

Celestron[®]
Telescopes ... Telephoto Lenses ... Binoculars



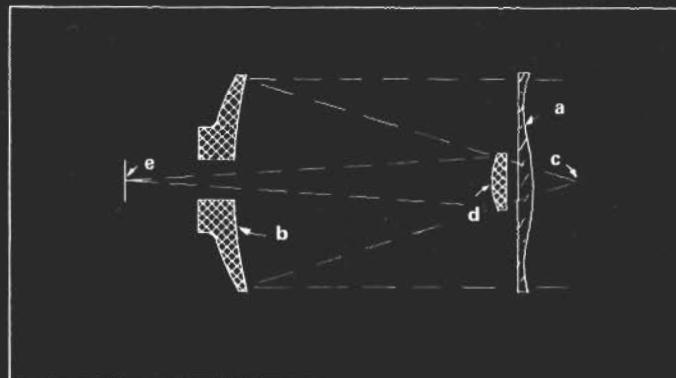
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The Schmidt-Cassegrain Optical System of the Celestron 5, 8, and 14

The light enters the system through a thin glass aspheric corrector plate (a); it is then reflected by a large spherical primary mirror (b) toward the prime focus (c). The light from the primary is intercepted by the convex secondary mirror (d) and reflected back through a hole in the primary mirror to the Cassegrain focus (e). The effect of folding the optical path back with a convex secondary mirror also increases the effective focal length by a factor of three to seven times that of the primary alone.



The Celestron Telescope

General Description and Use

The optical quality of Celestron Telescopes is famous the world over. These telescopes are selected repeatedly by professional educators, amateur astronomers and research scientists, as well as by casual observers and photographers throughout the world.

Attractively modern, Celestron Telescopes are superbly crafted for the discriminating telescope enthusiast. And they are worlds apart in performance, reliability and versatility.

Celestron Telescopes feature large optics, and employ lenses and mirrors to optically fold long high-power focal lengths into a compact configuration. The result is observatory-size optics portably packaged.

Because these telescopes are of large aperture, their images are bright and detailed. Even at high power, the clarity, brilliance and detail of the images will astonish you.

By day, the Celestron is superb for long-distance macroscopy, nature studies, sports action and candid. You can bring into sharp focus the antennae of a butterfly at 15 feet, or the face of a friend at half a mile.

At night under adverse city light conditions you can study the Moon and planets from your backyard — exploring lunar craters and rills. You can observe the Moon-like phases of Venus, the surface features of Mars, the cloud belts of Jupiter, or the rings of Saturn.

Under dark skies, you will have at your fingertips the vast star clouds of the Milky Way, hundreds of globular and galactic star clusters, scores of diffuse and planetary nebulae, and galaxies millions of light-years away. (See "Observing With The Celestron.")

At more than a thousand colleges and universities throughout the world, Celestron Telescopes are adding a new dimension to astronomy education — for the first time giving students access to large, modern, deep-space telescopes and the projects they make possible.

And at science centers around the world, these instruments are finding numerous research and industrial applications in such fields as laser communication, solar energy, satellite tracking, high-altitude atmospheric monitoring and pollution control.

These are truly scientific instruments, at popular prices.

The Ultimate in Operational Simplicity

Rest the Celestron anywhere, swing up its tube and it's ready for casual observing or scanning the night sky. The Celestron is the ultimate in operational simplicity.

With its sturdy fork mount, its slow-motion controls for fine adjustments in telescope point, and its instant-lock

clamps, aiming the instrument is as easy as pointing your finger.

The eyepiece and observing controls are always conveniently located. All are within inches of each other for the comfortably seated observer.

The compact tube and the fork mount of the Celestron rapidly damp wind and mechanical vibrations, assuring image stability for astronomical observing or guided deep-sky exposures.

A closed-tube design eliminates image-degrading air currents inside the tube. It also seals the tube against dust and other contaminants, assuring years of maintenance-free service.

Also standard are finely etched star-locating circles. These setting circles make it easy to dial celestial objects into the field of view when the telescope is equatorially mounted (installed on the Celestron wedge assembly).

And in the base of the Celestron, a system of motors and gears compensates for the Earth's rotation during astronomical observations. This electric clock drive keeps celestial objects centered in the field of view automatically.

All this, and more, has made the Celestron the world's best-selling modern telescope.

And a Telescope That Grows With Your Interests.

But the Celestron is more than a telescope. It is also part of a fully integrated system of photovisual instruments and accessories — the most extensive such system ever offered.

The capability of the Celestron system ranges from casual nature studies to advanced telephotography, and from astronomical observing to professional deep-sky photography.

So the basic features of Celestron Telescopes and the capability of the Celestron system make these the most versatile telescopes available. And they also make the Celestron a telescope that grows with your interests.

For instance, convenient photographic adaptors for terrestrial, planetary or deep-sky photography couple your 35mm SLR camera body to the telescope instantly. And the tube assembly demounts readily from its fork mount for telephotography on photo tripod.

By adding other accessories to the Celestron, you can expand it into a research instrument or into an astro-photographic laboratory. And your photographs will rival in aesthetic quality those produced at the major professional observatories.

This is the Celestron. It is what every telescope should have been in the past. It may well be what every telescope will be in the future.

C90 Astro Telescope



Celestron 8



8 inch Schmidt Camera on the Celestron 14



Observing With The Celestron

Your Window to the Universe

In the astronomical community, there's a saying that "There's no substitute for aperture." Put simply, this means that the larger the diameter of your telescope optics, the more you're going to be able to see — no matter what the power, or the seeing conditions.

We've tried to illustrate this principle — you might call it "the Palomar principle" — as we described the appearance of various celestial objects when viewed through the C5, the C8 and the C14. Read these sections, compare descriptions, and you'll see what we mean.

You'll also see the advantage of owning a large-aperture telescope like the Celestron — especially when it's so easy to use. We think entirely too many telescopes end up in storage either because they're too small to sustain their owners' interest in astronomy or because they're too cumbersome to use.

But you won't have either problem with a Celestron. In fact, after your first look at a bird 50 feet away or at a face half a mile away, you're going to find it difficult to put the telescope away. And you'll probably spend the rest of the day sharing sights through the instrument with your friends, and thinking about what's visible in the night sky.

If it happens to be the Moon, prepare for an awesome spectacle. Through a Celestron, the Moon is nothing at all like what it looks like through a smaller or less well made instrument. Against the pastel-cream and grey background of its disk, streamers of material from impact craters stretch halfway across the lunar surface; river-like rills wind for hundreds of miles; mountains and craters are sunlight-bright with intricate detail, and cast ink-black shadows.

If the Moon is down, select a planet from one of those steadily shining points of light in the sky. Watch the rotation of Jupiter or Mars in the course of an evening. Watch Venus go through its Moon-like phases, growing into a slender crescent, then retracing its steps in the course of a few months. Watch the rings of Saturn slowly close and open every eleven years as the planet makes its journey around the Sun.

Beyond the motion of our solar system lies the disk of stars in which we live: the Milky Way Galaxy. Scattered throughout are remote clouds of glowing gases (nebulae), the remains of exploded stars (planetary nebulae), loose gatherings of stars (open star clusters) and tightly packed

spheres of stars (globular star clusters). All are subjects for the Celestron.

Take the Great Nebula in Orion, one of the showpieces of the winter sky. Through the Celestron, the brilliant filamentary glow of this object backlights large dark clouds of cosmic dust, and at the center of the nebula is a cluster of newly formed stars. At least two new stars have formed here in the past 30 years. So far away and so large is this object that its light takes 1,500 years to reach us, and 30 years to cross the object itself.

Closer to home is another winter object: the Pleiades, a magnificent open cluster of young stars, enveloped in a blue reflection nebulosity. To the unaided eye, the Pleiades looks like a group of five or six stars, but through the Celestron we perceive the astonishing reality of this object. Here, at a distance of 400 light-years, this is a gathering of more than 400 stars confined to a region of space about 15 light-years in diameter. This is much what the Orion Nebula will look like in a few million years.

In the summer sky is another showpiece: the Great Globular Cluster in Hercules — M13 for short. Through binoculars, M13 is a faint, hazy patch of light, but through the Celestron it becomes a stunning sphere of stars, boasting half a million members. Like most other globular clusters, M13 orbits our galaxy at a great angle to the galactic plane. This star system is 22,500 light-years away and, incredibly, it takes light more than a century to cross it.

Later in the year, in early fall, another showpiece rides high into the sky: the planetary nebula called the Dumbbell Nebula. The Dumbbell is a translucent shell of gases thrown off from, and illuminated by the central star within it. It is completely invisible to the unaided eye, but through the Celestron it assumes an oval shape with a multitude of delicate contrast levels. Though by no means the only planetary nebula visible through the Celestron, the Dumbbell is perhaps the loveliest. This object is 650 light-years away and only 1½ light-years in diameter. Still, it is large enough to contain 800 of our solar systems placed end to end.

These objects represent just a glimpse of the thousands of celestial wonders that lie within reach of the Celestron in our galaxy. And beyond our galaxy lie countless other galaxies, many of which are visible through the Celestron. We urge you to explore them. For at the telescope, we may observe not only the heavens, but something of ourselves as well.



Globular Cluster M13



Dumbbell Nebula M27

Beauty In Nature



A Celestron telescope will expand your perception of nature ranging from unexplored macroscopic views in a tropical garden; striking close-ups in an animal sanctuary; dramatic views of the Moon and planets; and a journey to a remote twirling galaxy.

Observing With the Celestron 5

While there is no substitute for the brilliance, detail and clarity of image offered by a well-made, optically large telescope, extreme portability is sometimes as much a factor in selecting a telescope as is larger-aperture performance. The Celestron 5 offers extreme portability at an aperture large enough for serious astronomical observing and photography.

Weighing in at a mere 13 pounds, this 300-power telescope is as portable as your briefcase and as easy to use. It is also a remarkably versatile telescope — being a daytime telescope, a 25X telephoto lens, an astronomical tabletop observatory and a deep-space camera all in one instrument. This is the ideal telescope for nature enthusiasts, telephotographers and beginning amateur astronomers.

With it, you can see the dust on the wings of a butterfly at 15 feet, the whiskers of a cat at 75 feet or the markings of a goldfinch 500 feet away. You can read a newspaper at 100 feet, examine the bolts on the hull of a ship a mile away or identify an airliner at 20 miles. And the image will be so real, it will seem you can touch it.

With the Celestron 5, you can also explore our Sun, the nearest star. You can observe its granulated surface, the magnetic storms called sunspots and the occasional passages of Mercury, Venus and the Moon in front of the solar disk. (But *never* attempt this without the Celestron Solar Filter or a similarly approved device. See "Optional Visual Accessories.")

At night, you can view the Moon from your backyard — inspecting thousands of crater formations, towering mountain chains, great walled valleys or river-like rills — and you can study the other members of the solar system — such as Mars, Jupiter or Saturn — in detail.

Jupiter, swept by winds up to 10,000 miles per hour, appears shrouded in cloud belts. A "great Red Spot," thought to be a perpetual hurricane, rotates with the planet — along with lesser storms — in the course of an evening. And all the while, four of Jupiter's moons can be seen to revolve about the planet — sometimes casting shadows like sharply defined ink spots on its disk, or winking off and on as they pass into and out of the planet's shadow.

Saturn, crowned with a magnificent system of concentric rings, is no less exciting through the Celestron 5. Its ring system is clearly divided (by Cassini's division) and distinctly graduated in color — ranging from gold to cream. There is a hint of band structure and polar darkening on the globe, and the shadow of the globe on

the rings can be seen clearly, as can the innermost (crepe) ring against the background of the globe. Also visible are five of the planet's moons.

Under dark skies, you can enter the realm of the deep-sky observer. Within our galaxy lie brilliant open-star clusters, globular star clusters (great spheres of stars high above the galactic plane), brightly glowing emission nebulae, dark absorption nebulae and planetary nebulae (the remains of exploded stars). And beyond our galactic system lie numerous other galaxies, that are within the grasp of the Celestron 5.

Within visual reach of the Celestron 5 are such open clusters as the Pleiades or M35, such globular clusters as M13 or M22, such emission nebulae as the Orion Nebula or the Veil Nebula, such planetary nebulae as the Dumbbell Nebula or the Ring Nebula, and such galaxies as the Whirlpool Galaxy or M33.

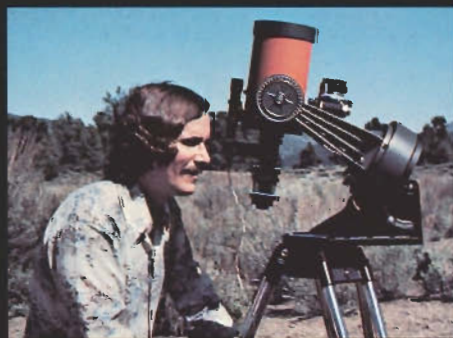
Through the C5

- the nebulosity surrounding the stars of the Pleiades can be seen,
- the companion cluster of open cluster of M35 is plainly visible,
- the outer regions of globular cluster of M13 are resolved and its central core is distinctly mottled,
- globular cluster M22 is resolved to the core,
- the dark clouds of the Orion Nebula are silhouetted against its filamentary glow,
- both parts of the Veil Nebula are visible,
- the complex oval of the Dumbbell Nebula is evident,
- the Ring Nebula lives up to its name, and
- the brighter features of the Whirlpool Galaxy and M33 can be discerned.

But that's just the beginning. A thousand other celestial wonders await the owner of this telescope.

For photography, convenient adaptors — available optionally — attach your 35mm SLR camera body or body-plus-lens to the Celestron 5 instantly, permitting telephotography, long-distance macrophotography, full-disk lunar or solar photography, close-up lunar or solar photography, planetary photography, basic deep-sky photography and constellation photography. (See the sections on basic and deep-sky photography.)

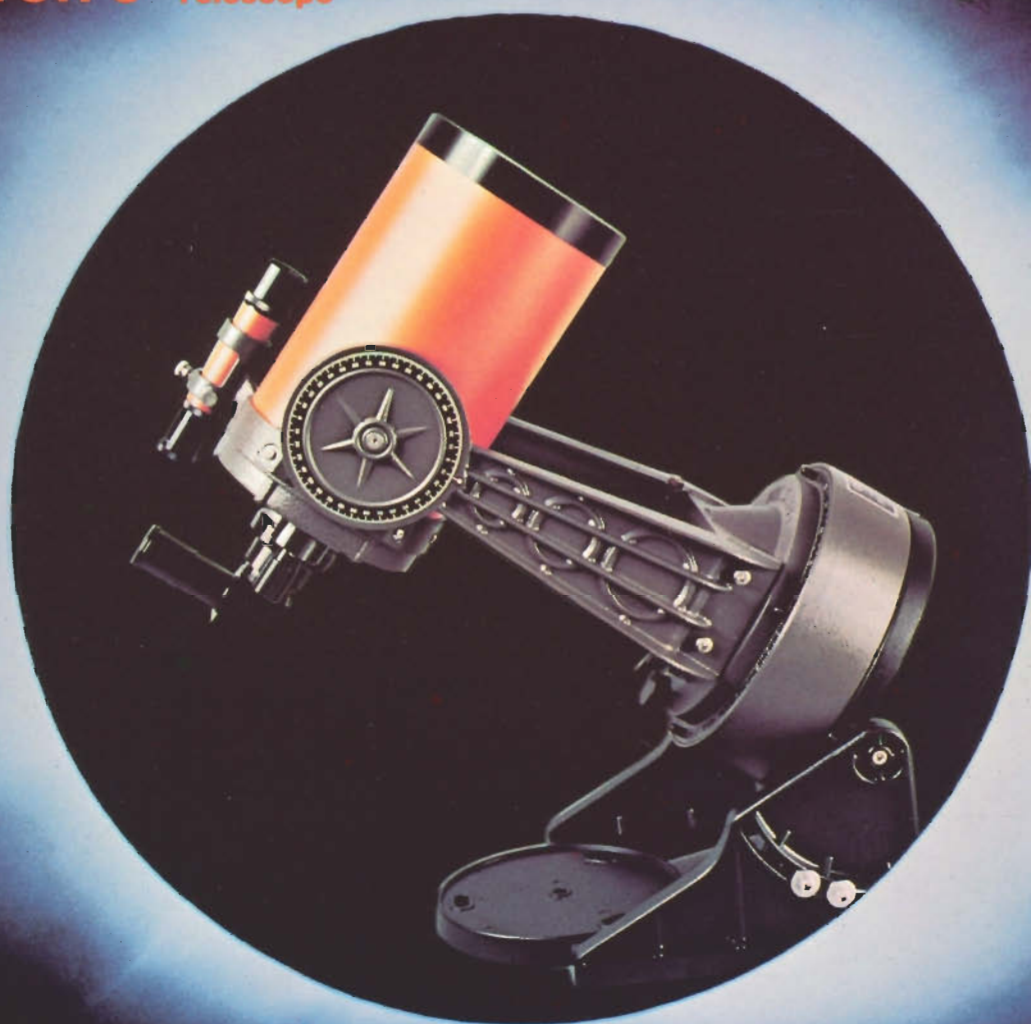
The Celestron 5 is also capable of much, much more. (For details, see the section on cold camera astrophotography.) And because the C5 is the most sturdily mounted telescope in its aperture range — sharing, as it does, a common drive base with the Celestron 8 — you can be assured of quality results.



The 5-inch aperture of the Celestron 5 may seem to be on the small size to many an experienced astrophotographer to be used as a deep-sky camera. None-the-less this small instrument may be fully equipped for deep-sky guided astrophotography. The small aperture of the instrument generally spells "long exposure time" with tedious guiding when going after faint deep-sky objects. This however, is offset by some of the special accessories offered for use with the Celestron telescopes. The cold camera offered as an accessory allows a reduction

of exposure time by a factor of 10 for certain films. Further, the use of the telecompressor further reduces the exposure time by a factor of 4. This combination allows superb quality deep-sky color photographs such as shown on page 9 of this catalog. Wide fields swaths of the Milky Way may be captured on film using your 35mm camera with its normal 50mm taking lens. It is mounted on the Celestron 5 with the Piggyback Camera Mount so that the telescope serves as a stable platform during the exposure.

Celestron 5 Schmidt-Cassegrain Telescope



Characteristics, Features, and Accessories

Optical configuration

Schmidt-Cassegrain

Clear Aperture 5" (125mm)

Effective Focal Length 50" (1,250mm)

Photographic Speed (focal ratio) f/10

Highest useful visual magnification 300X

Oculars (Eyepieces) included,

barrel dia.96" (24.5mm)

Focal lengths—25mm (50power),

12mm (100X)

Visual Back (Eyepiece tube)

Diameter96" (24.5mm)

Right Angle Viewing—

Star Diagonal96" Prism type

Closest Focus Approx. 15 feet

Resolution—(Dawes Limit)—

arc-seconds0.9

lines per millimeter 197

Stellar Magnitude Limit 13

Image Scale—degrees per inch. 1.15°

Film Coverage (35mm) at

30 feet 7" x 10"

100 feet 23" x 35"

1,000 feet 19' x 29'

Photographic Accessories Optional

Mounting (equatorial wedge

optional) Fork Type

Slow Motion Controls, both

axis Manual

Finder Scope 5 power 24mm

Electric Clock Drive, dual synchronous

motors 110v, 60Hz. 6 watts

Setting Circles

Declination—4", R.A. 8"

Drive Gear Diameter 6" spur

Polar Axis Diameter 1 3/8" tapered

Tube Dimensions

5 1/2" Dia. X 11" Long

Secondary Obstruction 16%, 2" Dia.

Tube Weight 4 1/4#

Telescope Weight 13#

Size, swung down 8" x 9" x 18"

Carrying Case

Dimensions 9" x 12" x 24"

Shipping Weight 28#

Non-U.S. Customers: We supply drive

motors of the proper voltage and

frequency. (You may have to supply your own power cord connector). Also for Southern Hemisphere operation we supply reverse operating motors and reverse reading setting circles. Please specify exact requirements if different from 110v-60Hz.

The compound Catadioptric system of the Celestron 5 uses a combination of mirrors and lenses in the basic objective system. In effect, it combines the good features of both of these optical systems and eliminates any disadvantages of either. By optically folding the light path within the short tube you have the performance of a 4-foot long refractor but with none of the image degrading tube currents. The mirror system assures absolute freedom from any color distortions but the closed tube assures freedom from contamination of the delicate first-surface mirrors assuring years of maintenance free operation.

Celestron 5 as a Telephoto Lens

Extreme Telephotography Lets You Join the Action

The telephoto lens is the lens of choice for the nature, industrial, sports or news photographer when the action is distant or inaccessible and the subject must be captured in detail.



Inset - Comparison Shots Taken With 50mm Lens - same Enlargement

Celestron 5 as an Astro Camera

The photos on this page illustrate the work that can be done with the Celestron 5 telescope when used as an astro camera. While we do not suggest that every photo that you take with your Celestron will be of the quality shown on this page (Even experienced astronomers may make hundreds of shots to achieve a single publishable photo), we assure you that superb deep sky and planetary photos are within your grasp with a Celestron 5. No auxiliary equipment other than offered in this catalog and your 35mm camera body would be required by you to duplicate photos like these.



Lagoon Nebula M8



Ring Nebula M57



Jupiter



Omega Nebula M17



Dumbbell Nebula M27



Saturn



Lunar Craters



Andromeda Galaxy M31

The Celestron 8

Viewing and Characteristics

When the Celestron 8 was first introduced, it caused more than a slight stir among serious amateur astronomers, astrophotographers and astronomy educators. Here, at last, was a large-aperture telescope designed for a modern age: it was really portable, easy-to-use and incredibly versatile. Today, the Celestron 8 is the world's best-selling 8-inch telescope.

Though it tips the scales at only 21 pounds and takes up less room than a suitcase, this 480X telescope more than delivers the optical performance so essential to the serious amateur or research scientist. And not only is the C8 the superior astronomical instrument its reputation suggests, it is also the ultimate daytime telescope and 40X telephoto lens.

With this instrument, the very textures of ordinary everyday objects stand out in bold relief, and their images are so brilliant — even in shadow — that high powers, completely beyond the capability of typical terrestrial spotting scopes, may be used routinely. Few people can look through a Celestron 8 for the first time and resist an exclamation of admiration for the optical quality of the instrument.

Well within the capability of the C8 are detailed observations of sunspot structure, the solar transits of Mercury or Venus, lunar craters within lunar craters, the delicate wisps of Jupiter's cloud belts, the cloud belts of Saturn and the surface features of Mars.

Through the C8 under good seeing conditions the cloud belts of Jupiter appear discontinuous, composed of a multitude of streamers and festoons — and at this aperture the oranges, the reds and the browns of the Jovian clouds are revealed. Further, the moons of Jupiter now appear as disks and can be followed across the entire face of the planet.

With the C8, Saturn's rings are marvelously detailed. The main division (Cassini's division) is instantly obvious even at low power; the innermost (crepe) ring has a distinctly rosy appearance even against the background of space; and there is a noticeable brightening of inner Ring B, as well as pronounced darkening of outer Ring A. Also visible through the C8 are at least two cloud belts and six of the planet's moons. Through the C8, even tiny Mars (with about half the diameter of Earth) is surprisingly detailed — especially during favorable oppositions. Then such surface features as Syrtis Major and Mare Erythraeum appear discontinuous, the clouds of the planet are visible and the facing polar cap as well as its melt band can be seen.

Under dark skies, the Celestron 8 brings its enormous light-gathering power and resolution to bear for the deep-sky observer.

With more than 800 times the light-gathering power of the human eye, the C8 presents star clusters, nebulae and even galaxies in intricate detail. At this aperture, for example, the translucence that characterizes the planetary nebulae begins to emerge and globular clusters are resolved to the core.

Within visual reach of the Celestron 8 are such open clusters as the Pleiades or M35, such globular clusters as M13 or M3, such emission nebulae as the Orion Nebula or the Trifid Nebula, such planetary nebulae as the Dumbbell Nebula or the Ring Nebula, and such galaxies as the Whirlpool Galaxy or M33.

Through the C8,

- the nebulosity surrounding the stars of the Pleiades can be seen and what to the unaided eye appears to be six or seven stars becomes hundreds of stars,
- the open cluster of M35 reveals its fainter members, presenting a jewel-box-like appearance, and its companion cluster is strikingly noticeable,
- globular cluster M13 is resolved to the core, and its central background blaze is dramatically bright,
- the tiny globular M3 is resolved to the core,
- the Orion Nebula glows with a multitude of intricately detailed filaments, and the four stars of the Trapezium suddenly become six or more stars.
- the dark lanes of the Trifid Nebulae are obvious, and the trisection of the brighter component begins to become evident,
- the fainter outer regions of the Dumbbell Nebula become a network of delicate contrast levels,
- the Ring Nebula blazes forth brightly and distinctly,
- the Whirlpool Galaxy reveals a hint of spiral structure directed toward its companion galaxy, and
- the galaxy M33 reveals faint knots of stellar associations as well as its giant nebulosity NGC 604.

But that's just the beginning. A hundred-fold other celestial wonders await the owner of this telescope.

For photography, convenient adaptors — available optionally — attach your 35mm SLR camera body or body-plus-lens to the Celestron 8 instantly, permitting telephotography, long-distance macrophotography, full-disk lunar or solar photography, close-up lunar or solar photography, planetary photography, basic deep-sky photography and constellation photography. (See the sections on basic and deep-sky photography.)

The Celestron 8 is also capable of much, much more. (For details, see the section on cold-camera astrophotography.) In fact, with accessories, the C8 is capable of

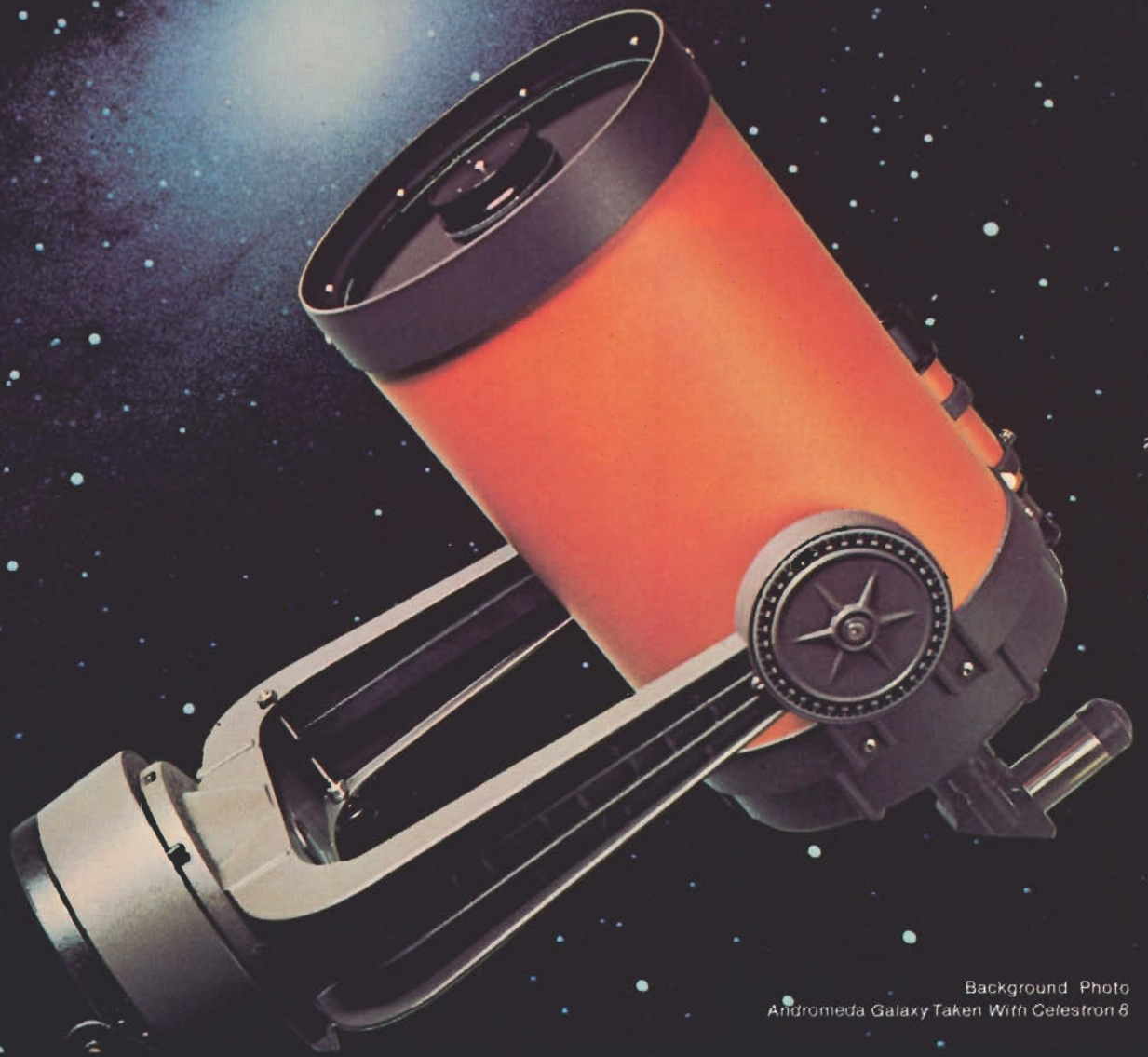
taking its owner to the very frontiers of contemporary deep-sky photography. (See the section on Schmidt-Camera photography.) With the Celestron 8 as a central instrumental component, you will be able to duplicate on a smaller scale some of the most advanced photographic techniques practiced at the major observatories.

Characteristics, Features, and Accessories

Optical configuration	Schmidt-Cassegrain
Clear Aperture	8" (200mm)
Effective Focal Length	80" (2,000mm)
Photographic Speed (focal ratio)	f/10
Highest useful visual magnification	480X
Oculars (Eyepieces) included,	
barrel dia.	1 1/4"
Focal lengths—25mm (80power),	
40mm (50X)	
Visual Back (Eyepiece tube)	
diameter	1 1/4"
Right Angle Viewing—	
Star Diagonal (Prism type)	1 1/4"
Closest Focus (approx.)	25 feet
Resolution—arc-seconds	
(Dawes Limit)	0.6
lines per millimeter	210
Stellar Magnitude Limit	14
Image Scale—degrees per inch	0.72°
Film Coverage (35mm) at	
30 feet	4" x 6"
100 feet	14" x 21"
1,000 feet	11' x 17'
Photographic Accessories	Optional
Mounting (equatorial wedge	
optional)	Fork Type
Slow Motion Controls, both	
axis	Manual
Finder Scope	6 power 30mm
Electric Clock Drive, dual synchronous	
motors	110v, 60Hz. 6 watts
Setting Circles	Dec.—4", R.A. 8"
Drive Gear Diameter	6" spur
Polar Axis Diameter	1 3/8" tapered
Tube Dimensions	9" Dia. X 17" Long
Secondary Obstruction	12%, 2 3/4" Dia.
Tube Weight	11 1/4#
Telescope Weight	21#
Size, swung down	9"x13"x24"
Carrying Case	
Dimensions	13"x16"x30"
Shipping Weight	43#

Non-U.S. Customers: We supply drive motors of the proper voltage and frequency. (You may have to supply your own power cord connector). Also for Southern Hemisphere operation we supply reverse operating motors and reverse reading setting circles. Please specify exact requirements if different from 110v-60Hz.

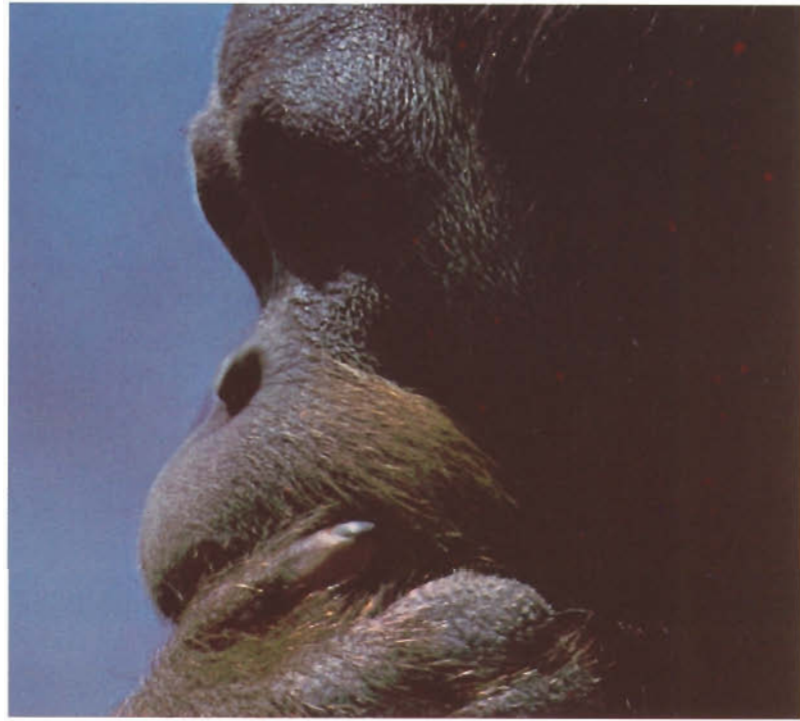
Celestron 8 Schmidt-Cassegrain Telescope



Background Photo
Andromeda Galaxy Taken With Celestron 8



Celestron 8 Macro and Telephoto Photographs



Celestron 8 Astrophotographs



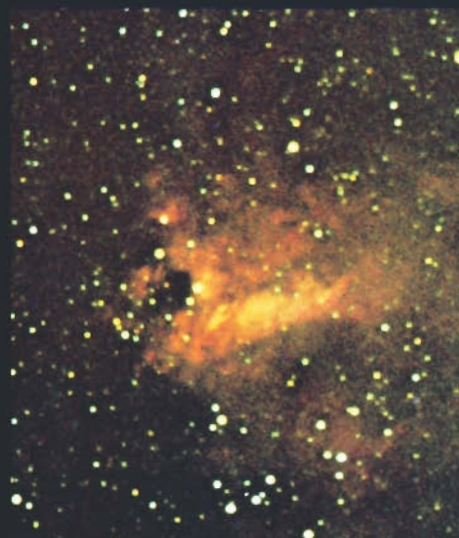
Trifid Nebula M20



Lagoon Nebula M8



Eagle Nebula M16



Omega Nebula M17



Dumbbell M27



Ring Nebula M57



Globular Cluster M15

The Celestron 14

The World's Largest One-Man-Portable Astronomical Observatory Telescope

Revolutionary in concept and design, the Celestron 14 for the first time makes truly portable a telescope with aperture approaching professional size. This is the world's largest one-man-portable observatory telescope. In 10 minutes, one person can demount the Celestron 14, load it into a compact car and be on his way to a remote star-party outing. Yet this prestigious instrument can be installed proudly on pier under a permanent dome. With an aperture suitable for advanced research projects or student training... with special high-transmission optical coatings... with a massively stable fork mounting... with remote-controlled electrical slow motions in both axes—the Celestron 14 is the optimum investment for the advanced amateur astronomer, university observatory or science center.

Though it weighs in at a little more than 100 pounds, this 840X instrument quickly breaks down into components weighing no more than 50 pounds each, making transport to a dark-sky observing site easier than it is with many smaller, conventionally mounted classical telescopes. In fact, when used terrestrially the C14 tube assembly becomes the world's largest mirror/lens telephoto, with an effective focal length of 3,900mm. at f/11.

As an astronomical telescope, the Celestron 14, with 2,580 times the light-gathering power of the human eye, is a superior instrument indeed — whether for lunar, planetary, or deep-sky observations. And the prestige of the instrument is enhanced by such amenities as a control panel and electrical slow-motions in both axes.

Through the Celestron 14, when the air is steady, the cloud belts of Jupiter are delicately festooned and display an enormous range of colors from cream through orange to grey, and within the belts are numerous smaller storms (white spots). Detail can even be glimpsed within the Red Spot and on the largest Jovian moon Ganymede (but only when seeing conditions are most favorable).

With the C14, the major divisions of Saturn's ring system are instantly obvious, and the observer's attention is drawn to the surface detail of the planet itself. There is a striking amount of banded detail on the globe, usually including one or more white spots, and there is a hint of belt structure near the polar region. The observer will notice, too, that Saturn's moon Titan appears as a disk.

In fact, at this aperture the domain of the observer encompasses virtually the entire solar system from tiny lunar rills broken by even tinier craterlets, through the bluish-green disks of Uranus and Neptune, to the pinpoint image of Pluto moving from month to month across faint star fields. But the

solar system is only a small part of the observer's domain, for at this aperture, globular clusters are so well resolved that each seems to have its own personality. Galaxies are revealed in intricate detail, and even the brighter quasars may be reached.

Well within visual reach of the C14 are such open clusters as M35 or M11, such globular clusters as M13 or M3, such emission nebulae as the Orion Nebula or the Trifid Nebula, such planetary nebulae as the Dumbbell Nebula or the Ring Nebula, and such galaxies as the Whirlpool Galaxy or the exploding galaxy M82.



Celestron 14 With Solar Filter

Through the C14,

- the tiny companion cluster of open cluster of M35 is resolved,
- open cluster M11 is revealed as a spectacularly densely packed strikingly noticeable, gathering of hundreds of stars,
- numerous dark lanes and streamers of stars radiate outward from the cores of globular clusters of M13 and M3,
- the intricate filamentary network of the Orion Nebula is laced with many knotty brightenings, and the dark clouds of the nebula are crisply defined,
- both components of the Trifid Nebula are well detailed, with the brighter clearly trisected by dark lanes,
- The Dumbbell Nebula becomes a complete oval with scores of stars apparently embedded in its gossamer beauty,
- the contrast levels of the Ring Nebula are evident, and its central star may be glimpsed occasionally,
- the nucleus of the Whirlpool Galaxy is very bright, and its spiral structure is quite distinct, with an arm connecting its companion galaxy, and
- galaxy M82 resembles a curved needle, with many knotty brightenings toward its center.

And that's just the beginning. Countless other celestial wonders await the owner of this telescope.

For photography, convenient adaptors—some of which are included in the base price with this instrument—attach your 35mm SLR camera body or body-plus-

lens to the Celestron 14, permitting telephotography, wide-field lunar photography, close-up lunar and planetary photography, basic deep-sky photography and constellation photography. (See the sections on basic and deep-sky photography.)

The Celestron 14 is also capable of much, much more. In fact, with accessories, the C14 can be converted to a full-fledged astrophotographic research station. (See the sections on cold-camera and Schmidt-Camera photography.)

Characteristics, Features, and Accessories

Optical configuration . . . Schmidt-Cassegrain
Clear Aperture 14" (350mm)
Effective Focal Length 154" (3,900mm)
Photographic Speed (focal ratio) f/11
Highest useful visual magnification 840X
Oculars (Eyepieces) included,
Barrel dia. 1 1/4"
40mm focal length — 100X;
25mm — 160X
12mm — 325X; 6mm — 650X

Star Diagonal (right angle viewing) 2" mirror type accepts 2" oculars and includes 1 1/4" adaptor.

Closest Focus (approx.) 100'
Resolution (Dawes Limit) —
arc seconds 0.3
lines per millimeter 181

Stellar Magnitude Limit 15
Image Scale - degrees per inch 0.37
Full Lunar Disc Diameter 1.3"

Mounting (equatorial wedge optional) Fork Type

Photographic accessories included in base price

T-Mount Camera Adaptor,
Tele-Extender
Piggyback Camera Mount,
Counterweight Set

Finder Scope 10 power, 40 mm
Electric Clock Drive —
synchronous motor

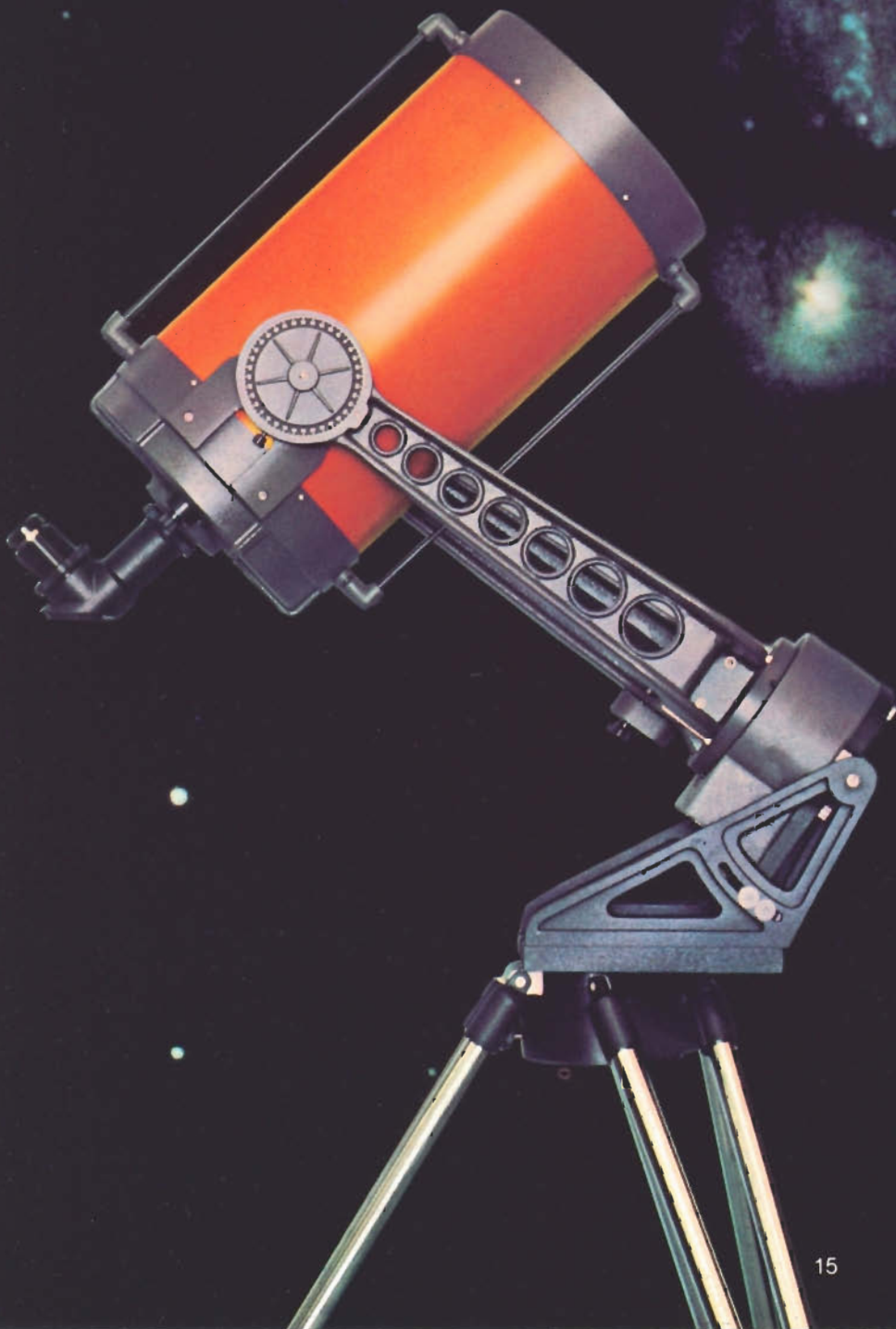
Slow Motion Control — dual speed,
both axes.

Power requirement . . . 110v, 60Hz., 10 watts
Setting Circles . . Declination -6", R.A. 9 1/2"
Drive Gear Diameter 6 3/4" worm
Polar Axis Diameter 3" tapered
Tube Dimensions 16" Dia., 30" long
Secondary Obstruction 10%, 4 1/4" Dia.
Tube Weight 50#
Telescope Weight (tube assy, mount,
drive) 108#

Size, swung down 18"x22"x44"
Case Dimensions, Tube 21"x22"x36"
Mount and Accessory 12"x21"x36"
Shipping Weight 200#

Non-U.S. Customers: We supply drive motors of the proper voltage and frequency and the proper reading R.A. setting circle for your geographic location at no extra charge. Please specify exact requirements if different than 110v, 60Hz.

Celestron 14 Schmidt-Cassegrain Telescope



The Whirlpool Galaxy M51
Shot with the Celestron 14

Celestron 14 Photographs



Omega Nebula M17



Dumbbell Nebula M27



Ring Nebula M57



Galaxy NGC4565

The deep sky photographs were all taken with the Celestron 14. Various combinations of accessories were used. Combinations included the Celestron 14, Camera, Drive Corrector, and the Celestron 14. Keep in mind that you will need good observing conditions and a great deal of patience to duplicate astronomical photographs taken with the Celestron 14.



Jupiter



Saturn



Galaxies M65-66



Globular Cluster M13



Lunar Craters

photos shown on these pages were taken with a Celestron 14 telescope using Celestron accessories including the Telecompressor, Cold Changer, and Off-Axis Guider. Please note that these photos require excellent viewing conditions and a lot of practice and patience to achieve photos of this quality with your

Optional Visual Accessories

To expand the utility of your Celestron Oculars (Eyepieces)



Oculars (Eyepieces)

The ocular or eyepiece is used like a small microscope and is inserted in the telescope to visually observe the image formed at the Cassegrain focus of the Celestron telescope. The Celestron oculars units are multi-element units of the design that is optimum for the particular focal length-magnification combination. (The price list designation is: K - Kellner, Or - Orthoscopic, Pl - Plossl, Er - Erfle).

Visual magnification is found by dividing the focal length of the telescope by the focal length of the ocular.

If you desire higher magnifications than provided by the standard oculars, several additional oculars are available. When ordering optional oculars, specify focal length and barrel diameter of each. The Celestron 5 is normally supplied with oculars of 24.5mm (.96-inch) barrel diameter. The Celestron 8 and C14 are normally supplied with 1¼-inch barrel diameter oculars.

Two-inch Oculars



50mm-2-inch Barrel Ocular with oversize 2-inch Diagonal on Celestron 8

For stargazers who desire wider fields of view at lower powers than those produced by our standard-size oculars, we offer the following oculars with a 2 inch barrel diameter: a 60mm Kellner, a 50mm Plossl and a 32mm Erfle. These oculars require a 2-inch diameter visual adaptor, such as one of our 2 inch Star Diagonals (see below).

Telephoto Visual Back

To convert the Celestron Multipurpose Telephoto into a telescope, we offer the 24.5mm (.96-inch) diameter Visual Back which is included in the base price of the C5. This accessory couples oculars to the telephoto either directly, or accepts the Star Diagonal or Porro Prism

Telephoto Star Diagonal

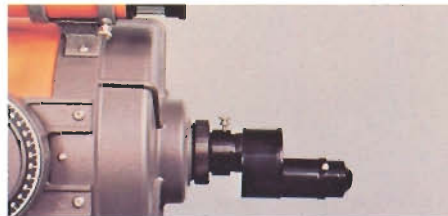
For erect images and convenient right-angle viewing when using the Celestron telephoto as a telescope, we offer the 24.5mm diameter Star Diagonal included in the base price of the C5. (An ocular inserted directly into the Visual Back of the Celestron produces images that are upside down and backwards. The Star Diagonal produces images that are right-side-up but reversed left-for-right.)

Two-inch Star Diagonals

To adapt our 2 inch Oculars (described above) for use with our telescopes or telephotos, we offer top-quality, mirror-type diagonals with a 2 inch barrel diameter. These provide the same right-angle-viewing convenience as our standard, base-price Star Diagonals, but with an added ad-

vantage: if necessary, they can be collimated for maximum performance when the observer switches oculars. 2 inch diagonals are available in two models: one for both our 5 inch instruments and our C8, and one for the C14 (included in C14 base price). The two models of this diagonal are not interchangeable. Each includes adaptor for 1¼ inch oculars.

Porro Prism



Porro Prism used with Celestron 8 for straight through erect image viewing.

For daytime observers who desire straight-through viewing with erect images with correct left to right orientation, we offer the Porro Prism. A 24.5mm barrel diameter unit for our 5 inch instruments, and in a 1¼" barrel diameter for our C8 and C14. (An ocular inserted directly into the Visual Back of the Celestron produces images that are upside down and backwards). The star diagonal supplied with the telescope turns the image right side up but does not correct it right for left.

Barlow Lens



Barlow lens shown here inserted between diagonal and visual back of Celestron 8

To double the visual power of any standard-size Celestron ocular, we offer the Barlow Lens assembly, 24.5mm barrel diameter for the 5-inch instruments, and in a 1¼" barrel diameter for our C8 or C14. In addition to doubling the magnification of a given ocular it increases the eye-relief.

Ocular Thread-In Filter Sets

For lunar or planetary observers who wish added visual contrast when viewing the features of Venus, Jupiter, Mars, Saturn or the Moon, we offer a set of six optical glass astrofilters — in a 24.5mm barrel diameter for our 5 inch instruments, and a 1¼" barrel diameter for our C8 or C14. These filters thread into the barrels of our oculars. Each set includes a #3N5 yellow, a #21 orange, a #47 violet, a 58# green, a #80A blue and a #96 neutral density.

Solar Filter



Solar filter shown on Celestron 8

For observing the Sun in complete safety and comfort, we offer front-cell, press-fit solar filters for our 5 inch instruments, for the C8 and for the C14. The optical windows of these filters are Inconel-coated and reduce the intensity of solar radiation to 1/100th of one percent at all wavelengths for correct color rendition. The filters are available in the following models: a full-aperture model or a 2-inch off-axis model for our 5 inch instruments, a full-aperture model or a 3-inch off-axis model for our C8 and an 8-inch off-axis model for our C14. The off-axis, stopped-down filters, although less expensive, do slightly compromise resolution.

Equatorial Wedge



Equatorial Wedge

For the electric drive and the setting circles of the Celestron Telescope to operate properly, the base of the telescope must be tilted up to an angle corresponding to your geographical latitude so that the polar axis of the telescope parallels the axis of rotation of the Earth. The Equatorial Wedge Assembly accomplishes this and is available in a model for our C5 or C8, and in a model for our C14. The equatorial wedge is constructed of heavy-duty cast aluminum. The C5/C8 wedge weighs 5 lbs. and the C14 wedge weighs 30 lbs. Both provide for fine adjustments along the vertical.

Locked Triangle Tripod



Locked Triangle Tripod

Designed for use with our equatorial wedge (see above), the Locked-Triangle Tripod is exceptionally sturdy, easy-to-use and portable. It is available in two models: one for the C5 or C8, and one for the C14. The C5/C8 tripod weighs 10 lbs. and, when set up, stands 37 inches tall. The C14 tripod weighs 30 lbs and stands 35 inches tall. The C5/C8 tripod accepts either telescope directly (without the wedge) for daytime alt-azimuth observing.

Permanent Pier

For C14 owners who wish a permanent equatorial mount for their telescope, we offer the steel-fabricated C14 Permanent Pier. The pier is

custom-made for your observing latitude (please specify) and the fork mount of your instrument bolts directly to the pier. Average pier weight: 170 pounds. Column diameter: 10½ inches. Base plate: 12 x 18 inches. Height ranges from 33 inches at 60° to 54 inches at 15°.

DC Inverter



DC Inverter

To permit the operation of the Celestron electric drive in the field where household current is not

available, we offer the DC Inverter, which transforms direct current of a 12-volt car battery into alternating current. The output frequency of this unit has a range of from 50 to 70 Hz, and a map light is included. (Deep-sky photographers, note that this function is also performed by our AC-DC drive corrector, which is required for guided exposures. See the section on deep-sky photography.) *Non-U.S. Customers:* Please specify exact voltage and frequency requirements if different than standard 110v-60Hz.

Right-Angle Finder Scopes

For C5 or C8 owners who prefer right-angle viewing with their finder scopes, we offer a 5 x 24mm finder for the C5 and a 6 x 30mm finder for the C8. These accessories are interchangeable with the standard C5 or C8 finder.

Giant Finder Scopes

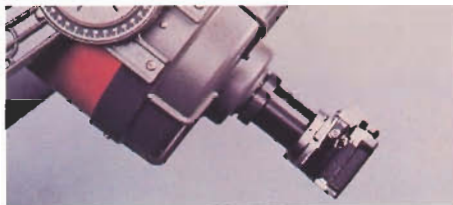
For C5, C8 or C14 owners who wish the added light grasp of a larger finder scope, we offer a 6 x

30mm finder for the C5, a 10 x 40mm finder for the C8 and a 10 x 70mm finder for the C14. Special brackets are supplied to couple these finders to our instruments. Bracket and finder must be removed from the C8 or C14 if the instrument is stored in its carrying case.

Special Optical Coatings

To enhance light transmission, we offer magnesium fluoride coatings on both surfaces of the corrector plate. These coatings increase transmission by about 10%. The standard reflective surfaces of our telephotos, C90, C5, C8, C14 and Schmidt cameras are enhanced aluminum with ½ wave silicon monoxide overcoat. Note: Magnesium-fluoride coatings are susceptible to etching by organic substances, such as those left by fingerprints.

Basic Photography With The Celestron



35mm camera couples to the Celestron using T-Adaptor and T-Ring

One of the most exciting features of the Celestron is just how easy it makes high-power photography. Simply couple a few accessories to the telescope and in seconds you're ready to photograph a hummingbird at 20 feet, or the rings of Saturn. With the Celestron, telephotography is a snap—as is lunar, solar or planetary photography—and with experience, dramatic nature shots or candid are more the rule than the exception.

Still Photography

For still photography with your 35mm single-lens-reflex camera body, all that is required is our T-Mount Camera Adaptor and a T-Ring for your specific camera. (We offer camera rings for most 35mm SLR's. See our price list. Other T-rings can be obtained through your photo dealer.) The T-Adaptor couples the camera body to the rear-cell of the telescope by way of the T-ring, and permits the camera body to be oriented in either a vertical or a horizontal format.

For greater mobility during photographic sessions or for motion-picture photography (see below), the tube assembly of the C5 or the C8 demounts from its fork for use on a photographic tripod. The tube is mounted on the tripod using one of our Photo Tripod Adaptors. Both the C5 and C8 Photo Tripod Adaptors fit the standard ¼-20 tripod head. (The tube assemblies of the C5, C8, C14 are available separately. The C5 or C8 tube assemblies include Finderscope, Tripod Adaptor and T-Adaptor. The C14 tube assembly includes Finderscope and T-Adaptor only.)



The Celestron accepts Series VI drop-in filters

At times, the telephotographer desires increased subject contrast, color temperature conversion or special filtration effects. For such times, we offer our Series VI Drop-In Filter Set. The set consists of six ring-mounted, optical glass filters, and includes a #1A Skylight, a #8 yellow, a #11 yellow-green, a #25 red, a #80A blue and a #96 neutral density. The filters fit into the rear-cell recess of the telescope, ahead of the T-Adaptor.

Motion-Picture Photography

When the element of motion is added to the dramatic close-up, remarkable pictorial effects are achieved, particularly in the realm of long-distance macrophotography. For motion-picture photography with the Celestron, we offer our T-to-C Movie Camera Adaptor, which couples C-mount-type reflex cameras to the tube assembly by way of our T-Mount Camera Adaptor.

For best results, motion-picture photography with our instruments requires a custom-fabricated mounting bar to couple the tube assembly rigidly to the camera body. Typical of the motion-picture cameras being used with the Celestron are the Beaulieu 4008 ZM4 (Super 8mm) and the Bolex EBM H16 (16mm).

For greater flexibility in making exposures, our Series VI Drop-In Filter Set (see above) will be useful.

Lunar and Planetary Photography

This is the least-expensive and least-complicated form of astrophotography. It is an excellent way for the beginner to learn the first steps of photographing the heavens. Yet it can also be in and of itself an absorbing discipline, as many an accomplished astrophotographer will tell you. For the challenge of producing an excellent picture of the crater Copernicus, say, or the belts of Jupiter, under perfectly steady skies, is virtually irresistible to many.

The simplest form of lunar or solar photography—full-disk or wide field—employs the same camera coupling used for still photography (see above). All that is required is to mount the complete telescope on our Equatorial Wedge Assembly and Locked-Triangle Tripod (see the section on visual accessories), and turn on the electric drive. Exposures of a 1/150th second or so are all that is necessary.

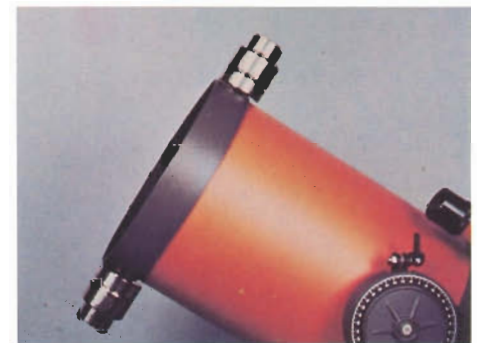
For close-up lunar or solar photography, or for planetary photography, the T-Mount Camera



Tele-Extender, eyepiece projection, used for Planetary photography to greatly increase image size

Adaptor is replaced with our Tele-Extender tube and visual back with an ocular used to project a magnified image to the film plane. You can select the amount of magnification that you desire by the focal length of the ocular that you use. The 40mm ocular increases the image size by 3.4 times. The 25mm, 18mm, and 12mm oculars increase the image size by 6, 8.7, and 13.6 times respectively. There is nothing gained by using shorter focal length oculars in the tele-extender as the diffraction limit of the telescope would be exceeded.

Counterweight Set



Counterweight Set shown on the Celestron 8

Using the Tele-Extender with the Celestron 5 or 8 places the camera back far enough that the out-of-balance condition could interfere with proper operation of the clock drive. A set of counterweights for each of these two instruments is offered as an optional accessory to achieve proper balance. Counterweights for the Celestron 14 are included with the instrument.

Deep Sky Photography With The Celestron

Few photographic subjects have the impact of deep-sky objects. Seen through the Celestron, star clusters, nebulae and galaxies are breathtaking. But recorded on film, with time exposures, they reveal their full extent and colors.

Guided Photography

Making time exposures of deep-sky objects requires "guiding," a process whereby the astro-photographer makes fine adjustments in telescope point during the course of the exposure. Guiding is necessary because even with an electric drive there is a very slight movement of the image in the field of view, and this movement cannot be tolerated on film. To guide the Celestron, we offer our AC-DC Drive Corrector and our Illuminated-Reticule Ocular Assembly.

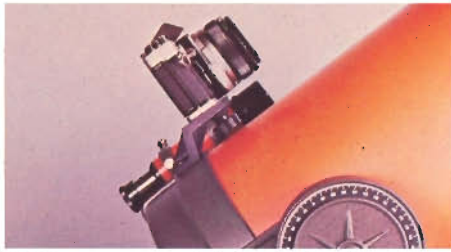


Drive Corrector

The drive corrector speeds up or slows down the electric drive of the Celestron for adjustments in celestial longitude. (Adjustments in latitude may be made with the Declination slow-motion control.) Instant-response "fast" and "slow" buttons on a remote-control box provide for a 50% increase or decrease in drive speed. The corrector, which can either operate on 110v, 60hz. household current or act as a d.c. inverter, also has an output jack for our illuminated-reticule ocular assembly. Adaptor cables for battery and automobile cigarette lighter are included.

The drive corrector also has a calibration control that permits sustained variations in drive speed of up to plus-or-minus 10%—a useful feature when critical resolution is desired in lunar, solar or planetary photography.

To determine just how much correction is needed during the course of an exposure, we offer our Illuminated-Reticule Ocular Assembly. This is a 12.5mm orthoscopic ocular with crosshairs illuminated by a variable-brightness battery pack. It permits the photographer to select a star as a reference point for guiding. During the exposure the guide star is kept centered on the crosshairs. The standard Celestron reticle assembly is of 1 1/4" barrel diameter. For C5 owners, a removable adaptor bushing is supplied to convert the ocular to 24.5mm barrel diameter.



35mm camera mounted piggyback on the Celestron 8 for wide field photography

Wide-field Photography

With these two accessories, and one other, the lunar, solar or planetary photographer can engage in the simplest form of deep-sky photography: "piggyback photography". In piggy-back photography, a camera with its normal taking lens is mounted atop the telescope and typically 17° x 35° swaths of the night sky are recorded. The photographer guides through the main optics of the telescope in timed exposures ranging from 1 minute to a full hour. To mount your camera on the Celestron, we offer Piggyback Camera Mounts for the C5, the C8 or the C14. Each is fitted with the standard 1/4-20 tripod-head bolt. (The C14 mount is included in the base price of the C14.)

We might say here that piggyback photography is a good way to get started in deep-sky photography, for two reasons. First, there are celestial subjects that can be photographed only with a wide field . . . star clouds of the Milky Way, long comet tails and meteor showers. Second, piggyback photography with a wide-angle or normal lens is low-power photography, and relatively forgiving of guiding errors. So the deep-sky photographer who masters the short-focal-length lens, then moves up to the telephoto lens and masters that, will be well prepared for narrow-field deep-sky photography.

Narrow-field Photography

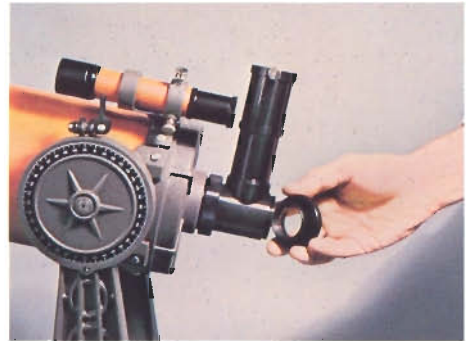
Having mastered wide-field or piggyback photography with the Celestron and the appropriate accessories, the astrophotographer usually finds the challenge of narrow-field photography through the Celestron itself irresistible. He, or she, dreams of producing deep-sky portraits like those found in textbooks. For this you will need to precisely guide the telescope during the photographic exposure.



Off-Axis Guider on the Celestron 8

The Off-Axis Guider Body couples your 35mm SLR camera body to the Celestron just as our T-Mount Camera Adaptor does, and permits you to guide *and* photograph through the main optics of the telescope at the same time. The guider body accepts your illuminated-reticule ocular and employs a prism to divert light from a star which is off the edge of the photographic field into the guiding ocular. This allows you to select a suitable guide star. (For those who wish to purchase guider body and illuminated-reticule ocular at the same time, we offer the Off-Axis Guiding Assembly.)

While short-focal-length piggyback photography is typically conducted at from less than 1X (50mm taking lens) with exposures ranging from about five minutes to a half an hour, Cassegrain-focus photography is conducted with the C5, C8 and C14 at 25X, 40X and 80X respectively, with exposures ranging from five minutes to an hour—or longer for very faint galaxies. To reduce the exposure times for the Celestron, we offer the Celestron-Williams Cold Camera (see Cold-Camera photography) and the Tele-Compressor.

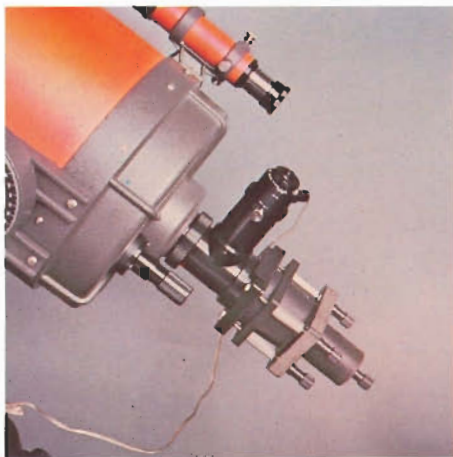


Tele-Compressor

The Tele-Compressor is a lens that reduces the effective focal length of the Celestron by one-half and therefore increases the photographic speeds of the C5, C8, and C14 to f/5, f/5 and f/5.5 respectively. This fourfold increase in photographic speed means that exposure times can be cut to one-fourth. This effectively reduces the focal length and thereby the image scale. Also, the usable field at the film plane is reduced to about a one-inch circle. The Tele-Compressor couples to the off-axis guider and accepts T-ring and camera body.

For C14 owners, we offer the **Celestron 5 Guidescope** with 5 x 24mm Finder Scope, Visual Back, Star Diagonal and Illuminated-Reticule Ocular Assembly. This add-on accessory also includes a tangent coupler assembly with manual slow-motions that permit you to sight in on stars up to 2 1/2° away from the optical axis of the C14. Users of the Guidescope are cautioned that the guiding-to-taking ratio becomes unfavorable and your photographs are much more susceptible to guiding errors, than when using the off-axis guider and the main optics.

The Celestron-Williams Cold Camera



The Celestron-Williams Cold Camera with off-axis guider coupled to the Celestron 8 Telescope

Astrophotographs of dim nebulous objects require a long exposure time because most commonly available films are relatively insensitive to faint light. These long exposure times necessitate correspondingly long (and tedious) periods of photographic guiding. Due to reciprocity failure in film, doubling the exposure time will not double the image density on the negative. This means that fainter objects require a disproportionately longer exposure time to record satisfactorily on film. Color film is even less sensitive to faint light than black and white film and requires an even longer exposure time. Additionally, the color balance of color

film can change radically during long exposures.

The Celestron-Williams cold Camera helps solve these problems by greatly increasing film sensitivity (3 to 6 times for color film and up to 15 times for black and white film) and practically eliminating any shift in color balance.

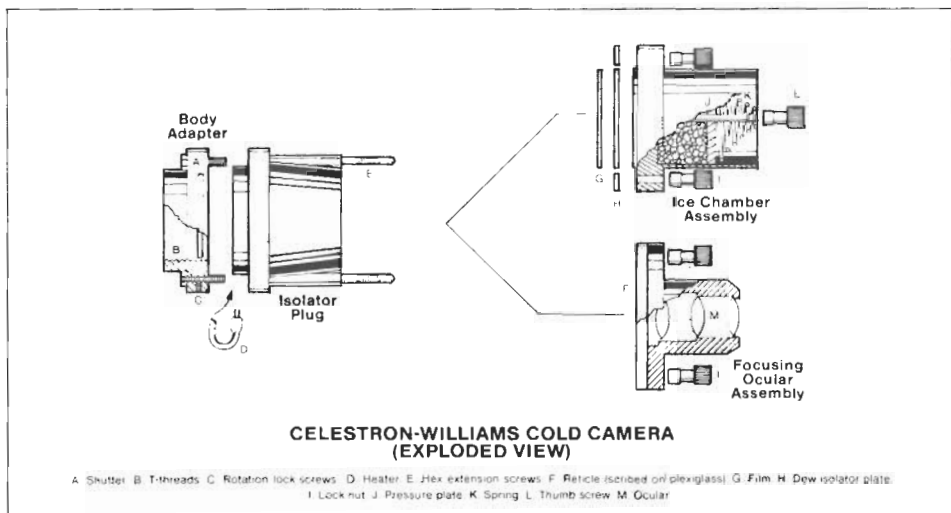
The cold camera increases film speed by chilling the film to sub-zero temperature during exposure thereby greatly reducing reciprocity failure.

The cold camera, which uses dry ice for cooling, is available in 35mm format only. It couples via the universal T-mount system to the Celestron off-axis guider.

Included with each cold camera are

two Isolator Plugs, a Focusing Ocular Assembly, a Heater, operating instructions and carrying case.

The cold camera uses a short length of film cut from a roll of ordinary 35mm film (two recommended films are: Ektachrome 200 for color work and Tri-X for B&W). Since the cold camera only accepts short pieces of film, be prepared to process the film yourself (commercial labs will not process short pieces of film). The cold camera was used to obtain the spectacular, full-color, deep sky photos that illustrate this catalog. The only limitations you have to producing similar pictures are your photo techniques and guiding ability.



THE ADVANTAGE OF CHILLED-EMULSION ASTROPHOTOGRAPHY — Above, two photos of the Lagoon Nebula (M8). The left photo was captured on ordinary Tri-X film chilled to sub-zero temperature with the Celestron-Williams Cold Camera. Exposure: 20 minutes with the Celestron 14



Telescope. The right photo was recorded with the same film, equipment, exposure time and image scale — but without chilling. Numerous of the color photos included throughout this catalog were shot using the chilled emulsion camera.

The Celestron Schmidt Camera

The Schmidt Camera is an instrument which can photograph wide sections of the sky with such detail that tiny sections of the negatives yield the extent of their definition only when examined with a high-power microscope or photographically enlarged 50 to 100 times. The fast speed of the lens system accomplishes these superb results in exposures ranging from a few seconds to 10 minutes.

Historically the Schmidt Camera has proven to be one of the most powerful research tools of modern astronomy. The famous 48-inch Palomar Schmidt Camera has figured prominently in more scientific discoveries than any other single instrument in existence. Educators, serious astrophotographers, amateurs and research institutions may now avail themselves of a Schmidt Camera at the modest price of a Celestron. These smaller instruments perform in exactly the same manner as the giant research instruments but are greatly simplified in operation. Note the amazing resolution of the Celestron Schmidt Camera photos reproduced in this catalog.

The optics of a Schmidt Camera consist only of a large spherical mirror of short focal length, a film holder that flexes the film to conform to the curved focal plane, and a Schmidt corrector lens. The implementation of a high-definition Schmidt Camera, however, places unusual demands of accuracy and stability on both the

optical and mechanical components. The optical components of the Celestron Schmidt Cameras are produced to the same diffraction-limited quality as our visual Schmidt-Cassegrain telescopes, and extreme efforts are made to give you a stable mount for these components. The mirror cell and spider assembly are mounted to an INVAR-bar cage assembly which permanently holds these components in their correct positions. Focus is factory adjusted and fixed assuring you of uniformly sharp photos.

The 8-inch f/1.5 Schmidt Camera can be mounted on the Celestron 14 or it may be interchanged with the Celestron 8 Telescope in its fork mount. When mounted on the C-14, the larger telescope serves as the guide scope. When used in the C-8 fork mount a separate guide scope must be mounted on the Schmidt Camera. The Celestron 5 is ideal for this purpose. When ordering the 8-inch Schmidt Camera please specify the combination you desire so that proper mounting brackets can be provided.

The 5½" Schmidt Camera shown here mounted on the Celestron 8 has a focal length of 9 inches and a photographic speed of f/1.65. It easily mounts on the Celestron 8 using the brackets provided (no additional holes need be drilled in the standard Celestron 8). In this configuration the equatorial mount of the 8-inch telescope serves as your stable platform for the Schmidt Camera, and you guide

through the main optics of the C-8 during your photographic exposure. Brackets are also available to mount the 5½" Schmidt Camera on the C14.

Film Holders

One 35mm film holder each is supplied with the 5½" and with the 8" Schmidt Camera. Larger format cannot be used with these units. Film holders are not interchangeable so if you wish additional film holders they should be ordered with the instrument.

Filters

Much of the sky-fogging which limits exposure time of the Schmidt Camera is in blue light. Fortunately many of the deep sky nebulous objects are predominately red. A red Gel filter can therefore be used with the Schmidt Camera to enhance (considerably) the density in red light. The filter is placed directly in front of the film holder and must be of the thin gelatin type to avoid shifting the focus too much. For those who wish to preserve the exact focus of the Schmidt Camera when used with these filters, we can provide special film holders which allow for the focus offset.

Schmidt Camera Specifications

Aperture	5½"	8"
Focal length	9"	12"
Speed	f/1.65	f/1.5
Image scale (degrees/inch)	6.35	4.8
Sky coverage		
35mm format	5.9 x 8.6°	4.5 x 6.5°
Light drop-off at corner of field	15%	17%



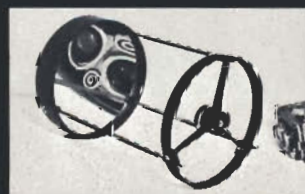
8 inch Schmidt Camera on the Celestron 14



5½ inch Schmidt Camera on the Celestron 8



Galaxy M33 - 8" Schmidt Camera



Mirror Cell with Invar Spacing Bars



Loading the Film Holder

Schmidt Camera and Piggyback Shots



North American Nebula - 8" Schmidt Camera



Comet West - 5½" Schmidt Camera



Andromeda Galaxy - 8" Schmidt Camera



Orion Constellation - 5½" Schmidt Camera



Sagittarius Region-35mm camera/50mm lens piggyback shot

Celestron 1250mm Telephoto Shots



Celestron telephoto as a telescope



Evening Grosbeak 30ft.



Squirrel 70 ft.



Cat 15ft.



Lion at 100ft. Inset - 50mm comparison shot- same enlargement



Purple Finch 30ft.

Celestron Multipurpose Telephotos



Celestron 750mm Mirror Lens shot

Speed, Power and Versatility Plus

For the long-lens photographer we offer two photo versions of the Celestron Telescope: a 750mm, f/6 and a 1250mm, f/10. Each is less than a foot long, tips the scales at four pounds and attaches instantly to your 35mm SLR or C-mount movie camera. (See the section on basic photography with the Celestron.)

The 750mm, f/6, which is very fast for a mirror-lens telephoto, is superb for focusing and shooting in low-light situations, and its focal length makes hand-holding the lens eminently practical. Also, compared to the 1250mm, f/10 telephoto, the 750mm has a closer near-focus distance (15 feet) and a wider photographic field. Magnification is 15X.

Unlike most other mirror-lens telephotos, the 750mm or the 1250mm can be used as a telescope for daytime observing or for stargazing, at powers up to 300X. (See the sections on op-

tional visual accessories and observing with your Celestron.) The 1250mm has a slight edge over the 750mm as a general-purpose daytime telescope and as a telescope for observing the Moon and planets. The 750mm is superior for observing extremely faint or extended astronomical objects.

The 1250mm, f/10, which is a photo version of the C5 telescope, is a moderately fast lens with higher power: 25X. It is excellent for extreme close-ups, especially in typical daylight—whether the subject is at 20 feet or on the horizon.

Celestron Mirror Lenses

The same superb optics used in our 5-inch astronomical telescopes are installed in these multipurpose telephoto lenses. The only difference is that the mirror lens tube assemblies are finished in textured black making them fully compatible with con-

ventional photographic equipment. This gives you resolution far in excess of that which is normally considered acceptable for use in a telephoto lens and also gives the added versatility of a superb visual telescope with the purchase of a few accessory items.

Telephoto Specifications

	750mm, f/6	1250mm, f/10
Focal Length	29.5"	50"
Mirror Diameter	5" or 125mm	5" or 125mm
f/Value (fixed)	f/6	f/10
Magnification	15X	25X
Closest Focus (approx.)	15'	20'
35mm Film Coverage (Diagonally)		
30 feet	20.8"	11.9"
100 feet	5.8'	3.3'
1000 feet	57.7'	33.2'
Tube Dimensions	5.5" x 10"	5.5" x 11"
Lens Weight	4 pounds	4 pounds
Case Dimensions	8½" x 8½" x 14½" same	
Shipping Weight	10 pounds	10 pounds

Standard with each lens: T-Mount Camera Adaptor, ¼-20 Photo Tripod Adaptor, lens caps and foam-lined carrying case.

Celestron 750mm Telephoto Shots



Inset - Comparison Shots Taken With 50mm Lens - same enlargement

Celestron Binoculars



Celestron 11 × 80mm Giant Binoculars

Incredible is the word that best describes this most popular Celestron binocular. For the star-gazer, they're like two richest-field telescopes side-by-side. The 11×80 giant binoculars easily reveal faint nebulae and galaxies. Under dark skies, they'll even show dust lanes in the Andromeda Galaxy. They're perfect for comet hunting, too. The 11×80 binoculars are also outstanding for long range hunting, surveillance, night sporting events, and the view home. The bright, clear images with 50% greater magnification bring you really close to the action in all sporting events.

For convenience in viewing over an extended period of time, a tripod adapter bracket is supplied that allows you to mount the 11 × 80 binoculars on your own photo tripod. Lens caps, carrying case and straps are also included.

Celestron Binocular Specifications

	7 × 35	7 × 50	11 × 80
Magnification . . .	7 ×	7 ×	11 ×
Objective			
Diameter	35mm	50mm	80mm
Angular Field	11°	7.5°	4.5°
Linear Field			
(at 1000 yds.) . .	576ft.	393ft.	235ft.
Near Focus			
(approx.)	13ft.	19ft.	30ft.
Interpupillary			
Range	52-	52-	52-
	78mm	78mm	75mm
Exit Pupil	5.0mm	7.1mm	7.3mm
Relative			
Brightness	25.0	51.0	52.9
Twilight Factor . . .	15.7	18.7	29.7
Relative Light			
Efficiency	41.3	84.2	79.4
Height	5¼"	7"	11¾"
Weight	2.2lbs.	2.6lbs.	5.0lbs.

The name Celestron is synonymous with the finest, highest quality, high resolution astronomical optical systems. In keeping with this reputation, we established binocular specifications far above those of the popularly offered, department-store-variety binoculars. To meet our standards for true astronomical image quality, the images must be crisp and free of color distortion. The optics must be antireflection coated for maximum light transmission and contrast. For maximum image brightness, the exit pupil of the binocular must closely match the size of the observer's dark-adapted eye pupil. Finally, the binoculars must be precisely collimated to eliminate double images and avoid eye strain and other visual discomfort. Celestron binoculars are collimated at the time of manufacture and then again just prior to shipment on the precision laser collimator at our factory.

And the quality doesn't stop with the optics. You can feel the expert craftsmanship when you hold the smoothly sculptured body balanced effortlessly in your hands and use the satin-smooth adjustments.

In short, Celestron binoculars are the first and only moderately priced glasses to meet our standards for astronomical viewing. What does this extra quality mean for ordinary viewing? It means, simply, unexcelled performance whether used for bird watching, nature viewing, hunting, boating, or general viewing.



Celestron 7 × 50mm Wide-Angle Binoculars

Superior for any low-light viewing—whether celestial or terrestrial—and yet compact and lightweight. Long considered the standard size "Marine Glass" by the Navy because of high performance under adverse lighting conditions—day or night. These binoculars are ideal for boating, hunting, sporting events (especially night games), surveillance, bird watching, nature study or the view home. Because of the high relative brightness and great light efficiency, the 7×50's are excellent for wide-field astronomical viewing. Lens caps, carrying case and straps are included.

Celestron 7 × 35mm Ultra-Wide-Angle Binoculars

Compactness, lightweight, and an extraordinarily large field-of-view make these binoculars a fine general purpose glass. They're ideal for travel, hiking, sporting events, nature and general viewing or virtually any other use. They really excel for viewing action sports because the ultra-wide field-of-view makes it easy to keep the ball in view. For astronomy, you won't believe how much of the Milky Way can fit into one field-of-view! Lens caps, carrying case and straps are included.



Celestron 90

Maksutov-Cassegrain Telescope



C90 Astro Telescope

The Celestron 90 is the newest, most compact and lowest-priced member of the Celestron family of telescopes. And, judging from the overwhelming response to the C90, it may well become the most popular Celestron telescope.

The C90 is unusually small and lightweight for its focal length (1000mm). This—coupled with its unusually-low price and high quality—makes the C90 Astro Telescope extremely desirable as a telephoto lens or spotting scope too. Accordingly, we've designed a complete product line around the C90 optical system.

The heart of the C90 series is the 90mm aperture, f/11, Maksutov-Cassegrain optical system, which is identical on all three C90 versions. As a result, the C90 is a telescope that's also a telephoto or a telephoto that's also a telescope. By adding the appropriate optional accessories, it's possible to use any C90 version in another mode.

FOR THE PHOTOGRAPHER:

A compact, crisp, light, easy to use 1000mm for 35mm SLR cameras or C-mount movie cameras . . .

FOR THE HOME WITH A VIEW:

See ships, planes, trains and people at incredible distances with complete clarity . . .

FOR THE NATURALIST:

Observe a warbler feeding her young from 100' . . .

See the geometric designs of a spider's web at 50' . . .

FOR THE BEGINNING ASTRONOMER:

You'll view thousands of lunar craters, the rings of Saturn, the cloud belts & moons of Jupiter, scores of deep-sky objects, all this and more . . .

The C90 Astro Telescope is supplied with advanced features usually found only on larger, more expensive telescopes—features like star locating setting circles, an automatic tracking system and slow-motion controls on both axes—that make using the telescope easy and convenient. The standard ocular and Barlow lens provide magnifications of 55 \times , 140 \times and 200 \times .

As a daytime telescope, the C90 is remarkably powerful. With it, you'll see bees buzzing in flowers 20 feet away, recognize the faces of friends 1/2 mile away, read auto license plates 2 miles away, or identify airliners many miles away.

At night, there are countless wonders in the night sky visible through the C90. The Moon, our nearest celestial neighbor, will display a multitude of craters, rugged mountains, rills and relatively smooth plains (maria).

Other members of the solar system may also be closely examined through

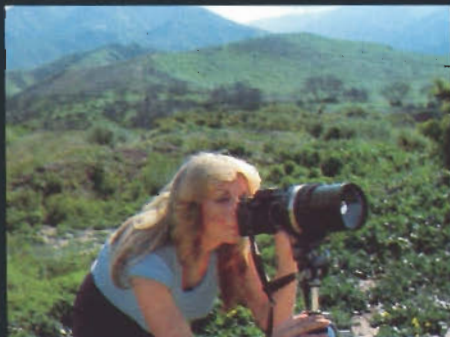
the C90. You'll see Jupiter's equatorial cloud belts as well as its great Red Spot. You'll also be able to watch the 4 Galilean satellites as they orbit Jupiter. The Rings of Saturn are easily visible through the C90, too.

Under dark skies, you'll be able to see scores of deep sky objects, such as: The Great Nebula in Orion; the Andromeda Galaxy; The Ring, Lagoon, Trifid and Dumbbell Nebulae; The Great Hercules Cluster; and countless other objects.

For photography, convenient adapters (optional) attach your 35mm SLR camera body to the C90, thus permitting telephotography, long-distance macrophotography, full-disk lunar or solar photography and planetary photography (see the section on basic photography on page 19).

In short, the C90 is the ideal choice for the beginning amateur astronomer, nature enthusiast, or photo hobbyist who wants a high quality telescope (or telephoto lens) for a relatively small investment.

C90 Telephoto



C90 Spotting Scope



C90 Astro Telescope



Celestron 90 Photographs

Celestron 90 Specifications

Optics Maksutov-Cassegrain
 Aperture 90mm (3.55")
 Focal Length 1000mm (40 inches)
 Focal Ratio f/11
 Photographic Power 20 ×
 Resolution (Dawes limit) 1.3 arc seconds
 (120 lines/mm)
 Visual Stellar Magnitude Limit 12
 Image Scale 1.43"/inch
 Near Focus (approx.) 10 Feet
 Secondary Obstruction 1 3/8" (15%)
 Finderscope** 5 × -24mm
 Slow-Motion Controls* Manual (both axes)
 Electric Drive* 3 watts, 110v 60Hz
 (unless otherwise specified)
 Drive Gear Diameter* 4 1/2 inch spur

Setting Circle Diameter* R.A. 6 1/4 inches (Driven)
 Dec.: 4 inches
 Visual Back (eyepiece tube)96" O.D. (built-in)
 Eyepiece (ocular)** 18mm Kellner, .96" O.D.
 Barlow Lens** 2.5 × .96" O.D.
 Star Diagonal*96" O.D. Prism type
 Telephoto/Spotting Scope Size 5" Dia. × 8" Long
 Weight 3# (approx.)
 Telephoto/Spotting Scope Case
 Size 6 1/2" × 8 1/2" × 10 1/2"
 Shipping Weight 8# (approx.)
 Telescope Size (swung down) 7" × 7" × 13"
 Weight 8# (approx.)
 Telescope Case Size 8 1/2" × 8 1/2" × 15"
 Shipping Weight 17# (approx.)
 *Only on C90 Astro Telescope
 **Only on C90 Astro Telescope and Spotting
 Scope



Butterfly at 7 ft.



Tiger at 30 ft.



Butterfly at 8 ft.



Squirrel at 15 ft.



Bird at 15 ft.



Bird at 50 ft.



Lion at 25 ft.



Fisherman-Inset: Comparison photo with normal 50mm lens.

Optical Testing and Warranty

Optical Testing

The optical testing and product warranty of our telescopes are as modern as the telescopes themselves. The most advanced laser collimation and interferometric testing techniques are routinely used in production testing Celestron optics, and our product warranty offers the protection afforded by the most recent consumer legislation.

Each Celestron optical system is set up in a double-pass autocollimator illuminated by a Helium-Neon laser at 6330 Angstroms. The optics are inspected for zonal irregularities with a 150-line Ronchi grating by a skilled optician. Then the secondary mirror is hyperbolized to assure the best optical figure that modern glass will support.

Our optical specification is as follows:

Each and every Celestron Telescope shall be diffraction-limited, and shall clearly define the image of a point-source at infinity, e.g. the Airy disc. With the optical system properly collimated, the knife-edge test shall show a clean optical null and a 150-line Ronchi grating shall show straight shadow bands (three lines intercepting the optical path). Also, the intra and extrafocal diffraction patterns of the system shall appear similar with respect to the secondary obstruction when a 12mm ocular is used to examine the out-of-focus blur circles (blur circle filling one third of the field). Further, each optical system is serialized, registered and warranted to be free from image-degrading defects in material and workmanship.

Please note that the above optical specification describes optical tests that you can verify by star testing your Celestron on a night of very steady seeing conditions. In addition, we offer assurance of optical quality in terms of wavefront tolerance. Each of our autocollimators can be converted to an interferometer permitting wavefront error to be determined. On the average the wavefront error of Celestron Telescopes amounts to 1/20th wave peak-to-peak. This translates to 1/30th wave root-mean-square (r.m.s.) when the actual contribution of zonal errors to overall performance is geometrically weighted.

Each Celestron product is 100% tested for mechanical operation and cosmetic appearance.

THIS WARRANTY SUPERSEDES ALL OTHER PRODUCT WARRANTIES.

Full One Year Warranty

All Celestron Products are warranted against defects in materials or workmanship for a full year from the date of purchase (Purchase being the date the product is received).

This warranty is for the benefit of the original retail purchaser and any subsequent transferee during the warranty period.

During the warranty period this product will be repaired or replaced, at Celestron's option, at no cost to you.

In event of a (warranted) product defect, please return the product to the Celestron factory or the retail establishment where purchased—freight prepaid.

This warranty does not apply in cases of abuse, mishandling, or unauthorized repair, by any other person or company.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

If warranty problems arise, contact:

Manager, Consumer Relations
2835 Columbia Street
Torrance, CA 90503

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**CELESTRON
INTERNATIONAL**

Officers Message

Tom Johnson

Tom Johnson, the creative genius behind the Celestron line of telescopes. Johnson, who holds numerous patents in optics and electronics, first became interested in telescopes through a compelling childhood desire to observe through a large research telescope the awesome ring structure of Saturn, the Polar caps of Mars, the great red spot and Galilean Moons of Jupiter and other wonders. After building his first 18-inch Cassegrain telescope he found that his real reward was in sharing this observing experience with others. He founded the Celestron company.

When Johnson set out to make a Schmidt Cassegrain telescope he took it as a personal challenge when some of the leading professional opticians and astronomers advised him that it was impossible to produce a quality telescope of this class economically. He departed from conventional techniques used in optical manufacture and in the production of the mechanical components of the Celestron. The result of this innovative thinking has given to the world an entirely new standard in optical excellence.

Johnson has insisted that the savings achieved in applying new technology to the optical production of these instruments be passed along to the customers. He derives great personal satisfaction in helping provide the avenue whereby countless thousands of people may view from their own backyards through a research quality optical system those same awesome rings of Saturn and the great red spot of Jupiter that were so much a thrill to him.

Alan Hale

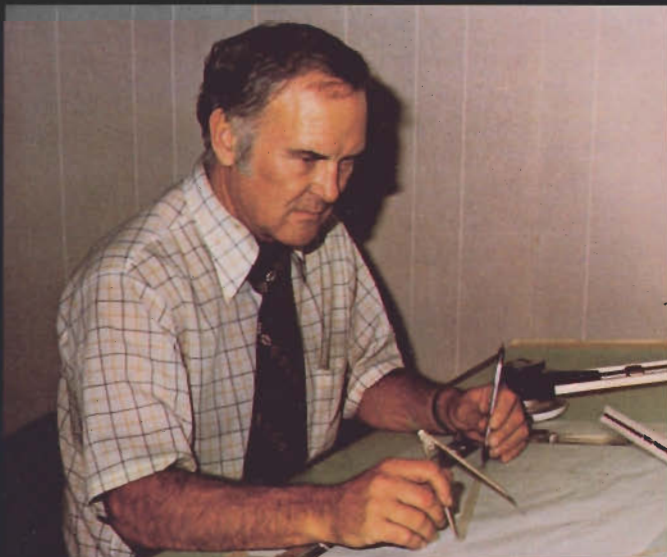
Alan Hale has been with Celestron since its inception and at the helm for five years. He has guided Celestron on its journey from a small optical house to the world's leading manufacturer of telescopes in its aperture and price range.

Hale combines a unique practical background with intensive academic training in business and finance. His insistence on the highest ethical and moral standards in dealing with employees, suppliers, and customers has been a major factor in the excellent reputation that Celestron enjoys.

Customer satisfaction and recommendations have been one of the goals set by Alan. Integrity has meant that customer inquiries are promptly and truthfully answered. No advertisement is released that exaggerates the characteristics of a Celestron product. He has felt that it is equally important to point out the things that our products cannot do as well as the merits with the ultimate goal of securing only happy customers.

Hale has insisted that the marketing and manufacturing areas coordinate their efforts to achieve high standards of quality, efficient servicing, and reliable delivery times.

The compliments that we have received from our accountants, bankers, and I.R.S. auditors to the effect "Celestron maintains a clean and conservative set of books" attributes directly to Alan Hale's administrative ability.

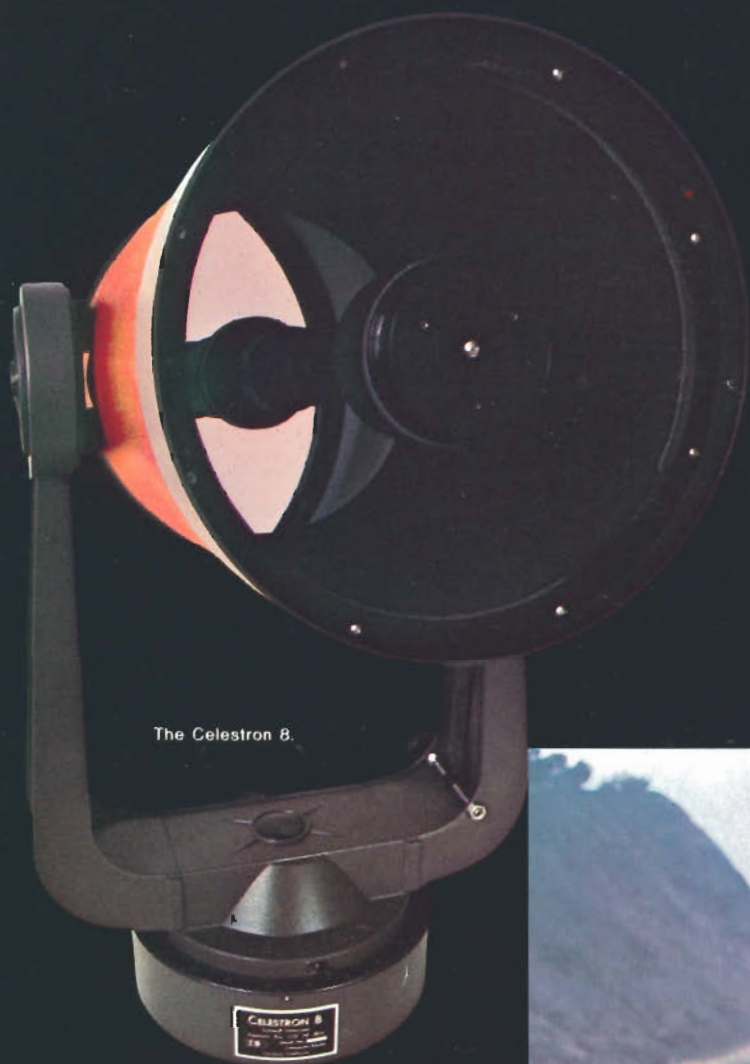


Thomas J. Johnson, Founder
Chief Executive Officer

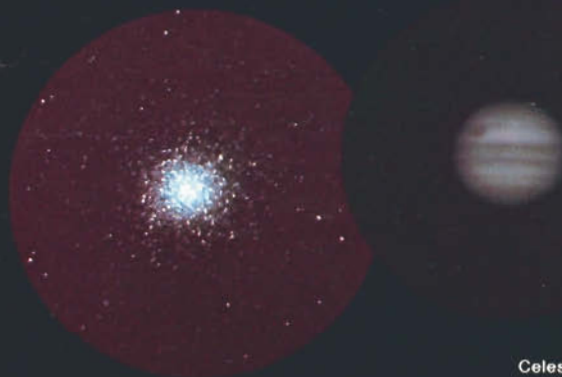


Alan R. Hale, President
Operations Manager

With a Celestron,
Large-Aperture
Performance
is Only Half the Fun.



The Celestron 8.



Celestron 8 photos

The Other Half is Where You Can take it.

Under clear, dark, steady skies, the amount of detail that can be seen through our large-aperture telescopes borders on the fabulous.

The lightweight, compact, modern design means you can take it anywhere you want, and have it set up and operating in no time—and 35mm photography is as easy as adding your camera.

Celestron®

Celestron International
2835 Columbia Street
Torrance, CA 90503
(213) 328-9560

