

# Chapter 1

## Getting to Know Your Camera

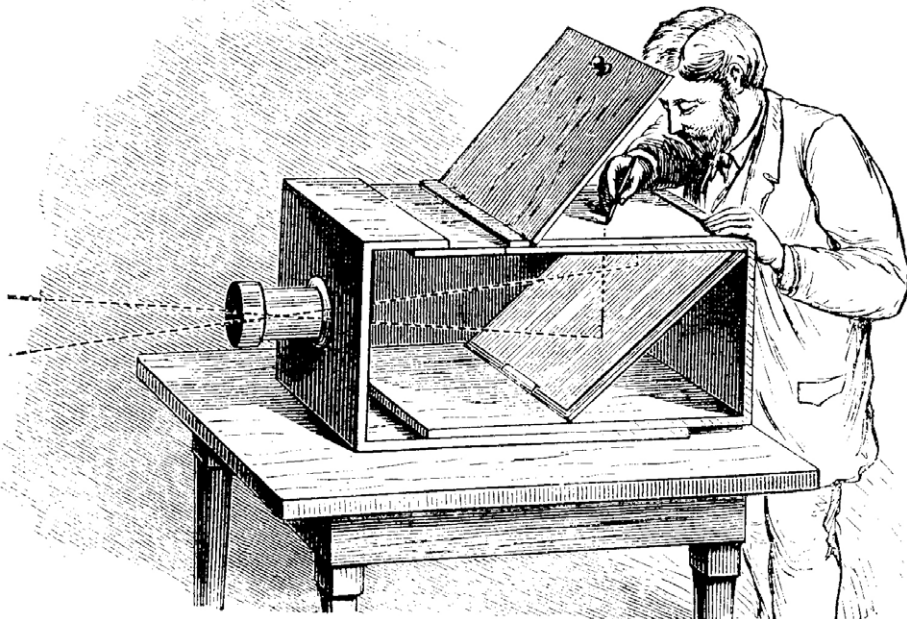
**S**erious digital cameras give you creative control over your images. The best cameras, such as Canon's 7D Mark II let you use the high quality RAW file format, let you change lenses, and give you more control over the camera's settings. Because of the number of controls it has, your camera may initially seem complicated, and in all truth it is. However, it needn't be complicated if you approach the camera in the right way. All you have to do to get good pictures is turn the camera on, set it to Scene Intelligent Auto shooting mode, and then take them. There's no more to it than that. Once you've taken images, you can play them back for yourself or others right on the camera's monitor.

In this chapter we discuss just about everything you need to know to operate your camera. We start with a brief history of photography and a close-up look at digital images, how your camera creates images made up of millions of small pixels. We then have a short step-by-step tutorial on using the camera's Scene Intelligent Auto shooting mode. The rest of the chapter focuses on operating the camera using menus and buttons. There are also sections on good things to know and when things go wrong. The foundation you lay by mastering this chapter will make it easy for you to understand and use the concepts and procedures discussed in the chapters that follow.



## Topic 1-1. In the Beginning

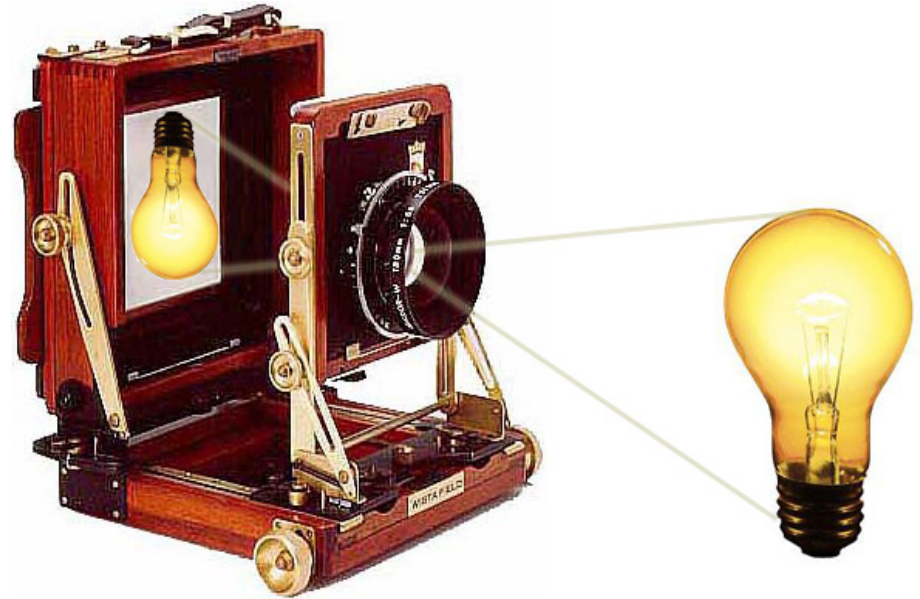
Long before photography was discovered, artists used *camera obscuras*—“dark chambers” in Italian. On one of these devices light enters a dark box through a small opening, called a *pinhole*, and projects an image of the scene onto the opposite wall. At first, special rooms were designed to display this phenomenon but in the sixteenth century, Italian artists shrunk the large chamber to a portable box, replaced the pinhole with a lens to increase the brightness of the image, added a mirror to invert the image so it’s displayed right side up, and added a translucent ground glass screen to display it. Artists traced the projected image by hand, and it was the desire of Henry Fox Talbot and others to capture the image directly that led to the invention of photography. Although there have been dramatic changes in technology over the years, the dark box and the lens still form the foundation of modern photography.



Interestingly, cameras were discovered before photography. Artists were seeing the projected image hundreds of years before they could capture it without having to draw it.



Abu Ali Hasan Ibn al-Haitham, also known as Alhazen, is shown here on an Iraqi 10,000 Dinar note. He gave the first correct explanation of vision, showing that light is reflected from an object into the eye. He is said to have originated the concept of the camera obscura.



Here is a modern Wista view camera. With its light-tight flexible bellows removed, you can see the ground glass focusing screen that is replaced by film or a digital back when a photo is taken. A lens projects a scene onto this screen upside down. Courtesy of HP Marketing Corp at [www.hpmarketingcorp.com](http://www.hpmarketingcorp.com).

### Tips

- A pinhole camera is much like an early camera obscura with the addition of a photo sensitive material that captures the image.
- Photos taken for over a century were composed on the camera’s ground glass upside down. For photographer’s using view cameras and film they still are.
- You can easily turn a room into a camera obscura as described in Topic X-X at the end of this chapter.



## Resources to Explore

1. *Cameras are dark boxes* is an animation that shows light reflecting off the subject and entering the lens that focuses it (upside down) on the ground glass of a camera obscura or view camera, on the film of a film camera, or on the image sensor in a digital camera at [www.photocourse.com/itext/boxcameral](http://www.photocourse.com/itext/boxcameral). Wista camera photos courtesy of HP Marketing Corp ([www.hpmarketingcorp.com](http://www.hpmarketingcorp.com)).
2. Search the Internet for the terms “camera obscura” and “pinhole camera” to see what you can learn about these early forms of photography.
3. Search the Internet for “camera obscura and perspective” or “camera obscura and Vermeer” to see how this early camera changed artists’ perceptions about how to accurately represent a 3D world on a 2D surface.
4. Search the Internet for “public camera obscuras” to see if there is one near you.
5. Search for “plans for a camera obscura” to see how you can build one. Also see Topic 1–15 on how to easily turn a room into a camera obscura.

## Seeing for Yourself

1. Pinhole photography is quite popular so you can easily find what you need to explore it on the Internet. To convert a camera with interchangeable lenses into a pinhole camera all you need is a body cap for your camera with a pinhole mounted in it. To find one, search the Internet for “body cap pinhole”. You can also use a variant of the pinhole called a zone plate that adds a glow where the contrast in the image changes from light to dark.



*Skink makes pinhole body caps for Canon and other cameras. There is a very tiny pinhole in the center of this body cap that is normally used to keep dust out of the camera when no lens is attached. Courtesy of Skink Pinhole Pancake at [skinkpinhole.com](http://skinkpinhole.com). Visit their Web site to learn more.*

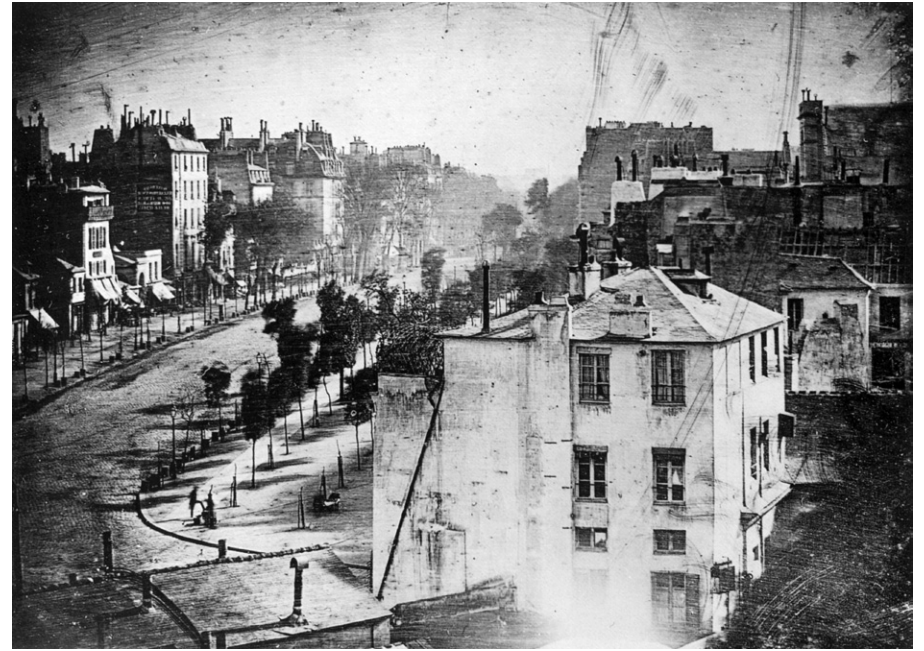


*A room-sized camera obscura that's free to visit in Santa Monica, California.*

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Joseph Nicéphore Niépce, in the summer of 1826, took the first actual photograph. “In the window of his upper-story workroom at his Saint-Loup-de-Varennes country house, Le Gras, he set up a camera obscura, placed within it a polished pewter plate coated with bitumen of Judea (an asphalt derivative of petroleum), and uncapped the lens. After at least a day-long exposure of eight hours, the plate was removed and the latent image of the view from the window was rendered visible by washing it with a mixture of oil of lavender and white petroleum which dissolved away the parts of the bitumen which had not been hardened by light. The result was the permanent direct positive picture you see here—a one-of-a-kind photograph on pewter. It renders a view of the outbuildings, courtyard, trees and landscape as seen from that upstairs window”. The original is at the Ransom Center at the University of Texas, Austin ([www.hrc.utexas.edu/exhibitions/permanent/wfp/](http://www.hrc.utexas.edu/exhibitions/permanent/wfp/)). Courtesy of Wikimedia Commons.



Boulevard du Temple, Paris, 3rd arrondissement, Daguerreotype. Taken in 1838 and believed to be the earliest photograph showing a living person. It is a view of a busy street, but because the exposure time was at least ten minutes the moving traffic left no trace. Only the two men near the bottom left corner, one apparently having his boots polished by the other, stayed in one place long enough to be visible. Courtesy of Wikimedia Commons.





Samuel F. B. Morse, inventor of the telegraph, happened to be in Paris when Daguerre's invention was announced. He was the first to communicate the discovery to America. Here he is shown next to his own camera. Courtesy of the Smithsonian Institute.



The first photograph taken from a balloon anticipates the current desire to use cameras mounted on drones. The image of Boston was captured on a wet collodion plate in 1861 by Professor Samuel A. King and J. W. Black



## Topic 1–2. What is a Digital Photograph?

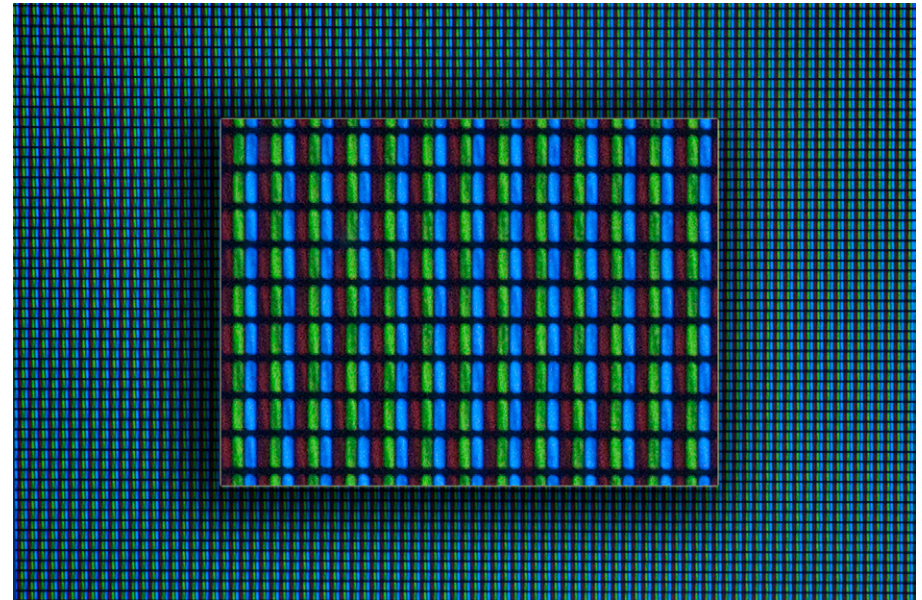
This book is about digital photography and understanding the end product, the digital photograph, is a good place to begin. It is all about dots.



This reproduction of the famous painting “The Spirit of ‘76” is done in jelly beans. Think of each jelly bean as a pixel and it’s easy to see how dots or pixels can form images. Jelly Bean Spirit of ‘76 courtesy of Herman Goelitz Candy Company, Inc. Makers of Jelly Belly jelly beans.

Photographs have always been made up of minute dots whether silver crystals in film or halftone dots on a printed page. Digital cameras have just taken this dot-like quality to a new level by electronically converting a scene into millions of dots almost instantly and then using computer power to organize, edit,

enhance, store, and distribute them.

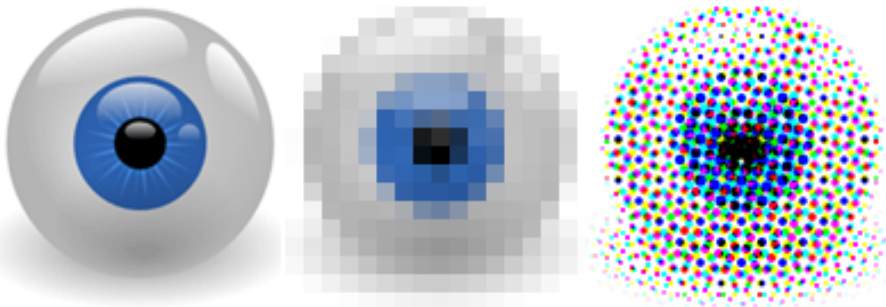


A close-up of a display screen shows the red, green and blue subpixels that make up each pixel.

In digital photographs the dots captured by the camera are called *picture elements*—commonly referred to as *pixels*. Like the impressionists who painted wonderful scenes with small dabs of paint, your computer and printer use these tiny pixels to display and print photographs. To display them, the computer divides the screen into a grid of pixels, each containing a red, green and blue bar—called *subpixels*. It then uses the values stored in the digital photograph to specify the brightness of each of the three subpixels and the combined brightnesses of the three are perceived by the eye and brain as a single color. Prints are made in a related way, but using a different set of colors. In the rest of this book you will learn how pixels are captured, edited and shared.



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A high resolution photograph of an eyeball (left), a low resolution image with its pixels showing (middle) and an image screened for printing (right). Art courtesy of webweaver.nu.

### Tips

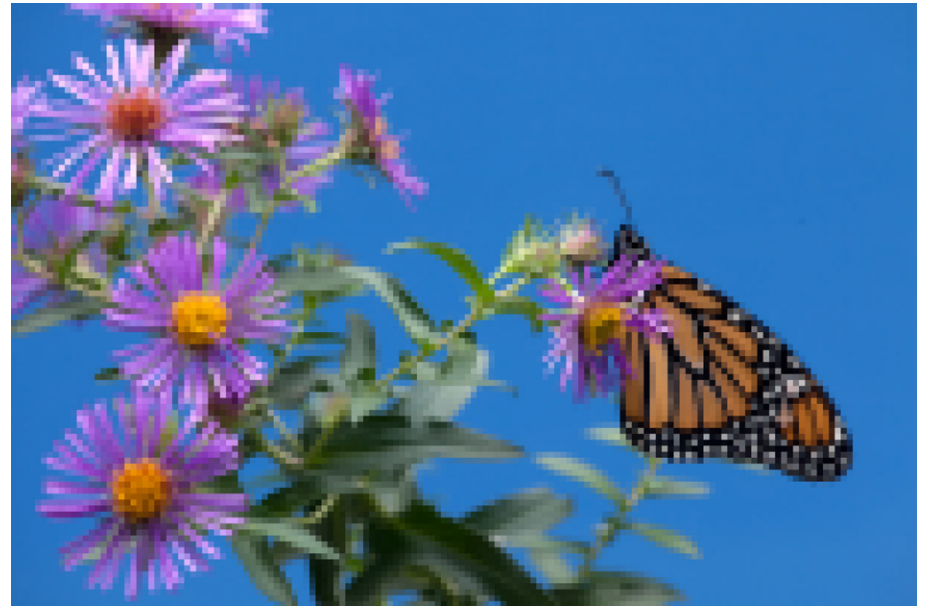
- Although marketing and sales people focus on the number of pixels a camera captures, image quality depends on many more things. In fact, it's often better to have fewer pixels for higher image quality. This is because on any given sensor more pixels means smaller sensor sites collecting light. Smaller sites mean more noise and lower image quality.
- The term “resolution” has two meanings in photography. Originally it referred to the ability of a camera system to resolve pairs of fine lines such as those found on a test chart. In this usage it's an indicator of sharpness, not image size. With the introduction of digital cameras it began being used to indicate the number of pixels a camera could capture.

### Resources to Explore

1. Search the Internet to find examples of “art in jelly beans”.
2. Using the traditional technique of needle point, you can copy a digital image onto fabric one pixel at a time. To learn more search the Internet for “photos to needlepoint”.
3. Search the Internet for “Canon 7D Mark II press release” to see what Canon thinks is important about your camera.
4. Search the Internet for “Canon 7D Mark II review” to see what others think about your camera.
5. Search the Internet for “Steve Sasson at Kodak” to learn more about the first digital camera in 1974.

### Seeing for Yourself

1. To see the pixels and subpixels used to make up images on a display screen, use a magnifying glass to examine the screen on your color eBook reader or computer monitor as well as a color photo in a magazine, book, or newspaper. You can also take close-up pictures and use your photo-editing program to enlarge them on the screen although you won't see subpixels since they have been blended into a single color. If you have a smart phone or a camera with a macro mode, you may be able to take a picture of a display screen, then enlarge that picture enough to see the pixels if not the subpixels. (It is harder to see the subpixels on a high resolution display because they are smaller.)
2. To see noise in an image set your camera to Program Auto (P) shooting mode and the ISO to it's highest setting as discussed in Topic X–Y. (You can also use a smart phone without changing any settings.) Photograph a sheet of white paper in a poorly lit room and then enlarge the image on the camera or computer to see the noise in the image. Take a second photo of the paper in bright light and compare the noise in the two images.



A very low resolution pixelated image.

## Topic 1–3. The Canon 7D Mark II Camera—Introduction

The EOS 7D Mark II is a single-lens reflex (SLR) camera so when you look in the viewfinder you are seeing the scene through the lens. The camera is a relatively affordable DSLR. Its magnesium alloy body houses a 20.2 megapixel APS-C CMOS image sensor protected by enhanced dust and weather proofing. Because the sensor is smaller than a full-frame sensor it increases the effective focal length of many lens as described in Chapter 4.



Included in the box are a Battery Pack LP-E6N with a protective cover, Battery Charger LC-E6E or LC-E6E. (The LC-E6E comes with a power cord), Interface Cable IFC-150U II, Camera with body cap, Wide Strap, Eyecup Eg, Cable protector, a lens (if a Lens Kit) and maybe a [lens instruction manual](#). There are also three CD ROM disks described on page X-Y in this book.

The camera has a number of outstanding features:

- **Focus:** Cameras use two types of autofocus sensors. The most accurate and fastest are cross-type sensors that detect contrast in two-directions. Less accurate are vertical line sensors that detect contrast in only one direction. On compatible lenses the 7D Mark II uses 65 AF points to autofocus and all of them are cross type. An AF Area Selection Lever around the multi-controller makes it easy to switch between AF Point Selection modes without removing your eye from the viewfinder.

**Tracking and Recognition:** The camera's EOS iTR (Intelligent Tracking and Recognition) system auto focuses by recognizing faces and subject colors. A metering sensor recognizes the subject and then all 65 AF points are used to track it. The camera uses what Canon calls *Dual Pixel CMOS AF* (DAF) technology to improve focusing speed, face detection performance, and performance in low light and with low-contrast subjects. This system uses an image sensor with pixels able to perform both imaging and *phase-detection focus* simultaneously and supports over 100 Canon EF lenses including many older models.

**Viewfinder:** The viewfinder covers almost the entire field of view and can superimpose a level or grid. The camera accepts interchangeable focusing screens including the standard Eh-A and the optional Eh-S Super Precision Matte which is designed for manually focusing large aperture lenses.

**Monitor:** The 3-inch LCD monitor on the back of the camera has approximately one million pixels and clearly displays menus and other information even in bright sunlight.

**Autoexposure:** The camera can detect and compensate for flickering light sources such as sodium vapor lamps that are often used in gymnasiums and indoor swimming pools.

**Drive Modes:** The camera can capture up to 10 frames per second and its buffer can store up to 31 RAW images or 1,090 Large Fine JPEGs. In addition to adjustable high and low speed continuous shooting modes, single-frame shooting and two self-timer settings, the camera also features silent drive modes so you can shoot discretely in quiet situations such as weddings.

**Video:** The camera can capture 1080p Full HD or 720p HD video and you can use the camera's mini HDMI port to record uncompressed Full HD video to external recorders. The camera also features a stereo microphone port and outputs stereo audio through its mini-HDMI port. A headphone jack lets you monitor the audio being captured so you can adjust audio levels. Canon's Stepping Motor (STM) lenses operate so quietly you can't hear their operation in videos you shoot.

**Ports:** The camera has a PC terminal to connect studio strobes and an N3 socket for dedicated Canon wired remote control accessories.

**ISO:** The camera's ISO range is 100–16000 for both still images and videos and the range is expandable up to ISO 51,600 if you can live with the resulting degraded image quality.

**High Dynamic Range (HDR):** The HDR mode includes five HDR shooting functions and allows you to save all source images in addition to the HDR image composited from them in the camera.



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**Multiple Exposure (ME):** A Multiple Exposure mode provides four compositing methods and allows you to save individual source images along with the image composited from them in the camera.

**An intervalometer and bulb timer** let you capture time-lapse and long-exposure images. These features are ideal for recording fireworks, star trails, sunrises and more.

**Corrections:** In addition to Peripheral Illumination Correction and Chromatic Aberration Correction the camera includes Distortion Correction that operates with most EF and EF-S lenses to improve image quality of movies and JPEGs.

**GPS:** A built-in GPS system can record location information including longitude, latitude, elevation, camera direction and universal coordinated time (UTC).

**Flash:** A built-in pop-up flash can also act as a controller when used with compatible EX-series Speedlites.

**Memory Cards:** The camera accepts SD/SDHC/SDXC and CF memory cards, including Ultra High Speed (UHS-1) SD cards.

**Battery:** The camera uses a LP-E6N lithium ion battery pack and comes with an LC-E6 charger. Optional are the Battery Grip BG-E16 and Wireless File Transmitter WFT-E7A Version 2. Both the camera and Battery Grip BG-E16 are backwards-compatible with the LP-E6 lithium ion battery pack.

### Tips

- When shooting movies you can choose from two kinds of video compression—IPB and ALL-I. To learn more about these search the Internet or your camera's [Instruction Manual](#) for "IPB and ALL-I" (the I is an uppercase letter i).
- The cable protector included with the camera is designed to prevent strain on the cables from damaging the USB 3.0 and mini-HDMI ports.

### Resources to Explore

1. Visit B&H on line at [www.bhphotovideo.com](http://www.bhphotovideo.com) to see if they have anything you are interested in knowing more about.
2. Click the link to visit the Canon Camera Museum to see what you can learn about the development of the SLR camera at [www.canon.com/camera-museum](http://www.canon.com/camera-museum).
3. Click the link to visit Wikipedia at [www.wikipedia.org](http://www.wikipedia.org) and search for "SLR camera" to find an article on the SLR.

4. Search the Internet for "pictures taken with Diana camera" to see how you can get great photos with the cheapest of film cameras. Try replacing "Diana" in the search with "Holga" to see photos taken with that film camera.

5. Click the link to see an animated history of photography "Illuminating photography: From camera obscura to camera phone" by Eva Timothy at [ed.ted.com/lessons/illuminating-photography-eva-timothy](http://ed.ted.com/lessons/illuminating-photography-eva-timothy).

6. Search the Internet for "Dual Pixel CMOS AF sensor" to find out more about this unique image sensor.

7. Search the Internet for "phase detection autofocus" to learn why it's better than the more common contrast detection.

8. To find your camera on the Internet, especially at retailers, you can search for it by its SKU. In the case of the 7D Mark II body only it's iSKU is 9128B002.

9. Search the Internet for "Canon EOS iTR" to learn more about this autofocus system.

10. Compatible memory cards, and the speeds needed for stills and videos, are discussed in detail on page 5 of your camera's [Instruction Manual](#).

11. To learn more about SD memory cards visit the SD Association Web site at <https://www.sdcard.org>

12. To learn more about CompactFlash cards visit the CompactFlash Association at <http://www.compactflash.org/>.

### Seeing for Yourself

1. Visit a physical camera store, if one survives near you, and see what cameras and accessories they carry. Try handling the cameras in which you are interested to get a hands on feel you can't get at an on-line store.
2. In a dust free environment, remove the lens from your camera and look through the opening. You should see the mirror that swings up and out of the way when you press the shutter button all of the way down. On the lens mount itself, you will see electrical contacts that carry signals between the camera and lens. In the old days, these were mechanical connections.
3. With the lens off, set the Mode Dial to B (bulb) and hold down the shutter button. In this mode this lifts the mirror up, and keeps it up so you can see the image sensor. When you release the shutter button the mirror descends.



*Photography wasn't always easy. Here is Herman A. "Germany" Schaefer trying out the other side of the camera during the Washington Senators visit to play the New York Highlanders in April, 1911. Courtesy of the Library of Congress.*



*Hill and Adamson photo titled Elizabeth Johnstone, Seated Newhaven Fishwife taken 1843-1848 using a calotype negative. Exposure times for this process ran from 10 seconds to 10 or more minutes. The quality is amazing given the early date and long exposure time.*





*A portrait captured in 1999 with a Nikon 950 has only 1.9 megapixels. More pixels wouldn't improve it much if at all.*

4. Although movies are beyond the scope of this book, they are really easy to take. To see how easy, just follow the steps below to get started. Learn more about it in [Chapter 9 Shooting Movies](#) starting on page 313 of your camera's [Instruction Manual](#).

#### SHOOTING MOVIES

1. Set the Mode Dial to Scene Intelligent Auto, P (program) or B (bulb).
2. Set the Live View/Movie shooting switch to the Movie icon. When you do so the reflex mirror lowers and the scene appears on the LCD monitor.
3. Focus on the subject using auto or manual focus. When you press the shutter button halfway down in autofocus, the camera focuses using the currently selected AF method.
4. Press the START/STOP button to begin recording and a red indicator is displayed on the upper right of the monitor. Sound is recorded by the built-in microphone.
5. To stop recording the movie, press the START/STOP button again.

## Topic 1-4. Jump Start—Using Scene Intelligent Auto Mode

Almost every digital camera ever made, including the Canon 7D Mark II, has a shooting mode that automatically sets the camera's focus, exposure and white balance. The 7D Mark II's auto mode is called *Scene Intelligent Auto* because it tries to identify a scene such as a sunset, landscape, or portrait so the camera can automatically select the best settings to capture it. The camera can even detect and track faces, setting their sharpness, brightness and color for the best possible results. This mode is great when you want to concentrate on the subject and not on the camera. In this tutorial we take a quick tour of the camera and some of the things it's important to know about it.



Colorful scenes make good initial subjects.

### ■ Getting Ready

If your camera is fresh out of the box, there are a few things discussed here that you have to do before you can start taking pictures.

- Install a charged battery pack LP-E6N. Charging a battery is discussed in detail on pages 32 and 38–39 of your camera's [Instruction Manual](#) and installing and removing it on page 40. Checking the battery level and seeing how long the change may last is discussed on page 46. Checking battery information is discussed on pages 470–474.

- Install a memory card as discussed on pages 41–43 in your camera's [Instruction Manual](#). If the card is new (or has developed problems), formatting it is discussed on pages 67–68 and other settings on pages 69–70. The memory cards that are compatible with your camera are discussed in detail on page 5.

The camera accepts both a CF and SD card. If only one is inserted, the camera will select it automatically for recording and playing back images. The number 1 on the LCD panel indicates it's using the CF card, and 2 the SD card. If both cards are inserted you have to tell the camera which to use, and when. How to do this is described on pages 146–148 of your camera's [Instruction Manual](#).

- If necessary, attach a lens to the camera and set its focus mode switch to AF (autofocus). Attaching and detaching a lens is discussed on page 50 of your camera's [Instruction Manual](#).

- If asked to, enter the date and time so this important information, used to organize and find photos, is accurately stored in your image files along with the image. Also specify a language for menus and other information. These settings are discussed on pages 47–49 of your camera's [Instruction Manual](#).

- If the viewfinder image isn't sharp, turn the dioptic adjustment knob next to the viewfinder until it is, as discussed on page 54 of your camera's [Instruction Manual](#).

### ■ The Step-by-Step Tutorial

To select and use the Scene Intelligent Auto shooting mode, just follow these simple steps:

**1. Turn on the camera** using the Power Switch below the Mode Dial.



The Mode Dial (here set to P) and an enlargement of the green A+ Scene Intelligent Auto icon.



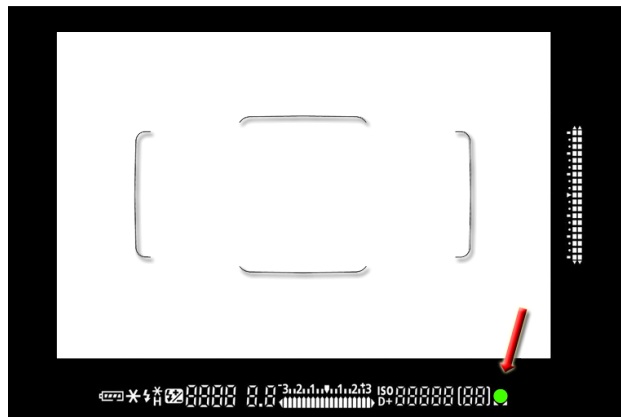


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**2. Select the shooting mode** by holding down the Lock Release button in the center of the Mode Dial while you turn it so the green A+ (Scene Intelligent Auto ) icon aligns with the white index mark on the camera body.

**3. Find an interesting scene and frame it** in the viewfinder. The area within the viewfinder's oblong AF area frame will be used to identify the closest part of the scene and focus on it. It may help if the area that you want sharpest is centered. (Initially a static subject might also work best):

- If you are using a zoom lens, turn its zoom ring to zoom in or out. As you do so the scene displayed in the viewfinder zooms along with the lens so you always see what will appear in the photograph. You can also change your distance to the subject and getting closer is often worth considering.



*If the focus confirmation light in the viewfinder blinks when you press the shutter button halfway down, the camera is having trouble autofocusing (Topic X–X).*

*The oblong Area AF frame is used to focus and is set automatically in the Scene Intelligent Auto shooting mode.*

**4. Press the shutter button halfway down** and pause so the camera can automatically set focus and exposure based not only on autofocus information, but also faces, colors and other details. As the camera auto focuses AF is displayed in the lower right corner of the viewfinder and the lens focus ring may rotate:

- If focus is achieved the camera beeps, the round green focus confirmation light in the lower right corner of the viewfinder glows, and the AF point(s) being used to set focus are displayed, or in low light, flash red. The current aperture and shutter speed are displayed on the LCD Panel and in the viewfinder and will remain displayed for 4 seconds if you release the button. If needed in this shooting mode—for example, when it's dark or the subject is backlit—the flash may pop up and the focus assist beam fire.
- If a subject moves so its distance to camera changes, during or after focusing, the camera automatically switches to AI Servo AF mode and continuously beeps softly as it keeps the subject in focus. It will continue to do so as long as you keep the Area AF frame positioned over the subject while holding the

shutter button halfway down.

- If focus isn't achieved, the green focus confirmation light flashes and the camera does not beep. Release the shutter button and try again—perhaps from farther away, or with a scene that has more contrast or brightness. Otherwise, push the button the rest of the way down to see that you can't take a picture.

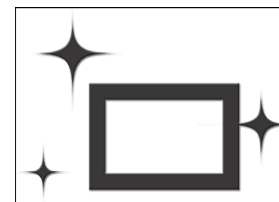
**5. Take the picture** by pressing the shutter button all the way down. The captured image is saved to the memory card while an indicator flashes and the image is displayed for 2 seconds so you can check it.

**6. Review the results** by pressing the Playback button on the back of the camera to display the last image you took. Press and release the Magnify button and turn the Main Dial to enlarge the image. Use the Multi-controller to move around it to examine details. To return to shooting, press the shutter button halfway down. If the flash popped up, press it down to close it.



*The playback button is on the back of the camera*

**7. Turn off the camera** and sensor cleaning is briefly performed.



*This icon is displayed when you turn the camera off to indicate the sensor is being cleaned automatically.*

### Tips

- If the camera can't focus refer to the section on focusing in Topic X–X.
- When you press the shutter button halfway down and focus is achieved, both exposure and focus are "locked" As you'll see, this can be used creatively to set the exposure and focus on one part of a scene and then photograph a different part.

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*Learning photography is easy if you take it just one step at a time.*

- **WARNING.** Never look at the bright sun through the viewfinder. You can seriously damage your eyes.
- In the Scene Intelligent Auto shooting mode an Auto Lighting Optimizer adjusts the image automatically to obtain the optimum brightness and contrast. It is also enabled by default in the P, Tv and Av modes and can be enabled manually in the M and B shooting modes.
- If any of the commands don't work as expected, it may be because you have changed a setting that causes a conflict. The 7D Mark II has a *Clear all camera settings* menu command on Set-up 4 menu tab that returns the camera to its factory default settings so you can try again.
- The remaining number of photos that can be stored on the current memory card is displayed on the LCD panel.
- When you don't use controls for a specified time the metering timer turns off. It's often set to 4 seconds but can be set to 4, 8, 16 or 30 seconds or 1, 10, 30 minutes.
- If you don't use any controls for 60 seconds, the camera enters auto power off mode. To wake it up, press the shutter button halfway down and release it. You can change the auto power off time using Set-up 2 menu tab.
- The flash pops up automatically, when needed, in Scene Intelligent Auto shooting mode. In other modes you pop it up by pressing the Flash button.

- If the flash fires repeatedly it's doing so to assist focus. This is called the AF assist beam.
- If more than one AF point is displayed, it means the areas covered by those points are all about the same distance from the camera.
- Scene Intelligent Auto mode manipulates your pictures to make their colors brighter, more saturated and more dramatic. For more natural results try one of the other shooting modes and use the RAW file format.
- If a flash photo is too light, move farther away and try again. If it is too dark, get closer.

### Resources to Explore

1. Search the Internet for "Canon scene intelligent auto" to learn more about this filly automatic shooting mode.
2. Search your camera's [Instruction Manual](#) for "faces" to see how it tracks a face or other moving subject.



*A boy is paid for monarch butterfly tags he collected and turned in to track the migration to Mexico. The lighting highlights the action.*

### Seeing for Yourself

1. Turn on your camera and set it to Scene Intelligent Auto shooting mode.
2. Press the INFO button repeatedly to cycle through *Camera Settings*, *Electronic Level* and *Shooting Functions*.
3. Look into the viewfinder to see what information is displayed then press the shutter button halfway down to see if the display changes. Do the same while watching the monitor. Press the INFO button to change the display and try again to see if there is any difference.



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4. Point the camera at near and far subjects and press the shutter button halfway down to set focus. Watch how the camera lets you know if the image is focused or not. Release the shutter button, recompose the scene and press it halfway down again. Are different AF points displayed?



*Everyday scenes such as the door being opened at Martin Luther King's Ebenezer Baptist Church offer good photographic opportunities.*

5. Point the camera at a normal scene and press the shutter button halfway down to see how it indicates that focus has been achieved. Then point the camera at a subject, such as your hand, only a few inches away so it's too close to focus and press the shutter halfway down while watching how it indicates focus has not been achieved.

6. Set the lens to M or MF and hold the shutter button halfway down while looking through the viewfinder. Turn the focusing ring on the lens to focus on a nearby subject and notice how when focus is achieved the AF points covering the area focused on are displayed.



*Capturing irony, such as a cemetery named "Delight" is one of the great uses of photography.*

5. Point the camera at dark and light scenes, such as the dark corner of a room and a bright lamp or window and press the shutter button halfway down as you watch how the ISO speed, shutter speed and aperture update on the screen and the image on the screen reflects those changes. Now point the camera at one of the areas, press the shutter button halfway down and hold it there as you point the camera at the other area. Notice how the ISO, aperture, shutter speed and image don't change because holding the shutter button halfway down locks focus and exposure.

6. Display *Target 1 Face Detect* in Appendix A full-screen and set the camera to Scene Intelligent Auto shooting mode. If one of more faces are detected, press the shutter button halfway down to see which frame is used to set focus.

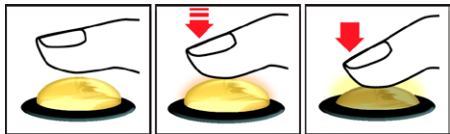
7. Take the camera into a dark closet, or a darkened room at night, and with it on look at the exposure information. Press the shutter button halfway down to fire the AF-assist beam that assists focus.

8. To simulate tracking, focus on a subject close up and continue holding the shutter button halfway down. Slowly pan the camera from side to side as you watch in the viewfinder how different AF points are displayed to indicate focus is following the subject.

## Topic 1–5. Good Things to Know

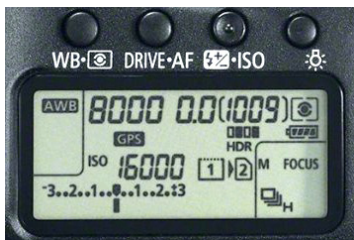
When you first start taking photos, it sometimes seems as if there is too much to learn. Here are some things you may want to know right off.

- **The camera has a built in metering timer** that ensures that exposure information is only briefly displayed on the camera’s three screens. To wake the camera up, press the shutter button halfway down.
- **The shutter button has two stages.** When you press it halfway down, the camera tries to lock exposure and focus. If successful it beeps, the round green focus confirmation light in the viewfinder blinks, and the AF area used to set focus is displayed or, in low light, blinks red. If the camera can’t focus, recompose the image and try again.



Pressing the shutter button halfway down locks focus and exposure and pressing it all the way down takes the picture.

- **The camera does not have Wi-Fi connectivity**, but does support Eye-Fi cards that do. These are discussed on pages 475–477 of your camera’s [Instruction Manual](#).
- **The camera has an Auto power off function** that turns off the three screens after one minute of inactivity. To wake the camera up, press the shutter button halfway down.
- **The camera cannot use** Type II CF cards or hard disk-type cards.
- **The information displayed on the LCD panel** on top of the camera is shown in your camera’s [Instruction Manual](#) on pages 25–26. You can illuminate the panel by pressing the button marked with the light bulb icon on top of the camera.



The LCD panel.

- **The LCD panel shows the number of new images** that will fit on the memory card and also the charge remaining in the battery.
- **The camera normally sounds** when you take a picture or use the self-timer but you can usually turn them off on the Shooting 1 tab.



Icons on the LCD panel show six levels of remaining battery power. The icons for the last two levels blink to draw your attention to the fact that the battery is almost dead.

- **The camera’s autorotate sensor** senses when you turn the camera vertically so images shot in that position (portrait mode) are rotated during playback so they can be viewed without rotating the camera or tilting your head when viewing them on a connected TV.
- **Pressing the Playback button** lets you scroll through the photos you’ve taken and pressing it again or pressing the shutter button halfway down returns you to shooting mode.
- **Image review** briefly displays each image for 2 seconds right after shooting.
- **If your exposures aren’t perfect**, you can use a live histogram in Live View to make sure they are.
- **There is a setting** on the Set-up 4 menu tab that tells you what firmware version has been installed on your camera.
- **You’ll see a number of abbreviations** as you read about photography. They include the following:

Abbreviation	Meaning	Abbreviation	Meaning
AF	Autofocus	MF	Manual focus
AE	Autoexposure	ISO	International Standards Organization
AFL	Autofocus lock	mm	Millimeters
AEL	Autoexposure lock	EV	Exposure value
AEB	Auto exposure bracketing	JPEG	Joint Photographic Experts Group
RAW	Unprocessed image format	f/stop	Aperture setting
EOS iTR	Intelligent Tracking and Recognition	LCD	Liquid crystal display



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- **To avoid missing action shots**, compose the image and press the shutter button halfway down to lock focus. Hold it down as you follow the action and press it all the way down to take the photo instantly. For an even faster response prefocus manually.

### ■ Supporting the Camera

As the focal length of your lens changes, so does the minimum shutter speed at which you can hand-hold the camera without having images blurred from camera shake. The rule of thumb is never to hand-hold the camera at a shutter speed lower than the reciprocal of your lens' focal length times its 1.6x focal length factor discussed in Topic X-Y. For example, a 100mm lens can be handheld at a shutter speed of 1/160 or faster ( $100 \times 1.6=160$ ). (The camera displays the current shutter speed on the LCD panel, and in the viewfinder when you press the shutter button halfway down.)

To hand hold the camera as steady as possible, hold it in your right hand while supporting the lens with your left. Brace the camera against your face as you look through the viewfinder and brace your elbows against your body. Press the shutter button down smoothly as you hold your breath after breathing in deeply and exhaling. If you hand hold the camera and shoot while viewing the LCD monitor, camera shake may make images less sharp. For the sharpest possible pictures you may want to find a support, such as a branch or railing, to rest the camera on. For real stability, anywhere, anytime, you need a tripod or an even easier to carry monopod.

### Tips

- The camera has an intervalometer mode you can use to capture time-lapse photos. This setting is discussed starting on page 250 in the camera's [Instruction Manual](#).
- The camera can capture multiple exposures as discussed in your camera's [Instruction Manual](#) on page 238.
- The camera can tag your images with their locations using GPS discussed starting on page 198 in the camera's [Instruction Manual](#).
- You may want more than one memory card so you don't run out of storage space. It's also prudent to avoid having all of your images on the same card.

### Resources to Explore

1. Search the Internet for "photography abbreviations" to find lists of them.
2. Search the Internet for "photography glossary" to find terms and definitions.
3. Search your camera's [Instruction Manual](#) to see how you format a memory card but see why you shouldn't do so if it has any images on it that you want to save.
4. Visit Canon's iMAGE GATEWAY to see what features it offers.
5. Search the Internet for "intervalometer" or "time-lapse photography" to get ideas about how to use this mode.
6. Search the Internet for "multiple exposure" to get ideas about how to use this mode.

### Seeing for Yourself

1. Page through your camera's [Instruction Manual](#) to get an idea of its contents and how it's organized.
2. With the camera off install a battery and memory card, then remove them to become familiar with both operations. Replace them so you are ready to shoot.
3. Turn on the camera and set it down. Time it for one minute to see if it goes into Auto power off mode. If it does, press the shutter button halfway down to wake it up.
4. Press the Playback button to display the last image you took, then press the shutter button halfway down to see how you instantly return to shooting mode.
5. The information displayed on the LCD panel on top of the camera is described on pages 25–26 of your camera's [Instruction Manual](#). Use the illustrations on those pages to identify the information displayed on your own LCD panel after you press the shutter button halfway down.

## Topic 1–6. When Things Go Wrong

According to Murphy’s Law, if anything can go wrong, it will. Most things go wrong because you are using the wrong settings or settings conflict with one another. Some of the problems can be fixed by changing the settings or restoring them to their factory defaults.

Here are some things that you might encounter when using your camera:

- **If the monitor or camera turns itself off or buttons don’t work**, it’s usually because the camera’s metering timer has expired or you haven’t used any controls for over a minute and the camera has entered Auto power off mode. In either case press the shutter button halfway down to wake it up.
- **In cold weather**, the battery discharges more rapidly so you’ll capture fewer photos and have less playback time. To prevent this, keep the camera or battery under your coat or in an inside pocket so the battery stays warmer. You may want to carry a second fully-charged battery. Also, remove the battery when not using the camera for extended periods. There is a slight but continuous drain even when the camera is turned off.
- **If you can’t take a picture**, it may be because the camera isn’t on, can’t focus or the memory card is full.
- **If your pictures are not the way you expect**, or the camera doesn’t work as expected, or as described in this book, it may be because the camera memorized a change you made to a setting. The camera may continue to use that changed setting even when you turn the camera off and back on. For example, two settings that are often overlooked are the ISO and exposure compensation. If this happens display Set-up 4 menu tab, select *Clear all camera settings* then press SET to restore most menu settings to their factory defaults (Topic 1–8). If you do this you will have to reselect the RAW image format and any other settings you use on a regular basis.
- **If your pictures are noisier than you expect**, with brightly colored pixels randomly distributed, you may have taken them with too long an exposure or with the ISO set too high. If this happens there are noise reduction settings you can use described in Topic 2–6.
- **If there is no memory card in the camera** and you press the shutter button all the way down, the shutter sounds. However you don’t actually capture an image. To be sure there is a card in the camera change the Shooting 1 menu tab’s *Release shutter without card* setting to *Disable*.
- **If there are any problems**, an error message is displayed.

- **If flash photos are too dark**, you are probably too far from the subject. If you can’t get closer you need a larger aperture, a higher ISO or an external flash.
- **If flash photos are too light**, you can get farther away, recompose the image, or reduce the flash output.
- **If flash photos have a round dark area** at the bottom, the lens is blocking the flash and casting a shadow. Move farther from the subject and try again.



*Here the lens casts a shadow when flash is used too close to the rabbit. The rabbit also has red-eye from the flash.*

- **If your pictures are blurred**, you may not be holding the camera steady as you smoothly press the shutter button. Most blurry photos are caused by jabbing the shutter button. If the same area is blurred in a number of images, there may be a fingerprint on the lens that needs cleaning.
- **If there are dark spots** in the same position of all of your photos, the sensor may need cleaning.
- **If the aperture or shutter speed values on the screen blink** when you press the shutter button halfway down the subject is too bright or too dark, and beyond the available exposure range of the camera. Change exposure settings, use flash or increase the ISO.



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### Tips

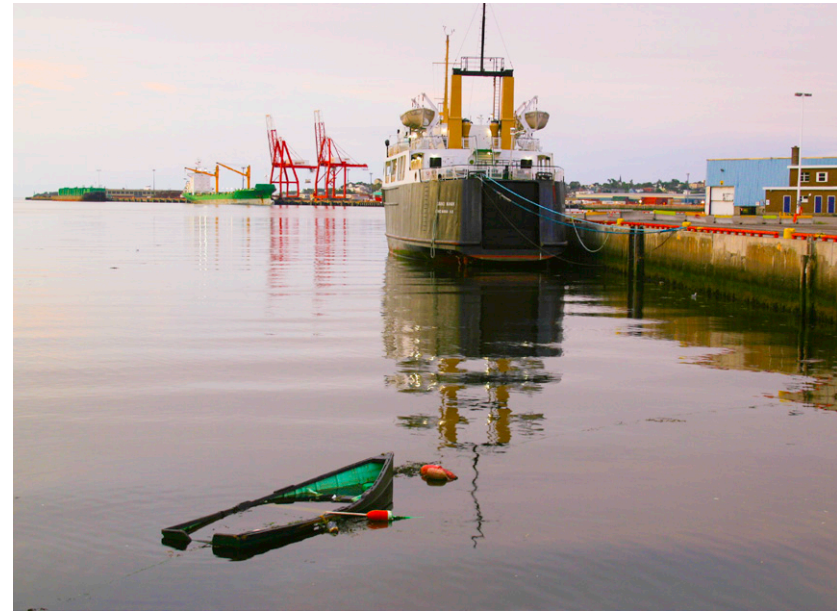
- To minimize problems it helps to have a structured routine called a *workflow*. For example, before heading out check that all camera settings are the way you want them, that there are no smears on the lens, that the batteries are charged and the camera has a memory card with space for the photos you anticipate taking. Finally, take a picture and play it back to see that everything is working the way you want.
- If you have any problems with the camera you can look for a solution in the section on troubleshooting on pages 495–509 of your camera’s [Instruction Manual](#).
- If an error code is displayed you can see what it means on page 510 of your camera’s [Instruction Manual](#).

### Resources to Explore

1. **Digital Photography Workflow** is a 37 page introduction to the way images flow step by step from your getting ready to take them through to editing and storage. Click to download the PDF at [www.photocourse.com/litext/workflow/workflow2.pdf](http://www.photocourse.com/litext/workflow/workflow2.pdf).
2. Search the internet for “photography workflow” to learn more about this important concept.

### Seeing for Yourself

1. The 7D Mark II let’s you think you’re taking pictures when there isn’t a memory card in the camera. To see this, remove the memory card or cards and turn the camera back on. Now take some pictures. What happens? Try playing back the images. You’ll find you can’t do so because they weren’t saved. To be sure there is a card in the camera change the Shooting 1 menu tab’s *Release shutter without card* setting to *Disable*.
2. A camera’s batteries drain relatively quickly, especially in cold weather, so you may want to carry a fully charged spare. To see how much they cost go to eBay or Amazon or use a search engine to search for the model number of your battery. (LP-E6N or LP-E6 for the 7D Mark II) There are always cheaper batteries from third parties but their quality varies widely.



Things gone wrong in different ways.

## Topic 1–7. Anatomy of the Camera

The 7D Mark II has a number of buttons and dials that quickly change frequently used settings without the time-consuming need to work your way through menus. Most controls are indicated with icons.

- Blue icons indicate the function of buttons in playback mode.
- White icons indicate functions in shooting mode.

After pressing many of these buttons you have a short period of time when you can select choices by turning the Main or Quick Control Dial and pressing SET.

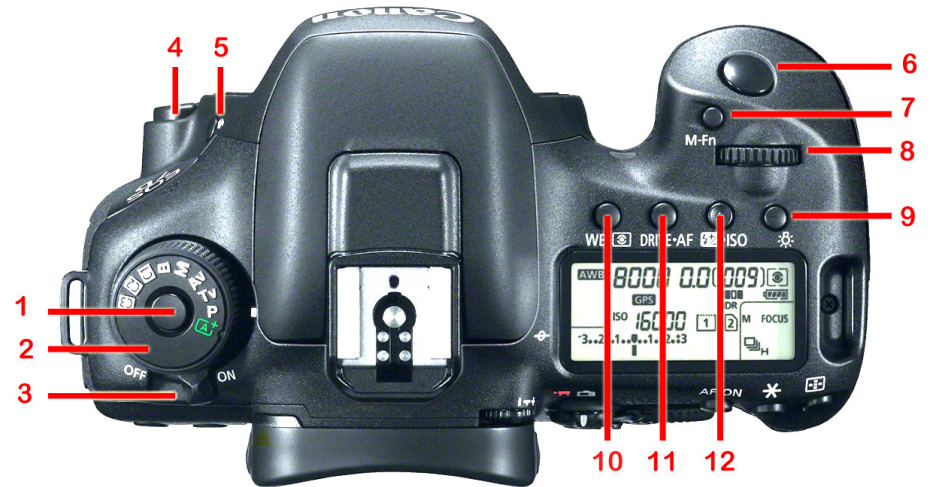
Buttons and dials are often used together. Pressing a button initiates a procedure by activating metering and the exposure displays in the viewfinder and on the LCD panel, and then turning a dial highlights one of the available options. Each time you press a button to initiate a procedure, you only have about 6 seconds or so to turn the dial or the displays become inactive.



*The camera has a built in timer called the “metering timer.” When you press many buttons, the timer keeps their function active for 4, 6, 10 or 16 seconds and it is only during that short period that you can change the setting. If you are slow, just press the button again for another try.*

- Many buttons, including Flash and the three above the LCD panel, won't work when the metering timer is off or auto power off is in effect. To wake the camera up, press the shutter button halfway down and release it.
- After pressing buttons that have two functions, such as AF–DRIVE, turning the Main Dial changes the setting listed first (AF) and turning the Quick Control Dial changes the one listed second (DRIVE).

## ■ Top View



- 1. Mode Dial Lock Release button** in the center of the Mode Dial must be held down so you can turn the dial to change shooting modes.
- 2. Mode Dial** selects any of the camera's shooting modes including:
  - Scene Intelligent Auto where most settings are automatically made for you.
  - P (Program), Tv (shutter-priority), Av (aperture-priority), M (manual), Bulb (bulb) and C1–C3 (custom) modes where you change most of the settings manually.
- 3. Power switch** around the Mode Dial turns the camera on and off.
- 4. Lens Release button**, when held down, lets you turn a lens to remove it. (This button is discussed in your camera's [Instruction Manual](#) on page 50.)
- 5. Flash button** pops up the flash. To close it when done, push it down until it clicks into place.
- 6. Shutter button** sets exposure and focus and turns on metering and the viewfinder and LCD panel displays when pressed halfway down, and takes the photo when pressed all the way.
- 7. AF Area Selection/Multi-Function button (M-fn)**, after being pressed
  - After pressing the AF Point Selection button press this button repeatedly to cycle through available AF area selection modes.
  - If the flash is popped up, pressing the button locks flash exposure by firing



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a pre-flash. The camera reads the light reflected back from the center of the scene using spot metering and sets the exposure that will be used for the flash photo you then take.

**8. Main Dial** is used by itself and with buttons to select menu tabs and change camera settings in shooting mode. After pressing a button you have a few seconds to turn this dial to change a setting such as the metering mode, AF operation, ISO speed or AF point. In playback mode, turning the dial jumps you through pictures you've taken and in menu mode scrolls you through menu tabs.

- When changing metering, AF mode, ISO or selecting an AF point, you first press and release a button to select a setting before you turn this dial.
- When changing shutter speeds and apertures you turn the dial without first pressing a button.
- After pressing MENU, turn the dial to scroll through main and secondary menu tabs listing commands. (Turning the Quick Control Dial moves the highlight up and down a menu and pressing SET selects the highlighted setting.)

**9. LCD Panel Illumination button** lights the LCD panel for 6 seconds each time you press it. During a bulb exposure, pressing the shutter button all the way down turns off the LCD panel illumination.



*After pressing a button that has two functions, you have a few seconds to turn the Main Dial to change the first setting or the Quick Control Dial to change the second.*

**10. White Balance/ Metering Mode Selection button** is pressed and you then:

- Turn the Main Dial to select a white balance setting.
- Turn the Quick Control Dial to change the metering mode.

**11. Drive Mode/AF Mode Selection button** is pressed and you then::

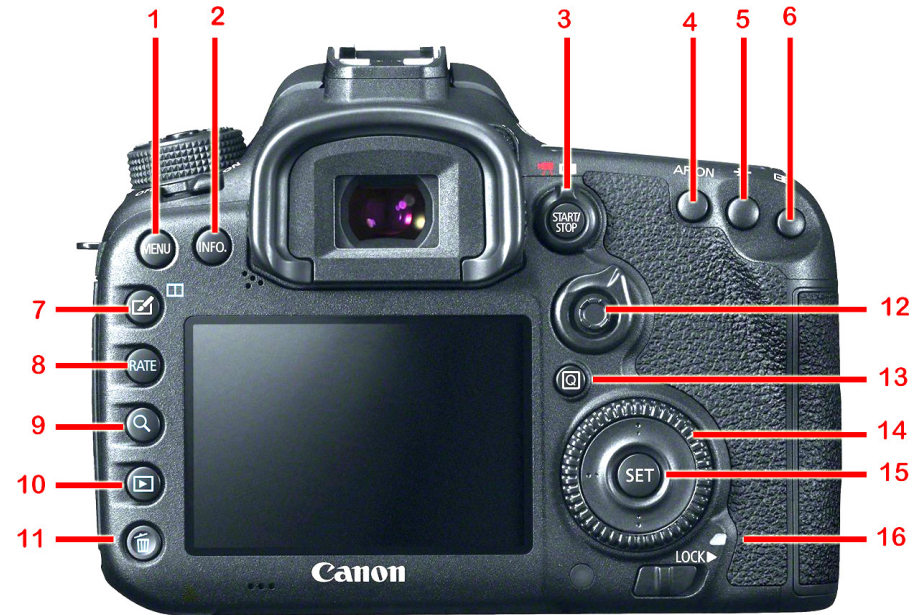
- Turn the Main Dial to change the drive mode.
- Turn the Quick Control Dial to change the autofocus (AF) mode.

**12. Flash Exposure Compensation/ISO Speed Setting button** is pressed

and you then::

- Turn the Main Dial to adjust exposure compensation.
- Turn the Quick Control Dial to change the ISO setting.

## ■ Rear View



**1. MENU button** displays and hides the menu and after pressing SET to display setting choices, it backs you up o the previous menu.

**2. INFO button** cycles you through the list-like *Camera Settings*, the electronic level and the grid-like *Shooting Functions* screens, and turning off the monitor. You can also use *INFO button display options* on the Set-up 3 menu tab.

**3. Live View Shooting/Movie Shooting switch** when pressed switches the camera between Live View and Movie mode. Depending on which mode you select the **START/STOP button** starts and stops recording a movie or Live View.

**4. AF-ON button** autofocuses the camera without having to press the shutter button halfway down. This separation of AF activation from shutter release, is referred to as “back button autofocus” and it has some advantages over the

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shutter button when focusing. It is discussed in detail in Topic 4-X in this book

**5. AE Lock button**, when pressed, locks the exposure, so you can recompose the scene and take the picture using the locked exposure. This is a way to lighten or darken an image.

**6. AF Point Selection button** changes the AF point and AF Area Selection mode. After pressing this button:

- Turn the Main or Quick Control Dials or tilt the AF Area Selection Lever to select the AF point(s) used to focus.
- Press the M-fn button to change the AF area selection mode.

**7. Creative Photo button** displays a menu from which you can select a picture style, multiple exposure mode or HDR.

**8. Rating button** can be used in playback to assign one of five ratings to a selected image. You can also use the button to protect images by setting the Set-up 3 menu tab's *RATE btn function* setting to *Protect* instead of *Rating*.

**9. Index/Magnify/Reduce button**, in conjunction with the Main Dial, enlarges and reduces an image or displays 4, 9, 36, or 100 images on one screen in Index view. Pressing it also jumps you from shooting to playback mode.

**10. Playback button** displays the last image you captured or displayed. You can then turn the Quick Control Dial to scroll through images and the INFO button to display information about captured images.

**11. Erase button** erases selected images one by one. To erase images in batches display the Playback 1 menu tab and select *Erase images*.

**12. AF Area Selection lever**, after you press the AF Point Selection button, you can use the lever or the **Multi-controller** in its center to select the AF point that will be used for focusing (You can't do this if the camera is set to 65-point automatic selection AF). The Multi-controller is used to select menus and settings on the Quick Control screen.

**13. Quick Control (Q) button** displays the Quick Control screen you can use to directly select and set shooting functions displayed on the LCD monitor. This is discussed in Topic 1-9.

**14. Quick Control Dial** works in shooting modes to change settings, in menu mode to highlight menu commands, and in playback mode to scroll through images. A **Touch Pad** adjusts settings quietly during movie shooting (see Tips below).

- Pressing the Quick Control button enables Quick Control of the shooting function settings. You can then turn the Mode Dial to see the settings for each

shooting mode. And use the screen display instead of the LCD panel as a guide when changing settings. It has the advantage of larger type and better illumination.

- When changing the white balance, drive mode, flash exposure compensation or AF point selection, you first press and release a button to select a setting before you turn the dial.
- When changing exposure compensation or selecting an aperture in manual (M) mode, you turn the dial by itself.
- After pressing MENU turn the dial to move the highlight up and down the menu tab.

**15. Setting button** selects a highlighted item.

**16. Multi-function Lock Switch**, when set to ON, prevents the Main Dial, Quick Control Dial, and Multi-controller from moving and inadvertently changing a setting. If you try to use one of the locked controls *L* is displayed in the viewfinder and on the LCD panel. On the function settings screen (displayed with the INFO button) *LOCK* is displayed.

### Tips

- You can connect the camera to a computer and use Live View so you and others can immediately see photos as you take them. This is a great way to take portraits and close-ups.
- During movie shooting, press the Quick Control button then tap the Main dial's inner ring, called the *Touch Pad*, at the top, bottom, left, or right. This provides a quiet way to adjust the shutter speed, aperture, exposure compensation, ISO speed, sound recording level, and headphone volume. This function works when *Silent Control* on the Shooting 5 menu tab is set to *Enable*.
- Many buttons won't work when the metering timer or auto power off are off so press the shutter button halfway down and release it to activate metering and the viewfinder and LCD panel displays.
- The features found on the camera body are identified in your camera's [Instruction Manual](#) on pages 27-28.
- INFO button functions are discussed starting on page 458.



## Resources to Explore

1. Canon's European Infobank features technical and technique information for Canon digital photographers. <http://cpn.canon-europe.com/content/education/infobank.do>.
2. If you have a smart phone or tablet, search its App store for your camera model to see if there are any applications you can use.
3. Search the Internet for "back button focus" or "back button autofocus" to learn more about how you use the camera's AF-ON button to autofocus.

## Seeing for Yourself

1. Pages 22–24 of your camera's *Instruction Manual* show drawings of your camera with labels identifying the buttons, dials and other physical features. Use these illustrations to help you identify each of the controls or other features on your own camera.
2. Press the shutter button halfway down, release it, and count off seconds (or use your cell phone's stop watch) to see when the LCD panel and viewfinder displays turn off. Try the same with one of the three buttons just above the LCD panel. Is there a difference?
3. Press each of the three buttons above the LCD panel and then immediately turn the Main and Quick Control Dial to see what settings you can select from.
4. Press the WB–Metering Mode Selection button and immediately turn the Main Dial and Quick Control Dial while watching the LCD panel and monitor. Press it again and count how many seconds the display remains active so you can change settings.
5. Set the Lock Switch below the Quick Control Dial to the right (Locked) and, while watching the LCD or viewfinder display, try turning the Main Dial, Quick Control Dial, Multi-controller, and AF area selection lever. Now set the switch to the left and try using the same controls. To the right they are locked and to the left they are unlocked. When locked, L is displayed in the viewfinder and on the LCD Panel, LOCK is displayed on the shooting settings display.

## Topic 1–8. Using Menu Settings

The Canon 7D Mark II lists almost all of its settings on menus—122 of them. Since it takes time to find and change menu settings, and monitors can be hard to read in direct sunlight, many important and frequently used settings are selected or adjusted using buttons and dials. Generally the less frequently used settings are relegated to menus. Many menu settings are not available in all shooting modes. The fewest are available Scene Intelligent Auto where many of the settings are automatically made for you by the camera and can't be changed.

### ■ Using Menus

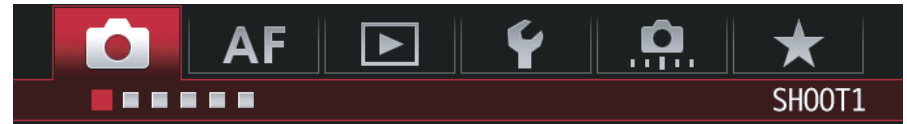
The menu is divided into tabs, indicated by square dots and listing commands. These tabs are organized into categories indicated with icons. The currently selected category and tab are highlighted. In this book we refer to menus by their name and number. For example, the Shooting 4 tab refers to the menu displayed when the Shooting tab's fourth dot from the left is selected.

Once you press MENU to display a series of menu tabs coded with colors, icons and dots, the Main Dial, the Quick Control Dial and the SET button in its center are all you need to change settings.

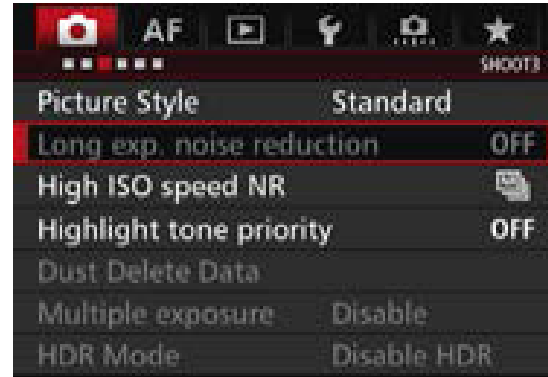
#### MAKING MENU CHOICES

- **To display the last menu you viewed**, press the MENU button.
- **To scroll through menu tabs** turn the Main Dial or press the Multi-controller.
- **To select a setting** listed on the menu, turn the Quick Control Dial to highlight it, then press SET. The currently selected setting is indicated in blue.
- **To backup without changing a setting**, press MENU before SET.
- **To exit the menu**, press the MENU button.
- **To instantly return to shooting**, press the shutter button halfway down.

If a menu setting is dimmed you can see why by selecting the dimmed item and then pressing SET. If you cancel the overriding setting, you will be able to change the dimmed menu item.



The menu is divided into 6 categories—Shooting, Autofocus, Playback, Set-up, Custom Functions and My Menu. Each category contains a number of tabs that list settings. The selected category icon and tabbed page dot are highlighted. The square dots indicate how many tabs are in a category.



When you turn the Quick Control Dial to select a tab, the settings on that tab are listed. Any dimmed setting is not currently available because of the shooting mode you are in or because of a conflicting setting.



Icons on the bottom of the screen indicate when pressing MENU backs you up and pressing INFO displays help on the selected setting.

### ■ Help

When using menus, if *INFO Help* is displayed at the bottom of the screen you can hold down the INFO button to display a description of the highlighted setting. If a scroll bar is displayed on the right side of the help screen turn the Quick Control dial to see more of the text.

### ■ Clearing all Camera Settings

When you change some settings, the camera remembers the changes, even when you turn the camera off and back on. Sometimes it can get confusing as your changes to button, dial, and menu settings accumulate. When lost or unsure, you can reset most of the camera's settings back to their original factory defaults using the camera's *Clear all camera settings* command. This function doesn't reset every command. For example, it won't reset the date and time.



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### CLEAR ALL CAMERA SETTINGS

1. With the Mode Dial set to any mode other than Scene Intelligent Auto, press MENU and select the Set-up 3 menu tab.
2. Turn the Quick Control Dial to highlight *Clear all camera settings* and press SET, then highlight *Clear all camera settings* and press SET.
3. Turn the Quick Control Dial to highlight OK and press SET to clear the settings and return to the menu.
4. Press the MENU or shutter button to exit the menu.

If there are some settings you don't want reset the camera has three custom shooting modes (C1–C3) you can use to save those settings. The settings in these modes are not reset unless you specifically specify that they be.

### CLEAR SHOOTING MODE C1–C2 SETTINGS

1. With the Mode Dial set to any mode other than Scene Intelligent Auto, press MENU and select the Set-up 4 menu tab.
2. Turn the Quick Control Dial to highlight *Custom shooting mode (C1-C3)* and press SET, then highlight *Clear settings* and press SET.
3. Turn the Quick Control Dial to highlight the shooting mode you want to clear and press OK.
4. Turn the Quick Control Dial to highlight and press SET to clear the settings and return to the menu.
5. Press the MENU or shutter button to exit the menu.

## Tips

- You can place up to six frequently used menu commands on your own “My Menu” and even have that menu displayed first when you press MENU.
- Menu settings that are dimmed cannot be changed. For information about a dimmed setting select it and press SET. One of the most common responses is “not available in the current shooting mode”.
- Throughout this book when we tell you to turn the Quick Control Dial, in many cases you can also turn the Main Dial.
- Not all functions are available in all shooting modes. To see a “Function Availability Table According to Shooting Mode” and other menu related information refer to the table below for pointers to sections of your camera's [Instruction Manual](#):

Topic	Page(s)
Function availability table	478
Function availability table—Movies	482
List of menu commands	484–494
Using menus	64–66
Using custom modes C1, C2 and C3	431
Default settings	71–73
<i>Clear all camera settings</i>	70

- You can use the Multi-controller to operate and set menu functions other than *Erase images* and *Format card*.
- You can customize the My Menu tab by registering just those menu items and Custom Functions whose settings you change frequently. You can also name the registered menu tabs and press MENU to display the My Menu tab first. My Menu is discussed on pages 459–463 of your camera's [Instruction Manual](#).

## Resources to Explore

1. A list of menu settings and their defaults is listed on pages 71–73 in your camera's [Instruction Manual](#).
2. Not all settings are available in all shooting modes. A [Function Availability Table According to Shooting Mode](#) is on pages 480–483 in your camera's [Instruction Manual](#).
3. A table on pages 484–494 in your camera's [Instruction Manual](#) lists all of the camera's menu settings and briefly describes them.

## Seeing for Yourself

1. Using what you've learned in this topic to display menus and scroll through available settings on your own camera. Select one setting to see what options are displayed, then back up and try another setting. Continue exploring menus until you are familiar with the available settings and are comfortable navigating them and making choices.
2. Change a number of menu settings and write down the changes—before and after—so you can check them later. Use the *Clear all camera settings* command to restore the camera to its factory default settings. Check your list of change you made to see that they were reset.

## Topic 1–9. The Quick Control & Function Settings Screens

The camera has two identical screens—the Quick Control screen where you can change the settings and the Function Settings screen where you can't.

### ■ The Quick Control Screen

In addition to using menus to change or confirm settings, you can also use the Quick Control screen. Both display setting choices on the monitor and are particularly useful when you're shooting from a tripod or monopod, with the camera at eye level, where it's hard to read the LCD panel on top of the camera.



The Quick Control screen is displayed by pressing the Q button in shooting modes. Here the icon for Flash exposure compensation is highlighted and its name is displayed below. The function settings screen is identical but you cannot select or change settings.

All of the settings on the Quick Control screen can also be changed using buttons, dials, or menus. Over time you will find which method you prefer in various situations.

#### USING THE QUICK CONTROL SCREEN

1. Press the Quick Control (Q) button to display the Quick Control screen. The currently selected setting is highlighted in orange on the screen.
2. Press the Multi-controller in any direction to highlight a setting and its function is indicated at the bottom of the screen.
3. Do one of the following to change the highlighted setting:
  - Press SET to display choices.
  - After or without pressing SET, turn either the Main or Quick Control Dial to scroll through different choices for the selected setting.

The settings on the Quick control screen are arranged in four rows. Some of the displayed settings are for your information only. Those you can't change are dimmed to indicate that you can't select them. This table shows both types of settings. They are listed by row from left to right. To learn more about any of them use your eBook reader to search for them by name in this book or your camera's [Instruction Manual](#). (\* indicates available in Scene Intelligent Auto.)

Row	Function	Settable?
1	Shooting mode	No
	Shutter speed	No
	Aperture	No
	AE lock	No
	Highlight tone priority	No
	ISO speed	Yes
2	Exposure compensation/AEB setting	Yes
	Flash exposure compensation	Yes
	Custom Controls/Flash firing (A mode)*	Yes
3	Picture Style	Yes
	White balance	Yes
	White balance correction /White balance bracketing	Yes
	Auto Lighting Optimizer	Yes
	Recording function/Card selection*	Yes
	Image-recording quality*	Yes
4	AF operation	Yes
	Metering mode	Yes
	Drive mode*	Yes

To operate the Quick Control screen you use the following camera controls:

Camera Control	Function in Quick Control
INFO	Displays a screen showing function settings.
Quick Control (Q) button	Displays the Quick Control screen.
Multi-controller	Highlights settable items on the screen
Main Dial and Quick Control Dials	Scrolls through options for the highlighted setting
SET	Displays a setting screen for the highlighted item
MENU	Backs you up to the previously displayed screen



## ■ The Function Settings Screen

If you press the INFO button one or more times, you can display the functions setting screen that displays the same settings as those listed in the table on the previous page. Although this screen looks identical to the Quick Control screen you can't change the displayed settings—they are just for information. To do that you have to first press the Quick Control button to switch to Quick Control.

### Tips

- On the Quick Control screen settings remain selected for 10 seconds if you don't use any controls. Press the Q button to reselect it.
- Just as it is true of menus, in Scene Intelligent Auto shooting mode, there are many fewer changeable settings on the Quick Control screen than in other shooting modes.

### Resources to Explore

- Quick Control, its screen, and its changeable settings are discussed on pages 61–63 of your camera's [Instruction Manual](#).

### Seeing for Yourself

1. Press the Quick Control button to display the screen and use the Multi-controller as described in the instructions above.
2. Press the Quick Control button and then use the Multi-controller to move from one setting to another. Highlight each setting in turn and as you do so:
  - Turn the Main and Quick Control Dials to see if, or how, they change the setting. Those that are dimmed can't be changed in the current shooting mode.
  - Press SET to display a separate screen for the highlighted setting to see how it can be changed there. When finished, press MENU to back up to the previous screen and continue with the next setting.

## Topic 1–10. Using the Camera's Displays

The camera has three displays, each of which is best for specific functions. They include the following:

### ■ The LCD Panel

**The LCD Panel** on top of the camera displays camera and exposure settings. It lets you know the status of some of the most important settings such as the aperture and shutter speed, ISO, exposure compensation, white balance and focus. It also indicates the number of shots remaining on the current memory card.

In dim or dark light you can press the LCD Panel Illumination button to illuminate the LCD panel for 6 seconds.

### ■ The Viewfinder

**The viewfinder** is used mainly to compose images. It displays almost 100% of the scene through the lens so when you take a photo what you see is what you get. Since this is your center of interest, the viewfinder also displays focus, exposure and other information to guide you.

When you press the shutter button halfway down, the viewfinder displays the current shutter speed and aperture, the ISO, the shots remaining in continuous mode, and the focus confirmation indicator. It also displays an exposure level indicator that's used for setting exposure compensation and manual (M) exposure. A number of other indicators are also displayed during various procedures.



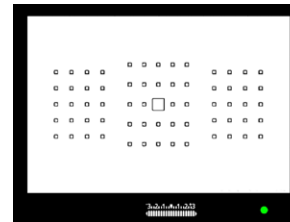
*The viewfinder display stays on for 4 seconds after you press the shutter button halfway down.*

• **Diopter Adjustment.** You can adjust the viewfinder display so you can read it without glasses. To do so, remove the lens cap and look through the viewfinder at an evenly lit surface or fairly bright light source (not the sun!). If the viewfinder display isn't sharp, try to bring it into focus by turning the dioptic adjustment knob in the upper right corner of the viewfinder. For far-sighted photographers, the camera accepts the Dioptic Adjustment Lens Eg that slips into the viewfinder's eyepiece holder to provide a clear viewfinder image without the use of eyeglasses.

• **Autofocus.** The viewfinder displays AF focus areas and small AF focus points (AF stands for *autofocus*). When the focus switch on the lens is set to AF, the camera focuses on the closest subject covered by one or more of these AF points. The one being used to set focus can be selected manually or automatically. When you press the shutter button halfway down, the focusing point or points being used to set focus are displayed or flash red in low light.



*The diopter adjustment knob.*



*When focus is achieved the AF point or points being used to set focus are displayed and the green confirmation light glows steady in the lower right corner of the viewfinder.*

### ■ The Monitor

The monitor on the back of the camera is used for a variety of purposes in both shooting and playback mode. The buttons that have an effect on the monitor and their functions are as follows:

- Shutter button takes photos which are then displayed on the monitor in image review for 2 seconds. Pressing this button halfway down also wakes the three displays when the camera's metering timer or Auto power off have turned them off.
- Playback button displays images stored on your memory cards.
- INFO button, when pressed repeatedly in shooting mode, cycles through camera settings, an electronic level you can use to keep horizontals and verticals



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aligned, and the function settings screen. In playback mode it displays information, including a histogram, of the selected image.

- MENU button displays and hides the camera's menu.
- Q button displays the Quick Control screen for the current shooting mode so you can change settings.
- START/STOP button turns Live View on and off when the Live View/Movie shooting switch is set to Live View. In this view you can compose images on the monitor with the aid of a larger view, 10x magnification to assist focus, and a live histogram to assist exposure.

You can adjust the brightness level of the monitor so it better matches the lighting under which you are viewing it. Just follow the steps below:

### ADJUSTING MONITOR BRIGHTNESS

1. With the camera in any mode, press MENU and select the Set-up 2 menu tab.
2. Turn the Quick Control Dial to highlight *LCD brightness* and press SET to display a thumbnail, the brightness adjustment scale and a gray scale.
3. Turn the Main Dial to select Auto or Manual.
4. Turn the Quick Control Dial so all segments of the gray scale can be distinguished from one another and the thumbnail looks good and press SET.
5. Press the MENU or shutter button to hide the menu.

## Tips

- The camera remembers which information display was last used and returns to it the next time you turn on the camera.
- The camera accepts interchangeable focusing screens including the standard Eh-A and the optional Eh-S Super Precision Matte for use during manual focusing with large aperture lenses.
- To turn on metering and display exposure information on the LCD panel and in the viewfinder, press the shutter button halfway down.
- You can display the electronic level in the viewfinder. How to do so, and how to read the results, are discussed on page 76 of your camera's [Instruction Manual](#).

## Resources to Explore

1. Search the Internet for "Canon Eh-S Super Precision Matte Focusing Screen" for information on this viewfinder accessory for precise focus in low light.
2. Search the Internet for "ocular dominance and the viewfinder" to learn more about dominant eyes and how they affect your looking through a viewfinder with one eye.
3. Additional information on the camera's displays can be found in your camera's [Instruction Manual](#) on the following pages:

Topic	Page(s)
Viewfinder information	27–28
LCD Panel information	25–26
Electronic level	75
Grid display	74
Customizing the viewfinder	77
INFO button	60, 288, 323, 354, 468

## Seeing for Yourself

1. Locate the diopter adjustment knob next to the viewfinder and turn it as you look through the viewfinder. You should be able to bring the scene and the screen display into sharp focus.
2. Press the buttons described in the monitor section of this topic to see their effect on the monitor display.
3. Most of us have a dominant eye and prefer to use it when looking through the viewfinder. To determine which of your eyes is dominant, hold your thumb out at arm's length and use it to cover a distant object with both eyes open. Look at your thumb first through the left eye and then the right. The eye that keeps the object covered is your dominant eye. Because viewfinders are positioned for right-eye dominant people, many photographers prefer to use their non-dominant eye and get used to doing so quite quickly. When adjusting the diopter be sure to do so while using the same eye you will use to compose images.
4. The information displayed in the viewfinder is described on pages 27–28 of your camera's [Instruction Manual](#). Use the illustrations on those pages to identify the information displayed in your own camera's viewfinder after you press the shutter button halfway down.

## Topic 1–11. Live View

You can use the monitor, or even a connected computer, to compose and focus images—a technology called *Live View*. In some ways using Live View is just like using the viewfinder. The difference is that in Live View the camera lifts the mirror up and out of the way (the viewfinder blacks out) and opens the shutter so the image sensor can capture the scene in real time and display it on the monitor.



*Live View displays the scene through the lens in real time. You can use the continuously updated stream of images to compose your shot or capture it as a movie.*

Live View offers a number of advantages over viewfinder shooting:

- Live View lets you enlarge the image on the screen by as much as 10x so you can focus very precisely on the smallest of details. You'll find Live View especially useful when using a tripod and macro lens to capture close-ups requiring very precise manual focusing.
- It's useful in a studio setting because using the EOS Utility software and the USB cable supplied with the camera you can use a computer's screen to compose and focus an image. You can even download captured images directly to the computer's hard drive. Using an optional wireless transmitter you can make the connection over some distance.
- By pressing the INFO button you can display a live histogram that lets you adjust the exposure and avoid clipping highlight and shadow details.

Although Live View is not designed for hand-held photography due to the possibility of camera shake blurring images, there's no reason you shouldn't give it a try.

When using Live View in Scene Intelligent Auto shooting mode the camera detects the scene type and sets everything automatically for best results. The detected scene type is indicated on the upper left corner of the monitor. For

certain scenes or shooting conditions, the icon displayed may not match the actual scene. You can learn more about this feature on page 290 of your camera's [Instruction Manual](#).

### USING LIVE VIEW

1. Set the Live View/Movie shooting switch to the Live View icon.
2. Press the START/STOP button to display the scene on the monitor and the viewfinder goes black.
3. Press INFO to display a live histogram to guide you, and in any shooting mode other than Scene Intelligent Auto turn the Quick Control Dial to lighten or darken the image.
4. Press the shutter button halfway down (or press AF-ON) to set focus and exposure. (You can also focus manually.)
5. Press the shutter button all the way down to take the picture.
6. When finished with Live View press the START/STOP button.



*The Live View/Movie shooting switch to the right of the viewfinder can be set to the movie or Live View icon. In the center of the switch is the START/STOP button you use to start and stop Live View or movie capture.*

### How Live View Works

Point and shoot and mirrorless cameras have had Live View since their beginnings. However, Live View has only recently become widespread on digital SLR cameras. The feature was slow in coming because SLRs use a mirror and prism to project the scene into the viewfinder. The image is only projected onto the sensor when the shutter opens briefly to take a picture. When you press the shutter button to do so when not using Live View, the sequence goes like this:

Step 1. The mirror goes up, causing the viewfinder to black out.

Step 2. The shutter briefly opens to let light strike the image sensor to capture the image and then closes to end the exposure.

Step 3. The mirror comes back down and you can again see through the viewfinder.



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When using Live View on an SLR, the sequence is somewhat different.

Step 1. When you press the START/STOP button, the mirror goes up and stays up so the viewfinder goes black. The shutter then opens and stays open so the sensor can capture and display a continuous sequence of images on the screen like frames in a movie. In fact SLRs with Live View can capture this stream and save it as a movie.

Step 2. When you take a picture the mirror remains up as the shutter closes and the image sensor is electronically cleared.

Step 3. The shutter then opens and closes to capture the image.

Step 4. After the image is saved, the shutter reopens and stays open as the camera again displays the scene on the monitor.

Step 5. When you press the START/STOP button to stop Live View, the mirror goes down so you can see through the viewfinder again, the shutter closes, and the image sensor is cleared.

### ■ Enabling and Disabling Live View

Live view has three stages. In the first you disable or enable it using the menu, then you turn it on with the Live View/Movie shooting switch. Finally, you start and stop it with the START/STOP button. Although it is enabled by default, here is how you can disable and enable it at any time:

#### ENABLING AND DISABLING LIVE VIEW

1. Select a shooting mode:
  - If you select Scene Intelligent Auto mode, press MENU and select the Shooting 3 Tab.
  - If you select any other shooting mode, press MENU and select the Shooting 5 tab.
2. Highlight *Live View shoot*, press SET to select it and turn the Quick Control Dial to select *Enable* or *Disable*.
3. Press SET to hide the menu.

### ■ Auto and Manual Focusing in Live View

You can focus in Live View automatically or manually:

**Auto focus** works much as it does when using the viewfinder. You can use the *AF method* setting on the Shooting 5 menu tab to select *Face+Tracking* (the

default), *Flexizone 1* or *Flexizone 2*. These AF modes are all discussed in detail in Chapter 4.

**Manual focus** is much more accurate than autofocus, especially when you use the Magnify frame and button. When the scene is magnified you may notice effects on other aspects of camera operation, such as auto focus, but none are very significant.



*The magnifying frame can be moved about the screen. When you then press the Index/Magnify/Reduce button the area within the frame is enlarged.*

#### MANUAL FOCUS IN LIVE VIEW

1. Set the focus switch on the lens to M or MF.
2. Press the START/STOP button to turn on Live View.
3. Press the Index/Magnify/Reduce button to display a rectangular focusing frame on the monitor.
4. Press the Multi-controller to move the frame over an important area of the scene (press it straight down to center the frame).
5. Press the Index/Magnify/Reduce button repeatedly to cycle through Full view >1x > 5x > 10x and then back to Full view.

### ■ Exposure Simulation

Live view presents a dilemma. The image on the monitor can be displayed as if it were perfectly exposed or as it will actually appear in the captured image. To handle this situation, you can set the *Exposure simulation* setting on the Shooting 5 menu tab to *Enable* or *Disable*.



*The exposure simulation icon.*

- *Enable* (the default) displays the image on the monitor so it looks like the image you will capture. This is especially useful if you use exposure compensation to lighten or darken the image. To do so, press INFO to display a live histogram to guide you as you turn the Quick Control dial to lighten or darken the image.

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If you use flash or B (bulb) mode the histogram is grayed out and although it still works it may not be accurate. When *Exposure simulation* is set to *Enable* the Exp.SIM icon displayed on the monitor indicates the following:

- **White** indicates that the Live View image's brightness on the monitor is close to that of the image you will capture.
  - **Blinking** indicates that the lighting is too dim or bright and the Live View image on the monitor isn't accurate although the exposure of the captured image will be.
  - **Grayed out** indicates that the histogram might not be properly displayed in low light or bright light conditions. It will be grayed out when using Multi Shot Noise Reduction, bulb exposure, or flash.
  - *During...* displays the image on the monitor the same as it does when set to *Enable* but does so only when you hold down the depth-of-field preview button. This is a good way to toggle back and forth between the two brightnesses.
  - *Disable* shows a well-exposed image on the monitor regardless of what the captured image will look like. Any changes in exposure do not affect the brightness of the image on the screen. This is useful at times, as when trying to focus in dim light.
- The 7D Mark II let's you select which exposure simulation mode to use as follows:

### EXPOSURE SIMULATION

1. Select any shooting mode other than Scene Intelligent Auto.
2. Display the Shooting 5 menu tab and select *Expo.Simulation*.
3. Highlight *Enable*, *During* or *Disable* and press SET to select it.
4. Press MENU to hide the menu.

## ■ Silent Shooting

You can set *Silent shoot* on the Shooting 6 menu tab to *Mode 1*, *Mode 2*, or *Disable* to avoid alarming people or wildlife.

- *Mode 1* reduces camera noise when shooting. High speed continuous shooting at up to 10 frames per second is possible.
- *Mode 2* takes only one photo when you press the shutter button all the way down. However, if you continue to hold the button down camera operations are suspended. When you then release the shutter button back to the halfway point camera operations resume. This two-step process reduces camera noise.

- *Disable* ensures you get the most accurate exposures when using TS-E lenses other than the TS-E17mm f/4L or TS-E24mm f/3.5L II or extension tubes.

## Tips

- In all modes other than Scene Intelligent Auto you can check the depth of field in Live View by pressing the depth-of-field preview button.
- When using Live View you can change settings by pressing the Q button to display the Quick Control screen discussed in Topic 1-9.
- The Shooting 5 and 6 menu tabs list many of the settings that effect only Live View. In the Scene Intelligent Auto shooting mode, some of these menu settings are displayed under the Shooting 3 tab. These settings only affect Live View shooting and have no effect on viewfinder shooting.

Setting	Choices	Page
Live View shooting	Enable or Disable	287
AF method	Face+Tracking, FlexiZone - Multi, or FlexiZone -Single	299
Continuous AF	Disable or Enable	294
Grid display	Off, 3x3 l, 6x4 m or 3x3+diag	295
Aspect ratio	3:2, 4:3, 16:9 or 1:1	295
Exposure simulation	Enable, During depth of field display or Disable	295
Silent LV shooting	Mode 1, Mode 2, Disable	297
Metering timer	4 second to 30 minutes	297

- With the EOS Utility software installed on your computer, you can connect the camera to the computer and shoot remotely while viewing the computer screen. For details, refer to pages 536–539 of your camera's [Software Instruction Manual](#).
- Using an HDMI cable you can display the Live View image on a TV screen. Note that no sound will be output. For details, refer to page 385 of your camera's [Software Instruction Manual](#).



In direct sunlight, or other situations that might heat the camera, the high temperature icon (above) may be displayed in white or red. White indicates that still image quality may be degraded by noise or irregular colors. If you continue shooting, the red icon indicates Live View is about to discontinue automatically and will not resume until the camera's temperature falls.



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- In Live View the monitor displays 100% of the area that will be captured in the photo.
- When autofocusing the AF-assist beam is not emitted.
- In all modes except Scene Intelligent Auto, you can preview depth of field by pressing the depth of field preview button.
- The image brightness may change during and after autofocusing.
- Press the INFO button to change the information displayed including a live histogram and electronic level.
- During autofocusing no AF points are displayed on the screen but they are still operational. Canon recommends that you position the focusing frame at the center and select the center AF point for autofocusing.
- A side benefit of Live View is that it reduces vibration by lifting the reflex mirror out of the way long before the exposure takes place. In this respect it is much like mirror lockup.
- In Live View the shutter is open so don't point the camera directly at the sun or you can harm the sensor.

### Resources to Explore

1. **The Light Path Through an SLR** shows how light coming through an SLR's lens bounces off a mirror, up into a prism, and out through the viewfinder eyepiece so you can compose a picture through the lens. When you then press the shutter button you'll see how the mirror rises and the shutter opens to expose the image sensor. Illustration courtesy of Nikon Imaging. [www.photocourse.com/itext/SLR](http://www.photocourse.com/itext/SLR).

2. The Live View screen display is described on page 288 of your camera's [Instruction Manual](#) and all aspects of Live View are discussed on pages 285–311. The histogram is discussed in Topic X-Y of this book.

### Seeing for Yourself

1. With the *AF method* on Shooting 5 menu tab set to **Face+Tracking** (the default), open *Target 1. Face Detect* in Appendix A. Start Live View and view the target on the camera's monitor as you press the shutter button halfway down to focus. Do so until at least one face is highlighted by a white rectangle. This is face detect. Now, with a face detected, continue to hold the shutter button halfway down as you swing the camera slowly from side to side. Notice how the white square remains fixed on the face. This is tracking and usually works when

the subject, not the camera moves. Face detect is discussed in detail in Topic X-Y of this book.

2. With the camera set to Av shooting mode and Live View started turn the Main Dial to select a large and then small aperture. As you cycle through apertures from one extrem to the other can you see any change in depth of field on the monitor? Now repeat the above steps but this time press the depth of field preview button for each of the two extreme aperture setting.

3. In Av shooting mode and with Live View started, set exposure simulation to *Enable* and then turn the Quick Control dial to change the image's exposure. Does the brightness of the image on the screen change? Set the simulation to *Disable* and again adjust the exposure with the Quick Control dial. Does the brightness image change this time? Can you explain the difference between the two results?



A street scene that is part real and part mural.

## Topic 1–12. Changing Drive Modes

In most situations, you normally take one photo at a time, but you're not limited to that way of shooting. You can also capture a continuous sequence of photos one after another at rates up to 10 per second. The camera also has a self-timer that triggers the shutter after a delay of 2 or 10 seconds.

### ■ Continuous Modes

To be sure you catch those fleeting moments so common in sports and wildlife photography you can set the camera to one of its *continuous modes*. You can then hold down the shutter button so images are captured one after another until you release it. The number of images you can capture in a single burst is usually limited by the size of the images and the size of the camera's *buffer*—an area of memory used to store just captured images until they are saved to the memory card. The speed at which they are captured is referred to as the *frame rate* which is specified in frames per second (fps).



Continuous mode can capture a series of images much like movie frames. You can select the best one for printing, use them all to create an animation, or use the series to analyze an action such as the swing of a golf club or baseball bat.

After capturing a sequence of images you can do one of the following:

- Choose the best image from the sequence—for example, one might be sharper than the others.
- Use all of the images to create an animated GIF so the images are quickly displayed one after the other like frames in a movie.
- Join together a number of sequences into a short movie.



The speed at which you can capture images in continuous mode is specified in frames per second (fps). The 7D Mark II can capture up to 10.



Here are the drive icons in the order in which they are discussed below: The icon for the currently selected mode is displayed in the lower right corner of the LCD panel.

The 7D has a number of drive modes from which you can choose including four continuous modes and two self-timer modes. These include the following:

- *Single shooting* takes one picture when you press the shutter button all the way down.
- *High-speed continuous shooting* captures images at 10 frames per second (fps).
- *Low-speed continuous shooting* captures images at approximately 3 fps.
- *Silent single shooting* is quieter than Single shooting during viewfinder shooting and reduces the chances of startling wildlife or attracting attention at quiet events such as weddings.
- *Silent continuous shooting* is quieter than High-speed continuous during viewfinder shooting and captures approximately 4 fps.
- *10-sec. self-timer/remote control* delays the shutter opening for 10 seconds.



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- *2-sec. self-timer/remote control* delays the shutter opening for 2 seconds.

### SELECTING A CONTINUOUS MODE

1. With the Mode Dial set to any shooting mode, press and release the DRIVE-AF button and then turn the Quick Control Dial until the desired continuous mode icon is displayed in the lower right corner of the LCD panel.
2. To run off photos, hold down the shutter button until you or the camera decides enough is enough. The last photo in the burst is briefly displayed on the monitor.
3. When finished, repeat Step 1 to return to single-frame mode.

## ■ All about Bursts

As you use continuous modes to capture images, they are first stored in the camera's internal memory, called a buffer, and then moved to the memory card. Using an Ultra DMA card, the camera's maximum burst is 31 RAW images or 1,090 Large Fine JPEGs. For very small S3 JPEG's it's an amazing 20,330. The approximate maximum burst is displayed on the lower right corner of the viewfinder and on the shooting function settings screen when you press INFO. Neither readout goes above 99, so when 99 is displayed it means you can capture 99 or more.

To capture more images in a single burst, reduce the image size, quality or format. Also, other settings may slow down the capture rate. For example, a slow shutter speed or using flash can slow down bursts.

When the buffer becomes full, *buSY* is displayed in the viewfinder and on the LCD panel and the camera starts capturing images much more slowly. After an image is moved from the buffer room is again available so the camera captures another image.

## ■ Using the Self-timer/Remote Switch

The camera has a self-timer that gives you a delay of 2 seconds or 10 seconds before the picture is taken. Although often used to give you time to get into a picture, the self-timer is also a great way to reduce blur caused by camera movement. Just place the camera on a tripod or other stable surface, compose the image, and use the timer to take the picture without any camera shake. The 2-second timer is especially useful in macro photography since it takes pictures without camera shake caused by pressing the shutter button. Don't stand in front of the camera when you press the shutter button to start the timer. If you

do so, you'll prevent the camera from focusing correctly. When using the timer to photograph yourself, focus it on something at the same distance at which you will be positioned when the shutter opens.

### USING THE SELF-TIMER

1. With the Mode Dial set to any mode, press and release the DRIVE-AF button and turn the Quick Control Dial until one of the self-timer icons is displayed on the LCD panel.
2. With the camera on a stable surface or tripod, and pointed at the subject you want to focus on, press the shutter button halfway down to set focus, then all the way down to take the picture.
  - The self-timer lamp on the front of the camera flashes, the camera beeps, and the LCD panel displays a countdown timer.
  - Two seconds before the picture is taken, the lamp glows steady and the beep rate increases. (To cancel the timer, press the DRIVE-AF button.)
3. When finished, repeat Step 1 to return to single-frame mode.

## Tips

- During Live View and movie shooting, the camera will not be silent even when set to one of the silent continuous modes.
- The drive modes are discussed in detail on pages 141–143 of your camera's [Instruction Manual](#).
- By selecting a *Continuous shooting speed* on the Custom Functions 2 menu tab you can adjust the continuous shooting speed.
- Continuous mode works well with tracking so a moving subject remains in focus.
- When hand-holding a camera, taking a series of photos in continuous mode gives you a better chance of capturing a sharp image. Just shoot a number of images and go through them to find the sharpest.
- Continuous modes work well with any camera setting that captures more than one photo such as exposure bracketing. You just have to hold down the shutter button to take a sequence of photos. If you also use the self-timer the entire series is shot when the timer expires. This helps eliminate camera shake because you are not touching the camera.
- In the days of film cameras, battery operated motors, called "motor drives" were used to quickly feed the film through the camera so you could shoot one photo after another. In the digital era, many camera companies continue to use

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the term “drive” to refer to shooting modes that capture images in bursts and somewhat artificially add in self-timer modes.

- Placing the eyepiece cover over the viewfinder blocks light from entering the camera and affecting the exposure when using the self-timer or remote.
- You can turn off the self-timer beep if it’s distracting. To do so set the *Beep* setting on the Shooting 1 menu tab to *Disable*.
- By changing the *Mirror lockup* setting on the Shooting 4 menu tab to *Enable* you can lock up the mirror while using a two second self-timer delay. This is the perfect combination to eliminate blur caused by camera movement.
- The camera has an N3 terminal into which you can plug the optional Remote Switch RS-80N3 or Timer Remote Controller TC-80N3 or any EOS accessory equipped with an N3-type terminal.

### Resources to Explore

**1. Continuous Mode** shows a series of four images captured in continuous mode and used to create an animated GIF showing motion. [www.photocourse.com/itext/continuous](http://www.photocourse.com/itext/continuous).

**2. Continuous Mode**, and not movie mode, was used by Patryk Rebisz to create this 4 minute film “Between You and Me”. It’s an amazing achievement and illustrates the triumph of imagination and creativity over tools. He found that he could record at five frames per second (as opposed to film’s 24) and could only shoot in 12 second segments before the camera’s memory buffer was filled. You can see and read more about this film and others Patryk has made on his Web site at [patrykrebisz.com](http://patrykrebisz.com). The movie can be viewed at [www.photocourse.com/itext/patryk](http://www.photocourse.com/itext/patryk).

3. You can combine a sequence of images captured in continuous mode to create an animated GIF. When it’s played, the images are displayed one after another like frames in a movie. To learn more search the Internet for “animated GIF” and click this link to see one created from Muybridge’s sequence proving that a running horse has all four feet off the ground at the same time. [www.photocourse.com/itext/muybridge/muybridge.gif](http://www.photocourse.com/itext/muybridge/muybridge.gif).

### Seeing for Yourself

1. Use continuous mode to capture a moving subject such as a Ferris wheel, windmill, or people and vehicles in motion.
2. After you capture a series of images, search the Internet for a Web site, a desk-

top program, or a mobile app you can use to turn them into an animated GIF.

3. Set the self-timer to 2 seconds and press the shutter button to take a picture. Notice how the delay is long enough for any camera shake caused when you pressed the shutter button to fade away.



*Monarchs flying overhead in Mexico were captured in continuous mode and then the best image was selected from those.*



## Topic 1–13. Playing Back & Managing Your Images

When taking photos, there are many times when you want to review the images you’ve taken, ideally before leaving the scene. There are also times when you want to manage or jump around your images. One word of advice. Since managing images in your camera is so complicated and time consuming most experienced photographers use a card reader to transfer all of their images to their computer. There they can view and manage the images with a much better program (for example, Lightroom) on a much more powerful system, with a dramatically larger screen. Other than checking your images to see if they are interesting or using a histogram to see if the exposure is right (Topic X-Y), it’s best to follow their example.

### ■ Image Review

When you take a photo, it is displayed on the monitor for 2 seconds (counting from when you release the shutter button). You can change the display time with the *Image review setting* on the Shooting 1 menu tab. With an image displayed for review:

- Press the Erase button to delete it.
- Press the INFO button to change the information display.

Pressing either button keeps the image on the screen until you press the shutter button halfway down to take another photo, or with Erase you cancel or confirm the deletion.

### ■ Image Playback

To view the images you have taken, press the Playback button to display the last photo you took or viewed. You can then change the viewing size of the selected image and even manage and edit it. In playback mode, you can press the shutter button halfway down at any time to instantly return to shooting mode.

One of the most important things you can do in playback is check your image’s histogram. This lets you know if the exposure is correct and there is no clipping (see Topic X-Y) To cycle through screens of information about the selected image, in review or playback modes, press the INFO button repeatedly. On one of the screens you will find a small thumbnail and a histogram. At this point you can use the Multi-controller to scroll through additional information. Once information is displayed for one image in playback (but not review) mode, you

can turn the Quick Control Dial to scroll through other images with the same information displayed.

#### PLAYING BACK CAPTURED IMAGES

1. Press the Playback button and use any of the following procedures:
  - To display one image after another, select an image in index view, or scroll around a magnified image, turn the Quick Control Dial or press the Multi-controller.
  - To display images at various sizes press the Index/Magnify/Review button and then turn the Main Dial. To return to single-image view, press the Q button.
  - To erase the selected image, press the Erase button and to confirm the erasure, turn the Quick Control Dial to highlight Erase and press SET.
    - To cycle through screens of information about the selected image, press INFO.
2. To resume shooting, press the Playback button or press the shutter button halfway down.

### ■ Managing Your Images

The Playback menu has three tabs of settings you can use. They are listed below and described in Chapter 10 of your camera’s [Instruction Manual](#) starting on page 353. In Playback mode you can also press the Q button to use those settings marked with an asterisk in the table.

Tab 1	Tab 2	Tab 3
Protect images*	Resize*	Highlight alert*
Rotate image*	Rating*	AF point disp.*
Erase images	Slide show	Playback grid
Print order	Repeat	Histogram disp
Photobook Set-up	Image transfer	Movie playback count
Image copy	Image jump with Main Dial*	Magnification (apx)
RAW image processing*		Control over HDMI

### ■ Jumping

In playback mode, it takes time to navigate through images when there are many of them on a card. To speed things up you can jump in Playback mode just by turning the Main Dial. You can select from a variety of jump categories including the following:

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- *1 image* is the default so you jump to the next or previous image or movie.
- *10 images* jumps you forward and back 10 images at a time.
- *100 images* jumps you forward and back 100 images at a time.
- *Date* jumps you forward or back to the first picture taken on the next or previous date.
- *Folder* jumps folder by folder.
- *Display movies only* jumps just to movies.
- *Display stills only* jumps just to still images.
- *Display protected images* only jumps to protected images.
- *Display by Image rating* lets you jump through images on 1 or 5 ratings. (Press INFO to see ratings you can select)

In all modes other than *1 image*, as you turn the Main Dial to jump, a position bar on the screen indicates where the currently displayed images fall within the total collection of images on the card. Also turning the Quick Control Dial continues to scroll through images one at a time.

### SELECTING A JUMP METHOD

1. Press the Playback button and then the Q button.
2. Use the Multi-controller to highlight the Jump category icon and turn the Quick Control Dial to select a setting. (If you select *Image jump with Main Dial* and then *Display by image rating*, press INFO to select one of the five.)
3. When finished, press the Q button to return to playback.

## Tips

- After zooming an image you can turn the Main or Quick Control Dials to scroll through other images using the same setting.
- One way to delete all images on a card (and all folders but the current one), is to format the card.
- If you set *Auto rotate* on the Set-up 1 menu tab to the camera and computer icon, any images you then take are automatically rotated.
- After selecting *Delete* from the Playback 1 menu tab, the best way to delete images depends on how many you are deleting.
  - When deleting 100% of the images, use the *All images on card* choice.

- When deleting less than 50%, use the *Select and erase images* choice.
- When deleting more than 50%, protect the images you want to save, and then use the *All images on card* choice to delete the rest.

## Resources to Explore

1. If you delete images by mistake, don't despair. There is software that will let you recover them provided you don't first save other photos on the same card. One such program is PhotoRescue at (<http://www.datarescue.com/photorescue/>) but you can find others by Googling "digital image recovery."
2. Check out your favorite shopping sites for "memory card readers" that accept both CF and SD cards. Read carefully to be sure you have the best possible USB transfer speeds.

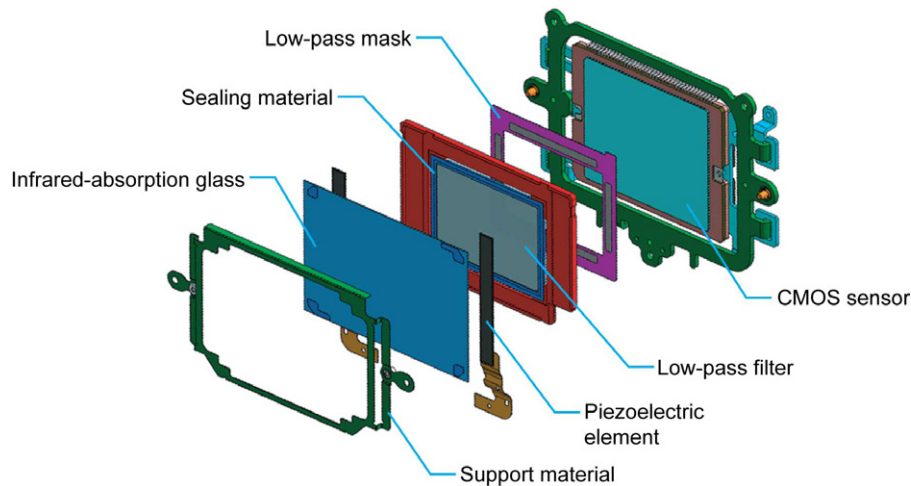
## Seeing for Yourself

1. Take 5 or 10 photos and then try using some of the settings listed in the "Managing Images section" in this topic.
2. Take 5 or 10 photos and then practice playing the back as described in the keystroke box "Playing Back Captured Images".
3. In Playback mode display the Playback menu tabs or press the Q button to explore the settings marked with an asterisk in the table in the section above titled "Managing Your Images".
4. Display an image in playback mode, then press INFO repeatedly to cycle through the information about it—especially its histogram. When the histogram is displayed press the Multi-controller to scroll through more information about the image. Histograms are discussed in Topic X–Y.

## Topic 1–14. Caring for Your Camera

Your camera may be very durable but it requires reasonable care and protection. This usually involves just cleaning it when necessary and protecting it from the elements and physical abuse.

### ■ Cleaning the Image Sensor



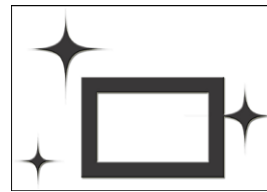
This Canon self-cleaning sensor assembly is typical on those in use throughout the industry. The infrared absorption glass (blue) is attached to piezoelectric elements that can vibrate it to shake dust loose. Courtesy of Canon.

If you change lens a lot, or even once in a windy or dusty environment, dust can enter the camera and stick to the low-pass filter covering the image sensor. This dust creates dark spots on the images. One way to check if this has happened is to take a few photos of a clear sky or white card. Open the images in your photo-editing program and flip through them. (On a PC running Photoshop, zoom the pictures to the same size then Ctrl-Tab through them quickly and the dust spots jump out at you.) If all of the images have dark spots in the same place, that's dust on the sensor. The 7D Mark II uses its *EOS Integrated Cleaning System* to automatically eliminate this problem. It has the following stages:

- *Reduce*. Canon minimizes the dust and particles created by the camera itself, by using materials in the body cap and shutter that don't create dust and other particles during normal wear and tear.
- *Repel*. Canon treats the camera's low pass filter with an anti-static fluorine

coating to prevent static-charged dust from adhering to it.

- *Remove*. The low pass filter in front of the CMOS image sensor, designed to eliminate moiré patterns and give accurate color under all conditions, is attached to an ultrasonic vibrating unit that literally shakes the loose dust particles off of the surface. The newly liberated dust is then captured by an adhesive material that keeps the particles from becoming airborne again once the camera moves. The low-pass filter, normally a single unit, is also divided into two components, a front and a rear. The front component, where any dust would accumulate, is positioned far enough out from the sensor so it's out of focus on the image and any dust is less likely to show.



This icon is displayed when you turn the camera

The self cleaning sensor unit's ultrasonic anti-dust shake activates automatically for one second whenever the camera is powered on or off, ensuring that the camera will be as relatively dust free as possible, and can be activated at other times through a simple menu selection. If you want to manually clean the camera or disable this function, you can do so as follows:

#### CLEANING THE SENSOR

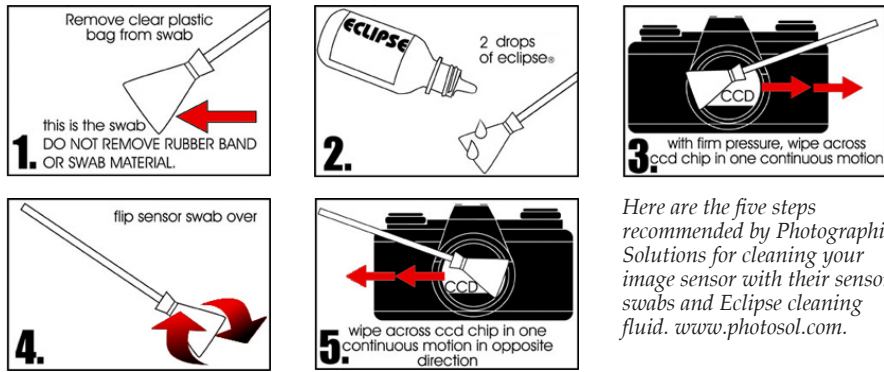
1. With the Mode Dial set to any mode, press MENU, display the Set-up 4 menu tab, highlight *Sensor cleaning* and press SET.
  - To turn auto cleaning on or off, highlight *Auto cleaning* and select *Enable* or *Disable*.
  - To clean now, highlight *Clean now* and press SET. When prompted to confirm, highlight *OK* and press SET
  - To manually clean the sensor, highlight *Clean manually* and press SET. See the next page and follow the instructions on pages 147–152 of the [Instruction Manual](#) that came with your camera.
2. Press the MENU or shutter button to hide the menu.

In addition to the EOS Integrated Cleaning System, the 7D Mark II lets you clean the sensor with sensor swabs and cleaning fluid. NEVER used compressed air, or other cleaning products, on the sensor. Cleaning supplies are available from B&H and Calumet. The most popular products seem to be those from Photographic Solutions (<http://www.photosol.com>). For more information Google "cleaning image sensor" but proceed at your own risk. One of the best



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Web sites I've found on this topic is *Cleaning Digital Cameras* at <http://www.cleaningdigitalcameras.com/howto.html>.



To clean a sensor you use the camera's Set-up 2 menu's *Sensor cleaning* command to access *Clean manually*. This locks the mirror up and out of the way and opens the shutter so you can get to the surface of the image sensor. This is a high-risk procedure and we recommend extreme caution. It's more prudent to have it done by you camera company's service center.



*The Giottos Rocket Air Blower.*

In addition to removing dust, the 7D Mark II will also work around it if it can't be removed. You just photograph a white wall or sheet of paper (or, in a pinch, removing the lens from the camera) and the camera's Dust Delete Data function maps the size and position of the dust particles remaining on the low pass filter. Once the dust is "mapped", that information is attached as metadata to all subsequently shot images regardless of recording format, RAW or JPEG. (It's a good idea to periodically update this information to keep it accurate.) When the images and appended dust data map are transferred to a computer using the 7D Mark II's Digital Photo Professional software, the dust information can be subtracted from the images simply by selecting the "apply dust delete data" option. You can update the Dust Delete Data at any time as follows:

### OBTAINING DUST DELETE DATA

#### 1. Get ready:

- Find a solid white surface like a sheet of white paper with no pattern or design.
- Set the lens focal length to 50mm or longer.
- Set the lens focus switch to MF and set focus to infinity. (If the lens has no focus scale, face the front of the lens and turn it all the way counter-clockwise as viewed from the back of the camera.)

2. With the Mode Dial set to any mode other than Scene Intelligent Auto, press MENU, select the Shooting 2 menu tab, highlight Dust Delete Data and press SET to display a confirmation screen.

3. Highlight OK to display an instructional screen.

4. At a distance of 0.7–1.0 feet (20–30cm) completely fill the viewfinder with the white surface and press the shutter button all the way down.

- If successful, you see the message *Data obtained*. (The image data is stored internally and is not saved to the CF card.) OK is highlighted so press SET.
- If unsuccessful, you'll be asked if you want to try again. If so, repeat Step 3–4.

5. Press the MENU or shutter button to hide the menu.

### ■ Cleaning the Camera and Lens

Periodically, clean the outside of the camera with a slightly damp, soft, lint-free cloth. Open the "flaps" to the memory and battery compartments and use a soft brush, cotton swap, or blower to remove dust. Clean the LCD monitor by brushing or blowing off dirt and wiping with a soft cloth. Be sure not to press hard and be sure there is no grit on the cleaning cloth that can scratch the surface. Monitor cleaning kits are available at most office supply stores.

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*A Canon lens cleaning kit.*

Clean the lens only when absolutely necessary because it is covered with a sensitive coating that can easily be damaged. A little dust on the lens won't affect the image, so don't be compulsive. Keep the lens covered when not in use to reduce the amount of cleaning required. When cleaning is necessary, use a soft brush, such as a sable artist's brush, and a blower to remove dust. Fingerprints can be very harmful to the lens coating and should be removed as soon as possible. Use a lens microfiber cleaning cloth with a small drop of lens cleaning fluid on it. (Your condensed breath on the lens also works well.) Never put cleaning fluid directly on the lens; it might run between the lens elements. Using a circular motion, clean the lens surface then use the cloth or a tissue rolled and torn the same way to dry it.

### ■ Protecting your Camera from the Elements

Some of the best opportunities for interesting photographs occur during bad weather or in hostile environments. You can take advantage of these opportunities as long as you take a few precautions to protect your camera.

Your camera should never be exposed to excessively high temperatures. Don't leave it in a car on a hot day, especially if the sun is shining on the car (or if it will later in the day). If the camera has to be exposed to the sun, such as when you are at the beach, cover it with anything that is sand free, will reflect the light and shade it from the sun. Dark materials will only absorb the heat and possibly make things worse. Indoors, avoid storage near radiators or in other places likely to get hot or humid.

When it's cold out, keep the camera as warm as possible by keeping it under your coat. It's prudent to carry extra batteries because they lose their charge more quickly at low temperatures just as your car battery weakens in cold weather. Prevent condensation when taking the camera from a cold area to a warm one by wrapping the camera in a plastic bag or newspaper until its temperature climbs to match that of its environment. If some condensation does

occur, do not use the camera or take it back out in the cold with condensation still on it or it can freeze. Remove any batteries or memory cards and leave the compartments covers open until everything dries out.

Never place the camera near electric motors, speakers, or other devices that have strong magnetic fields. These fields can corrupt the image data stored in the camera.

Always protect equipment from water, especially salt water, and from dust, dirt, and sand. A camera case helps but at the beach a plastic bag is even better. When shooting in the mist, fog, or rain, cover the camera with a plastic bag into which you've cut a hole for the lens to stick out. Use a rubber band to seal the bag around the lens. You can reach through the normal opening in the bag to operate the controls. Screwing a skylight filter over the lens allows you to wipe off spray and condensation without damaging the delicate lens surface.

### ■ Protecting when Traveling

Use lens caps or covers to protect lenses. Store all small items and other accessories in cases and pack everything carefully so bangs and bumps won't cause them to hit each other. Be careful packing photographic equipment in soft luggage where it can be easily damaged. When flying, carry-on metal detectors are less damaging than the ones used to examine checked baggage. If in doubt, ask for hand inspection to reduce the possibility of X-ray induced damage. Most airline baggage areas are dens of thieves so don't check your camera equipment, carry it on.

### ■ Storing a Camera

Store cameras in a cool, dry, well ventilated area, and remove the batteries if they are to be stored for some time. A camera bag or case makes an excellent storage container to protect your stored equipment from dust.

Digital cameras have many separate components including batteries, chargers, cables, lens cleaners, and what not. It helps if you have some kind of storage container in which to keep them all together.

### ■ Caring for Yourself

When hiking outdoors, don't wear the camera strap around your neck because if it snags or you fall it could strangle you. Wear it over your shoulder. Also don't aim the camera directly at the sun, because the glare it can injure your eye.

## Tips

- When self cleaning is in progress you can press the shutter button halfway down to stop it.
- Change lenses in a dust free environment and out of the wind.
- Cleaning the image sensor manually is a risky procedure so be cautious. You may want to have it done by you camera company's service center although that takes time and money. If you do it yourself use a freshly charged battery or AC adaptor so you don't run out of power in the middle of the procedure.
- Store the camera with a lens or cap attached and unmounted lenses with both a front and rear cap.
- Remove dust from the body cap and lens mounts before attaching them.
- When manually cleaning the sensor, set the camera down on a flat surface. For best results, don't tip it forward or back.
- Repeating automatic cleaning doesn't have much, if any effect.
- Be aware that there is lubricant on internal parts that could be spread to the front of the sensor. If visible spots still remain after a cleaning, have the sensor cleaned by a Canon Service Center.

## Resources to Explore

1. **Dust on your images** shows the effects of dust at [www.photocourse.com/itext/dust](http://www.photocourse.com/itext/dust).
2. To see some sensor and cleaning products visit Photographic Solutions at [www.photosol.com](http://www.photosol.com) or search for "sensor cleaning kits" or "lens cleaning kits" at B&H's Web site at [www.bhphotovideo.com](http://www.bhphotovideo.com).
3. For more information on cleaning an image sensor search the Internet for "cleaning image sensor" but proceed at your own risk. One good site to visit is *Cleaning Digital Cameras* at [www.cleaningdigitalcameras.com/howto.html](http://www.cleaningdigitalcameras.com/howto.html).
4. Straps and Cases is a seven page PDF that discusses cameras straps and cases for your camera and equipment at [www.photocourse.com/itext/cases/cases.pdf](http://www.photocourse.com/itext/cases/cases.pdf).

## Seeing for Yourself

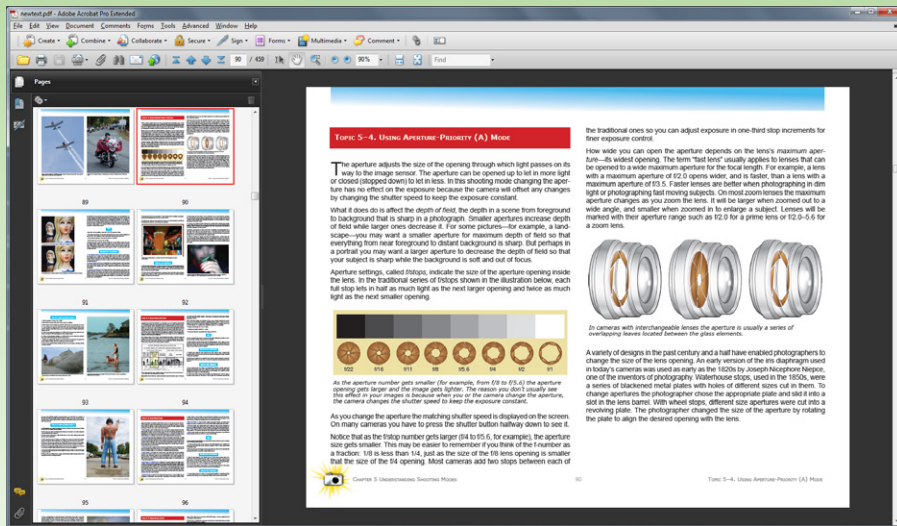
1. In good light closely examine the front of the lens to see if it has any dust or smears.
2. In a very clean and windless location remove the lens and look inside the camera to see the mirror. Use the sensor cleaning command to raise the mirror so you can see the front surface of the sensor. If any dust particles get on the sensor's surface they will appear as black dots in the same place on every image. If this happens you will need to clean the sensor, or have it cleaned. Never leave the lens mount on the camera uncovered. When a lens isn't mounted, cover the opening with the body cap that came with the camera.
3. When finished looking, lower the mirror, close the shutter and remount the lens.



## Topic 1–15. Projects in Photography

### ■ Using Your 7D Mark II eBook

There are free Adobe Readers for the devices on which you are most likely to be reading this eText including PCs, Macs, iPads and Android™ tablets. In this project you install one of these readers, if you haven't already, and become familiar with how to use it. To begin, if you haven't done so already, use the device you are using as an eReader to visit your App store and download the appropriate version of Adobe Reader. Once it's installed, use it to do the following and practice until you get comfortable with these actions.



A typical topic from the book along with thumbnails of other pages.

1. Open the PDF eBook *A Short Course in Canon 7D Mark II Photography*.
2. Display single pages and move forward and backward through the text.
3. Search the PDF to find things. The biggest obstacle to doing this is the way feature names vary from camera to camera. The last resort is to search for a broad term such as “flash” and browse through the hits.
4. Print selected pages. To print it on both sides of the paper requires some experimentation. Print odd pages, put the paper back in the printer tray and print even pages. Having a single copy of this text printed at a place such as Staples is OK as long as it's for personal use and not to be sold. Since there is no digital rights management involved, keep a copy on your computer to make printouts

for your personal use.

5. Annotate the eText with comments and place bookmarks.

6. Tap some of the links in the eText to jump onto the Internet then close the Internet tab to return to the eText.

### ■ Everyone Needs a Little Support

To review a camera in-depth before you buy it, or to use it afterwards, you need a copy of the [Instruction Manual](#). The best place to find information such as this is on the manufacturer's Web site. Normally a site has links such as *Support*, *News*, or *Company*—often at the bottom of the home page—that take you to detailed press releases and support materials including downloadable [Instruction Manuals](#) and occasionally animations, movies and other educational materials. In this project you explore your camera's company's site to see what you can learn about your camera. As you find things, make a list of them. If the site lets you search, search for your camera's model number. You can also search the entire Internet for the camera's model number or for its name followed by “[Instruction Manual](#)” or “manual” as in “Canon 7D Mark II [Instruction Manual](#)”. You can also search for your camera's press release by searching the Internet for the camera's name followed by “press release” as in “Canon 7D Mark II press release”. Once you have a copy of your camera's [Instruction Manual](#) save it on your eReader along with this text so you can search it for information as we go along. One thing to be aware of is that [Instruction Manuals](#) are usually available in a variety of languages. To find one visit the company's Web site in a major county that speaks the language and download the [Instruction Manual](#) there. You can search the Canon site for “Canon 7D Mark II [Instruction Manual](#)”.

### ■ Searching the Internet

Throughout this eText there are links you can click to visit Web sites and also guided instructions on searching for people, products, techniques and so on. You can follow any of these instructions on any browser, but there are subtle differences among them. The first thing to look for on your browser are links or tabs that display Web information, images and news. Depending on the circumstances you will want to search one or more of these categories. For example, to find the work of specific photographers such as Walker Evans or Diane Arbus you'll search Images. To find information about them you search the Web—the most general category. To find new product announcements and gallery shows you search News. To find videos on photographers or techniques you might search YouTube. You can also search other photo sources such as Flickr ([www.flickr.com](http://www.flickr.com)).

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[flickr.com](http://www.flickr.com)), [pinterest \(www.pinterest.com\)](http://www.pinterest.com), Instagram ([instagram.com](http://instagram.com)) and Getty Images ([www.gettyimages.com](http://www.gettyimages.com)).

### ■ Don't Get Depressed

Search the Internet for photos using broad themes such as sunsets, snow storms, barred owls and so on to see the magnitude of what's already out there. (Learn how to use the search engine to find photos). Do the same by searching Flickr ([www.flickr.com](http://www.flickr.com)) and Getty Images ([www.gettyimages.com](http://www.gettyimages.com)). What you'll find are hundreds if not thousands of technically perfect but uninteresting photos. Few make you pause and wonder about the world around you or elicit the excitement that comes from seeing the world in a new way. It's getting harder and harder to find the wheat amongst the chaff because there is so much on-line.



*There may be a lot of sunset pictures on the Internet but very few of swimming pig races. Look for the unusual scenes that capture the reality of life.*

### ■ Meeting Your Predecessors

Berenice Abbott, Ansel Adams, Diane Arbus, Eugene Atget, Dorothea Lange, Matthew Brady, Walker Evans, Robert Frank, Man Ray—it seems as if the list of great photographers goes on and on. Knowing the work of these people is important because it's difficult to take great photographs without being familiar

with the personal styles of those who made great photos before you. It's this background that makes it possible to evaluate your own work and find your own style in the context of what's preceded you. As you begin your study of photography be sure to include photographers and not just techniques. Go to your local library and see what books they have on photography—especially books of photos by leading photographers in the history of photography. Books you might specifically look for include:

- *The Photographer's Eye* by John Szarkowski, the late photography curator at the Museum of Modern Art, is an introduction to the art of photography that brings together pictures by both masters and unknown photographers. The pictures are divided into five sections, each an examination of one of the particular sets of choices imposed on the artist with the camera: The Thing Itself, The Detail, The Frame, Time and The Vantage Point".
- *Looking at Photographs*, also by John Szarkowski, features 100 photos with accompanying texts that discuss the photos and the photographers.
- *Why People Photograph* by the highly respected photographer Robert Adams is a wonderful discussion of photography. When discussing his like for photographers he says "I account for this by a quality they share—animation. They may or may not make a living from photography, but they are alive by it".
- Sunsan Sontag's *On Photography* is a collection of essays about aspects of photography in the real world. Included are statements such as "A family's photograph album is generally about the extended family—and, often, is all that remains of it" and "In America, the photographer is not simply the person who records the past, but the one who invents it".

If you find any images in the books that you really like, search the Internet for more information about them and the photographers who took them. You might also want to visit the Web site of the Photo-Eye bookstore at [www.photo-eye.com](http://www.photo-eye.com).

### ■ Be Hip, Visit Galleries and Museums

Buy an old beret on eBay and go visit galleries or museums to see actual prints. Reproductions in books are just approximations of fine prints made by the photographers who took them. Shows are generally heavily promoted in local newspapers so you should be able to find some, even if you have to wait until your vacation or business travel takes you to a place that has them. One way to find them is to search the Internet for your area of interest followed by "photography galleries" as in "Boston photography galleries". You can then visit each gallery's Web site to see what shows are currently on display or planned.



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### ■ Building a Room-sized Camera Obscura

Albano Morrell goes into a room and turns it into a camera obscura. He photographs the projected image and some of those photos have been published in a book called “*Camera Obscura*”. To see some of Albano Morrell’s work and learn more about him, visit his site at [www.abelardomorell.net](http://www.abelardomorell.net). It’s amazing that in less than an hour you can do as he does and turn an entire room into a camera obscura with some black plastic and tape to cover the windows, a dime-sized hole for the light to enter, and a wall across from the hole where the image is projected. From the first moment you first see the outside world projected huge and upside down on the wall, complete with people and cars in motion, you will be fascinated. To learn more about creating your own camera obscura, search the Internet for the phrase “building a room-size camera obscura”. One good site for a more serious camera obscura, including using a lens to brighten the image, is at [www.funsci.com/fun3\\_en/skylsky.htm](http://www.funsci.com/fun3_en/skylsky.htm).

### ■ You Have the Right to Remain Silent

Bert P. Krages II’s *The Photographer’s Right* is a downloadable guide that is loosely based on material from the ACLU Web site ([www.aclu.org/free-speech/known-your-rights-photographers](http://www.aclu.org/free-speech/known-your-rights-photographers)). It’s a PDF file that you can print out and carry so you know your rights and obligations if confronted over your photography. Download it at [www.krages.com/phoright.htm](http://www.krages.com/phoright.htm) and be sure to read it—especially the parts on how to peacefully resolve a confrontation. Another source is [www.andrewkantora.com/legalrights/Legal\\_Rights\\_of\\_Phottographers.pdf](http://www.andrewkantora.com/legalrights/Legal_Rights_of_Phottographers.pdf).

### ■ Watching Videos on Almost Anything

YouTube is a valuable source of information on photography. For example, searching for a somewhat obscure topic such as “stroboscopic photography” lists over 100 videos, most of which have some relation to the topic. Be specific in your searches. For example, searching for something as specific as a camera model yielded over 7,000 videos. In this project list some questions you might have and then try to find videos that answer them. When searching some topics you may be overwhelmed with the listings. One clue to which are worth reviewing in more depth is the number of views the video has had.

You can also search YouTube or the entire Internet for “interview with Robert Frank”, substituting any photographer’s name, and you’ll find an amazing amount of first person material.



This Youtube video on Joel Meyerowitz and street photography is just one of the hundreds of useful videos. [www.youtube.com/watch?v=5Qjym5uliDw&feature=share&list=PLF932CAE0671EC5C6](http://www.youtube.com/watch?v=5Qjym5uliDw&feature=share&list=PLF932CAE0671EC5C6)



Although best known for his landscapes, in 1943, Ansel Adams documented the Manzanar War Relocation Center in California where Japanese-Americans were interned during World War II. This scan of one of his images shows “Farm, workers, Mt. Williamson in background, Manzanar Relocation Center, California”. Courtesy of the Library of Congress at [www.loc.gov/pictures/collection/manz/](http://www.loc.gov/pictures/collection/manz/).



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### ■ Don't Just Stand There

Photographers almost always take photos from a standing position so the view we get is a familiar view. However, it often helps to change the camera position as William Eggleston did in one of his most famous photos of a tricycle you can find on the Internet by searching for “Tricycle and Memphis “. Look at the bike which is monumental due to the low angle of view from which it's taken. Try using this angle of view in some of your own shots.



*Photographing from ground level totally changes the perspective.*

### ■ Cameraless Photographs

*Photograms*, photos created without a camera, were widely used in the last century by a number of photographers including Man Ray, who referred to them as “rayographs”. The basic idea is to arrange physical objects directly on a light sensitive paper in a darkened room, expose the entire composition to light and then develop the resulting image. Man Ray and others made their photograms in their darkrooms using photographic paper which they then processed using darkroom chemicals—developer, stop bath and fixer. However, you can explore the field on your own using a different kind of paper which you work with in room light, expose in direct sunlight and develop in water. Search the Internet for “Man Ray”, “Rayographs”, “photograms” or “laszlo moholy-nagy photograms” to learn more about the artists and images. Using what you learn create your own photograms. To find the necessary materials search the Internet for “sun sensitive paper”. Follow the instructions that come with your kit or on the manufacturer’s Web site. If you want to get a little farther into this, search the Internet for images and information on creating a “cyanotype” (also known as a blueprint) which is much the same as the process described above but lets you paint a photo sensitive solution on a paper or cloth substrate before exposing it.



*Henry Peter Bosse cyanotype. Wagon Bridge at Fulton, Ill., 1889; cyanotype #198 from Mackenzie album. Courtesy of Wikimedia Commons.*

### ■ Going Negative

For well over a century, photography was based on the positive/negative concept first developed by Fox Talbot in England in 1839. In this system the camera captures a negative image of the subject. It is only when the negative is printed that you see the positive image. You can see this effect with sun sensitive paper. To do so you use a photo-editing program to convert a color photo into a grayscale image and then invert its tones. You then print the negative onto a sheet of acetate paper designed for your printer and place it on top of a sheet of sun sensitive paper, covering both with a thick sheet of acetate to press them together. In a few hours a positive image will appear on the paper. For more information on the materials you need search the Internet for “inkjet acetate” or laser printer acetate” depending on what kind of printer you plan on using.

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*A negative (left) is printed to create a positive (right).*

### ■ Shooting From the Hip

Garry Winogrand was famous for his off-kilter tilted images that give the feeling they were taken without looking through the viewfinder—a technique often referred to as “shooting from the hip”. Some think Winogrand did shoot this way at times because of his images’ characteristic tilt. Apparently though, Winogrand at some points denied that he used this technique because it would diminish his control over the framing of an image. Whether he did use this technique or not, it has been used by a number of very successful street photographers including Robert Frank and William Klein. In this project search the Internet for “Garry Winogrand photographs” to see some of his work, then search for “shooting from the hip” or “photographing not looking through the viewfinder”. Using what you learn try shooting from the hip to capture some pictures of your own. You can do so by holding the camera at your side, hanging it around your neck, having it peak out from under an open coat, or by tilting the monitor so you are looking down instead of at the people you are photographing. At this early stage use a wide angle lens, autoexposure and autofocus. Later you may want to try zone focusing discussed in another chapter. (To avoid drawing attention you may also want to mute camera sounds, turn off AF illumination, and even turn off or close the monitor.)

### ■ Finding a Theme

Having a theme for your photography lets you explore a subject in depth and focuses your efforts. The goal of this project is to put together ten or more photos that illustrate a single theme. This project is being introduced here so you have time to complete it while finishing the rest of this book.

Many photographers work on themes over a relatively short time frame, some juggle multiple themes at the same time, and others follow a single theme for years, or even an entire lifetime. Atget spent his life documenting Paris and its

environs. William Henry Jackson spent most of his best years documenting the American West but also did photography in other areas.



*One of the most amazing themes was Edward Curtis’s attempt to capture the disappearing first peoples’ cultures. For more on his efforts search the Internet for his name.*

photographers such as W. Eugene Smith were photojournalists so their photography was thematic until a story was finished, then they moved on. Jacob Riis and Lewis Hein took photos to illustrate their articles, books and presentations—exposing as only photos could—child labor and other byproducts of the newly emerging industrial age. As you study photography, you may find you also want to photograph around a theme. For now, just think about, and make a list of the themes that might interest you. One book to look for is Lee Friedlander’s *America by Car* with photos taken over a decade. You can also find photos from this book on the Internet. Lee Friedlander was asked about how he worked in themes. “Do you work on a series of pictures about a particular subject “ He responded “I just work and I throw the pictures in a box that says “X” or whatever, and eventually if the box gets full it merits looking at. I often work on two or three or four of those things at once. People tell me that they all look like



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they've been well thought out, and that's because I've worked on them for so long". (From *Maria: Photographs by Lee Friedlander* an edition from the Smithsonian Series *Photographers at Work*.)



"Bandit's Roost, 1890, New York City". Photograph by Jacob Riis, and featured in his book *How the Other Half Lives* (1890). Courtesy Wikimedia Commons.

One moving theme is featured in Martin Usborne's book "The Silence of Dogs in Cars." To see images from this work visit [www.martinusborne.com/dogs-in-cars](http://www.martinusborne.com/dogs-in-cars). Another theme to consider uses photos to do what Jason Polan does with drawings in his "Things I Saw" column in the New York Times. To see his work search the Internet for "Jason Polan things I saw". You can also look for his book "The Land Can Handle It" featuring some of his photos from a road trip. Finally, check out Todd McLellan's disassembly photos at [www.toddmclellan.com/thingscomeapart](http://www.toddmclellan.com/thingscomeapart).

Some other themes that might get you thinking of your own include the following:

- Numbers, letters, symbols, shapes or colors.
- Instructional series—making, fixing or using something
- Activities such as baseball, football, dancing
- Abandoned artifacts and properties
- Details of an old car or motorcycle
- Local shops and shop owners
- Architectural details
- Signs old and new
- Collections of things such as stamps, juke boxes
- Bins in an antique store
- Drawers in your house
- Doors
- Reflections of signs, people, landscapes
- Night life
- Events such as a concert, birthday, wedding
- Illustrating a calendar
- Nature in your backyard or neighborhood
- People
- Life on your dorm floor
- The activities of a group or organization.

### ■ Two Views of the American West

Both Ansel Adams and Robert Adams photographed the American West. Aside from their last names, they shared very little when it came to photography. Ansel captured the grandeur, the storms, the timeless beauty of the places he went. Robert, on the other hand, photographed man's intrusion into these places and showed more of what it now is rather than what it once was. Search for both of these photographers on the Internet or in books to get an idea of how each saw the West as a place. Then, using what you've learned do some landscape photography of your own.

### ■ I Have No Objections

Everyone is anxious at first of taking photos of strangers. Walker Evans and countless others used a right-angle lens, Cartier-Bresson used a 50mm lens and stood back or hid. In a 1974 Interview at MIT Garry Winogrand who shot millions of in-your-face photos was asked "What happens when someone catches you catching them?" Winogrand answered "Look, I'm not invisible". and then continued "Look, I do it a great deal. And I'd say that it just about never happens that anybody objects. Just about never". People who photographed with him said he was always smiling at the people he was photographing, and occasionally nodded or even stopped to talk to them. Diane Arbus had a softer approach, talking quietly to people before she photographed them. In this project, take photos of strangers to get over your fear of doing so without hiding and shooting secretly. You should be able to find a style that works for you and makes you feel comfortable.





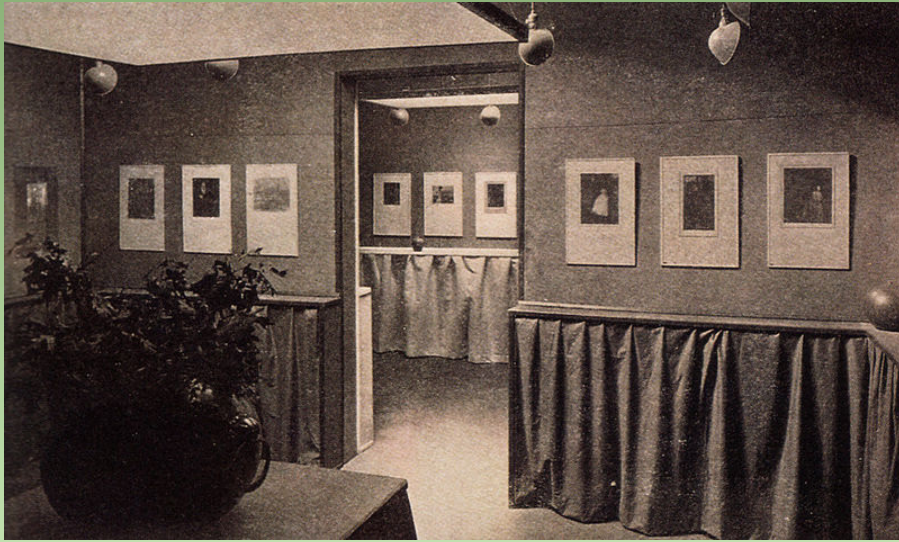
*A shell store along the Florida Coast is lit from overhead so the shark's jaw stands out against the dark open doorway.*

## ■ Stieglitz and Georgia O'Keeffe

In the early 1900s Alfred Stieglitz did a series of photos of the hands of his wife, the artist Georgia O'Keeffe. As she said years later "Stieglitz photographed me first at his gallery "291" in the spring of 1917. ... My hands had always been admired since I was a little girl—but I never thought much about it. He wanted head and hands and arms on a pillow—in many different positions. I was asked to move my hands in many different ways—also my head—and I had to turn this way and that. ... Stieglitz had a very sharp eye for what he wanted to say with the camera". Search the Internet for "Stieglitz photos of Georgia O'Keeffe's hands" to get an idea of what he was after. Use what you learn to photograph someone else's hands—they can say so much.



*Photograph of Georgia O'Keeffe by Alfred Stieglitz in 1918. Courtesy of Wikimedia Commons.*



The Little Galleries, at 291 Fifth Ave New York is where Alfred Stieglitz introduced Americans to modern art and photography.

## ■ Cartier-Bresson on Cropping

Many photographers are opposed to cropping images in a photo-editing program. Henri Cartier-Bresson was one of the most outspoken critics of cropping, although he did crop occasionally. A firm believer that you composed images in the viewfinder and not in the darkroom he sometimes demonstrated that his images weren't cropped by having them printed with a border created by the unexposed clear negative around the image area. In 1958 he was asked by an interviewer "You've been known for never cropping your photos. Do you want to say anything about that?" He responded "About cropping? Uh, I said in that forward, we have to have a feeling for the geometry of the relation of shapes, like in any plastic medium. And I think that you place yourself in time, we're dealing with time, and with space. Just like you pick a right moment in an expression, you pick your right spot, also. I will get closer, or further, there's an emphasis on the subject, and if the relations, the interplay of lines is correct, well, it is there. If it's not correct it's not by cropping in the darkroom and making all sorts of tricks that you improve it. If a picture is mediocre, well it remains mediocre. The thing is done, once for all". Search for "Henri Cartier-Bresson images" on the Internet and see if you can crop a more interesting image out of the one he took.



Henri Cartier-Bresson exhibit. Courtesy of Sonia Fantoli and Wikimedia Commons.

## ■ History of Photography in Mexico

Fine art photography has a long tradition in Mexico. In fact, two of the most famous photographers, Manuel Alvarez Bravo and Tina Modotti were both encouraged by Edward Weston. For example, Weston wrote a letter of encouragement to Bravo in 1929 in which he told him "Photography is fortunate in having someone with your viewpoint. It is not often I am stimulated to enthusiasm over a group of photographs". The relationship between Weston and Modotti was so close they opened a portrait studio together in Mexico City where Weston lived for three years.

Visit Bravo's Web site at [www.manuelalvarezbravo.org](http://www.manuelalvarezbravo.org) and search the Internet for "Tina Modotti" to learn more about these well-known photographers.

## ■ Quotes to Drop

Every well-read photographer has some favorite quotes that they find a way to drop into a conversation. You can take a shortcut to finding your own favorites on a number of Internet sites. One site to visit is [www.photoquotes.com](http://www.photoquotes.com) that has thousands of quotes such as Garry Winnogrand's "Photography is not about the thing photographed. It is about how that thing looks photographed" or when asked how he felt about missing photographs while he reloaded his camera with film, he replied "There are no photographs while I'm reloading". Once you



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find and memorize a few favorite quotes you'll be ready to drop them into your own conversations, sounding much more knowledgeable than you really are.



*The white Iris (with Tina Modotti) taken by Edward Weston in 1921. Courtesy Wikimedia Commons.*

## ■ See What's Happening in Photography

Browse the Web site for *Photograph* magazine, a resource on fine art photography exhibitions, events, news, reviews, profiles and resources. They even have an iPad app you can use to order single copies [www.photographmag.com](http://www.photographmag.com).

## ■ TED Talks on Photography

There are a number of interesting TED talks on photography at [www.ted.com](http://www.ted.com). One you might want to search for once you go to their site is by the photo director for National Geographic, David Griffin. In a talk filled with images, he talks about how we all use photos to tell our stories. The talk is called *David Griffin: How photography connects us*. Another talk, with amazing time lapse photography is "Louie Schwartzberg: The hidden beauty of pollination". You can find other sites by searching the Internet for "Louie Schwartzberg".



*Filmmaker Louie Schwartzberg (right) talks with Chip Taylor (left) in one of the monarch preserves while filming "Wings of Life".*