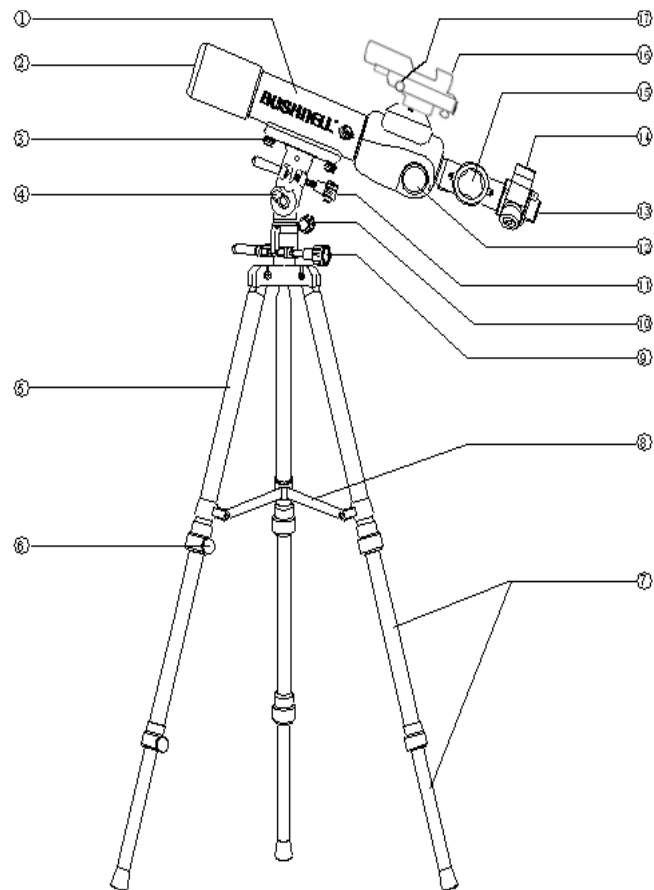


BUSHNELL®



570 x 60 Rotary Compact Refractor Telescope Model 78-9570



- | | |
|---------------------------------|--------------------------------------|
| 1. Main Telescope Tube | 9. Horizontal Fine Adjustment |
| 2. Objective Lens | 10. Horizontal Adjustment Lock Knob |
| 3. Main Tube locking Knobs (2) | 11. Vertical Fine Adjustment |
| 4. Vertical Adjustment Lock | 12. Rack & Pinion Focusing Mechanism |
| 5. Aluminum Tripod Leg | 13. T-18 Erecting Lens Receptor |
| 6. Tripod Leg - Lock Screws (6) | 14. Rotary Power Turret |
| 7. Tripod Leg Sections | 15. Accessory Turret |
| 8. Tripod Leg Supports | 16. Finderscope |
| | 17. Finderscope Adjustment Screws |

STANDARD EQUIPMENT

- Σ Refractor Telescope Assembly w/Rotary Power® Turret
- Σ Rotary Power® Turret Includes 4mm, 10mm, and 20mm eyepieces, 2.5x Barlow, and Moon Filter
- Σ Exclusive Metal Easy Track® Mount
- Σ Compact Three-Section Variable Height-Aluminum Tripod
- Σ Red Dot Finderscope
- Σ T-18 1.5x Erecting Lens

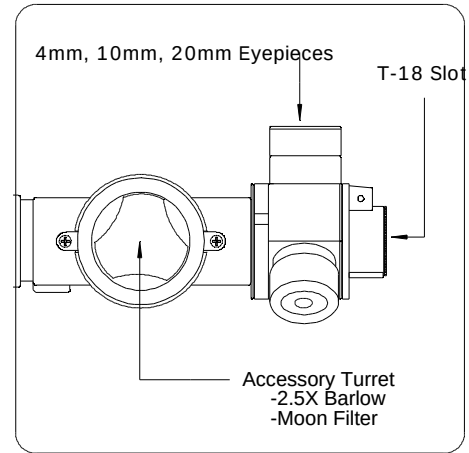


Fig.1

TELESCOPE ASSEMBLY

1. **Your Bushnell Voyager Telescope comes pre-assembled from the factory for quick set-up and use. Remove all components from the carton and identify all components. It is a good idea to lay all the parts out in front of you before assembly. READ THROUGH SET-UP INSTRUCTION BEFORE YOU SET-UP YOUR TELESCOPE**
2. **Set-Up Tripod**
 - Σ Remove pre-assembled tripod and mount from carton. Loosen the leg section locking screws (2 per leg) of one leg and gently extend each section to the desired height. Re-tighten locking screws. Repeat on remaining two legs.
3. **Attach Telescope and Finderscope**
 - Σ Locate the pre-assembled **Telescope Main Tube (1)**. Remove **Main Tube Locking Nuts (3)** from screws extending from bottom of **Telescope Main Tube (1)**. Insert extended screws into holes in cradle of **Easy Track® Mounting System**. Refasten **Main Tube Locking Nuts (3)**.
 - Σ Remove plastic insert on bottom side of finderscope to allow battery to make connection with battery contact for power. Turn power switch on. **See finderscope page.**
 - Σ Look through main telescope tube at low power and establish a well-defined stationary target. Looking through red dot finderscope, alternate tightening each adjustment wheel (at rear and left side of finderscope) until the red dot of finderscope is precisely aligned and centered on the same object being viewed in main telescope tube. **See finderscope page.**

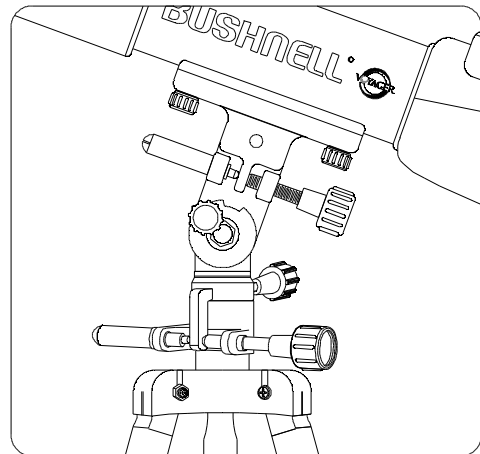


Fig. 2

4. **Remove Lens Covers** from **60mm Objective Lens** and each ocular eyepiece contained in **Rotary Power Turret®**.

Your Bushnell Voyager Telescope is now ready to be used. To obtain the fullest enjoyment from your telescope, please refer to the additional information below.

HOW TO USE YOUR NEW TELESCOPE

Astronomical telescopes are designed in such a way that the image you see appears UPSIDE DOWN and REVERSED, this is acceptable for viewing celestial bodies.

Selecting an Eyepiece:

1. Always begin viewing with the lowest power eyepiece, which in this case is the 20mm lens. Note: the base power of each eyepiece is determined by the focal length of the telescope objective lens, which for this model is 910 mm. A formula can be used to determine the power of each eyepiece: **telescope OBJECTIVE lens focal length ÷ EYEPIECE focal length = MAGNIFICATION** (e.g. Using the 20 mm lens, the calculation would look like this: $910\text{mm} \div 20\text{mm} = 46\text{x}$ or 46 power.)
2. To select the 20mm eyepiece, position the **Rotary Power Turret® (14)** so that the 20mm eyepiece is in line with the **Ocular Alignment Arrow**.
3. Included in the **Accessory Turret (15)** is a Barlow lens. Barlow lenses are used to double or triple the power of your telescope. Using the example above, your 2.5x Barlow lens would give you a total power of 115x or 115 power. ($46 \times 2.5 = 115\text{x}$ or 115 power).
4. The full moon can be so bright that distinct surface details are difficult to view and prolonged viewing is uncomfortable. Included in the **Accessory Turret® (15)** is a Moon Filter. Moon Filters are specially tinted lenses that reduce the glare of the moon so that enjoyable viewing can take place.

Focusing Telescope:

1. After selecting the desired eyepiece, aim main telescope tube at a land-based target at least 200 yards away (e.g. telephone pole or building). Fully extend focusing tube by turning **Rack and Pinion Focusing Mechanism (12)**.
2. While looking through selected eyepiece (in this case the 20 mm), slowly retract focusing tube by turning **Rack and Pinion Focusing Mechanism** until object comes into focus.

Aligning Finderscope:

Remove plastic insert on bottom side of finderscope to allow battery to make connection with battery contact for power. Turn power switch on. **See finderscope page.**

Look through main telescope tube at low power and establish a well-defined stationary target. Looking through red dot finderscope, alternate tightening each adjustment wheel (at rear and left side of finderscope) until the red dot of finderscope is precisely aligned and centered on the same object being viewed in main telescope tube. **See finderscope page.**

Now, objects located first with the **Finderscope (16)** will be centered in the main telescope.

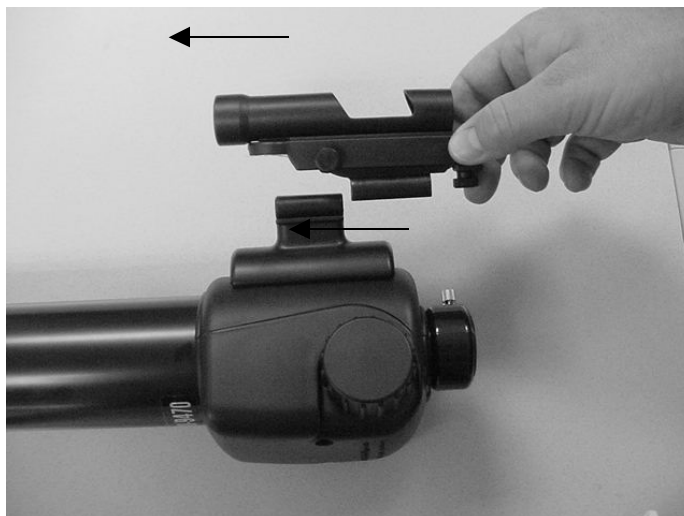
Viewing Land-Based Objects:

1. The T-18 Erecting Lens will correct the normally upside down and reversed image so that you can easily enjoy observing land-based objects through your compact telescope.
2. Simply insert the T-18 Erecting Lens into the **T-18 Erecting Lens Receptor (13)**.
3. Repeat focusing directions as described above except that you will be looking through the T-18 Erecting Lens instead of the 20mm eyepiece. **Note: When the T-18 Erecting Lens is inserted into the T-18 Erecting Lens Receptor (13) the Eyepieces contained in the Rotary Power Turret® (14) will be inoperable. Remove the T-18 Erecting Lens to regain eyepiece functionality.**

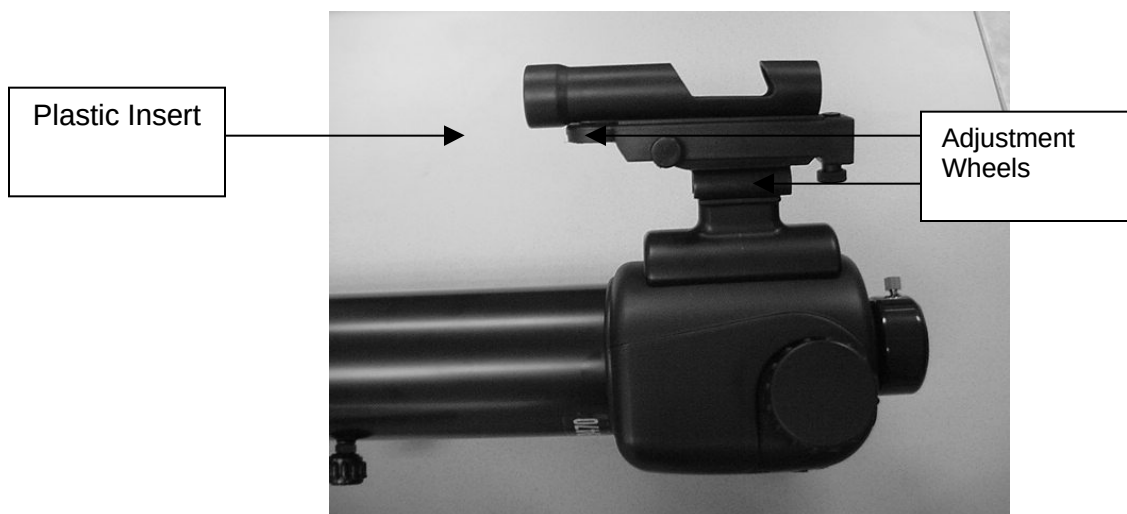
Transporting and Storing Telescope:

1. Loosen tripod-locking screws and collapse each tripod leg section. Collapse **Tripod Leg Brace (8)** and pull all three tripod legs together. Loosen **Vertical Adjustment Lock (4)** and tilt objective end of telescope toward tripod legs. Slip telescope into carrying case and pull drawstring to close.

Please find below an image depicting how to attach the red dot finderscope and an image depicting a fully-attached unit.



How-To-Attach: Place Finderscope Cylindrical Groove over Cylindrical Finderscope Mount Post until it clicks into place.



Aligning and Using Red Dot Finderscope

Remove plastic insert on bottom side of finderscope to allow battery to make connection with battery contact for power. Turn power switch on.

Look through main telescope tube at low power and establish a well-defined stationary target. Looking through red dot finderscope, alternate tightening each adjustment wheel (at rear and left side of finderscope) until the red dot of finderscope is precisely aligned and centered on the same object being viewed in main telescope tube.

<i>Never Look Directly At The Sun With Your Telescope</i> <i>Permanent Damage To Your Eyes May Occur</i>

Enjoying Your New Telescope

1. First determine your targeted object. Any bright object in the night sky is a good starting point. The moon is favorite starting points in astronomy is the moon. This is an object sure to please any budding astronomer or experienced veteran. When you have developed proficiency at this level, other objects become good targets. Saturn, Mars, Jupiter, and Venus are good second steps to take.
2. The first thing you need to do after assembling the telescope as planned is center the desired object in the finderscope's cross hairs. Provided you did a reasonable job aligning the finderscope, a quick look through the main telescope tube at low power should reveal the same image. With the lowest power eyepiece (the one with the largest number printed on it) you should be able to focus the same image that you saw through the finderscope. Avoid the temptation to move directly to the highest power. The low power eyepiece will give you a wider field of view, and brighter image--thus making it very easy to find your target object. At this point with a focused image in both scopes, you've passed the first obstacle. If you don't see an image after attempting to focus it in, you might consider aligning your finderscope again. Once you pass this step, you will enjoy the time spent ensuring a good alignment. Every object you center in the finderscope will be easily found in the main telescope tube, which is important for continuing your exploration of the night sky.
3. The low power eyepieces are perfect for viewing the full moon, planets, star clusters, nebulae, and even constellations. These should build your foundation. However, for more detail, try bumping up in magnification to higher power eyepieces on some of these objects. During calm and crisp nights, the light/dark separation line on the moon (called the "Terminator") is marvelous at high power. You can see mountains; ridges and craters jump out at you due to the highlights. Similarly, you can move up to higher magnifications on the planets and nebulae. Star clusters and stars are best viewed through the low power no matter what.
4. The recurring astronomical theater we call the night sky is an ever-changing billboard. In other words, not the same movie plays all the time. Rather, the positions of the stars change not only hourly as they seem to rise and set, but also throughout the year. As the earth orbits the sun our perspective on the stars changes on a yearly cycle about that orbit. The reason the sky seems to move daily just as the sun and the moon "move" across our sky, is that the earth is rotating about its axis. As a result you may notice that after a few minutes or a few seconds depending on what power you are viewing at, the objects in your telescope will move. At higher magnifications especially, you will notice that the moon or Jupiter will "race" right out of the field of view. To compensate, just move the fine adjustment controls on your telescope to "track" it in the necessary path.

Helpful Hints

1. Your telescope is a very sensitive instrument. For best results and fewer vibrations set your telescope up on a level location on the ground rather than your concrete driveway or your wooden deck. This will provide a more stable foundation for viewing, especially if you've drawn a crowd with your new telescope.
2. If possible, view from a location that has relatively few lights. This will allow you to see much fainter objects. You'd be surprised how much more you'll see from your local lake or park when compared to a backyard in the city.
3. Using your telescope out a window is NEVER recommended.
4. View objects that are high in the sky if possible. Waiting until the object rises well above the horizon will provide a brighter and crisper image. Objects on the horizon are viewed through several layers of earth's atmosphere. Ever wonder why the moon appears orange as it sets on the horizon. It's because you are looking through a considerable more amount of atmosphere than you would directly overhead. (Note: If objects high in the sky are distorted or wavy, you are probably viewing on a very humid night.) During nights of unstable atmosphere, viewing through a telescope can be frustrating if not impossible. Astronomers refer to crisp, clear nights as nights of "good seeing."

Where do I start?

Your Bushnell telescope can bring the wonders of the universe to your eye. While this manual is intended to assist you in the set-up and basic use of this instrument, it does not cover everything you might like to know about astronomy. The first thing you need to do is get a very simple star chart and a flashlight with a red bulb or red cellophane over the end. For objects other than stars and constellations, a basic guide to astronomy is a must. Some recommended sources appear on our website at **www.bushnell.com**. Also on our website will be current events in the sky for suggested viewing. But, some of the standbys that you can see are:

The Moon--a wonderful view of our lunar neighbor can be enjoyed with any magnification. Try viewing at different phases of the moon. Lunar highlands, lunar Maria (lowlands called "seas" for their dark coloration), craters, ridges and mountains will astound you.

Saturn--even at the lowest power you should be able to see Saturn's rings and moons. This is one of the most satisfying objects in the sky to see simply because it looks like it does in pictures. Imagine seeing what you've seen in textbooks or NASA images from your backyard!

Jupiter--the largest planet in our solar system is spectacular. Most noted features are its dark stripes or bands both above and below its equator. These are the north and south equatorial belts. Also interesting are Jupiter's four major moons. Pay close attention to their positions from night to night. They appear to be lined up on either side of Jupiter.

Mars--The Great Red Planet appears as a reddish-orange disk. Look at different times of the year and try to catch a glimpse of the white polar ice caps.

Venus--just like the moon, Venus changed phases from month to month. Some views of brilliant Venus appear as if you were looking at a distant crescent moon.

Nebulae--The Great Orion Nebula is a very well known night sky object. This and many others are brought to you by this telescope.

Star Clusters--View millions of stars densely packed in a cluster that resembles a ball.

Galaxies--One of the greatest and most interesting galaxies is our neighbor the Andromeda Galaxy. Enjoy this and many others.

Much, much, more!

For further questions or additional information please contact:

Bushnell Sports Optics Worldwide
9200 Cody
Overland Park, KS 66214

www.bushnell.com

ANSWERS TO COMMONLY ASKED QUESTIONS

1. The image I see in the telescope is upside down and reversed from right to left?	Σ An upside-down and reversed image is a common characteristic of most astronomical telescopes. Since telescopes are used for astronomical viewing orientation is not important. However, as described above, the T-18 erecting lens can be used to provide normal images.
2. How do I determine the power my telescope?	Σ The power of your telescope can be determined by dividing the focal length of the objective lens by the focal length of the eyepiece. The eyepiece focal length is the number printed on the eyepiece. (For example: 1000 ÷ 25 = 40X)
3. Where do I find the Telescope Focal Length	Σ The telescope focal length is the same focal length as the objective focal length. For this telescope it is 910mm. Telescope focal lengths range from 600mm to 910mm on Bushnell telescopes.
4. What can I see with my telescope?	Σ Telescopes with power ranging from 25X to 50X can be used to view Star Clusters and Nebulae. 90X to 120X telescopes can view galaxies. Most planets can be seen at 150X and higher.
5. What do the numbers on the eyepiece mean?	Σ The numbers on the eyepiece represents the "focal Length" of the eyepiece.

TROUBLESHOOTING GUIDE

<i>If after you have set-up your new telescope you are unable to see any objects, use this Quick Reference guide to help you to understand the cause of the problem and quickly determine a remedy</i>	
1. I've completed the set-up yet I cannot see anything	Σ Check to see if objective lens cover has been removed.
	Σ Try to view an object that is 200 or more yards away.
	Σ If there is more than one eyepiece included with the telescope, use the lowest power (highest number) eyepiece to begin viewing.
	Σ Use the Rack & Pinion Focusing Mechanism (3) to bring the object you are trying to view into focus