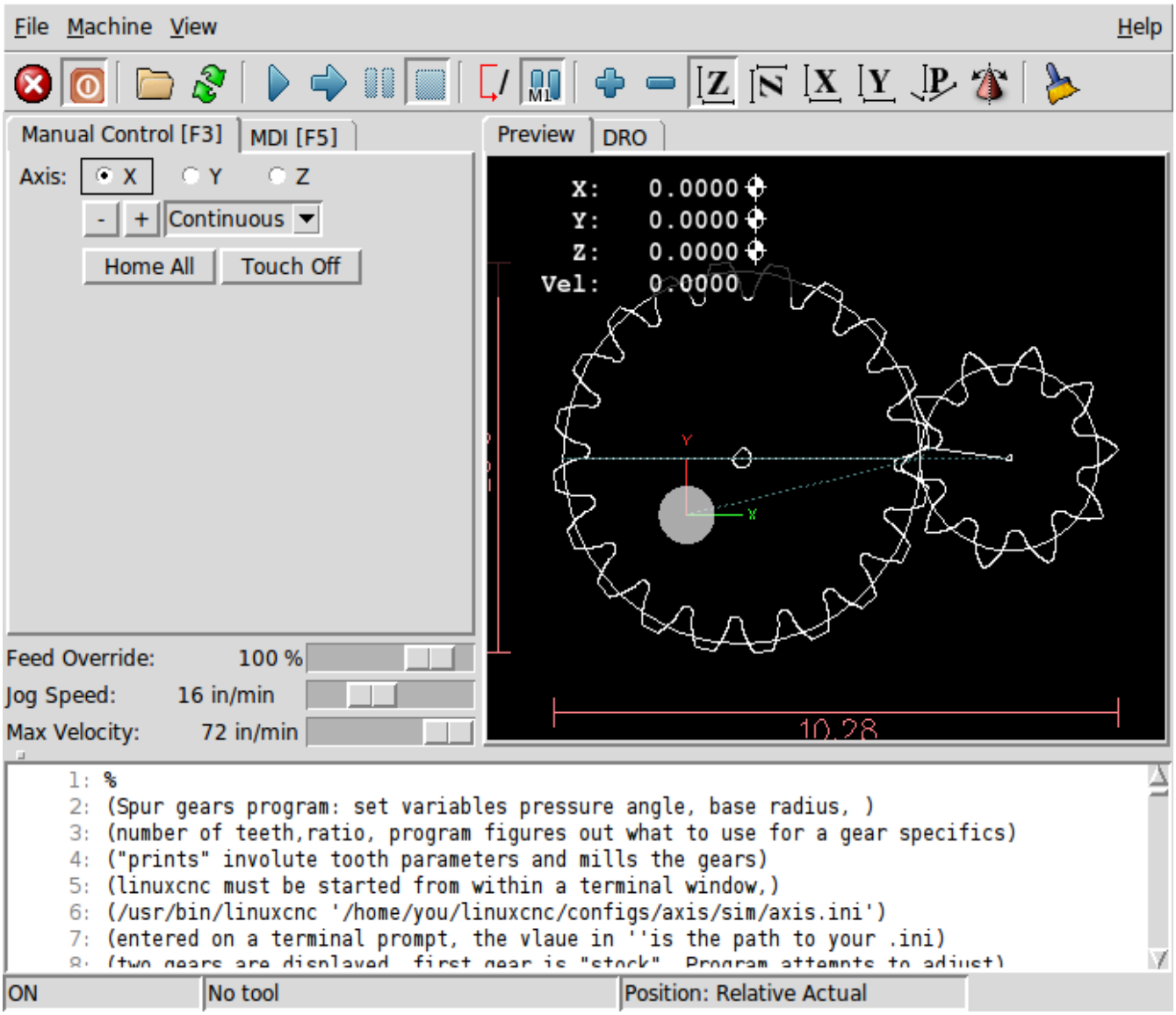
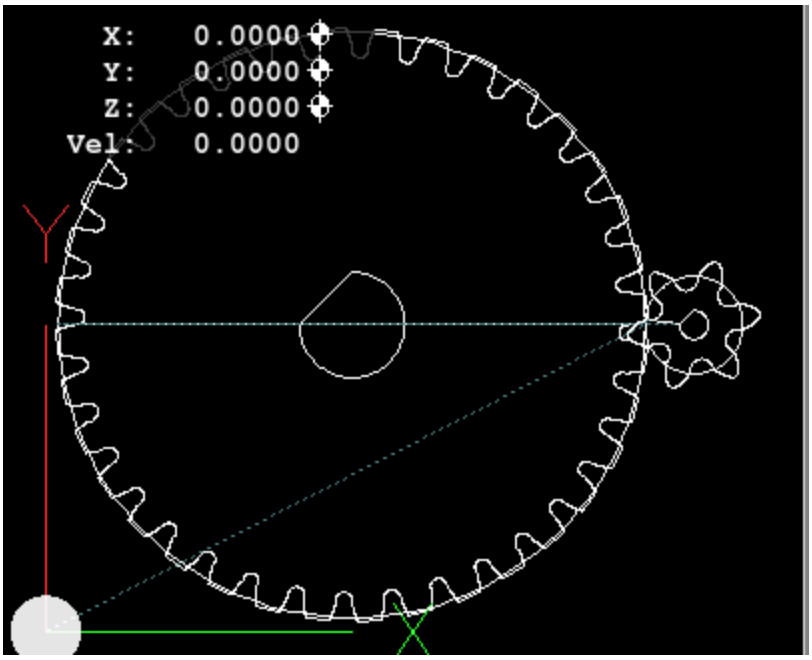
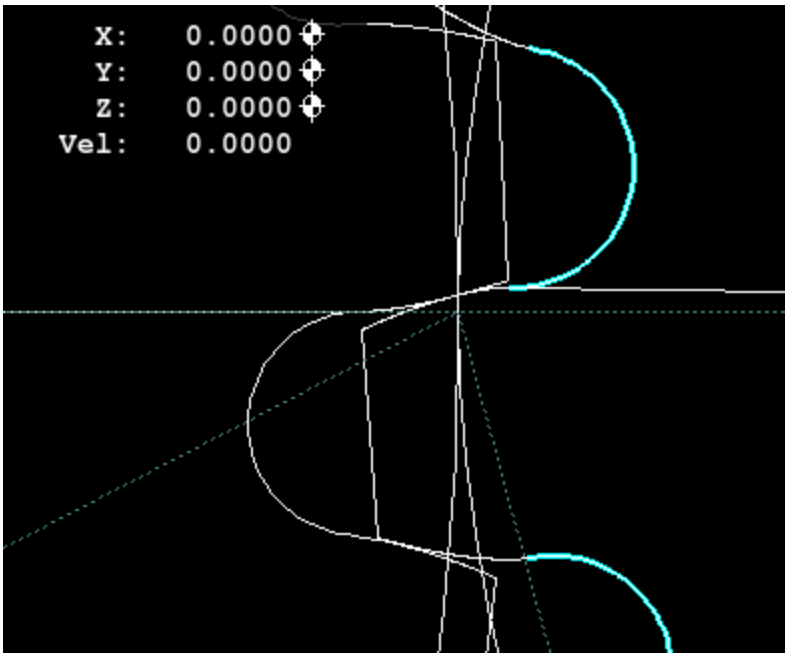
These are a few screen dumps of the output of the g-code program for making gears:



It’s a stand alone gear generating program making gears with teeth derived from involute of a circle. Open it like any other g-code program, print statements record gear specifics on the command window left over after starting linuxcnc.

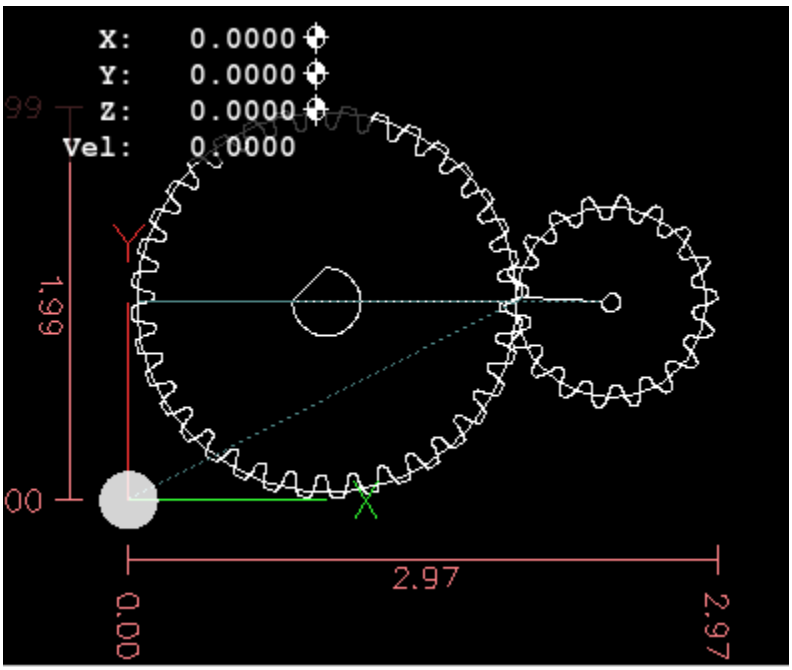


The program can be used to generate different ratios, heres a six tooth pinion driving a 36 tooth main gear. There's lots of documentation that says one should never use less than 12 teeth on an involute-toothed gear. (the mesh angle is steep, a heavy load may cause a little slippage and the gears may "stick" instead of rolling and the gear train would lock up catastrophically). It might work just fine for light loads right though.

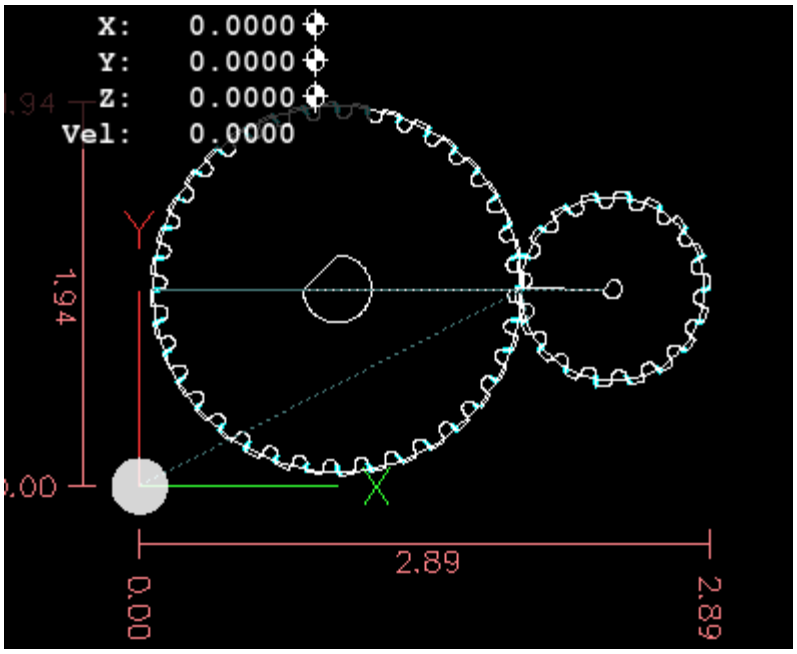


Here's a closep of gears meshing with the circular gullet highlighted. The program always tries to mesh the gears and includes a facility for rotating the meshed gears so one can check for interference. The width of a tooth and gullet are computed and the auto sizing feature can be disabled if it is necessary to increase or decrease the amount of backlash. With a Sherline 2000 vertical mill and a 5/64 endmill, my experience is that we have about .002" of slop in the cut. This is a large amount compared to the amount allowed in a good gear so I recommend using large teeth where possible and definitely make a test cut in fiber board or plastic before cutting any good material so you can confirm or refine the measurements shown. I don't have much experience with a regular gear cutter and a rotary table but I guess that their repeatability has to be much better than .002, and that's a second reason for making

big teeth. (aside from the fact that you won't be able to make very small teeth with a vertical endmill). This program uses many samples from the involute curve when generating the teeth so a large tooth "should" work ok and it will be stronger than a small tooth.

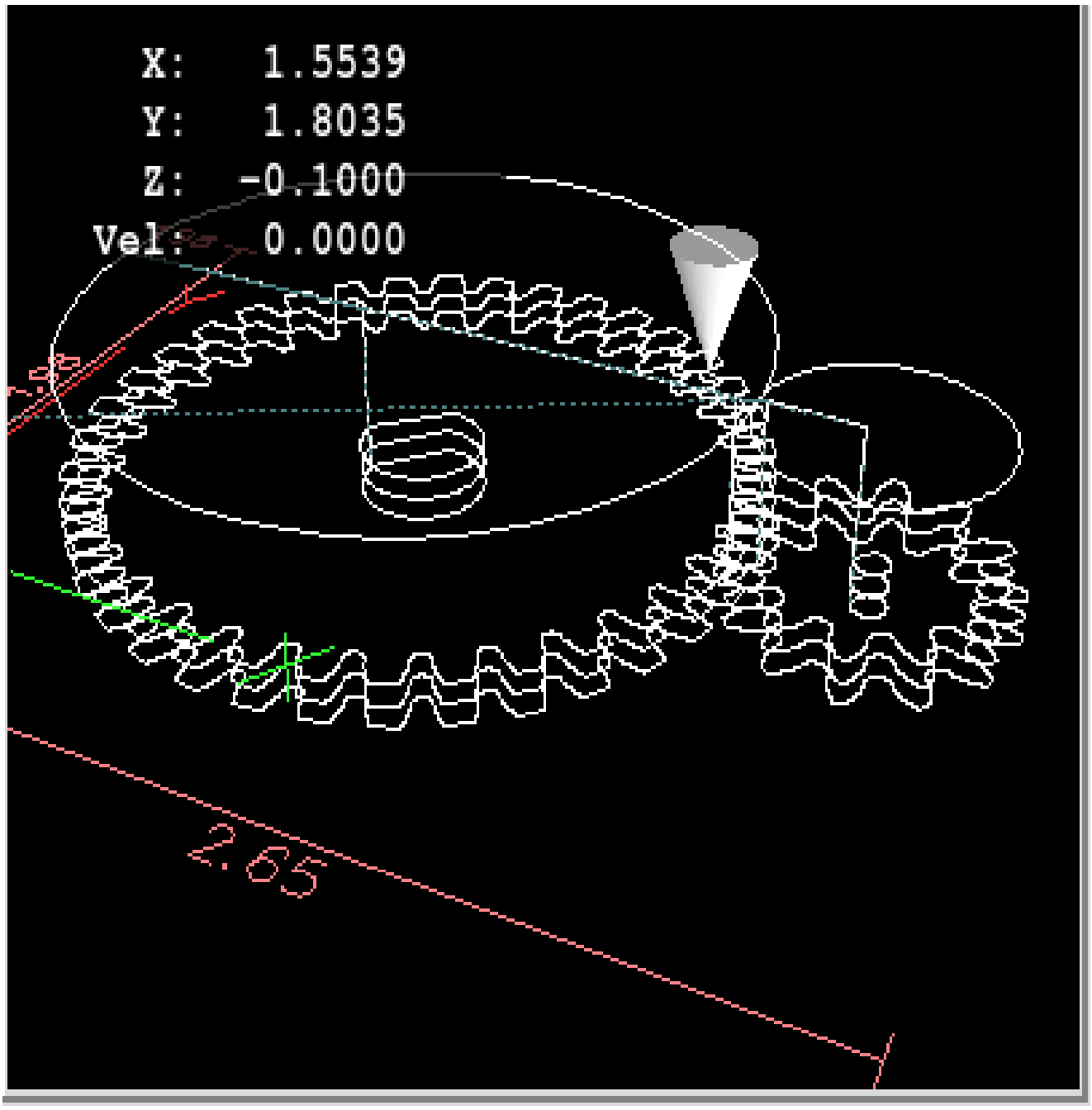


This shows the gear using different pressure angle, supposedly a larger pressure angle makes a longer tooth and puts more pressure on its supporting bearings. Smaller pressure angle are supposed to run smoother.



The program displays the co-ordinates of the gear center and one can determine the center to center distance of the gears. Be advised that this distance changes based on pressure angle gear diameter tooth number, size. The center to center mounting dimensions are important for a smooth running long lasting gear train. Mounting the gears at the correct center distance should also consider gear expansion and bearing run-out as well as gearbacklash requirements appropriate to the size and pitch of the gear. Its difficult to get it right accoding to

some of the documents I have seen, so good luck here.



The suggested milling setup just has a plate of material mounted to the cross table via clamp or two sided tape. Center hole mills completely, then complete gear blank, then smaller center hole and finally smaller gear. The program comes setup

for milling air, change feeds as appropriate to what you're cutting, program has a cutter comp line which should work for different cutters assuming you change the parameter cutterdiam to match.