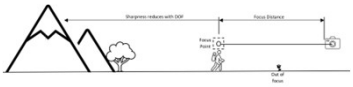
1

What is Focus

In photography, focus is the **sharpest area of the image**. It is the area where the lens works to highlight an object, a person, or a situation. This area is located a certain distance in front of your camera lens, and spans horizontally, left to right across your frame



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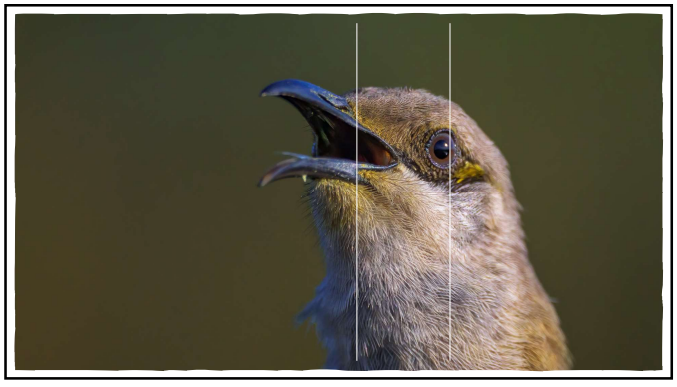

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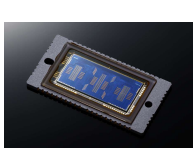
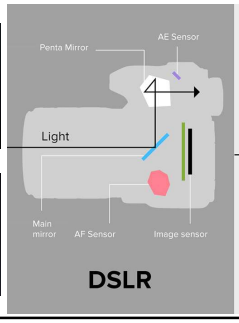
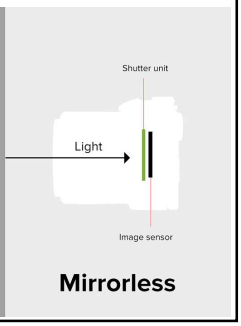
Focusing system







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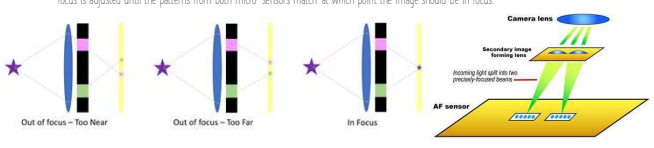
The Autofocus process
Phase & Contrast detect AF

Phase Detection Autofocus

- Phase detection works by splitting the light coming through the lens, the semi-transparent pellicle mirror sending light to both the viewfinder and a dedicated autofocus (AF) unit located at the bottom of the camera. Light rays from either side of the lens are then focused onto (at least) two micro-sensors within the AF unit.
- These micro-sensors are specialized strips that measure light intensity patterns. The pattern from each micro-sensor is analyzed and the lens focus is adjusted until the patterns from both micro-sensors match-at which point the image should be in focus.



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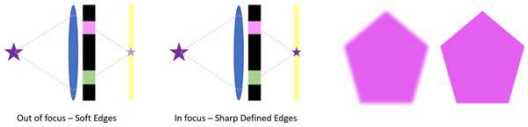
The Autofocus process Phase & Contrast detect AF

Contrast Detection Autofocus

- Unlike phase detection, contrast detection does not require a dedicated AF unit. Analysis is performed via the image sensor and best focus is calculated based on the theory that the point of focus will coincide with the highest point of contrast (local contrast, the difference in light intensity between neighboring pixels). It is the main method used in compact and mirrorless cameras and is generally speaking more accurate than phase-detection



Out of focus – Soft Edges

In focus – Sharp Defined Edges

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Focus Modes

- AF-S (Nikon) (Sony), One-Shot (Canon)

(AF single, sometimes called single area AF) mode, is good for photographing subjects that don't move, such as flowers or portraits etc. It locks the focus on the non-moving object that you want to photograph. You can then recompose the shot and take the photograph

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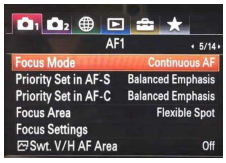
Focus Modes

- AF-C (Nikon) (Sony), AI-Servo (Canon)

AF continuous, sometimes called continuous servo is good use when photographing moving objects. When your camera is set to AF-C, or AI_Servo and you focus on a moving subject, for example a dog running towards you, the focus will stay on the animal so long as your shutter button is held halfway down. In other words, the camera will keep re-focusing as the animal moves. That is, so long as you keep your shutter button held halfway down..



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Focus Modes

- AF-A (Nikon) (Sony), AI-Focus AF (Canon)

For automatic switching of AF mode, AI Focus AF switches the AF mode from One-Shot AF to AI Servo AF automatically if the still subject starts moving. After the subject is focused on One-Shot AF, if the subject starts moving, the camera detects the movement and changes the AF operation to AI Servo AF. The camera also starts tracking the moving subject. When focus is achieved with AI Focus AF with the Servo operation active, the camera beeps softly. However, the focus indicator < > in the viewfinder does not light up.

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Focus Area – DSLR

Focus areas differ from manufacturer to manufacturer and even between models of the same manufacturer, DSLR's tend to have more basic focus areas including and not limited to

- Single point

Gives you a single focus point you can move around the entire focusing area. The sharpest part of your image will be the area under this single point and is best used on static subjects.

- Auto area AF

Activates all focus points and look for the highest area of contrast or closest subject to the camera to focus on. With this you have no control over what the camera focus on.

- Expanded areas/Zones/Groups

Select an medium size area to focus on, the areas or zone can normally be moved within the focus area.

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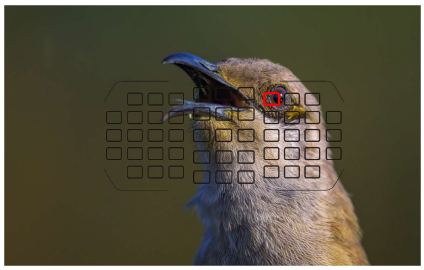
Focus Area – DSLR



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Focus Area – Mirrorless

Since focus in mirrorless system is achieved on the main sensor itself and not on a separate focussing sensor, manufacturers have more freedom in focussing areas. Focus areas differ from manufacturer to manufacturer and even between models of the same manufacturer.

Some focussing areas include:

- Single-point, Spot
- Dynamic-Area
- Auto-Area
- 3D Tracking (Nikon)
- Expanded area
- Zone
- Wide
- Face & Eye detection (Humans & Animals)
- Subject detection
- Tracking

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Focus Area – Mirrorless

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Where to focus

Most of the time, you should simply focus on your main subject. Typically, if you're photographing a person, wildlife, or event, focus on one of their eyes. Sometimes, you'll have a bit of artistic freedom when you focus. Say that you're photographing a flower. Should you focus on the nearest petal, or on the colourful centre? Neither option is wrong. It comes down to the effect you want to convey in an image. Remember that the sharpest objects in your photo stand out. You can use this to your advantage. If you want, you can focus somewhere unexpected to draw attention to a specific part of your photo. Make use of focus stacking in landscapes and macro to create details throughout your image.

When looking at focus, the importance of depth of field cannot be ignored and should always be considered.

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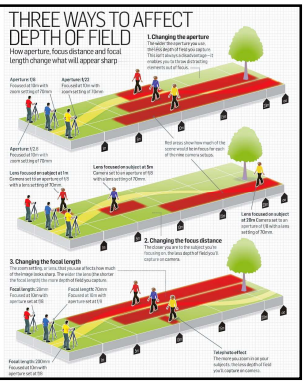
Focus and DOF



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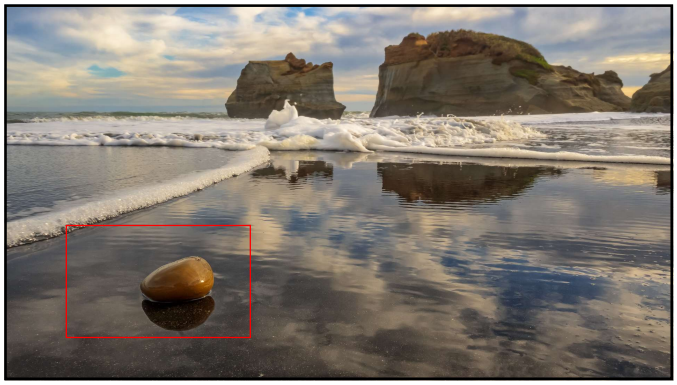

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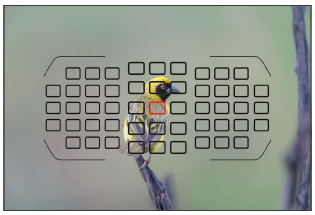
Focusing Techniques DSLR



Subject in the middle of the frame

Cropped for better composition

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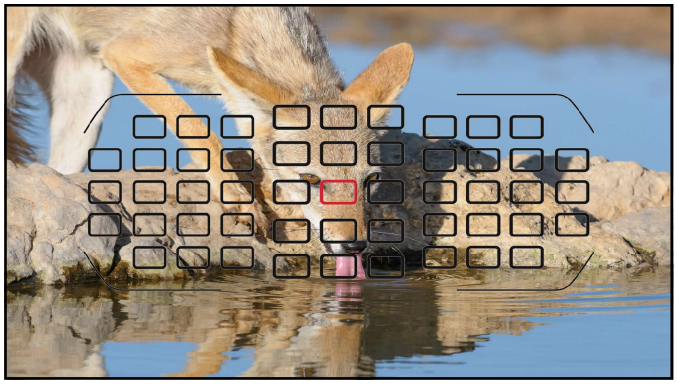

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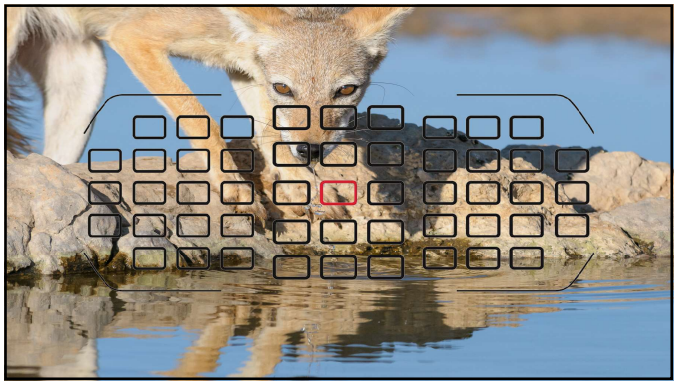

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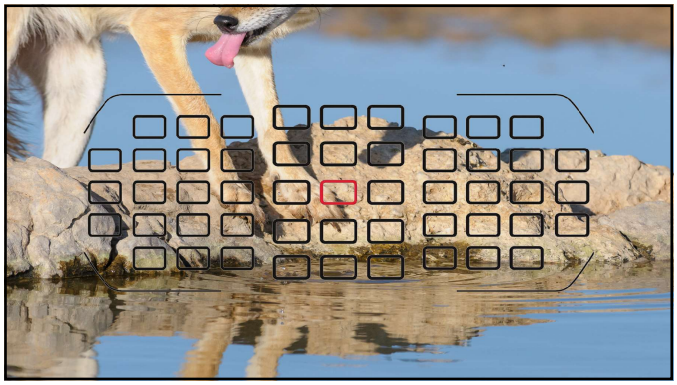

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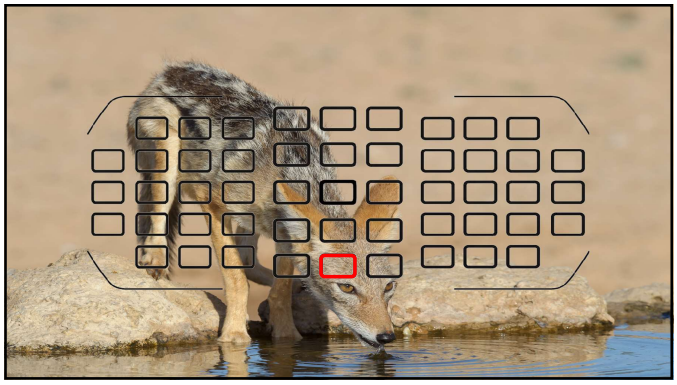

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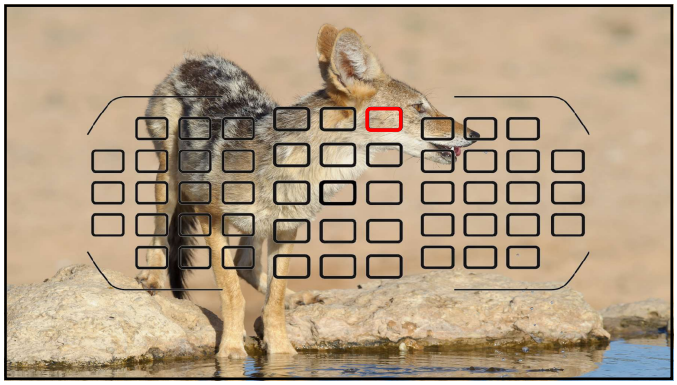

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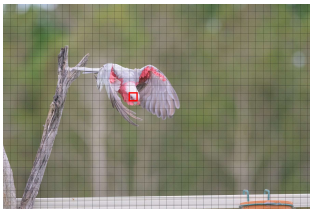
Focusing Techniques Mirrorless

Subject moved to top left corner



Subject flies into the centre of the frame

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Drive Modes

- Single shot

Every time you press the shutter button it records a single photo. The camera will still take just one picture even if you keep your finger down on the shutter button.

- Continuous drive

When using this drive mode, your camera will take photos for as long as you keep your finger pressed down on the shutter release button – or until the camera's buffer (its temporary memory) or memory card is full.

- Self-Timer

When using the self-timer drive mode, your camera will wait specific number of seconds before releasing the shutter and taking the picture. The number of delay time options varies by brand, but typically most cameras have 2sec and 10sec options. When using the self-timer drive mode, your camera will wait specific number of seconds before releasing the shutter and taking the picture. The number of delay time options varies by brand, but typically most cameras have 2sec and 10sec options.

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Drive Modes

- Mirror lock-up

When using your Mirror Lock-up mode, your camera will wait until its mirror has lifted to take a picture. This mode is often used by landscape photographers, macro, still life and night photographers who tend to work with longer shutter speeds, during which the slightest vibration from the camera's mirror box mechanism can cause camera shake and spoil an image.

- Bulb

The bulb mode is a shutter speed option accessible in manual mode on your camera. The bulb mode allows your shutter speed to be as long as you want, 1 minute, 5 minutes, 15 minutes, it's your choice! The bulb mode keeps the shutter of the camera open as long as you hold the shutter release

- Auto-Exposure Bracketing

Your camera's auto-exposure bracketing mode is a useful feature, generally it means taking a series of images,

each at slightly different exposure settings, and choosing the best one.

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Common Auto Focus problems

Nothing is more frustrating than looking at your images after a day out and some of the images look out of focus or a bit soft (Not 100% sharp)

What causes images to be out of focus or soft?

Let's look at the most common causes of soft or out of focus images

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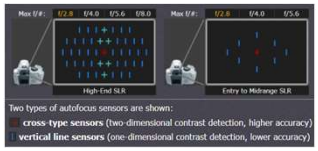
Common Auto Focus problems

1. Light Levels

All things have limitations including cameras and lenses and so it is that if the camera cannot "See It" then the camera can not focus on "it".

- Use a fast lens
- Use the center AF point
- Manual focus



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Common Auto Focus problems

2. Dirty Lens & Camera Contacts

Lenses have Central Processor Unit (CPU) contact pins located near the lens bayonet. When a lens is attached to a camera, the pins make contact with electronic contacts inside the camera body. This contact allows power and data to flow between the camera body and the lens.

Cleaning the CPU contacts on both the lens and camera body with a microfiber cloth. A general cleaning fluid such as a surgical spirit is recommended. Wipe the cleaning cloth slowly across the contacts a few times until they look clean. The contacts should be free of dust or dirt.

Avoid dusty environments during cleaning. Re-attach the lens after cleaning or use lens/body caps to reduce dust.

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Common Auto Focus problems

3. Dirty AF Sensor

We tend to forget that DSLR's have an AF Sensor and that dust can have a negative effect on our focus. Just as important as cleaning our image sensor correctly, we need to clean our AF sensor as well.

Caution:

Don't use mirror up as it might time out and close the mirror while your blower is inside the camera, rather make use of the camera's "Sensor Clean" function in the menu system to hold the mirror up till cleaning is complete.

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Common Auto Focus problems

4. Lens Calibration

Due to the nature of the phase detect autofocus system that is present on all DSLR cameras, both cameras and lenses must be properly calibrated by manufacturers in order to yield sharp images. Various factors such as manufacturer defects, sample variation, insufficient quality assurance testing/tuning and improper shipping and handling can all negatively impact autofocus precision.

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Common Auto Focus problems

5. Wrong AF-Mode

- AF-S (Nikon) (Sony), One-Shot (Canon)
- AF-C (Nikon) (Sony), AI-Servo (Canon)

One-Shot/AF-S is for when neither you, nor the subject, are moving. AI Servo/AF-C is for when either you, or the subject, is moving.

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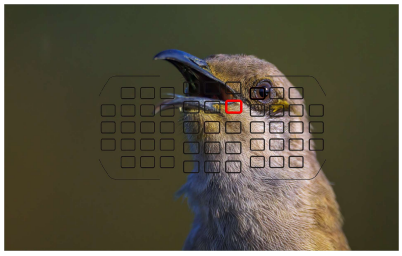
Common Auto Focus problems

6. AF-Point positioning

One of the most common mistakes, not having your AF-Point on target



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Common Auto Focus problems

7. OIS/IS/VR - Image stabilization

In order to get sharp, movement-free images on a tripod, be sure to flip that switch or setting to "off." When your camera is perfectly still, but the stabilization feature is turned on, it still tries to keep the lens stable and the tiny movements of it doing just that will shake your camera ever so slightly.

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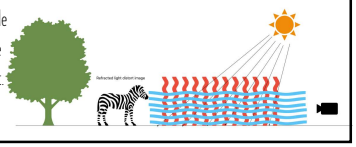
Common Auto Focus problems

7. Atmospheric Conditions

Heat distortion is caused when light is refracted through air of differing densities. Hot air is less dense than cold air, so light waves are bent differently in hot versus cold air. The result is visible heat waves when there is a significant temperature difference between the ground and the air above it.



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Common Auto Focus problems

8. Poor Technique

If your images are not as sharp as you want, is the image out of focus or is it motion blur?

- Don't underestimate the power of increasing your shutter speed to overcome motion blur, 1/2000 to 1/4000 sec for moving subjects will produce better results.
- How stable is the platform that you are working from? Are you using a sturdy tripod and if you shoot out of the hand remember;
  - ➢ Left hand under the lens
  - ➢ Arms tucked in comfortably

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Common Auto Focus problems

9. Post Processing

Modern software allows us to rescue slightly soft images. We need to take care that we don't "over do" the sharpening and/or noise reduction. Editing techniques should always enhance our images, never make them worse.

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Focussing techniques – Back button focus

Simply put, **back-button focus** is a technique that takes the autofocus function away from the shutter release button, and re-assigns it to another button on the back of the camera.

- *Advantages*

1. Having the **focus independent of the shutter** release for control.
2. Making each button **responsible for ONE FUNCTION,** either capture or autofocus.
3. Having independent functions prevents **having to constantly refocus.**
4. *Or the worst yet* **mistakenly focusing** instead of capture.
5. You don't have to switch between *AF-C (Nikon)/ AI Servo AF (Canon)* and *AF-S (Nikon)/ One-Shot AF (Canon)* You can keep your camera on AF-C but use it like AF-S by not using AF-ON to refocus.
6. You **don't have to turn off autofocus if you want to use manual focus.** Simply manually adjust the lens instead and the shutter release won't refocus.

- *Disadvantages*

One of the main drawbacks of Back-Button Focus is that it requires excellent coordination to operate fluidly. Initially, it might take some time and practice to fully master having to press two buttons to do the job that you had previously done with one.

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Questions?

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Thank you
• Stephan Labuschagné AFIAP, APSSA, MAPS
• Martie Labuschagné AFIAP, MAPS

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