

Choosing the Right Accessories

A COMPREHENSIVE LOOK AT THE LATEST GEAR AND DIGITAL CAMERA ACCESSORIES



LENSES AND LENS ACCESSORIES: By Colin Bell

In our previous issue, I looked at lens focal lengths and how this focal length works in conjunction with the size of the image sensor to give different fields of view. This month we're going to look a little bit more at lenses; the different features of lenses; why two apparently similar lenses can have price tags up to 10 times different, and some of the different accessories you can use with your lenses.

The first thing you'll notice about lenses is the complicated descriptions that make up the name. For example:

- Canon EF 28-300mm f/3.5-5.6 L IS USM
- Nikon 300mm f/2.8 ED-IF AF-S VR

Focal length is probably obvious to most readers – it controls the field of view (see previous issue of the magazine for more info on focal lengths). So let's look at some of the other characteristics. I've tried to give an indication of the letters you might see in the lens descriptions from different manufacturers although I may have missed a few out.

Aperture: For a prime lens this will be the f-number indicating the maximum aperture. On a zoom lens, there may be one value or a range of values (as in the Canon lens example). When a range is given, it shows the maximum aperture at the two focal length limits. The Canon lens has a maximum aperture of f/3.5 at 28mm and f/5.6 at 300mm. If only one number is given for a zoom lens, it means it has a constant aperture throughout the whole range, and these tend to be a little more expensive than the variable aperture models. Note that the minimum aperture is never quoted in the lens description but if you enjoy long exposure photography, it's a useful thing to check out before you buy.

For the nerds amongst us, a zoom lens which is classed as fixed aperture (has a constant minimum f-number throughout the range), is fixed in terms of its light gathering ability but not its diameter. Take a lens like the Sigma 17-50mm f/2.8 – the widest diameter of the aperture varies across the zoom range from 6mm at the widest end (17 divided by 2.8) to nearly 18mm at the long end (50 divided by 2.8). This is not of huge relevance in photography but an interesting fact to impress your friends with.

Digital Only Lens: Some lenses are designed to only work with crop sensor cameras as they create a smaller image circle that would not cover a full frame sensor or frame of 35mm film. The glass elements in the lens can therefore be smaller making the whole lens much lighter and cheaper to manufacture. Just remember that if you ever upgrade to a full frame sensor camera, these lenses will not work (with the exception of Nikon's DX lenses that give a reduced resolution image on their full frame cameras). *[Canon: EF-S; Nikon: DX; Sony: DT; Sigma: DC; Tamron: Di-II]*

Image Stabilization: If you take a photograph with a slow shutter speed, there is a good chance that camera shake will cause the image to become slightly blurred. Image stabilization attempts to counter this unwanted camera movement by either moving the image sensor (as used in Sony and Pentax cameras) or an element inside the lens (the option chosen by Canon and Nikon). The downside of lens based systems is that each stabilised lens will be more expensive than non-stabilised versions. It does however allow the stabilisation to be optimised for each lens and is more effective at reducing camera shake.

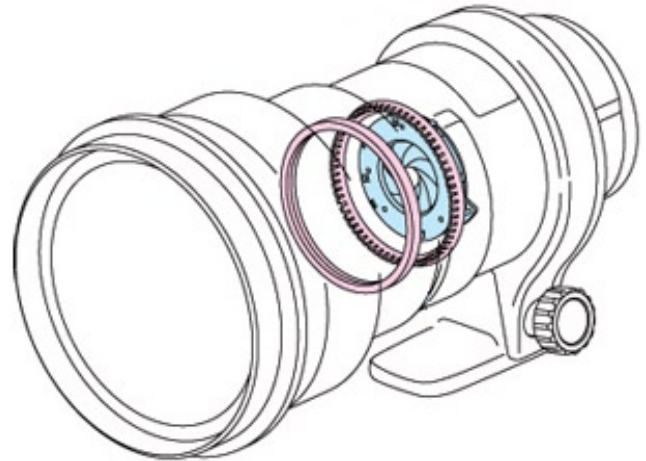
In general, image stabilisation can be a useful feature if you do a lot of hand held photography, but remember it's best to turn it off if you are using a tripod. *[Canon: IS; Nikon: VR; Sigma: OS; Tamron: VC]*

Better Quality Glass: Most lenses contain many individual glass elements (somewhere between 6 and 18). Making some of these elements out of better quality glass (ultra low dispersion glass or fluorite crystals for example) can have a significant effect on image quality – especially in terms of chromatic aberration (colour fringes around objects). *[Canon: L; Nikon: ED; Sigma: EX, APO; Sony: G; Tamron: LD – some of these letters mean a lot more than just better quality glass though]*

Non-Spherical Lens Elements: Most lens elements are spherical (i.e. if you continued the surface of the lens in all directions, you'd get a perfect sphere). However creating some aspherical elements can create more precise focusing right across the whole frame. *[Sigma: ASP; Tamron: ASL]*

Autofocus (AF) Motor: An auto focus lens requires

a motor to move the focusing elements. This can be either in the camera body or in the lens itself. When Canon introduced their EOS range in 1987, they decided all lenses would include an AF motor. Nikon however opted to put an AF motor in the camera body, although some Nikon lenses do have motors in the lens which takes over from the body motor. Nikon's budget DSLR cameras (D40, D60, D5000) have done away with the body motor altogether and must have a motor in the lens for autofocus to work.



Not all motors are created equally – and some lenses make use of ultrasonic motors (the pink ring in the illustration above shows a Canon ring-USM). These are near silent in operation and considerably faster at locking focus than a conventional motor. *[Canon: USM; Nikon: AF-S, AF-I, AF-G; Sony: SSM; Sigma: HSM; Tamron: BIM]*

Internal Focusing (IF): On budget lenses, focusing is achieved by moving the front element of the lens. This can be a problem if you like to use filters such as polarisers or ND-grads, as the filter will turn when the lens focuses. A lens with internal focusing moves one or more glass elements *inside* the lens so that the front of the lens neither rotates nor extends during focusing.

Full Time Manual Focus: Some lenses allow the photographer to manually focus the lens while still in the autofocus mode. You'll have to look in the detailed lens specification to find out if this is a feature of a particular lens though.

A Few Other considerations ...

Hopefully the previous section will help you if you're in the market for a new lens – but before parting with your money, here are a few other things you might want to consider.

Weight: If you want to carry it around on long walks, you might find a lighter lens the more 'friendly' option. Also consider whether a lens will feel balanced on your camera – a 2kg lens on an entry level DSLR body can feel extremely front heavy.

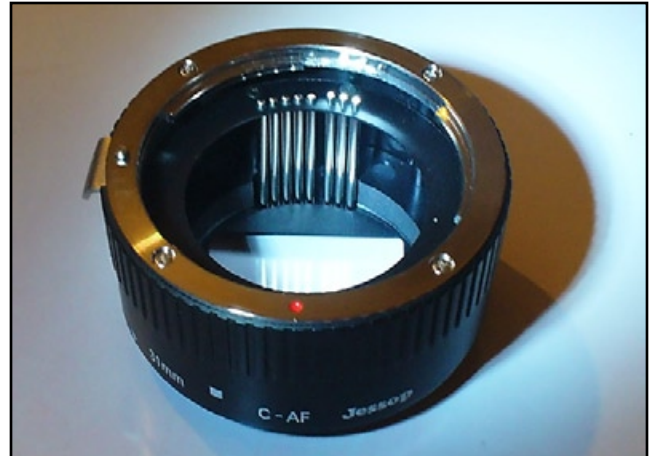
Lens Hood: Does this come included or is it an extra? Canon only includes hoods on their 'L' series lenses whereas Sigma gives you one with nearly all their models.



Quality of Bokeh: This refers to the 'quality' of the out of focus regions of the image. This is often considered very important for portrait and abstract photography, and related to the shape of the aperture in the lens. Cheap lenses may only have about 5 diaphragm blades which can lead to out-of-focus points of light appearing as pentagons rather than circles (see image). Quality of Bokeh is very hard to quantify and you can only really go by reviews and comments from fellow photographers. Some lenses have a good reputation for how well they render out of focus regions of the image.

Close focusing distance: If you like close-up photography, this might be important. For extreme closeup work, you will probably want a dedicated macro lens, however, some zoom lenses have a 'macro' mode which will get you fairly close to your subject without giving true 1:1 magnification. This is a nice bonus if you only do macro photography occasionally. There are also cheaper alternatives in the form of close up filters or extension tubes – the latter giving better image quality. The downside of extension tubes compared with a dedicated macro lens is that you will not be able to focus to infinity with the tube attached

whereas a macro lens can double as a normal prime lens.



A note about extension tubes

These are the next best thing to a dedicated macro lens and you can use them on all your lenses. They fit between the camera body and lens, and have no glass in them so there's minimal impact on image quality although you lose a little light. A word of warning however - if you are thinking of buying any, make sure that they have the electrical contacts to maintain communication between camera and lens (the 8 metal rods you can see in the picture running the length of the extension tube). Without them, you won't be able to change aperture or even use autofocus. Many of the cheap one's I've seen on eBay do not have these contacts so check carefully before parting with your money.

To finish off this article, I'd like to give you my own personal tips if you are looking to build a system containing more than just the kit lens.

- The kit lens that comes with many DSLRs is built to a low budget and it generally shows in the image quality. You will get a big improvement in quality by moving up to something better. The Sigma 18-50mm f/2.8 or Tamron 17-50mm f/2.8 are both excellent lenses and considerably cheaper than an equivalent quality one from Canon or Nikon.
- If you must use the kit lens, you'll get better results by stopping down to about f/8. When used wide-open, even the areas in focus will appear a little soft.
- Get yourself a 50mm prime lens. On a crop sensor camera this makes a great portrait lens. Being prime, it will be very sharp, and have a much faster aperture than your kit lens at the same focal length. This will

allow incredibly shallow depth-of-field shots. Canon and Nikon both make a 50mm f/1.8 (Pentax makes a 50mm f/1.4) and these are three of the most affordable lenses on the market today.

- Ultra-wide lenses have incredible creative scope. Sigma 10-20mm, Tamron 11-18mm, Canon 10-22mm, Nikon 10-24mm all create the sort of images at their extreme wide end which will really catch peoples attention. This motorbike image was taken with the lens at 10mm and with the bike's front wheel less than 2 metres in front of the camera lens.

- Filters for lens protection – a commonly debated topic on forums. I personally prefer a lens hood to protect the front of the lens from knocks - but if you must, don't buy cheap filters, and take them off when using your camera in a safe environment where damage is unlikely.

- Unless you really must only carry one lens, avoid the extremely wide ranging zooms such as the 18-250mm. As with kit lenses, compromises must be made in image quality to create such a wide ranging lens. Of course if Tamron or Sigma think differently and want to let me have one of their 18-250mm lenses to test, I'll have an open mind.



About Colin Bell:

Colin Bell is an enthusiastic amateur photographer that works in the IT business. Colin works as a software developer for an environmental research institute and is a specialist in tidal theory and marine software. Colin has had an interest in photography since 1984 when he received a Chinon CE-4 one Christmas. In 1991 he upgraded to a Pentax P30T and spent a lot of time shooting black & white film and developing it in his loft based darkroom. He bought his first digital camera in 1999 (a 0.8 Megapixel Fuji DX-10) and now uses a Canon EOS 350D and 40D.

For more information and digital photography tutorials, techniques and tips, visit Colin Bell at his website "Creative Photo Book" at:

<http://www.creativephotobook.co.uk>