Bury St Edmunds Photographic Society

"Nailing Focus"

So you have your camera and your pictures are not sharp and you are disappointed. Does this sound familiar? Unless you have bashed the lens, or the lens is faulty and we can check that for you, the chances are that it is the photographer i.e. you that is the cause of the problem. So what can you do? Here are some tips that I have picked up that hopefully will help you in getting sharper images.

Support the Camera.

If you have a tripod, use it. If you have not yet purchased a tripod, put it on your shopping list and go for the best one you can afford. Trust me, if you buy a cheap one you will regret it and you will be buying a better one before too long. Obviously tripods come in various sizes and they are normally made of aluminium or carbon fibre. Expect to pay at least £75 for an aluminium tripod and double that for carbon fibre. Carbon fibre as you might expect are very strong whilst at the same time being light in weight. It is worth keeping your ears open at the Society because from time to time members will be looking to sell their existing tripod to get a better one. When you buy a tripod the chances are that it will not come with a head, which is the part that you attach the camera or lens to and is an extra expense. Ball heads are good if the lens is not too heavy.

If you don't have a tripod then a monopod is an option, especially if you want portability. I have walking stick that you unscrew the knob on the top to reveal a ¼" screw that goes into the camera thus doubling as a monopod. Or of course you can buy a monopod, or even get one free if you sign up to some photographic magazines.

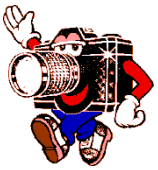
Another option is a bean bag. You can either make one, or ask you beloved to make one, or of course you can buy one. A bean bag will allow you to rest the camera & lens on say a wall, rock, vehicle etc., without scratching your camera or lens. I must admit that I have a bean bag but very rarely use it.

Other supports include a Gorillapod, which can be useful if the camera and lens are not too heavy. The Gorillapod can either work as a desktop tripod or you can bend the legs around something, there are different versions for different weight cameras. A screw and a piece of string can also be useful and yes you can even buy a screw and a piece string in the camera shops, although it is not really a piece of string. The screw and string works like a tripod in reverse whereby the screw goes into the bottom of the camera and you stand on the string that is attached to the screw. When taking the picture you tension the string by pulling up gently on the camera. The idea is that when you press the shutter release there is less likelihood of jerking the camera. The ¼" screws that you need for the camera can be purchased from D J Evans in Bury St Edmunds. They are quite used to people like me going in and asking for say half a dozen screws for some project that I am working on. You certainly will not get the ¼" screws in Homebase and even if you could you would have to buy a pack of 5 for about £2.50!

No Support

If you don't want to use a support in the form of a tripod, and there can be good reasons for this such as the subject is moving fast, or you simply don't want to lug a tripod around, then there are some basic things you can do to help get sharper pictures.

Handheld. If you are holding the camera, then get your elbows in against your chest. You will be surprised what a difference this can make. If there is a wall, lean against it. You can always sit down or even lay down of course. A ground sheet is useful for the latter as it saves on the washing and yes



you can buy a nice groundsheet that rolls up, in the camera shops for about £18.00. Yes I do have one and I do use it. Incidentally of you are going to be getting down on you knees why not buy some knee pads. These are silly cheap like £5.00 a pair from Rollson, in places like the Warehouse Shop in Bury St Edmunds. Admittedly I have not seen these in the camera shops yet, but no doubt given time I am sure they will appear and they will cost four times those from Rollson!

Pressing the shutter. In rifle and pistol shooting we have a saying, "don't snatch the trigger". It is quite common for the shooter to think I am now pointing at the bull's eye and I have to pull the trigger. Wrong – the mere fact that you pull the trigger will mean that you will move the rifle or pistol off the bull's eye and you won't score a 10. The trigger must be gently squeezed until the gun fires. Exactly the same applies to taking photographs. There is a great temptation to think that is the shot I want so I must press the shutter release. If you press the shutter release too quickly, the camera will move and you stand a good chance of not getting a sharp image. If you are using a tripod then use a remote shutter release. This will ensure that you don't move the camera when the shutter release is activated.

Mirror Up. If you are taking a picture with a camera on a tripod and the shutter speed is quite slow e.g. 1/15 sec, the operation of the mirror flipping up just prior to the picture being taken can cause a small amount of movement, which will result in an image that is not sharp. Fortunately the clever people who have designed DSLR cameras have thought of that and often incorporate a feature called mirror up. Don't confuse this mirror up with that used for cleaning the sensor. They work differently. With this mirror up set, the first press of the shutter release, or remote release will raise the shutter and the second press will take the image, after which the mirror drops back down again. In some cameras with mirror up set, it is automatic that when you press the shutter release it will raise the mirror then after a short delay the picture will be taken and then the mirror drops back down again all done with a single press of the shutter release.

Auto Focus. Most cameras will lock the focus when you half press the shutter release. If the subject is not moving this is fine however if the subject is moving either towards you or away from you the chances are that it will have moved between you half pressing the shutter release and fully pressing it to take the shot. With many cameras you can also set them to either take the picture whenever the shutter release is fully pressed irrespective of whether the camera has a focus lock, or only when the camera has focus lock. The latter can be quite frustrating and on many occasions my wife has complained that the camera will not fire when she presses the shutter release. It is because she has her camera set to single shot focus priority, rather than shutter release priority. Most cameras will allow continuous focus, or focus tracking and quite frankly this is probably the best mode to have your camera in. Basically all the time you have the shutter release half pressed the camera will keep the subject in focus. This is especially good if the subject is moving towards or away from you. If your camera allows you to detach the focusing from the shutter release button, this can be a very useful way of working, but it does take some getting used to. On some Nikon cameras there is a separate AF ON button that is conveniently placed by your right thumb. You set the camera to 'AF ON Only' and to Continuous Focus and now you have full control over when your camera focuses. If you keep the AF ON button pressed then the camera will continuously adjust the focus up until the point you press, gently of course, the shutter release button.

If the subject is moving past you then no doubt you will be panning with a slower shutter speed as you I am sure will be aiming to get the background to be blurred but the subject in focus to give that impression of speed. Doing it this way saves a lot of time messing about in Photoshop. Set your camera to continuous shutter release, on Nikon it is called Continuous Low or Continuous High and is

when the camera goes off like a machine gun when all the time you have your finger on the shutter release the camera will take a picture, until the buffer fills up that it. Doing this and panning removes the chance that pressing the shutter release will jerk the camera as the shutter release is already pressed. Another technique when panning is to use manual focus and to focus where you know the subject is going to be. This works very well at motor racing and motor cycle racing where you know absolutely where the vehicle is going to be as they are all achieving to stay on the racing line.

Shutter Speed. The reason that images are not sharp is normally due to movement of the camera whilst the shutter is open. The shorter the time the shutter is open the less chance there is of movement. As a rule, the shutter speed should be at least the same as the focal length of the lens. What I mean by this is that if you have a 300mm lens, then the minimum shutter speed you should be looking at is 1/300sec. Except that is not quite true. This rule of thumb was devised in the days of full frame or 35mm cameras. Most of the cameras that people use today have cropped sensors. For Nikon the cropping factor is typically 1.5 and for Canon 1.6. This means that if you put a 100mm lens on the Nikon with a cropped sensor, that is going to be the equivalent of 150mm on a full frame camera, so really if you are using a 300mm lens on a camera with a cropped sensor you should be looking for a minimum shutter speed of 1/450sec. Ah, but I hear you say that you have an image stabilised lens. Well the image stabilised will help a great deal with getting sharp picture. Nikon claim the image stabilisation on their lenses with VRII is worth 4 stops, which means in theory in the above case you can go down to 1/60sec. Well that is the theory. Incidentally the image stabilisation only helps with camera shake. It does not help if the subject is fast moving. If you don't believe me try taking a picture of a Blue Tit on a feeder. OK so you have a lens, which is f/4.5 and you need say 1/450sec but there is not enough light and the display on the camera is winking at you to let you know that you are likely wasting your time taking the picture. You could obviously go for a slower shutter speed and risk not having a sharp picture, or you can bring the ISO into the equation. ISO relates to the sensitivity of the film but it is still used today with digital cameras although it is not really the sensitivity of the sensor, more the amplification that is going to be applied to the image from the sensor to get the correct exposure. Most cameras we use will have a base ISO of 100 or 200, which means this is the setting that will give the best picture quality with the minimum amount of noise. Modern cameras will allow the ISO to go up to 6,400 and beyond. The penalty is noise. The higher the ISO the more noise you are going to get, but a higher ISO allows you to shoot at a higher shutter speed, which is what you want for a sharp image.

Lets take the example the of the f/4.5 lens and the need for say 1/500sec. The camera might say that given the lighting conditions and the f/4.5 lens that 1/60sec is what is required to get a correctly exposed picture. If the base ISO on the camera is 200 then if you set the ISO to 400 you will find the camera now says 1/125sec is the shutter speed required. Double the ISO again to 800 and the camera will now say 1/250 sec is the shutter speed. Double the ISO again to 1,600 and low and behold the camera now says 1/500sec is the shutter speed, just want you wanted. Depending upon the quality of the camera will depend on the amount of noise in the picture, but you have to ask yourself, "is it better to have a sharp image with some noise, or a blurred image without noise?" That actually is a stupid question because if the image is blurred, there is little you can do with it unless you are on one of these American crime series that are on TV where they can transform a blurred picture into a super sharp image. If the image is sharp but has some noise you can still do a lot with it.

Auto ISO. If you have not already discovered Auto ISO on your camera, now is the time to find that little book that came with the camera that you only open when all else has failed. Yes, the manual.

Auto ISO lets you program the camera to automatically increase the ISO if it cannot get the correct exposure. You might have for example a requirement for f/11 at say a minimum shutter speed of 1/125sec, but the light is not sufficient to allow this. You can set the camera to the minimum shutter speed you require, for example 1/125sec. If the light is too low, the camera will increase the ISO automatically until you get the required 1/125sec shutter speed. Magic! You can often program the camera to set the minimum shutter speed and the maximum ISO, as clearly there will come a point where the ISO could be so high that there would be too much noise or simply the camera does not go to a high enough ISO. I guess in this case the camera could say "Forget It!" or "You are having a laugh" in the display. As a plug for the two new Nikon cameras that have recently been announced, the auto ISO is intelligent in that you can set a minimum shutter speed for a given lens and the software in the camera knows which lens is attached to it. So attaching a 300mm lens the camera would use Auto ISO with the minimum shutter speed of 1/300sec or whatever margin you have programmed on top of that. Soon they will produce cameras with little legs and they will take themselves for a walk and take pictures, and we can all stay at home in front of the computers and Photoshop. Sorry, got carried away then.

Lens Sweet Spot

All lenses have a sweet spot, which is where they will perform best. Wide open at maximum aperture the lens can be soft especially around the edges. At the other end i.e. stopped down with a small aperture; diffraction comes into play causing the image to lose definition. Unless you have a need for a great depth of field provided by f/16, f/22 etc. don't be tempted to go to these small apertures on the basis that the images will be the sharpest, they won't. The trouble in this country and particularly in winter we are not blessed with a fantastic amount of light, which necessitates large apertures. Personally if I have an f/2.8 lens on the camera I will set the aperture to f/4 as I know I am getting towards the sweet spot of the lens. The problem is that the cost of lenses goes up with larger apertures and it also goes up with the focal length. Put the two together and you end up with a very expensive lens. The 300mm f/2.8 lens that Andy Abbotts brought along when he did his lecture has a price tag of £4.000. But what a lens! By comparison an f/5.6 300mm lens is around the £400.00. Two f stops and tens time the price! Put a teleconverter on a lens and you need to think about adding at least one stop over the maximum aperture. How much you need to add will depend upon the quality of the lens and the teleconverter.

Now for some Exercises.

Ok, so I have given you some ideas on how to get sharp in focus images. Now try some exercises to see if what I have suggested helps.

1. Put a newspaper on the wall with some blutack, but not on the emulsion because blutack is good at removing the emulsion when you come to peel it off. I have the tee-shirt on this one.
2. Hand holding the camera take shots of the newspaper at different shutter speeds on the camera ranging from say 1/15 sec upwards. There will come a point where you run out of aperture so you will need to increase the ISO if you have not got auto ISO set to on.
3. Repeat exercise 2) but with the camera on a tripod. If you have a remote release, then use it.
4. If you have a mirror up function Repeat exercise 3) with mirror up.

5. Compare the results of the above exercises and zoom in to 100%. Hopefully you should get to understand the effects of shutter speeds, tripods, mirror up etc. and understand what works and what does not.
6. Sweet Spot. Having determined the combination that gives the sharpest results, and with the camera on a tripod or supported now manually focus on the news print and take a series of images with the lens set to each of its f stops. This is best done when you have plenty of light as the purpose of this exercise is to find the sweet spot of the lens and you don't want too slow a shutter speed as that will colour (not literally) the results.
7. Again look at the results at 100%. You will probably find that the lens is sharpest 2 f stops above the maximum aperture. The more expensive the lens the closer the sweet spot is to the maximum aperture.

Front & back Focus.

If after having done exercises 1 – 4 above and determined the combination that gives the sharpest image with the camera on auto focus, you find that the images are not as sharp as you would expect, there is a chance that the lens is either front of back focussing. What we mean is that the camera/lens combination is either focussing just in front of the subject or just behind it. It only needs to be a fraction out to make a big difference on the focus of the subject.

If you suspect you have a front or rear focus issue then let me know and on a future workshop we can test it for you to confirm or allay your fears. Using a gizmo called a 'Lens Align Pro' I bought in the States it is very easy to test a camera/lens combination for focusing.

Sharpening.

When you have done all of the above, there is one last thing you can do to get the picture sharper. That is to use the sharpening tool in Photoshop, Elements, Lightroom or Capture NX2. In some cases it will be called "Sharpening" in other cases it might be called "Un-Sharp Mask". Almost all cameras have an anti-aliasing filter to combat moiré, which is the patterning that can appear on images. The effect of the anti-alias filter is to blur the image. By using the Sharpening or Un-Sharp Mask you can sharpen the image back up, but be careful because if it is over done the judge will comment that the image has been over sharpened. If there is interest on a future workshop we can cover sharpening.

Final Comment.

I hope the above has given you some ideas and some things to try out. I am sure there are some things I have missed so in the interests of self improvement please let me know and I will add them to the list for future use.

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