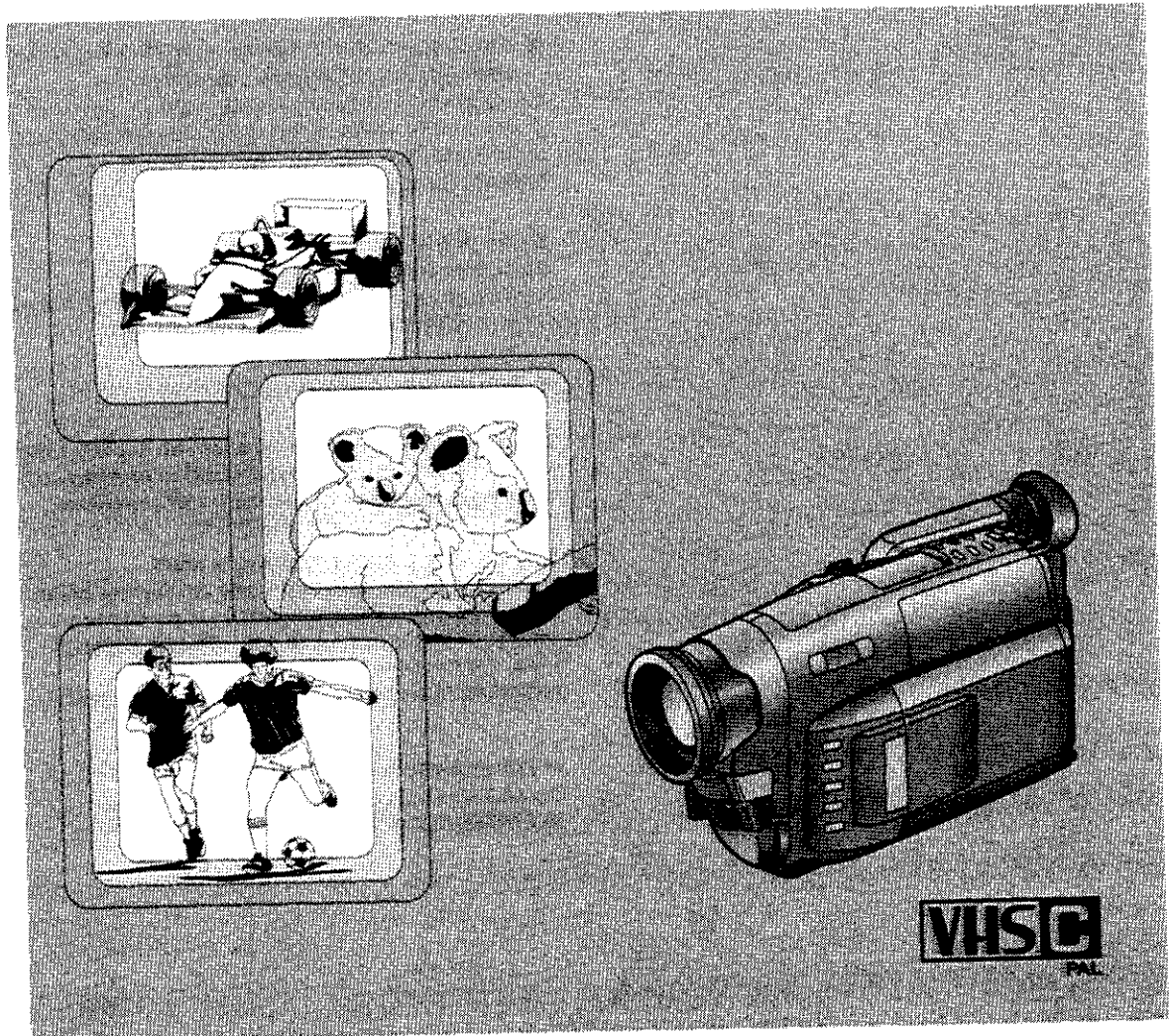# Panasonic

VHS-C Movie Camera

Operating Instructions

NV-VX27A

Model No. NV-VX27A

VHSC
PAL

Before use, please read these instructions completely.

Information for Your Safety

■ **Carefully read the Operating Instructions and use the Movie Camera correctly.**
Injury or material damage resulting from any kind of use that is not in accordance with the operating procedures explained in these Operating Instructions are the sole responsibility of the user.

■ **Try out the Movie Camera.**
Be sure to try out the Movie Camera before recording your first important event and check that it records properly and functions correctly.

■ **The manufacturer is not liable for loss of recorded contents.**
The manufacturer shall in no event be liable for the loss of recordings due to malfunction or defect of this Movie Camera, its accessories or cassettes.

■ **Carefully observe copyright laws.**
Recording of pre-recorded tapes or discs or other published or broadcast material for purposes other than your own private use may infringe copyright laws. Even for the purpose of private use, recording of certain material may be restricted.

IF THE POWER CORD OF THIS EQUIPMENT IS DAMAGED, IT MUST BE REPLACED WITH AN ELECTRICALY APPROVED POWER CORD.

Contents

If you want to start using the Movie Camera immediately, be sure to read at least the pages marked with ▲.

Preparations

Basic Operations

Advanced Operations

Precautions, Technical Information, etc.

1.	2.	3.
4.	5.	6.
7.		

This chapter explains the necessary steps before you can start using the Movie Camera.

Standard Accessories

1. **AC Adaptor (→ 8, 9, 26)**

   To supply power to the Movie Camera and to charge the Battery.

   DC Input Cable and AC Mains Cable (→ 8, 9)

   To connect the AC Adaptor to the Movie Camera and to an AC mains socket.

2. **Battery (→ 9, 11, 70)**

   To supply power to the Movie Camera.

3. **Cassette Adaptor and Battery (→ 36)**

4. **Shoulder Strap (→ 23)**

5. **AV Cable (→ 35, 68)**

   To connect the Movie Camera to the Video Input and Audio Input Sockets on a TV or a VCR.

6. **Remote Controller and Batteries for Remote Controller (→ 56, 57)**

7. **Cleaning Tissue (→ 39)**

   To clean the Lens and LCD Monitor.
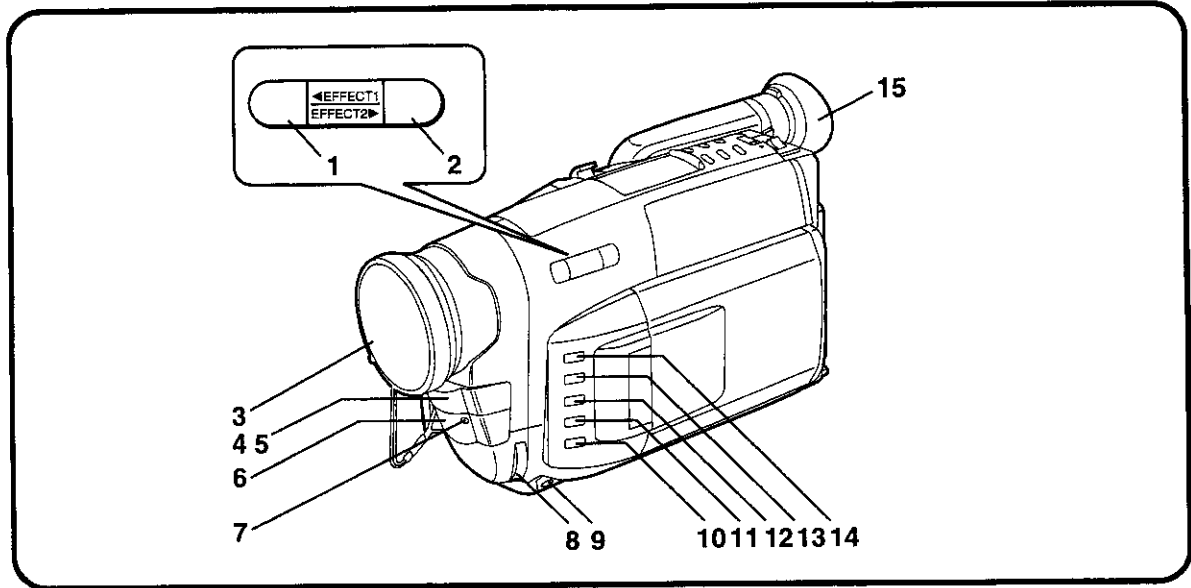
Controls and Components

1 Digital Effect 1 Button [EFFECT1] (→ 43)

2 Digital Effect 2 Button [EFFECT2] (→ 43)

3 Lens Cap (→ 22, 49)

4 White Balance Sensor (→ 72)

5 Remote Control Sensor (→ 55)

6 Microphone

7 Tally Lamp (→ 27)

8 Manual Focus Dial [MF] (→ 51)

9 LCD Monitor Support Leg (→ 34)

10 Focus Button [FOCUS] (→ 51)

11 White Balance Button [W.B] (→ 49)

12 Fade Button [FADE] (→ 42, 47)

13 Backlight Button [BACKLIGHT] (→ 54)

14 Auto Exposure Selector Button
[PROGRAMME AE] (→ 27, 49, 51, 52)

15 Eyecup
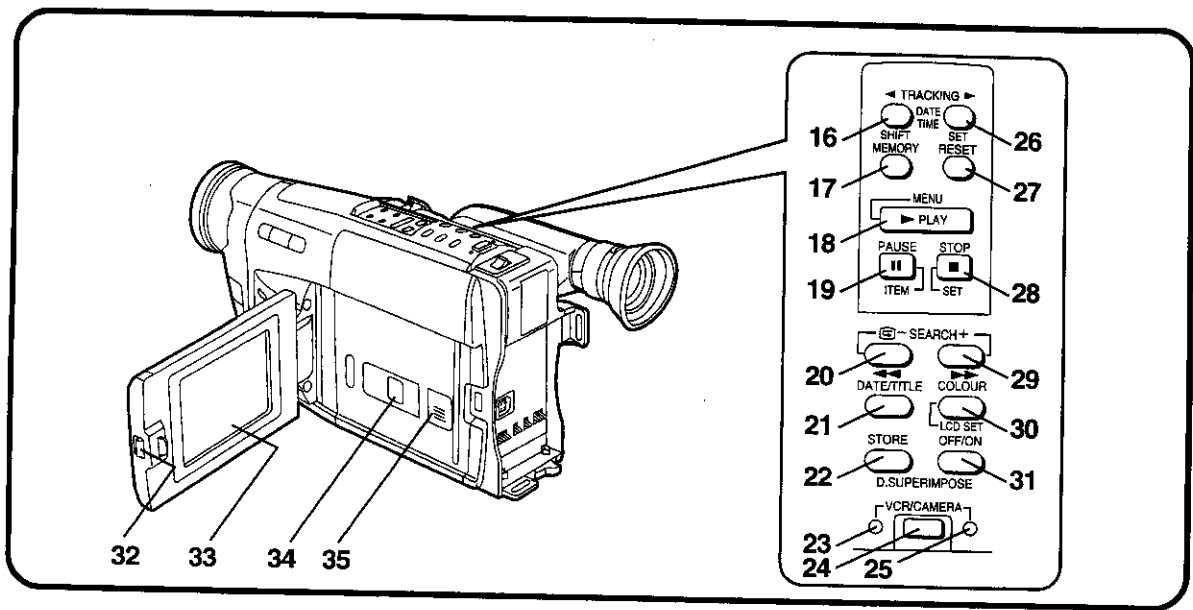
16 Date/Time Shift Button [DATE/TIME/SHIFT]
   (→ 24)
   Tracking Button [◄ TRACKING] (→ 37)

17 Memory Button [MEMORY] (→ 65, 67)

18 Playback Button [PLAY] (→ 33)
   Menu Button [MENU] (→ 14, 15)

19 Pause Button [PAUSE] (→ 38)
   Item Selector Button [ITEM] (→ 14, 15, 18)

20 Reverse Search Button [−SEARCH] (→ 30)
   Rewind/Review Button [◄◄] (→ 37, 38)
   Recording Check Button [⊝] (→ 29)
   LCD Adjustment Button[◄◄] (→ 18)

21 Date/Time/Title Button [DATE/TITLE]
   (→ 24, 25, 61)

22 Digital Image Store Button [STORE] (→ 62)

23 VCR (Playback) Mode Lamp [VCR] (→ 33)

24 VCR/Camera Mode Selector Button
   [VCR/CAMERA] (→ 33)

25 Camera (Recording) Mode Lamp [CAMERA]
   (→ 27)

26 Date/Time Set Button [DATE/TIME/SET] (→ 24)
   Tracking Button [TRACKING ►] (→ 37)

27 Tape Counter Reset Button [RESET]
   (→ 65, 67)

28 Stop Button [STOP] (→ 33)
   Item Set Button [SET] (→ 14, 15)

29 Forward Search Button [SEARCH+] (→ 30)
   Fast Forward/Cue Button [►►] (→ 37, 38)
   LCD Adjustment Button [►►] (→ 18)

30 Colour Selector Button for Digital Image
   [COLOUR] (→ 63)
   LCD Set Menu Display Button [LCD SET] (→ 18)

31 Digital Image Superimpose Button [OFF/ON]
   (→ 62, 63, 64)

32 LCD Monitor Open Lever [▲OPEN] (→ 13)

33 LCD Monitor (→ 13, 18)

34 Cassette Compartment (→ 19)

35 Cassette Compartment Lock Button [LOCK]
   (→ 19)
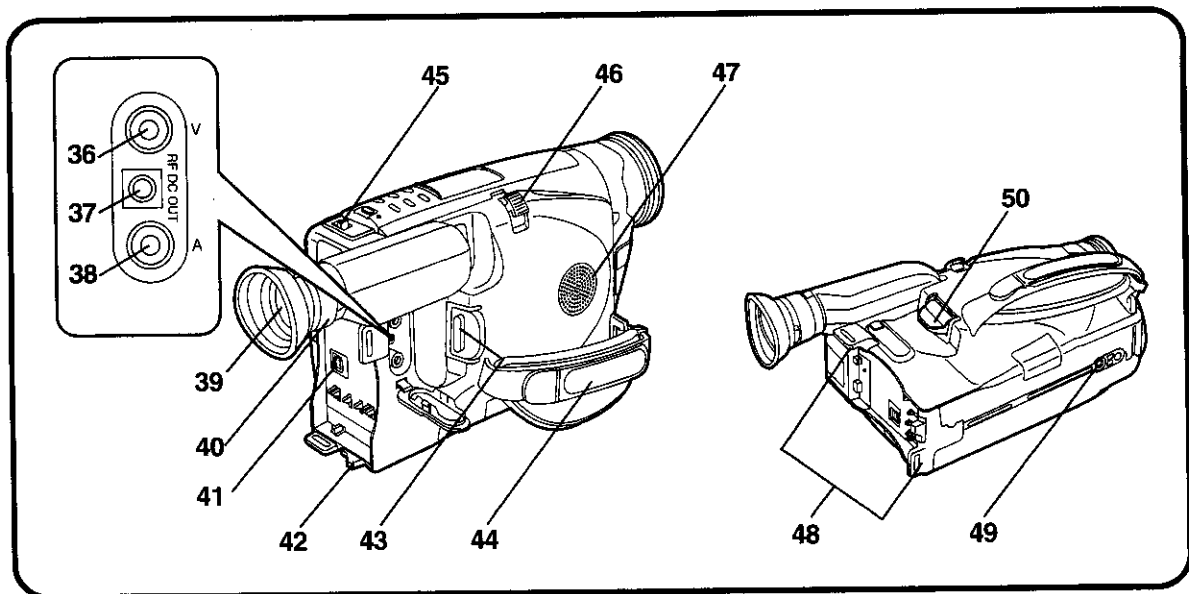
36 Video Output Socket [V] (→ 35, 68)

37 Radio Frequency DC Output Socket
   [RF DC OUT] (→ 35)

38 Audio Output Socket [A] (→ 35, 68)

39 Finder (→ 22, 39)

40 Eyepiece Corrector Ring (→ 22)

41 DC Input Socket [DC IN] (→ 8)

42 Battery Eject Lever [BATTERY EJECT] (→ 11)

43 Recording Start/Stop Button (→ 27)

44 Grip Belt (→ 22)

45 Cassette Eject Lever [▲ EJECT] (→ 19)

46 Zoom Lever [W • T] (→ 31, 46)
   Volume Adjustment Lever [−VOL+] (→ 33)

47 Speaker (→ 33)

48 Shoulder Strap Holders (→ 23)

49 Tripod Receptacle

50 Power Switch [POWER] (→ 27)
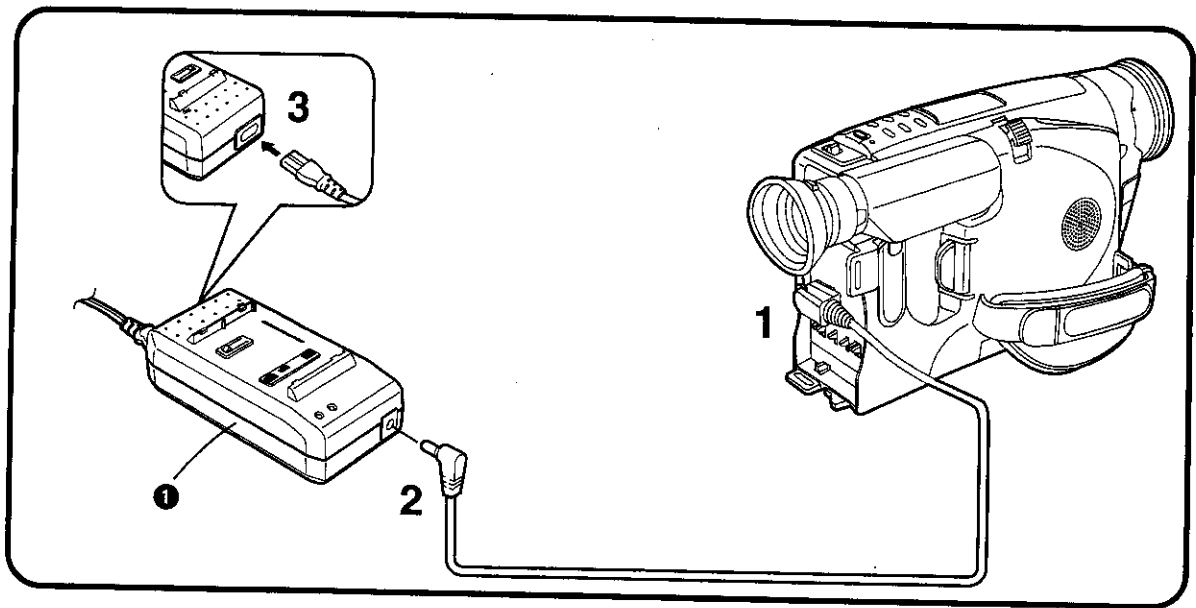
The 3 Types of Power Supplies

To try out the Movie Camera at home, we recommend that you use the AC Adaptor ❶.

1. AC Adaptor (supplied)

● To use the Movie Camera indoors.

● To charge the Battery. (→ 9)

2. Battery (supplied)

● To use the Movie Camera outdoors, and also indoors when there is no AC mains socket nearby. (→ 9)

3. Car Battery Charger (optional)

● To use the Movie Camera in a car.

Using the AC Adaptor as Power Supply Unit

1 Connect the DC Input Cable to the [DC IN] Socket on the Movie Camera.

2 Connect the other end of the cable to the [DC OUT] Socket on the AC Adaptor.

3 Connect the AC Mains Cable to the AC Adaptor and to an AC mains socket.

The AC Adaptor features automatic universal voltage adjustment (AC 100–240 V, 50/60 Hz), therefore, there is no need for any manual voltage adjustment for use in other countries.
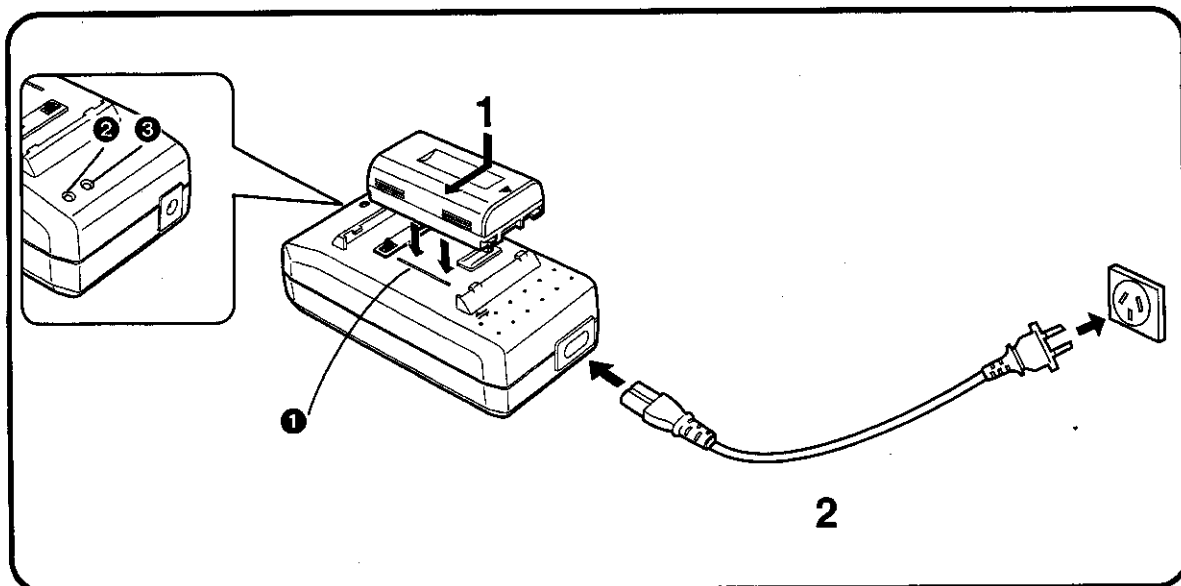
Charging the Battery

1 Attach the Battery.
- Align the Battery with line ❶ and push it in the direction of the arrow while holding it down.

2 Securely connect the AC Mains Cable to the AC Adaptor and an AC Mains Socket.
- The [POWER] Lamp ❷ lights and then the [CHARGE] Lamp ❸ flashes and charging starts.
- If the [CHARGE] Lamp ❸ does not flash even though the Battery is attached, remove the Battery and then re-attach it.

■ Charging Lamp [CHARGE]

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

■ Removing the Battery

Slide it in the opposite direction of that indicated in step 1 above.

- Charge the Battery at a room temperature between 10°C and 30°C.
- When charging, do not connect the DC Input Cable to the AC Adaptor.
- During recording and charging, the Battery becomes warm. However, this is normal.
- If you charge the Battery when it is not yet discharged, the [CHARGE] Lamp ❸ may flash briefly and then go out. This indicates that the Battery is fully charged. Therefore, this is not an indication of a malfunction.

■ Charging Time and Maximum Continuous Recording Time in the Manual Recording Mode

Battery Model No.	Charging Time	Max. Continuous Recording Time	
		①	②
CGR-V610 (Supplied)	80 min.	90 min.	120 min.
CGR-V620	145 min.	190 min.	240 min.
CGR-V816	310 min.	380 min.	480 min.

Battery Model No.	Approx. 30-Minute Charge	Max. Continuous Recording Time	
		①	②
CGR-V610 (Supplied)	30 min.	40 min.	50 min.
CGR-V620			
CGR-V816			

① LCD Monitor   ② Finder

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

Maximum Continuous Recording Time means the duration of continuous recording performed at an ambient temperature of 25°C and 60% relative humidity. In actual recording, however, the use of the zoom and other functions increases the power consumption, and higher or lower temperatures reduces the Battery's ability to generate electricity. Therefore, the actual recording time per Battery may be approximately 30%–50% shorter than listed above.
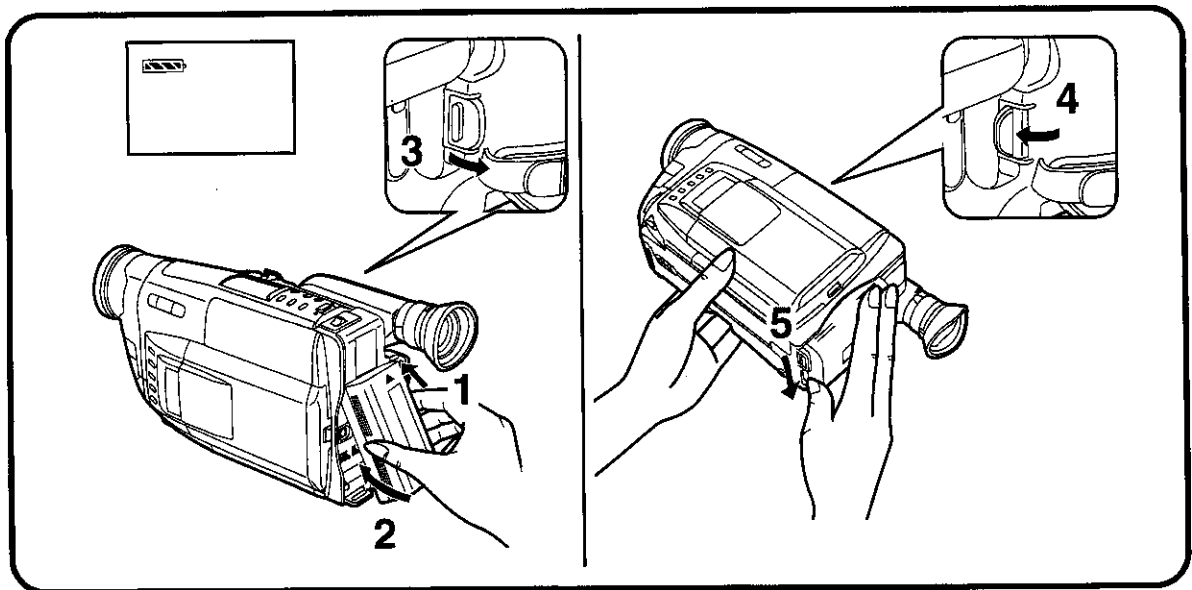
Attaching the Charged Battery

1 Insert the Battery with its top (so that the arrow points upward) into the top Battery Holder.

2 Press the bottom of the Battery toward the Movie Camera until it locks with a click.

3 Turn out the [POWER] Switch to turn the Movie Camera on.

●The remaining battery power can be confirmed both in the Finder and on the LCD Monitor.

●For details about the Remaining Battery Power Indication, read "Checking the Remaining Battery Power" (➔ 12).

■ Removing the Battery

4 Turn in the [POWER] Switch to turn the Movie Camera off.

5 Hold the Battery firmly to prevent it from dropping and pull it off while sliding the [BATTERY EJECT] Lever in the direction of the arrow.

CGR-V610

⏱ 0 ——1——3——5——10——20——40——60——

Ⓐ | 🔋 0:00 | 🔋 0:01 | 🔋 0:03 | 🔋 0:05 | 🔋 0:10 | 🔋 0:20 | 🔋 0:40 | 🔋 |

CGR-V620

⏱ 0 ——1——3——5——10——20——40——60——80——120——

Ⓐ | 🔋 0:00 | 🔋 0:01 | 🔋 0:03 | 🔋 0:05 | 🔋 0:10 | 🔋 0:20 | 🔋 0:40 | 🔋 1:20 | 🔋 |

CGR-V816

⏱ 0 ——1——3——5——10——20——40——60——80——120——160——240——

Ⓐ | 🔋 0:00 | 🔋 0:01 | 🔋 0:03 | 🔋 0:05 | 🔋 0:10 | 🔋 0:20 | 🔋 0:40 | 🔋 1:20 | 🔋 2:40 | 🔋 |
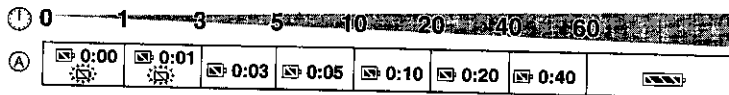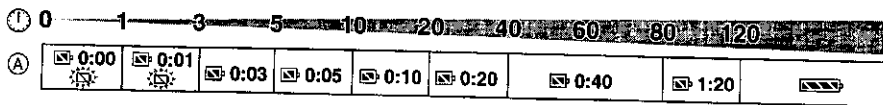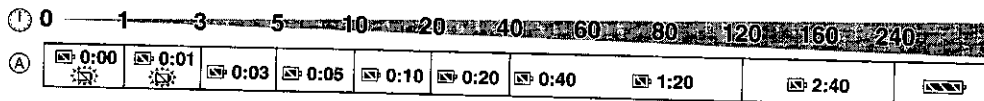
■ Checking the Remaining Battery Power

You can confirm the remaining charge in the attached Battery in the Finder or on the LCD Monitor. This also shows you approximately how much more continuous recording time you can get from the attached Battery. The indicated time does not change in 1-minute steps. The above illustrations show how the Remaining Battery Operation Time Indication changes according to the remaining operation time.

⏱: Actual remaining battery operation time

Ⓐ: Remaining Battery Operation Time Indication
(This indication does not appear when recording in the Mirror Mode.) (→ 57)

Remaining Battery Operation Time Indication
This Indication shows the remaining duration of continuous recording at an ambient temperature of 25°C when a fully charged Battery was attached. Therefore, in the following cases, the actual available recording time is different from the times shown above:

When Recording Is Not Performed Continuously
In most cases, you will frequently start and stop recording, turn the Movie Camera on and off, use the zoom and other functions, all of which consume power. Therefore, the actual available recording time from the Battery is approximately 30–50% shorter than listed. (→ 10)

When the Ambient Temperature Is Extremely Low or Extremely High
The characteristics of the Battery vary according to the ambient temperature, and at a very low temperature, the possible recording time becomes extremely short. In addition, the Remaining Battery Operation Time Indication on the Movie Camera decreases a little faster than at an ambient temperature of 25°C.
(At a higher temperature, it tends to decrease more slowly.)

When the Service Life of the Battery Has Reached Its End
When the operation time even after full charging is too short for normal use, the service life of the Battery has reached its end. (→ 70)
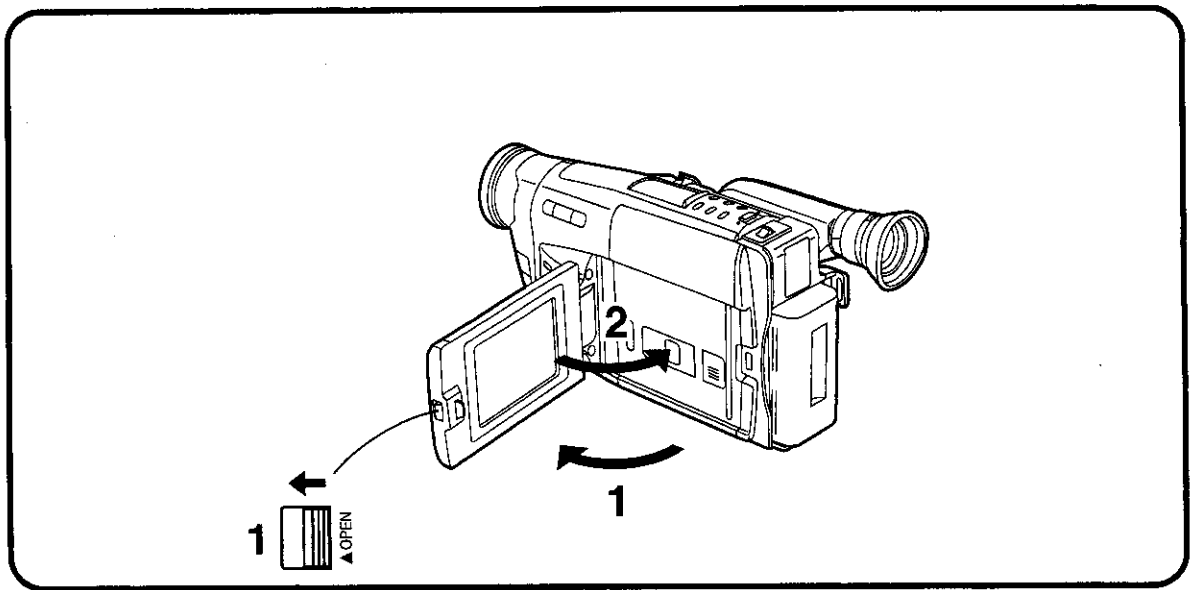
Using the LCD Monitor

Improved LCD backlight transmission makes the picture extra bright. In addition, special coating of the LCD's surface diffuses the light from outside to minimize light reflection, so the picture has vivid colours and is easy to see.

■ **Opening the LCD Monitor**

1 Slide the [▲OPEN] Lever to the left and simultaneously open the LCD Monitor in the direction of the arrow approximately 90°.

■ **Closing the LCD Monitor**

2 Turn the LCD Monitor back toward the Movie Camera body until it locks with a click.

- Return the LCD Monitor to its vertical position before closing it, Also, make sure that the Cassette Compartment is securely closed before closing the LCD Monitor.
- Opening the LCD Monitor automatically turns the Finder off. However, when you turn the LCD Monitor so that is faces forward, the Finder turns on again.
- Extremely high precision technology is employed in producing the LCD Monitor. The result is more than 99.99 % effective pixels with a mere 0.01 % of the pixels inactive or always lit. However, this is not a malfunction and does not affect the recorded picture.
- When the Movie Camera is very cold when turning it on, the picture on the LCD Monitor is darker than normally. However, as it reaches normal temperature, it regains its normal brightness.
- To remove fingerprints, wipe the LCD Monitor with the supplied Cleaning Tissue or a similar soft cloth.
- Do not expose the LCD Monitor to direct sunlight. When sunlight falls onto the LCD Monitor, it may be difficult to view the picture.
- Do not apply any pressure to the surface of the LCD Monitor or subject it to strong shocks.
- Before transporting the Movie Camera, securely close the LCD Monitor.

13

```
                    MENU
            1    ┌─►PLAY

               PAUSE  STOP
            2   ▐ ▌┐ ┌▐■▌   3
                ITEM┘ └SET
```

```
              MAIN  MENU
    SPEED          ►SP
    TAPE           ►30
    TITLE SET      ►OFF    ON
    APS            ►OFF
    SELF SHOOT     ►NOR.
    DEMO MODE      ►OFF


         PRESS MENU TO EXIT
```
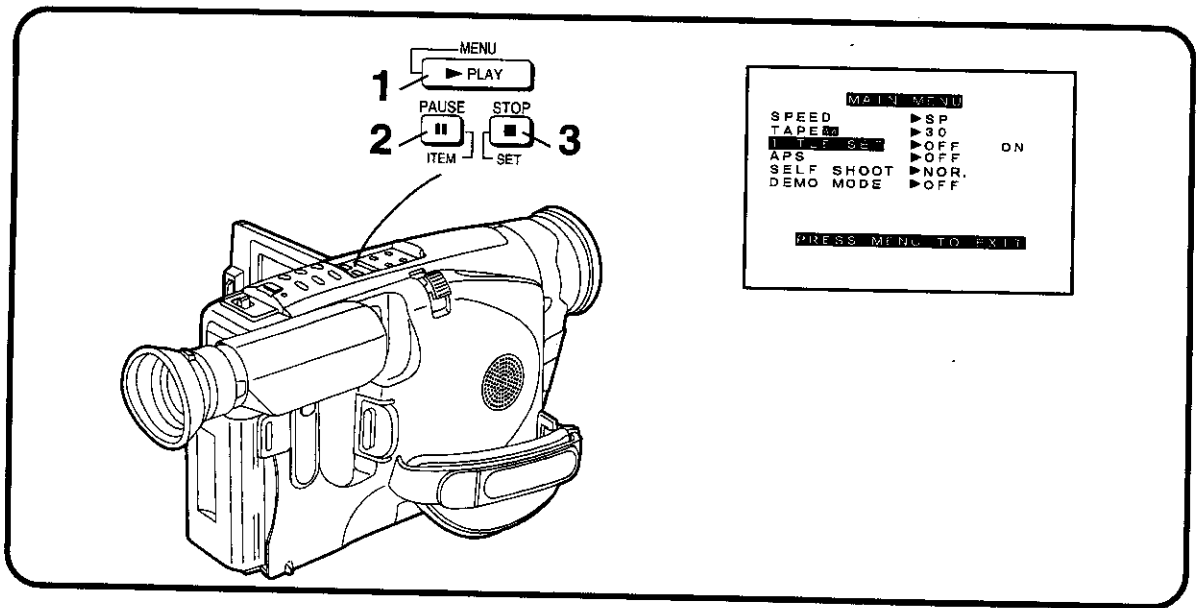
Using the Menu Screen

This Movie Camera displays the settings of various functions in Menus to make it easy to select the desired functions and settings.
Perform the following operations with the Movie Camera in the Camera Mode (the [CAMERA] Lamp lights) and in the Recording Pause Mode.

Using the Main Menu

1 **Press the [MENU] Button.**
   ●The [MAIN MENU] Menu appears.

2 **Press the [ITEM] Button repeatedly to select the item to be set.**

3 **Press the [SET] Button repeatedly to set the desired mode for the selected item.**

Exiting the Main Menu
Press the [MENU] Button.

MENU
► PLAY

1

PAUSE   STOP

2, 4   ▮▮   ▪   3, 5
        ITEM   SET

```
        MAIN  MENU
SPEED          ►SP
TAPE▦          ►30
TITLE SET        OFF    ►ON
APS            ►OFF
SELF SHOOT     ►NOR.
DEMO MODE      ►OFF


    PRESS MENU TO EXIT
```

↓

```
     TITLE SET MENU
DATE/TITLE
        DATE TIME
TITLE              HOLIDAY
LANGUAGE
FOR TITLE          ENGLISH
SIZE              ►NORMAL
COLOUR             WHITE

    PRESS MENU TO RETURN
```
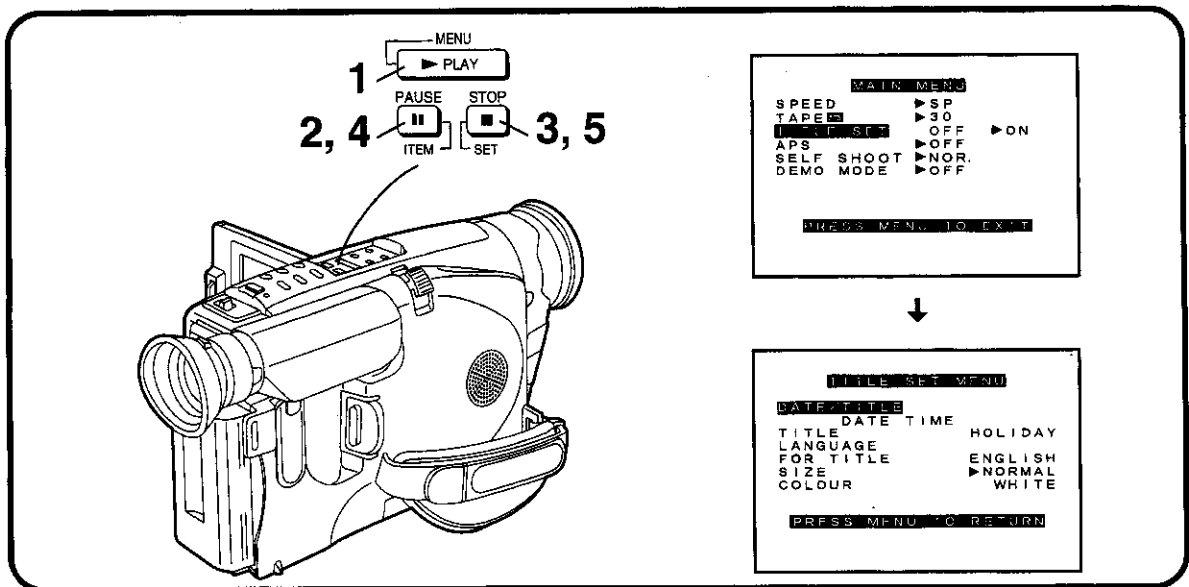
Using the Title Menu

1 Press the [MENU] Button.
● The [MAIN MENU] Menu appears.

2 Press the [ITEM] Button repeatedly to select [TITLE SET].

3 Press the [SET] Button to set to [ON].
● The [TITLE SET MENU] Menu appears.

4 Press the [ITEM] Button repeatedly to select the item to be set.

5 Press the [SET] Button repeatedly to set the selected item to the desired mode.

Exiting the Title Menu
Press the [MENU] Button once to return to the [MAIN MENU] Menu, and then press the [MENU] Button once more to exit the Menu.

● The settings that you have selected on the Menus are maintained when you turn the Movie Camera off. However, if you disconnect the power supply unit (Battery or AC Adaptor) from the Movie Camera before turning it off, the selected settings may not be maintained.
● If you connect the Movie Camera to a TV, the Menu can be displayed on the TV screen.

```
            MAIN  MENU
①---SPEED          ►SP        L P
②---TAPE🔲         ►30     45    60
③---TITLE  SET     ►OFF      ON
④---APS            ►OFF      ON
⑤---SELF  SHOOT    ►NOR.     MIR.
⑥---DEMO  MODE     ►OFF      ON


            PRESS  MENU  TO  EXIT
```
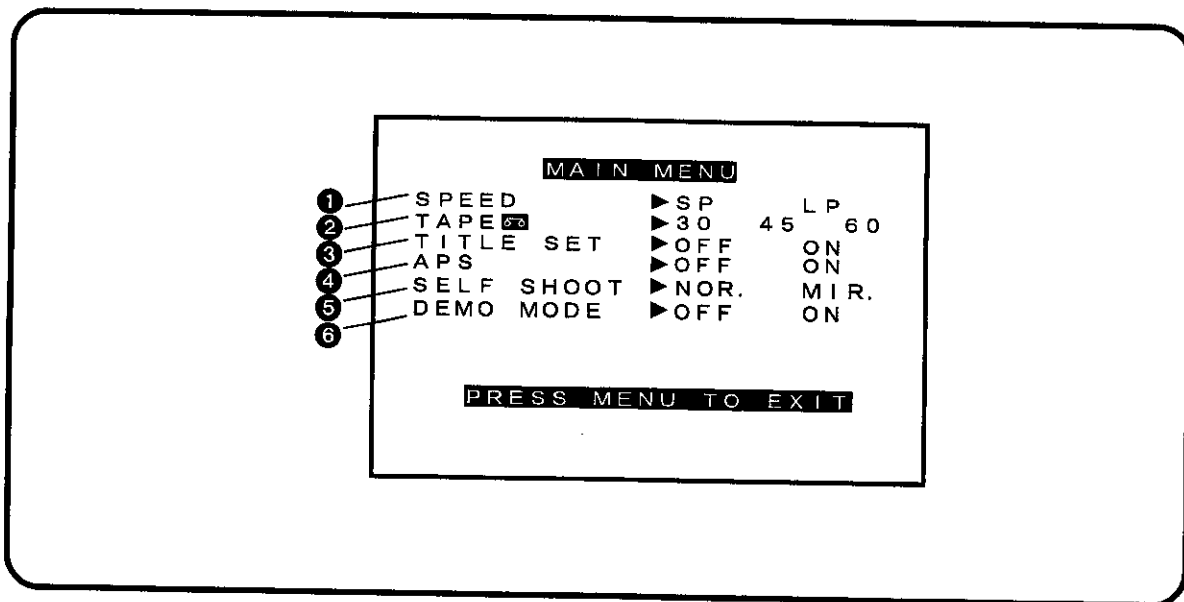
Menu Functions

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

Main Menu [MAIN MENU]

❶ **Recording Speed [SPEED] (→ 20)**

To select the recording speed.

❷ **Tape Length [TAPE🔲] (→ 20)**

To select the tape length of the cassette being used.

❸ **Setting the Title [TITLE SET] (→ 15)**

To change the Menu to the [TITLE SET MENU] Menu, set to [ON].

❹ **Automatic Power Save Functions [APS] (→ 40)**

To turn on the Power Save Functions, set to [ON].

❺ **Self-Recording [SELF SHOOT] (→ 57)**

To reverse the picture displayed on the LCD Monitor when recording with the LCD Monitor facing forward (Mirror Mode), set to [MIR.].

❻ **Demonstration Mode [DEMO MODE] (→ 78)**

To reactivate the cancelled Demonstration Mode, set to [ON].

```
┌─────────────────────────────────────────────┐
│         ▐ TITLE  SET  MENU ▌                 │
│ ─DATE／TITLE                                 │
│          DATE  TIME                          │
│ ─TITLE                   HOLIDAY             │
│  LANGUAGE                                    │
│  FOR  TITLE             ENGLISH              │
│ ─SIZE        ▶NORMAL  LARGE                  │
│ ─COLOUR                 WHITE                │
│                                              │
│  ▐ PRESS  MENU  TO  RETURN ▌                 │
└─────────────────────────────────────────────┘
```
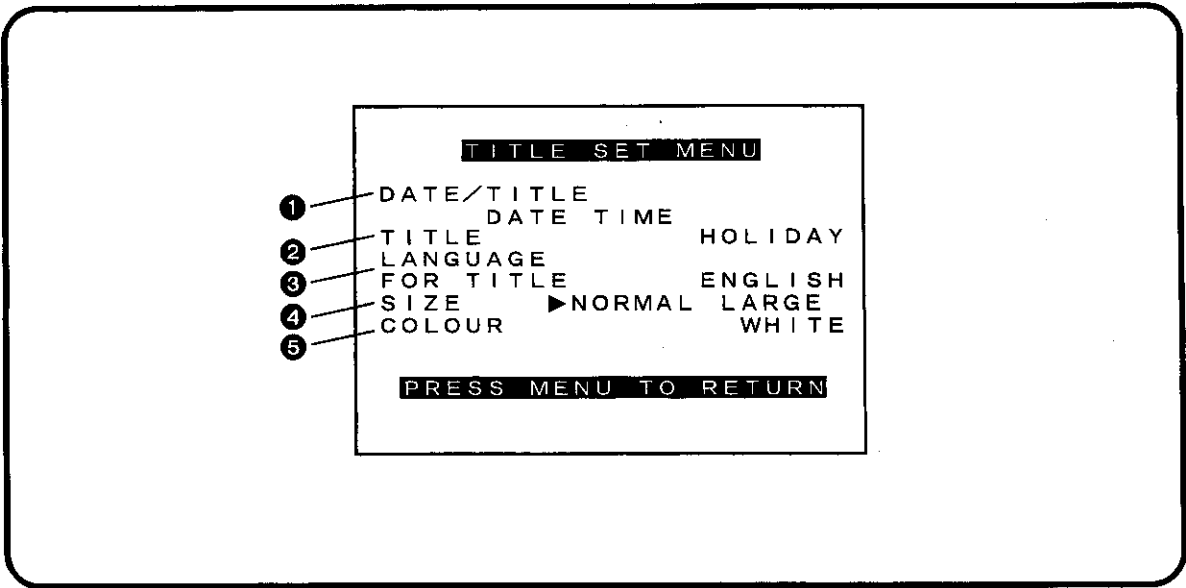
Title Menu [TITLE SET MENU]

❶ Date/Time/Title Indication [DATE/TITLE] (→ 25)

To select the desired Date/Time/Title indication.

❷ Title [TITLE] (→ 60)

To select the desired pre-programmed title.

❸ Language of the Title [LANGUAGE FOR TITLE] (→ 59)

To select the desired language of the title.

❹ Size of the Title [SIZE] (→ 61)

To select the desired size of the title.

❺ Colour of the Date/Time/Title Indication [COLOUR] (→ 60)

To select the desired colour of the Date/Time/Title Indication.
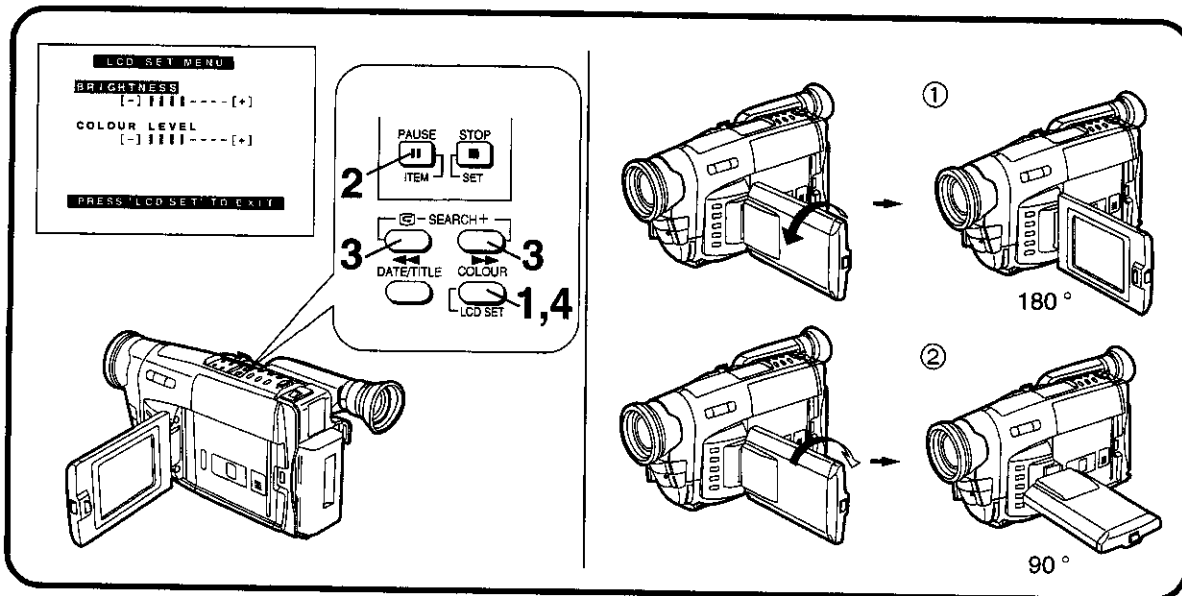
Adjusting the LCD Monitor

When the picture on the LCD Monitor cannot be seen clearly under certain lighting conditions, you can adjust the brightness and colour level on the menu.

1 Press the [LCD SET] Button.

The [LCD SET MENU] Menu appears and the following items are displayed:

LCD Brightness [BRIGHTNESS]
To adjust the brightness of the picture on the LCD screen.

LCD Colour Level [COLOUR LEVEL]
To adjust the colour saturation of the picture on the LCD screen.

●When you display the title created with the Digital Superimposer Function by pressing the [OFF/ON] Button (→ 62), you cannot display the [LCD SET MENU] Menu even if you press the [LCD SET] Button. In this case, press the [OFF/ON] Button again to make the title disappear and then press the [LCD SET] Button. (During playback, if you press the [LCD SET] Button but the [LCD SET MENU] Menu does not appear, first stop the playback and then press the [OFF/ON] Button to make the title disappear.)

2 Press the [ITEM] Button to select the item that you want to adjust.

3 Press the [◄◄] or [►►] Button to adjust the number of vertical bars.

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

4 Press the [LCD SET] Button to exit the [LCD SET MENU] Menu.

●These adjustments have no influence on the actually recorded picture.

■ Adjusting the Angle of the LCD Monitor

The LCD Monitor rotates upward a maximum of 180° ① and downward a maximum of 90° ② from its normal vertical position. Trying to forcefully rotate it beyond this range could seriously damage the Movie Camera.
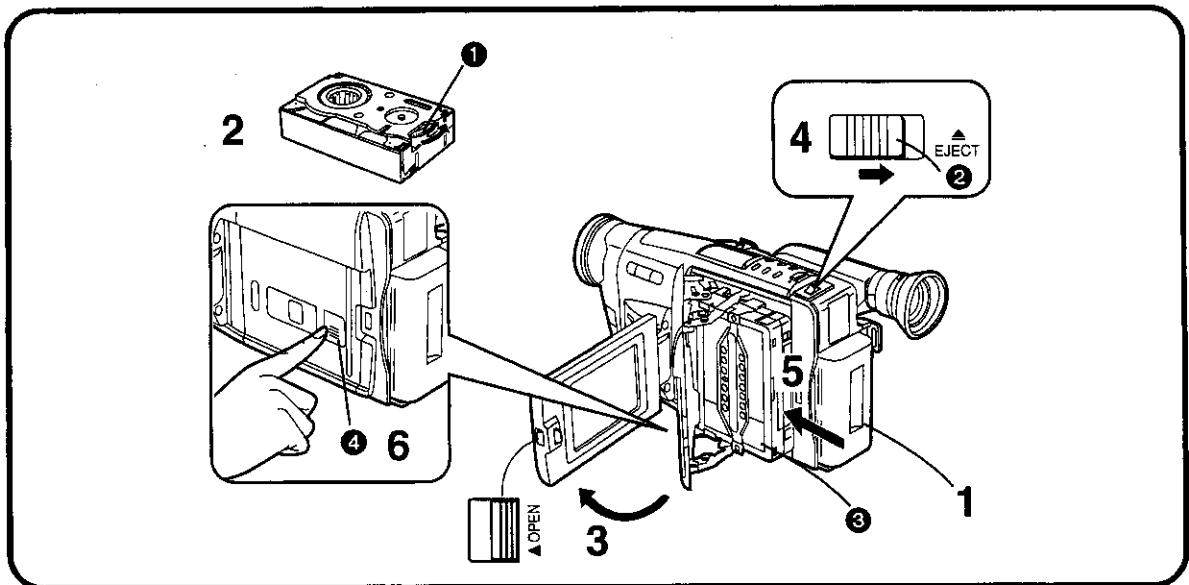
Inserting the Cassette

1 Connect the AC Adaptor or attach a charged Battery. (→ 8, 11)

2 Turn the cog wheel ❶ to tighten the tape.

3 Slide the [▲ OPEN] Lever to the left and simultaneously open the LCD Monitor in the direction of the arrow approximately 90°.

●Be sure to keep the LCD Monitor in its vertical position, so that the Cassette Compartment Cover, when it opens, does not hit the LCD Monitor.

4 Slide the [▲ EJECT] Lever ❷ in the direction of the arrow.

5 Insert the cassette with the cassette window ❸ facing outward and push it all the way in.

6 Close the Cassette Compartment by pressing the [LOCK] Button ❹.

●It is not possible to take out the cassette during recording.

●Do not insert and take out the cassette repeatedly. This could cause the tape to become loose or damaged.

●If a cassette with broken out erasure prevention tab is inserted, the [⊗] Indication flashes.

Ejecting the Cassette

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

1, 4, 5, 8 — MENU
► PLAY
PAUSE STOP
2, 6 — ITEM — SET — 3, 7

MAIN MENU

❶
SPEED   SP   ►LP
TAPE   ►30
TITLE SET   ►OFF
APS   ►OFF
SELF SHOOT   ►NOR.
DEMO MODE   ►OFF

PRESS MENU TO EXIT

MAIN MENU

❷
SPEED   ►SP
TAPE   30 ►45   60
TITLE SET   ►OFF
APS   ►OFF
SELF SHOOT   ►NOR.
DEMO MODE   ►OFF

PRESS MENU TO EXIT
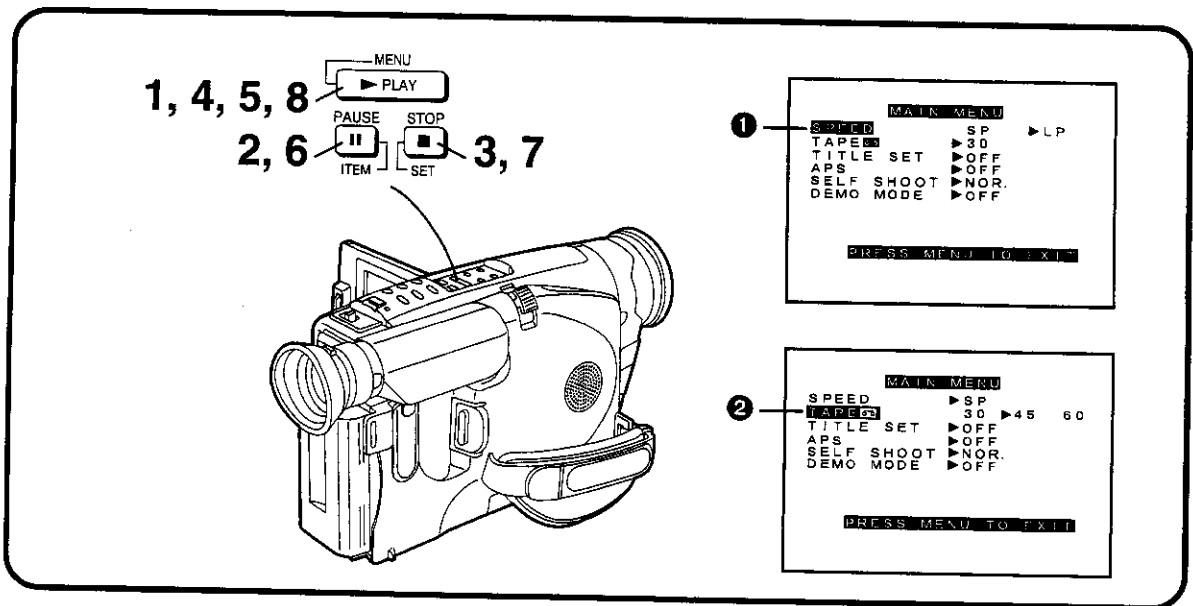
Selecting the Recording Speed

The desired recording speed can be selected with
[SPEED] on the [MAIN MENU] Menu.

1 Press the [MENU] Button.
●The [MAIN MENU] Menu appears.

2 Press the [ITEM] Button repeatedly to
select [SPEED] ❶.

3 Press the [SET] Button to select the desired
recording speed (SP or LP).
●The selected recording speed is marked with the
[►] mark.
●[SP] means Standard Play. [LP] means Long Play.

4 Press the [MENU] Button to exit the Menu .

Selecting the Correct Tape Length

To ensure that the Remaining Tape Time Indication
displayed during recording and playback is correct, you
need to set the tape length that matches that of the
inserted cassette.

5 Press the [MENU] Button.
●The [MAIN MENU] Menu appears.

6 Press the [ITEM] Button repeatedly to
select [TAPE⊡] ❷.

7 Press the [SET] Button to select the correct
tape length.
●The selected tape length is marked with the [►]
Mark.
●The Tape Length Indications change in the
following order:

┌──→[30] ──────→[45] ──────→[60] ──┐
   [⊡ 30]   [⊡ 45]   [⊡ 60]
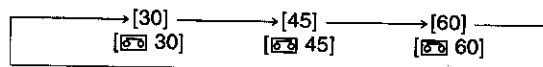
8 Press the [MENU] Button to exit the Menu .
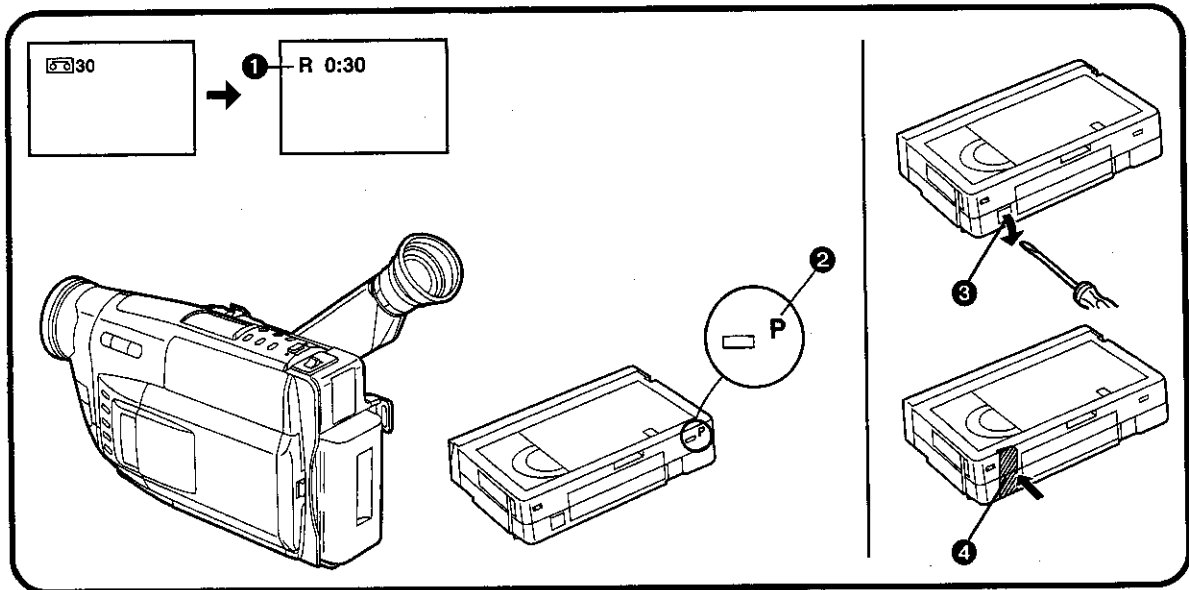
Confirming the Remaining Tape Time

During recording and playback, the Remaining Tape Time Indication ❶ is automatically displayed, so you always know how much time you have left on the cassette. However, to ensure correct display of the remaining tape time, the tape length of the cassette being used must be set correctly on the Movie Camera. (→ 20)

● When recording or playback starts, the Tape Length Indication disappears, and in its place the [R] Indication flashes while the remaining tape time is being calculated. A few seconds later, the Remaining Tape Time Indication appears. ([R] means Remaining.)
● When the remaining tape time is less than 2 minutes, the [R] Indication and the Remaining Tape Time Indication start to flash.

When you use a cassette bearing the [P] mark ❷ or other special types of cassettes, the Remaining Tape Time Indication may not be very precise.

■ Preventing Accidental Erasure of Recordings

● Recording on a previously recorded cassette erases the existing scenes and sound.
● To protect important recordings against accidental erasure, use a screwdriver to break out the tab ❸ on the cassette (some cassettes have sliding-type tabs).
● To be able to record again on a protected cassette, firmly cover the hole where the tab was with two layers of adhesive tape ❹.
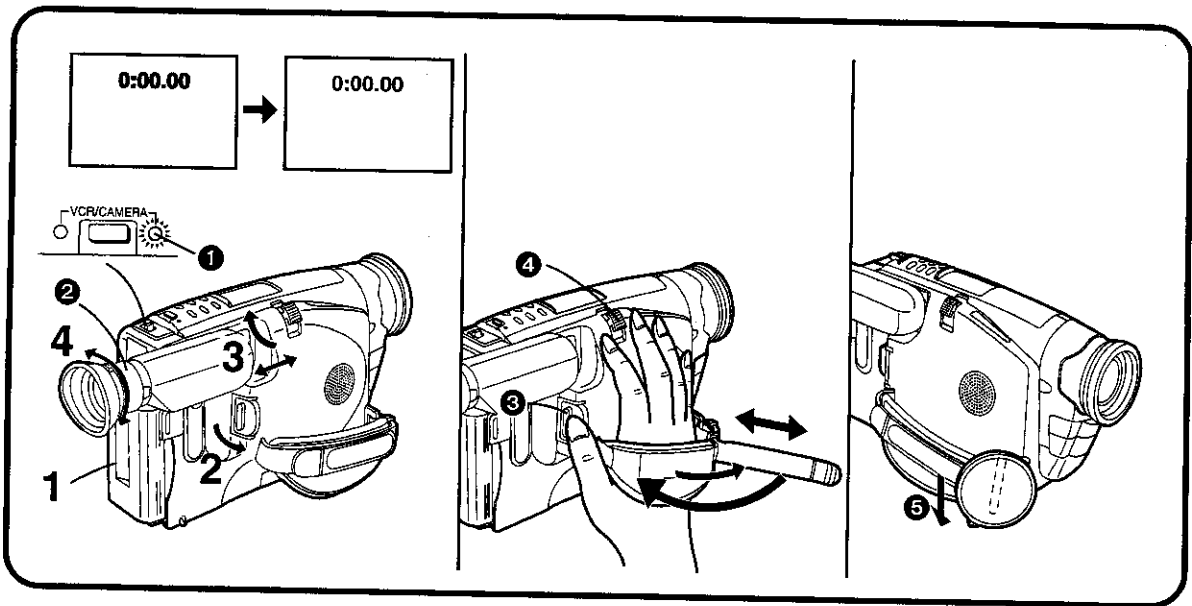
Adjusting the Finder

Before adjusting the Finder, make sure that the LCD Monitor is completely closed.

1 Connect the AC Adaptor or attach a charged Battery.

2 Turn out the [POWER] Switch to turn the Movie Camera on.
   ● The [CAMERA] Lamp ❶ lights.

3 If necessary, extend the Finder backward and adjust its angle upward.
   ● The Finder can be tilted upward up to 90°.

4 Look in the Finder and turn the Eyepiece Corrector Ring ❷ clockwise or counterclockwise.
   ● Stop turning the Eyepiece Corrector Ring at the point where the indications in the Finder are sharpest.

Never aim the Movie Camera with its Finder or Lens directly at the sun; this could damage internal parts of the unit.

Adjusting the Grip Belt

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

Handling the Lens Cap

Remove the Lens Cap from the Lens Hood and hook it onto the Grip Belt ❺.
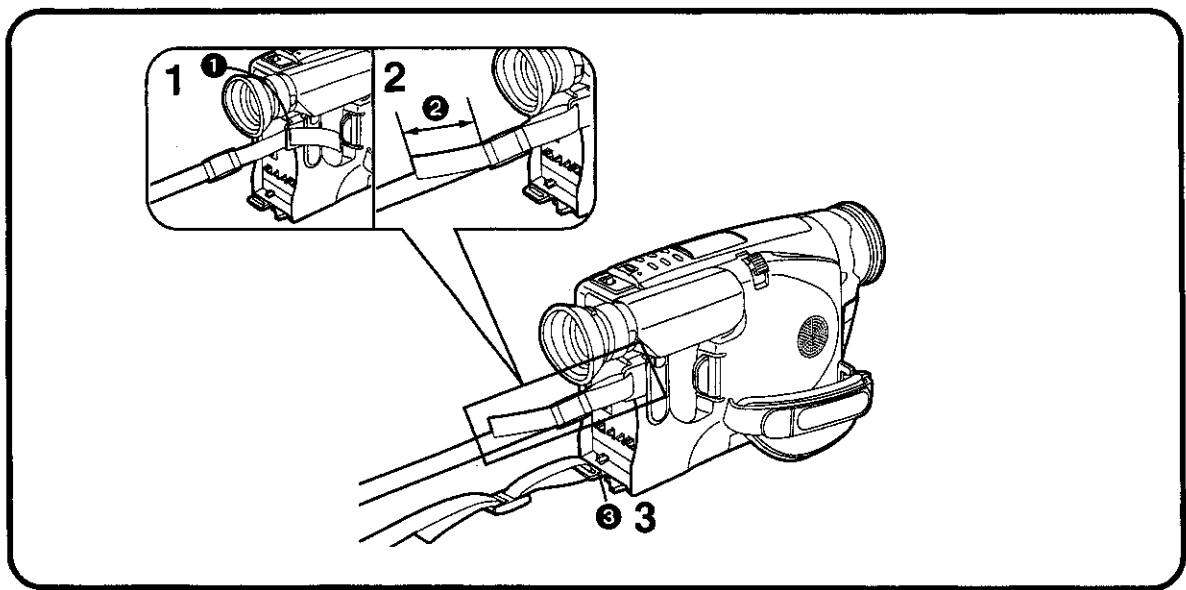
Attaching the Shoulder Strap

1 Pull one end of the Shoulder Strap through the Shoulder Strap Holder ❶.

2 Fasten this end of the Shoulder Strap securely (❷ more than 2 cm).

3 Perform the above steps to attach the other end of the Shoulder Strap to the other Shoulder Strap Holder ❸ on the Movie Camera.
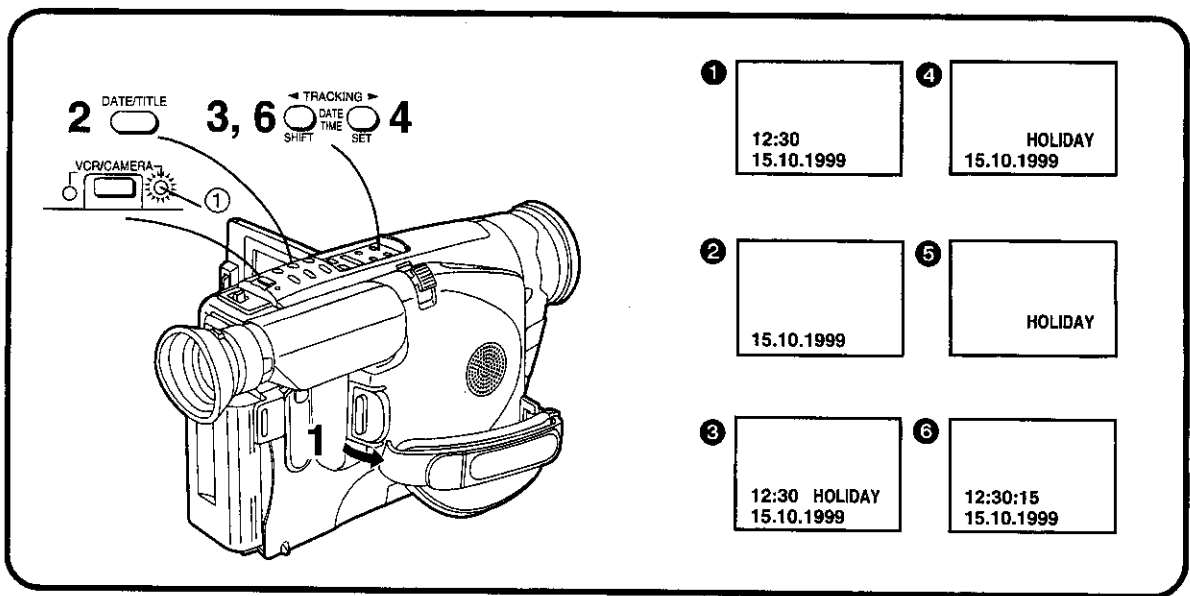
Setting the Date and Time

1 Turn out the [POWER] Switch to turn the Movie Camera on.

●The [CAMERA] Lamp ① lights.

2 Press the [DATE/TITLE] Button to make the Date/Time/Title Indication appear.

●To set the date and time, one of the indications other than the Title Indication alone ❺ shown above must be displayed. If the Title Indication alone ❺ is displayed, select another Date/Time/ Title indication (❶ – ❹ or ❻). (→ 25)

3 Press the [DATE/TIME/SHIFT] Button until the "Year" portion flashes.

4 Press the [DATE/TIME/SET] Button repeatedly until the current year (for example: 1999) is displayed.

●Keeping the [DATE/TIME/SET] Button pressed changes the figures more quickly.
●The figures in the Date/Time Indication change in the following order:

Year: 1990→1991→ .... →2089→1990→...

Month: 1→2→ .... →12→1→...

Day: 1→2→ .... →31→1→...

Hour: 0→1→ .... →23→0→...

Minute: 00→01→ .... →59→00→...

5 Also set the "Month", "Day", "Hour", "Minute" in the same way as explained in steps 3 and 4.

6 After you have set the date and time and confirmed that they are correct, press the [DATE/TIME/SHIFT] Button.

●The operation of the clock starts.
●If you make a mistake during setting, start again from step 3 above.

```
TITLE  SET  MENU
DATE / TITLE
          DATE  TIME
TITLE            HOLIDAY
LANGUAGE
FOR  TITLE       ENGLISH
SIZE            ►NORMAL
COLOUR           WHITE

PRESS  MENU  TO  RETURN
```

❶
12:30
15.10.1999

❹
HOLIDAY
15.10.1999

❷
15.10.1999

❺
HOLIDAY

❸
12:30 HOLIDAY
15.10.1999

❻
12:30:15
15.10.1999
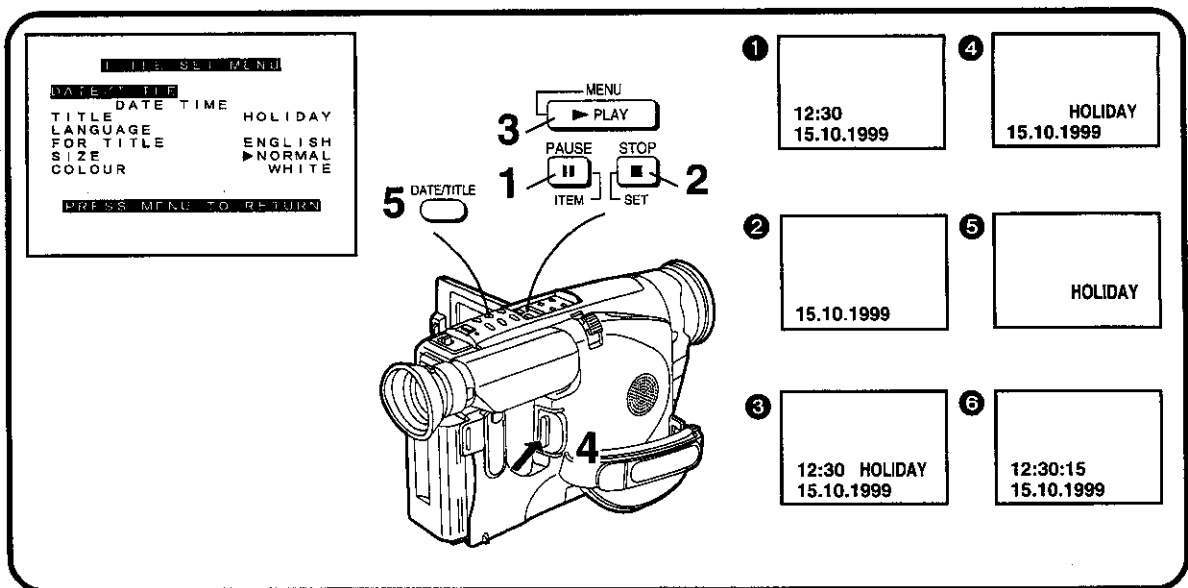
Recording with the Time and/or Date Superimposed in the Picture

After displaying the [TITLE SET MENU] Menu...
(→ 17)

1 Press the [ITEM] Button repeatedly to select [DATE/TITLE].

2 Press the [SET] Button repeatedly until the desired indication appears on the Title Menu.

●The indications change in the order ❶ to ❻.
❶ Date and Time ⟶❷ Date ⟶
❸ Date, Time and Title ⟶❹ Date and Title ⟶
❺ Title ⟶❻ Date and Time with seconds ⟶
●After turning the Movie Camera off and then on again, the previously selected Date/Time/Title Indication is no longer displayed. To make it appear again, press the [DATE/TITLE] Button once.

3 Press the [MENU] Button twice to exit the Menu.

●The selected Date/Time/Title Indication appears.

4 Press the Recording Start/Stop Button to start recording. (→ 27)

■ Deleting the Date/Time/Title Indication

5 During recording or when the Movie Camera is in the Recording Pause Mode, press the [DATE/TITLE] Button to make the Date/Time/Title Indication disappear.
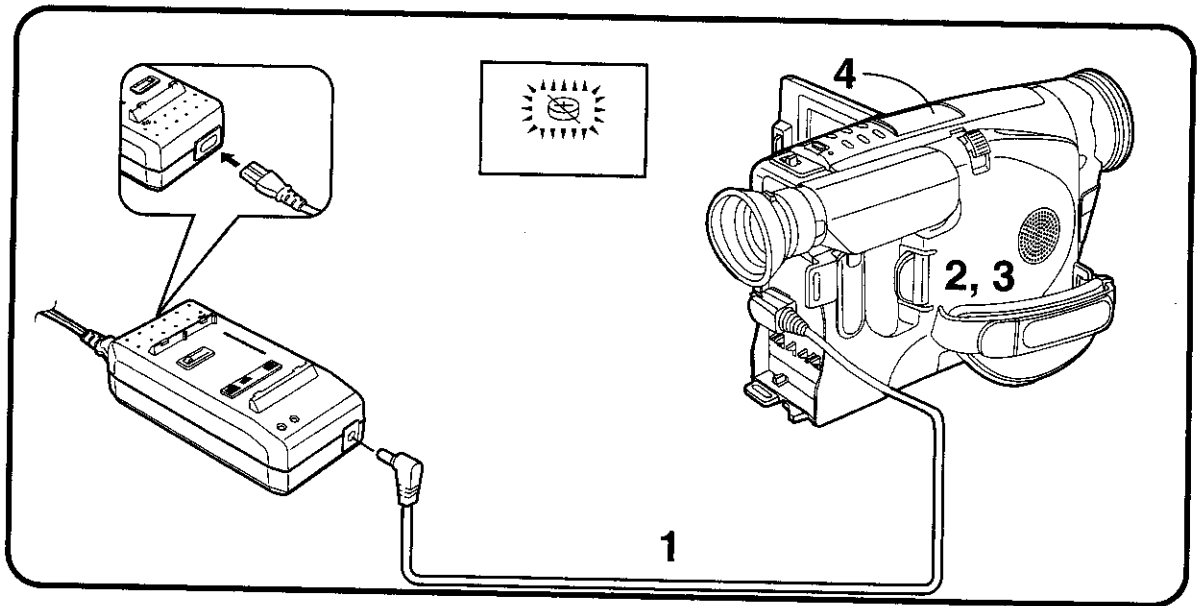
Charging the Built-in Lithium Battery

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

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

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

2 Leave the Movie Camera turned off.

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

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

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

4 Set the clock to the current date and time.
(→ 24)
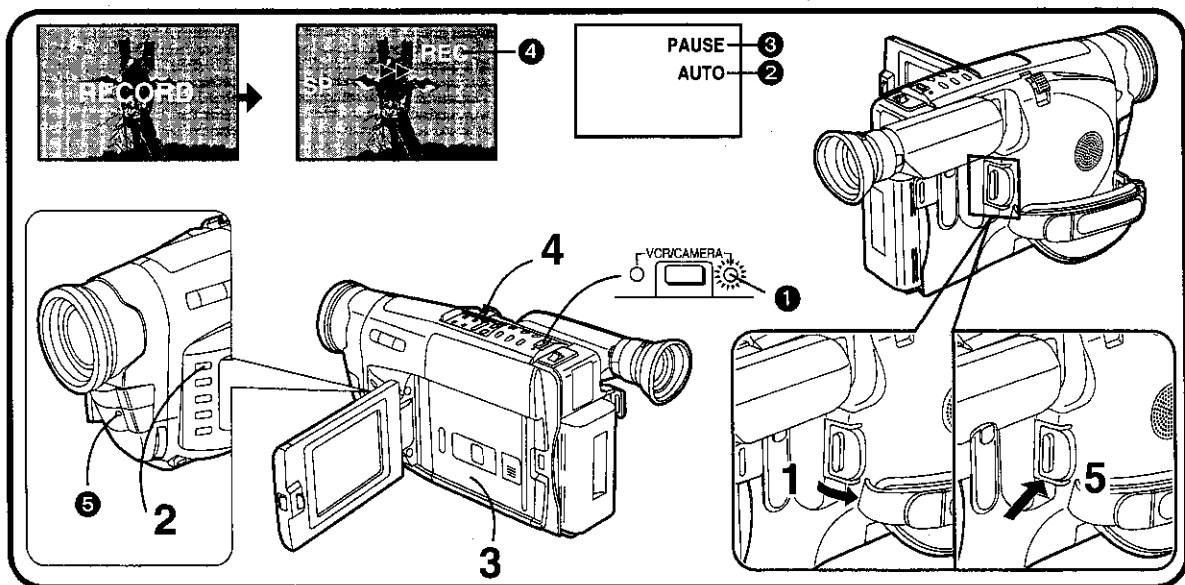
Basic Operations

Recording in the Full Auto Mode

The Full Auto Mode adjusts the white balance and focus automatically. However, if you want, you can also adjust either one or both of them manually (→ 49, 51).

1 **Turn out the [POWER] Switch to turn the Movie Camera on.**
●The [CAMERA] Lamp ❶ lights.

2 **Confirm that the [AUTO] Indication ❷ is displayed.**
●The initial setting is [AUTO].
●If the [MNL], [🔦], [👯], [♠], [🔧] or [😅] Indication is displayed, press the [PROGRAMME AE] Button repeatedly until the [AUTO] Indication appears.

3 **Insert a cassette with an intact erasure prevention tab. (→ 19)**
●The [PAUSE] Indication ❸ appears.

4 **Set [SPEED] on the [MAIN MENU] Menu to the desired recording speed ([LP] or [SP]). (→ 20)**
●The indication of the selected recording speed appears.

5 **Press the Recording Start/Stop Button to start recording.**
●Recording starts and the [▷▷] Indication and the [REC] Indication ❹ appear. The Tally Lamp ❺ on the front of the Movie Camera remains lit during recording.
([REC] means Recording.)

●During recording, it is not possible to change the recording mode ([MNL], [🔦], [👯], [♠], [🔧], [😅]), even if you press the [PROGRAMME AE] Button. (→ 52)
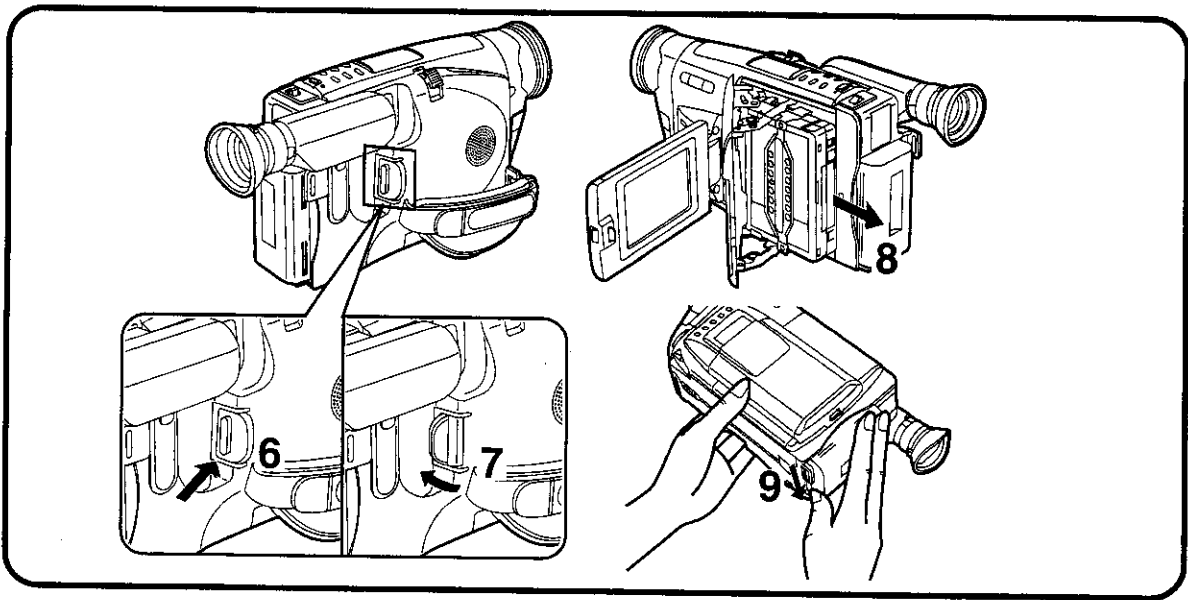
■ **Stopping Recording**

6 **Press the Recording Start/Stop Button.**
- ●Recording stops and the Movie Camera changes over to the Recording Pause (Standby) Mode.

7 **Turn in the [POWER] Switch to turn the Movie Camera off.**

8 **Take out the cassette. (→ 19)**

9 **Disconnect the AC Adaptor or remove the Battery.**

If you leave the Movie Camera in the Recording Pause Mode for more than 6 minutes, it automatically switches off to protect the tape and to conserve battery power. To resume recording from this condition, turn in the [POWER] Switch (the Movie Camera switches off) and then turn it out again.
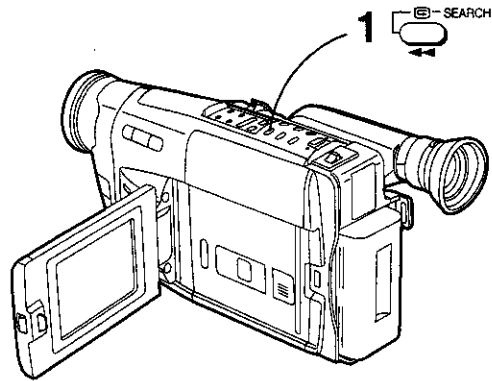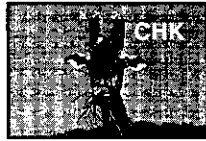
Checking the End of a Recorded Scene (Recording Check Function)

By automatically playing back the final approximately 2 seconds of the last recorded scene, this function lets you check if a just finished scene has been recorded correctly. When you then start recording the next scene, it is automatically joined with a smooth transition free from picture distortion. For especially important scenes, use this function from time to time for confirmation.

1 **Press the [[⊡]] Button briefly in the Recording Pause Mode.**

●The [CHK] Indication appears and the final approximately 2 seconds of the last recorded scene are played back.
After that, the Movie Camera returns to the Recording Pause Mode and is ready for recording the next scene.
([CHK] means Check.)
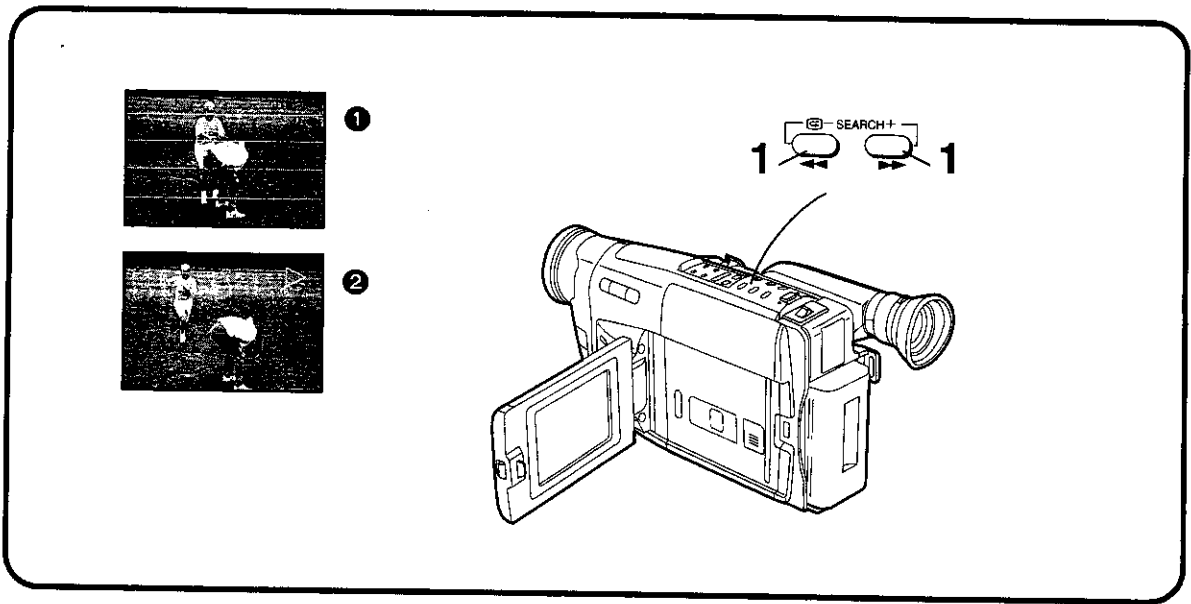
Searching for a Tape Position Before the End of the Last Recording (Camera Search Function)

This function makes it easy to search for a point in a previously recorded scene or cassette from which you want to start recording a new scene. In addition, it ensures smooth scene-to-scene transitions free from picture distortion.

1 Keep the [–SEARCH] Button (or the [SEARCH+] Button) pressed in the Recording Pause Mode.

❶: Reverse Search
❷: Forward Search
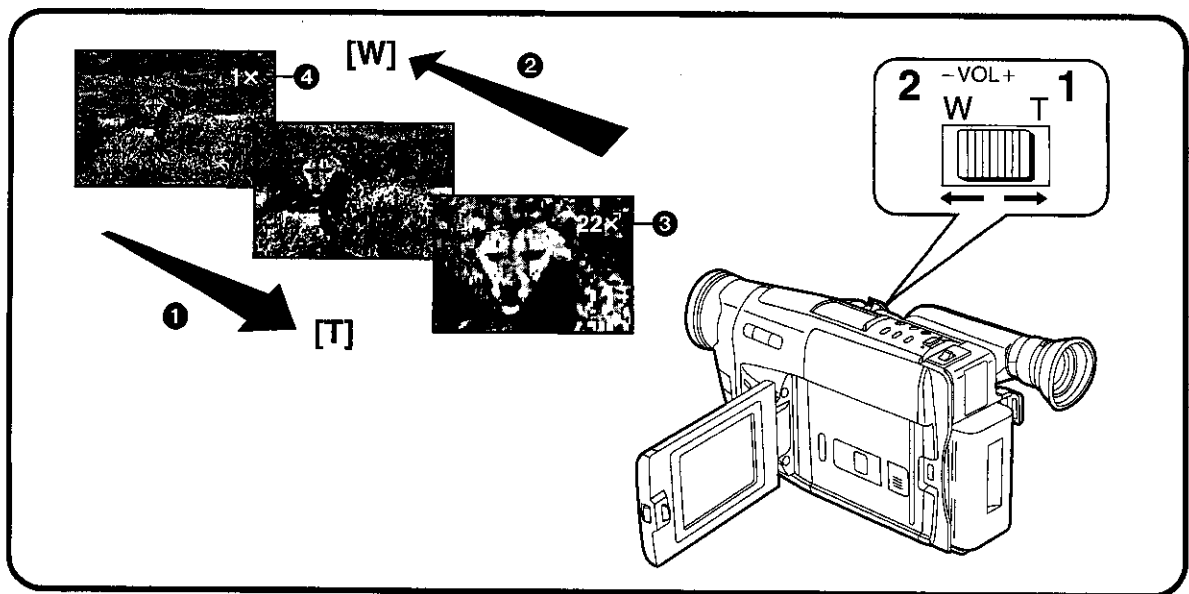
Zooming In/Out

■ Zooming-in ❶

Zooming in lets you record close-ups of distant subjects.

1 Push the [W • T] Zoom Lever toward [T].
● The Zoom Magnification Indication ❸ appears.

■ Zooming-out ❷

Zooming-out lets you record wider views.

2 Push the [W • T] Zoom Lever toward [W].
● The Zoom Magnification Indication ❹ appears.

● Zooming is possible between wide-angle (Zoom Magnification Indication [1 ×]) and telephoto (Zoom Magnification Indication [22 ×]).
● The farther you push the [W • T] Zoom Lever toward [W] or [T], the faster the zooming speed becomes.
● In the maximum telephoto setting (when you have zoomed in), precise focusing is only possible for subjects that are more than 2.2 m from the lens.

Avoid too much zooming during recording as it gives videos an unprofessional look.
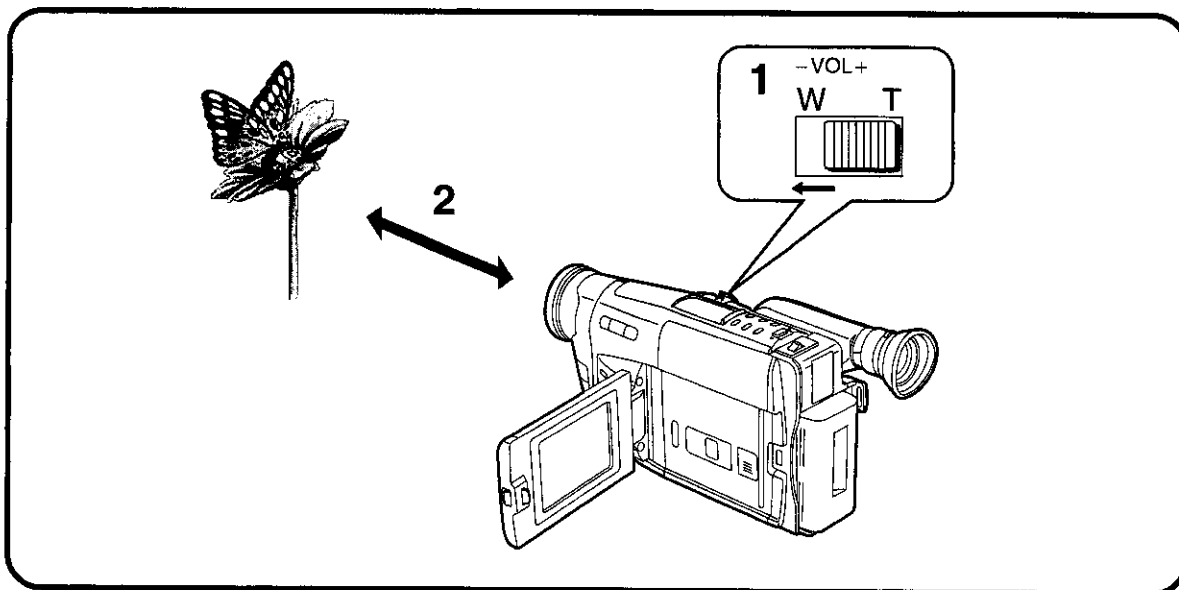
Using the Macro Close-up Function

This function lets you record very small subjects such as insects.

1 **Keep the [W • T] Zoom Lever pushed toward [W] to zoom to the maximum wide-angle setting (Zoom Magnification Indication [1×]).**

2 **Approach the subject with the Movie Camera until it reaches the desired size in the picture.**

● With the lens in the maximum wide-angle setting, the Movie Camera can automatically focus on subjects from infinity to a minimum distance of only 5 mm between lens and subject.
● To prevent unstable pictures, use a tripod (optional) for macro close-up recording.
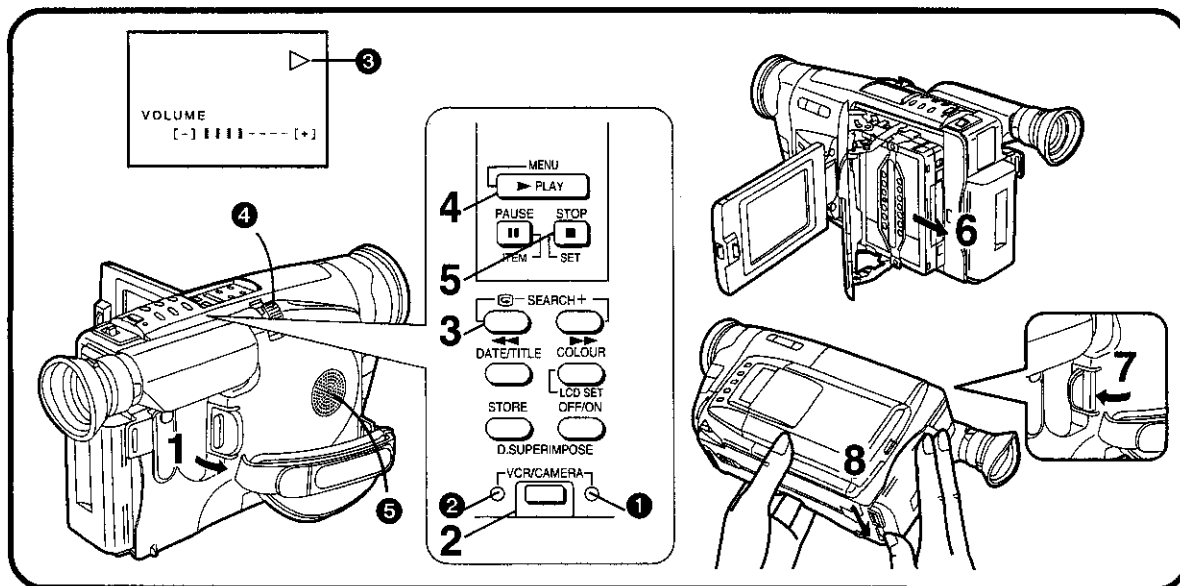
Playback

Watching Playback on the Movie Camera

You can watch playback of the recorded scenes.

1 **Turn out the [POWER] Switch to turn the Movie Camera on.**
- The [CAMERA] Lamp ➊ lights.

2 **Press the [VCR/CAMERA] Button to select the VCR Mode.**
- The [VCR] Lamp ➋ lights.

3 **Press the [◄◄] Button.**
- The tape starts to rewind. When the tape reaches the beginning, the rewinding automatically stops.

4 **Press the [PLAY] Button.**
- Playback starts and the [▷] Indication ➌ appears. When the tape reaches the end, it automatically rewinds to the beginning.

■ **Stopping Playback**

5 **Press the [STOP] Button.**
- Playback stops and the Movie Camera changes over to the Stop Mode.

6 **Take out the cassette. (→ 19)**

7 **Turn in the [POWER] Switch to turn the Movie Camera off.**

8 **Disconnect the AC Adaptor or remove the Battery.**

■ **Adjusting the Sound Volume**

Push the [−VOL+] Lever ➍ toward [+] to increase the volume or push it toward [−] to decrease the volume. The [VOLUME] Indication appears and the number of bars increases or decreases. When you release the Lever, this indication disappears.
You can also adjust the volume with the Remote Controller. Increase the volume by pressing the [T] Button, or decrease it by pressing the [W] Button. This adjustment is only possible during playback.

- Do not cover the Speaker ➎ during playback.
- Because the speaker contains a magnet, do not bring a cassette near the speaker. It could adversely influence the recorded content.
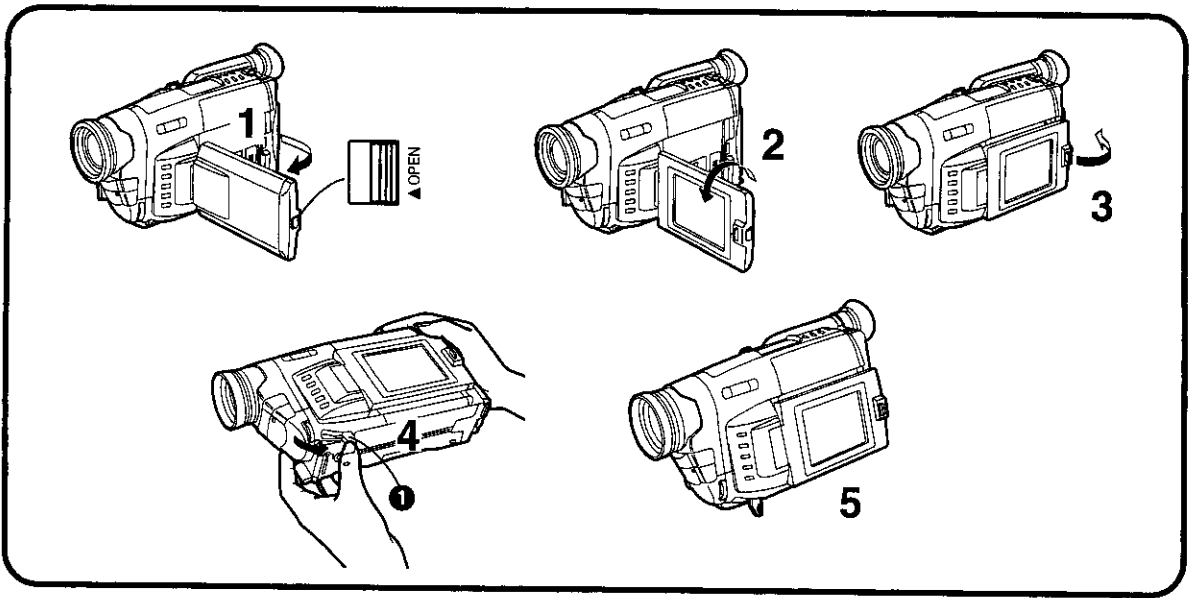
Watching Playback on the LCD Monitor with the Movie Camera Placed on a Table

1 Slide the [▲ OPEN] Lever to the left and simultaneously open the LCD Monitor in the direction of the arrow approximately 90°.

2 Turn the LCD Monitor so that it faces forward approximately 180°.

3 Close the LCD Monitor.

4 Extend the LCD Monitor Support Leg ❶.

5 Place the Movie Camera on a flat, stable surface for playback.

● If you use the Remote Controller to operate the Movie Camera, use it within approximately 1 metre from the Movie Camera.

● When recording in the Mirror Mode (➔ 58), the Date, Time and/or Title Indications cannot be inserted in the picture. Therefore, they are also not included in the playback picture.

VIDEO OUT

VIDEO IN ← → AUDIO IN

RF DC OUT

AUDIO OUT
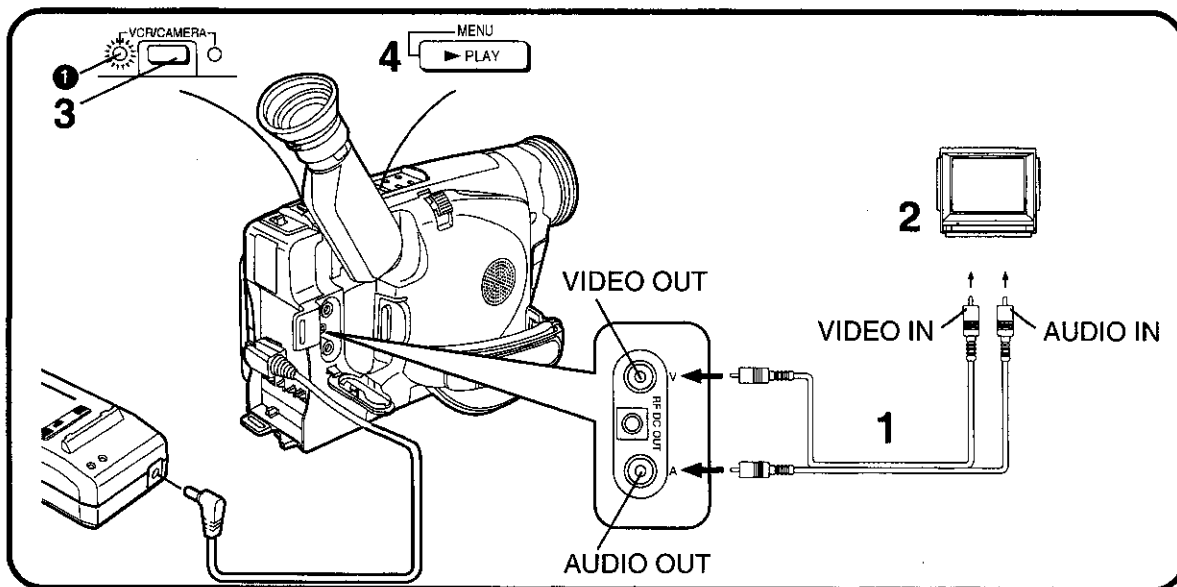
Watching Playback on a TV Set

By connecting the Movie Camera to a TV, you can watch playback of the recorded scenes on the TV screen.
Before connecting, turn off both the Movie Camera and the TV for safety's sake.

1 Use the AV Cable (supplied) to connect the Movie Camera with the TV.

Movie Camera		TV (AV Input Sockets)
VIDEO OUT	⟶	VIDEO IN
AUDIO OUT	⟶	AUDIO IN

2 Select the programme position (channel) or the AV input channel on the TV which corresponds to the video/audio input sockets used for connecting.

(Refer to the operating instructions of your TV).

3 Press the [VCR/CAMERA] Button to select the VCR Mode.

●The [VCR] Lamp ❶ lights.

4 Start playback on the Movie Camera. (➔ 33)

If your TV is not equipped with AV Input Sockets, the RF Adaptor (VW-RF7E; optional) is necessary.
Consult your dealer.
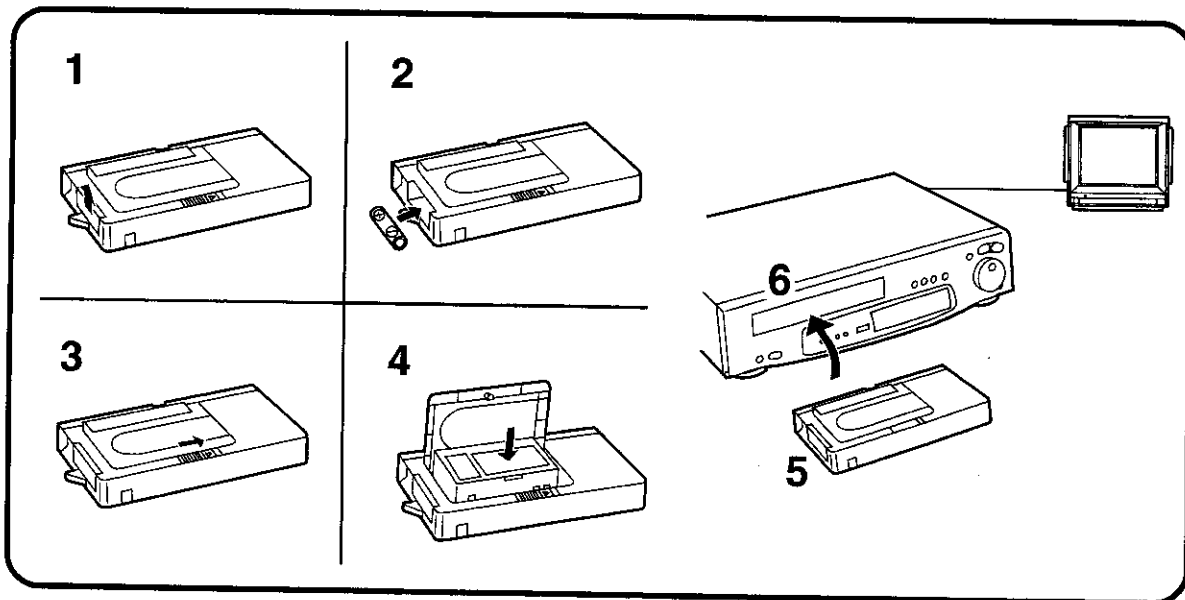
Playing Back on a VCR
(Using the Supplied Cassette Adaptor)

By using the supplied Cassette Adaptor, you can play back compact cassettes in your VCR in the same way as full-size cassettes.

1 Push the Battery Compartment Cover upward and remove it.

2 Insert the supplied battery and then re-attach the Battery Compartment Cover.

3 Slide the Open Lever in the direction of the arrow.

4 Insert the recorded cassette and close the Top Cover.

5 Insert the Cassette Adaptor into the VCR.

6 Start playback on the VCR.

After use, take out the cassette from the Cassette Adaptor.
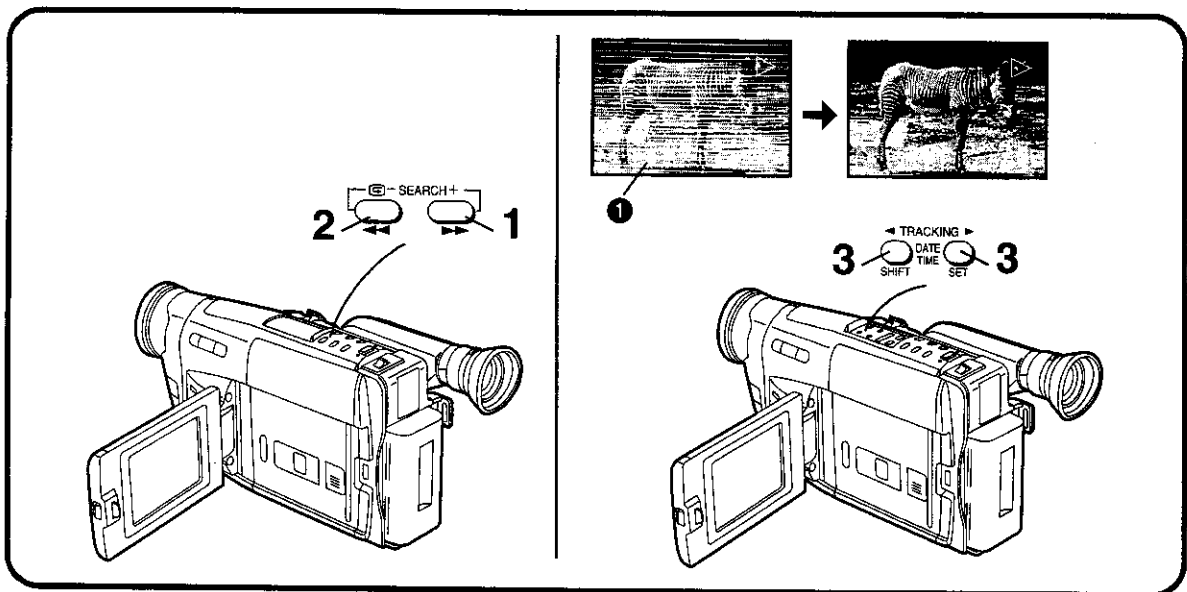
Fast-Forwarding

1 Press the [▶▶] Button in the Stop Mode.

●When the tape reaches the end, it automatically rewinds to the beginning.

Rewinding

2 Press the [◀◀] Button in the Stop Mode.

●When the tape reaches the beginning, the rewinding automatically stops.

Eliminating Picture Distortions (Tracking Adjustment)

If horizontal noise bars ❶ appear in the playback picture, you can reduce this picture distortion by adjusting as follows:

3 Press both the [◀ TRACKING] and [TRACKING ▶] Buttons simultaneously during playback.

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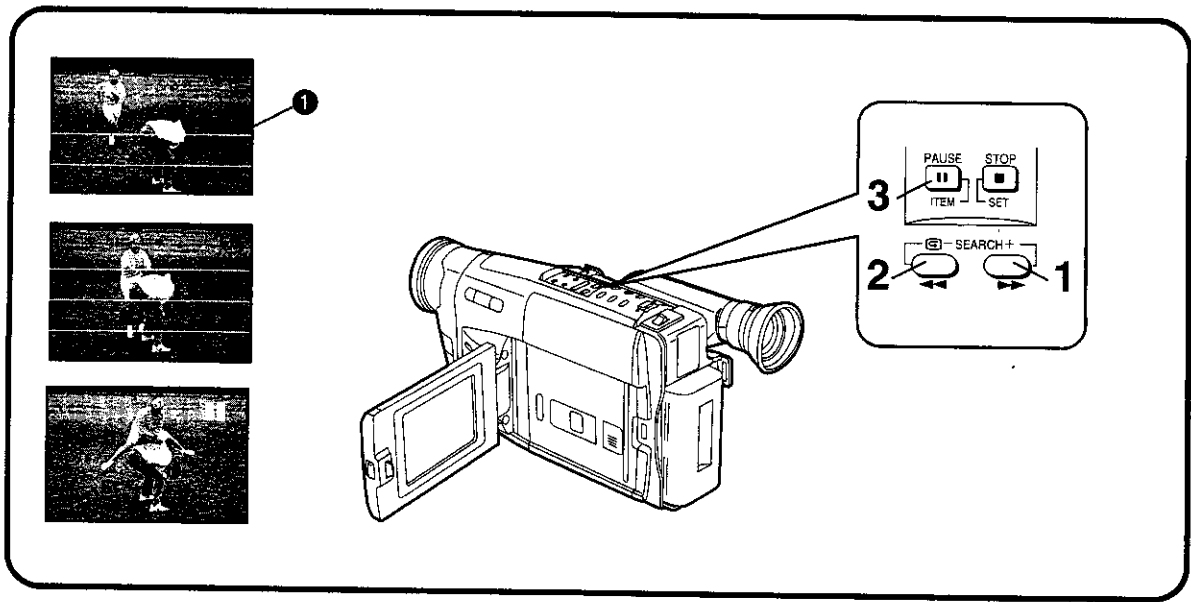
Cue Playback

1 Keep the [▶▶] Button pressed during normal playback.

Resuming Normal Playback
Release the [▶▶] Button.

Review Playback

2 Keep the [◀◀] Button pressed during normal playback.

Resuming Normal Playback
Release the [◀◀] Button.

Still Playback

3 Press the [PAUSE] Button during normal playback.

Resuming Normal Playback
Press the [PAUSE] Button again.

● In the Cue, Review and Still Playback Modes, horizontal noise bars ❶ appear in the picture, or the picture may become black and white or distorted.
● The horizontal noise bars have a different pattern in the SP mode and LP mode.
The illustrations on the above show the noise bar patterns of the LP mode.
● The picture reproduced on the LCD Monitor contains less noise than the picture in the Finder. During playback on a TV, however, the picture noise is the same as in the Finder.
● During Cue or Review Playback, no indications are displayed on the LCD Monitor.
● If you leave the Movie Camera in the Still Playback Mode for about 6 minutes, it automatically switches over to the Stop Mode. And, if the Movie Camera is being powered by the Battery, it switches off completely after a further 6 minutes.
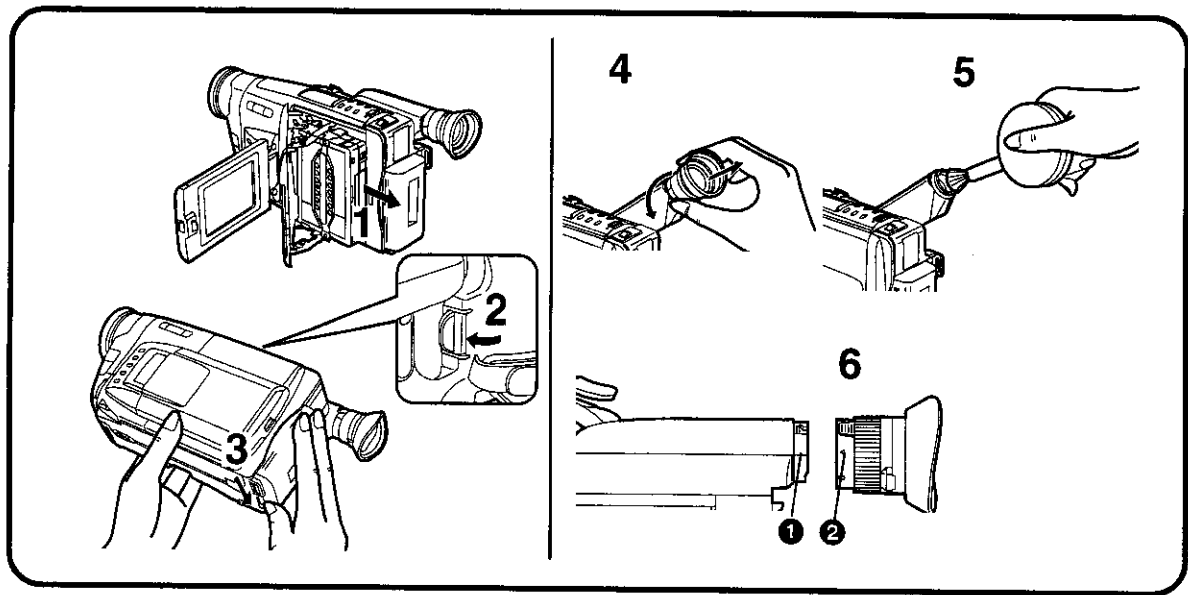
After Use

1 Take out the cassette. (→ 19)

2 Turn in the [POWER] Switch to turn the Movie Camera off.

3 Disconnect the AC Adaptor or remove the Battery.

Cleaning the Finder
If dust has entered the Finder...

4 Turn the Finder counterclockwise and pull it off.

5 Remove dust with a blower brush (not supplied).
- If you use a cotton swab or similar to clean the inside of the Finder, use it very carefully to prevent scratching the screen inside the Finder.

6 To re-attach the Finder, insert it so that the marks ❶ and ❷ are aligned, and then turn the Finder clockwise until it stops.

Cleaning the LCD Monitor

Clean the LCD Monitor with the supplied Cleaning Tissue or a blower brush.

Cleaning the Movie Camera Body
Wipe it with a clean, soft cloth.

Cleaning the Lens
Clean the lens with the supplied Cleaning Tissue or a blower brush.

```
        MAIN MENU
S P E E D        ▶ S P
T A P E▦         ▶ 3 0
T I T L E  S E T ▶ O F F
APS                O F F   ▶ O N
S E L F  S H O O T ▶ N O R.
D E M O  M O D E   ▶ O F F


        PRESS MENU TO EXIT
```
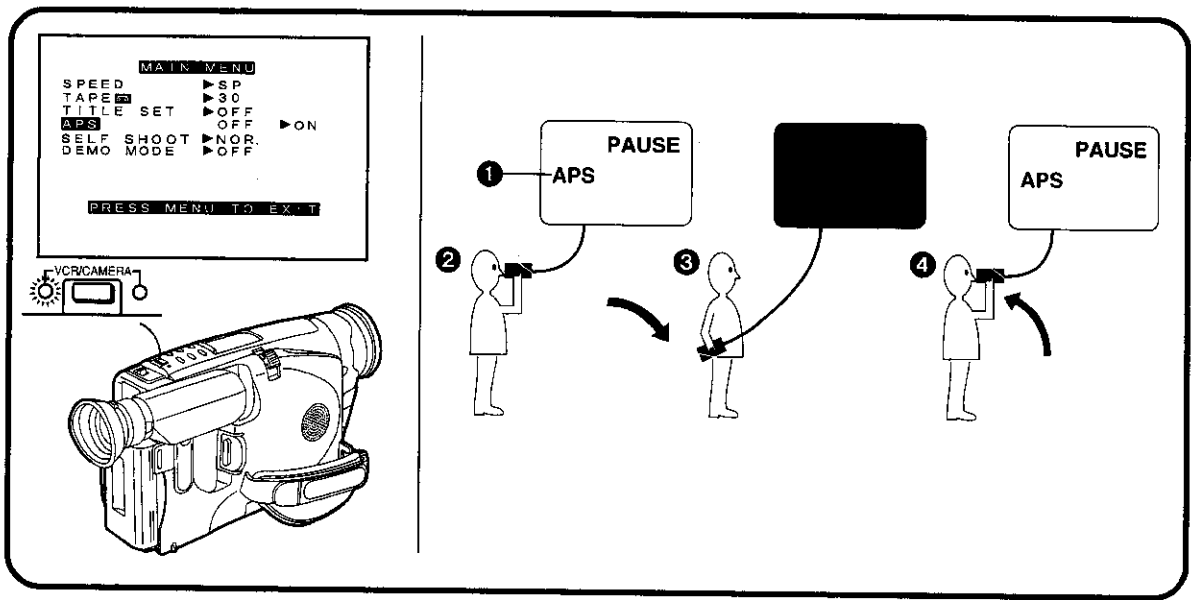
Advanced Operations

Using the Power Save Functions

To ensure economical use of electric power from your
Battery, this Movie Camera is equipped with two Power
Save Functions:

1. Auto Power Save Function (explained below)

2. Anti-Ground Recording Function (→ 41)

Before using these functions, make sure that the LCD
Monitor is completely closed. (While the LCD Monitor is
open, these functions do not become activated.)
If you want to use these functions, set [APS] on the
[MAIN MENU] Menu to [ON] so that the [APS] Indication
❶ appears in the Finder.
([APS] means Auto Power Save.)

Using the Auto Power Save Function

This function becomes activated only when the Movie
Camera is in the Recording Pause Mode and you tilt the
Movie Camera from the normal horizontal recording
position ❷ downward by more than about 70° ❸ for
more than a few seconds.

When this function becomes activated, the Finder turns
off and the [VCR] Lamp flashes.

Resuming Recording
When you return the Movie Camera to a roughly
horizontal position ❹, the Movie Camera is again in the
Recording Pause Mode. Press the Recording Start/Stop
Button to restart recording.

Cancelling the Auto Power Save Function
Set [APS] on the [MAIN MENU] Menu to [OFF] so that
the [APS] Indication ❶ disappears in the Finder.
This also cancels the Anti-Ground Recording Function.
(→ 41)

40
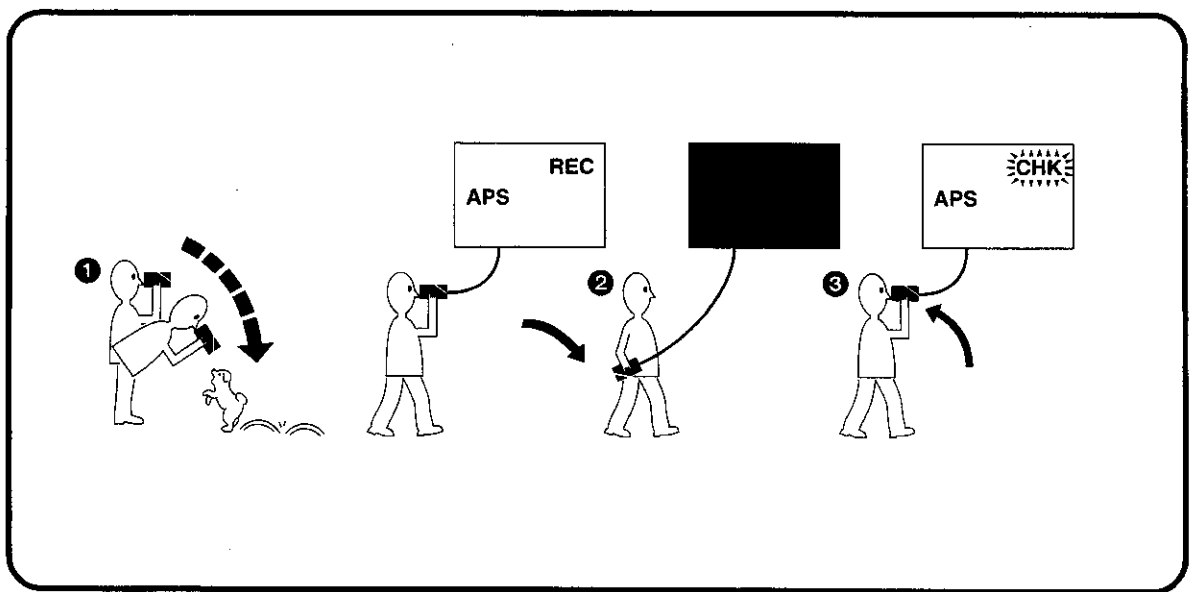
Using the Anti-Ground Recording Function

This function prevents unintentional recording of the ground, your feet, etc. It becomes activated only when the Movie Camera is in the Recording Mode and you do one of the following:

● You tilt the Movie Camera quickly downward. (When you tilt the Movie Camera slowly downward for vertical panning during recording ❶, it does not become activated.)
● You tilt the Movie Camera slowly downward (by more than 70° ❷ from the normal horizontal recording position for more than a few seconds) and walk swinging the Movie Camera back and forth.

When this function becomes activated, the Movie Camera automatically switches over to the Recording Pause Mode, the Finder turns off and the [VCR] Lamp flashes.

Resuming Recording

● When you return the Movie Camera to a roughly horizontal position ❸, the Movie Camera is again in the Recording Pause Mode. Press the Recording Start/Stop Button to restart recording.
● As recording may have continued for a few seconds, the [CHK] Indication flashes in the Finder. To erase this short unwanted part of the recording and smoothly join the next scene to the end of the last intentionally recorded scene, rewind the tape a little using the Camera Search Function (→ 30) to locate the end of the last intentionally recorded scene. Then start recording the next scene.

Cancelling the Anti-Ground Recording Function

Set [APS] on the [MAIN MENU] Menu to [OFF] so that the [APS] Indication disappears in the Finder.
This also cancels the Auto Power Save Function. (→ 40)
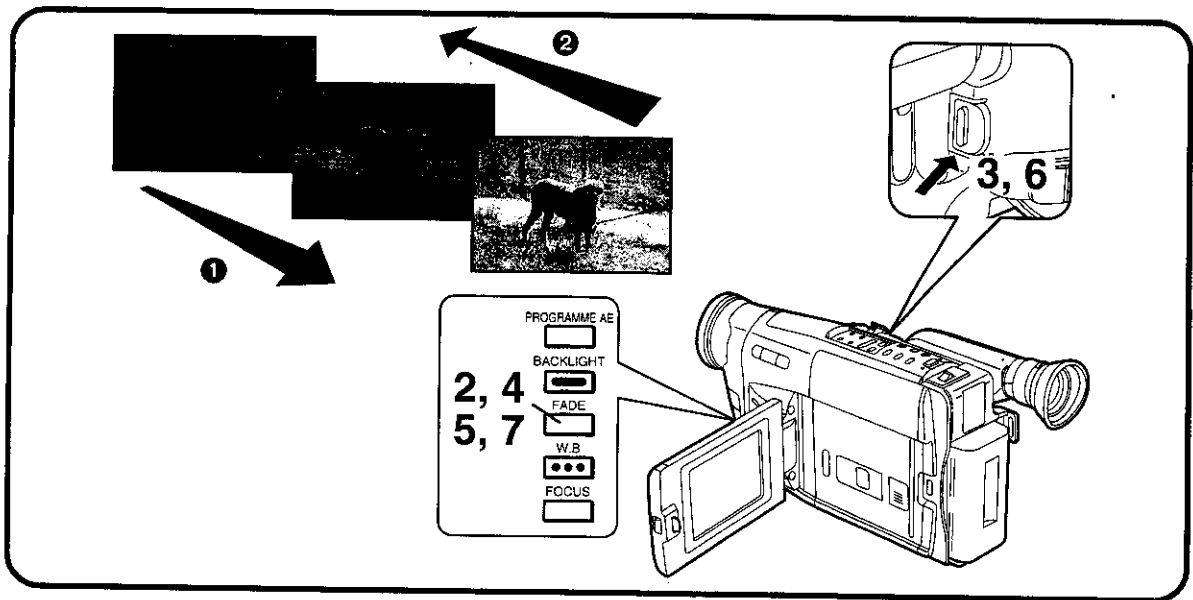
Fading In/Out

■ Fading In ❶

Fading-in lets you make the picture (and sound) appear gradually at the beginning of a recording.

1 With the Movie Camera in the Recording Pause Mode, aim it at the scene that you want to record.

2 Press the [FADE] Button and keep it pressed.

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

4 Wait 3–4 seconds and then release the [FADE] Button.

■ Fading Out ❷

Fading-out lets you make the picture (and sound) disappear gradually at the end of a recording. By fading out a scene and fading in the following one, you can produce smooth scene-to-scene transitions.

5 During recording, press the [FADE] Button at the point where you want to fade out, and keep it pressed.

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

7 Release the [FADE] Button.

1
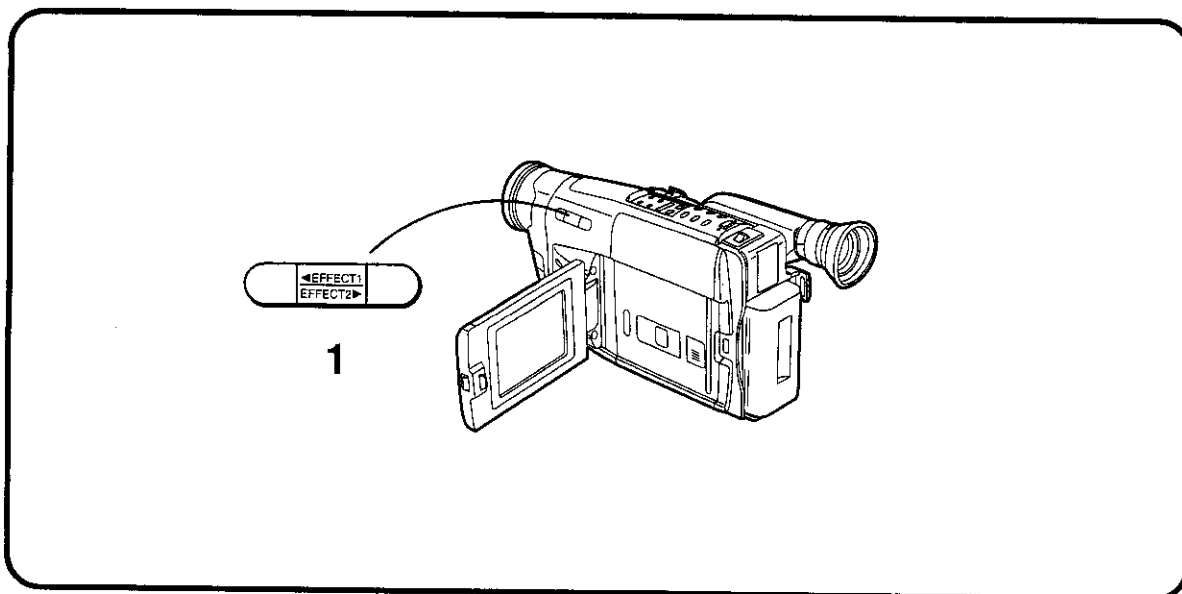
Using Special Effects (Digital Effects)

In addition to the Digital Zoom, this Movie Camera offers you a total of 9 different digital effect modes to make it easy to enhance your scenes in many creative ways. These effects are divided into two groups: Digital Effects 1 and Digital Effects 2. It is possible to select one effect from the Digital Effects 1 and another from the Digital Effects 2.

Selecting a Desired Digital Effect

1 **Press the [EFFECT1] or [EFFECT2] Button repeatedly until the indication of the desired Digital Effect appears.**

●If you turn in the [POWER] Switch to turn the Movie Camera off and then turn it on again, the indication of the selected digital effect flashes for a few seconds to inform you of the selected setting.

Digital Effect 1 Button [EFFECT1]
Repeatedly pressing this button changes the digital effects in the order ❶ to ❸ (→ 44).

Digital Effect 2 Button [EFFECT2]
Repeatedly pressing this button changes the digital effects in the order ❶ to ❼ (→ 45).

Cancelling the Selected Digital Effects
Press the [EFFECT1] or [EFFECT2] Button repeatedly until no Digital Effect Indication is displayed any more. Or, keep the [EFFECT1] or [EFFECT2] Button pressed for more than 2 seconds to make the Digital Effect Indication disappear.

43

Digital Effects 1 [EFFECT1]

❶ Digital Zoom Mode [D.ZOOM] (→ 46)

It enlarges the subject beyond the optical zooming range.

❷ Mosaic Mode [MOSAIC]

The picture becomes mosaic-like.

❸ Stretch Mode [STRETCH]

The picture is stretched horizontally while its height remains unchanged.
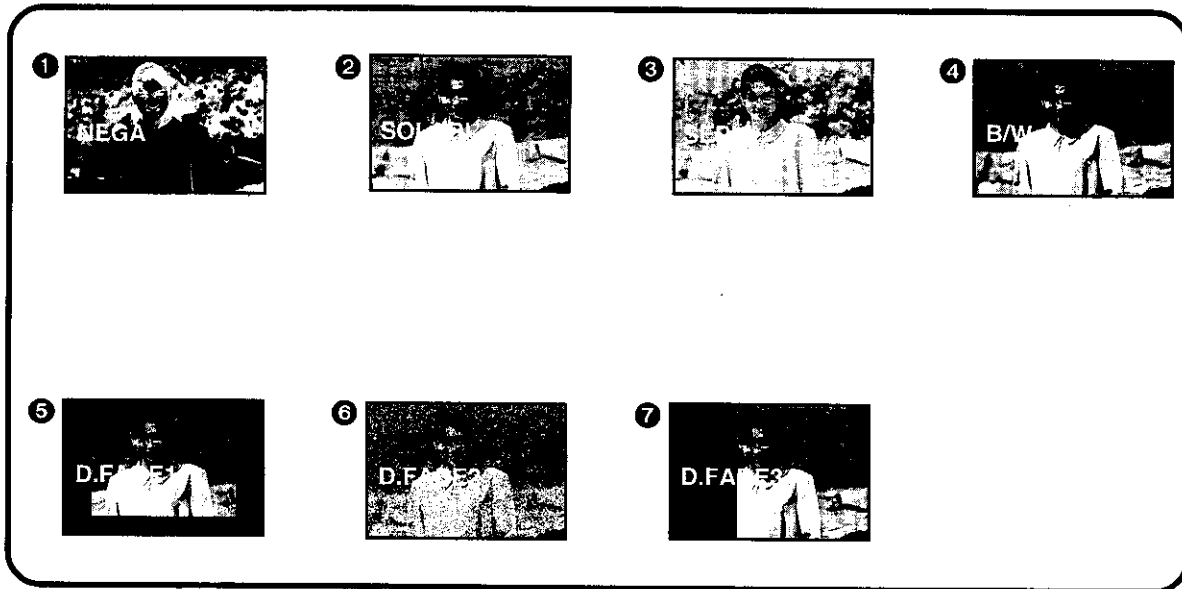
Digital Effects 2 [EFFECT2]

❶ Negative/Positive Mode [NEGA]

The picture has reversed colours similar to photographic negatives.

❷ Solarisation Mode [SOLARI]

The picture has an effect similar to a painting.

❸ Sepia Mode [SEPIA]

Scenes have a brown tint similar to the colour of old photographs.

❹ Black & White Mode [B/W]

The picture is in black and white.

❺ Digital Fade 1 Mode [D.FADE1] (→ 47)

The picture fades in starting at the centre and extending toward the edges, and it fades out in reverse direction.

❻ Digital Fade 2 Mode [D.FADE2] (→ 47)

The picture fades in from a white screen and fades out to white in small dots similar to snow melting or falling.

❼ Digital Fade 3 Mode [D.FADE3] (→ 47)

The picture fades in with a wipe effect from a black screen and fades out to black.
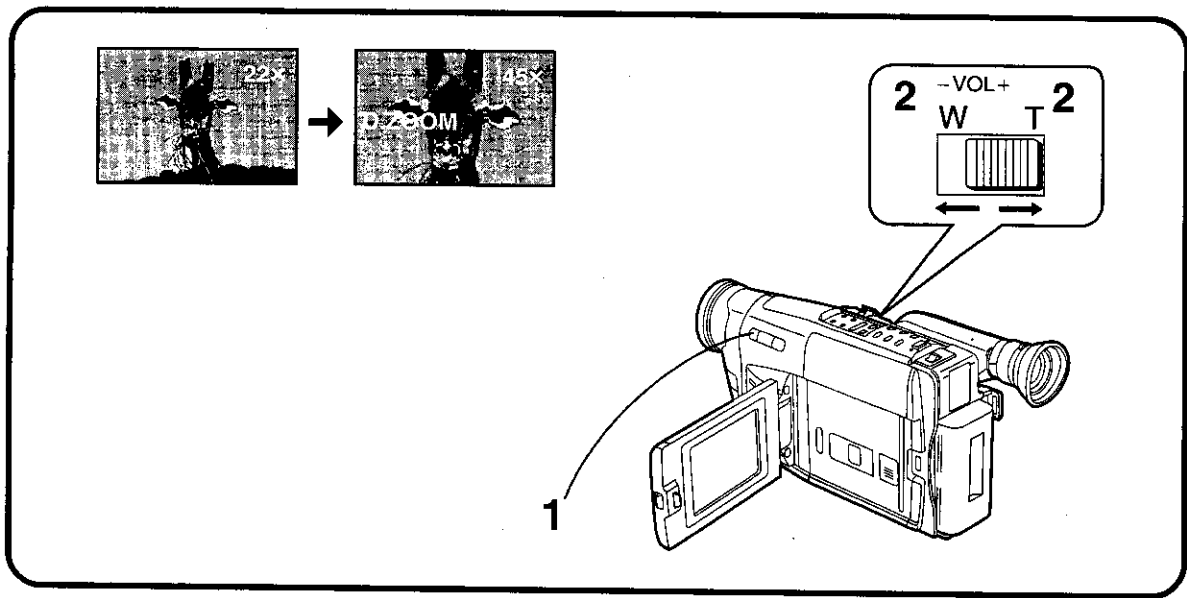
Using the Digital Zoom Function

This function is convenient, when you record a very distant subject and want to enlarge it even further than is possible with the normal (optical) zoom function.

1 Press the [EFFECT1] Button repeatedly until the [D.ZOOM] Indication appears.

2 Push the [W • T] Zoom Lever toward [T] or [W] to zoom in or out as desired.

●With the Digital Zoom Function activated, you can optically zoom between 1× (wide-angle) and 22× and digitally between 23× and 100×. The changeover between optical and digital zooming is automatic.

●The zooming speed is variable. The farther you push the [W • T] Lever toward [W] or [T], the faster the zooming speed becomes.

●When using the Digital Zoom Function, the picture quality is somewhat reduced.

Cancelling the Digital Zoom Function

Press the [EFFECT1] Button repeatedly until the [D.ZOOM] Indication disappears. Or, keep the [EFFECT1] Button pressed for more than 2 seconds to make the [D.ZOOM] Indication disappear.
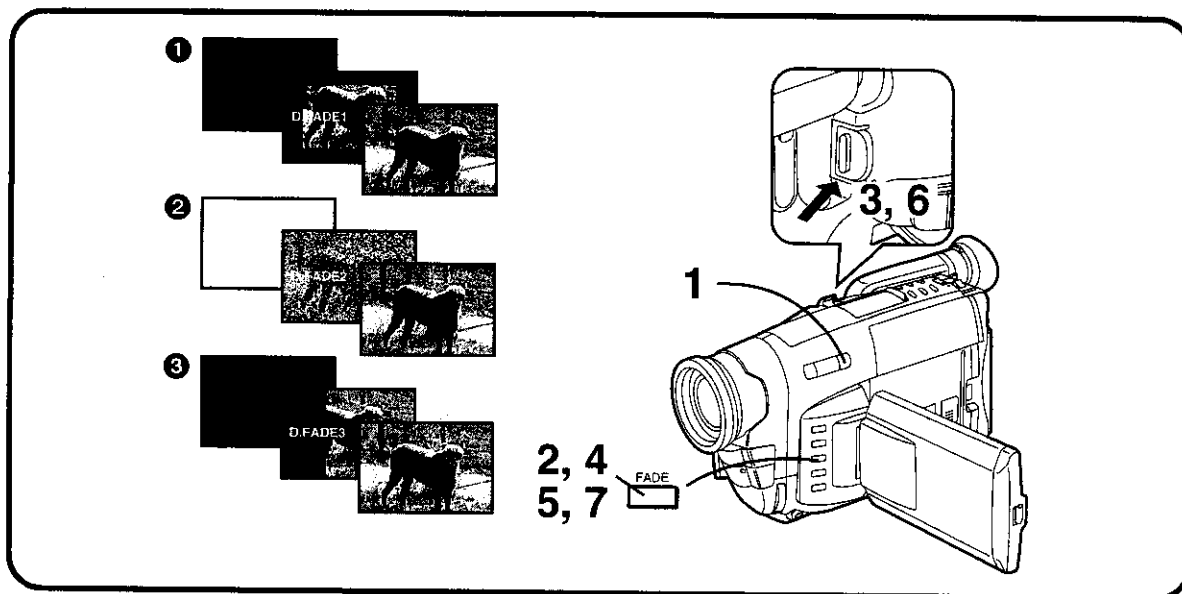
Digital Fade

There are 3 Digital Fade Modes available.

❶ Digital Fade 1 [D.FADE1]

❷ Digital Fade 2 [D.FADE2]

❸ Digital Fade 3 [D.FADE3]

1 Press the [EFFECT2] Button repeatedly until the desired Digital Fade Indication appears.

■ **Fading In**

2 With the Movie Camera in the Recording Pause Mode, keep the [FADE] Button pressed.

●The picture disappears gradually with the selected digital fade effect.

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

4 Approximately 3–4 seconds later, release the [FADE] Button.

■ **Fading Out**

5 During recording, press the [FADE] Button at the point where you want to fade out, and keep it pressed.

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

●The Movie Camera is now in the Recording Pause Mode.

7 Release the [FADE] Button.

Cancelling the Selected Digital Fade Function

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

Subjects and Recording Conditions for Which the Manual Mode Is More Suitable

The following subjects and recording situations are not suitable for recording in the Full Auto Mode. In these cases, adjusting the white balance and/or focus manually will provide more beautiful pictures. Also read the pages related to the manual adjustment indicated in parentheses.

1. **White Balance**

   To adjust the white balance manually, see "Recording with Manual White Balance Adjustment" (→ **49**).

2. **Focus**

   To adjust the focus manually, see "Recording with Manual Focus Adjustment" (→ **51**).

● During recording, it is not possible to change the recording mode ([AUTO], [🔧], [📷], [🏃], [☀], [🌙]), even if you press the [PROGRAMME AE] Button.
   (→ **52**)

■ Subjects and Recording Conditions Not Suitable for Recording in the Full Auto Mode (problematic adjustments in parentheses)

● Subjects with dark surfaces (White Balance, Focus)
● When moving the Movie Camera from outdoors to indoors while recording (White Balance)
● Subjects lit by different light sources (White Balance)
● Subjects lit by mercury-vapour or natrium lamps (White Balance)
● Subjects with shiny surfaces or a lot of light reflection (Focus)
● Subjects with weak contrast (Focus)
● Subjects with part of it near and part of it far away from the Movie Camera (Focus)
● Subjects without vertical contours (Focus)
● Subjects with fast movement (Focus)
● Subjects behind moving objects (Focus)
● Subjects behind glass covered by dirt, dust or water drops (Focus)
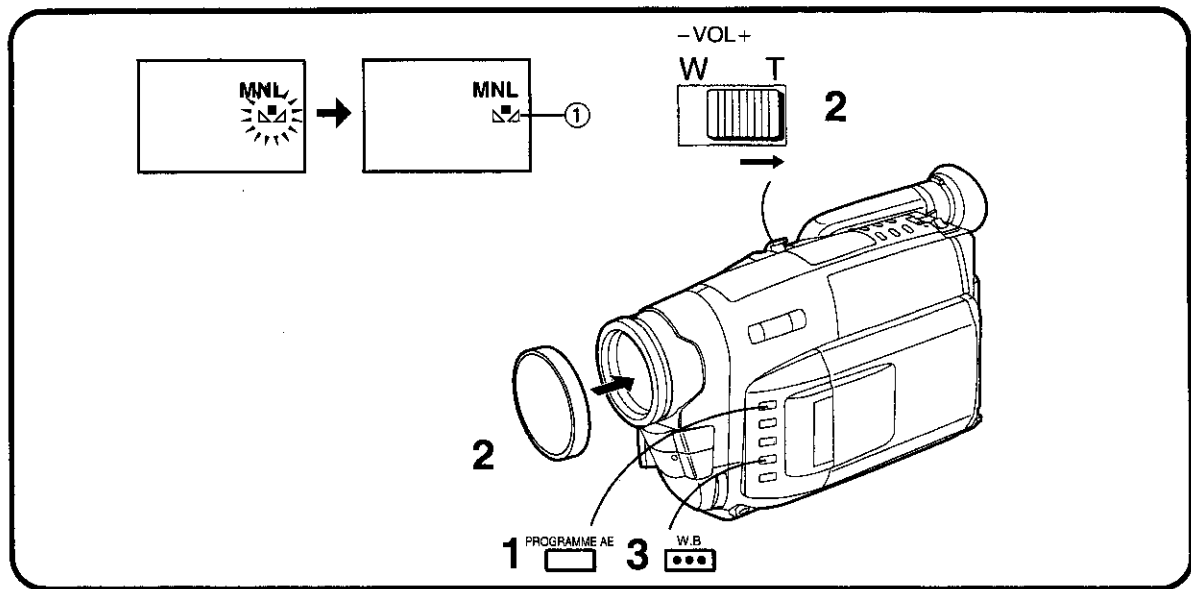
Recording with Manual White Balance Adjustment

With this Movie Camera, you can also adjust the white balance manually.

Use this mode for special subjects and recording conditions, such as listed (→ 48), for which the Full Auto Mode is not suitable, and for light sources outside the range ❶ (→ 50). Use it also when you want to manually adjust the white balance for each new scene as professionals do.

1 Press the [PROGRAMME AE] Button repeatedly until an indication other than [AUTO] appears.

2 Attach the White Lens Cap and zoom in until the entire screen is white.

3 Aim the Movie Camera at the subject that you want to record and then keep the [W.B] Button pressed until the [ ] Indication ① stops flashing and remains lit.

●When the Sepia Mode or Black & White Mode is used, it is not possible to manually adjust the white balance. Also, if the white balance was manually adjusted, it cannot be cancelled, even if you press the [W.B] Button.

In the following cases, the [ ] Indication flashes:
●During manual adjustment of the white balance. (If the surroundings are dark and the white balance cannot be adjusted, the [ ] Indication keeps flashing.)
●When the previously set white balance setting is maintained.
●When you are trying to adjust the white balance in the digital zoom range (23× - 100×). (In this case, first adjust the white balance in the optical zoom range (1× – 22×) and then zoom back to within the Digital Zoom Mode.)

Cancelling the Manual White Balance Mode
Press the [W.B] Button once. Or, press the [PROGRAMME AE] Button repeatedly until the [AUTO] Indication appears.

10 000K	❷
9 000K	
8 000K	❸
7 000K	
6 000K	❹
5 000K	❺
4 000K	❻ ❼
3 000K	❽ ❾
2 000K	❿ ⓫
1 000K	⓬
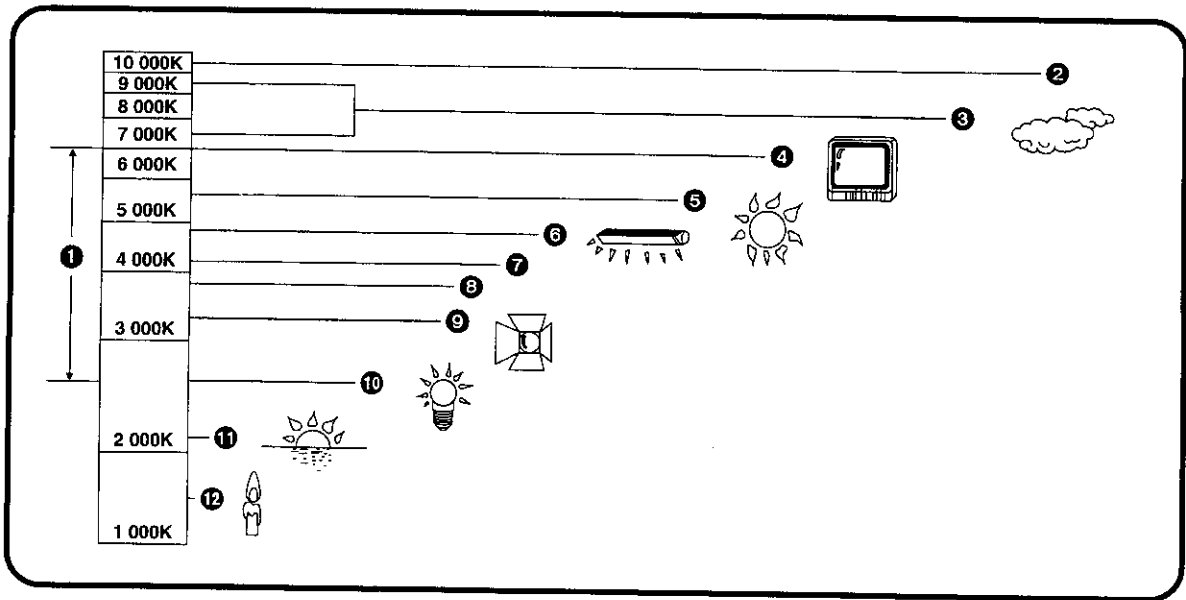
Colour Temperature and White Balance Adjustment

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

The range ❶ indicated in the illustration above shows the light sources for which this Movie Camera can provide precise white balance adjustment and, therefore, natural colours in the recorded pictures, when using the Full Auto Mode. For light sources outside this range, adjust the white balance manually (→ 49). Also, additional lighting may be necessary.

❶ Control range of this Movie Camera's Auto White Balance Adjustment Mode

❷ Blue sky

❸ Cloudy sky (Rain)

❹ TV screen

❺ Sunlight

❻ White fluorescent lamp

❼ 2 hours after sunrise or before sunset

❽ 1 hour after sunrise or before sunset

❾ Halogen light bulb

❿ Incandescent light bulb

⓫ Sunrise or sunset

⓬ Candlelight
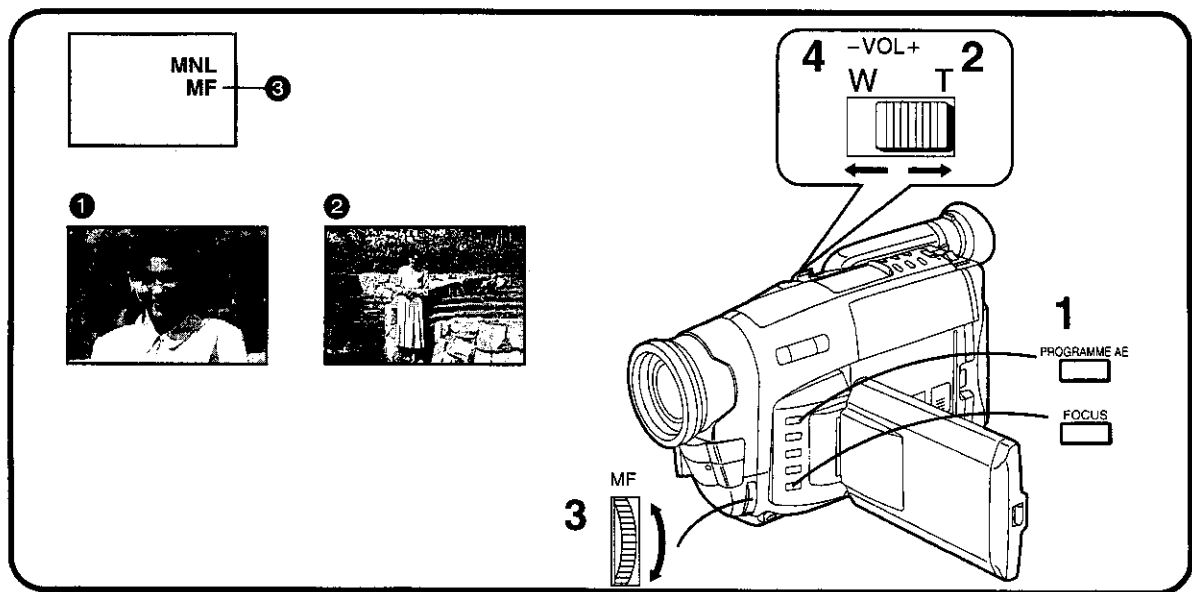
Recording with Manual Focus Adjustment

With this Movie Camera, you can also adjust the focus manually.

Use this mode for special subjects and recording conditions, such as listed (→ 48), for which the Full Auto Mode is not suitable.

1 Press the [PROGRAMME AE] Button repeatedly until an indication other than [AUTO] appears.

2 Keep the [W • T] Zoom Lever pushed toward [T] to zoom in on the subject ❶.

 ●Zooming in on the subject before adjusting the focus ensures that the subject remains precisely focused even when you later zoom out ❷.

3 Turn the [MF] Dial to adjust the focus.

 ●This activates the Manual Focus Adjustment Function, and the [MF] Indication ❸ appears. ([MF] means Manual Focus.)
 ●Pressing the [FOCUS] Button after performing steps 1 and 2 above also activates the Manual Focus Adjustment Function, and the [MF] Indication appears even before you turn the [MF] Dial.

4 Push the [W • T] Zoom Lever toward [W] to zoom out as desired.

Cancelling the Manual Focus Mode

Press the [FOCUS] Button once to make the [MF] Indication disappear. Or, press the [PROGRAMME AE] Button repeatedly until the [AUTO] Indication appears.
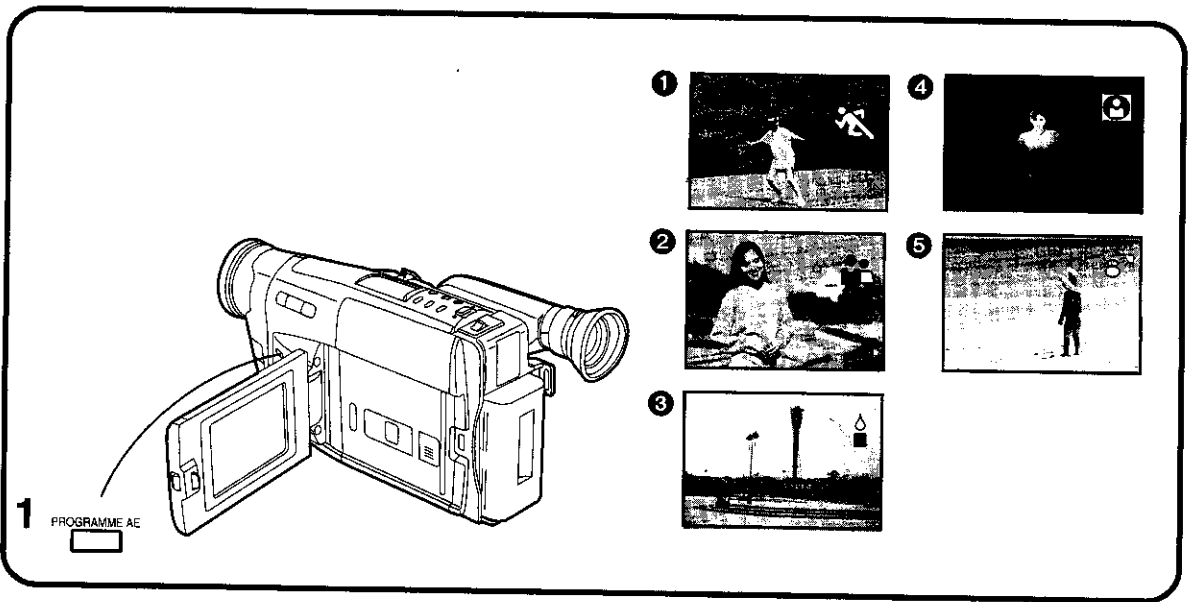
Recording in Special Situations
(Programme AE)

This Movie Camera gives you a choice of 5 different automatic exposure programmes optimized for typical recording situations.

1 Press the [PROGRAMME AE] Button repeatedly until the indication of the desired mode ([🏃], [👥], [🕯], [🅰] or [🏖]) appears.

❶ [🏃] **Sports Mode**

To record scenes with fast-moving subjects such as sports scenes.

❷ [👥] **Portrait Mode**

To make subjects stand out sharply from the background.

❸ [🕯] **Low Light Mode**

To record dark scenes more brightly.

❹ [🅰] **Spotlight Mode**

To record subjects under spotlights (party, theatre, etc.).

❺ [🏖] **Surf & Snow Mode**

To record subjects in brightly lit surroundings (ski slopes, beach, etc.).

●During recording, it is not possible to change the recording mode ([AUTO], [MNL], [🏃], [👥], [🕯], [🅰], [🏖]), even if you press the [PROGRAMME AE] Button.

Cancelling the Selected Programme AE Function
Press the [PROGRAMME AE] Button repeatedly until none of the above indications are displayed.

Sports Mode

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

Portrait Mode

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

Low Light Mode

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

Spotlight Mode

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

Surf & Snow Mode

● If a subject is extremely bright, the recorded picture may be whitish.
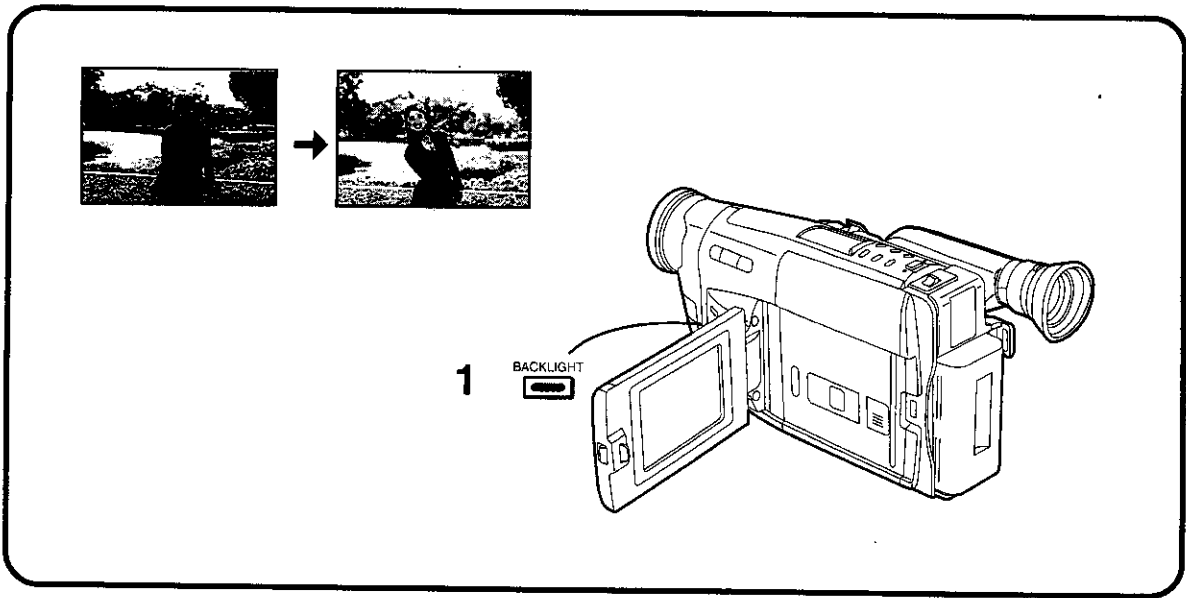
1 BACKLIGHT

Recording Backlit Scenes
(Backlight Mode)

As a general rule, subjects should be lit from the front by sunlight or strong artificial light. However, if recording a backlit subject cannot be avoided, the Backlight Mode lets you brighten up the subject a little to prevent very dark faces, etc.

1 When recording a backlit scene, keep the [BACKLIGHT] Button pressed from before you press the Recording Start/Stop Button to start recording until after you press it again to stop recording.

■ When Using the Backlight Recording Function

● The sky may appear whitish.
● When recording with the sun striking the subject at an angle, star-shaped light reflections may be recorded in the picture.
● When recording a subject in front of a very bright background, the subject may still appear dark in the picture.
● In some cases, the subject may look clear, but the background may be overexposed (almost completely white). However, this is normal and not a malfunction.
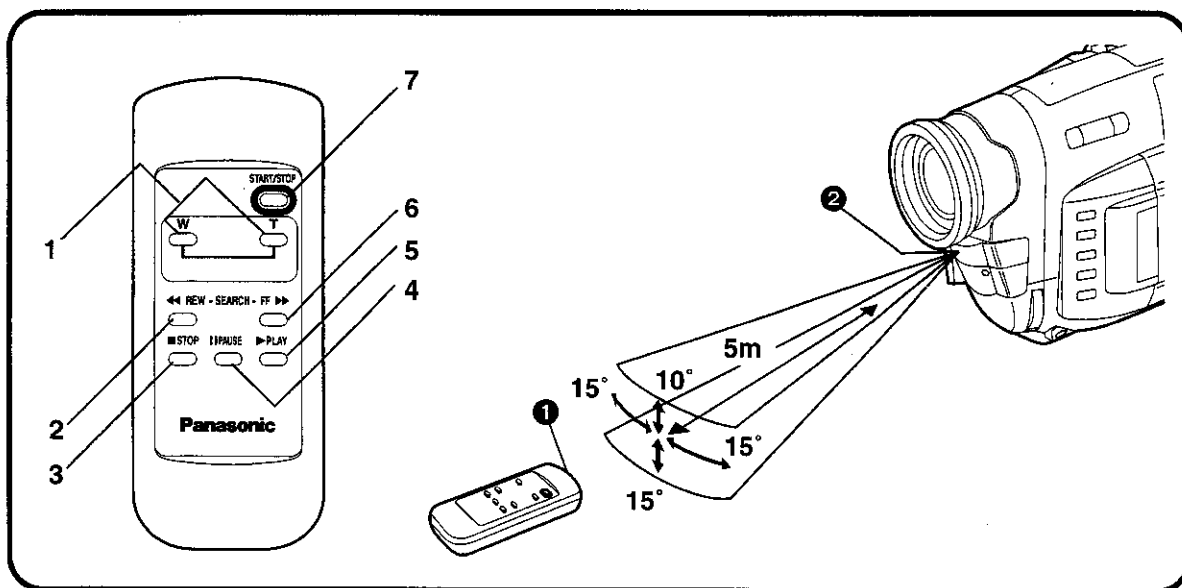
Using the Remote Controller

The Remote Controller lets you take part in the action and control the recording operation from in front of the Movie Camera. It is also convenient for controlling the playback functions for playback via a TV or for dubbing.

■ Buttons on the Remote Controller

The buttons with the same mark as on the Movie Camera generally have the same function.

1 Zoom Buttons [W • T] (→ 31, 46)

2 Rewind Button [◀◀] (→ 29, 30, 33, 37, 38)

3 Stop Button [■] (→ 33)

4 Pause Button [❙❙] (→ 38)

5 Playback Button [▶] (→ 33)

6 Fast-forward Button [▶▶] (→ 30, 37, 38)

7 Recording Start/Stop Button [START/STOP] (→ 27)

■ Conditions for Correct Operation of the Remote Controller

● The batteries must be inserted with the polarity (⊕ and ⊖) correctly aligned and they must not be exhausted.

● The distance to the Movie Camera must not be more than 5 metres.

● The Transmitter Window ❶ on the Remote Controller or the Remote Control Sensor ❷ on the Movie Camera must not be exposed to direct sunlight and not be covered with clothes, etc.

When operating the Zoom Function with the Remote Controller, it is not possible to vary the zooming speed. Also, there is a slight delay between pressing the Zoom Buttons on the Remote Controller and the mechanical zoom adjustment on the Movie Camera.
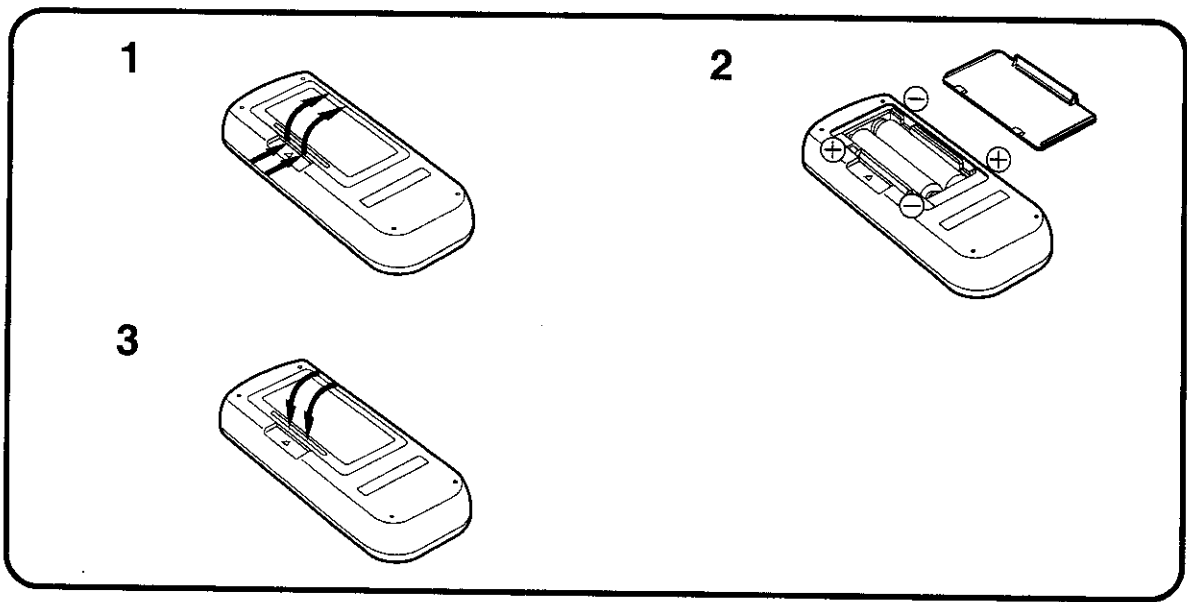
Inserting the Batteries into the Remote Controller

1 Remove off the Battery Cover.

2 Insert the batteries with the polarity ($\oplus$ and $\ominus$) correctly aligned.

3 Replace the Battery Cover.

■ Replacing the Batteries

The life of the batteries is about 1 year.
When the batteries are exhausted, purchase two new "UM-4" or "R03" type batteries and insert them in the same way as explained above.

- Do not mix old batteries with new batteries.
- Do not mix different battery types, i.e. Alkaline and Manganese.
- Do not use rechargeable (Ni-Cd) batteries.
- Do not short-circuit the batteries.
- When you do not use the remote controller for a long time, take out the batteries and store them in a cool, dry place.

CAUTION

Danger of explosion if batteries are incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

MAIN MENU

```
SPEED        ►SP
TAPE🔲       ►30
TITLE SET    ►OFF
APS          ►OFF
SELF SHOOT   NOR.  ►MIR.
DEMO MODE    ►OFF

PRESS MENU TO EXIT
```

2,5 — MENU
     ► PLAY

3 PAUSE STOP 4
   ❚❚   ■
   ITEM   SET

1 90°

7, 8

1 ←

180°

6
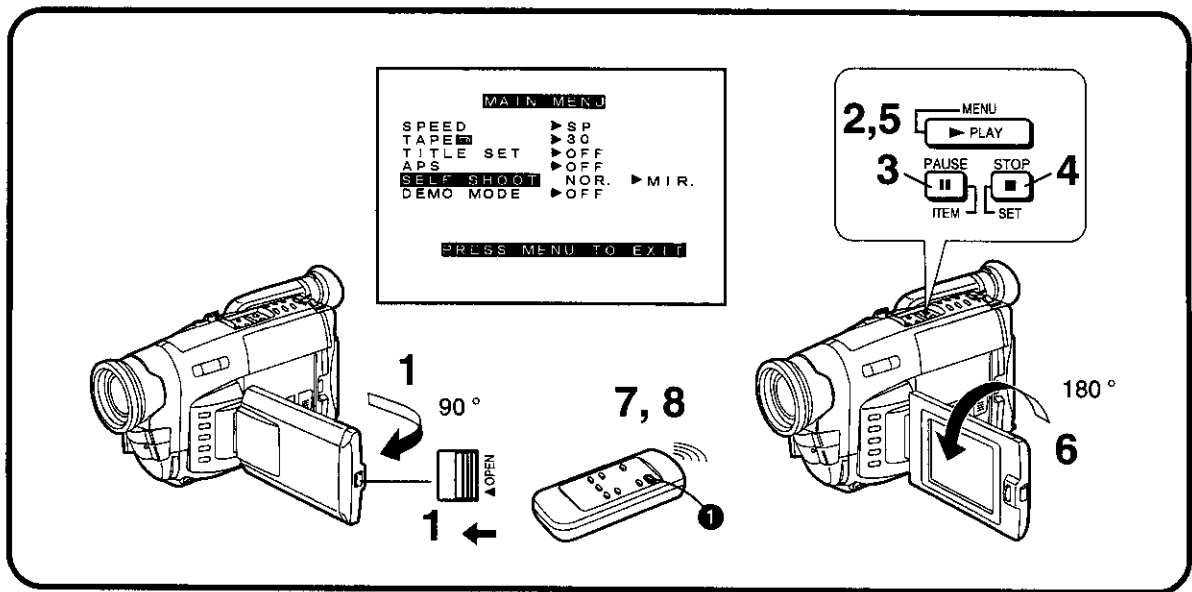
Recording Yourself with the LCD Monitor Facing Forward

Turning the LCD Monitor so that it faces forward, allows you to aim the Movie Camera and view the picture in the Finder, while the persons in front of the camera can check the picture on the LCD Monitor during recording. If you mount the Movie Camera on a tripod and use the Remote Controller, you can also take part in the action that you are recording and check the picture from the front on the LCD Monitor.

1 Slide the [▲ OPEN] Lever to the left and simultaneously open the LCD Monitor in the direction of the arrow approximately 90°.

2 Press the [MENU] Button.
●The [MAIN MENU] Menu appears on the LCD Monitor.

3 Press the [ITEM] Button repeatedly to select [SELF SHOOT].

4 Press the [SET] Button to select the desired mode ([NOR.] or [MIR.]).
●[NOR.] means normal Mode.
●[MIR.] means mirror Mode. (→ 58)

5 Press the [MENU] Button to exit the menu.

6 Turn the LCD Monitor until it faces forward approximately 180°.

7 Press the Recording Start/Stop Button ❶.

■ Stopping Recording

8 Press the Recording Start/Stop Button ❶.
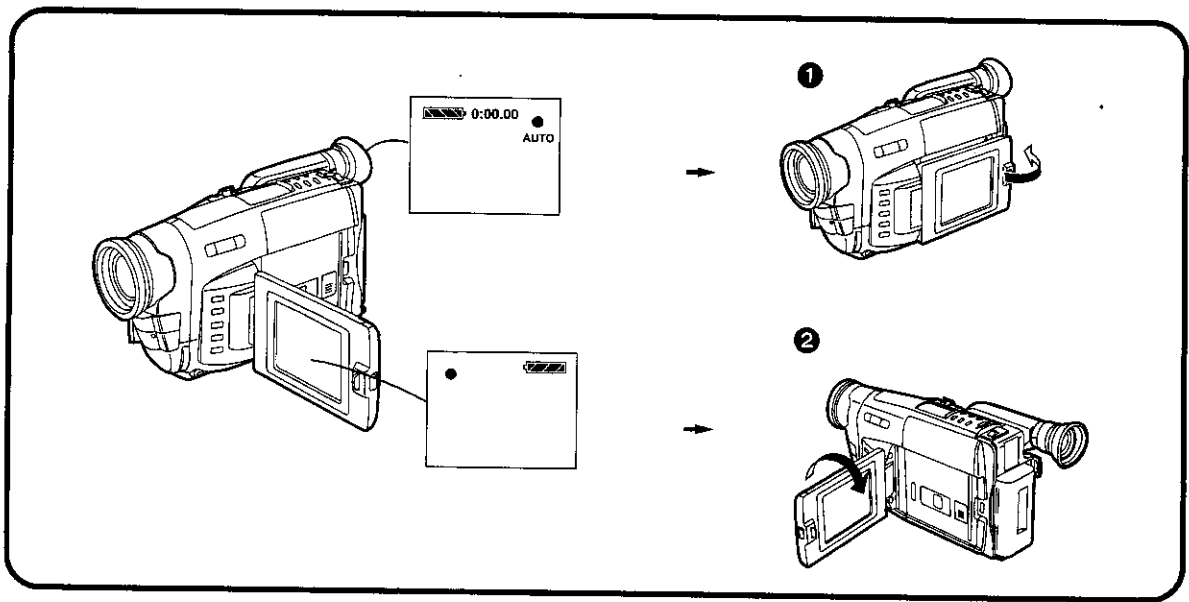
■ Mirror Mode

When recording yourself with the LCD Monitor facing forward, the picture shown on it the way it is being recorded may be difficult to get used to.
This is because we usually look at ourselves in the mirror, so we see a mirror-image and this feels more natural. This Movie Camera features the Mirror Mode which displays the picture as a mirror-image.
However, even if you have selected in the mirror Mode, the picture is recorded in the normal way.

In the Mirror Mode, only the following indications can be displayed on the LCD Monitor and in the Finder:

[●] : Recording Mode Indication
[II●] : Recording Pause Mode Indication
[⊞▰▰] : Remaining Battery Indication
[[I]] : General Warning/Alarm Indication
(In addition to these four indications, the Counter Indication and the Programme AE Mode Indications can also appear in the Finder.)

When you want to confirm other indications, return the LCD Monitor to position ❶ or ❷ shown in the illustration above.
Especially when the [[I]] Indication is displayed, be sure to return the LCD Monitor to position ❶ or ❷ so that you can confirm the actual Warning/Alarm Indication.

● If you turn the LCD Monitor so that it faces forward, the Finder also automatically turns on. However, in the following cases, the Finder turns off:
– Pressing the [VCR/CAMERA] Button to switch the Movie Camera over to the VCR Mode.
– Closing the LCD Monitor with the screen facing outward (as shown above ❶).
● It is not possible to display the Date, Time and/or Title Indication during recording in the Mirror Mode.

```
TITLE SET MENU
DATE/TITLE
        DATE TIME      TITLE
TITLE              URLAUB
LANGUAGE
FOR TITLE          GERMAN
SIZE              ►NORMAL
COLOUR             WHITE

PRESS MENU TO RETURN
```
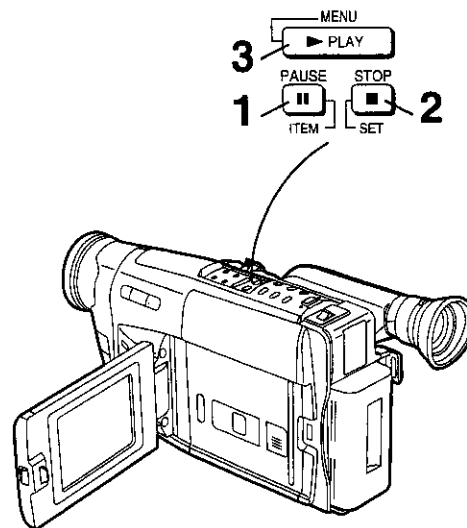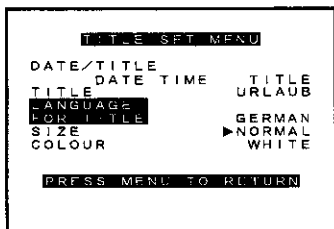
Recording with Pre-programmed Titles Inserted in the Picture

You can insert one of 10 pre-programmed titles in recordings of special occasions such as weddings and birthday parties. These titles are available in 8 languages.

Selecting the Desired Language

After displaying the [TITLE SET MENU] Menu...
(→ 17)

1 Press the [ITEM] Button repeatedly to select [LANGUAGE FOR TITLE].

2 Press the [SET] Button to select the desired language.
● The languages change in the following order:

```
┌─→English──→German────→French────→Italian──┐
│                                            │
└──Arabic←──Chinese←──Russian←──Spanish←──────┘
```
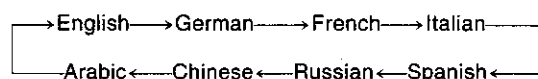
3 Press the [MENU] Button twice to exit the Menu.

The Date/Time/Title Indication remains displayed when you exit the Title Menu after having change the language of the title, the type of Date/Time/Title Indication (→ 24), the title itself (→ 60), the size of the title (→ 61) or the colour of the title (→ 60).

❶

```
TITLE SET MENU
DATE/TITLE
            DATE  TIME    TITLE
TITLE           HAPPY BIRTHDAY
LANGUAGE
FOR  TITLE            ENGLISH
SIZE               ►NORMAL
COLOUR                 WHITE

PRESS  MENU  TO  RETURN
```

❷

```
TITLE SET MENU
DATE/TITLE
            DATE  TIME    TITLE
TITLE                HOLIDAY
LANGUAGE
FOR  TITLE            ENGLISH
SIZE               ►NORMAL
COLOUR                 YELLOW

PRESS  MENU  TO  RETURN
```
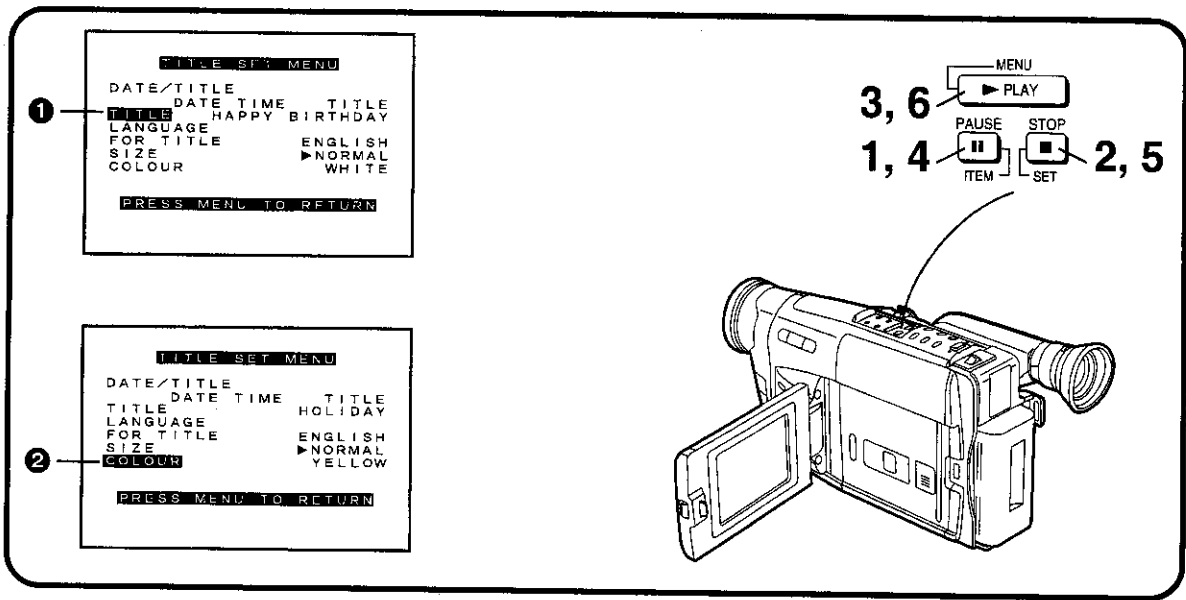
Selecting the Desired Pre-programmed Title

After displaying the [TITLE SET MENU] Menu...
(→ 17)

1 Press the [ITEM] Button repeatedly to select [TITLE] ❶.

2 Press the [SET] Button to select the desired title.

●The titles change in the order shown below. (In the other available languages, they are arranged in the same order.)

[HOLIDAY] ⟶ [HAPPY BIRTHDAY] ⟶
[WEDDING] ⟶ [FAMILY] ⟶ [PARTY] ⟶
[THE END] ⟶ [CONGRATULATIONS] ⟶
[MERRY CHRISTMAS] ⟶ [HAPPY MEMORIES]
⟶[HAPPY NEW YEAR] ⟶ [HOLIDAY] ⟶

3 Press the [MENU] Button twice to exit the Menu.

Selecting the Desired Colour of the Pre-programmed Title

You can select the colour of the title from among 8 colours.
After displaying the [TITLE SET MENU] Menu...
(→ 17)

4 Press the [ITEM] Button repeatedly to select [COLOUR] ❷.

5 Press the [SET] Button to select the desired colour.

●The colours for the title change in the following order:

⟶WHITE ⟶YELLOW ⟶MAGENTA ⟶RED ⟶
⟶ BLACK⟵ BLUE⟵ GREEN⟵ CYAN⟵

6 Press the [MENU] Button twice to exit the Menu.

TITLE SET MENU
DATE/TITLE
          DATE TIME   TITLE
TITLE   HOLIDAY
LANGUAGE
FOR TITLE   ENGLISH
SIZE   NORMAL ▶LARGE
COLOUR   WHITE

PRESS MENU TO RETURN

❶

❷

HOLIDAY → **HOLIDAY**
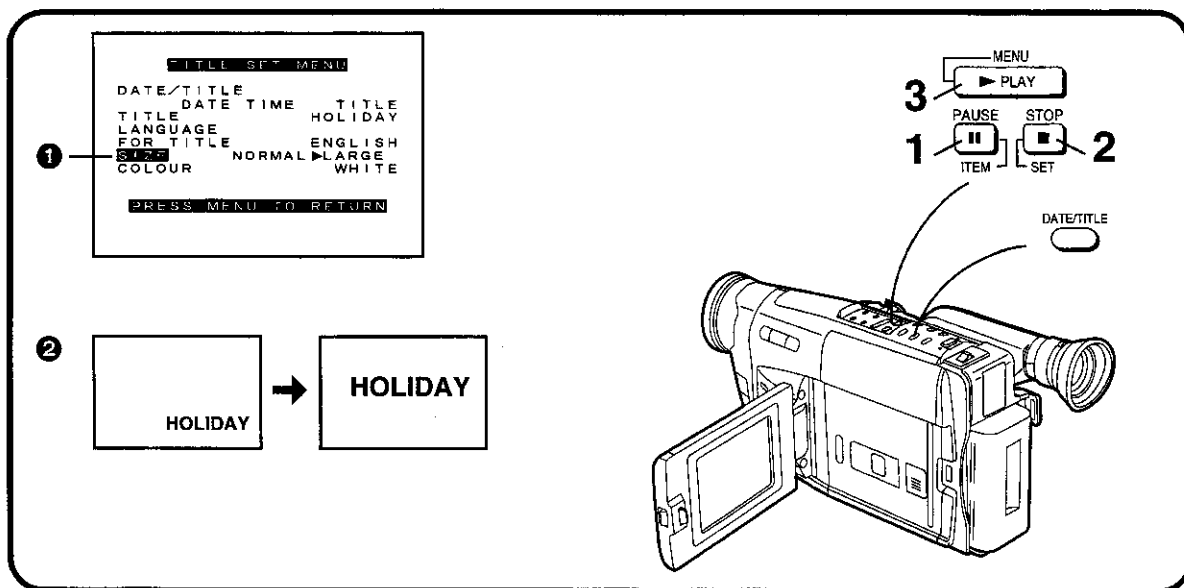
Selecting the Size of the Pre-programmed Title

You can choose either of 2 sizes for the title.

After displaying the [TITLE SET MENU] Menu...
(→ 17)

1 Press the [ITEM] Button repeatedly to select [SIZE] ❶.

2 Press the [SET] Button to select the desired size ([NORMAL] or [LARGE]).
   ●When you change the title size from [NORMAL] to [LARGE], the Title Indication changes as shown above ❷.

3 Press the [MENU] Button twice to exit the Menu.

●When you have set [LANGUAGE FOR TITLE] on the [TITLE MENU] Menu to [ARABIC], [POSITION] appears instead of [SIZE] and you can select [CORNER] or [CENTER] for the position of the title.
●When a large-size title is displayed, the Power Save Function Indication, Digital Zoom Mode Indication, Digital Effect Mode Indications, Manual White Balance Mode Indication, Manual Focus Mode Indication, and Colour Indication for Digital Image do not appear, even if these modes are activated.
●If you set [SIZE] on the [TITLE SET MENU] Menu to [LARGE], the large [RECORD] and [PAUSE] Indications, which usually appear briefly when you start or stop recording, do not appear. However, if you have set [LANGUAGE FOR TITLE] on the [TITLE SET MENU] Menu to [ARABIC], the large [RECORD] and [PAUSE] Indications do not appear at all.

Recording with a Pre-programmed Title Inserted in the Picture

During recording, press the [DATE/TITLE] Button to make the title appear.

Deleting the Title

Press the [DATE/TITLE] Button to make the title disappear.
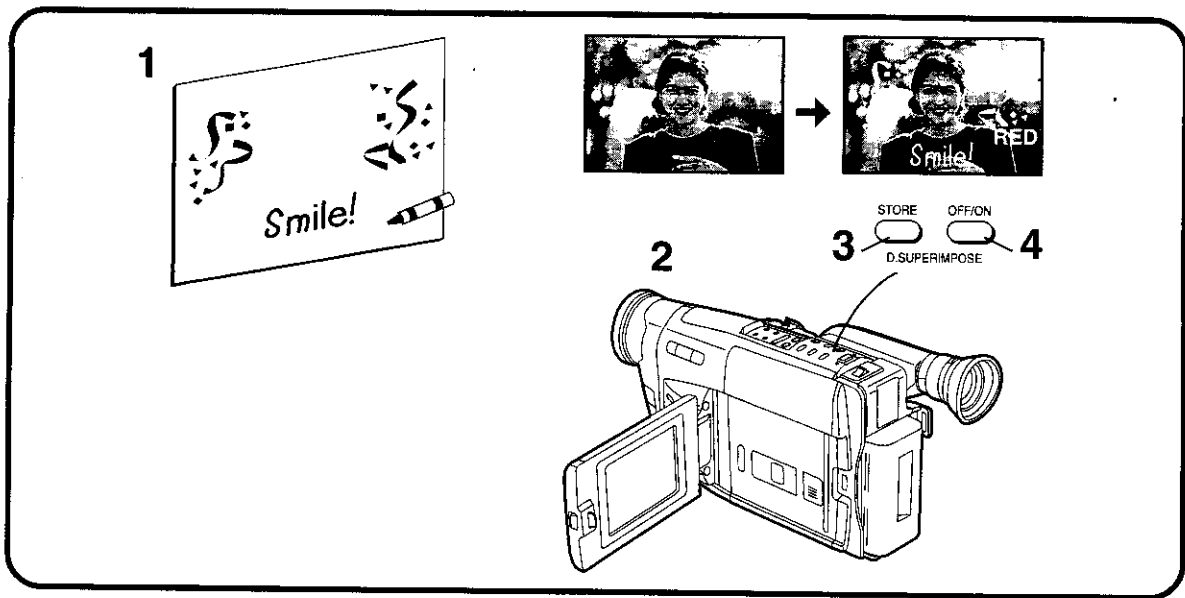
Creating Your Own Titles and Inserting Them During Recording

(Digital Superimposer Function)

This function lets you store the image of a handwritten title, signboard, printed title, (or some similar object with strong contrast) in the Movie Camera's digital image memory. You can then change the dark parts of this image to a desired colour and superimpose it during recording.

Storing Your Own Title in the Digital Image Memory

1 **Prepare a title that has strong contrast (e.g. write with a thick black marker or felt-tip pen on white paper).**

2 **With the Movie Camera in the Recording Pause Mode, aim it at the title.**
   - If Full Auto Mode does not provide a sharp picture, adjust the focus manually. (→ 51)
   - When you want to capture a small title, use the Macro Close-up Function (→ 32).
   - Aim the Movie Camera so that the title is in the centre of the screen to ensure that the title does not get clipped at the edges.

3 **Press the [STORE] Button for more than 0.5 second.**
   - The title is now stored in the digital image memory and it remains displayed.

4 **Press the [OFF/ON] Button to make the title disappear.**
   - Pressing the [OFF/ON] Button repeatedly makes the title appear and disappear.

The title stored in the digital image memory is automatically cancelled when you store a new title, remove the Battery, disconnect the AC Adaptor, or when the Battery becomes discharged.

- When you are using the Digital Superimposer Function, adjusting the LCD Brightness or LCD Colour Level on the [LCD SET MENU] Menu is not possible. (→ 18)
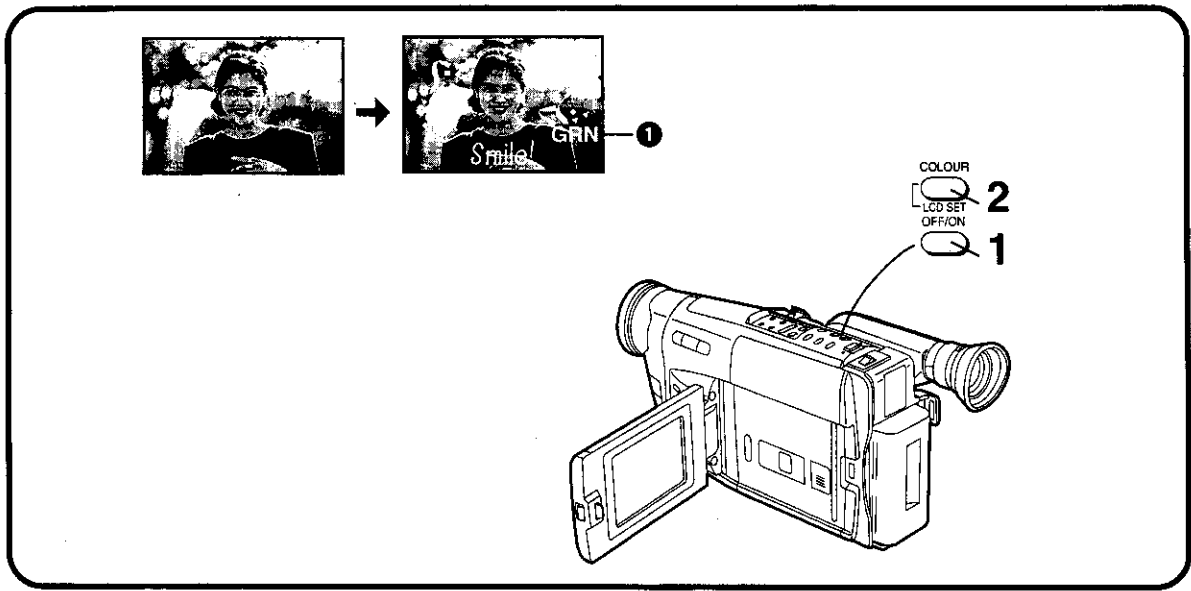
Selecting the Desired Colour for the Title

1 Press the [OFF/ON] Button to make the title appear.

2 Then, press the [COLOUR] Button repeatedly until the desired colour ❶ is displayed.

● The colours for the title change in the following order:

```
  ┌──→WHT──────→YEL──────→MAG──────→RED──┐
  │   (White)   (Yellow)  (Magenta)  (Red)  │
  └──BLK←──────BLU←──────GRN←──────CYN←──┘
     (Black)   (Blue)    (Green)    (Cyan)
```

● When you are using the Digital Superimposer Function, the [LCD SET MENU] Menu does not appear, even if you press the [LCD SET] Button. (→ 18)

63

OFF/ON
1, 5

2, 3, 4, 6
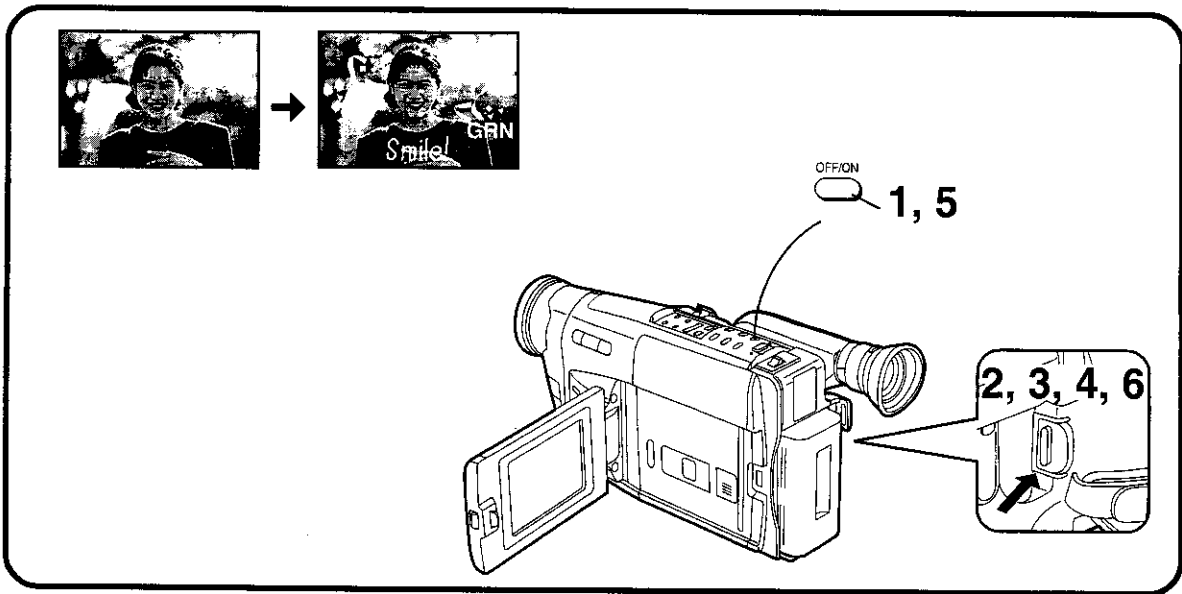
Inserting Your Own Title at the Beginning of a Recording

1 Press the [OFF/ON] Button to make the title appear.
●Confirm that the colour indicated is suitable for the intended scene. If necessary, change the colour (→ 63).

2 Press the Recording Start/Stop Button to start recording.
●To make the title disappear while recording of the scene continues, press the [OFF/ON] Button.

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

Inserting Your Own Title During Recording

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

5 At the point where you want to insert the title, press the [OFF/ON] Button to make the title appear.
●To make the title disappear while recording of the scene continues, press the [OFF/ON] Button.

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

●By displaying the title which you stored in the digital image memory and using the Digital Fade 1, Digital Fade 2 or Digital Fade 3 Function, you can fade the title together with the picture.
●It is not possible to apply the Negative Effect when storing a title in the digital image memory.
●After turning the Movie Camera off and then on again, the title that had been displayed in the picture is no longer displayed. To make it appear again, press the [OFF/ON] Button.

❶ `0:08.24` **→** **❷** `0:00.00`

1 MEMORY RESET 2
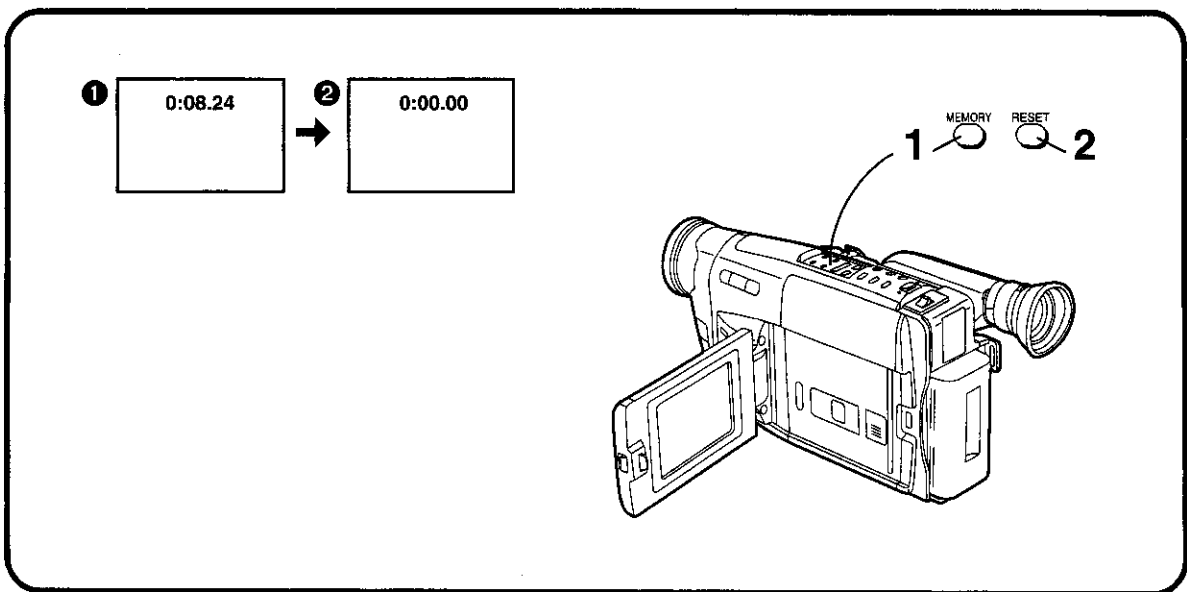
Using the Tape Counter Indication

The Tape Counter Indication is convenient for the
following 2 purposes: to check the Elapsed Tape Time
(described below), and to use the Memory Stop
Function (→ 67).

Checking the Elapsed Tape Time

The Elapsed Tape Time Indication shows the amount of
time that has elapsed during recording or playback.

1 **Press the [MEMORY] Button repeatedly
until the Elapsed Tape Time Indication ❶ is
displayed.**

2 **Press the [RESET] Button before starting to
record or play back to reset the Elapsed
Tape Time Indication to [0:00.00] ❷.**

●When recording or playback starts, the elapsed
tape time is indicated in hours, minutes and
seconds. During playback of parts of the tape on
which no recording has been made, this indication
does not change.

●If you rewind the tape further than the tape
counter position [0:00.00], the minus sign [–]
appears in front of the Tape Counter Indication.

●Taking out the cassette or removing the Battery
automatically resets the indication to [0:00.00].

65

(A)

1 R 0:30 SP 0:00.00 ▷▷ REC 14× AUTO

2 R 0:30 SP M0:00.00 ▷▷ REC 14× AUTO

4 REC

3 REC 14× AUTO

(B)

1 R 0:30 SP 0:00.00 ▷

2 R 0:30 SP M0:00.00 ▷

3 ▷
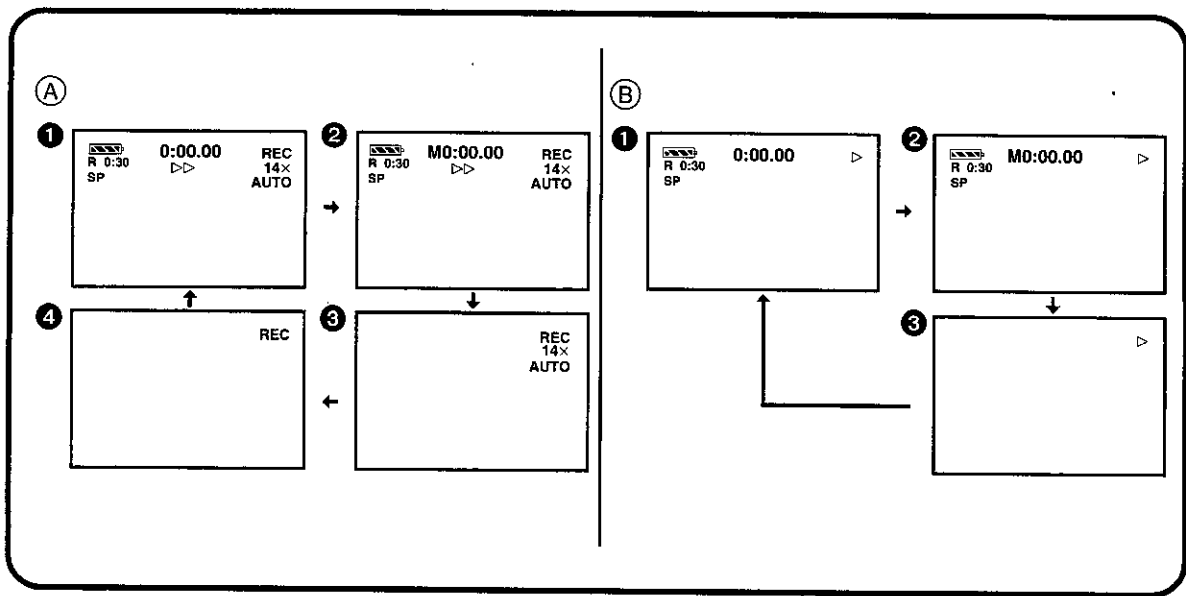
■ Changing theTape Counter Indication

Every press of the [MEMORY] Button changes the Tape Counter Indication in the following order:

During Recording, Recording Pause and in the Playback Stop Mode (A)

1 Elapsed Tape Time Indication (initial setting)

2 Memory Stop Indication and Elapsed Tape Time Indication (→ 67)

3 No Counter Indication (In this mode, only the following indications can appear: Operation Mode Indications, Warning/Alarm Indications, Programme AE Mode Indications, Manual Focus Mode Indication, Manual White Balance Mode Indication and Zoom Magnification Indication. However, when turning on the Movie Camera, all indications appear for a few seconds to inform you of the selected settings.)

4 No Counter Indication (In this mode, only the Operation Mode Indications and Warning/Alarm Indications can appear. However, when turning on the Movie Camera, all indications appear for a few seconds to inform you of the selected settings.)

During Playback (B)

1 Elapsed Tape Time Indication (initial setting)

2 Memory Stop Indication and Elapsed Tape Time Indication (→ 67)

3 No Counter Indication (In this mode, only the Operation Mode Indications and Warning/Alarm Indications can appear.)

M 0:00.00

MEMORY RESET

MENU
▶ PLAY

PAUSE STOP
ITEM SET

⊝ SEARCH +

DATE/TITLE COLOUR
LCD SET
STORE OFF/ON
D.SUPERIMPOSE

VCR/CAMERA
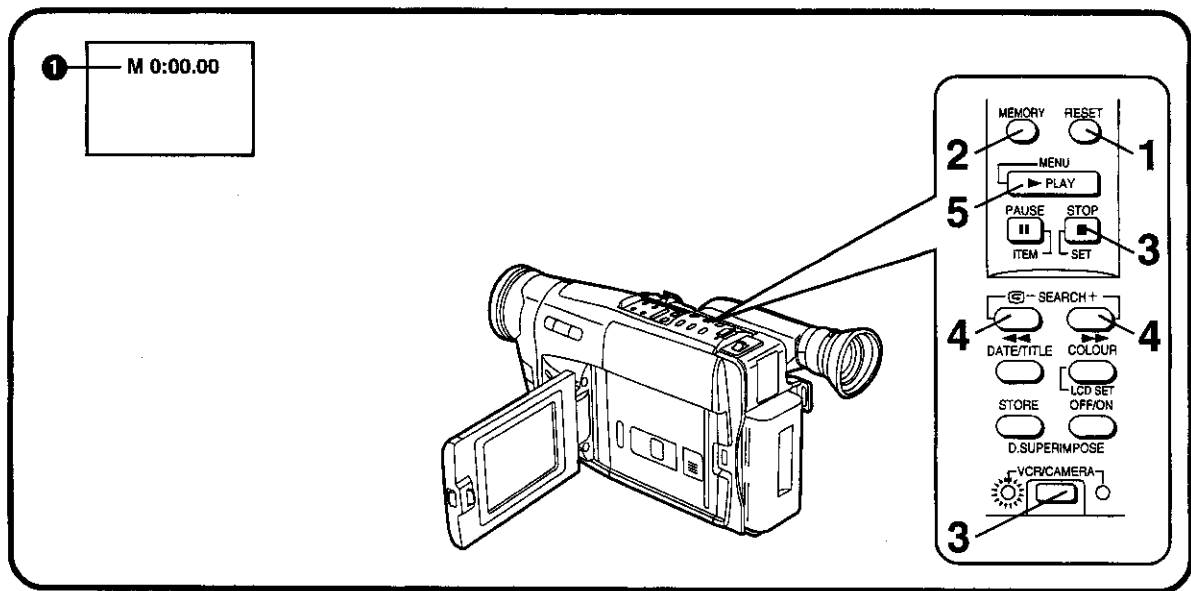
Using the Memory Stop Function

This function is convenient for temporarily marking a tape position during recording or playback so that you can easily find it again later for playback.

1 Press the [RESET] Button during recording or playback at the desired tape position to reset the Elapsed Tape Time Indication to [0:00.00].

2 Press the [MEMORY] Button so that the Memory Stop Indication [M] ❶ appears in front of the Elapsed Tape Time Indication.
● [M] means Memory.

3 During playback:
Press the [STOP] Button to stop playback.
During recording:
Press the Recording Start/Stop Button to switch the Movie Camera over to the Recording Pause Mode. Then, press the [VCR/CAMERA] Button to switch the Movie Camera over to the VCR Mode (the [VCR] Lamp lights.)

4 Press the [▶▶] or [◀◀] Button.
● The tape automatically stops approximately at the [M0:00.00] position.

5 Press the [PLAY] Button to start playback.

VCR/CAMERA

MENU
PLAY

PAUSE STOP
ITEM SET

2

4

7

3, 5, 6

VIDEO OUT

VIDEO IN   AUDIO IN

RF DC OUT

1

AUDIO OUT
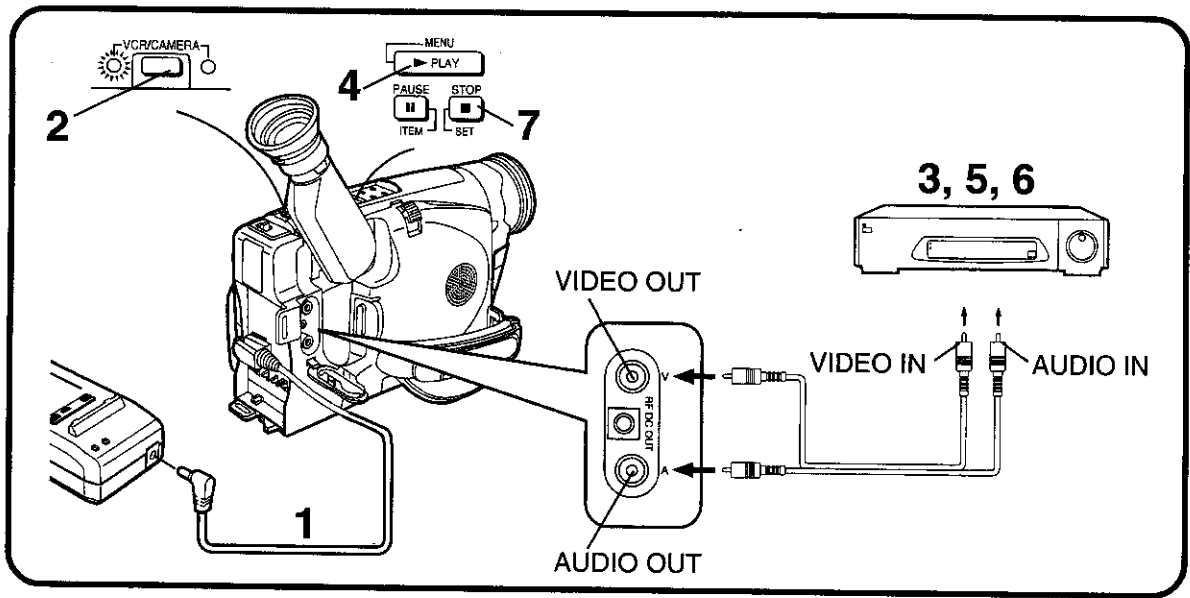
Dubbing (Copying)

By connecting the AV Cable (supplied), you can copy the cassette recorded with this Movie Camera onto a VCR.

1 **Connect the AC Adaptor.**

2 **Insert the recorded cassette into the Movie Camera and put it in the VCR Mode.**

3 **Insert an unrecorded cassette into the VCR and put it in the Recording Pause Mode.**

4 **Start playback on the Movie Camera.**

5 **Start recording on the VCR.**

After reaching the end of the original recording:

6 **Stop recording on the VCR.**

7 **Stop playback on the Movie Camera.**

● As the picture quality on the dubbed cassette is slightly reduced, we recommend that you select the standard speed (SP Mode) on the VCR for dubbing. (SP means Standard Play.)

● If your VCR is equipped with an Edit Switch, turn it on to ensure optimum picture quality of the dubbed cassette.

Precautions

Precautions for the Movie Camera

In the event of abnormal operation (e.g. if the unit emits smoke or an unusual smell), immediately stop operating the unit and consult the Panasonic Customer Care Centre on 132600.

■ To prevent fire, electric shock and malfunction, observe the following points:

- Do not disassemble the Movie Camera or make any alterations to it.
- Protect against spray water and sand.
- Take care that water splashes (especially seawater) or dust do not enter the Movie Camera. If seawater has accidentally splashed onto the Movie Camera, moisten a soft cloth with tap water, wring it out well and carefully wipe the camera body with it. Then thoroughly wipe it with a soft, dry cloth.
- Do not insert any foreign objects.
- Do not subject to strong vibrations or mechanical shocks.
- Do not use in places with oily smoke and a lot of dust.
- If a thunderstorm approaches, stop using the Movie Camera. (If you are using the AC Adaptor, disconnect if from the AC mains socket taking care not to touch any metal parts.)
- Do not use near magnetized equipment.
- Do not use near a radio or TV.
- Do not use with the cassette compartment facing down.
- Do not aim the Lens or Finder directly at the sun; the lens collects light and the resulting heat could deform internal precision parts and cause irreparable damage to the Movie Camera.
- Do not leave in a closed car on a summer day. The inside temperature becomes higher than you imagine and this could damage the Movie Camera.
- Do not wash it with water. Water might leak into the Movie Camera and cause an electric shock or fire.
- Do not use a cleaning fluid, benzine, thinner or other chemicals for cleaning. They might not only change the colour and damage the surface of the camera body, but might also increase the risk of fire if there is an open flame or heater nearby.

■ Precautions for Storing the Movie Camera

Be sure to take out the cassette and remove the Battery before storing.
Avoid the following places:
- Places with high temperature and high relative humidity
  Recommended temperature: 15°C–25°C
  Recommended relative humidity: 40%–60%
- Places exposed to direct sunlight
- In direct contact with rubber or plastic products for a long time
- In reach of children

Precautions for the AC Adaptor

■ Observe the following points:

- Use only for the specified Movie Camera and Battery.
- Do not handle with wet hands.
  To unplug the Mains Cable, be sure to pull it out by the plug, not by the cable.
- Do not forcefully bend the cables or alter them.
- Do not operate very close to a radio, TV etc.

Precautions for the Battery

The Battery's ability to generate electric energy is based on a chemical reaction. If the Battery is incorrectly handled, it could cause leakage, excessive rise in temperature, fire or explosion.

■ Observe the Following Points:

- Use only the specified AC Adaptor or Car Battery Charger to charge the Battery, and use the Battery only for this Movie Camera.
- When you have finished using the Movie Camera, be sure to remove the Battery.
  If you leave the Battery attached to the Movie Camera, a small amount of electricity is consumed even if the [POWER] Switch is turned in, and this reduces the Battery's charge. Leaving the Battery attached to the Movie Camera for a very long time could discharge it excessively and this could make charging impossible.
- Do not allow metal objects such as keys and necklaces to touch the battery terminals.
  Short-circuiting may occur and generate heat, and this could cause the Battery to explode. Be especially careful when storing or carrying the Battery in a bag.
- Do not deform or alter the Battery.
- When the operation time even after proper charging is too short for normal use, the service life of the Battery has reached its end.
- If the Battery becomes too warm, a protection function is activated and it puts the Battery temporarily out of operation.
- Do not throw the Battery into a fire.
  This could cause it to explode.

■ Precautions for Storing the Battery

Avoid the following places, as they could shorten the service life of the Battery:

- Places with extremely high temperature and high relative humidity
  Recommended temperature: 15°C–25°C
  Recommended relative humidity: 40%–60%
- Places with oily smoke and a lot of dust
  The terminals of the Battery might rust.
- Before you store the Battery for a long time, perform playback or other operations to completely use up the remaining charge in the Battery. Then remove it from the Movie Camera and store it. We recommend that you reactivate the Battery about once a year by charging it and then completely using up the charge before storing it again.

Precautions for the Cassette

When you have finished using the Movie Camera, rewind the tape to the beginning and take the cassette out of the Movie Camera. If you store the cassette for a long time, fast-forward and then rewind it at least once a year to expose the tape to fresh air.

Observe the following points to prevent deformation of the cassette case and deterioration of the picture and sound quality.
- Do not subject the cassette to strong vibration or mechanical shocks.
- Do not place it near magnetized equipment.
- Avoid places where the temperature can become very high.

Causes of Condensation and Remedy

When condensation has formed inside the Movie Camera and on the tape, recording becomes impossible. In addition, the tape might remain in contact with the heads and this could seriously damage the Movie Camera.

■ Main Causes of Condensation

● When the Movie Camera is brought from a cold to a warm place.
● When the Movie Camera is taken outdoors from inside an air-conditioned car or house.
● When the heating is turned on in a cold room.
● When the Movie Camera is exposed to the cold breeze from an air-conditioner.
● When the Movie Camera is in a very hot or humid place or in a place with steam.

■ Symptoms of Condensation

When turning on the Movie Camera, the Condensation Indication [U10/[▲]] appears.
(A few seconds later, the Movie Camera automatically turns itself off.)

■ Remedy as Follows:

1. Take out the cassette.

2. Keep the Cassette Compartment open and wait a few hours.

3. A few hours later, turn on the Movie Camera and confirm that the Condensation Indication is not displayed any more.
   For added safety, wait about 1 more hour.

■ To Prevent Condensation from Forming

When bringing the Movie Camera from a very cold to a warm place, keep it in a tightly closed plastic bag or something similar for 1 to 2 hours before using it again.

■ When the Lens Is Fogged up

Turn the Movie Camera on and wait for about 1 hour until it has reached about the same temperature as its surroundings.

Video Head Clogging and Remedy

If the video heads become dirty and clogged with dust, the picture quality deteriorates.

■ Symptoms of Dirty Video Heads

● When turning on the Movie Camera, the [U11/◎] Indication appears for the first few seconds.
● When playing back a cassette on the Movie Camera and watching the picture on a connected TV, white noise bars appear in the picture. However, if the heads are extremely dirty, the playback picture cannot be seen at all.

■ Remedy as Follows:

Use a video head cleaning cassette to clean the heads. Carefully follow the instructions for its use as too much cleaning wears down the heads. If the playback picture is not clear after cleaning, it means that the video heads are worn out. Consult qualified service personnel.

How the White Balance (Tint) Adjustment Works

Video recording takes place under various light sources, from sunlight as the main natural light source to a wide range of artificial light sources such as fluorescent lamps. As each of these light sources has a different colour temperature, each of them gives the colours of the subject a slightly different tint.

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

The eye of the Movie Camera (lens), however, cannot adapt to the change in lighting and is influenced by the lighting. Therefore, depending on the light source, the picture is recorded with a bluish or reddish tint. To minimize the influence of the lighting on the colours of the subject, an adjustment called White Balance Adjustment is necessary.

■ Auto White Balance

This Movie Camera offers both Auto White Balance Adjustment and Manual White Balance Adjustment. When the Movie Camera is in the Full Auto Mode, the internal system of the Movie Camera automatically determines the temperature of the light and compensates the tint of the subject accordingly. White is the basic colour by which the tint is determined.

Because this adjustment is performed based on the white colour, it is called White Balance Adjustment. The optimum settings of several light sources are stored in the memory of the Movie Camera. The internal microcomputer compares the colour temperature of the light received by the White Balance Sensor positioned on the front of the Movie Camera with the colour stored in memory, and selects the setting for the most similar tint.

Be careful not to cover the White Balance Sensor (→ 5) with your hand, etc.

■ Manual White Balance

Although this Movie Camera stores the optimum settings for several light sources in memory to correctly judge the white colour, it cannot cope with all light sources. Therefore, to record under those types of lighting (→ 48, 50) which cannot be correctly adjusted with Auto White Balance Adjustment, use Manual White Balance Adjustment (→ 49).

How the Focus Adjustment Works

If you look at an object through a magnifying glass and move it closer or further away from your eye, you will reach a point where the object becomes clearly visible. Being focused or in focus means that the subject can be seen with optimum clarity and sharpness. The distance between the lens and the point where the rays of light come together is called Focal Distance or Focal Length and depends on the size and shape of the lens. Human eyes have lenses too, and when we look at objects at different distances, the shape of these lenses changes automatically so that we can always see the objects clearly.

■ Auto Focus Adjustment

The image of the subject enters the Movie Camera through the lens and is converted into an electrical signal (video signal) for recording onto tape. Based on this signal, the Auto Focus System automatically adjusts the focal distance by moving the focusing lens forward or backwards.

The focus is adjusted on the subject in the centre of the Finder.
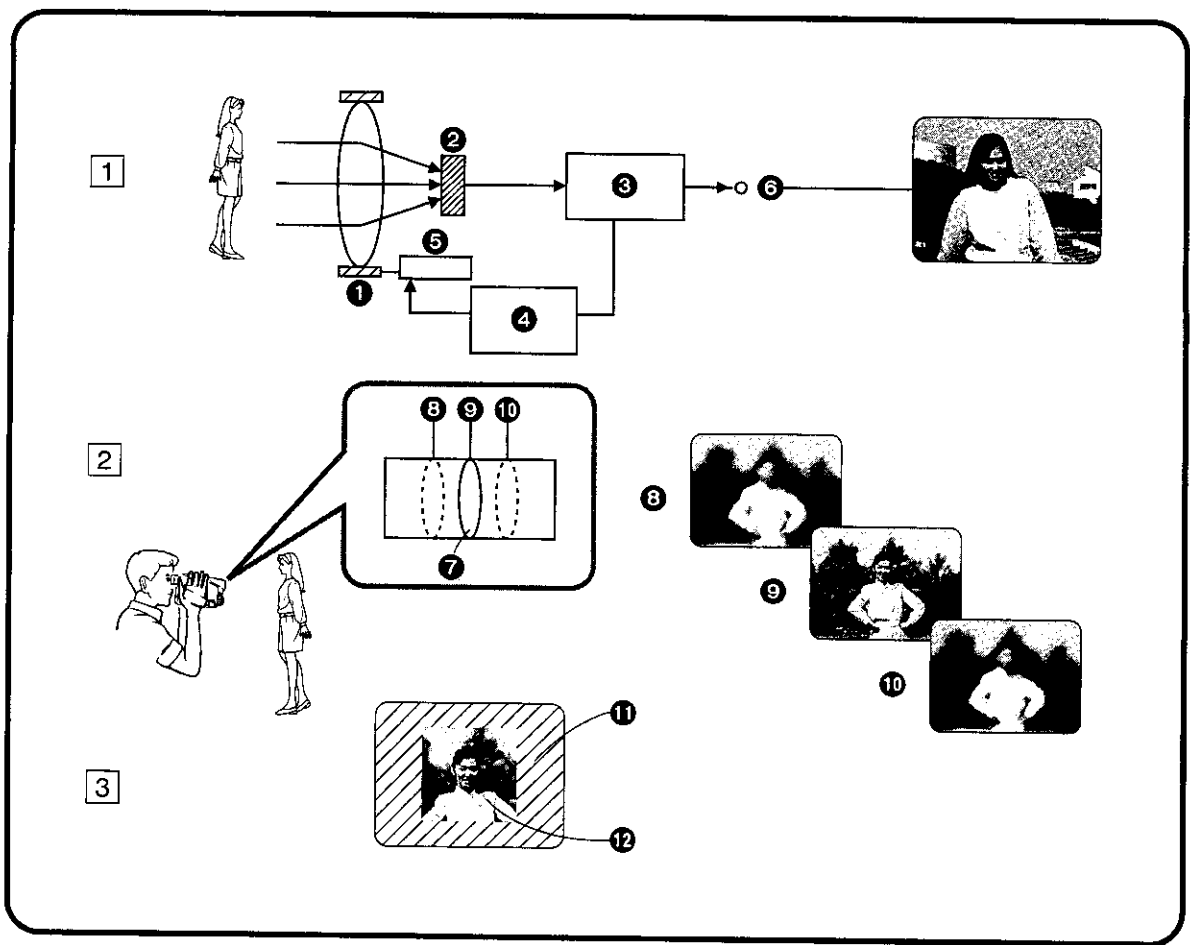
■ Functional Diagram of the Auto Focus Function

❶ Focusing Lens   ❷ CCD Image Sensor

❸ Signal Processing   ❹ Microprocessor

❺ Focusing Lens Motor   ❻ Picture Signal for Recording

❼ Focusing Lens   ⑪ Finder Screen

⑫ Image area on which the Auto Focus Function adjusts the focus

When you aim the Movie Camera at the subject that you want to record, the microprocessor determines (based on the information about the vertical contours in the picture signal received by the CCD Image Sensor) whether the subject in the middle of the picture is properly focused. If not optimally focused, it quickly moves the focusing lens in tiny steps from the previous focus setting ❽ or ⑩ until the vertical contours of the subject become sharpest ❾.

● As this Movie Camera automatically adjusts the focus based on the information on the subject's vertical contours, precise focusing is not possible for subjects with weak vertical contours (➜ 48).

● Unlike the human eye, the Movie Camera's Auto Focus System cannot change the focus from a distant to a close subject instantaneously.
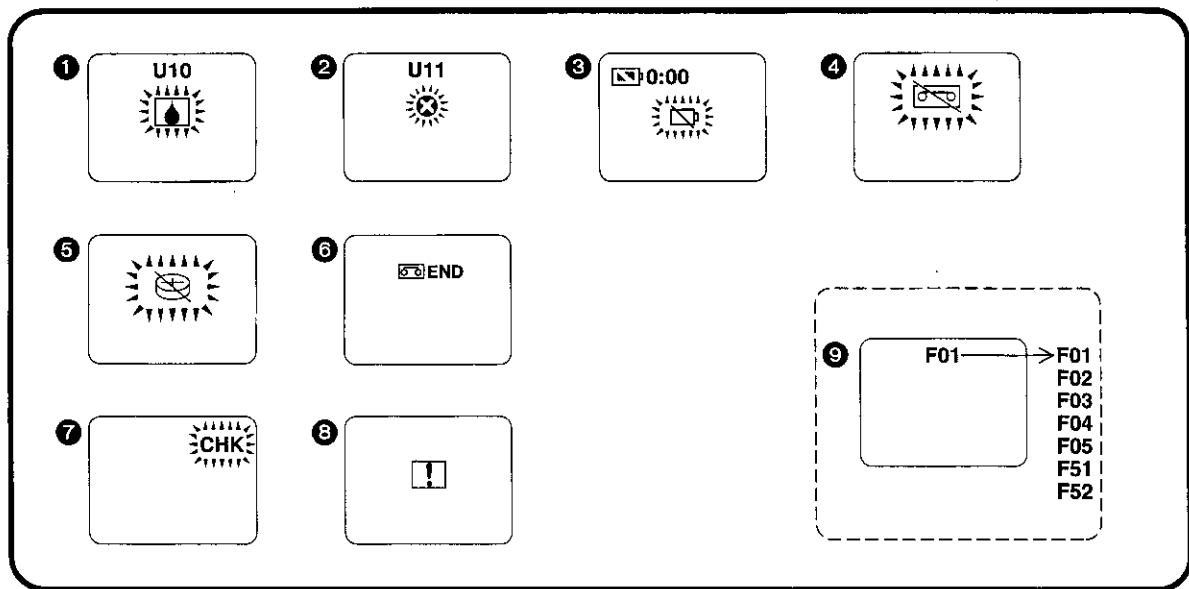
Indications

■ Warning/Alarm Indications

❶ Condensation (→ 71)

❷ Video Head Clogging (→ 71)

❸ Remaining Battery Power

When the remaining battery power is used up, the Movie Camera automatically switches off. Replace the Battery with a fully charged one.

❹ Cassette

No cassette is inserted. Or the tab of the inserted cassette is broken out. Insert a cassette with an intact tab.

❺ Built-in Lithium Battery (→ 26)

The built-in Lithium Battery is exhausted. Charge it.

❻ End of the Tape

When the tape has reached its end, this indication appears. Insert a new cassette.

❼ Anti-Ground Recording (→ 41)

❽ General Warning/Alarm Indication in the Mirror Mode

If you have selected the Mirror Mode (→ 58) on the [MAIN MENU] Menu and record with the LCD Monitor facing forward, this indication appears instead of the actual Warning/Alarm Indication and Error Code.

❾ Error Code

(Error codes are information for service personnel.)

If the [F] Indication with a 2-digit number appears, a malfunction has occurred.

If the indicated error code is between [F01] and [F05], the Movie Camera will turn off automatically one minute after the [CAMERA] Lamp has started to flash.

If the indication is [F51] or [F52], the Movie Camera will not turn off automatically.
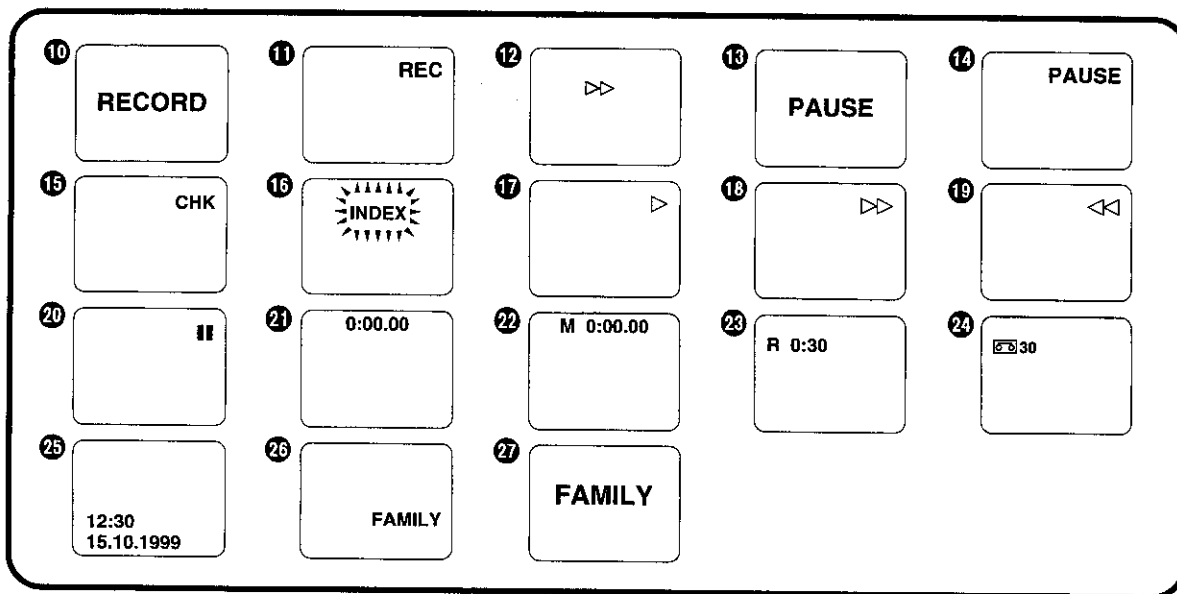
F01:Locked Take Up-Reel

F02:Locked Supply-Reel

F03:Locked Unloading Mechanism
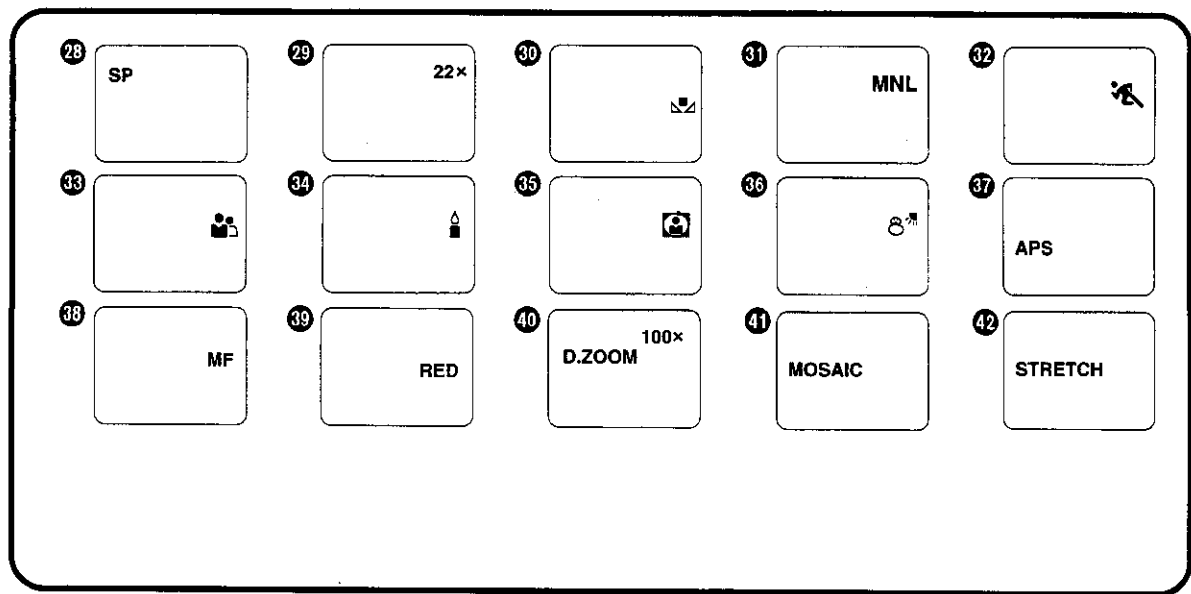
F04:Locked Loading Mechanism

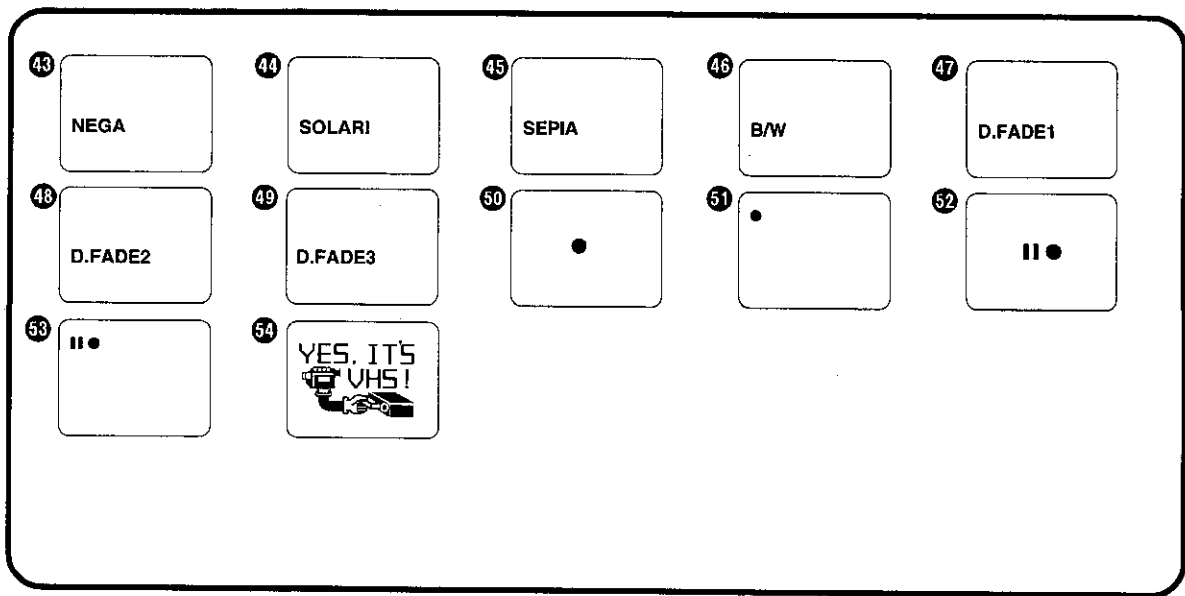F05:Locked Cylinder

F51:Locked Focus Motor

F52:Locked Zoom Motor

⑩ RECORD	⑪ REC	⑫ ▷▷	⑬ PAUSE	⑭ PAUSE
⑮ CHK	⑯ ≍INDEX≍	⑰ ▷	⑱ ▷▷	⑲ ◁◁
⑳ ❚❚	㉑ 0:00.00	㉒ M 0:00.00	㉓ R 0:30	㉔ 🔲30
㉕ 12:30 15.10.1999	㉖ FAMILY	㉗ FAMILY		

■ **Recording and Playback Indications**

⑩ Recording Mode (large indication) (➜ 27)

⑪ Recording Mode (small indication) (➜ 27)

⑫ Tape Movement during Recording (➜ 27)

⑬ Recording Pause Mode (large indication) (➜ 27)

⑭ Recording Pause Mode (small indication) (➜ 27)

⑮ Recording Check Mode (➜ 29)

⑯ Index Signal Recording Mode

An index signal is automatically recorded (and the [INDEX] Indication flashes briefly while it is being recorded) when you:

● Start recording after connecting the AC Adaptor or attaching the Battery.

● Start recording after inserting a cassette.

● Start recording after pressing the [VCR/CAMERA] Button to change from the VCR to the Camera Mode.

The recording of index signals makes it possible to use the VHS Index Search or Intro Scan Function during playback on a VCR equipped with these functions.
(Refer to the operating instructions of your VCR.)

⑰ Playback Mode (➜ 33)
Camera Search Mode (➜ 30)

⑱ Fast Forward/Cue Mode (➜ 37, 38)

⑲ Rewind/Review Mode (➜ 37, 38)
Camera Search Mode (➜ 30)

⑳ Still Playback Mode (➜ 38)

㉑ Elapsed Tape Time (➜ 65)

When the tape is rewound further than the position [0:00.00], the minus sign [–] appears in front of the Elapsed Tape Time Indication.

㉒ Elapsed Tape Time with activated Memory Stop Function (➜ 67)

㉓ Remaining Tape Time (➜ 21)

㉔ Tape Length (➜ 20)

㉕ Date and Time (➜ 25)

㉖ Title (small indication) (➜ 61)

㉗ Title (large indication) (➜ 61)

㉘ SP	**㉙** 22×	**㉚**	**㉛** MNL	**㉜**
㉝	**㉞**	**㉟**	**㊱**	**㊲** APS
㊳ MF	**㊴** RED	**㊵** D.ZOOM 100×	**㊶** MOSAIC	**㊷** STRETCH

㉘ Recording Speed Mode (→ 20)
㉙ Zoom Magnification (→ 31)
㉚ Manual White Balance Mode (→ 49)
㉛ Manual Recording Mode (→ 49, 51)
㉜ Sports Mode (→ 52)
㉝ Portrait Mode (→ 52)
㉞ Low Light Mode (→ 52)
㉟ Spotlight Mode (→ 52)
㊱ Surf & Snow Mode (→ 52)
㊲ Power Save Mode (→ 40)
㊳ Manual Focus Mode (→ 51)
㊴ Colour Indication for Digital Image (→ 63)
㊵ Digital Zoom Mode (→ 46)
㊶ Mosaic Mode (→ 44)
㊷ Stretch Mode (→ 44)

㊸ NEGA	㊹ SOLARI	㊺ SEPIA	㊻ B/W	㊼ D.FADE1
㊽ D.FADE2	㊾ D.FADE3	㊿ ●	51 ●	52 II●
53 II●	54 YES. IT'S VHS!			

㊸ Nega Mode (→ 45)

㊹ Solarisation Mode (→ 45)

㊺ Sepia Mode (→ 45)

㊻ Black-and-White Mode (→ 45)

㊼ Digital Fade 1 Mode (→ 47)

㊽ Digital Fade 2 Mode (→ 47)

㊾ Digital Fade 3 Mode (→ 47)

㊿ Recording Mode (large indication) (→ 58)

51 Recording Mode (small indication) (→ 58)

52 Recording Pause Mode (large indication) (→ 58)

53 Recording Pause Mode (small indication) (→ 58)

● The above indications ㊿ to 53 are only displayed when recording in the Mirror Mode. (→ 58)

54 Demonstration Mode

Demonstration Mode

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

Cancelling the Demonstration Mode
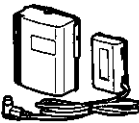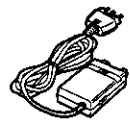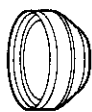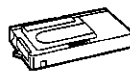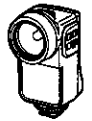
Set [DEMO MODE] on the [MAIN MENU] Menu to [OFF].

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

Reactivating the Demonstration Mode

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

1. VW-AS7A	2. CGR-V610	3. CGR-V620	4. CGR-V816	5. VW-KBC7E	6. VW-RF7E
7. VW-LF43WE	8. VW-LT4314WE	9. VW-LW4307WE	10. VZ-CT55E	11. VW-TCA7E	12. VW-VT1A
13. VZ-LDR10E	14. VW-SK11E				

Optional Accessories

1. AC Adaptor
2. Battery Pack (Lithium-Ion)
3. Battery Pack (Lithium-Ion)
4. Battery Pack (Lithium-Ion)
5. Car Battery Charger
6. RF-Adaptor
7. Filter Kit
8. Tele Conversion Lens
9. Wide Conversion Lens
10. Tripod
11. Cassette Adaptor
12. Video Titler
13. IR/Video DC Light (Halogen & Infra-red)
    (It requires the Shoe Adaptor for attaching to the Movie Camera. With this Movie Camera, its infra-red beam emission function has no effect.)
14. Shoe Adaptor (for attaching the IR/Video DC Light)

Some accessories are not available in some countries.

Specifications

VHS-C Movie Camera — Information for your safety

Power Source:	7.2 V (Battery)
	7.9 V (AC Adaptor)
Power Consumption:	4.7 W
(Battery Operation)	(When using the Finder)
	5.7 W (When using
	the LCD Monitor)

Tape Format:	VHS-C Cassette
Recording/Playback Time:	LP: 2hours with EC60
VIDEO	
Television System:	CCIR; 625 lines, 50 fields
	PAL colour signal
Output Level:	VIDEO OUT (PHONO);
	1.0 Vp-p, 75 ohm terminated
AUDIO	
Output Level/	AUDIO OUT (PHONO);
Impedance:	−6 dBV (47 kohm loaded)/
	less than 1 kohm
Audio Track:	1 track (Normal – Monaural)
Image Sensor:	1/4-inch CCD Image Sensor
Lens:	22:1 Power Zoom Lens
	(Optical capability)
	F1.6
	Focal Length; 3.7–81.4 mm
	Digital AI Auto Focus/Auto Iris
	Filter Diameter; 43 mm
Monitor:	2.5-inch Colour LCD Monitor
Finder:	0.5-inch Electronic Finder
Standard Illumination:	1,400 lx
Minimum Required	
Illumination:	0.5 lx (Low Light Mode)
	(0.3 lx: Minimum Required
	Illumination for visible image)
Operating Temperature:	0°C–40°C
Operating Humidity:	10–80%
Weight:	Approx. 850 g
	(without Battery)
Dimensions:	Approx. 102 (W)×127 (H)×
	255 (D) mm

AC Adaptor — Information for your safety

Power Source:	AC 100–240 V, 50/60 Hz
Power Consumption:	27 W
DC Output:	DC 7.9 V, 8.5 W
	(Movie Camera Operation)
	DC 8.4 V, 1.4 A
	(Battery Charging)

Weight:	Approx. 235 g
	(without AC Mains Cable)
Dimensions:	Approx. 72 (W)×49 (H)×
	143 (D) mm

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

Before Requesting Service

(Problems & Solutions)

Power Supply

P1: The Movie Camera does not turn on.
S1: Is the Battery or the AC Adaptor connected correctly? Confirm the connection. (➔ 8, 11)

P2: The Movie Camera has turned off automatically.
S2: If you leave the Movie Camera in the Recording Pause Mode for more than 6 minutes, it automatically switches off to protect the tape and to conserve battery power. Turn in the [POWER] Switch to switch the Movie Camera off, and then turn it out again to switch the Movie Camera on. (➔ 28)

P3: The Movie Camera quickly turns off.
S3-1: Is the Battery discharged? When the Remaining Battery Operation Time Indication shows "0:00" or the [▇] Indication is flashing, the Battery is discharged. Charge the Battery or attach a fully charged Battery. (➔ 9, 11)
S3-2: Has condensation formed? If the Movie Camera is brought from a cold to a warm place, condensation may form inside. In this case, the Movie Camera automatically switches off and no operations can be performed except taking out the cassette. Wait until the Condensation Indication disappears (approximately 2 - 3 hours). (➔ 71)

Cassette

P1: The Remaining Tape Time Indication is not correct.
S1: Is the tape length of the inserted cassette correctly selected? Select the correct tape length. (➔ 20)

P2: The Movie Camera and cassettes underwent security X-ray inspection at an airport. Does this affect the cassettes?
S2: No, this has no negative influence on the Movie Camera or the cassettes.

P3: When playing back a cassette that was stored for some time, the picture is distorted.
S3: The cassette was stored in an unsuitable place (dusty, humid, hot, etc.) or near strongly magnetized objects or equipment. Unfortunately, there is no remedy. Always store the cassettes correctly. (➔ 70)

Recording

P1: No picture appears in Finder.
S1: LCD Monitor is open (Except when recording with LCD Monitor facing forward). Securely close LCD Monitor. (➔ 13)

P2: Picture on LCD Monitor is not clear.
S2: Picture quality is not properly adjusted. Adjust picture quality. (➔ 18)

P3: Movie Camera is turned on but no picture appears in Finder.
S3: Power Save Functions have become activated. Hold Movie Camera again in horizontal position. Or set [APS] on the [MAIN MENU] Menu to [OFF]. (➔ 40)

Recording (Continued)

P4: Recording does not start when pressing the Recording Start/Stop Button.
S4: The tab of the inserted cassette is broken out. Insert a cassette with intact tab. Or cover the hole where the tab was with two layers of adhesive tape. (➔ 21)

P5: The Date/Time/Title Indication is not displayed.
S5-1: This is due to incorrect operation of the [DATE/ TITLE] Button and/or the [MENU] Button. Press the [MENU] Button and set the desired Date/ Time/Title Indication. Then press the [DATE/ TITLE] Button so that the Date/Time/Title Indication appears. (➔ 25)
S5-2: The built-in Lithium Battery is discharged. Charge it. (➔ 26)

Playback

P1: No playback picture is reproduced.
S1: The [POWER] Switch of the Movie Camera is not turned out. Turn it out and then press the [VCR/ CAMERA] Button, so that the [VCR] Lamp lights. (➔ 33)

P2: The playback picture is distorted or contains noise bars.
S2-1: The tape in the cassette is loose. Tighten it.(➔ 19)
S2-2: The video heads are dirty. Clean them with an optional video head cleaning cassette. (➔ 71)
S2-3: The tracking is not adjusted correctly. Adjust the tracking correctly. (➔ 37)

P3: The playback picture is not in colour.
S3: The colour adjustment on the TV is not made properly. Adjust the colour control on the TV.

Remote Controller

P1: The Remote Controller does not work.
S1-1: The batteries in the Remote Controller are exhausted. Replace them with new "UM-4" or "R03" type batteries. (➔ 56)
S1-2: The Remote Controller and/or the Movie Camera are exposed to strong light. Prevent strong light from falling on the Remote Controller and/or Movie Camera when using the Remote Controller.

Demonstration Mode

P1: The Movie Camera remains in the Demonstration Mode.
S1: The Demonstration Mode is designed for explaining the versatile functions of this Movie Camera. To switch this mode off, turn in the [POWER] Switch and then turn it out again while pressing the [STOP] Button. Or, set [DEMO MODE] on the [MAIN MENU] Menu to [OFF]. (➔ 78)

Flow Chart of the Main Menu

MENU
► PLAY

```
        MAIN MENU
SPEED      ►SP     LP
TAPE       ►30
TITLE SET  ►OFF
APS        ►OFF
SELF SHOOT ►NOR.
DEMO MODE  ►OFF

   PRESS MENU TO EXIT
```

STOP / SET

```
        MAIN MENU
SPEED       SP    ►LP
TAPE       ►30
TITLE SET  ►OFF
APS        ►OFF
SELF SHOOT ►NOR.
DEMO MODE  ►OFF

   PRESS MENU TO EXIT
```

PAUSE / ITEM

```
        MAIN MENU
SPEED      ►SP
TAPE       ►30   45  60
TITLE SET  ►OFF
APS        ►OFF
SELF SHOOT ►NOR.
DEMO MODE  ►OFF

   PRESS MENU TO EXIT
```

STOP / SET

```
        MAIN MENU
SPEED      ►SP
TAPE        30   ►45  60
TITLE SET  ►OFF
APS        ►OFF
SELF SHOOT ►NOR.
DEMO MODE  ►OFF

   PRESS MENU TO EXIT
```

PAUSE / ITEM

```
        MAIN MENU
SPEED      ►SP
TAPE       ►30
TITLE SET  ►OFF   ON
APS        ►OFF
SELF SHOOT ►NOR.
DEMO MODE  ►OFF

   PRESS MENU TO EXIT
```

STOP / SET

```
        MAIN MENU
SPEED      ►SP
TAPE       ►30
TITLE SET   OFF   ►ON
APS        ►OFF
SELF SHOOT ►NOR.
DEMO MODE  ►OFF

   PRESS MENU TO EXIT
```
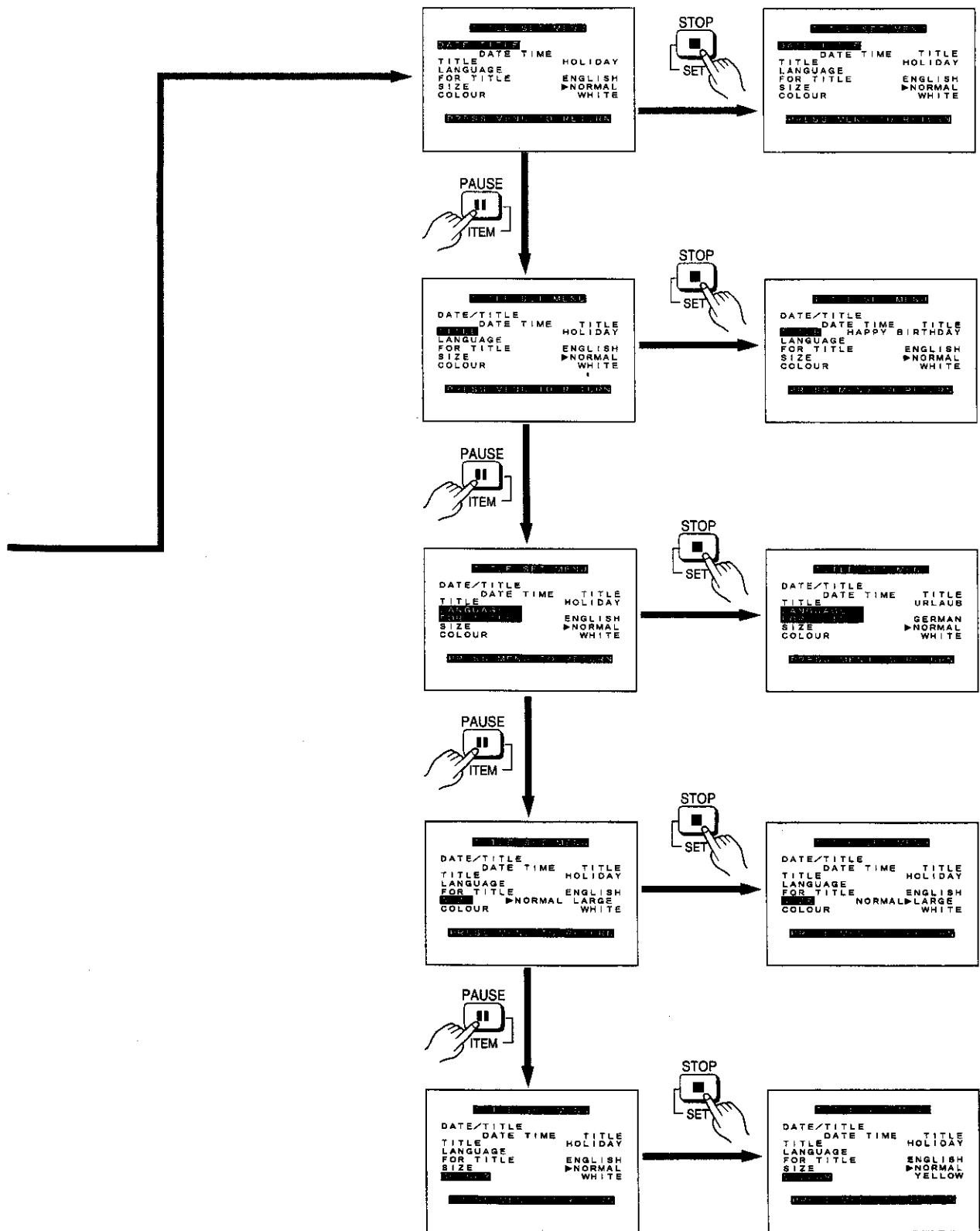
PAUSE / ITEM

```
        MAIN MENU
SPEED      ►SP
TAPE       ►30
TITLE SET  ►OFF
APS        ►OFF   ON
SELF SHOOT ►NOR.
DEMO MODE  ►OFF

   PRESS MENU TO EXIT
```

STOP / SET

```
        MAIN MENU
SPEED      ►SP
TAPE       ►30
TITLE SET  ►OFF
APS         OFF   ►ON
SELF SHOOT ►NOR.
DEMO MODE  ►OFF

   PRESS MENU TO EXIT
```

PAUSE / ITEM

```
        MAIN MENU
SPEED      ►SP
TAPE       ►30
TITLE SET  ►OFF
APS        ►OFF
SELF SHOOT ►NOR.  MIR.
DEMO MODE  ►OFF

   PRESS MENU TO EXIT
```

STOP / SET

```
        MAIN MENU
SPEED      ►SP
TAPE       ►30
TITLE SET  ►OFF
APS        ►OFF
SELF SHOOT  NOR.  ►MIR.
DEMO MODE  ►OFF

   PRESS MENU TO EXIT
```

PAUSE / ITEM

```
        MAIN MENU
SPEED      ►SP
TAPE       ►30
TITLE SET  ►OFF
APS        ►OFF
SELF SHOOT ►NOR.
DEMO MODE  ►OFF   ON

   PRESS MENU TO EXIT
```

STOP / SET

```
        MAIN MENU
SPEED      ►SP
TAPE       ►30
TITLE SET  ►OFF
APS        ►OFF
SELF SHOOT ►NOR.
DEMO MODE   OFF   ►ON

   PRESS MENU TO EXIT
```

Flow Chart of the Title Menu