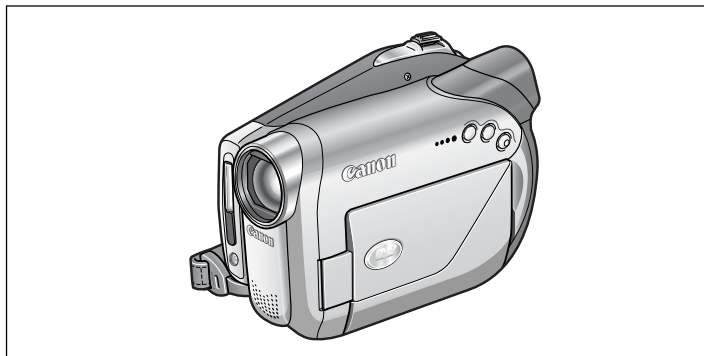


# Canon

## DVD Camcorder Instruction Manual

### English

# DC22 / DC21 / DC19



## PictBridge

Please read also the following instruction manual (electronic version on PDF file).

- **Digital Video Software**



Introduction

Preparations

Basic  
Functions

Advanced  
Functions

Editing  
Functions

Playing Back  
the Disc on an  
External Device

External  
Connections

Additional  
Information

**PAL**

# Important Usage Instructions

**WARNING!**

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

**WARNING!**

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

**CAUTION:**

TO REDUCE THE RISK OF ELECTRIC SHOCK AND TO REDUCE ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

**CAUTION:**

DISCONNECT THE MAINS PLUG FROM THE SUPPLY SOCKET WHEN NOT IN USE.

The Mains plug is used as the disconnect device. The Mains plug shall remain readily operable to disconnect the plug in case of an accident.

While using the compact power adapter, do not wrap it or cover it with a piece of cloth, and do not place it in confined narrow spaces. Heat may build up, the plastic case may deform and it could result in electric shock or fire.

CA-570 identification plate is located on the bottom.



Using any device other than the Compact Power Adapter CA-570 may damage the camcorder.

This product has been classified under IEC60825-1:1993 and EN60825-1:1994.

**CLASS 1 LASER PRODUCT**

**European Union (and EEA) only.**

This symbol indicates that this product is not to be disposed of with your household waste, according to the WEEE Directive (2002/96/EC) and your national law. This product should be handed over to a designated collection point, e.g., on an authorized one-for-one basis when you buy a new similar product or to an authorized collection site for recycling waste electrical and electronic equipment (EEE).

Improper handling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally associated with EEE. At the same time, your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, waste authority, approved WEEE scheme or your household waste disposal service. For more information regarding return and recycling of WEEE products, please visit [www.canon-europe.com/environment](http://www.canon-europe.com/environment).

(EEA: Norway, Iceland and Liechtenstein)

## **The Advantages of DVDs**

### **RECORDING**

With a DVD you just press the recording start/stop button and the camcorder will find the empty space on the disc (□ 28). Don't waste time fast forwarding and rewinding a tape to find from where to start a new recording.

Never worry about mistakenly recording over a precious memory!



### **PLAYING**

Just select a scene from the index screen!

Just insert your finalized\* disc into a DVD player and immediately find the scene you want to play back from the index (□ 31). No need to play the disc from the beginning or to run a tape forward and back to find the scene you want to see.



\* Disc finalization is the processing of the free space (the unrecorded area) on the disc in order to make it playable on external DVD devices (□ 70).

### **DC22/DC21 SHARING YOUR VIDEOS**

With the supplied software MyDVD for Canon\*\* you can easily create copies of your DVDs to share with family and friends and transfer your recordings to a computer for further editing.

\*\* Windows 2000/Me/XP systems only. The software is not compatible with Macintosh systems.



For inquiries regarding Roxio MyDVD for Canon, please contact directly the customer support centers of Sonic Solutions (□ 77).

## An Introduction to DVDs

DVD discs are available in various types and two sizes (12 cm and 8 cm discs). This camcorder uses the following types of commercially available 8 cm mini DVD discs: DVD-R (**DC22/DC21**): one disc supplied with the camcorder), DVD-R DL\* or DVD-RW discs.



### Choose the Disc Type...

#### DVD-R

Discs can be recorded only once. Recordings cannot be edited or deleted.

#### DVD-R DL\*

Discs can be recorded only once. Recordings cannot be edited or deleted.

#### DVD-RW

Discs can be initialized or recordings can be deleted to allow the discs to be recorded over numerous times.



### ...and the Disc Specification

#### VIDEO Mode (only)

Once finalized, DVD-R discs recorded in VIDEO mode can be played back in most common DVD players.

#### VIDEO Mode (only)

DVD-R DL\* discs can only be played back with DVD players capable of reading dual-layered DVD discs.

#### VIDEO Mode

Once finalized, discs recorded in VIDEO mode can be played back in most common DVD players. However, in VIDEO mode recordings cannot be edited.

or

#### VR\*\* Mode

You can easily edit the recordings. However, DVD-RW discs can only be played back with DVD players compatible with VR\*\* mode.

\* DL - Dual Layered.

\*\*VR - Video Recording.

• Attempting to record or play with this camcorder DVD discs that were recorded, initialized or finalized with other digital devices can result in lost data.

## DVD-R

Best for Compatibility



- **Available disc specifications:** VIDEO mode only.
- **Reusability:** Disc can be used only once. Recordings cannot be edited or deleted.
- **Finalization:** Once finalized, additional recordings cannot be made.
- **Compatibility:** A finalized DVD-R can be played back on most DVD devices.

DVD-R discs recorded in VIDEO mode offer the best compatibility with external DVD devices.

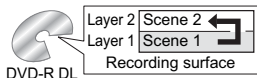
## DVD-R DL

Best for Recording Time



Dual-layered discs allow writing up to 80% more data (2.6 GB) on a single recording side according to DVD Forum specifications. Dual layered discs have two recording layers on a single recording side. The camcorder will record on the first layer until it is full and then continue on the second layer (as a separate scene).

- **Available disc specifications:** VIDEO mode only.
- **Reusability:** Disc can be used only once. Recordings cannot be edited or deleted.
- **Finalization:** Once finalized, additional recordings cannot be made. To finalize a dual layered disc the camcorder has to process both layers. Therefore, and depending on the amount of free space on the disc, this process may be lengthy.
- **Compatibility:** A finalized DVD-R DL can only be played back on DVD devices compatible with dual layered discs.
- During the playback of a recording spanning both layers, you may notice a brief stop at the point where the camcorder switches from Layer 1 to Layer 2.



## DVD-RW

Best for Reusability



- **Available disc specifications:** VIDEO mode or VR mode.  
[VIDEO]: Offers a higher compatibility with external DVD devices. However, correct playback cannot be guaranteed with all external DVD devices.  
[VR]: Offers easy editing of the recordings with the camcorder.
- **Reusability:** Recordings can be deleted or the disc can be initialized in order to use it multiple times or to change the disc specification. Note that initializing a disc will erase all the recordings on the disc.
- **Finalization:** Even after a DVD-RW disc is finalized, additional recordings can be made. The way to do it depends on the disc specification used.  
[VIDEO]: You will need to unfinalize the disc first.  
[VR]: You can record additional scenes even without unfinalizing the disc.
- **Compatibility:** The compatibility of the disc depends on the disc specification used.  
[VIDEO]: A finalized DVD-RW in VIDEO mode can be played back on most DVD devices.  
[VR]: A DVD-RW in VR mode can only be played back on DVD devices compatible with VR mode.

## Differences in Available Features Depending on the Disc

The camcorder's features and functions available will differ depending on the type of disc you use and the disc specification selected when initializing it.

Disc Type/Specification Feature	DVD-R DVD-R DL	DVD-RW		📖
	VIDEO mode	VIDEO mode	VR mode	
Editing scenes with this camcorder (deleting scenes, editing the Playlist)	—	—	●	62
Deleting a scene or still image immediately after recording it	—	●	●	63 66
Initializing the disc in order to use it again for recording	—	●	●	64
Giving a title to the disc	●	●	●	65
Finalizing the disc in order to play it with a DVD player	●	●	● <sup>1</sup>	70
Adding recordings to a disc already finalized	—	● <sup>2</sup>	●	71
Copying still images	●	●	●	67
Converting still images into Photomovie scenes	●	●	●	67
Editing scenes on a computer <sup>3</sup>	●	●	●	76

<sup>1</sup> Playback cannot be guaranteed with all external DVD devices.

<sup>2</sup> You will need to unfinalize the disc first.

<sup>3</sup> The MyDVD for Canon software is not included with the **DC19**.

- **Recommended Discs:** The camcorder's performance was tested with single-layered discs using the supplied discs and Hitachi-Maxell HG series DVD discs; and with dual-layered discs using Canon DVD-R DL54 discs and Verbatim DVD-R DL discs. For further details, contact directly the manufacturer's customer support center.
- For the highest compatibility with external DVD devices we recommend using the VIDEO mode.

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
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## About this Manual

Thank you for purchasing the Canon DC22/DC21/DC19. Please read this manual carefully before you use the camcorder and retain it for future reference. Should your camcorder fail to operate correctly, refer to the *Troubleshooting* table ( 89).

### Conventions Used in the Manual

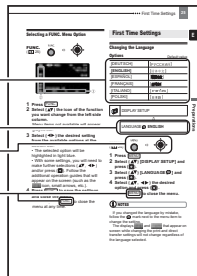
- **!** **IMPORTANT:** Precautions related to the camcorder operation.
- **i** **NOTES:** Additional topics that complement the basic operating procedures.
- **⊗** **POINTS TO CHECK:** Restrictions that apply if the function described is not available in all operating modes (the operating mode to which the camcorder should be set, the type of disc required, etc.).
- **□** : Reference page number.
- **DC22** : Option or feature that applies or is available only with this model.
- "Screen" refers to the LCD and the viewfinder screen.
- The photos included in the manual are simulated pictures taken with a still camera.

Brackets [ ] and capital letters are used to refer to menu options as they are displayed on screen. Menu options in boldface indicate the default setting (for example **[ON]**, **[OFF]**).

Menu item shown at its default position

Buttons and switches to be operated

Names of buttons and switches other than the multi selector are indicated within a "button" frame (for example **[MENU]**).



### Trademark Acknowledgements

- miniSD™ is a trademark of SD Card Association.
- Windows® is a registered trademark of Microsoft Corporation in the United States and/or other countries.
- Macintosh and Mac OS are trademarks of Apple Computer, Inc., registered in the United States and other countries.
- **DVD** is a trademark of DVD Format/Logo Licensing Corporation.
- Manufactured under license from Dolby Laboratories.  
"Dolby" and the double-D symbol are trademarks of Dolby Laboratories.
- Other names and products not mentioned above may be trademarks or registered trademarks of their respective companies.
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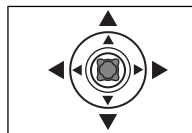


## About the Multi Selector

Use the multi selector to select options in a menu and change settings.

Push the multi selector like a joystick up, down, left or right (▲/▼/◀/▶) to select an item. In most places, press the multi selector itself (⊠) to make a selection or change a setting.

The display **SET** that appears in some menu screens refers to pressing the multi selector (⊠).

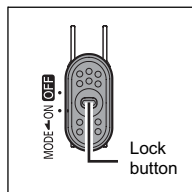


## About the Power Switch

In addition to turning the camcorder on and off, the power switch also toggles the camcorder's operating mode.

**To turn on the camcorder:** Hold the lock button pressed down and move the power switch down to ON.

**To change the operating mode:** From the ON position, slide down the power switch momentarily towards MODE and release it. This action will toggle the operating mode between recording (CAMERA - red indicator) and playback (PLAY - green indicator).



## About the Operating Modes

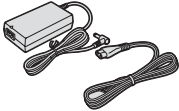
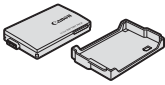



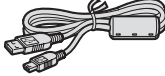
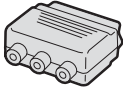

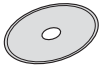
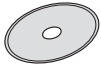
The camcorder's operating mode is determined by the positions of the power switch and the switch. In the manual, indicates that a function is available in the operating mode shown and indicates that the function is not available. When no operating mode icons are given, the function is available in all operating modes.

Operating Mode	Operating Mode Indicator	/  Switch	Icon Display	Operation	
	CAMERA (Red)	(Movies)		Recording movies on the disc	28
	PLAY (Green)			Playing movies from the disc	31
<sup>1</sup>	CAMERA (Red)	(Still images)	or <sup>2</sup>	Recording still images on the memory card or disc	29
<sup>1</sup>	PLAY (Green)		or <sup>2</sup>	Viewing still images from the memory card or disc	33

<sup>1</sup> Functions available only for still images recorded on the disc will be marked with and and functions available only for still images recorded on the memory card will be marked with and instead.

<sup>2</sup> Depending on whether you choose to save the still images on the disc or memory card.

## Supplied Accessories

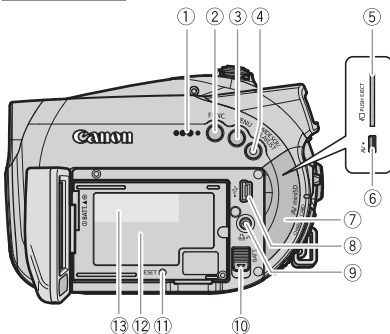
<p>CA-570 Compact Power Adapter (incl. power cord)</p> 	<p>BP-208 Battery Pack</p> 	<p><b>DC22/DC21</b> WL-D86 Wireless Controller</p> 	<p><b>DC22/DC21</b> Lithium Button Battery CR2025 for Wireless Controller</p> 
<p>MTC-100 Multi Cable</p> 	<p>IFC-400PCU USB Cable</p> 	<p>PC-A10 SCART Adapter*</p> 	<p><b>DC22/DC21</b> Blank DVD-R Disc (8 cm Mini DVD)</p> 
<p>DIGITAL VIDEO SOLUTION DISK Software CD-ROM**</p> 	<p><b>DC22/DC21</b> Roxio MyDVD for Canon Software CD-ROM</p> 		

\* Europe only.

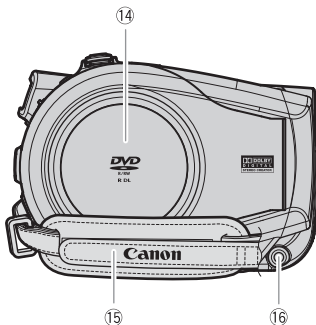
\*\* Includes the electronic version of the *Digital Video Software* instruction manual on PDF file.

## Components Guide

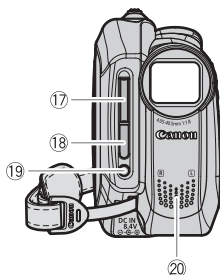
### Left side view



### Right Side View

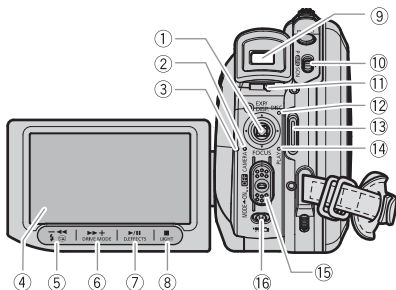
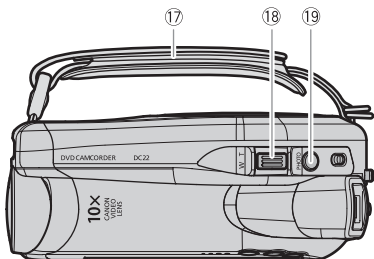
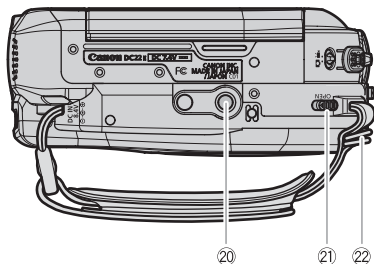




































### Front view




- ① Speaker ( 33)
- ② FUNC. button ( 25)
- ③ MENU button ( 24)
- ④ WIDE SCR (widescreen) button ( 29) /  
PLAYLIST button ( 62)
- ⑤ Memory card slot ( 22)
- ⑥ AV terminal ( 73)
- ⑦ Terminal cover
- ⑧ USB terminal ( 76)
- ⑨ (print/share) button  
( 79, 81, 84)
- ⑩ BATT. (battery release) switch ( 19)
- ⑪ RESET button ( 89)
- ⑫ Battery attachment unit ( 19)
- ⑬ Serial number
- ⑭ Disc compartment cover ( 22)
- ⑮ Grip belt ( 20)
- ⑯ DC IN terminal ( 19)
- ⑰ Flash ( 57)
- ⑱ Remote sensor ( 21)
- ⑲ LED light ( 57)
- ⑳ Stereo microphone

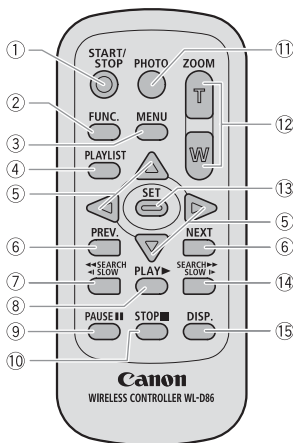
Names of buttons and switches other than the multi selector are indicated within a "button" frame (for example MENU).

**Back view****Top view****Bottom view**

- 
- ① Multi selector (  11) /  
 ▲ : EXP (exposure) (  48) /  
 DISP. (display) (  35)  
 ▼ : FOCUS (  49)
- 
- ② CAMERA mode indicator (red) (  11)
- 
- ③ CARD access indicator (  29) /  
 CHARGE indicator (  19)
- 
- ④ LCD screen (  21)
- 
- ⑤  (record review) button (  29) /  
 ⚡ (flash) button (  57) /  
 ◀◀ (fast reverse) button (  32) /  
 Index screen – button (  31)
- 
- ⑥ DRIVE MODE button (  54) /  
 ▶▶ (fast forward) button (  32) /  
 Index screen + button (  31)
- 
- ⑦ D.EFFECTS button (  58) /  
 ▶/|| (play/pause) button (  31)
- 
- ⑧ LIGHT button (  57) /  
 ■ (stop) button (  31)
- 
- ⑨ Viewfinder (  20)
- 
- ⑩ Mode switch (  45)
- 
- ⑪ Dioptic adjustment lever (  20)
- 
- ⑫ DISC access indicator (  28, 29)
- 
- ⑬ Start/stop button (  28)
- 
- ⑭ PLAY mode indicator (green) (  11)
- 
- ⑮ Power switch (  11)
- 
- ⑯  (movies/still images) switch (  11)
- 
- ⑰ Grip belt (  20)
- 
- ⑱ Zoom lever (  31)
- 
- ⑲ PHOTO button (  29)
- 
- ⑳ Tripod socket (  29)
- 
- ㉑ OPEN (disc cover) switch (  22)
- 
- ㉒ Strap mount

Names of buttons and switches other than the multi selector are indicated within a “button” frame (for example ).

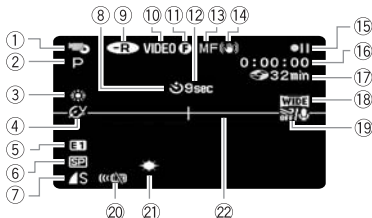
**DC22/DC21 Wireless Controller WL-D86**






- ① START/STOP button ( 28 )
- ② FUNC. button ( 25 )
- ③ MENU button ( 24 )
- ④ PLAYLIST button ( 62 )
- ⑤ Navigation buttons ( ▲/▼/◀/▶ )
- ⑥ PREV./NEXT buttons:  
Scene skip ( 33 )/  
Index screen page up/down ( 31 )
- ⑦ Reverse ◀◀ SEARCH button ( 32 ) /  
Reverse ◀◀ SLOW button ( 32 )
- ⑧ PLAY ▶▶ button ( 31 )
- ⑨ PAUSE || button ( 31 )
- ⑩ STOP ■ button ( 31 )
- ⑪ PHOTO button ( 29 )
- ⑫ Zoom buttons ( 31 )
- ⑬ SET button
- ⑭ Forward SEARCH ▶▶▶▶ button ( 32 ) /  
Forward SLOW ▶▶▶▶ button ( 33 )
- ⑮ DISP. (on-screen display) button ( 35 )




## Screen Displays

### CAMERA Recording Movies

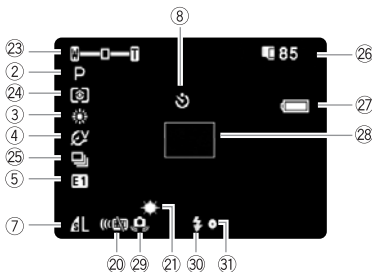





- ① Operating mode (□ 11)
- ② Recording program (□ 45)
- ③ White balance (□ 50)
- ④ Image effect (□ 51)
- ⑤ Digital effects (□ 58)
- ⑥ Recording mode (□ 43)
- ⑦ Still image quality/size (□ 52)
- ⑧ Self timer (□ 56)
- ⑨ Disc type  DVD-R,  DVD-R DL,  DVD-RW (□ 4)

- ⑩ Disc specification (VIDEO mode, VR mode) (□ 4)
- ⑪ Finalized disc mark (□ 70)
- ⑫ Recording reminder
- ⑬ Manual focus (□ 49)
- ⑭ Image stabilizer (□ 37)
- ⑮ Disc operation

- ⑯ Time code (hours : minutes : seconds)
- ⑰ Remaining recording time on disc (□ 28)
- ⑱ Widescreen mode (□ 29)
- ⑲ Wind screen (□ 38)
- ⑳ Remote sensor mode (□ 21)
- ㉑ LED light (□ 57)
- ㉒ Level marker (□ 40)
- ㉓ Zoom (□ 31), Exposure  (□ 48)
- ㉔ Metering mode (□ 49)
- ㉕ Drive mode (□ 54)
- ㉖ Number of still images available  on the card,  on the disc
- ㉗ Remaining battery charge
- ㉘ AF frame (□ 49)
- ㉙ Camcorder shake warning (□ 37)
- ㉚ Flash (□ 57)
- ㉛ AF/AE locked during still image recording (□ 29)

### CAMERA Recording Still Images



- ㉜ Time code (hours : minutes : seconds)
- ㉝ Remaining recording time on disc (□ 28)
- ㉞ Widescreen mode (□ 29)
- ㉟ Wind screen (□ 38)
- ㊱ Remote sensor mode (□ 21)
- ㊲ LED light (□ 57)
- ㊳ Level marker (□ 40)
- ㊴ Zoom (□ 31), Exposure  (□ 48)
- ㊵ Metering mode (□ 49)
- ㊶ Drive mode (□ 54)
- ㊷ Number of still images available  on the card,  on the disc
- ㊸ Remaining battery charge
- ㊹ AF frame (□ 49)
- ㊺ Camcorder shake warning (□ 37)
- ㊻ Flash (□ 57)
- ㊼ AF/AE locked during still image recording (□ 29)



**12 Recording reminder**

The camcorder counts from 1 to 10 seconds when you start recording. This is helpful to avoid scenes that are too short.

**15 Disc operation**

- Record, ● || Record pause,
- ▶ Playback, || Playback pause,
- ▶▶ Fast playback,
- ◀◀ Fast reverse playback,
- ▶ Slow playback,
- ◀ Slow reverse playback,
- ||▶ Frame advance,
- ◀|| Frame reverse

**17 Remaining recording time**

When there is no more disc space available, “END” will be displayed and the recording will stop.

**26 Number of still images available on the card/disc**

- 📷 flashing in red: No card
- 📷 in green: 6 or more images
- 📷 in yellow: 1 to 5 images
- 📷 in red: No more images can be recorded

- When viewing the still images, the display will always be in green.
- 📷 will be displayed instead of 📷 for still images on the disc.
- Depending on the recording conditions, the number of still images available displayed may not decrease even after a recording has been made, or may decrease by 2 still images at once.

**Card/Disc Access Display**


“▶” is displayed next to the number of images available while the camcorder is writing on the memory card or disc.

**27 Remaining battery charge**




- When “🔋” starts flashing in red replace the battery pack with a fully charged one.
- When you attach an empty battery pack, the power may turn off without displaying “🔋”.
- Depending on the conditions under which the camcorder and the battery pack are used, the actual battery charge may not be indicated accurately.






**PLAY  Playing Movies (Index Screen)**


- 
- ① Current scene number
- 
- ② Total number of scenes (  31 )
- 
- ③ Date and time of recording
- 

**PLAY  Playing Movies (During Playback)**


- 
- ① Disc operation
- 
- ② Playback time (hours : minutes : seconds)
- 
- ③ Scene number
- 
- ④ Data code (  35 )
- 

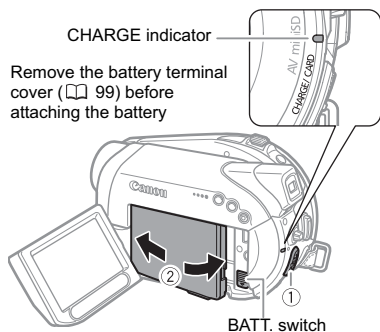
**PLAY  Viewing Still Images**


- 
- ① Image number (  41 )
- 
- ② Current image / Number of images  
 recorded on the card,  
 recorded on the disc
- 
- ③ Still image size
- 
- ④ Data code (  35 )
- 
- ⑤ Image protection mark (  68 )
-

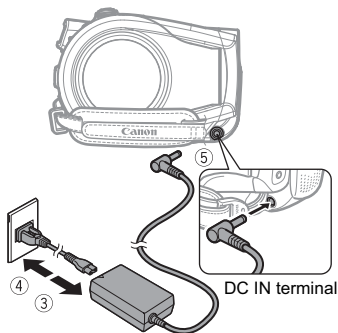
## Getting Started

### Preparing the Power Supply

The camcorder can be powered with a battery pack or directly using the compact power adapter. Charge the battery pack before use.



- 1 Turn off the camcorder.**
- 2 Attach the battery pack to the camcorder.**
  - Open the LCD panel.
  - Slide in the connector end of the battery in the direction of the arrow and press it gently until it clicks.



- 3 Connect the power cord to the compact power adapter.**
- 4 Plug the power cord into a power outlet.**
- 5 Connect the compact power adapter to the camcorder's DC IN terminal.**
  - The CHARGE indicator starts flashing. The indicator will stay on when the charging is completed.
  - You can also use the compact power adapter without attaching a battery pack.
  - When the compact power adapter is connected, even if a battery is attached its power will not be consumed.

Recording Mode		Maximum Recording Time	Typical Recording Time*	Playback Time
XP	Viewfinder	70 min.	40 min.	90 min.
	LCD [NORMAL]	70 min.	40 min.	
	LCD [BRIGHT]	70 min.	40 min.	
SP	Viewfinder	80 min.	45 min.	100 min.
	LCD [NORMAL]	80 min.	45 min.	
	LCD [BRIGHT]	75 min.	45 min.	
LP	Viewfinder	90 min.	45 min.	110 min.
	LCD [NORMAL]	85 min.	45 min.	
	LCD [BRIGHT]	85 min.	45 min.	

\* Approximate times for recording with repeated operations such as start/stop, zooming, power on/off.

**ONCE THE BATTERY IS FULLY CHARGED**

- 1 Disconnect the compact power adapter from the camcorder.
- 2 Unplug the power cord from the power outlet and the compact power adapter.

**TO REMOVE THE BATTERY PACK**

Slide down **[BATT.]** to release the battery pack, and pull out the battery pack holding it from the ridge on its bottom part.

**Charging, Recording and Playback Times with the BP-208 Battery Pack**

The charging time of the BP-208 battery pack is 155 min.

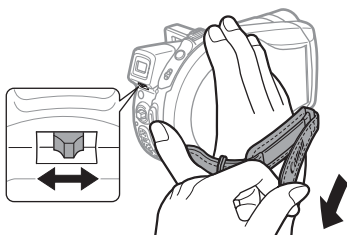
The recording and playback times given in the table on the previous page are approximate and vary according to the charging, recording or playback conditions.

**IMPORTANT**

- Turn off the camcorder before connecting or disconnecting the compact power adapter. After you turn off the power switch to **[OFF]** important file allocation data is updated on the disc. Be sure to wait until the LCD display is completely off.
- You may hear some noise from the compact power adapter during use. This is not a malfunction.
- We recommend charging the battery pack in temperatures between 10 °C and 30 °C. Outside the temperature range of 0 °C to 40 °C, the charging will not start.
- Do not connect to the camcorder's DC IN terminal or to the compact power adapter any electrical equipment that is not expressly recommended for use with this camcorder.
- To prevent equipment breakdowns and excessive heating, do not connect the supplied compact power adapter to voltage converters for overseas travels or special power sources such as those on aircraft and ships, DC-AC inverters, etc.

**NOTES**

- If you connect a faulty power adapter or battery pack, the CHARGE indicator flashes rapidly (approx. twice per second) and the charging stops.
- The CHARGE indicator also serves as a rough estimate of the battery charge status. Continuously on: Battery fully charged. Flashes approx. twice per second: Battery over 50% charged. Flashes approx. once per second: Battery less than 50% charged.
- The charging time will vary depending on the surrounding temperature and the battery pack's initial charge condition.
- In cold places, the effective usage time of the battery will decrease.
- We recommend that you prepare battery packs 2 to 3 times longer than you think you might need.

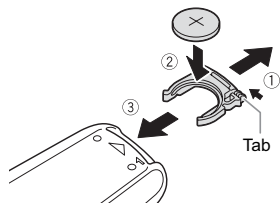
**Preparing the Camcorder**

- 1 **Turn on the camcorder.**  
The lens cover will open automatically.
- 2 **Adjust the viewfinder.**  
Keep the LCD panel closed to use the viewfinder and adjust the dioptic adjustment lever as necessary.
- 3 **Fasten the grip belt.**  
Adjust the grip belt so that you can reach the zoom lever with your index finger, and the start/stop button with your thumb.

## DC22/DC21 The Wireless Controller

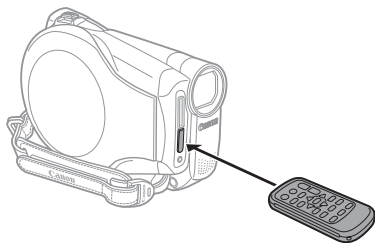
### Inserting the Battery (Lithium Button Battery

CR2025)



- 1 Press the tab in the direction of the arrow and pull out the battery holder.
- 2 Place the lithium button battery with the + side facing up.
- 3 Insert the battery holder.

### Using the Wireless Controller



Point the controller at the camcorder's remote sensor when you press the buttons.

#### **i** NOTES

- The wireless controller may not work properly when the remote sensor is situated under strong light sources or direct sunlight.
- If the wireless controller does not work, check that [WL.REMOTE] is not set to [OFF (OFF)] (p. 41).
- When the camcorder cannot be operated with the wireless controller, or when it can only be

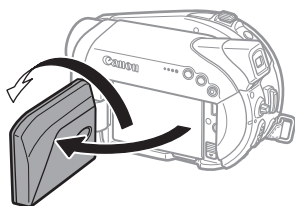
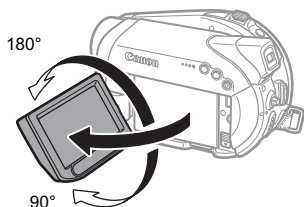
operated at a very close range, replace the battery.

### Adjusting the LCD Screen

#### Rotating the LCD Panel

Open the LCD panel 90 degrees.

- You can rotate the panel 90 degrees downward.
- You can rotate the panel 180 degrees toward the lens (allowing the subject to monitor the LCD screen while you use the viewfinder). Rotating the panel 180 degrees is also useful if you wish to include yourself when recording with the self timer.



Subject can monitor the LCD screen

#### LCD Backlight

You can switch the brightness of the LCD screen to [NORMAL] or [BRIGHT].



- 1 Turn on the camcorder.

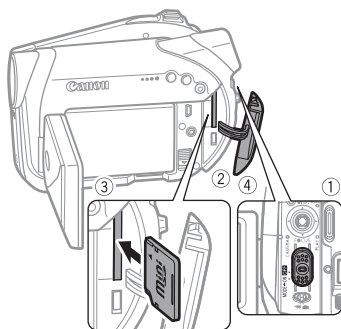
- 2 Press **[MENU]**.
- 3 Select **(▲▼)** **[DISPLAY SETUP]** and press **[OK]**.
- 4 Select **(▲▼)** **[BACKLIGHT]** and press **[OK]**.
- 5 Select **(▲▼)** the desired option and press **[OK]**.
- 6 Press **[MENU]** to close the menu.

### **i** NOTES

- This setting does not affect the brightness of the recording or the viewfinder screen.
- Using the **[BRIGHT]** setting will shorten the effective usage time of the battery.

## Inserting and Removing a Memory Card

Only miniSD cards can be used with this camcorder.



- 1 Turn off the camcorder.
- 2 Open the memory card slot cover.
- 3 Insert the memory card straight all the way into the memory card slot.
- 4 Close the cover.

Do not force the cover closed if the memory card is not correctly inserted.

## TO REMOVE THE MEMORY CARD

First push the memory card once to release it, and then pull the card out.

### **i** IMPORTANT

Make sure to initialize all memory cards before using them with this camcorder (□ 69).

### **i** NOTES

Performance cannot be guaranteed for all miniSD cards.

## Inserting and Removing a Disc

Use only 8 cm mini DVD discs marked with the DVD-R **DVD** logo (including DVD-R DL) or the DVD-RW **DVD** logo. Refer also to *Recommended discs* (□ 6).

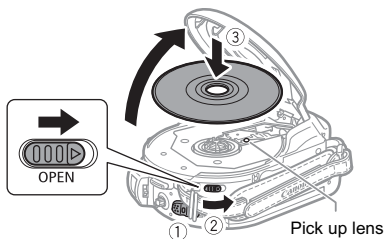
Before inserting the disc be sure to check that the recording surface is clean. If necessary, use a soft lens-cleaning cloth to remove any fingerprints, dirt buildup or smudges from the disc surface.

## Inserting the Disc

### **✓** POINTS TO CHECK



(□ 11)



Pick up lens

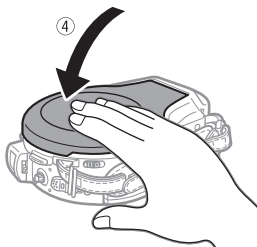
**1 Move the power switch to ON to set the camcorder in **CAMERA** mode.**

**2 Slide **OPEN** fully in the direction of the arrow and gently open the disc cover completely until it stops.**

Retract the grip belt under the camcorder so it will not get in the way of the disc cover.

**3 Insert the disc and press its center firmly until it clicks in place.**

- Insert the disc with the recording side facing down (single sided discs – label side facing out).
- Be careful not to touch the recording surface of the disc or the pick up lens.



**4 Close the disc cover.**

Do not force the cover closed if the disc is not correctly inserted and firmly set in place.

**WHEN USING DVD-R/DVD-R DL DISCS**

You can start recording movies once the record pause ●|| indication appears.

**WHEN USING A DVD-RW**

You need to initialize new discs before you can start recording. The disc initialization screen will appear when a new DVD-RW is first inserted. It will not appear when inserting a disc already initialized. In that case, you can start recording once the record pause ●|| indication appears.

① Select (▲▼) the desired disc specification and press (⊞). For a

comparison between the [VIDEO] and [VR] specifications, see *An Introduction to DVDs* (□ 4).

② You will be asked to confirm the disc specification you selected. Select (▲▼) [YES] and press (⊞) to continue, or select [NO] and press (⊞) to return and select a different disc specification.

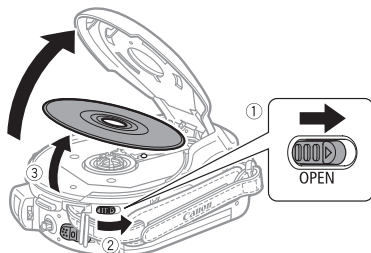
③ A confirmation message will appear on the screen. Select (▲▼) [YES] and press (⊞) to start the disc initialization.

- The disc initialization will take approximately one minute. Avoid moving the camcorder while the operation is in progress.
- You can start recording movies once the record pause ●|| indication appears.

**! IMPORTANT**

The process of recognizing a disc may take a moment. The Ⓜ display will move while the disc is being read. Wait until the camcorder finishes recognizing the disc before you start recording.

**Removing the Disc**



**1 Move the power switch to ON.**  
**2 Slide **OPEN** fully in the direction of the arrow and gently open the disc cover completely until it stops.**

- Do not subject the camcorder to strong impacts while the DISC access indicator is on or flashing.
- Retract the grip belt under the camcorder so it will not get in the way of the disc cover.
- It may take a moment after sliding **OPEN** for the disc cover to open.

### 3 Grab the edge of the disc and gently pull it out.

Be careful not to touch the recording surface of the disc or the pick up lens.

### 4 Close the disc cover.

#### IMPORTANT

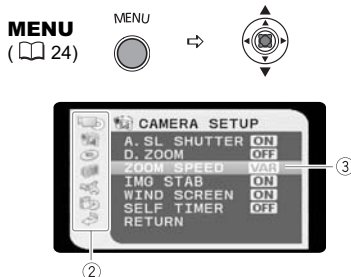
When you slide **OPEN** after making a recording, important file allocation data is updated on the disc before the disc cover opens. While the DISC access indicator is on or flashing do not subject the camcorder to shocks such as forcefully laying it on a table.

## Using the Menu

Many of the camcorder's functions can be adjusted from the menus that open after pressing the MENU button (**MENU**) and the FUNC. button (**FUNC.**).

For details about the available menu options and settings, refer to *Options Lists - MENU/FUNC.* ( 37).

### Selecting a MENU Option

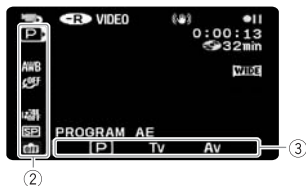


- 1 Press **MENU**.
- 2 Select (**▲▼**) the desired menu from the left side column and press (**□**).  
The title of the selected menu appears on top of the screen and under it the list of settings.
- 3 Select (**▲▼**) the setting you want to change and press (**□**).
  - The orange selection bar indicates the menu setting currently selected. Items not available appear in black.
  - To return to the menu selection screen, select (**▼**) [RETURN] and press (**□**).
- 4 Select (**▲▼**) the desired option and press (**□**) to save the setting.
- 5 Press **MENU**.  
You can press **MENU** to close the menu at any time.



## Selecting a FUNC. Menu Option

**FUNC.**  
( 25)



- 1 Press **FUNC.**.
- 2 Select (**▲▼**) the icon of the function you want change from the left side column.

Menu items not available will appear grayed out.

- 3 Select (**◀▶**) the desired setting from the available options at the bottom bar.

- The selected option will be highlighted in light blue.
- With some settings, you will need to make further selections (**▲▼**, **◀▶**) and/or press (**⊞**). Follow the additional operation guides that will appear on the screen (such as the **SET** icon, small arrows, etc.).

- 4 Press **FUNC.** to save the settings and close the menu.

You can press **FUNC.** to close the menu at any time.

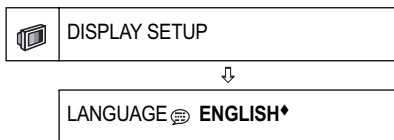
## First Time Settings

### Changing the Language

#### Options


◆ Default value

[DEUTSCH]	[РУССКИЙ]
[ <b>ENGLISH</b> ] <sup>◆</sup>	[简体中文]
[ESPAÑOL]	[繁體中文]
[FRANÇAIS]	[한국어]
[ITALIANO]	[ภาษาไทย]
[POLSKI]	[日本語]




**MENU**  
( 24)



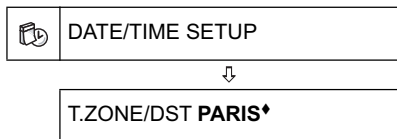
- 1 Press **MENU**.
- 2 Select (**▲▼**) **[DISPLAY SETUP]** and press (**⊞**).
- 3 Select (**▲▼**) **[LANGUAGE 

#### NOTES**

- If you changed the language by mistake, follow the  mark next to the menu item to change the setting.
- The displays **SET** and **MENU** that appear on screen while changing the print and direct transfer settings will not change regardless of the language selected.

## Changing the Time Zone

◆ Default value



- 1 Press **[MENU]**.
- 2 Select **(▲▼)** **[DATE/TIME SETUP]** and press **(□)**.
- 3 Select **(▲▼)** **[T.ZONE/DST]** and press **(□)**.

The time zone setting appears. The default setting is Paris.

- 4 Select **(▲▼)** your time zone and press **(□)**.

To adjust for daylight saving time, select the time zone with the \* mark next to the area.

### Time Zones

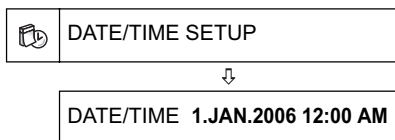
Once you have set the time zone, date and time, you do not need to reset the clock every time you travel to another time zone. Select the time zone referring to the date and time displayed on the screen.

### Time Zones and Difference from GMT/UTC

Location	GMT/UTC
London	
Paris◆	+1
Cairo	+2
Moscow	+3
Dubai	+4
Karachi	+5
Dacca	+6
Bangkok	+7
Singapore	+8
Tokyo	+9

Sydney	+10
Solomon	+11
Wellington [WELLINGTN]	+12
Samoa	-11
Honolulu	-10
Anchorage	-9
Los Angeles [L.A.]	-8
Denver	-7
Chicago	-6
New York	-5
Caracas	-4
Rio de Janeiro [RIO]	-3
Fernando de Noronha [FERNANDO]	-2
Azores	-1

## Setting the Date and Time



- 1 Press **[MENU]**.
- 2 Select **(▲▼)** **[DATE/TIME SETUP]** and press **(□)**.
- 3 Select **(▲▼)** **[DATE/TIME]** and press **(□)**.

The day is displayed in orange.

- 4 Select **(▲▼)** the day and move **(▶)** to the month setting.

- The next part of the date/time is displayed in orange.

- Set the month, year, hours and minutes in the same way.

- If you do not need to change all settings, move (◀▶) to a specific setting you want to change.

**5 Press [MENU] to close the menu and start the clock.**



**IMPORTANT**

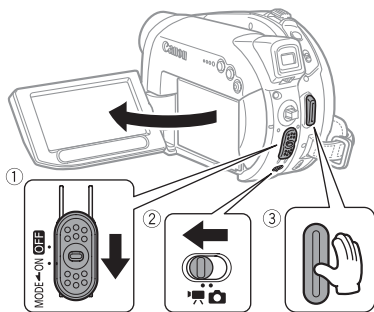
- When you do not use the camcorder for about 3 months, the built-in rechargeable lithium battery may discharge completely and the date and time setting may be lost. In such case, connect the compact power adapter to the camcorder, recharge the built-in lithium battery ([ ] 100) and set the time zone, date and time again.
- You can also change the date format ([ ] 42).

## Recording

### Recording Movies

#### Before You Begin Recording

Make a test recording first to check if the camcorder operates correctly. Since recordings made on a DVD-R or DVD-R DL disc cannot be deleted, we recommend you use a DVD-RW disc to make the test recordings.



#### 1 Move the power switch to ON to set the camcorder in CAMERA mode.

The red CAMERA indicator will turn on.

#### 2 Move the switch to the (Movies) position.

#### 3 Press to begin recording.

- The recording starts; press again to pause the recording.
- The DISC access indicator will flash while recording and will stay on briefly after pausing while the scene is recorded on the disc.

#### WHEN YOU HAVE FINISHED RECORDING

- 1 Remove the disc.
- 2 Turn off the camcorder.

#### 3 Disconnect the power source and remove the battery pack.

#### 4 Close the LCD panel.

#### IMPORTANT

Avoid the following actions while the DISC access indicator is on or flashing. Failing to do so may result in permanent data loss.

- Do not subject the camcorder to vibrations or strong impacts.
- Do not open the disc cover and do not remove the disc.
- Do not disconnect the power source or turn off the camcorder.
- Do not change the operating mode.

#### NOTES

● **About the recording time:** By changing the recording mode you can change the recording time available on the disc (□ 43).

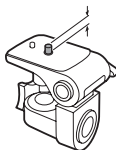
● When recording in bright places it may be difficult to use the LCD screen. In such case, use the viewfinder instead.

● When recording in very loud places (such as fireworks shows or concerts), sound may become distorted or it may not be recorded at the actual levels. This is not a malfunction.

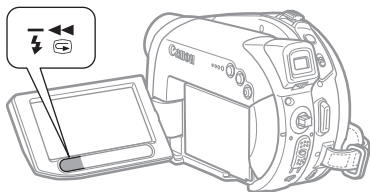
● **About the Power Save mode:** In order to save power when the camcorder is powered by a battery pack, the camcorder will automatically shut off if left without any operations for 5 minutes (□ 41). To restore the power, slide the power switch towards MODE and release it, or move the power switch to OFF and back to ON.

● **About the LCD and viewfinder screen:** The screens are produced using extremely high-precision manufacturing techniques, with more than 99.99% of the pixels operating to specification. Less than 0.01% of the pixels may occasionally misfire or appear as black, red, blue or green dots. This has no effect on the recorded image and does not constitute a malfunction.

● **When using a tripod:** Do not leave the viewfinder exposed to direct sunlight as it may melt (due to concentration of the light by the lens). Do not use tripods with fastening screws longer than 5.5 mm. Doing so may damage the camcorder.



## Reviewing the Last Scene Recorded



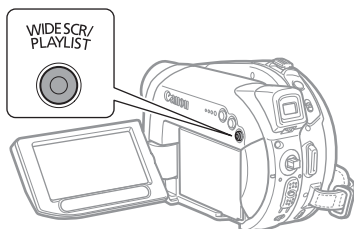
Press **[REVIEW]** (record review).

- The camcorder plays back the last scene and returns to record pause mode.
- While reviewing the scene, select (◀▶) the **[REVIEW]** icon and press (⏏) to return to the recording mode.
- While reviewing a scene immediately after recording it, you can also delete the scene by selecting (◀▶) the **[DELETE]** icon (□ 63).

## Selecting the Aspect Ratio of your Recordings (16:9 Widescreen or 4:3)

You can select the aspect ratio of your recording to match your TV.

### **[CHECK]** POINTS TO CHECK



Press **[WIDE SCR]**.

Repeatedly pressing **[WIDE SCR]** toggles between the widescreen (16:9) and normal (4:3) aspect ratios.

### **[i]** NOTES

- When recording in widescreen mode, with [IMG STAB] set to [OFF] (□ 37), you can have a wider view angle.
- **Playing back a widescreen recording:** TV sets compatible with the Video ID-1 system will automatically switch to wide (16:9) mode. Otherwise, change the aspect ratio of the TV manually. To play back on a TV with normal aspect ratio (4:3) change the [TV TYPE] setting accordingly (□ 42).

## Recording Still Images

Before using a memory card for the first time, be sure to initialize it with this camcorder (□ 69).





### 1 Move the power switch to ON to set the camcorder in CAMERA mode.

The red CAMERA indicator will turn on.

### 2 Move the MODE selector switch to the (Still images) position.

### 3 If necessary, change the media for recording the still images.

Refer to *Selecting the Media for the Still Images* (□ 30).

### 4 Press **PHOTO** halfway.

- Once the focus is automatically adjusted, will turn green and one or more AF frames appear.

- DC22/DC21** When you press **PHOTO** on the wireless controller, the still image is recorded immediately.

### 5 Press **PHOTO** fully.

The CARD access or DISC access indicator will flash as the image is being recorded.

## ! IMPORTANT

Avoid the following actions while the disc/card access display ( or ) appears on screen, and when either the DISC access or CARD access indicator is on or flashing. Failing to do so may result in permanent data loss.

- Do not subject the camcorder to vibrations or strong impacts.
- Do not open the disc cover or the memory card slot cover and do not remove the disc or memory card.

- Do not disconnect the power source or turn off the camcorder.
- Do not change the position of the switch or the operating mode.

## i NOTES

If the subject is not suitable for autofocus, turns yellow. Keep **PHOTO** pressed halfway and adjust the focus manually with the multi-selector ().

## Selecting the Media for the Still Images

You can record still images on the memory card or the disc. The default media for still images is the memory card. As long as you do not change the recording destination, still images will be recorded on the last selected media.



## MENU

(□ 24)

MENU



### 1 Press **MENU**.

### 2 Select () [SYSTEM SETUP] and press ().

### 3 Select () [MEDIA SEL. ] and press ().

### 4 Select () [DISC] or [CARD] and press () to save the setting and close the menu.

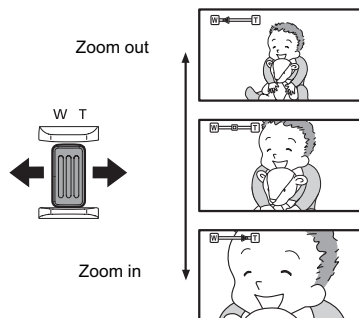
When recording, the operating mode symbol will change to (DISC stills) or (CARD stills), depending on the media selected. In playback mode, the operating mode symbol will change to (DISC stills) or (CARD stills), respectively.

## Zooming

### POINTS TO CHECK



**CAMERA** : In addition to the 10x optical zoom, the 200x digital zoom is also available ( 37 ).



## 10x Optical Zoom

Move the zoom lever toward **W** to zoom out (wide-angle). Move it toward **T** to zoom in (telephoto).

You can also change the zoom speed ( 37 ). You can select one of three fixed zoom speeds or a variable speed that depends on how you operate the zoom lever: Press gently for a slow zoom; press harder for faster zooms.

### NOTES

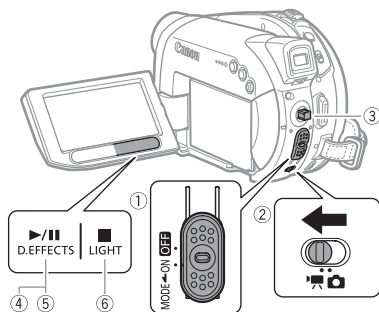
- **DC22/DC21** You can also use the **T** and **W** buttons on the wireless controller. The zoom speed with the wireless controller will be the same as with the camcorder (when one of the fixed zoom speed levels is selected) or fixed at [SPEED 3] (when [VARIABLE] is selected).
- When set to [VARIABLE], the zoom speed will be faster in the record pause mode.
- Keep at least 1 m to the subject. At wide-angle, you can focus on a subject as close as 1 cm.

## Playback

### Playing Back Movies

### POINTS TO CHECK

**DC22/DC21** For some operations you can also use the buttons on the wireless controller.



**1** Move the power switch to ON, then slide it down towards **MODE** and release it to set the camcorder in **PLAY** mode.

The green **PLAY** indicator will turn on.

**2** Move the switch to the (**Movies**) position.

The scene index screen appears with the selection frame on the first scene.

**3** Move (, ) the selection frame to the scene you want to play back.

Press or on the camcorder ( or on the wireless controller) to move to the next/previous index page.

**4** Press to begin the playback.

The playback will start from the scene selected and continue until the end of the last scene recorded.

**DURING PLAYBACK**

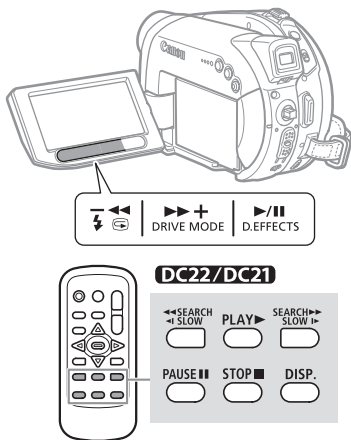
- 5 Press **▶||** again to pause the playback.
- 6 Press **■** to stop the playback and return to the scene index screen.

**i NOTES**

- To use the viewfinder, close the LCD panel.
- When playing back a DVD-R DL (dual-layered) disc, you might notice a brief stop (approx. 1 second) at the point where the playback switches from Layer 1 to Layer 2.
- **About the screen display:** During playback, the recording's time code will be displayed at the upper right corner of the screen in hours : minutes : seconds. You can also choose to display instead the date and time when the scene was recorded and additional recording data (□ 35).
- As long as you don't turn off the camcorder you can resume playback from the point you stopped last.

**Special Playback Modes****POINTS TO CHECK**

**DC22/DC21** For some operations you can also use the buttons on the wireless controller.

**▶▶ Fast Forward Playback /****◀◀ Fast Reverse Playback**

During normal playback, press **▶▶** or **◀◀** on the camcorder (**SEARCH ▶▶** or **◀◀ SEARCH** on the wireless controller). Repeatedly press the button to increase the playback speed.

Fast playback: 5x → 15x → 25x the normal speed.

**|| Playback Pause**

During normal playback, press **▶||** on the camcorder (**PAUSE ||** on the wireless controller).

**▶ Slow Forward Playback /****◀ Slow Reverse Playback**

During playback pause, press **▶▶** or **◀◀** on the camcorder (**SLOW ▶▶** or **◀ SLOW** on the wireless controller). Repeatedly



press the button to increase the playback speed.

Slow playback: 1/16 → 1/8 → 1/4 the normal speed.

### Skipping Scenes

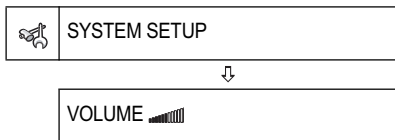
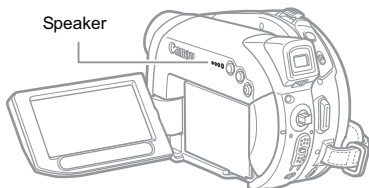
During normal playback, push the multi selector (▶) on the camcorder (NEXT on the wireless controller) to skip to the beginning of the next scene. Push the multi selector (◀) on the camcorder (PREV. on the wireless controller) to return to the beginning of the current scene. Repeat to skip to the beginning of the previous scene.

### NOTES

- There is no sound during special playback modes.
- During some special playback modes, you may notice some disturbances in the playback picture.
- Slow playback is not available with discs initialized in VIDEO mode.
- Depending on the recording, you might occasionally notice a brief stop of the picture or sound at the point where the scene changes.

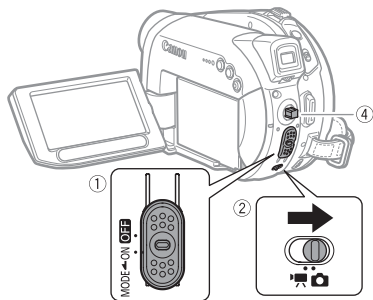
### Adjusting the Volume

The camcorder plays the sound with the built-in speaker. The volume will be muted when you close the LCD panel.



- 1 Press **MENU**.
- 2 Select (▲▼) [SYSTEM SETUP] and press (◻).
- 3 Select (▲▼) [VOLUME] and press (◻).
- 4 Adjust (◀▶) the volume as desired and press (◻).  
To turn off the volume completely, keep pressing (◀) until the volume icon changes to .
- 5 Press **MENU** to save the setting and close the menu.





### Viewing Still Images







- 1 Move the power switch to ON, then slide it down towards MODE and

release it to set the camcorder in **PLAY** mode.

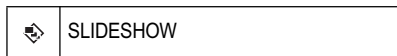
The green **PLAY** indicator will turn on.

- 2 Move the /  switch to the  (**Still images**) position.
- 3 If necessary, change the media for the still images.  
Refer to *Selecting the Media for the Still Images* (□ 30).
- 4 Use the multi selector () to move between images.


### ! IMPORTANT

- The following may not be displayed correctly.
  - Images not recorded with this camcorder.
  - Images edited on or uploaded from a computer (except for the sample images for the Card Mix function).
  - Images whose file names have been changed.
- Avoid the following actions while the disc/card access display ( or ) appears on screen, and when either the DISC access or CARD access indicator is on or flashing. Failing to do so may result in permanent data loss.
  - Do not subject the camcorder to vibrations or strong impacts.
  - Do not open the disc cover or the memory card slot cover and do not remove the disc or memory card.
  - Do not disconnect the power source or turn off the camcorder.
  - Do not change the position of the /  switch or the operating mode.








### Slideshow



- 1 Press .
- 2 Select () [ **SLIDESHOW**] and press ()
- 3 Select () [**START**] and press ()

- Images are played back one after another.
- Press  to stop the slideshow.

### Index Screen

- 1 Move the zoom lever toward **W**.  
The still images index screen appears.
- 2 Select (, ) an image.
  - Move the cursor () to the image you want to view.
  - Press  or  on the camcorder ( **NEXT** or  on the wireless controller) to move to the next/previous index page.
- 3 Move the zoom lever toward **T**.  
The index screen closes and the selected image is displayed.

### Image Jump Function

You can also quickly locate a specific image without having to browse all of them one by one.


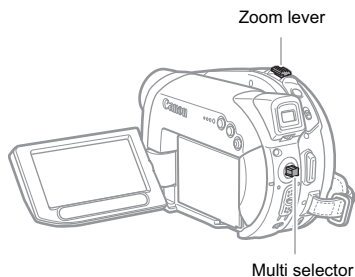
**Push the multi selector () and keep it pressed down.**

Image numbers will quickly run in sequence. When you release the multi selector the image corresponding to the number selected will be displayed.

### Magnifying the Still Image

During playback, still images can be magnified up to 5 times.





**1 Move the zoom lever toward T.**

- The image is magnified by 2 times and a frame appears indicating the position of the magnified area.
- To further enlarge the image, move the zoom lever toward **T**. To reduce the magnification to less than 2 times, move the zoom lever toward **W**.
- will appear for images that cannot be enlarged.

**2 Select the part of the image to be magnified with the multi selector.**

- Move (, ) the frame to the part of the image you want to see enlarged.
- To cancel the magnification, move the zoom lever toward **W** until the frame disappears.

**Selecting the Recording Data Display**

The camcorder keeps a data code containing the recording date and time and other camera data such as shutter speed and exposure (f-stop). You can select the data to be displayed.



**POINTS TO CHECK**



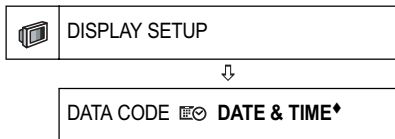
( 11)

: [DATE], [TIME], [DATE&TIME] only.

**Options**

♦ Default value

	[DATE], [TIME]
Displays the date or time when the scene or still image was recorded.	
	[DATE & TIME]♦
Displays both the date and time of the recording.	
	[CAMERA DATA]
Displays the exposure (f-stop) and shutter speed used when recording the image.	
	[CAM. & D/T]
Displays the exposure, shutter speed, date and time of the recording.	



**Selecting the Data Code**

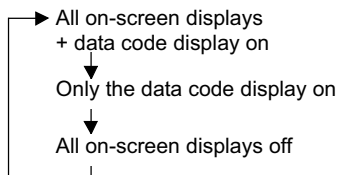


- 1 Press .
- 2 Select () [DISPLAY SETUP] and press ().
- 3 Select () [DATA CODE] and press ().
- 4 Select () the desired option and press ().
- 5 Press to close the menu.

## Turning the On-screen Displays On/Off



**During playback, repeatedly press (▲) DISP. to turn the on-screen displays on/off in the following sequence:**



## Menu Options Lists

Menu items not available appear in black on the screen. For details about how to select an item, refer to *Using the Menus* (□ 24).

### MENU Options

#### CAMERA SETUP

##### A.SL SHUTTER





Mode switch: P, SCN


[ON ON], [OFF OFF]

The camcorder automatically uses slow shutter speeds to obtain brighter recordings in places with insufficient lighting.

- The camcorder uses shutter speeds down to 1/25 (1/12 when recording still images).

-  : Set the flash mode to  (flash off).

- If a trailing afterimage appears, set the slow shutter to [OFF OFF].

- If  (camcorder shake warning) appears, we recommend stabilizing the camcorder, for example, by mounting it on a tripod.

##### D.ZOOM



[OFF OFF], [40x 40X], [200x 200X]

Determines the operation of the digital zoom.

- When activated, the camcorder will switch automatically to the digital zoom

when you zoom in beyond the optical zoom range.

- With the digital zoom the image is digitally processed, so the image resolution will deteriorate the more you zoom in.

- The digital zoom indicator will appear in light blue from 10x up to 40x and dark blue from 40x up to 200x.

- The digital zoom cannot be used with the [NIGHT] recording program (SCN) or with the multi-image screen.

##### AF AST LAMP

(□ 57)



[A AUTO], [OFF OFF]

##### ZOOM SPEED



[VAR VARIABLE], [SPEED 3],

[SPEED 2], [SPEED 1]

- When set to [VAR VARIABLE] the zoom speed depends on how you operate the zoom lever: Press lightly for a slow zoom; press harder for faster zooms.

- The fastest zoom speed can be achieved with [VAR VARIABLE]. Among the fixed zoom speeds, [SPEED 3] is the fastest and [SPEED 1] the slowest.

##### IMG STAB



Mode switch: P, SCN

[ON ON (👁)], [OFF OFF]

The image stabilizer compensates for camcorder shake even at full telephoto.

- The image stabilizer is designed to compensate for a normal degree of camcorder shake.

- The image stabilizer may not be effective when recording in dark places using the [ NIGHT ] recording program (scn).

- The image stabilizer cannot be turned off when the mode switch is set to **AUTO**.

- We recommend setting the image stabilizer to [ OFF OFF ] when using a tripod.

### FOCUS PRI.



[ ON ON ], [ OFF OFF ]

The camcorder records the still image only after the focus has been adjusted.

- Set it to [ OFF OFF ] if you wish to record a still image as soon as you press **PHOTO**. When set to [ OFF OFF ], no focusing frame appears.

- Focus priority cannot be turned off when the mode switch is set to **AUTO**.

- In the [ FIREWORKS ] recording program (scn) the setting is automatically set to [ OFF OFF ].

### REVIEW



[ OFF OFF ], [ 2s 2sec ], [ 4s 4sec ], [ 6s 6sec ], [ 8s 8sec ], [ 10s 10sec ]

Selects the time to display a still image after it has been recorded on the memory card.

- You can erase (□ 66) or protect (□ 68) the image if you press **FUNC.** while you are reviewing the image (or immediately after recording it, if set to [ OFF OFF ]).

- This menu item will not be available when (continuous shooting), (high-speed continuous shooting) or (auto exposure bracketing) is selected.

### WIND SCREEN



Mode switch: P, SCN

[ **A** AUTO ], [ OFF OFF ]

The camcorder automatically reduces the background sound of wind when recording outdoors.

- The wind screen cannot be turned off when the mode switch is set to **AUTO**.

- Some low-frequency sounds will be suppressed along with the sound of wind. When recording in surroundings unaffected by wind or if you want to record low-frequency sounds, we recommend setting the wind screen to [ OFF OFF ].

### SELF TIMER

(□ 56)



[ ON ON ], [ OFF OFF ]

## DISC OPERATIONS

### DISC INFO



Displays a screen where you can verify the details regarding the disc.

- The disc information includes the disc title, the disc type (DVD-R, DVD-R DL or DVD-RW), the disc specification (VIDEO mode or VR mode), and icons that indicate if the disc is finalized (Ⓢ) or protected (Ⓢ).

### DISC INITIALIZE

(□ 64)



[ VIDEO ], [ VR ], [ CANCEL ]

**FINALIZE**

( 70)



[NO], [YES]

**UNFINALIZE**

( 71)



[NO], [YES]

**MOVIES ALL DEL**

( 63)



[NO], [YES]

This option is available only in the original index screen.

**PLAYLIST ALL DEL**

( 63)



[NO], [YES]

This option is available only in the playlist index screen.

**DISC PROTECT**

( 64)



[NO], [YES]

**PHOTOMOVIE**

( 67)



[NO], [YES]

**DISC TITLE**

( 65)

**STILL IMG OPER.****ORD.ALL ERASE**

( 88)



[NO], [YES]

**ORD.ALL ERASE**

( 83)



[NO], [YES]

**ERASE ALL IMAGES**

( 66)



[NO], [YES]

**CARD INITIALIZE**

( 69)



[NO], [YES]

**ALL COPY [ ] → [ ]**

( 67)



[NO], [YES]

**ALL COPY [ ] → [ ]**

( 67)



[NO], [YES]

\* The following options are available only when you press **[MENU]** in the index screen.

→ **PROTECT\*** (p. 68)



[NO], [YES]

→ **PRINT ORDER\*** (p. 87)



[NO], [YES]

→ **TRANSFER ORDER\*** (p. 83)



[NO], [YES]

## DISPLAY SETUP

### BRIGHTNESS



Adjusts the brightness of the LCD screen.

- Use the multi selector (◀▶) to adjust the brightness to your preference.
- Changing the brightness of the LCD screen does not affect that of the viewfinder or the recordings.

**BACKLIGHT** (p. 21)



[☑] **NORMAL**, [☒] **BRIGHT**

- The setting will automatically change to [☒] **BRIGHT** when powering the camcorder with the compact power adapter.

### LCD MIRROR



[ON] **ON**, [OFF] **OFF**

When the LCD panel is rotated 180 degrees to face the subject, most screen displays will disappear and the image displayed will be as if the subject was looking at a mirror.

### TV SCREEN



[ON] **ON**, [OFF] **OFF**

When set to [ON] **ON**, the camcorder's on-screen displays will appear also on the screen of a connected TV or monitor.

- **[DC22/DC21]** You can also operate this function pressing **[DISP]** on the wireless controller.

**DATA CODE** (p. 35)



[☑] **DATE**, [☒] **TIME**, [☑] **DATE & TIME**, [☑] **CAMERA DATA**, [☑] **CAM. & D/T**



[☑] **DATE**, [☒] **TIME**, [☑] **DATE & TIME**

### LEVEL MARKER



[ON] **ON**, [OFF] **OFF**

A horizontal line will appear at the center of the screen. You can frame the picture by referring to the level marker. The level marker will not appear on the recorded picture.



**LANGUAGE** ( 25)

[DEUTSCH], [ENGLISH], [ESPAÑOL], [FRANÇAIS], [ITALIANO], [POLSKI], [РУССКИЙ], [简体中文], [繁體中文], [한국어], [ភាសាខ្មែរ], [日本語]

**DEMO MODE**

[ON ON], [OFF OFF]

The demonstration mode displays the camcorder's main features. It starts automatically when the camcorder is powered with the power adapter if you leave it turned on without loading a recording media for more than 5 minutes.

- To cancel the demo mode once it started, press any button, turn off the camcorder or load a recording media.

**SYSTEM SETUP****MEDIA SEL.** ( 30)

[CARD], [DISC]

**DC22/DC21  
WL.REMOTE**

[ON ON], [OFF OFF]

Allows the camcorder to be operated with the wireless controller.

**VOLUME** ( 33)**BEEP**

[HIGH VOLUME], [LOW VOLUME], [OFF OFF]

A beep will accompany some operations like turning on the camcorder, the self-timer countdown, etc. It also serves as a warning beep under unusual conditions.

**POWER SAVE**

[ON ON], [OFF OFF]

In order to save power when the camcorder is powered by a battery pack, it will automatically shut off if left without any operation for five minutes.

Approximately 30 seconds before the camcorder shuts off, the message "AUTO POWER OFF" will appear.

**FILE NOS.**

[RESET], [CONTINUOUS]

Select the image numbering method to be used on a new memory card or disc.

Images are automatically assigned consecutive image numbers from 0101 to 9900, and stored in folders containing up to 100 images. Folders are numbered from 101 to 998.

[RESET]: Image numbers will restart from 101-0101 every time you insert a new memory card or disc.

[CONTINUOUS]: Image numbers will continue from the number following that of the last image recorded with the camcorder.

- If the recording media you insert already contains an image with a larger number, a new image will be assigned a

number one higher than that of the last image on the memory card or disc.

- We recommend using the [CAMERA CONTINUOUS] setting.
- The setting is common to the memory card and the disc.

### TV TYPE



[4:3 NORMAL TV], [16:9 WIDE TV]

In order to display the picture in full and in the correct aspect ratio, select the setting according to the type of television to which you will connect the camcorder.

[NORMAL TV]: TV sets with 4:3 aspect ratio.

[WIDE TV]: TV sets with 16:9 aspect ratio.

- When the TV type is set to [NORMAL TV], if you play back a recording made in widescreen (16:9) the picture displayed on the LCD screen will be smaller than the full display area.

### DATE/TIME SETUP



#### T.ZONE/DST

(□ 26)

#### DATE/TIME

(□ 26)

#### DATE FORMAT

[Y.M.D (2006.1.1 AM 12:00)],  
[M.D,Y (JAN. 1, 2006 12:00 AM)],  
[D.M.Y (1.JAN.2006 12:00 AM)]

Changes the date format for on-screen displays and for date printing.

### LINE-IN MODE

#### LINE-IN MODE

(□ 74)



[⇒ S VIDEO], [⇒ VIDEO]

### FUNC. Menu Options

#### Recording programs

(□ 45)



Mode switch: P

[P PROGRAM AE],  
[Tv SHUTTER-PRIO. AE],  
[Av APERTURE-PRIO. AE]

Mode switch: SCN

[PORTRAIT], [SPORTS],  
[NIGHT], [SNOW], [BEACH],  
[SUNSET], [SPOTLIGHT],  
[FIREWORKS]

#### Light metering mode

(□ 49)



Mode switch: P

[EVALUATIVE],  
[CENT.WEIGHT.AVERAGE],  
[SPOT]

#### White balance

(□ 50)



Mode switch: P

[AUTO], [DAYLIGHT],  
[SHADE], [CLOUDY],  
[TUNGSTEN], [FLUORESCENT],  
[FLUORESCENT H], [SET]

**Image effect** ( 51)



Mode switch: P

- [  IMAGE EFFECT OFF ], [  VIVID ],
- [  NEUTRAL ],
- [  LOW SHARPENING ],
- [  SOFT SKIN DETAIL ],
- [  CUSTOM ]

**Drive mode** ( 54)



Mode switch: P, SCN

- [  SINGLE ], [  CONT.SHOOT. ],
- [  HISPEED CONT.SH ], [  AEB ],
- [  STITCH AST ]

Mode switch: **AUTO**

- [  SINGLE ], [  STITCH AST ]

**Digital effects** ( 58)



Mode switch: P, SCN

- [  D.EFFECT OFF ], [  FADER ],
- [  EFFECT ], [  MULTI-S ],
- [  CARD MIX ]

\* Not available while using the [  NIGHT ] recording program.



Mode switch: P, SCN

- [  D.EFFECT OFF ], [  BLK&WHT ]

**Recording mode**



- [  HIGH QUALITY ],
- [  STANDARD PLAY ], [  LONG PLAY ]

The table below gives the approximate recording times with a brand new DVD disc (on a single recording side).

Recording Mode	Disc Type	
	DVD-R, DVD-RW	DVD-R DL
<b>XP</b>	20 min.	36 min.
<b>SP</b>	30 min.	54 min.
<b>LP</b>	60 min.	108 min.

● **Recording in LP mode gives you a longer recording time; however, depending on the condition of the disc (long usage, imperfections, etc.) the picture and sound recorded in LP mode may be distorted. We recommend using the XP or SP mode for important recordings.**

● Depending on the recording mode, at the point where the scene changes you may notice brief disturbances in the playback picture or the time code may not be correctly updated.

● The camcorder uses a variable bit rate (VBR) when encoding the video data so the actual recording times will vary depending on the content of the scenes.

**Still image recording** ( 53)



- [  STILL I.REC OFF ],
- [  S FINE/640x480 ],
- [  S NORMAL/640x480 ]

**Still image size/quality** ( 52)



Size: [  L 1632x1224 ], [  M 1280x960 ], [  S 640x480 ]

Quality: [  SUPER FINE ], [  FINE ], [  NORMAL ]

**ADD TO PLAYLIST**

( 62)



[ALL SCENES], [ONE SCENE], [CANCEL]

Add a scene to the playlist. This option is available only from the original index screen.

**MOVE**

( 62)



Move a scene in the playlist. This option is available only from the playlist index screen.

**DIVIDE**

( 64)



Divide a scene.

**DELETE**

( 62)



Delete a scene.

**CONVERT TO SCENE**

( 67)



Convert a single still image into a 3-second scene.

**COPY [ ]**

( 67)



Copy a single still image from the memory card to the disc.

**COPY [ ]**

( 67)



Copy a single still image from the disc to the memory card.

**IMAGE ERASE**

( 66)



Erase a still image.

**CAMERA** : This option will appear only when the drive mode is set to [ SINGLE] and you press [FUNC.] within the time set for the [REVIEW] option (or immediately after recording the still image, if set to [ OFF OFF]).

**SLIDESHOW**

( 34)



[CANCEL], [START]

**PROTECT**

( 68)

[ OFF], [ ON]

Protect a still image on the memory card.

**PRINT ORDER**

( 87)



[ 0] - [ 99] COPIES

Set a print order for a still image on the memory card.

**TRANSFER ORDER**

( 83)

[ OFF], [ ON]

Set a transfer order for a still image on the memory card.

## Using the Recording Programs



### AUTO Auto

The camcorder adjusts the focus, exposure and other settings automatically, allowing you to just point and shoot.



### P : Flexible Recording Programs

[P PROGRAM AE]

(📖 46)

[TV SHUTTER-PRIO. AE]

(📖 47)

[AV APERTURE-PRIO. AE]

(📖 47)

### SCN: Special Scene Recording Programs

[👤 PORTRAIT]

The camcorder uses a large aperture, achieving a focus on the subject while blurring other distracting details.



[☔ SNOW]

Use this mode to record in bright ski resorts. It prevents the subject from being underexposed.



[🎤 SPOTLIGHT]

Use this mode to record spotlight scenes.



[🎾 SPORTS]

Use this mode to record sports scenes such as tennis or golf.



[🏖️ BEACH]

Use this mode to record on a sunny beach. It prevents the subject from being underexposed.



[🎆 FIREWORKS]

Use this mode to record fireworks.



[🌙 NIGHT]

Use this mode to record in dimly lit places.



[🌅 SUNSET]

Use this mode to record sunsets in vibrant colors.



## Selecting the Recording Program



Move the mode switch between the recording categories.



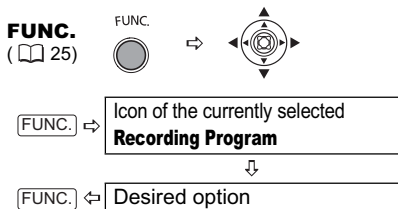
**AUTO** Automatic mode

**P** Select one of the 3 Flexible recording programs (□ 45).

**SCN** Select one of the 8 Special Scene recording programs (□ 45).

### TO SELECT A RECORDING PROGRAM

Set the mode switch to **P** or **SCN**.



### NOTES

- Do not change the recording program while recording as the brightness of the image may change abruptly.
- [**□** PORTRAIT]
  - The blur effect of the background increases the more you zoom in (**T**).
  - The picture may not appear smooth when played back.
- [**□** SPORTS]
  - The picture may not appear smooth when played back.
- [**□** NIGHT]
  - Moving subjects may leave a trailing afterimage.
  - Picture quality may not be as good as in other modes.
  - White points may appear on the screen.
  - Autofocus may not work as well as in other modes. In such case, adjust the focus manually.

### ● [**□** SNOW]/[**□** BEACH]

- The subject may become overexposed on cloudy days or in shaded places. Check the image on the screen.
- The picture may not appear smooth when played back.

### ● [**□** FIREWORKS]

- To avoid camcorder shake, we recommend using a tripod. Make sure to use a tripod especially in **CAMERA** mode, as the shutter speed slows down.

## P Programmed Auto Exposure

The camcorder automatically adjusts the aperture and shutter speed according to the subject to achieve the best exposure conditions. With [**P** PROGRAM AE], you can point and shoot as in **AUTO** mode, while still enjoying the option to manually adjust some settings.

### POINTS TO CHECK



Mode switch: **P**



Select the recording program [**P** PROGRAM AE] as described in *Selecting the Recording Program* (□ 46).

### NOTES

- If the optimal exposure cannot be obtained, try the following actions.
- Manually adjust the exposure (□ 48).
  - Change the light metering mode (□ 49).
  - Use the flash (□ 57).
  - Use the LED light (□ 57).

## Tv Shutter-Priority AE

You can select a shutter speed, and the camcorder automatically sets the aperture setting most appropriate for the subject. Select a high shutter speed for recording fast moving subjects, and a slow shutter speed to add a motion blur to moving objects, enhancing the feel of movement of the image.

### POINTS TO CHECK



Mode switch: P



### Shutter speed guidelines

CAMERA · [video icon]	1/6, 1/12, 1/25
CAMERA · [photo icon]	1/2, 1/3, 1/6, 1/12, 1/25
For recording subjects in dark places.	
CAMERA · [video icon]	1/50
CAMERA · [photo icon]	1/50
For general recordings.	
CAMERA · [video icon]	1/120
CAMERA · [photo icon]	1/120
For recording indoor sports scenes.	
CAMERA · [video icon]	1/250, 1/500, 1/1000
CAMERA · [photo icon]	1/250, 1/500
For recording from within a car or train, or for recording moving subjects such as roller coasters.	
CAMERA · [video icon]	1/2000
For recording outdoor sports such as golf or tennis on sunny days.	

**FUNC.**  
(11 25)

FUNC.



- 1 Select the recording program [Tv SHUTTER-PRIO.AE] as

described in *Selecting the Recording Program* (46).

- 2 Press ( [video icon] ).
- 3 Change ( [up/down arrow] ) the shutter speed and press ( [video icon] ) to save the setting.

### NOTES

- The shutter speed denominator flashes when the selected shutter speed is not appropriate for the recording condition. In such case, readjust the shutter speed.
- When using a slow shutter speed in dark places, you can obtain a brighter image, but the image quality may be lower, and the autofocus may not work well.
- Do not point the camcorder directly at the sun when the shutter speed is set to 1/1000 or higher.
- The picture may flicker when recording with high shutter speeds.

## Av Aperture-Priority AE

You can select an aperture value, and the camcorder automatically sets the shutter speed most appropriate for the subject. Use low aperture values (large aperture) to blur the background for a portrait, or high aperture values (small aperture) to achieve a broad depth of field for recording landscapes.

### POINTS TO CHECK



Mode switch: P



### Available aperture values

[1.8], [2.0], [2.4], [2.8], [3.4], [4.0], [4.8], [5.6], [6.7], [8.0], [9.5], [11], [14], [16]

**FUNC.**  
( 25)



- 1 Select the recording program [Av APERTURE-PRIO.AE] as described in *Selecting the Recording Program* ( 46).
- 2 Press ( ).
- 3 Change (▲▼) the aperture value and press ( ) to save the setting. Smaller aperture values (or f/ numbers) represent a larger lens opening, and vice versa.

### **i** NOTES

- Available aperture values vary depending on the zoom position.
- The aperture value flashes when the selected aperture is not appropriate for the recording condition. In such case, readjust the aperture.

## Adjusting the Picture: Exposure, Focus and Color

### Manual Exposure Adjustment

Adjust the exposure when a subject is underexposed (for example, when backlight subjects appear too dark in the image) or overexposed (for example, when recording subjects under very strong light and they appear too bright or glaring in the image).




### POINTS TO CHECK



( 11)

Mode switch: P, SCN (except for the [FIREWORKS] recording program).



- 1 Press (▲) [EXP].
  - The exposure adjustment indicator  and the neutral value "±0" appear on the screen.
  - If you operate the zoom during exposure lock, the brightness of the image may change.
- 2 Adjust (◀▶) the brightness of the image as required.
  - The adjustment range and the length of the exposure adjustment indicator will vary depending on the brightness of the picture at the time you locked the exposure.
  - Pressing (▲) [EXP] again will cancel the exposure lock and return the camcorder to automatic exposure.



## Light Metering Mode

You can select the light metering mode.

### POINTS TO CHECK



Mode switch: P

### Options

◆ Default value

#### EVALUATIVE\*

Appropriate for standard shooting conditions, including backlit scenes. The camcorder divides the picture into several areas and the light is measured in all of them to achieve the optimal exposure for the subject.

#### CENT.WEIGHT.AVERAGE

Averages the light metered from the entire screen, giving more weight to the subject in the center.

#### SPOT

Meters the area within the spot AE point frame. Use this setting to adjust the exposure to match the subject in the center of the screen.

**FUNC.**  
( 11 25)



**FUNC.** → Icon of the currently selected **Light Metering Mode**

**FUNC.** ← Desired option

## Automatic Focus Modes

You can change the AF (autofocus) frame selection mode.



### Options

#### 9 Point AiAF (Mode switch: P, AUTO, SCN)

Depending on the shooting conditions, one or more AF frames out of the nine frames available are automatically selected and the focus is fixed on them.

Four framing corners will appear on the screen when making the selection; they do not appear while actually recording.

#### Center point (Mode switch: P, SCN\*)

The focus is automatically fixed to the center AF frame. This is convenient for making sure the focus is exactly where you want it.

A single focusing frame appears in the center of the screen when making the selection; the frame will appear also while actually recording.

\* Except for the FIREWORKS recording program.



Select ( ) the autofocus mode.

## Manual Focus Adjustment

Autofocus may not work well on the following subjects. In such case, focus manually.

Reflective surfaces



Subjects with low contrast or without vertical lines



## Fast Moving Subjects



## Through dirty or wet windows



## Night Scenes


 POINTS TO CHECK


Mode switch: P, SCN

**1 Adjust the zoom.****2 Press (▼) [FOCUS].**

"MF" appears.

**3 Adjust (◀▶) the focus as required until the image appears focused.**

Pressing (▼) [FOCUS] again will return to autofocus.

 NOTES

- The camcorder will automatically return to autofocus when you set the mode switch to **AUTO**.
- Readjust the focus when you have turned off the camcorder.

**Infinity Focus**

Use this function when you wish to focus on faraway subjects such as mountains or fireworks.



Mode switch: P, SCN

**1 Adjust the zoom.****2 Keep (▼) [FOCUS] pressed down for more than 2 seconds.**

- ∞ appears.
- Pressing (▼) [FOCUS] again will return to autofocus.

 NOTES

If you operate the zoom or the multi selector (◀▶) during infinity focus, ∞ changes to "MF" and the camcorder returns to manual focusing mode.

**White Balance**

You can choose one of the preset settings or set a custom white balance to obtain the setting best suited to your specific recording conditions.

 POINTS TO CHECK

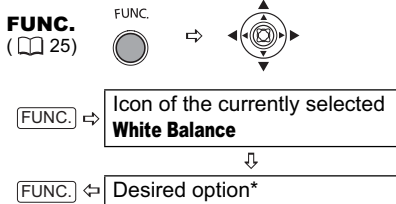

Mode switch: P

**Options**

♦ Default value

[ <b>AWB</b> <b>AUTO</b> ]♦
Settings are automatically set by the camcorder. Use this setting for outdoor scenes.
[ <b>DAYLIGHT</b> ]
For recording outdoors on a bright day.
[ <b>SHADE</b> ]
For recording in shaded places.
[ <b>CLOUDY</b> ]
For recording on a cloudy day.
[ <b>TUNGSTEN</b> ]
For recording under tungsten and tungsten type (3-wavelength) fluorescent lighting.

[  FLUORESCENT ]
For recording under warm white, cool white or warm white type (3-wavelength) fluorescent lighting.
[  FLUORESCENT H ]
For recording under daylight or daylight type (3-wavelength) fluorescent lighting.
[  SET ]
Use the custom white balance setting to make white subjects appear white under colored lighting.



\* When you select [ SET ], do not press [ FUNC. ], and continue instead with the procedure below.

**TO SET THE CUSTOM WHITE BALANCE**

- 1 Point the camcorder at a white object, zoom in until it fills the whole screen and press ( ). Keep the camcorder zoomed at the white object until stops flashing.
- 2 Press [ FUNC. ] to save the setting and close the menu.

**NOTES**

- Depending on the type of fluorescent light, optimal color balance may not be obtained with [ FLUORESCENT ] or [ FLUORESCENT H ]. If the color looks unnatural, adjust it using [ AUTO ] or [ SET ].
- When you have set the custom white balance:
  - Depending on the light source, may keep flashing. The result will still be better than with [ AUTO ].
  - Reset the white balance when the lighting condition changes.

- Turn off the digital zoom.
- The camcorder retains the custom white balance setting even if you turn it off.
- Custom white balance may provide better results in the following cases:
  - Changing lighting conditions
  - Close-ups
  - Subjects in a single color (sky, sea or forest)
  - Under mercury lamps and certain types of fluorescent lights

**Image Effects**

You can record with different color saturation and contrast effects.

**POINTS TO CHECK**




Mode switch: P

**Options**

◆ Default value

[  IMAGE EFFECT OFF ]◆
Records with no image enhancing effects.
[  VIVID ]
Emphasizes the contrast and color saturation.
[  NEUTRAL ]
Tones down the contrast and color saturation.
[  LOW SHARPENING ]
Records subjects with softened outlines.
[  SOFT SKIN DETAIL ]
Softens the details in the skin tone area for a more complimentary appearance. To obtain the best effect, use this setting when recording a person in close-up. Note that areas similar to the skin color may lack in detail.

[  CUSTOM ]

Allows you to adjust the brightness, contrast, sharpness, and color depth of the image.

- [BRIGHTN.]: (-) Darker picture,  
(+) Brighter picture
- [CONTRAST]: (-) Flatter picture,  
(+) More defined light and shade
- [SHARPNESS]: (-) Vaguer outlines,  
(+) Sharper outlines
- [COL.DEPTH]: (-) Shallower colors,  
(+) Richer color tonality

**FUNC.**  
(  25 )

FUNC.




FUNC. →

Icon of the currently selected  
**Image Effect**







FUNC. ←

Desired option\*

\* When you select [  CUSTOM ], do not press [FUNC.] and continue instead with the procedure below.

### TO SET THE CUSTOM IMAGE EFFECT

- 1 Press (  ) and select (  ) the custom setting options.
- 2 Adjust (  ) each setting as desired and then press (  ) .
- 3 Press [FUNC.] to save the setting and close the menu.

## Still Image Recording Options

### Selecting the Size and Quality of Still Images

Still images are recorded on the memory card or the disc using the JPEG (Joint Photographic Experts Group) compression. As a general rule select a larger image size for higher quality.

CAMERA

CAMERA




PLAY

PLAY

(  11 )




### Options

Approximate number of still images that can be recorded in different recording media with the following quality settings:




 : [SUPER FINE],  : [FINE],  
 : [NORMAL]

The figures for DVD discs refer to a single recording side.




#### On a 32 MB memory card

Image Size			
L 1632x1224	20	30	55
M 1280x960	30	50	90
S 640x480	165	285	365

#### On a 128 MB memory card

Image Size			
L 1632x1224	85	135	250
M 1280x960	140	215	395
S 640x480	690	955	1,525

#### On a 512 MB memory card

Image Size			
L 1632x1224	350	545	1,000
M 1280x960	555	860	1,585
S 640x480	2,740	3,770	6,035

**On a DVD-R or DVD-RW disc in VIDEO mode**

Image Size			
<b>L</b> 1632x1224	1,010	1,560	2,865
<b>M</b> 1280x960	1,600	2,455	4,525
<b>S</b> 640x480	7,825	9,999	9,999

**On a DVD-R DL disc in VIDEO mode**

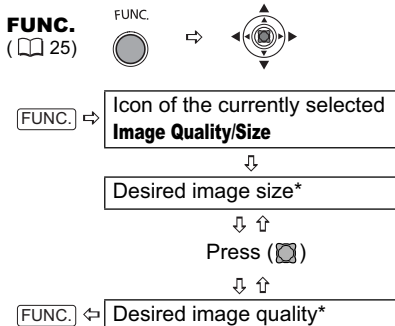
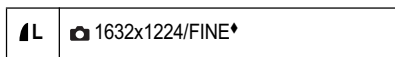
Image Size			
<b>L</b> 1632x1224	1,840	2,845	5,215
<b>M</b> 1280x960	2,925	4,470	8,235
<b>S</b> 640x480	9,999	9,999	9,999

**On a DVD-RW disc in VR mode**

Image Size			
<b>L</b> 1632x1224	1,025	1,590	2,915
<b>M</b> 1280x960	1,635	2,500	4,605
<b>S</b> 640x480	7,960	11,680*	19,470*

\* This number is the number of images that can be recorded on the disc; however, the maximum number of remaining images displayed on the screen will be 9999.

♦ Default value



\* The number displayed on the right corner indicates the approximate number of images that can be recorded with the current quality/size setting.

**NOTES**

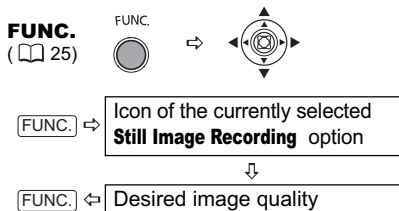
- Depending on the number of images on the memory card or disc (Windows: more than 1,800 images; Macintosh: more than 1,000 images), you may not be able to download images to a computer. Try using a card reader to download the still images recorded on the memory card.
- Connection to a PictBridge compatible printer will not work when the memory card contains more than 1,800 images. For best performance, we recommend to keep the number of images on the memory card under 100.

**Capturing a Still Image while Recording Movies**

While you are recording a movie on the disc you can simultaneously capture the same picture as a still image on the memory card. The size of the still image will be S 640x480 and cannot be changed, but the image quality can be selected.



♦ Default value



**TO CAPTURE THE STILL IMAGE**

While you are recording a movie, press **[PHOTO]**.

The still image is recorded on the memory card while the screen continues to show the video recording.

### **i** NOTES

- The still image cannot be recorded simultaneously on the disc.
- The still image cannot be recorded on the memory card while recording in widescreen or while a digital effect is activated.
- The quality of the still image is slightly lower than a still image of the same size recorded in **CAMERA** mode.

## Continuous Shooting and Exposure Bracketing

### **✓** POINTS TO CHECK



Mode switch: P, SCN (except for the **[FIREWORKS]** recording program).



DRIVE MODE button

## Options

◆ Default value

### SINGLE◆

Records a single still image.

**[CONT.SHOOT.]** (Continuous Shooting)  
**[HISPEED CONT.SHOOT.]** (High-Speed Continuous Shooting)

Captures a series of still images as long as you hold **[PHOTO]** pressed down. For the number of frames per second, refer to the table below.

### AEB (Auto Exposure Bracketing)

The camcorder records a still image in three different exposures (dark, normal, light in 1/2 EV steps), allowing you to choose the shot you like the best.

- 1 Press **[DRIVE MODE]** repeatedly to cycle between the drive modes.
- 2 Press **[PHOTO]** halfway to activate the autofocus.

## CONTINUOUS SHOOTING/HIGH-SPEED CONTINUOUS SHOOTING

- 3 Press **[PHOTO]** fully and hold it pressed down.

A series of still images will be recorded as long as you hold the button pressed.

## AUTO EXPOSURE BRACKETING

- 3 Press **[PHOTO]** fully. Three still images in different exposures will be recorded on the memory card.

### Maximum number of continuous shots at one time:

Still Image Size	Frames per Second			Maximum Number of Continuous Shots
	Normal speed	High speed	Using the Flash	
<b>L</b> 1632x1224	2.1 frames	3.1 frames	1.8 frames	10 images
<b>M</b> 1280x960	2.5 frames	4.2 frames	2.1 frames	10 images
<b>S</b> 640x480	2.5 frames	4.2 frames	2.1 frames	60 images

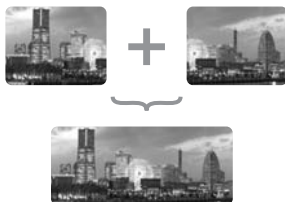
These figures are approximate and vary with the recording conditions and subjects. The actual number of frames per second will be lower when "⚠" (camcorder shake warning) is displayed on the screen.

**i NOTES**

- The drive mode can also be selected from the FUNC. menu (☰ 25).
- [DRIVE MODE] cannot be used while the FUNC. menu is being displayed.

**Creating Panoramic Images**

You can shoot a series of overlapping images and merge them on a computer into one large panoramic image using the supplied software (PhotoStitch). For further details about the procedure refer to the software's instruction manual on the supplied software CD-ROM.

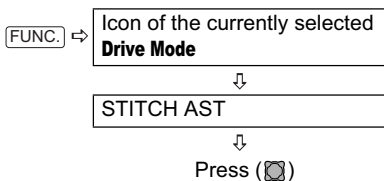


**✔ POINTS TO CHECK**



Mode switch: P, SCN

◆ Default value



The Stitch Assist screen appears.

**FROM THE STITCH ASSIST SCREEN**

**1 Select (◀▶) the direction in which you will take the sequence of still images.**

**2 Select the recording program and zoom on the subject.**

- The manual focus and manual exposure adjustment cannot be used with the Stitch Assist mode.
- Once the sequence has started, you cannot change the recording program or zoom.

**3 Press [PHOTO] to record the first image.**

The number of images recorded so far and the direction and number of the next image appear below the image.

**4 Record the next image so that it overlaps a portion of the previous one. Repeat this step until you complete the panoramic image.**

- Try to include a distinctive item (landmark, etc.) in the overlapping portion. Minor discrepancies in the overlapping area can be corrected with the software.
- You can retake an image using the multi selector (◀▶) to cancel the image recorded last and return to the previous one.
- Up to 26 images can be recorded.

**5 Press [FUNC.] after the last image.**

## **i** NOTES

- Compose each image so that it overlaps 30 to 50% of the adjoining image. Try to keep the vertical misalignment within 10%.
- Do not include a moving subject in the overlapping portion.
- Do not try to stitch images that include both distant and close subjects. They may appear warped or doubled up.

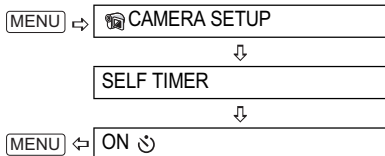
## Other Recording Options

### Self Timer

#### **POINT TO CHECK**



**CAMERA** (with camera icon) : Set the camcorder in record pause mode.



**ON** appears.

**CAMERA** (with camera icon) :

Press **Start/Stop**.

The camcorder starts recording after a 10-second countdown (**DC22/DC21** 2 seconds when using the wireless controller). The countdown appears on the screen.

**CAMERA** (with camera icon) :

Press **PHOTO**, first halfway to activate the autofocus and then fully to record the still image.

The camcorder will record the still image after a 10-second countdown (**DC22/DC21** 2 seconds when using the wireless controller). The countdown appears on the screen.

## **i** NOTES

Once the countdown has begun, you can press **Start/Stop** (when recording movies) or press **PHOTO** fully (when recording still images) to



cancel the self timer. The self timer will also be canceled if you turn off the camcorder.

## LED Light

You can turn on the LED light (assist lamp) at any time regardless of the recording program.



LIGHT button

Press **LIGHT**.

- appears on the screen.
- Press **LIGHT** again to turn the LED light off.

## Flash

You can use the built-in flash for recording still images in dark places. The flash is equipped with the red-eye reduction function.

### POINTS TO CHECK



Select a recording program other than **[FIREWORKS] (SCN)**.

### Options

◆ Default value

(auto)◆
The flash fires automatically according to the brightness of the subject.
(red-eye reduction, auto)
The flash fires automatically according to the brightness of the subject. The assist lamp lights up to reduce the red-eye effect.

(flash on)
The flash always fires.
(flash off)
The flash does not fire.



(flash) button

### 1 Press (flash button).

- Repeatedly pressing will cycle between the flash modes.
- The display disappears after 4 seconds.

### 2 Press **[PHOTO]**, first halfway to activate the autofocus and then fully to record the still image.

### NOTES

- The practical range of the flash is approx. 1 to 2 m. The range depends on the recording conditions.
- The range of the flash decreases in continuous shooting mode.
- For the red-eye reduction to be effective, the subject needs to look at the assist lamp. The degree of reduction depends on the distance and on each individual.
- The red-eye reduction mode cannot be used in Stitch Assist mode.
- The flash will not fire in the following cases:
  - When you manually adjust the exposure in (auto) or (red-eye reduction) mode.
  - During auto exposure bracketing.
- The flash mode cannot be selected when the exposure is locked, or after the first still image in Stitch Assist mode.
- **About the AF-Assist Lamp:** While you press **[PHOTO]** halfway, if the subject is too dark the assist lamp may light up briefly in order to enable the camcorder to focus more accurately (AF-assist lamp). You can also set [AF AST LAMP] to **[OFF]** so the assist lamp does not light up.
  - The camcorder may not be able to focus even if the AF-assist lamp is on.

- The brightness of the AF-assist lamp could be an inconvenience. Consider turning it off in public places such as restaurants or theaters.

## Digital Effects

### [ FADER ] Faders

Begin or end scenes with a fade to or from black. You can preview the effect on the display.

[ FADE-T ] (fade trigger)	[ PUZZLE ]
[ WIPE ]	[ ZIGZAG ]
[ CORNER ] (corner wipe)	[ BEAM ]
[ JUMP ]	[ TIDE ]
[ FLIP ]	

### [ EFFECT ] Effects

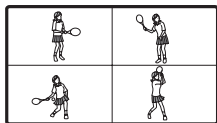
Add flavor to your recordings. Sound will be recorded normally. You can preview the effect on the display.

[ BLK&WHT ] (black and white)	[ CUBE ]
[ SEPIA ]	[ WAVE ]
[ ART ]	[ COLOR M. ] (color mask)
[ MOSAIC ]	[ MIRROR ]
[ BALL ]	

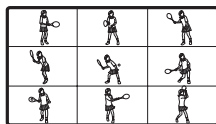
### [ MULTI-S ] Multi-Image Screen ( 59 )

Captures moving subjects as a sequence of 4, 9 or 16 still images and displays them as one split screen. Sound will be recorded normally.

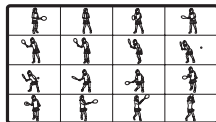
4 split images



9 split images



16 split images



### [ CARD MIX ] Card Mix ( 60 )

Combines a still image from the memory card with your recording.

#### NOTES

- When you are not using the digital effect, select [ D.EFFECT OFF].
- The camcorder retains the setting last used even if you turn off the digital effects or change the recording program. However, you will need to select again the still image for the Card Mix effect.

## Selecting a Fader / Effect

### POINTS TO CHECK



Mode switch: P, SCN

[ CAMERA ] : Only the [ BLK&WHT ] effect is available. Faders are not available.

♦ Default value

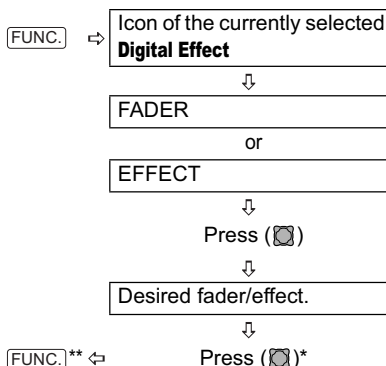


FUNC.  
( 25 )

FUNC.



## Setting



\* You can preview the effect on the screen before pressing (D.EFFECTS).

\*\* The icon of the selected effect appears.

## Applying



D.EFFECTS button

- Press (D.EFFECTS) to activate the fader/effect.
  - To fade in, press (D.EFFECTS) before you start recording, then press (Start/Stop) to start recording.
  - To fade out, press (D.EFFECTS) while recording, then press (Start/Stop) to pause the recording.
- Press (D.EFFECTS) again to deactivate the fader/effect.

## Using the Multi-Image Screen

### POINTS TO CHECK



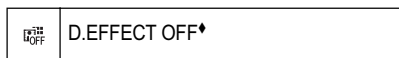
Mode switch: P, SCN (except for the [NIGHT] recording program).

## Options

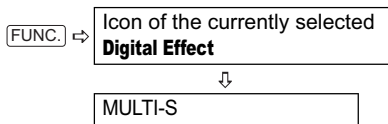
**[S.SPEED]**  
 Select how fast the images will be captured.  
**[MANUAL]:** One image will be added to the split screen every time you press (D.EFFECTS). Hold (D.EFFECTS) pressed down for more than 1 second to delete images from the split screen.  
**[FAST]:** Every 4 frames  
**[MOD.]:** Every 6 frames  
**[SLOW]:** Every 8 frames

**[S.SPLIT]**  
 Select how many images in the split screen: [4], [9], [16].

◆ Default value



## Setting



### TO CHANGE THE MULTI-IMAGE SETTINGS

- Select (▲▼) [S.SPEED] and then select (◀▶) the desired transition speed.
- Select (▲▼) [S.SPLIT] and select (◀▶) the desired number of split images then press (D.EFFECTS).
- Press (FUNC.).  
 ■■■ appears.

## Applying



D.EFFECTS button

- 1 Press **D.EFFECTS** to capture the images.
- 2 Press **Start/Stop** to record the multi-image screen displayed.

---

## Combining Images (Card Mix)

You can choose one of the sample images (including picture frames, backgrounds and animations) from the collection on the supplied DIGITAL VIDEO SOLUTION DISK and combine it with your live video recording to add a note of playfulness to your movies.

### Card Chroma Key [CARD CHROMA]



Combines frames with your recordings. The live video recording will appear instead of the blue area of the card mix image.

Mix level adjustment: Blue area of the still image.

### Card Luminance Key [CARD LUMI.]



Combines illustrations or titles with your recordings. The live video recording will

appear instead of the light area of the card mix image.

Mix level adjustment: Light area of the still image.

### Camera Chroma Key [CAM. CHROMA]



Combines backgrounds with your recordings. Record your subject in front of a blue background and any part of your subject that is not blue will appear superimposed on the picture with the card mix image serving as background.

Mix level adjustment: Blue area of the live video recording.

### Card Animation [C. ANIMATION]



Combines animations with your recordings. You can choose from three types of card animation effects.

- [CORNER]: The animation appears on the upper left and the lower right corner of the screen.
- [STRAIGHT]: The animation appears on the top and bottom of the screen and moves right and left.
- [RANDOM]: The animation moves randomly on the screen.

Mix level adjustment: Blue area of the card animation image.

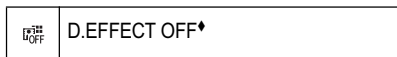
**POINTS TO CHECK**



Upload to the memory card a sample image from the supplied DIGITAL VIDEO SOLUTION DISK software CD-ROM. Refer to *Adding Still Images from your Computer to the Memory Card* in the electronic instruction manual (PDF file) included on the same CD-ROM.

Mode switch: P, SCN

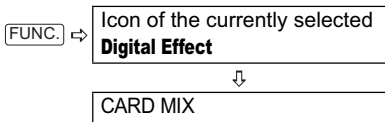
◆ Default value



**FUNC.**  
(book icon 25)



**Setting**



**TO SET THE CARD MIX**

- 1 Select (▲▼) [IMAGE SELECT] and then select (◀▶) the still image you want to combine.
- 2 Select (▲▼) [MIX TYPE] and set (◀▶) a mix type appropriate for the image you selected.  
If you selected [C.ANIMATION], select (▲▼) [ANIMAT.TYPE] and set (◀▶) the animation type preferred.
- 3 If you want to adjust the mix level, select (▲▼) [MIX LEVEL] and set (◀▶) the level preferred.
- 4 Press (⊞) to save the settings and press [FUNC.] to close the menu.  
⊞ appears.

**Applying**



D.EFFECTS button

Press [D.EFFECTS].

- ⊞ changes to green and the combined image appears.
- Still images cannot be recorded on the memory card while the Card Mix function is activated.

## Editing the Scenes

### Creating a Playlist

Create a playlist to easily edit your movies. Include in your playlist only the scenes you prefer or change the order in which they will be played back, without affecting your original recordings. After you add scenes to the playlist you will have two types of index screens: The original index screen (for the original recordings) and the playlist index screen.

#### POINTS TO CHECK





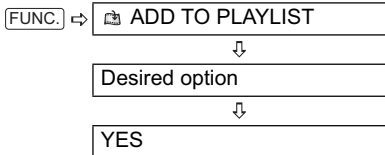
Disc type:  DVD-RW initialized in VR mode.


### Adding Scenes to the Playlist

#### Options

[ALL SCENES]
Adds all scenes in the original index screen to the playlist.
[ONE SCENE]
Adds only the selected scene to the playlist.
[CANCEL]
Returns to the original index screen.




From the original index screen, select (, ) the scene to add to the playlist. To add all scenes there is no need to select any particular scene.

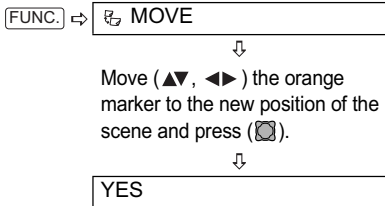


When the operation is completed "ADDED TO PLAYLIST" will be displayed. Press  to check the scenes in the playlist index screen.



### Moving Scenes in the Playlist

From the original index screen, press . From the playlist index screen, select (, ) the scene to move.



### Deleting Scenes

You can delete those scenes that you are not interested in keeping. Remember that when you delete scenes in the playlist, you do not affect your original recordings; However, when you delete an original recording, it will be deleted also from the playlist.

**IMPORTANT**

- Be careful when deleting original recordings. Once deleted, an original scene cannot be recovered.
- Do not change the position of the power switch or the switch while the scene is being deleted.

**NOTES**

- Scenes cannot be deleted when the disc is protected ( 64).
- You may not be able to delete scenes shorter than 5 seconds.

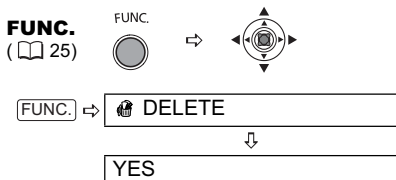
**Deleting a Single Scene**

**POINTS TO CHECK**



Disc type: DVD-RW initialized in VR mode.

From the original index screen, select (, ) the scene to delete. To delete a scene only in the playlist, press **[PLAYLIST]** first, and then select the scene.

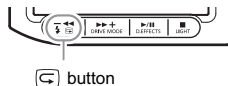


**Deleting a Scene Just After Recording**

**POINTS TO CHECK**



Disc type: DVD-RW discs (VIDEO or VR mode).



- 1 Immediately after recording a scene, press (record review).
- 2 While reviewing the scene, select () and press ().
- 3 Select () [YES] and press ().

**NOTES**

You will not be able to delete the last scene if after the scene was recorded you changed the operating mode, turned off the camcorder or removed the disc.

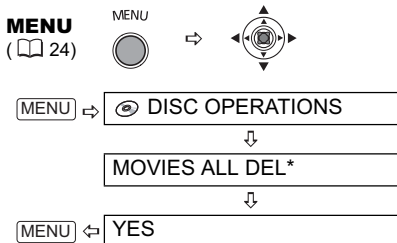
**Deleting All Scenes**

**POINTS TO CHECK**



Disc type: DVD-RW initialized in VR mode.

To delete all the scenes from the original index screen follow the procedure below. This will delete also the whole playlist. If you only want to delete all the scenes from the playlist (without affecting the original recordings), press **[PLAYLIST]** first and then continue as follows.



\* When you are deleting the playlist, this menu option will be replaced by [PLAYLST ALL DEL].

## Dividing a Scene

You can divide your recordings in order to leave only the best parts and later cut out the rest. Remember that when you divide scenes in the playlist, you do not affect your original recordings.

### NOTES

Photomovie scenes and scenes created by converting single still images (□ 67) cannot be divided.

### POINTS TO CHECK



Disc type: DVD-RW initialized in VR mode.

From the original index screen, select (, ) the scene to divide. To divide a scene only in the playlist, press first, and then select the scene.

### FUNC. (□ 25)

FUNC.



FUNC. → DIVIDE



Playback of the scene begins. Press () at the point where you want to divide the scene. \*



DIVIDE



YES

\* You can use the following icons and the special playback modes (□ 32) to bring the scene to a precise point.

- : Skip to the beginning of the current/next scene.
- : One frame reverse/advance.

## Disc Options

### Protecting the Disc

You can protect the whole disc to prevent the accidental erasure of important recordings.

### IMPORTANT

Initializing the disc (□ 64) will permanently erase all recordings, even if the disc is protected.

### POINTS TO CHECK



Disc type: DVD-RW initialized in VR mode.

### MENU (□ 24)

MENU



MENU → DISC OPERATIONS



DISC PROTECT



MENU → YES

### Initializing the Disc

You need to initialize a DVD-RW disc when first inserting it into the camcorder and you may have to initialize a disc if you get the "DISC ERROR" message. You can also choose to initialize the disc if you wish to erase all the recordings on the disc or in order to change the disc specification.



**! IMPORTANT**

- Initializing the disc will permanently erase all recordings, even if the disc is protected. The lost original recordings cannot be recovered.
- Initialize all DVD-RW discs before using them with this camcorder.

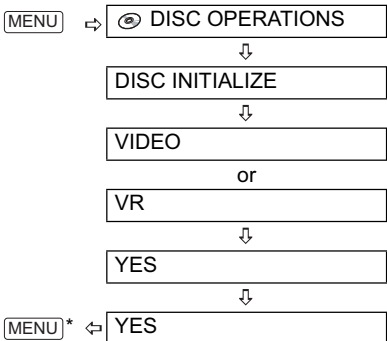
**✔ POINTS TO CHECK**



Disc type: DVD-RW discs (VIDEO or VR mode).

**Options**

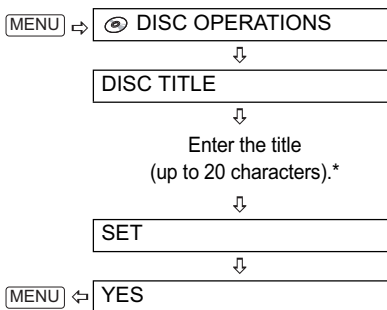
<b>[VIDEO] mode</b>
Most DVD players will play the disc, but except for the disc title, the recordings cannot be edited with the camcorder.
<b>[VR] mode</b>
You will have the option to edit the recordings with the camcorder, but the disc can only be played in VR mode-compatible DVD players and computer DVD drives.



\* Close the menu only after the screen display returns to the [DISC OPERATIONS] menu.

**Changing the Disc Title**

Before you finalize your disc, you can give it a title. The disc title will be displayed on the index screen when playing the finalized disc in most DVD players.



\* Select one character at a time and press to add it to the title. Select [BACKSPACE] and press to delete the character to the left of the cursor's position.

\* Close the menu only after the screen display returns to the [DISC OPERATIONS] menu.

## Still Image Options

### Erasing Still Images

You can erase still images recorded on the memory card or on the disc (DVD-RW only).

#### IMPORTANT

Be careful when erasing images. Erased images cannot be recovered.

#### NOTES

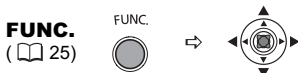
Protected images on the memory card and images on a protected disc cannot be erased.

### Erasing a Single Image

#### POINTS TO CHECK



Disc type: DVD-RW initialized in VR mode.



FUNC. → IMAGE ERASE



FUNC. ← ERASE

### Erasing a Single Image Just After Recording

You can erase the still image recorded last while reviewing it within the time set for the [REVIEW] option (or immediately after recording it, if [REVIEW] is set to [OFF OFF]).

#### POINTS TO CHECK



Disc type: DVD-RW discs (VIDEO or VR mode).



While reviewing the image immediately after recording:

FUNC. → IMAGE ERASE



FUNC. ← ERASE

### Erasing All Images

The following procedure will erase all the non-protected still images from the currently selected media (will not erase images with the mark).

#### POINTS TO CHECK



Disc type: DVD-RW initialized in VR mode.



MENU → STILL IMG OPER.



ERASE ALL IMAGES



MENU ← YES

## Copying Still Images

You can copy still images recorded on the memory card to the disc (for example, to add them to a Photomovie scene (□ 67)), or from the disc to the memory card (for example, to set print orders for a DPOF compatible printer (□ 87)).




### Copying a Single Image

**POINTS TO CHECK**

CAMERA CAMERA | PLAY PLAY (□ 11)

Select as the media for the still images, the media from where you want to copy images.

**FUNC.** (□ 25)  → 

FUNC. →  COPY  →  (card to disc)

or

 COPY  →  (disc to card)

↓

FUNC. → EXECUTE

### Copying All Images

**POINTS TO CHECK**



CAMERA CAMERA | PLAY PLAY (□ 11)

Select as the media for the still images, the media from where you want to copy images.



**MENU** (□ 24)  → 

MENU →  STILL IMG OPER.

↓

ALL COPY [ → ] \*  
(card to disc)

or

ALL COPY [ → ] \*  
(disc to card)

↓

MENU → YES

\* The total size of all image files on the source media and the space available on the destination media will be displayed.

### NOTES

- Still images not recorded with this camera may not be copied correctly.
- When there is not enough available space on the destination media, the operation will be terminated without copying all the image files.
- The copy operation may take a moment to complete depending on the number and total size of the image files.

## Converting Still Images into Photomovie Scenes

Still images are recorded using JPEG compression, but a DVD player only recognizes the MPEG standard. Thus, to play back your still images with your DVD player, first you need to create a Photomovie scene – a slide show of all still images on the disc, where each image will be displayed for approx. 3 seconds.

### Converting a Single Image

CAMERA CAMERA | PLAY PLAY (□ 11)

Select (◀▶) the still image you want to convert to a scene.

**FUNC.**

( 25)

FUNC.



FUNC. →

CONVERT TO SCENE



FUNC. ←

EXECUTE

**Converting All Images****POINTS TO CHECK**

If you want to include in your Photomovie scene still images recorded on the memory card, copy them to the disc in advance ( 67).

**MENU**

( 24)

MENU



MENU →

DISC OPERATIONS



PHOTOMOVIE



MENU ←

YES

**NOTES**

- If the disc becomes full while creating a Photomovie scene, the operation will be canceled.
- This function does not affect the original still images.

**Protecting Still Images on the Memory Card**

You can protect still images recorded on the memory card from accidental erasure.

**IMPORTANT**

Initializing the memory card ( 69) will permanently erase all recorded still images, even the protected ones.

**Protecting a Single Image****POINTS TO CHECK**

**CAMERA** : You can protect the still image recorded last while reviewing it within the time set for the [REVIEW] option (or immediately after recording it, if [REVIEW] is set to [OFF OFF]).

**FUNC.**

( 25)

FUNC.



FUNC. →

ON\* PROTECT



FUNC. ←

ON\*

**ON** appears and the image cannot be erased.

\* To cancel the image protection, select [OFF] instead.

**Protecting Still Images from the Index Screen**

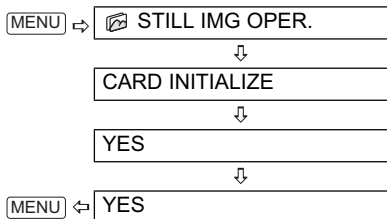
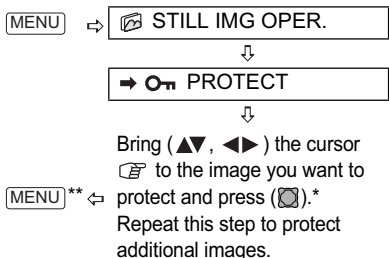
Move the zoom lever toward **W** to enter the still image index screen.


**MENU**

( 24)

MENU





\*  appears on protected images. Press (⏏) to cancel the protection.

\*\*After closing the menu the camcorder returns to the index screen.

## Initializing the Memory Card

Initialize a new memory card when first inserting it into the camcorder. You may have to initialize a card if you get the "CARD ERROR" message or you may choose to do so to erase all data recorded on it.

### ! IMPORTANT

- Initializing the memory card will erase all still images, even the protected ones. The original still images cannot be recovered.
- Initialize all memory cards before using them with this camcorder.



## Finalizing the Disc

To play the disc you recorded on a DVD player, a computer's DVD drive or other digital device, you need to finalize it first. You do not need to finalize the disc to play back your recordings with the camcorder connected to the TV.

To view your still images on a DVD player you will need to convert them to Photomovie scenes beforehand (p. 67).

### IMPORTANT

● Be sure to finalize the disc in normal room temperatures. If the procedure was not completed correctly due to high temperature, let the camcorder cool off before resuming operation.

● Place the camcorder on a table or other stable surface before starting the procedure. Subjecting the camcorder even to slight impacts (for example to place it on a table or to disconnect the AV cable) after the finalization process started may result in permanent data loss.

● Always power the camcorder using the compact power adapter. The operation cannot be started if the camcorder is powered only with the battery pack.

● Avoid the following actions while the operation is in progress. Failing to do so can interrupt the process and result in permanent data loss.

- Do not move the camcorder.
- Do not disconnect the compact power adapter.
- Depending on the type of disc and the disc specification, after finalizing the disc you may not

be able to initialize the disc, edit your recordings or add new recordings to the disc.

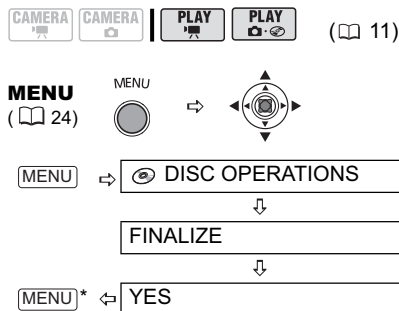
- Do not finalize with this camcorder discs that were not recorded using it.

### NOTES

The time required to complete the operation will vary depending on the recording conditions and the remaining free space on the disc.

## Finalizing the Disc

The length of the finalization process depends on the scenes recorded and the remaining free space on the disc.



\* During the disc finalization a progress bar is displayed. Close the menu only after the screen display returns to the [DISC OPERATIONS] menu.

## Restrictions after Disc Finalization

	Additional Recordings	Edit Recordings	Initializing the Disc	Unfinalizing the Disc
DVD-R/DVD-R DL in VIDEO mode	—	—	—	—
DVD-RW in VIDEO mode	●*	—	●	●
DVD-RW in VR mode	●	●	●	—

\* You will need to unfinalize the disc first.

## Playing Back your Disc on a DVD Player or a Computer's DVD Drive

After finalizing the disc you can play it on DVD players compatible with the type of disc you used (DVD-R, DVD-R DL or DVD-RW). For details about disc compatibility refer to the instruction manual of the DVD player or DVD drive.


### On a DVD Player

- 1 Turn on the TV and DVD player.
- 2 Insert a finalized disc in the DVD player.
- 3 Select the scene you want to play from the index screen.

### On a Computer's DVD Drive

- 1 Insert a finalized disc in the DVD drive.
- 2 Run the DVD playback software.
  - Refer also to the instruction manual and help modules of your DVD playback software.
  - To view still images recorded on the disc, close first any DVD playback software that may be running.

### NOTES


- DVD-RW discs recorded in VR mode can only be played on VR mode-compatible DVD players.
- Depending on your DVD device you may not be able to play the disc.
- In order to view the still images recorded on the disc in a DVD player, you have to convert individual images to scenes, or create a Photomovie scene ( 67) before finalizing the disc. The resolution of Photomovie scenes will be lower than that of the original still images.
- In order to play the disc on a computer you need to have DVD playback software installed and running. Also, in order to play back a DVD-R DL you must have a DVD drive capable of reading dual-layered DVD discs.

## Unfinalizing the Disc - Additional Recordings on a Finalized Disc

Unfinalize a disc to allow recording additional movies on the disc even after it was finalized.

### POINTS TO CHECK

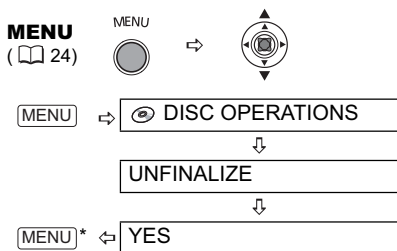


Disc type:  DVD-RW initialized in VIDEO mode.

### IMPORTANT

- Be sure to unfinalize the disc in normal room temperatures. If the procedure was not completed correctly due to high temperature, let the camcorder cool off before resuming operation.
- Place the camcorder on a table or other stable surface before starting the procedure. Subjecting the camcorder even to slight impacts (for example to place it on a table or to disconnect the AV cable) after the unfinalization process started may result in permanent data loss.
- Always power the camcorder using the compact power adapter. The operation cannot be started if the camcorder is powered only with the battery pack.
- Avoid the following actions while the operation is in progress. Failing to do so can interrupt the process and result in permanent data loss.
  - Do not move the camcorder.
  - Do not disconnect the compact power adapter.
- Only discs that were finalized using this camcorder can be unfinalized with it.

	Disc Can Be Unfinalized
DVD-R/DVD-R DL in VIDEO mode	—
DVD-RW in VIDEO mode	●
DVD-RW in VR mode	— You can record additional scenes even without unfinalizing the disc

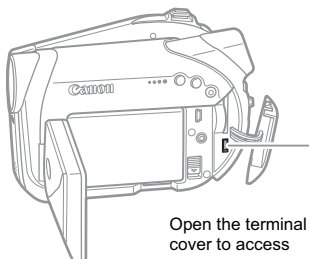



\* During the disc unfinalization a progress bar is displayed. Close the menu only after the screen display returns to the [DISC OPERATIONS] menu.



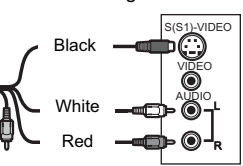
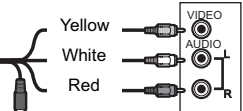
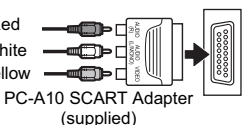
## Connecting to a TV or VCR

### Connection Diagrams



	<p><b>AV Terminal</b></p> <ul style="list-style-type: none"> <li>When connecting the MTC-100 Multi Cable to the camcorder, make sure to insert the cable straight and in the correct direction - aligning the ▲ marks on the cable's connector and on the AV terminal.</li> <li>Sound from the built-in speaker will be muted while the MTC-100 Multi cable is connected to the camcorder.</li> </ul>
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If your TV or VCR is equipped with an S-Video terminal use connection type **1**, otherwise connect using the AV terminals (connection type **2**). To connect to a TV or VCR using the SCART terminal, use connection type **3**.

Terminal on the Camcorder	Connecting Cable	Terminal on the Connected Device
<p><b>1</b> Output connection (Signal Flow →) to a TV or VCR with S-Video Terminal.</p> <p><b>DC22</b> Input connection (Signal Flow ←) from a TV, VCR or other analog video source with S-Video Terminal.</p>	<p>MTC-100 Multi Cable (Supplied)</p>	
<p><b>2</b> Output connection (Signal Flow →) to a TV or VCR with AV Terminals.</p> <p><b>DC22</b> Input connection (Signal Flow ←) from a TV, VCR or other analog video source with AV Terminals.</p>	<p>MTC-100 Multi Cable (Supplied)</p>	
<p><b>3</b> Output connection only (Signal Flow →) to a TV or VCR with SCART terminal.</p> <p>First, connect the supplied PC-A10 SCART Adapter to the SCART terminal on the TV or VCR and then connect the MTC-100 Multi Cable to the adapter. The supplied PC-A10 SCART Adapter is for output only.</p>	<p>MTC-100 Multi Cable (Supplied)</p>	

## Selecting the Type of TV



Before connecting the camcorder, select the [TV TYPE] setting according to the TV set to which you will connect the camcorder - [WIDE TV]: TV sets with 16:9 aspect ratio or [NORMAL TV]: TV sets with 4:3 aspect ratio (□ 42).

## Playback on a TV Screen

- 1 Connect the camcorder to the TV following one of the connection diagrams shown in the previous section *Connection Diagrams* (□ 73).
- 2 On a TV: Set the input selector to VIDEO. On a VCR: Set the input selector to LINE (IN).
- 3 Play back the movies (□ 31) or still images (□ 33).

### **i** NOTES

- Turn off all the devices before starting the connections.
- We recommend powering the camcorder using the compact power adapter.
- Picture quality is better when connecting to a TV using the S-Video terminal - connection type **1** (□ 73).
- The supplied PC-A10 SCART Adapter is for output only.

## Recording to a VCR

You can copy your recordings by connecting the camcorder to a VCR or a digital video device. Connect the camcorder to the VCR following one of the connection diagrams shown in the

previous section *Connection Diagrams* (□ 73).



- 1 **Connected device:** Load a blank cassette and set the device to record pause mode.
- 2 **This camcorder:** Locate the scene you wish to copy and pause playback shortly before the scene.
- 3 **This camcorder:** Resume the movie playback.
- 4 **Connected device:** Begin recording when the scene you wish to copy appears. Stop recording when copying is complete.
- 5 **This camcorder:** Stop playback.

### **i** NOTES

- We recommend powering the camcorder using the compact power adapter.
- By default, the on-screen displays will be embedded in the output video signal, but you can change the displays with (▲) [DISP.] (□ 35).

## **DC22** Video Input Recording

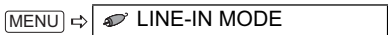
You can input video from an external device and record it on the disc in the camcorder.

### Selecting the type of Connection

Connect the camcorder to the analog input source following one of the connection diagrams shown in the previous section *Connection Diagrams* (□ 73).



**MENU**  
( 24 )



Desired connection type\*

Press ( ) to display the video input screen.

\* Select the setting according to the type of connection used.

[→S VIDEO]: Connection type **1**.

[→VIDEO]: Connection type **2**.



### FROM THE VIDEO INPUT SCREEN

The following icons are displayed at the bottom of the video input screen:

( ): Adjust the speaker volume (will not affect the recording).

(XP)/(SP)/(LP): Select the recording mode.

( )/( ): Start recording/pause the recording.

( ): Terminate the video input and return to (PLAY) mode.

- 1 This camcorder: Change the recording settings as necessary.**
- 2 Connected device: Load the recorded cassette or disc and start playback.**
- 3 This camcorder: Select ( ) the ( ) icon. When the scene you wish to record appears, press ( ).**

Recording starts.

- 4 This camcorder: To pause the recording, select ( ) the ( ) icon and press ( ).**

In record pause mode, select ( ) and press ( ) to resume recording.

### TO STOP RECORDING

- 5 This camcorder: In record pause mode, select ( ) the ( ) icon and press ( ).**

- 6 Connected device: Stop the playback.**

### IMPORTANT

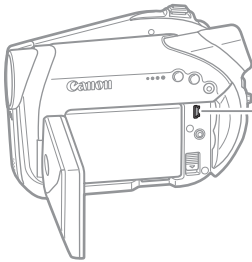
- Video input that includes copyright signals (for example digital content designated as “copy once” or copy protected) cannot be recorded. The video input will be recorded normally until the point a copyright signal is detected.
- Depending on the analog signal sent from the connected device the input image may be distorted or not be displayed at all (for example, video input that includes anomalous signals such as ghost signals).

### NOTES

We recommend powering the camcorder with the compact power adapter.

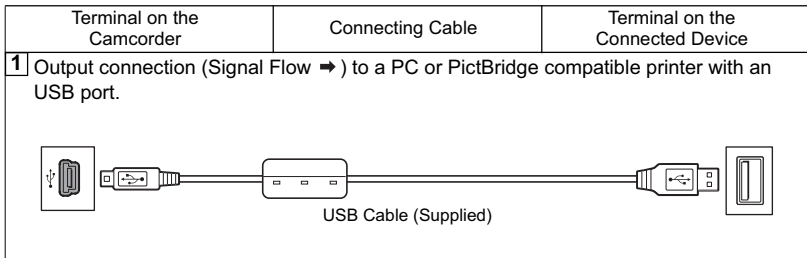
## Connecting to a Computer

### PC Connection Diagrams



#### USB Terminal

- Open the LCD panel to access.



### DC22/DC21 Transferring Recordings - MyDVD for Canon

Windows users only:

With the supplied USB cable and the MyDVD for Canon software you can transfer the movies and still images you recorded, from the disc to a computer and easily edit them. Please note that with MyDVD for Canon you can read 8 cm DVD-R DL discs, but the software does not support writing on dual-layered discs (neither with an external DL drive nor with the camcorder itself).

For further details about using MyDVD for Canon, refer also to the software's tutorial and help modules.

### MyDVD for Canon

#### One-touch dubbing (Windows XP only)

Insert a blank DVD-R/-RW in your computer's DVD drive (with writing capabilities), connect the camcorder and with only pressing the (print/share) button, create a copy of your DVD you can instantly share ( 79).

#### Transfer recordings to your computer

You can transfer your recordings to edit them on your computer ( 80).

#### Create a backup disc of your DVD

Transfer your recordings to the computer and even if your computer does not have a DVD drive with writing capabilities, use your camcorder itself to create a copy of your DVD ( 80)

- North America  
Web Based Service: <http://support.roxio.com>  
Phone assistance: 866-279-7694 (toll free) or 905-482-5555 (Canada only), 9:00 A.M. to 6:00 P.M., U.S Pacific Time - excluding Weekend and Holidays
- Europe  
Web Based Service:  
Germany  
<http://www.roxio.com/en/support/de/emc/index.jhtml>  
France  
<http://www.roxio.com/en/support/fr/emc/index.jhtml>  
U.K  
<http://www.roxio.com/en/support/uk/>  
Phone assistance: Germany 0900-1735096; France 0892-460909; U.K 0906-7320288, 1:00 P.M. to 10:00 P.M., GMT - excluding Weekend and Holidays
- China/Taiwan  
Web Based Service:  
<http://www.sonictaiwan.com/support/techsupport.aspx>  
[sonicsupport@gil.com.tw](mailto:sonicsupport@gil.com.tw)  
Phone assistance: 02-2658-8765 (Taiwan)

### **System Requirements**

- Operating System:  
Microsoft Windows 2000, Windows Me, Windows XP
- Minimum Hardware:  
Pentium III 1 GHz or higher (1.5 GHz or greater, recommended)  
128 MB RAM (256 MB or greater, recommended)  
10 GB hard drive space (20 GB or greater, recommended)  
Video adapter and display supporting at least 1024 x 768 resolution, 16 bit color
- Software Requirements:  
Microsoft Windows Media Player 9 or later
- Internet connection (for user registration).



#### **IMPORTANT**

- After installing MyDVD for Canon you will need an Internet connection to complete the user registration. Without completing the online user registration, you will not be able to use any of the software's functions.

#### ● For support concerning MyDVD for Canon:

- Canon Inc. and the Canon related customer support centers do not provide support concerning MyDVD for Canon. For any questions or technical issues regarding the software, its installation and operation, please contact directly Sonic Solutions customer support representatives or access online the Internet pages listed in the information box above.
- Operation may not work correctly depending on the specifications and settings of your computer.

### **Installing MyDVD for Canon**

- 1 Turn on the computer and start up Windows.**
- 2 Insert the Roxio MyDVD for Canon Software CD-ROM into the computer's CD or DVD drive.**
  - The Setup Wizard will launch automatically.
  - If you do not have Windows Media Player 9 or later installed, click "OK" on the setup window that appears and install the latest version of Windows

Media Player following the instructions on the screen.

• If the Setup Wizard does not start automatically:

- ① Windows 2000/Me: Double-click on the desktop's "My Computer" icon. Windows XP: Form the Start menu, select "My Computer".
- ② Right-click on the CD-ROM or DVD drive where you inserted the software disc and select "Open".
- ③ Double-click on the "SETUP.EXE" file. (Note that depending on the computer's settings the ".EXE" suffix may not be displayed).

**3 In the Setup Wizard screen click "Next".**

**4 Read the license agreement. If you agree, select "I accept the terms in the License Agreement" and click "Next".**

**5 Enter the user information and click "Next".**

The serial number will already be filled in.

**6 Click on the "Typical" installation.**


You can also select "Custom" to select the programs installed and the installation folder, or "Complete" to install all the program's features.

**7 Click "Install" to begin the installation.**

**8 When the "Setup Wizard Completed" screen appears, click "Finish".**

**9 Read the latest "Readme" file and click "Yes" to restart the computer.**

### **Completing the User Registration**

**1 After the computer has restarted, remove the Roxio MyDVD for Canon Software CD-ROM from the drive and double-click on the desktop's "MyDVD" icon .**

**2 Connect to the Internet to complete the user registration online.**

Without completing the online user registration you will not be able to use any of the software's functions.

**3 Click "Next" to start the registration.**

**4 Enter the user information and select your country/region from the selection box.**

**5 Click on "Privacy Policy" to read the terms. If you agree to the terms, check the box "I have read and agree to the terms of the Privacy Policy" and click "Register Now".**

After the user registration is completed automatically, the initial screen of MyDVD for Canon will be displayed.

### **NOTES**


Depending on the speed of your Internet connection, the user registration may take some time.


**If you cannot connect to the Internet the user registration will not be completed. Without completing the online user registration you will not be able to use any of the software's functions.**

### **Connecting the Camcorder**

You need to install the software and register online only the first time you connect the camcorder to the computer. From the second time on, just connect the camcorder to the computer.

**1 Connect the compact power adapter to the camcorder.**

**2 Turn on the camcorder and set it to  mode.**

**3 Connect the camcorder to the computer using the USB cable. Refer to PC Connection Diagrams ( 76).**

### **IMPORTANT**

● During the following operations, even if you connect the camcorder to the computer it will not be recognized.

- Deleting all scenes
- Protecting the disc

- Setting the disc title
- Initializing the disc
- Finalizing or Unfinalizing the disc
- Check the orientation of the USB cable and make sure you connect it properly.
- If you use discs other than the recommended DVD discs you may get an error message on the computer indicating that the disc cannot be read or that the camcorder is not ready.

**i NOTES**

DVD copies and DVD backup discs created with MyDVD for Canon cannot be unfinalized using the camcorder.


**One-Touch Dubbing (Windows XP only)**

**✔ POINTS TO CHECK**


- This function requires a computer equipped with a DVD drive with writing capabilities.
- If MyDVD for Canon is running, close the program first.

**1 Insert the finalized disc you wish to copy into the camcorder.**

**2 Insert a brand new DVD-R or DVD-RW disc into the computer's DVD drive.**

- The  button will light up in blue.
- To make a copy of a disc recorded in VR mode, be certain to insert a DVD-RW disc into the computer's DVD drive.

**3 Press .**

- The  button will flash while the copying is in progress, and will go off once the copy is completed.
- The copied disc will be finalized and automatically ejected from the drive.



**! IMPORTANT**

- DVD-R/RW discs can be copied to 12 cm or 8 cm DVD-R/RW discs. DVD-R DL discs can only be copied to 12 cm DVD-R/RW discs.
- If you did not complete the online user registration beforehand, you will not be able to use One-Touch Dubbing.

- Operation may not work properly if you connect more than one Canon camcorder to the computer at the same time.

**i NOTES**

● **If the operation is interrupted:** "OPERATION CANCELED" will be displayed on the camcorder's screen. The message disappears when you remove the disc or run MyDVD for Canon.

- When the DISC access indicator is on or flashing do not perform the following actions. Doing so may result in permanent data loss.
  - Do not subject the camcorder to vibrations or strong impacts.
  - Do not open the disc cover and do not remove the disc.
  - Do not disconnect the USB cable.
  - Do not turn off the camcorder or the computer.
  - Do not change the position of the  /  switch or the operating mode.


● You need to have DVD playback software installed in your computer in order to play the disc.




● We recommend powering the camcorder using the compact power adapter while it is connected to the computer.

● Refer also to the computer's instruction manual.

● For further details about restrictions when using MyDVD for Canon, refer also to the "README" section in the software's help modules.

● The following recordings cannot be transferred to the computer using MyDVD for Canon:

- Recordings made in LP mode in widescreen (16:9 aspect ratio) on a DVD-RW initialized in VR mode.
- Photomovie scenes created with this camcorder.
- Depending on the number and length of the scenes recorded, the One-Touch Dubbing may take some time.
- In the following cases, the  button will not light up in step 2 and you cannot use the One-Touch Dubbing function:
  - The online user registration was not completed correctly.
  - MyDVD for Canon is still running.

- A finalized disc is not inserted in the camcorder.
- A brand new disc is not inserted in the computer's DVD drive.
- The disc in the camcorder is a DVD-RW recorded in VR mode but the disc in the computer's DVD drive is a DVD-R disc.
- The disc in the computer's DVD-drive is a dual-layered disc.
- If none of the previous applies but  still does not light up, look for the  icon in the computer's desktop toolbar. If  does not appear, disconnect the USB cable from both, the camcorder and the computer. Restart the computer and turn the camcorder off and then on again. Then, connect the camcorder to the computer again.

### **Transferring Recordings to the Computer**

#### **1 Insert the source disc into the camcorder.**

You can use any disc regardless of whether it is finalized or not.

#### **2 Run MyDVD for Canon.**

#### **3 Click on the "DVD-Video" option in the New Project tab.**

#### **4 Check that the DISC access lamp is not on or flashing and click on the "Open Disc" icon.**

#### **5 Click on the "Import" button.**

Thumbnails of the imported scenes and still images will be displayed in the video project screen.

#### **6 To save the project, click on "Save Project" from the Project Tasks palette.**

The scenes and still images displayed in the main screen will be saved.

### **! IMPORTANT**

The following recordings cannot be transferred to the computer using MyDVD for Canon:

- Recordings made in LP mode in widescreen (16:9 aspect ratio) on a DVD-RW initialized in VR mode.
- Photomovie scenes created with this camcorder.

### **Creating Backup Copies of your DVD**

#### **1 Insert a finalized disc into the camcorder.**

#### **2 Run MyDVD for Canon.**

#### **3 Click on the "Make a Backup DVD" option in the New Project tab.**

#### **4 Select the camcorder as the "Device to read from".**

#### **5 Select the computer's DVD drive (with writing capabilities) as the "Device to write to".**

If your computer is not equipped with a DVD drive with writing capabilities, select the camcorder also as the "Device to write to".

#### **6 Check that the DISC access lamp is not on or flashing and click on the "Copy" button.**

#### **7 Follow the indications on the screen.**

If you selected the camcorder itself as the "Device to write to", after the camcorder finishes reading the original disc, remove it and insert a brand new DVD-R or DVD-RW disc into the camcorder.

#### **8 When the "Your disc was created successfully" screen appears, click "OK".**

The copied disc will be finalized and automatically ejected from the drive.



### **! IMPORTANT**

- To make a copy of a disc recorded in VR mode, be certain to insert a DVD-RW disc into the computer's DVD drive.
- The software does not support writing on dual-layered discs.
- Always use a brand new disc as the target disc in the computer's DVD drive or the camcorder.
- If you are using a computer's DVD drive to make the backup copy you can also use a fully erased DVD-RW disc. To fully erase a DVD-RW disc you will need DVD authoring software.



- When you are using a DVD-RW disc as the source disc, if the tray of a DVD drive other than that selected in step 5 opens when you need to insert the target disc, some recordings on the source disc may be lost. Click on "Cancel" and restart the computer.

## Transferring Still Images - Direct Transfer

With the supplied USB cable and Digital Video Software, you can transfer still images to a computer by simply pressing the   (print/share) button.

### Preparations

The first time you connect the camcorder to the computer, you need to install the software and set the auto-launch setting. From the second time on, you will only need to connect the camcorder to the computer to transfer images.

#### 1 Install the supplied Digital Video Software.



See *Installing the Software* in the *Digital Video Software* instruction manual (electronic version on PDF file).

#### 2 Set the camcorder to mode.



#### 3 Connect the camcorder to the computer using the USB cable.

See *Connecting the Camcorder to a Computer* in the *Digital Video Software* instruction manual (electronic version on PDF file).

#### 4 Set the auto-launch setting.

- See *Starting CameraWindow* (Windows) or *Auto-downloading* (Macintosh) in the *Digital Video Software* instruction manual (electronic version on PDF file).
- The direct transfer menu appears on the camcorder screen and the   button lights up.

### ! IMPORTANT

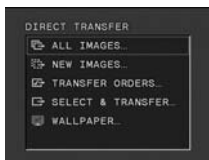
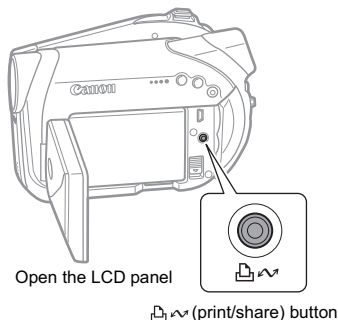
- Correct performance cannot be guaranteed for discs recorded on another digital device and inserted in this camcorder.
- When the DISC or CARD access indicator is on or flashing do not perform the following actions. Doing so may result in permanent data loss.
  - Do not subject the camcorder to vibrations or strong impacts.
  - Do not open the disc cover/memory card slot cover and do not remove the disc or memory card.
  - Do not disconnect the USB cable.
  - Do not turn off the camcorder or the computer.
  - Do not change the position of the  /  switch or the operating mode.
- Operation may not work correctly depending on the software and the specifications/settings of your computer.
- If you wish to use the image files on your computer, make copies of them first, and use the copied file, retaining the original.
- During the following operations, even if you connect the camcorder to the computer it will not be recognized.
  - Protecting the disc
  - Initializing the disc
  - Finalizing or Unfinalizing the disc
  - Erasing all still images from the disc or card
  - Copying still images between the disc and card
  - Erasing all transfer orders
  - Erasing all print orders

### i NOTES

- We recommend powering the camcorder using the compact power adapter while it is connected to the computer.
- Refer also to the computer's instruction manual.
- Users of Windows XP and Mac OS X: Your camcorder is equipped with the standard Picture Transfer Protocol (PTP) allowing you to download still images (JPEG only) by simply connecting the camcorder to a computer via USB cable without installing the software from the DIGITAL VIDEO SOLUTION DISK.

## Transferring Images

[ ALL IMAGES...]
Transfers all images to the computer.
[ NEW IMAGES...]
Transfers only those images that have not yet been transferred to the computer.
[ TRANSFER ORDERS...]
Transfers images with transfer orders to the computer. Transfer orders ( 83) are only available for images recorded on the memory card.
[ SELECT & TRANSFER...]
Allows you to select the still image you want to transfer to the computer.
[ WALLPAPER...]
Allows you to select the still image you want to transfer and set it as your computer's desktop background.



- 1 Select () a transfer option.
- 2 Press ().

[ ALL IMAGES] [ NEW IMAGES]  
[ TRANSFER ORDERS]:

- The images are transferred and displayed on the computer.
- The camcorder returns to the transfer menu once the transfer is complete.
- To cancel the transfer, select () [CANCEL] and press () or press [MENU].

### IF YOU SELECT [ SELECT & TRANSFER] OR [ WALLPAPER]

- 3 Select () the image you wish to transfer.

- 4 Press ().

- [ SELECT & TRANSFER]: The selected image is transferred and displayed on the computer. To continue transferring, select another image.
- [ WALLPAPER]: The selected image is transferred to the computer and displayed as the desktop's background.
- The button will flash while the images are being transferred.
- Press [MENU] to return to the transfer menu.

### NOTES

- You can press () to transfer the images, instead of the button. With [ ALL IMAGES], [ NEW IMAGES] or [ TRANSFER ORDERS], a confirmation message appears. Select [OK] and press () .
- When the camcorder is connected to the computer and the image selection screen is displayed, press [MENU] to return to the transfer menu.
- Even when still images recorded on the disc are correctly transferred to the computer, they will still be marked as images not yet transferred ("NEW IMAGES").

## Transfer Order Settings

Out of the still images recorded on the memory card, you can mark the ones you want to transfer to the computer with a transfer order. These transfer order settings are compatible with the Digital Print Order Format (DPOF) standards. Up to 998 images can be selected.

### Selecting Still Images to Transfer (Transfer Order)

Do not connect the USB cable to the camcorder while setting the transfer orders.

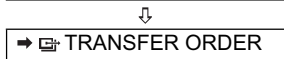
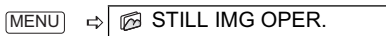


\* To cancel a transfer order, select [OFF] instead.

### Setting Transfer Orders from the Index Screen



Move the zoom lever toward **W** to enter the still image index screen.

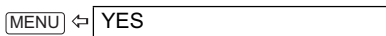
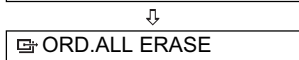
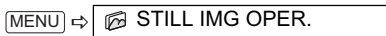


Bring (▲▼, ◀▶) the cursor to the image you want to transfer and press (Ⓚ).\*

\* appears on images marked with a transfer order. Press (Ⓚ) to cancel the transfer order.

\*\*After closing the menu the camcorder returns to the index screen.

### Erasing All Transfer Orders



## Connecting to a Printer

### Printing Still Images – Direct Print

The camcorder can be connected to any PictBridge compatible printer. You can use the print order settings for direct printing of still images recorded on the memory card (□ 87).

**Canon printers:** SELPHY CP and SELPHY DS printers and PIXMA printers marked with the PictBridge logo.



### Connecting the Camcorder to the Printer



- 1 Insert the memory card or disc containing the still images you want to print.
- 2 Turn on the printer.
- 3 Select as the media for the still images, the media from where you want to print the images.
- 4 Connect the camcorder to the printer using the supplied USB cable. Refer to *PC Connection Diagrams* (□ 76).

- appears and changes to . The symbol will not appear if the memory card or disc contains still images that cannot be viewed with this camcorder.
- The (print/share) button lights up and the current print setting will be displayed for approx. 6 seconds.

### IMPORTANT

- If continues to flash (for more than 1 minute) or if does not appear, the camcorder is not correctly connected to the printer. In such case, disconnect the cable from the camcorder and the printer. Turn them both off and then on

again and reconnect the camcorder to the printer.

- During the following operations, even if you connect a printer to the camcorder it will not be recognized.
  - Deleting all scenes
  - Protecting the disc
  - Setting the disc title
  - Initializing the disc
  - Finalizing or Unfinalizing the disc
  - Erasing all still images from the disc or card
  - Copying still images between the disc and card
  - Erasing all transfer orders
  - Erasing all print orders
- Correct performance cannot be guaranteed when printing images from a disc recorded on another digital device and inserted in this camcorder.

### NOTES

- will appear for images that cannot be printed.
- We recommend powering the camcorder using the compact power adapter.
- Refer also to the printer's instruction manual.

### Printing with the (Print/Share) Button

You can print a still image without changing the settings by simply pressing the (print/share) button.



- 1 Select () the still image you wish to print.
- 2 Press (print/share).
  - Printing starts. The button flashes and stays on when the printing is completed.
  - To continue printing, select () another still image.

## Printing after Selecting the Print Settings

You can select the number of copies and other settings for printing. The setting options vary depending on your printer model.

### 1 Press (OK).

- The print setting menu appears.
- Depending on the printer, the message "BUSY." may appear before the camcorder displays the print setting menu.

### 2 Select the print settings (PAGE 85).

### 3 Select (▲▼, ◀▶) [PRINT] and press (OK).

- Printing starts. The print setting menu disappears when the printing is completed.
- To continue printing, select (◀▶) another still image.

## IMPORTANT

• The following still images may not be correctly printed with a PictBridge compatible printer.

- Images created or changed on a computer and transferred to the memory card.
- Images recorded with the camcorder but edited on a computer.
- Images on the memory card whose file names were changed.
- Images copied from the memory card to the disc.
- Images not recorded with this camcorder.

• Observe the following precautions during printing:

- Do not turn off the camcorder or the printer.
- Do not change the position of the / switch.
- Do not disconnect the USB cable.
- Do not remove the disc or memory card.

• If the message "BUSY." does not disappear, disconnect the USB cable from both the camcorder and the printer and then reconnect them again.

## NOTES

• **To Cancel the Printing:** Press (OK) while printing. A confirmation screen appears. Select [OK] and press (OK). With Canon's PictBridge compatible printers, the printing will stop immediately (even if not completed) and the paper will be fed through.

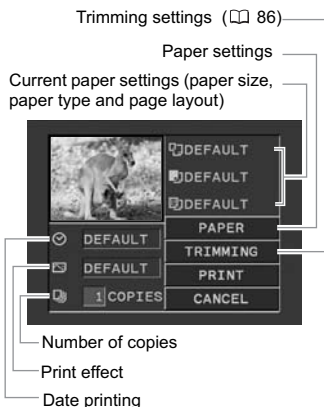
• **Printing Errors:** If an error occurs while printing, an error message appears (PAGE 96).

- Canon's PictBridge compatible printers: Resolve the error. When printing does not resume automatically, select [CONTINUE] and press (OK). If [CONTINUE] cannot be selected, select [STOP], press (OK) and retry printing. Refer also to the printer's instruction manual for details.







- If the error still persists and printing does not restart, disconnect the USB cable and turn the camcorder off. Turn it on again, set it to mode and reconnect the cable.

• **When you have finished printing:** Disconnect the cable from the camcorder and printer and turn off the camcorder.

## Print Settings



## Options

[PAPER]
[  PAPER SIZE] Available paper sizes vary depending on the printer model.
[  PAPER TYPE] Select [PHOTO], [FAST PHOTO] or [DEFAULT].
[  PAGE LAYOUT] Select [DEFAULT] or one of the following available page layouts. [BORDERED]: Prints the whole image area almost exactly as the recorded still image. [BORDERLESS]: Enlarges the center portion of the still image to fit the width/height ratio of the selected paper size. The top, bottom and sides of the still image may be slightly trimmed out. [2-UP], [4-UP], [8-UP], [9-UP], [16-UP]: Prints multiple small copies of the same still image on one sheet of paper. <b>Canon printers:</b> You can also use the specially designed Photo Stickers sheets.
[  Date print] Select [ON], [OFF] or [DEFAULT].
[  Print Effect] The print effect can be used with printers compatible with the Image Optimize function to achieve higher quality prints. Select [ON], [OFF] or [DEFAULT]. <b>Canon PIXMA/SELPHY DS printers:</b> You can also select [VIVID], [NR] and [VIVID+NR].
[  Number of Copies] Select 1-99 copies.

- 1 In the print setting menu, select (▲▼, ◀▶) the setting you want to change and press (⊞).
- 2 Select (▲▼) a setting option and press (⊞).

## i NOTES

- Print setting options and [DEFAULT] settings vary depending on the printer model. For details, refer to the printer's instruction manual.
- **Canon PIXMA/SELPHY DS Printers:** To print multiple small copies on a single print (2-, 4-, 9- or [16-UP]), set [PAPER SIZE] to [10 x 14.8 cm] or [9 x 13 cm].
- **Canon PIXMA/SELPHY CP Printers:** To print multiple small copies on a single print ([8-UP]), set [PAPER SIZE] to [CREDITCARD].

## Trimming Settings

Set the print style before changing the trimming settings.

- 1 In the print setting menu, select (▲▼, ◀▶) [TRIMMING] and press (⊞).

The trimming frame appears.



- 2 Change the size of the trimming frame.

- Move the zoom lever toward **T** to shrink the frame, and toward **W** to enlarge it. Press (⊞) to change the orientation of the frame (portrait/landscape).
- To cancel the trimming settings, move the zoom lever toward **W** until the trimming frame disappears.



### 3 Move (▲▼, ◀▶) the trimming frame.

Pressing [MENU] brings you back to the print settings menu.

#### **i** NOTES

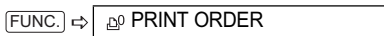
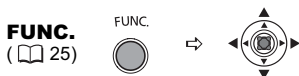
- About the color of the trimming frame:
  - White: No trimming settings.
  - Green: Recommended trimming size. (The trimming frame may not appear in green depending on the image size, paper size or borders settings.)
- The trimming setting applies only to one image.
- The trimming setting is canceled in the following cases:
  - When you turn off the camcorder.
  - When you disconnect the USB cable.
  - When you expand the trimming frame beyond its maximum size.
  - When you change the [PAPER SIZE] setting.

### Print Order Settings

Out of the still images recorded on the memory card, you can mark the ones you want to print and set the desired number of copies as a print order. These print order settings are compatible with the Digital Print Order Format (DPOF) standards and can be used for printing on DPOF compatible printers (□ 84). Up to 998 still images can be selected.

#### Selecting Still Images for Printing (Print Order)

Do not connect the USB cable to the camcorder while setting the print orders.

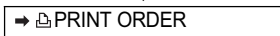


\* To cancel the print order, set the number of copies to 0.

### Setting Print Orders from the Index Screen



Move the zoom lever toward **W** to enter the still image index screen.



Bring (▲▼, ◀▶) the cursor to the image you want to print and press (□).

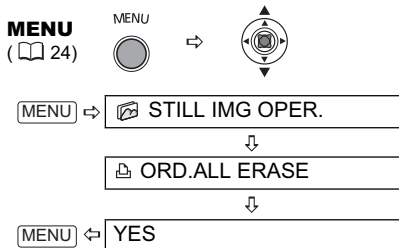
Set (▲▼) the desired number of copies and press (□).\* Repeat these steps to set print orders for additional images.



\* □ and the number of copies appear on images marked with a print order. To cancel the print order set (▲▼) the number of copies to 0.

\*\*After closing the menu the camcorder returns to the index screen.

## Erasing All Print Orders



● **Restarting Printing:** Press [MENU] and select [⇒ PRINT]. Select [RESUME] in the print setting menu and press ( ). The remaining images will be printed.

Printing cannot be restarted when the print order settings have been changed or if you deleted a still image with print order settings.

## Printing



**1** Connect the printer to the camcorder. Refer to *PC Connection Diagrams* ( 76).

**2** Press [MENU], select (▲) [⇒ PRINT] and press ( ).

- The print setting menu appears.
- The error message “SET PRINT ORDER” appears if you connect a printer with direct print function and select [⇒ PRINT] without having set any print orders.

**3** Select (▲, ◀▶) [PRINT] and press ( ).

Printing starts. The print setting menu disappears when the printing is completed.

## **i** NOTES

- Depending on the connected printer, you can change some print settings before step 3 ( 85).
- **Cancel Printing/Printing Errors** ( 85)



## Troubleshooting



If you have a problem with your camcorder, refer to this checklist. Consult your dealer or a Canon Service Center if the problem persists.

### Power Source




Problem	Solution	
<ul style="list-style-type: none"> <li>• Camcorder will not turn on.</li> <li>• The camcorder switches off by itself.</li> <li>• The disc compartment cover will not open.</li> <li>• LCD/viewfinder switches on and off.</li> </ul>	Battery pack is exhausted. Replace or charge the battery pack.	19
	Attach the battery pack correctly.	
Battery pack will not charge.	Charge the battery pack in temperatures between 0 °C and 40 °C.	–
	Battery packs become hot with use and may not charge. The charging will start once the battery pack temperature is below 40 °C.	–
	The battery pack is damaged. Use a different battery pack.	–


### Recording/Playback

Problem	Solution	
Buttons will not work.	Turn on the camcorder.	–
	Load a disc.	22
Abnormal characters appear on the screen. The camcorder does not operate properly.	Disconnect the power source and reconnect it after a short time. If the problem still persists, disconnect the power source and press the RESET button with a pointed item. Pressing the RESET button resets all settings.	–
"⊘" flashes on the screen.	Load a disc.	22
"⊘" flashes on the screen.	Battery pack is exhausted. Replace or charge the battery pack.	19
<b>DC22/DC21</b> The wireless controller will not work.	Set [WL.REMOTE] to [ON].	41
	The battery of the wireless controller is exhausted. Replace the battery.	21
Video noise appears on screen.	When using the camcorder in a room where a plasma TV is located, keep a distance between the camcorder and the plasma TV.	–
Video noise appears on the TV screen.	When using the camcorder in a room where a TV is located, keep a distance between the compact power adapter and the power or antenna cables of the TV.	–
Even without a disc loaded, when closing the disc compartment cover a motor sound can be heard.	The camcorder is checking if a disc is loaded or not. This is not a malfunction.	–



Problem	Solution	
The disc cannot be ejected.	Turn off the camcorder, disconnect the compact power adapter and remove the battery pack. Restore the power supply and try again.	–
	The camcorder has exceeded its operational temperature. Disconnect the compact power adapter and remove the battery pack and let the camcorder cool down before resuming use.	–
The disc cannot be recognized.	The disc is dirty. Clean the disc with a soft lens-cleaning cloth. If the problem persists replace the disc.	99
	The disc is not correctly loaded. Check the disc.	22
The camcorder vibrates.	Depending on the condition of the disc, the camcorder might vibrate occasionally. This is not a malfunction.	–
<ul style="list-style-type: none"> <li>• The disc's rotation can be faintly heard.</li> <li>• Occasionally the operation sound can be heard.</li> </ul>	The disc is activated from time to time. This is not a malfunction.	–
After using the camcorder for a long time the  lights up in red.	This is not a malfunction. Turn the camcorder off and let it cool for a while before resuming operation.	–



## Recording

Problem	Solution	
"4" flashes red on the screen.	The camcorder malfunctions. Consult a Canon Service Center.	–
Image will not appear on the screen.	Set the camcorder to  .	28
"SET THE TIME ZONE, DATE AND TIME" appears on the screen.	Set the time zone, date and time.	26
	Recharge the built-in lithium battery and set the time zone, date and time.	100
Pressing the start/stop button will not start recording.	Set the camcorder to  .	28
	Load a recommended disc.	22
	The disc is full ("END" flashes on the screen). Delete some recordings (DVD-RW in VR mode) to free some space or replace the disc.	22 62
	The camcorder has exceeded its operational temperature. Disconnect the compact power adapter and remove the battery pack and let the camcorder cool down before resuming use.	–
	Cancel the disc protection.	64
	Unfinalize the disc (DVD-RW in VIDEO mode).	71
Even after stopping recording, the disc access indicator does not go off.	The scene or still image is being recorded on the disc. This is not a malfunction.	28 29
The point where the start/stop button was pressed does not match the beginning/end of the recording.	There is a slight interval between pressing the start/stop button and the actual start of the recording on the disc. This is not a malfunction.	–

Problem	Solution	
The recording suddenly stops shortly after starting recording.	The disc is dirty. Clean the disc with a soft lens-cleaning cloth. If the problem persists replace the disc.	99
	The camcorder has exceeded its operational temperature. Disconnect the compact power adapter and remove the battery pack and let the camcorder cool down before resuming use.	–
Camcorder will not focus.	Autofocus does not work on that subject. Focus manually.	49
	Adjust the viewfinder with the dioptic adjustment lever.	20
	Lens is dirty. Clean the lens with a soft lens-cleaning cloth. Never use tissue paper to clean the lens.	101
Sound is distorted.	When recording near loud sounds (such as fireworks or concerts), sound may become distorted. This is not a malfunction.	–
A vertical light bar appears on the screen.	Bright light in a dark scene may cause a vertical light bar (smear) to appear. This is not a malfunction.	–
Viewfinder picture is blurred.	Adjust the viewfinder with the dioptic adjustment lever.	20


### Playback/Editing

Problem	Solution	
Pressing the playback button does not start playback.	Check that the disc contains recorded scenes.	–
	Load a disc.	22
	Set the camcorder to  .	31
	You may not be able to play with this camcorder discs recorded or edited with other DVD recorders or computer DVD drives.	–
	If using a single-sided disc, check that the disc is inserted with the label side facing up.	22
	The camcorder has exceeded its operational temperature. Disconnect the compact power adapter and remove the battery pack and let the camcorder cool down before resuming use.	–
During playback there is video noise, the sound is distorted or the disc cannot be read.	The disc is dirty. Clean the disc with a soft lens-cleaning cloth.	99
	You may not be able to play with the camcorder discs recorded or edited with other DVD recorders or computer DVD drives.	–
Cannot add scenes to the playlist.	The disc is full ("END" flashes on the screen). Delete some recordings to free some space.	62
	You cannot add more than 999 scenes to the playlist.	–
Cannot divide the scene.	You cannot edit or delete scenes on a disc that was protected in another digital device.	–
Cannot edit the disc title.	You cannot add a title to a DVD-R/DVD-R DL disc after it was finalized.	70
	Unfinalize the disc first (DVD-RW in VIDEO mode).	71
	You may not be able to edit the title if you entered it with another digital device.	–
	Remove the disc protection.	64




Problem	Solution	
Cannot create a Photomovie scene.	There are no still images recorded on the disc.	–
	The disc is full ("END" flashes on the screen). Delete some recordings (DVD-RW in VR mode) to free some space.	62
Cannot edit or delete scenes.	Remove the disc protection.	64
	You cannot edit or delete scenes on a disc that was protected with another digital device.	–
	Scenes cannot be deleted in a DVD-R/DVD-R DL disc or a DVD-RW disc recorded in VIDEO mode.	–
Cannot finalize the disc.	You cannot finalize a disc (DVD-R/DVD-R DL or DVD-RW) recorded in VIDEO mode if it contains only still images. Record at least one scene before finalizing the disc.	28 70
No sound from the built-in speaker.	Open the LCD panel.	–
	Speaker volume is turned off. Adjust the volume from the [SYSTEM SETUP] menu in (PLAY) mode.	33
<b>DC22/DC21</b> The keys on the wireless controller do not function.	Check that you did not lay the camcorder so the multi selector's  button is pressed down. Place the camcorder upright.	–

### Playing Back the Disc in an External DVD Device



External DVD device refers to DVD players, DVD recorders, computer's DVD drives and other digital devices.

Problem	Solution	
There is a brief stop between scenes.	Depending on the DVD player, there might be a very short stop between scenes during playback.	–
Disc is running, but image will not appear on the TV screen.	TV/VIDEO selector on the TV is not set to VIDEO. Set the selector to VIDEO.	73
	You attempted to play back or dub an incompatible disc. Stop playback/dubbing.	–
The disc cannot be recognized by the device. Or, even though the disc is read, cannot play back the disc or the picture is distorted.	The disc is dirty. Clean the disc with a soft lens-cleaning cloth.	99
	The disc has not been finalized.	70
	DVD-RW discs in VR mode can only be played back with VR mode-compatible DVD players. Refer to the instruction manual of your DVD device.	–
Cannot edit my recordings or add recordings to the disc with the DVD device.	It may not be possible to edit or add recordings with an external DVD recorder on a disc recorded with this camcorder.	–
When writing on a disc in this camcorder recordings transferred from a computer, an error message appears.	The camcorder has exceeded its operational temperature. Disconnect the compact power adapter and remove the battery pack and let the camcorder cool down before resuming use.	–


## Memory Card Operation


Problem	Solution	
Memory card cannot be inserted.	Memory card was not facing the correct direction. Turn the memory card over and reinsert it.	22
Memory card cannot be recorded.	Memory card is full. Erase still images to free some space or replace the memory card.	66
	Memory card was not initialized. Initialize the memory card.	69
	The folder and file numbers have reached their maximum value. Set [FILE NOS.] to [RESET] and insert a new memory card.	41
Memory card cannot be played back.	Insert a memory card.	22
	Set the camcorder to <b>PLAY</b>  .	33
	Make sure the memory card is selected as the media for still images.	30
Image cannot be erased.	Image is protected. Cancel the protection.	68
"  " flashes in red.	Card error occurred. Turn off the camcorder. Remove and reinsert the memory card. Initialize the memory card if flashing persists.	69



## Printing

Problem	Solution	
The printer is not operating even though the camcorder and printer are correctly connected.	<ol style="list-style-type: none"> <li>1. Set the camcorder to <b>PLAY</b> .</li> <li>2. Disconnect and reconnect the USB cable.</li> <li>3. Turn off the printer and turn it back on.</li> </ol>	–

## List of Messages

Message	Explanation	
SET THE TIME ZONE, DATE AND TIME	You have not set the time zone, date and time. This message appears each time you turn the power on until you set the time zone, date and time.	26
CHANGE THE BATTERY PACK	Battery pack is exhausted. Replace or charge the battery pack.	19
TEMPERATURE TOO HIGH CANNOT RECORD	The camcorder has exceeded its operational temperature. Disconnect the compact power adapter and remove the battery and let the camcorder cool down before resuming use.	–
TEMPERATURE TOO HIGH CANNOT REMOVE DISC		–
CANNOT RECORD CHECK THE DISC	There is a problem with the disc. Replace the disc.	22
	This message can also appear if condensation has formed. Wait until the camcorder dries completely before resuming use.	101
	The disc's recording surface may be dirty or scratched.	–










Message	Explanation	
REACHED THE MAXIMUM NUMBER OF SCENES	The maximum number of scenes has been reached. Delete some recordings (DVD-RW in VR mode) to free some space or replace the disc.	22 62
CANNOT PLAY DISC	The disc is dirty or you attempted to play back a disc type not supported (not DVD-R/RW).	–
	This message can also appear if condensation has formed. Wait until the camcorder dries completely before resuming use.	101
CANNOT EDIT DISC	There are no scenes to edit or the recording is damaged.	–
	This message can also appear if condensation has formed. Wait until the camcorder dries completely before resuming use.	101
CANNOT DIVIDE THE SCENE	Photomovie scenes cannot be divided.	67
	You may not be able to divide very short scenes.	–
	Scenes cannot be divided when the disc already contains 999 scenes.	–
	You may not be able to further divide scenes shorter than 5 seconds that were created by dividing a previous scene.	–
PLEASE USE ONLY THE RECOMMENDED DISCS	The dual layered disc you inserted cannot be used with this camcorder.	6
DISC IS FINALIZED CANNOT RECORD	You cannot record additional scenes on a finalized DVD-R/ DVD-R DL disc.	–
	You cannot record additional scenes or unfinalize a DVD-RW disc in VIDEO mode that was finalized with another digital device.	–
UNFINALIZE THE DISC	You cannot record additional scenes or convert still images to a Photomovie scene on a finalized DVD-RW in VIDEO mode. Unfinalize the disc first.	71
DISC IS PROTECTED	The disc is protected. Replace the disc or remove the disc protection.	64
CANNOT READ THE DISC CHECK THE DISC	Disc could not be read. Try cleaning it or replace the disc.	99
	This message can also appear if the camcorder has exceeded its operational temperature. Disconnect the power adapter and remove the battery and let the camcorder cool down before resuming use.	–
	This message can also appear if condensation has formed. Wait until the camcorder dries completely before resuming use.	101
	The disc may not be loaded correctly. Try removing the disc and reinserting it.	22
• ACCESS ERROR • DISC ACCESS FAILURE CHECK THE DISC	There was an error when reading the disc or attempting to write onto it. Try cleaning the disc or replace it.	99
	This message can also appear if condensation has formed. Wait until the camcorder dries completely before resuming use.	101
	The disc may not be loaded correctly. Try removing the disc and reinserting it.	22
DISC COVER IS OPEN	Verify the disc is correctly inserted and close the disc cover.	22

Message	Explanation	
NO DISC	No disc is loaded. Insert a disc.	22
	This message can also appear if condensation has formed. Wait until the camcorder dries completely before resuming use.	101
	You inserted a disc recorded in a different Television System (NTSC).	–
LOADING THE DISC	The disc is being read. Wait before you start recording.	–
AVOID MOVING THE CAMCORDER	Try not to move the camcorder while the image is being recorded.	–
UNABLE TO RECOVER DATA	Could not recover a corrupted file.	–
	This message can also appear if condensation has formed. If you suspect condensation is the reason, do not initialize the disc and wait until the camcorder dries completely before resuming use.	101
DISC FULL	The disc is full ("END" flashes on the screen) . Delete some recordings (DVD-RW in VR mode) to free some space or replace the disc.	22 62
NO CARD	Memory card not is inserted into the camcorder.	22
NO IMAGES	No images are recorded on the memory card.	–
CARD ERROR	A memory card error occurred. The camcorder cannot record or display the image. The error may be temporary. If the message disappears after 4 seconds and " " flashes red, turn the camcorder off, remove the card and reinsert the card. If " " changes to green, you can continue recording/playback.	–
CARD FULL	Memory card is full. Erase some images to free some space or replace the memory card.	66
NAMING ERROR	The folder and file numbers have reached their maximum value. Set the [FILE NOS.] option to [RESET] and initialize the disc or memory card, erase all the images on the memory card or replace the disc.	–
UNIDENTIFIABLE IMAGE	The image file is corrupted or it was saved using a compression method other than that compatible with this camcorder (JPEG).	–
 TRANSFER ORDER ERROR	You attempted to set more than 998 transfer orders.	83
TOO MANY STILL IMAGES DISCONNECT USB CABLE	Disconnect the USB cable and decrease the number of still images on the memory card or disc to less than 1800. Images cannot be erased from a DVD-R/DVD-R DL or DVD-RW disc recorded in VIDEO mode. If a dialog appeared on the computer screen, close it and then reconnect the USB cable.	–

## Direct Print Related Messages

### NOTES

**About Canon PIXMA/SELPHY DS Printers:** If the printer's error indicator flashes or an error message appears on the printer's operation panel, refer to the printer's instruction manual.

Message	Explanation
PAPER ERROR	There is a problem with the paper. Wrong paper size is inserted or the ink cannot be used with the selected paper. Or, if the paper output tray is closed, open it to print.
NO PAPER	Paper is not correctly inserted or there is no paper.
PAPER JAM	The paper jammed during printing. Select [STOP] to cancel printing. After removing the paper, set some paper again and retry printing.
INK ERROR	There is a problem with the ink.
NO INK	The ink cartridge is not inserted or is out of ink.
LOW INK LEVEL	The ink cartridge needs to be replaced soon. Select [CONTINUE] to restart printing.
INK ABSORBER FULL	Select [CONTINUE] to resume printing. Consult a Canon Service Center (refer to the list included with the printer) to replace the ink absorber.
• FILE ERROR • CANNOT PRINT!	You attempted to print an image that was recorded with another camcorder, with a different compression, or was edited on a computer.
COULD NOT PRINT X IMAGES	You attempted to use the print order settings to print X images that were recorded with another camcorder, with a different compression or were edited on a computer.
SET  PRINT ORDER	No still image on the memory card has been marked with a  print order.
 PRINT ORDER ERROR	You attempted to set more than 998 still images in the print order.
CANNOT TRIM	You attempted to trim an image that was recorded with another camcorder.
READJUST TRIMMING	You changed the print style after you set the trimming settings.
PRINTER ERROR	Cancel printing. Turn off the printer and turn it back on. Check the printer status. If the error still persists, refer to the printer's instruction manual and contact the appropriate customer support center or service center.
PRINT ERROR	Cancel printing, disconnect the USB cable and turn off the printer. After a while, turn the printer back on and reconnect the USB cable. Check the printer status. When you are printing using the   button, check the print settings.
HARDWARE ERROR	Cancel printing. Turn off the printer and turn it back on. Check the printer status. If the printer is equipped with a battery, it might be exhausted. In such case, turn off the printer, replace the battery and turn it back on.
COMMUNICATION ERROR	The printer is experiencing a data transfer error. Cancel printing, disconnect the USB cable and turn off the printer. After a while, turn the printer back on and reconnect the USB cable. When you are printing using the   button, check the print settings. Or, you attempted to print from a memory card that contains a large number of images. Reduce the number of images.
CHECK PRINT SETTINGS	The print setting cannot be used for printing with the   button.



Message	Explanation
INCOMPATIBLE PAPER SIZE	The paper settings of the camcorder conflict with the printer's settings.
PRINTER IN USE	The printer is in use. Check the printer status.
PAPER LEVER ERROR	Paper lever error occurred. Adjust the paper selection lever to the proper position.
PRINTER COVER OPEN	Close the printer cover securely.
NO PRINthead	No print head is installed in the printer or the print head is defective.

## Handling Precautions

### Camcorder

- Do not subject the camcorder to vibrations or strong impacts while the DISC access indicator is on or flashing. The data may not be correctly recorded on the disc, and the recording may be permanently lost.
- Do not touch the pick up lens.
- Do not carry the camcorder by the LCD panel or the disc cover. Be careful when closing the LCD panel.
- Do not leave the camcorder in places subject to high temperatures (like the inside of a car under direct sunlight), or high humidity.
- Do not use the camcorder near strong electric or magnetic fields such as above TVs, near plasma TVs or mobile phones.
- Do not point the lens or viewfinder at strong light sources. Do not leave the camcorder pointed at a bright subject.
- Do not use or store the camcorder in dusty or sandy places. The camcorder is not waterproof – avoid also water, mud or salt. If any of the above should get into the camcorder it may damage the camcorder and/or the lens. Be sure to close the disc compartment cover after use.
- Be careful of heat generated by lighting equipment.
- Do not disassemble the camcorder. If the camcorder does not function properly, consult qualified service personnel.
- Handle the camcorder with care. Do not subject the camcorder to shocks or vibration as this may cause damage.

### Battery Pack

#### **DANGER!**

#### **Treat the battery pack with care.**

- Keep it away from fire (or it might explode).
  - Do not expose the battery pack to temperature higher than 60 °C. Do not leave it near a heater or inside a car in hot weather.
  - Do not try to disassemble or modify it.
  - Do not drop or knock it.
  - Do not get it wet.
- 
- Charged battery packs continue to discharge naturally. Therefore, charge them on the day of use, or the day before, to ensure a full charge.
  - Attach the terminal cover whenever a battery pack is not in use. Contact with metallic objects may cause a short circuit and damage the battery pack.
  - Dirty terminals may cause a poor contact between the battery pack and the camcorder. Wipe the terminals with a soft cloth.
  - Since storing a charged battery pack for a long time (about 1 year) can shorten its lifecycle or affect performance, we recommend to discharge the battery pack fully and to store it in a dry place at temperatures no higher than 30 °C. If you do not use the battery pack for long periods, charge and discharge it fully at least once a year. If you have more than one battery pack, perform these precautions at the same time for all battery packs.
  - Although the battery pack's operating temperature range is from 0 °C to 40 °C, the optimal range is from 10 °C to 30 °C. At cold temperatures, performance will temporarily decline. Warm it in your pocket before use.

- Replace the battery pack if the usable time after full charge diminishes substantially at normal temperatures.

### About the battery terminal cover

The battery terminal cover has a [ ]-shaped hole. This is useful when you wish to differentiate between charged and uncharged battery packs.

Back side of the battery pack



Terminal cover attached  
Charged



Uncharged




---

## Mini DVD Disc

The recording surface of DVD discs is extremely delicate. If handled or stored in an incorrect manner, the camcorder may stop recognizing or may not be able to play back the disc. Be sure to observe the following precautions when storing/handling your discs.

- **Always remove the disc from the camcorder after you finish recording.**
- Do not store the camcorder with a disc left inside.
- Keep the disc clean of dust, dirt or smudges. Even very small smudges or particles of dust can lead to problems when recording or playing back the disc. Carefully inspect the recording surface of the disc before inserting it in the camcorder. If the disc gets dirty use a dry, soft lens-cleaning cloth to remove any fingerprints, dirt buildup or smudges from

the disc surface. Clean the disc in a radial motion from its center outwards.

- Never use a chemically treated cloth or flammable solvents such as paint thinner to clean the disc.
- Do not bend, scratch or wet the disc and do not subject it to strong shocks.
- Do not attach any labels or stickers on the disc surfaces. The disc may not rotate in a stable manner and this may cause malfunctions.
- To protect the disc, return it to its case for storage.
- When writing on the label side of the disc, avoid hard tip pens. Use waterproof soft-tipped felt pens instead.
- Moving a disc rapidly between hot and cold temperatures may cause condensation to form on its surfaces. If condensation forms on the disc, put it aside until the water droplets have evaporated completely.
- Never expose the disc to direct sunlight and do not store it in places subject to high temperatures or high humidity.
- Always finalize a disc before inserting it into an external DVD device. Failing to do so can result in the loss of the recorded data.

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## Memory Card

- We recommend saving backups of memory card images on your computer. Image data may be corrupted or lost due to memory card defects or exposure to static electricity. Canon Inc. makes no warranties for corrupted or lost data.
- Do not turn off the camcorder, disconnect the power source or remove the memory card while the CARD access indicator is flashing.
- Do not use memory cards in places subject to strong magnetic fields.

- Do not leave memory cards in places subject to high humidity and high temperature.
- Do not disassemble, bend, drop, or subject memory cards to shocks and do not expose them to water.
- Do not touch or expose the terminals to dust or dirt.
- Check the direction before inserting the memory card. Forcing a memory card into the slot if it is not correctly oriented may damage the memory card or the camcorder.
- Do not attach any labels or stickers on the memory card.
- When you erase image files or initialize the memory card, only the file allocation table is altered and the data itself is not actually deleted. Take the necessary precautions when you dispose of the memory card, for example by physically damaging it to prevent the leakage of private data.

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## Lithium Button Battery

### WARNING!

- The battery used in this device may present a fire or chemical burn hazard if mishandled. Do not recharge, disassemble, heat above 100 °C or incinerate the battery.
  - Replace the battery with a CR2025 made by Panasonic, Hitachi Maxell, Sony, Sanyo, or with Duracell2025. Use of other batteries may present a risk of fire or explosion.
  - The used battery should be returned to the supplier for safe disposal.
- Do not pick up the battery using tweezers or other metal tools as this will cause a short circuit.

- Wipe the battery with a clean dry cloth to ensure proper contact.
- Keep the battery out of the reach of children. If swallowed, seek medical assistance immediately. The battery case may break and the battery fluids may cause internal damage.
- Do not disassemble, heat or immerse the battery in water to avoid the risk of explosion.

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## Built-in Rechargeable Lithium Battery

The camcorder has a built-in rechargeable lithium battery to keep the date/time and other settings. The built-in lithium battery is recharged while you use the camcorder, however, it will become totally discharged if you do not use the camcorder for about 3 months.

### To recharge the built-in lithium battery:

Connect the compact power adapter to the camcorder and leave it connected for 24 hours with the power switch set to

**OFF**.

## Maintenance/Others

### Storage

- If you do not intend to use the camcorder for a long time, store it in a place free of dust, in low humidity, and at temperatures not higher than 30 °C.

### Cleaning

#### Camcorder Body

- Use a soft, dry cloth to clean the camcorder body. Never use chemically treated cloth or volatile solvents such as paint thinner.

#### Pick Up Lens

- Remove any dust or dirt particles using a non-aerosol type blower brush. Never touch the pick up lens directly to clean it.

#### Lens and Viewfinder

- If the lens surface is dirty, the autofocus may not work properly.
- Remove any dust or dirt particles using a non-aerosol type blower brush.
- Use a clean, soft lens-cleaning cloth to gently wipe the lens or viewfinder. Never use tissue paper.

#### LCD Screen

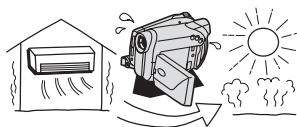
- Clean the LCD screen using a clean, soft lens-cleaning cloth.
- Condensation may form on the surface of the screen when the temperature changes suddenly. Wipe it with a soft dry cloth.

### Condensation

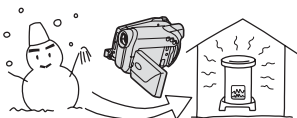
Moving the camcorder rapidly between hot and cold temperatures may cause condensation (water droplets) to form on its internal surfaces. Stop using the camcorder if condensation is detected. Continued use may damage the camcorder.

#### Condensation may form in the following cases:

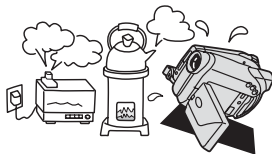
When the camcorder is moved from an air-conditioned room to a warm, humid place



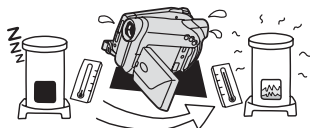
When the camcorder is moved from a cold place to a warm room



When the camcorder is left in a humid room



When a cold room is heated rapidly



**TO AVOID CONDENSATION**

- Do not expose the camcorder to sudden or extreme changes in temperature.
- Unload the disc, place the camcorder in an airtight plastic bag and let it adjust to temperature changes slowly before removing it from the bag.

**WHEN CONDENSATION IS DETECTED**

- The camcorder automatically shuts off. If a disc is loaded, remove the disc immediately and leave the disc cover open. Leaving the disc in the camcorder may damage it.
- A disc cannot be loaded when condensation is detected.

**RESUMING USE**

- The precise time required for water droplets to evaporate will vary depending on the location and weather conditions. As a general criterion, wait for 2 hours before resuming use of the camcorder.

Indonesia, Ireland, Israel, Italy, Jordan, Kenya, Kuwait, Liberia, Malaysia, Malta, Mozambique, the Netherlands, New Zealand, North Korea, Norway, Oman, Pakistan, Portugal, Qatar, Serbia and Montenegro, Sierra Leone, Singapore, South Africa, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Tanzania, Thailand, Turkey, Uganda, United Arab Emirates, United Kingdom, Yemen, Zambia.

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**Using the Camcorder Abroad****Power Sources**

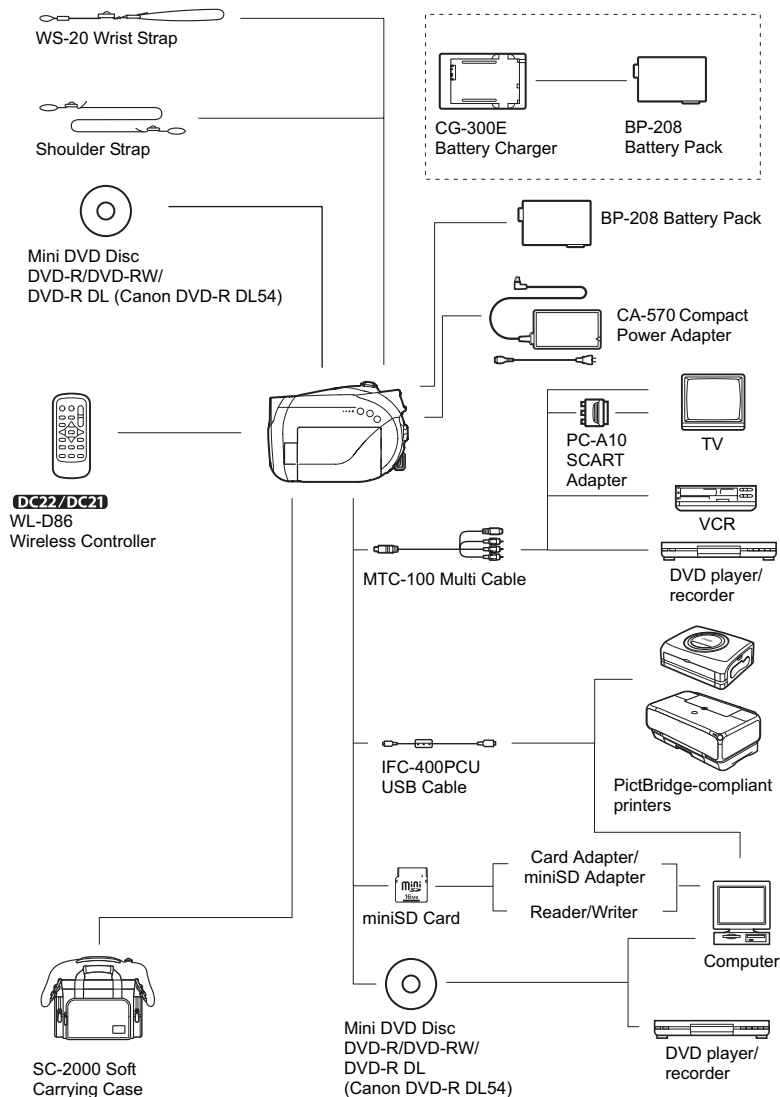
You can use the compact power adapter to operate the camcorder and to charge battery packs in any country with power supply between 100 and 240 V AC, 50/60 Hz. Consult the Canon Service Center for information on plug adapters for overseas use.

**Playback on a TV Screen**

You can only play back your recordings on TVs compatible with the PAL system. The PAL system is used in the following countries/areas:

Algeria, Australia, Austria, Bangladesh, Belgium, Brunei, China, Denmark, Finland, Germany, Hong Kong Special Administrative Region, Iceland, India,

# System Diagram (Availability differs from area to area)



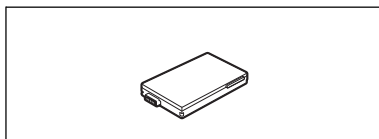
## Optional Accessories

### Use of genuine Canon accessories is recommended.

This product is designed to achieve excellent performance when used with genuine Canon accessories. Canon shall not be liable for any damage to this product and/or accidents such as fire, etc., caused by the malfunction of non-genuine Canon accessories (e.g., a leakage and/or explosion of a battery pack). Please note that this warranty does not apply to repairs arising out of the malfunction of non-genuine Canon accessories, although you may request such repairs on a chargeable basis.

### Battery Packs

When you need extra battery packs, select only the BP-208 battery pack.

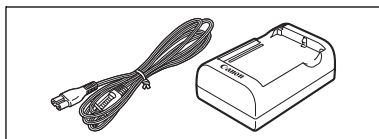


### CG-300E Battery Charger

Use the battery charger for charging the battery packs.

Charging Time: 105 min.

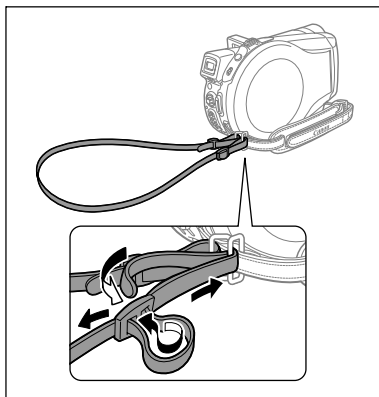
Charging time varies according to the charging condition.



### Shoulder Strap

You can attach a shoulder strap for more security and portability.

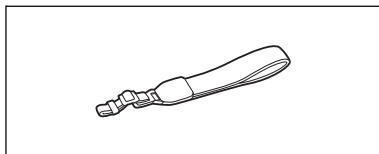
Pass the ends through the strap mount and adjust the length of the strap.





**WS-20 Wrist Strap**

Use this for extra additional protection for active shooting.



E

**SC-2000 Soft Carrying Case**

A handy camcorder bag with padded compartments and plenty of space for accessories.



This mark identifies genuine Canon video accessories. When you use Canon video equipment, we recommend Canon-brand accessories or products bearing the same mark.



## Specifications

### DC22/DC21/DC19

#### System

<b>Disc Recording System</b>	Movies	DVD-VIDEO (VIDEO mode) DVD-VR (VR mode) only with 8 cm DVD-RW Video Compression: MPEG2 Audio Compression: Dolby Digital 2ch
	Still Images	Exif 2.2** compliant with JPEG compression
<b>Television System</b>	CCIR standard (625 lines, 50 fields) PAL color signal	
<b>Image Sensor</b>	1/3.9-inch CCD, approx. 2,200,000 pixels	
	Effective pixels:	
	Movies	16:9 (Image stabilizer [ON]): approx. 1,380,000 16:9 (Image stabilizer [OFF]): approx. 1,500,000 4:3 recordings: approx. 1,770,000
	Still images	approx. 2,000,000
<b>Compatible Media</b>	8 cm mini DVD discs marked with the DVD-R, DVD-R DL or DVD-RW logo 	
<b>Maximum Recording Time</b>	1.4 GB single sided 8 cm mini DVD disc: XP: approx. 20 min., SP: approx. 30 min., LP: approx. 60 min.	
	2.6 GB single sided dual-layered 8 cm mini DVD disc: XP: approx. 36 min., SP: approx. 54 min., LP: approx. 108 min.	
<b>LCD Screen</b>	2.7 in., wide, TFT color, approx. 123,000 pixels	
<b>Viewfinder</b>	0.27 in., wide, TFT color, approx. 123,000 pixels	
<b>Microphone</b>	Stereo electret condenser microphone	
<b>Lens</b>	f=4.05-40.5 mm, F/1.8-2.8, 10x power zoom	
	35 mm equivalent:	
	Movies	16:9 (Image stabilizer [ON]): 43.3-433 mm 16:9 (Image stabilizer [OFF]): 41.6-416 mm 4:3 recordings: 40.6-406 mm
	Still images	38.1-381 mm
<b>Lens Configuration</b>	11 elements in 9 groups	
<b>AF system</b>	TTL autofocus, manual focusing possible	
<b>Minimum Focusing Distance</b>	1 m; 1 cm on maximum wide angle	
<b>White Balance</b>	Auto white balance, preset white balance (DAYLIGHT, SHADE, CLOUDY, TUNGSTEN, FLUORESCENT, FLUORESCENT H) or custom white balance	
<b>Minimum Illumination</b>	1.0 lx ([NIGHT] recording program (SCN), Shutter speed at 1/2) 12 lx (Auto mode, Auto slow shutter [ON], Shutter speed at 1/25)	
<b>Recommended Illumination</b>	More than 100 lx	
<b>Image Stabilization</b>	Electronic	
<b>Memory Card</b>		
<b>Recording Media</b>	miniSD Card*	
<b>Size of Still Images</b>	1632 x 1224, 1280 x 960, 640 x 480 pixels	
<b>File Format</b>	Design rule for Camera File system (DCF), Exif 2.2** compliant, DPOF compliant	
<b>Image Compression Method</b>	JPEG (compression: Super Fine, Fine, Normal)	

\* This camcorder has been tested with miniSD cards up to 1 GB. Performance cannot be guaranteed for all miniSD cards.

\*\* This camcorder supports Exif 2.2 (also called "Exif Print"). Exif Print is a standard for enhancing the communication between camcorders and printers. By connecting to an Exif Print-compliant printer, the camcorder's image data at the time of shooting is used and optimized, yielding extremely high quality prints.

### Input/Output Terminals

<b>AV Terminal</b>	10-pin multiconnector; <b>DC22</b> Input / Output, <b>DC21/DC19</b> Output only Video: 1 Vp-p / 75 ohms unbalanced S-Video: Luminance (Y) signal: 1 Vp-p / 75 ohms; Chrominance (C) signal: 0.3 Vp-p / 75 ohms Audio: Output: -10 dBV (47 kohm load) / 3 kohm or less <b>DC22</b> Input: -10 dBV / 40 kohm or more
<b>USB Terminal</b>	mini-B

### Power/Others

<b>Power supply (rated)</b>	7.4 V DC (battery pack), 8.4 V DC (compact power adapter)
<b>Power consumption (SP mode, AF on)</b>	4.5 W (viewfinder), 4.5 W (LCD screen [NORMAL])
<b>Operating temperature</b>	0 – 40 °C
<b>Dimensions (W x H x D)</b>	51 x 91 x 126 mm excluding the grip belt
<b>Weight (camcorder body only)</b>	410 g

### CA-570 Compact Power Adapter

<b>Power supply</b>	100 – 240 V AC, 50/60 Hz
<b>Power consumption</b>	17 W
<b>Rated output</b>	8.4 V DC, 1.5 A
<b>Operating temperature</b>	0 – 40 °C
<b>Dimensions</b>	52 x 90 x 29 mm
<b>Weight</b>	135 g

### BP-208 Battery Pack

<b>Battery type</b>	Rechargeable Lithium Ion Battery
<b>Rated voltage</b>	7.4 V DC
<b>Operating temperature</b>	0 – 40 °C
<b>Battery capacity</b>	850 mAh
<b>Dimensions</b>	39 x 8 x 63 mm
<b>Weight</b>	40 g

Weight and dimensions are approximate. Errors and omissions excepted. Subject to change without notice.

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\* **DC22/DC21** only. \*\* **DC22** only.



**CANON INC.**

**Canon Europa N.V.**

P.O. Box 2262, 1180 EG Amstelveen, the Netherlands

**Canon UK Ltd.**

CCI Service Centre, Unit 130

Centennial Park, Borehamwood, Hertfordshire, WD6 3SE, England

Telephone 0870-241-2161

**Canon Australia Pty. Ltd.**

Info-Line: 131383

[www.canon.com.au](http://www.canon.com.au)

**Canon New Zealand Ltd.**

Customer Care: (09) 489 0470

[www.canon.co.nz](http://www.canon.co.nz)

**Canon Singapore Pte. Ltd**

1 HarbourFront Avenue, #04-01 Keppel Bay Tower, Singapore 098632

Tel: (65) 6799 8888

Fax: (65) 6799 8882

**Canon Hongkong Company Ltd**

19/F., The Metropolis Tower, 10 Metropolis Drive, Hungghom, Kowloon, Hong Kong

**Canon Latin America, Inc.**

Sales & Enquiries: 703 Waterford Way Suite 400 Miami, FL 33126 USA

The information on this manual is verified as of July 1st, 2006.



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