

USING THE COMET CATCHER

It's as easy as 1,2,3...

1. GET READY

Put an eyepiece in the focus tube of the Comet Catcher. The power of any telescope is determined by the eyepiece. The 28 power eyepiece that is supplied with the Comet Catcher is a high quality, all-purpose eyepiece of the "Orthoscopic" design with an 18mm focal length. To determine the power of the Comet Catcher with any eyepiece just divide the eyepiece focal length into the focal length of the Comet Catcher itself (500mm). Put the Comet Catcher on any sturdy camera tripod for best performance. Although it can be hand-held, the Celestron Photographic Tripod is recommended.

2. AIM

Since the Comet Catcher has a wide field-of-view all you have to do is aim by sighting along the tube. If the object isn't immediately visible just scan the area. What should you look at? The Comet Catcher comes with Celestron's Sky Maps that lists hundreds of excellent astronomical objects. We suggest you begin by observing large, bright star clusters, nebulae, galaxies and the Moon. Use the Comet Catcher anytime - it's perfect for lunar eclipses or daytime viewing. **USE A SOLAR FILTER TO OBSERVE SUNSPOTS - DO NOT VIEW THE SUN BY PROJECTING THE SOLAR IMAGE.**

3. FOCUS

To focus turn the large focus knob on the sliding focus assembly. Be certain the smaller locking screw is loosened. Use the locking screw after you've focused, especially for photography. When the Comet Catcher is out-of-focus a star would look like a ball with a hole in it; when in-focus a star is a pinpoint of light.

If you have questions, contact Celestron's Toll-Free Telescope Information Service:

1-800-421-1526

M-F 8AM to 4:30PM continental U.S. only or write:

Celestron International
P.O. Box 3578 2835 Columbia St.
Torrance, CA 90503 (213) 528-9560
OR

Contact Your Celestron Dealer

COMET CATCHER ACCESSORIES

See Your Dealer for Prices

CELESTRON PHOTOGRAPHIC TRIPOD

The perfect tripod for your Celestron Comet Catcher. It's adjustable from 24 to 64 inches in height and weighs 6.5 lbs. The tilt and pan controls allow you to effortlessly scan the skies with this stable, portable tripod and your Comet Catcher.



PLÖSSL OCULARS AND DELUXE BARLOW LENS

Celestron recommends our 25mm Plössl Ocular as an exceptional extra bright, wide field eyepiece to use with your Comet Catcher. The high contrast multicoatings, optical design and exceptional care in manufacture assure you of the highest possible image quality. Celestron's matching 2x Deluxe Barlow Lens doubles the power of any eyepiece on any telescope that uses 1 1/4" diameter eyepieces; its design actually increases performance.

OTHER ACCESSORIES

See Celestron's Accessory Catalog for Description

- ☐ T-Adapter - RFT. Use this and the T-Ring to attach a camera. Unscrew the eyepiece holder tube, thread on the T-Adapter and attach your camera.
- ☐ T-Rings. This goes into your camera in place of its lens for attachment to your T-Adapter.
- ☐ High Power Eyepieces - 1 1/4". Any 1 1/4" eyepiece will fit the Celestron Comet Catcher. 4mm (125x), 5mm (100x), 6mm (83x), 7mm (71x), 9mm (56x), 10mm (50x), 12mm (42x), 16mm (31x), 20mm (25x), 24mm (21x), 26mm (19x), 28mm (18x). *Extra wide angle.
- ☐ LPR Filter #4. Thread this into your eyepiece to reduce city light pollution when you observe nebulae.
- ☐ Solar Filter - 2". Safely view and photograph the Sun.
- ☐ Eyepiece Filter Set - 1 1/4". Colored filters to reduce the brightness of the Moon and bring out details on the planets.
- ☐ Optics Cleaning Kit ☐ Carrying Case

CELESTRON RECOMMENDS THIS PACKAGE:

- Celestron Comet Catcher
- Celestron Photographic Tripod
- 25mm Ocular - For ultra wide views
- 7mm Ocular - for viewing planets

COMET CATCHER



*A Telescope
for the 1980's
and beyond...*

**PRECISION OPTICS
from
CELESTRON®**

COMET CATCHER

AT YOUR
CELESTRON
DEALER!

PRECISION ASPHERIC
SCHMIDT CORRECTOR
LENS FOR
BETTER IMAGES

UNIQUE SLIDE FOCUS
FOR PHOTOGRAPHY
OR VIEWING

1 1/4" EYEPIECE

ALL METAL

ATTACHES TO ANY
PHOTOGRAPHIC TRIPOD

Exclusive Schmidt-Newtonian Optics Means Extra-Sharp Brilliant Images

The Celestron Comet Catcher, and only the Comet Catcher, uses modern state-of-the-art aspheric optics to give you images sharper than ever possible in a wide field telescope. The secret is the corrector lens mounted in front. The aspheric corrector is laser tested to incredible accuracy by Celestron's experienced opticians, using the most modern testing devices available. Celestron's Comet Catcher uses only quality optical glass. The spherical primary mirror is properly supported and is of the proper thickness (1/8 thickness to diameter) to ensure quality images and permanent optical alignment.

Instead of the dim, unsharp images delivered by small beginner's telescopes the precision optics of the Celestron will open the Universe to you with crisp, bright detailed views.

SPECIFICATIONS

- Optical Design: Schmidt-Newtonian
- Clear Diameter: 5.5-inches (14cm)
- f/ratio: 3.64
- Focal Length: 500 mm
- Major Axis of Elliptical Secondary Mirror: 2.9 inches (7.4 cm)
- Light Grasp: 330 times the human eye
- Mechanical Construction: All aluminum
- Mirror Material: Fine annealed Pyrex
- Length of Tube: 19-inches (48cm)
- Weight: 6.4 lbs.
- Near Focus: 35 feet (10.7m)
- Standard Magnification: 20 power
- Useful Magnification Range: 15-330 power
- Field-of-view with Standard Power: 1.6 degrees
- Field with optional 28mm Ocular: 2.4 degrees

THE PERFECT BEGINNER'S TELESCOPE AND A PERFECT SECOND TELESCOPE

The Celestron Comet Catcher is a new kind of telescope. Exclusively manufactured by Celestron, it will show you *Adventure in Astronomy*. Celestron studied what people want when they're looking at our Universe. From our research, we know you need a telescope with: (1) A wide field-of-view - so you can easily find objects. (2) Precision Optics - so you won't be disappointed in what you see. (3) A large diameter - so the images are bright and detailed. (4) Portability - so you can use it anytime, anywhere. The Celestron Comet Catcher delivers all this... and more.

IS THE COMET CATCHER ONLY FOR COMETS?

NO! The Comet Catcher is for anything in the Universe! You can look at objects on the ground, the Moon, planets (the Rings of Saturn are easily seen), star clusters, nebulae, and galaxies. The Comet Catcher is so named because it gives you a wide, bright field-of-view that is excellent for observing comets and large deep sky objects - try it on the Orion Nebula, the Pleiades or the Lagoon Nebula! Although you may use the Comet Catcher at high powers it is designed for wide field, low power use.

CAN YOU USE THE COMET CATCHER FOR PHOTOGRAPHS?

YES! A camera adapter is available as an option. The Comet Catcher is a fast, excellent terrestrial telephoto. It can be used to photograph the craters of the Moon and piggybacked on other telescopes to serve as an excellent deep sky astrophotographer.

Product Information/Technical Specifications

CELESTRON DESIGN GOALS:

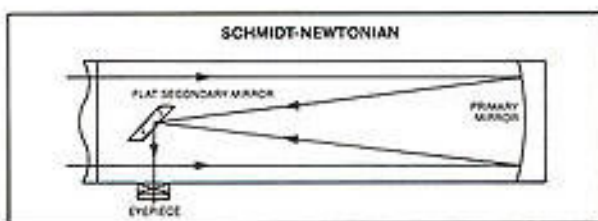
Its name says a lot about it: Celestron's Comet Catcher was designed to meet five very specific goals. It must provide a wide, rich, visual field in order to easily locate and contain objects in view. It must employ advanced design and quality optics so that an immense amount of light is captured and the view is bright, powerful and pleasing. It must utilize a large diameter mirror for maximum light transmission and detailed, high resolution images. It must be lightweight and portable, for easy transporting and set-up. And finally, it must be versatile — capable of visual or photographic observation and of accepting a wide variety of eyepieces and accessories. This telescope was specifically designed for viewing and photographing space objects such as galaxies, nebulae, star clusters and, of course, comets.

DESIGN FULFILLMENT:

Celestron chose an advanced Schmidt-Newtonian design for the Comet Catcher. This design utilizes elements of both refractor and reflector telescopes, and in this size and configuration is so effective that the standard Comet Catcher delivers a 1.5 degree field of view (with 18mm ocular), gathers 330 times more light than the human eye and features an incredible $f/3.6$ photographic speed. Yet, this instrument is only 19 inches long and weighs less than 6½ pounds.

OPTICAL DESIGN:

The Schmidt-Newtonian design utilizes a sealed optical tube to protect sensitive mirror surfaces from dust and damage. Light enters the front of the Comet Catcher through a 140mm aspheric corrector lens. This lens is highly figured and laser tested to outstanding accuracy. Its purpose is to "correct" or focus the light image and send it to the back of the Comet Catcher where it strikes the large 5.5 inch spherical primary mirror. This mirror is made of aluminum coated and SIO protected Pyrex glass for brilliance and long life. It is sturdily supported, stationary, and of the proper 1 to 6 ratio of thickness to diameter, to insure a high quality image and permanent alignment. The primary mirror directs the light image forward. Near the front of the instrument the image is focused on a small diameter "secondary" mirror which deflects the image at right angles and into the ocular or eyepiece. The eyepiece magnifies the image and focuses it on the eye.



WARNING! Never view or photograph the sun with an optical instrument without professionally designed and manufactured solar filters and by carefully following the manufacturer's directions.

TECHNICAL INFORMATION:

- 500mm effective focal length
- 140mm (5.5 inches) clear aperture
- 1.5 degree rich field (with 18mm ocular) — about two to three times "wider" than the average telescope
- Gathers 330 times more light than the human eye
- Brilliant, fast, $f/3.64$ photographic speed
- All optics are hand-figured, hand-collimated, laser tested
- Near focus: 35 feet
- Length: 19 inches
- Weight: 6.4 pounds
- Accepts 1.25 inch eyepieces
- Unique slide focus
- 18mm Orthoscopic ocular
- Lens cap
- Built-in tripod adapter
- Celestron 25 year limited warranty

FEATURES:

The Comet Catcher is a wonderful first telescope—and an extremely useful second telescope. Because of its wide field, it's superb for quickly locating and holding deep space objects in view. And the view is not only wide, it's brilliant. As a second scope for advanced amateurs, the Comet Catcher offers great portability and outstanding astrophotography potential. This is truly a unique and highly capable instrument of outstanding design and craftsmanship.

CELESTRON PRODUCTS OF RELATED INTEREST:

- A sturdy Telescope Tripod is a virtual necessity for serious observation. Celestron makes several models.
- The Comet Catcher accepts any of the full line of Celestron 1.25 inch oculars.
- For precise tracking and time exposure astrophotography, consider adding the optional German Equatorial Mount. It features an adjustable height tripod, setting circles, slow motion controls, azimuth and elevation fine adjustments, counterweights accessory tray and bubble level.
- Added tracking and location options include a quartz controlled pulse motor and Polar axis finder.
- Celestron's Star Chart will help you quickly locate objects of interest based upon your location, the month, day and hour. Even though the Comet Catcher (because of its wide field) is one of the easiest instruments with which to locate objects, a Star Chart shows you where to look!
- Celestron makes a full line of refractor and reflector telescopes, including the famous Super C8—the world's most popular modern telescope. We also market binoculars, spotting scopes and telephotos.

QUESTIONS & ANSWERS ABOUT CELESTRON'S COMET CATCHER:

Q. Why is it named the "Comet Catcher"?

A. Because it's specifically designed to capture large, dim objects in space—and that pretty well describes comets. It also describes deep space objects like nebulae, galaxies, dust clouds and star clusters. And, while the Comet Catcher is best at wide views of wide objects, it still will provide very good views of the moon and planets. It can resolve Saturn's rings and Jupiter's clouds. And by the way, since we are talking about the Comet Catcher, please remember that our world's most unique and spectacular comet—Halley's comet—will be returning in 1985-1986!

Q. Is the Comet Catcher difficult to use?

A. Because it features a wide field, the Comet Catcher is one of the easiest telescopes to use successfully. Just set up, point to the approximate

area of the object using a low power ocular, locate the object and then change to a higher power if desired.

Q. What do I do to convert the Comet Catcher to astrophotography?

A. Buy a Celestron T-ring and T-adaptor to fit your 35mm camera and you're in business. Because of its outstanding f/3.6 lens speed you can photograph some objects with just a tripod. For longer exposure photography you'll need the equatorial mount, a Polar axis finder and quartz pulse motor drive. At that stage, you'll have one of the finest photographing telescopes around!

Q. I hear a lot about the power of telescopes. Some inexpensive telescopes are advertised as being very powerful. What goes?

A. Brilliance and wide image—not power—is what the Comet Catcher is all about. But you should still know how to calculate power. The power of a telescope is determined simply by dividing the size of the ocular (e.g. 18mm) into the focal length of the telescope lens (e.g. 500mm). The smaller the eyepiece in millimeters, the higher the power. Therefore, the power can be changed easily by changing the oculars.

When telescopes sell "power," it's really a fairly meaningless statement. Light-gathering ability is really what all good telescopes are about... especially the Comet Catcher. Remember, also, that most astronomical observation involves a quality image and often utilizes lower magnification powers.

Q. You mention that other oculars are available. Which ones would you recommend for the Comet Catcher?

A. In addition to the standard 18mm that comes with the instrument, consider adding a 4mm, 10mm, 26mm and a Celestron 2X Barlow lens to double the magnification of any ocular. With that combination, you'd have a choice of 2mm, 4mm, 5mm, 9mm, 10mm, 13mm, 18mm, and 26mm oculars and a power range from 19x to 250x.

Q. I'm impressed—but I see similar looking telescopes in stores and magazines for less money. What's the story?

A. In a sentence—you can't tell a telescope by its wrapper. One of the least expensive parts of any telescope is its optical tube. Any manufacturer can make a telescope that looks good outside. But you have to select an instrument by its craftsmanship, optical quality and performance—and that's not always easy when you're shopping. Stores understandably don't want you taking their instruments apart! But don't give up, there are ways to separate the Celestrons from the cigar wrappers. First, ask owners. More amateurs own Celestrons than any other modern telescope. That should tell you something, and the owners will tell you more.

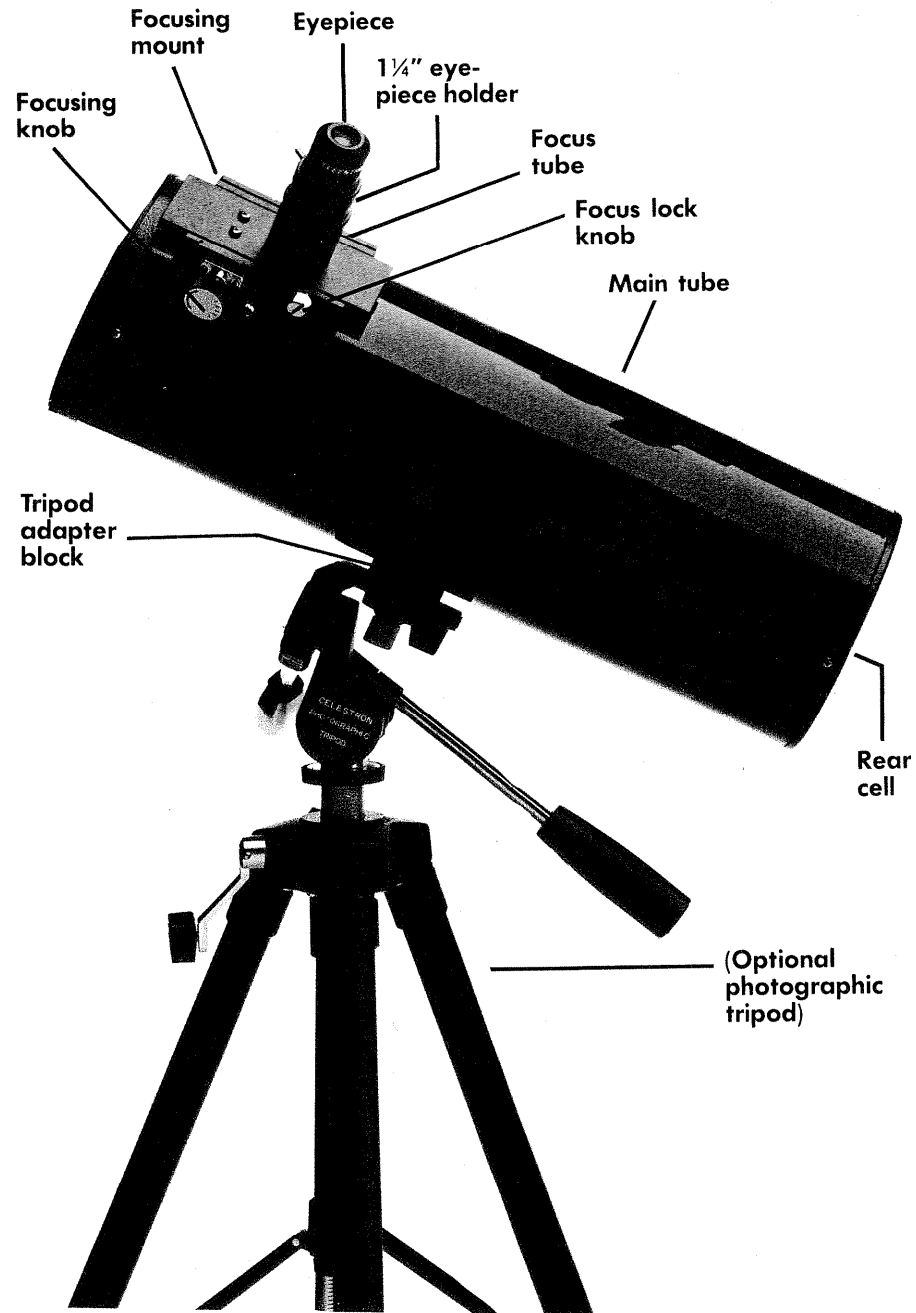
Then look at the reputation, history and reliability of the manufacturer. When Celestron gives you a 25 year limited warranty, you know we'll be around in 25 years to back up our good name.

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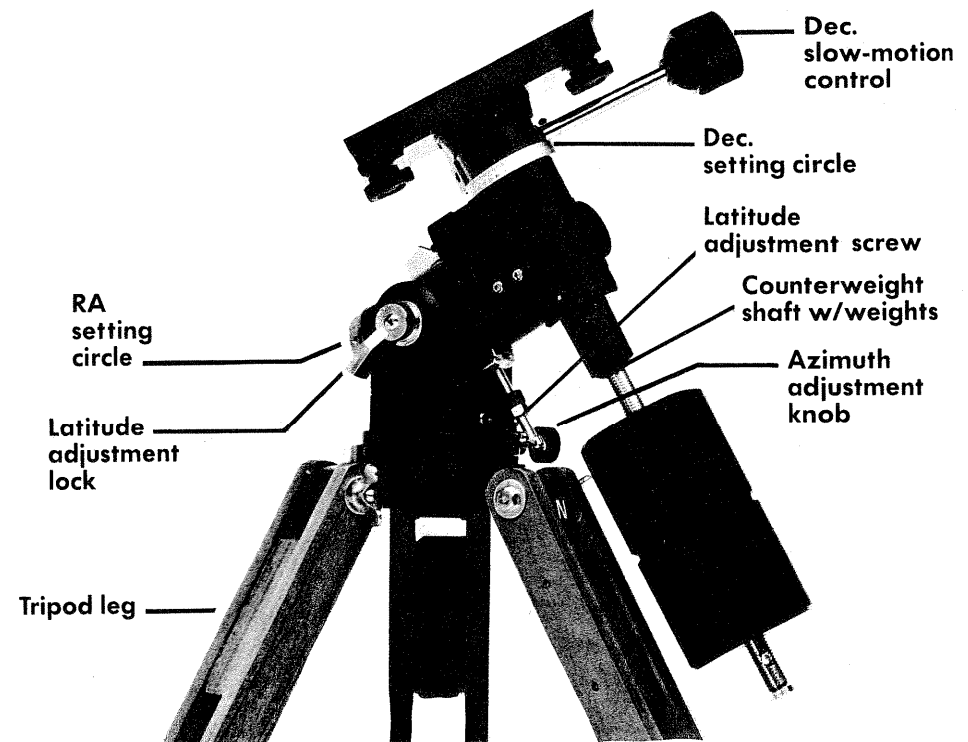
CELESTRON®
PRECISION OPTICS

CELESTRON INTERNATIONAL, P.O. Box 3578, 2835 Columbia St., Torrance, CA 90503 (213) 328-9560

Celestron Comet Catcher



Standard Polaris Mount



Celestron Comet Catcher Telescope (#21004)

Specifications and Standard Features

Precision optical tube assembly
500mm effective focal length
140mm (5.5 inches) clear aperture
f/ratio: f/3.64
Light grasp: 330 times the human eye
with 7mm pupil
Mirror material: Fine annealed Pyrex
Major axis of elliptical secondary
mirror: 2.9 inches (7.4cm)
Field of view with 18mm ocular: 1.6°
(standard)
with 26mm Plossl ocular: 2.4° (not
included)
Accepts 1.25-inch eyepieces
Useful magnification range: 18-150
power
Near focus: 35 feet (10.7m)
All optics are hand-figured, hand-
collimated, and laser tested
Built-in tripod adapter
Lens cap
Length of tube: 19-inches (48cm)
Weight: 6.4 lbs.

The Comet Catcher is a wonderful first telescope, and an extremely useful second telescope. Because of its wide field of view, it is superb for quickly locating and holding deep space objects in view. And the view is not only wide, it is brilliant. The Comet Catcher will give you intimate views of the surface of the Moon, of Comets, and neighboring galaxies that share our universe. You will be able to look deep into space at the nebulae that are the birthplace of new stars or the dying embers of old ones.

Even the massive formations of stars that make up globular star clusters, and double stars that orbit each other endlessly can be seen. The Comet Catcher is also good for looking around right here on our own home planet and even to photograph the wonderful things you see.

The Comet Catcher is a Rich Field Telescope (RFT). One advantage of the RFT is its great image quality. When you look through the eyepiece of the Comet Catcher, you will see extremely bright, vivid images, that seem to jump right out of the telescope.

A second advantage of all RFT telescopes is their wide fields of view. For example, when you look through the eyepiece of the Comet Catcher, you can see three galaxies at once, M31 and its companions M32 and M110.

The Comet Catcher has been designed to be a low power telescope. Its purpose is to show you a large slice of the heavens at once. It is extremely easy to use, so you can get exciting, satisfying results without having to spend a lot of time and energy learning how to use the instrument. It is a great telescope for amateur astronomers, beginners, children, or anyone who wants to take a portable, easy-to-use telescope wherever they go.

The Comet Catcher comes out of the box, ready to mount onto a photographic tripod. (If you don't already have one, Celestron makes a perfect tripod for the Comet Catcher, the Celestron Photographic Tripod #93596).

Assembly of the Comet Catcher

Operation of Your Comet Catcher

1. Attach the Comet Catcher to the tripod by screwing the tripod into the mounting block located at the bottom of the telescope.
2. Loosen the thumbscrew on the eyepiece sleeve. Insert the 18mm eyepiece that comes with the Comet Catcher into this sleeve. Tighten the screw so the eyepiece (ocular) does not slip out. Now you are ready for your first look.

With the wide field of view of the Comet Catcher, objects will be easy to find.

1. For your first look through the Comet Catcher, choose a bright object that can be easily found. The Moon would be perfect for this. **WARNING! NEVER USE THIS OR ANY OTHER OPTICAL INSTRUMENT TO OBSERVE THE SUN WITHOUT A PROPER FILTERING DEVICE! INSTANT AND PERMANENT (BLINDNESS) EYE INJURY WILL RESULT.**
2. Sight along the telescope by holding your eye level to the top of the scope and aim along the telescope at the Moon.
3. Look through the eyepiece. You should be able to see the Moon. If not, scan the sky until you locate the Moon.

Focusing the Comet Catcher

4. Make sure the small set screw (focus lock) under the eyepiece sleeve is loose.
5. While looking through the eyepiece, turn the focus knob until the image comes into focus. You may find that you have to pass in and out of the focus point in order to obtain sharp focus.
6. By tightening the set screw on the focusing mechanism, you will insure that the object stays in focus.

**Setting Up
and Using Your
Equatorial Mount—
Optional Equipment**

The Comet Catcher Equatorial Mount will enable you to align your telescope with the polar axis (or tilt) of the Earth. Once you are polar aligned, your telescope can actually move synchronously with the Earth's rotation. The mount includes setting circles to help you locate hard to find celestial objects, and slow motion controls for fine pointing adjustments. An optional quartz pulse motor (#93516) is also available for automatic visual tracking and astrophotography.

1. Take the three tripod legs and the accessory tray and place them on a flat surface. Loosen the wing nuts (two-thirds of the way down the legs) and extend the legs all the way. Retighten the wing nuts.
2. Lay the legs down and pick up the equatorial mount. Insert the tripod legs, one leg at a time, so that the lip of the base fits right over the bolt in the tripod leg, and tighten the nut. Make sure that the tabs for the accessory tray are facing upward so that you will be able to attach the accessory tray. If all of the wing nuts are on the right side of the tripod legs, then you have put them together correctly. Next, attach the accessory tray. Slip the screws through the slots in the tab and tighten down the hand tightening knobs.
3. Take out the counterweight bar and insert it into the base of the mount. Look for its fitting at the bottom of the base, perpendicular to the telescope position. Twist the bar in as far as it will go and then tighten the small sleeve over it.

The sleeve acts as a safety to keep the bar from accidentally becoming loose. Once it is secure, twist on the counterweights.

4. Mounting the tube. To mount the telescope onto the equatorial mount, first set the main telescope cradle so that the indicator (arrow) points to 90° on the right side of the mount. Then tighten all the tracking bolts on the mount so that the telescope does not flip over, and tighten the latitude adjuster until the rubber cap is touching the base of the mount. (If the locking clamp will not tighten all the way in one rotation, simply continue to rotate the clamps in a clockwise direction until they are tight).
5. There are two mounting rings that hold the telescope onto the main telescope cradle. Each of these attach to the cradle with one bolt. Attach the main telescope rings securely to the main telescope cradle and then remove the bolts (on the side) that hold them closed. Open the rings, lay the telescope inside them, close them, and replace and tighten the bolts.
6. To balance the telescope, lock the Dec clamp, loosen the RA clamp and turn the telescope and mount so that the telescope and counterweights are parallel to the ground. Twist the counterweights up or down until the telescope is balanced (does not swing or fall in either direction, toward or away from the counterweights). When the telescope and counterweights are balanced, lock the RA clamp.

7. Lock the RA and loosen the Dec clamp. Move the telescope forward or backward in its mounting rings until the telescope is balanced and it does not swing in either direction (towards the mirror or towards the eyepiece end). Set the declination on 90° and lock the Dec clamps. Loosen the RA clamp and bring the telescope up until it is directly above the counterweight and parallel to the main shaft of the mount.
8. Attach the two slow-motion knobs. The short one goes on the side of the telescope and controls Right Ascension, (left-to-right). The longer one goes under the telescope and controls Declination, (up-and-down).

Your Comet Catcher is now equatorially mounted.

Using the Comet Catcher on the Equatorial Mount

Polar Alignment

Although it is not necessary to polar align your telescope in order to observe, this simple procedure will enable you to use the setting circles on the mount and allow you to use a clock drive for tracking during astrophotography.

METHOD #1

To polar align without axis scope (an optional accessory) set the telescope so that it is directly over and parallel to the main body of the mount. (The Dec should read 90° .) Move the tripod and adjust the latitude adjuster and azimuth fine adjustment controls until you can see Polaris in the telescope. (The location of Polaris can be found in elementary sky charts and astronomy

books, or in the Celestron Sky Maps (#93722).) This method, and Method #2, allow approximate polar alignment.

METHOD #2

Set the angle of the telescope so that it is at the same angle as the latitude of your viewing location (a scale is on the side of the equatorial mount). Adjust the angle coarsely by loosening the latitude clamp on the side of the mount. Make fine adjustments in latitude with the latitude adjuster. It is best to set the telescope a little too high and to use the latitude fine adjustment to lower the telescope to the proper angle. Then point your telescope mount North.

METHOD #3

A polar alignment telescope (#93605) is available as an accessory. With this accessory, you can get very accurate polar alignment within minutes. The polar alignment you get will be accurate enough for long exposure astrophotography through the Comet Catcher.

Using Your Setting Circles

The Right Ascension (RA) setting circle is located at the base of the equatorial mount. The Declination (Dec) setting circle is located just under the main telescope cradle.

1. Polar align the telescope.
2. Calibrate your Dec setting circle by pointing the telescope tube exactly along the polar axis (parallel to the main body of the mount) and setting the Dec circle at 90° . (This setting circle is

calibrated at the factory and should not need recalibration. If it does, loosen the circle with a small screwdriver, adjust its position and re-tighten.)

3. Center a bright star with coordinates you know (or one which is listed in the Celestron Sky Maps #93722) in your telescope. Turn the RA setting circle so that the RA for the star you are viewing is indicated by the pointer.
4. Without turning the setting circles, move the telescope so the circles read the coordinates of the object you are looking for. Look in the telescope under low power and the object should be in the field of view.

Use your slow-motion controls to make any fine adjustments that are necessary.

You can change the power of a telescope by changing the eyepiece which is being used. Power, or magnification, is simply the word for the relationship between the focal length of the telescope and the focal length of the eyepiece. The focal length of the Comet Catcher is 500mm. The focal length of the eyepiece that comes with the Comet Catcher is 18mm.

Magnification— Power-Eyepieces

The power of the Comet Catcher when used with the 18mm eyepiece is 28 power. To calculate a telescope's power, simply divide the focal length of the telescope by the focal length of the eyepiece. So, 500mm (telescope) divided by 18mm (eyepiece) equals 28 power.

If you want the Comet Catcher to function as a higher power instrument, put in an eyepiece with a shorter focal length, such as a 12mm eyepiece. Now the

telescope will be 40 power; 500mm divided by 12mm equals 40 power.

Although, theoretically, you can make a telescope any power, there is an optimum limit to telescope performance. The optimum power limit for the Comet Catcher is about 150 power. Higher powers (up to 150X) may be used on nights of exceptional seeing conditions. In order to obtain this type of power, you will need to use a combination of an eyepiece and Barlow lens. A Barlow lens multiplies the power of a telescope/eyepiece combination. The Celestron Deluxe 2X Barlow Lens (#93509) works especially well with the Comet Catcher.

If you use the Comet Catcher for terrestrial viewing you will need to correct the image. When you place an ocular in the focusing tube of the Comet Catcher your image is upside down and reversed. To correct the image you will need a 1.25" Porro Prism (#93612) and the Deluxe 2X Barlow Lens (#93509). To use the Comet Catcher for such applications, put the Barlow lens in the focusing tube, then place the Porro Prism into the Barlow lens. Now, use a desired eyepiece and you're ready to view.

Below are two tables to help you know what power you are using and help you decide what eyepiece to use.

EYEPIECE	POWER*
4mm Orthoscopic	125
5mm Orthoscopic	100
6mm Orthoscopic	83
7mm Orthoscopic	71
9mm Orthoscopic	56

10mm Plossl	50
12mm Orthoscopic	42
17mm Plossl	29
18mm Orthoscopic	28
26mm Plossl	19

VIEWING PURPOSE	EYEPIECE
Locating objects	26mm or 18mm
Moon, full disk	18mm
Moon, in detail	18mm & 2X Barlow
Saturn	4-18mm/12mm & 2X Barlow
Venus	4-18mm/12mm & 2X Barlow
Galaxies	26mm or 18mm
Nebulae (wide field)	26mm or 18mm
Nebulae (close)	10mm or 18mm
Globular star clusters	26mm, 18mm, 10mm
Double Stars	26mm or 18mm to locate, higher power to "split the double"
Terrestrial viewing	18mm, 12mm

*Double power when using the eyepiece with a 2X Barlow lens, and triple power when using a 3X Barlow lens.

As you increase the magnification of your telescope, filling more and more of the frame with the object you are looking at, you are also decreasing the field of view. It is harder to find objects with a smaller field of view, so always locate your object first with a low power eyepiece and then switch to a high power eyepiece for a closer view.

The night sky is full of interesting things to look at. Once you are comfortable finding the Moon, set your sights higher. A perfect complement to the Comet Catcher is a set of Celestron Sky Maps (#93722). Locate a brighter deep space object like the Pleiades (M45)

or the Orion Nebula (M42) in the Celestron Sky Map. If you can, go out to the country where you will get the thrill of seeing the stars and nebulae under a dark sky. Deep space objects like the Orion Nebula and the Pleiades star cluster will look a hundred times brighter than from city locations, although you will be able to see and enjoy many of them in the city.

Once you find the object you are looking for, point the Comet Catcher toward the section of the sky where the object is located. Look into the eyepiece. If the object is not immediately visible, just scan the area. The wide field Comet Catcher will let you find what you are looking for quickly and easily. Once you are accomplished at looking at the Moon, the planets and the brighter deep space objects that are difficult or impossible to see with the naked eye can be seen through the Comet Catcher. Use the Star Maps (#93722) to find the location of the objects that are to be viewed. Once you have done it a few times, it is almost as easy as finding objects you can see with the naked eye.

Best Deep Sky Targets for Beginners

OBJECT	CONSTELLATION	VISIBLE
M42 (The Orion Nebula)	Orion	Winter
M45 (The Pleiades)	Taurus	Winter
M44 (The Beehive Cluster)	Cancer	Spring
M81/M82	Big Dipper	Spring
M31 (The Great Galaxy in Andromeda)	Andromeda	Fall
The Dbl Cluster	Perseus	Fall

What's Up There to Look At?

M8 (The Lagoon Nebula)	Sagittarius	Summer
M27 (The Dumb- bell Nebula)	Vulpecula	Summer
M11 (The Wild Goose Cluster)	Serpeus	Summer
M15	Pegasus	Fall
M13 (The Great Cluster in Hercules)	Hercules	Summer
M6/M7	Sagittarius	Summer
M22	Sagittarius	Summer
M3	Canes Venatici	Spring

When to Collimate

The Comet Catcher is a finely tuned visual instrument. As such, it may need slight adjustment or collimation. Collimation is a fairly simple procedure that can be easily accomplished in a few short minutes. It basically involves looking into the telescope and adjusting the location and aim of the mirrors so that they are concentric. The Celestron factory will clean and collimate any Celestron product for a nominal charge.

Collimate your Comet Catcher when you cannot get any images to focus sharply at any position of the sliding focus mechanism, when star images have little flares splayed out to one side throughout the entire field, when the image seems to be coming out of the eyepiece tube at an unusual angle, or if you can see that rough handling has shifted the position of one of the mirrors.

Collimating Tools

You will need a Celestron collimating tool (#93520), and both a flat head and Phillips head screwdriver to collimate the Comet Catcher.

Collimating Procedure

COLLIMATING PROCEDURE

1. Point the telescope at a bright colored surface, or the daytime sky (BUT NOT AT THE SUN!).
2. Remove the eyepiece from the sleeve and rack the sliding focus mechanism out all the way.
3. Insert the Celestron collimating tool (with the small hole in the cup towards your eye) into the eyepiece sleeve and tighten the thumb screw. Look into the eyepiece. You should see three concentric circles. In the center of the smallest circle you will see your own eye, and a small black dot (the reflection of the primary mirror). If the dot is centered in the cross hairs of the collimating tool and all three circles are concentric, your telescope is already collimated. If the dot is off center or the circles are askew, continue the collimation process. (You may temporarily remove the cap from the tool to get your bearings--put it back to continue collimation.)
4. To collimate the secondary mirror, first remove the gray front cell (that holds the corrector plate) by removing the three Phillips head screws that hold the cell in place. Slide the cell out and place it down carefully on a flat surface. Be careful not to put it somewhere where it can get scratched. Now look into the eyepiece sleeve, through your collimating tool, and adjust the angle and direction of the secondary mirror, until the dot lines up with the cross hairs in the tool and you see a round circle. Hold the diagonal steady, reach around and tighten the bolt, and replace the front cell. The Comet Catcher has three collimation screws on

the back of the diagonal holder. Use an Allen head wrench to slightly turn the diagonal mirror adjusting screws to achieve proper collimation. Turn the collimation screw--if the wrong screw is turned, the collimation will look worse; just turn the screw back to the original position and try another screw.

5. Check the collimation on the primary mirror by checking that the black dot lines up with the cross hairs and that the primary mirror appears as a complete circle, concentric with the secondary mirror. Make any adjustments by slightly turning the screws located on the surface of the rear cell with a flat head screwdriver. Each of the screws will change the angle of the mirror. Trial and error will show you which screws to move and how much. Keep adjusting the screws until the black dot is located in the cross hairs of the eyepiece. (It should not take many turns of the screws.)
6. Remove the collimating tool and replace the eyepiece in the sleeve. Your Comet Catcher is now collimated.

Photographing Through the Comet Catcher

Photography is very easy and fun with the Celestron Comet Catcher. You will need a few basic accessories. They are the Celestron T-Ring, an adapter especially designed to fit your camera (it snaps on just like your camera lens), and a Celestron Comet Catcher T-Adapter (#93634). The T-Adapter allows you to attach your camera (with T-Ring) to the telescope so that the telescope itself becomes the camera lens.

These simple steps are all it takes to convert your Comet Catcher to a powerful telephoto lens.

1. With the Comet Catcher mounted on a photographic tripod, remove the whole eyepiece sleeve. It unscrews easily by hand.
2. Screw in the T-Adapter in its place. It has the same threads as the eyepiece sleeve, so it will fit in with no trouble. Screw the T-Ring onto the T-Adapter.
3. Remove the lens from your camera and put it safely out of the way. Fit your camera right onto the T-Ring. You now have a telephoto lens with a focal length of 500mm. You may adjust the orientation of the camera by loosening the small set screws in the T-Ring, turning to the desired position and retightening the camera.
4. Look into the eyepiece of the camera and find your target. Focus through the eyepiece by turning the large focus knob. **Once you have focused the telescope be sure to lock down the focus locking screw so it doesn't slip while you are taking the picture.** For terrestrial photography, use your internal light meter to determine shutter speed, since you cannot adjust the aperture (f/stop) of the Comet Catcher. If your camera will allow it, lock up the viewing reflex mirror to reduce vibration. Use a cable release to trip the shutter. Avoid shooting across a heat source such as a hot parking lot, so that the air currents (heat waves) do not ruin your photographs.

Deep Sky Photography with the Comet Catcher

Photographing nebulae and galaxies is one of the most difficult challenges facing an astrophotographer. To photograph a nebula such as M42 (The Orion Nebula), the exposure time will be very long, about 20 minutes.

You must make the Comet Catcher track your photographic target precisely in order for the star images to be sharp pinpoints rather than elongated streaks.

The Comet Catcher's clock drive could track an object for this time period, to a degree. But there is no clock drive that will absolutely, perfectly track the sky to the accuracy required to render a sharp high-power astrophoto. One must "guide" during the exposure.

To guide the Comet Catcher for long exposure astrophotography, you must have the following equipment: Comet Catcher Equatorial Mount (#91101), Polar Axis Finder (#93605), Pulse Motor Drive (#93516), Illuminated Reticle Ocular (#93565) and a Guide Telescope (420mm focal length suggested).

To do deep sky photography, the following steps are required:

1. Set up and polar align the telescope.
2. Attach your camera (a fast color slide film is suggested for starting experiments).
3. Locate your photographic target in the Comet Catcher. Focus carefully--lock the focus lock screw.
4. Start the motor and lock the Comet Catcher in position.
5. Find a nearby star (guide star) in the guide telescope (without moving the Comet

- Catcher). Focus and lock down the guide scope. The illuminated reticle should have the star on the cross hair.
6. Begin your exposure (set the camera on Time Exposure or "B" and keep the shutter open with a cable release).
7. During the exposure, you must keep the guide star exactly on the cross hair in the guide scope. For east-west (RA) corrections, use the motor drive's electric speed controls to slowly keep the star position correct. For north-south (Dec) corrections, you can carefully use the declination slow-motion control to keep the star position correct. These corrections are called "guiding".
8. Guide carefully during the photographic exposure and you will get good sharp astrophotos; practice helps and the results are fun and educational.

Accessories Available for Comet Catcher

Deluxe Barlow Lens 2X-1½" (#93509)
Comet Catcher Case (#93515)
Comet Catcher Equatorial Mount (#91101)
Comet Catcher Collimation Tool (#93520)
Eyepiece Filter Set-1½" (#93541)
Extra Eyepieces in 1½" size
Guidescope 420/60 w/brackets (#91016)
LPR Filter #4 (#93571)
Photographic Tripod (#93596)
Porro Prism (#93612)
Pulse Motor Drive (#93516)
Sky Maps (#93722)
Solar Filter-2" (#93624)
T-Adapter Comet Catcher (#93634)
T-Ring for brand of 35mm camera
Tele-Extender (#93646)

Suggested Kit

26mm 1½" Plossl Ocular (#93315)
7.5mm 1½" Plossl Ocular (#93310)

Deluxe Barlow Lens-2X 1¼" (#93509)
LPR Filter #4 (#93571)
Celestron Sky Maps (#93722)
Book, "Star Watch" (#93723)

Care of Your Telescope

Your telescope has been designed to be maintenance-free. The only normal care you need to give your telescope will be common sense: keep all optical surfaces covered (lens caps for all accessible optical surfaces are supplied), avoid dropping the instrument or subjecting it to significant mechanical shock, and avoid spilling liquids on it. With this simple care, you will find that it takes a long period of use (usually more than a year), before a significant buildup of dust and/or film will occur on the optical surfaces. Because eyepieces are handled more often, they will probably need more frequent cleaning. When it is time to clean any of your optics, follow these guidelines:

- use only optical lens cleaning fluid and lens tissue (available at camera stores).
- before using fluid, remove dust particles with a camel hair brush or pressurized air.
- never add cleaning fluid directly to the lens; always place cleaning fluid onto lens tissue, then apply to lens.
- when cleaning with fluid, use only gentle, long strokes with moistened tissue.

The non-optical parts of your telescope may be cleaned when desired with a very slightly damp, soft cloth.

Caution! Please Read!

NEVER ATTEMPT TO VIEW THE SUN THROUGH ANY TELESCOPE WITHOUT PROPER FILTERING. VIEWING THE SUN WITHOUT A PROPER FILTER MAY RESULT IN PERMANENT BLINDNESS, AS WELL AS DAMAGE TO THE TELESCOPE. NEVER ALLOW CHILDREN TO PLAY WITH THE TELESCOPE DURING DAYLIGHT HOURS, UNLESS THEY ARE SUPERVISED BY AN ADULT WHO IS FAMILIAR WITH THESE INSTRUCTIONS.

Additional Information

Your authorized Celestron Dealer can offer assistance for many different types of questions and problems about your instrument. In the event he is unable to assist you, contact a customer service representative at:

1-800-421-1526
(Continental U.S.A. Only)
Outside the Continental U.S.A.
Call (213) 328-9560
Mon-Fri, 8 AM to 4 PM Pacific Time

CELESTRON INTERNATIONAL
Torrance, CA 90503
(800) 421-1526