

DIGITAL PHOTOGRAPHY

Kelvin Aitken's unique and comprehensive how-to guide

MANAGING MANUAL FOCUS

In our previous article, we discussed how to take control of your camera's autofocus functions. However, sooner or later, you're going to come up against a situation that requires your full input. Yes, autofocus is not perfect.

While deliberately using manual focus might be a rare event, it can be the best solution to a difficult situation. Close up photography is an area where autofocus can be a life saver, a flare gun with all the bells and whistles, or it can be a deflated life boat; it can work perfectly or it can be a disaster.



A simple solution to close focus issues is a diopter adjustment filter. They come as single filters or kits of 3 or 4 of varying magnification. They are usually screwed into the front of the lens but space issues interfere with that. You can try attaching them or holding them on the outside of the port while shooting.

An example of this is an even toned subject, similar to the wide angle subjects we discussed last issue, such as a smooth white cowry shell or a black nudibranch.

With little or no texture, your camera's autofocus can hunt away forever. Or a very small subject, even with lots of texture, may be so small that the camera jumps to another object or hunts back and forth, from wildly out of focus to oh so briefly back in focus then back out again.

In practical terms, there are two situations which we should take into consideration. First, you may be using a compact digital camera, or, secondly, you may be using an SLR with a macro lens designed for close focus work. Both have restrictions and positives. Let's look at the compact camera first.

The main problem with compact cameras is that they have fixed lenses, so you are stuck with a 'not so good' minimum focus. They may work fine for most situations but when it comes to very small critters, say 3cm or less, it just will not do the job. The only solution is to add on a glass element to the front of the lens. Most camera stores will carry a line of screw-in glass diopter adjustment filters, usually sold as a kit of 3 or 4 filters. These filters are really just magnifying lenses of varying magnification, usually listed as +1 diopters up to +4 diopters. You can use one or you can piggy back them (i.e. a +4 and a +3 together to give you a +7) though your image quality will

drop and they will be harder to use due to the resultant miniscule depth of field.

You can find, if you hunt hard enough, diopter filters more powerful than this or even negative (i.e. -2 diopters) filters; not that you would ever need to use one for underwater use. I have used these negative diopters, cut in half, for above/below shots, pulling the abovewater focus distance back to match the underwater distance.

The logistical problem with that is, in a flurry of engineering efficiency with absolutely no forethought, your housing will be made to precisely take the full extension of your lens when focused at the minimum distance, and no more. There will be no room to put anything thicker than a tissue, between the end of the lens and your flat port.

So, the only place an additional diopter lens can be placed is outside the housing. Yes, this will work just fine, with a slight drop in quality, but it will work. Some housings provide a holder or a swing-in type system to hold such a close focus filter, or any kind of filter for that matter. Some may even provide a threaded collar around the flat port. You can buy snap on filter holders for some housings or, in a pinch, you can use old Mr Gaffer tape.

I have seen some nifty filter holders including strips of industrial strength velcro glued to the plastic housing with the matching



Sometimes the subject can be a bit skittish or just plain antsy, buzzing around like a blowfly in a jar. Focus lock and anticipating your subjects movements will help you nail it.



With small subjects, shallow depth of field can throw out an important part of your image. With this tiny nudibranch laying eggs, I chose a high viewpoint but also angled the camera so that the plane of focus ran from the bottom on the ribbon up through the top of the nudibranch. A low angle would have made just the eggs or just the nudi sharp. Not necessarily a bad thing, but I wanted to show the entire process so a completely sharp subject was called for.

small critter is awaiting you and you want to devote most of your dive to capturing it for posterity, then tape the filter on. You can always take it off underwater, though you may not be able to reapply it, depending on the adhesive on the tape.

Autofocus, when using these filters, may work just fine with a highly textured subject. If you find that your lens searches a lot, just let the lens focus to minimum distance and lock it there. Check your manual to find out how to lock focus, as discussed in the previous article. You will find that the higher the diopter magnification, the harder it will be for your camera to lock onto the subject. Since focus distance is so critical with a small depth of field, caused by the close focus distance, you will also find that even if the camera autofocus is working just fine, any movement of the camera to or from the subject will drastically effect where your point of sharp focus falls.

Minimise camera movement by propping yourself, carefully so as not to damage the reef, with your elbows and/or arms and/or camera body. Lock focus then fine tune your placement of focus by moving the camera back and forth whatever tiny distance is required (often just a cm or so). When all is ready, squeeze the shutter button all the way down to take your photo, and hope that your shutter delay does not interfere.

You may find that the subject may also decided to wander in and out of your locked focus point. In that case you need to anticipate when it will be in the right spot, allow for any shutter lag (a real problem with many compact cameras as they are

velcro on the diopter filter ring. Few of us will have the patience or means to make a metal or plastic custom holder, and frankly, you don't need it for casual use. If you find that you only need an occasional addition of a close up diopter filter, then you can, at a pinch, just hold it in place with your fingers, keeping the filter in a protective cover in your BC pocket. If you know that on a particular dive a certain

small critter is awaiting you and you want to devote most of your dive to capturing it for posterity, then tape the filter on. You can always take it off underwater, though you may not be able to reapply it, depending on the adhesive on the tape.

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busy processing the live LCD image) and shoot at the right moment. You will get better at this with practice, and it is obvious that you will want to take more than one exposure to increase your chances of that perfect image.

Something that we have touched on and which applies to both compact and SLR cameras, is the drastically reduced depth of field when shooting extreme close ups. You can improve this by using the minimum f-stop, such as f22 or whatever the smallest diameter f-stop is for your lens. There is a slight trade off where the subject becomes slightly less sharp when shooting close up with very small apertures. However, this is usually not a major issue and the slight increase in depth of field is a good compromise.

To make the most of your limited depth of field, place the most important part of your subject in the sharp plane of focus. This is almost always the eyes of your subject (if they have any) or the part of your subject that is most important to you. For example, if you are photographing a tiny nudibranch, then even though there are no eyes, the head and rhinophores are usually what we first look at, so they need to be as sharp as possible. No use having it's bum in sharp focus and a fuzzy head.

You can take full advantage of your limited sharp zone by laying it along your subject. Taking a nudibranch again as an example, their basic shape is like a squeezed out rod of toothpaste or one of those yummy Fruits of the Forest jubes. Shot front on, you are only going to have about 2-5mm in focus. But change your composition so that it is coming at



You should be able to purchase spacers or extenders for your housing. You can use whatever is needed to get the flat port far enough away to add in any filters or macro extenders you intend to use. You can even stack them for extra long lenses. With all that air space, you may want to experiment with adding weight to the port to counteract the buoyancy of the unit. You can see the middle spacer has gaffer tape on it, under which is a flat piece of lead, about 3cm x 12cm, to help balance the longer set-up.

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he's always the first to put up his hand. He's also dived the southeastern Australian continental shelf and photographed shark species nobody knew would be found out there. Kelvin is a BBC Wildlife Photographer of the Year marine category winner

and his unique work is on www.marinethemes.com

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you at a 3/4 angle or even side on, and you can get most or all of it sharp, or at worst, the head sharp and the body only slightly less so.



You can use an extender, which contains optics, or an extension tube to increase the amount of magnification of your macro lens. An extension tube is just an empty tube between the lens and the camera body but with contacts to allow autofocus. If you do use an extender, make sure it will fit to your lens. Sometimes they have protruding optic which may not allow them to be mounted on short lenses. If you want to be radical, you can always mount the extender on the camera then an extension tube then your lens. Super magnification, tiny depth of field.

It only takes a little practice, all of which you can do while sitting at your kitchen table.

For those of you with SLR cameras, this is where they shine. After all, why bother having a big bulky rig if it does not pay you back in some way. With compact cameras having 10 megapixel, or more, sensors, there must be an up side of all that weight and bulk. Hey, even my phone has a bigger file size than my first digital camera.

The single most useful feature of a housed SLR is that they can be adapted to any use you can imagine. Super wide, fisheye, big zooms, long lenses, macro lenses, micro lenses. You name it, you can adapt them to make it all work.

You can be forgiven for thinking that housings are designed by people who never dive. Bulky design, uncomfortable handles (if they have any), stupid control placement, lack of access for battery replacement, etc. And like the compact camera housings, the flat ports are made to within a micrometer so you can never fit a filter inside. However, with a bit of ingenuity you can get past all that.

When it comes to photographing small critters, a must have is a decent macro lens. These come in the 'normal' range of 50-

60mm and a longer 100-105mm. You can also get a 200mm macro and lenses designed for smaller chip cameras, such as the superb Canon 60mm macro. You can, if you are on a limited budget, also get similar lenses from third party manufacturers, though the optical quality may be not as good.

Usually, a housing manufacturer will have one flat fronted macro port designed for the shortest lens. You then buy an extension port, basically just a ring of varying length, to extend the macro port out to accommodate the longer lens. Before handing over your hard earned cash, check that the port is designed to take your particular lens, especially if you are using a third party lens.

If you are buying a macro port for your Nikon camera, the standard port will be made to exactly fit the Nikon 60mm macro, a beautiful lens which gives superb results. But if you are buying a Vivitar or Sigma, etc, third party product, the actual length of the lens may be longer at its maximum extended length (which occurs at the minimum focus distance). Check that your lens is not longer than the camera manufacturers equivalent by looking up the technical specs for your lens.

A macro lens, one that is designed to focus up to a 1:1 ratio (where an image projected onto the sensor is exactly the same size on the sensor as it is in real life), will overcome most of the issues with compact cameras and their limited close focus capability. The longer the lens, the further away you will be from your subject to get identical magnification. So, in practice, I use a short macro in dirty water and a longer macro in clear water.

To go beyond 1:1 and shift from macro to micro photography (where the image projected onto the sensor is larger than life size) you will need a bit of extra glass. While you could place a diopter ring on the outside of the housing, allowing you to remove it and therefore give you greater flexibility during your dive, you will get a much better result from mounting the diopter into the lenses threaded front mount. To do this, you will need to add a small extender ring on your macro port. I suggest you buy an extension ring which will be useful for other lenses. For myself, I bought an extension ring that is used with my wide angle lenses on a dome port, making the purchase more practical than some random spacer.



Some compact camera housings have a threaded outer collar on the flat port, some don't. Check before you buy.



Yes, you can use a macro lens inside a dome. To make full use of the focus range, put the same diopter adjustment ring on that you use for your wide angle lenses. It is a little unwieldy but it will allow you to get closer in dirty water, or just cut down on the amount of heavy metal you are carrying in your baggage.

You can also use an optical tele converter, turning your macro into something 50% or 100% longer in focal length. You just have to do all your measuring and calculations to make sure that you have an appropriate extension ring or rings to make room for the new set-up. If you are using auto focus (which I don't recommend for ultra close up work) then make sure the lens does not rack forward and hit the port. It will put a strain on your lens focus motor and possibly scratch the inside of the port.

When photographing minute subjects with a 200mm or 100mm macro while also using tele converters or close up extension tubes, you probably already know that you will be working at minimal distances. Using autofocus under those conditions, if your camera even allows it, will be a slow, tedious and less than accurate event. Racking the lens back and forth will be far less efficient than changing the camera to subject distance.

From infinity down to 1:1 magnification, autofocus works just fine. Once you go beyond that, though, using the lens racking system has less effect on focus. With the lens racked out it is quicker and more accurate to change or adjust focus by moving the camera (or to be more precise, the image sensor in your camera) back and forth by a tiny amount. This can apply also to subjects that are between half size (1:2) and full size (1:1) but is much more obvious at higher magnifications.

No matter if you are using a wide angle lens, a super macro or anything in between, when shooting on manual focus your friend in the viewfinder is the 'in focus' dot. When the selected focus point senses that the subject is sharp, the infocus indicator in your viewfinder will light up. If it flickers, you are close, but no muffin for you yet. When it is fully lit, press the shutter button.

Even better than a diopter is a matched macro extension tube. This fits between the macro lens and the camera body. It has no optics so does not degrade the image. Your manual focus knob will no longer match up but it should still autofocus and you can use focus lock. If you are doing a dive just to photograph one subject, such as a pygmy seahorse, before you dive you just rack it all the way out to minimum focus and leave it there.

You can imagine how handy this can be if you are using a lens on manual focus, having visual confirmation that your focus is correct. Especially for the mildly visually impaired.

Don't worry too much though if the focus confirmation light does not go on if your composition has a deliberately out of focus area on the focus spot. In fact, in this instance you don't want it to come on. Just keep your eye on the important area of the frame and hit the shutter button when all looks good.

You can also use your macro lens inside a dome port. It will work just fine. Just check that at maximum extension, the lens does not hit the port. This is handy if you want to save a few dollars and only have one port, if you want to cut down on the amount of gear when you travel or, which is my reason, if you want to avoid the slight telephoto magnification of a flat port. For example, on a dive where I was photographing handfish in the dirty waters of Hobart, Tasmania, I needed a short macro, almost a wide angle macro, to get as close as possible to my subject to cut out the silty water. A 60mm behind a dome was the answer.

You will need to change your strobe positioning with ultra close-ups as often the subject is very close to the port you are using. A practice dive or two is recommended when trying a new set-up.



This tiny seahorse, about as long as your thumb nail if stretched out, half that normally, requires special effort in the close focus department. I used a flat port, two spacers, an extension tube and a +4 diopter. I worked it all out well ahead of the dive on my kitchen table. I focused the lens at the minimum distance possible then set it on manual and taped it in place so that it would not move on the boat ride.

LINKS>

http://en.wikipedia.org/wiki/Macro_photography

<http://www.macro-photography.eu/>

http://www.kevinwille.com/l3_topic05.htm

http://www.marinetemes.com/aasearchfiles/Seahorses/index_11.html