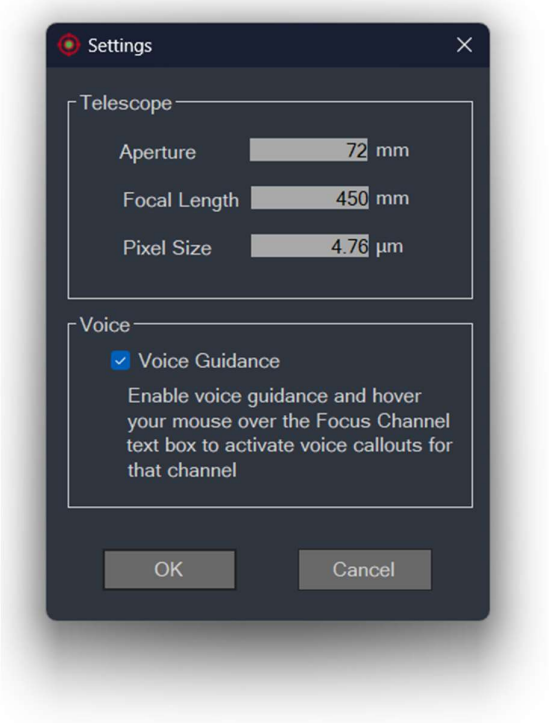
SkyCal User Manual

1. Setting



1.1 Settings

- **Instructions:**

    1. Open the **Settings** dialog.
    2. Enter the aperture and focal length of the telescope and the pixel size of the attached camera.
    3. Select Voice Guidance to have SkyCal announce the error values of selected Tri-Bahtinov line groups or Bahtinov focus error value.
    4. Click **OK** to apply the changes, or **Cancel**.

2. Collimating with a Tri-Bahtinov Mask

2.1 Attaching the Tri-Bahtinov Mask

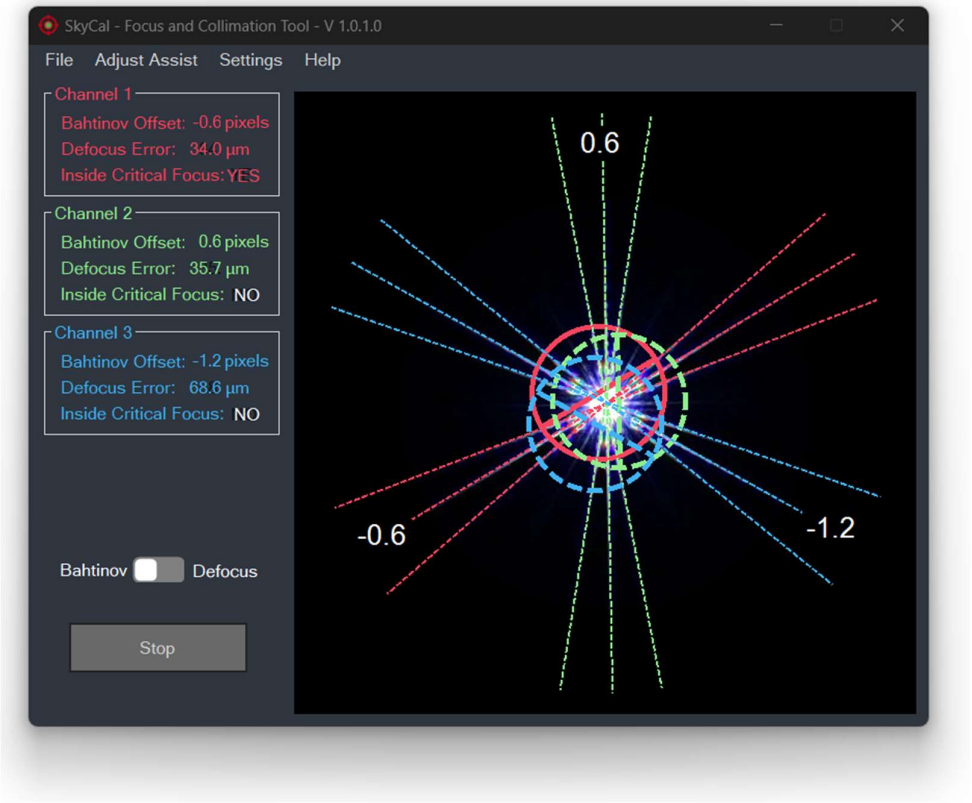
- **Instructions:**

    1. Secure the tri-Bahtinov mask over the front aperture of your telescope.
    2. Ensure that the mask is correctly oriented with the secondary adjustment screws.
    3. Make sure your camera is rotated appropriately.

2.2 Capturing the mask image

- **Instructions:**

    1. Slew to a bright star
    2. Begin imaging and displaying the TB image on screen.
    3. Make sure the Bahtinov/Defocus switch is in the Bahtinov position.
    4. Press the “Select Star”. The screen will darken.
    5. Move the mouse pointer over the bright centre of the TB image and press and hold the left mouse button.
    6. Drag the circle out over the TB image trying to include as much of the radial lines as possible without including any other star images.
    7. Release the mouse button.



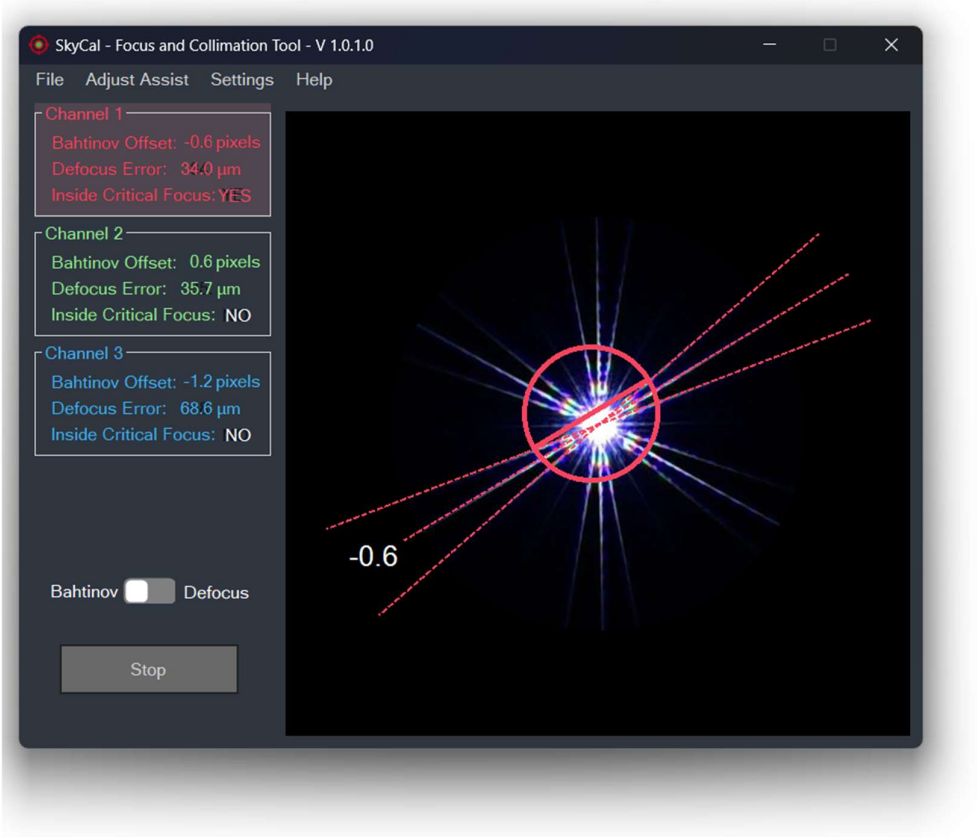
2.3 Interpreting the image

The image displayed and the associated additional lines and error circles can make the image difficult to interpret. By moving the mouse over the 3 left side channel boxes SkyCal will display only the channel selected. The error circle with the line represents the error calculated for this channel.

When adjusted correctly the central line of the error circle should overlay the middle line of the Bahtinov image.

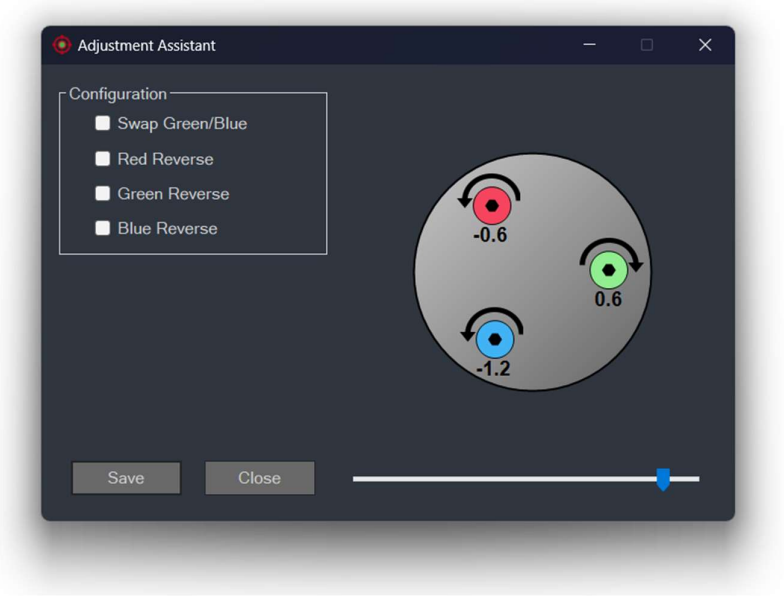
- **Suggested Adjustment Method:**

    1. Select one of the three channels as the focus reference and adjust the focus controls of your telescope until this channel is as close to 0.0 as possible.
    2. Adjust the remaining 2 channels adjustment screws to minimise the error value
    3. After each adjustment refocus as in step 1.
    4. Repeat this process until all channels are as close to 0.0 as possible.



2.4 Using the Adjustment Assistant

- **Introduction:** The Adjustment Assistant in SkyCal provides a visual indication of the adjustments required.



- **Instructions:**

1. After the TB image is displayed on SkyCal, from the menu bar click on “Adjust Assist”
2. Setup Adjust Assist
    - Identify which adjustment screw is associated with the Red channel
    - Rotate the Adjust Assist adjustment image using the bottom slider until the red adjustment is oriented similar to your adjustment screws.
    - Identify the Green and Blue channels and select “Swap Green/Blue” if necessary to match your telescope adjustments.
    - Select the “Reverse” tick boxes so that the adjustments indicated on the Adjust Assist are correct for your optics.
    - Press “Save”
3. Follow the suggested adjustment method above and the adjustment directions displayed in the Adjust Assist to collimate

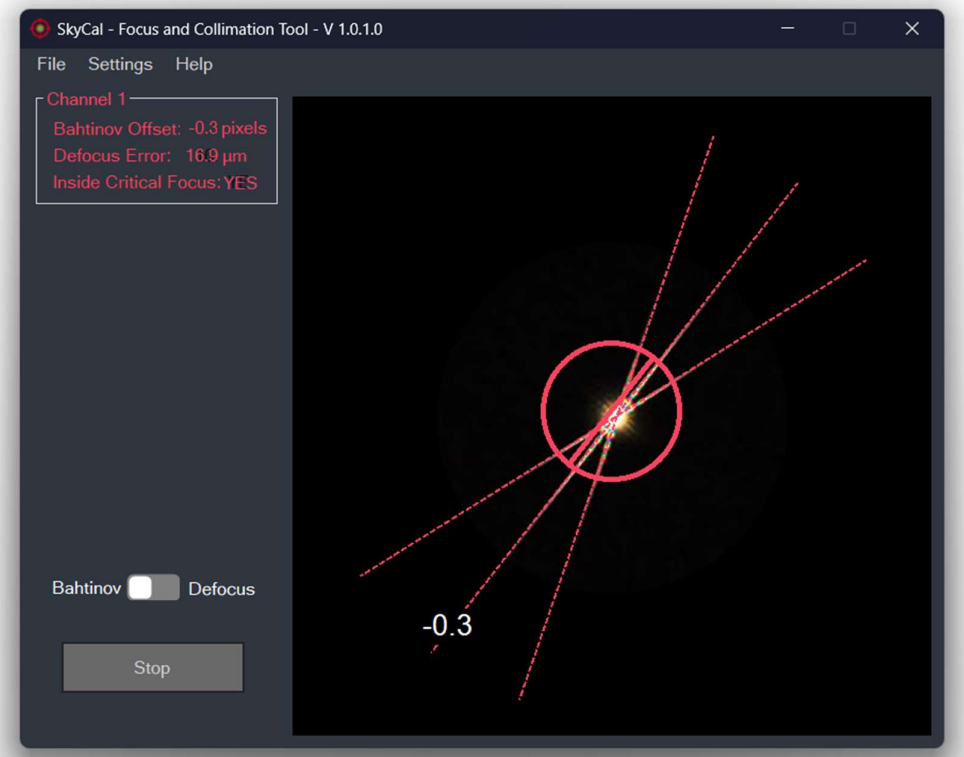
2.5 Voice Outputs During Adjustment

If the settings tickbox Voice Guidance is selected and the mouse is left over one of the 3 left side channel boxes then when the image is updated the new error value will be spoken.

3. Focusing with a Bahtinov Mask

Introduction

A Bahtinov mask is a popular tool for achieving precise focus in astrophotography. SkyCal uses the diffraction pattern generated by the mask to assist you in focusing your telescope.



3.1 Interpreting the Focus Display

- **Instructions:**

    1. Attach the Bahtinov mask to your telescope
    2. Point your telescope at a bright star.
    3. Make sure the Bahtinov/Defocus switch is in the Bahtinov position.
    4. Use SkyCal to select the displayed image as described above.
    5. Adjust the telescope's focus until the central spike is perfectly aligned between the two outer spikes as indicated by the error circle and the displayed error value.

4. Defocus Star Collimation

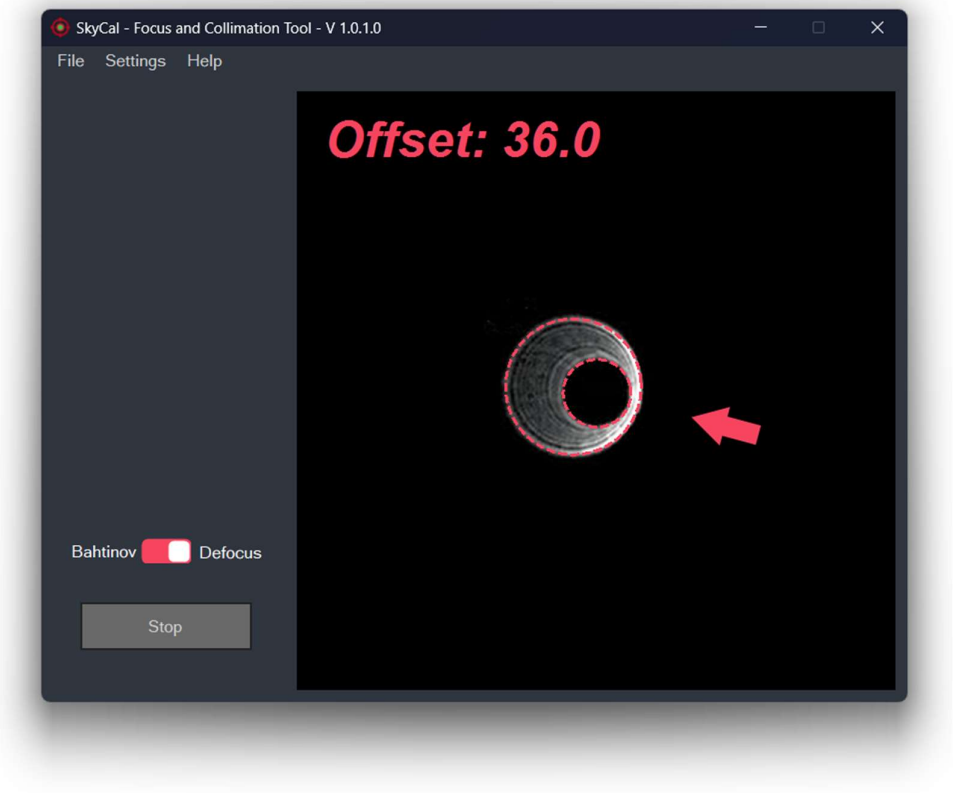
Introduction

The Tri-Bahtinov mask method of collimation is only practical when the telescope is very close the collimation, and only requires minor adjustment. I recommend the Defocus star method for initial collimation before using the Tri-Bahtinov mask. SkyCal now supports Defocus Star collimation.

4.1 Capturing a Defocus Star Image

- **Instructions:**

    1. Point your telescope at a bright star.
    2. Defocus the telescope slightly until the star appears as a donut-shaped image.
    3. Make sure the Bahtinov/Defocus switch is in the Defocus position.
    4. Capture the image using SkyCal.



4.2 Analysing the Defocus Pattern

- **Instructions:**

    1. Red dashed circle will define the inner and outer limits of the image.
    2. The arrow shows the direction you should move the centre circle for collimation.
    3. The Offset value is displayed. Adjust the collimation to reduce this value.

5.1 Contact Information

Leave any issue or problems at:

- https://github.com/insertnamehere1/Bahtinov-Collimator/issues
- https://www.cloudynights.com/topic/878820-bahtinov-and-tri-bahtinov-focuscollimation-software/

If you have any questions you can PM me at:

https://cloudynights.com

User: insertnamehere