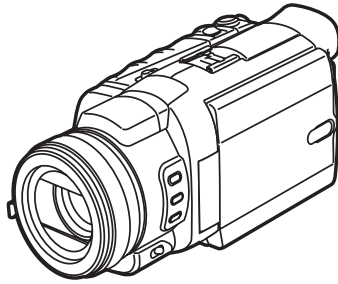


Digital Palmcorder® MultiCam™ Camcorder

**Panasonic**®



# Operating Instructions

## Digital Video Camcorder

Model No. **PV-GS400**



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

Spanish Quick Use Guide is included.

Guía para rápida consulta en español está incluida.

**MultiMediaCard™**  
**LEICA DICOMAR**



**Mini DV**



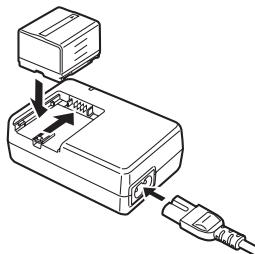
For USA assistance, please call: 1-800-211-PANA(7262) or, contact us via the web at: <http://www.panasonic.com/contactinfo>

For Canadian assistance, please call: 1-800-561-5505 or visit us at [www.panasonic.ca](http://www.panasonic.ca)

LSQT0801 A

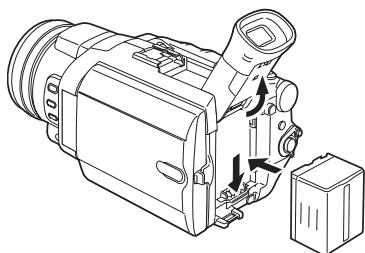
## Quick Guide

- 1 Attach the Battery to the AC Adaptor and charge it.



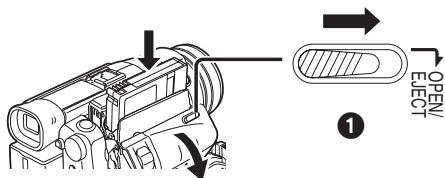
- Before use, fully charge the Battery.
- Since the Battery will not be charged when the DC Cable is connected to the AC Adaptor, disconnect it from the AC Adaptor.
- The [CHARGE] Lamp lights up, and charging starts.
- When the [CHARGE] Lamp goes off, charging is completed.

- 2 Attach the charged Battery to the Camcorder.

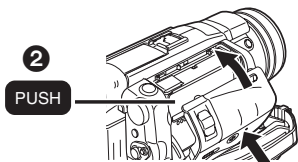


### Inserting a Cassette

- 1 Slide the [OPEN/EJECT] Lever ① toward the front and pull down to open the Cassette Compartment Cover.
- 2 Insert a Cassette.

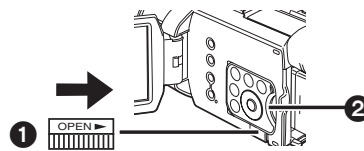


- 3 Close the Cassette Holder by pressing the [PUSH] mark ②.
- 4 Close the Cassette Compartment Cover.

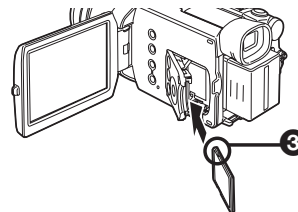


### Inserting a Card

- 1 Slide the [OPEN] Lever ① to open the Card Slot Cover ②.



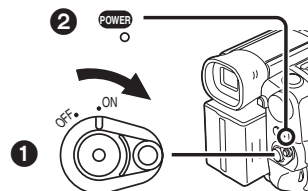
- 2 While holding the Memory Card with its cut corner on top ③, insert it into the Card Slot.



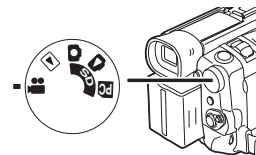
- 3 Close the Card Slot Cover ② securely.

### Recording on a Tape

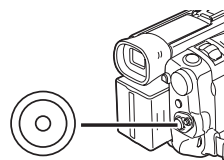
- 1 Set the [OFF/ON] Switch ① to [ON].
  - The [POWER] Lamp ② lights up.



- 2 Set the Mode Dial to Tape Recording Mode.



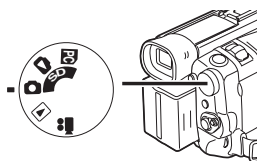
- 3 Press the Recording Start/Stop Button.
  - Recording starts.



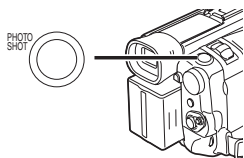
- 4 Press the Recording Start/Stop Button again to pause the recording.

## Recording a Still Picture on a Card (Photoshot)

1 Set the Mode Dial to Card Recording Mode.



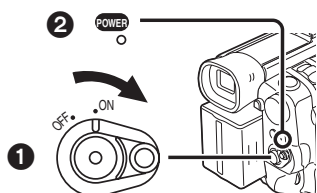
2 Press the [PHOTO SHOT] Button.



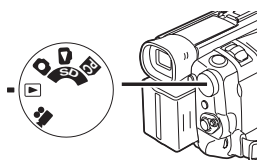
## Playing Back a Tape

1 Set the [OFF/ON] Switch ① to [ON].

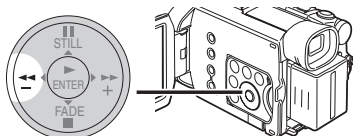
- The [POWER] Lamp ② lights up.



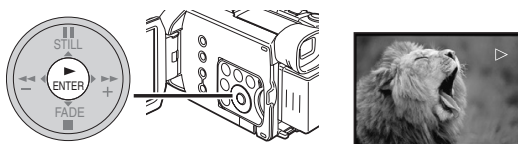
2 Set the Mode Dial to Tape Playback Mode.



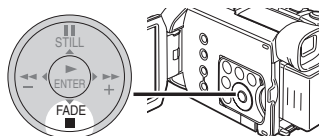
3 Press the [◀◀] Button to rewind the tape.



4 Press the [▶] Button to start playback.



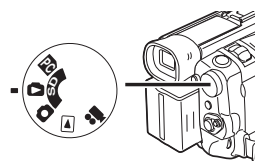
5 Press the [■] Button to Stop Playback.



## Playing Back a Card

It plays back files recorded on a Card.

1 Set the Mode Dial to Picture Playback Mode.





2 Start Playback.

- ▶: Starting the Slide Show
- ▶▶: Playing back the next picture
- ◀◀: Playing back the previous picture
- : Stop the Slide Show
- ||: Pause the Slide Show

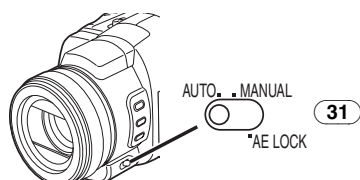
## Recording Mode

### About Recording

When recording pictures on a tape, set the Mode Dial to Tape Recording Mode [  ].

When recording still pictures on a card, set the Mode Dial to Card Recording Mode [  ].

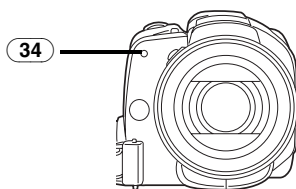
When recording with the [AUTO/MANUAL/AE LOCK] Switch (31) set to [AUTO], the Camcorder automatically adjusts the focus and white balance. In some cases, they cannot be adjusted automatically and need to be adjusted manually. (-36-, -37-, -38-)



- Before turning on the power, remove the Lens Cap. If the Lens Cap is still attached when the power is turned on, Automatic White Balance Adjustment (-36-) may not function correctly.
- When the Recording Pause Mode continues for more than 5 minutes, the power is turned off automatically for tape protection and power conservation. (If the AC Adaptor is used, the power is turned off only when the tape is inserted in Tape Recording Mode.) When the tape is inserted in Tape Recording Mode and if the Recording Pause Mode continues for more than 5 minutes the power is turned off automatically. To resume recording from this condition, turn off, then turn on the power again.

### Recording Lamp

The Recording Lamp (34) lights up during recording and alerts those being recorded that recording is in progress.

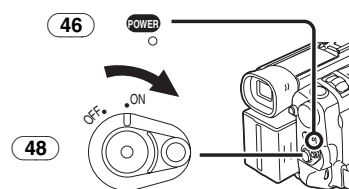


- The Recording Lamp does not light up if the [REC LAMP] on the [INITIAL] Sub-Menu is set to [OFF].

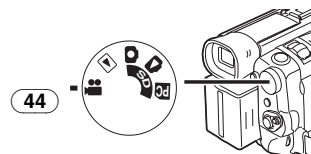
### Recording on a Tape

#### 1 Set the [OFF/ON] Switch (48) to [ON].

- The [POWER] Lamp (46) lights up.

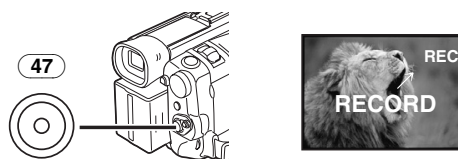


#### 2 Set the Mode Dial (44) to Tape Recording Mode.



#### 3 Press the Recording Start/Stop Button (47).

- Recording starts.
- After [RECORD] is displayed, it changes to [REC].



#### 4 Press the Recording Start/Stop Button (47) again to pause the recording.

- The [PAUSE] Indication is displayed.

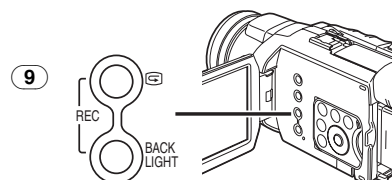


### Recording "Simultaneous Motion/Still Record Mode"

- Even if the Mode Dial is set to Tape Recording Mode and the recording to a tape is in progress, you can also record a still picture on a card by pressing the [PHOTO SHOT] Button.

### To Check the Recording

By pressing the [G] Button (9) briefly in the Recording Pause Mode, you can play back the last few seconds of the recorded scene.



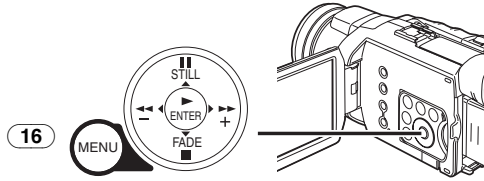
- The [CHK] Indication is displayed. After checking, the Camcorder resumes the Recording Pause Mode.

- For other notes concerning this item, see -74-.

## ■ Finding the End of Recording (Blank Search Function)

The Blank Search Function aids you in locating the end of the recording on the Cassette quickly.

- 1 Set [TAPE RECORDING MENU] or [TAPE PLAYBACK MENU] >> [INITIAL] >> [BLANK SEARCH] >> [YES].



- The [BLANK] Indication appears during the Blank Search.
- Approximately 1 second before the last recorded scene, the Camcorder switches to the Recording Pause Mode or the Still Playback Mode.
- If there is no blank left on the Cassette, the Camcorder stops at the end of the tape.

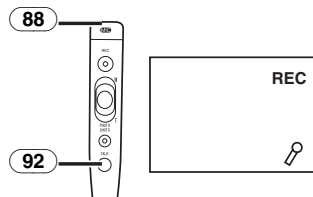
### To Cancel Blank Search Before Completion

Press the [■] Button.

## ■ To Add a Sound while Recording

With the supplied Magic Wire Remote Control with Narration Mic connected to the [REMOTE] Jack (38), you can add a narration while recording is in progress.

While the [TALK] Button (92) is pressed, the [P] Indication is displayed and the sound is recorded from [MIC] (88).

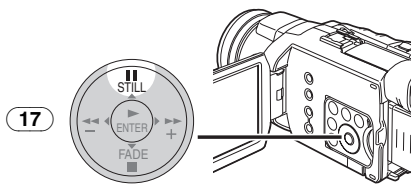


- While the [TALK] Button is pressed, the built-in microphone does not operate.

## ■ Digital Still Picture

You can record images stilled by Digital Still Picture Mode onto a tape.

When the [STILL] Button (17) is pressed, images become still pictures. When the button is pressed again, the Digital Still Picture Mode is cancelled.



- You can also record pictures onto a Card by pressing the [PHOTO SHOT] Button after setting to the Digital Still Picture Mode and then checking the image.

## ■ Progressive Photoshot

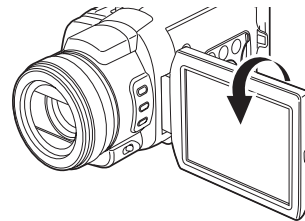
When the [P] Indication is displayed, Progressive Photoshot Function works.

You can record still pictures with higher quality by using this function.

- The Progressive Photoshot Function may not be activated depending on the function you use. (-72-)
- To record still pictures with higher quality, we recommend setting to the Card Recording Mode. (To activate the progressive function regardless of the function you use)
- When you record onto the tape and the card simultaneously, the progressive function will not work.

## ■ Recording Yourself

By opening the LCD Monitor and rotating it forward (to the lens side), you can let the subject in front of the Camcorder monitor the shot while recording is in progress.

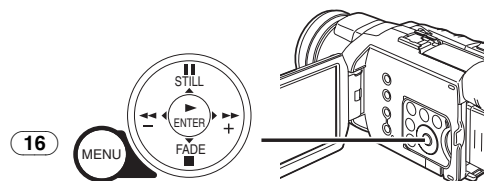


- When the [EVF ON/AUTO] is set to [AUTO] and the LCD Monitor is opened, the Viewfinder is disabled automatically. However, when the LCD Monitor is rotated forward, the image is also shown in the Viewfinder.
- If you prefer to have the image on the LCD Monitor to look like an image in a mirror, set [SELF REC] on the [LCD/EVF] Sub-Menu to [MIRROR]. Images are recorded normally and no left and right reversal occurs.

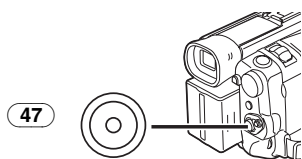
## ■ Frame Moving Pictures (Frame Mode)

Frame moving-picture recording enables you to obtain natural still pictures with a high picture quality, even when the scenes involve a lot of movement recording frame still pictures continuously at a rate of 30 frames a second. (It is also possible to record sound.)

- 1 Set [TAPE RECORDING MENU] >> [CAMERA] >> [REC MODE] >> [FRAME].



- The [FRAME] Indication appears.

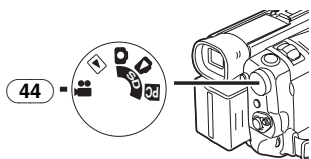
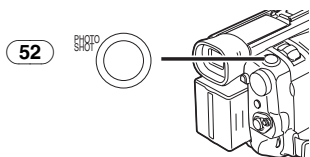
**2 Press the Recording Start/Stop Button (47).**

- For other notes concerning this item, see -74-.

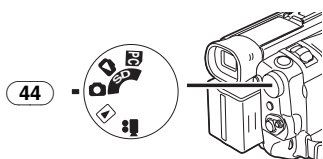
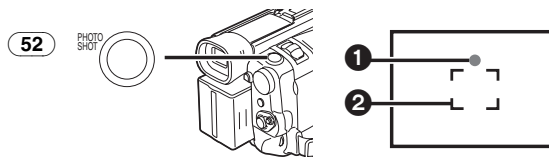
**Recording a Still Picture on a Card (Photoshot)**

Still pictures can be recorded on the Memory Card from the Camcorder.

The size of images that are recorded using this Camcorder is approximately 4.0 million pixels. Recording of images with a size that is larger than a million pixels is called mega-pixel still-picture recording. Compared to images of normal recording, images that are created by mega-pixel still-picture recording can be printed out clearly.

**When recording in Tape Recording Mode:****1 Set the Mode Dial (44) to Tape Recording Mode.****2 Press the [PHOTO SHOT] Button (52).**

- To record still pictures with higher quality, we recommend recording in the Card Recording Mode.

**When recording in the Card Recording Mode:****1 Set the Mode Dial (44) to Card Recording Mode.****2 Press the [PHOTO SHOT] Button (52) halfway.**

- The aperture value and gain are fixed and the Camcorder automatically focuses on the subject.

- 1 Shutter Chance Mark
- 2 Focus Area

**Shutter Chance Mark**

Lights (green): The subject is adequately focused. (The focus is stable and you can record pictures more clearly.)

Lights (white): The subject is almost focused.

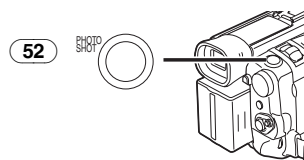
Blinks (white): The Camcorder is focusing on the subject.

No Mark: The Camcorder cannot focus on the subject.

- When the Image Stabilizer Function (-32-) is set to [ON], the Image Stabilizer Function works more effectively. ([MEGA EIS] Indication appears.)



- The [PHOTO SHOT] Button on the Magic Wire Remote Control with Narration Mic cannot be pressed halfway.

**3 Press the [PHOTO SHOT] Button (52) fully.**

- The [PICTURE] Indication lights up in red.

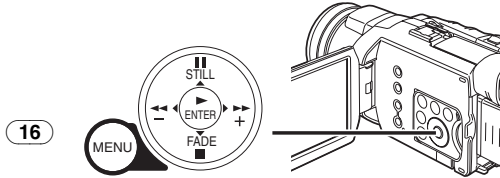
- The Shutter Chance Mark appears even when the [PHOTO SHOT] Button is not pressed. Check it for your reference.
- Even if the [PHOTO SHOT] Button is pressed halfway, the Shutter Chance Mark does not appear in Manual Focus Mode.

**Selecting the Size of Photoshot Images****1 Tape Recording Mode:**

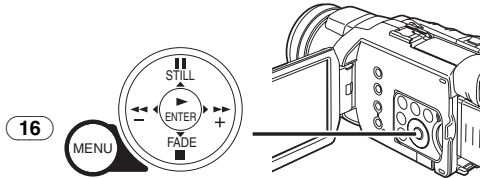
Set [TAPE RECORDING MENU] >> [CARD]  
>> [PICTURE SIZE] >> [1280×960] or  
[640×480].

**Card Recording Mode:**

Set [CARD RECORDING MENU] >> [CARD]  
>> [PICTURE SIZE] >> [2288×1728],  
[1600×1200], [1280×960] or [640×480].

**Selecting the Quality of Photoshot images**

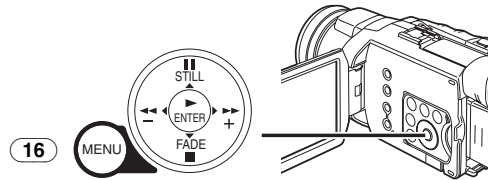
**1** Set [TAPE RECORDING MENU],  
[TAPE PLAYBACK MENU] or  
[CARD RECORDING MENU] >> [CARD] >>  
[PICT QUALITY] >> a desired image quality.

**RapidFire Consecutive Photoshot**

The still pictures can be recorded on a Card at regular intervals.

- Available only with [640×480] picture size.

**1** Set [CARD RECORDING MENU] >> [CARD]  
>> [BURST MODE] >> [ON].

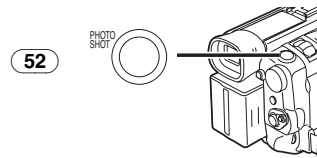


- The [ ] Indication appears.



**2** Keep pressing the [PHOTO SHOT] Button

[52].



- You can also activate RapidFire Consecutive Photoshot Function after pressing the [PHOTO SHOT] Button halfway. In this case, if the Image Stabilizer Function (-32-) is set to [ON], the Image Stabilizer Function works more effectively.
- When [ON] is selected, the still pictures can be recorded in approximately 0.7 second intervals until the [PHOTO SHOT] Button is released or 10 pictures are recorded. (You cannot use the RapidFire Consecutive Photoshot if the shutter speed is set to 1/2, 1/4, 1/8 or 1/15.)

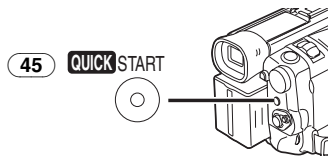
- For other notes concerning this item, see -75-.

## Quick Start

By pressing the [QUICK START] Button (45), the Camcorder will be ready for recording in approximately 1.7 seconds after the Camcorder is turned on.

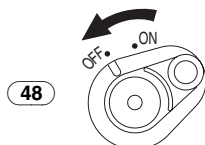
### 1 Press the [QUICK START] Button (45).

- The Quick Start Recording Lamp lights up.



### 2 Set the [OFF/ON] Switch (48) to [OFF].

- The Quick Start Recording Lamp remains lit.



### 3 Set the [OFF/ON] Switch (48) to [ON].

- The Camcorder will be ready for recording in approximately 1.7 seconds.

### To Cancel the Quick Start

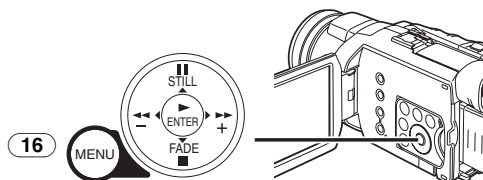
Keep the [QUICK START] Button pressed for approximately 2 seconds and make sure the Quick Start Recording Lamp is not lit.

- For other notes concerning this item, see -75-.

## Self-timer Recording

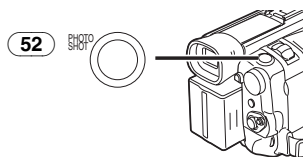
When you set the self-timer, the recording starts automatically after 10 seconds on the Card.

### 1 Set [TAPE RECORDING MENU] or [CARD RECORDING MENU] >> [CAMERA] >> [SELF TIMER] >> [ON].



- The [ ] Indication appears.

### 2 Press the [PHOTO SHOT] Button (52).



- The Recording Lamp (34) and the [ ] Indication flash and the recording starts after 10 seconds.

- To cancel the Self-timer Recording while the [ ] Indication is blinking, press the [MENU] Button.

- You can also use the RapidFire Consecutive Photoshot. (-30-)

- For other notes concerning this item, see -76-.

## Zoom In/Out Functions

This feature gives special effects to the picture by recording objects close by or with wide-angle shot.

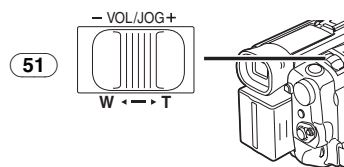
### When using [W/T] Lever (51)

#### 1 For wide-angle shots (zoom out):

Push the [W/T] Lever (51) towards [W].

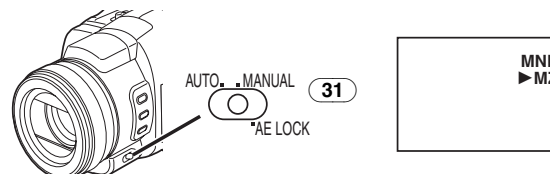
For close-ups (zoom in):

Push the [W/T] Lever towards [T].



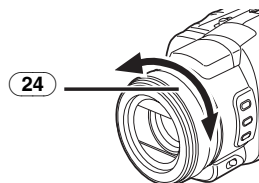
### When using Multi Manual Ring (24)

#### 1 Set the [AUTO/MANUAL/AE LOCK] Switch (31) to [MANUAL].

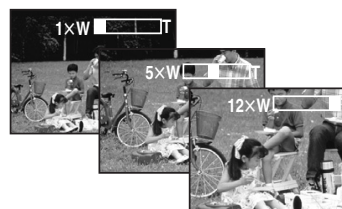


- The [MNL] Indication and [▶MZ] (Manual Zoom Mode) Indication appear. (When [▶MZ] Indication appears, the Camcorder is set to Auto Focus Mode.)

#### 2 Turn the Multi Manual Ring (24) to zoom in/out.



- Zoom speed changes according to the speed to turn the ring or to push the [W/T] Lever.
- Zoom Magnification Indication is displayed for a few seconds.



## ■ To Take Close-up Shots of Small Subjects

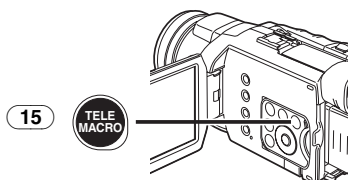
### (Macro Close-up Function)

When the zoom magnification is 1×, the Camcorder can focus on a subject that is as close as approximately 1.6 inches (4 cm) from the Lens. Small subjects like insects can be recorded with this function.

## ■ To Use the Tele-Macro Function

With the zoom magnification of 12×, the Camcorder can bring the subject into focus as close as approximately 19 inch (50 cm) from the Lens. Focusing only on the subject and displaying the background out of focus makes the picture more impressive.

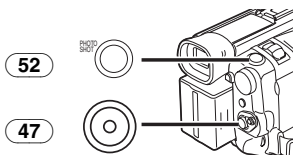
**1 Press the [TELE MACRO] Button (15).**



- The zoom magnification is temporarily set to 12× and the subject can be focused on as close as approximately 19 inch (50 cm).
- The [T.MACRO] Indication appears.



**2 Press the Recording Start/Stop Button (47) or the [PHOTO SHOT] Button (52).**



### To Cancel the Tele-Macro Function

Press the [TELE MACRO] Button (in this case, the zoom magnification is not restored). Or push the [W/T] Lever.

## ■ To Use the Zoom Microphone Function

Along with the zooming operation, the microphone's directional angle and sensitivity are varied for recording sounds.

- Set [TAPE RECORDING MENU] >> [RECORDING] >> [ZOOM MIC] >> [ON]. (The [Z.MIC] Indication is displayed.)

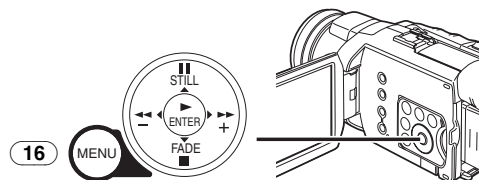


- For other notes concerning this item, see -76-.

## Digital Zoom Function

This function is useful when you want to record close-up shots of subjects located beyond a normal zoom range of 1× to 12× magnification. With the Digital Zoom Function, you can select a magnification from 30× up to 700×.

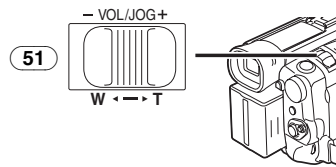
**1 Set [TAPE RECORDING MENU] >> [CAMERA] >> [D.ZOOM] >> [30×] or [700×].**



- 30×: Digital zooming to 30×
- 700×: Digital zooming to 700×



**2 Push the [W/T] Lever (51) towards [W] or towards [T] to zoom in or out.**



### To Cancel the Digital Zoom Function

Set [TAPE RECORDING MENU] >> [CAMERA] >> [D.ZOOM] >> [OFF].

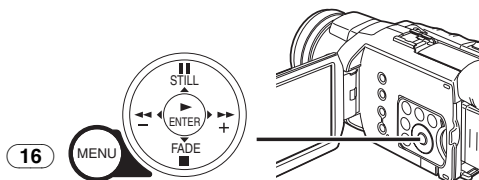
- For other notes concerning this item, see -76-.

## Image Stabilizer Function

If the Camcorder is shaken while recording, the camera shake in the image can be corrected.

- If the Camcorder shakes too much, the images may not be stabilized.

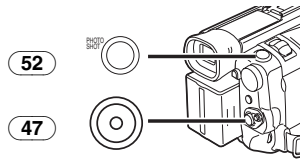
**1 Set [TAPE RECORDING MENU] or [CARD RECORDING MENU] >> [CAMERA] >> [EIS] >> [ON].**



- The [EIS] Indication appears.



- 2 Press the Recording Start/Stop Button (47) or [PHOTO SHOT] Button (52) to start recording.**



### To Cancel Image Stabilizer Function

Set [TAPE RECORDING MENU] or [CARD RECORDING MENU] >> [CAMERA] >> [EIS] >> [OFF].

- For other notes concerning this item, see -76-.

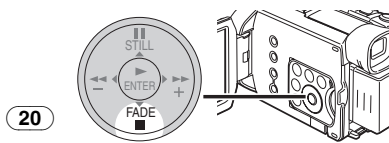
## Fade In/Out Functions

### Fade In

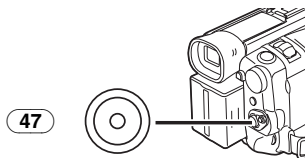
Fade In brings out images and sounds gradually from a black screen at the beginning of a scene.



- 1 Keep pressing the [FADE] Button (20) during the Recording Pause Mode.**



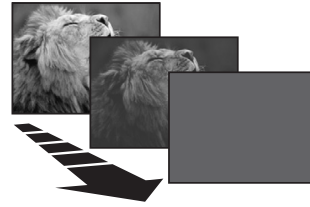
- The image fades out gradually.
- 2 When the image is completely gone, press the Recording Start/Stop Button (47) to start recording.**



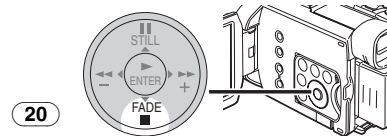
- 3 Release the [FADE] Button (20) about 3 seconds after starting recording.**
- The image reappears gradually.

### Fade Out

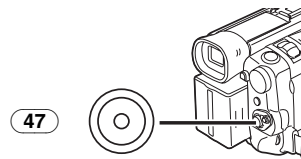
Fade Out causes images and sounds to disappear gradually, leaving a black screen at the end of a scene.



- 1 Keep pressing the [FADE] Button (20) while recording.**



- The image fades out gradually.
- 2 When the image is completely gone, press the Recording Start/Stop Button (47) to stop recording.**



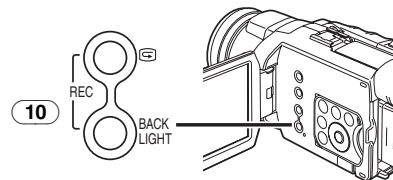
- 3 Release the [FADE] Button (20).**

- The still picture cannot fade in or fade out.

## Backlight Compensation Function

This prevents the subject from being recorded too darkly when backlit. (Backlight is the light that shines from behind the subject being recorded.)

- 1 Press the [BACK LIGHT] Button (10).**



- The [REC] Indication flashes and then is displayed.
- The entire screen becomes brighter.



### To Resume Normal Recording

Press the [BACK LIGHT] Button.

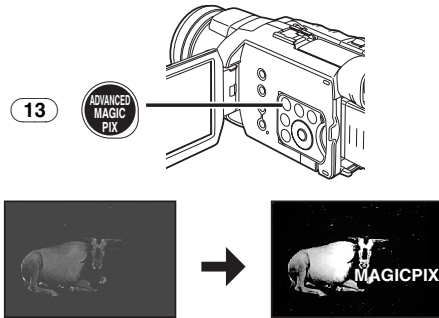
- For other notes concerning this item, see -76-.

## MagicPix Functions

### Advanced MagicPix Function

This function allows you to record color images brightly in a dark place.

- 1 Press the [ADVANCED MAGICPIX] Button **13** until the [MAGICPIX] Indication appears.



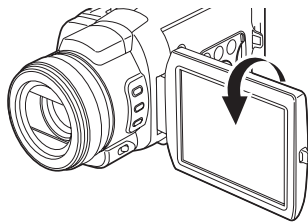
### 0 Lux MagicPix Function

Using the LCD Monitor light, a dark scene of almost 0 lux can be recorded.

- 1 Press the [ADVANCED MAGICPIX] Button **13** until the [0LUX MAGICPIX] Indication appears.



- The [REVERSE THE LCD MONITOR] Indication appears.
- 2 Rotate the LCD Monitor forward (to the lens side).



- The screen becomes white and the Viewfinder turns on.
- The available range of the LCD Monitor light is within approximately 3.9 feet (1.2 meter).

### To Cancel the MagicPix Functions

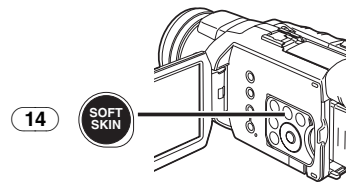
Press the [ADVANCED MAGICPIX] Button repeatedly until neither the [MAGICPIX] Indication nor the [0LUX MAGICPIX] Indication appears.

- For other notes concerning this item, see -76-.

## Soft Skin Function

This enables you to record skin colors in a softer tone. In order to get the best result, avoid background colors similar to the skin color of the subject. Otherwise, this may result in a softer background lacking in detail.

- 1 Press the [SOFT SKIN] Button **14**.



- The [SOFT SKIN] Indication appears.



- To obtain the best effect, we recommend taking an upper body shot, so that the upper part of the subject can be framed in the screen.

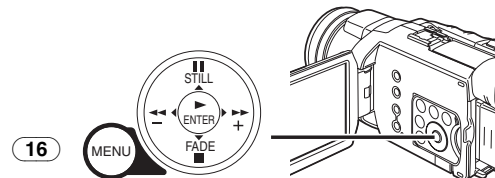
### To Cancel the Soft Skin Function

Press the [SOFT SKIN] Button.

## Wind Noise Reduction Function

This function reduces the sound of wind hitting the microphone when recording.

- 1 Set [TAPE RECORDING MENU] or [CARD RECORDING MENU] >> [RECORDING] >> [WIND CUT] >> [ON].



- The [WIND CUT] Indication appears.



### To Cancel the Wind Noise Reduction Function

Set [TAPE RECORDING MENU] or [CARD RECORDING MENU] >> [RECORDING] >> [WIND CUT] >> [OFF].

- For other notes concerning this item, see -77-.

## Wide/Pro-Cinema Function

You can record images compatible with a wide-screen format TV which has a Video terminal.

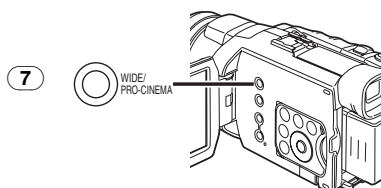
The image looks vertically stretched on the screen of the Camcorder.

- The aspect ratio of the playback images in the tape differs depending on the TV to be connected.

### Wide Function

The image is recorded with an aspect ratio of 16:9.

- 1 Press the [WIDE/PRO-CINEMA] Button (7).

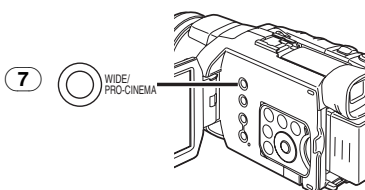


- The [WIDE] Indication appears.

### Pro-Cinema Function

In addition to the effects on Wide Function, images are recorded at a rate of 30 frames a second similar to cinema quality.

- 1 Press the [WIDE/PRO-CINEMA] Button (7) twice.



- The [PRO.CINE]/[FRAME] Indication appears.

### To Cancel the Wide/Pro-Cinema Function

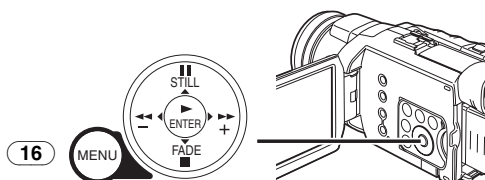
Press the [WIDE/PRO-CINEMA] Button until the [WIDE] or [PRO.CINE]/[FRAME] Indication disappears.

- For other notes concerning this item, see -77-.

## Cinema Function

This function is used for recording a cinema-like image.

- 1 Set [TAPE RECORDING MENU] >> [RECORDING] >> [CINEMA] >> [ON].



- Black bars appear at the top and bottom of the screen.



### To Cancel the Cinema Mode

Set [TAPE RECORDING MENU] >> [RECORDING] >> [CINEMA] >> [OFF].

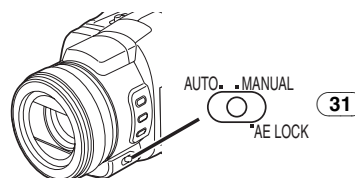
- For other notes concerning this item, see -77-.

## Recording in Special Situations

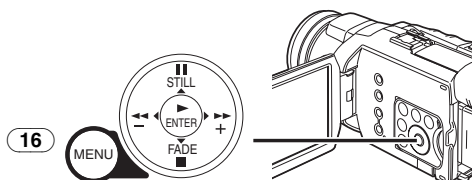
### (Program AE)

You can select optimal automatic exposure under specific recording situations.

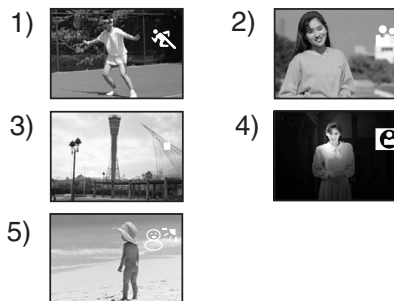
- 1 Set the [AUTO/MANUAL/AE LOCK] Switch (31) to [MANUAL].



- The [MNL] Indication appears.
- 2 Set [TAPE RECORDING MENU] or [CARD RECORDING MENU] >> [CAMERA] >> [PROG.AE] >> a desired mode ([Sports], [Portrait], [Low Light] or [Spotlight]).



- The Indication of the selected Mode appears.



- 1) [Sports] Sports Mode
  - For recording scenes involving quick movements, such as sports scenes.
- 2) [Portrait] Portrait Mode
  - Use when you want to make people (subjects) stand out from the background.
- 3) [Low Light] Low Light Mode
  - For brightening a dark scene.
- 4) [Spotlight] Spotlight Mode
  - For recording a subject under a spotlight.

### 5) [WB] Surf & Snow Mode

- For recording in glaring surroundings, such as ski slopes, beaches, etc.

#### To Cancel the Program AE Function

Set the [PROG.AE] on the [CAMERA] Sub-Menu to [OFF]. Or, set the [AUTO/MANUAL/AE LOCK] Switch to [AUTO].

- For other notes concerning this item, see -77-.

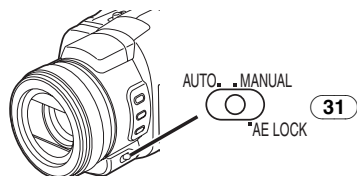
## Recording in Natural Colors

### (White Balance)

Depending on the scene or light condition, the Automatic White Balance Adjustment Mode may not be able to bring out natural colors. In this case, the white balance can be adjusted manually.

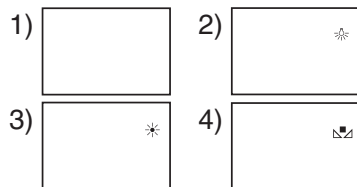
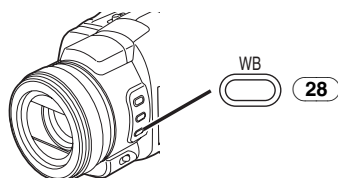
When the Camcorder is turned on with the Lens Cap on, the Automatic White Balance Adjustment may not function properly. Please turn on the Camcorder after removing the Lens Cap.

- 1 Set the [AUTO/MANUAL/AE LOCK] Switch (31) to [MANUAL].



- The [MNL] Indication appears.

- 2 Repeatedly press the [WB] Button (28) to select a desired White Balance Mode.



- If you hold down the [WB] Button when the [AUTO/MANUAL/AE LOCK] Switch is set to [MANUAL] or [AE LOCK], the Manual White Balance Adjustment Mode (MNL) is set.

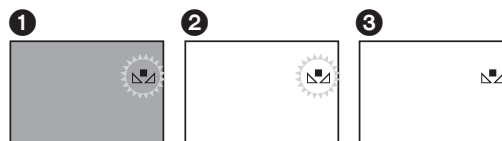
- 1) Automatic White Balance Adjustment
- 2) Indoor Mode (recording under incandescent lamp) [☀]
- 3) Outdoor Mode [★]
- 4) The white balance setting that was previously set manually [■]

### To Resume Automatic Adjustment

Press the [WB] Button repeatedly until none of the White Balance Mode Indications ([■], [☀], [★]) appear. Or, set the [AUTO/MANUAL/AE LOCK] Switch to [AUTO].

### About Black Balance Adjustment

Black Balance Adjustment is one of the functions of the 3CCD system. It automatically adjusts the hue of black color in the picture. When the Black Balance Adjustment is activated, the screen becomes dark for a moment.



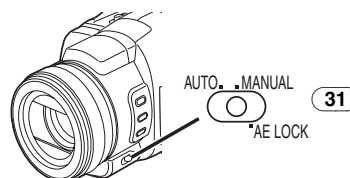
- 1 Adjusting the Black Balance (Blinking)
- 2 Adjusting the White Balance (Blinking)
- 3 Adjustment is completed. (Lit)

## Adjusting White Balance Manually

White Balance Adjustment recognizes the color of light and adjusts so that white will become pure white. The Camcorder determines the hue of light that comes through the Lens and the White Balance Sensor, thereby judging the recording condition, and selects the closest hue setting. This function is called Automatic White Balance Adjustment.

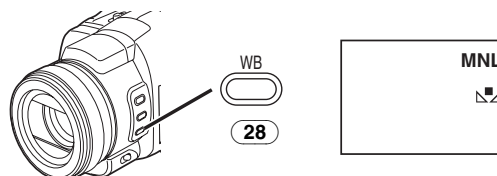
For light outside the functional Auto White Balance Adjustment range, use the Manual White Balance Adjustment Mode.

- 1 Set the [AUTO/MANUAL/AE LOCK] Switch (31) to [MANUAL].



- The [MNL] Indication appears.




- 2 Press the [WB] Button (28) until the [■] Indication is displayed.



- 3 Point the Camcorder at a full-screen white subject.

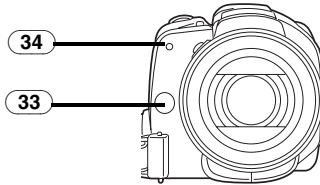
- 4 Keep pressing [WB] Button (28) until the [■] Indication stops flashing.

**To Resume Automatic Adjustment**

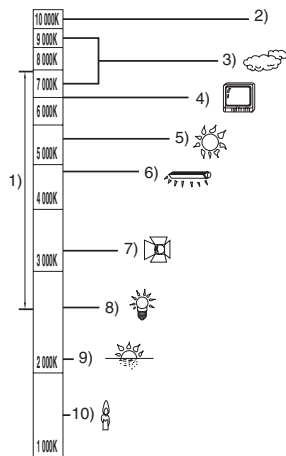
Press the [WB] Button repeatedly until none of the White Balance Mode Indications ([, [, []) appear. Or, set the [AUTO/MANUAL/AE LOCK] Switch to [AUTO].

**About White Balance Sensor**

The White Balance Sensor (33) determines the nature of the light source during recording.



- Do not cover the White Balance Sensor with your hand during recording because White Balance will not function normally.
- The red light from the Recording Lamp (34) will be reflected off your hand or an object, possibly causing the White Balance sensor to operate incorrectly and changing the coloring.



Outside of the effective range of Automatic White Balance Adjustment, the image will become reddish or bluish. Even within the effective range of Automatic White Balance Adjustment, the Automatic White Balance Adjustment may not function properly if there is more than one light source. In this case, adjust the White Balance.

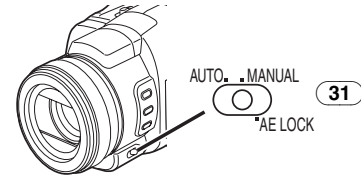
- 1) The effective range of Automatic White Balance Adjustment on this Camcorder
- 2) Blue sky
- 3) Cloudy sky (rain)
- 4) TV screen
- 5) Sunlight
- 6) White fluorescent lamp
- 7) Halogen light bulb
- 8) Incandescent light bulb
- 9) Sunrise or sunset
- 10) Candlelight

- For other notes concerning this item, see -77-.

**Manual Shutter Speed Adjustment**

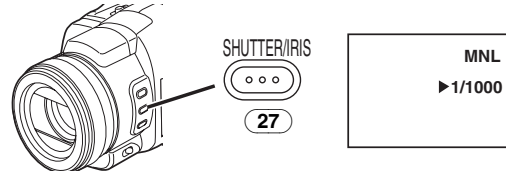
Useful for recording fast-moving subjects.

- 1 Set the [AUTO/MANUAL/AE LOCK] Switch (31) to [MANUAL].



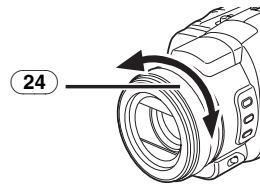
- The [MNL] Indication appears.

- 2 Press the [SHUTTER/IRIS] Button (27) once.



- The Shutter Speed Indication appears.

- 3 Turn the Multi Manual Ring (24) to adjust the shutter speed.

**Range of Shutter Speed Adjustment**

1/60–1/8000 s in Tape Recording Mode

1/2–1/2000 s in Card Recording Mode

The standard shutter speed is 1/60 s.

Selecting a speed closer to [1/8000] causes faster shutter speed.

**To Resume Automatic Adjustment**

Set the [AUTO/MANUAL/AE LOCK] Switch to [AUTO], or keep pressing the [SHUTTER/IRIS] Button.

**About the Card Slow Shutter**

When you adjust the shutter speed to 1/2, 1/4, 1/8 or 1/15 in Card Recording Mode, the Card Slow Shutter Mode is activated.

- The Slow Shutter Mode is cancelled and the shutter speed is set to 1/30 when the [OFF/ON] Switch or the Mode Dial is operated.
- In the Slow Shutter Mode:
  - the White Balance cannot be changed.
  - the Camcorder focuses on the subject manually.
- When you set to the Manual Focus Mode, the shutter speed is already set to 1/60 of a second. It will later return to the previous shutter speed of 1/60 when you go back to automatic mode. [MF] blinks while the subject is focused.



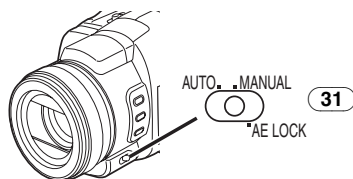
- For other notes concerning this item, see -77-.

## Manual Iris Adjustment

### (F Number)

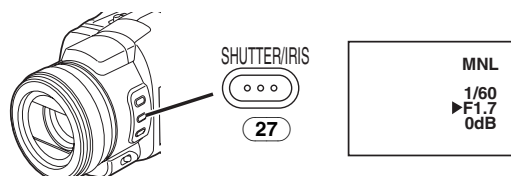
You can use this function when the screen is too bright or too dark.

- 1 Set the [AUTO/MANUAL/AE LOCK] Switch (31) to [MANUAL].



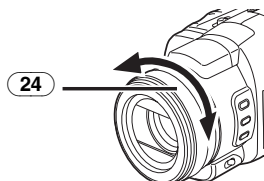
- The [MNL] Indication appears.

- 2 Press the [SHUTTER/IRIS] Button (27) twice.



- The Iris Indication appears.

- 3 Turn the Multi Manual Ring (24) to adjust the iris.



### Range of Iris Adjustment

CLOSE (Closed), F16, ..., F1.7,

OPEN (Opened) 0dB, ..., 18dB

When a value closer to [CLOSE] is selected, the image becomes darker.

When a value closer to [18dB] is selected, the image becomes brighter.

The value to which dB is attached indicates a Gain-up value. If this value is too large, the quality of the image deteriorates.

### To Resume Automatic Adjustment

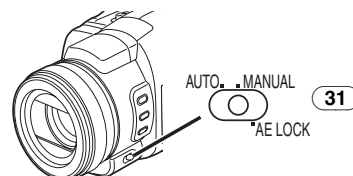
Set the [AUTO/MANUAL/AE LOCK] Switch to [AUTO], or keep pressing the [SHUTTER/IRIS] Button.

- For other notes concerning this item, see -78-.

## Manual Focus Adjustment

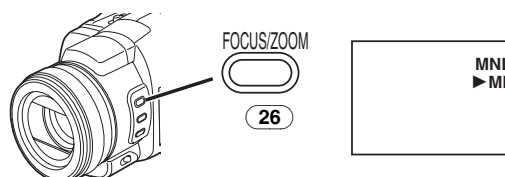
Focus can be adjusted manually for recording in a situation where auto focus may not function well.

- 1 Set the [AUTO/MANUAL/AE LOCK] Switch (31) to [MANUAL].



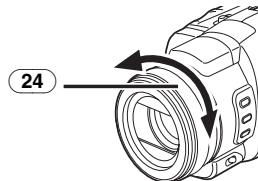
- The [MNL] Indication appears.

- 2 Press the [FOCUS/ZOOM] Button (26).



- The [▶MF] Indication (Manual Focus Mode) appears.

- 3 Turn the Multi Manual Ring (24) to adjust the focus.



### To Resume Automatic Adjustment

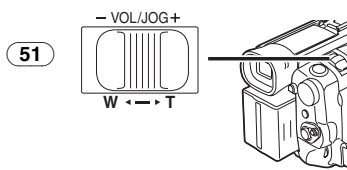
Set the [AUTO/MANUAL/AE LOCK] Switch to [AUTO].

## Recording with Fixed Brightness

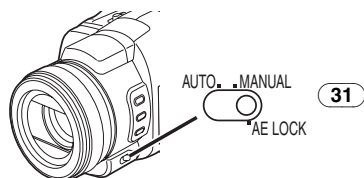
### (AE Lock)

This is a function for setting a fixed brightness. When recording in light with an extreme difference in the brightness of the background and the subject, such as a person standing in front of a dark background, the person can be recorded brightly if the brightness is adjusted to the person.

- 1 Push the [W/T] Lever (51) toward [T] to zoom in on the subject.



## 2 Set the [AUTO/MANUAL/AE LOCK] Switch 31 to [AE LOCK].



- The [AE LOCK] Indication flashes and then lights. The brightness of the picture is now locked to the value it had at the moment of setting the switch to [AE LOCK].

### To Cancel the AE Lock

Set the [AUTO/MANUAL/AE LOCK] Switch to [AUTO] or [MANUAL].

### To Lock the Brightness at a Desired Level

After Step 1, set the [AUTO/MANUAL/AE LOCK] Switch to [MANUAL] to adjust the iris/gain manually (-38-) and then set the [AUTO/MANUAL/AE LOCK] Switch to [AE LOCK].

- Set the AE Lock again when the [AUTO/MANUAL/AE LOCK] Switch is switched after the AE Lock has been set. (The brightness setting may be changed.)

- For other notes concerning this item, see -78-.

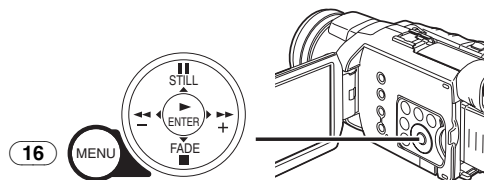
## Advanced Functions

This Camcorder comes with 5 professional functions (Advanced Functions) which come in handy for different recording conditions.

### Zebra Pattern

Using the Zebra Pattern makes it easy to adjust the brightness of the picture to an optimum level, even before you start recording.

- 1 Set [TAPE RECORDING MENU] or [CARD RECORDING MENU] >> [ADVANCED] >> [ZEBRA] >> [ON].



- Diagonal white bands (Zebra Pattern) and [ZEBRA] Indication appear on parts of the picture which are overexposed (extremely brightly lit and shiny subjects).

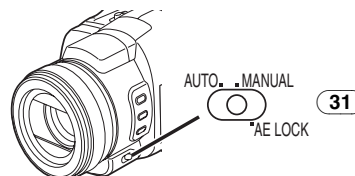


- To prevent recording of overexposed, whitish pictures, manually adjust the iris/gain (-38-) so that the Zebra Pattern disappears. The recorded picture may become dark.
- The Zebra Pattern is not recorded.

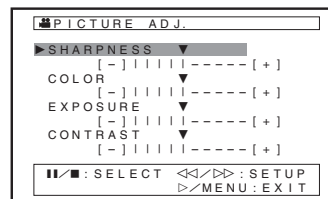
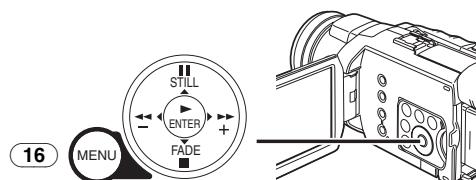
### Picture Adjustment

This enables the sharpness and color levels of the pictures to be adjusted during recording.

- 1 Set the [AUTO/MANUAL/AE LOCK] Switch 31 to [MANUAL].



- 2 Set [TAPE RECORDING MENU] or [CARD RECORDING MENU] >> [ADVANCED] >> [PICTURE ADJ.] >> [YES].

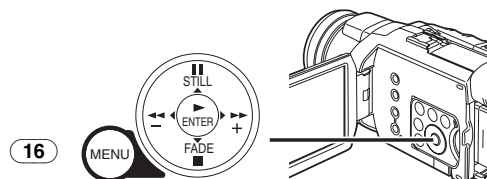


- When the level of the Bar Indication is set to a position other than [▼], the [P-ADJ] Indication appears.
- The setting procedure is the same as for [LCD/EVF SET] on the [LCD/EVF] Sub-Menu. (-21-)

### Microphone Sensitivity Level

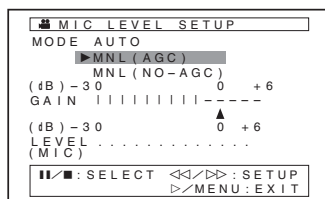
You can adjust the microphone sensitivity for recording.

- 1 Set [TAPE RECORDING MENU] >> [ADVANCED] >> [MIC LEVEL] >> [YES].



- 2 Press the [MNL] Button to select the [MNL (AGC\*, NO-AGC)].

- AGC\*: Auto Gain Control
- When you set [MODE] to any other setting than [AUTO], the Microphone Sensitivity Level appears.

**AUTO:**

AGC is activated, and the recording level is adjusted automatically.

**MNL (AGC):**

The desired recording level can be set. AGC will also be activated to reduce the amount of distortion in the audio.

**MNL (NO-AGC):**

AGC is not activated and so natural recording can be performed. Adjust in such a way that the sound will not be distorted at the maximum volume level. When the Zoom Microphone Function is set to [ON], adjust the recording level after pushing the [W/T] Lever toward [T].

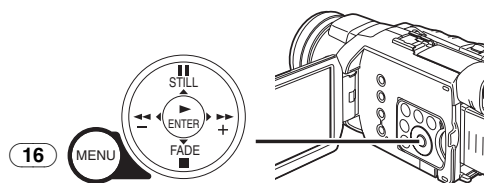
**3 Press the [▶▶] Button (18) or [◀◀] Button (21) to increase or decrease the bars of the [GAIN] Indication.**

- Adjust the [GAIN] value so that the last three Bars of the [LEVEL (MIC)] will not light red. (Otherwise, the Sound will be distorted.)

### ■ Bass Enhancer

It strengthens the lower area of the audio to record more powerful audio.

**1 Set [TAPE RECORDING MENU] >> [ADVANCED] >> [BASS ENHANCE] >> [3dB] or [6dB].**



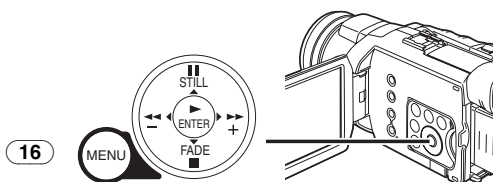
### To Cancel the Bass Enhancer Function

Set [TAPE RECORDING MENU] >> [ADVANCED] >> [BASS ENHANCE] >> [0dB].

### ■ Color Bar

This Camcorder displays a color bar chart which is useful for adjusting the picture quality of the TV or external monitor.

**1 Set [TAPE RECORDING MENU] >> [ADVANCED] >> [COLOR BAR] >> [ON].**

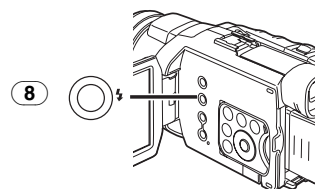


- The color bars are not recorded onto the card.
- For other notes concerning this item, see -78-.

## Using the Auto Pop-up Flash

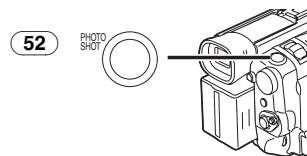
The Auto Pop-up Flash enables you to record still pictures in a dark place.

**1 Repeatedly press the [⚡] Button (8) to select a desired flash mode.**



- 1) Auto: The Camcorder perceives the brightness around the subject and the Auto Pop-up Flash is automatically popped up and activated. (In bright places, the indication disappears and the Auto pop-up Flash does not light.)
- 2) OFF: The Auto Pop-up Flash is not popped up and activated.
- 3) ON: The Auto Pop-up Flash is always popped up and activated.

**2 Press the [PHOTO SHOT] Button (52) halfway to pop up the Flash.**



- The Auto Pop-up Flash is not activated depending on the setting on the flash and the brightness around the subject.

**3 Press the [PHOTO SHOT] Button (52) fully which is already pressed halfway.**

- The flash lights and a still picture is recorded.
- After recording, close the Auto Pop-up Flash by pressing on it.

### To Activate the Auto Pop-up Flash with the [STILL] Button

If you press the [STILL] Button (17) in Step 2, the image becomes still. (It is canceled when you press the [STILL] Button again.) Record your favourite scene.

**Adjusting Brightness of the Video Flash**

Set [TAPE RECORDING MENU] or [CARD RECORDING MENU] >> [CAMERA] >> [FLASH LEVEL] >> a desired Flash Level.

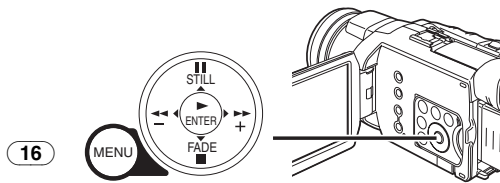
- Normally, set it to [NORMAL]. (The [⚡] Indication appears.)
- If the brightness is not enough in [NORMAL] setting, set it to [+] (the [⚡+] Indication appears), if it is too much, set it to [-] (the [⚡-] Indication appears).

• For other notes concerning this item, see -78-.

**Red Eye Reduction Function**

This function reduces a phenomenon which causes the subject's eyes to turn red when you record pictures with a flash.

**1** Set [TAPE RECORDING MENU] or [CARD RECORDING MENU] >> [CAMERA] >> [RED EYE] >> [ON].



- The [👁] Indication appears.

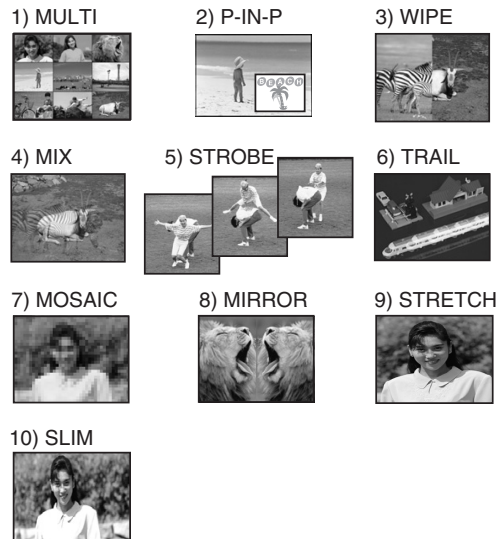
**To Cancel the Red Eye Reduction Function**

Set [TAPE RECORDING MENU] or [CARD RECORDING MENU] >> [CAMERA] >> [RED EYE] >> [OFF].

- For other notes concerning this item, see -79-.

**Digital Effect Functions**

This Camcorder is equipped with Digital Effect Functions that add special effects to the scene.

**Digital Effects 1 [EFFECT1]**

- 1) Multi Mode [MULTI]
- 2) Picture-In-Picture Mode [P-IN-P]
- 3) Wipe Mode [WIPE]
- 4) Mix Mode [MIX]
- 5) Strobe Mode [STROBE]
  - Records images with a stroboscopic effect.
- 6) Trailing Effect Mode [TRAIL]
  - Records images with a trailing effect.
- 7) Mosaic Mode [MOSAIC]
  - Produces a mosaic-like image.
- 8) Mirror Mode [MIRROR]
  - The right half of an image becomes a mirror image of the left half.
- 9) Stretch Mode [STRETCH]
  - The picture is expanded horizontally.
- 10) Slim Mode [SLIM]
  - The picture is expanded vertically.

**Digital Effects 2 [EFFECT2]**

11) NEGA



12) SEPIA



13) B/W



14) SOLARI



- 11) Negative Mode [NEGA]  
 ● The colors of the recorded image are inverted as seen in a negative.
- 12) Sepia Mode [SEPIA]  
 ● Records a scene with a brownish tint, like the color of old pictures.
- 13) Black & White Mode [B/W]  
 ● Records an image in black and white.
- 14) Solarisation Mode [SOLARI]  
 ● Records an image with a painting-like effect.

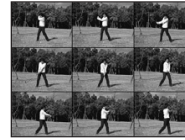
**To Select a Desired Digital Effect**

Set [TAPE RECORDING MENU] >> [DIGITAL] >> [EFFECT1] or [EFFECT2] >> a desired Digital Effect.

**To Cancel the Digital Effect**

Set [TAPE RECORDING MENU] >> [DIGITAL] >> [EFFECT1] or [EFFECT2] >> [OFF].  
 ● If the Camcorder is turned off, the [EFFECT2] settings are cancelled.

● For other notes concerning this item, see -79-.

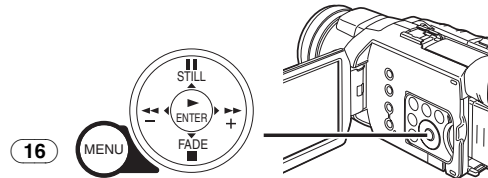
**Multi-Picture Mode****Strobe Multi-Picture Mode:**

You can capture and record 9 consecutive small still pictures.

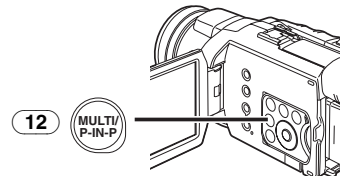
**Manual Multi-Picture Mode:**

You can manually capture and record 9 small still pictures.

- 1 Set [TAPE RECORDING MENU] >> [DIGITAL] >> [EFFECT1] >> [MULTI].



- 2 Set [TAPE RECORDING MENU] >> [DIGITAL] >> [MULTI MODE] >> [STROBE] or [MANUAL].
- 3 Press the [MULTI] Button (12).



- If [MANUAL] is selected, press the [MULTI] Button at each scene you want to capture.

**Deleting All the Captured Multi-Pictures**

While 9 multi-pictures are displayed, press the [MULTI] Button.

- If [MANUAL] has been selected, press the [MULTI] Button after 9 pictures are displayed.

**To Display the Multi-Pictures Again**

Press the [MULTI] Button for 1 second or longer.

**To Delete Multi-Pictures One by One**

**(When pictures were captured in [MANUAL])**

When the [MULTI] Button is pressed for 1 second or longer while the still pictures are displayed, the pictures captured last are deleted continuously.

- After still pictures are deleted one by one, they cannot be displayed again.

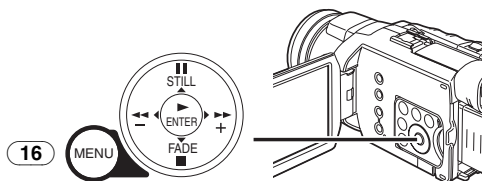
● For other notes concerning this item, see -79-.

## Picture-in-Picture Mode

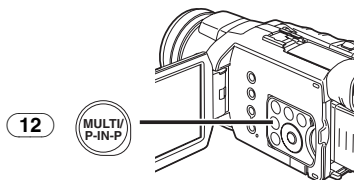


You can display a sub-screen (still picture) inside the screen.

**1** Set [TAPE RECORDING MENU] >> [DIGITAL] >> [EFFECT1] >> [P-IN-P].



**2** Aim the Camcorder at the scene you want to capture and press the [P-IN-P] Button (12) to insert a small still picture.



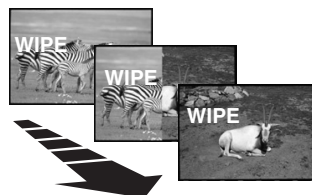
- A small still picture is displayed in a normal picture.
- If the [P-IN-P] Button is pressed again, the small still picture is cleared.

• For other notes concerning this item, see -79-.

## Wipe Mode and Mix Mode

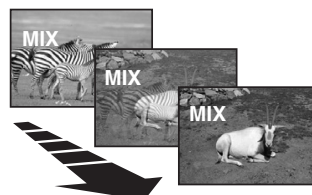
### Wipe Mode:

Like drawing a curtain, the still picture of the last recorded scene gradually changes to the moving image of a new scene.

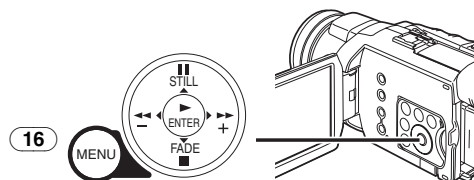


### Mix Mode:

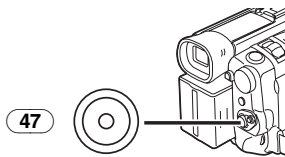
While the moving image of a new scene fades in, the still image of the last recorded scene gradually fades out.



**1** Set [TAPE RECORDING MENU] >> [DIGITAL] >> [EFFECT1] >> [WIPE] or [MIX].



• The [WIPE] or [MIX] Indication appears.  
**2** Press the Recording Start/Stop Button (47) to start recording.



**3** Press the Recording Start/Stop Button (47) to pause the recording.

- The last scene is stored in memory. The [WIPE] or [MIX] Indication changes to [WIPE] or [MIX].

**4** Press the Recording Start/Stop Button (47) to restart the recording.

- The last image of the previous scene gradually changes to the new scene.

• For other notes concerning this item, see -79-.

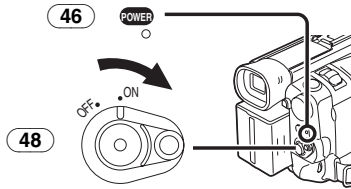
## Playback Mode

### Playing Back a Tape

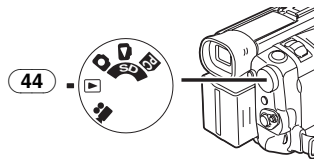
The recorded scene can be played back immediately after the recording.

**1 Set the [OFF/ON] Switch (48) to [ON].**

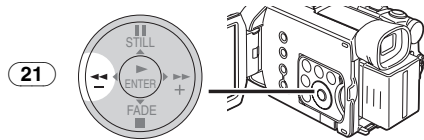
- The [POWER] Lamp (46) lights up.



**2 Set the Mode Dial (44) to Tape Playback Mode.**



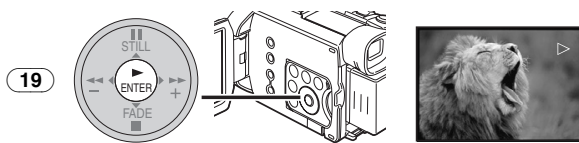
**3 Press the [◀◀] Button (21) to rewind the tape.**



- Rewind the tape to the point where you want to start playback.
- When the tape reaches the beginning, rewinding stops automatically.

**4 Press the [▶] Button (19) to start playback.**

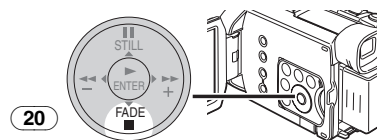
- The [▶] Indication appears.



- If a cassette recorded with a copyright protection signal is played back, the picture is distorted by mosaic-like patterns.

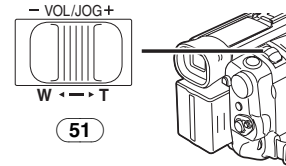
### To Stop Playback

Press the [■] Button (20).



### Adjusting the Sound Volume

To adjust the volume, push the [-VOL/JOG+] Lever (51) to display the [VOLUME] Indication. Push the [-VOL/JOG+] Lever towards [T] to increase the volume or push the [-VOL/JOG+] Lever towards [W] to decrease the volume. The [VOLUME] Indication goes off after the adjustment is finished.



To adjust the volume with the Remote Controller, press the [T] or [W] Button to display the [VOLUME] Indication. Press the [T] Button to increase the volume or press the [W] Button to decrease the volume. The [VOLUME] Indication goes off after the adjustment is finished.

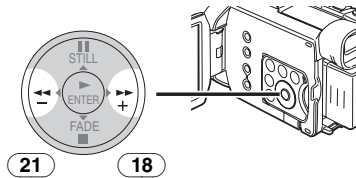


- The sound volume cannot be adjusted using the Remote Controller in Playback Zoom Mode. (-46-)

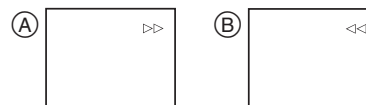
- For other notes concerning this item, see -79-.

### Finding a Scene You Want to Play Back

#### Cue/Review Playback



If the [▶▶] Button (18) or [◀◀] Button (21) is pressed during Playback, it turns to Cue Playback (A) or Review Playback (B).



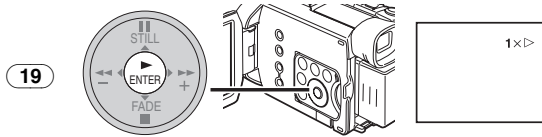
- If the Button is held continuously, it turns to Cue Playback or Review Playback until you release it.

### Variable Speed Search Function

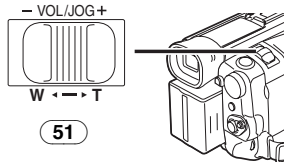
The speed of Cue Playback or Review Playback can be varied.

**1 During playback, press the [▶] Button (19).**

- The [1x▶] Indication appears.



**2 Push the [-VOL/JOG+] Lever (51) to select a desired search speed.**



The following 6 playback speeds are available for the Variable Speed Search Function in both the fast-forwarding and rewinding directions: 1/5x (slow playback in SP Mode only), 1/3x (slow playback in LP Mode only), 1x, 2x, 5x, 10x and 20x.

- This function works by pressing the [VAR. SEARCH] and [T] or [W] Button on the Remote Controller. (-14-)

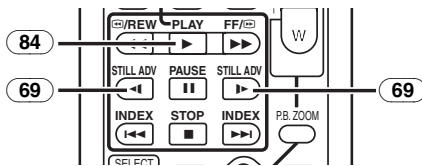
#### To Resume Normal Playback

Press the [▶] Button (19).

- During Cue or Review Playback, fast-moving images may show mosaic-like patterns.
- The sound is muted during search.

### Slow Motion Playback

This Camcorder can play back at a slow speed.



**1 Press the [▶] Button (84).**  
**2 Press the [◀] Button or [▶] Button (69) on the Remote Controller.**

- The [||▶] or [◀||] Indication appears.



- When the [◀] Button is pressed, Slow Motion Playback proceeds in the reverse direction. When the [▶] Button is pressed, Slow Motion Playback proceeds in the forward direction.

Scenes recorded in the SP Mode are played back at approximately 1/5th of the normal speed.

Scenes recorded in the LP Mode are played back at approximately 1/3rd of the normal speed.

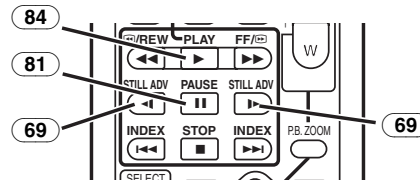
#### To Resume Normal Playback

Press the [▶] Button (84).

- If the Camcorder is left in the Slow Motion Playback Mode for more than 10 minutes, the Camcorder switches to Stop Mode to protect the video heads from excessive wear and tear. (It takes 10 minutes to play about 2 minutes of tape in SP mode, and about 3 minutes of tape in LP Mode.)

### Still Playback/Still Advance Playback

This Camcorder is capable of still picture playback and frame-advance playback.



**1 Press the [▶] Button (84).**  
**2 Press the [||] Button (81).**  
**3 Press the [◀] Button or [▶] Button (69) on the Remote Controller.**

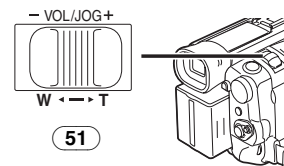
- The playback image stops in the Still Playback Mode.
- With each press of the [◀] Button, still pictures advance in the reverse direction. With each press of the [▶] Button, still pictures advance in the forward direction. If one of the buttons continues to be pressed, still pictures advance continuously 1 frame at a time until the button is released.

#### To Resume Normal Playback

Press the [▶] Button (84).

### Playback with Volume/Jog Lever

By pushing the [-VOL/JOG+] Lever (51) of the Camcorder in the Still Playback Mode, still pictures can be advanced one frame at a time in the forward or backward direction. If you keep pushing the Lever, still pictures advance continuously.



- If the Camcorder is left in the Still Playback Mode for more than 5 minutes, the Camcorder switches to the Stop Mode to protect the video heads from excessive wear and tear.

## Connecting Computer and Camcorder

When your OS is Windows 98SE, install USB Driver before connecting.

**Never connect the USB Connecting Cable until the USB Driver is installed.**

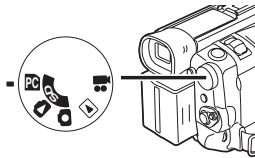
Before making these connections, turn off all devices which are to be connected.

- When using the USB Connection Kit, it is recommended that you use the AC Adaptor as the power supply of the Camcorder.

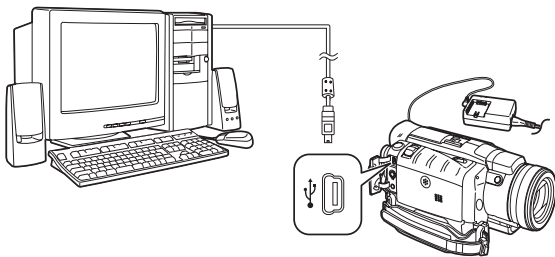
### ■ For Using Built-in SD Drive

By connecting the Camcorder and personal computer with the USB Cable, you can transfer still images saved on a Memory Card directly to your personal computer.

- 1 Insert the Memory Card into the Camcorder.
- 2 Set the Camcorder to PC Mode.



- 3 Connect the Camcorder to your personal computer with the USB Cable.



- It enters PC Connecting Mode.
- 4 Open [My Computer] and click [Removable Disk] (For Windows 98SE/Me/2000 users).  
Click [Open folder to view files using Windows Explorer] and then [OK] (For Windows XP users).
    - You can view images stored on the Memory Card and also save them to your hard disk.
    - Please do not change file or folder names on the personal computer. The images on the Memory Card may then not be viewable on the Camcorder.
- After making the connections, turn the connected equipment on.

- Appropriate driver to recognize Camcorder is automatically installed by Windows Plug and Play when connected for the first time.
- After the USB Driver is installed and USB Connection Cable is connected to the Camcorder, open [My Computer] or [Windows Explorer] to check that the drive is displayed as a removable disk drive (only when card is inserted into the Camcorder). It enables you to operate it in the same way as a floppy disk drive, and you can use the same drag and drop or copy methods.

## Using as a Web Camera

If the Camcorder is connected to your personal computer, you can send video and sound from the Camcorder to other parties via the network. (You can use the microphone equipped with the personal computer instead of the one on the Camcorder.)

### Note:

- Do not connect the USB Cable until the Video Stream Driver is installed.

**This feature can be used only if both parties are using the same operating system. Please see chart below:**

[Send]		[Receive]	[Software]
Windows XP	←OK→	Windows XP	Windows Messenger
Windows XP	←NG→	Windows 98SE/Me/2000	X
Windows 98SE/Me/2000	←OK→	Windows 98SE/Me/2000	MSN Messenger

### ■ Operating environment

#### OS:

IBM PC/AT compatible personal computer with preinstalled  
 Microsoft Windows XP Home Edition/  
 Professional SP1 or later  
 Microsoft Windows 2000 Professional SP4 or later  
 Microsoft Windows Me (Millennium Edition)  
 Microsoft Windows 98 Second Edition

#### CPU:

Intel Pentium III 450 MHz or higher  
 Celeron 400 MHz or higher (including compatible CPU)

#### RAM:

128 MB or more (256 MB or more recommended)

#### Free hard disk space:

250 MB or more

#### Interface:

USB

**Graphic display:**

High Color (16 bit) or more  
Desktop resolution of 800×600 pixels or more

**Communication Speed:**

56 kbps or faster is recommended

**Necessary software:**

Windows Messenger 5.0 or later (Windows XP)  
MSN Messenger (Windows 98SE/Me/2000)  
DirectX 9.0b or later (Windows XP)

**Other requirements (to send/receive audio):**

Sound card  
Speaker or headphones

**To use the Camcorder as a Web Camera, the following conditions must be met.**

- In this case, Windows XP SP1 or later is needed.
- To upgrade Windows XP to SP1, click [Start] >> [All Programs] >> [Windows Update]. (Requires Internet connection.)
- To upgrade Windows 2000 Professional to SP4, click [Start] >> [All Programs] >> [Windows Update]. (Requires Internet connection.)
- You have direct dial-up connection capability to the Internet (minimum requirement). Also, you and the other person(s) are on the same Network (LAN).
- Install Windows Messenger (Windows XP) or MSN Messenger (Windows 98SE/Me/2000). If you have a version older than 5.0, please download the latest version (5.0 or later) from the Microsoft Home Page.  
<http://www.microsoft.com/>  
<http://www.msn.com/>  
(For download and installation instructions, please refer to Help on the Home Page.)
- If the installed version is not the latest, update it by performing the Windows update.
- If you are connected to the Internet through a firewall or a router, proper communication will not be possible.

**Installing Video Stream Driver**

DirectX 9.0b must be installed in your PC if it is not already installed.

- When DirectX 9.0b is installed, applications supported by previous versions of DirectX may not run. In this case, consult the manufacturers of the applications disabled.

**1 Insert the supplied CD-ROM into the personal computer's CD-ROM drive.**

- Quit all applications.
- The [Setup] screen appears.

**2 Click [Video Stream Driver].**

- The set up program starts running.

**3 Depending on your system environment, installation of "DirectX 9.0b" may be**

**required. Click [Yes] and continue with installation.**

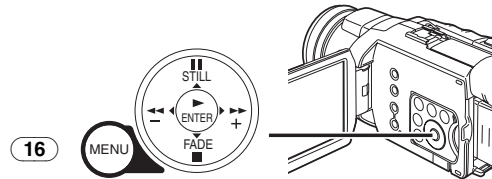
- After "DirectX 9.0b" is installed, the computer will restart.
- Do not remove the CD-ROM.
- Installation may take a little while.

**4 Finish installation by following the on-screen instructions.**

- Click [Next] and proceed with installation.
- After completing the installation, Click [Finish].

**5 Click [OK].****Connecting the Camcorder to personal computer (For Use as a Web Camera)**

- 1 Install the supplied Video Stream Driver on the provided CD-ROM.**
- 2 Set the Mode Dial to Tape Recording Mode.**
- 3 Set [CAMERA] >> [USB FUNCTION] >> [WEB CAMERA].**



- It enters WEB CAMERA Mode.
  - To send pictures recorded on a tape to another personal computer using Windows Messenger, set [PLAYBACK] >> [USB FUNCTION] >> [WEB CAMERA] on Tape Playback Mode before connecting the Camcorder to your personal computer.
- 4 Connect the Camcorder to a personal computer with the USB Connection Cable.**
  - **When the Camcorder and personal computer (with Windows 2000) are connected via USB Cable, a message, such as the one below, is displayed. However, testing by the manufacturer has confirmed functionality of this Camcorder with Windows 2000. Click [Yes] and proceed.**



- **For Windows 98SE/Me users, "USB Audio Device" is required. Click [Next] and proceed.**
- **If you use Windows 98SE, the OS installation CD may be required.**

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