

Canon 80D Experience

The Still Photography Guide to Operation
and Image Creation with the Canon EOS 80D

an e-book by:
Douglas J. Klostermann



PREVIEW of:

Canon 80D Experience

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and Image Creation with the
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by

Douglas J. Klostermann

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Canon 80D Experience - *PREVIEW*

The Still Photography Guide to Operation and Image Creation with the Canon EOS 80D

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1. INTRODUCTION

The introduction of the Canon EOS 80D brings about several important updates to its highly competent predecessor, the EOS 70D. Many of the camera's essential specifications have been improved, including the addition of Canon's new 45 point Viewfinder autofocus system, a 24.2 megapixel sensor, an improved 7560-pixel RGB+IR metering sensor, and built-in Wi-Fi with Near Field Connection (NFC). Plus the 80D boasts a fast 7 frames per second continuous shooting speed, Digic 6 processor, Touch Screen Monitor, and several improvements to its HD video capabilities including the 1080 at 60p/50p frame size and rates, a headphone jack, and more precise control of autofocus during video recording.



Figure 1 - Detail of the Canon EOS 80D.

The customizable 45 point Viewfinder autofocus system, with all cross-type points spread widely across the Viewfinder, will allow you to focus exactly where you desire without necessarily having to lock focus and recompose. And when tracking moving subjects with *AI Servo* Autofocus Mode, the 45 AF Points will allow you to more successfully retain focus on a wide variety of different types of subjects during sports, action, and wildlife shooting. The four AF Area Selection Modes, ranging from a *Single-Point*, to a *Zone* or *Large Zone* of several points, to all 45 points, will enable you to more easily keep subjects of different sizes and motions located at the active focus points. The camera's *Custom Controls* menu will allow you to assign numerous different

options to various camera buttons, giving you quick access to the functions and settings you use most frequently.

The improved *Dual Pixel CMOS AF* autofocus system will enable you to quickly and accurately track and focus on a moving subject, virtually anywhere in the frame, when working in Live View or shooting video. When combined with one of Canon's STM "stepping motor" or NANO lenses, this can even be accomplished with considerably reduced lens operation noise and faster autofocus speeds. The 7 frames per second (fps) continuous shooting speed will enable you to capture exactly the right moment, expression, or peak of action, and the fast frame rate can be maintained for a continuous burst of up to 25 RAW images or 110 JPEG images. A new *7,560-pixel RGB+IR* metering system includes the option of using color information to assist with initiating and retaining focus on human subjects, which is ideal for sports and action situations. The improved metering system also allows for the new flicker detection feature, which can help to eliminate inconsistent exposures when shooting a continuous burst under certain types of lighting.



Figure 2 - Fallen Birch and Leaves - Whipple Hill, Lexington, Mass. - Canon 80D, Shutter speed 1/100, Aperture f/5.6, ISO 500.

The 80D also includes wireless flash control via the built-in flash, better low-light capabilities at high ISO settings, an internal mirror vibration control system to help reduce internal camera movement that might cause image blur, Interval Timer and Time-Lapse shooting, and in-camera processing and lens correction features such as

Multiple Exposures, HDR shooting, and chromatic aberration and distortion corrections. Expanded Auto ISO capabilities make this feature much more versatile, including when shooting in Manual (M) Mode for stills or video. And for capturing HD video, the 80D offers higher ISO capabilities, a new HDR movie mode, and the ability to apply Creative Filters such as *Dramatic Black and White* and *Miniature Effect* to videos.

With its high-resolution, high-quality image sensor, 45 point autofocus system, 7 frames per second continuous shooting speed, 7,560-pixel exposure metering system, Digic 6 processor, and high ISO capabilities in low light, the Canon 80D enables photographers to consistently capture sharp, clean, and well-exposed images. Borrowing from the improved features of the Canon 7D Mark II, the 80D also boasts a big and bright Viewfinder with 100% coverage, a ruggedly built and weather-sealed body, and numerous customization options. The 80D is clearly a powerful, advanced tool for digital photography and is fully capable of capturing professional quality images in most any situation you wish to use it.

But the 80D is merely a tool. It is up to you to make use of its features and capabilities to create the images you envision. While the camera's manual will tell you about the settings and controls, how to change them, and their intended functions, this guide will build upon that and explain when and why you may want to use and customize them. Every button, feature, menu item, and Custom Function setting of the 80D is there for a reason: to help you capture the images you want. Some of them are more useful to different types of photographers and shooting situations and you don't necessarily need to learn and use them all immediately, but this guide will help to give you the knowledge to confidently use the ones that turn your Canon 80D into an image capturing tool that works best for you and the photography situations you work in.

1.1 Take Control of Your Camera

Since the camera is a tool to take the images *you* want to take, you obviously can't always allow the camera to make decisions for you. You have to take control of the camera to ensure that you capture exactly the images you intend - by autofocusing precisely where you want, setting the aperture or shutter speed that you want, and obtaining the exposure you want. While the 80D is an intelligent camera, it cannot read your mind and your intentions and does not know that you wish to focus on and properly expose the closest leaves, while making the background branches appear out of focus, and the leaves to be caught still and not blurred from the motion of the wind, on this bright and sunny day (see *Figure 3*). You have to tell the camera to do all of this through the various controls and settings, such as the autofocus AF Mode (focus on the near leaves), the Exposure Metering Mode (properly expose for the leaves and the scene), the Aperture setting (the out-of-focus background), the Shutter Speed (freeze the motion of the leaves), the ISO (bright day) and the White Balance (sunny day).



Figure 3 - Leaves, Whipple Hill, Lexington, Mass. - Autofocus, exposure metering mode, aperture, shutter speed, ISO, and white balance all considered in capturing this image. Shutter speed 1/800, Aperture f/3.5, ISO 200.

One has to think about all this stuff for every photo? Well, yes, that is what digital SLR photography is all about! At least if you wish to consistently create the well made, interesting, and compelling images you envision. And that is why the 80D has all the buttons, controls, custom functions, and features for you to make use of.

Learning to use and get the most out of a highly advanced digital SLR (dSLR) camera like the 80D takes time, practice, patience, mistakes, and experimentation. If you have upgraded from a previous dSLR such as the EOS 60D or one of its predecessors, or from a Rebel such as the T5i/700D to the 80D, you are in for a treat. The additional features and capabilities will more easily help you to capture images and photographs that you may have been limited in consistently attaining before. The versatile and accurate autofocus system coupled with its rapid continuous shooting speed, plus its exposure metering system and high ISO capabilities will help you capture sharp images of subjects and moments that previously you may have missed, especially in action and in lower light situations.

If you are relatively new to dSLR photography and are still in the process of learning all the controls of a dSLR and the exposure concepts of digital photography, you have perhaps ventured towards the proverbial deep end of the pool by choosing the advanced 80D! But don't worry, this book will help guide you through its features,

controls, and capabilities. Be sure to take it slowly and patiently as you learn the features and concepts that I will explain. With practice and experience you will soon be shooting with confidence and can begin to take advantage of the camera's more advanced functions. Even if you are an intermediate photographer, don't expect to just pick up all the new information at once, in one or two readings of a single book. (In fact, you wouldn't want to, as the never ending journey of learning and mastering photography is a big part of what it's all about!) Try not to become frustrated if you don't quite understand something or aren't always getting the results you desire. Instead learn the controls, functions, settings, and concepts bit by bit, try them out in real life shooting situations, and return to this guide, the manual, and other photography books to address questions and problems you encounter. Continue to learn and to photograph often and it should all begin to come together, sometimes slowly and sometimes in rapid bursts of discovery and understanding.

1.2 Using This Guide

There are many different ways to use a dSLR camera and its controls to capture images, and many diverse situations in which photographers work. I'm going to concentrate on the techniques that I believe are the most practical, useful, and effective for the majority of photographers using the 80D. The settings and techniques I discuss can apply to various types of photography including general photography, action, portrait, and travel photography. Once you have a firm grasp of the controls, settings, and basic techniques you will have the tools and knowledge to address different issues, specialized situations, and challenging scenes, and I encourage you to experiment and continue to learn.

Since this guide is intended to help you get the most out of your 80D, it will not go into extensive detail about the automatic features. The Canon 80D is a highly sophisticated tool that deserves to be used to its full potential, and that involves taking control of the camera and its functions, which means taking it off Auto+, off Program, and off automatically selected auto-focus points when not required. While this may be more challenging for some users at first, these are the techniques that are necessary to take full advantage of the capabilities of any dSLR, including the 80D, and will lead you to having more control and consistency over your image making. Hopefully this will inevitably lead to better images!



Figure 4 - Swimming Duck, Arlington Mass. - Canon 80D, Shutter speed 1/250, Aperture f/4.0, ISO 100, Exposure Compensation +2/3.

This guide is intended to be used with the camera in your hands. That is the best way to directly follow and understand the controls, functions, and settings as they are being explained. It is also intended to be used in conjunction with and in addition to the camera's manuals, not to completely replace them, so every bit of information in the *Canon EOS 80D Instruction Manual* and in the *Wi-Fi manual* will not be repeated here. Among the often brief descriptions and sometimes frustratingly incomplete or disjointed explanations in the Canon manuals, there is some very valuable information as well as the basics for buttons, controls, and how to access and change most all the settings. Following what seems to be a new trend, the camera does not come with printed versions of the full *Instruction Manual*, the full *Wi-Fi Function Instruction Manual*, or the software instruction manuals - only the PDF versions of them which can be found on the included discs. All of these manuals can also be obtained as a PDF files from the EOS 80D page on the Canon website, under the *Manuals* tab, then the *Guides and Manuals* sub-tab:

<https://www.usa.canon.com/internet/portal/us/home/support/details/cameras/dslr/eos-80d>

If you have an iPad or tablet you will find that it is helpful to download all the manuals onto your device for reading and reference (along with this e-book). As you can see, there is a lot to make sense of regarding terminology and controls, so I recommend that you familiarize yourself with the controls and displays of the camera body, as shown on

pages 26-31 of the *Canon EOS 80D Instruction Manual* and explained in the following chapter of this book. Also, read through the Canon manual at some point and attempt to understand or absorb as much as possible. Yes, some of it may be complicated and confusing at first, but this guide will explain and clarify the numerous buttons, controls, menus, functions, and settings and explain how, when and why you will want to use them in your photography. Also be sure to read and follow all the official use, safety, and handling instructions and precautions explained in the manuals provided with the camera and software, including those on pages 20-25 of the *Canon EOS 80D Instruction Manual*. Additional cautions throughout the Canon manual are important to read because they explain things such as the high internal temperature that the camera can reach due to prolonged Live View / movie use, and how using a non-compatible external flash can cause your camera to malfunction. Live View cautions are on pages 290-291 of the Canon 80D manual, and movie shooting cautions are on page 302.



Figure 5 - Detail of the Canon EOS 80D.

Various settings of the 80D can be controlled in multiple ways: using the buttons and dials on the camera body while reading the settings on the top LCD Panel or in the Viewfinder, through the Quick Control Screen accessed with the [Q] Button or [Q] icon on the Touch Screen and read on the rear LCD Monitor, in the menus accessed with the Menu Button, or even by customizing the buttons and controls on the camera body via the Custom Functions. Explore the options, which will be explained throughout this guide, and find the ways that work most quickly and intuitively for you.

3.2 Shooting Menus

Shooting 1 menu

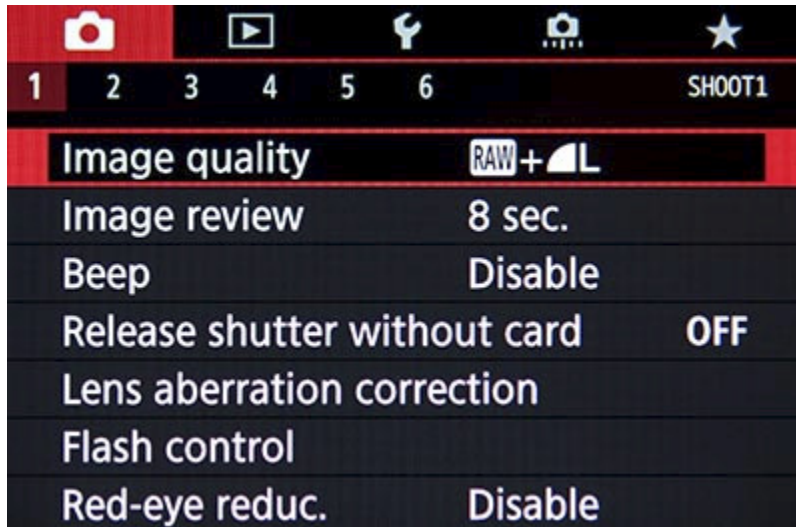


Figure 32 - Shooting 1 menu.

Image Quality

You are putting a lot of effort into taking your images, and the 80D provides an exceptional sensor on which to record them. You should take advantage of this and make sure the files are of the best possible quality - unless you have a specific reason to save smaller size files, such as creating them for immediate use on social media sites. Though even then you can capture the full size image and use Resize to create a smaller copy, in-camera.

Set either the highest quality RAW setting if you shoot RAW, or the highest quality and largest JPEG setting (*Fine/Large*) if you shoot JPEG, or both combined if you need both types of files (see *Figure 33 - left*). If you only wish to capture one file type, select the dash icon for the other, to indicate that you don't wish to select the other file type. The different file formats, including M RAW and S RAW, will be discussed in the **Image File Formats - JPEG vs. RAW** section of the text in Chapter 5. When working in Live View, the Image Quality can be set on the Live View Quick Control Screen. On that screen, press the INFO Button to access the RAW Image Quality options (see *Figure 33 - right*).

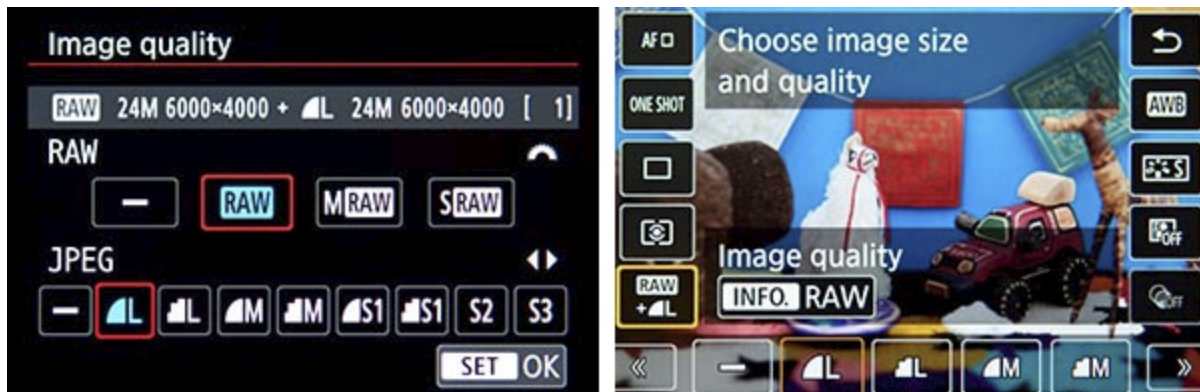


Figure 33 - Left: The Image Quality menu, used to choose for images to be saved as RAW and/ or JPEG files. Right: Selecting Image Quality on the Live View Quick Control Screen.

Image Review

This is the length of time that the image you just took stays visible on the rear LCD Monitor. Select *2 sec.*, *4 sec.*, or *8 sec.*, or *Hold* for the image to remain on the screen until you tap the Shutter Button or turn one of the dials (see Figure 34 - left). If you don't always review your images, you may wish to leave it *Off* to save the battery, then hit the Playback Button quickly (and soon instinctively) when you want to review an image on the LCD Monitor. Also, you can interrupt the 2, 4, or 8 second Image Review time by tapping the Shutter Button when you are finished reviewing and ready to return to shooting.

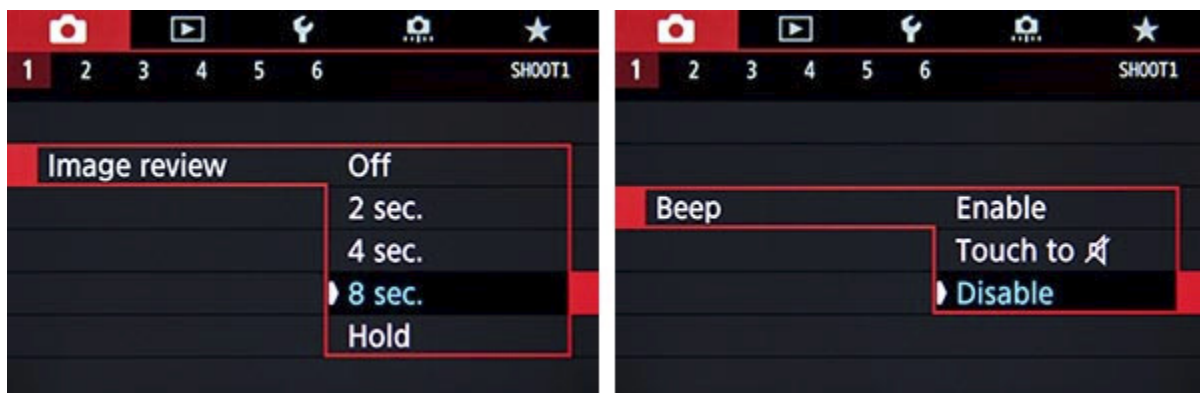


Figure 34 - Left: Image Review menu screen and options, for setting the duration that an image stays visible on the LCD Monitor immediately after capture. Right: Options for the Beep setting.

Beep

The camera will beep when it achieves focus, as well as when using the Touch Screen and the self timer. *Disable* if you find it annoying or unnecessary, or set for *Touch to (mute)* if you wish to enable it except for when using the Touch Screen (see Figure 34 - right).

Release Shutter Without Card

This setting prevents you from taking photos if there is no memory card in the camera, and is typically used for camera stores to demo the camera even without a memory card inserted.

*Disable. **Please!*** You do not want to take 800 images of your niece's wedding and discover there was no memory card in the camera (see *Figure 35 - left*). Test it to make sure you set it properly.

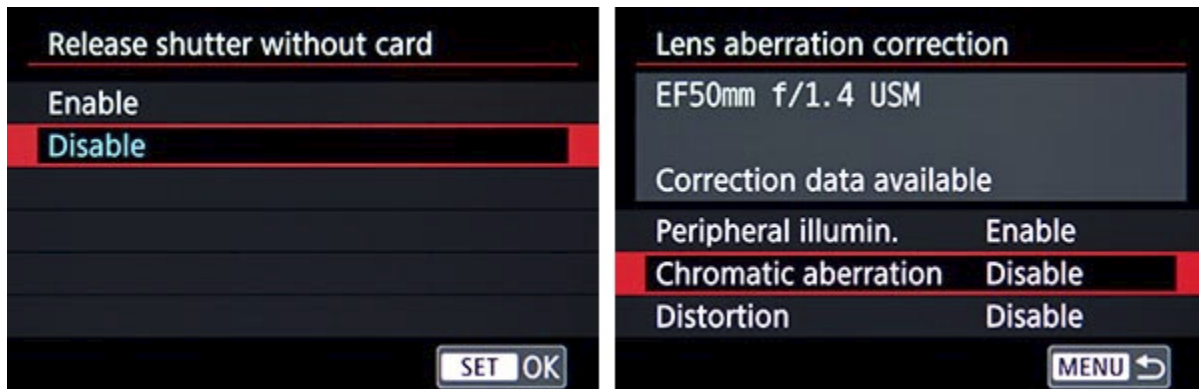


Figure 35 - Left: Be sure to Disable the “Release shutter without card” setting so that the camera will not take images unless a memory card is inserted. Right: Lens Aberration Correction menu for the camera to automatically correct for lens issues when using Canon lenses.

Lens Aberration Correction

These menu options can be used to automatically correct images for image quality issues introduced by the optical characteristics of some lenses. The correction information for 30 Canon lenses is available, and you can use the included *EOS Utility 3* software to enter the data of other lenses.

Peripheral Illumination Correction will correct for darkened corners of an image that occur with certain lenses or at certain focal lengths, such as when using a very wide-angle focal length. If you wish to use this setting, attach the lens then access this menu to see that the correction data is available, then set for *Enable* (see *Figure 35 - right*). Using this option may introduce digital noise to the area being corrected. This correction can also be made with the included Digital Photo Professional (DPP) software, which contains Canon lens profiles, as well as the latest versions of Adobe Camera Raw and Lightroom which also include specific lens profiles. The in-camera correction amount will be lower than what you can apply in DPP.

Chromatic Aberration Correction is color fringing caused by different colors, which travel at different wavelengths, not focusing at exactly the same spot on the sensor. This can cause an image to appear less sharp and to have fringes of color along light/ dark boundaries. As with above, if you wish to use this, attach the lens before accessing this menu to see that the correction data is available before setting for *Enable*.

Distortion Correction is used to automatically correct barrel or pincushion distortion (the apparent curving of an image) caused by a wide angle or a telephoto lens. Barrel distortion is a curving outward of horizontal and vertical lines, usually increasing toward the edges of the frame, and is typically caused by wide angle zoom lenses. Pincushion distortion is a curving inward of horizontal and vertical lines, usually increasing toward the edges of the frame, and can be caused by telephoto zoom lenses. Enabling this feature may slow down image recording and decrease the burst rate, so you won't want to use it during continuous shooting such as for sports or action situations.

You may wish to use this correction with your Canon lenses that exhibit distortion, but if you do not want the camera doing this without any of your control, you can disable this and correct distortion in post-processing. Adobe Camera RAW, Photoshop, and Lightroom contain specific lens profiles to use in correcting for these types of issues.

I suggest you set each of these for *Disable* unless you have a specific issue with vignetting, chromatic aberration, and/ or distortion when using a particular lens. Then decide if you want the camera to deal with this or if you wish to address it in post-processing. Maybe put this item in My Menu to quickly access it if you sometimes need it with specific lenses (more about **My Menu** later in this chapter). Also, set for *Disable* when using non-Canon lenses. While you cannot apply these corrections to JPEG images that have already been captured, you can process RAW images in-camera to apply these settings after the image has been taken, as will be explained with the RAW Image Processing item in the *Playback 1* menu.

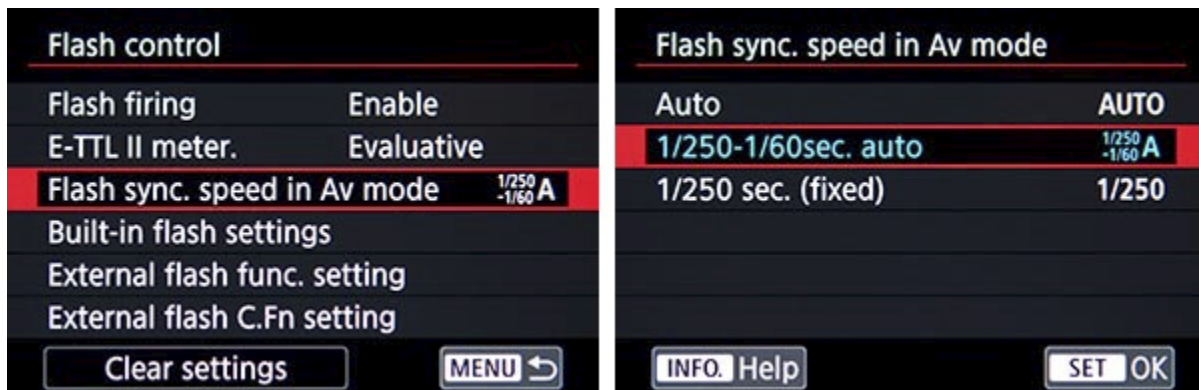


Figure 36 - Left: Flash Control menu, for built-in, wireless, and external flash settings. Right: The “Flash sync. Speed in Av mode” options.

Flash Control

These settings allow you to set the options for the built-in flash, as well as for an external flash if you have an optional Canon EX Speedlite attached and turned on (see *Figure 36 - left*). Some of the basic settings will be explained here, and then flash settings and flash use are further discussed in the **Flash** chapter of the text, including external flash and wireless flash use.

Flash Firing: *Enable* so that the internal or external flash will function. If set for *Disable*, the flash will only act as the AF-Assist Beam.

E-TTL II Metering: Set this for *Evaluative*.

Flash Sync. Speed in Av Mode: This setting determines the flash sync shutter speed setting or range that will be selected by the camera when using the built-in flash or an external flash while shooting in Aperture Priority (Av) mode (see *Figure 36 - right*). The setting you choose really depends on your use and experience with a flash, and whether or not you are using a tripod:

Auto will choose a wide range between 1/250 to 30 seconds, which may give you very slow shutter speeds in certain situations which might be too long for hand-held images.

1/250-1/60 sec. auto will keep it in a more reasonable range for hand holding, but won't allow you to "drag the shutter" slower than 1/60 second. (*Drag the shutter* means to use a slow shutter speed to let in more ambient light to better expose the background, as the flash illuminates the subject.)

1/250 sec. (fixed) keeps it fixed at the camera's sync speed of 1/250 at all times, which is the most "efficient" setting for external flash operation - meaning you won't be using settings that may give similar lighting results but which are causing your flash to work harder and inefficiently. The downside is you lose control of this setting and the ability to drag your shutter.

recommend: *Auto* will obviously give you the widest shutter speed range, but will require that you keep a close eye on the shutter speed to make sure it doesn't get too slow. If you have less experience with flash or aren't certain you will carefully keep your eye on the shutter speed, it would be wise to keep it set on *1/250-1/60 sec. auto*. Remember, this setting only applies to Av Shooting Mode.

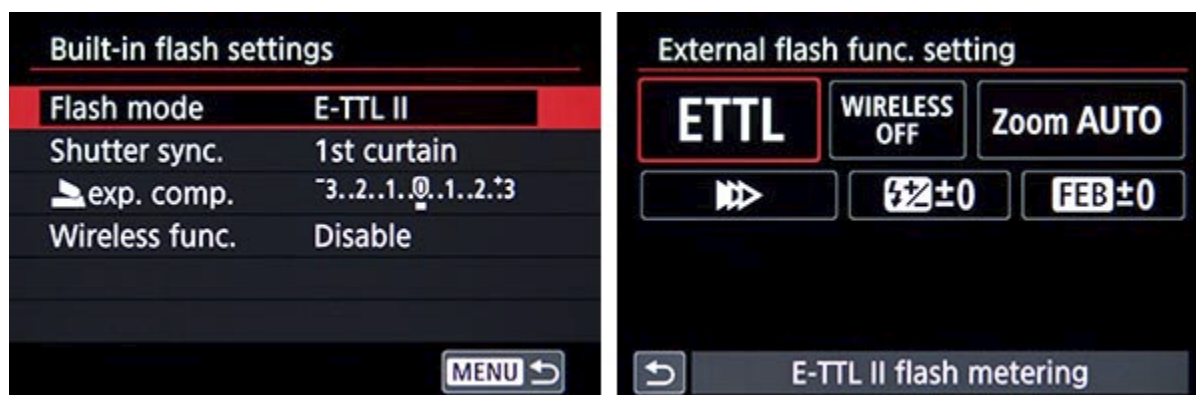


Figure 37 - Built-in Flash Settings menu (left), and External Flash Function Settings (right). Both of these are sub-menus of the Flash Control menu.

4. CUSTOM FUNCTION MENUS

4.1 C.Fn I: Exposure

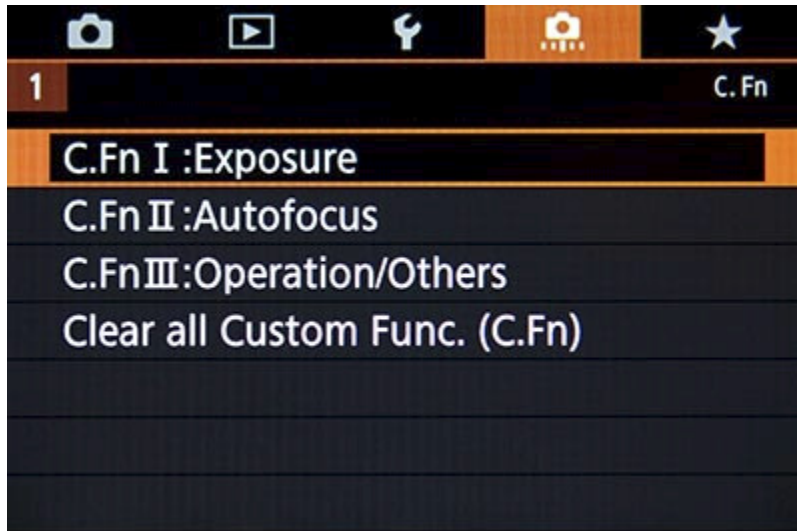


Figure 122 - Custom Functions C.Fn I: Exposure.

I-1: Exposure Level Increments

This is to change the increments of shutter speed, aperture, and exposure compensation available for you to select, either *1/3-stop* increments or *1/2-stop* (see *Figure 123 - left*). This will apply to the Shooting Modes where you can select your desired aperture setting and/ or shutter speed, such as Aperture-Priority (Av) Mode, Shutter-Priority (Tv) Mode, or Manual (M) Mode. This setting will also apply to the increments for Auto Exposure Bracketing (AEB) and Flash Exposure Compensation.

For example, to progress 1 full stop using *1/3-stop* increments, you will be able to select:

Aperture: f/5.6, f/6.3, f/7.1, f/8.0, etc.

Shutter speed: 125, 160, 200, 250, etc.

With *1/2-stop* increments, you can select:

Aperture: f/5.6, f/6.7, f/8.0, etc.

Shutter speed: 125, 180, 250, etc.

Set this based on your personal preference and what you are used to using for these increments. Many photographers prefer the greater precision of *1/3 stops*, which is generally the traditional and standard setting, but you may prefer the simplicity and ease of *1/2 stops* (which may also make “in-your-head” exposure calculations easier). Shutter speed, aperture, and Exposure Compensation will all be fully explained in the Exposure chapters of this text.

recommend: 1/3-stop



Figure 123 - Exposure Level Increments options (left), and ISO Speed Setting Increments (right).

I-2: ISO Speed Setting Increments

This sets the increments for ISO settings, either *1/3-stop* or *1-stop* (full stop), for when you manually set the ISO setting (see Figure 123 - right).

For example, to progress 1 full stop using *1/3-stop* increments, you will be able to select:

ISO: 100, 125, 160, 200, etc.

With *1-stop* increments, you can select:

ISO: 100, 200, etc.

When Auto ISO is used, the camera will always use *1/3-stop* increments, regardless of this setting. Again, the setting depends on your personal preference and what you are used to using. Many photographers prefer the greater precision of *1/3 stops*, which is generally the standard setting, but you may prefer the simplicity and ease of full stops. ISO is discussed in the **Exposure Part 1** chapter.

recommend: 1/3-stop

I-3: Bracketing Auto Cancel

Bracketing is when you take a series of the same image using different camera settings, in order to ensure that at least one of the images is correct, or to experiment, or for HDR purposes. Auto Exposure Bracketing (AEB) is when the camera automatically changes the exposure settings and takes this series of shots, according to your user-determined settings. This menu item sets whether or not Auto Exposure Bracketing or White Balance Bracketing is canceled when you turn off your camera (see Figure 124 - left). I recommend that you have this cancellation set for *On*, because if you have a shooting session where you are auto-bracketing, then use your camera the next day, you will probably have forgotten that it is set on bracketing, and then auto bracketing is going to occur and most of your shots are going to be improperly exposed. **Auto Exposure Bracketing** will be explained later in this text.

recommend: On



Figure 124 - Left: Exposure Bracketing Auto Cancel options to cancel Bracketing when the camera is turned off. Right: Bracketing Sequence options, to determine the order that Auto Exposure Bracketing (AEB) and White Balance Bracketing shots are taken.

I-4: Bracketing Sequence

This setting determines the sequence of exposures when using Auto Exposure Bracketing (AEB) or White Balance Bracketing. (The 80D can bracket either 2, 3, 5, or 7 shots, not just the traditional 3 shots - this number will be set with the next menu item.) The bracketing sequence setting depends how you like to order your bracketing, and this may be important to you if you do a lot of HDR work. Setting 0: 0, -, + means the “correct” exposure is taken first, then the darker exposure(s) (under exposed), then the lighter exposure(s) (over exposed), with “correct” meaning what the camera thinks is the proper exposure (see Figure 124 - right). Setting 1: -, 0, + means the order is darker, normal, lighter. Setting 2: +, 0, - means the order is over exposed (lighter), normal, under exposed (darker). An HDR shooter and their software may prefer setting 1: -, 0, +. This also affects the bracketing sequence for white balance (WB) bracketing so determine what sequence you want if you make use of WB bracketing.

When making use of White Balance Bracketing, the zero (0) in the series indicates the standard white balance. With White Balance Bracketing you can bracket along either the Blue/Amber axis or along the Magenta/Green axis, so the negative (-) will indicate either blue or magenta bias, and the positive (+) will indicate either amber or green bias. White Balance Bracketing will be explained in the **White Balance** section.

recommend: User preference. The second setting (1: -, 0, +) is suggested for HDR shooters if it matches their personal and software workflow.

I-5: Number of Bracketed Shots

This is to set the number of shots that are taken in an Auto Exposure Bracketing (AEB) sequence or a White Balance (WB) Bracketing sequence. The number you choose is obviously the number of shots that will be taken: 3, 2, 5, or 7 (see Figure 125 - left). Typically, bracketing is 3 shots, but those shooting for HDR work will want to take advantage of 5 or 7 shots.

recommend: varies by user



Figure 125 - Left: Number of Bracketed Shots options, to determine how many exposures are automatically taken during auto Bracketing. Right: Safety Shift options, to determine which exposure settings the camera will automatically change, if necessary, in order to obtain the correct exposure.

I-6: Safety Shift

The Safety Shift feature allows your camera to change an exposure setting without your expressed permission when it is vital to getting the shot (see *Figure 125 - right*). This is a good thing in certain situations, such as when shooting at a concert and the lighting and lighting-levels are changing erratically, or when shooting in very dim light without flash, and proper exposure may not occur based on your current aperture or shutter speed settings. It only functions in Tv, Av, or P Shooting Modes, based on the following options:

0: Disable - Safety Shift not used.

1: Shutter Speed/ Aperture will automatically change the current Shooting Mode's setting in order to obtain the proper exposure, meaning that in Shutter-Priority (Tv) mode it will change the shutter speed setting (which you are selecting when using Tv mode), and in Aperture-Priority (Av) mode it will change the aperture setting (which you choose when working in Av mode). So when using this option, realize that if the camera cannot obtain the proper exposure by changing the "other" exposure setting, it will change the exposure setting that you set. For example, if you are working in Shutter-Priority Tv Mode and have set the shutter speed at 1/1000 in order to freeze the subject, the camera will normally adjust the aperture setting in order to obtain the proper exposure. If the camera reaches the limit of the available aperture settings (the aperture is as wide open or as closed as it can be) and the proper exposure still cannot be obtained, the camera will then change the shutter speed that you set so that the proper exposure can be captured.

2: ISO Speed will work in Av, Tv, and P modes. In order to obtain the proper exposure, the camera will change the ISO speed. This may be the more desirable setting, since the low light capability of the 80D is very good even at high ISO settings, and that way you can allow the camera to adjust the ISO while

you set and retain the aperture or shutter speed setting you desire. But because you may not want the camera to automatically select an excessively high ISO setting in these situations, you will be able to dictate the minimum and maximum ISO settings that the camera will use.

The minimum and maximum ISO settings selected by the camera during Safety Shift are set in the *Auto Range* option of the *Shooting 2* menu > *ISO Speed Settings*. The camera will choose an ISO setting in that range unless you have manually selected an ISO setting outside that range, and in that case the camera may exceed the set range, up to your manually selected ISO. Safety Shift may override the *Range for Stills* or *Minimum Shutter Speed* that you also set in this *Shooting 2* menu > *ISO Speed Settings* if it needs to in order to obtain the proper exposure.

Consider enabling Safety Shift in unpredictable or erratically changing lighting situations, *except* when shooting with a flash and you need more precise control of the exposure settings to avoid blur and don't want the camera overriding your settings without you having control or even realizing it, as Safety Shift operates even when a flash is used. Failing to disable it during flash use may drive you crazy as you try to determine why the resulting exposures do not seem to be changing based on your settings changes, because the camera keeps over-riding your settings with Safety Shift. Keep this in mind if you are going to be photographing indoor events or receptions using a flash.

recommend: Set for ISO Speed when needed for certain shooting situations. Disable when using flash and controlling your exposure settings and flash output.

6. AUTOFOCUSING

6.1 Using Autofocus

One of the essential steps in taking a successful and sharp photo is controlling where the camera autofocuses. During Viewfinder shooting, if you allow the camera to autofocus by automatically choosing the focus point(s) (such as in Auto+ Shooting Mode or with *One-Shot AF* mode and Automatic AF Point Selection) it typically focuses on the closest object. This may or may not be what you want to focus on, so you should almost always select where the camera focuses by selecting the desired autofocus AF Point. Or if the situation or subject does not allow you to quickly or easily focus by selecting a specific point, you can instead decide to select a *Zone* or *Large Zone* made up of several AF Points.



Figure 161 - Alpacas, Lexington, Mass. - Combine precise autofocusing with shallow depth of field to call attention to the desired subject - here, the near alpaca. Canon 80D, Shutter speed 1/1000, Aperture f/4.0, ISO 100, Exposure Compensation +2/3.

By selecting an AF Point (or Zone), you are telling the camera exactly where to autofocus (in *One-Shot AF* mode) or where to look to find a moving subject to start tracking (when working in *AI Servo AF* mode). For example, you often want to focus on a subject's closest eye, but if you allow the camera to choose the autofocus point itself, it may select another part of the face, or somewhere else on the body, or even a raised hand that is nearer to the camera than the face, to focus most sharply on. If you are

capturing an image of a bird in a tree the camera has no idea you want the autofocus system to zero in on the bird so that it is in sharp focus, and not the branches or leaves near it or perhaps even some leaves closer to you and nowhere near the intended subject.

The autofocus system of a dSLR plays a large role in allowing you to capture exactly the shot you intend. In the Creative Zone Shooting Modes (P, Av, Tv, M, and Bulb-B) you can, and should, take control of the autofocus system. The Viewfinder autofocus system is comprised of the autofocus related controls, the autofocus AF Modes (also called the AF Operation), the autofocus AF Area Selection Modes, the autofocus AF Points, and the autofocus related menu and Custom Function items described at the beginning of this text which customize how the AF system works. (Live View autofocusing is slightly different, and will be covered later in this chapter.) You will select an AF Mode typically based on if the subject is still (or perhaps only moving slightly or relatively slowly), or if you wish to continuously track and retain focus on a moving subject. And you will choose an AF Area Selection Mode based on how large of an area you want the camera to look at to find or track your intended subject - in other words how many AF Points will be active when attempting to focus on the subject. This can range from a single AF Point to a wider *Zone* or *Large Zone*, to all the AF Points available in the Viewfinder. You can set the AF Modes and AF Area Selection Modes in a variety of combinations based on what and how you are shooting. Be sure to read the **Menu Settings** and the **Custom Functions Menus** chapters first to make sure your camera is properly set up to always display your active AF Point(s), and various other recommended AF settings.

Viewfinder autofocus works by looking for contrast so you should try to focus (locate the active AF Point as seen in the Viewfinder as in *Figure 162*) on a texture or a detail with a pronounced line or some amount of contrast between light and dark. The camera may not be able to focus on a large area of consistent color - such as an all-white wall or clear blue sky, or even a uniformly colored and lit shirt - or on a subject that is too dark. It can be disrupted by regular patterns or confused when looking through close objects to objects farther away, such as looking through a fence. And it sometimes fails to work well in dim light, though the center AF Point is more responsive than the outer AF Points in low light situations (down to -3 EV for the center point). Also, the *AF-Assist Beam Firing* of Custom Function *C.Fn II-6* can assist in low light situations if you are using the built-in flash or an optional Speedlite. All of the 45 AF Points are the accurate cross-type points, so you should feel comfortable making use of any of them. (A cross-type AF Point detects contrast in both the horizontal and vertical directions, as opposed to AF Points which are only sensitive to contrast in one of these directions.) The center AF Point of the 80D performs with additional sensitivity when using most Canon lenses with an f/2.8 or wider maximum aperture. Note that with certain older Canon lenses, many of the outer AF Points will not act as cross-type points. See pages 128-135 of the Canon manual for this list of lenses.

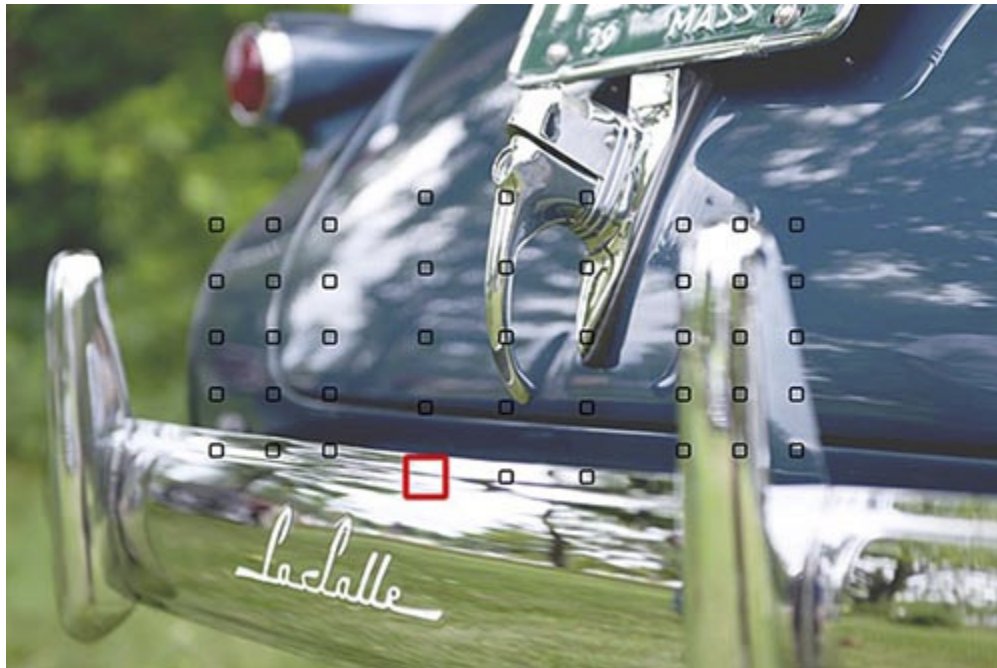


Figure 162 - Recomposition Image 1 - Simulated view of Canon 80D Viewfinder.

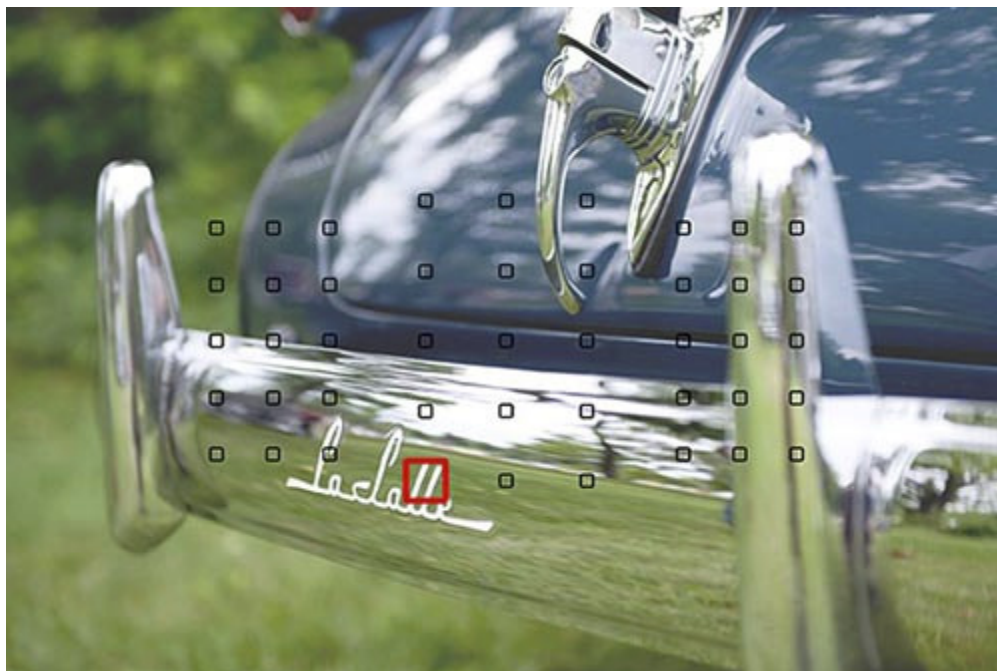


Figure 163 - Recomposition Image 2 - Simulated view of Canon 80D Viewfinder - In this example, the top image (Figure 162) shows the desired final framing, however I wish to focus on the "LaSalle" name on the bumper, but it is not located at any of the AF Points. The bottom image (Figure 163) shows what is seen in the Viewfinder as the camera is moved and the framing is temporarily recomposed so that the "LaSalle" detail is located at an AF Point (the active AF Point shown in red), and focus can be locked by half-

pressing the Shutter Button. I then return to the top framing to take the image. Background images shown at 75% to better see Viewfinder elements.

I will use the term “*recompose*” a few times throughout the text. By this I mean moving the camera after you have locked the focus or exposure such as with a half-press of the Shutter Button, but before you fully press the Shutter Button and take the picture. This means that what you see in the Viewfinder changes from when you do those first actions to when you take the picture; you have *re-composed* the view you see in the Viewfinder (see *Figures 162 and 163*) This will be further explored in the **AF Points and Composition** section of this chapter. And remember, when photographing people generally try to focus somewhere on the face, ideally on the nearest eye, then recompose the framing of your image if necessary.



Figure 164 - Autofocus related controls of the Canon EOS 80D.

6.2 Autofocus - AF Point Selection

As I go over the Autofocus Modes in the next section, I will talk about manually selecting your desired AF Point. This is done to tell the camera exactly which AF Point to use for autofocus, and is generally recommended so that you have full control over where the camera focuses. Alternately, you can make use of Automatic Selection of the AF Point where the camera decides which of the 45 AF Points to use, but then you will have little control over where the camera focuses, as it typically looks for the nearest

subject. However, automatic AF Point selection is required in certain subject-tracking situations, as will be described below.

To choose between manual and automatic AF Point selection, press the rear AF Point Selection Button or the top AF Area Selection Mode Button, then press the top AF Area Selection Mode Button a couple times. When the autofocus brackets are visible in the Viewfinder and the far-right AF Area Selection Mode icon is indicated in the Viewfinder, you are using 45-point Automatic Selection AF (see *Figure 165 - right*). This is also the mode used by the camera in the Auto+, Creative Auto, and Scene modes. When any of the other icons are selected in the Viewfinder, you are using one of the manual AF Point selection modes, either Single-Point AF (left icon), Zone AF (middle-left icon), or Large Zone AF (middle-right icon) (see *Figure 165 - left*). For now set this on Single-Point AF, the left icon.

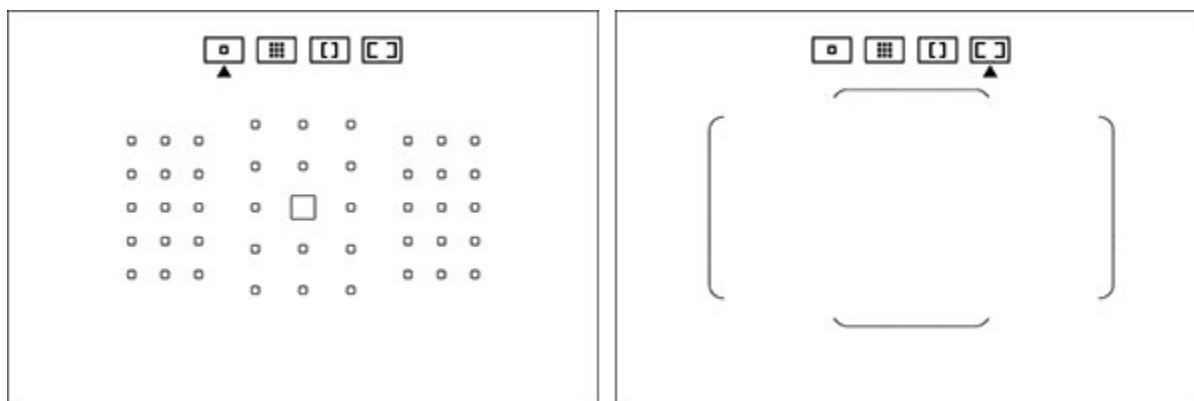


Figure 165 - Single-Point AF Manual Selection (left) and 45-point Automatic Selection AF area modes (right), as indicated in the Viewfinder by the AF Area Selection Mode icons and the configuration of AF Points or brackets.

When making use of manual Single-Point AF, Zone AF, or Large Zone AF selection, with the default camera settings, you first press the rear AF Point Selection Button (at the upper-right of the rear of the camera) and then use the Multi-Controller to select your desired AF Point or Zone as you look in the Viewfinder. If you set the *C.Fn III-4: Custom Controls* menu item to have the Multi-Controller perform *AF Point Direct Selection*, you can instead use the Multi-Controller directly to select the AF Point without pressing the AF Point Selection Button first. However, you will need to press the AF Point Selection Button before pressing the SET Button to quickly choose the center AF Point.

To see how manual autofocus point selection works, turn the Mode Dial to Av, and make sure the switch on your lens is set to AF. Set your Autofocus Mode to *One-Shot* using either the [Q] Button and Quick Control Screen, or more simply press the AF Button on the top of the camera (the one labeled “AF”), then turn the Main Dial or Quick Control Dial as you view the setting on the top LCD Panel. Next press the top AF Area Selection Mode Button or rear AF Point Selection Button, then repeatedly press the top AF Area Selection Mode Button (the small button near the Shutter Button) until you see

the left AF Area Selection Mode icon selected and a single large AF Point among the smaller AF Points in the Viewfinder, as shown in *Figure 165 - left*. You can also use the Quick Control screen to change this setting by selecting the AF Area Selection Mode icon.

- Tap the Shutter Button with a half-press to wake up the camera.
- To select your own desired AF Point, while looking through the Viewfinder use your thumb on the Multi-Controller to select the focus point that is nearest to where you want to focus. Press the Multi-Controller up, down, side-to-side, or diagonal. If you did not set the Custom Control for *AF Point Direct Selection*, you will need to press the AF Point Selection Button first before using the Multi-Controller to move the AF Point.
- Place that AF Point over your intended subject or detail (see *Figure 166*).
- Press and hold the Shutter Button halfway down and see that point blink (if Custom Function *C.Fn II-15: VF Display Illumination* is set for *Enable*). The Focus Confirmation Light should light up in your Viewfinder, and the camera will beep if you have that enabled. You have locked the focus.
- Keeping the Shutter Button pressed halfway to keep the focus distance locked, recompose if necessary, and take the shot by fully pressing the Shutter Button.

If the Focus Confirmation Light does not light up and the camera does not take the photo, the camera may not be finding enough contrast to focus on, you may be too close to your subject for the lens to focus, or the lighting may be too dim for the AF system to work properly. Try using the center AF Point, which performs better in low light, and is a more sensitive cross-type point with certain lenses (having an f/2.8 or wider maximum aperture). Or you may be in AI Servo AF mode, which does not lock focus in this manner because it is tracking a moving subject. Note that the area that the camera evaluates for focus is slightly larger than the actual active AF Point squares you see in the Viewfinder. In rare situations when autofocus fails, you can also resort to manual focusing by switching your lens to MF and using the lens focusing ring. Or you can autofocus on an object at the same distance from the camera as the subject, and then recompose the image back to the subject. This technique can also be used in other situations such as a sporting event, where you pre-focus at a specific spot or distance and wait for the subject to get to that point - so that the camera is already in proper focus and the moment or subject can be captured.

With the use of certain lenses or lenses plus an extender, some AF Points will be seen to blink in the Viewfinder. This indicates that those AF Points are not acting as cross-type points. This will occur with Canon lenses designated as Group C through G in the *Canon EOS 80D Instruction Manual* on pages 128-135. And with lenses in Group E through H, not all 45 AF Points will be available for selection. Lenses in these groups are typically older lenses, telephoto lenses, or lenses being used with an extender.



Figure 166 - Cambridge Carnival - Cambridge, Mass. - Simulated view of 80D Viewfinder, using a single, manually selected AF Point to focus on the subject's eye (selected Focus Point emphasized here in red, shown at right over the subject's eye). Shutter speed 1/1000, Aperture f/4.0, ISO 400. Background image shown at 75% opacity to better see Viewfinder elements.

There are important reasons to use the outer focus points, and not just the center one all the time as some photographers may be in the habit of doing. One reason for this is that if you lock focus with the center point and recompose, you moved the camera in a slight arc and the focus plane will thus be located slightly behind your subject. This could be more noticeable when working close to the subject and/ or when using wide aperture settings (f/1.4, f/2.8). The potential consequences of recomposing will also be discussed later in the text in relation to exposure and metering. It may sound difficult to select the focus point each time, but it is actually very feasible and will likely become instinctive. You may even find that you start to set your focus point with your thumb on the Multi-Controller as you approach a scene before even bringing your camera to your eye. For example, if you know the subject will be on the right side of the frame, you can click, click, click the Multi-Controller to the right a few times so that the active AF Point is already on the right as you bring the camera to your eye.

6.3 Autofocus - AF Modes

The 80D has three different focus modes (AF Modes or AF Operations) to choose from for Viewfinder shooting, typically depending if your subject is still or slightly moving, or if

it is actively moving and you wish to track its movement and remain continuously focused on it. Select the AF Mode by pressing the AF Operation Selection Button on the top of the camera (marked “AF”), and turning the top Main Dial or rear Quick Control Dial while reading the setting on the top LCD Panel. You can also use the [Q] Button and Quick Control Screen to change this setting (see *Figure 167*). Or if the Shooting Function Settings Screen is visible on the rear LCD Monitor, you can press the top AF Button and make your selection on the rear LCD Monitor, similar to the screen shown in *Figure 167 - right*.



Figure 167 - Selecting the Autofocus Mode via the Quick Control Screen.

One-Shot AF Focus Mode

Use this mode when your subject is still and not going to move, or if your subject is not going to move very much or very quickly, or if the distance between you and the subject is not going to change between the time you lock focus, recompose, and take the shot. This mode can even be used for moving people or objects if you quickly take the shot after establishing or locking focus.

You will often wish to use this in conjunction with one of the manual selection AF Area Selection Modes (to be explained in the next section), either Single-Point AF, Zone AF, or Large Zone AF so that you can tell the camera where to focus. For now, set the AF Area Selection Mode on Single-Point AF. Do this by pressing the top AF Area Selection Mode Button (near the Shutter Button) as you look through the Viewfinder. You will see four small icons in the top of the Viewfinder - press the button repeatedly until you see the left icon selected.

As you look through the Viewfinder, focus on your subject by first using the Multi-Controller to manually select the AF Point closest to your subject, locate that point over your subject, then press the Shutter Button halfway. The active AF Point will illuminate (blink), and the Focus Confirmation Light at the lower-right in the Viewfinder will illuminate as well. Continue to press the Shutter Button all the way to take the shot. If you half-press the Shutter Button to lock focus on your subject, the camera will remain focused at that distance as long as you keep half-pressing the Shutter Button. You can recompose the shot as you wish and then fully press the Shutter Button to take the photo. If the Focus Confirmation Light does not light up and the camera does not take

the photo, the camera may not be finding enough contrast to focus on, you may be too close to your subject for the lens to focus, or the lighting may be too dim for the AF system to work properly.

You can also use 45-point Automatic Selection AF with One-Shot AF, where the camera chooses which of the 45 AF Points to use to focus on the subject. When shooting in One-Shot AF Mode and choosing this mode, the camera will use all 45 AF Points to automatically locate the closest subject (generally) and focus on that. Or if you have enabled C.Fn II-12: *Auto AF Point Selection: Color Tracking*, the camera will look for skin tones in order to focus on a human subject. Since the camera does not know what your intended subject is, it will not consistently focus where you may want it to, and thus manual AF Point selection rather than automatic AF Point selection is recommended for most situations.

If you are photographing a subject that is approaching or receding from view at a relatively constant rate, or photographing a subject that is moving about the frame, or photographing sports, action, or active wildlife you will instead usually want to use AI Servo AF focus mode.



Figure 168 - Autofocus AF Modes - One-Shot AF is used to focus on a still subject (left), and AI Servo AF can be use to retain continuous autofocus on a moving subject (right).

AI Servo AF Focus Mode

This mode, used in conjunction with the various AF Area Selection Modes and the autofocus related Custom Function settings, is what makes the 80D such a powerful, well-performing camera for capturing action and motion. To take full advantage of this mode you will need to also understand the AF Area Selection Modes, as will be described in the **Autofocus - AF Area Selection Modes** section just below. AI Servo mode is used for tracking and focusing on moving subjects, and is ideal for capturing sports and wildlife including birds. If the subject is moving towards you or away from you, the camera will keep evaluating the focus distance, and if the subject is moving from side to side or throughout the frame the camera may track it as it passes from one AF Point to the immediate surrounding ones or to any of the other points - depending on which AF Area Selection Mode you are using. The Autofocus Custom Functions options will even allow you to tell the camera exactly how fast to react to new subjects that

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-Camea

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Douglas Klostermann is a travel, culture, and humanitarian photographer as well as the author and publisher of the bestselling *Full Stop* e-book camera guides including *Canon 7D Mark II Experience* and *Nikon D750 Experience*. He has photographed for numerous organizations in the United States and Latin America, been recognized by the *United Nations Development Programme* for his humanitarian photography, and been published in magazines, books, and websites including *Conde Nast Traveler*, *Sherman's Travel*, *NationalGeographic.org*, *South American Explorer*, and *Viva Travel Guides*. Doug is a member of the North American Nature Photography Association (NANPA).

Learn more about photography techniques and equipment on his blog *Picturing Change* at <http://blog.dojoklo.com/>, view his photography and e-books at www.dojoklo.com, and follow him on Twitter at [@dojoklo](https://twitter.com/dojoklo).