ASKAR FRA500 Quintuplet Refractor User Review

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Introduction

The past few years have seen a continuing shift in the markets for astronomy gear with several Chinese manufacturers running their own brands direct to market and making a real impact by providing quality optics at attractive prices.

This slow but steady penetration of the markets has allowed optics from these vendors to directly compete with the big-name brands on the world markets and culminated in many astronomy stores clambering to get their hands on stock and it is disappearing out of the door just as soon as they get their hands on it.

With global supplies under pressure from COVID its not surprising these quality telescopes are in high demand and many dealers unable to keep up stock levels.

Still, many astro photographers remain very wary of buying from overseas companies but if you look at any of the major dealers you will find cameras, filters, telescopes and practically every kind of accessory, all from Chinese manufacturers.

These manufacturers have also been quick to build trusted relationships with dealers and many dealers have also been clever enough to recognise the potential of these suppliers and the keen demand for well-priced, high-quality instruments.

Sharpstar Optics and the launch of Askar

One supplier that many will recognise is sold under the brand Sharpstar, and they have become a well-known provider of quality telescopes for astro photographers.

Sharpstar and Askar are brand names of the Jiaxing Ruixing Optical Instrument Company located in Jiaxing city in China's Zhejiang province. Many dealers now sell Askar/Sharpstar telescopes, and they build some fine instruments that can compete with many of the bigger names. Their range of mid-priced telescopes are excellent performers but at a price point that makes them very attractive and puts quality telescope optics in the hands of someone who may not have the means to purchase high end high telescopes but still desires to own something that performs well.

Their range continues to grow and recently we have seen new telescopes arriving from smaller wide field compact refractors to larger CDK style reflectors and there are more designs arriving in quick time.

Askar markets some rather interesting products including the ACL200 f4 astrophotography lens for DSLRs, the tiny and rather unique, FMA135 and FMA180 wide field astrograph lenses, the FRA400 and 600 Quintuplet Astrograph refractors and now the FRA500. There is recent news of a smaller 60mm version too, the FRA300.

Sharpstar and Askar are continuing to develop some interesting products and I will be having a closer look at some of these other products in future so watch out for further reviews. And for openness, the items in this review were purchased by myself for my own use and I have not been sponsored by Askar/Sharpstar for this article.

The FRA500 Astrograph Refractor

FRA stands for *Flatfield Refractive Astrograph* and this beautiful wide field scope fits well to that acronym. The FRA500 is a 90mm aperture refractor with a native focal length of 500mm at f5.6 but has the option for a 0.7 focal reducer to widen the field and improve speed to a speedy f3.9.

This little telescope is built on a Petzval design and has a three-element main objective with two main ED elements with non-ED centre, an inbuilt 2 element field flattener, which uses an additional ED element for a true flat field experience and produces a 55mm image circle, perfect use with full frame cameras.

The FRA500 comes fitted with a large 3.5" focuser and includes the standard 10:1 micro focuser, a 68mm-48mm adapter kit on the rear, a carry handle, anodised rings and a D style mounting plate.

Unlike its smaller brother, the FRA500 comes with a Losmandy D style dovetail as standard as well as a set of rather interesting red anodised scope rings that include mounting points on three side. These mounting points are an interesting development and the top side of these includes a small carry handle as standard.

A short red trimmed dew shield finishes off the OTA. The FRA400 was friction fit but the FRA500 has received a nice upgrade in the form of a locking knob to reduce slippage and is a nice touch.

Askar also sell additional mounting plates so you can attach other accessories to the FRA500, and you can even remove the carry handle and add an additional plate in this location for more space.

There is also a finder foot fitted and this can be swapped between sides. There is plenty of mounting spots on this scope!

These mounting points make the FRA500 a superb scope for mounting astrophotography computers like the ASIAIR making for a very lightweight setup suitable for a lightweight mount like the new ZWO AM5 harmonic mount.

The main Optical Tube Assembly is finished in a nice white finish. The focuser is black, trimmed with red highlights and the dew shield also finished with a red metal trim. The dovetail and rings are finished in a red anodised coating and a matching red anodised metal lens cap finishes the overall look.

All fixtures are nicely finished and look and feel like a quality item. They feel like an improvement from the FRA400 too and that was already well appointed.

Overall, the finish looks beautiful and the paint and anodising nicely done, it looks very well made and parts finished beautifully. This really does feel like a quality instrument. The telescope comes in an attractive aluminium case as standard to protect the telescope during shipping and transport.

I also received the matching focal reducer which is also presented in a nice printed sturdy box.

Both scope and reducer come with instruction manuals which is good if this might be a first scope for you and the instruction booklet details various setups and diagrams to help guide you.

Opening the case reveals a good amount of packaging and protection and the scope was received double boxed in a strong brown cardboard outer as well.

The telescope box also contains an extension tube set which takes the M86 thread at the rear of the scope down to a M68, M54 and, finally, an M48 thread.

With the reducer this is dropped to M48 as the reducer mounts in the telescope drawer tube.

A small bag of spare screws and there is even a hex key included in the kit to fit the machine screws on the scope rings.

The huge focal reducer increases the capability of this little scope. It increases the field of view but also creates a fast astrograph reducing exposure times. The reducer is a multi-element design with a huge aperture capable of supporting full frame cameras.

The reducer also comes with a set of instructions and includes metal end caps. I was really pleased to see the reducer is also fitted with internal threads for 48mm filters, something I find missing on many reducers and correctors on the market.

The X0.7 reducer is a thing of beauty and quite weighty, it's a beautiful bit of engineering. Askar have really thought out the design and kindly added internal threads to parts to allow easy fitting of filters which meant I could quickly add my UVIR cut filter or my L-Enhance filters to either the extension tube or focal reducer very easily.

One interesting fact is that the FRA500 is the same reducer as the FRA400 as well. The FRA600 has a different reducer build.

The scope weighs about 4kg with no reducer and just over 5.1kg with the reducer fitted and it's worth noting that the reducer fits inside the focuser drawer tube which reduces the overall length. Again, a nice thought when building a compact wide field scope. It's simple to fit, you simply remove the rear adapter and screw the reducer into the rotator.

When not using the reducer, it can be replaced with the extension tube set supplied with the main telescope package.

The standard focal length is a well-balanced 500mm at f5.6.

With the reducer the focal length is reduced to 350mm and turns the scope into a very speedy f3.9 astrograph, which really gathers light quickly as you will see from my sample images.

The reducer has a standard back focus length of 55mm, and I was keen to see how well this performed as using a reducer at such fast speeds can be quite demanding on tolerances to keep stars round across the field and many '55mm back focus' reducers need to be tuned to get decent shaped stars.

I must mention the camera rotator as well, as this continues the Askar approach from the FRA400 and is probably the nicest stock one I have come across on scopes I have used.

The rotator feels exceptionally smooth with no lateral play when the locking screw is tightened and has no slop in it at all – its feels very solid. Like the FRA400 the one thing I think is missing is a calibrated scale, so you must guess the amount of angle by eye.

I have gotten pretty good at estimating the angle by eye and I can get close within a few exposures and plate solves but an engraved scale would really help here.

A camera rotator is one of the most useful items when doing mosaics or set field of views in Sequence Generator Pro for example. Once you have used one you will wonder how you managed without!

Prepping for First Light

I run autofocus with all my telescopes and I decided I was going to fit a ZWO EAF to this rig so that I can test the ASIAIR and my Primalucelabs Eagle with it mounted to the ZWO AM5 harmonic drive mount which I am currently testing.

Like the rest of the FRA range, the ZWO EAF focus motor fits perfectly on the pre-existing holes.

The 3.5" focuser is well made and has all the holes needed to directly install the EAF with the screws in the EAF kit and I think this scope qualifies for the fastest install of an EAF!

It literally took 5 minutes to install and setup the EAF thanks to the clever idea of including the threaded holes in the focuser body for an EAF. Nothing to remove – just bolt it on. Of course, it comes in a matching red finish!

For my first tests I decided to run the FRA500 in wide field mode using the reducer and my ZWO ASI2600MC Pro One-Shot Colour camera with its 26mpx APS-C sensor.

I was extremely interested to see how well the stars appeared in this wide field setup and how it would perform at f3.9.

Would it be as clean and sharp as the dreamy little FRA400?

My first tests were run using the ZWO ASIAIR computer mounted on the FRA500.

Setting up this rig was simple, and I used my common short refractor settings for the EAF to quickly set up for the FRA500.

The EAF was first manually moved to get close to focus using the ASIAIR focus controls then I ran an auto focus routine. The final FWHM figures are pleasing and show sharp focus.

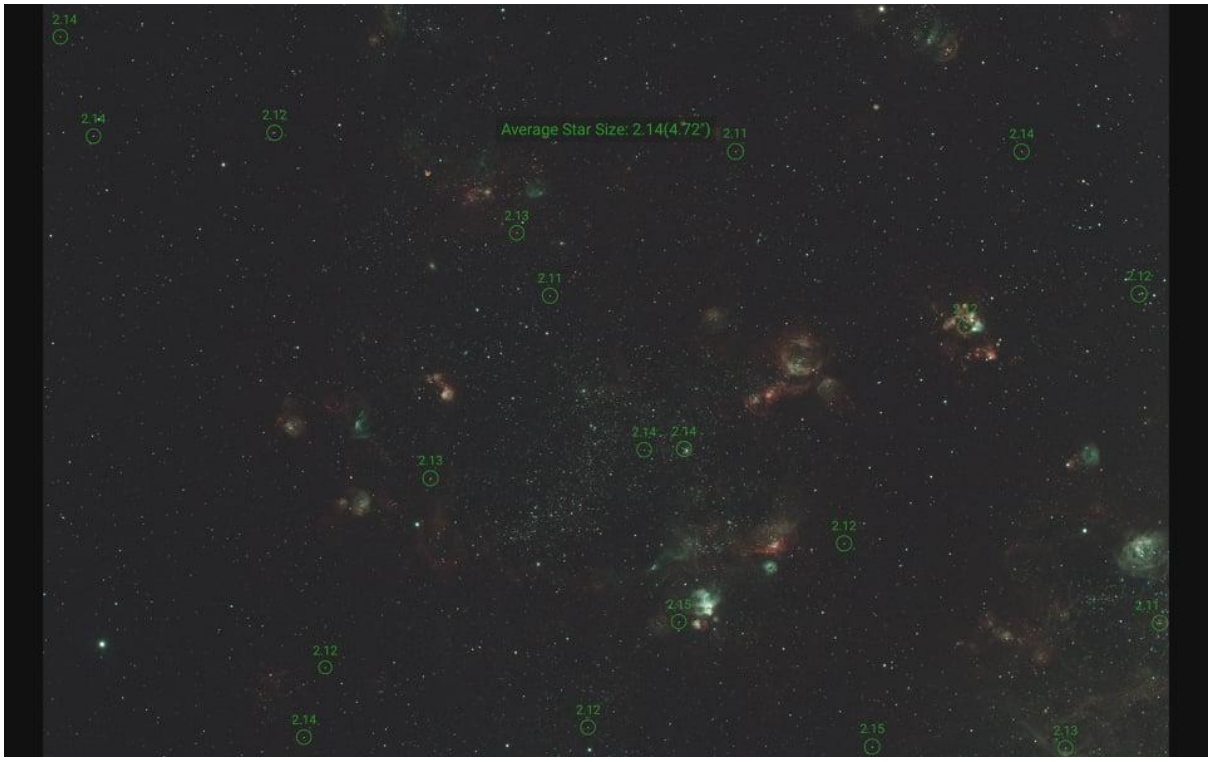
Taking some sample shots in a very short window showed a very nice flat field and a fast little refractor capable of gathering an impressive amount of light in a short time. My initial images showed a nice flat field with well-shaped stars even at the edge – all good so far.

I had only a few short hours to test this scope as it's been the most abysmal summer for imaging but in that short space of time I was really impressed by the FRA500.

Did I like it as much as the FRA400?

Yes! I do, it's really a beautiful scope that really performs well. It's fast and gathers a lot of light with clean crisp images to boot.

FRA400 field aberration @ 280mm f3.9 – ASI2600MC Pro



Horsehead & Flame Nebula – 600s sub ASI2600 + Lextreme

Zoomed corner of the LMC – 600s sub ASI2600 + Lextreme

Conclusion

The FRA500 is a fabulous compact scope that provides a good flat field suitable for cameras up to full frame and at a very reasonable price.

I was really impressed with how crisp the image was and it gave me lovely sharp stars even to the corners. The FRA500 follows on from the FRA400 in terms of quality with the addition that 90mm aperture really pulls in the light at f3.9!

The continued ability to fit a ZWO EAF to the huge focuser out of the box within a few minutes was a fantastic experience and when combined with an ASIAIR this will make a very capable lightweight, wide field rig with the reducer and at f3.9 a real light gathering machine. Even at full 500mm and f5.6 the scope is a superb performer and a pleasure to use.

Askar should be commended for the inclusion of well thought out features like a quality camera rotator as standard, a set of high-quality anodised rings and dovetail, the inclusion of threads for filters in the reducer and extension tubes and the quality packaging and instructions. The focal reducer is well built, and I love the mounting method inside the drawer tube/rotator body. Helps a lot to reduce the overall length.

Like its smaller (and larger!) brother and sisters, there's a lot to like about this scope and I am sure it will become a popular scope like its siblings, and I'd highly recommend the FRA series build and finish if you're looking for a new scope.

Further details on the FRA500 can be found at: http://www.askarlens.com/