Test program for TNC simple path using Tool Node Compensation

Front post lathe test code

```
(GENERAL TNC EXAMPLE)
(T101 - O.D. Rough Tool)
(55 Deg. x .031 TNR, TIP Direction 3)
N010  G18
N106 G54 G00 X2.1 Z0.1 M08 (Rapid to start point)

(Define part path PQ sequence)
N112 G41 G00 X0.55 Z0.1 (Start TNC move)
N113 G01 Z0. F0.004
N114 X0.65
N115 X0.75 Z-0.05
N116 Z-0.75
N117 G02 X1.25 Z-1.0 R0.5
N118 G01 Z-1.5
N119 Z-1.72 X1. F0.006
N120 G01 Z-2.5
N121 G02 X1.25 Z-2.625 R0.25
N122 G01 Z-3.5 F0.004
N123 X2. Z-3.75 F0.008
N124 G40 G00 X2.1 (Cancel TNC Departure move)
N317 M30
```

```
The above plots as shown below (which matches what I thought I had
programmed) with my gcode editing tool (NCPLot):
```
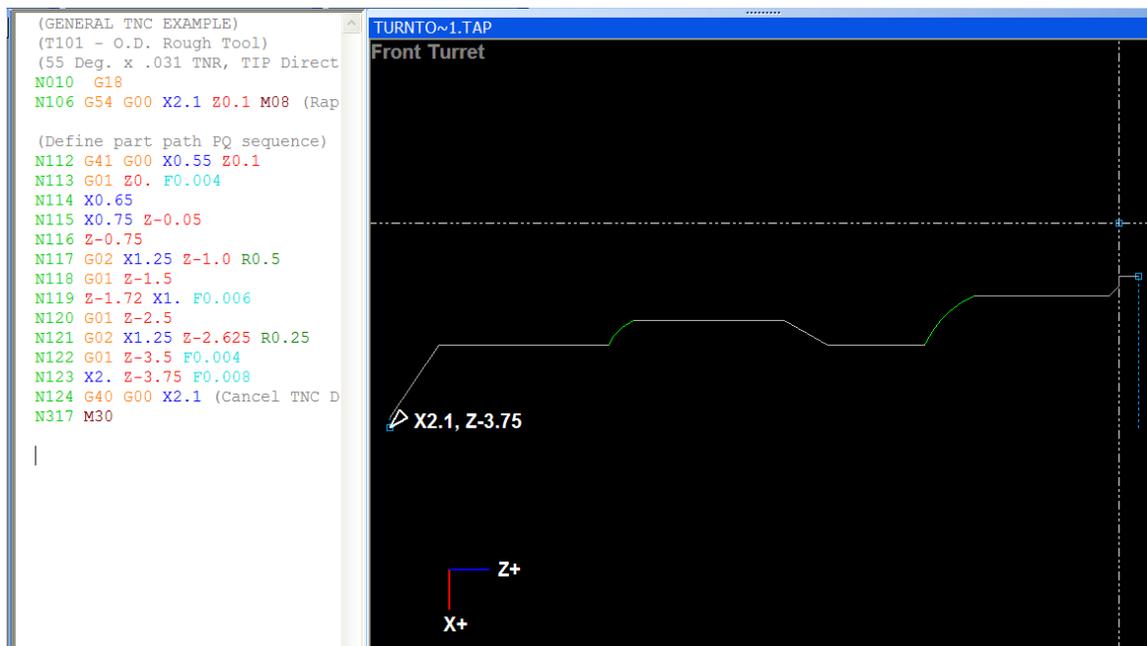

But mach shows a path of this:
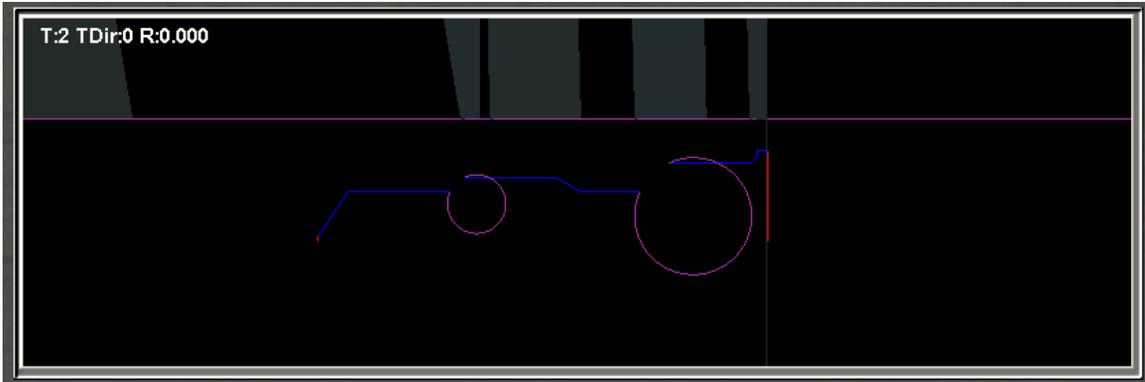
Note the arc difference.

The stock object rendering is messed up (the grey streaks) due to a bug in mach that has been on the yahoo list discussion the last few days – so I ignored that for this exercise.

It seems that mach is picking the wrong one of the two possible solutions to fit the arc to the start and end point?

The turn gcode manual says:

> **Radius Format Arc**
> In the radius format, the coordinates of the end point of the arc in the selected plane are specified along with the radius of the arc. Program G2 X~ Z R~ (or use G03 instead of G02). R is the radius. The axis words are all optional except that at least one must be used.
> The R number is the radius. A positive radius indicates that the arc turns through 180 degrees or less, while a negative radius indicates a turn of 180 degrees to 359.999 degrees.

So I think the use of R+ radii in the code is correct, but it looks as if maybe mach plots them as R- radii? So I tried reversing the sign of the radii in the code.

That experiment resulted in:
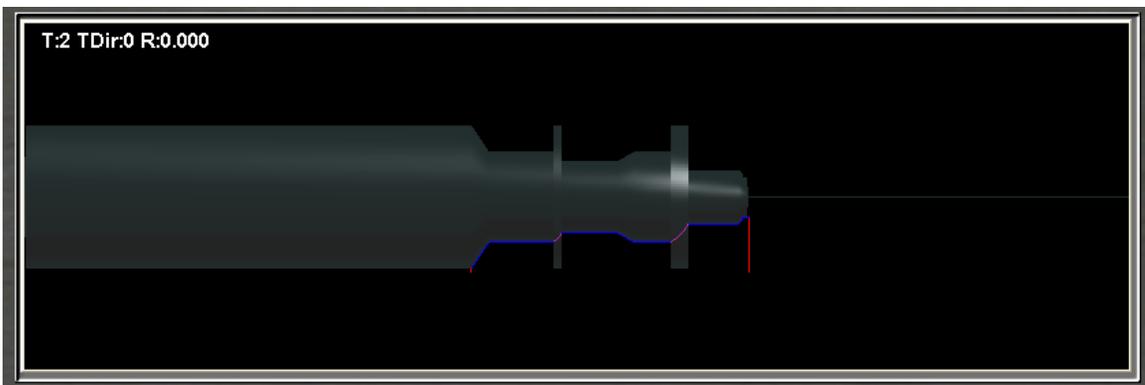
So the R sign reversal caused the arcs to do the smaller circumference, but also reversed the direction of the arc.

There is also a problem in that the turn object is not begin "Cut" for arcs in the rendering – I'm also ignoring that and focusing just on the path shape.

I'm confused – I think my gcode is correct, but I've not enough confidence to make that claim strongly… have I done something wrong?

FYI – this is mach 3.43.37

Dave