Langenbrettach/Germany, January 6th 2002
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Hello,

during the last days I extended the anti dew heating environment around my NexStar5. Some of the elements for heating my telescope and it's accessories have been explained in another notice I posted in the file area of the NexStar Yahoo Group. Here I want to focus on the controller for the anti-dew heaters and the modifications of my Telrad finder to prevent dew.

In the picture on the right you see my homebrew controller. In the lower left the black and red cables/plugs is the supply voltage input. The controller does work in a very wide supply voltage range of 6 to 18V. Next to the input you find the mandatory fuse holder to protect the source from any short circuits. The On/Off switch right to the fuse holder activates the controller and the LED above flashes in the clock of the controller. The width of output pulses can be controlled by the potentiometer in the lower right corner. The controller features to outputs: the little black and red plugs on the right and the black connector in the center of the front panel both supply the pulse width modulated DC voltage to the heater units. The black 3 pin-connector in the center does actually provide not only the pulse width modulated DC-voltage but also the DC-input-voltage of the controller and thus the following units can be powered by this constant voltage too.

Fig.1: Controller for Anti-Dew-Heater

In spite of the fact that I use a dew shield on my Telrad I did experience frequent problems with dew especially of the projection window. Thus I decided to heat the glass but also to heat the interior of the Telrad in the area of the reticle and the projection lens. I selected a heating wire made of Konstantan with a specific resistance of 28 Ohm/m and when laying it around the projection window it's length was 38cm and thus a total resistance of approx. 11 Ohm. Inside the Telrad I connected 4 resistors (1 W types) of 120 Ohms each in parallel and this resulting 30 Ohm network in series to the external heating wire. Using a 12V supply voltage and maximum duty cycle of the anti-dew heater controller (which results almost in CW mode) I get a total power dissipation of approx. 3.6 Watt. This splits into 1 Watt heating the projection window and 2.6 Watt heating the Telrad inside. This setup proved to be sufficient down to an ambient temperature of –18°C = 0°F ( I did not test it below).

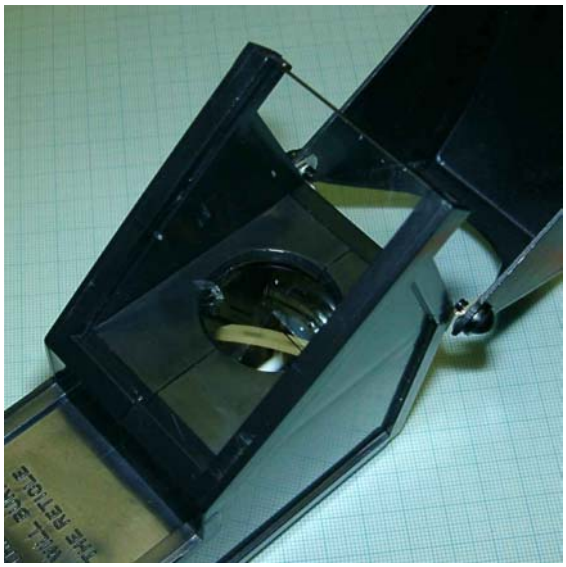
Fig.2: Telrad finder before modification

Fig.3: The projection window can be easily removed. It is glued in the plastic frame only by some silicone type of adhesive.

Fig.4: A thin wire (Konstantan) is laid around the window. This wire acts as the heater dissipating some power while the current is flowing through it. It has to be partly isolated (red isolation visible) to avoid short circuits. The ends are routed through a small existing opening inside the Telrad.

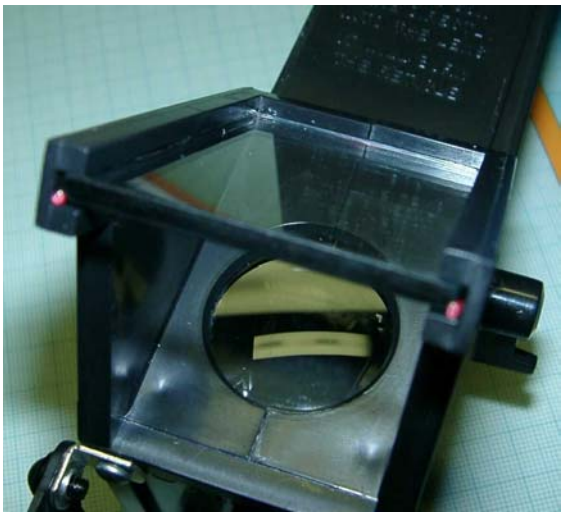

Fig.5: Glass window shifted back into position. At the ends the red isolation of the wires can still be seen. I did not even glue in the window because it fits quite tight.

Fig.6: Telrad after modification mounted on N5. An additional socket was mounted which provides continuous DC power for the Telrad itself as well as pulse width controlled DC power for the heater only. Thus the Telrad and the heater can be powered independently

Fig.7: Telrad with closed dew shield from the rear. Please note that the dew shield alone (without additional heating) was not sufficient.

Feedback and questions are always welcome.

Kind regards

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