

Celestron's Radial Guider

Introduction

In order to take long exposure photographs with a telescope it is generally necessary to manually correct for tracking errors using an eyepiece fitted with illuminated cross hairs or similar markings. There are two ways to achieve this guiding, one is to use a guide scope mounted in parallel with the main instrument the other uses some form of off axis guiding. The term 'off axis' means the main (wanted) axis is used to focus light into the camera, the guider picks a small amount of light from outside this main axis. Celestron's Radial Guider is one such off axis unit.

There are pros and cons to both systems, with the **guide scope** you have the advantages of working at full aperture (well OK I know it's only going to be 60 to 90mm of aperture) and being able to guide on any object within perhaps 4 or 5 degrees of the wanted object. The disadvantage of the guide scope is it's more complicated to fit, it will be heavier than an off axis guider and can flex relative to the main instrument.

With a **Radial Guider** you have the advantage of a small light unit that locks solidly to a SCT, the (big) disadvantage is that it only picks a small amount of light and can't point at any part of the field you are taking a photograph of (this means you can't take a full comet photograph by guiding on the head of the comet), not only that, the adjustment is limited and being off the main optical axis you get anything but sharp points of light from your chosen guide stars!



A closer look

Unlike some other units, the Celestron Guider has plenty of adjustment in more or less all directions, the view below shows how some of this adjustment is achieved. By slackening off the chromed bolt on the underside of the unit, the eyepiece and prism assembly can be rotated radially up to 130 degrees without moving the camera. The angle of the prism can be adjusted by adjusting the chromed bolt pointing away from the camera body in the top photograph.



The guider consists of a machined aluminium body 55mm long with a central hole diameter of 38mm. One end is threaded to take a camera 'T2' mount the other has a threaded ring to screw onto a Celestron or Meade SCT. The eyepiece tube extends 77mm from the centre line of the instrument. The prism protrudes 4mm into the barrel in order to pick some off axis light, this is OK provided it isn't rotated to clip one corner of the photographic area where you will see a shadow of the prism on the photograph. For

those cases where there is no alternative, removing a small collar around the eyepiece and prism assembly allows for a further 4mm intrusion into the main light path, giving 8mm in all. This ensures you have maximum brightness of guide stars at the expense of

introducing a shadow over part of the photograph. The collar is secured with two Allen bolts. The prism/eyepiece assembly is a snug fit into the main body of the unit and is secured in place with an Allen set screw. By slackening off this securing screw it is possible to adjust the prism in a 'left - right' direction, the down side is the prism assembly can become loose and fall to the floor with terminal consequences ie. DON'T slacken this Allen screw!

While the above adjustments seem to offer an almost infinite choice of guide star, in practice life isn't that simple. In most areas of sky there is a lack of bright guide stars suitable for easy off axis guiding. Initial tests did allow me to find something to guide on when taking images of M27, M31 and M33. Even using a 10 inch F6.3 SCT, guide stars from a 9mm guiding eyepiece are extremely dim and difficult to guide on. It's nothing like as bright as viewing through a normal right angle adapter and more probably equates to the view through one inch of aperture rather than 10 inches!

Conclusions

While there is little doubt a well secured and compact guide scope is far better than an off axis guider, the Celestron unit is probably as good as any available for the money (just over 100 UK Pounds including tax), it's solidly constructed and has a very professional feel about it. The instructions are more than adequate. It is supplied with an Allen key to fit the various grub screws. You only need a suitable T2 camera mount and guiding eyepiece to take photographs through your backyard SCT.

The results have been quite encouraging with only minimal vignetting (due to the narrow hole in the main body). The reason you get vignetting with 35mm film is the diagonal measurement of a slide mount is 41mm, you can't fully illuminate that area through a barrel 38mm in diameter. This is a common problem with many amateur telescopes.

© 2005 Dave's Astronomy Magazine www.astromag.co.uk

