

?? Astro photography

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?? Guiding Aids

Motorized astronomical mounts track the celestial rotation, allowing the telescope to remain pointed at a set object for hours. For this to work, the mount must be precisely aligned. For instance, the polar axis (or hour axis) of an equatorial mount must point as accurately as possible toward the celestial pole.

However, in astrophotography, simply aligning the mount as accurately as possible is not enough. Depending on the exposure time, mechanical inaccuracies in the mount become noticeable. The longer the desired exposure, the more pronounced these effects are. The mount's tracking must be constantly monitored and corrected. For this, **guiding aids** such as a guide scopes with guide scope rings or an off-axis guider are required.

If the mount's correction is performed automatically, it is called **autoguiding**. This requires a camera and a control system that constantly sends impulses to the mount. Suitable cameras can be found [here](#) in the Astro Cameras category.

?? Guidescopes

To ensure that an astronomical mount remains precisely aligned with a set object, the tracking must be controlled. This control can be done using a small telescope mounted parallel to the main telescope. This small telescope is called a **guidescope**.

In contrast to a standard finder scope, guidescopes allow the attachment of a camera. This makes the tracking control process known as **autoguiding** possible. Guidesscopes can also be used as finder scopes, though the necessary eyepiece is usually not included in the delivery.

The focus point of guidescopes is generally set so that cameras with a flange focal distance (back focus) of up to 2 cm can be used. For use as a finder scope, this means it is usually not possible to use a star diagonal or an erecting prism between the guidescope and the eyepiece.

Guidescopes are typically attached to the telescope's finder bracket ("finder shoe"); guidescope rings are used for this purpose.

?? Guide Scope Rings

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If you want to mount a guide scope parallel to your telescope for **guiding in astrophotography**, guide scope rings are the simplest solution. The guide scope rings are attached either directly to the main tube rings or—even better—to the main instrument using a dovetail bar.

The adjustment screws on guide scope rings should be fitted with a **plastic tip** to prevent scratching your guide scope.

Follow these steps to align the telescope and the guide scope parallel to each other:

1. Set up the telescope, including the main camera, during the day and aim at a very distant landmark. This could be a spire or something similar. The target should be at least one kilometer away.
2. Adjust the screws on the guide scope rings so that the setup looks as symmetrical as possible. Tighten the screws hand-tight. Connect the guiding camera.
3. Point the telescope at this target and turn off the tracking (if motorized).
4. Verify that the target is centered in the main telescope. Tip: Many camera control programs allow you to overlay a crosshair.
5. Switch from the live view of the main camera to the live view of the guiding camera.
6. Only now should you begin to move the screws on the guide scope rings. We recommend starting with only the screws on the front or rear ring.
7. Loosen one of the screws slightly. It should not be more than a half turn, as the guidescope could become too loose otherwise. Observe whether the target moves closer to the center.
 1. If not, tighten the screw again and move to the next screw.
 2. If it does move closer, tighten the other two screws hand-tight and move to the next screw.
8. Continue this process until the target is centered in both the main camera and the guiding camera.

It is not necessary for the guidescope to be pedantically accurate in its alignment. Guiding still works very well even if the axes of the two optics deviate slightly from one another.

The fields of view of the two cameras may be rotated relative to each other. However, for the purpose of adjusting the guidescope axis, it helps greatly if the fields of view have the same orientation.