REVIEWED

Helios Lightquest HR 28 × 110 binoculars

Binocular vision

Helios' new large and extremely powerful binoculars are like twin light-buckets that give wide and deep views of the night sky, but does their design match their optical capability? **Steve Ringwood** finds out.

▶ The Helios 28 × 110 Lightquest HR binoculars. Image: Helios.

It will come as no surprise to anyone that binocular users are just as prone to aperture fever as those who use telescopes – and for the same reasons. Increased lens diameters bring access to fainter objects and better resolution of fine detail. Provision of such instruments has in the past depended on ex-military examples, but happily this is no longer so. Here reviewed is one of the latest out of the Helios stable, the Lightquest HR 110mm. This model comes in two magnifications, 23× and 28×, the latter of which has been passed to me.

Encased within tight-fitting foam, the Lightquest comes in an armoured aluminium case. These are, of course, a large pair of binoculars, but as you lift them out, they are not particularly heavy for this class of binocular, the magnesium alloy body keeping the total weight (including the tripod adaptor) to a modest 4.65 kilograms.

At a glance

Magnification: 28×
Aperture: 110mm
Field of view: 42m at 1,000m (2.4-degrees)
Nearest focus distance: 36m
Dioptre adjustment range: –7/+18
Interpupillary distance range: 56–74mm
Exit pupil diameter: 3.93mm
Weight: 4.5kg
Water resistant to: IPX7 (0.5m depth for 30 mins)
Details: opticalvision.co.uk
Price: £749

▲ Though impressively robust, the cap segment of the tripod adaptor is too bulky to allow the binoculars to be supported at their centre of gravity, without impeding interpupillary-distance adjustment. Image: Steve Ringwood.

The main objectives are conventional f/3.9 doublet achromats. That being said, the eyepieces are highly corrected eight-element oculars offering the observer a generous eye lens for comfortable viewing of a 2.4-degree field. With the optical train being multicoated throughout, the prisms used are creditably of the high-index BaK4 (barium crown) variety.

Daytime use

My first course was to set up during daylight to see how they perform in terrestrial use. The view through them was promising, but it was while setting them up that I came across, what I would call, some very odd design decisions.

The binoculars come supplied with their own impressively robust tripod adaptor that attaches to the centre rail. Seeking to place this at the binocular's centre of gravity, to afford stability when mounted, I found that I could not quite do so. This was because the broad head of the adaptor could not pass far enough down the centre rod between the twin barrels without impairing the adjustment of the inter-pupillary distance. This makes them front-heavy when mounted, requiring greater tension on the pan head or fork mount clamps to keep them from tipping forward. This in turn impairs smooth motion when tilting. The simple solution is to swap out this adaptor for one that passes along the centre rod without impairment. But, sticking to the one supplied, I pressed on, attaching the binoculars to a fork mount that I had ready.

The large 110mm objectives are protected by rubber caps that seal the optics against dust. This seal is unfortunately so airtight that the caps resist being removed sufficiently for fingernails to be endangered. The simple common remedy here is for the caps to have a pinhole, but none was present. I could have created the pinholes myself, but these were not my lens caps.

I then proceeded to pull out the dew shields – which did not move. What I had assumed to be dew tubes were simply body cowlings for the lens compartment. This did surprise me. The main lenses are recessed barely one-centimetre within the body and are thus rather exposed to the ingress of stray light and dew. By unscrewing

The scatter of stars also meant that I could confirm that they were pin sharp to the periphery, too. It was a beautiful view and one that I absorbed at length.

▲ Helios 28 × 110 Lightquest HR binoculars, ready for action on a fork mount. Image: Steve Ringwood.

▲ The eye lens of the eyepieces is large and passes an exit pupil of almost 4mm. Image: Steve Ringwood.

▲ The 110mm objective lenses in all their glory. Image: Steve Ringwood.

▲ The binoculars' interior surfaces are milled to reduce light scatter. Image: Steve Ringwood.

▲ The object lenses are hermetically protected by rubber caps – be careful not to break finger nails trying to pry them off! Image: Steve Ringwood.

one, I discovered that, if the cowling's fixed thread was a slip ring instead, these tubes would be perfectly able to slip forward over the lenses to adequately perform as dew shields. Duct tape and ingenuity could retrofit this oversight.

With the optical paths open, all that was left was to adjust the interpupillary distance for my eyes, but this was much easier said than done. The resistance against adjusting the distance between the eyepieces is truly colossal. I looked for a facility to ease this tension but found none in either the single-page manual or anything obvious on the binoculars themselves. (I found some tiny grub screws, but they did not look obvious or user-friendly.)

Mechanics aside, it was now time to actually look through the binoculars. It was a bright sunlit day and distant trees offered themselves as a target. Actually, these trees had to be very distant, for the minimum focus distance on these binoculars is stated as 36 metres. Indeed, I tested this by measuring to the nearest tree I could focus on, which proved to be about 40 metres. At the risk of mixing my adjectives, this strikes me as a very distant minimum range.

What was highlighted by sunlit branches was a degree of chromatic aberration. Deep into the foliage it was not a problem; but against sharp contrasted boundaries, like leaves and twigs against the backdrop of a cloudless sky, the purple fringe was distracting. However, it's worth remembering that to eradicate chromatic aberration in binoculars of this size, esoteric optics costing many times more are required.

Nevertheless, at a magnification of 28×, the giant 110mm lenses were certainly providing resolution. Distant those branches may have been, but I could make out veins in the leaves and insects on the bark. The field was flat with great 3D depth. I used the pole of a local radio mast to look for field curvature and there was barely any – just a trace, which is impressive given the objectives' small focal ratio.

Because of the binoculars' impressive light grasp, slowly panning through the star-rich regions of Cassiopeia and Cygnus was a voyage of discovery

Night-time use

Terrestrial use aside, I was eager to test these observation binoculars on the night sky. It was then that the binoculars revealed themselves to be truly creatures of the night.

My first evening session was not exactly deep-sky friendly, as a Moon less than a day from full flooded the sky with milky light. Yet it afforded the binoculars with a chance to show the Lightquest's nominative HR (high-resolution) credentials.

Despite a thin line of chromatic aberration around the Moon's limb, lunar features leapt out in fantastic detail. Near the north-eastern terminator, the bright splash of Aristarchus, including its sinewy companion Schröter's Valley, was well shown in sharp relief against the subdued pallor of Oceanus Procellarum (the Ocean of Storms). Further onto the disc, giant Copernicus was rising to its full lunar brilliance, its impact rays already spider-like across the darker plains. There was still sufficient shadow to make out the crags of its central mountains too. The lunar surface was well contrasted and subtle

▲ Shooting through the objective lens reveals a clean optical train through BaK4 prisms. Image: Steve Ringwood.

shades in the lava showed up nicely. Of course, with a field of view almost five times the Moon's diameter, I was presented with a beautiful vista of the Moon hanging in space, enhanced by the fact that stars in its backdrop were also well shown. I would imagine that these binoculars would present quite an atmospheric scene during lunar eclipses too.

Panning to the side of this dominant Moon, I cast my gaze upon Jupiter. Little more than a month past its July opposition, the size of its disc at 28× was more than sufficient to reveal the main atmospheric belts and polar hoods. In attendance, the four Jovian moons were also well picked out. Sweeping east, Saturn too gave well of itself, the heavily tilted rings giving the planet its classic photogenic appearance.

Pleasing though this performance was, I really wanted to rid the sky of its orbiting solar reflector and waited impatiently for darker nights. They were worth the wait.

The autumn offered me an obvious target rising steadily in the north-eastern sky – the Double Cluster in Perseus. As the Lightquest alighted on that target, I gasped. This binary explosion of stars was seen in all its glory – on two counts. First, the 110mm aperture was clearly pulling a wealth of dimmer stars into the field. Secondly, the breadth of that field meant that these open clusters could be observed within their surrounding context. The scatter of stars also meant that I could confirm that they were pin sharp to the periphery, too. It was a beautiful view and one that I absorbed at length.

Swinging the binoculars high and further south, the Andromeda Galaxy hove into view. Admittedly, I had cast a glance here when the Moon's light had all but obliterated everything else, and had been impressed that even under the cast of lunar pollution, the galaxy's form could be clearly seen. Against a dark sky, the hard lenticular shape of its core was well contrasted, and to an extent even the fainter apses of its outer regions could be traced.

Greater light grasp

I do not normally favour comparative testing, but out of interest I paired this observation with similar 100mm binoculars of my own. Whether because of the reviewed instrument's additional

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10mm aperture or other factors, there was definitely clear water of additional light grasp in favour of the Lightquest.

Near the zenith, the Ring Nebula (M57) beckoned. Without right-angled eyepieces this took more neck contortion than I liked, but the nebula's smoke ring was bright – and again seen in valuable context, since the 2.4-degree field also encompassed its flanking constellation companions, beta and gamma Lyrae.

Because of the binoculars' impressive light grasp, slowly panning through the star-rich regions of Cassiopeia and Cygnus was a voyage of discovery. I stepped off that journey to alight on Albireo, enjoying the binary's colourful contrast of yellow and blue.

The cherry on the observing cake, though requiring some sleep-loss dedication, was the pre-dusk morning of 14 September, when the crescent Moon, M44 (Praesepe, or the Beehive) and Venus huddled together in a fabulous conjunction in the eastern sky.

Epitomising its alternate name, M44 did indeed look like an angry swarm of fire-lit bees, flanked to the left by the crescent Moon and to the right by blazing Venus. At 2.4 degrees, the binocular field could not capture the grouping's almost four-degree span, but I was in turn able to accompany Praesepe with either the Moon or Venus. With only nearby foxes for company, it was a wonderful experience that also demonstrated that within the binocular field this cluster of stars was not optically drowned out by the planetary bodies on either side.

Being deep into the autumn night, access to winter's Orion made it possible to observe its cascade of clusters and nebulae within the sword. Despite this feature already vanishing into the growing twilight, I ascertained that its entire length could be contained within the eyepiece field.

These binoculars are definitely happier under a dark astronomical sky and will serve as a rewarding deep-sky and comet instrument. The only thing I would add is that as the eyepieces are held parallel to the optical train and not right-angled, celestial use is going to require a large angled fork or parallel mount in order to get underneath the eyepieces for accessing near-zenith objects.

Steve Ringwood is a regular contributor to *Astronomy Now*.

▲ The Helios 28 × 110 Lightquest HR binoculars give excellent, pin-sharp views all the way to the edge of the 2.4-degree field of view.

▲ A mount providing room underneath the eyepieces is needed to give access to objects at the zenith. Image: Steve Ringwood.