



Next Wave Commemorative Chess Board Piece “The Squid Bishop”

Design by Rick Frazier

Next Wave Automation is celebrating the 10th Anniversary of their “CNC Shark” by building a unique chess set. This unique set will be revealed one project each month, starting with a chess board, followed by individual pieces. This month’s project is The Squid Bishop. This project is aimed at the woodworker with moderate to intermediate skills. You will need access to V-Carve 9.0 with updates, and the tools listed below. With the V-Carve software, open the project CNC files. Carefully review all the toolpaths and make necessary changes to suit your tools and machine. The toolpaths are currently set with tool, feeds and speeds that were used in designing the original project. Don’t use them directly until you review them for your machine. You can edit the tools and change the settings to fit you own machine and requirements. It is very important to recalculate all toolpaths after making any changes. Once you have recalculated for your own machine and tools, reset the preview, and then preview all toolpaths again to visually verify the project outcome. Then create the tap file for your machine using the correct post processor. Now you’re ready to make your own Next Wave Automation 10th Anniversary Chess Set piece, The Squid Bishop.

Next Wave Automation 10th Anniversary Chess Board Piece “Squid Bishop”



For this month’s project we will be building a Next Wave Automation Commemorative chess piece the Squid Bishop. This Chess Board Piece is a two sided highly detailed Squid. You will need to make two maple and two walnut pieces for your set. As usual, you will find a material list, tool list, videos and the V-Carve files on Next Wave Automation’s Website to complete the project.

Project material list:

- 2 Walnut Blanks (2” x 2 3/4”x 8”)
- 2 Hard Maple Blanks (2” x 2 3/4”x 8”)
- 5/16” dowel rod
- 1” Bristle radial disks (100,120 and 240 grit)
- Sanding Cord 120 grit
- 1” Rotary Scotchbrite disks (brown)
- Polyurethane Clear

Project Tool List:

- 1/4” up cut Spiral straight bit
- 1/16” dia. Tapered ball nose bit

Project CNC Files:

- Squid Bishop_8.crv



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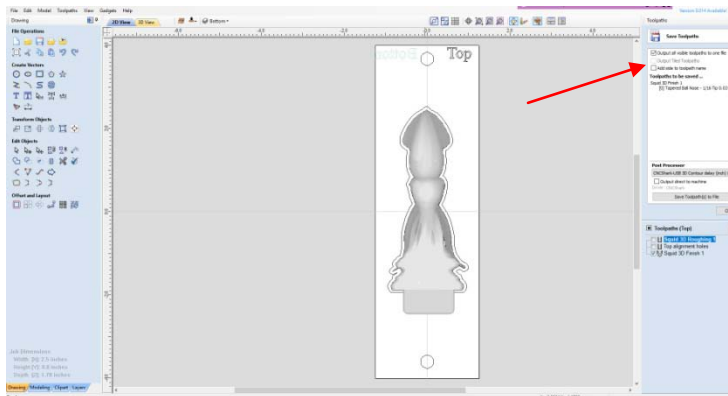
Video Files:

Creating Tap files

Squid Bishop Roughing and Finishing

Squid Bishop sanding and finishing

Step 1: Creating Tap Files:



The first step in creating a tap file is to open the Squid Bishop_8.crv. After opening the Squid Bishop_8.crv go over to the tool path menu and save each of the following tool paths.

Top Squid Bishop Roughing

Top Squid Bishop Finish

Bottom Squid Bishop Roughing B

Bottom Squid Bishop Finish B

Use your corresponding post processor to save the tap files. For this project you should create 4 tap files. To retain the tool path names for your tap file. Make sure you click the radio button, in the upper left corner of the Save Tool Paths menu box "add side to tool paths name" so they match the tap files that are in the instructions.

For more information please watch the video on "Creation of Tap Files."

Step 2: Machining the materials:

You will need 2 pieces of walnut,
1.78"x 2 1/2"x 8"

You will need 2 pieces hard maple,
1.78"x 2 1/2"x 8"



Plane down the material to 1.78" thick. Take care to make this as exact as you can. Cut the material to a width of 2.5 ". Take care to make this as exact as you can. Cut all of the material in to pieces with the length of 8". Now that all of the pieces are machined to size mark the center of the ends and the top.



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Step 3: Machining the Top of the Bishop.

Top Rough Cut



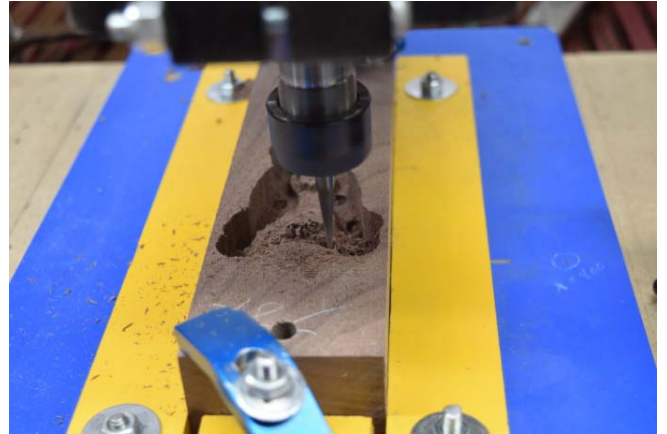
Mount the material to the centerline of the fixture. Secure in the corners with clamps as in the [figure above](#). This is so the clamps do not get hit by the bit during machining.

Install a 1/4" spiral up cut bit. Touch off the Z-axis on the **"TOP of the Material"** see [Reference Video](#).

Load the Top Roughing tap file. **"Top Squid Bishop Roughing.tap"**.

Run the tap file with a router speed at 12,000 to 16,000 RPM.

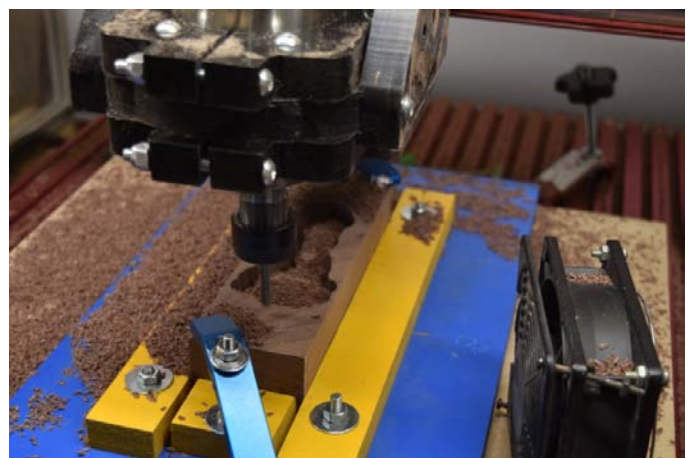
Top Finish Cut



Remove all burrs from the top material. Install a 1/16" dia. Tapered ball nose bit. Touch off the Z-axis on the **"TOP of the Material"** see [Reference Video](#)

Load the Top Finish tap file. **"Top Squid Bishop Finish .tap"**. Run the tap file with a router speed at 12,000 to 16,000 RPM.

Step 4: Flipping and machining the bottom of the Bishop.



Rough Cut 1



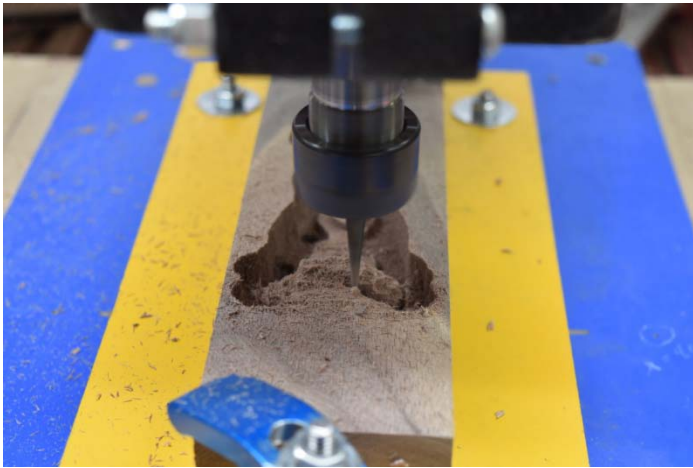
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Clean the fixture of all debris. Install the 5/16" dowels in the alignment holes on the blank. Flip and install the blank in the fixture with the bottom side up, securing with the clamps. Make sure that the centerline of the blank is lined up with the centerline on the fixture.

Touch off on the "Fixture base" (blue part of fixture), in order to assure all of our dimensions are measured off the top side of the blank which is now at the level of the fixture base. Load the bottom roughing tap file. "Bottom Squid Bishop Roughing . tap." Run the tap file with a router speed at 12,000 to 16,000 RPM.

Finish cut 1



Vacuum the top of the fixture. Install the 1/16" tapered ball nose bit. Touch off on the "Fixture base" (blue part of fixture); remember the fixture base is on the same level as the top of the blank. Load the bottom finish program. "Bottom Squid Bishop Finish.tap". Run the tap file with a router speed at 12,000 to 16,000 RPM.

Step 5: Sanding and finishing the Bishop:

Cut off block



Cut the Bishop free from the blank but leave one end to hold for Sanding and finishing. [See Reference video: Squid Bishop sanding and finishing.](#)

Using the one-inch bristle disk, sand and remove any unwanted material from the completed Bishop. Be careful not to overdo, it will take away features away on your Bishop. Sand everything down to with 240 grit bristle disk and sandpaper. Once you are satisfied with the Sanding and detailing of your Bishop we are ready for finishing.



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Enjoy the creation of your "Squid Bishops"

Next month we will add another piece to the chess set.

Rick Frazier

Step 6: Finishing the Bishop:

Take all the Bishops clean and prep for finish. I chose to put on three coats of polyurethane. It gives it that satiny sheen and good protection. You could finish them with glaze to bring out the highlights or in any creative way you desire.



This is the Squid Bishop Chess pieces. For a completed chess set it is necessary to have 2 hard Maple and 2 Walnut Bishops.