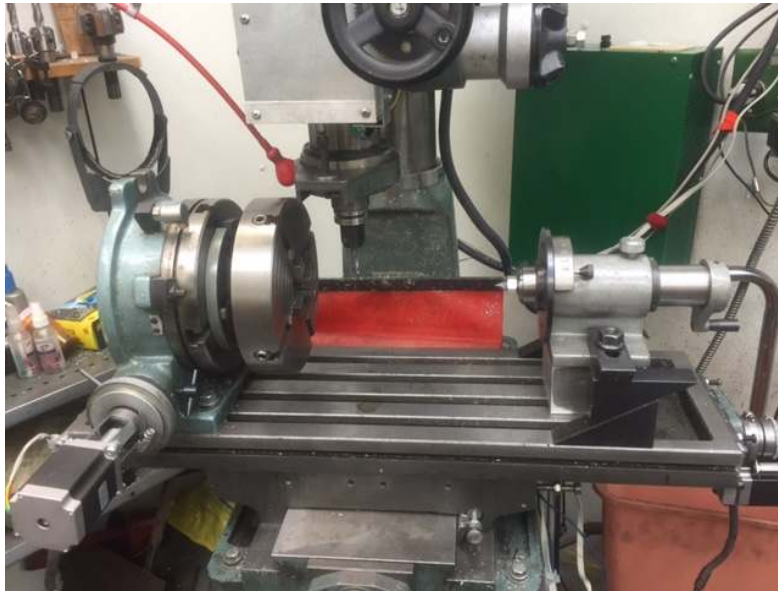


Aligning My 4th Axis on a RF-30 Mill/Drill, version 1.1

By R. G. Sparber

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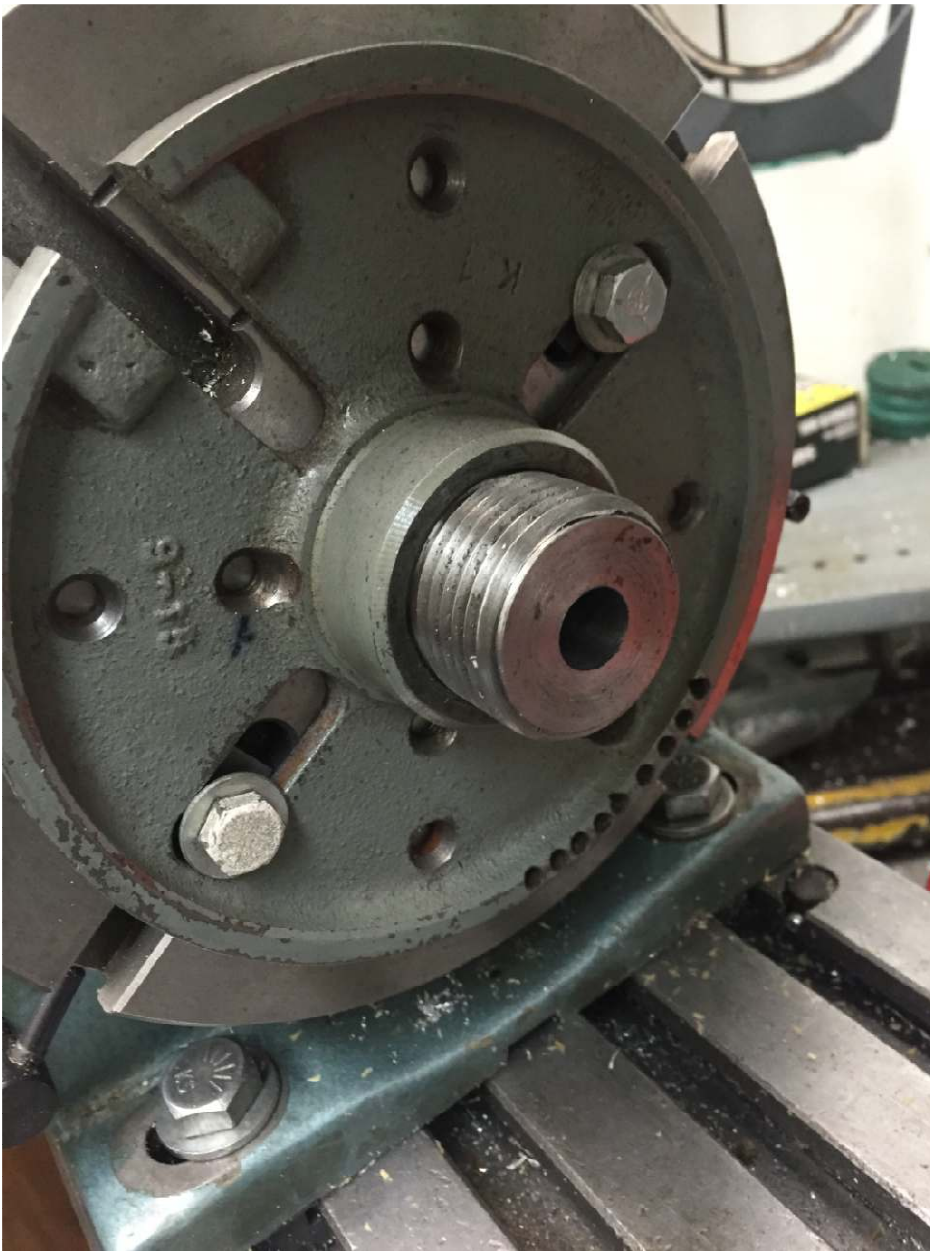
First I converted my 8 inch rotary table into my 4th axis². Then I built the tailstock³. The final step was to figure out how to align the tailstock to the rotary table.

With the use of a simple tool, the job can be done quickly and fairly accurately.

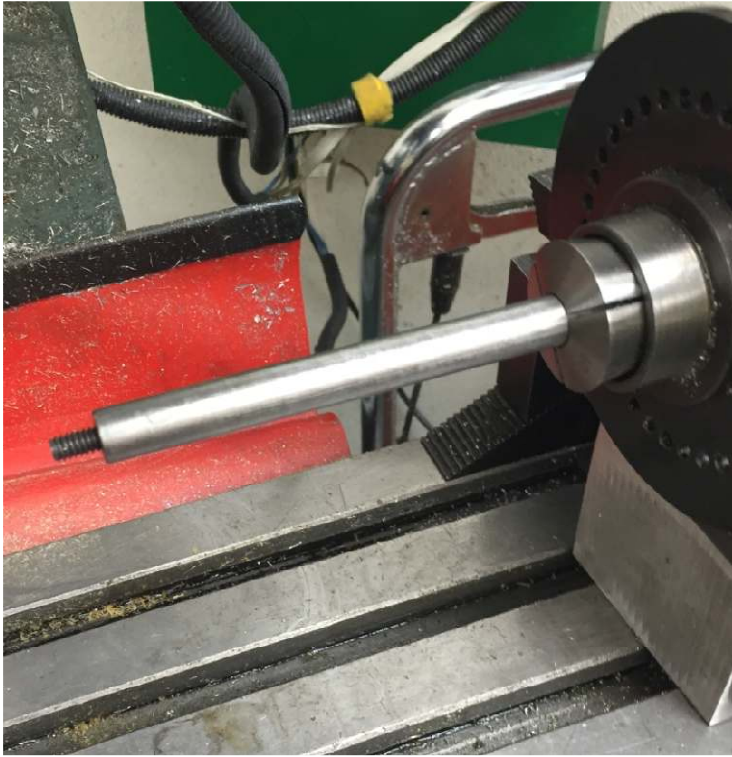
¹ You are free to distribute this article but not to change it.

² See <http://rick.sparber.org/AAD.pdf>

³ See <http://rick.sparber.org/RTT.pdf>



I borrowed the faceplate from my lathe and bolted it to my rotary table. A long time ago I had turned a length of CRS to match the lathe spindle. It is a handy way to attach a chuck to the rotary table. Today I drilled the threaded section out to just under $\frac{1}{2}$ inch and reamed it to 0.500 inches. This is the first piece of the puzzle.

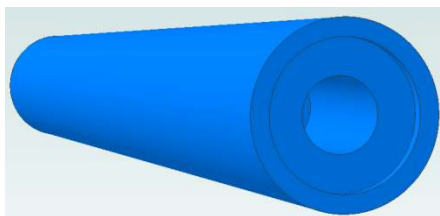


Using my lathe, I faced a piece of $\frac{1}{2}$ inch CRS. Then I drilled and tapped it $\frac{1}{4}$ - 20 to a depth of about $\frac{1}{2}$ inch. A 1 inch long piece of threaded rod was screwed into the hole. Puzzle piece two.



I had a spare tapered shank that fit the taper in the center of my rotary table. I faced the wide end on my lathe. Then I drilled and tapped it $\frac{1}{4}$ - 20. The taper can be screwed onto the end of the rod and removed at will.

This is the third and final puzzle piece.

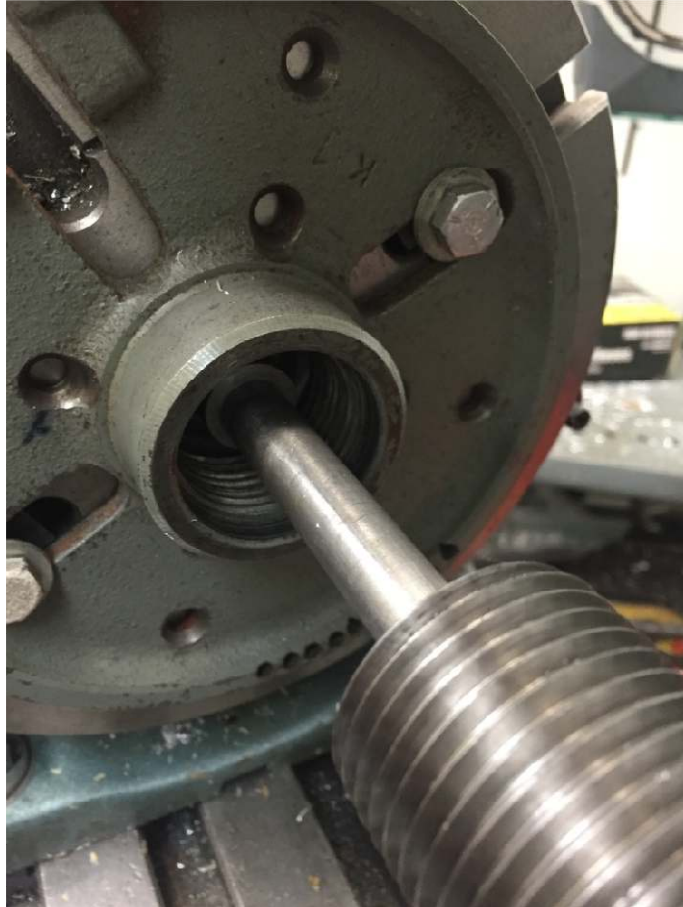


John Herrmann noticed that the alignment of the taper to the rod was not as good as it could be.

By cutting a sliding fit recess into the end of the taper, alignment will be improved.

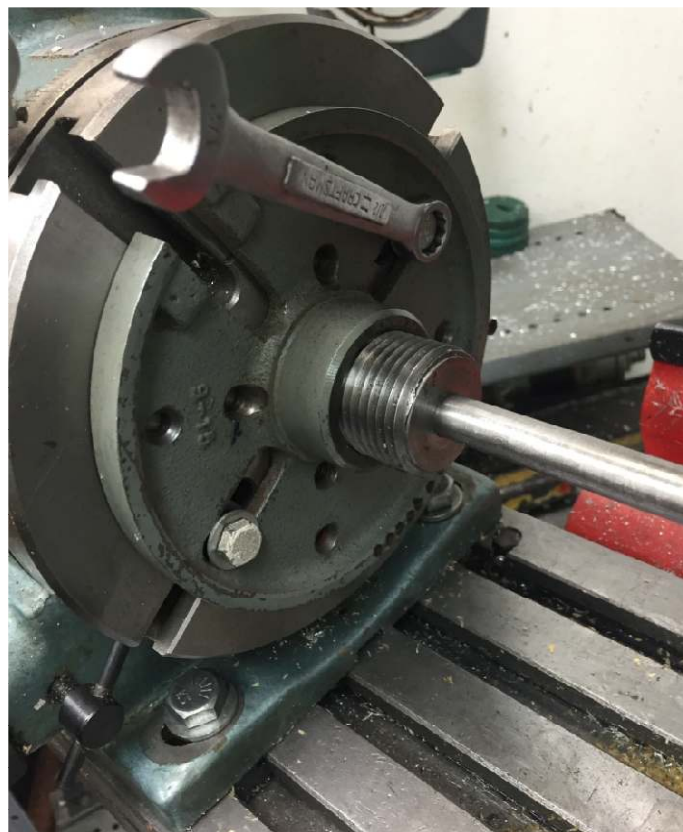
I slid the ½ inch rod into the collet which is mounted in the spinner. Then the threaded section went on. And finally the tapered was screwed in place.





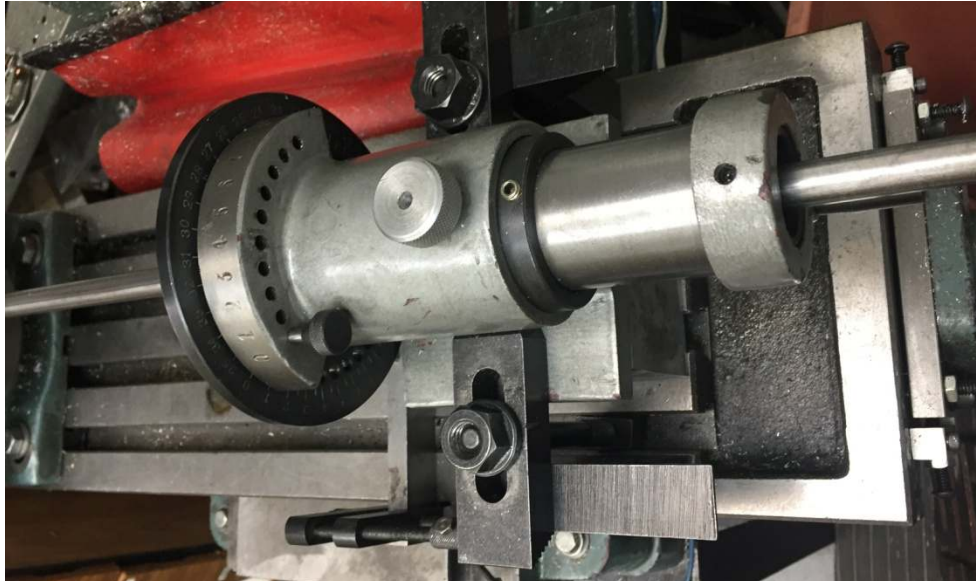
The tapered end slides into the tapered hole in the rotary table.

The two mounting screws that secure the face plate are loose.

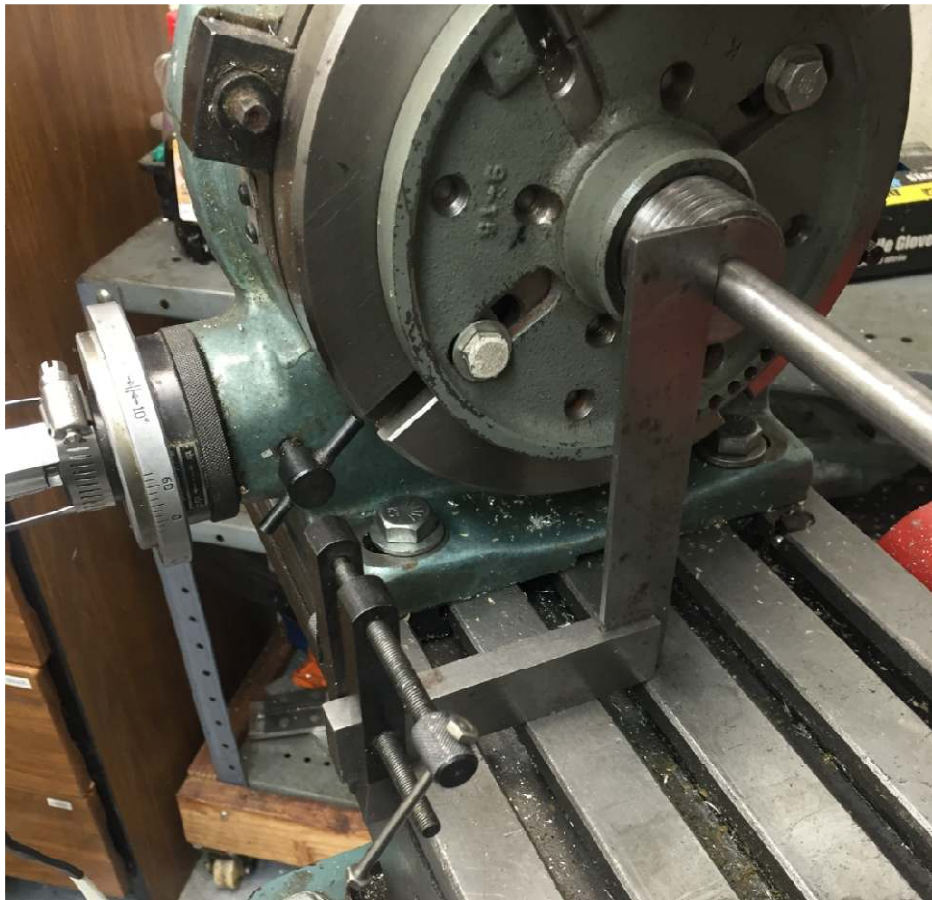


After the threaded section is run into the faceplate, the two mounting screws are tightened.

This insures that the faceplate's center is fairly well aligned with the rotary table's center of rotation. Final alignment is done within the 4 jaw chuck that is mounted later.

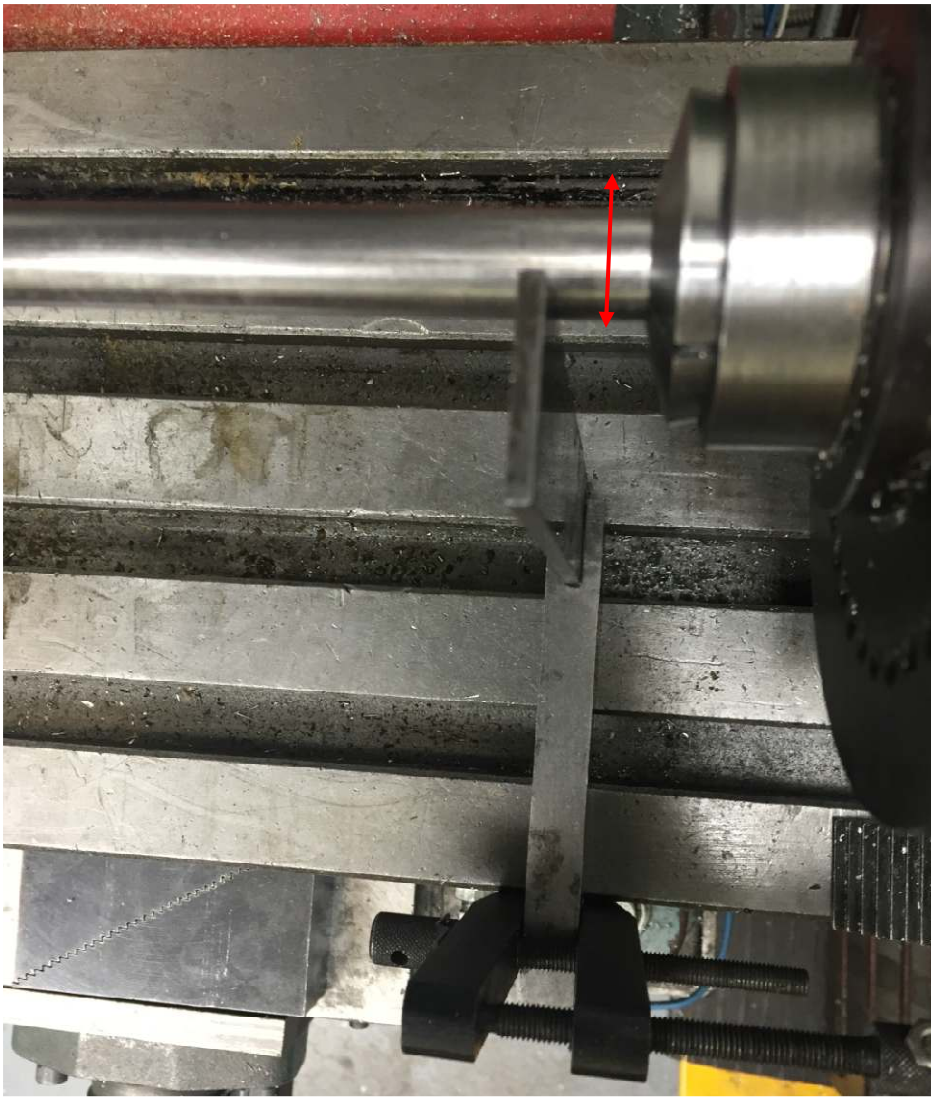


The collet spinner is loosely clamped down on its block.



The rotary table has previously been aligned to the front face of the table and locked in place.

Using a square with a clamp on the end, I touch off on the side of the $\frac{1}{2}$ inch rod and the front face of the mill's table.



Sliding down to the other end, I slide the collet spinner forward and back along the Y axis until the blade of the square touches the rod. Then the spinner is locked down.

This insures that the center of rotation of the rotary table is aligned with the center of rotation of the tailstock.

The final step is to unscrew the threaded section, extract the taper, unscrew the taper from the rod, and pull the rod through the collet. The 4 jaw chuck is mounted.



And finally, the dead center is installed into the collet and we are ready to run the 4th axis.

Acknowledgement

Thanks to John Herrmann for the design improvement.

I welcome your comments and questions.

If you wish to be contacted each time I publish an article, email me with just "Article Alias" in the subject line.

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