Panasonic®

Basic Operating Instructions
SD Card/Hard Disk Video Camera

Model No. **SDR-H90**
SDR-H80
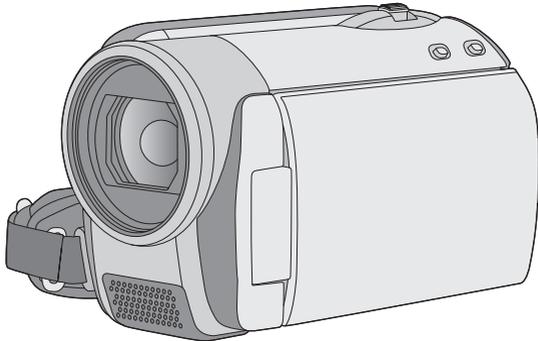
Before use, please read these instructions completely.

Please also refer to Operating Instructions (PDF format) recorded on the CD-ROM containing the Operating Instructions (supplied). You can learn about advanced operation methods and check the Troubleshooting.

SDHC™

PictBridge

DOLBY DIGITAL STEREO CREATOR

Web Site: http://www.panasonic-europe.com

LSQT1467 A

Information for Your Safety

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

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

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

■ EMC Electric and magnetic compatibility

This symbol (CE) is located on the rating plate.

Use only the recommended accessories.
● Do not use any other AV cables and USB
cables except the supplied one.
● When you use the cable which are sold
separately, please make sure to use the one
whose length is less than 3 meters.

● Keep the Memory Card out of reach of children
to prevent swallowing.

Product Identification Marking is located on
the bottom of units.

∎ Caution for use

Keep the SD Card/Hard Disk Video Camera as far away as possible from electromagnetic equipment (such as microwave ovens, TVs, video games etc.).

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

Do not use the SD Card/Hard Disk Video Camera near radio transmitters or high-voltage lines.

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

About connecting to a TV or other video devices.

- Do not use any other AV cables except the supplied one.

About connecting to a PC or a printer.

- Do not use any other USB cables except the supplied one.

∎ Information for Users on Collection and Disposal of Old Equipment and used Batteries

These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries should not be mixed with general household waste. For proper treatment, recovery and recycling of old products and used batteries, please take them to applicable collection points, in accordance with your national legislation and the Directives 2002/96/EC and 2006/66/EC.

By disposing of these products and batteries correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling.

For more information about collection and recycling of old products and batteries, please contact your local municipality, your waste disposal service or the point of sale where you purchased the items.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

For business users in the European Union
If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

[Information on Disposal in other Countries outside the European Union]
These symbols are only valid in the European Union. If you wish to discard these items, please contact your local authorities or dealer and ask for the correct method of disposal.

Note for the battery symbol (bottom two symbol examples):
This symbol might be used in combination with a chemical symbol. In this case it complies with the requirement set by the Directive for the chemical involved.

Cd

■ Indemnity concerning recording content

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

■ Carefully observe copyright laws

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

■ Cards that you can use with this unit

SD Memory Card and SDHC Memory Card
- 4 GB or more Memory Cards that do not have the SDHC logo are not based on SD Memory Card Specifications.
- Refer to page 15 for more details on SD cards.

■ For the purposes of these operating instructions

- SD Memory Card and SDHC Memory Card are referred to as the "SD card".
- Pages for reference are indicated by an arrow, for example: ➜ 00
- These operating instructions are designed for use with models SDR-H90 and SDR-H80. Pictures may be slightly different from the original.
  - The illustrations used in these operating instructions show model SDR-H80, however, parts of the explanation refer to different models.
  - Depending on the model, some functions are not available.
  - Features may vary, so please read carefully.

■ Licenses

- SDHC Logo is a trademark.
- U.S. Patent Nos. 6,836,549; 6,381,747; 7,050,698; 6,516,132; and 5,583,936.
  This product incorporates copyright protection technology that is protected by U.S. patents and other intellectual property rights. Use of this copyright protection technology must be authorized by Macrovision, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision. Reverse engineering or disassembly is prohibited.
- Manufactured under license from Dolby Laboratories.
  Dolby and the double-D symbol are trademarks of Dolby Laboratories.
- Microsoft®, Windows®, Windows Vista®, DirectDraw®, DirectSound® and DirectX® are either registered trademarks or trademarks of the Microsoft Corporation in the United States and/or other countries.
- Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation.
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- Macintosh and Mac OS are either registered trademarks or trademarks of Apple Inc. in the United States and/or other countries.
- Other names of systems and products mentioned in these instructions are usually the registered trademarks or trademarks of the manufacturers who developed the system or product concerned.

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Preparation

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Others

Accessories

Check the accessories before using this unit.

Battery pack
VW-VBG070

● The battery is not charged. Be sure to charge the battery before using this unit. (➜ 10)

AC adaptor
VSK0698

AC cable
K2CQ2CA00006 or
K2CR2DA00004

DC cable
K2GJ2DC00015

AV cable
K2KC4CB00022

USB cable
K1HA05AD0006

CD-ROM
Software

CD-ROM
LSFT0775
Operating Instructions

Optional accessories

Some optional accessories may not be available in some countries.

AC adaptor (VW-AD21E-K)
Battery pack (lithium/VW-VBG070)
Battery pack (lithium/VW-VBG130)
Battery pack (lithium/VW-VBG260)
Battery pack (lithium/VW-VBG6)[*1]
Battery Pack Holder Kit (VW-VH04)
Wide conversion lens (VW-W3707H)
Filter kit (VW-LF37WE)
DVD burner (VW-BN1)
Shoe adaptor (VW-SK12E)
Video DC light (VW-LDC103E)[*2]
Light bulb for video DC light (VZ-LL10E)

*1 The battery pack holder kit VW-VH04 (optional) is necessary.
*2 The shoe adaptor VW-SK12E (optional) is necessary.

Before using

1

Parts identification and handling

1 2 3   4 5 6

7   8   9 10 11   12 13 14

15
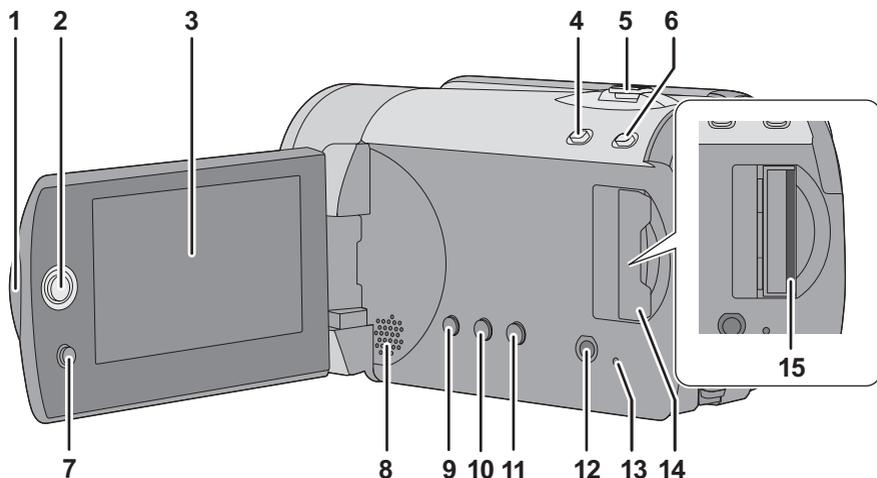
1 **LCD monitor open part**
2 **Joystick**
3 **LCD monitor**

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

4 **Web mode button [WEB MODE]**
5 **When recording: Zoom lever [W/T]**
   When playing back: Volume lever [−VOL+]
6 **Intelligent auto button [iA]**
7 **Menu button [MENU]**
8 **Speaker**
9 **Delete button [🗑]**
10 **Manual button [MANUAL AF/MF]**
11 **Optical image stabilizer button [(((⾶))) , O.I.S.]**
12 **Audio-video output terminal [A/V]**
13 **SD Card access lamp [ACCESS]**
14 **SD Card slot cover [SD CARD]**
15 **SD card slot**

LCD monitor
Pull the LCD monitor out in the direction of the arrow with your fingers.
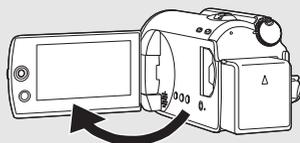
● It can open up to 90°.

Ⓐ   Ⓑ
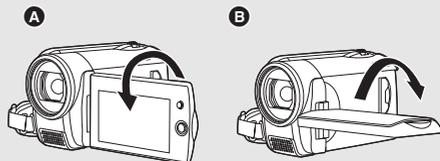
● It can rotate up to 180° Ⓐ towards the lens or 90° Ⓑ towards the opposite direction.

● The brightness and colour level of the LCD monitor can be adjusted.

Joystick

Use the joystick to select the recording functions and playback operations, and to operate the menu screen.

Move the joystick up, down, left, or right to select a setting or scene, and then press the joystick to set it.
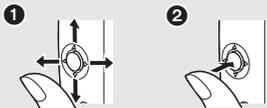
❶ Select by moving up, down, left, or right.
❷ Set by pressing the centre.

16   17
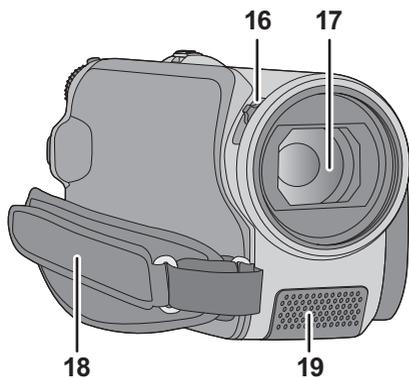
16 Open/close switch for the lens cover
17 Lens

● Attach the MC protector or the ND filter of the Filter Kit (VW-LF37WE; optional) or the wide conversion lens (VW-W3707H; optional) in front of the lens.
● When using the wide conversion lens, if the magnification exceeds 20× then the image quality is degraded.
● The tele conversion lens cannot be used.

Attaching the lens cap (Included in the Filter Kit (VW-LF37WE; optional))

● When the filter kit (VW-LF37WE; optional) is used, protect the lens surface while the unit is not used with the lens cap supplied with the filter kit.
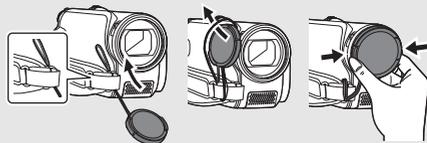
● To attach or remove the lens cap, hold both sides of the lens cap with the tips of your finger and thumb.

18 Grip belt
19 Microphone (built-in, stereo)

Lens cover

For the lens protection, be sure to close the lens cover when not in use.
Slide open/close switch for the lens cover.
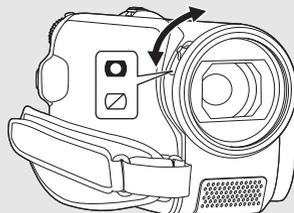
Grip belt

Adjust the belt length and the pad position.
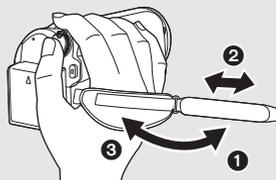
❶ Flip the belt.
❷ Adjust the length.
❸ Replace the belt.
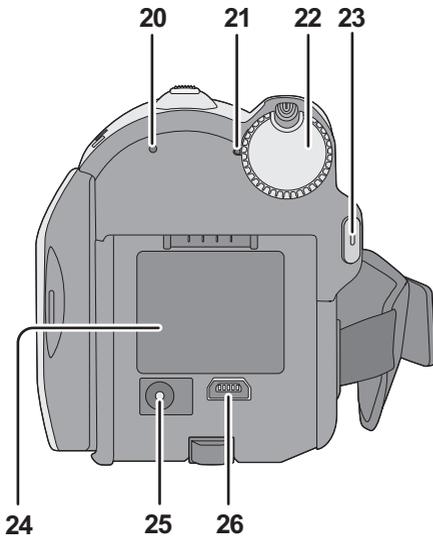
20 **HDD access lamp [ACCESS HDD]**
21 **Status indicator**
22 **Mode dial**
23 **Recording start/stop button**
24 **Battery holder**
25 **DC input terminal [DC IN]**
● Always use the supplied AC adaptor or a genuine Panasonic AC adaptor (VW-AD21E-K; optional).
26 **USB terminal [←]**
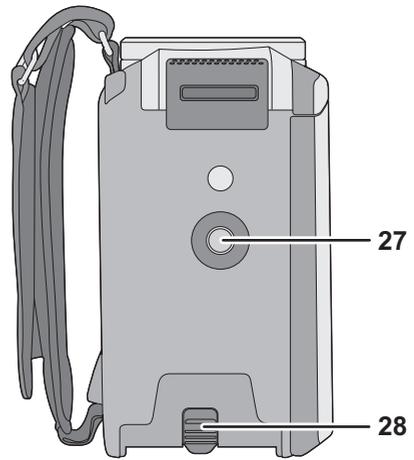
27 **Tripod receptacle**
28 **Battery release lever [BATTERY]**

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

2 Power supply
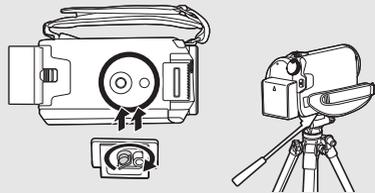
■ About batteries that you can use with this unit

The battery that can be used with this unit is supplied battery/VW-VBG070/VW-VBG130/VW-VBG260/VW-VBG6.
- This unit has a function to distinguish the batteries that can be used, and the batteries (VW-VBG070/VW-VBG130/VW-VBG260/VW-VBG6) are compatible with this function. (The batteries that are not compatible to this function cannot be used.)
- The battery pack holder kit VW-VH04 (optional) is necessary if using VW-VBG6.

It has been found that counterfeit battery packs which look very similar to the genuine product are made available to purchase in some markets. Some of these battery packs are not adequately protected with internal protection to meet the requirements of appropriate safety standards. There is a possibility that these battery packs may lead to fire or explosion. Please be advised that we are not liable for any accident or failure occurring as a result of use of a counterfeit battery pack. To ensure that safe products are used we would recommend that a genuine Panasonic battery pack is used.

Charging the battery

When this unit is purchased, the battery is not charged. Charge the battery before using this unit.
Important:
If the DC cable is connected to the AC adaptor, the battery will not charge. Remove the DC cable from the AC adaptor.
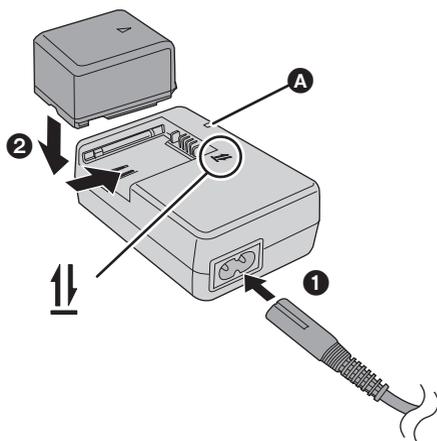
Charging lamp [CHARGE] Ⓐ
Lights up:
Charging (➔ 12, Charging time)
Goes off:
Charging completed
Flashing:
- When the battery temperature is excessively high or low, the lamp flashes and the charging time will be longer than normal.
- Remove dirt, foreign objects or dust on the terminals of the battery or the AC adaptor. If the lamp is still flashing, something may be wrong with the battery or AC adaptor. Contact your dealer.

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

2 Insert the battery on the AC adaptor by aligning the arrows.

- We recommend using Panasonic batteries. (➔ 6, 12)
- If you use other batteries, we cannot guarantee the quality of this product.

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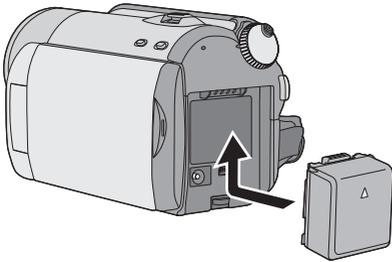
Push the battery against the battery holder and slide it until it clicks.

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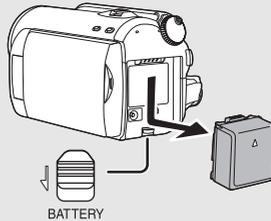
BATTERY

● Hold the battery with your hand so that it does not fall.

● Be sure to set the mode dial to OFF and check that the status indicator is off before removing the battery.
● Do not heat or expose to flame.
● Do not leave the battery(ies) in an automobile exposed to direct sunlight for a long period of time with doors and windows closed.

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

Warning
Risk of fire, explosion and burns. Do not disassemble, heat above 60 ℃ or incinerate.

Charging time and recordable time

■ Charging time

● Temperature: 25 °C/humidity: 60%

Battery model number	Voltage/Capacity (Minimum)	Charging time
Supplied battery/VW-VBG070 (optional)	7.2 V/725 mAh	1 h 35 min
VW-VBG130 (optional)	7.2 V/1250 mAh	2 h 35 min
VW-VBG260 (optional)	7.2 V/2500 mAh	4 h 40 min
VW-VBG6* (optional)	7.2 V/5400 mAh	9 h 25 min

● If the temperature is higher or lower than 25 °C, the charging time will become longer.

■ Recordable time

● Temperature: 25 °C/humidity: 60%

Battery model number	Voltage/ Capacity (Minimum)	Recording destination	Recording mode	Maximum continuously recordable time	Actual recordable time
Supplied battery/ VW-VBG070 (optional)	7.2 V/ 725 mAh	HDD	XP	1 h 50 min	55 min
			SP/LP	1 h 55 min	1 h
		SD	XP/SP/LP	2 h	1 h 5 min
VW-VBG130 (optional)	7.2 V/ 1250 mAh	HDD	XP	2 h 55 min	1 h 30 min
			SP/LP	3 h	1 h 35 min
		SD	XP/SP/LP	3 h 10 min	1 h 45 min
VW-VBG260 (optional)	7.2 V/ 2500 mAh	HDD	XP	5 h 20 min	2 h 50 min
			SP/LP	5 h 35 min	2 h 55 min
		SD	XP/SP/LP	5 h 50 min	3 h 15 min
VW-VBG6* (optional)	7.2 V/ 5400 mAh	HDD	XP	13 h 20 min	7 h
			SP/LP	13 h 50 min	7 h 20 min
		SD	XP/SP/LP	14 h 30 min	8 h 5 min

* The battery pack holder kit VW-VH04 (optional) is necessary.

● These times are approximations.
● The actual recordable time refers to the recordable time when repeatedly starting/stopping recording, turning the unit on/off, moving the zoom lever, etc.
● The recordable times will vary depending on the status of use. Be aware that the operating time of the battery will become shorter in low temperatures. We recommend charging a spare battery for use when recording.
● The batteries heat up after use or charging. This unit will also heat up while being used. This is not a malfunction.

Battery capacity indication

● The display changes as the battery capacity reduces. → → → →
If there is less than 3 minutes remaining, then will become red. If the battery discharges, then ( ) will flash.
● The remaining battery capacity is displayed when using the Panasonic battery that you can use for this unit. It may take time to display the remaining battery capacity. The actual time can vary depending on your actual use.
● The maximum amount of remaining battery capacity able to be indicated is 9 hours 59 minutes. If the actual remaining time exceeds 9 hours 59 minutes, the indication will stay green and will not change until the remaining time falls below 9 hours 59 minutes.
● When turning the mode dial to switch modes, the time indication will turn off momentarily in order to recalculate the remaining battery capacity time.
● When using the AC adaptor or batteries made by other companies, the remaining battery capacity will not be shown.

Connecting to the AC outlet

The unit is in the standby condition when the AC adaptor is connected. The primary circuit is always "live" as long as the AC adaptor is connected to an electrical outlet.
Important:
While the DC cable is connected to the AC adaptor, the battery will not charge.
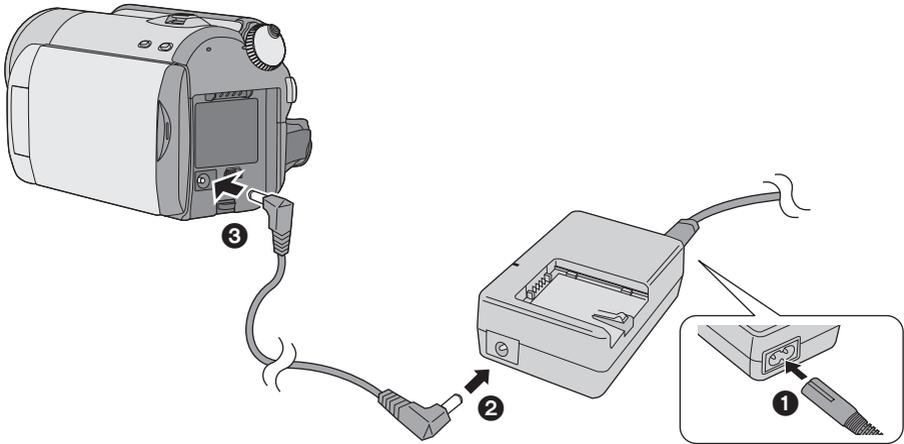
1 **Connect the AC cable to the AC adaptor and the AC outlet.**

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

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

● Do not use the AC cable with any other equipment as it is designed only for this unit. Also, do not use the AC cable from other equipment with this unit.

About HDD and SD cards

This unit can be used for recording motion pictures and still pictures to the internal HDD and an SD card.

	Internal HDD (Hard Disk Drive)	SD Memory Card			SDHC Memory Card
Display on the screen	⊜	▯			
Indication in these instructions	HDD	SD			
Capacity	80 GB*1 (SDR-H90) 60 GB*2 (SDR-H80)	8 MB/ 16 MB	32 MB/ 64 MB/ 128 MB	256 MB/ 512 MB/ 1 GB/ 2 GB	4 GB/ 6 GB/ 8 GB/ 12 GB/ 16 GB/ 32 GB
Functions					
Recording motion pictures	●	–	●*3	●	
Recording still pictures	●	●			
Creating playlists	●	–			

●: applicable   –: not applicable

*1 The 80 GB hard drive utilizes a portion of the storage space for formatting, file management and other purposes. 80 GB is 80,000,000,000 bytes. Usable capacity will be less.
*2 The 60 GB hard drive utilizes a portion of the storage space for formatting, file management and other purposes. 60 GB is 60,000,000,000 bytes. Usable capacity will be less.
*3 Cannot be guaranteed in operation.

About SD cards that you can use for motion picture recording

We recommend using SD cards conforming to Class 2 or higher of the SD Speed Class Rating or the following SD cards made by Panasonic for motion picture recording. (If another kind of SD card is used, the recording may suddenly stop during motion picture recording.)

	High Speed SD Memory Card	Class 2 SD/SDHC Memory Card	Class 4 SD/SDHC Memory Card	Class 6 SD/SDHC Memory Card
256 MB	RP-SDH256	RP-SDR256	–	–
512 MB	RP-SDK512	RP-SDR512	–	–
1 GB	RP-SDH01G	RP-SDR01G	–	RP-SDV01G
2 GB	RP-SDK02G	RP-SDR02G	RP-SDM02G	RP-SDV02G
4 GB	–	RP-SDR04G	RP-SDM04G	RP-SDV04G
6 GB	–	–	RP-SDM06G	–
8 GB	–	–	–	RP-SDV08G
12 GB	–	–	RP-SDM12G	–
16 GB	–	–	–	RP-SDV16G
32 GB	–	–	–	RP-SDV32G

● Operation in motion picture recording is not guaranteed with the following SD cards.
  – SD cards from 32 MB to 128 MB
  – SD cards from 256 MB to 32 GB other than the ones mentioned above

SD card handling

● Do not touch the terminals on the back of the card.
● Do not expose the terminals of the card to water, garbage or dust.
● Do not leave SD card in the following areas:
  – In direct sunlight.
  – In very dusty or humid areas.
  – Near a heater.
  – Locations susceptible to significant difference in temperature (condensation can occur).
  – Where static electricity or electromagnetic waves occur.
● To protect SD cards, keep them in their cases when not being used.
● Electrical noise, static electricity, or failure of this unit or the SD card may damage or erase the data stored on the SD card. We recommend saving the SD data to a PC.
● Keep the Memory Card out of reach of children to prevent swallowing.

HDD handling

This unit has an internal HDD. The HDD is a precision instrument so take care when handling it.

■ Do not cause any vibrations or impacts to this unit

Impact may cause the HDD to malfunction.
● The HDD may no longer be recognised by this unit.
● Recording may no longer be possible on the HDD.
● Playback of contents stored on HDD may no longer be possible.
During recording or playback:
● Do not cause vibrations or any impact to the HDD.

■ Do not drop this unit

The HDD may be damaged if this unit receives a strong impact due it to being dropped etc.
This unit has a drop detection function to protect the HDD from impact if the unit is dropped. If it detects that the unit has been dropped during motion picture recording, the HDD protection operation sound may be recorded. Also if it detects that the unit is being continuously dropped, recording or playback may stop.

■ Take note of the temperature of this unit

It may no longer be possible to record or playback if the temperature of this unit is too high or low. A warning message will appear on this unit's LCD monitor if an irregularity in the temperature is detected.

■ Do not use the unit in a low pressure area

The HDD may be damaged if you use this unit where the altitude is more than 3000 m.

■ Back up important recorded data to protect it

Save recorded data periodically on a PC, DVD disc, etc. for backup purposes.
If the HDD fails, the recorded data cannot be repaired.

■ Notes for recording

Images may not be recorded properly to the HDD near high-volume speakers due to the vibration from the speakers. In such cases, record in a location away from the speakers or use an SD card.

■ About disposing of or giving away this unit

Read the Operating Instructions (PDF format)

■ Indemnity about recorded content

Panasonic does not accept any responsibility for damages directly or indirectly due to any type of problems that result in loss of recording or edited content, and does not guarantee any content if recording or editing does not work properly. Likewise, the above also applies in a case where any type of repair is made to the unit (including any other non-HDD related component).

Access lamp
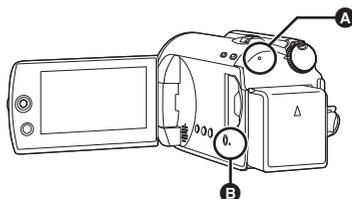
Ⓐ HDD access lamp [ACCESS HDD]
● When this unit accesses the HDD, the lamp lights up.
● **When lamp is on, do not**
  – **Expose the unit to strong vibrations or impacts**
  – **Operate the mode dial**
  – **Remove the battery or disconnect the AC adaptor**
● Performing the above while lamp is on may result in damage to data/HDD or this unit. However, the access lamp is supposed to light up while rotating the dial to select a mode. In this case, there is no problem.

Ⓑ SD card access lamp [ACCESS]
● When this unit accesses the SD card, the lamp lights up.
● **When lamp is on, do not**
  – **Open the SD card slot cover and remove the SD card**
  – **Operate the mode dial**
  – **Remove the battery or disconnect the AC adaptor**
● Performing the above while lamp is on may result in damage to data/SD card or this unit. However, the access lamp is supposed to light up while rotating the dial to select a mode. In this case, there is no problem.

Before using

4

Inserting/removing an SD card

Caution:
If the SD card is inserted or removed while the power is on, this unit may malfunction or the data recorded on the SD card may be lost.

Ⓐ Label side
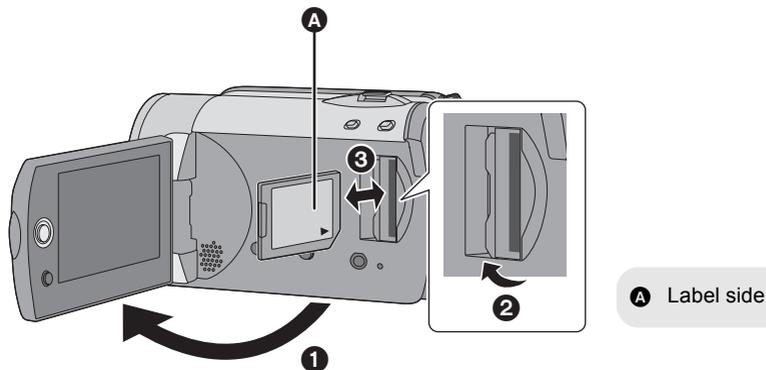
1 Rotate the mode dial to OFF.
● Check that the status indicator has gone off.

2 Open the LCD monitor and then open the SD card slot cover.

3 Insert/remove the SD card.
● Press the SD card straight in as far as it will go.
● Press the centre of the SD card and then pull it straight out.

4 Securely close the SD card slot cover.

Setup

1

Turning the unit on/off Selecting a mode

Rotate the mode dial to switch to recording, playback or power OFF.
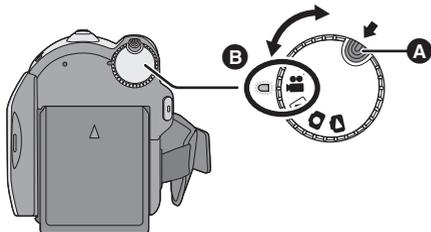
● Rotate the mode dial while at the same time pressing in the lock release button Ⓐ if changing from OFF to another mode.
● Align with the status indicator Ⓑ.

While pressing the lock release button, set the mode dial to 🎥, ▶, 📷 or 📂 to turn on the power.

The status indicator lights and the power turns on.
● When the unit is turned on for the first time, a message asking you to set the date and time will appear. Select [YES] and set the date and time. (→ 20)

To turn off the power
Set the mode dial to OFF.
● The status indicator goes off and the power turns off.

🎥	Video recording mode (→ 22)
▶	Video playback mode (→ 25)
📷	Picture recording mode (→ 23)
📂	Picture playback mode (→ 26)
OFF	

How to turn the power on and off with the LCD monitor

When the mode dial is set to 🎥 or 📷, the power can be turned on and off with the LCD monitor.

■ To turn on
Open the LCD monitor.
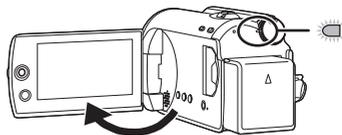
The status indicator lights.

■ To turn off
Close the LCD monitor.

The status indicator goes off.
● When quick start is set to [ON], the status indicator flashes green. To turn off the power immediately after closing the LCD monitor, set quick start to [OFF].

Set the mode dial to OFF when this unit is not being used.

Setup

2

Using the menu screen

ENTER
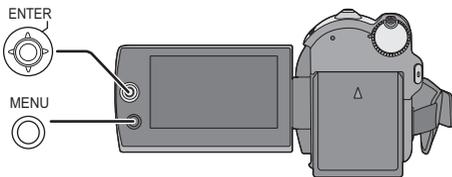
MENU

1 Press the MENU button.

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

2 Select the desired top menu, then move the joystick right or press the joystick.

BASIC
ADVANCED
MEDIA SELECT
SETUP
LANGUAGE

SELECT ◂ ENTER   EXIT MENU

3 Select the submenu item, then move the joystick right or press the joystick.

ADVANCED
D.ZOOM   OFF
FACE FRAMING   ON
ZOOM MIC   OFF
FADE COLOUR   BLACK

SELECT ◂ ENTER   EXIT MENU
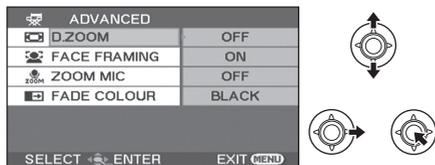
4 Select the desired setting, then press the joystick to enter the selection.

ADVANCED
D.ZOOM   OFF
FACE FRAMING   100x
ZOOM MIC   3500x
FADE COLOUR

SELECT ◂ ENTER   EXIT MENU
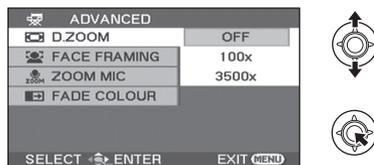
To get back to the previous screen
Move the joystick left.

To exit the menu screen
Press the MENU button.

● Do not switch the mode dial when the menu is displayed.
● The menu screen does not appear during recording or playing. You cannot start other operations while the menu screen is displayed.

Language selection

You can select the language displayed on the screen.

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

2 Select [English] and press the joystick.

Setup

3

Setting date and time

When the unit is turned on for the first time, a message asking you to set the date and time will appear. Select [YES] and press the joystick. Perform steps 2 and 3 below to set the date and time.

◇ Rotate the mode dial to select 🎥 or 📷.

1 Select the menu. (→ 19)

[BASIC] → [CLOCK SET] → [YES]

2 Select the date or time, then adjust the desired value with the joystick.

```
⏰ CLOCK SET                    🏠

  15 . 11 . 2009  12 : 34

  SELECT
SET ◄📖 ENTER        EXIT MENU
```
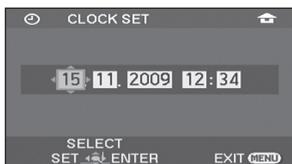
- The year will change as follows:
  2000, 2001, ..., 2099, 2000, ...
- The 24-hour system is used to display the time.
- [🏠] appears on the right top of the screen when [SET WORLD TIME] is set to [HOME], while [✈] appears when it is set to [DESTINATION].

3 Press the joystick to enter the selection.

- The clock function starts at [00] seconds when the joystick is pressed.

4 Press the MENU button to finish the setting.

- Check the date and time displayed.

■ **Changing the date and time display mode**
Select the menu. (→ 19)
[SETUP] → [DATE/TIME] → desired display style

[DATE]   [D/T]   [OFF]

15.11.2009   15.11.2009 12:34

■ **Changing the date format**
Select the menu. (→ 19)
[SETUP] → [DATE FORMAT] → desired display style

Display style	Screen display
[Y/M/D]	2009.11.15
[M/D/Y]	11.15.2009
[D/M/Y]	15.11.2009

- To set summer time, select the summer time in [HOME] for [SET WORLD TIME] after setting the clock.
- The date and time function is driven by a built-in lithium battery.
- If the time display is [- -], the built-in lithium battery needs to be charged. Use the following steps to charge the battery, and then set the date and time.
  To recharge the built-in lithium battery
  Connect the AC adaptor or insert the battery to the unit, and the built-in lithium battery will be recharged. Leave the unit as it is for approx. 24 hours and the battery will save the date and time for approx. 6 months. (Even if the mode dial is set to OFF, the battery is still being recharged.)

Before recording

Intelligent auto mode

It will make an optimal setting automatically depending on the objects and recording conditions.

◇**Rotate the mode dial to select 📹 or 📷.**
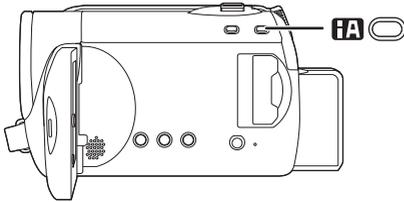
It is automatically set to the following modes depending on the objects and recording conditions.

Mode	Scene/Effect
🔲 Portrait	**When the object is a person** Faces are detected automatically, and the brightness is adjusted so it is recorded clearly.
🔲 Scenery	**Recording outdoors** The whole landscape will be recorded vividly without whiting out the background sky, which may be very bright.
🔲 Spotlight	**Under a spotlight** Very bright object is recorded clearly.
🔲 Low light	**Dark room or twilight** It can record clearly even in a dark room or twilight.

Intelligent auto button
Press this button to switch on/off the intelligent auto mode.

Mode	Scene/Effect
🔲 Normal	**Other situations** Brightness and colour balance are adjusted automatically for clear image.

● Due to conditions, a different mode may be identified for the same subject.
● Modes are selected automatically by the unit, so it may not choose desired mode depending on the recording conditions.
● Brightness may change suddenly or flicker when set to on.
● Optical image stabilizer function (➜ 24) is set to on in all modes.
● If this is turned to on, the guideline function is disabled.

■ When the intelligent auto mode is set to off

The auto mode icon [AUTO] appears.
Colour balance (white balance) and focusing will be adjusted automatically.
Depending on the brightness of the subject etc., the aperture and shutter speed are automatically adjusted for optimum brightness.
(When set to the video recording mode:
The shutter speed is adjusted to a maximum of 1/350.)
● Colour balance and focus may not be adjusted automatically depending on light sources or scenes. If so, manually adjust these settings.

Recording motion pictures

HDD SD

● Open the lens cover before turning the unit on.
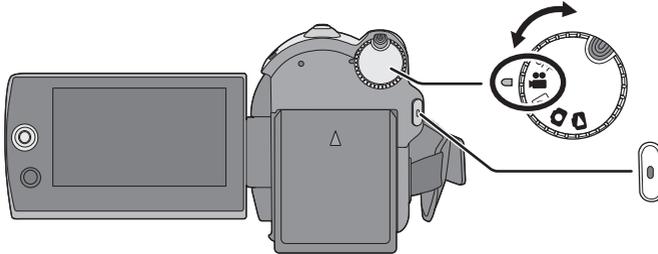
1 **Rotate the mode dial to select 🎥 and open the LCD monitor.**

2 **Select the recording destination by the menu. (→ 19)**

> [MEDIA SELECT] → [HDD] or
> [SD CARD]

3 **Press the recording start/stop button to start recording.**

To end the recording
Press the recording start/stop button again.
● [●] and [❚❚] are red during recording. Do not move this unit until [❚❚] is green.

● The images recorded between pressing the recording start/stop button to start recording and pressing it again to pause recording become one scene.
The scene is automatically divided when the recorded data exceeds 3.9 GB. (The recording will continue.)

● When about 5 minutes have passed without any operation in recording pause, the unit automatically turns off to save battery life.
To use the unit, turn it on again.
This economy feature can also be set to [OFF].

■ **Screen indications**

Ⓐ **Recording mode**
Ⓑ **Selected recording destination**
Ⓒ **Remaining time left for recording**
When the remaining time is less than 1 minute, [R 0h00m] flashes red.
Ⓓ **Recording time elapsed**
Each time the unit enters the recording pause mode, the counter display will be reset to "0h00m00s".

● While motion picture recording is in progress, the recording will not stop even if the LCD monitor is closed.
● Do not disconnect the AC adaptor or remove the battery if the unit is in recording mode. This may cause a repair message to appear when powered up again.

Recording still pictures

● Open the lens cover before turning the unit on.

1 **Rotate the mode dial to select** ⬛ **and open the LCD monitor.**

2 **Select the recording destination by the menu. (→ 19)**

[MEDIA SELECT] → [HDD] or [SD CARD]

3 **Press the recording start/stop button.**
The unit automatically focuses on the subject at the centre of screen (when auto focus is selected).

■ Screen indications

Ⓐ **Size of still pictures**
Ⓑ **Selected recording destination**
Ⓒ **Remaining number of still pictures**
Flashes in red when [R 0] appears.

■ To record still pictures clearly
● When zooming in on the subject with a magnification of 4× or higher, it is difficult to reduce the slight shaking from holding this unit by hand. We recommend decreasing the zoom magnification and approaching the subject when recording.
● When recording still pictures, hold the unit firmly with your hands and keep your arms stationary at your side so as not to shake the unit.
● You can record stable pictures without shaking by using a tripod.

Recording functions

Zoom in/out function

You can zoom in up to 70× optically.

◇**Rotate the mode dial to select 🎥 or
🎞.**

Move the zoom lever.
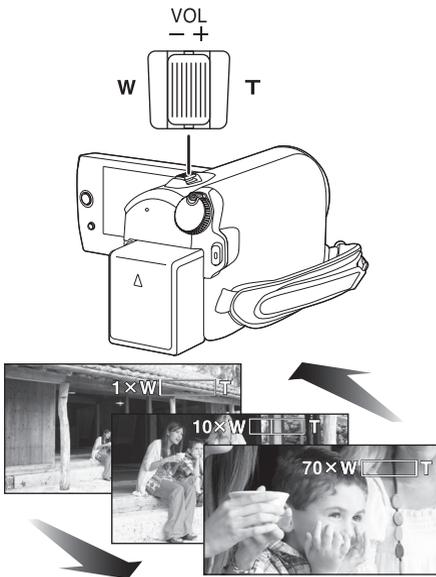
T side:
   Close-up recording (zoom in)
W side:
   Wide-angle recording (zoom out)
● The zoom speed varies depending on the
   range over which the zoom lever is moved.

● If you take your finger off the zoom lever during
   zoom operation, the operation sound may be
   recorded. When returning the zoom lever to
   the original position, move it quietly.
● When distant subjects are brought closer, they
   are focused at about 1.5 m or more.

HDD SD

● When the zoom magnification is 1×, this unit
   can focus on a subject approx. 2 cm away from
   the lens. (Macro function)
● When the zoom speed is high, the subject may
   not be focused easily.

Optical image stabilizer function

Reduces the image shaking (jitter) due to hand
movement when recording.

◇**Rotate the mode dial to select 🎥 or
🎞.**

Press the O.I.S. button.
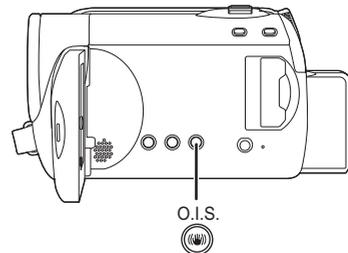
O.I.S.: Optical Image Stabilizer
The image stabilizer icon [ ] appears.

***To cancel the optical image stabilizer
function***
Press the O.I.S. button again.

● The default setting is on.
● Set the intelligent auto mode to off before
   turning the optical image stabilizer function to
   off.
● When a tripod is used, we recommend that you
   turn the image stabilizer off.
● In the following cases, the image stabilizer
   function may not work effectively.
   − When the digital zoom is used
   − When the unit is shaken greatly
   − When you record a moving subject while
      tracking it

Playback

1

Motion picture playback

HDD SD

ENTER
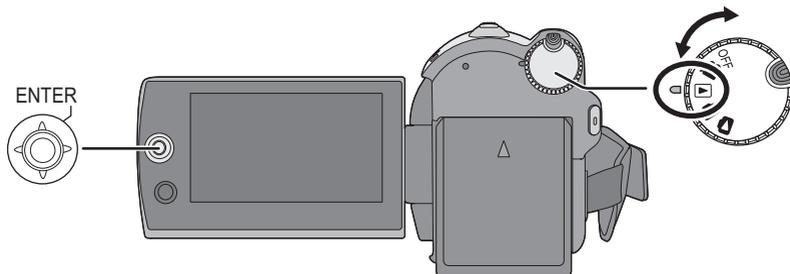
▶/❚❚:	Playback/Pause
◀◀:	Skip playback (backward)
▶▶❙:	Skip playback (forward)
■:	Stops the playback and shows the thumbnails.

1 Rotate the mode dial to select ▶.

2 Select the playback medium by the menu. (→ 19)

[MEDIA SELECT] → [HDD] or
[SD CARD]

3 Select the scene to be played back, then press the joystick.

15.11.2009 12:45   0:03.11
SELECT PLAY   006-00B

Ⓐ Scene number (Page number: Except when
thumbnails are selected.)
The selected scene is played back, and the
operation icon is automatically displayed on the
screen.

4 Select the playback operation with the joystick.

Selecting pages
● Select [<]/[>] and then press
the joystick.
● If you move and hold the joystick left or
right, you can fast forward or fast rewind the
pages. The thumbnails will disappear, but
the scene or page numbers will change.
Release the joystick when you have arrived
at the page with the scene you want to
display.

2 Still picture playback

HDD SD

ENTER
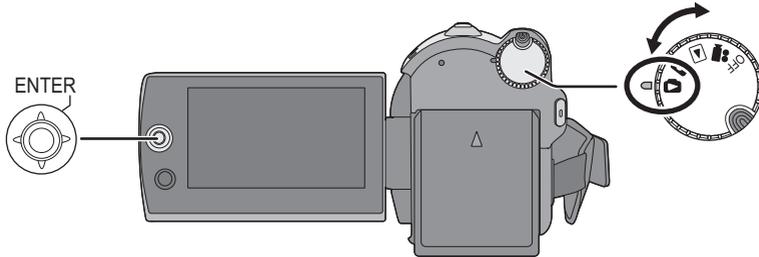
Icon	Function
▶/❙❙ :	Slide show start/pause.
◀❙❙ :	Plays back the previous picture.
❙❙▶ :	Plays back the next picture.
■ :	Stops the playback and shows the thumbnails.

1 **Rotate the mode dial to select 🄫.**

2 **Select the playback medium by the menu. (→ 19)**

[MEDIA SELECT] → [HDD] or
[SD CARD]

3 **Select the file to be played back, then press the joystick.**

15.11.2009 12:35   16/16
SELECT PLAY   100-0016

Ⓐ File number (Page number: When [<]/
[>] is selected.)
● The method for selecting pages is the same as for motion picture playback. (→ 25)

The selected file is played back, and the operation icon is automatically displayed on the screen.

4 **Select the playback operation with the joystick.**

Deleting scenes/files

Important:
The deleted scenes/files cannot be restored.

ENTER
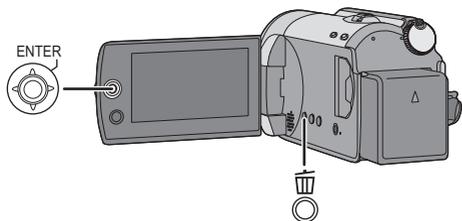
◇ Deleting motion picture scenes:
 Rotate the mode dial to select ▶.

◇ Deleting still picture files:
 Rotate the mode dial to select 📷.

◇ **Select [HDD] or [SD CARD] in [MEDIA SELECT].**

Deleting scenes/files one at a time

1 **Press the** 🗑 **button during playback.**

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

Deleting multiple scenes/files

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

2 **Select [SELECT] or [ALL] and press the joystick.**
(Only when [ALL] is selected)

● All the scenes/files on the HDD or SD card except the locked scenes/files will be deleted. Proceed to step 5.
● When the date is selected in motion picture playback, all scenes on the selected date are deleted.

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

🗑 DELETE SCENES

16/16

SELECT ◆ ENTER   DELETE 🗑
                    EXIT MENU

The selected scene/file is encircled by a red frame.
● To unselect the scene/file, press the joystick again.
● Up to 50 scenes/files can be selected to be deleted.

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

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

(Only when [SELECT] is selected in step 2)
To continue deleting other scenes/files
Repeat steps 3 to 5.

To complete editing
Press the MENU button.

1 HDD and SD card management

Formatting HDD

HDD

This is for initializing HDD.
Please be aware that if the HDD is formatted, then all the data recorded on the HDD will be erased. Store important data on a PC, etc.

◇ **Rotate the mode dial to select ▶.**

◇ **Select [HDD] in [MEDIA SELECT].**

1 Select the menu. (→ 19)

[SETUP] → [FORMAT HDD] → [YES]

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

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

● During formatting, do not turn this unit off.
● When you format the HDD, use a battery with sufficient battery power or the AC adaptor.
● During formatting, do not cause any vibrations or impacts to this unit.
● Perform a physical formatting of the HDD when this unit is to be disposed/transferred.

Displaying HDD information

HDD

Information about the space used and remaining on the HDD is displayed.

◇ **Rotate the mode dial to select ▶.**

◇ **Select [HDD] in [MEDIA SELECT].**

Select the menu. (→ 19)

[SETUP] → [HDD STATUS] → [YES]

To exit the information screen
Press the MENU button.

● The unit indicating the capacity of the used and usable area is 1 GB=1,073,741,824 bytes.
● (SDR-H90) The 80 GB hard drive utilizes a portion of the storage space for formatting, file management and other purposes. 80 GB is 80,000,000,000 bytes. Usable capacity will be less.
● (SDR-H80) The 60 GB hard drive utilizes a portion of the storage space for formatting, file management and other purposes. 60 GB is 60,000,000,000 bytes. Usable capacity will be less.

Formatting an SD card

SD

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

◇ **Select [SD CARD] in [MEDIA SELECT].**

1 Select the menu. (→ 19)

[SETUP] → [FORMAT CARD] → [YES]

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

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

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

Reading the Operating Instructions (PDF format)

- You have practised the basic operations introduced in these operating instructions and want to progress to advanced operations.
- You want to check the Troubleshooting.

In these kinds of situations refer to Operating Instructions (PDF format) recorded on the CD-ROM containing the Operating Instructions (supplied).

■ For Windows

1 Turn the PC on and insert the CD-ROM containing the Operating Instructions (supplied).

2 Select the desired language and then click [Operating Instructions] to install.

(Example: When an English language OS)
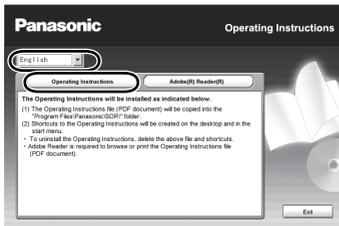
3 Double click the "H90_H80 Operating Instructions" shortcut icon on the desktop.

■ When the Operating Instructions (PDF format) will not open

You will need Adobe Acrobat Reader 4.0 or later or Adobe Reader 6.0 or later to browse or print the Operating Instructions (PDF format).
Download and install a version of Adobe Reader that you can use with your OS from the following Web Site.
http://www.adobe.com/products/acrobat/readstep2_allversions.html

If using the following OS
- Windows 2000 SP4
- Windows XP SP2/SP3
- Windows Vista and SP1

Insert the CD-ROM containing the Operating Instructions (supplied), click [Adobe(R) Reader(R)] and then follow the messages on the screen to install.

■ To uninstall the Operating Instructions (PDF format)

Delete the PDF file from the "Program Files\Panasonic\SDR\" folder.
- When the contents in the Program Files folder cannot be displayed, click the [Show the contents of this folder] to display them.

■ For Macintosh

1 Turn the PC on and insert the CD-ROM containing the Operating Instructions (supplied).

2 Open the "Manual" folder in "LSFT0775" and then copy the PDF file with the desired language inside the folder.

3 Double click the PDF file to open it.

Specifications

SD Card/Hard Disk Video Camera
Information for your safety

Power source:	DC 9.3 V/7.2 V
Power consumption:	Recording 3.8 W

Signal system	CCIR: 625 lines, 50 fields PAL colour signal
Recording format	SD card: Based on the SD-Video standard HDD: Independent standard
Image sensor	1/8″ CCD image sensor Total: 800 K Effective pixels: Moving picture: 400 K (4:3), 370 K (16:9) Still picture: 410 K (4:3), 380 K (16:9)
Lens	Auto Iris, F1.9 to F5.7 Focal length: 1.5 mm to 105 mm Macro (Full range AF)
Filter diameter	37 mm
Zoom	70$\times$ optical zoom, 100$\times$/3500$\times$ digital zoom
Monitor	2.7″ wide LCD monitor (approx. 123 K pixels)
Microphone	Stereo (with a zoom function)
Speaker	1 round speaker $\varnothing$ 15 mm
Standard illumination	1,400 lx
Minimum required illumination	Approx. 6 lx (1/25 in low light mode) Approx. 2 lx with the colour night view function
Video output level	1.0 Vp-p, 75 Ω
Audio output level (Line)	316 mV, 600 Ω
USB	Card reader function (No copyright protection support) HDD reader function Hi-Speed USB (USB 2.0) compliant USB terminal Type Mini AB PictBridge-compliant USB host function (for DVD burner)
Dimensions (excluding the projecting parts)	53 mm (W) $\times$ 66.3 mm (H) $\times$ 107 mm (D)
Mass	Approx. 310 g [without battery (supplied) and an SD card (optional)]
Mass in operation	Approx. 361 g [with battery (supplied) and an SD card (optional)]
Operating temperature	0 °C to 40 °C
Operating humidity	10% to 80%
Operating altitude	Less than 3000 m above sea level

Motion pictures

Recording media	SD Memory Card (removable type): 32 MB[*1]/64 MB[*1]/128 MB[*1]/256 MB/512 MB/1 GB/2 GB (FAT12 and FAT16 format corresponding) SDHC Memory Card (removable type): 4 GB/6 GB/8 GB/12 GB/16 GB/32 GB (FAT32 format corresponding) HDD (fixed type): 80 GB[*2] (SDR-H90)/60 GB[*3] (SDR-H80)
Compression	MPEG-2
Recording mode and transfer rate	XP: 10 Mbps (VBR) SP: 5 Mbps (VBR) LP: 2.5 Mbps (VBR)
Audio compression	SD card: Dolby Digital/MPEG-1 Audio Layer 2 HDD: Dolby Digital 16 bit (48 kHz/2 ch)
Maximum number of recordable folders and scenes	SD card: 99 folders×99 scenes (9801 scenes) HDD: 999 folders×99 scenes (98901 scenes) (When the date changes, a new folder is created and scenes are recorded in this new folder even if the number of scenes in the old folder has not reached 99.)

*1 Cannot be guaranteed in operation.
*2 The 80 GB hard drive utilizes a portion of the storage space for formatting, file management and other purposes. 80 GB is 80,000,000,000 bytes. Usable capacity will be less.
*3 The 60 GB hard drive utilizes a portion of the storage space for formatting, file management and other purposes. 60 GB is 60,000,000,000 bytes. Usable capacity will be less.

Still pictures

Recording media	SD Memory Card (removable type): 8 MB/16 MB/32 MB/64 MB/128 MB/256 MB/512 MB/1 GB/2 GB (FAT12 and FAT16 format corresponding) SDHC Memory Card (removable type): 4 GB/6 GB/8 GB/12 GB/16 GB/32 GB (FAT32 format corresponding) HDD (fixed type): 80 GB[*1] (SDR-H90)/60 GB[*2] (SDR-H80)
Compression	JPEG (Design rule for Camera File system, based on Exif 2.2 standard), DPOF corresponding
Picture size	640×480 (4:3), 640×360 (16:9)

*1 The 80 GB hard drive utilizes a portion of the storage space for formatting, file management and other purposes. 80 GB is 80,000,000,000 bytes. Usable capacity will be less.
*2 The 60 GB hard drive utilizes a portion of the storage space for formatting, file management and other purposes. 60 GB is 60,000,000,000 bytes. Usable capacity will be less.

AC adaptor
Information for your safety

Power source:	AC 110 V to 240 V, 50/60 Hz
Power consumption:	19 W
DC output:	DC 9.3 V, 1.2 A (Unit operation) DC 8.4 V, 0.65 A (Battery charging)

Dimensions	92 mm (W) × 33 mm (H) × 61 mm (D)
Mass	Approx. 115 g

Specifications may change without prior notice.

EU

Panasonic Corporation

Web site: http://panasonic.net