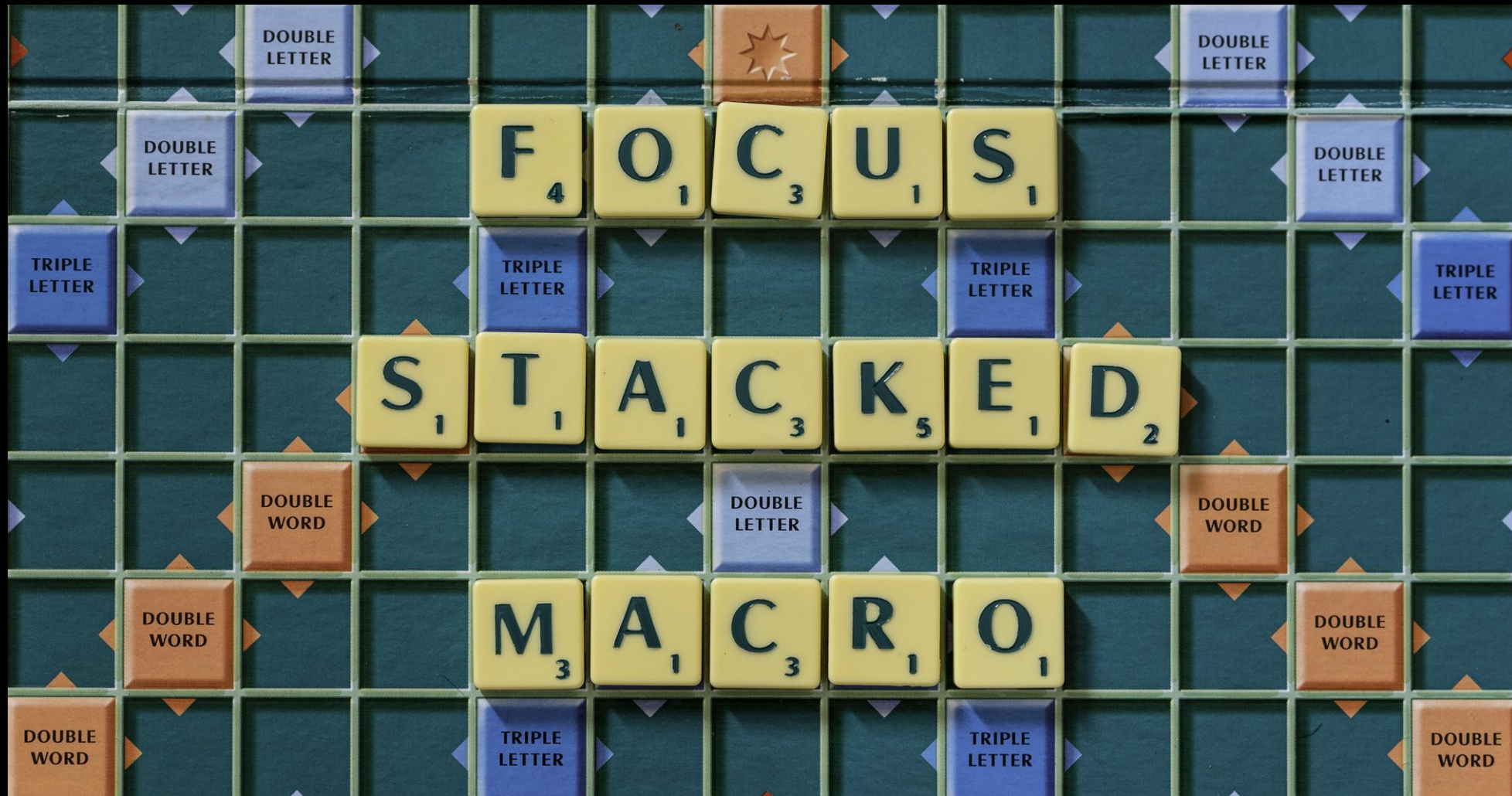


A1 CAMERA CLUB



FOCUS STACKED MACRO PART 1

Overview

- Macro photography and depth of field
- What is focus stacked macro
- Macro photography equipment
- Subject set up and lighting
- Camera technique
- Further reading

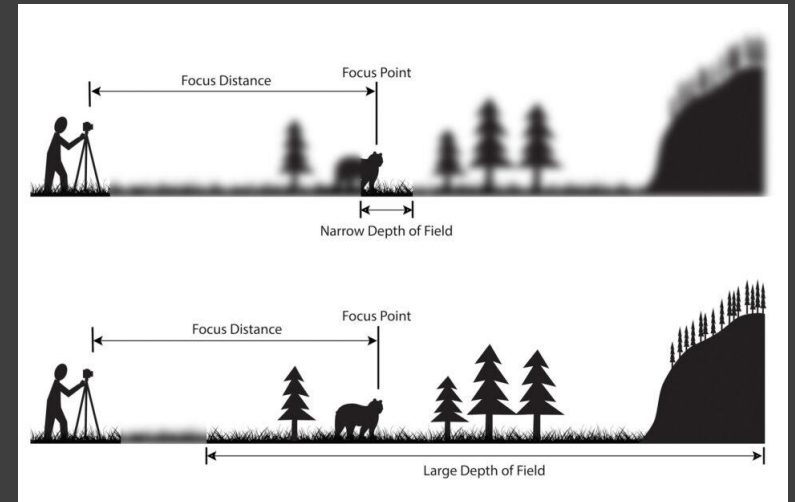
MACRO PHOTOGRAPHY AND DEPTH OF FIELD

Depth of field is the zone within a photo that appears sharp and in focus.

It is controlled by adjusting aperture and focus distance:

- Shorter focus distance = shallower depth of field
- Wider aperture (lower f number) = shallower depth of field

Very short focus distances are used for macro photography and the depth of field is therefore extremely shallow, even when using a narrower aperture.



MACRO PHOTOGRAPHY AND DEPTH OF FIELD

Depth of field in centimetres – 90mm lens on a Nikon FX body:

Focus distance	F2.8	F5.6	f8	f11	f16
10 cm			0.01	0.01	0.01
15 cm	0.02	0.04	0.05	0.08	0.11
25 cm	0.08	0.17	0.24	0.34	0.47
50 cm	0.43	0.86	1.21	1.72	2.43
100 cm	1.91	3.81	5.40	7.64	10.82

This shallow depth of field makes it very difficult to get the whole subject in focus and this is where focus stacking comes in.

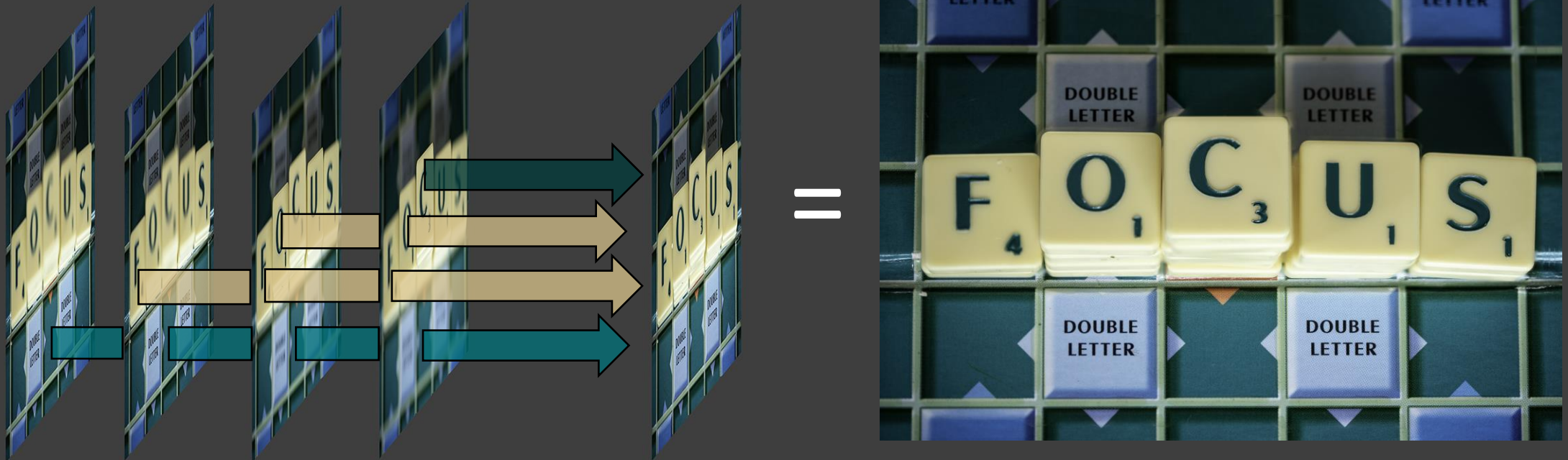
WHAT IS FOCUS STACKED MACRO?

Taking a number of images using different focus distances to cover the full front to back distance of the subject,



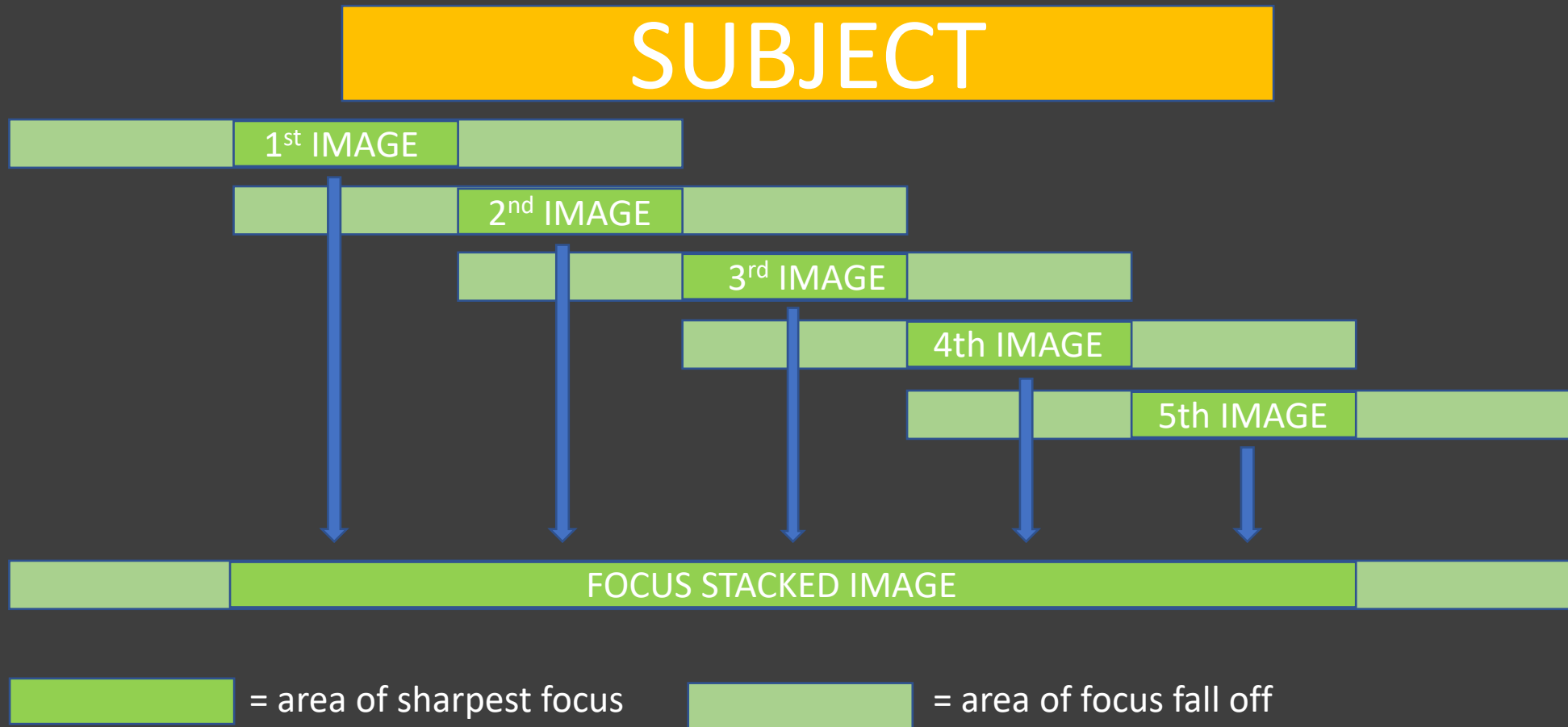
WHAT IS FOCUS STACKED MACRO?

and, using software to combine a those images to create a single sharp image.



WHAT IS FOCUS STACKED MACRO?

To create a good macro focus stack you need to space your images evenly throughout the front to back subject range.



MACRO PHOTOGRAPHY EQUIPMENT

Essential Equipment

- Macro lens, extension tubes or lens reversing adapter
- Tripod (ideally with a reversible and multiangle centre column)

MACRO PHOTOGRAPHY EQUIPMENT

Optional Equipment

- Lighting
 - Diffusers/reflectors for on camera flash
 - Torches and clamps to hold them
 - Led light panels
 - Ring lights
 - Off camera flash and light modifiers
- Macro subject clamp such as Wimberley Plamp
- Focusing rail/slide or helicon tube
- Lab scissor jack
- Remote shutter release

SUBJECT SET UP AND LIGHTING (1)

- If possible use a draft free environment
- If not try to eliminate movement using a clamp as a “third hand”
- Position camera on tripod, frame subject and compose image
- Note that with a lot of tripods the camera will sag when you take your hands off the camera/tripod head. You can get round this by:
 - Anticipating the sag (cheap but hit and miss)
 - Using a geared tripod head (expensive)
 - Using an adjustable slide /focusing rail (can be purchased at reasonable cost)
 - Fine tuning is often best done by making small adjustments to the subject position

SUBJECT SET UP AND LIGHTING (2)

- Consider lighting, background and the effect you want to achieve
- If necessary adjust position to get lighting and framing right or move items in the frame to desired position
- Take a test shot and make adjustments to set up as appropriate

CAMERA TECHNIQUE (1)

General set up

- Attach remote cable before turning camera on, or
- Set up wireless remote or timed shutter release when camera turned on
- Select spot focus
- Turn off VR and IBIS
- Set your camera to manual mode
- Select a low ISO
- Select a fixed white balance

CAMERA TECHNIQUE (2)

General set up contd.

- Choose an f stop that gives the sharpest/acceptably sharp image for your lens and makes the subject stand out (*as a general guide the sharpest f stop is usually between f5.6 and f8 but lower f stops such as f2.8 may be required to get the background out of focus*)
- Set your camera to “Mirror lock up” or live view (unless using a mirrorless camera)

Stacking images - Two options:

- Fixed focus plus macro focusing rail or
- Fixed camera position and change focus

CAMERA TECHNIQUE

Fixed focus plus macro focusing rail (1)

- Ensure rail has enough travel
- Set focusing rail and focus camera on front of subject
- Compose image and choose camera settings
- Check depth of field at chosen settings
- Work out focus stacking increments (suggest maximum of 2/3 of depth of field to ensure adequate overlap of sharp areas between successive images)
- Move camera forward on the rail until focused on the back of subject.
- Check subject framing to ensure that no areas that you want to be sharp fall out of the frame

CAMERA TECHNIQUE

Fixed focus plus macro focusing rail (2)

- Set focusing rail back to original position (reason for this will be explained in the session covering the use of software)
- Check focus and take first image
- Move camera along rail by desired increment
- Pause long enough for camera vibration to stop, then take shot
- Repeat until you have reached the back of the subject area that you want in sharp focus
- This approach has the advantage of greater accuracy

CAMERA TECHNIQUE

Fixed camera position and change focus (1)

- Compose image and choose camera settings
- Check depth of field at chosen settings
- Work out focusing increments (as per previous slide)
- If your camera does not automate focus stacking, identify focus points on the subject that approximate to the focusing increments you require

Note: an alternative is to note where the subject begins to fall out of focus and focus on that point in the next image in the sequence

- Focus on back of subject and ensure no areas that you want sharp fall out of frame

CAMERA TECHNIQUE

Fixed camera position and change focus (2)

- Set focus on front of subject and take first image
- Without moving the camera focus on the next focus point
- Pause long enough for camera vibration to stop, then take shot
- Repeat until you reach the back of the subject
- This technique avoids some of the set up issues associated with a focusing rail/slider but set up and getting the right focus throughout can be more tricky.

FURTHER READING

Basic articles

Mastering Focus Stacking for Stunning Macro Shots

[Mastering Focus Stacking for Stunning Macro Shots \(photographylife.com\)](#)

Focus stacking: how to achieve pin sharp macro shots

(this one includes tips on hand held image capture for focus stacking)

[Focus stacking: How to achieve pin sharp macro shots - Amateur Photographer](#)

Advanced articles

Focus Stacking

[Focus Stacking Tutorial From Start To Finish \(extreme-macro.co.uk\)](#)

Focus stacking: how to get amazing depth of field in macro photography

(this one has some good tips for studio macro)

[Focus stacking: how to get amazing depth of field in macro photography | Digital Camera World](#)