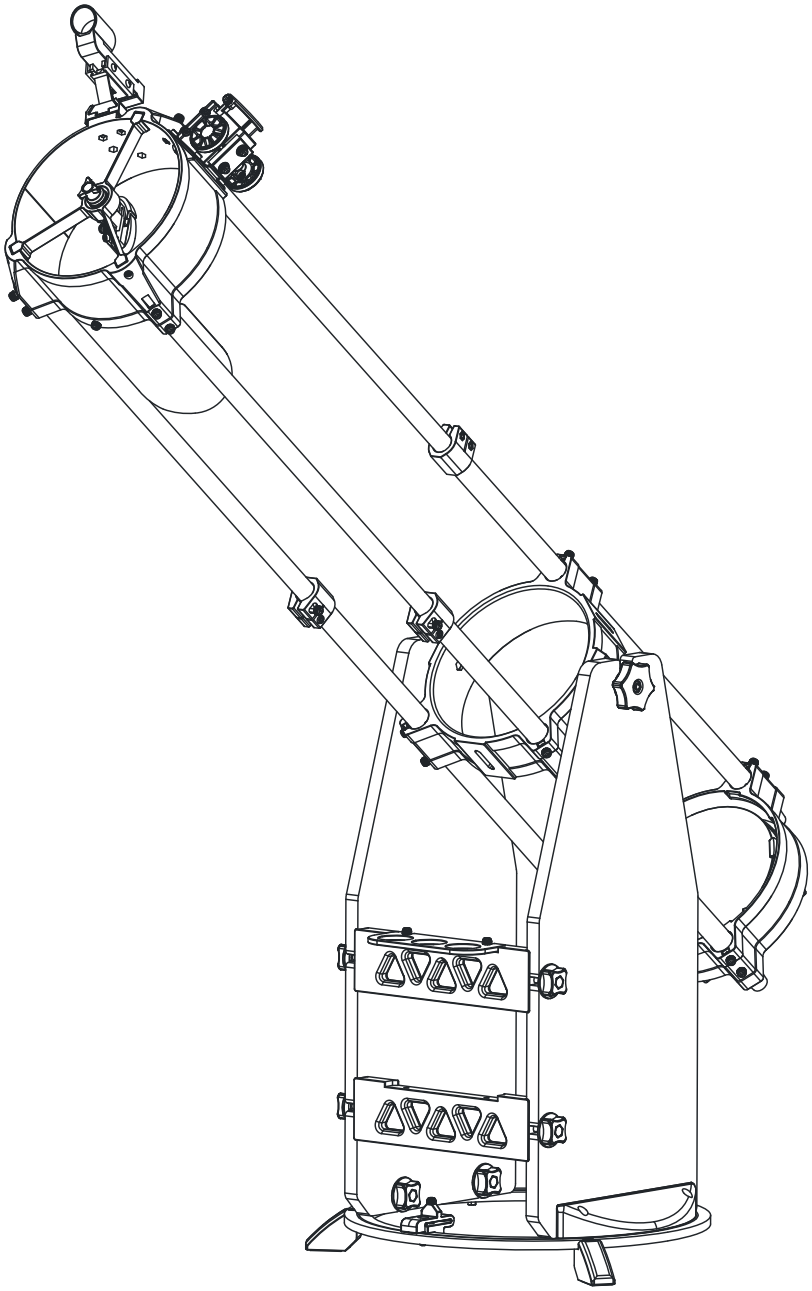
Meridian C160

assembly guide



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Safety

Read this safety information before assembly or use. These warnings cover hazards that can cause eye injury, cuts, pinching, or damage to the telescope if the instructions are not followed.

- **WARNING — Solar viewing hazard:** Never look at or near the Sun through this telescope, finder, eyepiece, camera, or any other optical device. This telescope is not designed for solar observing, and no solar filter is provided or intended for use with it. Do not use the telescope for daytime observing, as there is a risk of accidentally pointing it at or near the Sun. Looking at the Sun through a telescope can cause instant, permanent eye injury or blindness. Eye damage may be painless and may not be noticed immediately.
- **WARNING — Not a toy:** This product is not a toy. Recommended for ages 14 and older. Adult supervision is required during assembly and use by minors.
- **WARNING — Choking hazard:** Small parts are present. Keep all loose parts, fasteners, packaging, and tools away from children under 3 years old.
- **CAUTION — Sharp edges:** Printed, machined, or cut parts may have sharp edges or burrs. Handle parts carefully and deburr or sand sharp edges before use.
- **CAUTION — Pinch points:** Moving joints, knobs, bearings, and sliding parts can pinch fingers. Keep hands clear while adjusting or tightening assemblies.
- **CAUTION — Assembly and tools:** Assemble on a stable surface. Wear eye protection when cutting, sanding, drilling, or deburring. Do not overtighten fasteners into printed parts.
- **NOTICE — Pre-use inspection:** Before each use, verify that all knobs, screws, mirrors, optical parts, and structural connections are secure.

The Parts

Printed Parts

Part	Qty		Part	Qty	
Altitude clutch axle left	1		Secondary cell spider knob	1	
Altitude clutch axle right	1		Secondary cell spring base	1	
Altitude clutch handle	1		Secondary cell tab	1	
Altitude clutch washer	1		Stand anchor	2	
Finder mount	1		Stand azimuth clutch	1	
Focuser base	1		Stand eyepiece tray	1	
Focuser bridge	1		Stand feet	3	

Part	Qty	
Focuser knob	2	
Focuser tube	1	
Light shield	1	
Primary cell	1	
Primary cell knob	3	
Primary cell tab	3	
Secondary cell	1	
Secondary cell spider	1	

Part	Qty	
Stand front	2	
Stand knob	8	
Telescope bottom	1	
Telescope bottom lid	1	
Telescope center	1	
Telescope top	1	
Tube clamp	3	

Hardware

Part	Qty	
3 mmx60 pin	1	
Aluminum rail for focuser	3	
Base bearing	1	
Bearing 6042RS	4	
Bearing AXK0819	3	
Felt tape piece	3	
M4 nut	63	
M4 washer	8	
M4×10 socket head screw	22	
M4×10 thumbscrew	26	
M4×20 cone head screw	3	
M4×20 socket head screw	12	
M4×30 thumbscrew	4	
M6 nut	25	
M6 washer 18mm wide	10	

Part	Qty	
M6 washer 40mm wide	2	
M6×35 hex head screw	13	
M6×45 hex head screw	1	
M8 washer 19mm wide	6	
Primary mirror	1	
PTFE sheet	1	
Red dot finder	1	
Rubber feet	3	
Secondary mirror	1	
Silicone band 20×5	2	
Spring 0.9mm	1	
Spring 1.2mm	3	
Tube narrow	3	
Tube wide	3	
Wooden stand side	2	

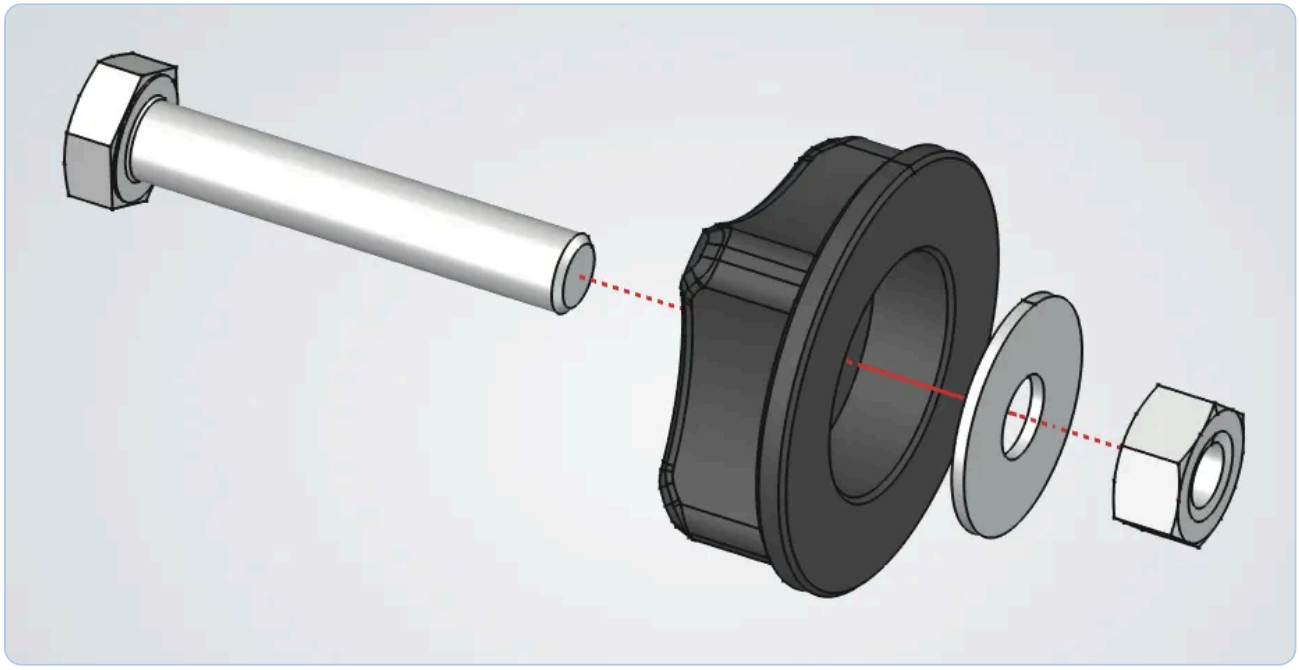
The Tools

Tool	
2.5mm hex key	
3mm hex key	
Printed wrench. Print it with the other parts if you have the 3D Printing Kit. It comes with the Full Kit.	
Ruler	
Scissors	
Clear, stable, soft work surface, such as cardboard or a rug	

The Stand Assembly

Stand Knob (x8)

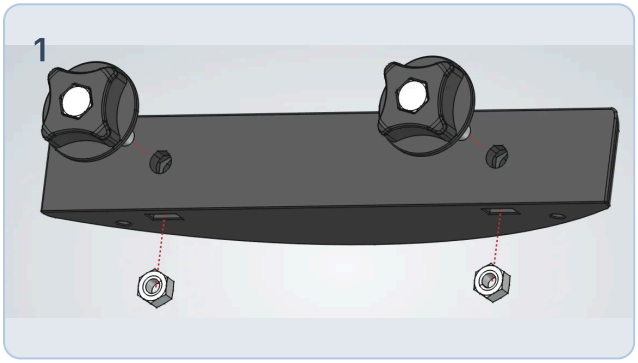
Part	Qty	
Stand knob	1	
M6×35 hex head screw	1	
M6 washer 18mm wide	1	
M6 nut	1	

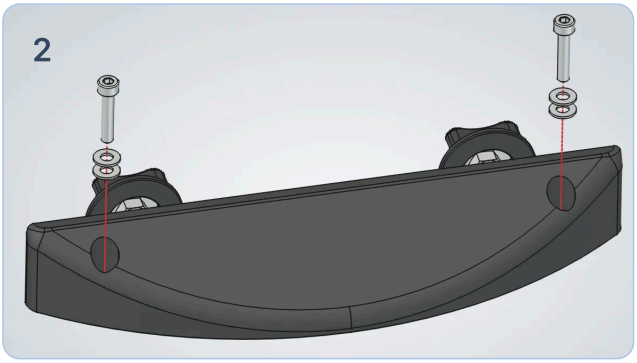


1. Insert the screw into the knob.
2. From the other side, add the 18mm washer and thread the nut onto the screw.
3. Spin the nut down to the bottom, then use the printed wrench to tighten it.

Stand Anchor (x2)

Part	Qty	
Stand anchor	1	
Stand knob assembly	2	
M6 nut	2	
M4×20 socket head screw	2	
M4 washer	4	





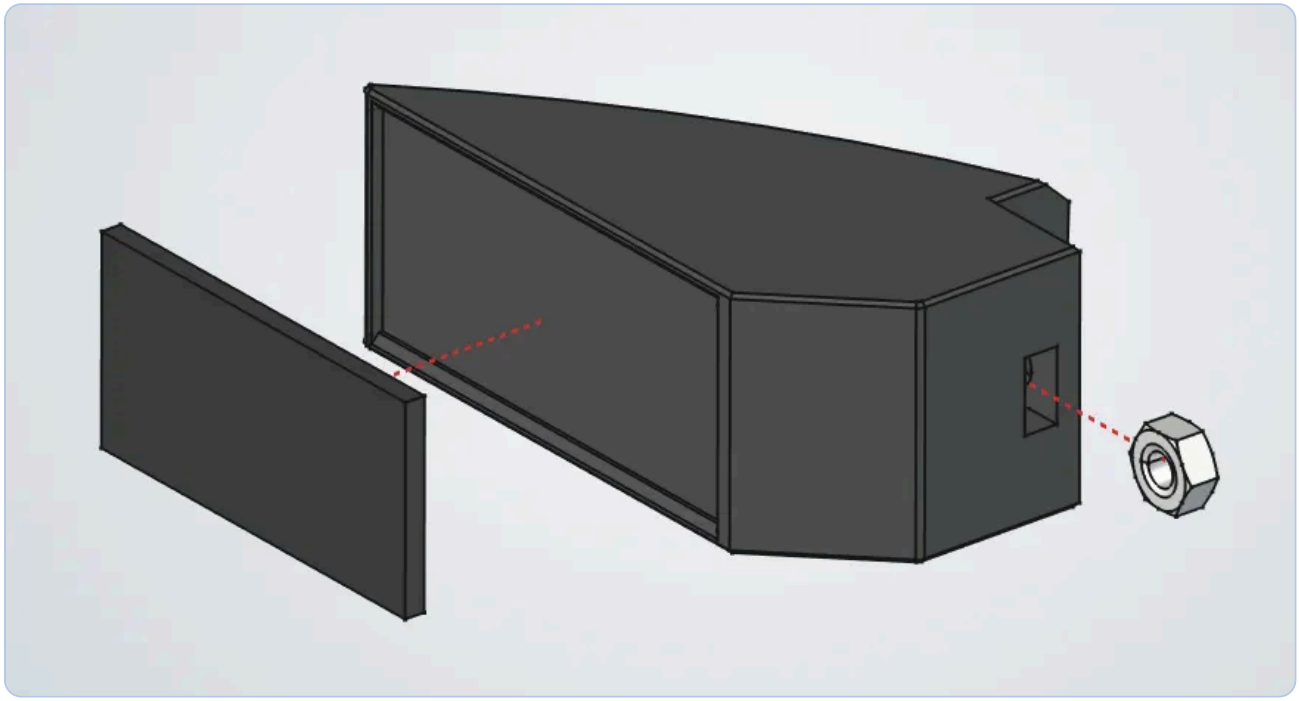
1. a. Insert the two nuts into their slots.

   b. Thread the knobs into the nuts, leaving about 1 cm of space from the anchor itself.

2. Place each M4 screw through two M4 washers and into position.
   These will attach the anchor to the base later.

Stand Feet (x3)

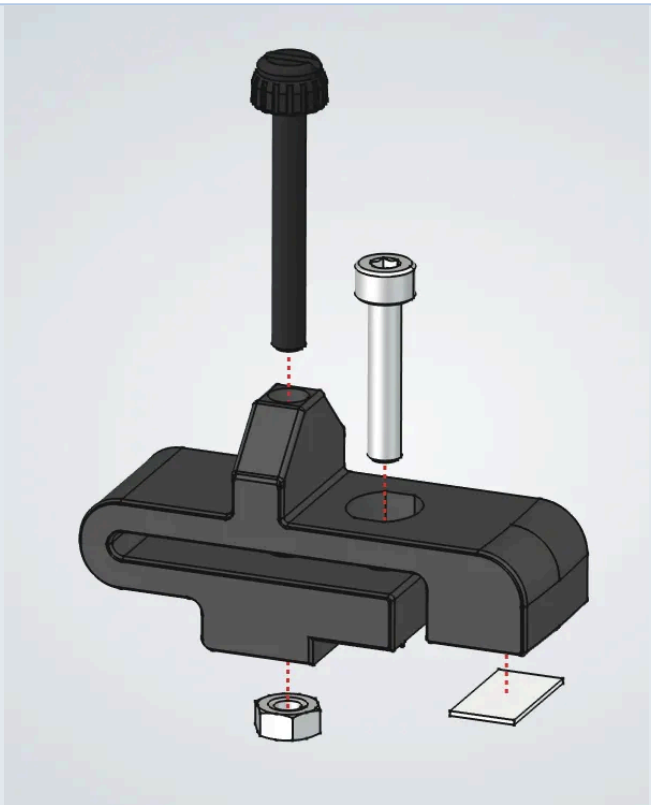
Part	Qty	
Stand feet	1	
M4 nut	1	
Felt tape piece	1	



1. Insert the M4 nut into the side pocket of the foot.
2. Take a piece of felt tape and stick it onto the flat bottom face.
3. Repeat for the two other feet.

Stand Azimuth Clutch

Part	Qty	
M4 nut	1	
M4×30 thumbscrew	1	
PTFE piece	1	
M4×20 socket head screw	1	
Stand azimuth clutch	1	

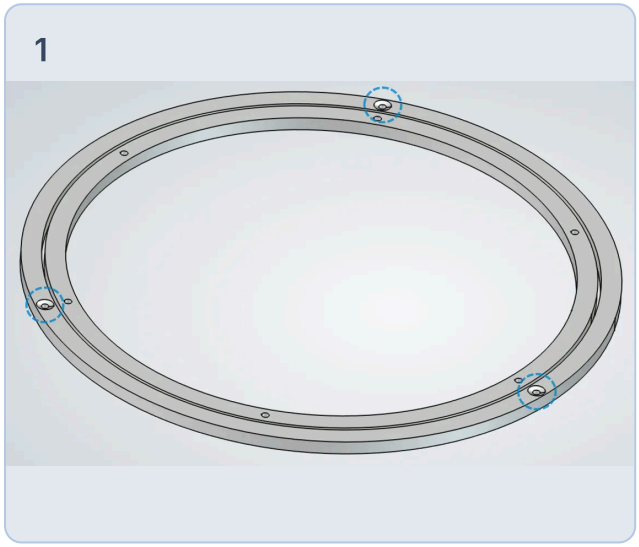


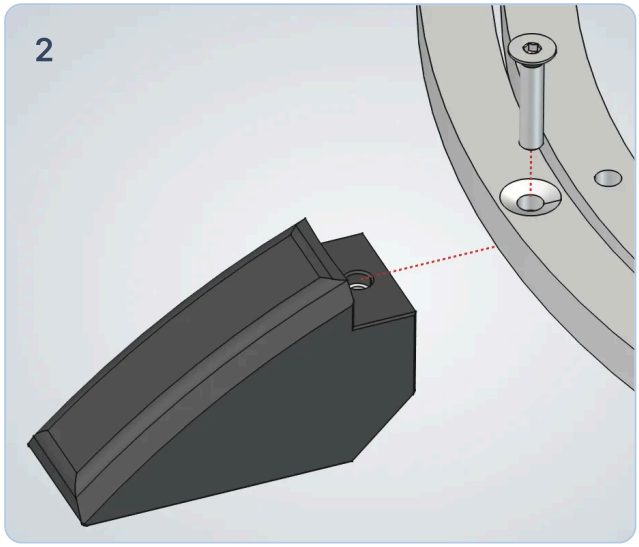
1. Insert the M4 nut into the underside pocket.
2. Thread the thumbscrew through the raised part and into the nut.
3. Install the screw through the round hole in the top of the clutch.
4. Cut a 1.5 cm by 0.8 cm piece from the PTFE sheet, peel off the backing, and stick it onto the flat contact face.

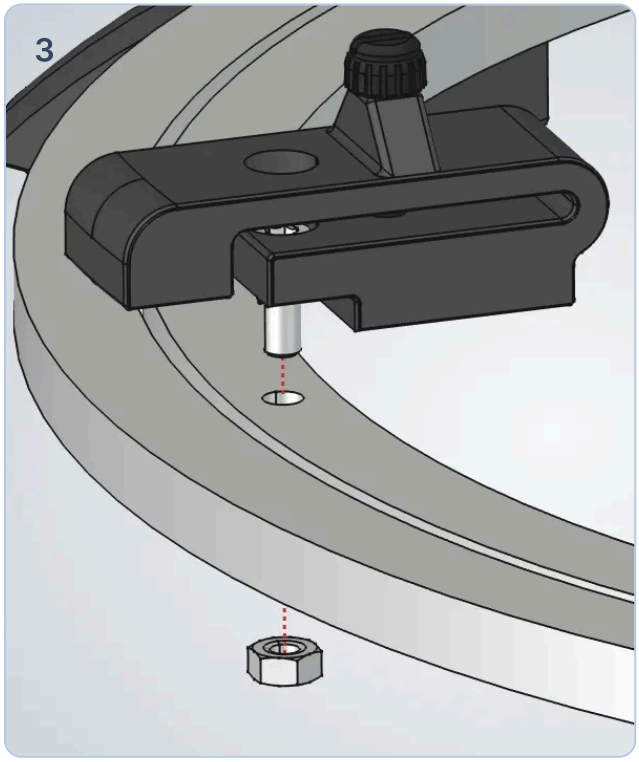
Stand Base

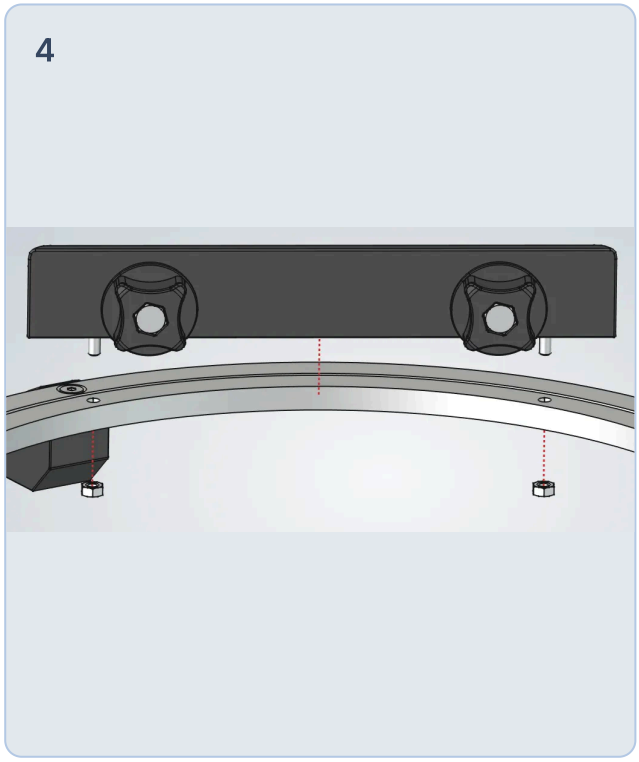
Part	Qty	
Base bearing	1	
M4×20 cone head screw	3	
Stand anchor assembly	2	

Part	Qty	
M4 nut	5	
Stand azimuth clutch assembly	1	
Stand feet assembly	3	









1. Place the base bearing with the countersunk holes of the outer ring facing up.

2. a. For each foot, place it under a matching hole and insert the screw from above.

   b. Press the foot fully into the base bearing, then tighten the screw with the 2.5mm hex key.

3. Place the azimuth clutch over the remaining hole in the inner ring, then add the nut on the other side and tighten the screw.

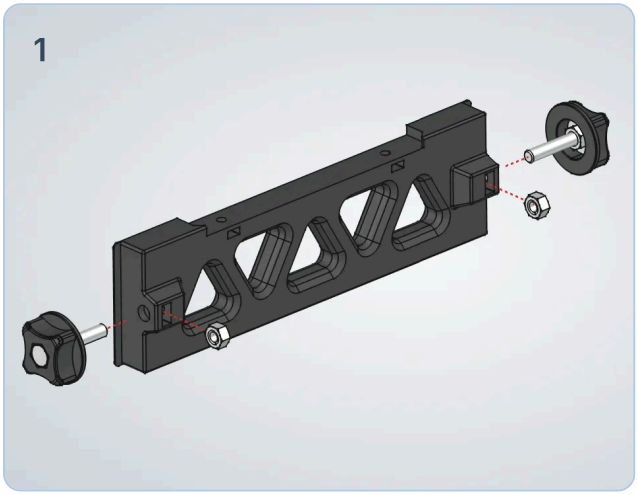
4. a. Place the two anchors against the outer ring, opposite to each other, and insert their screws through the matching holes.

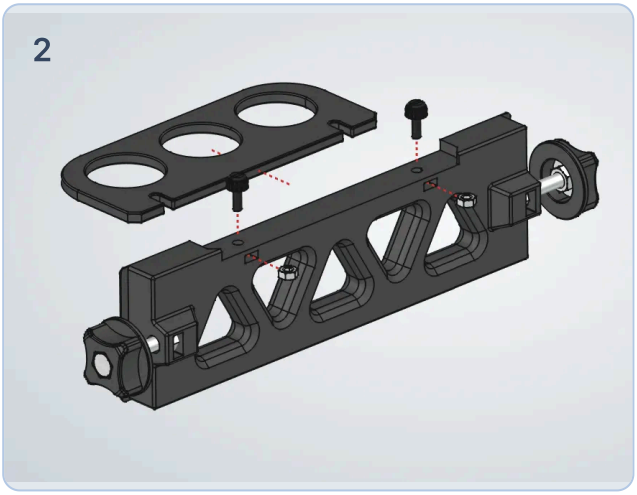
   b. While tightening the nuts on the other side, press the anchor outward so it sits near the edge of the ring.

Stand Front

Part	Qty	
Stand front	1	
Stand knob assembly	2	
M4×10 thumbscrew	2	

Part	Qty	
M4 nut	2	
Stand eyepiece tray	1	
M6 nut	2	



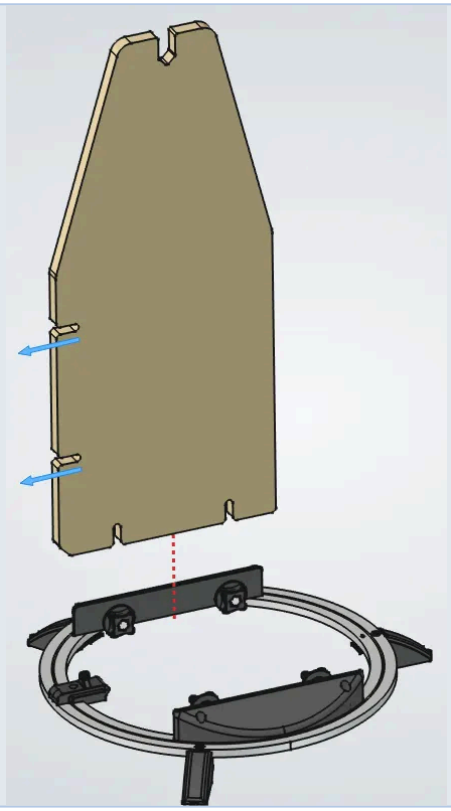


1. a. Insert the four M6 nuts into the side pockets.
   b. Thread the knobs into the nuts, leaving about 1 cm of space from the panel itself.
2. a. Insert the M4 nuts into their slots.
   b. Thread the thumbscrews into the front panel, leaving enough space for the eyepiece tray to slide under them.
   c. Slide the eyepiece tray into place under the thumbscrews.

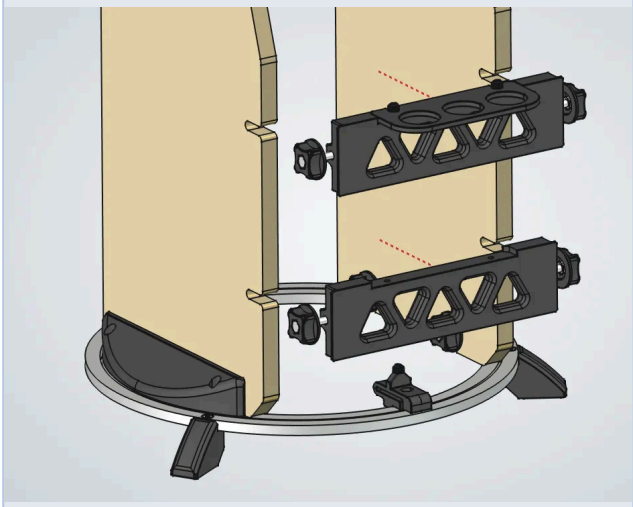
Stand Assembly

Part	Qty	
Stand base assembly	1	
Wooden stand side	2	
Stand front assembly	1	
Stand front without tray assembly	1	

1



2



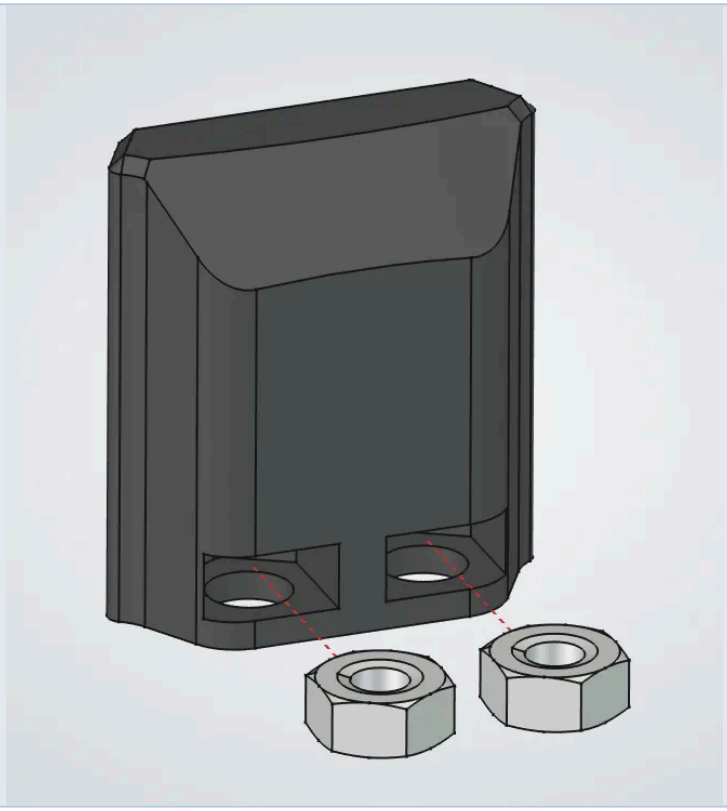
1. Slide one of the side boards under the base knobs and lock it in place.
   Orient the board so its slots face toward the azimuth clutch, as shown by the arrows.
   Repeat for the other side.

2. Slide the front panels in so their knobs pass through the slots in the side boards, then lock the knobs.

The Bottom Assembly

Primary Cell Tab (x3)

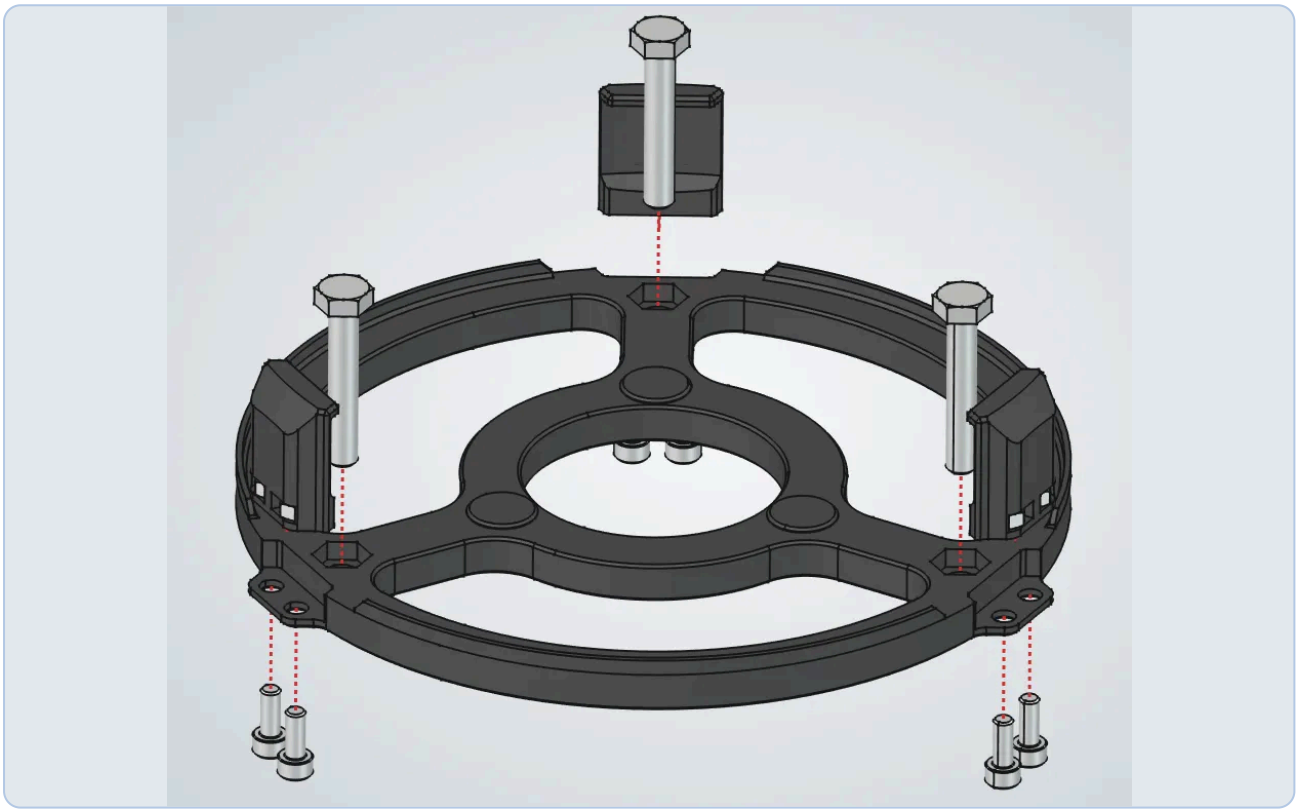
Part	Qty	
Primary cell tab	1	
M4 nut	2	



1. Insert the two M4 nuts into the pockets at the bottom of the tab.
2. Press the nuts fully into place so they sit flush.
3. Repeat for all three primary cell tabs.

Primary Cell

Part	Qty	
Primary cell	1	
M6×35 hex head screw	3	
Primary cell tab assembly	3	
M4×10 socket head screw	6	



1. Thread two M4 nuts onto the tab just enough to hold it in place.
   Thread them just enough so the screws will not fall off, but keep plenty of space for the tab to pivot.

2. Repeat for the remaining tabs.

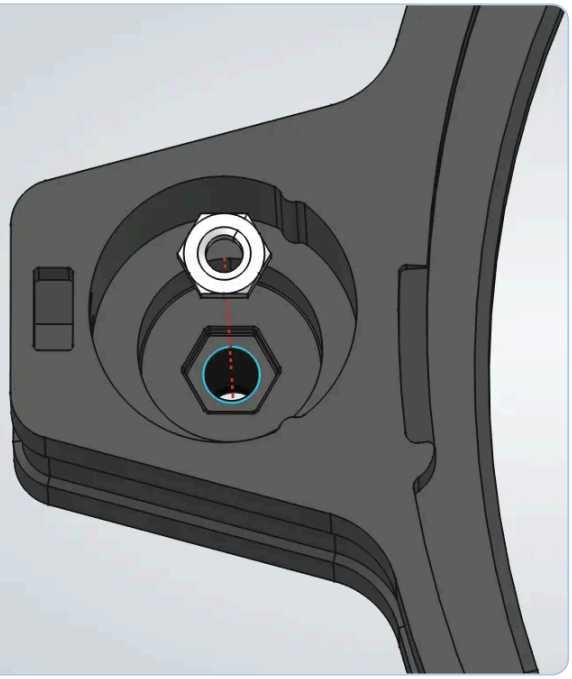
3. Place the three hex screws into their recesses.

Bottom Assembly

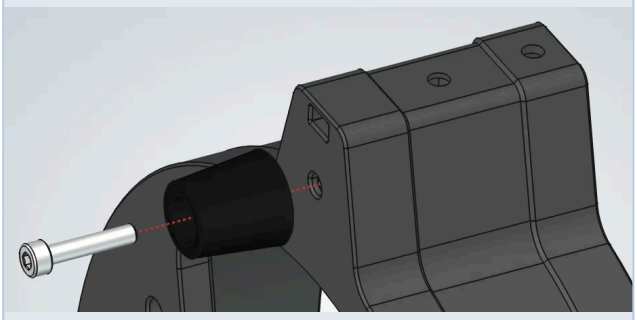
Part	Qty	
Telescope bottom	1	
Primary cell knob	3	
Rubber feet	3	
M4×20 socket head screw	3	
M4 nut	9	
M6 nut	3	

Part	Qty	
M4×10 thumbscrew	6	
Primary cell assembly	1	
Spring 1.2mm	3	
Telescope bottom lid	1	
Primary mirror	1	

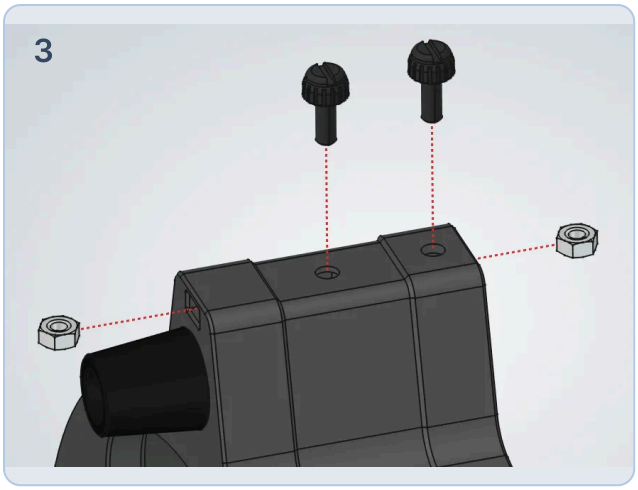
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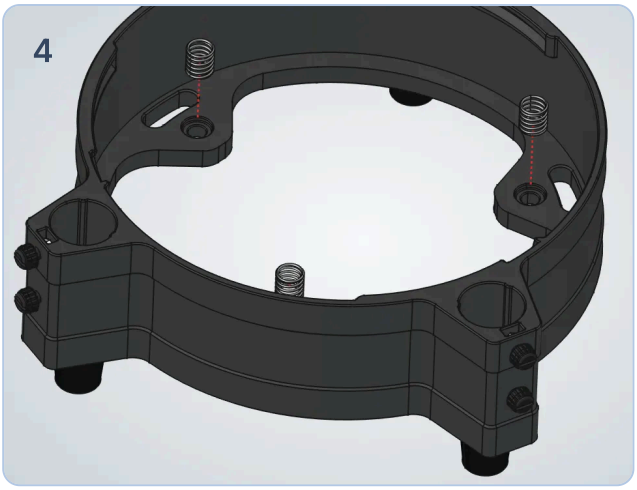


2



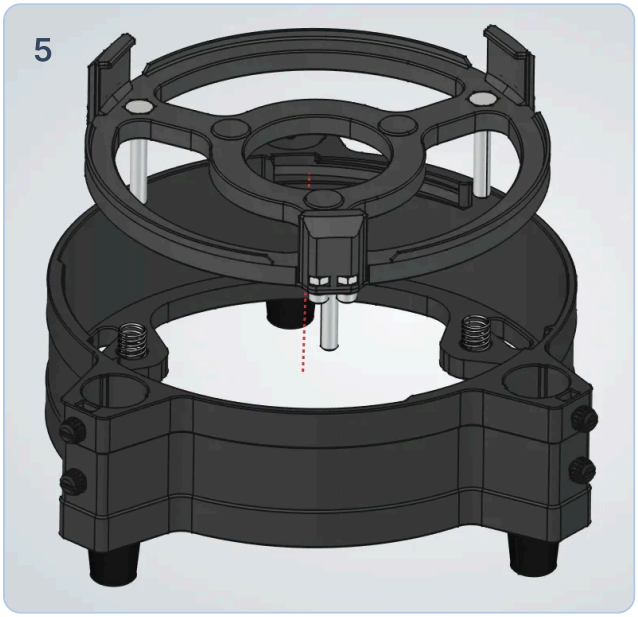
1. From above, insert an M4 nut into its pocket in one of the tube openings.
2. From below, attach a rubber foot with a long screw.
   Repeat for the other two feet.

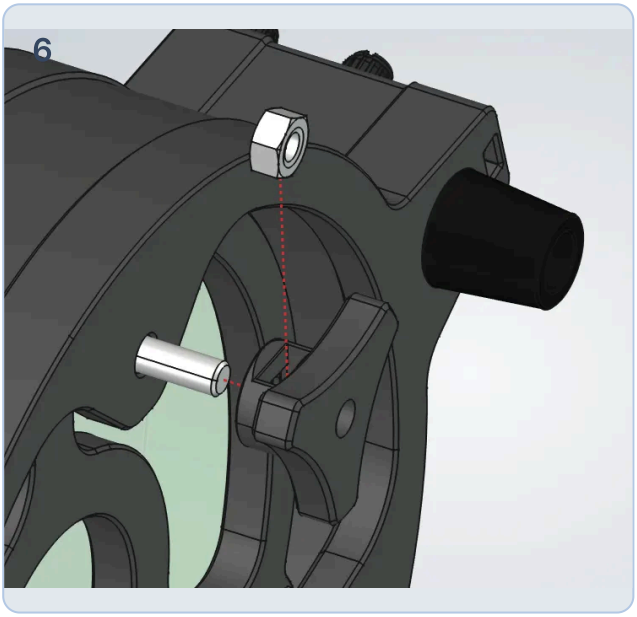




3. Insert the two nuts and screws into their pockets in the tube slot. Repeat for all three sides.

4. Set the springs into the primary cell support points.





5. Lower the primary cell so the hex screws pass through the springs, then rest it on the springs.

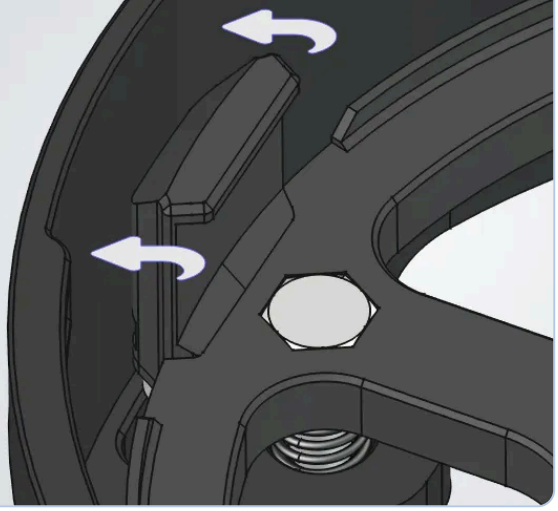
6. Install the knobs.

   a. Press down on the primary cell until the screw protrudes from the other side.

   b. Thread the knobs into place using M6 nuts.

   c. Repeat for all three knobs.

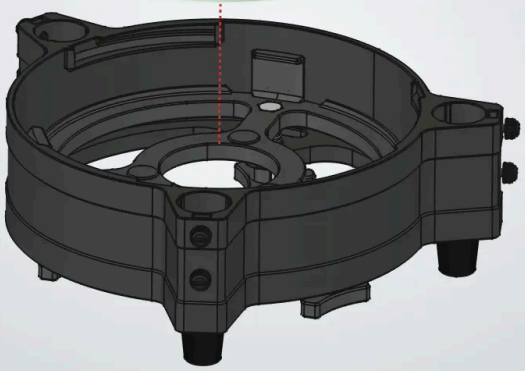
7



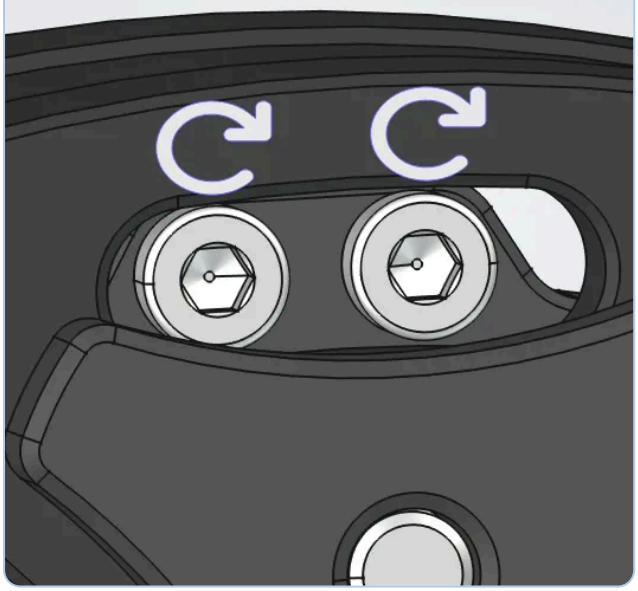
8

Use gloves in this step.

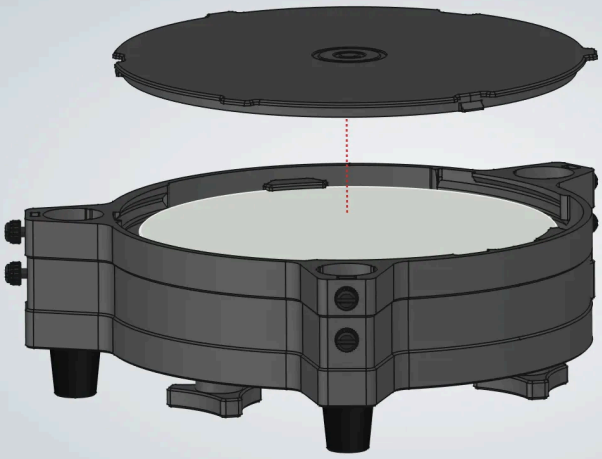
This step is hard, so see the YouTube video as well.



9



10



7. Install the mirror.

   a. **Single-use gloves are recommended for this step to avoid fingerprints on the mirror. With or without gloves, avoid touching the mirror surface.**

   b. Pivot the tabs to the side so the mirror can drop into place.

   c. Lower the mirror into the cell.

   d. Pivot the tabs back over the mirror.

   e. From the back, tighten the screws shown in image 9. Press each tab against the mirror while tightening to make sure the mirror is seated correctly.

   f. You may place the entire assembly on its side to do this, but keep the tab you are holding on top so the mirror cannot fall out.

   g. Repeat for all three tabs.

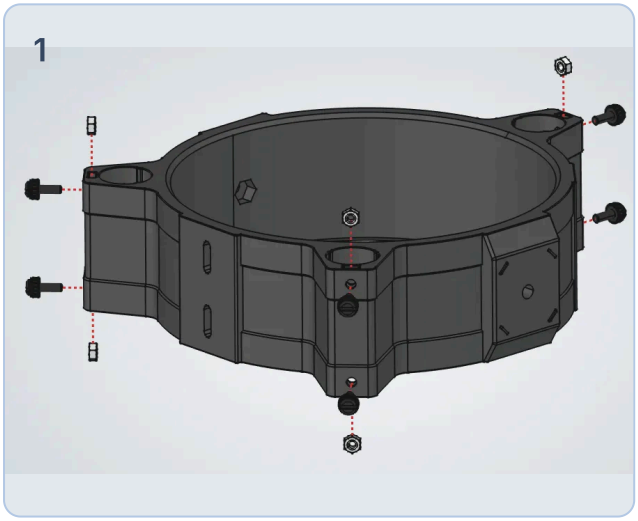
   h. The mirror should be able to move slightly.
   This is normal and prevents it from being under stress.
   The tabs are only there to keep it from falling out.

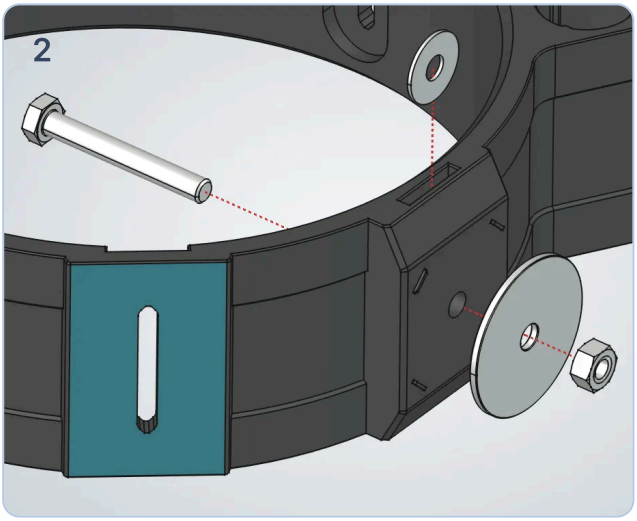
8. Place the lid over the mirror opening and rotate to lock it in place.

Center Assembly

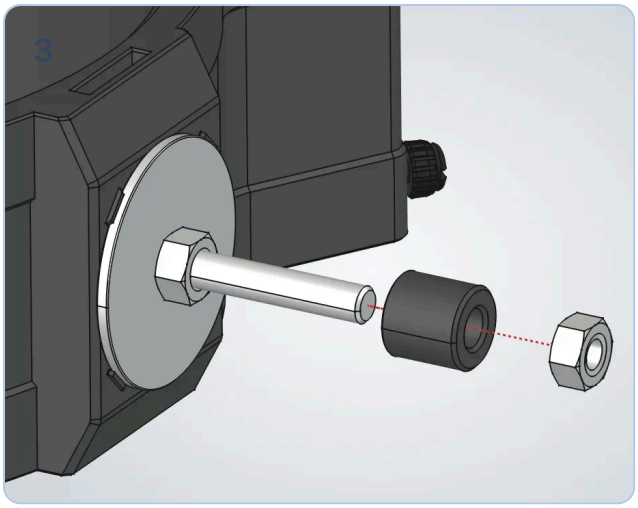
Part	Qty	
Telescope center	1	
Altitude clutch washer	1	
Altitude clutch handle	1	
Altitude clutch axle left	1	
M6×45 hex head screw	1	
M6 washer 40mm wide	2	
M6×35 hex head screw	1	

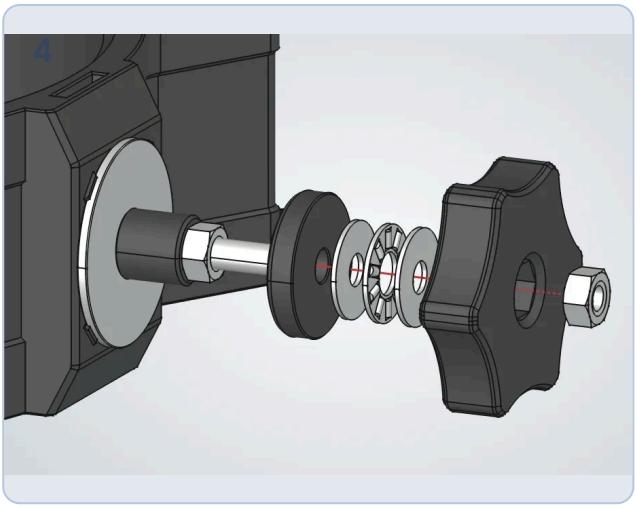
Part	Qty	
M6 washer 18mm wide	2	
M6 nut	5	
Bearing AXK0819	1	
M8 washer 19mm wide	2	
Altitude clutch axle right	1	
M4×10 thumbscrew	6	
M4 nut	6	



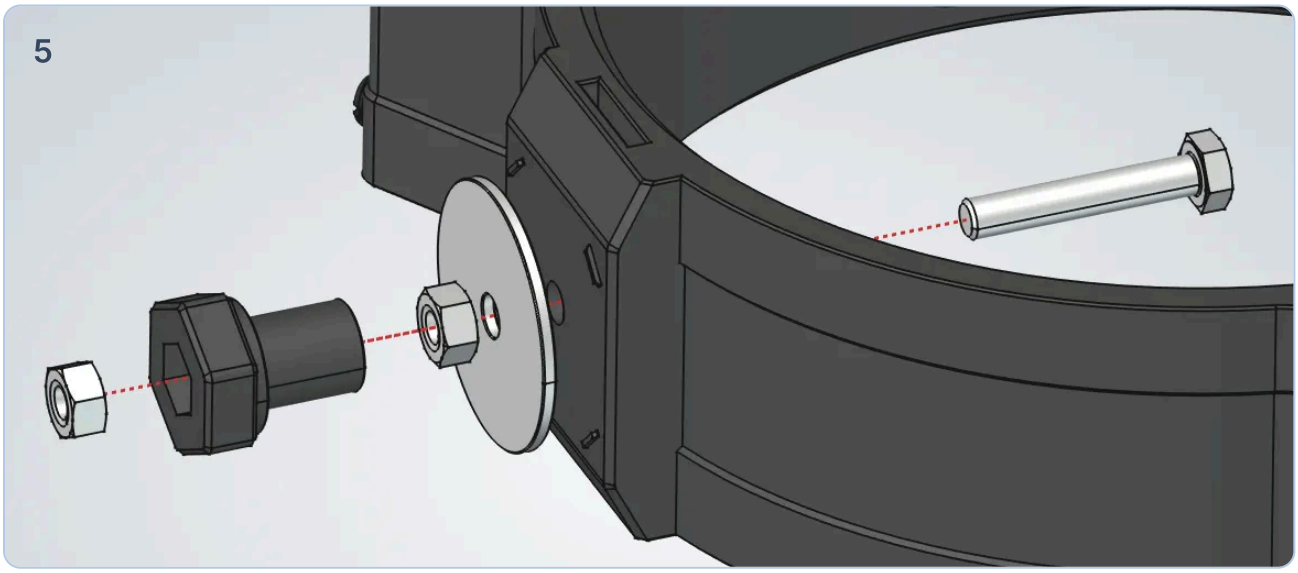


1. Insert the two nuts and screws into their pockets in the tube slot. Repeat for all three sides.
2. Find the side that is near the rail that is marked in blue.
    a. Take an 18mm washer and slide it into its designated slot.
    Make sure this is an 18mm washer, not the 19mm washer used with the bearings.
    b. **Make sure not to mix up the 45mm and 35mm screws.**
    This side uses the 45mm screw. Save the 35mm screw for the other side.
    c. Insert the large 45mm hex screw through the washer, then add the 40mm washer and M6 nut from the other side.
    Make sure the large washer sits between the tabs.
    d. Tighten the nut with the printed wrench.





3. Add the right axle on top of the screw and lock it in place using another M6 nut.
4. Build the handle stack.
    a. Add the printed washer with the recessed side facing the part.
    b. Add the 19mm washer.
    c. Add the bearing.
    d. Add another 19mm washer.
    e. Add the printed handle and nut.
    f. Tighten the handle just enough so it does not rattle.



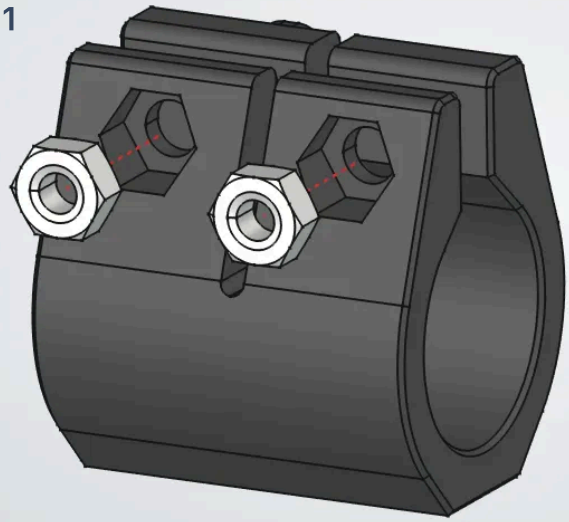
5. Repeat step 2 on the other side, this time with a 35mm hex screw.
6. Insert an M6 nut into the left axle's recess, then thread the axle onto the 35mm screw by hand until it locks in place.

The Tubes Assembly

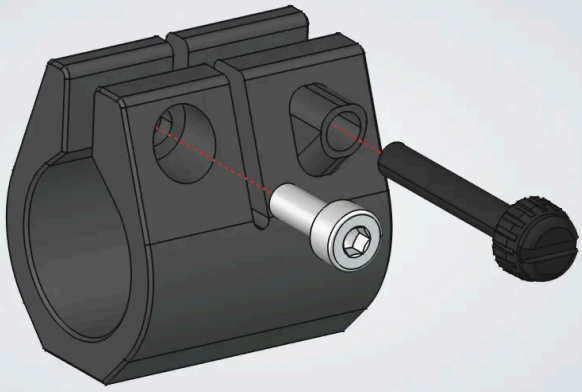
Tube Clamp (x3)

Part	Qty	
Tube clamp	1	
M4 nut	2	
M4×30 thumbscrew	1	
M4×20 socket head screw	1	

1



2

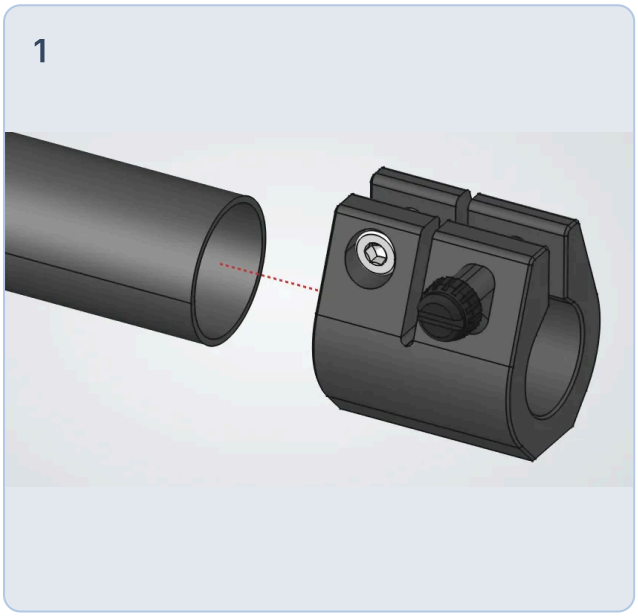


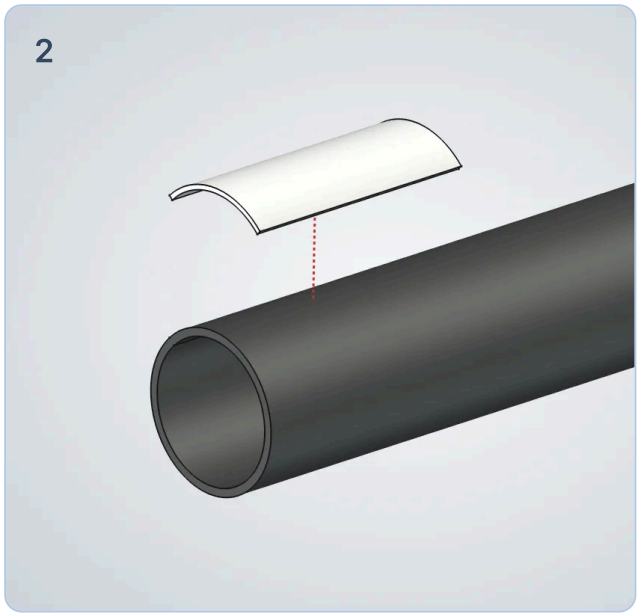
1. Insert the two M4 nuts into the top pockets of the clamp.

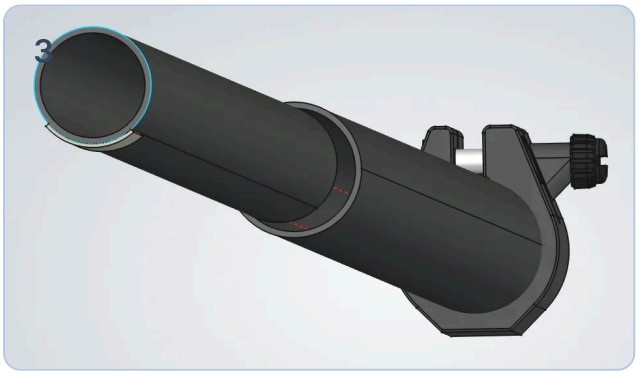
2. Insert the M4 screw and thumbscrew through the side holes, then thread them into the nuts.

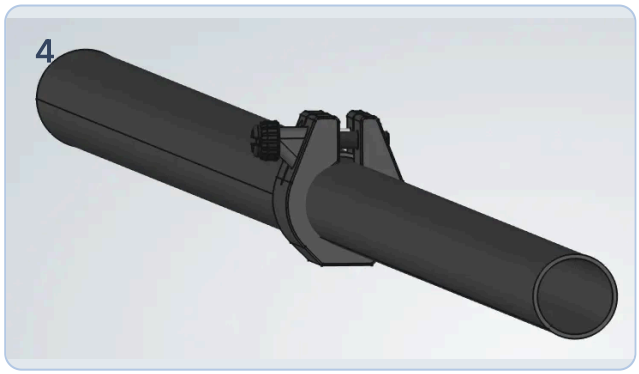
Tubes Assembly (x3)

Part	Qty	
Tube clamp assembly	1	
Tube wide	1	
Tube narrow	1	
PTFE piece	1	









1. Slide a tube clamp onto the wider tube and tighten the M4 screw to hold it in place.

2. Cut a 3 cm by 1.5 cm piece from the PTFE sheet and stick it onto the outside edge of the narrow tube.

3. Insert the narrow tube from the back of the wider tube, with the PTFE piece on the side opposite the clamp, facing down.

4. Check that the narrow tube slides out until the PTFE piece reaches the clamp, then stops.
5. Tighten the clamp to keep the tube extended.
6. Repeat for the remaining tubes.

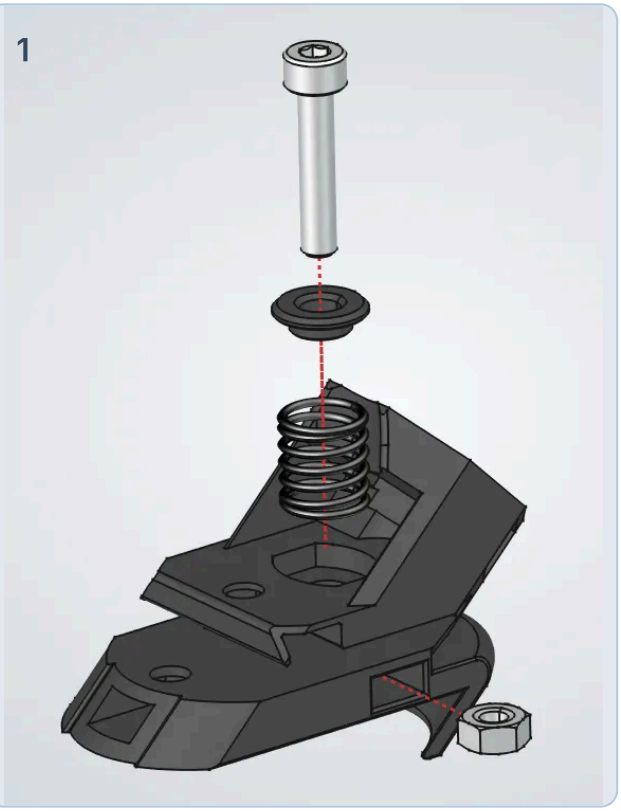
The Top Assembly

Secondary Cell

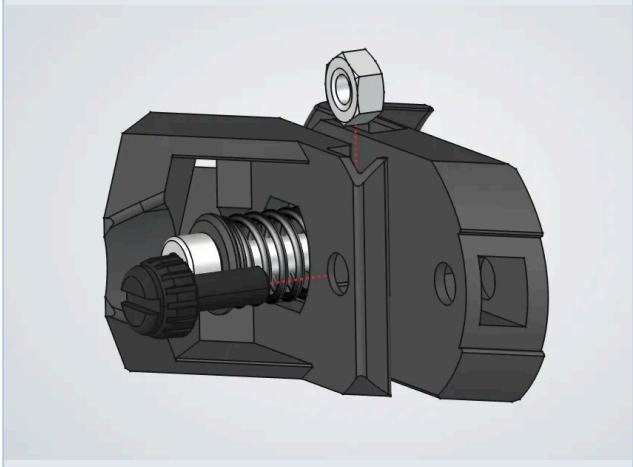
Part	Qty	
Secondary cell	1	
M4×20 socket head screw	1	
M4 nut	3	
M4×10 thumbscrew	1	
Spring 0.9mm	1	

Part	Qty	
Secondary mirror	1	
Secondary cell tab	1	
Secondary cell spring base	1	
M4×10 socket head screw	1	

1



2



1. Install the spring

   a. Put the cell facing down like shown in image 1, and insert an M4 nut into the side pocket shown.

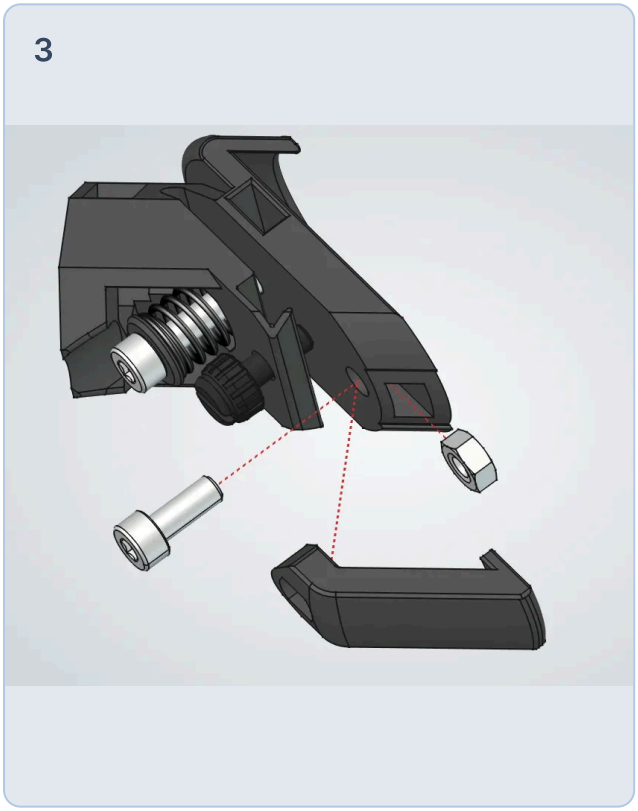
   b. Place a 0.9mm spring, the softer of the two spring types, in its recess.

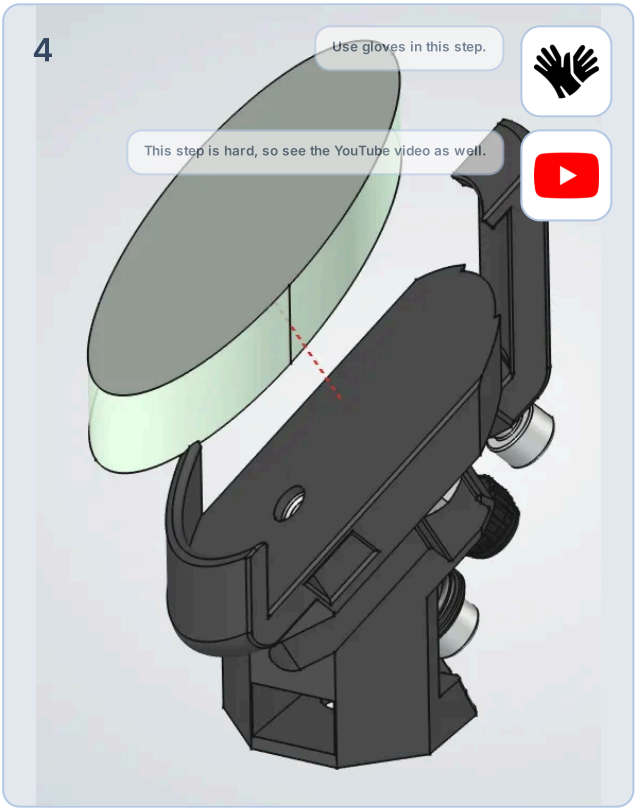
   c. Add the spring base with its recess facing down, then place a 20mm screw on top.

   d. Press the spring down with one hand while using the Allen key in your other hand to tighten the screw.

   e. Watch the nut from the opposite side as the screw threads through it.
   Stop once the screw is fully engaged, before it protrudes past the nut.

2. Install the thumbscrew and nut shown in image 2.
   Tighten it until it touches the other side, then tighten it another 1-2mm.





3. Install the secondary cell tab using an M4 nut and a 10mm screw.
   Keep it loose so the secondary mirror can be installed.

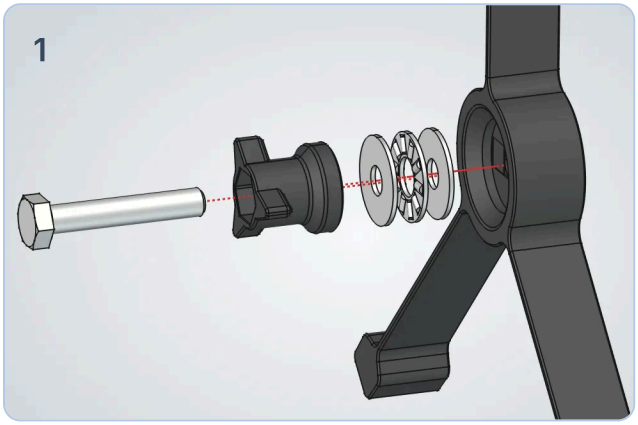
4. Install the secondary mirror.
    a. **Single-use gloves are recommended for this step to avoid fingerprints on the mirror. With or without gloves, avoid touching the mirror surface.**
    b. Place the mirror in its recess and make sure it is fully seated.
    c. Press the tab firmly against the mirror with one hand while using the Allen key in your other hand to tighten the tab's screw.
    d. Try to move the mirror to make sure it is held firmly. It should not move.
5. Cover the mirror cell with one of the velvet bags to keep the mirror clean during the next steps.

Spider

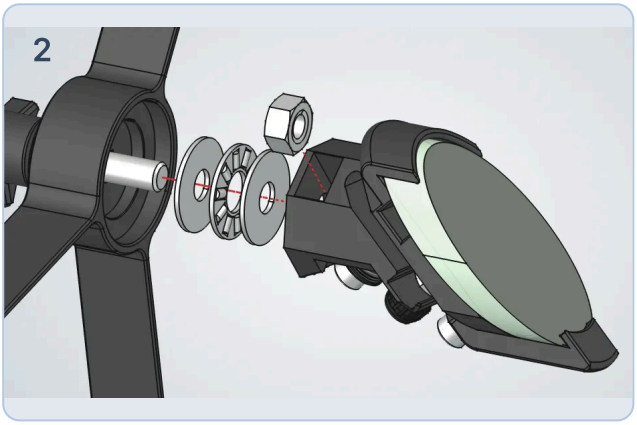
Part	Qty	
Secondary cell assembly	1	
Secondary cell spider	1	
M6×35 hex head screw	1	
M8 washer 19mm wide	4	

Part	Qty	
Bearing AXK0819	2	
M4 nut	3	
Secondary cell spider knob	1	
M6 nut	1	

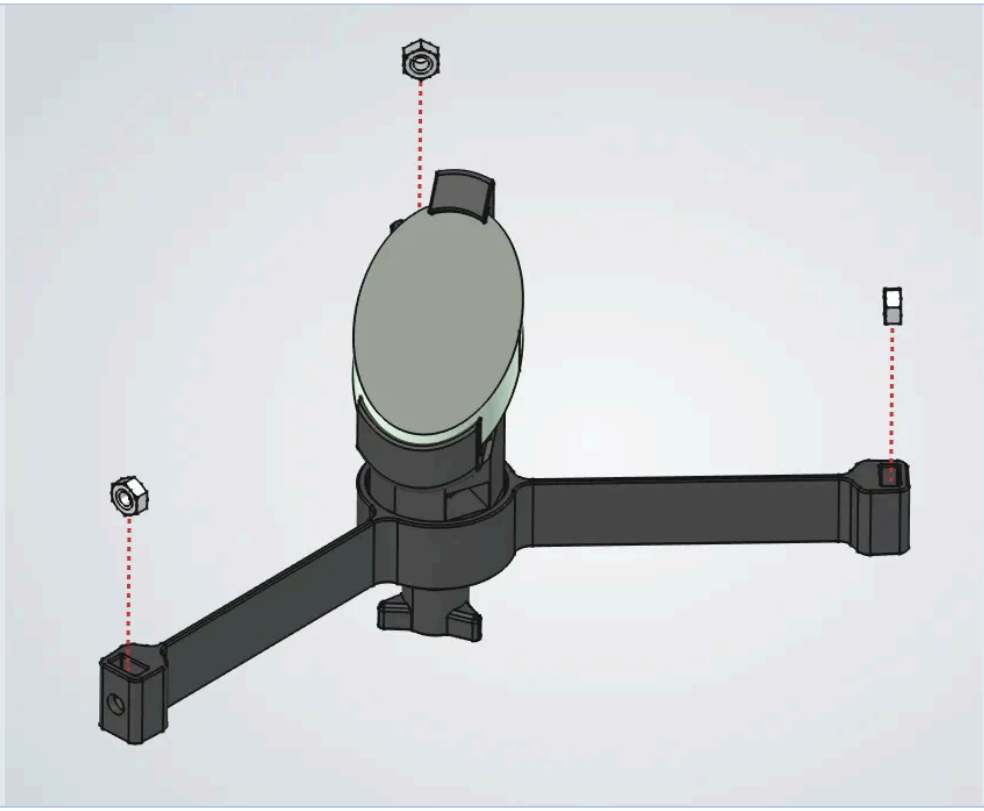
1



2



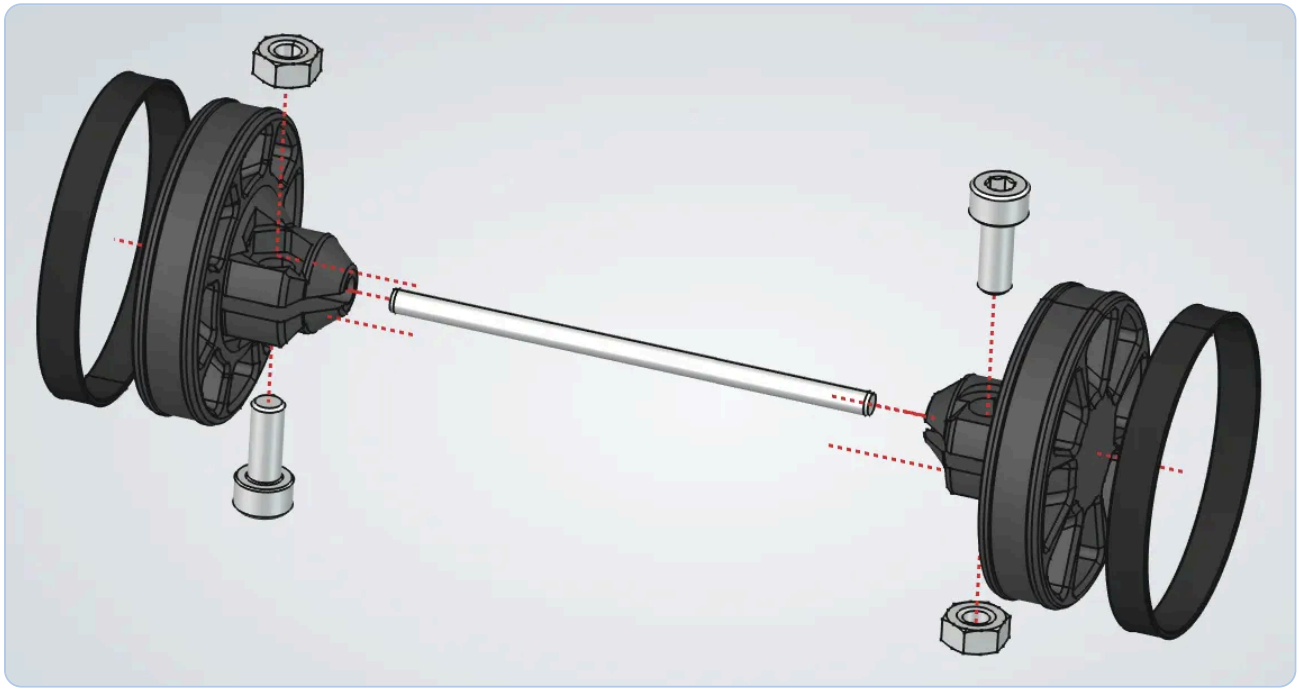
3



1. From the front of the spider, install these parts through the center hole.
    a. M6×35 screw.
    b. Spider knob.
    c. Two 18mm washers.
2. On the other side of the spider, add these parts onto the screw.
    a. 19mm washer.
    b. AXK bearing.
    c. Another 19mm washer.
3. Tighten the spider knob until the secondary cell turns only when you turn the knob, with firm friction and no free play.
4. Put the velvet bag over the secondary cell so the mirror stays clean for the rest of the assembly.
5. Insert the nuts into the pockets at the ends of the spider arms.

Focuser Knob

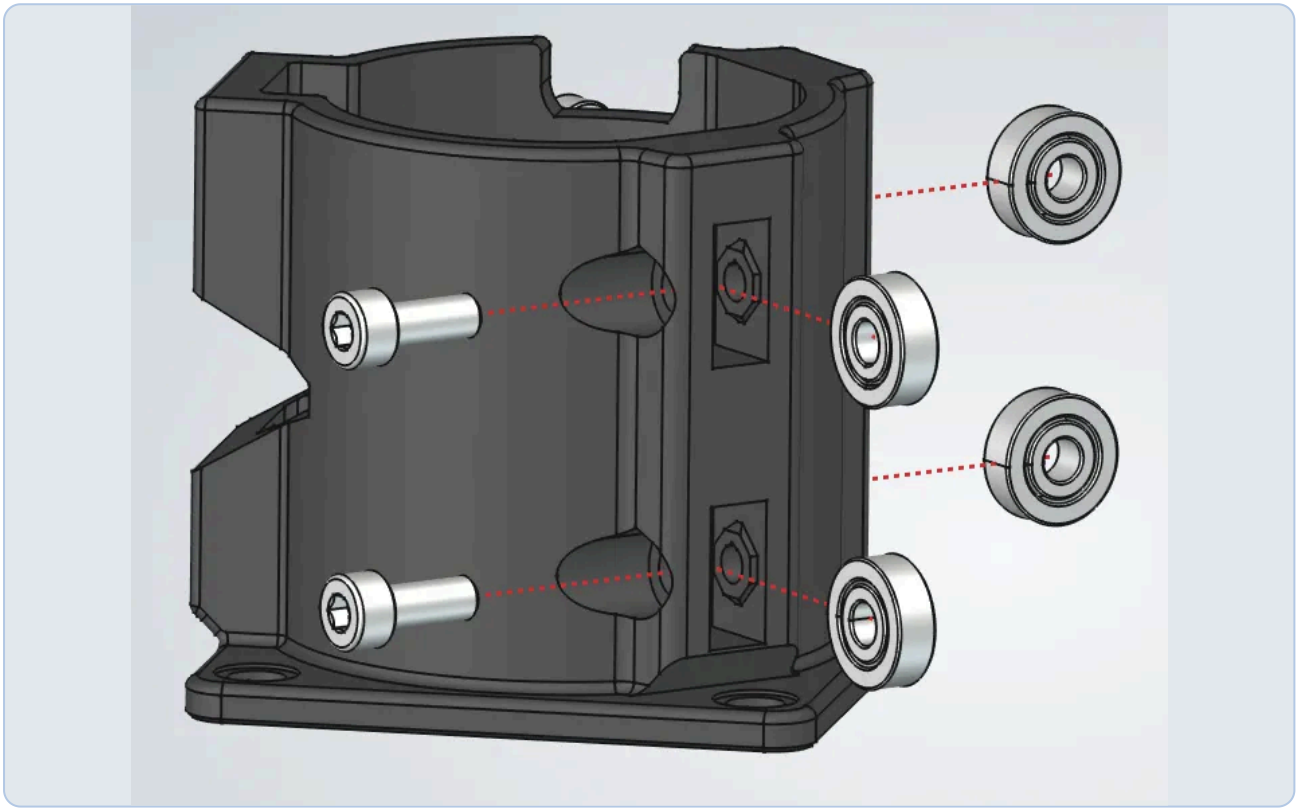
Part	Qty	
Focuser knob	2	
3 mmx60 pin	1	
M4×10 socket head screw	2	
M4 nut	2	
Silicone band 20×5	2	



1. Install a screw and nut in each knob.
2. Fit the rubber bands onto the knobs.
3. Slide the knobs onto the shaft until fully seated, then tighten the screws to clamp them in place.

Focuser Base

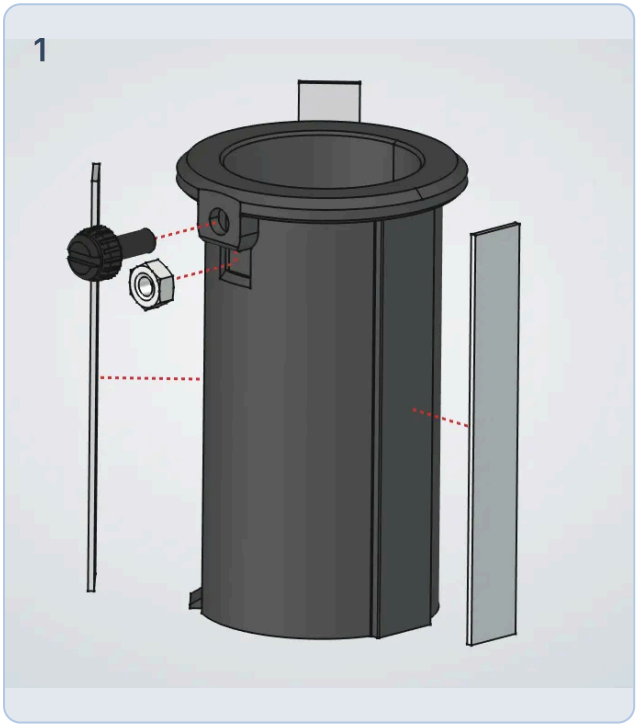
Part	Qty	
Focuser base	1	
Bearing 6042RS	4	
M4×10 socket head screw	4	

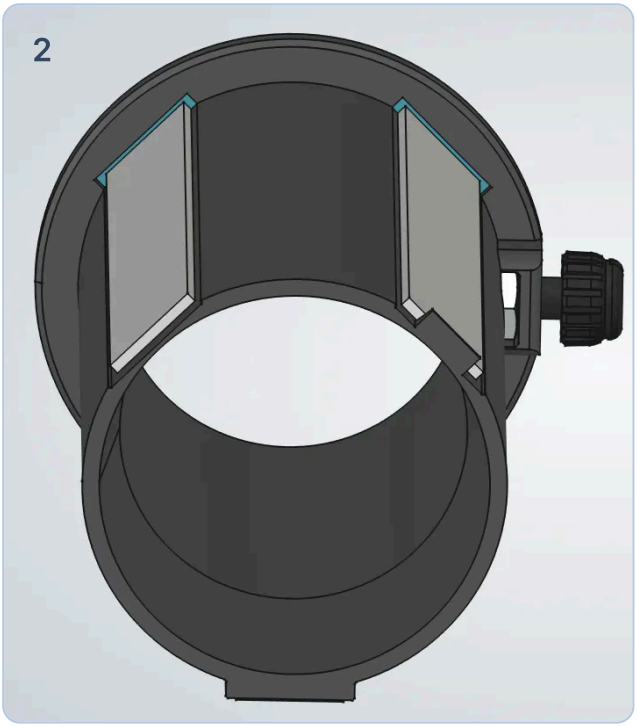


1. Place a bearing in one of the bearing pocket on the base.
2. Insert the M4 screw through the bearing and into the opposite side of the pocket.
3. Tighten the screw into the plastic until the screw lip seats in place.
4. Check that the bearing still spins freely.
5. Repeat for the other bearings.

Focuser Tube

Part	Qty	
Focuser tube	1	
M4×10 thumbscrew	1	
M4 nut	1	
Aluminum rail for focuser	3	

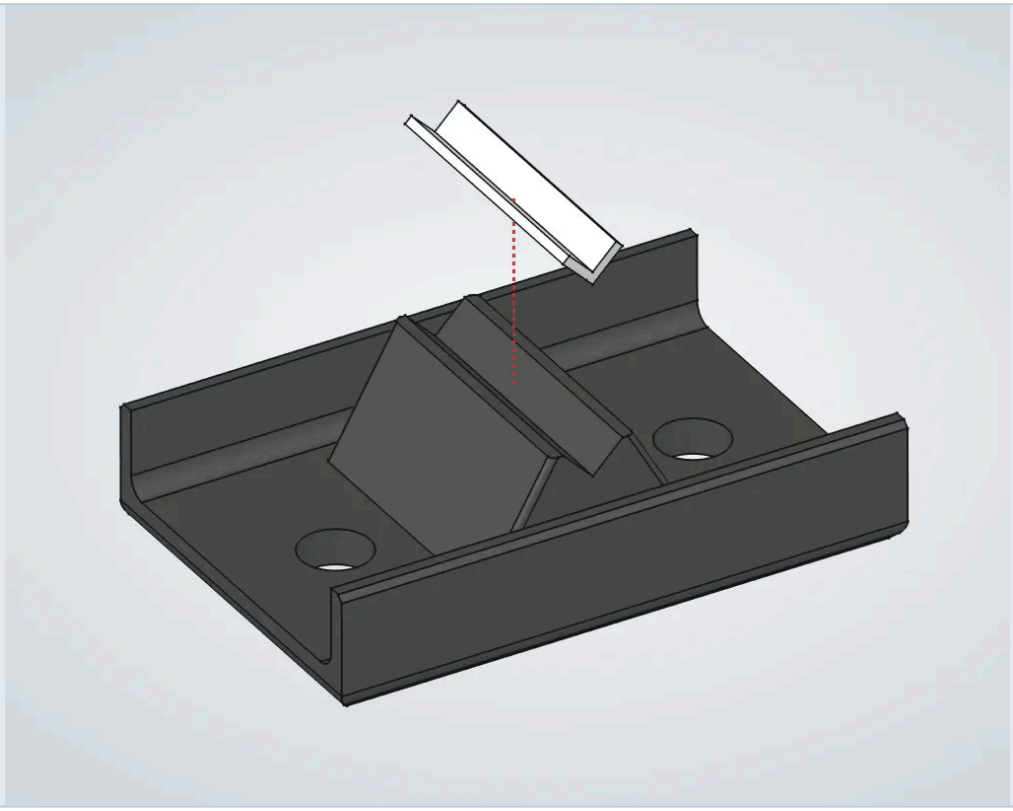




1. Install the thumbscrew and captive nut in the focuser tube.
2. For each rail, peel off the double-sided tape backing and place the rail on the tube.
3. Align each rail with the shallow groove in the tube.
4. Press each rail firmly for a few seconds so the tape bonds well.
5. Do not worry about the tape strength. It only needs to hold the rails during assembly, the pressure from the bearing will keep them in place.

Focuser Bridge

Part	Qty	
Focuser bridge	1	
PTFE piece	1	

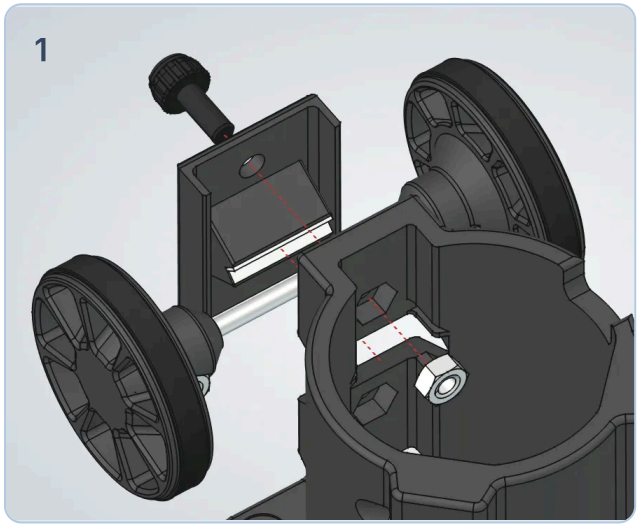


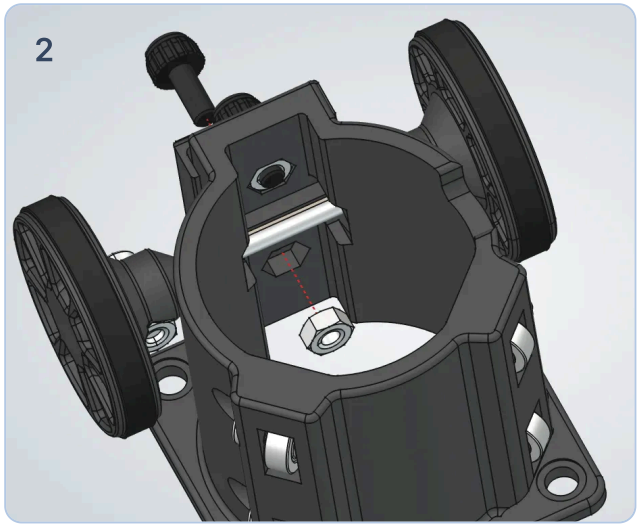
1. Cut a 1.5 cm by 0.8 cm piece from the PTFE sheet.
2. Peel off the backing and stick the PTFE piece into the recess on the bridge.
3. Use the long shaft of the Allen key to press it down firmly so it takes the shape of the recess.

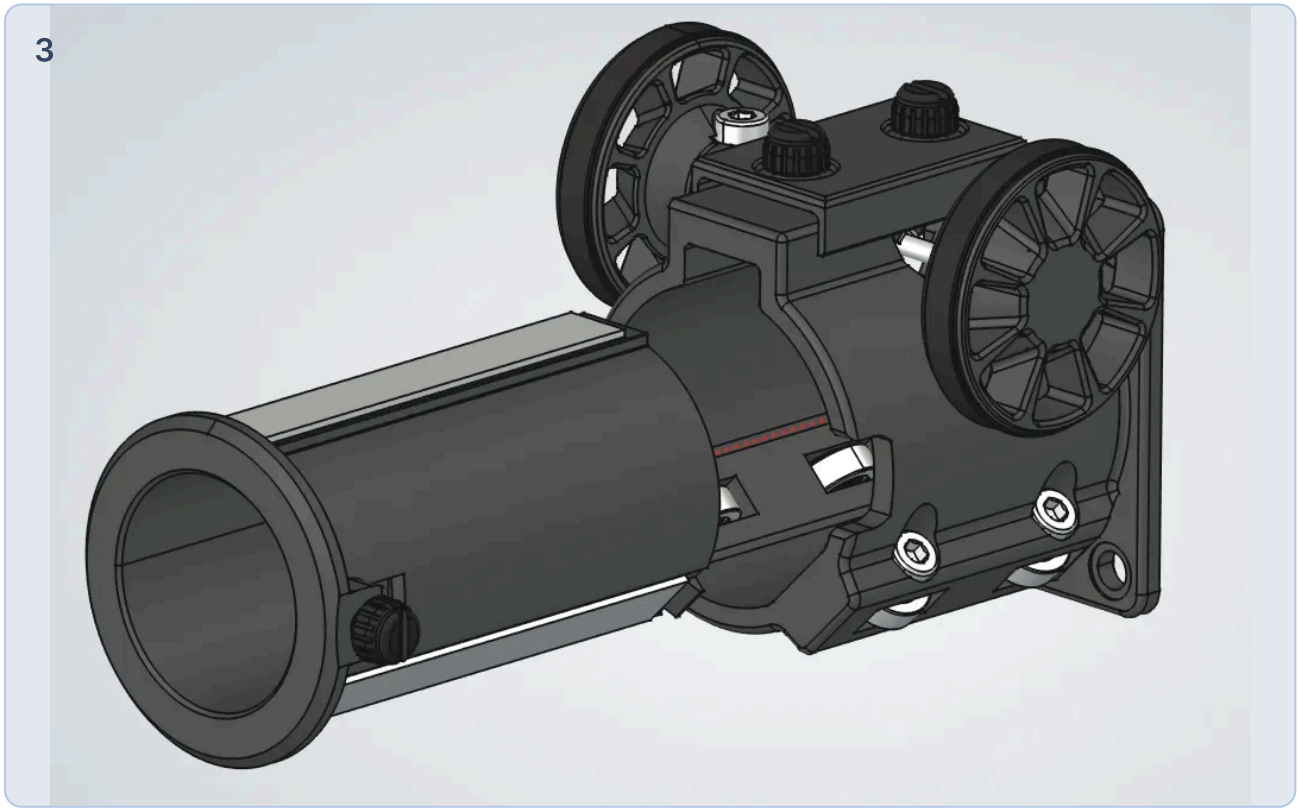
Focuser

Part	Qty	
M4×10 thumbscrew	2	
M4 nut	2	
Focuser bridge assembly	1	

Part	Qty	
Focuser knob assembly	1	
Focuser tube assembly	1	
Focuser base assembly	1	







1. Insert an M4 nut into the top pocket in the base.
   From the other side, thread the thumbscrew through the focuser bridge and the knob into the nut.

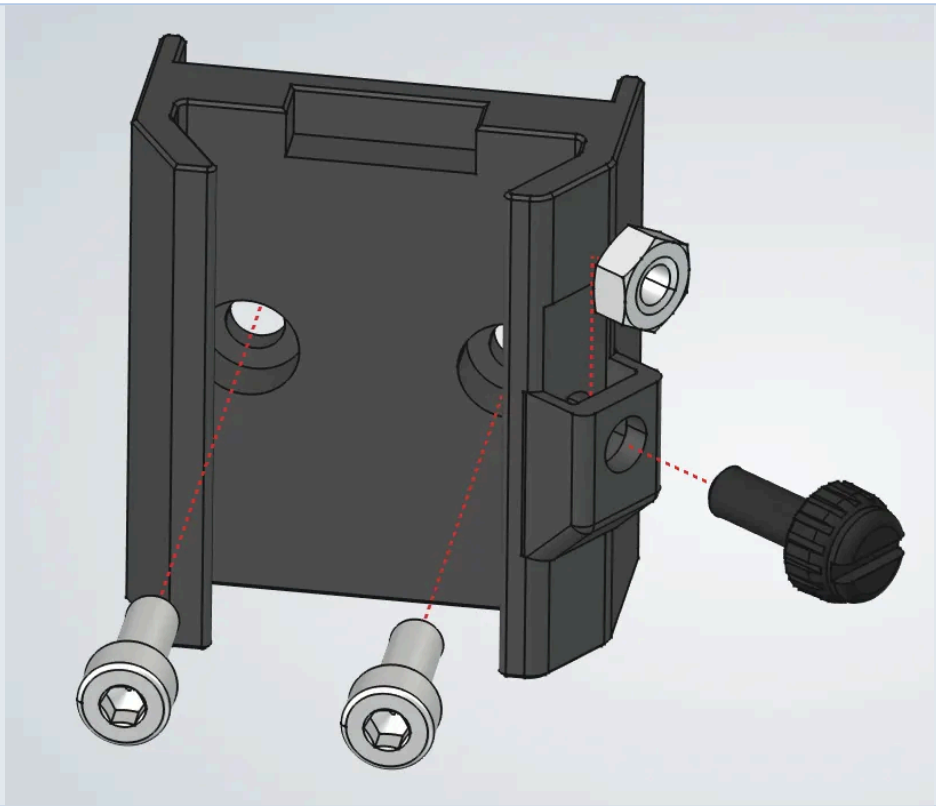
2. Add the lower thumbscrew and nut the same way. Tighten both thumbscrews only enough to keep the assembly from falling apart.

3. Slide the focuser tube into the base. The thumbscrew should fit into the pocket in the base so the tube can reach all the way down.

4. Tighten the bridge thumbscrews until the tube moves smoothly when you turn the knob, even while pressing down on the tube.

Finder Mount

Part	Qty	
Finder mount	1	
M4×10 socket head screw	2	
M4×10 thumbscrew	1	
M4 nut	1	



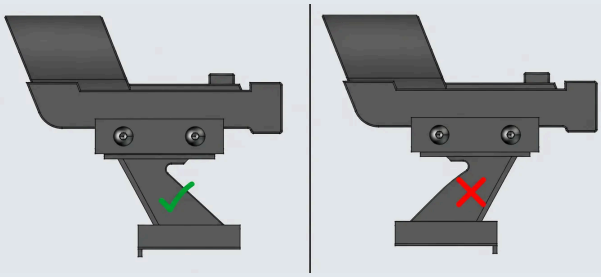
1. Insert the M4 nut into its pocket, then thread the thumbscrew into it.

2. Insert the two M4 screws that will later attach the mount to the top assembly.

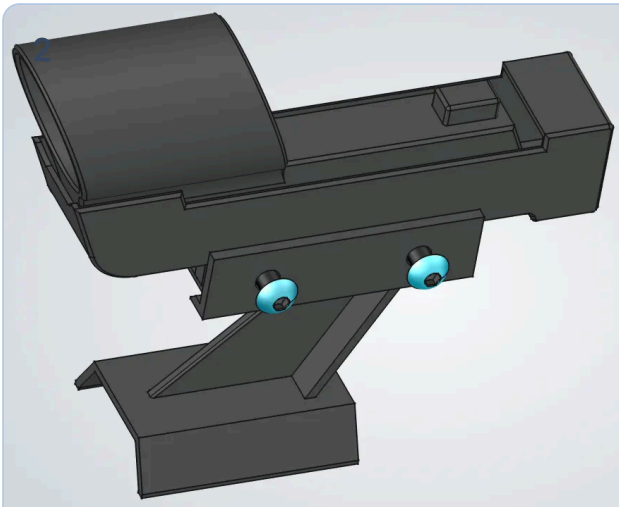
Preparing the Finder

Part	Qty	
Red dot finder	1	

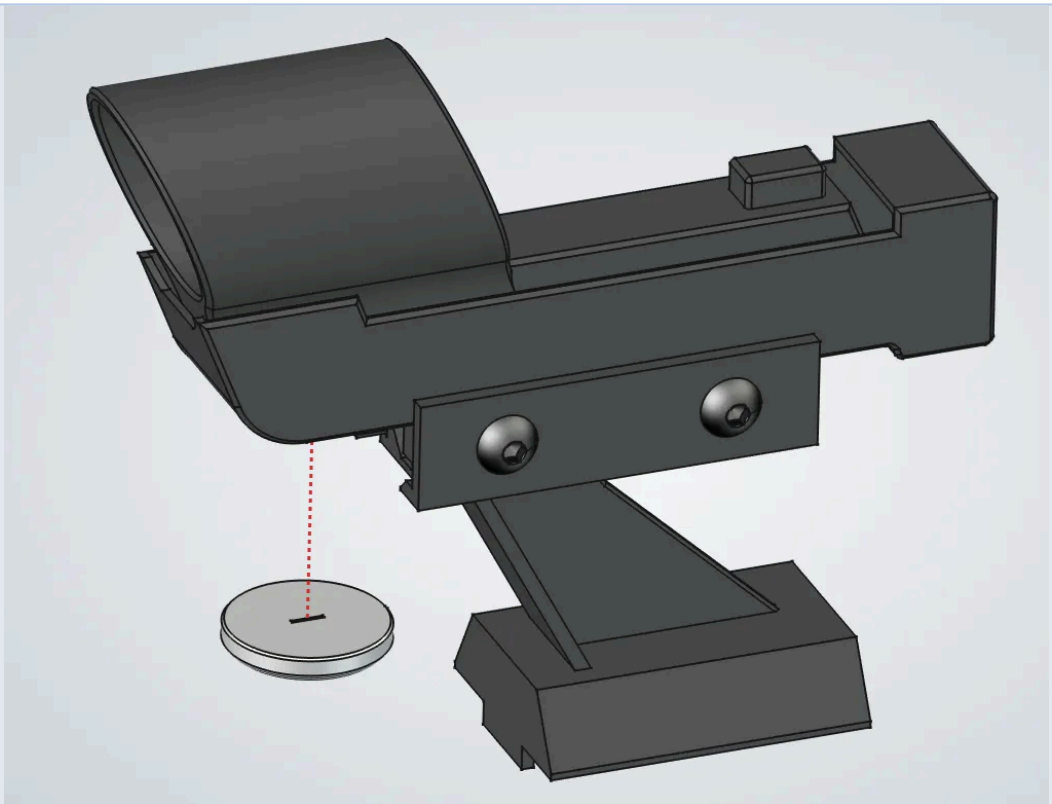
1



2



3



1. First, flip the finder on its stem so the small tab sits at the front.
   This helps keep the finder from sliding off its mount. The first image shows the correct orientation versus the incorrect one.

   a. Loosen the two side screws on the finder just enough to slide the base off.

   b. Flip the base so the side with the small tab faces forward.

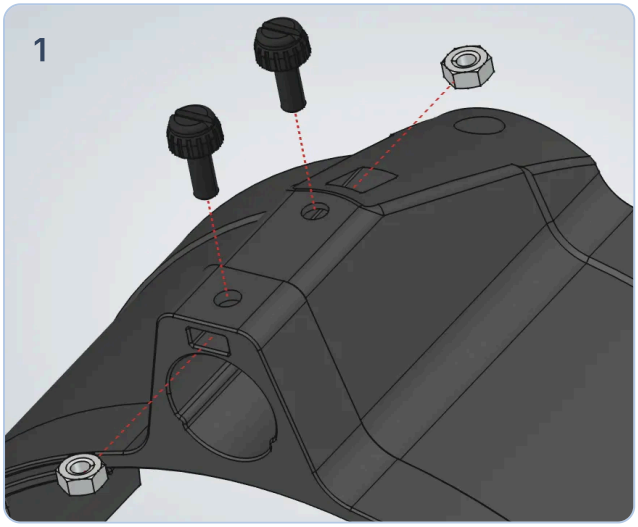
   c. Slide the base back into the finder and tighten the two side screws.

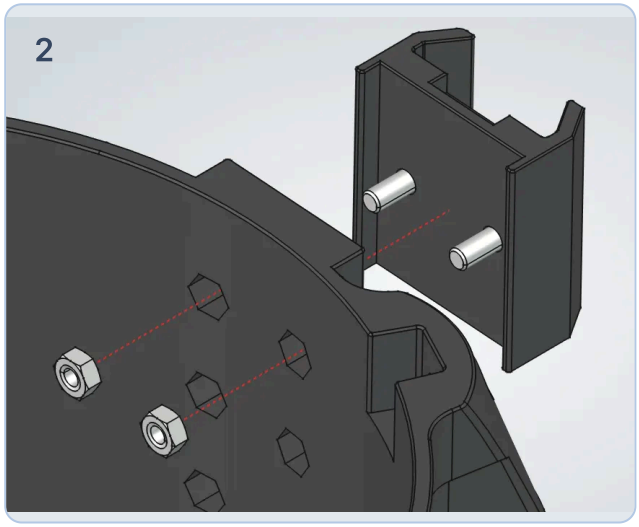
2. Install the battery in the compartment at the front.

Top Assembly

Part	Qty	
Telescope top	1	
M4 nut	13	
Finder mount assembly	1	
M4×10 thumbscrew	7	
Focuser assembly	1	

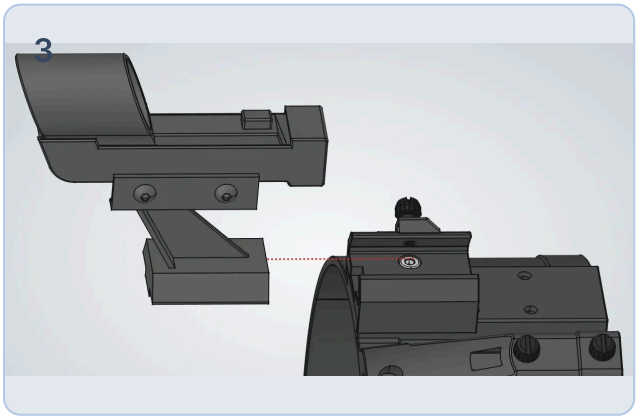
Part	Qty	
M4×10 socket head screw	7	
Spider assembly	1	
Light shield	1	
Red dot finder	1	

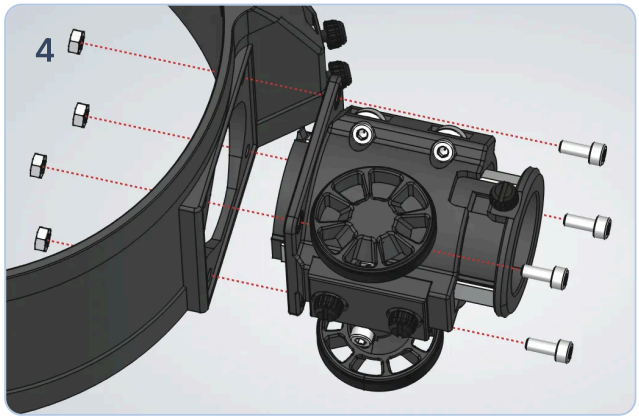




1. Insert the two nuts and screws into their pockets in the tube slot.
   Repeat for all three sides.

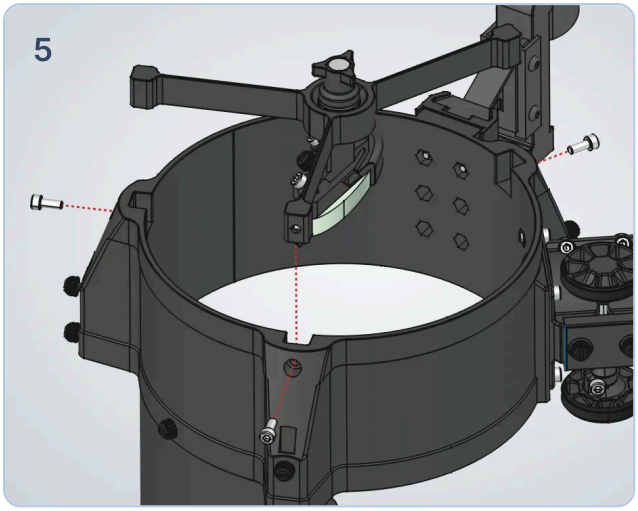
2. Attach the finder mount to the accessory rail with the recessed side facing up.

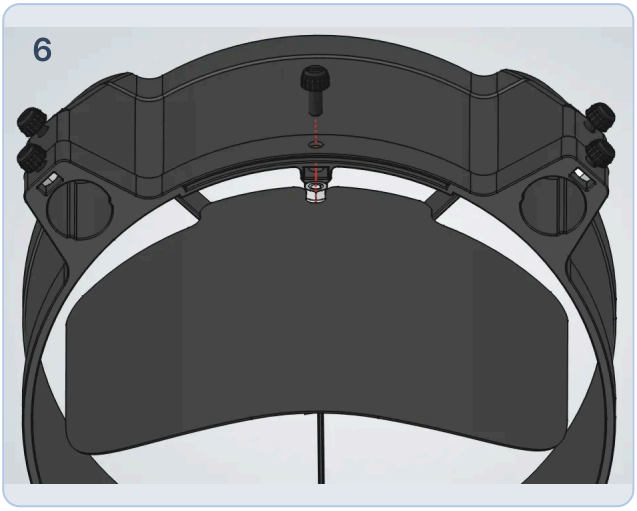




3. Seat the finder in its mount and lock it with the mount's thumbscrew.

4. Mount the focuser assembly with four M4 nuts. Face the handle away from the tube slot near the focuser, as shown.



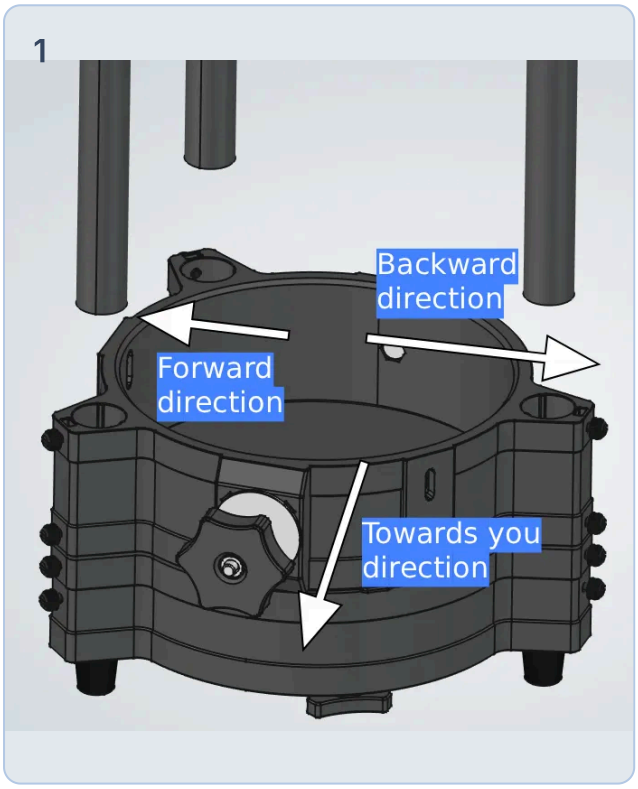


5. Install the spider assembly and secure it with three M4 screws.

6. Install the nut and screw for the light shield, then install the light shield.

Telescope Assembly

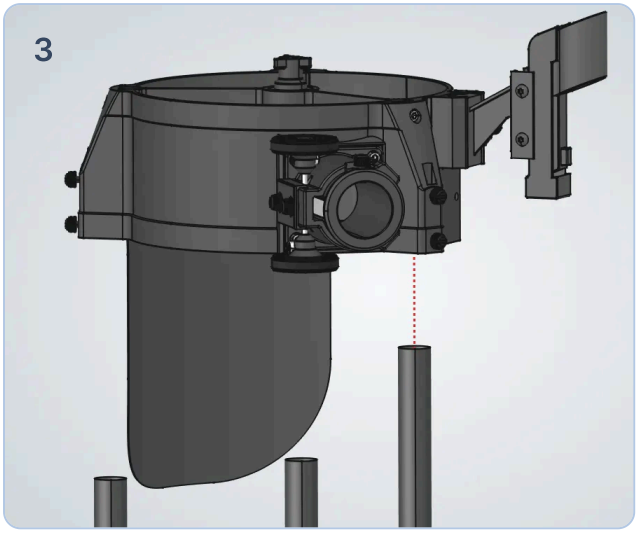
Part	Qty	
Telescope bottom assembly	1	
Telescope center assembly	1	
Tube assembly	3	
Telescope top assembly	1	

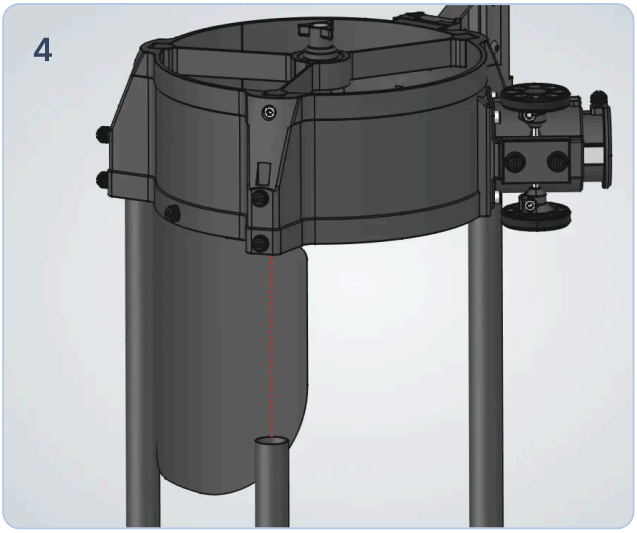




1. Place the bottom assembly on your build surface, aligned as shown in image 1.
2. Place the center assembly on top of it with the handle facing you.
3. Insert the tubes through both assemblies, making sure they slide all the way down and do not get caught on the thumbscrews.
4. Rotate the tubes so the bottom clamps face forward and the top one faces backward, as shown in image 2.
5. Lock the thumbscrews on the bottom assembly.
6. Slide the center assembly up about 30cm (1 ft).

7. Lock some of the center assembly's thumbscrews.
Not all are needed yet, since we will adjust the distance later.





8. By now, all three tubes should be extended from the earlier steps.
Keep only the back one extended, and retract the other two halfway so they will not interfere.

9. Place the top assembly on the tube and lock the thumbscrew, making sure it is fully seated.

10. Extend the other two tubes, then insert and lock their thumbscrews.

11. Now you can collapse the whole telescope:

    a. Unlock the clamps and collapse the telescope.

    b. Lock the clamps again.

    c. As you do this, the light shield will slide above the clamp and will not interfere.

Finish

Good job! Your Meridian C160 is fully assembled.

Go to Getting Started