

Clement Focuser

# Cable Drive

**Telescope Cable Drive**  
designed and fabricated by Don Clement

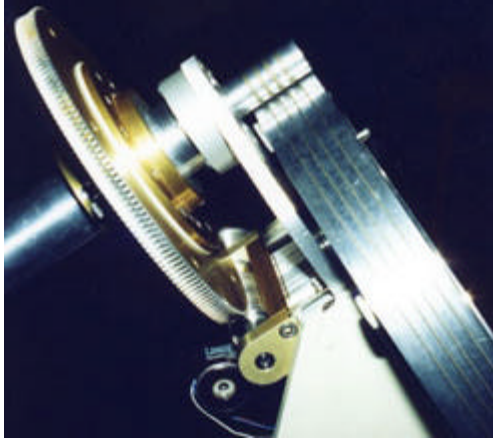
This is a description of a backlash free drive used as the final reduction in my equatorial telescope mount. I first saw this type of cable drive in a brochure from a company called Trax. The advantages of a cable drive are: backlash free, no periodic error, smooth round easily made surfaces, and extreme stiffness. The final drive ratio of my RA axis is 15:1 formed by coupling a 0.82" diameter shaft to the 12.5" diameter ring. The shafts are connected by four independent 0.037" diameter multistrand cables. One end of each cable is anchored to the 12.5" ring and travels around the small shaft 3 times and is attached with a spring to 12.5" ring. The 12.5" ring forms part of a clutch. The clutch rotates on the outer housing of a single 8" bore Kaydon X bearing on twelve 1/4" Delrin plugs. The Delrin plugs ID were machined on the same setup as the 12.5" disk OD, insuring that all pieces rotate concentrically. The small shaft is driven by a Byres 8" worm gear. The worm also has a clutch. This enables the drive to be reset and also allows slow motion control of RA by manual manipulation of the small shaft.

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*RA drive assembly*

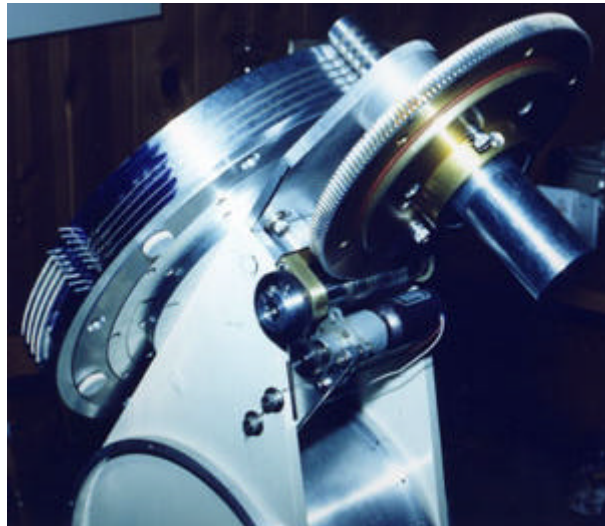


*with latitude adjuster on tripod.*

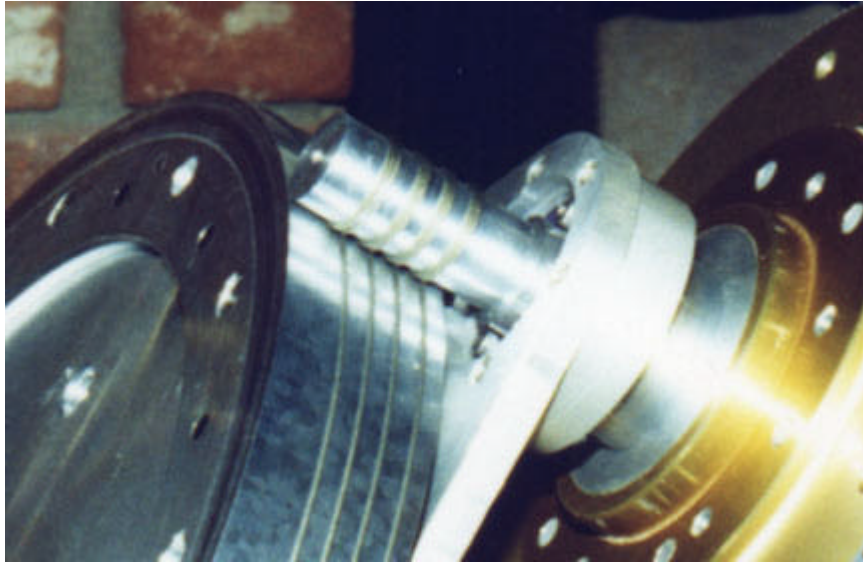


*Side view of cable drive.*

*Cables hard anchored at one end.*



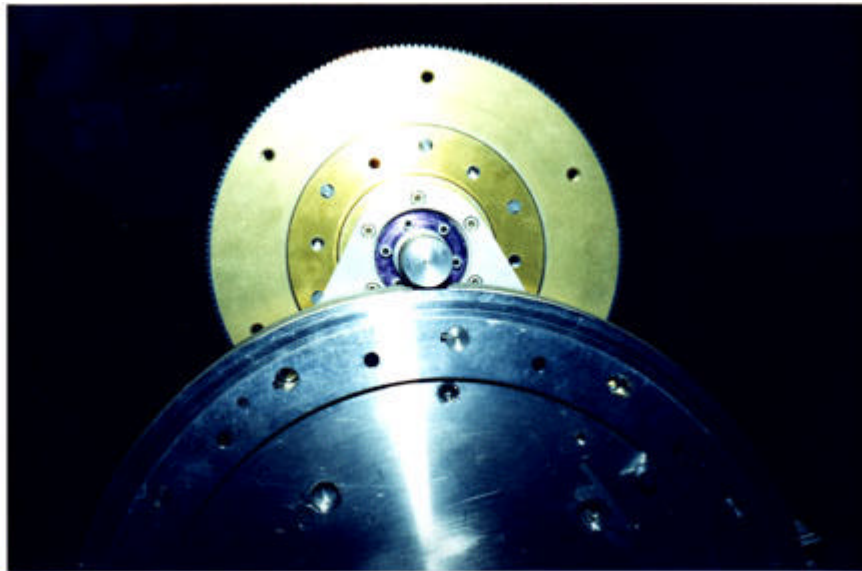
*Other end attached with springs.*



**View of cables wrapping around two shafts.**

Multiple cable wraps around the small shaft increases friction and eliminates slippage. Minimal separation of the two shafts maximizes stiffness by minimizing the length of unsupported cable.

**Byre"s 8" worm gear, small and large shaft.**



**The top view showing shaft spacing.**

If you have comments or suggestions, email me at: [clement.focuser@charter.net](mailto:clement.focuser@charter.net)

Check out my [Dew Heater Control](#) and [Flexible Threaded Rod Drive](#).

