

## *The SV NightHawk(W/ R&P focuser) The Short Tube Revised*

[Tom Trusock](#) – 5/05



**S**mall refractors are probably the most popular type of scope on the market today – and for good reason.

Let's take a minute and talk about the different options for those of you who may be looking at purchasing your first telescope. Readers having a basic familiarity with optics should feel free to skip over this next part.

There are several types of telescopes available to the amateur astronomer, and the choices can be confusing. Especially when you hear the phrase aperture rules – you begin to wonder why someone wouldn't pick the largest telescope they could afford. To understand how to pick a telescope you need to have an idea of what your options are.

There are three main variants:

**Reflectors:** These telescopes use mirrors to gather light. There are several different reflector variants, but the one of most interest to most astronomers is the Newtonian. There are also several types of mounts that you can place a reflector on; the two most common being the German Equatorial Mount (GEM) and the Dobsonian Mount. A GEM

is aligned with the night sky and only requires movement in one axis to track the stars. A Dobsonian (or Dob) is commonly used to refer to a reflector on a simple alt/az mount that requires motions across two axes to track the night sky. While both are popular today, Dobsonians are probably the best selling of the two because the smaller size and cheaper cost of the mount results in telescope that is both more affordable and more portable. Reflectors generally give you the most Bang for the Buck – an 8” reflector often costing no more than a 3.1” refractor. Reflectors are a little more maintenance intensive than their refractor brethren, and owners should be prepared to collimate them.

**Refractors:** These telescopes use lenses to gather light. Again, there are several different design variants, but there are two classifications that it would do well for us to define: Achromat and Apochromat. Literally, the term Achromat means without color, leaving Apochromat to connote “Really with out color, and we pretty much mean it this time – we’re serious. Really.” Astute readers will probably have an inkling that there’s a bit more to it than that – and they are correct. If you want to get technical, you need to start taking about where individual wavelengths of light come into focus – an apo (short for apochromat) brings at least three differing wavelengths to a similar focus, while an achro (short for achromat) brings only two. Apo’s and achro’s come in multiple designs: the most common today is probably the doublet (two pieces of glass in one group) and the triplet (three pieces of glass in one group). There are at least two companies that also market a four lens design called a petzval (four pieces of glass in two groups of two). Most (but not all) achros are doublets whose objectives are made up of flint and crown glasses. If you use a special type of glass (special dispersion glasses) that refracts (bends) light in a special way, you can further correct color thus you can design a faster doublet apo. Triplets are generally apo’s and take color correction a step further than doublets (allowing them to be faster yet and retain their color correction), while petzvals are often prized for their flat fields and used mainly for photography, although many visual observers appreciate them as well. Refractors are the lowest maintenance design of the three main types as the design is fairly rugged and rarely requires collimation.

**Compound:** These telescopes use both lenses and mirrors to gather light, and thus inherit some of the advantages and disadvantages of both. They come in several different flavors, but the two most common are probably the Mak (or Maksutov-Cassegrain) and SCT (or Schmidt Cassegrain Telescope).

Buy the biggest telescope you can afford is often the advice given to beginners, but this isn’t strictly true – there is another (often neglected) axiom: that the telescope is best for you is the telescope you would use the most. What sense does it make to purchase a 20” dob and then only take it out once a year? Odds are a small lightweight refractor will be used far more often. You won’t see as deeply, but you will observe more. And there’s no question that it’s far easier to transport and store. Not to mention the wide fields you’ll be treated to - if you haven’t scanned the summer milky way with a wide field scope, you don’t know what you are missing out on.

So, at this point, the question often becomes apo or achro? While a small quality apo may stretch the budget, small achros are far more reasonably priced, and make a great

compliment to a larger reflector. Little refractors provide sharp, wide fields of view for those immense clusters and do well for ole luna and the planets too.

Let's take a look at one of the most popular 80mm achros on the market today – the StellarVue NightHawk.

## StellarVue NightHawk

Price: \$399 (as reviewed)  
Focal Length: 480mm  
Aperture: 80 (advertised), 80 mm Effective (measured)  
Focal Ratio: f6  
Highest Typical Effective Power: 120x-160x  
Focuser: 2" Rack and Pinion (Crayford is now standard)

NightHawk	
<i>HOTS</i>	<i>NOTS</i>
<ul style="list-style-type: none"><li>• Excellent Lens cell design</li><li>• Good optics</li><li>• Finder Mount System</li><li>• 2" Focuser</li></ul>	<ul style="list-style-type: none"><li>• Heavy</li><li>• Setscrew fittings (in reviewed version – crayford has compression)</li></ul>

The NightHawk has a very interesting history – it's particularly notable in that it was one of the first high quality, low priced achromats to be available to the US market. When introduced, it was bracketed by the Synta ST80 on the low end and the TeleVue Pronto on the high end. It offered affordable hand tuned quality for less than you would expect to pay. While it wasn't without some birthing pains, Vic Maris's innovative little scope cut out a niche for itself and helped to establish SV's reputation for quality, value and customer service. It's introduced many to the SV product line, and has many happy users. It's been through many iterations and improvements over the years, and this review is of one of those later iterations (but not the latest – specs changed just as we went to electrons, read on for details).



*Oversized focus knob emblazoned with the SV logo are a nice touch on the R&P focuser*

The NightHawk is a tank – with all that that implies. From its oversized focuser knobs to its heavy duty dewshield, it looks like it could take just about anything the end user dished out and keep coming back for more. If I wanted a scope that could also fend off bears in the wilderness – or one that I could hand to my 4 year old - this would be it. Those of you who love overbuilt construction are going to absolutely adore this scope. In external appearance, the focuser and tube are similar to ones found on Orion telescopes, with a shoe mount for a stalk finder. On this unit, the focuser

knobs are large heavy rubber coated plastic, and in the field are quite nice - especially on cold nights. There is no sign of the dreaded synta-glue however, and that makes for a much nicer focusing experience.

The objective cover is included and is a metal screw in type that has an SV logo emblazoned on the front.

The dew shield is retractable, but the clamshell limits its retraction to 2" or so. The Nighthawk is fitted with traditional setscrews in the visual back and 2" to 1.25" adapter and lacks compression ring fittings on the R&P focuser. Note that the new crayford version does have compression ring fittings.



*Excellent Coatings*

The AT1010 has an available clamshell (that can be slid along the OTA for balance – similar to the TeleVue clamshell) that fits Tele Vue mounts and adapter plates. The SV Red Dot Finder also came in the package I was shipped. The SV RDF is very similar to the Apogee Giant Mars Eye Finder, except there is no color choice for the red dot. The SV RDF (with its large window for easy viewing) mounts directly on the SV clamshell, through the use of their bracket. There was no case supplied with the review unit, but one is available as an option.

Although new in the box from Astronomics, my review sample came with a few minor cosmetic blemishes – namely a couple of paint chips and a missing screw on the focuser housing. Vic Maris offered to replace the unit and emphatically indicated that he felt this is not indicative of their QA. However since the cosmetic blemishes didn't affect the optical performance, I didn't feel replacement was necessary.

Overall, fit and finish is quite good, but in my opinion, is not up to the level of the premium scopes – Tak, TeleVue, or even what I've seen of SV's own top end. That's probably not a real fair comparison, as it's more of an entry level scope and the price is also far below the premium refractors, but it will give you an idea what to expect. It is unquestionably superior to the typical Chinese (Synta) import.

The NightHawk's objective is an 80mm air spaced doublet in an adjustable lens cell. This is a boon to advanced amateurs who aren't satisfied with anything less than perfect collimation. The NightHawk arrived ever so slightly out of collimation, but I judged it was not enough to affect its performance.

I measured the clear aperture of the scope at 80mm, with no signs of any vignetting.

## Field Notes

I found the Nighthawk to be rather large for an 80mm telescope – both in length and weight. It's collapsed length surprised me a bit, but upon inspection, I found it was because the sliding dew shield can retract only to the clamshell which prevents a very short storage length.

OTOH, that same clamshell makes the NightHawk much easier to balance on various mounts.

The focuser was a little rough in spots on the NightHawk, but over all quite serviceable. The oversized rubber knobs were a nice touch and appreciated in Michigan's cold weather.

At the time of this review, the Nighthawk was upgradeable to a crayford for an additional \$100. Then, days before it was initially due to be posted, the NightHawk's optional crayford became standard.

Currently, the scope is available from SV with the crayford focuser (sans clamshell, RDF and Case that Vic had previously packaged – these are now options) for \$399. Overall, I think this is a good move, as I was going to suggest you consider upgrading to the crayford if you are thinking about obtaining a NightHawk for visual use. Vic showed me his crayford upgrade at NEAF, and man, did it make the NightHawk look sharp.



*The NightHawk w/ Crayford -  
Picture supplied by StellarVue*

## Optics and Performance

The optical evaluation was conducted over the course of several nights. The scope was typically outfitted with a WO diagonal (an SV diagonal was not supplied), and was used with a variety of eyepieces – everything from plossls, to orthos, to naglers, to supermonos and more. For a mount, the NightHawk rode on Tom Peter's new Discmount – the DM4. I found this to be an excellent combo with damping times at a second or under.

The NightHawk is an achromat, and thus shows false color – if it's significant or not is partly a personal issue, and partly dependent on your target selection. Personal tolerances and experience play a large hand.

Overall, I found the optics in the SV to be as sharp or perhaps a bit sharper than most small achros in this price/performance class, star tests showed acceptable optics, and the scope had the snap to focus that's typical of a good telescope. Luna in particular presented good views, although I did find the false color a bit intrusive. Luna was lined

with a violet halo and showing tints of green and purple on the lunar surface and shadows. Jupiter likewise revealed both of the main bands, but was surrounded by a violet halo. This is where the benefits of an apo come in – when viewing the moon and planets. However, for wide field viewing, and casual lunar and planetary work, either apo or achromat delivers fine images. Overall the Nighthawk took magnification well and effectively topped out around 120x + on the moon and planets before the image began to breakdown (this was largely due to intrusive amounts of false color). While it could be taken higher, I found little benefit.



As you would expect with a small, wide field telescope, the SV performed quite well on the larger and brighter DSO's. It's constantly surprising to me just how much you can see with little telescopes. Delving the deeps of Virgo (well, at least the brighter deeps) or picking out open clusters in Gemini and Auriga was a real kick, and on targets like this the scopes achromatic status is of little to no import.

### **Bottom line**

Optically, there's no question that the NightHawk passed muster. I particularly liked the lens cell design. Advanced amateurs will appreciate the ability to tweak the alignment of the lens to get the best view possible.

Making allowance for the blem as atypical of the line, I found the overall fit and finish on the review sample acceptable. I do feel the upgrade to the crayford will be welcomed by most users, however when you look at the overall package it does increase the price. Unfortunately, nothing's free in this world.

About the only drawbacks I found were the size and weight. It's very well built and that translates into a heavy telescope as compared to most other scopes in it's class. This is a consideration if you are looking for an ultra portable travel scope. It's not so much the weight of the scope itself – rather the mount you will want to pair it with.

If you are looking at a NightHawk, be sure to check directly with SV for their current package. The package I was shipped contained a scope, an RDF, a clamshell and a 1.25" adapter (setscrew type). The package offered on the SV website at the time also included a case, and just before this review went public the options changed again as I noted above.

Finally, I had opportunity to meet Vic Maris over the course of this article. Vic is quite personable and without a doubt conveys a passion for his scopes. Additionally, I would rate SV as good when it came to technical support and communications. For the most

part my e-mails were returned quite promptly, and as a customer I felt that SV would do their best to ensure my satisfaction.

In my opinion, the Nighthawk offers very good achromatic performance and quality at a decent price. As many have discovered, it's an option that should be given consideration to when shopping for a small, high quality achromat.

**Available from:**

*StellarVue (and assorted dealers)*

<http://www.stellarvue.com>

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