**FREE SOLDIER 40070**

# FREE SOLDIER 40070 Black Telescope Instruction Manual

70mm Aperture 400mm Focal Length Portable Astronomical Telescope

## 1. Introduction

This manual provides detailed instructions for the assembly, operation, and maintenance of your FREE SOLDIER 40070 Black Telescope. Designed for beginners, this portable astronomical telescope features a 70mm aperture and 400mm focal length, offering clear views of celestial objects and terrestrial scenes. It includes two replaceable eyepieces (10X, 25X), a 3x Barlow lens, a finder scope, a smartphone adapter, and a wireless remote for enhanced viewing and astrophotography.

**Warning: CHOKING HAZARD - Small parts. Not for children under 3 years.**

## 2. Product Components

Before assembly, ensure all components listed below are present in your package:

- Telescope Tube (Main Optical Tube)
- Adjustable Aluminum Tripod
- 3X Barlow Lens
- K25mm Eyepiece
- K10mm Eyepiece
- Rotating Diagonal Mirror (Erecting Image Diagonal)
- Finder Scope Bracket
- Finder Scope
- Smartphone Adapter
- Wireless Remote
- Carry Bag
- Accessory Tray


**Figure 2.1:** Exploded view diagram showing the main telescope tube, tripod, eyepieces, Barlow lens, finder scope, zenith mirror, and accessory tray.


**Figure 2.2:** A comprehensive diagram labeling each part of the telescope system, including the carry bag, telescope tube, aluminum tripod, 3X Barlow lens, K25mm eyepiece, K10mm eyepiece, rotating diagonal mirror, finder scope bracket, finder scope, smartphone

adapter, wireless remote, accessory wrap, user manual, and tray.

## 3. Setup Guide

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

1. **Set up the Tripod:** Extend the aluminum tripod legs to your desired height. Ensure the tripod is stable on a flat surface. Attach the accessory tray to the center brace of the tripod for stability and storage of eyepieces.
2. **Attach the Telescope Tube:** Locate the mounting screw on the tripod head. Align the telescope tube's mounting hole with the screw and secure it firmly.
3. **Install the Finder Scope:** Slide the finder scope into its bracket on the main telescope tube. Tighten the small screws on the bracket to hold it in place.
4. **Insert the Diagonal Mirror:** Remove the dust cap from the focuser tube. Insert the rotating diagonal mirror into the focuser tube and secure it with the small thumbscrew. The diagonal mirror provides a more comfortable viewing angle and corrects the image orientation for terrestrial viewing.
5. **Insert an Eyepiece:** Insert either the K25mm or K10mm eyepiece into the diagonal mirror. Secure it with the thumbscrew on the diagonal mirror.


**Figure 3.1:** The FREE SOLDIER 40070 Black Telescope fully assembled on its tripod, with eyepieces, remote, and smartphone adapter visible.

## 4. Operating Instructions

This section details how to use your telescope for observation.

### 4.1. Finding an Object with the Finder Scope

The finder scope helps locate objects before viewing them through the main telescope. It has a wider field of view than the main telescope.

1. **Align the Finder Scope:** Before first use, align the finder scope with the main telescope. Point the main

telescope at a distant, easily identifiable object (e.g., a tree top or a street sign) during daylight hours.

2. **Center the Object:** Look through the main telescope with the lowest power eyepiece (K25mm) and center the object in the field of view.
3. **Adjust Finder Scope:** Look through the finder scope. Use the adjustment screws on the finder scope bracket to move the crosshairs until they are centered on the same object.
4. **Locate Objects:** Once aligned, use the finder scope to locate celestial objects. Center the desired object in the finder scope's crosshairs, and it should then be visible in the main telescope's eyepiece.

### 4.2. Focusing

To achieve a clear image, adjust the focus:

- Look through the eyepiece.
- Slowly turn the focus knob located on the side of the focuser tube until the image becomes sharp and clear.
- Fine-tune the focus as needed, especially when changing eyepieces or observing different objects.

### 4.3. Changing Eyepieces and Using the Barlow Lens

The telescope comes with two eyepieces (K10mm and K25mm) and a 3x Barlow lens to vary magnification.

- Always start with the lowest power eyepiece (K25mm) to locate and center an object.
- To change eyepieces, loosen the thumbscrew on the diagonal mirror, carefully remove the current eyepiece, insert the new one, and tighten the thumbscrew.
- To use the 3x Barlow lens, insert it into the diagonal mirror first, then insert an eyepiece into the Barlow lens. This will triple the magnification of the eyepiece.


**Figure 4.1:** Visual representation of the moon's surface as seen through the 10mm eyepiece, 25mm eyepiece, and the 25mm eyepiece combined with the 3x Barlow lens, demonstrating varying levels of detail and magnification.

## 5. Magnification Guide

The magnification of your telescope is determined by the focal length of the telescope divided by the focal length of the eyepiece. The FREE SOLDIER 40070 Black Telescope has a focal length of 400mm.

| Eyepiece | Magnification (400mm Focal Length) |
|---|---|
| K25mm Eyepiece | 400mm / 25mm = **16x** |
| K10mm Eyepiece | 400mm / 10mm = **40x** |
| K25mm Eyepiece + 3x Barlow Lens | 16x * 3 = **48x** |
| K10mm Eyepiece + 3x Barlow Lens | 40x * 3 = **120x** |

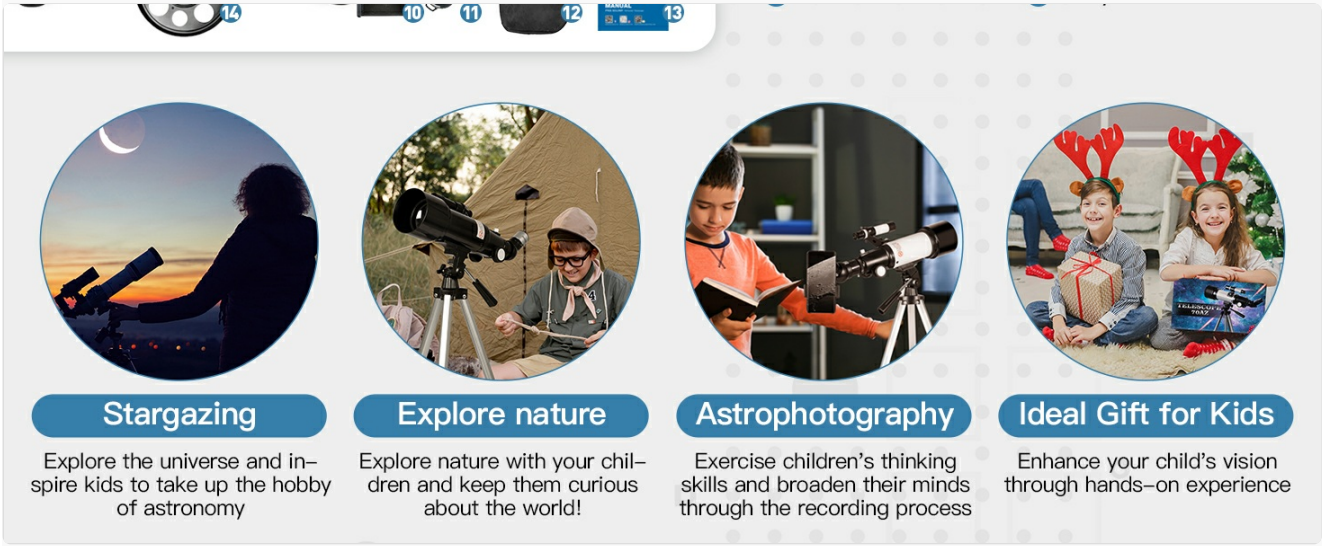


**Figure 5.1:** This diagram illustrates the magnification achieved with the 25mm and 10mm eyepieces, both with and without the 3x Barlow lens, showing how the view of distant objects and the moon changes with increased power.

## 6. Smartphone Adapter and Wireless Remote

The included smartphone adapter and wireless remote allow you to capture images and videos through your telescope.

### 6.1. Attaching the Smartphone Adapter

1. Secure your smartphone into the adapter's clamp.
2. Align your phone's camera lens with the adapter's eyepiece opening.
3. Carefully attach the adapter to the telescope's eyepiece. Ensure the phone's camera is centered over the eyepiece for the best view.

### 6.2. Using the Wireless Remote

The wireless remote connects to your smartphone via Bluetooth and allows you to trigger the camera shutter without touching the phone, minimizing vibrations and ensuring clearer images.

- Pair the remote with your smartphone via Bluetooth settings.
- Open your phone's camera app.
- Use the remote to take photos or start/stop video recording.

**Figure 6.1:** A four-panel image demonstrating the process of attaching a smartphone to the telescope eyepiece using the provided adapter, ensuring proper alignment for photography.

## 7. Care and Maintenance

Proper care will ensure the longevity and performance of your telescope.

- **Cleaning Optics:** Use a soft, lint-free cloth specifically designed for optical lenses. Gently wipe the lens

surfaces. 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.

- **Cleaning the Body:** Wipe the telescope tube and tripod with a soft, damp cloth. Avoid abrasive cleaners.
- **Storage:** When not in use, store the telescope in its carry bag in a dry, dust-free environment. Replace all dust caps on the objective lens, focuser, and eyepieces.
- **Temperature Changes:** Avoid sudden temperature changes, which can cause condensation on optical surfaces. Allow the telescope to acclimate to ambient temperature before use.

## 8. Troubleshooting

Here are solutions to common issues you might encounter:

- **Image is blurry:**
  - Adjust the focus knob slowly until the image is sharp.
  - Ensure the eyepiece is fully inserted and secured in the diagonal mirror (or Barlow lens).
  - Check for condensation on the lenses. Allow the telescope to acclimate to the ambient temperature.
- **Cannot find objects:**
  - Ensure the finder scope is properly aligned with the main telescope (refer to Section 4.1).
  - Start with the lowest magnification eyepiece (K25mm) for a wider field of view.
  - Practice locating terrestrial objects during the day.
- **Image is dim or dark:**
  - Ensure all lens caps are removed.
  - High magnification can make images appear dimmer. Use a lower power eyepiece for brighter views.
  - Observe from a location with minimal light pollution for celestial objects.
- **Smartphone adapter alignment issues:**
  - Carefully adjust the smartphone's position within the adapter to ensure the camera lens is perfectly centered over the eyepiece.
  - Tighten all adjustment screws on the adapter to prevent movement.

## 9. Specifications

| Feature | Specification |
|---|---|
| Model Number | 40070 |
| Optical Design | Refractor |
| Aperture | 70 mm |
| Focal Length | 400 mm |
| Eyepieces Included | K10mm, K25mm |
| Barlow Lens | 3x |
| Finder Scope | Reflex |

| Feature | Specification |
|---|---|
| Telescope Mount | Altazimuth Mount |
| Focus Type | Manual Focus |
| Tripod Material | Aluminum Alloy |
| Item Weight | 1.1 pounds (500 Grams) |
| Product Dimensions | 27.56 x 15.75 x 39.37 inches |
| Compatible Devices | Smartphone |
| Power Source (for remote) | 1 Unknown battery (included) |


**Figure 9.1:** An illustration emphasizing the 70mm super large objective lens, which allows more light to pass through for brighter and clearer images.

## 10. Warranty and Support

FREE SOLDIER offers a Limited Lifetime Warranty for this product. For any questions regarding the product or service, please contact FREE SOLDIER customer support. We are committed to providing assistance within 24 hours.

For further assistance, please refer to the contact information provided with your purchase or visit the official FREE SOLDIER website.