



# Back-Button Auto Focus Explored

For years, Canon EOS cameras have offered photographers an option to change the way autofocus is activated. Often referred to as “back-button focus”, this feature lets the user customize the camera so that focusing is performed by pressing a rear button with the photographer’s right thumb. The shutter button still wakes up the camera with a half-press, and fires the shutter with a full press downward. It just does not cause the lens motor to focus the lens.

By separating AF activation from shutter release, it’s possible in some cases to be more effective with AF, and not have the focus thrown off if something momentarily enters the picture area while you’re shooting.

Canon was the world’s first camera maker to incorporate such a feature, launching it back in 1989 with the EOS 630 (35mm film SLR) but most other major camera manufacturers have now introduced their own version. All current EOS digital SLR models have this feature in the camera’s Custom Functions, including the entry level range e.g. the 1000D and the 450D.



The world’s first SLR with a back-button AF option was the EOS 630 (35mm film SLR), which was introduced in 1989. All current EOS models now include this feature, from the entry-level Rebels to the flagship EOS-1D range (although the functionality differs slightly between bodies and generations, as explained further below).

## Why would anyone want to remove AF from the shutter button?

This is a question many users ask when **Back-button focus** is first explained to them. ‘It has always worked well for me and is surely the easiest solution’. ‘This is surely the way the camera manufacturers intended you to use the camera’.

There are certainly many times where the standard method of operation — press the shutter button half-way down to focus, and then press fully to shoot — works

perfectly well. Everything is controlled by one finger, and if you like, you can lock the focus with a stationary subject by holding the shutter button half-way down.

Even dedicated supporters of back-button AF will change back to this standard camera operation from time to time.

Back-button focus does however offer some significant advantages, especially for the experienced photographer and is worth exploring. There is one really important piece of advice however. As with any new approach to using your camera experiment with it well before going on an important photo shoot.

The following represents some examples where Back-button focusing can really help you produce better results – after practise that is:

N.B. To use the back button focus does not only require that you set the camera up to accommodate it but also that you also set up the focus “dots” in a particular way (usually setting it to use the centre dot only) but more on that later.

## 1. Easier to lock focus

If you are shooting a photograph of an animal or a portrait of a person, and you want them composed off-centre, back-button AF makes it extremely easy to ensure that the focus is exactly where you want it to be.

Focus on your subject by pressing the rear button (more on which button later in this article). Once in-focus, take your thumb off the rear button. Re-compose the shot to move your subject off-centre. Shoot as many pictures as you like and the focus point will remain exactly where you set it. In natural history shots you often want e.g. the animal’s eye in sharp focus and the background out of focus. This approach allows you to do exactly that, set the focus on the eye, re-compose the shot and take the photo.



If you like to lock focus and re-compose your subjects, you'll find back-button AF very helpful: Once your focus is set, you can move the camera and take as many shots as you like without AF trying to re-focus on what's now in the centre of your picture

With focus activation removed from the shutter button, you now can fire the shutter, and remove your index finger from the shutter button after a shot is taken. Irrespective of what happens in the frame the camera will not re-focus but will remain locked when you press the shutter button half-way down again.

## 2. Easier timing of shots

Similar to point number one above, but yet another benefit of separating the focus from the shutter button is that critical timing becomes simpler to manage. For example, if you were shooting a speaker at a podium, he or she might periodically look up or make a gesture that would be an ideal instant to capture. If shooting an animal again there will be an exact moment when you want to take that split second photo without having to worry if the focus is right.

If you have previously focused with back-button, your index finger is free to shoot at the decisive moment. There are other approaches you could adopt of course.

- The text books will tell you that the prime one is to “pre-focus”. They tell you to switch off the auto focus, manually focus on the point you want and then wait.
- The camera manual will tell you that you can press the shutter button half way down to get a focus then hold it there until the decisive moment then press down fully.

These do both work but are not the easiest or most reliable approaches. Pre-focusing is however useful when the light level is low or when using macro. In other situations why trust your judgement to get a focus when the modern camera lens and electronics can do it faster and more accurately. Whilst the half button press approach is good in an emergency when you don't have the camera set to back button focus it is fiddly as you have to very carefully hold your finger half-way down waiting, waiting, waiting in that position for your subject to do something interesting.

It is sometimes said that the conventional approach is required with a very animated or fast moving subject. As the subject moves the focus has to keep changing. To accommodate this you will have your camera's focus set to AI Servo AF (to track any movement). In these situations you simply just keep



your right thumb on the back button to keep focus active, while your index finger can be ready to shoot with no worries about also preserving focus.

Sports photographers know how common it is for a referee or another player to momentarily step between you and your subject. With back-button AF, it's easy to keep shooting and halt AF by just pulling your thumb off the rear button until your view is totally clear again

An added advantage here is that if you should e.g. be tracking a flying bird and suddenly notice something come into the side of the frame that you experience will tell you will 'draw the focus' you can momentarily release the back button to ensure that the focus does not change, pressing it again when you want the focus to 'catch up'.

### 3. Easier over-riding of AF with full-time manual focus

Most of Canon's more modern lenses (as well as those of other suppliers) have a neat feature called full-time manual focus. Even if the lens's AF/MF switch is in the AF position, these lenses allow the shooter to instantly adjust focus manually by simply turning the focus ring on the lens. There's no need to first move the switch to MF.

With back-button AF, this becomes a nearly foolproof feature. Use the autofocus whenever you like by pressing the rear button with your right thumb. Shoot whenever you like by pressing the shutter button. And if you want to touch-up focus, or totally over-ride what the AF is doing, just pull your thumb off the rear button and turn the ring. No matter how many pictures you shoot, pressing the shutter button will not cause the AF to try to activate and re-set the focus you just carefully adjusted manually.

### 4. Easier macro and close-up focusing



In close-up photography, it's often necessary to lock the focus, because AF tries to make little changes each time you shoot. With back-button AF, you can concentrate on composition, instead of focus.

Very often, you'll find that it's actually easier to get consistently sharp close-up pictures of small objects by pre-focusing, and then moving yourself forward or backward until you see the critical sharp focus appear in your viewfinder. If the level of light allows, crucially in macro work it sometimes is not enough for autofocus to work, it is far quicker and more predictable to let the camera determine the focus and then lock it.

Once again, with back-button AF active, you can use the AF to get within general range (press the rear button with your thumb, then take your thumb off the button), and move a little bit to get things critically sharp. Most important, you can then shoot freely, without AF trying to re-focus each time you touch the shutter button. Finally, touching-up focus with the full-time manual focus feature if the lens permits it is simple and quick, and the autofocus never fights you by trying to un-do what you just adjusted.

## Exposure considerations.

All Canon cameras provide some form of auto exposure. The way this functions is the subject of another paper but in principle once the mode – P, AV, TV, Man etc. has been selected and the relevant options chosen pressing the shutter button half down sets the exposure (and the focus). Pressing it fully down takes the photo.

## Using Auto Exposure (AE) Lock

Auto Exposure Lock (sometimes called AEL) is a feature on all Canon EOS camera models, as well as some of their basic “point and shoot” range. Just as with back button focusing it’s an excellent method of gaining added control over exposure, without losing the speed and convenience of automation. A full understanding of how AE Lock operates can add a new dimension to your photography.

All EOS camera models, film and digital, have a button on the back of the camera that’s marked with an asterisk or star icon. This is the AE Lock button. Pressing it when you’re in any “creative zone” auto exposure mode — P, Av, Tv, or A-DEP — will immediately lock exposure in-place, and you’ll get an asterisk icon in the viewfinder to advise you of this.



The positioning of the “\*” or AE button on the 50D camera.

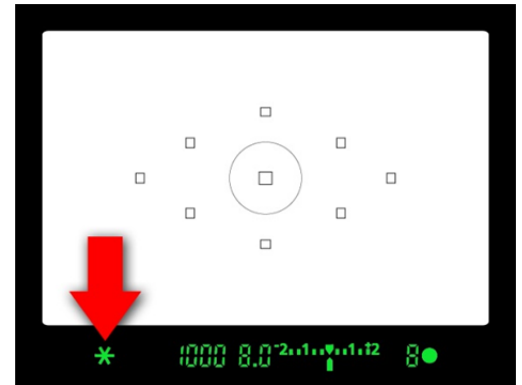
## What is AE Lock?

What AE Lock does is simple. Much like back button focus it “freezes” the camera’s exposure settings, so that if the camera is moved from one area to another, the auto exposure system won’t change aperture/shutter speed values.

There are many situations where this may be useful. A photographer shooting a portrait, for example, might want to place the subject off-centre. Taking a meter reading from the subject, locking it (along with focus), and then moving the camera to re-compose the subject means that exposure won’t shift if the background is lighter or darker than the subject itself. Another example might be a shooter taking a sequence of images, panning the camera from one area

to another (following a moving subject, for example). If there are differences in the background or lighting, it's possible that exposures will vary from one shot to the next. With AE Lock active, exposures would be consistent from shot to shot.

The procedure is quite simple. Aim the camera at the part of the subject or scene that's most important to meter accurately. Press the shutter button half-way to start metering, and then press the rear AE Lock button. An asterisk will appear in the bottom left of the view finder, so you know exposure won't shift as you move the camera to re-compose the shot. You do need to keep pressing the shutter button half-way to keep the meter active (and locked); if you were to pull your finger totally off the shutter button, the camera would turn the meter off in about 4 to 6 seconds, and you'd lose the reading you just locked-in. The length of time the exposure is retained is pre-set to 4 to 6 seconds for all bar the 1D professional range where there is an option to vary it up to 1 hour.



Space does not permit for a full explanation of exposure and exposure lock here but it is important to understand how to use it and how this links to the back button focus options. If you are opting to separate the focus to a back button you need to consider what you want to happen with the exposure setting too. Controlling both is not that difficult once learnt and gives you ultimate control.

## How do you set up you camera for ultimate control over focus and exposure ?

First you have to determine the focus sensors you wish to use. Most of the canon range have a grid of sensors visible in the view finder and you can select all or any particular one. Space does not permit here to explain how but to achieve the best results with Back button focus select the centre one as shown in red below.



Next you need to activate the back button focusing.


You then need to determine the exposure mode i.e. Evaluative, Partial, Spot or Centre Weighted Average metering.


This is explained in the Canon manual for the 50D as follows:

## **Selecting the Metering Mode** ☆


The metering mode is the method of measuring the brightness of the subject. In the Basic Zone modes, evaluative metering is set automatically.


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**1** Press the  **•WB> button.** (Ⓔ6)

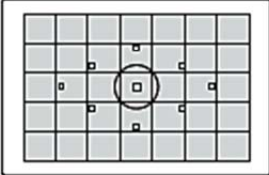



**2** **Select the metering mode.**


- While looking at the LCD panel, turn the  dial.




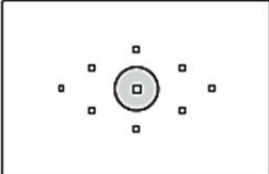
 **Evaluative metering**  
This is an all-around metering mode suited for portraits and even backlit subjects. The camera sets the exposure automatically to suit the scene.




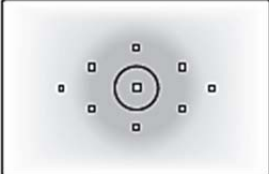
 **Partial metering**  
Effective when the background is much brighter than the subject due to backlighting, etc. Partial metering covers about 9% of the viewfinder area at the center.



 **Spot metering**  
This is for metering a specific part of the subject or scene. The metering is weighted at the center covering about 3.8% of the viewfinder area.



 **Center-weighted average metering**  
The metering is weighted at the center and then averaged for the entire scene.



I could spend a great deal of time considering the various options but when using back button focusing the best two are Partial and Spot metering. The latter if you want a very localised meter reading. Centre weighted might be useful in some circumstances but Evaluative certainly is not. It removes any gain you make by selecting your own metering area.

## Activating back-button AF

Back-button AF is engaged by setting the appropriate Custom Function in your EOS camera. Remember, to use any Custom Function, your camera must first be in one of the “creative zone” exposure modes – P (Program auto exposure), Av (aperture-priority mode), Tv (shutter-priority mode), or M (manual exposure mode). Custom Functions are totally locked-out if you’re in the full-auto “green zone”, or a picture-icon setting like the Portrait mode or Landscape mode.

The particular Custom Function number varies, depending on the EOS model in question. Also, certain models in the EOS Digital series (principally the early entry level models e.g. the 300D) don’t have this capability. The table on the following page gives the custom settings for the most popular cameras. If your camera is not here but does support back button focusing please refer to the manual for the correct custom function.

N.B. The 1D professional range have more options so have been left off this table. Please refer to the manual for these cameras.

<b>EOS Model</b>	<b>Custom Function for Back-Button AF</b>
EOS 300D:	C.Fn 9
EOS 400D:	C.Fn 04
EOS 450D:	C.Fn 04
EOS 20D:	C.Fn 04
EOS 30D:	C.Fn 04
EOS 40D:	C.Fn IV-1
EOS 50D:	C.Fn IV-1
EOS 5D:	C.Fn 04
EOS 5D Mark II:	C.Fn IV-1

## Understanding the on-screen wording:

The terminology on the menu for this particular custom function may seem a little confusing and the manual is not at all clear, so an explanation is required. The function is headed “**Shutter button/AF-ON button**”, or similar.



There are various options (1 – 4 in the 40D and 50D). They all have the same format namely a setting then a slash (/) then another setting. Once understood this is quiet easy

Anything before the slash mark refers to how the shutter button will behave and anything after the slash tells you how the rear button will work if that option is selected.

Using the EOS 50D as an example, here's what you see on-screen, and the following pages explain what it means:



### **Setting 0:** The default.

This is where focus and exposure or meter setting are both achieved with a half press of the shutter button (focus but not exposure can also be achieved by pressing the AF button on the back). You can also use the '\*' button to lock the exposure for 4 seconds. This setting is perfect for someone staring out with a DSLR or if you want the camera to manage all the options for you. Having said that there are many occasions when a professional might use this option. With this setting you do have the option to lock the exposure by pressing the '\*' button on the back of the camera.

### **Setting 1:**

In my opinion this is only really useful if you are following a moving object with for example the servo focus mode selected. The shutter button performs as in setting 0, i.e. the default. If however you are following a subject with the shutter button held half down and notice something coming into the edge of the viewfinder which, from your experience, you feel would 'draw the focus' you can 'lock the focus' by pressing and holding the AF button (with the shutter still held half down). Releasing the AF button when appropriate then allows the focus to catch up again. This is only really useful in these

circumstances when the subject is moving fast across a messy background. Basically you are locking the focus just before the messy background and release it when things clear. The dexterity required to hold the shutter half down and press the AF button fully down takes some mastering and experience shows that options 2 or 3 are easier to master.

### **Setting 2:**

Again in my opinion this is the most useful option. Focus alone is removed to the back button but exposure is held on the shutter or '\*' exposure lock.

This works particularly well as you can determine the focus point, lock it and recompose then either allow exposure to be automatic or locked by pressing the '\*' button. i.e. if the light changes the exposure won't or alternatively you can take a reading on a new area press the '\*' button again, N.B. pressing the shutter button half way does not set or change the exposure in this option. That is what makes this setting particularly useful.

The challenge with this option is that after pressing the '\*' button the settings are only retained for 4 seconds and to keep it 'awake' you have to keep ½ pressing the shutter button every 4 seconds. This is not too difficult to master and becomes quite natural after a while. You will spot photographer who use this setting as their index finger 'dances' on the shutter every 2 or 3 seconds.

The professional 1D range allow you to extend the time the exposure is locked up to 1 hour and this would be very valuable if included on the rest of the Canon range too. If you are using a 1D camera refer to the manual to discover how to effect this change but it is to be found under Custom Function IV.

### **Setting 3**

This is the most confusing and in some ways very similar to setting 2.

It sets the camera up so that the focus is taken away from the shutter button to the back button but, unlike setting 2, the exposure is left on the shutter button which functions in the default manner. i.e. the exposure is set and locked when you half press the shutter button.

This supposedly gives you the most control but is tricky to use. In this mode just to confuse further the '\*' button does not lock the exposure rather if whilst holding the shutter button half down you press it the exposure will reset and be retained.

### **Setting 4**

This is simply the same as setting 0 but the AF back button is disabled altogether. It is in my opinion of limited use.

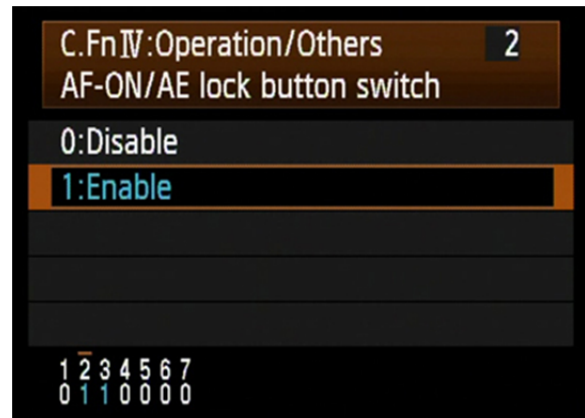
## Which button is used for back-button AF?

Those cameras with the separate AF-ON and '\*' buttons and also have a Custom Function that lets you 'flip' their roles. This is particularly useful if you find the AE Lock or '\*' button easier to reach. In these circumstances you may want to use this function as well.



It should also be noted that if you use the separate battery grip available for Canon cameras only one – the '\*' is replicated on the grip. Thus to use the AF function when using the camera in portrait mode you would need to swap the buttons functions so that you can use this button for AF.

To swap the roles of the AF and '\*' buttons navigate to the relevant custom function. C Fn IV 2 on the 40D, 50D, 5D and 5D Mark II and select enable to swap the buttons, disable to return to the default mode.



## Simplifying the swapping of back button focus modes.

If you decide to try this function it is quite likely that you will want to swap the mode or selection at different time and for different situations. Navigating all the way to custom function C Fn IV 2 each time would be difficult but fortunately on the later models of camera Canon have introduced a “My Menu” Option. This is accessed via the final ☆ tab on the menus.

Setting this up is explained very clearly in the relevant section of the manual below (50D version but exactly the same for 40D – please consult your manual for other camera models). The item you require is called “**Shutter button/AF-ON button**”.

### C.Fn IV: Operation/Others

#### C.Fn IV -1 Shutter button/AF-ON button

##### 0: Metering + AF start

##### 1: Metering + AF start/AF stop

During autofocusing, you can press the <AF-ON> button to stop the autofocusing.

##### 2: Metering start/Metering + AF start

This is useful for subjects which keep moving and stopping repeatedly. In the AI Servo AF mode, you can press the <AF-ON> button to start or stop the AI Servo AF operation. The exposure is set at the moment the picture is taken. Thus, the optimum focusing and exposure will always be achieved as you wait for the decisive moment.

##### 3: AE lock/Metering + AF start

Convenient when you want to focus and meter at different parts of the picture. Press the <AF-ON> button to meter and autofocus, and press the shutter button halfway to attain AE lock.

##### 4: Metering + AF start/Disable

The <AF-ON> button will not function.

#### C.Fn IV -2 AF-ON/AE lock button switch

##### 0: Disable

##### 1: Enable

The functions of the <AF-ON> and <✳/Q> buttons will be switched with each other's function.



When set to 1, press the <AF-ON> button to display the image index or to reduce the image display.

## Summary:

It can take a little practice to get the hang of back-button AF, but I suggest giving it a try if you haven't done so already. Even if at first its operation seems unorthodox, in fact it can simplify certain types of shooting and allow you to work more quickly with fewer missed shots. Back-button AF was first suggested to Canon back in the late 1980s by sports photographers who saw the need for some way to be able to start and stop AF without interfering with shooting continuous pictures. The feature is now available on all current and many previous EOS models. It's no longer just for pros — any photographer can experiment with it and benefit from it in certain conditions.

Finally, remember that like any Custom Function, you can always return the camera back to factory-default operation by returning that Custom Function to option “zero”.