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Getting Ready

The Video Recording Workflow

1 Prepare.
Before making videos, learn the names and locations of camera controls and insert a battery and memory card.
- The supplied EH-7P charging AC adapter or an optional AC adapter is recommended for extended recording. The camera can also be powered via USB. For more information, see page 744 of the Z 9 Reference Guide, available from the Nikon Download Center’s Z 9 product page (https://downloadcenter.nikonimglib.com/en/products/589/Z_9.html).
- Once you’re ready to proceed, turn the camera on.

2 Select video mode by rotating the photo/video selector to 🎥.
The camera is now ready to record. Adjust recording settings as desired.

3 Press the video-record button to start recording.
- Press the video-record button to start recording.
- You can also start recording via a control chosen using Custom Setting g2 [Custom controls] (52).

- A recording indicator will appear in the shooting display. The shooting display also shows the time remaining, or in other words the approximate amount of new footage that can be recorded to the memory card.

- Sound is recorded via the video microphone. Do not cover the video microphone during recording.
4 Adjust focus as required.

In the default focus mode—AF-F—the camera adjusts focus automatically. No particular action is required on your part, as the camera will adjust focus continuously in response to subject movement or changes in composition.

- To focus on a new subject, tap it in the monitor. The camera will also automatically refocus on subjects in focus points chosen using the multi selector.
- To focus in modes AF-S and AF-C, press the AF-ON button or press the shutter-release button halfway.
- When MF is selected for focus mode, you can adjust focus by rotating the lens focus ring or control ring. If [ON] is selected for Custom Setting a13 [Focus peaking] > [Focus peaking display], objects that are in focus will be indicated by colored outlines.

5 Press the video-record button to end recording.

Press the video-record button again to end recording.
Using Other Controls for Video Recording

- You can start and end video recording using a control that has been assigned [Record videos] via Custom Setting g2 [Custom controls]. [Record videos] can be assigned to (52):
  - the focus-mode button,
  - the shutter-release button,
  - the AF-ON button,
  - the center of the sub-selector,
  - the  button,
  - the AF-ON button for vertical shooting, or
  - the center of the vertical multi selector.

- If, after assigning [Record videos] to the shutter-release button, you would prefer that the camera not focus at the start of recording, select [AF-ON only] for Custom Setting a6 [AF activation].

Starting and Ending Recording Remotely

When [Record videos] is selected for Custom Setting g2 [Custom controls] > [Shutter-release button], the shutter-release buttons on MC-36A remote cords and other remote release accessories can be used to start and stop video recording.
Dust on the Image Sensor

Dust on the image sensor can greatly complicate the post-production process, particularly when it comes to video. For this reason, we recommend that, before exchanging lenses or the like, you configure the sensor shield to close when the camera is turned off. This can be accomplished by selecting [Sensor shield closes] for [Sensor shield behavior at power off] in the setup menu.

- Camera startup times may increase.
- The shield can be damaged by touching it when it is closed.
- When exchanging lenses with the shield closed, be sure to insert the lens perpendicular to the mount. If inserted at an angle, lenses could contact the sensor shield and damage the shield or the image sensor.
The Video Recording Display

Exposure for videos and photos shot in video mode can be previewed in the monitor and viewfinder. The explanation that follows concentrates mostly on the monitor.

The Shooting Display

The following are displayed in the monitor in video mode:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Rec</td>
<td>Recording indicator Indicates that recording is in progress. A “no video” indicator (REC) is displayed if videos cannot currently be recorded.</td>
</tr>
</tbody>
</table>
| 2 Erc | External recording control Displayed if video is simultaneously being recorded to a device connected via HDMI (125).
| 3 Ven | Video recording time The time elapsed from the start of recording. |
| 4 Fsr | Frame size and rate The frame size (in pixels) and frame rate for video recording (126). |
| 5 Tre | Time remaining The recording time available for videos (127). |
| 6 Vft | Video file type The video file type (128). |
| 7 Slv | Sound level The sound level for audio recording. Displayed in red if the level is too high. Reduce microphone sensitivity. |
| 8 Ms | Microphone sensitivity The current microphone sensitivity (129) setting. |
| 9 Tsf | Touch shooting Enable or disable touch AF.  
• When [AF Touch AF] is enabled, the focus point can be positioned and autofocus initiated by tapping the monitor.  
• When [Position focus point] is enabled, tapping the monitor positions the focus point but does not initiate autofocus. |
| 10 Vr | Vibration reduction indicator The current vibration reduction setting (130). |
| 11 Evr | Electronic VR indicator Displayed when electronic vibration reduction is on (131). |
| 12 Hvr | Headphone volume Displayed when third-party headphones are connected. Shows the volume of the audio output to the headphones. |
| 13 Zdb | Zebra pattern Used to indicate selected tone ranges (132). |
The Information Display: Video Mode

Press the DISP button to choose the information displayed in video mode. The type and content of the displays available vary with the options chosen for Custom Settings g12 [Custom monitor shooting display] and g13 [Custom viewfinder shooting display] (58).

Temperature Warnings
- If the camera temperature becomes elevated, a temperature warning and count-down timer will be displayed. When the timer reaches zero, the shooting display will turn off.
- The timer turns red when the thirty second mark is reached. In some cases, the timer may be displayed immediately after the camera is turned on.
- Turn the camera off if the shooting display turns off due to the camera overheating. To cool the camera, we recommend that you shade it from direct sunlight using a parasol, towel, or the like.

Memory Card High-Temperature Warning
A high-temperature warning appears in the shooting display when the temperature of the memory card rises. Do not attempt to remove the memory card; instead, wait for the camera to cool and the warning to clear from the display.
### Customizing the Displays

The indicators shown in the displays can be chosen using Custom Settings g12 [Custom monitor shooting display] and g13 [Custom viewfinder shooting display]. For more information, see “Custom Shooting Displays” (58). The options available are listed below.

<table>
<thead>
<tr>
<th>Simple</th>
<th>Basic shooting info</th>
<th>View the shooting mode, shutter speed, aperture, and other basic shooting info.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detail</td>
<td>Detailed shooting info</td>
<td>View the focus mode, AF-area mode, white balance, and other detailed shooting info.</td>
</tr>
</tbody>
</table>
| Touch controls | Touch controls | View options that can be accessed via touch controls, including touch AF and the \( \text{i} \) menu.  
  - This option cannot be accessed via Custom Setting g13 [Custom viewfinder shooting display]. |
| Virtual horizon | Virtual horizon | Enable the virtual horizon. The display type can be selected using Custom Setting d16 [Virtual horizon type]. |
| Histogram | Histogram | Enable the RGB histogram. |
| Framing grid | Framing grid | Enable the framing grid. |
| Center indicator | Center indicator | Display crosshairs at the center of the frame. |
The Virtual Horizon Display
The virtual horizon can be used to help level the camera. It can be used, for example, to level the camera when it is mounted on a tripod. At default settings, it can be viewed by pressing the DISP button to cycle to Display 3.

- The indicators are displayed in green when the camera is level.

<table>
<thead>
<tr>
<th>Camera level</th>
<th>Camera tilted left or right</th>
<th>Camera tilted forward or back</th>
</tr>
</thead>
</table>

- The display type can be selected using Custom Setting d16 [Virtual horizon type]. If [Type B] is selected, the roll indicator will appear at the bottom of the display and the pitch indicator at its right edge.

The Virtual Horizon Display
Note that the display may not be accurate when the camera is tilted at a sharp angle forward or back. The camera will not display pitch and roll indicators when held at angles at which tilt cannot be measured.
Quick Display Selection
Controls can be assigned display-related functions using Custom Setting g2 [Custom controls].

- [Live view info display off]: Pressing the control hides indicators in the shooting display. Press again to view indicators.

- [Framing grid]: Pressing the control displays a framing grid. Press the control again to turn the display off. The display type can be selected using Custom Setting g11 [Grid type].

- [Virtual horizon]: Pressing the control displays the virtual horizon. Press the control again to turn the display off. The display type can be selected using Custom Setting d16 [Virtual horizon type].

Using Zoom in Video Mode
To zoom in on the display in video mode (to a maximum of approximately 16×), press the 撮 button.

- Use the 撮 and 快 ( ) buttons to zoom in and out.
- A navigation window will appear at the bottom right corner of the display.
- Use the multi selector to scroll to areas of the frame not visible in the display.
- Pressing 撮 during recordingzooms the display in to a 1:1 (100%) zoom ratio. Press 快 ( ) to cancel zoom.
- When viewing videos, you can zoom in on the current frame while playback is paused.
- When shooting in video mode, you can also zoom in on the current focus point using a control assigned [Zoom on/off] via Custom Setting g2 [Custom controls]. The zoom ratio can be chosen from [Low magnification (50%)], [1:1 (100%)], and [High magnification (200%)].
Settings

Accessing Video Settings

Video settings can be adjusted in video mode using any of the following three methods: the i button menu, video-related controls, or the video recording menu.

The i-Button Menu

- To display the video i menu, rotate the photo/video selector to 🎥 and either press the i button or tap the i icon.

<table>
<thead>
<tr>
<th>Option</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Set Picture Control]</td>
<td>[Electronic VR]</td>
</tr>
<tr>
<td>[White balance]</td>
<td>[Vibration reduction]</td>
</tr>
<tr>
<td>[Frame size/frame rate]</td>
<td>[Shooting menu bank] —</td>
</tr>
<tr>
<td>[Microphone sensitivity]</td>
<td>[Custom controls]</td>
</tr>
<tr>
<td>[AF-area mode/subj. detection]</td>
<td>[Airplane mode] —</td>
</tr>
<tr>
<td>[Focus mode]</td>
<td>[Destination]</td>
</tr>
</tbody>
</table>

Using the i Button

1. With the camera in video mode, press the i button.
   - Available settings will be displayed.
   - If desired, you can navigate the menu using touch controls after pressing the i button.

2. Highlight the desired item and press ⊗.
   - Options for the selected item will be displayed.

3. Press ④or ⑤to highlight the desired option and press ⊗to select.
   - The menu shown in Step 1 will be displayed.
   - To exit to the shooting display, press the i button again.

Using the Command Dials

Items for which the camera displays an on-screen guide can be adjusted by highlighting them in the i menu and rotating a command dial. In some cases, adjustments can be made using both the main and sub-command dials.

Customizing the i Menu

The items displayed in the video-mode i menu can be chosen using Custom Setting g1 [Customize i menu] (49).
### Video-Related Controls

The following controls can be used for video recording:

<table>
<thead>
<tr>
<th>Control</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODE button</td>
<td>Shooting mode</td>
</tr>
<tr>
<td>button</td>
<td>Exposure compensation</td>
</tr>
<tr>
<td>ISO button</td>
<td>ISO sensitivity</td>
</tr>
<tr>
<td>Fn2 button</td>
<td>Image area</td>
</tr>
<tr>
<td>Focus-mode button</td>
<td>Focus and AF-area mode</td>
</tr>
<tr>
<td>(Fn4) button</td>
<td>Picture Control</td>
</tr>
<tr>
<td>button</td>
<td>Microphone sensitivity</td>
</tr>
<tr>
<td>WB button</td>
<td>White balance</td>
</tr>
</tbody>
</table>

#### Custom Controls

The following controls can be assigned video-related functions using Custom Setting g2 [Custom controls]. For more information, see “Custom Controls” (52).

- [Fn1 button]
- [Fn2 button]
- [Fn3 button]
- [Fn button for vertical shooting]
- [Focus mode button]
- [AF-ON button]
- [Protect/Fn4 button]
- [OK button]
- [Sub-selector center]
- [QUAL button]
- [Audio button]
- [AF-ON button for vertical shooting]
- [Vertical multi selector center]
- [Command dials]
- [Shutter-release button]
- [Lens Fn2 button]
- [Lens Fn button]
- [Lens control ring]
The Video Recording Menu

The video recording menu can be displayed by pressing the MENU button and selecting the 4 tab.

| Item                          |  
|------------------------------|---|
| (Shooting menu bank)         | — |
| (Extended menu banks)        | — |
| (Storage folder)             | — |
| (File naming)                | — |
| (Destination)                | 17 |
| (Video file type)            | 18 |
| (Frame size/frame rate)      | 19 |
| (ISO sensitivity settings)   | 20 |
| (White balance)              | 21 |
| (Set Picture Control)        | 25 |
| (Manage Picture Control)     | — |
| (HLG quality)                | 28 |
| (Active D-Lighting)          | 34 |
| (High ISO NR)                | 28 |
| (Vignette control)           | 28 |
| (Diffraction compensation)   | 29 |

| Item                          |  
|------------------------------|---|
| (Auto distortion control)    | 29 |
| (Video flicker reduction)     | 34 |
| (Metering)                   | 35 |
| (Focus mode)                 | 36 |
| (AF-area mode)               | 37 |
| (AF subject detection options)| 38 |
| (Vibration reduction)        | 30 |
| (Electronic VR)              | 31 |
| (Microphone sensitivity)     | 44 |
| (Attenuator)                 | 45 |
| (Frequency response)         | 45 |
| (Wind noise reduction)       | 45 |
| (Mic jack plug-in power)     | 46 |
| (Headphone volume)           | 46 |
| (Timecode)                   | 47 |
| (External rec. cntrl (HDMI)) | 65 |

Accessing Settings

Throughout this chapter, the means by which the settings discussed in each section can be accessed are listed in tables like that below. The methods that can be used are indicated by check marks (✔) and those that cannot by dashes (—).

<table>
<thead>
<tr>
<th>Button menu</th>
<th>Camera controls</th>
<th>Other menus</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
<td>—</td>
<td>✔</td>
</tr>
</tbody>
</table>

- The items that can be accessed via the 4-button menu can be chosen using Custom Setting g1 [Customize 4 menu] (49).
- “Camera controls” includes controls to which the function in question has been assigned using Custom Setting g2 [Custom controls] (52).
Choose a memory card and format for video recording.

**Destination**
To choose the slot used for video recording when two memory cards are inserted:

1. With the camera in video mode, press the **i** button and then highlight [Destination] and press **OK**.
   - Options will be displayed.
   - You can also select an option using the command dials before pressing the **OK** button.

2. Press **4** or **2** to highlight the desired option and press **OK** to select.
   - The menu shows the time available on each card.
   - Recording ends automatically when no time remains on the current card.
   - Overflow and backup storage are not available during video recording.
   - To exit to the shooting display, press the **i** button again.
**Video File Type**

Choose the video encoding and file type.

The selection can be made using [Video file type] in the video recording menu. You have a choice of MOV and MP4 formats.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Tone mode</th>
<th>Inter-frame compression</th>
<th>Audio recording format</th>
<th>YCbCr</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ProRes 422 HQ 10-bit (MOV)]</td>
<td>Choose for footage destined for editing post-production.</td>
<td>[SDR]</td>
<td>ALL-I</td>
<td>Linear PCM</td>
<td>4:2:2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[N-Log]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[H.265 10-bit (MOV)]</td>
<td>This format assumes the footage will be processed on a powerful computer.</td>
<td>[SDR]</td>
<td>Long GOP</td>
<td></td>
<td>4:2:0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[HLG]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[N-Log]</td>
<td></td>
<td>[SDR]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[N-Log]</td>
<td>This format offers superior compression.</td>
<td>[SDR]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[H.264 8-bit (MP4)]</td>
<td>A widely-supported file type.</td>
<td>[SDR]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Tone Mode**

To choose the tone mode, highlight [ProRes 422 HQ 10-bit (MOV)] or [H.265 10-bit (MOV)] and press ②. The tone mode for videos shot using [H.265 8-bit (MOV)] and [H.264 8-bit (MP4)] is fixed at [SDR].

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[SDR]</td>
<td>This mode supports a normal range of brightnesses (dynamic range).</td>
</tr>
<tr>
<td>[HLG]</td>
<td>This mode supports HDR (high dynamic range). It has a wider dynamic range than SDR.</td>
</tr>
<tr>
<td></td>
<td>• It is available only when [H.265 10-bit (MOV)] is selected for [Video file type].</td>
</tr>
<tr>
<td>[N-Log]</td>
<td>This mode uses Nikon’s unique log curve. Choose for pictures with a wide dynamic range. 3D LUTs for use with N-Log curves can be applied post-production for footage that displays beautifully on monitors that support Rec. 709.</td>
</tr>
</tbody>
</table>
The settings covered in this section control video picture quality.

**Frame Size/Frame Rate**
Choose the video frame size (in pixels) and frame rate.

**Choosing a Frame Size and Frame Rate**

1. With the camera in video mode, press the \( i \) button and then highlight \[ Frame size/frame rate \] and press \( \).
   - Options will be displayed.
   - The options available for frame size vary with the settings chosen for \[ Video file type \] in the video recording menu. See the table below for more information.
   - You can also select an option using the command dials before pressing the \( \) button.

2. Press \( \) or \( \) to highlight the desired option and press \( \) to select.
   - To exit to the shooting display, press the \( i \) button again.

**“Frame Size/Frame Rate”**
The options available for frame size and rate vary with the setting chosen for \[ Video file type \], as shown in the table below.

<table>
<thead>
<tr>
<th>Option1</th>
<th>Video file type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ProRes 422 HQ 10-bit</td>
</tr>
<tr>
<td>[7680×4320; 30p]1,2</td>
<td>—</td>
</tr>
<tr>
<td>[7680×4320; 25p]1,3</td>
<td>—</td>
</tr>
<tr>
<td>[7680×4320; 24p]1,3</td>
<td>—</td>
</tr>
<tr>
<td>[3840×2160; 120p]1,4</td>
<td>—</td>
</tr>
<tr>
<td>[3840×2160; 100p]1,4</td>
<td>—</td>
</tr>
<tr>
<td>[3840×2160; 60p]4</td>
<td>—</td>
</tr>
<tr>
<td>[3840×2160; 50p]4</td>
<td>—</td>
</tr>
<tr>
<td>[3840×2160; 30p]4</td>
<td>—</td>
</tr>
<tr>
<td>[3840×2160; 25p]4</td>
<td>—</td>
</tr>
<tr>
<td>[3840×2160; 24p]4</td>
<td>—</td>
</tr>
<tr>
<td>[1920×1080; 120p]4</td>
<td>—</td>
</tr>
<tr>
<td>[1920×1080; 100p]4</td>
<td>—</td>
</tr>
<tr>
<td>[1920×1080; 60p]</td>
<td>—</td>
</tr>
<tr>
<td>[1920×1080; 50p]</td>
<td>—</td>
</tr>
<tr>
<td>[1920×1080; 30p]</td>
<td>—</td>
</tr>
<tr>
<td>[1920×1080; 25p]</td>
<td>—</td>
</tr>
<tr>
<td>[1920×1080; 24p]</td>
<td>—</td>
</tr>
</tbody>
</table>

1. The actual frame rate may differ from that shown. The actual frame rates are: 120p: 119.88 fps; 100p: 100 fps; 60p: 59.94 fps; 50p: 50 fps; 30p: 29.97 fps; 25p: 25 fps; 24p 23.976 fps.
2. Fixes \[ Electronic VR \] in the video recording menu at \[ OFF \].
3. Videos are recorded in 8K UHD. Not available with DX lenses.
4. Videos are recorded in 4K UHD.

---

**Settings**

19
**Choose Image Area**

Choose the image area. Select [FX] to shoot videos in what is referred to as “FX-based video format”, [DX] to shoot in “DX-based video format”.

- **Video Image Area Options**
  The illustration shows the crops used for filming videos. Regardless of the option selected, the aspect ratio is 16:9.

- Select [FX] to shoot videos in what is referred to as “FX-based video format”, [DX] to shoot in “DX-based video format”.
- Selecting [DX] for [Choose image area] or mounting a DX lens on the camera with [3840×2160; 120p], [3840×2160; 100p], [1920×1080; 120p], or [1920×1080; 100p] chosen for [Frame size/frame rate] increases the apparent focal length by approximately 2.3x when compared to FX format.
- The sizes of the different crops are as follows.

<table>
<thead>
<tr>
<th>Format</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX-based video format</td>
<td>Approx. 35.9 × 20.2 mm</td>
</tr>
<tr>
<td>DX-based video format</td>
<td>Approx. 23.5 × 13.2 mm</td>
</tr>
<tr>
<td>2.3x</td>
<td>Approx. 16.7 × 9.4 mm</td>
</tr>
</tbody>
</table>

- DX-based video format is selected automatically when a DX lens is attached.
- When 7680 × 4320 is selected for frame size, image area is fixed at [FX]. The frame size changes to 3840 × 2160 when a DX lens is attached.
- Selecting [ON] for [Electronic VR] in the video recording menu reduces the size of the crop.

- **Choosing the Image Area**
  The image area can be selected by holding the Fn2 button and rotating a command dial.

- The option currently selected is shown by an icon in the display.
ISO Sensitivity

Videos recorded in modes P, S, and A are shot using auto ISO sensitivity (ISO AUTO). You can, however, select an upper limit to prevent the camera choosing too high a value. In mode M, you also have the option of adjusting ISO sensitivity manually.

- **Modes P, S, and A.**
  - The camera adjusts ISO sensitivity automatically in response to shooting conditions, choosing from values of from ISO 64 to Hi 2.0; the chosen value is shown in the shooting display and control panel.

- **Mode M**
  - Auto ISO sensitivity control can be enabled or disabled by holding the ISO button and rotating the sub-command dial; the display shows ISO AUTO when auto ISO sensitivity control is enabled and ISO when it is disabled. If desired, auto ISO sensitivity control can also be enabled or disabled using [ISO sensitivity settings] > [Auto ISO control (mode M)] in the video recording menu.
  - When auto ISO sensitivity control is disabled (i.e., when ISO appears in the shooting display and control panel), ISO sensitivity can be manually set to values between ISO 64 and Hi 2.0 by holding the ISO button and rotating the main command dial. If desired, ISO sensitivity can also be adjusted using [ISO sensitivity settings] > [ISO sensitivity (mode M)] in the video recording menu.
  - Your selection will be shown in the shooting display and control panel.

- **Maximum Sensitivity**
  - To prevent auto ISO sensitivity control setting ISO sensitivity too high, you can use the [ISO sensitivity settings] > [Maximum sensitivity] option in the video recording menu to select an upper limit from values between ISO 200 and Hi 2.0.
  - The maximum ISO sensitivity for videos recorded with [ON] selected for [Electronic VR] in the video recording menu is ISO 25600.
  - The selected setting applies in modes P, S, and A and in mode M when [ON] is selected for [Auto ISO control (mode M)].

⚠️ **Cautions: Auto ISO Sensitivity Control**
- At high ISO sensitivities, “noise” (randomly-spaced bright pixels, fog, or lines) may increase. Noise can be reduced by selecting [High], [Normal], or [Low] for [High ISO NR] in the video recording menu (📸 28).
- At high ISO sensitivities, the camera may have difficulty focusing.
- The foregoing can be prevented by choosing a lower value for [ISO sensitivity settings] > [Maximum sensitivity] in the video recording menu.
- The minimum values available for [Maximum sensitivity] and [ISO sensitivity (mode M)] when [HLG] is selected for video tone mode are ISO 800 and 400, respectively.
- The minimum values available for [Maximum sensitivity] and [ISO sensitivity (mode M)] when [N-Log] is selected for video tone mode are ISO 1600 and 800, respectively.
**White Balance**

Adjust white balance according to lighting conditions.

- **Adjusting White Balance**
  - Hold the **WB** button and rotate the main command dial. The effect of the chosen setting can be previewed in the shooting display.
  - When **AUTO** (auto) or **I** (fluorescent) is selected, you can choose an **AUTO** (auto) or **I** sub-option by holding the **WB** button and rotating the sub-command dial.
  - When **K** (choose color temperature) is selected, you can choose the color temperature by rotating the sub-command dial.
  - When preset manual is selected, you can choose a white balance preset by rotating the sub-command dial.
  - Your selection is shown in the shooting display.

- **Fine-Tuning White Balance from the **ı** Menu**
  - Pressing **ı** when [White balance] is highlighted in the **ı** menu displays a list of white balance options. If an option other than **K** [Choose color temperature] is highlighted, fine-tuning options can be displayed by pressing **ı**. Any changes to fine-tuning options can be previewed in the shooting display.
  - Tap the arrows in the display or use the multi selector to fine-tune white balance.
  - Press **ı** to save changes and return to the **ı** menu.

**“Same as Photo Settings”**

To use the option currently selected for photos, choose [Same as photo settings] for [White balance] in the video recording menu.
“Auto” and “Natural Light Auto”: Locking Auto White Balance

You can temporarily lock auto white balance when shooting in [Auto] and [Natural light auto] modes. This can, for example, be used to prevent colors changing when you zoom in on subjects wearing reds, greens, or other bright colors.

White balance in close shot is adjusted to reflect colors of objects visible in frame, potentially lending shot a color cast.

Using auto white-balance lock (AWB-L) to lock auto white balance before starting close shot eliminates color cast.

- Assigning [AWB lock (hold)] to a control using Custom Setting g2 [Custom controls] lets you lock white balance at the touch of a button. If desired, you can assign [AE/AWB lock (hold)] to a control to lock both white balance and exposure (52).
- The lock ends when the control to which [AWB lock (hold)] or [AE/AWB lock (hold)] is assigned is pressed a second time or the standby timer expires.
Measuring a New Value for Preset Manual White Balance

Use preset manual white balance to measure a custom white balance value for the current light source and save it for later recall.

1. Hold the WB button and rotate the main command dial to select PRE.

2. Hold the WB button and rotate the sub-command dial until the destination preset is displayed.
   - Choose from presets d-1 through d-6.

3. Release the WB button briefly and then press it again to select direct measurement mode.
   - The PRE icon in the shooting display will flash.
   - A white balance target (□) will be displayed in yellow in the center of the frame.

4. While PRE flashes in the display, use the multi selector to position the □ over a white or gray area of the subject.
   - To zoom in on the area around the □ for more precise positioning, press the Q button.
   - Position the target (□) using the multi selector.
   - To measure white balance, press the shutter-release button all the way down or press 

5. Press the i button to exit direct measurement mode.
**Picture Controls**

Choose a Picture Control according to the subject or type of scene. Choose [Same as photo settings] to use the option currently selected for photos. [Flat] preserves details over a wide tone range, from highlights to shadows, making it a good choice for footage that will be tweaked in post-production. Combining this option with highlight-weighted metering minimizes loss of detail in highlights.

- **Choosing a Picture Control**
  Hold the \( \text{Fn4} \) button and rotate the main command dial to choose a Picture Control.
  - The shooting display will immediately be updated to show the effects of the selected Picture Control.
  - When a Creative Picture Control is selected, the effect level can be chosen by holding the \( \text{Fn4} \) button and rotating the sub-command dial.
  - The camera will exit to the shooting display.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SSD</td>
<td>[Standard]</td>
<td>Choose for results that give more priority to resolution than does [Auto].</td>
</tr>
<tr>
<td>NL</td>
<td>[Neutral]</td>
<td>Minimal processing for natural results.</td>
</tr>
<tr>
<td>VI</td>
<td>[Vivid]</td>
<td>Pictures are enhanced for a vivid, photoprint effect.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Choose for photographs that emphasize primary colors.</td>
</tr>
<tr>
<td>M</td>
<td>[Monochrome]</td>
<td>Take monochrome photographs.</td>
</tr>
<tr>
<td>LS</td>
<td>[Landscape]</td>
<td>Shoot vibrant landscapes and cityscapes.</td>
</tr>
<tr>
<td>F</td>
<td>[Flat]</td>
<td>Details are preserved over a wide tone range, from highlights to shadows.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Choose for photographs that will later be extensively processed or retouched.</td>
</tr>
<tr>
<td>0–20</td>
<td>[Creative Picture Control]</td>
<td>Creative Picture Controls offer unique combinations of hue, tone, saturation, and other settings tuned for particular effects.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Choose from a total of 20 options, including [Dream] and [Morning].</td>
</tr>
</tbody>
</table>

**HLG and N-Log Recording**

Picture Controls are not available in [HLG] and [N-Log] video tone modes. Settings for HLG recording can be adjusted using [HLG quality] in the video recording menu (28).
■ Modifying Picture Controls from the i Menu

- Highlighting [Set Picture Control] in the i menu and pressing ⊙ displays a Picture Control list. To modify a Picture Control while previewing the effects in the shooting display, highlight it in the Picture Control list and press ⊙.
- Press ⊙ or ⊙ to highlight settings. Press ⊙ or ⊙ to choose a value in increments of 1, or rotate the sub-command dial to choose a value in increments of 0.25.
- The options available vary with the Picture Control selected.
- To abandon any changes and start over from default settings, press the ⊗ (Q) button.
- Press ⊙ to save changes.

[Modified Picture Controls]
Picture Controls that have been modified from default settings are indicated by an asterisk (*).

■ Picture Control Settings

<table>
<thead>
<tr>
<th>Effect level</th>
<th>Mute or heighten the effect of Creative Picture Controls.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quick sharp</td>
<td>Use [Quick sharp] to quickly adjust levels for balanced [Sharpening], [Mid-range sharpening], and [Clarity]. These parameters can also be adjusted individually.</td>
</tr>
<tr>
<td>Sharpening</td>
<td>Control the sharpness of details and outlines.</td>
</tr>
<tr>
<td>Mid-range sharpening</td>
<td>Adjust the sharpness of patterns and lines in the range between [Sharpening] and [Clarity].</td>
</tr>
<tr>
<td>Clarity</td>
<td>Adjust overall sharpness and the sharpness of thicker outlines without affecting brightness or dynamic range.</td>
</tr>
<tr>
<td>Contrast</td>
<td>Adjust contrast.</td>
</tr>
<tr>
<td>Brightness</td>
<td>Raise or lower brightness without loss of detail in highlights or shadows.</td>
</tr>
<tr>
<td>Saturation</td>
<td>Control the vividness of colors.</td>
</tr>
<tr>
<td>Hue</td>
<td>Adjust hue.</td>
</tr>
<tr>
<td>Filter effects</td>
<td>Simulate the effect of color filters on monochrome pictures.</td>
</tr>
<tr>
<td>Toning</td>
<td>Choose the tint used in monochrome pictures.</td>
</tr>
<tr>
<td>Toning (Creative Picture Control)</td>
<td>Choose the shade of color used for Creative Picture Controls.</td>
</tr>
</tbody>
</table>
The [A Auto] Picture Control
Settings can be adjusted in the range \([A-2]\) to \([A+2]\).

[A] (Auto)
- Selecting the A (auto) option available for some settings lets the camera adjust the setting automatically.
- Results vary with exposure and the position of the subject in the frame.

The △ Indicator
The △ indicator under the value display in the Picture Control setting menu indicates the previous value for the setting. You’ll find that this comes in handy when making adjustments with reference to the previous value.

[Monochrome] > [Filter Effects]
Choose from the following [Filter effects]:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Y</strong> (yellow)*</td>
<td>These options enhance contrast and can be used to tone down the brightness of the sky in landscape photographs. Orange ([O]) produces more contrast than yellow ([Y]), red ([R]) more contrast than orange.</td>
</tr>
<tr>
<td><strong>O</strong> (orange)*</td>
<td></td>
</tr>
<tr>
<td><strong>R</strong> (red)*</td>
<td></td>
</tr>
<tr>
<td><strong>G</strong> (green)*</td>
<td>Green softens skin tones. Use for portraits and the like.</td>
</tr>
</tbody>
</table>

* The term in parentheses is the name of the corresponding third-party color filter for black-and-white photography.

Toning (Monochrome Only)
Pressing \(\circ\) when an option other than \([B&W]\) (black-and-white) is selected for [Toning] displays saturation options. Press \(\circ\) or \(\circ\) to adjust saturation.
**HLG Quality**

Adjust HLG video image processing options for use when [HLG] is chosen for tone mode.

HLG quality can be adjusted using [HLG quality] in the video recording menu.

### HLG Quality Settings

| [Quick sharp] | Use [Quick sharp] to quickly adjust levels for balanced [Sharpening], [Mid-range sharpening], and [Clarity]. These parameters can also be adjusted individually. |
| [Sharpening] | Control the sharpness of details and outlines. |
| [Mid-range sharpening] | Adjust the sharpness of patterns and lines in the range between [Sharpening] and [Clarity]. |
| [Clarity] | Adjust overall sharpness and the sharpness of thicker outlines without affecting brightness or dynamic range. |
| [Contrast] | Adjust contrast. |
| [Saturation] | Control the vividness of colors. |
| [Hue] | Adjust hue. |

**High ISO NR**

Reduce “noise” (randomly-spaced bright pixels) in videos recorded at high ISO sensitivities.

Choose a setting using the [High ISO NR] item in the video recording menu.

- To enable noise reduction at all ISO sensitivities, select [High], [Normal], or [Low]. The higher the sensitivity, the greater the effect.
- The amount of noise reduction performed can be selected from (in order from high to low) [High], [Normal], and [Low].
- Note that edges may soften and the picture may lose definition at higher settings.
- If [Off] is selected, noise reduction will be performed only as required. The amount of noise reduction performed is always lower than when [Low] is selected.

### Vignette Control

Vignette control reduces “vignetting”—a drop in brightness at the edges of the frame—by an amount that varies from lens to lens. Its effects are most noticeable at maximum aperture.

[Vignette control] is available in both the photo shooting and video recording menus. Changes to one apply to the other.

- To enable vignette control, select [High], [Normal], or [Low].
- The amount can be selected from (in order from high to low) [High], [Normal], and [Low].
**Diffraction Compensation**
Select [ON] to reduce diffraction at small apertures (high f-numbers).

[Diffraction compensation] is available in both the photo shooting and video recording menus. Changes to one apply to the other.

**Auto Distortion Control**
Select [ON] to reduce barrel distortion when shooting with wide-angle lenses and pin-cushion distortion when shooting with long lenses.

[Auto distortion control] is available in both the photo shooting and video recording menus. Changes to one apply to the other.
- When [ON] is selected, auto distortion control will be applied only if the camera judges it necessary.
- Note that [ON] may be selected automatically with some lenses, in which case this item will be grayed out and unavailable.
**Vibration Reduction**
Choose whether to enable vibration reduction.

### Choosing a Vibration Reduction Option

1. With the camera in video mode, press the ⌘ button and then highlight [Vibration reduction] and press ⌘.  
   - Options will be displayed.  
   - The options available vary with the lens. See the table below for more information.  
   - Select [Same as photo settings] to use the option currently selected for photos.  
   - You can also select an option using the command dials before pressing the ⌘ button.

2. Press ⬅️ or ⬇️ to highlight the desired option and press ⌘ to select.  
   - To exit to the shooting display, press the ⌘ button again.

### Vibration Reduction Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Choose for enhanced vibration reduction when photographing static subjects.</td>
</tr>
<tr>
<td>Sport</td>
<td>Choose when photographing athletes and other subjects that are moving rapidly and unpredictably. Selecting [Sport] is recommended for videos. Selecting [Sport] eliminates choppiness during recording.</td>
</tr>
<tr>
<td>Off</td>
<td>Vibration reduction is disabled.</td>
</tr>
</tbody>
</table>

⚠️ **Cautions: Using Vibration Reduction**
- Vibration reduction may be unavailable with some lenses.  
- We recommend that you wait for the image in the display to stabilize before shooting.  
- If an F mount lens with a vibration reduction switch is attached via an optional FTZ II or FTZ mount adapter, [Vibration reduction] will be grayed out and unavailable. Use the lens switch for vibration reduction.
**Electronic VR**

Choose whether to enable electronic vibration reduction in video mode.

1. With the camera in video mode, press the i button and then highlight [Electronic VR] and press ‡.
   - Options will be displayed.
   - You can also select an option using the command dials before pressing the ‡ button.

2. Press † or ‡ to highlight the desired option and press ‡ to select.
   - To exit to the shooting display, press the i button again.

**Electronic Vibration Reduction**

- Electronic vibration reduction is fixed at [OFF] at a frame size of 7680 × 4320 and at frame rates of 120p or 100p.
- Selecting [ON] reduces the size of the crop, slightly increasing the apparent zoom ratio.
- Selecting [ON] may result in a slight delay before the image in the display follows the movement of the camera when the camera is panned horizontally or vertically.
Exposure

This section is devoted to settings that affect exposure.

**Shooting Mode**

To choose a shooting mode, hold the MODE button and rotate the main command dial.

- The selected option is shown in the shooting display and control panel.

- If the image in the display seems over- or under-exposed in mode P or S, switch to mode A and adjust aperture until the desired result is achieved.

- The exposure settings that can be adjusted during filming vary with the shooting mode:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Aperture</th>
<th>Shutter Speed</th>
<th>ISO sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>P, S¹</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>A</td>
<td>✓</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>M</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

1 Exposure control in mode S is the same as in mode P.
2 The maximum ISO sensitivity for videos recorded with [ON] selected for [Electronic VR] in the video recording menu is ISO 25600.
3 The upper limit for ISO sensitivity can be selected using the [ISO sensitivity settings] > [Maximum sensitivity] item in the video recording menu.
4 If [ON] is selected for [ISO sensitivity settings] > [Auto ISO control (mode M)] in the video recording menu, the upper limit for ISO sensitivity can be selected using [Maximum sensitivity].

**Shutter Speed (Mode M)**

In mode M, shutter speed can be set to values between ¹⁄₂₅ s and ¹⁄₃₂₀₀₀ s. The slowest available shutter speed varies with the frame rate.
Exposure Compensation

Exposure compensation is used to alter exposure from the value suggested by the camera. It can be used to make pictures brighter or darker.

Hold the 
button and rotate a command dial.

- icons appear in the shooting display and control panel. The current value is shown in the control panel. It can also be viewed in the shooting display by pressing the icon.
- Choose from values between –3 EV and +3 EV.
- At default settings, changes are made in increments of 1/3 EV. The size of the increments can be changed using Custom Setting b2 [EV steps for exposure cntrl].
- Higher values make the subject brighter, lower values darker.
- Normal exposure can be restored by setting exposure compensation to ±0.0. Exposure compensation is not reset when the camera is turned off.


**Active D-Lighting**

Preserve details in highlights and shadows, creating pictures with natural contrast. Use for high-contrast scenes, for example when photographing brightly-lit outdoor scenery through a door or window or taking pictures of shaded subjects on a sunny day.

Settings can be adjusted using [Active D-Lighting] in the video recording menu.

- The option currently selected is shown in the display during shooting.

![Active D-Lighting](image)

**Video Flicker Reduction**

Reduce flicker and banding when shooting under fluorescent or mercury-vapor lighting during video recording.

Settings can be adjusted using [Video flicker reduction] in the video recording menu.

- Choose [Auto] to allow the camera to automatically choose the correct frequency.
- If [Auto] fails to produce the desired results, select [50 Hz] or [60 Hz] according to the frequency of the local power supply. Choose [50 Hz] for areas with a 50 Hz power supply, [60 Hz] for areas with a 60 Hz power supply.

![Video Flicker Reduction](image)

**Cautions: “Video Flicker Reduction”**

- If [Auto] fails to produce the desired results and you are unsure as to the frequency of the local power supply, test both the 50 and 60 Hz options and choose the one that produces the best results.
- Flicker reduction may not produce the desired results if the subject is very bright. If this is the case, try choosing a smaller aperture (higher f-number).
- Tailoring shutter speed to minimize flicker may not produce the desired results in modes other than M, as the actual speed may not precisely match the value selected. If this is the case, select mode M and choose a shutter speed adapted to the frequency of the local power supply:
  - 50 Hz: ¹⁄₁₀₀ s, ¹⁄₅₀ s, ¹⁄₂₅ s
  - 60 Hz: ¹⁄₁₂₅ s, ¹⁄₆₀ s, ¹⁄₃₀ s
**Metering**

Metering determines how the camera sets exposure.

Settings can be adjusted using [Metering] in the video recording menu.

- The option currently selected is shown in the shooting display.

### Metering Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Matrix metering]</td>
<td>The camera meters a wide area of the frame and sets exposure according to tone distribution, color, composition, and distance for results close to those seen by the naked eye.</td>
</tr>
<tr>
<td>[Center-weighted metering]</td>
<td>The camera assigns the greatest weight to the center of the frame. This mode can, for example, be used with subjects that dominate the composition.</td>
</tr>
<tr>
<td>[Highlight-weighted metering]</td>
<td>The camera assigns the greatest weight to highlights. Use this option to reduce loss of detail in highlights, for example when photographing spotlit performers on stage.</td>
</tr>
</tbody>
</table>

### Spot Metering

Spot metering cannot be used to record videos.
Focus

This section covers the focus settings used when recording videos.

**Focus Mode**

Choose how the camera focuses.

- **Choosing a Focus Mode**
  Hold the focus-mode button and rotate the main command dial.

- The option currently selected is shown in the shooting display and control panel.

**Focus Mode Options**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
</table>
| AF-S [Single AF] | Use with stationary subjects.  
  - The camera focuses when the shutter-release button is pressed halfway or the AF-ON button is pressed. When the subject is in focus, the focus point will turn from red to green and focus will lock. |
| AF-C [Continuous AF] | Use for shots of athletes and other moving subjects.  
  - The camera adjusts focus continuously in response to changes in the distance to the subject while the shutter-release button is pressed halfway or the AF-ON button is pressed. |
| AF-F [Full-time AF] | The camera adjusts focus continuously in response to subject movement or changes in composition.  
  - The camera focuses when the shutter-release button is pressed halfway or the AF-ON button is pressed, at which point the focus point will turn from red to green and focus will lock. |

**Cautions: Autofocus**

- The camera may be unable to focus under the conditions listed below. Use manual focus if the camera is unable to focus because:
  - the subject contains lines parallel to the long edge of the frame,
  - the subject lacks contrast,
  - the subject in the focus point contains areas of sharply contrasting brightness,
  - the focus point includes night-time spot lighting or a neon sign or other light source that changes in brightness,
  - flicker or banding appears under fluorescent, mercury-vapor, sodium-vapor, or similar lighting,
  - a cross (star) filter or other special filter is used,
  - the subject appears smaller than the focus point, or
  - the subject is dominated by regular geometric patterns (e.g., blinds or a row of windows in a skyscraper).
- The display may brighten or darken while the camera focuses.
- The focus point may sometimes be displayed in green when the camera is unable to focus.
- The camera may take longer to focus when lighting is poor.
**AF-Area Mode**

Choose how the camera selects the focus point for autofocus.

- **Choosing an AF-Area Mode**

  Hold the focus-mode button and rotate the sub-command dial.

  - The option currently selected is shown in the shooting display and control panel.

**AF-Area Mode Options**

| [ ]  | Single-point AF | The camera will focus on the subject in the selected focus point only. |
| [ ]  | Wide-area AF (S) | As for single-point AF except that the camera focuses on a wider area. Wide-area AF can be used to smooth focus for panning or tilting shots or when filming moving subjects. |
| [ ]  | Wide-area AF (L) | Track focus on a selected subject.  
  - Position the reticle over the target and start tracking by pressing the shutter-release button halfway or by pressing [ ] or AF-ON; the focus point will track the selected subject as it moves through the frame.  
  - To end tracking and select the center focus point, press [ ]. |
| [ ]  | Subject-tracking AF | The camera automatically detects the subject and selects the focus area. |

**Caution: Subject Tracking**

The camera may be unable to track subjects that are obscured by other objects or leave the frame.
AF Subject Detection Options

Choose the type of subject to which the camera gives priority when focusing using autofocus.

■ Choosing a Subject Detection Option

1. With the camera in video mode, press the [ button and then highlight [AF-area mode/subj. detection] and press .
   • Options will be displayed.
   • You can also select an option using the sub-command dial before pressing the button.

2. Press or to highlight [AF subject detection options] and then press or to highlight the desired option and press .
   • To exit to the shooting display, press the [ button again.
   • Subject detection is available when [Wide-area AF (S)], [Wide-area AF (L)], [Subject-tracking AF], or [Auto-area AF] is selected for [AF-area mode].

■ Subject Detection Options

| [People] | Human faces detected by the camera are identified by a border indicating the focus point. If the camera detects the subject’s eyes, the focus point will instead appear over one or the other of their eyes (face/eye-detection AF). If the subject looks away after their face is detected, the focus point will move to track their motion. |
| [Animal] | If a dog, cat, or bird is detected, the focus point will appear over the face of the animal in question (animal-detection AF). If the camera detects the subject’s eyes, the focus point will instead appear over one or the other of their eyes. If the camera can detect neither face nor eyes, it will display a focus point over the detected animal. |
| [Vehicle] | If a car, motorcycle, train, airplane, or bicycle is detected, the focus point will appear over the vehicle in question.  
• In the case of trains, the camera will detect only the front end.  
• With planes, the camera will detect the body, nose, or cockpit depending on the aircraft’s size. |
| [Auto] | The camera detects humans, animals, and vehicles and chooses a subject for focus automatically. |
| [Subject detection off] | Subject detection disabled. |
Caution: Face/Eye-Detection AF
Face/eye detection may not perform as expected if:
• the subject’s face is too large or small relative to the frame,
• the subject’s face is too brightly or dimly lit,
• the subject is wearing glasses or sunglasses,
• the subject’s face or eyes are obscured by hair or other objects, or
• the subject moves excessively during shooting.

Cautions: Animal-Detection AF
• Animal detection may not perform as expected if:
  – the subject’s face is too large or small relative to the frame,
  – the subject’s face is too brightly or dimly lit,
  – the subject’s face or eyes are obscured by fur or the like,
  – the subject’s face and eyes are of similar colors, or
  – the subject moves excessively during shooting.
  – The camera may display a border around subjects that are not dogs, cats, or birds but which resemble these animals.
• The light from the AF-assist illuminator may adversely affect the eyes of some animals; when using animal-detection AF, select [OFF] for Custom Setting a12 [Built-in AF-assist illuminator].

Cautions: Vehicle-Detection AF
• Vehicle detection may not perform as expected with subjects that are:
  – too large or small relative to the frame,
  – too bright or too dark,
  – partially hidden,
  – similar in color to surrounding objects, or
  – moving excessively.
• The camera may fail to detect vehicles of some shapes and colors. Alternatively, it may display a border around subjects that are not vehicles.

Subject Detection
The performance of subject-detection may drop if either [HLG] or [N-Log] is selected for video tone mode.

[AF When Subject Not Detected]
Choose whether the camera focuses if unable to detect a subject of the type selected for [Subject detection] when AF-F is selected for focus mode.
This setting can be adjusted using [AF subject detection options] > [AF when subject not detected] in the video recording menu.
• [ON]: The camera will focus even if unable to detect a subject of the selected type.
• [OFF]: The camera will not focus if unable to detect a subject of the selected type.
Focus, Continued

**Focus Point Display**

Choose focus point display options.

Settings can be adjusted using Custom Setting a11 [Focus point display].

- **Manual Focus Mode**
  Choose whether the focus point is displayed at all times in manual focus mode.
  - [ON]: The focus point is displayed at all times in manual focus mode.
  - [OFF]: The focus point is displayed only during focus point selection.

- **AF-C In-Focus Display**
  Choose whether the focus point changes color when the subject is in focus in focus mode AF-C.
  - [ON]: The focus point is displayed in green when the camera judges that the subject is in focus. This is a good choice in cases in which it is otherwise difficult to determine whether the subject is in focus.
  - [OFF]: The active focus point is displayed in red or yellow at all times, whether or not the camera is in focus.
Focus Peaking
When focus peaking is enabled in manual focus mode, objects that are in focus are indicated by colored outlines in the display.

Settings can be adjusted using Custom Setting a13 [Focus peaking] > [Focus peaking display].

Focus Peaking Display
Select [ON] to enable focus peaking. This helps when it comes to determining what portions of the frame are currently in focus.

Focus Peaking Display
Using Custom Setting g2 [Custom controls], you can assign [Focus peaking] to a control and then use it to turn focus peaking on or off (52).

Focus Peaking Sensitivity
Choose the depth that will be shown as being in focus.
- Choose [3 (high sensitivity)] for greater depth and [1 (low sensitivity)] for reduced depth.

Focus Peaking Highlight Color
Choose the highlight color.
**Limit AF-Area Mode Selection**

Choose the AF-area modes that can be selected by pressing the focus-mode button and rotating the sub-command dial.

Settings can be adjusted using Custom Setting g4 [Limit AF-area mode selection].

- Only modes marked with a check (✓) can be selected by pressing the focus-mode button and rotating the sub-command dial.
- The check (✓) cannot be removed from [Single-point AF].

**Focus Mode Restrictions**

Limit focus-mode selection to a single focus mode.

Settings can be adjusted using Custom Setting g5 [Focus mode restrictions].

- If an option other than [No restrictions] is selected, the focus mode cannot be changed by holding the focus-mode button and rotating the main command dial, preventing unintended changes to focus mode.

**AF Speed**

Choose the speed at which the camera focuses in focus modes AF-F and AF-C.

Focus speed can be adjusted in the range −5 to +5 using Custom Setting g6 [AF speed].

- Choose higher values for faster focus, lower values for slower focus.

Use [When to apply] to choose when the selected option applies.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ALWAYS</strong></td>
<td>[Always] The camera focuses at the selected speed at all times in video mode.</td>
</tr>
<tr>
<td><strong>REC</strong></td>
<td>[Only while recording] Focus is adjusted at the selected speed only while video recording is in progress. At other times, the camera focuses as quickly as possible.</td>
</tr>
</tbody>
</table>

**Lens Sounds**

The sound produced by the lens during focus operations increases with AF speed. The effect is particularly noticeable at a setting of [+5], so choose lower values if you find the noise distracting.
**AF Tracking Sensitivity**
Choose how quickly focus switches from one subject to another.

AF tracking sensitivity can be adjusted in the range 1 to 7 using Custom Setting g7 [AF tracking sensitivity].
- Choose [7] (Low) to help maintain focus on your original subject.
- If the subject leaves the selected focus area when [1] (High) is selected, the camera will respond by quickly shifting focus to a new subject in the same area.

**Save Focus Position**
Choose whether the camera saves the current focus position when turned off and restores it when turned on.

Settings can be adjusted using [Save focus position] in the setup menu.
- When [ON] is selected, the camera will save the current focus position when turned off.

⚠️ **Save Focus Position**
- Camera startup times may increase.
- Even when [ON] is selected, changes in temperature, zoom position, or other conditions while the camera is off may result in focus resuming from a different position when the camera is turned on.
- Similarly, note that even when [OFF] is selected, focus may resume from the previously-selected position depending on the state of the camera and lens.
Audio

Read this section for information on adjusting audio settings when recording sound with videos.

**Microphone Sensitivity**

Turn the built-in or external microphones on or off or adjust microphone sensitivity.

Microphone sensitivity can be adjusted by holding the button and rotating a command dial.
- Choose a setting between 1 and 20. The higher the value, the higher the sensitivity; the lower the value, the lower the sensitivity.
- Select “auto” to adjust sensitivity automatically.
- To disable audio recording, choose [Microphone off].

If the sound level is displayed in red, the volume is too high. Reduce microphone sensitivity.

**Using an External Microphone**

- Audio can be recorded with videos using external microphones with 3.5 mm mini-jack plugs connected to the camera’s microphone connector.
- Use [Mic jack plug-in power] in the video recording menu to choose whether the power for the external microphone is supplied by the camera (46).
**Attenuator**

Enable the attenuator to reduce microphone gain and prevent audio distortion when filming in loud environments.

Settings can be adjusted using [Attenuator] in the video recording menu.

- Select [ON] to reduce audio distortion when recording videos.

---

**Frequency Response**

Choose the range of frequencies to which built-in and external microphones respond.

Settings can be adjusted using [Frequency response] in the video recording menu.

- [Wide range]: Record a wide range of frequencies. Choose for everything from music to the bustling hum of a city street.
- [Vocal range]: Choose for human voices.

---

**Wind Noise Reduction**

Enable the low-cut filter to reduce noise caused by wind blowing over the built-in microphone.

Settings can be adjusted using [Wind noise reduction] in the video recording menu.

- Select [ON] to enable wind-noise reduction.

---

**Wind Noise Reduction**

- Note that other sounds may also be affected when [ON] is selected.
- Selecting [ON] for [Wind noise reduction] has no effect on optional stereo microphones. Wind-noise reduction for optional stereo microphones that support this feature can be enabled or disabled using microphone controls.
Microphone Jack Plug-in Power: Mic Jack Plug-in Power
Choose whether the camera powers external microphones.

Settings can be adjusted using [Mic jack plug-in power] in the video recording menu.
- The camera does not provide power to external microphones when [OFF] is selected.
- To prevent noise from interference generated by the power supply, we recommend turning plug-in power [OFF] when using microphones that do not require plug-in power.
- For information on whether your microphone requires plug-in power, consult the manufacturer.

Headphone Volume
Adjust headphone volume.

Settings can be adjusted using [Headphone volume] in the video recording menu.
- Press  or  to choose from values between 0 and 30.
The settings discussed in this section affect video controls and displays.

**Timecode**

To record time codes giving the hour, minute, second, and frame number for each frame when shooting videos, select [On] or [On (with HDMI output)] for [Timecode] > [Record timecodes] in the video recording menu. Time codes help you keep track of the current playback and edit position when editing video.

<table>
<thead>
<tr>
<th>Record timecodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• [On]: Record time codes. The time code appears in the shooting display.</td>
</tr>
<tr>
<td>• [On (with HDMI output)]: Time codes will be included with footage saved to external recorders connected to the camera via an HDMI cable. The camera supports Atomos SHOGUN, NINJA, and SUMO-series Monitor recorders.</td>
</tr>
<tr>
<td>• [Off]: Time codes are not recorded.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Count-up method</th>
</tr>
</thead>
<tbody>
<tr>
<td>• [Record run]: Time codes are incremented only while recording is in progress.</td>
</tr>
<tr>
<td>• [Free run]: Time codes are incremented continuously. Time codes continue to be incremented while the camera is off.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Timecode origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>• [Reset]: Reset the time code to 00:00:00.00.</td>
</tr>
<tr>
<td>• [Enter manually]: Enter the hour, minute, second, and frame number manually.</td>
</tr>
<tr>
<td>• [Current time]: Set the time code to the current time as reported by the camera clock. Before proceeding, select [Time zone and date] in the setup menu and make sure that the camera clock is set to the correct time and date.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drop frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select [ON] to compensate for discrepancies between the frame count and the actual recording time at frame rates of 30 and 60 fps.</td>
</tr>
</tbody>
</table>

**Time Codes**

Time codes are available only with videos recorded in MOV format.

**The Time Code Display**

Time codes are displayed as follows:

The values for frame number vary with the currently-selected frame rate:

- 30, 60, or 120 fps: 00–29
- 25, 50, or 100 fps: 00–24
- 24 fps: 00–23
Reverse Ring for Focus
Choose whether to reverse the direction of rotation for lens focus or control rings during manual focus.

Settings can be adjusted using Custom Setting f8 [Reverse ring for focus]. Select [ON] to reverse the ring rotation direction for manual focus.
- This setting is available when a Z mount lens is attached. It does not apply to F mount lenses connected via an FTZ II or FTZ mount adapter.
- Certain Z mount lenses that can only be focused manually are not supported.

Focus Ring Rotation Range
Choose how far lens focus or control rings must be rotated to go all the way from the minimum focus distance to infinity.

Settings can be adjusted using Custom Setting f9 [Focus ring rotation range].

| Non-linear | The focus distance changes by a large amount when the ring is rotated rapidly and by a small amount when the ring is rotated slowly, without regard to how far the ring is rotated. |
| 90°–720° | Choose how far the ring must be rotated to go all the way from the minimum focus distance to infinity. |
| Max. | Taking focus from the minimum focus distance to infinity requires rotating the ring the maximum distance permitted at current lens settings. |

- To take focus from the minimum distance to infinity when, for example, [90°] is selected, the ring need only be rotated 90°. Larger values permit finer adjustments.

- If the lens does not support rotation range selection, [Focus ring rotation range] will be fixed at [Non-linear].
Control Ring Response

Choose how responsive the lens control ring is when assigned the [Aperture], [Power aperture], [Exposure compensation], or [ISO sensitivity].

Settings can be adjusted using Custom Setting f10 [Control ring response]; choose from [High] and [Low].
- The function performed by the lens control ring can be selected using Custom Setting g2 [Custom controls].

Customize i Menu

Choose the items listed in the i menu displayed when the i button is pressed in video mode.

1. Highlight Custom Setting g1 [Customize i menu] and press .

2. Highlight the position you want to change and press .
   - A list of the items available for the selected position will be displayed.

3. Highlight the desired item and press .
   - The item will be assigned to the selected position and the options shown in Step 2 will be displayed.
   - Repeat Steps 2 and 3 as desired.

4. Press the MENU button.
   Changes will be saved and the Custom Settings menu will be displayed.

The Still Photography i Menu

The items displayed in the photo-mode i menu can be chosen using Custom Setting f1 [Customize i menu].
Items That Can Be Assigned to the i Menu

The following items can be assigned to the i menu for video mode.

- [Shooting menu bank]
- [Select custom settings bank]
- [Choose image area]
- [Frame size/frame rate]
- [Destination]
- [Exposure compensation]
- [ISO sensitivity settings]
- [White balance]
- [Set Picture Control]
- [HLG quality]
- [Active D-Lighting]
- [Metering]
- [Focus mode]
- [AF-area mode/subj. detection]
- [Vibration reduction]
- [Electronic VR]
- [Microphone sensitivity]
- [Attenuator]
- [Frequency response]
- [Wind noise reduction]
- [Headphone volume]
- [Silent mode]
- [Custom controls]
- [Focus peaking]
- [Monitor/viewfinder brightness]
- [Airplane mode]
- [Multi-selector power aperture]
- [Multi selector exposure comp.]
- [Warm display colors]

Multi-Selector Power Aperture

Choose whether the multi selector can be used for power aperture. Enabling this option allows aperture to be adjusted using the multi selector, helping prevent the clicking sounds made by the command dials being recorded with videos. The adjustment is smooth and continuous, as are the resulting changes to depth of field and the like during filming.

1. Assign [Multi-selector power aperture] to the desired position using Custom Setting g1 [Customize i menu].

2. With the camera in video mode, press the i button and then highlight [Multi-selector power aperture] and press 
   - Options will be displayed.
   - You can also select an option using the command dials before pressing the button.

3. Press  or  to highlight the desired option and press  to select.
   - To exit to the shooting display, press the i button again.
   - When [Enable] is selected, holding widens the aperture. Holding narrows the aperture.

Power Aperture

- Power aperture is available only in modes A and M.
- The display may flicker while aperture is adjusted.
- Power aperture can also be assigned to a control using Custom Setting g2 [Custom controls] (52).
Multi-Selector Exposure Compensation: Multi Selector Exposure Comp.
Choose whether the multi selector can be used to adjust exposure compensation. Enabling this option allows exposure compensation to be adjusted using the multi selector, helping prevent the clicking sounds made by the command dials being recorded with videos.

1. Assign [Multi selector exposure comp.] to the desired position using Custom Setting g1 [Customize i menu].

2. With the camera in video mode, press the i button and then highlight [Multi selector exposure comp.] and press 
   - Options will be displayed.
   - You can also select an option using the command dials before pressing the 

3. Press 
   - or 
   - To exit to the shooting display, press the i button again.
   - Selecting [Enable] allows exposure compensation to be set by pressing 

Exposure Compensation
Exposure compensation can also be assigned to a control using Custom Setting g2 [Custom controls] (52).
Custom Controls

Use Custom Setting g2 [Custom controls] to choose the roles played by camera controls during filming.

1. Highlight Custom Setting g2 [Custom controls] and press 
   - A list of controls will be displayed.

2. Highlight a control and press 

3. Highlight the desired function and press 

- **Customizable Camera Controls**
  You can choose the roles played by the following controls:

  - [Fn1 button]
  - [Fn2 button]
  - [Fn3 button]
  - [Fn button for vertical shooting]
  - [Focus mode button]
  - [AF-ON button]
  - [Protect/Fn4 button]
  - [OK button]
  - [Sub-selector center]

  - [QUAL button]
  - [Audio button]
  - [AF-ON button for vertical shooting]
  - [Vertical multi selector center]
  - [Command dials]
  - [Shutter-release button]
  - [Lens Fn2 button]
  - [Lens Fn button]
  - [Lens control ring]
Roles That Can Be Assigned to Camera Controls
The roles that can be assigned to these controls are listed below.

<table>
<thead>
<tr>
<th>Control</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silent mode</td>
<td><img src="image" alt="Silent mode" /></td>
</tr>
<tr>
<td>Live view info display off</td>
<td><img src="image" alt="Live view info display off" /></td>
</tr>
<tr>
<td>Framing grid</td>
<td><img src="image" alt="Framing grid" /></td>
</tr>
<tr>
<td>AF-ON</td>
<td><img src="image" alt="AF-ON" /></td>
</tr>
<tr>
<td>AF lock only</td>
<td><img src="image" alt="AF lock only" /></td>
</tr>
<tr>
<td>AE lock (Hold)</td>
<td><img src="image" alt="AE lock (Hold)" /></td>
</tr>
<tr>
<td>AWB lock (Hold)</td>
<td><img src="image" alt="AWB lock (Hold)" /></td>
</tr>
<tr>
<td>AE/AWB lock (hold)</td>
<td><img src="image" alt="AE/AWB lock (hold)" /></td>
</tr>
<tr>
<td>AE lock only</td>
<td><img src="image" alt="AE lock only" /></td>
</tr>
<tr>
<td>AE/AF lock</td>
<td><img src="image" alt="AE/AF lock" /></td>
</tr>
<tr>
<td>Zoom on/off</td>
<td><img src="image" alt="Zoom on/off" /></td>
</tr>
<tr>
<td>Focus peaking display</td>
<td><img src="image" alt="Focus peaking display" /></td>
</tr>
<tr>
<td>MY MENU</td>
<td><img src="image" alt="MY MENU" /></td>
</tr>
<tr>
<td>[Access top item in MY MENU]</td>
<td><img src="image" alt="Access top item in MY MENU" /></td>
</tr>
<tr>
<td>Filtered playback</td>
<td><img src="image" alt="Filtered playback" /></td>
</tr>
<tr>
<td>Power aperture (open)</td>
<td><img src="image" alt="Power aperture (open)" /></td>
</tr>
<tr>
<td>Power aperture (close)</td>
<td><img src="image" alt="Power aperture (close)" /></td>
</tr>
<tr>
<td>Exposure compensation +</td>
<td><img src="image" alt="Exposure compensation +" /></td>
</tr>
<tr>
<td>Exposure compensation −</td>
<td><img src="image" alt="Exposure compensation −" /></td>
</tr>
<tr>
<td>Pattern tone range</td>
<td><img src="image" alt="Pattern tone range" /></td>
</tr>
<tr>
<td>Preset focus point</td>
<td><img src="image" alt="Preset focus point" /></td>
</tr>
<tr>
<td>Select center focus point</td>
<td><img src="image" alt="Select center focus point" /></td>
</tr>
<tr>
<td>Same as AF-ON button</td>
<td><img src="image" alt="Same as AF-ON button" /></td>
</tr>
<tr>
<td>Record videos</td>
<td><img src="image" alt="Record videos" /></td>
</tr>
<tr>
<td>Shooting mode</td>
<td><img src="image" alt="Shooting mode" /></td>
</tr>
<tr>
<td>Shooting menu bank</td>
<td><img src="image" alt="Shooting menu bank" /></td>
</tr>
<tr>
<td>Choose image area</td>
<td><img src="image" alt="Choose image area" /></td>
</tr>
<tr>
<td>Set Picture Control</td>
<td><img src="image" alt="Set Picture Control" /></td>
</tr>
<tr>
<td>Active D-Lighting</td>
<td><img src="image" alt="Active D-Lighting" /></td>
</tr>
<tr>
<td>Metering</td>
<td><img src="image" alt="Metering" /></td>
</tr>
<tr>
<td>Focus mode/AF-area mode</td>
<td><img src="image" alt="Focus mode/AF-area mode" /></td>
</tr>
<tr>
<td>Control lock</td>
<td><img src="image" alt="Control lock" /></td>
</tr>
<tr>
<td>Microphone sensitivity</td>
<td><img src="image" alt="Microphone sensitivity" /></td>
</tr>
<tr>
<td>Focus (M/A)</td>
<td><img src="image" alt="Focus (M/A)" /></td>
</tr>
<tr>
<td>Power aperture</td>
<td><img src="image" alt="Power aperture" /></td>
</tr>
<tr>
<td>Exposure compensation</td>
<td><img src="image" alt="Exposure compensation" /></td>
</tr>
<tr>
<td>ISO sensitivity</td>
<td><img src="image" alt="ISO sensitivity" /></td>
</tr>
</tbody>
</table>
**Power Aperture**

- Power aperture is available only in modes A and M.
- The display may flicker while aperture is adjusted.

## Control Lock

Lock exposure settings or focus-point selection during filming.

Settings can be adjusted using Custom Setting g3 [Control lock].

<table>
<thead>
<tr>
<th>Shutter speed lock</th>
<th>Select [ON] to lock shutter speed at its current value in mode M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aperture lock</td>
<td>Select [ON] to lock aperture at its current value in modes A and M.</td>
</tr>
<tr>
<td>Focus-point lock</td>
<td>Select [ON] to lock focus-point selection on the currently-selected focus point.</td>
</tr>
</tbody>
</table>

- Focus point lock does not apply when [Auto-area AF] is selected for AF-area mode.
- When [Subject-tracking AF] is selected, the focus point will track subject motion.
View Assist

Preview the effects of the [HLG] and [N-Log] tone modes during recording using simplified colors for enhanced contrast.

Settings can be adjusted using Custom Setting g8 [View assist]. Select [ON] to preview the effect using simplified colors.

- Colors in the actual recorded footage are unaffected.
- Contrast is also enhanced when HLG or N-Log footage is viewed on the camera.

View assist off

View assist on
Zebra Pattern

Choose whether a zebra pattern is used to indicate selected tone ranges.

Settings can be adjusted using Custom Setting g9 [Zebra pattern].

| Pattern tone range | Choose the tone range shown by the zebra pattern.  
|                   | - [Highlights]: Highlights (the brightest portions of the image) are shown by a zebra pattern. Highlights can be defined using [Highlight threshold].  
|                   | - [Mid-tones]: Mid-tones (areas of middling brightness) are shown by a zebra pattern. Mid-tones can be defined using [Mid-tone range].  
|                   | - [Zebra pattern off]: Turn off the zebra pattern display.  

| Pattern | Choose a zebra stripe pattern ([Pattern 1] or [Pattern 2]).

| Highlight threshold | Choose the brightness needed to trigger the zebra display when [Highlights] is selected for [Pattern tone range].  
|                    | - Choose from values of from 120 to 255. The lower the value, the greater the range of brightnesses that will be shown as highlights.  
|                    | - If 255 is selected, the display will show only areas that are potentially overexposed.  

| Mid-tone range | Choose the brightness needed to trigger the zebra display when [Mid-tones] is selected for [Pattern tone range].  
|               | - The [Value] around which the mid-tone range is defined can be anywhere from 0 to 255. [Range] is the range of brightnesses around this value.  
|               | - Press 4 or 2 to highlight items and press 1 or 3 to change.  

⚠️ Caution: Zebra Pattern

If both the zebra display and focus peaking are enabled in manual focus mode, only focus peaking will take effect. To view the zebra display in manual focus mode, select [OFF] for Custom Setting a13 [Focus peaking] > [Focus peaking display].

⚠️ Turning the Zebra Display On and Off Using Camera Controls

- Zebra pattern can be assigned to a control using Custom Setting g2 [Custom controls]. Pressing the control to which [Pattern tone range] is assigned cycles the zebra pattern display in the order [Highlights], [Mid-tones], and [Zebra pattern off].  
- The tone ranges displayed can be restricted using Custom Setting g10 [Limit zebra pattern tone range]. If [Highlights] or [Mid-tones] is selected, pressing the control to which [Pattern tone range] is assigned will display a zebra pattern only over areas in the selected tone range; pressing the control a second time hides the zebra pattern.
**Grid Type**

Choose a framing grid for video mode.

The grid can be selected using Custom Setting g11 [Grid type]. It is displayed either by:
- pressing a control to which [Framing grid] has been assigned using Custom Setting g2 [Custom controls] or
- placing a check (✓) next to in the Custom Setting g12 [Custom monitor shooting display] or g13 [Custom viewfinder shooting display] list.
Custom Shooting Displays

Choose the shooting displays accessible by pressing the DISP button in video mode. The displays can be tailored to different conditions.

Display 1

Display 2

Display 3

Display 4

The monitor and viewfinder displays can be customized using Custom Settings g12 [Custom monitor shooting display] and g13 [Custom viewfinder shooting display], respectively.

- Highlight items ([Display 2] through [Display 4], or in the case of Custom Setting g13, [Display 2] through [Display 3]) and press ⊡ to select (☑) or deselect (☐). Only displays marked with a check (☑) can be accessed by pressing the DISP button during shooting. [Display 1] cannot be deselected (☐).

Customizing the Displays

To choose indicators that appear in displays [Display 1] through [Display 4] (or in the case of Custom Setting g13, [Display 1] through [Display 3]), highlight the corresponding option and press ⊡. You can then highlight options and press ⊡ to select (☑) or deselect (☐).

- Press MENU when changes are complete.

<table>
<thead>
<tr>
<th>SIMPLE [Basic shooting info]</th>
<th>View the shooting mode, shutter speed, aperture, and other basic shooting info.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DETAIL [Detailed shooting info]</td>
<td>View the focus mode, AF-area mode, white balance, and other detailed shooting info.</td>
</tr>
<tr>
<td>[Touch controls]</td>
<td>View options that can be accessed via touch controls, including touch AF and the i menu.</td>
</tr>
<tr>
<td>· This option cannot be accessed via Custom Setting g13 [Custom viewfinder shooting display].</td>
<td></td>
</tr>
<tr>
<td>[Virtual horizon]</td>
<td>Enable the virtual horizon. The display type can be selected using Custom Setting d16 [Virtual horizon type].</td>
</tr>
<tr>
<td>[Histogram]</td>
<td>Enable the RGB histogram.</td>
</tr>
<tr>
<td>[Framing grid]</td>
<td>Enable the framing grid.</td>
</tr>
<tr>
<td>[Center indicator]</td>
<td>Display crosshairs at the center of the frame.</td>
</tr>
</tbody>
</table>
■ Histogram
Selecting (✓) [Histogram] displays an RGB histogram.

■ Framing Grid
Selecting (✓) [Framing grid] displays a framing grid. The type of grid can be selected using Custom Setting g11 [Grid type] (57).

■ Center Indicator
Selecting (✓) [Center indicator] displays crosshairs at the center of the frame.
Monitor Mode

Press the M (monitor mode) button to cycle between viewfinder and monitor displays. The choice of modes can be restricted if desired.

Press the M button to cycle through the displays as follows.

[AUTOMATIC DISPLAY SWITCH]: The camera automatically switches between the viewfinder and monitor displays based on information from the eye sensor.
- In video mode, the eye sensor will not trigger the viewfinder while the monitor is tilted.

[VIEWFINDER ONLY]: The monitor remains blank. The viewfinder is used for shooting, menus, and playback.

[MONITOR ONLY]: The monitor is used for shooting, menus, and playback. The viewfinder display will remain blank even if you put your eye to the viewfinder.

[PRIORITY VIEWFINDER]: In photo mode, placing your eye to the viewfinder turns the viewfinder on; the monitor remains off after you take your eye away. In video mode, this option functions in the same way as [AUTOMATIC DISPLAY SWITCH].

LIMIT MONITOR MODE SELECTION

You can limit the choice of monitor modes available using the [LIMIT MONITOR MODE SELECTION] item in the setup menu. Highlight options and press ⊙ or ☑ to select (☑) or deselect (☐). Options marked with a check (☑) can be selected via the monitor mode button.
HDMI Output

The camera can record video directly to connected HDMI recorders.

A third-party type A HDMI cable is required. The cable must be purchased separately. Always turn the camera off before connecting or disconnecting a cable.

- If a memory card is inserted in the camera when it is connected to a recorder, video will be recorded both to the recorder and the memory card. If no memory card is inserted, the footage will be recorded only to the external device.

HDMI

Adjust settings for connection to HDMI devices.

Use [HDMI] in the setup menu.

Options for Use When Connecting to External HDMI Recorders

<table>
<thead>
<tr>
<th>[Output resolution]</th>
<th>The format for output to HDMI devices can be selected from [Auto], [4320p (progressive)], [2160p (progressive)], [1080p (progressive)], and [720p (progressive)].</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Output range]</td>
<td>The RGB video signal input range varies with the HDMI device. [Auto], which matches the output range to the HDMI device, is recommended in most situations. If the camera is unable to determine the correct RGB video signal output range for the HDMI device, you can choose from the following options:</td>
</tr>
<tr>
<td></td>
<td>• [Limited range]: For devices with an RGB video signal input range of 16 to 235. Choose this option if you notice a loss of detail in shadows.</td>
</tr>
<tr>
<td></td>
<td>• [Full range]: For devices with an RGB video signal input range of 0 to 255. Choose this option if you notice that shadows are “washed out” or too bright.</td>
</tr>
<tr>
<td>[Output shooting info]</td>
<td>Choose whether shooting information is displayed on the HDMI device. If [ON] is selected, icons and other information in the shooting display will be recorded with the footage saved to external recorders.</td>
</tr>
<tr>
<td>[Mirror camera info display]</td>
<td>Choose whether the camera display remains on while an HDMI device is connected.</td>
</tr>
<tr>
<td></td>
<td>• If [OFF] is selected, the display will remain off, reducing the drain on the camera battery.</td>
</tr>
<tr>
<td></td>
<td>• [Mirror camera info display] will be fixed at [ON] while [OFF] is selected for [Output shooting info].</td>
</tr>
</tbody>
</table>
When “Auto” is Selected for Output Resolution

- When [Auto] is selected for [HDMI] > [Output resolution] in the setup menu, the camera automatically detects whether the external recorder supports the frame size and rate selected on the camera. If it does not, the camera will search for a supported resolution and frame rate. If no supported resolution and frame rate is found, output will be suspended.

- The camera searches for a supported resolution and frame rate in the order listed below.

<table>
<thead>
<tr>
<th>Frame size/frame rate</th>
<th>Output resolution/frame rate search order</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No memory card inserted in camera</td>
</tr>
<tr>
<td>[7680×4320; 30p]</td>
<td>4320/30p → 2160/30p → 1080/30p</td>
</tr>
<tr>
<td>[7680×4320; 24p]</td>
<td>4320/24p → 2160/24p → 1080/24p</td>
</tr>
<tr>
<td>[3840×2160; 120p]</td>
<td>2160/120p → 1080/120p → 2160/60p → 1080/60p → 2160/30p → 1080/30p</td>
</tr>
<tr>
<td>[3840×2160; 100p]</td>
<td>2160/100p → 1080/100p → 2160/50p → 1080/50p → 2160/25p → 1080/25p</td>
</tr>
<tr>
<td>[3840×2160; 60p]</td>
<td>2160/60p → 1080/60p → 2160/30p → 1080/30p</td>
</tr>
<tr>
<td>[3840×2160; 30p]</td>
<td>2160/30p → 1080/30p</td>
</tr>
<tr>
<td>[3840×2160; 24p]</td>
<td>2160/24p → 1080/24p</td>
</tr>
<tr>
<td>[1920×1080; 120p]</td>
<td>1080/120p → 1080/60p → 1080/30p</td>
</tr>
<tr>
<td>[1920×1080; 100p]</td>
<td>1080/100p → 1080/50p → 1080/25p</td>
</tr>
<tr>
<td>[1920×1080; 60p]</td>
<td>1080/60p → 1080/30p</td>
</tr>
<tr>
<td>[1920×1080; 50p]</td>
<td>1080/50p → 1080/25p</td>
</tr>
<tr>
<td>[1920×1080; 30p]</td>
<td>1080/30p</td>
</tr>
<tr>
<td>[1920×1080; 24p]</td>
<td>1080/24p</td>
</tr>
</tbody>
</table>
When an Option Other Than “Auto” Is Selected for Output Resolution
The signal will be output at the selected resolution.

<table>
<thead>
<tr>
<th>Frame size/frame rate</th>
<th>Output resolution/frame rate search order</th>
</tr>
</thead>
<tbody>
<tr>
<td>[7680×4320; 30p]</td>
<td>4320/30p → 2160/60p → 1080/30p → 720/60p</td>
</tr>
<tr>
<td>[7680×4320; 24p]</td>
<td>4320/24p → 2160/30p → 1080/24p → 720/60p</td>
</tr>
<tr>
<td>[3840×2160; 120p]</td>
<td>2160/120p → 2160/60p → 1080/120p → 1080/60p → 720/60p</td>
</tr>
<tr>
<td>[3840×2160; 100p]</td>
<td>2160/100p → 2160/50p → 1080/100p → 1080/50p → 720/50p</td>
</tr>
<tr>
<td>[3840×2160; 60p]</td>
<td>2160/60p → 1080/60p → 720/60p</td>
</tr>
<tr>
<td>[3840×2160; 50p]</td>
<td>2160/50p → 1080/50p → 720/50p</td>
</tr>
<tr>
<td>[3840×2160; 30p]</td>
<td>2160/30p → 1080/30p → 720/30p</td>
</tr>
<tr>
<td>[3840×2160; 24p]</td>
<td>2160/24p → 1080/24p → 720/24p</td>
</tr>
<tr>
<td>[1920×1080; 120p]</td>
<td>—</td>
</tr>
<tr>
<td>[1920×1080; 100p]</td>
<td>—</td>
</tr>
<tr>
<td>[1920×1080; 60p]</td>
<td>—</td>
</tr>
<tr>
<td>[1920×1080; 50p]</td>
<td>—</td>
</tr>
<tr>
<td>[1920×1080; 30p]</td>
<td>—</td>
</tr>
<tr>
<td>[1920×1080; 25p]</td>
<td>—</td>
</tr>
<tr>
<td>[1920×1080; 24p]</td>
<td>—</td>
</tr>
</tbody>
</table>

* Recording rate changes if original frame rate (120p, 100p, 60p, or 50p) is not compatible with frame rate chosen for external recorder.

**Caution: Auto Output Resolution**
HDMI output will be suspended if:
- output resolution is higher than the current frame size or
- the recorder does not support the selected output resolution.

**Caution: “4320p (Progressive)” and “2160p (Progressive)”**
If a memory card is inserted when [4320p (progressive)] or [2160p (progressive)] is selected for output resolution, footage filmed at a frame size of 7680 × 4320 or a frame size/frame rate of 3840 × 2160; 120p or 3840 × 2160; 100p will not be output via HDMI. Remove the memory card before recording footage to an external recorder.
**YCbCr and Bit Depth**
The YCbCr value and bit depth for footage output to external HDMI devices when [H.265 10-bit (MOV)] or [H.265 8-bit (MOV)] is selected for [Video file type] in the video recording menu varies with the frame size and rate.

<table>
<thead>
<tr>
<th>Frame size/frame rate</th>
<th>Video file type</th>
</tr>
</thead>
<tbody>
<tr>
<td>[7680×4320; 30p]</td>
<td></td>
</tr>
<tr>
<td>[7680×4320; 25p]</td>
<td></td>
</tr>
<tr>
<td>[7680×4320; 24p]</td>
<td>4:2:0 10-bit</td>
</tr>
<tr>
<td>[3840×2160; 120p]</td>
<td>4:2:0 8-bit</td>
</tr>
<tr>
<td>[3840×2160; 100p]</td>
<td></td>
</tr>
<tr>
<td>[3840×2160; 60p]</td>
<td></td>
</tr>
<tr>
<td>[3840×2160; 50p]</td>
<td></td>
</tr>
<tr>
<td>[3840×2160; 30p]</td>
<td></td>
</tr>
<tr>
<td>[3840×2160; 25p]</td>
<td></td>
</tr>
<tr>
<td>[3840×2160; 24p]</td>
<td></td>
</tr>
<tr>
<td>[1920×1080; 120p]</td>
<td>4:2:2 10-bit</td>
</tr>
<tr>
<td>[1920×1080; 100p]</td>
<td>4:2:2 8-bit</td>
</tr>
<tr>
<td>[1920×1080; 60p]</td>
<td></td>
</tr>
<tr>
<td>[1920×1080; 50p]</td>
<td></td>
</tr>
<tr>
<td>[1920×1080; 30p]</td>
<td></td>
</tr>
<tr>
<td>[1920×1080; 25p]</td>
<td></td>
</tr>
<tr>
<td>[1920×1080; 24p]</td>
<td></td>
</tr>
</tbody>
</table>

- [ProRes 422 HQ 10-bit (MOV)] footage is output at a YCbCr value of 4:2:2 and a bit depth of 10 bits, regardless of the option selected for [Frame size/frame rate].
- [H.264 8-bit (MP4)] footage is output at a YCbCr value of 4:2:2 and a bit depth of 8 bits, regardless of the option selected for [Frame size/frame rate].

**Recording to External Recorders That Support a Bit Depth of 10 Bits**
The HDMI signal will be output at a bit depth of 10 bits only to HDMI recorders that support this option.
External Recording Control: External Rec. Cntrl (HDMI)

Choose whether camera controls can be used to start and stop recording on the external recorder.

Settings can be adjusted using [External rec. cntrl (HDMI)] in the video recording menu.

- For information on whether your recorder supports external recording control, consult the manufacturer.
- The camera display will turn off automatically when the time selected for Custom Setting c3 [Power off delay] > [Standby timer] expires, ending HDMI output. When recording videos to an external device, select [Standby timer] and choose [No limit] or a time longer than the anticipated recording time.
- An icon appears in the camera display when [ON] is selected: ⚫️STBY is displayed if no footage is currently being recorded, ⚫️REC while videos are being recorded. During recording, check the recorder and recorder display to ensure that footage is being saved to the device.
- Note that selecting [ON] may disrupt the footage output to the device.
Viewing Videos

Video Playback

Video playback controls are described below.

<table>
<thead>
<tr>
<th>Control</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pause</td>
<td>Press ⊿ to pause playback.</td>
</tr>
<tr>
<td>Resume</td>
<td>Press the ⊿ button to resume playback when playback is paused or during rewind/advance.</td>
</tr>
<tr>
<td>Rewind/advance</td>
<td>Press ⊿ to rewind, ⊿ to advance. Speed increases with each press, from 2× to 4× to 8× to 16×.</td>
</tr>
<tr>
<td>Start slow-motion playback</td>
<td>Press ⊿ while the video is paused to start slow-motion playback.</td>
</tr>
<tr>
<td>Jog rewind/advance</td>
<td>• Press ⊿ or ⊿ while the video is paused to rewind or advance one frame at a time.</td>
</tr>
<tr>
<td></td>
<td>• Keep ⊿ or ⊿ pressed for continuous rewind or advance.</td>
</tr>
<tr>
<td>Skip 10 s</td>
<td>Rotate the sub-command dial one stop to skip ahead or back 10 s.</td>
</tr>
<tr>
<td>Skip 10 frames</td>
<td>Rotate the main command dial one stop to skip ahead or back 10 frames.</td>
</tr>
<tr>
<td>Skip to last or first frame</td>
<td>• Keep ⊿ or ⊿ pressed to skip respectively to the first frame or last frame.</td>
</tr>
<tr>
<td></td>
<td>• The first frame is indicated by a ‘i’ in the top right corner of the display, the last frame by a ‘f’.</td>
</tr>
<tr>
<td>Zoom in</td>
<td>Rotate ⊿ to zoom in on the current frame while playback is paused.</td>
</tr>
<tr>
<td>Adjust volume</td>
<td>Press ⊿ to increase volume, ⊿ to decrease.</td>
</tr>
<tr>
<td>Edit video</td>
<td>To display video menu, pause playback and press the ⊿ button.</td>
</tr>
<tr>
<td>Exit</td>
<td>Press ⊿ or ⊿ to exit to full-frame playback.</td>
</tr>
<tr>
<td>Exit to shooting mode</td>
<td>Press the shutter-release button halfway to return to shooting mode.</td>
</tr>
</tbody>
</table>

Using the Command Dials

During video playback, the command dials can be used to skip ahead or back a few seconds or a few frames at a time.

■ Skip 10 Seconds
Rotate the sub-command dial one stop to skip ahead or back 10 s.

■ Skip 10 Frames
Rotate the main command dial one stop to skip ahead or back 10 frames. Use this feature to review video footage in detail.

■ Customizing the Command Dials for Video Playback
Choose the roles played by the command dials during frame advance.
Settings can be adjusted using Custom Setting f3 [Custom controls (playback)] > [Main command dial]/[Sub-command dial] > [Video playback].

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1 frame]</td>
<td>Advance or rewind a frame at a time.</td>
</tr>
<tr>
<td>[5 frames]</td>
<td>Advance or rewind 5 frames at a time.</td>
</tr>
<tr>
<td>[10 frames]</td>
<td>Advance or rewind 10 frames at a time.</td>
</tr>
<tr>
<td>[2 s]</td>
<td>Skip forward or back 2 s at a time.</td>
</tr>
<tr>
<td>[5 s]</td>
<td>Skip forward or back 5 s at a time.</td>
</tr>
<tr>
<td>[10 s]</td>
<td>Skip forward or back 10 s at a time.</td>
</tr>
<tr>
<td>[First/last frame]</td>
<td>Skip to the first or last frame.</td>
</tr>
</tbody>
</table>
Video Stills

Save a frame from a video as a JPEG still.

1 Display a video full frame.

2 Pause the video on the desired frame.
   • Press ✯ to pause playback.
   • Your approximate position in the video can be ascertained from the video progress bar.
   • Press △ or □ or rotate the command dials to locate the desired frame.

3 Press the ✌️ button, then highlight [Save current frame] and press ✯.

• This option is not available with videos recorded with [ProRes 422 HQ 10-bit (MOV)] or [H.265 10-bit (MOV)] selected for [Video file type] in the video recording menu.

[Save Current Frame]
• Stills are saved at the dimensions selected for [Frame size/frame rate] in the video recording menu when the video was recorded.
• They cannot be retouched.
• Some categories of photo information are not displayed during playback.
Choose the role assigned to the flick up and flick down gestures during full-frame playback. Settings can be adjusted using Custom Setting f11 [Full-frame playback flicks] > [Flick up] and [Flick down].

**Flick Up/Flick Down Options**

<table>
<thead>
<tr>
<th></th>
<th>[Rating]</th>
<th>Assign the current picture a pre-selected rating.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[Rating]</td>
<td>The rating can be chosen by pressing 1. Choose from ratings of from zero to five stars, or select 6 to mark the picture as a candidate for later deletion.</td>
</tr>
<tr>
<td></td>
<td>[Rating]</td>
<td>Assigning different ratings to [Flick up] and [Flick down] helps you rate pictures quickly.</td>
</tr>
<tr>
<td>![PC]</td>
<td>[Select for upload to computer]</td>
<td>Mark the current picture for priority upload to a computer.</td>
</tr>
<tr>
<td>![FTP]</td>
<td>[Select for upload (FTP)]</td>
<td>Mark the current picture for priority upload to an FTP server.</td>
</tr>
<tr>
<td>![Protect]</td>
<td>[Protect]</td>
<td>Protect the current picture.</td>
</tr>
<tr>
<td>![Voice memo]</td>
<td>[Voice memo]</td>
<td>Record and play voice memos. Voice memos cannot be added to videos.</td>
</tr>
<tr>
<td>![None]</td>
<td>[None]</td>
<td>Flicking up or down has no effect.</td>
</tr>
</tbody>
</table>

Pictures selected by flicking up or down during playback are indicated by icons. The marking can be removed by flicking again in the same direction.

**Priority Upload Marking**

Choosing [Select for upload to computer] or [Select for upload (FTP)] allows priority upload marking to be added when the camera is connected to a computer or FTP server.
Filtered Playback

View only pictures that meet the criteria chosen for [Filtered playback criteria].

1. With the camera in playback mode, press the [ button and then highlight [Filtered playback criteria] and press ( ).
   • Options will be displayed.

2. Highlight options using ( ) and ( ).
   • Press ( ) to select ( ) or deselect ( ).
   • During filtered playback, only pictures that meet all the criteria selected ( ) for [Filtered playback criteria] will be displayed.
   • Filtered playback criteria can also be selected using [Filtered playback criteria] in the playback menu.

3. Press the MENU button and select [Filtered playback].

   • During filtered playback, a white border appears around the display.
   • To end filtered playback, select [Filtered playback] again.

■ Filtered Playback Criteria

| [Protect] | ☑: Include protected pictures. |
| [Picture type] | ☑: Include pictures of the selected types. |
| [Rating] | ☑: Include pictures with selected ratings. |
| [Select for upload to computer] | • Select ( ) [Uploaded pictures] to include pictures previously uploaded to a computer or ftp server. |
| [Select for upload (FTP)] | • Select ( ) [Pictures not uploaded] to include pictures that have yet to be uploaded. |
| [Voice memo] | ☑: Include pictures with voice memos. |
| [Retouched pictures] | ☑: Include retouched pictures. |
Troubleshooting

Image Artifacts

- You may notice the following in the shooting display during filming. These phenomena will also be visible in any footage recorded with the camera:
  - distortion during motion (individual subjects such as trains or cars moving at high speed through the frame may be distorted, or the entire frame may appear distorted when the camera is panned horizontally),
  - jagged edges, color fringing, moiré, or bright spots,
  - bright regions or bands in scenes lit by flashing signs and other intermittent light sources or when the subject is briefly illuminated by a strobe or other bright, momentary light source, or
  - flicker when power aperture is used during video recording.
- Banding caused by “flicker” may be visible in footage of scenes lit by such sources as fluorescent, mercury vapor, or sodium lamps. Flicker can be reduced using [Video flicker reduction] (34) in the video recording menu. Flicker reduction may not produce the desired results if the subject is very bright. If this is the case, try choosing a smaller aperture (higher f-number).
- Note that noise (randomly-spaced bright pixels, fog, or lines) and unexpected colors may appear if you use the Q button to zoom in on the view through the lens.

Other Notes

- Video recording will end automatically if:
  - the maximum length is reached,
  - you switch shooting modes,
  - you switch modes using the photo/video selector,
  - the lens is removed, or
  - the camera’s internal temperature rises.
- The current video will not be saved if the battery is removed during recording.