



Short and Sweet

Does TMB's new 92-mm refractor live up to the claim that it's a replacement for the legendary Astro-Physics Stowaway?



TMB-92 Signature Series Refractor

Supplied with dual-speed 3-inch Feather Touch focuser, 1¼-inch adapter, dew shield, dust covers, and hard carrying case (optional 114-mm tube rings are available for \$99.95).

US Price: \$1,999.00

TMB Optical
tmboptical.com

Sold by select dealers, including Astronomics (astronomics.com) and High Point Scientific (highpointscientific.com)

ALL PHOTOGRAPHS TAKEN BY AUTHOR

Even with its dewcap fully extended, the TMB-92 still boasts a very compact tube assembly. With the dewcap collapsed, the telescope can be stored in its included hard-sided carrying case with the tube rings in place, a nice convenience.

WHEN I OPENED its fitted carrying case for my first look at the TMB-92 refractor, I thought, “Wow! Is it ever short!” And no wonder. Part of TMB’s Signature Series, this 92-mm apochromat is a fast $f/5.5$ triplet-lens design, making for a stubby, ultra-compact tube assembly. The little apo is said to “fill the void left by the discontinued 90mm Astro-Physics Stowaway,” a scope so revered by observers that it became a legend in its own time.

I tested the TMB-92 against a Stowaway, albeit not an original $f/5$ model but a later, longer-focal length $f/7$ Stowaway. The new TMB fared very well indeed when pitted against this remarkable Astro-Physics apo. The TMB-92 presented images of bright stars and planets that were as free of chromatic aberration (false color) as the Stowaway. It’s fair to say that the TMB had no visible chromatic aberration, stunning for such a fast instrument.

In other star tests, however, the Stowaway pulled ahead. While it had no astigmatism, the TMB did exhibit

WHAT WE LIKE:

First-class color correction
Superb focuser and fittings
Compact tube, adaptable for binoviewers

WHAT WE DON’T LIKE:

Slight spherical aberration
Heavy for its aperture class
Photography requires third-party field flattener

slight spherical aberration from an undercorrected lens, even on cool autumn nights. Star images viewed at high magnifications were not quite identical inside and outside of focus. And in focus, stars exhibited diffraction rings that were a touch brighter than expected for an ideal image. Jupiter looked just a bit soft — though only when compared to the

Stowaway in side-by-side testing.

If I were to rate the Stowaway with 5 stars for optical perfection, then the TMB-92 earns $4\frac{1}{2}$. Considering that Stowaways have been known to command \$5,000 to \$6,000 on the used market, \$2,000 for a new TMB-92 is an excellent bargain.

Adding to its value, the TMB handily beat the Stowaway when comparing their tube assemblies. The TMB has a robust, 3-inch-diameter Feather Touch focuser (model #3025), which can be rotated for best camera and eyepiece orientations. The TMB’s drawtube locks securely for use with cameras and heavy eyepieces. But there is a price to pay for this heavy-duty focuser. The TMB’s large-diameter tube assembly weighs in at more than 9 pounds,

The North America Nebula captured with a 48-minute exposure at ISO 400 and the TMB-92 setup as shown on page 39.



The author star-tested the TMB-92 (left) against his limited-edition Astro-Physics 92-mm $f/7$ Stowaway (right), an instrument that has become the gold standard for small apo refractors.





For those who want to use the TMB-92 with a binoviewer, the scope features a removable tube section, which locks solidly into place with oversized, nylon-tipped, thumbscrews. The focuser's drawtube is marked in two locations with an engraved millimeter scale.

about 3 pounds more than the trim and slim Stowaway, and as much as some of today's 100-mm refractors.

But just 15 inches (38 cm) long with the dewcap retracted, the TMB tube is as short as some 80-mm apo refractors. And that's not all. You can make the scope even shorter by removing a 2¼-inch-long tube section that connects the focuser to the main tube. Removing this piece adds the several inches of extra "focus travel" that binoviewers demand. As such, you can enjoy two-eyed panoramic views through the TMB at low powers, without the need for a Barlow lens in the system to make the binoviewer reach focus.

I tested a William Optics binoviewer (similar to other low-cost units), and it reached focus without its Barlow lens, but only when inserted into a 1¼-inch star diagonal. When used with a 2-inch diagonal, the William Optics just reached focus with the Feather Touch racked all the way in; there was no focus travel to spare. A premium Baader binoviewer, again with no compensating lens in place, focused with oodles of travel left, thanks to the Baader's special low-profile 2-inch prism diagonal. Combined with a pair of Tele Vue 24-mm Panoptic eyepieces, the 3°-wide views of Milky Way starfields through either binoviewer were spectacular.

With the tube section in place for normal viewing, and using a conventional

S&T RATINGS	
Optics	★★★★★
Mechanics	★★★★★
Overall	★★★★★

★★★★★ Sensibly perfect. No meaningful improvements possible
 ★★★★★ Any shortcomings will go unnoticed in normal use.
 ★★★★★ Problems noticeable but do not seriously affect performance.
 ★★★ Problems noticeable during normal use — performance compromised.
 ★ Problems so severe that the equipment is virtually unusable.
 Ratings are intended to convey performance compared with equivalent equipment and should not be used to predict the relative performance of instruments having markedly different designs or specifications.

SPECIFICATIONS & MEASUREMENTS*

TMB-92 Signature Series Refractor

Clear aperture	92 mm
Effective focal length	505 mm
Focal ratio	f/5.5
Weight	9.4 pounds (4.3 kg)
Minimum tube length (assembled)	15 inches (38 cm)

* All measurements by Sky & Telescope.

2-inch star diagonal, the focuser provided sufficient travel for all of the eyepieces I tried — from Tele Vue's 31-mm Nagler and high-power Radians to several models from the Pentax line. The only caveat involved Tele Vue's new 8-mm Ethos. This eyepiece fits both 1¼- and 2-inch focusers,



The TMB-92 fitted with a Borg 0.85× field flattener and camera adapter, an Orion Autoguider on a 50-mm finder/guidescope, and an Astrophysics Mach 1 mount served as the astrophotography platform that the author used for his Canon 20Da DSLR camera.

but it reached focus on the TMB-92 only when used in the 2-inch diagonal with a 1¼-inch adapter, which holds the eyepiece farther out from the diagonal than when it's inserted directly into the 2-inch holder.

The beauty of the compact TMB scope is its adaptability for both visual use at all magnifications with and without a binoviewer and for astrophotography. I used it extensively to take deep-sky images with a DSLR camera, a task well suited to its fast f/5.5 optics. As with most triplet apos, however, the scope's inherent field curvature meant star images were sharply focused across only a central 15-mm-diameter image circle. TMB does not offer a field flattener for its 92-mm model. But I ran some tests using a Borg 0.85× focal reducer/field flattener, and stars were recorded as nearly pinpoints out to the corners of an APS-format chip (measuring 23 by 15 mm). Similar field flatteners are available from Tele Vue and William Optics, and I would consider one essential for serious imaging with the TMB-92.

In all, I'm impressed with this new telescope from TMB. It combines superb optics with solid, well-crafted mechanics for a versatile, compact instrument. What more could an apo-lover want? ♦

Alan Dyer is coauthor with Terence Dickinson of The Backyard Astronomer's Guide, recently published in a revised third edition.

Here are some more **Hot Products** and rave reviews from Astro-Tech and TMB . . .

True Ritchey-Chrétiens at phenomenal prices.
The 6" 2009 Hot Product Astro-Tech R-C is only \$795
The 8" Astro-Tech R-C is only \$1995
The 10" Astro-Tech R-C saves you big at only \$2795
The 12" Astro-Tech R-C is not \$20,000+, but only \$4495



A true Ritchey-Chrétien design astrograph used to cost a fortune.

And for some reason, most Ritchey-Chrétien scopes from other manufacturers still do.

But advances in computerized mirror grinding and CNC machining let Astro-Tech produce true Ritchey-Chrétien astrographs at prices starting at a remarkably affordable \$795. Despite their low prices, Astro-Tech R-Cs (each named a *Cloudy Nights Gear of the Year* product for 2008) give you the same kind of coma-free R-C performance you still have to pay a fortune to get from other manufacturers.

The **Astro-Tech AT6RC** is the only 6" true R-C made. It was named a *Sky & Telescope Hot Product for 2009* when it was tentatively priced at \$1295. It's even hotter now at its actual price of only \$795! The AT6RC is ideal for imaging with Deep Sky Imager-type cameras, webcams, and DSLRs. **\$795**

The **Astro-Tech AT8RC** is the only 8" true R-C from a U. S. supplier. Ideal for large format (STL-type) CCDs and long imaging equipment trains. It has a carbon fiber tube, low expansion quartz mirrors, dielectric mirror coatings, 1/12th wave or better optics, and more. The AT8RC is only **\$1995**



AT8RC image of IC1396, the Keyhole Nebula, taken by John O'Neill using an SBIG ST10XME CCD camera and Astrodon LRGB filters. Four 400 second exposures.

The 10" **Astro-Tech AT10RC** is priced nearly \$4000 less than a competitive 10" R-C. It has a carbon fiber tube, quartz mirrors, dielectric mirror coatings, 1/12th wave or better optics, triple cooling fans, and more. The AT10RC is only **\$2795**

The 12" **Astro-Tech AT12RC** is the bigger brother of the 10". It has 44% more light gathering than the 10", but is otherwise identical. A competitive 12.5" costs over \$20,000. For the price of that competitive 12.5" R-C, you could buy a 12" Astro-Tech and have enough cash left over to buy a compact car! The AT12RC is only **\$4495**

This Astro-Tech 2007 Hot Product is still hot in 2009.

The \$69.95 **Astro-Tech AT1D 1.25" star diagonal**, like all Astro-Tech diagonals, has durable 46-layer 99% reflectivity dielectric coatings on its premium 1/10th wave BK7 optical glass substrate. In addition to its exceptionally high reflectivity, the very smooth ion-deposited dielectric surface improves contrast during lunar and planetary observing.



AT1D 1.25" \$69.95

The 2" Astro-Tech BK7 substrate dielectric diagonals start at only \$119.95, while the 2" Astro-Tech dielectrics with low-expansion quartz substrates start at \$189.95.



AT2DQ 2" quartz \$189.95

If you liked the TMB-92 review on the first 3 pages, you'll love its big brother, the **Hot Product TMB-130**.



Tired of being on a multi-year waiting list for apo optics that never come? Here's a better idea. The **TMB Optical TMB-130** 130mm f/7 triplet apo refractor – a *Sky & Telescope Hot Product for 2007* and *Cloudy Nights 2006 Gear of the Year* that's available from stock.

The TMB-130 Signature Series refractor uses FPL-53 ED glass in its fully multicoated air-spaced triplet lens for a level of apochromatic color correction that impressed even its creator, renowned optics designer Thomas M. Back.

It has a collimatable temperature-compensated lens cell; a genuine Feather Touch rotating 3.5" dual-speed rack and pinion focuser ideal for imaging; 2" and 1.25" compression ring eyepiece holders; a fitted hard case; and much more. It's available from stock and priced right!

In addition to the TMB-130, other *Cloudy Nights Gear of the Year* winners include the TMB-80, TMB-92, TMB eyepieces, and the Astro-Tech R-Cs, AT-102ED, and AT-66.

The return of the TMB planetary eyepiece.

The acclaimed *Hot Product for 2007* long eye relief/high power 1.25" **TMB Optical eyepieces** are again available for serious lunar, planetary, and binary star observing.

These are the only TMB Optical eyepieces authorized by the estate of the late Thomas M. Back. They have been optimized to give you the highest contrast and the

sharpest images possible. Each 60° field TMB splits close binary pairs with ease and reveals the subtle lunar and planetary detail you've only dreamed of seeing.

TMB eyepieces come in 2.5, 3.2, 4, 5, 6, 7, 8, and 9mm focal lengths ideal for today's fast f/ratio scopes.



TMB Planetary \$64.95

The Astro-Tech Voyager is "a really sweet grab-and-go."

A recent *Sky & Telescope* review said that the \$299 **Astro-Tech Voyager** altazimuth mount was "unusually stable for its size and weight" and that it was packed with "lots of first-class engineering" that made it "a really sweet grab-and-go setup that's ideal for viewing day or night."

The *Sky & Telescope* review said the Voyager's "smooth slow motion controls" were one of the mount's many virtues. Their value was "immediately obvious . . . Couple them with the Voyager's stability, and it was a pleasure viewing at magnifications approaching 200x – something I can't say for

most alt-azimuth mounts that you have to push by hand."

The Voyager holds a 20 pound payload, has dual automatic clutch worm gear manual slow motion controls, an adjustable height aluminum tripod, a Vixen-style dovetail, and a very affordable price. Any way you look at it, the Astro-Tech Voyager is clearly today's best value in altazimuth mounts.



\$299

Astro-Tech Voyager with optional Cloudy Nights 2007 Gear of the Year Astro-Tech 4"

If our smallest refractor can take pictures like this, imagine what our bigger scopes can do . . .



Astro-Tech AT66 refractor image of the North American and Pelican Nebulas, taken by Sean Walker using an SBIG ST11000 CCD camera. *Astronomy* said the inexpensive 66mm AT-66 (a *Cloudy Nights 2006 Gear of the Year*) was "a product everyone should own."

Astro-Tech Paradigm Dual ED eyepieces. Once again, more performance for less money.

With Astro-Tech eyepieces, you see more, but spend less!

For only \$79.95 each, the new 60° field 5, 8, 12, 15, 18, and 25mm **Astro-Tech Paradigm Dual ED 1.25" 6 element/4 group eyepieces** have two ED elements for sharp, flat-field

images that will have you wondering why other eyepiece brands cost so much more.

And here are more great values . . . **Astro-Tech Titan 1.25" and 2" eyepieces** have a wide 70° field, twist-up eyecups, high contrast, and low prices. Compare them to other wide field eyepieces. At their low, low prices, these Astro-Tech Titans have no competition.

- Titan** – 1.25", 70° field, 10 or 15mm **\$99.95**
- Titan** – 1.25", 70° field, 20mm **69.95**
- Titan** – 2", 70° field, 26mm **79.95**
- Titan** – 2", 70° field, 32mm **89.95**
- Titan** – 2", 70° field, 38mm **99.95**



Titan 2" 38mm \$99.95

Want still more proof you can get more and pay less? Compare the 2" **Astro-Tech Titan Type 2 68° field 6-element 30mm, 35mm, and 40mm ED eyepieces** to similar eyepieces costing several times the sensible \$159.95 Astro-Tech price. Optically, you will be very hard-pressed to see any difference.

Titan Type 2 2" 40mm \$159.95

Astro-Tech nebula filters are simply better values.

Why pay more? The 1.25" **Astro-Tech light pollution filters** give you virtually identical performance to the expensive filters, but at much more attractive prices.

The 1.25" **Broadband filter** is only \$59.95, and the UHC and Oxygen III filters are only \$69.95 each. *Nice!*



Astro-Tech 1.25" filters starting at \$59.95

These Astro-Tech and TMB hot products (and many more) are available from . . .

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Astro-Tech is also available at these U. S. dealer websites: highpointscientific.com • starizona.com • auroraastro.com • greatredspot.com • sunriversatcenter.org • camerabug.com

In Canada, Astro-Tech is available at escience.ca, and in Europe at these dealer websites: altiraastro.com • locascope.com • scsastro.com • robtics.nl • aleph-lab.com

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