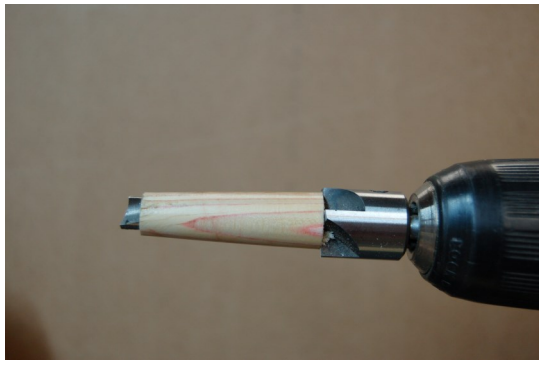
Project Tutorial

Custom Pens **(Designed by Rick Frazier)**

Supplies

- 10mm Pen Maker Bit
- 3/4 x 3/4 x 2 1/16 cap blank
- 3/4 x 3/4 x 2 1/4 body blank
- Pen Mandrel
- Thick CA or 5 minute epoxy
- Pen kit
- Sandpaper
- Eye and ear protection
- Dust Mask
- 1/4" threaded rod
- 3/4" hardwood dowel
-

Files



Custom Pens feature an attractive design that is simple but elegant in which we introduce the setup and machining of a pen on the 4th Axis. The sample was made using Baltic Birch 3/4 inch plywood, however, you might use woods of your own choosing. We recommend using any suitable hardwood. This is a nice project to do over a weekend and is an excellent introduction to the process of 4th Axis machining.

The finished dimensions of the pen are 3/8" x 5".

Part of the preparation for this project is to thoroughly read and understand the instruction for the 4th Axis and the instruction for the pen kit. I hope you enjoyed making your own

Preparing the Blanks

1. Cut the Body and Cap blanks to length (Additional length has been included to accommodate the truing of the ends).
2. Drill a 10mm hole the length of the body and cap blanks.
3. Rough the surface of the tubes with 180 grit sandpaper. Next use either CA or 5 minute epoxy to glue the tube to the blank. Let fully cure.
4. Square the blank by sanding or truing with a barrel trimmer

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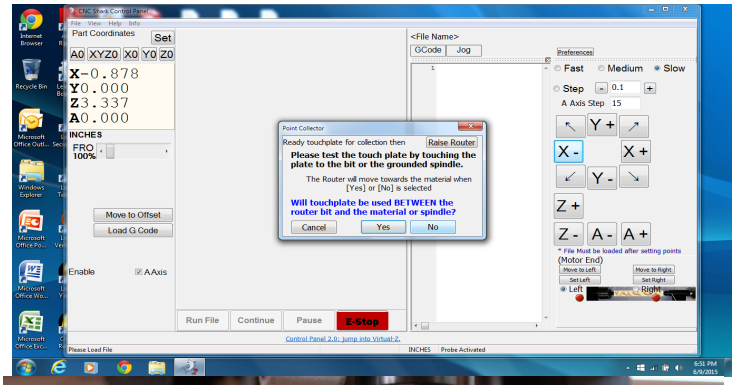
STEP 1 - Prepare the bushings.

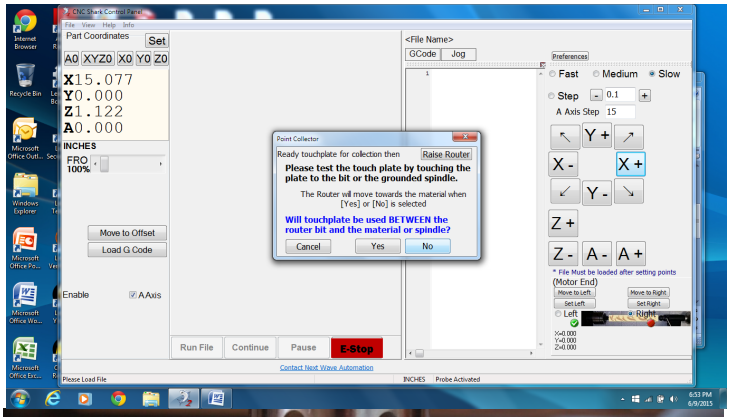
We must prepare the bushings for the pen it is my suggestion to create wooden bushings to protect your tooling in the case of an error. You drill a 1/4 inch hole in the center of the 3/4 inch wood dowel. Mount the dowel on to the pen mandrel on to the 4th Axis.

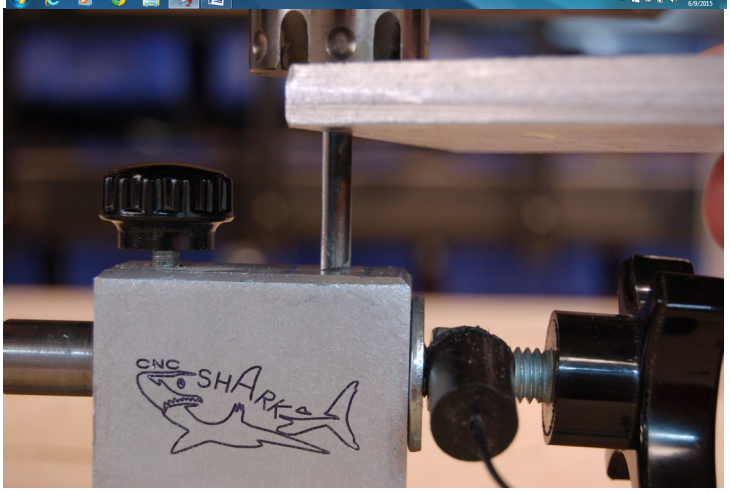
The Tapping off Procedure.

When the AAxis is enabled, the Jog panel is configured to support the use with a rotary setup. You typically use the Jog Controls to move the gantry to: Position the tool at the head stock to touch off and establish the zero point .



Then jog the tool in position over the tailstock to touch off and establish the zero point for the tailstock.





After taping off on the head stock and tail stock you will move to the offset position.

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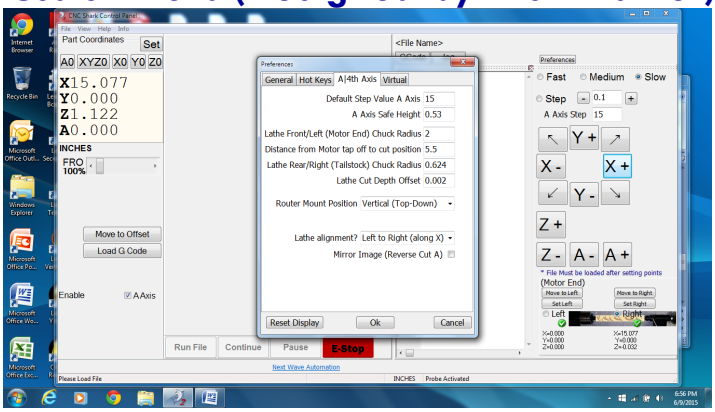
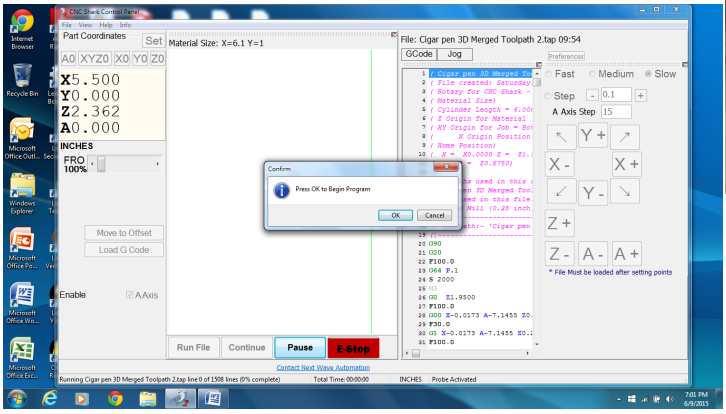


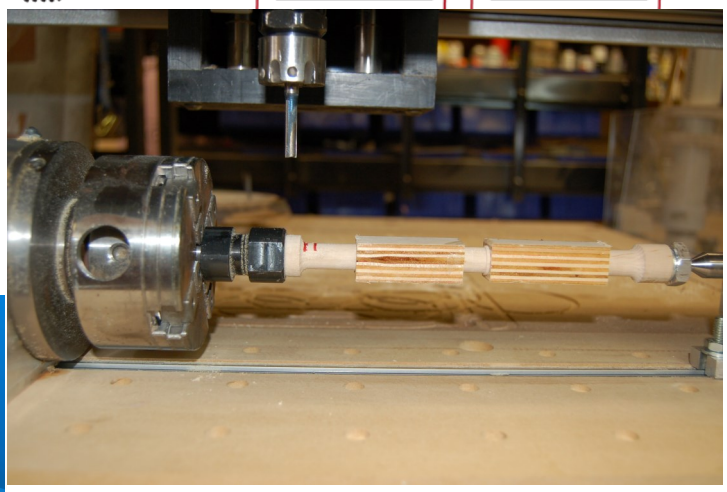
These two measurements plus distance from motor tap off cut position= the move to offset position



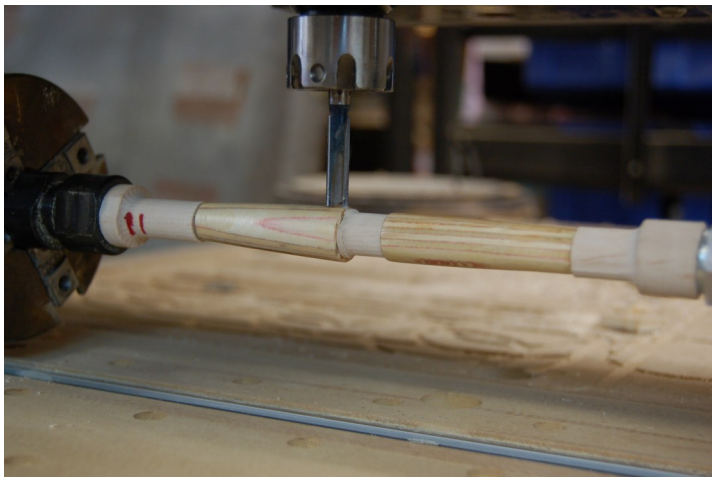
Loading and running the job is the same whether you are in 4th axis mode or 3 axis mode. Once you've selected the file and it is loaded in the SCP2, hit 'Run'. On 'Run', the gantry will immediately move to the generated offset (the cut start location). After finishing the move, the SCP will load the gcode onto the SCB. Once that is loaded, you will be presented with a confirmation message. Press 'OK' if you are ready to run the tapfile.

Step 2 Installing the blanks onto the mandrel

Install the pen blanks on to the mandrel as illustrated below.



Mount the cap and body mandrel onto the 4th Axis. Loading and running the job is the same As the procedure for setup and running the file for the Bushings



Next Wave Automation

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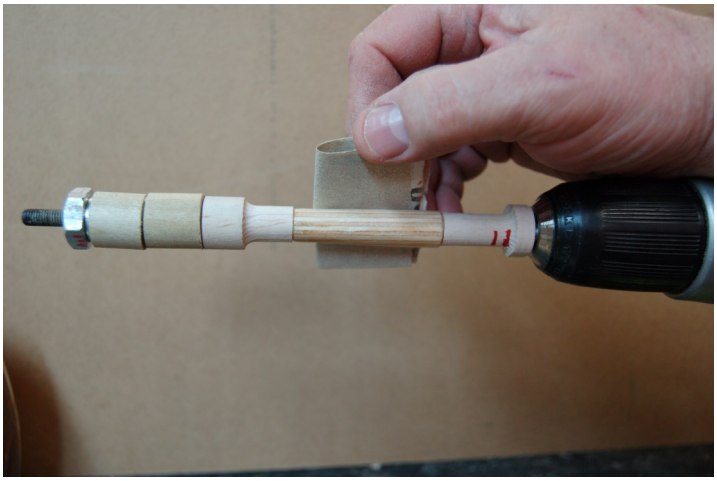
Step 4 Sand and Prefinish the Pens.

You can use a drill and a 1/4 " threaded rod to spin and to sand the pen blanks. Be careful not to sand your designs away. Some of the carving can be very light.



STEP 5 Finishing the Parts.

To finish the project , spray on a light coating of urethane.

Some of tools used in this project

IN CONCLUSION

Part of the preparation for this project is to thoroughly read and understand the instruction for the 4th Axis and the instruction for the pen kit. I hope you enjoyed making your own Personalized Pens! You can customize the project using the editing tools in your Vectric software, if desired. Here are a few possibilities:

- Make a square pen
- Different logos or patterns

Happy Carving!