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My mirror cell adventure

by Ralph Marple

My entry into telescope making began one winter night in 1994 when I dropped my 4.25" "department store" Newtonian telescope. Its poorly functioning 0.965" focuser was trashed in the fall and I was forced to upgrade to a 1.25" focuser and eyepieces. When the new focuser arrived I discovered that it wouldn't reach focus because it was nearly an inch taller than the old one. I either had to cut a new hole in the tube to relocate the focuser or cut the end of the tube to move the mirror to the proper location. I opted to cut the tube.

The views through the new eyepieces were tremendous, but the wobbly mount became a real irritant. I resolved this issue by building a dobsonian mount scaled down from one for a 10" scope in Richard Berry's book *Build Your Own Telescope* (published by Willmann-Bell). The improved viewing I obtained from these upgrades cannot be overstated. The scope went from barely useable to a respectable instrument with which I observed most of the Messier objects.

Finally, during the summer of '99, aperture fever drove me to build the 10" scope in Berry's book. I deviated from the basic design in several areas. Most significantly, I used an aluminum tube instead of cardboard and I didn't include the flanges at the ends of the scope. I also shied away from the collimation adjustment design for mir-

ror cell that included three pairs of push-pull bolts. This was similar to the collimation adjustment on my 4.25" scope, and I'd never liked it because the adjustment would move when the final bolts were tightened.

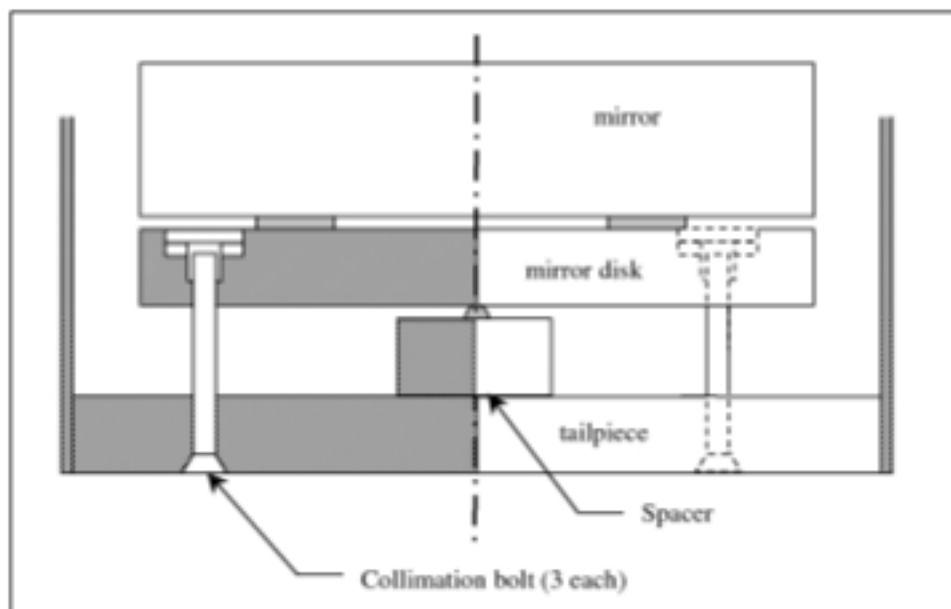
Instead, I opted for collimation bolts that each passed through the center of a spring. The springs were held in compression by the alignment bolts, but the collimation was never "locked" down. This arrangement worked very well even though I could hear the mirror moving every time I moved the scope. The sound of the moving was disconcerting, but the collimation was surprisingly stable. It did not need tweaking very often.

Cement woes

During the process of constructing the scope I made numerous trips to Hechinger's (which was still in business) and Lowe's trying to locate the recommended parts and materials. One item of particular concern was the silicon cement needed to fasten the mirror to the mirror cell, which in my 10" is made from 1/2" plywood. I purchased what I thought was the right stuff, and meticulously followed the instructions for attaching the mirror.

With supplies in hand, I carefully placed spacers on the plywood disk, fastidiously applied little puddles of cement at the

see "Mirror Cell" on page 10



Ralph Marple's mirror cell design. Note the countersunk flat head screws that pull on T-ruts in the mirror disk.