Canon 77D Experience

The Still Photography Guide to Operation and Image Creation with the Canon EOS 77D

an e-book by:
Douglas J. Klostermann

PREVIEW of:

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Special thanks to **Newtonville Camera** of Newton, Mass.
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1. INTRODUCTION

With the introduction of the Canon EOS 77D, Canon boasts of creating a new category in their dSLR line-up. While this model adds to the features found on the entry-level Rebel T7i (EOS 800D), it also borrows numerous features and capabilities from the mid-level Canon 80D including the 45-point Viewfinder autofocus system, Dual-Pixel Live View autofocus system, 24.2 megapixel sensor, 3" touch screen monitor, 7560-pixel RGB+IR exposure metering sensor, and dual control dials. The 77D adds the improved Digic 7 processor, an expanded ISO range, and Wi-Fi plus Bluetooth capabilities for wireless connection to a smart device. The 77D can shoot at a fast 6 frames per second continuous shooting speed, includes HD video capabilities with full manual exposure control and 1080 at 60p/50p frame size and rates, and adds a time-lapse movie shooting feature.

Figure 1 - Detail of the Canon EOS 77D.

The 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 several 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* autofocusing 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 when 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 autofocusing speeds. The *63-zone, 7560-pixel RGB+IR* exposure metering sensor will help you to obtain a properly exposed image in a wide variety of challenging lighting situations, and makes use of skin-tone color detection to help locate and track moving subjects when shooting through the Viewfinder. The 6 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 27 RAW images or unlimited JPEG images. 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 - Swan, Arlington, Mass. - Canon 77D, Shutter speed 1/1000, Aperture f/4.0, ISO 200.

The 77D also includes wireless flash control via the built-in flash, better low-light capabilities at high ISO settings, Interval Timer and Time-Lapse shooting, in-camera

processing with Creative Filters, and lens correction features such as chromatic aberration and distortion corrections. And for capturing HD video, the 77D offers higher ISO capabilities and the option of using Auto ISO in Manual shooting mode, a new HDR movie mode, electronic image stabilization, 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, 6 frames per second continuous shooting speed, 7,560-pixel exposure metering system, Digic 7 processor, customizable controls, and high ISO capabilities in low light, the Canon 77D enables photographers to consistently capture sharp, clean, and well-exposed images. The 77D is clearly a versatile, advanced tool for digital photography and is fully capable of capturing professional quality images in a wide variety of shooting situations.

But the 77D 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 77D 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 77D 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 77D 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 trees and 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).

One has to think about all this stuff for every photo? Well, yes, to some degree if you wish to consistently create the well made, interesting, and compelling images you envision. And that is why the 77D has all the buttons, controls, Custom Functions, and features for you to make use of.

Figure 3 - Leaves, Whipple Hill, Lexington, Mass. - Autofocus, exposure metering mode, aperture, shutter speed, ISO, and white balance all considered in capturing this image. Canon 77D, Shutter speed 1/800, Aperture f/4.0, ISO 100.

Learning to use and get the most from a highly advanced digital SLR (dSLR) camera like the 77D takes time, practice, patience, mistakes, and experimentation. If you have upgraded from a previous dSLR such as the T6i / 750D or the T6s / 760D, or one of their predecessors, you are in for a treat. The additional features and capabilities will help you to more easily capture images and photographs that you may have been limited in consistently obtaining 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, there is certainly a lot of information to absorb! But don't worry, this book will help guide you through the camera's 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 77D. 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.

Figure 4 - Great Blue Heron Taking Flight, Arlington Mass. - Canon 77D, Shutter speed 1/1000, Aperture f/4.5, ISO 200.

Since this guide is intended to help you get the most from your 77D, it will not go into extensive detail about the automatic features. The Canon 77D is a 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 77D, and will lead you to having more control and consistency over your image making. Hopefully this will inevitably lead to better images!

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 77D 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. The camera does not come with printed versions of the full *Wi-Fi Function Instruction Manual* or the software instruction manuals. These manuals, as well as the *Canon EOS 77D Instruction Manual,* can be obtained as PDF files from the EOS 77D page on the Canon website, under the *Manuals* tab. The software can be found under the *Drivers and Downloads* tab:

https://www.usa.canon.com/internet/portal/us/home/support/details/cameras/dslr/eos-77d

If you have an iPad or tablet you will find it 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 28-34 of the *Canon EOS 77D 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 22-27 of the *Canon EOS 77D 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 273-274 of the Canon 77D manual, and movie shooting cautions are on pages 321-322.

Various settings of the 77D 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.

Figure 5 - Detail of the Canon EOS 77D.

Any time I capitalize something in the text, it is a proper term that can be looked up in the *Canon EOS 77D Instruction Manual*. I will capitalize the names of actual buttons, controls, camera parts, and menu items, such as Quick Control [Q] Button, Main Dial, LCD Panel, and Auto Lighting Optimizer. Again, please review the **Camera Controls** chapter below or the camera diagrams in your 77D manual (pages 28-34) to familiarize yourself with the names of various parts, controls, and displays. Words and phrases in this text that are capitalized *and* bold refer to chapters and sections within this guide. Turn on the bookmarks or contents navigation panel in your document viewer or access the Table of Contents of your e-book reader to quickly navigate to these different sections.

Many of the functions, controls, and menu items of a dSLR such as the 77D are closely inter-related, such as the shooting mode, exposure settings, and the metering mode. As a result of this I must sometimes indicate that a previous or upcoming section of the text has further explanation of a related function. However, there is no need to jump ahead or behind in the text - this is merely a "heads-up" that the feature will be fully explained in the appropriate section. ***It is best to read through the entire text, in the order it is organized.*** The Menu and Custom Functions chapters are particularly prone to referring to upcoming chapters, but this initial menu walkthrough is needed at the front of the

and down on the Multi-Controller to navigate the sub-tabs and menu items, or make use of the touch screen. Press the SET Button to select a menu item and view its options.

3.2 Shooting Menus

Shooting 1 menu
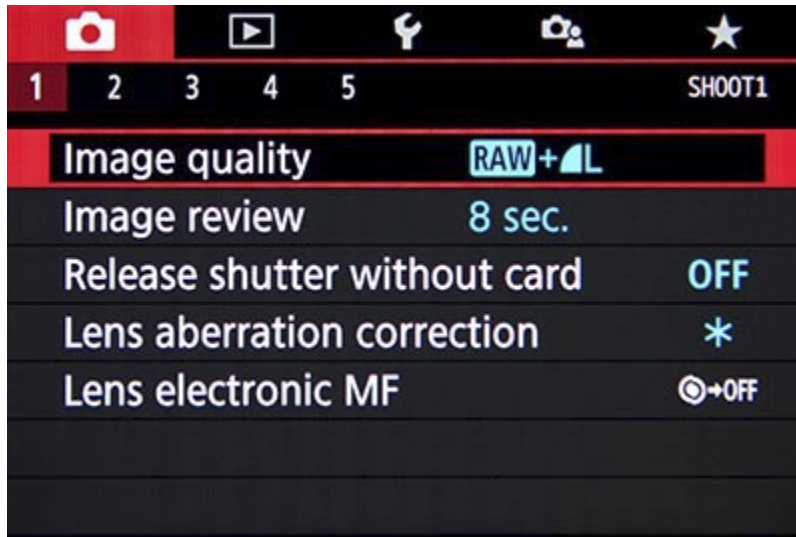
Figure 35 - Shooting 1 menu.

Image Quality
You are putting a lot of effort into taking your images, and the 77D 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 to the RAW setting if you wish to capture images in the RAW format, which will require that you post-process all your image files in order to obtain a final image. Set to the highest quality and largest JPEG setting (*Fine/Large*) if you want to capture JPEG files, which do not necessarily require post-processing. You can set for RAW+JPEG if you desire both types of files (see *Figure 36 - left*). The different file formats will be discussed in the **Image File Formats - JPEG vs. RAW** section of the text in Chapter 5. Image Quality can also be set on the Quick Control Screen, and when working in Live View the Image Quality can be set on the Live View Quick Control Screen (see *Figure 36 - right*).

Figure 36 - 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 37 - left*). If you don't always review your images, you may wish to leave it *Off* to conserve 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.
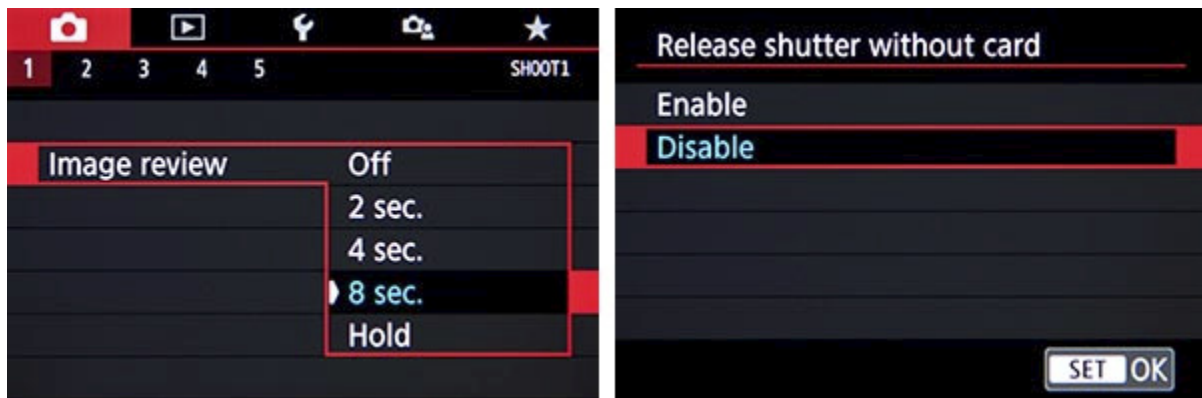
Figure 37 - Left: Image Review menu screen and options, for setting the duration that an image stays visible on the LCD Monitor immediately after capture. Right: Be sure to Disable the "Release shutter without card" setting so that the camera will not take images unless a memory card is inserted.

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. Set this for *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 37 - right*). Test it to make sure you set it properly.

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 stored in-camera, and you can use Canon's *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 38 - left*). Using this option may introduce digital noise to the area being corrected. This correction can also be made with Canon's 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 the above correction, 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.

Diffraction Correction corrects for decreased image sharpness caused by the aperture, and decreased image resolution caused by the low pass filter. Using it may increase noise, and it is less effective at higher ISO speeds.

You may wish to experiment with these various lens correction features, particularly if you have a specific issue with vignetting, distortion, chromatic aberration, etc. 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). Be sure to set these for *Disable* when using non-Canon lenses.
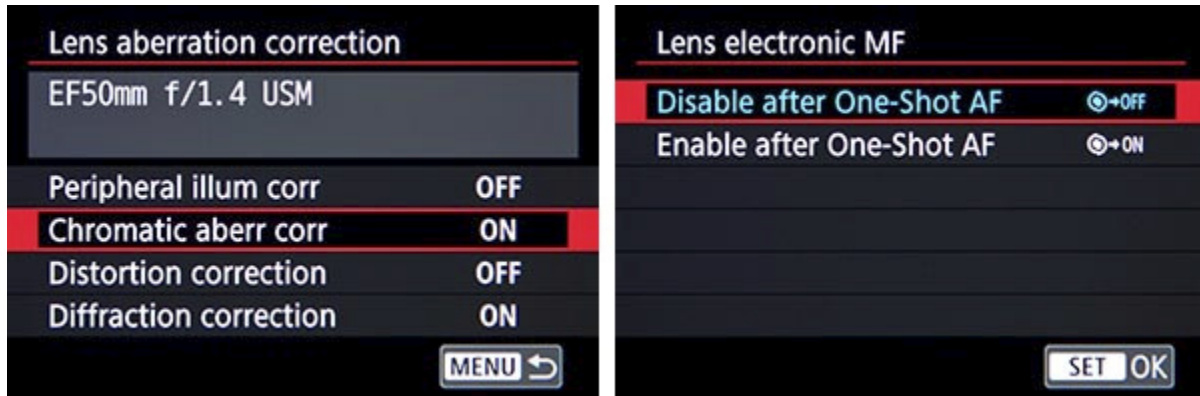
Figure 38 - Left: Lens Aberration Correction menu for the camera to automatically correct for various lens issues when using Canon lenses. Right: Lens Electronic MF, for lenses with electronic manual focus.

Lens Electronic MF
Some extremely high-quality Canon L lenses as well as some STM lenses feature an electronic manual focus ring that can be used to override or tweak the focus determined by the USM autofocus motor, for ultimate precision. With this setting you can determine how the electronic focusing ring operates (see *Figure 38 - right*). *Disable after One-Shot AF* will disable the focus ring after autofocus is achieved with a half-press of the Shutter Button, so that you don't inadvertently change the focus by moving the extremely sensitive focus ring. *Enable after One-Shot AF* will allow you to use the focus ring to focus manually if you continue to hold the Shutter Button half-pressed after focus is achieved. Both of these options will only work in *One-Shot AF* (not *AI Servo* where the focus system does not lock at a specific distance). The lenses which feature electronic focus motors are listed on page 128 of the *Canon 77D Instruction Manual*.

Shooting 2 menu
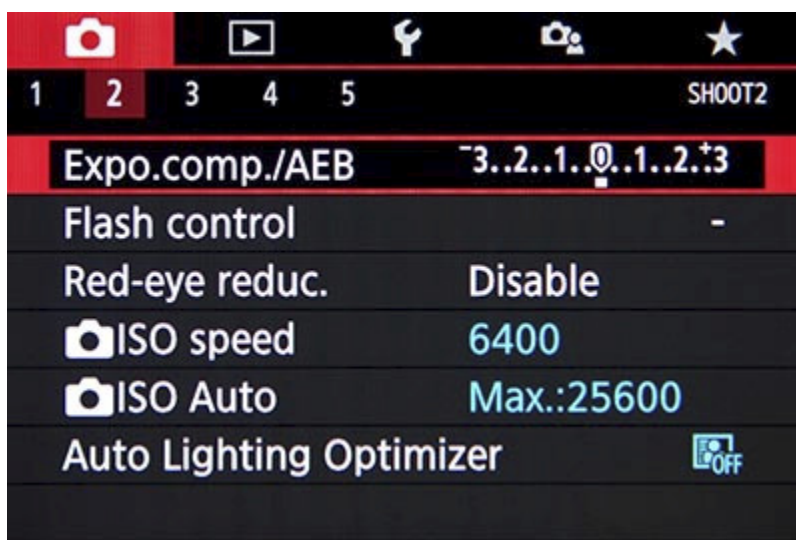
Figure 39 - Shooting 2 menu.

Exposure Compensation/AEB
You can use the Quick Control Dial for directly changing Exposure Compensation as you shoot in Tv, Av, or P Modes, and monitor the setting in the Viewfinder or on the top LCD Panel. But you need to access this menu item (or the Quick Control Screen) for Auto Exposure Bracketing (AEB) (see *Figure 40 - right*). And if you wish to set exposure compensation greater than +/-2 stops (up to +/-5 stops) you will need to use this menu item or the [Q] Button and Quick Control Screen and select the EC icon, rather than just turning the Quick Control Dial, as the top LCD Panel and Viewfinder only display up to +/-2 stops (see *Figure 40 - left*). The **Exposure Compensation** and **Auto Exposure Bracketing** features will be explained in those sections of this text.

Figure 40 - Accessing the Exposure Compensation / Auto Exposure Bracketing menu item to set the exposure compensation amount (left), and the bracketing amount (right).

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 41 - left*). Some of the basic settings will be introduced 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.
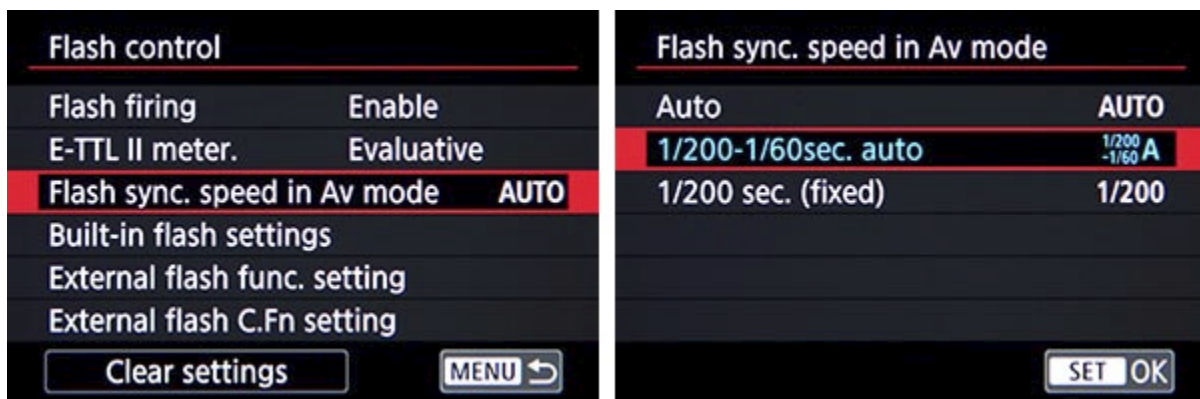
Figure 41 - Left: Flash Control menu, for built-in, wireless, and external flash settings. Right: The "Flash sync. speed in Av mode" options.

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 41 - 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 1/200 to 30 seconds, which may give you very slow shutter speeds in certain situations which might be too long for hand-held images.

1/200-1/60 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.)

1/200 sec. (fixed) keeps it fixed at the camera's sync speed of 1/200 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 *1/200-1/60 sec. auto*. Remember, this setting only applies to Av Shooting Mode.
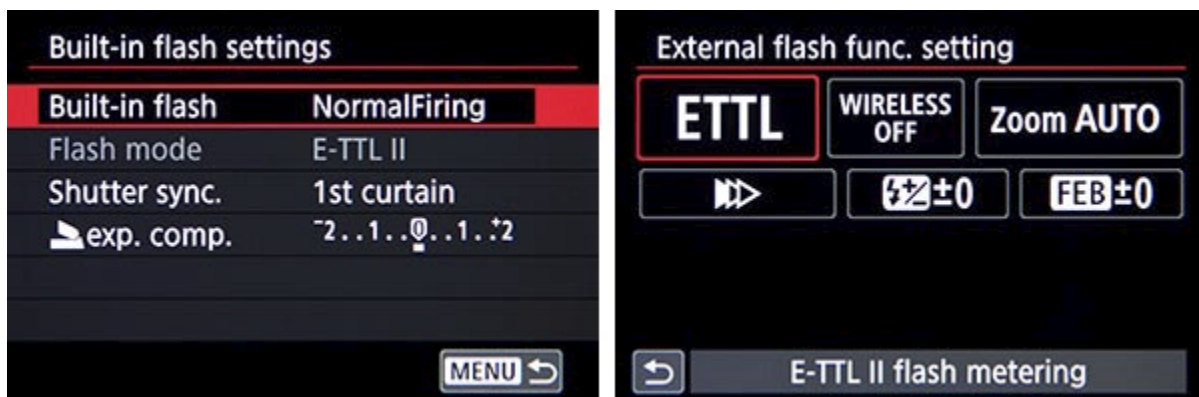
Figure 42 - Built-in Flash Settings menu (left), and External Flash Function Settings (right). Both of these are sub-menus of the Flash Control menu.

4. CUSTOM FUNCTION MENUS

Figure 123 - Custom Functions menu item in Set-up 4 menu.

4.1 C.Fn I: Exposure

C.Fn 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 124 - left*). This will apply to the Shooting Modes where you can select your desired exposure settings, 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 124 - Exposure Level Increments options (left), and ISO Expansion (right).

C.Fn I-2: ISO Expansion
This is to set if the highest ISO setting "H" is available for selection (see *Figure 124 - right*). The "H" setting is the equivalent of ISO 51,200 for stills and ISO 25,600 for movies. You may wish to set this for *Off* if you don't plan on ever using the highest ISO setting, such as if you find the digital noise and color shifts those images to be excessive. Note that the "H" ISO setting cannot be selected if you have enabled *C.Fn II-4 Highlight Tone Priority.*
Recommend: Off, unless you plan to use the highest ISO setting

C.Fn I-3: Exposure Compensation Auto Cancel
This is to specify if the Exposure Compensation setting will be cancelled or not when you turn the camera off (see *Figure 125- left*). If you find that the camera has not determined the correct exposure for an image, you can use Exposure Compensation so that the camera will increase or decrease the exposure of subsequent images, as will be explained in the **Exposure Part 2** chapter. If this Custom Function is set for *Enable,* the Exposure Compensation amount will be cancelled when you turn the camera off. This can be helpful if the next time you use the camera, you do not wish for Exposure Compensation to be used, and you may have forgotten that you set it previously. If you want the Exposure Compensation setting to still apply the next time you use the camera, set this for *Disable,* and Exposure Compensation will not be cancelled when you turn off the camera. However, if you then forget that Exposure Compensation is in use, all of your images may be under- or over-exposed, so be sure to check the setting to make sure it is set as you wish.
Recommend: Enable, unless you typically want the Exposure Compensation amount to remain in effect the next time you use the camera.

Figure 125 - Left: Exposure Compensation Auto Cancel option. Right: Highlight Tone Priority menu options.

4.2 C.Fn II: Image

C.Fn II-4: Highlight Tone Priority
This setting improves the details seen in highlights and helps prevent them from being overexposed or "blown-out" (see *Figure 125 - right*). It shifts the dynamic range of the image to the brighter end, meaning the camera captures more information about the brighter tones at the expense of information about the darker tones. So you may sacrifice some detail in the shadows, and digital noise may be increased. It is worth using in certain situations, such as when photographing a wedding dress, or something very bright, or a "high key" image where you don't wish to lose the subtle details. (A "high key" image is one with only very light tones and with low contrast, typically with a very light, brightly lit subject and a white background. The interest often lies in the subtle gradations of light grey tones, though they can also contain color. You can find countless examples by searching for "high key image" online.)

However, you typically don't want this setting on all the time. I suggest putting it in **My Menu** so you remember it is there to use when you need it. Note that when you enable this, the camera will disable Auto Lighting Optimizer (ALO) and will limit your ISO range from 200 to 25,600. It can also be used during movie shooting. Also note that Highlight Tone Priority affects JPEG and RAW image files while ALO affects only JPEGs. When Highlight Tone Priority is enabled, a [D+] icon will appear in the Viewfinder and top LCD Panel.
Recommend: Disable, except for specific situations where Highlight Tone Priority is useful.

4.3 C.Fn III: Autofocus/Drive

C.Fn III-5: AF-Assist Beam Firing
This setting is to enable or disable the autofocus assist beam, which is a flash or flashes of light emitted from the built-in flash or from a dedicated external Speedlite flash, to help the camera focus on the subject (see *Figure 126 - left*). I suggest enabling it, setting *0*, unless you are in a situation where it is unwanted or too distracting in some

way, and then you will wish to set for *1: Disable*. If you only wish to use this feature with an optional external Speedlite and not have the built-in flash act as an AF-Assist Beam, set it on *2: Enable external flash only,* or on *3: IR AF assist beam only* which will only use the Speedlite's infrared AF-assist beam and not the series of small flashes of light. Make sure the Speedlite's Custom Functions have the AF-assist options turned on as well if you wish to make use of them.
Recommend: user preference

Figure 126 - Left: AF-Assist Beam Firing options, applicable when using the built-in flash or an optional Speedlite flash. Right: AF Area Selection Method, to choose which control is used to change the AF Area Selection Mode while shooting.

C.Fn III-6: AF Area Selection Method
This menu item determines which camera controls you will use while shooting to select your desired Autofocus (AF) Area Selection Mode (such as *Single-Point AF, Zone AF, Large Zone AF,* or *Automatic Selection AF*) (see *Figure 126 - right*).
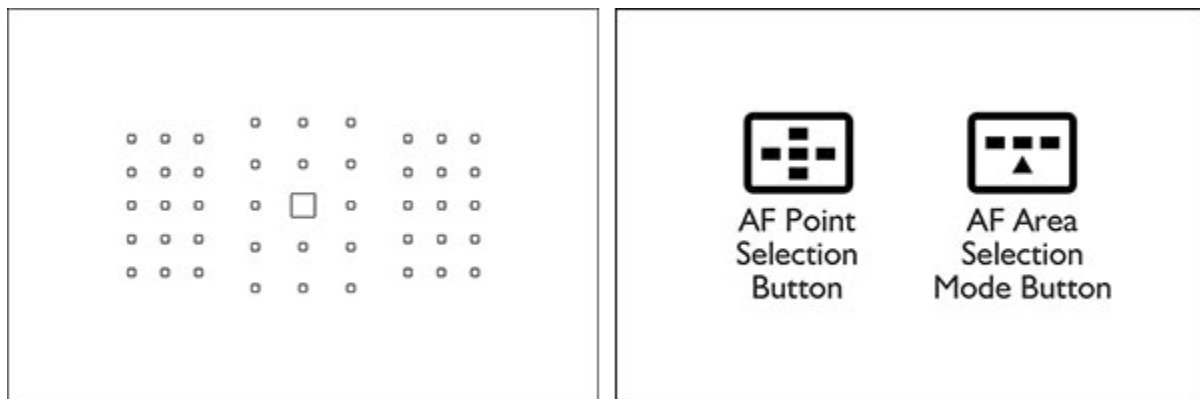
Figure 127 - Left: The autofocus AF Points as seen in the Viewfinder. Right: The icons used to represent the two autofocus-related buttons, and which represent the pattern of AF Points as seen in the Viewfinder, and the selection of different AF modes.

As explained in the **Camera Controls** section, the 77D has two somewhat similar looking autofocus-related buttons, but which typically perform different functions. The

AF Area Selection Button is on the top of the camera, and the AF Point Selection Button is at the upper-right on the rear of the camera (see *Figure 127 - right*).

The first menu option *0: [AF Point Selection Button]>AF Area Selection Button* means that you first press the rear AF Point Selection Button (or you can press the top AF Area Selection Button) and then press the top AF Area Selection Button repeatedly to "click" through the four AF area modes as you look through the Viewfinder, until you arrive at your desired mode. The second option *[AF Point Selection Button]>Main Dial* means that you first press the rear AF Point Selection Button (or you can press the top AF Area Selection Button) and then turn the top Main Dial to select the autofocus area mode as you look through the Viewfinder. The different modes will be represented by the number and configuration of AF points and brackets you see in the Viewfinder (see *Figures 127* and *128*). The various modes will be fully explained and illustrated in the **Autofocus - AF Area Selection Modes** section of the **Autofocusing** chapter.
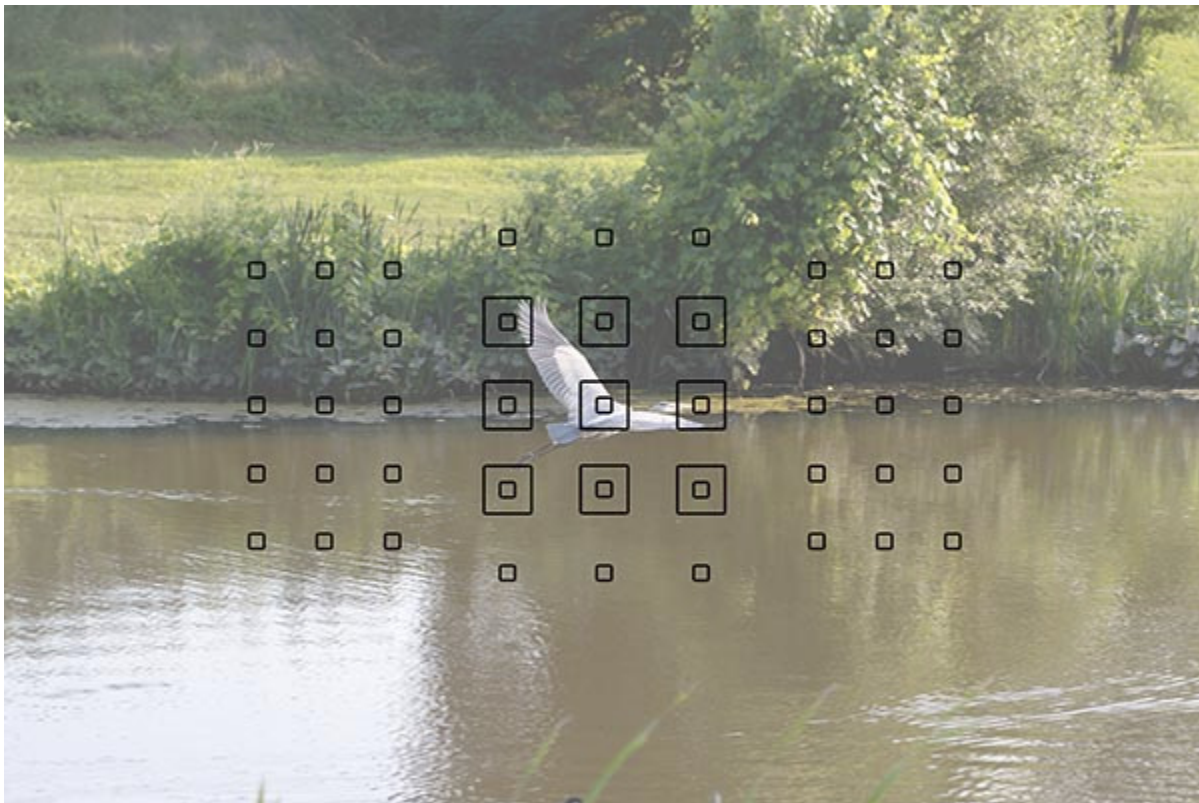
Figure 128 - Heron in Flight - Arlington, Mass. - Simulation of Zone AF Autofocus Area Selection Mode as viewed in the 77D Viewfinder. Shutter speed 1/800, Aperture f/4.5, ISO 400. (Background image shown here at 65% opacity to better see Viewfinder elements).

If you set the second option you will not be able to use the Main Dial in conjunction with the AF Point Selection Button to manually select an AF Point while shooting, and will always need to make use of the Multi-Controller instead to select your desired AF Point, which shouldn't be an issue unless you are in the habit of using the Main Dial to select

your AF Point. I suggest leaving this set for the first option, *0: [AF Point Selection Button]>AF Area Selection Button*, unless you have a specific reason to change it, such as you are used to using the top Main Dial to choose the AF Area Selection Mode or find that to be quicker or instinctive.
Recommend: 0: [AF Point Selection Button]>AF Area Selection Button

C.Fn III-7: Auto AF Point Selection: Color Tracking

This option means the camera's metering sensor will look for skin tones to assist with autofocusing, when using either *Zone AF, Large Zone AF,* or *Automatic Selection AF* as the AF Area Selection Mode (see *Figure 129 - left*. Typically when using one of these AF Area Selection Modes, the camera will focus on the closest subject, however if you *Enable* this menu item, the skin tone (ideally of the subject's face) will assist with focusing.

When working in *AI Servo* AF Mode, used to track moving subjects, the skin-tone color of the subject found at the AF Point that is used to initiate tracking will assist in retaining focus on that subject, even as it moves to the other AF Points. When working in *One-Shot* AF Mode, typically used for still subjects, enabling this feature will allow the camera to detect human subjects and prioritize them for focusing, rather than simply focusing on the nearest subject or object in the active Zone. Again, this option only works when using *Automatic Selection AF* or one of the *Zone AF* area modes.

Often you may be using *Single Point AF* so that you can better narrow-down where the camera will focus, and thus this setting will not apply. Enabling this setting may also cause the camera to take longer to focus. Low light and challenging conditions may prevent it from working well. However for situations where you will be Using *AI Servo* AF Mode and tracking a human subject that moves about a portion of the frame or the entire frame, this function may help you to better track and retain focus.
Recommend: user's choice
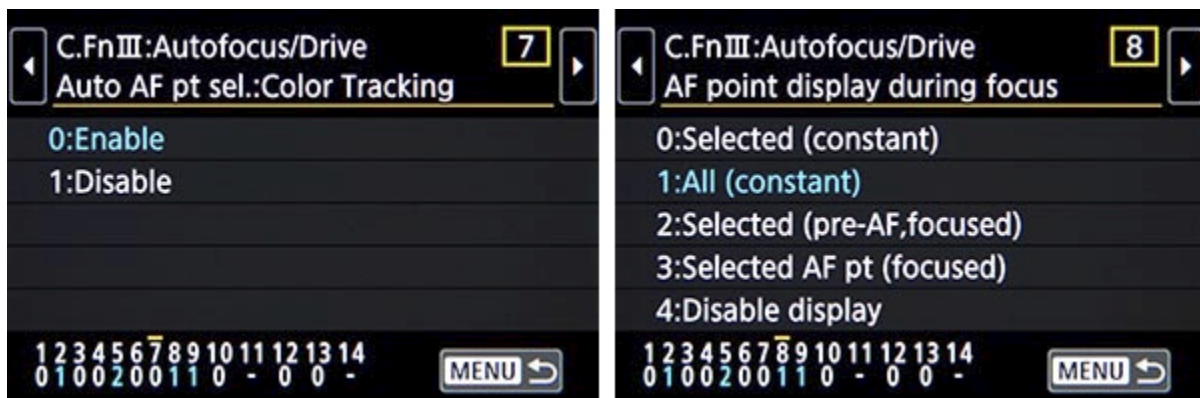
Figure 129 - Left: "Auto AF Point Selection: Color Tracking" menu, which is a complicated way of saying "skin tone recognition to assist with focusing and tracking." Right: AF Point Display During Focus options, to determine if and how the selected and active AF Points are seen in the Viewfinder.

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 149 - Alpacas, Lexington, Mass. - Combine precise autofocusing with shallow depth of field to call attention to the desired subject - here, the near alpaca. 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 made up 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 151*) 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 quickly 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 III-5* 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 77D 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 136-144 of the Canon manual for this list of lenses.
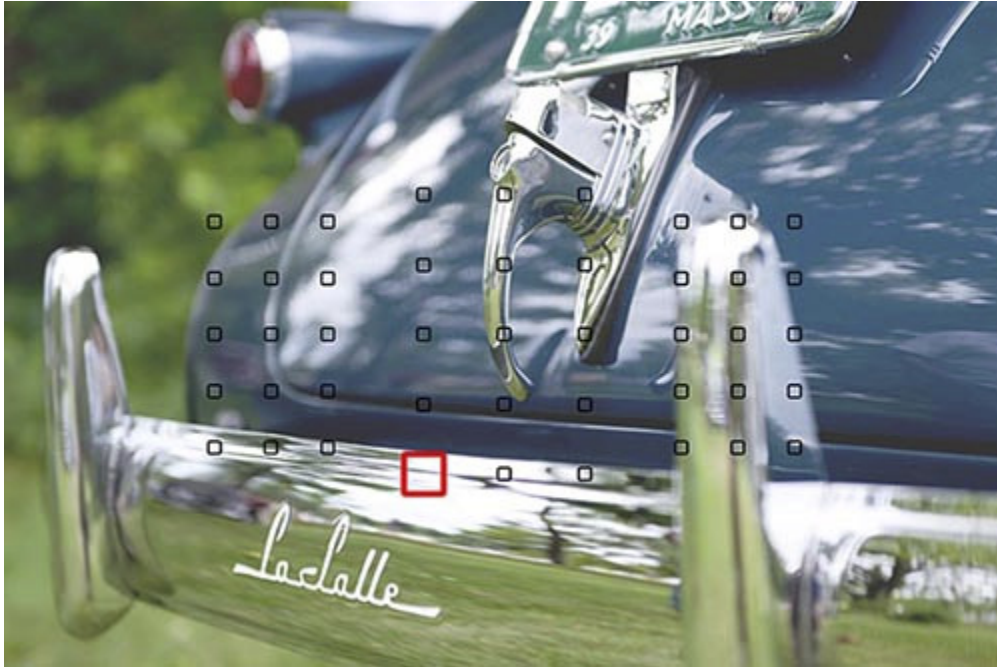
Figure 150 - Recomposition Image 1 - Simulated view of Canon 77D Viewfinder.

Figure 151 - Recomposition Image 2 - Simulated view of Canon 77D Viewfinder - In this example, the top image (Figure 150) 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 151) 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 150* and *151*) 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 152 - Autofocus related controls of the Canon EOS 77D.

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 autofocusing, 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 Button, then press the top AF Area Selection Button a couple times. When the autofocus brackets are visible in the Viewfinder, you are using Automatic Selection AF (see *Figure 153 - right*). This is also the mode used by the camera in the Auto+, Creative Auto, and Scene modes. When any of the other modes are selected, you are using one of the manual AF Point selection modes, either Single-Point AF, Zone AF, or Large Zone AF (see *Figure 153 - left*). For now set this on Single-Point AF.
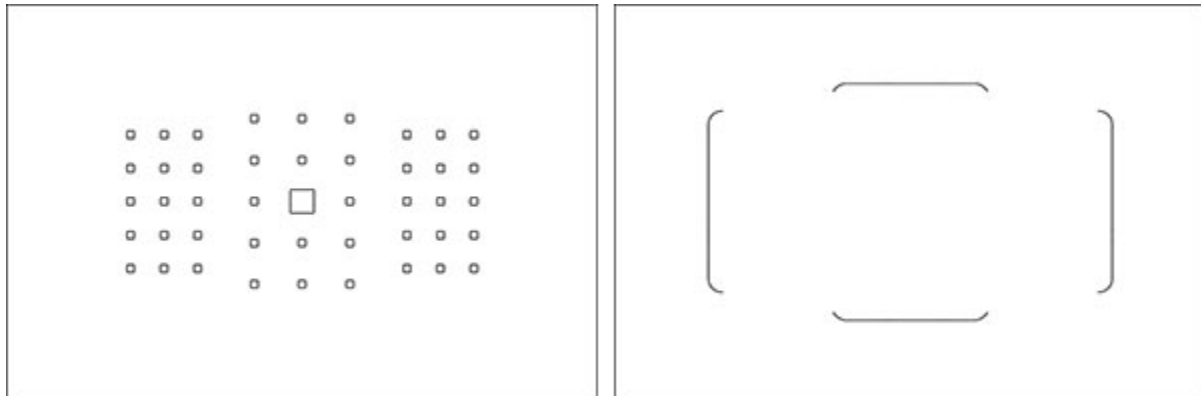
Figure 153 - Single-Point AF Manual Selection (left) and Automatic Selection AF area modes (right), as indicated in the Viewfinder by the configuration of AF Points or brackets.

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.

To see how manual autofocus point selection works, turn the Mode Dial to Av for now, 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 rear of the camera (the one labeled "AF" on the Multi-Controller), 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 Button or rear AF Point Selection Button, then repeatedly press the top AF Area Selection Button (the small button near the Shutter Button) until you see a single large AF Point among the smaller AF Points in the Viewfinder, as shown in *Figure 153 - left*. You can also use the Quick Control screen to change this setting by selecting the AF Area Selection Mode icon.

Manual autofocus point selection process:

- 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 first press the rear AF Point Selection Button, then 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, left, or right.

- Place that AF Point over your intended subject or detail (see *Figure 154*).

- Press and hold the Shutter Button halfway down and see that point blink (if Custom Function *C.Fn III-9: 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 autofocusing 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 then 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 77D Instruction Manual* on pages 137-144. 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 154 - Cambridge Carnival - Cambridge, Mass. - Simulated view of 77D 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 a quick press of the AF Point Selection Button and 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 77D 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 rear Multi-Selector pad (marked "AF"), and turning the top Main Dial or rear Quick Control Dial (or using the touch screen) while reading the setting on the rear Monitor. You can also use the [Q] Button and Quick Control Screen to change this setting (see *Figure 155*).

Figure 155 - Selecting the Autofocus Mode via the Quick Control Screen. Highlight the AF Mode icon (left), and press SET or use the touch screen to view the options (right).

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 Button (near the Shutter Button) as you look through the Viewfinder. You will see a single larger AF Point and all of the other smaller AF Points - press the button repeatedly until you see this configuration.

As you look through the Viewfinder, focus on your subject by first pressing the AF Point Selection Button then 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 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 III-7: *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 156 - 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, in conjunction with the various AF Area Selection Modes, can be used for capturing action and motion (see *Figure 157*). 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 next. 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

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-Camea

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-Robert

Superb Guide - An excellent guide, clear and concise. A great tool for budding photographer as well as the seasoned pro. A sure way to get the most out of your camera.
-Mark S.

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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, follow him on Facebook at www.facebook.com/FullStopDSLRGuides, and on Twitter at @dojoklo.