

## Binocular Sky Review: Helios LightQuest-HR 16x70

### Manufacturer's Specification

Weight (g)	1930
Field of View (°)	4.1
Eye Relief (mm)	20
IPD (mm)	56-74
Waterproof	Yes (IPX7)
Prism Type	Porro
UK Guarantee	Not specified
Origin	China
Body Material	Magnesium Alloy
Armour Type	Thin synthetic "leatherette"
Nitrogen Gas Filled	Yes
Prism Material	BaK4
Prism Coating	Multi-coated
Lens Coating	Fully multi-coated
Eyecup Type	Fold down

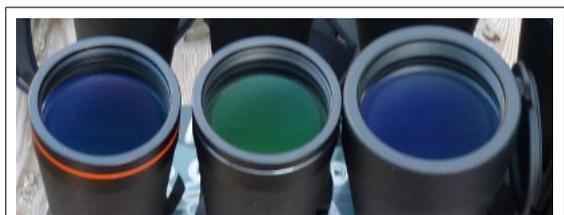


**Price: £420**

**Available from: [First Light Optics](#)**

### Initial Impressions

The binocular is of Bausch&Lomb (aka "American")-type construction, i.e. the objective tube is integral to the prism housing. It is similar in appearance to the [Lunt Magnesium 16x70](#); the only immediately obvious differences are the colour of the band on the metal ring around the objective and the dominant colour reflected by the coatings of the objectives and eyepieces.

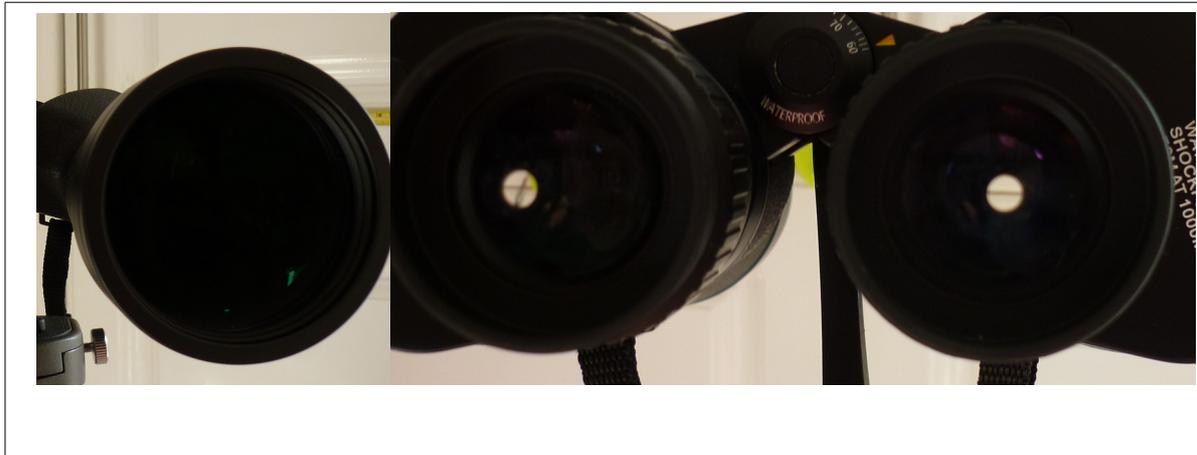


Objectives. L-R: Lunt 70, LightQuest 70, LightQuest 80

Like the Lunt, the binocular is covered in a thin synthetic "leatherette"-type armour, which gives a secure grip with or without gloves. The eyepiece focusing is smooth, with no "stiction" and is sufficiently stiff to prevent accidental refocusing, especially when folding down the eye cups. There is a knurled ring on each eyepiece; this makes it easy to focus with gloved fingers. The hinge is smooth and tight enough not to accidentally slip once it is adjusted or when you are adjusting the focus. The eye-cups fold down easily.

The prisms are housed in a proper "cage" and are not merely held in place with clips. They do not appear to be grooved on their hypotenuses.

The coatings look very good and reflect only a small amount of light (green dominant). The insides of the objective tubes are ribbed along their entire length, suggesting that control of stray light should be good. There are no cut-offs in the light path, suggesting that the prisms are adequately sized.



The cordura case is quite stiff and has enough padding to protect the binocular from knocks it might get in reasonable use. The strap attaches to the case with side-release buckle clips and is therefore easily removable. There are substantial belt/harness loops on the back of the case. The case closes with a side-release buckle, not the hook-and-loop fasteners that are nowadays ubiquitous. The untethered plug-in type objective covers are an excellent fit, and do not come off accidentally; they are fitted with, and need, tabs to aid removal. The eyepieces have a tetherable (left hand side) double rainguard-type cover that fits securely. It does not restrict the interpupillary distance when it is in place.



The binocular is also provided with a sturdy metal tripod adaptor.

### Testing the Specifications

As you would expect with a binocular of this quality, the aperture is the full 70mm and is not internally stopped. Examination of reflections when a bright light is shone down the objective end confirms the fully multi-coated spec. There are no grey segments in the exit pupil, confirming that the prisms are of high-index glass. I measured the minimum interpupillary distance at 56 mm, but with the included tripod adaptor in place it is only 57mm. This is because the tripod mounting bush is recessed between the prism housings and the



adaptor is pinched between them. The eye cups are 46 mm diameter, so there is 10 mm between them at their closest (11mm when mounted); this should accommodate most people's noses. The objective lenses are recessed 13.5 mm into their barrels, offering good protection against accidental touching, but insufficient for dew protection. With fully-corrected vision, the eyepiece dioptres are set close to zero when you focus to infinity, suggesting that they are properly adjusted. There is a nominal 5-dioptre adjustment available either side of this, so the binocular could be used without spectacles by people with moderate to strong myopia or hyperopia/presbyopia. For those who do need spectacles, the eye lenses are recessed 3mm into their housings so, with the eye-cups folded down, there is 17mm of the specified 20mm eye relief available. I found this to be adequate to enable the entire field of view to be visible.

### Under the Stars

For testing, which involved a comparison with other binoculars, I mounted it either on an [Amazon Basics tripod with a trigger-grip \(aka joystick\) head](#), or on a Universal Astronomics T-mount (parallelogram). For normal observing with a 70mm binocular, I use a monopod instead of a tripod, but this is less satisfactory when doing comparisons. I compared this to [Lunt Magnesium 16x70](#), which has become my 16x70 of choice for astronomy. My observing site is in a reasonably dark suburban location.

Collimation was, as far as I could ascertain, perfect. The field of view easily contains *Polaris* and *Delta Ursae Minoris* ( $4^\circ$ ), which is consistent with the specified field of  $4.1^\circ$ . The view is extremely sharp and flat over the central 80% of the field.

Slight field curvature affects the periphery. *Delta Cephei* (40 arcsec separation, magnitudes +4.1 and +6.1) started to deteriorate at 80% out, but was still cleanly split to about 90% out from the centre of the field if I focused out the field curvature. There was noticeable vignetting in the outer 5% or so of the field of view. Control of false colour (chromatic aberration) is very good on axis, but becomes noticeable on bright objects (e.g. Venus or the lunar limb) once they are off-axis, although it is still very well-controlled and not overly obtrusive here. I did not notice it at all on first magnitude stars, although the colour of Betelgeuse changed slightly towards the edge. Colour correction is quite sensitive to eye positioning: you do need to ensure your eyes are on-axis to get the best of this.

There is an unobtrusive amount of pincushion distortion, just sufficient to eliminate the nauseating "rolling ball" effect that can occur without it. Control of stray light from objects in the field of view is good but when the Moon was to the side and below the field of view, I noticed ghost images of the Moon with obtrusive streaks of light at  $45^\circ$  extending to either

side, across the entire field of view. The angle suggests that they are produced by prism edges. In the Lunt, the Moon in the same place produced less obtrusive streaks with an almost imperceptible ghost image, suggesting that the difference in the appearance of the coatings is not merely cosmetic. These spurious reflections were also apparent with Sirius in a similar position, but I could not detect them on Betelgeuse or Arcturus. However, even if they are not visible, they must slightly reduce



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contrast. Colour rendition was very good. The varied colours of the stars in the Meissa cluster was indistinguishable from that in the Lunt. I also compared the binoculars on NGC 1981, Cr70, M45. M3 and M51 and the LightQuest held up very well indeed, indistinguishable from the Lunt. M51 looked elongated with averted vision, but showed two core condensatins with averted vision. On the night I tested the binocular, the Orion nebula was only 12° above the horizon, but it still showed good stgructure and I could distinguish two stars of the Trapezium. Using a star-count in NGC 1981 as a guide to brightness, I found the LightQuest to be indistinguishable from the Lunt.

Jupiter showed a clean disc, with the four Galilean satellites sharply defined either side of it. With the planet on-axis, the contrast and, therefore, the visibility of the moons was subtly better than in the Lunt.

The very good images must be due, at least in part, to the length of the binocular as compared to other 70mm glasses. They are noticeably longer than both the BA1 and the BA8 binoculars from United Optics. The UO binocualrs have objectives at f/4; nothing is achromatic at f/4, even at low magnifications. With a relative aperture of approximately f/5 in the LightQuest, you would expect better optical performance and, indeed, this is what you get. I was simultaneously testing the LightQuest 20x80, and I found the 16x70 to give slightly sharper images (but not as bright).



The LightQuest is significantly longer than other 70mm binoculars, resulting in better quality images.

## Conclusions

The LightQuest is priced more than £50 less than the Lunt, but the quality of the image is almost indistinguishable . It has noticeably better edge performance, and is about 0.1 magnitudes brighter than that the Helios Apollo. However incremental improvements in quality at this end of the market, become increasingly more expensive, so you would not expect to see enormous differences. They are 500g (17.5 oz, 20%) lighter than the Apollo and it makes an enormous difference, both to the ease of hand-holding them for brief periods and to mounting them on a monopod or using them with a trigger-grip head. The effective eye relief is greater than the Apollo, making it much more suitable for specatacle wearers, and the eye-cups are somewhat more comfortable. I would rate these as good as the Lunt, with the exception of stray light control on bright objects outside the field

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of view where they fare slightly worse and, paradoxically, on combinations of bright and faint targets e.g. Jupiter and its moons) where they fare slightly better.

This binocular would be an excellent purchase for someone who wants a very good astronomical 16x70 but does not want to stretch to the extra £100 or more that would purchase an ED binocular.

At its price of £420, I think the [Helios LightQuest-HR 16x70](#) is exceptionally good value for money in a high-end astronomical binocular.

<b>Binocular Sky Ratings (/10)</b>	
Sharpness of Image	10
Size of usable field	9.5
Colour Correction	8
Control of stray light	7
Eye relief	10
IPD	10
<b>Overall Optical Quality</b>	<b>9.1</b>
Focus mechanism	10
Eye cups	8
Hinge	10
<b>Overall Mechanical Quality</b>	<b>9.5</b>
Case	7
Neck-strap	10
Objective caps	8
Eyepiece caps	10
<b>Value for Money</b>	<b>9.5</b>
<b>Overall</b>	<b>9.4</b>

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