

Orion 21190

Orion StarBlast 102mm Altazimuth Travel Refractor Telescope Kit

Instruction Manual

INTRODUCTION

The Orion StarBlast 102mm Altazimuth Travel Refractor Telescope Kit is designed for both daytime terrestrial viewing and nighttime astronomical observation. This portable refractor telescope features a 102mm (4-inch) aperture, making it suitable for beginners and families. It provides clear views of the Moon, planets, and various deep-sky objects. The kit includes a full-length stainless steel tripod, a two-way pan head, and a range of accessories, all conveniently stored in a rugged carry case.

SAFETY INFORMATION

- **Never look directly at the Sun through the telescope or its finder scope without a professionally manufactured solar filter.** Permanent eye damage or blindness can result.
- Always supervise children when using the telescope.
- Ensure the tripod is stable on a level surface to prevent tipping.
- Handle optical components with care to avoid scratches or damage.

PACKAGE CONTENTS

Verify that all components are present in your kit:

- Orion StarBlast 102mm Refractor Optical Tube
- Stainless Steel Altazimuth Tripod with Accessory Tray

- Correct-Image 90-Degree Diagonal
- 25mm Plossl Eyepiece (24x magnification)
- 10mm Plossl Eyepiece (60x magnification)
- Red-Dot Finder Scope
- Orion Shorty 2x Barlow Lens
- Orion Star Target Planisphere
- Orion Telescope Observer's Guide Book
- Orion RedBeam Mini LED Flashlight
- Rugged Carry Case
- Orion MoonMap 260



Image: Included accessories such as the MoonMap 260, 25mm and 10mm eyepieces, 90-degree diagonal, and red-dot finder scope.

SETUP

1. **Assemble the Tripod:** Extend the tripod legs to a suitable height and spread them for stability. Attach the accessory tray to the center brace by twisting it into place.
2. **Mount the Telescope:** Place the telescope optical tube onto the altazimuth mount head. Secure it using the provided mounting screws. Ensure the telescope is balanced and firmly attached.
3. **Install the Finder Scope:** Slide the red-dot finder scope into its bracket on the telescope tube. Tighten the thumbscrew to hold it in place.

4. **Insert the Diagonal:** Insert the 90-degree correct-image diagonal into the focuser drawtube. Secure it with the small thumbscrew on the focuser.
5. **Insert an Eyepiece:** Insert either the 25mm or 10mm Plossl eyepiece into the diagonal. Secure it with the thumbscrew on the diagonal. The 25mm eyepiece provides lower magnification and a wider field of view, useful for initial object location.



Image: The Orion StarBlast 102mm Refractor Telescope fully assembled on its altazimuth tripod.

OPERATING THE TELESCOPE

1. Aligning the Red-Dot Finder Scope

The red-dot finder scope helps you aim the telescope. It projects a small red dot onto a viewing window, which you align with your target. To align it:

1. Point the main telescope at a distant, stationary object (e.g., a tree top or street sign) during the day.
2. Look through the 25mm eyepiece and center the object in the main telescope's field of view.
3. Turn on the red-dot finder. Look through the finder scope and use its adjustment knobs to move the red dot until it is centered on the same object you see in the main telescope.
4. Once aligned, the red dot indicates where the main telescope is pointing.

2. Focusing

To achieve a sharp image, turn the focus knob located on the side of the focuser until the object appears clear. For astronomical viewing, slight adjustments may be needed as objects drift across the field of view due to Earth's rotation.

3. Using Eyepieces and Barlow Lens

- **25mm Plossl Eyepiece:** Provides 24x magnification. Ideal for locating objects and viewing wider fields of view, such as star clusters or large nebulae.
- **10mm Plossl Eyepiece:** Provides 60x magnification. Useful for more detailed views of the Moon, planets, and smaller deep-sky objects.
- **Shorty 2x Barlow Lens:** Doubles the magnification of any eyepiece. Insert the Barlow lens into the diagonal first, then insert an eyepiece into the Barlow. For example, with the 25mm eyepiece, it provides 48x magnification ($24x \times 2$). With the 10mm eyepiece, it provides 120x magnification ($60x \times 2$).



Image: The Orion Shorty 2x Barlow Lens, which doubles the magnification of any eyepiece.

4. Terrestrial and Astronomical Viewing

The correct-image diagonal ensures that images are upright and correctly oriented, making the telescope suitable for both land eye viewing and sky observation. For astronomical viewing, start with the lowest magnification (25mm eyepiece) to locate your target, then switch to higher magnifications (10mm eyepiece or with Barlow) for more detail.

5. Using Included Educational Tools

- **Orion MoonMap 260:** Use this map to identify approximately 260 lunar surface features, including craters, mountain ranges, and 'seas'.
- **Orion Star Target Planisphere:** This rotating star chart helps you identify constellations and celestial objects visible from your location at any given time of night.
- **Orion Telescope Observer's Guide:** A book providing guidance on observing various celestial objects and general astronomy tips.



Image: The Orion MoonMap 260, a guide to lunar features.



Image: The Orion Star Target Planisphere, a rotating star chart.



Image: The Orion Telescope Observer's Guide book.

MAINTENANCE

- **Cleaning Optics:** Use a soft, clean brush to remove dust from lenses. For smudges, use a specialized optical cleaning fluid and lens tissue. Avoid touching optical surfaces with bare hands.
- **Cleaning the Telescope Body:** Wipe the telescope tube and tripod with a soft, damp cloth. Avoid abrasive cleaners.
- **Storage:** When not in use, store the telescope and accessories in the provided carry case in a dry, dust-free environment. Replace all lens caps to protect the optics.

TROUBLESHOOTING

Problem: Image is blurry or out of focus.

Solution: Adjust the focus knob slowly until the image is sharp. Ensure the eyepiece is fully inserted and secured. Allow the telescope to acclimate to the ambient temperature for 15-30 minutes to reduce thermal currents inside the tube.

Problem: Cannot find objects in the telescope.

Solution: Ensure the red-dot finder scope is properly aligned with the main telescope. Start with the lowest magnification eyepiece (25mm) for a wider field of view to locate objects, then switch to higher power. Make sure you are observing from a dark location away from light pollution.

Problem: Image appears dim or faint.

Solution: This is common for deep-sky objects. Ensure you are observing from a dark-sky location. Higher magnification can make images appear dimmer; try a lower power eyepiece. Your eyes also need time to adapt to the dark (at least 20 minutes).

Problem: Tripod is unstable or difficult to tighten.

Solution: Ensure all leg clamps and mounting screws are fully tightened. Place the tripod on a firm, level surface. Avoid extending the legs to their absolute maximum if stability is an issue.

SPECIFICATIONS

Feature	Specification
Brand	Orion

Model Number	21190
Optical Tube Length	22.8 Inches
Objective Lens Diameter	102 Millimeters
Telescope Mount Description	Altazimuth Mount
Focus Type	Manual Focus
Finderscope	Reflex (Red-Dot)
Lens Coating Description	StarBright XLT
Focal Length Description	Fixed Focal Length
Zoom Ratio (with 10mm eyepiece)	60x
Eyepieces Included	25mm Plossl, 10mm Plossl
Barlow Lens Included	Shorty 2x

WARRANTY AND SUPPORT

For information regarding product warranty, please refer to the documentation included with your purchase or visit the official Orion Telescopes & Binoculars website. For technical support or assistance, please contact Orion customer service directly.