

# Orion® Tele-Extender

**#5125** Standard Tele-Extender

**#5127** Variable Tele-Extender

Your Orion Tele-Extender will allow you to take high-magnification photographs of celestial objects with a Schmidt-Cassegrain telescope. It is particularly useful for planetary astro-photography, close-ups of lunar craters, and extremely long distance terrestrial photography.



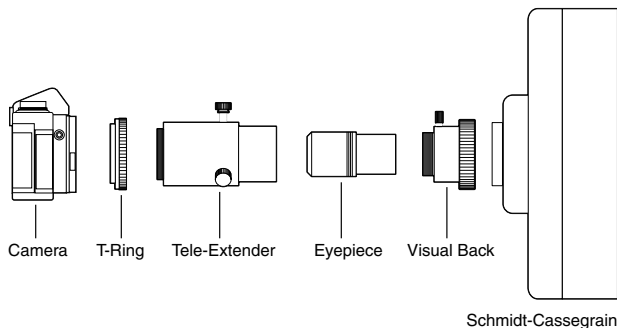
## How To Use The Orion Tele-Extender

The Standard Tele-Extender (A) is a fixed-length extension tube, which produces a fixed magnification for a given eyepiece used with the tele-extender. The Variable Tele-Extender (B) has an adjustable-length extension tube, allowing magnification to be changed without switching eyepieces.

For high-powered photography through your Schmidt-Cassegrain, attach the visual back in the normal manner. Instead of inserting the star diagonal into the visual back, insert an eyepiece and hand tighten the set screw. Thread the tele-extender onto the visual back, over the eyepiece. Thread your T-ring onto the end of the tele-extender and attach your camera.

Some telescopes do not have a separate visual back, such as the Meade LX5 series, LX6, and the Meade 2045. You may have to purchase a visual back to use a tele-extender. A 1.25" visual back which fits Meade and Celestron Schmidt-Cassegrain 4", 8", 10", 11", and 14" scopes is available from Orion (#15048). (Celestron C-90s and some other small spotting scopes have threads that will fit a tele-extender directly but require the use of .965" eyepieces to create the higher magnifications.)

Most standard eyepieces are useable with a tele-extender. Some eyepieces have barrel assemblies that are too large to fit inside a tele-extender. See the diagram below for reference on how to attach a tele-extender to your telescope.



When you look through your camera and focus the telescope, you will notice a dim, highly magnified image. This is normal when using a tele-extender. The eyepiece enlarges the image and therefore reduces the amount of light. Shorter-focal-length eyepieces magnify the image more, causing it to be dimmer. Dimmer images mean longer exposure times will be necessary.

## Tele-Extender Effective Focal Length Chart

Below is a chart of effective focal lengths and f/ratios to assist you in determining the best combinations for your system. Values are rounded to the nearest 5 or 0 for convenience. For the variable tele-extender, the effective focal length below applies when the unit is fully extended. Shortening the variable tele-extender will reduce the effective focal length.

Instrument	8" f/10	10" f/10	11" f/10
Base Focal Length	2000mm	2500mm	2800mm
<b>Eyepiece</b>			
40mm	7000mm f/35	8700mm f/35	9800mm f/35
30mm	9500mm f/50	1200mm f/50	13100mm f/50
25mm	12000mm f/60	14000mm f/60	15700mm f/60
20mm	14000mm f/70	17800mm f/70	19600mm f/70
18mm	18000mm f/90	12000mm f/90	21777mm f/80
15mm	19000mm f/95	24000mm f/95	26500mm f/100
13mm	*22000mm f/115	28000mm f/110	30600mm f/115
12mm	*28500mm f/140	*30000mm f/140	*33000mm f/125
10mm	*29000mm f/140	*36000mm f/145	*40600mm f/150
9mm	*39000mm f/190	*40300mm f/165	*45000mm f/165
7mm	*41000mm f/210	*52000mm f/210	*58000mm f/215

\*Beyond useful magnification—not recommended

## Focusing

It can be quite difficult to focus the telescope, especially when using eyepiece projection! In fact, with most cameras the image in the viewfinder can be so dim that it may be difficult to find the focal point at all. Use a bright object such as the Moon or a bright star for focusing. Find and center this object in the telescope's field before installing the camera adapter.

If your camera has interchangeable focusing screens, use a fine-ground glass screen. It will be much brighter and will make focusing easier.

## Vibration During Exposure

It is very important to minimize vibration during an exposure. If your camera is equipped with a "mirror lock-up," use it before you start the photo. Use a cable release to trip the self-timer on the camera. To further reduce vibration, the best solution is the "hat trick." Set your camera's exposer time (shutter speed) to the "B" (bulb) setting, which will hold the shutter open indefinitely when triggered. Hold a black piece of cardboard or a "hat" in front of the telescope (but not touching it) while you open the shutter. Wait approximately 8 seconds and then remove the "hat." It is important that nothing touch the telescope or camera during the exposure. When you're finished exposing, place the



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“hat” in front of the telescope again and trip the cable-release to close the shutter.

### **Precautions**

Be very careful not to release the set screw holding the eyepiece before removing your camera and tele-extender. If the screw is released and the eyepiece falls through the extender tube, it can damage your camera.

## **One-Year Limited Warranty**

The Orion Standard Tele-Extender and Variable Tele-Extender are warranted against defects in materials or workmanship for a period of one year from the date of purchase. This warranty is for the benefit of the original retail purchaser only. During this warranty period Orion Telescopes & Binoculars will repair or replace, at Orion's option, any warranted instrument that proves to be defective, provided it is returned postage paid to: Orion Warranty Repair, 89 Hangar Way, Watsonville, CA 95076. If the product is not registered, proof of purchase (such as a copy of the original invoice) is required.

This warranty does not apply if, in Orion's judgment, the instrument has been abused, mishandled, or modified, nor does it apply to normal wear and tear. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. For further warranty service information, contact: Customer Service Department, Orion Telescopes & Binoculars, 89 Hangar Way, Watsonville, CA 95076; (800) 676-1343.



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