  **Turn Power ON/OFF switch out. Press Record Start/Stop Button.**	**■ To Pause the Filming** Press the Record Start/Stop Button again. The "PAUSE" Indication appears in the Viewfinder. • If the Movie Camera is left in the Filming Pause Mode for more than 6 minutes, it will automatically switch off to protect the tape and to conserve battery power. To resume filming from this condition, turn the Power ON/OFF Switch in (the Movie Camera is switched off) and then turn it out again. **■ To Stop Filming** Turn the Power ON/OFF Switch in.
1 **■ Zooming In**  **"T" means Tele.** **■ Zooming Out**  **"W" means Wide.** • The zooming speed varies depending on how far the [W • T] Zoom Lever is pushed towards "W" or "T". (The further it is pushed, the faster the zooming speed becomes.)		**■ Using the Macro Close-up Function** 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. • 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). • When shooting pictures in a photo album or a similar situation with insufficient lighting, use a Video DC Light (optional). 



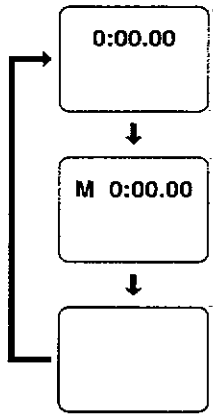
Title	Viewfinder	Procedure
Using the Tape Counter Indication The Tape Counter in the Viewfinder shows the elapsed recording or playback time in hours, minutes and seconds. Resetting the Tape Counter to "0:00.00" by pressing the [RESET] Button before starting to film makes it easy to keep track of the elapsed recording time.	0:00.00 Hours Minutes Seconds	**1** ■ **To Reset the Tape Counter:** RESET
Using the Memory Function 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.	M 0:00.00 Means: Memory	**1** ■ **To Make the "M" Indication Appear:** MEMORY
Confirming the Remaining Tape Time During recording or playback, the Remaining Tape Time is automatically displayed in the Viewfinder.	30 R 0:30 Means: Remaining	**1** TAPE Select the Tape Length Indication (" 30" or " 45") that matches the Video Cassette being used.

Video Cassette



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

At every press of the [MEMORY] Button, the Counter Indication will change as follows:



Tape Counter Indication

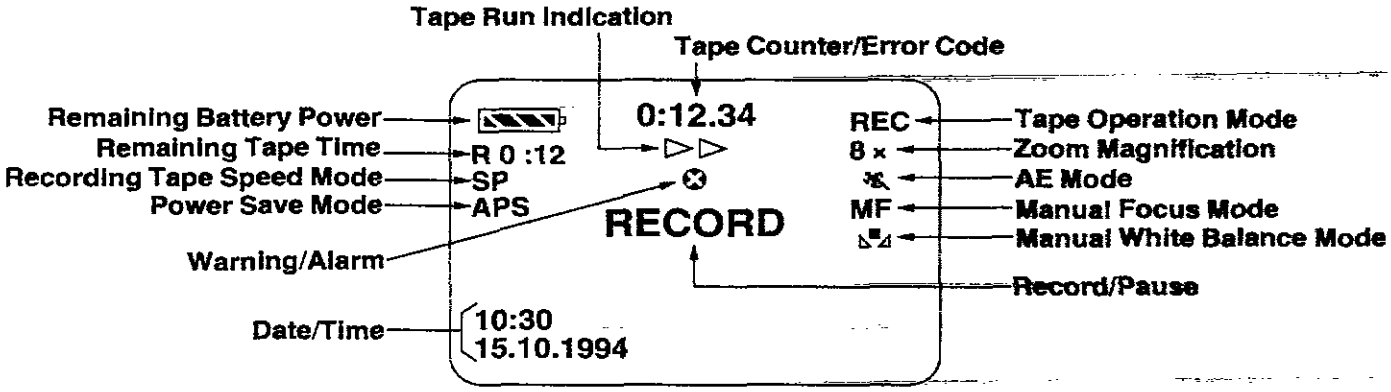
Memory Indication "M" appears with Tape Counter Indication

No Indication
(All Indications except the Warning/Alarm Indications and the Tape Running Indications will disappear.)

		Remarks, etc.
		•The Tape Counter Indication does not change during playback of tape on which recording has never been made. •Taking out the Cassette or removing the Battery Pack automatically resets the Tape Counter Indication to "0:00.00". •When the tape is rewound 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:** RESET	**3** or REW/ /FF	
■ **To Check the Tape Length of the Video Cassette Being Used while the Remaining Tape Time is Displayed:** TAPE The Tape Length Indication " 30" or " 45" is displayed for approx. 2 seconds, and then the Remaining Tape Time Indication will again appear instead of it.		•While the Movie Camera calculates the Remaining Tape Time, the "R" Indication flashes in the Viewfinder. •When the Remaining Tape Time becomes less than 2 minutes, the Indication "R" and the Remaining Tape Time start to flash. ■ **When Inserting an EC45-type Video Cassette** Press the [TAPE] Button to change the Tape Length Indication in the Viewfinder to " 45" so that the Remaining Tape Time Indication will be correct.

Quick Reference Guide to the Indications in the Viewfinder

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
U10	**Condensation** Condensation has formed inside the Movie Camera. Wait until the "U 10/ " Indication disappears.	48
U11	**Video Head Clogging** The video heads are dirty.	47
	Remaining Battery Power 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.	24
	Tape 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.	8, 45

1 Warning/Alarm Indications (cont.)

Viewfinder	Condition	Page
	Built-in Lithium Battery The Built-in Lithium Battery is exhausted. Recharge it.	11
END	**End of the Tape** When the tape has reached its end, indication appears. Insert a new cassette.	—
CHK	**Anti-Ground-Filming** When the Movie Camera is tilted more than about 70° from its normal horizontal position during filming (with the [POWER SAVE] Switch set to "ON"), the Movie Camera automatically switches over to the Filming Pause Mode. If the Movie Camera is then returned to its normal horizontal filming position, the "CHK" Indication will flash in the Viewfinder.	38

2 Error Code Indications

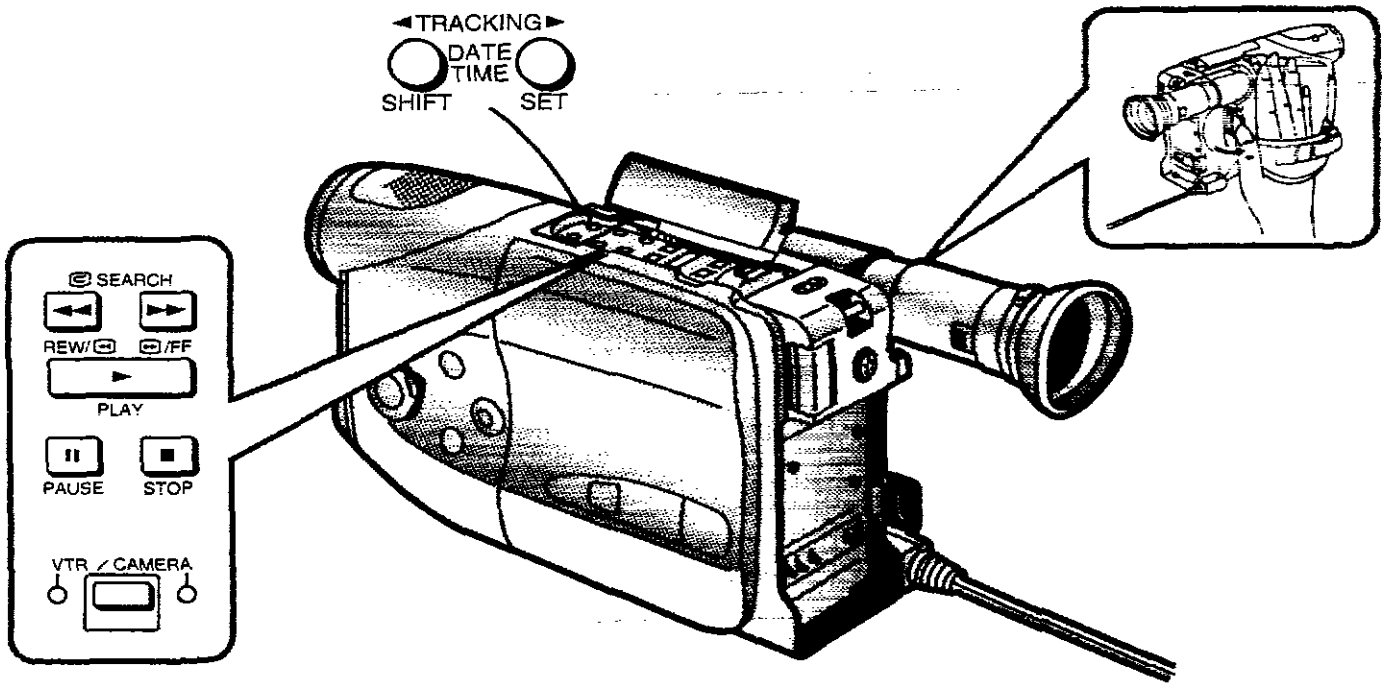
Viewfinder	Condition	Page
F01 ⋮ F01 F02 F03 F04 F05 F51 F52	**Error Code** When the "F" Indication appears in the Viewfinder, some malfunction has occurred. If the indicated error code is between "F01" and "F05", the Movie Camera will turn itself off automatically one minute after the "CAMERA" Lamp has 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.	—

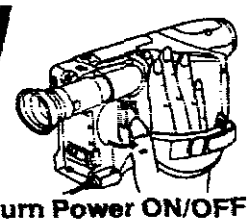
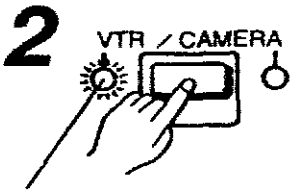
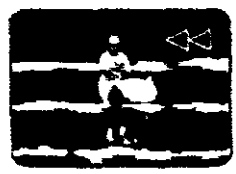
Quick Reference Guide to the Indications in the Viewfinder (cont.)

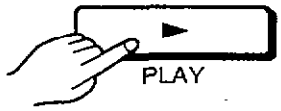
3 Filming/Playback Indications

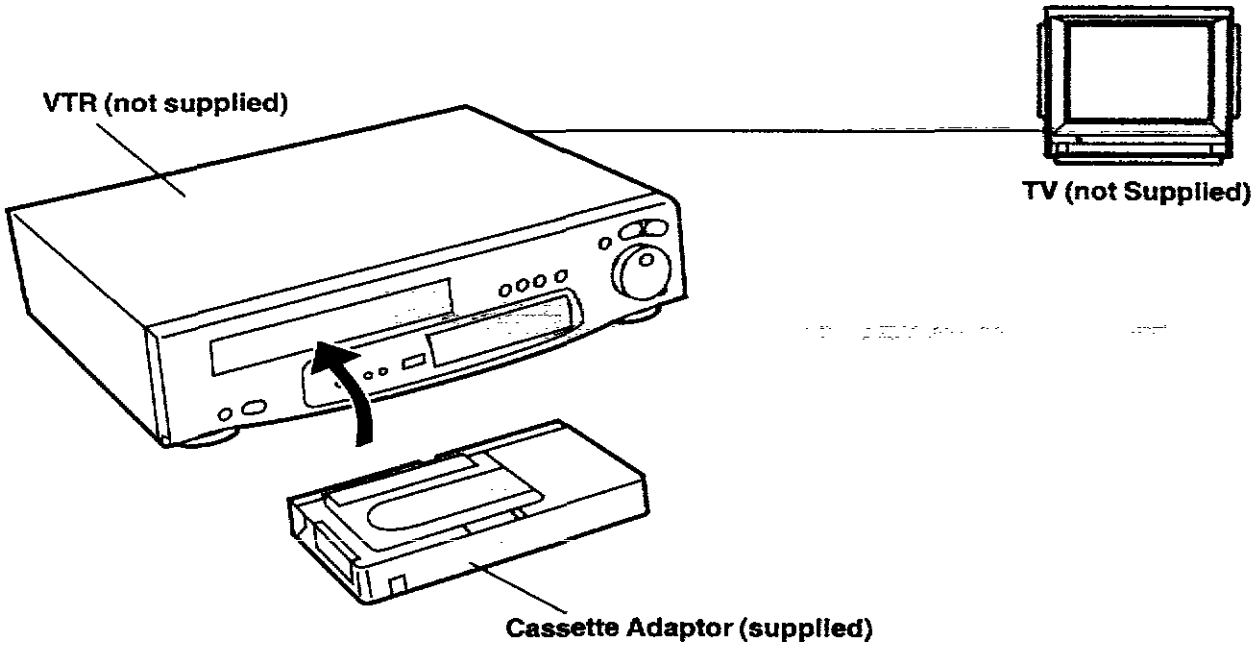
Viewfinder	Condition	Page
RECORD	**Filming Mode (large indication)** When the Record Start/Stop Button is pressed from the Filming Pause Mode, this indication is displayed for approx. 1 second.	12
REC	**Filming Mode (small indication)** "REC" means Recording.	12
▷▷	**Tape Run Indication**	12
PAUSE	**Filming Pause Mode (large indication)** When the Record Start/Stop Button is pressed from the Filming Mode, this indication is displayed for approx. 1 second.	13
PAUSE	**Filming Pause Mode (small indication)**	13
CHK	**Rec Check Mode** "CHK" means Check.	36
SP	**Recording Speed Indication** SP: means Standard Play. LP: means Long Play. The mode can be selected with the [SP/LP] Button.	12
▷	**Playback/Search Mode**	21 37
▷▷	**Fast Forward/Cue Mode**	20
◁◁	**Rewind/Review/Search Mode**	20 36
II	**Still Playback Mode**	21
0:00.00	**Tape Counter**	14
M 0:00.00	**Tape Counter with activated Memory Function** "M" means Memory.	14
R 0:30	**Remaining Tape Time** "R" means Remaining.	14

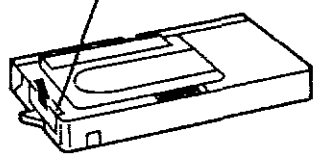
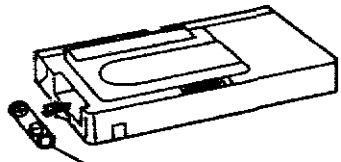
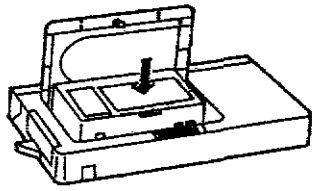
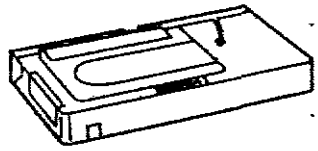
Viewfinder	Condition	Page
30	**Tape Length** The Tape Length Indication can be selected with the [TAPE] Button.	14
12:30 15.10.1994	**Date and Time**	11
10×	**Zoom Magnification** When zooming in on a subject, the indicated zoom magnification value increases.	12
	Manual White Balance Mode	29
MNL	***Manual Filming Mode*** "MNL" means Manual.	26 28
	Sports Mode This indication is displayed when the Sports Mode has been selected.	32
	Portrait Mode This indication is displayed when the Portrait Mode has been selected.	32
	Low Light Mode This indication is displayed when the Low Light Mode has been selected.	32
MF	**Manual Focus Mode** "MF" means Manual Focus.	26
INDEX	**Index** While this indication is visible, an index signal is being recorded.	13
APS	**Power Save Mode** *This Indication is displayed when the [POWER SAVE] Switch set to "ON".*	38



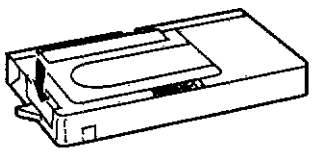
Title	Procedure	
Playing Back on the Viewfinder or the TV **[To Play Back Via TV Set]** 1. Connect the Movie Camera to a TV set. (p. 6, 40) 2. Follow steps 1 through 4 opposite.	**1**  **Turn Power ON/OFF switch out.**	**2**  **The "VTR" Indication Lamp lights up.**
Rewinding or Fast-Forwarding the Tape Perform these operations with the Movie Camera in the VTR Stop Mode ("VTR" Indication Lamp is lit).	■ **For Fast-Forward** 	■ **For Rewind**
Using the Cue, Review and Still Playback Functions During Normal Playback	■ **For Cue Playback** **Keep pressed.** **Cue Playback Mode** 	■ **For Review Playback** **Keep pressed.** **Review Playback Mode** 

		Remarks, etc.
3 **The tape will stop automatically when it reaches the beginning**	**4** 	•When the tape reaches its end during playback, it will be rewound automatically. **■ To Stop the Playback** Press the [STOP] Button.
		•When the tape reaches its end during Fast-Forward, it will be rewound automatically. •When the tape reaches the beginning during Rewind, it will stop automatically.
■ For Still Playback	**To return to normal playback**	•The sound will be played back only during normal playback. •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. •The horizontal noise bars have a different pattern in the SP mode and LP mode. The illustrations on the left show the noise bar pattern of the LP mode.
Still Playback Mode		



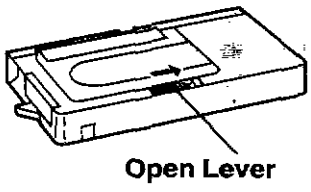
Title	Procedure	
Playing Back on VTR, use the Supplied Cassette Adaptor	**1** Battery Compartment Cover  Remove the Battery Compartment Cover.	**2**  Supplied battery (R6) Insert the Battery (R6).
	5  Insert the recorded video cassette.	**6**  Close the Top Cover.

3



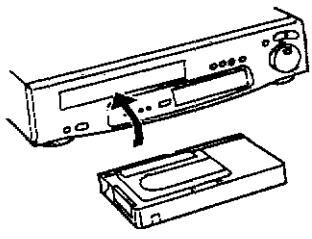
Re-attach the Battery Compartment Cover.

4



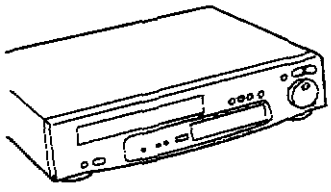
Slide the Open Lever.

7



Insert the Cassette Adaptor into the VTR.

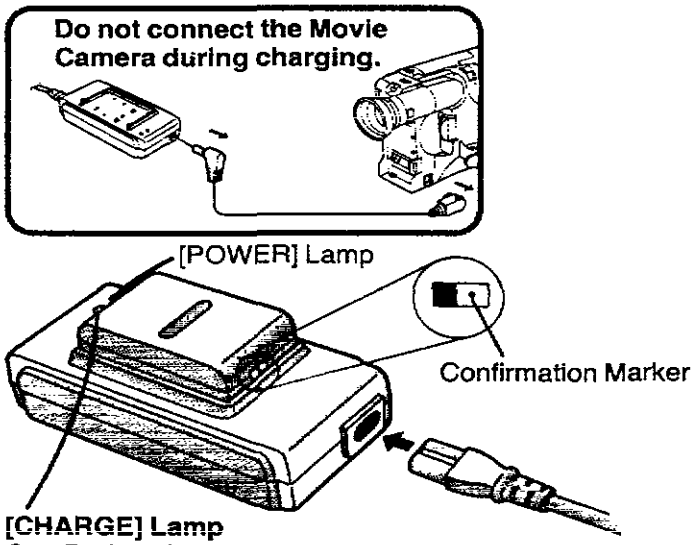
8

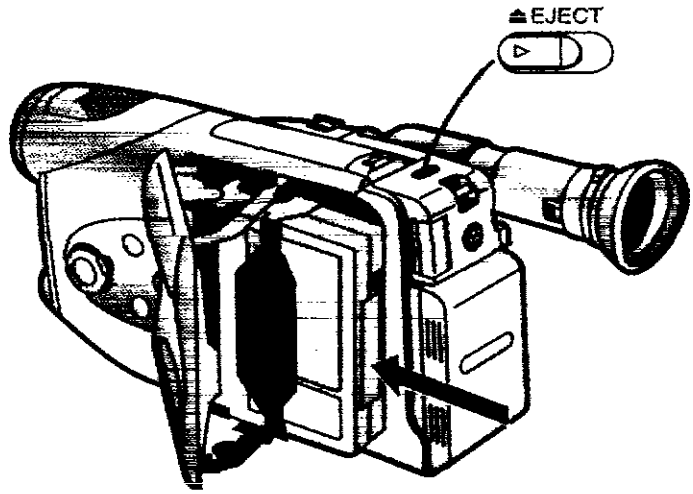


Operate the VTR.

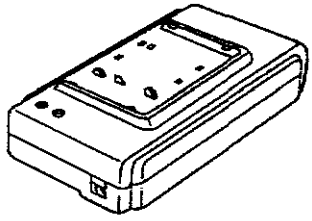
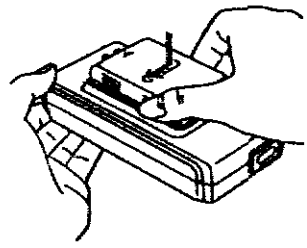
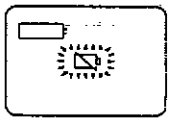
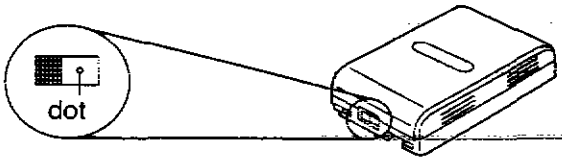
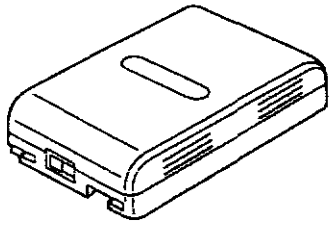
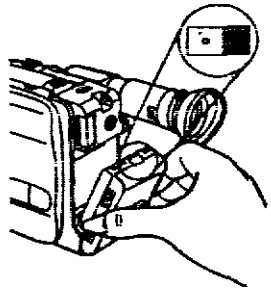
Remarks, etc.

- For optimum picture quality, it may be necessary to adjust the tracking control on the VTR.
- Never insert the empty Cassette Adaptor (without a video cassette) into a VTR.
- Do not insert the Cassette Adaptor into a VTR and take it out again without running the tape, because this could loosen the tape.
- When loading the video cassette into the Cassette Adaptor, do not touch the tape directly.
- After use, take the video cassette out from the Cassette Adaptor.





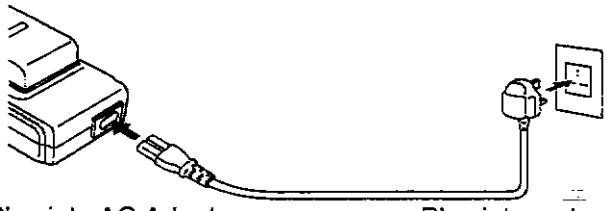
[CHARGE] Lamp
On: During charging.
Off: Charging is finished.
(For maximum charge, continue charging for 2 hours after the [CHARGE] Lamp has gone off.)

Title	Procedure	
Charging the Battery Pack • Be sure to insert the mains plug completely into the correct socket. • Do not connect the DC Input Cable to the AC Adaptor otherwise the Battery Pack cannot be charged.		**1**  **Attach Battery.**
Attaching the Charged Battery Pack  If an exhausted Battery Pack is attached, the " " Indication in the Viewfinder flashes, when turning the Movie Camera on. **Charging Confirmation Marker** 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.  		**1**  **Attach the Battery Pack with its Confirmation Marker facing upward.**

Cautions for Use

- When the operation time even after correct charging is too short for normal use, the service life of the Battery Pack has reached its end.
- Do not try to disassemble or reconstruct Battery Pack.
- Do not throw the exhausted Battery Pack into a fire.
- Make sure that no metal objects touch the contacts of the Battery Pack.
- Do not recharge the Battery Pack when it is already fully charged.
- During filming or during recharging, the Battery Pack may become warm, this is not a malfunction.

2

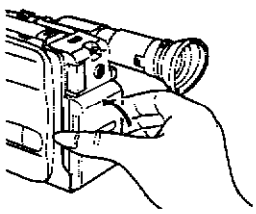


Plug into AC Adaptor. Plug into mains.

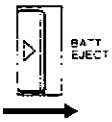
■ Removing the Battery Pack

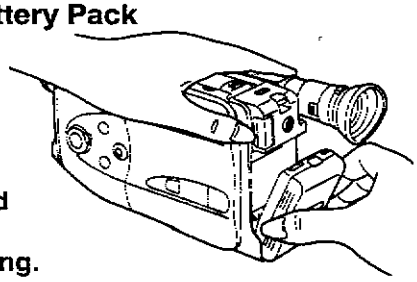
Slide it in the opposite direction to step 1.

2



■ Removing the Battery Pack



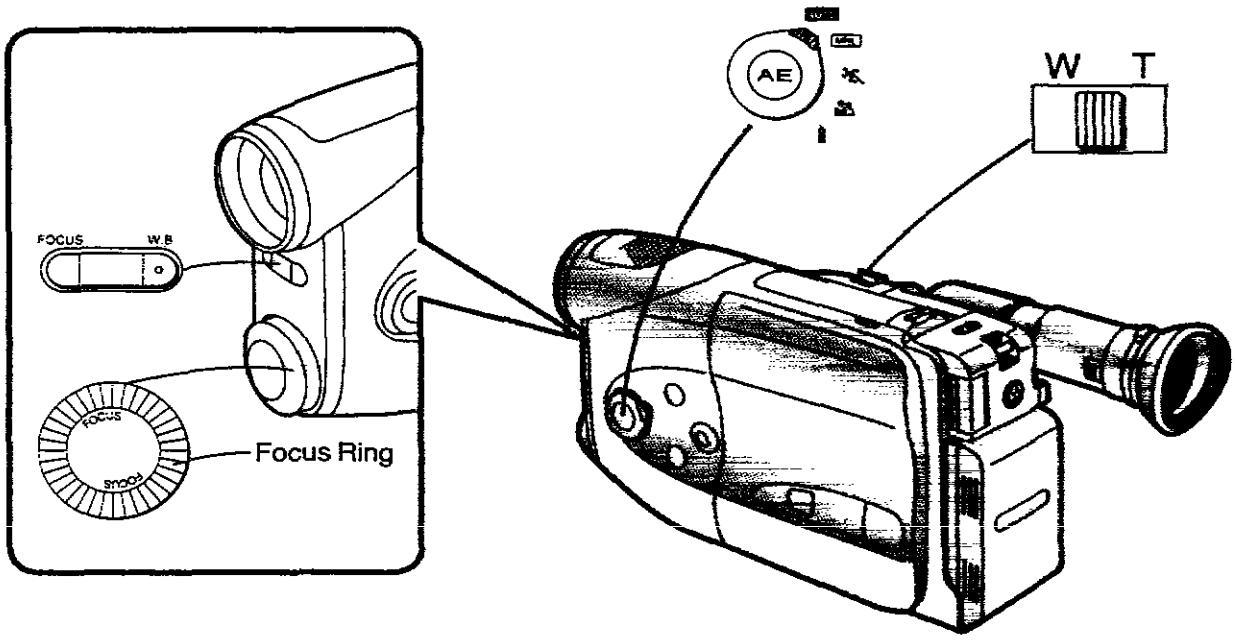


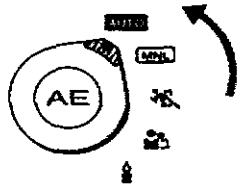
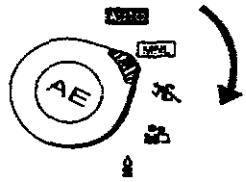
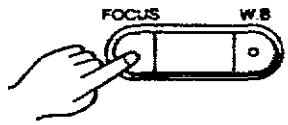
When pushing the Button, be sure to hold the Battery Pack, to prevent it from dropping.

Remarks, etc.

Battery Pack No.	Charging Time	Max. Filming Time
Supplied	Approx. 90 min.	Approx. 45 min.
VW-VBS10E	Approx. 110 min.	Approx. 50 min.
VW-VBS20E	Approx. 220 min.	Approx. 100 min.
VW-VBH10E	Approx. 150 min.	Approx. 60 min.
VW-VBH20E	Approx. 300 min.	Approx. 120 min.

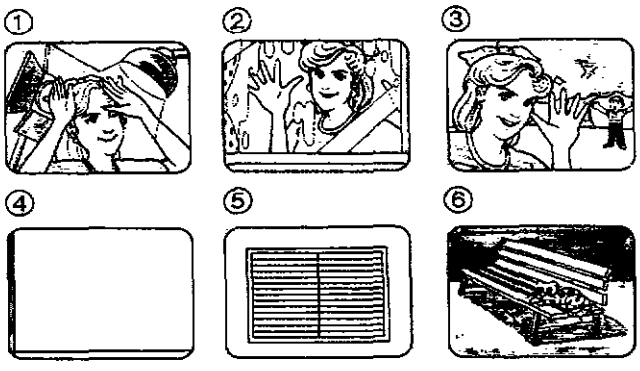
- The figures in the table above are based on an ambient temperature of 25°C.
- Charge the Battery Pack at an ambient temperature between 10°C and 35°C.
  The Battery Pack's ability to generate electric energy is based on a chemical reaction. This reaction can take place better at high temperatures. Therefore, when filming at low ambient temperature, the maximum filming time may be considerably shorter than listed.
- To recharge a Battery Pack whose operation time has become too short for practical use, or which has been stored for a long period of time.
  Continue charging for 24 hours even after the Charging Lamp on the AC Adaptor goes out.
  (If this does not result in an operation time close to those shown in the table, the service life of this Battery Pack has reached its end. Replace it with a new one.)
- Never remove the Battery Pack during recording or playback, because the tape will remain in contact with the video heads and this could cause damage to the heads and tape.
- When the Battery Pack has become exhausted and the Movie Camera has turned off automatically, remove the Battery Pack before connecting the DC Input Cable of the AC Adaptor to the Movie Camera, otherwise the Movie Camera cannot be turned on.



Title	Procedure	
Filming with the Auto Focus Mode When the [AE] Dial is set to "AUTO", the Movie Camera will automatically focus precisely on almost any subject located in the centre of the Viewfinder. • If you want to film with automatic focussing in one of the other settings of the [AE] Dial, press the [FOCUS] Button to make the "MF" Indication in the Viewfinder disappear.	**1**  	
Filming with the Manual Focus Mode	**1**  **The "MNL" Indication appears in the Viewfinder.**	**2**  **The "MF" Indication appears in the Viewfinder.**

Remarks, etc.

In the following filming situations, use the Manual Focus Mode:



① A subject with shiny surfaces or much light reflection

② A subject behind glass that is covered with dirt, dust or water drops

③ A subject with a part of it near the Movie Camera and another parts far away from it.

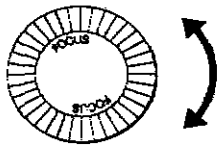
④ A flat surface, e.g. a white wall

⑤ A subject with horizontal stripes

⑥ An oblique subject

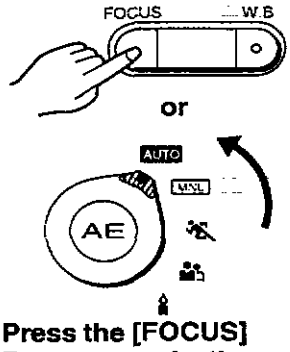
- A fast-moving subject
- A subject with a dark surface
- When using the Macro Close-up Function, special lenses or filters

3



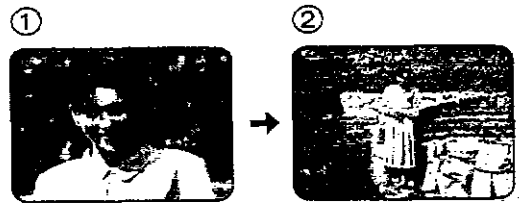
Adjust the Focus Ring until the subject is in focus.

■ To Cancel the Manual Focus Mode



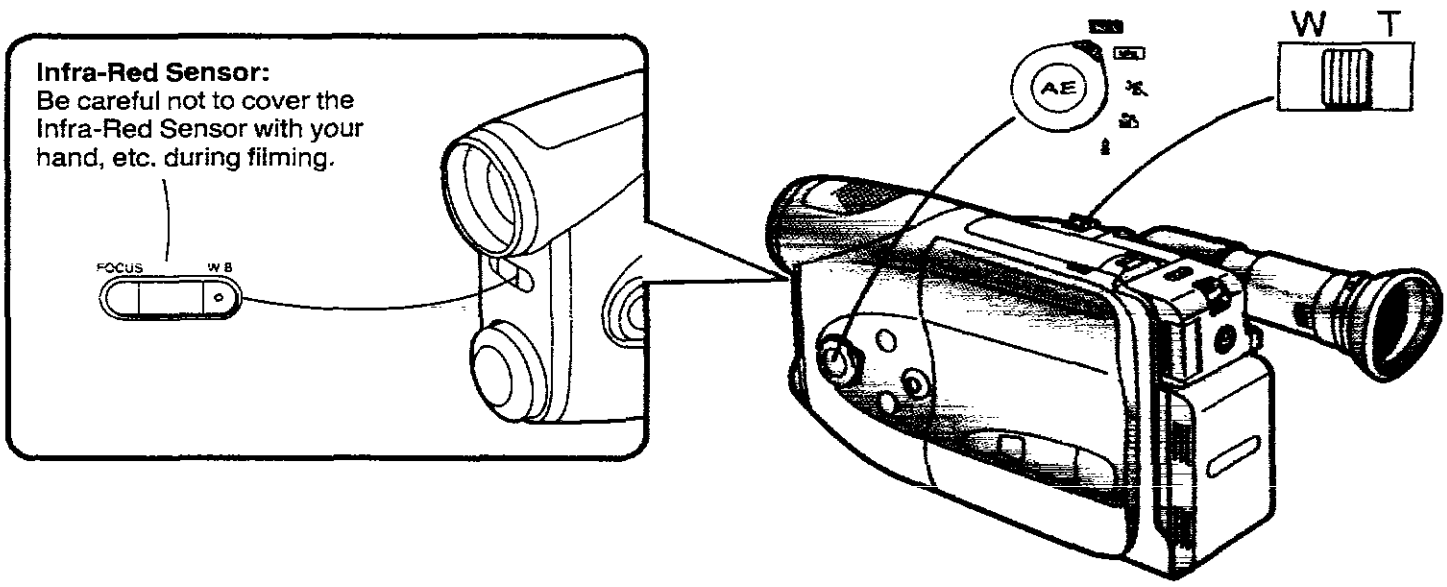
Press the [FOCUS] Button to make the "MF" Indication disappear. Or reset the [AE] Dial to "AUTO".

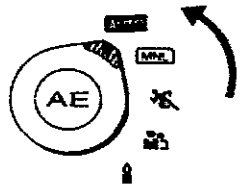
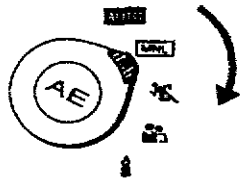
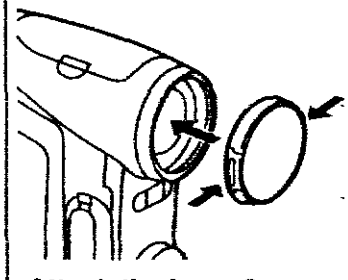
■ Hints for Manual Focus Adjustment



① Be sure to adjust the focus after zooming in on the subject.

② Adjusting the focus with the lens zoomed in on the subject assures precisely focussed pictures even when subsequently zooming back.
- If the focus is adjusted with the lens in the wide-angle setting, the subject may go out of focus when zooming in on the subject.



Title	Procedure	
Filming with Automatic White Balance Adjustment When the [AE] Dial is set to "AUTO", it is possible to film pictures with natural colours under almost any filming condition. • If you want to film with automatic white balance adjustment in one of the other settings of the [AE] Dial, press the [W.B] Button to make the " " Indication in the Viewfinder disappear.	**1** 	
Filming with Manual White Balance Adjustment If there is only one light source: Follow the operation steps **1**~**4** on the right. **Note:** 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.	**1**  **The "MNL" Indication appears in the Viewfinder.**	**2**  **Attach the Lens Cap.** **or** **Point the Movie Camera at a pure white subject.**

	Remarks, etc.
In the following filming situations, film with Manual White Balance Adjustment: ❶ ❷ ❸	❶ When filming under mercury-vapor, natrium or some types of fluorescent lamps etc. ❷ When intense lighting is used, e.g. spot lights in a theatre or when the colour temperature of the light source is low. ❸ When filming at sunrise or sunset. • When filming with an ND Filter (optional) or a Conversion Lens (optional).
3 W T **Keep pushed until the Viewfinder becomes completely white.**	• Under weak illumination, Manual White Balance Adjustment may not be possible. In this case, film in the "AUTO" Mode. • If an additional light source with low colour temperature (e.g. halogen lamp) is used momentarily while filming a subject with high colour temperature (e.g. blue sky or TV screen), unnatural colours will result. • The manually adjusted white balance setting will be maintained until it is cancelled. However, to ensure optimum colour reproduction, it is recommended to adjust the white balance for each new scene. • When the Manual White Balance Adjustment is finished, the " " Indication remains lit in the Viewfinder.
4 FOCUS W.B **Press for more than 1 second.**	**■ To Cancel the Manual White Balance Mode** Press the [W.B] Button one time. Or reset the [AE] Dial to "AUTO".

Title	Natural Light	Colour
Colour Temperature and White Balance The colour temperature of the light source is measured in Kelvin. The higher the Kelvin vale is, the more bluish is the light; the lower the value, the more reddish is the light. This is not directly related to the brightness. The table shows the relationship between natural light, artificial light and colour temperature.	•Blue sky	10,000°K
	•Slightly overcast sky	7,000°K~ 8,000°K
	•Cloudy sky (Rain)	6,000°K
	•Sunlight	5,000°K
	•1~2 hours after sunrise or before sunset	3,000°K~ 4,200°K
	•Sunrise of sunset	2,000°K~ 2,500°K

Optional Accessories

■ Video DC Light VZ-LDCS13E

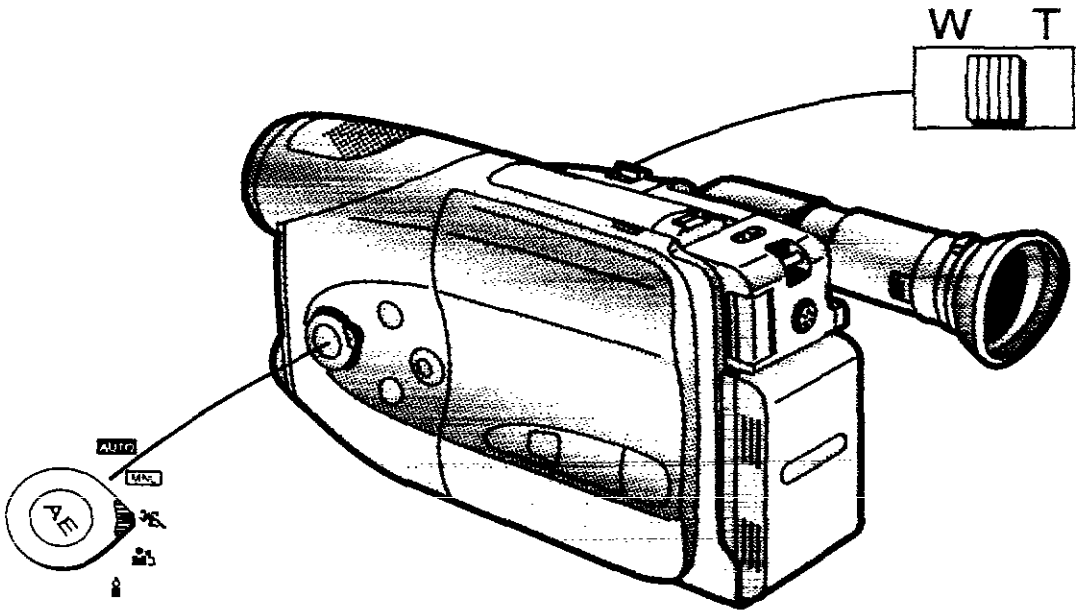
This Video DC Light is recommended for filming in a dark room as well as for filming photographs and pictures with the macro function (p. 13).
To attach the Video DC Light VZ-LDCS13E to the Movie Camera, the Shoe Adaptor (VW-SK9E) is necessary.

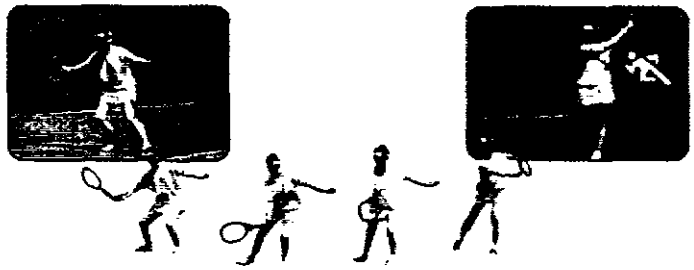
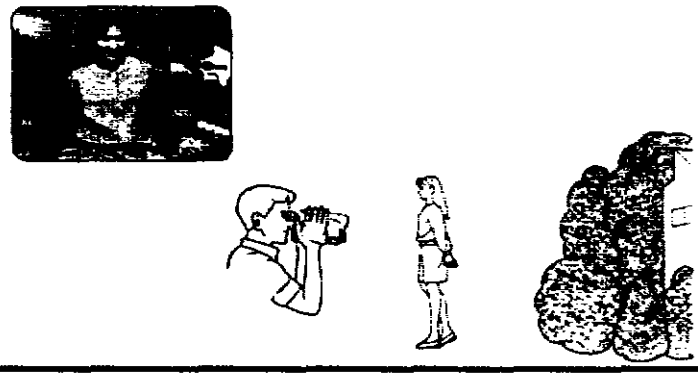
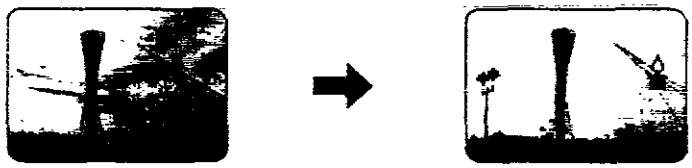
■ Filter Kit VW-LF37E

The Filter Kit VW-LF37E contains an ND Filter and an MC Protector.
The ND Filter is recommended for filming 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 filming with the ND Filter attached, the Manual White Balance Adjustment Mode should be used, since Auto White Balance Adjustment Mode would not work normally.)
The MC Protector is used for protecting the lens.

Temperature	*Artificial Light*	*White Balance Adjustment*
8,000°K~ 9,000°K	•TV screen	Bluish colour
4,800°K	•Fluorescent lamp (white)	Whitish colour
2,500°K~ 3,500°K	•Fluorescent lamp (not white) or studio lamp	
2,000°K~ 2,800°K	•Halogen light bulb	Reddish colour
2,000°K~ 2,500°K	•Tungsten lamp	
1,500°K~ 2,000°K	•Candle-light	

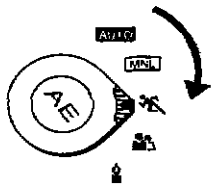
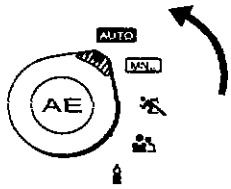
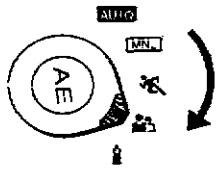
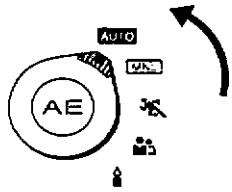
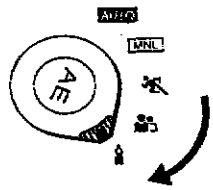
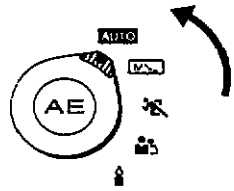
Range in which the Auto White Balance Adjustment is effective

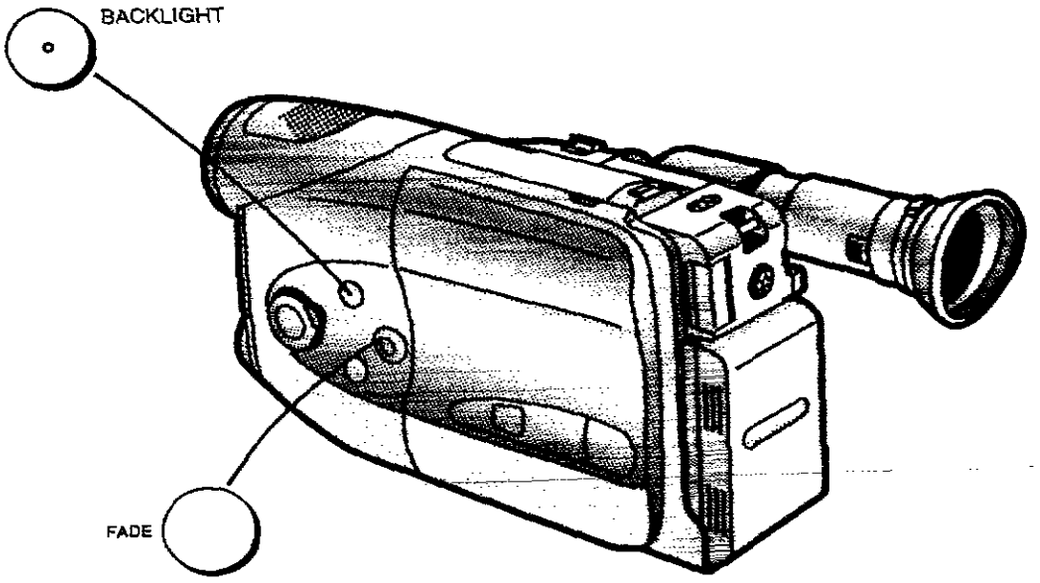


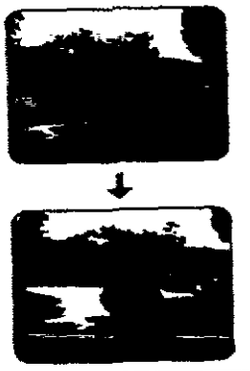
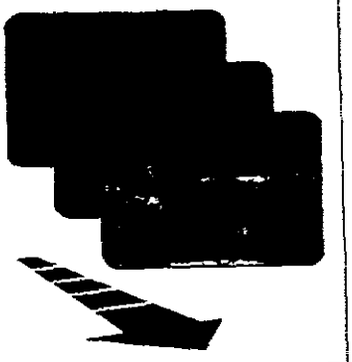
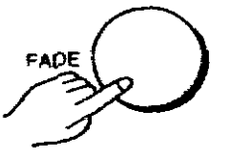
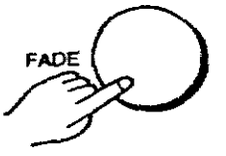
Title	Viewfinder
Filming Fast-Moving Subjects **■ Using the Sports Mode** This function makes it possible to obtain pictures with minimized blur when filming fast-action scenes such as tennis or other types of sports. When scenes recorded with the Sports Mode are later played back on a VTR, still and slow motion playback with very sharp picture contours and brilliant details can be obtained.	
Making People Stand out Sharply from the Background **■ Using the Portrait Mode** In the Portrait Mode, the Iris is automatically set to its maximum opening which results in a very small depth-of-field. This causes the subject in the center of the picture to be sharply focussed while the background is blurred.	
Filming Dark Scenes More Brightly **■ Using the Low Light Mode** This increases the sensitivity and brightens up the picture.	

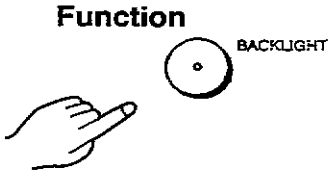
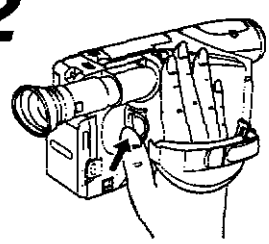
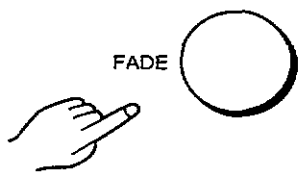
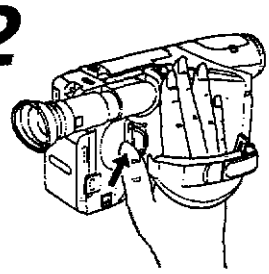
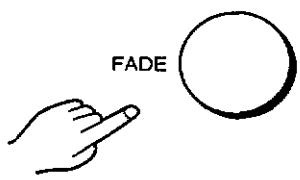
Notes for Use of the Sports Mode

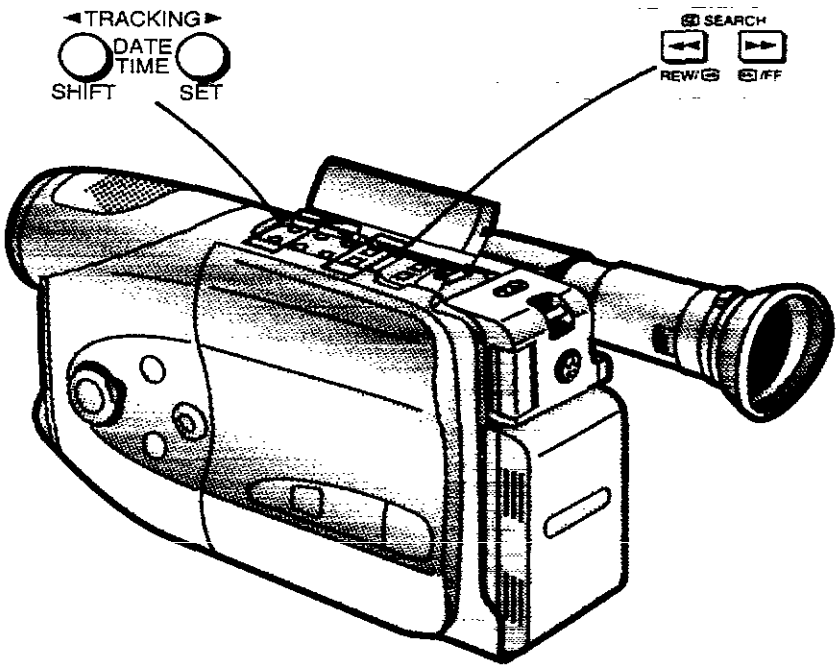
- The subject must be brightly lit by sunlight or a Video DC Light (optional), with little shade.
- When filming under fluorescent, mercury-vapor or natrium lamps, the picture will be adversely influenced by flickering.
- When a scene filmed in the Sports Mode is played back in the normal playback mode, the picture movement may not be as smooth as normal.
- If the picture is recorded with high shutter speed, the playback picture will be slightly darker.

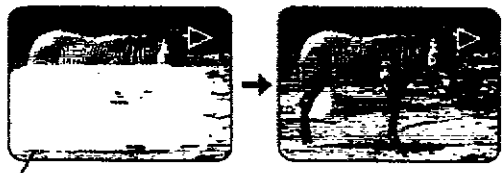
Procedure		Remarks, etc.
1 	**To Return to the Normal Filming Mode** 	• In the Sports Mode, the shutter speed is automatically adjusted (between 1/50 s and 1/500 s) according to the brightness of the scene, so even fast movements will be captured in sharp and stable pictures. • If the surrounding illumination is weak, the " " Indication flashes. In this case, the Sport Mode may not be effective.
1 	**To Return to the Normal Filming Mode** 	• The shutter speed is automatically adjusted between 1/50 s and 1/1500 s according to the brightness of the subject. • Zooming in on the subject by pushing the [W • T] Zoom Lever toward "T" increases the blurring of the background.
1 	**To Return to the Normal Filming Mode** 	• Even if this mode is used for outdoor filming in daylight, the result will be almost the same as when filming in the other mode.

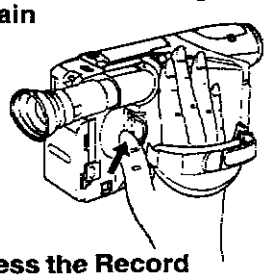
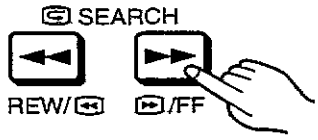


Title	Viewfinder	
Filming Backlit Scenes By keeping this button pressed, the blacklight can be compensated.		**1** **Keep pressed.**
Fading In the Picture and Sound At the beginning of a movie, etc. fading in is often used. For example, after recording the title, starting the first scene with the Fade-in Function is very effective.		**1**  **Keep pressed while in the Shooting Pause Mode.**
Fading Out the Picture and Sound Fading out is used to create a soft ending or (together with fade-in) for a soft transition from one scene to the next.		**1**  **Press during shooting at the point where you wish to fade out.**

Procedure		Remarks, etc.
2 ■ **To Cancel this Function**  **Release the Button.**		•The sky may become whitish. •When filming with the sun striking the subject at an angle, star-shaped light reflexes may be recorded in the picture. •When filming a subject in front of a very bright background, the subject will appear dark in the picture.
2  **Press after the picture in the Viewfinder has disappeared.**	**3**  **Release after approx. 3 seconds.**	
2  **Press after the picture in the Viewfinder has disappeared.**	**3**  **Release.**	

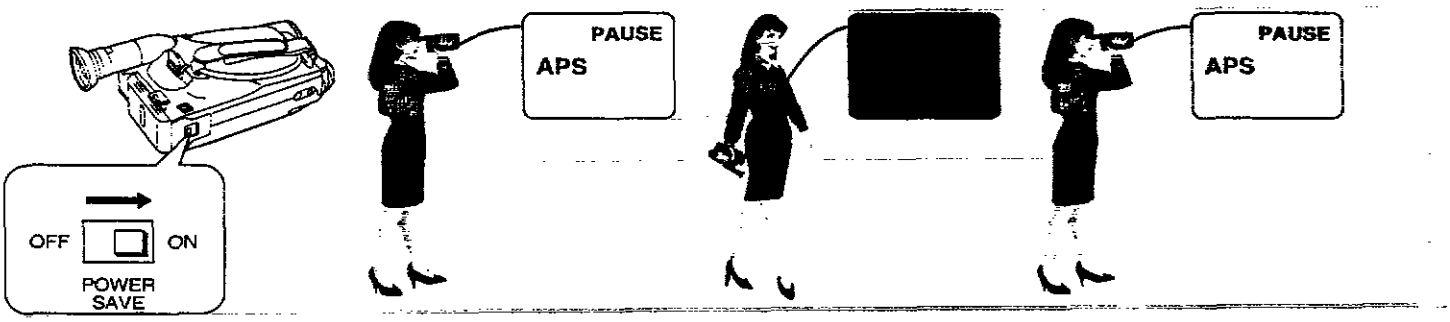


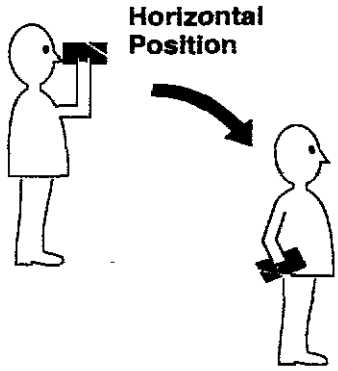
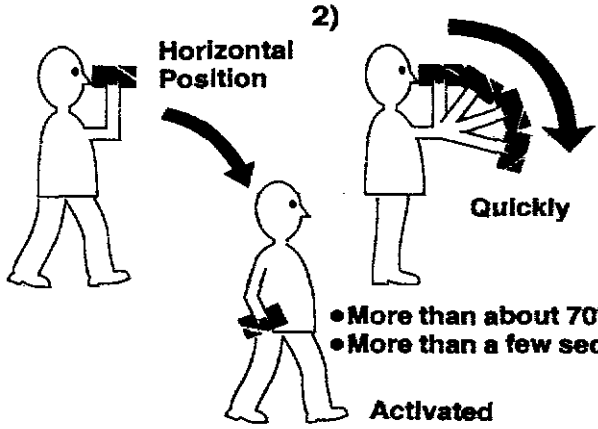
Title	Procedure
Checking the End of the Recorded Scene For occasionally important scenes, use this check function during filming to confirm that the recording has been performed correctly.	**1** **Press while in the Filming Pause Mode.**
Locating a Point Where You Wish to Add a New Scene Film the individual 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 Filming Pause Mode.	**1** ■ **Reverse direction** **Keep pressed while in the Filming Pause Mode.**
Adjusting the Tracking 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, the tracking needs to be adjusted.	 **White noise**

	Remarks, etc.
2 **To start the filming again**  **Press the Record Stat/Stop Button.**	•The final 2 seconds of the last recorded scene will be played back in the Viewfinder and then the Movie Camera returns to the Filming Pause Mode.
2 **■ Forward direction**  **Keep pressed while in the Filming Pause Mode.**	•When the [REW/] Button is kept pressed: 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. •When the [/FF] Button is kept pressed: The Indication "▷" appears in the Viewfinder. The scene is played back in forward direction at normal speed.
1 **Press both the [◄ TRACKING] and [TRACKING ►] Buttons simultaneously.**	•If pressing both buttons simultaneously does not improve the picture quality, adjust by pressing the [◄ TRACKING] or [TRACKING ►] Button individually. (It may not be possible to remove the noise bars completely.)

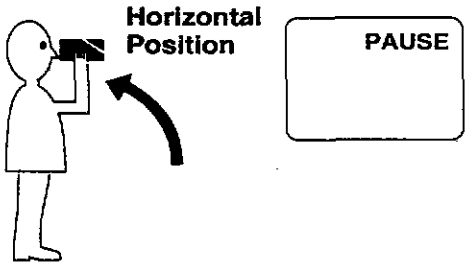
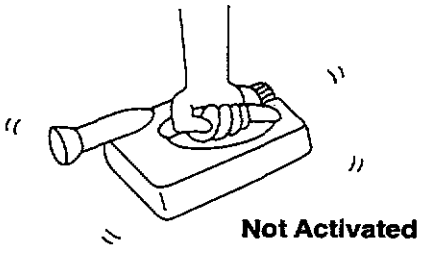
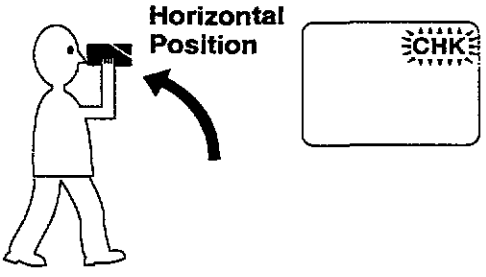
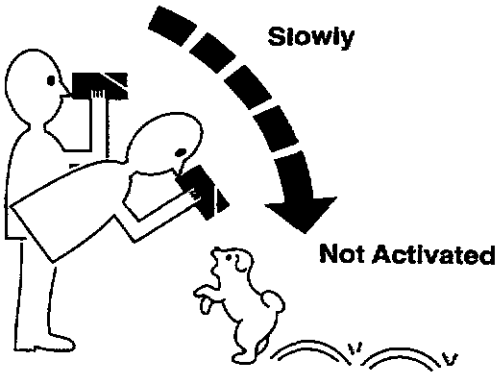
Using the Power Save Functions

❶ Auto Power Save (in the Filming Pause Mode)



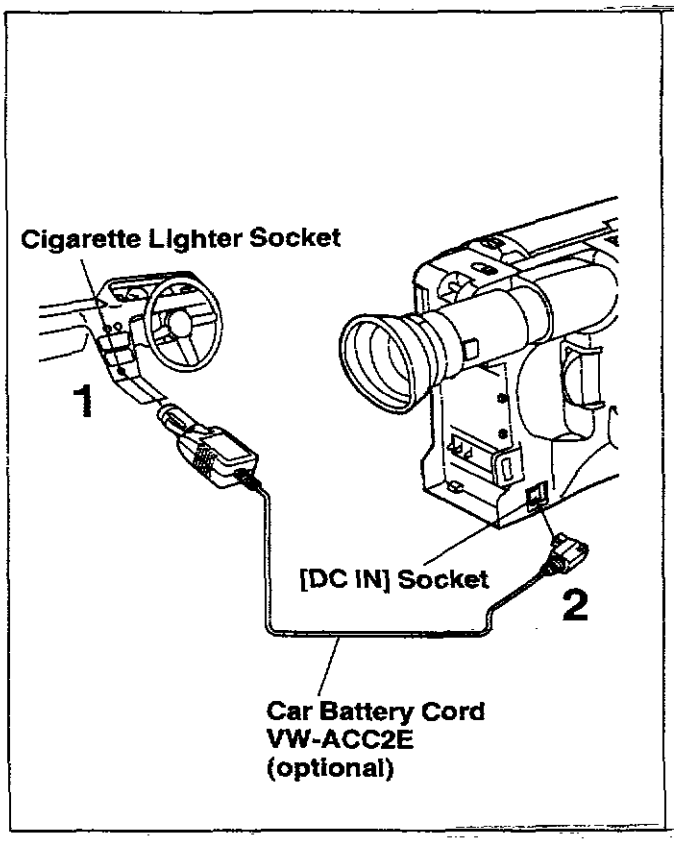
	Movie Camera Mode	Becomes Activated:	Conditions of Move Camera
❶ Auto Power Save Function	**During Filming Pause** **Viewfinder** PAUSE APS The "APS" Indication is displayed.	 •More than about 70° •More than a few seconds Activated •When Movie Camera is tilted downwards by more than about 70° from the normal horizontal filming position for more than a few seconds.	•Viewfinder: OFF •Auto Focus: OFF •Zoom Motor: OFF •VTR Indication: Flash (Green)
❷ Anti-Ground-Filming Function	**During Filming** **Viewfinder** REC APS The "APS" Indication is displayed.	1) 2)  •More than about 70° •More than a few seconds Activated •When tilting the Movie Camera downwards by more than about 70° from the normal horizontal filming 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.	•Viewfinder: OFF •Auto Focus: OFF •Zoom Motor: OFF •Filming Mode ↓ Filming Pause Mode •VTR Indication: Flash (Green)

❷ Anti-Ground-Filming (in the Filming Mode)

Result	To Resume Filming	Operating Restrictions
•**Saving Power** The Battery Pack can be used longer for filming. •**Preventing Lengthy Filming of the Ground** The Movie Camera automatically prevents filming even when the Record Start/Stop Button is pressed accidentally.	 •When the Movie Camera is returned to an approximately horizontal position, the Movie Camera is automatically put into the Filming Pause Mode and the filming can be restarted by pressing the Record Start/Stop Button.	When holding the Movie Camera with the Grip Belt facing upwards. 
•**Saving Power The Battery Pack can be used longer for filming.** •**Preventing Lengthy Filming of the Ground** The Movie Camera automatically switches over to the Filming Pause Mode to stop the unintentional filming when forgetting to press the Record Start/Stop Button at the end of a scene.	 •When the Movie Camera is returned to an approximately horizontal position, the "CHK" (=check) Indication will flash in the Viewfinder. Since the filming may have continued for several seconds, rewind the tape a little using the Camera Search Function (p. 36) to locate the exact end of the last desired scene, and then start filming again.	When slowly tilting the Movie Camera downwards during filming.  •This function is designed so that it is not activated when the Movie Camera is slowly tilted downwards during filming. •The Anti-Ground-Filming feature is not intended to replace the manual stopping of filming.

Note: When changing locations between scenes or when not planning to film for a longer period of time, it is recommended to turn off the Movie Camera with the Power ON/OFF Switch.

Using the Car Battery Cord (Optional)



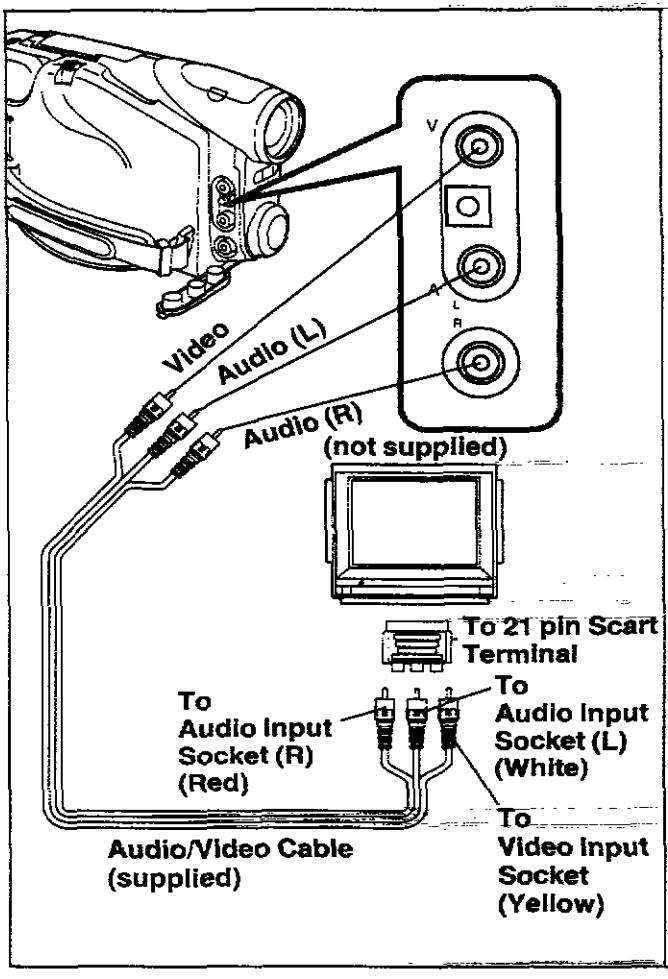
Notes:

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 warranty.

1 **Start the engine and then plug the Car Battery Cord into the Cigarette Lighter Socket.**

2 **Connect the other end of cord to the DC Input Socket on the Movie Camera.**

Playing back on a TV Set with 21 pin Scart Terminal



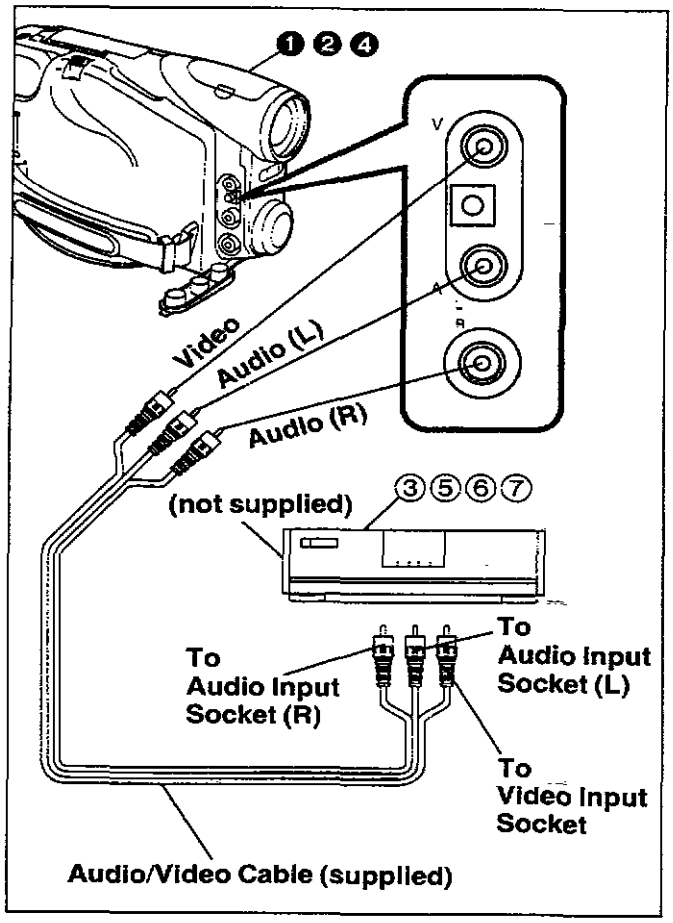
Using the Supplied 21 pin Adaptor and Audio/Video Cable

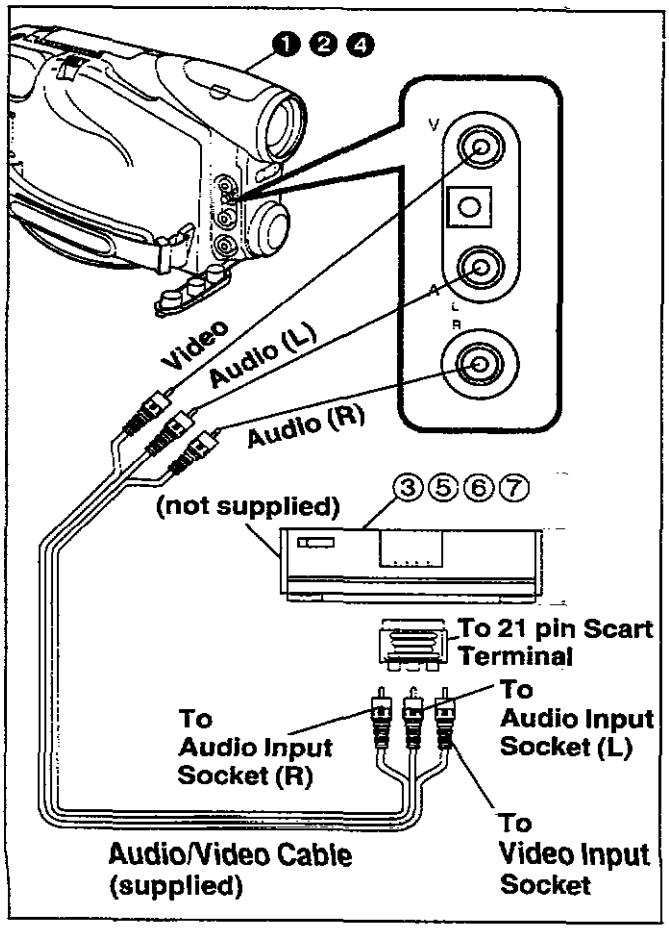
Connect after turning off the Movie Camera and the TV Set.

■ Activate the Playback Operation

(p. 20)

Editing a Previously Recorded Tape





Connect the Movie Camera to the VTR using the Supplied Audio/Video Cable or 21 pin Adaptor.

■ Operations

Playback Unit (Movie Camera): ❶❷❹

Recording Unit (VTR): ③⑤⑥⑦

❶ Insert the recorded video cassette for playback into the Movie Camera.
Find the point on the tape where you want to cut and note the tape counter position.

❷ Rewind the tape and find the point where the dubbing is to start.

③ Insert the video cassette for recording into the VTR and put it in the Recording Pause Mode. Also read the Operating Instructions of the VTR.
The picture quality deteriorates slightly in the dubbing process, however, this can be minimized by *selecting the standard recording speed* (SP Mode) on the VTR.

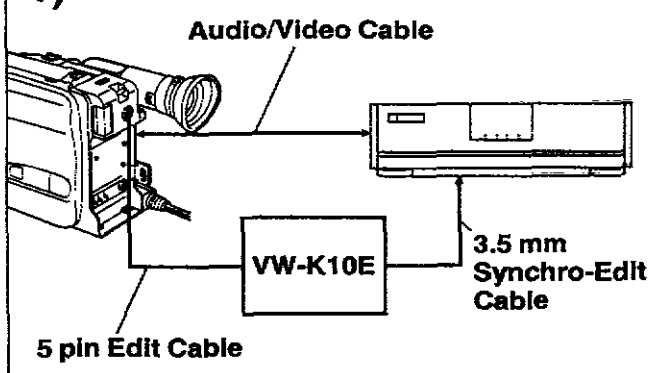
❹ Start the playback.

⑤ Press the Pause/Still Button to start recording.

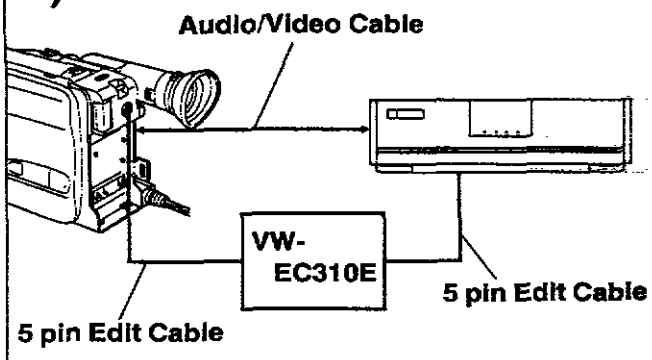
⑥ Press the Pause/Still Button at the point where the dubbing is to end.
The VTR is now in the recording pause mode.

⑦ When the next scene which you want to record appears, press the Pause/Still Button one more time.

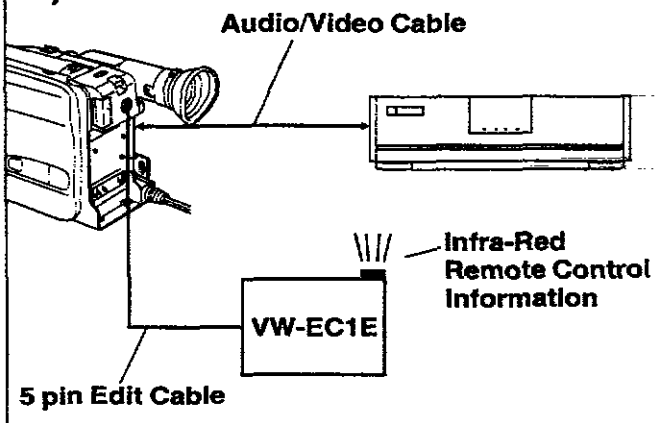
1)



2)



3)

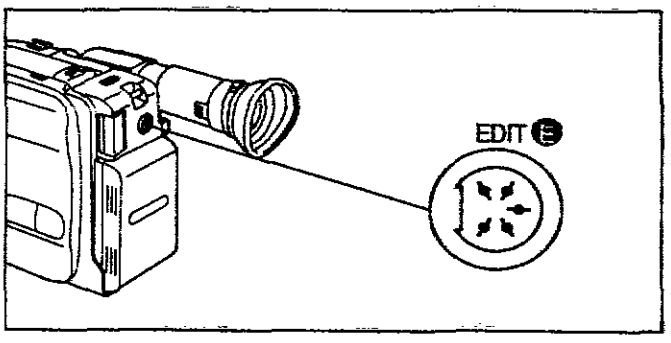


■ **[EDIT] Socket**

By connecting a Panasonic Editing Controller (optional) to this socket as well as to a Panasonic VTR 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 VTR 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 of Panasonic VTR 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.
3) Connecting the Movie Camera to any brand of VTR 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.



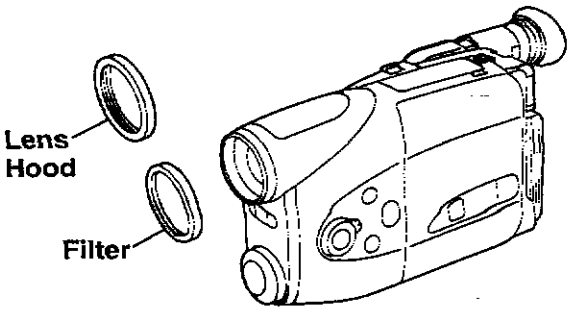
Optional Accessories

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
System Case VW-SHCS5E	Soft Cover VW-SCS9E	Video DC Light VZ-LDCS13E	Shoe Adaptor VW-SK9E	Filter Kit VW-LF37E
Special Effect Filter Kit (A) VW-LFA37E	Special Effect Filter Kit (B) VW-LFB37E	Tele Conversion Lens VW-LT3714E	Wide Conversion Lens VW-LW3707E	Standard Tripod VZ-CT55E
Deluxe Tripod VZ-CT75E	Table Tripod VZ-CTT1E	Cassette Adaptor VW-TCA7E	Editing Controller VW-EC310E	Editing Controller VW-EC1E
Video Titler VW-VT1B	RF Adaptor VW-RF7E			

Notes:
- Consult your dealer for details of other accessories not listed here.
- When using the Video DC Light, the Shoe Adaptor (optional) is necessary.
- Some accessories listed above may not be available in some countries.

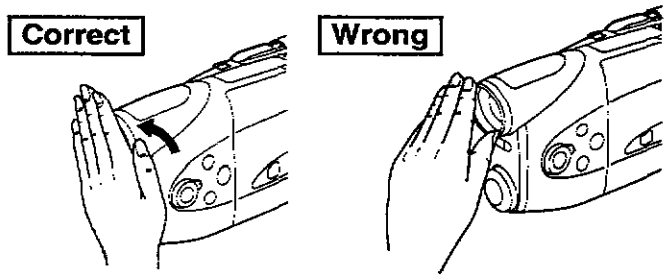
■ Lens Hood

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

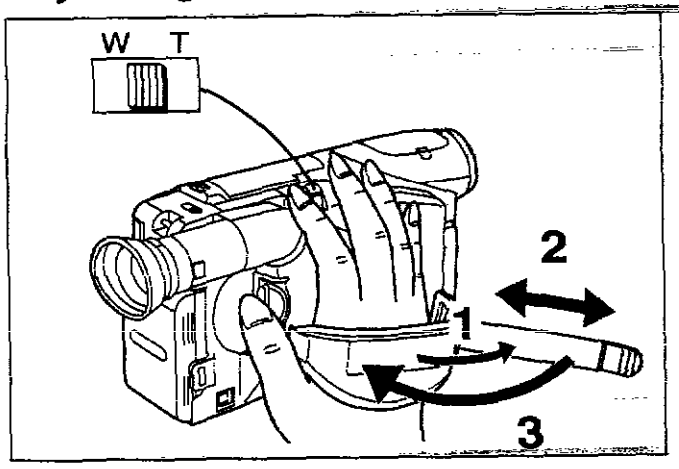


Battery Pack No.	Charging Time	Max. Filming Time
VW-VBS10E	Approx. 110 min.	Approx. 50 min.
VW-VBS20E	Approx. 220 min.	Approx. 100 min.
VW-VBH10E	Approx. 150 min.	Approx. 60 min.
VW-VBH20E	Approx. 300 min.	Approx. 120 min.

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



Adjusting the Length of the Grip Belt



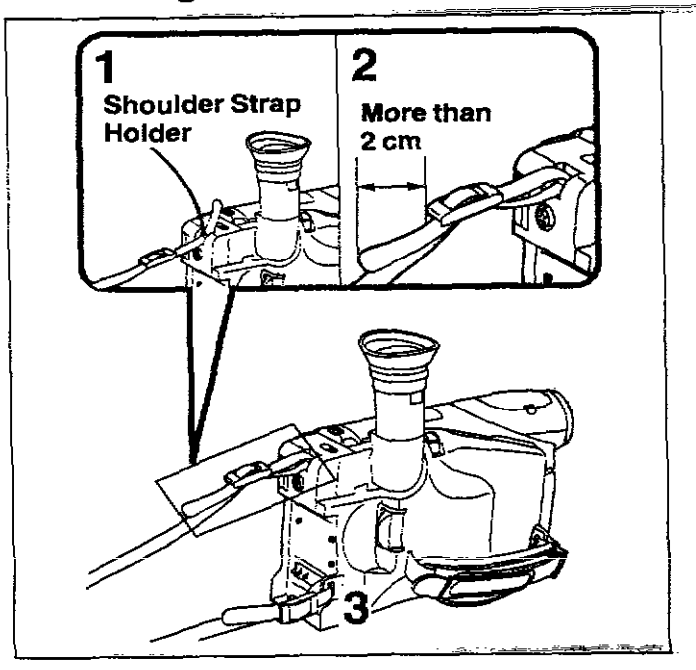
Adjust the Grip Belt so that the Record Start/Stop Button can easily be pressed with the thumb and the [W • T] Zoom Lever can be pushed with the index finger.

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

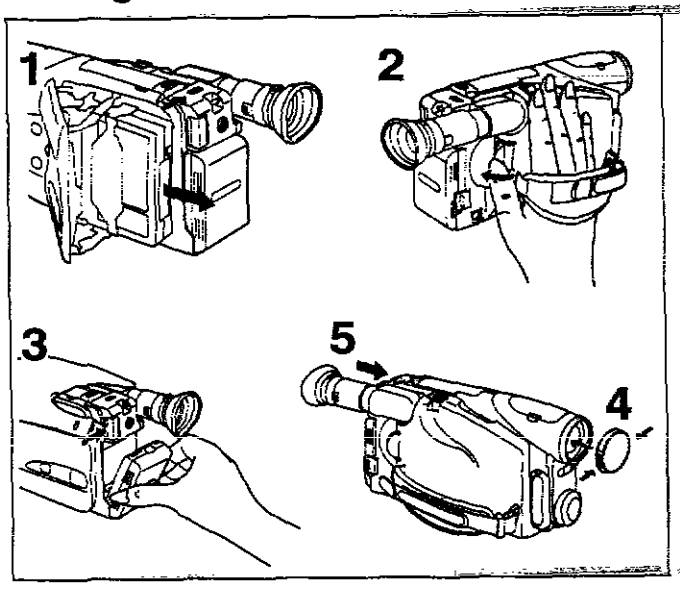


1 **Pull the end of the Shoulder Strap through the Shoulder Strap Holder.**

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.)**

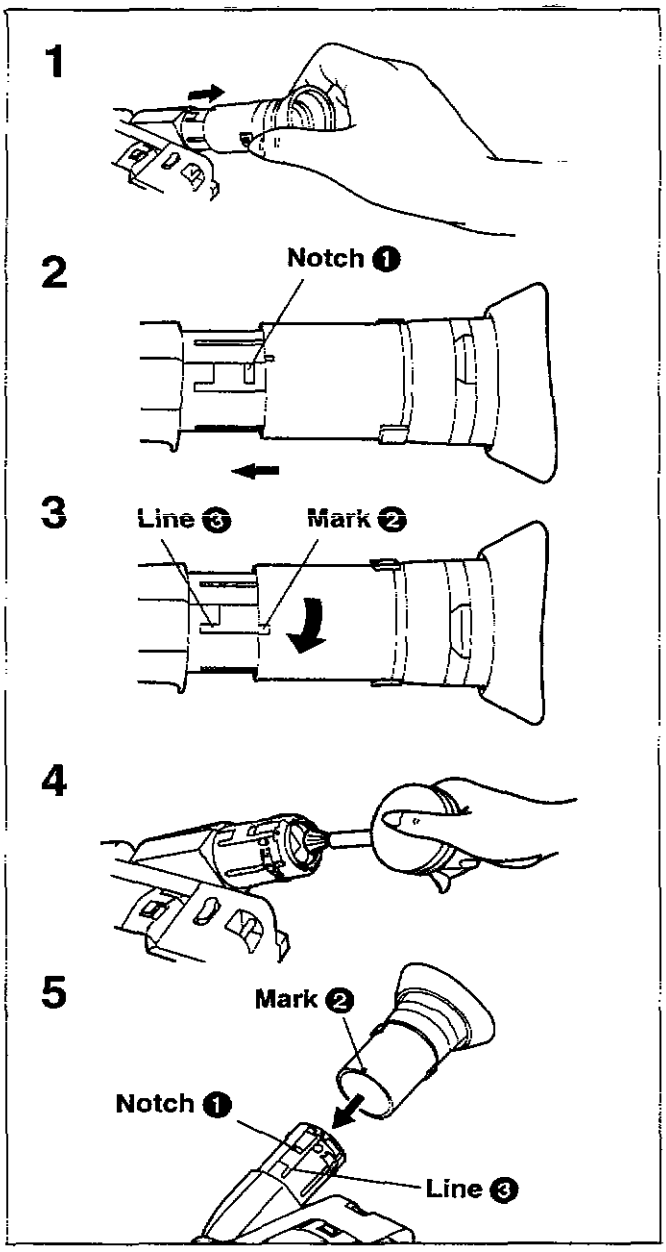
3 **Push the [BATT. EJECT] Button and remove the Battery Pack.**

4 **Attach the Lens Cap.**

5 **Retract the Viewfinder.**

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 shortens the battery life.

Cleaning the Viewfinder



1 Grasp the projections on the either side of the Viewfinder and fully extend it.

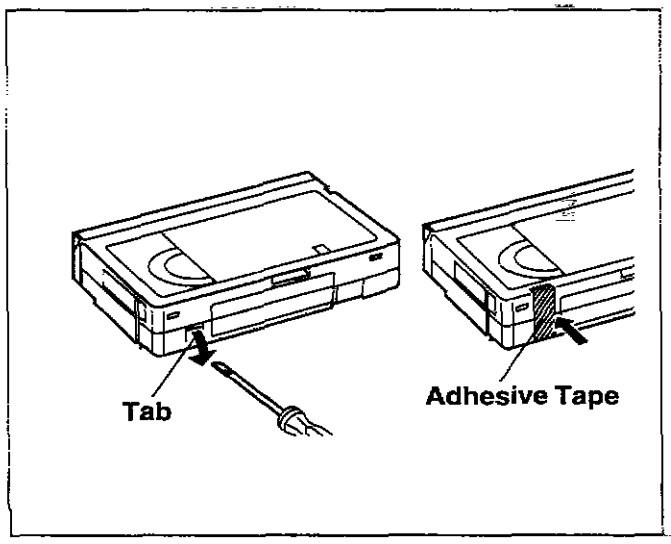
2 Push the Viewfinder back approx. 3 mm so that its front edge is precisely aligned with the notch ❶.

3 Turn the Viewfinder counterclockwise so that the mark ❷ is aligned with the line ❸ and pull it off.
(While turning it, some increased resistance can be felt; however, be sure to turn it to the line ❸.

4 Remove dust with a blower brush (not supplied).

5 To re-attach the Viewfinder, align the mark ❷ with the line ❸, slip the Viewfinder on as far as the notch ❶ and turn it clockwise.

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.

Before Requesting Service

	Item	Symptom	Cause	Action	Reference page
Power	Using the Battery Pack	•Movie Camera does not turn on.	•Not attached.	•Attach it correctly.	24
			•Not charged.	•Charge it.	24
		•Movie Camera turns off too soon.	•Exhausted.	•Use a fully charged one.	24
			•Shooting was pause for more than 6 minutes.	•Turn the Power ON/OFF in Switch inwards to turn off the Movie Camera, and then turn it outwards again to turn on the Movie Camera.	13
	Using the AC Adaptor	•Movie Camera does not turn on.	•Not connected.	•Connect correctly.	6
	Using any of the power sources	•Movie Camera does not turn on.	•Power ON/OFF Switch is not turned out.	•Turn it out.	8
		•Movie Camera turn off too soon.	•Condensation has formed inside.	•Wait several hours.	48
Filming		•No picture in the Viewfinder.	•Power ON/OFF Switch is not turned out.	•Turn it out.	8
			•Lens Cap is attached.	•Remove it.	8
			•The Power Save Function has been activated.	•Hold the Movie Camera in horizontal position.	38
		•Indications in the Viewfinder are not clear.	•The Viewfinder is not extended.	•Extend it.	8
			•Eyepiece Corrector is not adjusted.	•Adjust it.	8
			•Lens is dirty.	•Clean it.	45

Item		Symptom	Cause	Action	Reference page
Filming		•Filming cannot be started.	•The erasure prevention tab of the inserted cassette is broken off.	•Cover the tab hole with adhesive tape.	45
			•No cassette is inserted.	•Insert a cassette with intact erasure prevention tab.	8
			•Tape has reached its end.	•Insert a new one.	8
		•Some noise from the zoom operation is picked up.	•The surroundings are very quiet.	•Use an external microphone (optional).	5
		•Date and time cannot be recorded.	•Date and time are not set.	•Set the date and time.	10
	12:30 15.10.1994	•Date and time are not displayed in the Viewfinder.	•[DATE/TIME] Button was not pressed.	•Press the [DATE/TIME] Button.	10
			•Built-in Lithium Battery is exhausted.	•Recharge the Built-in Lithium Battery.	11
		•"U11/ ⊗ " appears in the Viewfinder.	•The video heads are dirty.	•Return the Movie Camera to an approved repair agent.	—
Playback (picture)		•No picture.	•Power ON/OFF Switch is not turned outwards.	•Turn the switch outwards and press the [VTR/CAMERA] Button so that the "VTR" Indication Lamp lights up.	20
			•Not connected or incorrectly connected to TV set.	•Connect correctly.	6
			•Wrong channel is selected on TV set.	•Select the correct channel.	—
		•Picture is not in colour or distorted.	•Tracking is not adjusted.	•Adjust the tracking.	36
		•Picture contains noise bars.	•Cue Review or Still Playback is activated.	•It is not a malfunction.	21

Cautions

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 mains outlet.)
- 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 mains outlet.)
- 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 filming, 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.

Condensation

If Condensation Has Formed Inside the Movie Camera, Filming 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.

Questions & Answers

1 Power Sources

Q: What types of power sources can be used for this Movie Camera? And how are they used?

A: There are basically the following 3 different power sources.

1) Battery Pack: Use it when filming outdoors and indoors, when there is no mains socket available.
2) AC Adaptor: Use it to connect the Movie Camera to a mains socket when filming indoors or near a mains socket outdoors.
   It can also be used to save Battery Pack power when setting the time and date of the built-in clock, or when trying out some camera functions.
3) Car Battery Cord: Use the Car Battery Cord (optional) to connect the Movie Camera to the cigarette lighter socket.

Q: Why isn't the Battery Pack sold in charged condition?

A: Ni-Cd (Nickel-Cadmium) Battery Packs or Ni-MH (Nickel-Hydrogen) Battery Packs can be used with this Movie Camera. Both types are subject to self-discharging, i.e. their capacity will decrease gradually when they are left unused after charging. In one month, the capacity decreases by approx. 20%. Therefore, to ensure that you have the maximum charge available for filming, be sure to charge the Battery Packs no more than a few days before using them.

Q: In spite of fully charging a Battery Pack, its operation time is much shorter than expected...?

A: This may be due to one of the following reasons:

1) The maximum operation time of the Battery Pack listed in the Operating Instructions is for continuous filming at an ambient temperature of 20°C. However, the use of the zoom and other functions increases the power consumption, so that the actual recording time per Battery Pack is 30%–50% less than for continuous filming.
2) The Battery Pack is used at the place with low temperature e.g. a ski slope.
   The useful operation time of the Battery Pack becomes shorter as the ambient temperature gets lower. When filming on a ski slope, for example, it may be possible to film no longer than 5 minutes, even when using a fully charged Battery Pack. Therefore, it is recommended to take along 3–5 times as many charged Battery Packs as you would for filming at normal temperature. Also, using large-capacity Battery Packs will give you double the uninterrupted filming time of normal ones.

Q: Are there any ways to refresh the Battery Pack whose useful operation time has become very short?

A: Refreshing Battery Packs is possible with the following procedures:
Continue charging the Battery Pack for an additional 24 hours after the Charging Indication Lamp goes out. However, if the useful operation time is still too short for normal use, even after this procedure, the service life of the Battery Pack has reached its end.

Q: How often can a Battery Pack be recharged?

A: Approx. 200 times.

Q: How can one distinguish charged from discharged Battery Packs?

A: There is no difference in appearance. Therefore, it is recommended to make use of the marker on the Battery Pack.
For example, slide the marker so that the red dot is visible for a charged Battery Packs and slide it the other way so that the red dot is not visible for partially or completely discharged Battery Packs.

Q: Are there any points to observe for effective use of the Battery Pack?

A: Observe the following points faithfully.
1) Charge the Battery Pack immediately before use or on the day before.
2) When the filming of a scene is finished, turn off the Movie Camera.
3) Since the operation time of the Battery Pack becomes shorter at low ambient temperature, wrap the Movie Camera with a towel or blanket so that it does not get cold when carrying it outside.
4) When the Battery Pack is not being used, remove it from the Movie Camera and store it in a cool place. If the Battery Pack is left attached to the Movie Camera for a long period of time, excessive discharging may occur, and it will not be possible to use such a Battery Pack again.
5) When carrying or storing the Battery Pack, ensure that no metal objects e.g. keys, etc. touch the connectors of the Battery Pack.

Q: After turning on the Movie Camera, the [CAMERA] Lamp flashes and the Movie Camera turns itself off immediately.

A: This may be due to one of the following reasons:
1) The Battery Pack is completely discharged.
2) Condensation has formed inside the Movie Camera.

Q: About 6 minutes after turning on the Movie Camera, it turns itself off again...

A: If the Movie Camera is left in the Filming Pause Mode (PAUSE) for more than 6 minutes, it will automatically turn itself off to protect the video tape.
Turn it on again to start filming.
(The Movie Camera turns itself off, even if no video cassette is inserted.)

Q: Can the AC Adaptor be used in any country?

A: Yes. If can be used all over the world.
The AC Adaptor adjusts automatically to local voltage (100 V, 120 V, 220 V or 240 V). (However, since the shape of the mains socket differs almost from country to country, mains adaptor plugs are necessary. Before travelling abroad, confirm what type of mains socket is used in the country of your destination and take along the matching adaptor plug.)

2 Video Cassettes

Q: What kind of video cassettes can be used in this Movie Camera?

A: All video cassettes carrying the "VHS [C]" or "S-VHS [C]" logo mark can be used.
[C] stands for "Compact".

Q: What is the difference between "VHS" and "S-VHS" video cassettes? Are they compatible?

A: "VHS" stands for Video Home System. "S-VHS" stands for Super Video Home System. The S-VHS system was developed based on the VHS system to provide enhanced picture resolution and higher overall picture quality. For this reason, it is named "Super".
When recording (filming) in the S-VHS system, these recordings can only be played back on equipment carrying the "S-VHS" or "SQPB" logo mark.

	Equipment for recording		Recording System	Equipment for Playback		Playback System
VHS	VHS S-VHS	Movie Camera VTR	VHS	VHS S-VHS	Movie Camera VTR	VHS
S-VHS	VHS		VHS	VHS		VHS
	S-VHS		S-VHS	S-VHS SQPB		S-VHS

Q: Is it possible to record on the both sides of a video tape?

A: No. Video cassettes can only be recorded on one side.
Therefore, there is only one way in which video cassettes can be inserted into the Movie Camera or a VTR. Insert it in the direction indicated by the arrow on the video cassette.

Q: How often can a video cassette be used?

A: In normal use approx. 100 times.

Q: Does removing the video cassette in bright daylight erase part of the recording?

A: No. Video cassettes contain magnetic tape, and light does not negatively influence it.

Q: Does the security scanning equipment at airports damage video cassettes?

A: No.

Q: Is there any way to protect important recordings against accidental erasure by recording again on a previously recorded tape?

A: If the tab of a video cassette is broken out, it cannot be recorded any more.
However, when you want to record again on that video cassette, firmly cover the hole where the tab was with two layers of adhesive tape.

Q: What do SP and LP stand for?

A: "SP" stands for Standard Play. Filming and playback are possible for the duration indicated on the video cassette.
"LP" stands for Long Play. Filming and playback are possible for approx. double the duration indicated on the video cassette. While it is more economical, the picture quality is slightly inferior to that of the SP mode.
(For example, on a video cassette NV-EC45XG, recording is possible for 45 minutes in the SP mode and for 90 minutes in the LP mode.)

Q: What precautions must be observed for handling video cassettes?

A: Special attention should be paid to the following points:

1) Before inserting a video cassette into the Movie Camera, make sure that the tape is tight. If it is loose, turn the cog wheel to tighten it.
2) After filming, remove the video cassette from the Movie Camera, put it back into its case and store it in vertical position. Stacking the video cassettes could deform them and damage the edges of the tape.
3) Since the video cassettes are easily affected by dust, high humidity and high temperature, store them in a cool place that is not exposed to direct sunlight.
4) Do not place them near electronic equipment with a strong magnetic field.
5) Be sure to fully rewind the tape to its beginning before storing the video cassette.
6) Expose the tape to air by fast-forwarding and then rewinding it once a year.

3 Filming

Q: Is it possible to film at night or in a dimly lit room?

A: At the light of at least one candle, filming is still possible.
In the specifications, the minimum required illumination is listed as 1 lux. As a rough estimate, at a distance of 30 cm, the light cast by a burning candle is 7 lux. Since the minimum required illumination is lower than this, filming is possible.
(To brighten up a dark scene, use the Low Light Mode.)

Q: What precautions must be observed for filming performances on a stage?

A: A subject that is brightly lit by spot-lights surrounded by dark parts of the stage or hall may result in excessive contrast and cause the subject to appear whitish in the playback picture. To prevent this, zoom in on the subject so that the brightly lit area fills most of the picture.

Q: Faces in the playback picture appear dark...?

A: This may be due to the following reasons:

1) When filming backlit scenes:
It is a basic rule to film your subjects with the sun in your back, just like for taking photos. Also zoom in on the subject so that strong light sources are no longer close to the subject in the picture, and then start filming. Be careful when filming outside from inside a room, because the same phenomenon could occur. In some situations, using the Video DC Light (optional) may help to brighten up the subject.
2) The surroundings are too bright. When filming on a beach in summer or on a ski slope, the light may be too strong because of the added light reflection from the water, sand or snow, causing the subject to appear dark in the playback picture. Zoom in on the subject so that strong light sources are no longer close to the subject in the picture, and then start filming.

Q: What precautions must be observed for filming on a beach?

A: Pay attention to the following 4 points:

1) Splashing Sea Water
Water, especially saltwater, splashing on the Movie Camera may cause mold. Take care that no water splashes onto the camera. If saltwater has splashed on it, or if it was exposed to a sea breeze (containing salt), wipe it with a clean, damp cloth after filming.
2) Sand (Dust)
Take great care that fine sand does not enter the Movie Camera, as it can cause serious malfunction. Also, do not insert or remove the video cassette in places with much dust.
3) Heat (High temperature)
Almost the entire body of the Movie Camera is black. If it is exposed to direct sunlight for a long time, the temperature inside it will rise excessively and cause malfunction.
4) Light (Too Bright)
The reflection of light on a beach in summer is much stronger than may be realized. Just like you can see much more comfortably under such conditions if you wear sunglasses, the pictures filmed with the ND Filter attached to the lens will be much more comfortable to watch.
"ND" stands for Neutral Density, and this filter reduces strong light in a similar way as sunglasses, but without tinting the picture brown.

Q: While filming with the Movie Camera, is it possible to monitor the picture on a TV set?

A: Yes. Simply use an Audio/Video Cable to connect the Video Output Socket of the Movie Camera with Video Input Socket of a VTR or of a TV set and select the video playback channel on the TV set.

Q: Is it possible to film without sound?

A: If the Movie Camera is equipped with a socket for connecting an external microphone, insert an M3 type plug (that is not connected to anything) into the socket. This deactivates the built-in microphone.

Q: What precautions must be observed for filming in a cold place, for example on a ski slope?

A: Pay attention to the following points.

1) Protection against Water (Snow)
   Take care that the Movie Camera does not get wet with snow.
   Even if only very little snow is left on the Movie Camera, it may melt and flow inside. Therefore, prepare a plastic bag, some other waterproof bag or a towel or small blanket. After filming, wrap the Movie Camera with a towel or blanket etc. and put it into the plastic bag.
2) Protection against Cold (Low temperature)
   The temperature range for normal operation of the Movie Camera is 0°C–40°C. The colder the ambient temperature becomes, the shorter becomes the operation time of the Battery Pack. Be sure to take along extra Battery Packs. After use, wrap the Movie Camera with a towel or blanket, etc. to keep it warm.
3) Strong Light (Too bright)
   On a ski slope, the direct sunlight and the light reflected by the snow surface is surprisingly strong.
   As the iris automatically adjusts to the white snow, the people and their colourful ski wear will appear too dark in the playback picture.
   To prevent this, zoom in on the subject so it occupies as much as possible of the picture, or use an ND Filter (optional).
4) Condensation (When the Movie Camera is brought from cold surroundings into a warm room)
   When you bring the Movie Camera from a ski slope, etc. into a warm room, condensation will form inside the Movie Camera and the video cassette. This is the biggest danger to the proper functioning of the Movie Camera. If the Condensation Indication appears in the Viewfinder, filming is no longer possible. Immediately take out the video cassette and turn the Movie Camera off. Wait for the Movie Camera to warm up and turn it on about once an hour to check if the Condensation Indication is still visible. It may take several hours before this indication disappears and filming can be resumed.
   To prevent condensation from forming, wrap the Movie Camera with a towel or small blanket to prevent it from getting cold during filming.
   Before taking the Movie Camera into a warm room, put it into a plastic bag and close it tightly. Do not take it out of the bag for at least one hour, so that it can slowly acclimate to the room temperature.

4 Playback

Q: Is it possible to play back video cassettes filmed in a foreign country via a TV set in that country?

A: Basically, there are 3 television systems used in the world. If the TV set uses the same television system as the Movie Camera, it can be used for playback.

1) PAL (Great Britain, Germany, Australia, Holland, Italy, Spain, China, etc.)
2) SECAM (France, Greece, Iran, Russia, etc.)
3) NTSC (USA, Canada, Japan, Korea, Philippines, etc.)

Q: When playing back on a VTR a video cassette recorded with the Movie Camera, some noise bars appear in the picture. How can I eliminate them?

A: The tracking of the two units is not precisely matched.
Eliminate the noise bars by adjusting with the tracking control on the VTR.
When filming and playback are performed on the same unit, the tracking will match precisely.

Q: The Movie Camera is connected to the Movie Camera. However, no playback picture appears on the TV screen...?

A: Select the video playback channel on the TV set.

Q: The red lever on the side of the Cassette Adaptor stands out and prevents inserting the Cassette Adaptor into the VTR...?

A: Insert a battery (R6) into the Cassette Adaptor. If the battery is exhausted, replace it with a new one.

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VHS-C Movie Camera

Information for your safety

Power Source:	4.8 V (Battery Pack) 6.0 V (AC Adaptor)
Power Consumption:	6.4 W (Battery Pack Operation)

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

Video Recording System:	Rotary four heads, helical scanning system
Tape Speed:	SP; 23.39 mm/s LP; 11.7 mm/s
Tape Format:	VHS-C tape
Recording/Playback Time:	SP; 45 min. with NV-EC45XG LP; 90 min. with NV-EC45XG

VIDEO

Television System:	CCIR; 625 lines, 50 fields PAL colour signal
Modulation System:	Luminance; FM azimuth recording Colour signal; Converted subcarrier phase shift recording
Output Level:	VIDEO OUT (PHONO); 1.0 Vp-p, 75 ohm unbalanced

AUDIO

Output Level:	AUDIO OUT (PHONO); −8 dB, 47 kohm loaded
Input Level:	MIC IN (M3); −70 dB, 4.7 kohm or more unbalanced
Audio Track:	1 track (Normal-Monaural) 2 channels (Hi-Fi Sound-Stereo)
Image Sensor:	¼-inch CCD Image Sensor
Lens:	10:1 Variable Speed Power Zoom Lens with Digital AI Auto Focus Focal Length; 4.6–46 mm F1.8 Auto Iris Filter Diameter 37 mm
Viewfinder:	0.5-inch Electronic Viewfinder
Standard Illumination:	1,400 lux
Minimum Required Illumination:	1 Lux (Low Light Mode)
Video Horizontal Resolution:	More than 230 lines (SP)
Signal-to-Noise Ratio:	Video; More than 40 dB (SP) Audio; More than 47 dB (Hi-Fi) More than 41 dB (Normal)
Audio Frequency Response:	Hi-Fi; 50–20,000 Hz (SP) Normal; 80–8,000 Hz (SP)
Operating Temperature:	0°C–40°C
Operating Humidity:	10%–80%
Weight:	Approx. 710 g (without Battery Pack)
Dimensions:	Approx. 88 (W)×118 (H)×242 (D) mm

AC Adaptor

Information for your safety

Power Source:	AC 100–240 V, 50–60 Hz (Automatic voltage adjustment)
Power Consumption:	18 W
DC Output:	DC 6.0 V, 7.0 W (Movie Camera Operation) DC 4.8 V, 0.8 A (Battery Pack Charging)

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

Weight:	Approx. 210 g (without AC Cable)
Dimensions:	Approx. 72 (W)×39 (H)×143 (D) mm

THIS APPARATUS WAS PRODUCED TO BS800.

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

B

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