Trioplan 100mm & TT Artisan 100mm + FIT Focus Gear

by Alex Tyrell

The classic Meyer Görlitz Trioplan 100mm, created by Hugo Meyer in 1916, is based on the Cooke-Triplet designed by Harold Dennis Taylor in 1893.

The Trioplan was one of the first affordable lens constructions, comprising of three lenses arranged in three groups, that allowed for a relatively high optical correction. The lens has 15 rounded aperture blades, and when shot wide open at f/2.8, especially when exposed to backlighting, it produces the famous characteristic circular bokeh, known as Soap Bubble Bokeh. This is a vintage lens with manual aperture and focus controls. In 2020 Meyer Optik Görlitz released an updated version of the lens using current manufacturing techniques and materials, but this came with a hefty price tag of €999 / £850 / $1100. Original models of the Trioplan can be picked up on eBay starting from around £250 going up to £750+ for ones in pristine condition. The original lens came in Exacta and M42 mounts, therefore requiring an adapter to use on modern cameras, but as electrical contacts are not needed, they are very cheap. The newer version came in a variety of mounts for current cameras.

I first shot a Trioplan 100mm underwater in early 2016, after picking one up on eBay and botched together gears for both the aperture and focus controls for my Subal ND-7000. I soon found out that the aperture control was mainly redundant, as the main goal of using this lens was to get the Bubble Bokeh, with a secondary benefit being the creamy soft backgrounds it also produced when backlighting wasn't present. Both of these however needed the lens to be shot wide open for optimal results, hence the redundancy of the aperture gear. The minimum focusing distance for this lens is around 100cm, so the addition of a close-up lens or macro extensions tubes were needed to bring this in closer underwater. My friend Mark Drayton then machined me a far more professional looking (and working) aluminium collar that perfectly fitted the focus ring of the lens, for precise fit and stability. I now had a gear that didn't slip off during the dive! I used this lens on my D500 up to 2022 when I switched to the D850. Shooting on FX gave a wider field of view than on DX and the depth of field was a bit less, but other than that shooting it was pretty much the same.

This year I finally made the jump to mirrorless, switching to the Sony A1 in a Nauticam housing, so needed to rethink how I would get the Trioplan working, as it would need a new M42-E Mount Adapter and longer Macro Extension Tubes on a mirrorless body. My initial thought was to once again botch a solution with a Nauticam N100 focus gear of a similar diameter to the aluminium collar that fitted the Trioplan, but these were looking quite pricey. I then turned my attention to the newly produced replica Trioplan from Chinese manufacturer TTArtisan. Given the budget friendly

Top: TT Artisan 100mm
Right: Trioplan 100mm

price tag of USD150 for a lens that is more or less identical in design and optical effect to the Trioplan, I hoped that someone may have already have produced a focus gear for it.

After some Googling it soon became apparent that finding a focus gear wasn't happening, so I turned my attention to 3D Printed options. A few places produce 3D Printed gears for more commonly used lenses, but not for the TTArtisan. I then saw a Facebook post that Fun-In Taiwan were now producing 3D Printed Gears for

variety of lenses, so sent Joe at Fun-In a message to ask if they had made one for the TTArtisan. They hadn't, but Joe said if I could send the lens to their shop in Shenzhen, they could scan it and make a custom gear.

I knew the lens would need some Macro Extension Tubes to reduce the minimum focussing distance down from 90cm to a more underwater friendly distance, but didn't know what would be the optimal length. I did some tests using my Trioplan with the A1 to get a rough idea and came to the conclusion that in addition to the M42-NEX Adapter that was 28mm, either 21mm or 28mm should work. Things then got a little lost in translation whereby they produced a gear that fitted the lens with just the 28mm M42-NEX Adapter, not accommodate Macro Extension Tubes, but I knew it wouldn't do the job as I intended, the minimum focusing distance of 90cm was going to be too restrictive underwater. A few messages back and fourth, and things were worked out. My request for a gear that could accommodate various length Extension Tubes up to 28mm, in addition to the M42-NEX Adapter was designed, some clever engineering put into action and a dual-section telescopic gear was produced. The extra time and print materials increased the cost a little, but it made sense to pay the extra. For those interested, the Retail Price of the gear will be USD165.

About 10 days later the gear and lens arrived and I must say I am impressed with both the design and quality of the 3D Print. The two section of the gear slide along silicon rails that grip well creating a secure fit of the two sections. At it's shortest length, with both sections fully telescoped together, the gear works with just the 28mm M42-NEX Adapter. Fully extended the gear can accommodate Macro Extension Tubes of approx. 35mm, though this is at the limit of it's extension and therefore is a little bit wobbly. The set of M42 Extension Tubes I have consists of three pieces that combine in various combinations, usable at 7mm, 14mm, 21mm, 28mm and 35mm. From 7mm through to 28mm is very secure with the gear, it is just at 35mm that it isn't perfectly secure, but still usable.

Next I set about testing the minimum and maximum focusing distances of the lens with the different length extension tubes, plus measured the horizontal distance across the frame for each. I also checked what port/extension ring combination would be needed on my NA-A1. The following chart is my findings with the TTArtisan 100mm + M42-NEX Adapter (28mm) on the Full Frame Sony A1 (completed in air, so refraction has not been taken into account):

Wide-Barred Shrimpgoby - Koh Tao, Thailand - TTArtisan 100mm+28mm Extension Tube on Sony A1: f/2.8 - 1/400th - ISO80 - Retra Pro X

Extension Tube Length	Min. Focussing Distance / Frame Width	Max. Focussing Distance / Frame Width	Port & Extension Ring
0mm	78cm / 25cm	∞ / n/a	Macro Port 105
7mm	56cm / 17cm	158cm / 65cm	Macro Port 105
14mm	44cm / 13cm	87cm / 29cm	Macro Port 105 + EXR 15
21mm	37cm / 11cm	59cm / 19cm	Macro Port 105 + EXR 30
28mm	32cm / 9cm	47cm / 14cm	Macro Port 105 + EXR 30
35mm	29cm / 7cm	38cm / 11cm	Macro Port 105 + EXR 30

Ports & Extension Rings:
- Nauticam N100 Macro Port 105 for Sony 90mm
- Nauticam N100 Extension Ring 30mm
- Saga N100 Extension Ring 15mm

Scalefin Anthias - Similan Islands, Thailand - Trioplan 100mm on Nikon D500: f/2.8 - 1/125th - ISO100 - Retra Pro X

Shooting either the Trioplan or TTArtisan is going to be quite similar. Both require pre-setting the aperture, and having this wide-open at f/2.8 is optimal for the Soap Bubbles, however the images are a fraction softer than when closed down. You can still get the soap bubbles at f/3.2 and f/4 but they look slightly more defined at f/4, and I prefer the effect at f/2.8 and f/3.2. As you close down further the bubbles are even less apparent. I would suggest setting to either of the first two f-stops on the dial. Both lenses also require manual focussing and I would highly recommend the focus gear. I have heard of people using it without the gear, pre-setting the focus and then adjusting their distance from the subject. This works but will be restrictive, limiting you to shooting at a precise distance for the entire dive.

Having shot the Trioplan quite a bit on DSLR you soon learn that the hit rate is low, especially with moving subjects. Combine a moving subject with a moving background for the bubbles (think a school of silversides) and it's extremely low, as you are not only attempting sharp focus on the subject, you also need precise

Banggai Cardinalfish - Lembeh - Trioplan 100mm w/ Nikon 5T on Nikon D7000: f/2.8 - 1/320th - ISO100 - Inon Z240

distance on the background for the bubble effect. Eyeballing precise focus in the viewfinder is tricky, it's very easy to just miss critical focus with such an extremely shallow depth of field. If you have static subjects then it is not too bad, you just need to bracket focus so you have a few options to select from post dive. On a mirrorless system everything gets that much easier when you utilise Focus Peaking. This nifty little feature dramatically increases the number of sharp shots. Peaking basically superimposes a coloured outline in the EVF/LCD on areas that it deems are in focus. You can change the sensitivity of the Peaking, the options are Low, Standard & High, as well as the Colour from White, Red, Yellow & Blue. You can then adjust the colour depending on the subject you are shooting, so you are not using red Focus Peaking on a red subject. High sensitivity may be too strong, showing you more in focus than actually is. Low may be too weak making it hard to see. Experiment with your camera to see what works best. I have found Standard to be most effective, though depending on the subject it may be hard to see, and then I increase to High, though you may get some shots that you slightly miss precise focus. The best method I have found for attaining sharp focus is to use the focus gear to adjust the focusing distance to the size of the subject, then make minor adjustments of the cameras distance to the subject for precise focus. This is especially valid for moving subjects whereby it is much easier to adjust your distance to the subject than using the gear.

In water tests are at the early stages having completed just 8-dives using the TTArtisan. Also for testing purposes, I introduced an artificial background (wire wool) to give reflected highlights to create the bubble effect, as where I am based

Pygmygoby - Koh Tao, Thailand - TTArtisan 100mm+21mm Extension Tube on Sony A1: f/2.8 - 1/200th - ISO80 - Backscatter HF-1

Banded Shrimpgoby Koh Tao, Thailand - TTArtisan 100mm+14mm Extension Tube on Sony A1: f/3.2 - 1/400th - ISO50 - Backscatter HF-1

in Koh Tao, we don't have schools of small reflective fishes on the dive sites that I could use to create the bubble bokeh. I also shot benthic subjects so I could use the artificial background on the sand without causing any damage to the environment. We have an abundance of Shrimpgoby, so these are easy to locate and won't swim away, so were an good test subject, as were the Anemonefish that won't swim away from the Anemone for too long. But the lens isn't just about bubble bokeh, so I didn't use the background on every shot, though finding suitable colourful backgrounds for nice bokeh wasn't so easy on the dive sites I visited. Other destination with colourful soft corals, sponges, etc would potentially be more productive.

The first dive I used the 14mm Extension, but this to made the minimum focusing distance too long for smaller subjects. It worked, but every shot was at the closest range the lens would focus and they needed a slight crop in most circumstances. The second dive I increased to 21mm and this worked better, bringing the minimum focusing distance in closer, allowing use of the focus gear to adjust the shooting distance for different sized subjects. Next I used the 28mm Extension Tube and found this further improved the usability, as while it gave me a closer minimum focusing distance, it also provided a more varied working range as I adjusted focus. I continued to use this set up for the remaining dives, as it seemed to be the sweet spot for the type of shot I was attempting. I didn't want to completely fill the frame with a subject, as the bokeh is what this lens is all about, so you need a good proportion of background. Also, with the gear being fractionally wobbly at 35mm, there is the chance of it moving out of position, rendering focussing impossible, so with the negligible gain in magnification, I doubt I will try this. But I did find this less than ideal for larger subjects. I attempted shooting some Sweetlips, hoping for a sharp face with their spots blurring out into bubbles, but even with the lens at its maximum focusing distance, it brought me too close to them whereby they turned away before I could get the eye into focus. A shorter extension tube would have worked better, allowing me to shoot from a further distance. This is a big advantage of a variable length

focus gear over a fixed one, allowing for flexibility in set up for subject size and shooting distance.

I also tested the lens apertures of f/3.2 and f/4 to check if it improved the sharpness. I still used the same 28mm Macro Extension Tube and found that at at f/3.2 it was sharper with less haze, whilst still retaining nice bubbles and this may well be the f-stop I use from now on. At f/4 it was little sharper still, but I didn't like the overall effect quite as much, the ethereal feeling diminished as the bubbles were rendered with more definition.

I really enjoyed experimenting with this lens, especially shooting it with Focus Peaking on the A1. Though the TTArtisan 100mm is essentially identical to the Trioplan 100mm that I have been using for years, this feature transformed the challenging, though mildly frustrating Trioplan/Nikon DSLR experience into a much more enjoyable one. Being able to clearly see if focus is on the eye of your subject via Focus Peaking drastically reduces out of focus shots. You could get the same experience with the Trioplan on mirrorless, but its going to cost you a bit more. And Fun-In have already scanned the TTArtisan 100mm, so in addition to Nauticam N100 Focus Gear, they can make them for Nauticam N120, Marelux, Sea & Sea and Seacam.

If you are considering getting this lens yourself, here are some points to note:

•My Sony A1 requires me to turn on a feature that allows it to shoot without a lens being recognised, as there are no electronics in the lens to communicate with the camera body. Other brands may well need a similar feature enabled.

•Be careful if using M42 threaded Extension Tubes that screw together, as if you don't tighten them enough, the gear can potentially unscrew them inside the housing, rendering the focus control inoperable.

•Adjust the length of the Macro Extension Tubes based on expected subject size and required working distance, though I found 28mm to be optimal for most subjects.

•If you are shooting on an APS-C or Micro Four-Thirds sensor, then you will have to account for the crop factor (x1.5 / x2) giving you a smaller area across the frame than on an FX sensor.

•In most conditions you need to minimise the ambient light when shooting at wide apertures (f2.8) to avoid over exposure of the background. You will be using a fast shutter speed and a low ISO most of the time, plus low strobe powers so as not to overexpose the subject.

•If your strobe/flash trigger works in HSS it can be very helpful in bright conditions to quell ambient light using faster shutter speeds. Or consider fitting a weak ND Filter to the lens (i.e. ND4) in bright conditions.

•The distance of reflected highlights behind the subject controls the look of the Bubble Bokeh. Closer creates smaller, more defined bubbles, whereas further creates larger less defined bubbles.

A final point I'd like to stress; do not expect this lens to replace your standard macro lens. It isn't as sharp as a modern Autofocus lens comprised of multiple, optically coated elements. Sharpness drops off towards the edges, the centre and middle being OK at the wider apertures, so consider your subject placement. Yes, you can close the lens down for a sharper overall image, but then you'll loose the bubbles and creamy bokeh, and may as well just shoot your standard autofocus macro lens. Also, contrast is low when shot wide open, making the images a bit hazy at times. This can be partially fixed in post processing using the Dehaze slider and applying some Clarity to the subject via a Mask. In extreme cases you may want to look at using a program like Topaz Labs Sharpen AI, or the newer Photo AI to help out. Due to the softness, I have heard of people using this lens for the backgrounds of double exposures; capturing the bubbles with

Ornate Ghost Pipefish - Anilao, Philippines - Trioplan 100mm on Nikon D850: f/2.8 - 1/250th - ISO250 - Retra Pro X

White-Spotted Hermit Crab - Koh Tao, Thailand - TTArtisan 100mm+28mm Extension Tube on Sony A1: f/2.8 - 1/200th - ISO80 - Retra Pro X

the Trioplan/TTArtisan and then using a modern much sharper lens for the subject. But to me that takes away some of the challenges, though the end result may well be superior.

So to sum up, treat this lens as a bit of fun that produces images with a different look to a standard macro optic. You won't be shooting it on every dive, but if, like me, you repeatedly dive the same sites with the same subjects, it can produce images a little different. And assuming it fits into one of your current ports, with it coming in at under $300 for lens and focus gear, it's a fraction of the cost of most underwater photography related gadgets.

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