

## Re: 4 inch reflector can't resolve Mars at all

---

*Source:* <http://sci.tech--archive.net/Archive/sci.astro.amateur/2007-05/msg00524.html>

---

- *From:* [wsnell01@xxxxxxxxxxx](mailto:wsnell01@xxxxxxxxxxx)
  - *Date:* 13 May 2007 04:16:06 -0700
- 

On May 12, 5:41 am, pau...@xxxxxxx (Paul Schlyter) wrote:

In article <1178927950.515878.321...@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx>,

<wsnel...@xxxxxxxxxxx> wrote:

On May 11, 3:42 am, pau...@xxxxxxx (Paul Schlyter) wrote:

In article

<1178842877.144621.36...@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx>,

<wsnel...@xxxxxxxxxxx> wrote:

To obtain tracking with all but the smallest scopes often seems to double the cost of the instrument, conservatively.

It will probably double the cost even for the smallest scopes: try to buy a toy scope at some department store, then buy an equatorial mounting with a clock drive for that scope.... I don't think cost doubling is enough in that case.

Well, yeah, I suppose you could put a 50mm refractor on an Astrophysics mount – or a Questar OTA on an EQ-1,

You could do a lot of weird things of course. But will you be able to even find an equatorial mount, with tracking, which costs not much more than a 50mm refractor in a department store?

## Re: 4 inch reflector can't resolve Mars at all

A Poncet table, built in the original form (S&T Jan. 1977) should do the trick. A cheap synch motor/tangent arm would suffice as the drive. Even 50mm scopes run \$40 to \$50 or more, if a tripod/mount is included.

but in general an equatorial mount seems to account for about half the cost of a – typical– setup. The mount for a Dobsonian OTOH consists mostly of a few square yards of plywood, even for the large scopes, i.e. an almost miniscule cost in comparison to the tube assembly.

You said: "To obtain tracking with all but the smallest scopes often seems to double the cost of the instrument". My argument was that to get tracking on one of those smallest scopes will more than double the cost of it.

The equatorial StarBlast w /drive is only 45% more expensive than the alt–az StarBlast, and only 10% more w/o drive. Look at the Orion site for other examples. In the smaller sizes, an equatorial mount isn't much more complicated to build than an altazimuth, and the cost of eyepieces, finders, focusers, spiders, etc., is a larger factor in the cost of small scopes, compared to larger scopes, as it should be.

For a few examples, \$500–\$600 buys you a 10–inch Dob or a 5–inch equatorial Mak; \$900–\$1000 buys a 12–inch Dob or a 6–inch equatorial Mak. OTOH an 8–inch Dob is available for around \$360, while an 8–inch equatorial Newt w/drive will run well over \$700.

Of course your argument is valid in \*some\* cases! I was merely arguing against its claimed general validity.

My arguments are valid in most cases not just some cases, and usually valid for the sort of scope/mount combinations that most amateurs would consider buying or building.

I could point to the Questar which costs several thousand in its 3.5" version. This is much more than your 12–inch Dob or 6–inch equatorial, so in that particular case "a smaller aperture is more expensive". But that's a very special, not a general, rule!

Re: 4 inch reflector can't resolve Mars at all

Everything about the Questar is more expensive and it is aimed at a somewhat different market than the usual astro telescope. However, the lowest priced Standard Questar seems to be only 40% more expensive than the lowest priced Field Model and the cost to convert that Field to a Duplex adds about 80% to the cost, i.e. once again the mount is less than half the cost in small apertures.

Or for the same outlay you might get about half the aperture with a scope that tracks.

Comparing a clock-driven 4-inch with an 8-inch Dob, by the end of the night, you will have seen more detail in the larger scope. No matter how long you stare at the perfectly centered image in the smaller, clock-driven, scope, you will not, ultimately see as much as you would through the larger Dob.

Doesn't the cost of a scope generally increase more than the aperture?  
So that a scope with twice the aperture will cost more than twice as much?

Otherwise giant scopes would be quite affordable – so that instead of 25 people each buying an 8-inch scope of their own, they could instead join and together buy, say, the 200-inch Hale telescope. If 50 people joined, they could buy one of the Keck telescopes. Wouldn't that be something? ;-)

## Re: 4 inch reflector can't resolve Mars at all

Earlier I've heard estimates that the cost of a scope is apporimately proportional to something between the square and the cube of the aperture, and that sounds more reasonable to me. If the cost rises as the cube of the aperture, then some 125,000 instead of just 50 potential buyers of personal 8-inch scopes would have to join forces to afford the Keck.

Yes, again, the cost does seem to scale up exponentially with aperture, but the cost of an equatorial mounts rises too, as carrying capacity increases.

So the equatorial tracking mount will probably be about as expensive as the rest of the scope, and adding an equatorial mount and tracking will probably double the cost of the scope for many common scope sizes.

But since the cost of the scope rises faster than linearly with aperture, if you omit the eq. mount you can probably not get a scope with twice the aperture for the same cost. Perhaps 40–50% larger aperture, but not 100% larger. In some cases (like the ones you pointed to above) you could probably get twice the aperture, but not in general.

In the middle range of aperture, an equatorial mount w/drive will usually be roughly equal to the cost of the OTA, although it can be argued that this might result in an undersized mount. In that case you might consider spending more on a sturdier mount and/or a Mak or SCT(compact, lighter, more expensive for given aperture) instead of a Newtonian (long and heavy.) You will probably end up with about half the aperture of a comparably priced Dob as a result, especially if you are seeking a rig as smooth and stable as the Dob. The OP's 4-inch scope tracked Mars for about the same price as an XT-8, but its OTA was short and light; try using that mount for a 6-inch f/6!

Also, a Dob isn't merely "an equatorial with the eq. mount removed". The Dob tries to simplify the entire scope to keep the costs down. As a result, the Dob is most likely of lower quality than the OTA of the equatorial scope. And I'm not just talking about the optics here. Perhaps the tube of the Dob is less stable, or causes more thermal turbulence during the cooldown of the scope? Perhaps the focusing of the Dob runs less smoothly? Perhaps the finder scope of the Dob is of lower quality, or even absent? There are many ways you could cut down the cost of a product – you do get what you pay for.

Re: 4 inch reflector can't resolve Mars at all

The XT-8 has a 50mm finder, 2-inch focuser, Plossl eyepieces, a steel tube, a spider and mirror cell that look fine. Overall the OTA looks comparable to Orion's 8-inch f/5 equatorials.

"But giant scopes also have an observatory built around them!", I hear

you object. True, but people buy personal observatories around their 8-inch scopes too. And the cost of buildings will also increase faster than their physical size.

I don't get your point WRT to observatories, but a very large scope might no longer be portable, so, yes, you will probably need an observatory.

Very large scopes must have an observatory: they're not portable but they still need shelter against bad weather. And I thought it was unfair to compare the cost of a very large scope with observatory with a much smaller scope without an observatory. That's how the observatory entered the discussion....

YOU brought up the idea of an observatory; I'm not even factoring it in WRT cost. But if your scope is so large that you really do need to build an observatory for it, it certainly seems fair to include that in the costs

.