Canon T4i / 650D Experience

The Still Photography Guide to Operation and Image Creation with the Canon Rebel T4i / EOS 650D

an e-book by:
Douglas J. Klostermann

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good writing for better photography

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Author's website: www.dojoklo.com
Author's blog: http://blog.dojoklo.com

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CONTENTS

1. INTRODUCTION

With the introduction of the Rebel T4i (also known as the EOS 650D) Canon has made important leaps in upgrading this line of versatile, affordable, and easy to operate digital SLR cameras. On the surface, the T4i / 650D shares the appearance and many of the specifications of recent previous models: an 18 megapixel sensor to provide detailed and low-digital-noise images, a 63-zone dual-layer exposure metering system to properly determine the correct exposure even in challenging lighting situations, and high ISO performance (now expandable up to 25,600) for working in low light settings.

But look a little deeper and it is revealed that the T4i / 650D now shares several other capabilities of Canon's semi-professional models. The camera boasts a faster Digic 5 processor to allow for rapid and advanced in-camera processing of images, incorporates the 9 point, all cross-type autofocus system of the mid-level models (50D, 60D, 5D Mk II), as well as a quicker 5 frames per second (fps) maximum continuous shooting speed. These upgraded features will help you capture more sharp images and optimum moments while photographing both still and moving subjects. Plus the Digic 5 chip paired with the more rapid shutter allows for new multi-shot modes that can capture and combine a burst of images to obtain results with wider dynamic range or lower digital noise than a single frame can deliver.

Figure 1 - Detail of the Canon T4i, shown with the Canon EF 50mm f/1.4 USM lens.

Not to mention the T4i / 650D adds Touch Screen capabilities to its articulating high resolution rear LCD Monitor for easier selection of settings and menu items, multi-touch image review, and autofocus initiation in Live View and Movie shooting.

While the previous Canon dSLR models did not allow for continuous autofocusing during Movie shooting, the T4i / 650D incorporates a new hybrid autofocus system that enables fast, accurate, full-time autofocusing during Live View and Movie shooting. The autofocus operation is made even faster and quieter when using one of Canon's new STM "stepping motor" lenses. The T4i / 650D also has a built-in stereo microphone and stereo mic output jack, additional shooting modes, and new Creative Filters. And it incorporates Lens Aberration and Chromatic Aberration Correction - features recently introduced on the high-end Canon 5D Mark III.

With all of these features and its customization options, this camera has the ability to meet or exceed most enthusiast photographers' needs. The Canon Rebel T4i / EOS 650D is 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 it 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 and how they function, this guide builds upon that to explain when and why you want to use them. Every button, menu item, Custom Function setting, and feature of the T4i / 650D is there for a reason: to help you capture and output the images you want. Some of them are more useful to different types of photographers and shooting situations and you don't need to learn and use them all immediately, but this guide should help to give you the knowledge to confidently use the ones that turn your Canon Rebel T4i / EOS 650D into an image capturing tool that works best for you.

1.1 Take Control of Your Camera

Since the T4i / 650D is a tool to take the images *you* want to take, you 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 where you want, setting the aperture or shutter speed that you want, and obtaining the exposure you want. While the T4i / 650D 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 face of the man on the right side of the frame, while making the other man and the background appear out of focus, and the subject to be caught still and not be blurred from his motion, on this bright and sunny day (see *Figure 2*). 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 face on the right), the Exposure Metering Mode (properly expose for the face and the scene), the Aperture setting (the out-of-focus second man and background), the Shutter Speed (freeze the motion of the subject), the ISO (bright day) and the White Balance (sunny day).

Figure 2 - Parade, Brooklyn, NY - Autofocus, exposure metering mode, aperture, shutter speed, ISO, and white balance all considered in capturing this image. Shutter speed 1/320, aperture f/4.5, ISO 100.

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 well made, interesting, and compelling images. That is why the T4i / 650D has all these controls and features for you to make use of. You're not in the realm of point-and-shoots anymore!

Learning to use and get the most out of a versatile dSLR camera like the T4i / 650D takes time, practice, patience, mistakes, and experimentation. If you are not yet familiar with all the controls of a dSLR and the exposure concepts of digital photography, don't expect to just pick it all up at once, in one or two readings of a single book. (In fact, you wouldn't want to, as the never ending task of learning and mastering photography is a big part of what it's all about!) Try not to become frustrated when you don't quite understand something or aren't yet 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 Canon 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.

If you have upgraded from an older Canon dSLR to the T4i / 650D, you should find that many of the basic controls and features are similar. And its additional features and

Shooting 3 Menu

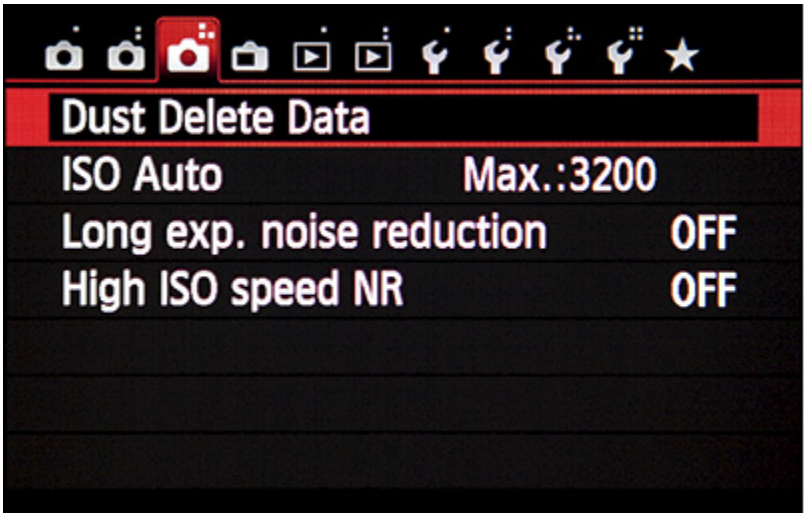

Figure 12 - Shooting 3 Menu.

Dust Delete Data
This is used to automatically "delete" dust spots from your images using the Canon Digital Photo Professional (DPP) software that comes with the camera. Use this menu item to initiate the process that will involve taking a reference image of a solid white object from about 1 foot away (30cm) using a focal length of 50mm or longer and manually focused to infinity. Hopefully you won't need this because your sensor stays clean with the camera's automatic sensor cleaning. Plus it is better to have a properly cleaned sensor than to resort to using this. More about **Sensor Cleaning** later. If you wish to use this in conjunction with DPP, follow the instructions in the manual on pages 220-221, and remember to occasionally repeat the process to update the data.

ISO Auto
This is to set the maximum ISO setting that the camera will select when you are using Auto ISO. It is limited at 400 to 6400 ISO. Depending on your tolerance of digital noise, set to perhaps *Max 3200* unless you have a specific need for extremely high ISO. After learning about ISO in the **Exposure** section later, you will hopefully be setting the ISO yourself and not using Auto ISO, so this setting shouldn't make a difference.

Long Exposure Noise Reduction
This setting is for the camera to apply noise reduction to long exposures (over 1 second). It does this by taking a blank image right after you take your image, for the same length of time as your image. It then compares where the noise is on your image and on the blank image, and cancels it out. This setting will most likely result in more accurate noise reduction than any attempt in Photoshop. If you typically take long exposures, especially at high ISOs, you should determine if you want to apply this sometimes when the camera thinks it should, setting *AUTO*; or all the time for long exposures, setting *Enable: ON*. Note that if you take a 10 second exposure, the noise reduction will take another 10 second blank exposure and you will not be able to take

another picture until it is complete. If you never take long exposures, leave it off. If you sometimes take them, I suggest you enable the *Auto* setting so that it functions when the camera believes it is appropriate.

High ISO Speed Noise Reduction
This setting is used to reduce noise that appears due to using high ISO speeds. This type of noise appears at all shutter speeds when using high ISO settings, so it is different than the Long Exposure Noise Reduction setting above. If you enable it you can choose *Standard, Low,* or *High* level (see *Figure 13*). I suggest first turning it off and seeing if you encounter any digital noise issues in your photos, and if so then experimenting with this setting to see if it gives you desired results without affecting your images in any undesired ways. Then decide if you wish to use it or not or if you prefer to perform noise reduction in post-processing if needed.

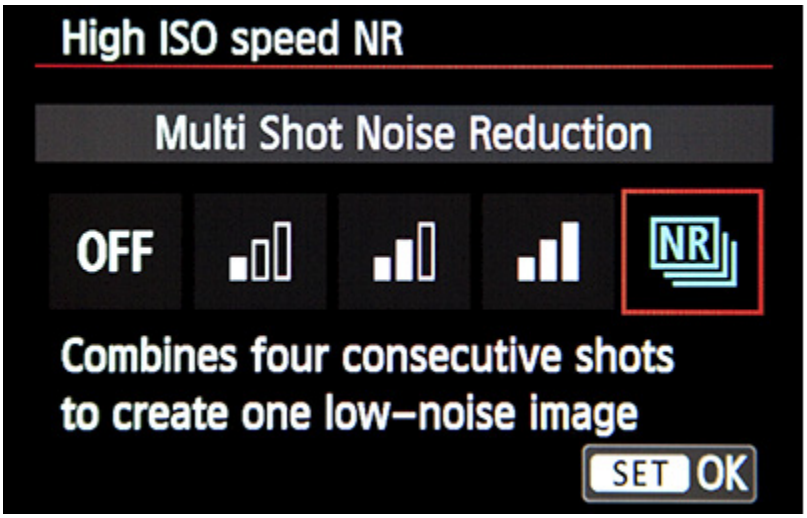

Figure 13 - High ISO Speed Noise Reduction menu, including Multi Shot Noise Reduction.

Multi Shot Noise Reduction - The High ISO Speed Noise Reduction menu item also now includes the *Multi Shot Noise Reduction* option. This feature will take a burst of four images which are then automatically combined into a single JPEG image. This allows for a high amount of noise reduction with a better quality image result than the *High* setting provides (see *Figure 14*). However when using this feature, you will have to be sure to either hold the camera extremely still or use a tripod. You will not want to use this feature all the time, so perhaps add it to My Menu for quick access when you wish to make use of it. Note that this feature cannot be used if certain other functions are in use such as Auto Exposure Bracketing, White Balance Bracketing, or flash use. You cannot use this feature if you are capturing your images as RAW or RAW+JPEG files.

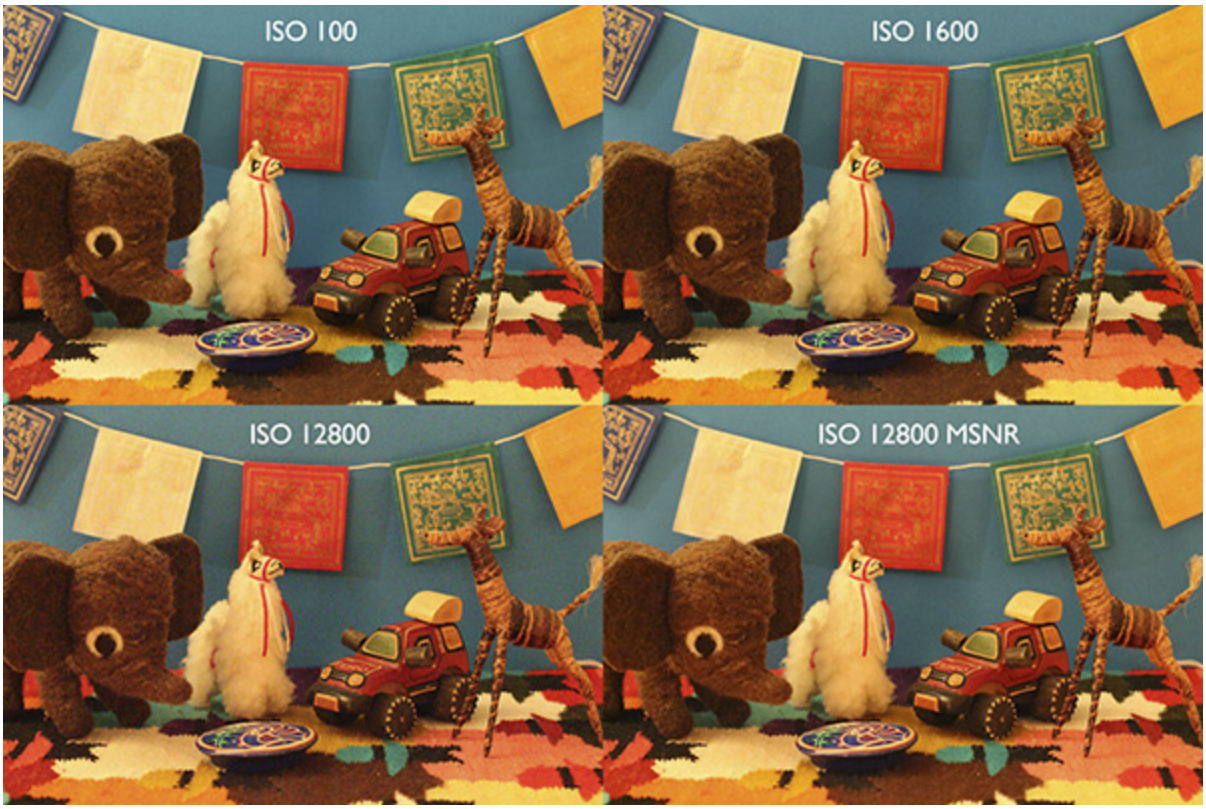

Figure 14 - Comparison of JPEG image results and digital noise at various ISO settings - The Multi Shot Noise Reduction feature resulted in an image with about the same amount of noise as 1600 ISO except with some color shift and lack of clarity and sharpness (which could be addressed with post-processing). The individual images can be viewed at a larger size here:
http://www.flickr.com/photos/dojoklo/sets/72157630202666884/

2.8 Custom Functions (C.Fn) Menu

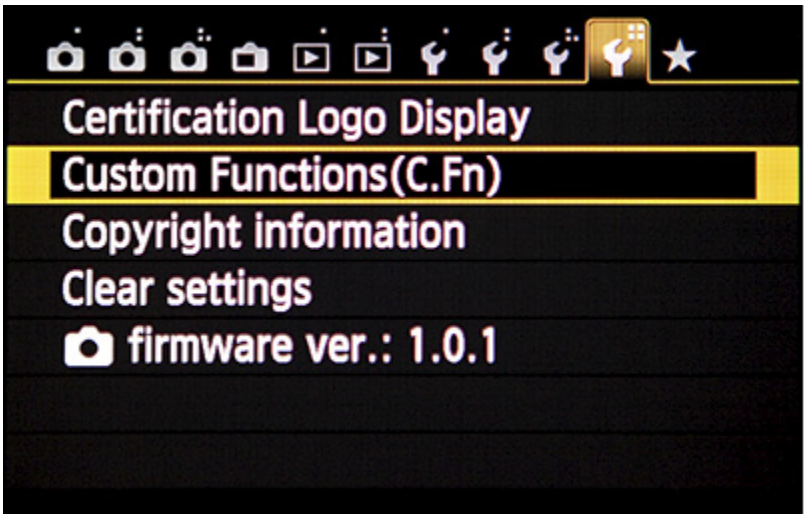

Figure 38 - Custom Functions (C.Fn) Menu.

C.Fn I: Exposure

C.Fn-1 - Exposure Level Increments
This is to change the increments of shutter speed, aperture, and exposure compensation: 1/2 stop increments or 1/3 stop (see *Figure 39*). This setting will also apply to Auto Exposure Bracketing (AEB) and Flash Exposure Compensation. Set this depending 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. Shutter speed and aperture will be covered in the **Exposure, Part 1** chapter, and **Exposure Compensation** in its own section of the text.
recommend: 0: 1/3-stop

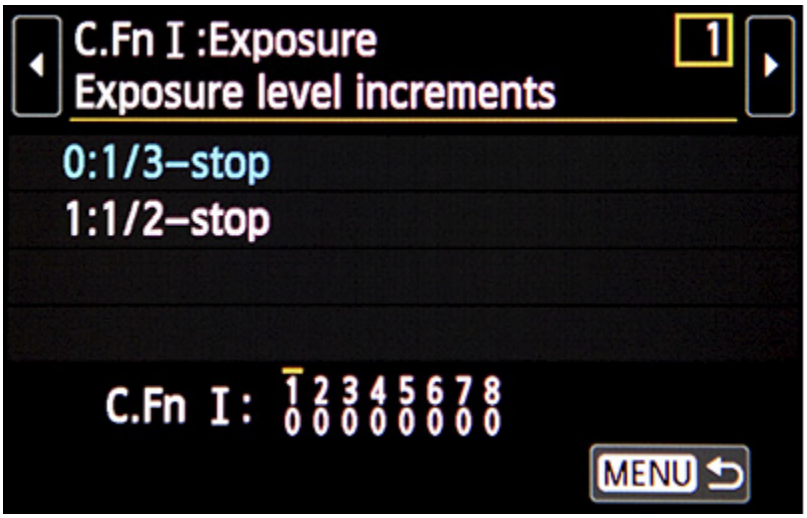

Figure 39 - C.Fn-1 - Exposure Level Increments options.

4. AUTOFOCUSING

4.1 Introduction to Autofocus

With the T4i, Canon upgraded the camera's autofocus (AF) system so that not only the center AF Point, but all nine AF points are now more accurate cross-type points (see *Figure 54*). With this improved autofocus system, you will be able to quickly and accurately achieve focus on a wider range of subjects and lighting situations. Photographers can feel more confident using and taking advantage of all nine of the AF Points to focus on a still subject or to track and maintain focus on a moving subject. Plus, the center AF point is now also an even more accurate diagonal-cross-type sensor when using an f/2.8 lens (a lens with a maximum aperture of f/2.8).

Figure 54 - Caribbean Carnival, Cambridge, Mass. - The nine AF Points as seen in the T4i viewfinder (simulated here). The selected AF Point (shown here in red) positioned over the subject's eye, focus distance locked with half-press of Shutter Button, and Shutter Button fully pressed to take the photo. Shutter speed 1/1000, aperture f/4.0, ISO 400.

In addition to the upgraded autofocus system used during still-image viewfinder shooting, Canon has modified the Live View and Movie Shooting autofocus system of the T4i and introduced new focus modes that take advantage of the sensor's ability to focus using phase detection and contrast detection (rather than the previous contrast-detection only system). The T4i camera's revamped hybrid autofocus system for Live View and Movie shooting allows for Canon dSLR first: continuous autofocus during Live

View and Movie shooting. And the phase detection aspect of the new AF system enables the camera to determine both the out-of-focus distance and the direction in which to correct, finally eliminating the slow and awkward focus hunting of previous models. Add one of Canon's new "stepping motor" STM lenses, such as the ***EF-S 18-135mm f/3.5-5.6 IS STM*** kit lens or the ***EF 40mm f/2.8 STM*** "pancake" lens and the lens will now silently focus during movie shooting, thus eliminating the autofocus motor noise previously picked up by the camera's built-in microphone.

4.2 Viewfinder Autofocus

To take full advantage of this versatile autofocus system, you will need to take control of it in order to have the camera autofocus where and how you want. One of the essential steps in taking a successful photo is controlling where the camera focuses. If you allow the camera to autofocus by choosing its own focus point(s), it typically focuses on the closest object. This may or may not be what you want to focus on. So you should select where the camera focuses using the Auto Focus Points. This does not mean you have to manually focus the camera, it means you tell the camera exactly where to autofocus. For example, you often want to focus on a subject's eyes, 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 the leaves closest to you.

Autofocus works by looking for contrast (even phase-detection systems), so try to focus (align your AF Point as you see it in the Viewfinder) on a detail with a strong line or strong contrast between light and dark. Note that the actual focus area is slightly larger than the rectangle of the AF Point shown in your viewfinder. The AF system may not be able to focus on a large area of consistent color - such as a white wall or blue sky or even an evenly 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 as well in dim light, though the flash functions as an AF-Assist Beam to assist in this situation. When photographing people, always try to focus somewhere on the face, ideally on the eyes or eyebrows (see *Figure 54*), then recompose the framing of your image if necessary.

I will use the term *"recompose"* a few times throughout the text. By this I mean moving the camera after you have set 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 frame 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 *Figure 60 and Figure 61* a little later in this chapter).

Select an Auto Focus Point, or AF Point, using the AF Point Selection Button and the Cross Keys. Use the center SET Button to choose the center AF Point.

To see how autofocus point selection works, make sure the switch on your lens it set to AF and your Autofocus Mode, as seen on the Quick Control Screen, is set to One Shot, then:

1. Tap the Shutter Button with a half-press to wake up the camera.
2. Looking through the viewfinder, press and release the AF Point Selection Button with your thumb and then use the Cross Keys to select the focus point that is nearest to where you want to focus.
3. Place that point over your intended subject.
4. Press and hold the Shutter Button halfway down and see that point blink red (just the inner dot will light up). The Focus Confirmation Light should light up in your viewfinder. You have locked the focus.
5. Keeping the Shutter Button pressed halfway, recompose if necessary, and take the shot by fully pressing the Shutter Button.

You can also turn the Main Dial after pressing the AF Point Selection Button to select an AF Point. Pressing the SET button once or twice after pressing the AF Point Selection Button will activate automatic AF Point selection and you will see all the AF Points light up. Press SET again to return to just the center point, or press one of the Cross Keys to select another single AF Point.

These actions can also be viewed (and practiced) on the LCD Monitor if the Shooting Settings Screen in on (press the INFO Button) before pressing the AF Point Selection Button (see *Figure 55*).

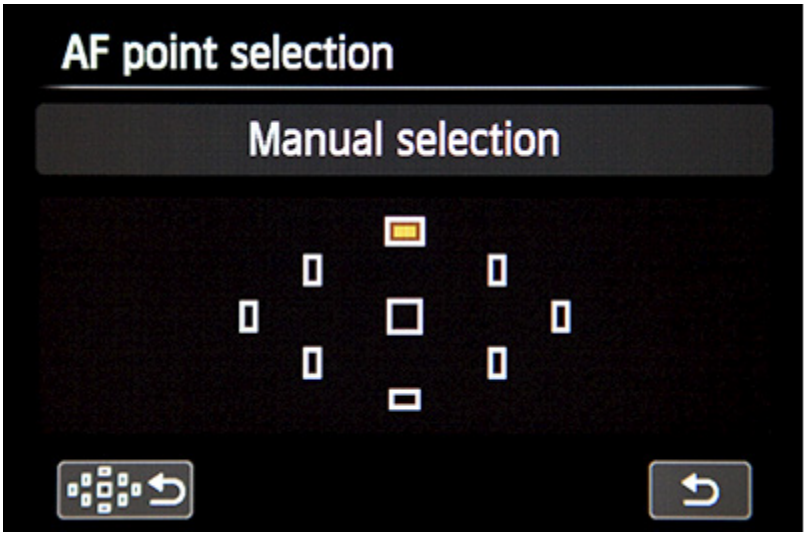

Figure 55 - Autofocus (AF) Point Selection screen, showing a manually selected single point highlighted. Press the lower-left icon to return to Automatic AF Point Selection.

There are reasons to use the outer focus points and not just the center one all the time, which will be discussed later. It may sound difficult to select the focus point each time,

but it is actually very quickly done and will become instinctive. You may even start to set your focus point as you approach a scene before even bringing your camera to your eye. But if you wish, you can start by always using the center point and recomposing before taking the shot.

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, so remember to locate your active AF point over an area of contrast or a strong line. Or you may be too close to your subject for the lens to focus or there may not be enough light. If the flash is not automatically popping up to act as an AF-Assist Beam, such as in the non-automatic modes, manually raise it by pressing the Flash Button.

4.3 Focus Modes

The T4i has different focus modes to choose from, typically depending if your subject is still or moving, or if you wish to track its movement.

One-Shot AF

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 if the distance between you and the subject is not going to change between the time you lock focus, recompose, and take the shot. Lock focus on the subject and recompose if necessary. This mode can even be used for moving people or objects if you quickly take the shot after establishing or locking focus.

Focus on your subject by pressing the Shutter Button halfway. The active AF Point will illuminate, and the Focus Confirmation Light at the lower right in the Viewfinder will light up 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.

As just noted, 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.

However, if you are photographing a subject that is approaching or receding from view at a relatively constant rate, or photographing fast or erratic or unpredictably moving subjects, or photographing sports, action, or wildlife you will usually want to use AI Servo Focus Mode.

AI Servo

AI Servo mode is used for tracking and focusing on moving subjects, and is ideal for capturing sports and wildlife including birds (see *Figure 56*). If the subject is moving towards you or away from you the camera will keep evaluating the focus distance *as*

8. EXPOSURE Part 2

8.1 Exposure Lock

As discussed in the Custom Functions section, with the default settings of your camera, the focus and exposure are both locked when you press the Shutter Button halfway when using Evaluative Metering Mode. You then recompose if necessary and then fully press the Shutter Button to take your photo. The problem with this is that if you recompose, the required proper exposure may change due to your new framing, and the photo may be slightly, or possibly greatly under- or over-exposed. For example, your subject may be standing in a sunny spot near a large, dark shadow area. You use the center AF Point to focus on the subject, press the Shutter Button halfway to lock this focus, then recompose the shot to place your subject off center. But now that large area of shadow is no longer in your shot and most of the scene is sunny area. You had also locked the exposure with that Shutter Button half-press, but that exposure was determined by the camera to be correct for the sunny *plus* shady spot. Now there is a lot more of the brightly lit area in your frame that is going to be dramatically over-exposed. To prevent this exposure problem, you can use the AE Lock Button to first lock in the exposure of your desired framing. This is the button that is labeled with the [*] (see *Figure 92*).

Figure 92 - Detail of the Canon T4i showing the AF Point Selection Button and the AE Lock Button [*].

What Readers are Saying About Doug's dSLR Camera Guides:

This book, together with the manual that came with your camera, is all you need to start discovering the full potential of the camera.
-Max M.

***A Pro Right There With You** - If you want to get the camera up and running with the feeling of a pro right there with you then I would strongly recommend it. He walks you through setting the camera up and gives you his reasoning for the settings. His explanation is first class and he explains how various custom settings are related to each other. All in all a great read. Camera in one hand and reader in the other and dig in. Thanks Doug, just what I was looking for.*
-Tim S.

***A Must-Have Accessory** - What a great addition to my bag. This is a well written, full body of work that explains, in plain English, how to get the most out my new camera. Doug provides the knowledge and experience to bring you to the next level. I look forward to learning more every time I open the book.*
-Steven

***Brilliant - just what I was looking for!** A manual that was exciting, clear to follow, had examples and was used by a professional who gave just the right amount of technical info with explanations of why you use those settings, when to use those settings and so on...all properly explained. Doug's book is a joy to follow, well thought through and well written. The camera company should be employing Doug to write their cameras manuals!*
-Robert D.

***It's clear, concise** and gets to the heart of the camera's multiple and often confusing options. Very highly recommended - for experienced user and beginner alike. The official manual is very good on what to do, but not so clear on why. Perhaps the camera company should just hire Doug to write their manuals - it would be so much simpler for all concerned!*
-G.S.A.

It's the first guide I've read which has taken me through all the settings in an understandable way. I now feel that I have control over the camera.
-Peter S.

***Really Focuses on the "Why"** - I found the (camera's) manual good for understanding how to set things up but not much on the why - this book really focuses on the "why." The guide helped me understand why to use specific settings for specific needs.*
-Benoit A.

***Amazing!** - Great and easy to understand and very complete. Very highly recommended. The guy REALLY knows what he's talking about.*
-P.M.

Purchase *Canon T4i / 650D Experience* at:
http://www.dojoklo.com/Full_Stop/Canon_T4i_Experience.htm