Canon

EOS-1D
Mark IV

AI Servo AF Custom Function
&
ISO Speed Settings Guide

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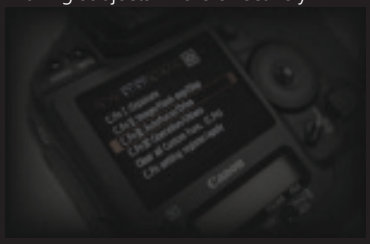
AI Servo AF Custom Functions

Custom functions for personalized AI Servo AF settings to capture moving subjects more effectively



The EOS-1D Mark IV offers photographers a variety of options to customize AF and Continuous shooting operation. These can be found in the third Custom Function group (C.Fn III). Among the Custom Function options are those that can be set for a variety of subjects when using AI Servo AF which is the best AF mode for moving subjects. As introduced on page 4, the Custom Function settings provide a greater level of versatility for a wide variety of shooting situations. Depending on the shooting conditions, it is possible for the AI SERVO AF mode to focus more accurately on fast moving subjects by selecting an appropriate Custom Function. This guide describes the features of these key Custom Functions, and how to select and use the most appropriate settings.

ISO Speed Settings

A wide range of normal ISO speeds (ISO 100 – 12800) and ISO expansion options (ISO 50, 25600, 51200, 102400) are available

A major feature of the EOS-1D Mark IV is its outstanding image quality at high ISO speeds. Image quality improvements brought about as a result of the newly developed 16 megapixel CMOS sensor and Dual "DIGIC 4" image processing make it possible to use a maximum standard ISO speed of 12800, with an ISO expansion of up to ISO 102400. Until now, images at ISO speeds of 3200 and 6400 were of such a quality that usage was generally due to the need for an image rather than a desire to have the best possible image quality. With the EOS-1D Mark IV, image quality has improved so much that the normal ISO range up to 12800 is now suitable for a much greater range of photographic situations. The second half of this guide introduces the superior image quality of the EOS-1D Mark IV including use of high ISO speeds, and offers tips for getting the best results at all ISO speed settings.

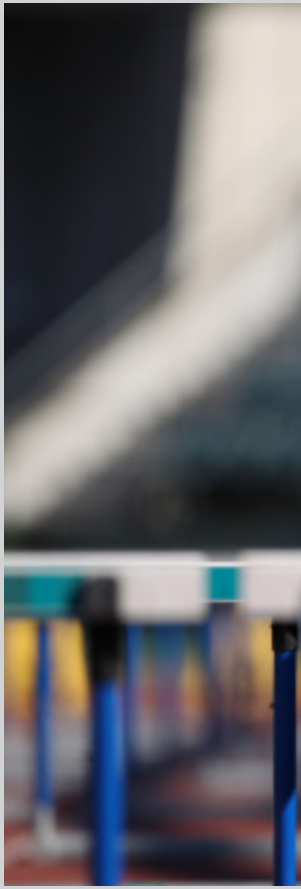
EOS DIGITAL

Contents

The basic settings have great levels of versatility and can handle a wide variety of shooting opportunities and subjects

Custom Functions related to AI Servo AF are included in the C.Fn III AF/ Drive group.

The default out of the box settings are the simplest settings and are more than capable of handling shooting for a variety of subjects.



EOS-1D Mark IV Custom Functions related to AI Servo AF are included in the C.Fn III AF/Drive group. This group's default Custom Function settings are the basic settings for AI Servo AF.

Basic Settings are the most general settings, capable of handling the majority of shooting conditions. The Custom Functions that will be introduced later, when set for specific conditions can raise the probability and precision of focusing. However, when the settings are not appropriate, the probability and precision of focusing may actually be reduced.

AI Servo AF on the EOS-1D Mark IV uses a new AF algorithm, and the tracking performance of moving subjects has been significantly improved. So, first try shooting with just the default settings and none of the Custom Functions selected. Then after considering the shooting conditions try setting the Custom Functions for even higher consistency and precision of focusing.

Photo taken with the default settings, and not using any of the C.Fn III AF/Drive Custom Functions. This setting will get the best possible performance when shooting subjects that generally do not move.

EF400mm f/2.8L IS USM 1/2000 sec. f/2.8 ISO100

Setting hints

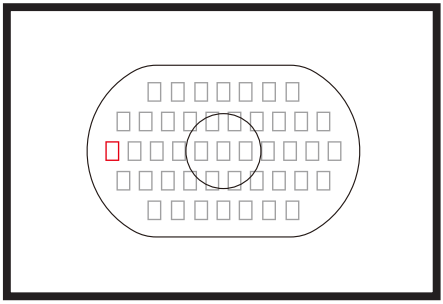
When even more stability is required than that provided by the Default Settings, using the options within C.Fn III-8 (AF expansion)**, and C.Fn III-4** (AI Servo AF tracking method) **are also effective**

Default settings are the easiest to use, however, when you want to consistently capture subjects that move extremely quickly, C.Fn III-8 AF expansion, and C.Fn III-4 AI Servo AF tracking method: Option 1 (Continuous AF track priority) will be effective. Refer to the description pages (pp. 16, 20).

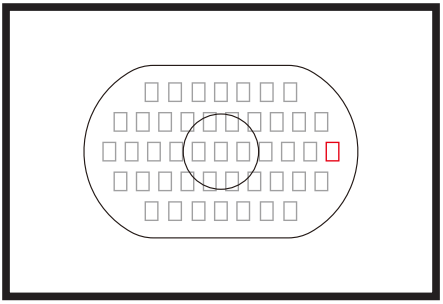
Switch to Registered AF Point

You can instantly shoot with a different registered AF point

Registered points can be applied with one button



Manually selected AF point



Switch to registered AF point

Press the Multi-controller once, or

While pressing the AE lock button

In the manual AF point selection mode select the desired AF point, by pressing the AF point selection button. Once the required point has been chosen, then press the ISO button, the AF point will then be registered and this is confirmed by a beep.

The 45-point AF system on the EOS-1D Mark IV makes it possible to capture the subject within a wide area. However, when shooting sports where the players move around quickly, switching from a manually selected AF point while shooting can be difficult. In situations like this, Custom Function C.Fn III-11 Switch to registered AF point is useful.

This function allows instant switching to a previously registered AF point with just one button. Registration of AF points can be carried out during normal shooting conditions by manually selecting the AF point, then while pressing the AF point selection button, press the ISO button to register. Then when C.Fn III-11 is set to option 1 or 2 switching to the registered AF point is possible.

Because it is possible to switch the AF point with just one button, while shooting with a manually selected AF point on the left edge, it is also possible to instantly switch and shoot with a registered AF point on the right side.

This function is convenient for registering an AF point that is frequently used.

* With the C.Fn III-6 option, when lenses with an AF stop button are attached, selection of registered AF point with the AF stop button is possible.

Manually selected AF point

EF300mm f/2.8L IS USM 1/1600 sec. f/2.8 ISO3200

It is possible to instantly switch between two AF points

In order to capture the skater on the right hand side while shooting with a manually selected AF point on the left hand side, this photo was shot by switching to a registered AF point on the right. This feature is effective for shooting sports where there is a lot of left-right, right-left movement.

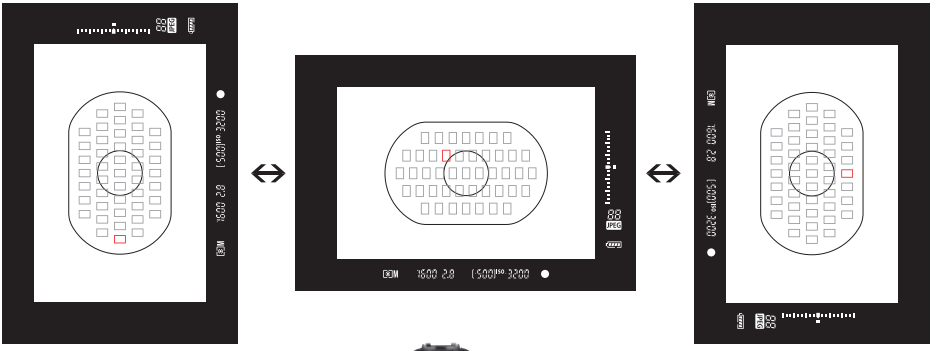
Switch to registered AF point

EF300mm f/2.8L IS USM 1/1600 sec. f/2.8 ISO3200

For illustrative purpose, all AF points are displayed superimposed.

Three AF Points with differing orientations can be set

Automatically switch between set AF points for each different hold



Vertical position, with grip on top

Horizontal position

Vertical position, with grip on bottom

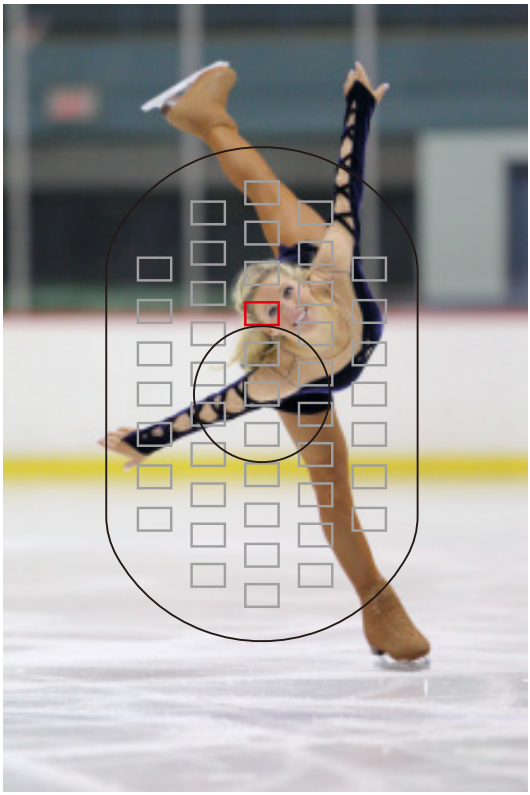
Different AF points can be set to three orientations. Changing the orientation of the camera will automatically switch to the preset AF point

Set C.Fn III-16 Orientation linked AF point to Option 1: Select different points, and then while holding the camera in each orientation, carry out the AF point registration.

With the EOS-1D Mark IV, it is possible to select individual AF points according to the camera orientation (horizontal position, vertical position with grip on top, and vertical position with grip on bottom) for the AF points. First, select C.Fn III-16 Orientation linked AF point Option 1: Select different AF points, then while holding the camera in each different orientation, select each AF point. Then, by switching back and forth between horizontal and vertical positions, the preset points will automatically switch according to the orientation.

By using this it is possible to shoot in rapid succession without button operation, additional moving from the horizontal position with the AF point on the right, to the vertical position with the AF point at the top.

This function is effective for shooting subjects where changes in framing are required.



EF300mm f/2.8L IS USM 1/1600 sec. f/2.8 ISO3200

Automatically switch AF points between the vertical and horizontal positions

Shoot with the set AF point in the vertical position (center of the screen), then right away in the horizontal position shoot when automatically switched to the AF point at the top right of the screen. By using AF point selection for each orientation, this kind of shooting is possible.

For illustration, all AF points are shown at once.

Pinpoint focusing is possible

Spot AF narrows the operating area of the AF sensor

EF200mm f/2L IS USM 1/1000 sec. f/2.8 ISO3200

Spot AF can be used by selecting Custom Function C.Fn III-6 Lens/Stop Button Function for setting: 7 Spot AF. (Illustration is the AF sensor during AF. Actual length not displayed.)

Among the EOS-1D Mark IV AF functions, a new function that stands out is Spot AF.

This function narrows the operation area of each individual AF point. As focus can be attained on a smaller area of the image, it can be effective when used in situations like sports when aiming at players through a net, or when attempting to focus on the eyes of a race driver wearing a helmet. (When using a normal line sensor, the probability of focusing on a net in the foreground or on the edge of the helmet is higher, this will make it possible to focus on the

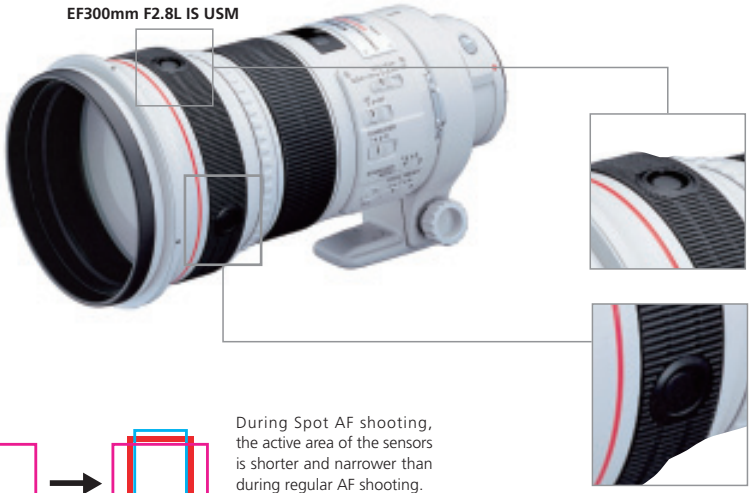
* This function can only be used when lenses with an AF stop button are attached.

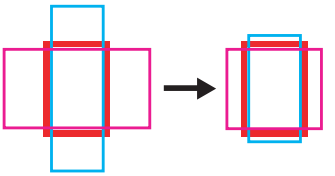
Lens AF stop button on large-diameter single focal length telephoto and super-telephoto lenses

Spot AF can be activated on super-telephoto L-type IS lenses by pressing and holding the AF stop button after C.Fn. III-6 AF stop button function has been set to option 7: Spot AF setting.

EF400mm F2.8L IS USM

EF300mm F2.8L IS USM





During Normal AF

During Spot AF

During Spot AF shooting, the active area of the sensors is shorter and narrower than during regular AF shooting. (Note: The above drawings are for illustration purposes only and do not accurately represent the size and shape of the AF sensor.)

main subject at the back.) Also, for distant subjects (athletes on a podium, etc.) that must be captured even though appearing very small within the image, Spot AF is effective in preventing focus shifting to the background.

When compared to normal settings, the AF tracking speed on the subject will not be slower in Spot AF mode, however, it is important to be aware that the focusing speed from a completely defocused state may be slower.

For illustration, all AF points are shown at once.

Set the sensitivity to the intermediate slow setting when stability is important

Effective for extremely fast subjects and sports with random movement

Set C.Fn III-2 AI Servo tracking sensitivity (hereafter "sensitivity"), when shooting fast moving subjects and sports with lots of close activity, to one of the slower options for even more stable tracking performance.

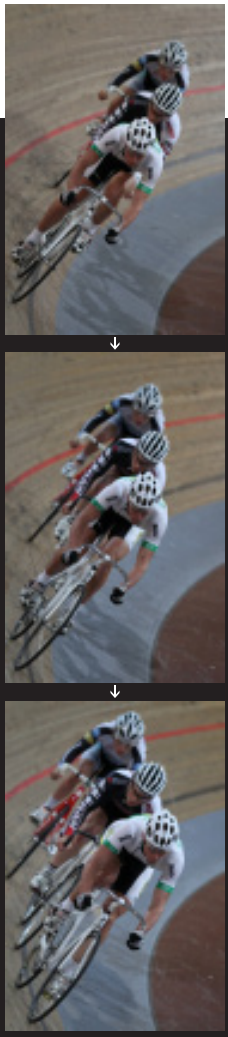
With sensitivity set to fast, when a background with no subject or a secondary subject cuts in front of the AF point, a new point of focus will be quickly detected, and AF point will shift. So, for fast moving subjects (where there is a chance of the AF point moving away in a short time), and sports with lots of close play (players that are not the primary point of focus cut into the foreground), the fast setting will raise the probability of focus shifting to unwanted subjects or obstructions.

In many cases, appropriate focus is achievable with the default sensitivity setting, however, when shooting fast subjects and when obstacles cut in, in order to raise the focus stability (less likely to be unfocused) selecting option -1: the intermediate slow setting can be effective.

In sports such as soccer or basketball where obstacles can often cut into the foreground (players that are not the target), this setting is very effective.

EF300mm f/2.8L IS USM 1/3200 sec. f/4 ISO200

EF400mm f/2.8L IS USM 1/400 sec. f/3.2 ISO1600



With manually selected focusing points, when the subject is extremely fast, selecting the intermediate slow option means less chance of the focus shifting to the background, and makes focusing more stable.

Key point

Focusing speed for the first shot is always at maximum speed regardless of sensitivity

Regardless of the fast, or slow sensitivity options, AF speed from the time the AF drive starts to the first focus is always optimized for maximum speed. This initial focus speed (or catching speed) is a main feature of AF on the EOS-1D Mark IV. It is possible to capture the subject quickly whenever you want to shoot.

For illustration, all AF points are shown at once.

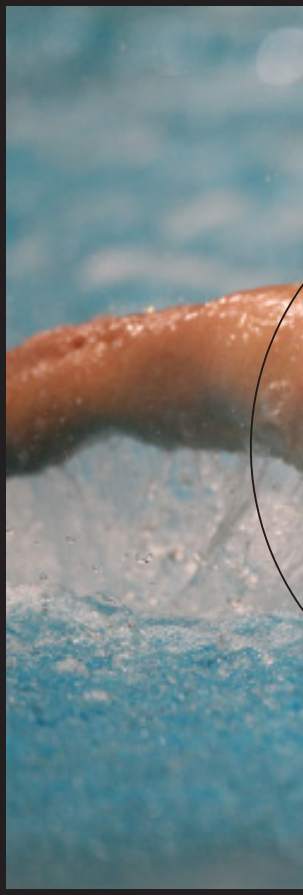
Take advantage of slow sensitivity for intermittently appearing subjects

Use at swimming events or event where the subject disappears and appears

When tracking sensitivity is set to slow (option -2) the length of time that objects entering the AF point are viewed as obstructions will be longer than when set to the intermediate slow option (-1). So, when the time a subject is hidden behind an obstruction is brief (long means about "0.X" sec.), this setting can be highly effective.

For example, when shooting events like breast stroke and butterfly in swimming, with repetitive patterns such as the swimmer going in and out of the water at regular intervals, the slow option (-2) setting can often be effective.

Depending on how long the subject is hidden, it will be best to distinguish between the intermediate slow option (-1) when the time hidden is shorter, and slow option (-2), when it is slightly longer.



→

When shooting skiing sports like slalom where the skiers are often hidden behind flags, sensitivity set to option -2: slow, can improve the hit rate.

EF300mm f/2.8L IS USM 1/3200 sec. f/4 ISO100

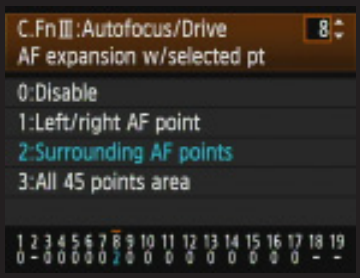
EF400mm f/2.8L IS USM 1/4000 sec. f/2.8 ISO3200

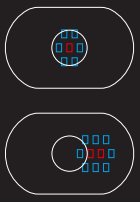
Competitive swimming's breast stroke and butterfly can be highlighted as typical examples of sports where the athlete disappears and reappears at regular intervals. For events like this, sensitivity set to slow can be effective.

For illustration, all AF points are shown at once.

Capture quickly moving objects with AF point area expansion

Expanded by 1 point all around assists the photographer's selected AF point





Manually selected AF point

AF point area expansion
(Red SI appears in AI Servo when SW-1 is active.)

There are times when it is difficult to focus accurately using the selected AF point when the subject is agile and moves around extremely quickly. In situations like this, using C.Fn III-8 'AF Expansion with selected point' will increase the number of active AF points for steadier and more consistent tracking by using the AF points surrounding the manually selected AF point. When shooting primary subjects that move rapidly up and down, or left and right, C.Fn III-8 option 2: 'manually selected AF point expanded by 1 assist AF point all around' is effective. For example, when the center AF point is selected, a total of 6 points, upper diagonal left and right, same row left and right, and lower diagonal left and right are available. With this setting, when it is not possible to capture extreme movement with the selected AF point, the expanded points will function, increasing the odds of capturing the desired subject. This option is most effective when shooting dynamic scenes such as sports with rapid up/down or left/right movement.

When capturing dynamic vertical movement, such as this skier leaping from a mogul, expanding the manually selected AF point by 1 Assist AF point all around can be effective.

EF300mm f/2.8L IS USM 1/4000 sec. f/6.3 ISO400

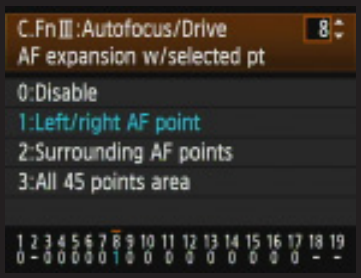
EF16-35mm f/2.8L II USM 1/2000 sec. f/5.6 ISO320

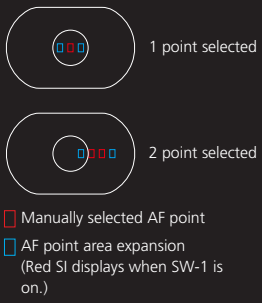
For sporting events that include dynamic up and down movement, tracking the athletes with one AF point is difficult. By using area expansion, it is easier to pursue the subject accurately with an expanded area.

For illustrative purposes, all AF points are displayed superimposed. The blue assist AF points are for illustrative purpose only, and they do not actually light up in blue.

Reliably focus-track subjects with extreme left and right movement

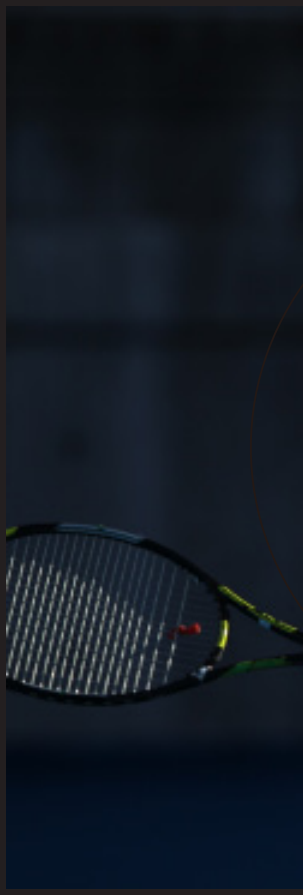
AF point expansion expanded by 1 point on left and right is effective for horizontal movement



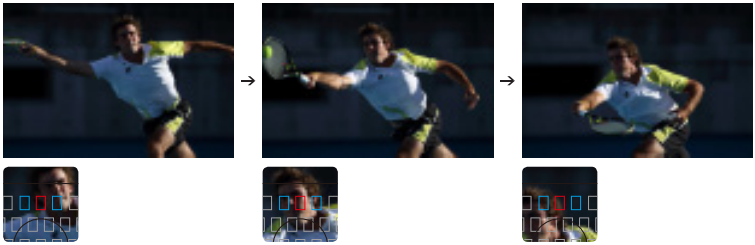


When increasing the number of AF points with area expansion to capture fast moving subjects, option 2: 'Assist AF point expanded by surrounding points' is the most versatile and easy to use setting. However, with extremely fast subjects that are limited to left and right movement, shooting with option 1: 'Expanding left and right AF point,' and using only the AF points on the left and right of the selected AF point with area expansion is recommended. You will want to use this setting with subjects having mainly horizontal movement, however, when held vertically it will be up/down Assist AF points, so option 1 is the best setting when shooting events and scenes with mainly up and down movement.

When using C.Fn III-8 AF Expansion with option 3: 'Use all 45 points' selected, during AI Servo AF, (if the center AF point is manually selected), 6 AF points in the rows above and below, and 3 AF points to the right and left (total 18 focus points) are available. The AF Expansion area follows the subject wherever it moves within the 45-point AF coverage area. All 45 AF points operate in this instance.



EF300mm f/2.8L IS USM 1/2000 sec. f/2.8 ISO100

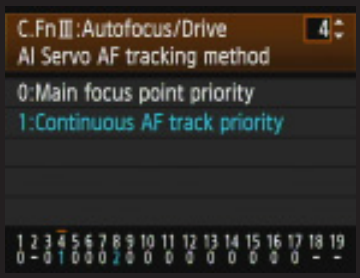


Option 1: Expanding 1 point on left and right is effective for sports like tennis characterized by active horizontal movement. Sudden horizontal movement will be dealt with by the AF points included in the area expansion.

For illustrative purposes, all AF points are displayed superimposed. The blue assist AF points are for illustrative purposes only, and they do not actually light up in blue.

Use Continuous AF track priority when tracking one person during area expansion

Subjects in the foreground will be treated as obstructions with this setting

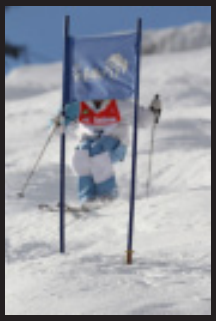


Use C.Fn III-8 'AF Expansion with selected point' as described on the previous page, and when shooting extremely fast moving subjects, another important Custom Function is C.Fn III -4 option 1: 'AI Servo AF tracking method' (hereafter tracking method).

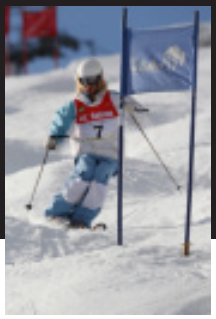
Basically, when you want to track one subject using area expansion, it is best to set the tracking method to option 1: 'Continuous AF track priority' (hereafter continuous priority). When shooting with area expansion and using this setting, if another subject comes into the foreground, it will be treated as an obstruction by the manually selected AF point (the center of the area expansion). Results of focusing are used to detect the position of the subject, and AF points switch from one to the next within the expanded AF points to capture the subject.

With shooting situations like this, when using area expansion to shoot moving subjects, the continuous priority setting is effective in almost every situation. When there is no specific target, as we will introduce on the next page, it is probably best to remember, if area expansion is used, use C.Fn III-4 option 1: 'Continuous AF track priority.'

Main focus point priority



Avoid

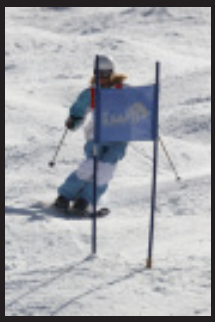


When shooting sports with a variety of shooting situations with setting C.Fn III-4 AF tracking method option 1: continuous priority selected, it will be easier to focus-track the targeted player.

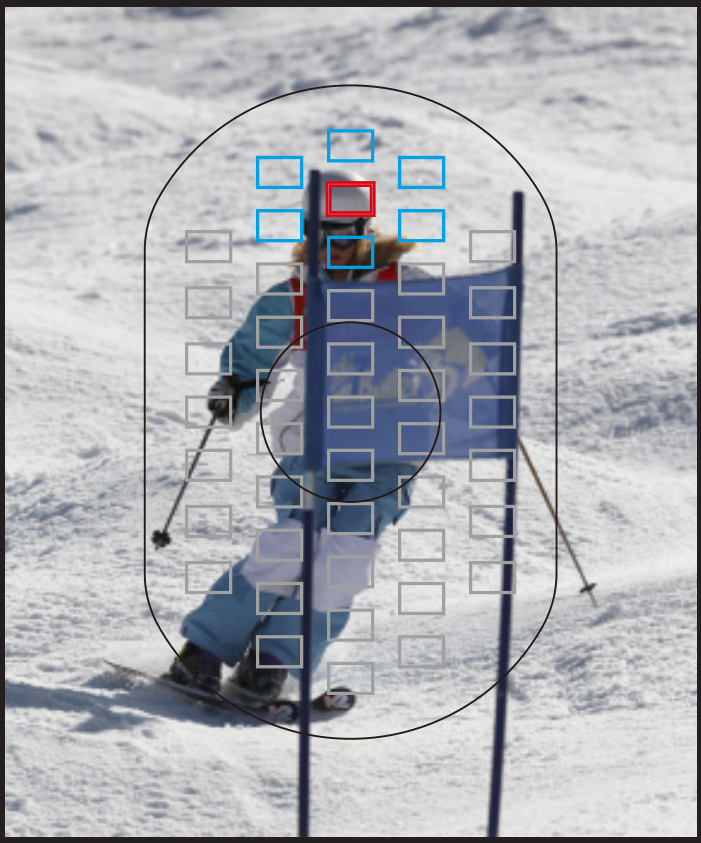
EF300mm f/2.8L IS USM 1/500 sec. f/2.8 ISO1600

EF400mm f/2.8L IS USM 1/4000 sec. f/5.6 ISO200

Continuous priority



OK

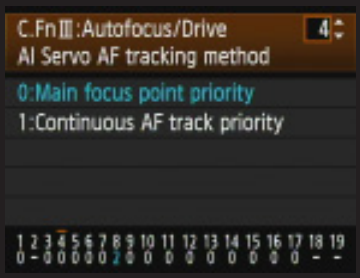


In cases where an obstruction cuts into the foreground, and the AF tracking method is set to option 0: Main focus point priority, focus can shift to the obstruction resulting in a missed image. If it is set to Continuous priority, it will continuously track the subject.

For illustrative purposes, all AF points are displayed superimposed. The blue assist AF points are for illustrative purposes only, and they do not actually light up in blue.

Shift focus to the subject in the foreground with Main focus point priority

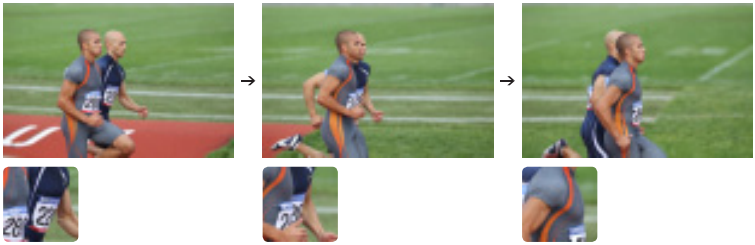
Effective for extremely fast moving subjects and sports with random movements



With Custom Function C.Fn III-4 'AF tracking method,' the default setting is option 0: 'Main focus point priority.' However, when actually shooting with AI Servo AF, there are many situations where option 1: 'Continuous AF track priority' is appropriate. So, what type of situation is appropriate for the Main focus point priority setting? With the Main focus point priority option selected, when a subject other than the primary subject moves into the area of the manually selected AF point (usually in the center of the expanded area so it is called the main focus point), you can specify whether the focus should switch to the secondary subject.

With characteristics like this, by continuing to take advantage of area expansion (athletes in sports), 'Main focus point priority' is effective when you want to continuously switch between targeted subjects. At track events, when you want to switch the focus to an athlete that comes into the foreground, or when you want to continuously switch focus between cyclists in a bicycle road race, this setting can be highly effective.

EF200mm f/2L IS USM 1/3200 sec. f/2.5 ISO400



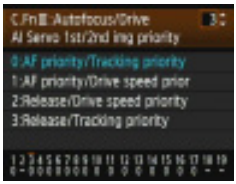
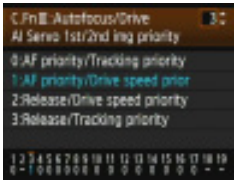
When you want to switch the focus and photograph the athlete that has come to the front, with Main focus point priority it is possible to shift focus to the athlete in front very quickly.

For illustrative purposes, all AF points are displayed superimposed. The blue assist AF points are for illustrative purposes only, and they do not actually light up in blue.

Decide whether to prioritize shutter release timing based on control by the camera or the photographer

Select the optimum setting from four combinations

Focus-tracking of the subject, and the relationship of the shutter's timing speed can be set with C.Fn III-3 AI Servo 1st/2nd image priority.

C.Fn III-3		1st image operations	Operations from the 2nd image onward
Option [0] Shooting with AF priority/ Tracking priority		Focusing on the subject has priority (a specific time is maintained for carrying out focusing)	Focus-tracking of the subject has priority (a specific time is maintained for carrying out focusing)
Option [1] AF priority/ Drive speed priority		Focusing on the subject has priority (a specific time is maintained for carrying out focusing)	(Rather than focus-tracking of the subject) continuous shooting speed has priority
Option [2] Release/ Drive speed maximum priority		(Rather than focusing on the subject) the shutter release timing speed has priority	(Rather than focus-tracking of the subject) continuous shooting speed has priority
Option [3] Release/ Tracking priority		(Rather than focusing on the subject) the shutter release timing speed has priority	Focus-tracking of the subject has priority (a specific time is maintained for carrying out focusing)

Setting [0] Shooting with AF priority/Tracking priority

Continuous photos of a soccer scene taken with option: 0 Shooting with AF priority/Tracking priority. Priority is on focus with this option, however, it is possible to maintain a fast continuous shooting speed in almost all scenes.

EF300mm f/2.8L IS USM
1/2500 sec. f/2.8
ISO200

1st image

2nd image

3rd image

4th image

5th image

When shooting in continuous mode with AI Servo AF, Custom Function III-3 'AI Servo 1st/2nd image priority' can determine whether shutter release timing is controlled by the camera or the photographer. When AF Priority is selected for the first frame, the camera controls shutter release timing based on focusing data. If Release Priority is selected, then the photographer controls shutter release timing for the first frame. If Tracking Priority is selected for subsequent frames during continuous shooting, the camera will control shutter release timing based on AF data. If Drive Speed Priority is selected for subsequent frames, the camera will fire at the framing rate selected by the photographer regardless of the focusing conditions.

There are four combinations of AF or Release Priority for the first image, and Tracking or Drive Speed Priority for subsequent images. You can select the option for your requirements depending on whether you want priority on focus-tracking or shutter release timing.

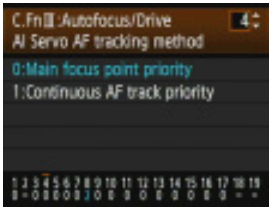
In normal shooting conditions, there will be no extreme differences no matter what the setting is. However, in conditions such as low light where autofocusing takes more time, please note that the probability of accurate focusing may be lower in some cases if Drive Speed Priority is selected.

With AF point expansion, choices of AF tracking methods will change

C.Fn III-8
AF expansion with selected point

C.Fn III-2
AI Servo tracking sensitivity

C.Fn III-4
AI Servo AF tracking method



C.Fn Mutual association | **1** | III-8 Area expansion and III-4 Tracking method

Two types of AF tracking methods during area expansion

III-8 AF point expansion

With Enable → III-4 AI Servo AF tracking method Available

- **0: Main focus point priority**
  - Subject that entered the foreground ← **Tries to focus as fast as possible**
- **1: Continuous AF track priority**
  - Subject that entered the foreground ← **Disregard**

With Disable → III-4 AI Servo AF tracking method Not available

Other than the reaction time to when a subject comes into the foreground, for both options 0 and 1, the AF tracking method will be set according to the option for tracking sensitivity (the same as Area expansion set to Disable).

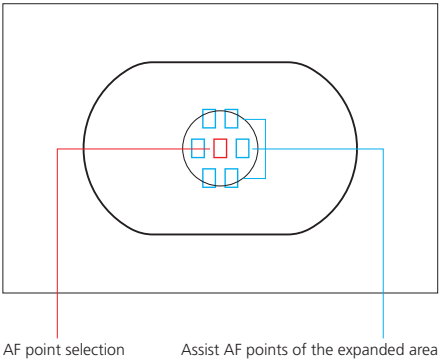
The three important AF related Custom Functio ns introduced up to now, C.Fn III-2 Tracking Sensitivity, C.Fn III-4 Tracking Method, and C.Fn III-8 AF Point Expansion are associated such that each of their settings exert an influence on the workings of the other functions. For example, if AF point expansion is turned off, the AI Servo AF tracking method will not function. Regardless of which C.Fn III-4 setting is used, the C.Fn III-2 setting [AI Servo tracking sensitivity] generally takes priority. However, if another subject blocks the main subject when the C.Fn III-4 setting is 0, the camera refocuses on the new subject regardless of the C.Fn III-2 setting.

There are three cases for the three C.Fn's related to AI Servo AF operation

Case 1

When C.Fn III-4 option 0: Main focus point priority is selected and the selected AF point detects a new subject, the camera quickly focuses on that subject.

The C.Fn III-4 Tracking method function is always available when C.Fn III-8 AF point expansion is active. With this combination, the way the AF points show up, and the speed at which focusing occurs can change depending on the specific settings and is subject to the conditions at that time. When 'Main Focusing Point Priority' is selected and a new subject is detected, the AF point showing the fastest response is used first, even if it is not the manually selected focusing point. Focusing control reverts to the manually selected focusing point as soon as possible if the movement of the subject allows it.



Case 2

Regardless of the C.Fn III-4 Tracking Method setting, if there is an AF point within the expanded area that should be used, control will quickly transfer to that focusing point.

When conditions differ from case 1, and the camera determines that the AF point should be transferred within the area, it quickly transfers to that AF point and carries out focusing.

Case 3

When neither Case 1 nor Case 2 applies, AF operation is carried out according to the Tracking Sensitivity settings

When the conditions in both case 1 and case 2 do not apply, AF operation according to C.Fn III-2 Sensitivity is prioritized (For example, if Slow is selected, focus will not quickly shift to the background even if the subject moves away from the expanded area AF points.)

* New subject refers to a subject that the manually selected AF point lands on that is closer than the subject that was tracked up to that time.

Reliably raise the probability of focusing the first image by tracking the subject for 0.5 sec. before the shutter is released

When the shutter button is fully pressed with no predictive computation

When the AI Servo AF is not in operation, a photo of a moving subject is taken by suddenly pressing the shutter button fully.

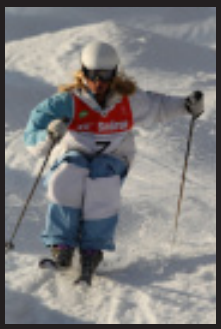
EF300mm f/2.8L IS USM 1/3200 sec. f/4 ISO100

Avoid

The first image may not be focused in some cases

When the shutter button is pressed suddenly, it will be difficult to accurately focus the first image

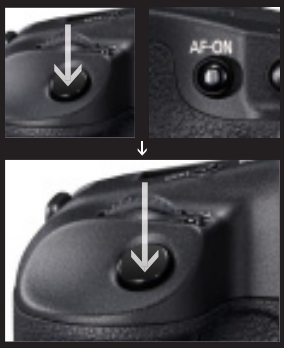
Focus



* The time of 0.5 sec. is only a guideline, and by operating the AI Servo AF a little before shooting, focus probability is increased.

First image countermeasures

Track the subject with predictive computation for 0.5 sec. (*) prior to shooting, then shoot continuously



Press the shutter button fully after the AF has operated for about 0.5 sec.

Pressing the shutter button halfway, or the AF ON button so the AI Servo AF operates, then pressing the shutter button fully to start shooting means there is a higher probability of obtaining photos that are in focus from the first image.

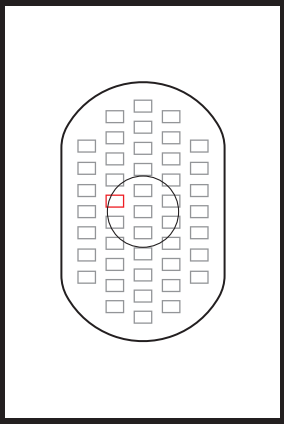
EF300mm f/2.8L IS USM 1/2500 sec. f/4 ISO100

OK **Steady focus from the first image**

Focus

AI Servo AF is a function that determines anticipated subject movement, then carries out focusing based on a prediction of the subject's location at the instant the shutter is released. Prediction is an important point when using this function effectively. For example, comparing a photo of a moving subject taken by suddenly pressing the shutter button fully when AF is not in operation, and a photo taken after pressing the shutter button halfway and continuing to operate AF by keeping the button pressed, the focus probability of the latter will be higher. With AI Servo AF, ensuring a certain amount of time for the predictive computation to be carried out for moving subjects is a technique for achieving well focused results.

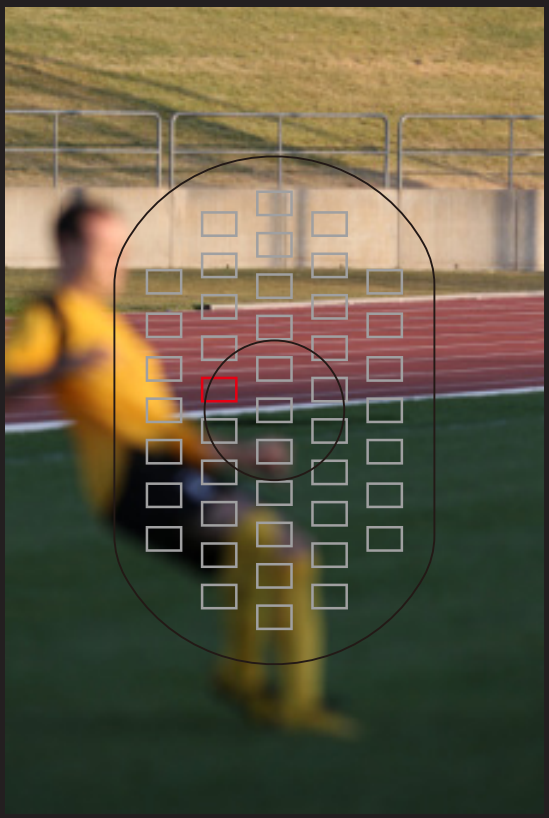
The area expansion setting is effective in cases where the focus may easily shift to the background



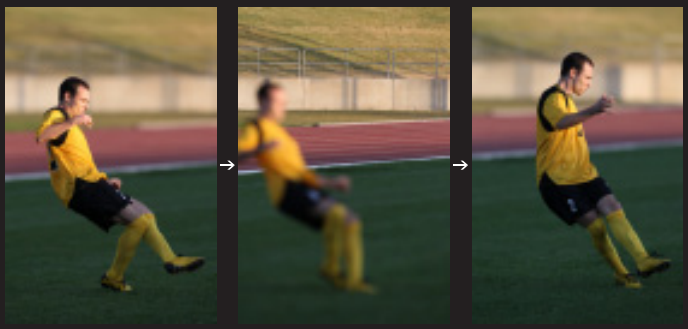
Shoot with a manually selected single AF point

It is difficult to track an extremely fast subject with just one of 45 points.

EF400mm f/2.8L IS USM 1/2500 sec. f/4 ISO800



NG



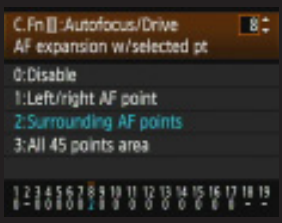
A case of the focus shifting to the background

While shooting continuously, as the AF point separated from the subject, during one frame the focus shifted to the background.

Countermeasures for focus shifting to the background

Use AF Expansion with selected point (C.Fn III-8) to make it difficult for focus to shift to the background

EF400mm f/2.8L IS USM 1/2500 sec. f/4 ISO800



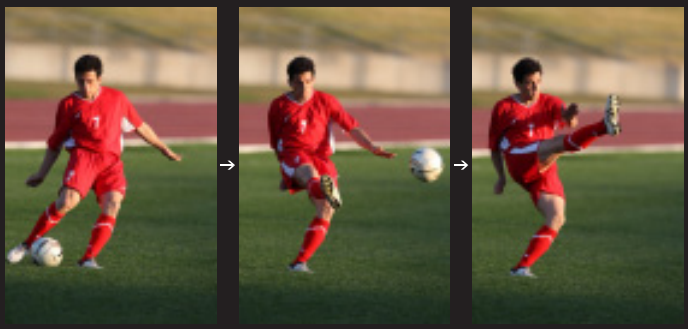
Shoot with C.Fn III-8 option 2: Assist AF point expanded by Surrounding AF points

Set C.Fn III-8 Area expansion to option 2: Surrounding AF points, and capture the subject with the selected AF point plus the Surrounding AF points.

When using AI Servo AF for continuous shooting of moving subjects, one of the most common issues is the focus shifting to the background instead of the targeted subject. Focus shifting to the background usually occurs because the subject is moving extremely quickly, and it is caused by the selected AF point not being able to continue tracking the subject. When the AF point is on the background instead of the subject, focus naturally shifts to the background.

Custom Function C.Fn III-8 'AF point expansion' can reduce occurrences of this issue. When option 2: 'Surrounding AF point' is selected, it increases the number of active AF points. The subject is easier to track because it is more likely to remain within the area covered by the active focusing points. Also, setting C.Fn III-2 'Tracking Sensitivity' to one of the slower options can improve the stability of subject tracking.

OK

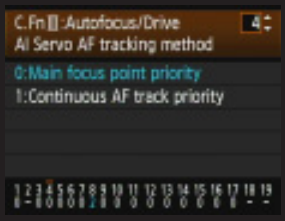


A case of continuously tracking the subject

Even with subjects that move extremely quickly it is possible to shoot continuous burst of images without the focus shifting to the background.

For illustration, all AF points are shown together. The blue assist AF points are for illustrative purposes only, and they do not actually light up in blue.

When focus is likely to shift due to obstructions in the foreground, set C.Fn III-4 Tracking Method to option 1: Continuous AF tracking priority



Shooting with C.Fn III-4 Tracking Method option 0: Main focus point priority

When an obstruction appears in the foreground with C.Fn III-4-0, the camera will focus on the obstruction because it is under the active focusing point.

EF300mm f/2.8L IS USM 1/1600 sec. f/5.6 ISO100

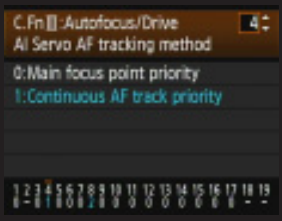
Avoid

A case of the focus shifting to obstructions in the foreground

With C.Fn III-4 option 0:Main focus point priority selected the camera will instantly focus on close subjects that move into the area of the selected AF point, so focus ends up on the obstruction, not the desired subject.

Countermeasures for obstructions in the foreground

C.Fn III-4 option 1: Continuous AF tracking priority will suppress the likelihood of focus shifting to the foreground



Shooting with C.Fn III-4 Tracking Method Option 1: Continuous AF tracking priority

Shooting the same scene with C.Fn III-4-1 keeps the focus on the main subject instead of the obstruction.

Similar to when focus shifts to the background, a common error that occurs when shooting moving subjects with AI Servo AF is when focus shifts to obstructions in the foreground. The AF function basically operates to focus as quickly as possible on subjects that the AF point is covering, meaning that because the AF is so agile and high performance it is difficult to avoid mistakes like this.

In Area expansion introduced on P 30, when shooting moving subjects, an effective countermeasure for obstructions in the foreground is C.Fn III-4 option 1: Continuous AF tracking priority. With this setting, when another subject comes in front of the manually selected AF point it is disregarded as an obstruction. Then, as the coordination of the increased AF points captures the subject, the number of times focus transfers to obstructions can be dramatically reduced.

Also, as with the case on P 30, using at the same time as one of the slower options from C.Fn III-2 can be highly effective.

EF300mm f/2.8L IS USM 1/1600 sec. f/5.6 ISO100

OK

Continuous focus on the subject was made possible

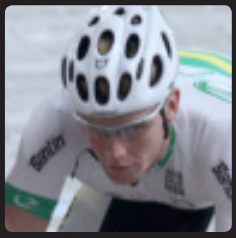
As objects cut in front of the primary subject will be viewed as obstructions, mistakes with focus on the obstructions can be avoided.

Motion blur can be suppressed by utilizing faster shutter speeds

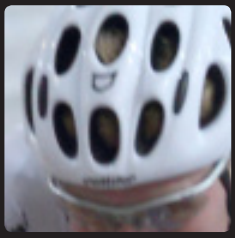
EF200mm f/2L IS USM 1/500 sec. f/4 ISO3200

Avoid

Photos that look sharp at a glance, however…



25%



50%

100%

Viewed at 100% on a computer screen you can see it is slightly blurred

When viewed initially there is very little cause for concern, however, when viewed at 100%, an image that is slightly blurred could be caused by the use of a shutter speed that is too slow to stop the action.

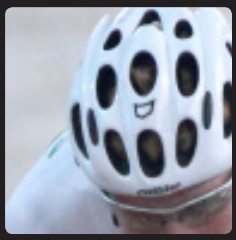
Often the cause of this is not focus, but rapid subject movement

Countermeasures for minor camera shake visible at 100% display

Minor motion blurs can be suppressed with high speed shutter speeds of 1/1000 and 1/2000 sec.

EF200mm f/2L IS USM 1/2000sec. f/2.8 ISO6400

OK



50%

100%

Camera shake thoroughly suppressed with faster shutter speeds

In order to suppress minute camera shake that is visible when images are viewed at 100%, daring to use fast shutter speeds like 1/2000 sec. can be highly effective. Take advantage of the higher ISO speed image quality and strength of the EOS-1D Mark IV, use the fast shutter speeds.

When an AI Servo AF photo of a moving subject is viewed on a computer display and the photo seems to be slightly unsharp, it is incorrect to assume that a focusing issue is always the cause of the problem. Even in photos shot with a fairly fast shutter speed, the lack of sharpness could be a result of subject movement or camera shake. This is particularly relevant to the EOS-1D Mark IV because even small levels of motion blur are noticeable at 100% magnification due to the camera's 16.1 megapixel resolution. First, determine whether the sharpness problem is caused by poor focusing, camera shake or subject movement. If it is camera shake or subject movement, an effective countermeasure is to use a faster shutter speed. Up to now, if you thought increasing the shutter speed by one stop was sufficient to eliminate motion blur, try increasing the shutter speed by two steps and then shoot the photo.

ISO 100 – 12800 image quality

The EOS-1D Mark IV achieves low noise and high image quality even at high ISO speeds

From ISO100 - ISO12800 it is possible to set the EV value of the ISO speed from 7 stops up to the desired ISO speed level.

EF24-105mm f/4L IS USM f/8

ISO100

ISO200

ISO1600

ISO3200

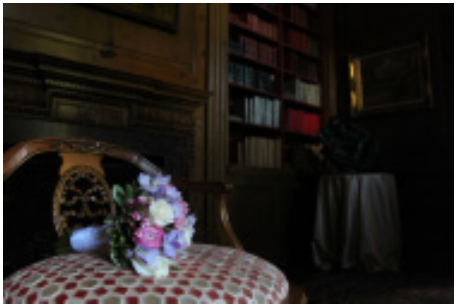
The EOS-1D Mark IV is capable of achieving extremely high ISO speed image quality. As a result, normal ISO speeds (ISO speeds that can be used at default settings) boast a range of ISO100 – 12800. Now, let's take a look at the image quality of the normal ISO speed level.

Nothing needs to be said about the great image quality of ISO100 – 800 which has been used often up to now. In particular, we would like you to refer to the image quality of ISO3200, and ISO6400 which are desired for use when shooting indoor sports and night and evening events with fast shutter speeds.

Even high ISO speeds like ISO3200 and 6400 are actively becoming usable image quality.

ISO400

ISO800



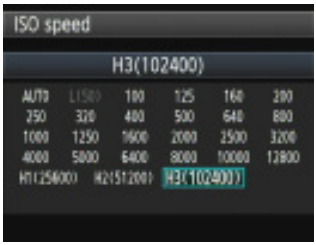
ISO6400

ISO12800

Magnification rate of the above cropped pictures is matched with 50% of PC monitor's resolution (96dpi).

ISO25600 (H1) – 102400 (H3) image quality

In situations with almost no lighting, ISO 102400 can make the difference between getting the shot or not



ISO25600

With Custom Function C.Fn I-3 'Set ISO speed range,' when the upper limit is set to H3, it is possible to select ultra-high ISO speeds from ISO 25600 – ISO 102400. How responsive to light is the ISO 102400 setting? Testing this ultra-high ISO setting in extremely low light will amaze you.

Of course these ultra-high ISO speeds are outside of the normal range, and there are some compromises in image quality. There is a significant amount of noise, and for some photographers the gradations are not smooth enough. However, when using ISO 102400, it is possible to shoot with minimal camera shake even in some of the darkest conditions. When you need the photo, and image quality is not the primary concern, you can get images with these ultra-high ISO speed settings that would have been impossible with previous cameras.

ISO51200 (H2)

ISO102400 (H3)

Confirm the change in image quality when High ISO speed noise reduction is set from Disable to Strong

Set C.Fn II-2 High ISO speed noise reduction to option:0 Standard, 1: Low, 2: Strong, 3: Disable, and confirm the changes in image quality.

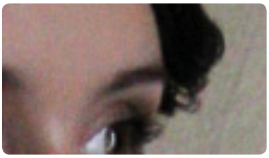
Key point

With High ISO speed reduction set from Disable to Standard, the number of shots during continuous shooting will not change. When set to Strong, there will be a noticeable drop in the number of shots during a continuous shooting burst.

EF24-105mm f/4L IS USM f/4

Standard

ISO1600



Disable

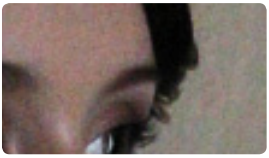
Low

Standard

Strong

Standard

ISO3200



Disable

Low

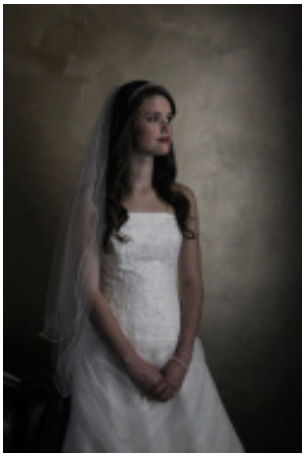
Standard

Strong

The appearance of high ISO speeds on the EOS-1D Mark IV are the result of an advanced image sensor and image processing technology.

The Custom Function C.Fn II-2 High ISO speed noise reduction setting is set to a default setting (option: 0) of Standard. In order to get an idea of the noise reduction function effects, you should compare photos taken with ISO speeds of ISO1600 or higher by changing Noise Reduction from Disable to Strong.

You will be able to see that approaching high ISO speeds of ISO12800, when set to Disable, noise will become more visible. Even at extremely high ISO speeds, if Standard and Low noise reduction are working, noise will be considerably reduced.



Standard

ISO6400

Disable

Low

Standard

Strong

Standard

ISO12800

Disable

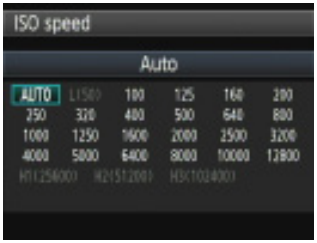
Low

Standard

Strong

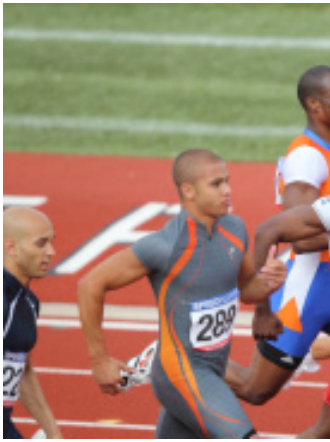
Auto ISO

With the ISO speed set to “A” (ISO Auto), when using manual exposure it is possible to shoot continuously with the same aperture and shutter speed



In the ISO speed settings, turn the dial from ISO100 (default setting) to the left to display “A” and set ISO Auto.

Aperture f/2.8 1/1000 sec. (ISO800)



Aperture f/2.8 1/1000 sec. (ISO400)

Shooting with manual exposure using the Auto ISO setting

The exposure mode is set to Manual, the desired aperture value and shutter speed are set, and shooting is carried out.

As introduced on P 36, the EOS-1D Mark IV has an extremely wide range of normal ISO levels from ISO100 - 12800. By using this wide range of normal ISO speeds and ISO Auto, it is possible to shoot continuously with the same aperture value and shutter speed going from bright locations to dark locations. By simply selecting "A" in the ISO speed settings, the ISO Auto setting will be activated.

Next, the exposure mode is set to Manual, the desired aperture value and shutter speed are set, and then shooting is carried out. Shooting begins in a bright location, and as the camera is directed toward a darker location, shooting takes place with the ISO speed increasing automatically. This method is effective when you want to continuously shoot with a certain aperture value and shutter speed setting.

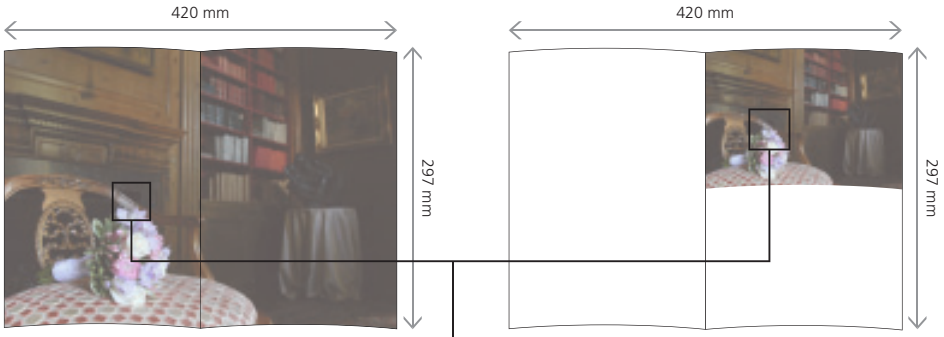
EF70-200mm f/2.8L IS USM 1/1000 sec. f/2.8 ISO Auto

Aperture f/2.8 1/1000 sec. (ISO320)

Shooting takes place with the same aperture value and shutter value and only the ISO speed will change

It was possible to photograph the athlete continuously from a bright location to a dark location with no changes to the aperture at f/2.8 and shutter speed at 1/1000 sec.

Confirm the noise appearance at the actual printing size (magnification)



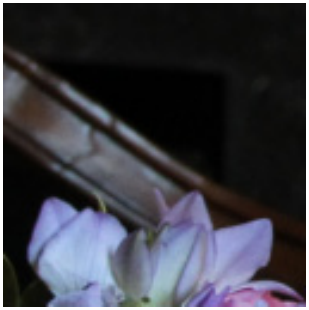
A | Actual size sample of printing at A4 size two-page full-sized (420 x 297 mm)

B | Actual size sample of printing at approximately ½ of an A4 page (210 x 148 mm)

4 x 4 cm section of each displayed

ISO1600

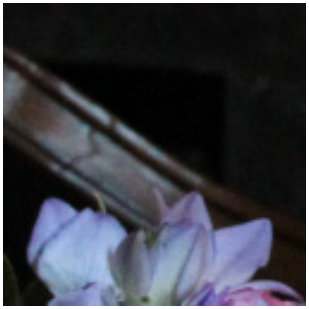
A



B

ISO6400

A



B

An increasing amount of attention is being paid to the image quality of digital SLR cameras, in particular in reference to the noise at high ISO speeds.

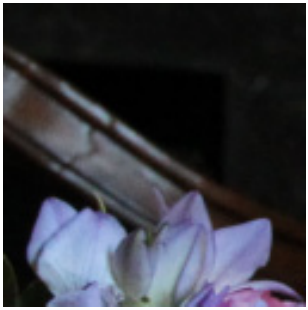
So, when photos are printed, how will the noise and image quality appear in printed materials? There should be a visible difference in the noise and image quality when confirming an image is magnified (at 100% display on a monitor), compared to the actual print size used.

Here we have placed high ISO speed images from an EOS-1D Mark IV, shown at the magnification of two popular printed sizes used in magazines. You will notice the image quality of EOS-1D Mark IV images at high ISO speeds with a lack of visible noise, however, at actual printing sizes, you will notice that image quality even at low ISO speeds compares favorably.

Use these photos as a reference when deciding your own standard ISO speeds.

ISO3200

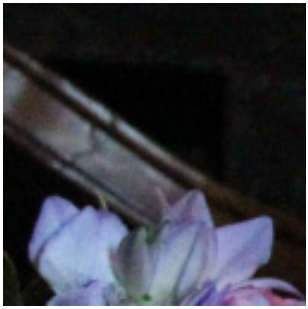
A



B

ISO12800

A



B

EF24-105mm F4L IS USM f/8

Using lower shutter speeds, aim for creativity by making use of low ISO speeds

Using C.Fn I-3 Set ISO speed range, with the minimum value registered to L, it is possible to set ISO50 (L).

At ISO50 the shutter speed is set 1 stop down and panned

With the EOS-1D Mark IV, in addition to ISO100 – 12800 normal ISO speeds, it is possible to use 3 stops for the higher ISO speeds (ISO25600 – 102400), and 1 stop for the lower ISO speeds (ISO50) as ISO expansion.

To use low ISO speed ISO50, it is necessary to register the minimum low ISO speed setting L with Custom Function C.Fn I-3, the same as with the high ISO speed options.

With the lower ISO speed ISO50, compared to ISO100, it is possible to set a 1 stop slower shutter speed, or a 1 stop brighter aperture value. Due to this, when you want to pan with a slow shutter speed in comparatively bright conditions, or shoot with a blurred background in the same bright conditions with the lens towards maximum aperture, setting to ISO50 can be effective.

When set to ISO50, compared to ISO100, note that highlight areas can be more easily blown out.

A variety of Custom Functions that can be applied to shooting

C.Fn I-14 | Apply shooting/metering mode [Setting:1 Enable]

EF300mm f/2.8L
IS USM
1/1250 sec.
f/2.8 ISO100
(Manual exposure)

EF300mm f/2.8L
IS USM
1/1000 sec.
f/2.8 ISO640
(Shutter-priority AE)

While shooting in manual exposure, large differences in brightness or contrast are dealt with by applying auto exposure

This function can be useful in scenes where you primarily want to shoot with manual exposure, but you need to be able to deal with cases where the subject suddenly moves into dark or bright areas. Set C.Fn I-1 Apply shooting/metering mode to option: Enable, and auto exposure (Aperture priority AE for example) will be registered. With this option set, while shooting in Manual exposure mode, the camera will switch to the registered auto exposure mode only when pressing the AE lock button. If the subject moves into a dark or bright location, the appropriate auto exposure can be carried out. When the subject returns to the original lighting conditions, manual exposure mode can be restored by releasing the AE lock button. This setting is effective while shooting locations with great differences in brightness or contrast.

With C.Fn I-14 using Register you can register the exposure mode, metering mode, shutter speed, aperture, and exposure compensation amount to the camera, and you can instantly apply any of these with the AE lock button.

C.Fn IV-3 | Quick Control Dial in metering [Options: 1 or 3 AF point selection]

Using the Quick Control Dial while shooting can be an effective way of moving the AF point

While continuously shooting moving subjects, it is difficult to instantly switch the AF point to the desired location. As introduced on pp. 8 – 11, the registered AF point function is one useful function for switching AF points during continuous shooting.

Also, when you want to move the AF point horizontally, options 1 and 3: AF point selection of C.Fn IV-3 Quick Control Dial in metering is also effective. By using these settings, while metering is active it is possible to move the selected AF point left and right with the Quick Control Dial.

As the Quick Control Dial is easy to operate during continuous shooting, carrying out extremely fast horizontal movement of the AF point while shooting is possible.

By setting C.Fn IV-3 Quick Control Dial in metering to option: 3 AF point selection, horizontal movement of the AF point using the Quick Control Dial is possible.

Canon

www.canon.co.uk/eospro-network/

http://cpn.canon-europe.com