Barlow Notes

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Purpose

This test was run to see how the Tele-Vue PowerMate 2.5 Barlow (hereafter referred to as the 'Barlow') works with the eyepiece and camera. I had bought some other much cheaper Barlows before and tried them out, however everyone says the Tele-Vue PowerMate Barlows are the best. So, I decided to run the test with them to eliminate any problems due to poor quality Barlows.

Setup

The Barlow was switched between the following configurations on the C11 HD – (a) on the eyepiece (left) and (b) on the camera using the Tele-Vue T-Ring adapter (right.)

The telescope was initially setup pointing to the radio towers on the mountain top behind my house. This was done using no Barlow at approximately noon – so there was considerable solar heating of the landscape causing image rippling due to the rising heat waves off the land surface. This was done on 11/20/2024 and the temperature was approximately 60F.

Eyepiece Barlow Observations

After adding the Barlow to the eyepiece, it was necessary to re-adjust the focus due to the change in focal length caused by the Barlow.

As expected, the Barlow did magnify the image. I could tell because, with the Barlow, the image perfectly framed the building and the tower next to it – and without the Barlow, the image showed the building and tower next to it occupying less than half of the frame.

The Barlow image showed noticeably more heat 'rippling' and jitter (from mount movement.)

Focusing using the eyepiece was relatively easy with the Barlow.

Camera Barlow Observations

Since the eyepiece and camera focal points had not been matched, focusing was rather tedious after moving the Barlow from the eyepiece to the camera.

Focusing Process

After some experimentation, I found that the following process works reasonably well for manual focusing.

1) Turn the exposure up until the image is ‘almost’ washed out
2) Back off one exposure setting lower (shorter time period)
3) Focus (turn knob) until image is ‘roughly’ in focus
4) REPEAT back to step (2) until image is almost too dark to see on ASI app

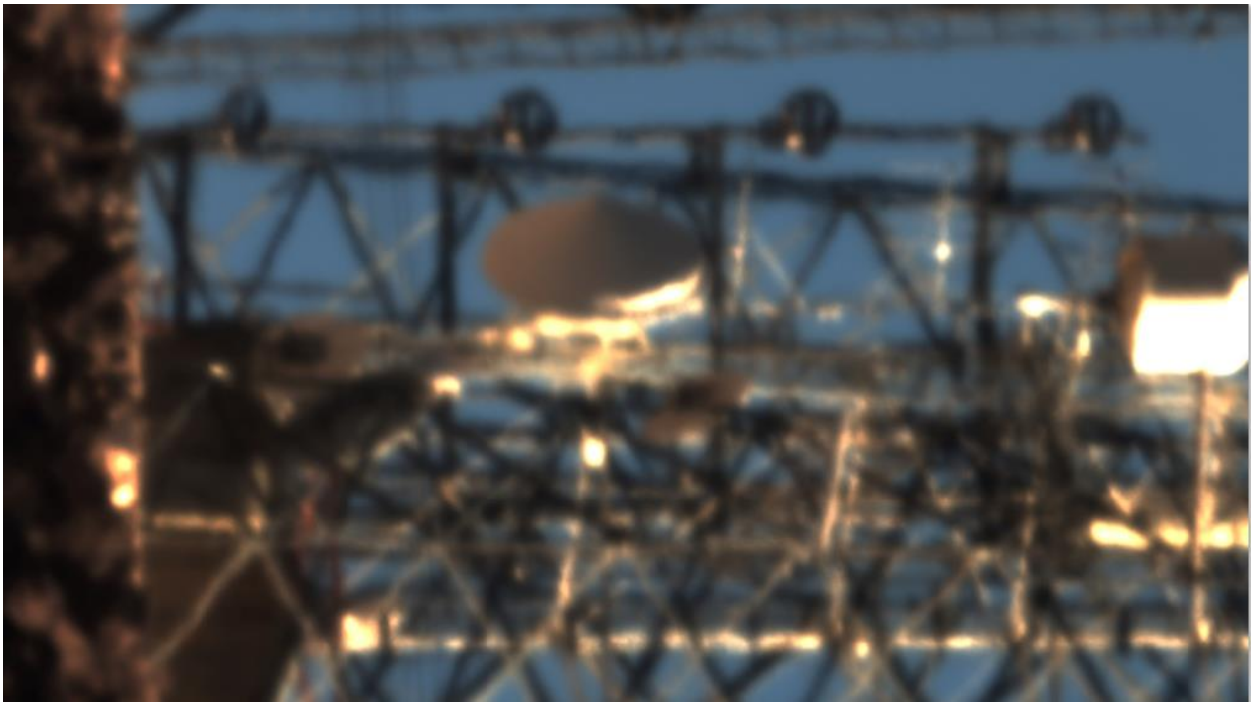
At this point the image should be pretty good and not clipped at the upper end of the histogram.

Conclusion

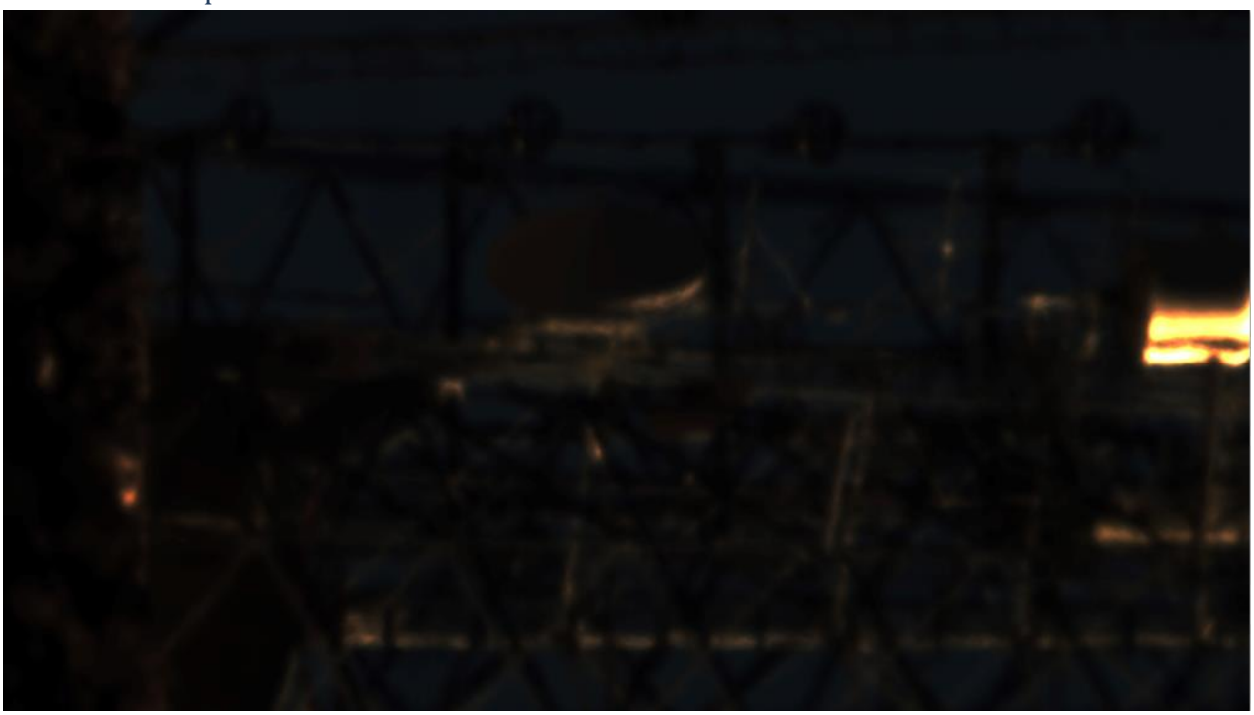
After much tedious experimenting, I learned that (given this exact setup) I had to turn the C11 focus knob roughly one full turn clock-wise (from where the eyepiece was focused – I’m only about 90% sure on the direction as I didn’t write it down) to get close to where the camera was focused using the Barlow.

Images without Barlow

0.02 second exposure

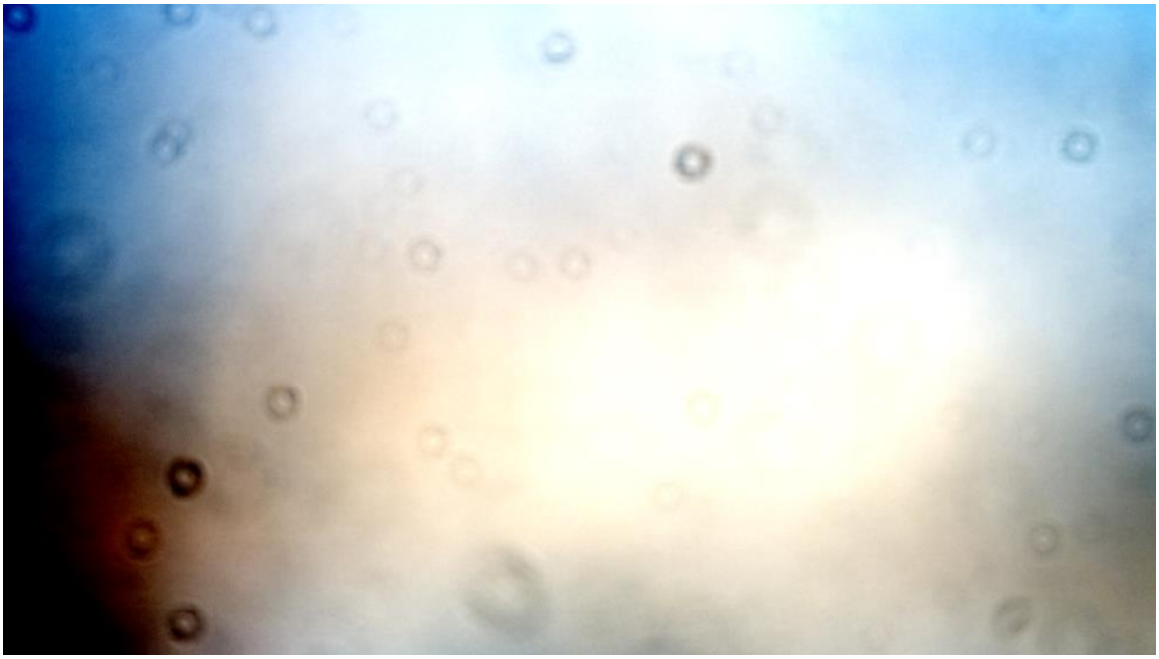


0.01 second exposure



Images with Barlow

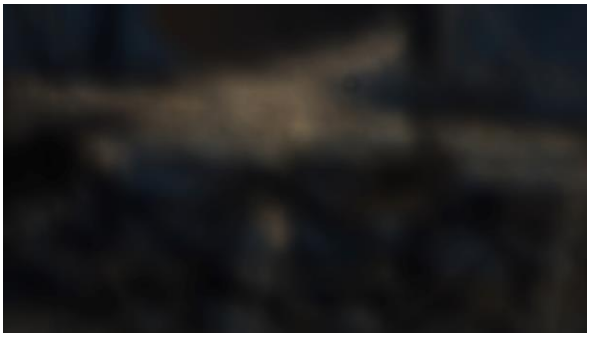
After switching to the Barlow on the camera (with the exposure still set at 0.02 seconds), all I could see was a black frame. I had to bump the exposure up to 0.5 seconds to start seeing something which was very blurry – see below.



After adjusting the focus, I was able to see a somewhat clear image. Because the focus is manual in this scenario it took a HUGE amount of time to take a shot, wait to see it on the screen, adjust the focus, repeat until something looked good. It took me 15 minutes to get from the image above to the one below (which was also using 0.5 second exposure.)

I spent another 15 minutes tediously trying unsuccessfully to get a better focused shot. Below are some of the better ones – although none are as good as the previous shot. The brighter ones were at 0.5 second exposure, and the darker ones were at 0.2 second exposure.







Comparison No-Barlow vs Barlow

Here you can see side by side the difference the Barlow makes (top no-Barlow, bottom Barlow.)