

RRT Rotator and Off-Axis Sensor Model

Sept 12, 2023
(Rev 1)

To use the RRT rotator functionality, the user must first determine the rotator position angle. Stellarium provides a mechanism to project the field of view of the RRT imaging camera and off axis guide camera. Open Stellarium and click on the wrench icon in the upper right. Select the Sensors tab and fill in the values shown below. Sorry for the dim image, but Stellarium is fussy about a screen copy. See the last page for a printed list.

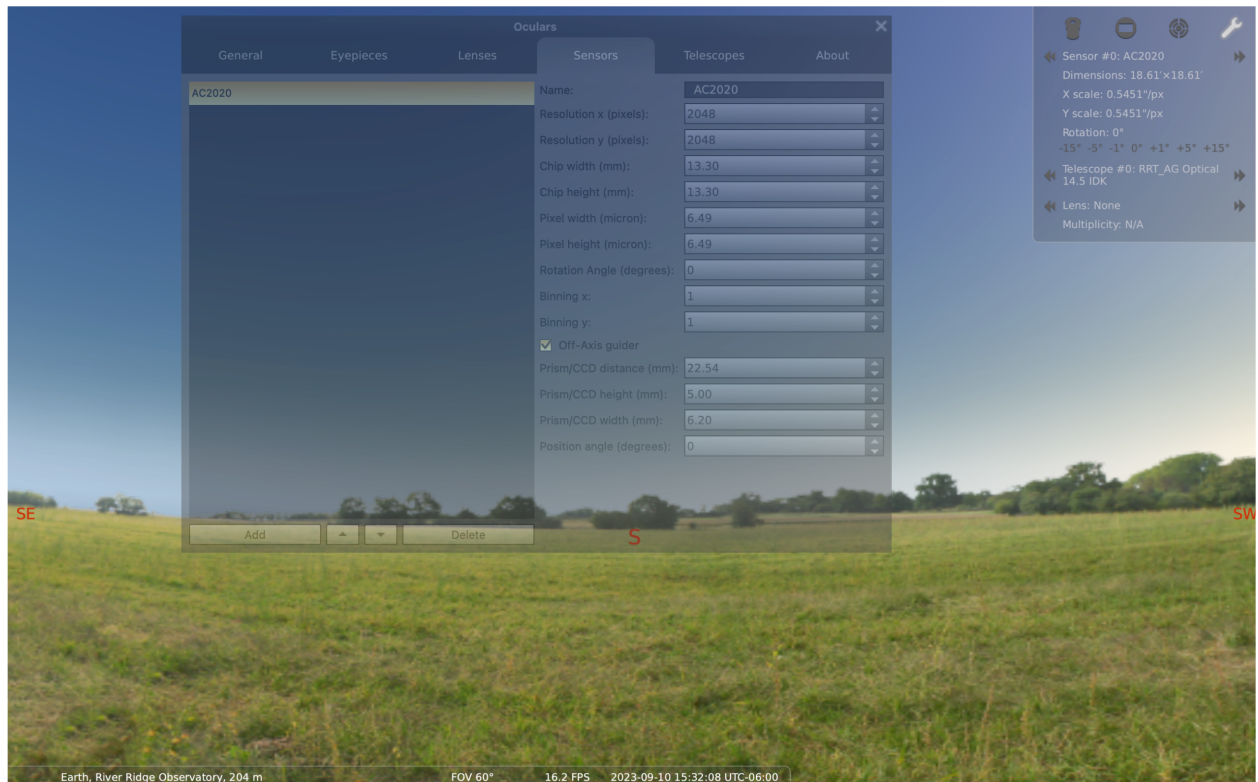


Figure 1. The Sensor (imager) set up window.

After you complete the entries. Hit the 'Add' button in the lower left. Next set up the telescope.

Next select the telescope tab and enter the data for the RRT telescope.

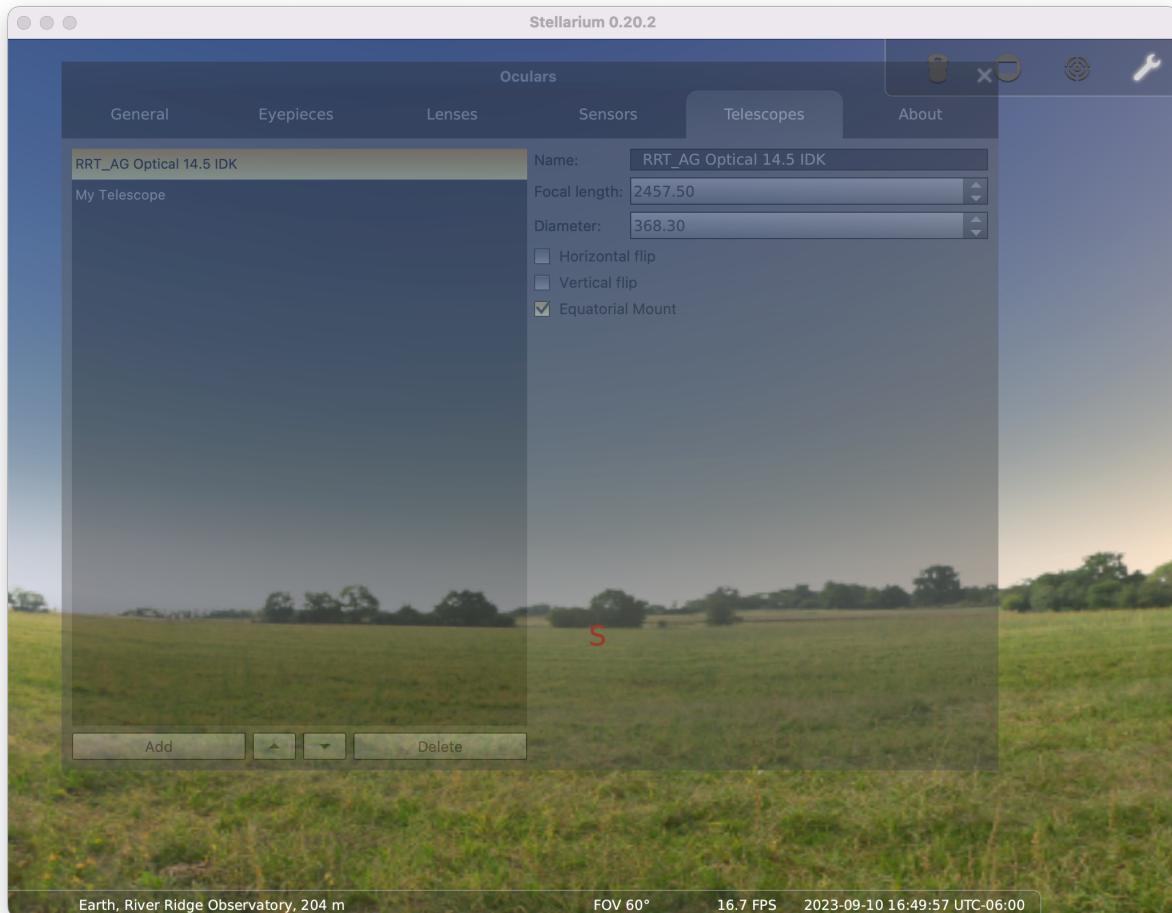


Figure 2. The telescope setup window.

Again, click 'Add' in the lower left to store the description of the telescope. Close the "Oculars" window. Be sure to leave the RRT's Sensor and Telescope model selected – highlighted in yellow.

Using the model is simple. Focus on some sky object as normal, then click on the icon that looks like a circle with a square in it. It is in the upper right panel, third from the right. This icon activates the model and you should now see the main camera field of view and the off axis guider field of view in red. The RA/DEC for J2000 is above the FOV (field of view) box. This is what is needed for the RRT plan. If the rotation angle is 0, then the side with the J2000 label is the North side of the box. Also, the FOV box dimensions should read 18.6' by 18.6' at the opposite side.

If the RRT is instructed to rotate the image +10degrees, it will rotate the image counter clockwise 10degrees. To keep the correct angle, always enter negative values in Stellarium and positive values in the RRT plan set up. That is, if the Stellarium angle needed is -350degrees then that corresponds to an RRT value of +350degrees. Unchecking the off-axis guider check box will remove the off-axis camera projection from your display. Note: do not change the guide camera's position angle because the guide camera and main camera always move as one unit.

If exposures are greater than 62 seconds, one should center the off-axis guider FOV on a bright star. If the off-axis guider fails to find a bright enough star, the observation will fail.

Table 1. Oculars – Sensors Tab

Name:	AC2020
Resolution x (pixels):	2048
Resolution y (pixels):	2048
Chip width (mm):	13.30
Chip height (mm):	13.30
Pixel width (micron):	6.49 ¹
Pixel height (micron):	6.49 ¹
Rotation Angle (degrees):	0 to -360, 0 is default for rotator
Binning x:	1
Binning y:	1
Off-axis guider __	checked -> visible, unchecked -> not visible
Prism/CCD distance (mm):	22.54
Prism/CCD height (mm):	5.00
Prism/CCD width (mm):	6.20
Position Angle degrees:	0

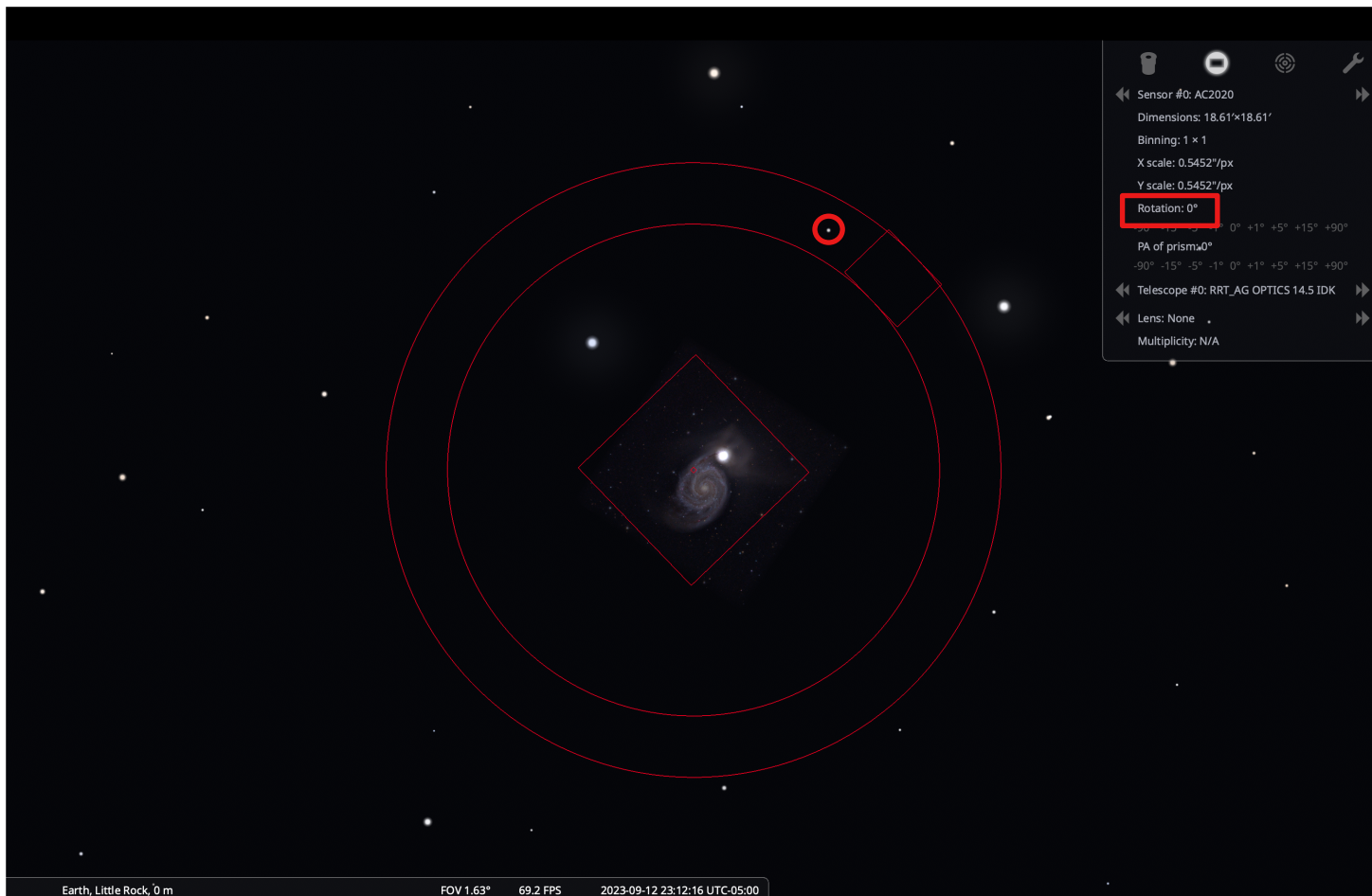
Note 1: Some versions of Stellarium don't ask for this info because it can be computed from chip width and number of pixels (both width and height).

Table 2. Oculars – Telescope Tab

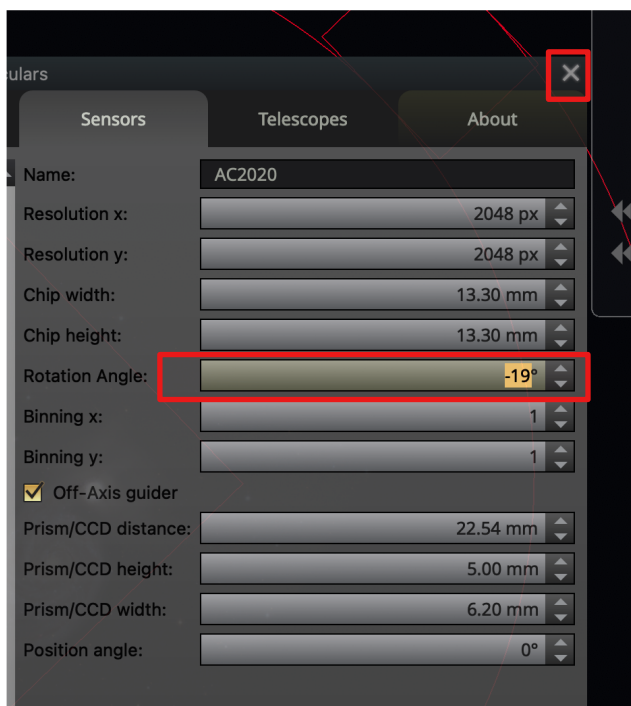
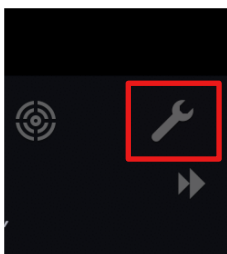
Name:	RRT_AG Optical 14.5 IDK
Focal Length (mm)	2457.5
Diameter (mm)	368.3
Horizontal flip	unchecked
Vertical flip	unchecked
Equatorial Mount	checked

Rotating to a Guide Star

Figure 3 shows M51 in the FOVI. The Rotation is at zero. Our guide star is to the left of the off-axis guide box.



Click on Settings and adjust the Rotation Angle. Close settings to go back to the FOVI.



The off-axis guider is centered on the guide star. In the observing plan, the Pos. Angle will be 19.

