Cloudy Nights Telescope Reviews

# Edmund Astroscan

by Allister St. Claire click to email author

**Introduction**

I recently purchased a used and battered red Astroscan, which sits on a tripod in my study. My daughter of 3 years, who up until today has ignored the many telescopes and binoculars that have come and gone in the house, spotted the scope. Her eyes lit up. She ran over to the Astroscan, hugged it tightly, and announced to her shocked father "My telescope!"

"Your telescope?" I asked in a surprised but friendly tone.

"My telescope - the one I use!" came the enthusiastic reply.

"Ok , it's your telescope - but can I use it while I write a review?"

To say I was surprised was as an understatement. Why a bruised and battered 4" newtonian reflector would light the fires in my daughter's eyes mystified me. With time I understood, however, and I learned a vital lesson.

After years in the hobby, I had forgotten what it's like to be completely new to astronomy and telescopes. Experienced astronomers easily forget that a first telescope serves as an important bridge into this amazing hobby. That first telescope must ignite a beginner's interest long enough for them to learn the rudiments of astronomy. Unless they have a positive experience in a short time, the spark will be extinguished and they will move on to another hobby.

A person's first telescope will not necessarily be a good second telescope. Many times people just entering the hobby go out and buy an advanced or "serious" telescope. They do this under the assumption that they can skip the beginning stage all together and save themselves money. When they get home, they find their "serious" telescope presents them with many unfamiliar astronomical concepts. Worse, they find the telescope is heavy, difficult to transport, or delicate. Soon they tire of these problems and move on to something more rewarding or relaxing.

A first telescope must be intuitive to use and easy to set up and transport. It shouldn't require beginners to learn complex astronomical concepts. Budding astronomers care about what they can see. Anything that impedes viewing time increases the chance that they will give up Thrusting a telescope on a beginner based upon the recommendations of an "expert" may lead to failure.

So does the Astroscan fit the above requirements? Read on and decide for yourself.

**The Edmund Astroscan - what is it?**

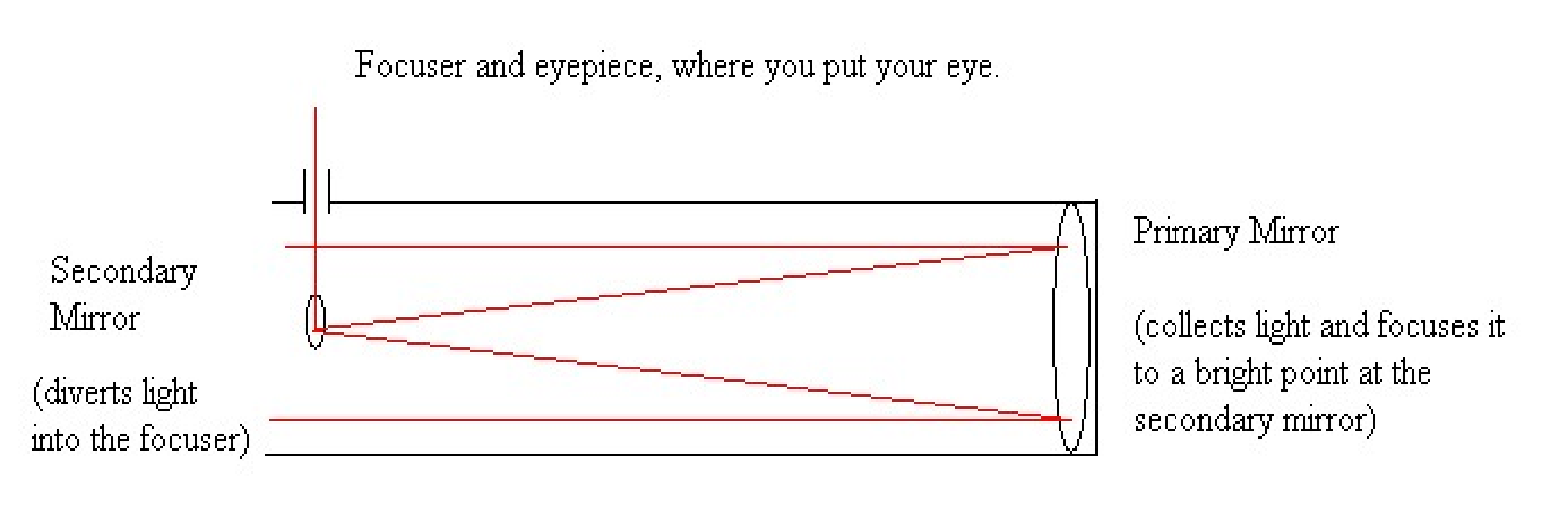
The Edmund Astrocan (now named the Edmund Astroscan 2001 telescope) has been sold by the Edmund Scientific company since the mid 1970s. Many of us who grew up during that time period remember drooling over the glossy ads that Edmund ran in many popular magazines. We also remember our families not having the money to buy one, so drooling was all we could do.

As far as I can tell, the Edmund Astroscan itself remains unchanged. This isn't surprising, as many of the "advances" in amateur telescopes have nothing to do with the telescope itself. The simple newtonian telescope is a design that challenges the most modern and expensive telescopes available today. Many beginners, having looked at the full-page ads of the newest telescopes with their GOTO electronics, will find this hard to believe. Compare the views of that $2500 GOTO scope and simple newtonian of the same size, however, and feelings will be hurt. Some things are very difficult to improve upon.

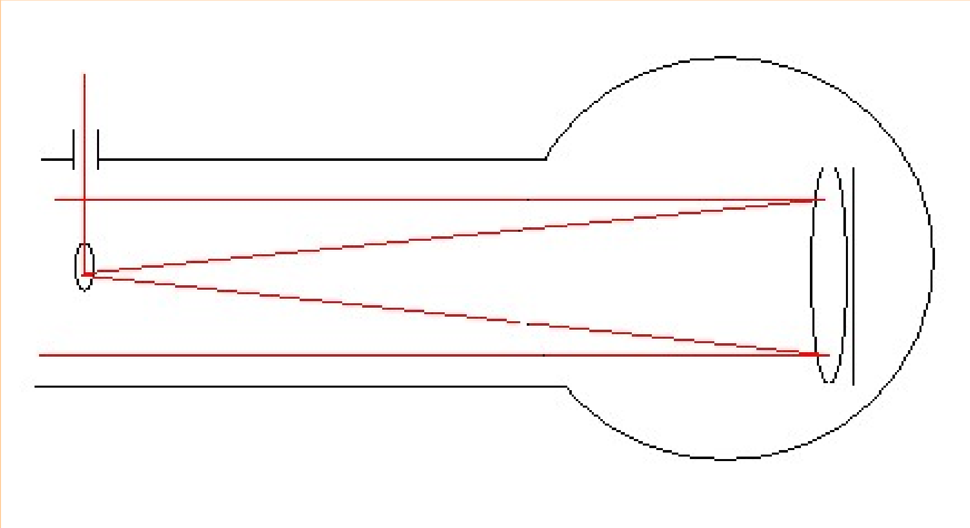
Edmund describes the Astroscan as a 4 1/8" clear aperture Newtonian Rich Field reflector. To a beginner, that statement is a bit of a mouthful. Let me break it down for you:

4 1/8" clear aperture: Aperture is an astronomical term that refers to the size of a telescope's main optics. In this case, it's the size of the primary mirror at the bottom of the Astroscan itself. Some companies measure their telescope optics in inches, while others use millimeters. The Astroscan's primary mirror is 105 mm. Sooooo, if somebody asks you what aperture scope you use, you can now say "I use a 105mm Astroscan."

Newtonian: A newtonian telescope uses a bowl-shaped mirror at the bottom to collect the light and bring it to a bright point. A much smaller "secondary" mirror at the top end redirects this light out through the focuser and into your eyepiece. For example:




*A simple Newtonian Reflector telescope*



*The Astroscan Telescope (a simple newtonian reflector in a ball)*

Rich Field: A generic term used to describe a telescope that can view a large section of the sky at one time (i.e. a rich or wide field).

Reflector: A telescope that forms an image by focusing light with a mirror. (By comparison, a refractor bends light with a lens.)

To summarize, an Astroscan is a 105mm, wide field newtonian reflector telescope housed in a cute red ball. Nothing more, nothing less.

**Ball and Joint - the mechanics**

The Astroscan design differs from the traditional newtonian in that the entire sphere acts as part of the "mount". The plastic sphere sits in a small plastic base and moves when pushed in any direction. Mine didn't come with the plastic base shown in the current catalog; instead, it had a simple wooden bowl attached to the Edmund tripod. Apparently this base was sold with the Astroscan years ago, and it works just fine.

When I first received my telescope, it was hard to move smoothly at high magnification. However, a couple of coats of turtle wax cleared up this problem and made the movements acceptable. It will never be "silky" smooth or "buttery" but it accomplishes the job.

So, what happens if you forget your Astroscan base? No problem - simply use something that is shaped like it. On one evening I used a Tupperware bowl from the kitchen. It wasn't as smooth as the base, but it's reassuring to know that if the base is ever left behind or lost, the scope will still work.

**It's not a corrector**

One thing that throws people when they first see an Astroscan is the glass "window" sitting at the top of the tube and holding the secondary mirror in place. Unlike the popular Schmidt Cassegrain telescopes from Meade and Celestron, this window is NOT an optical corrector. It's simply a clear glass panel that serves three functions:

1. Holds the secondary mirror in place and avoids the use of a traditional secondary mirror holder which causes "diffraction spikes" in the image
2. Keeps dust and dirt out of the ball so your primary mirror doesn't have to be cleaned
3. Maintains permanent collimation (doesn't require the user to align the optical mirrors)

However, this clear glass window has some drawbacks. First, in high humidity the window will fog up with dew. If you live in an area of high humidy, consider making a dew shield so you'll be able to observe longer. Second, dirt and dust WILL get into the ball though the shoulder strap holes in the sides of the telescope's "neck". Over time you may find the inside face of the optical window getting smudged. Fortunately, a little dust or dirt on the inside of the corrector or mirror really doesn't affect the views. Only the worst accumulation of dirt or dried-on dew will require a shipment back to Edmund for cleaning.

**Ruggedness and the Permanent Collimation Issue**

Several days after receiving my Astroscan, I set it up in my living room and wandered off to find the digital camera. While rummaging through my study, I heard a loud "Wham!" and my daughter crying. Rushing upstairs, I found my daughter in tears and the Astroscan and tripod on the floor. After consoling my daughter, we assessed the damage over a hunk of brownie. I couldn't find any new dents or scratches. Pointing the telescope at a tree outside, I popped in an eyepiece and focused to a sharp image. Nothing was hurt! The optics remained intact and aligned after falling three feet to the hardwood floor. Now that's what I call child-proof.

This event really emphasized several aspects of the Astroscan that make it well suited for either a child or a beginning astronomer. First, its high impact ABS body can absorb a great deal of punishment without damaging the scope or optics.

People can toss these into the back of their cars or bring them along on camping trips with the peace of mind that the telescope will survive where other telescopes would perish.

Second, the factory collimation works. My 10-year-old Astroscan has been shipped across country and dropped to the floor without any misalignment of the optics. Also, a beginner would not have to learn how to collimate the optics prior to viewing. However, factory-set collimation is controversial in the astronomy community. Critics argue that once the optics are misaligned the owner is forced to ship the telescope back to the manufacturer for alignment. Each company has its own warranty, but even if the repair is free budding astronomers will need to give up their telescopes for several weeks while the work is being done. Decide for yourself which is most important.

**Fiddling with the Focuser**

The simple focuser consists of a hard rubber roller (with the focuser knobs at the ends) that moves the metal drawtube up and down. Unlike conventional rack and pinion focusers, the Astroscan focuser relies upon the tension between the drawtube and focuser roller to work. If anything disturbs this tension, problems occur. I found that on cold nights the focuser would slip and the roller would simply spin against the drawtube no matter how hard I turned the focusing knobs. I assume this is due to the contraction of the metal in the drawtube at low temperatures.

Low temperature problems aside, the focuser did a reasonable job, outperforming most entry level focusers. Control was good and at no point did I feel the focuser was sloppy and overshooting the point of focus. The incredibly hardy Astroscan focuser translates into longevity with kids or rough handling.

**1st Night Out**

Several days after I received the Astroscan, the weather cleared for the first time in a month. I was surprisingly excited to use the Astroscan. I've owned about 35 telescopes, including expensive and precise optical instruments. Why should the simple Astroscan kindle such child-like anticipation? Well, all those years of looking at the Astroscan ads and not having the money to ever buy one had built a heightened sense of expectation. Please read my comments not as the truly objective evaluation of an adult but as the ramblings of a child who finally received the toy he always wanted.

Setup time, which encompassed the Astroscan, tripod, piano stool, small table, recently acquired "Pen Light", Field Guide to the Stars and a collection of 1.25" eyepieces, was a short 2 minutes. For those looking for a quick setup scope, it doesn't get any better. A child can carry the Astroscan and tripod in one trip.

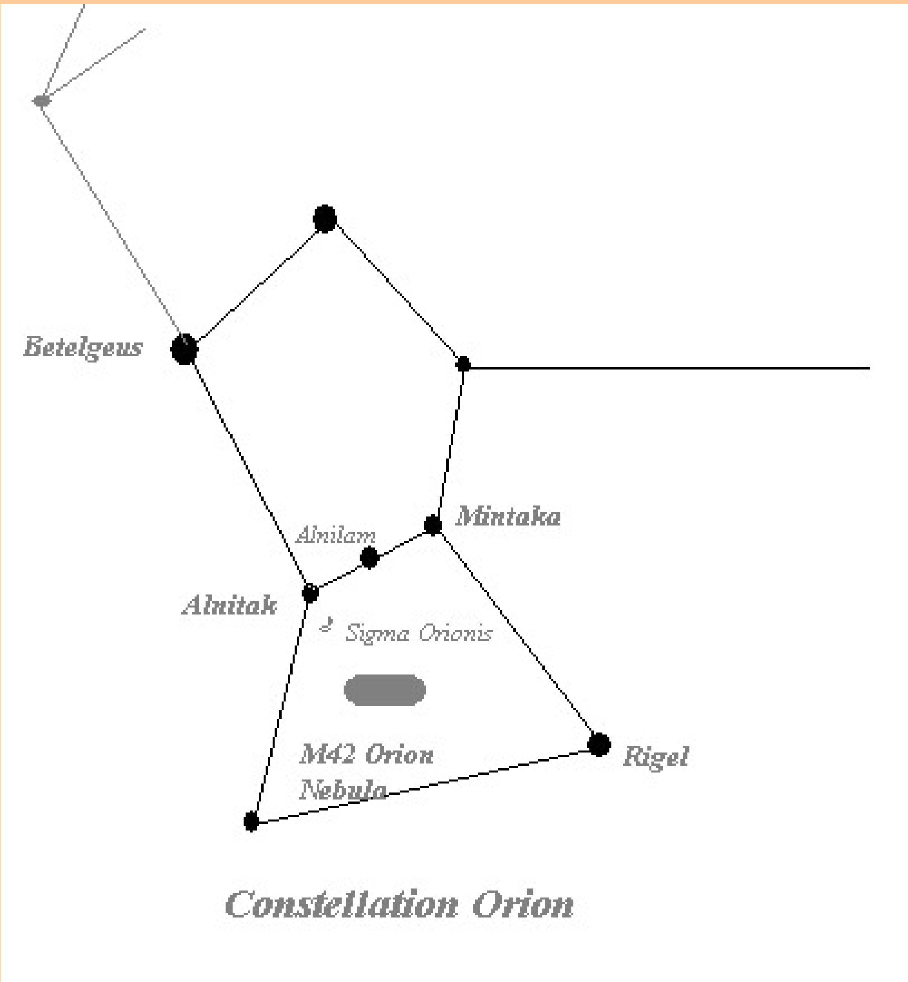
Looking up into the brisk 5 degree skies, I rated the transparency an 8 and the seeng a 7 (out of 10). Rather excellent skies for Illinois in February!

My first target was Jupiter. I used the defocused planet to gauge the cool-down of telescope optics. All telescopes must reach thermal equilibrium with the surrounding air to give decent images. In the case of the Astroscan, the mirror at the bottom of the ball needed to shed the heat from my garage, which was 20 degrees warmer than the outside air. Failure to give the Astroscan proper time to cool will result in "blobby" images that won't focus down to a sharp image.

Quickly defocusing my 25mm GTO plössl eyepiece on Jupiter showed the Astroscan was indeed cooling down. The defocused image looked like a sun dapple on the bottom of a pond. Plumes were erupting forth in my Astroscan as the trapped heat was shed from the primary 4" mirror. The images became acceptable after 30 minutes and appeared fully cooled at 45. Be warned and give your Astroscan time to cool before using it or you will be disappointed in the views!

**Images of Jupiter**

No matter how long I waited or which eyepiece I used, Jupiter never focused down to a definite disk. It would almost come to focus and then begin to flare off to one side or the other. At best, I could I detect 2 bands on Jupiter, along with all 4 moons. Though disappointed, I had actually anticipated planetary problems with a short telescope that did not have a method for collimation. More on that later. My sample of an Astroscan would never give satisfactory images of the planets.




**Orion**

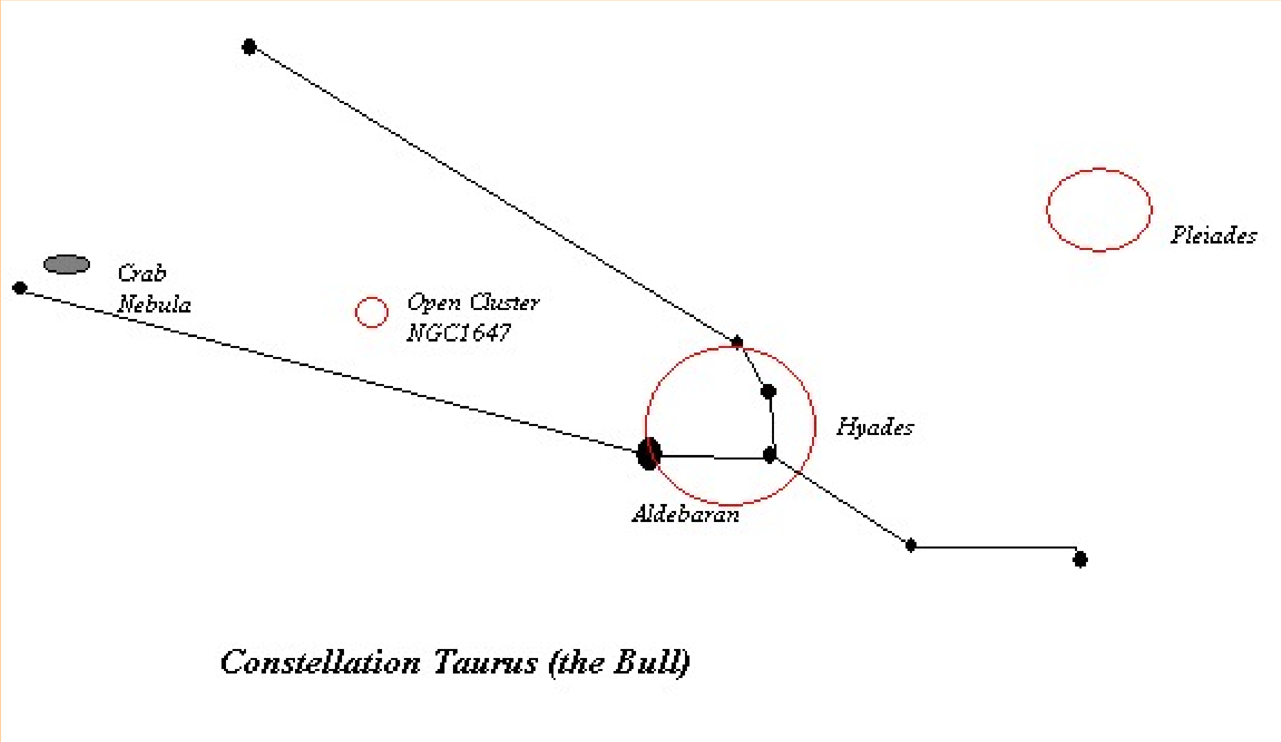
Slewing over to Orion, the view changed dramatically for the better. My 25mm GTO plössl gave a 3-degree field of view (FOV) at 18x. The Orion Nebula (M42) lay nestled below the 3 stars in the belt of Orion. Such a huge 3-degree FOV usually requires an expensive apochromatic refractor. Rich field viewing gives the viewer a sense of "context" for the object. The Astroscan is designed for this type of viewing, and I'd forgotten how much fun it could be. Not bad for a $300 telescope.

Examining Orion and the surrounding star field at various powers with various eyepieces revealed the following:

1. Maximum magnification seemed to be around 40-45x. Beyond that, the image swiftly broke down.
2. Coma, an optical error that distorts round objects into fan or "vee" shapes, occured in a whopping 60% of the FOV in my 25 & 20mm plössl eyepieces.
3. Coma in my 16mm plössl eyepiece was 50% of the FOV. The amount of coma was the same in both my GTO plössls and University Optics Super Erfles.
4. My 10mm Pentax XL, too heavy for the Astroscan, caused it to rocket towards the ground at Mach 1.
5. Neither my Leica nor my Nikon zoom would come to focus with the Astroscan.

Moving up to Mintaka, the 3rd star in the belt of Orion, I split this double star with my 20mm Super Erfle. The tiny blue companion star snuggled up against Mintaka makes a nice introduction to double star observing for a beginner. Lurking slightly below Alnitak is the quadruple star Sigma Orionis. Though it's typically a fairly easy split, I found the 3rd star barely visible in my 16mm Super Erfle (27x). The Astroscan does not perform clean splits, as brighter stars appear spiky. These spikes overlap a close companion star, making it hard to split any but the widest doubles.

Moving down the bottom "foot" of Orion I viewed Rigel, the 7th brightest star in the sky, a bright blue-white supergiant estimated to be 40x the size of our sun. The surface of Rigel would touch the orbit of Mercury. Counterpointing Rigel is the grand old red supergiant Betelegeuse, located in the upper left shoulder of Orion. Betelgeuse is the only star (other than the sun) where astronomers have observed surface details. Even more massive than Rigel, its surface would touch the orbit of Mars. This extremely bright, dull, red star makes an excellent second target (after Rigel) when demonstrating that stars have different colors.




**Night #2: Taurus**

The constellation Taurus (the Bull) is located between Orion (the Hunter) and the most famous and brightest open star cluster in the sky, the Pleiades (seven sisters). Legend has it that Taurus guards the Pleiades from the advances of Orion, whose heart is set on making one of the sisters his wife. Taurus contains two well-known but distinctly different objects: M1 (the Crab Nebula), and the Hyades Cluster. My journey for the evening would be to view both through the Astroscan.

I started with the Crab Nebula, which is located 1 degree northwest of Zeta Tauri, one of the "horns" of the bull. Sighting along the tube of the Astroscan (a frustrating experience), I found what I thought was Zeta Tauri and searched just northwest of it. After consulting a star chart and searching for another 10 minutes, I was confounded by not being able to find it. Suddenly uncertain that I was indeed viewing Zeta Tauri, I pulled out my Orion 30x125mm binoculars and quickly found both Zeta and the Crab Nebula. Having verified that the Astroscan was indeed pointed at Zeta and using the binoculars as an aid for exactly where to look, I spotted the Crab Nebula in the Astroscan using averted vision and the 16mm Super Erfle. The Crab wasn't much to see in the Astroscan, simply a light gray smudge - not something that would ignite the passions of a beginner. OK - on to the Hyades.

The Hyades is easily overlooked in most telescopes - not because it is dim or difficult to find but because it is a HUGE astronomical target. Spanning a full 4 degrees of the sky, it overflows the abundantly wide field view that even the Astroscan gives. Approximating the position as best I could, I slowly nudged the Astroscan into the Hyades. The Hyades, a triangular version of the Pleides but not as impressive, should be an easy find for a beginner. Large, bright stars forming a lazy triangle greeted me from the eyepiece. I had to drift back and forth to see it all. I would recommend this target for any beginner.

From there I moved to the open star cluster NGC1647. NGC1647 can be a bit difficult for beginners as it doesn't have any nearby guide stars. It appeared as a sprinkling of light sugar dust against the dark sky in my 20mm Super Erfle. Increasing the magnification didn't help to resolve the individual stars. Also, the moon had risen, making deep sky objects somewhat dim.

All in all, a satisfying evening with the Astroscan.

**Three nights of lunar observing**

I spent the next three observing sessions viewing the moon. Given the Astroscan's poor planetary performance, I braced myself for further problems on the moon. I was wrong. Lunar views were nice for a beginner's scope. Following the terminator (the line where the sunlit portion of the moon meets the shadowed portion) I viewed craters (Posidonius, Atlas, Hercules, Plato, Mitchell, Eudoxus, Aristillus, Aurolycus), mountain ranges (Appeninus, Caucasus), singular mountains (Pico, Piton), Maria (Fecunditatis, Tranquillitatis, Serenitatis, Frigoris), a spectacular play of shadows on Vallis Alpes, and many, many more lunar sites. My notes drone on and on, and these are but a fraction of the Moon's great objects visible through a beginner's telescope.

The contrasty lunar landscape conceals optical defects, making the moon an ideal target for a beginner's scope. The major optical problem of the Astroscan, coma, is not readily apparent when viewing the moon. One tends to look only at the central portion of the field of view, and on the moon coma shows itself as a softening of the image around that central portion. This softening is much less distracting then a flaring star.

Over these three nights I found the following;

1. Maximum magnification is around 60x for lunar observing
2. At 60x, tracking becomes a bit stiff. I found myself overshooting while moving the sphere
3. Views were nice and should impress any beginner
4. The Astroscan is very comfortable to use while viewing the moon straight overhead

It's easy to overlook ergonomics when contemplating the purchase of a telescope. When they look to buy a telescope, how many people think about how comfortable it is to use? Beginners don't know what it is like to remain seated for hours on a cold, damp night. Poor ergonomics mean less viewing time as your body grows tired of strange positions.

I'm happy to say that the Astroscan is one of the most comfortable telescopes I've used. The maximum height that the eyepiece travels, from horizon to zenith (straight overhead), is short. Also, you can rotate the tube to accomodate your position. Simply being able to rotate the tube saved me a good deal of fiddling with my piano stool. It also meant I had the eyepiece at the proper height for me. I didn't become lazy and slump or strain to meet the eyepiece.

**A Night with the Astroscan and Short Tube 80 (80mm achromat refractor)**

I spent part of another evening comparing the views between my little red Astroscan and my extremely battered short tube 80 refractor. Here's what I learned.

1. The Astroscan gives brighter images
2. The Astroscan doesn't show any secondary color on bright objects; the ST80 does
3. The ST80 gives sharper images
4. The ST80 splits binary stars in a reasonable manner, but the Astroscan has a hard time with this.
5. Coma is reasonable in the ST80 (given the price), distracting and problematic in the Astroscan

I found the ST80 views more pleasing due to the lack of coma. Stars appeared as points of light. The Astroscan images always appeared "messy" in comparison - stars spiky and coma noticeable in the 60% of the field. Once again, happenstance demonstrated an overwhelming strength of the Astroscan. During this evening of comparison I accidentally bumped against the astroscan's tripod and it tumbled straight down into my lawn. I brushed grass and mud from the glass window and quickly cleaned it up with some water and lens cleaner. Taking it back outside I was (once again) surprised to see no damage or miscollimation of the optics. Views were fine and nothing was broken. Whew! Saved again!

**Conclusions**

At the beginning of this article I posed the question whether the Astroscan was a good first telescope. After a month of use, my answer is yes and no.

The big strengths of the Astroscan are:

1. Indestructability
2. Permanent collimation
3. Absolutely intuitive to use

These are primary characteristics I would look for in a child's telescope. It won't break, miscollimation while it is with them on a sleepover isn't a problem, and a chimpanzee can figure out how to use it. It's easy to store or travel with. Kids will also love the cute red ball.

Additionally, it can double as a daytime spotting scope. Take it bird watching or on a nature hike and spot away.

For older kids or adults, the rather poor views may detract from the experience. Edmund got the mechanics and looks of this telescope right, but the short focal length cripples the views. Coma is distracting and stars never really come down points of light. Planetary views are nil, and the scope has an upper ceiling of 40x on all targets but the moon. This creates a bit of a bind. If you use it as a rich field telescope, you will probably be bothered by the coma. Increase the power to decrease the coma, and you quickly hit the upper magnification ceiling.

For a kid itching for a first telescope, the Edmund Astroscan is a great choice. I'm happy my daughter loves hers and can't wait for when she'll have her first view of the moon through it. I actually like it, too, and it will be with me for many years to come.

Thanks