THREADING ALONG A TAPER – SIMPLE THREADING LATHE WIZARD

The threading wizard will generate gcode to cut threads along a taper. The following are just some remarks relative to the wizard inputs and the generated pathing.

LATHE CONFIGURATION
Imperial units
Radius mode
Reversed arcs checked
Exact stop mode
M1076 MACRO set to generate G32 code

WIZARD SETTING
All the following settings and inputs are just for a ***hypothetical*** tapered thread.
In this case threading will be done on a 45 degree tapper, ten thread passes with a total depth of 0.1" .

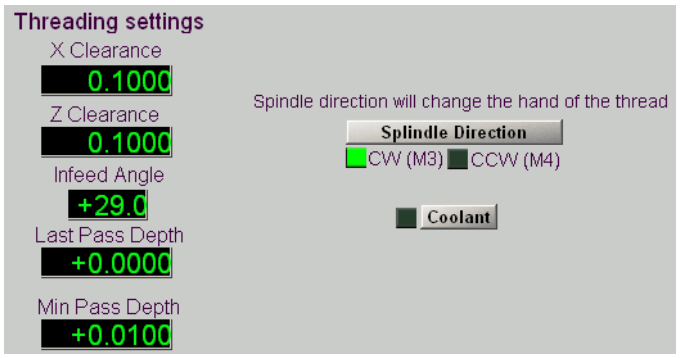

FIGURE 1

WIZARD INPUTS

If this was straight threading the taper input would "0.00" and results are as follows:

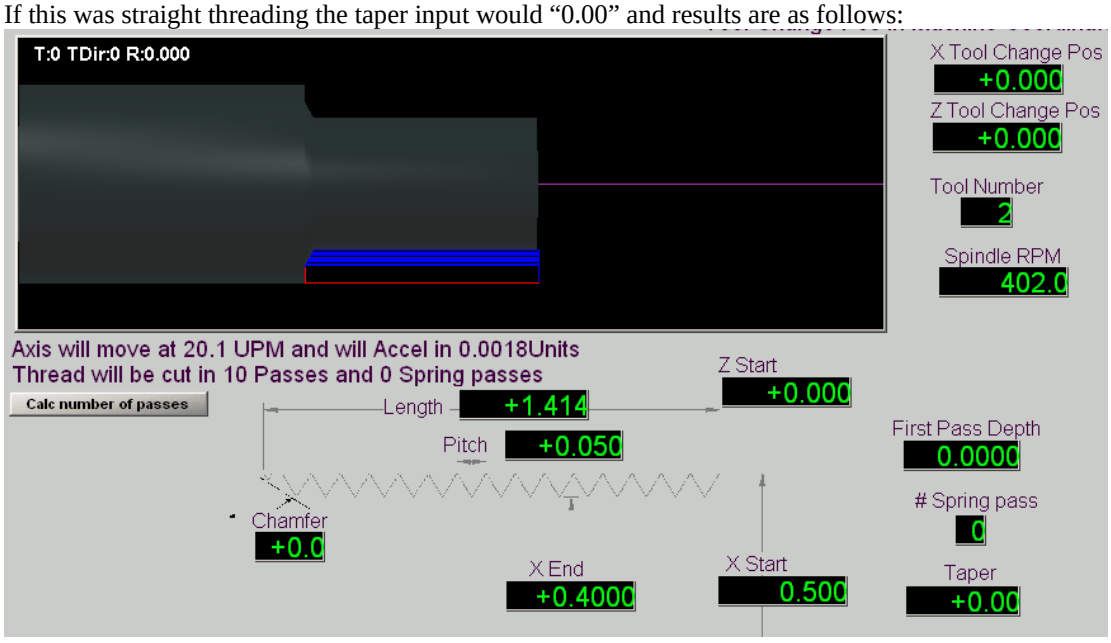

FIGURE 2

If the user uses 45 deg for the taper the results would be:

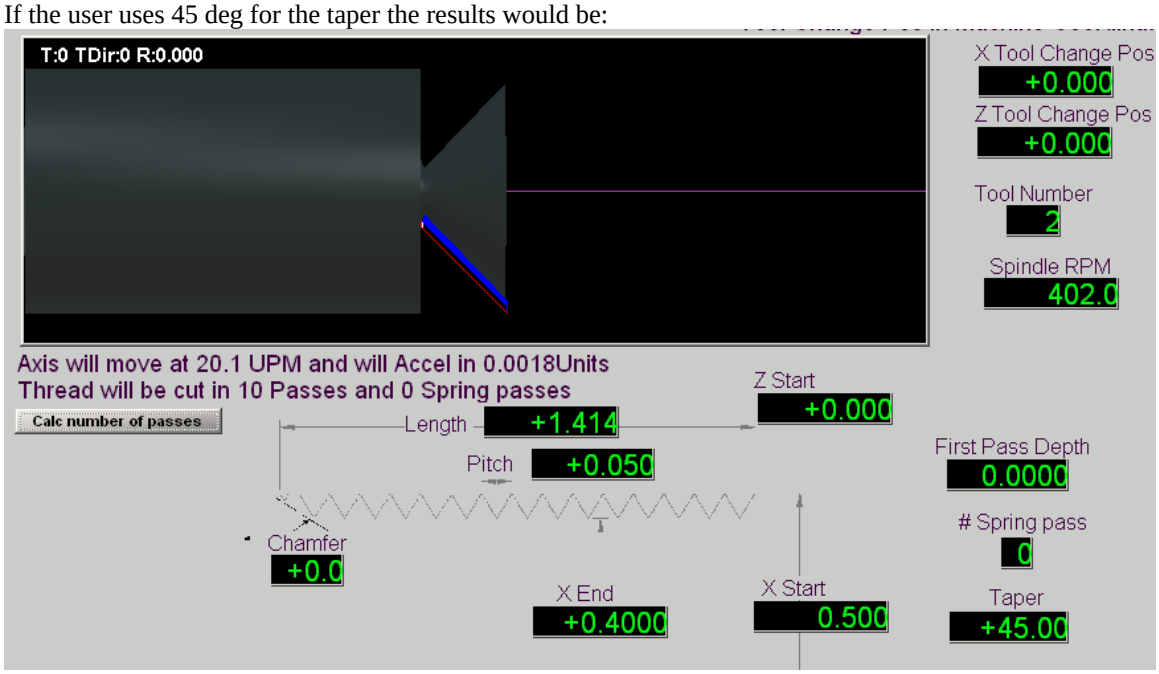

FIGURE 3

If the user uses a negative length and 45 deg for the taper the results would be:

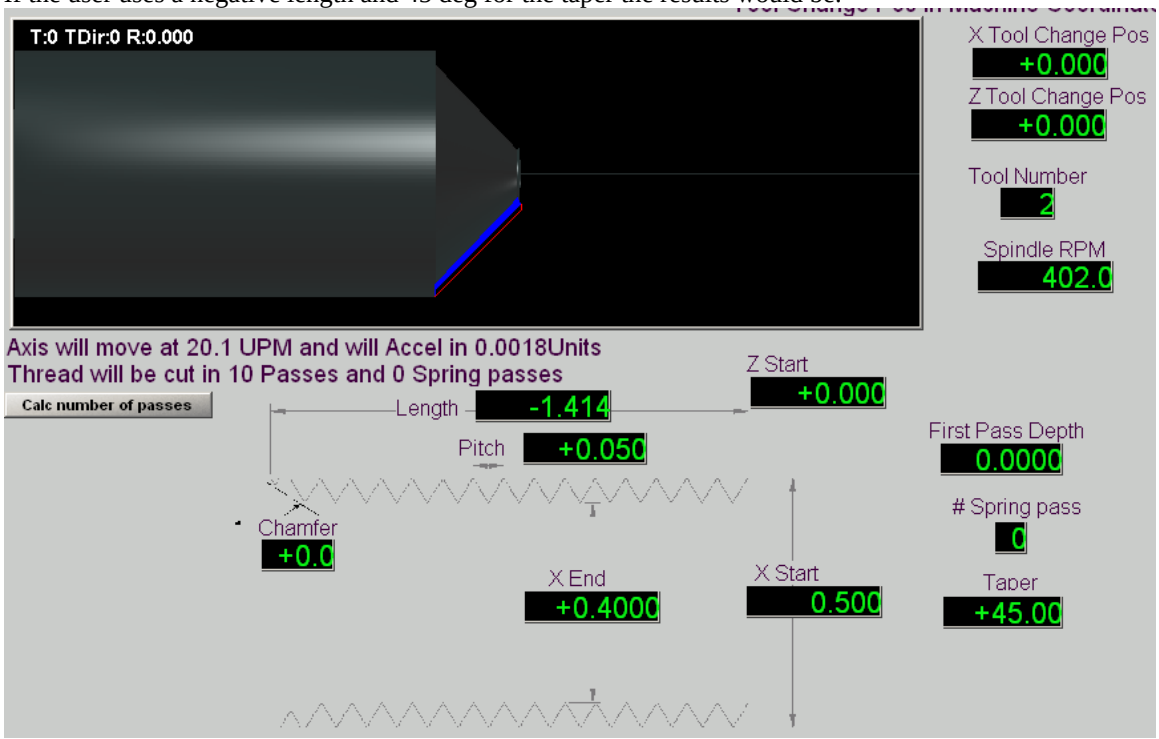

FIGURE 4

The threading file in Mach3 Turn using inputs from figure 4.

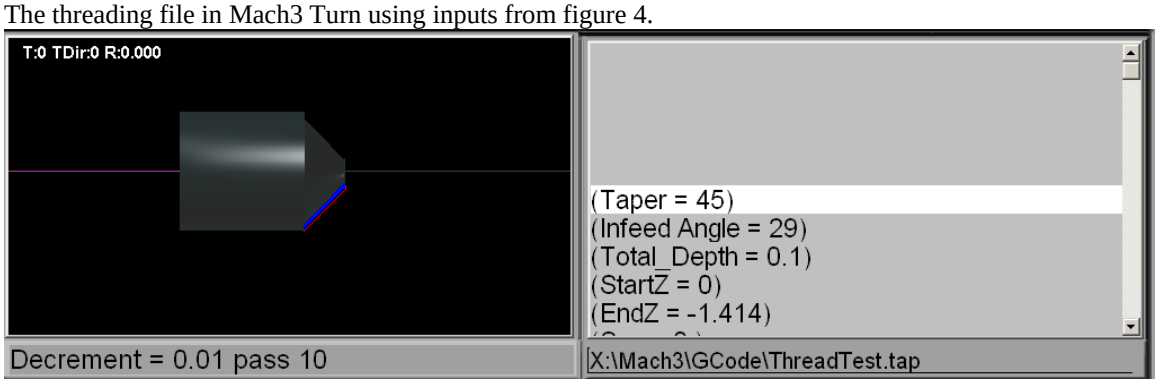

FIGURE 5

Part of posted g code (MY COMMENTS IN RED)

```
(Taper = 45)
(Infeed Angle = 29)
(Total_Depth = 0.1)
(StartZ = 0)
(EndZ = -1.414)
(Seq = 0 )    FLANK CUTTING
(Min_Decrement = 0.01 )
(Rad Mode )
G0 X0.6 Z0
G0 X0.5
(Min decremant being used)
(Decrement = 0.01 pass 1)
G01 Z0
G32 X0.49 Z-0.0055 F0.05
G32 X1.904 Z-1.414 F0.05
G01 X2.014 Z-1.414 F0.05
G00 X0.6 Z0
G00 X0.5
(Min decremant being used)
```

The following back plot of the generated code shows the stock in blue with a 45 degree taper, that the pathing starts at X= 0.5" , and defines how the length input value was used when code is generated.

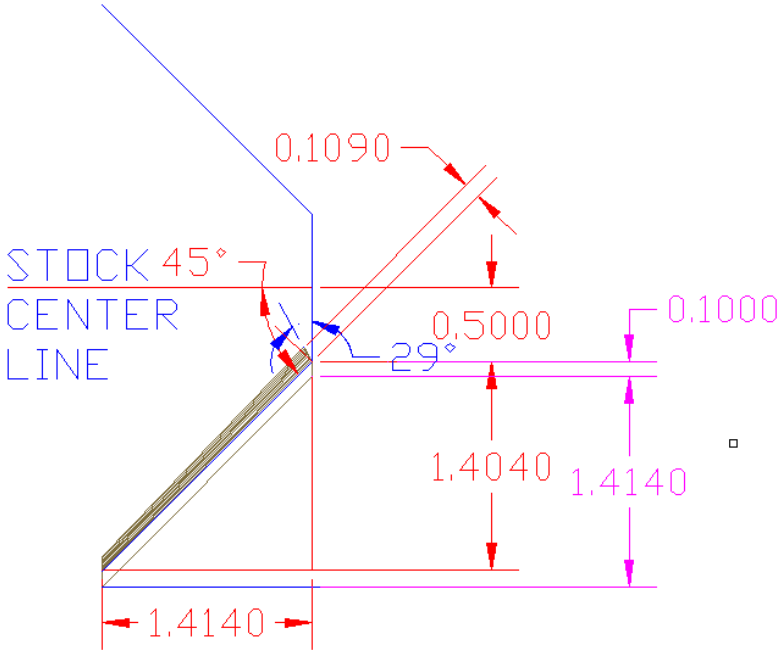

FIGURE 6

FIGURE COMMENTS:

1. The input value for length is along the radius and is not the actual threaded length. Thus the threaded length is based on the taper angle input, Z and X start inputs.
2. Positive values of length generate code for an inward cutting (FIGURE 3) and negative values of length generate code for an outward cutting (FIGURE 4).
3. Note that total thread depth is also affected by settings and is not as input IE; a value of 0.1". (Seems to have added an extra pass , but you could always offset the Z by .009",….not sure if the wizard builds in for acceleration in the pathing as that is normally defined by the user?)
4. The taper angle is equal to ½ the total angle on the end of the stock.

As noted in the beginning, all of the above was for a hypothetically cut thread. Should the user want to cut an actual tapered thread, the taper would be cut first, the inputs (X and Z start) in the wizard would be changed to allow for axis acceleration, etc. In the case of NPT there are different standards which define basic sizes and tolerances to be used and all that depends on the intended function of the thread.

SO…..until I get some more definition on the wizard ……what more can I say!

RICH