

Making a ring flash

By Alexander Mustard

With the credit crunch in full swing, I felt it was timely to pen another Do It Yourself article. Underwater photography has always been an expensive passion, so for those who want the fun of new toys without the pain of paying, here is another project to add to my homemade polecam in Issue 45.

I have long been curious about using ring flashes underwater. I have played with a few, but never owned one, or had the chance to shoot one extensively. Their main advantage is that they produce high quality flat, directionless, front lighting that is well suited to revealing colour and detail in subjects. They also make camera rigs more compact and easier to squeeze into and light tight places. They are best suited for macro and super-macro photography at short camera to subject distances (one manufacturer quotes less than 50cm on their website).

Several commercial models have existed or still exist. Perhaps the best known and most commonly seen is Inon's Z22, which is actually a quad flash, with 4 straight flash tubes arranged around the port. As far as I know, it is now discontinued. British underwater photographers Martin Edge and Ken Sullivan developed their "Ring of Light" flash, but, with only Nikon film-TTL protocols and no manual controls, its popularity has waned with the migration to digital. Still current are UK-Germany ring-flashes, they continue to produce small numbers of their custom versions, and Athena's AFR-10 that has become

popular in recent years. There may well be others.

While I have always wanted to use one, a few factors have always stopped me putting my hand in my pocket. First many of the older systems do not offer fine manual control over flash power. Second quite a few of the rings are narrow bore and as such do not fit all ports, particularly the increasingly wider macro ports required to house fatter, more modern lenses like the Sigma 150mm macro and the Nikon 105mm VR. It is possible to get custom-made narrower ports, but these don't always fit the new lenses. The other stumbling blocks are price and travelling. Most of these units are considerably more expensive than standard strobes and if you have one you will still need to buy and bring standard strobes for other types of shots. More weight, more expense.

So instead of buying one I decided to make one. Not a fully functioning ring-flash, but a ring reflector box powered by my existing strobes. It is not an original idea, I have seen it done on land, and the designs seem ideal for submergence with no moving or electrical parts. The entire system is intended to fill up with water quite happily.

Not only was this design much more inline with my DIY skills, but more importantly it would cost very little, weight very little and would fit all my lenses and ports as well as allowing me all the manual power settings of my normal strobes. One other advantage would be the ability to open the strobes out and shoot normally. For me this is not a big issue because I find that focusing each dive to a particular type of photography produces the best results. But it is worth mentioning.

In this article I want to run through how I made it, how it worked and whether it was worth it.

I won't provide a precise step-by-step guide



Ring flash lighting is appealing underwater, but is it worth it? I decided to build my own to find out.

In production: before being painted it is easy to see its origins as a casserole dish. My Inon strobes fire light in the sides, which comes out of the ring shaped opaque window around the front of the port.



to building one, because the exact parts that you will need will depend on your housing and strobe setup. But the basic design is very simple. It is a reflective chamber around the port with holes in the sides into which the strobes are fired and an opaque window at the front, around the port, out of which the light shines. As you can see from the photos, the reflective chamber and opaque window are only about 25mm (1") wider than the port.

I chose to make the outside of my reflective chamber out of a plastic, microwaveable casserole dish and the inside out of a rubber drainage tube, that happened to fit snugly on my Subal ports. I cut a port-sized hole in both the bottom of dish and in the lid so the port would fit through and then holes in either side of the dish to fire the strobes into. Both internal surfaces were made reflective: the inside of the dish I sprayed with chrome paint and the rubber tube was covered in two layers of aluminium foil (the paint did not set on the rubber, when I tried it). I then put the tube inside the dish and glued the lid down, which kept it all together. Later I sprayed the outside of the dish black to give it a nicer finish. It all cost less than 20 Euros.

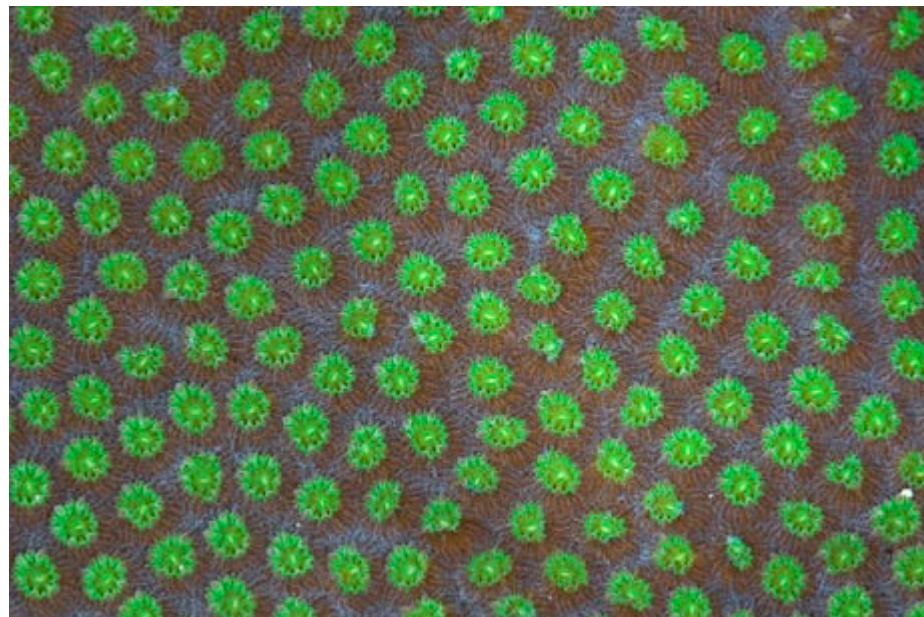
I put it together and tested it by photographing cactuses in the house. Much to my surprise it worked and worked well. The light loss was more than a stop compared to aiming the strobes directly at the subject, but since my Inon Z240 strobes pack a lot of punch I was not overly concerned at this stage. I also stretched some short sections of old wetsuit sleeves over the front of the strobes to stop any light spillage, just to be sure that all the light was coming through the ring-reflector. In the future I might make more permanent light funnels for my Inons.

My January photo workshops in Grand



(Left) Pool tests. Much to my surprise the system held together and worked. Nikon D700 + Sigma 150mm + Canon 500D. Subal housing. 2x Inon Z240 fired through ring diffuser. 1/250th @ F10.

(Right) Coral detail. The ring-reflector produces shadowless lighting, which is accentuates the patterns in the star coral. Nikon D700 + Sigma 150mm + Canon 500D. Subal housing. 2x Inon Z240 fired through ring diffuser. 1/125th @ F14.



Cayman provided an ideal opportunity to put it through its paces. Half expecting it all to float away in pieces, I decided to test it first in the pool. It would be less embarrassing there. Again it worked well. If I sound surprised, I was. I photographed a rubber duck attached to a diving weight and got pleasing flat light. In the reflective pool I was easily able to shoot at F22 without taking the strobes to full power using my Sigma 150mm with my D700 on base ISO. But there was not that much room for manoeuvre and I was worried I might not be able to shoot on F22 on the reef. So I took some shots at wider apertures between F10 and F14 to get a feeling for the depth of field these apertures

produced.

Cayman is a wide-angle destination, with clear waters, colourful sponges and dramatic walls and caverns. So it took me a few days to get the chance to shoot the ring-reflector in the ocean. But once I did I was pleased that it produced acceptable results. I started off with easy subjects, such as coral details, which were well suited to the flat light. The shadowless lighting certainly revealed the patterns of the corals, although at the expense of textures.

I then moved on to shoot fish and critters. Again the ring flash worked well and produced many pleasing images, although because of its limited range it performed best on highly



(Left) Because of the limited range of the ring flash I generally had to stick to approachable subjects, but was happy with the results. Nikon D700 + Sigma 150mm + Canon 500D. Subal housing. 2x Inon Z240 fired through ring diffuser. 1/125th @ F13.

(Right) Alex was in Lembeh as UWP went to press, but he managed to send this extra image in. Ring flashes produce flat lighting, which suits some images, although the effect is boring to some. Nikon D700 + Sigma 150mm + Canon 500D in Subal housing. F11 @ 1/10th. ISO 400. Inon Z240s fired through ring flash.

approachable species. Over the two weeks I also tried it with the Nikon 60mm AFS lens, which I should remind you is really quite wide on an FX camera. This allowed me to shoot larger species from within its camera-to-subject-distance sweet spot, and again I was happy with the results. I was generally able to shoot at F14-F16 with the Sigma 150mm, which was adequate, but it would be nice to

have another stop to play with. For critters on the sand I could reach F22, but for more distant fish I might have to drop as low as F8-F11. With the 60mm I shot balanced light images at F8-11, without using the strobes on full power.

The over-riding impression was how easy the system was to use. Nothing to adjust, just shoot, shoot, shoot. Changing orientation was

simple. I look forward to using it next time I am in cold waters, where I always feel less inclined to fiddle with everything and just want to bag the image. I also felt that light fell off more quickly than in conventionally lit images, probably because it was coming directly from the front. This has advantages and disadvantages, depending on the affects we are after. I never had problems with backscatter,

possibly because in Cayman's clear waters the flash power fell off before I found myself shooting through too much water.

In conclusion, my ring diffuser certainly produced ring-flash lighting and fulfilled its brief in being inexpensive and lightweight for travel. It is excellent for shooting small subjects, getting light inside complex shaped subjects and for revealing patterns.

I would like to refine my design to improve its light efficiency so that I could shoot on F22 on all subjects, should I want to. And I need to find a more durable reflector than aluminium foil, which is really only good for a couple of weeks of diving before it needs replacing. Apparently, it is possible to get stainless foil that will last longer in seawater.

Apart from that I feel that there are two main downsides to the images. First, which was pointed out by friends who saw some of the early shots, is that flat lighting gets boring after a while. The ring-flash is excellent for adding certain images to your portfolio, but you would not want to use it for all your macro photography. I tried adjusting the power of the two strobes, but it is still not possible to produce any directional lighting without moving the strobes away from the ring. The second, and perhaps more critical



I like this image of a flounder, but feel that I may have got slightly better results without the ring flash, particularly avoiding the highlight in the foreground. This is the drawback of a ring-flash. It is not always ideal and in most cases its lighting effect can be replicated with carefully positioned dual strobes. Nikon D700 +

downside is that ring flash lighting can be so closely approximated by placing two strobes either side and close to the port, that I would struggle to distinguish the shots on 9 out of 10 subjects. This is probably the main reason we don't see more ring flash systems underwater.

But maybe as I test it more I will discover more subjects that reveal its advantages. There is one factor that is undeniable, that you the guaranteed to be the centre of attention when you

stride onto the diveboat and put your contraption down on the camera table. Tupperware Mustard they called me.

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