Anatomy of the PowerShot G11

Now that you've covered the Quick Tour and probably have had some fun test driving your new camera in a variety of shooting situations, it's time to move on and explore the key features and components of your PowerShot G11. This first chapter brings you up to speed with the most readily accessible controls of the G11 that are located on the outside of the camera: the buttons, dials, and 4-Way Controller.

Many of you may be upgrading from a previous G-series camera, but there are plenty of new features on the G11 that require a more detailed look. Bear in mind, this info comes to you from a professional photogra-

Magidah Sa'id, belly dancer, instructor, and entrepreneur, photographed in her studio for INUR Magazine. Taken in Manual mode at ISO 320, f/8, 1/30 second with a 9.8mm lens setting.

pher who has been using digital cameras for several years and is impressed with the wide array of convenient features and shooting modes that the G11 offers.

Camera Controls

In the Quick Tour, I briefly told you where some of the controls were located and outlined some simple settings to start taking pictures right away. You should be pretty familiar with the basic buttons and dials you need to use to make your initial settings. This section covers the camera from all sides so you can fully understand the layout of all the controls available to you on the outside of the camera.

One of the really cool features of the G11 is its retro design with several exposed dials that harks back to the look of film cameras, and I'm happy to accept the extra bulk of the G11 in order to afford those exterior functions. The great thing about these external controls is that they give you quick access to important settings you will use over and over again. Searching through menus to find the option you want can get old very quickly and can increase the likelihood of missing important shots.

4-Way Controller

Before getting into detail about the buttons and dials, you need to understand the function and navigation of the 4-Way Controller, usually referred to by one or more of its parts. You will use this control more than any other with the exception of the Shutter Release button. It functions very similar to the arrow keys on your computer keyboard and is used to move up, down, left, and right as you scroll through selections on the LCD monitor. Those same up, down, left, and right area movements also give you access to several core groups of functions. Some of these options may be inaccessible depending on your Shooting or Scene mode.

1.1 The layout and option areas of the 4-Way Controller

The 4-Way Controller on the PowerShot G11 includes the following functions:

▶ **Control dial.** This textured ring that surrounds the 4-Way Controller is used to make selections, adjust settings, adjust focus, and navigate the menus. It mimics the function of other controls, too, so give it a try first to change a selection.

▶ **Manual focus.** When you press this icon the G11 switches to Manual focus mode and displays a magnified area of the scene when you turn the Control dial. It also displays a focusing scale on the right-hand side of the LCD. You turn the Control dial to focus the magnified area and thus the photo to make sure it's sharp.

▶ **Flash control.** Pressing this icon displays the flash mode options available to you in the particular Shooting mode setting you've chosen. Flash options include Auto, On, Slow Synchro, and Off.

▶ **Self-Timer.** You access the five Self-timer modes by pressing the clock icon at the bottom of the 4-Way Controller. The Self-timer allows delaying the camera's firing by 2 or 10 seconds, usually to allow the photographer to be in the shot, or when a new face enters the scene, or when using a special custom mode that allows you to set the delay time and the number of shots to be taken.

▶ **Macro mode.** Pressing the flower icon on the left side of the 4-Way Controller switches the camera lens between normal and Macro modes. Macro mode allows the lens to focus on objects that are very close; so close, in fact, that care must be taken not to bump the object with the front element of the lens.

Instead of zooming in to frame the subject when you are shooting in Macro mode, keep your lens zoomed to the Landscape setting and move the camera closer or farther away from the object to compose the shot. The G11 will be unable to focus on macro subjects using a telephoto lens setting in Macro mode.

Top camera controls

Figure 1.2 shows the top camera controls, which provide ease of use so the thumbs and index fingers of both the right and left hands control common adjustments quickly without taking the camera away from the shooting position. The top camera controls are:

▶ **Exposure Compensation dial.** In Shooting modes, use this dial to adjust exposure anywhere between +2 to –2 stops off of the base exposure.

▶ **Exposure Compensation lamp.** This handy lamp illuminates in particular Shooting modes when adjusting Exposure Compensation is possible.

Chapter 3 explains how to use the Exposure Compensation dial in more detail.

Lens barrel
Hot shoe/Flash sync contacts
Microphone
Flash
ISO dial
Strap mount
Zoom lever
Shutter button
Strap mount
PowerShot G11
ON/OFF
Exposure Compensation dial
Exposure Compensation lamp
Dioptric Adjustment dial
ISO Speed lamp
Mode dial
On/Off button

1.2 The G11 top camera controls

▶ **Dioptric Adjustment dial.** This small dial nestled to the left of the viewfinder is used to make adjustments for viewfinder clarity to suit your eyesight. It has no effect on the LCD monitor. The range of dioptric adjustment is –3 to +1. To set the dioptric adjustment, focus the lens by pressing the Shutter Release button halfway down, and then turn the knob until the image in the viewfinder is sharp. If you wear eyeglasses when shooting, like I do, be sure to wear them when setting the dioptric adjustment. Adjusting this dial to suit your eyes makes it very easy to review images on the LCD and go right back to looking through the viewfinder.

▶ **Flash sync contacts.** The hot shoe contains the standard flash sync contacts for mounting an external Canon EX-series Speedlite or the ST-E2 wireless transmitter to fire remote flashes.

▶ **Microphone.** When shooting movies, the mono microphone picks up the voices and sounds in your scene and is the only audio input on the G11. Due to its close proximity to the camera controls, it also may pick up operational control sounds like zooming in and out or active camera handling, so be sure to keep these actions to a minimum when shooting video.

▶ **ISO speed dial.** In Shooting modes that allow it, this dial controls the ISO setting from Auto to ISO 3200. Use this dial in low light or overly bright situations to manually set the ISO.

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▶ **ISO Speed lamp.** At the 9 o'clock position outside the ISO speed dial, the ISO Speed lamp lights to indicate manual ISO adjustment is possible in certain Shooting modes.

▶ **Mode dial.** Turning this dial changes the Shooting modes. Shooting modes determine how much control you have over the final exposure. The dial provides fully automatic shooting with Auto, and includes Program, Shutter Priority, Aperture Priority, Manual, Quick Shot, Movie, and Low Light modes, a complete selection of Special Scene modes, and two user-customizable C1 and C2 modes.

▶ **Zoom lever.** The zoom lever allows adjusting the focal length of the lens during shooting to aid in composition. When reviewing images, it is used to magnify an image, show the full image, or display a grid of images on the memory card, similar to a contact sheet.

▶ **Shutter Release button.** Pressing this button halfway down activates autofocusing, auto white balance, and automatic exposure metering that then sets the shutter speed and aperture. Pressing down completely releases the shutter and captures the image.

▶ **On/Off button.** This button is used to turn the G11 on and off, and a green LED at the center of the button indicates the camera's status.

Rear camera controls

Figure 1.3 shows the rear camera controls, which provide quick access to the LCD monitor, menus, various playback and image deletion controls, display options, and exposure information:

▶ **LCD monitor screen.** The LCD monitor screen is where you compose the image prior to shooting, make menu selections, and review the images after you have taken them. Part of the excitement of the new G11 is the added function with a new 2.8-inch vari-angle PureColor II VA LCD, a feature introduced as a direct result of customer feedback.

The adaptable screen makes the PowerShot G11 ideal for shooting in all situations, such as shooting when using the optical viewfinder may not be practical. Perfect for creative and macro photography, the vari-angle lens has a wide viewing angle and 461K dot resolution with natural color accuracy, giving photographers a detailed view of their subjects — both before and after the shoot. It rotates a full 180 degrees to also protect the LCD monitor when the camera is not in use.

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▶ **Shortcut/Direct Print button.** Once a control is registered, pressing this button allows you quick access to a camera function of your choosing from a prescribed list. Some registered controls may not be available in all Shooting modes.

In addition, when a camera is connected with a PictBridge, Canon CP Direct, or Canon Bubble Jet Direct–enabled printer and the camera is set to Print/PTP, this button in conjunction with the Playback button can also display JPEG-only images for cropping, layout, and direct printing. When connected to a computer via the USB digital terminal, use this button to begin downloading images to the computer.

▶ **Viewfinder.** The viewfinder is used to compose the image the same way you would in dSLR and many other cameras. The viewfinder only shows 77 percent of the actual picture taken, so there will be more image in the file than what you saw through the viewfinder.

▶ **Indicator lamps.** The indicator lamps to the right of the viewfinder illuminate or blink to alert you to various camera states.

▶ **Playback button.** This button displays or turns off the playback display of the images or movies on the LCD. Press the Playback button to enter the Playback mode and review still images or videos. The image shown will be the last picture or video the camera captured. It also turns the camera on when it is connected to a television set for viewing images.

▶ **AE Lock/FE Lock button.** Auto-exposure lock and Flash-exposure lock can be activated by pressing this button.

> **CROSS REF** Chapter 3 explains why you might want to use AE Lock and FE Lock.

▶ **AF frame selector/single image erase button.** When the AF frame is set to FlexiZone mode, pressing this button will turn the AF frame orange to indicate it can be moved or resized to an area of your choosing. If you hold it down, it returns the AF frame to the original center position. If the AF frame mode is set to Face AiAF, pressing the Menu button repeatedly will move the AF frame from face to face allowing you to choose which one to focus on. Pressing this button during Playback mode will delete the image shown on the LCD from the memory card.

> **CROSS REF** Chapter 2 explains more about focus modes and FlexiZone and Face Detect.

▶ **Metering light/Jump button.** Use this button to choose between Evaluative, Center-Weighted Evaluative, or Spot metering modes when in the Shooting modes. During Playback mode, use this button to jump among different amounts of photos or to sort between still images and videos for playback.

▶ **Menu button.** The Menu button displays groups of camera functions organized under three tabs, Shooting settings, Camera settings, and My Menu, an area where you can register settings from the Shooting and Camera menus to tailor the menu to contain the controls that you use most often. The Menu button is also used during other camera functions to change settings.

> **CROSS REF** Chapter 2 explains the entire menu system of the G11.

▶ **Display button.** Pressing the Display button enters the mode where you can change the display on the LCD monitor between Off and two user-configurable display modes. You use this button to switch between display modes that can show shooting info, grid lines, a brightness histogram, or a 3:3 ratio guide.

1.3 The rear camera controls of the G11

Front camera controls

Figure 1.4 shows the front of the camera, which is one view that photographers usually see only in camera ads. But there are lamps and features located there that you use often. Front features of the PowerShot G11 include the following:

1.4 The front camera controls of the G11

▶ **Lens.** The lens of the PowerShot G11 allows both wide-angle and telephoto pictures and any setting in between. The lens is 6.1mm at its wide angle setting and 30.5mm at its telephoto setting, the equivalent of a 28-140mm lens on a 35mm camera, and also includes optical Image Stabilization (IS), a feature found on more expensive dSLR lenses.

▶ **Flash.** The built-in flash has a range of 50cm/1.6 feet to 5 meters/16 feet when shooting wide-angle photos and 50cm/1.6 feet to 5 meters/16 feet when shooting telephoto pictures.

> **CROSS REF** Chapter 4 explains the on-board flash in more detail.

▶ **AF-assist beam/Self-timer lamp.** This lamp flashes to count down the seconds to shutter release when the camera is set to one of the Self-timer modes. This lamp also illuminates in low-light shooting situations to aid operation of the autofocus system.

▶ **Ring.** A bezel that surrounds the lens, this ring is removed to attach accessory lenses or to switch to different color accessory rings.

▶ **Ring release button.** Pressing this button disengages the ring from around the lens mount to facilitate mounting the optional conversion lens and teleconverter or to change the color of the ring with the optional RAK-DC-2 Accessory Kit.

Camera terminals

Figure 1.5 shows the interface terminals, which are located on the right side of the PowerShot G11 under the spring-loaded terminal door. The cover door is embossed with icons that identify the terminals underneath. The terminals include the following:

▶ **HDMI mini OUT terminal.** Located at the top of the terminal compartment is the HDMI mini OUT terminal. It connects the Type 2 HDMI HTC-100 cable to any high-definition television, monitor, or DVR unit with an HDMI input port.

▶ **Remote switch terminal.** This terminal, in the middle of the terminal compartment, connects with a remote control switch to fire the camera to avoid camera shake when shooting in telephoto and macro modes as well as when shooting time exposures. The optional Remote Switch RS-60E3 replicates the functionality of the Shutter Release button, providing half and full depression of the Shutter

HDMI terminal

Remote terminal

Audio/ Video Output Digital terminal
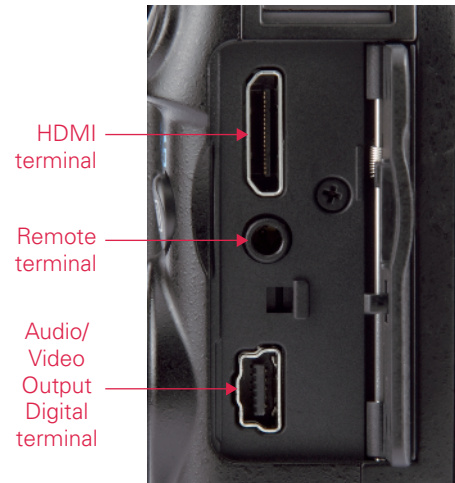
1.5 **The camera terminals of the G11**

1.6 **The G11 with the HDMI HTC-100 cable attached for viewing images and videos on a high-definition TV**

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1.7 The Remote Switch RS-60E3 connects to the G11 by the center port in the terminal compartment.

Release button as well as the shutter-release lock to keep the shutter open for longer periods of time up to 15 seconds when shooting time exposures.

▶ **A/V Output Digital terminal.** Located on the bottom of the terminal panel, the digital terminal connects the camera to a standard television for viewing images, for downloading images to a computer, or for printing to a compatible printer. The cable for direct printing comes with the printer, and printer cables must support PictBridge, PictBridge and CP Direct, PictBridge and Bubble Jet Direct, CP Direct only, or Bubble Jet Direct only.

Side and bottom camera features

Figure 1.9 shows the bottom features of the PowerShot G11, which includes the release latch and cover for the battery and memory card compartment, and the tripod socket used when securing the camera to a tripod or tripod quick-release plate.

1.8 The AV/Out/Digital Terminal is used to download images, print pictures, or view still images and videos on a TV.

Battery lock   Battery

Memory card

Battery/ Memory card cover

Tripod socket

1.9 The bottom features of the PowerShot G11

The side panels of the G11 also include:

▶ **Speaker.** A speaker is included on the left-hand side of the G11 to listen to audio after recording movies.

▶ **DC coupler cable cover.** When using the optional AC Adapter Kit ACK-DC50, the coupler cable that connects the camera to household power exits the camera via this opening on the right side that is closed by the cover when the camera uses a standard NB-7L battery.

LCD Monitor Screen

A big part of the excitement of the new G11 is the new high-resolution 2.8-inch vari-angle PureColor II VA LCD. Although slightly smaller than the 3.0 inch LCD monitor on the previous G10, it includes the same number of pixels, and the smaller size allows the LCD to be positioned for shooting comfort and functionality, or completely flipped around to protect the face of the LCD when the camera is not in use.

You use the LCD to compose images while shooting, review images and videos during Playback mode, and operate the menus. As an added feature, the LCD monitor brightness level can be set over a five-step range, convenient when shooting in brightly lit situations or when shooting in low-light locations where the glow of the LCD may be distracting to others.

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1.10 The new 2.8-inch vari-angle PureColor II VA LCD of the PowerShot G11

Positioning

From its closed position, the vari-angle LCD monitor is positioned for shooting by flipping it out to the left, away from the camera body, rotating the top edge of the LCD 180 degrees away from you, and then flipping it back to the right, filling the indentation on the back of the camera for a streamlined fit.

You can position the LCD to allow full view of the lens coverage area from a convenient shooting angle, such as when holding the camera above your head in event or concert situations, or low to the ground when photographing children, wildlife, flowers, or pets.

Another cool feature of the vari-angle LCD monitor is the mirror-image display the LCD switches to when the monitor is positioned facing the front of the camera as when composing a shot with you in it. This way you can see exactly what the picture will look like when holding the camera away from you. You can compose the shot with you and your family or friends and see what the background looks like before you make the exposure.

To change the display when the LCD monitor is positioned towards the front of the camera, follow these steps:

1. **Press the Menu button.**

2. **Press the up area of the 4-Way Controller to select Reverse Display.** You can turn this feature on or off.

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1.11 The LCD monitor can display a mirror image when oriented toward the front of the camera.

Quick Shot mode

When you need to shoot quickly because the action in front of your lens is happening fast and you want to see all the pertinent camera settings on one screen, switch to the Quick Shot mode on the Mode dial. The Quick Shot mode is ideal for those run-and-gun situations where you will not be reviewing images on the LCD until after you finish shooting. In Quick Shot mode, you compose images while looking through the viewfinder so you never have to take your eye away from the action.

Several camera controls are accessible and fully adjustable from the new Quick Shot mode screen on the LCD. To see what your options are, follow these steps:

1. **Turn the Mode dial to the flying camera icon and then press the Function/ Set button.** The last value changed will be highlighted.

2. **Press the 4-Way Controller right, left, up, or down to scroll through the available functions.**

3. **Once you highlight something you want to change, turn the Control dial to make the change.** You do not need to press the Function/Set button to apply the change. A message at the bottom of the LCD screen will show you the options you've selected for that particular function.

4. **From this control screen, use the 4-Way Controller and Control dials to make your selections.**

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The LCD monitor displays the status of the following shooting functions in Quick Shot mode:

- ▶ Shutter Speed
- ▶ Aperture Value
- ▶ AE Lock/FE Lock
- ▶ ISO Speed
- ▶ Exposure Compensation
- ▶ My Colors
- ▶ Flash Exposure Compensation
- ▶ Flash mode
- ▶ White balance
- ▶ Image quality
- ▶ Drive mode
- ▶ Self-Timer
- ▶ Histogram
- ▶ Camera orientation
- ▶ Image Stabilization
- ▶ Battery charge indicator
- ▶ Recordable shots

Depending which of these functions you have turned on, the Quick Shot screen will also indicate the status of the following:

- ▶ i-Contrast
- ▶ Red-Eye Correction
- ▶ Date Stamp
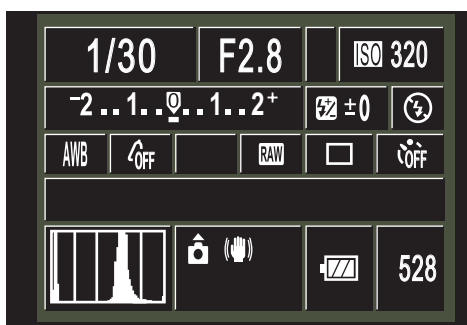
1.12 The Quick Shot screen of the G11

The interface is elegant, the type and symbols are large and easy to see, and the 4-Way Controller response is fast and accurate. I must say that I was very impressed with this new display on my first few outings with the PowerShot G11 — not only for its

ability to quickly change settings but for its ability to pick one mode and see an illumi-
nated, adjustable readout of those settings in the midst of a fast-paced shooting
session.

Face Detection modes

The PowerShot G11 was designed first and foremost to take great shots of people.
Several features built in to the G11 support this objective, but probably none more so
than the Face Detection modes. The G11 comes loaded with not just one but three
Face Detection features for different types of shooting scenarios.

CROSS REF Face Detection is a sophisticated technology that can detect and track numer-
ous faces within the frame to ensure the correct exposure and focus for
them. If that is not enough, the G11 also features Blink Detection that alerts you if
someone in your shot blinked so you can retake the photo. This feature can also be
turned off in the Shooting menu. See Chapter 2 for more information on setting Face
Detection modes.

The Face Detection features of the G11 include the following:

▶ **Face AiAF.** In Face AiAF mode, the G11 adjusts exposure and white balance to
optimize exposure for people's faces. This is a great setting to use in most situ-
ations for photos with people in them. In rare occasions, the camera may blow
out a few highlights attempting to get proper exposure on the face, but it does a
much better job in difficult lighting situations, resulting in faces that are bright
and clear.

This feature also works extremely well in strong backlit scenarios where your
subject's face may be in a shadow, resulting in underexposure, or it counteracts
overexposing faces that appear against darker backgrounds, which is common
with digital cameras that don't include this technology. The G11 displays a white
frame around the face it detects as the main subject and gray frames around the
other faces in the scene.

▶ **Face Selection.** With the G11 set to Face AiAF in the Shooting menu, you also
have the ability to choose which face to focus on when your shot includes more
than one face. This is desirable in group shots where one face is more important
to you than the others. Face Select mode displays an orange frame around the
face it detects as the main subject, and the orange face frame follows this per-
son's face, even if that person moves around in the scene. You are then free to
move the face frame to a different face using the 4-Way Controller areas and the
Control dial, and then shoot the picture.

▶ **Face Self-timer.** With the Face Self-timer mode, gone are the days of having to run to get in the picture when shooting images with you in them. Previous G-series cameras gave you the option of a 2- or 10-second delay before the camera took the picture. Often, this wasn't enough time for the photographer to get into the group, resulting in poorly timed group photos. When the Shutter Release button is pressed, Face Self-timer waits until the G11 detects a new face entering the scene, indicated by the Self-timer beep and warning light speeding up, and after 2 seconds, the camera takes a series of three shots. If your face or the added face is not recognized by the camera, the camera takes the three pictures after approximately 30 seconds.

▶ **Blink Detection.** Although not actually a Face Detection mode, this new feature is related and bears mentioning here. As an added safeguard, Blink Detection alerts you via the LCD monitor anytime it detects what it perceives to be closed eyes in the picture. The camera displays a face icon with greater than/less than symbols for the eyes, allowing you to reframe and take an additional picture to make sure everyone's eyes are open. Blink Detection can be turned on or off in the Shooting menu.

Grid Display

As an added feature, the PowerShot G11 includes a display option for Grid Display, which overlays the LCD monitor with a nine-box Rule-of-Thirds grid. This grid is an ideal compositional aid when shooting architecture, landscapes, and scenics, and helps you follow the Rule of Thirds by showing where you might place your subject for more interesting images.

CROSS REF The Rule-of-Thirds and other compositional aids are explained in more detail in Appendix A.

1.13 Grid lines help you follow the Rule of Thirds when composing your images. Taken at ISO 100, f/4, 1/60 second with a 6.1mm lens setting.
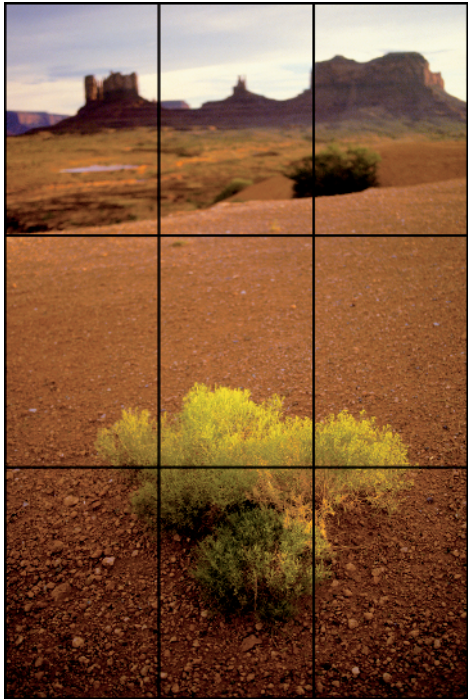
Clock Display

In the Quick Tour, I described how to set the Clock Display when you first set up the camera. This is an important setting for those shooting situations like weddings or vacations where you may be generating lots of images over several memory cards. By having the clock set properly, you can organize your images later in the included Canon Zoom Browser software in chronological order that sets all the images in the order they were captured.

1.14 The standard Clock Display on the G11 in horizontal orientation

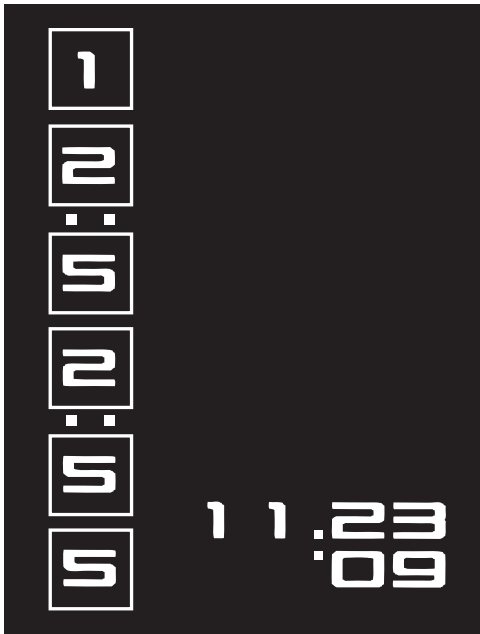See the Quick Tour for instructions on how to set the clock.

You can access the Clock Display at any time by pressing and holding down the Function/Set button. The Clock Display also shows the date (mm/dd/yy) when the camera is turned to a vertical position.

Lens Controls

The Canon lens of the PowerShot G11 delivers high performance, offering a 5x wide-angle (28mm) zoom with optical Image Stabilizer (IS). This enables you to take handheld shots at shutter speeds 4 stops slower than conventional non-IS models, allowing perfect shooting in darker conditions or at lower ISO settings.

1.15 The Clock Display when the PowerShot G11 is held in a vertical orientation. The time is displayed vertically on the left, while the date is on the right.

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Image Stabilization

Image Stabilization (IS) is a technology that counteracts motion blur from handholding the camera. Canon has built the same Image Stabilization technology used in its premium lenses into the G11 for sharper pictures of moving subjects and handholding the camera in low light. The IS needs to be fluid because different shooting scenarios have different stabilization needs. The IS of the G11 enables you to gain from 1 to 4 f-stops of stability — and that means that you may be able to leave the tripod or monopod at home.

Canon's inclusion of optical Image Stabilization (IS) technology in the PowerShot G11 makes handholding the camera at slow shutter speeds and in low-light scenes more likely to produce a sharp image.

The rule of thumb for handholding a camera has always been 1/shutter speed to [focal length]. For example, the slowest shutter speed at which you can handhold a 140mm lens and avoid motion blur is 1/140 second. If the handholding limit is pushed, then shake from handholding the camera bends light rays coming from the subject into the lens relative to the optical axis, and the result is a blurry image.

1.16 For fast-paced action like this NASCAR race, Image Stabilization (IS) assures sharp images. Taken in Aperture Priority mode at ISO 400, f/5.6, 1/4000 second with a 30.5mm lens setting.

IS Lenses and Panning

IS detects *panning* (moving the camera with the motion of a subject) as camera shake, and the stabilization then interferes with framing the subject. To correct this, Canon offers four settings on the G11 for IS: Off, Continuous, Shoot Only, and Panning. Continuous and Shoot Only are designed for stationary subjects, whereas Panning shuts off IS in the direction of movement when the lens detects large movements for a preset amount of time. So, when panning horizontally, horizontal IS stops, but vertical IS continues to correct any vertical shake during the panning movement.

With an IS lens, the built-in miniature sensors and a high-speed microcomputer analyze vibrations and apply corrections via a stabilizing lens group that shifts the image parallel to the focal plane to cancel camera shake. The lens detects camera motion via two gyro sensors — one for yaw and one for pitch. The sensors detect the angle and speed of shake. Then the lens shifts the OIS lens group to suit the degree of shake to steady the light rays reaching the focal plane.

Stabilization is particularly important with long lens settings and macro shooting where the effect of shake is more pronounced as the focal length increases. As a result, the correction needed to cancel motion shake increases proportionately.

Image Stabilization can be a lifesaver, particularly in low-light situations such as weddings, music concerts, or sporting events where tripods are impractical.

Optical zoom

The 5x optical zoom extends the camera's telephoto capabilities by way of optics only with no digital enhancement. I prefer to stay in this smaller zoom range because of the better quality images the G11 attains, because some image degradation can occur when employing the higher-powered digital zoom.

The zoom range on the optical zoom of the G11 is more than adequate for most subjects. I nearly always choose a telephoto lens setting, not only when shooting portraits of people and pets but also to capture distant subjects such as race cars, landscapes, wildlife, and close-ups. It's simply a must for shooting sports. Telephoto lens settings allow you to photograph distant birds, wildlife, and most sporting events. When photographing wildlife, these lens settings also allow you to maintain a safe working distance from the subject, whether it's snakes in the desert or elk in the mountains.

1.17 Bicycle racers at Alpenrose Velodrome. A telephoto lens setting is required for shooting action scenes such as this. Taken in Manual mode at ISO 100, f/8, 1/250 second with a 30.5mm lens setting.

When you shoot with a telephoto lens, keep these lens characteristics in mind:

▶ **Shallow depth of field.** Telephoto lenses magnify subjects, yield a smaller field of view, and provide a limited range of acceptably sharp focus. At large apertures, such as f/4, you can render the background to a soft blur, but with an extremely shallow depth of field, it's important to get tack-sharp focus somewhere in the frame.

▶ **Narrow coverage of a scene.** Because the angle of view is narrow with a telephoto lens, much less of the scene is included in the image. You can use this characteristic to exclude distracting scene elements from the image.

▶ **Perspective.** Telephoto lens settings tend to compress perspective, making objects in the scene appear stacked together. You can sometimes offset this by changing your shooting or lighting angle.

Digital zoom

The 4x digital zoom extends the camera's telephoto capabilities to a total zoom capability of 20x. This function allows you to shoot distant subjects such as wildlife at a much greater focal length than the standard zoom settings, providing a larger subject that fills the frame.

You enter the Digital Zoom range by zooming out all the way in Standard zoom using the Zoom lever, then moving the lever again toward the single tree icon to activate Digital Zoom. Digital Zoom is a handy feature when shooting sports events or wildlife or scenic landscapes, or in any situation where you may not be able to get physically closer to your subject or when doing so might be dangerous or not allowed.

Digital Tele-Converter

Similar to adding a teleconverter between a conventional lens and a dSLR camera body, the G11's Digital Tele-Converter increases the focal length of the lens by 1.4x or 2.3x digitally. These digital teleconverter settings allow you to shoot with faster shutter speeds than with standard zoom at the same focal lengths. The digital camera allows you to adjust the zoom among four settings:

▶ **Off.** Turning the zoom off enables shooting without digital zoom with a focal length of 28mm to 140mm (35mm equivalent).

▶ **Standard.** Selecting standard zoom enables shooting at zoom factors of up to 20x with digital and optical zooms combined at a focal length of 28mm to 560mm.

▶ **1.4x.** Digital zoom is fixed at the select zoom factor of 1.4x for a focal length of 39.2mm to 196mm (35mm equivalent) enabling faster shutter speed and less chance of blurry pictures.

▶ **2.3x.** Digital zoom is fixed at the select zoom factor of 2.3x for a focal length of 64.4mm to 322mm (35mm equivalent) enabling faster shutter speed and less chance of camera shake affecting the image.

These settings may produce some image degradation depending on image quality settings and cannot be engaged when shooting in RAW capture or Wide (panoramic) file size mode.

Canon CCD Sensor

The PowerShot G11 utilizes a 1/1.7-inch CCD (charged coupled device) sensor with an approximate pixel count of over 10 million pixels and is manufactured by Sony. This

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small device, usually referred to as the image sensor, captures the light entering the camera as an electrical signal then sends it to the DiG!C 4 for processing.

Compact digital cameras like the PowerShot G11 typically have much smaller sensors than standard digital SLR cameras and are thus less sensitive to light and inherently more prone to noise, which can degrade picture quality, especially in the dark areas.

PowerShot users cite Canon's decision to go with the CCD sensor for the G11 instead of a CMOS sensor as the main reason the camera doesn't feature a high-definition video capability because the CCD sensor can't handle it. CCD sensors cost less to manufacture than the CMOS sensors used in dSLRs, which is why the price of the G11 stays at an affordable level.

DiG!C Image Processor

Between the capture and recording stages is the image processing that determines how the signals from the sensor are translated into a viewable image. The PowerShot G11 employs a newly developed, 10.0 megapixel High Sensitivity System by combining a powerful CCD sensor and Canon's new DiG!C 4 Image Processor with iSAPS technology. Major advances responsible for the incredible speed, advanced image-processing capabilities, and lower power consumption over the processor found in older PowerShots include lower-noise image development at all ISOs, higher-speed image processing, improved highlight and shadow details, extended dynamic range, more accurate saturated colors that maintain fine details, and improved performance.

In addition, a new Low Light mode lets you capture images in an astonishing range of conditions. The camera automatically adjusts the ISO speed from ISO 320 to ISO 12,800 in relation to ambient brightness, subject movement, and camera movement.

The new DiG!C 4 image processor significantly raises the bar with increased ISO ranges in normal and expanded modes and adds an Auto ISO range feature to select from a range of 100–3200 ISO.