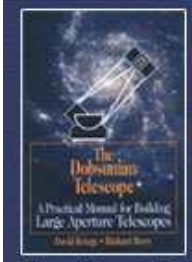


Isn't it time you got Obsessed?

Learning Center

Collimation Instructions
Learn how to accurately collimate the optics in your telescope.

Video Imaging
Exciting real time imaging with your Obsession scope

Cleaning your mirror

Dave Kriege shows the process for cleaning a mirror in the mirror cell. The process is fairly straight forward. The list of supplies is small and should be available at your local grocery store or Drug store. The list includes: One gallon of distilled water with a drop of dish soap added for washing the mirror, one gallon of distilled water for rinsing, a roll of clean cotton batting, paper towels and three small wooden blocks (or similar).

Dew heater installation instructions

This series of photos show the process of installing our dew heater.

Free Obsession DVD product Video

To obtain a hard copy of Obsession literature including our 120 minute product video, e-mail your POSTAL address, or fill out this form and we'll mail it to you at no charge (World-wide).

The video is great for determining which aperture is best for you.

Collimation Instructions & Barlowed Laser Technique

Learn how to accurately collimate the optics in your telescope. You need a laser collimator. Be sure to try the **barlowed laser technique**, the most accurate method to align the primary mirror. Any barlow laser combination will work fine as long as your barlow can accept your laser. TeleVue's Paracor coma corrector also works extremely well.

Collimating the optics:

Before you observe, you need to align or collimate the optical system. The goal of collimation is to insure that the primary, the secondary, and the eyepiece are correctly lined up to give good images. Of course, the first time you collimate is bound to be the hardest time, but after a few months it will become second nature to you.

You might think that collimation begins with the primary mirror because the primary mirror is the most important part of the optical system, but curiously enough, it does not. Collimation is done backwards, starting at the focuser and working step-by-step back to the primary. The reason is that before you can adjust the most important optic, all of the less important optical parts must be doing their jobs properly. Think of it that way and it makes perfect sense.

For fast and efficient collimation, you need a laser collimator. Laser collimators are very accurate and very easy to use. In general you adjust the mirrors until the beam hits the center dots on both mirrors and returns right back into the output hole of the laser. So to achieve the best collimation you it is imperative that you "center dot" both mirrors. If you have not done so you simply cannot collimate the optics. Instructions for center dotting the mirrors as well as a template for dotting the secondary mirror are found in the Assembly Instructions that came with your Obsession.

COLLIMATING THE FOCUSER

The focuser must be square to the secondary mirror. In other words it must be aimed correctly both left and right, and up and down. First square the focuser left and right. Do this indoors on the kitchen table. With a tape measure, check to see if the spider hub is precisely in the center of the Upper Tube Assembly (UTA). If it is not, then center the spider by adjusting the mounting screws on the ends of the vanes. Remove the secondary holder and temporarily install a long bolt or length of threaded rod into the spider hub. Pick a bolt that is the same type as the holder stem, usually it is 3/8 inch in diameter. Insert the laser into the focuser. The laser beam should sight to the center of the bolt. Don't worry about up and down, only left and right for now. Reach inside the UTA, loosen the four nuts on the focuser mounting screws and adjust the base with the four set screws until the laser beam is in the center of the bolt. Remove the bolt. Next draw a short vertical pencil line on the inside of the black Kydex directly opposite the focuser where the laser beam hits the Kydex. This is the left and right alignment of the focuser.

Next square the focuser up and down. Insert your laser in the focuser but DO NOT turn it on. Adjust the focusers until the out put hole of the laser is flush with the inside of the UTA. With a tape measure or ruler, measure down from the top of the wood ring of the UTA to the output hole of the laser. Remember this measurment. Now move across to the opposite side of the UTA and measure down the same amount and make a white dot on the pencil line.

Typewriter correction fluid works good for this. Now turn on the laser. Adjust the focuser accordingly using the four set screws on the base until the beam hits the dot. The focuser is now square to the optical axis of the UTA both left and right and up and down. Retighten the four nuts on the mounting screws and recheck your work. Once this adjustment has been made, it is a good idea to check it once a year as part of you telescope's annual maintenance.

COLLIMATING THE SECONDARY MIRROR

Install the secondary mirror in its holder and the holder in the spider. Set the scope up. It helps if you do this in the shade or at night so the laser beam is easier to see. Look through the focuser barrel at the secondary mirror. You will see the secondary holder and mirror in some odd position. Rotate the holder so that mirror is exactly face-on to the focuser. Put the laser in the focuser. Next use the adjustment nuts on the stem of the holder to move it up and down until the laser beam hits the dot on the surface of the secondary mirror. The secondary mirror is now centered under the focuser.

The next step is to aim the secondary mirror at the primary mirror. Put the laser in the focuser. If you have the nylon light shroud in place, release the two bungi cord loops on the side of the mirror box with the brass name plate so you peek inside and see the primary mirror. Turn the laser on. Using the three brass adjustment nut on the secondary holder, tilt the secondary mirror until the beam bounces off the tiny black dot on the secondary and hits the center of the primary mirror. The beam easily fits inside the little black donut in the center of the primary mirror. When you have gotten the alignment done, check to be sure the secondary is still centered properly under the focuser. If not recenter it and then recheck the tilt so the beam bounces off the secondary and hits the center of the primary.

COLLIMATING THE PRIMARY MIRROR

When everything else is aligned correctly, you are ready to collimate the primary mirror. This is the easiest step. With laser turned on the return beam needs to bounce off the primary and secondary mirrors right back into the output hole in the laser. Adjust the three collimation knobs behind primary mirror to do this. The first time you collimate your scope the primary may way off such that the return beam may miss the secondary entirely. It helps to have someone hold a piece of paper over the end of the UTA so you find the return beam coming off the primary. Adjust the primary mirror collimation knobs until the beam moves over hits secondary mirror and then continue until it hits the tiny dot on the secondary mirror. That's it. Peek inside the upper end of the UTA and look at the end of the laser. You should see the return beam hitting the end of the laser or the inside of the Kydex. Adjust the primary mirror until the beam re enters the output hole of the laser. That's it your optical system is collimated. (See below for the new "Barlowed-Laser" primary mirror technique.) Collimating the primary is much faster if you have a friend turn the collimation knobs behind the primary while you watch the return beam enter the output hole of the laser.

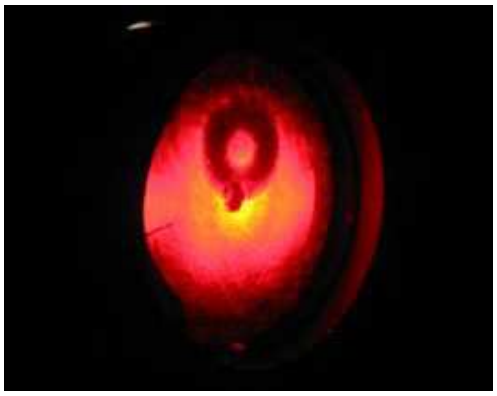
Once you have aligned your telescope, the primary usually stays pretty close to proper position from one observing session to the next. Travel over rough

roads, the bumps and joggles of setup, and the inquisitive fingers of other telescope builders at star parties can change the alignment of the primary. Since it takes only a few minutes to collimate, check the collimation each time you observe. If it stays dead on, that's great, but if it's gone off, it will take just a few minutes to recollimate.

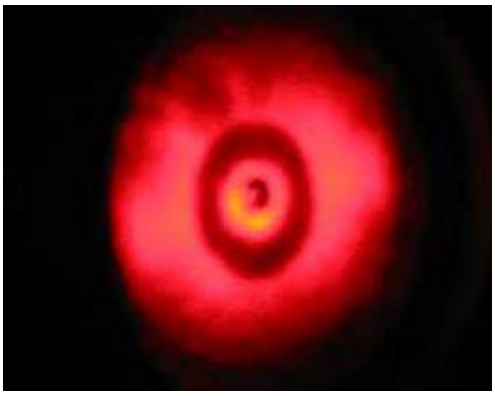
Barlowed Laser Technique

A new method for very precise primary mirror collimation is called the barlowed laser technique. This method was invented by Nils Olof Carlin in Ystad Sweden and published in the January 2003 issue of Sky and Telescope magazine. As Nils explains in his article, collimating any Newtonian telescope like the Obsession with a laser is fast and easy, but not as precise as possible. Space does not permitt going into all the details why this is the case. If you want a full explanation please contact Sky and Telescope for a copy of the article. In short, any small mis-alignment of the secondary mirror as well as flexure in the mechanical parts of the telescope often cannot be detected. The slop that exists in all focusers when you rack them in and out and the slop between the laser-focuser draw tube have a large impact on the position of the laser beam. In fact just tightening the set screws on the focuser can often make the laser beam dance around considerably. How do you know where the sweet spot really is? The barlowed laser technique elliminates these problems.

To try this method you need a barlow that will accept your laser. If you have a 2 inch laser then you need a 2 inch barlow (TeleVue's big barow is perfect). TeleVue's 2 inch Paracor also works well for this technique. Measure the diameter of the inside edge of the barrel of the barlow or Paracor around the field lens. Cut out a small round piece of white paper this same diameter so that the paper circle will have a press fit over the field lens against the inside edge of the barrel. You will need a hole punched or cut into the exact center of this paper circle large enough for the laser beam to pass through. A simple way to make this paper circle is to use your computer drawing program to draw the necessary circle with the smaller circle in the exact center. Print it out and cut out the circle with scissors. Cut out the center hole with an exacto knife.



Before



After

With the paper mask press fit over the end of the barlow (or Paracor), put your laser in the barlow (or Paracor), and into the focuser. Turn on the laser. The barlow spreads out the laser beam so it splashes over the black donut ring on the primary mirror. The return reflection displays a shadow of the black ring within a soft red patch of laser light on the the paper mask on your barlow or Paracor. (Or the image may appear nearby on the inside of your telescope wall if your primary mirror collimation is way off). Adjust the primary mirror until the shadow of the black ring is around the out put hole on the laser on the paper mask. You are finished. Notice how the dark shadow of the ring does not move when you rack the focuser in and out, tighten set screws, or even push on the laser laterally. The ring shadow stays in place. The barlowed laser elliminates all the guess work you get when using the laser alone. Do this technique at night so it is easier to see the shadow. Also after you have aligned the primary with the barlowed laser, you should remove the barlow (or Paracor) and recheck the secondary mirror. Put just the laser in the focuser and be sure the beam hits the dot on the secondary and the exact center of the primary mirror. Don't worry about the primary. After the beam hits the exact center of both mirrors then do the barlowed laser method to finalize the primary alignment.