Have lens, will travel

How easy a telescope is to set up usually determines how often it will be used. Two small scopes — the MaxKuei 80HD and the Phoenix 80S — make fine traveling companions. With one of these quick-setup scopes, wide-field Milky Way views are only a minute away.

Several trends exist in today’s telescope marketplace. One is the inexpensive, short-focal-length refractor. This trend began more than 15 years ago with the introduction of the Orion ShortTube 80. Today, we are seeing the next wave with the introduction of small, mid-price refractors costing between $400 and $600. Some of those upwardly mobile short-tube achromatic refractors include the Vixen 80M, the Stellarvue Nighthawk, and the Zenithstar 80 from William Optics.

Recently, I tested two other tiny titans — the MaxKuei 80HD and Phoenix 80S. Both are manufactured by ODM Engineering, a little-known company in Taiwan. (Unfortunately, as this review was going to press, the North American distributor for these scopes announced it no longer will carry them. Astronomy will notify its readers when a new distributor emerges.)

Outwardly, the MaxKuei 80HD and Phoenix 80S look like two completely different telescopes. The MaxKuei features a nicely finished, off-white aluminum tube, while the Phoenix’s flat black aluminum tube looks more austere. Inside, however, these telescopes are next of kin. Both feature 3.2-inch (80mm) f/6 achromatic objective lenses, as well as smooth 2” focusers, retractable dew shields, tripod mounting plates, and padded carrying cases. The MaxKuei has a press-on dust cap, while the Phoenix comes with a screw-on dust cap, which I prefer.

Available options for both include 45° erect-image and 90° star diagonals and an 8x50 finder scope. One of the diagonals is a must because of the scopes’ limited amount of back-focus. The MaxKuei’s focuser has 2¼” of travel, while the Phoenix extends that to 2⅛”. Because the 90° diagonal was out of stock when I was testing the scopes, I used the 45° diagonal, which is less suitable for astronomical viewing because you have to bend more. With it in place, all of my eyepieces focused through both scopes with focuser travel to spare.

When I swapped the diagonal and eyepiece for my camera with adapter to try prime-focus photography, however, I could reach focus only through the Phoenix. The MaxKuei needed an extension tube between the telescope and the camera; this caused some vignetting around the corners of the image’s field of view.

Each telescope needs a suitable support. The Phoenix weighs 4 pounds and the MaxKuei only 4.5 pounds, so almost any reasonably sturdy photographic tripod or telescope mount will do. For these tests, I used my own CG-5 equatorial mount. Because both scopes are light and small, they set up in about a minute.

The MaxKuei was advertised as an astronomical telescope, and the Phoenix was marketed as a terrestrial spotting scope, but each fills both roles. Overall construction quality is excellent — no plastic here. The fully multicoated objective lenses show an even, greenish glint when studied under a bright light. I detected no evidence of coating irregularities.

Inside, the tubes are flat black. The MaxKuei’s tube has six baffles to keep stray light from infiltrating the optical path and

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washing out the image. The baffles are large enough to do the job but small enough so as not to reduce the telescope’s effective aperture. All baffles are made from curved strips of dark-gray, high-density foam, similar to insulation boards found at home-improvement stores.

Although effective, the baffles are not flat black, which might cause some minor contrast issues when the scope is pointed at a bright object. The Phoenix has one baffle ring just behind the objective, although the inside tube wall has a multitude of tiny ridges to muffle stray light.

Both instruments have 2” Crayford-style focusers that work smoothly, but only the MaxKuei’s can be rotated in place. To do this, loosen a large lock collar. This feature is handy if the telescope is used on an equatorial mount, which can tilt the focuser’s knobs at some pretty odd angles. I found no play in the MaxKuei’s focuser, which means collimation (alignment of the optical components) should remain unaffected whenever the focuser is rotated.

Initially, the weight of my 2” eyepiece caused the MaxKuei focuser’s drawtube to slip slowly back when I tilted the telescope more than 45°. To prevent this, turn a small setscrew on the focuser’s bottom to adjust the roller pressure. The Phoenix’s focuser has the same setscrew adjustment.

To star-test each telescope, I aimed at a bright star and defocused the image, first by turning the focuser inward slightly and then turning it outward beyond the focus point. In an ideal telescope, the two images should look identical. Through both scopes, however, I saw a brighter outer ring around the star on one side of focus but not the other. This indicates spherical aberration, which is caused by a minor imperfection in the way the objective focuses light. The MaxKuei’s star-test images also showed a small amount of astigmatism, denoted by slightly oval defocused stars. The Phoenix gave no indication of astigmatism.
THE OPTICS of the Phoenix 80S and the MaxKuei 80HD are the same. Each telescope is a 3.2-inch (80mm) f/6 achromatic refractor ideally suited for travel and quick setup.

To test both telescopes for the presence of chromatic aberration (a defect that causes light of different colors to focus at different places), I aimed at the magnitude 0 star Vega. While there were some purple fringes around the star’s disk, it was well within expectations for the telescopes’ aperture and focal ratio. Likewise, Jupiter and the Moon showed surprisingly little chromatic aberration.

I resolved the four individual suns in the famous Double Double quadruple star (Epsilon [ε] Lyrae) with each telescope at 120x. The Phoenix delivered a slightly better image, probably due to the MaxKuei’s slight astigmatism. A 7mm eyepiece (69x) revealed both of Jupiter’s prominent equatorial belts but little additional detail.

This is not surprising. Neither the MaxKuei nor the Phoenix should be considered a planetary scope. These scopes excel in low-powered star-field views. With that in mind, and with the summer Milky Way coming into view when I conducted these tests, I took each telescope on a tour of some of the finest clusters and nebulae visible. The short focal lengths of these instruments makes them ideal for sailing through the Milky Way’s rich star clouds.

I began my journey at two of my favorite summer objects, the Lagoon Nebula (M8) and the Trifid Nebula (M20). In a word: spectacular! Through a 22mm eyepiece (22x), both objects easily fit into the 3° field of view. The view became even better when I added a narrowband nebula filter. The dark lagoon in M8 was readily visible, as were the brightest stars in the nebula’s off-spring star cluster, NGC 6530. On the other side of the field of view, the soft light from the Trifid was also unmistakable. I could even make out subtle hints of the criss-crossing ribbons of dark nebulosity that give the object its name.

Scanning westward, the Butterfly Cluster (M6) was also a pleasant sight through these scopes at 22x. The brightest stars unmistakably formed the outline of a butterfly’s wings in flight, while fainter suns littered the area with misty starlight. The golden glint from the cluster’s lone orange supergiant, BM Scorpii, stood out nicely among the other blue-white points.

Northward along the Milky Way, I visited several deep-sky friends, including the Omega Nebula (M17), the large open cluster IC 4665 in Ophiuchus, the Coathanger asterism (Collinder 399), and the Dumbbell Nebula (M27). The last two lie in Vulpecula. All of these objects are enmeshed within rich star fields and were pleasant sights through both telescopes.

The “Gulf of Mexico” and “Florida panhandle” portions of the North America Nebula (NGC 7000) in Cygnus were both easy to pick out at 22x once I added a nebula filter. Globular clusters M4, M22, and M13 each looked like a ball of cotton suspended in space, although at 69x, M13 looked grainy because I wasn’t using enough magnification. Moving up to 120x resolved the stars. I also saw the subtle smoke-ring shape of the Ring Nebula (M57) with averted vision at 69x.

I enjoyed my low-power voyages across the summer sky with both the MaxKuei and Phoenix refractors. Few things are more pleasant than just kicking back and visually drifting through the Milky Way. If you’re looking for a worthy traveling companion that’s ready to grab and go at a moment’s notice, then the MaxKuei 80HD and the Phoenix 80S are good choices. Don’t overdo the magnification, and you’re sure to have a pleasant journey.
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