

Orion 10273

Orion Observer 80ST 80mm Equatorial Refractor Telescope User Manual

Model: 10273

1. INTRODUCTION

The Orion Observer 80ST 80mm Equatorial Refractor Telescope is designed for beginners and experienced astronomers alike, offering clear views of celestial objects. This compact and portable telescope features an 80mm aperture and a short 400mm focal length (f/5), making it ideal for wide-field observations of the Moon, planets, star clusters, and brighter nebulae and galaxies. This manual provides detailed instructions for assembly, operation, maintenance, and troubleshooting to ensure optimal performance and enjoyment of your telescope.

2. PACKAGE CONTENTS

Before beginning assembly, carefully unpack all components and verify that all items are present. Refer to the image below for a visual representation of the included parts.



Figure 2.1: All components included with the Orion Observer 80ST telescope, neatly arranged outside their packaging.

- 80mm Refractor Optical Tube Assembly
- EQ-1B Equatorial Mount
- Adjustable-Height Aluminum Tripod
- Accessory Tray
- Counterweight and Counterweight Shaft
- Slow-Motion Control Cables (2)
- Red-Dot Reflex Sight
- 90-Degree Star Diagonal (1.25")
- Kellner Eyepiece 25mm (1.25")
- Kellner Eyepiece 10mm (1.25")
- Orion MoonMap 260
- Hardware (various screws and knobs)

3. ASSEMBLY INSTRUCTIONS

Follow these steps to assemble your Orion Observer 80ST telescope. It is recommended to perform initial assembly indoors.

1. Set Up the Tripod:

Spread the tripod legs apart until they are fully extended. Secure the accessory tray to the center brace of the tripod. Adjust the leg height to a comfortable viewing level, ensuring the tripod is stable.

2. Attach the Equatorial Mount:

Place the EQ-1B equatorial mount onto the tripod head. Secure it using the large knob or bolt located underneath the tripod head. Ensure the mount is firmly attached and does not wobble.

3. Install the Counterweight Shaft and Counterweight:

Thread the counterweight shaft into the appropriate opening on the equatorial mount. Slide the

counterweight onto the shaft and secure it with its locking knob. Position the counterweight near the end of the shaft for now; fine-tuning will occur later.

4. Attach Slow-Motion Control Cables:

Connect the two slow-motion control cables to the appropriate gears on the equatorial mount. These cables allow for precise, smooth adjustments when tracking celestial objects.

5. Mount the Optical Tube:

Locate the mounting rings or dovetail plate on the optical tube. Attach the optical tube to the equatorial mount's saddle plate. Ensure it is securely fastened with the provided screws or clamps. The telescope should be balanced on the mount.

6. Install the Red-Dot Reflex Sight:

Slide the red-dot reflex sight into its mounting shoe on the optical tube. Tighten the retaining screw to hold it in place.

7. Insert the Star Diagonal:

Loosen the thumbscrew on the focuser drawtube and insert the 90-degree star diagonal. Tighten the thumbscrew to secure it.

8. Insert an Eyepiece:

Loosen the thumbscrew on the star diagonal and insert the 25mm Kellner eyepiece. Tighten the thumbscrew to secure it. This eyepiece provides the lowest magnification and widest field of view, useful for initial setup and locating objects.



Figure 3.1: The Orion Observer 80ST telescope fully assembled, ready for use.





Figure 3.2: Front view of the assembled Orion Observer 80ST telescope.

4. FIRST LIGHT & OPERATION

4.1 Aligning the Red-Dot Reflex Sight

The red-dot reflex sight acts as a pointing device to help you locate objects. It must be aligned with the main telescope tube:

1. Point the main telescope at a distant, stationary object (e.g., a streetlight or a distant tree during the day). Use the 25mm eyepiece for the widest field of view.
2. Center the object in the telescope's eyepiece.
3. Turn on the red-dot sight. Look through the sight and use its adjustment knobs to move the red dot until it is centered on the same object you see in the telescope's eyepiece.
4. Once aligned, the red-dot sight will accurately indicate where the telescope is pointing.

4.2 Focusing the Telescope

To achieve a sharp image, rotate the focuser knobs until the object appears clear. You may need to adjust focus slightly as objects move or if you change eyepieces.

4.3 Using the Equatorial Mount

The EQ-1B equatorial mount allows you to track celestial objects as they move across the night sky due to Earth's rotation. To use it effectively:

1. **Polar Alignment:** For accurate tracking, the mount's polar axis should be aligned with the Earth's rotational axis. This means pointing it towards Polaris (the North Star) in the Northern Hemisphere. Loosen the altitude and azimuth adjustment knobs on the mount to make coarse adjustments, then tighten them.
2. **Balancing:** Ensure the telescope is balanced on both axes (Right Ascension and Declination) by adjusting the counterweight and the optical tube's position in its rings. This prevents strain on the mount and allows for smoother movement.
3. **Tracking:** Once an object is centered in the eyepiece and the mount is polar aligned, you can use the Right Ascension slow-motion control cable to smoothly track the object as it drifts across the field of view, keeping it centered.

4.4 Exploring with MoonMap 260

The included Orion MoonMap 260 is a valuable tool for identifying lunar features. Use it to locate craters, maria, and other interesting formations on the Moon's surface as you observe through your telescope.

more detailed views of planets and smaller deep-sky objects.

Always start with the lowest magnification (25mm eyepiece) to locate and center an object, then switch to a higher magnification (10mm eyepiece) for more detailed observation.

6. MAINTENANCE AND CARE

Proper care will extend the life and performance of your telescope.

- **Cleaning Optics:** Dust on the objective lens or eyepieces should be removed with a soft brush or compressed air. For smudges, use a specialized optical cleaning solution and a clean, soft microfiber cloth. Avoid touching optical surfaces with your fingers.
- **General Cleaning:** Wipe down the telescope tube and mount with a soft, damp cloth. Avoid harsh chemicals.
- **Storage:** Store the telescope in a dry, dust-free environment. If possible, keep it in its original packaging or a dedicated telescope case to protect it from impacts and environmental elements. Replace dust caps on the optical tube and eyepieces when not in use.
- **Temperature Acclimation:** Allow the telescope to acclimate to outdoor temperatures for 30-60 minutes before observing to minimize image distortion caused by temperature differences.

7. TROUBLESHOOTING

Here are solutions to common issues you might encounter:

- **Cannot see anything through the eyepiece:**
Ensure the dust caps are removed from both ends of the telescope and the eyepiece. Check that the star diagonal and eyepiece are securely inserted. Make sure you are looking through the eyepiece, not the red-dot sight.
- **Images are blurry:**
Adjust the focuser knobs until the image is sharp. If using a high magnification eyepiece, atmospheric conditions can cause blurriness. Allow the telescope to acclimate to outdoor temperatures.
- **Difficulty finding objects:**
Ensure your red-dot reflex sight is properly aligned with the main telescope. Start with the lowest magnification (25mm eyepiece) to locate objects, then switch to higher magnification.
- **Objects drift out of view too quickly:**
This is normal due to Earth's rotation. Use the slow-motion control cables on the equatorial mount to track objects. For best results, ensure the equatorial mount is polar aligned.
- **Wobbly image:**
Ensure the tripod legs are fully extended and stable on a firm surface. All knobs and bolts securing the mount and optical tube should be tightened. Avoid touching the telescope during observation.

8. SPECIFICATIONS

Feature	Detail
Optical Design	Refractor
Optical Diameter	80mm
Focal Length	400mm
Focal Ratio	f/5.0
Eyepieces Included	Kellner 10mm, 25mm (1.25")
Magnification (with included eyepieces)	16x, 40x
Resolving Power	1.45 arc*sec
Lowest Useful Magnification	11x
Highest Useful Magnification	160x
Mount Type	Equatorial (EQ-1B)
Finderscope	Red-Dot Reflex
Optical Tube Length	15 Inches
Item Weight	10 Pounds (fully assembled)
Product Dimensions	62 x 32 x 62 inches (assembled)
Model Number	10273
Manufacturer	Orion

9. WARRANTY AND SUPPORT

Orion Telescopes & Binoculars is committed to providing quality products and excellent customer service. While specific warranty details may vary, Orion generally offers support for their products.

If you encounter any issues with your Orion Observer 80ST telescope or require assistance, please contact Orion customer support directly. They can provide guidance on troubleshooting, replacement parts, or warranty claims.

For the most current support information, please visit the official Orion website or refer to the documentation included with your purchase.