Flexible Threaded Rod Telescope Drive

designed and fabricated by Don Clement

This is a report about a telescope drive system that doesn't use a worm gear. Threaded rod drive systems have a reputation for extreme smoothness, no periodic error, and large reduction ratio. Some threaded rod drives use a straight rod with a band or cable connection to the driven axis. Others have tried to curve the threaded rod itself. I propose using a flexible threaded rod that uses the machined circular shape of the driven sector and only deviates from this circular shape in the vicinity of the drive nut.

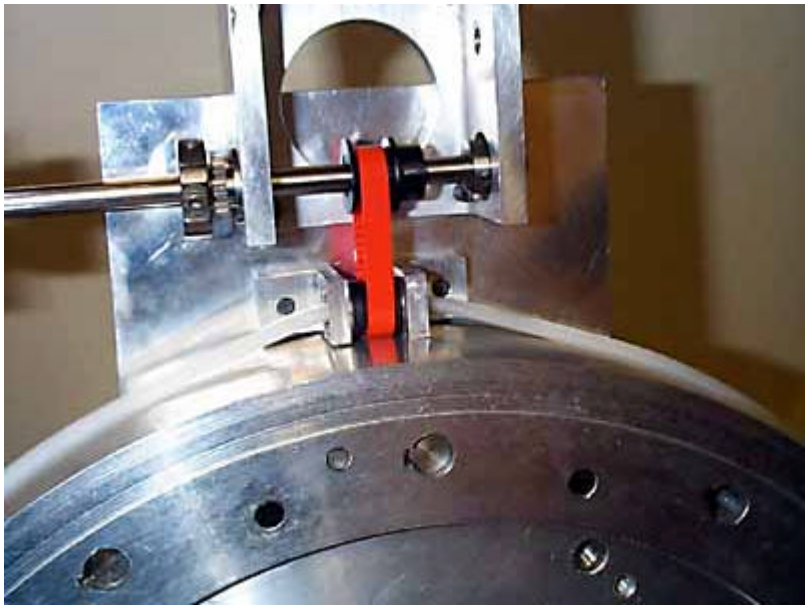
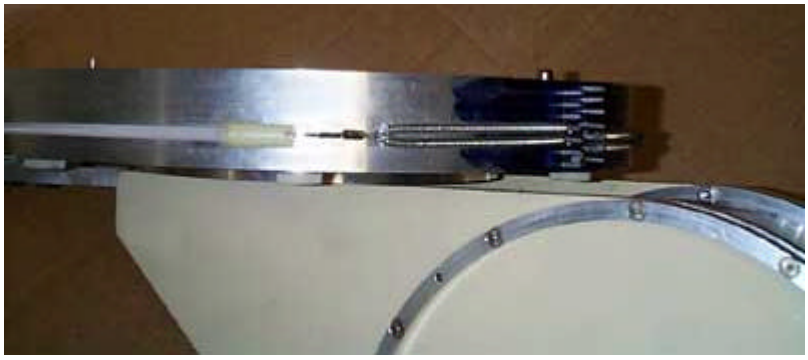


Figure #1 Flexible Rod Drive Assembly

The drive I have built is shown in figure #1. I used the RA bearing assembly from another Cable Drive system for a test platform. An off the shelf nylon #10-32 threaded rod is used. A flat has been milled the entire length of the rod making the rod a "D" shape. The rod is attached to the 12.5" drive disc at both ends with springs shown in figure #2.

The drive nut is a 1/4" brass rod threaded through and held between two 1/4" bore BB races shown in figure #3. The drive nut is driven by a small cog drive belt from a counter shaft that is coupled 1:1 to a stepper motor. No other reduction is necessary.



Figure#2 Rod End Spring Anchored

I have not completed testing of this drive yet. It looks good so far. I plan to parallel multiple threaded rods on the same axis, each driven by a separate stepper motor. The final drive rate should be the average of the parallel driven rods with better quality than each individually.

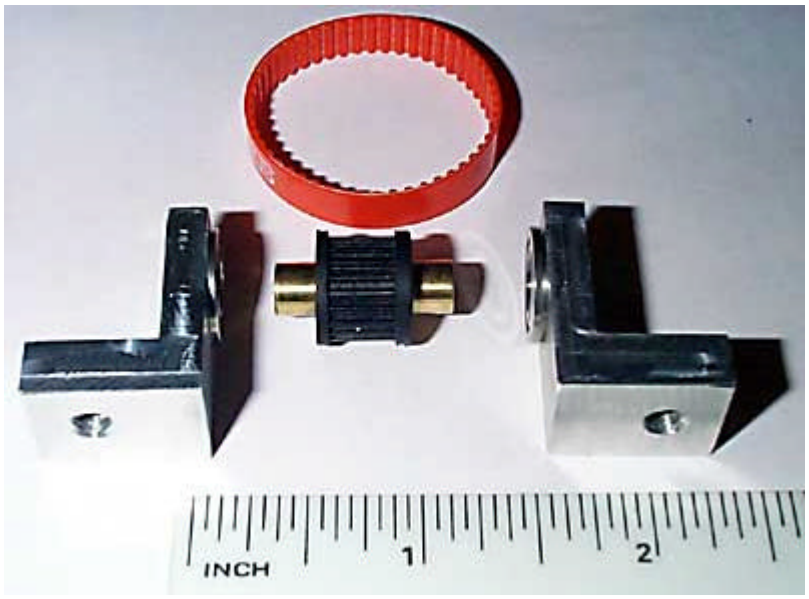


Figure #3 An exploded view of the drive nut assembly.

If you have comments or suggestions, email me at: clement.focuser@charter.net
While your here check out my Dew Heater Control circuit.