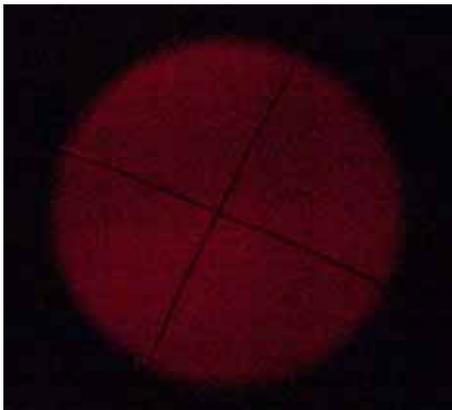


Hello,

After a short search of commercial crosshair eyepieces, I was quite astonished by the rather high prices so I decided to build one myself. I was looking for a lit 1 1/4 " crosshair eyepiece with decent optical quality. I did not plan to use it for precise astronomical measurements, but mostly for the alignment of my NexStar telescopes. Fortunately I found a suitable eyepiece in my eyepiece box: a quite high-quality Vixen eyepiece. It is an orthoscopic eyepiece designed according to Abbe, with a focal length of 25mm and a field of view of 45°. All 4 of its lenses are fully multicoated and this eyepiece features a high transmission.

I built a crosshair from thin wires and inserted it at the field stop. I added two red miniature SMD light emitting diodes to get a dim shine and thus make the crosshair visible in the night. After the installation was completed, everything was carefully blackened to avoid disturbing reflections. The picture to the right shows the structure quite well.



As mentioned before the crosshair is lit up from the front with red LEDs. The brightness is continuously adjustable. This makes the crosshair visible during very dark skies without degrading the dark adaptation of the eyes. When observing during the day the black hair cross is easily visible too. The picture to the left was taken with a digital camera, through the eyepiece as it stood on a black sheet of paper dimly lit by the 2 red LEDs.

An isolated cable is routed through the eyepiece from the side and connects the eyepiece to a small black plastic housing. The next two pictures show the eyepiece and the small battery/control-box. In the left picture the lighting is switched on, which is evident by the red light emitting diode.

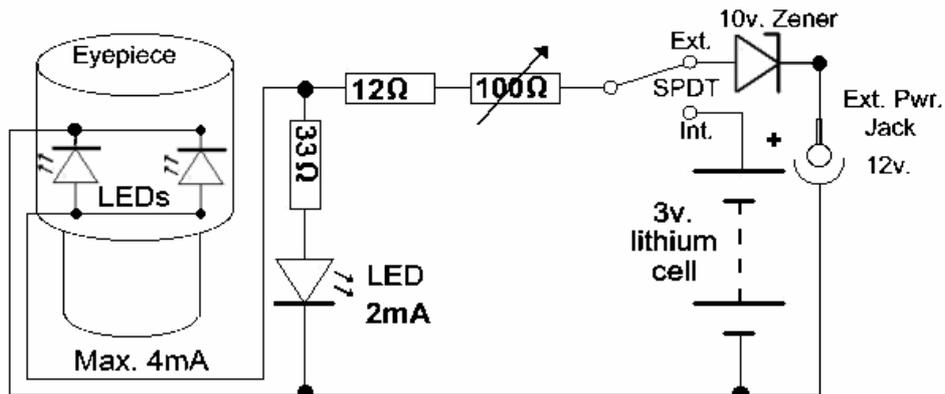


The black plastic box contains a simple circuit including a 3Volt lithium battery of the usual type CR2430. On the picture to the right, it can be seen in opened condition. By means of a small slide switch, the lighting can be switched on, which is indicated also by a small red light emitting diode. This is to avoid draining the lithium battery, in case it was forgotten to be switched off. The brightness of the field lighting is continuously adjustable by means of a small variable resistor (trimmer).



Additionally a 3 pole socket is inserted, for use with power from the telescope. Using this socket you can optionally supply +12V externally to the unit while having the internal battery switched off. This can be used for any continuous operation of the lighting without draining the lithium cell. I simply use the pulsed 12V supply of my dew heater system and thereby have a pulsating lighting of the crosshair. I find this helpful when aligning on dim stars but that may be a matter of taste. The external supply is not necessary or can be also set up to run continuously.

Finally please find a sketch of the small circuit. I apologize the poor readability of the hand drawing, but hope the simple circuit is nevertheless understandable.



Feedback is always very welcome.

Best regards

Matthias

Email: [DD1US@AMSAT.ORG](mailto:DD1US@AMSAT.ORG)  
 Homepage: <http://www.dd1us.de>