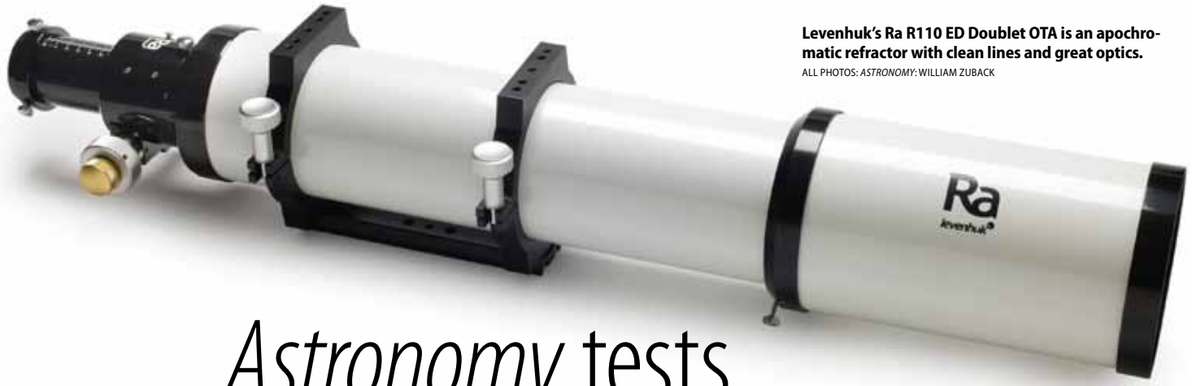
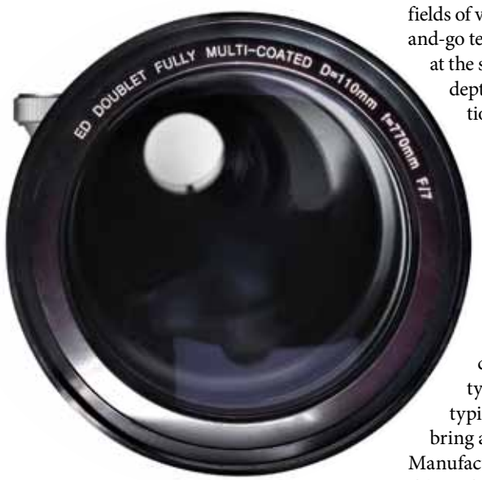


Levenhuk's Ra R110 ED Doublet OTA is an apochromatic refractor with clean lines and great optics.
ALL PHOTOS: *ASTRONOMY*: WILLIAM ZUBACK

Astronomy tests Levenhuk's new refractor

The Ra R110 ED Doublet OTA offers high-quality optics, good portability, and nice styling — all at a great price.

By Tom Trusock



The objective lens in the R110 is a 4.3-inch f/7 doublet with one element manufactured from FPL-53 extra-low dispersion glass.

In my opinion, the best telescope design for smaller apertures is the refractor. In the 3- to 5-inch range, these are typically small and light, easy to store and transport. They are simple to mount, make great wide-field instruments, and are relatively rugged. Their practically nonexistent cool-down times combine with their wide fields of view to make them fantastic grab-and-go telescopes. Perfectly suited for a peek at the summer Milky Way or some in-depth lunar and planetary investigations, a refractor can do it all.

For many years, the standard in refracting technology was the achromatic doublet. Such a telescope has a two-element front lens that features high-quality color correction.

That said, bright objects like the Moon and Jupiter tend to show varying amounts of false color through such doublets. The types of glass used in the lens — typically flint and crown — don't bring all colors of light to the same focus. Manufacturers partially compensate for this problem by building in a long focal ratio. This means a long optical tube, which trades portability for optical quality.

The apochromat (meaning without color) is a decided improvement over the achromat, especially when it comes to fast-focal-ratio scopes. Apochromatic (APO) telescopes use special types of glass to bring the wavelengths of visible light closer to common focus, thus eliminating (or at least greatly reducing) the purple fringe seen in achromats.

Stats and features

The one drawback of the modern apochromatic refractor is cost. These special types of glass don't come cheap. Luckily, recent changes in the world economy have made them more affordable than ever. Into this market comes the affordably priced Levenhuk Ra R110 ED Doublet OTA.

The "ED" in this refractor's name indicates that the manufacturer uses extra-low-dispersion glass in one of the two lens elements. Another nice feature is that Levenhuk fully multicoats all lens faces.

And just in case you're new to telescope reviews, the "OTA" means "optical tube assembly." When you see that designation, it basically means you have to supply your own mount and tripod.

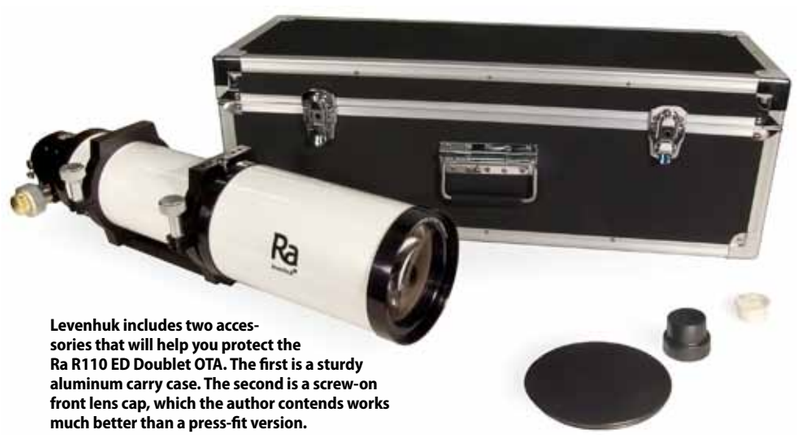
Tom Trusock *is a seasoned skywatcher and equipment guru who observes from his home in Ubly, Michigan.*

PRODUCT INFORMATION

Levenhuk Ra R110 ED Doublet OTA
Optical design: Apochromatic refractor
Lens: two-element design
Diameter: 4.3 inches (110 millimeters)
Focal length: 770 millimeters
Focal ratio: f/7
Weight: 12.2 pounds (5.5 kilograms)
Includes: Vixen-style dovetail plate, tube rings, 2" dual-speed Crayford focuser, dew shield with a screw-on lens cap, aluminum travel case
Price: $1,329.95
Contact:
Levenhuk, Inc.
1935 Brandon Court, Suite A–1
Glendale Heights, IL 60139
[t] 800.342.1706
[w] www.levenhuk.com

Apart from its optics, this 4.3-inch (110 millimeters) f/7 doublet sports a 2" dual-speed Crayford focuser. The tube's finish is a pearl-white paint with black trim, which provides a classic look. The dew shield slides out and locks into place with a thumbscrew, while a screw-on lens cap protects the optics. The cap is a nice touch. I've found that these are far more secure than the press-fit type. I don't know about you, but I like keeping my optics protected.

The telescope comes with mounting rings and a Vixen-style dovetail plate. Levenhuk includes a black aluminum travel case, but the lack of space for a diagonal or eyepieces means you'll be bringing along a few other cases, too. Mechanically, the scope is sound with a fine fit and finish, but you don't look *at* a telescope for long.



Levenhuk includes two accessories that will help you protect the Ra R110 ED Doublet OTA. The first is a sturdy aluminum carry case. The second is a screw-on front lens cap, which the author contends works much better than a press-fit version.

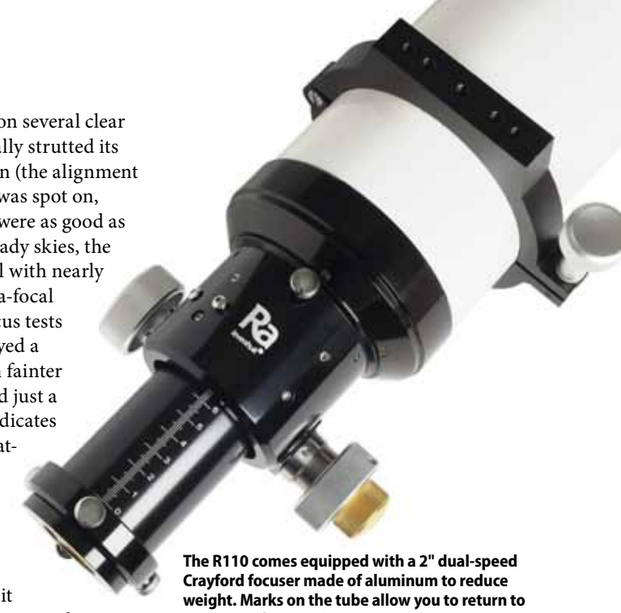
Under the sky

When I set the R110 up on several clear nights, this telescope really strutted its stuff. Factory collimation (the alignment of the optical elements) was spot on, ensuring that the views were as good as they could be. Under steady skies, the telescope star-tested well with nearly identical intra- and extra-focal diffraction patterns. Focus tests showed that stars displayed a bright Airy disk, a much fainter first diffraction ring, and just a hint of a second. This indicates that the lens is concentrating most of the light where it should go with little waste.

The field showed pinpoint stars from edge to edge, which indicated it would be great for visual use, and color correction also was quite good. As with any high-quality ED doublet, I found some minor color fringing on high-contrast targets like the lunar limb, but it definitely wasn't objectionable. Likewise, glare was not an issue.

Another thing that pleased me was that the telescope has that definite "snap-to" focus, a characteristic of high-quality optics. As for the focuser itself, I found its movement to be a little gritty, but it certainly got the job done. The fine focuser is a nice touch, and it has a great feel. That particular add-on also is necessary to get the last little bit out of this or any other fairly fast telescope.

Through any high-quality refractor, the Moon and planets are superb targets, and the R110 proved no exception. Cruising the lunar surface was just plain fun. Lunar shadows were deep and dark, and the stark gray coloration of the surface showed excellent contrast. Lunar features popped well even at high magnification. I even managed to pick out a couple of craterlets in Plato — something I've found to be a good resolution test for small optics.



The R110 comes equipped with a 2" dual-speed Crayford focuser made of aluminum to reduce weight. Marks on the tube allow you to return to a previous focus setting.

As I scanned the lunar surface, I had the magnification up to around 300x; while that much power is a bit empty for a 4-inch telescope, the view held together well and was still sharp. All in all, I spent a pleasant couple of hours hopping around Luna and revisiting old friends.

Finally, I put the telescope to good use on Jupiter, where it showed me four belts — the North and South Equatorial Belts and both the North and South Temperate Belts. The R110 also clearly resolved the Great Red Spot in the South Equatorial Belt along with some fine detail.

Great bang for the buck

As I've said many times, one of the wonderful things about a refractor is its flexibility, and this scope is no exception. In addition to taking high power well, I found I could get approximately 3.5° of true field — perfect for the star clusters and bright nebulae of the summer Milky Way.

Apochromatic refractors have made great strides in the past few years. With their reputation for optical quality and portability, their now reduced cost is making them a more popular option for amateur astronomers. If you're looking for a budget APO, I'd give some serious consideration to the Levenhuk Ra R110 ED Doublet OTA.