Astro-Tech 8” Imaging Newtonian

Two modifications were made to the optical tube before this review was written. The paragraphs that pertain are in italics.

Over the past few years I have plied my trade as an imager with a few low and medium priced refractors for wide angle imaging and an old Celestron C8 SCT for longer focal length work. The C8, while having very nice optics for its type, just wasn't giving me the images that I wanted so it was time for a change.

We're lucky these days. There are so many very good yet inexpensive optical tubes out there that the journey started with the 'I need a new telescope' thought can be long and arduous. Fortunately, or unfortunately depending upon how you look at it, I'm not rich so that cut the field significantly. Eventually I settled on three newcomers to the scene; all from Astronomy Technologies.

The first two on the list were a pair of Ritchey-Chretiens. The GSO/Astro-Tech offerings in 8” and 6” apertures. The 8” f/8 was very tempting but would mean imaging at 1600mm focal length. Longer than my C8 with its reducer/flattener. This was not something that I relished and there was no dedicated focal reducer for the telescope on the horizon. Its smaller brother, the 6” f/9, has a shorter focal length, but looses a lot of light with its aperture 50% obstructed by a very large secondary. In the end, both were relegated to the 'also ran' list.

The third Astro-Tech is another optical tube optimized for imaging; the 8” Imaging Newtonian (AT8IN). While I've never been a big fan of newtonians ongerman equatorials this one intrigued me. The AT8IN operates at a fast f/4 for a focal length of about 800mm, which is just about where I like to be. While only 13% longer than my Stellarvue SV102ED it has almost four times the light gathering area AND is almost 2 stops faster. I don't care how many people say that speed doesn't matter when imaging digitally... faster is faster. After reading the scanty information available on-line about these scopes I took the plunge and ordered one from Astronomics in Norman, OK. Oh, the price? A very pleasant $449USD, less than half the price of the 8” R-C.

Packaging and shipping

The telescope arrived in a few days in a single thin box with two very cheap foam 'clamshells' to keep the tube from bouncing around. Fortunately FedEx seems to have played nicely with the package as nothing was damaged. I would really liked to have seen a bit more packaging. They did fill the box

with foam peanuts as they had to open it to add the Cheshire sight-tube that I ordered with it. These really only served to keep the Cheshire from bouncing around. Inside the box was a second that held the supplied accessories; split-rings, the finder with hardware and a 35mm extension tube

Description and accessories

The AT8IN is a nominal 200mm aperture, 800mm focal length standard Newtonian telescope with a few well thought out twists. The unit comes replete with a handful of molded plastic light baffles inside its tube, which is extended almost 120mm past where a normal newtonian's tube would end. This longer 'snout' is designed to cut more off-axis light from reaching the optics which, indeed, it seems to do. The tube is rolled steel which is fairly stiff.. I would have preferred a seamless tube but one can't have everything, at least the seam is fairly unobtrusive. The baffles some say add stiffness to the tube. If true it would be fine by me but, unfortunately I don't think this is the case (more later). The paint is glossy white and I did not find any blemishes in the finish. The Astro-Tech logo is big and bold and announces to all what the scope is and what its purpose is. At the front of the tube is a generous cast alloy ring.

Whether the baffles do anything other than look pretty is still being argued in various forums. Personally, I don't care whether they decrease scattered light or not; they are flat black. The plastic chosen by GSO (the maker of the tube) is interesting as it shrinks MORE than the steel tube as the temperature drops. In cold weather the baffles loosen up; so much for stiffening. Each baffle is on its own ring which means when they find some slop there's a lot that can move around inside the tube. While possibly not as effective as touted by the markers I haven't found the baffles to have any detrimental effect.

Inside the AT8IN the secondary mirror is over-sized for even an f/4 tube. This is to better allow the light cone to fully illuminate an APS-C sized sensor with no vignetting. The spider, which uses fairly thin vanes, holds a standard low-cost plastic and metal Taiwanese secondary mirror holder. On checking, the secondary appears to have been offset properly away from the focuser in the tube. Adjusting the secondary mirror requires a Phillips screwdriver.

I had some modifications planned for the the optical tube even as I placed my order for the telescope. Collimating the secondary on the AT8IN requires a screwdriver. Fiddling with a screwdriver in the mouth of your optical tube in the dark, in the field, is a recipe for catastrophe. On receiving the telescope I replaced the screws with M4 screws with press-on knobs from the local fastener store. These work perfectly and I'm not tempting fate when setting collimation.

The focuser is dual-speed Crayford which appears to be well positioned in the tube and machined as well as is needed. It is quite smooth and has thumbscrews for tension and locking. The tension screw provides force to keep a Canon DSLR from slipping. The locking screw did not appear to 'cock' the drawtube appreciably when gently tightened. The focuser drawtube is very short and is meant to hold a

camera. The 35mm extension tube supplied with the scope was nowhere near long enough to hold any of my eyepieces and still come to focus but with the DSLR attached it was quite ample.

One problem with the focuser arose when I decided that it needed to be powered. While the square base of the focuser is square to the tube, the round part that holds all of the moving bits (and cameras or eyepieces) isn't, at least on mine. This has absolutely NO effect on function and I didn't even notice the slight 'cock' to the focuser until I added belts and pulleys. But that too was taken into account

The supplied finder is a standard 50mm (8x?) straight through unit. Not my favourite format and, in my opinion, is almost useless (read on). The cylindrical finder mount makes use of a rubber O-ring at one end and two thumbscrews and a spring at the other. This is very nice setup as it means that when you adjust the finder there is no fighting to change where it's pointed.

The finder's mounting bracket fits a standard dovetail and herein lies the problem. The dovetail is positioned so that when you are looking through the finder with your neck cocked over an a very unnatural angle you are breathing across the eyepiece. Not great especially if it's cold outside.

At the bottom end of the tube lies the primary mirror. This is properly centre spotted and resides in a 'no tools' collimatable cell with six 'glove-use-sized' knobs. Three are spring tensioned to adjust the mirror orientation and the other three are there only to lock the cell in place. The placement of the three locking screws is very poor. Instead of placing them close to the adjustment screws they are sited midway between them. This means that when you have gotten your mirror where you want it, the locking screws can lever it out of position. I found that I have to lock the cell and then re-adjust with it locked to keep things straight.

As with the secondary screws I replaced the locking knobs with M6x25 parts with knobs (red) that felt different so I could tell which was which while looking in the Cheshire and reaching around the tube.

The cell appears to be heavy enough to hold the primary in place while not too beefy. The springs, as on most Taiwanese cells are definitely not heavy enough and in the future I will be replacing them. In the centre of the primary cell is a 12V fan to help the mirror cool. This is supplied with a battery pack for 8 1.5v C cells.

The telescope comes with two properly sized split rings. These are fairly cheap but do hold the telescope in place and they have enough felt glued on the inside to keep the tube from getting marred. These could use a bit of 'fit and finish' work (basically washers and screws) but are adequate for the task. The rings have attachment points at two opposing flats with M6 threaded holes in one set and 1/4-20 holes in the other. I chose to mount the rings with 1/4-20 screws leaving the M6 at the top for accessories. Either are fine. The only other item shipped is the plastic dust cover for the front end which fits, but not very tightly.

The AT8IN is not for everyone. This is a large and heavy optical tube at least 3kg heavier than a standard 8” f/4 such as sold by Orion. This is due to the baffling system and the extended tube. This means that the AT8IN may possibly need a larger, more robust mount than a standard model. Something to consider.

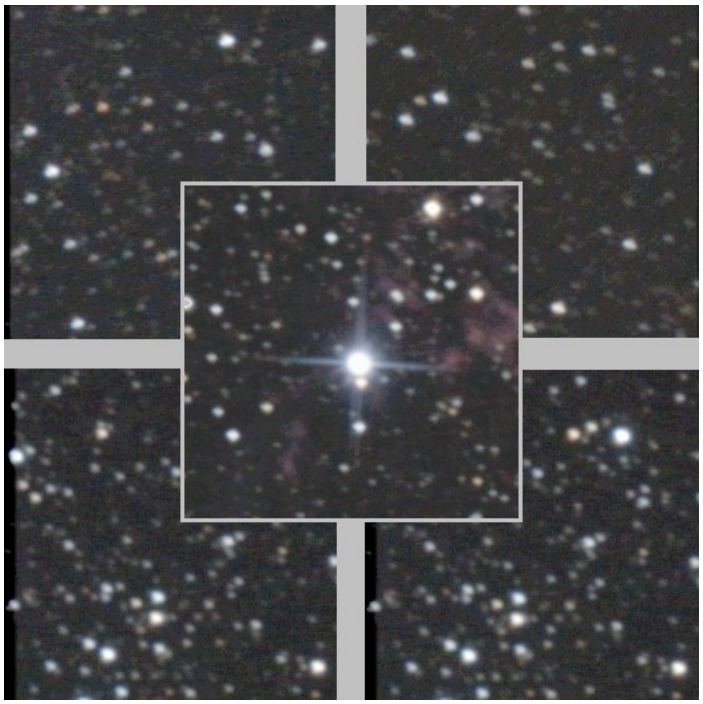
First Light

First light for the AT8IN took place at my friend Doug's place in Indiana. After mounting a 13” Vixen-type dovetail bar to the rings the scope was collimated with the Cheshire and mounted on the CGE. Needing access to the focuser to align the mount meant that some thought needed to be taken in placing the AT8IN in its rings. Eventually I settled on having the focuser point straight down when the scope was pointed north. This seemed to work well enough and I had access to the focuser when pointed south-ish.

As I mentioned earlier the scope would not come to focus with eyepieces and the supplied 35mm extension tube. Fortunately my kit includes a 50mm extension that I need for my Stellarvue refractor so I was able to get my 9mm illuminated reticule to come to focus to align the mount.

Function - Photographic

There were a few false starts in the first imaging session with the AT8IN as I fiddled with the collimation (it's been a long time since I owned a newtonian) but eventually things settled down and the scope worked like a champ. I ordered a Baader MPCC coma corrector the same day I ordered the telescope (from another source) and was imaging with this unit in the optical train.



An MPCC requires that the collimation be spot-on. This can be hard to achieve with any focuser that has enough play to allow something to be inserted into it but I think I was close enough. I know now why laser collimators are so popular. Using the Cheshire is a bit of a pain in the dark but it is quite accurate. I finally succumbed and bought a laser which I use with my Celestron Ultima barlow. It works beautifully day or night.

The image above shows stas in all four corners of a Canon DSLR frame along with one from the centre. The top-right image seems to show some elongation while the others are fairly free of this. Was the camera slightly cocked in the focuser? Who knows.

My targets for the night were the ever-elusive Crescent Nebula (NGC6888) and the PacMan Nebula (NGC281). The Crescent continued to be elusive and until I decide that narrowband imaging is in the cards it will remain so. PacMan on the other hand gave up its photons nicely as the picture on the next

page shows. For anyone interested that is ten 5 minute subs processed with darks and flats. None were discarded.

The AT8IN/MPCC duo gave me an image with very nice stars (not perfect) to the corners. Any remaining bit of coma I saw in the corners were most likely due to imperfect collimation. Star colours were faithfully rendered in my Canon/Hutech 500D and there was ample contrast. I'll bow to the marketers and attribute this to the long snout and baffles.

Function – Visual

I wanted to test the AT8IN visually so one night when the local club was gathering at our dark-site I loaded up the scope and my modified Sky Watcher HEQ5 and voyaged off into the gathering dusk.

Note: The coma corrector was not in the optical path as I don't have the correct accessories to use it visually; all of the reports are with a 'naked' f/4 optical system.

Eyepieces

I used several eyepieces on objects from Saturn to M104 through a night. I'm not an eyepiece snob. I don't like huge amounts of space around what I'm observing so I can't give you any Nagler or Ethos reports. My single 2” eyepiece, a 32mm Astro-Tech Titan, was not a good match for the telescope. At f/4 this eyepiece delivers a lot of 'seagulls' very quickly as you move from the centre of the field. Some of these are due to the eyepiece and some due to the deep mirror.

My Televue Plossls worked exceedingly well in the telescope as did my Burgess/TMB Planetaries. The plossls run from 15mm to 25mm and the stars in the field were excelent close to axis and remained very good out to the field stop.

I have two Burgess/TMB Planetary eyepieces in 9mm and 5mm. The 5mm with a Celestron Ultima 2x barlow showed no breakdown in image at 40 magnification per inch. When the seeing steadied objects appeared painted on the sky.

Now, the AT8IN IS a newtonian. This means that when mounted in a German equatorial the eyepiece is NEVER where you want it to be. Like any tube with split rings rotating it into position is a major pain. The tube is also a lot heavier than a 'normal' 8” newtonian. This means that it needs a lot more mount. I had it mounted on my highly modified HEQ5. This mount handled the heavy tube nicely but still showed the effects of the weight; especially while focusing.

The views

M13 in Hercules was beautifully framed with my 15mm TV Plossl and I found that the colours of the two stars framing the cluster were well rendered and quite vivid. I mentioned this to another experienced observer who, on looking, claimed the colour 'refractor-like'. The cluster itself was classic 'diamond dust on black velvet'. The baffles and snout on the tube in action? I don't know, but the views were dark and very contrasty.

M92, one of my favourite globulars, showed up very well in the 9mm Burgess/TMB. Again, black sky and sparks.

M57 needs lots of magnification and I used the 5mm Burgess/TMB for 160x. The contrast this telescope delivers makes observing small objects like the Ring a joy.

M104 showed up a slightly more than 'faint fuzzy'. Some shape was discernible in the 20mm Plossl but I didn't go to any higher powers as it was fairly low in the sky.

Saturn was, well... Saturn. Sharp, with lots of contrast. The almost edge-on rings were framed by two moons. I pushed the AT8IN to a 40x/inch (5mm Burgess/TMB and a Celestron Ultima 2x barlow) on Saturn which didn't seem to bother the view at all. Seeing was in and out but when steady Saturn was magnificent.

So... while not intended to be a visual-use telescope, the AT8 did a fine job.

So does Astro-Tech have a winner in the AT8IN?

Pros	**Cons**
Price	Weight
Aperture	Coma
Lengthened tube	Slight fit and finish problems (rings/focuser)
Baffles	Rear cell locking screws
Solid focuser	Awkward in a german equatorial

The pros in the list above are, in my mind, much more important than cons. Weight and coma won't be

an issue for anyone using the tube for its intended purpose of imaging and the fit and finish problems are trivial. As for mounting it on a GEM? Again, not an issue if you're not using it visually. I think that this one is a winner especially at its price point.

Recommended? You bet. I would heartily recommend the scope to anyone for use with a camera. I would have no problems recommending it to a visual observer AFTER pointing out the problems with a newt on a GEM.

Clear skies...

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