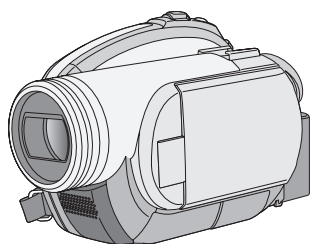


# Panasonic<sup>®</sup>

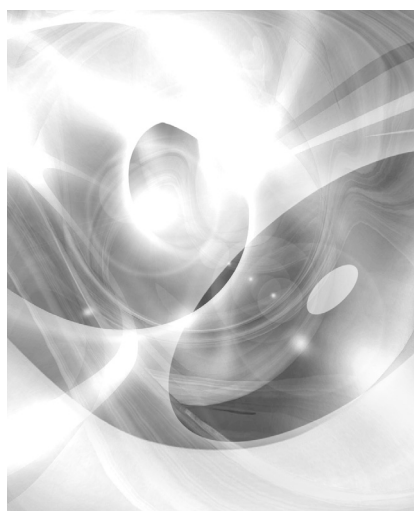


## Operating Instructions

DVD Video Camera

Model no. **VDR-D310GN**  
**VDR-D220GN**

Before use, please read these instructions completely.



LSQT1161 A

## Information for Your Safety

### WARNING:

TO REDUCE THE RISK OF FIRE,  
ELECTRIC SHOCK OR PRODUCT  
DAMAGE,

- DO NOT EXPOSE THIS APPARATUS TO RAIN, MOISTURE, DRIPPING OR SPLASHING AND THAT NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.
- USE ONLY THE RECOMMENDED ACCESSORIES.
- DO NOT REMOVE THE COVER (OR BACK); THERE ARE NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

### CAUTION!

- DO NOT INSTALL OR PLACE THIS UNIT IN A BOOKCASE, BUILT-IN CABINET OR IN ANOTHER CONFINED SPACE. ENSURE THE UNIT IS WELL VENTILATED. TO PREVENT RISK OF ELECTRIC SHOCK OR FIRE HAZARD DUE TO OVERHEATING, ENSURE THAT CURTAINS AND ANY OTHER MATERIALS DO NOT OBSTRUCT THE VENTILATION VENTS.
- DO NOT OBSTRUCT THE UNIT'S VENTILATION OPENINGS WITH NEWSPAPERS, TABLECLOTHS, CURTAINS, AND SIMILAR ITEMS.
- DO NOT PLACE SOURCES OF NAKED FLAMES, SUCH AS LIGHTED CANDLES, ON THE UNIT.
- DISPOSE OF BATTERIES IN AN ENVIRONMENTALLY FRIENDLY MANNER.

The socket outlet shall be installed near the equipment and easily accessible.  
The mains plug of the power supply cord shall remain readily operable.  
To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from AC receptacle.

Product Identification Marking is located on the bottom of unit.

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

### Use only the recommended accessories.

- Do not use any other AV/S cables and USB cables (VDR-D310) except the supplied one.
- When you use the cable which are sold separately, please make sure to use the one whose length is less than 3 meters.

CLASS 1  
LASER PRODUCT

IEC 60825-1:2001

### CAUTION

This product contains a laser diode of higher class than 1. To ensure continued safety, do not remove any covers or attempt to gain access to the inside of the product. Refer all servicing to qualified personnel.

### -If you see this symbol-

#### Information on Disposal in other Countries outside the European Union



This symbol is only valid in the European Union.  
If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

## ■ Indemnity concerning recording content

The manufacturer shall in no event be liable for the loss of recordings due to malfunction or defect of this unit, its accessories or recordable media.

## ■ 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.**

- SDHC Logo is a trademark.
- miniSD Logo is a trademark.
- The Movie Camera uses copyright-protected technologies and is protected by the patented technologies and intellectual properties of Japan and the U.S. To use these copyright-protected technologies, authorization of the Macrovision Company is required. It is prohibited to disassemble or modify the Movie Camera.
- Manufactured under license from Dolby Laboratories.  
"Dolby" and the double-D symbol are trademarks of Dolby Laboratories.
- LEICA is a registered trademark of Leica microsystems IR GmbH and DICOMAR is a registered trademark of Leica Camera AG.
- Other names of systems and products mentioned in these instructions are usually the registered trademarks or trademarks of the manufacturers who developed the system or product concerned.

- Depending on the model, some functions are not available.
- Features may vary, so please read carefully.

These operating instructions are designed for use with models VDR-D310 and VDR-D220. Pictures may be slightly different from the original.

- The illustrations used in these operating instructions show model VDR-D310, however, parts of the explanation refer to different models.

## Contents

### Information for Your Safety..... 2

### Before using

|                                                |           |
|------------------------------------------------|-----------|
| <b>Features .....</b>                          | <b>6</b>  |
| <b>Accessories .....</b>                       | <b>8</b>  |
| <b>Parts identification and handling .....</b> | <b>9</b>  |
| Using the LCD monitor .....                    | 12        |
| Using the viewfinder .....                     | 13        |
| Using the remote control (VDR-D310) .....      | 13        |
| <b>Discs and cards.....</b>                    | <b>15</b> |
| Discs that can be used on this unit.....       | 15        |
| Cards that you can use with this unit.....     | 19        |
| Disc and card handling.....                    | 20        |

### Setup

|                                                    |           |
|----------------------------------------------------|-----------|
| <b>Power supply .....</b>                          | <b>21</b> |
| Charging the battery .....                         | 21        |
| Connecting to the AC outlet .....                  | 25        |
| Turning the unit on/off.....                       | 25        |
| <b>Inserting/removing a disc.....</b>              | <b>26</b> |
| <b>Inserting/removing an SD card.....</b>          | <b>28</b> |
| <b>Selecting a mode.....</b>                       | <b>29</b> |
| <b>How to use the joystick .....</b>               | <b>29</b> |
| <b>Switching the language .....</b>                | <b>33</b> |
| <b>Using the menu screen.....</b>                  | <b>33</b> |
| <b>Setting date and time.....</b>                  | <b>35</b> |
| <b>Adjusting LCD monitor/<br/>viewfinder .....</b> | <b>36</b> |

### Recording

|                                                                               |           |
|-------------------------------------------------------------------------------|-----------|
| <b>Before recording .....</b>                                                 | <b>37</b> |
| <b>Recording motion pictures .....</b>                                        | <b>39</b> |
| Recording modes and recordable time<br>available for the motion picture ..... | 40        |
| <b>Recording still pictures</b>                                               |           |
| <b>(JPEG still pictures) .....</b>                                            | <b>42</b> |
| Number of pixels and picture quality<br>for still picture recording .....     | 45        |
| <b>Various recording functions .....</b>                                      | <b>46</b> |
| Zoom in/out function .....                                                    | 46        |
| Recording yourself .....                                                      | 47        |
| Backlight compensation function.....                                          | 47        |
| Fade in/fade out function.....                                                | 48        |

|                                                    |           |
|----------------------------------------------------|-----------|
| Soft skin mode .....                               | 49        |
| Tele macro function (VDR-D310) .....               | 49        |
| Colour night view function .....                   | 50        |
| Self-timer recording.....                          | 50        |
| Recording guideline function.....                  | 51        |
| Wide mode.....                                     | 51        |
| Image stabilizer function .....                    | 51        |
| Wind noise reduction function.....                 | 52        |
| <b>Manual recording functions .....</b>            | <b>52</b> |
| Scene mode.....                                    | 52        |
| Manual focus adjustment .....                      | 53        |
| White balance .....                                | 54        |
| Manual shutter speed/<br>aperture adjustment ..... | 55        |

### Playback

|                                      |           |
|--------------------------------------|-----------|
| <b>Motion picture playback .....</b> | <b>57</b> |
| <b>Still picture playback</b>        |           |
| <b>(JPEG still pictures) .....</b>   | <b>61</b> |

### Editing

|                                    |           |
|------------------------------------|-----------|
| <b>Editing scenes.....</b>         | <b>63</b> |
| Deleting scenes .....              | 63        |
| Dividing a scene.....              | 64        |
| Combining scenes .....             | 64        |
| <b>Using playlists .....</b>       | <b>65</b> |
| What is a playlist? .....          | 65        |
| Creating a new playlist.....       | 65        |
| Playing back a playlist.....       | 66        |
| Editing a playlist.....            | 66        |
| <b>Editing still pictures.....</b> | <b>70</b> |
| Deleting still pictures .....      | 70        |
| Locking still pictures.....        | 71        |
| DPOF setting .....                 | 71        |

### Disc and card management

|                                   |           |
|-----------------------------------|-----------|
| <b>Disc management .....</b>      | <b>73</b> |
| Finalizing a disc .....           | 73        |
| Un-finalizing a DVD-RW .....      | 74        |
| Protecting a disc .....           | 74        |
| Formatting discs.....             | 74        |
| Displaying disc information ..... | 75        |
| <b>Card management.....</b>       | <b>75</b> |
| Formatting an SD card.....        | 75        |

## With other products

|                                                             |           |
|-------------------------------------------------------------|-----------|
| <b>With a TV .....</b>                                      | <b>77</b> |
| Playback on TV .....                                        | 77        |
| <b>With a DVD recorder/player .....</b>                     | <b>78</b> |
| Playback on DVD recorder,<br>DVD player, computer etc. .... | 78        |
| Dubbing recordings<br>onto a DVD recorder's hard disk ..... | 79        |
| <b>With a VCR .....</b>                                     | <b>80</b> |
| Dubbing images<br>onto other video devices .....            | 80        |
| <b>With a printer (PictBridge) .....</b>                    | <b>80</b> |

## Others

|                                                               |            |
|---------------------------------------------------------------|------------|
| <b>Menus .....</b>                                            | <b>83</b>  |
| Menu list .....                                               | 83         |
| Other menus .....                                             | 84         |
| <b>Indications .....</b>                                      | <b>85</b>  |
| Indications .....                                             | 85         |
| Messages .....                                                | 88         |
| <b>Functions that cannot be used<br/>simultaneously .....</b> | <b>90</b>  |
| <b>Frequently asked questions .....</b>                       | <b>91</b>  |
| <b>Troubleshooting .....</b>                                  | <b>92</b>  |
| <b>Cautions for use .....</b>                                 | <b>96</b>  |
| <b>Explanation of terms .....</b>                             | <b>99</b>  |
| <b>Specifications .....</b>                                   | <b>101</b> |
| Number of recordable pictures<br>on an SD card .....          | 103        |

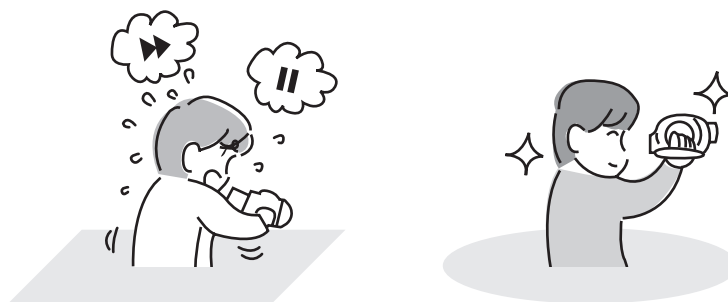
## Before using

## Features

### ■ Easy recording! (→ 39)

No need to search for the recording start position.

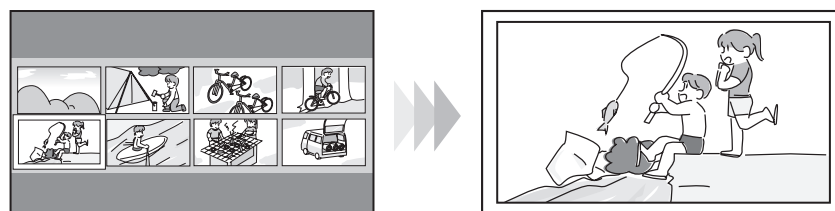
The new recording will not overwrite any previously recorded scene.



### ■ Easy playback! (→ 57)

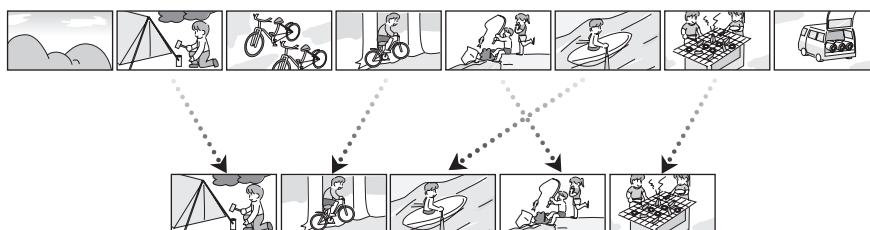
Recorded scenes are displayed as thumbnails.

You can easily search for the scenes you want to watch.



### ■ Editing scenes! (→ 63, 65)

You can create an original video (playlist) by collecting your favourite scenes together and then easily dub this video to a VCR or a DVD recorder hard disk.



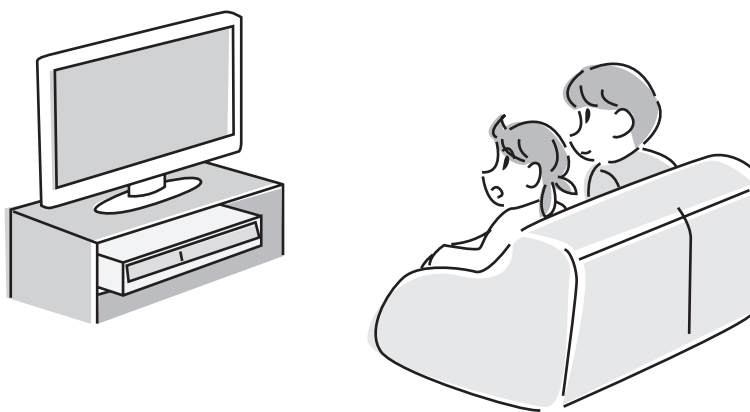
## Before using

**If you insert a DVD-RW or a DVD-R disc recorded in this unit (that has not been finalized) into another device such as DVD recorder, computer, etc., the disc may become unusable. Be sure to finalize the disc on this unit before inserting it in other devices. (→ 73)**

### ■ Using with DVD player/recorder! (→ 78)

Just insert the disc into a DVD player/recorder compatible with 8 cm discs to play back the scenes recorded with this unit on it.

If you have a DVD recorder with hard disk, you can dub scenes recorded on a disc with this unit to the hard disk.



### ■ Using with a computer! (VDR-D310) (Refer to the operating instructions for PC connection.)

You can enjoy editing scenes with the software on the supplied CD-ROM and creating original DVD-Video discs.



## Before using

### Accessories

Check the accessories before using this unit.

**Battery pack  
(VDR-D310)**



**Battery pack  
(VDR-D220)**



**AC adaptor**



**DC cable**



**AV/S cable**



**AC cable**



**Remote control  
(VDR-D310)  
Button-type battery  
(VDR-D310)**



**Lens cap**



**USB cable  
(VDR-D310)**



**CD-ROM  
(VDR-D310)**



**Disc cleaning cloth**



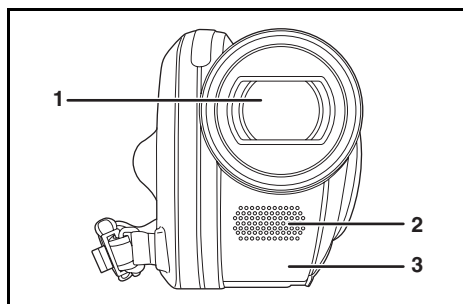
### Optional accessories

Some optional accessories may not be available in some countries.

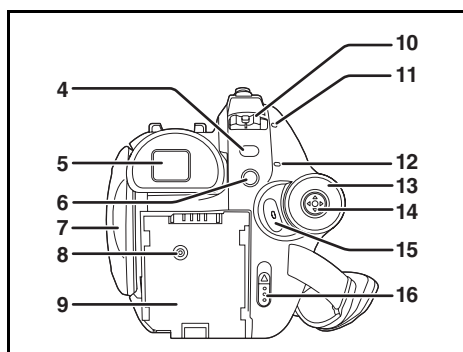
|                                                             |
|-------------------------------------------------------------|
| AC adaptor (VW-AD11GN)                                      |
| Battery pack (lithium/CGR-DU06/640 mAh)<br>(VDR-D220)       |
| Battery pack (lithium/CGA-DU12/1150 mAh)                    |
| Battery pack (lithium/CGA-DU14/1360 mAh)                    |
| Battery pack (lithium/CGA-DU21/2040 mAh)                    |
| Wide conversion lens (VW-LW3707M3E)<br>(VDR-D310)           |
| Tele conversion lens (VW-LT3714ME)<br>(VDR-D310)            |
| Filter kit (VW-LF37WE)                                      |
| Video DC light (VW-LDC10E)                                  |
| Light bulb for video DC light (VZ-LL10E)                    |
| Stereo microphone (VW-VMS2E)<br>(VDR-D310)                  |
| Tripod (VW-CT45E)                                           |
| 8 cm DVD-RAM disc (single sided/LM-AF30E)                   |
| 8 cm DVD-RAM disc (double sided/<br>LM-AF60E)               |
| 8 cm DVD-RW disc (single sided/LM-RW30E)                    |
| 8 cm DVD-RW disc (double sided/<br>LM-RW60E)                |
| 8 cm DVD-R disc (single sided/LM-RF30E)                     |
| 8 cm DVD-R disc (double sided/LM-RF60E)                     |
| 8 cm DVD-R DL disc (dual layer on single<br>side/LM-RF55LE) |

Before using

## Parts identification and handling



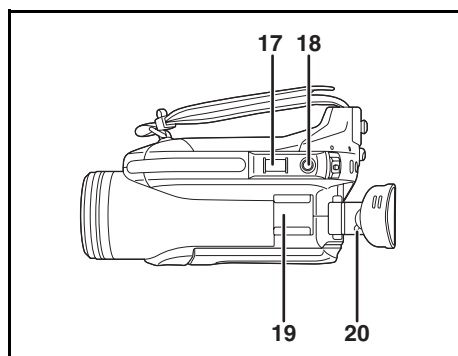
- 1 Lens (LEICA DICOMAR) (VDR-D310)  
Lens (VDR-D220)
- 2 Microphone (built-in, stereo)
- 3 White balance sensor (→ 55)  
Remote control sensor (VDR-D310) (→ 14)



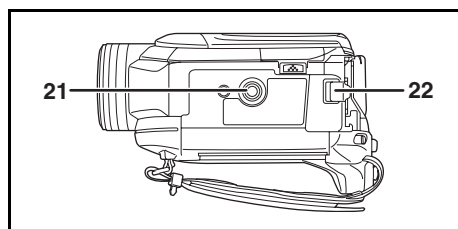
- 4 Menu button [MENU] (→ 33)
- 5 Viewfinder (→ 13)
- 6 Delete button [ ] (→ 63, 67, 70)
- 7 LCD monitor open part (→ 12)
- 8 DC input terminal [DC/C.C. IN] (→ 25)
- 9 Battery holder (→ 21)
- 10 Power switch [OFF/ON] (→ 25)
- 11 Status indicator (→ 25)
- 12 Disc/computer access lamp [ACCESS/PC] (VDR-D310) (→ 26) (Refer to the operating instructions for PC connection.)

Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the viewfinder screen. However, this is not a malfunction and does not affect the recorded picture.

- Disc access lamp [ACCESS/PC] (VDR-D220) (→ 26)
- 13 Mode dial (→ 29)
- 14 Joystick (→ 29)
- 15 Recording start/stop button (→ 39)
- 16 Disc eject lever [DISC EJECT] (→ 26)

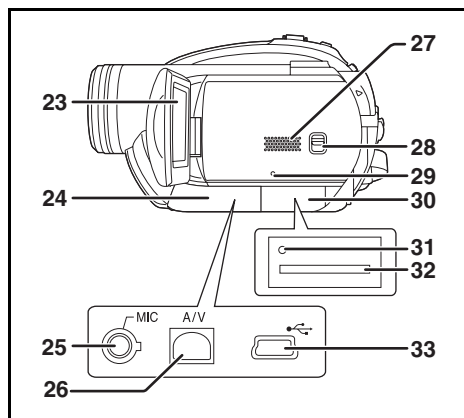


- 17 When recording: Zoom lever [W/T] (→ 46)  
When playing back: Volume lever [–VOL+] (→ 59)
- 18 Photoshot button [ ] (→ 42)
- 19 Accessory shoe
  - Accessories, such as a video DC light (optional), are attached here.
- 20 Eyepiece corrector knob (→ 36)



- 21 Tripod receptacle (→ 12)
- 22 Battery release lever [BATTERY] (→ 21)

## Before using



### 23 LCD monitor (→ 12)

Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the LCD monitor screen. However, this is not a malfunction and does not affect the recorded picture.

### 24 Terminal cover

### 25 Microphone terminal [MIC] (VDR-D310)

- A compatible plug-in powered microphone can be used as an external microphone.
- When the unit is connected with the AC adaptor, sometimes noise may be heard depending on the microphone type. In this case, please switch to the battery for the power supply and the noise will stop.

### 26 Audio-video output terminal [A/V] (→ 77, 80)

### 27 Speaker

### 28 Mode select switch [AUTO/MANUAL/ FOCUS] (→ 38, 52, 53)

### 29 Reset button [RESET] (→ 95)

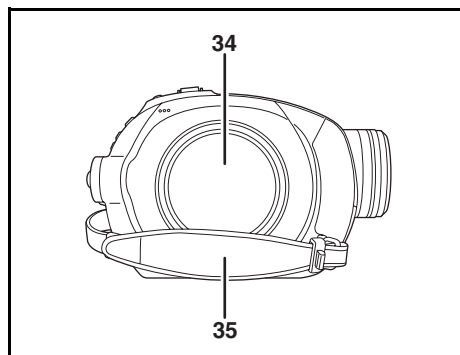
### 30 Card slot cover [SD CARD] (→ 28)

### 31 Card access lamp (→ 29)

### 32 Card slot (→ 28)

### 33 USB terminal [ ] (→ 80)

(Refer to the operating instructions for PC connection.) (VDR-D310)



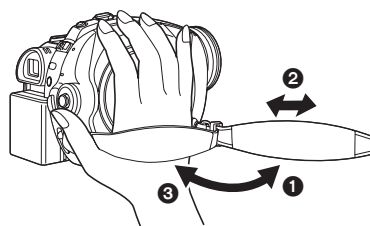
### 34 Disc compartment (→ 26)

### 35 Grip belt (→ 10)

## Using grip belt

Adjust the belt length so it fits your hand.

## Adjust the belt length and the pad position.



① Flip the belt.

② Adjust the length.

③ Replace the belt.

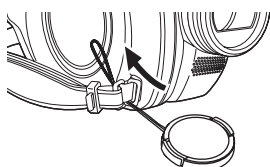
## Attaching the lens cap

Attach the lens cap to protect the surface of the lens.

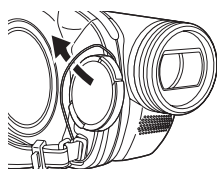
- When the MC protector or the ND filter of the Filter Kit (VW-LF37WE; optional) is attached, use the lens cap included in the Filter Kit.

Before using

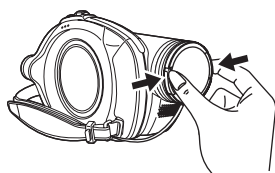
- 1 Pass the end of the lens cap cord through the belt.



- 2 Pass the lens cap through the loop.

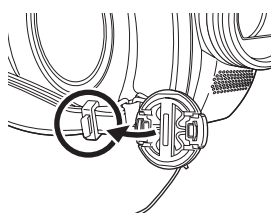


- 3 To attach or remove the lens cap, hold both sides of the lens cap with the tips of your finger and thumb.



#### During recording

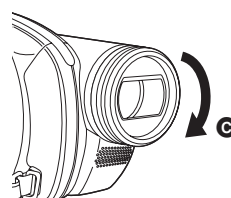
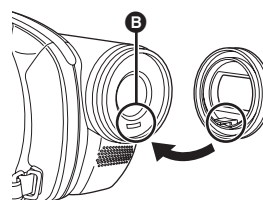
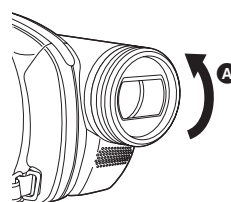
The removed lens cap can be attached to the lens cap fixture.



#### Lens hood

##### ■ VDR-D310

Rotate the lens hood counter-clockwise **A** to remove it.  
In order to attach it, place into slot **B**, and then rotate it clockwise **C**.



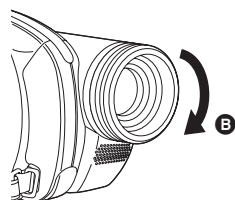
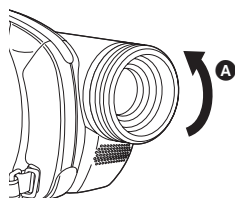
- Attach the MC protector or the ND filter of the Filter Kit (VW-LF37WE; optional) in front of the lens hood. Do not attach the other accessories on the hood. (Except for the lens cap) (Refer to the operating instructions for the Filter Kit.)
- When attaching the tele conversion lens (VW-LT3714ME; optional) or the wide conversion lens (VW-LW3707M3E; optional), first remove the lens hood. (Refer to the operating instructions for the tele conversion lens or the wide conversion lens.)

## Before using

- When 2 lens accessories, such as the ND filter and tele conversion lens, are attached and the W/T lever is pressed toward the W side, the 4 corners of an image will be darkened. (Vignetting)

### ■ VDR-D220

Rotate the lens hood counter-clockwise **A** to remove it. In order to attach it, rotate it clockwise **B**.

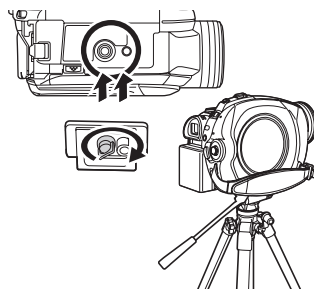


- Do not attach the accessories on the hood. (Except for the lens cap)
- When attaching the MC protector or the ND filter of the Filter Kit (VW-LF37WE; optional), first remove the lens hood. (Refer to the operating instructions for the accessories.)

### Tripod receptacle

This is a hole for attaching the unit to the optional tripod.

(Please carefully read the operating instructions for how to attach the unit to the tripod.)

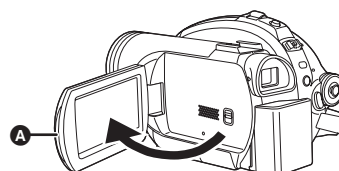


- When the tripod is used, the card slot cover cannot be opened. Insert an SD card before attaching this unit to the tripod. (→ 28)

## Using the LCD monitor

You can record the image while viewing it on the LCD monitor.

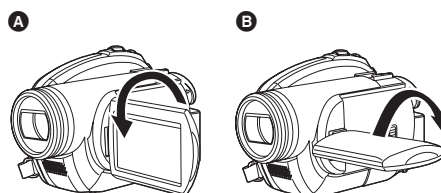
- Place your finger on the LCD monitor open part **A** and pull the LCD monitor out in the direction of the arrow.



- It can open up to 90°.

- Adjust the angle of the LCD monitor as desired.

- It can rotate up to 180° **A** towards the lens or 90° **B** towards the viewfinder.

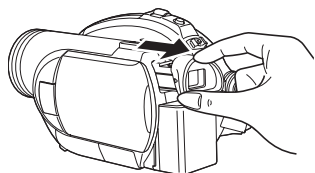


## Before using

- The brightness and colour level of the LCD monitor can be adjusted from the menu. (→ 36)
- The unit may be damaged or fail if the LCD monitor is forcibly opened or rotated.
- If the LCD monitor is rotated by 180° towards the lens and the viewfinder is extended (when recording yourself), the LCD monitor and the viewfinder simultaneously light.

## Using the viewfinder

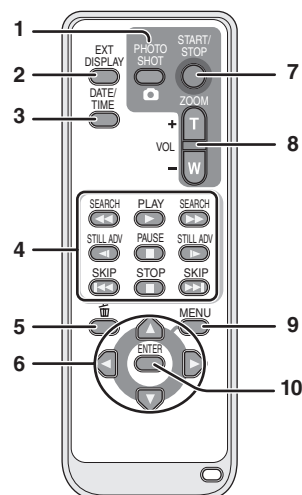
**Pull out the viewfinder.**



The viewfinder will be activated. (If the LCD monitor is opened, the viewfinder will be deactivated.)

- The brightness of the viewfinder (→ 36) and the field of view (→ 36) can be adjusted.

## Using the remote control (VDR-D310)



- 1 Photoshot button [PHOTO SHOT, ]\*
- 2 On-screen display button [EXT DISPLAY] (→ 78)
- 3 Date/time button [DATE/TIME] (→ 35)
- 4 Playback operation buttons (→ 58)
- 5 Delete button []\*
- 6 Direction buttons [, , , , ] (→ 34)
- 7 Recording start/stop button [START/STOP]\*
- 8 Zoom/volume buttons [ZOOM, VOL]\*
- 9 Menu button [MENU]\* (→ 34)
- 10 Enter button [ENTER] (→ 34)

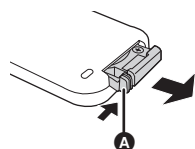
\* means that these buttons function in the same manner as the corresponding buttons on the unit.

## ■ Install a button-type battery

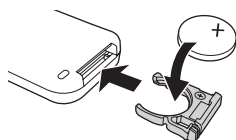
Install the supplied button-type battery in the remote control before using it.

**Before using**

- 1 While pressing the stopper **A**, pull out the battery holder.**



- 2 Set the button-type battery with its (+) mark facing upward and then put the battery holder back in place.**

**■ Concerning the button-type battery**

- When the button-type battery runs down, replace it with a new battery (part number: CR2025). The battery should normally last about 1 year, however this depends on how frequently the unit is used.
- Keep the button-type battery out of the reach of children.

**CAUTION**

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

**Warning**

Risk of fire, explosion and burns. Do not recharge, disassemble, heat above 60 °C or incinerate.

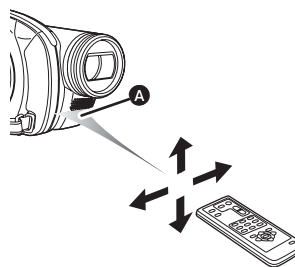
**Warning**

Keep the Button-Type battery out of the reach of children. Never put Button-Type battery in mouth. If swallowed call your doctor.

**■ Remote control usable range**

The distance between the remote control and the unit's remote control sensor **A**: Within approx. 5 m

Angle: Approx. 10° up and 15° down, left, and right



- The remote control is intended for indoor operation. Outdoors or under strong light, the unit may not operate properly even within the usable ranges.

Before using

## Discs and cards

### Discs that can be used on this unit

| Disc type                                     | DVD-RAM<br>8 cm<br>Single sided/<br>double sided                                                           | DVD-RW<br>8 cm<br>Single sided/double sided                                                                               |                                                                                       |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                                               | <br>(DVD-RAM<br>Ver. 2.1) | <br>[DVD-RW Ver. 1.1/2X-SPEED (2X/1X)] |                                                                                       |
| Recording format                              | DVD Video<br>Recording format<br>(VR format)                                                               | DVD Video<br>Recording format<br>(VR format)                                                                              | DVD-Video format<br>(Video format)                                                    |
| Characteristic                                | Rewritable disc                                                                                            | Rewritable disc                                                                                                           | One time recording<br>disc <sup>*1</sup>                                              |
| Display on the screen                         |                         |                                        |  |
| Indication in these<br>instructions           | <b>RAM</b>                                                                                                 | <b>-RW(VR)</b>                                                                                                            | <b>-RW(V)</b>                                                                         |
| Functions                                     |                                                                                                            |                                                                                                                           |                                                                                       |
| • Deleting recorded scenes                    | ●                                                                                                          | ●                                                                                                                         | —                                                                                     |
| • Editing on this unit                        | ●                                                                                                          | ●                                                                                                                         | —                                                                                     |
| • Playback on other<br>products <sup>*2</sup> | ● <sup>*3</sup>                                                                                            | ● <sup>*4</sup>                                                                                                           | ● <sup>*5</sup>                                                                       |
| • Recording after finalizing                  | —                                                                                                          | ●                                                                                                                         | ● <sup>*6</sup>                                                                       |

**Before using**

| Disc type                        | DVD-R<br>8 cm<br>Single sided/double sided                                                                        | DVD-R DL<br>8 cm<br>Dual layer on single side                                                                  |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|                                  | <br>(DVD-R for General Ver. 2.0) | <br>(DVD-R for DL Ver. 3.0) |
| Recording format                 | DVD-Video format<br>(Video format)                                                                                | DVD-Video format<br>(Video format)                                                                             |
| Characteristic                   | One time recording disc                                                                                           | One time recording disc                                                                                        |
| Display on the screen            |                                  |                             |
| Indication in these instructions |                                  |                                                                                                                |
| Functions                        |                                                                                                                   |                                                                                                                |
| • Deleting recorded scenes       | —                                                                                                                 |                                                                                                                |
| • Editing on this unit           | —                                                                                                                 |                                                                                                                |
| • Playback on other products*2   | ●*5                                                                                                               |                                                                                                                |
| • Recording after finalizing     | —                                                                                                                 |                                                                                                                |

●: available —: not available

\*1 By formatting the disc, it can be used repeatedly. (→ 74)

\*2 DVD players and DVD recorders that support 8 cm discs.

\*3 Playback is possible on compatible products.

\*4 Must be finalized on this unit. (→ 73) Playback is possible on compatible products.

\*5 Must be finalized on this unit. (→ 73) Playback of DVD-R DL is possible on compatible products.

\*6 Un-finalize the disc. (→ 74)

## Before using

- For the purposes of these operating instructions, DVD-R and DVD-R DL are referred to as the "DVD-R".
- **Still pictures cannot be recorded on a disc with this unit.**
- You cannot record or play continuously from one side of the disc to the other when using a double sided disc. You will need to eject the disc and turn it over.
- Discs inserted in a holder, cartridge, or caddy case cannot be used. Always remove bare discs from these containers prior to use.
- It is recommended that you use Panasonic discs. Usually discs compatible with the DVD standard can be used for recording and playback with no problems. However, some commercially available discs do not meet the DVD standard for quality and performance. If you use one of these discs, you may not be able to record or playback normally. (The message "FOR BEST PERFORMANCE PANASONIC DISC IS RECOMMENDED." appears.) Refer to the following support site for information about discs that have been confirmed as compatible by Panasonic.  
[http://panasonic.co.jp/pavc/global/cs/e\\_cam](http://panasonic.co.jp/pavc/global/cs/e_cam) (This website is in English only.)
- **Discs recorded on this unit may not be playable on other products.**
- Recording on DVD-R in DVD Video Recording format is not supported.
- **When using DVD-RW or DVD-R, do not perform the following as it may make the disc unusable.**
  - Record on a disc with other products after recording on it with this unit.
  - Record on a disc with this unit after recording on it with other products.
  - Insert an un-finalized disc in any other products.

### ■ About format types

#### What is the DVD Video Recording format (VR format)?

This is a format for recording on DVD discs which allows you to record and erase repeatedly and create playlists. You can record on DVD-RAM and DVD-RW in DVD Video Recording format with this unit.

#### What is the DVD-Video format (Video format)?

By finalizing the disc, it can be played back on most DVD players. You can record on DVD-RW and DVD-R in DVD-Video format with this unit.

- If a disc is recorded in VR format, the data can be exported on a computer.

### ■ About DVD-R DL (Dual Layer)

DVD-R DL (Dual Layer) discs have two layers of recording/playback surface on one side.

If the first layer (L0) becomes full during recording, the recording continues uninterrupted on the second layer (L1). However, the recorded picture is divided into 2 scenes at the point where the layers switch. The unit automatically switches layers during disc playback so you can play the whole of the disc continuously like a normal disc. However, the image or sound momentarily stop at the point where the layers switch.

### ■ Examples of discs that cannot be used on this unit

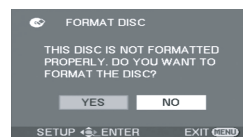
- Discs other than those with diameter of 8 cm
- Double layer discs other than DVD-R DL
- +RW
- +R
- DVD-ROM
- DVD-Video
- CD-RW
- CD-R
- CD-ROM
- CD

## Before using

### When using brand-new DVD-RW

When using DVD-RW, select whether to record in DVD Video Recording format (VR format) or DVD-Video format (Video format) and then format the disc. (→ 17, About format types)

- 1 When a brand-new DVD-RW is inserted in this unit, the screen on the right appears. Select [YES], then press the joystick.**



- 2 Select format type, then press the joystick.**

[VIDEO]: DVD-Video format

[VR]: DVD Video Recording format



- 3 When the confirm screen appears, select [YES], then press the joystick.**

- To change the format type, format the disc again. (→ 74)  
If the disc is formatted, then all the data recorded on the disc will be erased.

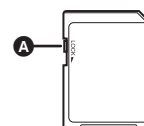
## Before using

## Cards that you can use with this unit

| Card type                        | SD Memory Card                                                      | SDHC Memory Card |
|----------------------------------|---------------------------------------------------------------------|------------------|
| Capacity                         | 8 MB, 16 MB, 32 MB, 64 MB,<br>128 MB, 256 MB, 512 MB, 1 GB,<br>2 GB | 4 GB             |
| Indication in these instructions | SD                                                                  |                  |

This unit is compatible with both SD Memory cards and SDHC Memory cards. You can only use SDHC Memory cards on devices that are compatible with them. You cannot use SDHC Memory cards on devices that are only compatible with SD Memory cards. (When using an SDHC Memory card on another device, be sure to read the operating instructions for that device.)

- For the purposes of these operating instructions, SD Memory Card and SDHC Memory Card are referred to as the "SD card".
- **Motion pictures cannot be recorded on an SD card with this unit.**
- Please confirm the latest information on the following website. (This website is in English only.)  
[http://panasonic.co.jp/pavc/global/cs/e\\_cam](http://panasonic.co.jp/pavc/global/cs/e_cam)
- This unit supports SD Memory Cards formatted in FAT12 system and FAT16 system based on SD Memory Card Specifications and SDHC Memory Cards formatted in FAT32 system.
- Use this unit to format SD cards. If an SD card is formatted on other products (such as a computer), the time spent for recording may become longer and you may not be able to use the SD card. (→ 75)
- We recommend that you use a Panasonic brand SD card.
- When the write-protect switch **A** on SD card is locked, no recording, deletion or editing will be possible on the card.
- Keep the Memory Card out of reach of children to prevent swallowing.
- A MultiMediaCard cannot be used on this unit.



## Before using

### Disc and card handling

#### ■ How to hold a disc or card

Do not touch the recording/playback surface or the terminal surface.



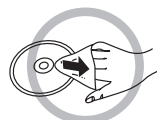
#### ■ When inserting/removing a disc

Do not allow the recording/playback side of the disc to get fingerprints or dirty.

- If there is a scratch or dirt (e.g. dust or fingerprints) on the recording/playback side of the disc, images cannot be recorded or played back normally and the following phenomena may occur:
  - Recording or playback become impossible.
  - Playback image stops momentarily or sound is interrupted during playback.
  - Block noise appears on playback images.
  - The message "PLEASE CHECK FOR SCRATCHES OR STAINS ON DISC." appears.

#### ■ If there is dirt on the disc

Clean it with the supplied disc cleaning cloth. Wipe the disc from the centre to the outer edge to remove the dirt. Do not use force when wiping the disc as it may scratch it. Also, do not use solvents (thinner, water, antistatic agent, detergent etc.)



#### ■ Handling precautions

- Be careful about scratches and dirt.
- Do not attach labels or stickers to discs.  
(This may cause disc warping and un-balanced rotation, rendering it unusable.)
- Write on the label side of the disc only with a soft, oil-based felt pen. Do not use ballpoint pens or other hard writing implements.
- Do not use record cleaning sprays, benzene, thinner, static electricity prevention liquids or any other solvent.
- Do not use scratch-proof protectors or covers.
- Do not drop, stack, or impact discs. Do not place objects on them.
- Do not use the following discs:
  - Discs with exposed adhesive from removed stickers or labels.
  - Discs that are badly warped or cracked.
  - Irregularly shaped discs, such as heart shapes.
- Do not expose the terminals of the card to water, garbage or dust.
- Do not place in the following areas:
  - In direct sunlight.
  - In very dusty or humid areas.
  - Near a heater.
  - Locations susceptible to significant difference in temperature (condensation can occur).
  - Where static electricity or electromagnetic waves occur.
- Put discs and cards back in their cases for protection when not using them.

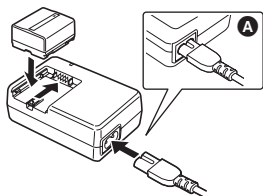


## Power supply

### Charging the battery

When this unit is purchased, the battery is not charged. Charge the battery before using this unit.

- If the DC cable is connected to the AC adaptor, then the battery will not charge. Remove the DC cable from the AC adaptor.



- 1 Connect the AC cable to the AC adaptor and the AC outlet.

- 2 Put the battery on the battery mount by aligning the mark, and then securely plug it in.

- The output plug of the AC cable is not completely connected to the AC adaptor socket. As shown in A, there is a gap.

#### ■ Charging lamp

Lights up: Charging

Goes off: Charging completed

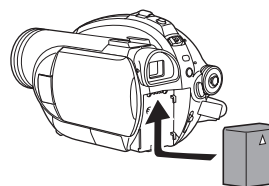
Flashing: The battery is over discharged (discharged excessively). In a while, the lamp will light up and normal charging will start.

When the battery temperature is excessively high or low, the CHARGE lamp flashes and the charging time will be longer than normal.

- Battery charging time (→ 22)
- We recommend using Panasonic batteries. (→ 8)
- If you use other batteries, we cannot guarantee the quality of this product.

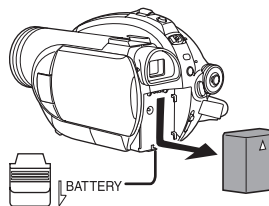
### Fitting the battery

Push the battery against the battery holder and slide it until it clicks.



### Removing the battery

While sliding the BATTERY lever, slide the battery to remove it.



- Hold the battery with your hand so it does not fall.
- Before removing the battery, be sure to set the OFF/ON switch to OFF and check that the status indicator is off.

#### CAUTION

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

## Setup

### Charging time and recordable time

The times shown in the tables below are for when the temperature is 25 °C and the humidity is 60%. If the temperature is higher or lower than 25 °C, the charging time will become longer.

#### ■ Charging time

- The charging time shown in the table are approximations.
- “2 h 25 min” indicates 2 hours 25 minutes.

#### VDR-D310:

| Battery model number                     | Voltage/capacity | Charging time |
|------------------------------------------|------------------|---------------|
| Supplied battery/<br>CGA-DU12 (optional) | 7.2 V/1150 mAh   | 2 h 25 min    |
| CGA-DU14 (optional)                      | 7.2 V/1360 mAh   | 2 h 45 min    |
| CGA-DU21 (optional)                      | 7.2 V/2040 mAh   | 3 h 55 min    |

#### VDR-D220:

| Battery model number                     | Voltage/capacity | Charging time |
|------------------------------------------|------------------|---------------|
| Supplied battery/<br>CGR-DU06 (optional) | 7.2 V/640 mAh    | 1 h 40 min    |
| CGA-DU12 (optional)                      | 7.2 V/1150 mAh   | 2 h 25 min    |
| CGA-DU14 (optional)                      | 7.2 V/1360 mAh   | 2 h 45 min    |
| CGA-DU21 (optional)                      | 7.2 V/2040 mAh   | 3 h 55 min    |

## Setup

■ **Recordable time** (When using a DVD-RAM disc)

- The times indicate the recordable time when the viewfinder is used. The times in parentheses indicate the recordable time when the LCD monitor is used.
- The actual recordable time refers to the recordable time on a disc when repeatedly starting/stopping recording, turning the unit on/off, moving the zoom lever, etc.
- "1 h 25 min" indicates 1 hour 25 minutes.

**VDR-D310:**

| Battery model number                        | Voltage/capacity   | Recording mode | Maximum continuously recordable time | Actual recordable time     |
|---------------------------------------------|--------------------|----------------|--------------------------------------|----------------------------|
| Supplied battery/<br>CGA-DU12<br>(optional) | 7.2 V/<br>1150 mAh | XP             | 1 h 25 min<br>(1 h 20 min)           | 35 min<br>(35 min)         |
|                                             |                    | SP             | 1 h 40 min<br>(1 h 30 min)           | 45 min<br>(40 min)         |
|                                             |                    | LP             | 1 h 45 min<br>(1 h 40 min)           | 45 min<br>(45 min)         |
| CGA-DU14<br>(optional)                      | 7.2 V/<br>1360 mAh | XP             | 1 h 45 min<br>(1 h 40 min)           | 45 min<br>(45 min)         |
|                                             |                    | SP             | 2 h<br>(1 h 50 min)                  | 50 min<br>(50 min)         |
|                                             |                    | LP             | 2 h 5 min<br>(1 h 55 min)            | 55 min<br>(50 min)         |
| CGA-DU21<br>(optional)                      | 7.2 V/<br>2040 mAh | XP             | 2 h 50 min<br>(2 h 40 min)           | 1 h 15 min<br>(1 h 10 min) |
|                                             |                    | SP             | 3 h 10 min<br>(3 h)                  | 1 h 25 min<br>(1 h 20 min) |
|                                             |                    | LP             | 3 h 20 min<br>(3 h 5 min)            | 1 h 30 min<br>(1 h 20 min) |

**VDR-D220:**

| Battery model number                        | Voltage/capacity   | Recording mode | Maximum continuously recordable time | Actual recordable time |
|---------------------------------------------|--------------------|----------------|--------------------------------------|------------------------|
| Supplied battery/<br>CGR-DU06<br>(optional) | 7.2 V/<br>640 mAh  | XP             | 1 h 5 min<br>(1 h)                   | 30 min<br>(25 min)     |
|                                             |                    | SP             | 1 h 20 min<br>(1 h 10 min)           | 35 min<br>(30 min)     |
|                                             |                    | LP             | 1 h 25 min<br>(1 h 15 min)           | 35 min<br>(30 min)     |
| CGA-DU12<br>(optional)                      | 7.2 V/<br>1150 mAh | XP             | 2 h<br>(1 h 50 min)                  | 55 min<br>(50 min)     |
|                                             |                    | SP             | 2 h 20 min<br>(2 h 10 min)           | 1 h<br>(55 min)        |
|                                             |                    | LP             | 2 h 30 min<br>(2 h 15 min)           | 1 h 5 min<br>(1 h)     |

## Setup

| Battery model number | Voltage/capacity   | Recording mode | Maximum continuously recordable time | Actual recordable time     |
|----------------------|--------------------|----------------|--------------------------------------|----------------------------|
| CGA-DU14 (optional)  | 7.2 V/<br>1360 mAh | XP             | 2 h 35 min<br>(2 h 20 min)           | 1 h 5 min<br>(1 h)         |
|                      |                    | SP             | 3 h<br>(2 h 40 min)                  | 1 h 20 min<br>(1 h 10 min) |
|                      |                    | LP             | 3 h 10 min<br>(2 h 50 min)           | 1 h 25 min<br>(1 h 15 min) |
| CGA-DU21 (optional)  | 7.2 V/<br>2040 mAh | XP             | 3 h 50 min<br>(3 h 30 min)           | 1 h 40 min<br>(1 h 35 min) |
|                      |                    | SP             | 4 h 30 min<br>(4 h 5 min)            | 2 h<br>(1 h 50 min)        |
|                      |                    | LP             | 4 h 45 min<br>(4 h 20 min)           | 2 h 5 min<br>(1 h 55 min)  |

- The display changes as the battery capacity reduces.

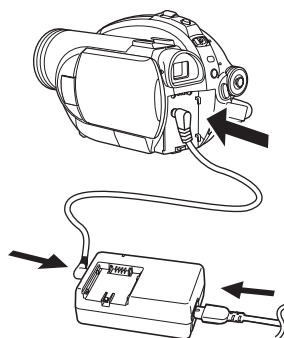
 →  →  →  → .

If the battery discharges, then  (  ) will flash.

- The recordable times will vary depending on the status of use. These times are approximations. The recordable time will become shorter when you use both the viewfinder and the LCD monitor simultaneously while rotating the LCD monitor frontward to record yourself, etc.
- The batteries heat up after use or charging. This unit will also heat up while being used. This is not a malfunction.
- Be aware that the operating time of the battery will become shorter in low temperatures. We recommend charging a spare battery for use when recording.

## Connecting to the AC outlet

The unit is in the standby condition when the AC adaptor is connected. The primary circuit is always "live" as long as the AC adaptor is connected to an electrical outlet.



**1** Connect the AC cable to the AC adaptor and the AC outlet.

**2** Connect the DC cable to the AC adaptor.

**3** Connect the DC cable to this unit.

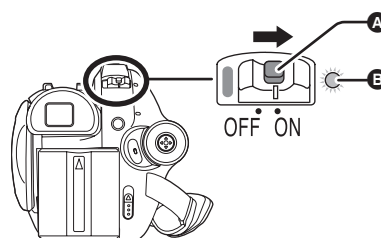
- Do not use the AC cable with any other equipment as it is designed only for this unit. Do not use the AC cable from other equipment with this unit.
- While the DC cable is connected to the AC adaptor, the battery will not charge.

## Turning the unit on/off

- When recording, remove the lens cap before turning the unit on. If the unit is turned on with the lens cap attached, the automatic white balance adjustment (→ 99) may not function properly.

## How to turn on the power

While pressing the button **A**, set the OFF/ON switch to ON.

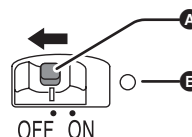


The status indicator **B** lights and the power turns on.

- When the unit is turned on for the first time, a message asking you to set the date and time will appear. Select [YES] and set the date and time. (→ 35)

## How to turn off the power

While pressing the button **A**, set the OFF/ON switch to OFF.



The status indicator **B** goes off when the power turns off.

## Setup

When the power is turned on for the first time after changing the disc or battery, the unit carries out a recognition procedure to check that there are no problems with the disc. This takes approximately 25 seconds with DVD-RAM.

If you want to start using the unit as soon as you turn on the power, do the following.

- 1) Turn on the power.
- 2) After "READING DISC..." disappears from the screen, turn off the power.

You can start recording approximately 8 seconds after you turn on the power again.

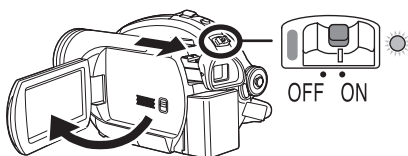
- Depending on the condition of the disc, it may take longer than this.
- If the date and time are not set, it will take longer than usual before you can start recording.

### How to turn the power on and off with the LCD monitor/viewfinder

When the OFF/ON switch is set to ON, the power can be turned on and off with the LCD monitor and the viewfinder when the unit is in video recording mode or picture recording mode.

#### ■ To turn on the power

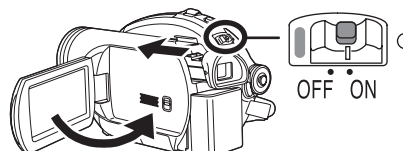
**Open the LCD monitor or extend the viewfinder.**



The status indicator lights and the power turns on.

#### ■ To turn off the power

**Close the LCD monitor and retract the viewfinder.**



The status indicator goes off and the power turns off.

- The power will not turn off unless the LCD monitor is closed and the viewfinder is retracted.
- The power will not turn off while recording on a disc even if the LCD monitor is closed and the viewfinder is retracted.

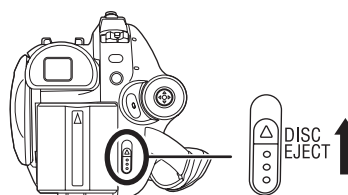
Set the OFF/ON switch to OFF when the unit is not being used.

## Inserting/removing a disc

When inserting or removing the disc, fit the charged battery pack or connect the AC adaptor to the unit. The cover of the disc compartment will not open unless the unit is powered.

**1 Fit the battery or connect the AC adaptor.**

**2 Slide the DISC EJECT lever once and release it.**



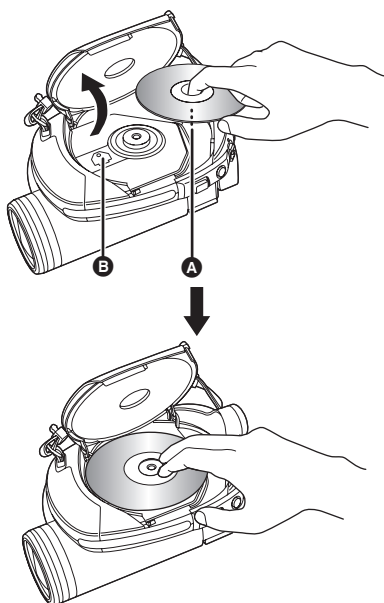
A few moments after the ACCESS/PC lamp blinks, the cover of the disc compartment will open slightly.

### 3 Open the cover of the disc compartment by hand and insert/remove the disc.

#### ■ Inserting disc

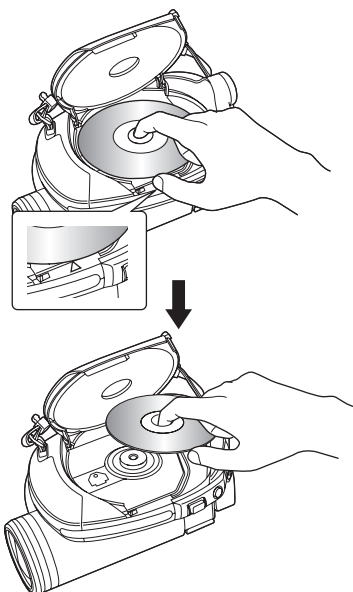
Fit the disc onto the spindle in the centre and then push the disc down until it clicks into place.

- A** Recording/playback side
- B** Pickup lens



#### ■ Removing disc

While pressing down on the spindle, grasp the edge of the disc and gently lift it out.



- Take care not to touch the recording/playback sides of a disc when inserting or removing it.

### 4 Push the section marked **PUSH CLOSE** on the cover of the disc compartment to close the cover.

- If you use a new DVD-RW, it is necessary to format the disc. (→ 18)

#### ■ Identifying recording/playback sides of disc

##### Single sided disc:

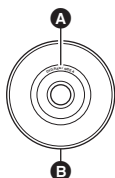
The recording/playback side is opposite to the labelled side.

##### Double sided disc:

The "SIDE A" recording/playback side is the side opposite the side with the "SIDE A" mark. The

## Setup

"SIDE B" recording/playback side is the side with the "SIDE A" mark.



- A** "SIDE A" mark
- B** The opposite side is the "SIDE A" recording/playback side.

- Do not use excessive force when opening the cover.
- Do not touch the pickup lens or the recording/playback side of the disc.  
This may impair recording and playback.
- Insert the disc securely to prevent damage.
- When you open the cover, the ACCESS/PC lamp flashes red. Do not leave the cover open.
- If the cover is open, the power will not turn off even if the OFF/ON switch is set to OFF.
- If the disc is not correctly inserted, the cover will not close. Never try to forcibly close the cover. This could cause damage. Reinsert the disc properly.
- If a single sided disc is inserted into the unit with the printed label facing the inside, an error message will appear. Remove the disc and reinsert it with its recording/playback side facing the inside.
- Do not allow the recording/playback side to become dirty or scratched.
- Do not remove the battery pack or disconnect the AC adaptor while removing the disc or until power is completely turned off. If you do, the cover will not open. If this happens, reattach the battery pack or reconnect the AC adaptor, slide the DISC EJECT lever once, and then release it. A repair disc message may be displayed when the power is turned back on. (→ 89, About recovery)
- Do not insert anything other than the 8 cm DVD-RAM, DVD-RW, DVD-R or DVD-R DL disc into the disc compartment. Doing so could cause malfunctions. (→ 17, Examples of discs that cannot be used on this unit)
- Do not touch the pickup lens or other parts inside the disc compartment. Be sure not to

touch the area around the pickup lens for it becomes extremely hot.

### After inserting a disc/After recording finishes

While the ACCESS/PC lamp is lit, the disc is rotating and disc information is being recorded. If the power supply is interrupted at this time, the disc may become unusable. Do not disconnect the AC adaptor or remove the battery. Also, do not strongly shake or cause impact to the unit.

## Inserting/removing an SD card

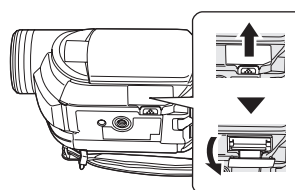
**Before inserting/removing an SD card, be sure to set the OFF/ON switch to OFF.**

If the SD card is inserted or removed while the OFF/ON switch is set to ON, this unit may malfunction or the data recorded on the SD card may be lost.

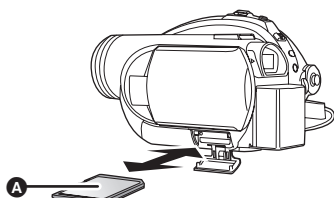
### 1 Set the OFF/ON switch to OFF to turn off the power.

- Check that the status indicator has gone off.

### 2 Slide the card slot cover to open.



### 3 Insert/remove the SD card into/from the card slot.



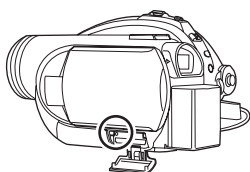
- When inserting an SD card, face the label side **A** upwards and press it straight in as far as it goes.
- When removing the SD card, press the centre of the SD card and then pull it straight out.

### 4 Securely close the card slot cover.

#### ■ Concerning the SD card

- Electrical noise, static electricity or failure of this unit or the SD card may damage or erase the data stored on the SD card. We recommend saving important data on a computer.

#### ■ Card access lamp

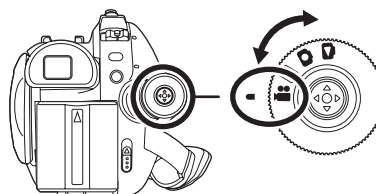


- When this unit accesses the SD card (reading, recording, playback, erasing, etc.), the access lamp lights up.
- If the following operations are performed when the access lamp is lit, then the SD card or the recorded data may be damaged or this unit may malfunction.
  - Removing the SD card
  - Operating the OFF/ON switch or the mode dial
  - Removing the battery or disconnecting the AC adaptor

## Selecting a mode

The mode dial is used to switch between recording and playback modes. Rotate the mode dial slowly but surely.

**Rotate the mode dial, and set the desired mode pictograph to the position shown in the illustration.**



|                                                                                     |                                                                                            |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
|   | <b>Video recording mode (→ 39)</b><br>Use this to record motion pictures on a disc.        |
|  | <b>Video playback mode (→ 57)</b><br>Use this to play back motion pictures on a disc.      |
|  | <b>Picture recording mode (→ 42)</b><br>Use this to record still pictures on an SD card.   |
|  | <b>Picture playback mode (→ 61)</b><br>Use this to play back still pictures on an SD card. |

- Do not forcefully rotate the dial.

## How to use the joystick

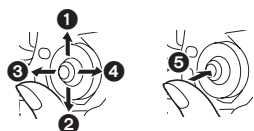
This unit has a joystick for selecting functions, performing operations, etc. so it is easy to operate this unit with one hand.

### Basic operations

Operations on the menu screen and selection of files on the thumbnail view screen, etc.

## Setup

Move the joystick up, down, left, or right to select an item or scene, and then press the joystick to set it.



- ❶ Select by moving up.
  - ❷ Select by moving down.
  - ❸ Select by moving left.
  - ❹ Select by moving right.
  - ❺ Press the joystick to select the item.
- Menu screen operations (→ 33)

## Operations during recording

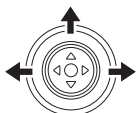
- ◇ Rotate the mode dial to select or .

- 1 Press the centre of the joystick, and icons will be displayed on the screen.



- The indication disappears when the centre of the joystick is pressed again.
- The indication changes each time the joystick is moved down.

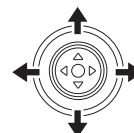
- 2 Move the joystick up, left or right to select an item.



## Operations during playback

- ◇ Rotate the mode dial to select or .

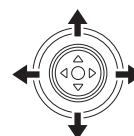
- 1 Move the joystick up, down, left or right to select the scene to be played back and press the joystick.



The selected scene is played back on the full screen.

The operation icon is automatically displayed on the screen.

- 2 Move the joystick up, down, left or right to operate.

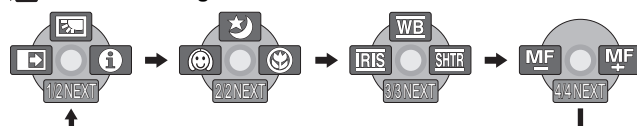


- The operation icon appears or disappears each time the centre of the joystick is pressed.

## About the operation icons displayed in each mode

About auto mode and manual mode (→ 38)

### Video recording mode



| Icon                       | Direction | Function                | Page |
|----------------------------|-----------|-------------------------|------|
| (1/2)                      |           | Backlight compensation  | 47   |
|                            |           | Fade                    | 48   |
|                            |           | Help mode               | 33   |
| (2/2)                      |           | Colour night view       | 50   |
|                            |           | Soft skin mode          | 49   |
|                            |           | Tele macro (VDR-D310)   | 49   |
| In manual mode (3/3)       |           | White balance           | 54   |
|                            |           | Iris or gain value      | 55   |
|                            |           | Shutter speed           | 55   |
| In manual focus mode (4/4) |           | Manual focus adjustment | 53   |

• The shaded operation icons are not displayed while recording.

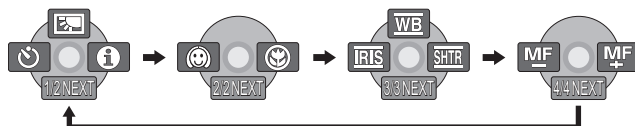
### Video playback mode



| Icon | Direction | Function                                   | Page |
|------|-----------|--------------------------------------------|------|
|      | ▲         | Playback/pause                             | 57   |
|      | ▼         | Stop playback and show thumbnails          | 57   |
|      | ◀         | Skip                                       | 57   |
|      |           | Rewind                                     | 58   |
|      |           | Reverse slow/frame playback (during pause) | 58   |
|      | ▶         | Skip                                       | 57   |
|      |           | Fast forward                               | 58   |
|      |           | Forward slow/frame playback (during pause) | 58   |

## Setup

### Picture recording mode



| Icon                          | Direction                                                                          | Function                | Page |
|-------------------------------|------------------------------------------------------------------------------------|-------------------------|------|
| (1/2)                         |   | Backlight compensation  | 47   |
|                               |   | Self timer              | 50   |
|                               |   | Help mode               | 33   |
| (2/2)                         |   | Soft skin mode          | 49   |
|                               |   | Tele macro (VDR-D310)   | 49   |
| In manual mode<br>(3/3)       |   | White balance           | 54   |
|                               |   | Iris or gain value      | 55   |
|                               |   | Shutter speed           | 55   |
| In manual focus<br>mode (4/4) |  | Manual focus adjustment | 53   |

### Picture playback mode



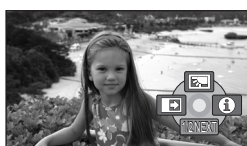
| Icon                                                                                | Direction | Function                                 | Page |
|-------------------------------------------------------------------------------------|-----------|------------------------------------------|------|
|  | ▲         | Slide show start/pause                   | 61   |
|  | ▼         | Stop playback and show thumbnails        | 61   |
|  | ◀         | Playback previous picture (during pause) | 61   |
|  | ▶         | Playback next picture (during pause)     | 61   |

## ■ Help mode

The help mode explains the operation icons that are displayed when the AUTO/MANUAL/FOCUS switch is set to AUTO in video/picture recording mode.

◇ Rotate the mode dial to select  or .

**1 Press the joystick to display the icon during the recording pause.**



**2 Move the joystick right to select [i].**



**3 Move the joystick up, left or right to select the desired icon.**



- An explanation of the selected icon is displayed on the screen.
- The indication changes each time the joystick is moved down.

### To exit the help mode

Press the MENU button or select [EXIT].

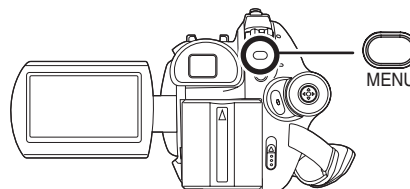


- When the help mode is used, functions cannot be set.
- When the help mode is used, motion pictures and still pictures cannot be recorded.

## Switching the language

You can switch the language on the screen display or the menu screen.

**1 Press the MENU button, then select [LANGUAGE] and press the joystick.**

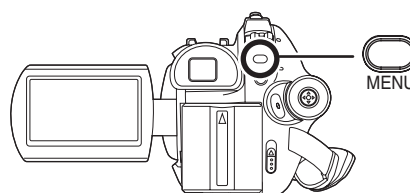


**2 Select [English] and press the joystick.**

## Using the menu screen

Refer to "Menu list" (→ 83) for information about the menus.

**1 While stopped, press the MENU button.**



The menu displayed differs depending on the position of the mode dial.

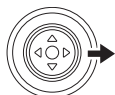
- Do not switch the mode dial when the menu is displayed.

## Setup

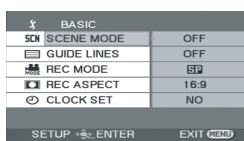
- 2** Move the joystick up or down in order to select the desired top menu.



- 3** Move the joystick right or press the joystick.



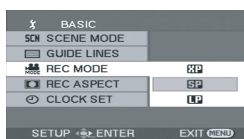
- 4** Move the joystick up or down in order to select the submenu item.



- 5** Move the joystick right or press the joystick.



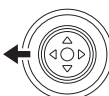
- 6** Move the joystick up or down in order to select the desired item.



- 7** Press the joystick to enter the selection.



**To get back to the previous screen**  
Move the joystick left.



**To exit the menu screen**  
Press the MENU button.

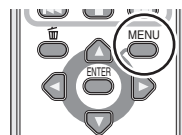


- The menu screen does not appear during recording or playing. You cannot start other operations while the menu screen appears.

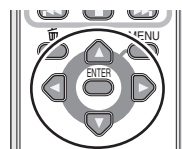
### Operating with remote control (VDR-D310)

The menu screen transition is the same as when the buttons on the main unit are used.

- 1** Press the MENU button.



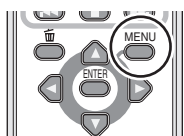
- 2** Select a menu item.



## Setup

- Use the direction buttons (▲, ▼, ◀, ▶) and ENTER button in place of the joystick on the main unit.

### 3 Press the MENU button to exit the menu screen.



## Setting date and time

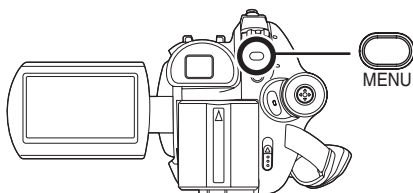
When the unit is turned on for the first time, a message asking you to set the date and time will appear.

- Select [YES] and press the joystick. Perform steps 2 and 3 below to set the date and time.

If the screen shows the incorrect date and time, then adjust it.

- ◇ Rotate the mode dial to select or .

### 1 Press the MENU button, then select [BASIC] → [CLOCK SET] → [YES] and press the joystick.



### 2 Move the joystick left or right to select the item to be set. Then,

move the joystick up or down to set the desired value.



- The year will change as follows:  
2000, 2001, ..., 2099, 2000, ...
- The 24-hour system is used to display the time.

### 3 Press the joystick to enter the selection.

- The clock function starts at [00] seconds when the joystick is pressed.
- After pressing the MENU button to finish the setting, check the date and time display.

#### ■ Changing the date and time display style

Press the MENU button, then select [SETUP] → [DATE/TIME] → desired display style and press the joystick.

- You can also show or change the date and time display by repeatedly pressing the DATE/TIME button on the remote control. (VDR-D310)

[DATE]

15.12.2007

[D/T]

15.12.2007 15:30

[OFF]

#### ■ Changing the display style

Press the MENU button, then select [SETUP] → [DATE FORMAT] → desired display style and press the joystick.

| Display style | Screen display |
|---------------|----------------|
| [Y/M/D]       | 2007.12.15     |
| [M/D/Y]       | 12.15.2007     |
| [D/M/Y]       | 15.12.2007     |

## Setup

- The date and time function are driven by a built-in lithium battery.
- Make sure to check the time before recording.
- If the time display becomes [- -], the built-in lithium battery has run down. Use the following steps to charge the battery. When you turn on the power for the first time after charging, a message asking you to set the date and time will appear. Select [YES] and set the date and time.

### To recharge the built-in lithium battery

Connect the AC adaptor or attach the battery to the unit, and the built-in lithium battery will be recharged. Leave the unit as it is for approx. 24 hours and the battery will save the date and time for approx. 6 months. (Even if the OFF/ON switch is set to OFF, the battery is still being recharged.)

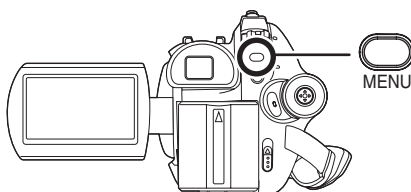
### WARNING

**THE LITHIUM BATTERY IN THIS UNIT MUST ONLY BE REPLACED BY QUALIFIED PERSONNEL. IF THIS IS NECESSARY, CONTACT THE PANASONIC CUSTOMER CARE CENTRE ON 132600 FOR YOUR NEAREST AUTHORIZED SERVICE CENTRE.**

## Adjusting LCD monitor/ viewfinder

### Adjusting the brightness and colour level

- 1 Press the MENU button, then select [SETUP] → [LCD SET] or [EVF SET] → [YES] and press the joystick.



- 2 Move the joystick up or down to select the item to be adjusted. Then, move the joystick left or right to make the adjustment.



The bar display moves.

### ■ [LCD SET]

#### [BRIGHTNESS]:

Brightness of the LCD monitor

#### [COLOUR]:

Colour level of the LCD monitor

### ■ [EVF SET]

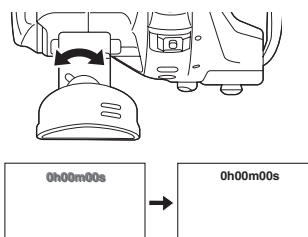
#### [BRIGHTNESS]:

Brightness of the viewfinder

- To adjust the brightness of the viewfinder, extend the viewfinder and close the LCD monitor to activate the viewfinder.
- When the LCD monitor is rotated by 180° towards the lens, the brightness and colour level of the LCD monitor cannot be adjusted.
- These settings will not affect the images actually recorded.

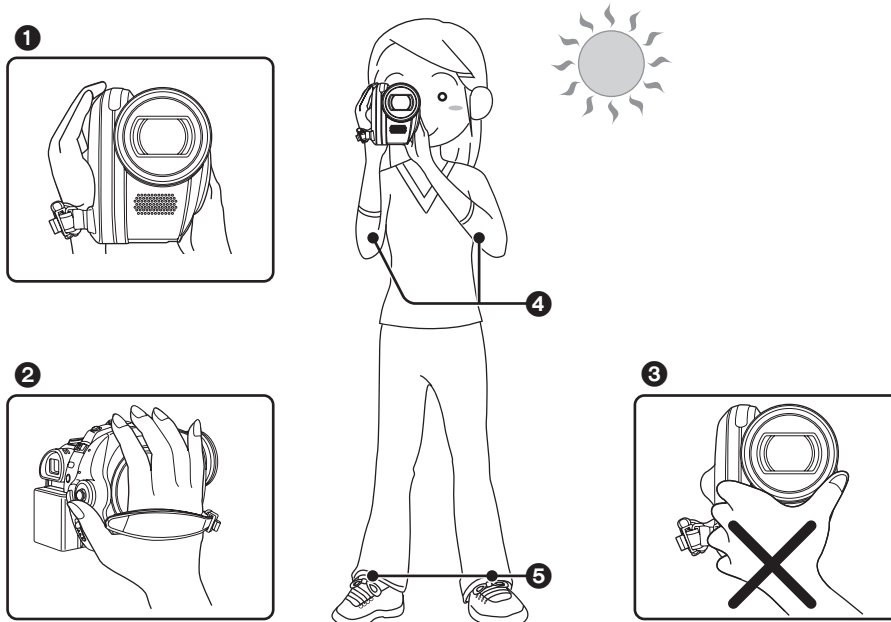
### Adjusting the field of view

Adjust the focus by sliding the eyepiece corrector knob.



## Before recording

### Basic camera positioning



- ❶ Hold the camera with both hands.
  - ❷ Put your hand through the grip belt.
  - ❸ Do not cover the microphones or sensors with your hands.
  - ❹ Keep your arms near your body.
  - ❺ Slightly open your legs.
- When you are outdoors, record pictures with the sunlight behind you. If the subject is backlit, it will become dark in the recording.
  - When recording, make sure your footing is stable and there is no danger of colliding with another person, a ball etc.

## Recording

### ■ About auto mode

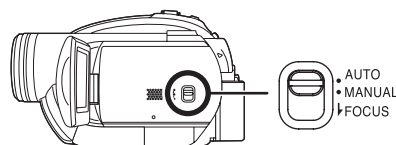
Set the AUTO/MANUAL/FOCUS switch to AUTO, and colour balance (white balance) and focusing will be adjusted automatically.

- Auto white balance (→ 99)
- Auto focusing (→ 100)

Depending on the brightness of the subject etc., the aperture and shutter speed are automatically adjusted for an optimum brightness.

(When set to the video recording mode: The shutter speed is adjusted to a maximum of 1/250.)

- Colour balance and focus may not be adjusted automatically depending on light sources or scenes. If so, manually adjust these settings.
  - Scene mode (→ 52)
  - White balance (→ 54)
  - Shutter speed (→ 55)
  - Iris/gain value (→ 55)
  - Focus (→ 53)



### ■ Anti-Ground-Shooting (AGS) (VDR-D310)

This function prevents unnecessary recording when you forget to pause recording and walk with the unit tilted upside down while recording continues.

- If the unit continues to be tilted upside down from the normal horizontal position while recording on a disc, it is automatically set to recording pause.

◇ Rotate the mode dial to select .

Press the MENU button, then select [SETUP] → [AGS] → [ON] and press the joystick.



- The AGS function may activate and cause the unit to pause the recording if you are recording a subject right above or right below you. In these cases, set [AGS] to [OFF] then continue the recording.
- Use the recording start/stop button to pause the recording. The AGS function is only a backup function for when you forget to pause the recording.
- The time it takes the unit to be put into recording pause after being tilted upside down varies depending on the operating conditions.

## Recording motion pictures

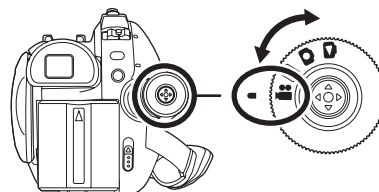
RAM -RW(VR) -RW(V) -R

Record motion pictures onto a disc.

- When the unit is purchased, the aspect ratio is set to [16:9] for recording images compatible with a wide-screen TV.  
To watch images on a regular TV (4:3), change the aspect ratio setting (→ 51) before recording the images or when watching them on the connected TV (→ 77).
- Remove the lens cap before turning the unit on.  
If the unit is turned on with the lens cap attached, the automatic white balance adjustment may not function properly.

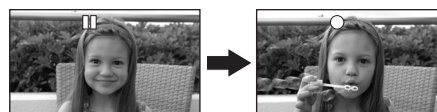
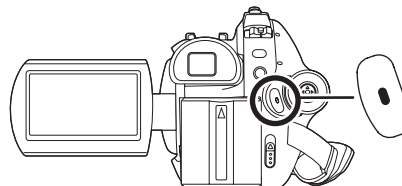
### 1 Turn the unit on.

### 2 Rotate the mode dial to select .



### 3 Open the LCD monitor or extend the viewfinder.

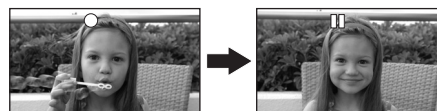
### 4 Press the recording start/stop button to start recording.



#### To end the recording

Press the recording start/stop button again to pause recording.

-  and  are red during recording. Do not move this unit until  is green.



- The images recorded between pressing the recording start/stop button to start recording and pressing it again to pause recording become one scene.

## Recording

- When about 5 minutes have passed without any operation in recording pause, the unit automatically turns off to prevent the battery from running down. When you want to use the unit, turn it on again. This setting can also be set to [OFF]. (→ 84, [POWER SAVE])

## Screen indications in the video recording mode

- A Recording mode**
- B Remaining time left for recording**  
(When the remaining time is less than 1 minute, [R 0min] flashes red.)
- C Recording time elapsed**



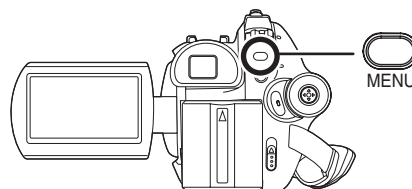
- The maximum number of scenes on a disc (per side): 999 (Even if there is remaining capacity for recording on a disc, you may not be able to record 999 scenes.)
- Maximum number of dates on a disc (per side): 99 (Even if scenes are recorded on the same day, they may be grouped on a different recording date.) (→ 60)
- Sound is recorded in Dolby Digital from the internal stereo microphone on the front of the unit. Take care not to block this microphone.
- Each time the unit enters the recording pause mode, the counter display will be reset to "0h00m00s".
- While motion picture recording is in progress, the recording will not stop even if the LCD monitor is closed and the viewfinder is retracted.
- While "WRITING CONTROL DATA TO DISC. DO NOT SHAKE THE UNIT." is displayed, do not disconnect the AC adaptor or remove the battery as doing so may make the disc unusable.
- While motion picture recording is in progress, do not disconnect the AC adaptor or remove the battery. If you do, a repair disc message may be displayed when the power is turned back on. (→ 89, About recovery)

The ACCESS/PC lamp lights immediately after recording finishes. While it lights, the disc is rotating and disc information is being recorded. If you run while holding the unit or swing it, the recorded images may be distorted so do not strongly shake or cause impact to it.

## Recording modes and recordable time available for the motion picture

Changing the recording mode of the motion picture.

**Press the MENU button, then select [BASIC] → [REC MODE] → desired item and press the joystick.**



**Recording****■ Approximate recordable time for 1 disc (single sided)**

| Disc type | Recording mode       |                |                   |
|-----------|----------------------|----------------|-------------------|
|           | XP<br>(High quality) | SP<br>(Normal) | LP<br>(Long play) |
| DVD-RAM   | Approx. 18 min       | Approx. 37 min | Approx. 75 min    |
| DVD-R DL  | Approx. 35 min       | Approx. 69 min | Approx. 138 min   |

Image quality  
prioritizedRecording time  
prioritized

- This unit records in VBR. VBR is an abbreviation for Variable Bit Rate. VBR recording automatically varies the bit rate (amount of data in a fixed time) depending on the subject being recorded. This means if a subject with sharp movements is recorded, the recording time is reduced.
- Mosaic-pattern noise may appear on a playback image in the following cases.
  - When there is a complicated pattern in the background
  - When the unit is moved too much or too fast
  - When a subject with sharp movements has been recorded  
(Particularly if it has been recorded in [LP] mode.)

## Recording

### Recording still pictures (JPEG still pictures)

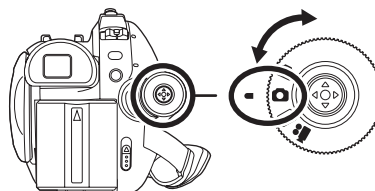
SD

Record the still picture on an SD card.

- When this unit is purchased, [PICTURE SIZE] is set to [**2M**] (VDR-D310)/[**0.2M**] (VDR-D220) for recording pictures compatible with a wide-screen TV (16:9).  
To record pictures with a 4:3 aspect ratio, change the [PICTURE SIZE] setting before recording (→ 45).
- Remove the lens cap before turning the unit on.  
If the unit is turned on with the lens cap attached, the automatic white balance adjustment may not function properly.

#### 1 Turn the unit on.

#### 2 Rotate the mode dial to select .



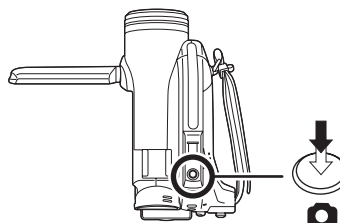
#### 3 Open the LCD monitor or extend the viewfinder.

##### ■ VDR-D310

#### 4 Press the button halfway in order to adjust focusing. (For auto focusing only)

The shutter speed and the iris/gain value are fixed and the unit focuses on the subject automatically.

- If [O.I.S.] (→ 51) is set to [ON], the image stabilizer function will become more effective when the  button is pressed halfway. ([**MEGA**] (MEGA optical image stabilizer) will be displayed.)



## Recording

**A** Shutter chance mark

○ (The white lamp flashes.): Focusing

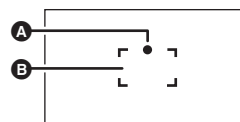
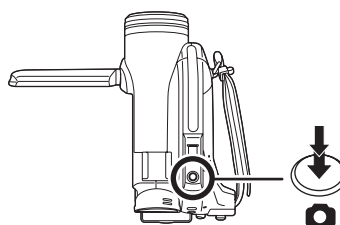
● (The green lamp lights up.): When in focus

No mark: When focusing is unsuccessful.

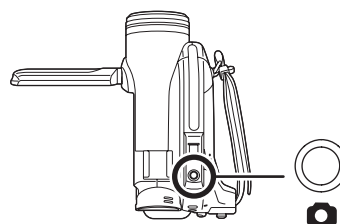
● The shutter chance mark is indicated as follows when the  button is not pressed halfway. Please use it as a guide for recording.

● (The green lamp lights up.): When in focus and a good picture can be recorded.

○ (The white lamp lights up.): Almost in focus

**B** Focus area**5 Press the  button fully to take the picture.****■ VDR-D220****4 Press the  button.**

The unit automatically focuses on the subject at the centre of screen (when auto focus is selected).



- For information about the number of recordable still pictures on an SD card (→ 103)
- The sound cannot be recorded.
- If the write protection switch on the SD card is set to LOCK, it cannot be used for recording.
- The  button on the remote control cannot be pressed halfway. (VDR-D310)
- If the [PICT.QUALITY] is set to [ ], mosaic-pattern noise may appear on a playback image depending on the picture content.
- While this unit accesses the SD card (  is displayed/the access lamp is lit), do not perform the following operations. The SD card or the recorded data may be damaged.
  - Turn the unit off.
  - Remove the SD card.
  - Operate the mode dial.
- Other products may degrade or not play back still pictures recorded on this unit.

**■ To record still pictures clearly**

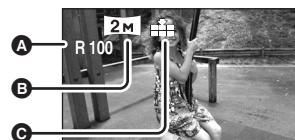
- When zooming in on the subject with a magnification of 4× or higher, it is difficult to reduce the slight shaking from holding this unit by hand. We recommend decreasing the zoom magnification and approaching the subject when recording.

## Recording

- When recording still pictures, hold the unit firmly with your hands and keep your arms stationary at your side so as not to shake the unit.
- You can record stable pictures without shaking by using a tripod and the remote control.

### Screen indications in picture recording mode

- A** Remaining number of still pictures  
(Flashes in red when [R 0] appears.)
- B** Size of still pictures
- C** Quality of still pictures



#### ■ About the shutter chance mark (VDR-D310)

- The shutter chance mark does not appear in manual focus mode.
- Focus on a subject manually when it is not easily focused.
- You can record still pictures on the card even if the shutter chance mark does not appear, but pictures may be recorded without being focused.
- The shutter chance mark does not appear or has difficulty displaying in the following cases.
  - When the zoom magnification is high.
  - When the unit is shaken.
  - When the subject is moving.
  - When the subject stands in front of a light source.
  - When close subjects and far subjects are included in the same scene.
  - When the scene is dark.
  - When there is a bright part in the scene.
  - When the scene is filled with only horizontal lines.
  - When the scene lacks contrast.

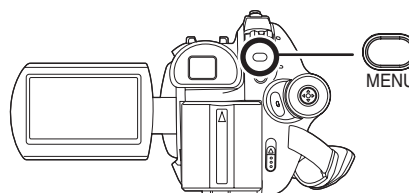
#### ■ Concerning the focusing area (VDR-D310)

When there is a contrasting object ahead or behind the subject in the focus area, the subject may not be focused. If so, move the contrasting object out of the focus area. Even when it is still difficult to focus, adjust the focus manually.

### Recording with a shutter operation effect

You can add a shutter sound when recording still pictures.

**Press the MENU button, then select [ADVANCED] → [SHTR EFFECT] → [ON] and press the joystick.**



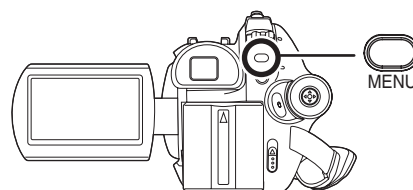
- This function's default setting is [ON].

## Number of pixels and picture quality for still picture recording

### ■ [PICTURE SIZE]

Changing the recording size.

Press the **MENU** button, then select **[BASIC] → [PICTURE SIZE] → desired item** and press the joystick.



#### VDR-D310:

| Icon | Aspect | Number of pixels |
|------|--------|------------------|
|      | 4:3    | 2048×1512        |
|      | 4:3    | 1280×960         |
|      | 4:3    | 640×480          |
|      | 16:9   | 1920×1080        |

#### VDR-D220:

| Icon | Aspect | Number of pixels |
|------|--------|------------------|
|      | 4:3    | 640×480          |
|      | 16:9   | 640×360          |

- When this unit is purchased, [PICTURE SIZE] is set to (VDR-D310)/ (VDR-D220). The sides of pictures recorded with a 16:9 aspect ratio may be cut at printing. Check before printing.

### ■ [PICT.QUALITY]

Selecting the picture quality.

Press the **MENU** button, then select **[BASIC] → [PICT.QUALITY] → desired item** and press the joystick.

- : Still pictures with a high picture quality are recorded.
- : Priority is given to the number of still pictures recorded. Still pictures are recorded in normal picture quality.

## Recording

### Various recording functions

#### Zoom in/out function

RAM -RW(VR) -RW(V) -R SD

##### VDR-D310:

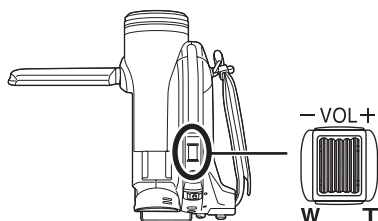
You can zoom in up to 10× optically.

##### VDR-D220:

You can zoom in up to 32× optically.

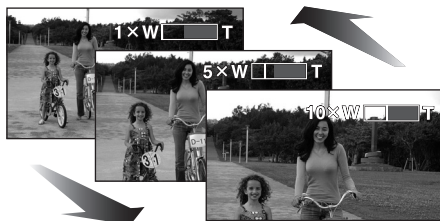
◇ Rotate the mode dial to select  or .

Move the zoom lever.



**T side:** Close-up recording (zoom in)

**W side:** Wide-angle recording (zoom out)



- When zooming in while holding this unit by hand, we recommend using the image stabilizer function. (→ 51)
- When distant subjects are brought closer, they are focused at about 1 m (VDR-D310)/1.3 m (VDR-D220) or more.
- When the zoom magnification is 1×, this unit can focus on a subject approx. 3.5 cm (VDR-D310)/2 cm (VDR-D220) away from the lens. (Macro function)

- The zoom speed varies depending on the range over which the zoom lever is moved. (The zoom speed does not vary when operating with the remote control.)
- When the zoom speed is high, the subject may not be focused easily.
- If you take your finger off the zoom lever during zoom operation, the operation sound may be recorded. When returning the zoom lever to the original position, move it quietly.

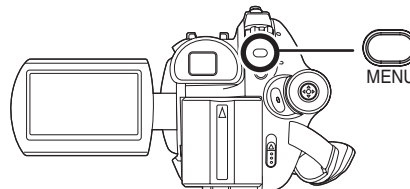
#### Digital zoom function

RAM -RW(VR) -RW(V) -R

If the zoom magnification exceeds 10× (VDR-D310)/32× (VDR-D220), then the digital zoom function will be activated. The maximum magnification provided by the digital zoom can be switched.

◇ Rotate the mode dial to select .

Press the MENU button, then select [ADVANCED] → [D.ZOOM] → desired item and press the joystick.



##### VDR-D310:

[OFF]: Optical zoom only (Up to 10×)

[25×]: Up to 25×

[700×]: Up to 700×

- If [25×] or [700×] is selected, the digital zoom range is displayed in blue while zooming.

##### VDR-D220:

[OFF]: Optical zoom only (Up to 32×)

[50×]: Up to 50×

[1000×]: Up to 1000×

- If [50×] or [1000×] is selected, the digital zoom range is displayed in blue while zooming.

- The larger the digital zoom magnification, the more the image quality is degraded.

## Recording

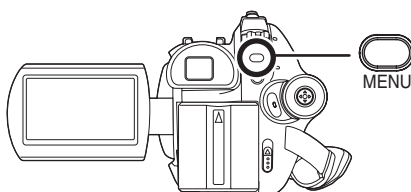
- This function cannot be used in picture recording mode.

### To use the zoom microphone function

RAM -RW(VR) -RW(V) -R

The zoom microphone is linked to the zooming operation so that far-away sounds with a tele-shot and close-up sounds with a wide-angle shot are recorded more clearly.

- ◇ Rotate the mode dial to select .
- Press the MENU button, then select [ADVANCED] → [ZOOM MIC] → [ON] and press the joystick.



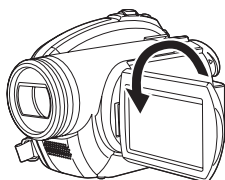
- The zoom microphone function does not work with an external microphone. (VDR-D310)

### Recording yourself

RAM -RW(VR) -RW(V) -R SD

You can record yourself while viewing the LCD monitor. You can record persons in front of the unit while showing them the image.

- ◇ Rotate the mode dial to select or .
- Rotate the LCD monitor towards the lens side.



The image is horizontally flipped as if you see a mirror image. (However the image recorded is the same as a normal recording.)

- Extend the viewfinder to see the picture while recording.
- When the recording aspect is 16:9, the image displayed on the viewfinder screen is squeezed horizontally, but this is normal and not a sign of any trouble.
- When the LCD monitor is rotated towards the lens side, the icon will not be displayed even if you press the joystick.
- Only some indications will appear on the screen. When appears, return the direction of the LCD monitor to normal position and check the warning/alarm indication. (→ 88)

### Backlight compensation function

This is for protecting a backlit subject from being darkened.

RAM -RW(VR) -RW(V) -R SD

Use this function when the light is emanating from behind the subject and the subject appears dark.

- ◇ Rotate the mode dial to select or .

- 1 Press the joystick. Then move the joystick down to display the icon shown in the illustration.



## Recording

### 2 Move the joystick up to select .



The image on the screen will become brighter.

#### To return to normal recording

Select  again.

- If you turn off the power or operate the mode dial, the backlight compensation function is cancelled.

## Fade in/fade out function

RAM -RW(VR) -RW(V) -R

**Fade in:** The image and audio gradually appear.

**Fade out:** The image and audio gradually disappear.

◆ Rotate the mode dial to select .

### 1 Press the joystick. Then move the joystick down to display the icon shown in the illustration.



### 2 Move the joystick left to select .



### 3 Press the recording start/stop button.

Start recording. (Fade in)



When you start recording, the image/audio gradually appears.

Pause recording. (Fade out)



The image/audio gradually disappears. After the image/audio completely disappears, recording stops.

- After recording, the fade setting is cancelled.

#### To cancel fading

Select  again.

#### To select the colour for fade in/out

The colour which appears in fading pictures can be selected.

Press the MENU button, then select [ADVANCED] → [FADE COLOUR] → [WHITE] or [BLACK] and press the joystick.

- If you turn off the power, the fade function is cancelled.
- While the fade in/fade out function is selected, it takes several seconds to display the image when you start recording. It also takes several seconds to pause recording.
- The thumbnails of scenes recorded using fade in become black (or white).

### Soft skin mode

This makes skin colours appear softer for a more attractive appearance.

RAM -RW(VR) -RW(V) -R SD

This is more effective if you record the bust image of a person.

◇ Rotate the mode dial to select  or .

**1** Press the joystick. Then move the joystick down to display the icon shown in the illustration.



**2** Move the joystick left to select .



#### To cancel the soft skin mode

Select  again.

- If the background or anything else in the scene has colours similar to the skin colour, they will also be smoothed.
- If the brightness is insufficient, the effect may not be clear.
- You may not be able to see the face clearly when recording a distant person. In this case, cancel soft skin mode or zoom in on the face.

### Tele macro function (VDR-D310)

This is for bringing only what you want to record into focus to take close-ups.

RAM -RW(VR) -RW(V) -R SD

By focusing only on the subject and blurring the background, the image can be impressive. The unit can focus on the subject at a distance of approx. 50 cm.

◇ Rotate the mode dial to select  or .

**1** Press the joystick. Then move the joystick down to display the icon shown in the illustration.



**2** Move the joystick right to select .



- If the magnification is 10× or less, then it is automatically set to 10×.

#### To cancel the tele macro function

Select  again.

- If a sharper focus cannot be achieved, adjust the focus manually. (→ 53)

## Recording

- In the following cases, the tele macro function is cancelled.
  - The zoom magnification becomes lower than 10×.
  - The power is turned off or the mode dial is operated.

### Colour night view function

This allows recording in dark locations.

**RAM -RW(VR) -RW(V) -R**

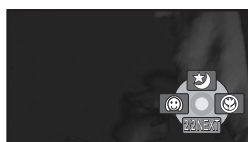
This function allows you to record colour subjects in dark locations to stand out against the background.

Attach this unit to a tripod, and you can record images free from vibration.

- Minimum required illumination: approx. 1 lx (VDR-D310)/approx. 2 lx (VDR-D220)
- Recorded scene is seen as if frames were missed.

◇ Rotate the mode dial to select .

- 1 Press the joystick. Then move the joystick down to display the icon shown in the illustration.



- 2 Move the joystick up to select .



- If it is difficult to focus, adjust the focus manually. (→ 53)

### To cancel the colour night view function

Select  again.

- The colour night view function makes the signal charging time of CCD up to approximately 25× longer than usual, so that dark scenes can be recorded brightly. For this reason, bright dots that are usually invisible may be seen, but this is not a malfunction.
- If you turn off the power or operate the mode dial, the colour night view function is cancelled.
- If set in a bright place, the screen may become whitish for a while.

### Self-timer recording

This is for recording shots of yourself as well.

**SD**

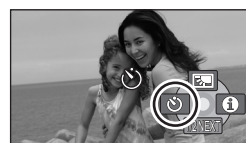
You can record still pictures on an SD card using the timer.

◇ Rotate the mode dial to select .

- 1 Press the joystick. Then move the joystick down to display the icon shown in the illustration.



- 2 Move the joystick left to select .



- 3 Press the  button.

After the  display flashes for approx.

10 seconds, a still picture will be recorded.

- After recording, the self-timer is cancelled.

## Recording

- If you press the  button halfway and then fully, the subject is focused when the button is pressed halfway. (VDR-D310)
- When you press the  button fully in auto focus mode, the subject is focused just before recording. (VDR-D310)

**To stop the timer midway through**

Press the MENU button. (The self-timer setting is cancelled.)

- If you turn off the power, the self-timer standby mode is cancelled.
- Depending on the time taken to bring the subject into focus, the recording may take longer than set to start.

### Recording guideline function

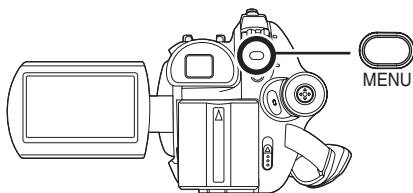
Checking if the image is level.

RAM -RW(VR) -RW(V) -R SD

You can check if the image is level while recording by using the lines displayed on the screen.

- ◇ Rotate the mode dial to select  or .

Press the MENU button, then select [BASIC] → [GUIDE LINES] → [ON] and press the joystick.

**To cancel the Recording guideline function**

Press the MENU button, then select [BASIC] → [GUIDE LINES] → [OFF] and press the joystick.

- The guidelines do not appear on the images actually recorded.
- The guidelines are not displayed while rotating the LCD monitor frontward to record yourself.

### Wide mode

This is for selecting the screen's aspect ratio when recording motion pictures.

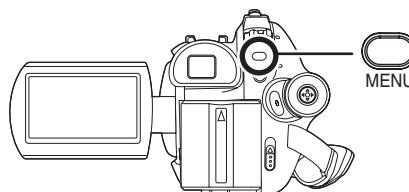
RAM -RW(VR) -RW(V) -R

This allows you to record images compatible with wide-screen TVs (16:9) and regular TVs (4:3).

#### ■ Recording images with a 16:9 aspect ratio

- ◇ Rotate the mode dial to select .

Press the MENU button, then select [BASIC] → [REC ASPECT] → [16:9] and press the joystick.



#### ■ Recording images with a 4:3 aspect ratio

- ◇ Rotate the mode dial to select .

Press the MENU button, then select [BASIC] → [REC ASPECT] → [4:3] and press the joystick.

- The default setting is [16:9].

### Image stabilizer function

This is for reducing image shakes during recording.

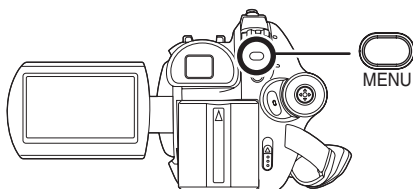
RAM -RW(VR) -RW(V) -R SD

Reduces the image shaking due to hand movement when recording.

- ◇ Rotate the mode dial to select  or .

## Recording

Press the MENU button, then select [ADVANCED] → [O.I.S.] → [ON] and press the joystick.



### To cancel the image stabilizer function

Press the MENU button, then select [ADVANCED] → [O.I.S.] → [OFF] and press the joystick.

- This function's default setting is [ON].
- In the picture recording mode, pressing the button halfway increases the effect of the image stabilizer function. (MEGA optical image stabilizer) (VDR-D310)
- In the following cases, the image stabilizer function may not work effectively.
  - When the digital zoom is used
  - When the unit is shaken greatly
  - When you record a moving subject while tracking it

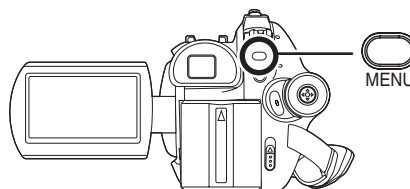
## Wind noise reduction function

This is for reducing the wind noise coming into the microphone when recording.

RAM -RW(VR) -RW(V) -R

◇ Rotate the mode dial to select .

Press the MENU button, then select [ADVANCED] → [WIND CUT] → [ON] and press the joystick.



### To cancel the wind noise reduction function

Press the MENU button, then select [ADVANCED] → [WIND CUT] → [OFF] and press the joystick.

- This function's default setting is [ON].
- The wind noise reduction depends on the wind strength. (If this function is activated in strong winds, the stereo effect may be reduced. When the wind weakens, the stereo effect will be restored.)
- The wind noise reduction function does not work with an external microphone. (VDR-D310)

## Manual recording functions

### Scene mode

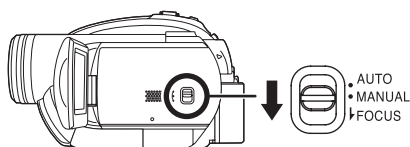
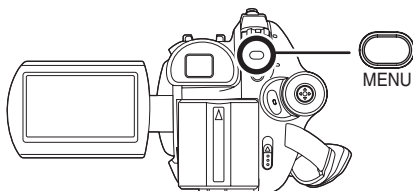
This is for recording in various situations.

RAM -RW(VR) -RW(V) -R SD

When you record images in different situations, this mode automatically sets optimum shutter speeds and apertures.

◇ Rotate the mode dial to select or .

## Recording

**1 Set the AUTO/MANUAL/FOCUS switch to MANUAL.****2 Press the MENU button, then select [BASIC] → [SCENE MODE] → desired item and press the joystick.****[Sports]**

To record sports scenes or scenes where there are quick motions

**[Portrait]**

To make people stand out against the background

**[Low light]**

To make the scene brighter in dark conditions

**[Spotlight]**

To make the subject under a spotlight look more attractive

**[Surf & snow]**

To record images in bright places such as ski slopes and beaches

**To cancel the scene mode function**

Press the MENU button, then select [BASIC] → [SCENE MODE] → [OFF] and press the joystick.

- You can also cancel the scene mode function by setting the AUTO/MANUAL/FOCUS switch to AUTO.

**Sports mode**

- For slow-motion playback or playback pause of recorded pictures, this mode helps diminish camera shake.
- During normal playback, the image movement may not look smooth.

- Avoid recording under fluorescent light, mercury light or sodium light because the colour and brightness of the playback image may change.
- If you record a subject illuminated with strong light or a highly reflective subject, vertical lines of light may appear.
- If the brightness is insufficient, the sports mode does not function. The [Sports] display flashes.
- If this mode is used indoors, the screen may flicker.

**Portrait mode**

- If this mode is used indoors, the screen may flicker. If so, change the scene mode setting to [OFF].

**Low light mode**

- Extremely dark scenes may not be able to be recorded finely.

**Spotlight mode**

- If the recording subject is extremely bright, the recorded image may become whitish and the periphery of the recorded image extremely dark.

**Surf & snow mode**

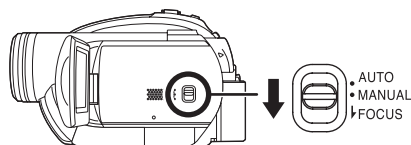
- If the subject is extremely bright, the recorded image may become whitish.

**Manual focus adjustment**

RAM -RW(VR) -RW(V) -R SD

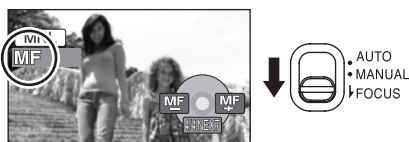
If auto focusing is difficult due to the conditions, then manual focusing is available.

- ◇ Rotate the mode dial to select [Sports] or [Portrait].

**1 Set the AUTO/MANUAL/FOCUS switch to MANUAL.**

## Recording

### 2 Move the switch down and set it to FOCUS position.

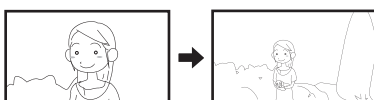


The manual focus indication [MF] and the icon shown in the illustration appear.

### 3 Move the joystick left or right to bring the subject into focus.



- The subject may not be in focus when zoomed in if focusing with a wide angle. First, zoom in on the subject, and then focus on it.



#### To restore to the automatic adjustment

Press the AUTO/MANUAL/FOCUS switch down again to the FOCUS position.

- You can also restore the auto focusing by setting the AUTO/MANUAL/FOCUS switch to AUTO.

## White balance

This is for recording in natural colours.

RAM -RW(VR) -RW(V) -R SD

The automatic white balance function may not reproduce natural colours depending on the scenes or lighting conditions. If so, you can adjust the white balance manually.

- ◇ Rotate the mode dial to select or .

### 1 Set the AUTO/MANUAL/FOCUS switch to MANUAL.



The icon shown in the illustration is displayed automatically.

### 2 Move the joystick up to select [WB].



### 3 Move the joystick left or right to select the white balance mode.



#### [AWB] Auto white balance adjustment

#### [] Indoor mode (for recording under incandescent lamps)

- Incandescent lights, halogen lamps

#### [] Outdoor mode

- Outdoors under a clear sky

#### [] Manual adjustment mode

- Mercury-vapor lamps, sodium lamps, some fluorescent lights
- Lights used for wedding receptions at hotels, stage spotlights in theatres
- Sunrise, sunset, etc.

#### To restore to the automatic adjustment

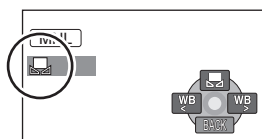
Set the white balance mode to [AWB].

- You can also restore the automatic adjustment by setting the AUTO/MANUAL/FOCUS switch to AUTO.

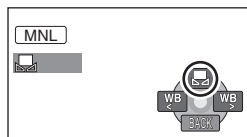
## Recording

## To set the white balance manually

- 1** Select [MNL], fill the screen with a white subject.



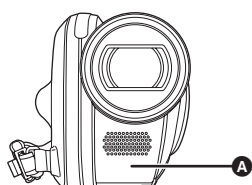
- 2** Move the joystick up to select [MNL].



When the [MNL] display changes from flashing to on, setting is complete.

- When the [MNL] display continues flashing, the white balance cannot be set because the place is dark etc. In this case, use the automatic white balance.

#### ■ About the white balance sensor **A**

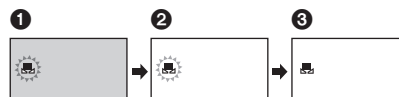


The white balance sensor detects the type of light source during recording. Do not cover the white balance sensor during recording, or it may not function properly.

#### ■ About the black balance adjustment (VDR-D310)

This is one of the 3CCD system functions that automatically adjusts the black when the white balance is set in the manual adjustment mode. When the black balance is adjusted, the screen

will temporarily be black. (The black balance cannot be adjusted manually.)



- 1** Black balance adjustment in progress. (Flashes.)
- 2** White balance adjustment in progress. (Flashes.)
- 3** Adjustment completed. (Lights up.)

- When the unit is turned on with the lens cap attached, the automatic white balance adjustment may not function properly. Please turn the unit on after removing the lens cap.
- When the [MNL] display flashes, the manual white balance previously adjusted is stored. Whenever recording conditions change, re-set the white balance for correct adjustment.
- When setting both the white balance and the iris/gain, set the white balance first.

### Manual shutter speed/aperture adjustment

RAM -RW(VR) -RW(V) -R SD

#### Shutter Speed:

Adjust it when recording fast-moving subjects.

#### Aperture:

Adjust it when the screen is too bright or too dark.

- ◇ Rotate the mode dial to select or .

- 1** Set the AUTO/MANUAL/FOCUS switch to MANUAL.



The icon shown in the illustration is displayed automatically.

## Recording

### 2 Move the joystick left or right to select [IRIS] (aperture) or [SHTR] (shutter speed).



### 3 Move the joystick left or right to make the adjustment.



#### A Shutter speed:

- 📷 1/50 to 1/8000
- 📷 1/25 to 1/2000 (VDR-D310)
- 📷 1/50 to 1/500 (VDR-D220)
- The shutter speed closer to 1/8000 is faster.

#### B Iris/Gain value:

**CLOSE → (F16 to F2.0) → OPEN → (0dB to 18dB)**

- Value closer to [CLOSE] darken the image.
- Value closer to [18dB] brighten the image.
- When the iris value is adjusted to brighter than [OPEN], it changes to the gain value.

#### To restore to automatic adjustment

Set the AUTO/MANUAL/FOCUS switch to AUTO.

- When setting both the shutter speed and the iris/gain value, set the shutter speed and then set the iris/gain value.

#### ■ Manual shutter speed adjustment

- Avoid recording under fluorescent light, mercury light or sodium light because the colour and brightness of the playback image may change.
- If you increase the shutter speed manually, the gain value will increase automatically depending on how much the sensitivity lowers and the noise on the screen may increase.

- You may see vertical lines of light in the playback image of a brightly shining subject or highly reflective subject, but this is not a malfunction.
- During normal playback, image movement may not look smooth.
- When recording in an extremely bright place, the screen may change colour or flicker. If so adjust the shutter speed manually to [1/50] or [1/100].

#### ■ Manual iris/gain adjustment

- If the gain value is increased, the noise on the screen increases.
- Depending on the zoom magnification, there are iris values that are not displayed.

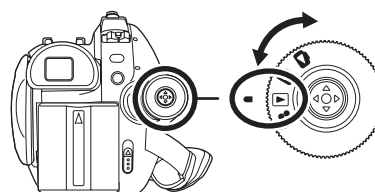
## Motion picture playback

RAM -RW(VR) -RW(V) -R

Play back the motion pictures recorded on the disc.

### 1 Rotate the mode dial to select .

The motion pictures recorded on the disc are displayed as thumbnails.

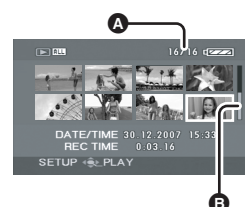


### 2 Select the scene to be played back.

- A Scene number
- B Scroll bar display

The selected scene will be encircled by a yellow frame.

- When 9 or more scenes have been recorded, the next (or previous) page is displayed by moving the joystick.
- If you move and hold the joystick up or down, you can advance 8 scenes at a time. The screen will not change at this time, but the scene numbers and scroll bar display will change so release the joystick when you have arrived at the page with the scene you want to display.



### 3 Press the joystick.

The selected scene is played back on the full screen.  
The operation icon is automatically displayed on the screen.



### 4 Move the joystick to operate.

- ▶/||: Playback/Pause
- ◀◀: Skip playback (backward)
- ▶▶: Skip playback (forward)
- : Stops the playback and shows the thumbnails

## Playback

- No sound will be heard except during normal playback.
- If pause play is continued for 5 minutes, the screen returns to the thumbnails.
- When the amount of time recorded on the scene is short, playback may not be possible.
- When a scene is displayed as [!] on the thumbnail display, playback is not possible.
- The power will not turn off when the LCD monitor and the viewfinder are closed and retracted.
- When playing back a motion picture recorded with other products on this unit or playing back a motion picture recorded with this unit on other products, the picture quality may deteriorate and it may be unplayable. (The message "CANNOT PLAY." appears.)
- The time displayed may be different from the recording time and it may take time to display the thumbnail display when playing back motion pictures recorded on another product.

### To display the recording date during playback

Press the MENU button, then select [SETUP] → [DATE/TIME] → [D/T] or [DATE] and press the joystick.

- You can also show or change the date and time display by repeatedly pressing the DATE/TIME button on the remote control. (VDR-D310)
- The recording time is not displayed on the screen during playback of scenes recorded on other products.

## Fast forward/rewind playback

**Move and hold the joystick right during playback until fast-forward starts.**

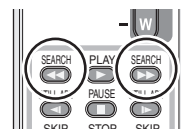
**(Move and hold the joystick left to rewind.)**

- Move the joystick again to increase the speed.
- Normal playback is restored when you move the joystick up.



### ■ Operating with the remote control (VDR-D310)

Press the ◀◀ or ▶▶ button.



## Slow-motion playback

**1 Move the joystick up during playback to pause the playback.**

**2 Move and hold the joystick right.**  
**(Slow-motion pictures will be played back in reverse when you move and hold the joystick left.)**

- Normal playback is restored when you move the joystick up.



## Playback

### ■ Operating with the remote control (VDR-D310)

Press the ◀ or ▶ button.



### Frame-by-frame playback

The motion picture is advanced one frame at a time.

**1** Move the joystick up during playback to pause the playback.

**2** Move the joystick right.  
(The frames will be advanced one at a time in the reverse direction when you move the joystick left.)

- Normal playback is restored when you move the joystick up.

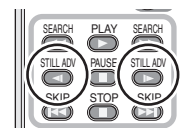


### ■ Operating with the remote control (VDR-D310)

**1** Press the || button.



**2** Press the ◀ or ▶ button.



### To adjust the volume

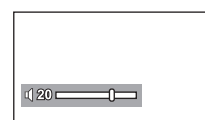
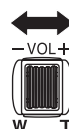
Adjust the speaker volume during playback.

**Move the volume lever to change the volume level.**

**Towards “+”:** increases the volume

**Towards “-”:** decreases the volume

- The further the [ ] indicator moves to the right, the higher the volume level becomes.
- When the adjustment is completed, the volume setting display will disappear.



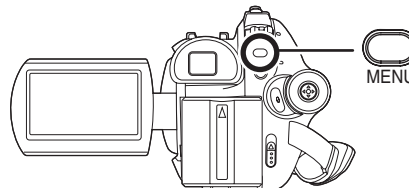
## Playback

### Playing back motion pictures by date

Recorded scenes are grouped by date on this unit.  
Scenes recorded on the same day can be played back in succession.

- 1 Press the **MENU** button, then select **[PLAY SETUP]** → **[PLAY MODE]** → **[BY DATE]** and press the joystick.

- When [PLAY MODE] is set to [VIEW ALL], all recorded motion pictures will be played back in succession.



- 2 Select the date for playback, then press the joystick.

The scenes recorded on the same day are displayed as thumbnails.



- 3 Select the scene to be played back.

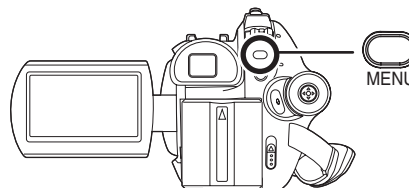
- Even if scenes are recorded on the same day, they are grouped separately in the following cases.
  - When the number of scenes exceeds 99 **RAM** **-RW(VR)** **-RW(V)** **-R**
  - When the disc is removed **-RW(V)** **-R**
  - When the [REC ASPECT] setting is changed **-RW(V)** **-R**
  - When the disc is repaired **-RW(V)** **-R**
  - When the layers switch on a DVD-R DL **-R**

### Resuming the previous playback

- Press the **MENU** button, then select **[PLAY SETUP]** → **[RESUME PLAY]** → **[ON]** and press the joystick.

If playback of a motion picture is stopped, [R] appears on the thumbnail view of the stopped scene.

- If playback is stopped at any point during a motion picture while [RESUME PLAY] is set to [OFF], the next time the motion picture is played back, it will be from the beginning.



- The resume position memorized is cleared if you open the disc cover or operate the mode dial, etc. (The [RESUME PLAY] setting is kept.)

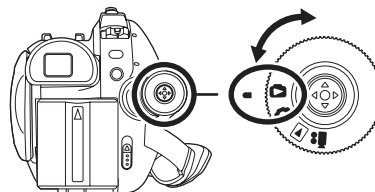
## Still picture playback (JPEG still pictures)

SD

Play back the still pictures recorded on the card.

### 1 Rotate the mode dial to select .

The still pictures recorded on the SD card are displayed as thumbnails.

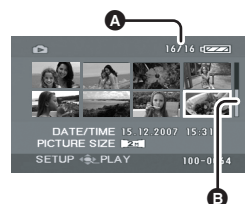


### 2 Select the file to be played back.

- A** File number
- B** Scroll bar display

The selected file will be encircled by a yellow frame.

- When 9 or more files have been recorded, the next (or previous) page is displayed by moving the joystick.
- If you move and hold the joystick up or down, you can advance 8 files at a time. The screen will not change at this time, but the file numbers and scroll bar display will change so release the joystick when you have arrived at the page with the file you want to display.



### 3 Press the joystick.

The selected file is played back on the full screen.

The operation icon is automatically displayed on the screen.



### 4 Move the joystick to operate.

- : Slide show (playback of the still pictures on the SD card in numerical order) start/pause.
- : Plays back the previous picture.
- : Plays back the next picture.
- : Stops the playback and shows the thumbnails.

#### ■ About still picture compatibility

- This unit is compliant with the unified standard DCF (Design rule for Camera File system) established by JEITA (Japan Electronics and Information Technology Industries Association).
- The file format supported by this unit is JPEG. (Not all JPEG formatted files will be played back.)
- If a non-standard file is played back, the folder/file number may not be displayed.
- This unit may degrade or not play back data recorded or created on another product and another product may degrade or not play back data recorded on this unit.

- Do not operate the mode dial during the slide show.
- While this unit accesses the SD card (the access lamp is lit), do not remove the SD card.

## Playback

---

- It takes time to display the file depending on the number of pixels of the file.
- When a file is displayed as [!] on the thumbnail display, playback is not possible.
- If you attempt to play back file recorded in a different format or file data is defective, an error message may appear.
- The time displayed may be different from the recording time and it may take time to display the thumbnail display when playing back still pictures recorded on another product.
- The power will not turn off when the LCD monitor and the viewfinder are closed and retracted.

## Editing scenes

### Deleting scenes

This is for deleting scenes recorded on discs.

RAM -RW(VR)

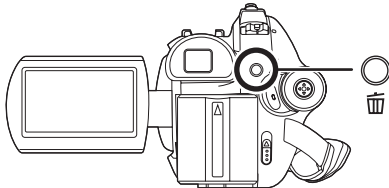
The deleted scenes cannot be restored.

- Scenes on DVD-RW (Video format) and DVD-R cannot be deleted.

#### Deleting scenes one at a time

◇ Rotate the mode dial to select .

**1** Press the  button during playback.

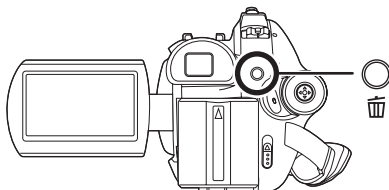


**2** When the confirmation message appears, select [YES], then press the joystick.

#### Deleting multiple scenes from the thumbnail display

◇ Rotate the mode dial to select .

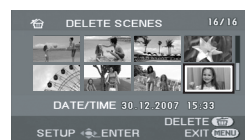
**1** Press the  button in the thumbnail display.



**2** Select [SELECT] or [ALL] and press the joystick.

- When [ALL] is selected, the following scenes will be deleted. Proceed to step 5.
  - When [PLAY MODE] is set to [VIEW ALL]: All the scenes on the disc
  - When [PLAY MODE] is set to [BY DATE]: All the scenes selected by date

**3** (Only when [SELECT] is selected in step 2) **Select the scene to be deleted, then press the joystick.**



The selected scene is encircled by a red frame.

- When the joystick is pressed again, the selected scene will be cancelled.
- Up to 8 scenes displayed on a page can be set in succession.

**4** (Only when [SELECT] is selected in step 2) **Press the  button.**

**5** When the confirmation message appears, select [YES], then press the joystick.

(Only when [SELECT] is selected in step 2)

**To continue deleting other scenes**

Repeat steps 3-5.

#### To complete editing

Press the MENU button.

- You can also delete scenes by pressing the MENU button, selecting [EDIT SCENE] → [DELETE] and then selecting [SELECT] or [ALL].
- To delete an unwanted part of a scene, divide the scene first, and then delete the unnecessary part. (→ 64)
- In case of [ALL], the deletion may take time if there are many scenes on the disc.

## Editing

- Do not turn off this unit while deleting.
- When you delete scenes, use a battery with sufficient battery power or use the AC adaptor.
- It may not be possible to delete scenes that have been divided. Combine the divided scenes, and then delete them.

### Dividing a scene

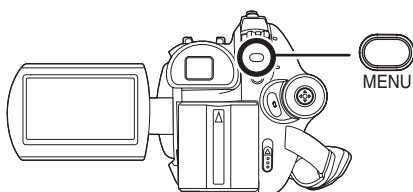
This is for dividing a scene into two.

**RAM -RW(VR)**

To delete an unnecessary portion of a scene, first divide the scene and then delete the unnecessary portion.

◇ Rotate the mode dial to select .

- 1 Press the MENU button, then select [EDIT SCENE] → [DIVIDE] → [YES] and press the joystick.



- 2 Select the scene to be divided, then press the joystick.



The selected scene is played back.

- 3 When you reach the area where you want to divide the scene,

move the joystick down to set the dividing point.



- Using slow-motion playback or frame-by-frame playback makes it easy to search for the point where you want to divide the scene. (→ 58)

- 4 When the confirmation message appears, select [YES], then press the joystick.

*To continue dividing other scenes*

Repeat steps 2-4.

*To complete editing*

Press the MENU button.

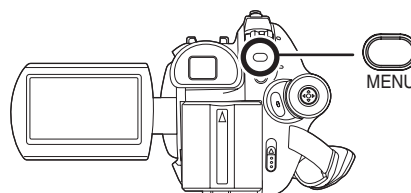
### Combining scenes

This function is only for combining two consecutive scenes into one.

**RAM -RW(VR)**

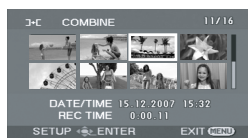
◇ Rotate the mode dial to select .

- 1 Press the MENU button, then select [EDIT SCENE] → [COMBINE] → [YES] and press the joystick.



## Editing

## 2 Select the scene to be combined, then press the joystick.



- The selected scene and the next scene are combined.
- If you wish to combine scenes that are not next to each other or scenes with different recording dates, first create a playlist and then combine the scenes on the playlist. (→ 65, 69)

## 3 When the confirmation message appears, select [YES], then press the joystick.

### To continue combining other scenes

Repeat steps 2-3.

### To complete editing

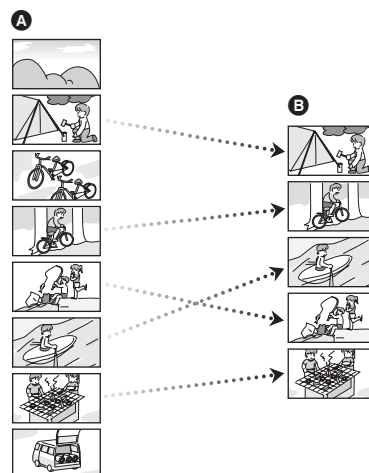
Press the MENU button.

## Using playlists

### What is a playlist?

You can create a playlist by gathering your favourites from the recorded scenes. Since the playlist is not created by copying data, you will consume little of the disc capacity by making a playlist.

- If you create or delete playlists, the original scenes will not be modified. Editing scenes on a playlist will not affect the original scenes.



- A** Recorded scenes
- B** Playlist

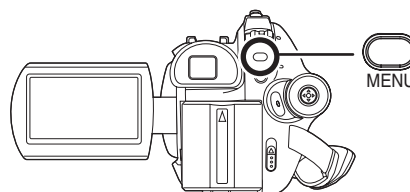
- The maximum number of items on a disc (per side)
  - Playlists: 99
  - Playlist scenes: 999
- If original scenes are deleted, the portion of playlists created with these scenes is also deleted.

## Creating a new playlist

RAM -RW(VR)

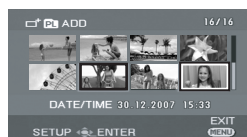
- ◇ Rotate the mode dial to select .

- 1 Press the MENU button, then select [PLAY SETUP] → [PLAYLIST] → [CREATE] and press the joystick.



## Editing

### 2 Select the scene to be added to the playlist, then press the joystick.



The selected scene is encircled by a red frame.

- When the joystick is pressed again, the selected scene will be cancelled.
- Up to 50 scenes can be set in succession.
- The scenes are registered in the playlist in the order that they were selected. After creating a playlist, the order of the scenes in it can be changed with the [MOVE] function. (→ 68)

### 3 Press the MENU button.

### 4 When the confirmation message appears, select [YES], then press the joystick.

The thumbnail view screen of the created playlist is displayed.

#### To add another scene to the same playlist

Select [ADD]. (→ 67)

#### To playback a playlist

Select the scene to start playback, then press the joystick.

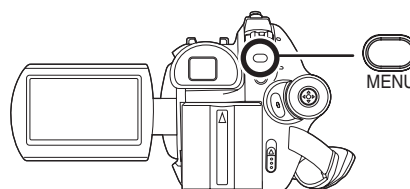
## Playing back a playlist

RAM -RW(VR)

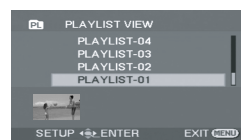
◇ Rotate the mode dial to select .

### 1 Press the MENU button, then select [PLAY SETUP] →

[PLAYLIST] → [VIEW LIST] and press the joystick.



### 2 Select the playlist to be played back, then press the joystick.



Scenes in the selected playlist are displayed as thumbnails.

### 3 Select the scene to start playback, then press the joystick.



#### To select a different playlist

Press the MENU button, then select [PLAYLIST VIEW] and press the joystick.

#### To return to showing the original scenes

Press the MENU button, then select [END] and press the joystick.

## Editing a playlist

RAM -RW(VR)

Editing scenes on a playlist will not affect the original scenes.

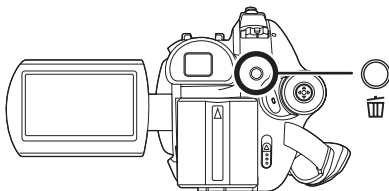
## Deleting scenes

- Deleting scenes on a playlist will not affect the original scenes.

### ■ Deleting scenes one at a time

- ◇ Select playlist playback mode. (→ 66, steps 1 and 2)

#### 1 Press the button during playback.

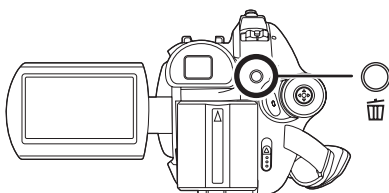


#### 2 When the confirmation message appears, select [YES], then press the joystick.

### ■ Deleting multiple scenes from the thumbnail display

- ◇ Select playlist playback mode. (→ 66, steps 1 and 2)

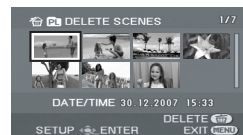
#### 1 Press the button in the thumbnail display.



#### 2 Select [SELECT] or [ALL] and press the joystick.

- When [ALL] is selected, the selected playlist will be erased. Proceed to step 5.

#### 3 (Only when [SELECT] is selected in step 2) Select the scene to be deleted, then press the joystick.



The selected scene is encircled by a red frame.

- When the joystick is pressed again, the selected scene will be cancelled.
- Up to 8 scenes displayed on a page can be set in succession.

#### 4 (Only when [SELECT] is selected in step 2) Press the button.

#### 5 When the confirmation message appears, select [YES], then press the joystick.

(Only when [SELECT] is selected in step 2)

#### **To continue deleting other scenes**

Repeat steps 3-5.

#### **To complete editing**

Press the MENU button.

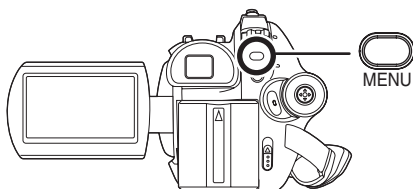
- You can also delete scenes by pressing the MENU button, selecting [EDIT] → [DELETE] and then selecting [SELECT] or [ALL].
- Deleting scenes on a playlist will not increase the remaining capacity for recording.
- The playlist itself is deleted if you delete all the scenes in it.
- When a playlist is deleted, the number of each subsequent playlist decreases by one.
- It may not be possible to delete scenes that have been divided. Combine the divided scenes, and then delete them.

## Adding scenes to playlist

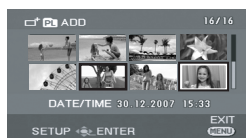
- ◇ Select playlist playback mode. (→ 66, steps 1 and 2)

## Editing

- 1 Press the MENU button, then select [EDIT] → [ADD] → [YES] and press the joystick.



- 2 Select the scene to be added, then press the joystick.



The selected scene is encircled by a red frame.

- When the joystick is pressed again, the selected scene will be cancelled.
- Up to 50 scenes can be set in succession.
- The scenes are added to the playlist in the order that they were selected. The order of the scenes in the playlist can be changed by [MOVE] function. (→ 68)

- 3 Press the MENU button.

- 4 When the confirmation message appears, select [YES], then press the joystick.

The thumbnail view screen of the playlist that scenes were added to is displayed.

### To continue adding scenes to the playlist

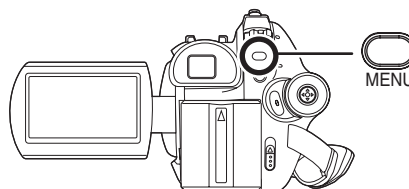
Repeat steps 1-4.

### Moving scenes

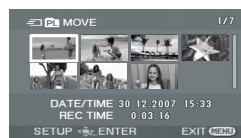
The scenes in a playlist can be moved.

- ◇ Select playlist playback mode. (→ 66, steps 1 and 2)

- 1 Press the MENU button, then select [EDIT] → [MOVE] → [YES] and press the joystick.

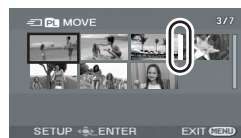


- 2 Select the scene to be moved, then press the joystick.



The selected scene is encircled by a red frame, and the position to insert is shown by a yellow bar.

- 3 Select the position to insert the scene, then press the joystick.



### To continue moving other scenes in the playlist

Repeat steps 2-3.

### To complete editing

Press the MENU button.

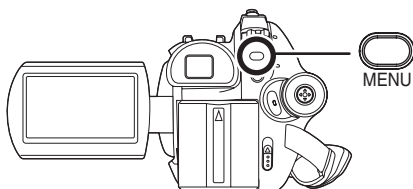
### Dividing a scene

You can divide a scene into two parts.

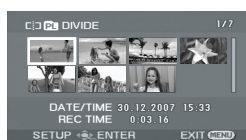
- Dividing scenes on a playlist will not affect the original scenes.

- ◇ Select playlist playback mode. (→ 66, steps 1 and 2)

- 1 Press the MENU button, then select [EDIT] → [DIVIDE] → [YES] and press the joystick.



- 2 Select the scene to be divided, then press the joystick.



The selected scene is played back.

- 3 When you reach the area where you want to divide the scene, move the joystick down to set the dividing point.



- Using slow-motion playback or frame-by-frame playback makes it easy to search for the point where you want to divide the scene. (→ 58)

- 4 When the confirmation message appears, select [YES], then press the joystick.

**To continue dividing other scenes**  
Repeat steps 2-4.

**To complete editing**  
Press the MENU button.

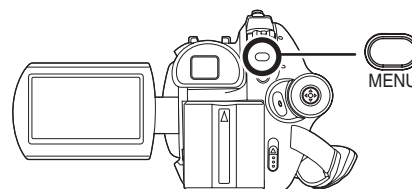
## Combining scenes

Two consecutive scenes can be combined into one.

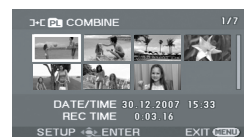
- Combining scenes on a playlist will not affect the original scenes.

- ◆ Select playlist playback mode. (→ 66, steps 1 and 2)

- 1 Press the MENU button, then select [EDIT] → [COMBINE] → [YES] and press the joystick.



- 2 Select the scene to be combined, then press the joystick.



- The selected scene and the next scene are combined.

- 3 When the confirmation message appears, select [YES], then press the joystick.

**To continue combining other scenes**  
Repeat steps 2-3.

**To complete editing**  
Press the MENU button.

## Editing

## Editing still pictures

## Deleting still pictures

This is for deleting still picture files recorded on SD cards.

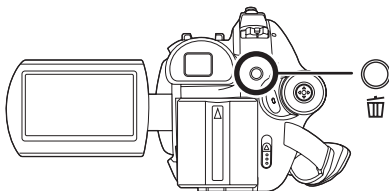
SD

The deleted files cannot be restored.

## Deleting files one at a time

◇ Rotate the mode dial to select .

**1** Press the  button during playback.

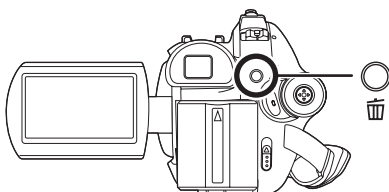


**2** When the confirmation message appears, select [YES], then press the joystick.

## Deleting multiple files from the thumbnail display

◇ Rotate the mode dial to select .

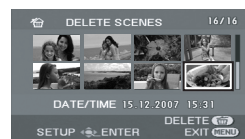
**1** Press the  button in the thumbnail display.



**2** Select [SELECT] or [ALL] and press the joystick.

- When [ALL] is selected, all files on the SD card except the locked files will be erased. Proceed to step 5.

**3** (Only when [SELECT] is selected in step 2)  
**Select the file to be deleted, then press the joystick.**



The selected file is encircled by a red frame.

- When the joystick is pressed again, the selected file will be cancelled.
- Up to 8 files displayed on a page can be set in succession.

**4** (Only when [SELECT] is selected in step 2)  
**Press the  button.**

**5** When the confirmation message appears, select [YES], then press the joystick.

(Only when [SELECT] is selected in step 2)

**To continue deleting other files**

Repeat steps 3-5.

**To complete editing**

Press the MENU button.

■ **Deleting still picture files recorded on an SD card by other products**

A still picture file (other than JPEG) that cannot be played back on this unit may be erased.

- You can also delete files by pressing the MENU button, selecting [PHOTO SETUP] → [DELETE] and then selecting [SELECT] or [ALL].
- In case of [ALL], the deletion may take time if there are many files on the SD card.
- Do not turn off this unit while deleting.
- When you delete files, use a battery with sufficient battery power or use the AC adaptor.
- Do not remove the SD card while deleting.

- If files conforming to DCF standard are deleted, all the data related to the files will be deleted.

## Locking still pictures

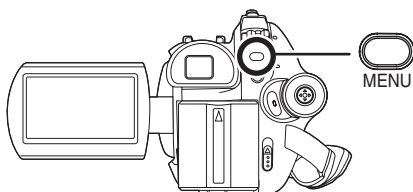
This is for preventing still picture files from being deleted by mistake.

SD

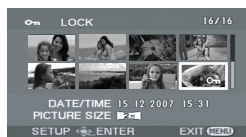
Still picture files recorded on an SD card can be locked so that they are not deleted by mistake. (However even if you lock some files on an SD card, formatting the card will delete all the files.)

- ◇ Rotate the mode dial to select .

- 1 Press the MENU button, then select [PHOTO SETUP] → [LOCK] → [YES] and press the joystick.



- 2 Select the file to be protected, then press the joystick.



[On] display appears and the selected file is locked.

- Press the joystick again to release the lock setting.
- You can also select multiple files in succession.

### To complete the settings

Press the MENU button.

## DPOF setting

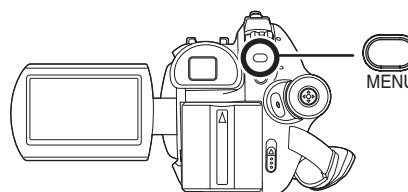
This is for writing the printing data on an SD card.

SD

You can write the data of the still pictures to be printed and the number of prints (DPOF data) onto the SD card.

- ◇ Rotate the mode dial to select .

- 1 Press the MENU button, then select [PHOTO SETUP] → [DPOF SET] → [SET] and press the joystick.



- 2 Select the file to be set, then press the joystick.



The number of prints set to be in DPOF is displayed.

- 3 Move the joystick up or down to select the number of prints, then press the joystick.

- You can select from 0 to 999. (The selected number of pictures can be printed with the printer supporting DPOF.)
- To cancel the setting, set the number of prints to [0].
- You can also select multiple files in succession.

### To complete the settings

Press the MENU button.

## Editing

### **To cancel all DPOF settings**

Press the MENU button, then select  
[PHOTO SETUP] → [DPOF SET] →  
[CANCEL ALL] and press the joystick.

- When the confirmation message appears, select [YES], then press the joystick.

### ■ What is DPOF?

DPOF stands for Digital Print Order Format. This enables picture printing information to be written onto an SD card so that it can be used on a system supporting DPOF.

- The DPOF setting can be established for up to 999 files.
- DPOF setting made on other devices may not be recognized by this unit. Please perform the DPOF settings on this unit.
- You cannot add the recording date to pictures to be printed with the DPOF settings.

## Disc management

### Finalizing a disc

It allows the discs to be played on other devices.

**-RW(VR) -RW(V) -R**

If you insert a DVD-RW or a DVD-R disc recorded in this unit (that has not been finalized) into another device such as DVD recorder, computer, etc., the disc may become unusable.

Be sure to finalize the disc on this unit before inserting it in other devices.

#### DVD-RAM:

- It is not necessary to finalize DVD-RAM.

#### DVD-RW (VR format):

- DVD-RW (VR format) after finalization can be recorded and edited in the same way as DVD-RW (VR format) before finalization.
- After finalizing a DVD-RW (VR format) once, you cannot finalize it again. (Even if you record on or edit a DVD-RW (VR format) after finalizing, it is not necessary to finalize it again.)

#### DVD-RW (Video format), DVD-R:

- After finalizing, the disc becomes play-only and you can no longer record.
- When you un-finalize a DVD-RW (Video format), the disc can be used for recording again. (→ 74)

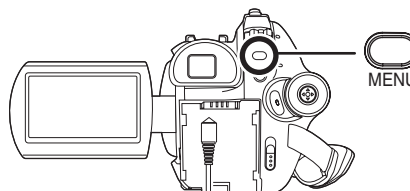
◇ Rotate the mode dial to select .

### 1 Connect this unit to the AC adaptor.

- Finalization cannot be executed when using a battery. If the power supply stops while finalizing, the finalization will fail and the data may be damaged. Use the AC adaptor.

### 2 Press the MENU button, then select [DISC SETUP] →

[FINALIZE] → [YES] and press the joystick.



### 3 When the confirmation message appears, select [YES], then press the joystick.

When finalizing a DVD-RW (Video format) or DVD-R, a top menu containing thumbnails is created.

- When finalizing is complete, press the MENU button to exit the message screen.

- Do not finalize a disc recorded on this unit using any other device.
- In the case of a double sided disc, finalize each side.
- The top menu created when finalizing does not appear on this unit. Play back the disc on a DVD player.

Titles are displayed by recording date on the top menu. However, when [PLAY MODE] is set to [BY DATE] to view scenes by recording date, some scenes recorded on the same date may be separated. (→ 60) These scenes will be displayed as separate titles on the top menu.

- It may take time to finalize a disc.
- If this unit becomes hot or is shaken strongly or impacted while finalizing, the finalization will fail and the disc may become unplayable on other devices.
- If the power supply stops while finalizing, the finalization will fail and the disc may become unplayable on other devices even if disc repair is carried out.

## Disc and card management

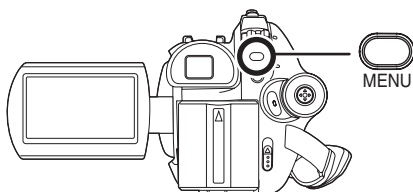
**Un-finalizing a DVD-RW**

This is for un-finalizing a DVD-RW (Video format) so that it can be used for recording.

**-RW(V)**

◇ Rotate the mode dial to select .

- 1 Press the MENU button, then select [DISC SETUP] → [UN-FINALIZE] → [YES] and press the joystick.



## 2 When the confirmation message appears, select [YES], then press the joystick.

- When un-finalizing is complete, press the MENU button to exit the message screen.
- DVD-RW (VR format) cannot be un-finalized. DVD-RW (VR format) after finalization can be recorded and edited in the same way as DVD-RW (VR format) before finalization.
- DVD-R cannot be un-finalized.
- When you un-finalize the disc, use a battery with sufficient battery power or the AC adaptor.

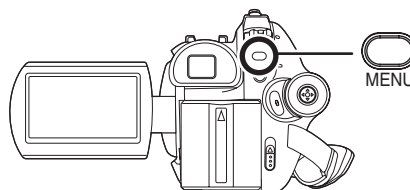
**Protecting a disc****RAM -RW(VR)**

This is for preventing recorded contents from being deleted or edited by mistake. Further recording and editing is not possible on protected discs until the protection is released.

◇ Rotate the mode dial to select .

- 1 Press the MENU button, then select [DISC SETUP] →

[DISC PROTECT] and press the joystick.



- 2 When the confirmation message appears, select [YES], then press the joystick.

**To release disc protection**

- 1) Press the MENU button, then select [DISC SETUP] → [DISC PROTECT] and press the joystick.
- 2) When the confirmation message appears, select [YES], then press the joystick.

- If the disc has been protected on another device, it may not be possible to release the protection on this unit. In this case, release the protection on the device that you used to protect it.

**Formatting discs**

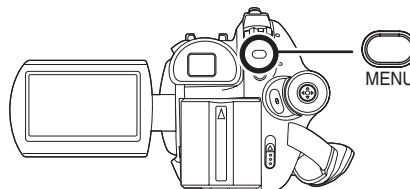
This is for initializing discs.

**RAM -RW(VR) -RW(V)**

Please be aware that if a disc is formatted, then all the data recorded on the disc will be erased.

◇ Rotate the mode dial to select  or .

- 1 Press the MENU button, then select [DISC SETUP] → [FORMAT DISC] → [YES] and press the joystick.



## Disc and card management

- When formatting a DVD-RAM, skip to step 3.

- 2** (When formatting a DVD-RW only)  
**Select format type (→ 17), then press the joystick.**



- 3** When the confirmation message appears, select [YES], then press the joystick.

- When formatting is complete, press the MENU button to exit the message screen.

- In the case of a double sided disc, format each side.
- It may not be possible to format a disc with many scratches or dirt. Such discs cannot be used.
- During formatting, do not turn this unit off.
- When you format the disc, use a battery with sufficient battery power or the AC adaptor.

**Formatting DVD-RAM:**

- We recommend formatting on this unit. If formatting on a computer, use the supplied software (VDR-D310). For more details, refer to the operating instructions of the software. If you connect this unit to a computer to format a DVD-RAM, you cannot use DVDForm to physically format it. Use a separate DVD-RAM drive to physically format a DVD-RAM.

**Formatting DVD-RW:**

- Format on this unit.

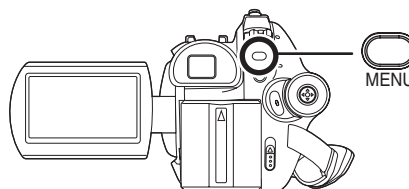
## Displaying disc information

**RAM -RW(VR) -RW(V) -R**

Information such as the number of recorded scenes, the remaining space and whether or not the disc is finalized or protected is displayed.

- ◇ Rotate the mode dial to select or .

**Press the MENU button, then select [DISC SETUP] → [INFORMATION] → [YES] and press the joystick.**

**To exit the information screen**

Press the MENU button.

## Card management

### Formatting an SD card

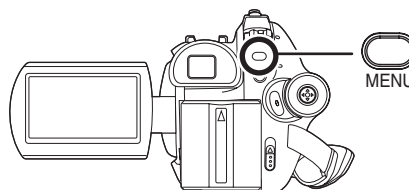
This is for initializing cards.

**SD**

Please be aware that if an SD card is formatted, then all the data recorded on the card will be erased. Store important data on a computer, etc.

- ◇ Rotate the mode dial to select or .

- 1** Press the MENU button, then select [SETUP] → [FORMAT CARD] → [YES] and press the joystick.



- 2** When the confirmation message appears, select [YES], then press the joystick.

- When formatting is complete, press the MENU button to exit the message screen.

## Disc and card management

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- Use this unit to format SD cards. If an SD card is formatted on other products (such as a computer), the time spent for recording may become longer and you may not be able to use the SD card.
- Depending on the type of SD card being used, it may take time to format.
- During formatting, do not turn this unit off.
- When you format the SD card, use a battery with sufficient battery power or the AC adaptor.
- Do not remove the SD card while formatting.

## With other products

## With a TV

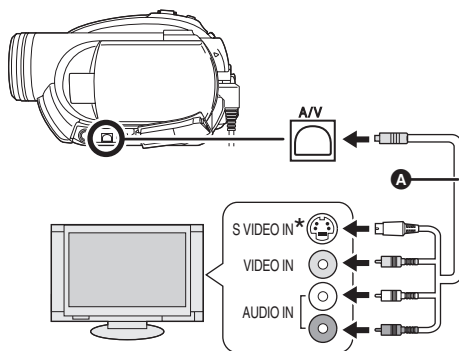
## Playback on TV

RAM -RW(VR) -RW(V) -R SD

The motion pictures and still pictures recorded by this unit can be played back on a TV.

- Use the AC adaptor to free you from worrying about the battery running down.

## 1 Connect this unit and a TV.



- A** AV/S cable (supplied)
- Insert the plugs as far as they will go.

\* If the TV has an S Video terminal, also connect the S Video plug to it. This allows you to enjoy more beautiful pictures.

## 2 Turn on this unit, then rotate the mode dial to select or .

## 3 Change the input channel on the TV.

- The channel set will differ depending on the terminal to which the unit is connected.

## 4 Start playback on this unit.

The image and audio are output on the TV.

## ■ If the image or audio from this unit is not output on the TV

- Check that the plugs are inserted as far as they go.
- Check the connected terminal.
- **Check the TV's input setting (input switch).** (For more information, please read the operating instructions for the TV.)

- If the images are not displayed correctly on a wide-screen TV, adjust the aspect setting on the TV. (Refer to the operating instructions of the TV for details.) If the pictures are displayed squeezed horizontally on a regular TV (4:3), change the [TV ASPECT] setting on this unit. (→ below)

## ■ To watch images with a 16:9 aspect ratio on a regular TV (4:3)

When playing back motion pictures recorded with a 16:9 aspect ratio ([REC ASPECT] was set to [16:9]) or still pictures recorded with a 16:9 aspect ratio ([PICTURE SIZE] was set to []) (VDR-D310)/[] (VDR-D220)] on a TV with a 4:3 aspect ratio, the images may be squeezed horizontally. In this case, change the menu setting to play back the pictures in the original aspect ratio. (Depending on the TV setting, the pictures may not be displayed correctly. For more information, please read the operating instructions of your TV.)

**Press the MENU button, then select [SETUP] → [TV ASPECT] → [4:3] and press the joystick.**

Example of images with a 16:9 aspect ratio on a regular TV (4:3)

| [TV ASPECT] setting |       |
|---------------------|-------|
| [16:9]              | [4:3] |
|                     |       |

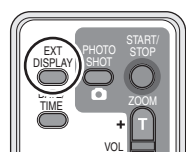
- This function's default setting is [16:9].

## With other products

### ■ To display the on-screen information on the TV (VDR-D310)

The information displayed on the screen (operation icon and time code, etc.) can be displayed on the TV.

**Press the EXT DISPLAY button on the remote control.**



- Press the button again to erase the information.
- The screen on this unit will not change.

## With a DVD recorder/ player

### Playback on DVD recorder, DVD player, computer etc.

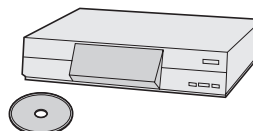
- Do not insert a DVD-RW or a DVD-R disc recorded in this unit (that has not been finalized) into another device such as DVD recorder, DVD player, computer, etc. as the disc may become unusable.
- If you insert a DVD-RW disc recorded in this unit (that has not been finalized) into another device such as DVD recorder, computer, etc., a format message may appear. Do not format the disc as all the important data recorded on the disc will be erased and cannot be recovered.
- When playing back a disc on a DVD recorder/ player, place the device so that the disc lies flat.

### Playing back a DVD-RAM or a DVD-RW (VR format)

**RAM -RW(VR)**

- 1 [Only when playing back a DVD-RW (VR format)]  
**Finalize the disc on this unit.**  
(→ 73)

- 2 **Insert the disc in the playback device and then play it back.**



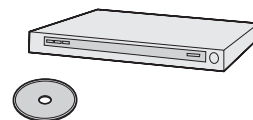
- Playback is only possible on devices that support 8 cm DVD-RAM or DVD-RW (VR format). Refer to the operating instructions of the playback device.
- You cannot record images that allow "One time only recording" on a 8 cm disc.

### Playing back a DVD-RW (Video format) or a DVD-R

**-RW(V) -R**

- 1 **Finalize the disc on this unit.**  
(→ 73)

- 2 **Insert the disc in the playback device and then play it back.**



- Playback is possible on devices that support 8 cm DVD-Video, but playback on all DVD players is not guaranteed.
- Playback of DVD-R DL is only possible on devices that support 8 cm DVD-R DL. Refer to

## With other products

the operating instructions of the playback device.

- The recording time is not displayed.

## Dubbing recordings onto a DVD recorder's hard disk

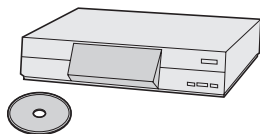
RAM -RW(VR) -RW(V) -R

If you have a DVD recorder with hard disk, images recorded by this unit can be stored on the hard disk.

- **Do not insert a DVD-RW or a DVD-R disc recorded in this unit (that has not been finalized) into the DVD recorder as the disc may become unusable.**
- **If you insert a DVD-RW disc recorded in this unit (that has not been finalized) into the DVD recorder, a format message may appear. Do not format the disc as all the important data recorded on the disc will be erased and cannot be recovered.**
- If you want to dub a disc that the DVD recorder is not compatible with, connect this unit and the DVD recorder with the AV/S cable and then dub the disc. (→ 80)

- 1** [Only when you dub a DVD-RW or a DVD-R] **Finalize the disc on the unit.**  
(→ 73)

- 2** **Insert the disc in the DVD recorder, then dub the contents onto the hard disk.**



- For details on how to dub the images onto the hard disk, refer to the operating instructions of the DVD recorder.
- If your DVD recorder has an SD card slot, you can write the still picture files recorded on an SD card with this unit to a disc or the hard disk.
- You cannot record images that allow "One time only recording" on a 8 cm disc.

- If you dub images recorded on a DVD-RW (Video format) or a DVD-R disc, the title name of the images after dubbing becomes the date they were dubbed.

If you dub images directly from the disc or with the AV/S cable and then play them back on a wide-screen TV, they may be squeezed horizontally. In this case, refer to the operating instructions of the device you are dubbing to or read the operating instructions of the wide-screen TV and set the aspect setting to 16:9 (Full).

## With other products

### With a VCR

#### Dubbing images onto other video devices

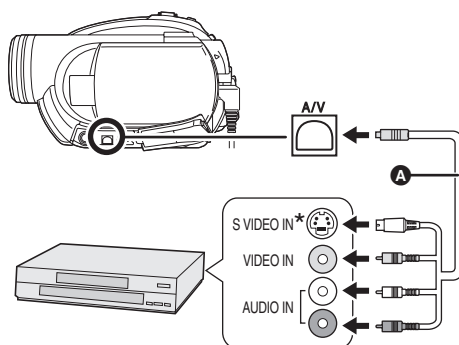
RAM -RW(VR) -RW(V) -R

You can dub images played back on this unit onto other video devices.

You can create a playlist by gathering the scenes you want to dub, then dub the scenes in this playlist only to other devices. (→ 65)

- Use the AC adaptor to free you from worrying about the battery running down.

#### 1 Connect this unit and a video device.



**A** AV/S cable (supplied)

- Insert the plugs as far as they will go.

\* If the video device has an S Video terminal, also connect the S Video plug into it. This allows you to enjoy more beautiful pictures.

#### 2 Turn on this unit, then rotate the mode dial to select .

#### 3 Change the input channel on the video device and TV.

- The channel set will differ depending on the terminal to which the unit is connected.

#### 4 Start playback on this unit. Then start recording on the connected device.

- See the operating instructions of the video device for details.

#### To stop dubbing

Stop recording on the connected device. Then stop playback on this unit.

- If the date and time display and function indication are unnecessary, cancel them before dubbing. (VDR-D310) (→ 35, 78)

### With a printer (PictBridge)

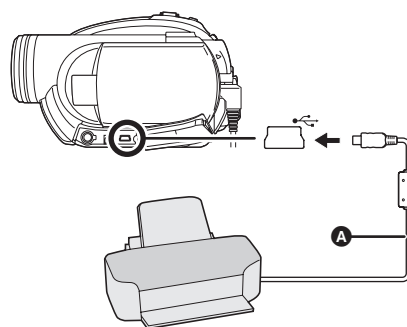
SD

To print pictures by directly connecting this unit to the printer, use a printer compatible with PictBridge. (Read the operating instructions for the printer.)

- Use the AC adaptor to free you from worrying about the battery running down.

◇ Insert an SD card with recorded images in the unit, then turn on the unit.

#### 1 Connect this unit and a printer.



**A** USB cable [supplied (VDR-D310)]

- Insert the plugs as far as they will go.
- Do not use any other USB cables except the supplied one. (Operation is not guaranteed with any other USB cables.) (VDR-D310)

## With other products

The USB function selection screen will appear.

## 2 Select [PictBridge] and press the joystick.

The [PictBridge] indication appears on this unit's screen.

## 3 Select a file to be printed, then press the joystick.

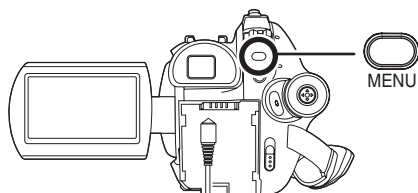


The number of pictures set is displayed.

## 4 Move the joystick up or down to select the desired number of prints, then press the joystick.

- You can set up to 9 prints.
- To cancel the setting, set the number of prints to [0].
- Up to 8 files displayed on a page can be set in succession by repeating steps 3 and 4.

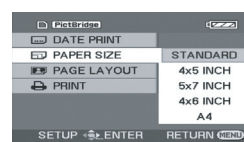
## 5 Press the MENU button to display the PictBridge menus.



## 6 Select the date print setting on [DATE PRINT].

- If the printer is not capable of date printing, this setting is unavailable.

## 7 Select the paper size setting on [PAPER SIZE].



[STANDARD]: Size specific to the printer

[4×5 INCH]: L size

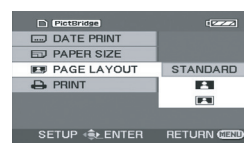
[5×7 INCH]: 2L size

[4×6 INCH]: Postcard size

[A4]: A4 size

- You cannot set paper sizes not supported on the printer.

## 8 Select the layout setting on [PAGE LAYOUT].



[STANDARD]: Layout specific to the printer

[No frame icon]: No frame print

[Frame icon]: Frame print

- You cannot set page layouts not supported on the printer.

## 9 Select [PRINT] → [YES] and press the joystick.

The pictures are printed.

- Exit PictBridge by disconnecting the USB cable after the pictures have been printed.

### When you stop printing halfway

Move the joystick down.

A confirmation message appears. If [YES] is selected, the number of prints set is cancelled and the screen returns to step 3. If [NO] is selected, all the settings are kept and the screen returns to step 3.

### With other products

---

- Avoid the following operations during printing.  
These operations disable proper printing.
  - Disconnecting the USB cable
  - Removing the SD card
  - Switching the mode dial
  - Turning off the power
- Check the settings for the paper size, quality of print, etc. on the printer.
- The sides of pictures recorded when [**2M**] (VDR-D310)/[**0.2M**] (VDR-D220) is set may be cut at printing. Check before printing.  
When using a printer with a trimming or borderless printing function, cancel this function before printing. (Refer to the operating instructions of the printer for details.)
- You may not be able to print still pictures recorded with other products.
- When the unit is connected directly to the printer, the DPOF settings cannot be used.
- Connect the printer directly to this unit. Do not use a USB hub.

## Menus

### Menu list

#### Motion picture recording menus

| BASIC                                                                                                                                                                                |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| SCN SCENE MODE                                                                                                                                                                       | OFF  |
| GUIDE LINES                                                                                                                                                                          | OFF  |
| REC MODE                                                                                                                                                                             | SP   |
| REC ASPECT                                                                                                                                                                           | 16:9 |
| CLOCK SET                                                                                                                                                                            | NO   |
| SETUP  ENTER EXIT  |      |

##### ■ [BASIC]

[SCENE MODE] (→ 52)  
 [GUIDE LINES] (→ 51)  
 [REC MODE] (→ 40)  
 [REC ASPECT] (→ 51)  
 [CLOCK SET] (→ 35)

##### ■ [ADVANCED]

[D.ZOOM] (→ 46)  
 [O.I.S.] (→ 51)  
 [FADE COLOUR] (→ 48)  
 [WIND CUT] (→ 52)  
 [ZOOM MIC] (→ 47)

##### ■ [DISC SETUP]

[FORMAT DISC] (→ 74)  
 [INFORMATION] (→ 75)

##### ■ [SETUP]

[DISPLAY] (→ 84)  
 [DATE/TIME] (→ 35)  
 [DATE FORMAT] (→ 35)  
 [POWER SAVE] (→ 84)  
 [AGS] (VDR-D310) (→ 38)  
 [BEEP SOUND] (→ 84)  
 [LCD SET] (→ 36)  
 [EVF SET] (→ 36)  
 [INITIAL SET] (→ 85)  
 [DEMO MODE] (→ 85)

##### ■ [LANGUAGE] (→ 33)

#### Still picture recording menus

| BASIC                                                                                                                                                                                   |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| SCN SCENE MODE                                                                                                                                                                          | OFF  |
| GUIDE LINES                                                                                                                                                                             | OFF  |
| PICTURE SIZE                                                                                                                                                                            | [2:] |
| PICT.QUALITY                                                                                                                                                                            | +    |
| CLOCK SET                                                                                                                                                                               | NO   |
| SETUP  ENTER EXIT  |      |

##### ■ [BASIC]

[SCENE MODE] (→ 52)  
 [GUIDE LINES] (→ 51)  
 [PICTURE SIZE] (→ 45)  
 [PICT.QUALITY] (→ 45)  
 [CLOCK SET] (→ 35)

##### ■ [ADVANCED]

[O.I.S.] (→ 51)  
 [SHTR EFFECT] (→ 44)

##### ■ [SETUP]

[DISPLAY] (→ 84)  
 [DATE/TIME] (→ 35)  
 [DATE FORMAT] (→ 35)  
 [FORMAT CARD] (→ 75)  
 [POWER SAVE] (→ 84)  
 [BEEP SOUND] (→ 84)  
 [LCD SET] (→ 36)  
 [EVF SET] (→ 36)  
 [INITIAL SET] (→ 85)  
 [DEMO MODE] (→ 85)

##### ■ [LANGUAGE] (→ 33)

#### Motion picture playback menus

| PLAY SETUP                                                                                                                                                                                  |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| PLAY MODE                                                                                                                                                                                   | VIEW ALL |
| RESUME PLAY                                                                                                                                                                                 | OFF      |
| PLAYLIST                                                                                                                                                                                    | CREATE   |
| SETUP  ENTER EXIT  |          |

##### ■ [PLAY SETUP]

[PLAY MODE] (→ 60)  
 [RESUME PLAY] (→ 60)  
 [PLAYLIST] (→ 65, 66)

##### ■ [EDIT SCENE]

[DIVIDE] (→ 64)  
 [COMBINE] (→ 64)

## Others

[DELETE] (→ 63)

### ■ [DISC SETUP]

[FINALIZE] (→ 73)  
[UN-FINALIZE] (→ 74)  
[DISC PROTECT] (→ 74)  
[FORMAT DISC] (→ 74)  
[INFORMATION] (→ 75)

### ■ [SETUP]

[DISPLAY] (→ 84)  
[DATE/TIME] (→ 35)  
[DATE FORMAT] (→ 35)  
[POWER SAVE] (→ 84)  
[BEEP SOUND] (→ 84)  
[LCD SET] (→ 36)  
[EVF SET] (→ 36)  
[TV ASPECT] (→ 77)

### ■ [LANGUAGE] (→ 33)

(In playlist playback mode)

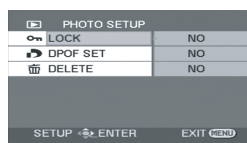
### ■ [EDIT]

[ADD] (→ 67)  
[MOVE] (→ 68)  
[DIVIDE] (→ 68)  
[COMBINE] (→ 69)  
[DELETE] (→ 67)

### ■ [CREATE]

■ [PLAYLIST VIEW]  
■ [END]

## Still picture playback menus



### ■ [PHOTO SETUP]

[LOCK] (→ 71)  
[DPOF SET] (→ 71)  
[DELETE] (→ 70)

### ■ [SETUP]

[DISPLAY] (→ 84)  
[DATE/TIME] (→ 35)

[DATE FORMAT] (→ 35)  
[FORMAT CARD] (→ 75)  
[POWER SAVE] (→ 84)  
[BEEP SOUND] (→ 84)  
[LCD SET] (→ 36)  
[EVF SET] (→ 36)  
[TV ASPECT] (→ 77)

### ■ [LANGUAGE] (→ 33)

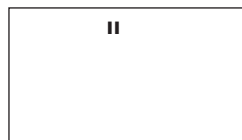
## Other menus

### ■ [DISPLAY]

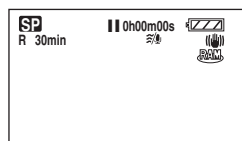
• [OFF] • [ON]

The screen indications are selected as shown in the illustration below.

[OFF]



[ON]



### ■ [POWER SAVE]

• [OFF] • [5 MINUTES]

[OFF]:

The power saving function is not activated.

[5 MINUTES]:

When about 5 minutes have passed without any operation, this unit automatically turns off to prevent the battery from running down. When you use this unit, turn it on again.

- In the following cases, the unit may not turn off even when you set this to [5 MINUTES].
  - When using the AC adaptor
  - When connecting the unit to a computer or printer via the USB cable

### ■ [BEEP SOUND]

• [OFF] • [ON]

This allows operations such as starting and ending recording to be signaled by a beep. When [OFF] is set, no beep is heard when an operation such as recording is started or ended.

**1 Beep**

When you start recording

When you turn on the power

When this unit is recognized by the computer or the printer, etc.

**2 Beeps**

When you pause recording

When you turn off the power

**2 Beeps for 4 times**

When an error occurs e.g. recording not starting.  
Check the sentence displayed on the screen.

(→ 88)

**■ [INITIAL SET]**

- [YES]                      • [NO]

When there is a menu that cannot be selected due another function or mode being activated, set to [YES] for changing the menu settings back to the initial shipping condition.

(The language setting cannot be changed back to the initial shipping condition.)

**■ [DEMO MODE]**

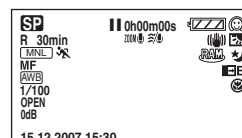
- [OFF]                      • [ON]

This item is used to start the unit demonstration. (Only when using the AC adaptor and the mode dial is at the  or  position)

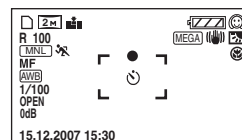
If you set this to [ON] without inserting a disc or an SD card, this unit is automatically set to the demonstration mode for introducing its functions. If any button is pressed or operated, the demonstration mode is cancelled. If no operations take place for approx. 10 minutes, the demonstration mode automatically starts. To terminate the demonstration mode, insert a disc or an SD card, or set this to [OFF]. For normal use, set this function to [OFF].

**Indications****Indications****■ Recording indications**

Motion picture recording



Still picture recording



|                                                                                     |                               |
|-------------------------------------------------------------------------------------|-------------------------------|
|  | Remaining battery power       |
| R 0min                                                                              | Remaining time for recording  |
| 0h00m00s                                                                            | Elapsed recording time        |
| 15.12.2007 15:30                                                                    | Date/time indication          |
| ●/II (Red)                                                                          | Recording/writing to a disc   |
| II (Green)                                                                          | Recording pause               |
| 16:9                                                                                | Wide mode                     |
| AUTO                                                                                | Auto mode                     |
| MNL                                                                                 | Manual mode                   |
| MF                                                                                  | Manual focus                  |
| 2×                                                                                  | Zoom magnification indication |
|  | Back light mode               |
|  | Image stabilizer              |
| 1/100                                                                               | Shutter speed                 |
| OPEN, F2.0                                                                          | F number                      |
| 0dB                                                                                 | Gain value                    |
|  | Soft skin mode                |
|  | Tele macro                    |
| W, B                                                                                | Fade (White), Fade (Black)    |
|  | Colour night view function    |

## Others

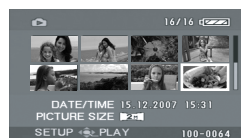
|                   |                                                 |
|-------------------|-------------------------------------------------|
|                   | Zoom microphone                                 |
|                   | Wind noise reduction                            |
| <b>XP, SP, LP</b> | Motion picture recording mode                   |
|                   | Sports mode                                     |
|                   | Portrait mode                                   |
|                   | Low light mode                                  |
|                   | Spotlight mode                                  |
|                   | Surf & snow mode                                |
| <b>AWB</b>        | Auto white balance                              |
|                   | Indoor mode (recording under incandescent lamp) |
|                   | Outdoor mode                                    |
|                   | Manual adjustment mode                          |
|                   | Disc type                                       |
|                   | DVD-RAM                                         |
|                   | DVD-RW (VR format)                              |
|                   | DVD-RW (Video format)                           |
|                   | DVD-RW (unformatted)                            |
|                   | DVD-R                                           |
|                   | DVD-R DL                                        |
|                   | Shutter chance mark                             |
|                   | Self-Timer recording                            |
| <b>MEGA</b>       | MEGA OIS                                        |
| <b>VDR-D310:</b>  | Number of recording pixels for still pictures   |
|                   | 2048×1512                                       |
|                   | 1920×1080                                       |
|                   | 1280×960                                        |
|                   | 640×480                                         |
| <b>VDR-D220:</b>  |                                                 |
|                   | 640×480                                         |
|                   | 640×360                                         |
|                   | Card can be recorded to                         |
|                   | Recognizing the card                            |
|                   | Recording/accessing the card                    |
|                   | Still picture quality                           |
| <b>R 100</b>      | Remaining number of still pictures              |

## ■ Playback indications

## Motion picture playback



## Still picture playback



|                 |                                                        |
|-----------------|--------------------------------------------------------|
|                 | Playback                                               |
|                 | Pause                                                  |
|                 | Fast forward/rewind                                    |
|                 | Last/first scene paused                                |
|                 | Skip playback                                          |
|                 | Slow motion playback                                   |
|                 | Frame-by-frame playback                                |
| <b>0h00m00s</b> | Motion picture playback time                           |
|                 | Play mode                                              |
|                 | All scenes on the disc displayed                       |
|                 | Scenes recorded on the selected date displayed         |
|                 | Scenes in the selected playlist displayed              |
| <b>No.10</b>    | Scene number                                           |
|                 | Volume adjustment                                      |
| <b>R</b>        | Resume playback                                        |
|                 | Contents that have been protected on another device.   |
| <b>100-0001</b> | Still picture folder/file number display               |
|                 | When a printer compatible with PictBridge is connected |
|                 | Accessing the card (When connected to a computer)      |
|                 | DPOF already set (to more than 1)                      |

## Others

|                                                                                                                                                 |                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
|                                                                | Locked still pictures                         |
| <b>VDR-D310:</b>                                                                                                                                | Number of recording pixels for still pictures |
|                                                                | 2048×1512                                     |
|                                                                | 1920×1080                                     |
|                                                                | 1280×960                                      |
|                                                                | 640×480                                       |
| <b>VDR-D220:</b>                                                                                                                                |                                               |
|                                                                | 640×480                                       |
|                                                                | 640×360                                       |
| The picture size is not displayed for still pictures recorded with other products that have different picture sizes from the sizes shown above. |                                               |

### ■ Confirmatory indications

|                                                                                     |                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -- (Time display)                                                                   | The built-in battery is low.<br>(→ 36)                                                                                                                                                     |
|  | The warning/alarm indication appears when LCD monitor is rotated towards the lens side. Return the direction of the LCD monitor to normal position and check the warning/alarm indication. |
|  | No disc is inserted.                                                                                                                                                                       |
|  | Unusable disc                                                                                                                                                                              |
|  | No SD card is inserted/<br>unusable card.                                                                                                                                                  |

## Others

## Messages

|                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CAN NOT READ THIS DISC. PLEASE CHECK FOR SCRATCHES OR STAINS ON DISC.</b> | The disc is scratched or dirty. Eject the disc and clean it. (→ 20) If there are scratches on the disc, use a new disc.                                                                                                                                                                                                                                                                            |
| <b>NO DATA.</b>                                                              | There are no images recorded on the disc or card.                                                                                                                                                                                                                                                                                                                                                  |
| <b>INCOMPATIBLE DISC.</b>                                                    | You inserted an incompatible disc (copy-protected discs, etc.).                                                                                                                                                                                                                                                                                                                                    |
| <b>PLEASE CHECK THE DISC.</b>                                                | You inserted a disc that cannot be read on this unit (a disc recorded in an incompatible data format etc.).                                                                                                                                                                                                                                                                                        |
| <b>FOR BEST PERFORMANCE PANASONIC DISC IS RECOMMENDED.</b>                   | You inserted a disc that does not meet the DVD standard for quality and performance so you may not be able to record normally. Refer to the following support site for information about discs that have been confirmed as compatible by Panasonic.<br><a href="http://panasonic.co.jp/pavc/global/cs/e_cam">http://panasonic.co.jp/pavc/global/cs/e_cam</a><br>(This website is in English only.) |
| <b>CANNOT RECORD IN AGS MODE.</b>                                            | The AGS function is activated. (→ 38)                                                                                                                                                                                                                                                                                                                                                              |
| <b>CANNOT RECORD.<br/>(THIS DISC IS FINALIZED)</b>                           | A finalized DVD-RW (Video format) or DVD-R has been inserted. After finalizing, the discs become play-only and cannot record. If you un-finalize a DVD-RW (Video format), it can be used for recording. (→ 74)                                                                                                                                                                                     |
| <b>CANNOT RECORD. DISC IS FULL.</b>                                          | The disc is full or the number of scenes has reached the maximum limit so no further data can be recorded. Delete unnecessary scenes (→ 63) or insert a new disc.                                                                                                                                                                                                                                  |
| <b>CANNOT RECORD. THE NUMBER OF SCENES HAS EXCEEDED THE MAXIMUM LIMIT.</b>   |                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>INTERNAL TEMPERATURE TOO HIGH. PLEASE TURN UNIT OFF AND WAIT A WHILE.</b> | The temperature of the unit is high so it cannot be operated. Turn off the power, wait until the unit cools and then turn on the power again.                                                                                                                                                                                                                                                      |
| <b>FINALIZE THE DISC FOR PLAYBACK ON OTHER DEVICES.</b>                      | If you insert a DVD-RW or a DVD-R disc recorded in this unit (that has not been finalized) into another device such as DVD recorder, computer, etc., the disc may become unusable. Be sure to finalize the disc on this unit before inserting it in other devices.                                                                                                                                 |
| <b>CANNOT UN-FINALIZE THIS DISC.</b>                                         | DVD-R cannot be un-finalized.                                                                                                                                                                                                                                                                                                                                                                      |
| <b>CHECK CARD.</b>                                                           | This card is not compatible or it cannot be recognized by the unit.                                                                                                                                                                                                                                                                                                                                |
| <b>CARD LOCKED.</b>                                                          | The write protection switch on the SD card is set to LOCK. (→ 19)                                                                                                                                                                                                                                                                                                                                  |

## Others

|                                                                    |                                                                                                                                                                                               |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CARD FULL.</b>                                                  | The SD card is full so no further data can be recorded. Delete unnecessary files (→ 70) or insert a new SD card.                                                                              |
| <b>PUSH THE RESET SWITCH.</b>                                      | An irregularity in the unit has been detected. Press the RESET button to restart the unit. (→ 95)                                                                                             |
| <b>CHECK THE DISC AFTER PUSHING THE RESET SWITCH TO REPAIR IT.</b> |                                                                                                                                                                                               |
| <b>CHANGE TO MANUAL MODE.</b>                                      | You are attempting to use a function that cannot be used simultaneously.                                                                                                                      |
| <b>CANCEL NIGHT VIEW MODE</b>                                      |                                                                                                                                                                                               |
| <b>CANNOT SET.</b>                                                 | With DVD-RW (Video format) and DVD-R, if the number of dates displayed becomes 99 when [PLAY MODE] is set to [BY DATE], you cannot change the aspect setting from 16:9 to 4:3 and vice versa. |
| <b>PLEASE CONNECT AC ADAPTOR</b>                                   | Finalizations cannot be executed and the unit cannot be connected to the computer when using a battery. Use the AC adaptor.                                                                   |
| <b>DISCONNECT USB CABLE.</b>                                       | The unit cannot correctly establish the connection to the computer or printer. Disconnect and reconnect the USB cable and then select the desired USB function again.                         |
| <b>CANNOT OPERATE WHILE USB CONNECTED.</b>                         | The unit's power cannot be turned off when the unit is connected to the computer.                                                                                                             |

## About recovery

It is possible that the system cannot complete writing of a file normally when, for example, power is turned off for some reason during recording or editing.

If faulty management information is found when a disc is accessed, the following message may appear. Be sure to follow the messages. (Repairing may take time depending on the error.)

**DISC ERROR HAS OCCURRED. NOW REPAIRING THE DISC.**

- When you repair the disc, use a battery with sufficient battery power or the AC adaptor. Even if the power is turned off without repairing the disc, you can repair the disc when you turn the power on again.
- Depending on the condition of the data, it may not be possible to completely repair the data.
- Do not repair a disc that has been recorded on another device. This may cause the loss of data or the disc.

## Others

### Functions that cannot be used simultaneously

Some functions in this unit are disabled or cannot be selected due to the unit's specifications. The table below shows examples of functions restricted by various conditions.

| Functions                              | Conditions which disable the functions                                                                                                                       |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Digital zoom                           | <ul style="list-style-type: none"> <li>• In picture recording mode</li> </ul>                                                                                |
| Fade                                   |                                                                                                                                                              |
| Colour night view                      | <ul style="list-style-type: none"> <li>• While recording to a disc (Cannot set or cancel)</li> <li>• In picture recording mode</li> </ul>                    |
| Backlight compensation                 | <ul style="list-style-type: none"> <li>• When the colour night view function is used</li> <li>• When the iris/gain is set</li> </ul>                         |
| Soft skin mode (Set and cancel)        | <ul style="list-style-type: none"> <li>• While recording to a disc</li> </ul>                                                                                |
| Tele macro (Set and cancel)            |                                                                                                                                                              |
| Help mode                              |                                                                                                                                                              |
| Zoom microphone                        | <ul style="list-style-type: none"> <li>• An external microphone is used</li> </ul>                                                                           |
| Wind noise reduction                   |                                                                                                                                                              |
| Scene mode                             | <ul style="list-style-type: none"> <li>• When setting the AUTO/MANUAL/FOCUS switch to AUTO</li> <li>• When the colour night view function is used</li> </ul> |
| Change of white balance                | <ul style="list-style-type: none"> <li>• When digital zoom is used</li> <li>• When the colour night view function is used</li> </ul>                         |
| Adjusting the shutter speed, iris/gain | <ul style="list-style-type: none"> <li>• When the colour night view function is used</li> <li>• When the scene mode is used</li> </ul>                       |

## Frequently asked questions

### ? What kind of discs can be used?

 DVD-RAM, DVD-RW, DVD-R and DVD-R DL can be used if they are 8 cm bare discs.  
(→ 15)

### ? Can discs with a cartridge be used?

 They can be used if the cartridge is removed.

### ? Can double sided discs be used?

 They can be used.  
However you cannot record or play continuously from one side of the disc to the other.  
You will need to eject the disc and turn it over.

### ? Can I record continuously from one side of the disc to the other on a double sided disc?

 You cannot record continuously from one side of the disc to the other. The recording time indicated on the disc package is the total time for both sides. You will need to eject the disc and turn it over to record on both sides.

### ? Can DVD-R only be recorded to once only?

 Recording can be started and stopped until the disc is full.  
However the data recorded on the DVD-R cannot be erased.

### ? Is playback possible on a DVD player?

 By finalizing a DVD-RW (VR format/Video format) or a DVD-R in this unit, it can be played back on a DVD player.  
To playback a DVD-RAM, DVD-RW (VR format) or DVD-R DL, you will need a DVD recorder or a DVD player that supports DVD-RAM, DVD-RW (VR format) or DVD-R DL.  
Refer to the operating instructions of the DVD recorder or DVD player.

## Others

## Troubleshooting

| Problem                                                                                                 | Check points                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| This unit cannot be turned on.                                                                          | <ul style="list-style-type: none"> <li>● <b>Is the battery fully charged?</b><br/>→ Charge the battery using the AC adaptor. (→ 21)</li> <li>● <b>The battery protection circuit may have operated. Attach the battery to the AC adaptor for 5 to 10 seconds. If the unit still cannot be used, the battery is faulty.</b></li> <li>● <b>Is the LCD monitor opened or the viewfinder extended?</b></li> </ul>                                                                                                                                                 |
| This unit is turned off automatically.                                                                  | <ul style="list-style-type: none"> <li>● <b>If you do not use the unit for approximately 5 minutes, the power is automatically turned off to conserve the battery charge. To resume recording, turn the power back on. The power will not turn off automatically when the power save function (→ 84) is set to [OFF].</b></li> </ul>                                                                                                                                                                                                                          |
| This unit does not stay on long enough.                                                                 | <ul style="list-style-type: none"> <li>● <b>Is the battery low?</b><br/>→ If the remaining battery power indication is flashing or the message "LOW BATTERY." is displayed, the battery has run down. Charge the battery. (→ 21)</li> </ul>                                                                                                                                                                                                                                                                                                                   |
| A clicking sound is heard when the power is turned off.                                                 | <ul style="list-style-type: none"> <li>● <b>This is the sound of the lens moving and is not a malfunction.</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Battery runs down quickly.                                                                              | <ul style="list-style-type: none"> <li>● <b>Is the battery fully charged?</b><br/>→ Charge it with the AC adaptor. (→ 21)</li> <li>● <b>Are you using the battery in an extremely cold place?</b><br/>→ The battery is affected by ambient temperature. In cold places, the operating time of the battery becomes shorter.</li> <li>● <b>Has the battery worn out?</b><br/>→ The battery has a limited life. If the operating time is still too short even after the battery is fully charged, the battery has worn out and can no longer be used.</li> </ul> |
| <p>This unit cannot be operated though it is turned on.</p> <p>This unit does not operate normally.</p> | <ul style="list-style-type: none"> <li>● <b>The unit cannot be operated unless you open the LCD monitor or extend the viewfinder.</b></li> <li>● <b>Press the RESET button. (→ 95) If normal conditions are not restored yet, remove the battery or AC adaptor, wait about 1 minute and then reconnect the battery or AC adaptor. Then about 1 minute later, turn on the power again. (Conducting the above operation when the access lamp is on may destroy the data on the disc or card.)</b></li> </ul>                                                    |
| The screen has changed suddenly.                                                                        | <ul style="list-style-type: none"> <li>● <b>Has the demonstration started?</b><br/>→ If you set [DEMO MODE] to [ON] without inserting a disc or a card in video recording mode or picture recording mode, the unit is automatically set to the demonstration mode for introducing its functions. Normally this should be set to [OFF]. Press the MENU button, then select [SETUP] → [DEMO MODE] → [OFF] and press the joystick.</li> </ul>                                                                                                                    |

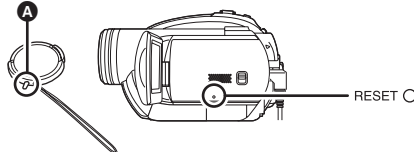
## Others

| Problem                                                                                                      | Check points                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The remote control does not function.                                                                        | <ul style="list-style-type: none"> <li>• <b>Has the button-type battery of the remote control run out?</b><br/>→ Replace it with a new button-type battery. (→ 13)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| The DISC EJECT lever does not work.                                                                          | <ul style="list-style-type: none"> <li>• <b>The disc cover will not open unless the unit is powered.</b><br/>→ Connect a charged battery or AC adaptor.</li> <li>• <b>The DISC EJECT lever does not work when the unit is connected to the computer. (VDR-D310) (Refer to the operating instructions for PC connection.)</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| The disc cannot be read.                                                                                     | <ul style="list-style-type: none"> <li>• <b>Are there fingerprints or dirt on the surface of the disc?</b><br/>→ If there are fingerprints or dirt on the disc, wipe them off. (→ 20)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| A function indication such as the remaining time indication or the elapsed time indication is not shown.     | <ul style="list-style-type: none"> <li>• <b>If you set [SETUP]→[DISPLAY]→[OFF], indications other than warnings and date indications disappear.</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Recording does not start although power is supplied to this unit and the disc or card is correctly inserted. | <ul style="list-style-type: none"> <li>• <b>Is the DVD-RAM or the DVD-RW (VR format) write-protected?</b><br/>→ Release the protection. (→ 74) If the DVD-RAM or DVD-RW (VR format) was protected on another device, release the protection on the same device.</li> <li>• <b>Has the DVD-RW (Video format) or DVD-R been finalized?</b><br/>→ After finalizing, the discs become play-only and cannot record. If you un-finalize a DVD-RW (Video format), it can be used for recording. (→ 74)</li> <li>• <b>Has the SD card's write protect switch been set to LOCK?</b><br/>→ No recording is possible while the write protect switch is set to LOCK. (→ 19)</li> <li>• <b>Is the memory of the disc or card full?</b><br/>→ If the disc or card has no more available memory, free up some memory by deleting unnecessary scenes (→ 63, 70) or use a new disc or card.</li> <li>• <b>Is the unit set to the video recording mode or picture recording mode?</b><br/>→ No recording is possible unless the mode dial is at  or .</li> <li>• <b>Is the disc cover open?</b><br/>→ If the cover is open, this unit may not operate normally. Close the disc cover.</li> </ul> |
| Recording starts but stops immediately.<br>The playback picture breaks up for a moment.                      | <ul style="list-style-type: none"> <li>• <b>Is the disc scratched or dirty?</b><br/>→ Clean the disc. (→ 20) If there are scratches on the disc, use a new disc.</li> <li>• <b>The unit is hot. Follow the messages on the display. To use the unit again, turn the unit off and leave it for a while.</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| The unit arbitrarily stops recording.                                                                        | <ul style="list-style-type: none"> <li>• <b>Is the AGS function activated?</b><br/>→ Record in the normal horizontal position or set [AGS] to [OFF]. (→ 38)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## Others

| Problem                                                                                                                                  | Check points                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recorded still pictures are not clear.                                                                                                   | <ul style="list-style-type: none"> <li>• <b>Are you trying to record small or finely detailed objects with [PICT.QUALITY] set at [ ]?</b><br/>→ If you try to record small or finely detailed objects with [PICT.QUALITY] set at [ ], the images may break up into a mosaic-like pattern. Record with [PICT.QUALITY] set at [ ] instead. (→ 45)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Auto focus function does not work.                                                                                                       | <ul style="list-style-type: none"> <li>• <b>Is manual focus mode selected?</b><br/>→ Set the AUTO/MANUAL/FOCUS switch to AUTO.</li> <li>• <b>Are you trying to record a scene which is hard to bring into focus in auto focus mode?</b><br/>→ There are some recording subjects and surroundings for which the auto focus does not operate correctly. (→ 100) If so, use the manual focus mode to adjust the focus. (→ 53)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sound is not played back from the built-in speaker of this unit.                                                                         | <ul style="list-style-type: none"> <li>• <b>Is the volume too low?</b><br/>→ During playback, move the volume lever to display the volume indication and adjust it. (→ 59)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Although this unit is correctly connected to a TV, playback images cannot be seen.<br><br>The playback images are squeezed horizontally. | <ul style="list-style-type: none"> <li>• <b>Have you selected video input on the TV?</b><br/>→ Please read the operating instructions of your TV and select the channel that matches the input used for the connection.</li> <li>• <b>Is the [TV ASPECT] setting correct?</b><br/>→ Change the setting to match the aspect ratio of the TV. Press the MENU button, then select [SETUP] → [TV ASPECT] → [16:9] or [4:3] and press the joystick.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Scenes cannot be deleted or edited.                                                                                                      | <ul style="list-style-type: none"> <li>• <b>Is the DVD-RAM or the DVD-RW (VR format) write-protected?</b><br/>→ Release the protection. (→ 74)<br/>If the disc or the contents on the disc have been protected on another device, release the protection on the same device.</li> <li>• <b>It may not be possible to delete scenes that have been divided.</b><br/>→ Combine the divided scenes, and then delete them. (→ 64)</li> <li>• <b>It may not be possible to delete scenes that are displayed as [!]</b> on the thumbnail display. If the scenes are unnecessary, format the disc or card to erase the data. (→ 74, 75) Please be aware that if a disc or card is formatted then all the data recorded on the disc or card will be erased.</li> <li>• <b>Is the file on the SD card locked?</b><br/>→ Locked files cannot be deleted. Release the lock setting. (→ 71)</li> <li>• <b>If the SD card's write protect switch is set to LOCK, then deletion is disabled.</b> (→ 19)</li> </ul> |
| The images on the SD card do not look normal.                                                                                            | <ul style="list-style-type: none"> <li>• <b>The data may be destroyed. It may have been destroyed by static or electromagnetic waves. Store important data on a computer or other products as well.</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Even if a disc or a card is formatted, it cannot be used.                                                                                | <ul style="list-style-type: none"> <li>• <b>Either this unit or the disc or card may be damaged. Please consult a dealer. Use an SD card from 8 MB to 4 GB with this unit.</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

## Others

| Problem                                                                                                        | Check points                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The indication disappears.</p> <p>The screen is frozen.</p> <p>No operation can be performed.</p>           | <ul style="list-style-type: none"> <li>● <b>Is this unit connected to a computer?</b><br/>→ No operation can be performed on this unit when it is connected to a computer. (VDR-D310) (Refer to the operating instructions for PC connection.)</li> <li>● <b>Turn off the power to this unit. If the power cannot be turned off, press the RESET button, or remove the battery or AC adaptor and then reattach it. After that, turn on the power again. If normal operation is still not restored, detach the power connected, and consult the dealer who you purchased this unit from.</b></li> </ul>                                                                                                                                                                                                                                                                                                                                            |
| <p>“PUSH THE RESET SWITCH.” or “CHECK THE DISC AFTER PUSHING THE RESET SWITCH TO REPAIR IT.” is displayed.</p> | <ul style="list-style-type: none"> <li>● <b>Is the disc scratched or dirty?</b><br/>→ After using the following method to restart the unit, eject the disc and clean it. (→ 20) If there are scratches on the disc, use a new disc.</li> <li>● <b>The unit has automatically detected an error. Press the RESET button with the projecting part of the lens cap <b>A</b>. This will restart the unit.</b></li> </ul>  <ul style="list-style-type: none"> <li>● If you do not press the RESET button, the power to this unit is turned off automatically about 1 minute later.</li> <li>● Even after you press the RESET button, the indication may still appear repeatedly. If so, this unit needs repair. Detach the power connected, and consult the dealer who you purchased this unit from. Do not attempt to repair the appliance by yourself.</li> </ul> |
| <p>If the SD card is inserted in another device, it is not recognized.</p>                                     | <ul style="list-style-type: none"> <li>● <b>Check that the device is compatible with the capacity or type of SD card (SD Memory Card/SDHC Memory Card) that you inserted.</b><br/>→ Refer to the operating instructions of the device for details.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## Others

### Cautions for use

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.

#### About this unit

- The unit, disc and card become warm after long operation, but this is not a malfunction.

**Keep the DVD Video Camera as far away as possible from electromagnetic equipment (such as microwave ovens, TVs, video games etc.).**

- If you use the DVD Video Camera on top of or near a TV, the pictures and sound on the DVD Video Camera may be disrupted by electromagnetic wave radiation.
- Do not use the DVD Video Camera near cell phones because doing so may result in noise adversely affecting the pictures and sound.
- Recorded data may be damaged, or pictures may be distorted, by strong magnetic fields created by speakers or large motors.
- Electromagnetic wave radiation generated by microprocessors may adversely affect the DVD Video Camera, disturbing the pictures and sound.
- If the DVD Video Camera is adversely affected by electromagnetic equipment and stops functioning properly, turn the DVD Video Camera off and remove the battery or disconnect AC adaptor. Then reinsert the battery or reconnect AC adaptor and turn the DVD Video Camera on.

**Do not use the DVD Video Camera near radio transmitters or high-voltage lines.**

- If you record near radio transmitters or high-voltage lines, the recorded pictures and sound may be adversely affected.

**Make sure to use the supplied cords and cables. If you use optional accessories, use the cords and the cables supplied with them. Do not extend the cords and the cables.**

**Do not spray insecticides or volatile chemicals onto the unit.**

- If the unit is sprayed with such chemicals, its body may be marred and the surface finish may peel off.
- Do not leave rubber or plastic products in contact with the unit for a long time.

**When you use the unit in a sandy or dusty place such as a beach, do not let sand or fine dust get into the body and terminals of the unit.**

**Also, keep the unit away from sea water.**

- Sand or dust may damage the unit. (Care should be taken when inserting and removing a disc or a card.)
- If sea water splashes onto the unit, wipe off the water with a well wrung cloth. Then wipe the unit again with a dry cloth.

**When carrying the unit, do not drop or bump it.**

- A strong impact can break the unit's casing, causing it to malfunction.

**Do not use benzine, paint thinner or alcohol for cleaning the unit.**

- Before cleaning, detach the battery or pull out the AC cable from the AC outlet.
- The camera body may be discoloured and the surface finish may peel off.
- Wipe the unit with a soft dry cloth to remove dust and fingerprints. To remove stubborn stains, thoroughly wring a cloth that has been soaked in a neutral detergent diluted with water and wipe the unit with it. Afterwards, wipe it with a dry cloth.
- When you use a chemical dust cloth, follow the instructions that came with the cloth.

**Do not touch the laser pickup lens.**

- If you touch the laser pickup lens directly it may cause malfunctions.

**Do not use any other lens cleaners except a commercial available 8 cm DVD video camera lens cleaner.**

- Using any other lens cleaners except the one for 8 cm DVD video camera could cause this unit to malfunction.

## Others

**Do not use the unit for surveillance purposes or other business uses.**

- If you use the unit for a long time, heat will build up inside it and this may cause a malfunction.
- This unit is not intended for business use.

**When you are not going to use the unit for an extended time**

- When storing the unit in a cupboard or cabinet, it is recommended that you place a desiccant (silica gel) in with it.

**About the battery**

The battery used in this unit is a rechargeable lithium-ion battery. It is susceptible to humidity and temperature and the effect increases the more the temperature rises or falls. In cold areas, the full charge indication may not appear or the low battery indication may appear about 5 minutes after starting use. At high temperatures, the protection function may be triggered, making it impossible to use the unit.

**Be sure to detach the battery after use.**

- If the battery is left attached, a minute amount of current continues to flow even if the unit's power is off. Keeping the unit in this state may result in over discharge of the battery. This may result in you not being able to use the battery even after it is charged.
- The battery should be stored in the vinyl bag so metal does not come into contact with the terminals.
- The battery should be stored in a cool place free from humidity, with as constant temperature as possible. (Recommended temperature: 15 °C to 25 °C, Recommended humidity: 40% to 60%)
- Extremely high temperatures or low temperatures will shorten the life of the battery.
- If the battery is kept in high-temperature, high-humidity, or oily-smoky places, the terminals may rust and cause malfunctions.
- To store the battery for a long period of time, we recommend you charge it once every year and store it again after you have completely used up the charged capacity.
- Dust and other matter attached to the battery terminals should be removed.

**Prepare spare batteries when going out for recording.**

- Prepare batteries appropriate to 3 to 4 times the period during you want to record pictures in. In cold places such as a ski resort, the period during which you can record pictures is shortened.
- When you travel, do not forget to bring an AC adaptor so that you can recharge the batteries at your destination.

**If you drop the battery accidentally, check to see if the terminals are damaged.**

- Attaching a battery with damaged terminals can damage the unit or AC adaptor.

**Do not throw old battery into fire.**

- Heating a battery or throwing it into a fire may result in an explosion.
- If the operating time is very short even after the battery has been recharged, the battery has worn out. Please purchase a new battery.

**About the AC adaptor**

- If the battery is warm, charging requires more time than normal.
- If the temperature of the battery is extremely high or extremely low, the CHARGE lamp may continue flashing, and the battery may not be charged. Wait until the appropriate temperature is restored before charging the battery again. If the battery still fails to charge, something may be wrong with the battery or AC adaptor. Contact your dealer.
- If you use the AC adaptor near a radio, radio reception may be disturbed. Keep the AC adaptor 1 m or more away from the radio.
- When using the AC adaptor, it may generate whirring sounds. However, this is normal.
- After use, be sure to disconnect the AC adaptor. (If it is left connected, a minute amount of current is consumed.)
- Always keep the electrodes of the AC adaptor and battery clean.

**Put this unit near the outlet to make it easy for the interrupting device (plug) to reach it.**

## Others

### About the disc

- If there is dust, a scratch, or dirt on disc or if it is warped, the following phenomena may occur:

- Block noise in playback image
- Momentary stop of playback image
- Sound interrupted during playback, or abnormal sound
- Scenes are displayed as [!] on the thumbnail display
- Disc cannot correctly be recognized
- Delay between video and audio

**When the access lamp is illuminated (during access to the disc), do not open the disc cover, turn off the power, or cause any vibrations or impacts.**

### DVD-R/DVD-R DL

- For optimum recording on DVD-R discs, this unit writes control data to a DVD-R used for recording when it is being inserted and ejected. If the disc has no area for control data to be written, recording may not be possible. To prevent this, do not insert a DVD-R which has been recorded on more than 50 times.
- Do not insert a DVD-R recorded on this unit that has not been finalized into a recordable device, such as a DVD recorder. The recorded data may be damaged.

### About the SD card

- The memory capacity indicated on the label of an SD card is the total of the capacity for copyright protection and management and the capacity which can be used on the unit, a computer etc.
- During prolonged use, the unit's surfaces and the SD card will heat up slightly. This is normal.
- Keep the Memory Card out of reach of children to prevent swallowing.

**When inserting or removing the SD card, always set the OFF/ON switch to OFF.**

**While this unit accesses the SD card (while  /  is being displayed/the access lamp**

**is lit), do not remove the SD card, operate the mode dial, turn off the power or shake or impact the unit.**

### About the miniSD Card

- Be sure to insert miniSD Cards in the dedicated card adaptor before use. Inserting a card in this unit without the adaptor may damage the unit or the card.
- Do not insert an empty card adaptor in this unit. Do not leave the adaptor in this unit while inserting or removing miniSD Cards. This may cause the unit to malfunction.

### LCD monitor/viewfinder

- When the LCD monitor gets dirty, wipe it with a dry soft cloth.
- In a place with drastic temperature changes, condensation may form on the LCD monitor. Wipe it with soft dry cloth.
- When the unit has become very cold, for example due to storage in a cold area, its LCD monitor will be slightly darker than usual immediately after the power is turned on. The normal brightness will be restored when the unit's internal temperature rises.

Extremely high precision technology is employed to produce the LCD Monitor screen featuring a total of approximately 123,000 pixels. 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.

Extremely high precision technology is employed to produce the viewfinder screen featuring a total of approximately 113,000 pixels. 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.

### About condensation

When condensation forms on the unit, the lens will cloud up and the unit may not work properly. Make every effort to ensure that condensation does not form. If it does form, take the actions described below.

### Causes of condensation

**Condensation takes place when the ambient temperature or humidity is changed as follows.**

- When this unit is brought inside from the cold (e.g. a ski slope) to a warm room.
- When this unit is moved from an air-conditioned car to outside.
- When a cold room has been warmed up quickly.
- When cool wind from an air conditioner is directly blown onto this unit.
- After summer afternoon showers of rain.
- When this unit is in a very humid place where the air is thick with steam. (e.g. a heated swimming pool)

**When this unit is taken to a location with a significant temperature difference such as from a cold place to a hot place.**

If, for example, you have used this unit for recording on a ski slope and are taking it into a heated room, place the unit inside a plastic bag, remove as much of the air from inside the bag as possible, then seal the bag. Leave the unit for about an hour in the room so the temperature of the unit is close to the ambient temperature of the room, then use it.

**What to do with the lens is fogged up.**

Remove the battery or AC adaptor and leave the unit for about 1 hour. When the unit becomes close to the ambient temperature, the fog disappears naturally.

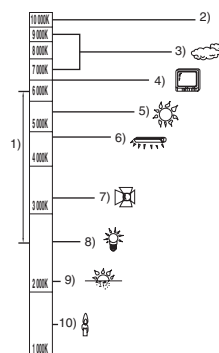
## Explanation of terms

### Automatic white balance

White balance adjustment recognizes the colour of light and adjusts so the white colour will become a purer white. The unit determines the hue of light that comes through the lens and white balance sensor, thereby judging the recording condition, and selects the closest hue setting.

This is called automatic white balance adjustment.

However, since the unit only stores white colour information under several light sources, automatic white balance adjustment does not function normally under other light sources.



The illustration above shows the range over which the auto white balance functions.

- 1) The effective range of automatic white balance adjustment on this unit
- 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

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

## Others

source. For light outside the functional automatic white balance adjustment range, use the manual white balance adjustment mode.

### White balance

The images recorded by the unit may become bluish or reddish under the influence of certain light sources. To avoid such phenomena, adjust the white balance.

White balance adjustment determines the white colour under different light sources. By recognizing which is the white colour under sunlight and which is the white colour under a fluorescent light, the unit can adjust the balance among the other colours.

Since the white colour is the reference for all the colours (that make up light), the unit can record pictures in a natural hue if it can recognize the reference colour white.

### Auto focus

The lens is moved forward or backward automatically to bring the subject into focus.

#### Auto focus has the following characteristics.

- Adjusts so that the vertical lines of a subject are seen more clearly.
- Attempts to bring an object with higher contrast into focus.
- Focuses on the screen centre only.

Due to these characteristics, auto focus does not work correctly in the following situations. Record pictures in the manual focus mode.

#### Recording distant and close-up objects at the same time

Since the unit focuses on whatever is at the centre of the screen, it is difficult to bring the background into focus when close-up objects are placed in focus. When recording people with distant mountains in the background, you cannot focus on both the subject which is close-up and the objects which are in the distance.

#### Recording a subject behind dirty or dusty window

The subject behind the window will not be focused because the focus is on the dirty window.

Similarly, when recording something on the opposite side of a road with heavy traffic, a vehicle that happens to pass by may be brought into focus.

#### Recording a subject that is surrounded by objects with glossy surfaces or by highly reflective objects

Since whatever is shiny or glistens is brought into focus, it is hard to focus on the subject to be recorded. The focus may become blurry when recording subjects at the seashore, in night views or in scenes involving fireworks or special lights.

#### Recording a subject in dark surroundings

The unit cannot focus correctly because the light information that comes through the lens decreases considerably.

#### Recording a fast-moving subject

As the focus lens-inside moves mechanically, it cannot keep up with a fast-moving subject. When, for example, recording a sports event with fast moving subjects, the focus may lose its sharpness.

#### Recording a subject with little contrast

It is easy to bring subjects with a sharp contrast or vertical lines or stripes into focus. This means that a subject with little contrast, such as a white wall, may become blurry because the unit achieves focus based upon the vertical lines of an image.

## Specifications

### DVD Video Camera

Information for your safety

|                           |                                     |
|---------------------------|-------------------------------------|
| <b>Power source:</b>      | DC 7.9 V/7.2 V                      |
| <b>Power consumption:</b> | <b>VDR-D310:</b><br>Recording 7.0 W |
|                           | <b>VDR-D220:</b><br>Recording 6.0 W |

|                         |                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Signal system</b>    | CCIR: 625 lines, 50 fields PAL colour signal                                                                                                                                                                                                                                                                                                                  |
| <b>Recording format</b> | DVD Video Recording format (DVD-RAM, DVD-RW)<br>DVD-Video format (DVD-RW, DVD-R, DVD-R DL)                                                                                                                                                                                                                                                                    |
| <b>Image sensor</b>     | <b>VDR-D310:</b><br>1/6" 3CCD image sensor<br>Total: 800 K×3<br>Effective pixels:<br>Moving picture: 630 K×3 (4:3), 540 K×3 (16:9)<br>Still picture: 710 K×3 (4:3), 540 K×3 (16:9)<br><b>VDR-D220:</b><br>1/6" CCD image sensor<br>Total: 800 K<br>Effective pixels:<br>Moving picture: 400 K (4:3), 540 K (16:9)<br>Still picture: 410 K (4:3), 550 K (16:9) |
| <b>Lens</b>             | <b>VDR-D310:</b><br>Auto Iris, F1.8 to F2.8<br>Focal length:<br>3.0 mm to 30.0 mm<br>Macro (Full range AF)<br><b>VDR-D220:</b><br>Auto Iris, F1.8 to F3.7<br>Focal length:<br>2.3 mm to 73.6 mm<br>Macro (Full range AF)                                                                                                                                      |
| <b>Filter diameter</b>  | 37 mm                                                                                                                                                                                                                                                                                                                                                         |
| <b>Zoom</b>             | <b>VDR-D310:</b><br>10× optical zoom, 25/700× digital zoom<br><b>VDR-D220:</b><br>32× optical zoom, 50/1000× digital zoom                                                                                                                                                                                                                                     |
| <b>Monitor</b>          | 2.7" wide LCD monitor (approx. 123 K pixels)                                                                                                                                                                                                                                                                                                                  |
| <b>Viewfinder</b>       | Colour electric viewfinder (approx. 113 K pixels)                                                                                                                                                                                                                                                                                                             |
| <b>Microphone</b>       | Stereo (with a zoom function)                                                                                                                                                                                                                                                                                                                                 |
| <b>Speaker</b>          | 1 round speaker Ø 20 mm                                                                                                                                                                                                                                                                                                                                       |

## Others

|                                                       |                                                                                                                           |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>Standard illumination</b>                          | 1,400 lx                                                                                                                  |
| <b>Minimum required illumination</b>                  | 12 lx (Low light mode: 1/50)<br>[approx. 1 lx (VDR-D310)/approx. 2 lx (VDR-D220) with the colour night view function]     |
| <b>Video output level</b>                             | 1.0 Vp-p, 75 Ω                                                                                                            |
| <b>S Video output level</b>                           | Y: 1.0 Vp-p, 75 Ω<br>C: 0.3 Vp-p, 75 Ω                                                                                    |
| <b>Audio output level (Line)</b>                      | 316 mV, 600 Ω                                                                                                             |
| <b>Mic input (VDR-D310)</b>                           | Mic sensitivity –50 dB (0 dB=1 V/Pa, 1 kHz)<br>(Ø 3.5 mm stereo mini jack)                                                |
| <b>USB</b>                                            | Card reader/writer function (No copyright protection support)<br>Hi-Speed USB (USB 2.0) compliant<br>PictBridge-compliant |
| <b>Dimensions</b><br>(excluding the projecting parts) | 66.7 mm (W) × 91.1 mm (H) × 142.7 mm (D)                                                                                  |
| <b>Mass</b><br>(without battery, lens cap and a disc) | Approx. 510 g                                                                                                             |
| <b>Operating temperature</b>                          | 0 °C to 40 °C<br>(0 °C to 30 °C when connected to the computer)                                                           |
| <b>Operating humidity</b>                             | 10% to 80%                                                                                                                |

## Motion pictures

|                                         |                                                                                                                                                                                                                                                       |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Recording media</b>                  | 8 cm DVD-RAM Ver. 2.1<br>8 cm DVD-RW Ver. 1.1/2X-SPEED (2X/1X)<br>8 cm DVD-R for General Ver. 2.0<br>8 cm DVD-R for DL Ver. 3.0                                                                                                                       |
| <b>Compression</b>                      | MPEG2                                                                                                                                                                                                                                                 |
| <b>Recording mode and transfer rate</b> | XP: 10 Mbps (VBR)<br>(Approx. 18 min recordable time on a single-sided DVD-RAM)<br>SP: 5 Mbps (VBR)<br>(Approx. 37 min recordable time on a single-sided DVD-RAM)<br>LP: 2.5 Mbps (VBR)<br>(Approx. 75 min recordable time on a single-sided DVD-RAM) |
| <b>Audio compression</b>                | Dolby Digital, 16 bit (48 kHz/2 ch)                                                                                                                                                                                                                   |

## Still pictures

|                        |                                                                                                                                                                              |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Recording media</b> | SD Memory Card:<br>8 MB/16 MB/32 MB/64 MB/128 MB/256 MB/512 MB/1 GB/2 GB<br>(FAT12 and FAT16 format corresponding)<br>SDHC Memory Card:<br>4 GB (FAT32 format corresponding) |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Others

|                     |                                                                                                                   |
|---------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Compression</b>  | JPEG (Design rule for Camera File system, based on Exif 2.2 standard), DPOF corresponding                         |
| <b>Picture size</b> | <b>VDR-D310:</b><br>2048×1512, 1920×1080 (16:9), 1280×960, 640×480<br><b>VDR-D220:</b><br>640×480, 640×360 (16:9) |

**AC adaptor**

Information for your safety

|                           |                                                                         |
|---------------------------|-------------------------------------------------------------------------|
| <b>Power source:</b>      | AC 110 V to 240 V, 50/60 Hz                                             |
| <b>Power consumption:</b> | 19 W                                                                    |
| <b>DC output:</b>         | DC 7.9 V, 1.4 A (Unit operation)<br>DC 8.4 V, 0.65 A (Battery charging) |

|                   |                                   |
|-------------------|-----------------------------------|
| <b>Dimensions</b> | 61 mm (W) × 32 mm (H) × 91 mm (D) |
| <b>Mass</b>       | Approx. 110 g                     |

Specifications may change without prior notice.

**Number of recordable pictures on an SD card****VDR-D310:**

| Picture size    | <b>3.1M</b> (2048×1512)                                                             |                                                                                     | <b>2M</b> (1920×1080)                                                                 |                                                                                       |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Picture quality |  |  |  |  |
| <b>8 MB</b>     | 3                                                                                   | 5                                                                                   | 4                                                                                     | 7                                                                                     |
| <b>16 MB</b>    | 8                                                                                   | 13                                                                                  | 10                                                                                    | 17                                                                                    |
| <b>32 MB</b>    | 18                                                                                  | 29                                                                                  | 24                                                                                    | 39                                                                                    |
| <b>64 MB</b>    | 39                                                                                  | 61                                                                                  | 51                                                                                    | 81                                                                                    |
| <b>128 MB</b>   | 75                                                                                  | 120                                                                                 | 98                                                                                    | 155                                                                                   |
| <b>256 MB</b>   | 160                                                                                 | 250                                                                                 | 210                                                                                   | 330                                                                                   |
| <b>512 MB</b>   | 320                                                                                 | 490                                                                                 | 410                                                                                   | 650                                                                                   |
| <b>1 GB</b>     | 630                                                                                 | 990                                                                                 | 820                                                                                   | 1290                                                                                  |
| <b>2 GB</b>     | 1290                                                                                | 2010                                                                                | 1680                                                                                  | 2630                                                                                  |
| <b>4 GB</b>     | 2520                                                                                | 3950                                                                                | 3290                                                                                  | 5170                                                                                  |

# Others

| Picture size    | 1M (1280×960)                                                                     |                                                                                   | 0.3M (640×480)                                                                      |                                                                                     |
|-----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Picture quality |  |  |  |  |
| 8 MB            | 8                                                                                 | 14                                                                                | 42                                                                                  | 86                                                                                  |
| 16 MB           | 21                                                                                | 34                                                                                | 97                                                                                  | 195                                                                                 |
| 32 MB           | 47                                                                                | 75                                                                                | 210                                                                                 | 420                                                                                 |
| 64 MB           | 97                                                                                | 155                                                                               | 430                                                                                 | 870                                                                                 |
| 128 MB          | 185                                                                               | 300                                                                               | 820                                                                                 | 1650                                                                                |
| 256 MB          | 390                                                                               | 620                                                                               | 1710                                                                                | 3430                                                                                |
| 512 MB          | 780                                                                               | 1230                                                                              | 3400                                                                                | 6790                                                                                |
| 1 GB            | 1550                                                                              | 2470                                                                              | 6800                                                                                | 13600                                                                               |
| 2 GB            | 3160                                                                              | 5030                                                                              | 13830                                                                               | 27660                                                                               |
| 4 GB            | 6210                                                                              | 9870                                                                              | 27150                                                                               | 54310                                                                               |

## VDR-D220:

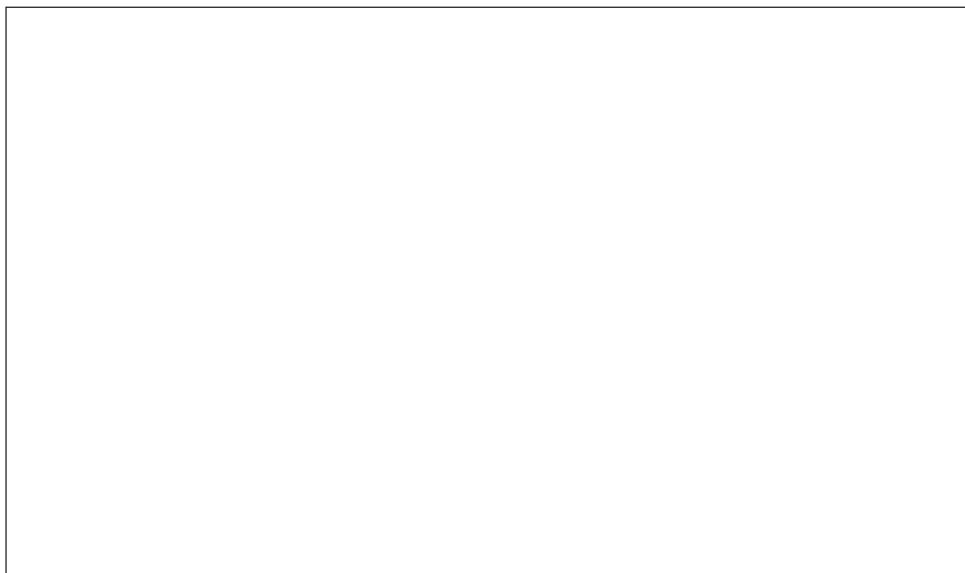
| Picture size    | 0.3M (640×480)                                                                    |                                                                                   | 0.2M (640×360)                                                                      |                                                                                     |
|-----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Picture quality |  |  |  |  |
| 8 MB            | 42                                                                                | 86                                                                                | 42                                                                                  | 86                                                                                  |
| 16 MB           | 97                                                                                | 195                                                                               | 97                                                                                  | 195                                                                                 |
| 32 MB           | 210                                                                               | 420                                                                               | 210                                                                                 | 420                                                                                 |
| 64 MB           | 430                                                                               | 870                                                                               | 430                                                                                 | 870                                                                                 |
| 128 MB          | 820                                                                               | 1650                                                                              | 820                                                                                 | 1650                                                                                |
| 256 MB          | 1710                                                                              | 3430                                                                              | 1710                                                                                | 3430                                                                                |
| 512 MB          | 3400                                                                              | 6790                                                                              | 3400                                                                                | 6790                                                                                |
| 1 GB            | 6800                                                                              | 13600                                                                             | 6800                                                                                | 13600                                                                               |
| 2 GB            | 13830                                                                             | 27660                                                                             | 13830                                                                               | 27660                                                                               |
| 4 GB            | 27150                                                                             | 54310                                                                             | 27150                                                                               | 54310                                                                               |

- The number of recordable pictures depends on whether [] and [] are used together and on the subject being recorded.
- The numbers shown in the table are approximations.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There is a thicker grey band at the top edge, likely representing a binding or header area. The overall appearance is that of a clean, unused piece of stationery.

| Case No. | Case Name      | Case Address  | Case City     | Case State | Case Zip | Case Phone   | Case Email                 | Case Date  | Case Time | Case Status | Case Notes                                    |
|----------|----------------|---------------|---------------|------------|----------|--------------|----------------------------|------------|-----------|-------------|-----------------------------------------------|
| 1        | John Doe       | 123 Main St   | New York      | NY         | 10001    | 212-555-1234 | john.doe@example.com       | 2023-10-27 | 14:30     | Completed   | Initial assessment and data collection.       |
| 2        | Jane Smith     | 456 Elm St    | Los Angeles   | CA         | 90001    | 310-555-5678 | jane.smith@example.com     | 2023-10-28 | 10:15     | In Progress | Interview with subject and review of records. |
| 3        | Robert Johnson | 789 Oak St    | Chicago       | IL         | 60601    | 312-555-9012 | robert.johnson@example.com | 2023-10-29 | 09:00     | Pending     | Awaiting approval for field research.         |
| 4        | Emily White    | 101 Pine St   | San Francisco | CA         | 94101    | 415-555-3456 | emily.white@example.com    | 2023-10-30 | 16:45     | Completed   | Final report and data analysis.               |
| 5        | Michael Brown  | 202 Cedar St  | Phoenix       | AZ         | 85001    | 602-555-7890 | michael.brown@example.com  | 2023-10-31 | 11:30     | In Progress | Interview with subject and review of records. |
| 6        | Sarah Green    | 303 Birch St  | Philadelphia  | PA         | 19101    | 215-555-2345 | sarah.green@example.com    | 2023-11-01 | 13:00     | Pending     | Awaiting approval for field research.         |
| 7        | David Black    | 404 Maple St  | San Diego     | CA         | 92101    | 619-555-6789 | david.black@example.com    | 2023-11-02 | 10:00     | Completed   | Initial assessment and data collection.       |
| 8        | Lisa Gray      | 505 Walnut St | Seattle       | WA         | 98101    | 206-555-0123 | lisa.gray@example.com      | 2023-11-03 | 15:30     | In Progress | Interview with subject and review of records. |
| 9        | James Hall     | 606 Elm St    | Portland      | OR         | 97201    | 503-555-4567 | james.hall@example.com     | 2023-11-04 | 08:45     | Pending     | Awaiting approval for field research.         |
| 10       | Amanda King    | 707 Oak St    | Denver        | CO         | 80201    | 303-555-8901 | amanda.king@example.com    | 2023-11-05 | 12:15     | Completed   | Final report and data analysis.               |





This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.[illegible]



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F0107Ra0 ( 3000 Ⓐ )



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