SONY

Interchangeable Lens Digital HD Video Camera Recorder
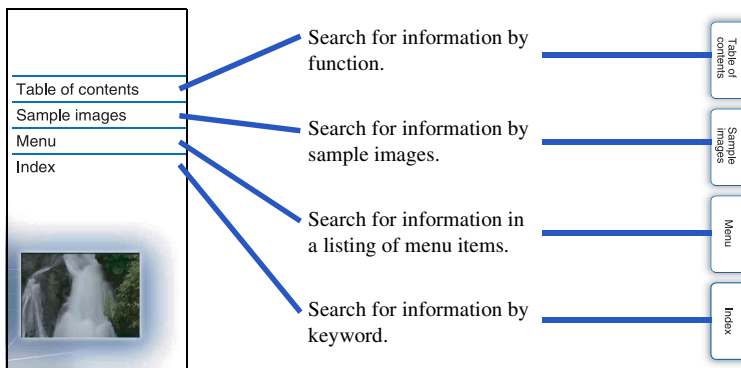
"Handycam" Handbook

GB

NEX-VG10/VG10E

How to use this handbook

Click on a button at upper right on the cover and each page to jump to the corresponding page.
This is convenient when searching for a function you want to use.

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Search for information by function.

Search for information by sample images.

Search for information in a listing of menu items.

Search for information by keyword.

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Sample images

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You can jump to the pages by clicking on the page numbers mentioned in the book.

Marks and notations used in this handbook

Gain

Increase the gain when recording in dim places. Select the desired gain value when you do not want the gain to be increased with the [Auto] setting.

1 In movie recording mode, GAIN button → desired setting.
Or, MENU button → [Brightness/Color] → [Gain] → desired setting.

| ✔ | [dB/3dB/6dB/9dB/ 12dB/15dB/18dB/ 21dB/24dB/27dB | You can set a larger number, and reduce image blur in dark locations or of moving subjects by increasing gain. |

Notes
- The larger the number, the higher the noise level.
- When the exposure mode is set to [Program Auto], [Aperture Priority], [Shutter Priority], and [Gain] is set to [Auto], [Gain] is automatically set between 0 dB and 27 dB.
- The [Auto] setting is not provided in [Manual Exposure]. If you change the exposure mode to [Manual Exposure] with the [Auto] setting, it is switched to 0 dB. Set the gain according to your shooting conditions.

💡 Adjusting Gain/ISO Sensitivity (Recommended Exposure Index)

Gain/ISO setting is the sensitivity to light of recording media that incorporates an image sensor that receives light. Even when the exposure is the same, images differ depending on the Gain/ISO setting.

High Gain/ISO sensitivity
With high Gain/ISO sensitivity, images will be captured with an appropriate brightness even under insufficient exposure. However, increasing Gain/ISO sensitivity will cause images to become noisy.

Low Gain/ISO sensitivity
You can record smooth images. However, the shutter speed may slow down to compensate for low Gain/ISO sensitivity. You should take camera shake or movement of subjects into account, too.

In this handbook, the sequence of operations is shown by arrows (→). Operate the camcorder in the order indicated.

The default setting is indicated by ✔.

Indicates cautions and limitations relevant to the correct operation of the camcorder.

💡 Indicates information that is useful to know.

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Sample images

"This is the scene I want to capture in an image, but how can I do?"
You may find the answer by going through the sample images listed here. Click the desired sample image.

Shooting movies as clear as still images (page 6)
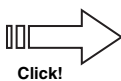Shooting when holding the camcorder by hand (page 6)
Shooting landscapes (page 6)
Shooting clear still images (page 7)

If you click on an image, the screen will jump to the page describing the function recommended for shooting that kind of image.

Defocusing the background (25)

Aperture Priority

Blurs or sharpens things in front of and beyond the subject.

1 Press the control dial and select [Aperture Priority].
   Or, MENU button → [Shoot Mode] → [Aperture Priority].
2 Turn the control dial and select a desired value.
   • Smaller F-value: The subject is in focus, but things in front of and beyond the subject is blurred.
   • Larger F-value: The subject and its foreground and background are all in focus.
3 Adjust the focus and shoot the subject.
   The shutter speed is automatically adjusted to obtain proper exposure.

Aperture (F-number)

Notes
• If proper exposure cannot be obtained after the setup in still image recording mode, when you press the PHOTO button halfway down, the shutter speed blinks. Although you can shoot as it is, resetting is recommended.
• The brightness of the image on the LCD monitor may differ from the actual image being shot.
• The F value may vary according to the zoom position of the lens. In the case of the supplied E18 ~ 200 mm zoom lens, even if you open the aperture wider than F6.3 (a smaller F-value), such as F3.5, the F-value becomes F6.3 as you move the zoom from the wide side to the telephoto side.

Aperture

Smaller F-value (opening the aperture) narrows the range that is in focus. This allows you to put the subject in sharp focus and blur things in front of and beyond the subject. (Depth of field becomes shallower.)

Larger F-value (narrowing down the aperture) widens the range that is in focus. This allows you to shoot the depth of the scenery. (Depth of field becomes deeper.)

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Shooting movies as clear as still images

Defocusing the background (25)

Adjusting the color (21)

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Shooting when holding the camcorder by hand

Preventing camera shake (32)

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The sky in vivid colors (20)

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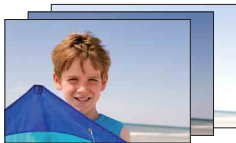

Keeping your shot level (53)

Shooting clear still images

In candle light (29)

Holding the camera by hand (28)

The same scene with different brightness (36)

Scenery with a wide range of brightness (44)

Light outdoors shot from a dark interior (44)
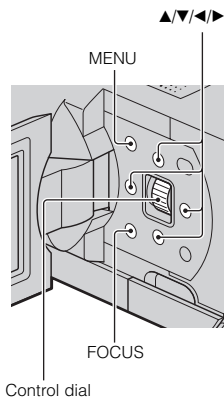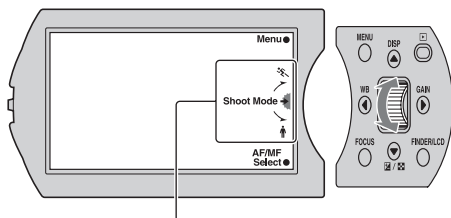
Capturing the best moment (34)

Using the operating buttons

The control dial and ▲/▼/◄/► buttons allow you to use
various functions of the camcorder.

▲/▼/◄/►

MENU

FOCUS

Control dial

When you turn the control dial or press the ▲/▼/◄/► buttons following the on-screen
display, you can select items and settings. Your selection is determined when you press
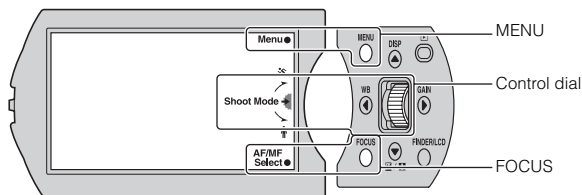the control dial.

The arrow means you can turn the control dial.
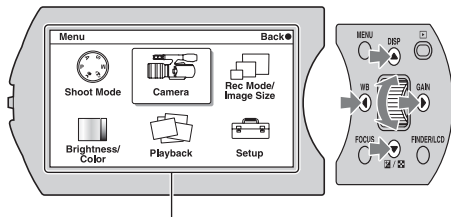
When options are displayed on the screen, you can browse through them by turning the control dial
or press the ▲/▼/◄/► buttons. Press the control dial to make your choice.

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The MENU and FOCUS buttons and the control dial have different roles, depending on the screen display. The assigned role (function) of each button is shown on the screen. To use the function shown at the upper right corner of the screen, press the MENU button. To use the function shown at the center, press the control dial. To use the function shown at the lower right corner of the screen, press the FOCUS button. In this manual, the buttons are indicated by the icon or the function shown on the screen.

In this case, the MENU button works as [Menu], and the control dial as [Shoot Mode], and the FOCUS button as [AF/MF Select].

The ▲/▼/◄/► buttons are assigned with the functions that will be used frequently.
▲: DISP (Display Contents) (page 14)
▼: ⬛ (Exposure Comp.) during recording (page 20)/⬛ (Image Index) during playback (page 48)
◄: WB (White Balance) (page 21)
►: GAIN (Gain) (page 18)

Menu

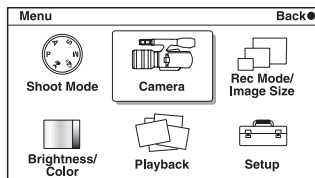You can set up the basic settings for the camcorder as a whole, or execute functions such as recording, playback, or other operations.

Menu		Back●
Shoot Mode	Camera	Rec Mode/ Image Size
Brightness/ Color	Playback	Setup

1 Press the MENU button.

2 Select the desired item by turning the control dial, or pressing the ▲/▼/◄/► buttons, and then press the control dial.

3 Following the instructions on the screen, select the desired item and press the control dial to make your choice.

▲/▼/◄/►

MENU

Control dial
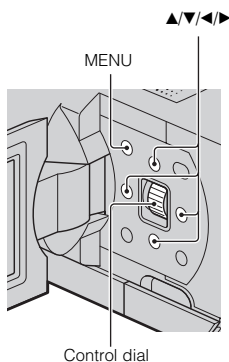
Shoot Mode

Allows you to select a shooting mode.

Program Auto	Allows you to customize settings, except for the exposure (shutter speed and aperture).
Hand-held Twilight*	Shoots night scenes with less noise and blur without using a tripod.
Anti Motion Blur*	Reduces the camera shake when shooting a slightly dark indoor scene or a telephoto.
Manual Exposure	Adjusts the aperture and shutter speed.
Shutter Priority	Adjusts the shutter speed to express the movement of the subject.
Aperture Priority	Adjusts the range in focus, or defocuses the background.

* Still image only

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Camera

Allows you to set focusing method, continuous shooting, self-timer, etc.

AF/MF Select	Selects auto focusing or manual focusing.
Autofocus Area*	Selects the area to be focused on.
Autofocus Mode*	Selects the autofocus method.
SteadyShot	Sets camera shake compensation.
Drive Mode*	Selects the drive mode, such as continuous shooting, self-timer, or bracket shooting.
Flash Mode*	Selects the method used to fire the attached flash (sold separately).
Display Contents	Switches the information to be displayed on the shooting screen.

* Still image only

Rec Mode/Image Size

Allows you to set the recording mode of movies and the image size of still images.

Movie	
Rec Mode	Selects the image quality.
Still	
Image Size	Selects the image size.
Aspect Ratio	Selects the aspect ratio.

Brightness/Color

Allows you to make brightness settings such as exposure compensation, and color settings such as white balance.

Exposure Comp.	Compensates for the brightness of the entire image.
Gain	Sets the luminous sensitivity for movie recording.
ISO*	Sets the luminous sensitivity for still image shooting.
White Balance	Selects the color tones according to the ambient light conditions.
Creative Style	Selects the image processing method.
Metering Mode*	Selects the method used for measuring the brightness.
Flash Compensation*	Adjusts the light amount of the attached flash (sold separately).
DRO/Auto HDR*	Corrects the brightness or contrast automatically.

* Still image only

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Playback

Allows you to set playback functions.

Delete	Deletes images.
Movie/Still Select	Selects a movie or still image to play back.
Image Index	Selects the number of images to be displayed on the index screen.
Protect	Protects images, or cancels the protection.
Still Slide Show*	Plays back still images automatically.
⊕ Enlarge Still image*	Enlarges the still image.
Display Contents	Switches the information to be displayed on the playback screen.

* Still image only

Setup

Allows you to make more detailed shooting settings, or change the camcorder settings.

Shooting Settings	
Movie Audio Rec	Sets whether or not to record the sound for movie recording.
Grid Line	Turns on the grid line that helps you to adjust the composition of images.
Shoot w/o Lens	Sets whether or not to record images when there is no lens.
Red Eye Reduction*	When using a flash (sold separately), prevents eyes from being shot in red.
Auto Review*	Shows the image right after shooting.
Main Settings	
Volume Settings	Sets the sound volume of movies.
Beep	Sets the sound produced when you operate the camcorder.
🅰 Language	Selects the language used on the screen.
Date/Time Setup	Sets the date and time.
Area Setting	Selects the area where you are using the camcorder.
Power Save	Turns the camcorder to the power save mode.
LCD Brightness	Sets the brightness of the LCD monitor.
Viewfinder Bright.	Sets the brightness of the viewfinder.
Cleaning Mode	Allows you to clean the image sensor.
Version	Displays the version of the camcorder and the lens.
Demo Mode	Sets whether or not to use the movie for the demonstration.
Reset Default	Resets the camcorder to the factory-settings.

Memory Card Tool	
Format	Formats the memory card.
Recover Image DB	Repairs the image database file of movies when inconsistencies are found.
File Number*	Selects the method used for assigning file numbers to images.

* Still image only

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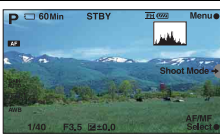
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DISP (Display Contents)

Using the button:

1 Press the DISP button repeatedly to select the desired mode.

Using the menu:

1 During shooting, MENU button → [Camera] → [Display Contents].
  During playback, MENU button → [Playback] → [Display Contents].
2 Select the desired mode by turning the control dial.

During shooting

✔	**Display Info.**	Shows basic shooting information.	
	Histogram	Displays the luminance distribution graphically, in addition to recording condition.	
	No Disp. Info.	Does not show recording information.	

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What is histogram

The histogram displays the luminance distribution that shows how many pixels of a particular brightness exist in the picture. Brighter image will make the entire histogram shift to the right side, and darker image to the left side.

Ⓐ Number of pixels
Ⓑ Brightness

Dark   Bright
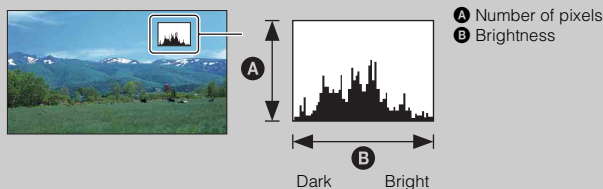
During playback

	Disp. Basic Info	Shows recording information.	
	Disp. Detail Info	Shows detailed recording information.	
	No Disp. Info.	Does not show recording information.	

Note

• The TV or monitor connected to the camcorder using an HDMI cable (sold separately) will show the same display contents set with [Display Contents].

AF/MF Select

Selects auto focusing or manual focusing.

1 FOCUS button → desired mode.
  Or, MENU button → [Camera] → [AF/MF Select] → desired mode.

✓	**AF** **(Autofocus)**	Focuses automatically.
	DMF **(DMF)***	After focusing automatically, make fine focus adjustment manually (Direct Manual Focus).
	MF **(Manualfocus)**	Adjusts the focus manually. Turn the focusing ring right or left to make the subject look clearer.

* Still image only

⚡ Using auto focusing effectively

If it is difficult to focus on a subject while recording a movie, press PHOTO halfway down to activate [Single-shot AF] (page 31) temporarily. This will make focusing easier.

⚡ Using manual focusing effectively

Use manual focusing to record the following subjects.
- A subject behind a window covered with raindrops.
- A subject behind a glass window with horizontal stripes.
- A subject with little contrast between the subject and its background.
- When an object in the foreground is in focus, but you want to shift to focus on a subject in the background.

Tip on focusing

Focus on the subject with the telephoto side of zoom first, and then move the zoom toward the wide side. When recording a close-up image, focus on the subject with the wide end of zoom.
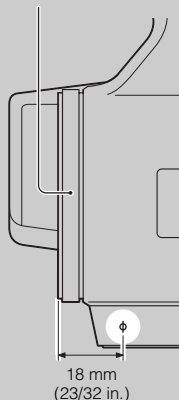

"Focus fixing" is convenient when you can predict the distance to the subject. With "Focus fixing," you can fix the focus in advance to the distance at which the subject is to pass.

☼ To measure the exact distance to the subject

Lens mount

The ⊖ mark shows the location of the image sensor[1]. When you measure the exact distance between the camcorder and the subject, refer to the position of the line. The distance from the lens contact surface to the image sensor is about 18 mm (23/32 in.).

[1] The image sensor is the part of the camcorder that acts as the film.

- If the subject is closer than the minimum shooting distance[2] of the attached lens, the focus cannot be confirmed. Make sure you put enough distance between the subject and the camcorder.

[2] The minimum shooting distance of the supplied E18 – 200 mm zoom lens is 0.3 m (11 7/8 in.) (Wide end) – 0.5 m (19 3/4 in.) (Telephoto end).

18 mm
(23/32 in.)

DMF (Direct Manual Focus)

1 MENU button → [Camera] → [AF/MF Select] → [DMF].

2 Press the PHOTO button halfway down to focus automatically.

3 Keep the PHOTO button halfway down, rotate the focusing ring of the lens to achieve a sharp focus.

Note

- [Autofocus Mode] is fixed to [Single-shot AF].

Gain

Increase the gain when recording in dim places. Select the desired gain value when you do not want the gain to be increased with the [Auto] setting.

1 In movie recording mode, GAIN button → desired setting.
   Or, MENU button → [Brightness/Color] → [Gain] → desired setting.

✓	GAIN AUTO **(Auto)**	Sets the gain automatically.
	0dB/3dB/6dB/9dB/ 12dB/15dB/18dB/ 21dB/24dB/27dB	You can set a larger number, and reduce image blur in dark locations or of moving subjects by increasing gain.

Notes

- The larger the number, the higher the noise level.
- When the exposure mode is set to [Program Auto], [Aperture Priority], [Shutter Priority], and [Gain] is set to [Auto], [Gain] is automatically set between 0 dB and 21 dB.
- The [Auto] setting is not provided in [Manual Exposure]. If you change the exposure mode to [Manual Exposure] with the [Auto] setting, it is switched to 0 dB. Set the gain according to your shooting conditions.

ϟ Adjusting Gain/ISO Sensitivity (Recommended Exposure Index)

Gain/ISO setting is the sensitivity to light of recording media that incorporates an image sensor that receives light. Even when the exposure is the same, images differ depending on the Gain/ISO setting.

High Gain/ISO sensitivity
With high Gain/ISO sensitivity, images will be captured with an appropriate brightness even under insufficient exposure. However, increasing Gain/ISO sensitivity will cause images to become noisy.

Low Gain/ISO sensitivity
You can record smooth images. However, the shutter speed may slow down to compensate for low Gain/ISO sensitivity. You should take camera shake or movement of subjects into account, too.

ISO

Sets the luminous sensitivity for recording still images.

1 In still image recording mode, GAIN button → desired setting.
  Or, MENU button → [Brightness/Color] → [ISO] → desired setting.

✓	ISO AUTO **(ISO AUTO)**	Sets the ISO sensitivity automatically.
	200/400/800/1600/ 3200/6400/12800	You can set a faster shutter speed, and reduce image blur in dark locations or of moving subjects by increasing ISO sensitivity (select a larger number).

Notes

• [ISO AUTO] is selected when using the following functions:
  – [Hand-held Twilight]
  – [Anti Motion Blur]
• The larger the number, the higher the noise level.
• When the exposure mode is set to [Program Auto], [Aperture Priority], [Shutter Priority], and [ISO] is set to [ISO AUTO], ISO is automatically set between ISO 200 and 1600.
• The [ISO AUTO] setting is not provided in [Manual Exposure]. If you change the exposure mode to [Manual Exposure] with the [ISO AUTO] setting, it is switched to 200. Set the ISO according to your shooting conditions.

☀ Adjusting Gain/ISO Sensitivity (Recommended Exposure Index)

Gain/ISO setting is the sensitivity to light of recording media that incorporates an image sensor that receives light. Even when the exposure is the same, images differ depending on the Gain/ISO setting.

High Gain/ISO sensitivity
With high Gain/ISO sensitivity, images will be captured with an appropriate brightness even under insufficient exposure. However, increasing Gain/ISO sensitivity will cause images to become noisy.

Low Gain/ISO sensitivity
You can record smooth images. However, the shutter speed may slow down to compensate for low Gain/ISO sensitivity. You should take camera shake or movement of subjects into account, too.

Exposure Comp.

You can adjust the exposure in 1/3 EV steps in a range of –2.0 EV to +2.0 EV.

1 ☒ (Exposure Comp.) button → desired value.
  Or, MENU button → [Brightness/Color] → [Exposure Comp.] → desired
  value.

Notes

- You cannot use [Exposure Comp.] when using [Manual Exposure].
- If you shoot a subject in extremely bright or dark conditions, or when you use a flash (sold separately), you may not be able to get a satisfactory effect.

☼ Adjusting the exposure for better looking images

Overexposure = too much light
Whitish image

Set [Exposure Comp.] toward –.

Correct exposure

Set [Exposure Comp.] toward +.

Underexposure = too little light
Darker image

- To shoot subjects in brighter tones, set a +-side exposure compensation.
  To make photos of food look more appealing, shoot the food a little brighter than usual and try to use a white background.
- When shooting a blue sky, setting a –-side exposure compensation will allow you to capture the sky in vivid colors.

White Balance

Adjusts the color tones according to the ambient light conditions.
Use this feature when the color tone of the image did not come out as you expected, or when you want to change the color tone on purpose for photographic expression.

1 WB (White Balance) button → desired mode.
  Or, MENU button → [Brightness/Color] → [White Balance] → desired mode.
  To adjust the white balance to suit a specific light source, see the explanation on each mode.

✓	**AWB (Auto WB)**	The camcorder automatically detects a light source and adjusts the color tones.
	☀ **(Daylight)**	If you select an option to suit a specific light source, the color tones are adjusted for the light source (preset white balance).
	⛰ **(Shade)**	
	☁ **(Cloudy)**	
	☼ **(Incandescent)**	
	☰ **(Fluorescent)**	
	⚡ **(Flash)**	
	⬚ **(C.Temp./Filter)**	Adjusts the white balance depending on the light source (color temperature). Achieves the effect of CC (Color Compensation) filters for photography.
	⬚ **(Custom)**	Allows to use the white balance setting retained by [Custom Setup].
	⬚ SET **(Custom Setup)**	Memorizes the basic white color (Custom white balance).

☀ Effects of lighting conditions

The apparent color of the subject is affected by the lighting conditions.
The color tones are adjusted automatically, but you can adjust color tones manually using the [White Balance] function.

Weather/ lighting	Daylight	Cloudy	Fluorescent	Incandescent
Characteristics of light	White (standard)	Bluish	Green-tinged	Reddish

Preset white balance (☀ ♠ ♣ ☼ ♨ ♨)

1 MENU button → [Brightness/Color] → [White Balance] → desired mode.

2 As necessary, [Option] → adjust the color tone.
   Adjusting it toward + turns the image reddish and adjusting it toward – turns the image bluish.

C.Temp./Filter

1 MENU button → [Brightness/Color] → [White Balance] → [C.Temp./Filter].

2 [Option] → desired value.

| Color Temp. | The higher the number, the more reddish the image, and the lower the number, the more bluish the image. (The default setting is 5500 K.) |
| Color Filter | Based on using the set color temperature as the standard, the color can be compensated to G (Green) or M (Magenta). The higher the number, the more the color is compensated. (The default setting is 0.) |

Custom white balance

1 MENU button → [Brightness/Color] → [White Balance] → [Custom Setup].

2 Hold the camcorder so that the white area fully covers the AF area located in the center, and then press the PHOTO button down.
   The shutter clicks and the calibrated values (color temperature and color filter) are displayed.

3 To call the custom white balance setting, MENU button → [Brightness/Color] → [White Balance] → [Custom].

Note

• If a flash (sold separately) is used when the PHOTO button is pressed, a custom white balance is registered with the flash light taken into account. Take pictures with flash in later still image shootings.

Image Index

Displays multiple images at the same time.

In movie recording mode:

1 Press the ▶ (Playback) button to switch to the playback mode.
   6-image index appears.
   You can switch to 12-image index; MENU button → [Playback] → [Image Index].

In still image recording mode:

1 Press the ▶ (Playback) button to switch to the playback mode.

2 Press the ◨ (Image Index) button.
   6-image index appears.
   You can switch to 12-image index; MENU button → [Playback] → [Image Index].

3 To return to the single-image playback, select the desired image and press the control dial.

ϔ Switching between the movie and still image
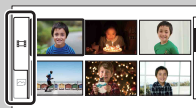
On the image index screen, you can switch the image type by selecting ▤ (movie) or ▱ (still image) on the left of the screen followed by pressing the center of the control dial.
Movies and still images cannot be displayed on the same index.

Program Auto

While exposure is adjusted by the camcorder automatically, you can set shooting functions such as Gain/ISO sensitivity, Creative Style, White Balance.

1 Press the control dial and select [Program Auto].
   Or, MENU button → [Shoot Mode] → [Program Auto].

2 Set the shooting functions to your desired settings.

3 Adjust the focus and shoot the subject.

Aperture Priority

Blurs or sharpens things in front of and beyond the subject.
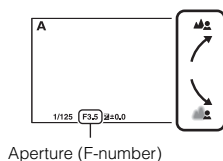
1 Press the control dial and select [Aperture Priority].
   Or, MENU button → [Shoot Mode] → [Aperture Priority].

Aperture (F-number)

2 Turn the control dial and select a desired value.

   • Smaller F-value: The subject is in focus, but things in front of and beyond the subject is blurred.
   • Larger F-value: The subject and its foreground and background are all in focus.

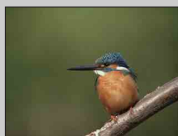3 Adjust the focus and shoot the subject.

   The shutter speed is automatically adjusted to obtain proper exposure.

Notes

• If proper exposure cannot be obtained after the setup in still image recording mode, when you press the PHOTO button halfway down, the shutter speed blinks. Although you can shoot as it is, resetting is recommended.
• The brightness of the image on the LCD monitor may differ from the actual image being shot.
• The F-value may vary according to the zoom position of the lens. In the case of the supplied E18 – 200 mm zoom lens, even if you open the aperture wider than F6.3 (a smaller F-value), such as F3.5, the F-value becomes F6.3 as you move the zoom from the wide side to the telephoto side.

☼ Aperture

Smaller F-value (opening the aperture) narrows the range that is in focus. This allows you to put the subject in sharp focus and blur things in front of and beyond the subject. (Depth of field becomes shallower.)

Larger F-value (narrowing down the aperture) widens the range that is in focus. This allows you to shoot the depth of the scenery. (Depth of field becomes deeper.)

Shutter Priority

Allows you to manually adjust and fix the shutter speed. You can make a moving subject look still or emphasize the movement of a moving subject by adjusting the shutter speed.

1 Press the control dial and select [Shutter Priority].
   Or, MENU button → [Shoot Mode] → [Shutter Priority].

2 Turn the control dial and select a desired value.

3 Adjust the focus and shoot the subject.
   The aperture is automatically adjusted to obtain proper exposure.

Shutter speed

Notes

- The (Camera shake warning) indicator is not indicated in shutter speed priority mode.
- If you shoot an image with 1 second or slower shutter speed in still image recording mode, noise reduction (Long Exposure NR) will be done after shooting. You cannot do any further shooting during the reduction.
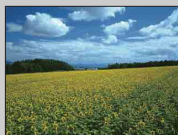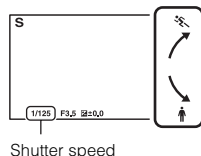- If proper exposure cannot be obtained after the setup in still image recording mode, when you press the PHOTO button halfway down, the aperture value blinks. Although you can shoot as it is, resetting is recommended.
- The brightness of the image on the LCD monitor may differ from the actual image being shot.
- It is difficult to focus automatically at a lower shutter speed. Manual focusing with your camcorder attached to a tripod is recommended.
- When recording under fluorescent lamps, sodium lamps, or mercury lamps, the image may flicker or change colors, or may have horizontal bands of noise. You may be able to improve the situation by adjusting the shutter speed.

☼ Shutter speed

When a faster shutter speed is used, each frame of a moving subject such as a running person, cars, and sea spray appears as if they are stopped.

When a slower shutter speed is used, a trailing image of the movement of the subject is captured to make flowing image.

Manual Exposure

You can shoot with the desired exposure setting by adjusting both the shutter speed and aperture.

1 Press the control dial and select [Manual Exposure].
   Or, MENU button → [Shoot Mode] → [Manual Exposure].

2 Press the ▼ botton repeatedly to select shutter speed or aperture.

   Shutter speed and aperture adjustment screens appear alternately.
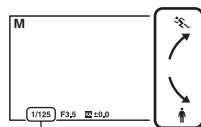
Shutter speed
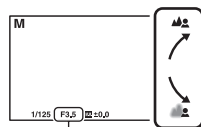
Aperture (F-value)

3 Turn the control dial to select the desired value.

   Check the exposure value at 🔲 (metered manual).
   Toward +: Images become brighter.
   Toward –: Images become darker.
   0: Appropriate exposure analyzed by the camcorder

Exposure value

4 Adjust the focus and shoot the subject.
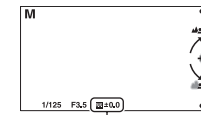
Notes

- The 📷 (Camera shake warning) indicator is not indicated in manual exposure mode.
- In manual exposure mode, the [Gain] setting [Auto] is set to [0dB], and the [ISO] setting [ISO AUTO] is set to [ISO 200]. Set the Gain/ISO sensitivity as necessary.
- The brightness of the image on the LCD monitor may differ from the actual image being shot.

Hand-held Twilight

Shoots night scenes with less noise and blur without using a tripod.
This item is available in still image recording mode only.

1 Press the control dial and select [Hand-held
  Twilight].
  Or, MENU button → [Shoot Mode] →
  [Hand-held Twilight].
  ⤷🖐 appears on the screen.

2 Shoot with the PHOTO button.
  A burst of shots are taken, and image processing is applied to reduce subject blur, camera
  shake, and noise.

Notes

- The shutter clicks 7 times and an image is recorded.
- After shooting, noise reduction (Long Exposure NR) will be done for the same amount of time that the
  shutter was open. You cannot do any further shooting during the reduction.
- Reducing blur is less effective when shooting:
    - Subjects with erratic movement
    - Subjects that are too close to the camcorder
    - Subjects with a repeating pattern such as tiles, and subjects with little contrast such as sky, sandy
      beach, or lawn
    - Subjects with constant change such as waves or water falls
- Block noise may occur when using a light source that flickers, such as fluorescent lighting.
- [Shoot Mode] becomes [Program Auto] when movie recording mode is selected.

Anti Motion Blur

This is suitable for indoor shots without using a flash (sold separately), to reduce the subject blur.
This item is available in still image recording mode only.

1 Press the control dial and select [Anti Motion Blur].
   Or, MENU button → [Shoot Mode] → [Anti Motion Blur].
   《📷》 appears on the screen.

2 Shoot with the PHOTO button.
   The camcorder combines 6 shots at high sensitivity into 1 still image, so camera shake is reduced while preventing noise.

   Notes

   • The shutter clicks 7 times and an image is recorded.
   • Reducing blur is less effective when shooting:
     – Subjects with erratic movement.
     – Subjects that are too close to the camcorder.
     – Subjects with a repeating pattern such as tiles, and subjects with little contrast such as sky, sandy beach, or lawn.
     – Subjects with constant change such as waves or water falls.
   • When using a light source that flickers, such as fluorescent lighting, block noise may occur.
   • The noise reduction function does not work.
   • [Shoot Mode] becomes [Program Auto] when movie recording mode is selected.

Autofocus Area

Selects the focusing area. Use this function when it is difficult to get the proper focus in auto focus mode.

1 MENU button → [Camera] → [Autofocus Area] → desired mode.

✓	(Multi)	The camcorder determines which of the 25 AF areas is used for focusing. When you press the PHOTO button halfway down in still image recording mode, a green frame is displayed around the area that is in focus.	AF range finder frame
	(Center)	The camcorder uses the AF area located in the center area exclusively.	AF range finder frame
	(Flexible Spot)	Moves the focusing area to focus on a small subject or narrow area by pressing the ▲/▼/◄/► buttons.	AF range finder frame

Note

• [Multi] is selected when using the following functions:
    – [Hand-held Twilight]
    – [Anti Motion Blur]
    – Movie recording

Autofocus Mode

Selects the focus method when the PHOTO button is pressed.
This item is available in still image recording mode only.

1 MENU button → [Camera] → [Autofocus Mode] → desired mode.

✓	**AF-S** (Single-shot AF)	The camcorder focuses and the focus is locked when you press the PHOTO button halfway down. Use this when the subject is motionless.
	AF-C (Continuous AF)	The camcorder continues to focus while the PHOTO button is pressed and held halfway down. Use this when the subject is in motion.

Notes

- In movie recording mode, the camcorder automatically focuses appropriately to record movies. If it is difficult to focus on a subject, press PHOTO halfway down to activate [Single-shot AF] temporarily. This will make focusing easier.
- [Single-shot AF] is selected when using the following functions:
  – [Self-timer]
  – [Hand-held Twilight]
  – [Anti Motion Blur]
- In [Continuous AF] mode, the audio signals will not sound when the subject is in focus.

SteadyShot

Sets whether or not you use the SteadyShot function of the lens.

1 MENU button → [Camera] → [SteadyShot] → desired setting.

	Active	Uses SteadyShot with more powerful effect.
✓	**Standard**	Uses SteadyShot.
	Off	Does not use SteadyShot. This setting is recommended when you use a tripod.

Notes

- [Standard] is selected when using the following functions:
  - [Hand-held Twilight]
  - [Anti Motion Blur]
- [Active] can be selected when recording movies using a lens with optical SteadyShot complying with Active SteadyShot.
- You cannot set [SteadyShot] when an E16 mm F2.8 lens (sold separately) or an A-mount lens (sold separately) is attached.

Drive Mode

You can set the drive mode, such as continuous, self-timer, or bracket shooting.
This item is available in still image recording mode only.

1 MENU button → [Camera] → [Drive Mode] → desired mode.

✓	☐ (Single-shot Adv.)	Shoots 1 still image. Normal shooting mode.
	☐ (Continuous Adv.)	Shoots images continuously at high speed while you press and hold down the PHOTO button (page 34). Focus and brightness settings of the first shot are used for the following shots.
	⟳ (Self-timer)	Shoots an image after 10 or 2 seconds (page 35).
	BRK C (Bracket: Cont.)	Shoots 3 images, each with different degrees of exposure (page 36).

Note

- You cannot change the setting when using the following functions:
  – [Hand-held Twilight]
  – [Anti Motion Blur]
  – [Auto HDR]
  – Movie recording

Continuous Adv.

Shoots images continuously while you press and hold down the PHOTO button.

1 MENU button → [Camera] → [Drive Mode] → [Continuous Adv.].

Notes

- You cannot use [Continuous Adv.] with the following functions.
  – [Hand-held Twilight]
  – [Anti Motion Blur]
  – [Auto HDR]
- Focus and brightness settings of the first shot are used for the following shots.

Self-timer

This item is available in still image recording mode only.

1 MENU button → [Camera] → [Drive Mode] → [Self-timer].

2 [Option] → desired mode.

✓	⟳₁₀ **(Self-timer: 10 Sec)**	Sets the 10-second delay self-timer. When you press the PHOTO button, the audio signal sounds until the shutter operates.
	⟳₂ **(Self-timer: 2 Sec)**	Sets the 2-second delay self-timer. This reduces the camera shake caused by pressing the PHOTO button.

Note

- You cannot use [Self-timer] with the following functions:
  – [Hand-held Twilight]
  – [Anti Motion Blur]
  – [Auto HDR]

Bracket: Cont.

Shoots 3 images while automatically shifting the exposure from base, to darker, then to lighter. Press and hold down the PHOTO button until the bracket recording is completed. You can select an image that suits your intention, after recording.

This item is available in still image recording mode only.

1 MENU button → [Camera] → [Drive Mode] → [Bracket: Cont.].

2 [Option] → desired mode.

✓	**(Bracket: Cont.: 0.3 EV)**	Images are taken with the set value of deviation (steps) from the base exposure.
	(Bracket: Cont.: 0.7 EV)	

Notes

- You cannot use [Bracket: Cont.] with the following functions:
  – [Hand-held Twilight]
  – [Anti Motion Blur]
  – [Auto HDR]
- The last shot is shown on the auto review.
- In [Manual Exposure], the exposure is shifted by adjusting the shutter speed.
- When you adjust the exposure, the exposure is shifted based on the compensated value.
- The noise reduction function does not work.

Flash Mode

In a dark location, using a flash (sold separately) allows you to shoot the subject brightly, and it also helps to prevent camera shake. When shooting into the sun, you can use a flash to shoot a bright image of the backlit subject.
This item is available in still image recording mode only.

1 Attach a flash.
2 MENU button → [Camera] → [Flash Mode] → desired mode.
3 Turn on the power of the flash when using the flash.

⚡ (Fill-flash)	Allows you to shoot a subject brightly.
⚡ₛₗₒᵥᵥ (Slow Sync.)	Allows you to shoot a clear image of both the subject and the background by slowing the shutter speed.
⚡ᵣₑₐᵣ (Rear Sync.)	Allows you to shoot a natural image of the trail of a moving subject such as a moving car or a walking person. The flash fires right before the exposure is completed.

Note

• You cannot use a flash when recording movies.

ဝ̈ Using an external flash

Make sure that you use a Sony external flash (sold separately).
There are certain Sony flashes or functions that cannot be used with your camcorder. For the compatibility of a particular flash unit, visit the Sony web site in your area, or consult your Sony dealer or local authorized Sony service facility.

ဝ̈ Tips on flash shooting

• The lens hood may block the light of flash. Remove the lens hood when using a flash.
• When using a flash, shoot the subject at a distance of 1 m (3.3 feet) or greater.
• When shooting a backlit subject, select [Fill-flash]. A flash will operate even in bright daylight, and make faces come out brighter.

Rec Mode

Sets the recording mode of movies.

1 MENU button → [Rec Mode/Image Size] → [Rec Mode] → desired mode.

Mode		Image size	Average bit-rate
	FX 24M	1920 × 1080	24 Mbps (max.)
✓	**FH 17M**	1920 × 1080	17 Mbps
	HQ 9M	1440 × 1080	9 Mbps

Note

• You cannot create an AVCHD disc from a movie recorded with [FX 24M] mode. Save a movie recorded with [FX 24M] mode onto a Blu-ray Disc (page 73).

Image Size

The image size determines the size of the image file that is recorded when you record a still image.

The larger the image size, the more detail will be reproduced when the image is printed on large-format paper. The smaller the image size, the more images can be recorded.

1 MENU button → [Rec Mode/Image Size] → [Image Size] → desired mode.

Image size when [Aspect Ratio] is 3:2		Usage guidelines
✓	⊡⌷ (L: 14M) 4592 × 3056 pixels	For prints up to A3+ size
	⊡ₘ (M: 7.4M) 3344 × 2224 pixels	For prints up to A4 size
	⊡ₛ (S: 3.5M) 2288 × 1520 pixels	For prints L/2L size
Image size when [Aspect Ratio] is 16:9		Usage guidelines
✓	⊡⌷ (L: 12M) 4592 × 2576 pixels	For viewing on a high-definition TV
	⊡ₘ (M: 6.3M) 3344 × 1872 pixels	
	⊡ₛ (S: 2.9M) 2288 × 1280 pixels	

Note

• When you print still images recorded with 16:9 aspect ratio, both edges may be cut off.

Aspect Ratio

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Sets the aspect ratio of still images.

1 MENU button → [Rec Mode/Image Size] → [Aspect Ratio] → desired
  mode.

✓	**3:2**	Standard aspect ratio. Suitable for prints.
	16:9	For viewing on a high-definition TV.

Creative Style

Allows you to select the desired image processing.
You can adjust exposure (shutter speed and aperture) as you like with [Creative Style].

1 MENU button → [Brightness/Color] → [Creative Style] → desired mode.

2 When you want to adjust contrast, saturation, or sharpness, [Option] → desired setting.

✅	⬛std.⁺ (Standard)	For shooting various scenes with rich gradation and beautiful colors.
	Vivid⁺ (Vivid)	The saturation and contrast are heightened for shooting striking images of colorful scenes and subjects such as flowers, spring greenery, blue sky, or ocean views.
	Port.⁺ (Portrait)	For shooting the skin color in a soft tone, ideally suited for shooting portraits.
	Land⁺ (Landscape)	The saturation, contrast, and sharpness are heightened for shooting vivid and crisp scenery. Distant landscapes also stand out more.
	Sunset⁺ (Sunset)	For shooting the beautiful red of the setting sun.
	B/W⁺ (Black & White)	For shooting images in black and white monotone.

◗ (Contrast), ⊛ (Saturation), and ▯ (Sharpness) can be adjusted for each Creative Style item.

◗ (Contrast)	The higher the value selected, the more the difference of light and shadow is accentuated, thus making an impact on an image.
⊛ (Saturation)	The higher the value selected, the more vivid the color. When a lower value is selected, the color of the image is restrained and subdued.
▯ (Sharpness)	Adjusts the sharpness. The higher the value selected, the more the contours are accentuated, and the lower the value selected, the more the contours are softened.

Note

• When [Black & White] is selected, you cannot adjust the saturation.

Metering Mode

Selects the metering mode that sets which part of the subject to measure to determine the exposure.
This item is available in still image recording mode only.

1 MENU button → [Brightness/Color] → [Metering Mode] → desired mode.

✓	⊞ (Multi)	Measures light on each area after dividing the total area into multiple areas and determines the proper exposure of the entire screen (Multi-pattern metering).
	⊙ (Center)	Measures the average brightness of the entire screen, while emphasizing the central area of the screen (Center-weighted metering).
	⊡ (Spot)	Measures only the central area (Spot metering). This function is useful when the subject is backlit or when there is strong contrast between the subject and the background. Spot metering cross hairs position on the subject.

Note

• [Multi] is selected when using the following function:
  – Movie recording

Flash Compensation

Adjusts the light amount of flash (sold separately) in 1/3 EV steps in a range of –2.0 EV to +2.0 EV.
Flash compensation changes the amount of flash light only. Exposure compensation changes the amount of flash light along with the change of the shutter speed and aperture.

1 MENU button → [Brightness/Color] → [Flash Compensation] → desired value.

Selecting higher values (+ side) makes the flash level higher and images brighter. Selecting lower values (– side) makes the flash level lower and images darker.

Notes

- You cannot use [Flash Compensation] with the following functions:
    – [Hand-held Twilight]
    – [Anti Motion Blur]
    – when no flash is attached
    – Movie recording
- The higher flash effect may not be visible due to the limited amount of flash light available, if the subject is outside the maximum range of the flash. If the subject is very close, the lower flash effect may not be visible.

☀ Tips to adjust the brightness when shooting people

- It is important to balance the brightness of people against the dark background in night portraits. You can adjust the brightness of people near the camcorder by changing the flash light intensity.
- If the subject is too far to flash and still too dark after adjustment, move closer to your subject.

DRO/Auto HDR

Corrects the brightness or contrast.
This item is available in still image recording mode only.

1 MENU button → [Brightness/Color] → [DRO/Auto HDR] → desired mode.

	(Off)	Does not use [DRO/Auto HDR].
✓	**(D-Range Opt.)**	By dividing the image into small areas, the camcorder analyzes the contrast of light and shadow between the subject and the background, producing the image with the optimal brightness and gradation.
	(Auto HDR)	Shoots 3 images with different exposures, and then overlays the bright area of the under exposed image and the dark area of the over exposed image to create an image with rich gradation. An image with proper exposure and an overlaid image are recorded.

Note

- You can select [DRO/Auto HDR] only in the following modes:
  - [Manual Exposure]
  - [Shutter Priority]
  - [Aperture Priority]
  - [Program Auto]

D-Range Opt.

Corrects the brightness of the image (DRO: Dynamic Range Optimizer).

1 MENU button → [Brightness/Color] → [DRO/Auto HDR] → [D-Range Opt.].
2 [Option] → desired value.

✓	**(Auto)**	Corrects the brightness automatically.
	Lv1 – Lv5	Optimizes the gradations of a recorded image in each area of the image. Select the optimal level between Lv1 (weak) and Lv5 (strong).

Note

- When shooting with the D-Range optimizer, the image may be noisy. Select the proper level by checking the recorded image, especially when you enhance the effect.

Auto HDR

Widens the range (gradations) so that you can record from bright parts to dark parts in correct brightness (Auto High Dynamic Range). An image with proper exposure and an overlaid image are recorded.

1 MENU button → [Brightness/Color] → [DRO/Auto HDR] → [Auto HDR].

2 [Option] → desired value.

✓	🖼 (Auto Exposure Diff.)	Corrects the exposure difference automatically.
	1.0 EV – 6.0 EV	Sets the exposure difference, based on the contrast of the subject. Select the optimal level between 1.0 EV (weak) and 6.0 EV (strong).

Notes

- You cannot start the next shoot until the capture process is completed after you shoot.
- Since the shutter is released 3 times for 1 shot, be careful about the following:
    - Use this function when the subject is motionless or does not blink.
    - Do not recompose.
- You may not obtain a desired effect depending on the luminance difference of a subject and the shooting conditions.
- When a flash is used, this function has little effect.
- When the contrast of the scene is low or when significant camera shake or subject blur has occurred, you may not obtain good HDR images. If the camcorder detects such situation, 🖼 🔲 is indicated on the recorded image to inform you of this situation. Shoot again, as necessary, recomposing or paying attention to the blur.

Delete

Allows you to select unwanted images for deletion.

1 MENU button → [Playback] → [Delete] → desired mode.

✅	**Multiple Movies**	Deletes the selected movies. Press the control dial to confirm [Select] and [OK].
	Multiple Still Images	Deletes the selected still images. Press the control dial to confirm [Select] and [OK].

Note

• You can select up to 100 images.

☞ To delete an image

It is easier to delete an image displayed on the screen by pressing the FOCUS button.

Movie/Still Select

Selects movies or still images to play back.

1 MENU button → [Playback] → [Movie/Still Select] → desired mode.

✅	**Movie**	Displays the movie.
	Still	Displays the still image.

Note

- You cannot display movies and still images on the same index screen.
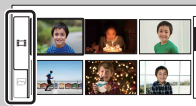
ϔ Switching between the movie and the still image

You can switch the image type on the image index easily. Select ▤ (movie) or ▱ (still image) on the left of the screen.

Image Index

Selects the number of images to be displayed on the index.

1 MENU button → [Playback] → [Image Index] → desired mode.

✓	**6 Images**	Displays 6 images.	
	12 Images	Displays 12 images.	

✦ Switching between the movie and the still image
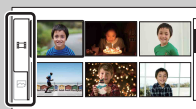
You can switch the image type on the image index easily. Select 🎞 (movie) or 📷 (still image) on the left of the screen.
You cannot display movie and still image on the same index screen.

Protect

Protects recorded images against accidental erasure.
The ⊶ mark is displayed for registered images.

1 MENU button → [Playback] → [Protect] → desired mode.

✓	**Multiple Movies**	Applies or cancels the protection of the selected movies. Press the control dial to confirm [Select] and [OK].
	Cancel All Movies	Cancels the protection of all movies.
	Multiple Still Images	Applies or cancels the protection of the selected still images. Press the control dial to confirm [Select] and [OK].
	Cancel All Images	Cancels the protection of all still images.

Note

• You can protect up to 100 images at a time.

Still Slide Show

Plays back still images automatically.

1 MENU button → [Playback] → [Still Slide Show] → desired mode → [OK].

Repeat		
	On	Plays back images in a continuous loop.
✓	**Off**	After all the images have been played back, the slide show ends.
Interval		
✓	**1 Sec**	Sets the display interval of images.
	3 Sec	
	5 Sec	
	10 Sec	
	30 Sec	

Note

• You cannot pause the slide show. To stop the slide show, press the control dial.

⊕ Enlarge Still image

You can check the focus by enlarging a portion of the still image on the screen.

1 MENU button → [Playback] → [⊕ Enlarge Still image].

2 Adjust the scaling by turning the control dial.

3 Select the portion you want to enlarge by pressing the ▲/▼/◀/▶ button.

4 To cancel the operation, press [Exit].

Note

• You cannot enlarge the movies.

☼ Scaling range

The scaling range depends on the image size.

Image size	Scaling range
L	Approx. ×1.1 – ×13
M	Approx. ×1.1 – ×10
S	Approx. ×1.1 – ×6.7

Movie Audio Rec

Sets whether or not you record the sound during movie recording.

1 MENU button → [Setup] → [Movie Audio Rec] → desired setting.

✓	**On**	Records sound.
	Off	Does not record sound.

Note

• When [Off] is selected, the camcorder does not record sound from either the built-in microphone or an external microphone (sold separately).

Grid Line

Sets whether the grid line is displayed or not. The grid line will help you to adjust the composition of images.

1 MENU button → [Setup] → [Grid Line] → desired setting.

	On	Displays the grid line.
✓	Off	Does not display the grid line.

Shoot w/o Lens

Sets whether or not the recording can be started when no lens is attached.

1 MENU button → [Setup] → [Shoot w/o Lens] → desired setting.

	Enable	Allows you to use non-Sony E-mount lenses and mount adaptors.
✓	**Disable**	Recording starts only when a lens is attached.

Red Eye Reduction

A flash (sold separately) strobes 2 or more times before shooting to reduce the red-eye phenomenon.
This item is available in still image recording mode only.

1 MENU button → [Setup] → [Red Eye Reduction] → desired setting.

	On	A flash always strobes to reduce the red-eye phenomenon.
✓	Off	Does not use Red Eye Reduction.

Notes

• Turn on the power of a flash (sold separately) attached to use Red Eye Reduction.
• Red Eye Reduction may not produce the desired effects. It depends on individual differences and conditions, such as distance to the subject, or if the subject looked away from the pre-strobe.
• There are certain flash units that you cannot use with Red Eye Reduction. For the compatibility of a particular flash unit, consult your Sony dealer or local authorized Sony service facility.

☀ What causes the red-eye phenomenon?

Pupils become dilated in dark environments. Flash light is reflected off the blood vessels at the back of the eye (retina), causing the "red-eye" phenomenon.

Flash

Eye

Retina
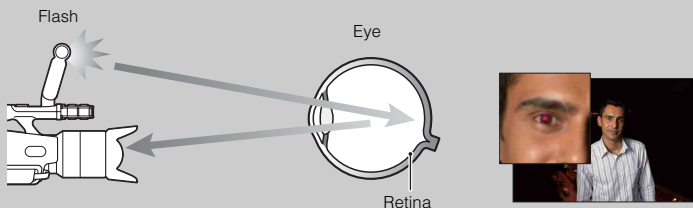
Auto Review

You can check the recorded image right after the shooting.
This item is available in still image recording mode only.

1 MENU button → [Setup] → [Auto Review] → desired setting.

✓	**2 Sec**	Displays for 2 seconds.
	Off	Does not display.

Volume Settings

Adjusts the sound volume of movies in 16 steps.
You can check the sound that is actually recorded using headphones, etc.

1 MENU button → [Setup] → [Volume Settings] → desired value.
Or, press MENU while recording or playing back movies → desired value.

Note

• This adjustment does not change the volume of the actual recorded sound.

Beep

Sets whether or not the beep sounds.

1 MENU button → [Setup] → [Beep] → desired setting.

	On	The beep sounds when the subject comes into focus, during countdown of the self-timer, etc.
	Off	Turns off the beep.

🄰 Language

Selects the language to be used in the menu items, warnings and messages.

1 MENU button → [Setup] → [🄰 Language] → desired language.

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Date/Time Setup

Sets the date and time again.

1 MENU button → [Setup] → [Date/Time Setup].

2 Set the date, time, etc.
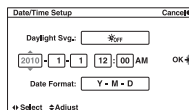
| Daylight Svg. | Selects [ON] or [OFF]. |
| Date Format | Selects the date and time display format. |

Note

• The camcorder does not have a feature for superimposing dates on still images. By using "PMB" in the CD-ROM (supplied), you can print or save still images with the date.

60^{GB}

Area Setting

Sets the area where you are using the camcorder. This allows you to set the local area when you use the camcorder abroad.

1 MENU button → [Setup] → [Area Setting]
  → desired setting.

2 Press the ◄/► buttons to select an area.
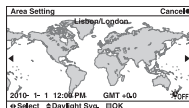
Power Save

You can make the camcorder switch to power save mode. Opening/closing the LCD panel, etc. returns the camcorder to the shooting mode.

1 MENU button → [Setup] → [Power Save] → desired setting.

✓	**5 Min**	Switches to power save mode after about 5 minutes.
	Off	Does not switch to power save mode.

Notes

- Turn off the camcorder when you do not use it for a long time.
- When the camcorder is connected to a wall outlet (wall socket), the power save mode is set to [Off].

LCD Brightness

Sets the brightness of the LCD monitor in 5 steps between –2 and +2.

1 MENU button → [Setup] → [LCD Brightness] → desired value.

Note

• You can adjust [LCD Brightness] only when the LCD monitor is turned on.

Viewfinder Bright.

Sets the brightness of the viewfinder in 3 steps between –1 and +1.

1 MENU button → [Setup] → [Viewfinder Bright.] → desired value.

Note

• You can adjust [Viewfinder Bright.] only when the viewfinder is turned on.

Cleaning Mode

Allows you to clean the image sensor.

1 MENU button → [Setup] → [Cleaning Mode] → [OK].
   The message "After cleaning, turn camera off. Continue?" appears.

2 Confirm [OK].
   The anti-dust is activated automatically.

3 Turn off the camcorder and detach the lens.

4 Use a blower to clean the image sensor
   surface and the surrounding area.

5 Attach the lens.
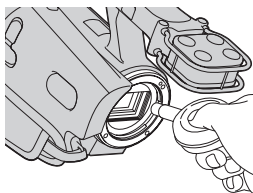
Notes

- Cleaning can be performed only when the battery level is ▭▭▭ (3 remaining battery icons) or more. We recommend that you use the AC Adaptor.
- Do not use a spray blower because it may scatter water droplets inside the camcorder body.
- Do not put the tip of a blower into the cavity beyond the mount, so that the tip of the blower does not touch the image sensor.
- Hold the camcorder's face downward to prevent the dust from resettling in the camcorder.
- Do not apply a mechanical shock to the camcorder during cleaning.

Version

Displays the version of your camcorder and lens. Confirm the version when a firmware update is released.

1 MENU button → [Setup] → [Version].

Note

• An update can be performed only when the battery level is ▙▛▜ (3 remaining battery icons) or more. We recommend that you use a sufficient battery or the AC Adaptor.

Demo Mode

Sets whether or not to display the movie for the demonstration, when there is only one movie on the memory card.
Select [Off] when you do not want to see the demonstration.

1 MENU button → [Setup] → [Demo Mode] → desired setting.

	On	If there is only one movie on the memory card, the demonstration begins automatically when the camcorder is not operated for about 1 minute.
✓	Off	Does not show the demonstration.

Reset Default

Initializes the setting to the default setting.
Even if you activate [Reset Default], the images are retained.

1 MENU button → [Setup] → [Reset Default] → [OK].

• Be sure not to turn off the camcorder while resetting.
• The settings of [Date/Time Setup] and [Area Setting] are not reset.

Format

Formats the memory card. When you use a memory card with this camcorder for the first time, it is recommended to format the memory card using the camcorder for stable performance of the memory card before shooting. Note that formatting permanently erases all data on the memory card, and is unrecoverable. Save precious data on a computer, etc.

1 MENU button → [Setup] → [Format] → [OK].

Notes

- Formatting permanently erases all data including even protected images.
- During the format, the access lamp lights up. Do not eject the memory card while the lamp is lit.
- Format the memory card using the camcorder. If you format it on a computer, the memory card may not be usable with the camcorder, depending on the format type used.

Recover Image DB

When inconsistencies are found in the image database file of movies, caused by processing movies on computers, etc., movies will not be recorded or played back. If this happens, the camcorder repairs the file.

1 MENU button → [Setup] → [Recover Image DB] → [OK].

The [Recover Image DB] screen is displayed, and the camcorder repairs the file.
Wait as it is until repairing is completed.

Note

• Use a sufficiently charged battery. Low battery power during repairing can cause damage to data.

File Number

Selects the method for assigning file numbers to still images.

1 MENU button → [Setup] → [File Number] → desired setting.

✓	**Series**	Does not reset numbers of still image files, and assigns numbers to files in sequence until the number reaches "9999."
	Reset	Resets numbers of still image files in the following cases and assigns numbers to files from "0001." When the recording folder contains a file, a number incremented one higher than the largest number is assigned. • When all the images in the folder are deleted. • When the memory card is replaced. • When the memory card is formatted.

Creating a disc using a computer

Selecting the method for creating your desired type of disc

Select the method that best suits your disc player.
See "PMB Help" for details on creating a disc using "PMB."

When you want	Player
to save movies in high definition image quality (HD) on a Blu-ray Disc Blu-ray	Blu-ray Disc playback devices (Blu-ray Disc player, PlayStation®3, etc.)
to save movies in high definition image quality (HD) on a DVD DVD	AVCHD format playback devices (Sony Blu-ray Disc player, PlayStation®3, etc.)
to save movies in standard definition image quality (STD) on a DVD for distribution DVD	Ordinary DVD playback devices (DVD player, DVD playable computer, etc.)

Notes

• A DVD recorded with high definition image quality (HD) is called an "AVCHD disc" in this manual.
• You can play an AVCHD disc on AVCHD format playback devices, such as a Sony Blu-ray Disc player and a PlayStation®3. You cannot play the disc on ordinary DVD players.

ϙ゙ Discs you can use with "PMB"

You can use 12 cm discs of following type with "PMB."

Disc type	Features
DVD-R/DVD+R/DVD+R DL	Unrewritable
DVD-RW/DVD+RW	Rewritable

• Always maintain your PlayStation®3 to use the latest version of the PlayStation®3 system software.
• The PlayStation®3 may not be available in some countries/regions.

Creating a Blu-ray Disc

You can create a Blu-ray Disc from AVCHD format movies imported to a computer using the supplied software "PMB."
To creating a Blu-ray Disc, you must install [BD Add-on Software].
Click [BD Add-on Software] on the installation screen of "PMB," and install this plug-in according to the on-screen instructions.

1 Turn on your computer and place an empty Blu-ray Disc on the Blu-ray Disc drive.

2 Start "PMB."

3 Click [Calendar] or [Index] to the left of the screen, and select the date or folder of the high definition image quality (HD) movies you want to write.

4 Click [icon] (Disc Creation) at the top of the screen → [Create Blu-ray Disc (HD)].

5 Follow the instructions on the screen to create a disc.

Notes

- Install "PMB" beforehand.
- Your computer must support the creation of a Blu-ray Disc.
- Connect your computer to the Internet when you install [BD Add-on Software].
- BD-R (non-rewritable) and BD-RE (rewritable) media can be used to create a Blu-ray Disc. You cannot add contents to either type of disc once it has been created.
- It may take a long time to create a Blu-ray Disc.

Creating an AVCHD disc

You can create an AVCHD disc from AVCHD format movies imported to a computer using the supplied software "PMB."

1 Turn on your computer and place an empty disc on the DVD drive.

2 Start "PMB."

3 Click [Calendar] or [Index] to the left of the screen, and select the date or folder of the high definition image quality (HD) movies you want to write.

4 Click [icon] (Disc Creation) at the top of the screen → [Create AVCHD Format Discs (HD)].

5 Follow the instructions on the screen to create a disc.

Notes

- Install "PMB" beforehand.
- Still images cannot be recorded on an AVCHD disc.
- It may take a long time to create a disc.

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☆ Playing an AVCHD disc on a computer

You can play back an AVCHD disc using "Player for AVCHD" that is installed together
with "PMB."
To start the software, click on [Start] → [All Programs] → [PMB] → [PMB Launcher] →
[View] → [Player for AVCHD].
For detailed operations, see the Help for "Player for AVCHD."
• Movies may not be played smoothly depending on the computer environment.

Creating a standard definition image quality (STD) DVD

You can create a standard definition image quality (STD) DVD from AVCHD format
movies imported to a computer using supplied software "PMB."

1 Turn on your computer and place an empty disc on the DVD drive.

2 Start "PMB."

3 Click [Calendar] or [Index] to the left of the screen, and select the date or
   folder of the movies you want to write.

4 Click   (Disc Creation) at the top of the screen → [Create DVD-Video
   Format Discs (STD)].

5 Follow the instructions on the screen to create the disc.

Notes

• Install "PMB" beforehand.
• It will take a longer time to create a disc because AVCHD format movies are converted to standard
  definition image quality (STD) movies.
• An Internet connection environment is required when creating a DVD-Video (STD) disc for the first
  time.

Creating a disc using a DVD writer/recorder

You can create an AVCHD disc using a DVD writer/recorder (excluding DVDirect Express), and play it on AVCHD format playback devices (Sony Blu-ray Disc player, PlayStation®3, etc.)

Notes

- A DVD recorded with high definition image quality (HD) is called an "AVCHD disc" in this manual.
- Always maintain your PlayStation®3 to use the latest version of the PlayStation®3 system software.
- The PlayStation®3 may not be available in some countries/regions.
- An AVCHD disc can be played back only on AVCHD format compatible devices.
- An AVCHD disc should not be used in DVD players/recorders. Because DVD players/recorders are not compatible with the AVCHD format, DVD players/recorders may fail to eject the disc.
- You cannot create an AVCHD disc from a movie recorded with [FX 24M] mode of [Rec Mode]. Save a movie recorded with [FX 24M] mode onto a Blu-ray Disc (page 73).

Creating an AVCHD disc

Use the USB cable to connect the camcorder to a disc creation device, which is compatible with high definition image quality (HD) movies. Refer also to the instruction manuals supplied with the device to be connected.

Notes

- Connect your camcorder to the wall outlet (wall socket) using the AC Adaptor for this operation.
- Do not disconnect the USB cable while transferring movies to prevent corruption of the data.
- Sony DVD writer may not be available in some countries/regions.

1 Connect the AC Adaptor and the power cord (mains lead) to the DC IN jack of the camcorder and the wall outlet (wall socket).

2 Turn on the camcorder, and connect a DVD writer, etc. to the ← (USB) jack of the camcorder with the USB cable (supplied).

   When both devices are connected, the display on the camcorder is turned off.
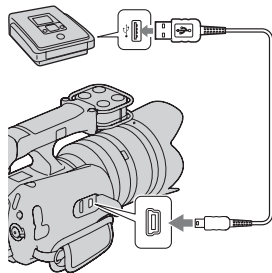
3 Record movies on the connected device.
   - For details, refer to the instruction manuals supplied with the connected device.

4 Disconnect the USB cable after you finish creating a disc.

Troubleshooting

If you experience trouble with the camcorder, try the following solutions.

❶ **Check the items on pages 76 to 81.**

▼

❷ **Remove the battery pack, wait for about 1 minute, reattach the battery pack, then turn on the power.**

▼

❸ **Reset the settings (page 68).**

▼

❹ **Consult your Sony dealer or local authorized Sony service facility.**

Battery pack and power

The battery pack cannot be attached.

- You cannot use NP-FV30/FV50.

Sufficient remaining battery indicator is displayed but the power runs out too quickly.

- This phenomenon occurs when you use the camcorder in an extremely hot or cold location.
- The battery pack is discharged. Attach a charged battery pack.
- The battery pack is dead. Replace it with a new one.

Cannot turn on the camcorder.

- Attach the battery pack correctly.
- The battery pack is discharged. Attach a charged battery pack.
- The battery pack is dead. Replace it with a new one.
- Connect the AC Adaptor to the wall outlet (wall socket).

The power turns off suddenly.

- When the camcorder or battery pack is too warm, the camcorder displays a warning message and turns off automatically to protect the camcorder.
- If you do not operate the camcorder for 5 minutes or more, the camcorder turns to power save mode. To cancel the power save mode, operate the camcorder, such as opening/closing the LCD panel (page 62).

The CHARGE lamp flashes when charging the battery pack on the supplied battery charger.

- If you charge a battery pack that has not been used for a long time, the CHARGE lamp may flash.
- If the CHARGE lamp is flashing fast (about 0.15-second intervals)
  Remove the battery pack and reattach the same battery pack securely. If it flashes fast again, it suggests that there is something wrong with the battery pack.

- If the CHARGE lamp is flashing slowly (about 1.5-second intervals)
  The ambient temperature is outside the suitable range for charging the battery pack. Charge the battery pack under the suitable temperatures between 10 °C and 30 °C (50 °F and 86 °F).

Recording

Nothing is displayed on the viewfinder or the LCD monitor when the power is turned on.

- If you do not operate the camcorder for 5 minutes or more, the camcorder turns to power save mode. To cancel the power save mode, operate the camcorder, such as opening/closing the LCD panel (page 62).
- The camcorder displays images on the viewfinder or the LCD monitor. You can switch between the viewfinder and the LCD monitor by pressing the FINDER/LCD button.

The camcorder does not start shooting when the START/STOP or PHOTO button is pressed.

- The camcorder is in the playback mode. Press the MODE button to turn on the lamp of the desired recording mode.
- The camcorder is writing the image you have just shot on the memory card. You cannot shoot new image during this period.
- There is no empty space on the memory card. Delete unnecessary images (page 46).
- Total number of movie scenes exceeds the recordable capacity of the camcorder. Delete unnecessary images (page 46).
- The lens is not attached correctly. Reattach the lens.

The access lamp remains lit even after recording was stopped.

- The camcorder is recording the image you have just shot on the memory card.

The actual recording time for movies is less than the estimated recording time of the memory card.

- Depending on the recording conditions, the time available for recording may be shorter, for example, when recording a fast moving subject, etc.

There is a time difference between the point when the START/STOP button is pressed and the point that the recording movie is started or stopped actually.

- On the camcorder, there may be a slight time difference between the point where you press the START/STOP button and the actual point that recording movie starts/stops. This is not a malfunction.

Recording takes a long time.

- The noise reduction function is working. This is not a malfunction.

The image is out of focus.

- The subject is too close. Check the minimum focal distance of the lens.
- You are shooting in manual focus mode. Use the autofocus function (page 16).
- Ambient light is insufficient.
- The subject may require special focusing. Use the manual focus function (page 16).

Flash shooting cannot be done.

- Turn on the attached flash (sold separately).
- The flash is not attached correctly. Reattach the flash.

- You cannot use a flash with the following recording mode:
  – [Bracket: Cont.]
  – [Hand-held Twilight]
  – [Anti Motion Blur]
  – Movie recording

Fuzzy white circular spots appear on images shot using a flash.

- Particles (dust, pollen, etc.) in the air reflected the flash light and appeared on the image. This is not a malfunction.

The image taken with flash is too dark.

- If the subject is beyond the flash range (the distance that the flash can reach), the pictures will be dark because the flash light does not reach the subject. If the ISO is changed, the flash range also changes with it.

The date and time are recorded incorrectly.

- Set the correct date and time (page 60).
- The area selected with [Area Setting] is different from the actual area. To set the actual area, press the MENU button , then select [Setup] → [Area Setting].

The aperture value and/or shutter speed flashes when you press the PHOTO button halfway down.

- Since the subject is too bright or too dark, it is beyond the available range of the camcorder. Adjust the setting again.

The image is whitish (Flare).
Blurring of light appears on the image (Ghosting).

- The picture was taken under a strong light source, and excessive light has entered the lens. When using the zoom lens, attach a lens hood.

The corners of the picture are too dark.

- Take off the filter or hood. Depending on the thickness of the filter and improper attachment of the hood, the filter or the hood may partially appear in the image. The optical properties of some lenses may cause the periphery of the image to appear too dark (insufficient light).

The eyes of the subject come out red.

- Activate the Red Eye Reduction function (page 55).
- Get close to the subject, and shoot the subject within the flash range using a flash.

Dots appear and remain on the LCD monitor.

- This is not a malfunction. These dots are not recorded.

The image is blurred.

- The picture was taken in a dark location without a flash, resulting in camera shake. The use of a tripod or flash (sold separately) is recommended (page 37). [Hand-held Twilight] (page 28) and [Anti Motion Blur] (page 29) are also effective in reducing blur.

The exposure value is flashing on the LCD monitor.

- The subject is too bright or too dark for the metering range of the camcorder.

The subjects passing by the frame very fast appear crooked.

- This is called the focal plane phenomenon. This is not a malfunction. Because of the way that the image device (CMOS sensor) reads out image signals, the subjects passing by the frame rapidly might appear crooked depending on the recording conditions.

Sound is not recorded correctly.

- You cannot switch between the built-in microphone and an external microphone (sold separately) while recording movies. Attach or remove an external microphone before you start recording.

Playback

Images cannot be played back.

- The folder/file name has been changed on your computer.
- When an image file has been processed by a computer or when the image file was recorded using a model other than that of your camcorder, playback on your camcorder is not guaranteed.
- The camcorder is in USB mode. End the USB connection.
- To play images that are stored on a computer on your camcorder, copy the images to your camcorder first, using "PMB."
- Images recorded on other devices may not be played back, or displayed in incorrect size. This is not a malfunction.

Images cannot be played back on the TV.

- The camcorder outputs signals to a TV via the HDMI terminal only. Connect the camcorder to the TV using an HDMI cable (sold separately).

Deleting/Editing

Cannot delete images.

- Cancel the protection (page 49).

Deleted images by mistake.

- Once you have deleted an image, you cannot restore it. We recommend that you protect images that you do not want to delete (page 49).

Computers

Cannot copy images.

- Make the USB connection by properly connecting the camcorder with your computer.
- Follow the designated copy procedure for your OS.
- When you shoot images with a memory card formatted by a computer, you may not be able to copy the images to a computer. Shoot using a memory card formatted by your camcorder.

Cannot play back images on a computer.

- If you are using "PMB," refer to the "PMB Help."
- Consult the computer or software manufacturer.

The image and sound are interrupted by noise when viewing a movie on a computer.

- You are playing back the movie directly from the memory card. Import the movie to your computer using "PMB" and play it back.
- The image and sound may be interrupted, depending on the performance of the computer used.

After making a USB connection, "PMB" does not start automatically.

- Make the USB connection after the computer is turned on.

Memory card

The camcorder does not operate with the memory card inserted.

- The memory card was formatted on a computer. Format it on your camcorder (page 69).

Cannot insert a memory card.

- Insertion direction of the memory card is wrong. Insert it in the correct direction.

Cannot record on a memory card.

- The memory card is full. Delete unnecessary images (page 46).
- An unusable memory card is inserted.

Formatted the memory card by mistake.

- All the data on the memory card is deleted by formatting. You cannot restore it.

Others

The lens gets fogged.

- Moisture condensation has occurred. Turn off the camcorder and leave it for about an hour before using it.

The image in the viewfinder is not clear.

- Move the viewfinder lens adjustment lever until the image appears clearly.

No image is displayed on the LCD monitor or the viewfinder.

- The camcorder displays images on the LCD monitor or the viewfinder, not both of them. Select the LCD monitor or the viewfinder by pressing the FINDER/LCD button.
- The camcorder does not display images on the LCD monitor and the viewfinder during HDMI output operation.

The message "Set Area/Date/Time." appears when the camcorder is turned on.

- The camcorder has been left unused for sometime with a low battery or no battery pack. Charge the battery pack and set the date again (page 60). If the message appears every time you charge the battery pack, the internal rechargeable battery may be exhausted. Consult your Sony dealer or local authorized Sony service facility.

The number of recordable images does not decrease, or decreases 2 at a time.

- This is because the compression rate and the image size after compression change depending on the image when you shoot a JPEG image.

The setting is reset without the resetting operation.

- The battery pack was removed when the power switch was set to ON. When removing the battery pack, make sure the camcorder is turned off and the access lamp is not illuminated.

The camcorder does not work properly.

- Turn off the camcorder. Remove the battery pack and attach it again. If the camcorder is hot, remove the battery pack, and allow it to cool down before trying this corrective procedure.
- If the AC Adaptor is used, disconnect the power cord. Connect the power cord and turn on the camcorder again. If the camcorder does not work after doing these solutions, consult your Sony dealer or local authorized Sony service facility.

"--E-" is indicated on the screen.

- Remove the memory card, and insert it again. If this procedure does not turn off the indication, format the memory card (page 69).

"Recovering data. Please wait..." is indicated on the screen, and recording stops.

- Recording and deleting data has been repeated too many times on the memory card, or the memory card was formatted on another device. Save the data on the hard disk of a computer, etc., first, and then format the memory card using your camcorder (page 69).
- The writing speed of the memory card you are using is not fast enough to accommodate the recording speed of movies of your camcorder. Use one of the recommended memory cards (page 87).

Nothing appears on the LCD monitor and viewfinder of the camcorder.

- When the camcorder is connected to a computer or another device using the USB cable, nothing appears on the LCD monitor and viewfinder. This is not a malfunction. The screen turns on when the device is disconnected.

Warning messages

If the following messages appear, follow the instructions below.

Incompatible battery. Use correct model.

- An incompatible battery pack is being used.

Set Area/Date/Time.

- Set the date and time. If you have not used the camcorder for a long time, charge the internal rechargeable battery.

Power insufficient

- You tried to clean the image sensor (Cleaning Mode) when the battery level is insufficient. Charge the battery pack or use the AC Adaptor.

Unable to use memory card. Format?

- The memory card was formatted on a computer and the file format was modified. Select [OK], then format the memory card. You can use the memory card again, however, all previous data in the memory card is erased. It may take some time to complete the format. If the message still appears, change the memory card.

Memory Card Error

- An incompatible memory card is inserted or the format has failed.

Reinsert memory card.

- The inserted memory card cannot be used in your camcorder.
- The memory card is damaged.
- The terminal section of the memory card is dirty.

This memory card may not be capable of recording and playing normally.

- The inserted memory card cannot be used in the camcorder.

Processing...

- Long exposure noise reduction will be done for the same amount of time that the shutter was open. You cannot do any further shooting during this reduction process.

Unable to display.

- Images recorded with other camcorders or images modified with a computer may not be able to be displayed.

Recovering data. Please wait...

- Recording and deleting data has been repeated too many times on the memory card, or the memory card was formatted on another device. Save the data on the hard disk of a computer, etc., first, and then format the memory card using your camcorder (page 69).
- The writing speed of the memory card you are using is not fast enough to accommodate the recording speed of movies of your camcorder. Use one of the recommended memory cards (page 87).

82GB

Cannot recognize lens. Attach it properly.

- The lens is not attached properly, or the lens is not attached. If the message appears when a lens is attached, reattach the lens. If the message appears frequently, check whether the contacts of the lens and camcorder are clean or not.
- When attaching a non-Sony E-mount lens or mount adaptor, set [Shoot w/o Lens] to [Enable] (page 54).

No images

- There is no image on the memory card.

Image protected

- You tried to delete protected images.

Camera overheating. Allow it to cool.

- The camcorder has become hot because you have been recording for a long time. Turn the power off. Cool the camcorder and wait until the camcorder is ready to record again.

[⚠]

- The camcorder is getting too hot. Turn it off and leave it in a cool place for a while.

((⚠))ERROR

- The SteadyShot function does not work. You can continue recording but the SteadyShot function will not work. Turn the camcorder off and on. If this icon does not disappear, consult your Sony dealer or local authorized Sony service facility.

⬛FULL

- Total number of movie scenes exceeds the recordable capacity of the camcorder.

⬛ERROR

- Unable to register to the database file. Import all the images to a computer using "PMB" and recover the memory card.

Camera Error

System Error

- Turn the power off, remove the battery pack, then reattach it. If the message appears frequently, consult your Sony dealer or local authorized Sony service facility.

Image Database File error.

- There is something wrong occurred in the Image Database File. Select [Setup] → [Recover Image DB] → [OK].

Image Database File error. Recover?

- You cannot record or play back movies because the Image Database File is damaged. Follow the on-screen instructions to recover data.

Unable to magnify.

- Images recorded with other camcorders may not be enlarged.

No images selected.

- You attempted to delete without specifying images.

Cannot create more folders.

- The folder with a name beginning with "999" exists on the memory card. You cannot create any folders if this is the case.

Using the camcorder abroad

You can use the battery charger (supplied), and the AC Adaptor (supplied) in any country or region where the power supply is within AC 100 V to 240 V, 50 Hz/60 Hz.

Note

• Do not use an electronic transformer (travel converter), as this may cause a malfunction.

Viewing recorded movies on a TV

To view movies recorded on the camcorder on a TV, you must use a TV (or monitor) equipped with an HDMI connector and an HDMI cable (sold separately). In addition, the television system of the TV must comply with the output signal system of the camcorder. Countries/regions that use each television system are as follows.

1080 60i (NTSC)
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

1080 50i (PAL)
Australia, Austria, Belgium, China, Croatia, Czech Republic, Denmark, Finland, Germany, Holland, Hong Kong, Hungary, Indonesia, Italy, Kuwait, Malaysia, New Zealand, Norway, Poland, Portugal, Rumania, Singapore, Slovak Republic, Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom, Viet Nam, etc.

1080 50i (PAL-M)
Brazil

1080 50i (PAL-N)
Argentina, Paraguay, Uruguay

1080 50i (SECAM)
Bulgaria, France, Greece, Guiana, Iran, Iraq, Monaco, Russia, Ukraine, etc.

AVCHD format

The AVCHD format is a high definition digital video camera format used to record a high definition (HD) signal of either the 1080i specification[1] or the 720p specification[2] using efficient data compression coding technology. The MPEG-4 AVC/H.264 format is adopted to compress video data, and the Dolby Digital or Linear PCM system is used to compress audio data.

The MPEG-4 AVC/H.264 format is capable of compressing images at higher efficiency than that of the conventional image compressing format. The MPEG-4 AVC/H.264 format enables a high definition video signal shot on a digital video camera recorder to be recorded on 8 cm DVD discs, hard disk drive, flash memory, memory card, etc.

Recording and playback on your camcorder

Based on the AVCHD format, your camcorder records with the high definition image quality (HD) mentioned below.

Video signal[3]: **1080 60i-compatible device**
MPEG-4 AVC/H.264 1920 × 1080/60i 1440 × 1080/60i
1080 50i-compatible device
MPEG-4 AVC/H.264 1920 × 1080/50i 1440 × 1080/50i

Audio signal: Dolby Digital 2ch

Recording media: Memory card

[1] 1080i specification
A high definition specification which utilizes 1,080 effective scanning lines and the interlace system.
[2] 720p specification
A high definition specification which utilizes 720 effective scanning lines and the progressive system.
[3] Data recorded in AVCHD format other than the above mentioned cannot be played on your camcorder.

Memory card

You can use following memory cards with this camcorder: "Memory Stick PRO Duo" (Mark2) media, "Memory Stick PRO-HG Duo" media, SD memory card, SDHC memory card, and SDXC memory card of Class 4 or more. However, proper operation cannot be guaranteed for all memory cards. You cannot use a MultiMedia Card. "Memory Stick PRO Duo" media of up to 32 GB and SD card of up to 64 GB are confirmed to work with this camcorder.

Notes

- Memory card formatted with a computer are not guaranteed to operate with the camcorder.
- Data read/write speeds differ depending on the combination of the memory card and the equipment used.
- Do not remove the memory card while reading or writing data.
- Data may be corrupted in the following cases:
  - When the memory card is removed or the camcorder is turned off during a read or write operation
  - When the memory card is used in locations subject to static electricity or electrical noise
- We recommend backing up important data, such as to a hard disk of a computer.
- Do not attach a label on the memory card itself nor on a memory card adaptor.
- Do not touch the terminal section of the memory card with your hand or a metal object.
- Do not strike, bend or drop the memory card.
- Do not disassemble or modify the memory card.
- Do not expose the memory card to water.
- Do not leave the memory card within the reach of small children. They might accidentally swallow it.
- The memory card may be hot just after it has been used for a long time. Be careful when you handle it.
- Do not use or store the memory card under the following conditions:
  - High temperature locations such as the hot interior of a car parked in direct sunlight
  - Locations exposed to direct sunlight
  - Humid locations or locations with corrosive substances present
- Images recorded on an SDXC memory card cannot be imported to or played on computers or AV devices that are not compatible with exFAT. Make sure that the device is compatible with exFAT before connecting it to the camcorder. If you connect your camcorder to an incompatible device, you may be prompted to format the card. Never format the card in response to this prompt, as doing so will erase all data on the card. (exFAT is the file system used on SDXC memory cards.)

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"Memory Stick" media

The types of "Memory Stick" media that can be used with the camcorder are listed in the table below. However, proper operation cannot be guaranteed for all "Memory Stick" media functions.

"Memory Stick PRO Duo" media[1][2][3]	Available with your camcorder	
"Memory Stick PRO-HG Duo" media[1][2]		
"Memory Stick Duo" media	Unavailable with your camcorder	
"Memory Stick" media and "Memory Stick PRO" media	Unavailable with your camcorder	

[1] This is equipped with MagicGate function. MagicGate is copyright protection technology that uses encryption technology. Data recording/playback that requires MagicGate functions cannot be performed with this camcorder.

[2] Supports high-speed data transfer using a parallel interface.

[3] When using "Memory Stick PRO Duo" media to record movies, only those marked with Mark2 can be used.

Battery pack

Your camcorder operates only with V series battery packs. You cannot use any other battery packs. You cannot use NP-FV30/FV50, even though they are V series.

On charging the battery pack

We recommend charging the battery pack in an ambient temperature of from 10 °C to 30 °C (50 °F to 86 °F). The battery pack may not be effectively charged in temperatures outside this range.

Effective use of the battery pack

- Battery performance decreases in low temperature surroundings. So in cold places, the operational time of the battery pack is shorter. To ensure longer battery pack use, we recommend putting the battery pack in a pocket close to your body to warm it up, and attach it to the camcorder immediately before you start shooting.
- We recommend having spare battery packs handy and making trial shots before taking the actual shots.
- Do not expose the battery pack to water. The battery pack is not water-tight.
- Do not leave the battery pack in extremely hot places, such as in a car or under direct sunlight.

How to store the battery pack

- Fully discharge the battery pack before storing and store it in a cool, dry place. To maintain the battery pack's function, charge the battery pack and then fully discharge it on the camcorder at least once a year.
- To use the battery pack up, leave the camcorder in playback mode until the power goes off.
- To prevent staining the terminal, short-circuiting, etc., be sure to use a plastic bag to keep away from metal materials when carrying or storing the battery pack.

On battery life

- The battery life is limited. Battery capacity decreases over time and through repeated use. If decreased usage time between charges becomes significant, it is probably time to replace it with a new one.
- The battery life varies according to how it is stored and the operating conditions and environment in which each battery pack is used.

Battery charger

- Only NP-FV series type battery packs (and no others) can be charged in the battery charger (supplied). Batteries other than the specified kind may leak, overheat, or explode if you attempt to charge them, posing a risk of injury from electrocution and burns.
- Remove the charged battery pack from the battery charger. If you leave the charged battery pack in the charger, battery life may be shortened.
- The CHARGE lamp of the supplied battery charger flashes in either way:
  Fast flashing: Turns the light on and off repeatedly at the interval of 0.15 seconds.
  Slow flashing: Turns the light on and off repeatedly at the interval of 1.5 seconds.

- When the CHARGE lamp flashes fast, remove the battery pack being charged, and then insert the same battery pack into the battery charger securely again. When the CHARGE lamp flashes fast again, this may indicate a battery error or that a battery pack other than the specified type has been inserted. Check that the battery pack is the specified type. If the battery pack is the specified type, remove the battery pack, replace it with a new one or another one and check if the battery charger operates correctly. If the battery charger operates correctly, a battery error may have occurred.

- When the CHARGE lamp flashes slowly, it indicates that the battery charger stops charging temporarily on standby. The battery charger stops charging and enters the standby status automatically when the temperature is outside of the recommended operating temperature. When the temperature gets back within the appropriate range, the battery charger resumes charging and the CHARGE lamp lights up again. We recommend charging the battery pack in an ambient temperature of from 10 °C to 30 °C (50 °F to 86 °F).
- If the battery charger is dirty, batteries may not be charged correctly. Clean the battery charger with dry cloth, etc.

Mount Adaptor

Using the Mount Adaptor LA-EA1 (sold separately), you can attach an A-mount lens to your camcorder. For details, refer to the operating instructions supplied with the Mount Adaptor.
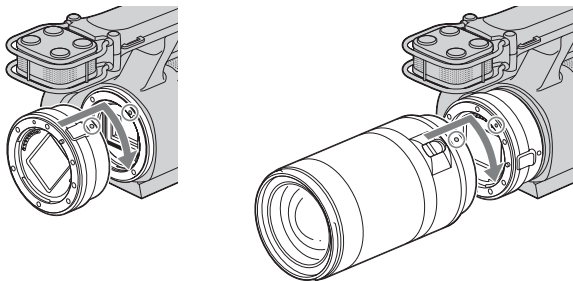
Notes

- When an A-mount lens is attached, you cannot use the auto focus function. You may not be able to use certain A-mount lenses. For the compatibility of a particular A-mount lens, visit the Sony web site in your area, or consult your Sony dealer or local authorized Sony service facility.
- The continuous shooting speed of still images will be slower.

Cleaning

Cleaning the camcorder

- Do not touch the inside of the camcorder, such as lens contacts. Blow away dust from inside the mount using a commercially available blower*. For details on cleaning the image sensor, see page 65.
  * Do not use a spray blower. Using one may cause a malfunction.
- Clean the camcorder surface with a soft cloth slightly moistened with water, then wipe the surface with a dry cloth. Do not use the following as they may damage the finish or the casing.
  – Chemical products such as thinner, benzine, alcohol, disposable cloths, insect repellent, sunscreen or insecticide, etc.
  – Do not touch the camcorder with the above on your hand.
  – Do not leave the camcorder in contact with rubber or vinyl for a long time.

Cleaning the lens

- Do not use a cleaning solution containing organic solvents, such as thinner, or benzine.
- When cleaning the lens surface, remove dust using a commercially available blower. In case of dust that sticks to the surface, wipe it off with a soft cloth or tissue paper slightly moistened with lens cleaning solution. Wipe in a spiral pattern from the center to the outside. Do not spray lens cleaning solution directly onto the lens surface.

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