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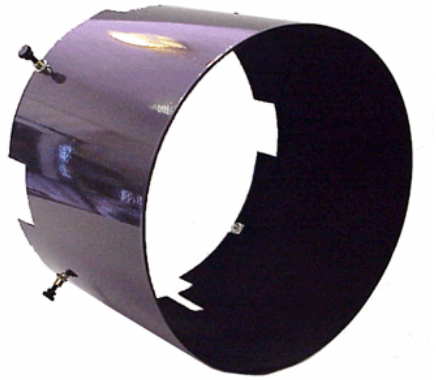
Matthias Bopp

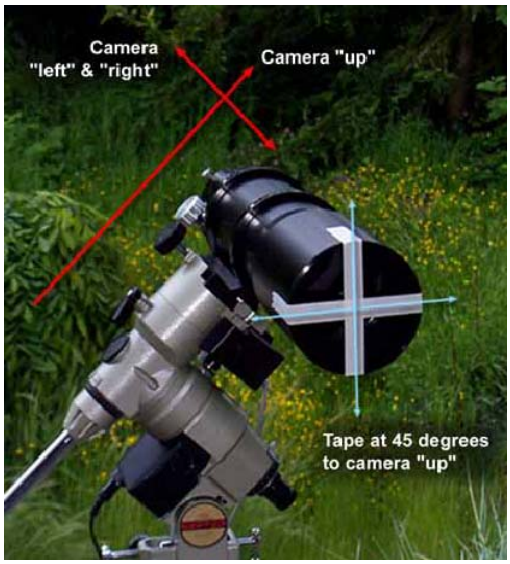
Portable Focusing Aid

Some time ago I bought a dew-shield for my N11GPS which I like very much: the AstroZapTM Dew-Shield. In contrast to the flexible Dew-Shields this one is rigid as it is made from solid aluminium. It is notched to allow an easy fit over the sidebars and optional counterweight systems for the NexStar11GPS.

My version is also ideal for HyperStar CCD imaging: the Dew-Shield is shorter than standard to allow air to pass over the cooling fins of a HyperStar-mounted CCD camera. Also, a cut-out on the bottom allows the Dew-Shield to easily fit over the computer interface / video output / power supply cable from the CCD. The Dew-Shield is felt-lined and has four nylon set screws to lock it securely in place. Its dimensions are 9"x12.5". It works great in conjunction with my Mintron video camera attached to the HyperStar lens assembly.



When starting to use the N11GPS for imaging using my Casio digital camera in afocal configuration, I soon learned how critical proper focusing is. So I thought about building a classical Hartmann mask by cutting 2 or 3 holes in a cardboard mask. However I did not like the large dimension of such a mask which is only needed a few minutes during a session and the rest of the time only taking space …

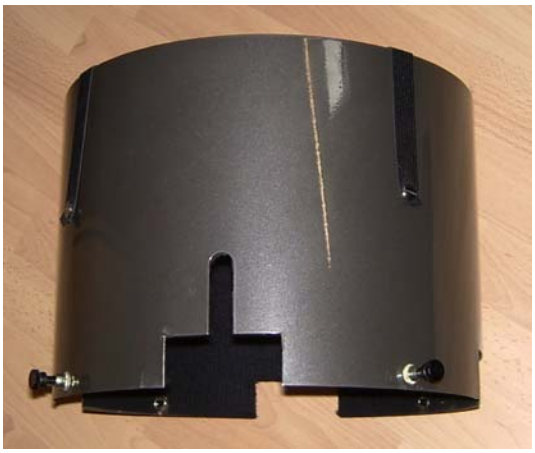


Browsing the internet for an alternative solution I found the book “The New CCD Astronomy“of Ron Wodaski. In chapter 2 “Practical focusing“ he explains in section 4 the different options of “Aids to Focusing”. I especially liked the idea of adding an artificial spider in front of the OTA to create diffraction spikes, which can used for proper focusing. For further details please see this section of Ron Wodaski’s book online at http://www291.pair.com/rwodaski/ebook/c2d.pdf .

One thing I did not like was his idea of adding such a spider made of self adhesive tape, which has to be disposed after each focusing session. I wanted to have something which can be reused. Thus I came up with the idea of using 2 flexible stripes made from black rubber band. You may know this stuff – it is approximately 2 cm wide and some people need it to keep their jogging trousers tight to their waists ;-)

First you have to determine the length of the 2 stripes. This is done by wrapping the stripes under slight tension half way around the Dew-Shield. The resulting length is a bit less than half the circumference of the Dew-Shield. Now you cut the stripes to that length and cut a hole in each end of the stripes using a perforator as used for cutting holes in paper for filing.

To attach the stripes to the Dew-Shield I drilled 4 holes in the Dew-Shield and attached screws with large heads. I could thus fix the stripes to the dew-shield by clamping them under the large headed screws. Please do not forget to paint the nuts inside the Dew-Shield black to avoid reflections once the stripes are attached.



By the way the location of the 4 holes is easy to determine: you hold the stripes diagonal over the opening of the Dew-Shield and stretch them symmetrically down along the sides of the Dew-Shield while keeping under moderate tension. Here you now mark the points to drill the holes.

Here are pictures of the completed setup. You see the stripes are in place for creating the diffraction spikes during focusing because of the cross they form (same principle as the diffraction spikes you see in a Newtonian reflector telescope by the spider holding the secondary mirror). Luckily when in use with a Schmidt-Cassegrain telescope as the N11GPS we can remove the stripes after focusing.

Finally here are 2 pictures of the stripes while not in use. They are wrapped around the Dew-Shield and thus securely stored. As you can see we met our target of having an easy to use focusing aid which takes virtually no additional space when not in use.

I have not yet tested the setup under clear skies but I have no doubt that it will work as planned.

I appreciate comments and I am happy to answer any questions.

Best regards

Email: DD1US@AMSAT.ORG
Matthias Homepage: http://www.dd1us.de