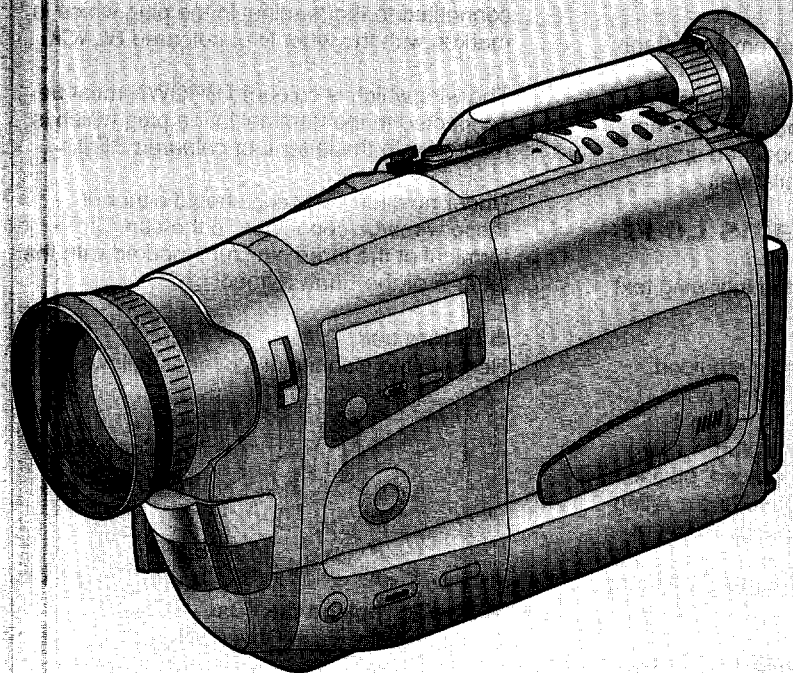


Panasonic

VHS-C Movie Camera
NV-RX64B
Operating Instructions



VHS-C
PAL

Basic
Operations

4~

Advanced
Operations

36~

Options/
Editing

76~

Miscellaneous/
Care of Unit

81~

Index

103~

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

VQT7859

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

Information for Your Safety

WARNING

To reduce the risk of fire or shock hazard and annoying interference, use only the recommended accessories and do not expose this equipment to rain or moisture.

Do not remove the cover (or back); there are no user serviceable parts inside. Refer servicing to qualified service personnel.

VHS-C Movie Camera

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

AC Adaptor



- The rating plate is on the bottom side of the AC Adaptor.
- As this equipment gets hot during use, operate it in a well ventilated place; do not install this equipment in a confined space such as a book case or similar unit.

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:

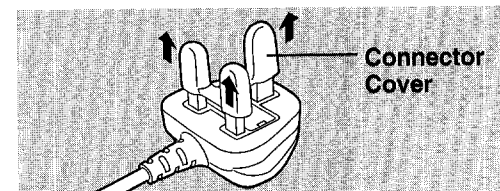
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

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 .

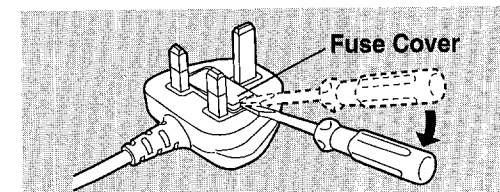
■ Before use

Remove the Connector Cover as follows.

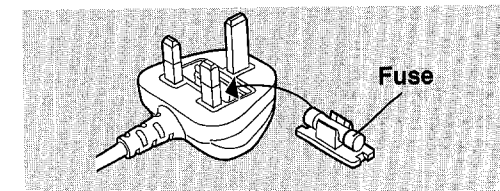


■ How to replace the Fuse

1. Remove the Fuse Cover with a screwdriver.



2. Replace the fuse and attach the Fuse Cover.



Contents

Basic Operations

Check List for the Standard Accessories	4
Controls and Functions	5
Using the AC Adaptor as a Power Supply Unit.....	8
Watching the Playback Picture on a TV (Using the Audio/Video Cable)	8
Charging the Battery	10
Attaching the Charged Battery	12
Powering the Movie Camera On and Off.....	14
Inserting a Cassette	14
Adjusting the Eyepiece.....	14
Using the Menus	16
Setting the Date and Time.....	18
Starting to Record (Filming)	20
Zooming In/Out	20
Using the Tape Counter Indication.....	22
Using the Memory Stop Function.....	22
Confirming the Remaining Tape Time	22
Quick Reference Guide to the Indications in the Viewfinder	24
Quick Reference Guide to the Indications in the Multi Info Window.....	30
Using the Power Save Functions.....	32
Playing Back in the Viewfinder or on a TV.....	34
Using the Cue, Review and Still Playback Functions During Normal Playback	34

Advanced Operations

Recording in the Auto Focus Mode.....	36
Recording with Manual Focus Adjustment.....	36
Recording with Automatic White Balance Adjustment.....	38
Recording with Manual White Balance Adjustment.....	38
Using the Backlight Mode	40
Fading In	40
Fading Out	40
Using Special Effects (Digital Effects).....	42
Super Image Stabilizer Function.....	44
Using the Digital Zoom Function.....	44
Fading Over from the Last Recorded Scene to the Next	46
Using the Digital Fade Functions	48
Creating Your Own Titles and Inserting Them During Recording (Digital Superimposer Function)	50
Recording in Special Situations (Programme AE).....	54
Checking the End of a Recorded Scene (Recording Check Function)	56
Searching for a Tape Position Before the End of the Last Recording (Camera Search Function)	56
Eliminating Picture Distortions (Tracking Adjustment).....	56

Recording with the Time and/or Date Superimposed in the Picture.....	58
Recording with Pre-programmed Titles Inserted in the Picture.....	58
Motion-Sensor-Controlled Recording.....	62
Displaying 9 Small Still Pictures on the Screen (Multi Image).....	64
Displaying a Small Still Picture Inside the Normal Picture (Picture-in-Picture).....	68
Recording a Still Picture (Snapshot Recording).....	68
Recording in Dark Places Without Any Illumination (0 Lux Night View Function).....	70
Using the 0 Lux Night View Function together with the Motion-Sensor-Controlled Recording Function in Dark Places without Any Illumination	70
Using Various Functions during Playback.....	72

Options/Editing

Editing a Previously Recorded Tape.....	76
Using the Car Battery Charger (optional).....	76
Playing Back on a TV Equipped with 21-pin AV Input Socket.....	77
Editing with a Editing Controller	78
Optional Accessories	79
Attaching a Filter (optional)	80

Miscellaneous/Care of Unit

Adjusting the Grip Belt	81
Attaching the Shoulder Strap	81
Storage.....	81
Using the Remote Controller.....	82
Cleaning the Viewfinder	84
Preventing Accidental Erasure of Recordings.....	84
Lighting.....	85
Standard Values of Brightness.....	85
Before Requesting Service	90
Cautions.....	92
Condensation	93
Questions & Answers.....	94
Demonstration Mode (Shipping Condition)	99
Flow Chart of the Main Menu 1	100
Flow Chart of the Main Menu 2.....	101
Flow Chart of the Title Set Menu.....	102
Index.....	103
Specifications	105

Basic Operations

Advanced Operations

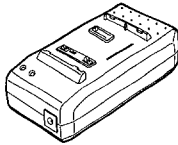
Options/Editing

Miscellaneous/
Care of Unit

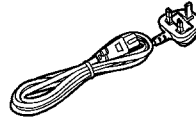
Index

Check List for the Standard Accessories

AC Adaptor Set



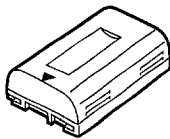
.....AC Adaptor
(VSK0541)



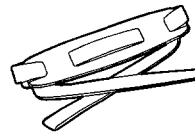
.....AC Mains Lead
(VJA0940)



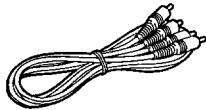
.....DC Input Cable
(VJA1087)



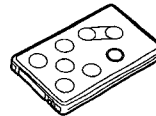
.....Battery Pack
(VSB0399)



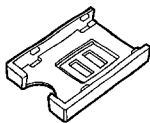
.....Shoulder
Strap
(VFC2522)



.....Audio/Video
Cable
(VFA0039)



.....Remote Controller
(VEQ1697)



.....Remote Controller
Holder (VGQ6893)

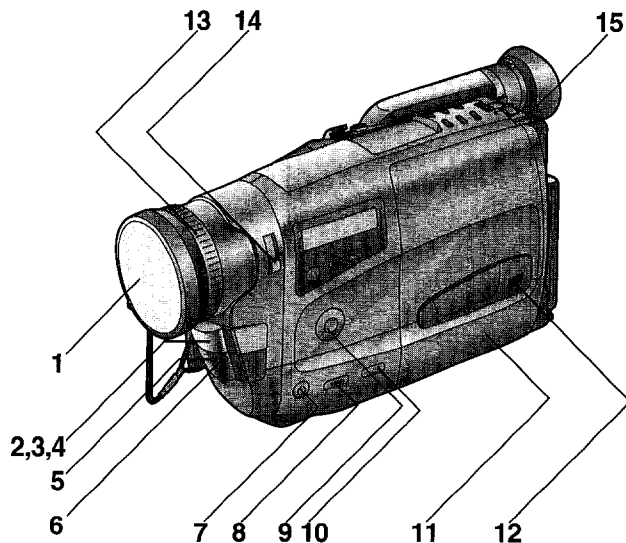


.....Button-Type Battery
(CR2025)

- To purchase additional Batteries, see the list of optional accessories on p. 79.

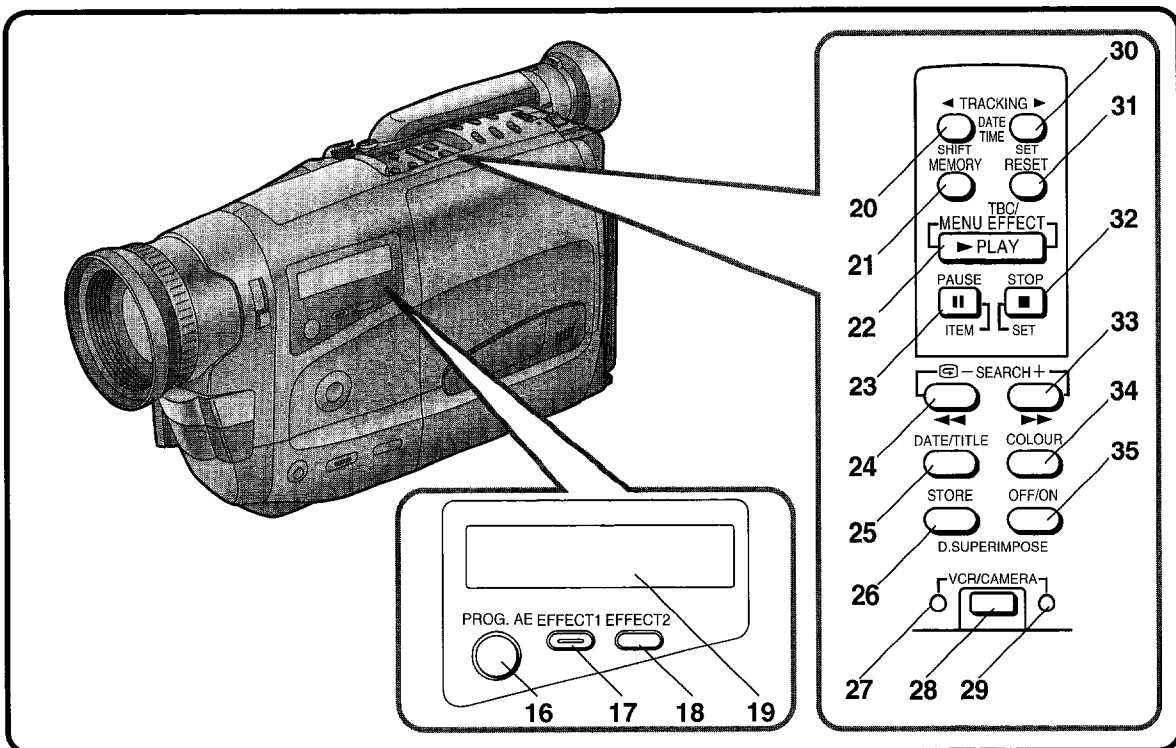
Controls and Functions

For more details, see the pages indicated in brackets.



- 1 Lens Cap (p. 14, 38)
- 2 White Balance Sensor (p. 38, 88)
- 3 Remote Control Sensor (p. 83)
- 4 Built-in Infra-red Beam Emitters (p. 71)
- 5 Microphone
- 6 Recording Indicating (Tally) Lamp (p. 20)
This Lamp lights during recording.
- 7 Focus Button [FOCUS] (p. 36)
- 8 Fade Button [FADE] (p. 40, 48)
- 9 Backlight Button [BACKLIGHT] (p. 40)
- 10 White Balance Button [W.B] (p. 38)
- 11 Cassette Compartment (p. 14)
- 12 Cassette Compartment Lock Button [LOCK]
(p. 14)
- 13 Focus Ring (p. 36)
- 14 0-Lux Recording Switch [0 LUX ON/OFF]
(p. 70)
- 15 Eyecup

Controls and Functions (Cont.)



16 Auto Exposure Selector Button [PROG. AE]
(p. 20, 36, 38, 54)

Use this selector to set the desired AE mode.

17 Digital Effect 1 Button [EFFECT1]
(p. 42, 44)

18 Digital Effect 2 Button [EFFECT2]
(p. 42, 48)

19 Multi Info Window (p. 30)

20 Date/Time Shift Button [DATE/TIME/SHIFT]
(p. 18)

Tracking Button [◀ TRACKING] (p. 56)

Press this button to advance to the next item during the setting of the date and time, or press it to adjust the tracking in order to eliminate distortions in the playback picture.

21 Memory Button [MEMORY] (p. 22)

22 Playback Button [PLAY] (p. 34)
Menu Button [MENU] (p. 16, 58, 60)
Time Base Corrector Button [TBC] (p. 35)
Effect Button [EFFECT] (p. 73)

23 Pause Button [PAUSE] (p. 34)
Item Selector Button [ITEM] (p. 16, 58, 60)

24 Reverse Search Button [–SEARCH] (p. 56)
Rewind/Review Button [◀◀] (p. 34)
Recording Check Button [Ⓢ] (p. 56)

25 Date/Time/Title Button [DATE/TITLE]
(p. 18, 59)

26 Digital Image Store Button [STORE] (p. 50)

27 VCR (Playback) Mode Lamp [VCR] (p. 34)

28 VCR/Camera Mode Selector Button [VCR/CAMERA]
(p. 34)

Press this button to select the “VCR” Mode for playback or the “CAMERA” Mode for recording.

29 Camera (Recording) Mode Lamp [CAMERA]
(p. 14, 20)

30 Date/Time Set Button [DATE/TIME/SET]
(p. 18)

Tracking Button [TRACKING ▶] (p. 56)

Press this button to set the correct date and time, or press it to adjust the tracking in order to eliminate distortions in the playback picture.

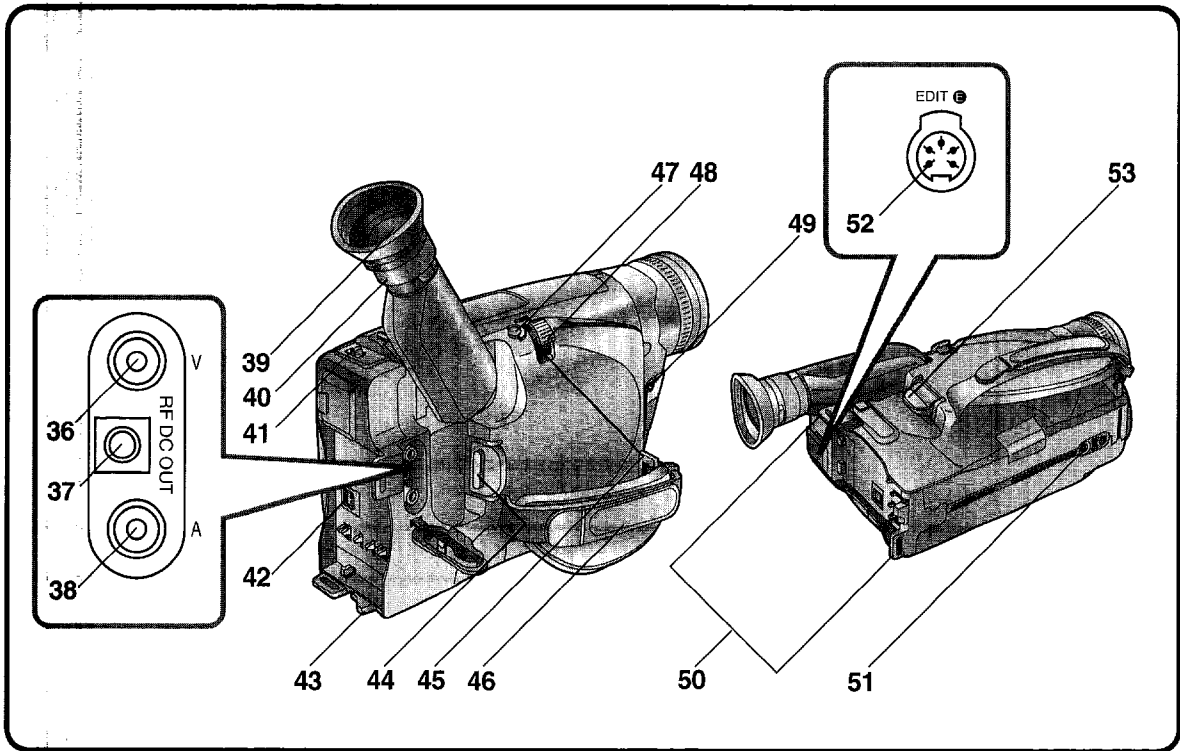
31 Tape Counter Reset Button [RESET] (p. 22)

32 Stop Button [STOP] (p. 34)
Item Set Button [SET] (p. 16, 58, 60)

33 Forward Search Button [SEARCH+] (p. 56)
Fast Forward/Cue Button [▶▶] (p. 34)

34 Colour Selector Button for Digital Image [COLOUR] (p. 50)

35 Digital Image Superimpose Button [OFF/ON]
(p. 50, 52)



36 Video Output Socket [V]
(p. 8, 76)

37 Radio Frequency DC Output Socket [RF DC OUT]
To play back via a TV without AV Input Socket, connect this Socket to the RF IN Socket of the TV using an RF Adaptor (optional).

38 Audio Output Socket [A]
(p. 8, 76)

39 Viewfinder (p. 15, 84)

40 Eyepiece Corrector Ring (p. 14)

41 Cassette Eject Lever [▲ EJECT] (p. 14, 81)

42 DC Input Socket [DC IN] (p. 8)

43 Battery Eject Lever [◀BATTERY EJECT]
(p. 12, 81)

44 Recording Start/Stop Button (p. 20)

45 Dew Sensor Slot
Through this slot, the Movie Camera detects condensation. Take care not to let this slot get clogged with dirt and not to cover it with your fingers, etc.

46 Grip Belt (p. 81)

47 Snapshot Recording Button [SNAP] (p.68)
Multi Image/Picture-in-Picture Button [MULTI] (p.64, 66, 68)

48 Zoom Lever [W • T] (p. 20)

49 Microphone Socket [MIC]
To record sound with an external microphone, connect it to the [MIC] Socket. (Connecting an external microphone automatically disconnects the built-in microphone.) Ensure that the microphone conforms with the following requirements:

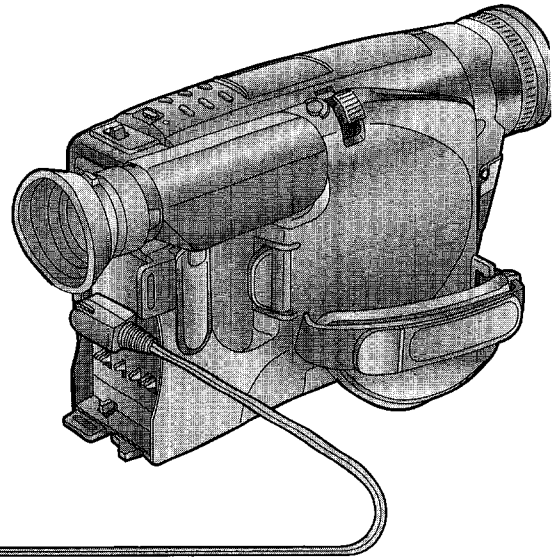
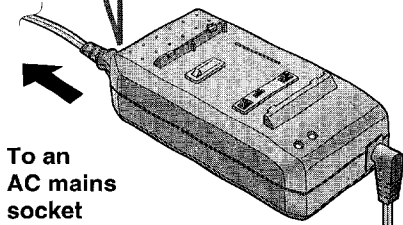
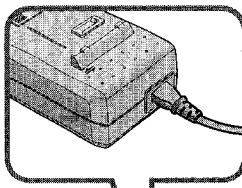
- Connection Cable: M3-type plug
- Impedance: less the 4.7 kohm
- Type: Mono-type
- Sensitivity: Approx. -70dB
- Microphone Power Source: A type that does not require a power source

50 Shoulder Strap Holders (p. 81)

51 Tripod Receptacle
Attach a tripod (optional) to this receptacle.

52 [EDIT] Socket (p. 78)

53 Power Switch [POWER] (p. 14, 81)

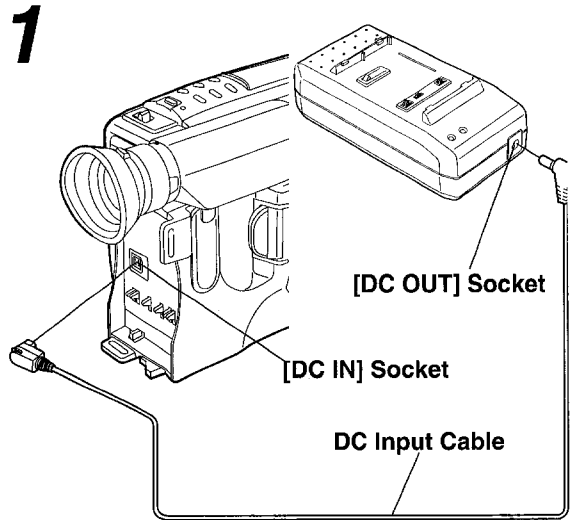


Title

Procedure

Using the AC Adaptor as a Power Supply Unit

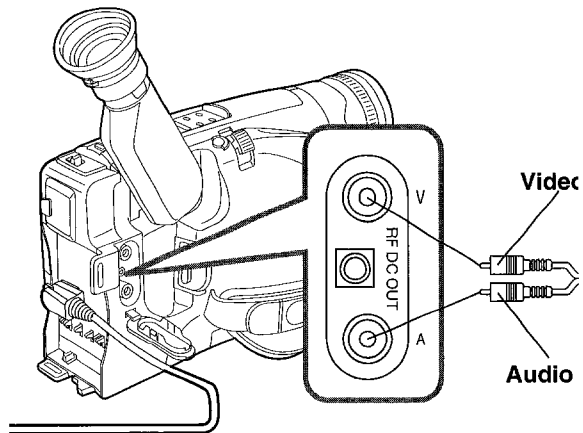
Supplying the Movie Camera with power from the AC Adaptor is ideal when you want to record or play back at home or some other place within easy reach of an AC mains socket. This lets you save battery power. We suggest that you also power the Movie Camera with the AC Adaptor when first trying it out at home. In addition to using it as power supply unit, the AC Adaptor is also necessary to charge the Battery. Before using the Battery on the Movie Camera, be sure to charge it as explained on p. 10.



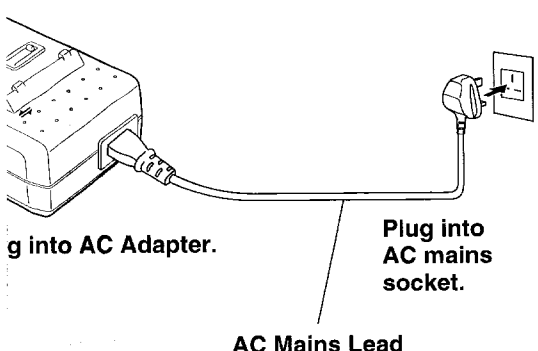
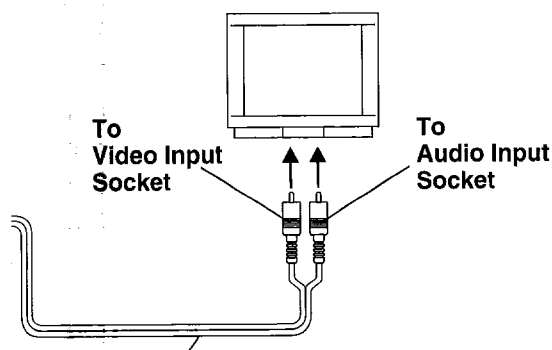
Watching the Playback Picture on a TV (Using the Audio/Video Cable)

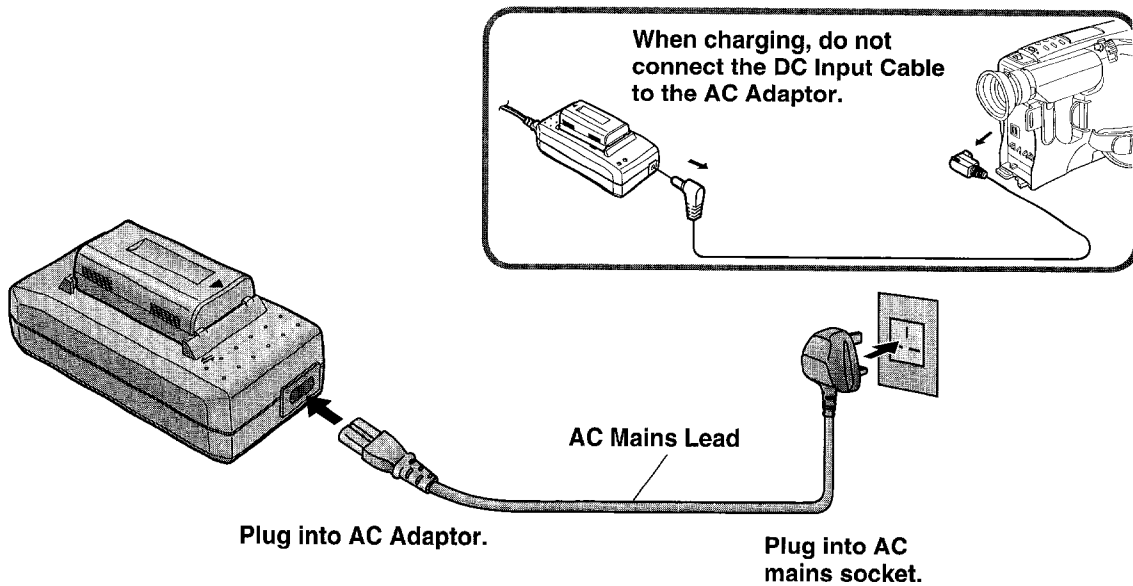
After turning off the Movie Camera and the TV, connect them as shown on the right.

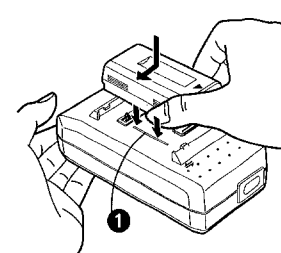
After connecting, switch on the TV and select the AV input channel which corresponds to the AV input sockets that you have connected the Movie Camera to.



Connect the Movie Camera to the TV.

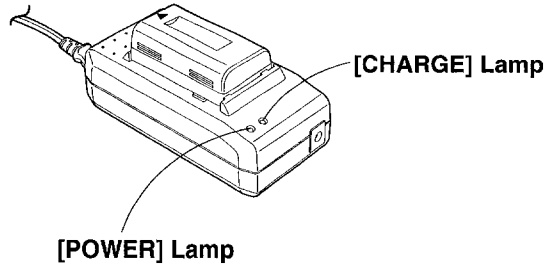
	Remarks, etc.
 <p>Plug into AC Adapter.</p> <p>AC Mains Lead</p> <p>Plug into AC mains socket.</p>	<ul style="list-style-type: none"> • Do not use the AC Adaptor for any purposes other than supplying the unit with power or charging the Battery. • When listening to a radio while the AC Adaptor is in operation, there may be some interference. In this case, move the radio further away from the AC Adaptor or move the AC Adaptor away from the radio. • When not using the AC Adaptor, unplug its AC Mains Lead from the AC mains socket. To unplug, pull it by the plug, not by the cable. • This AC Adaptor works on any mains supply voltage between 100 and 240 V, and any frequency between 50 and 60 Hz. For use in other countries, an adaptor plug may be necessary. • Do not handle the AC Adaptor with wet hands. • Before cleaning the AC Adaptor, make sure that it is disconnected from the AC mains socket.
<p>On the TV, select the AV input channel which corresponds to the AV input sockets that you have connected the Movie Camera to.</p>  <p>To Video Input Socket</p> <p>To Audio Input Socket</p> <p>Audio/Video Cable (supplied)</p>	<ul style="list-style-type: none"> • If your TV is equipped with a 21-pin AV input socket, see p. 77. • If your TV is not equipped with AV input sockets, the RF Adaptor (optional) is necessary. For its connection, read the operating instructions of the RF Adaptor (VW-RF7E). Be sure to turn the Movie Camera off before connecting the RF Adaptor.



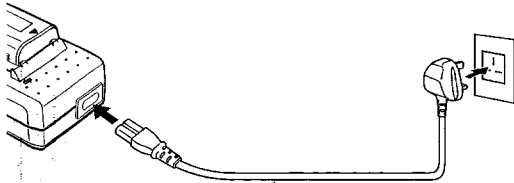
Title	Procedure
<p>Charging the Battery</p> <p>Before using the Battery, it needs to be charged.</p>	<p>1</p>  <p>To attach the Battery, align it with line ❶, push it down and slide it in the direction of the arrow.</p> <p>■ Charging Time and Maximum Continuous Recording Time in the Manual Recording Mode</p> <p>Maximum Continuous Recording Time means the duration of continuous recording performed at an ambient temperature of 25°C and 60% relative humidity.</p> <p>In actual recording, however, the use of the zoom and other functions increases the power consumption, and higher or lower temperature reduces the Battery's ability to generate electricity. Therefore, the actual recording time per Battery may be approximately 30%–50% shorter than listed on the right.</p>

[CHARGE] Lamp

- Flashing: During charging.
- Lit: The Battery can already be used to operate the Movie Camera but it is not yet fully charged. (Approximately 30-minute battery charge)
- Off: The Battery is fully charged.



2



Plug Into AC Adaptor. / Plug into AC mains socket.
AC Mains Lead

To Remove the Battery:
Slide it in the opposite direction of that indicated in step 1.

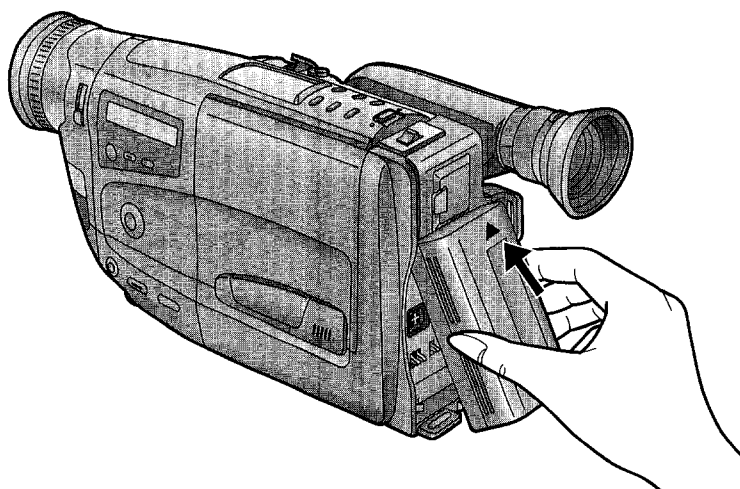
Battery Model No.	Charging Time for a Full Charge	Max. Continuous Recording Time
:GR-V610 (supplied)	Approx. 80 min.	Approx. 105 min.
:GR-V620	Approx. 145 min.	Approx. 225 min.
:GR-V816	Approx. 310 min.	Approx. 440 min.

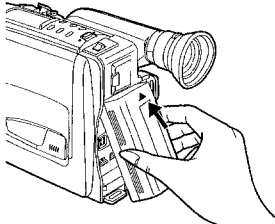
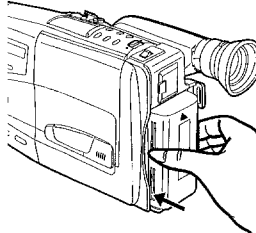
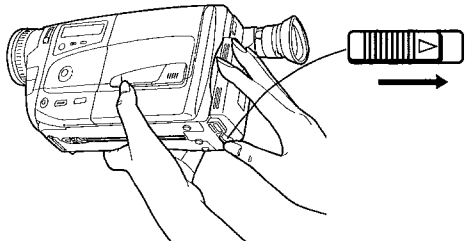
Battery Model No.	Approx. 30-Minute Charge	Max. Continuous Recording Time
:GR-V610 (supplied)	Approx. 30 min.	Approx. 45 min.
:GR-V620		
:GR-V816		

Remarks, etc.

■ **Cautions for Use**

- To prevent leakage, excessive rise in temperature and explosion, be sure to observe the following points:
 - 1) Use only the specified AC Adaptor or Car Battery Charger to charge the Battery.
 - 2) Do not store or carry the Battery with any metal objects (coins, keys etc.) that may accidentally short across the terminals.
 - 3) Do not heat the Battery or throw it into a fire.
 - 4) Do not disassemble, reconstruct or apply solder to the Battery.
- Be sure to insert the mains plug completely into the correct socket.
- If the [CHARGE] Lamp does not flash even though the Battery is attached, remove the Battery and then re-attach it.
- Do not connect the DC Input Cable to the AC Adaptor, otherwise the Battery cannot be charged.
- If you have any problems with charging the Battery, refer to p. 94.
- Charge the Battery at a room temperature between 10°C and 30°C.
- During recording and charging, the Battery becomes warm. However, this is normal.
- If you charge the Battery when it is not yet discharged, the [CHARGE] Lamp may flash briefly and then go out. This indicates that the Battery is fully charged. Therefore, this is not an indication of a malfunction.



Title	Procedure	
<p>Attaching the Charged Battery</p> <p>After you attach the charged Battery, the Movie Camera is ready for use.</p>	<p>1</p>  <p>Insert the Battery with its top (so that the arrow points upward) into the top Battery Holder.</p>	<p>2</p>  <p>Press the bottom of the Battery toward the Movie Camera until it locks with a click.</p>
<p>Remarks, etc.</p> <ul style="list-style-type: none"> • Never remove the Battery during recording or playback, because the tape would remain in contact with the video heads and this could cause damage to the heads and tape. • The remaining battery power can be confirmed both in the Viewfinder and in the Multi Info Window. • To ensure more precise indication of the remaining battery power, attach a fully charged Battery. • For details about the Remaining Battery Power Indication, read "Checking the Remaining Battery Power". (p. 13) 	<p>■ To Remove the Battery:</p>  <p>When sliding the [◀BATTERY EJECT] Lever to the right, be sure to hold the Battery, to prevent it from dropping.</p>	

Remaining Battery Power and Operation Time

CGR-V610



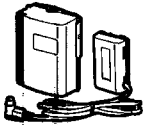
ⓐ	0:00	0:01	0:03	0:05	0:10	0:20	0:40	
ⓑ								
ⓒ	R 0:00	R 0:01	R 0:03	R 0:05	R 0:10	R 0:20	R 0:40	No Indication

CGR-V620



ⓐ	0:00	0:01	0:03	0:05	0:10	0:20	0:40	1:20	
ⓑ									
ⓒ	R 0:00	R 0:01	R 0:03	R 0:05	R 0:10	R 0:20	R 0:40	R 1:20	No Indication

CGR-V816



ⓐ	0:00	0:01	0:03	0:05	0:10	0:20	0:40	1:20	2:40	
ⓑ										
ⓒ	R 0:00	R 0:01	R 0:03	R 0:05	R 0:10	R 0:20	R 0:40	R 1:20	R 2:40	No Indication

Checking the Remaining Battery Power
 You can confirm the remaining charge in the attached Battery in the Viewfinder or the Multi Info window. This also shows you approximately how much more continuous recording time you can get from the attached Battery. The time indication does not change in 1-minute steps.

The above charts show how the Remaining Battery Power Indications change according to the remaining operation time.

- ⓐ: Remaining Battery Operation Time
- ⓑ: Remaining Battery Operation Time Indication in the Viewfinder
- ⓒ: Remaining Battery Power Indication in the Multi Info Window
- ⓓ: Remaining Battery Operation Time Indication in the Multi Info Window

When the AC Adaptor is used to supply the Movie Camera with power, the indications ⓐ and ⓑ always show "", and ⓒ shows the Tape Counter.

Remaining Battery Power & Operation Time Indications

These indications show the remaining duration of continuous recording at an ambient temperature of 5°C when a fully charged Battery was used. Therefore, in the following cases, the actual available recording time is different from the times shown above:

When Recording Is Not Performed Continuously

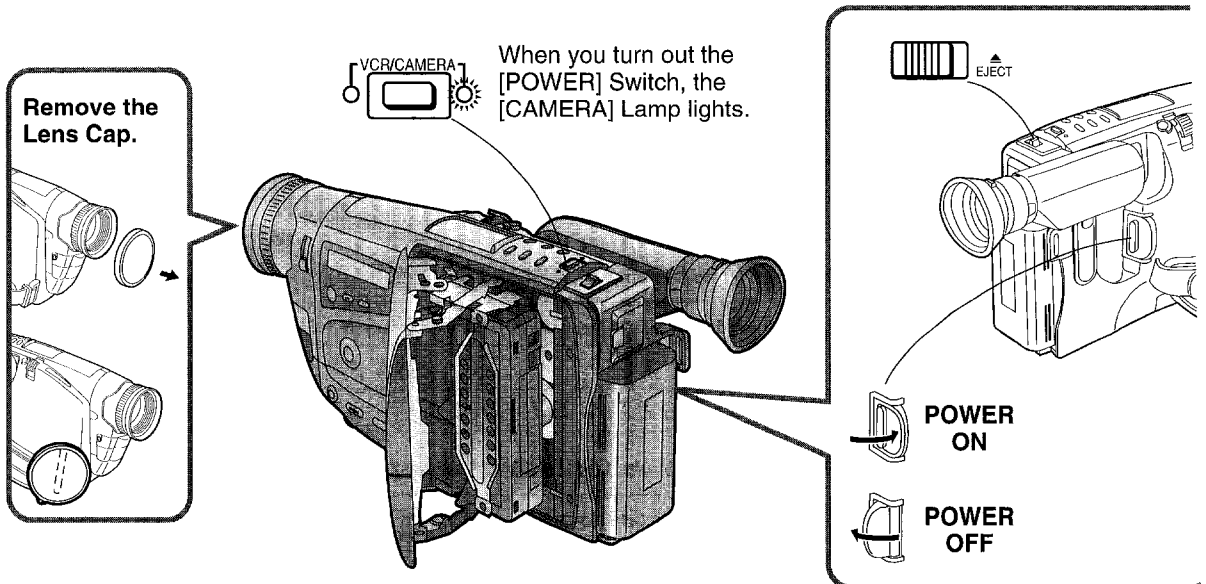
In most cases, you will frequently start and stop recording, turn the Movie Camera on and off, and use the zoom and other functions, all of which consume power. Therefore, the actual available recording time from the Battery is approximately 50–50% shorter than listed. (p. 11)

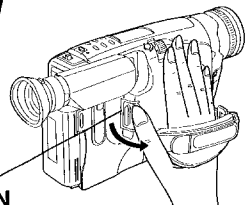
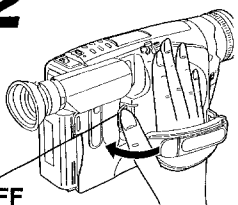
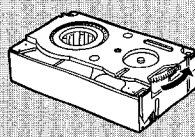

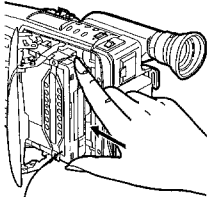
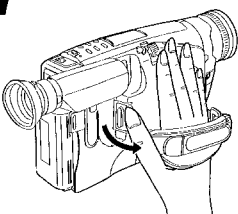
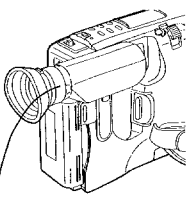
When the Ambient Temperature Is Extremely Low or Extremely High

The characteristics of the Battery vary according to the ambient temperature, and at a very low temperature, the possible recording time becomes extremely short. In addition, the Remaining Battery Power and Operation Time Indications on the Movie Camera decrease a little faster than at an ambient temperature of 25°C. (At a higher temperature, they tend to decrease more slowly.)

When the Service Life of the Battery Has Reached Its End

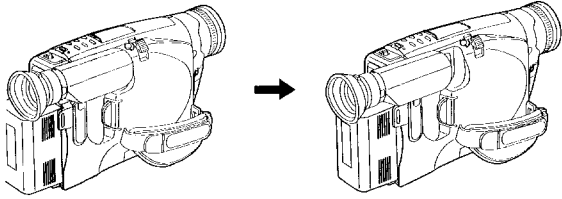
When the operation time even after full charging is too short for normal use, the service life of the Battery has reached its end. (p. 94)



Title	Procedure	
<p>Powering the Movie Camera On and Off</p>	<p>1</p>  <p>ON</p> <p>Turn the [POWER] Switch out.</p>	<p>2</p>  <p>OFF</p> <p>Turn the [POWER] Switch in.</p>
<p>Inserting a Cassette</p> <p>Before inserting the cassette, make sure that the tape is tight. If it is loose, turn the cog wheel in the direction of the arrow to tighten it.</p>  <p>Cog Wheel</p>	<p>1</p>  <p>EJECT</p> <p>Slide the [▲ EJECT] Lever in the direction of the arrow.</p>	<p>2</p>  <p>Cassette Window</p> <p>Insert the cassette.</p>
<p>Adjusting the Eyepiece</p> <p>Before using the Viewfinder, adjust the Eyepiece to your eyesight so that the indications in the Viewfinder are clear and easy to read.</p>	<p>1</p>  <p>Turn the [POWER] Switch out.</p>	<p>2</p>  <p>Eyepiece Corrector Ring</p>

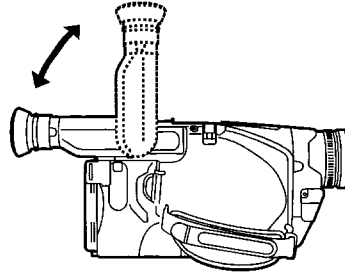
Adjusting the Length of the Viewfinder

When you use a large Battery (CGR-V620), pull the Viewfinder backward to extend it so that you can view the picture comfortably and without your nose touching the Battery.



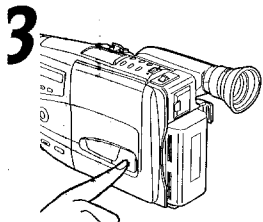
Adjusting the Angle of the Viewfinder

- The tilting range of the Viewfinder is approximately 90°.
- To return the Viewfinder to its original horizontal position, turn it all the way down.



Remarks, etc.

When you turn on the Movie Camera while a cassette is already inside, it is automatically put into the Recording Pause Mode. (p. 21)



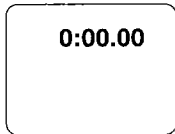
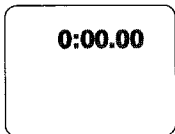
3 Close the Cassette compartment by pressing the [LOCK] button.

■ To Eject the Cassette:



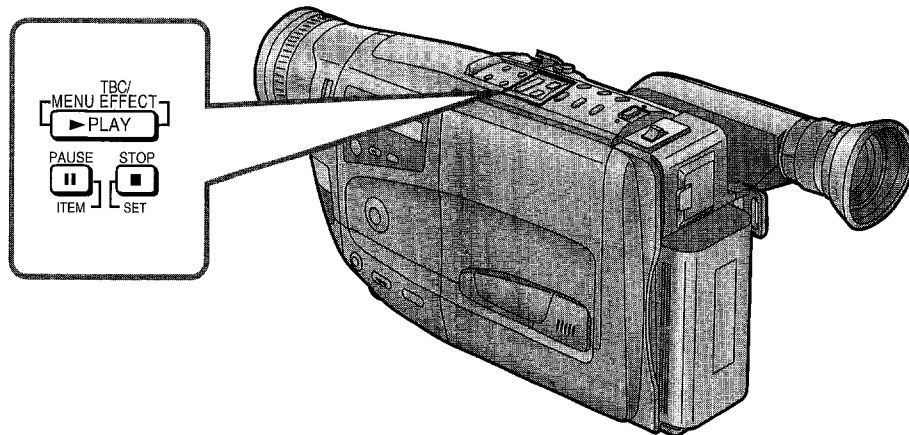
Slide the [▲ EJECT] Lever in the direction of the arrow and pull out the cassette. Close the Cassette Compartment by pressing the [LOCK] Button.

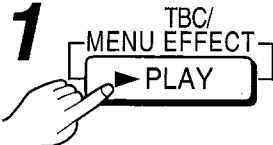
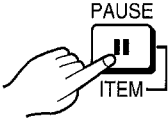
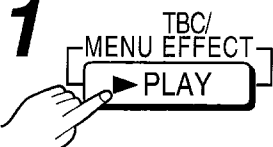
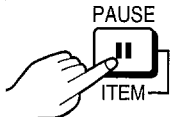
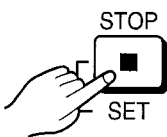
- It is not possible to take out the cassette during recording.
- Do not insert and take out the cassette repeatedly. This could cause the tape to become loose or damaged.
- If a cassette with broken out erasure prevention tab is inserted, the "⊗" Indication flashes.



Look in the Viewfinder and turn the Eyepiece Corrector Ring clockwise or counterclockwise.

- Do not hold the Movie Camera by the Viewfinder or apply any pressure on it.
- Never aim the Movie Camera with its Viewfinder or Lens directly at the sun; this could damage internal parts of the unit.

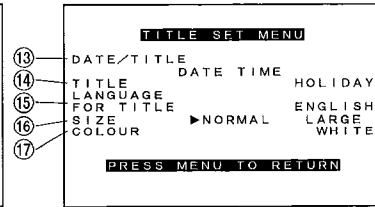
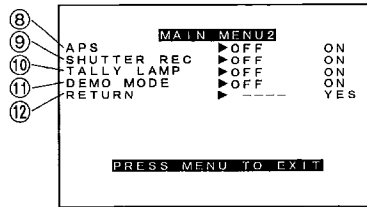
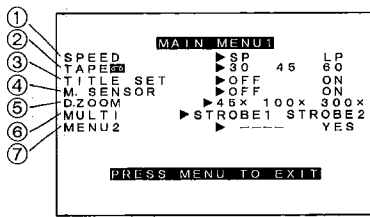


Title	Procedure	
<p>Using the Menus</p> <p>The Menu Function is used to select the items displayed as shown above.</p> <p>[MAIN MENU1]</p> <p>① To select the SP Mode or LP Mode “SP” means Standard Play. Recording is possible for the time indicated on the cassette. “LP” means Long Play. Recording is possible for approximately double the time indicated on the cassette.</p> <p>② To select the tape length of the cassette being used (marked on the cassette; e.g. EC45) to ensure correct indication of the remaining tape time.</p> <p>③ To change the Menu to the [TITLE SET MENU] Menu, set to [ON].</p> <p>④ To turn on the Motion-Sensor-Controlled Recording Mode, set to [ON]. (p. 62)</p> <p>⑤ To select the desired digital zoom range.</p> <p>⑥ To select the desired Multi Image Mode. (p. 64, 66)</p> <p>⑦ To change to the [MAIN MENU2] Menu, set to [YES].</p> <p>[MAIN MENU2]</p> <p>⑧ To turn on the Power Save Functions, set to [ON].</p> <p>⑨ To record still pictures in the Snapshot Recording Mode with a visual shutter effect (the screens blinks for an instant), set to [ON].</p> <p>⑩ To make the Recording indicating (Tally) Lamp light during recording.</p> <p>⑪ To reactivate the cancelled Demonstration Mode, set to [ON]. (p. 99)</p> <p>⑫ To change the Menu to the [MAIN MENU1] Menu, set to [YES].</p> <p>[TITLE SET MENU]</p> <p>⑬ To select the desired Date/Time/Title Indication. (p. 58)</p> <p>⑭ To select the desired pre-programmed title. (p. 60)</p> <p>⑮ To select the desired language of the title. (p. 58)</p> <p>⑯ To select the desired size of the title Indication. (p. 60)</p> <p>⑰ To select the desired colour of the Date/Time/Title Indication. (p. 60)</p>	<p>■ Using the Main Menu(s)</p> <p>1</p>  <p>Press to make the [MAIN MENU1] Menu appear.</p>	<p>2</p>  <p>Press repeatedly to select the item to be set. If you select [MENU2], the [MAIN MENU2] Menu appears.</p>
<p>⑬ To select the desired Date/Time/Title Indication. (p. 58)</p> <p>⑭ To select the desired pre-programmed title. (p. 60)</p> <p>⑮ To select the desired language of the title. (p. 58)</p> <p>⑯ To select the desired size of the title Indication. (p. 60)</p> <p>⑰ To select the desired colour of the Date/Time/Title Indication. (p. 60)</p>	<p>■ Using the Title Set Menu</p> <p>1</p>  <p>Press to make the [MAIN MENU1] Menu appear.</p>	<p>2</p>  <p>Press repeatedly to select [TITLE SET].</p>
<p>⑬ To select the desired Date/Time/Title Indication. (p. 58)</p> <p>⑭ To select the desired pre-programmed title. (p. 60)</p> <p>⑮ To select the desired language of the title. (p. 58)</p> <p>⑯ To select the desired size of the title Indication. (p. 60)</p> <p>⑰ To select the desired colour of the Date/Time/Title Indication. (p. 60)</p>	<p>5</p>  <p>Press repeatedly to set the selected item to the desired mode.</p>	

[MAIN MENU1]

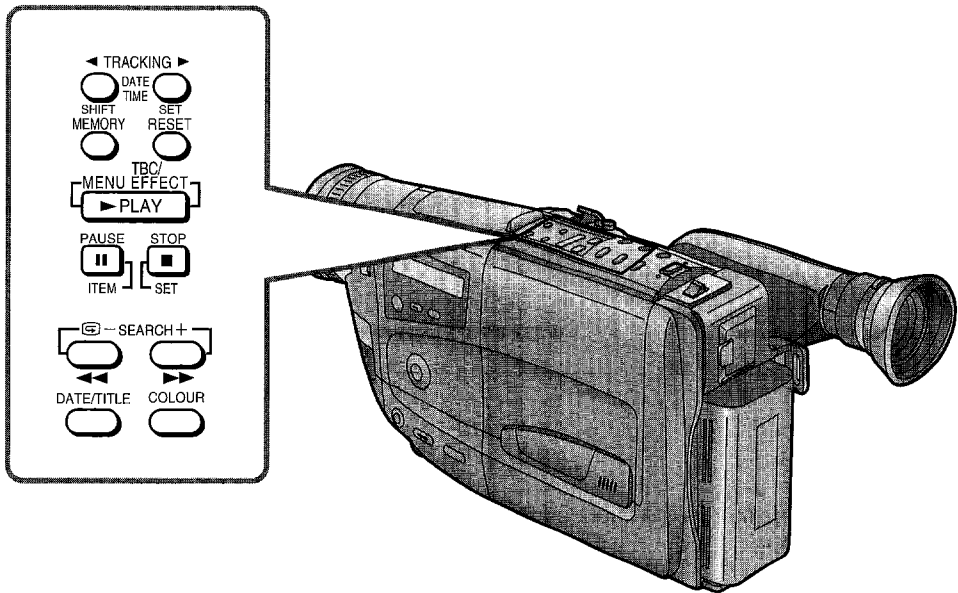
[MAIN MENU2]

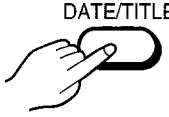

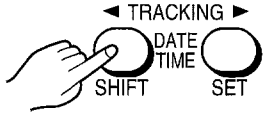
[TITLE SET MENU]



- The illustrations of the menus are intended for explanation purposes only and the actual menus may be somewhat different.

		Remarks, etc.
<p>3</p> <p>Press repeatedly to set the desired mode for the selected item.</p>	<p>■ To Exit the Main Menu(s):</p> <p>Press.</p>	<ul style="list-style-type: none"> • The settings that you have selected on the Menus are maintained when you turn the Movie Camera off. However, if you disconnect the power supply unit (Battery or AC Adaptor) from the Movie Camera before turning it off, the selected settings may not be maintained. • It is possible to display the Menu on the TV screen. (For the connection to a TV, see pages 8 and 77.) • When you change the setting for [TAPE] on the [MAIN MENU1] Menu to [30], [45] or [60], the corresponding indication "30", "45" or "60" appears.
<p>3</p> <p>Press to set to [ON], when the [TITLE SET MENU] Menu appears.</p>	<p>4</p> <p>Press repeatedly to select the item to be set.</p>	
	<p>■ To Exit the Title Set Menu</p> <p>Press twice.</p>	



Title	Procedure
<p>Setting the Date and Time</p> <p>Before setting the date and time, attach the charged Battery or connect the AC Adaptor to the Movie Camera and turn the Movie Camera on.</p>	<p>1</p>  <p>DATE/TITLE</p> <p>Press to make the Date/Time/Title Indication appear.</p> <hr/> <p>3</p>  <p>TRACKING DATE TIME SHIFT SET</p> <p>Press repeatedly until the current year (for example: 1999) is displayed.</p> <hr/> <p>5</p>  <p>TRACKING DATE TIME SHIFT SET</p> <p>After you have set the date and time and confirm that they are correct, press the [DATE/TIME/SHIFT] Button to start the clock.</p>

The Built-in Lithium Battery

The internal clock works even when the Movie Camera is turned off, and it consumes power from the built-in lithium battery. When the Movie Camera is in operation, it automatically charges this battery. However, if the Movie Camera is not used for a very long time, the lithium battery can become discharged. This has occurred if the "⊗" Indication flashes when you turn on the Movie Camera. In this case, perform the following operations.

1 Charging the Built-in Lithium Battery and Other Required Operations

Connect the AC Adaptor to an AC mains socket and to the Movie Camera.

2 Leave the Movie Camera turned off.

Although charging the lithium battery is possible with the Movie Camera turned on or off, we recommend to keep it turned off to conserve energy.

3 Leave the Movie Camera in this condition for approximately 4 hours.

Charging the lithium battery in this way for 4 hours maintains the clock operation for approximately 6 months, charging for 26 hours (full charge) maintains it for approximately 2 years.

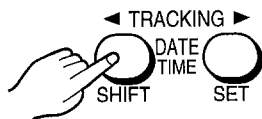
4 Set the clock to the current date and time as explained below.

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.

2



Keep pressed until the "Year" portion flashes.

4

Also set the "Month", "Day", "Hour", "Minute" in the same way as explained in steps 2 and 3.

Be sure to turn the Movie Camera off before removing the Battery or disconnecting the AC Adaptor. Disconnecting the power supply while the Movie Camera is on erases the Date/Time/Title indication (p. 59) stored in memory.

Remarks, etc.

To Change the Figures of the Date/Time Indication

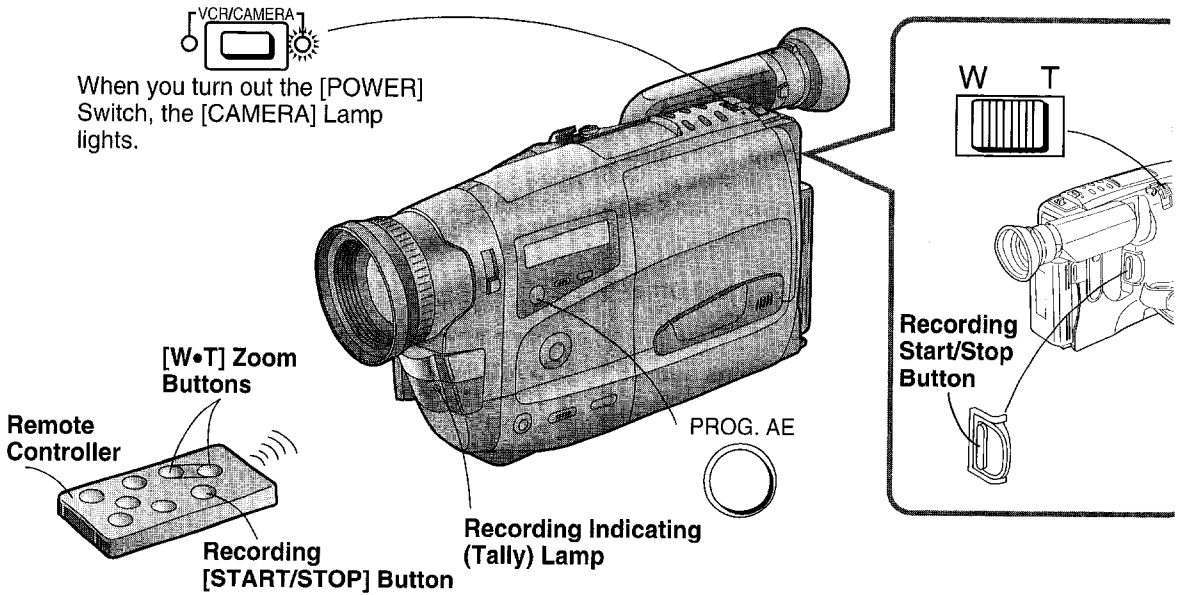
You can change the Date/Time Indication in the order shown below by pressing the [SET] Button repeatedly.


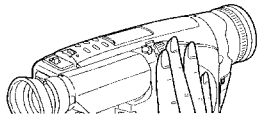
Year; 1990 → 1991 → → 2089 → 1990 → ...
 Month; 1 → 2 → → 12 → 1 → ...
 Day; 1 → 2 → → 31 → 1 → ...
 Hour; 0 → 1 → → 23 → 0 → ...
 Minute; 00 → 01 → → 59 → 00 → ...

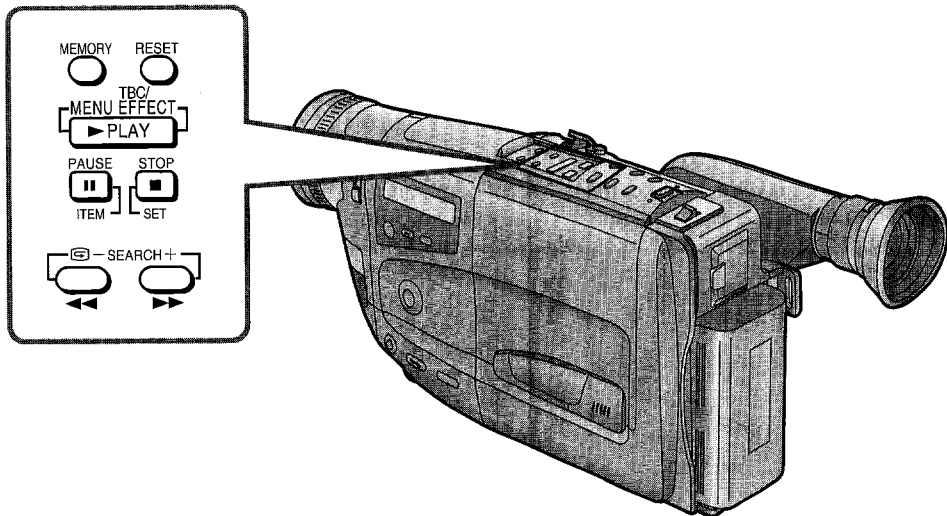
- If you want to change the figures faster, keep the [SET] Button pressed.
- If you make a mistake during setting, start again from step 2 on the left.
- If the Title indication alone ⑤ is displayed, select another Date/Time/Title indication (① - ④ or ⑥) with the item [DATE/TITLE] on the [TITLE SET MENU]. (p. 58)

For example: When the clock is set to 15 October, 1999, 12:30...

12:30 15.10.1999	15.10.1999	12:30 HOLIDAY 15.10.1999
① [DATE TIME] Date and Time (h/m)	② [DATE] Date only	③ [DATE TIME TITLE] Date, Time and Title
HOLIDAY 15.10.1999	HOLIDAY	12:30:15 15.10.1999
④ [DATE TITLE] Date and Title	⑤ [TITLE] Title only	⑥ [DATE TIME + SECONDS] Date and Time (h/m/s)



Title	Procedure	
<p>Starting to Record (Filming)</p> <p>The Full Auto Mode adjusts the white balance and focus automatically. However, if you want, you can also adjust either one or both of them manually. (p. 36, 38)</p>	<p>1</p> <p>PROG. AE</p> 	<p>2</p> 


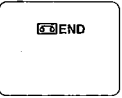
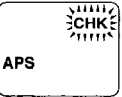


Quick Reference Guide to the Indications in the Viewfinder

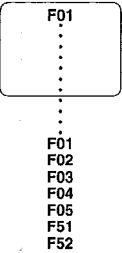
The following indications are displayed in the Viewfinder to inform you about the condition of the Movie Camera.

**Tape Movement
during Recording**

1 Warning/Alarm Indications (cont.)

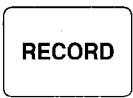
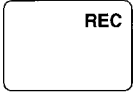


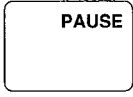
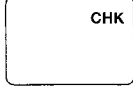

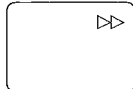
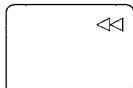

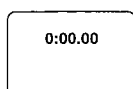
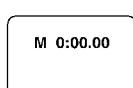
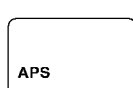
Viewfinder	Condition	Page
	<p>Built-in Lithium Battery The built-in lithium battery is discharged. Recharge it.</p>	19
	<p>End of the Tape When the tape has reached its end, this indication appears. Insert a new cassette.</p>	—
	<p>Anti-Ground Recording If you have set [APS] on [MAIN MENU2] to [ON] and you tilt the Movie Camera downward more than about 70° from its normal horizontal position during recording, the Movie Camera automatically switches over to the Recording Pause Mode. If the Movie Camera is returned to its normal horizontal recording position, the "CHK" Indication will flash in the Viewfinder.</p>	32

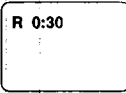
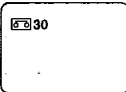
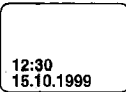
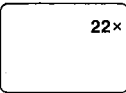
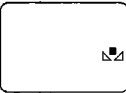

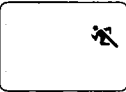



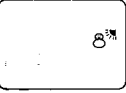
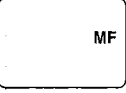

2 Error Code Indications

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

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

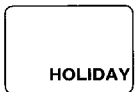

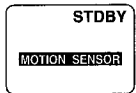

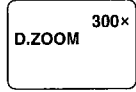
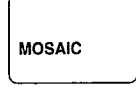

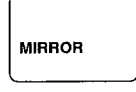
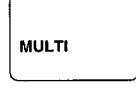
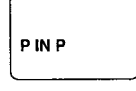
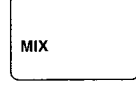
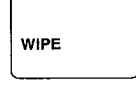
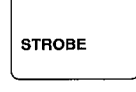
3 Recording/Playback Indications

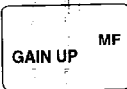
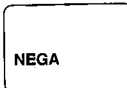
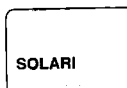
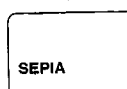
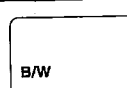
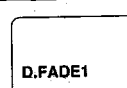
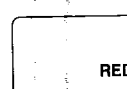
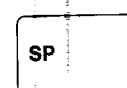
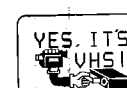
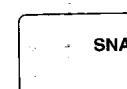
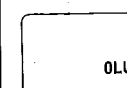
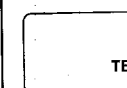
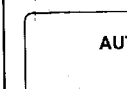
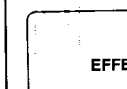
Viewfinder	Condition
	Recording Mode (large indication) (p. 20) When the Recording Start/Stop Button is pressed in the Recording Pause Mode, this indication is displayed for approximately 1 second. (If you set [SIZE] on the [TITLE SET MENU] Menu to [LARGE], this indication does not appear.)
	Recording Mode (small indication) (p. 20) This indication appears approximately 1 second after you start recording and it remains displayed until you stop recording. "REC" means Recording.
	Tape movement during recording (p. 20)
	Recording Pause Mode (large indication) (p. 20) When the Recording Start/Stop Button is pressed in the Recording Mode, this indication is displayed for approximately 1 second. (If you set [SIZE] on the [TITLE SET MENU] Menu to [LARGE], this indication does not appear.)
	Recording Pause Mode (small indication) (p. 20) This indication appears approximately 1 second after you pause the recording and it remains displayed until you restart the recording, change over to the VCR Mode or turn the Movie Camera off.
	Recording Check Mode (p. 56) This indication appears when you press the [G] Button in the Recording Pause Mode, and the final approximately 2 seconds of the last recorded scene are played back.
	Normal Playback/Camera Search Mode (p. 34, 56)
	Fast Forward/Cue Playback Mode (p. 34)
	Rewind/Review Playback/Camera Search Mode (p. 34, 56)
	Still Playback Mode (p. 34)
	Elapsed Tape Time (p. 22)
	Elapsed Tape Time with Memory Stop Function activated (p. 22) "M" means Memory.
	Power Save Mode (p. 32)

Viewfinder	Condition
	Remaining Tape Time (p. 22) "R" means Remaining.
	Tape Length (p. 17) The Tape Length Indication should be matched to the tape length of the inserted cassette (EC30, EC45 or EC60) to ensure correct indication of the remaining tape time.
	Date and Time (p. 18)
	Zoom Magnification (p. 20) When zooming in on a subject, the indicated zoom magnification value increases.
	Manual White Balance Adjustment Mode (p. 38)
	Manual Recording Mode (p. 36, 38) This indication is displayed when you select the Manual Recording Mode with the [PROG. AE] Button. In this mode, you can adjust the focus and the white balance manually. "MNL" means Manual.
	Sports Mode (p. 54) This indication appears when you select the Sports Mode with the [PROG. AE] Button.
	Portrait Mode (p. 54) This indication appears when you select the Portrait Mode with the [PROG. AE] Button.
	Low Light Mode (p. 54) This indication appears when you select the Low Light Mode with the [PROG. AE] Button.
	Spotlight Mode (p. 54) This indication appears when you select the Spotlight Mode with the [PROG. AE] Button.
	Surf & Snow Mode (p. 54) This indication appears when you select the Surf & Snow Mode with the [PROG. AE] Button.
	Manual Focus Mode (p. 36) "MF" means Manual Focus.
	Index Signal Recording Mode (p. 21) This indication flashes briefly while, an index signal is being recorded.

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

3 Recording/Playback Indications

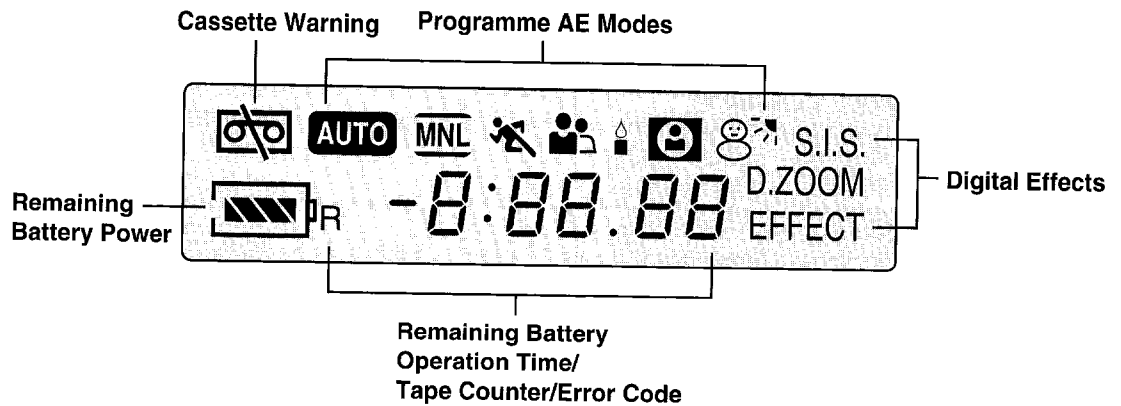
Viewfinder	Condition
	Title (small Indication) (p. 60) This indication shows the selected pre-programmed small title.
	Title (large Indication) (p. 60) This indication shows the selected pre-programmed large title.
	Motion-Sensor-Controlled Recording Function Stand-by Mode (p. 62) If the Error Code appears in the Viewfinder, the Motion Sensor Function is cancelled.
	Super Image Stabilizer Mode (p. 44)
	Digital Zoom Mode (p. 44) The "D.ZOOM" Indication appears and the Zoom magnification is extended to 300x.
	Mosaic Mode (p. 42) This indication appears when you select the Mosaic Mode with the [EFFECT1] Button.
	Stretch Mode (p. 42) This indication appears when you select the Stretch Mode with the [EFFECT1] Button.
	Mirror Mode (p. 42) This indication appears when you select the Mirror Mode with the [EFFECT1] Button.
	Multi Image Mode (p. 64, 66) This indication appears when you select the Muti Image Mode with the [EFFECT1] Button.
	Picture-in-Picture Mode (p. 68) This indication appears when you select the Picture-in-Picture Mode with the [EFFECT1] Button.
	Mix Mode (p. 46) This indication appears when you select the Mix Mode with the [EFFECT1] Button.
	Wipe Mode (p. 46) This indication appears when you select the Wipe Mode with the [EFFECT1] Button.
	Strobe Mode (p. 42) This indication appears when you select the Strobe Mode with the [EFFECT1] Button.

Indicator	Condition
	Gain up Mode (p. 42) This indication appears when you select the Gain up Mode with the [EFFECT1] Button.
	Negative Mode (p. 42) This indication appears when you select the Negative Mode with the [EFFECT2] Button.
	Solarisation Mode (p. 42) This indication appears when you select the Solarisation Mode with the [EFFECT2] Button.
	Sepia Mode (p. 42) This indication appears when you select the Sepia Mode with the [EFFECT2] Button.
	Black & White Mode (p. 42) This indication appears when you select the Black-and-White Mode with the [EFFECT2] Button.
	Digital Fade 1, 2 or 3 Mode (p. 48) This indication appears when you select the Digital Fade 1, 2 or 3 Mode with the [EFFECT2] Button.
	Colour Indication for Digital Image (p. 50) This indication shows the colour selected for a title that you have stored in memory.
	Recording Speed Indication (p. 16) SP: means Standard Play. LP: means Long Play. The desired mode can be selected on the [MAIN MENU1] Menu.
	Demonstration Mode (p. 99)
	Snapshot Recording Mode (p. 68)
	0 Lux Night View Mode (p. 70)
	Time Base Corrector (p. 35)
	Full Auto Mode (p. 20)
	Effect Mode (p. 73)








Quick Reference Guide to the Indications in the Multi Info Window

The LCD Window on the side of the Movie Camera lets you confirm the selected settings and other information at a glance.

The indications in the illustration below are for explanation purposes only and the actual indications may be somewhat different.




1 Programme AE Mode Indications

Multi Info Window	Condition	Page
	Auto Mode This indication appears when you select the Auto Mode with the [PROG. AE] Button.	20
	Manual Mode This indication appears when you select the Manual Recording Mode with the [PROG. AE] Button. In this mode, you can adjust the focus and the white balance adjustment manually. "MNL" means Manual.	36,38
	Sports Mode This indication appears when you select the Sports Mode with the [PROG. AE] Button.	54
	Portrait Mode This indication appears when you select the Portrait Mode with the [PROG. AE] Button.	54
	Low Light Mode This indication appears when you select the Low Light Mode with the [PROG. AE] Button.	54
	Spotlight Mode This indication appears when you select the Spotlight Mode with the [PROG. AE] Button.	54
	Surf & Snow Mode This indication appears when you select the Surf & Snow Mode with the [PROG. AE] Button.	54

2 Digital Effect Indications

Info Window	Condition	Page
D.ZOOM	Digital Zoom Mode This indication appears when you activate the Digital Zoom Mode.	44
EFFECT	Digital Effect Mode This indication appears when you activate a Digital Effect Mode.	42
S.I.S.	Super Image Stabilizer Mode This indication appears when you activate the Super Image Stabilizer Mode.	44

3 Remaining Battery Power Indication

Info Window	Condition	Page
	Remaining Battery Power When using the Battery, this indication gives a rough indication of the power remaining in the attached Battery.	13

4 Remaining Battery Operation Time Indication

Info Window	Condition	Page
R 8:88	Remaining Battery Operation Time When using the Battery, it shows the approximate remaining operation time of the attached Battery. The precision varies according to the ambient temperature and the temperature of the Battery.	13


5 Tape Counter Indication

Info Window	Condition	Page
8:88.88	Tape Counter When using the AC Adaptor, the Tape Counter is displayed instead of the Battery Operation Time Indication.	22

6 Error Code Indication

Info Window	Condition	Page
F 00	Error Code When some malfunction has occurred, the "F" Indication appears together with a 2-digit number.	25

7 Cassette Warning Indication

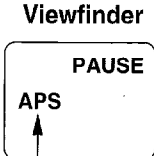
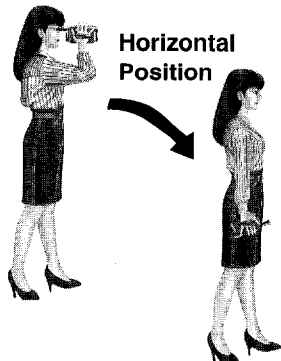

Info Window	Condition	Page
	No Cassette This indication flashes when a cassette with a broken-out erasure prevention tab is inserted or no cassette is inserted.	15,84

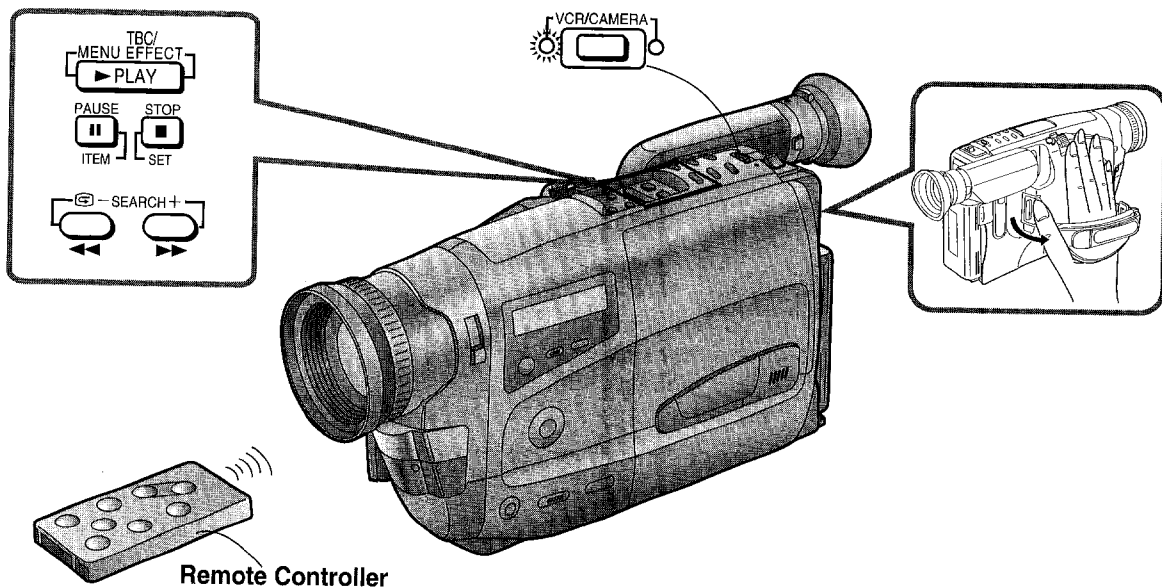
Using the Power Save Functions


If you set [APS] on the [MAIN MENU2] Menu to [ON] (p.16), the functions explained below will be activated.

1 Auto Power Save (in the Recording Pause Mode)



	Movie Camera Mode	Becomes Activated	Conditions of Movie Camera
1 Auto Power Save Function	<p>During Recording Pause</p> <p>Viewfinder</p>  <p>The "APS" Indication is displayed.</p>	<p>Horizontal Position</p>  <ul style="list-style-type: none"> • More than about 70° • More than a few seconds <p>Activated</p> <ul style="list-style-type: none"> • When the Movie Camera is tilted downwards by more than about 70° from the normal horizontal recording position for more than a few seconds. 	 <ul style="list-style-type: none"> • Video and Audio will be faded during this mode so no picture or sound will be present. • Viewfinder: OFF • Auto Focus: OFF • Zoom Motor: OFF • VCR Indication: Flashes (Green) <p>[VCR/CAMERA]</p>



Title	Procedure
Playing Back in the Viewfinder or	<p>1</p>  <p>2</p> <p>[VCR/CAMERA]</p>

Notes for Recording with Automatic White Balance Adjustment

- For detailed explanations about the white balance adjustment, see p. 88 and 89.
- Be careful not to cover the White Balance Sensor for the Automatic White Balance Adjustment with your hand, etc. during recording.
- If the "W.B." Indication is displayed in the Viewfinder together with the [MNL], [MNL], [MNL], [MNL], [MNL] or [MNL] Indication, press the [W.B] Button to make the "W.B." Indication disappear.

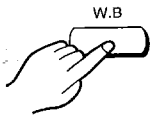
Notes for Recording with manual White Balance Adjustment

- If you select the Manual Mode, the "MNL" Indication appears in the Viewfinder and the "MNL" Indication in the Multi Info Window.
- During recording, it is not possible to change the recording mode ([AUTO], [MNL], [MNL], [MNL], [MNL], [MNL], [MNL]), even if you press the [PROG. AE] Button. (p. 54)
- If you use an additional light source with low colour temperature (e.g. halogen lamp) while recording a subject with high colour temperature (e.g. blue sky or TV screen), unnatural colours will result.
- 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.
- If you want to record under weak illumination, precise Manual White Balance Adjustment may not be possible. In this case, record in the "AUTO" Mode.
- When the Sepia Mode, Black & White Mode, 0 Lux Night View Mode or Gain-up Mode is being used, it is not possible to manually adjust the white balance, or to cancel the manually adjusted white balance setting even if you press the [W.B] Button.

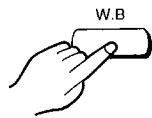
In the following cases, the "W.B." Indication flashes:

- During manual adjustment of the white balance. (If the surroundings are dark and the white balance cannot be adjusted, the "W.B." Indication keeps flashing.)
- When the previously set white balance setting is maintained.
- When you are trying to adjust the white balance in the digital zoom range (23x-300x). (In this case, first adjust the white balance in the optical zoom range (1x-22x) and then zoom back to within the Digital Zoom Mode.)

3



■ To Cancel the Manual White Balance Mode:

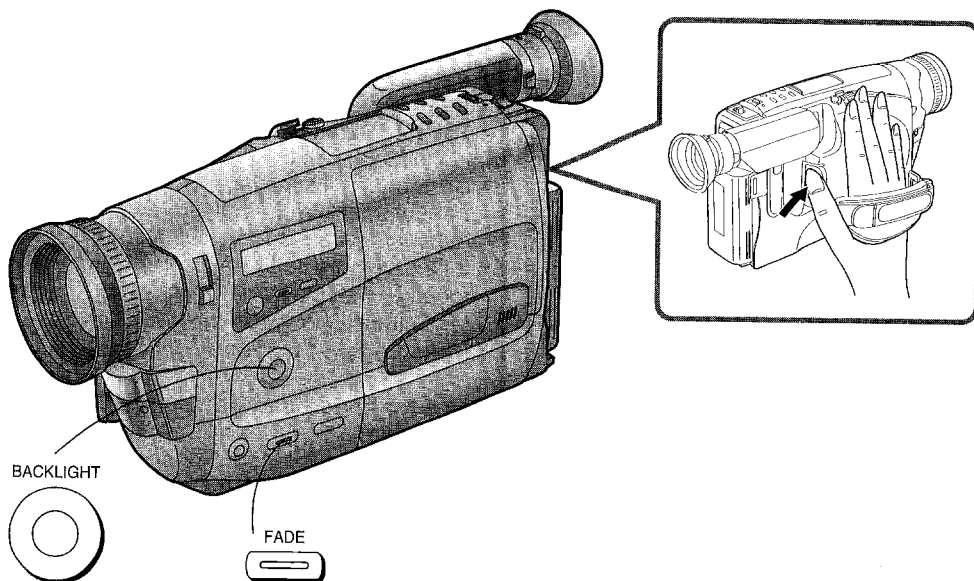


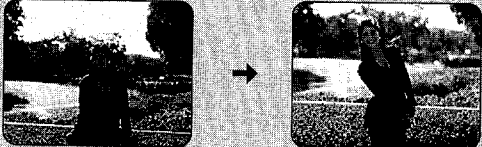
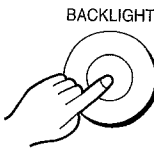
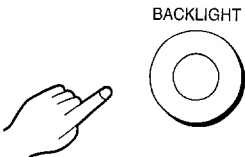
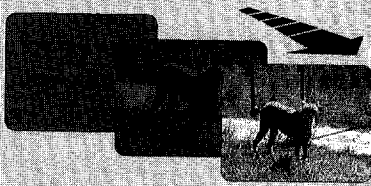
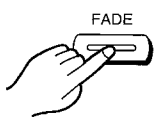
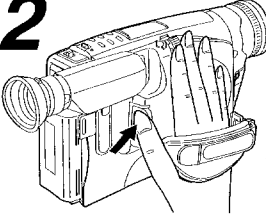

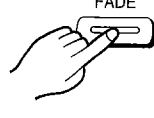
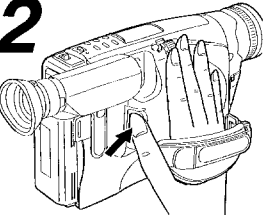
or

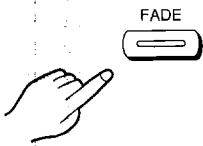
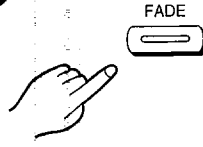


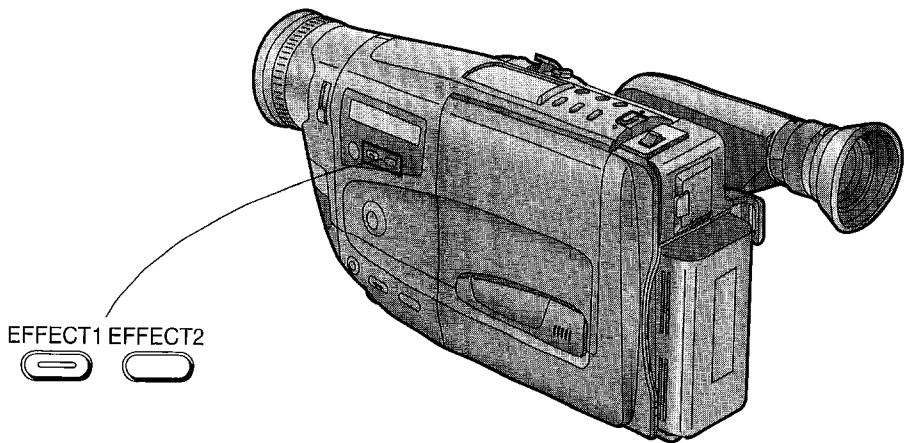
Aim the Movie Camera at the subject that you want to record and then press the [W.B] Button repeatedly until the "W.B." Indication stops flashing and remains lit.

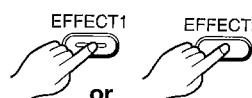
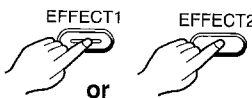
Press the [W.B] Button once. Or, press the [PROG. AE] Button repeatedly until the "AUTO" indication appears.



Title	Procedure	
<p>Using the Backlight Mode</p> <p>When you record a subject that has a strong light source behind it, for example a person with the sun behind him/her, the face is in the shade and appears too dark. In such a case, you can brighten up the subject.</p> 	<p>1</p> <p>BACKLIGHT</p>  <p>Keep Pressed.</p>	<p>■ To Cancel this Function:</p> <p>BACKLIGHT</p>  <p>Release.</p>
<p>Fading In</p> <p>At the beginning of a movie, etc. fading in is often used. For example, after recording the title, starting the first scene with the Fade-in Function is very effective.</p> 	<p>1</p> <p>FADE</p>  <p>Keep pressed while in the Recording Pause Mode.</p>	<p>2</p>  <p>Press the Recording Start/Stop Button after the picture has disappeared.</p>
<p>Fading Out</p> <p>Fading out is used to create a soft ending or (together with fade-in) for a soft transition from one scene to the next.</p> 	<p>1</p> <p>FADE</p>  <p>Press during recording at the point where you wish to fade out, and keep it pressed.</p>	<p>2</p>  <p>Press the Recording Start/Stop Button after the picture has disappeared.</p>

		<i>Remarks, etc.</i>
		<ul style="list-style-type: none"> • The sky may appear whitish. • When recording with the sun striking the subject at an angle, star-shaped light reflections may be recorded in the picture. • When recording a subject in front of a very bright background, the subject may still appear dark in the picture. • In some cases, the subject may look clear, but the background may be overexposed (almost completely white). However, this is normal and not a malfunction.
<p>3</p>  <p>Release after approximately 3–4 seconds</p>		<ul style="list-style-type: none"> • Fading in is not possible in the Multi Image Mode (p. 64, 66) or the Picture-in-Picture Mode (p. 68).
<p>3</p>  <p>Release</p>		<ul style="list-style-type: none"> • Fading out is not possible in the Multi Image Mode (p. 64, 66) or the Picture-in-Picture Mode (p. 68).



Title	Procedure	
<p>Using Special Effects (Digital Effects)</p> <p>In addition to the Super Image Stabilizer and Digital Zoom, this Movie Camera offers you a total of 16 different digital effect modes to make it easy to enhance your scenes in many creative ways. These effects are divided into two groups: Digital Effects 1 and Digital Effects 2.</p>	<p>1</p>  <p>Press the [EFFECT1] or [EFFECT2] Button repeatedly until the indication of the desired Digital Effect appears.</p>	<p>■ To Cancel the Selected Digital Effect(s):</p>  <p>Press the [EFFECT1] or [EFFECT2] Button repeatedly until no Digital Effect Indication is displayed any more. Or, keep the [EFFECT1] or [EFFECT2] Button pressed for more than 2 seconds to make the Digital Effect Indication disappear.</p>











Remarks, etc.

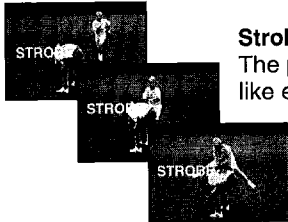
- If you turn in the [POWER] Switch to turn the Movie Camera off and then turn it on again, the indication of the selected digital effect flashes for a few seconds to inform you of the selected setting.
- When selecting a digital effect, the following indications appear in the Multi Info Window:
 - [D.ZOOM] When you select the Digital Zoom Mode.
 - [S.I.S.] When you select the Super Image Stabilizer Mode.
 - [EFFECT] When you select any of the other digital effects.
- In the Following Digital Effects Mode, the pictures are recorded with slightly inferior picture quality compared to that of normal pictures:
 - The small pictures of Multi Image Mode
 - The small picture of Picture-in-Picture Mode
 - The picture of Strobe Mode
- When recording under fluorescent lamps, the brightness of the picture may fluctuate in the Strobe Mode.
- It is not possible to use the Gain-up Mode together with the Sports Mode or the Portrait Mode.
- Some after-image distortion may occur during recording with the Gain-up Function.
- When the Digital Zoom Mode, Gain-up Mode, Sepia Mode or Black & White Mode is used, it is not possible to manually adjust the white balance or to cancel the manually adjusted white balance setting, even if you press the [W.B] Button.


S.I.S.
D.ZOOM
EFFECT

Digital Effects 1 [EFFECT1]

Repeatedly pressing this button changes the digital effects in the order 1 to 12.








- 1  **Super Image Stabilizer Mode [S.I.S.] (p. 44)**
This prevents shaky pictures when recording in the tele range or from a moving vehicle.
- 2  **Super Image Stabilizer and Digital Zoom Mode [S.I.S./D.ZOOM]**
This combination mode allows recording in the extreme tele range and prevents shaky pictures.
- 3  **Digital Zoom Mode [D.ZOOM] (p. 44)**
It enlarges the subject beyond the optical zooming range.
- 4  **Mosaic Mode [MOSAIC]**
The picture becomes mosaic-like.
- 5  **Stretch Mode [STRETCH]**
The picture is stretched horizontally while its height remains unchanged.
- 6  **Mirror Mode [MIRROR]**
The right half of the picture is a mirror image of the left half.
- 7  **Multi Image Mode [MULTI] (p. 64, 66)**
The screen is divided into 9 small still fields.
- 8  **Picture-in-Picture Mode [P IN P] (p. 68)**
A small still picture is inserted and displayed inside the normal picture.
- 9  **Mix Mode [MIX] (p. 46)**
It gradually fades out one scene while fading in the new scene over it.
- 10  **Wipe Mode [WIPE] (p. 46)**
With this function, you can change over from one scene to the next like drawing a curtain.

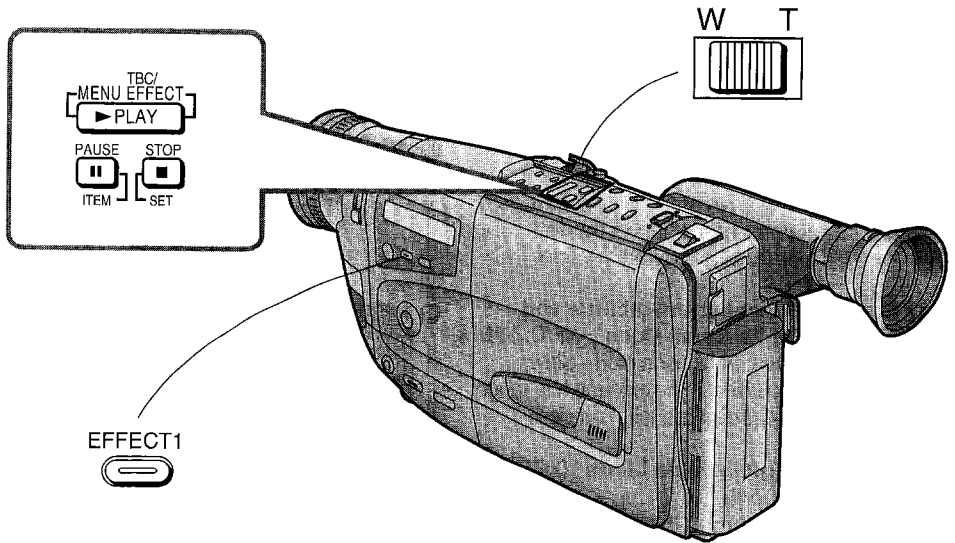
- 11  **Strobe Mode [STROBE]**
The picture has stroboscope-like effect.

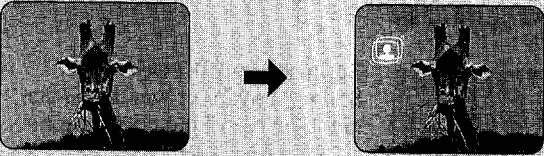
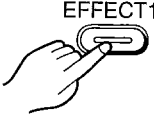

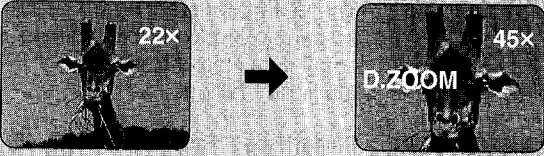
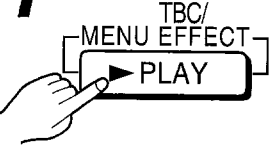
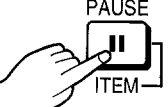
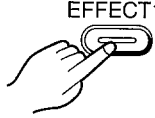
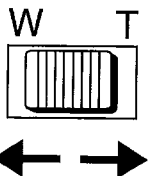
- 12  **Gain-up Mode [GAIN UP]**
It electronically brightens up the picture. In this mode adjust the focus manually.
 - The focus can only be adjusted manually even if the "AUTO" Indication is displayed.

Digital Effects 2 [EFFECT2]

Repeatedly pressing this button changes the digital effects in the order 13 to 19.

- 13  **Negative/Positive Mode [NEGA]**
The picture has reversed colours similar to photographic negatives.
- 14  **Solarisation Mode [SOLARI]**
The picture has an effect similar to a painting.
- 15  **Sepia Mode [SEPIA]**
Scenes have a brown tint similar to the colour of old photographs.
- 16  **Black & White Mode [B/W]**
The picture is in black and white.
- 17  **Digital Fade 1 Mode [D.FADE1] (p. 48)**
The picture fades in starting at the centre and extending toward the edges, and it fades out in reverse direction.
- 18  **Digital Fade 2 Mode [D.FADE2] (p. 48)**
The picture fades in from a white screen and fades out to white in small dots similar to snow melting or falling.
- 19  **Digital Fade 3 Mode [D.FADE3] (p. 48)**
The picture fades in with a wipe effect from a black screen and fades out to black.



Title	Procedure	
<p>Super Image Stabilizer Function</p> <p>This function compensates for camera-shake during hand-held recording and ensures stable pictures. It is especially practical for the following recording situations:</p> <ul style="list-style-type: none"> • Recording a zoomed-in distant subject. • Recording while walking. • Recording from inside a moving car. 	<p>1</p>  <p>Press repeatedly until the “” Indication appears.</p>	
<p>Using the Digital Zoom Function</p> <p>This function is convenient, when you record a very distant subject and want to enlarge it even further than is possible with the normal (optical) zoom function.</p> 	<p>1</p>  <p>Press to make the [MAIN MENU1] Menu appear.</p>	<p>2</p>  <p>Press repeatedly to select [D.ZOOM].</p>
	<p>5</p>  <p>Press repeatedly until the “D.ZOOM” Indication appears.</p>	<p>6</p>  <p>Push toward [T] or [W] to zoom in or out as desired.</p>

Notes for Use of the Super Image Stabilizer Function

- The "S.I.S." Indication appears in the Multi Info Window.
- When you use the Super Image Stabilizer Function, the shutter speed is automatically adjusted between 1/50 s and 1/125 s according to the brightness of the scene.
- Cancelling the Super Image stabilizer Function also resets the shutter speed to 1/50 s. However, after selecting the Sports Mode or the Portrait Mode, cancelling the Super Image Stabilizer Function does not reset the shutter speed to 1/50 s.

■ In the Following Recording Conditions, the Picture Stabilizing Effect May Not Be Sufficient:

- Subjects with horizontal or vertical stripes
- Flat subjects
- Dark subjects (In this case, the "S.I.S." Indication flashes in the Viewfinder and the "S.I.S." Indication flashes in the Multi Info Window. Increase the amount of light.)
- Subjects under many fluorescent lamps
- Fast-moving subjects
- Subjects with a flat background

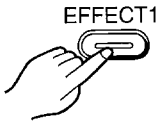
■ When Using the Super Image Stabilizer Function, the Picture Changes as Follows:

- The picture quality deteriorates slightly.
- Under fluorescent lamps, the picture brightness may fluctuate and the colours may be unnatural.

Notes for Use of the Digital Zoom Function

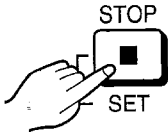
- The "D.ZOOM" Indication also appears in the Multi Info Window.
- When using the Digital Zoom Function, the picture quality is somewhat reduced.
- The zooming speed is variable. The farther you push the [W•T] Zoom Lever toward "W" or "T", the faster the zooming speed becomes.
- With the Digital Zoom Function activated, you can optically zoom between 1× (wide-angle) and 22× and digitally between 23× and 300×. The changeover between optical and digital zooming is automatic.
- Within the digital zoom range (23×-300×), it is not possible to adjust the white balance manually or to cancel the manually adjusted white balance setting, even if you press the [W.B] Button.
- After selecting the Digital Zoom Mode on the Movie Camera, digital zooming can also be operated with the Remote Controller.

To Cancel this Function



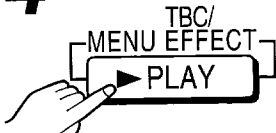
Press repeatedly until the "S.I.S." Indication disappears. Or, keep pressed for more than 2 seconds to make the "S.I.S." Indication disappear.

3



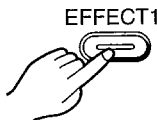
Press to select the desired digital zoom angle (up to 45×, up to 100× or up to 300×)

4

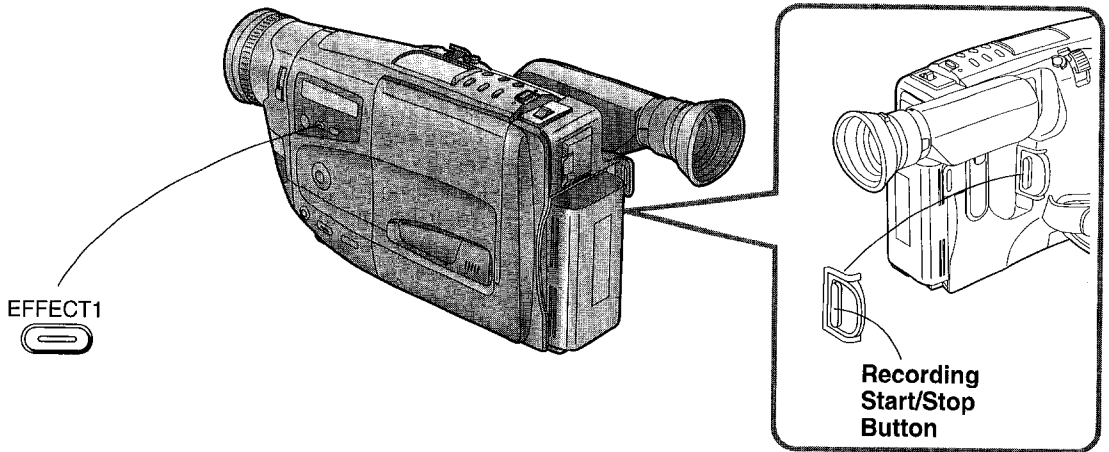


Press to exit the Menu Function.

To Cancel this Function:



Press repeatedly until the "D.ZOOM" Indication disappears. Or, keep pressed for more than 2 seconds to make the "D.ZOOM" Indication disappear.



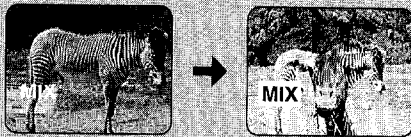
Title

Procedure

Fading Over from the Last Recorded Scene to the Next

1) Digital Mix

This function makes it possible to achieve a smooth transition from the last recorded scene to the next scene. When starting to record the new scene, a still picture of the last recorded scene appears, and it is then gradually replaced by the moving picture of the new scene.

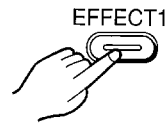


2) Digital Wipe

This function makes it possible to achieve a smooth transition from the last recorded scene to the next scene. When starting to record the new scene, a still picture of the last recorded scene appears, and it is then changed over to the moving picture of the new scene with Digital Wipe (like opening a curtain).

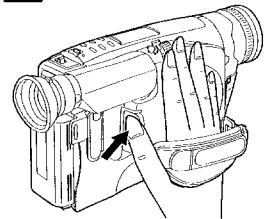


1



Press repeatedly until the "MIX" or "WIPE" Indication appears.

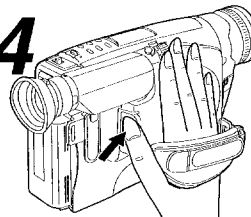
2



Press the Recording Start/Stop Button to start recording normally.

■ MIX

4

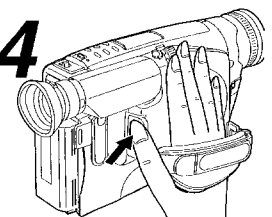


Press to start recording the next scene.

- First the still picture (from the digital image memory) appears, and it then gradually disappears while the moving picture of the new scene gradually appears.

■ WIPE

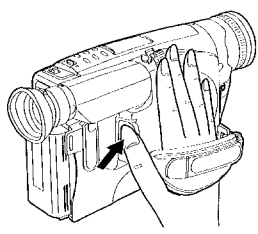
4



Press to start recording the next scene.

- First, the still picture (from the digital image memory) appears and it then gradually replaced by the moving picture of the new scene, starting from the right.

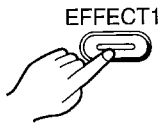
3



Press the Recording Start/Stop Button to stop recording the scene.

- The Movie Camera is in the Recording Pause Mode.
- The "MIX" or "WIPE" Indication changes to "MIX" or "WIPE" to indicate that the last picture of the just recorded scene is stored in the digital image memory.

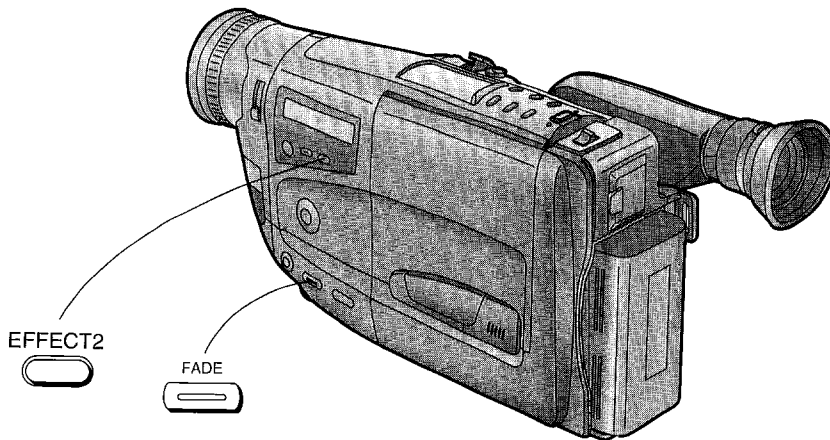
■ To Cancel these Functions

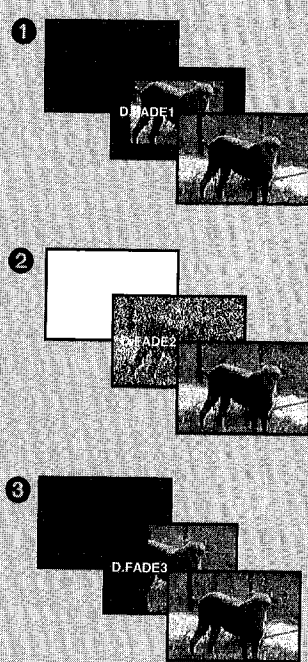
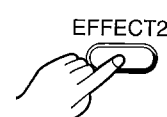
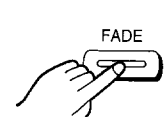

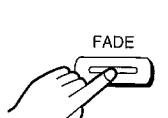


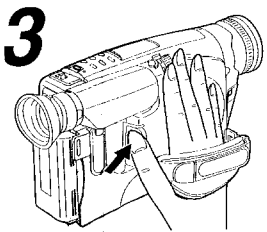
Press repeatedly to make the "MIX" or "WIPE" indication disappear.
 Or, press for more than 2 seconds to make the "MIX" or "WIPE" Indication disappear.

Remarks, etc.

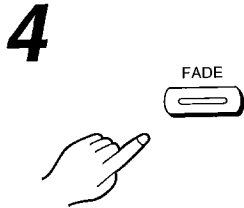
- All subsequent scene-to-scene transitions will be recorded with this Mix or Wipe Effect until you cancel the Mix or Wipe Function.
- It is not possible to use the Mix or Wipe Mode together with the Snapshot Mode.
- The Negative and Solarisation Effects cannot be applied to a picture stored in the digital image memory for the Mix or Wipe Function.
- The Mix or Wipe Mode cannot be used together with the Snapshot Mode or any of the Digital Fade Modes.



Title	Procedure	
<p>Using the Digital Fade Functions</p> <p>There are 3 Digital Fade Modes available.</p> <ul style="list-style-type: none"> ❶ Digital Fade 1 "D.FADE1" ❷ Digital Fade 2 "D.FADE2" ❸ Digital Fade 3 "D.FADE3" 	<p>1</p> <p>■ To Fade in:</p>  <p>Press repeatedly until the desired Digital Fade Indication appears.</p>	<p>2</p>  <p>With the Movie Camera in the Recording Pause Mode, keep pressed.</p>
	<p>1</p> <p>■ To Fade out:</p>  <p>Press repeatedly until the desired Digital Fade Indication appears.</p>	<p>2</p>  <p>During recording, press at the point where you want to fade out, and keep pressed.</p>

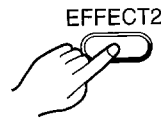


3
When the picture has completely disappeared, press the Recording Start/Stop button to start recording.

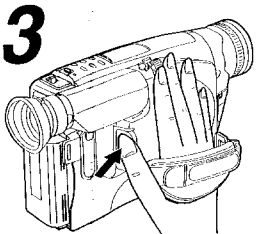


4
Approximately 3-4 seconds later, release.

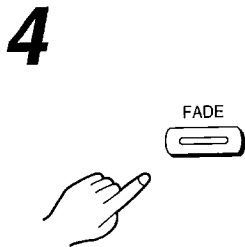
■ To Cancel the Selected Digital Fade Function:



Press the [EFFECT2] Button repeatedly until none of the Digital Fade Indications are displayed any more.
Or, press the [EFFECT2] Button for more than 2 seconds to make the Digital Fade Indication disappear.



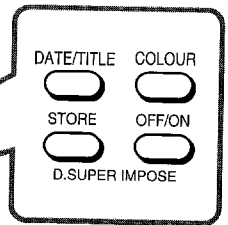
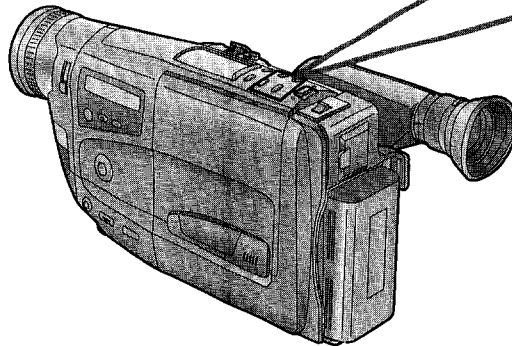
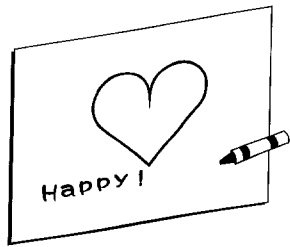
3
After the picture has completely disappeared, press the Recording Start/Stop button to stop recording.


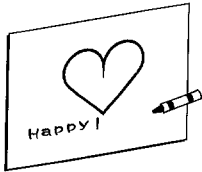
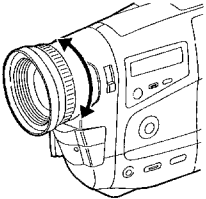
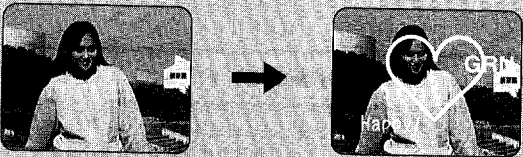
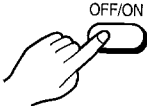
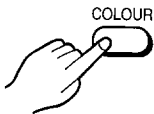



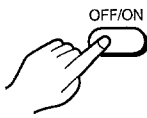
4
Release.

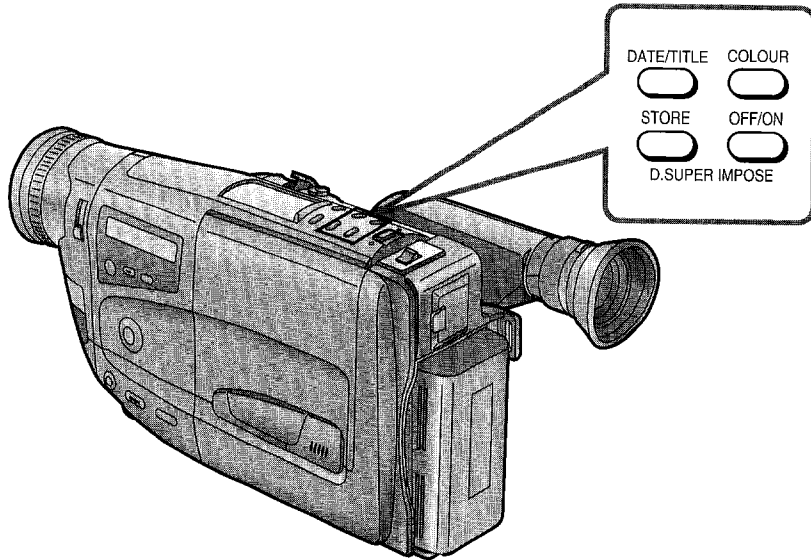
Remarks, etc.

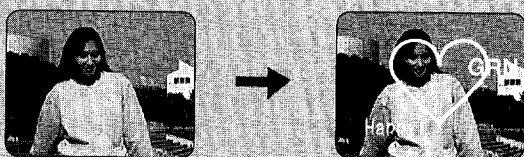
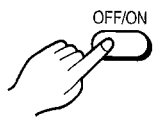
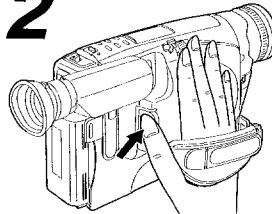
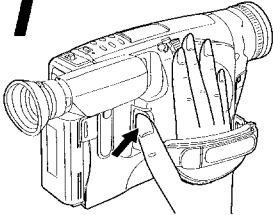
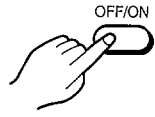
- It is not possible to use any of the Digital Fade Functions together with the Multi Image Mode, Picture-in-Picture Mode, Mix Mode or Wipe Mode.



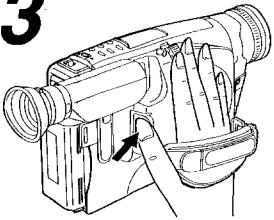
Title	Procedure	
<p>Creating Your Own Titles and Inserting Them During Recording (Digital Superimposer Function)</p> <p>This function lets you store the image of a handwritten title, signboard, printed title, (or some similar object with strong contrast) in the Movie Camera's digital image memory. You can then change the dark parts of this image to a desired colour and superimpose it during recording.</p> <p>1) Storing Your Own Title in the Digital Image Memory</p> 	<p>1</p>  <p>Prepare a title that has strong contrast (e.g. write with a thick black marker or felt-tipped pen on white paper).</p>	<p>2</p>  <p>With the Movie Camera in the Recording Pause Mode, aim it at the title. If the Full Auto Mode does not provide a sharp picture, adjust the focus manually.</p>
<p>2) Selecting the Desired Colour of Your Own</p> 	<p>1</p>  <p>Press to make the title appear.</p>	<p>2</p>  <p>Press repeatedly until the desired colour is displayed.</p>

		Remarks, etc.
<p>3</p>  <p>Press for more than 0.5 second. The title is now stored in the digital image memory and it remains displayed.</p>	<p>4</p>  <p>Press to make the title disappear. Pressing the [OFF/ON] Button repeatedly makes the title appear and disappear.</p>	<ul style="list-style-type: none"> • The title stored in the digital image memory is automatically cancelled when you store a new title, remove the Battery, disconnect the AC Adaptor, or when the Battery becomes discharged. • By displaying the title which you stored in the digital image memory and using the Digital Fade 1, Digital Fade 2 or Digital Fade 3 Function, you can fade the title together with the picture. • It is not possible to apply the Negative Effect when storing a title in the digital image memory. • After turning the Movie Camera off and then on again, the title that had been displayed in the picture is no longer displayed. To make it appear again, press the [OFF/ON] Button. • When you want to capture a small title, use the Macro Close-up Function. (p. 21) • Aim the Movie Camera so that the title is in the centre of the screen to ensure that the title does not get clipped at the edges.
		<ul style="list-style-type: none"> • The colours of the title change in the following order: White [WHT] → Yellow [YEL] → Magenta [MAG] → Red [RED] → Cyan [CYN] → Green [GRN] → Blue [BLU] → Black [BLK] → White [WHT] → <p>[]: Colour Indications displayed in the Viewfinder</p>



Title	Procedure	
<p>Creating Your Own Titles and Inserting Them During Recording (Digital Superimposer Function) (Cont.)</p> <p>3) Recording with the Title from the Memory Superimposed over the Moving Picture</p> <ul style="list-style-type: none"> ■ Inserting Your Own Title at the Beginning of a Recording 	<p>1</p>  <p>Press to make the title appear.</p>	<p>2</p>  <p>Press the Recording Start/Stop Button to start recording.</p>
<ul style="list-style-type: none"> ■ Inserting Your Own Title During Recording 	<p>1</p>  <p>Press the Recording Start/Stop Button to start recording.</p>	<p>2</p>  <p>At the point where you want to insert the title, press to make the title appear.</p>

3

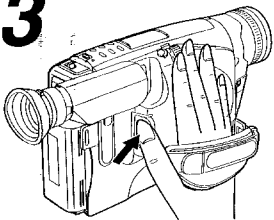


Press the Recording Start/Stop Button to stop recording.

Remarks, etc.

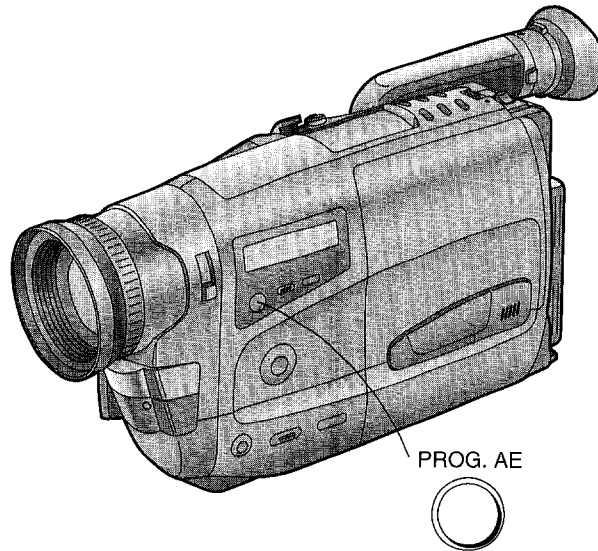
- Confirm that the colour indicated is suitable for the intended scene.
If necessary, change the colour. (p. 50)
- To make the title disappear while the recording of the scene continues, press the [OFF/ON] Button.

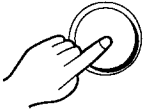










3



Press the Recording Start/Stop Button to stop recording.

- To make the title disappear while the recording of the scene continues, press the [OFF/ON] Button.

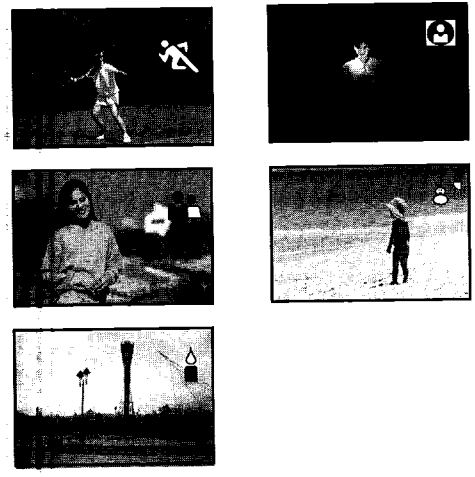


Title	Procedure
<p>Recording in Special Situations (Programme AE)</p> <p>This Movie Camera gives you a choice of 5 different automatic exposure programmes optimised for typical recording situations.</p>	<p>1</p> <p>PROG. AE</p>  <p>Press repeatedly until the indication of the desired mode ([, [, [, [] or [) appears.</p> <hr/> <p>[] Sports Mode To record scenes with fast-moving subjects such as sports scenes.</p> <p>[] Portrait Mode To make subjects stand out sharply from the background.</p> <p>[] Low Light Mode To record dark scenes more brightly.</p> <p>[] Spotlight Mode To record subjects under spotlights (party, theatre, etc.).</p> <p>[] Surf & Snow Mode To record subjects in brightly lit surroundings (ski slopes, beach, etc.).</p>

o Cancel the Selected Programme AE Mode:



Press the [PROG. AE] Button repeatedly until none of indications below are displayed.



Remarks, etc.

- The [], [], [], [] or [] Indication also appears in the Multi Info Window.
- During recording, it is not possible to change the Programme AE Mode ([AUTO], [MNL], [], [], [], [], []), even if you press the [PROG. AE] Button.
- It is not possible to use any of the Programme AE Modes when the 0 Lux Night View Mode is activated.

Sports Mode

- When playing back on a VCR scenes that you have recorded in the Sports Mode, you can enjoy slow motion and still playback of very sharp images with fine details.
- Avoid recording under fluorescent, mercury-vapour or sodium lamps as the colour and the brightness of the playback picture may fluctuate.
- When recording subjects lit by strong lights or with much light reflection, the playback picture may contain vertical streaks of light.
- When the scene is not sufficiently lit, the " " Indication flashes.
- When using this mode for recording indoors, the playback picture may flicker.

Portrait Mode

- When using this mode for recording indoors, the playback picture may flicker.

Low Light Mode

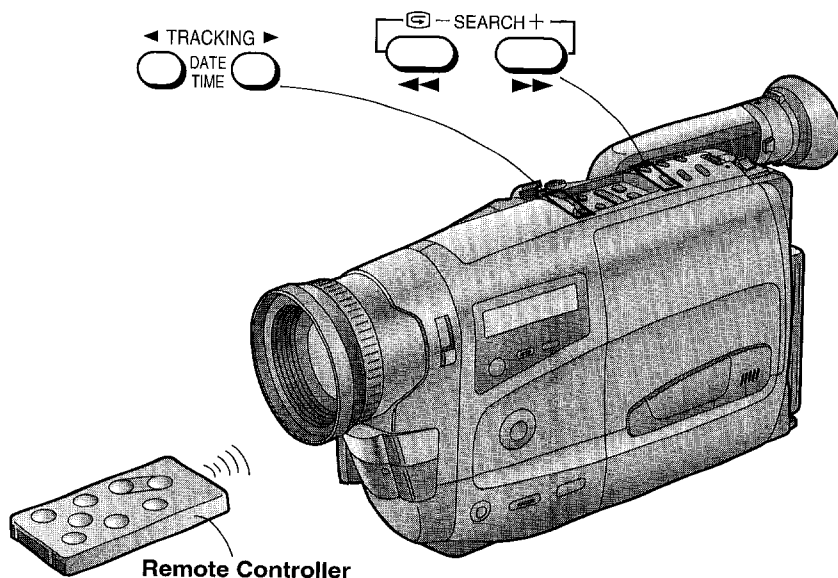
- It may not be possible to sufficiently brighten up extremely dark scenes.

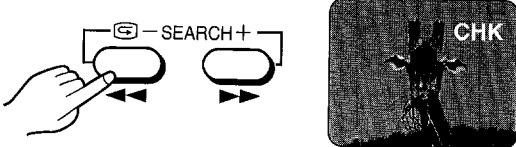
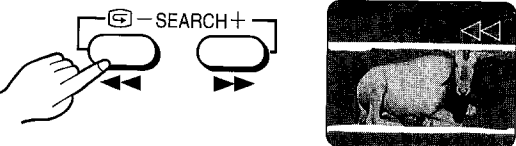
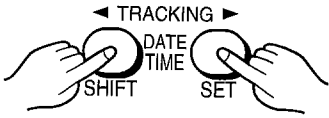
Spotlight Mode

- When using this mode, the recorded picture may be extremely dark.
- If a subject is extremely bright, the recorded picture may be whitish.

Surf & Snow Mode

- If a subject is extremely bright, the recorded picture may be whitish.

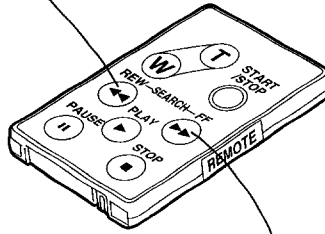


Title	Procedure
<p>Checking the End of a Recorded Scene (Recording Check Function)</p> <p>For important scenes, use this check function after each scene to confirm that the recording has been performed correctly.</p>	<p>1</p>  <p>Briefly press while in the Recording Pause Mode.</p>
<p>Searching for a Tape Position Before the End of the Last Recording (Camera Search Function)</p> <p>This function makes it easy to search for a point in a previously recorded scene or cassette from which you want to start recording a new scene. In addition, it ensures smooth scene-to-scene transitions free from picture distortion.</p>	<p>■ Reverse direction</p>  <p>Keep pressed while in the Recording Pause Mode.</p>
<p>Eliminating Picture Distortions (Tracking Adjustment)</p> <p>When playing back a recorded tape, especially a tape recorded on another Movie Camera, horizontal bars of white noise may appear in the picture. If this occurs, you can eliminate them by adjusting the tracking.</p>	<p>1</p>  <p>Press both the [◀ TRACKING] and the [TRACKING ▶] Buttons simultaneously during playback.</p>

■ **Remote Controller**

The Recording Check Function and the Camera Search Functions can be operated with this Remote Controller.

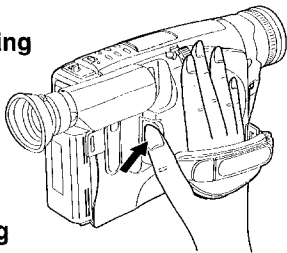
[REW] Button



[FF] Button

2

To Start the Recording Again:

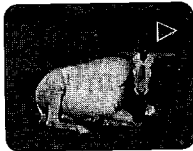
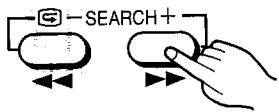


Press the Recording Start/Stop Button.

Remarks, etc.

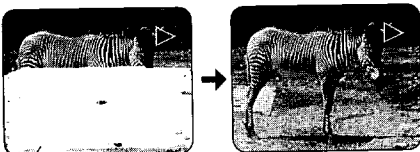
- The final 2 seconds of the last recorded scene is played back, and then the Movie Camera returns to the Recording Pause Mode.

■ **Forward Direction**



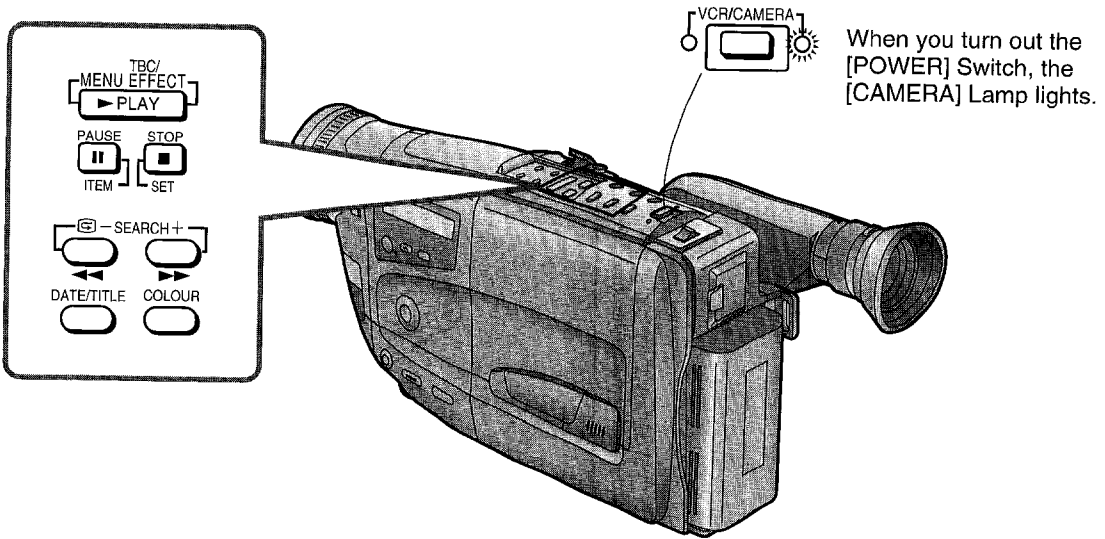
Keep pressed while in the Recording Pause Mode.

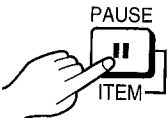
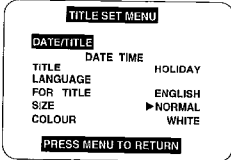
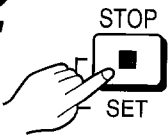
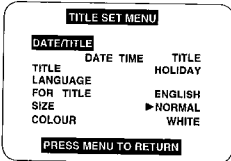
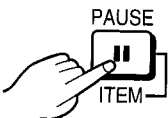
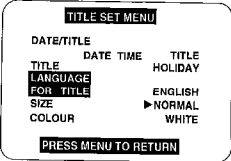
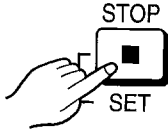
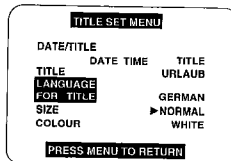
- If you keep the [-SEARCH] Button pressed: The "◀◀" Indication appears in the Viewfinder. The scene is played back in reverse direction at 3 times normal speed in the SP Mode and 6 times in the LP Mode.
- If you keep the [SEARCH+] Button pressed: The "▶" Indication appears in the Viewfinder. The scene is played back in forward direction at normal speed.



White noise bars

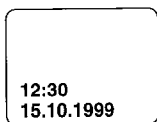
- If pressing both buttons simultaneously does not improve the picture quality, adjust the tracking by pressing the [◀ TRACKING] or [TRACKING ▶] Button individually. (It may not be possible to remove the noise bars completely.)



Title	Procedure	
<p>Recording with the Time and/or Date Superimposed in the Picture</p> <p>Confirm that the [CAMERA] Lamp is lit.</p>	<p>1 After displaying the [TITLE SET MENU] Menu... (p. 16):</p>   <p>Press repeatedly to select [DATE/TITLE].</p>	<p>2</p>   <p>Press repeatedly until the desired indication appears on the [TITLE SET MENU] Menu.</p>
<p>Recording with Pre-programmed Titles Inserted in the Picture</p> <p>You can insert one of 10 pre-programmed titles when recording of special occasions such as weddings and birthday parties. These titles are available in 6 languages.</p> <p>1) Selecting the Desired Language</p>	<p>1 After displaying the [TITLE SET MENU] Menu... (p. 16):</p>   <p>Press repeatedly to select [LANGUAGE FOR TITLE].</p>	<p>2</p>   <p>Press to select the desired language.</p>

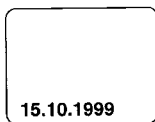
The Date/Time/Title Indication

1



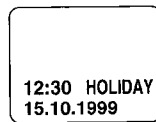
[DATE TIME]
Date and Time (h/m)

2



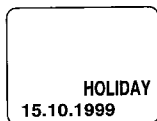
[DATE] Date only

3



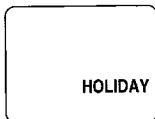
[DATE TIME TITLE]
Date, Time and Title

4



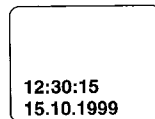
[DATE TITLE]
Date and Title

5



[TITLE] Title only

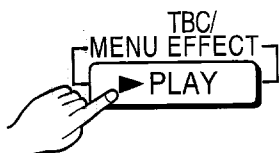
6



[DATE TIME + SECONDS]
Date and Time (h/m/s)

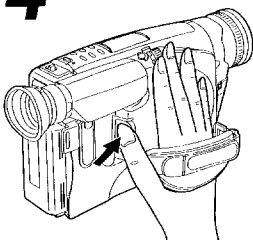
- The indications change in the order 1 to 6.

3



Press twice to exit the Menu Function and to make the selected Date/Time/Title Indication appear.

4



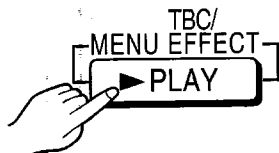
Press the Recording Start/Stop Button to start recording.

Remarks, etc.

- When you turn the Movie Camera off and then on again, none of the above indications are displayed.
- The Date/Time/Title Indication remains displayed when you exit the Title Set Menu after having change the language of the title, the type of Date/Time/Title Indication, the title itself (p. 60), the size of the title (p. 60) or the colour of the title (p. 60).

■ **To Delete the Date/Time/Title Indication:**
During recording or when the Movie Camera is in the Recording Pause Mode, press the [DATE/TITLE] Button to make the Date/Time/Title Indication disappear.

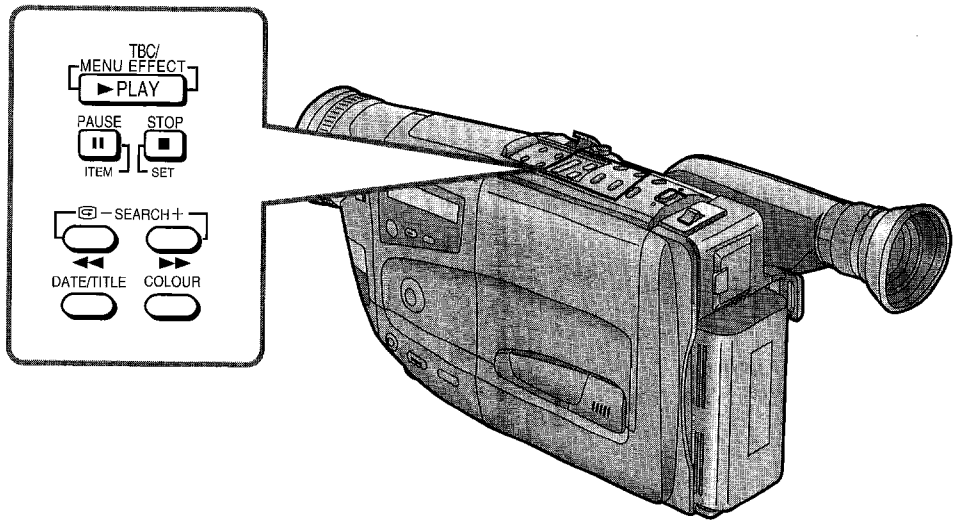
3



Press twice to exit the Menu.

- Repeatedly pressing the [SET] Button changes the language in the following order.

ENGLISH → GERMAN → FRENCH → ITALIAN →
→ SPANISH → RUSSIAN → ENGLISH



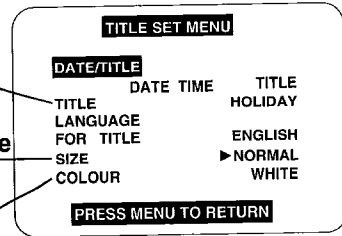
Title	Procedure	
<p>Recording with Pre-programmed Titles Inserted in the Picture (Cont.)</p> <p>2) Selecting the Desired Pre-programmed Title</p> <div data-bbox="333 962 487 1078" style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto; width: 100px;"> HOLIDAY </div>	<p>1</p> <p>After displaying the [TITLE SET MENU] Menu... (p. 16):</p> <div data-bbox="809 913 977 1029" style="text-align: center;"> </div> <p>Press repeatedly to select [TITLE].</p>	<p>2</p> <div data-bbox="1131 875 1306 1010" style="text-align: center;"> </div> <p>Press repeatedly to select the desired title.</p>
<p>3) Selecting the Size of the Pre-programmed Title Indication</p> <p>When you change the title size from [NORMAL] to [LARGE], the Title Indication changes as shown below.</p> <div data-bbox="207 1309 676 1445" style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-right: 20px;"> HOLIDAY </div> → <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-left: 20px;"> HOLIDAY </div> </div>	<p>1</p> <p>After displaying the [TITLE SET MENU] Menu... (p. 16):</p> <div data-bbox="809 1290 977 1406" style="text-align: center;"> </div> <p>Press repeatedly to select [SIZE].</p>	<p>2</p> <div data-bbox="1131 1222 1306 1358" style="text-align: center;"> </div> <p>Press repeatedly to select [NORMAL] or [LARGE].</p>
<p>4) Selecting the Desired Colour of the Pre-programmed Title</p> <p>You can select the colour of the title from among 8 colours.</p>	<p>1</p> <p>After displaying the [TITLE SET MENU] Menu... (p. 16):</p> <div data-bbox="809 1657 977 1773" style="text-align: center;"> </div> <p>Press repeatedly to select [COLOUR].</p>	<p>2</p> <div data-bbox="1131 1590 1306 1725" style="text-align: center;"> </div> <p>Press repeatedly to select the desired colour.</p>

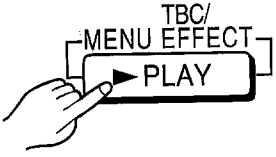
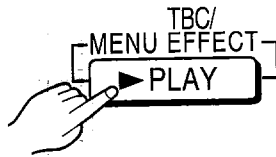
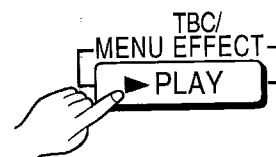
[TITLE SET MENU]

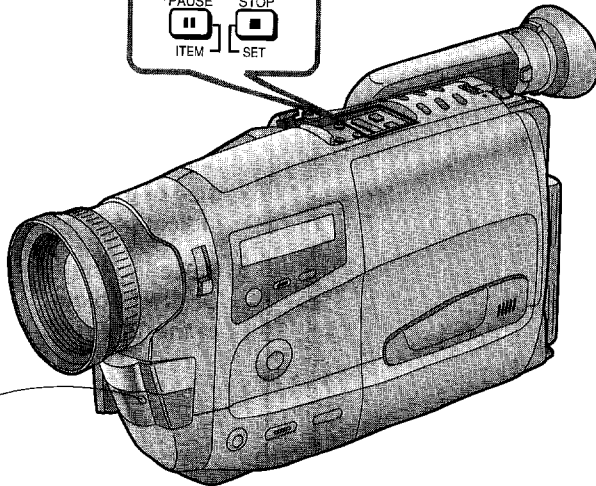
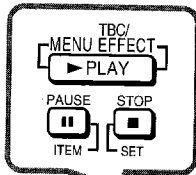
2) Selecting the Desired Title

3) Selecting the Size of the Title Indication

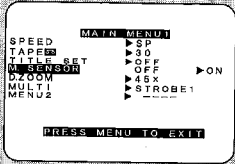
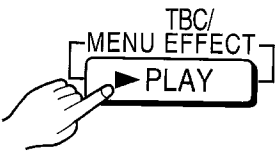
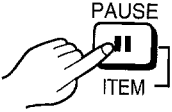
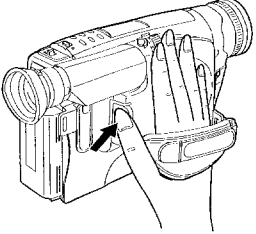
4) Selecting the Desired Colour of the Title



	<i>Remarks, etc.</i>
<p>3</p>  <p>Press twice to exit the Menu.</p>	<ul style="list-style-type: none"> Repeatedly pressing of the [SET] Button changes the title in the following order. (In the other available languages, they are arranged in the same order.) <p>[HOLIDAY] → [HAPPY BIRTHDAY] → [WEDDING] → [FAMILY] → [PARTY] → [THE END] → [CONGRATULATIONS] → [MERRY CHRISTMAS] → [HAPPY MEMORIES] → [HAPPY NEW YEAR] → [HOLIDAY] →</p>
<p>3</p>  <p>Press twice to exit the Menu.</p>	<ul style="list-style-type: none"> When a large-size title is displayed, the indications of the following modes do not appear even if the corresponding modes are activated: Super Image Stabilizer, Digital Zoom, Digital Effects, Manual White Balance, Manual Focus, TBC, Colour for Digital Image, 0 Lux Night View, Auto Power Save, Effect. If you set [SIZE] on the [TITLE SET MENU] Menu to [LARGE], the large "RECORD" and "PAUSE" Indications, which usually appear briefly when you start or stop recording, do not appear.
<p>3</p>  <p>Press twice to exit the Menu.</p>	<ul style="list-style-type: none"> The colours of the title change in the following order: WHITE → YELLOW → MAGENTA → RED → CYAN → GREEN → BLUE → BLACK → WHITE →



The Recording Indicating (Tally) Lamp lights when recording starts.

Title	Procedure	
<p>Motion-Sensor-Controlled Recording</p> <p>In this mode, recording automatically starts when the built-in Motion Sensor detects some movement in the picture.</p> <ul style="list-style-type: none"> Select the desired Date/Time/Title Indications before activating the Motion-Sensor Mode.  <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>STDBY</p> <p>MOTION SENSOR</p> </div> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>▶▶ REC</p> <p>MOTION SENSOR</p> </div>	<p style="text-align: center;">1</p>  <p>Press to make the [MAIN MENU1] Menu appear.</p>	<p style="text-align: center;">2</p>  <p>Press repeatedly to select [M.SENSOR].</p>
	<p>■ To cancel the Motion Sensor Function During Stand-by Set [M.SENSOR] on the [MAIN MENU1] Menu to [OFF].</p>	<p>■ To cancel the Motion Sensor Function During Recording</p>  <p>Keep the Recording Start/Stop Button pressed for 2 seconds.</p>

The Following Recording Situations Could Also Activate the Motion Sensor Function:

- A white wall or another single-colour background behind the subject.
- A subject with horizontal, vertical or oblique stripes.
- Sudden changes in the surrounding brightness.
- Exposure of the Movie Camera to slight shocks or vibration.
- Recording in a dimly lit place. (The "MOTION SENSOR" Indication flashes.)

The Following Recording Situations May Not Activate the Motion Sensor:

- Extremely slow or fast movement of the subject.
- Very little movement of the subject.
- Recording in a dimly lit place. (The "MOTION SENSOR" Indication flashes.)
- A very small subject.
- Movement of the subject near the edge of the picture.
- A background with horizontal or vertical stripes.

The Following Function Do Not Activate in the Motion Sensor Function Stand-by Mode:

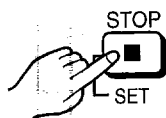
- normal recording
- Super Image Stabilizer
- Digital Zoom
- Digital Effect
- Recording Check
- Camera Search Function

The Following Situations Cancel the Motion Sensor Function:

- If there is a power interruption.
- If an Error Code (p. 25) appears.

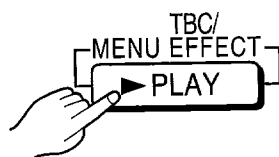
- To prevent accidental recording start caused by Movie Camera movement, the Movie Camera should be mounted on a tripod or be otherwise secured in a very stable position.
- When you use the AC adaptor to power the Movie Camera, the Motion Sensor Function Stand-by Mode will continue when no movement is detected in the picture, even when the tape has reached the end during recording. Therefore, we recommend that you check the tape within a week. When you use the Battery to power the Movie Camera, it remains in the Motion Sensor Function Stand-by Mode until the Battery is discharged, at which time the [CAMERA] Lamp flashes for a few seconds.
- To ensure correct functioning of the Motion Sensor Function, the moving subject should be quite large in the picture. Therefore, when you have zoomed the lens to the maximum wide-angle position, the distance between lens and subject should preferably be within about 2 metres. For subjects at larger distances, be sure to zoom in accordingly.
- The Movie Camera requires time to set up before recording starts. Therefore, the beginning of movement is not recorded.

3



Press to select [ON].

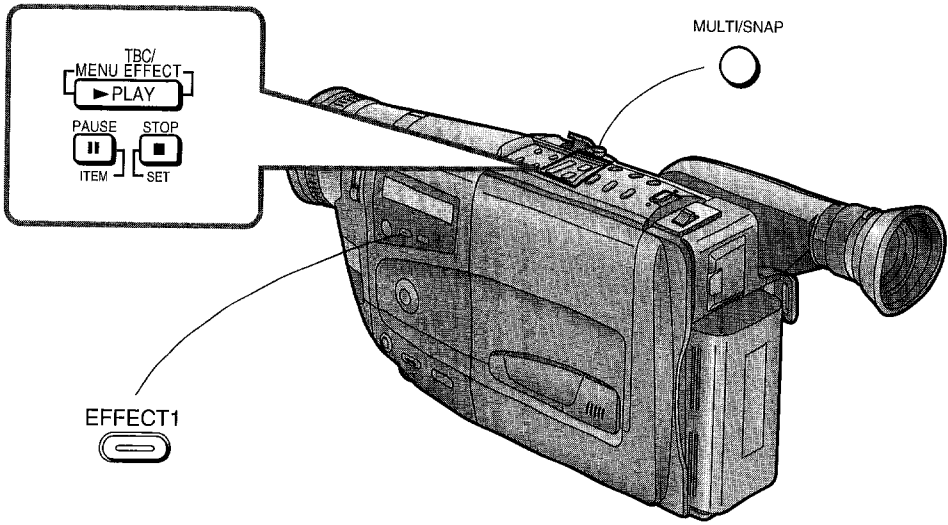
4

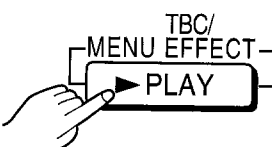
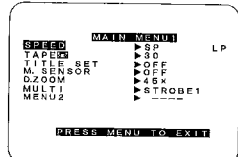
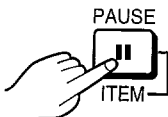
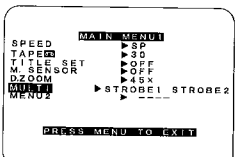
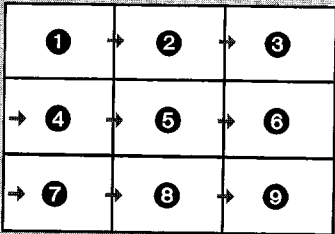
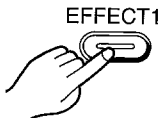



Press to exit the Menu Function and to make the Motion Sensor Function Stand-by "STDBY" Indication appear.

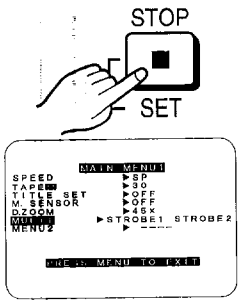
Approximately 1 second after the Movie Camera's Motion Sensor has detected movement in the picture, recording automatically starts. Approximately 10 seconds after movement in the picture has stopped, recording automatically stops and the Movie Camera is in the Motion Sensor Stand-by Mode.

When the Movie Camera remains in the Motion Sensor Stand-by Mode for more than 6 minutes, the Viewfinder automatically turns off to conserve power. When the Motion Sensor again detects movement in the picture, recording automatically restarts after approximately 4 seconds and the Viewfinder turns on.



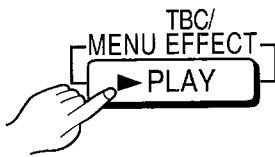
Title	Procedure	
<p>Displaying 9 Small Still Pictures on the Screen (Multi Image)</p> <p>The Multi Image Mode lets you divide the screen into 9 small fields. You can then fill them with still pictures using the Multi Image Strobe 1 Mode (explained below) or the Multi Image Strobe 2 Mode (p. 66). You can use these functions in the Recording, Recording Pause, or Playback Stop Mode.</p> <p>1) Capturing and Displaying a Sequence of 9 Still Pictures (Multi Image Strobe 1 Mode)</p> <p>This function captures and displays a sequence of 9 still pictures over approximately 1.5 seconds. This is very convenient for motion analysis of sports action, animal studies, etc.</p>	<p>1</p>   <p>Press to make the [MAIN MENU1] Menu appears.</p>	<p>2</p>   <p>Press repeatedly to select [MULTI].</p>
	<p>5</p>  <p>Press repeatedly until the "MULTI" indication appears.</p>	<p>6</p>  <p>Press at the scene that you want to capture as a sequence of 9 still pictures. A sequence of 9 still pictures appears.</p>

3



Press to select [STROBE1].

4



Press to exit the menu.

Remarks, etc.

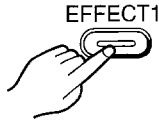
- It is not possible to use the Multi Image Mode together with the Snapshot Mode.
- In the Multi Image Mode, normal fading in/out and using any of the Digital Fade Modes are not possible.
- The Sepia or Black & White Modes cannot be used for the displayed 9 still pictures (even though these indications may appear).
- If you press the [MULTI] Button during recording, a small noise may also be recorded.

■ To erase the 9 Still Pictures

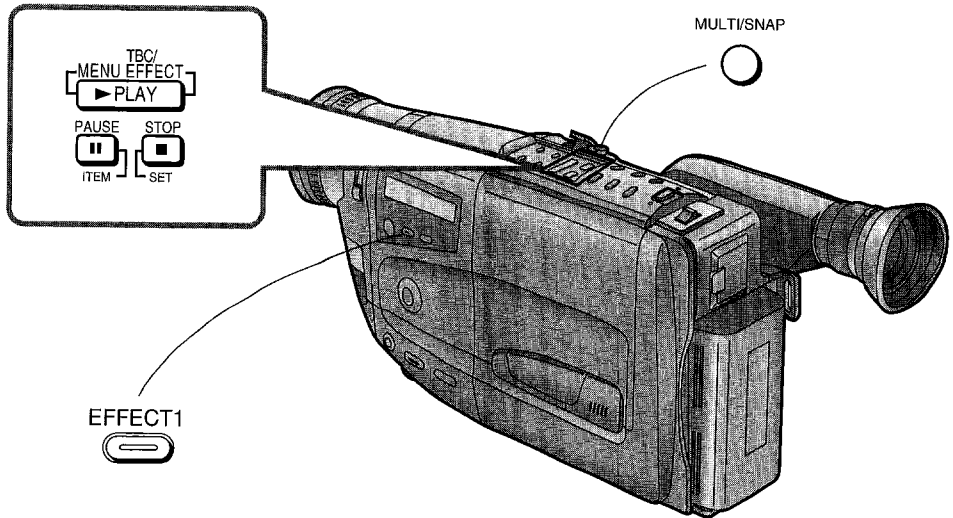


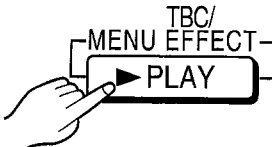
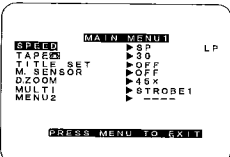
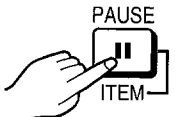
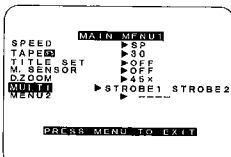
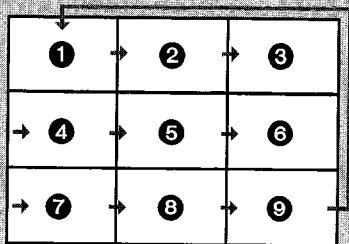
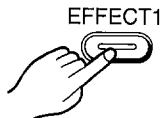

Press. If you press again, another sequence of 9 still pictures is captured and displayed.

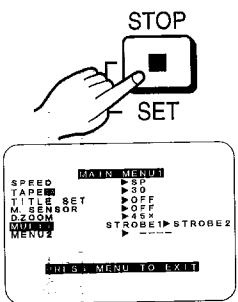
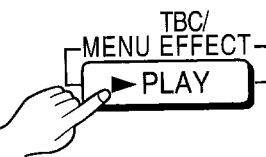

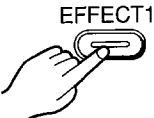
■ To cancel the Multi Image Mode

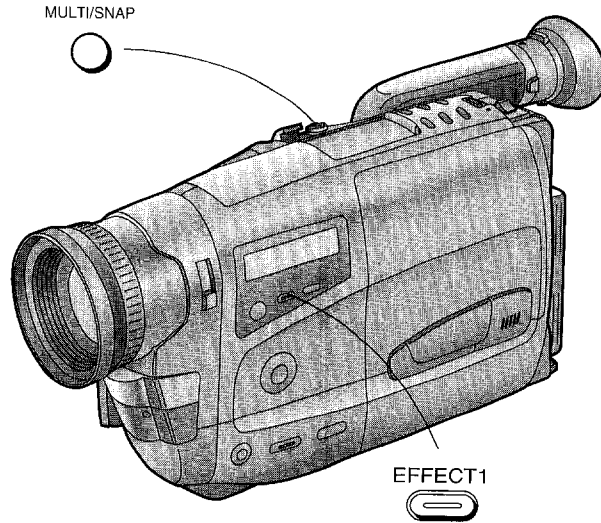


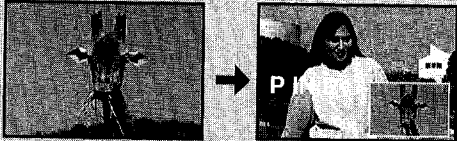
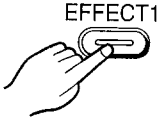


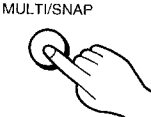
Press repeatedly to make the "MULTI" Indication disappear. Or, keep pressed for more than 2 seconds to make the "MULTI" Indication disappear.

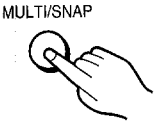
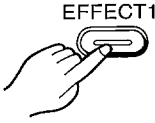
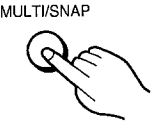


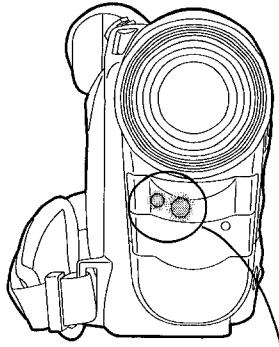
Title	Procedure	
<p>Displaying 9 Small Still Pictures on the Screen (Multi Image) (Cont.)</p> <p>2) Continuously Capturing and Displaying 9 Still Pictures (Multi Image Strobe 2 Mode)</p> <p>This function continuously captures and displays sequences of 9 still pictures taken over approximately 1.5 seconds each.</p>	<p>1</p>   <p>Press to make the [MAIN MENU] Menu appears.</p>	<p>2</p>   <p>Press repeatedly to select [MULTI].</p>
	<p>5</p>  <p>Press repeatedly until the "MULTI" Indication appears.</p>	<p>6</p>  <p>Press at the scene that you want the Multi Image Strobe 2 Function to start.</p>

		Remarks, etc.
<p>3</p>  <p>Press to select [STROBE2].</p>	<p>4</p>  <p>Press to exit the menu.</p>	<ul style="list-style-type: none"> • It is not possible to use the Multi Image Mode together with the Snapshot Mode. • In the Multi Image Mode, normal fading in/out and using any of the Digital Fade Modes are not possible. • The Sepia and Black & White Modes cannot be used for the displayed sequences of 9 still pictures (even though these indications may appear). • If you press the [MULTI] Button during recording, a small noise may also be recorded.
<p>■ Erasing the 9 Still Pictures</p>  <p>After pressing to stop the capturing and displaying of sequences of 9 pictures, press again. If you press once more, the capturing and displaying of sequences of 9 pictures starts again.</p>	<p>■ To cancel the Multi Image Mode</p>  <p>Press repeatedly to make the "MULTI" Indication disappear. Or, keep pressed for more than 2 seconds to make the "MULTI" Indication disappear.</p>	

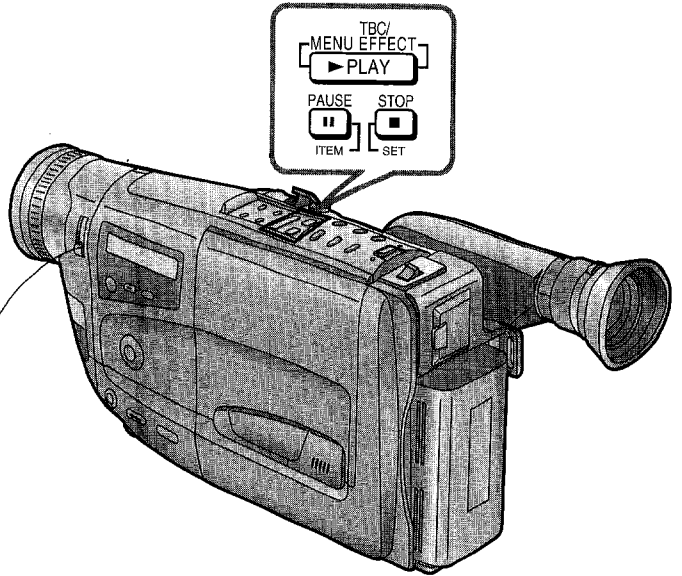


Title	Procedure	
<p>Displaying a Small Still Picture Inside the Normal Picture (Picture-in-Picture)</p> <p>This function lets you display a small still picture inside the normal picture. Therefore, you can write, draw, print, etc. a title, and then capture and insert it as small still picture.</p> <p>You can use this function in the Recording, Recording Pause, or Playback Stop Mode.</p> 	<p>1</p>  <p>Press repeatedly until the "P in P" Indication appears.</p>	<p>2</p>  <p>Aim the Movie Camera at the scene or subject that you want to capture as small still picture and press.</p>
<p>Recording a Still Picture (Snapshot Recording)</p> <p>You can record a still picture together with sound for approximately 5 seconds at the press of a button. This is convenient for example for recording sharp, stable still pictures of signboards, maps, etc. in your videos.</p> 	<p>1</p>  <p>Press in the Recording Pause Mode.</p>	

		Remarks, etc.
<p>■ To erase the Small Picture</p>  <p>Press. If you press again, another small picture is displayed.</p>	<p>■ To Cancel the Picture-in-Picture Mode</p>  <p>Press repeatedly to make the "P IN P" Indication disappear. Or, keep pressed for more than 2 seconds to make the "P IN P" Indication disappear.</p>	<ul style="list-style-type: none"> • It is not possible to use the Picture-in-Picture Mode together with the Snapshot Mode. • In the Picture-in-Picture Mode, normal fading in/out and using any of the Digital Fade Modes are not possible. • The Sepia or Black & White Mode cannot be used for the small picture inside the normal picture (even though these indications may appear). • If you press the [MULTI] Button during recording, a small noise may also be recorded.
<p>■ Shutter Effect Mode</p>  <p>If you set [SHUTTER REC] on the [MAIN MENU2] Menu to [ON], the screen blinks briefly like an SLR photo camera when you press the [SNAP] Button. This visual shutter effect is also recorded.</p>		<ul style="list-style-type: none"> • Since the still picture is recorded in the digital image memory, the picture quality is slightly inferior to that of normally recorded pictures. • To prevent picture distortion, do not move or shake the Movie Camera during still picture recording. • The image stands still and the "SNAP" Indication appears. • The still picture is recorded for approximately 5 seconds. • When using the Snapshot Function repeatedly, wait at least 3-4 seconds before pressing the [SNAP] Button again. • It is not possible to use the Snapshot Mode together with the Mix, Wipe, Multi Image, or Picture-in-Picture Mode.



**built-in Infra-red
Beam Emitters**

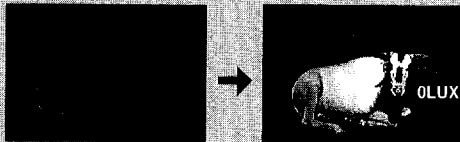


Title

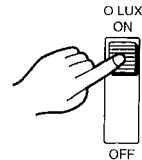
Procedure

**Recording in Dark Places
Without Any Illumination
(0 Lux Night View Function)**

This function is convenient when you want to record at night in places without any illumination, for example for observing the behaviour of nocturnal animals, etc. In this mode, the Movie Camera emits Infrared rays which makes it possible to record subjects that are invisible to the naked eye.



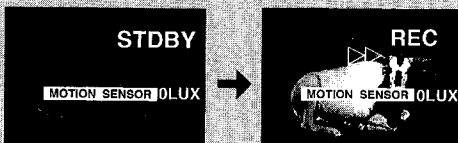
1



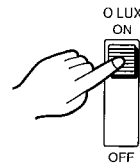
Set to [ON] to make the "0LUX" Indication appear.

**Using the 0 Lux Night View
Function together with the
Motion-Sensor-Controlled
Recording Function in Dark
Places without Any Illumination**

If you use the 0 Lux Night View Function together with the Motion-Sensor-Controlled Recording Function, recording starts automatically when the Movie Camera's built-in Motion Sensor detects some movement in the picture. This combined function is convenient for easy, unattended animal observation recordings at night.

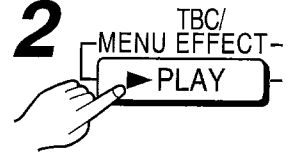


1



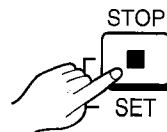
Set to [ON] to make the "0LUX" Indication appear.

2



Press to make the [MAIN MENU1] Menu appear.

4

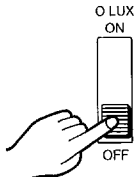
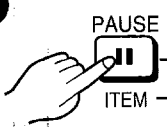
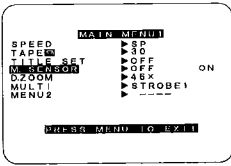


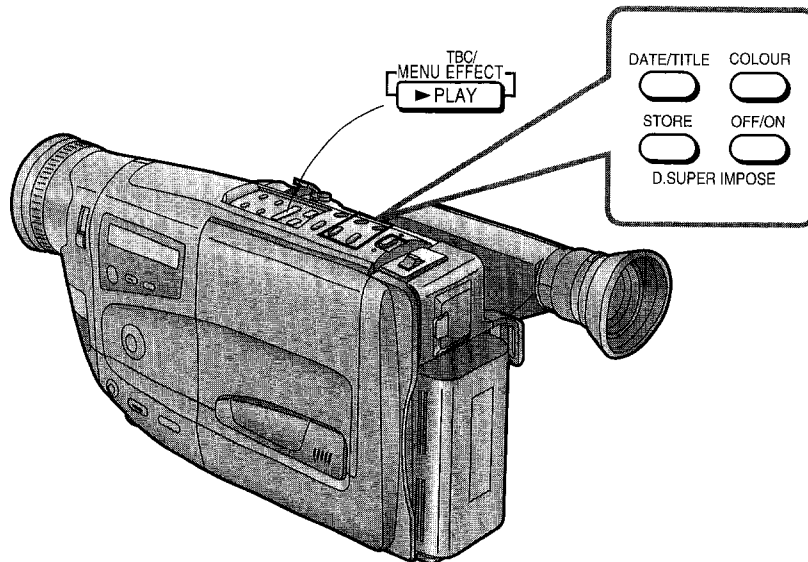
Press to select [ON].

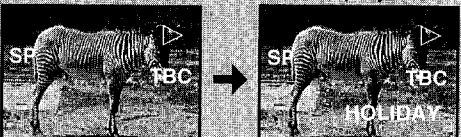
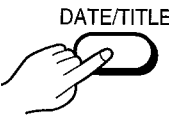
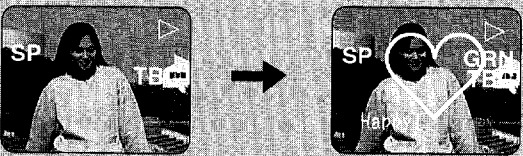
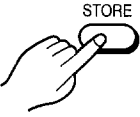
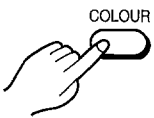
5



Press to exit the Menu. The Motion Sensor Function Stand-by "STDBY" Indication appears.

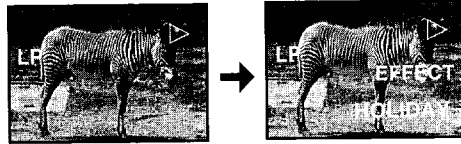
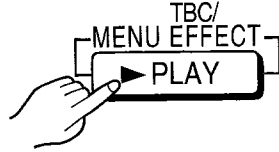
		<i>Remarks, etc.</i>
<p>To cancel this Function</p>  <p>Set to [OFF] to make the "0LUX" Indication disappear.</p>	<p>Notes for Recording in Dark Places Without Any Illumination</p> <ul style="list-style-type: none"> • The built-in Infra-red Beam Emitters light. Be careful not to cover them with your hand when recording. • Do not use the 0 Lux Night View Function in brightly lit places and never aim the Movie Camera against the sun, as this could cause irreparable damage. • The playback picture of scenes recorded with the 0 Lux Night View Function will be in black and white. • If you change the setting of the [0 LUX ON/OFF] Switch during recording, a switching noise is also recorded. • When recording in the 0 Lux Night View Function, it is not possible to adjust the white balance manually or to cancel the manually adjusted white balance setting. • It is not possible to use any of the Programme AE Modes when the 0 Lux Night View Mode is activated. • When using the 0 Lux Night View Function, the subject should be within 3 metres from the Movie Camera. • When the automatic focusing is not precise, adjust the focus manually. • If you do not want the Recording Indicating (Tally) Lamp to light during recording using the 0 Lux Night View Function, set [TALLY LAMP] on the [MAIN MENU2] Menu to [OFF]. • If you use the Macro close-up Function and approach extremely close to the subject when recording in the 0 Lux Night View Function, the infra-red beam from the Movie Camera's built-in Infra-red Beam Emitters may not reach the subject. 	
<p>3</p>   <p>Press repeatedly to select [M.SENSOR].</p>		
<p>To cancel these Function during Stand-by</p> <p>Set [M.SENSOR] on the [MAIN MENU1] Menu to [OFF] and then set the [0 LUX ON/OFF] Switch to [OFF].</p>	<p>To cancel these Function during Recording</p> <p>Press the Recording Start/Stop Button for more than 2 seconds and then set the [0 LUX ON/OFF] Switch to [OFF].</p>	



Title	Procedure
<p>Using Various Functions during Playback</p> <p>With this Movie Camera you can add various effects to the recorded picture during playback. This is especially convenient for creatively enhancing certain scenes when you edit individual recorded scenes into a finished video.</p> <p>1) Playback Title Indication</p> <p>The Date/Time/Title Indication that can be inserted in the pictures during recording (p. 58) can also be inserted in the picture during playback (editing). You can select the desired language, title, colour and size on the [TITLE SET MENU] Menu.</p> <p>In the SP Mode, this function can be used when the [TBC] Indication is displayed, and in the LP Mode, when the [EFFECT] Indication is displayed. Make sure that the corresponding indication is displayed.</p> 	<p>1</p>  <p>During playback, press to superimpose the desired Date/Time/Title Indication.</p>
<p>2) Playback Digital Superimposer</p> <p>This function gives the pictures the same visual effect as the Digital Superimposer Function (p. 50).</p> <p>In the SP Mode, this function can be used when the [TBC] Indication is displayed, and in the LP Mode, when the [EFFECT] Indication is displayed. Make sure that the corresponding indication is displayed.</p> 	<p>■ Storing Your Own Title in the Digital Image Memory</p>  <p>During playback or in the Playback Stop Mode, when you reach the scene that you want to superimpose as a title in another scene, press for more than half a second.</p> <p>■ Selecting the Desired Colour for the Title</p>  <p>While the title is displayed, press repeatedly until the desired colour appears</p>

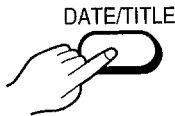
■ **“EFFECT” Indication**

To use various functions during playback in the LP Mode, first display the [EFFECT] Indication by keeping the [EFFECT] Button pressed for a few seconds.



- When you display the [EFFECT] Indication and play back scenes recorded in the LP Mode, slight horizontal shaking may occur in the picture. In this case, keep the [EFFECT] Button pressed until the [EFFECT] Indication disappears. (However, the below functions cannot be used.)

■ **To disappear the superimposed Date/Time/Title Indication**

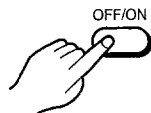


Press again.

Remarks, etc.

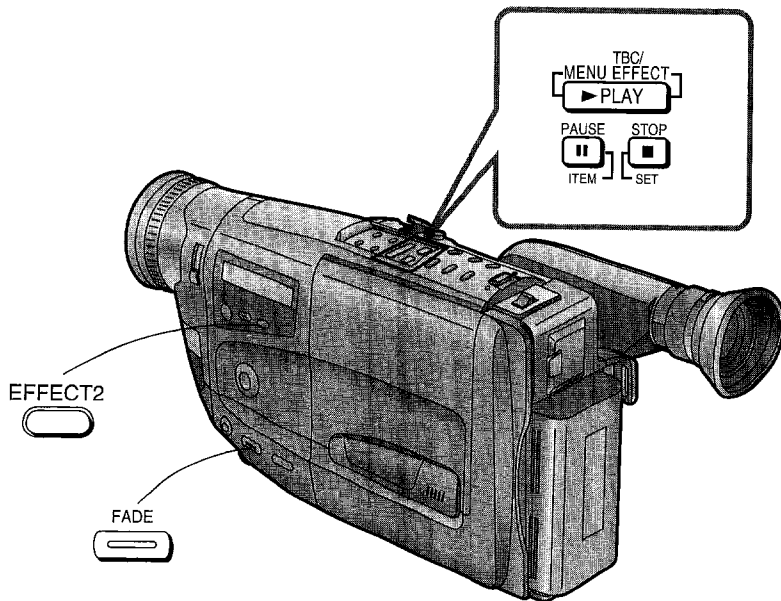
- The date and time are generated by the Movie Camera's built-in clock.

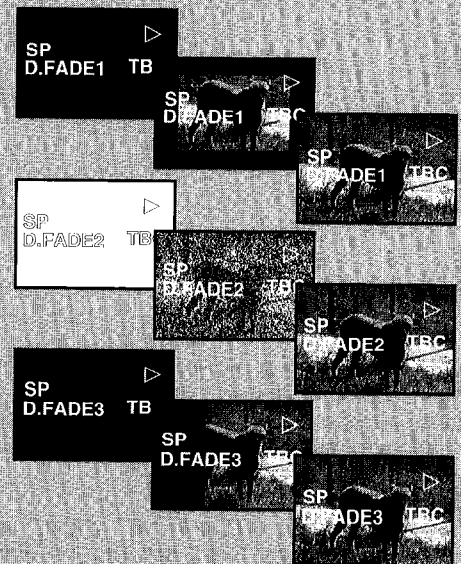
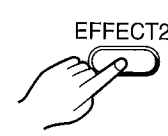
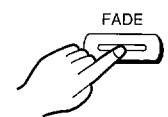
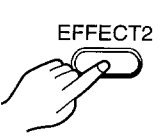
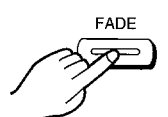
■ **To Cancel the Playback Digital Superimposer Function**



Press to make the title disappear.

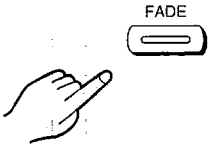
- The title captured in the digital image memory remains on the screen.
- The colours for the title change in the following order:
 White [WHT] → Yellow [YEL] → Magenta [MAG] → Red [RED] → Cyan [CYN] → Green [GRN] → Blue [BLU] → Black [BLK] → White [WHT] →



Title	Procedure	
<p>3) Playback Digital Fade There are 3 Playback Digital Fade Modes available. They are the same as the Digital Fade Modes that can be used for recording (p. 48).</p> <p>In the SP Mode, these functions can be used when the [TBC] Indication is displayed, and in the LP Mode, when the [EFFECT] Indication is displayed. (p. 73) Make sure that the corresponding indication is displayed.</p> 	<p>1 ■ To Fade in:</p>  <p>With the Movie Camera in the VCR Mode ([VCR] Lamp lights), press repeatedly until the desired Digital Fade Indication appears.</p>	<p>2</p>  <p>During playback, keep pressed. The picture disappears gradually with the selected digital fade effect.</p>
	<p>1 ■ To Fade out:</p>  <p>With the Movie Camera in the VCR Mode ([VCR] Lamp lights), press repeatedly until the desired Digital Fade Indication appears.</p>	<p>2</p>  <p>During playback, press at the point where you want to fade out, and keep pressed.</p>

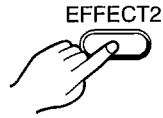


3



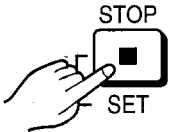
Approximately 3-4 seconds later, release.

■ To Cancel the Selected Digital Fade Function:



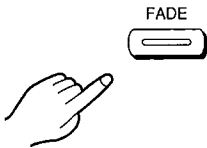
Press repeatedly until none of the Digital Fade Indications are displayed any more.
Or, press for more than 2 seconds so that none of the Digital Fade Indications are displayed any more.

3

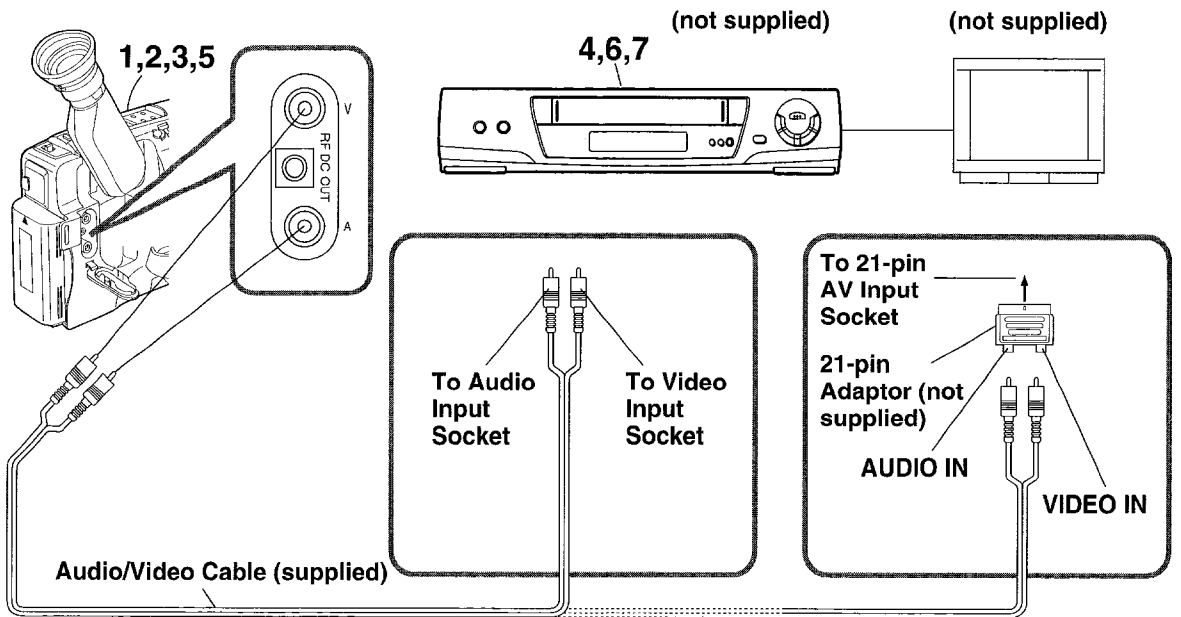


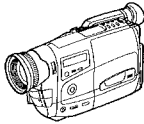

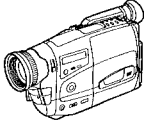
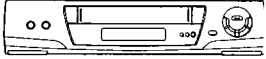
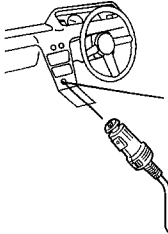
After the picture has completely disappeared, press to make playback stop.

4



Release.

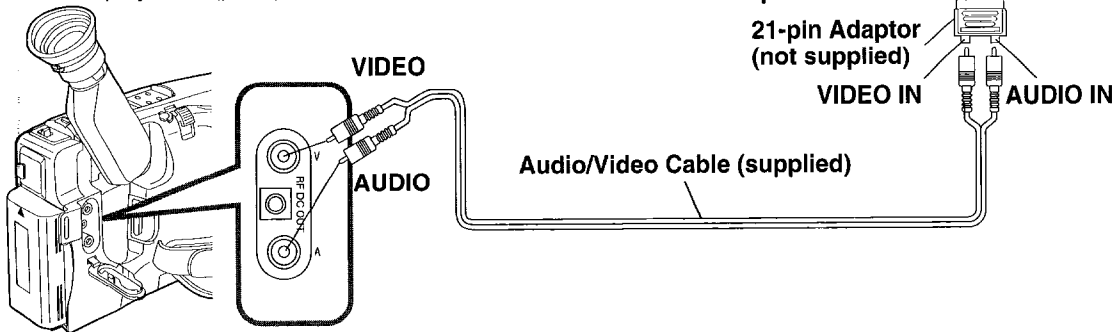


Title	Procedure	
<p>Editing a Previously Recorded Tape</p> <p>Connect the Movie Camera to the VCR using the Audio/Video Cable (supplied) and, if necessary, a 21-pin Adaptor (not supplied).</p>	<p>1</p> <p>Insert the recorded cassette for playback into the Movie Camera.</p> 	<p>2</p> <p>Play back the tape and locate the end of the scene that you want to dub, and write down the tape counter position.</p> 
	<p>5</p> <p>Start the playback.</p> 	<p>6</p> <p>Press the Pause/Still Button to start recording.</p> 
<p>Using the Car Battery Charger (optional)</p>	<p>1 Start the engine.</p>  <p>Cigarette Lighter Socket</p>	

Playing Back on a TV Equipped with 21-pin AV Input Socket

Using the Audio/Video Cable (supplied) and a 21-pin adaptor (not supplied)

Connect after turning off the Movie Camera and the TV. After connections are complete, perform operations for playback. (p. 34)



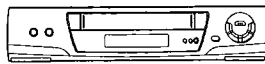
3

rewind the tape and locate the beginning of the scene that you want to dub.



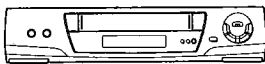
4

Insert the cassette for recording into the VCR and press the Pause/Still Button to put the VCR in the Recording Pause Mode.



7

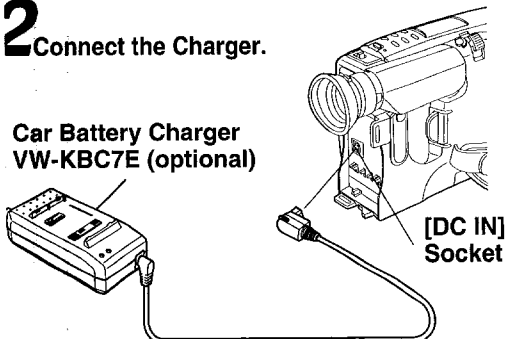
As soon as the Tape Counter Indication on the Movie Camera reaches the position noted in step 2: press the Pause/Still Button to put the VCR in the recording pause mode, thus finishing the dubbing.



2

Connect the Charger.

Car Battery Charger VW-KBC7E (optional)



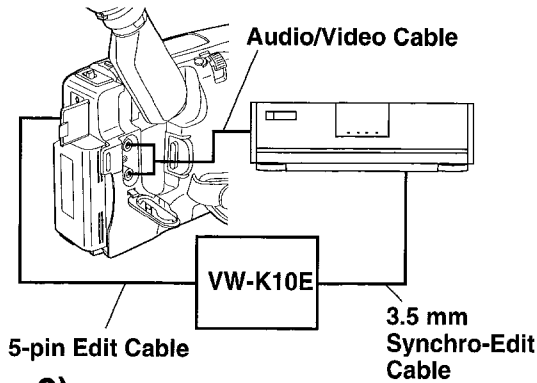
Remarks, etc.

- Also read the Operating Instructions of the VCR.
- The picture quality deteriorates slightly in the dubbing process, however, this can be minimized by selecting the standard recording speed (SP Mode) on the VCR.
- For all additional scenes that you want to dub, follow steps 2 to 7.

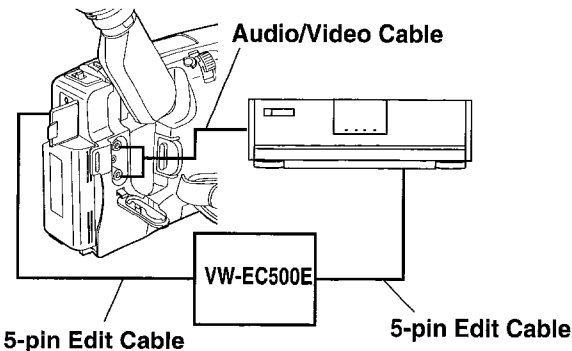
- The Car Battery Charger can be used with 12 V and 24 V DC negative-grounded vehicles.
- Do not start the car engine while the Movie Camera is being powered by the car battery.
- If the voltage drops suddenly e.g. because the car air-conditioner is turned on, the Movie Camera is automatically turned off to protect it. Wait about 10 seconds before turning it on again.

Editing with a Editing Controller

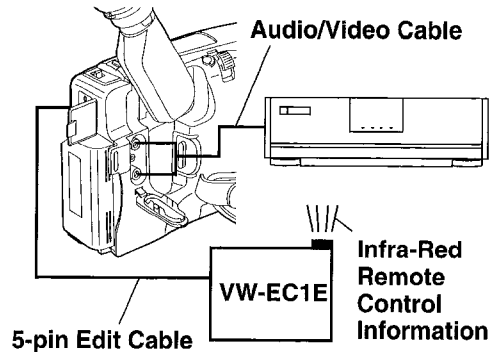
1)



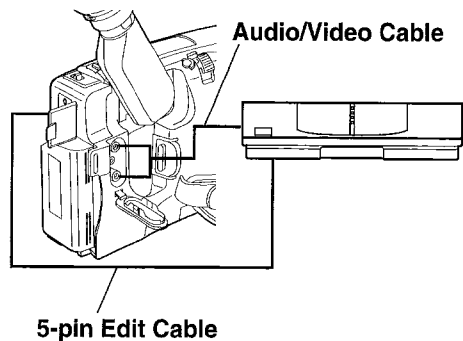
2)



3)



4)



■ [EDIT] Socket

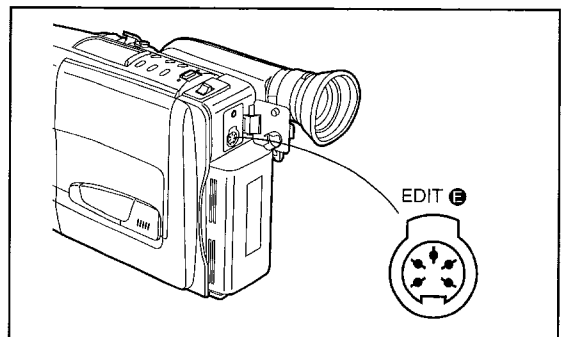
By connecting Panasonic Editing Controller (optional) to this socket as well as to a Panasonic VCR equipped with Edit Socket, highly precise and speedy editing becomes possible. The following types of Editing Controller can be used with this Movie Camera.

- 1) Connecting the Movie Camera to a Panasonic VCR equipped with synchro-edit socket (3.5 mm stereo jack) as the recording unit, using the 5-pin Synchro Cord VW-K10E (optional).
 - This is a single event edit controlling system. Therefore, the user needs to know the start and end points of the scene to be edited and needs to start and stop the editing manually.
- 2) Connecting the Movie Camera to a Panasonic VCR equipped with 5-pin edit socket as the recording unit, using the Editing Controller VW-EC500E (optional).
 - This Editing Controller can be programmed for automatic editing of up to 8 scenes.
- 3) Connecting the Movie Camera to any brand of VCR equipped with Infra-Red Remote Controller as the recording unit, using the Editing Controller VW-EC1E (optional).
 - This Editing Controller can be programmed for automatic editing of up to 4 scenes.




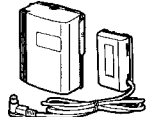
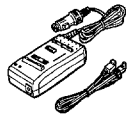





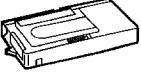


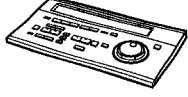

- 4) Connecting the Movie Camera to a Panasonic VCR with built-in Editing Controller. Consult the operating instructions of the VCR for details.

Notes:

- This Movie Camera is not compatible with editing systems of other brands (such as VCRs equipped with a LANC socket).
- 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

AC Adaptor VW-AS7B 	Battery Pack CGR-V610 	Battery Pack CGR-V620 	Battery Pack CGR-V816 	Car Battery Charger VW-KBC7E 
RF Adaptor VW-RF7E 	Filter Kit VW-LF43WE 	Tele Conversion Lens VW-LT4314WE 	Wide Conversion Lens VW-LW4307WE 	Tripod VZ-CT55E 
Cassette Adaptor VW-TCA7E 	Video Titler VW-VT1B 	5-Pin Synchro Cord VW-K10E 	Editing Controller VW-EC500E 	Editing Controller VW-EC1E 

- IR/Video DC Light
VZ-LDR10E
(Halogen & Infra-red)

- Shoe Adaptor
VW-SK11E

Notes:

- Consult your dealer for details of other accessories not listed here.
- Some accessories are not available in some countries.

■ Charging Time and Maximum Time for Continuous Recording

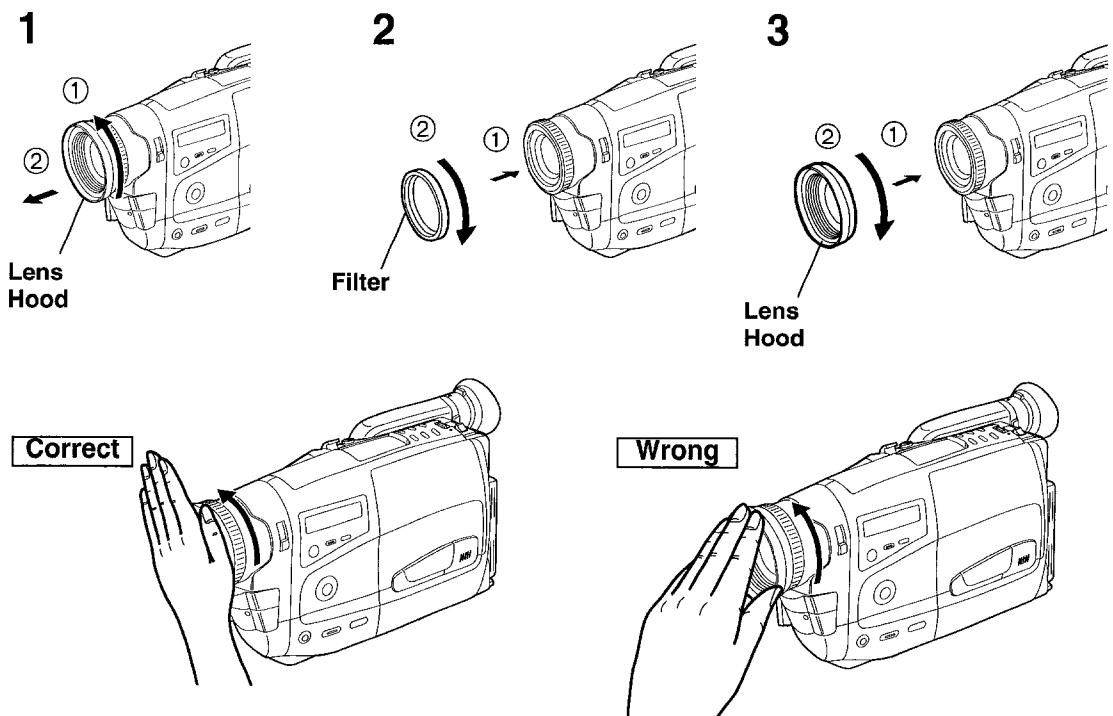
Battery Model No.	Charging Time for a Full Charge	Max. Continuous Recording Time
CGR-V610 (supplied)	Approx. 80 min.	Approx. 105 min.
CGR-V620	Approx. 145 min.	Approx. 225 min.
CGR-V816	Approx. 310 min.	Approx. 440 min.

Battery Model No.	Approx. 30-Minute Charge	Max. Continuous Recording Time
CGR-V610 (supplied)	Approx. 30 min.	Approx. 45 min.
CGR-V620		
CGR-V816		

■ IR/Video DC Light (VZ-LDR10E)

It requires the Shoe Adaptor (VW-SK11E) for attaching to the Movie Camera.

Attaching a Filter (optional)



Note:

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

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

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

Note:

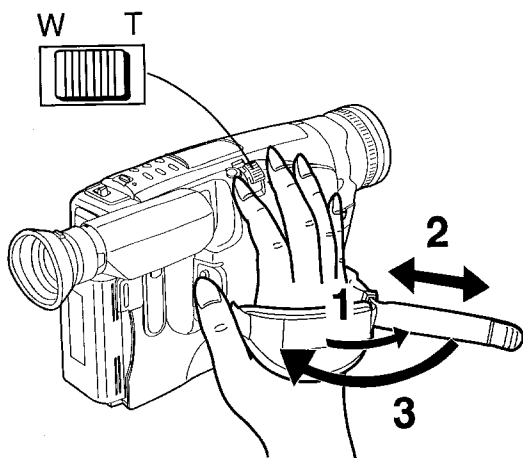
• Filter Kit (VW-LF43WE)

The Filter Kit (VW-LF43WE) contains an ND Filter and an MC Protector.

The ND Filter is recommended for recording in extremely bright places, e.g. on a beach or ski slope. It prevents the picture from becoming whitish, yet without changing the colours. (When recording with the ND Filter attached, the Manual White Balance Adjustment Mode should be used, since the Auto White Balance Adjustment Mode would not work precisely.)

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

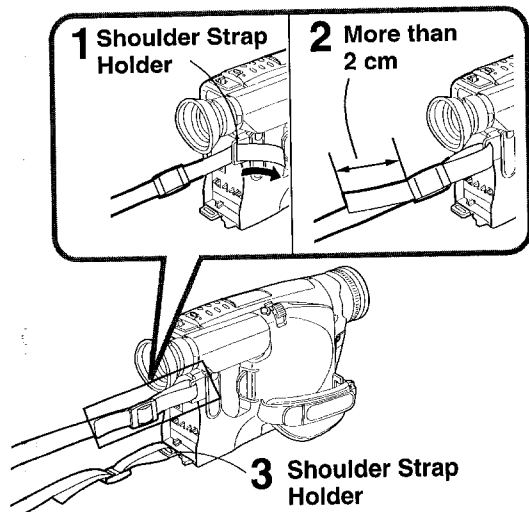
Adjusting the Grip Belt



Adjust the length of the Grip Belt so that you can easily press the Recording Start/Stop Button with your thumb and push the [W•T] Zoom Lever with your index or middle finger.

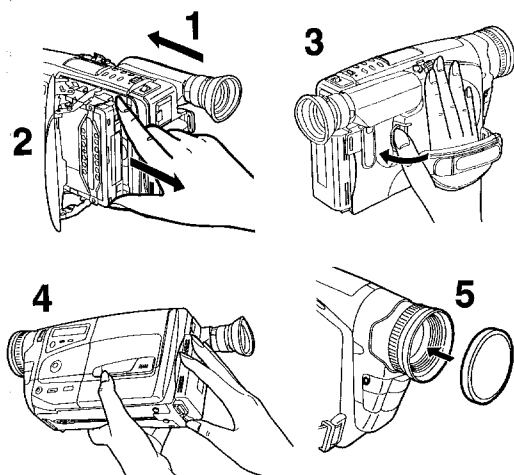
- 1 Unfasten the fastening tape closure.
- 2 Adjust the length to the size of your hand.
- 3 Fasten the fastening tape closure.

Attaching the Shoulder Strap



- 1 Pull the end of the Shoulder Strap through the Shoulder Strap Holder.
- 2 Fasten this end of the Shoulder Strap securely (more than 2 cm).
- 3 Attach the other end of the Shoulder Strap to the other Shoulder Strap Holder on the Movie Camera.

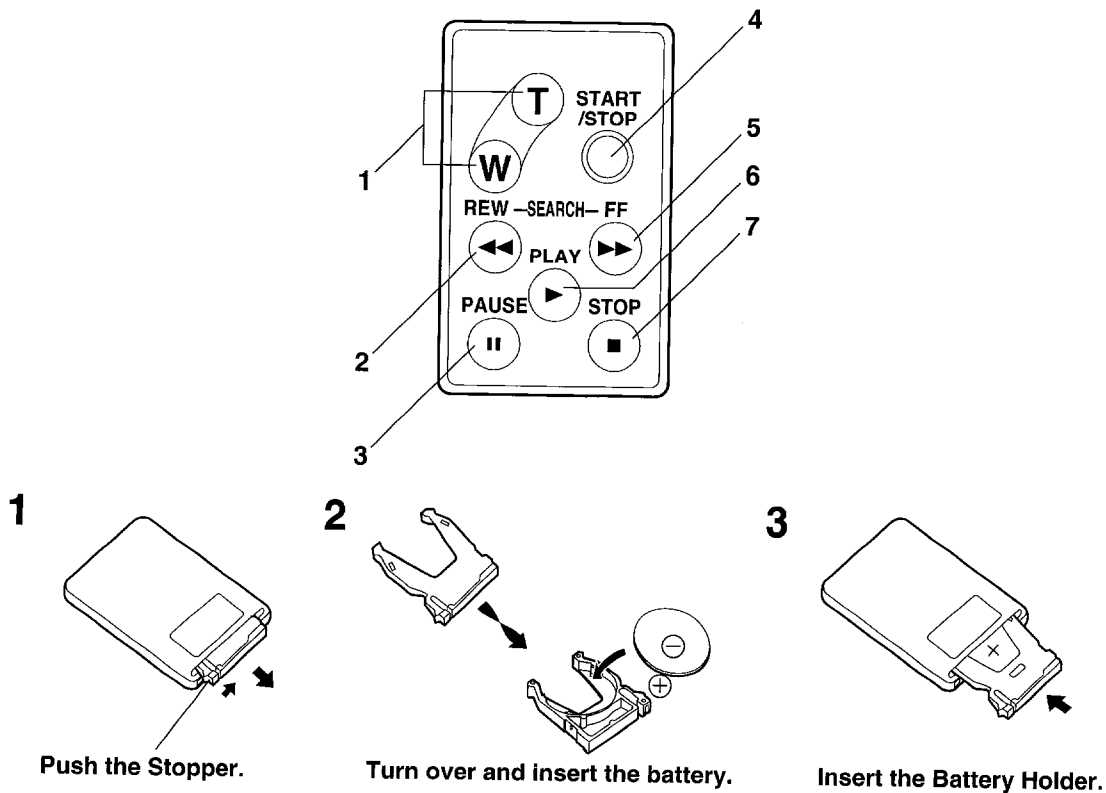
Storage



- 1 Retract the Viewfinder.
- 2 Slide the [▲ EJECT] Lever and remove the cassette. (p. 14)
- 3 Turn the [POWER] Switch in. (The Movie Camera is switched off.)
- 4 Slide the [◀ BATTERY EJECT] Lever to the right and remove the Battery.
- 5 Attach the Lens Cap.

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

Using the Remote Controller



■ Controls and Functions

- 1 **Zoom Buttons [W • T]** (p. 20)
- 2 **Rewind Button [◀◀]** (p. 34, 56)
Use this Button for:
 - Recording Check
 - Review
 - REW (Rewind)
 - Reverse Search
- 3 **Pause Button [||]** (p. 34)
- 4 **Recording Start/Stop Button [START/STOP]** (p. 20)
- 5 **Fast-Forward Button [▶▶]** (p. 34, 56)
Use this Button for:
 - Cue
 - FF (Fast-Forwarding)
 - Forward Search
- 6 **Playback Button [▶]** (p. 34)
- 7 **Stop Button [■]** (p. 34)

■ How to Insert the Button-Type Battery

- 1 Pull out the Battery Holder while pushing the stopper.
- 2 Turn the Battery Holder upside down and insert the battery with the (+) mark facing downward until it locks with a click.
- 3 Insert the Battery Holder into the Remote Controller.

■ Replacing the Button-Type Battery

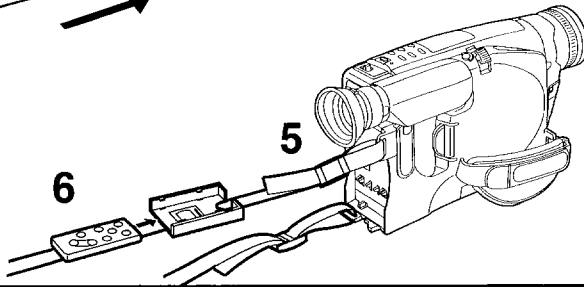
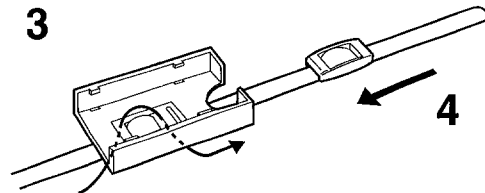
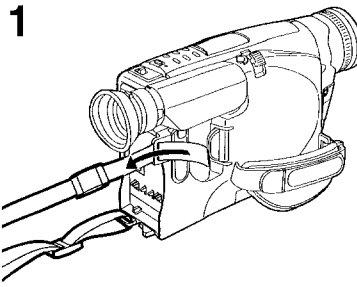
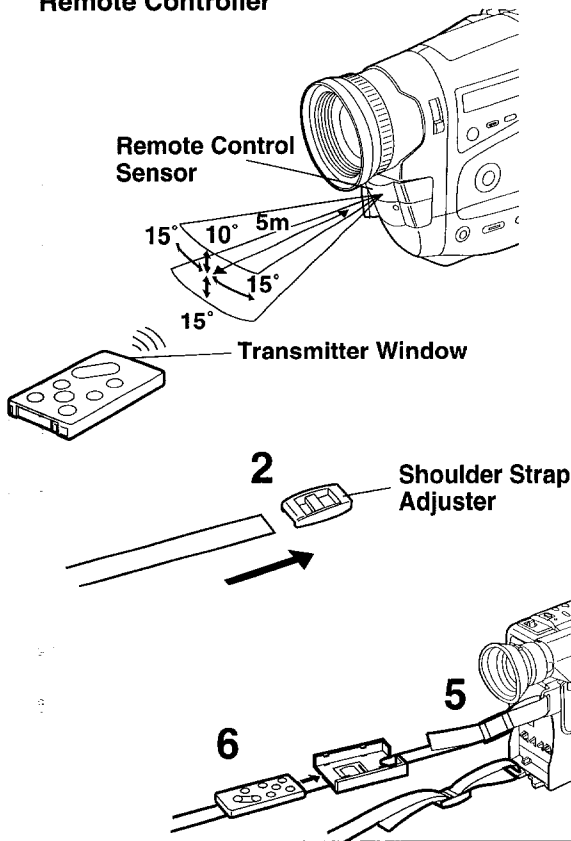
The life of the battery is about one year.
Replace the exhausted battery with a new CR2025 Battery.

Information for your safety

WARNING

“THE LITHIUM BATTERY IS A CRITICAL COMPONENT (TYPE NUMBER CR2025 MANUFACTURED BY PANASONIC). IT MUST NEVER BE SUBJECTED TO EXCESSIVE HEAT OR DISCHARGE. IT MUST THEREFORE ONLY BE FITTED IN EQUIPMENT DESIGNED SPECIFICALLY FOR ITS USE. REPLACEMENT BATTERIES MUST BE OF THE SAME TYPE AND MANUFACTURER. THEY MUST BE FITTED IN THE SAME MANNER AND LOCATION AS THE ORIGINAL BATTERY, WITH THE CORRECT POLARITY CONNECTIONS OBSERVED. DO NOT ATTEMPT TO RE-CHARGE THE OLD BATTERY OR RE-USE IT FOR ANY OTHER PURPOSE. IT SHOULD BE DISPOSED OF IN WASTE PRODUCTS DESTINED FOR BURIAL RATHER THAN INCINERATION.”

■ Operation Range for the Remote Controller



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

Notes:

- Do not cover the Transmitter Window on the Remote Controller with your hand, etc.
- The Remote Controller may not operate correctly if it is used in direct sunlight, near fluorescent lamps or too close to the Movie Camera.
- When using the Remote Controller outdoors, the operating range may become less than 5 metres.
- The zooming speed cannot be changed with the Remote Controller.

To prevent inadvertent operation by other infrared remote controllers, the Movie Camera needs to receive each command signal three times. For this reason, there is a slight delay between pressing the [W] or [T] Button on the Remote Controller and the actual operation of the zoom function on the Movie Camera.

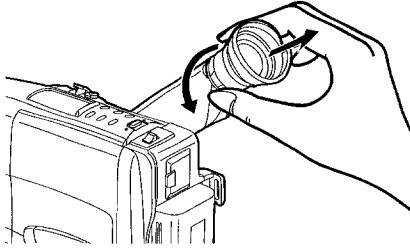
■ Using the Remote Controller Holder

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

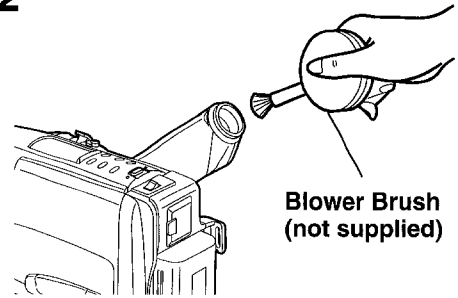
- 1 Remove one end of the Shoulder Strap from the Movie Camera.**
- 2 Remove the Shoulder Strap Adjuster.**
- 3 Pull the Shoulder Strap in the direction of the arrow through the two slits on the back of the Remote Controller Holder.**
- 4 Re-attach the Shoulder Strap Adjuster.**
- 5 Re-attach the Shoulder Strap to the Movie Camera.**
(See "Attaching the Shoulder Strap" on p. 81.)
- 6 Insert the Remote Controller securely into the Holder.**

Cleaning the Viewfinder

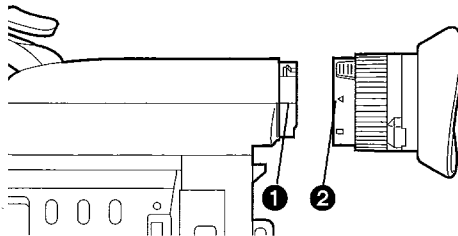
1



2



3



1 Turn the Viewfinder counterclockwise and pull it off.

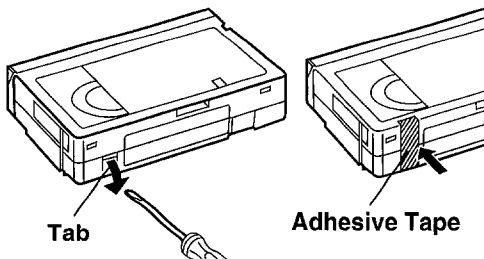
2 Remove dust with a blower brush (not supplied).

3 To re-attach the Viewfinder, insert it so that the marks **1** and **2** are aligned, and then turn the Viewfinder clockwise until it stops.

Note:

If you use a cotton swab or similar to clean the inside of the Viewfinder, use it very carefully to prevent scratching the screen inside the Viewfinder.

Preventing Accidental Erasure of Recordings



When you record on a previously recorded tape, the previously recorded contents are 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 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 Cassette with a Missing Tab:

Cover the hole firmly with two layers of adhesive tape.

Lighting

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

■ Outdoors

Choose a Movie Camera position with the sun behind you, so that the sunlight falls evenly on the subject and makes for a beautiful picture. See the table below and on p. 88 - 89 to decide whether to record in the Auto or Manual White Balance Adjustment Mode, and whether a Filter Kit (optional) or a Video DC Light (optional) is necessary to obtain brilliant pictures with vivid colours.

■ Indoors

It is possible to record indoors under fluorescent, halogen, tungsten or even candlelight. However, note that the brighter the subject is lit, the more

vivid a picture will be obtained. Therefore, we recommend that you brighten up the scene with additional lighting, such as a Video DC Light (optional) or a spotlight. However, if you want to capture the special mood of a dimly lit indoor (or outdoor) scene, recording is possible in the Low Light Mode under weak lighting down to only 0.7 lx. In the Low Light Mode, the picture quality may be impaired by increased picture noise. This is normal and not a malfunction of the unit.

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

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

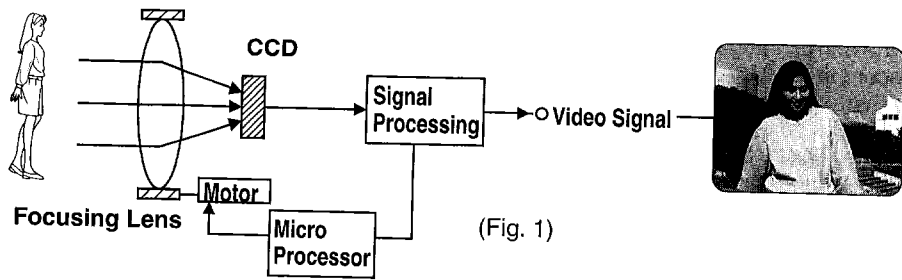
Standard Values of Brightness

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

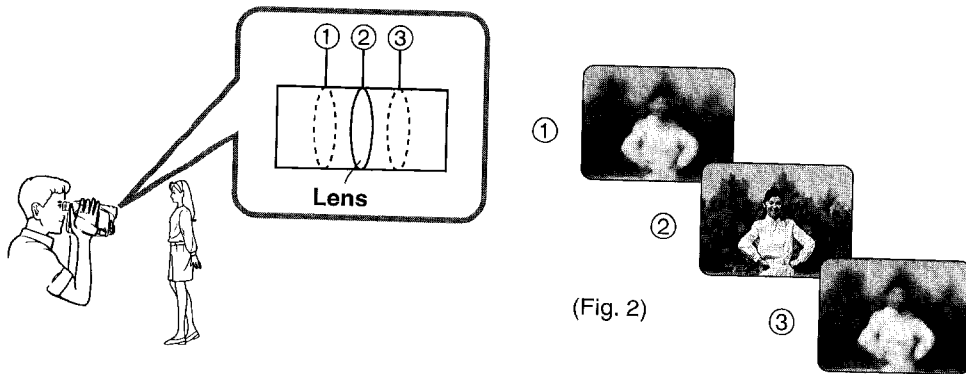
Lux: Unit of illumination (the larger the figure, the brighter the light source)

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

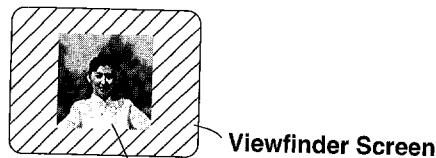
■ How the Auto Focus Mode Works (Automatic Focusing)



(Fig. 1)



(Fig. 2)



(Fig. 3)

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

■ Focusing

If you look at an object through a magnifying glass and move it closer or further away from your eye, you will reach a point where the object becomes clearly visible, and when you move it past that point, it will become blurred again. Being focused or in focus means that the subject is seen with optimum clarity and sharpness. The distance between the lens and the point where the rays of light come together is called "focal distance" or "focal length" and it depends on the size and shape of the lens.

● In Human Eyes

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

● In the Movie Camera

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

■ The Auto Focus Mechanism of this Movie Camera

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

This Panasonic Movie Camera employs the Internal Electronic Focusing Method.

- As shown in Fig. 1 on the left page, when you aim the Movie Camera at the subject you want to record, the microprocessor moves the lens little by little based on the information about vertical contours of the subject in the picture signal. At the point where the vertical contours of the

subject become sharpest, it judges that the subject is in focus and stops the lens.

(See Fig. 2.)

- Special Characteristics of the Movie Camera's Automatic Focus Adjustment Mode.
 - (A) It adjusts the focus for sharpest vertical lines.
 - (B) It adjusts the focus on parts of the subject with strong contrast.
 - (C) It adjusts the focus only on the centre part of the picture on the Viewfinder screen. (The area where the subject is in focus is much smaller than the TV screen, as shown in the Fig. 3.)

Unlike the human eye, however, the Movie Camera's Auto Focus System cannot change the focus from a distant to a close subject without any delay. Therefore, use the Manual Focus Mode when you are going to record under the following circumstances:

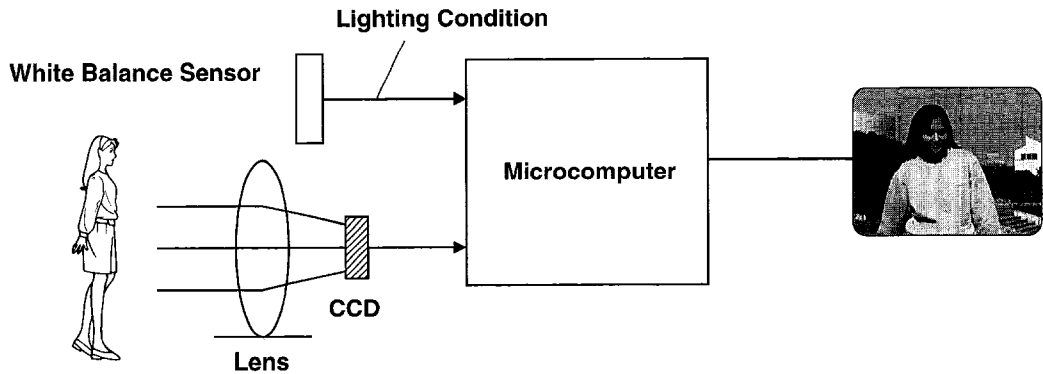
<p>Subjects with Shiny Surfaces or Reflected Light As the Movie Camera adjusts the focus on the subjects with shiny surfaces or much reflected light, the subject may go out of focus.</p> <ul style="list-style-type: none"> ● The subject may be out of focus when it is recorded at the seaside in the evening,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

- Precise focusing may also not be possible for subjects that have no vertical contours or are behind glass covered with dirt, dust or water droplets.
- Fingerprints on the lens may cause incorrect focusing. Especially with the zoom set to wide-angle, the Movie Camera may attempt to focus on the fingerprints (treating them as a macro subject).
- When recording from a moving vehicle, focusing accuracy may be impaired due to the following:
 - a) Recording through a car window covered with dirt or water droplets may cause the Movie Camera to adjust the focus on the window.

- b) Quick changes in scenery leave the Movie Camera no stable vertical contours on which to adjust the focus.
- c) Frequent quick changes in the distance to subject give the Movie Camera no time to adjust the focus.

We suggest that you focus manually when recording from inside a vehicle. Refer to p. 36 and 37 "Recording with Manual Focus Adjustment".

■ How the Auto White Balance Works



■ White Balance

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

● Human Eyes

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

● Movie Camera

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

■ White Balance Adjustment

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

■ Automatic White Balance Adjustment

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

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

■ Manual White Balance Adjustment

With the Manual White Balance Adjustment, the user can adjust the colour compensation for the light source used for a particular scene. For this adjustment, the Lens Cap is put on the lens and the [W.B] Button pressed, so the Movie Camera can determine how much the white of the lens cap under the present lighting deviates from the value for pure white stored in memory. Alternatively, the user can aim the Movie Camera at a pure white object (e.g. a sheet of pure white paper) instead of using the Lens Cap.





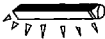





The chart below shows the range of lighting sources within which the Automatic White Balance Adjustment can provide accurate compensation.

For recording under lighting conditions outside this range, use the Manual White Balance Adjustment because the Automatic White Balance Adjustment cannot provide satisfactory results.

■ Colour Temperature and White Balance

The colour temperature of the light source is measured in Kelvin. The higher the Kelvin value, the more bluish the light; the lower the value, the more reddish the light. This is not directly related to the brightness.

The table below shows the relationship between natural light, artificial light and colour temperature.

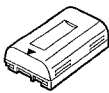
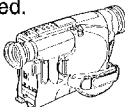
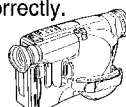
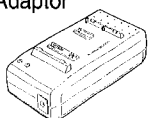
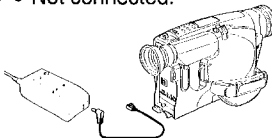
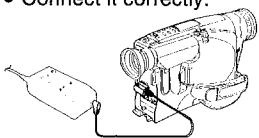
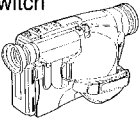
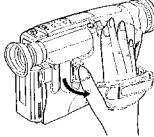


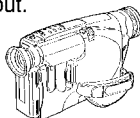
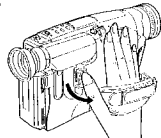
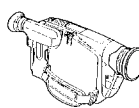
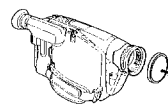
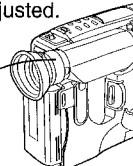
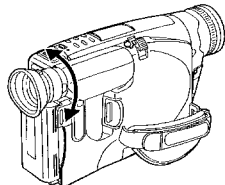
Natural Light	Colour Temperature		Artificial Light	Effect on the Picture
• Blue sky	10,000 K			Bluish colour To record under light sources within this range, use the Manual White Balance Adjustment. (In the Auto White Balance Adjustment, the picture could have a bluish cast.)
• Slightly overcast sky 	7,000 K-8,000 K	8,000 K-9,000 K	• TV screen 	
• Cloudy sky (Rain) 	6,000 K			
• Sunlight 	5,000 K			Whitish colour To record under light sources within this range, you can use the Auto White Balance Adjustment.
		4,800 K	• Fluorescent lamp (white) 	
• 1-2 hours after sunrise or before sunset	3,000 K-4,200 K	2,500 K-3,500 K	• Fluorescent lamp (not white) or studio lamp 	Reddish colour To record under light sources within this range, use the Manual White Balance Adjustment. (In the Auto White Balance Adjustment, the picture could have a reddish cast.)
• Sunrise or sunset 	2,000 K-2,500 K	2,000 K-2,800 K	• Halogen light bulb 	
		2,000 K-2,500 K	• Tungsten lamp 	
		1,500 K-2,000 K	• Candlelight 	



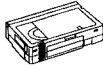







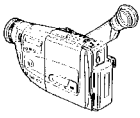
For the following types of scenes, the Automatic White Balance Adjustment cannot provide satisfactory results, even if the light source is

within the effective range of the Automatic White Balance described above. Use the Manual White Balance Adjustment instead.

<p>When a Scene is Lit by Several Light Sources If there are two or more light sources for a scene, the Movie Camera cannot decide which of the stored White Balance Adjustment settings to use. Therefore, precise Automatic White Balance Adjustment is not possible in such cases.</p>	<p>When Recording an Outdoor Scene from Inside a Building As the colour of the light entering through the lens differs greatly from that received by the White Balance Sensor, the Automatic White Balance Adjustment will compensate for indoor lighting and this results in unnatural colours.</p>	<p>When Recording in a Very Dark Place As the colour information entering through the lens is greatly reduced, the Automatic White Balance Adjustment cannot correctly compensate for the colour of the lighting and this results in unnatural colours.</p>
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Before Requesting Service

Item	Symptom	Cause	Action	Reference page
Power 	<ul style="list-style-type: none"> • Movie Camera does not turn on. 	<ul style="list-style-type: none"> • Not attached. 	<ul style="list-style-type: none"> • Attach it correctly. 	12
		<ul style="list-style-type: none"> • Not charged. 	<ul style="list-style-type: none"> • Charge it. 	10
	<ul style="list-style-type: none"> • Movie Camera turns off too soon. 	<ul style="list-style-type: none"> • Exhausted. 	<ul style="list-style-type: none"> • Use a fully charged one. 	10
		<ul style="list-style-type: none"> • Recording was paused for more than 6 minutes. 	<ul style="list-style-type: none"> • Turn [POWER] Switch in to turn off Movie Camera, and then turn it out again to turn on Movie Camera. 	21
Power 	<ul style="list-style-type: none"> • Movie Camera does not turn on. 	<ul style="list-style-type: none"> • Not connected. 	<ul style="list-style-type: none"> • Connect it correctly. 	8
	<ul style="list-style-type: none"> • Movie Camera does not turn on. 	<ul style="list-style-type: none"> • [POWER] Switch is not turned out. 	<ul style="list-style-type: none"> • Turn it out. 	14
Power 	<ul style="list-style-type: none"> • Movie Camera turns off too soon. 	<ul style="list-style-type: none"> • Condensation has formed inside. 	<ul style="list-style-type: none"> • Wait several hours. 	93
	Recording 	<ul style="list-style-type: none"> • No picture is visible in the Viewfinder. 	<ul style="list-style-type: none"> • [POWER] Switch is not turned out. 	<ul style="list-style-type: none"> • Turn it out. 
<ul style="list-style-type: none"> • Lens Cap is attached. 			<ul style="list-style-type: none"> • Remove it. 	14
<ul style="list-style-type: none"> • Indications in the Viewfinder are not clear. 		<ul style="list-style-type: none"> • Eyepiece Corrector Ring is not adjusted. 	<ul style="list-style-type: none"> • Adjust it. 	14
		<ul style="list-style-type: none"> • Viewfinder is dirty. 	<ul style="list-style-type: none"> • Clean it. 	84

Item	Symptom	Cause	Action	Reference Page
	<ul style="list-style-type: none"> Recording cannot be started. 	<ul style="list-style-type: none"> Erasure prevention tab of inserted cassette is broken off.  	<ul style="list-style-type: none"> Cover the tab hole with adhesive tape.  	84
		<ul style="list-style-type: none"> No cassette is inserted.  	<ul style="list-style-type: none"> Insert a cassette with intact erasure prevention tab. 	14
		<ul style="list-style-type: none"> Tape has reached its end.  	<ul style="list-style-type: none"> Insert a new one. 	14
	<ul style="list-style-type: none"> Date and time cannot be recorded. 	<ul style="list-style-type: none"> Date and time are not set.  	<ul style="list-style-type: none"> Set the date and time.  	18
	<ul style="list-style-type: none"> Date/Time/Title Indication is not displayed in the Viewfinder. 	<ul style="list-style-type: none"> Incorrect operation of [DATE/TITLE] and/or [MENU] Buttons.  	<ul style="list-style-type: none"> Press [MENU] Button and set desired Date/Time/Title Indication, and then press [DATE/TITLE] Button so that Date/Time/Title Indication appears.  	58
	<ul style="list-style-type: none"> "U11/⊗" appears in the Viewfinder. 	<ul style="list-style-type: none"> Built-in Lithium Battery is exhausted. 	<ul style="list-style-type: none"> Recharge built-in Lithium Battery. 	19
 	<ul style="list-style-type: none"> No picture. 	<ul style="list-style-type: none"> [POWER] Switch is not turned out. 	<ul style="list-style-type: none"> Turn switch out and press [VCR/CAMERA] Button so that [VCR] Lamp lights up. 	34
		<ul style="list-style-type: none"> Not connected or incorrectly connected to TV. 	<ul style="list-style-type: none"> Connect correctly. 	8
		<ul style="list-style-type: none"> Wrong channel is selected on TV. 	<ul style="list-style-type: none"> Select the correct channel. 	—
	<ul style="list-style-type: none"> Picture is distorted or not in colour. 	<ul style="list-style-type: none"> Tracking is not adjusted. 	<ul style="list-style-type: none"> Adjust tracking. 	56
	<ul style="list-style-type: none"> Picture contains noise bars. 	<ul style="list-style-type: none"> Cue, Review or Still Playback is activated. 	<ul style="list-style-type: none"> It is not a malfunction. 	34
	<ul style="list-style-type: none"> Operation with Remote Controller is not possible. 	<ul style="list-style-type: none"> Remote Controller's battery is exhausted. 	<ul style="list-style-type: none"> Replace it with a new one (CR2025). 	82
		<ul style="list-style-type: none"> Battery is not inserted correctly. 	<ul style="list-style-type: none"> Insert battery with its poles correctly aligned. 	82
Demonstration Mode	<ul style="list-style-type: none"> Movie Camera remains in Demonstration Mode. 	<ul style="list-style-type: none"> Demonstration Mode is designed for explaining functions of this Movie Camera. 	<ul style="list-style-type: none"> Turn in [POWER] Switch and then turn it out again while pressing [STOP] Button. Or, set [DEMO MODE] on [MAIN MENU2] Menu to [OFF]. 	99

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 the Movie Camera. (If the AC Adaptor is being used, disconnect it from the AC mains socket.)
- Do not aim the Lens at the sun. (This could damage internal parts of the Movie Camera.)
- Do not use it in the water or in places where water or some other liquid could splash on it. (If it is accidentally dropped into water while the AC Adaptor is being used, disconnect it from the AC mains socket.)
- Take care that water splashes (especially seawater) or dust do not enter the Movie Camera. If seawater has accidentally splashed onto the Movie Camera, moisten a soft cloth with tap water, wring it out well and carefully wipe the camera body with it. Then thoroughly wipe it with a soft, dry cloth.
- Do not use it with the cassette compartment facing down. (This could cause uneven winding of the tape.)
- Do not insert or remove the 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 very close to a radio, TV etc.
- Do not use it in places with steam or oily smoke.
- When unplugging the AC Mains Lead, 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).

■ Optimum Use of the Battery

Special Characteristics of the Battery

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

After Use, Always Remove the Battery.

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

Discarding a Battery That Has Become Unusable

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

Keep the Battery's Terminals Clean.

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

■ Precautions for Storage

- **Before Storing the Movie Camera, Take out the Cassette and Remove the Battery.**
- Store all equipment in a dry place where the temperature remains relatively constant. (Recommended temperature is 15°C–25°C and recommended relative humidity is 40%–60%.)
- Do not leave it in direct contact with rubber or plastic products for a long time.
- Keep it out of reach of children.

Movie Camera

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

Battery

- Extremely low or high temperature shortens the Battery life.
- Storing it in places with oily smoke and a lot of dust could cause the terminals to rust, and this can result in a malfunction.
- **Do not allow metal objects (such as necklaces and hair pins) to touch the battery terminals. Short-circuiting could occur and generate heat, and touching it in this condition could inflict serious burns.**
- Store the Battery in discharged condition. If you store the Battery for a long time, we recommend that you charge it once a year and completely use up the charge before storing it again in discharged condition.

Cassette

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

■ Cautions for Transport

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

Condensation

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

■ Symptoms of Condensation

- If the following symptoms occur, condensation has formed inside the Movie Camera.
 - ① The Condensation Indication “U10/☒” in the Viewfinder flashes.
(After this indication flashes for a few seconds, the Movie Camera automatically turns off.)
 - ② When you turn on the Movie Camera, it turns off.
(However, the Movie Camera also turns off when the Battery is discharged.)

■ 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:

Use it when recording outdoors and indoors, when there is no AC mains socket available.

2) AC Adaptor:

Use it to connect the Movie Camera to a mains socket when recording indoors or near an AC mains socket outdoors.

It can also be used to save battery power when setting the time and date of the built-in clock, or when trying out some camera functions.

3) Car Battery Charger:

Use the Car Battery Charger (optional) to connect the Movie Camera to the cigarette lighter socket in a car or other vehicle.

Q: Even though I charged the Battery, its operation time is much shorter than indicated. Why is that?

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

1) The maximum operation time of the Battery listed in the Operating Instructions is for continuous recording at an ambient temperature of 25°C. However, the use of the zoom and other functions increases the power consumption, so that the actual recording time per Battery is 30%–50% less than for continuous recording.

2) The Battery is used at a place with low temperature e.g. a ski slope.

The useful operation time of the Battery becomes shorter as the ambient temperature gets lower.

When you record on a ski slope, for example, it may be possible to record no longer than 5 minutes, even when you use a fully charged Battery. Therefore, we recommend that you take along 3–5 times as many charged Batteries as you would for recording at normal temperature. Also, using large-capacity Batteries will give you greatly extended uninterrupted recording time of normal ones.

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

A: Observe the following points faithfully:

1) Charge the Battery shortly before use or on the day before.

2) When you have finished the recording of a scene, turn the Movie Camera off.

3) Since the operation time of the Battery 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 is not being used, remove it from the Movie Camera, AC Adaptor or Car Battery Charger and store it in a cool place. If you leave the Battery attached to the Movie Camera for a very long period of time, excessive discharging may occur, and it may not be possible to use that Battery again.

5) When carrying or storing the Battery, ensure that no metal objects e.g. keys, etc. touch the connectors of the Battery.

Q: The Battery discharges quickly.

A: 1) If the Battery is discharged, charge it until the Charge Lamp on the AC Adaptor turns off. (p. 10)

2) The ambient temperature greatly influences the Battery's performance. If it is used in a cold place, its operation time could become very short. (p. 92)

3) Has the Battery reached the end of its service life? The service life of the Battery is limited, but its length depends on the way the Battery is used. When the operation time – even after proper charging – is too short for normal use, the service life of the Battery has reached its end. Replace it with a new one.

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

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

1) The Battery is completely discharged.

2) Condensation has formed inside the Movie Camera.

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

A: If you leave the Movie Camera in the Recording Pause Mode for more than 6 minutes, it automatically turns off to protect the video tape and to conserve battery power. Turn it the [POWER] Switch to switch the Movie Camera off, and then turn it out again to switch the Movie Camera on.

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

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

2 Cassettes

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

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

Q: What is the difference between "VHS" and "S-VHS" 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 in the S-VHS system, these recordings can only be played back on equipment bearing the "S-VHS" or "SQPB" logo.

■ Format Compatibility Chart:

Cassette	Equipment for Recording		Recording System	Equipment for Playback		Playback System
	VHS	S-VHS		VHS	S-VHS	
S-VHS	VHS	Movie Camera or VCR	VHS	VHS	Movie Camera or VCR	VHS
	S-VHS		S-VHS	S-VHS SQPB		S-VHS

Questions & Answers (cont.)

Q: Is it possible to record on both sides of a cassette?

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

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

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

Q: Does the security scanning equipment at airports damage 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 cassette is broken out, you cannot record on that cassette any more. However, when you want to record again on that cassette, firmly cover the hole where the tab was with two layers of adhesive tape.

Q: What precautions must be observed for handling cassettes?

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

- 1) Before inserting a 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 recording, remove the cassette from the Movie Camera, put it back into its case and store it in vertical position.
Stacking the cassettes could deform them and damage the edges of the tape.
- 3) Since the 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 the cassettes near electronic equipment with a strong magnetic field.
- 5) Be sure to fully rewind the tape to its beginning before storing the cassette.
- 6) Expose the tape to air once a year by fast-forwarding and then rewinding it.

Q: What do SP and LP stand for?

A: "SP" stands for Standard Play. Recording and playback are possible for the duration indicated on the cassette.
"LP" stands for Long Play. Recording and playback are possible for approximately double the duration indicated on the cassette. While it is more economical, the picture quality is slightly inferior to that of the SP mode.
(For example, on a cassette EC60, Recording is possible for 60 minutes in the SP mode and for 120 minutes in the LP mode.)

3 Recording

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

A: A subject that is brightly lit by spotlights and 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. In such a situation, it is also effective to use the Spotlight Mode of the Movie Camera's Programme AE Function. (p. 54)

Q: Even though the scene was brightly lit, the subject's face appears too dark in the playback picture. How can I prevent this?

A: It is a basic rule to record 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 recording. Be careful when recording 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.

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

A: Pay attention to the following 4 points:

1) Splashing Sea Water

Take care that no water splashes onto the Movie Camera as this may result in damage to the Movie Camera.

2) Sand (Dust)

Take great care that fine sand does not enter the Movie Camera, as it can cause a serious malfunction.

Also, do not insert or remove the cassette in dusty conditions.

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 a malfunction.

4) Light (Too bright)

The reflection of light on a beach in summer is much stronger than may be realised. Just as you can see much more comfortably under such conditions if you wear sunglasses, the pictures recorded with an 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. When recording a relatively dark subject against a bright background, it is effective to use the Surf & Snow Mode of the Movie Camera's Programme AE Function. (p. 54)

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

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

Questions & Answers (cont.)

Q: What precautions must be observed for recording 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 recording, 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. Be sure to take along extra Batteries. 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.

In such a situation, it is also effective to use the Surf & Snow Mode of the Movie Camera's Programme AE Function. (p. 54)

However, if you want to capture the subject together with much background, we recommend that you use the ND Filter of the Filter Kit (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 forms inside the Movie Camera and the cassette. This is the biggest danger to the proper functioning of the Movie Camera. If the Condensation Indication appears in the Viewfinder, recording is no longer possible. Immediately take out the 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 recording 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 recording.

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 acclimatise to the room temperature.

4 Playback

Q: When on holidays in a foreign country, can I play back the recordings made with this Movie Camera via a TV in that country?

A: Basically, there are 3 different television systems used in the world. If the TV uses the same television system as this Movie Camera (PAL), 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 VCR a cassette recorded with this 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 VCR.

When recording and playback are performed with the same Movie Camera, the tracking matches precisely.

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

A: Select the video playback channel on the TV.

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

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

Demonstration Mode (Shipping Condition)

If you connect the AC Adaptor to the Movie Camera, turn the Movie Camera on without any cassette inserted, and leave it on for approximately 10 minutes without performing any operation, it automatically switches over to the Demonstration Mode. The Movie Camera remains in this mode until you turn it off and disconnect the AC Adaptor.

■ **To Cancel the Demonstration Mode**

Set [DEMO MODE] on the [MAIN MENU2] Menu to [OFF].

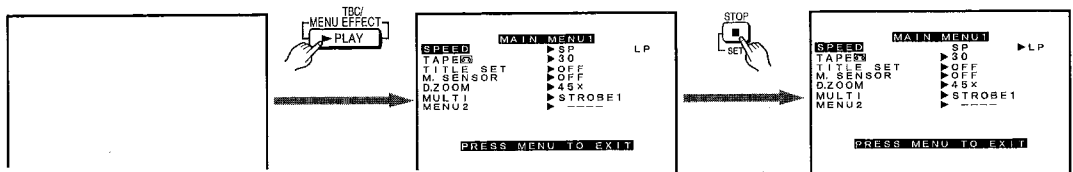
Or, turn in the [POWER] Switch to turn the Movie Camera off, then turn it out again while pressing the [STOP] Button. (This cancels the Demonstration Mode even if [DEMO MODE] on the [MAIN MENU2] Menu is still set to [ON].)

■ **To Reactivate the Demonstration Mode**



Set [DEMO MODE] on the [MAIN MENU2] Menu to [ON].

Or, turn out the [POWER] Switch while pressing the [PLAY] Button. (This reactivates the Demonstration Mode even if [DEMO MODE] on the [MAIN MENU2] Menu is still set to [OFF].)

Flow Chart of the Main Menu 1



Flow Chart of the Title Set Menu

 KG1J	Door No. 3	 51
	Drop No. 0	
Customer: TECHNICA42		
Load: SPOTU1		
Model: VQT7858	Qty: 1	
Assemble at: 60	04/07/00	

Index

A

AC Adaptor (p. 8, 10)
AC mains socket (p. 8, 10)
[A] Socket (p. 8, 76, 77)
Auto Focus Mode (p. 36)
Automatic White Balance Adjustment (p. 38)
Auto Mode (p. 20)

B

[BACKLIGHT] Button (p. 40)
[◀BATTERY EJECT] Lever (p. 12, 81)
Battery (p. 10, 12)
Before Requesting Service (p. 90)
Built-in Lithium Battery (p. 19)
“B/W” Indication (p. 42)

C

[CAMERA] Indication Lamp (p. 14, 20)
Camera Search Function (p. 56)
Cassette Compartment (p. 14)
“CHK” Indication (p. 56)
[COLOUR] Button (p. 50)
Condensation (p. 93)
Cue Playback (p. 34)

D

[DATE/TITLE] Button (p. 18, 59)
Date/Time Setting (p. 18)
[DC IN] Socket (p. 8)
Digital Zoom Function (p. 44)

E

[EFFECT1] Button (p. 42, 44)
[EFFECT2] Button (p. 42, 48)
[▲ EJECT] Lever (p. 14, 81)
Error Code (p. 25)
Eyepiece Corrector Ring (p. 14)

F

[FADE] Button (p. 40, 48)
FF (Fast-Forward) (p. 34)
[FOCUS] Button (p. 36)
Focus Ring (p. 36)

G

Grip Belt (p. 81)

H

Head Clogging (p. 91)

I

Index signals (p. 21)
[ITEM] Button (p. 16, 58, 60)

L

Lens Cap (p. 14, 38)
[LOCK] Button (p. 15)
Low Light Mode (p. 54)

M

Manual Focus Mode (p. 36)
Manual White Balance Adjustment (p. 38)
Max. Continuous Recording Time with Battery (p. 10, 79)
[MEMORY] Button (p. 22)
[MENU] Button (p. 16, 58, 60)
“MOSAIC” Indication (p. 42)
Motion Sensor (p. 62)
Multi Info Window (p. 30)

N

“NEGA” Indication (p. 42)

