Collimating an SCT

• Common Misconceptions:
  – SCT's don't lose collimation
  – Not as important due to the long focal length
  – Collimating is hard

• Some “horror” stories about bad SCT's are likely due to mis-collimated optics.
A “Perfect” SCT:
An Uncollimated SCT
Uncollimated SCT
Collimate on a star

- Use an artificial star!
- I used a #80 drill through thin aluminum for the first baffle.
- Apparent size = baffle1diameter % (length%eyepiece_fl)
How to Collimate Quickly

• 2 stages of collimation:
  – 1. Centering the secondary shadow
  – 2. Centering the Airy disk

• Both stages use the EXACT same procedure

• The final stages will be turning the screws such a small amount that you can barely tell your taking action
How to Collimate Quickly

• Divide the 3 screws into 2 halves
How to Collimate Quickly

• Assign each screw a name:
  – The one closest to the top is the “12 o'clock” screw
  – The next two are the right and left screws
  – Right and left should be from the rear of the scope
How to Collimate Quickly

• Step one:
  – Rotate diagonal to match the 12 o'clock screw

• Step two:
  – Center your target in the 'scope.
  – Must do this EACH AND EVERY time you adjust a screw

• Step three:
  – Determine which direction the pattern is off in the horizontal plane. Don't worry about vertical yet.
How to Collimate Quickly

• This star is skewed to the left.
How to Collimate Quickly

• If performing a rough collimation, the shadow of the secondary would be at about the 10:30 position in the previous example.
• So now looking only at the horizontal error we want to center the pattern horizontally.
• ONLY work with the right/left screws in the first step. Don't touch the 12 o'clock screw
• To adjust for the above error tighten the screw opposite the error to “pull” it back into the correct place.
How to Collimate Quickly

• You may need to loosen the opposite screw while making the adjustments. Only loosen when you MUST, tight screws are good and you are not likely to warp the secondary.
• DON'T TOUCH THE 12 O'CLOCK SCREW!
• Remember to keep the star centered while adjusting.
How to Collimate Quickly

• After L/R adjustment:
How to Collimate Quickly

• Now that it is correct horizontally, adjust it vertically

• Treat the L/R screws like one screw

• Action is reversed compared to the L/R adjustment.
  – Tightening a screw will push the pattern away from the screw.
How to Collimate Quickly

• Which way do we go?
How to Collimate Quickly

• In this example the pattern is skewed high.
• So we would tighten the 12 o'clock screw to push the pattern down, if needed loosen the R/L screws
• If the pattern was skewed low, you would tighten the R/L screws, and possibly loosen the 12 o'clock screw.
How to Collimate Quickly

• Overview
  – Assign screw “names”
  – Start with secondary shadow
  – Adjust horizontally
  – Adjust vertically
  – Move to diffraction rings
  – Repeat
  – Remember to always defocus in the same direction
Final Result: