The TTS-160 Panther Lite Telescope Mount User Manual

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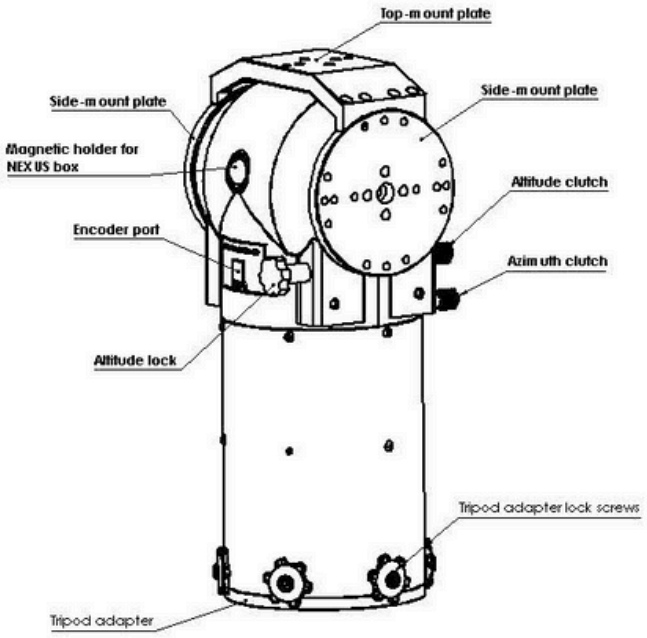
1 - Introduction

Congratulations on your purchase of the TTS-160 Panther Lite manual telescope mount! This mount is designed to provide a stable and reliable base for your telescopes, ensuring a smooth and enjoyable stargazing experience. This manual will guide you through the safe and efficient use of your mount.



Join the Panther Mount User Group and get tips and tricks from other Panther Mount owners.

2 - Safety Guidelines

To ensure your safety and the longevity of your TTS-160 Panther Lite telescope mount, please follow these precautions:

- **Stability.** Always set up the mount on a stable, flat surface to prevent tipping. If the mount is loaded with a large telescope on the side, the tripod may tip over when rotating the telescope in azimuth. Check stability during the first use by rotating a full turn in azimuth while testing the tripod's tilt resistance.
- **Weight Limits:** Do not exceed the maximum weight capacity specified for your mount.
- **Secure Attachments:** Ensure all components are securely fastened before use.
- **Dovetail Saddle Use:** It is demanded always to have a security stop at both ends of the dovetail plate to ensure it can't slide out if the saddle is clamped too lightly.
- **Avoid Excessive Force:** Adjust and push the mount with gentle force to avoid damaging the clutches or other components.

3 - Unpacking and Checking Components

The TTS-160 Panther Lite package contains the following parts:

1. Telescope Mount Head
2. Two counterweight arms
3. One vertical counterweight bracket
4. One Tripod adapter
5. Allen Keys
6. Screws for installation of counterweight arms and dovetail saddles:
    a. 8 pcs M5x16 Countersunk screws for counterweight arms and vertical counterweight bracket
    b. 4 pcs M6x12 Cylinderhead screws for dovetail saddles
    c. 4 pcs M8x212 Cylinderhead screws for dovetail saddles

Contact the manufacturer or retailer immediately if any components are missing or damaged.

4 - Possible Configurations of the Mount

The TTS-160 Panther Lite can be configured to suit many different observational needs. Below follows a list of the most common configurations. Choose your desired configuration and prepare it indoors. The mount head is lightweight, and it is easy to set up any configuration already assembled.

1. **Side-mounted telescope,** normal balancing
2. **Side-mounted telescope,** comfort balancing
3. **Top-mounted telescope,** normal balancing
4. **Two side-mounted telescopes,** no counterweights
5. **Top- and side-mounted telescopes,** normal balancing
6. **Top- and side-mounted telescopes,** comfort balancing

Side-mounted telescope with normal balancing

Side-mounted telescope with comfort balancing

Top-mounted telescope with normal balancing

Two side-mounted telescope with no counterweights

Top- and side-mounted telescopes with normal balancing

Top- and side-mounted telescopes with comfort balancing

(image without side-mounted telescope)

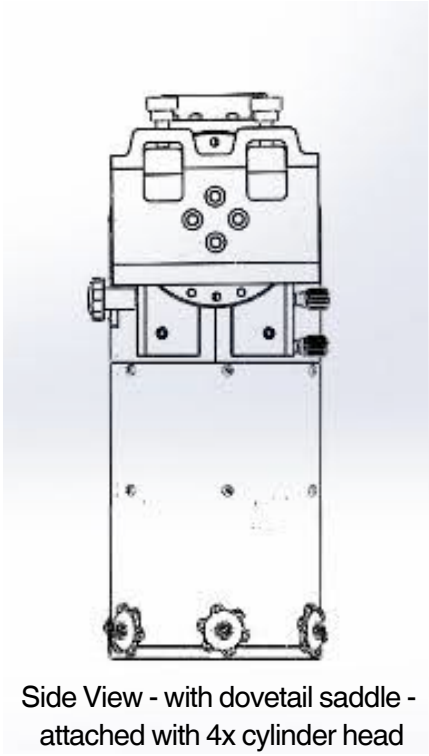
4.1 - Side-mounted telescope

- with normal balancing

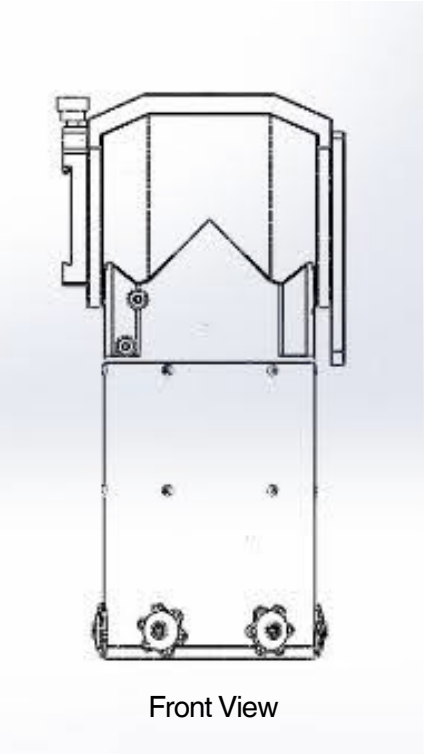
This is the easiest and simplest configuration to set up.

- One Mount Head
- One Vertical Balancing Bracket
- One Dovetail Saddle (Losmandy or Vixen)
- One Counterweight (4kg or 8kg)

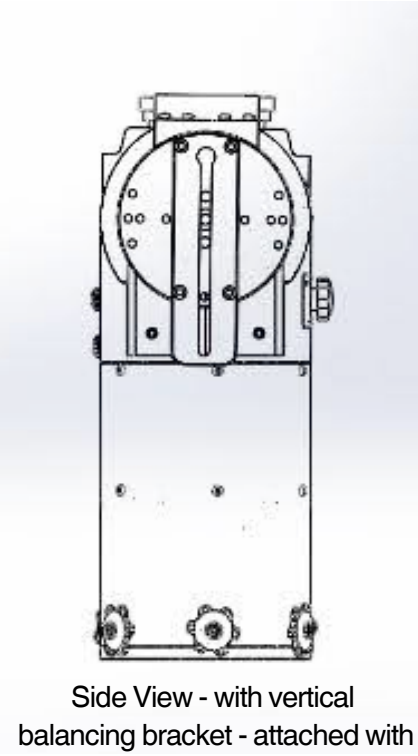
Attach the pieces according to the images below.



Side View - with dovetail saddle - attached with 4x cylinder head M8x12 screws



Front View



Side View - with vertical balancing bracket - attached with 4x countersunk M5x16 screw

The capacity of this configuration is listed below:

- One telescope up to 15kg with no counterweights
- One telescope up to 25kg with one 8kg counterweight

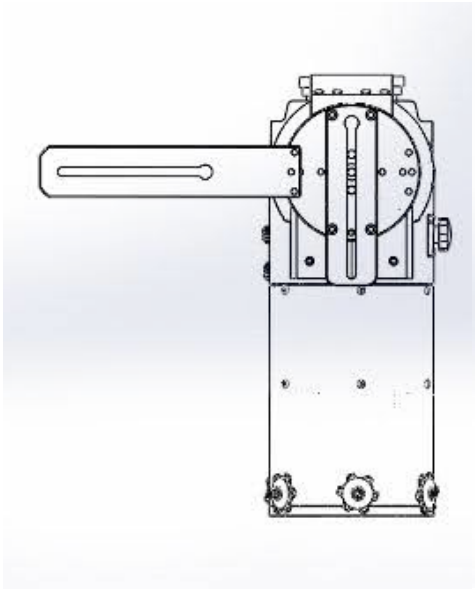
4.2 - Side-mounted telescope

- with comfort balancing

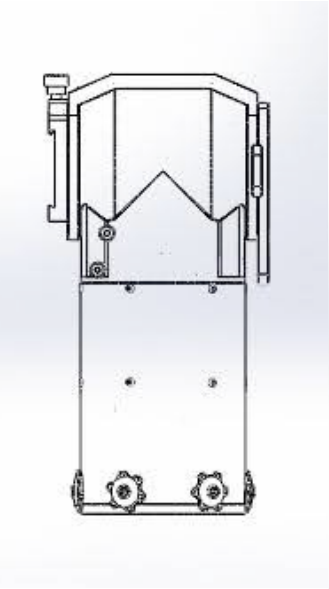
For those wanting to try the new comfort balancing exclusive to the TTS-160 Panther Lite, this configuration is a great place to start.

- One Mount Head
- One Vertical Balancing Bracket
- One Counterweight Arm
- One Dovetail Saddle (Losmandy or Vixen)
- Two Counterweights (4kg or 8kg)

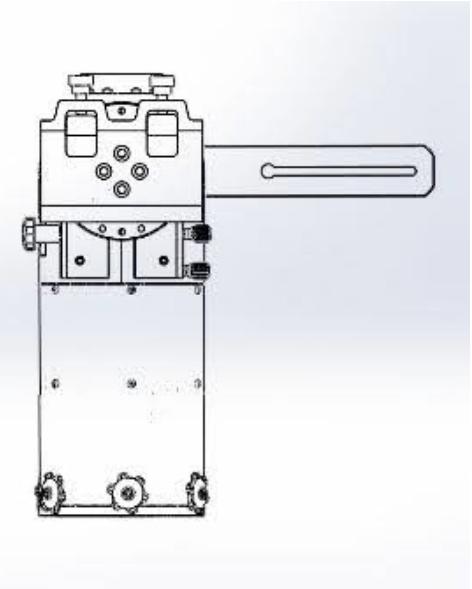
Attach the pieces according to the images below.



Side View - with vertical balancing bracket and counterweight arm - attached with 6x countersunk M5x16 screws



Front View



Side View - with dovetail saddle - attached with 4x cylinder head M8x12 screw

The capacity of this configuration is listed below:

- One telescope up to 15kg with no counterweights *(a 4kg or 8kg counterweight for comfort balancing).*
- One telescope up to 25kg with one 8kg counterweight *(a 4kg or 8kg counterweight for comfort balancing).*

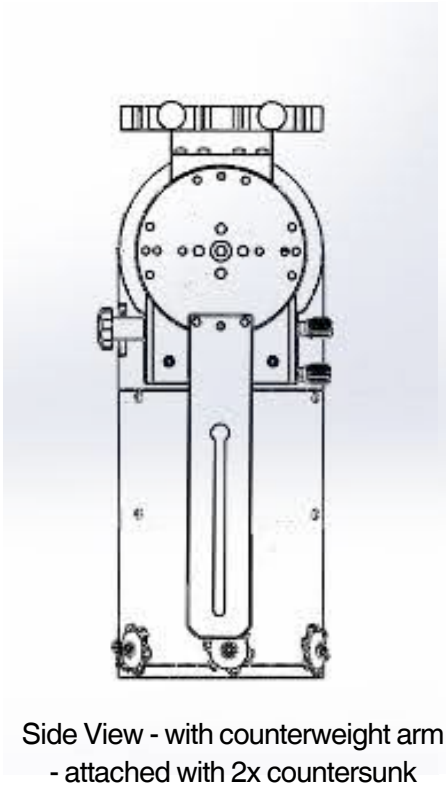
4.3 - Top-mounted telescope

- with normal balancing

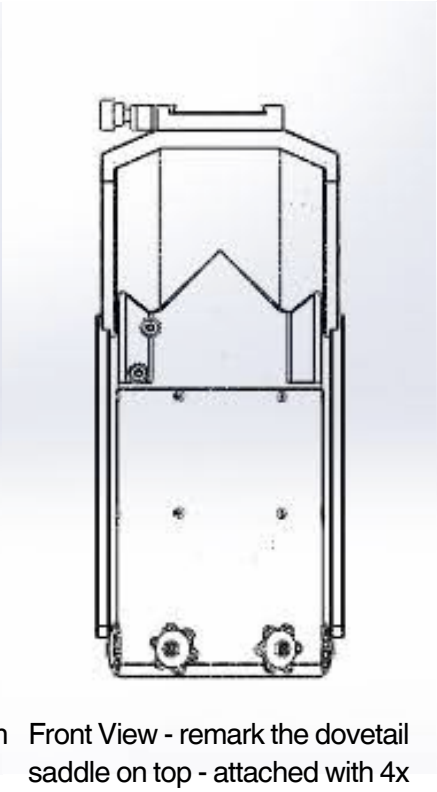
For those using bino-scopes a top-mounted configuration is needed. This is the top-mounting configuration without comfort balancing.

- One Mount Head
- Two Counterweight Arm
- One Dovetail Saddle (Losmandy or Vixen)
- Two Counterweights (4kg or 8kg)

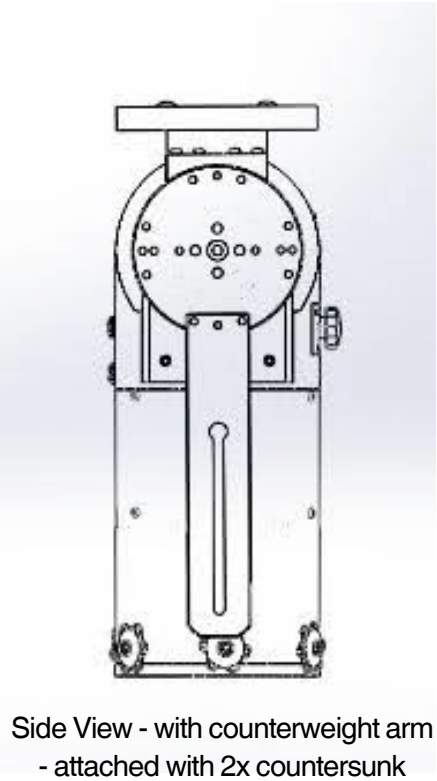
Attach the pieces according to the images below.



Side View - with counterweight arm - attached with 2x countersunk M5x16 screws



Front View - remark the dovetail saddle on top - attached with 4x cylinder head M8x12 screws



Side View - with counterweight arm - attached with 2x countersunk M5x16 screws

The capacity of this configuration is listed below:

- One telescope up to 25kg with appropriate counterweights.

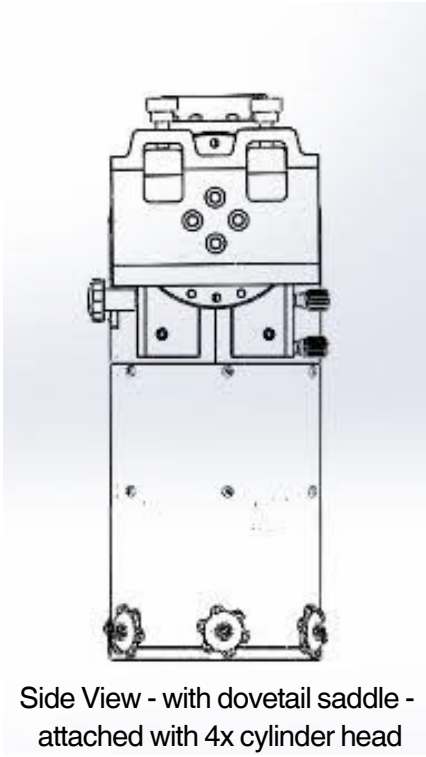
4.4 - Two side-mounted telescopes

- with no counterweights

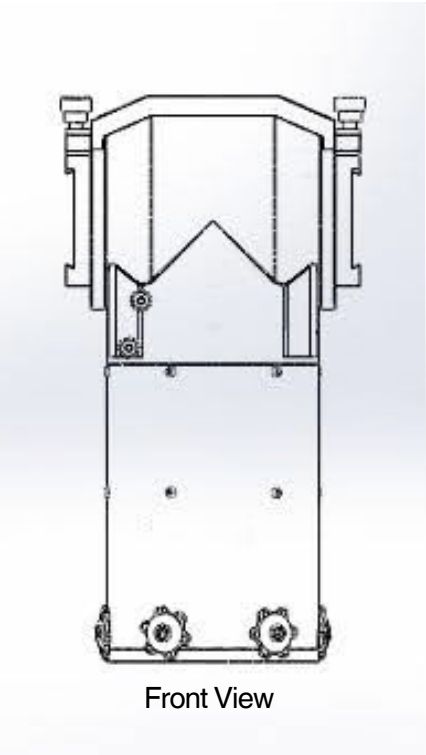
By mounting 2 telescopes, one on each side, no counterweights are needed to balance out the setup.

- One Mount Head
- Two Dovetail Saddles (Losmandy or Vixen)

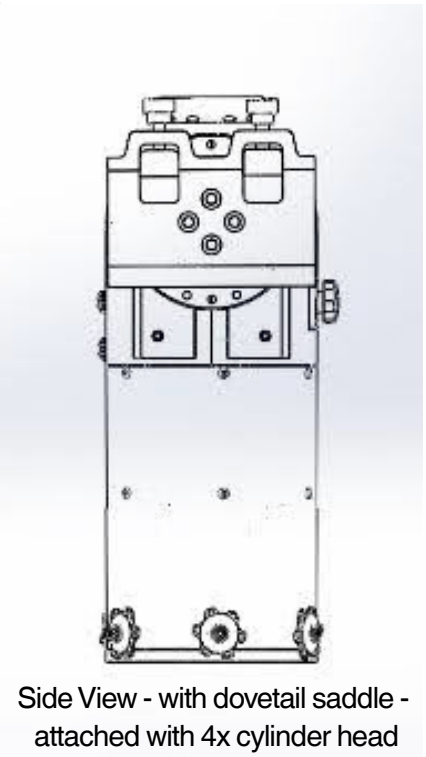
Attach the pieces according to the images below.



Side View - with dovetail saddle - attached with 4x cylinder head M8x12 screws



Front View



Side View - with dovetail saddle - attached with 4x cylinder head M8x12 screws

The capacity of this configuration is listed below:

- Two telescopes up to 20kg each *(Weight difference between the telescopes may not exceed 15kg).*

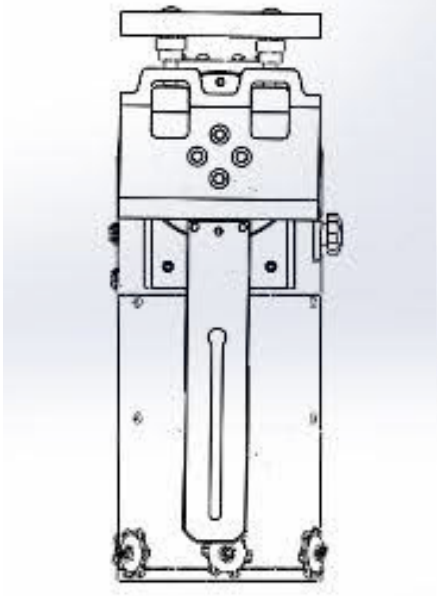
4.5 - Top- and side-mounted telescopes

- with normal balancing

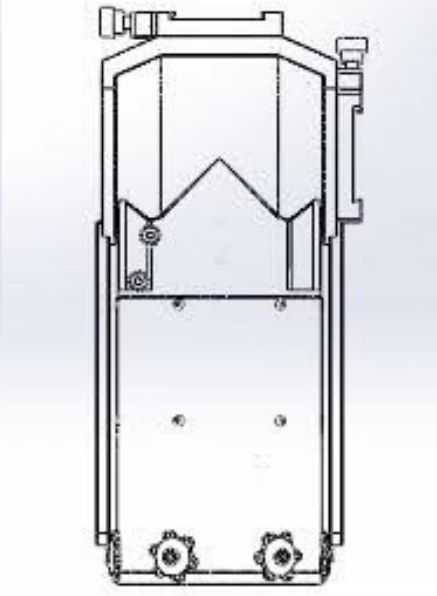
A perfect configuration for using a bino-scope with another type of telescope for another purpose.

- One Mount Head
- Two Dovetail Saddles (Losmandy or Vixen)
- Two Counterweight Arms
- Two Counterweights (4kg or 8kg)

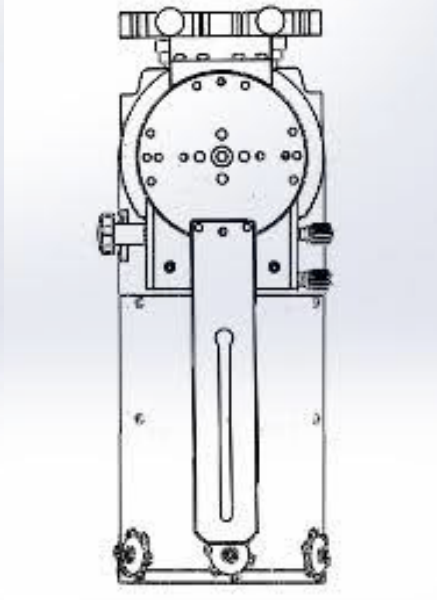
Attach the pieces according to the images below.



Side View - with dovetail saddle and counterweight arm - attached with 4x cylinder head M8x12 screws, and 2x countersunk M5x16



Front View - remark the dovetail saddle ontop - attached with 4x cylinder head M8x12 screws



Side View - with counterweight arm - attached with 2x countersunk M5x16 screws

The capacity of this configuration is listed below:

- Top-mounted telescope up to 20kg with appropriate counterweights. Side-mounted telescope up to 15kg.

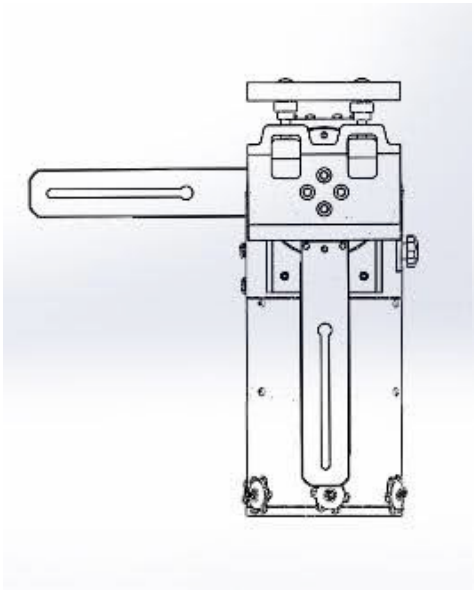
4.6 - Top- and side-mounted telescopes

- with comfort balancing

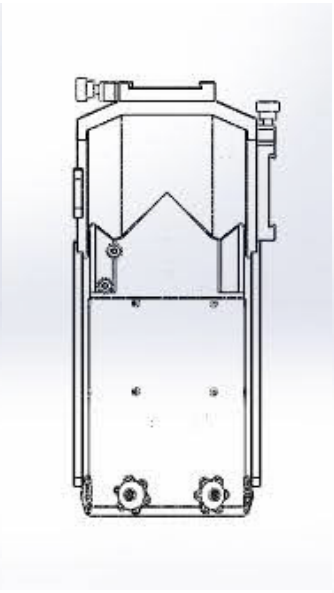
And if you are thinking of going all the way, then you can comfort balance with multiple telescopes on the mount.

- One Mount Head
- Two Dovetail Saddles (Losmandy or Vixen)
- Three Counterweight Arms
- Three Counterweights (4kg or 8kg)

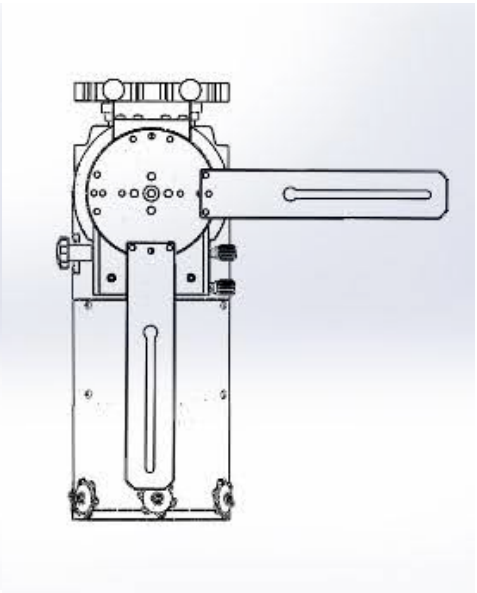
Attach the pieces according to the images below.



Side View - with dovetail saddle and counterweight arm - attached with 4x cylinder head M8x12 screws, and 2x countersunk M5x16



Front View - remark the dovetail saddle ontop - attached with 4x cylinder head M8x12 screws



Side View - with two counterweight arms - attached with 4x countersunk M5x16 screws

The capacity of this configuration is listed below:

- Top-mounted telescope up to 20kg with appropriate counterweights. Side-mounted telescope up to 15kg.

5 - Setup Instructions

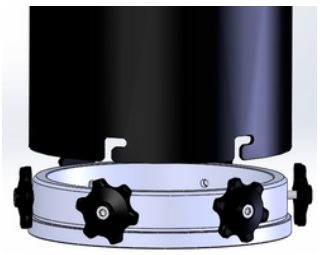
The mount head matches the TTS-160 Folding Pier for optimal use. It is also possible to use other piers and tripods.

Step 1: Assemble the tripod or pier

- Follow the instructions provided with your tripod or pier.
- Attach the tripod adapter:
  - For the TTS-160 Folding Pier, use the included M8x40 bolt with washer. Tighten securely but avoid overtightening.
  - For other flat-top tripods or piers, use a 3/8" 16TPI bolt from below.
  - **Note:** Leave the tripod adapter attached to the tripod or pier.

Step 2: Attach the Mount head to the tripod/Pier

- Loosen the six finger screws to create space for the mount head base below the screw handles.
- Place the mount head on the tripod adapter aligning the vertical slots with the finger screws.
- Rotate the mount head clockwise so that the finger screws are in the horizontal slots.
- Tighten the finger screws.



Step 3: Install the Counterweights

- Install the counterweights onto the arms and secure them with the locking knobs. Position the weights at the bottom of the arm for the initial setup.
- For comfort-balancing, lock the altitude clutch, then insert the counterweight on the arm around the middle.
- NOTE: The Counterweight is now out of balance until the telescope is installed and balanced together with the counterweight. DO NOT loosen the altitude clutches before the telescope is installed. Rember to hold onto the telescope when loosening the clutches.

Step 4: Mount the Telescope

- Lock the **altitude lock handle** before attaching the telescope.
- Carefully place the telescope onto the dovetail saddle and secure it with the locking knobs. Ensure it is tightly fastened.
- TELESCOPE POINTING DIRECTION: The encoder port must be pointing in the viewing direction.

6 - Balancing the Mount

Proper balance ensures smooth operation and prevents unnecessary strain on the mount.

Step 1: Balance the Altitude Axis

- Keep the telescope in a horizontal position.
- Loosen the altitude clutch and altitude lock.
- Adjust the position of the telescope forward or backwards in the dovetail saddle until balanced. Tighten the dovetail saddle locks securely.
- Point the telescope upwards high in the sky and adjust the counterweights on the counterweight arms for top-mounting or the vertical balancing bracket for side-mounting, until balanced.
- Set the Altitude clutch to a light pressure, just enough to hold the telescope in position. This gives the smoothest movement.

Step 1.1: Comfort Balancing for optimal Eyepiece position

- The comfort balance counterweight is used to easily balance any eyepiece or other changing equipment.
- Simply slide/rotate the counterweight on the arm to achieve perfect balancing.

Step 2: Balance the Azimuth Axis

- Install a counterweight on the opposite side of a heavy telescope to prevent tripod instability.
- There is no actual balancing of the Azimuth axis.

Note: Repeat these steps whenever you change accessories or configurations.

7 - Adjusting clutch power – Orange finger screws

The adjustable clutches control how much force is needed to move the mount by hand.

- **Altitude clutch:** Adjust with the top finger screw.
- **Azimuth clutch:** Adjust with the bottom finger screw.

Tips for Optimal Adjustment:

- Ensure the altitude balancing is set precisely, when pointing both horizontal and vertical.
- To get the overall best performance of the mount the clutches must be set lightly. It should be possible to move the telescope with a light push of a finger.
- Try different settings to find the optimal position. Damping time can also be optimized when setting the clutches.
- When a good position has been found leave the clutches untouched and use the altitude lock handle when changing eyepieces etc.
- Avoid overtightening to prevent damage.

The two Altitude and Azimuth clutch screws are orange and can be found on the front of the mount

8 - Using the Built-in Encoders

The mount is equipped with optical encoders on each axis:

- **Azimuth encoder:** Resolution 79888,
  Pulses per round – 16 arcsec/pulse
- **Altitude encoder:** Resolution 79888,
  Pulses per round - 16 arcsec/pulse

Connections

The table below shows the different connections the encoders have.

Pin Number	Connection
1	Channel B of Azimuth encoder
2	+5 V
3	Channel A of Azimuth encoder
4	Ground
5	Channel B of Altitude encoder
6	+5 V
7	Channel A of Altitude encoder
8	Ground

The encoder connector pinout matches the *NEXUS-II* and the *NEXUS DSC Pro* digital setting circles from Astro Devices.
Use a standard Ethernet cable (RJ45 connectors) to connect the adapter to the mount head.
The NEXUS-II box *(only the version from TTS with magnetic plate)* can be placed on the magnetic holder on the mount head.

Software integration:

- Use the SkySafari App to control the system.
- Follow the instructions for NEXUS device and SkySafari app setup.

9 - Appendix

Dovetail saddle mounting hole pattern