



# TELESCOPE PRODUCT GUIDE



2005/2006

# ABOUT CELESTRON

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C14 • Rosette Nebula • Image courtesy of Richard Hedrick

### CELESTRON. OVER 40 YEARS OF TELESCOPE HISTORY

The history of Celestron dates back to 1957 when it was founded and incorporated as Valor Electronics by Mr. Tom Johnson, an electrical engineer and avid amateur astronomer. Mr. Johnson's passion for telescope making became the basis for the future of his company. The name of the company was soon changed to Celestron. In 1980, Celestron was acquired by the Swiss firm Diethelm Ltd. In 1998 Tasco International, a large global marketer and distributor of telescopes binoculars and other sport optics products, purchased Celestron from Diethelm. In June of 2002, Tasco Intl. ceased operations and as a result three members of Celestron's senior management purchased Celestron. This acquisition initiated a new era for Celestron and began the implementation and realization of long-term goals of designing, manufacturing, and marketing a new generation of telescope, binocular, and sport optics products to an ever-increasing market. Under its new management, Celestron has expanded its channels of distribution and increased its product selection in order to better serve its customers.



Celestron is a U.S.-based company with manufacturing and corporate offices located in Torrance, California and a new and extensive warehouse and distribution center located in nearby Carson, California. Celestron's Schmidt-Cassegrain optical systems are manufactured entirely in the Torrance facility. All of Celestron's products are designed and manufactured to meet the highest production and quality standards. This commitment to quality and value has always been the foundation for Celestron and the products we offer to our customers. We emphasize the attention to detail that goes into each of our products and the strict quality control standards that are enforced.

In all of these products, our mission is to provide the highest quality optical products at a competitive price.

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Celestron takes pride in its reputation for innovation. These innovations, which have changed the landscape of amateur astronomy, began with the introduction of the first commercially available Schmidt-Cassegrain telescope. Below are some of the notable innovations Celestron has introduced over the years\*.

- 1966 — Introduced the first commercially available Schmidt-Cassegrain telescopes.
- 1969 — First to have an entire line of Schmidt-Cassegrain telescopes; the now famous C6, C8, C10, C12, C16, and C22.
- First to offer commercially available Observatory Class Telescopes, the C16 and C22.
- First to offer commercially available Schmidt Cameras in the late 1960's.
- Popularized the Cold Camera in the early 1970's.
- Popularized piggyback photography.
- 1979 — Popularized the Maksutov-Cassegrain optical design in astronomy with the introduction of the C90 Astro for \$495.
- 1979 — Popularized Maksutov-Cassegrains as spotting scopes with the introduction of the C90 Spotter.
- Popularized eyepiece projection with the introduction of tele-extenders for Celestron's line of Schmidt-Cassegrain telescopes.
- Popularized off-axis guiders for long exposure photography.
- 1983 — First to offer enhanced reflectivity and transmission coatings with the introduction of StarBright® coatings.
- First to offer a telescope drive system that utilized 9V batteries.
- 1987 — First to introduce the Compustar 14, a mass-produced fully-integrated computerized GoTo observatory class telescope.
- 1996 — First to offer the Ultima 2000, a computerized telescope that utilized AA batteries as a power source.
- First to introduce a commercially available reducer/corrector for Schmidt-Cassegrain telescopes.
- First and currently the only commercial telescope manufacturer to offer true hand-figured and matched optics in Schmidt-Cassegrain telescopes.
- First to offer a commercially available 8" fork mounted Schmidt-Cassegrain for under \$1,000 with the introduction of the Celestar.
- 1997 — First to offer a commercially available Schmidt-Cassegrain telescope capable of f/2 CCD imaging with the introduction of the Fastar® System.
- 2001 — Introduced the first commercially available Schmidt-Cassegrain telescope with carbon fiber optical tube, the NexStar 11 GPS.
- 2001 — First to offer a commercially available fully computerized GoTo telescope with integrated GPS and compass with the introduction of the NexStar 11GPS.
- 2002 — Introduced the NexStar 5i and 8i, the first commercially available telescopes to be GPS compatible.
- 2002 — Introduced the CN16 GPS, a commercially available GPS accessory with an integrated compass that provides GPS functions to Celestron GPS-compatible computerized telescopes.

\*For information on Celestron's latest telescope innovations, see pg. 2

C8 • Whirlpool Galaxy • Image courtesy of Sebastian Voltmer

## TELESCOPE TECHNOLOGIES

### Introducing Celestron's Revolutionary SkyAlign

Pick three stars, any stars...

Aligning your telescope is easier and faster than ever. Simply input the date, time and your location (GPS models obtain all this information automatically) and then point the telescope at three bright stars of your choosing. You do not need to know the names of the stars — you could even pick the moon or bright planets! The NexStar computer system will figure out which stars were chosen and then align the telescope. SkyAlign is standard with NexStar SLT and CPC models.



There is no need to point the telescope north or to level the optical tube. The initial position of the telescope is irrelevant. This makes for a fast and very easy method for aligning the telescope.

#### How does it work?

The NexStar® software with SkyAlign calculates the angles measured between the objects and then compares them to the known angles between objects. Using this method, the telescope determines what objects were chosen. The display will tell you which three objects you aligned to for confirmation.

### StarBright® XLT — An Optical System Breakthrough!

Celestron has elevated its renowned StarBright® technology to an even higher level of light transmission with the introduction of our optional StarBright® XLT High Performance Optical System.



One of the most important factors in the evaluation of a Schmidt-Cassegrain telescope's optical system performance is its transmission — the percentage of incoming light that reaches the focal plane. The design of the XLT System accomplishes two crucial objectives — 1. To develop a coating system that is optimized for visual use and, 2. To optimize the coating system and optics for CCD/Photographic imaging.

The StarBright® XLT High Performance Optical System design consists of:

#### 1. Unique enhanced multi-layer mirror coatings

Our mirror coatings are made from precise layers of Aluminum (Al), SiO<sub>2</sub> (Quartz), TiO<sub>2</sub> (Titanium Dioxide), and SiO<sub>2</sub>. Reflectivity is fairly flat across the spectrum, optimizing it for both CCD imaging and visual use.

#### 2. Multi-layer anti-reflective coatings

Made from precise layers of MgF<sub>2</sub> (Magnesium Fluoride), and HfO<sub>2</sub> (Hafnium Dioxide), which costs nearly \$2000 per kilogram, Hafnium results in a wider band pass than Titanium, used in competitive coatings.

#### 3. High Transmission Water White glass

Our Schmidt-Cassegrain optical systems with optional StarBright® XLT coatings use Water White glass instead of Soda Lime glass for the corrector lens. Water White glass transmits about 90.5% without anti-reflective coatings. That is 3.5% better transmission than uncoated Soda Lime glass. When Water White glass is used in conjunction with StarBright® XLT's anti-reflective coatings, the average transmission reaches 97.4% — an 8% improvement!

These three components of our StarBright® XLT coatings result in one of the finest coatings available. The peak transmission for the systems is 89% at 520 nm. The overall system transmission is 83.5% averaged over the spectrum from 400 to 750 nm.

### News "Flash" — Upgradeable Hand Controls!

Available with NexStar SLT, CPC and C20 Astrograph Telescopes...

The wait is over. The latest NexStar Computerized Control System is now completely upgradeable using flash technology.

Users can download the latest firmware for their telescopes directly from Celestron's website and ensure that their telescope is always on the cutting edge of technology.

### NexRemote™ Remote Control Software

Celestron has been in the forefront of computerized telescope technology for over two decades. We have taken this expertise in telescope technology one step further by introducing the NexRemote™ Telescope Remote Control Software. NexRemote allows the user to control their Celestron computerized telescope from their personal computer. Every function that is normally done using the telescope's hand control can now be duplicated remotely from a PC or laptop. This software was developed for Celestron's telescopes that use the NexStar control system. These include the NexStar SLT Series, Advanced Series, CPC Series and CGE Series (NexRemote ships standard with CPC and CGE Series models).



NexRemote provides full emulation of every aspect of the Celestron Computerized Hand Control including functions such as:

- All telescope alignment options
- Access to the database of objects
- User objects
- Hibernation
- Integration with popular planetarium programs

NexRemote has additional powerful new features that include:

- NexRemote voice output - Allows you to keep your eyes on the stars instead of the LCD by enabling speech support.
- Select the objects you want to see and the order that you want to see them.
- Create and save custom tours using the NexTour feature.
- Reduce the effect of the laptop screen illumination on your eyes using Night Vision Mode.
- Wireless control of the telescope with optional game pad support.
- Use your personal GPS device to interface with NexRemote using NexGPS™.
- Download the latest NexRemote updates online.

Contact your Celestron dealer to find out availability of upgraded models that include NexRemote. NexRemote software comes with a RS-232 cable to connect your Celestron telescope to a PC. The software can be also be purchased separately as a kit from an Authorized Celestron Dealer (Item #93710). The kit includes the NexRemote software and license, a RS-232 cable, and a Serial-to-USB adapter.

### CN16 GPS Accessory Kit

The CN16 will automatically establish your location by downloading the exact time, date, longitude, and latitude from one of many global positioning satellites orbiting the Earth. The CN16 plugs into your telescope's base Aux port and adds an extra element of simplicity, convenience, and accuracy to your stargazing.



## TELESCOPE CHARACTERISTICS

This section looks at the separate component parts of a telescope. This will help you in making important decisions when selecting a telescope model. This section also discusses the uses of a telescope for astronomy or terrestrial (land viewing) use. It is important to read this section if you aren't sure which Celestron telescope product is right for you.

### What Is A Telescope?

A telescope is, simply, a light collector. Its main task is to form the brightest possible optical image of the object on which it is focused. This task is accomplished by the primary optical element, called the “primary” or “objective” inside the telescope’s optical tube. “Primary” usually refers to the mirror in a reflecting telescope while “objective” refers to the main lens of a refracting telescope. The image formed by the primary is then magnified by a removable component called an eyepiece. By using different eyepieces, you can change the magnification and the field of view of what you see through the telescope.

When comparing telescopes, there are a number of characteristics that can help identify their differences. The most common ones are: Light Gathering Power, Limiting Magnitude, Resolution, and Magnification. No matter what types of optical designs you compare, these characteristics provide valuable information that will help you determine what you can expect to see through a telescope.

### Light Gathering Power

**The most important characteristic of a telescope is its light gathering ability.** The light gathering capability of a telescope is determined by the diameter of its aperture. The larger the aperture, the more light it collects. When looking at a star, nebula, or galaxy it’s especially important that as much light be gathered as possible. Fainter celestial objects may be invisible to smaller aperture telescopes. Without enough light, dim objects cannot be seen, no matter how much they might be magnified!

The relationship between a telescope’s light gathering power and the diameter of its lens or mirror is not directly proportional. As the diameter gets larger, the amount of light gathered increases by the square of the diameter. So if you double the diameter of the primary lens, its light gathering ability increases by four times!

To calculate the light collecting area:

Light Collecting Area =  $\pi r^2$  (where  $\pi = 3.1416$  and  $r$  = the radius of the primary)

For an 8” primary: Light Collecting Area =  $3.1416 \times 4^2 = 50.24$  square inches

For an 4” primary: Light Collecting Area =  $3.1416 \times 2^2 = 12.56$  square inches

### Limiting Magnitude

Astronomers use a system of “magnitudes” to indicate the brightness of a stellar object. An object is said to have a certain numerical magnitude with 0 (the star Vega) as the baseline. The larger the magnitude number, the fainter the object. Each magnitude is a difference in brightness by a factor of 2.51 times. For example, a star that is considered 5th magnitude is 100 times fainter than Vega, a zero magnitude star ( $2.51^5$ ). The faintest star you can see with your unaided eye is about sixth magnitude (from dark skies) whereas the brightest stars are magnitude zero (or even a negative number).

The faintest star you can see with a telescope (under excellent seeing conditions) is referred to as the “limiting magnitude”. The limiting magnitude of a telescope is directly related to aperture. Larger apertures allow you to see fainter objects. A rough formula for calculating the visual limiting magnitude of any telescope is:  $7.5 + 5 \text{ LOG (aperture in cm)}$ . For example, the limiting magnitude of an 8” (20.32cm) aperture telescope is 14.0.

Limiting Magnitude =  $7.5 + 5 \text{ LOG } 20.32 = 7.5 + (5 \times 1.3) = 14.0$ .

Atmospheric conditions and the visual acuity of the observer will often reduce limiting magnitude.

### Resolution

Resolution is the ability of a telescope to render fine detail. Higher resolution lets you see more detail on the surface of a planet or separate stars that are close together. Resolution is measured in terms of degrees of arc (called degrees), minutes of arc (called arcminutes), and seconds of arc (called arcseconds). Thus, something that spans one degree of arc is also 60 arcminutes, or 3600 arcseconds (60 x 60). So, something that is one arcsecond is very small — only 1/3600th of a degree.

Resolution for a given telescope is calculated using the formula: Resolution =  $((1.22 \times \lambda) / D) \times 206265$  where resolution is in arcseconds, “ $\lambda$ ” is the wavelength of light (.00055mm for common visible wavelengths), “D” is the diameter of the primary in millimeters and 206265 is the number of arcseconds in one Radian.

### Magnification

Magnification is frequently referred to as “power” and is a function of the focal lengths of both the primary and the eyepiece. The focal length is the distance from the primary lens or mirror to the point where an image is formed. The eyepiece magnifies the image formed by the primary.

The highest magnification you can reasonably achieve with your telescope is once again determined by the size and light gathering ability of the primary. The practical limit is about 60 times the diameter of the primary in inches. So, an 8” telescope should not be expected to produce reasonable images if the telescope/eyepiece combination produces a magnification greater than 480x. In practice, the amount of magnification that can be used will often be reduced by atmospheric conditions.

Since many astronomical objects are relatively large but faint, moderate magnification and a larger diameter primary to gather light is the best combination for viewing most celestial objects. When looking at stars, high power is of little use since they always look like pinpoints (stars are so far away they can not be resolved as anything other than a pinpoint).

To calculate magnification:

$$\text{Magnification} = \frac{(\text{Focal Length of Primary in mm})}{(\text{Focal Length of Eyepiece in mm})}$$

So, for a 8” SCT using a 25mm eyepiece:

$$\text{Magnification} = 2000/25 = 80 \text{ times the power of the unaided eye.}$$

### The Mount and Tripod

To a large extent, a telescope is only as good as its tripod and mount. A telescope magnifies everything, including vibration. That’s why many telescopes with good optics are rendered useless when supplied on an inexpensively made mount. Since you’ll be using a mount’s controls to track the slow and steady apparent movement of the stars, a suitable mount’s adjustments should be smooth, yet precise.

### Altazimuth vs. Equatorial

There are two basic types of mounts: Altazimuth (Alt-Azimuth) and Equatorial. Altazimuth mounts are the simplest type of mount with two motions: altitude (up and down/vertical) and azimuth (side-to-side/horizontal). Good Altazimuth mounts will have slow motion cable controls to make precise adjustments, which aid in keeping tracking motion smooth.

## MOUNT AND TELESCOPE TYPES

### Altazimuth vs. Equatorial (cont.)

These type mounts are good for terrestrial observing and for scanning the sky at lower power but are not advised for deep sky photography.

Both Altazimuth and Equatorial mounts can track the stars sufficiently for visual use, however, only equatorials can be used for long exposure astrophotography. Since Altazimuth mounts are not aligned with the Earth's axis, they must use both axes to track an object. With Altazimuth mounts you will be able to accurately track an object centered in the field of view, however over time all the other stars in the field will appear to rotate around the center of the field. This is hardly noticeable in an eyepiece, but is obvious on film.

### Altazimuth Advantages

- Easy to setup and use
- Least expensive type of mount
- Ideal for terrestrial observing

### Altazimuth Disadvantages

- Cannot be used for long exposure photography
- Non-computerized models cannot track stars and planets



On an Equatorial mounting, the two axes are perpendicular to each other as they are on an Altazimuth mount. But on an Equatorial mounting, the left-to-right axis has been tilted so that it is parallel to the Earth's axis instead of at the horizon. On an Equatorial mount, only the axis that is parallel to the Earth's axis, needs to be rotated. On an Altazimuth mount, BOTH axes must be moved.

If you would like to do long exposure photography, the telescope must be mounted on an equatorial mount. Some Celestron telescopes that are on Altazimuth mountings can be tilted up (with the use of an equatorial wedge) to orient the azimuth axis parallel to the Earth's axis.

### Equatorial Advantages

- Best for long exposure photography
- Easy to use visually because only one axis movement compensates for Earth's rotation
- Setting circles on non-computerized models help locate astronomical objects



### Equatorial Disadvantages

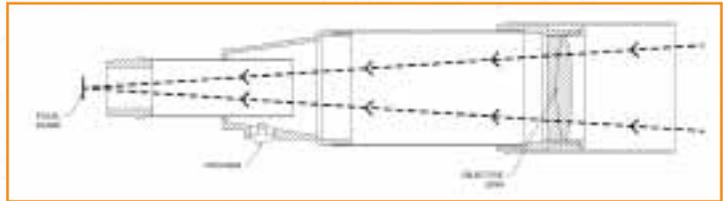
- Set-up is more extensive because of polar alignment requirements
- Not suitable for terrestrial use

### Do you want a GoTo computerized telescope?

Many Celestron telescopes are computerized "GoTo" telescopes. GoTo capability is very useful for the novice who needs assistance in finding objects in the night sky. Since there is a large database of celestial objects, it is unnecessary to refer to star charts to identify objects. Once the telescope is properly aligned and an object is selected, the telescope will automatically "go to" the object. GoTo equipped Celestron telescopes include both altazimuth and equatorial models. Even without GoTo, many Celestron equatorial scopes have manual setting circles that allow you to find objects in the sky with the help of a good star map.

There are a number of factors to consider when selecting a particular telescope. These factors will usually depend on your individual requirements including cost, portability, versatility, usability and appearance. You should also consider how you plan to use the instrument both now and in the future. Most important, consider your budget and portability requirements, and select a telescope with the largest aperture possible.

### Types of Telescopes



### Refractor Telescope

A refractor telescope uses a lens as the primary. The lens at the front of the telescope bends the light passing through it until it comes to a single point called the "focal plane".

The long, thin tubes of refractor telescopes look much the same as those Galileo used centuries ago. High quality optical glass and multi-coatings provide today's sky watchers views Galileo never dreamed of. The refractor type of telescope is very popular with individuals who want mechanical simplicity, rugged reliability and ease of use. Because the focal length is limited by the length of the tube, refractor telescopes become quite bulky and expensive beyond a four inch aperture. This limits the light gathering properties of refractor telescopes, but it is an excellent choice for beginners and those who prefer simple operation and versatility. Refractor telescopes are also a popular choice because of their unobstructed view, high contrast and good definition.

### Refractor Advantages:

- Easy to set up and use
- Simple and reliable design
- Little or no maintenance
- Excellent for lunar, planetary and binary star observing especially in larger apertures
- Good for terrestrial viewing
- High contrast images with no secondary mirror or diagonal obstruction
- Color correction is good in achromatic designs and excellent in apochromatic and fluorite designs
- Sealed optical tube reduces image-degrading air currents and protects optics
- Objective lens is permanently mounted and aligned

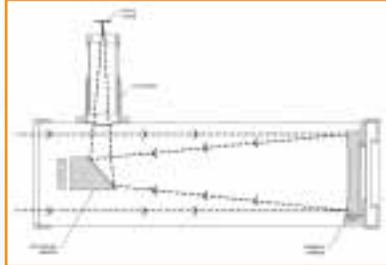
### Refractor Disadvantages

- More expensive per inch of aperture than Newtonians or Catadioptrics
- Heavier, longer and bulkier than equivalent aperture Newtonians and Catadioptrics
- The cost and size factors limit the practical maximum size primary to smaller apertures
- Some color aberration in achromatic designs (doublet)

## TELESCOPE TYPES

### Newtonian Reflector Telescope

A Newtonian reflector uses a single concave mirror as its primary. Light enters the tube traveling to the mirror at the back end. Light is then “bent” forward in the tube to a single point, its focal plane. A flat mirror called a “diagonal” intercepts the light and points it out the side of the tube at right angles to the tube through the eyepiece. The eyepiece is placed there for easy viewing.



Newtonian Reflector telescopes replace heavy lenses with mirrors to collect and focus the light, providing much more light gathering power for the money. You can have focal lengths up to 1000mm and still enjoy a telescope that is relatively compact and portable. Newtonian Reflector telescopes do require more care and maintenance because the primary mirror is exposed to air and dust. However, this small drawback does not hamper this type of telescope’s popularity with those who want an economical telescope that can still resolve faint, distant objects.

Newtonian reflectors produce a “right-side-up image” but the image will appear rotated based on the location of the eyepiece holder in relation to the ground. Newtonian reflectors are best for astronomical use where right-side-up does not matter.

### Newtonian Advantages

- Lowest cost per inch of aperture compared to Refractors and Catadioptrics since mirrors can be produced at less cost than lenses in medium to large apertures
- Reasonably compact and portable up to focal lengths of 1000mm
- Excellent for faint deep sky objects such as remote galaxies, nebulae and star clusters due to the generally fast focal ratios (f/4 to f/8)
- Adequate for lunar and planetary work
- Good for deep sky astrophotography (but not as convenient and more difficult to use than Catadioptrics)
- Free of color aberration due to the use of a primary mirror

### Newtonian Disadvantages

- Generally not suited for terrestrial applications
- Slight light loss due to secondary (diagonal) obstruction when compared with Refractors

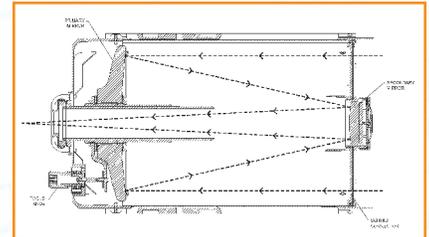
### Catadioptric Telescopes

Catadioptrics use a combination of mirrors and lenses to “fold” (reflect) the light path and form an image. There are two popular designs: the Schmidt-Cassegrain and the Maksutov-Cassegrain. In a Schmidt-Cassegrain, the light enters through a thin aspheric Schmidt correcting lens. It then strikes the spherical primary mirror. It is reflected back up the tube and intercepted by a small secondary mirror which reflects the light out an opening in the rear of the instrument where the image is formed at the eyepiece. Catadioptrics are the most popular and most modern type of telescope optical design and are marketed throughout the world in 3.5” and larger apertures.

Catadioptric telescopes combine the practical advantages of lenses and mirrors while eliminating their disadvantages. They offer the clarity and contrast of refractors with the low aberration of reflectors. Catadioptrics have an average focal ratio of f/10 which is wide enough for all types of photography. They are also easier to maintain because all optical elements are solidly mounted and rigidly collimated. Catadioptric telescopes provide the best possible combination of light gathering power, long focal length, portability and affordability.

### Schmidt-Cassegrain Advantages

- Best all-purpose telescope design
- Combines the optical advantages of both lenses and mirrors while eliminating their disadvantages
- Excellent optics and razor sharp images over a wide field
- Excellent for deep sky observing and astrophotography
- Very good for lunar, planetary and binary star observing
- Excellent for terrestrial viewing and photography
- Focal ratio generally around f/10
- Closed tube design reduces image-degrading air currents
- Extremely compact and portable
- Easy to use
- Durable and virtually maintenance free
- Large apertures at reasonable cost and less expensive than equivalent aperture refractors
- Most versatile type of telescope
- More accessories available than with other types of telescopes
- Best near focus capability of any type of telescope



### Schmidt-Cassegrain Disadvantages

- More expensive than Newtonians of equal aperture
- Slight light loss due to secondary mirror obstruction compared to refractors

### Maksutov-Cassegrain Telescopes

The Maksutov-Cassegrain is similar to the Schmidt-Cassegrain with essentially the same advantages and disadvantages. It uses a thick meniscus correcting lens with a strong curvature and a secondary mirror that is usually an aluminized spot on the corrector. The Maksutov secondary mirror is typically smaller than the Schmidt’s which gives it slightly better resolution for planetary observing.

### Advantages of Maksutov-Cassegrain Compared to Schmidt-Cassegrain

- Smaller secondary obstruction results in a slight increase in planetary detail and contrast
- Less expensive to manufacture
- Longer focal lengths resulting in higher magnifications for planetary viewing



### Disadvantages of Maksutov-Cassegrain Compared to Schmidt-Cassegrain

- Slightly heavier because of the thick meniscus correcting lens
- Increased time to reach thermal stability in larger apertures over 90mm
- Longer focal lengths resulting in smaller field of views

# TELESCOPES

## FIRSTSCOPE SERIES



## STARHOPPER SERIES



## NEXSTAR SLT SERIES



## ADVANCED SERIES



## CPC SERIES

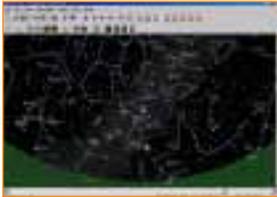


## CGE SERIES



## C20 ASTROGRAPH





Locate and identify thousands of celestial objects on your laptop or PC with "The Sky" Level 1 software included FREE with every FirstScope model.



FirstScope 114EQ

## The Celestron FirstScope Series was designed with the first-time telescope buyer in mind.

Offering exceptional value, these scopes feature compact and portable designs with ample optical performance to excite any newcomer to the world of amateur astronomy. Each telescope has its own design characteristics to help you choose which is best for you. The smaller FirstScopes feature refractor optical designs while the larger aperture models feature Newtonian reflector optical systems.

### Which FirstScope model best fits your needs?

If you're looking for a dual-purpose telescope appropriate for both terrestrial and celestial viewing, then a refractor model is for you. Refractors produce bright, clear images of the Moon and planets as well. It is easy to see the moons of Jupiter and the rings of Saturn with every one of these fine instruments. For views of the brighter deep space objects like galaxies and nebulae, we recommend the larger aperture and light gathering ability of the Newtonian reflectors.

If your interest is strictly watching whales, spotting birds, or viewing nature, altazimuth-mounted models are ideal. A model featuring a German Equatorial mount is a good choice for viewing stars, nebulae, star clusters, and planets

When used for astronomical viewing, FirstScopes yield breathtaking views of the Moon, Saturn with its ring structure, Jupiter and its belts and moons, nebulae and star clusters. Add an optional solar filter, and you can observe activity on the Sun.

Every instrument features all glass optical elements as well as smooth operating aluminum tripod mountings featuring slow motion controls on most models. Refractor models feature coated optics for enhanced image brightness and clarity. There are FirstScope models that use altazimuth mountings suitable for terrestrial as well as astronomical viewing.

Equatorial models are intended for astronomical use only. Adding a motor drive that moves one axis to compensate for the Earth's rotation can enhance equatorial mounts. When properly aligned, the motor keeps objects in the field of view for longer periods without having to move the telescope by hand. Alignment also improves the accuracy of the setting circles. Setting Circles are used to locate objects by means of coordinates found in optional star charts.

Every FirstScope model features Celestron's commitment to quality and design features.

## FIRSTSCOPE SERIES FEATURES AT A GLANCE

### Standard Features and Accessories Include:

- All coated glass optics for clear, crisp images
- Rugged pre-assembled aluminum tripod for increased sturdiness
- StarPointer™ advanced red dot LED finderscope for accurately locating celestial objects
- Choice of German Equatorial mount with setting circles and slow motion adjustment controls or Altazimuth mount with slow motion control
- Quick and easy no-tool setup
- Deluxe accessory tray for convenient storage of accessories
- 1 1/4" eyepieces for wider fields of view and increased magnification power
- "The Sky" Level 1 planetarium software with 10,000 object database and enhanced images



NexStar 4 • Moon • Image courtesy of Mario Mariani

# FIRSTSCOPE SERIES



FirstScope  
60AZ



FirstScope  
60EQ



FirstScope  
70EQ



FirstScope  
76EQ



**NEW!**

FirstScope  
90AZ



**NEW!**

FirstScope  
90EQ



FirstScope  
114



FirstScope  
114 Compact

## FIRSTSCOPE SERIES SPECIFICATIONS

Model	Item #	Aperture	Type	Focal Length	Eyepieces	Finderscope	Mount	Weight
60AZ	21052	60mm (2.4")	Refractor	700mm f/12	20mm (35x), 10mm (70x)	StarPointer™	Altazimuth	7 lbs
60EQ	21067	60mm (2.4")	Refractor	900mm f/15	20mm (45x), 10mm (90x)	StarPointer™	Equatorial	11 lbs
70EQ	21076	70mm (2.8")	Refractor	900mm f/13	20mm (45x), 10mm (90x)	StarPointer™	Equatorial	17 lbs
76EQ	31032	76mm (3")	Reflector	700mm f/9	20mm (35x), 10mm (70x)	StarPointer™	Equatorial	15 lbs
90AZ	21084	90mm (3.5")	Refractor	1000mm f/11	20mm (50x), 10mm (100x)	StarPointer™	Altazimuth	19 lbs
90EQ	21085	90mm (3.5")	Refractor	1000mm f/11	20mm (50x), 10mm (100x)	StarPointer™	Equatorial	22 lbs
114EQ	31044	114mm (4.5")	Reflector	900mm f/8	20mm (45x), 10mm (90x)	StarPointer™	Equatorial	19 lbs
114EQ Compact	31041	114mm (4.5")	Reflector	1000mm f/9	20mm (50x), 10mm (100x)	StarPointer™	Equatorial	16 lbs

For complete specifications and product information, visit: [www.celestron.com](http://www.celestron.com)

FIRSTSCOPE SERIES



C11 • Saturn • Image courtesy of Damian Peach

Celestron's StarHopper series of Dobsonian telescopes are available in 6", 8", 10" and 12" apertures. Dobsonian telescopes are recognized by amateur astronomers as an excellent value for the aperture size, and our StarHopper line is as rich in features as it is in value.

## The StarHopper Configuration is a Newtonian Optical Tube Mounted on an Altazimuth Mount.

This optical system is characterized by a large primary mirror at the bottom of the tube which collects light and concentrates it onto a small secondary mirror. The light is then reflected out the side of the tube and into the eyepiece. Best of all, StarHopper Dobsonians are easy to observe with. The user navigates through the night sky by simply moving the tube up or down, or side to side, by hand.

All Celestron StarHoppers use optical quality BK-7 glass. This is the same high-quality glass used in most binocular prisms and refractor telescope lenses. All StarHoppers use a roller track bearing on the azimuth surface providing dozens of support points for smooth swivel motion. They also use a variable tension clutch system for proper balance and control in both altitude and azimuth. The 10" & 12" StarHoppers have cooling fans built into the rear cell to decrease cooling times.

The 8", 10" and 12" models come standard with 2" focuser and 1.25" adapter. The 10" & 12" models come standard with a 32mm 2" eyepiece. 12" StarHoppers use a 9-point flotation mirror cell for equal support of the primary mirror.

StarHopper 10



10" & 12" StarHoppers have cooling fans built-in to the rear cell to decrease cooling times.

## STARHOPPER SERIES FEATURES AT A GLANCE

### Standard Features and Accessories Include:

- Adjustable roller track bearing on the azimuth surface provides a smooth motion
- Variable tension clutch system for proper balance and control in both altitude and azimuth
- Optical quality BK7 annealed glass provides better thermal expansion properties than standard plate glass mirrors
- Built-in cooling fan improves mirror cooling time and reduces damaging tube currents (for StarHopper 10" and 12" models)
- 9-point flotation mirror cell gives equal support of the primary mirror to minimize mirror deflection (for StarHopper 12" model)
- Quick release finder bracket with spring loaded pivot and x-y adjustments
- Carrying handle and eyepiece holder for convenience



C11 • Jupiter • Image courtesy of Damian Peach



# STARHOPPER® SERIES



StarHopper 6



StarHopper 8



StarHopper 10



StarHopper 12

## STARHOPPER SERIES SPECIFICATIONS

Model	Item #	Primary Mirror	Type	Focal Length	Eyepieces	Finderscope	Focuser
StarHopper 6	10600	6"	Dobsonian	48"	25mm-1 <sup>1</sup> / <sub>4</sub> "	6x30	1 <sup>1</sup> / <sub>4</sub> "
StarHopper 8	10800	8"	Dobsonian	48"	25mm-1 <sup>1</sup> / <sub>4</sub> "	9x50	2" with 1 <sup>1</sup> / <sub>4</sub> " adapter
StarHopper 10	10110	10"	Dobsonian	50"	32mm E-Lux™ 2"	9x50	2" with 1 <sup>1</sup> / <sub>4</sub> " adapter
StarHopper 12	10112	12"	Dobsonian	60"	32mm E-Lux™ 2"	9x50	2" with 1 <sup>1</sup> / <sub>4</sub> " adapter

For complete specifications and product information, visit: [www.celestron.com](http://www.celestron.com)



NexStar 130 SLT

## The completely new NexStar series....

Designed to be an affordable entry level to mid-level computerized GoTo telescope, the NexStar SLT refractors and reflectors are available in the most popular sizes and are loaded with valuable design features. With pre-assembled, adjustable stainless steel tripods, and quick release fork arms and tubes, NexStar SLT telescopes can be set up in a matter of minutes — with no tools required!

You can see details of the lunar surface, Venus and its phases, Mars resolved as an orange disc, Jupiter and its four moons, Saturn with its rings plainly visible and much more! Most NexStar SLT's can also be used as a land-based spotting telescope.

## Intelligent Design

Powered by 8 AA user supplied batteries or an optional AC adapter (#18773) these NexStar GoTo's love to travel. The internal battery compartment provides power to the high precision servo motors for rigid low-vibration performance while eliminating cord wrap issues associated with external battery packs.

With the NexStar's ergonomically-designed hand control, the user is free to remove the hand control from its holder for remote use or leave it cradled for hands-free operation. With a touch of a button you can select the object catalog, change the slew speed, view fascinating information about an object, or simply know if a desired object is visible in the sky.

## Celestron's Revolutionary SkyAlign

Using Celestron's patented SkyAlign\* (patent pending), simply input the date, time and location into the hand control then slew the telescope to any three bright celestial objects in the sky. You do not need to know the names of the stars — you could even pick the moon or bright planets!

\*For more information on SkyAlign, see information on page 2



## Compatible with:



## NEXSTAR SLT SERIES FEATURES AT A GLANCE

### Standard Features and Accessories Include:

- Computerized hand control with 4,000+ object database
- Quick-release fork arm mount, optical tube and accessory tray for quick no tool set up
- SkyAlign allows you to align on any three bright celestial objects, making for a fast and easy alignment process
- Comes with "The Sky" Level 1 planetarium software and NSOL telescope control software for controlling your telescope via computer
- Internal battery compartment to prevent cord wrap during use
- Sturdy stainless steel tripod
- StarPointer finderscope to help with alignment
- Auxiliary port for additional accessories such as GPS accessory
- Motorized altazimuth mount and fully computerized hand control
- U.S. and International city database to easily set your location
- Flash upgradeable hand control software and motor control units

# NEXSTAR® SLT SERIES

C102 • Rosette Nebula • Image courtesy of Frederic Caron



**NEW!**

NexStar  
60 SLT



**NEW!**

NexStar  
80 SLT



**NEW!**

NexStar  
102 SLT



**NEW!**

NexStar  
114 SLT



**NEW!**

NexStar  
130 SLT

## NEXSTAR SLT SERIES SPECIFICATIONS

Model	Item #	Aperture	Type	Focal Length	Eyepieces	Finderscope	Mount	Weight
60 SLT	22076	60mm (2.4")	Refractor	700mm f/12	25mm (28x), 9mm (78x)	StarPointer™	Altazimuth	9.5 lbs
80 SLT	22086	80mm (3.1")	Refractor	900mm f/11	25mm (36x), 9mm (100x)	StarPointer™	Altazimuth	14 lbs
102 SLT	22096	102mm (4")	Refractor	660mm f/6.5	25mm (26x), 9mm (73x)	StarPointer™	Altazimuth	14 lbs
114 SLT	31143	114mm (4.5")	Reflector	1000mm f/9	25mm (40x), 9mm (111x)	StarPointer™	Altazimuth	15 lbs
130 SLT	31145	130mm (5")	Reflector	650mm f/5	25mm (26x), 9mm (62x)	StarPointer™	Altazimuth	18 lbs

For complete specifications and product information, visit: [www.celestron.com](http://www.celestron.com)



Advanced  
C11-SGT

The Advanced Series family of computerized GoTo and non-computerized telescopes was designed to offer the novice or more advanced user a selection of models with the features and quality that serious amateurs can appreciate. These scopes come on heavy-duty German Equatorial mounts with ultra-sturdy 2" stainless steel legs and center tray for superior rigidity and vibration dampening. The Advanced Series comes in refractor, reflector, Maksutov-Cassegrain and Schmidt-Cassegrain models. The refractor models range from a 3" (80mm) to an impressive 6" aperture and include our NEW 80ED and 100ED refractors. For even more light gathering power there are 6", 8" and 10" Newtonian Reflectors. We added a 5" Maksutov-Cassegrain with our NEW C130 model. There are also 8", 9 1/4" and our NEW 11" Schmidt-Cassegrain optical designs that feature Celestron's precision matched and hand-figured optical systems.

## CG-5 Mount — Precision Engineered For Stability

Our new CG-5 German Equatorial mount has precision worm gears on both axes for extremely smooth operation. The key component that makes this system the most stable in its class is the heavy-duty tripod. It features larger and more substantial legs that offer excellent damping characteristics for more stable views. The CG-5 also has a convenient latitude scale for easier alignment and an optional polar finderscope for the ultimate in precision alignments.



## GoTo Convenience and GPS Compatibility For Precision Accuracy

We are proud to offer the GT versions of the Advanced Series on a computerized GoTo version of Celestron's sturdy CG-5 mount. Couple this solidly-built mount with the included NexStar® computerized control system to utilize many of the same functions and features as Celestron's most advanced GoTo telescopes. GoTo models are also upgradeable to GPS with the optional CN16 GPS Accessory (#93966). This accessory allows your telescope to pinpoint your location on the Earth, the date and time, and makes the alignment process faster and easier than ever before! These GoTo versions of the Advanced Series also come loaded with new software features and over 40,000 database objects. Capable of holding over 35 lbs of payload and slewing at 3° per second, you will be able to instantly point to any of the celestial objects in the database.

## Auxiliary Port Accessory Kit

The Auxiliary Port Accessory (Item #93965) was designed to expand your Advanced GT's ability to interface with multiple devices including personal computers and the Celestron CN16 GPS accessory. The Auxiliary Port Accessory has a PC port which allows the user to download and update motor control firmware from the internet. It has two auxiliary ports, one for the NexStar Hand Control and one for the CN16 GPS accessory.



Note: The Auxiliary Port Accessory comes standard in the CN16 GPS Accessory Kit for the Advanced GT Series (#93966). The Programming Cable is NOT included in the CN16 GPS Accessory Kit for the Advanced GT Series.

## Options Available On Selected Advanced Models

See product specifications for applicable models.





C8 • Swan Nebula • Image courtesy of Sebastian Voltmer



# ADVANCED SERIES

**NEW!**



Advanced  
C80ED-R

**NEW!**



Advanced  
C100ED-R



Advanced  
C4-R

**NEW!**



Advanced  
C130-MGT  
Computerized

## ADVANCED SERIES FEATURES AT A GLANCE

### Standard Features and Accessories Include:

- Computerized or non-computerized CG-5 German Equatorial Mount (CG-4 with C4-R and C6-N)
- CG-5 Mount features precision worm gears on both axes for extremely smooth tracking and slewing
- CG-5 Mount uses large shafts and bearings and substantial base castings for additional stability
- Ultra sturdy adjustable tripod with 2" stainless steel legs
- 2" focuser that allows use of 2" eyepieces on C6-R, C6-R GT, C8-N, C8-N GT, C10-N, C10N GT, C80ED, C80ED-RGT, C100ED, C100ED-RGT
- "The Sky" Level 1 software

### Computerized GT Model Features Include:

- 40,000+ object database
- DC servo motors with encoders on both axes
- Hand control with double line, 16 character LCD display; red night vision backlighting
- RS-232 communication port on hand control; Auxiliary Port and Autoguider port on motor drive

## ADVANCED SERIES SPECIFICATIONS

Model	Item #	Aperture	Type	Focal Length	Eyepieces	Finderscope	Mount	Computerized	Weight
C80ED-R	21021	80mm (3.1")	Refractor	600mm f/7.5	20mm (30x)	6x30	CG-5	No	42 lbs
C80ED-RGT	21022	80mm (3.1")	Refractor	600mm f/7.5	20mm (30x)	6x30	CG-5	Yes	42 lbs
C100ED-R	21026	100mm (4")	Refractor	900mm f/9	20mm (45x)	9x50	CG-5	No	50 lbs
C100ED-RGT	21027	100mm (4")	Refractor	900mm f/9	20mm (45x)	9x50	CG-5	Yes	50 lbs
C4-R	21016	102mm (4")	Refractor	1000mm f/10	20mm (50x)	6x30	CG-4	No	36 lbs
C130-M	31063	130mm (5")	Maksutov	2000mm f/15	32mm (63x)	10x50	CG-5	No	51 lbs
C130-MGT	31064	130mm (5")	Maksutov	2000mm f/15	32mm (63x)	10x50	CG-5	Yes	51 lbs

For complete specifications and product information, visit: [www.celestron.com](http://www.celestron.com)

# ADVANCED SERIES

C11 • Orion Nebula • Image courtesy of Sebastian Voltmer



Advanced  
C6-N



Advanced  
C6-NGT  
Computerized



Advanced  
C6-RGT  
Computerized



Advanced  
C8-NGT  
Computerized



Advanced  
C8-S



Advanced  
C8-SGT  
Computerized

## ADVANCED SERIES SPECIFICATIONS

Model	Item #	Aperture	Type	Focal Length	Eyepieces	Finderscope	Mount	Computerized	Weight
<b>C6-N</b>	31056	150mm (6")	Reflector	750mm f/5	20mm (38x)	6x30	CG-4	No	35 lbs
<b>C6-N-HD</b>	31053	150mm (6")	Reflector	750mm f/5	20mm (38x)	6x30	CG-5	No	54 lbs
<b>C6-NGT</b>	31054	150mm (6")	Reflector	750mm f/5	20mm (38x)	6x30	CG-5	Yes	54 lbs
<b>C6-R</b>	21019	150mm (6")	Refractor	1200mm f/8	20mm (60x)	9x50	CG-5	No	68 lbs
<b>C6-RGT</b>	21020	150mm (6")	Refractor	1200mm f/8	20mm (60x)	9x50	CG-5	Yes	68 lbs
<b>C8-N</b>	31061	200mm (8")	Reflector	1000mm f/5	20mm (50x)	9x50	CG-5	No	67 lbs
<b>C8-NGT</b>	31062	200mm (8")	Reflector	1000mm f/5	20mm (50x)	9x50	CG-5	Yes	67 lbs
<b>C8-S</b>	11025	203mm (8")	Schmidt-Cassegrain	2032mm f/10	25mm (81x)	6x30	CG-5	No	54 lbs
<b>C8-S (XLT)</b>	11025-XLT	203mm (8")	Schmidt-Cassegrain	2032mm f/10	25mm (81x)	6x30	CG-5	No	54 lbs
<b>C8-SGT</b>	11026	203mm (8")	Schmidt-Cassegrain	2032mm f/10	25mm (81x)	6x30	CG-5	Yes	54 lbs
<b>C8-SGT (XLT)</b>	11026-XLT	203mm (8")	Schmidt-Cassegrain	2032mm f/10	25mm (81x)	6x30	CG-5	Yes	54 lbs



C8 • Andromeda Galaxy • Image courtesy of Sebastian Voltmer



# ADVANCED SERIES



Advanced  
C9 1/4-S



Advanced  
C9 1/4-SGT  
Computerized



Advanced  
C10-NGT  
Computerized

**NEW!**



Advanced  
C11-S

**NEW!**



Advanced  
C11-SGT  
Computerized

## ADVANCED SERIES SPECIFICATIONS

Model	Item #	Aperture	Type	Focal Length	Eyepieces	Finderscope	Mount	Computerized	Weight
<b>C9 1/4-S</b>	11045	235mm (9 1/4")	Schmidt-Cassegrain	2350mm f/10	25mm (94x)	6x30	CG-5	No	74 lbs
<b>C9 1/4-S (XLT)</b>	11045-XLT	235mm (9 1/4")	Schmidt-Cassegrain	2350mm f/10	25mm (94x)	6x30	CG-5	No	74 lbs
<b>C9 1/4-SGT</b>	11046	235mm (9 1/4")	Schmidt-Cassegrain	2350mm f/10	25mm (94x)	6x30	CG-5	Yes	74 lbs
<b>C9 1/4-SGT (XLT)</b>	11046-XLT	235mm (9 1/4")	Schmidt-Cassegrain	2350mm f/10	25mm (94x)	6x30	CG-5	Yes	74 lbs
<b>C10-N</b>	11047	254mm (10")	Reflector	1200mm f/4.7	20mm (60x)	9x50	CG-5	No	93 lbs
<b>C10-NGT</b>	11048	254mm (10")	Reflector	1200mm f/4.7	20mm (60x)	9x50	CG-5	Yes	93 lbs
<b>C11-S</b>	11066	279mm (11")	Schmidt-Cassegrain	2800mm f/10	40mm (70x)	9x50	CG-5	No	91 lbs
<b>C11-S (XLT)</b>	11066-XLT	279mm (11")	Schmidt-Cassegrain	2800mm f/10	40mm (70x)	9x50	CG-5	No	91 lbs
<b>C11-SGT</b>	11067	279mm (11")	Schmidt-Cassegrain	2800mm f/10	40mm (70x)	9x50	CG-5	Yes	91 lbs
<b>C11-SGT (XLT)</b>	11067-XLT	279mm (11")	Schmidt-Cassegrain	2800mm f/10	40mm (70x)	9x50	CG-5	Yes	91 lbs

For complete specifications and product information, visit: [www.celestron.com](http://www.celestron.com)



CPC 800

## Celestron Professional Computerized Series (CPC) 8", 9.25", 11"

The telescopes of tomorrow are here today! New alignment technology, advanced engineering, and a bold new design at a price that is out of this world!

Celestron's new CPC Series with revolutionary SkyAlign Alignment Technology re-defines everything that amateur astronomers are looking for — quick and simple alignment, GPS, unsurpassed optical quality, ease of set-up and use, ergonomics, enhanced computerization and, most important, affordability.

### Internal GPS

The CPC Series' internal GPS receiver automatically downloads the date and time from orbiting satellites and pinpoints its exact location on Earth. This eliminates the need for you to manually enter the date, time, longitude and latitude.

### Celestron's Revolutionary SkyAlign

Once the CPC's internal GPS has established the telescope's position, aligning the telescope is as easy as 1-2-3! Simply locate and manually point (slew) the telescope to three bright celestial objects. You do not need to know the names of the stars — you may even pick the moon or bright planets!

Celestron's NexStar® software technology will model the night sky to determine the position of every star, planet and celestial object above the horizon. Once aligned, the remote hand control allows direct access to each of the celestial catalogs in its user-friendly database.

### Celestial Object Database

The CPC database contains over 40,000 celestial objects including Messier objects, the Caldwell Catalog, as well as NGC Galaxies, nebulae and planets. User-definable filter limits make navigating through this expansive database quicker and easier. When using the "filter limits" feature, only those objects that are above the horizon are displayed for your exact date, time and location.

### Innovative Features

The new CPC Series telescopes, like our acclaimed Advanced Series and premium CGE Series telescopes feature meticulously matched and hand-figured optical systems that are manufactured in our facilities in Torrance, California. In addition, all CPC models are available with optional StarBright XLT High Performance Optical Coatings. With the introduction of the CPC Series, Celestron has "gone back to the drawing board" and re-designed, re-engineered, and re-invented a telescope family that provides superior quality, unsurpassed ease of use, and incomparable value. All CPC models ship standard with our NexRemote telescope control software.

### Features Available On Selected CPC Models

See product specifications for applicable models.



C8 • Orion Nebula • Image courtesy of Sebastian Voltmer



CPC 800  
Rear View



## CPC FEATURES AT A GLANCE

- Re-designed drive base and drive mechanics — quiet operation; large drive gears, quick release clutch; Auxiliary ports for AutoGuider, PC; easily mounts to tripod
- SkyAlign Alignment Technology — simply choose three bright celestial objects, the telescope does the rest
- Convenient remote hand control holder — allows you to view information hands-free while using the scope
- 40,000+ object database
- Flash upgradeable hand control software and motor control units
- Easy to locate over-sized clutching knobs on both axes for manual use
- All metal quick release finderscope bracket with spring loaded pivot and easy to use x-y adjustment screws
- Ultra-wide 9.8" bearing track drive base provides smooth stable tracking at any rate
- Ergonomic design — comfortably lift and move the telescope from location to location
- Permanent Periodic Error Correction (PEC)
- NexRemote™ Included
- Newly designed tripod: heavy-duty steel leg tripod with accessory tray/center leg support bracket for rock solid stability; spring-loaded mounting screws and recessed mounting platform for quick setup

## CPC SPECIFICATIONS

Model	Item #	Aperture	Type	Focal Length	Eyepieces	Finderscope	Coating	Weight
<b>CPC 800</b>	11073	203mm (8")	Schmidt-Cassegrain	2032mm f/10	40mm (51x)	8x50	Starbright®	61 lbs
<b>CPC 800 (XLT)</b>	11073-XLT	203mm (8")	Schmidt-Cassegrain	2032mm f/10	40mm (51x)	8x50	Starbright® XLT	61 lbs
<b>CPC 925</b>	11074	235mm (9.25")	Schmidt-Cassegrain	2350mm f/10	40mm (59x)	8x50	Starbright®	77 lbs
<b>CPC 925 (XLT)</b>	11074-XLT	235mm (9.25")	Schmidt-Cassegrain	2350mm f/10	40mm (59x)	8x50	Starbright® XLT	77 lbs
<b>CPC 1100</b>	11075	279mm (11")	Schmidt-Cassegrain	2800mm f/10	40mm (70x)	8x50	Starbright®	84 lbs
<b>CPC 1100 (XLT)</b>	11075-XLT	279mm (11")	Schmidt-Cassegrain	2800mm f/10	40mm (70x)	8x50	Starbright® XLT	84 lbs

For complete specifications and product information, visit: [www.celestron.com](http://www.celestron.com)



CGE 1400

The CGE series is Celestron's line of observatory class Schmidt-Cassegrain telescopes. Offered in 8", 9 1/4", 11" and 14" apertures, all are mounted on the state of the art CGE GoTo German Equatorial mount. The German Equatorial mount has long been the favored choice of astronomy buffs and astrophotographers because of its stability and portability. More stable because the center of gravity is directly over the center of its base, and more portable because it can be disassembled into smaller component parts for easy storage and transportation. For astrophotography, the German Equatorial mount offers easier balancing, unlimited space at the rear of the telescope tube to mount a camera, and whole sky access. All CGE models ship standard with our NexRemote telescope control software.

In addition to being fully computerized with a database of over 40,000 celestial objects, the CGE German Equatorial mount offers numerous design advantages:

### Designed For Portability

Set up and transportation of the CGE telescopes is made easy by separating the CGE instruments into individual, easy-to-carry components. Unlike fork arm mounted telescopes, the CGE's optical tubes can be quickly removed from its mounts making even the CGE 1400 easily assembled by only one person.

### Recognized For Superior Stability

German Equatorial mounts place the center of gravity directly over the tripod legs making the system extremely stable. This proven design reduces the "tuning fork" vibration that can be associated with undersized fork mounts. An improved Super HD Tripod supports the CGE mount. This fully extendable tripod is made from the finest cold rolled carbon steel and can be raised to a height of 50". The tripod uses a dual leg support for maximum rigidity with an upper leg brace to provide an outward preload and a lower leg brace providing inward tension.

### CGE Equatorial Mounts Can Easily Be Balanced In Both Axes

Balancing the weight of camera equipment and other visual accessories is accomplished by simply sliding the counterweight for Right Ascension and moving the optical tube along its dovetail mounting for Declination. This means that no additional weight needs to be added to balance the telescope when additional accessories are added.

### Clearance For Accessories

CGE mounts support their tubes at a single contact point allowing the tube to move freely around its polar axis without making contact with the telescope's mount. This is particularly useful when adding photographic and CCD instruments that extend from the rear of the telescope.

### GPS Compatible

All CGE mounted telescopes are compatible with Celestron's CN16 GPS accessory (Item #93967). Combine the GPS and built-in Hibernate mode and these telescopes will keep track and remember their exact location and time without the need to re-enter the information into the remote hand control.



### Features Available On Selected CGE Models

See product specifications for applicable models.



# CGE SERIES

C14 • Tarantula Nebula • Image courtesy of Sébastien Voltmer



## CGE SERIES FEATURES AT A GLANCE

### Mechanical Features

- Carbon Fiber Tube – Strong and lightweight (CGE 925 and 1400 feature aluminum optical tubes)
- CNC machined aluminum and stainless steel components
- Autoguide port, PC port and auxiliary ports located on the electronic pier
- Strain relief power cord cable protection
- Backlit power switch
- Drive Motors – Made in the U.S.A., Pittman® LO-COG™ brush-commutated DC motors offer smooth, quiet operation and long life
- Precision Bronze Worm Gear – 32 pitch, 5.625" pitch diameter, 180 tooth bronze gear. Manufactured to AGMA Quality Class 10 standard, which minimizes total composite error and backlash
- Bearing and Shaft – Stainless steel worm shaft has 0.4375 pitch diameter and is preloaded with two ball bearings; the single piece steel worm is made to minimize run-out, which is a source of periodic error
- No-slip clutch system for pointing precision
- Schmidt-Cassegrain mechanism that moves the primary mirror to adjust focus is supported by two pre-loaded ball bearings, minimizing the "mirror flop" typical of bushing focus mechanisms
- Latitude range: 10° to 60° northern or southern hemispheres
- Maximum payload: 65 lbs

### Tripod

- Adjustable height: 36" to 50"
- Leg material: cold rolled carbon steel
- Upper leg diameter: 2.75"; lower leg diameter: 2.375"

### Electronic and Software Features

- GoTo system is precision accurate to 1.5 arcminutes
- 40,000+ object database with 400 user-defined objects
- Hibernate – maintains alignment even while powered down
- Polar alignment routines for Northern and Southern hemispheres
- Filter limits – displays only objects above the horizon, also allows for user-defined limits
- Permanent programmable periodic error correction (PEC) – corrects for periodic tracking errors inherent to all worm drives
- Smooth ramping of slew motors to reduce wear on the drive train
- Home sensors on R.A. and Dec axes
- Fail-safe slew limit switches in R.A.
- Real-time clock – maintains time even when powered down
- 12VDC Servo Motors with integrated optical encoders with 0.11 arcsecond resolution
- NexRemote™ Included

## CGE SERIES SPECIFICATIONS

Model	Item #	Aperture	Type	Focal Length	Eyepieces	Finderscope	Mount	Computerized	Weight
<b>CGE 800</b>	11058	200mm (8")	Schmidt-Cassegrain	2032mm f/10	25mm (81x)	6x30	CGE	Yes	113 lbs
<b>CGE 800 (XLT)</b>	11058-XLT	200mm (8")	Schmidt-Cassegrain	2032mm f/10	25mm (81x)	6x30	CGE	Yes	113 lbs
<b>CGE 925</b>	11059	235mm (9 1/4")	Schmidt-Cassegrain	2350mm f/10	25mm (94x)	6x30	CGE	Yes	134 lbs
<b>CGE 925 (XLT)</b>	11059-XLT	235mm (9 1/4")	Schmidt-Cassegrain	2350mm f/10	25mm (94x)	6x30	CGE	Yes	134 lbs
<b>CGE 1100</b>	11061	279mm (11")	Schmidt-Cassegrain	2800mm f/10	40mm (70x)	9x50	CGE	Yes	142 lbs
<b>CGE 1100 (XLT)</b>	11061-XLT	279mm (11")	Schmidt-Cassegrain	2800mm f/10	40mm (70x)	9x50	CGE	Yes	142 lbs
<b>CGE 1400</b>	11063	355mm (14")	Schmidt-Cassegrain	3910mm f/11	40mm (90x)	9x50	CGE	Yes	184 lbs
<b>CGE 1400 (XLT)</b>	11063-XLT	355mm (14")	Schmidt-Cassegrain	3910mm f/11	40mm (90x)	9x50	CGE	Yes	184 lbs
<b>CGE 1400</b>	11064-XLT	355mm (14")	Schmidt-Cassegrain	3910mm f/11	40mm (90x)	9x50	CGE	Yes	184 lbs

For complete specifications and product information, visit: [www.celestron.com](http://www.celestron.com)

# C20 ASTROGRAPH

C20 • Dumbbell Nebula • Image courtesy of Richard Hedrick

**The C20 Astrograph is a complete telescope system featuring a revolutionary optical design that delivers pinpoint stars across the entire field.**

**Goal:** To design, engineer, and manufacture the finest large aperture optical system possible for both imaging and visual observation.

**Achievement:** The C20 Astrograph is the first telescope system of its kind ever offered by a large commercial telescope manufacturer.

After evaluating numerous design options, our solution to the design of this instrument is a 20" (1/2 meter) diameter f/6.8 coma-correct flat-field Dall-Kirkham Cassegrain (corrected Dall-Kirkham) optical assembly that is mounted on a newly designed, massive CGE Pro observatory-class computerized German Equatorial mount.

## Revolutionary Optical System

**Celestron's Corrected Dall-Kirkham design exceeds the off-axis performance of even the Ritchey-Chrétien design.** RMS spot sizes at the edge of a 35mm frame remain smaller than a single pixel on the most advanced CCD cameras available to amateurs today. The optical system also features a conical primary mirror with low thermal mass and three cooling fans to minimize the cool down time. This no-compromise design provides the superb resolving power Dall-Kirkham telescopes are known for, but without the coma and field curvature that has previously limited their wide-field performance. Because of its flat-field design, you'll find it a joy to use for imaging as well as visual use. The C20 optical system will come standard with Celestron's advanced StarBright® XLT High Performance Optical system.

## The CGE Pro Mount

The tracking accuracy of this observatory-class mount is better than 5 arcseconds peak to valley without enabling the PEC function. The C20 Astrograph mount separates into three components for easier transporting and includes fully integrated electronics as well as Celestron's renowned and proven NexStar® software. It is also supplied with NexRemote® Pro, a software package that creates models of the mount which yields observatory class pointing accuracy.

## In A Class Of Its Own

Other telescopes that are in this premium category, such as the Ritchey-Chrétien, cost many thousands of dollars more than a C20 and require that the optical tube, mount, and tripod be purchased separately. In contrast, the C20 Astrograph is a complete package.

The C20 system includes the optical assembly, a carbon-fiber truss system which minimizes refocusing due to temperature changes, high performance computerized German Equatorial mount, and professional class pier/tripod. The pier will be available in both portable and permanent versions.

## An Engineering Triumph

The C20 is without a doubt the most sophisticated telescope that Celestron has ever designed and manufactured. The C20 is a system that meets the highest standards Celestron sets for technical innovation, design and engineering superiority, precision performance, and uncompromising optical quality.

**We are now proud to offer our C20 OTA, CGE Pro Mount, CGE Pro Tripod and CGE Pro Pier for sale separately.**



C20 Astrograph

CGE Pro  
Observatory-Class  
Computerized  
German Equatorial  
Mount

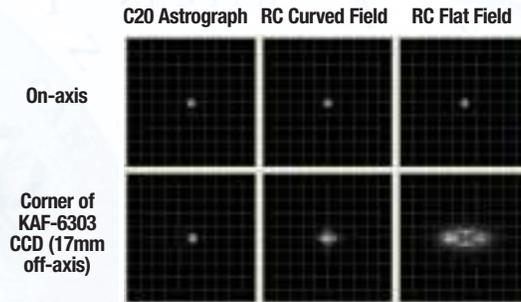
# C20 ASTROGRAPH

C20 • Whirlpool Galaxy • Image courtesy of Richard Hedrick

## Optical performance comparison of the C20 astrograph with an equivalent Ritchey-Chrétien (RC) system.

Grid squares are 9 microns and represent the pixel size of the KAF-6303 CCD. The RC has a curved field and requires a field flattener to achieve optimum imaging performance. The C20 has an inherently flat field. Simulated wavelength is 550 nm.

Note: The C20 optical performance is the same whether using the system visually or using the system for imaging since it has a flat field. The RC design has a curved field. This means that the system will perform visually like the example labeled RC curved field because the eye can accommodate the curved field of the design. When imaging, the design will perform like the example labeled RC flat field.



## C20 ASTROGRAPH FEATURES AT A GLANCE

### OTA Features

- Coma-Corrected Flat-Field Dall-Kirkham Cassegrain (Corrected Dall-Kirkham) - The C20 is called an Astrograph because it is designed for a coma free flat field which gives pinpoint stars across a large CCD chip or a wide field eyepiece.
- 20" (Half meter) aperture - Large aperture for imaging faint objects with ultra fine resolution.
- F/6.8 Focal Ratio - A fast system f-ratio for shorter image times and a wider field of view. This is 28% faster than f/8 and 54% faster than f/10.
- Carbon Fiber Dual Truss Design - both the lower primary mirror cage and the upper cage are supported by a truss design made of carbon fiber tubes; this minimizes expansion and contraction due to temperature change, and therefore limits the change in focus.
- Carbon Fiber Light Shrouds - Carbon fiber light shrouds are available for the C20 OTA; the lower light shroud comes standard while the upper light shroud is optional and removable. The shrouds physically protect the mirror and block unwanted stray light.
- Filtered Cooling Fans - Three fans blow filtered air onto the back of the primary mirror to minimize cool-down times.
- Fixed Conical Primary Mirror - The primary is fixed at Celestron to ensure that the focal plane of the optics is true to the focal plane of the mechanics; the primary is molded in a conical shape to reduce thermal mass (for quick cooling) and minimize flexure of the optics.
- Spherical Secondary - A spherical secondary is much more forgiving to centering errors compared to ellipsoidal or hyperbolic secondaries used in competing high-end telescope designs; the result is that with the C20 you can easily align the system to get the performance you paid for. With aspheric secondaries, you may never achieve the performance you paid for.
- Dovetail Expansion Joint - the dovetail is made of aluminum and thus expands and contracts due to temperature changes; the C20 dovetail has a built-in expansion joint which allows it to expand and contract without inducing stress to the optical tube.
- 3.5" Heavy Load Focuser - This Crayford style focuser has been modified to run on a lead screw rather than a friction surface; the result is a focuser that can handle heavy imaging equipment without the focus shifting due to changes in the telescope's orientation.
- Temperature Sensors - The C20 has built-in temperature sensors; with the optional control electronics, the sensors detect the temperature of the primary mirror and the ambient air, and automatically control the fans to minimize any temperature differential that may exist.

### Mount Features

- Heavy Duty Computerized CGE Pro Mount - Weighing over 150 pounds the mount is massive enough to hold payloads of 180 pounds.
- Meridian Limits - This mount can track more than 30 degrees beyond the meridian; this is more than any other German Equatorial mount in the high-end market.
- Internal Wiring - For a permanent setup, the mount has an internal path through which cable can be routed; for a CCD Camera for instance, the control cable, the Autoguider cable and the power cable can be routed through the mount to minimize dangling wires.
- Internal Switches - Built-in optical switches on both axes give the mount a very accurate home position and will prevent the mount from tracking or slewing to the point where the Dec axis hits the RA axis.
- Clutch System - Four set screws, orthogonal to the RA and Dec axes, lock the axes so there is no slipping; when the set screws are loosened, the axes move freely to facilitate precise balancing of the system.
- NexStar Computerized Control System - The mount comes standard with the latest NexStar Computerized Control System; both the hand control and motor control firmware are upgradeable with the latest firmware revisions which can be downloaded from Celestron's website.
- NexRemote Pro: Software for controlling the C20 from a personal computer; NexRemote Pro models the mount to the sky using multiple alignment stars in order to dramatically increase pointing accuracy. NexRemote Pro has a built-in polar alignment algorithm accurate enough for a permanent observatory and quick enough for a one night observing run; this alignment algorithm does not require sighting on Polaris. Also included is a Finder Screen that acts like a mini-planetarium program, a Mount Model Screen that displays the mount errors and the expected pointing accuracy, and a virtual hand control that has most of the features of the NexStar hand control unit — all displayed on the user's computer screen.



NexRemote Pro Finder Screen



NexRemote Pro Mount Model Screen

## C20 ASTROGRAPH SPECIFICATIONS

Model	Item #	Aperture	Type	Focal Length	Pier/Tripod
<b>C20 Astrograph</b>	11095	0.51m (20")	Corrected Dall-Kirkham	3454mm f/6.8	Professional Class Portable
<b>C20 Astrograph</b>	11096	0.51m (20")	Corrected Dall-Kirkham	3454mm f/6.8	Professional Class Permanent
<b>C20 OTA</b>	91095	0.51m (20")	Corrected Dall-Kirkham	3454mm f/6.8	N/A
<b>CGE Pro Mount</b>	91520	N/A	Computerized German EQ	N/A	N/A
<b>CGE Pro Tripod</b>	93490	N/A	Heavy Duty Field Tripod	N/A	Professional Class Portable
<b>CGE Pro Pier</b>	93491	N/A	Heavy Duty Pier	N/A	Professional Class Permanent

For complete specifications and product information, visit: [www.celestron.com](http://www.celestron.com)

# OPTICAL TUBE ASSEMBLIES

C8 • Eta Carinae • Image courtesy of Sebastian Voltmer



C14-A

Celestron Schmidt-Cassegrain Optical Tube Assemblies (OTA) are available individually for use with your favorite mount. Each OTA is made to the same exacting standards as those used on all our high quality telescopes. All optical surfaces are coated with Celestron's high efficiency StarBright® multi-layered coating group. These tube assemblies are equipped with the same dovetail mounting bar used on the CGE and Advanced Series for easy attachment to a variety of popular mounts. Every tube assembly is made, assembled and quality control tested at our manufacturing facility in Torrance, California.

## OTA FEATURES AT A GLANCE

- Carbon fiber or aluminum tube available on 8" through 11" tubes
- 14" models available only in aluminum
- Optional StarBright® XLT coating is available on all models
- Item #s 91023 and 91038 are FASTAR compatible



C8-CF



C9 1/4-CF



C11-CF

## OPTICAL TUBE ASSEMBLY SPECIFICATIONS

Model	Item #	Aperture	Type	Focal Length	Eyepieces	Finder scope	Dovetail	Coatings	Weight
C8-A	91024	200mm (8")	Aluminum	2032mm f/10	25mm (81x)	6x30	CGE	StarBright®	12 lbs
C8-A (XLT)	91024-XLT	200mm (8")	Aluminum	2032mm f/10	25mm (81x)	6x30	CGE	StarBright® XLT	12 lbs
C8-A	91020	200mm (8")	Aluminum	2032mm f/10	25mm (81x)	6x30	CG-5	StarBright®	12 lbs
C8-A (XLT)	91020-XLT	200mm (8")	Aluminum	2032mm f/10	25mm (81x)	6x30	CG-5	StarBright® XLT	12 lbs
C8-CF	91023	200mm (8")	Carbon Fiber	2032mm f/10	25mm (81x)	6x30	CGE	StarBright®	12 lbs
C8-CF (XLT)	91023-XLT	200mm (8")	Carbon Fiber	2032mm f/10	25mm (81x)	6x30	CGE	StarBright® XLT	12 lbs
C9 1/4-A	91027	235mm (9 1/4")	Aluminum	2350mm f/10	25mm (94x)	6x30	CGE	StarBright®	20 lbs
C9 1/4-A (XLT)	91027-XLT	235mm (9 1/4")	Aluminum	2350mm f/10	25mm (94x)	6x30	CGE	StarBright® XLT	20 lbs
C9 1/4-A	91025	235mm (9 1/4")	Aluminum	2350mm f/10	25mm (94x)	6x30	CG-5	StarBright®	20 lbs
C9 1/4-A (XLT)	91025-XLT	235mm (9 1/4")	Aluminum	2350mm f/10	25mm (94x)	6x30	CG-5	StarBright® XLT	20 lbs
C9 1/4-CF	91026	235mm (9 1/4")	Carbon Fiber	2350mm f/10	25mm (94x)	6x30	CGE	StarBright®	20 lbs
C9 1/4-CF (XLT)	91026-XLT	235mm (9 1/4")	Carbon Fiber	2350mm f/10	25mm (94x)	6x30	CGE	StarBright® XLT	20 lbs
C11-A	91036	279mm (11")	Aluminum	2800mm f/10	40mm (70x)	9x50	CGE	StarBright®	27 lbs
C11-A (XLT)	91036-XLT	279mm (11")	Aluminum	2800mm f/10	40mm (70x)	9x50	CGE	StarBright® XLT	27 lbs
C11-CF	91035	279mm (11")	Carbon Fiber	2800mm f/10	40mm (70x)	9x50	CGE	StarBright®	27 lbs
C11-CF (XLT)	91035-XLT	279mm (11")	Carbon Fiber	2800mm f/10	40mm (70x)	9x50	CGE	StarBright® XLT	27 lbs
C11-A	91067	279mm (11")	Aluminum	2800mm f/10	40mm (70x)	9x50	CG-5	StarBright®	27 lbs
C11-A (XLT)	91067-XLT	279mm (11")	Aluminum	2800mm f/10	40mm (70x)	9x50	CG-5	StarBright® XLT	27 lbs
C14-A	91037	355mm (14")	Aluminum	3910mm f/11	40mm (98x)	9x50	CGE	StarBright®	45 lbs
C14-A (XLT)	91037-XLT	355mm (14")	Aluminum	3910mm f/11	40mm (98x)	9x50	CGE	StarBright® XLT	45 lbs
C14-A (XLT)	91038-XLT	355mm (14")	Aluminum	3910mm f/11	40mm (98x)	9x50	CGE	StarBright® XLT	45 lbs

For complete specifications and product information, visit: [www.celestron.com](http://www.celestron.com)

C8 • Trifid Nebula • Image courtesy of Sebastian Voltmer



## CG-5 MOUNT FEATURES

### CG-5 Mount — Precision engineered for stability

The CG-5 German Equatorial mount has precision worm gears on both axes for extremely smooth operation. The key element that makes this system the most stable in its class is the heavy-duty tripod with larger and more substantial legs that offer excellent damping characteristics for more stable views. The CG-5 also has a convenient latitude scale for easier alignment and an optional polar finder scope for the ultimate in precision alignments.

### CG-5 Computerized — GoTo convenience and GPS compatibility for precision accuracy

We are proud to offer a computerized GoTo version of Celestron's sturdy CG-5 mount. Couple this solid mount with the included computerized control system to utilize many of the same functions and features — like the NexStar computer control system and an Autoguider port for long exposure deep sky astrophotography — as Celestron's most advanced GoTo telescopes. GoTo models are also upgradeable to GPS with the optional CN16 GPS Accessory (#93966) allowing your telescope to pinpoint your position on the earth, the date and time, making the alignment process faster and easier than ever before!

### Options Available On Computerized Mounts

See product specifications for applicable models.



## CGE MOUNT FEATURES

### Recognized For Superior Stability

An improved Super HD Tripod supports the CGE mount. This fully extendable tripod is made from the finest cold rolled carbon steel and can be raised to a height of 50". The tripod uses a dual leg support for maximum rigidity with an upper leg brace to provide an outward preload and a lower leg brace providing inward tension.

### CGE Equatorial Mounts Can Easily be Balanced on Both Axes

Balancing the weight of camera equipment and other visual accessories is accomplished by simply sliding the counterweight for Right Ascension and moving the optical tube along its dovetail mounting for Declination. This means that no additional weight needs to be added to balance the telescope when additional accessories are added.

### Clearance For Accessories

CGE mounts support their tubes at a single contact point allowing the tube to move freely around its polar axis without making contact with the telescope's mount. This is particularly useful when adding photographic and CCD instruments that extend from the rear of the telescopes.

### GPS Compatible

All CGE mounts are compatible with Celestron's CN16 GPS accessory (Item #93967). Combine the GPS and built-in Hibernate mode and these mounts will keep track and remember their exact location and time without the need to re-enter the information into the remote hand control.

## MOUNT SPECIFICATIONS

Model	Item #	Description	Weight
CG-5 Mount	91517	German Equatorial Mount and Tripod. Includes one 11lb. Weight	41 lbs
CG-5 Computerized Mount	91518	Same as #91517 plus dual-axis slew motors and computerized hand control w/ 40,000+ object database	42 lbs
CGE Computerized Mount	91524	German Equatorial Mount and Tripod. Includes one 25lb. weight	114 lbs

For complete specifications and product information, visit: [www.celestron.com](http://www.celestron.com)

# ACCESSORIES

C11 using Celestron's NexImage • Jupiter • Image courtesy of Jason Fournier

## Astro Imaging Made Easy

Whether you currently own a telescope or are contemplating a purchase, Celestron's NexImage™ Solar System Imaging Kit is a MUST HAVE!

NexImage is a complete CCD solar system imager capable of producing high quality planetary images with greater light sensitivity and color fidelity than comparable CMOS imagers. Combined with the NexImage software package, NexImage can bring out tremendous detail and reveal a final image that will rival those taken with astronomical CCD cameras costing thousands of dollars more.



### NEXIMAGE FEATURES

- View and capture live video on your computer screen
- Software automatically filters out video frames most affected by poor atmospheric "seeing" leaving only the sharpest, clearest frames to be stacked and aligned into one high quality image
- Easy to follow quick start instructions and tutorial with sample video file that will have you producing quality images your first night out
- Camera control software allows you to manually change the gain, contrast, exposure time, frame rate and color saturation using your PC
- Compatibility – threaded on 1.25" adapter barrel makes NexImage compatible with most any telescope.
- Versatility – 1.25" adapter is threaded for standard eyepiece filters and can be removed and replaced with optional focal reducer lens.
- Tutorial – step-by-step Quick start and tutorial complete with sample video file that will have you producing quality images your first night out.
- Power – NexImage uses a 1/4" format color CCD chip that gives the same approximate magnification as a 5mm, 50° field of view eyepiece.

#### NexImage comes with the following:

- NexImage Camera with 1.25" adapter and USB cable attached (7ft long)
- CD-ROM including:
  - Image capture software – to capture streaming video of image
  - Image processing software – to align and stack individual frame into one high quality image.
- Quick Setup and Tutorial – complete with sample images

#### NexImage Specifications

- Chip: 1/4" format, HAD, color CCD chip
- Resolution: VGA 640x480; Size: 3.6mm x 2.7 (4.5mm diagonal)
- Pixel Size: 5.6 micron square
- Sensitivity: <1 lux

#### Recommended Minimum System Requirements:

- PC running Windows 98SE or better; 333Mhz Pentium II or better
- 128 MB of RAM; 40 MB of hard drive space
- Screen resolution of 1024x768 or higher

Model	Item #	Description
NexImage	93712	CCD Solar System Imager

Please visit our web site to see our full line of accessories designed to enhance your astronomical experience. [www.celestron.com](http://www.celestron.com)

## PowerTank 7 & 17

Take your telescope anywhere with this portable rechargeable power supply.

PowerTanks include an emergency light, and booster terminals to start weak car batteries.



### POWER TANK FEATURES

#### PowerTank 7

- 7-amp hour, 12 Volt D.C.
- Two 12V output cigarette lighter ports
- 3V, 6V and 9V outputs for accessories
- Built-in flashlight with red filter cap
- 800,000 candle power Halogen emergency spotlight
- Booster terminal on rear side
- Built-in Circuit Breaker for safety
- Cigarette lighter adapter included
- 110V/220V switchable universal AC adapter included

#### PowerTank 17

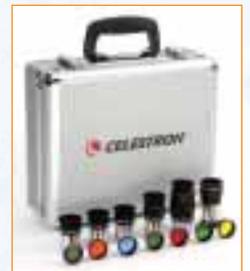
- 17 amp hour, 12 Volt D.C.
- 2 x 12V DC output car jack socket
- 3V, 6V, 9V output jacks
- Built-in AM/FM Radio and Siren
- Removable red filtered flashlight with magnetic back
- Built-in multi-angle 800,000cp emergency Halogen spotlight
- Handy jump-start system - 250 cranking AMPS (5 sec.)
- Built-in circuit breaker for safety
- Cigarette lighter adapter included
- Switchable 110V-220V AC adapter

Model	Item #	Description
PowerTank 7	18774	Portable Rechargeable Power Supply
PowerTank 17	18777	Portable Rechargeable Power Supply

## Eyepiece and Filter Kit

All eyepieces are fully multi-coated offering superb color resolution, edge sharpness and clarity. Supplied are a 4mm, 6mm, 9mm, 15mm, and 32mm.

A 2x Barlow Lens complements the Plössl eyepieces in this kit and gives you a total of ten power combinations. High grade glass optics with fully multi-coated lenses are used so there is no degradation of image. Also included are a variety of lunar and planetary filters, a moon filter and aluminum carrying case.



### EYEPIECE & FILTER KIT FEATURES

- Five Superior Grade Plössl Eyepieces - 1.25" — 4-element design with a 52° AFOV (32mm has 44°); Barlow Lens - 2x 1.25"
- Six Colored Eyepiece (Lunar & Planetary) Filters - 1.25" — Included are Kodak Wratten #12, #21, #25, #56, #58A, and #80A. These filters will greatly enhance your enjoyment of our solar system.
- Moon Filter - 1.25" — A neutral density filter which allows you maximum enjoyment of the moon especially during the brighter phases.
- Aluminum Carrying Case — This sturdy case fits all of the above items in the die-cut foam interior and has room for additional accessories.

Model	Item #	Description
Eyepiece & Filter Kit	94303	1.25" Eyepieces & Filters

For complete specifications and product information, visit: [www.celestron.com](http://www.celestron.com)

# FIRSTSCOPE SERIES SPECIFICATIONS

FirstScope 60 • Moon • Image courtesy of Klaus Modinger

FirstScope Models	21052 FirstScope 60AZ	21067 FirstScope 60EQ	21076 FirstScope 70EQ	31032 FirstScope 76 EQ
<b>Specifications</b>				
Optical Design	Refractor	Refractor	Refractor	Reflector
Aperture	60mm (2.4")	60mm (2.4")	70mm (2.8")	76mm (3")
Focal Length/Ratio	700mm F/12	900mm F/15	900mm F/13	700mm F/9
Finderscope	StarPointer	StarPointer	StarPointer	StarPointer
Mount	Altazimuth	Equatorial	Equatorial	Equatorial
Eyepiece	20mm (35x)	20mm (45x)	20mm (45x)	20mm (35x)
Eyepiece	10mm (70x)	10mm (90x)	10mm (90x)	10mm (70x)
Star Diagonal / Erect Image Eyepiece	1.25" / 1.5x E.I. Eyepiece	1.25" 90°	1.25" 90°	n/a
Accessory Tray	Round, Thread-in	Round, Thread-in	Round, Thread-in	Round, Thread-in
Tripod	Aluminum	Aluminum	Aluminum	Aluminum
CD ROM	The Sky L1	The Sky L1	The Sky L1	The Sky L1
<b>Technical Specifications</b>				
Highest Useful Magnification	142x	142x	165x	180x
Limiting Stellar Magnitude	11.4	11.4	11.7	11.9
Resolution: Rayleigh	2.31 arc seconds	2.31 arc seconds	1.98 arc seconds	1.82 arc seconds
Dawes Limit	1.93 arc seconds	1.93 arc seconds	1.66 arc seconds	1.53 arc seconds
Light Gathering Power	73x unaided eye	73x unaided eye	100x unaided eye	118x unaided eye
Field of View: standard eyepiece	1.20°	.90°	.90°	1.20°
Linear FOV (@1000 yds)	75 ft.	58 ft	48 ft	62 ft.
Secondary Mirror Obstruction	n/a	n/a	n/a	.75" (25% by diameter, 6% by area)
Optical Coatings	Fully Coated	Fully Coated	Fully Coated	Aluminum
Optical Tube Length	28 inches	30 inches	30 inches	27 inches
Telescope Weight	7 lbs	11 lbs	17 lbs	15 lbs

FirstScope Models	21084 FirstScope 90AZ	21085 FirstScope 90EQ	31041 FirstScope 114 Compact	31044 FirstScope 114
<b>Specifications</b>				
Optical Design	Refractor	Refractor	Reflector	Reflector
Aperture	90mm (3.5")	90mm (3.5")	114mm (4.5")	114mm (4.5")
Focal Length	1000mm F/11	1000mm F/11	1000mm F/9	900mm F/8
Finderscope	StarPointer	StarPointer	StarPointer	StarPointer
Mount	Altazimuth	Equatorial	Equatorial	Equatorial
Eyepiece	20mm (50x)	20mm (50x)	20mm (50x)	20mm (45x)
Eyepiece	10mm (100x)	10mm (100x)	10mm (100x)	10mm (90x)
Star Diagonal / Erect Image Eyepiece	1.25" 45° Erect Image	1.25" 90°	n/a	n/a
Accessory Tray	Round, Thread-in	Round, Thread-in	Round, Thread-in	Round, Thread-in
Tripod	Aluminum	Aluminum	Aluminum	Aluminum
CD ROM	The Sky L1	The Sky L1	The Sky L1	The Sky L1
<b>Technical Specifications</b>				
Highest Useful Magnification	213x	213x	269x	269x
Limiting Stellar Magnitude	12.3	12.3	12.8	12.8
Resolution: Rayleigh	1.54 arc seconds	1.54 arc seconds	1.21 arc seconds	1.21 arc seconds
Dawes Limit	1.29 arc seconds	1.29 arc seconds	1.02 arc seconds	1.02 arc seconds
Light Gathering Power	165x unaided eye	165x unaided eye	265x unaided eye	265x unaided eye
Field of View: standard eyepiece	.80°	.80°	.80°	.90°
Linear FOV (@1000 yds)	43 ft.	43 ft.	43 ft.	48 ft.
Secondary Mirror Obstruction	n/a	n/a	1.4" (31% by diameter, 10% by area)	1" (22% by diameter, 5% by area)
Optical Coatings	Multi-Coated	Multi-Coated	Aluminum	Aluminum
Optical Tube Length	40 inches	40 inches	20 inches	34 inches
Telescope Weight	19 lbs	22 lbs	16 lbs	19 lbs

Specifications are subject to change without notice or obligation.

# STARHOPPER SERIES SPECIFICATIONS

C14 • Mars • Image courtesy of Sebastian Voltmer

StarHopper Models	10600 StarHopper 6	10800 StarHopper 8	10110 StarHopper 10	10112 StarHopper 12
Optical Design	Dobsonian Reflector	Dobsonian Reflector	Dobsonian Reflector	Dobsonian Reflector
Aperture	6" (152mm)	8" (203mm)	10" (254mm)	12" (305mm)
Focal Length	48" (1219mm)	48" (1219mm)	50" (1270mm)	60" (1500mm)
Focal Ratio	f/8	f/6	f/5	f/5
Eyepieces	25mm Plossl 1.25"	25mm Plossl 1.25"	32mm e-lux 2"	32mm e-lux 2"
Collimation Cap	Yes	Yes	Yes	Yes
Eyepiece Tray	Yes	Yes	Yes	Yes
Focuser	1.25"	2"	2"	2"
Finder	6x30	9x50	9x50	9x50
Primary	BK7	BK7	BK7	BK7
Cooling	N/A	N/A	Fan	Fan
Mirror Cell	3-point	3-point	3-point	9-point
Azimuth Bearing	Roller track	Roller track	Roller track	Roller track
Altitude Bearing	Nylon Cylinder	Nylon Cylinder	Nylon Cylinder	Nylon Cylinder
Tension System	Variable friction clutch	Variable friction clutch	Variable friction clutch	Variable friction clutch
Handle	Base	Base	Base	Base
Tube	Steel	Steel	Steel	Steel
Highest Useful Magnification	359x	480x	600x	721x
Lowest Useful Magnification	22x	29x	36x	44x
Limiting Stellar Magnitude	13.4	14	14.5	14.9
Resolution: Rayleigh	.91 arcsec	.68 arcsec	.54 arcsec	.45 arcsec
Dawes Limit	.76 arcsec	.57 arcsec	.46 arcsec	.38 arcsec
Light Gathering Power	472	843	1317	1898
Field of View: standard eyepiece (°)	1.03	1.03	1.0	0.83
Linear FOV (@1000 yds)	54.1	54.1	52.5	43.6
Secondary Mirror Obstruction (inches)	1.5	1.95	2.5	2.75
by Diameter	25%	24%	25%	23%
by Area	6.3%	5.9%	6.3%	5.3%
Optical Tube Length	45"	45"	48"	58"
Telescope Weight	46 lbs	54 lbs	65 lbs	80 lb

Specifications are subject to change without notice or obligation.

# NEXSTAR SLT SERIES SPECIFICATIONS

C8 • NGC 772 • Image courtesy of Sebastian Voltmer

NexStar SLT Models	22076 NexStar 60 SLT	22086 NexStar 80 SLT	22096 NexStar 102 SLT	31143 NexStar 114 SLT	31145 NexStar 130 SLT
<b>Specifications</b>					
Optical Design	Refractor	Refractor	Refractor	Reflector	Reflector
Aperture (mm)	60mm (2.4")	80mm (3.1")	102mm (4")	114mm (4.5")	130mm (5")
Focal Length (mm)	700mm	900mm	660mm	1000mm	650mm
Focal Ratio	F/12	F/11	F/6.5	F/9	F/5
Finderscope	StarPointer	StarPointer	StarPointer	StarPointer	StarPointer
Mount	Motorized Altazimuth				
Eyepiece (mm)	25mm (28x)	25mm (36x)	25mm (26x)	25mm (40x)	25mm (26x)
Eyepiece (mm)	9mm (78x)	9mm (100x)	9mm (73x)	9mm (111x)	9mm (72x)
Star Diagonal	1.25"	1.25"	1.25"	n/a	n/a
Accessory Tray	No Tool, Quick release				
Tripod	Pre-assembled Steel				
CD ROM	The Sky L1 & NSOL				
Telescope Control System	NexStar Computer Control System	NexStar Computer Control System	NexStar Computer Control System	NexStar Computer Control System	NexStar Computer Control System
Computerized Hand Control	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons
Database	4,000 Object Database	4,000 Object Database	4,000 Object Database	4,000 Object Database	4,000 Object Database
Slew Speeds	Nine slew speeds: 4° /sec, 2° /sec, 1°/sec, .5 /sec, 32x,16x, 8x, 4x, 2x	Nine slew speeds: 4° /sec, 2° /sec, 1°/sec, .5 /sec, 32x,16x, 8x, 4x, 2x	Nine slew speeds: 4° /sec, 2° /sec, 1°/sec, .5 /sec, 32x,16x, 8x, 4x, 2x	Nine slew speeds: 4° /sec, 2° /sec, 1°/sec, .5 /sec, 32x,16x, 8x, 4x, 2x	Nine slew speeds: 4° /sec, 2° /sec, 1°/sec, .5 /sec, 32x,16x, 8x, 4x, 2x
Tracking Rates	Sidereal, Solar and Lunar				
Tracking Modes	Alt-Az, EQ North & EQ South				
GPS Compatible	CN-16 GPS Accessory				
Alignment Procedures	SkyAlign, Auto 2-Star Align, 1-Star Align, 2-Star Align, Solar System Align	SkyAlign, Auto 2-Star Align, 1-Star Align, 2-Star Align, Solar System Align	SkyAlign, Auto 2-Star Align, 1-Star Align, 2-Star Align, Solar System Align	SkyAlign, Auto 2-Star Align, 1-Star Align, 2-Star Align, Solar System Align	SkyAlign, Auto 2-Star Align, 1-Star Align, 2-Star Align, Solar System Align
<b>Technical Specifications</b>					
Highest Useful Magnification	142x	189x	240x	269x	306x
Limiting Stellar Magnitude	11.4	12	12.5	12.8	13.1
Resolution: Rayleigh (arc sec)	2.31 arc seconds	1.73 arc seconds	1.36 arc seconds	1.21 arc seconds	1.06 arc seconds
Dawes Limit (arc sec)	1.93 arc seconds	1.45 arc seconds	1.14 arc seconds	1.02 arc seconds	.89 arc seconds
Photographic Resolution	171 lines/mm	182 lines/mm	308 lines/mm	228 line/mm	400 line/mm
Light Gathering Power	73x unaided eye	131x unaided eye	212x unaided eye	265x unaided eye	345x unaided eye
Field of View (degrees)					
w/ low power eyepiece	1.6°	1.3°	1.7°	1.1°	1.7°
Linear FOV (ft@1000 yds)	84 ft.	66 ft.	91 ft.	59 ft	91 ft.
Optical Coatings	Fully Coated	Fully Coated	Multi-Coated	Aluminum	Aluminum
Secondary Mirror Obstruction	n/a	n/a	n/a	1.6"	1.7"
Secondary Mirror Obstruction (dia.)	n/a	n/a	n/a	36%	34%
Secondary Mirror Obstruction (area)	n/a	n/a	n/a	13%	12%
Optical Tube Length	28 inches	34 inches	23 inches	19 inches	21 inches
Telescope Weight	10 lbs	14 lbs	14 lbs	15 lbs	18 lbs

Specifications are subject to change without notice or obligation.

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# ADVANCED SERIES SPECIFICATIONS

C11 • Flame Nebula • Image courtesy of Sebastian Voltmer

Advanced Model	21021 C80ED-R	21026 C100ED-R	21016 C4-R	31063 C130-M	31056 C6-N	31053 C6-N HD
<b>Specifications</b>						
Optical Design	Refractor	Refractor	Refractor	Maksutov-Cassegrain	Reflector	Reflector
Aperture	80mm (3.2")	100mm (4")	102mm (4")	130mm(5")	150mm (6")	150mm (6")
Focal Length/Ratio	600mm F/7.5	900mm F/9	1000mm F/10	2000mm F/15.3	750mm f/5	750mm f/5
Eyepiece	20mm (30x)	20mm (45x)	20mm (50x)	32mm (63x)	20mm (38x)	20mm (38x)
Finderscope	6x30	9x50	6x30	10x50	6x30	6x30
Mount	CG-5 Equatorial	CG-5 Equatorial	CG-4 Equatorial	CG-5 Equatorial	CG-4 Equatorial	CG-5 Equatorial
Star Diagonal	1.25"	1.25"	1.25"	1.25"	n/a	n/a
Accessory Tray	yes	yes	yes	yes	yes	yes
Tripod	2" Stainless Steel	2" Stainless Steel	Aluminum	2" Stainless Steel	Aluminum	2" Stainless Steel
CD ROM	The Sky L1					
Counterweights	1-7lbs	1-11 lbs	1-7lb, 1-4lbs	1-11lbs	1-7lbs, 1-4lbs	1-7lbs, 1-4lbs
Power (GT versions only)	Car Battery Adapter					
Fastar Compatible	n/a	n/a	n/a	n/a	n/a	n/a
Highest Useful Magnification	189x	236x	241x	300x	354x	354x
Lowest Useful Magnification	11x	14x	15x	18x	21x	21x
Limiting Stellar Magnitude	12	12.5	12.5	14	13.4	13.4
Resolution: Rayleigh	1.73 arc seconds	1.38 arc seconds	1.36 arc seconds	1.1arc seconds	.92 arc seconds	.92 arc seconds
Dawes Limit	1.45 arc seconds	1.16 arc seconds	1.14 arc seconds	.91 arc seconds	.77 arc seconds	.77 arc seconds
Light Gathering Power	131x unaided eye	204x unaided eye	212x unaided eye	329x unaided eye	459x unaided eye	459x unaided eye
Field of View: standard eyepiece	1.67°	1.1°	1°	.83°	1.3°	1.3°
Linear FOV (@1000 yds)	87.5 ft	70 ft	52.5 ft	44 ft.	68 ft.	68 ft.
Optical Coatings	Fully Multi-Coated	Fully Multi-Coated	Multi-Coated	Multi-Coated	Aluminum	Aluminum
Secondary Mirror Obstruction	n/a	n/a	n/a	1.5"	1.75"	1.75"
by Area	n/a	n/a	n/a	9%	8.5%	8.5%
by Diameter	n/a	n/a	n/a	29%	29%	29%
Optical Tube Length	23 inches	34 inches	40 inches	18 inches	27 inches	27 inches
Telescope Weight	42 lbs	50 lbs	36 lbs	51 lbs	35 lbs	54 lbs

Advanced Computerized Models	21022 C80ED-RGT	21027 C100ED-RGT	31064 C130-MGT	31054 C6-N GT
<b>Additional Specifications for Computerized Models</b>				
Computerized Hand Control	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons
Max Slew Speed	3°/second	3°/second	3°/second	3°/second
Software Precision	24bit, 0.08 arcsec calculation			
Hand Control Ports	RS-232 communication port on hand control			
Motor Ports	Aux Port, Autoguide Ports	Aux Port, Autoguide Ports	Aux Port, Autoguide Ports	Aux Port, Autoguide Ports
Tracking Rates	Sidereal, Solar and Lunar			
Tracking Modes	EQ North & EQ South			
Alignment Procedures	AutoAlign, 2-Star Alignment, Quick Align			
Database	40,000+ objects, 400 user defined programmable objects Enhanced information on over 200 objects	40,000+ objects, 400 user defined programmable objects Enhanced information on over 200 objects	40,000+ objects, 400 user defined programmable objects Enhanced information on over 200 objects	40,000+ objects, 400 user defined programmable objects Enhanced information on over 200 objects
Complete Revised NGC Catalog	7,840	7,840	7,840	7,840
Complete Messier Catalog	110	110	110	110
Complete IC Catalog	5,386	5,386	5,386	5,386
Complete Caldwell	109	109	109	109
Abell Galaxies	2,712	2,712	2,712	2,712
Solar System objects	9	9	9	9
Famous Asterisms	20	20	20	20
Selected CCD Imaging Objects	25	25	25	25
Selected SAO Stars	29,500	29,500	29,500	29,500
Total Object Database	45,492	45,492	45,492	45,492

Specifications are subject to change without notice or obligation.

# ADVANCED SERIES SPECIFICATIONS

C9-1/4 • Trifid Nebula • Image courtesy of Richard Jacobs

Advanced Standard Models	21019 C6-R	11025/11025-XLT C8-S	31061 C8-N	11045/11045-XLT C9.25-S	11047 C10-N	11066/11066-XLT C11-S
<b>Specifications</b>						
Optical Design	Refractor	Schmidt-Cassegrain	Reflector	Schmidt-Cassegrain	Reflector	Schmidt-Cassegrain
Aperture	150mm (6")	203mm (8")	200mm (8")	235mm (9.25")	254mm (10")	279mm (11")
Focal Length/Ratio	1200mm F/8	2032mm F/10	1000mm F/5	2350mm F/10	1200mm F/4.7	2800mm F/10
Eyepiece	20mm (60x)	25mm (81x)	20mm (50x)	25mm (94x)	20mm (60x)	40mm (70x)
Finderscope	9x50	6x30	9x50	6x30	9x50	9x50
Mount	CG-5 Equatorial	CG-5 Equatorial	CG-5 Equatorial	CG-5 Equatorial	CG-5 Equatorial	CG-5 Equatorial
Star Diagonal	1.25"	1.25"	n/a	1.25"	n/a	1.25"
Accessory Tray	yes	yes	yes	yes	yes	yes
Tripod	2" Stainless Steel	2" Stainless Steel	2" Stainless Steel	2" Stainless Steel	2" Stainless Steel	2" Stainless Steel
CD ROM	The Sky L1	The Sky L1	The Sky L1	The Sky L1	The Sky L1	The Sky L1
Counterweights	2-11lbs	1-11lbs	2-11lbs	2-11lbs	3-11lbs	3-11lbs
Power (GT versions only)	Car Battery Adapter	Car Battery Adapter	Car Battery Adapter	Car Battery Adapter	Car Battery Adapter	Car Battery Adapter
Fastar Compatible	n/a	yes	n/a	n/a	n/a	n/a
Highest Useful Magnification	354x	480x	480x	555x	600x	660x
Lowest Useful Magnification	21x	29x	29x	34x	36x	40x
Limiting Stellar Magnitude	13.4	14	14	14.4	14.5	14.7
Resolution: Rayleigh	.92 arc seconds	.68 arc seconds	.69 arc seconds	.59 arc seconds	.54 arc seconds	.50 arc seconds
Dawes Limit	.77 arc seconds	.57 arc seconds	.58 arc seconds	.49 arc seconds	.46 arc seconds	.42 arc seconds
Light Gathering Power	459x unaided eye	843x unaided eye	843 unaided eye	1127x unaided eye	1316 unaided eye	1593x unaided eye
Field of View: standard eyepiece	.83°	.64°	1°	.55°	.83°	.71°
Linear FOV (@1000 yds)	43.8 ft	33.6 ft.	52.5 ft.	29 ft.	43.8 ft.	38 ft.
Optical Coatings	Multi-Coated	StarBright Coating/XLT	Aluminum	StarBright Coating/XLT	Aluminum	StarBright Coating/XLT
Secondary Mirror Obstruction	n/a	2.7"	2.2"	3.35"	2.3"	3.75"
by Area	n/a	11%	8%	13%	5%	12%
by Diameter	n/a	34%	28%	36%	23%	34%
Optical Tube Length	50.5 inches	17 inches	37 inches	22 inches	45 inches	24 inches
Telescope Weight	68 lbs	54.5 lbs	67 lbs	73 lbs	93 lbs	91 lbs

Advanced Computerized Models	21020 C6-R GT	11026/11026-XLT C8-S GT	31062 C8-N GT	11046/11046-XLT C9.25-S GT	11048 C10-N GT	11067/11067-XLT C11-S GT
<b>Additional Specifications for Computerized Models</b>						
Computerized Hand Control	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons
Max Slew Speed	3°/second	3°/second	3°/second	3°/second	3°/second	3°/second
Software Precision	24bit, 0.08 arcsec calculation					
Hand Control Ports	RS-232 communication port on hand control					
Motor Ports	Aux Port, Autoguide Ports	Aux Port, Autoguide Ports	Aux Port, Autoguide Ports	Aux Port, Autoguide Ports	Aux Port, Autoguide Ports	Aux Port, Autoguide Ports
Tracking Rates	Sidereal, Solar and Lunar					
Tracking Modes	EQ North & EQ South					
Alignment Procedures	AutoAlign, 2-Star Alignment, Quick Align					
Database	40,000+ objects, 400 user defined programmable objects Enhanced information on over 200 objects	40,000+ objects, 400 user defined programmable objects Enhanced information on over 200 objects	40,000+ objects, 400 user defined programmable objects Enhanced information on over 200 objects	40,000+ objects, 400 user defined programmable objects Enhanced information on over 200 objects	40,000+ objects, 400 user defined programmable objects Enhanced information on over 200 objects	40,000+ objects, 400 user defined programmable objects Enhanced information on over 200 objects
Complete Revised NGC Catalog	7,840	7,840	7,840	7,840	7,840	7,840
Complete Messier Catalog	110	110	110	110	110	110
Complete IC Catalog	5,386	5,386	5,386	5,386	5,386	5,386
Complete Caldwell	109	109	109	109	109	109
Abell Galaxies	2,712	2,712	2,712	2,712	2,712	2,712
Solar System objects	9	9	9	9	9	9
Famous Asterisms	20	20	20	20	20	20
Selected CCD Imaging Objects	25	25	25	25	25	25
Selected SAO Stars	29,500	29,500	29,500	29,500	29,500	29,500
Total Object Database	45,492	45,492	45,492	45,492	45,492	45,492

Specifications are subject to change without notice or obligation.

ADVANCED SERIES SPECIFICATIONS

# CPC SERIES SPECIFICATIONS

C11 • Dumbbell Nebula • Image courtesy of Sebastian Voltmer

CPC Models	11073/11073-XLT CPC 800	11074/11074-XLT CPC 925	11075/11075-XLT CPC 1100
<b>Specifications</b>			
Optical Design	Schmidt-Cassegrain	Schmidt-Cassegrain	Schmidt-Cassegrain
Aperture	8" (203mm)	9.25" (235mm)	11" (279mm)
Focal Length/Ratio	2032mm F/10	2350mm F/10	2800mm F/10
Finderscope	8x50mm Finderscope w/ quick release bracket	8x50mm Finderscope w/ quick release bracket	8x50mm Finderscope w/ quick release bracket
Mount	Dual Fork Arm	Dual Fork Arm	Dual Fork Arm
Optical Tube	Aluminum	Aluminum	Aluminum
Eyeiece	40mm Plossl (51x)	40mm Plossl (59x)	40mm Plossl (70x)
Star Diagonal	1.25"	1.25"	1.25"
Accessory Tray	Leg Brace / Eyepiece Holder	Leg Brace / Eyepiece Holder	Leg Brace / Eyepiece Holder
Tripod	Heavy Duty Steel Adjustable	Heavy Duty Steel Adjustable	Heavy Duty Steel Adjustable
Power Supply	Car Battery Adapter	Car Battery Adapter	Car Battery Adapter
Telescope Control System	NexStar Computer Control System	NexStar Computer Control System	NexStar Computer Control System
Software	NexRemote control software w/RS232 cable	NexRemote control software w/RS232 cable	NexRemote control software w/RS232 cable
Computerized Hand Control	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons
Hand Control Ports	RS-232 communication port on hand control	RS-232 communication port on hand control	RS-232 communication port on hand control
Drive Base Ports	Aux Port, Autoguide Ports	Aux Port, Autoguide Ports	Aux Port, Autoguide Ports
Database	40,000 Object Database	40,000 Object Database	40,000 Object Database
GPS	Internal 16 channel	Internal 16 channel	Internal 16 channel
<b>Software Specifications</b>			
Motor: Type	DC Servo motors with encoders, both axes	DC Servo motors with encoders, both axes	DC Servo motors with encoders, both axes
Resolution	.1406 arcsecond	.1406 arcsecond	.1406 arcsecond
Slew Speeds	Nine slew speeds: 3° /sec, 2° /sec, .5°/sec, 64x, 16x, 8x, 4x, 1x, .5x	Nine slew speeds: 3° /sec, 2° /sec, .5°/sec, 64x, 16x, 8x, 4x, 1x, .5x	Nine slew speeds: 3° /sec, 2° /sec, .5°/sec, 64x, 16x, 8x, 4x, 1x, .5x
Software Precision	24bit, 0.08 arcsec calculations	24bit, 0.08 arcsec calculations	24bit, 0.08 arcsec calculations
Tracking Rates	Sidereal, Solar and Lunar	Sidereal, Solar and Lunar	Sidereal, Solar and Lunar
Tracking Modes	Altazimuth, EQ North & EQ South	Altazimuth, EQ North & EQ South	Altazimuth, EQ North & EQ South
Alignment Procedures	SkyAlign, Auto Two Star Align, One-Star Align, EQ Align, Solar System Align	SkyAlign, Auto Two Star Align, One-Star Align, EQ Align, Solar System Align	SkyAlign, Auto Two Star Align, One-Star Align, EQ Align, Solar System Align
<b>Mechanical Specifications</b>			
Fork Arm	Dual fork arm, cast aluminum w/ detachable HC cradle	Dual fork arm, cast aluminum w/ detachable HC cradle	Dual fork arm, cast aluminum w/ detachable HC cradle
Gear	5.625" 180 tooth hard anodized aluminum gear mated w/ brass worm	5.625" 180 tooth hard anodized aluminum gear mated w/ brass worm	5.625" 180 tooth hard anodized aluminum gear mated w/ brass worm
Bearings	9.8" azimuth bearing	9.8" azimuth bearing	9.8" azimuth bearing
Periodic Error Correction	Permanently Programmable	Permanently Programmable	Permanently Programmable
<b>Optical Specifications</b>			
Highest Useful Magnification	480x	555x	660x
Lowest Useful Magnification	29x	34x	40x
Limiting Stellar Magnitude	14	14.4	14.7
Resolution: Rayleigh	.68 arc seconds	.59 arc seconds	.50 arc seconds
Dawes Limit	.57 arc seconds	.49 arc seconds	.42 arc seconds
Light Gathering Power	843x unaided eye	1127x unaided eye	1593x unaided eye
Field of View :standard eyepiece	.8°	.7°	.6°
Linear FOV (@1000 yds)	42 ft.	38 ft.	32 ft.
Optical Coatings	Standard: StarBright Coatings Optional: StarBright XLT Coatings	Standard: StarBright Coatings Optional: StarBright XLT Coatings	Standard: StarBright Coatings Optional: StarBright XLT Coatings
Secondary Mirror Obstruction	2.5"	3.35"	3.75"
by Area	10%	13%	12%
by Diameter	31%	36%	34%
Optical Tube Length	17 inches	22 inches	23 inches
Telescope Weight	42 lbs	58 lbs	65 lbs
Tripod/Mount Weight	19 lbs	19 lbs	19 lbs

Specifications are subject to change without notice or obligation.



C11 • M51 Whirlpool Galaxy • Image courtesy of Sebastian Voltmer



# CGE SERIES SPECIFICATIONS

CGE Models	11058/11058-XLT CGE 800	11059/11059-XLT CGE 925	11061/11061-XLT CGE 1100	11063/11063-XLT CGE 1400	11064-XLT CGE 1400
<b>Specifications</b>					
Optical Design	Schmidt-Cassegrain	Schmidt-Cassegrain	Schmidt-Cassegrain	Schmidt-Cassegrain	Schmidt-Cassegrain
Aperture	8" (203mm)	9.25" (235mm)	11" (279mm)	14" (356mm)	14" (356mm)
Focal Length/Ratio	2032mm F/10	2350mm F/10	2800mm F/10	3910mm F/11	3910mm F/11
Finderscope	6x30	6x30	9x50	9x50	9x50
Mount	Computerized Equatorial Mount	Computerized Equatorial Mount	Computerized Equatorial Mount	Computerized Equatorial Mount	Computerized Equatorial Mount
Optical Tube	Carbon Fiber	Aluminum	Carbon Fiber	Aluminum	Aluminum
Fastar Compatible	Yes	No	No	No	Yes
Eyepiece	25mm Plossl- 1.25" (81x)	25mm Plossl - 1.25" (94x)	40mm Plossl - 1.25" (70x)	40mm 2" (98x)	40mm 2" (98x)
Star Diagonal	1.25"	1.25"	1.25"	2" with 1.25" adapter	2" with 1.25" adapter
Tripod	Adjustable, Carbon Steel				
Software	NexRemote control software w/RS232 cable				
Power Supply	Car Battery Adapter				
<b>Technical Specs</b>					
Highest Useful Magnification	480x	555x	660x	840x	840x
Lowest Useful Magnification	29x	34x	40x	51x	51x
Limiting Stellar Magnitude	14	14.4	14.7	15.3	15.3
Resolution: Rayleigh	.68 arc seconds	.59 arc seconds	.50 arc seconds	.39 arc seconds	.39 arc seconds
Dawes Limit	.57 arc seconds	.49 arc seconds	.42 arc seconds	.33 arc seconds	.33 arc seconds
Light Gathering Power	843x unaided eye	1127x unaided eye	1593x unaided eye	2581x unaided eye	2581x unaided eye
Field of View :standard eyepiece	.62°	.53°	.71°	.51°	.51°
Linear FOV (@1000 yds)	32 ft.	28 ft.	38 ft.	27 ft.	27 ft.
Optical Coatings	Standard: StarBright Optional: StarBright XLT				
Secondary Mirror Obstruction by Area	2.7"	3.35"	3.75"	4.5"	4.5"
by Diameter	11%	13%	12%	10%	10%
Optical Tube Length	34%	36%	34%	32%	32%
Optical Tube Weight	17 inches	22 inches	24 inches	31 inches	31 inches
Tripod and Pier	12.5 lbs	20 lbs	27.5 lbs	45 lbs	45 lbs
EQ Mount Weight	41.5 lbs				
Counterweight bar	42 lbs				
Counterweight	5 lbs				
	1 x 11 lbs	1 x 25 lbs	1 x 25 lbs	2 x 25 lbs	2 x 25 lbs
<b>CGE Mount Specifications</b>					
Motor Drive	DC Servo motors with encoders, both axes				
Computerized Hand Control	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons	Double line 16 character, Liquid Crystal Display; 19 LED backlit buttons
Slew Speeds	Nine slew speeds: 4° /sec, 2° /sec, .5°/sec, 64x, 8x, 4x, 1x, .5x	Nine slew speeds: 4° /sec, 2° /sec, .5°/sec, 64x, 8x, 4x, 1x, .5x	Nine slew speeds: 4° /sec, 2° /sec, .5°/sec, 64x, 8x, 4x, 1x, .5x	Nine slew speeds: 4° /sec, 2° /sec, .5°/sec, 64x, 8x, 4x, 1x, .5x	Nine slew speeds: 4° /sec, 2° /sec, .5°/sec, 64x, 8x, 4x, 1x, .5x
Tracking Rates	Sidereal, Solar and Lunar				
Tracking Modes	EQ North & EQ South				
Alignment Procedures	AutoAlign, 2-Star Align, Quick Align, 1-Star Align, Recall Last Alignment, 3-Star Align	AutoAlign, 2-Star Align, Quick Align, 1-Star Align, Recall Last Alignment, 3-Star Align	AutoAlign, 2-Star Align, Quick Align, 1-Star Align, Recall Last Alignment, 3-Star Align	AutoAlign, 2-Star Align, Quick Align, 1-Star Align, Recall Last Alignment, 3-Star Align	AutoAlign, 2-Star Align, Quick Align, 1-Star Align, Recall Last Alignment, 3-Star Align
Software Precision	24bit, 0.08 arcsec calculation				
Database	40,000+ objects, 400 user defined programmable objects. Enhanced information on over 200 objects	40,000+ objects, 400 user defined programmable objects. Enhanced information on over 200 objects	40,000+ objects, 400 user defined programmable objects. Enhanced information on over 200 objects	40,000+ objects, 400 user defined programmable objects. Enhanced information on over 200 objects	40,000+ objects, 400 user defined programmable objects. Enhanced information on over 200 objects
Power Requirements	12 VDC 2.0A				
Idle Current	215mA	215mA	215mA	215mA	215mA
Slew one axis	600mA	600mA	600mA	600mA	600mA
Slew both axes	850mA (with 1A spikes)				
Internal clock	Yes	Yes	Yes	Yes	Yes
GPS Compatible	CN-16 GPS Accessory				

Specifications are subject to change without notice or obligation.

# C20 ASTROGRAPH SPECIFICATIONS

C20 • Eagle Nebula • Image courtesy of Richard Hedrick

C20 Models	11095 C20 Astrograph	11096 C20 Astrograph w/ Permanent Pier
<b>Standard Equipment</b>		
Optical Tube	20" (0.51 m) Corrected Dall-Kirkham	20" (0.51 m) Corrected Dall-Kirkham
Mount	CGE Pro German Equatorial Mount	CGE Pro German Equatorial Mount
Pier/Tripod	Super Heavy Duty Portable Tripod	Permanent Pier
Computerized Drive Control	NexStar Computer Control System	NexStar Computer Control System
Software	NexRemote Pro	NexRemote Pro
Optical Tools	Spacing and collimation tools provided	Spacing and collimation tools provided
Counterweights	6x 22 lbs counterweights	6x 22 lbs counterweights
Focuser	3.5" Heavy Payload Focuser	3.5" Heavy Payload Focuser
Finderscope	8x50 Finderscope w/ quick release bracket	8x50 Finderscope w/ quick release bracket
Power Supply	Car Battery Adapter	Car Battery Adapter

## C20 ASTROGRAPH SPECIFICATIONS

### OTA Specifications

- Design: Coma-Corrected Flat-Field Dall-Kirkham Cassegrain (Corrected Dall-Kirkham)
- Aperture: 20" (0.51 m)
- Focal Length: 3454 mm; System Focal Ratio: 6.8
- Central Obstruction: 39%
- Optical Performance: Flat field over 42mm film plane, 6 micron RMS spot size 21mm off axis
- Weight: 140 lbs
- Back focus: 8.9" (from the Focuser mounting surface of the back plate)

### Primary

- Diameter: 20.25"; Aperture: 20"; F-ratio: 3
- Material: Precision Annealed Pyrex
- Shape: Prolate Ellipsoid
- Coating: StarBright XLT Multilayer Reflective Coating

### Secondary

- Diameter: 7.5"
- Magnification ratio: 2.3x
- Material: Annealed Pyrex
- Coating: StarBright XLT Multilayer Reflective Coating

### Lens Group

- Coma correcting, field flattening, doublet lens group
- Lens Diameter: 90mm
- Coating: StarBright® XLT High Transmission Coating

### Mount Specifications

- Type: Computerized German Equatorial
- Instrument: Capacity 180 lbs
- RA Gear Diameter: 11.25" Anodized Aluminum

- RA Gear tooth count: 360
- RA Worm: 1.0" diameter stainless steel
- RA Shaft Diameter: 2.5" aluminum to match the thermal expansion of the RA bearing housing
- RA Axis Bearings: Contains 4 separate bearings, a 9.8" thrust bearing, 8.16" thrust bearing, 4.33" ball bearing, and 4.33" tapered roller bearing
- DEC Gear Diameter: 9"
- DEC Gear tooth count: 360
- DEC Worm Diameter: .745" diameter stainless steel
- DEC Shaft Diameter: 2.5" aluminum to match the thermal expansion of the DEC bearing housing
- DEC Axis Bearings Contains: 4 separate bearings, a 6.7" thrust bearing, 6.1" thrust bearing, 4.33" ball bearing, and a 4.33" tapered roller bearing
- Latitude Range: 25 - 60 deg (optional latitude wedge for 0 - 90 deg)
- Tracking Accuracy: 5 arcseconds or less without Periodic Error Correction enabled
- Weight: 156 lbs without counterweight shaft
- RA Axis + Latitude Base: 90 lbs
- Dec Axis with dovetail: 66 lbs
- RA Axis: 64 lbs
- Counterweight shaft: 24 lbs
- Counterweight, individual: 22.5 lbs

### Electronics

- Hand Control: NexStar Computerized Hand Control with 40,000+ objects and flash upgradeable
- Software: NexRemote Pro Precision Telescope Guidance Software (for PC Control)
- Power Required: 12V DC, 5 amps; Sidereal Tracking = .33 amps  
Slew Dual Axis = 2 amps

## C20 ASTROGRAPH RECOMMENDED ACCESSORIES

Description	Item #	Description	Item #
Upper Cage Carbon Fiber Light Shroud	62230	PowerTank 17	18777
2" Mirror Diagonal w/ Dielectric Coatings	93530	Focus Motor w/ Electronics Panel	94150
5 Amp Regulated Power Supply	18780		

Specifications are subject to change without notice or obligation.

# OPTICAL TUBE SPECIFICATIONS

C14 • NGC104 • Image courtesy of Sebastian Voltmer

Optical Tubes Model	Item #	Aperture	Tube	Focal Length/Ratio	Eyepieces	Finderscope	Mount	Optical Coatings	Sec. Mirror Obstruction (in., dia., area)	Tube Length	Weight
<b>C8-A</b>	91024	200mm (8")	Aluminum	2032mm f/10	25mm (81x)	6x30	CGE	StarBright®	2.5", 31%, 10%	17"	12.5 lbs
<b>C8-A (XLT)</b>	91024-XLT	200mm (8")	Aluminum	2032mm f/10	25mm (81x)	6x30	CGE	StarBright® XLT	2.5", 31%, 10%	17"	12.5 lbs
<b>C8-A</b>	91020	200mm (8")	Aluminum	2032mm f/10	25mm (81x)	6x30	CG-5	StarBright®	2.5", 31%, 10%	17"	12.5 lbs
<b>C8-A (XLT)</b>	91020-XLT	200mm (8")	Aluminum	2032mm f/10	25mm (81x)	6x30	CG-5	StarBright® XLT	2.5", 31%, 10%	17"	12.5 lbs
<b>C8-CF</b>	91023	200mm (8")	Carbon Fiber	2032mm f/10	25mm (81x)	6x30	CGE	StarBright®	2.7", 34%, 11%	17"	12.5 lbs
<b>C8-CF (XLT)</b>	91023-XLT	200mm (8")	Carbon Fiber	2032mm f/10	25mm (81x)	6x30	CGE	StarBright® XLT	2.7", 34%, 11%	17"	12.5 lbs
<b>C9<sup>1</sup>/4-A</b>	91027	235mm (9 <sup>1</sup> / <sub>4</sub> ")	Aluminum	2350mm f/11	25mm (94x)	6x30	CGE	StarBright®	3.35", 36%, 13%	22"	20 lbs
<b>C9<sup>1</sup>/4-A (XLT)</b>	91027-XLT	235mm (9 <sup>1</sup> / <sub>4</sub> ")	Aluminum	2350mm f/11	25mm (94x)	6x30	CGE	StarBright® XLT	3.35", 36%, 13%	22"	20 lbs
<b>C9<sup>1</sup>/4-A</b>	91025	235mm (9 <sup>1</sup> / <sub>4</sub> ")	Aluminum	2350mm f/11	25mm (94x)	6x30	CG-5	StarBright®	3.35", 36%, 13%	22"	20 lbs
<b>C9<sup>1</sup>/4-A (XLT)</b>	91025-XLT	235mm (9 <sup>1</sup> / <sub>4</sub> ")	Aluminum	2350mm f/11	25mm (94x)	6x30	CG-5	StarBright® XLT	3.35", 36%, 13%	22"	20 lbs
<b>C9<sup>1</sup>/4-CF</b>	91026	235mm (9 <sup>1</sup> / <sub>4</sub> ")	Carbon Fiber	2350mm f/11	25mm (94x)	6x30	CGE	StarBright®	3.35", 36%, 13%	22"	20 lbs
<b>C9<sup>1</sup>/4-CF (XLT)</b>	91026-XLT	235mm (9 <sup>1</sup> / <sub>4</sub> ")	Carbon Fiber	2350mm f/11	25mm (94x)	6x30	CGE	StarBright® XLT	3.35", 36%, 13%	22"	20 lbs
<b>C11-A</b>	91036	279mm (11")	Aluminum	2800mm f/10	40mm (70x)	9x50	CGE	StarBright®	3.75", 34%, 12%	24"	27.5 lbs
<b>C11-A (XLT)</b>	91036-XLT	279mm (11")	Aluminum	2800mm f/10	40mm (70x)	9x50	CGE	StarBright® XLT	3.75", 34%, 12%	24"	27.5 lbs
<b>C11-CF</b>	91035	279mm (11")	Carbon Fiber	2800mm f/10	40mm (70x)	9x50	CGE	StarBright®	3.75", 34%, 12%	24"	27.5 lbs
<b>C11-CF (XLT)</b>	91035-XLT	279mm (11")	Carbon Fiber	2800mm f/10	40mm (70x)	9x50	CGE	StarBright® XLT	3.75", 34%, 12%	24"	27.5 lbs
<b>C11-A</b>	91067	279mm (11")	Aluminum	2800mm f/10	40mm (70x)	9x50	CG-5	StarBright®	3.75", 34%, 12%	24"	27.5 lbs
<b>C11-A (XLT)</b>	91067-XLT	279mm (11")	Aluminum	2800mm f/10	40mm (70x)	9x50	CG-5	StarBright® XLT	3.75", 34%, 12%	24"	27.5 lbs
<b>C14-A</b>	91037	355mm (14")	Aluminum	3910mm f/11	40mm (98x)	9x50	CGE	StarBright®	4.5", 32%, 10%	31"	45 lbs
<b>C14-A (XLT)</b>	91037-XLT	355mm (14")	Aluminum	3910mm f/11	40mm (98x)	9x50	CGE	StarBright® XLT	4.5", 32%, 10%	31"	45 lbs
<b>C14-A (XLT)</b>	91038-XLT	355mm (14")	Aluminum	3910mm f/11	40mm (98x)	9x50	CGE	StarBright® XLT	4.5", 32%, 10%	31"	45 lbs

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