COLLIMATING A REFRACTOR

(with Adjustable Objective-Lens Cell)

Collimation is the process of aligning the lenses of your telescope so that the light they collect will focus at the right spot at the back of your telescope for your eyepieces to work.

Collimation is a simple process and works like this:

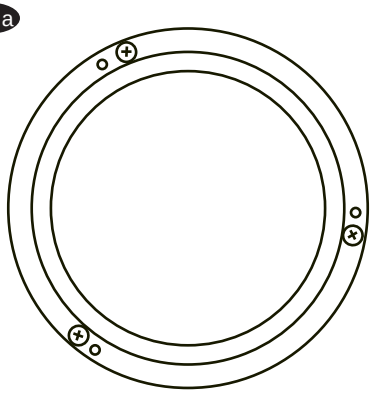
Pull off the dew cap at the front of your telescope and look into the scope. The pair of lenses are held in a cell by a threaded ring. This cell is held in place by three pairs of screws spaced 120 degrees apart. The larger Phillip's head screws actually hold the cell on, while the smaller, buried Allen screws push against a ledge at the front of the tube and allow the cell to tilt slightly, by tension against the Phillips screws (Fig.a). The idea being to alternately loosen and tighten each against the other until you have a round star image.

There are a number of devices available for collimation. The best one is your eyepiece and the North Star. The easiest way to find the North Star is to look for the Big Dipper. Draw an imaginary line along the two end stars in the bowl of the Big Dipper. The first star you come to along this line is Polaris (Fig.b). It is best for this purpose that your telescope not be polar aligned, in fact point the mount head due east or west. This is because German Equatorial Mounts have a blind spot around the pole. Also turn off your motor drive if you have one attached to the mount.

Use your lowest power (largest number eyepiece) to acquire Polaris, centre it using your slow motion controls. Now switch to your next higher power eyepiece, while keeping the image centred. The in-focus star image will have a bright innermost point, a slightly fainter inner ring and a fainter still outer ring that is hard to see (Fig.c). If it doesn't look like this, or you can't reach focus then start with: take out your star diagonal and look at the image slightly out of focus, this will allow you to gauge the deflection. A typical off-collimation image will have a bright spot off to one side when you bring the focus out (Fig.d).

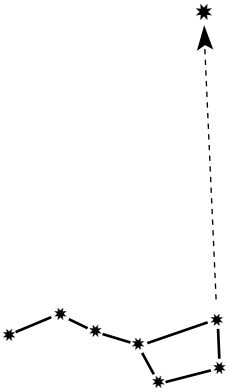
The actual process is to slightly loosen the pair on the side the deflection is, slacken the Allen head screws then tighten the Phillip's head screws against them again. Check the star image again after moving it into the centre of the eyepiece. If you find your image getting worse, then go the other way, or slacken the other two Allen screws a little. Once you have a round star image you are set. It helps to have a friend to help for collimation. Have your partner adjust the screws according to your directions while you look in the eyepiece.

Fig.a



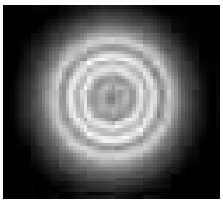
Polaris

Fig.b



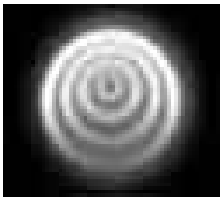
Big Dipper

Fig.c



Corretly aligned

Fig.d



Needs collimation