REVIEWED

CELESTRON NEXSTAR 6SLT

The Celestron NexStar 6SLT on its fork-arm computerised mount and tripod. Note that the fully extended tripod is a little shaky. Image: Celestron.

The next star to shine bright for Celestron

Celestron have reinvigorated their 14-year-old SLT suite by adding larger apertures to the popular computerised mount made for those on a budget. **Ade Ashford** evaluates the top-of-the-range model equipped with the highly regarded C6 Schmidt–Cassegrain.

At a glance

Type: Schmidt–Cassegrain
Aperture: 150mm
Focal length: 1,500mm
Focal ratio: f/10
Optical coatings: StarBright XLT
Optical tube weight: 3.6kg
Eyepieces: 25mm (60×) and 9mm (167×)
Star diagonal: 1.25-inch
Highest useful magnification: 300×
Resolution: 0.93 arcseconds
Mount type: Computerised alt-az single-fork arm
Load capacity: 3.6kg
Mount head weight: 2.3kg
Tripod weight: 2.3kg
Price: £649
Details: celestron.co.uk

Celestron unveiled their entry- to mid-level computerised Star Locating Telescope (SLT) range in early 2005. Initially offering 60-, 80- and 102mm-aperture refractors plus 114 and 130mm Newtonians on a single-arm fork mount, the SLT garnered praise for its intuitive SkyAlign set-up procedure (more on this later) that is easy enough for beginners to master, while its NexStar hand controller provided enough objects and advanced features to grow one's knowledge of the night sky. During its 13-year production run, the SLT has adopted the more advanced NexStar+ hand controller and new optical configurations, culminating in the 150mm aperture Schmidt–Cassegrain telescope (SCT) reviewed here.

Delivery and assembly

The NexStar 6SLT arrives at your door in a 40 × 58 × 98cm shipping box grossing 16 kilograms. Divested of the considerable and perhaps unnecessary cardboard packaging (thankfully recyclable), the instrument tips the scales at 8.4 kilograms. The optical tube has a fetching gunmetal-grey satin livery with black castings fore and aft in a non-slip finish. The single-fork mount and stainless steel tripod are pre-assembled, so all that you need to do is add the accessories to the optical tube and attach the latter to the mount. A profusely illustrated four-page colour set-up guide enables novices to get started quickly, while a comprehensive 24-page instruction manual covers the finer points.

The optical tube's 26cm-long Vixen-style dovetail bar permits ample movement to balance the instrument, sliding in a fork-arm clamp that's locked by a single hand knob. Note that the SLT mount cannot be moved manually for casual viewing. You must first install eight AA alkaline batteries in the drive base before powering it up, then use the directional arrow buttons on the hand control to move the telescope up, down, left or right. There are nine different slew speeds from a glacial 2× sidereal rate up to a swift three degrees per second. The internal DC servo motors are modestly audible, even at maximum slew speed, which is reassuring for back-garden stargazing when you're concerned about waking the neighbours.

The latest version of the NexStar+ hand controller supplied with the telescope has a 10-page supplement of its own, plus there are two DVDs bundled in containing owner's manuals written in multiple languages and Mike Swanson's NexStar Observer List software (for Windows). If you have Internet access, you also get a code to download *Starry Night 7 Celestron Special Edition*. Available for Windows or Mac, *Starry Night 7* is a desktop planetarium package featuring realistic night-sky simulations and providing another way of controlling your SLT telescope (the cable for which comes as an extra). These software freebies are useful products in their own right and are a welcome addition to the package.

Mount and tripod

With the optical tube attached, and the star diagonal and eyepiece inserted, the average eyepiece height with the tripod legs fully retracted is 75cm (29.5 inches). In this configuration, a typical adult would need to sit on the floor to access the eyepiece comfortably. The eyepiece height is 120cm with the legs fully extended, a configuration that provides a convenient observing height for most people while standing.

The penalty for operating such a relatively lightweight tripod at full extension is stability, particularly with the mass of the C6 optical tube, StarPointer finder, star diagonal and eyepiece tipping the scales at 3.4 kilograms (measured). When one adds even a lightweight dew-shield, which is effectively mandatory for observing in the UK, then the fully laden C6 optical tube is perilously close to the 3.6 kilogram payload limit of the SLT mount as given in Celestron's online specification.

In tests conducted on firm soil with the tripod fully extended, vibrations from a gentle tap on the tube dissipated in about five seconds, or in about four seconds after I had tightened all the tripod bolts. To put this into context, the substantially better-engineered NexStar 6SE mount and tripod, which is £230 more expensive than the NexStar 6SLT, has a vibration dissipation time of about two seconds when the tripod is fully extended on grass.

Five seconds of dancing images after adjusting focus or buffeting from a gust of wind is just about tolerable for the SLT, although in fairness to the mount, it is the tripod that is mostly the source of the instability. If you have a modicum of practical skill with a drill and hand saw, it's easy to fashion full-length replacement tripod legs from planed timber, a few coach bolts, washers and wingnuts. For an outlay of about £25 and an afternoon's work, I once made a set for a Celestron

The versatile C6 strikes a balance between a manageable physical size and impressive visual or photographic performance

The NexStar 6SLT range is designed for entry- to mid-level users. Image: Ade Ashford.

The NexStar 6SLT's primary and secondary mirrors plus the front corrector plate benefit from Celestron's StarBright XLT coatings for bright, contrasty images. The anti-reflection coatings on the corrector are so good that it is very difficult to photograph them! Image: Ade Ashford.

The NexStar 6SLT running off an external 12V battery supply (cable not supplied). When operated this way the NexStar+ hand controller has a software cable management system to prevent it becoming entangled. Note the two ports, one for the hand controller and the other for an AUX connector for an optional Celestron SkyPortal WiFi module to control your telescope wirelessly. Image: Ade Ashford.

SkyProdigy – a self-aligning derivative of the SLT, but with the same tripod – that dramatically enhanced rigidity.

NexStar+ hand controller

Whereas the introductory NexStar SLT hand controller had a database of 4,000-plus objects, including planets, stars and the Messier, NGC and Caldwell catalogues, the NexStar+ hand control sports a faster processor for improved responsiveness and possesses an object database capacity ten times larger than that of its forebear. The NexStar+ also incorporates several hardware improvements, such as improved LCD readability at low temperatures.

In every other respect, the bundled NexStar+ hand controller is identical to that provided on other high-end Celestron altazimuth mounts, so you can access some advanced features once your experience grows. This also means that you will have no difficultly upgrading to a larger and higher-specification Celestron altazimuth mount, since the controls and menu layout will be the same, significantly reducing the learning curve.

The latest NexStar+ also sports a mini-USB port in the base of the hand controller. This type of connector affords greater compatibility with computers operating under Windows, macOS or Linux and running the free multi-platform *Celestron Firmware Manager* (*CFM*) firmware updater software obtainable from software.celestron.com/updates/CFM/CFM/. With *CFM*, everyone can update their NexStar+ hand controller with the latest features and databases as they arise. All you need apart from the *CFM* software is a widely available mini-USB cable.

A mini-USB cable also permits you to control your SLT mount from a desktop computer or laptop. The graphical user interface of planetarium software is preferable to the two-line alphanumeric display of the NexStar+ hand controller for many people. The SLT mount also has a spare AUX port above the hand-controller socket where you can plug in an optional Celestron SkyPortal WiFi module to control your telescope wirelessly from a selection of iOS or Android apps. All of these options worked flawlessly in multi-platform testing.

Alignment options

As every owner of a computerised telescope mount knows, it can only locate objects once its internal mathematical model of the night sky matches what actually lies above you. The act of synchronising the mount's view of the stars with their real counterparts is called alignment, and the NexStar+ hand controller provides seven ways to achieve it under just about every observing scenario imaginable. While this may sound disturbingly complicated for the novice, one of the much-lauded features of the SLT mount since its introduction is SkyAlign.

SkyAlign, which has since migrated to many of Celestron's computerised mounts compatible with the NexStar+ hand controller, is simple to use. Once the mount knows where you live (either from a built-in gazetteer, or by latitude and longitude) and what the local time is, SkyAlign prompts you to direct the telescope at any three bright objects that you can see in the night sky. You don't need to know any stars by name, plus you can use the Moon or bright planets.

Even in these days of self-aligning technology such as StarSense, SkyAlign is a quick and reliable way to get your SLT mount up and running. Furthermore, if you can identify a planet or one star by name, there is a faster alignment option to suit provided that your tripod head is horizontal to the ground according to the built-in bubble-level. In fact, if you must use the short-lived internal power option of eight AA alkaline batteries, these speedy Solar System or One-Star Align methods can get you observing quickly and save precious battery charge by eliminating multiple alignment slews.

Optics and optical performance

When Celestron became a subsidiary of Taiwan-based Synta Technology Corporation in 2005, their first foray into manufacturing a Schmidt–Cassegrain telescope (SCT) was the 150mm aperture C6 reviewed in a contemporary guise here. I'll cut to the chase: I've used upwards of a dozen C6 optical tubes in all its forms and without exception the optical quality and performance have been outstanding for the aperture. Observations with a C6 on a night of good seeing yield views that are more akin to those through a Maksutov–Cassegrain telescope, but without the excessive weight and long cool-down time.

The NexStar 6SLT optical tube comes with two eyepieces of 25 and 9mm focal length, which deliver magnifications of 60× and 167×, respectively. Other than the stated focal length, there were no indications of optical type, but disassembly of the 25mm eyepiece revealed that it is a Kellner. Such simple optical designs still perform well at the f/10 focal ratio of a typical Schmidt–Cassegrain, as borne out in subsequent tests. While the outer 50 per cent of each eyepiece field of view revealed expected aberrations, partially from SCT field curvature with the 25mm, the inner field-of-view was very sharp. For example, millimetre-height text on control circuitry in a streetlight was legible from a distance of 100 metres through the 9mm eyepiece.

It was therefore unfortunate that during tests of the telescope in July 2019, the two brightest and most detailed planets on show – Jupiter and Saturn – were so low in the UK's sky. Nevertheless, despite the fact that the Solar System's largest gas giants currently struggle to attain an altitude of more than 15 degrees as seen from the British Isles, tantalising detail was on show. When observing Jupiter on the meridian at civil dusk on 22 July at 167×, the largest planet revealed to me, albeit fleetingly, detailed views of its Great Red Spot and its environs, plus a shadow transit of Jupiter's innermost Galilean moon, Io, when my locally poor-seeing permitted.

Seeing conditions were much better just after midnight on 23 July, when Saturn was best-placed for observation. The ringed planet's globe revealed an equatorial band at 167× magnification and, despite atmospheric dispersion adding spurious colour fringing, the glorious aspect of the ring system's northern face showed the Cassini Division extending well beyond the ring ansae. Saturn's largest moon Titan was a conspicuous target south of the planet, while slightly less conspicuous Rhea close to western elongation and fainter Dione nearby were also easily seen. I have no doubt that when seen at a respectable altitude with the NexStar 6SLT, Jupiter and Saturn will both be replete with fine detail.

The NexStar 6SLT is supplied with the latest NexStar+ hand controller. It incorporates a database of 40,000 objects, including planets, stars and the Messier, NGC and Caldwell catalogues. Image: Ade Ashford.

The supplied 25mm and 9mm focal length Kellner eyepieces. Image: Ade Ashford.

The NexStar+ hand controller sports a faster processor and an object database capacity 10 times larger than that of its forebear

Observations with a NexStar 6SLT on a night of good seeing yield views that are more akin to those through a Maksutov–Cassegrain telescope

The deep nautical twilight of British summer nights is not the best time to view deep-sky objects, but a few gems of the season presented well. The Ring Nebula (Messier 57) appeared as a slightly elliptical smoke ring with good contrast against the stellar backdrop, while the core of the globular cluster Messier 13 in Hercules sparkled with innumerable resolved stars when viewed using averted vision. The double star Rasalgethi (also known as alpha [α] Herculis) easily revealed its orange-red primary with a greenish companion just 4.6 arcseconds away. Mu (μ) Draconis, better known as 'Arrakis', was a stiffer test at 2.6 arcseconds, but it still resolved at 167× with the 9mm eyepiece.

The NexStar 6SLT is the latest model in a range that has proved popular for 13 years, and this latest version lives up to that legacy. Image: Celestron.

Conclusions

It is the superb 150mm C6 Schmidt–Cassegrain optical tube that affords this NexStar SLT model a certain prestige. Natively f/10 but capable of working at f/6.3 and f/1.95 with optional accessories, the versatile C6 strikes a balance between a manageable physical size and combining an impressive visual or photographic performance on a wide range of celestial objects.

The NexStar 6SLT mount would benefit from a more substantial tripod for an optical payload of this size (something that a modest DIY enthusiast could remedy, as I mentioned) and the internal eight AA battery power supply will soon have you investing in a rechargeable 12V power pack, but these cons are far outweighed by the pros of sharp views and the advanced yet easy-to-use features of the NexStar+ hand controller. However, if your budget can stretch to an extra £230, the NexStar 6SE has a better-engineered mount and tripod.

However, ponder this final thought: at the time of writing, Celestron UK sells the NexStar 6SLT package for £649 from all participating dealers. The bare Celestron C6 XLT optical tube – albeit with a quality 25mm Plössl eyepiece, 6 × 30 optical finderscope and star diagonal – currently retails for £679. A NexStar 6SLT offers the best way to obtain a superb C6 telescope that you can extensively accessorise and use in a wide variety of future configurations, while obtaining an SLT mount essentially for free. Get one while you can!

The eyepiece end of the NexStar 6SLT 150, with a clear view of the the telescope's Vixen-style dovetail bar clamped to the mount's fork arm, and the star diagonal, StarPointer finder and the 25mm eyepiece all visible. Image: Ade Ashford.

Ade Ashford has travelled the globe writing about astronomy and telescopes, serving on the staff of astronomy magazines on both sides of the Atlantic. His first *Astronomy Now* review appeared 25 years ago.