To: <tec@telescopengineering.com>
Sent: Friday, April 25, 2003 2:19 AM
Subject: FW: TEC140 test report/translation

> Dear Yuri-san
> I am sending you T.-san`s translated test report, including his photos. T.-san is like a machine when it comes to thorough > testing and his one drawback is that maybe he is not very diplomatic with his assessments. But he is honest in and only > wants to help. I told him to give the scope hell and really check it out closely. FYI, here is his report:

TEC 140 APO TEST REPORT, BY M.T. (JAPAN).

TUBE ASSEMBLY

Lens coatings are hightly anti-reflective and of excellent quality. Lenses are not black-end on their edges.

Dewcap is long enough to block stray light from entering but dewcap interior is anodized and reflects the light that enters into it. Light absorbing flock paper or felt applied to the dewcap`s interior might help reduce these unwanted reflections.

There are only 3 baffles inside the scope. TAK uses 5 baffles and my COMPETITION Telescope has 16. The black painted tube interior is rather reflective of stray light and this bothers me.

Focuser internal baffling is accomplished by use wavy edges located around the focuser interior. My Competition Telescop as 13 of these wavy mini "baffles" and the TEC has 12. This number is definately enough for the job and no problem there. However,the TEC`s focusers baf- fles reflect much more stray light than the baffles on my Competition.

Focuser is extremely robust and the feel of the micro focuser is quite excellent. However, making small adjustments with the microfocuser is hard to do with gloves on. Also, there seems to be a backlash of about 1/2 a gear tooth when the knob is let go.

TESTING

I tested the TEC 140 7 times, on 4/9, 4/10, 4/13, 4/15, 4/16, 4/17 and 4/21, for a total of 12 hours of actual viewing time. Viewing times were generally from 7PM to about 10PM. Outside temperatures dropped about 3~4 degrees from a starting temp of about 15 degress C down to about 11 degrees C. Interior temperatures were about 17~20 degrees C at the time I took the scope outside for testing.

VIEWING LOCATION was in the outskirts of U. City, for the planets, moon and fixed stars. Other objects were observed on Mt.T. at a height of about 500 meters and at about 3 degrees Celsius. I asked my buddy S-san to join me in order to get a more objective impression of the scope. We used a 2" TV Everbright diagonal mirror.

EYEPIECES used were the NAG 4.8mm, Nag 9mm, Pan Optic 22mm, Vixen AV 4mm, Pentax XL7mm, Meade SW6.7, Baader Eudiascopic 3.8mm / 5mm and 10mm, GOTO Optical OR6mm, Kasai OR7mm and Nikon OR9mm.

BARLOWS: TV 2" 2X Big Barlow, Baader 2" Flourite Barlow, Intes 2.4X and Kokusai Kohki 3X barlow. For direct comparisons, I used my AP SDF 155 telescope, applying a 140mm ID aperature mask.

OBSERVING IMPRESSIONS:

SATURN Observed outdoors for about 1.5 hours.

TEC
Extremely sharp image. The entire Cassini ring was visible and equatorial regions both faint and distinct were easily discernable. Background was a little bit bright, and seeing somewhat unsteady.

Competition (at 140mm)
Could NOT see the entire Cassini ring. Equatorial regions both faint and distinct somewhat visible. Background was distinctly darker than the TEC. Background was dark, see- ing very unsteady.

Competition (155mm) without aperature stop:
Equatorial regions somewhat faint but color / grey scale rendition very good, while contrast was somehwat low

JUPITER Observed outside for about 2 hours

TEC
Jupiter`s edge very distinct. The two main belts are very clear and almost leap out at you. Image overall is very white. Jupiter is extremely white overall. Tiny belts were certainly visible but the overall planet appeared somehwat mushy, with a lack of 3D feeling. Seeing on the steady side.

Competition (stopped down to 140mm aperature)
Image is somewhat soft. Contrast not so high but color rendition very good. Image is somewhat darker than TEC and image looks somewhat yellowish. Seeing very unstable.

Competition without aperature stop: Image is brighter than TEC but color/grey scale rendition was about the same. NTB/ NNTB/STB`s very faint areas are easily visible. Could not see these areas as easy on the TEC?

MOON

TEC
Extremely white image. Crater walls are so sharp they almost hurt my eyes. Seeing steady.

Competition without aperature mask
Somewhat yellowish. Image is sharp but the unsteady seeiing botherd my eyes.

FIXED STARS: Castor, Pollux, Algieba, arcturus, Mizar, etc

TEC
Background is whitish. Airy disk is extremely small. Though still visible and perfectly round, the scopes needs to be cooled down thoroughly first in order to see the entire ring. Also, while the scope was cooling down, I witnessed that the Airy disk would change shape slightly until becoming a perfect circle. TAK FCT 100 would also exhibit the same behavior. My AP did not show this behavior.
Second outer diffraction ring would form a delicate circle. For 1st mag or brighter stars, a tiny bit of red color was visible.

Competition
Image was not quite settled until after a 3 hour cool down but the Airy disc was perfect and the secondary diffraction ring was beautifully visible. For 1st mag or brighter stars, a tiny bit of yellow color was visible.

OBJECTS M4, M44 ETC.

TEC
Stars were pin piont. Seeing good. Background was whitish and stars did not stand out quite as much as I would like.

Competition
Seeing conditions were variable but stars are brilliant pin points. Background is very dark and image is very transparent.

IMAGE IN AND OUT OF FOCUS

TEC
A virtually perfect textbook image both in and out of focus. This is my first time to experience such perfection in this regard. My subjective evaluation put the optics at 1/8 to 1/16th wave but I have no way to actually test this.

Competition
Images in and out of focus loose contrast slightly. Maybe 1/8W quality??

RONKI TEST
I used a 200 line [per ??] Ronki test film I got from Tenmon Guide magazine

TEC
Almost perfectly straight but line cirvature at field edge seems to indicate a slight overcorrection.

Competition
Lines similar to the TEC but line curvature at field edges is even more pronounced.

MY TEC140 IMPRESSIONS

Chromatic aberration, and speherical aberation level is probably the best
I have ever seen and very good.

Images are plenty bright.If my Competition stopped down to 140mm aperature reperesents "100", the TEC would be about a "130", with the Competition at full aperature being about a "150" in comparison. Also, the lens is extremely color free and images are very clear and distinct.

The TEC cools down relativly quickly in the field. The Competition`s fatter tube and the many baf- fles (16 in all) might look good in the showroom but too many baffles might impede the flow of air, this possibly causing an increase in my Competition`s cool down times.

However, no matter what object was observed, the TEC had a noticelably brighter and whiter background than the Competition. I feel there is room for improvement in the interior paint job of the TEC 140.

A scope`s performance relies on more than just the lens. Lack of contrast hurts detail in planetary images and also inversely affects deep space objects.

I feel an improvement in contrast is imperative but just adding more baffles is perhaps not the answer. It is best to perform a more balanced improvement that perhaps adds some baffles and also paints those baffles with decidedly more light absorbing paint. Or how about applying some highly light absorning black flocking paper? Edge blackening the lenses might also be a good idea.

The merits of a 14cm refractor include: excellent compactness, higher contrast, exceptional resolution, adequate light gathering power and quick temperature acclimitization for maximum viewing efficiency. By fully utilizing all these qualities, we can look forward to the ultimate observing tool.