



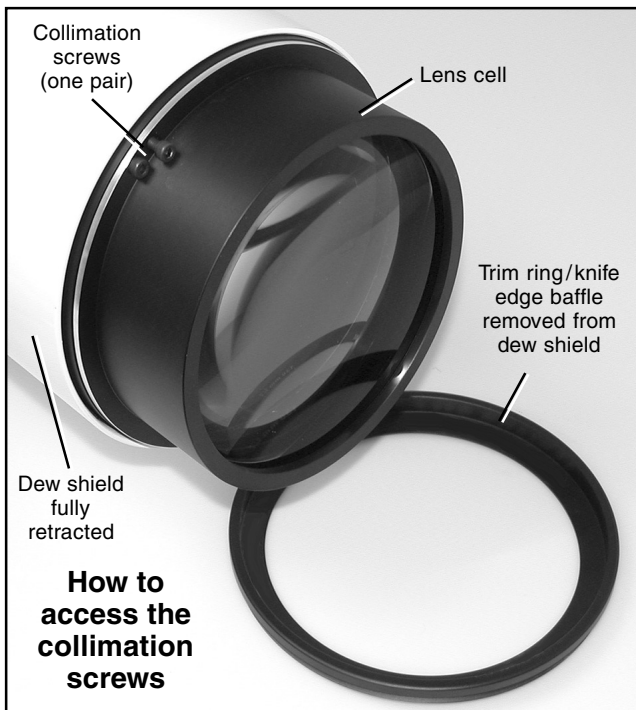
ASTRO-TECH

from Astronomy Technologies

Lens Cell Collimation

The lens cell of your Astro-Tech refractor has been factory collimated, then retested by Astro-Tech technicians prior to shipment to your dealer. With normal care the optics will keep that alignment permanently. However, if the telescope receives an exceptionally strong blow in shipping or while transporting it to an observing site, there is a small possibility that you may have to adjust the collimation. The lens cell has three pairs of push-pull collimating screws that allow you to collimate your scope using only a metric Allen wrench.

To gain access to the collimation screws, remove the black trim ring and knife-edge baffle from the front of the dew shield by unthreading it in a counter-clockwise direction. Set it aside and push the dew shield back on the optical tube until the front of the dew shield clears the lens cell and exposes the collimation screws at the rear of the lens cell, as shown in the illustration below.



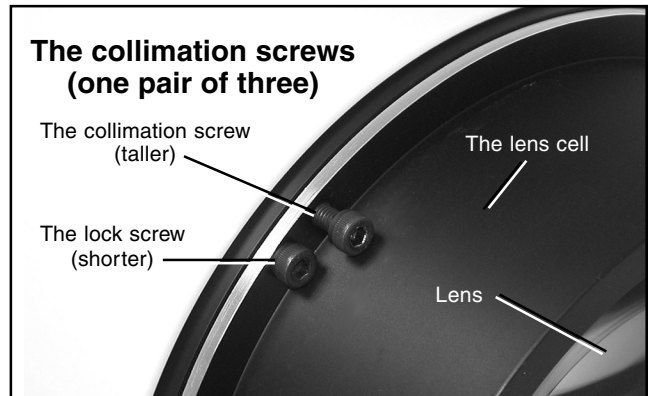
In the case of scopes with carbon fiber bodies, the knife-edge baffle is a separate ring threaded into the center of the black trim ring. The trim ring is permanently attached to the carbon fiber dew shield. Do not attempt to unscrew the black trim ring itself. To expose the collimation screws, remove only the inner knife-edge baffle from the black outer trim ring by unthreading it in a counter-clockwise direction.

To collimate your refractor, we recommend either of two methods. In the first and easiest, a "Cheshire" eyepiece (available from Tectron or your telescope dealer) is inserted directly into the eyepiece holder (without using a star diagonal). The Cheshire method can be used outdoors during the day or indoors day or night.

Your scope's dust cover is placed over the lens cell to seal the objective end of the scope and keep light from entering the optical tube. A bright light source is aimed at the opening

in the side of the Cheshire eyepiece. You can use the light from the sky during the day. If indoors, aim the light of a table lamp directly at the opening in the side of the Cheshire.

Look through the hole in the end of the Cheshire eyepiece. You will see a series of faint circles of reflected light against a black background. If the circles of light are all concentric, your scope is in collimation. If the circles of light are off-centered, adjust the push-pull collimation screws until you line up the off-centered circles to form a single round circle. The illustration below shows a close-up of one of the three pairs of collimation screws.



The taller screw is the actual collimation screw, while the shorter of each pair is the lock screw that holds the proper collimation after adjustment. Be sure to adjust only one set of collimation screws at a time. Make only small changes (turning the collimating screw only a fraction of a turn and checking to see the results before turning further). Be sure to loosen the lock screw of each pair of screws before attempting to turn the collimating screw.

When you have finished adjusting the collimating screws, snug down all lock screws to hold the correct collimation. Do not over-tighten the lock screws, but make sure they are firmly in place. Once collimation is complete, your objective lens will be on the same optical axis as the eyepiece, camera, or CCD, and you will obtain the best possible optical performance. Reinstall your dew shield trim ring.

The other method of collimation is to examine a first or second magnitude star image at high power at night after the scope has reached thermal equilibrium. This collimation method requires an equatorially-mounted scope and a motor drive to keep the star image centered while you adjust the collimation screws. It is generally a more difficult and time-consuming method of collimation than using a Cheshire eyepiece, as you are working on a moving scope with a small and droppable Allen wrench in the dark and are at the mercy of changing seeing conditions.

Be sure not to choose a closely-spaced binary star as your test star. Do not use a star diagonal when collimating, as you may be attempting to correct a problem in the diagonal, rather than in the telescope. Adjust the push-pull collimation screws until the star images are tight and round, and the first and second diffraction rings are uniform in their intensity for a complete 360° around the star image.

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