

MSM Mill-turn Step by step numbers check exercise

This is a set of screen shots taken as I walked thru using mill-turn to set WC offsets (with the master tool) and tool offsets for a non-master tool.

I did this example on a sim setup (that I can use easy numbers for illustration of the calculations).

We are using MT mode, so Mt = ON and MT = tool #1 for this example.

We start with all 0 tool offsets:

Please Enter/Edit Tool Parameters:

Tool Description:
master tool

Tool Attributes

☐ Empty Tool

Turn Tool Type

☒ Turning ☐ Center ☐ Boring

Tip Type: 0

Tool Geometry (Setup Units)

X Offset: 0.000000 X Wear: 0.000000

Z Offset: 0.000000 Z Wear: 0.000000

MTurn Y / Turret: 0.000000

Tool Post

☒ Front ☐ Rear

Tool Nose Radius (Tool Units)

☐ Inch ☒ mm

Radius: 0.000000

OK Cancel

Please Enter/Edit Tool Parameters:

Tool Description:
#2 non-master tool

Tool Attributes

☐ Empty Tool

Turn Tool Type

☒ Turning ☐ Center ☐ Boring

Tip Type: 0

Tool Geometry (Setup Units)

X Offset: 0.000000 X Wear: 0.000000

Z Offset: 0.000000 Z Wear: 0.000000

MTurn Y / Turret: 0.000000

Tool Post

☒ Front ☐ Rear

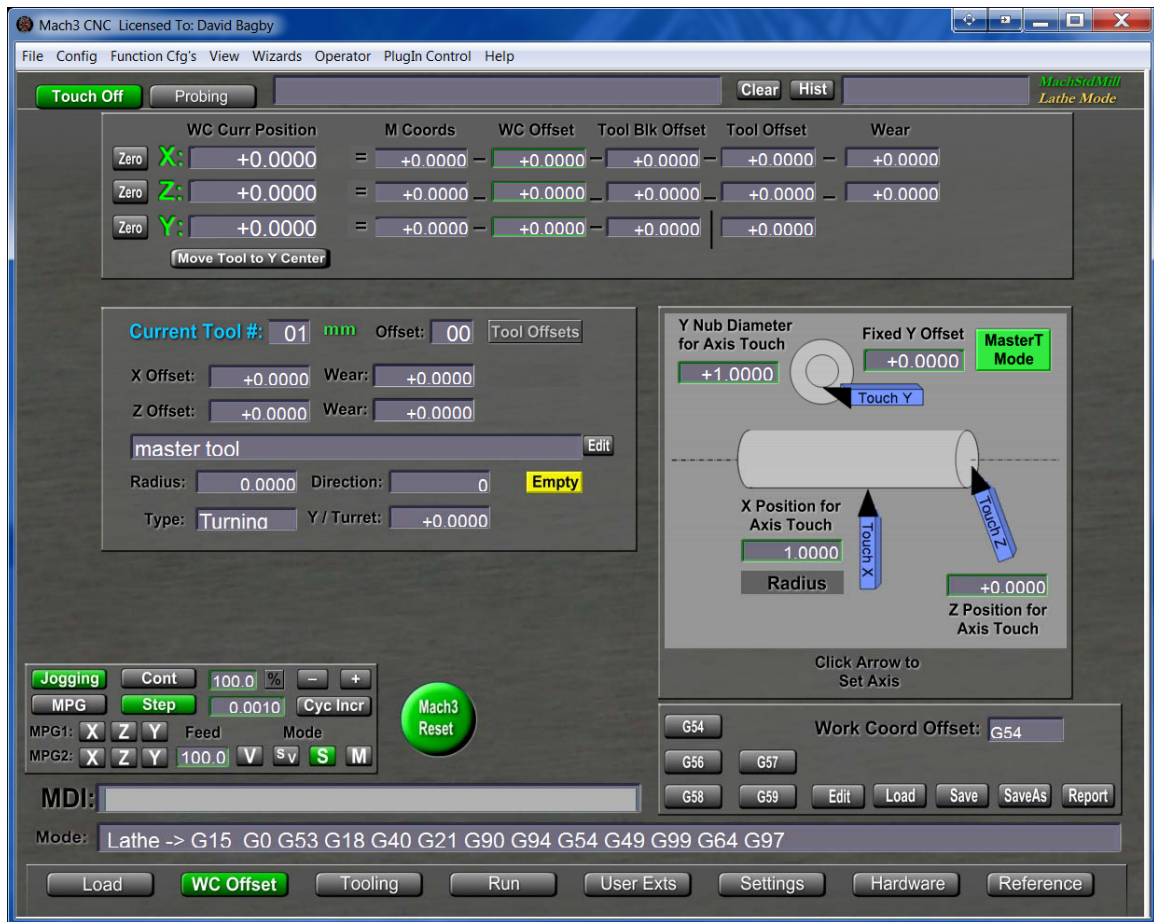
Tool Nose Radius (Tool Units)

☐ Inch ☒ mm

Radius: 0.000000

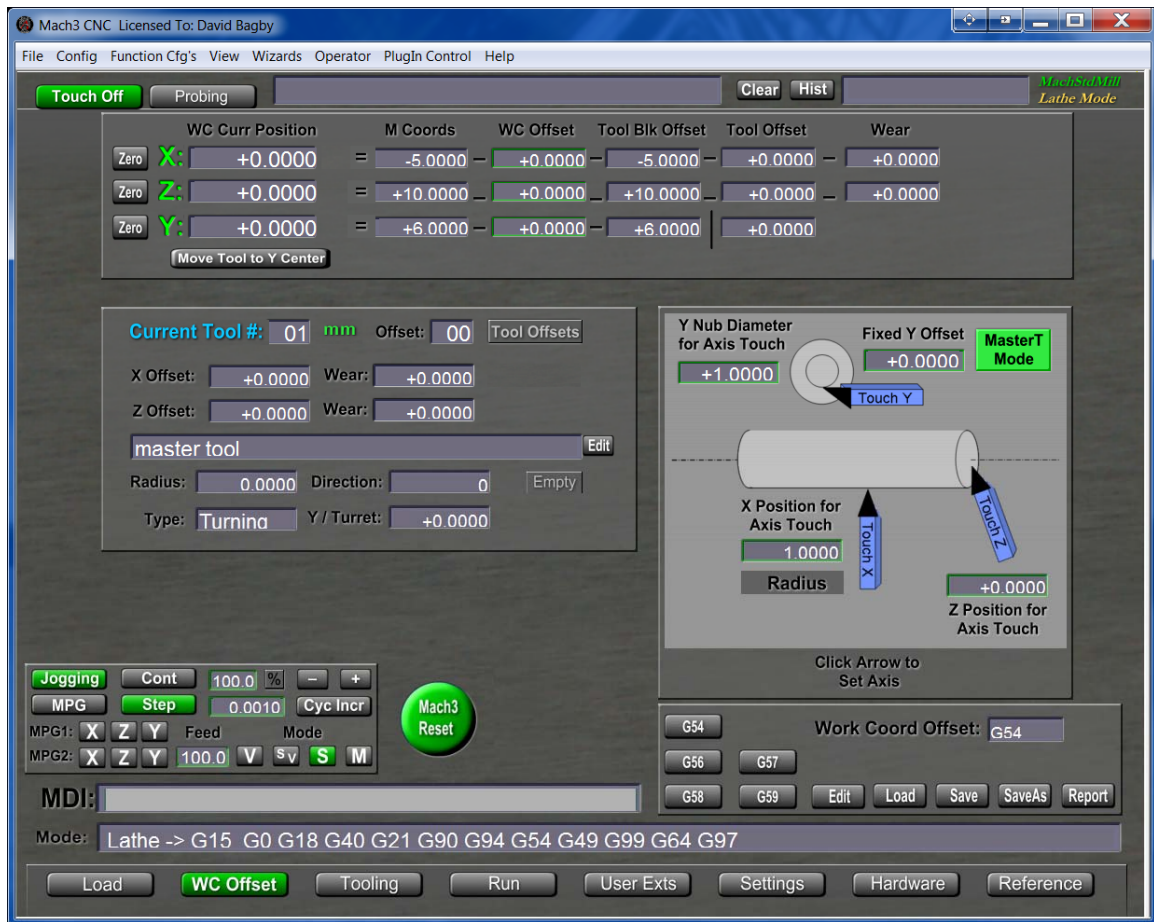
OK Cancel

And we start with everything at MC 0's



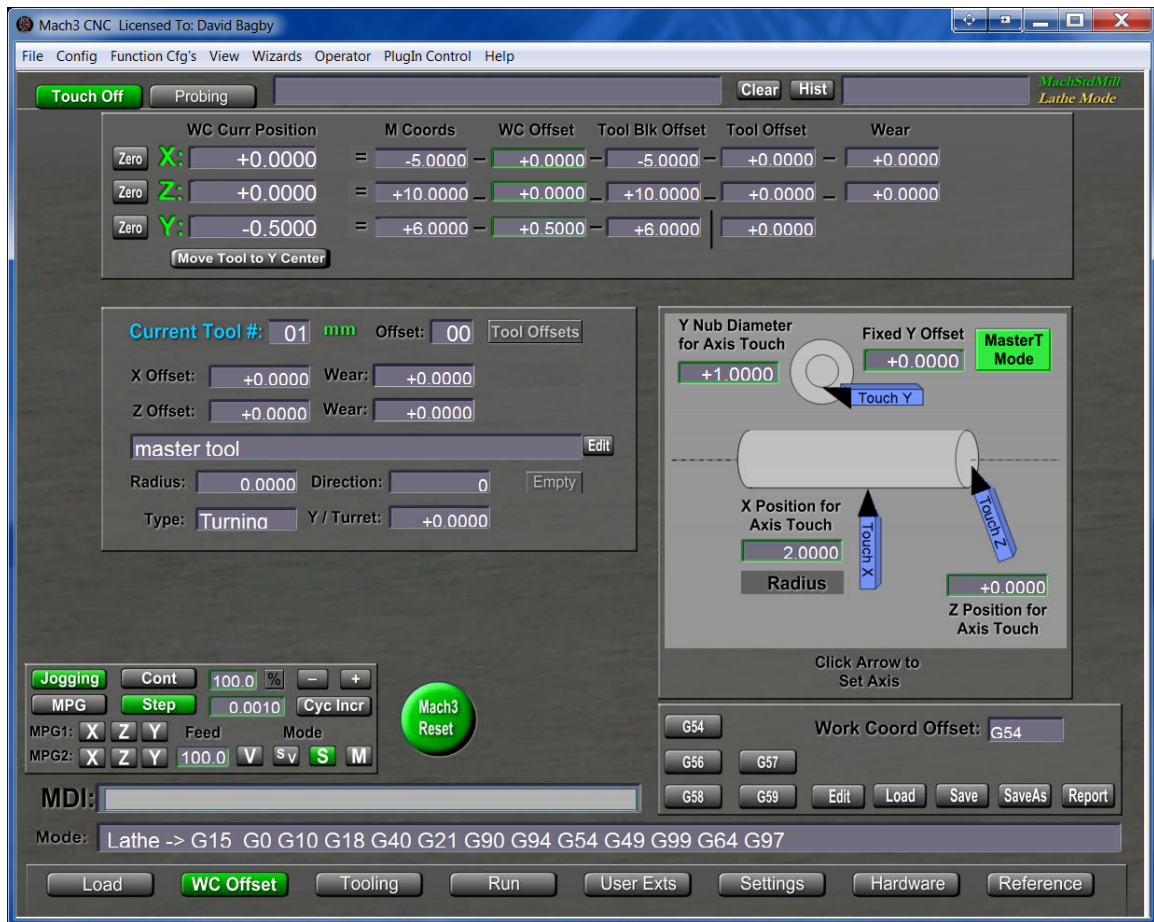
Now we set up the TB zero. I'll use some arbitrary integer numbers to make things easy to see. The TB0 will be at X5, Y-6, Z-10

And to illustrate the values, this is what we would see if we were at the TB0 point. The G52/92 register values are giving the offset between MC and the TB0 point.

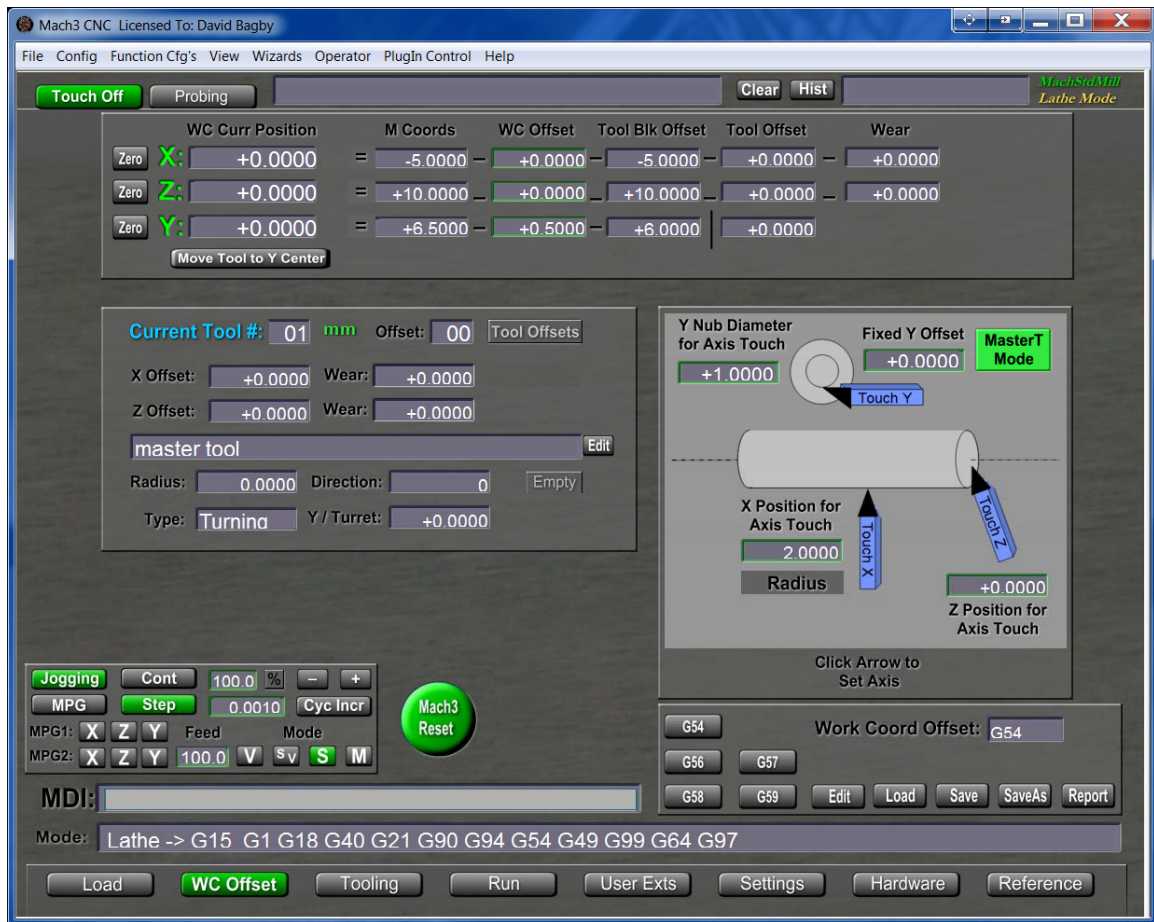


Now let's use a 2" diam piece of stock in the spindle, and we'll use a 1" diam nub for Y, (again to make the numbers easy).

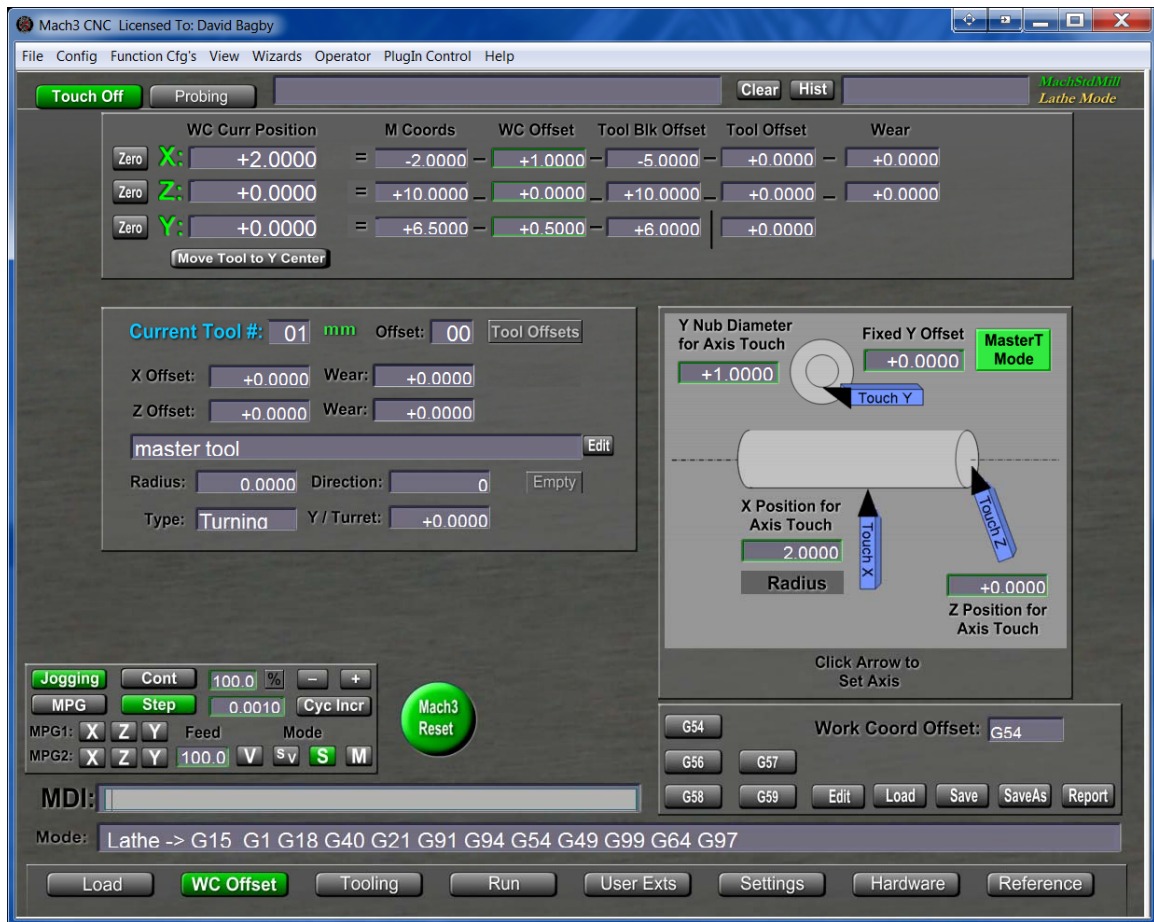
Let set Y offset – we get:



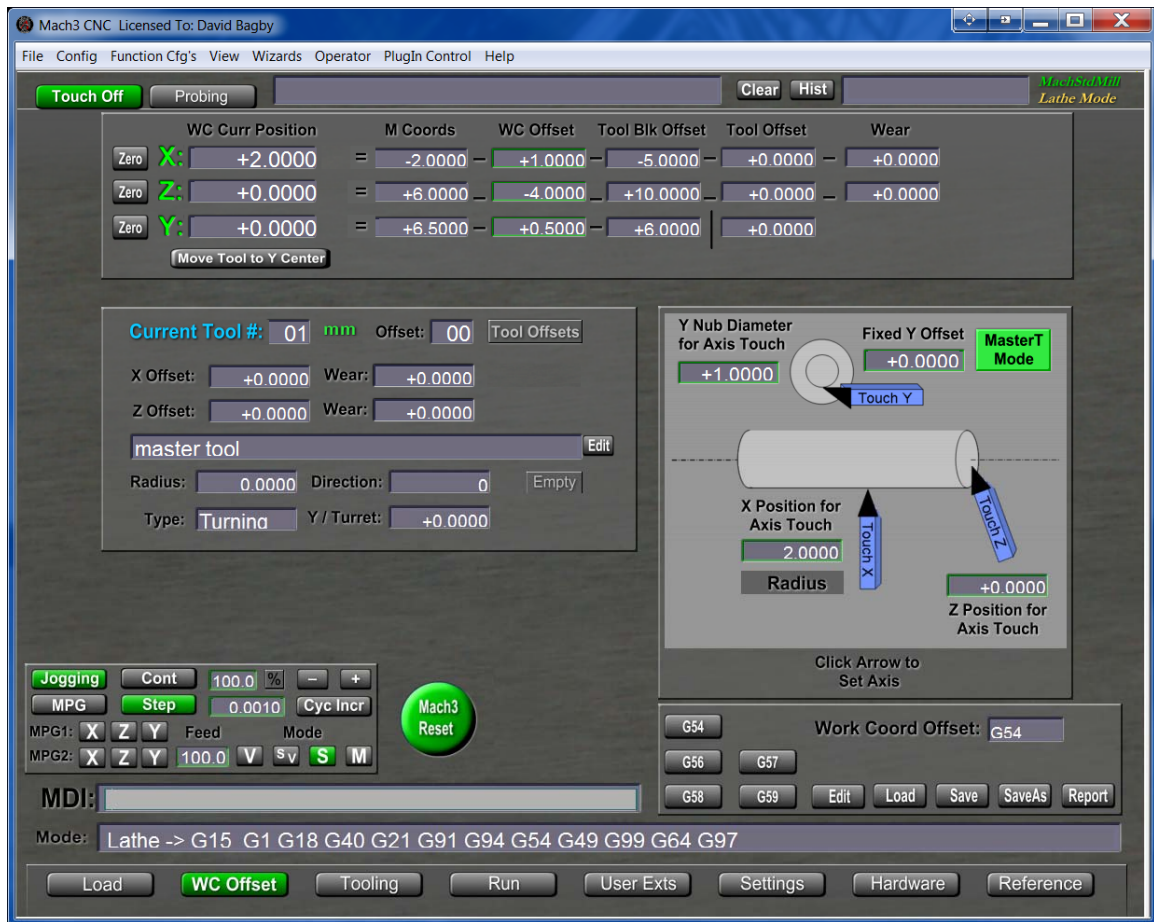
Now move Tool to put Y on center of stock



Now we move over until tool touches stock in X, and click touch X, we get:



Now move tool down to where we want Z0 and click touch Z. we get

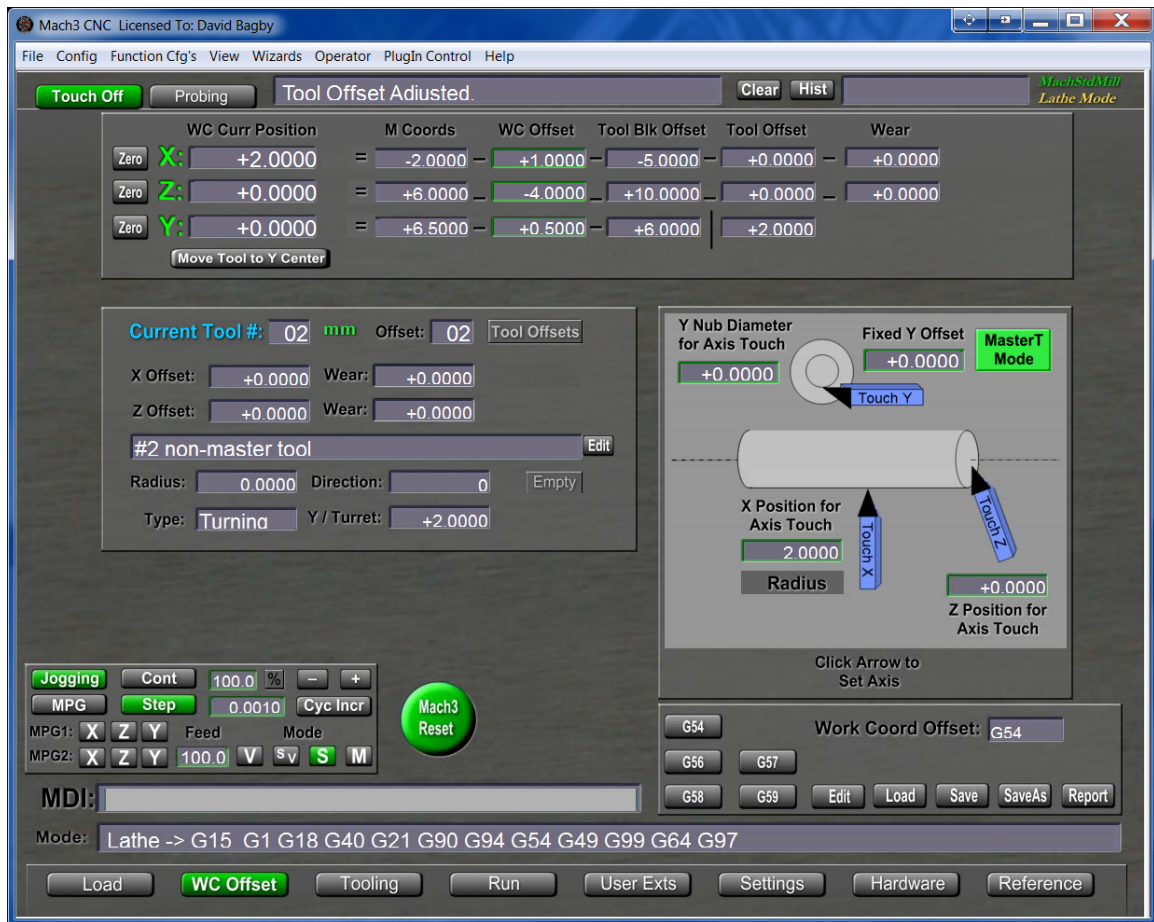


Note that all these operations set the WC offsets as we had the master tool mounted. Touching with the master sets WC offsets. Touching with a non-master will set tool offsets for the non-master tool – we'll do that next for T#2.

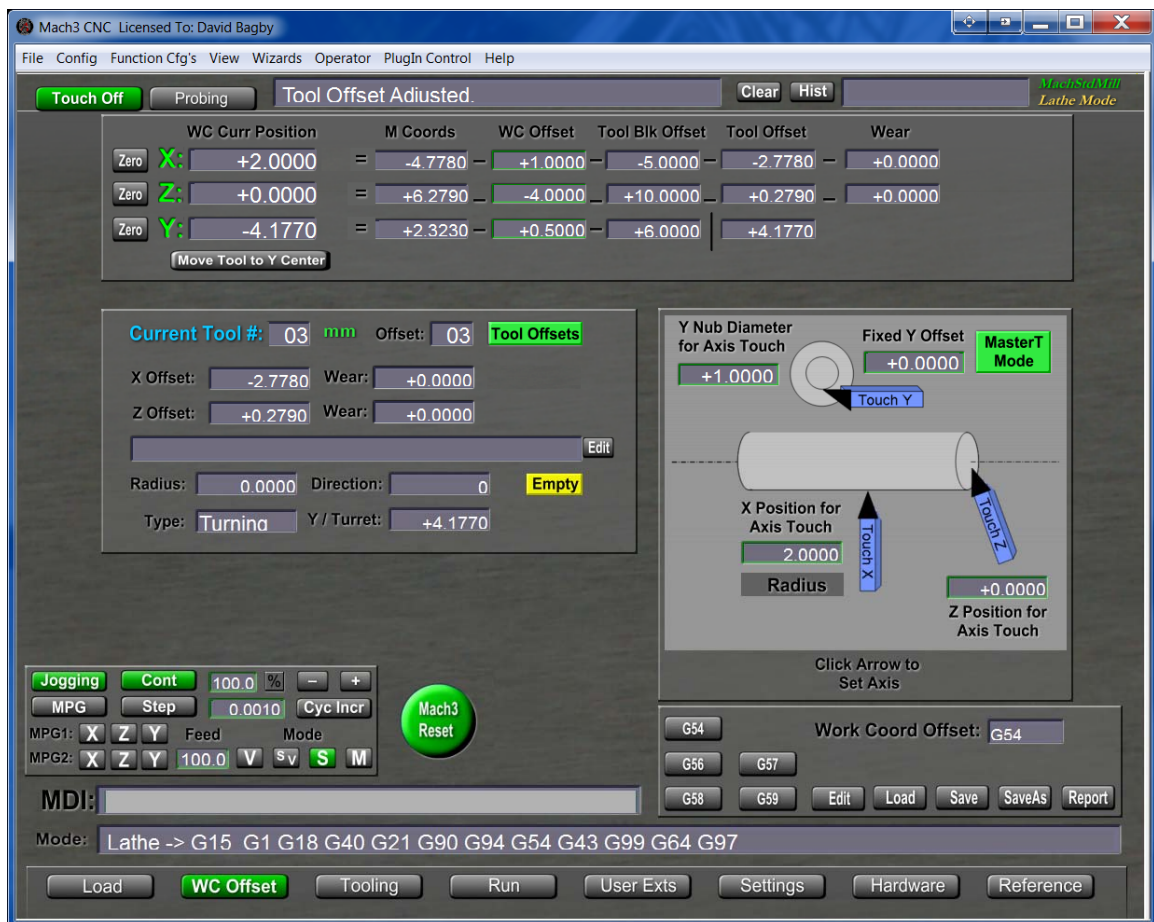
Now change to #2 – a non-master tool via mdi t0202 (I constructed this so that we now have T2 mounted AND the machine is in the same MC position – I turned off the Toll change position stuff)

Thus the tip of T2 is now exactly where the tip of T1 was.... So touching tool 2 to the same point, will give offsets for t2 that are all =0. This is a sanity check as a tool that is the same as the master will have 0 delta from the master and so it's offsets will all = 0.

(we set nub diam = 0 as we are already on the center so 0 nub, when we touch Y)
This gives:



Now mount t3, I then jogged a bit until I had a Y nub of 1, t#3 touching the stock diam and at Z0, then touched off X and Z and we get:



You can see that T3 now has non-0 tool offsets.