Quick Look

William Optics FLT-98 f/6.3 Apo Refractor

U.S. price: $2,395
Worldwide dealer list available online at www.williamoptics.com

THE TIMING WAS PERFECT. I was just beginning my tests of SBIG's ST-8300M CCD camera when I spotted the William Optics FLT-98 f/6.3 apo refractor at the Northeast Astronomy Forum last April. The scope's 618-mm focal length is an excellent match for the camera's 5.4-micron pixels, producing an image scale of 1.8 arcseconds per pixel. Equally attractive for astrophotography is the FLT-98's built-in digital focusing scale (called the Digital Display Gauge, or DDG for short) and $269 optional Adjustable Flattener Reducer IV (AFR-IV). The AFR-IV has a 0.8× magnification factor, and while its made for several William Optic refractors, with the FLT-98 it yields an effective focal length of 500 mm and an image scale of 2.2 arcseconds per pixel on the ST-8300M. A loan was quickly arranged for this review.

Visually, the FLT-98's air-spaced triplet objective, made with extra-low dispersion (ED) glass, delivers the bright, crisp, color-free star images that we've all come to expect from modern apochromatic refractors. But with photography being my main interest, I didn't linger at the eyepiece.

In addition to delivering excellent star images across the ST-8300M's CCD, the field flattener has a unique feature, making it especially useful with astronomical CCD cameras. For the best optical performance, the spacing between any field flattener and the camera's focal plane must be critically set. All the flatteners I've used in the past have been made with the 55-mm back focus dictated by the T standard established for 35-mm cameras. That's great if you shoot with DSLRs, but there's no industry standard for the back focus of astronomical CCD cameras. Getting the proper spacing for these cameras usually means cobbling adapters and a lot of trial-and-error experimenting.

WHAT WE LIKE:

- Excellent apo performance
- Built-in digital focusing scale

WHAT WE DON'T LIKE:

- Focuser may flex under heavy loads

The position of the AFR-IV's two-element lens can be varied within the body of the flattener by more than 20 mm with a simple twist of an external ring. It was thus a simple matter of screwing the flattener onto the ST-8300M's filter wheel and shooting a couple of short test exposures at different lens positions to zero-in on the optimum spacing. What a joy it was to nail the proper setting without endless tinkering with adapters and spacers.

The field illumination with the AFR-IV is notably uniform across the ST-8300M's chip, and I really only needed to use flat-field images for calibration when there were image artifacts due to dust on the camera's filters and/or CCD window.

It's probably a carryover from years of doing "old-fashion" astrophotography with film and manual guiding, but I like being outside with a telescope while shooting pictures. So I've never considered it a burden to manually focus my cameras even in this age of sophisticated autofocus gizmos.

Nevertheless, I immediately took a real liking to the DDG. It displays the position of the focuser's draw tube to an accuracy of 0.01 mm. This is a bit of overkill, and even with a deft touch on the scope's fine-focus knob, it's challenging to set a position this accurately. But achieving an accuracy of 0.05 mm is a breeze, and that was certainly accurate enough for my setup and observing conditions. I've never used a manual system that was faster to focus than the DDG. It's great.

The DDG is powered by a small, internal 12-volt battery, and its large digits are very easy to read. The display has red backlighting controlled by a separate on/off button. The battery lasts a long time, especially if, unlike me, you remember to turn off the backlighting when you're done using it!

The FLT-98's focuser is a modified-Crayford design with ball bearings encasing a moving stainless-steel rail on the drawtube. The manufacturer doesn't specify its load capacity. While I had no flexure problems during 10-minute exposures with the 4.1-pound load of the AFR-IV and ST-8300M, heavier cameras might present problems for setups involving a guidescope (focuser flexure is rarely a problem with off-axis guiding).

Overall, this imaging setup was extremely nice. I only wish I could have used it to advantage on the big, splashy targets that become available in my late-summer and autumn evening skies. ✦

— D. di C.

Above: **Weighing 13 pounds (5.9 kg) and measuring just 20 inches (51 cm) with the dewcap retracted, the William Optics FLT-98 comes with this exceptionally heavy-duty carrying case.**

Right: **The author quickly took a liking to the FLT-98's built-in digital readout for the position of the focuser's drawtube.**