SUSSEX ASTRONOMY CENTRE

Collimating Newtonian Telescopes

Adjusting the main and secondary mirrors is a simple operation that should be checked and carried out regularly.
The adjustment is usually carried out in two steps.
1. Preliminary adjustment is completed during daylight.
2. Precision adjustment is completed at night on a star.

1. Preliminary adjustment

Looking down the focusing unit with out an eyepiece with the telescope pointing at the sky well away from the sun, it is possible that you may see an image similar to fig s 1 to 3.

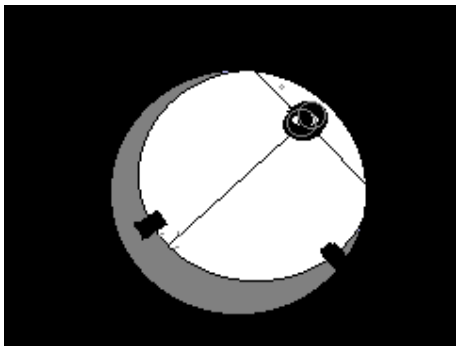


Fig 1.

The main and secondary mirrors require adjustment. The secondary mirror is moved using the adjusting screws so that it is centred as in figure 2. A 35 mm film canister with a small hole in the centre placed into focuser will help the operation.

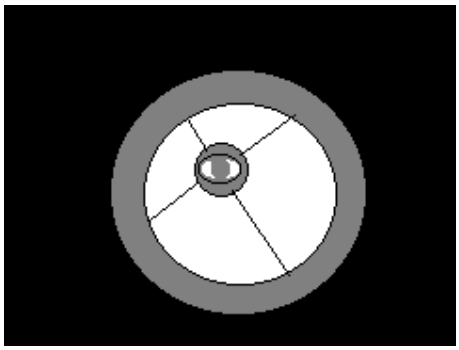


Fig 2. Small mirror adjusted. Primary mirror requires adjustment.

The small-silhouetted reflection of the primary mirror must be bought into the centre as shown in fig 3. This is achieved by positioning main mirror using the three adjusting screws on the rear of the mirror. Adjustment of these screws to centre the mirror is best carried out by trial and error, rather than trying to work it out!

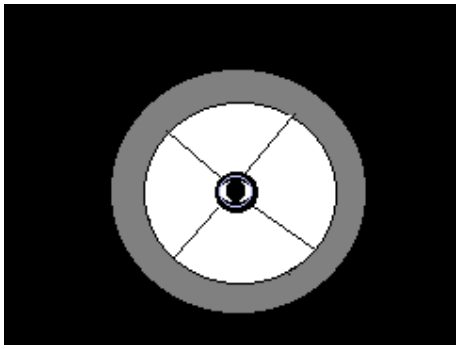


Fig 3. Secondary and main mirrors aligned.

When the image in fig 3 is seen the next step is to precision align the telescope.

2. Precision adjustment

The telescope is pointed at a bright Star high in the sky and observed with a medium power eyepiece in the centre of the field of view. The defocused image seen may look like fig 4 or 5

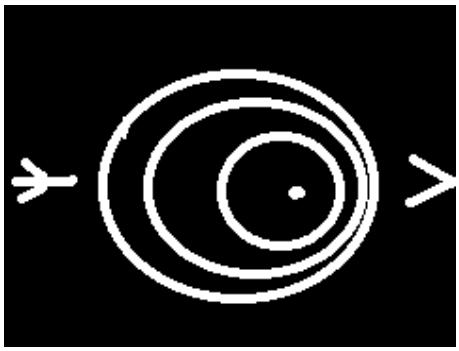
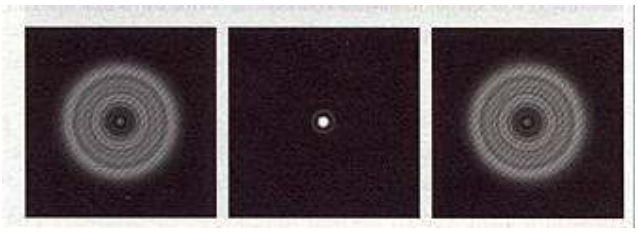


fig 4. Small centring error.

The star image is moved in the direction of the arrow using the main mirror adjustment screws. Turning them a small amount at a time. When the image looks like fig 5 the medium power eyepiece is replaced with a high power and the final adjustments made.



inside focus at focus outside focus