Binocular Sky Review: Helios LightQuest-HR 20x80

Manufacturer's Specification

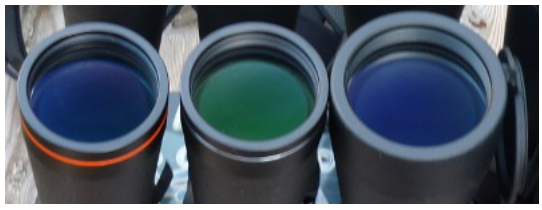
Weight (g)	2490
Field of View (°)	3.3
Eye Relief (mm)	16
IPD (mm)	56-74
Waterproof	Yes (IPX7)
Prism Type	Porro
UK Guarantee	Not specified
Origin	China
Body Material	Magnesium Alloy
Armour Type	Textured rubber
Nitrogen Gas Filled	Yes
Prism Material	BaK4
Prism Coating	Multi-coated
Lens Coating	Fully multi-coated
Eyecup Type	Fold down

Price: £520

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. The coatings are a different colour to those in its smaller siblings, but similar in appearance to those on the Lunt Magnesium. It is the same length as the LightQuest 16x70 (they are standing on the saem surface in the image on the right). The objectives have tethered caps.


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

The binocular is covered in a synthetic rubber-type armour, which gives a secure grip with or without gloves and also when the bincilar is damp with dew. The individual 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 large 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


Proper prism cage

eye-cups fold down quite easily, but not quite as easily as those on the smaller binoculars in the LightQuest range.


Ribbed objective tubes

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 (blue 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 looks very much like those supplied with Steiner binoculars. It is quite stiff and has sufficient 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 tethered plug-in type objective covers are a good fit, and do not come off accidentally as long as they are put properly in place. The eyepieces have a tetherable (left hand side) double rainguard-type cover that fits securely. It does not to restrict the interpupillary distance when it is in place.

The binocular is also provided with a sturdy metal tripod adaptor with a ¼-inch Whitworth threaded base to fit a standard photographc tripod thread.

Testing the Specifications

As you would expect with a binocular of this quality, the aperture is the full 80mm and is not internally stopped. Examination of reflections when a bright light is shone down the objective end confirms the fully multi-coated spec. The eyepiece coatings reflect very little light. 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 59 mm. This is because the tripod mounting bush is recessed between the prism housings and the adaptor is pinched between them. Those with small faces should be aware of this. The eye cups are 46 mm diameter, so


The supplied tripod adaptor restricts the minimum IPD to 59mm

there is 10 mm between them at their closest (increasing to a minimum of 13 mm when mounted); this should accommodate most people's noses. The objective lenses are recessed 17 mm into their barrels, offering very 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 10-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 13mm of the specified 16mm eye relief available. I found this to be only just adequate to enable the entire field of view to be visible when I was wearing specatacles, but potential users who need to observe with their glasses on should ascertain that it is adequate for them.

Very good anti-reflective coatings on the objectives and eyepieces.

Under the Stars

For testing, which involved a comparison with other binoculars in the LightQuest-HR range, I mounted it either on an Amazon Basics tripod with a trigger-grip (aka joystick) head or on a Universal Astronomics T-mount (parallelogram). I compared this to 16x70 and 25x100 versions of the same binocular. My observing site is in a reasonably dark suburban location.

Collimation was, as far as I could ascertain, perfect. The field of view just failed to contain Capella and Almaaz (3.4°), which is consistent with the specified field of 3.3°. The view is sharp and flat over the central 70% of the field; I could easily distinguish three Trapezium (θ *Ori*) stars in this region when it was just 12° above the horizon. Slight field curvature affects the periphery. *24 Comae* (20 arcsec separation, magnitudes +5.0 and +6.3) was splittable to about 80% 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 good but not perfect on axis, but becomes noticeable on bright objects (e.g. Venus or the lunar limb) once they are off-axis, although it is still well-controlled here. Colour correction is very sensitive to eye positioning, so 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 very good but when the Moon was to the side and below the field of view, I noticed the same ghost images of the Moon, with 45° streaks extending either side, that I could see in the 16x70, although they were not as bright or pronounced in the larger binocular. The angle suggests that they are produced by prism edges. These spurious reflections were just apparent with Sirius in a similar position, but I could not detect them on Betelgeuse or Arcturus.

> **"The 0.2 magnitude difference...may not sound like much, but it is very noticeable..."**

Colour rendition was very faithful and, due to the greater aperture than the 16x70, seemed slightly more vibrant in the 20x80. As you would expect, globular clusters like M3 and M53 were distinctly larger and brighter in the 80mm than in the 70mm. Even with direct vision, M51 was clearly two different, but connected, discs which showed core condensations. It was easier to see galaxies in the Virgo-Coma cluster than with the 16x70.

Jupiter showed a clean disc, with the four Galilean satellites sharply defined either side of it.

Conclusions

The 20x80 member of the Helios LightQuest-HR range is a fine binocular for astronomy. Compared to the 16x70 version, it is about 0.2 magnitudes brighter and has noticeably better control of out-of-image stray light. However, it is not as sharp over as much of the field of view and it suffers from more chromatic aberration; this is almost certainly due to it having a relative aperture of about f/4 as

compared to the f/5 of the 16x70. Nothing is achromatic at f/4, and it gets less achromatic as aperture increases.

However, most people who use large astronomical binoculars tend not do so for detailed observation of bright objects or measured splitting of double stars; the target objects for this binocular are more likely to be 'faint fuzzies' in the deep sky, and here the Helios LightQuest-HR 20x80 performs very well indeed. The 0.2 magnitude difference over the 16x70 may not sound like much, but it is very noticeable on the objects on which you are most likely to use it.

They are less easy, although not prohibitively more difficult, than the 16x70 to use on a monopod, but an inexpensive trigger-grip/tripod combination was more than adequate if the tension was appropriately adjusted.

In summary I rate the Helios LightQuest-HR 20x80 as good value for money in a high-end, individual eyepiece focusing, astronomical binocular.

Binocular Sky Ratings (/10)	
Sharpness of Image	10
Size of usable field	7.7
Colour Correction	7
Control of stray light	8
Eye relief	8
IPD	9
Overall Optical Quality	**8.3**
Focus mechanism	10
Eye cups	8
Hinge	10
Armour	10
Overall Mechanical Quality	**9.5**
Case	7
Neck-strap	10
Objective caps	10
Eyepiece caps	10
Value for Money	**8.5**
Overall	**8.8**

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2017 March 21