Recently I acquired a Celestron altazimuth mounting, as used on the "Premium" 80 mm f/11.3 refractor, similar to the the altazimuth mount for the Meade 90 mm f/11.1 refractor. This light-weight, compact, unit has slow motions and clutches on both axes. The world needs more such mountings -- they facilitate quickly carting useful telescopes outside, for hasty looks at things. I have a larger altaz mount, a Vixen bent-yoke unit; the Celestron is notably easier to haul around.

The mounting had some problems, which I fixed. Others might be like to know what they were, and how I proceeded.

First, the legs were poorly braced and not triangulated at all; but they were not standard -- I bought the mount used -- so I will defer telling how to fix them, just recommend you do so if need be.

Second, the azimuth slow motion had a lot of slop. The mechanisms are similar for both axes, so my advice might apply to either.

Third, the altitude clutch took a wrench to adjust -- two, in fact, as the adjustment, made by rotating a nut on the free, threaded end of the altitude bearing shaft, is held fast by tightening down another nut against the first one. It's a fussy job, and furthermore, friction between the cast metal mounting parts and the inner nut tended to back off the clutch in casual use.

The fix was easy. There was a flat metal washer between the nuts and the casting. I cut a thin teflon washer to match, to go between flat washer and the casting. That decreased friction enough to make the clutch easier to use and less likely to back off. Almost any plastic should work as well, since this application does not use Teflon's special quality of lower static friction than kinetic friction. A better fix might have been to replace both nuts with a single wing nut, so the clutch became adjustable by hand, but I haven't yet chased down a 12 mm wing nut, and maybe my hands are not strong enough to tighten one. A star washer might help.

The slop in the azimuth slow motion exceeded half a turn of the control knob -- way too much. I could not make two-way corrections without releasing my hand and regripping the knob. There were two sources of excess play, but to describe them I need to tell how the slow motion works. My explanation will likely not make sense unless you have a similar mounting in front of you, and the requirements for a sketch are beyond my abilities with "ASCII graphics". But, if you don't have such a mount, this article likely isn't of much interest.

The control knob is affixed to a flexible shaft, which in turn is

attached to a threaded rod held between bearings, so it can rotate without going anywhere. An odd-shaped nut is threaded onto the rod -- a little squarish block with a round "thumb" sticking off to the side. The thumb fits between the "tines" of a metal fork protruding from another part of the mount. When you turn the knob, the rotating threaded shaft carries the nut along, so the thumb pushes on one "tine" or the other, and makes it move.

A screw and washer threaded into the tip of the "thumb" prevent it from rotating out from between the fork tines as the threaded rod rotates. A small amount of the slop in my mount was caused by that screw not being tight enough, easily fixed with a screwdriver.

The lion's share of the slop came from the diameter of the "thumb" being less than the spacing between the "fork tines". When I reversed the direction of rotation of the control knob, nothing happened till the thumb had backed its way across the gap.

A feeler gage is an inexpensive jack-knife-like clump of leaves of metal of known small thicknesses, made just for finding out how tight such gaps are. My mount's gap was a little wider than 0.010 inch. I found some 0.005-inch brass "shim stock" at a hardware store, at a cost of only a few pennies per square inch, and cut a strip large enough to wrap around the "thumb". That fixed the problem. Actually, it took me a few days to get by the hardware store; as a stop-gap (*ahem*) measure, a few layers of aluminum foil did satisfactory temporary duty.

The total cost of these changes was under a dollar, and they made a dramatic improvement in the usability of the Celestron altazimuth mounting. I hope some of you find this information useful, or are inspired to come up with better ways of fixing up your own mountings.