William Optics 80mm Megrez II ED Optical Tube

By Lawrence Carlino - 2/4/2005

... Yet, between the compact Chinese-made achromats such as the Orion Short Tube 80 and the superb but expensive instruments from Takahashi, TeleVue, Stellarvue , and TMB, the choices have been quite limited. Certainly, the fine achromatic Stellarvue Nighthawk has developed a loyal following, and the Orion 80mm ED is highly regarded. But for those who desire APO performance coupled with superior mechanical quality, fit, and finish, there is a new and unique player in town.

The 80mm Megrez II ED. Photo by the manufacturer.

The William Optics Megrez II ED is evolved from the previous generation of Megrez II semi-APO doublets, but it utilizes an air-spaced triplet lens design to provide claimed true APO performance. Priced at $798, the new ED scope uses the same beautifully crafted tube assembly as WO top-of-the-line fluorite triplet APO, a smooth rotatable 2-inch Crayford focuser, retractable dew shield, tastefully executed gold trim, and a backpack-style carrying case. Parts are cnc machined into an aesthetically pleasing instrument that could easily serve as a living room work of art when not in use under the stars. A matching finder bracket to accommodate WO 6x30mm illuminated finderscope (or, in my case, a gloss black 6x30 Celestron unit) is an optional accessory. An L-bracket hoe?on the bottom side of the scope has a ?- 20 female thread for attachment to a variety of tripods and mounts, but a pair of inexpensive 90mm tube rings from Orion fit the tube perfectly and permit even more mounting options. Total weight of the Megrez II is 5 pounds and dewcap-retracted length a mere 15 inches, so a relatively light-weight mount such as a Universal Astronomics Unistar light or TeleVue Tele-pod will provide adequate stability for visual observation. The heavier TeleVue Panoramic mount creates a beautiful and very sturdy combination.

Putting the Megrez II to the test under late autumn and early winter cloud cover in the Northeast became an exercise in frustration, but an occasional ucker hole?in the overcast and a handful of clear nights finally allowed an evaluation of the scope performance. One factor became immediately apparent: the chrome-plated 2-inch extender tube provided with the M II was essential in reaching infinity focus, and then, only with a 2-inch mirror star diagonal. Though the tube of the Megrez is the same length as that of the shorter-focus WO fluorite APO, its longer 560mm focal length (f/7) pushes the focal plane well beyond the confines of the tube. This is a wonderful feature for prime-focus photography or bino-viewer, but it precludes straight-through or 1.25?diagonal visual observing without additional extenders. The configuration also makes the scope slightly •ail heavy.?br />
This minor quirk aside, I finally managed to get a good look at the first-quarter moon ?an effective initial test of color correction and contrast. Impressive! The characteristic purple fringing of an achromat was completely absent at 80x using a TV Nagler 7mm Type 6 eyepiece. Shadows in the lunar Alps near Plato and the Alpine Valley were black and vividly defined. Detail in the heavily-cratered lunar south was satisfyingly sharp and surprisingly bright for the scope 80mm aperture. A few days later, when Copernicus popped into view, the crater terraced walls stood

out in stark contrast at 112x (5mm Nagler Type6), and the chain of coalesced craterlets nearby was well defined. Even the tiny rill Rima Birt near the Straight Wall could be glimpsed when the air steadied. Pushing the little refractor to 200x with a 2.8mm Takahashi LE eyepiece showed only a slight softening of the image, but no obvious false color.

With Saturn finally attaining reasonable altitude, the ringed planet became an attractive target. At only 80x, the Cassini Division stood out boldly, and the •?or Crepe ring was just visible as it crossed the disk of the planet. At 112x, the South Equatorial Belt(s) were easily seen, and the dusky South Polar Hood could be discerned. Titan and Rhea were easy to pick up as the Megrez?excellent baffling provided a black, high-contrast background. Focusing, however, at this power and above was touchy: a little inside or outside of perfection yielded a greenish or red cast. Overall, I would have to rate the image quality as very good, but not quite up to the lofty standard created by the superb Takahashi FS-78 fluorite apochromat.

As good as the Megrez II performance was on the moon and planets, it became a bit enigmatic when several double stars were targeted. I found that the diffraction patterns of brighter stars were asymmetrical, the diffraction rings being offset to one side of the airy disk. An e-mail to William Optics provided a partial solution. The threaded front lens cell had become loose in shipment and needed to be tightened to restore alignment. (The objective lens itself cannot be collimated by the user.) With the cell fully reseated, a 50 percent improvement in alignment resulted. The remaining small error in exact collimation became unnoticeable at powers under 100x and a little annoying only with the scope pushed to 160x or more. I suspect that the residual error is being caused by a slight decentration of the lens and focuser.(As an aside, David Yang of William Optics was very helpful: he replied to my inquiries immediately, in detail, and was very concerned with my satisfaction as a WO customer.)

A classic test for double star resolution, Epsilon Lyrae, though fairly low in the northwestern sky, was neatly resolved into four pinpoints at only 62x with a 9mm Nagler Type 6. At 112x, the quartet displayed neat airy disks, delicate first diffraction rings, and a barely discernible yellow-green cast. Certainly very good, but I would rate the view slightly inferior to that provided by the Tak FS-78, and about the same as one might expect from the Orion 80mm ED.

A tougher test, Delta Cygni, was barely resolved at 200x using a 2.8mm Takahashi LE eyepiece. Flares of red and blue emanated from the second-magnitude primary and tended to blot out its elusive companion. In similar fashion, the close and challenging Zeta Aquarii did resolve at 200x, though a red excess surrounded both components and the bright stars flared during moments of less-than-perfect seeing. At the same power, the very close double Eta Orionis was just resolved, the 1.7 arc-second companions nearly touching when the seeing steadied. As David Yang informed me, the scope is designed to support from 120x to 140x, and it certainly does that very well, but things do get a bit sloppy at perhaps 160x or more.

With just 80mm of clear aperture, the Megrez can• be expected to be a deep-sky dynamo, but it does squeeze fine performance out of every available millimeter of its multi-coated glass.
With a wide range of potential magnifications, the scope performed admirably as a rich-field instrument. With a big 40mm Orion 2-inch Optilux in the WO star diagonal, the resulting 14x yielded a true 4.3 degree field-of-view - wide enough to take in the entirety of M 31 and frame the blue glory of the Pleiades. At 43x (13mm Nagler Type 6) the Orion Nebula became a lovely sight with the •at wings?being easily visible and wide extensions of nebulosity glimpsed with averted vision The Trapezium was sharply separated into its four major components, and the faint •? companion could just be detected in brief flashes at 112x.

Open clusters such as M 35, the Auriga trio, and Double Cluster in Perseus were very satisfying: well-defined pinpoints of starlight against a very dark, velvety background. The seven anti-glare baffles in the tube of the Megrez do their job effectively in enhancing contrast and reducing stray light.

Clearly, the 80mm Megrez II ED is a compromise, but a pretty good one

for most observers. The telescope is built to a price point and is undoubtedly meant to fill the void between inexpensive achromats and top-of-the-line, pricey APO . What the potential buyer gets is very good optical performance: a complete absence of the achromats?purple color fringing (trading it for a little red excess), fine contrast, and the ability to use moderately high magnifications without severe image breakdown. The wonderful fit, finish, and aesthetic value may be its greatest virtues, however, as the pure beauty of the scope more than justifies its price of $798. In comparison, the less expensive Orion 80ED has roughly similar optical performance, but it is larger and a bit crude in its construction. The Stellarvue AT 1010 bears magnification as well or better, but is hampered by significant chromatic aberration. The TeleVue 76 seems to have slightly better optical performance, a tad less light grasp, superb build quality, but a considerably higher price tag. At the far end of the price spectrum, the true perfectionist would probably be satisfied with nothing less than a Takahashi FS-78, TMB triplet, or William Optics?own 80mm Megrez fluorite triplet ?all of these choices upping the ante considerably.

At the very least, a viable choice now exists in the vast middle ground between frugal and perfect. In my opinion, the Megrez II ED fills that role very well.

Clear skies!
Larry Carlino

Click here for more about this scope . -Ed.

All times are in (GMT-8:00) Pacific Standard Time Zone