Zenithstar 80: Review-Part 2

By Otto Piechowski - 10/17/2005

Zenithstar 80 Review: Part 2

Summary of Previous Report:
This telescope is excellent in terms of mechanical functionality and cosmetic appearance. It visual performance is good. The quality of the optical components and the optical system is very good. As received, this scope matches or slightly exceeds its advertised performance. It gives superb crisp views with a snappy focus up to 100 to 120X (30 to 40X per inch of aperture).

Customer service by William-Optics is excellent and always a pleasant experience. For example, though William-Optics was under no obligation to do so since my scope matched advertised performance expectations, the manufacturer was willing to check, fix or replace the objective for no charge and assume the cost of shipping. Later, when I lost the screw that tightens the Crayford focuser, William-Optics offered to send me a replacement free of charge.

As received, my scope contained two optical path defects. First, mis-collimation resulted in slightly less than diffraction-limited instrument. Second, the installation of an incorrectly designed baffle cone resulted in a significant loss of effective aperture. Due to matching advertised performance parameters and due to the support of William-Optics and the seller, I chose to attempt an end-user improvement of the collimation. Disassembly of the optical components allowed me to analyze the baffle-cone. Comparison of the baffle-cone with the description given in Tom Trusock article revealed the presence of a baffle-cone design flaw.

The end-user is able to perform some improvement of less than optimal collimation. These end-user improvements are made possible due to the simple and excellent design of this instrument. I need to credit Jeff Barbour for facilitating my comfort of disassembling optical systems. Having performed the end-user improvement described in the first report, I am satisfied that this scope exceeds diffraction limited performance. There is no astigmatism. Color correction is better than a well collimated and planarised (thanks go to Jeff for teaching me how to do this) ST80 but not as good as an ED80. The intra-extra focal images are beautifully similar. Images of third and second magnitude stars at 140X do show images indicative of about a total 1/5 waverfront error (.15 wavefront error of coma and .1 waverfront error in pinch). The improved collimation resulted in reducing multiple diffraction arcs on one side and a single faint arc on the other to a single ring. This improvement accomplished in collimation was offset to a degree by the single diffraction ring being slightly green on the brighter side and slightly red on the fainter side. The overall improvement allows superb views with a snappy focus up to 140X (45X per inch) and crisp views in steady seeing up to 190X (60X per inch).

The second defect with my scope was that it contained the original baffle cone that cut off some 10mm of its 80mm of aperture. The purchaser needs to check to make sure that the purchased unit contains the new baffle that allows full use of all 80mm of aperture. This check can be done by following directions readily provided by William-Optics. However, now that it is some six months since Tom Trusock review of this problem, the purchaser has every reason to expect the seller to ascertain that the correct baffle is in place. In my case, the seller willingly and quickly without charge shipped a replacement baffle when informed that I was aware of this defect.

Second Visual Assessment:

This scope provides a visual performance superior to an optimally collimated and planarised ST80; though not as good as a properly collimated ED80. Visual results in steady seeing include the following:
- Using an Agena-AstroProducts 70mm Baader solar filter (a well designed and attractive filter that cosmetically complements this scope), rice grain is easily seen.
- Rima Birt is visible, but barely so, with direct vision. (The moon was two days past sunrise on Rima Birt and at an elevation of 30 degrees above the horizon.
- Two craters are seen within Plato.
- The Cassini division is easily visible with direction vision, but not dark-pencil-sharp. (45 degree elevation, with a full moon, in a steady but not perfectly steady sky, with a less than optimal ring orientation)
- Trapezium e is not seen.
- Resolved and visible as separate components are alpha Piscium and Epsilon Arietis. Both are at the resolution limit of an 80mm scope (1.46 arc seconds). According to 33-doubles, the difficulty index (DI) factor of alpha Piscium is 84.1. According to this scale, a superb 4 inch instrument is needed to see doubles with a DI of 85 to 90.
The optical performance of this scope is not magical. But it is good for an 80mm aperture and very good for an F6 80mm achromat.
- distinct detail on Mars

A Comparison:
I am not a professional astronomer. I am not even a serious amateur. Though in the view of those who have no interest in astronomy or telescopes my fascination may seem obsessive, compared to most of the persons who read reviews such as this I am a leisurely scopist and stargazer and have been so for over forty years. I feel it is unreasonable for me to expect perfection from any optical instrument. In the words of my mother-in-law, one needs to be satisfied with less than the whole pie. Smart person, she. In a similar vein, I feel that amateur telescopes of today (with the exception of the ubiquitous department store telescope) are much like modern automobiles, there really aren• any bad models, though individual examples may be lacking.

In light of the foregoing inexpert opinion I preface the following by saying that all of the following have been good satisfying performers. I have learned much about telescopes and a bit about astronomy from the use of each. These include the Orion Short Tube 80 (ST80), the Orion ED80 (ED80), the AstroRubinar100 (AR100), the ETX90 (ETX90), the 100mm APM Triplet-Achromat (TA100), the Celestron C90 (C90) and the Zenithstar 80 (ZS80). In each of the following categories, my rating goes from pleasing (good) to wow! (very good).

Visual Performance (crisp, good detail, snappy focus):
- C90, ST80
- AR100, TA100, ZS80
- ETX90, ED80

Aesthetic Appeal (cosmetics-looking at the scope):
- AR100, ST80, C90
- TA100, ED80
- ETX90, ZS80

Mechanical Functionality:
- ST80, C90
- AR100, TA100, ETX90, ED90
- ZS80

Aesthetic Appeal (looking through the scope):
- C90, ST80, AR100, TA100
- ETX90
- ED80, ZS80

Portability and Ease of Use:
- AR100
- ETX90, ED80, TA100
- C90, ST80, ZS80

A Third Assessment:

This second visual assessment was performed over a series of nights in good but not superb seeing conditions. I am sufficiently pleased with the performance of the ZS80 that I will not be availing myself of the offer by William-Optics to correct or replace the optics. The performance is satisfying. The Zenithstar 80 now exceeds advertised performance expectations. In light of the latter, asking William-Optics to repair or replace the optics without charge would be unjust.

As I have not yet used the scope under superb seeing conditions, I feel that there is a reasonable chance that the ZS80 visual performance will more nearly approach that of the ED80/TA100 in terms of crisp detail. In particular, giving a sharp rendition of Cassini and Rima Birt, and a glimpse of Trapezium e. Should an experience of such seeing provide these results, I will offer up a third assessment.

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