

## Upper Cage Mods by Jim Fitch

The upper cage on a 30" dob is pretty big. No matter how you pick it up it's an awkward piece to handle. Weight is not a big problem when carrying it around, unless you add weight to it. What? Why would anybody add weight and make this thing harder to haul around? Counter weight.

We all hate it, but many Dobs need counter weight for balance. Short f/ratio Dobs frequently need counter weight at the top and the f/4.2 30" is no exception. The traditional way to add weight to an upper cage with tubes is to add lead shot to the tubes. Once balance is achieved epoxy is poured in the tubes cementing the lead shot in place. The shot is usually placed in all four tubes to prevent torquing forces.

The advantage of this is not having to add counter weight separately when setting up the scope. The disadvantage is having to carry the extra weight, some of it positioned at arms length away - awkward.

I wanted to eat my cake and have it to! This time I could do it. The secret is adding useful weight to the upper cage, like a bigger finder scope. I already had a Williams Optics 80mm refractor and some rings. I just needed to see if it was heavy enough.

The first step was to remove the lead shot from the tubes. After breaking a couple of epoxied bolts - the ones that hold the rings to the tubes - I decided to make new tubes. Now I could remove the old tubes without the concern of reusing them. I used a hack saw to cut the tubes in half and then twisted them free of the bolts holding them to the rings. Further inspection of the cut away tubes showed I would never have been able to get the epoxied shot out.

I had some aluminum tubing, but the finish was not very pretty. The originals were probably clear anodized. I decided to peen them with glass beads. Nick had a sand blasting tank loaded with glass beads, so I spent an hour or so blasting the tubes. The finished tubes have a nice satin finish that looks great.

I rebuilt the upper cage with the new light weight tubes. Lifting and maneuvering the cage is way easier. Now to find out how much counter weight I needed. The photo on the left below shows about how much I needed if it were all on the outer ring. The finder was going to be a bit heavy.



I decided to make the finder's position adjustable so I'd have a fudge factor. I used the original wood strut as the support for the new finder. It needed to be built up for clearance, both optical and mechanical. A couple of apple ply pieces, laminated together worked quite well as a riser. There were already two holes in the strut, so I used those to mount the riser block to the strut. I then mounted a Losmandy dovetail to the riser block. The photos below give you the general idea.



The scope rings are mounted to a long plate, which allows me to fine tune the “counter weight”. The photos below show what things look like fully assembled. Note the finish on the tubes.



The mounting hardware, scope and eyepiece work perfect as a counterweight. No additional weight is needed, at either end of the scope. The cage is much easier to handle, and I’ve got a great finder to boot!