Optical Supports
“Traditional Mirror Cells”

A Classic Design, Revised

By Doug Reilly

A hole in the ATM market has been filled at last! That’s what I thought when I first visited the web page of Curt Walker’s Optical Supports. Finally, I mused, someone has realized the need for premium-quality mirror cells for the diminutive apertures.

I suppose most ATMers make larger telescopes these days, as strip mall lights slowly force us to get bigger light buckets, but at the time I visited Optical Support’s web page, I had not one but two small reflector projects on the work bench in my basement “man space,” as we call it around here.

I started in this hobby about a decade ago with a Meade Model 628 reflector, built in the early 1980s. It was a great telescope, a lightweight tube made of “Fiberlite,” (essentially Sonotube with a fiberglass coating), one of those great all-metal Japanese-produced rack-and-pinion focusers, and an excellent primary mirror. Along the way, someone had upgraded the secondary spider to a Novak. The mirror cell was the old stalwart design, two cast/machined metal rings with three collimation thumbscrews, and mirror clips to hold the primary down.

I put a lot of light years on that scope. 6-inch is a great aperture. I used to set up next to my friend Peter at star parties like Black Forest in Pennsylvania. Peter would find faint fuzzies in his great 17-inch Discovery Truss, and I’d try to find the same in little 628. Under a dark sky, the 6-inch did really well, and we were always surprised what it could see compared to the big light bucket. And along the way, I guess I became a little obsessed with squeezing every bit of performance I could from that tiny aperture. It’s still a challenge I’m working on.

I changed to a three-vane Protostar spider and higher-quality secondary. I added a 2-inch Crawmach Crayford focuser and flocked the tube. And then I got to thinking about things like secondary size. The Fiberlite tube is narrow by modern standards, just over 7-inches wide. With the low-profile focuser and the short distance between the secondary and focal plane, could I drop the secondary size and thus increase contrast.

And then I saw an ad online for a 6-inch f/5 mirror ground by Mark Harry with some impressive test results, and my mischievous mind started thinking: Could I preserve the high-contrast performance of the f/8 scope but gain the rich field of the f/4.7, and essentially use the same 1.3-inch diagonal, representing a pretty low 21% obstruction?

I sold that honey of an f/8 and bought the Mark Harry mirror, and then chopped off a portion of the tube. The secondary and focuser would stay. I started contemplating the mirror cell. Should I just reuse that old Meade cell? Collimation was a primary concern (no pun intended); with a short focal length of f/4.7, collimation would need to be spot on to get the maximum performance out of this scope on planets.

It was about this time that Optical Supports announced their "traditional mirror cells." There isn't much to choose from in this sector of the market; if you need a sub-10-inch mirror cell you have the choice of University Optics cell, a stalwart and functional design that's been around forever, buying a cell on the used market, or constructing your own.

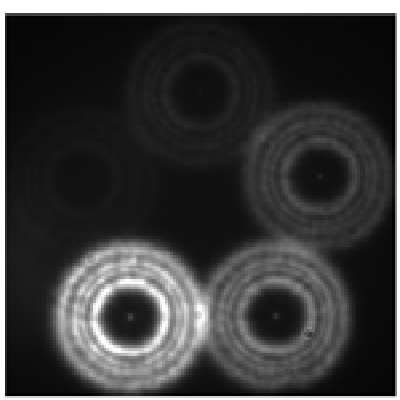
Optical Supports' TMC line represents the highest end of the off-the-shelf small cell market. I liked the build, which matched my other machined components, and I liked the thought put into the design, like stalks holding the mirror instead of clips which, aptly-named, clip off a bit of the light-gathering capacity of the mirror. Most importantly, I liked the precise and lockable collimation the cell promised. I contacted Curt Walker and reserved one of the first of his production

Image 1

run. Since my scope is stored in an unheated garage, I did not get the cooling fan option.

Looking at the 6TMC out of the well-packaged box (**Image 1**), the lineage back to the Meade, Cave, and Optical Craftsman cells of the past is evident – at least, the basic form is there. But the traditional cell form has been given the fully modern, machined makeover. The superfluous rings have been shed, and the supporting interior triangles have been carved out and made more beefy. The three spring-loaded collimation bolts have been joined by three locking bolts to help preserve collimation between viewing sessions. Instead of mirror clips that block a tiny portion of the primary mirror's surface, Curt has designed vertical stalks that would grip the mirror on the sides. Curt even designed in a way to neatly-attach a mirror-cooling fan to help bring the mirror to ambient temperature before an observing session. I decided to uninstall the fan (since I have one attached to my rear telescope tube cap) and can only comment that the fan is neatly integrated into the cell structure, as you can see in **Image 2**.

The mirror cell is extremely well machined and appointed. Everything is top quality, down to the stainless steel hard-



Then, I let it dry. I was a bit concerned that the mirror might shift around on the felt pads, but once it was dry, I lifted the mirror and cell and shifted it around. The mirror stayed put.

Installing the reassembled cell into the tube was a more simple process; I just drilled three holes into the tube at 120-degree increments. The supports that connect the tube to the cell also slide in and out—that's what gives the cell their flexibility as regards to tube diameters, and they also shift slightly side to side in case your holes are not perfectly drilled. As Curt describes on the Optical Supports website, the 6TMC self-centered itself in the tube as I tightened everything down. (**Image 3**)

Image 3

So, how does it work? First light of the scope was pure joy. I collimated the scope first with a laser, then with a Catseye Cheshire, then with an autocollimator. The collimation bolts are quite precise. Based on several observing sessions, the locking bolts and general precision put into the mount's machining does contribute to consistent collimation. My only caveat is that the locking bolts do effect collimation slightly, enough that for me it became a kind of give and take between the collimation bolts and the locks, until it was both zeroed in and locked down. There's a learning curve, but I appreciate the precision. I still check the collimation each time I go out, but I find that most of the time I don't have to tweak the scope at all.

I don't have any evidence of pinched optics or introduced aberrations by the cell's support structure. The views provided by the finished scope (**Image 4**) – both planetary and deep sky – are exemplary. In fact, they far exceeded the original Meade 628 and the scope gave me the second-best planetary views I've ever seen in a 6-inch scope. (The best come from the other 6-inch scope project on my workbench, an off-axis reflector that's a subject for another review.)

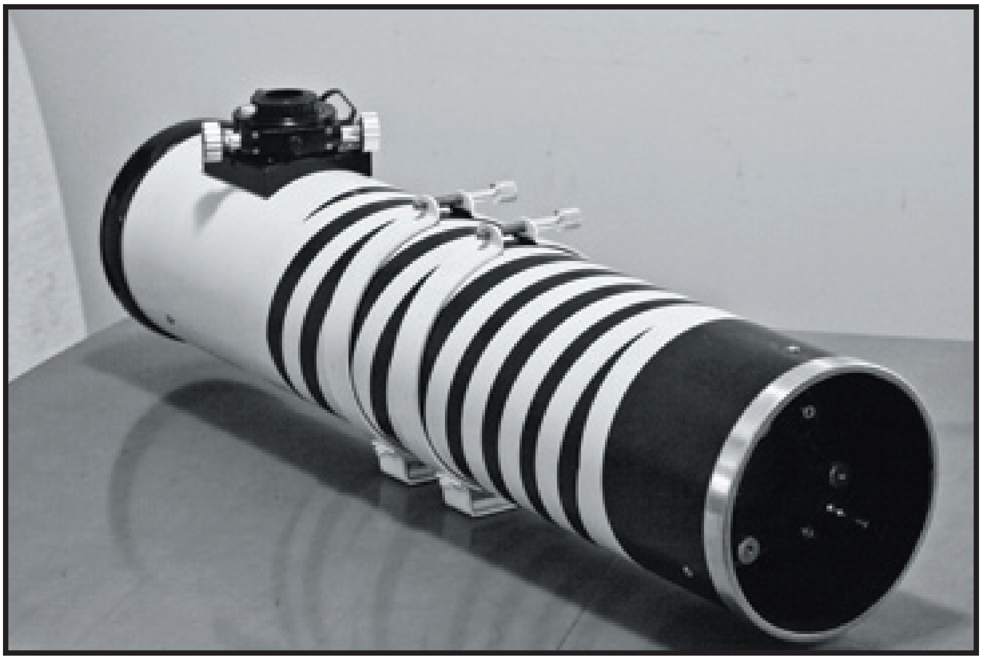


Image 4

The bottom line: Curt Walker's Optical Supports Traditional Mirror Cells do everything their forebears do, but with precision machining and enhanced functionality that demanding modern ATMers are looking for as they put together optical systems designed to push the envelope of performance per inch of glass.

If you are interested in the Optical Supports mirror cells visit www.optical-supports.com. ATT