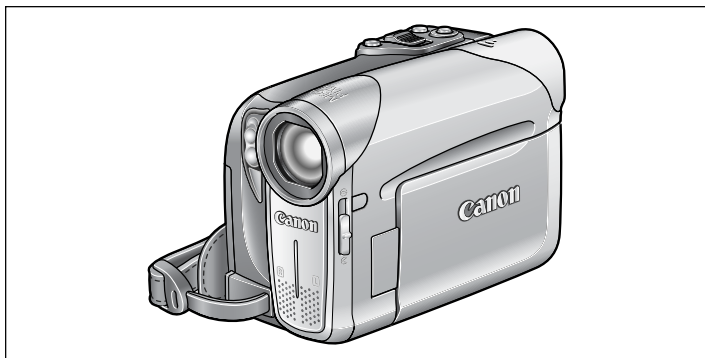


Digital Video Camcorder Instruction Manual

English

MVX460/MVX450/MVX430



Mini **DV** Digital
Video
Cassette


PictBridge

Please read also the following instruction manual (electronic version on PDF file). For further details refer to the installation guide.

- **Digital Video Software**



Introduction

Preparation

Basic
FunctionsAdvanced
Functions

Editing

Printing

Connecting
to a PC

Trouble?

Do's & Don'ts

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.



CA-570 identification plate is located on the bottom.

Using this Manual

Thank you for purchasing the Canon MVX 460/MVX 450/MVX 430. 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 (□ 110).

Symbols and References Used in this Manual

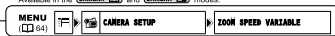
-  : Precautions related to the camcorder operation.
-  : Additional topics that complement the basic operating procedures.
- □ : Reference page number.
- Capital letters are used to refer to buttons on the camcorder or the wireless controller.
- [] are used to refer to menu items displayed on the screen.
- “Card” or “Memory card” refers to an SD memory card or a MultiMediaCard (MMC).
- “Screen” refers to the LCD and the viewfinder screen.
- **MX460** : Option or feature that applies or is available only with this model.

Menu item shown at its default position


Buttons and switches to be operated


Selecting the Zoom Speed

When operating the zoom with the camcorder, you can set the zoom speed to variable or to one of 3 levels of fixed zoom speeds. When set to [VARIABLE], the zoom speed depends on how you activate the zoom lever—press softly for a slower zoom or press more strongly for a faster zoom.
Available in the **CAMERA-200** and **CAMERA-100** modes.




1. Press the FUNC. button to open the FUNC. menu.



2. With the joystick select (▲▼) the  icon and press (⊙).

3. Select (▲▼) the [CAMERA SETUP] menu and press (⊙). Then, select (▲▼) the [ZOOM SPEED] option and press (⊙).

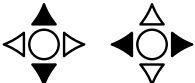



4. Select a setting option and press (⊙) to save the changes.





5. Press the FUNC. button to close the menu.

About the Joystick and the Joystick Guide

The mini joystick allows you to control many of the camcorder's operations and to select and change setting options in menus.











	Push the joystick up, down, left or right (▲▼, ◀▶) to select an item or change settings.
	Press the joystick itself (⊙) to save the settings or confirm an action.

The functions assigned to the joystick change according to the operation mode. You can display the joystick guide to remind you of the joystick's functions in each operating mode.

Recording movies:	Playing back movies:	Recording still images:	Playing back still images:
			

Selecting the Operating Modes

The camcorder's operating mode is determined by the positions of the power and TAPE/CARD switches.

Operating Modes	POWER Switch	TAPE/CARD Switch	Icon Display	Operation	
	CAMERA	 (Tape)		Recording movies on a tape	27
	PLAY			Playing movies from a tape	37
	CAMERA	 (Card)		Recording still images or movies on a card	30
	PLAY			Viewing still images or playing movies from a card	39

Trademark Acknowledgements

- ^{Mini} DV is a trademark.
- SD 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.
- HDV is a trademark of Sony Corporation and Victor Company of Japan, Limited (JVC).
- Other names and products not mentioned above may be registered trademarks or trademarks of their respective companies.

Table of contents

Introduction

Using this Manual	3
Checking the Supplied Accessories	7
Components Guide.....	8
Screen Displays.....	12

Preparation

Step 1: Preparing the Power Supply.....	14
Step 2: Loading a Cassette	17
Step 3: Inserting a Memory Card.....	18
Step 4: Preparing the Camcorder.....	19
Step 5: Using the Wireless Controller.....	21
Step 6: Installing the Backup Battery.....	22
Step 7: Adjusting the LCD Screen.....	23
Step 8: Changing the Display Language	24
Step 9: Setting the Time Zone, Date and Time.....	25

Basic Functions

Recording

Recording Movies on a Tape.....	27
Recording on a Memory Card	30
Zooming.....	33
Widescreen TV Recording (16:9).....	35
Tips for Better Recording.....	36

Playback

Playing Back a Tape.....	37
Playing Back a Memory Card	39
Adjusting the Volume.....	40
Playing Back on a TV Screen.....	41

Advanced Functions

Recording Programs

Using the Recording Programs	43
P Using the Program AE Mode	46

Recording

Adjusting the Exposure Manually	47
Adjusting the Focus Manually.....	48
Using the LED Light.....	50
Using the Self-Timer	51
Using an External Microphone	52

Changing the Settings (1)

Changing the Settings with the FUNC. Button	53
List of Menu Items (FUNC.).....	54
Setting the White Balance	55
Selecting an Image Effect.....	57
Using Digital Effects.....	58

Changing the Settings (2)

Changing the Settings with the Setup Menus.....	63
List of Menu Items (Setup Menus).....	64
Using the Wind Screen.....	69

Playback

Magnifying the Image	70
Displaying the Data Code	71
End Search	72
Returning to a Pre-marked Position	73
Date Search.....	74

Digital Camera Functions

Selecting the Image Quality/Size.....	75
Simultaneous Recording on the Tape and Memory Card	77
Changing the Focusing Method.....	78
Selecting the Drive Mode	79
Playing Back/Searching Images	81
Erasing Images.....	82
Protecting Images.....	83
Initializing a Memory Card	84

Editing

Recording to a VCR or Digital Video Device	85
MX460/MX430 Analog Line-in Recording	87
MX460/MX430 DV Dubbing	89
MX460/MX430 Converting Analog Signals into Digital Signals (Analog-Digital Converter)	92
Audio Dubbing	94
Recording from the Tape on a Memory Card	96

Printing

Printing Still Images	97
Selecting the Print Settings	100
Printing with Print Order Settings	102

Connecting to a PC

Transferring Video Recordings to a Computer	104
Transferring Memory Card Images to a Computer	106
Selecting Images for Transfer (Transfer Order).....	109

Trouble?

Troubleshooting	110
List of Messages.....	114

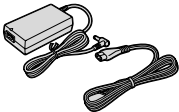
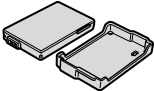




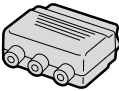


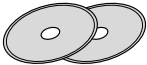

Do's & Don'ts

Handling Precautions	117
Cleaning the Video Heads	120
Maintenance/Others	121

Additional Information

System Diagram	122
Optional Accessories	123
Specifications.....	125
Index.....	127

Checking the Supplied Accessories

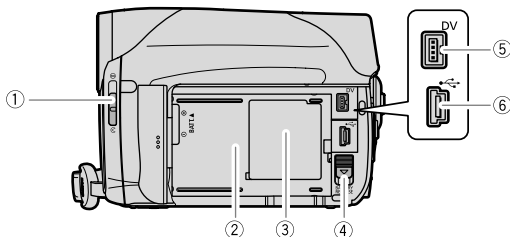
<p>CA-570 Compact Power Adapter (incl. power cord)</p> 	<p>BP-208DG Battery Pack</p> 	<p>Lithium Button Battery CR1616</p> 	<p>WL-D85 Wireless Controller</p> 
<p>Lithium Button Battery CR2025 for the Wireless Controller</p> 	<p>STV-250N Stereo Video Cable</p> 	<p>PC-A10 SCART Adapter*</p> 	<p>SS-900 Shoulder Strap</p> 
<p>IFC-300PCU USB Cable</p> 	<p>DIGITAL VIDEO SOLUTION DISK For Windows For Macintosh</p> 	<p>MVX460 WA-27 Wide Attachment</p> 	

* Europe only.

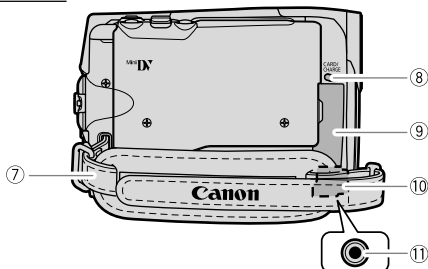
Components Guide

MVX 460/MVX 450/MVX 430

Left side view



Right side view



① Lens Cover Switch (27, 30)
(☞ - open, ☹ - closed)

② Battery attachment unit (14)

③ Serial number

④ BATTERY RELEASE button (14)

⑤ DV terminal (85, 89, 92, 104)

⑥ USB terminal (97, 106)

⑦ Grip belt (19)

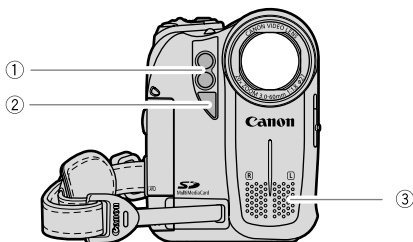
⑧ CARD access indicator (30) /
CHARGE indicator (14)

⑨ Memory card slot (18) / Backup battery
compartment (22)

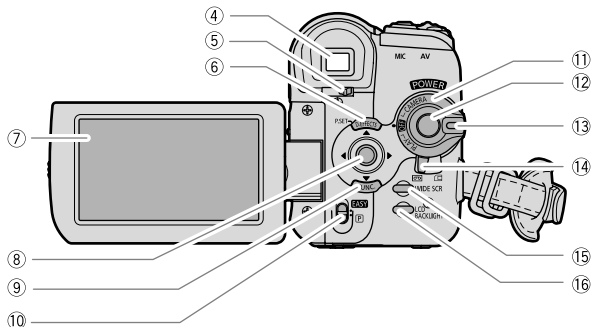
⑩ Terminal cover

⑪ DC IN terminal (14)

Front view



Back view



① Twin LED light (assist lamp) (□ 50)

② Remote sensor (□ 21)

③ Stereo microphone

④ Viewfinder (□ 19)

⑤ Dioptic adjustment lever (□ 19)

⑥ D.EFFECTS button (□ 58) /
P.SET button (□ 98)

⑦ LCD screen (□ 23)

⑧ Joystick (□ 3)

⑨ FUNC. button (□ 53)

⑩ Mode switch (□ 43)

⑪ **POWER** switch (□ 4)

⑫ Start/stop button (□ 27, 30)

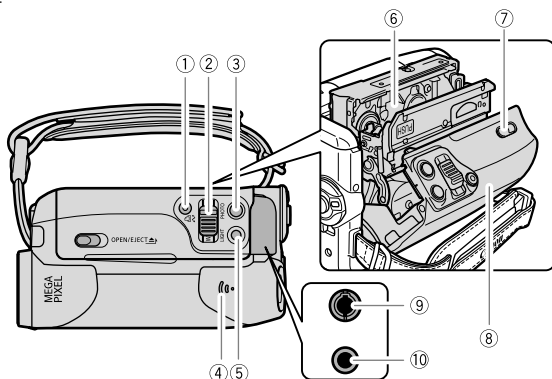
⑬ Lock button

⑭ TAPE/CARD switch (□ 4)

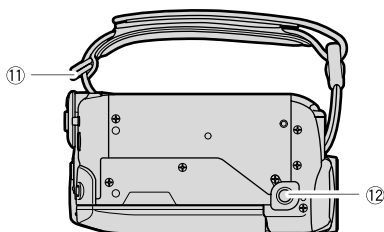
⑮ WIDE SCR button (□ 35)


⑯ LCD BACKLIGHT button (□ 23)

Top view



Bottom view



①  (print/share) button (□ 98, 107)

② Zoom lever (□ 33)

③ PHOTO button (□ 30)

④ Speaker (□ 40)

⑤ LIGHT button (□ 50)

⑥ Cassette compartment (□ 17)

⑦ OPEN/EJECT  switch (□ 17)

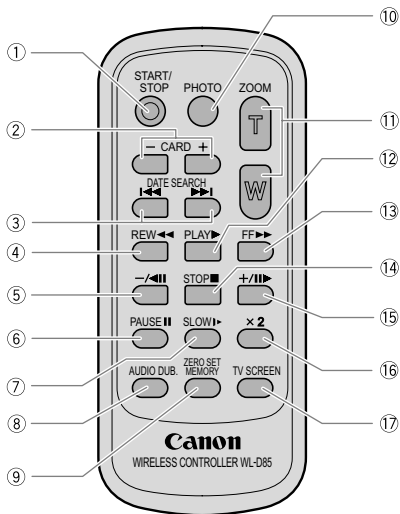
⑧ Cassette compartment cover (□ 17)

⑨ AV terminal (□ 41, 87, 92, 94)

⑩ MIC (microphone) terminal (□ 52)

⑪ Strap mount (□ 19)

⑫ Tripod socket (□ 36)



- ① START/STOP button (□ 27, 30)
- ② CARD -/+ buttons (□ 39)
- ③ DATE SEARCH ◀▶ buttons (□ 74)
- ④ REW ◀◀ button (□ 37)
- ⑤ -/ ◀ button (□ 38)
- ⑥ PAUSE || button (□ 38)
- ⑦ SLOW ▶ button (□ 38)
- ⑧ AUDIO DUB. button (□ 94)
- ⑨ ZERO SET MEMORY button (□ 73)

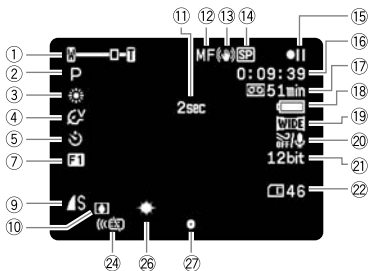
- ⑩ PHOTO button (□ 30)
- ⑪ Zoom buttons (□ 33)
- ⑫ PLAY ▶ button (□ 37)
- ⑬ FF ▶▶ button (□ 38)
- ⑭ STOP ■ button (□ 37)
- ⑮ +/ ▶▶ button (□ 38)
- ⑯ x2 button (□ 38)
- ⑰ TV SCREEN button (□ 67)

Screen Displays

Screen Displays during Recording

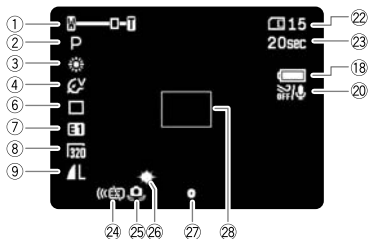
When recording movies on a tape

(CAMERA )



When recording on a memory card



(CAMERA )

































18 Remaining battery charge

The battery symbol indicates the charge status of the battery pack.



- 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.

- ① Operating mode () 4, Zoom () 33, Exposure  () 47)
- ② Recording program () 43)
- ③ White balance () 55)
- ④ Image effect () 57)
- ⑤ Self-timer () 51)
- ⑥ Drive mode () 79)
- ⑦ Digital effects () 58)
- ⑧ Movie size () 75)
- ⑨ Still image quality/size () 75)
- ⑩ Condensation () 113)
- ⑪ Recording reminder () 28)
- ⑫ Manual focus () 48)
- ⑬ Image stabilizer () 64)
- ⑭ Recording mode () 65)
- ⑮ Tape operation () 13)
- ⑯ Time code () 28)
- ⑰ Remaining tape () 28)
- ⑱ Remaining battery charge () 18)
- ⑲ Widescreen mode () 35)
- ⑳ Wind screen () 69)
- ㉑ Audio mode () 66)
- ㉒ Remaining card capacity for still images () 32)
- ㉓ Remaining card capacity for movies () 32)
- ㉔ Remote sensor mode () 67)
- ㉕ Camcorder shake warning () 64)
- ㉖ LED light () 50)
- ㉗ AF/AE locked during still image recording () 30)
- ㉘ AF frame () 78)

Screen Displays during Playback

When playing a tape (**PLAY**)



- ① 12 bit audio (95)
- ② End search (72), Date search (74), Audio dubbing (94)
- ③ Digital effects (58)
- ④ Movie size (96)
- ⑤ Still image quality/size (77)
- ⑥ Recording mode (65)
- ⑦ Tape operation
- ⑧ Time code (28)
- ⑨ Remaining tape (28)
- ⑩ Joystick guide (3)
- ⑪ Data code (71)

E

Introduction

Tape operation

- : Record
- || : Pause
- : Stop
- ▲ : Eject
- ▶ : Play
- ▶▶ : Fast forward
- ◀◀ : Rewind
- ▶▶ / ◀◀ : Fast forward playback/ Rewind playback (38)
- x2 ▶▶ / ◀◀ x2 : Playback at twice normal speed (38)
- x1 ▶▶ / ◀◀ x1 : Playback at normal speed (38)
- ▶▶ / ◀◀ : Slow playback (38)
- ||▶▶ / ◀◀|| : Frame advance playback/ Frame reverse playback (38)
- ▶▶ || / || ◀◀ : Playback pause (38)
- ▶▶▶ / ◀◀◀ : Date search (74)
- ▶▶▶ / ◀◀◀ : Zero set memory (73)
- / ● || : Audio dubbing (94)

When playing back a still image from a memory card (**PLAY**)



- ① Image number (67)
- ② Current image/Total number of images
- ③ Still image size (75)
- ④ Movie size (75)/Playback time
- ⑤ Protected image mark (83)
- ⑥ Data code (71)

When playing back a movie from a memory card (**PLAY**)



Step 1: Preparing the Power Supply

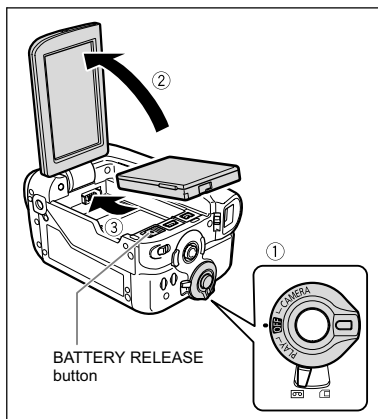
The camcorder can be powered by a battery pack or be connected to a household power source. Charge the battery pack before use.

Attaching the Battery Pack

1. Turn the **POWER** switch to **OFF**.
2. Open the LCD panel.
3. Attach the battery pack to the camcorder.
 - Remove the terminal cover of the battery pack.
 - Slide in the connector end of the battery in the direction of the arrow and press it gently until it clicks.

To remove the battery pack:

1. Open the LCD panel.
2. Hold down the **BATTERY RELEASE** button and pull out the battery from the ridge on its bottom part.



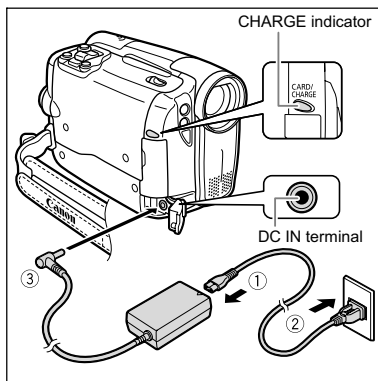
Charging the Battery Pack

1. Connect the power cord to the adapter.
2. Plug the power cord into a power outlet.
3. Open the front terminal cover and connect the power adapter to the camcorder's DC IN terminal.

The CHARGE indicator starts flashing. The indicator will stay on when the charging is completed.

To remove the power adapter:

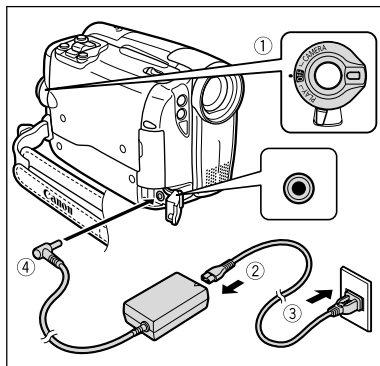
1. Disconnect the power adapter from the camcorder.
2. Unplug the power cord from the power outlet.
3. Disconnect the power cord from the adapter.



Using a Household Power Source

Connect to a household power source to use the camcorder without worrying about the battery power. You can keep the battery pack attached; the battery power will not be consumed.

1. Turn the **POWER** switch to **OFF**.
2. Connect the power cord to the power adapter.
3. Plug the power cord into a power outlet.
4. Open the front terminal cover and connect the power adapter to the camcorder's DC IN terminal.



- Turn off the camcorder before connecting or disconnecting the power adapter.
- Do not connect any products that are not expressly recommended to the camcorder's DC IN terminal or to the power adapter.
- You may hear some noise from the power adapter during use. This is not a malfunction.
- Do not disconnect and reconnect the power cord while charging a battery pack. Charging may stop. The battery pack may not be charged correctly even if the CHARGE indicator is continuously on. The battery pack may also not be charged correctly when a power outage occurs during charging. Remove the battery pack and attach it back to the camcorder.



- When the power adapter or battery pack is defective, the CHARGE indicator flashes rapidly (at about 2 flashes/second) and the charging stops.
- The CHARGE indicator informs you about the charge status.
 - 0-50%: Flashes once every second
 - More than 50%: Flashes twice every second
 - 100%: Continuously on

○ Charging, Recording and Playback Times

The following times are approximate and vary according to the charging, recording or playback conditions.


Battery Pack		BP-208DG
Charging Time		165 min.
Max. Recording Time		
Viewfinder		150 min.
LCD	normal	150 min.
	bright	140 min.
Typical Recording Time*		
Viewfinder		85 min.
LCD	normal	85 min.
	bright	80 min.
Playback Time		175 min.

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

- 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. If the battery temperature goes outside this temperature range while charging, the CHARGE indicator will start flashing rapidly and the charging will stop.
- A lithium ion battery pack can be charged at any charge state. Unlike conventional battery packs, you do not need to completely use or discharge it before charging.
- To conserve battery power, turn off the camcorder instead of leaving it in record pause mode.
- We recommend that you prepare battery packs 2 to 3 times longer than you think you might need.

Step 2: Loading a Cassette

Use only videocassettes marked with the Mini DV logo.

1. Slide the **OPEN/EJECT**  switch and open the cassette compartment cover.

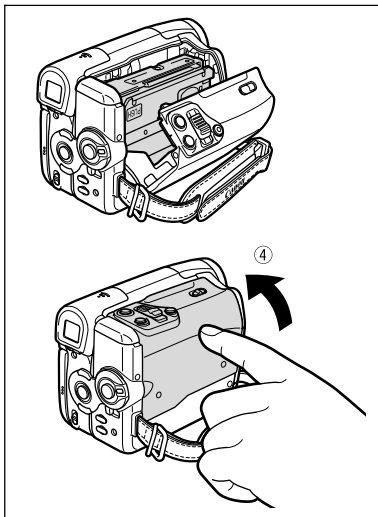
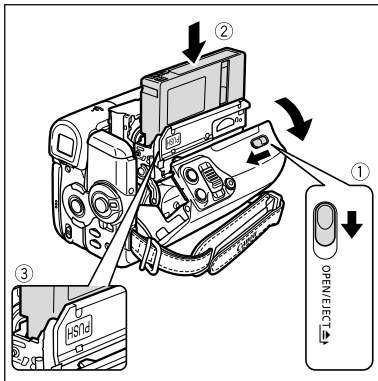
The cassette compartment opens automatically.

2. Load the cassette.

- Load the cassette with the window facing the grip belt.
- Unload the cassette by pulling it straight out.

3. Press the **(PUSH)** mark on the cassette compartment until it clicks.

4. Wait for the cassette compartment to retract automatically and close the cassette compartment cover.



○ Do not interfere with the cassette compartment while it is opening or closing automatically, or attempt to close the cover before the cassette compartment has fully retracted.

○ Be careful not to get your fingers caught in the cassette compartment cover.



If the camcorder is connected to a power source, cassettes can be loaded/unloaded even if the **POWER** switch is set to **OFF**.

Step 3: Inserting a Memory Card

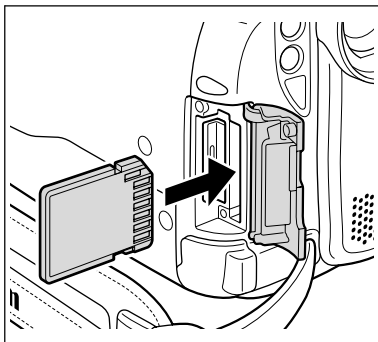
You can use commercially available  SD memory cards or MultiMediaCards (MMC) with this camcorder.

Inserting the Card

1. Set the **POWER** switch to **OFF**.
2. Open the cover.
3. Insert the memory card straight into the memory card slot and push it in until it clicks.
4. Close the cover.

If the memory card is not correctly inserted the cover will not close – do not forcefully close the cover. Verify that the memory card is inserted in the correct direction.

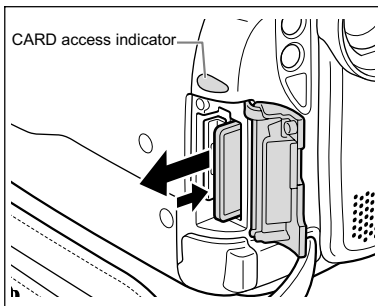
5. Turn on the camcorder.



Removing the Card

Do not forcefully remove the memory card without first pushing it in.

1. Set the **POWER** switch to **OFF**.
Make sure that the **CARD** access indicator is not flashing before you turn off the camcorder.
2. Open the cover.
3. Push the memory card to release it. Remove the memory card.
4. Close the cover.



- Before using them, make sure to initialize all memory cards with this camcorder (□ 84).
- Memory cards have front and back sides that are not interchangeable. Inserting a memory card facing the wrong direction can cause a malfunction of the camcorder.

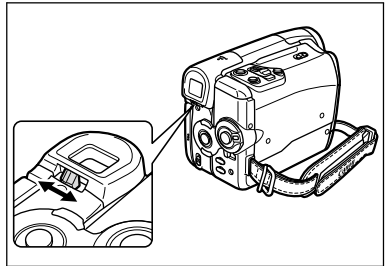


Proper operation cannot be guaranteed for all memory cards.

Step 4: Preparing the Camcorder

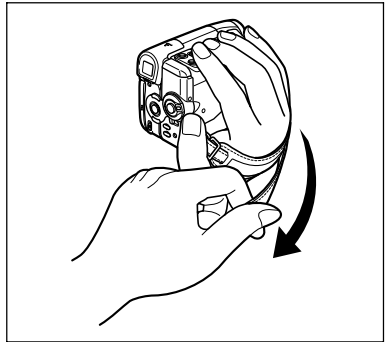
Adjusting the Viewfinder (Dioptric Adjustment)

1. Turn on the camcorder and keep the LCD panel closed.
2. Adjust the dioptric adjustment lever.



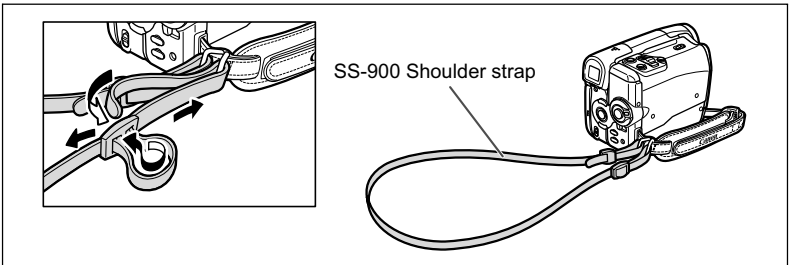
Fastening the Grip Belt

Adjust the grip belt so that you can reach the zoom lever with your index finger, and the start/stop button with your thumb.



Attaching the Shoulder Strap

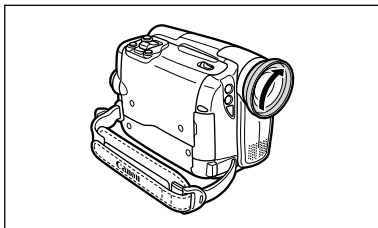
Pass the ends through the strap mount and adjust the length of the strap.



MVX460 Mounting the Wide Attachment

The WA-27 Wide Attachment gives you a wide perspective for indoor shots or panoramic views (0.75x). The wide attachment is for use at maximum wide-angle.

Screw the wide attachment fully into the lens filter thread.

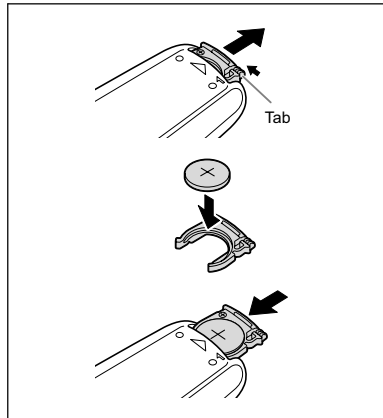


- Do not look directly at the sun or other strong light sources through the wide attachment. It could damage your eyesight.
- If you zoom to telephoto, the picture will not be in focus.
- The wide attachment may obstruct the remote sensor (the range of the wireless controller narrows), or may cause a shadow to appear on the picture when recording with the assist lamp.
- Filters cannot be used with the wide attachment.
- If dust accumulates on the wide attachment or on the camcorder lens, clean both lenses gently with a blower brush.
- Do not touch the lens to avoid smudges and fingerprints.
- Do not store the wide attachment in a humid place as it may mold.

Step 5: Using the Wireless Controller

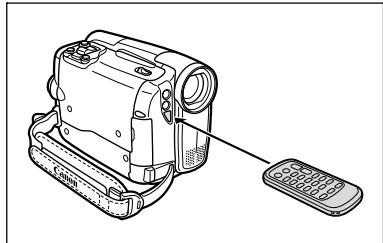
Inserting the Battery (Lithium Button Battery CR2025)

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

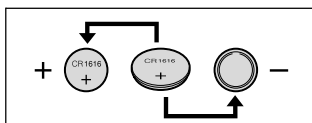


- The wireless controller may not work properly when the remote sensor is subjected to strong light sources or direct sunlight.
- If the wireless controller does not work, check if the remote sensor is set to [OFF] (OFF) (p. 67).
- When the camcorder cannot be operated with the wireless controller, or when it can only be operated at very close range, replace the battery.

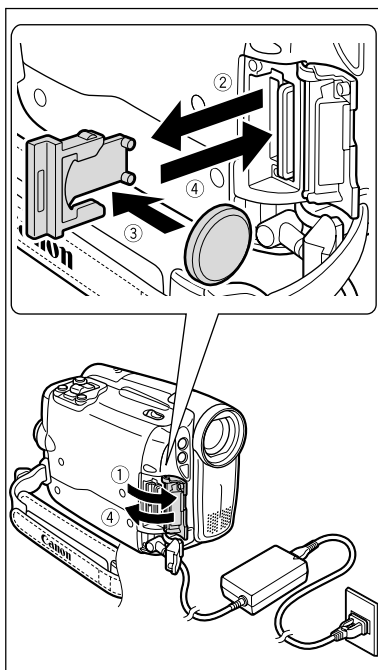
Step 6: Installing the Backup Battery


The backup battery (lithium button battery CR1616) allows the camcorder to retain the date, time (☐ 25) and other camcorder settings while the power source is disconnected. Connect a power source to the camcorder when replacing the backup battery to retain the settings.

1. Open the memory slot/backup battery compartment cover.
2. Pull out the backup battery holder using a flat screwdriver or a similar tool.
3. Insert the backup battery in the holder with the + side facing down.



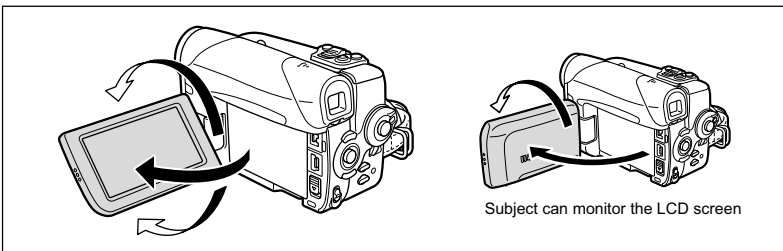
4. Insert the battery holder and push it in until it clicks, then close the cover.



The backup battery has a life span of about a year. “” flashes in red to inform you that it needs to be replaced.

Step 7: Adjusting the LCD Screen

Rotating the LCD Panel



Open the LCD panel 90 degrees.

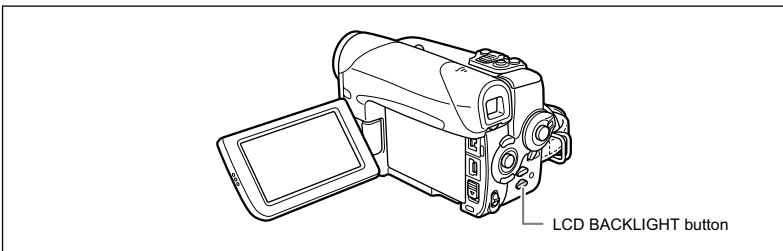
- You can rotate the panel downward by 90 degrees.
- You can rotate the panel by 180 degrees toward the lens (allowing the subject to monitor the LCD screen while you use the viewfinder).
- When the LCD screen is facing the subject, the LCD image will be reversed right-left and the subject will see a mirror image. In the LCD mirror mode, only the tape and card operation and the self-timer displays will appear on the LCD screen. All displays will appear normally on the viewfinder screen.



Rotating the panel by 180 degrees is also useful if you wish to include yourself when recording with the self-timer (□ 51).

LCD Backlight

You can switch the brightness of the LCD screen between normal and bright by pressing the LCD BACKLIGHT button. This is useful for outdoor recordings.



Press the LCD BACKLIGHT button.

The brightness changes with each press of the button.



- This setting does not affect the brightness of the recording or the viewfinder screen.
- When using a battery pack, the camcorder retains the setting even if you change the position of the **POWER** switch.
- The battery usage time shortens when the LCD screen is set brighter.

Step 8: Changing the Display Language

The language used in the camcorder displays and menu items can be changed. A different set of languages will be available with your camcorder, depending on the area where you acquired it.

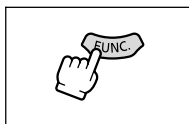
Language Set A	German, English, Spanish, French, Italian, Polish, Russian, Simplified Chinese, Japanese
Language Set B	English, Simplified Chinese, Traditional Chinese, Thai



1. Turn the **POWER** switch to **CAMERA** or **PLAY**.

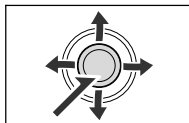
2. Press the **FUNC.** button to open the **FUNC.** menu.

The **FUNC.** menu will open. Continue the procedure with the joystick to open the setup menus.



3. With the joystick select (**▲▼**) the  icon and press (**⊕**).


4. Select (**▲▼**) the [**DISPLAY SETUP/**] menu and press (**⊕**). Then, select (**▲▼**) the [**LANGUAGE**] option and press (**⊕**).



5. Select (**▲▼**, **◀▶**) a language and press (**⊕**) to save the changes.

6. Press the **FUNC.** button to close the menu.



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

Step 9: Setting the Time Zone, Date and Time

Setting the Time Zone/Daylight Saving Time

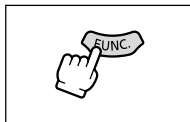
MENU
(63)



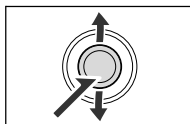
DATE/TIME SETUP

T.ZONE/DST PARIS

1. Turn the **POWER** switch to **CAMERA** or **PLAY**.
2. Press the **FUNC.** button to open the **FUNC.** menu.



3. With the joystick select ($\blacktriangle\blacktriangledown$) the icon and press (\oplus).
4. Select ($\blacktriangle\blacktriangledown$) the [DATE/TIME SETUP] menu and press (\oplus). Then, select ($\blacktriangle\blacktriangledown$) the [T.ZONE/DST] option and press (\oplus).



The time zone setting appears (see table on the next page). The default setting is Paris or Singapore depending on the region.

5. Select ($\blacktriangle\blacktriangledown$) your time zone and press (\oplus).

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

Setting the Date and Time

MENU
(63)

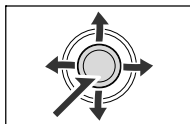


DATE/TIME SETUP

DATE/TIME 1. JAN. 2006
12:00AM

6. Select ($\blacktriangle\blacktriangledown$) the [DATE/TIME] option and press (\oplus).

A selection frame will be displayed around the date and the selection arrows around the day will flash.



7. With the joystick change ($\blacktriangle\blacktriangledown$) the day as required and move (\blacktriangleright) to the next field.

- The selection arrows will flash around the next field of the date/time.
- Set the month, year, hours and minutes in the same way.
- If you do not need to change all settings, you can use the joystick to move ($\blacktriangleleft\blacktriangleright$) to the specific setting you want to change.

8. Press (\oplus) to start the clock.

9. Press the **FUNC.** button to close the menu.



Time Zones

Once you have set your time zone, date and time, you do not need to reset the clock each time you travel to another time zone. Just set the time zone to the one of your destination, and the camcorder automatically adjusts the clock.



Time Zones and Difference from GMT/UTC.

London	GMT/UTC	Wellington (WELLGTN)	+12
Paris	+1	Samoa	-11
Cairo	+2	Honolulu	-10
Moscow	+3	Anchorage	-9
Dubai	+4	Los Angeles (L.A.)	-8
Karachi	+5	Denver	-7
Dacca	+6	Chicago	-6
Bangkok	+7	New York	-5
Singapore	+8	Caracas	-4
Tokyo	+9	Rio de Janeiro (RIO)	-3
Sydney	+10	Fernando de Noronha (FERNANDO)	-2
Solomon	+11	Azores	-1

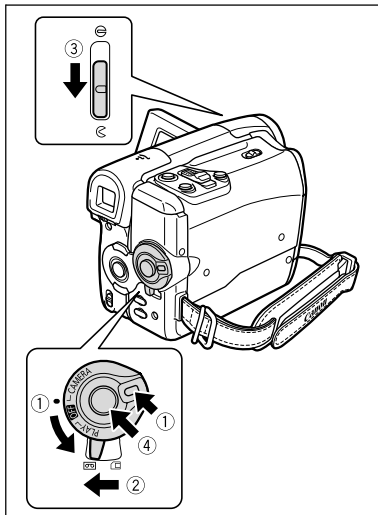
Recording Movies on a Tape

Before You Begin Recording


Make a test recording first to check if the camcorder operates correctly. If necessary, clean the video heads (□ 120).

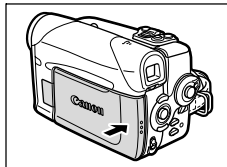
1. Holding the lock button on the **POWER** switch pressed down, set the switch to **CAMERA**.
2. Set the **TAPE/CARD** switch to .
3. Open the lens cover (move the lens cover switch down to .
4. Press the start/stop button to begin recording.

Press the start/stop button again to pause recording.



When You Have Finished Recording

1. Turn the **POWER** switch to **OFF**.
2. Close the lens cover (move the lens cover switch to .
3. Unload the cassette.
4. Disconnect the power source.
5. Close the LCD panel.



- Wait until the tape counter stops completely before you start recording.
- When you do not remove the cassette, you can record the next scene without producing any noise or blank sections between the recordings even if you turn the camcorder off.
- Bright light may make it difficult to use the LCD screen. In such case, use the viewfinder instead.
- When recording near loud sounds (such as fireworks, drums or concerts), the sound may become distorted or may be recorded not in the actual sound level. This is not a malfunction.
- The camcorder enters the stop mode (■) after 4 minutes 30 seconds when left in record pause mode (● ||) to protect the tape and video heads. In stop mode, press the start/stop button to start recording.

- When powered by a battery pack, the camcorder shuts off to save power (67) if left without any operation for 5 minutes. Approximately 30 seconds before the camcorder shuts off the message “ ⚠ AUTO POWER OFF” will appear. If the camcorder shuts off, turn the **POWER** switch to **OFF** and back on again.
- About the LCD and viewfinder screen: The screens are produced with 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 or green dots. This has no effect on the recorded image and does not constitute a malfunction.

Screen Displays during Recording



① Time Code

Indicates the recording time in hours, minutes and seconds.

② Remaining tape

Indicates the remaining time of the tape in minutes. “55min” moves during recording. “END” flashes when the tape reaches the end.

- When the time left is less than 15 seconds, the remaining tape time may not appear.
- Depending on the type of the tape, the indication may not be displayed correctly.

③ Recording reminder

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

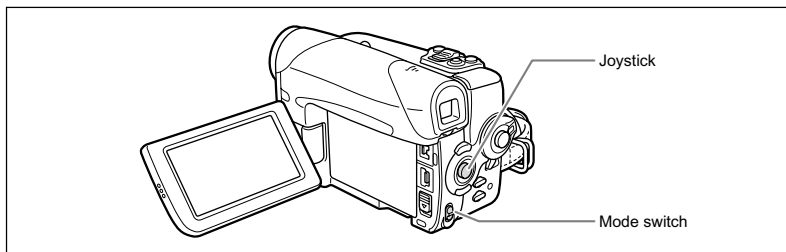
④ When “ ” flashes

“ ” flashes in red when the lithium button battery is not installed, or when it needs replacing.

Reviewing and Searching when Recording

You can review the last few seconds of your recording (record review). You can also play back the tape to locate the point where you wish to begin recording (record search).

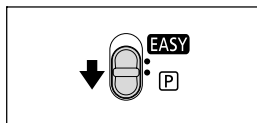
Available only in the **CAMERA** mode.



Record Review

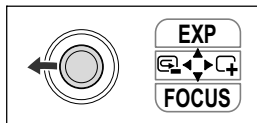
In record pause mode:

1. Set the mode switch to **P**.



2. If the joystick guide does not appear on screen, press (⊕) to display it.
3. Push the joystick (◀) momentarily towards and release it.

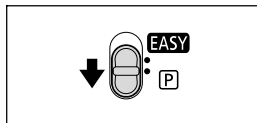
The camcorder rewinds the tape, plays back the last few seconds, and returns to record pause mode.



Record Search

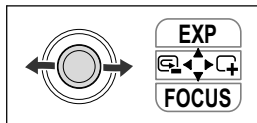
In record pause mode:

1. Set the mode switch to **P**.








2. If the joystick guide does not appear on screen, press (⊕) to display it.
3. Hold the joystick pushed (◀) towards to search back towards the beginning of the recording or pushed (▶) towards to search forward towards the end of the recording.

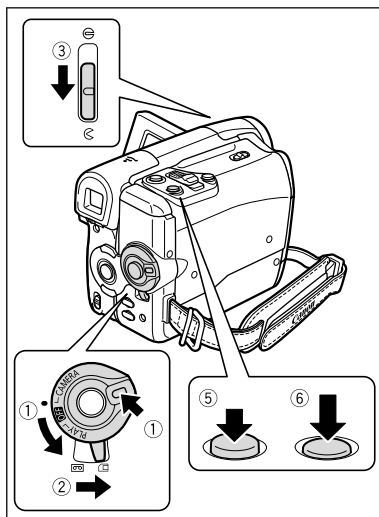
- Release the joystick at the point where you wish to begin recording.
- The camcorder returns to record pause mode.








Recording on a Memory Card

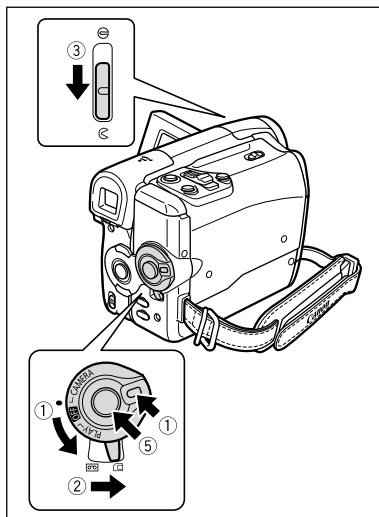
Recording Still Images on a Memory Card

1. Holding the lock button on the **POWER** switch pressed down, set the switch to **CAMERA**.
2. Set the **TAPE/CARD** switch to .
3. Open the lens cover (move the lens cover switch down to ) .
4. Change the size and quality of the still images, as necessary ( 75).
The default image size and quality is L 1152x864.
5. Press the **PHOTO** button halfway.
 - “” turns green when the focus is adjusted and a green frame appears. The beep sounds.
 - When you press the **PHOTO** button on the wireless controller the still image is recorded immediately.
6. Press the **PHOTO** button fully.
 - “” and the focusing frame disappear and you hear a shutter sound.
 - The **CARD** access indicator flashes.



Recording Movies on a Memory Card

1. Holding the lock button on the **POWER** switch pressed down, set the switch to **CAMERA**.
2. Set the **TAPE/CARD** switch to .
3. Open the lens cover (move the lens cover switch down to ) .
4. Select the movie size ( 75).
Set a size other than the default  [ **MOVIE REC OFF**].
5. Press the **start/stop** button to begin recording.
 - The **CARD** access indicator flashes.
 - Press the **start/stop** button to stop recording.





Do not turn off the camcorder, change the position of the TAPE/CARD switch, disconnect the power source, open the memory card cover or remove the memory card while the CARD access indicator is flashing. Doing so could result in data damage.



○ **About the focusing frame:**

- The camcorder automatically selects the appropriate focusing frames out of the 9 focusing frames, allowing to focus on subjects out of the center (□ 78).
- If the subject is not suitable for autofocus, “●” turns yellow. Keep the PHOTO button pressed halfway and adjust the focus manually with the joystick (◀▶).
- When recording a still image (step 5 above), the image may appear out of focus for a moment while the camcorder is focusing.
- When the subject is too bright, “OVEREXP.” starts flashing. In such case, use the optional FS-H27U ND filter.
- Sound for movies recorded on the memory card will be monaural.
- We recommend using a memory card with a transfer rate of more than 2 MB/sec., after initializing it with this camcorder. With memory cards not initialized with this camcorder, or after repeatedly recording and erasing the memory card, the writing speed may be slower and the recording may stop.
- When powered by a battery pack, the camcorder shuts off to save power (□ 67) if left without any operation for 5 minutes. Approximately 30 seconds before the camcorder shuts off the message “⚠ AUTO POWER OFF” will appear. If the camcorder shuts off, turn the **POWER** switch to **OFF** and back on again.

Screen Displays during Still Image Recording



① Still Image Quality and Size (75)

Indicates the image quality and the image size of the still image.

② Remaining Card Capacity for Still Images

- flashing in red: No card
 - in green: 6 or more images
 - in yellow: 1 to 5 images
 - in red: No more images
- The indication may not decrease even though a recording has been made, or may decrease by 2 images at once.
 - All indicators are displayed in green when a memory card is played back.

Card Access Display

“▶” appears to indicate that the camcorder is writing on the memory card.

Screen Displays during Movie Recording



① Movie size (75)

Indicates the movie size.

② Card Access Display

“▶” appears and the “ ” display moves to indicate that the camcorder is writing on the memory card.




③ Remaining Card Capacity for Movies

- Indicates the remaining time in hours and minutes. At less than 1 minute, the remaining time will be displayed in 10-second steps, at less than 10 seconds in 1-second steps.
- The indication varies depending on the recording condition. The actual remaining time may be longer or shorter than indicated.

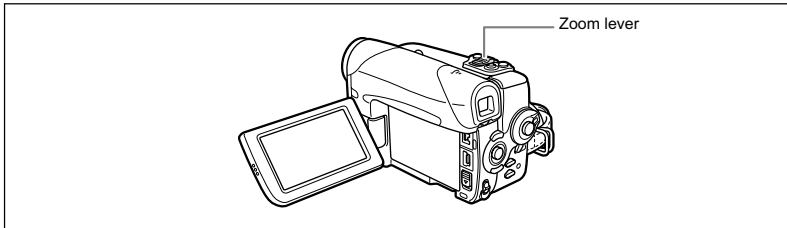
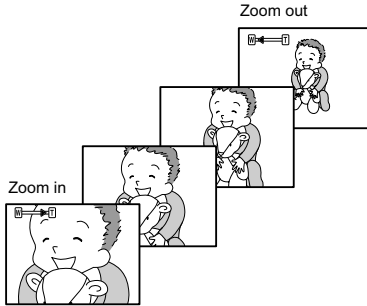
④ Movie recording time

Indicates the recording time of the movie in hours : minutes : seconds.

Zooming


The zoom is available in the **CAMERA** -  and **CAMERA** -  modes. When recording on the tape, in addition to the optical zoom you can also use the digital zoom ( 64).

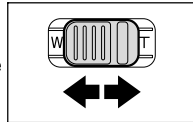
	MVX460/MVX450	MVX430
Optical zoom	20x	18x
Digital zoom	80x / 800x	72x / 720x



Optical Zoom

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

When operating the zoom from the camcorder you can also change the zoom speed ( 34).

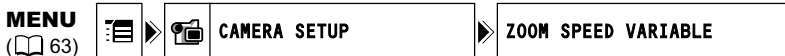


- You can also use the **T** and **W** buttons on the wireless controller. The zoom speed with the wireless controller will be the same as with the camcorder (when one of the fixed zoom speed levels is selected) or fixed at [SPEED 3] (when [VARIABLE] is selected).
- When the zoom speed is set to [VARIABLE], the zoom speed will be faster in the stop and record pause modes.
- Overusing the zoom feature when recording movies can result in recordings that may have an unsettled feel or cause discomfort on playback. Make effective use of the zoom.
- Keep at least 1 m to the subject. At wide-angle, you can focus on a subject as close as 1 cm.

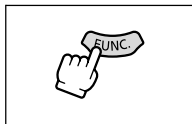
Selecting the Zoom Speed

When operating the zoom with the camcorder, you can set the zoom speed to variable or to one of 3 levels of fixed zoom speeds. When set to [VARIABLE], the zoom speed depends on how you activate the zoom lever – press softly for a slower zoom or press more strongly for a faster zoom.

Available in the **CAMERA**  and **CAMERA**  modes.

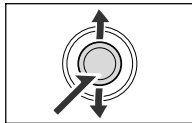


1. Press the **FUNC.** button to open the **FUNC.** menu.



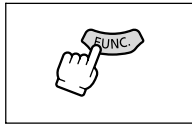
2. With the joystick select () the  icon and press ().


3. Select () the [CAMERA SETUP] menu and press (). Then, select () the [ZOOM SPEED] option and press ().



4. Select a setting option and press () to save the changes.

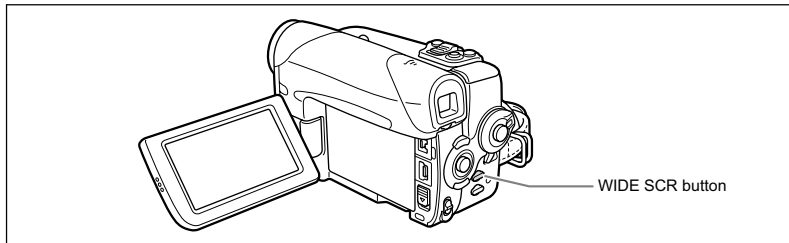
5. Press the **FUNC.** button to close the menu.



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

Widescreen TV Recording (16:9)

The camcorder uses the full width of the CCD providing high-resolution 16:9 recording. Available only in the **CAMERA** mode.



Press the WIDE SCR button.

- Pressing the WIDE SCR button will toggle between the widescreen (16:9) and 4:3 aspect ratios. In widescreen mode "WIDE" will appear.
- On the LCD screen: Widescreen video will display normally; video in 4:3 aspect ratio will appear with black side bars.
- On the viewfinder screen: Widescreen video will appear in the "letterbox" display; video in 4:3 aspect ratio will display normally.



- When you turn off the image stabilizer, you will get a larger horizontal angle of view.
- Select the [TV TYPE] according to the type of television you connect the camcorder to - wide (16:9) or normal (4:3) aspect ratios (□ 41). That will ensure that widescreen recordings are played back without distortions.

Tips for Better Recording

Holding the Camcorder

For maximum stability, grip the camcorder in your right hand and keep your right elbow pressed against your body. If necessary, support the camcorder with your left hand. Be careful that your fingers do not touch the microphone or lens.



For More Stability

Lean against a wall



Put the camcorder on a table



Kneel on one knee



Use a tripod



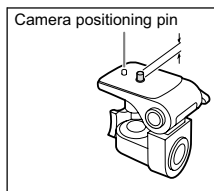
Lie on your elbow

Lighting

When recording outdoors, we recommend recording with the sun at your back.




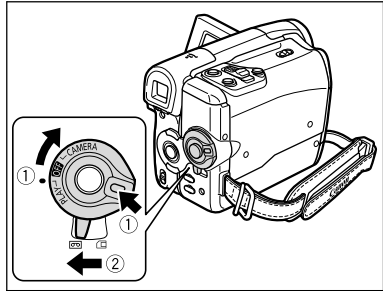
- When using a tripod, do not leave the viewfinder exposed to direct sunlight as it may melt (due to concentration of the light by the lens).
- Do not use tripods with fastening screws longer than 5.5 mm as it may damage the camcorder. The camcorder cannot be mounted on tripods with fixed (non-retractable) camera positioning pins.



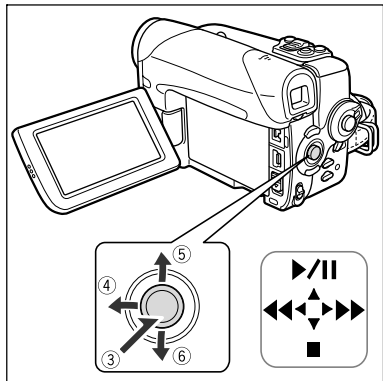
Playing Back a Tape

If the playback picture is distorted, clean the video heads using a Canon Head Cleaning Cassette or a commercially available digital video head-cleaning cassette (□ 120).

1. Holding the lock button on the **POWER** switch pressed down, set the switch to **PLAY**.
2. Set the TAPE/CARD switch to .

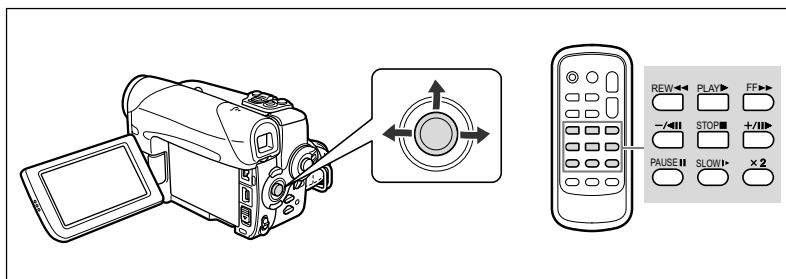


3. If the joystick guide does not appear on screen, press (⊕) to display it.
4. Push the joystick (◀) towards ◀◀ to rewind the tape.
5. Push the joystick (▲) towards ▶/|| to play back the tape.
Push (▲) again to pause the playback.
6. Push the joystick (▼) towards ■ to stop the playback.



- To use the viewfinder, close the LCD panel.
- About the screen display: During playback, the time code gives the hours, minutes, seconds and frames. The remaining tape time may not appear when the time left is less than 15 seconds.

Special Playback Modes



▶/|| (Playback Pause)

During normal playback, push the joystick (▲) towards ▶/|| or press the PAUSE || button on the wireless controller.

▶▶ (Fast Forward Playback) / ◀◀ (Rewind Playback)

Plays back the tape at 11.5 times the normal speed. During normal playback, hold the joystick pushed (▶) towards ▶▶ or pushed (◀) towards ◀◀. You can also press and hold the FF ▶▶ or REW ◀◀ button on the wireless controller instead. Release the joystick or wireless controller button to return to normal playback.

-/◀|| (Reverse Playback)

Press the button on the wireless controller during normal playback. Press the PLAY ▶ button on the wireless controller or push the joystick (▲) towards ▶/|| to return to normal playback.

+/||▶ (Frame Advance) / -/◀|| (Frame Reverse)

Plays back frame-by-frame. Press the button on the wireless controller repeatedly during playback pause. Press and hold it to play back continuous frame advance/frame reverse. Press the PLAY ▶ button on the wireless controller or push the joystick (▲) towards ▶/|| to return to normal playback.

SLOW ▶ (Slow Forward)/(Slow Reverse)

Plays back at about 1/3 the normal speed. Press the button on the wireless controller during normal or reverse playback. Press the PLAY ▶ button on the wireless controller or push the joystick (▲) towards ▶/|| to return to normal playback.


x2 (Forward x2 Playback)/(Reverse x2 Playback)

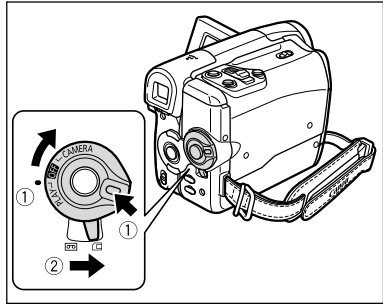
Plays back at 2 times the normal speed. Press the x2 button on the wireless controller during normal or reverse playback. Press the PLAY ▶ button on the wireless controller or push the joystick (▲) towards ▶/|| to return to normal playback.



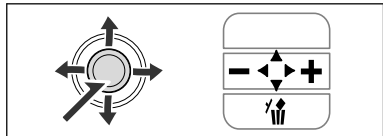
- There is no sound during special playback.
- The picture may become distorted during some special playback modes.
- The camcorder stops the tape automatically after 4 minutes 30 seconds in playback pause mode to protect the tape and video heads.

Playing Back a Memory Card

1. Holding the lock button on the **POWER** switch pressed down, set the switch to **PLAY**.
2. Set the TAPE/CARD switch to .












3. If the joystick guide does not appear on screen, press () to display it.
4. Push the joystick () to move between images.

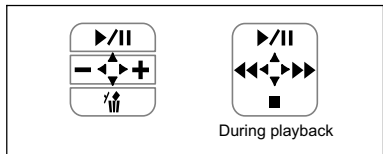



To play back a movie on the memory card:

5. Push the joystick () towards .

- Push the joystick () towards  again to pause/resume the playback.
- Push the joystick () towards  to stop the playback.

- When the movie playback ends or is stopped, the first frame of the movie appears as a still image.
- Push the joystick () towards  or  or press the REW /FF  button on the wireless controller for 8x fast forward/fast rewind playback.

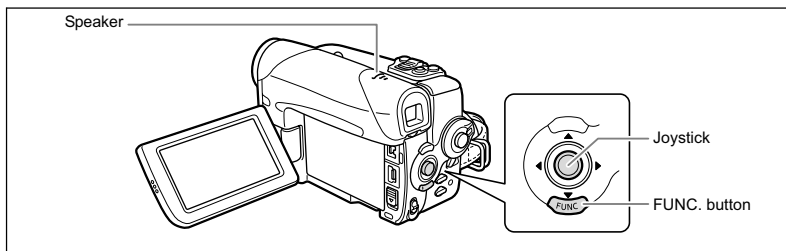


- Images not recorded with this camcorder, uploaded from a computer (except the sample images , 61), edited on a computer and images whose file names have been changed may not be played back correctly.
- Do not turn off the camcorder, change the position of the TAPE/CARD switch, disconnect the power source, open the memory card cover or remove the memory card while the CARD access indicator is flashing. Doing so could result in data damage.

Adjusting the Volume

When you use the LCD screen for playback, the camcorder plays back the sound using the built-in speaker. The sound will be muted when the LCD panel is closed.

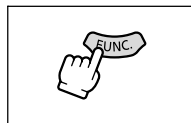
Available in the **PLAY** (video) and **PLAY** (photo) modes.



FUNC.
(book 63)

 **SPEAKER VOLUME**

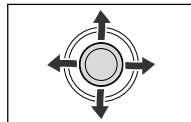
1. Press the **FUNC.** button to open the **FUNC.** menu.



2. With the joystick select (**▲▼**) the speaker volume icon.

3. Adjust (**◀▶**) the volume as required.

4. Press the **FUNC.** button to save the setting and close the menu.



If you turn off the volume completely the volume display will change to "**OFF**".



When the stereo video cable is connected to the AV terminal, the speaker sound will be muted.

Playing Back on a TV Screen

Selecting the Type of TV

During playback, set the [TV TYPE] option according to the TV set to which you connect the camcorder.

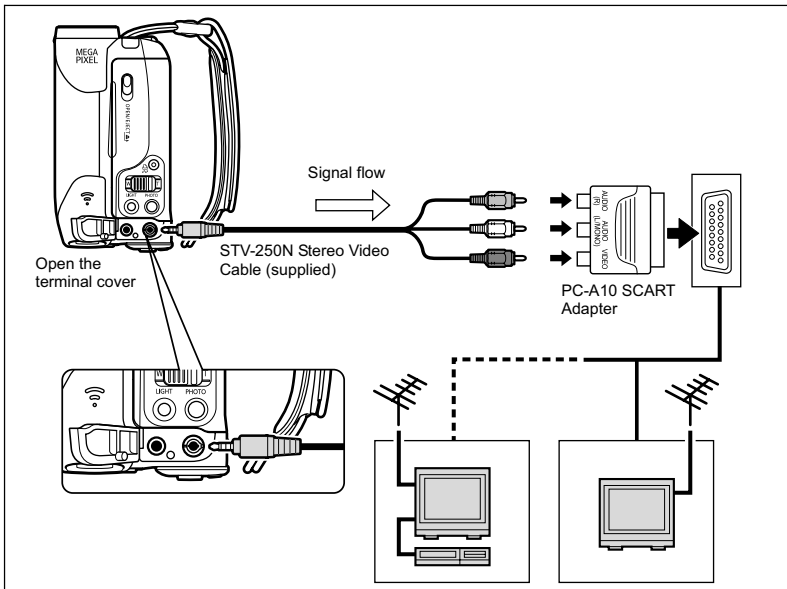
Available only in the **PLAY** mode.



1. Press the **FUNC.** button to open the **FUNC.** menu.
2. With the joystick select (**▲▼**) the icon and press (**⊕**).
3. Select (**▲▼**) the [VCR SETUP] menu and press (**⊕**). Then, select (**▲▼**) the [TV TYPE] option and press (**⊕**).
4. Select a setting option and press (**⊕**) to save the changes.
 - [WIDE TV]: TV sets with 16:9 aspect ratio.
 - [NORMAL TV]: TV sets with 4:3 aspect ratio.
5. Press the **FUNC.** button to close the menu.

TVs with SCART Terminal

Refer also to the TV or VCR instruction manual.



1. Turn off all devices before starting the connections.
2. Connect the PC-A10 SCART Adapter to the TV or VCR's terminals.

3. Connect the stereo video cable to the camcorder's AV terminal and the terminals on the SCART Adapter.

Connect the white plug to the white AUDIO terminal L (left), the red plug to the red AUDIO terminal R (right) and the yellow plug to the yellow VIDEO terminal.

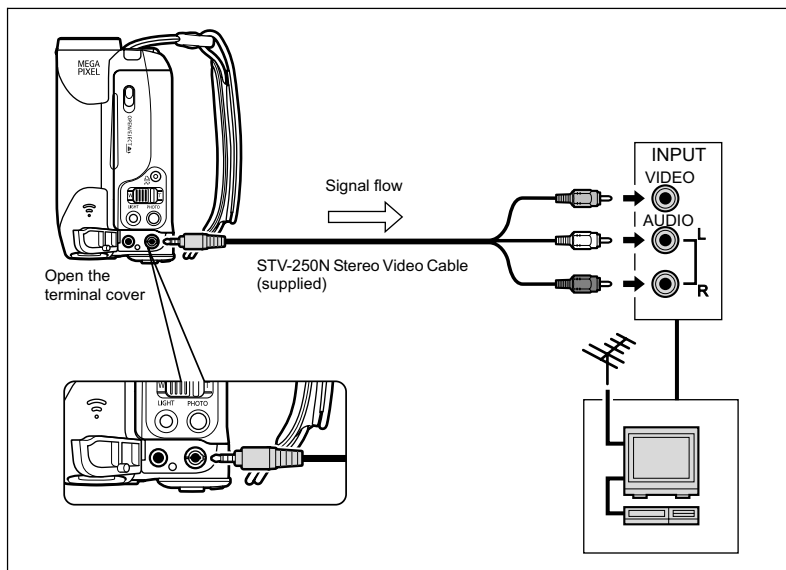
4. If connecting to a TV, set the input selector to VIDEO. If connecting to a VCR, set the input selector to LINE.



The supplied PC-A10 SCART Adapter is for output only. For analog line-in recording or analog-digital conversion, please use a SCART Adapter with input capability (commercially available).

TVs without SCART terminal

Refer also to the TV or VCR instruction manual.



1. Turn off all devices before starting the connections.
2. Connect the stereo video cable to the camcorder's AV terminal and the audio terminals on the TV/VCR.

Connect the white plug to the white AUDIO terminal L (left), the red plug to the red AUDIO terminal R (right) and the yellow plug to the yellow VIDEO terminal.

3. If connecting to a TV, set the input selector to VIDEO. If connecting to a VCR, set the input selector to LINE.



- We recommend powering the camcorder from a household power source.
- When the stereo video cable is connected to the AV terminal, the speaker sound will be muted.

Using the Recording Programs



EASY Easy mode

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



E

P-Recording programs

P Program AE (46)

In Program AE mode, you can point and shoot as in Easy mode, however, you have the option of changing some settings.



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.

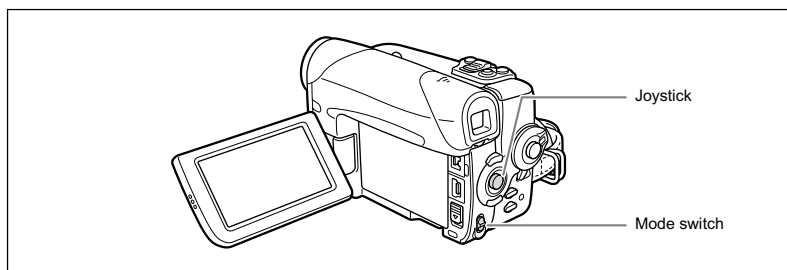


Sunset

Use this mode to record sunsets in vibrant colors.



Selecting the Recording Program

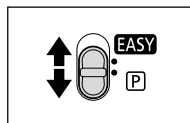


Available only in the **CAMERA** (📷) and **CAMERA** (📹) modes.

Set the mode switch to the desired position.

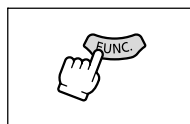
EASY: Easy (full automatic) recording mode.

P: Program AE, Portrait, Sports, Night, Snow, Beach, Sunset, Spotlight, or Fireworks can be selected (📖 43).

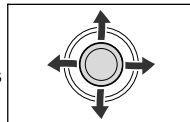


To select a recording program after setting the mode switch to **P**:

1. Press the FUNC. button to open the FUNC. menu.

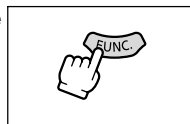


2. With the joystick select (▲▼) the recording programs icon.



3. Select (◀▶) the recording program from the options on the bottom bar.

4. Press the FUNC. button to save the setting and close the menu.




The symbol of the selected recording program appears.



- 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 to telephoto.
 - 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 (📖 48).
 - The digital zoom cannot be used with this recording program.


- 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:

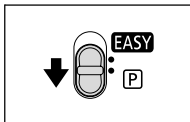
To avoid camcorder shake, we recommend using a tripod. Use a tripod when recording in **CAMERA**  mode as the shutter speed slows down.

P Using the Program AE Mode



The camcorder automatically adjusts the shutter speed and exposure according to the brightness of the subject. With the **P** Program AE recording program, you can point and shoot as in **EASY** mode, however, you have the option of changing some settings.

Available only in the **CAMERA**· and **CAMERA**· modes.


Set the mode switch to **P** and select the [PROGRAM AE] recording program ( 44).



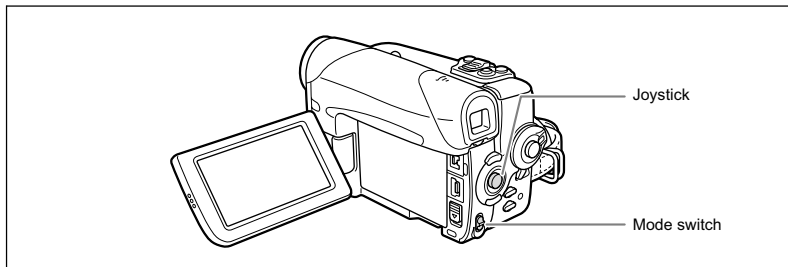
If the optimal exposure cannot be obtained, try the following actions.

- Manually adjust the exposure ( 47).
- Use the LED light ( 50).




Adjusting the Exposure Manually

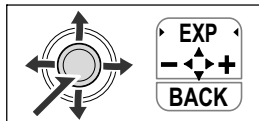
Adjust the exposure when a backlit subject becomes underexposed, or overexposed due to bright light. Exposure cannot be adjusted in the  Fireworks recording program.

Available only in the  and  modes.



Exposure Lock





1. Set the mode switch to .
2. If the joystick guide does not appear on screen, press  to display it.
3. Push the joystick () towards [EXP] to enter the exposure lock mode.



- [EXP] on the joystick guide will be displayed in light blue and the exposure adjustment indicator and the neutral value "±0" appear on the screen.
- When you operate the zoom during exposure lock, the brightness of the image may change.

Exposure Adjustment

During exposure lock:

4. **Adjust ( ) the brightness of the image as necessary.**
To return to automatic exposure, push the joystick () towards [EXP] once more. The exposure adjustment indicator will disappear and [EXP] will turn white again.
5. **Push the joystick () towards [BACK] to save the exposure setting.**
 - When you operate the zoom during exposure lock, the brightness of the image may change.
 - The adjustment range depends on the brightness at the time you locked the exposure.
 - The manual exposure setting will reset to auto exposure when you turn the camcorder off or change the recording program.

Adjusting the Focus Manually

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

Reflective surfaces



Subjects with low contrast or without vertical lines



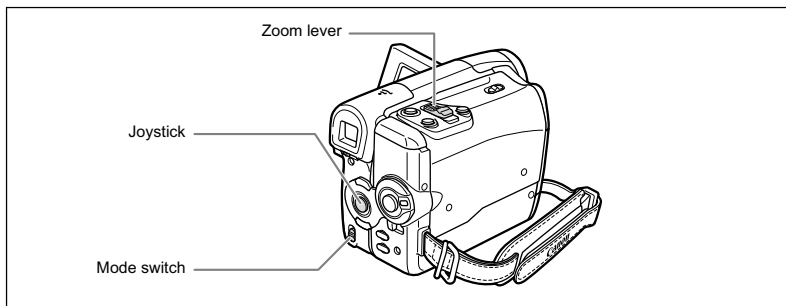
Fast Moving Subjects



Through dirty or wet windows



Night Scenes



Available only in the **CAMERA**  and **CAMERA**  modes.

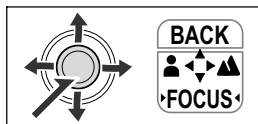
1. Set the mode switch to **P**.

2. Adjust the zoom.






3. If the joystick guide does not appear on screen, press  to display it.

4. Push the joystick () towards **[FOCUS]** to activate the manual focus.

[FOCUS] on the joystick guide will be displayed in light blue and "MF" appears on the screen.



5. Adjust () the focus as necessary.

- Push the joystick () towards  for a farther focal distance or push it () towards  for a closer focal distance.
- To return to autofocus, push the joystick () towards **[FOCUS]** once more. "MF" will disappear and [FOCUS] will turn white again.

6. Push the joystick () towards **[BACK]** to save the focus adjustment.



- The setting resets to autofocus when you set the mode switch to **EASY**.
- 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.

Available only in the  and  modes.

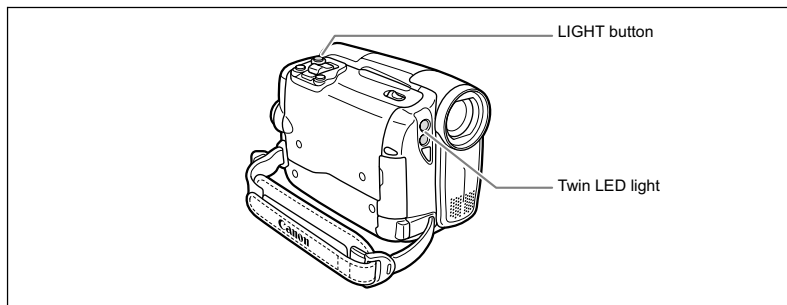
1. **If the joystick guide does not appear on screen, press (⬇️) to display it.**
2. **Keep the joystick pushed (⬇️) towards [FOCUS] for more than 2 seconds.**
At first, "MF" will appear on the screen and then it will be replaced by the "∞" symbol.
3. **Push the joystick (⬆️) towards [BACK] to save the focus adjustment.**



In the infinity focus mode: If you operate the zoom or the joystick (⬅️➡️) or if you turn the camcorder off, the infinity focus will be canceled and the camcorder will return to manual focus.


Using the LED Light

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



Available only in the **CAMERA**  and **CAMERA**  modes.

Press the LIGHT button.

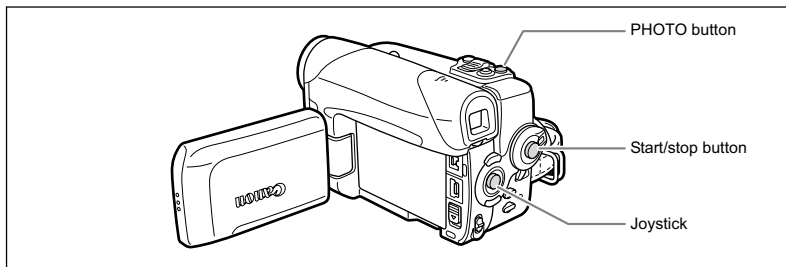
- “” appears on the screen.
- The LED light turns on and off with each press of the button.



- Do not point the LED light at persons while they are driving.
- Do not look at the LED light for a long time.
- Do not use the LED light close to people's eyes.

Using the Self-Timer

The self-timer can be used for recording movies and still images.



Available only in the **CAMERA**  and **CAMERA**  modes.

When recording movies:



1. Open the **FUNC.** menu and select (▲▼) the self timer icon.

2. Set (◀▶) it to [SELF TIMER ON] and close the menu.

"⌚" appears.

3. Press the start/stop button.

The camcorder starts recording after a 10-second countdown (2 seconds when using the START/STOP button of the wireless controller). The countdown appears on the screen.

When recording still images:



1. Open the **FUNC.** menu and select (▲▼) the drive mode icon.


2. Select (◀▶) the [SELF TIMER] option and close the menu.

"⌚" appears.

3. Press the **PHOTO** button, first halfway to activate the autofocus and then fully.

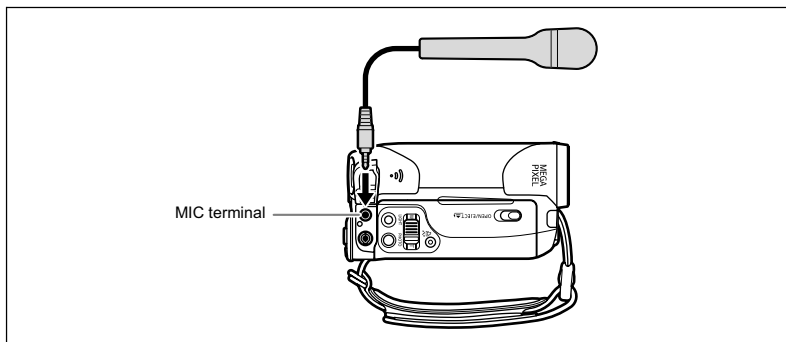
The camcorder will record the image after a 10-second countdown (2 seconds when using the PHOTO button of the wireless controller). The countdown appears on the screen.




- To cancel the self-timer, select the [SELF TIMER OFF] option (or a different drive mode in **CAMERA**  mode). Once the countdown has begun, you can also press the start/stop button (when recording movies) or the PHOTO button fully (when recording still images) to cancel the self-timer.
- The self-timer will be canceled when you turn off the camcorder or change the position of the TAPE/CARD switch.


Using an External Microphone

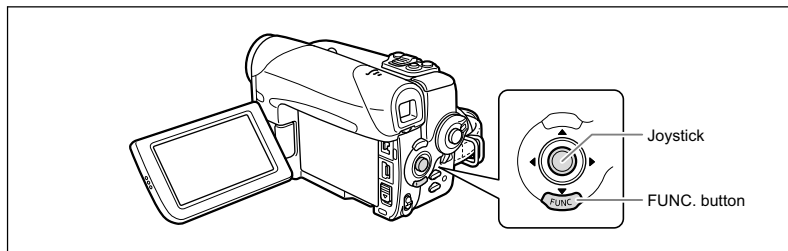
You can connect an external microphone to the MIC terminal. Use commercially available condenser microphones with their own power supply.



- You can connect almost any stereo microphone equipped with a $\varnothing 3.5$ mm plug but the audio level will be different than with the built-in microphone.
- When an external microphone is connected the wind screen setting will automatically reset to [OFF ].

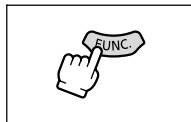
Changing the Settings with the FUNC. Button

The camcorder's functions and settings are controlled from a series of menus that appear when you press the FUNC. button. Most basic functions appear on the first menu screen - the FUNC. menu. For more advanced settings you have to open the setup menus by selecting the  [MENU] option from the FUNC. menu ([□ 63](#)). For menu items, see *List of Menu Items (FUNC.)* ([□ 54](#)).

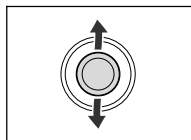


1. Press the FUNC. button.

- The FUNC. menu appears.
- The symbols of the current settings are displayed.

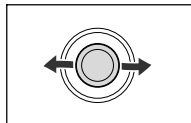


2. With the joystick select (▲▼) the icon of the function you want to change.



3. Select (◀▶) a setting option from the bottom bar.

With some settings, you will need to press (⊕) or make further selections with the joystick. In such cases, a joystick icon (next to the bottom bar) or small arrows (around the setting option) will be displayed as an additional operation guide.



4. Press the FUNC. button to save the setting and close the menu.



- Pressing the FUNC. button at any time closes the menu.
- The menu will not appear when you press the FUNC. button while recording movies on the tape or memory card.
- Items that are not available appear grayed out.

List of Menu Items (FUNC.)

Available menu items vary depending on the operation mode. Default settings are in boldface text. For details on each function, see the reference page.

Menu Items	Setting Options					
Recording programs ¹	P (PROGRAM AE), (PORTRAIT), (SPORTS), (NIGHT), (SNOW), (BEACH), (SUNSET), (SPOTLIGHT), (FIREWORKS)	<input type="radio"/>	<input type="radio"/>			43
White balance	(AUTO), (DAYLIGHT), (TUNGSTEN), (SET)	<input type="radio"/>	<input type="radio"/>			55
Image effect	(IMAGE EFFECT OFF), (VIVID), (NEUTRAL), (SOFT SKIN DETAIL)	<input type="radio"/>	<input type="radio"/>			57
Self Timer	(SELF TIMER OFF), (SELF TIMER ON)	<input type="radio"/>				51
Drive mode	<input type="checkbox"/> (SINGLE), (CONT.SHOOT.), (HISPEED CONT.SHOOT.), (AEB), (SELF TIMER)			<input type="radio"/>		79, 51
Digital Effects	(D.EFFECT OFF), (FADER), (EFFECT), (CARD MIX)	<input type="radio"/>				58
	(D.EFFECT OFF), (FADER), (EFFECT)		<input type="radio"/>			
	(D.EFFECT OFF), (BLK&WHT)			<input type="radio"/>		
Still image recording	(STILL IMG REC OFF), (S FINE/640x480), (S NORMAL/640x480)	<input type="radio"/>				77
Movie size	(320x240), (160x120)		<input type="radio"/>			75
	(MOVIE REC OFF), (320x240), (160x120)			<input type="radio"/>		
Still image quality	(S FINE/640x480), (S NORMAL/640x480)		<input type="radio"/>			96
Still image size/ quality	L (1152x864), S (640x480)					75
	(SUPER FINE), (FINE), (NORMAL)			<input type="radio"/>		
Speaker volume		<input type="radio"/>		<input type="radio"/>		40
Recording pause ³	-		<input type="radio"/>			87, 89
End search	-		<input type="radio"/>			72
Image erase	-			<input type="radio"/>	²	82
Slideshow	-				<input type="radio"/>	81
Image protection	-			<input type="radio"/>	²	83
Print order	-				<input type="radio"/>	102
Transfer order	-				<input type="radio"/>	109
Menu	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	63

¹ This menu item will not appear in **EASY** mode.

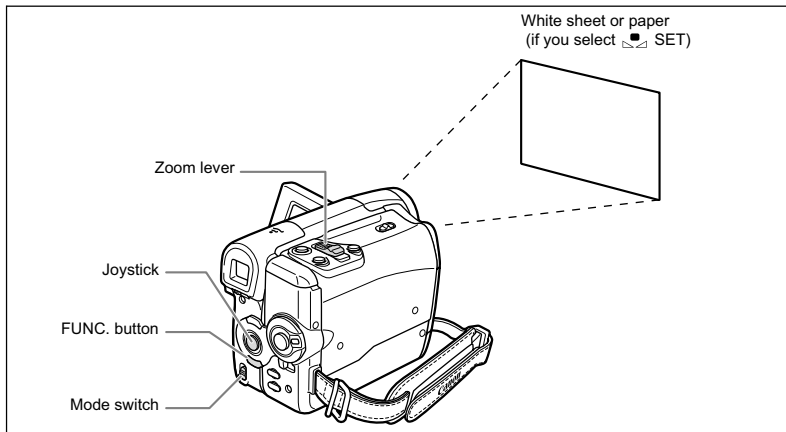
² When recording still images on the card with the drive mode set to [SINGLE] or [SELF TIMER], this setting option appears if you press the FUNC. button while reviewing the image immediately after recording it.

³ **MX460/MX430** only

Setting the White Balance

You can use the preset modes to reproduce colors more accurately, or set a custom white balance to obtain the optimal setting.

AWB AUTO	Settings are automatically set by the camcorder.
☀ DAYLIGHT	For recording outdoors on a bright day.
⚡ TUNGSTEN	For recording under tungsten and tungsten type (3-wavelength) fluorescent lighting.
📷 SET	Use the custom white balance setting to make white subjects appear white under colored lighting.



Available only in the **CAMERA** (📷) and **CAMERA** (📷) modes.

FUNC.
(📖 53)








1. Set the mode switch to **[P]**.
2. Press the **FUNC.** button to open the **FUNC.** menu.
3. With the joystick select (**▲▼**) the white balance icon.
4. Select (**◀▶**) the white balance setting from the options on the bottom bar.

If you select a white balance setting other than **📷 [SET]**, continue directly to step 6.

To set the custom white balance when you select **📷 [SET]**:





5. 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 step 6 is completed.
 - “📷” flashes and stops flashing when the adjustment is completed.
6. Press the **FUNC.** button to save the setting and close the menu.



- Use the [AUTO] setting for normal outdoor scenes.
- If the colors on screen do not look natural with one of the preset modes, use the [AUTO] or  [SET] settings.
- The camcorder retains the custom white balance setting even if you turn it off.
- When you want to use a previously made  [SET] setting, after selecting  [SET] in step 4, press the FUNC. button without pressing ().
- When you have set the custom white balance:
 - Depending on the light source, "" may keep flashing. The result will still be better than with the auto setting.
 - Reset the white balance when the lighting condition changes.
 - Turn off the digital zoom.
- 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 or certain types of fluorescent lights

Selecting an Image Effect

You can record with different saturation and contrast color effects.




 IMAGE EFFECT OFF	Records with no effect.
 VIVID	Emphasizes the contrast and color saturation to record in crisp colors.
 NEUTRAL	Tones down the contrast and color saturation to record in neutral hues.
 SOFT SKIN DETAIL	Softens the details in the skin tone area for a more complimentary appearance.

Available only in the  and  modes.



 53



1. Set the mode switch to .
2. Press the FUNC. button to open the FUNC. menu.
3. With the joystick select () the image effects icon.
4. Select () the image effect from the options on the bottom bar.
5. Press the FUNC. button to save the setting and close the menu.

The symbol of the current setting is displayed.












[SOFT SKIN DETAIL]: To obtain the best effect, use this function when recording a person in close-up. Note that areas similar to the skin color may lack in detail.

Using Digital Effects

The Digital Effects functions include faders, effects and Card Mix.








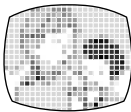









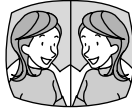
Faders (📖 60)

Begin or end scenes with a fade to or from black.

<p>1 Fade Trigger (FADE-T)</p> 	<p>2 Wipe (WIPE)</p> 
<p>3 Corner Wipe (CORNER)</p> 	<p>4 Jump (JUMP)</p> 
<p>5 Flip (FLIP)</p> 	<p>6 Puzzle (PUZZLE)</p> 
<p>7 Zigzag (ZIGZAG)</p> 	<p>8 Beam (BEAM)</p> 
<p>9 Tide (TIDE)</p> 	

Effects (61)





Add flavor to your recordings.

 Black and White (BLK & WHT) 	 Sepia (SEPIA) 	 Art (ART) 
 Mosaic (MOSAIC) 	 Ball (BALL) 	 Cube (CUBE) 
 Wave (WAVE) 	 Color Mask (COLOR M.) 	 Mirror (MIRROR) 

Card Mix (61)

You can combine still images from the card with your live video and record on the tape to achieve interesting effects.

The availability of the various Digital Effects depends on the operation mode.

			 **		
	Movies	Still Images*			
Faders	○	×	○	×	×
Effects	○	×	○	[BLK & WHT] only	×
Card Mix	○	×	×	×	×

○ : Available × : Not available

* When recording simultaneously on the tape and memory card.

** Only when the TV type is set to [NORMAL TV].

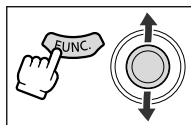
Selecting a Fader

Available only in the **CAMERA**  and **PLAY**  modes. When recording, set the mode switch to **P**.

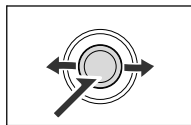
FUNC.
 53



1. Open the **FUNC.** menu and select (**▲▼**) the digital effects icon.

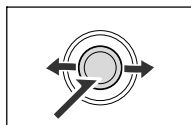


2. Select (**◀▶**) the **[FADER]** option and press (**⊕**).



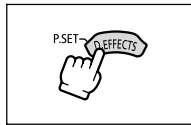
3. Select (**◀▶**) a fader, press (**⊕**) and close the menu.

- While selecting the fader, it will be demonstrated on the current screen.
- After closing the menu the symbol of the selected fader will appear on screen.



4. Press the **D.EFFECTS** button.

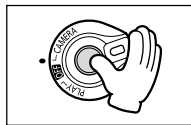
- The symbol changes to green.
- Pressing the **D.EFFECTS** button again deactivates the fader.



CAMERA  mode:

5. **Fade in:** Press the start/stop button in record pause mode.

Fade out: Press the start/stop button in record mode.

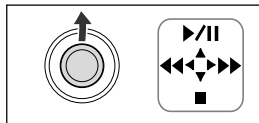


PLAY  mode:




5. If the joystick guide does not appear on screen, press (**⊕**) to display it.

6. **Fade in:** In playback pause mode, push the joystick (**▲**) towards **▶/||**.

Fade out: During playback, push the joystick (**▲**) towards **▶/||**.

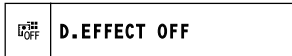


Selecting an Effect

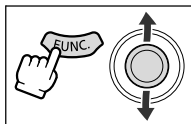
Available in the **CAMERA** , **PLAY** , and **CAMERA**  modes. When recording, set the mode switch to **P**.

FUNC


( 53)

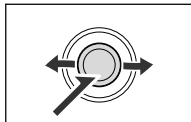


1. Open the **FUNC.** menu and select (**▲▼**) the digital effects icon.



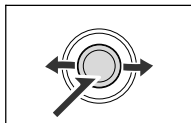
2. Select (**◀▶**) the **[EFFECT]** option and press (**⊕**).

In **CAMERA**  mode only the **[BLK & WHT]** effect is available. Select it, close the menu and continue directly to step 4 below.



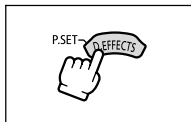
3. Select (**◀▶**) an effect, press (**⊕**) and close the menu.

- While selecting the effect, it will be demonstrated on the current screen.
- After closing the menu the symbol of the selected effect will appear on screen.



4. Press the **D.EFFECTS** button.

- The symbol turns green, and the effect is activated.
- From the playback pause mode, start playing the tape before pressing the **D.EFFECTS** button.
- Pressing the **D.EFFECTS** button again deactivates the effect.



Combining Images (Card Mix)

You can choose one of the sample images from the collection on the supplied disk (picture frames, backgrounds) and combine it with the live video recording.

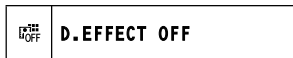
The live video recording will appear in place of the light area of the card mix image. Mix level adjustment: light area of the still image.



Selecting the Card Mix Effect

Available only in the **CAMERA** mode.

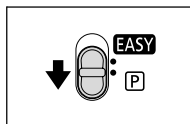
FUNC
(53)



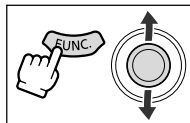
1. Upload a sample image from the supplied disk to the memory card.

Refer to *Adding Still Images from Your Computer to the Memory Card* in the *Digital Video Software* instruction manual (available on PDF file).

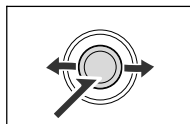
2. Set the mode switch to **P**.



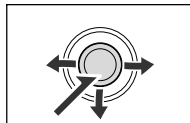
3. Open the menu and select (▲▼) the digital effects icon.



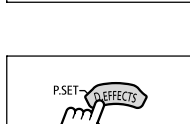
4. Select (◀▶) the [CARD MIX] option and press (⊕).



5. Select (◀▶) the still image to mix with the recording and push the joystick (▼) to adjust the mix level.




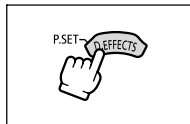
6. Adjust (◀▶) the mix level, press (⊕) and close the menu.



"" appears.


7. Press the D.EFFECTS button.

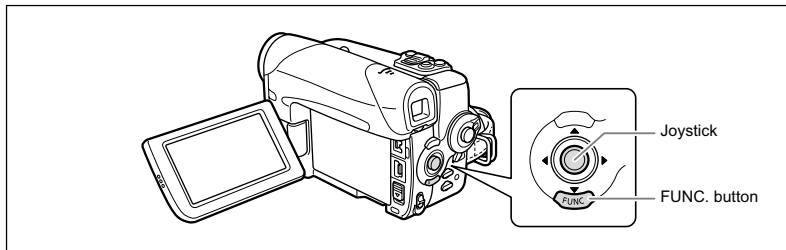
- "" turns green and the combined image appears.
- Still images cannot be recorded on the memory card while using the Card Mix function.



- Turn off the digital effect when you do not use it.
- The camcorder retains the setting even if you turn it off or change the recording program. However, you need to select again the still image to be used with the Card Mix effect.
- Digital effects cannot be used during DV dubbing.

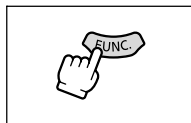
Changing the Settings with the Setup Menus




Although most basic functions appear on the first menu screen – the FUNC. menu (53), for more advanced settings you have to open the setup menus by selecting the  [MENU] option from the FUNC. menu. For menu items see *List of Setup Menu Items* (64).

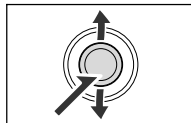


Selecting Menus and Settings



1. Press the FUNC. button to open the FUNC. menu.



2. With the joystick select () the  icon and press ().

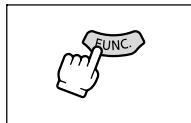


3. Select () a setup menu and press ().

4. Select () a menu item and press ().


5. Select () a setting option and press () to save the changes.

6. Press the FUNC. button to close the menu.








- Items that are not available appear grayed out.
- Pressing the FUNC. button at any time closes the menu.
- You can also open the menu directly on the setup menus screen by holding the FUNC. button pressed for more than 2 seconds.
- The menu will not appear when you press the FUNC. button while recording movies on the tape or memory card.
- **PLAY** mode: Pressing the FUNC. button while the index screen is displayed will open the menu directly on the setup menus screen.

List of Menu Items (Setup Menus)



Available menu items vary depending on the operation mode. Default settings are in boldface text. Menu items marked  with a bold frame can be changed also when the mode switch is set to **EASY**.

For details on each function, see the reference page. Functions without reference page are explained below the tables.


CAMERA SETUP

Menu Items	Setting Options					
SHUTTR SPEED	AUTO , 1/50, 1/120, 1/250, 1/500, 1/1000, 1/2000	<input type="radio"/>				-
	AUTO , 1/50, 1/120, 1/250			<input type="radio"/>		-
A.SL SHUTTER	ON , OFF	<input type="radio"/>		<input type="radio"/>		-
D.ZOOM	MOVX460/MOVX450 OFF, 80x, 800x	<input type="radio"/>				33
	MOVX430 OFF, 72x, 720x	<input type="radio"/>				33
ZOOM SPEED	VARIABLE , SPEED 3, SPEED 2, SPEED 1	<input type="radio"/>		<input type="radio"/>		34
IMG STAB	ON , OFF	<input type="radio"/>				-
FOCUS PRI.	ON: AiAF , ON: CENTER, OFF			<input type="radio"/>		-
REVIEW	OFF, 2sec , 4sec, 6sec, 8sec, 10sec			<input type="radio"/>		-


A.SL SHUTTER: The camcorder automatically uses slow shutter speeds to obtain a brighter recording in places with insufficient lighting.

- The camcorder uses shutter speeds down to 1/25 (1/12 in **CAMERA**  mode).
- Available only with the **P** Program AE recording program.
- When a trailing afterimage appears, set it to [OFF].
- If “” (camcorder shake warning) appears, we recommend stabilizing the camcorder, for example, by mounting it on a tripod.


D.ZOOM: Determines the operation of the digital zoom.

- When the digital zoom is 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 image resolution will deteriorate the more you zoom in.
- The digital zoom indicator will appear in light blue from 20x up to 80x (18x up to 72x with the **MOVX430**), and extend further in dark blue from 80x to 800x (72x to 720x with the **MOVX430**).
- The digital zoom cannot be used with the  Night recording program.






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

- The image stabilizer is designed to compensate a normal degree of camcorder shake.
- The image stabilizer may not be effective when recording in dark places using the  Night mode.
- The image stabilizer cannot be turned off when the mode switch is set to **EASY**.
- We recommend turning off the image stabilizer when using a tripod.






FOCUS PRI.: The camcorder records the still image once focus is adjusted.

- Set it to [OFF] when you wish to record a still image as soon as you press the PHOTO button.
- When set to [OFF], no focusing frame appears.
- The setting cannot be turned off when the mode switch is set to **EASY**.
- In the  Fireworks recording program the setting is automatically turned off.

REVIEW: Sets how long a still image will be displayed after recording.






- You can erase () 82) or protect () 83) the image when you press the FUNC. button while you are reviewing the image, or when you press the FUNC. button right after recording.
- [REVIEW] cannot be selected when  (continuous shooting),  (high-speed continuous shooting) or  (auto exposure bracketing) is selected.

CARD OPERATIONS

Menu Items	Setting Options					
PRINT ORD. ALL ERASE	NO, YES				○	103
TRANS.ORD. ALL ERASE	NO, YES				○	109
ERASE ALL IMAGES	NO, YES				○	82
INITIALIZE	NO, YES				○	84
➔ PROTECT ¹					○	83
➔ PRINT ORDER ¹					○	102
➔ TRANSFER ORDER ¹					○	109

¹ After opening the menu from the index screen

VCR SETUP

Menu Items	Setting Options					
REC MODE	STD PLAY, LONG PLAY	○	○ ²			-
AV ➔ DV ²	ON, OFF		○			93
TV TYPE	NORMAL TV, WIDE TV		○			41

² **MX460/MX430** only

REC MODE: You can choose between SP (standard play) and LP (long play). LP extends the tape usage by 1.5 times.

- Tapes recorded in LP mode cannot be used for audio dubbing.
- Depending on the nature and usage condition of the tape, picture and sound recorded in LP mode may be distorted. We recommend using the SP mode for important recordings.
- If you record in both SP and LP modes on the same tape, the playback picture may become distorted and the time code may not be written correctly.

- If you play back a tape that has been recorded in LP mode with another digital device on this camcorder, or vice versa, picture and sound may become distorted.

🔊 AUDIO SETUP

Menu Items	Setting Options					
OUTPUT CH	L/R, L/L, R/R		<input type="radio"/>			-
AUDIO DUB. ²	AUDIO IN, MIC. IN		<input type="radio"/>			94
WIND SCREEN	AUTO, OFF	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		69
12bit AUDIO	STEREO1, STEREO2, MIX/FIXED, MIX/ VAR.		<input type="radio"/>			95
MIX BALANCE	ST-1 ST-2		<input type="radio"/>			95
AUDIO MODE	16bit, 12bit	<input type="radio"/>	<input type="radio"/>			-

² **MX460/MX430** only

OUTPUT CH: Switches the output channels when playing back a tape with audio recorded on two channels.

- [L/R]: Stereo: L+R channels / Bilingual: Main+Sub.
- [L/L]: Stereo: L channel / Bilingual: Main.
- [R/R]: Stereo: R channel / Bilingual: Sub.

WIND SCREEN:

- When an external microphone is connected the setting will automatically reset to [OFF

AUDIO MODE: Switches the audio recording mode.

- [16bit] records in high sound quality.
- Select [12bit] if you plan to dub audio later.

📺 DISPLAY SETUP/🌐

Menu Items	Setting Options					
BRIGHTNESS		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-
TV SCREEN	ON, OFF	<input type="radio"/>		<input type="radio"/>		-
	ON, OFF		<input type="radio"/>		<input type="radio"/>	-
DISPLAYS	ON, OFF<PLAYBK>		<input type="radio"/>		<input type="radio"/>	-
6SEC.DATE	ON, OFF		<input type="radio"/>			-
DATA CODE	DATE, TIME, DATE&TIME		<input type="radio"/>		<input type="radio"/>	71
LEVEL MARKER	ON, OFF	<input type="radio"/>				-
LANGUAGE	List of languages depends on the language set.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	24
DEMO MODE	ON, OFF	<input type="radio"/>		<input type="radio"/>		-

BRIGHTNESS: Adjusts the brightness of the LCD screen.

- Adjust the LCD brightness with the joystick (◀▶).

- Changing the brightness of the LCD screen does not affect that of the viewfinder or the recordings.

TV SCREEN: Shows the camcorder displays on a connected TV screen.

- You can also use the TV SCREEN button on the wireless controller.

DISPLAYS: Shows the displays on the screen during playback.

- When set to [OFF<PLAYBK>]:
 - Displays, except for the data code, disappear (however, the displays during the magnification of the playback image and the activation of the digital effects, as well as the FUNC. menu will still appear).
 - Tape operation displays appear for approximately 2 seconds.
 - Displays also disappear from the connected TV, except for some warning messages.

6SEC. DATE: The camcorder displays the date and time for 6 seconds when you begin playback, or to indicate that date or time zone has changed.

- The 6-second auto date appears even if [DISPLAYS] is set to [OFF<PLAYBK>].

LEVEL MARKER: A horizontal guide line will appear at the center of the screen. You can better frame the picture better by referring to the level marker.

DEMO MODE: The demonstration mode displays the camcorder's main features. It starts automatically when you leave the camcorder turned on without loading a recording media for more than 5 minutes using the power adapter.

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

🔧 SYSTEM SETUP

Menu Items	Setting Options					
WL. REMOTE	ON, OFF (🔊)	○	○	○	○	-
BEEP	HIGH VOLUME, LOW VOLUME, OFF	○	○	○	○	-
START-UP IMG	ON, OFF	○	○	○	○	-
POWER SAVE	ON, OFF	○				-
FILE NOS.	RESET, CONTINUOUS	○	○	○		-

WL. REMOTE: Sets the camcorder to be operated with the wireless controller.

BEEP: A beep sounds upon operations such as turning on the camcorder, during self-timer countdown or warnings such as condensation.

START-UP IMG: Sets whether the Canon logo will be displayed or not when you turn on the camcorder.

POWER SAVE: When powered by a battery pack, the camcorder shuts off to save power if left without any operation for 5 minutes. Approximately 30 seconds before the camcorder shuts off the message "⚠️ AUTO POWER OFF" will appear.

FILE NOS.: Select the file numbering method upon inserting a new memory card.

- Images are automatically assigned file numbers from 0101 to 9900, and stored in folders containing up to 100 images. Folders are numbered from 101 to 998.
[RESET]: The file number starts at 101-0101. If the memory card already contains images files, the consecutive file number will be assigned.
[CONTINUOUS]: The consecutive file number of the last recorded image will be assigned. If a higher file number already exists on the memory card, the consecutive number will be assigned. This is useful for organizing images on a computer.
- We recommend setting [FILE NOS.] to [CONTINUOUS].

☑ **D/TIME SET**

Menu Items		Setting Options				
T. ZONE/DST	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	25
DATE/TIME	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
DATE FORMAT	Y.M.D : 2006.1.1 AM12:00 M.D,Y : JAN. 1, 2006 12:00AM D.M.Y : 1. JAN. 2006 12:00AM	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-

DATE FORMAT: Changes the displayed date format (includes date format for printing).

Using the Wind Screen

The camcorder reduces the wind noise automatically (only when recording audio with the built-in microphone). However, you can turn off the wind screen when recording indoors, or when you want the microphone to be as sensitive as possible.

Available in the **CAMERA** (CAMERA · [MIC]) and **CAMERA** (CAMERA · [OFF]) modes.

MOVX460/MOVX430 : Available also in **PLAY** (PLAY · [MIC]) mode for audio dubbing only when [AUDIO DUB.] is set to [MIC. IN].



CAMERA (CAMERA · [MIC]) or **CAMERA** (CAMERA · [OFF]) mode:

1. Set the mode switch to **P**.

PLAY (PLAY · [MIC]) mode (**MOVX460/MOVX430** only):

1. Select the microphone as the input for audio dubbing.

Open the FUNC. menu. Select (▲▼) [MENU] → [AUDIO SETUP] → [AUDIO DUB.] → [MIC. IN] and close the menu.

2. Open the FUNC. menu, select (▲▼) the [MENU] icon and press (⊕).

3. Select (▲▼) the [AUDIO SETUP] menu and press (⊕). Then, select (▲▼) the [WIND SCREEN] option and press (⊕).

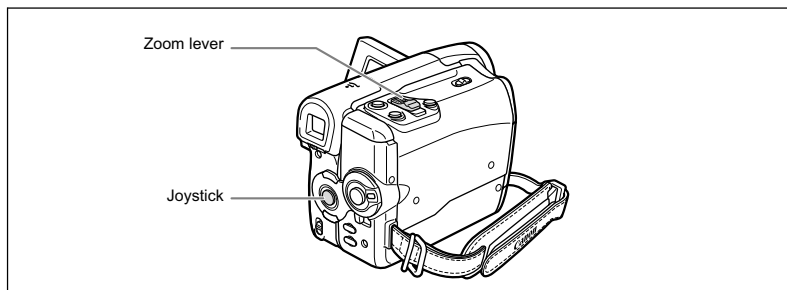
4. Set it to [OFF] and press (⊕) to save the changes, then close the menu.

"OFF" appears when you turn the wind screen off.


Magnifying the Image

When playing back movies from the tape or viewing still images from the memory card, the image can be magnified up to 5 times.

Available in the **PLAY** (📺) and **PLAY** (📷) modes.



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

- The image is magnified by 2 times.
- A frame appears indicating the position of the magnified area.
- To further enlarge the image, move the zoom lever toward **T**. To shrink the image below 2 times magnification, move the zoom lever toward **W**.
- “” will appear for images that cannot be enlarged.

2. Select (▲▼, ◀▶) the magnified area.

3. To cancel the magnification, move the zoom lever toward **W** until the frame disappears.

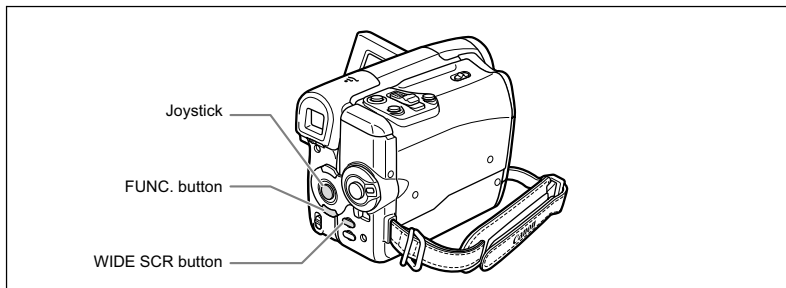






The position of the magnified frame cannot be selected with the wireless controller.

Displaying the Data Code

The camcorder maintains a data code containing the recording date and time. When you play back a tape, you can display the data code and select the data code combination you wish to display.

Available in the **PLAY**· and **PLAY**· modes.



1. Open the FUNC. menu, select (**▲▼**) the  icon and press (**⊕**).
2. Select (**▲▼**) the [DISPLAY SETUP/] menu and press (**⊕**). Then, select (**▲▼**) the [DATA CODE] option and press (**⊕**).
3. Select a setting option and press (**⊕**) to save the changes, then close the menu.
4. **PLAY**· mode: Play back a tape and press the WIDE SCR button.
PLAY· mode: Select the still image and press the WIDE SCR button.
 Pressing the WIDE SCR button again makes the data code disappear.

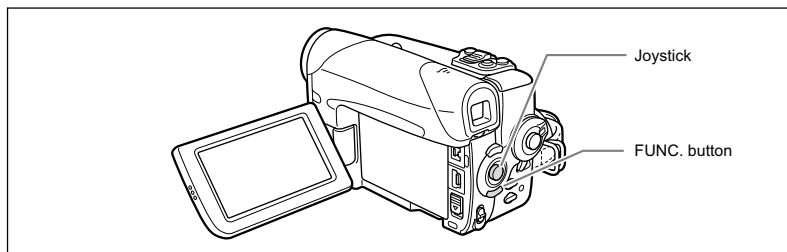


The data code will not display the next time you turn on the camcorder.

End Search

When you have played back a tape, you can use this function to locate the end of the last recorded scene.

Available only in the **PLAY** mode.



In stop mode:

1. **Open the FUNC. menu, select (▲▼) the end search icon (▶|) and press (⊕).**
2. **Select (◀▶) [EXECUTE] and press (⊕) to start the search.**
 - "END SEARCH" appears.
 - The camcorder rewinds/fast forwards the tape, plays back the last few seconds of the recording and stops the tape.
 - Operating the joystick (▲▼, ◀▶) will cancel the search.






- End search cannot be used once you unload the cassette.
- If there are blank sections between recordings or sections recorded in different recording modes on the same tape, the end search function may not work properly.
- You cannot use end search to locate the editing end of audio dubbing.

Returning to a Pre-marked Position

If you wish to return to a particular scene later, mark the point with the zero set memory and the tape will stop at that point when you rewind/fast forward the tape.

Available only in the **CAMERA**  and **PLAY**  modes.

- 1. During recording or playback, press the ZERO SET MEMORY button on the wireless controller at the point you wish to return to later.**
 - "0:00:00  " appears.
 - To cancel, press the ZERO SET MEMORY button again.
- 2. If you were playing back a tape, rewind the tape. If you were recording, after you finish turn the **POWER** switch to PLAY and then rewind the tape.**
 - " " appears.
 - The tape stops automatically at "0:00:00 ".
 - The tape counter changes to time code.



If the time code has not been recorded consecutively, the tape may not stop correctly at the scene marked with the zero set memory.

Date Search

You can locate the change of the date/time zone with the date search function.
Available only in the **PLAY** mode.

Press the |◀◀ or ▶▶| button on the wireless controller to begin searching.

- Press more than once to search for further date changes (up to 10 times).
- Press the STOP ■ button to stop searching.









- Recordings shorter than 1 minute per date/time zone cannot be located with this function.
- Date search may not function if the data code is not correctly displayed.

Selecting the Image Quality/Size



Still images are compressed and recorded in JPEG (Joint Photographic Experts Group). Movies are recorded in Motion JPEG. You can select the image quality of still images, and the image size of still images and movies.



The number of still images and maximum recording time of movies that can be recorded on a memory card vary according to the recording condition. The estimated figures are as follows:

Number of still images that can be recorded on a memory card:



Image Size	Image Quality	Number of Images			File Size per Image
		16MB	128MB	512MB	
L 1152x864	 Super Fine	20	195	790	608KB
	 Fine	30	290	1115	416KB
	 Normal	55	540	2150	224KB
S 640x480	 Super Fine	75	690	2740	176KB
	 Fine	105	955	3770	120KB
	 Normal	170	1525	6035	72KB

Maximum recording time of a movie on an SD memory card:

Image Size	Recording Time			File Size per Second
	16MB	128MB	512MB	
 320 x 240	50 sec.	8 min.	32 min.	250KB
 160 x 120	1 min.	17 min.	67 min.	120KB

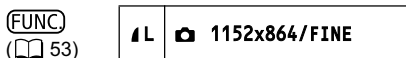
* When using a MultiMedia Card (MMC) the maximum recording time of movies is 10 seconds (at  320x240) or 30 seconds (at  160x120).



- Depending on the number of images on the memory card, you may not be able to download images to a computer (Windows: more than 1800 images; Macintosh: more than 1000 images). In such case, use a card reader.
- Connection to a PictBridge compatible printer will not work when the memory card contains more than 1800 images. For best performance, we recommend to keep the number of images on the memory card less than 100.
- Users of Windows XP: When you plan to connect the camcorder to a computer using a USB cable, keep the length of one movie shorter than approx. 12 min. at  320 x 240 and 35 min. at  160 x 120.

Selecting the Still Image Size and Quality

Available only in the **CAMERA** mode (the image quality only can also be set in the **CAMERA** mode).



1. Press the **FUNC.** button.
2. Select (**▲▼**) the still image size/quality symbol.
The symbol of the current setting is displayed.
3. Select (**◀▶**) the still image size.
The number on the right indicates the approximate number of images that can be recorded on the memory card at the current image size/quality setting.
4. If you want to change also the image quality: Press (**⊕**) and select (**◀▶**) the desired still image quality.
 - The number on the right indicates the approximate number of images that can be recorded on the memory card at the current image size/quality setting.
 - You can press (**⊕**) again to go back to select the image size (step 3).
5. Press the **FUNC.** button.

Selecting the Movie Size


Available only in the **PLAY** and **CAMERA** modes.



1. Press the **FUNC.** button.
2. Select (**▲▼**) the movie size symbol.
The symbol of the current setting is displayed.
3. Select (**◀▶**) the movie size.
The number on the right indicates the approximate remaining recording time for movies on the memory card at the current movie size.
4. Press the **FUNC.** button.

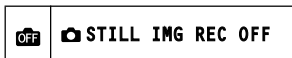
Simultaneous Recording on the Tape and Memory Card

When you are recording a movie on a tape, you can record the same picture as a still image on the memory card. The size of the still image will be S 640 x 480. The image quality can be selected.

Available only in the  mode.

 FUNC.


 53



1. Press the **FUNC.** button.
2. Select (**▲▼**) the still image recording symbol.
The symbol of the current setting is displayed.
3. Select (**◀▶**) the still image quality.
4. Press the **FUNC.** button.
5. While you are recording a movie, press the **PHOTO** button.

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



- The quality of the still image is slightly lower than a still image of the same size recorded in the  mode.
- Still images cannot be recorded on the memory card when a digital effect is activated or while recording in widescreen (16:9) mode.

Changing the Focusing Method

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

AiAF	Depending on the shooting conditions, one or more AF frames out of the 9 AF frames available will automatically be selected and focused on.
Center	Of 9 AF frames, the center one is selected to focus. This is convenient for making sure the focus is exactly where you want it.

Available only in the **CAMERA** mode.

1. Set the mode switch to **P**.

- The focusing method cannot be changed in the **Fireworks** recording program.
- When the program selector is set to **EASY**, the focusing point will automatically be set to [ON: AiAF].

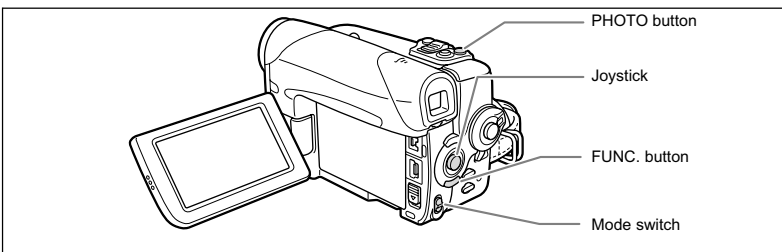
2. Open the **FUNC.** menu and select (▲▼) [**MENU**] ▶ [**CAMERA SETUP**] ▶ [**FOCUS PRI.**]. Select a setting option and close the menu.

3. Hold the **PHOTO** button half-pressed.

- [ON: AiAF]: One or more AF frames are automatically selected.
- [ON: CENTER]: An AF frame will appear at the center of the screen.

Selecting the Drive Mode

<input type="checkbox"/> Single	Records a single still image when you press the PHOTO button.
Continuous Shooting	Captures a quick series of still images while you press the PHOTO button. For the number of frames per second, refer to the table on the next page.
High-Speed Continuous Shooting	
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.
Self-timer	Records a still image after a self-timer delay (☐ 51).



Changing the Drive Mode

Available only in the **CAMERA** mode.

1. Set the mode switch to **P**.
2. Open the FUNC. menu and select (▲▼) the drive mode icon.
3. Select (◀▶) a setting option and close the menu.

Continuous Shooting/High-Speed Continuous Shooting

1. Press the PHOTO button halfway.
2. Press and hold the PHOTO button fully.

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



- Maximum number of continuous shots at one time:

Still Image Size	Frames per Second		Maximum Number of Continuous Shots
	Normal speed	High speed	
L 1152 x 864	2.5 frames	4.2 frames	10 images
S 640 x 480	2.5 frames	4.2 frames	60 images

These figures are approximate and vary with the recording conditions and subjects. Sufficient space on the memory card is required. Continuous shooting stops when card is full.

- The number of frames per second will be lower when “” (camcorder shake warning) is displayed on the screen.

Auto Exposure Bracketing

1. Press the PHOTO button halfway.
2. Press the PHOTO button fully.

Three still images in different exposures are recorded to the memory card.

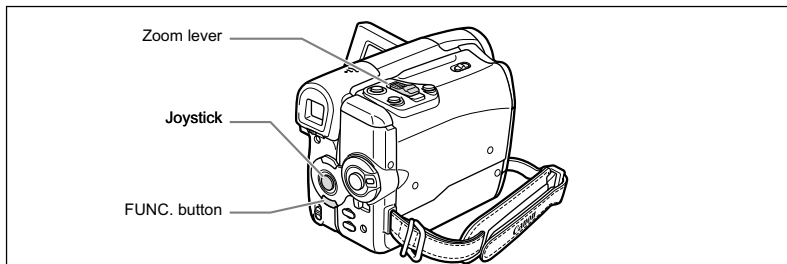


Make sure that there is sufficient space on the memory card.

Playing Back/Searching Images

You can display images one after another (slide show) or 6 at one time (index screen). With the Card Jump function, you can quickly locate an image without displaying them one by one.

Available only in the **PLAY** mode.



Slide Show



1. Open the **FUNC.** menu and select (**▲▼**) the slide show icon.
2. Press (**⊕**) to start the slide show.
 - Images and movies are played back one after another.
 - Press (**⊕**) again to stop the slide show.

Index Screen

1. Move the zoom lever toward **W**.
 - Up to 6 images appear.
 - With movies, the index screen can only be started when the first scene is displayed as a still image.
2. Use the joystick (**▲▼◀▶**) to move between the images.
Move the "**☞**" to the image you wish to view.
3. Move the zoom lever toward **T**.
The index screen is cancelled and the selected image is displayed.

Card Jump Function

You can locate images without displaying them one by one. The number displayed next to the memory card icon **☐** indicates the current image number out of the total number of images on the card.

1. If the joystick guide does not appear on screen, press (**⊕**) to display it.
2. Hold the joystick pushed (**◀**) towards **[-]** or (**▶**) towards **[+]** to run through the image numbers.
When you release the joystick, the image corresponding to the displayed image number will appear.

Erasing Images

You can erase images one at a time or all at once.



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



○ Protected images cannot be erased.

○ Movies can only be erased when the first scene is displayed as a still image.

Erasing a Single Image

Available only in the **CAMERA** and **PLAY** modes.

1. If the joystick guide does not appear on screen, press (⊕) to display it.
2. Use the joystick (◀▶) to select the image you want to erase.
3. Push the joystick (▼) towards to erase the image.
In **CAMERA** mode: The image erase menu appears only when you press the FUNC. button while reviewing a still image immediately after recording it.
4. Select (◀▶) [ERASE] and press (⊕) to erase the image and close the menu.

Erasing All Images

Available only in the **PLAY** mode.



1. Open the FUNC. menu, select (▲▼) the icon and press (⊕).
2. Select (▲▼) the [CARD OPERATIONS] menu and press (⊕). Then, select (▲▼) the [ERASE ALL IMAGES] option and press (⊕).
3. Select (▲▼) [YES] and press (⊕) to erase the images, then close the menu.

All still images or movies with exception of the protected ones are erased.

Protecting Images

You can protect important images from accidental erasure when displaying a single image or index screen.



If a memory card is initialized, all still images and movies, even protected ones, will be erased permanently.



Movies can only be protected when the first scene is displayed as a still image.

Protecting during Single Image Playback

Available only in the **CAMERA** and **PLAY** modes.

FUNC.

(53)



1. Open the **FUNC.** menu and select (**▲▼**) the image protection icon.

In **CAMERA** mode: The image protect menu appears only when you press the **FUNC.** button while reviewing a still image immediately after recording it.

2. Set (**◀▶**) it to **[PROTECT ON]**, press (**⊕**) and close the menu.

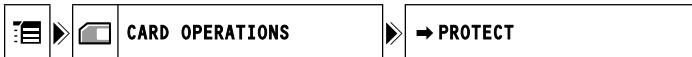
- “**On**” appears, and now the image cannot be erased.
- To cancel the protection, select **[PROTECT OFF]**.

Protecting during Index Screen Display

Available only in the **PLAY** mode.

MENU

(63)



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

Up to 6 images appear.

2. Open the menu, select (**▲▼**) the **[CARD OPERATIONS]** menu and press (**⊕**).

Pressing the **FUNC.** button from the index screen will open the menu directly in the setup menu screen.

3. Select (**▲▼**) the **[⇒ PROTECT]** option and press (**⊕**).

4. Select (**▲▼** **◀▶**) the image you want to protect and press (**⊕**).

- “**On**” appears on the image.
- To cancel the protection, press (**⊕**) again.
- You can select (**▲▼** **◀▶**) additional images to protect from the index screen.

5. Press the **FUNC.** button.

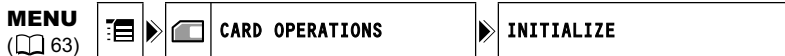
Initializing a Memory Card


Initialize new memory cards, or when you get the message "CARD ERROR". You can also initialize a memory card to erase all data recorded on it.



- Initializing a memory card erases all data, including protected images.
- Images erased with the initialization of the memory card cannot be recovered.
- Initialize all memory cards before using them with this camcorder.

Available only in the **PLAY** mode.



1. Open the **FUNC.** menu, select (**▲▼**) the  icon and press (**⊕**).
2. Select (**▲▼**) the [**CARD OPERATIONS**] menu and press (**⊕**). Then, select (**▲▼**) the [**INITIALIZE**] option and press (**⊕**).
3. Select (**▲▼**) [**YES**] and press (**⊕**).
4. In the confirmation screen, select (**▲▼**) [**YES**] to initialize the memory card.

The card initialization will take a moment. When the initialization is completed the camcorder will return to the [**CARD OPERATIONS**] menu. Press the **FUNC.** button to close the menu.

Recording to a VCR or Digital Video Device

You can copy your recordings by connecting the camcorder to a VCR or a digital video device (DVD recorder, another digital camcorder, etc.). If you connect a digital video device, you can copy recordings with virtually no generation loss in image and sound quality.

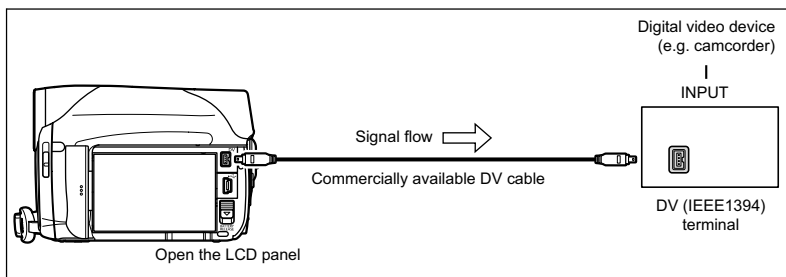
Connecting the Devices

① Connecting a VCR

See *Playing Back on a TV Screen* (□ 41).

② Connecting a DVD Recorder or other digital video device with a DV Terminal

Refer also to the instruction manual of the digital video device.



Recording

Available only in the **PLAY** mode.

1. Load a recorded cassette.
2. Connected device: Load a blank cassette or disc and set the device to record pause mode.
3. Locate the scene you wish to copy and pause playback shortly before the scene.
4. Play back the tape.
5. Connected device: Begin recording when the scene you wish to copy appears. Stop recording when copying is complete.
6. Stop playback.



- We recommend powering the camcorder from a household power source.
- When connecting a VCR, the quality of the edited tape will be slightly lower than that of the original.
- When connecting a DVD recorder or other digital video device with a DV terminal:
 - If the picture does not appear, reconnect the DV cable or turn the camcorder off and back on again.
 - Proper operation cannot be guaranteed for all digital video devices equipped with a DV terminal. If the operation does not work, use the AV terminal.
 - In some cases and depending on the connected digital device, the data code may not be displayed. Use the AV terminal instead to display the data code.
 - In some cases and depending on the connected digital device, audio dubbed later on a recording may not be recorded.

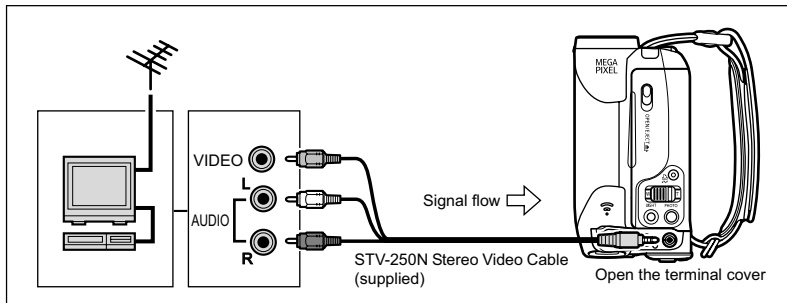
MVX460/MVX430 Analog Line-in Recording

E

You can input video from other analog devices (VCR, TV or camcorder) via the AV terminal, and record the input video on the tape in the camcorder. You can also record the input video as a movie or still image on a memory card.

Connecting

Refer also to the instruction manual of the connected device.



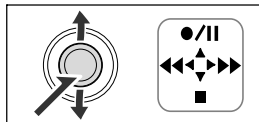
Recording

Available only in the **PLAY** mode.

1. Load a blank cassette in this camcorder.
2. Connected device: Load the recorded cassette.
3. Open the FUNC. menu, select (▲▼) the record pause icon ●/|| and press (⊕).
4. Select (◀▶) [EXECUTE] and press (⊕).

In record pause mode and during recording, you can check the picture on the screen.

5. Connected device: Play back the tape.
6. If the joystick guide does not appear on screen, press (⊕) to display it.
7. Push the joystick (▲) towards ●/|| when the scene you wish to record appears.



- Recording starts.
 - Push the joystick (▲) towards ●/|| again to pause/resume the recording.
8. Push the joystick (▼) towards ■ to stop recording.
 9. Connected device: Stop playback.

Editing

Recording the Input Video on a Memory Card

The size of the still image recorded on the memory card will be S 640 x 480. The still image quality and the movie size can be selected.

Available only in the **PLAY** mode.

1. Check that a memory card is inserted.

If a cassette is loaded, make sure that the tape is stopped.

2. Open the FUNC. menu. Select (▲▼) [MENU] ▶ [VCR SETUP] ▶ [AV⇒DV] ▶ [ON] and close the menu.

3. Selecting the still image quality:

Press the FUNC. button. Select (▲▼) the still image quality symbol followed (◀▶) by a setting option and press the FUNC. button.

Selecting the movie size:

Press the FUNC. button. Select (▲▼) the movie size symbol followed (◀▶) by a setting option and press the FUNC. menu.

4. Connected device: Load a recorded cassette and play back the tape.

When recording a still image:

5. Press the PHOTO button halfway when the scene you wish to record appears.

- The captured scene appears as a still image and the remaining card capacity for still images and other card information appears on screen.
- If you press the PHOTO button on the wireless controller, the still image is recorded immediately.

6. Press the PHOTO button fully.

When recording a movie:

5. Press the start/stop button when the scene you wish to record appears.

Pressing the start/stop button again stops recording.



○ When connecting to a TV/Video with SCART terminal, use a SCART adapter with input capability (commercially available). The supplied SCART Adapter PC-A10 is for output only.

○ Depending on the signal sent from the connected device, the input image may be distorted or not be displayed at all (e.g. signals that include copyright protective signals or anomalous signals such as ghost signals).



○ We recommend powering the camcorder from a household power source.

○ The data code of the image will reflect the date and time it was recorded on the memory card.

○ An image recorded from an image in widescreen mode will be vertically compressed.

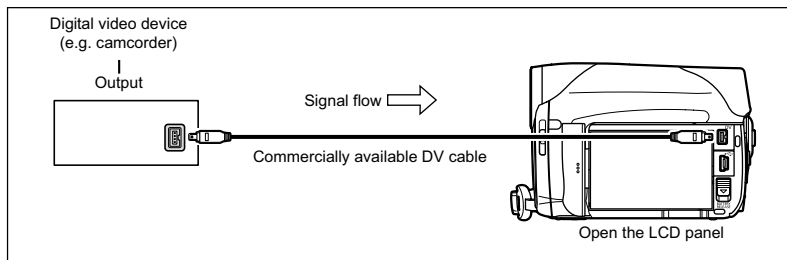
MVX460/MVX430 DV Dubbing

You can input video from other digital video devices via the DV terminal, and record the input video on the tape in the camcorder. You can also record the input video as a movie or still image on a memory card.

E

Connecting

Check the type and orientation of the DV terminal and make sure you connect the DV cable properly. Refer also to the instruction manual of the connected device.



Dubbing

Available only in the **PLAY** mode.

1. Load a blank cassette in this camcorder.

If "AV → DV" is displayed, change the setting (93).

2. Connected device: Load the recorded cassette or disc.

3. Open the FUNC. menu, select (▲▼) the record pause icon ●/|| and press (⊕).

4. Select (◀▶) [EXECUTE] and press (⊕) to start the search.

5. Connected Device: Play back the tape or disc.

In record pause mode and during recording, you can check the picture on the screen.

6. If the joystick guide does not appear on screen, press (⊕) to display it.

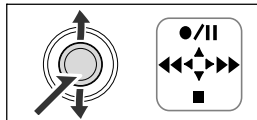
7. Push the joystick (▲) towards ●/|| when the scene you wish to record appears.

- Recording starts.

- Push the joystick (▲) towards ●/|| again to pause/resume the recording.

8. Push the joystick (▼) towards ■ to stop recording.

9. Connected Device: Stop playback.



Editing

Recording the Input Video on a Memory Card

The size of the still image recorded on the memory card will be S 640 x 480. The still image quality and the movie size can be selected.

Available only in the **PLAY** mode.

1. Check that a memory card is inserted.

- If a cassette is loaded, make sure that the tape is stopped.
- If "AV → DV" is displayed, change the setting (□ 93).

2. Selecting the still image quality:

Press the FUNC. button. Select (▲▼) the still image quality symbol followed (◀▶) by a setting option and press the FUNC. button.

Selecting the movie size:

Press the FUNC. button. Select (▲▼) the movie size symbol followed (◀▶) by a setting option and press the FUNC. menu.

3. Connected device: Load a recorded cassette or disc and start the playback.

When recording a still image:

4. Press the PHOTO button halfway when the scene you wish to record appears.

- The captured scene appears as a still image and the remaining card capacity for still images and other card information appears on screen.
- If you press the PHOTO button on the wireless controller, the still image is recorded immediately.

5. Press the PHOTO button fully.

When recording a movie:

4. Press the start/stop button when the scene you wish to record appears.

Pressing the start/stop button again stops recording.



- Blank sections may be recorded as anomalous picture.
- If the picture does not appear, reconnect the DV cable or turn the camcorder off and back on again.
- Do not connect any devices to the camcorder's USB terminal.
- You can only record video signals from devices with the **DV** logo from recordings in SD (standard definition) standard, in SP or LP recording mode. Note that signals from identically shaped DV (IEEE1394) terminals may be in different video standards (□ 112).



- We recommend powering the camcorder from a household power source.
- The data code of the image will reflect the date and time it has been recorded on the memory card.
- An image recorded from an image in widescreen mode will be vertically compressed.

Concerning Copyright

Copyright Precaution

Certain pre-recorded video tapes, films and other materials, as well as some television programmes are copyrighted. Unauthorised recording of these materials may violate copyright protection laws.

Copyright Signals

During playback: If you try to play back a tape that contains copyright control signals for protection of software, "COPYRIGHT PROTECTED PLAYBACK IS RESTRICTED" appears for a few seconds and the camcorder displays a blank blue screen. You cannot playback the contents of the tape.

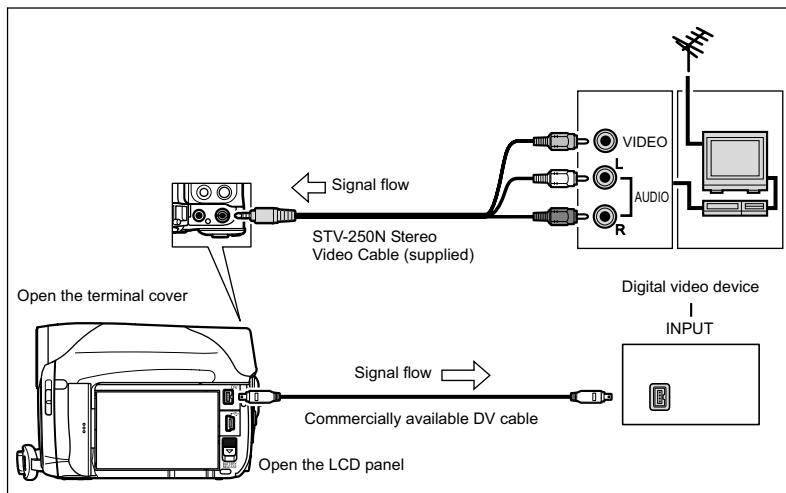
During recording: If you try to record from software that contains copyright control signals for protection of software, "COPYRIGHT PROTECTED DUBBING RESTRICTED" appears. You cannot record the contents of the software.
You cannot record copyright protection signals to a tape using this camcorder.

MVX460/MVX430 Converting Analog Signals into Digital Signals (Analog-Digital Converter)

By connecting the camcorder to a VCR or 8mm video camcorder, you can convert analog video/audio signals to digital signals and output the digital signals via the DV terminal. The DV terminal serves as output terminal only.

Connecting the Devices

Turn off all devices before starting the connections. Unload the tape from the camcorder. Check the type and orientation of the DV terminal and make sure you connect the DV cable properly. Refer also to the instruction manual of the connected device.



Turning On the Analog-Digital Converter

Available only in the **PLAY** mode.

MENU
(63)



VCR SETUP



AV → DV OFF

1. Open the **FUNC.** menu, select (**▲▼**) the icon and press (**⊕**).
2. Select (**▲▼**) the **[VCR SETUP]** menu and press (**⊕**). Then, select (**▲▼**) the **[AV → DV]** option and press (**⊕**).
3. Set it to **[ON]** and press (**⊕**) to save the changes, then close the menu.



- Depending on the signal sent from the connected device, the conversion from analog to digital signals might not work properly (e.g., signals that include copyright protective signals or anomalous signals such as ghost signals).
- When connecting to a TV/Video with SCART terminal, use a SCART adapter with input capability (commercially available). The supplied SCART Adapter PC-A10 is for output only.
- For normal use, set **[AV → DV]** to **[OFF]**. If it is set to **[ON]**, digital signals cannot be input via the camcorder's DV terminal.



- We recommend powering the camcorder from a household power source.
- Connecting the camcorder to the computer you can also use the analog-digital conversion to transfer analog recordings to your computer as digital signals.
- The required equipment and operation is the same as when Transferring Video Recordings to a Computer (104), except for step 3: In this case set the **[AV → DV]** to **[ON]**. Check the setting before connecting the camcorder to the computer.
- The analog-digital conversion may not operate properly depending on the software and the specifications and settings of your computer.

Audio Dubbing

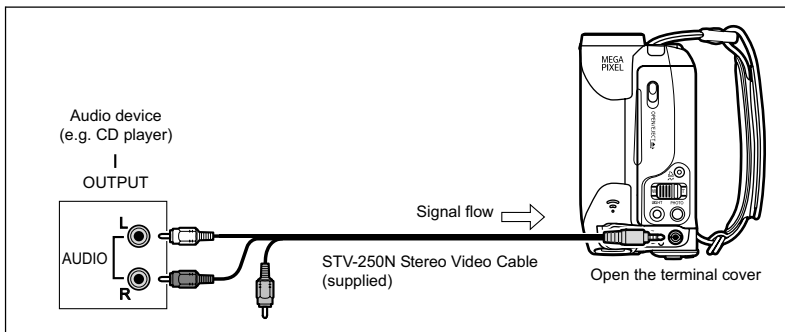
You can add sound on a tape with the built-in or with an external microphone.

MX460/MX430 : You can also add sound from external audio devices.

This function is operated with the wireless controller.

MX460/MX430 Connecting an Audio Device

Refer also to the instruction manual of the connected device.



Dubbing

Available only in the **PLAY** mode.



1. Load a recorded cassette.

Use a tape recorded in SP, 12-bit mode with this camcorder.

MX450 : Continue directly to step 4.

MX460/MX430 : Select the audio source for the audio dubbing with the following procedure.

2. Select (▲▼) the [AUDIO SETUP] menu and press (⊕). Then, select (▲▼) the [AUDIO DUB.] option and press (⊕).

3. Set it to [AUDIO IN] or [MIC.IN] and press (⊕) to save the changes, then close the menu.

4. Locate the scene you wish to start audio dubbing.

5. Press the PAUSE || button on the wireless controller.

6. Press the AUDIO DUB. button on the wireless controller.

"AUDIO DUB." and "● ||" appear.

7. Press the PAUSE || button on the wireless controller to begin dubbing.

• Microphone: Speak into the microphone.

• **MX460/MX430** Audio device: Begin playback.

8. Press the STOP ■ button on the wireless controller to stop dubbing.

MX460/MX430 Audio device: Stop playback.



- Audio dubbing will stop if the tape has a blank section or a section recorded in LP mode or 16-bit mode.
- You cannot use the DV terminal for audio dubbing.
- The sound quality of the audio dubbed will deteriorate when you audio dub a tape that was recorded with a different camcorder or when you audio dub the same tape more than 3 times.

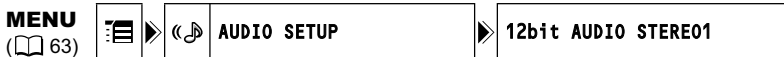



- You can check the picture on the LCD screen.
- **MX460/MX430** If you use [AUDIO IN] for the dubbing, you can check the audio on the camcorder's speaker.
- Set the zero set memory at the end of the scene you wish to audio dub. The camcorder will automatically stop audio dubbing at that point.

Playing Back the Added Sound

You can select to play back Stereo 1 (original sound), Stereo 2 (dubbed audio), or adjust the balance of both sounds.

Available only in the **PLAY** mode.



1. Open the **FUNC.** menu, select (**▲▼**) the  icon and press (**⊕**).
2. Select (**▲▼**) the [AUDIO SETUP] menu and press (**⊕**). Then, select (**▲▼**) the [12bit AUDIO] option and press (**⊕**).
3. Select a setting option and press (**⊕**) to save the changes.
 - STEREO1: Plays back the original sound.
 - STEREO2: Plays back the added sound.
 - MIX/FIXED: Plays back Stereo 1 and Stereo 2 at the same level.
 - MIX/VAR.: Plays back Stereo 1 and Stereo 2. The mix balance can be adjusted.
 - If you select an audio setting other than [MIX/VAR.], close the menu.

To adjust the mix level when you select [MIX/VAR.]:

4. From the [AUDIO SETUP] menu select (**▲▼**) the [MIX BALANCE] option and press (**⊕**).
5. Adjust (**◀▶**) the mix level between ST-1 and ST-2 and press (**⊕**) to save the changes, then close the menu.



The camcorder resets to [STEREO1] when you turn the camcorder off. However, the mix balance is memorized by the camcorder.

Recording from the Tape on a Memory Card

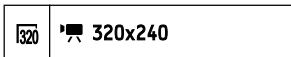
You can record movies or still images from a tape in the camcorder.

Available only in the **PLAY** mode.

Recording a Movie from the Tape

FUNC.

( 53)



1. Selecting the movie size:

Press the **FUNC.** button. Select (**▲▼**) the movie size symbol followed (**◀▶**) by a setting option and press the **FUNC.** button.

2. Press the start/stop button when the scene you wish to record appears.

Pressing the start/stop button again stops recording.



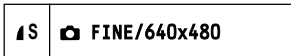
- The data code of the movie will reflect the date and time it was recorded on the memory card.
- An image recorded from an image in widescreen mode will be vertically compressed.

Recording a Still Image from the Tape

The size of the still image recorded on the memory card will be **S 640 x 480**. The still image quality can be selected.

FUNC.

( 53)



1. Selecting the still images quality:

Press the **FUNC.** button. Select (**▲▼**) the still image quality symbol followed (**◀▶**) by a setting option and press the **FUNC.** button.

2. Press the PHOTO button halfway when the scene you wish to record appears.

- The captured scene appears as a still image and the remaining card capacity for still images and other card information appears on screen.
- If you press the PHOTO button on the wireless controller, the still image is recorded immediately.

3. Press the PHOTO button fully.

- The CARD access indicator flashes.
- You can also record a still image by pressing the PHOTO button fully when the tape is in playback pause mode.



- The data code of the image will reflect the date and time it was recorded on the memory card.
- An image recorded from an image in widescreen mode will be vertically compressed.

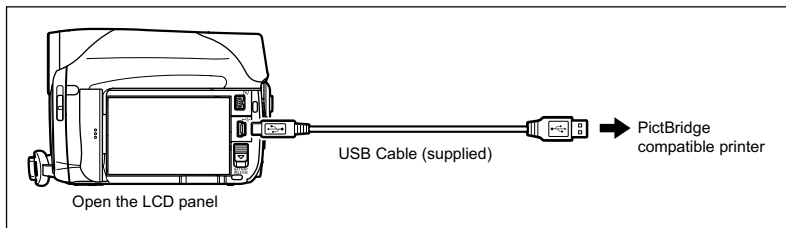
Printing Still Images



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 (102).
Canon printers: SELPHY CP, SELPHY DS and PIXMA printers.

E

Connecting the Printer to the Camcorder



1. Turn off the camcorder and insert a memory card that contains still images.
2. Turn on the printer.
3. Set the camcorder to **PLAY** mode.
4. Connect the camcorder to the printer using the USB cable.
 - “ ” appears and changes to “ ”. **Does not appear** with movies, or still images that cannot be played back with the camcorder.
 - The (print/share) button lights up and the current print setting will be displayed for approx. 6 seconds.




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 camcorder and printer, turn off camcorder and printer, turn both back on and reconnect the camcorder to the printer.



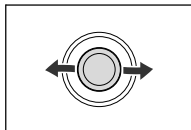
- “ ” will appear for images that cannot be printed.
- We recommend powering the camcorder from a household power source.
- Refer also to the instruction manual of the printer.

Printing with the (Print/Share) Button




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

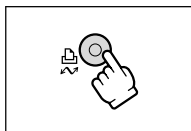
Available only in the **PLAY**  mode.

1. Select () the still image you wish to print.



2. Press the (print/share) button.

- Printing starts. The  button flashes and then stays on when the printing is completed.
- If you wish to continue printing, select ( ) another still image.

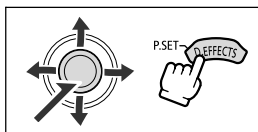


Printing after Selecting the Print Settings

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



1. Press the P.SET button.

- 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 (100).

3. Select () the [PRINT] option and press (.

- Printing starts. The print setting menu disappears when the printing is completed.
- If you wish to continue printing, select ( ) another still image.



- Images not recorded with this camcorder, uploaded from a computer, edited on a computer and images whose file names have been changed may not be printed correctly.
- Observe the following precautions during printing:
 - Do not turn off the camcorder or the printer.
 - Do not change the position of the TAPE/CARD switch.
 - Do not detach the cable.
 - Do not open the memory card cover or remove the memory card.
- If the message "BUSY." does not disappear, disconnect the cable from camcorder and printer and reconnect the camcorder to the printer.



○ **Cancel Printing**

Press (⊕) during printing. A confirmation dialog appears. Select [OK] and press (⊕). The printing will stop immediately (even if not completed) and the paper will be fed through.

○ **Printing Errors**

If an error occurs during the printing process, an error message appears (□ 115).

- Resolve the error. When printing does not resume automatically, select [CONTINUE] and press (⊕). If [CONTINUE] cannot be selected, select [STOP], press (⊕) and retry printing. Refer also to the printer manual for details.
- If the error still persists and printing does not restart, follow the procedure below:
 1. Disconnect the USB cable.
 2. Turn the **POWER** switch of the camcorder to **OFF** and back to **PLAY**.
 3. Reconnect the USB cable.

○ **When you have finished printing:**

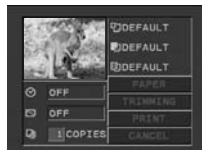
1. Disconnect the cable from the camcorder and printer.
2. Turn off the camcorder.

Selecting the Print Settings

Selecting the Number of Copies

A maximum of 99 copies can be selected for one still image.

1. In the print setting menu, select (▲▼ ◀▶) (COPIES) and press (⊕).
2. Select (▲▼) the number of copies and press (⊕).



Setting the Print Style

PAPER	PAPER SIZE	Available paper sizes vary depending on the printer model.
	PAPER TYPE	PHOTO, FAST PHOTO, DEFAULT
	PAGE LAYOUT	BORDERLESS, BORDERED, 2-UP, 4-UP, 8-UP, 9-UP, 16-UP, DEFAULT
☉ (date print)		ON, OFF, DEFAULT
☑ (print effect)		ON, OFF, VIVID, NR, VIVID+NR, DEFAULT

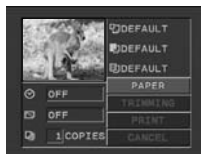
The settings in the table are given as an indication. Available setting options will differ depending on the printer model.



- Print setting options and [DEFAULT] settings vary depending on the printer model. For details, refer to the instruction manual of your printer.
- [BORDERED]: The image area remains relatively unchanged from the recorded image when it is printed. [BORDERLESS]: The center portion of the recorded image is printed at an enlarged size. The image's top, bottom and sides may be cropped slightly.
- [VIVID], [VIVID+NR] and [NR] can be selected with Canon PIXMA/SELPHY DS printers.
- **Canon printers:**
 - The [PAGE LAYOUT] setting depends on the paper size selected. When [PAPER SIZE] is set to [10 x 14.8 cm], select as the layout 2-, 4-, 9- or [16-UP]; when [PAPER SIZE] is set to [A4], select as the layout [4-UP]. Canon PIXMA/SELPHY DS printers: You can also print on the specially designed Photo Stickers sheets.
 - When selecting [8-UP], set the [PAPER SIZE] to [CREDITCARD]. Canon SELPHY CP printers: You can also print on the specially designed Photo Stickers sheets.

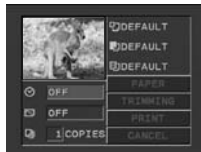
Paper Settings

1. In the print setting menu, select (▲▼ ◀▶) [PAPER] and press (⊕).
2. Select (▲▼) the paper size and press (⊕).
Select the paper size of the paper set in your printer.
3. Select (▲▼) the paper type and press (⊕).
Select the paper type of the paper set in your printer.
4. Select (▲▼) a layout option and press (⊕).



Including the Date in the Print

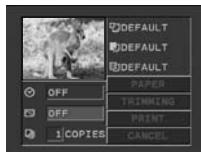
1. In the print setting menu, select (▲▼ ◀▶) the ☺ (date) icon and press (⊕).
2. Select (▲▼) a date print option and press (⊕).



Setting the Print Effect (Image Optimize)

This function uses the camcorder's recording information to optimize the image data, yielding high quality prints.

1. In the print setting menu, select (▲▼ ◀▶) the ☒ (print effect) icon and press (⊕).
2. Select (▲▼) a setting and press (⊕).



Printing with Print Order Settings

You can select still images for printing and set the number of copies. These print order settings are compatible with the Digital Print Order Format (DPOF) standards and can be used for printing on DPOF compatible printers (📖 97). A maximum of 998 still images can be selected.

Available only in the **PLAY** mode.

Selecting Still Images for Printing (Print Order)

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

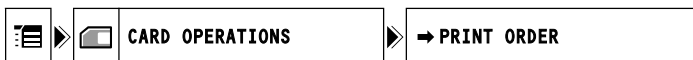
FUNC.
(📖 53)



1. Press the **FUNC.** button.
2. Select (**▲▼**) [**PRINT ORDER**].
3. Select (**◀▶**) the number of copies and press (**⊕**).
To cancel the print order, set the number of copies to 0.
4. Press the **FUNC.** button.

Selecting in Index Screen Display

MENU
(📖 63)



1. Move the zoom lever toward **W**.
Up to 6 images appear.
2. Open the menu, select (**▲▼**) the [**CARD OPERATIONS**] menu and press (**⊕**).
Pressing the **FUNC.** button from the index screen will open the menu directly in the setup menu screen.
3. Select (**▲▼**) the [**PRINT ORDER**] option and press (**⊕**).
4. Select (**▲▼** **◀▶**) the image you want to print and press (**⊕**).
5. Set (**▲▼**) the number of copies and press (**⊕**).
 - "📄" and the number of copies appear on the image.
 - To cancel the print order, set the number of copies to 0.
6. Press the **FUNC.** button.

Erasing All Print Orders



1. Open the FUNC. menu, select (▲▼) the icon and press (⊕).
2. Select (▲▼) the [CARD OPERATIONS] menu and press (⊕). Then, select (▲▼) the [PRINT ORD.ALL ERASE] option and press (⊕).
3. Select (▲▼) [YES] and press (⊕) to erase all the print orders, then close the menu.

Printing



1. Connect the printer to the camcorder (📖 97).
2. Open the FUNC. menu, select (▲▼) the icon and press (⊕).
3. Select (▲▼) the [PRINT] menu and press (⊕).
 - The print setting menu appears.
 - "SET PRINT ORDER" appears, when you connect a printer with direct print function and select [PRINT] without having set the print order.
4. Make sure that [PRINT] is selected and press (⊕).

Printing starts. The print setting menu disappears when printing is complete.



○ Depending on the connected printer, you can select style or paper settings before step 4.

○ **Cancel Printing/Printing Errors** (📖 99)

○ **Restarting Printing**

Open the FUNC. menu and select (▲▼) [MENU] ▶ [PRINT]. Press (⊕) and close the menu. Select [RESUME] or [CONTINUE] in the print setting menu and press (⊕). The remaining images will be printed.

Printing cannot be restarted in the following cases:

- When you change the print order settings.
- When you delete a still image with print order settings.

Transferring Video Recordings to a Computer

You can transfer recordings to a computer using the IEEE1394 (DV) terminal.

You can also use this camcorder to transfer through it recordings from an analog VCR or 8 mm camcorder to your computer using the USB terminal (see Converting Analog Signals into Digital Signals (□ 92)).

Before starting the video transferring, make sure to prepare the following:

- A computer equipped with a IEEE1394 (DV) terminal or a IEEE1394 (DV) capturing board.
- A DV cable (sold separately)
- Video Editing Software

You can use the video editing software that came bundled with your computer or video capturing board. You can also use the video editing software included with your operating system (Windows Movie Maker with Windows XP and Windows ME, iMovie with Mac OS 9 and later).

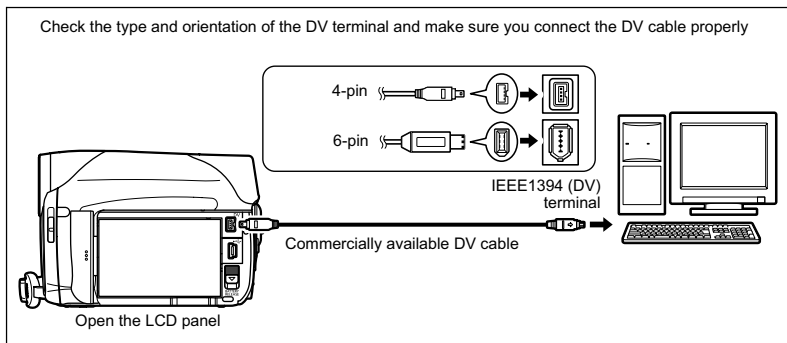
- The appropriate driver

A driver is included with Windows operating systems later than Windows 98 Second Edition and Mac operating systems later than Mac OS 9. The driver is installed automatically when you connect the camcorder to the computer.

1. Start your computer.
2. Set the camcorder to **PLAY** mode.
3. Check the **[AV → DV]** setting.

If you want to transfer your recordings from the tape, edit the video on the computer and record it back on the tape, set **[AV → DV]** to **[OFF]**. If you want to convert an analog recording to digital, set **[AV → DV]** to **[ON]**.

4. Connect the camcorder to the computer with the DV cable as shown below.






- Operation may not work correctly depending on the software and the specifications/settings of your computer.
- If the computer freezes while you have connected the camcorder, disconnect and reconnect the DV cable. If the problem persists, disconnect the DV cable, turn off both the camcorder and the computer and then turn them back on and reconnect them.
- Before connecting the camcorder to the computer using a DV cable make sure that camcorder and computer are not connected with a USB cable, and that no other IEEE1394 device is connected to the computer.
- Depending on the video editing software you use, you may need to set the **POWER** switch of the camcorder to a mode other than PLAY. Refer also to the instruction manual of the editing software.



- We recommend powering the camcorder from a household power source while it is connected to the computer.
- Refer also to the instruction manual of the computer.
- The programs ZoomBrowser EX and Image Browser included with the supplied CD-ROM are intended for use only with images recorded on the memory card.
- Video recordings on the tape cannot be transferred to the computer using the software included with the supplied CD-ROM.


Transferring Memory Card Images to a Computer

With the supplied USB cable and Digital Video Software, you can transfer images recorded on the memory card to the 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.

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


Available only in the  mode.

1. Install the supplied Digital Video Software.

2. Connect the camcorder to the computer using the USB cable.

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

3. Set the auto-launch setting.

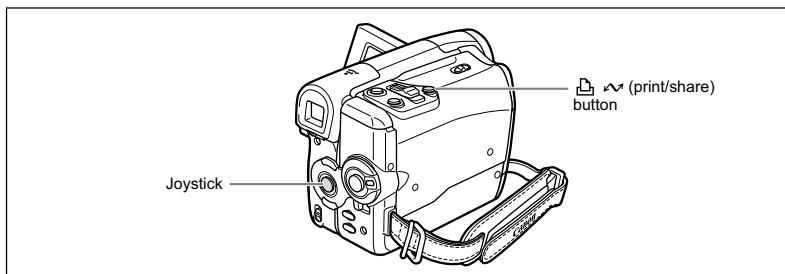
- See *Starting CameraWindow* in the *Digital Video Software* instruction manual (available on PDF file).
- The direct transfer menu appears on the camcorder screen and the  button lights up.



- Do not disconnect the USB cable, open the memory card cover, remove the memory card, change the position of the TAPE/CARD switch or turn off the camcorder and computer while data is being transferred to the computer (while the camcorder's CARD access indicator is flashing). Doing so may damage the memory card's data.
- Operation may not work correctly depending on the software and the specifications/settings of your computer.
- The image files on your memory card and the image files saved on the hard disk drive of your computer are valuable, original data files. If you wish to use image files on your computer, make copies of them first, and use the copied file, retaining the original.
- Make sure that the camcorder and computer are not connected with a DV cable before connecting the camcorder to the computer using the USB cable. Otherwise, the computer may not operate properly.



- We recommend powering the camcorder from a household power source 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

To transfer images with transfer orders, you need to set the transfer orders beforehand (109).

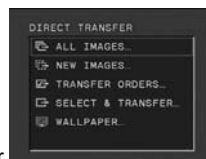
ALL IMAGES	Transfers all images to the computer.
NEW IMAGES	Transfers only those images that have not yet been transferred to the computer.
TRANSFER ORDERS	Transfers images with transfer orders to the computer.
SELECT & TRANSFER	Allows you to select an image and transfers the selected image to the computer.
WALLPAPER	Allows you to select a still image and transfers the selected image to the computer as wallpaper.

Available only in the **PLAY** mode.

1. Select (**▲▼**) the transfer method.

2. Press the button.

- [ALL IMAGES], [NEW IMAGES], [TRANSFER ORDERS]: The images are transferred to the computer and displayed in the Main Window of ZoomBrowser EX.
- The camcorder displays the transfer menu when the transfer is completed.
- To cancel transfer, select (**◀▶**) [CANCEL] and press (**⊕**), or press the FUNC. button.
- If choosing [SELECT & TRANSFER] or [WALLPAPER], continue as follows:








3. Select (**◀▶**) the image you wish to transfer.

4. Press the button.

- [SELECT & TRANSFER]: The selected image is transferred to and displayed on the computer. To continue transferring, select (**◀▶**) another image.
- [WALLPAPER]: The selected image is transferred to the computer and displayed on the desktop.
- Pressing the FUNC. button brings you back to the transfer menu.



- You can press (⊕) instead of the  button. With [ ALL IMAGES], [ NEW IMAGES] or [ TRANSFER ORDERS], a confirmation message appears. Select [OK] and press (⊕).
- When transferring with the  button, the camcorder retains the transfer setting even if you change the position of the **POWER** switch.
- When the camcorder is connected to the computer and the screen to select images displays, press the FUNC. button. The transfer menu will appear.

Selecting Images for Transfer (Transfer Order)

You can select images for transfer to the computer (max. 998). These transfer settings are compatible with the Digital Print Order Format (DPOF) standards.

Do not connect a USB or DV cable to the camcorder while setting the transfer orders. Available only in the **PLAY** mode.

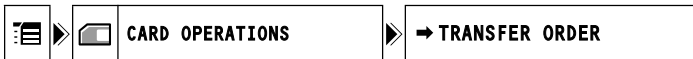
FUNC.
(53)



1. Open the **FUNC.** menu and select (**▲▼**) the transfer order icon.
2. Set (**◀▶**) it to **[TRANS.ORDER ON]**, press (**⊕**) and close the menu.
To cancel the transfer order, set it to **[TRANS.ORDER OFF]** again.

Selecting in Index Screen Display

MENU
(63)



1. Move the zoom lever toward **W**.
Up to 6 images appear.
2. Open the menu, select (**▲▼**) the **[CARD OPERATIONS]** menu and press (**⊕**).
Pressing the **FUNC.** button from the index screen will open the menu directly in the setup menus screen.
3. Select (**▲▼**) the **[➔ TRANSFER ORDER]** option and press (**⊕**).
4. Select (**▲▼** **◀▶**) the image you want to transfer and press (**⊕**).
 - "" appears on the image.
 - To cancel the transfer order, press (**⊕**) again.
5. Press the **FUNC.** button.

Erasing All Transfer Orders

MENU
(63)




1. Open the **FUNC.** menu, select (**▲▼**) the icon and press (**⊕**).
2. Select (**▲▼**) the **[CARD OPERATIONS]** menu and press (**⊕**). Then, select (**▲▼**) the **[TRANS.ORD.ALL ERASE]** option and press (**⊕**).
3. Select (**▲▼**) **[YES]** and press (**⊕**) to erase all the transfer orders, then close the menu.
All "" disappear.
4. Press the **FUNC.** button.





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	
Camcorder will not turn on.	Battery pack is exhausted. Replace or charge the battery pack.	14
	Attach the battery pack correctly.	
The camcorder switches off by itself.	Battery pack is exhausted. Replace or charge the battery pack.	14
	Power save function has been activated. Turn on the camcorder.	67
Cassette compartment will not open.	Battery pack is exhausted. Replace or charge the battery pack.	14
	Open the cassette compartment cover fully.	17
Cassette compartment stopped during loading/unloading.	Battery pack is exhausted. Replace or charge the battery pack.	14
LCD/viewfinder switches on and off.	Battery pack is exhausted. Replace or charge the battery pack.	14
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. Wait until the battery pack temperature is below 40 °C and retry charging.	–
	The battery pack is damaged. Use a different battery pack.	–

Recording/Playback

Problem	Solution	
Buttons will not work.	Turn on the camcorder.	27
	Load a cassette.	17
Camcorder will not focus.	Autofocus does not work on that subject. Focus manually.	48
	Adjust the viewfinder with the dioptic adjustment lever.	19
	Lens is dirty. Clean the lens.	121
Viewfinder picture is blurred.	Adjust the viewfinder with the dioptic adjustment lever.	19
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.	–
Abnormal characters appear on the screen. The camcorder does not operate properly.	This camcorder uses a microcomputer. External noise or static electricity may cause abnormal characters to appear on the screen. In such case, disconnect the power source and reconnect it after a short time. If the problem persists, remove all power source including the removal of the back up battery to reset all the camcorder's settings.	–
"  " flashes on the screen.	Load a cassette.	17
"  " flashes on the screen.	Battery pack is exhausted. Replace or charge the battery pack.	14
"  " flashes on the screen.	Condensation is detected. See reference page.	113
"REMOVE THE CASSETTE" appears on the screen.	Unload and reload the cassette.	17


Problem	Solution	
"SET THE TIME ZONE, DATE AND TIME" appears on the screen.	Set the time zone, date and time.	25
	Replace the backup battery with a new lithium button battery CR1616. After replacing the backup battery set the time zone, date and time again.	22, 25
The wireless controller will not work.	Set [WL.REMOTE] to [ON].	67
	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.	-

Recording on the Tape



Problem	Solution	
Image will not appear on the screen.	Set the POWER switch to CAMERA.	27
	Open the lens cover.	
Pressing the start/stop button will not start recording.	Set the POWER switch to CAMERA.	27
	Load a cassette.	17
	Tape reached the end ("END" flashes on the screen). Rewind the tape or replace the cassette.	17
	Cassette is protected ("P" flashes on the screen). Change the position of the protect switch.	118
Sound is distorted.	When recording near loud sounds (such as fireworks, drums or concerts), sound may become distorted.	-
Sound is recorded in a lower level than the actual level.	When recording near loud sounds (such as fireworks, drums or concerts), sound may be recorded not in the actual sound level.	-

Playback of the Tape


Problem	Solution	
During playback there is video noise.	Video heads are dirty. Clean the video heads.	120
Pushing the joystick towards ►/II does not start playback.	Set the POWER switch to PLAY.	37
	Load a cassette.	17
	Tape reached the end ("END" flashes on the screen). Rewind the tape.	37
Image will not appear on the TV screen.	MOV460/MVX430 Set [AV → DV] to [OFF].	93
	Check again that the camcorder is properly connected to the TV.	41
Tape 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.	41
	Video heads are dirty. Clean the video heads.	120
	You attempted to play back or dub copyright protected tape. Stop playback/dubbing.	-
No sound from the built-in speaker.	Speaker volume is turned off. Adjust the volume with the [SPEAKER VOLUME] option of the FUNC. menu.	40

Problem	Solution	
The tape stops during playback pause.	When playback pause continues for more than 4 minutes 30 seconds during playback or audio dubbing, the camcorder shuts off to protect the tape and video heads. When audio dubbing, restart the playback of the tape and press the PAUSE  button on the wireless controller.	-

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.	18
Memory card cannot be recorded.	Insert a memory card.	18
	Memory card is full. Replace the memory card or erase images.	82
	Memory card is not initialized. Initialize the memory card.	84
	The folder and file numbers have reached their maximum value. Set [FILE NOS.] to [RESET] and insert a new memory card.	67
Memory card cannot be played back.	If you are using an SD memory card, make sure the card protection tab is set to allow recording.	-
	Set the POWER switch to PLAY and the TAPE/CARD switch to  .	39
Image cannot be erased.	Insert a memory card.	18
Image cannot be erased.	Image is protected. Cancel the protection.	83
"  " flashes red.	Card error occurred. Turn off the camcorder. Remove and reinsert the memory card. Initialize the memory card if flashing persists.	84

Printing

Problem	Solution	
The printer is not operating even though camcorder and printer are correctly connected.	1. Set the POWER switch to PLAY and the TAPE/CARD switch to  . 2. Disconnect and reconnect the USB cable. 3. Turn off the printer and turn it back on.	-

MX460/MX430 Editing

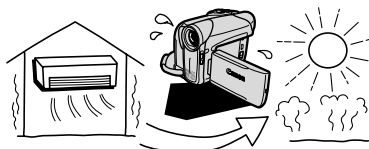
Problem	Solution	
Dubbing via the camcorder's DV terminal does not work.	Set [AV → DV] to [OFF].	93
	Wrong signal standard. Dubbing may work via the AV terminal. Refer also to the instruction manual of the connected device.	-

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.

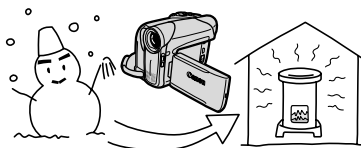
Condensation may form in the following cases:

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

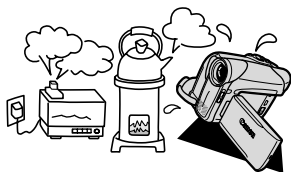


When the camcorder is left in a humid

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



When a cold room is heated rapidly



How to avoid condensation:

- Unload the cassette, 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 stops operating and the warning message "CONDENSATION HAS BEEN DETECTED" appears for approx. 4 seconds and "🔴" starts flashing.
- If a cassette is loaded, the warning message "REMOVE THE CASSETTE" appears and "🔴" starts flashing. Remove the cassette immediately and leave the cassette compartment open. Leaving the cassette in the camcorder may damage the tape.
- A cassette cannot be loaded when condensation is detected.




Resuming use:




- It takes about 1 hour until the water droplets evaporate. After the condensation warning stops flashing, wait for 1 more hour before resuming use.

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.	25
CHANGE THE BATTERY PACK	Battery pack is exhausted. Replace or charge the battery pack.	14
THE TAPE IS SET FOR ERASURE PREVENTION	Cassette is protected. Replace the cassette or change the position of the protect switch.	118
REMOVE THE CASSETTE	Camcorder stopped operating to protect the tape. Unload and reload the cassette.	17
CHECK THE INPUT	DV cable is not connected, or the connected digital device is turned off.	89
CONDENSATION HAS BEEN DETECTED	Condensation has been detected in the camcorder.	113
CONDENSATION HAS BEEN DETECTED REMOVE THE CASSETTE	Condensation has been detected in the camcorder. Unload the cassette.	113
TAPE END	Tape reached the end. Rewind the tape or replace the cassette.	-
INCORRECT TAPE SPECIFICATION	You attempted to perform audio dubbing on a tape recorded in HDV standard.	-
INCORRECT TAPE SPECIFICATION PLAYBACK IS RESTRICTED	You attempted to play back a tape recorded in HDV standard.	-
INPUT SIGNAL NOT SUPPORTED	You attempted to input video signal in HD standard through the DV terminal.	-
CHECK THE CASSETTE [REC MODE]	You attempted to perform audio dubbing on a tape recorded in a mode other than the SP mode.	94
CHECK THE CASSETTE [AUDIO MODE]	You attempted to perform audio dubbing on a tape recorded in 16-bit or 12-bit 4-channel sound.	94
CHECK THE CASSETTE [BLANK]	You attempted to perform audio dubbing on a tape with a blank section.	94
HEADS DIRTY, USE CLEANING CASSETTE	Video heads are dirty. Clean the video heads.	120
COPYRIGHT PROTECTED PLAYBACK IS RESTRICTED	You attempted to play back a copyright protected tape.	91
COPYRIGHT PROTECTED DUBBING RESTRICTED	You attempted to dub a copyright protected tape. May also appear when an anomalous signal is received during analog line-in recording.	91



Memory Card Related Messages







Message	Explanation	
NO CARD	Memory card not is inserted into the camcorder.	18
NO IMAGES	No images are recorded on the memory card.	-
CARD ERROR	A memory card error occurred. The camcorder cannot record or play back the image. The error may be temporary. If the message disappears after 4 seconds "  " flashes red, turn the camcorder off, remove the card and reinsert the card. If "  " changes to green, you can continue recording/playback.	-

Message	Explanation	
CARD FULL	No remaining capacity on the memory card. Replace with another card or erase images.	–
NAMING ERROR	The folder and file numbers have reached their maximum value.	–
THIS IMAGE CANNOT BE RECORDED	Some analog images cannot be recorded on the memory card depending on the signal.	–
UNIDENTIFIABLE IMAGE	The image was not recorded with JPEG compression, or was recorded with a compression incompatible with the camcorder, or the image file is corrupted.	–
 PRINT ORDER ERROR	You attempted to set more than 998 still images in the print order.	102
 TRANSFER ORDER ERROR	You attempted to set more than 998 transfer orders.	109
CANNOT TRANSFER!	You attempted to transfer a movie file as wallpaper.	107
TOO MANY STILL IMAGES DISCONNECT USB CABLE	Disconnect the USB cable, decrease the number of still images on the memory card to less than 1800. If a dialog appeared on the computer screen, close it. Reconnect the USB cable.	–

Direct Print Related Messages

The following messages may appear on the camcorder screen. On printers equipped with an operation panel or printers that can be connected to a TV, an error number or message appears on the panel or TV monitor. Refer to the printer's instruction manual to find out how to solve the problems corresponding to each error number or message.

Message	Explanation
PAPER ERROR	There is a problem with the paper. The paper is not correctly inserted, the wrong paper size is inserted, or the ink cannot be used with the selected paper.
NO PAPER	There is no paper. If the printer is equipped with a photo paper cassette, specify the paper feed location using the Paper Feed switch.
PAPER JAM	The paper jammed during printing. Select [STOP] to cancel printing. After removing the paper, set some paper again and press the resume button on the printer.
INK ERROR	Refer to the printer's manual to solve the problem.
NO INK	The ink cartridge is not inserted or is out of ink. Refer to the printer's manual to solve the problem.
LOW INK LEVEL	The ink cartridge needs to be replaced soon. Select [CONTINUE] to restart printing.
WASTE TANK FULL	Waste tank is full. Select [CONTINUE] to restart printing. Consult your dealer or a Canon Service Center listed in the Contact List provided with the printer or the printer manual to replace the waste tank (waste ink absorber).
FILE ERROR	You attempted to print an image that was recorded with another camcorder, with a different compression, or was edited on a computer.
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 images on the memory card have been marked with a  print order.

Message	Explanation
PRINTER ERROR	Cancel printing. Turn off the printer and turn it back on. Check the printer status. If the error persists, consult your dealer or a Canon Service Center listed in the Contact List provided with the printer or the printer manual.
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. If the error persists, consult your dealer or a Canon Service Center listed in the Contact List provided with the printer or the printer manual. When you are printing using the   button, check the print settings.
HARDWARE ERROR	Refer to the printer's manual to solve the problem. 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. If the error persists, consult your dealer or a Canon Service Center listed in the Contact List provided with the printer or the printer manual.
COMMUNICATION ERROR	The printer is experiencing a data transmission 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.
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 print head is defect. Refer to the instruction manual of your printer.

Handling Precautions

Camcorder

- Do not carry the camcorder by the LCD panel.
- Do not leave the camcorder in places subject to high temperatures, such as a sun-heated car, and 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 the camcorder in dusty or sandy places. Dust or sand getting inside the cassette or camcorder may cause damage. Dust and sand can also damage the lens. Close the lens cover after use.
- The camcorder is not waterproof. Water, mud or salt getting inside the cassette or camcorder may cause damage.
- 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.
- Avoid sudden changes in temperature. Moving the camcorder rapidly between hot and cold temperatures may cause condensation to form on its internal surfaces (□ 113).

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.

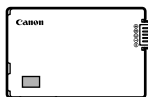
- Charged battery packs continue to discharge naturally. Therefore, charge them on the day of use, or the day before, to ensure a full charge.
- Attach the terminal cover whenever a battery pack is not in use. Contact to metallic objects may cause a short circuit and damage the battery pack.
- Dirty 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 1 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.

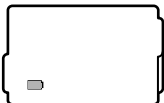
About the battery terminal cover

The battery terminal cover has a []-shaped hole. This is useful when you wish to differentiate between charged and uncharged battery packs. For example, with charged battery packs, attach the terminal cover so that the []-shaped hole shows the white label.

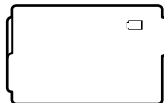
Back side of the battery pack



Terminal cover attached
Charged



Uncharged

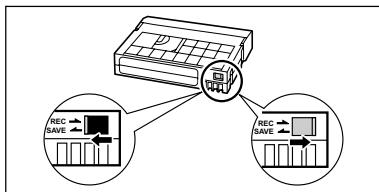


Cassette

- Rewind tapes after use. If the tape becomes slack and damaged, it may cause picture and sound distortion.
- Return cassettes to the case and store them upright. Rewind tapes from time to time if they are stored for a long time.
- Do not leave the cassette in the camcorder after use.
- Do not use spliced tapes or nonstandard cassettes as they may damage the camcorder.
- Do not use tapes that have been jammed as video heads may become dirty.
- Do not insert anything into the small holes of the cassette, or cover them with cellophane tape.
- Handle cassettes with care. Do not drop or subject them to severe impact as this may damage the cassettes.
- With cassettes equipped with a memory function, metal plated terminals may become dirty with use. Clean the terminals with a cotton swab after about 10 times of loading/unloading. The memory function is not supported by the camcorder.

Protecting Tapes from Accidental Erasure

To protect your recordings from accidental erasure, slide the tab on the cassette to SAVE or ERASE OFF.



Memory Card

- Initialize new memory cards with the camcorder. Memory cards initialized with other devices such as a computer may not operate correctly.
- We recommend saving backups of memory card images on your computer's hard drive or other external memory device. 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 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 memory cards.
- Do not bend, drop, or subject memory cards to shocks and do not expose them to water.
- Moving a memory card rapidly between hot and cold temperatures may cause condensation to form on its external and internal surfaces. If condensation forms on the card, put it aside until the droplets have evaporated completely.
- Do not touch or expose the terminals to dust or dirt.
- Check the direction before inserting the memory card. Forcing a memory card backwards into the slot may damage the memory card or the camcorder.
- Do not remove the label from the memory card, or affix other labels on the memory card.

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.

CR1616:

- Replace the battery with a CR1616 made by Panasonic, Hitachi Maxell, Sony, Toshiba, Varta or Renata. Use of other batteries may present a risk of fire or explosion.

CR2025:

- 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 reach of children. If it is swallowed, seek medical assistance immediately. The battery case may break and the battery fluids may damage stomach and intestines.
- Do not disassemble, heat or immerse the battery in water to avoid the risk of explosion.

Cleaning the Video Heads

When the message "HEADS DIRTY, USE CLEANING CASSETTE" appears, or when the playback picture becomes distorted, the video heads need to be cleaned.

To maintain the best picture quality, we recommend cleaning the video heads frequently with the Canon DVM-CL Digital Video Head Cleaning Cassette or a commercially available dry cleaning cassette.



- Do not use wet type cleaning cassettes as this may damage the camcorder.
- Tapes already recorded with dirty video heads may not be played back correctly even when you clean the video heads.

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.
- After storage, check the functions of your camcorder to make sure that the camcorder is still working properly.

Cleaning

Camcorder Body and Lens

- Use a soft, dry cloth to clean the camcorder body. Never use chemically treated cloth or volatile solvents such as paint thinner.
- Use a clean, soft cloth of the type used to clean eyeglasses to gently wipe the lens. Never use tissue paper to clean the lens.

LCD Screen

- Clean the LCD screen using a commercially available cleaning cloth for glasses.
- Condensation may form on the surface of the screen when the temperature changes suddenly. Wipe it with a soft dry cloth.

Viewfinder

- Clean the viewfinder screen using a blower brush or a commercially available cleaning cloth for glasses.

Using the Camcorder Abroad

Power Sources

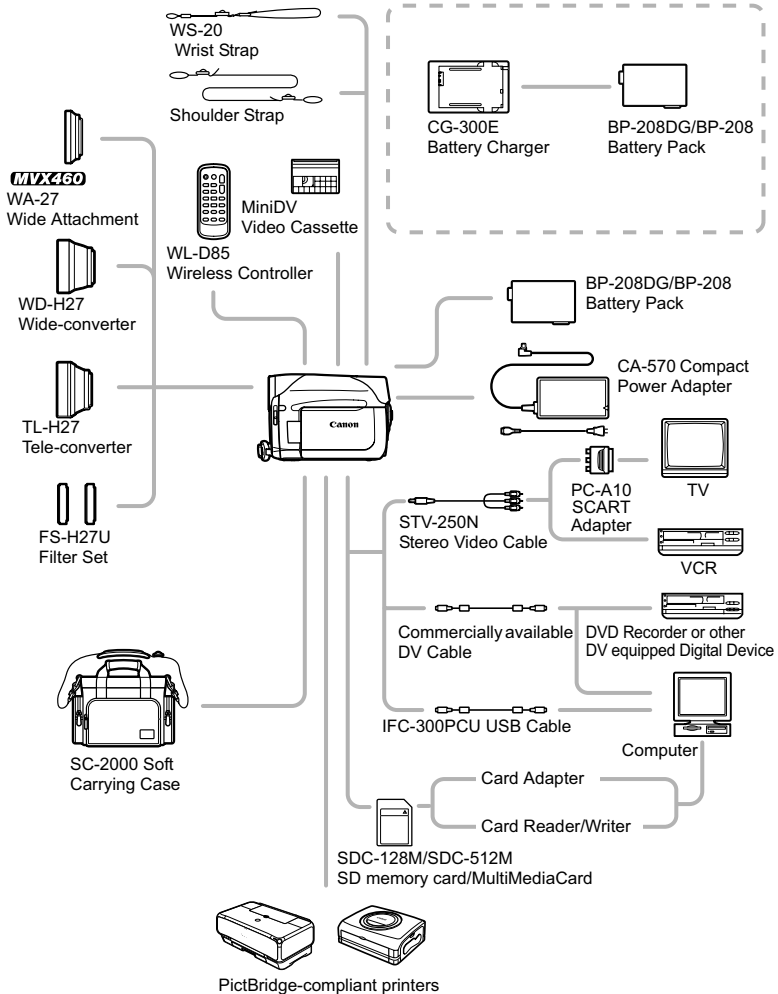
You can use the compact power adapter to operate the camcorder and to charge battery packs in any country with power supply between 100 and 240 V AC, 50/60 Hz. Consult the Canon Service Center for information on plug adapters for overseas use.

Playback on a TV Screen

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

System Diagram (Availability differs from area to area)



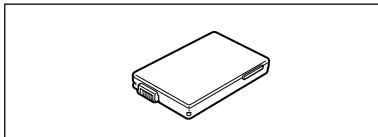
Optional Accessories

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

The BP-208DG is not available as a separate optional accessory. When you need extra battery packs, select only the BP-208 battery pack.

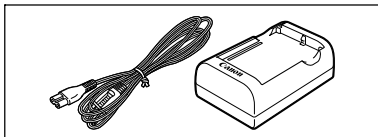


CG-300E Battery Charger

Use the battery charger for charging the battery packs.

Charging Time: 105 min.

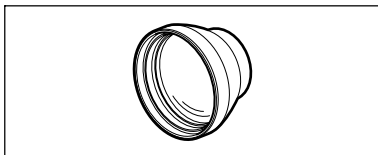
Charging time varies according to the charging condition.



TL-H27 Tele-converter

This Tele-converter lens increases the focal length of the camcorder lens by a factor of 1.7.

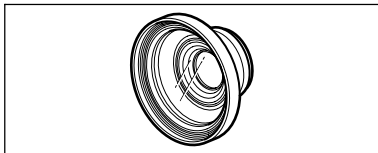
- The image stabilizer is not as effective when the Tele-converter is attached.
- The minimum focusing distance with the TL-H27 is 3 m; 3 cm at maximum wide angle.
- When the Tele-converter is attached, a shadow may appear in the picture when you record with the assist lamp.



WD-H27 Wide-converter

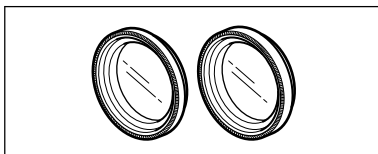
This lens decreases focal length by a factor of 0.7, giving you a wide perspective for indoor shots or panoramic views.

- When the Wide-converter is attached, a shadow may appear in the picture when you record with the assist lamp.



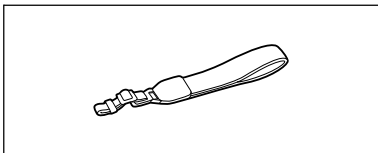
FS-H27U Filter Set

Neutral density and MC protector filters help you to control difficult lighting conditions.



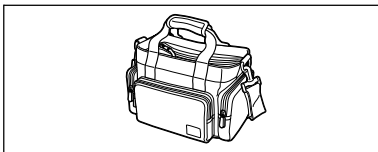
WS-20 Wrist Strap

Use this for extra additional protection for active shooting.



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

MXV 460/MXV 450/MXV 430

System

Video Recording System	2 rotary heads, helical scanning DV system (consumer digital VCR SD system), digital component recording
Audio Recording System	PCM digital sound: 16 bit (48 kHz/2 ch); 12 bit (32 kHz/4 ch)
Television System	CCIR standard (625 lines, 50 fields) PAL colour signal
Image Sensor	1/5-inch CCD, approx. 1,330,000 pixels Effective pixels: Tape: 16:9 (with image stabilizer): approx. 750,000 16:9 (no image stabilizer): approx. 880,000 4:3 recording: approx. 690,000 Card (still images): approx. 1,000,000
Tape Format	Videocassettes bearing the ^{Mini} DV mark.
Tape Speed	SP: 18.83 mm/s, LP: 12.57 mm/s
Maximum Recording Time (80 min. cassette)	SP: 80 min., LP: 120 min.
Fast Forward/Rewind Time	Approx. 2 min. 20 sec. (with a 60 min. cassette)
LCD Screen	2.7-inch. wide, TFT color, approx. 123,000 pixels
Viewfinder	0.33-inch. TFT color, approx. 113,000 pixels
Microphone	Stereo electret condenser microphone
Lens	MXV460/MXV450 f=3.0–60 mm, F/1.8–3.6, 20x power zoom 35 mm equivalent: Tape: 16:9 (with image stabilizer): 43.7–874 mm 16:9 (no image stabilizer): 40.3–806 mm 4:3 recording: 48.1–962 mm Card (still images): approx. 40.1–802 mm MXV430 f=3.0–54 mm, F/1.8–3.3, 18x power zoom 35 mm equivalent: Tape: 16:9 (with image stabilizer): 43.7–787 mm 16:9 (no image stabilizer): 40.3–725 mm 4:3 recording: 48.1–866 mm Card (still images): approx. 40.1–722 mm
Lens Configuration	10 elements in 8 groups
Filter Diameter	27 mm
AF system	TTL autofocus, manual focusing possible
Minimum Focusing Distance	1 m; 1 cm on maximum wide angle
White Balance	Auto white balance, pre-set white balance (DAYLIGHT, TUNGSTEN) or custom white balance
Minimum Illumination	2 lx (Night mode, Shutter speed set at 1/6)
Recommended Illumination	More than 100 lx
Image Stabilization	Electronic

Memory Card

Recording media	SD Memory Card, MultiMediaCard*
Size of Images on the Card	Still image: 1152 x 864, 640 x 480 pixels Movie: 320 x 240, 160 x 120 pixels, 15 frames/sec.
File Specification	Design rule for Camera File system (DCF), Exif 2.2** compliant, DPOF compliant
Image Compression Method	Still image: JPEG (compression: Super Fine, Fine, Normal) Movie: Video data: Motion JPEG, audio data: WAVE (monaural)

* The camcorder's operations have been tested with SD memory cards up to 2GB. Performance cannot be guaranteed for all memory 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

AV Terminal	Ø3.5 mm minijack Video: 1 Vp-p/75 ohms unbalanced Audio: output: -10dBV (47 kohms load)/3 kohms or less input: -10dBV/40 kohms or more (MX460/MX430 only)
DV Terminal	Special 4-pin connector (IEEE 1394 compliant)
USB Terminal	mini-B
MIC Terminal	Ø3.5 mm stereo minijack, -57dBV (with a 600 ohms microphone)/ 5 kohms or more

Power/Others

Power supply (rated)	7.4 V DC
Power consumption (AF on)	2.5 W (using viewfinder), 2.5 W (using LCD screen in normal brightness)
Operating temperature	0 – 40 °C
Dimensions (W x H x D)	57 x 77 x 109 mm excluding protrusions
Weight (camcorder body only)	370 g

CA-570 Compact Power Adapter

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

BP-208DG Battery Pack

Battery type	Rechargeable Lithium Ion Battery
Rated voltage	7.4 V DC
Operating temperature	0 – 40 °C
Battery capacity	850 mAh
Dimensions	39 x 8 x 63 mm
Weight	40 g

Weight and dimensions are approximate. Errors and omissions excepted. Subject to change without notice.

12bit audio	95	Exposure lock/adjustment	47
16:9 (Widescreen)	35		
A		F	
Abroad, using the camcorder	121	Faders	58
Analog line-in recording*	87	File numbers	67
Analog/digital (A/D) converter*	92	Fireworks (recording program)	43
Audio dubbing	94	Focus	48
Audio mode	66	Focus priority	64
Auto exposure bracketing	79	Focusing frame	31
Auto slow shutter	64	FUNC. menu	54
		G	
B		Grip belt	19
Backup battery	22		
Battery pack	14	H	
Beach (recording program)	43	High-speed continuous shooting	79
Beep	67		
		I	
C		Image effects	57
Card jump	81	Image stabilizer	64
Card mix	61	Index screen	81
Charging a battery pack	14	Initialization (memory card)	84
Condensation	113		
Connection to a computer	104, 106	J	
Connection to a digital recording device	85	Joystick	3
Connection to a TV or VCR	87	Joystick guide	3
Continuous shooting	79		
		L	
D		Language	24
Data code	71	LCD backlight	23
Date and time	25	LCD screen	23
Date search	74	LED light	50
Digital effects	58	Lithium button battery	21, 119
Digital zoom	33	LP mode	65
Direct printing	97		
Direct transfer	107	M	
Drive mode	79	Magnification of playback image	70
DV (IEEE1394) terminal	85	Maintenance	121
DV dubbing	89	Memory card	18
		MIC (microphone) terminal	52
E		Movies (memory card)	30
Easy mode	43	Movies (tape)	27
Effects	59	MultiMediaCard	18
End search	72		
Erasing still images	82	N	
		ND filter	123

Night (recording program) 43

O

Operating modes 4

P

Playback - Memory card 39

Playback - Tape 37

Portrait (recording program) 43

Power - Battery pack 14

Power - Household power source 14

Power save 67

Print order 102

Printing still images 97

Program AE (recording program) 43

Protecting still images 83

R

Record review/search 29

Recording - Memory card 30

Recording - Tape 27

Recording mode 65

Recording programs 43

Remaining battery charge indicator 12

Remote sensor 21

S

Screen displays 12

Screen messages 114

SD memory card 18

Self timer 51

Serial number 8

Setup menus 64

Shoulder strap 19

Slide show 81

Snow (recording program) 43

SP mode 65

Speaker 40

Sports (recording program) 43

Spotlight (recording program) 43

Still image quality/size 75

Still image review 65

Still images 30

Sunset (recording program) 43

T

Telephoto 33

Time code 28

Time zone 25

Transfer order 109

Transferring still images to a computer 106

Tripod 36

Troubleshooting 110, 117

TV screen 66

U

USB terminal 97, 106

V

Video heads 120

Videocassettes 17

Viewfinder - Dioptic adjustment 19

Volume 40

W

White balance 55

Wide angle 33

Wide attachment 20

Widescreen TV (16:9) 35

Wind screen 69

Wireless controller 21

Z

Zero set memory 73

Zoom 33



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

Canon New Zealand Ltd.

Customer Care: (09) 489 0470

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, Hunghom, Kowloon, Hong Kong

Canon Latin America, Inc.

Sales & Enquiries: 703 Waterford Way Suite 400 Miami, FL 33126 USA



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