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› FREE SOLDIER 70mm Aperture 400mm Focal Length Astronomical Telescope User Manual

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Model: 70mm Aperture 400mm Focal Length Astronomical Telescope

1. INTRODUCTION

This manual provides detailed instructions for the assembly, operation, and maintenance of your FREE SOLDIER 70mm Aperture 400mm Focal Length Astronomical Telescope. This refractor telescope is designed for beginners to explore celestial objects such as the moon, planets, and brighter deep-sky objects. Please read this manual thoroughly before using your telescope to ensure proper setup and safe operation.

2. SAFETY WARNINGS

- **DO NOT** aim your telescope at the sun or even close to the sun. Observing the sun directly or indirectly through the telescope can cause permanent eye damage, including blindness.
- **CHOKING HAZARD:** This product contains small parts and is not suitable for children under 3 years of age. Adult supervision is required during assembly and use.
- If the image appears blurred, adjust the focus wheel carefully.
- When observing outdoor objects from indoors, avoid closing the window, as reflections from the glass can distort the image.
- For optimal performance, allow the telescope to acclimate to the outdoor temperature before use, especially when moving from an environment with a large temperature difference. This prevents moisture condensation on the objective lens.

3. PACKAGE CONTENTS

Verify that all the following components are included in your package:

- 1x Telescope Optical Tube
- 1x Stainless Steel Tripod
- 2x Eyepieces (K10mm, K25mm)
- 1x 5x20 Finderscope
- 1x Finderscope Base
- 1x 48° Erecting BAK4 Prism (Zenith Mirror)
- 1x 3X Barlow Lens

- 1x Smartphone Adapter
- 1x Bluetooth Remote (with 1 unknown battery included)
- 1x Moon Mirror
- 1x User Manual (this document)

4. ASSEMBLY AND SETUP

Follow these steps to assemble your telescope. No special tools are required.

4.1. Tripod Setup

1. Unfold the stainless steel tripod legs and extend them to your desired height. Secure the legs using the locking clamps.
2. Ensure the tripod is stable on a flat, level surface.

4.2. Attaching the Telescope Optical Tube

1. Locate the mounting screw on the top of the tripod's altazimuth mount.
2. Align the optical tube with the mount and secure it using the mounting screw. Ensure it is firmly attached but do not overtighten.

4.3. Installing the Finderscope

1. Slide the 5x20 finderscope into its base on the optical tube.
2. Tighten the small screws on the finderscope base to hold it in place.

4.4. Inserting the Zenith Mirror and Eyepiece

1. Remove the dust cap from the focuser tube at the end of the telescope.
2. Insert the 48° Erecting BAK4 Prism (Zenith Mirror) into the focuser tube and secure it with the small thumbscrew.
3. Insert one of the eyepieces (K10mm or K25mm) into the zenith mirror and secure it with its thumbscrew.
4. To use the 3X Barlow lens, insert it into the zenith mirror first, then insert an eyepiece into the Barlow lens.



Image: The FREE SOLDIER 70mm Aperture 400mm Focal Length Astronomical Telescope fully assembled on its tripod, showing the optical tube, finderscope, and eyepiece. This image illustrates the complete setup of the telescope, ready for observation.

5. OPERATING INSTRUCTIONS

5.1. Aligning the Finderscope

The finderscope helps locate objects before viewing them through the main telescope. It must be aligned with the main telescope first.

1. During daylight hours, point the main telescope at a distant, easily identifiable object (e.g., a tree top or street sign).
2. Look through the main telescope's eyepiece and center the object in the field of view.
3. Now, look through the finderscope. Use the adjustment screws on the finderscope bracket to move the finderscope until the same object is centered in its crosshairs.
4. Once aligned, objects centered in the finderscope will also be visible in the main telescope's eyepiece.

5.2. Focusing

To achieve a clear image:

1. Point the telescope at an object.
2. Slowly turn the focus wheel until the image appears sharp and clear.

5.3. Changing Magnification

The telescope comes with two eyepieces (K10mm, K25mm) and a 3X Barlow lens. Magnification is calculated by dividing the telescope's focal length (400mm) by the eyepiece's focal length.

- **K25mm Eyepiece:** $400\text{mm} / 25\text{mm} = 16\text{X}$ magnification. Provides a wider field of view, ideal for locating objects.
- **K10mm Eyepiece:** $400\text{mm} / 10\text{mm} = 40\text{X}$ magnification. Provides higher magnification for more detailed views.
- **With 3X Barlow Lens:** The Barlow lens triples the magnification of any eyepiece.
 - K25mm + 3X Barlow: $16\text{X} * 3 = 48\text{X}$ magnification.
 - K10mm + 3X Barlow: $40\text{X} * 3 = 120\text{X}$ magnification.

Start with the lowest magnification (K25mm eyepiece) to locate and center objects, then switch to higher magnifications for detailed observation.

5.4. Using the Smartphone Adapter and Bluetooth Remote

The smartphone adapter allows you to capture images or videos through the telescope.

1. Attach the smartphone adapter to an eyepiece.
2. Secure your smartphone onto the adapter, aligning the phone's camera with the eyepiece.
3. Connect the Bluetooth remote to your smartphone (refer to your phone's Bluetooth pairing instructions).
4. Use the remote to trigger your phone's camera shutter without touching the phone, minimizing vibrations for clearer images.

6. MAINTENANCE

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

- **Cleaning Lenses:** Use a soft, lint-free cloth specifically designed for optical lenses. Gently wipe the lens surface. For stubborn smudges, use a small amount of optical cleaning fluid on the cloth, not directly on the lens. Avoid touching the lens surfaces with your fingers.
- **Storage:** When not in use, store the telescope in a dry, dust-free environment. Replace all dust caps on the optical tube, finderscope, and eyepieces.
- **Avoid Moisture:** Protect the telescope from rain and high humidity. If condensation occurs, allow the telescope to air dry naturally at room temperature before storing.
- **Handling:** Always handle the telescope and its components with care to prevent damage.

7. TROUBLESHOOTING

Problem	Possible Cause	Solution
Image is blurred	Improper focus; atmospheric conditions; temperature difference.	Adjust the focus wheel slowly. Wait for atmospheric conditions to stabilize. Allow telescope to acclimate to outdoor temperature.

Problem	Possible Cause	Solution
Cannot find objects	Finderscope not aligned; using too high magnification initially.	Align the finderscope (see Section 5.1). Start with the K25mm eyepiece (lowest magnification) to locate objects.
Image is dim or dark	High magnification in poor light; dirty lenses.	Switch to a lower magnification eyepiece. Clean the objective lens and eyepieces (see Section 6).
Image is upside down or reversed	This is normal for astronomical telescopes without an erecting prism. The included 48° Erecting BAK4 Prism corrects the image for terrestrial viewing.	Ensure the 48° Erecting BAK4 Prism is correctly installed for terrestrial viewing. For astronomical viewing, an inverted image is common and does not affect observation.

8. SPECIFICATIONS

Feature	Specification
Telescope Type	Refractor
Aperture	70mm (2.75")
Focal Length	400mm
Mount Type	AZ Altazimuth Mount
Eyepieces Included	K10mm (40X), K25mm (16X)
Barlow Lens	3X
Zenith Mirror	48° Erecting BAK4 Prism
Finderscope	5x20
Tripod	Adjustable Stainless Steel Tripod
Lens Coating	Fully Coated Optics
Compatible Devices	Smartphone (via adapter)
Item Weight	5.39 pounds
Package Dimensions	23.6 x 8.6 x 4.9 inches

9. WARRANTY AND SUPPORT

FREE SOLDIER is committed to providing quality products. For any questions regarding your telescope, including technical support or warranty claims, please contact our customer service team. Please refer to your purchase documentation for specific warranty terms and contact information. We strive to respond to inquiries within 24 hours.

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