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Introduction

Astronomy, in some way or another, has always been an interest of mine. In the early 2001, I started to read books and get interested in the night sky. It was over the course of that year that I decided that I wanted to purchase a telescope to more fully appreciate the beauty and scale of the universe. Being interested and practicing photography for over ten years it was natural that I wanted to get a refractor as my first scope. In the ensuing search for the first scope, I came across the myriad of ads and websites. Many suggested the Synta 80mm short tube, or the ubiquitous 6" Newtonian. Looking through the various scopes available, it seemed clear that I wanted something a little more crafted and well built than the Syntas.

Not knowing for sure how keen I would be in the hobby, I set myself a reasonable budget. So it was that after much searching and asking, I settled on the William Optics Megrez 80SD. Being in Australia, it severely limited the availability and choice of telescopes. Although many are available, the Australian dollar (at that time) was not very good, resulting in a generally high price. Nonetheless, I ordered the scope from a good dealer in Australia (Daniel of Frontier Optics), and it arrived within a few weeks. The review that follows is my own beginner's experience. I have no interest or affiliation in any products mentioned in this review, I just wanting to share my experiences of this scope.

The Scope

Being my first telescope, but not my first optical instrument, I was very pleased with the overall

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construction and design (not referring to the optical design) of the scope. When I first unpacked it, it certainly looked bigger than the photos! It is quite large, and comparable to many of the Nikon or Canon 400mm f/2.8 lenses. It is well built. The powder-coating on the tube is very nicely executed. The gold rims are a nice touch. It was very well finished and all materials are of a high quality. Having used many of the big name cameras; Leica, Hasselblad, Contax, Nikon and Canon, I was pleased with the general construction. The focuser was smooth, though I felt the action and force required to turn it, was a little on the light side. I would've preferred a more deliberation action. Though that may not be well suited to high power viewing. The only complaint that I have is in the focusing knobs. Compared to the rest of the scope, it feels almost plastic. Perhaps a stainless steel knob with rubber grip rings would have been better suited.



The scope is very solid when held, and all components fitted together tightly. Truly a crafted instrument. The provided accessories was a 2" diagonal, 2" extension tube, a 2" to T-mount adapter and several 2" to 1.25" adapters. Generally, I was very impressed with all of the accessories. It is important to note that this scope is not the cheapest 80mm short tube out there. However, this is what you get in addition to the optical tube: an excellent 2" diagonal, which costs around US\$99. You get two 2" to 1.25" adapters of high quality, with brass compression rings (around \$25). You also get a foam lined soft carry case (around \$50). Finally, you also get a 2" to T-thread camera adapter (\$35). These 'extras' may total around \$225, give or take.

The optical system employed is a two element lens with one being a 'Special Dispersion' glass type. It didn't mean terribly much to me at that time. The general coating on the lenses was smooth and has a slight blue tinge to it. Reflections were generally okay and not too strong. The tube was baffled and lined with a type of foam rubber in concentrically cut circles. A novel idea that I have not seen elsewhere, and was interested in seeing the results. The company describes this lens as "semi-apochromatic", and as many reviewers and people have said, it is a rather nebulous term. It is clear that it would not be a true APO by Abbe's and Zeiss' definition, The question remains as to the extent in which chromatic aberration and spherical aberration is present in this scope.

In Use

Initially, I mounted it on my photo tripod, and it was a nice match and balance. The scope was not overly large and the tripod coped well with damping vibrations. The only snag is the lack of fine adjustments on my tripod head. Apart from that, I spend the better part of nine months looking at the stars on the tripod. I initially invested in a set of University Optics Orthoscopes (7, 12.5 and 25mm) and then later in their HD Orthos (5 and 9mm) and finally the Pentax XL 10.5mm. All these eyepieces worked well and could reach focus on the Megrez.

Firstly, I used my scope to do some day light views. I know that I can quickly judge the scope during the day, as it is what I am most familiar with optically. The scope performs well. I was looking at some plants

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in my backyard on a sunny day. When not in full and direct sunlight, the images are crisp, sharp and contrasty. Almost like looking at a transparency under a loupe over a light box. Tried to look for colour fringing, and that violet halo. Couldn't find any. At this stage, I was using a range of UO Orthos and Pentax XL. So far, so good. I now turned the scope towards my neighbor's front yard, where they had their car parked. This was looking into the sun, so to speak, whereas the sun was behind me before, in strong daylight.

The image was reasonable at low powers, but this time, it is softer and lacking the 'snap' that it had previously. This is where chromatic aberration started to affect the image. At medium powers from 50x to 100x, the image is just softer, with a noticeably annoying blue or violet halo around most edges. That is not to say that the image was blurry. The image was just lacking contrast and distinct (as in razor sharp) colour boundaries and edges.

The first night time I looked through this telescope, I was definitely impressed. It was with the 25mm Ortho, and the view was sharp in the entire view, and no discernible purple halo. It was very nice! Through further use, it was revealed that only in brighter objects or higher magnification that the dreaded violet (or purple) halo was visible. Did I find it annoying, well, yes and no. When you don't look for it, it really isn't much of a bother. For me, it was well controlled. But, when you look for it, it does become somewhat of a bother. All in all, I would say that the scope is relatively free of chromatic aberrations at low to medium powers. At higher powers, it is present, but not objectionable (for me).

Viewing the moon for the first time was also very nice. I did notice colour on the fringes, but on the moon itself, it was fairly colorless. Using it with a 5mm Ortho allowed 96x view that did show a lot of detail of the moon. Observing over a number of nights, the moon was definitely sharp. Very sharp. To my eyes, it was almost like looking at a high quality photo. There is something sublimely enchanting with looking at the moon. It just floats in the sky, so peaceful. It is truly something that I will always come back to. The moon was sharp at all magnifications and showed great detail. However, the violet halo around the edge of the moon was visible at most magnifications. On a more 'technical' observation, the violet halo surrounded the outside of the moon, whilst there was a yellow halo around the inside of the edge. I am not experienced enough to see what that means, but I am sure some of you can comment on that.

Not knowing the night sky terribly well, I was very content on moving the scope around and digesting in the lovely views. I saw Jupiter and its moons' and Saturn for the first time. It was totally mesmerizing. Did I notice colour in the views? Not really. Did I see much detail? Not having used other scopes, it is hard to compare. Regardless of how little detail is visible, when compared with Hubble pictures, it is so much more emotional and evoking to actually look at it through your own eyes. Knowing, that the light that is reaching your eyes comes directly from the planet or star. And for me, that is how it is. Even though the views are not highly detailed, or not knowing what I was looking at, it was nonetheless enchanting.

Moving to other bright stars, the scope is able to resolve (or I was able to... me being the weakest link...) two distinct disks in Acrux which is 5" apart. Nothing difficult. But for someone doing it the first time, it was great! Next, I was able to see two, very close, but not touching disks in B Centauri, which is a 1.4" split. Which is close to the Dawes limit. However, I believe that it can probably be pushed a little bit further, say 1" resolution. Please forgive me in this area of star splitting. Not being an experienced observer, I am not in a good spot to comment critically. This was observed with the 5mm HD-UO. Now, I settled on Arcturus. Nice orange colour. Looking at some DSO they generally appear as a real faint smudge that, when in focus, took a lot of concentration to see, but with averted vision, it was there. I have also had the pleasure of seeing the Orion nebula. It is nicely framed and provided nice details. Revisiting M42 after some more experience and better conditions, revealed more detail. I could make out four stars in the Trapezium (I am not sure if I am seeing it correctly, or just another 'trapezium' shape. It was inside the nebula, and had two brighter stars and two dimmer stars. I checked the charts and thought I was looking at it.).

Moving onto an area that I have very little experience with. I decided to look at the various diffraction patterns for out of focus stars. I popped in a 5mm UO-HD, and voila! I can see many rings when it is quite out of focus, and generally, can make out at most 3 or so rings. Beyond that, I think my eyes are limiting. But the diffraction pattern was circular, almost perfect. This showed that the scope was in pretty good collimation. Not bad considering it was shipped from Taiwan to my dealer in NSW, then down to Melbourne, and then in my car, etc. When I looked at the diffraction pattern of in an out focus, this showed more of the scope's optics. Out of focus patterns was very well defined and tight. The concentric rings were easy to see and were crisp. The in focus image was more subjective to seeing and became more unstable. But in the moments of good seeing, the rings were visible. The structure was similar to the out of focus. However, I do not believe that the colour of the rings, or the exact make up of the

diffraction rings was exactly the same. HOWEVER, remember that my eyes are quite inexperienced, and an experienced observer in good seeing conditions may draw other more valid conclusions. This indicated, to me, that this is well corrected for spherical aberrations. In whole, objects in the field of view were circular and round.



Beyond the above simple tests, I do not have enough experience to comment on. But what I can say is that with this scope, I had an interesting education in seeing different aberrations that occur in different eyepieces. Without a doubt, the best images were seen on the UO HD-Orthos (pictured above) and the Pentax XL (pictured below). They were pinpoints in the entire field. The Konig II 16mm performed the worse. With edge distortions as well as some kind of flare seen. But I must say, that my favorite view is through the 25mm UO Ortho. For a beginner, seeing so much of the sky with so many stars is more encouraging and rewarding than a highly magnified view of a small field. That is the eyepiece that I always end up using and enjoying the most. With the 25mm, there is very little violet halo, and stars are sharp everywhere.

Inevitably, I got the itch to take photos. First, I performed some tests on the scope during the day. Taking photos with and without the WO Violet reducer (VR-1). Although using the filter did produce a colour shifted image, the fringes around wires was suppressed somewhat. However, I was more concerned with the colour changes that take place. This colour shifting can be corrected digitally, but does change the visual balance somewhat.

My first venture in astrophotography was targeted at the moon. Both film and CCD results were encouraging. In general, my photographs of the moon were not too bad. The results looked similar to a 70's and early 80's telephoto lens. Especially the non-professional lenses. The slides were tack sharp, but when scanned at 4000dpi. I cannot comment terribly much in this subject, however, the Megrez has whet my appetite in astrophotography. In particular, looking at the work done by others with this scope, and my own initial adventures, has shown that this is a capable telescope for photography.

Later, I acquired a SAC-IVc camera, and it was almost unfocusable without the filter (during the day), it was awash in violet. It was only after the use of the filter, that the image could be seen and focused. Again, it was colour shifted. After more careful use, the VR-1 is now mounted on my diagonal and used visually and for CCD permanently.

After more use of the scope, it became clear to me, that this is a very well made telescope, and could offer a long time of fine viewing. Overall, this is a very impressive package and telescope. It has satisfied all my initial requirements and is a scope that I will keep for many years. I can high recommend this scope to those looking for a high quality small refractor, but cannot afford an APO. In the future, as I gain more experience in observing and photography, I hope to fully push the Megrez to its limits and utilize the full capability of this wonderful scope.

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