

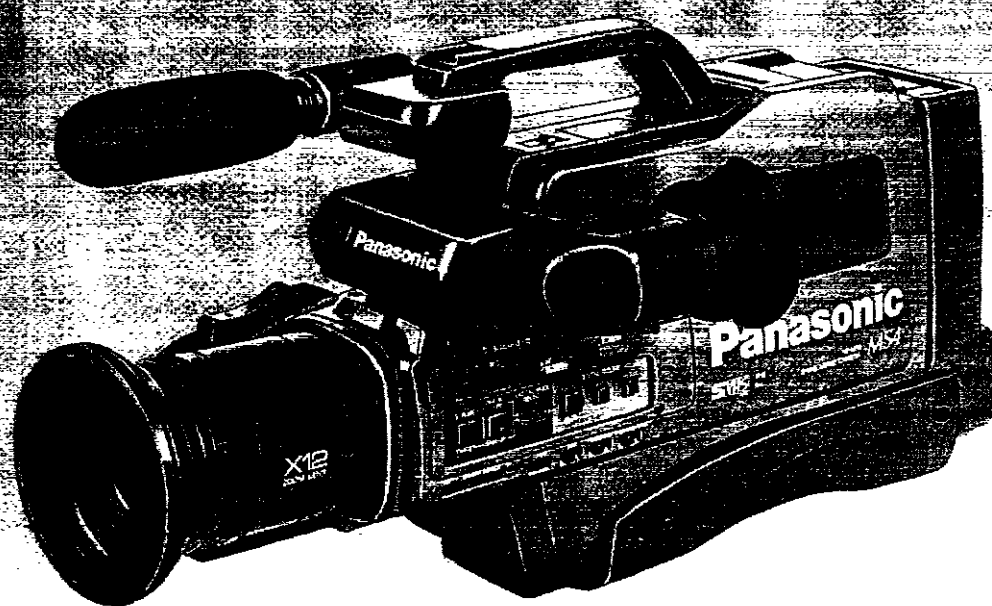
# Panasonic

Basic  
Operations  
Before Shooting  
**4**

Shooting  
**13**

Playback  
**16**

Advanced  
Operations  
**20**



**S VHS** VHS  
PAL

Notes,  
Others  
**50**

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

VQT4835

## 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 later reference, in case you wish to look up something in the future.

### Caution:

Injury or material damage resulting from any kind of use that is not in accordance with these operating procedures explained in the Operating Instructions are the sole responsibility of the user.

## Shooting with this Movie Camera is possible simply by:

1. Inserting the charged Battery Pack.
2. Inserting a Video Cassette.
3. Pressing the Start/Stop Button.



## Guide to these Operating Instructions

These Operating Instructions consist of 3 sections. Basic Operations, Advanced Operations and Others.

### Basic Operation:

(Before Shooting, Shooting, Playback)

In this section, the basic preparations for basic shooting and basic playback are described.

People inexperienced in the use of a Movie Camera should read from this section.

### Advanced Operations:

The use of various functions and the necessary preparations for performing these operations are described in this section.

Please study and try out these functions one by one, until you have all the capabilities of this Movie Camera at your command.

### Notes, Others:

This section describes the controls and functions of this Movie Camera and it contains a troubleshooting guide.

## Before Use

### ■ After Opening the Packing Case...

1. Check the Standard Accessories. (p. 4)  
Note:  
If the accessories are not going to be used immediately, put them back into the Packing Case and store them carefully.
2. Charge the Battery Pack. (p. 6)
3. Insert the Battery Pack into the Movie Camera. (p. 7)
4. Adjust the length of the Grip Belt. (p. 8)
5. Attach the Shoulder Strap. (p. 8)
6. Insert a Video Cassette. (p. 9)
7. Adjust the Viewfinder to your eyesight. (p. 10)
8. Remove the Lens Cap. (p. 11)

After completing the above preparations, you are ready for shooting.

# Information for Your Safety

## IMPORTANT

YOUR ATTENTION IS DRAWN TO THE FACT THAT RECORDING OF PRE-RECORDED TAPES OR DISCS OR OTHER PUBLISHED OR BROADCAST MATERIAL MAY INFRINGE COPYRIGHT LAWS.

## WARNING

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

## CAUTION

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

### S-VHS Movie NV-MS4B

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

### AC Adaptor VW-AM10B

The rating plate is on the bottom side of the unit.

THIS APPARATUS WAS PRODUCED TO BS800.

## FOR YOUR SAFETY

### ■ DO NOT REMOVE THE OUTER COVER.

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



## Caution for AC mains lead

For your safety, please read the following text carefully.

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

A 5-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amperes and it is approved by ASTA or BSI to BS1362.

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

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

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

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

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

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

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt, please consult a qualified electrician.

## ■ IMPORTANT


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

Blue: Neutral  
Brown: Live

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

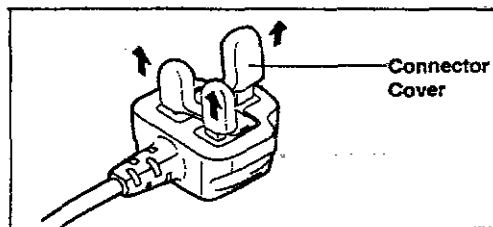
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

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

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

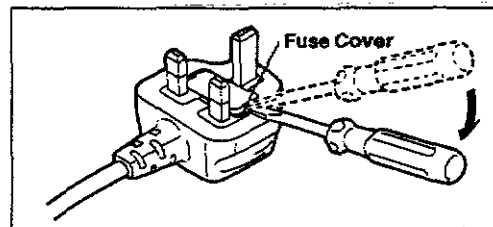
## ■ Before Use

Remove the Connector Cover as follows.

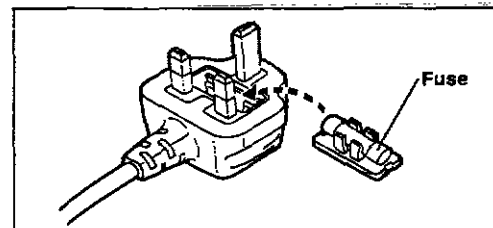


## ■ How to replace the Fuse

1. Remove the Fuse Cover with a screwdriver.



2. Replace the fuse and attach the Fuse Cover.



# Contents

# Before Shooting

## Basic Operations/Before Shooting

1 Preparation for Use, Standard Accessories	4
2 S-VHS Format	5
3 Compatibility of VTRs and Tapes	5
4 Charging the Battery pack for the First Time	6
5 How to Insert the Battery Pack	7
6 Adjusting the Grip Belt	8
7 Attaching the Shoulder Strap	8
8 Inserting the Video Cassette	9
9 Preventing Accidental Erasure of Recordings	9
10 Viewfinder	10
11 Adjusting the Viewfinder to Your Eyesight	10
12 Removing the Lens Cap	11
13 How to Hold the Movie Camera for Shooting	11

## Basic Operations/Shooting

1 How to Shoot from the Beginning of the Cassette	13
2 How to Check the End of the Recorded Scene	14
3 Searching for a Previously Shot Scene	14
4 How to Add New Scenes at the End of Previous Shots	15

## Basic Operations/Playback

1 How to Playback via the Viewfinder (Playback from the Beginning of the Tape)	16
2 How to Adjust the Tracking	16
3 How to Rewind or Fast-Forward the Tape	17
After Use	18
Cleaning	18



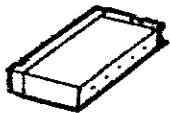
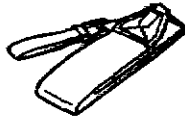

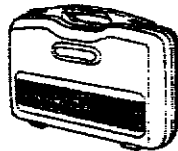



## Advanced Operations

Power Supply	21
How to Use the Tape Counter Indication	22
How to Record the Date and Time during Shooting	24
The Sound that is Being Recorded	27
How to Enlarge the Subject during Shooting	28
How to Fade in at the Beginning and Fade out at the End of a Scene	29
How to Shoot a Still Picture	30
How to Shoot with Strobe Effect	31
How to Shoot with the After-Image Effect	32
How to Shoot Sunsets or Other Evening Scenes	32
How to Approach very Small Subjects and Shoot them enlarged	33
How to Shoot All Scenes with Natural Colours	34
How to Adjust the Focus	37
How to Shoot Backlit Scenes	39
How to Shoot Fast-Moving Subjects	40
How to Shoot a Portrait	41
Inserting a Still Picture with Wipe Editing (Digital Wipe) Fading over or Superimposing a Still Picture onto the Moving Picture (Digital Image Mix)	42-43
Self-Timer Recording and Interval Recording	44
How to Playback via a TV Set	45
How to Edit a Previously Recorded Tape	47
Insert Editing	48
Audio Dubbing	49

## Notes, Other

Cautions	50
Before Requesting Service	52
Colour Temperature and White Balance	53
Quick Reference Guide to the Indications in the Viewfinder	54
Controls and Functions	56
Optional Accessories	61
Possible Use of the Functions Buttons in the Different Operation Modes	62
Specifications	63

## 1 Preparation for Use, Standard Accessories

Accessories Used for the Basic Operations		
<p>AC Adaptor VW-AM10B</p>  <p>For supplying power to the Movie Camera or for charging the Battery Pack</p>	<p>DC Input Cable VJA0573-1</p>  <p>For connection to the AC Adaptor</p>	<p>Battery Pack VW-V8F2E</p>  <p>For supplying power to the Movie Camera</p>
<p>Shoulder Strap VFC1309</p> 	<p>Battery Pack Charging Connector VJA0180-1</p>  <p>To recharge the Battery Pack, connect it to the AC Adaptor with this connector.</p>	<p>System Case VW-SHM20E</p> 
Accessories Used in the Advanced Operations		
<p>AV Output Cable Audio/Video Cable VFA0028</p>  <p>For connection to a TV set or VTR</p>	<p>S-Video Cable VJA0658</p>  <p>For connection to a TV set or VTR</p>	<p>AV Output Cable VFA0096-1</p>  <p>For connection to a TV set or VTR</p>



VHS  
PAL

## 2 S-VHS Format

### About the S-VHS Format

The S-VHS video format is the new video system that fulfills the exceedingly high demands and expectations of today's video-information age. It is newly developed based on the VHS video format established throughout the world for home use, and it employs a wealth of latest technology to provide higher resolution and picture quality. The newly developed, high-performance S-VHS video cassette tapes enable the S-VHS format to realize truly epoch-making improvements in overall picture quality and clarity.

This S-VHS Movie Camera allows high picture quality recording and playback by using the video cassettes carrying the S-VHS logo as well as conventional VHS recording and playback on the video cassettes bearing VHS logo.

Before Shooting

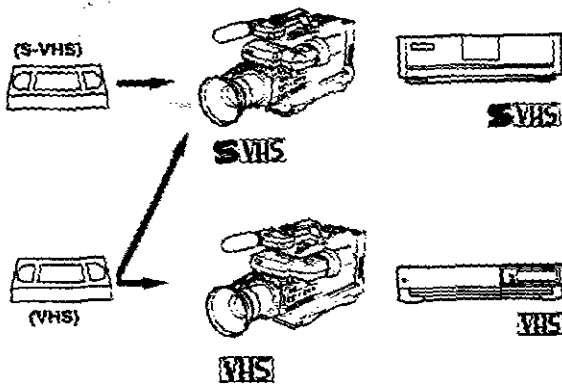
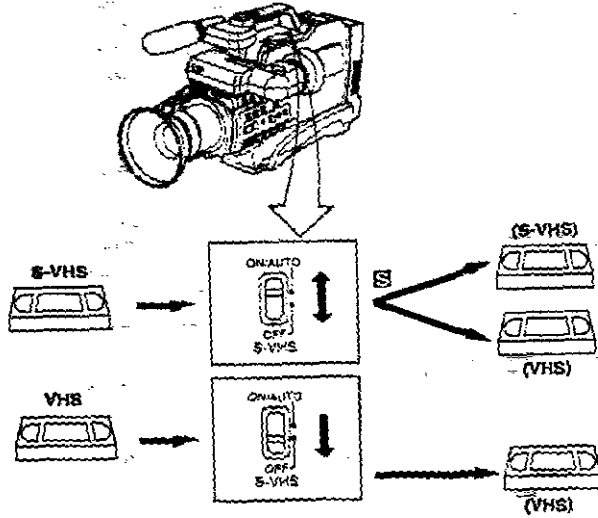
## 3 Compatibility of VTRs and Tapes

### When recording

When using an S-VHS video cassette for recording, the recording format (S-VHS or VHS) can be selected as follows with the [S-VHS ON/AUTO/OFF] Switch.

"S" S-VHS format  
No indication VHS format

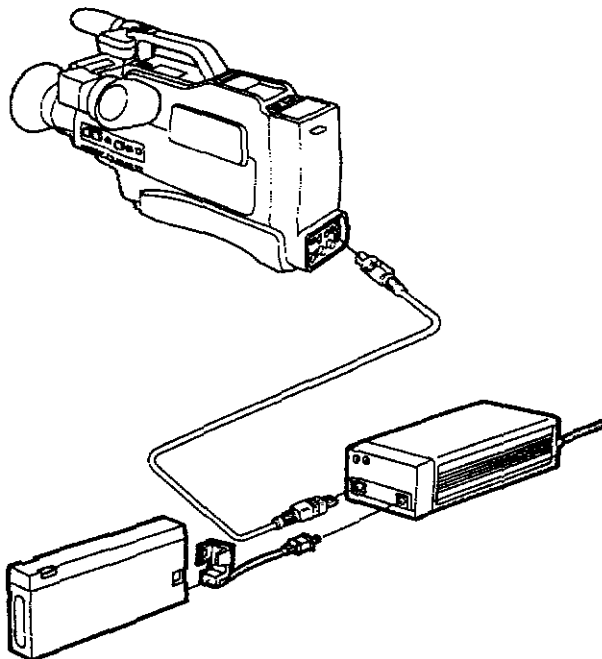
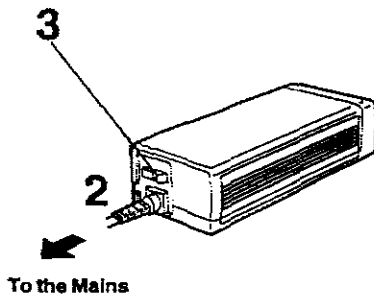
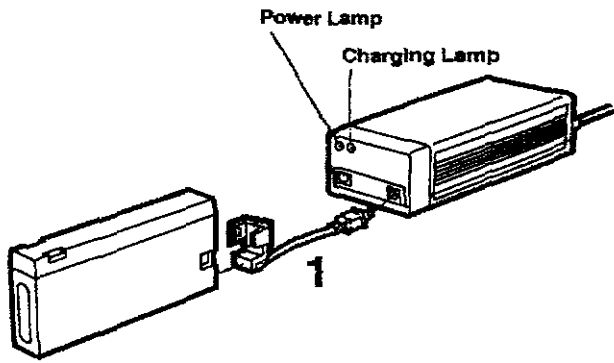
- The indication "S" is displayed in the Viewfinder.



### When Playing Back

- Tapes recorded in the S-VHS format can be played back on this Movie Camera or on other S-VHS VTRs. (However, they cannot be played back on VHS VTRs.)
- Tapes recorded in the VHS format can be played back on VHS VTRs as well as on this Movie Camera and on other S-VHS VTRs.
- The video format in which the video cassette was recorded will automatically be detected and selected for playback.
- If the setting of the [S-VHS ON/AUTO/OFF] Switch is changed during shooting, some picture distortion will occur at that tape position during playback.

## Before Shooting (cont'd)



### 4 Charging the Battery Pack for the First Time (new one)

#### Note:

Charge the Battery Pack within a temperature range of 10°C–35°C.

**1** Connect the Battery Pack and the AC Adaptor with the Battery Pack Charging Connector.

**2** Connect the Power Cable of the AC Adaptor to the Mains.

**3** Turn the AC Adaptor on.

#### Charging Indication Lamp:

When charging is started, the red lamp lights up. When approx. 45 minutes of charging time remain, the lamp will change to green. The Charging Indication Lamp will go out about 100 minutes after charging starts. However, the Battery Pack should be charged for at least 3 hours for extended use.

#### Operation Time:

With a fully charged Battery Pack (VW-VBF2E), the Movie Camera can be used (in record mode only) continuously for approx. 110 minutes at 25°C. However, depending on how often the various functions listed below are used, and depending on the shooting conditions, the actual operation time may be considerably shorter.

- Shooting Start/Stop (p. 13)
- Auto focus (p. 37)
- Zoom function (p. 28)
- Playback, Fast Forward, Rewind, and other operations (p. 16)
- Digital Functions (p. 30)

- Use of the Movie Camera at low temperature

Therefore, it is recommended to take along a charged spare Battery Pack.

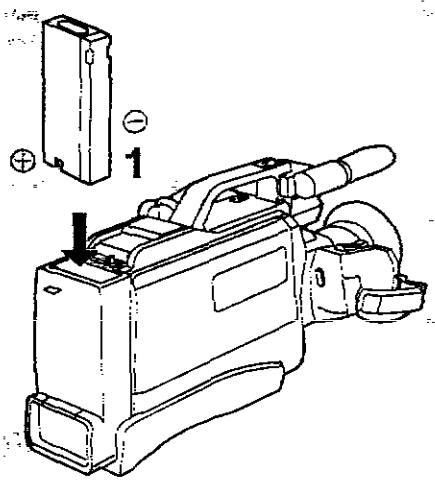
### ■ Charging two Battery Packs simultaneously

When the AC Adaptor is connected to the Movie Camera and the Movie Camera is turned off, it is possible to charge two Battery Packs simultaneously—one connected to the AC Adaptor and the other inserted into the Movie Camera. However, charging them at the same time takes twice as long as charging only one Battery Pack.

## 5 How to Insert the Battery Pack

- 1 Insert the Battery Pack until it locks with a click.

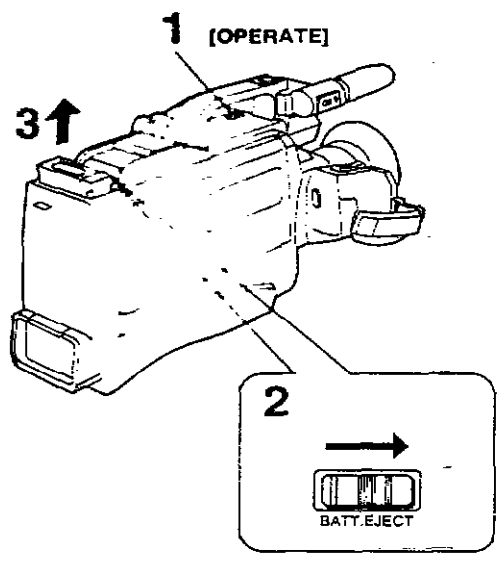
**Note:**  
Insert the Battery Pack with its + side facing the rear of the Movie Camera.



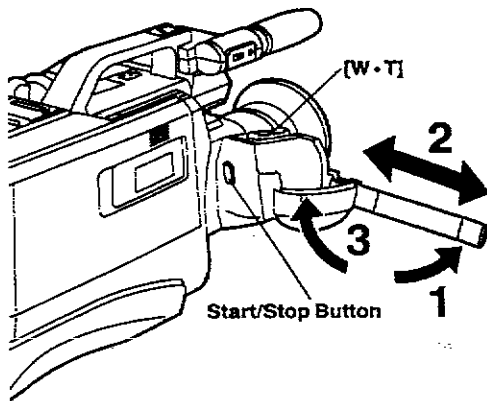
## How to Remove the Battery Pack

- 1 Slide the [OPERATE] Switch and turn the Movie Camera off.
- 2 After two or three seconds, slide the [BATT.EJECT] Lever in the direction of the arrow.
- 3 Remove the Battery Pack.

**Caution:**  
If the Battery Pack is removed during recording or playback, the tape remains wound around the video head cylinder and could become damaged.  
This is also the case during loading and unloading of the tape.



## Before Shooting (cont'd)

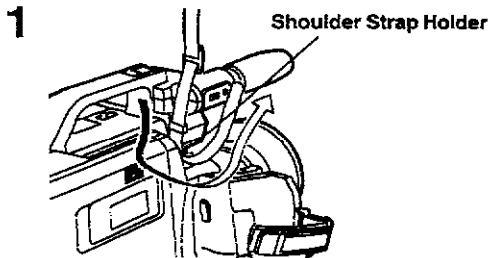


## 6 Adjusting the Grip Belt

### ■ Adjusting the Length of the Grip Belt

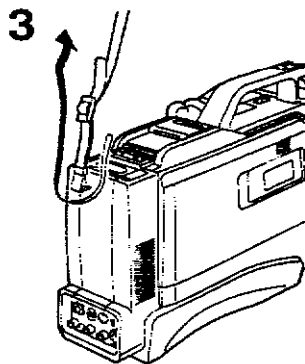
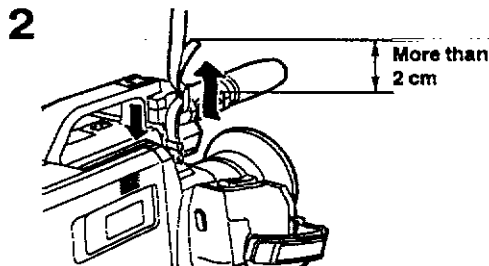
The length of the Grip Belt should be adjusted so that the Grip fits comfortably into the palm of your hand and the Start/Stop Button and the [W] and [T] Zoom Buttons can easily be pressed with the fingertips

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



## 7 Attaching the Shoulder Strap

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

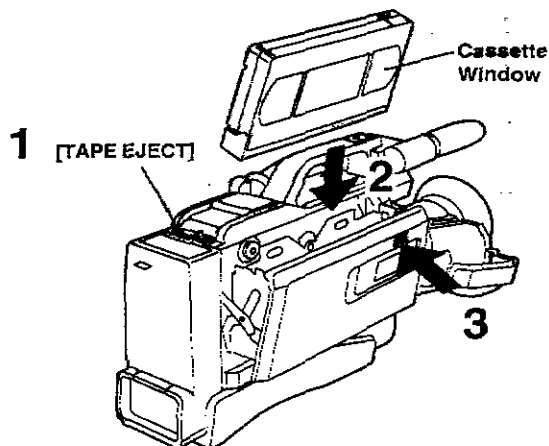




## 8 Inserting the Video Cassette

### ■ How to Insert the Video Cassette

Use only **VHS, VHS** Video Cassettes.



**1** Press the [TAPE EJECT] Button.  
After a few seconds, the Cassette Compartment Cover opens.

**2** Insert the video cassette with the cassette window facing outwards.

**3** Close the Cover until it locks with a click.

### ■ How to Eject the Video Cassette

Make sure that power is supplied to the Movie Camera.

**1** Press the [TAPE EJECT] Button.

**2** Pull out the Video Cassette.

**3** Close the Cover until it locks with a click.

## 9 Preventing Accidental Erasure of Recordings

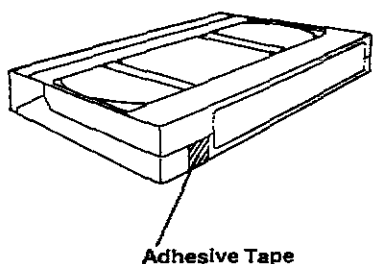
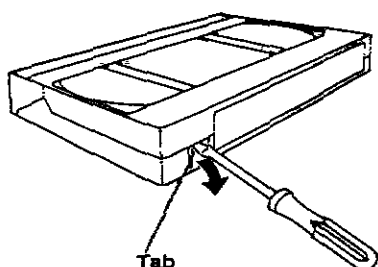
When recording on a previously recorded tape, the previously recorded contents will be erased and replaced by the new recording. An important recording can be protected against accidental erasure, by breaking out the tab. If the tab is removed, recording on this Video Cassette is no longer possible.

### ■ How to Break off the Tab

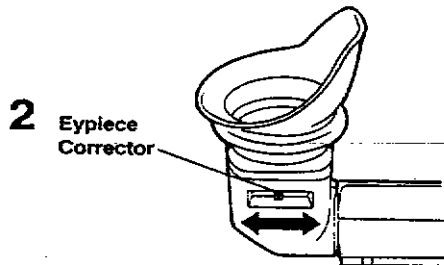
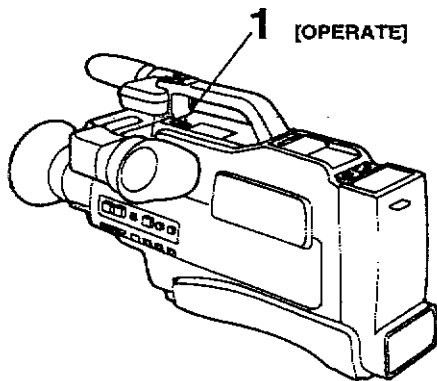
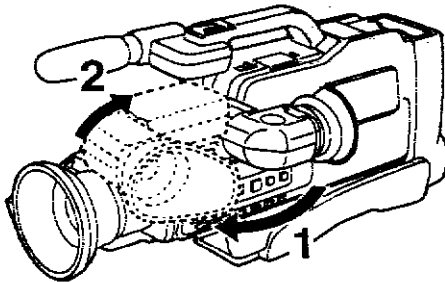
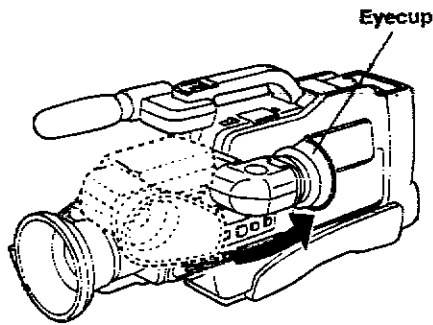
Break off the tab with a screwdriver in the direction of the arrow.

### ■ How to Record Again onto a Video Cassette with Removed Tab

Cover the hole firmly with two layers of adhesive tape.



## Before Shooting (cont'd)



## 10 Viewfinder

### ■ Setting the Viewfinder to Its Shooting Position

Turn the Viewfinder backwards by 90° so that the Eyecup faces the rear of the movie camera.

- The angular part of the Viewfinder can be tilted up or down by 90°.
- To be able to watch the picture in the Viewfinder without holding the Viewfinder close to the eye, swing up the Eyecup.
- By pulling on the Viewfinder it can be extended further outside to a position that is most comfortable for shooting.

### ■ Returning the Viewfinder to Its Original Position

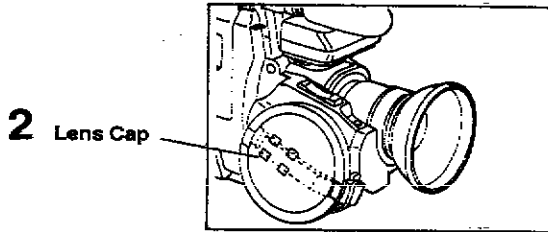
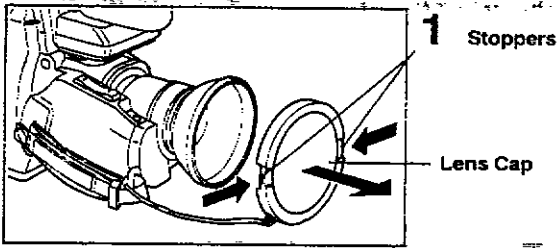
- 1 Turn it forward toward the Lens.
- 2 Retract the Viewfinder by pushing it back toward its base.

## 11 Adjusting the Viewfinder to Your Eyesight

- 1 Turn the **Movie Camera** on.
- 2 Slide the control until the indications in the Viewfinder can be seen clearly.

#### Notes:

1. Do not apply any pressure to the Viewfinder except when folding it up, raising, lowering and folding down.
2. For viewing the picture in the Viewfinder with the left eye, remove the Eyecup and attach it with its longer side facing left.



## 12 Removing the Lens Cap

- 1** Press the Stoppers on each side and gently remove it.
- 2** Hook the Lens Cap onto the Grip Belt to prevent it from getting in front of the Lens.

**1**



**2**



## 13 How to Hold the Movie Camera for Shooting

### 1 Basic Shooting

- When walking while shooting, keep both eyes open so that you can see where you are going and what is happening around you.
- Place the Movie Camera on your right shoulder and hold it firmly with both hands.
- Hold the Eyecup of the Viewfinder as close as possible to your right or left eye.
- Take a firm stance with the legs slightly apart.
- For stable images, it is recommended to use a tripod (optional) whenever possible. (p. 61)

### 2 Low-Angle Shooting

- Adjust the angle of the Viewfinder according to the position in which the Movie Camera is held.
- If the Movie Camera is not held firmly in stable position, the picture in the Viewfinder cannot be watched properly.
  - For easier low-angle shooting, the Start/Stop Button on the front of the Movie Camera can be used.

**3**



**4**

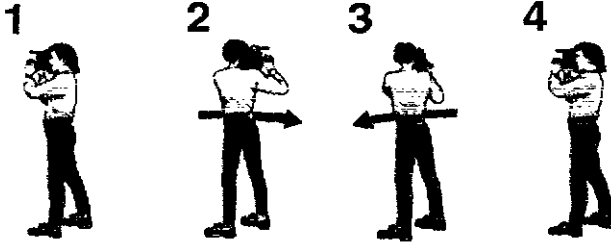
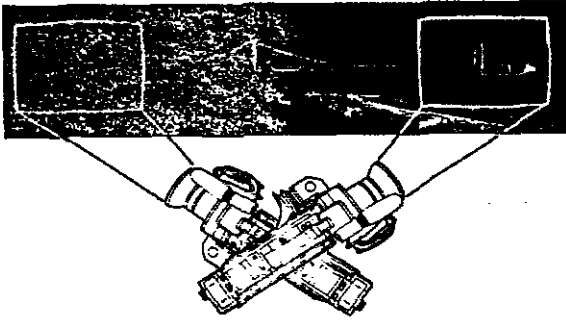


### 3 Shooting from a high position

### 4 For More Stable Pictures

- Stabilize the Movie Camera by resting your elbows on a table or another stable horizontal surface.

## Before Shooting (cont'd)



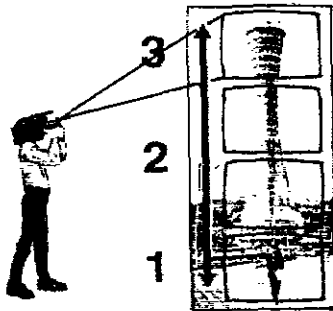
### ■ For shooting *Panoramic or Wide Open View*

For best results, always move the Movie Camera horizontally and very slowly.

- 1** First, turn your body so that you are facing the point where the shooting is to end.
- 2** Without moving your feet, turn your upper body to face the point where the shooting is to start, and then start shooting.  
In this position, shoot for about 5 seconds without moving the Movie Camera.
- 3** Gradually turn your upper body toward the point where the shooting is to stop.  
While shooting continues, slowly move the Movie Camera laterally so that the viewer will be able to follow the action easily.
- 4** Finish the shooting at the same point as in step (1).  
In this position, shoot again for about 5 seconds without moving the Movie Camera.

### ■ For Shooting Tall Narrow Subjects such as Tall Buildings or Trees

For best results, move the Movie Camera vertically from top to bottom, or vice versa.

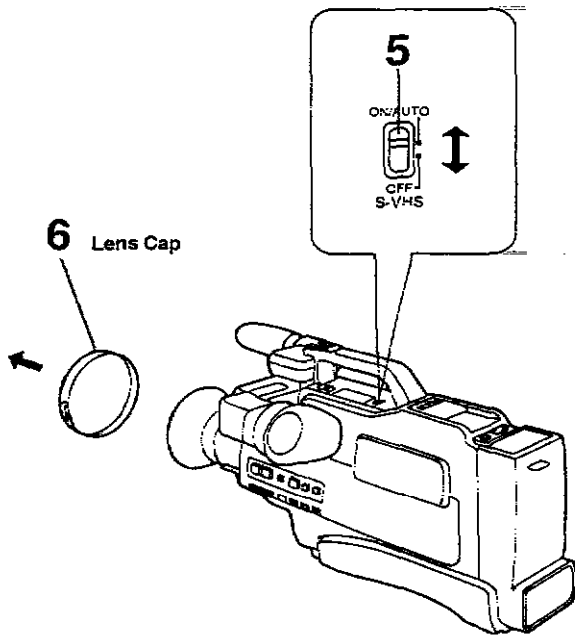
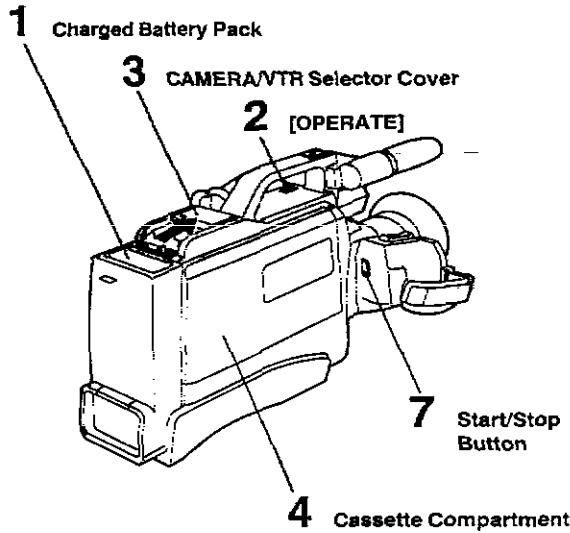


- 1** First, shoot the bottom part for about 5 seconds.
- 2** Gradually turn the Movie Camera from bottom to top.
- 3** Shoot the top part for about 5 seconds.

#### Hints:

- To emphasize the height of a subject, shoot it from the bottom to the top.
- To emphasize the stream of the people coming out of the tall building, shoot it from the top of the building to the bottom. In this way, the flow of the people coming out of the entrance of the building is natural.

# Shooting



## 1 How to Shoot from the Beginning of the Cassette

- 1 Insert the charged Battery Pack. (p. 7)
- 2 Turn the Movie Camera on.
- 3 Slide the [CAMERA/VTR] Selector Cover to "CAMERA".
- 4 Insert a cassette with intact erasure prevention tab.  
A few seconds after closing the Cassette Compartment, the Movie Camera will be in the shooting pause mode.
- 5 Slide to "ON/AUTO" or "OFF".
  - In the "ON/AUTO" position and using the S-VHS Video Cassette, the S-VHS recording system is selected and the "S" Indication is lit. Playback will not be possible on a normal VHS VTR.
  - In the "OFF" position, the "S" Indication is not lit.
- 6 Remove the Lens Cap.
- 7 Press the Start/Stop Button.

### ■ How to Pause the Shooting...

Press the Start/Stop Button.

### ■ To Shoot the Next Scene(s)...

Press the Start/Stop Button again.

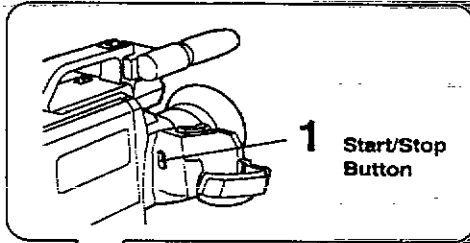
### ■ To Stop the Shooting...

Press the Start/Stop Button to pause the shooting and then turn the Movie Camera off.

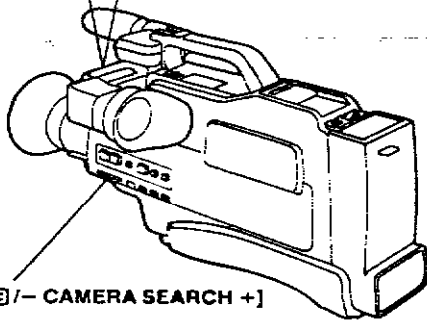
#### Note:

If the Movie Camera is left in the Shooting Pause Mode for more than 6 minutes, the Shooting Pause Mode will be cancelled and the Viewfinder will be turned off (Recording Lock Mode). To resume shooting from this condition, turn the Movie Camera on again. If the Movie Camera is left in the Recording Lock Mode for more than 48 hours, it will automatically switch off completely.

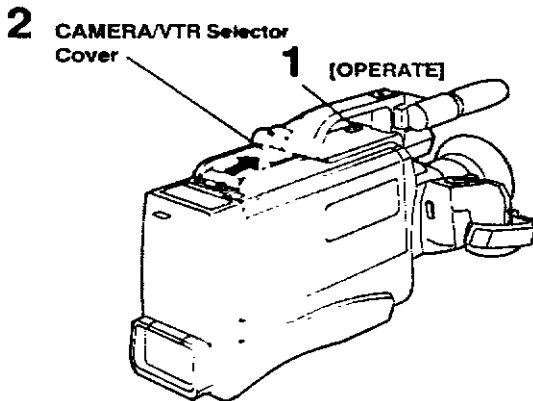
## Shooting (cont'd)



1 Start/Stop Button

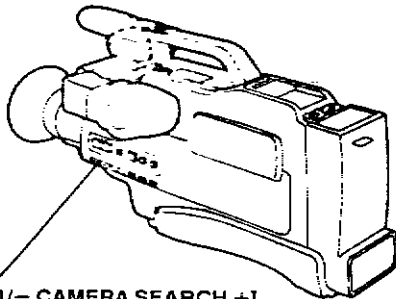


2 [CAMERA SEARCH +/-]



1 [OPERATE]

2 CAMERA/VTR Selector Cover



3-4 [CAMERA SEARCH +/-]

### 2 How to Check the End of the Recorded Scene

- 1 Press the Start/Stop Button to pause the shooting.

The "PAUSE" indication appears in the Viewfinder.

- 2 Press the - side of [CAMERA SEARCH +/-] Button briefly.

The "CHK" indication in the Viewfinder lights up, and the last 2-3 seconds of the last recorded scene will be played back in the Viewfinder. After that, Movie Camera is again in the Shooting Pause Mode. ("CHK" means Check.)

#### Note:

During shooting, use this function to confirm from time to time that the recording has been performed correctly.

### 3 Searching for a Previously Shot Scene

#### ■ How to Search for a Point in a Recorded Scene

After inserting the recording video cassette.

- 1 Turn the Movie Camera on.
- 2 Slide the [CAMERA/VTR] Selector Cover to "CAMERA".
- 3 Keep the - side of [CAMERA SEARCH +/-] Button pressed.

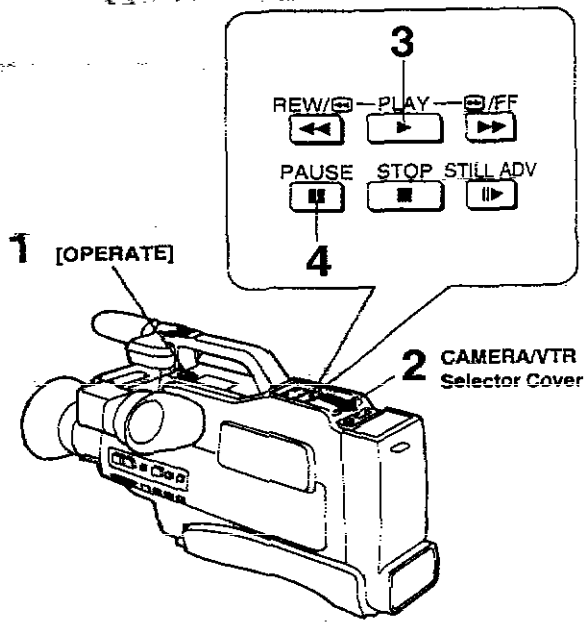
The recorded scene will be played back at high speed in reverse direction.

Or keep the + side of [CAMERA SEARCH +/-] Button pressed.

The recorded scene will be played back at normal speed in forward direction.

- 4 Release this button after reaching the desired point.

The Movie Camera is put into the recording pause mode.

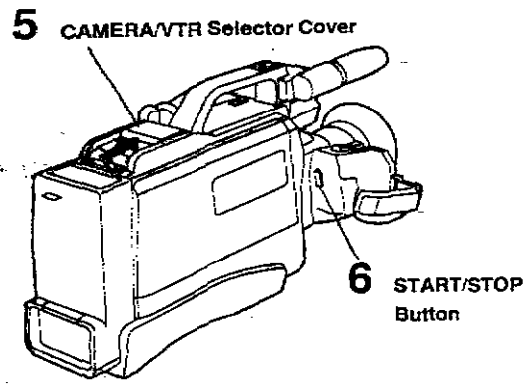


## 4 How to Add New Scenes at the End of Previous Shots

This function makes it possible to achieve smooth transitions between a previously and a newly shot scene.

- 1 Turn the Movie Camera on.
- 2 Slide the [CAMERA/VTR] Selector Cover to "VTR".  
(“VTR” means Video Tape Recorder.)
- 3 Press the [PLAY] Button.
- 4 Press the [PAUSE] Button after reaching the point where you want to add the next scene.  
(Thereby erasing the rest of the previously recorded scene.)
- 5 Slide the [CAMERA/VTR] Selector Cover to "CAMERA".
- 6 Press the START/STOP Button to start shooting the new scene.  
The shooting starts.

Shooting

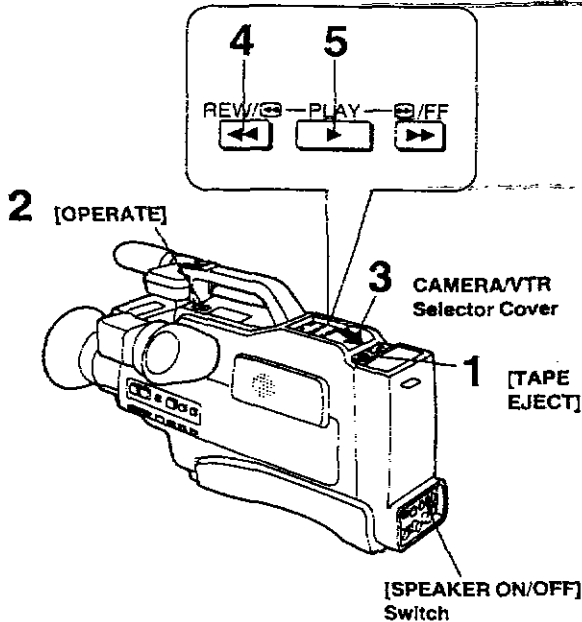


# Playback



## 1 How to Playback Via the Viewfinder (Playback from the Beginning of the Tape)

The recorded tape can be played back in the Viewfinder or on a connected TV set.



- 1 Press the [TAPE EJECT] Button and insert the recorded video cassette.
- 2 Turn the Movie Camera on.
- 3 Slide the [CAMERA/VTR] Selector Cover to "VTR".
- 4 Press the [REW/⏮] Button.  
The tape will stop automatically when it reaches its beginning.
- 5 Press the [PLAY] Button.
  - The playback starts.
  - The Playback Indication "▷" appears in the Viewfinder.
  - The tape will be rewound automatically when it reaches its end.
  - When the [SPEAKER ON/OFF] Switch is set to "ON", the sound can be heard from the built-in speaker.

### How to Stop the Playback...

Press the [STOP] Button.

## 2 How to Adjust the Tracking

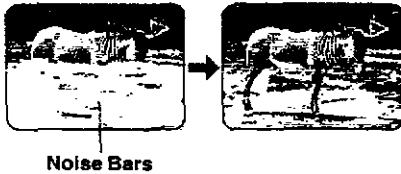
### Notes:

1. When playing back a Video Cassette which has been recorded on another Movie Camera, it may not be possible to eliminate these noise bars completely.
2. If the picture is distorted by noise bars during playback, the tracking needs to be adjusted.

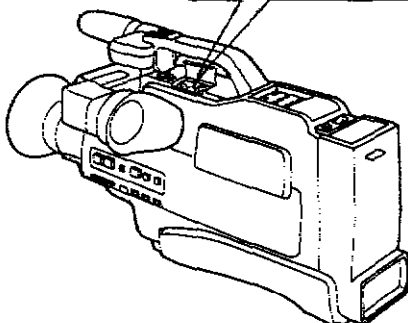
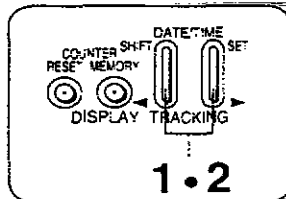
### What is the Purpose of the Tracking Adjustment

When playing back a recorded tape, especially a tape recorded on another Movie Camera, bands of white noise may appear in the picture. This occurs when the video heads don't precisely trace the recorded video tracks during playback. Adjusting the tracking pattern of the heads is called tracking adjustment.

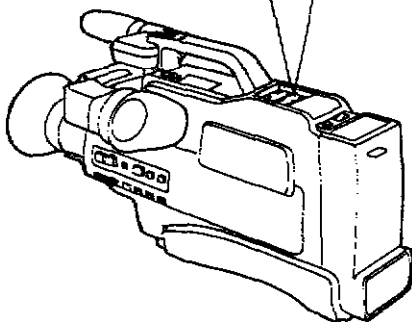
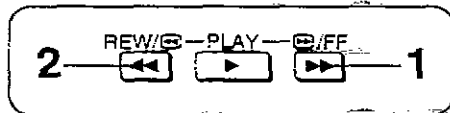
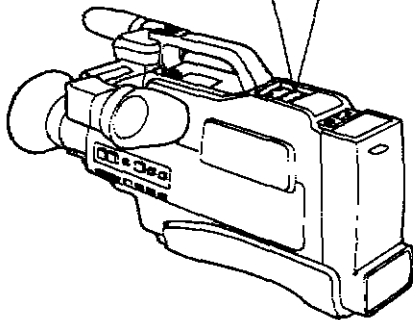
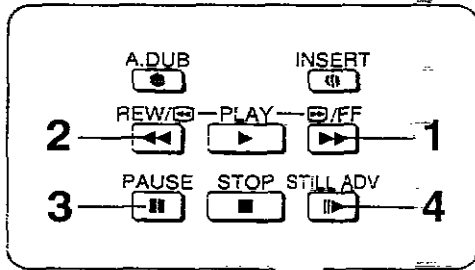
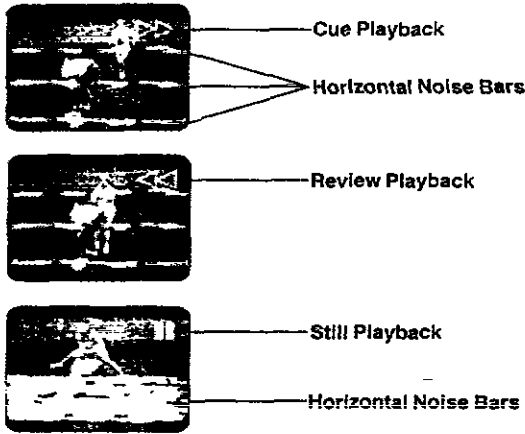
- 1 Press both the [◀ TRACKING] and [TRACKING ▶] Buttons simultaneously.
- 2 Eliminate any noise bars by adjusting the tracking with the [◀ TRACKING] or [TRACKING ▶] Button.



Noise Bars







### How to Use Cue, Review and Still Playback Functions During Normal Playback.

**Note:**  
The sound will be played back only during normal playback.

#### ■ For Cue Playback

- 1 Keep the [FF] Button pressed.  
The Fast Forward/Cue Mode Indication ">>" appears in the Viewfinder.

#### ■ For Review Playback

- 2 Keep the [REW] Button pressed.  
The Rewind/Review Mode Indication "<<" appears in the Viewfinder.

#### ■ For Still Playback

- 3 Press the [PAUSE] Button.  
The Still Mode Indication "II" appears in the Viewfinder.

#### ■ For Still Advance Playback (During Still Playback)

- 4 Press the [STILL ADV] Button.

#### How to Resume Normal Playback

Press the [PAUSE] Button again.  
If the Movie Camera is left in the Still Playback Mode for about 6 minutes, it will switch over to the stop mode, to protect the tape and the video heads.

Playback

### 3 How to Rewind or Fast-Forward the Tape

**Note:**  
With the Movie Camera in the Stop Mode:

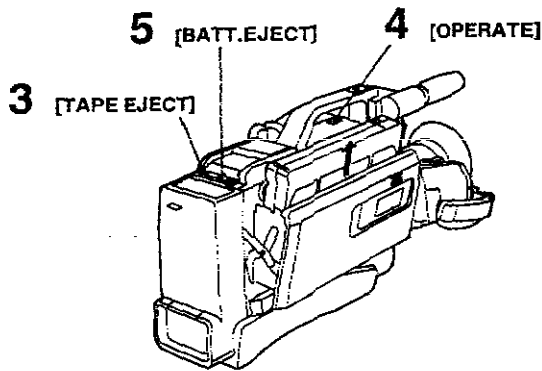
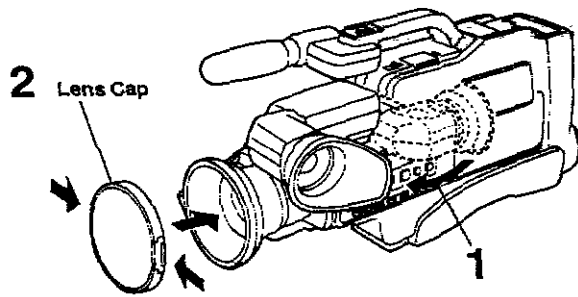
#### ■ For Fast-Forwarding

- 1 Press the [FF] Button to wind the tape forward at high speed.  
The tape will be rewound automatically when it reaches its end.

#### ■ For Rewinding

- 2 Press the [REW] Button to rewind the tape at high speed.  
The tape will stop automatically when it reaches its beginning.

## After Use

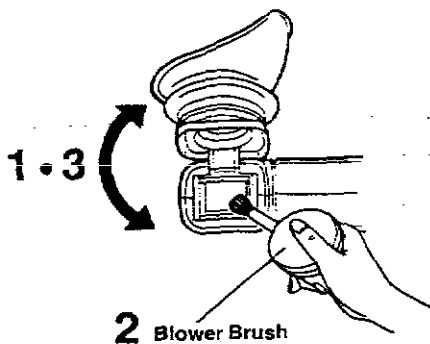


- 1 Retract the Viewfinder.
- 2 Attach the Lens Cap to the Lens.
- 3 Press the [TAPE EJECT] Button and remove the video cassette. (p. 9)
- 4 Turn the Movie Camera off.
- 5 Slide the [BATT.EJECT] Lever and remove the Battery Pack.

### ■ When the Movie Camera will not be Used for a Long Period of Time

Turn the unit on occasionally to prevent malfunction.

## Cleaning



### 1 Cleaning the Viewfinder

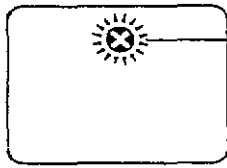
- 1 Swing up the eyecup.
- 2 Remove dust with a blower brush.
- 3 Swing down the eyecup.

### 2 Cleaning the Movie Camera

- Clean the lens only with a blower brush (used for photo cameras) or special lens cleaning tissue (used for glasses and cameras).
- Wipe the Movie Camera with a clean, dry cloth. Never use cleaning fluid or other chemicals.

#### Cautions for Cleaning

1. Do not use benzine, thinner or other chemicals for cleaning, because they could change the colour and damage the surface of the camera body.
2. When using a chemically treated cloth for cleaning, carefully follow the instructions for its use.



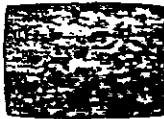
Clogging Mark



The picture shakes vertically.



The whole picture contains noise.



The picture is totally distorted.

### 3 Cleaning the Video Heads

The video heads are the means by which the Movie Camera places picture signals on the tape during recording, and reads picture signals from the tape during playback. If these heads become dirty and clogged from long use, the signals can no longer be recorded correctly, and the playback picture will be distorted accordingly. This is the case, for example, during the playback of a tape, the sound of which is reproduced normally, but no picture is seen, or the picture is greatly distorted. If such symptoms occur, have the Movie Camera checked by qualified service personnel. This Movie Camera is equipped with Head Clogging Detection Function. When the heads are clogged, the "☒" Indication in the Viewfinder appears. As the accumulation of dirt on the heads may be dislodged by the movement of the tape, it is possible that this indication sometimes appears, but may not reappear on the next recording start.

The Head Clogging Detection Function will be activated when the shooting is started from the Shooting Pause Mode. However, it will not be activated when shooting immediately after replacing the cassette and after playing back some part of the tape.

#### Symptom:

The Head Clogging Indication "☒" appears in the Viewfinder. The playback image becomes distorted as shown in the illustrations on the left.

#### Remedy:

Use an optional Cleaning Tape and play it back to remove dirt from the video heads.

#### ■ Causes of Video Head Clogging

1. Dust in the air
2. High ambient temperature, high humidity
3. Scratches on the tape
4. Long-term use of the Movie Camera

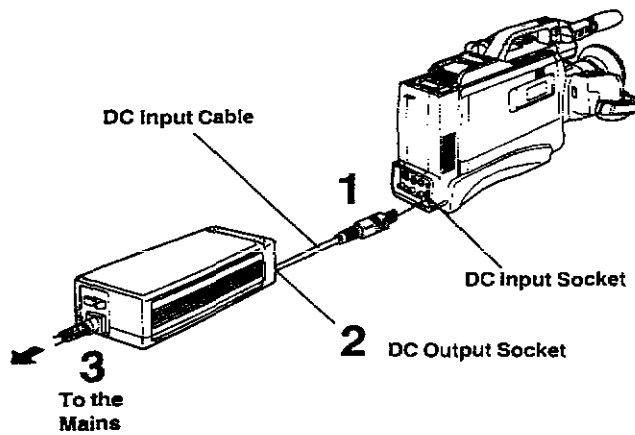
# Advanced Operations



## Contents

Power Supply .....	21
1 How to Use the AC Adaptor as Power Supply Unit .....	21
2 How to Use the Car Battery Cord (Optional) .....	21
How to Use the Tape Counter Indication .....	22
How to Record the Date and Time during Shooting .....	24
1 How to Recharge the Built-In Lithium Battery .....	24
2 How to Set the Year, Date and Time .....	25
3 How to Record the Date and Time during Shooting .....	26
The Sound that is Being Recorded .....	27
1 Sound Recorded with the Stereo Microphone .....	27
2 To Listen to the Sound during Recording or Playback .....	27
3 Sound Recorded with the Audio Dubbing Function .....	27
4 Sound Recorded with the Insert Function .....	27
How to Enlarge the Subject during Shooting (Using the Zoom Function) .....	28
1 How to Use the Power Zoom Function .....	28
2 How to Use the Digital Zoom Function .....	28
How to Fade in at the Beginning and Fade out at the end of a Scene .....	29
1 How to Fade in .....	29
2 How to Fade out .....	29
How to Shoot a Still Picture .....	30
How to Shoot with Strobe Effect .....	31
How to Shoot with the After-Image Effect .....	32
How to Shoot Sunsets or Other Evening Scenes .....	32
How to Approach very Small Subjects and Shoot them enlarged .....	33
How to Shoot All Scenes with Natural Colours .....	34
1 How to Shoot with Automatic White Balance Adjustment .....	34
2 How to Shoot with Manual White Balance Adjustment .....	35
How to Adjust the Focus .....	37
1 How to Shoot with the Auto Focus Mode .....	37
2 How to Shoot with the Manual Focus Mode .....	38
How to Shoot Backlit Scenes .....	39
How to Shoot Fast-Moving Subjects .....	40
How to Shoot a Portrait .....	41
Inserting a Still Picture with Wipe Editing (Digital Wipe) .....	42
Fading over or Superimposing a Still Picture onto the Moving Picture (Digital Image Mix) .....	43
Self-Timer Recording and Interval Recording .....	44
1 Self-Timer Recording .....	44
2 Interval Recording .....	44
How to Playback via a TV Set .....	45
1 Playback via a TV Set with AV Input Socket (Using the Supplied AV Output Cable) .....	45
2 Playback via a TV Set with S-Video Input Socket (Using the Supplied S-Video Cable) .....	45
3 Playback via a TV Set with AV Input Socket (21 Pin) (Using the Supplied AV Output Cable) .....	46
4 Playback via a TV Set without AV Input Socket (Using the Optional RF Adaptor) .....	46
How to Edit a Previously Recorded Tape .....	47
Insert Editing .....	48
Audio Dubbing .....	49

# Power Supply



## 1 How to Use the AC Adaptor as Power Supply Unit

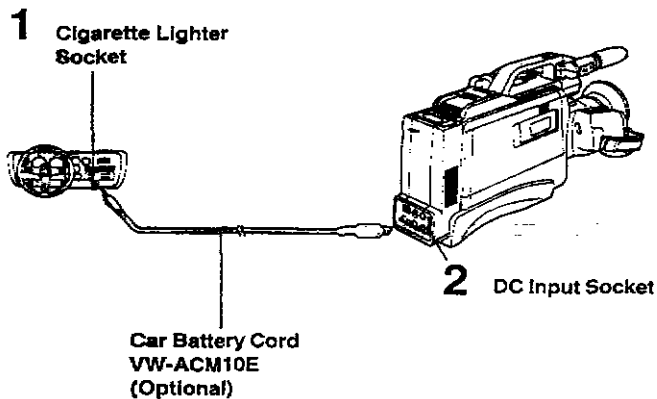
### Notes:

1. When the Movie Camera is turned off, the charging of the Battery Pack inserted into the Movie Camera starts.
2. Do not use the AC Adaptor for any purposes other than supplying the Movie Camera with power and charging the Battery Pack.
3. When listening to a radio while the AC Adaptor is in operation, the radio reception may be distorted. In this case, move the radio further away from the AC Adaptor.
4. When not using the AC Adaptor, unplug its mains cable. When unplugging the mains cable, pull it by the plug, not by the cable.

**1** Connect the DC Input Cable to the DC Input Socket on the Movie Camera.

**2** Connect the other end of the cable to the DC Output Socket on the AC Adaptor.

**3** Connect the Mains Cable of the AC Adaptor to the mains.



## 2 How to Use the Car Battery Cord (Optional)

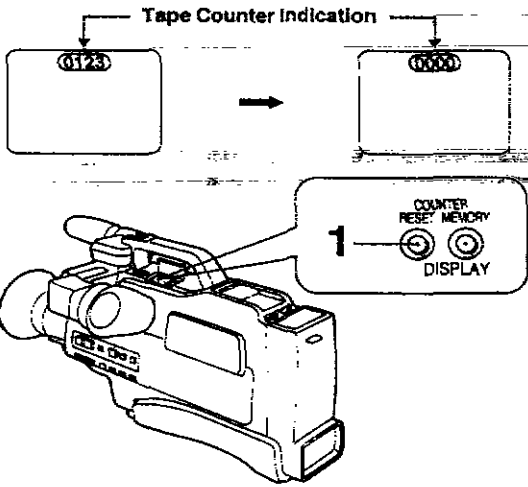
### Notes:

1. The Car Battery Cord can only be used with 12 V DC negative-grounded vehicles.
2. Do not start the car engine while the Movie Camera is powered by the car battery.
3. When the voltage drops suddenly for example 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.

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

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

# How to Use the Tape Counter Indication



## ■ How to Reset the Tape Counter to "0000"...

- 1 Press the [RESET] Button.

## ■ How to Search for the Tape Position "0000" After Shooting or Playback...

Resetting the Tape Counter to "0000" and making the "M" Indication appear before starting to shoot or playback makes it easy to find that tape position again when rewinding the tape.

### Note:

After fast-forwarding or rewinding the tape, the Tape Counter Indication may deviate a little from the "M 0000" tape position.

- 1 Press the [MEMORY] Button.  
The "M" Indication appears in the Viewfinder next to the Tape Counter Indication.

### ■ For Rewinding

- 2 Press the [REW/⏮] Button.  
The tape stops automatically at about the point where the tape counter reads "M 0000".

### ■ For Fast Forwarding

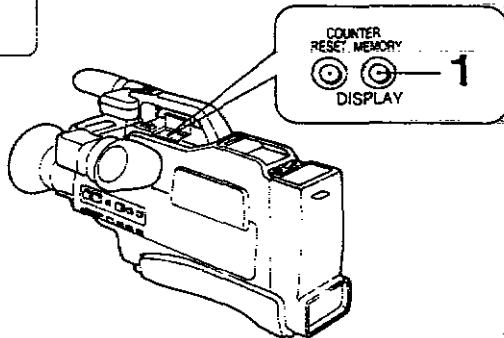
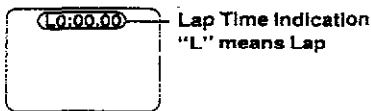
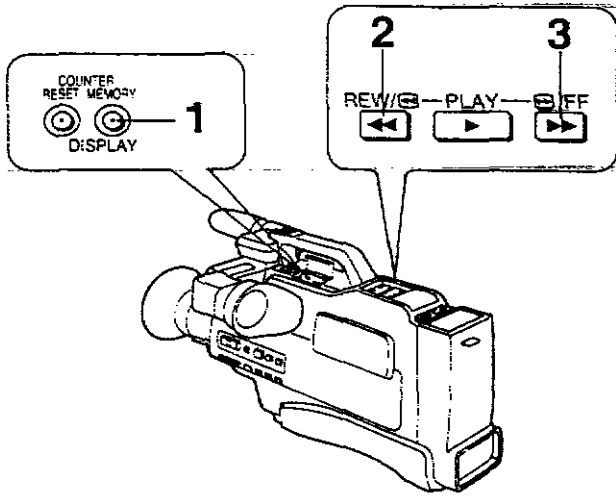
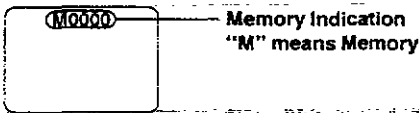
- 3 Press the [FF/⏭] Button.  
The tape stops automatically at about the point where the Tape Counter reads "M 0000".

## ■ How to Cancel the Memory Function...

Press the [MEMORY] Button twice.  
The "M" Indication disappears.

## ■ How to Make the Lap Time Counter Indication Appear

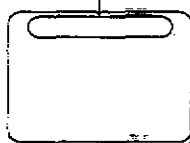
- 1 Press the [MEMORY] Button.  
The Lap Time Counter Indication "L 0:00.00" (real time) appears.
  - The Lap Time Counter counts up only during recording.
  - The Lap Time Counter Shows the elapsed time in hours, minutes and seconds.



Tape Counter Indication



No Indication



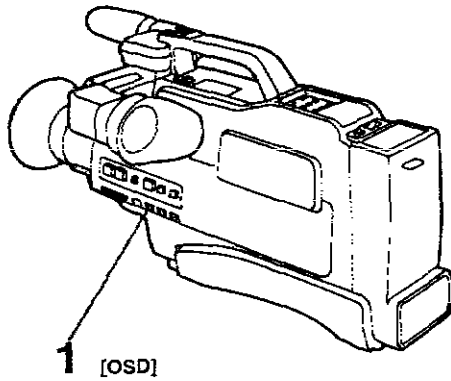
### ■ How to Turn off the Indications in the Viewfinder (Using the On-Screen Display Function)

#### 1 Press the [OSD] Button.

The indications in the Viewfinder disappear except the Warning and Alarm Indications, the Date/Time Indication and the Manual White Balance Indications.

#### ■ To Return to the Initial Mode...

Press the [OSD] Button again.



INDEX Indication

### ■ Index Signals (VISS)

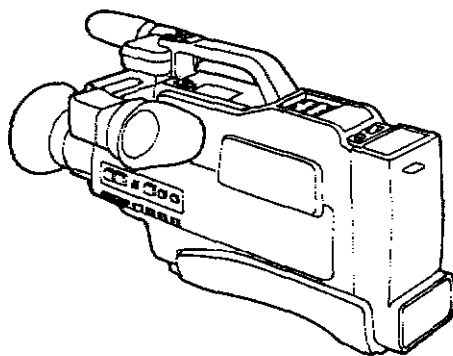
The index signals make possible the use of the VHS Index Search or the Intro Scan Function when playing back the tape on a VTR equipped with these functions.

An index signal is recorded automatically in the following cases:

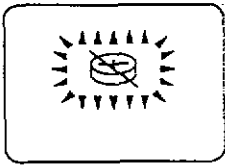
- When shooting is started for the first time after attaching the Battery Pack.
- When shooting is restarted after exchanging the cassette.

In each of these cases, the "INDEX" Indication in the Viewfinder flashes for a few seconds.

- For the correct functioning of the VHS Index Search and Intro Scan Functions on the VTR, the index signals should be at intervals of not less than 2 minutes.



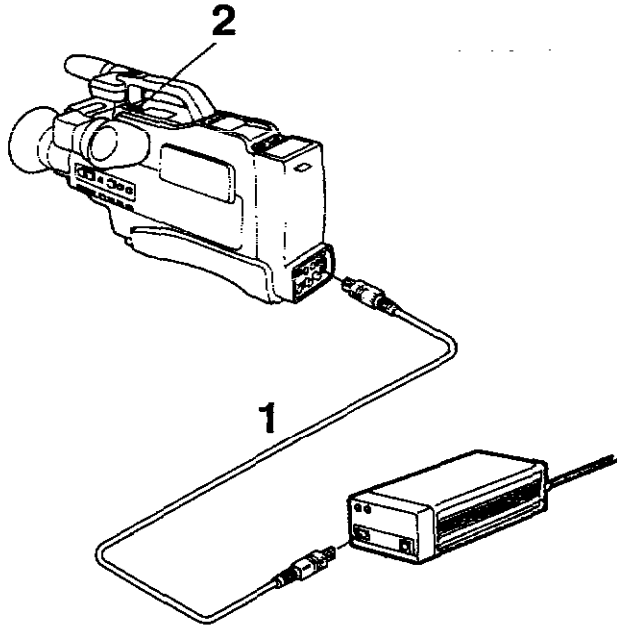
# How to Record the Date and Time during Shooting



## ■ The Built-in lithium battery

A built-in rechargeable lithium battery maintains the operation of the built-in clock when the Movie Camera is turned off. When the Movie Camera is in operation, this battery is recharged automatically.

However, if the Movie Camera is not used for a very long time, the lithium battery can become exhausted. In this case, the indication "ⓑ" in the Viewfinder flashes and the date and time return to the initial indication "1.1.1990".



## 1 How to Recharge the Built-In Lithium Battery

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

**1** Connect the Movie Camera to the AC Adaptor or Insert the Battery Pack into the Movie Camera.

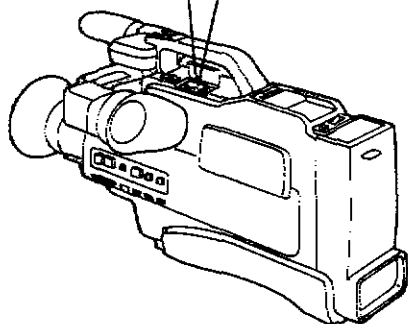
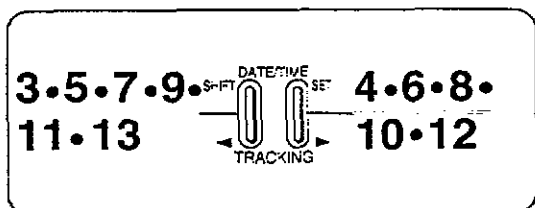
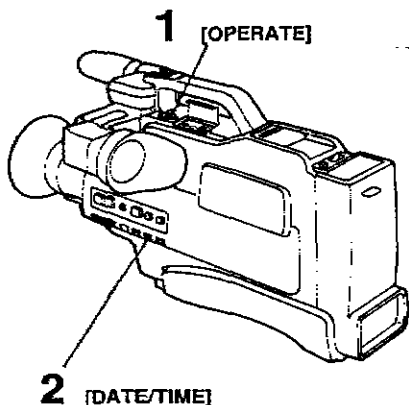
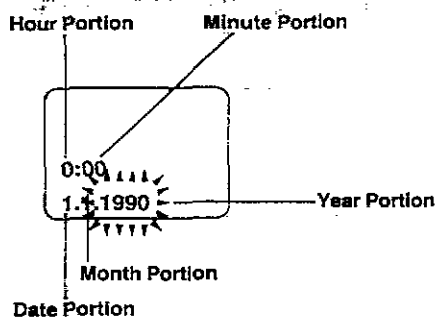
**2** Leave the Battery Pack in the Movie Camera for 20 hours.

The Movie Camera does not need to be turned on.

When the lithium battery is fully charged, it can maintain the operation of the clock for approx. one year.

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





## 2 How to Set the Year, Date and Time

Attach the charged Battery Pack or connect the AC Adaptor to the Movie Camera. Set the date and time in the following sequence: Year, Month, Day, Hour and Minute.

For example: To set the clock to October 15, 1993, 12:30...

- 1 Turn the Movie Camera on.
- 2 Press the [DATE/TIME] Button.  
The Date Indication appears.
- 3 Keep the [SHIFT] Button pressed until the "Year" portion flash.
- 4 Press the [SET] Button to set to "1993".
- 5 Press the [SHIFT] Button to make the "Month" portion flash.
- 6 Press the [SET] Button to set to "10".
- 7 Press the [SHIFT] Button to make the "Day" portion flash.
- 8 Press the [SET] Button to set to "15".
- 9 Press the [SHIFT] Button to make the "Hour" portion flash.
- 10 Press the [SET] Button to set to "12".
- 11 Press the [SHIFT] Button to make the "Minute" portion flash.
- 12 Press the [SET] Button to set to "30".
- 13 Press the [SHIFT] Button.  
The clock starts.  
After a few minutes, check in the Viewfinder that the clock is functioning.

### Note:

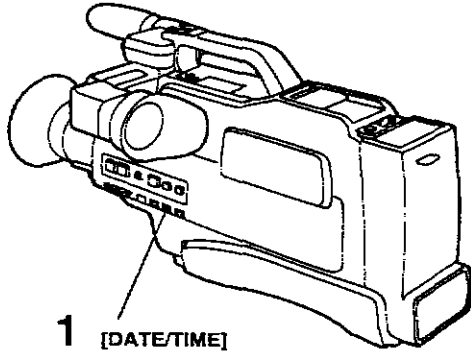
At the time of purchase, the clock does not show the correct time and must first be adjusted.

### ■ If You Make a Mistake during the Setting:

Press the [SHIFT] Button until the portion that is to be changed flashes, and then change the figure with the [SET] Button.

When the [SET] Button is kept pressed, the figures change more quickly.

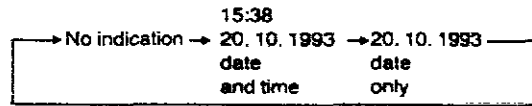
## How to Record the Date and Time during Shooting (cont'd)



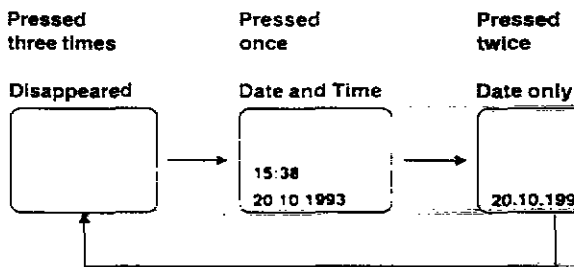
### 3 How to Record the Date and Time during Shooting

During shooting, the Date/Time Indication displayed in the Viewfinder will also be recorded.

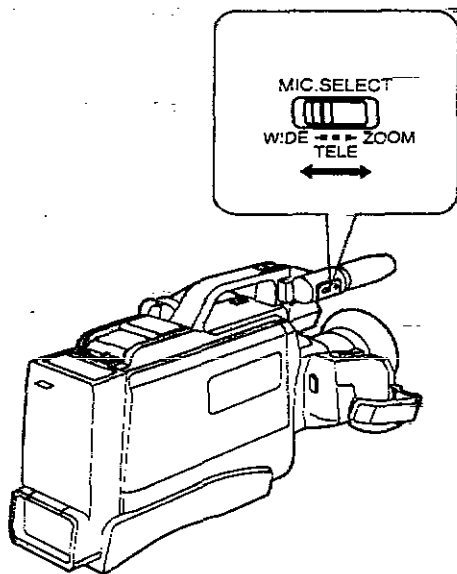
- 1 Press the [DATE/TIME] Button.  
At each press of the [DATE/TIME] Button, the Date/Time Indication in the Viewfinder can be changed in the following order:



Press the [DATE/TIME] Button to select the desired indication.



# The Sound that is Being Recorded

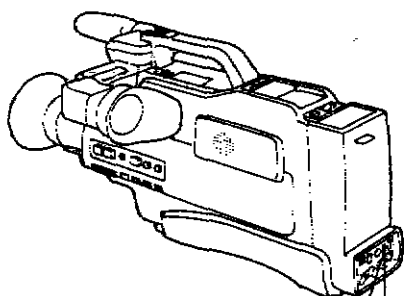


## 1 Sound Recorded with the Stereo Microphone

This Movie Camera is equipped with a stereo zoom microphone. Depending on the setting of the Microphone Mode Selector Switch, the sound will be recorded with different effect.

- WIDE:** The sound will be recorded with stereo effect.
- TELE:** The sound will be recorded with tele effect. Compared with the "WIDE" setting, the microphone directivity is stronger and the sound from distant subjects can be received louder and more distinctly.
- ZOOM:** The zoom control of the microphone is coupled with the Zoom Buttons. When pressing the [W] Zoom Button, the sound will be recorded with stereo effect. When pressing the [T] Zoom Button, the microphone directivity becomes stronger and the sound from distant subjects can be received louder and more distinctly.

For normal shooting, set the Microphone Mode Selector Switch to "WIDE".



## 2 To Listen to the Sound during Recording or Playback

When the Speaker ON/OFF Switch is set to "ON", it is possible to listen to the sound during recording or playback. When it is set to "OFF", the sound cannot be heard.

## 3 Sound Recorded with the Audio Dubbing Function

For playback, select the desired sound with the Audio Select Switch.

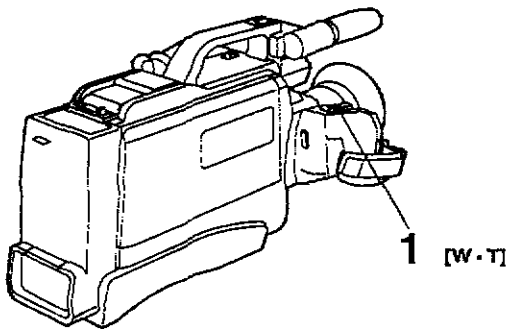
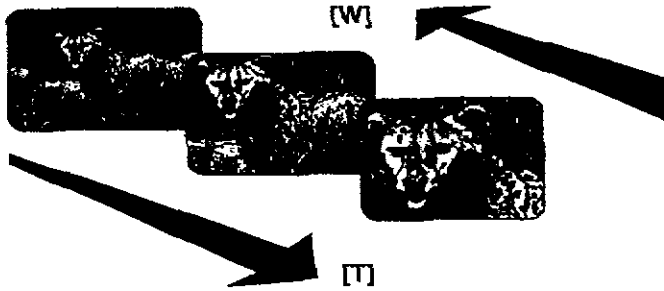
- HiFi:** The original sound (sound before performing audio dubbing) alone can be heard.
- MIX:** The original and the dubbed sound can be heard mixed together.
- NORMAL:** The dubbed sound alone can be heard.

## 4 Sound Recorded with the Insert Function

For playback, select the desired sound with the Audio Select Switch.

- HiFi:** The inserted sound alone can be heard.
- MIX:** The original and the inserted sound can be heard mixed together.
- NORMAL:** The inserted sound (sound before performing Insert) alone can be heard.

## How to Enlarge the Subject during Shooting (Using the Zoom Function)



There are two ways to zoom in on the subject: with the Power Zoom Function and the Digital Zoom Function. Select them according to your shooting purpose.

### 1 How to Use the Power Zoom Function

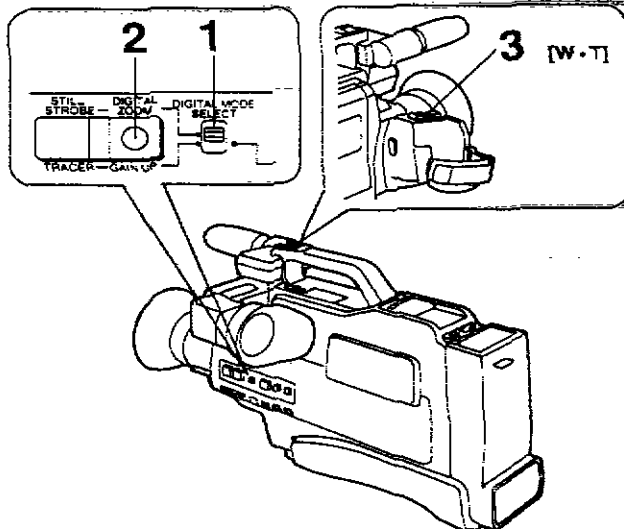
There are two zooming speeds. For faster zooming, press the [W] or [T] Zoom Button firmly. For slow zooming, press either of these buttons lightly.

#### ■ To Zoom In on the Subject:

Keep the [T] Zoom Button pressed until the subject has the desired size in the viewfinder, then release the finger from the button. The subject can be enlarged up to 12 times.

#### ■ To Zoom back from the Subject:

Keep the [W] Zoom Button pressed until the subject has the desired size in the Viewfinder, then release the finger from the button.



### 2 How to Use the Digital Zoom Function

When the Digital Zoom Function is activated, the picture is magnified electronically and the zoom range is increased to  $\times 24$  (D.ZOOM 1) and  $\times 100$  (D.ZOOM 2).

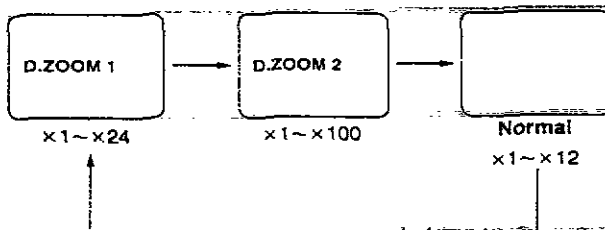
- 1 Slide the [DIGITAL MODE SELECT] switch up.
- 2 Press the [DIGITAL ZOOM] Button. After one press, the "D.ZOOM 1" indication appears in the Viewfinder; on the second press, the "D.ZOOM 2" indication appears.
- 3 Press the [W·T] Button.

#### ■ How to Cancel this Function

Press the [DIGITAL ZOOM] Button.

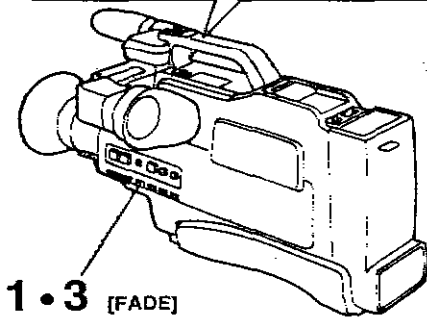
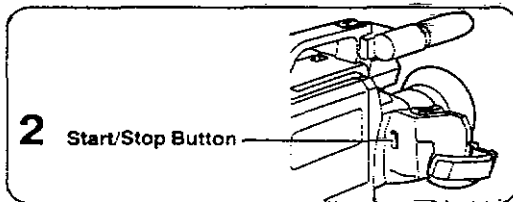
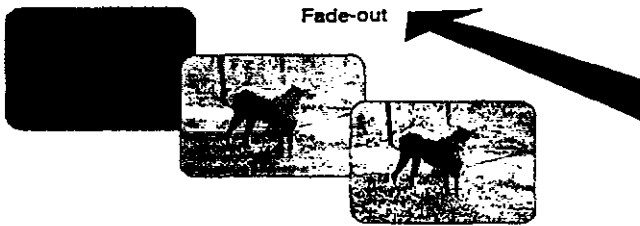
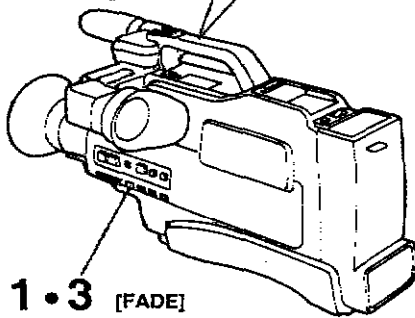
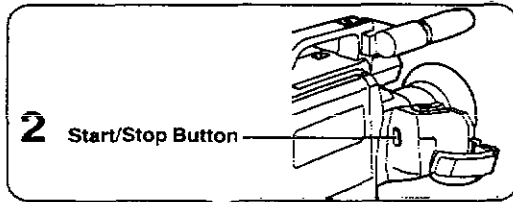
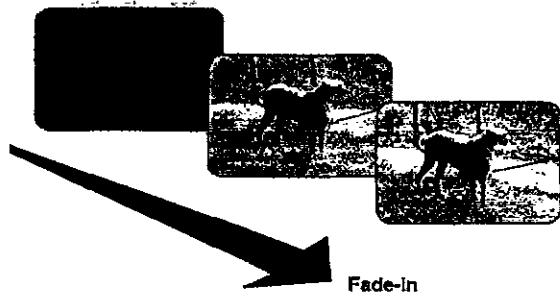
#### Notes:

1. The Digital Zoom Function decreases the picture resolution and fine picture details.
2. When shooting under very bright conditions, the after-image can be eliminated by selecting a shutter speed of 1/250 or 1/500 sec.
3. The higher the magnification of the Digital Zoom becomes, the grainier the picture will be. When the zoom range is increased to  $\times 100$ , the picture and its colours may become unnatural.



# How to Fade in at the Beginning and Fade out at the End of a Scene

Fading in from black is very effective at the beginning of a movie and for soft transitions between scenes.



## 1 How to Fade in

In the shooting pause Mode:

- 1 Keep the [FADE] Button Pressed.
- 2 After the picture in the Viewfinder has disappeared, Press the Start/Stop Button to Start the shooting.
- 3 After about 3 seconds, release your finger from the [FADE] Button.

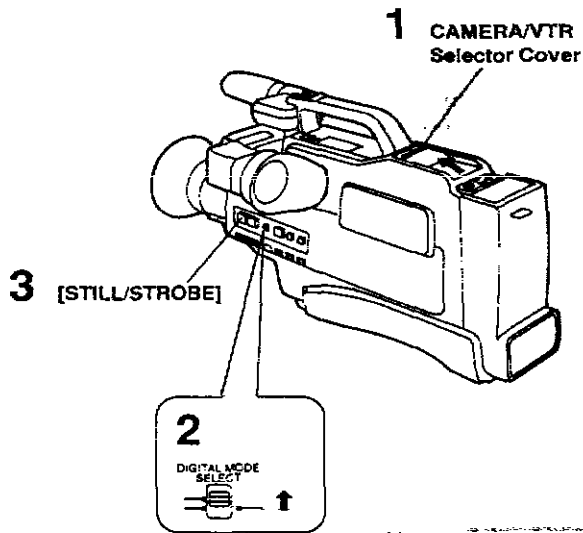
Fading out to black is convenient at the end of a scene to create a soft ending.

## 2 How to Fade out

During shooting:

- 1 Keep the [FADE] Button pressed.
- 2 After the picture has disappeared, press the Start/Stop Button to stop the shooting.
- 3 Release your finger from the [FADE] Button.

# How to Shoot a Still Picture



## ■ Using the Digital Shooting Function

### Notes:

- To prevent picture distortion, do not move or shake the Movie Camera during still picture shooting.
- Since the still picture is recorded from the digital image memory, the picture quality may be slightly inferior to that of normally recorded pictures.

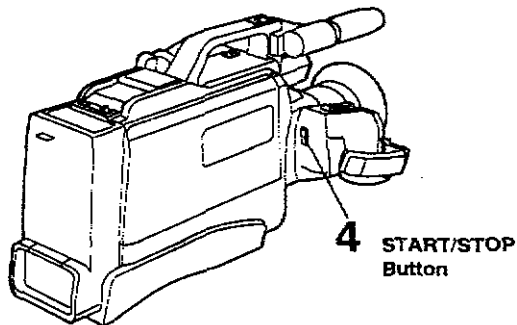
### For recording a Still Picture of Any Desired Duration:

- 1 Slide the [CAMERA/VTR] Selector Cover to "CAMERA".
- 2 Slide the [DIGITAL MODE SELECT] Switch up.
- 3 Press the [STILL/STROBE] Button.
  - The image in the Viewfinder stands still.
  - By pressing the [STILL/STROBE] Button repeatedly, the mode can be changed in the following order:
- 4 Press the Start/Stop Button.  
The still picture in the Viewfinder will be recorded.

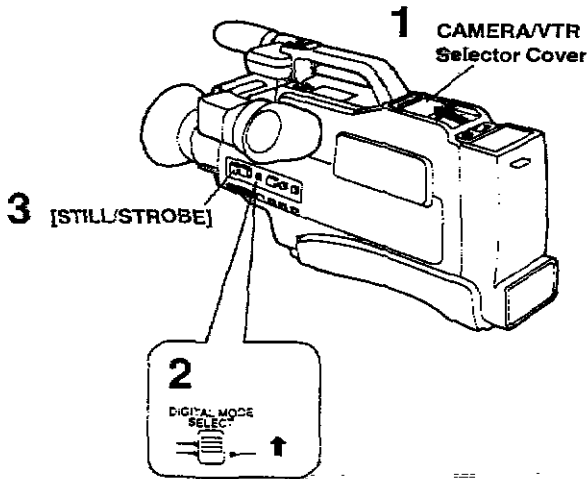
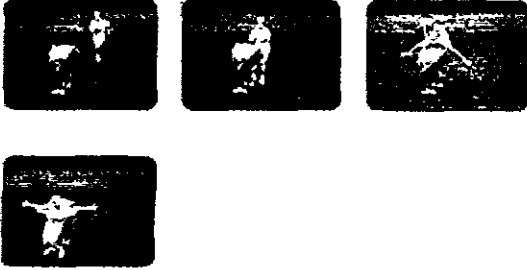
→NORMAL→STILL→STROBE→

### ■ How to Cancel this Function

Press the [STILL/STROBE] Button twice until normal movement in the Viewfinder is observed.

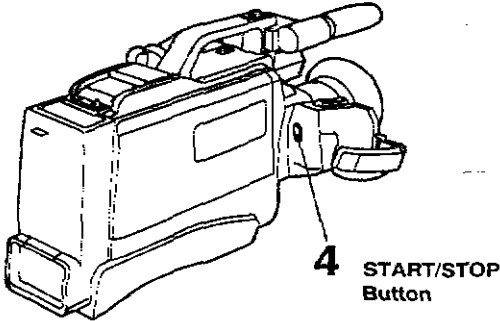
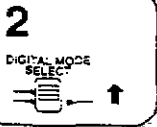


# How to Shoot with Strobe Effect



3 [STILL/STROBE]

1 CAMERA/VTR Selector Cover



4 START/STOP Button

## ■ Using the Digital Shooting Function

For continuously recording 6 still images per second:

- 1 Slide the [CAMERA/VTR] Selector Cover to "CAMERA".
- 2 Slide the [DIGITAL MODE SELECT] Switch up.
- 3 Press the [STILL/STROBE] Button twice.  
The picture in the Viewfinder will also have a strobe effect.
- 4 Press the Start/Stop Button.  
Continuous shooting with strobe effect is now possible.

## ■ How to Cancel this Function

Press the [STILL/STROBE] Button until normal movement in the Viewfinder is observed.

### Hints for Shooting Pictures with Strobe Effect

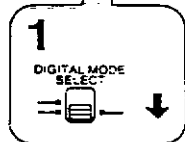
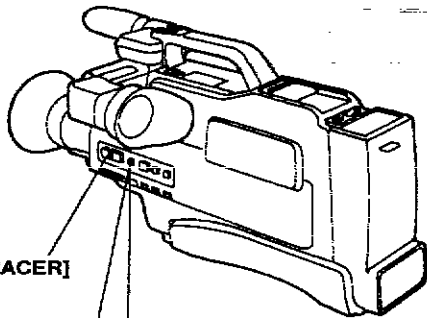
By combining the Strobe Function with the High-Speed Shutter, the strobe effect can be increased. (For outdoor shooting, the 1/250-second shutter speed is recommended.) (P. 40)

### Notes:

1. When shooting under fluorescent lamps, the brightness of the picture may fluctuate.
2. Since the strobe pictures are recorded from the digital image memory, the picture quality may be slightly inferior to that of normally recorded pictures.

## How to Shoot with the After-Image Effect

TRACER



### ■ Using the Tracer Function

This function can be used to emphasize the speed of movements in fast-action scenes.

**1** Slide the [DIGITAL MODE SELECT] Switch to downward.

**2** Press the [TRACER] Button.

The "TRACER" Indication appears.

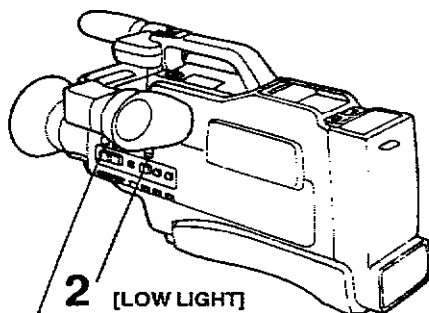
### ■ How to cancel this function...

Press the [TRACER] Button again or slide the [DIGITAL MODE SELECT] Switch to upward.

## How to Shoot Sunsets or Other Evening Scenes



LOW L — Low Light Indication



### ■ Using the Low Light Function

**1** Slide the [AUTO/MANUAL/PORTRAIT] Switch to "MANUAL".

**2** Press the [LOW LIGHT] Button.

•The "LOW L" Indication appears.

•This increases the sensitivity compared to the "AUTO" setting of the [AUTO/MANUAL/PORTRAIT] Switch and assures stable images with relatively weak contrast.

#### Notes:

1. Even if this mode is used for outdoor shooting in the daytime, the result will be almost the same as when the [AUTO/MANUAL/PORTRAIT] Switch is set to "AUTO".
2. In the Portrait Mode, the Lowlight Function is activated. (P. 62)



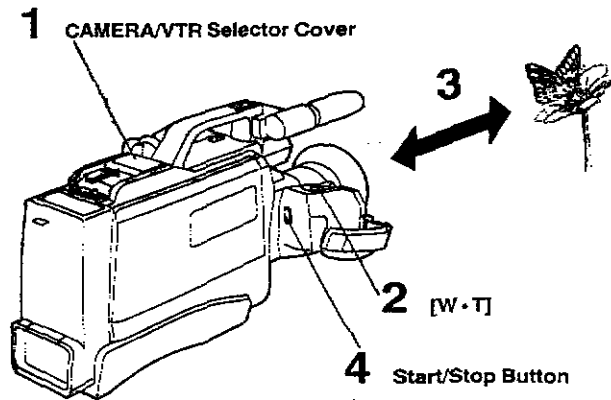
# How to Approach very Small Subjects and Shoot them enlarged



The Macro Close-up Function makes it possible to shoot very small objects, photos, printed matter, insects and many other things. The subject can be approached down to a minimum distance of 5 mm between lens and subject.

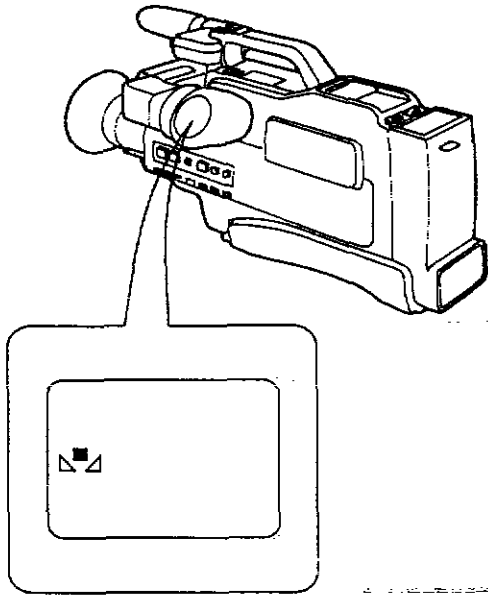
## Hints for Shooting with the Macro Close-up Function

- To get more or less of the subject into the picture, change the distance between the lens and the subject; do not use the [W] or [T] Zoom Button.
- As the depth of field is very small in macro shooting, even slight camera movements can cause the subject to go out of focus. Therefore, it is recommended to use a tripod (optional).
- When shooting pictures in a photo album or a similar situation with insufficient lighting, use a Video DC Light (optional).
- When the zoom lens is in its maximum telephoto position, the minimum shooting distance between lens and subject is 1 m.
- It is recommended to use the Auto Focus Mode. However, with a stable camera position (tripod, etc.), the Manual Focus Mode can also be used.



- 1 Slide the [CAMERA/VTR] Selector Cover to "CAMERA".
- 2 Keep the [W] Zoom Button pressed to zoom to the maximum wide-angle position.
- 3 Approach the subject to the desired distance. The focus will be adjusted automatically (Auto Focus Mode). (p. 37)
- 4 Press the Start/Stop Button. The shooting starts.

# How to Shoot All Scenes with Natural Colours

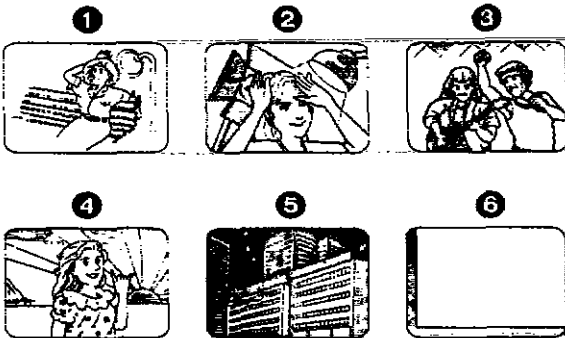


## 1 How to Shoot with Automatic White Balance Adjustment

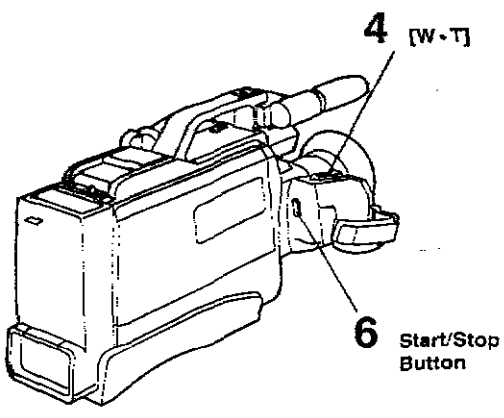
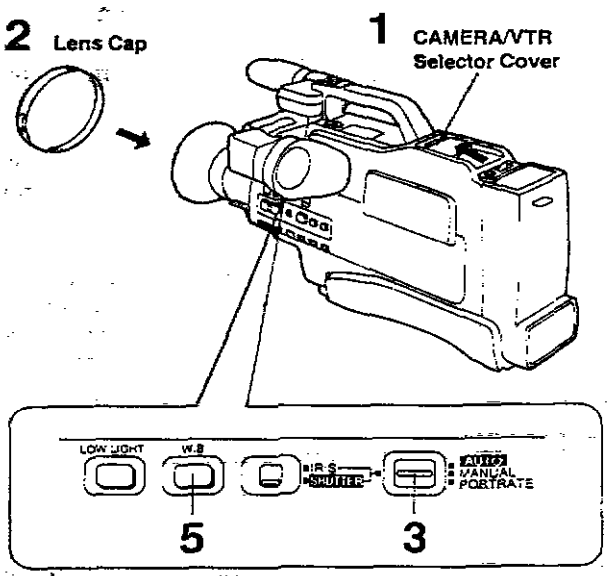
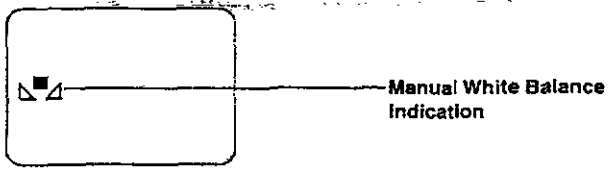
To human eyes, white subjects appear as white even under different lighting conditions. A Movie Camera, however, would give these white subjects, depending on the colour of the light source, a reddish or bluish tint. To attain recordings with natural colours, it is necessary to adjust the sensor in the camera to the existing colour of the light. This adjustment is called white balance adjustment. This camera offers two modes for this adjustment: Automatic and Manual White Balance Adjustment. The Automatic White Balance Adjustment Function provides satisfactory results with almost all subjects. (No operation is necessary.)

When the "WB" indication is displayed in the Viewfinder, the Movie Camera is not in the Auto White Balance Mode. In this case, press the [W.B.] Button to make the "WB" indication disappear.

- If the Movie Camera is moved from outdoors to indoors during shooting, the picture will initially take on a slightly reddish cast but it will gradually regain its natural colours.
- In the following shooting situations, the Auto White Balance Adjustment Mode may not provide satisfactory results; use the Manual White Balance Adjustment Mode instead.



- 1 When shooting under mercury-vapor, sodium or some types of fluorescent lamps.
- 2 When intense lighting is used, e.g. from a halogen lamp, or when the colour temperature of the light source is low.
- 3 When shooting under lighting conditions which change suddenly.
- 4 When shooting outdoors at sunrise or sunset.
- 5 When shooting under firework illumination at night outdoors.
- 6 When shooting a subject or background of a single colour.



## 2 How to Shoot with Ma Balance Adjustment

There are two ways to perform the Manual White Balance adjustment:

1. Using the white Lens Cap.
2. Using a pure white sheet of paper or wall.

**Using the white Lens Cap**  
 When the surrounding Light is bright, the White Balance can be adjusted based on the light passing through the Lens Cap.

- 1 Slide the [CAMERA/VTR] Selector Cover to "CAMERA".
- 2 Attach the Lens Cap to the Lens.
- 3 Slide the [AUTO/MANUAL/PORTRAIT] Switch to "MANUAL".
- 4 Keep the [T] Zoom Button pressed until the screen in the Viewfinder becomes completely white.
- 5 Keep the [W.B] Button pressed until the Manual White Balance Indicator is lit.  
 The following indications in the Viewfinder inform about the state of the adjustment:  
 W.B: means White Balance.  
 " [W.B.] " flashes slowly ..... Not adjusted  
 " [W.B.] " flashes rapidly ..... During adjustment  
 " [W.B.] " is lit ..... Adjustment is finished  
 The Movie Camera is now ready for shooting.
- 6 Press the Start/Stop Button.  
 The shooting starts.

### ■ How to Change Back to the Auto White Balance Adjustment Mode...

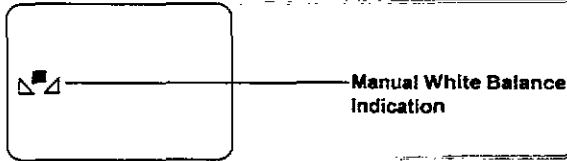
Press the [W.B] Button to the " [W.B.] " Indication in the Viewfinder disappears or slide the [AUTO/MANUAL/PORTRAIT] Switch to "AUTO".

### ■ How to Recall the Last Manual White Balance Setting

After turning the Movie Camera off and later on again, the " [W.B.] " Indication flashes slowly, however, the last previous white balance setting is still maintained.  
 However, to ensure the best possible colour reproduction, adjust the white balance again.  
 The last previous white balance setting is also maintained after pressing the [ [ ] - CAMERA SEARCH + ] Button to confirm the end of the previously recorded scene.  
 But after removing the Battery Pack (or disconnecting the AC Adaptor from the Movie Camera) the last previous white balance setting is no longer maintained.

**Note:**  
 When moving the Movie Camera from indoors to outdoors or vice versa, be sure to adjust the white balance again, as the colour of the light has changed considerably.

## How to Shoot All Scenes with Natural Colours (cont'd)



Using a pure white sheet of paper or wall  
When the surrounding light is not bright, or when various kinds of light are mixed, use a pure white sheet of paper or wall.

**1** Slide the [CAMERA/VTR] Selector Cover to "CAMERA".

**2** Slide the [AUTO/MANUAL/PORTRAIT] Switch to "MANUAL".

**3** Remove the Lens Cap from the Lens.

**4** Point the Movie Camera at white paper or at another pure white object.

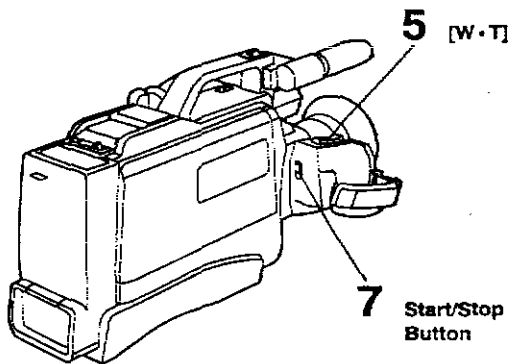
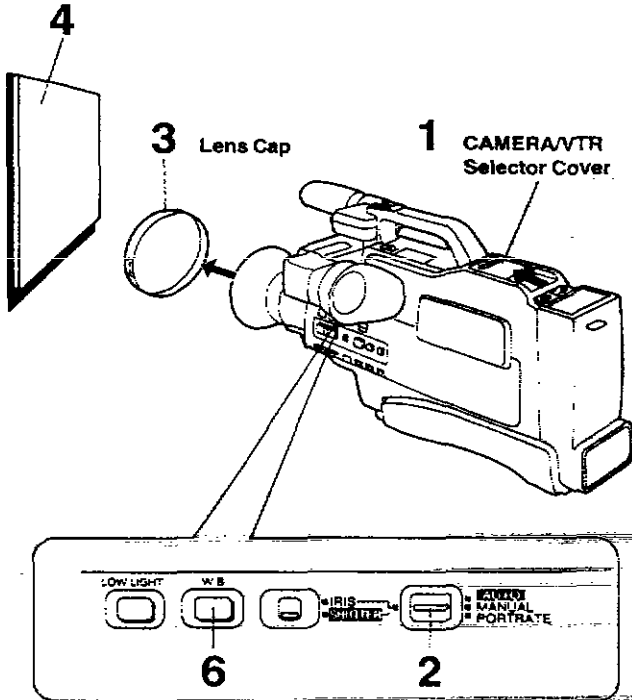
**5** Keep the [T] Zoom Button pressed until the screen in the Viewfinder becomes completely white.

**6** Keep the [W.B] Button pressed until the Manual White Balance Indication appears.  
The condition of the Manual White Balance Indication in the Viewfinder informs about the state of the adjustment:  
"☐" flashes slowly ..... Not adjusted  
"☐" flashes rapidly ..... During adjustment  
"☐" is lit ..... Adjustment is finished.  
The Movie Camera is now ready for shooting.

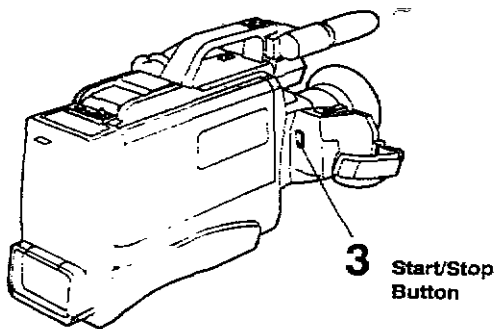
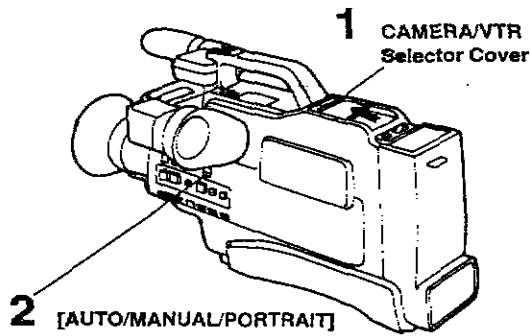
**7** Press the Start/Stop Button.  
The shooting starts.

### How to Change Back to the Auto White Balance Adjustment Mode...

Press the [W.B] Button to the "☐" Indication in the Viewfinder disappears or slide the [AUTO/MANUAL/PORTRAIT] Switch to "AUTO".



# How to Adjust the Focus



There are two ways to perform the focus adjustment: 1 Auto Focus Mode and 2 Manual Focus Mode.

Select the mode according to the condition of the subject or the surroundings.

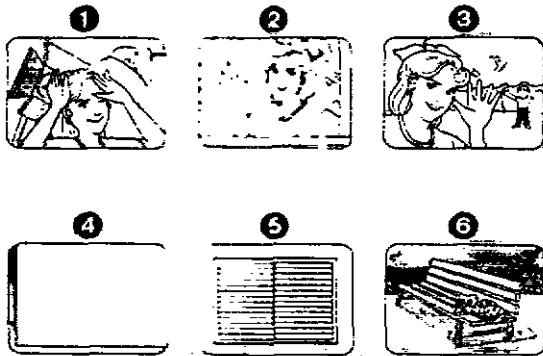
## 1 How to Shoot with the Auto Focus Mode

This Movie Camera focuses Automatically on almost any subject.

- 1 Slide the [CAMERA/VTR] Selector Cover to "CAMERA".
- 2 Confirm that the [AUTO/MANUAL/PORTRAIT] Switch is set to "AUTO".
- 3 Press the Start/Stop Button.  
The shooting starts.

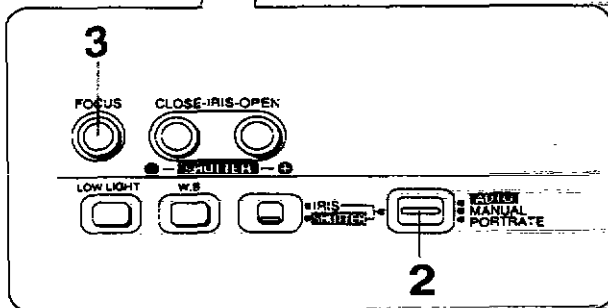
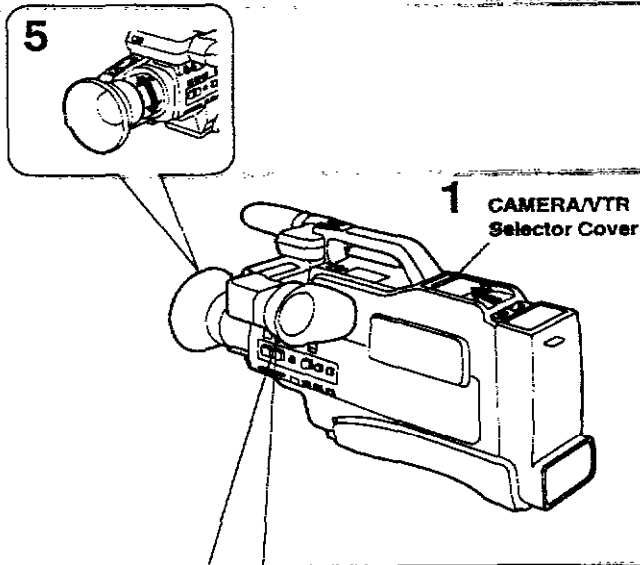
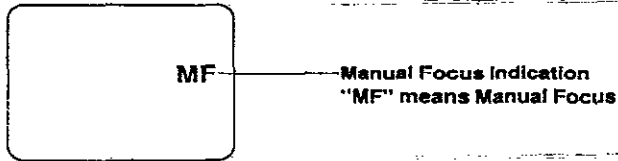
### Notes:

1. When zooming from wide-angle toward telephoto, the subject may slightly go out of focus depending on the shooting conditions.
2. In the shooting situations listed below, the Auto Focus Mode may not provide satisfactory results; use the Manual Focus Mode instead. (See next page.)



- 1 Shiny surfaces Subjects with backlighting or light reflection.
  - 2 A subject behind dirty glass.
  - 3 A subject with a part of it near the Movie Camera and another part far away from it.
  - 4 A flat surface, e.g. white wall.
  - 5 A subject with horizontal stripes.
  - 6 An oblique subject.
- A fast-moving subject.
  - A subject with a dark surface.
  - When using the Macro Close-up Function, special lenses or filters.

## How to Adjust the Focus (cont'd)



### 2 How to Shoot with the Manual Focus Mode

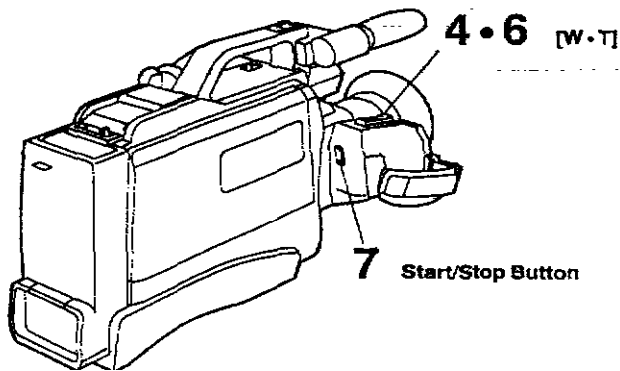
**Note:**

When using the Manual Focus Mode, always adjust the lens with the Zoom [T] Button in the maximum tele setting. This will ensure that the subject remains precisely focused throughout the zoom range from the maximum tele to maximum wide-angle setting.

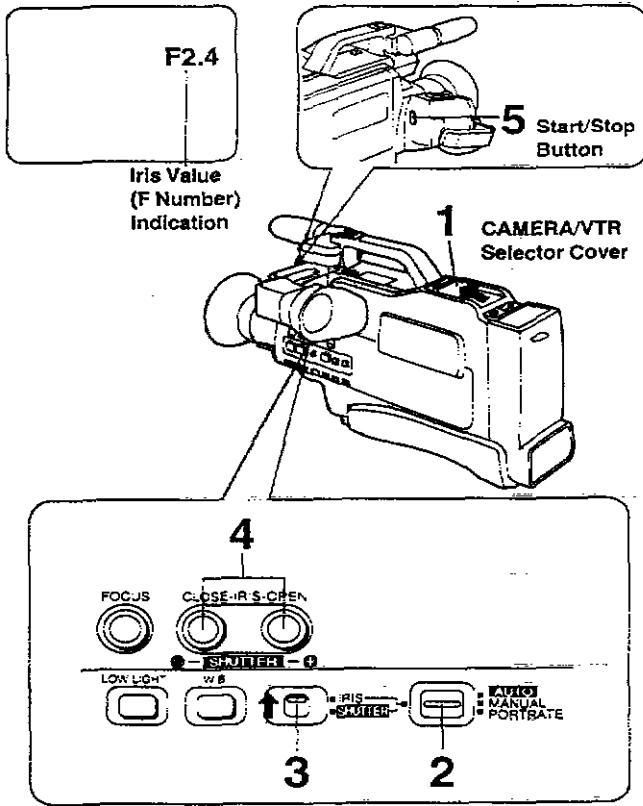
- 1 Slide the [CAMERA/VTR] Selector Cover to "CAMERA".
- 2 Slide the [AUTO/MANUAL/PORTRAIT] Switch to "MANUAL".
- 3 Press the [FOCUS] Button. The "MF" indication appears in the Viewfinder.
- 4 Press the [T] Zoom Button to zoom in on the subject to be focused.
- 5 Turn the Focus Ring to adjust the focus.
- 6 Press the [W] Zoom Button to zoom back as desired.
- 7 Press the Start/Stop Button. The shooting starts.

### How to Change back to the Auto Focus Mode

Press the [FOCUS] Button or slide the [AUTO/MANUAL/PORTRAIT] Switch to "AUTO". The "MF" indication disappears from the Viewfinder.



## How to Shoot Backlit Scenes



### ■ Using the Iris Adjustment

#### Notes:

1. The sky may become whitish.
2. In case of extremely strong backlight, it may not be possible to brighten up the subject sufficiently.
3. When shooting with the sun striking the subject at an angle, star-shaped light reflexes may be recorded in the picture.

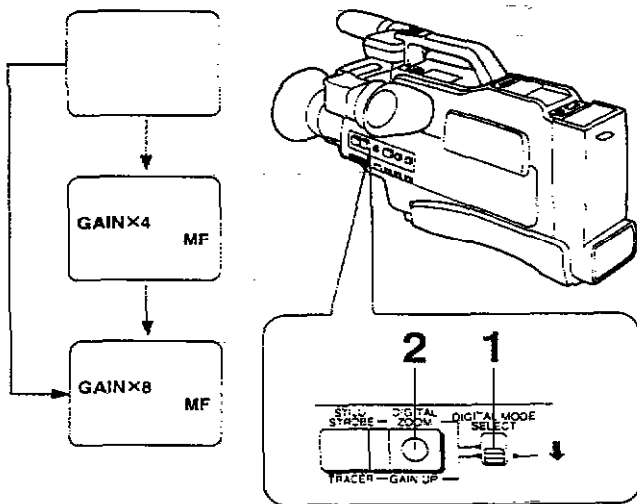
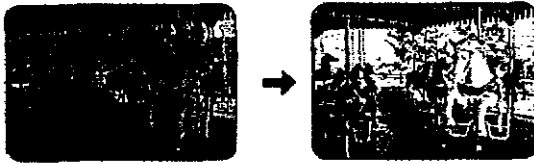
This function makes it possible to brighten up the subject when shooting a backlit scene.

- 1 Slide the [CAMERA/VTR] Selector Cover to "CAMERA".
- 2 Set the [AUTO/MANUAL/PORTRAIT] Switch to "MANUAL".
- 3 Slide the [IRIS/SHUTTER] Switch to "IRIS".
- 4 Press either the Iris Open or Close Button repeatedly to select the desired F Number.
  - The F Number Indication appears.
  - The F Number can be changed in 18 steps: OP+, G2, OP-, G1, OPEN, F2, F2.4, F2.8, F3.4, F4, F4.8, F5.6, F6.8, F8, F9.6, F11, F14, F16, F19, CLOSE
- 5 Press the Start/Stop Button.

### ■ How to Return to the Standard Iris Setting...

- Press the [OPEN -] Button and [CLOSE -] Button simultaneously for more than 1 second.
- Returning to the standard iris setting is also possible by setting the [AUTO/MANUAL/PORTRAIT] Switch to "AUTO".

## How to Shoot in the Dark



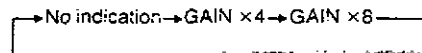
### ■ Using the High Sensitivity Function

#### Notes:

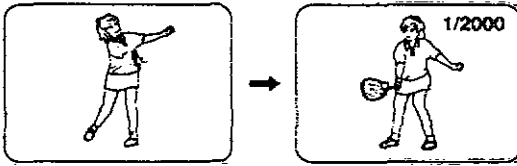
1. Some after-image distortion will occur.
2. When the High Sensitivity Function is activated, no other Digital Mode Function can be used.
3. The High-Speed Shutter Function will be cancelled automatically.
4. In the High-Sensitivity Mode, the focus must be adjusted manually since the Movie Camera is automatically put into the Manual Focus Mode.

- 1 Slide the [DIGITAL MODE SELECT] Switch down.

- 2 Press the [GAIN UP] Button. By pressing the [GAIN UP] Button repeatedly, the degree of the sensitivity can be changed as follows:

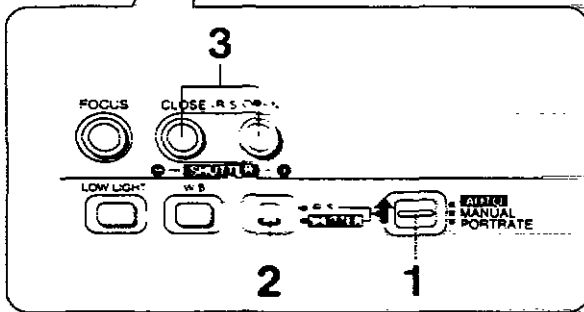
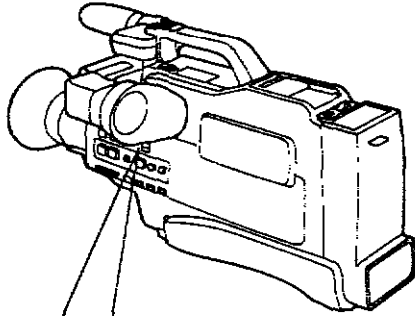


# How to Shoot Fast-Moving Subjects



## ■ Using the High-Speed Shutter Function

A range of different high shutter speeds makes it possible to shoot scenes with fast movements. When scenes recorded with a high shutter speed are later played back on a VTR equipped with super still and super fine slow motion functions, still and slow motion playback with very sharp picture contours and brilliant details can be obtained.



**1** Slide the [AUTO/MANUAL/PORTRAIT] Switch to "MANUAL".

**2** Slide the [IRIS/SHUTTER] Switch to "SHUTTER".

**3** Press either the Shutter  $\ominus$  or  $\oplus$  Button repeatedly to select the desired shutter speed.

The shutter speed can be changed in 8 steps:

Pressing the [OPEN +] Button  $\longrightarrow$

1/50 1/120 1/250 1/500 1/1000 1/2000 1/4000 1/8000  
 (No indication)  
 Normal

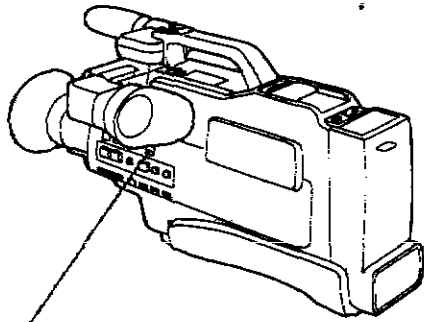
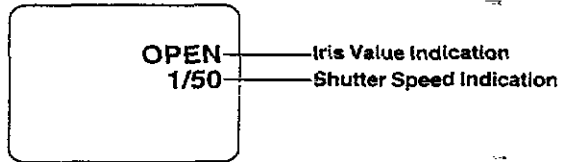
$\longleftarrow$  Pressing the [CLOSE -] Button

### Notes:

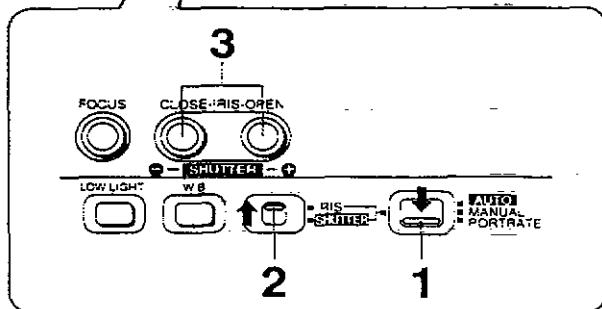
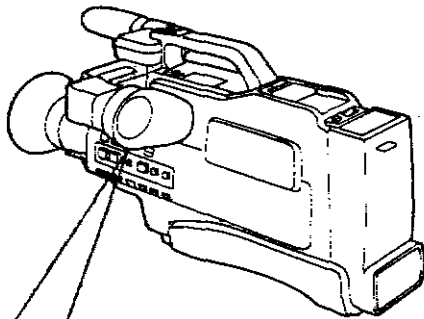
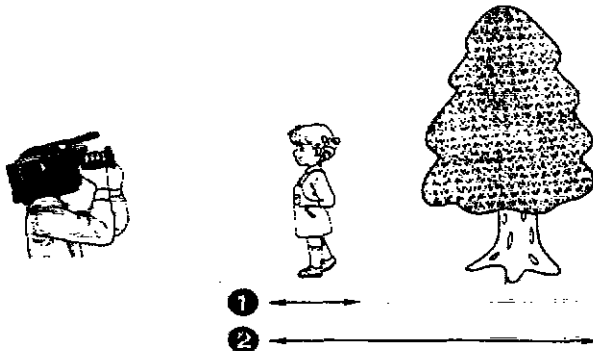
1. The subject must be brightly lit by sunlight or other strong illumination, with little shade.
2. When shooting under fluorescent lamps, the picture will be adversely influenced by flickering.
3. When the picture is played back in the normal playback mode, the picture movement may not be as smooth as normal.
4. The playback picture will be slightly darker than the picture recorded without using the High-Speed Shutter Function.



# How to Shoot a Portrait



1 [AUTO/MANUAL/PORTRAIT]



This function makes it possible to shoot a portrait with the face perfectly focused and the background blurred. If the scene is too bright or too dark for proper exposure, the F number indication will change automatically.

1 Slide the [AUTO/MANUAL/PORTRAIT] Switch to "PORTRAIT".

The F Number Indication "OPEN" and Shutter Speed Indication appear.

## How to Cancel this Function...

Set the [AUTO/MANUAL/PORTRAIT] Switch to "AUTO".

## Iris Priority Mode

Any of 15 F Number settings between "OPEN" and "F19" (p. 39) can be selected. The optimum shutter speed (between 1/50 and 1/1000 sec.) will automatically be selected according to the brightness of the subject and the selected F Number.

• In the Portrait Mode, all functions can be used except the High-Speed Shutter Function. (P. 62)

By setting the iris to or near the "OPEN" position, it is possible to shoot a portrait with the person perfectly focused and the background blurred.

- Opening the iris reduces the depth of field, i.e. the distance range within which the subject is sharp becomes smaller.
- Closing the iris increases the depth of field, i.e. the distance range within which the subject is sharp becomes larger.

① Depth of field with iris turned toward "OPEN"

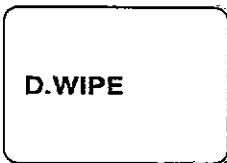
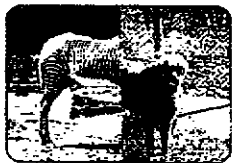
② Depth of field with iris turned toward "F19"

1 Slide the [AUTO/MANUAL/PORTRAIT] Switch to "PORTRAIT".

2 Slide the [IRIS/SHUTTER] Switch to "IRIS".

3 Press either Iris Close Open/Shutter -/+ Button repeatedly to select the desired F Number.

# Inserting a Still Picture with Wipe Editing (Digital Wipe)



## ■ Storing a Still Picture into the Memory

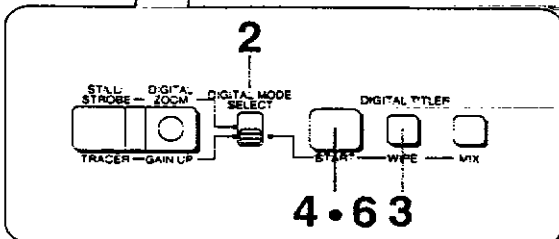
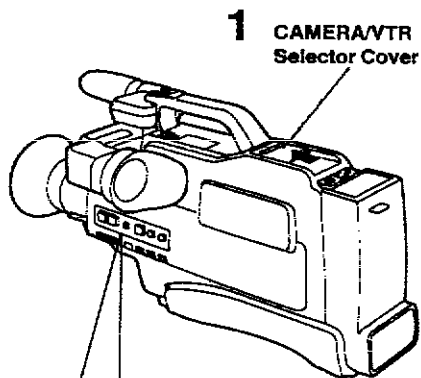
When the Movie Camera is in the shooting pause mode.

- 1 Slide the [CAMERA/VTR] Selector Cover to "CAMERA".
- 2 Slide the [DIGITAL MODE SELECT] Switch down.
- 3 Press the [WIPE] Button.
  - Press this button while aiming the Movie Camera at the scene to be used for the still picture.
  - The image in the Viewfinder stands still for approx. 2 seconds and this still picture is stored into the memory.

## ■ Starting to Shoot a Scene with the Still Picture

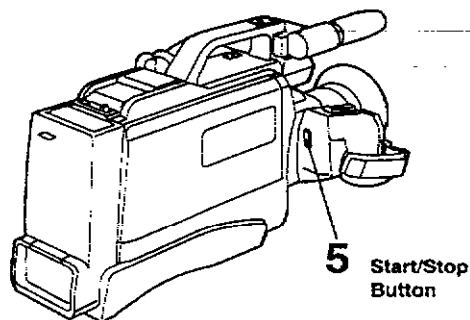
In the shooting pause mode:

- 4 Press the [START] Button.
  - The still picture from the memory replaces the moving picture gradually, starting from the left side.
  - The Movie Camera should be aimed at the scene, which is to be shot following the recording of the still picture.
- 5 Press the Start/Stop Button.
  - The still picture from the memory is now being recorded.
- 6 Press the [START] Button again.
  - The moving picture again replaces the still picture gradually, starting from the right side, and the shooting of the moving picture continues.

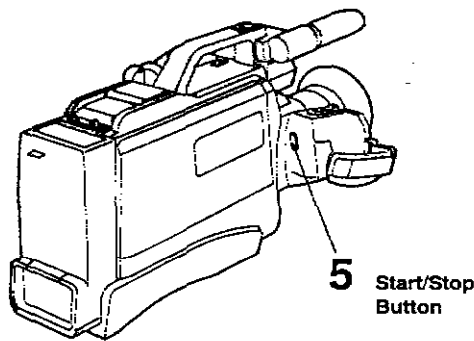
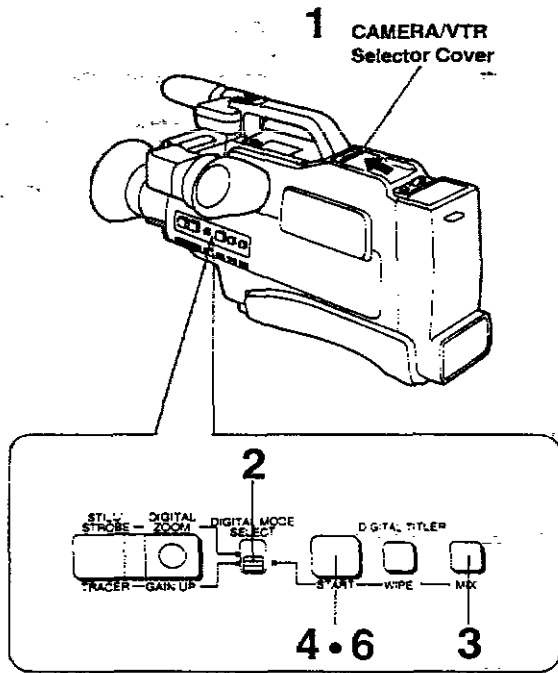


## ■ Cancelling the Digital Wipe Function

Slide the [DIGITAL MODE SELECT] Switch up.



# Fading Over or Superimposing a Still Picture onto the Moving Picture (Digital Image Mix)



## ■ Storing a Still Picture into Memory

When the Movie Camera is in the shooting pause mode:

- 1** Slide the [CAMERA/VTR] Selector Cover to "CAMERA".
- 2** Slide the [DIGITAL MODE SELECT] Switch down.
- 3** Press the [MIX] Button.
  - Press this button while aiming the Movie Camera at the scene to be used for the still picture.
  - The image in the Viewfinder stands still for approx. 2 seconds and this still picture is stored into the memory.

## ■ Starting to Shoot a Scene with the Still Picture

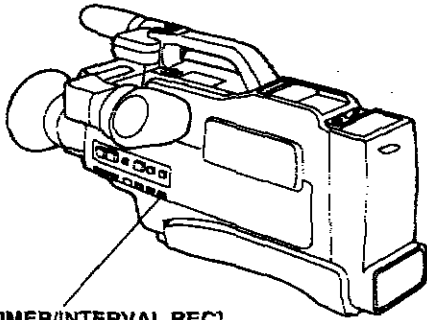
In the shooting pause mode:

- 4** Press the [START] Button.
  - The still picture from the memory replaces the moving picture gradually.
  - If this button is pressed for 2 seconds, the still picture appears superimposed onto the moving picture.
  - The Movie Camera should be aimed at the scene, which is to be shot following the recording of the still picture.
- 5** Press the Start/Stop Button.
  - The still picture from the memory is now being recorded.
- 6** Press the [START] Button again.
  - The moving picture replaces the still picture gradually, and the shooting of the moving picture continues.
  - If the [MIX] Button was pressed for 2 seconds to superimpose the still picture, the superimposed still picture will disappear, and the shooting of the moving picture alone continues.

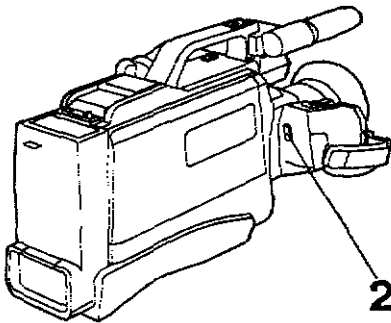
## ■ Cancelling the Digital Mix Function

Slide the [DIGITAL MODE SELECT] Switch up.

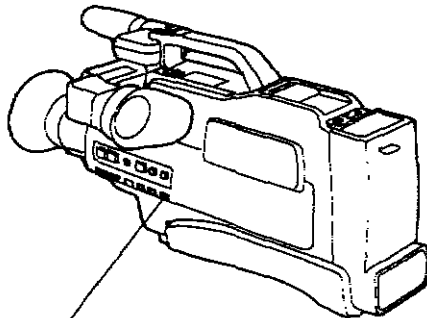
# Self-Timer Recording and Interval Recording



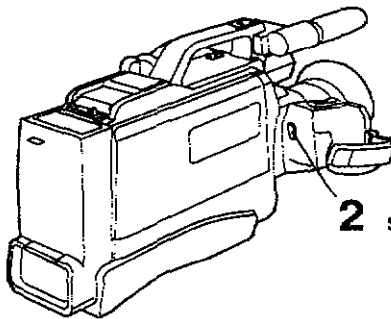
1 [TIMER/INTERVAL REC]



2 Start/Stop Button



1 [TIMER/INTERVAL REC]



2 Start/Stop Button

## 1 Self-Timer Recording

When the Movie Camera is in the shooting pause mode:

- 1 Press the [TIMER/INTERVAL REC] Button during recording pause to select the desired recording mode.

When the [TIMER/INTERVAL REC] Button is pressed once, "SLF20" will appear in the EVF, and when the button is pressed twice, "SLF" will appear in the EVF.

- 2 Press the Start/Stop Button.

- The self-timer recording will start 10 seconds later.

- When "SLF20" is indicated, the recording will be made for 20 seconds.

- When "SLF" is indicated, the recording will be made until the tape reaches its end.

### ■ How to stop the Self-Timer Recording Midway

Press the Start/Stop Button, and the self-timer recording will be cancelled.

## 2 Interval Recording

This recording function automatically makes recordings of approx. 1 second duration at 1-minute intervals. (However, the initial recording will continue for about 5 seconds.) The interval recording will continue for a maximum of 10 hours, after which the Movie Camera will turn itself off.

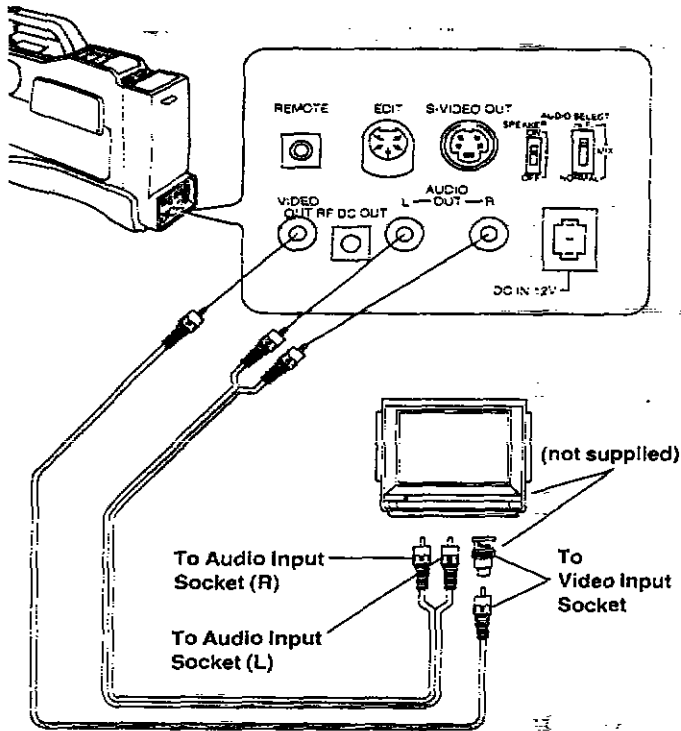
- 1 Press the [TIMER/INTERVAL REC] Button three times during recording pause mode. "INT" will appear in the EVF.

- 2 Press the Start/Stop Button.

### ■ How to stop the Interval Recording Midway

Press the Start/Stop Button, and the interval recording will be cancelled.

# How to playback via a TV Set

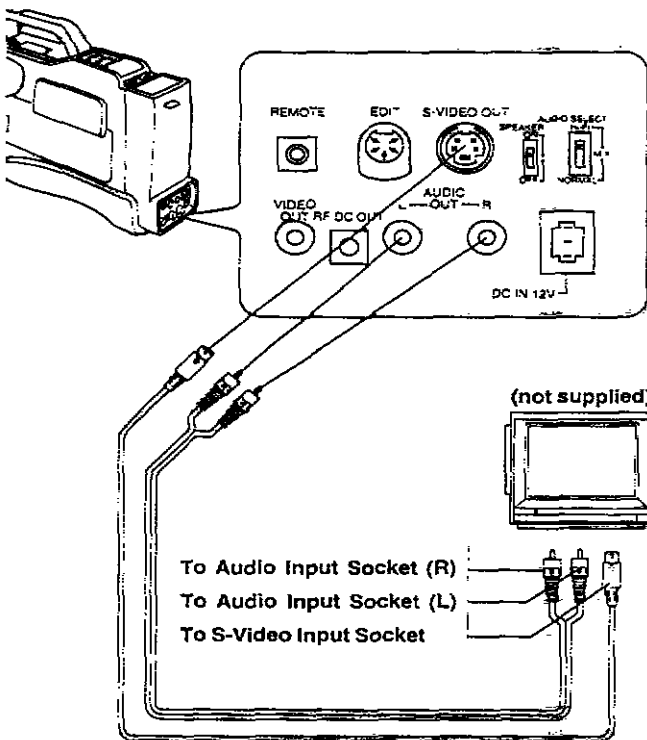


## 1 Playback via a TV Set with AV Input Socket (Using the Supplied AV Output Cable)

Turn off the Movie Camera and the TV set.

Connect the Movie Camera to the TV set.

■ Activate the Playback Operation (p. 16)



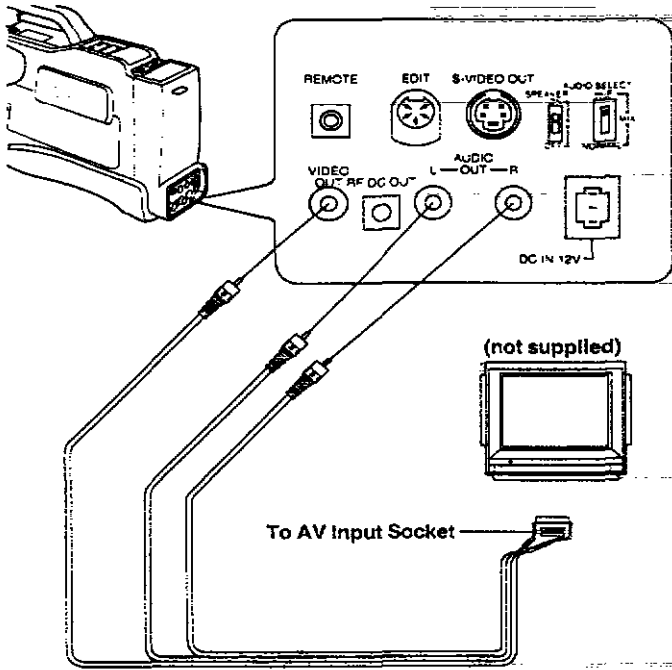
## 2 Playback via a TV Set with S-Video Input Socket (Using the Supplied S-Video Cable)

Turn off the Movie Camera and the TV set.

Connect the Movie Camera to the TV set. (S-Video Cable and Audio Cable are supplied.)

■ Activate the Playback Operation (p. 16)

## How to playback via a TV Set (cont'd)

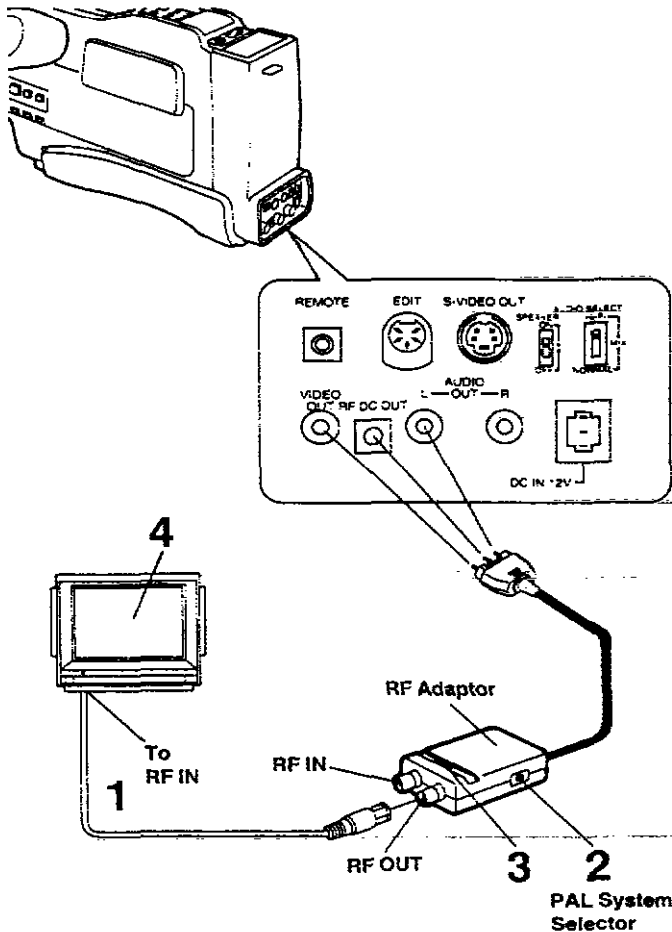


### 3 Playback via a TV Set with AV Input Socket (21 Pin) (Using the Supplied AV Output Cable)

Turn off the Movie Camera and the TV set.

Connect the Movie Camera to the TV set.

■ **Activate the Playback Operation**  
(p. 16)



### 4 Playback via a TV Set without AV Input Socket (Using the Optional RF Adaptor)

Turn off the Movie Camera and the TV set.

**1** Connect the Movie Camera to the TV set.

**2** Set the PAL System Selector Switch to the correct position.

- Set to "I" for the UK.
- Set to "G" for continental Europe. If set to the wrong position, the sound will be muted.

**3** Set the TV/VTR Selector Switch on the RF Adaptor to:

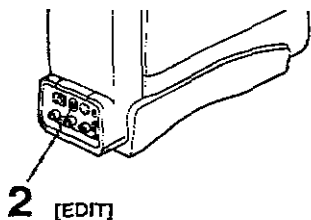
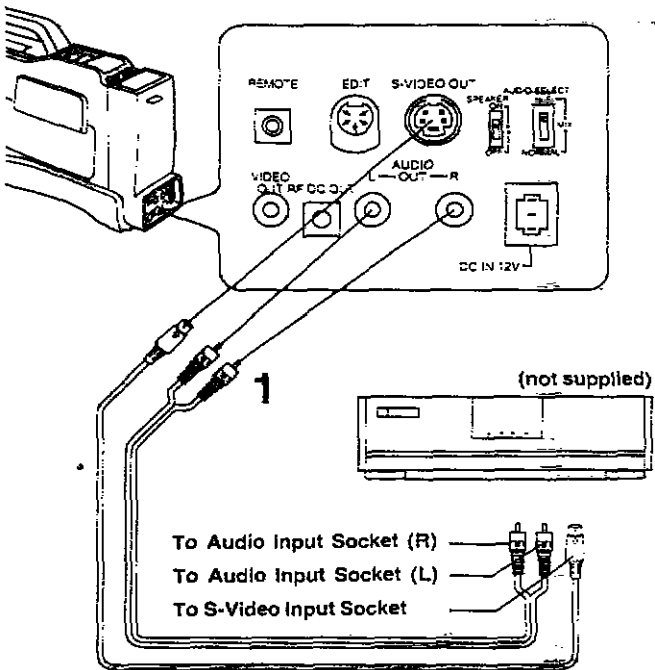
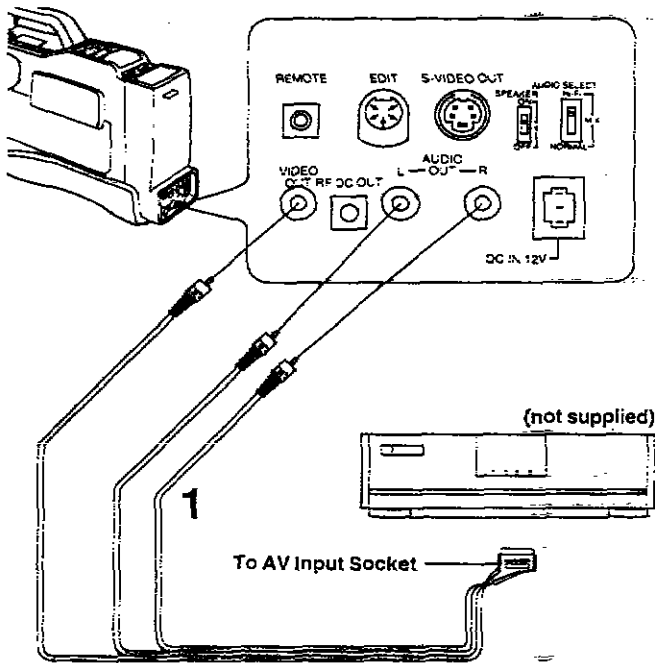
- VTR: For playing back a video cassette
- TV: For watching TV

**4** Select an unused TV programme position (channel).

- Follow the tuning procedure outlined in the instruction booklet for your TV set to re-tune your TV set to the UHF transmission channel 36. The camera picture now appears on the TV screen.
- If in doubt, consult your local video dealer

■ **Activate the Playback Operation**  
(p. 16)

# How to Edit a Previously Recorded Tape



## ■ Connections

### 1 Connect the Movie Camera to a VTR.

Using the Supplied AV Output Cable

## ■ Operations

### Movie Camera

1. Insert a recorded Video Cassette into the Movie Camera.
2. Press the [PLAY] Button.  
(and if necessary the [FF] or [REW] Button to locate the scene from where the dubbing is to start.)
3. Press the [PAUSE] Button at the point where the dubbing is to start.

### VTR

4. Insert a Video Cassette with intact erasure prevention tab into the VTR.  
If your VTR is equipped with SP and LP modes, it is recommended to use the SP mode.
5. Press the Record Button to start recording.

### Movie Camera

6. Press the [PAUSE] Button to start the playback.

### VTR

7. Press the Pause/Still Button at the exact position where the recording is to end.  
The VTR is now in the Recording Pause Mode.

### Movie Camera

8. Locate the beginning of the next scene to be dubbed, and press the [PAUSE] Button at that point.

### VTR

9. Press the Pause/Still Button again to resume recording.

Repeat the operation steps 6 to 9 for each additional scene to be edited.

## ■ Connections

### 1 Connect the Movie Camera to a VTR.

Using the Supplied S-Video Cable

## ■ Operations

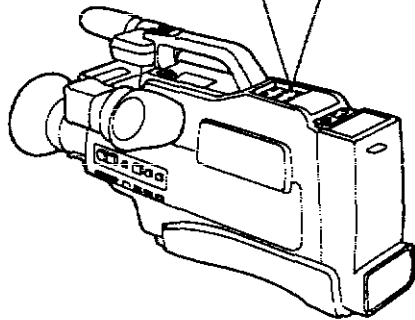
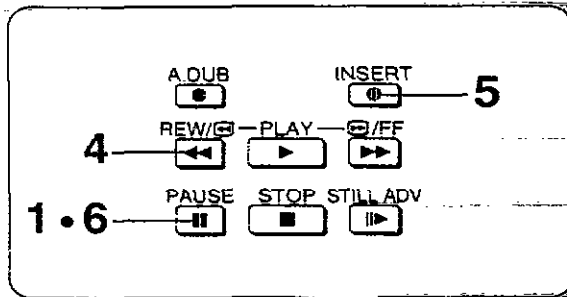
The operation is the same as the operation described above.

### 2 Edit Socket

By connecting an Editing Controller (optional) to this socket as well as to a VTR equipped with Edit Socket, highly precise and speedy editing becomes possible.

# Insert Editing

Replacing pictures *and* sound on a recorded tape with new scenes and sound.



**1 Press the [PAUSE] Button.**  
Playback the tape to locate the point where the Insert Editing is to finish, and press the Pause Button at that point

**2 Press the [RESET] Button.**

**3 Press the [MEMORY] Button.**  
The indication "M 0000" appears in the EVF.

**4 Press the [REW] Button.**  
Rewind the tape to locate the point where the Insert Editing is to start, and release the button at that point.

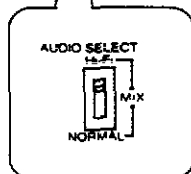
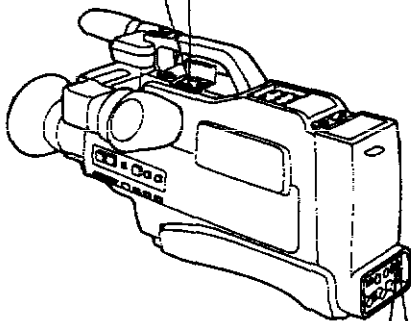
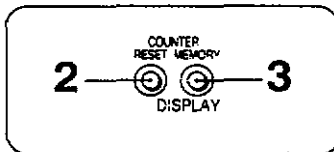
**5 Press the [INSERT] Button.**

**6 Press the [PAUSE] Button again.**  
The Insert Editing starts.

The Insert Editing will automatically finish at the point where the counter indicates "M 0000".  
To stop the Insert Editing midway, press the [Pause] Button.

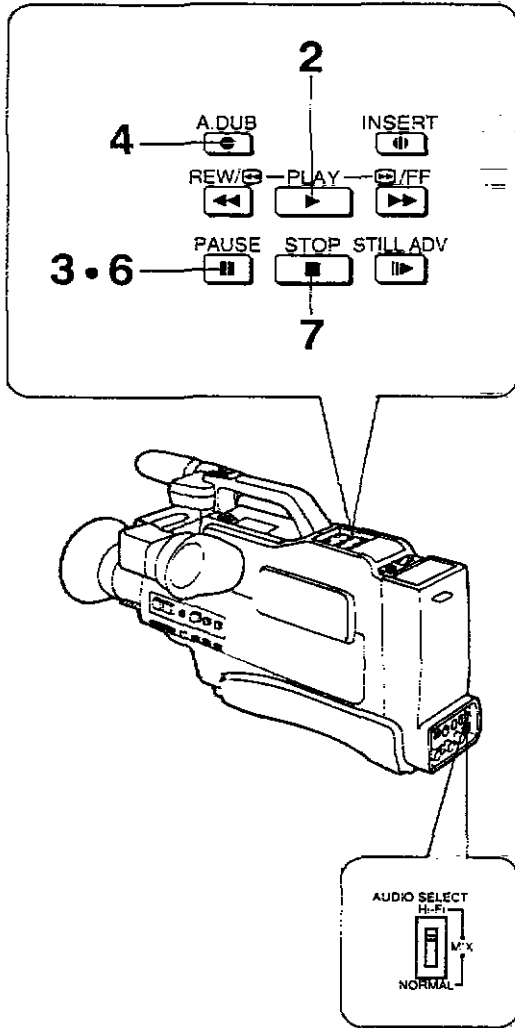
**■ When playing back a cassette tape on which insert editing has been performed...**

Use the [AUDIO SELECT] Switch to select the sound to be played back. (p. 26)





# Audio Dubbing



Audio Dubbing can be performed by using the built-in microphone or an external microphone.

- 1 Insert the recorded cassette.**  
Insert a video cassette with intact tab.  
If the tab is removed, cover the hole with adhesive tape. (p. 9)
- 2 Press the [PLAY] Button.**  
Playback the tape to locate the point where you wish to start the Audio Dubbing.
- 3 Press the [PAUSE] Button.**
- 4 Press the [A.DUB] Button.**
- 5 Operate the audio source unit.**
- 6 Press the [PAUSE] Button again.**  
The Audio Dubbing starts.
- 7 Press the [STOP] Button.**  
The Audio Dubbing stops.

■ **When playing back a cassette tape on which audio dubbing has been performed...**

Use the [AUDIO SELECT] Switch to select the sound to be played back. (p. 27)

■ **VITC signals**

This Movie Camera is equipped with a built-in VITC Generator and it automatically records VITC signals (Vertical Interval Time Code). It can count up continuously from 0 to a maximum of 24 hours. Using a VITC Editing Controller System (optional), cassette tapes recorded with VITC signals can be edited more conveniently and with frame-by-frame precision.

**Note:**

For actual editing, refer to the Operating Instructions of the VITC Editing Controller System.  
A built-in lithium battery ensures that the last time code value reached before the recording was interrupted is always retained in memory. Thus when camera recording is resumed later, the time code sequence continues from the point where it was halted, even if the Movie Camera was switched off.

**Cautions for Shooting with VITC Time Code**

- To ensure that the desired scenes can be found during editing, the time code must be recorded continuously without any gaps.
1. Provide a blank leader portion at the beginning of each video cassette by leaving the Lens Cap on the Lens and starting to shoot. Continue shooting like this for at least 20 seconds.
  2. Each time you start the Movie Camera, small jumps may appear in the time code. These jumps would make editing of the first frames of a scene difficult. Therefore, get into the habit of always starting the camera approx. 5 seconds before the actions which you wish to record actually start.
  3. Do not wind the tape in the video cassette forwards or backwards after taking a shot. The successive shots must be recorded in continuous sequence.
  4. Do not use the Camera Search or Rec Review Function.
  5. Never make new recordings over parts of a previously recorded video cassette.

## Cautions

Please read these cautions before operating the Movie Camera and its accessories.

### Video Head Clogging

The video heads are the means by which the Movie Camera places picture signals on the tape during recording, and reads picture signals from the tape during playback. If these heads become dirty and clogged from long use, the signals can no longer be recorded or played back correctly. This is the case, if the sound of a tape during playback is reproduced normally, but the picture is not visible or greatly distorted. When such symptoms occur, have the Movie Camera checked by qualified service personnel.

This Movie Camera is equipped with Head Clogging Detection Function. When the heads are clogged, the "⊗" Indication in the Viewfinder will appear. As the accumulation of dirt on the heads may be dislodged by the movement of the tape, it is possible that this indication sometimes appears, but may not reappear on the next recording start.

The Head Clogging Detection Function will be activated when the shooting is started from the shooting pause mode. However, it will not be activated when shooting immediately after replacing the cassette and after playing back some part of the tape.

### If Condensation Forms Inside the Movie Camera

Condensation (dew) forms when warm air comes in contact with a cold object, for example on a window in a heated room in winter. Condensation may also form in the Movie Camera and damage the tape and the video heads, if:

- The Movie Camera is in a room where the heater has just been turned on.
- The Movie Camera is in a room with steam or high humidity.
- The Movie Camera is brought from cold surroundings into a well-heated room.
- The Movie Camera is suddenly brought from cool surroundings, such as an air-conditioned room or car, to a place which is hot and humid.
- When condensation has formed inside the Movie Camera, the "DEW" Indication in the Viewfinder will flash and few seconds later, the Movie Camera will turn itself off to protect the tape and the video heads.  
After a while, turn the Movie Camera on again and make sure that the "DEW" Indication is not displayed any more. Then, wait about 1 hour before operating the Movie Camera again. Depending on the surrounding conditions, it may take several hours before the Movie Camera can be used again.
- As condensation forms gradually, it may take about 10–15 minutes before the Movie Camera turns itself off after a change of working environment.
- In an extremely cold place, condensation may freeze and turn into frost. In this case, it may take quite some time for the frost to melt, turn into dew and evaporate.
- When you bring the Movie Camera from a very cold place, e.g. the ski slopes, into a heated room, keep it in a tightly closed plastic bag or similar to prevent condensation from forming inside the Movie Camera.

### Cautions for the Movie Camera

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

#### ■ Cautions for Use:

- Do not disassemble or reconstruct this Movie Camera. Some internal parts of this Movie Camera have high voltage. Disassembling or reconstructing is very dangerous and may cause serious damage to the Movie Camera.
- Never put any objects inside.  
Never insert any metal objects or inflammable material through any of the openings (cassette compartment, etc.). If any liquid is spilled into the Movie Camera, immediately stop the operation and consult qualified service personnel.  
Operating the Movie Camera with some foreign matter inside may cause malfunction or electric shock.  
If children have access to this Movie Camera, special attention should be paid to this point.
- Never aim the lens at the sun because this could cause permanent damage to the CCD image sensor. Such damage could manifest itself in reduced picture quality or could make shooting altogether impossible. Attention should be paid to this point not only during shooting but during other operations as well.
- Never subject the Movie Camera to strong vibrations or shocks. Shocks during use may result in picture distortion.
- Do not use this Movie Camera during a thunderstorm, especially not in a large open field, because this would be very dangerous. If used indoors during a thunderstorm, be sure to disconnect the AC Adaptor from the mains outlet.
- Never use this Movie Camera with the cassette compartment facing down, because this could cause uneven winding, slacking and damage to the tape.
- Do not use the viewfinder as a carrying handle when transporting the Movie Camera.

### ■ Cautions for Surroundings:

- Do not use the Movie Camera in places where water or some other liquid could splash on it.
- Do not operate the Movie Camera very near a TV set or radio, because this could negatively influence the picture and sound reception.
- Keep the Movie Camera away from areas with strong electric fields, because they could impair the proper functioning of the Movie Camera and cause picture distortion.
- Keep the Movie Camera away from objects emitting high temperature, such as heaters.
- Do not insert video cassettes into the Movie Camera or take them out from it in dusty places.
- It is not possible to use the Movie Camera in the water. If it is accidentally dropped into water (or some other liquid), disconnect it from the AC Adaptor, take it out of the water, and then consult qualified service personnel.

### ■ Cautions for Connections:

- Before connecting, confirm that all systems are turned off and that the connecting cables are not damaged.
- Do not expose the connection cables to high temperature, chemicals and objects with sharp edges; also do not bend the cables excessively.

### ■ Cautions for Storage and Transportation:

- Do not leave the Movie Camera in places exposed to direct sunlight (e.g. a closed car in summer) or near heaters. Excessive heat could deform the body or cause other damage to the Movie Camera.
- The packing materials in which the Movie Camera is shipped are designed for optimum protection. Keep them for transporting the Movie Camera in the future. Store the Movie Camera and video cassettes away from magnetized objects such as toys containing motors and batteries.
- Do not leave the Movie Camera in places with high temperature and high humidity such as in a closed car or in places with steam or oily smoke. If the Movie Camera is left in a damp place for a long time, mold could form on and damage the lens.
- Do not leave the Movie Camera in contact with rubber or plastic products for a long time, because it could cause deformation and discoloration of the body.

### ■ After Use:

- Be sure to attach the Lens Cap.
- When the Movie Camera is connected to the AC Adaptor, turn the Movie Camera off before unplugging the AC Adaptor.
- When the Movie Camera is not going to be used for a longer period of time, remove the cassette before turning the Movie Camera off.
- When the Movie Camera is not going to be used for a long period of time, turn the Movie Camera on occasionally to prevent malfunction.

## Cautions for the Battery Pack

The function of the Battery Pack is based on a chemical reaction. Pay attention to the following points when using it.

- If charged at low temperatures, the operation time of the Battery Pack becomes shorter.
- For recharging, use the specially designed AC Adaptor only.
- Charge the Battery Pack within a temperature range of 10°C–35°C. At higher or lower temperatures, the Battery Pack cannot be charged to its full capacity.
- Do not recharge the Battery Pack when it is already fully charged.
- If, in spite of normal recharging, the operation time of the Battery Pack becomes too short for practical use, the service life of the Battery Pack has reached its end. Replace it with a new one.
- During operation of this unit or during recharging, the Battery pack may become warm. However, this does not pose any problem.
- When the Battery Pack is not being used, remove it from the Movie Camera or the AC Adaptor.
- Do not short-circuit the connectors nor disassemble or reconstruct the Battery Pack.
- Do not throw the exhausted Battery Pack into a fire.

### ■ Cautions for Storing the Battery Pack:




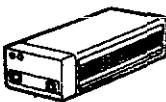
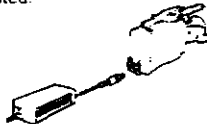
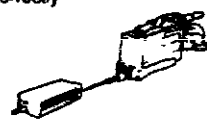

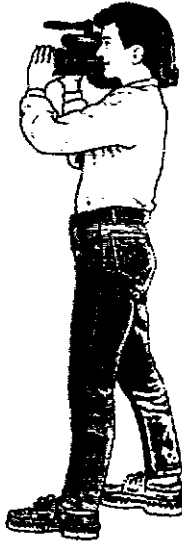









- Do not store the Battery Pack in contact with metal objects because they could short-circuit the connectors of the Battery Pack and exhaust it.
- Do not leave the Battery Pack at places with high temperature, e.g. on the dashboard of a car or other places exposed to direct sunlight.







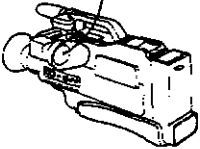





## Cautions for the AC Adaptor

- Before connecting the AC Adaptor to an AC wall outlet, confirm that the voltage on the rating plate matches your local AC mains voltage.
- When not using the AC Adaptor, unplug its mains cable.
- Do not use the AC Adaptor for any purposes other than supplying the unit with power and charging the Battery Pack.
- When unplugging the mains cable, pull it by the plug, not by the cable.
- When listening to a radio while the AC Adaptor is in operation, the radio reception may be distorted. In this case, move the radio farther away from the AC Adaptor.
- Do not place any heavy objects on the AC Adaptor.
- Before cleaning the AC Adaptor, make sure that it is disconnected from the AC mains socket.

Be sure to obtain a warranty card from the shop at the time of purchase, and make sure that it contains all necessary information.

# Before Requesting Service













	Items	Symptom	Cause	Action	Reference pages
Power	Using the Battery Pack 	• Movie Camera does not turn on.	• Not inserted. 	• Insert it correctly. 	7
			• Not charged. 	• Charge it.	6
		• Movie Camera turns off soon.	• Exhausted. • Shooting was paused for more than 6 minutes.	• Use a fully charged one • Slide the [OPERATE] Switch backward to turn the Movie Camera on	6 13
	Using the AC Adaptor 	• Movie Camera does not turn on	• Not connected. 	• Connect it correctly 	21
	Using any of the Power sources 	• Movie Camera turns off soon.	• Dew has formed inside	• Wait several hours.	50
	Shooting		• No picture in the Viewfinder.	• Movie Camera is not turned on. 	• Turn the Movie Camera on, and slide the CAMERA/VTR Selector Cover to "CAMERA". 
• Lens Cap is attached 				• Remove it. 	11
• Indications in the Viewfinder are not clear.			• Eyepiece Corrector is not adjusted 	• Adjust it. 	10
			• Lens is dirty. 	• Clean it.	18
• Shooting cannot be started.			• The erasure prevention tab of the inserted cassette is broken out. 	• Cover the tab hole with adhesive tape. 	9
			• No cassette is inserted 	• Insert a cassette with intact erasure prevention tab.	9
			• Tape has reached its end 	• Insert a new cassette	54

Items	Symptom	Cause	Action	Reference pages
Shooting 	•Date and time cannot be recorded.	•Date and time are not set. 	•Set the date and time. 	25
	•Date and time are not displayed in the Viewfinder.	•Date/Time Button was not pressed 	•Press the Date/Time Button. 	25
Playback (picture)  	•No picture.	•Movie Camera is not turned on. 	•Turn the Movie Camera on, and slide the CAMERA/VTR Selector Cover to "CAMERA". 	13
		•Not connected or incorrectly connected.	•Connect correctly.	45, 46
		•Wrong channel is selected on TV set.	•Select the correct channel.	46
	•Picture is not in colour or distorted.	•Tracking is not adjusted. 	•Adjust the tracking. 	16
	•Picture contains noise bars.	•Cue, Review or Playback is activated. 	•It is not a malfunction.	17

## Colour Temperature and White Balance

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





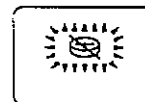
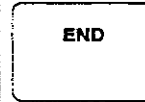

The table below shows the relationship between natural light, artificial light and colour temperature.

Natural light	Colour Temperature	Artificial Light	White Balance Adjustment
•Blue sky 	10,000 K		Bluish colour ↑ Range in which the Auto White Balance Adjustment is effective ↓ Whittish colour ↓ Reddish colour
•Slightly overcast sky 	7,000 K ~8,000 K	•TV screen 	
•Cloudy sky (Rain) 	6,000 K		
•Sunlight 	5,000 K		
	4,800 K	•Fluorescent lamp (white) 	
•1~2 hours after sunrise or before sunset 	3,000 K ~4,200 K	•Fluorescent Lamp (not white) or studio lamp 	
•Sunrise or sunset 	2,000 K ~2,500 K	•Halogen light bulb 	
	2,000 K ~2,500 K	•Tungsten lamp 	
	1,500 K ~2,000 K	•Candle-light 	


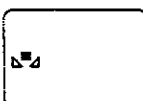
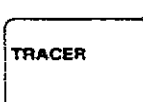
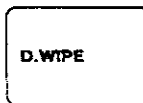

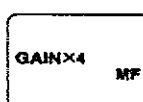
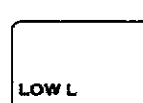
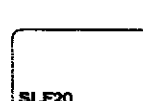
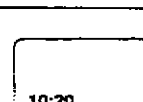
# Quick Reference Guide to the Indications in the Viewfinder

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

## 1 Warning/Alarm Indications in the Viewfinder

Viewfinder	Conditions
	When condensation has formed inside the Movie Camera, the "DEW" indication will flash and a few seconds later, the Movie Camera will turn itself off. — Press the Cassette Eject Button, remove the Video Cassette and wait until the "DEW" indication disappears.
	Video Head Clogging. (p. 19, 49)
	The "—" Indications begin to disappear one after another as the power of the Battery Pack weakens. When the last bar has disappeared, the Battery Indication "⚡" will flash. — Replace with a fully charged Battery Pack. When a newly charged Battery Pack is inserted, this indication initially always shows E----F, regardless of the Battery Pack charging condition.
	There is no cassette inside, or the tab of the inserted cassette is broken out. The indication flashes to warn that shooting is not possible. — Insert a video cassette with intact erasure prevention tab. If the tab is broken out, seal the hole with adhesive tape.
	When the Button-Type Battery (for the auto date function, etc.) is exhausted, this indication will flash for 10 seconds after the Movie Camera has been turned on.
	During shooting: The tape has reached its end. Replace the video cassette with a new one whose tab is intact.
	It appears briefly while an index signal is being recorded.

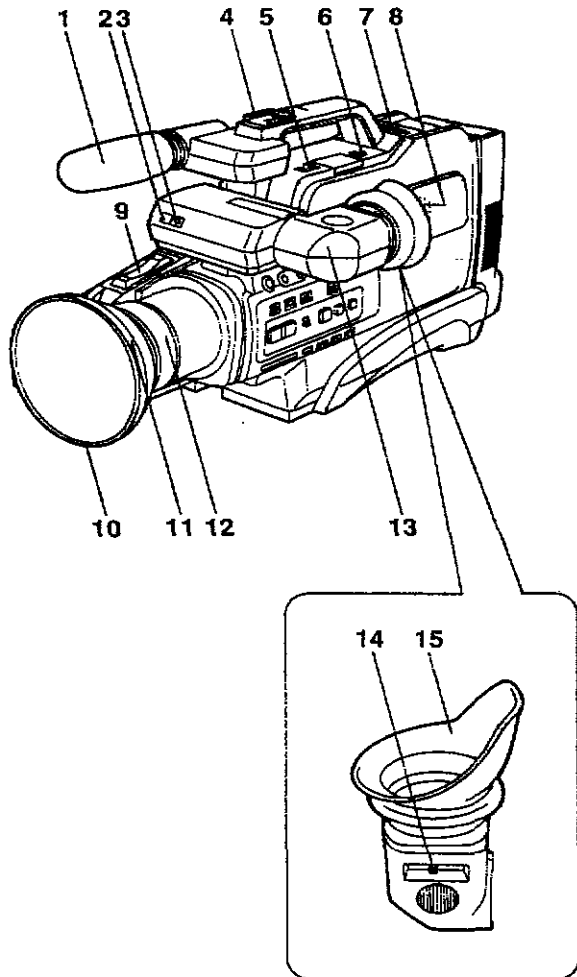
## 2 Shooting/Playback Indications

Viewfinder	Conditions
	"S" S-VHS system recording (p. 5)
	Manual White Balance Mode (p. 34)
	When the [TRACER] Button is pressed, the "TRACER" indication appears.
	When the [WIPE] Button is pressed, the "D.WIPE" indication appears.
	When the [MIX] Button is pressed, the "D.MIX" indication appears.
	High Sensitivity Indication At every press of the [GAIN UP] Button, the indication changes in the following order: → no indication → "GAIN x4" → "GAIN x8"
	When the [LOW LIGHT] Button is pressed, the "Low L" indication appears.
	Self-Timer and Interval Indications At every press of the [TIMER-INTERVAL REC] Button, the indication changes in the following order: → no indication → "SLF20" → "SLF" → "INT"
	Date and Time Mode (P. 25) The Date and Time Indication can be removed from the Viewfinder with the [DATE/TIME] Button.

Viewfinder	Conditions
0000	Tape Counter (p. 22)
M0000	Tape Counter with activated Memory Function. "M": means Memory (p. 22)
L0:00.00	The Lap Time Counter counts up only during recording. (p. 22)
REC	<p>Shooting Mode Indications</p> <p>"REC" During Shooting "PAUSE" During Shooting Pause "CHK" During Rec Review</p> <p>Tape Running Indications</p> <p>Depending on the operation being currently performed by the Movie Camera, one of the following indications appears.</p> <p>"▷" During Playback Camera Search (in forward direction) "II" During Still Playback "◁◁" Rewind/Review Mode Camera Search (in reverse direction) "▷▷" Fast Forward/Cue Mode INST &lt; Insert Editing mode INST II Insert Editing Pause mode A.DUB ▷ Audio Dubbing mode A.DUB II Audio Dubbing Pause mode</p>
x8	Magnification Ratio Indication It appears when the Movie Camera is turned on.
OPEN	F Number Indication The desired F Number can be selected by repeatedly pressing the Iris Close Open/Shutter $\rightarrow$ Button (p. 39)
1/2000	Shutter Speed Mode (p. 40) The Shutter Speed can be selected with the [SHUTTER] Button.

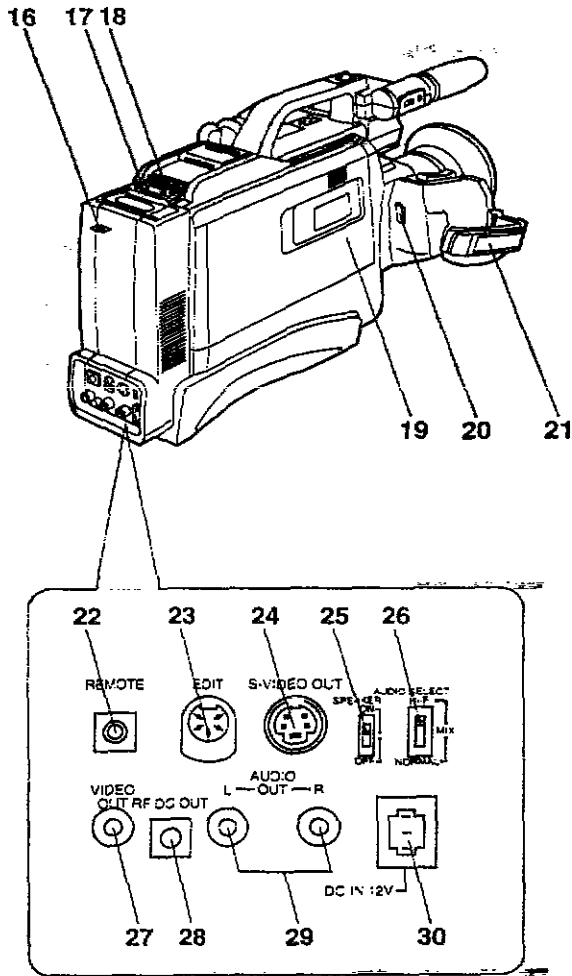
Viewfinder	Conditions
MF	Manual Focus Mode (p. 38) "MF": means Manual Focus
D.ZOOM	Digital Zoom Mode (p. 28) The range of the Digital Zoom can be changed with the [DIGITAL ZOOM] Button. "D": means Digital

# Controls and Functions

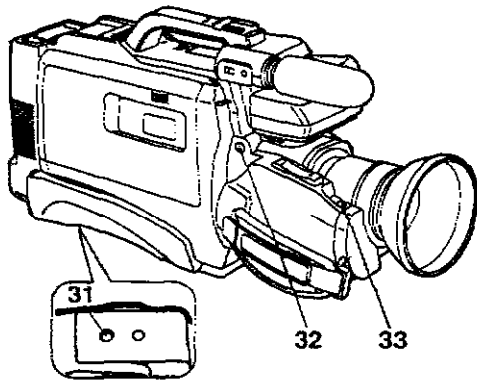


- 1 Stereo Microphone
- 2 White Balance Sensor Window
- 3 Tally Lamp  
It is lit during shooting to inform the people in front of the Movie Camera that shooting is under way.
- 4 Accessory Shoe  
Some optional accessories (External Microphone, etc.) can be attached to this Accessory Shoe.
- 5 Operation Switch [OPERATE]  
For turning the Movie Camera on and off.
- 6 S-VHS System Selector Switch [S-VHS ON/AUTO/OFF]  
The selected recording system can be selected by sliding the [S-VHS ON/AUTO/OFF] Switch to the corresponding position.
- 7 CAMERA/VTR Selector Cover [CAMERA/VTR]
- 8 Built-in Speaker
- 9 Zoom Buttons  
Press these buttons to gradually zoom in and out.
- 10 Lens Cap
- 11 Lens Hood
- 12 Focus Ring  
After selecting the manual focusing mode with the [FOCUS] Button, adjust the focus to the desired subject by turning this ring.
- 13 Viewfinder  
The subject in front of the camera can be seen on the viewfinder screen.
- 14 Eyepiece Corrector  
Adjust the Eyepiece Corrector to your eyesight so that the picture and indications in the Viewfinder become as clear and sharp as possible.
- 15 Eyecup

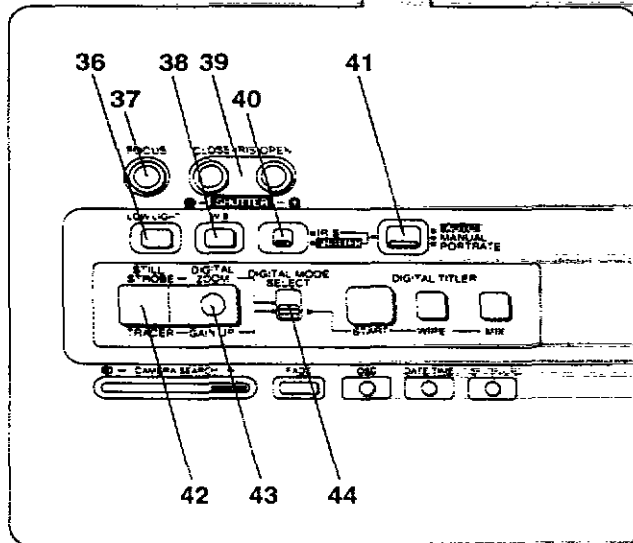
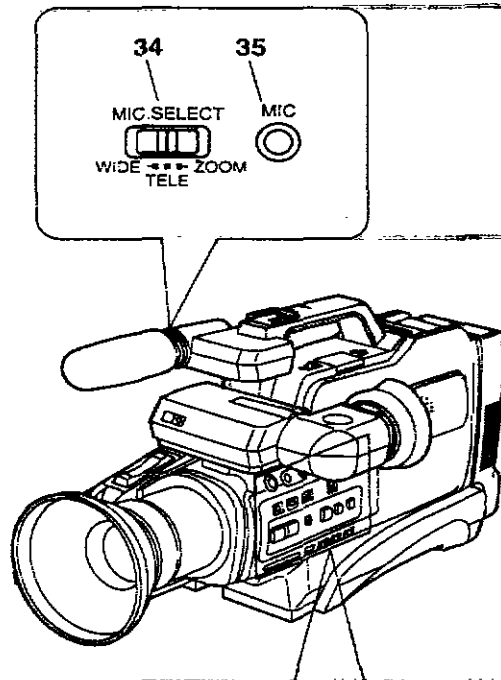




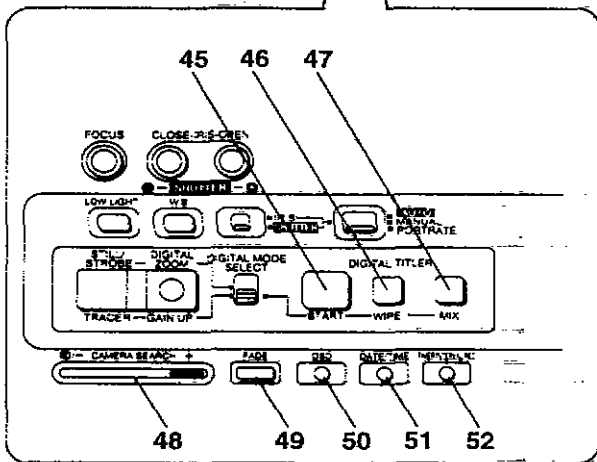
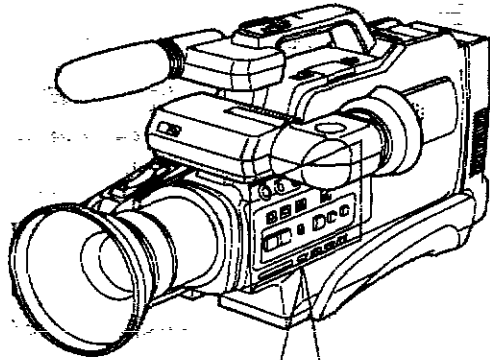
- 16 Shoulder Strap Holders**
- 17 Tape Eject Button [TAPE EJECT]**  
To insert or take out a video cassette, press this button.
- 18 Battery Pack Eject Lever [BATT. EJECT]**  
Slide this lever when removing the Battery Pack.
- 19 Cassette Compartment**  
Insert a video cassette into this compartment.
- 20 Start/Stop Button**  
Press this button to start and stop shooting a scene.
- 21 Grip Belt**
- 22 Remote Control Socket [REMOTE]**
- 23 Edit Socket [EDIT]**  
Connect an Editing Controller, etc. to this socket.
- 24 S-Video Output Socket [S-VIDEO OUT]**
- 25 Speaker On/Off Switch [SPEAKER ON/OFF]**
- 26 Audio Selector Switch [HI/FI/MIX/NORMAL]**
- 27 Video Output Socket [VIDEO OUT]**
- 28 RF DC Output Socket [RF DC OUT]**
- 29 Audio Output Socket [AUDIO OUT]**
- 30 DC Input Socket [DC IN 12 V]**  
Connect the DC Input Cable to this socket.
- 31 Tripod Mounting**  
When using a tripod for stable shooting, attach the screw of the tripod to this mounting.
- 32 Character Generator Socket [CHAR.GEN]**  
Connect a Character Generator or VITC Generator (both optional) to this socket.
- 33 Start/Stop Button**  
Press this button to start and stop shooting a scene for low angle shooting.



## Controls and Functions (cont'd)

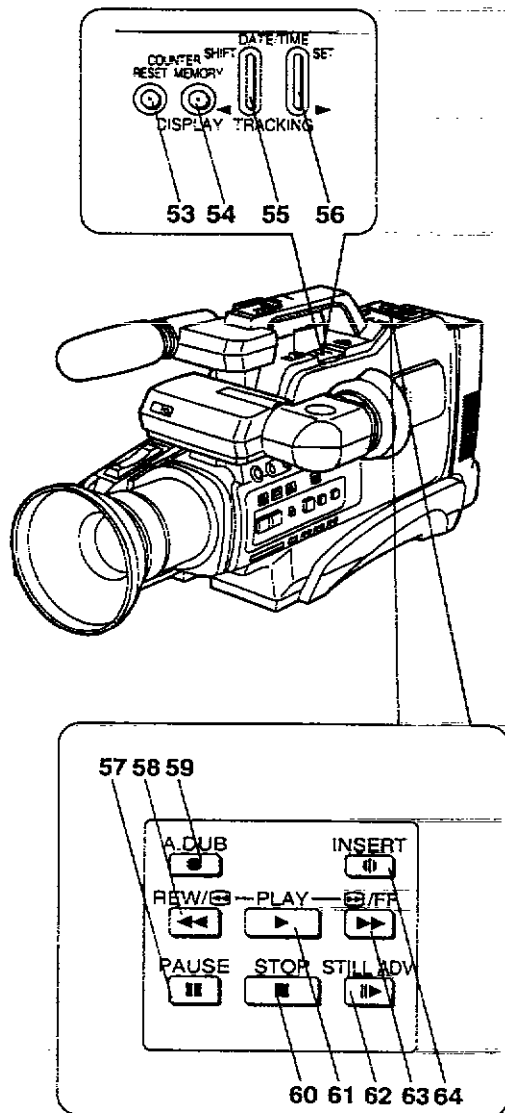


- 34 Microphone Mode Selector Switch [MIC.SELECT WIDE/TELE/ZOOM]**
- 35 External Microphone Socket [MIC]**
- 36 Low-Light Button [LOW LIGHT]**  
For shooting evening scenes and other scenes in low light conditions.
- 37 Focus Button [FOCUS]**  
Press this button to select manual focus adjustment for shooting.
- 38 White Balance Button [W.B]**  
Press this button to select manual white balance adjustment.
- 39 Iris Close Open/Shutter -/+ Button**  
The iris value and the shutter speed can be adjusted manually by pressing these buttons.
- 40 Selector Switch for the Iris/Shutter Speed Adjustment Function [IRIS/SHUTTER]**  
The Iris Adjustment Function and the High-Speed Shutter Adjustment Function can be selected with this button.
- 41 Mode Selector Switch [AUTO/MANUAL/PORTRAIT]**  
Use this selector switch to select the automatic, manual or portrait shooting mode.
- 42 Still/Strobe Button [STILL/STROBE]**  
When the [DIGITAL MODE SELECT] Switch is set to its upper position:  
Press this button for shooting still pictures and pictures with strobe effect.  
**Tracer Button [TRACER]**  
When the [DIGITAL MODE SELECT] Switch is set to its lower position:  
Press this button to shoot with an intentional after-image effect.
- 43 Digital Zoom Button [DIGITAL ZOOM]**  
When the [DIGITAL MODE SELECT] Switch is set to its upper position:  
Press this button to increase the power of the Power Zoom Function.  
**Gain Button [GAIN UP]**  
When the [DIGITAL MODE SELECT] Switch is set to its lower position:  
When shooting in the dark, the sensitivity can be increased in 2 steps by pressing this button.
- 44 Digital Mode Selector Switch [DIGITAL MODE SELECT]**  
Use this switch to select the desired Digital Shooting Function.



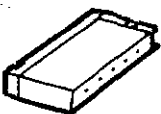

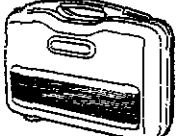








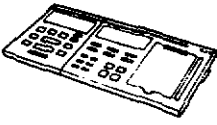

- 45 Digital Start Button [START]**  
To start the Digital Wipe Function or the Digital Mix Function, press this button.
- 46 Digital Wipe Button [WIPE]**  
Press this button for a horizontal wipe transition from a moving picture to a still picture from the memory, or vice-versa.
- 47 Digital Mix Button [MIX]**  
Press this button to gradually fade over from the moving picture to a still picture from the memory, or vice-versa. or to combine the two pictures.
- 48 Camera Search Button [CAMERA SEARCH]**  
Keep these buttons pressed during shooting pause mode to playback recorded scenes at high speed in reverse direction or at normal speed in forward direction.  
To check the last few seconds of the last recorded scene, press the - side of the [CAMERA SEARCH +] Button briefly.
- 49 Fade Button [FADE]**  
Press this button to fade out a scene and to fade in the following scene for a soft scene-to-scene transition.
- 50 On-Screen Display Button [OSD]**  
Press this button to make the indications in the Viewfinder disappear.
- 51 Data/Time Button [DATE/TIME]**  
Press this button to make the time and/or date appear in the Viewfinder and superimpose them onto the picture during shooting.
- 52 Interval Button [TIMER/INTERVAL REC]**  
Press this button to activate the Self-Timer and Interval Shooting Functions.

## Controls and Functions (cont'd)



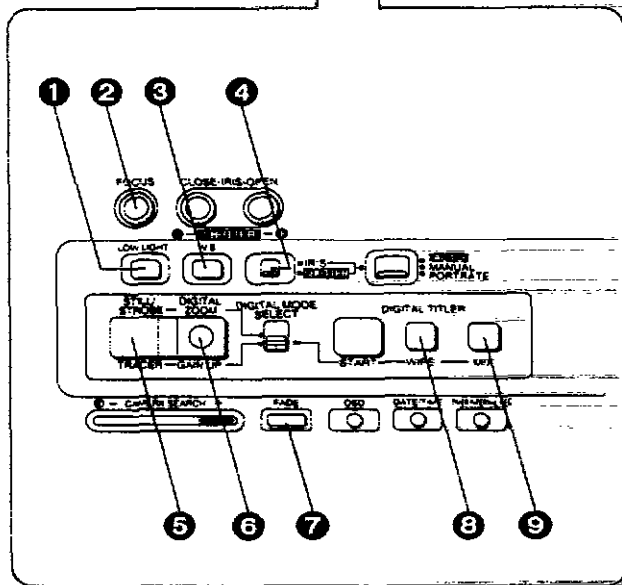
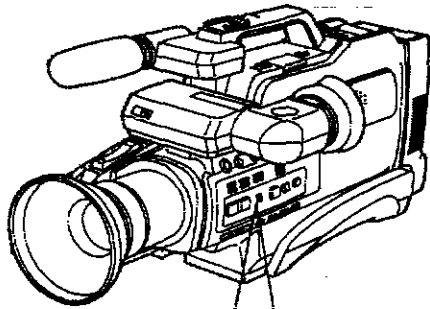
- 53 Reset Button [RESET]**  
Press this button to reset the tape counter to "0000".
- 54 Memory Button [MEMORY]**  
Press this button to activate the Tape Counter Memory Function.
- 55 Tracking/Date/Time Shift Button [DATE/TIME SHIFT - TRACKING]**  
1) Press it to advance to the next item during the setting of the time and date.  
2) Press it when you want to adjust the tracking manually.
- 56 Tracking/Date/Time Set Button [DATE/TIME SET - TRACKING]**  
1) Press it to change the figures during the setting of the time and date.  
2) Press it when you want to adjust the tracking manually.
- 57 Pause Button [PAUSE]**  
Press this button during playback to be able to watch a still picture.
- 58 Rewind/Review Button [REW]**  
Press this button to rewind the tape.
- 59 Audio Dubbing Button [A.DUB]**  
Press this button to add new sound on a recorded tape with the Audio Dubbing Function.
- 60 Stop Button [STOP]**  
Press this button to stop the playback.
- 61 Play Button [PLAY]**  
Press this button to start the playback.
- 62 Still Advance Button [STILL ADV]**  
After pressing the Pause Button, press this button to advance the still picture frame by frame.
- 63 Fast Forward/Cue Button [FF]**  
Press this button to wind the tape forward.
- 64 Insert Button [INSERT]**  
Press this button to insert new scenes on a previously recorded video cassette.

# Optional Accessories

<p><b>Battery Pack</b> VW-VBF2E</p> 	<p><b>Car Battery Cord</b> VW-ACM10E</p> 	<p><b>System Case</b> VW-SHM20E</p> 	<p><b>Filter Kit</b> VW-LF49E</p> 	<p><b>Tele Conversion Lens</b> VW-LT2E</p> 
<p><b>Wide Conversion Lens</b> VW-LW2E</p> 	<p><b>Standard Tripod</b> VZ-CT55E</p> 	<p><b>Deluxe Tripod</b> VZ-CT75E</p> 	<p><b>Pause Remote Control</b> VW-RM1E</p> 	<p><b>RF Adaptor</b> VW-RF7E</p> 
<p><b>Character Generator</b> VW-CG5E</p> 	<p><b>VITC Controller</b> VW-EC10E</p> 	<p><b>Editing Controller</b> VW-EC310E</p> 		

**Note:** Consult your dealer for details of other accessories not listed here.

# Possible Use of the Function Buttons in the Different Operation Modes



Operation Mode	Still	Movie	Time Lapse
1 [LOW LIGHT] Button	No	Yes	Yes
2 [FOCUS] Button	No	Yes	Yes
3 [W.B] Button	No	Yes	Yes
4 [IRIS/SHUTTER] Switch	IRIS	Yes	Yes
	SHUT-TER	No	Yes
5 [STILL/STROBE/ TRACER] Button	Yes	Yes	Yes
6 [DIGITAL ZOOM/ GAIN UP] Button	Yes	Yes	Yes
7 [FADE] Button	Yes	Yes	Yes
8 [WIPE] Button	Yes	Yes	Yes
9 [MIX] Button	Yes	Yes	Yes

# Specifications

NV-MS4B

Information for your safety.

<b>Power Source:</b>	DC 12.0 V
<b>Power Consumption:</b>	Recording mode: 9.3 W (Battery Operation)

## Video Recording

<b>System:</b>	4 Rotary heads, helical scanning system
<b>Tape Speed:</b>	23.39 mm/s
<b>Tape Format:</b>	S-VHS/VHS
<b>Recording/Playback Time:</b>	240 min. with NV-E240
<b>FF/REW Time:</b>	Less than 12 min. with NV-E180

## VIDEO

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

## AUDIO

<b>Input Level:</b>	MIC IN (M3); -70 dB, 4.7 kohm unbalanced
<b>Output Level:</b>	Audio out (PHONO); -8 dB, 47 kohm unbalanced
<b>Audio Track:</b>	1 track (Normal-Mono only), 2 channels (Hi-Fi Sound-Stereo)
<b>Image Sensor:</b>	1/4-inch CCD Image Sensor
<b>Lens:</b>	12:1 Variable Speed Control Power Zoom Lens with Digital AI Auto Focus; Focal Length 5.6-67 mm F1.6 Auto Iris/Manual Iris Filter Diameter 49 mm
<b>Viewfinder:</b>	0.7-inch Electronic Viewfinder
<b>Standard Illumination:</b>	1,400 Lux
<b>Minimum Required Illumination:</b>	1 Lux (Digital Gain Up Mode)
<b>Video Horizontal Resolution:</b>	S-VHS; More than 400 lines (S-Video Out) VHS; More than 250 lines
<b>Signal-to-Noise Ratio:</b>	Video; More than 43 dB Audio (Hi-Fi); More than 47 dB (Normal); More than 43 dB
<b>Audio Frequency Response:</b>	Hi-Fi; 50-20,000 Hz Normal; 80-8,000 Hz
<b>Operating Temperature:</b>	0°C-40°C
<b>Operating Humidity:</b>	10%-80%
<b>Weight:</b>	Approx. 2.7 kg (without Battery Pack)
<b>Dimensions:</b>	130 (W) x 245 (H) x 476 (D) mm

## VW-AM10B

Information for your safety.

<b>Power Source:</b>	AC 100-240 V, 50-60 Hz (Automatic voltage adjustment)
<b>Power Consumption:</b>	44 W
<b>DC Output:</b>	DC 12 V 1.8 A (VHS Movie) DC 12 V 1.5 A (Battery pack charging)

<b>Weight:</b>	Approx. 0.62 kg
<b>Dimensions:</b>	80 (W) x 54 (H) x 196 (D) mm


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

279

ne

**B**

Printed in Japan  
VQT4835

F0892K0-3000 



**Matsushita Electric Industrial Co., Ltd.**  
Central P.O. Box 288, Osaka 530-91, Japan