

Sky Watcher S20590

Sky Watcher Star Adventurer GTI Mount Head Kit Instruction Manual

Model: S20590

1. PRODUCT OVERVIEW

The Sky Watcher Star Adventurer GTI Mount Head Kit is a portable and lightweight equatorial (EQ) tracking mount designed for astrophotography. It features full GoTo performance, allowing for automated tracking and pointing to celestial objects. This kit includes the mount head, a counterweight, and a counterweight bar.

- Full GoTo EQ tracking mount for portable and lightweight astrophotography.
- Built-in illuminated polar scope for precision alignment.
- Integrated Wi-Fi for smartphone control via the SynScan Pro app.
- Ports for USB, autoguider, V-style dovetail, and SNAP shutter control for DSLR cameras.
- Dual-position counterweight for use at low latitudes.
- Multiple tracking rates: lunar, solar, and sidereal.
- Payload capacity: 11 pounds (5 kg).
- Device weight: 5.7 pounds.
- Power: 12VDC or 8x AA Batteries.



Figure 1: Sky Watcher Star Adventurer GTI Mount Head Kit with counterweight and bar.

2. SETUP GUIDE

1. **Mounting:** Fasten the Star Adventurer GTI to a tripod with a 3/8" screw.
2. **Power:** Insert the AA battery packs into the compartment. Ensure correct orientation. Alternatively, use an external 12VDC power source.
3. **Latitude Adjustment:** Determine your current latitude using a reliable map application (e.g., Apple Maps, Google Maps). Tilt the device up based on the markings on the side to match your latitude.

4. **Attach Counterweight:** Securely attach the counterweight to the counterweight bar.
5. **Attach Camera:** Mount your DSLR or mirrorless camera to the V-style dovetail.
6. **Shutter Cable (Optional):** If desired, attach the shutter cable from your camera to the SNAP port on the mount.
7. **Balance the Mount:**
 - Slide the counterweight along the bar to balance the Right Ascension (RA) axis.
 - Slide the camera mount to balance the Declination (DEC) axis.
8. **Align with North/Polaris:** Rotate the tripod so the device is roughly aligned with North (or Polaris for Northern Hemisphere users).
9. **Leveling:** Use the built-in bubble level on the mount to ensure your tripod is level.
10. **Prepare Polar Scope:** Point your camera to the right. Remove the caps covering the polar scope.
11. **Power On:** Turn on the device using the power switch.





Figure 2: Front view of the mount, showing the polar scope and control panel.

3. OPERATION

3.1 Polar Alignment (Using SynScan Pro App)

1. Open the SynScan Pro app on your smartphone.
2. Navigate to **Utility** > **Advanced** > **Polar Scope**.
3. Slide the illumination control in the app to glow the polar scope reticle enough for visibility.
4. Look through the polar scope and align Polaris (or the appropriate celestial pole star) with the pattern displayed in the app.
5. Once aligned, slide the illumination control back to **Off** and replace the polar scope caps.
6. Point the camera forward until Polaris is centered in your camera's view.
7. Tighten both the RA and DEC clutches (righty-tighty).

3.2 GoTo Alignment and Tracking

1. In the SynScan Pro app, go to **Alignment**.
2. Select **1-Star Alignment**, **2-Star Alignment**, or **3-Star Alignment** based on your preference and visibility. The app will suggest optimal stars.
3. Select a star from the list. The mount will automatically slew to that star.
4. Make minor manual modifications using the app's directional controls to precisely center the star in your camera's field of view.
5. Click **Next** to proceed with additional stars if performing a 2- or 3-star alignment.
6. Once the alignment calibration is complete, you are ready to select a celestial object.
7. Navigate to **Deep Sky** or **Star** in the app. You can type in the object's name (e.g., "M31" for

Andromeda Galaxy) or select from a list.

8. The mount will slew to the selected object and begin tracking it across the night sky.

3.3 Camera Control (Exposure Groups)

To set up exposure groups for astrophotography, you can either use your camera's built-in intervalometer or an external device. The mount also supports direct control via the SNAP port.

1. In the SynScan Pro app, go to **Utility** > **Advanced** > **Camera Control** .
2. Here, you can add and edit your exposure groups, specifying the number of photos, exposure time, and pause between shots.
3. Once configured, press **Start** to begin the automated exposure sequence.



Figure 3: Side view of the mount, showing adjustment knobs.

4. ASTROPHOTOGRAPHY RESULTS & PERFORMANCE

The Star Adventurer GTI is capable of producing impressive astrophotography results, especially when paired with appropriate camera and lens setups. Its GoTo and tracking capabilities significantly enhance image quality by minimizing star trails.

4.1 Example Images

Andromeda Galaxy

Captured with a Canon R5 and a Canon 100-500mm L lens (at 500mm, f/7.1). This image is a stack of 30 exposures, each 30 seconds long, at ISO 1000. Total exposure time: 15 minutes.



Figure 4: Andromeda Galaxy, showcasing detailed galactic structure.

Orion Nebula

Captured with a Canon R5 and a Canon 100-500mm L lens (at 500mm, f/7.1). This image is a stack of 40 exposures, each 30 seconds long, at ISO 800. Total exposure time: 20 minutes.



Figure 5: Orion Nebula, highlighting vibrant colors and intricate gas clouds.

For longer exposure times (e.g., 1-3 minutes) at 500mm, some elongation of stars may occur, requiring careful pruning during post-processing. However, the mount generally provides sufficient data for high-quality images.

5. CALIBRATION FRAMES FOR POST-PROCESSING

To achieve the best possible astrophotography results, it is crucial to capture various calibration frames in addition to your main "light" images. These frames help to reduce noise, remove dust motes, and correct for vignetting and other optical aberrations.

| File Type | Quantity | Aperture | Shutter | ISO | Focus | Temperature | Scene |
|-----------|----------|----------------|----------------|----------------|----------------|----------------|-----------------------|
| Lights | # | Widest | 0.5 - 3m | 800 - 1600 | # | # | Sky |
| Darks | 20-40 | Same as lights | Same as lights | Same as lights | Same as lights | Same as lights | Blocked (Lens Cap On) |

| File Type | Quantity | Aperture | Shutter | ISO | Focus | Temperature | Scene |
|-----------|----------|----------------|------------------------|----------------|----------------|-------------|---------------------------|
| Bias | 50-100 | Same as lights | Fastest | Same as lights | Same as lights | N/A | Blocked (Lens Cap On) |
| Flats | 30-50 | Same as lights | 1/2 - 2/3 in histogram | Same as lights | Defocused | N/A | White (Pure White Screen) |
| Dark Flat | 30-50 | Same as flats | Same as flats | Same as lights | Same as lights | N/A | Blocked (Lens Cap On) |

Table 1: Recommended Calibration Frame Settings.

6. POST-PROCESSING SOFTWARE

After capturing your images and calibration frames, specialized software is used to stack and process them to reveal the hidden details of deep-sky objects.

- **Affinity Photo 2:** A versatile image editing software with an astro-processing feature that allows you to load and stack different file types.
- **SIRIL:** A free, more advanced tool for astrophotography processing. While it offers powerful capabilities, it may require some time and tutorials to master.

7. PROS AND CONS

7.1 Pros

- Excellent astrophotography results.
- Quick to set up and tear down.
- Highly portable and lightweight.
- Uses readily available AA batteries, allowing for quick swaps in the field.

7.2 Cons

- The polar scope cap is prone to falling off.
- The battery compartment design is not optimal; AA battery packs can be inserted backward, and the cover is held by a screw and small plastic pegs.

8. SPECIFICATIONS

- **Product Dimensions:** 12 x 7 x 16 inches
- **Item Weight:** 15.18 pounds
- **Item Model Number:** S20590
- **Brand:** Sky Watcher
- **Telescope Mount Description:** Equatorial Mount
- **Focus Type:** Manual Focus

- **Power Source:** Battery Powered, External Power (12VDC)
- **Finderscope:** Reflex
- **Compatible Devices:** Cellphone, Camera
- **Lens Coating Description:** StarBright XLT
- **Exit Pupil:** 10.29 Millimeters
- **Payload Capacity:** 11 lb / 5 kg
- **Device Weight:** 5.7 lb
- **Counterweights:** 5 lb & 1.3 lb (included)

9. MAINTENANCE

Regular maintenance ensures the longevity and optimal performance of your Star Adventurer GTI mount. Keep the mount clean and free of dust and debris. Store it in a dry, cool environment when not in use. For detailed cleaning and lubrication procedures, please refer to the comprehensive user manual provided with your product.

10. TROUBLESHOOTING

If you encounter any issues with your Star Adventurer GTI mount, please consult the following common troubleshooting tips. For more complex problems, refer to the full user manual or contact Sky Watcher customer support.

- **Mount not powering on:** Check battery orientation and charge level. Ensure external power supply (if used) is correctly connected and functional.
- **Polar scope illumination not working:** Verify the illumination slider in the SynScan Pro app is set correctly.
- **Difficulty with GoTo alignment:** Ensure accurate latitude input and precise polar alignment. Confirm clear line of sight to alignment stars.
- **Star trails in images:** Re-check polar alignment accuracy. Ensure the mount is properly balanced. Verify correct tracking mode (sidereal, lunar, solar) is selected.
- **Battery compartment issues:** Ensure battery packs are inserted with the "UP" arrow facing the correct direction. Secure the cover screw firmly.

11. WARRANTY AND SUPPORT

For warranty information, product registration, and technical support, please visit the official Sky Watcher website or contact their customer service department. Keep your purchase receipt for warranty claims.

Sky-Watcher Store: <https://www.amazon.com/stores/Sky-Watcher/page/F4F03049-6A2C-4FE9-B78C-9465EC7C1696>