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# Edge Clamp Joinery Jig Install and Usage

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# Table of Contents

Introduction....3
Installing....3
Tools Required and Parts List....3
Parts List....3
Usage....5
X & Y zero (Desktop MAX)....5
Cutting holes for a second fence....10
Machine setup (Desktop MAX)....11
X & Y zero (Desktop)....14
Index hole file (Desktop)....14
Cutting holes for a second fence....18
Machine setup (Desktop)....19
Creating a Tenon (Desktop)....22
Layout the Blanks (Desktop)....22
Draw the Tenons....24
Toolpath the Tenon pockets....28
Create the Mortices:....30
Save the toolpaths....32
Exploring other tenon shapes....33
Clamping material....36

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## Introduction

This document will explain the setup and usage of the Edge Clamp Joinery Jig accessory.  It is compatible with the DT3 edition Desktop and the Desktop MAX.

## Installing

Run the squaring and X,Y homing routines before installing the Edge Clamp Joinery Jig

## Tools Required and Parts List

## Parts List

Edge Clamp Joinery Jig accessory (005697)

2x Wood Dowel 3/8 x 1 (005703)

Hex key 4mm (003884)

Drill Rod (001781)

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Start by removing the spoil board on the Desktop or Desktop MAX using a 4mm hex key.

Use a 4mm hex key to remove the first 3 pieces of aluminum decking.

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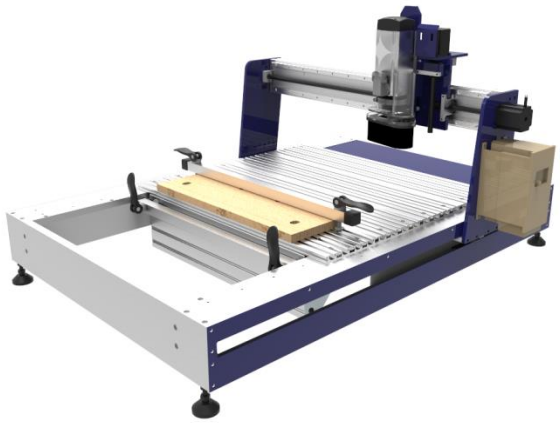
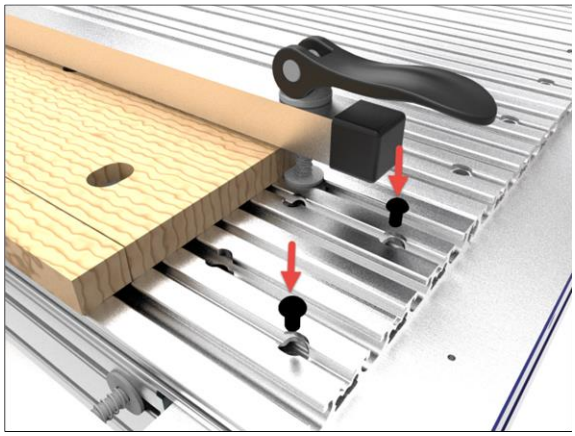
Place the jig assembly into the Desktop where the decking was just removed. Secure it to the frame using 4 of the M6-1.0x10mm button head cap screws that held the aluminum deck pieces in place. Push the clamp up against the remaining deck to make sure it is square. Then tighten down the screws, two on each side.





## Usage

The first step is to set the X and Y zero location. The machine will be used to position one axis by drilling index pins into the spoil board using a CAD model as the guide. This is the X axis if using a Desktop and the Y if using a MAX.

### X & Y zero (Desktop MAX)

Now, to create a file to drill a series of 3/8” index holes for dowels that will act as a fence to define the X axis zero point.

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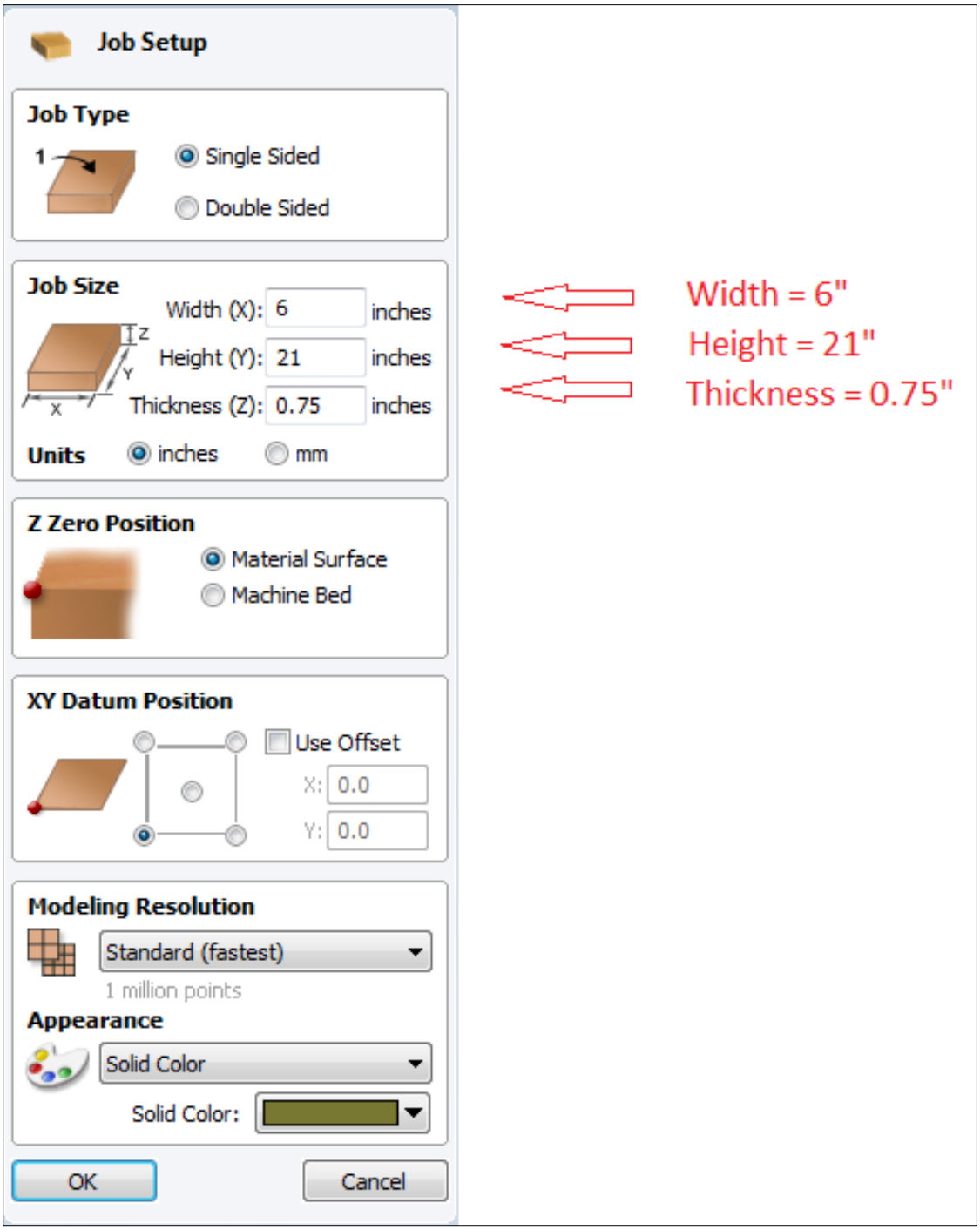
Start VCarve Pro or Aspire and set the job size to be:

- X = 6”
- Y = 21”
- Z = 0.75”

Set Z Zero to be the top of the material, then click OK.

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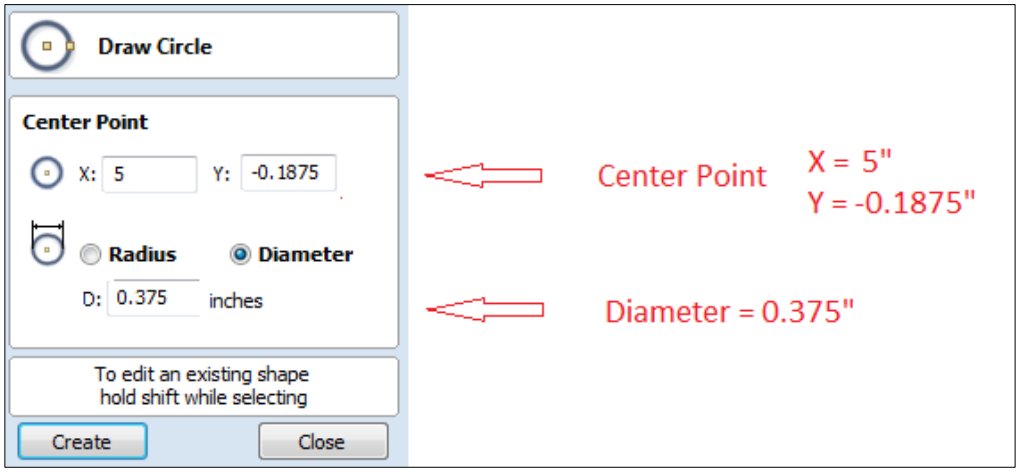
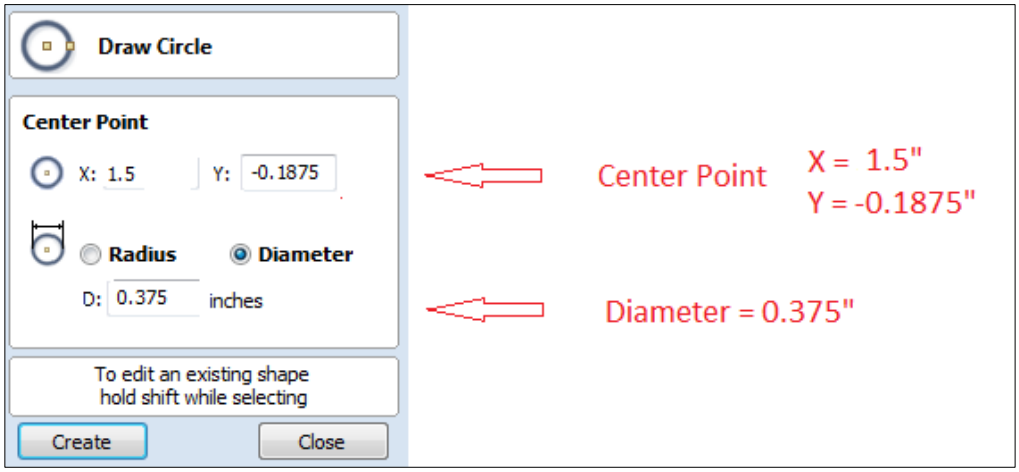
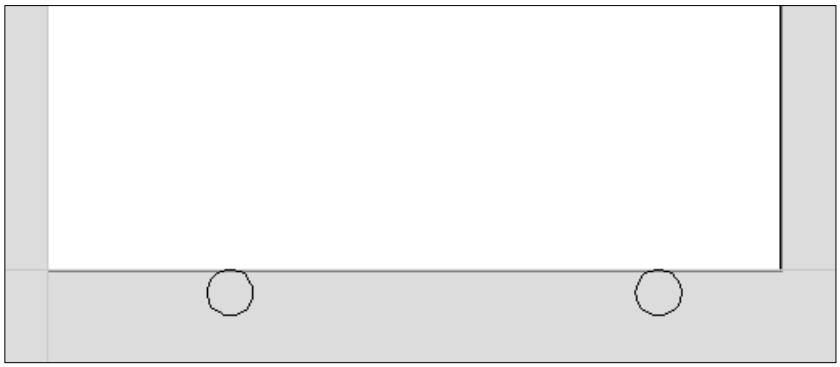
Use the Draw Circle tool to place a 3/8” circle at X, 5.0” and Y, -0.1875”, click Create to make the circle.




Repeat to draw another circle at X, 1.5” and Y, -0.1875”, click Create.




The drawing screen should now look like the below graphic.



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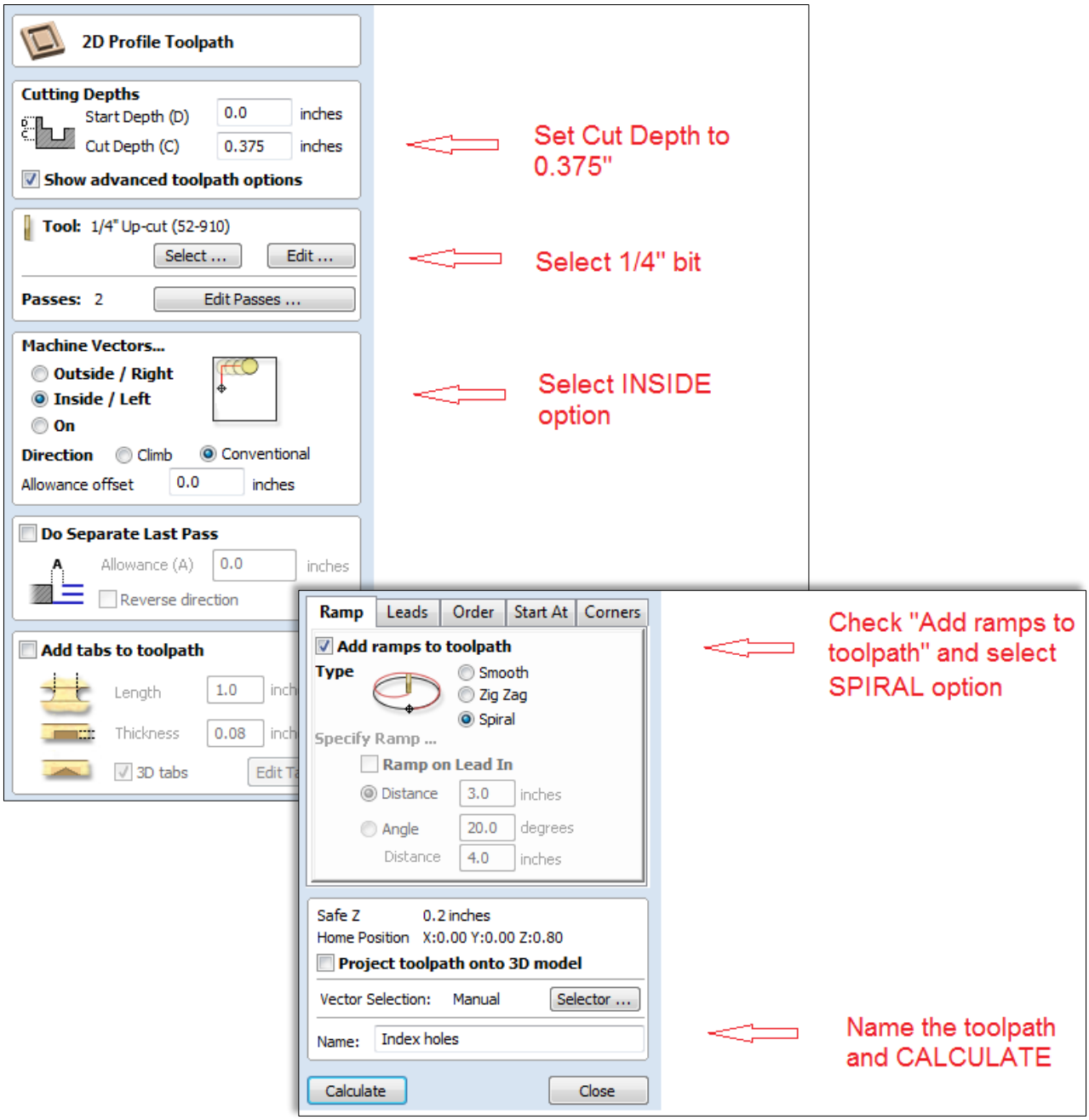
Toolpath the two circles using a 2D profile with the shown settings.




Name it “Index Holes” and click CALCULATE.

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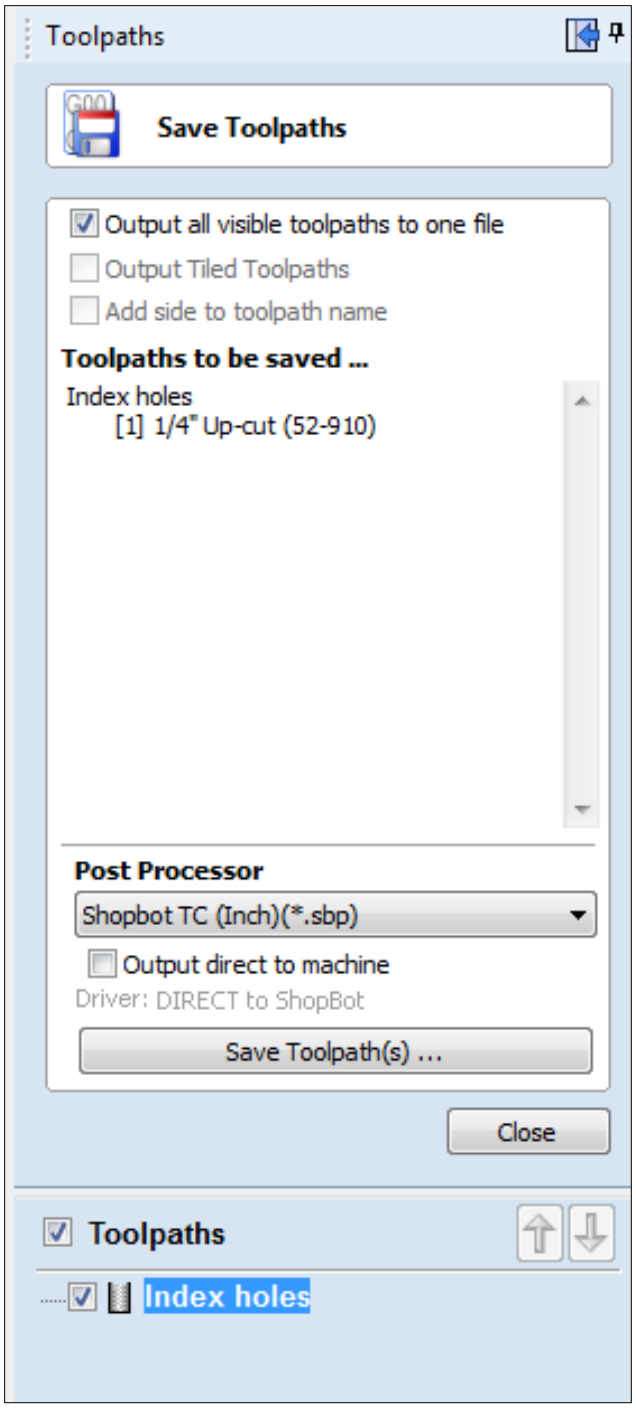
After the toolpath has been calculated, save it as a ShopBot cutting file using the proper post processor for the ShopBot tool being used. Remember the location and name of the saved cutting file!

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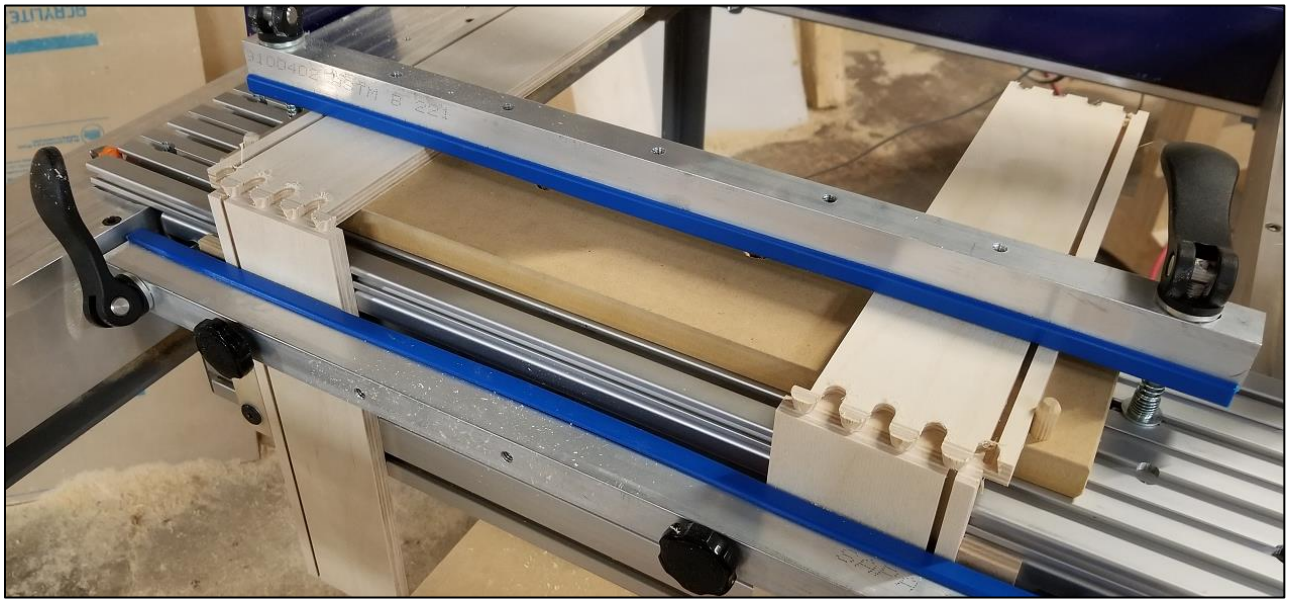
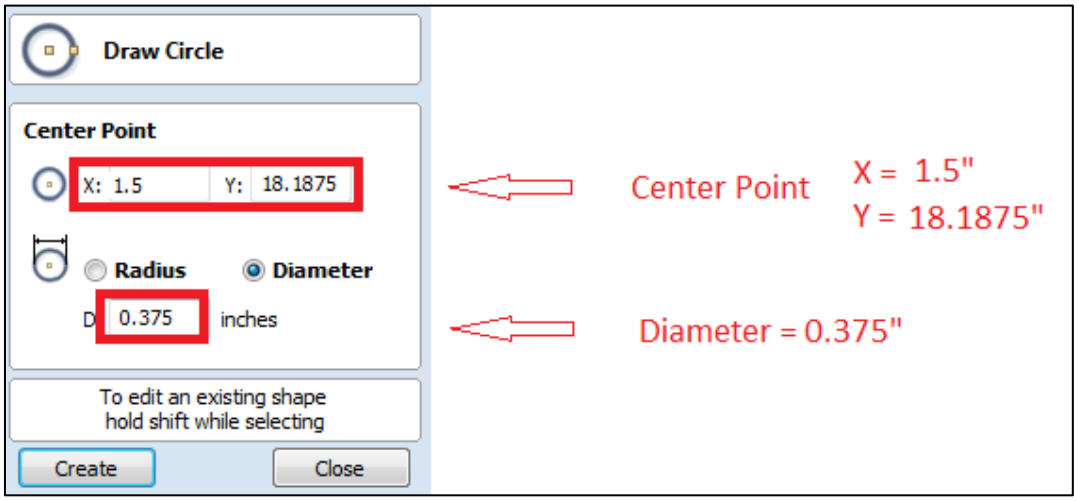
## Cutting holes for a second fence

If planning on cutting dovetails or other parts that may need multiple matching pieces, now is a good time to cut a second set of index pin holes on the other side of the spoilboard. Two extra dowels are needed if completing this step.



For ease of use it is very important that the spacing between these pins is accurate, thus it is recommended that these holes be machined with 18” between the faces of the two pins

Follow the same steps in the previous section to layout the holes and create the toolpath for the second set of index pin holes, with the only change being the center location of the new holes: Change the original -0.1875” center value to 18.1875” like shown here:

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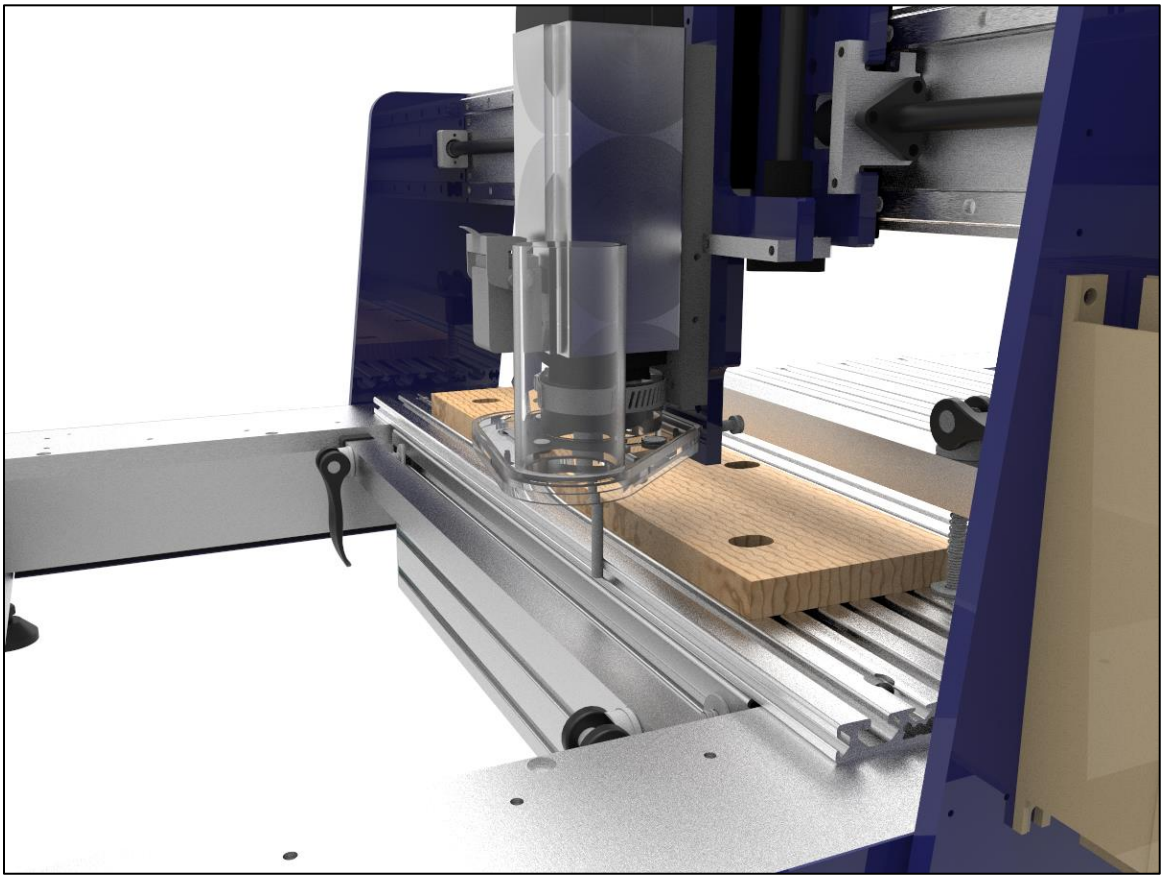
## Machine setup (Desktop MAX)

1. Open SB3 and connect to the machine.
2. Run the XY homing routine [C3].
3. Install a ¼" drill rod into the spindle.
4. Open the KeyPad control and lower the Z to around 0.25" below the surface of the aluminum extrusion deck.
5. With the Z lowered, move the X in the positive direction until the edge of the drill rod touches the edge of the aluminum deck.
   **NOTE**: Use the fixed distance feature of the KeyPad control to make fine adjustment easier.



6. Once the drill rod is touching the edge of the deck, the X zero location can be set.
7. To set the X zero, double-click the X value in the red position window, this will open the Axis location window.
   **NOTE**: Remember/record the value of X for future use. Enter **-0.125** for the value of "New X location". This will set X zero to be centered over the edge of the aluminum deck.
8. Raise the Z using the KeyPad and move the Y to the location of 3.25.
   **NOTE**: Remember/record the value of Y for future use, this will allow a quick return to the same location.
   Zero the Y axis at this location.

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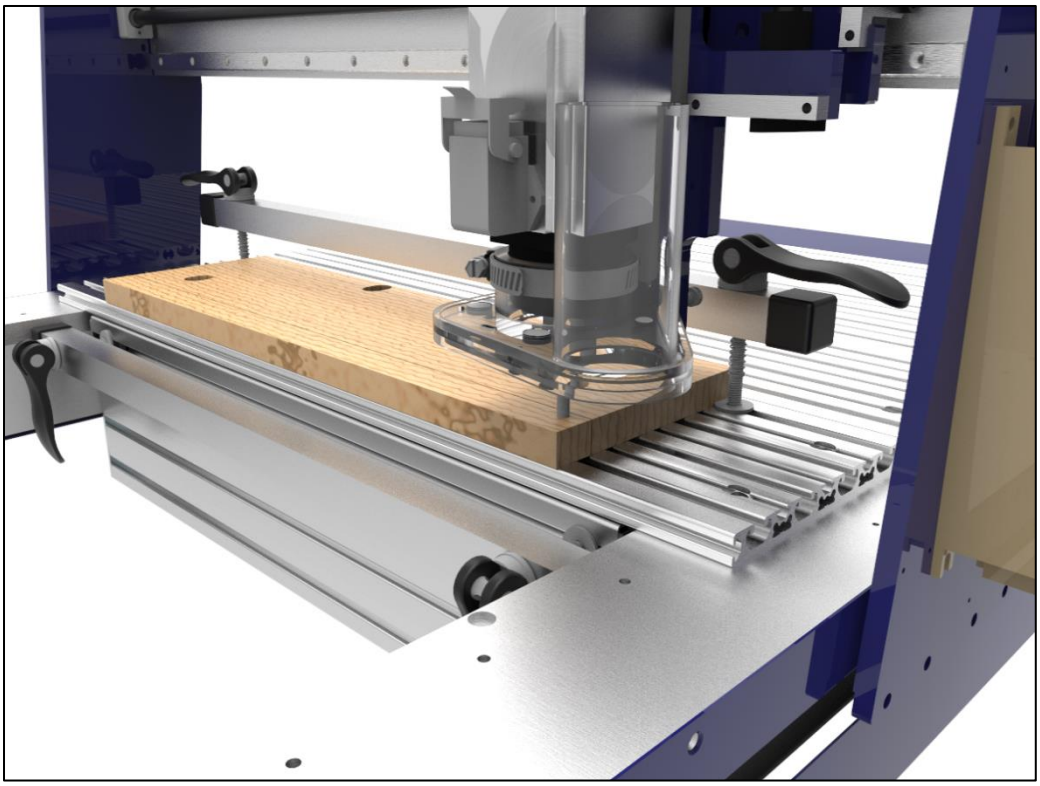
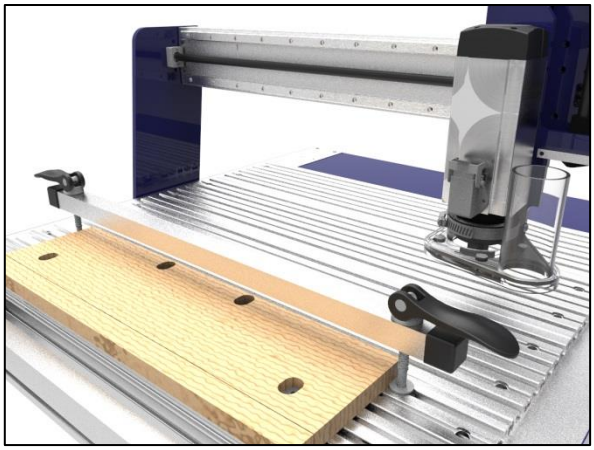
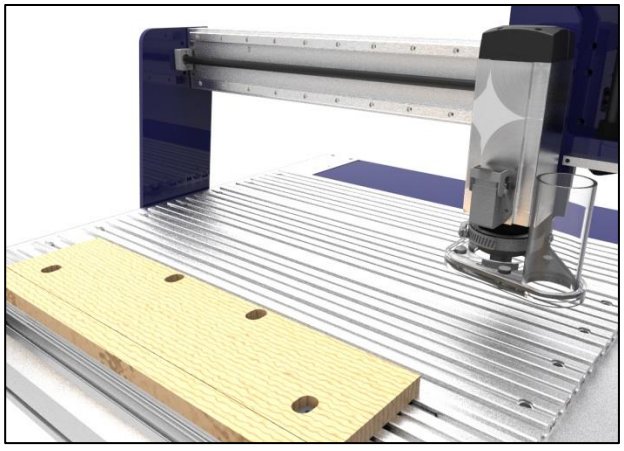


9. Now to remove the upper clamping bar before cutting the index holes. To remove the clamp, rotate the cam handles counterclockwise until they are unthreaded from the T-nut.





10. Once the clamping bar is removed, install a ¼" bit into the spindle and zero the Z to the top of the spoil board.
11. Run the Index hole cutting file now.
12. Insert 3/8" dowels into the cut holes. This will act as the fence and will locate the part to Y Zero.

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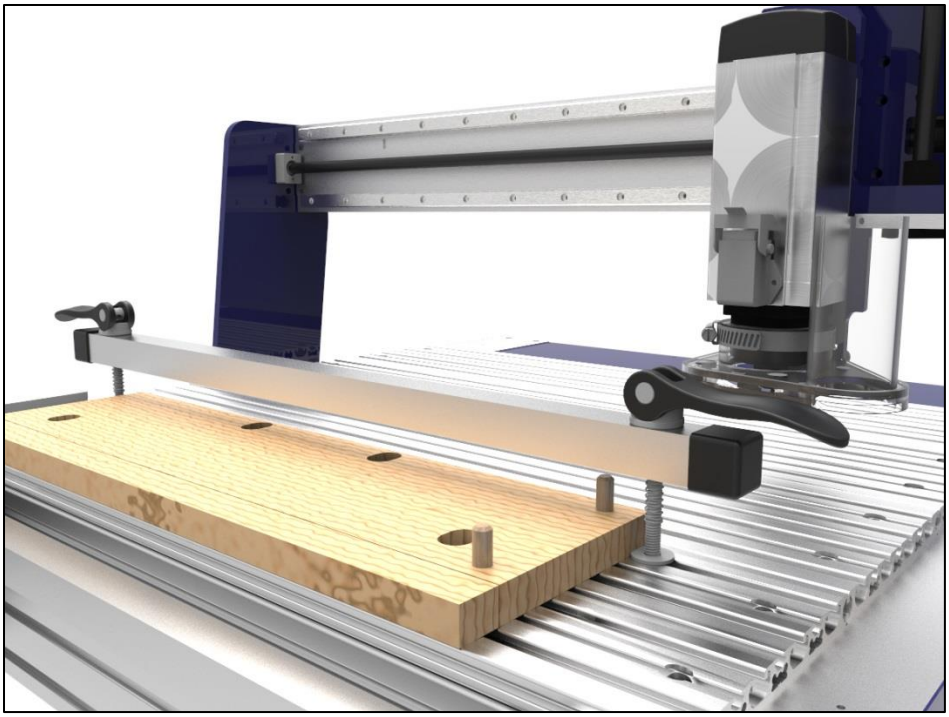
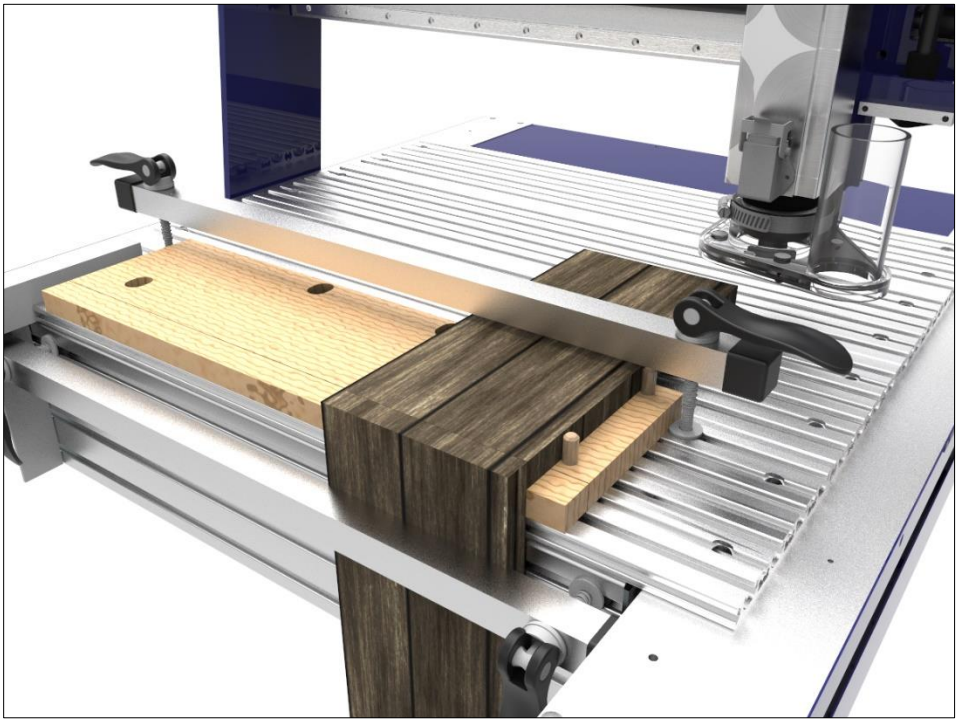
13. Reinstall the upper clamping Bar.





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## X & Y zero (Desktop)

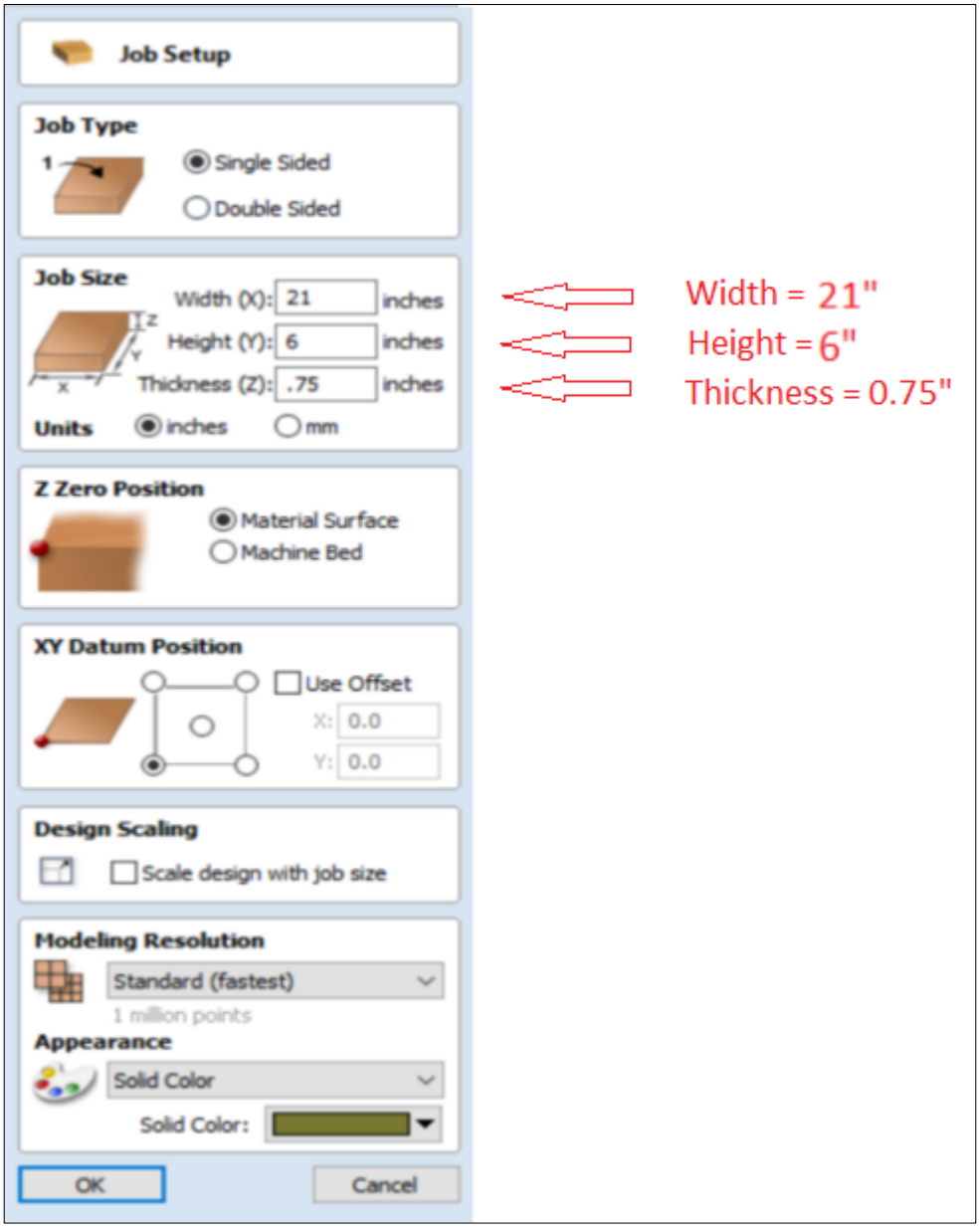
### Index hole file (Desktop)

First, to create a file to drill the 3/8” index holes. 3/8” dowels will be inserted into these holes which will act as a fence for locating the X zero point.

Start VCarve Pro and set the job size to:

- X = 21”
- Y = 6”
- Z = 0.75”

Set Z Zero to be top of the material.
Click OK

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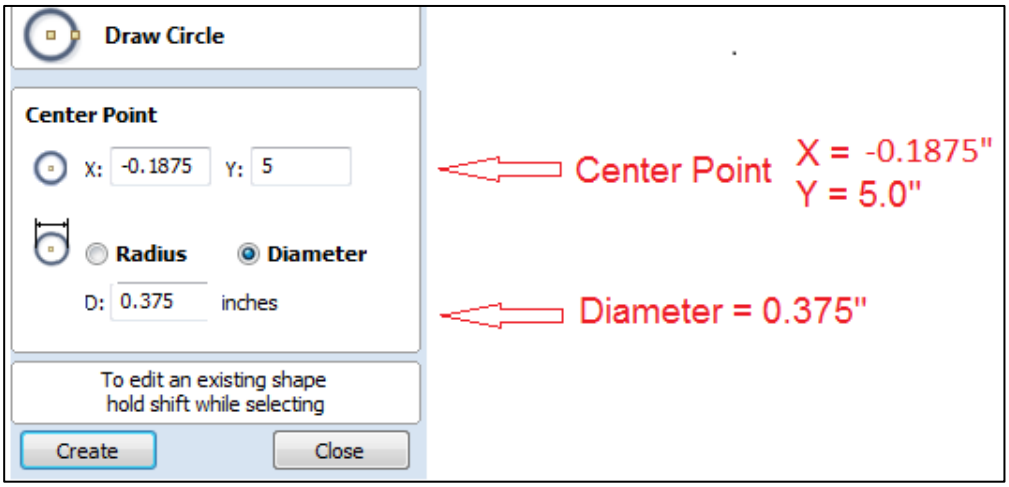
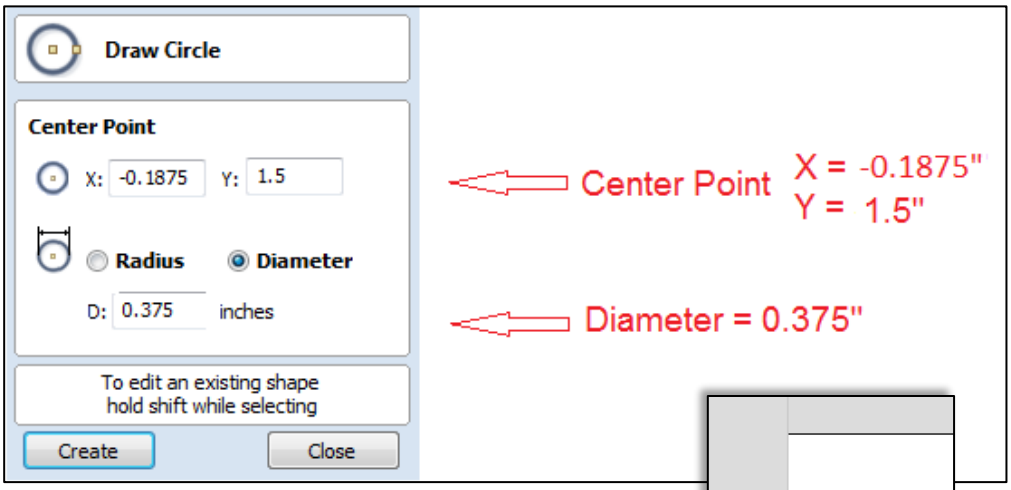
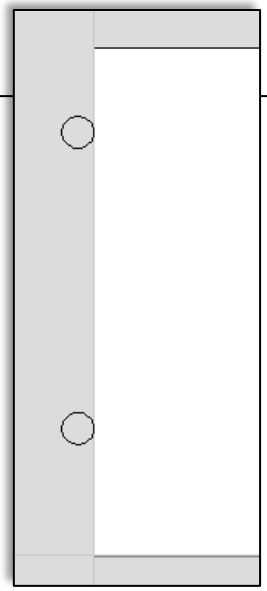
Use the Draw Circle tool to place a 3/8” circle at X, 0.1875” and Y, 5.0”




Repeat to draw another circle at X,-0.1875” and Y, 1.5”.




The drawing screen should now look like the following graphic.



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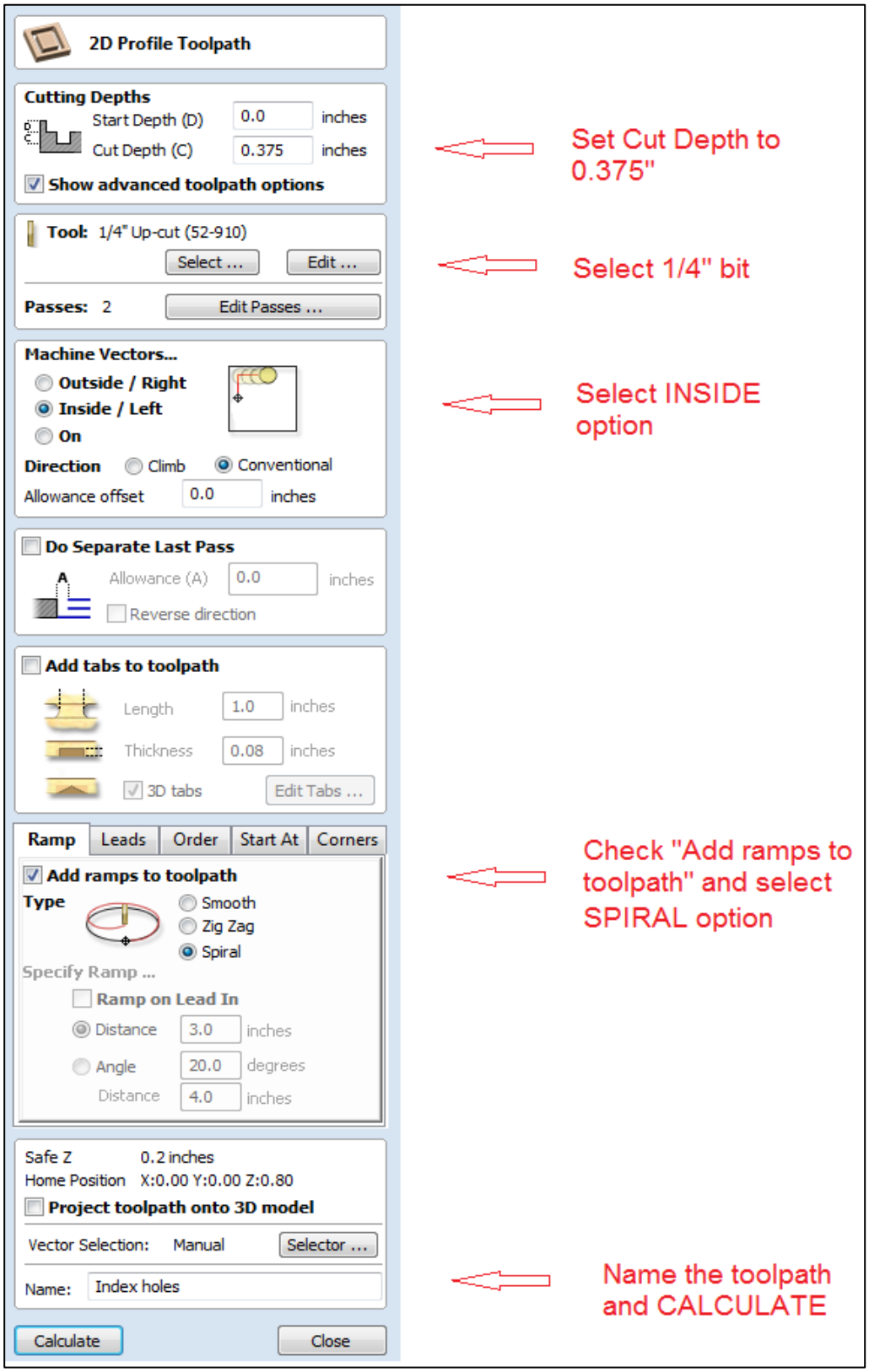
Toolpath the two circles using a 2D profile with the following settings. Name it “Index Holes” and click CALCULATE

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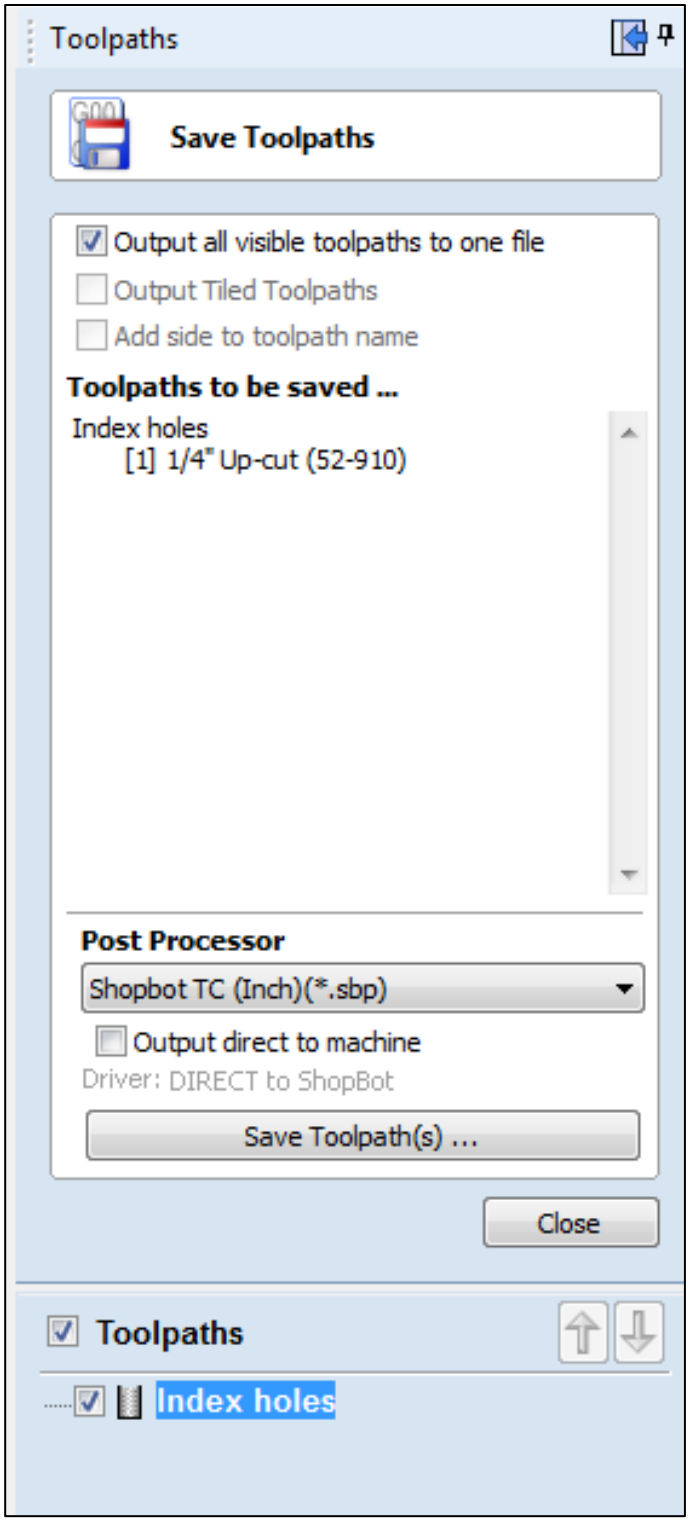
After the toolpath have been calculated, save the toolpath as a ShopBot cut file (.sbp). Remember the location and name of the saved cutting file!

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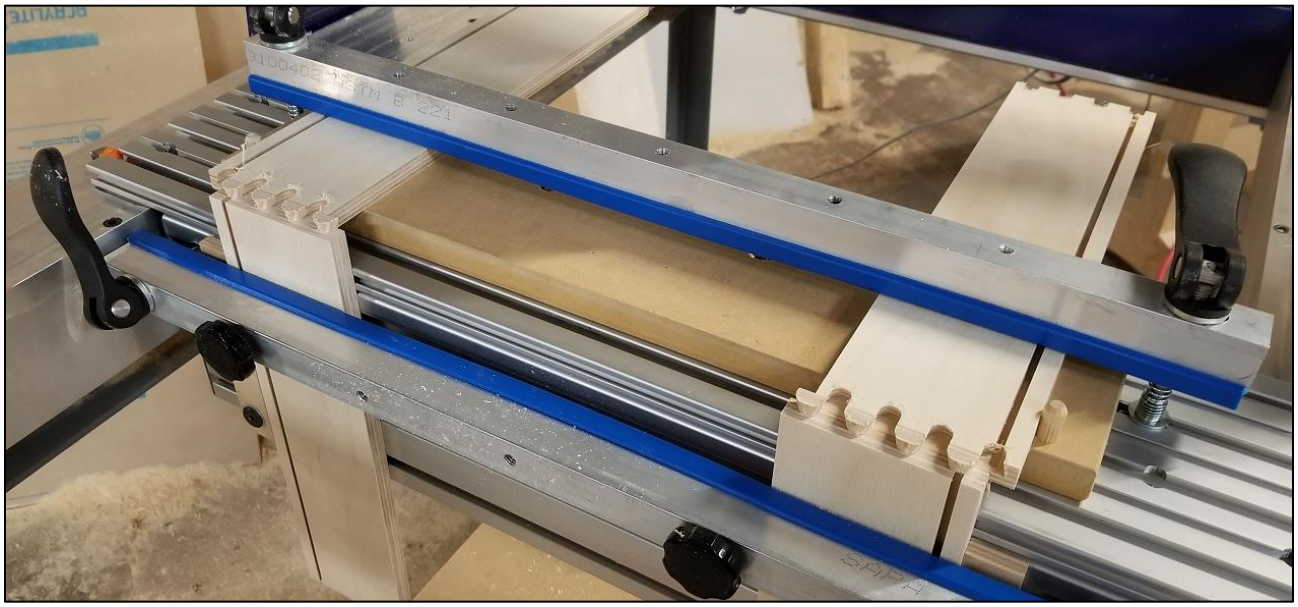
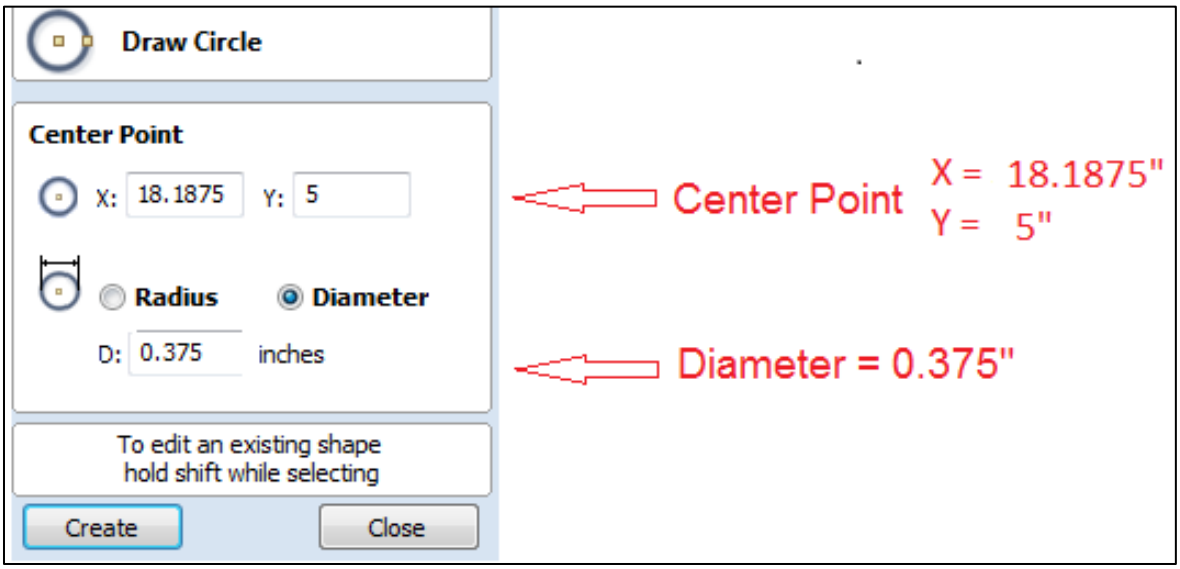
### Cutting holes for a second fence

If planning on cutting dovetails or other parts that may need multiple matching pieces, now is a good time to cut a second set of index pin holes on the other side of the spoilboard.



For ease of use it is very important that the spacing between these pins is accurate, thus it is recommended that these holes be machined with 18” between the faces of the two pins

Follow the same steps in the previous section to layout the holes and create the toolpath for the second set of index pin holes, with the only change being the center location of the new holes: Change the original -0.1875” center value to 18.1875” like shown here:

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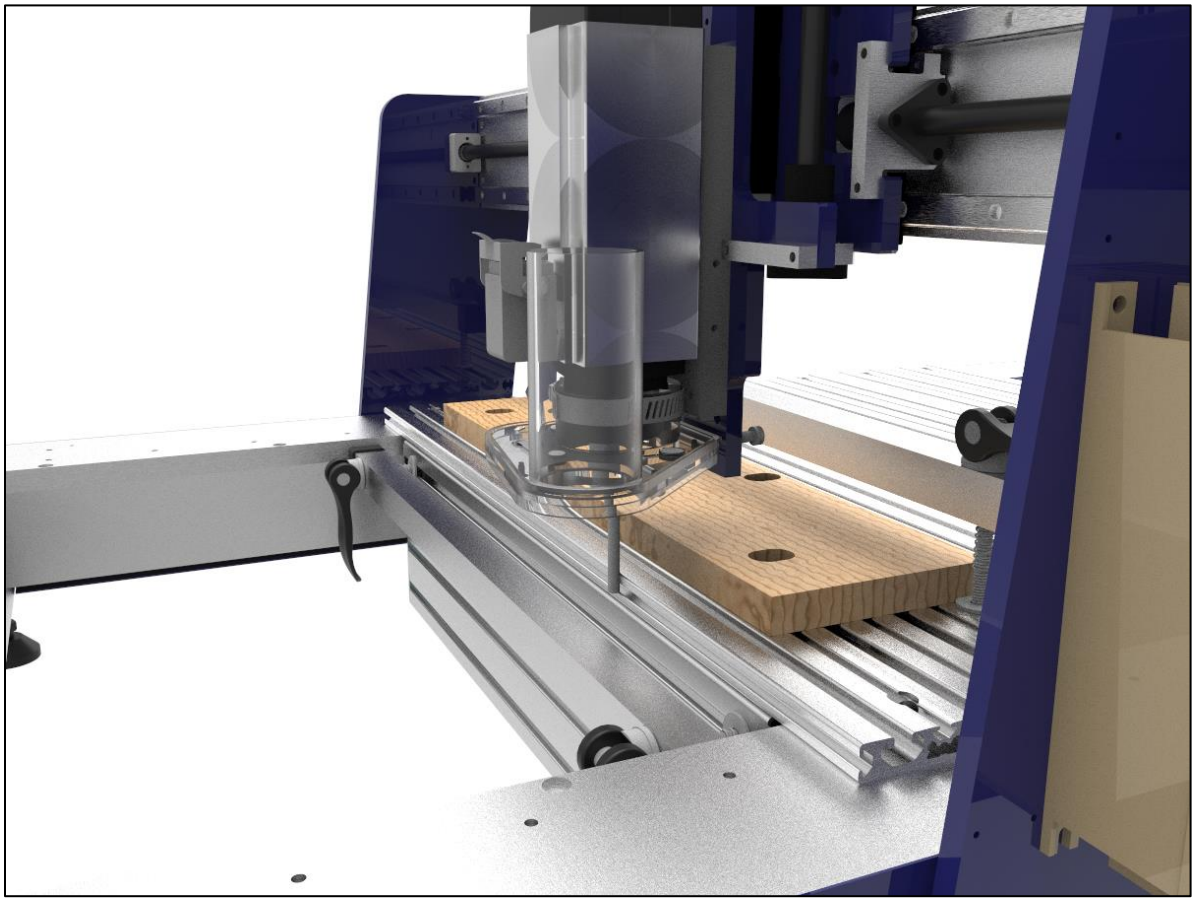
## Machine setup (Desktop)

1. Open SB3 and connect to the machine.
2. Run the XY homing routine [C3].
3. Chuck a ¼" drill rod into the spindle.
4. Open the KeyPad control and lower the Z about 0.25" below the surface of the aluminum extrusion deck.
5. With the Z lowered, move the Y axis in the positive direction until the edge of the drill rod touches the edge of the aluminum deck. **NOTE**: Use the fixed distance feature of the KeyPad control to make fine adjustment easier.



6. Once the drill rod is touching the edge of the deck the Y zero location can be set.
7. To set Y zero, double-click the Y value in the red position window, this will open the Axis location window. **NOTE**: Remember the value of Y for future use. Enter -0.125 for the value of "New Y location". This will set Y zero to be centered over the edge of the aluminum deck.
8. Raise the Z axis using the KeyPad, then move X to the location of 3.25". **NOTE**: Remember/record the value of X for future use, this will allow a quick return to the same location.
   Zero the X axis at this location.

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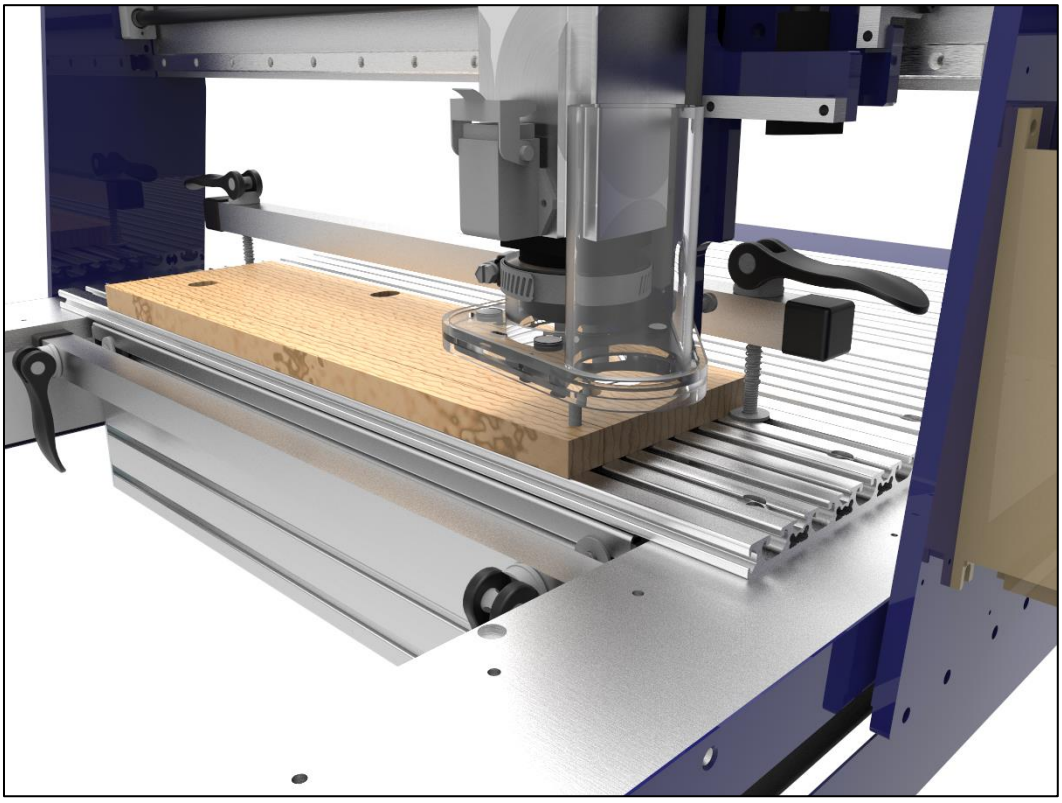
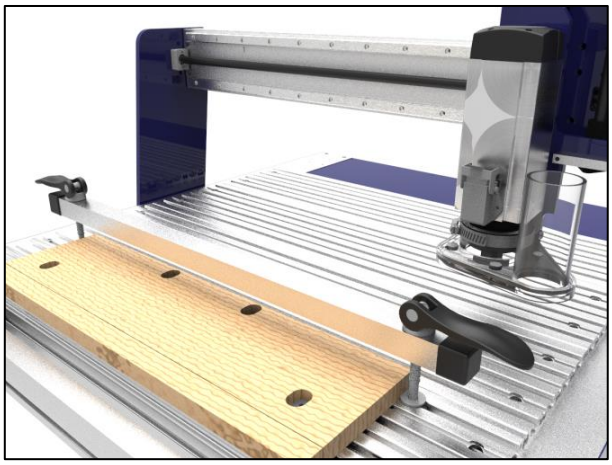
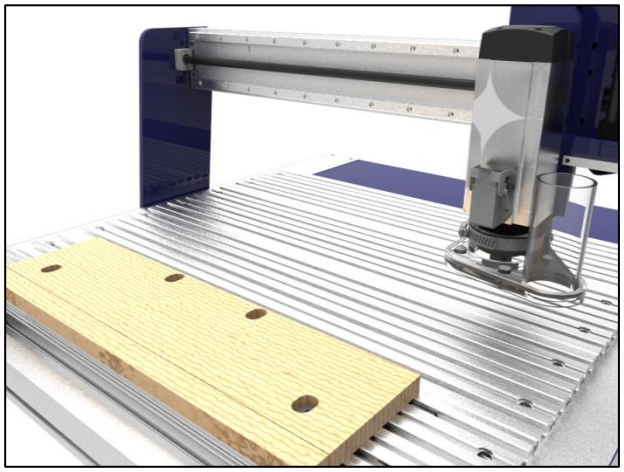


9. Now to remove the upper clamping bar before cutting the index holes. To remove the clamp, rotate the cam handles counterclockwise until they are unthreaded from the T-nut.





10. Once the clamping bar is removed, install a ¼" bit into the spindle and zero the Z to the top of the spoil board.
11. Run the Index hole cutting file now.
12. Insert 3/8" dowels into the cut holes. This will act as the fence and will locate the part to X zero.

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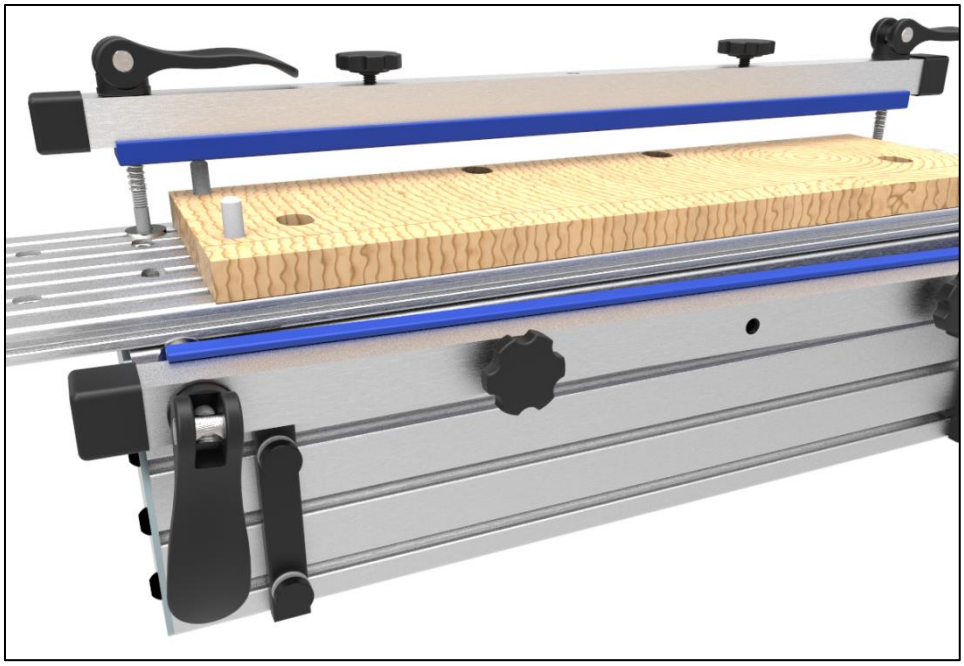
13. Reinstall the upper clamping bar.



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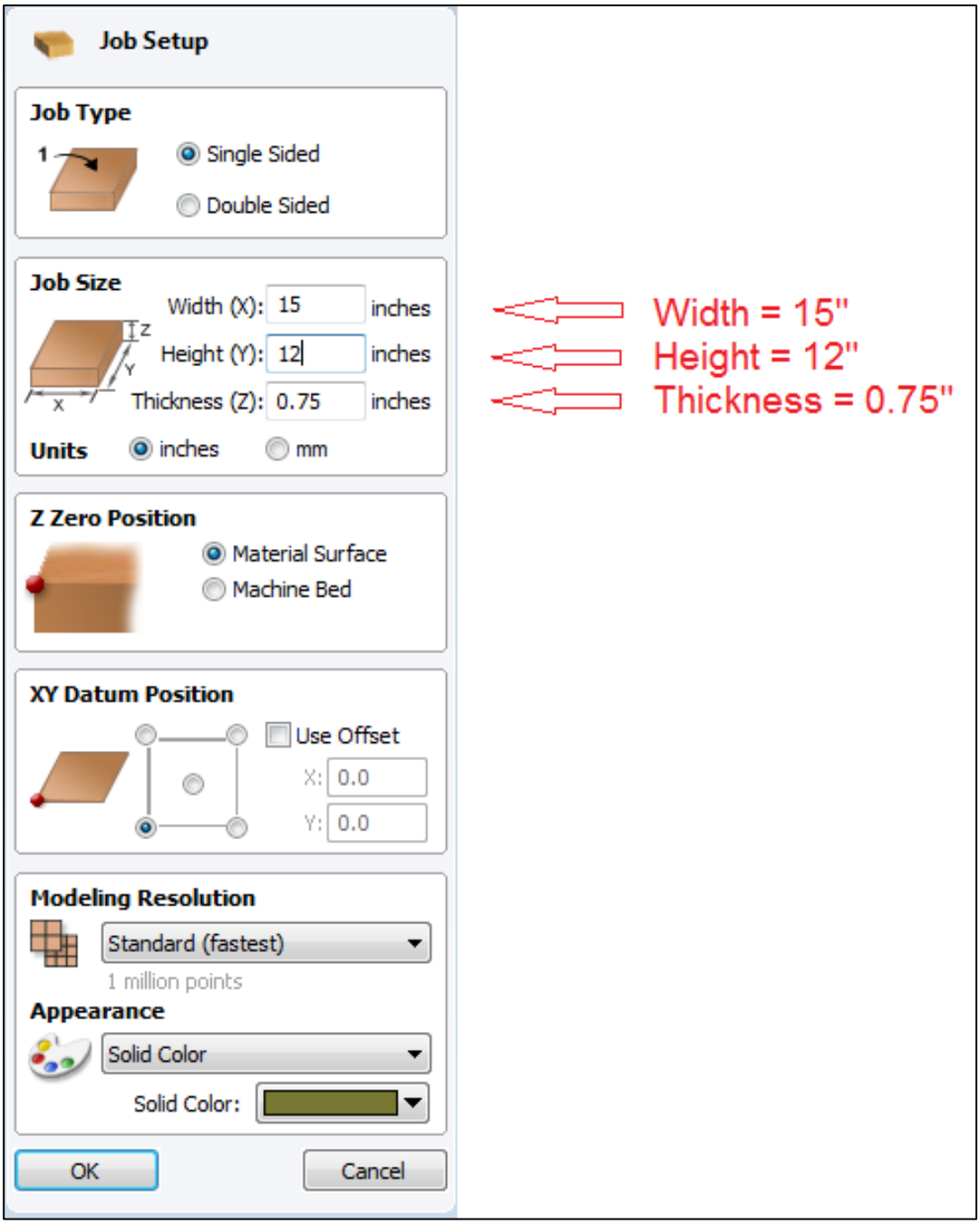
# Creating a Tenon (Desktop)

## Layout the Blanks

This example is written as if using a Desktop. NOTE: for a Desktop MAX orient the tenon along the Y-Axis instead of the X.

1. Create a new VCarve job.

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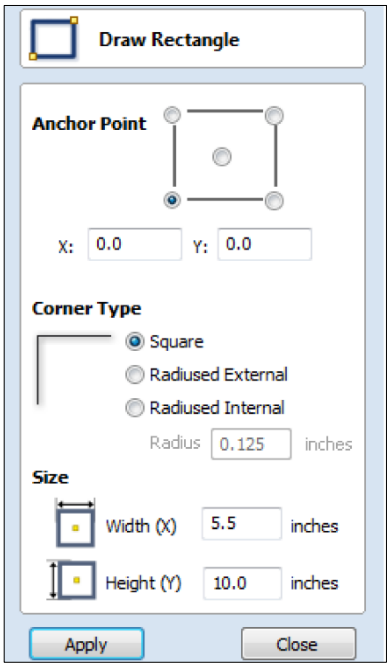
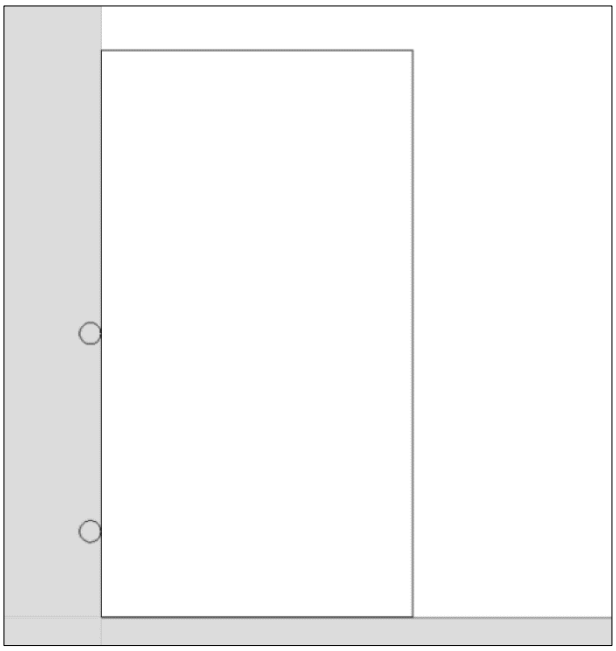
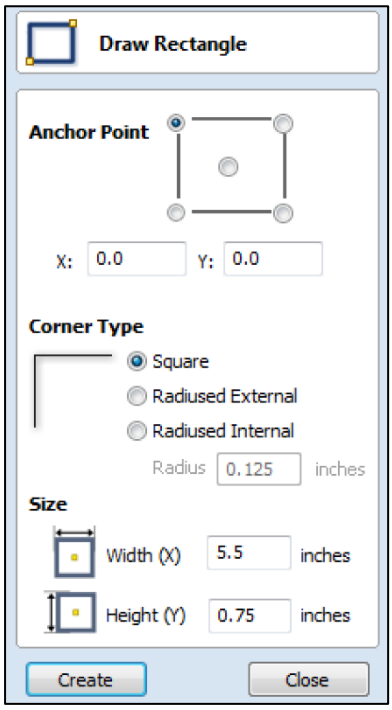
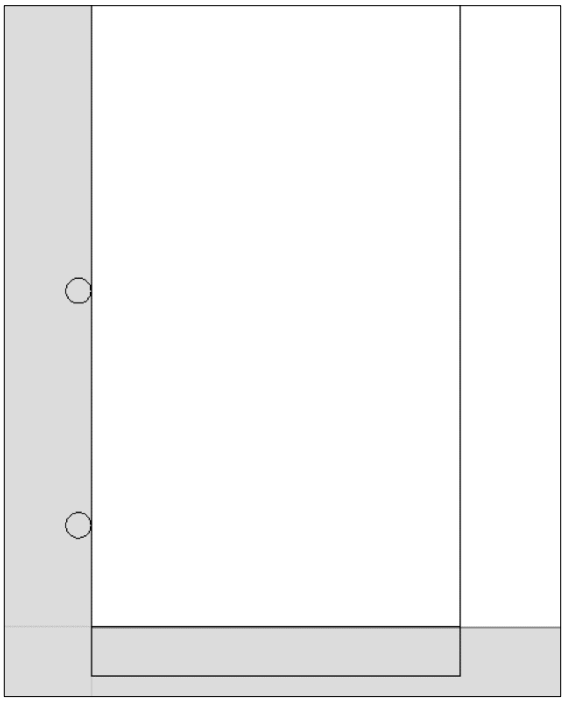
2. Draw a 5.5” x 10” rectangle at X, 0 and Y, 0:



3. Draw a 5.5” x 0.75” rectangle at X, 0 and Y, 0.
**Note:** Set anchor point to the upper left.



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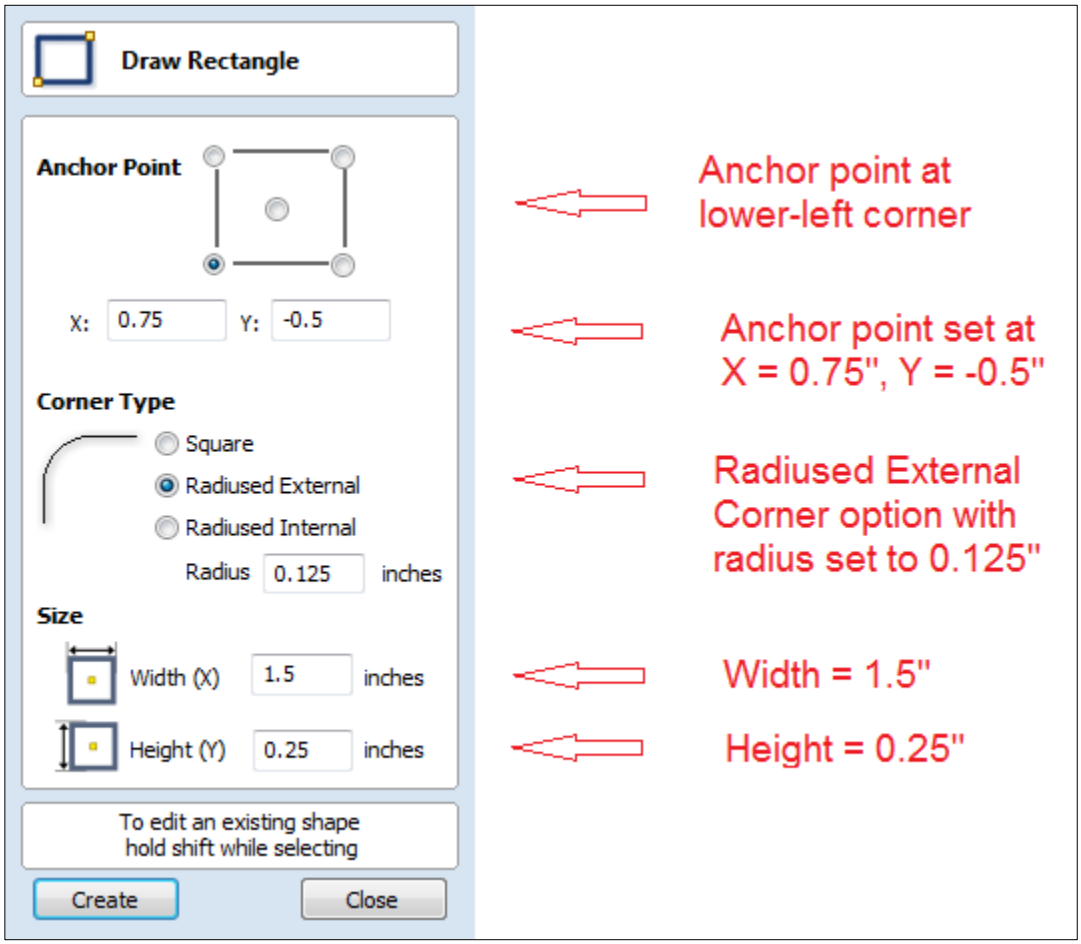
## Draw the Tenons

Draw two rounded rectangles on the lower piece that will become the tenons.

First tenon:

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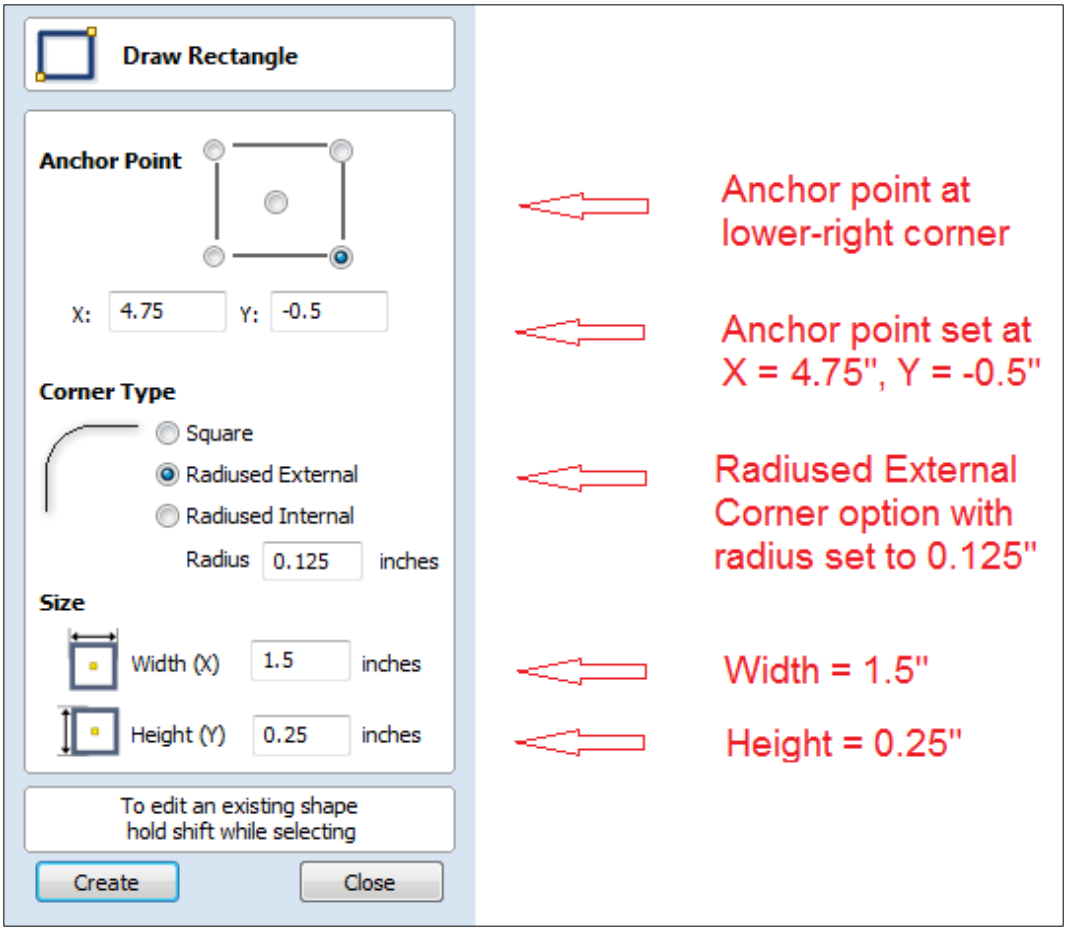
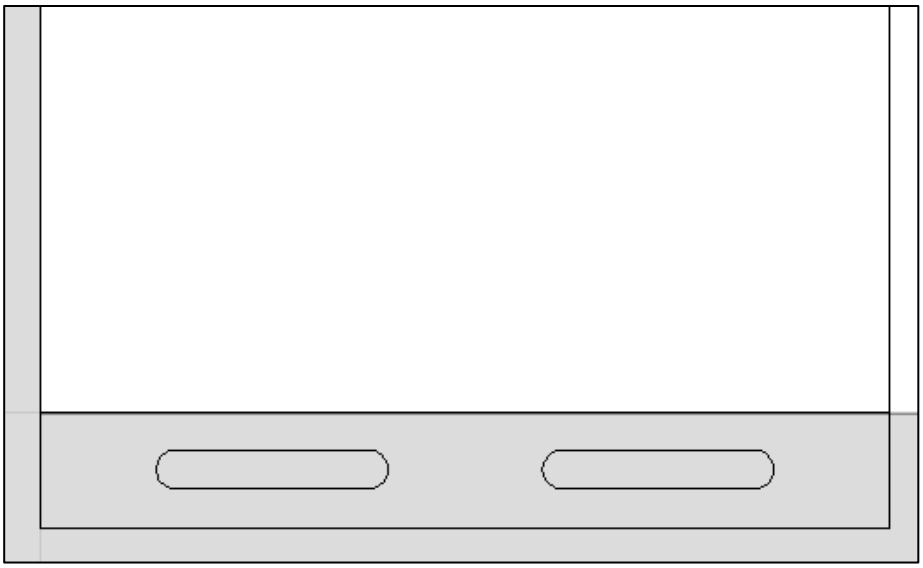
Second Tenon:




The layout should look like this:



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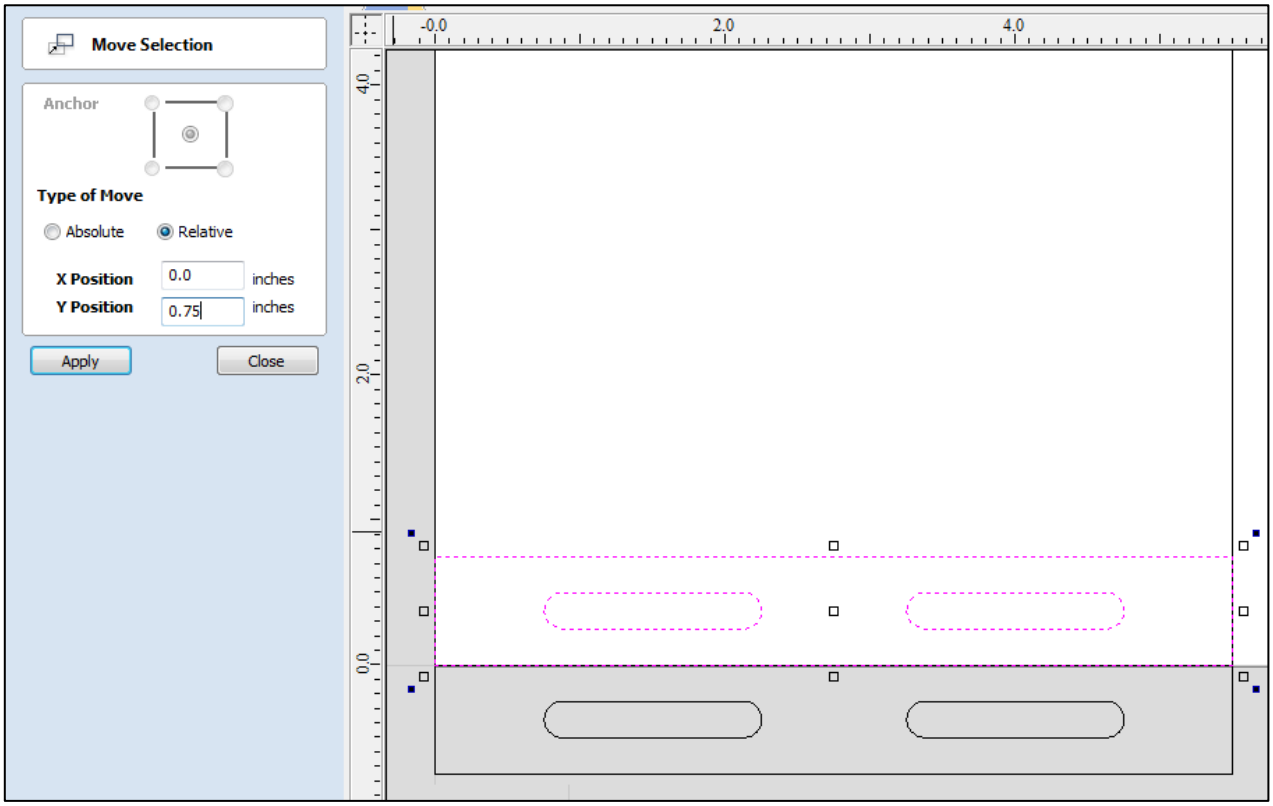
Next, to create the layout for the mortices.
Select the smaller rectangle with the two tenon rectangles, then go to Edit menu and select Copy.

Next, select Paste and a second copy will be superimposed over the original. While that copy is still selected, move it up 0.75” in the Y-axis

When complete, it will look like the below image:

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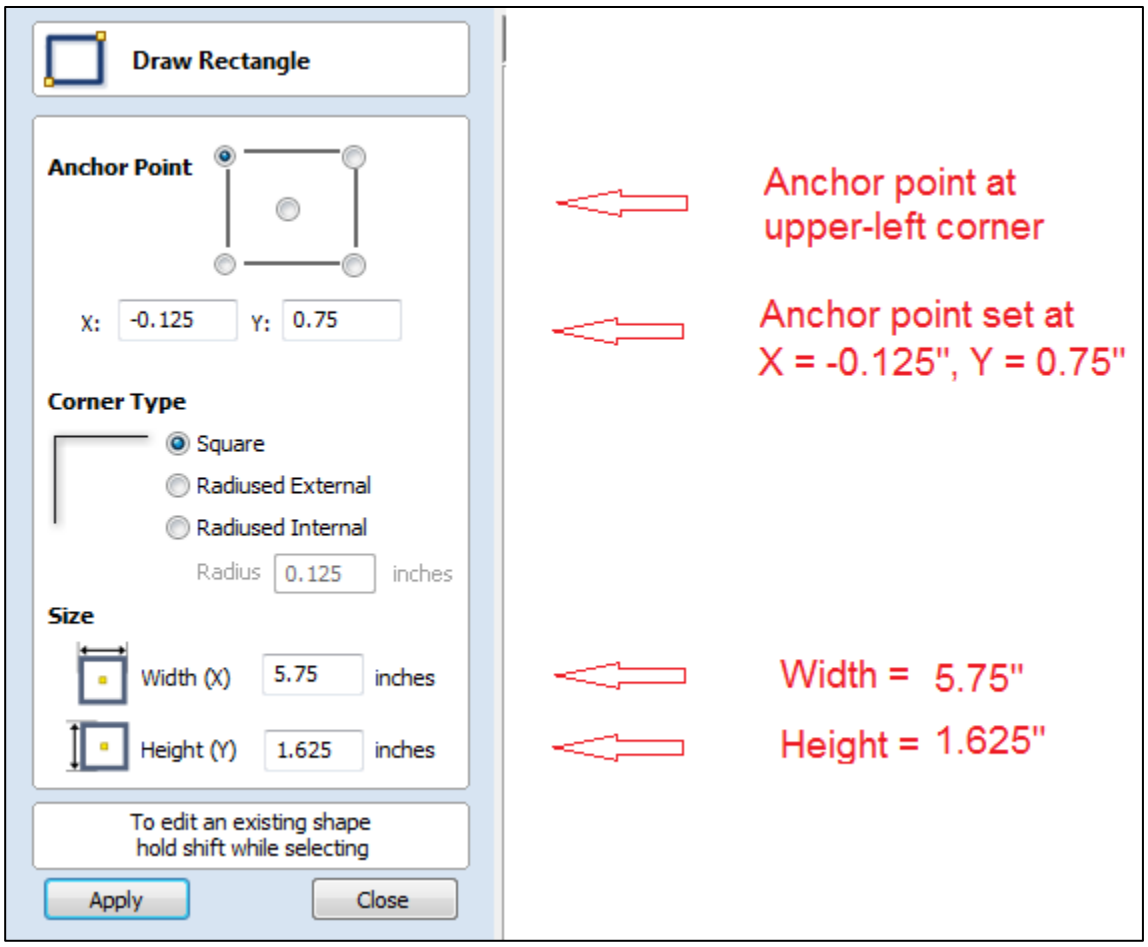
One more rectangle is needed to be the boundry for the tenon pocket.  Draw that rectangle using the following settings:

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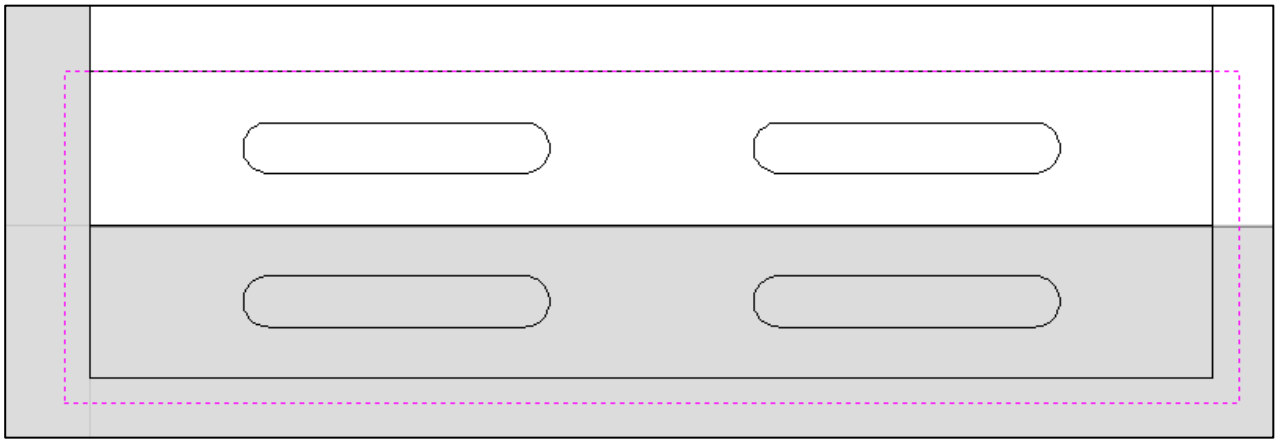
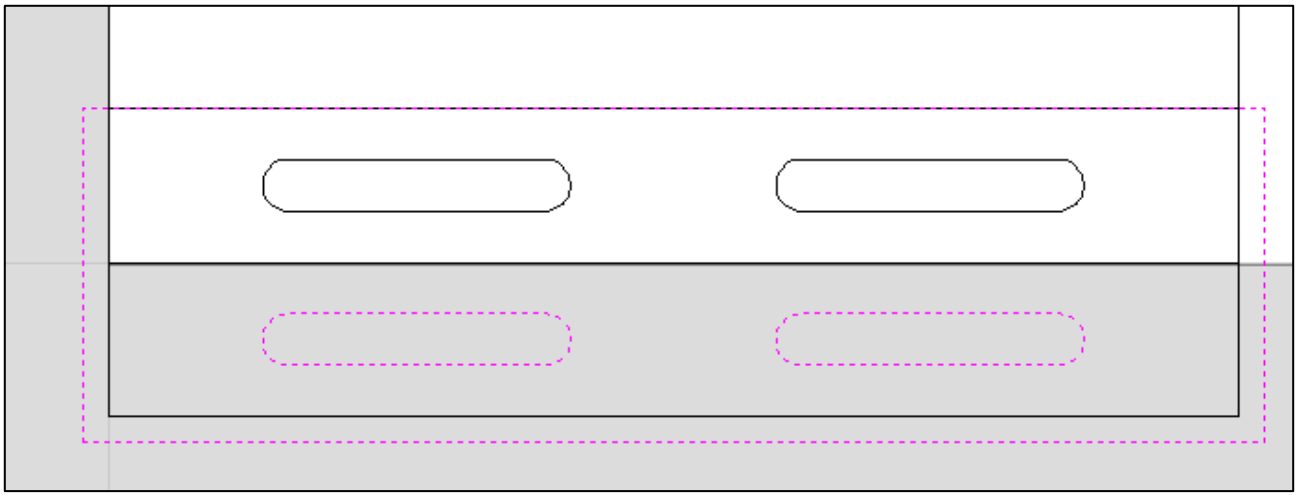
When finished, the drawing will look like this:



## Toolpath the Tenon Pockets

Select the larger rectangle and the two lower tenons



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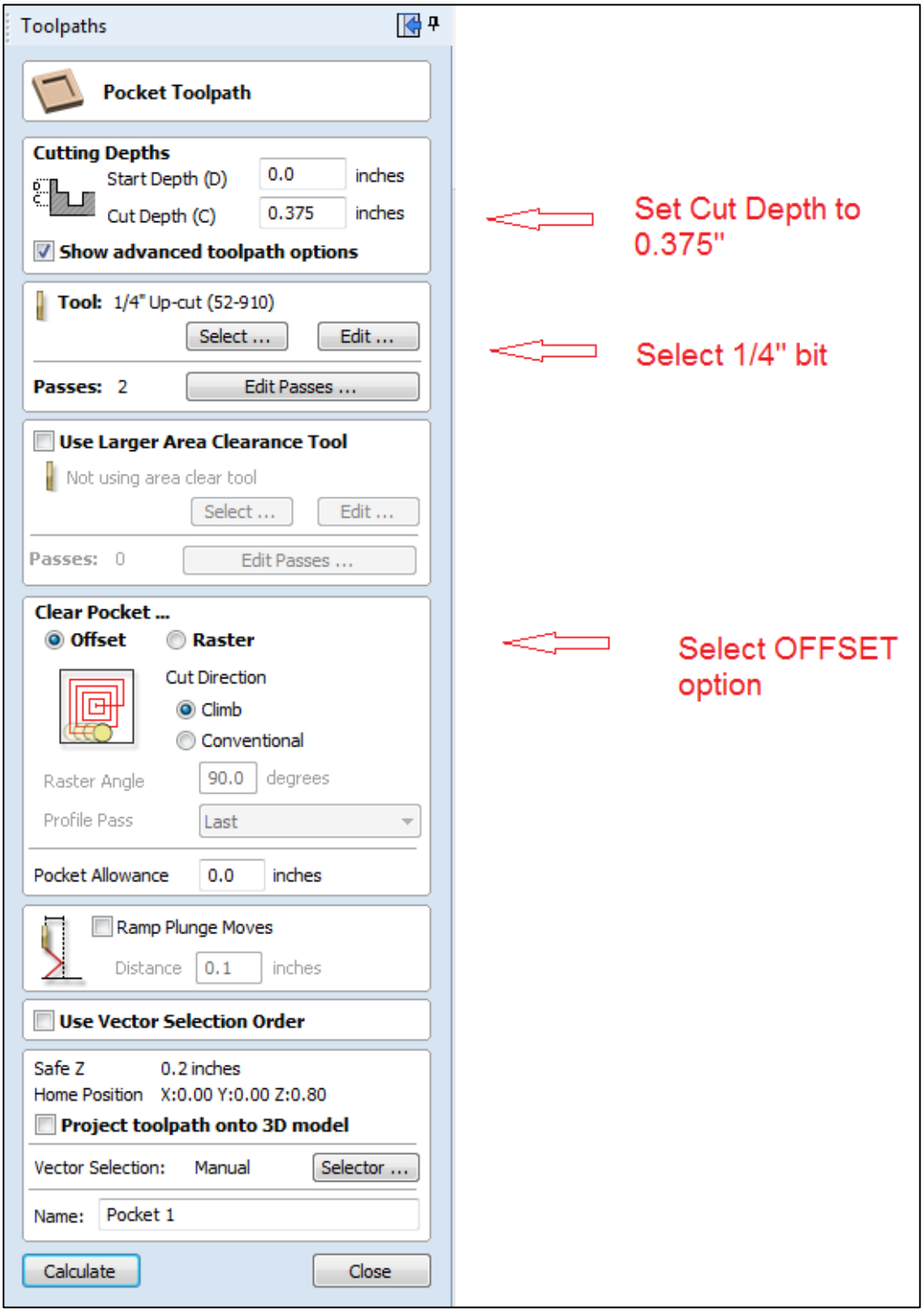
Create a pocketing toolpath using the selected vectors:

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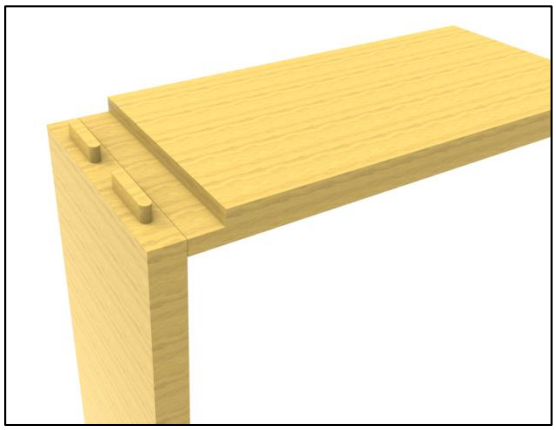
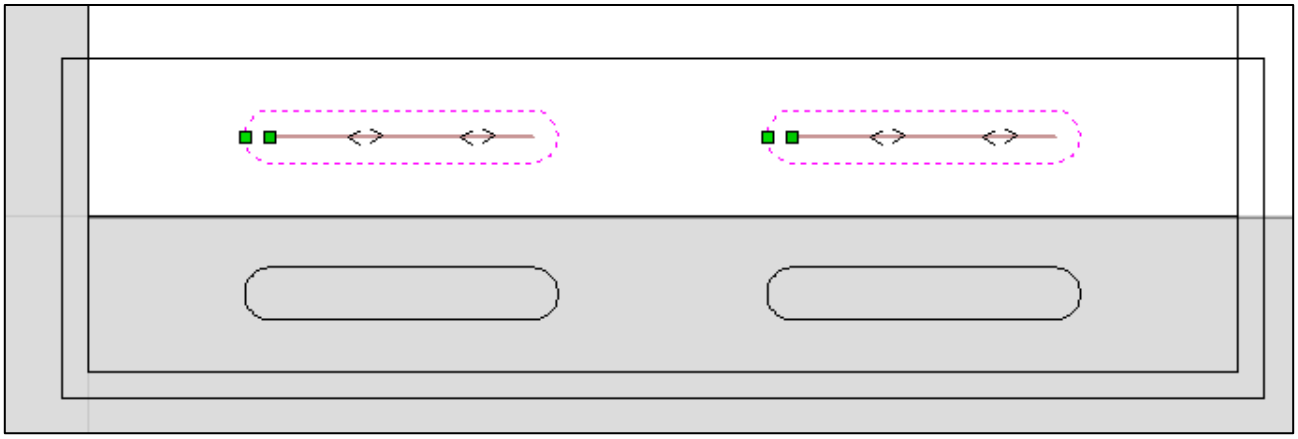
This will create the tenons on the vertical piece and a rabbet on the horizontal.



## Create the Mortices:

Select the other two rounded rectangles



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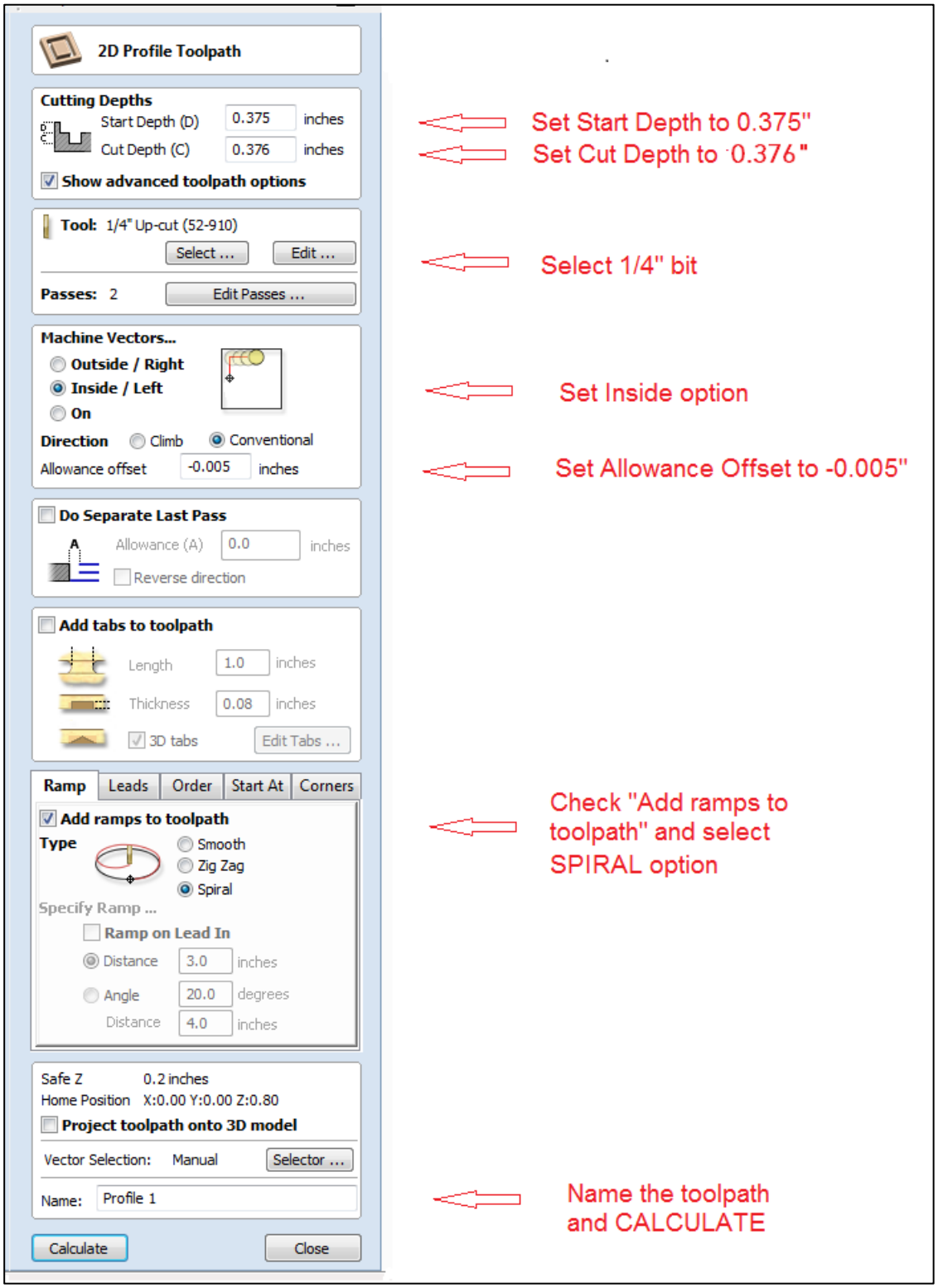
Using the 2D profile toolpath option, use the inside option to create mortices

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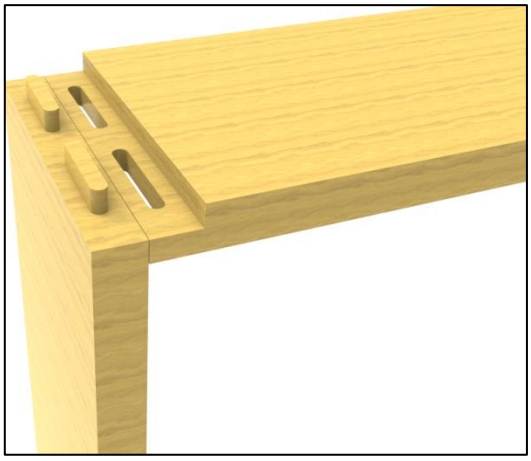
This will create the mortices on the horizontal piece.

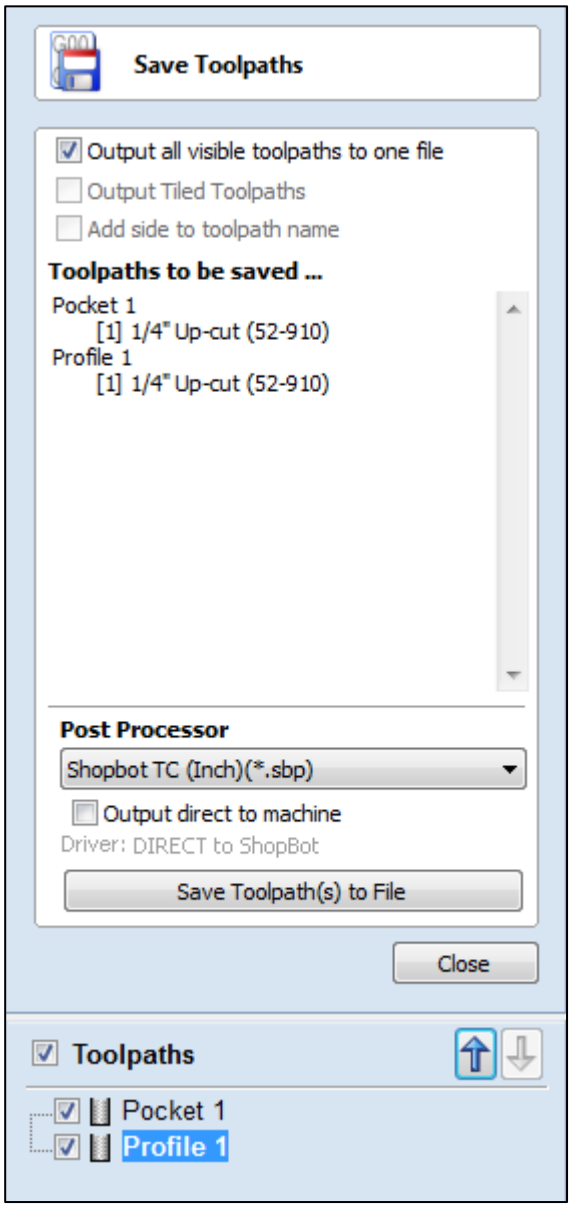


## Save the toolpaths

Now to save the cutting file.

Click the checkbox to make all toolpaths visible, then click the icon to save toolpath.

Add a check to output all visible toolpaths to one file, then click “Save Toolpath(s) to File”, which is the file needed to run on the ShopBot.

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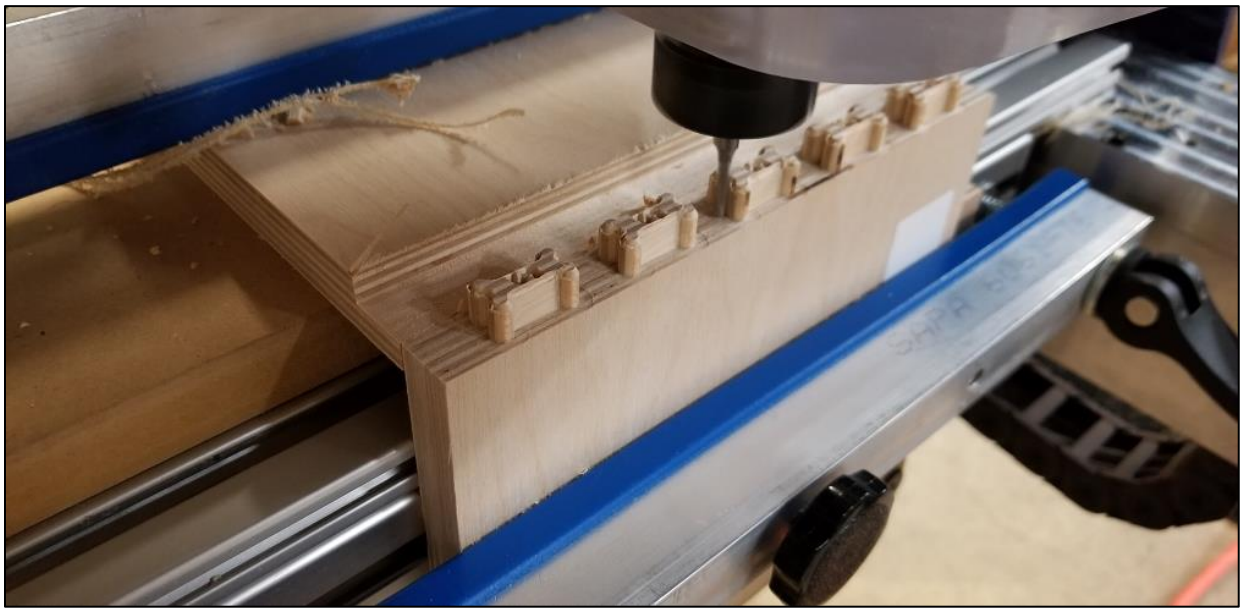
## Exploring other tenon shapes

The same technique for creating these tenons can be applied to make all kinds of interesting connections that would be very difficult to do any other way. Here are some examples of other possibilities:



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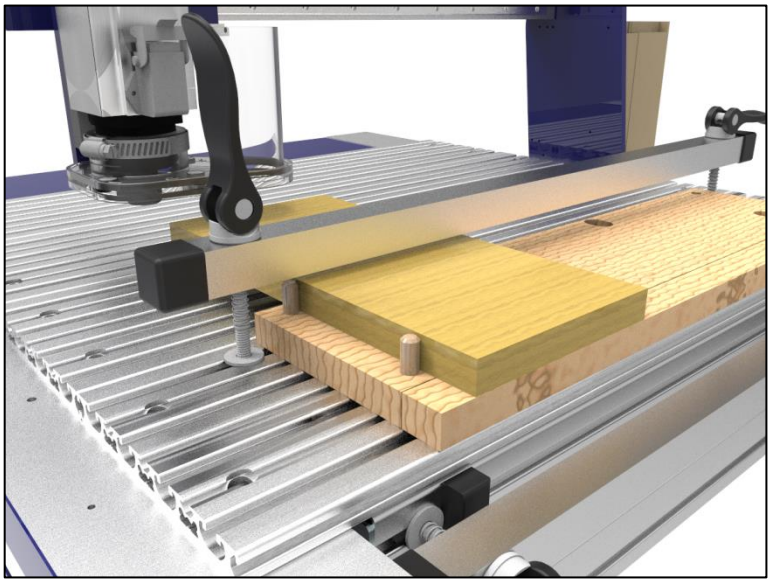
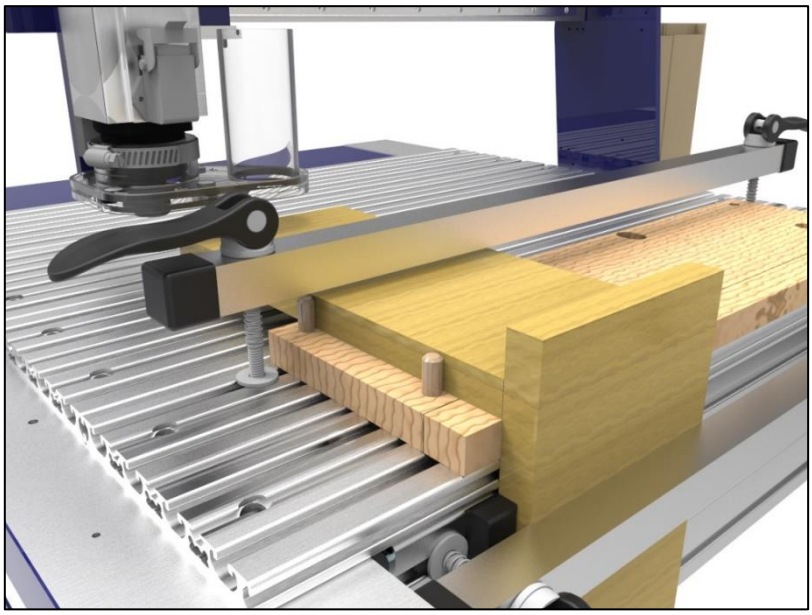
## Clamping material

1. Lift the cam handles and rotate counterclockwise to loosen the bar clamp enough to slide the 0.75” material under the bar.
2. Place the horizontal board on first, with the long edge against the dowels.
3. With the cam handle lifted vertically, rotate the handle clockwise to lower the bar down. Continue to rotate the handle until the bar is just touching the top of the material. This will set and give the clamp enough pressure to hold the material. Make the same adjustments to the lower clamping bar on the other side.



4. Slide the vertical board into place and clamp high enough to act as a stop for the horizontal board. The exact height will be adjusted next. Now, move the horizontal board along the dowels until it presses against the vertical board. Clamp the horizontal board in place by tightening the cam handle.



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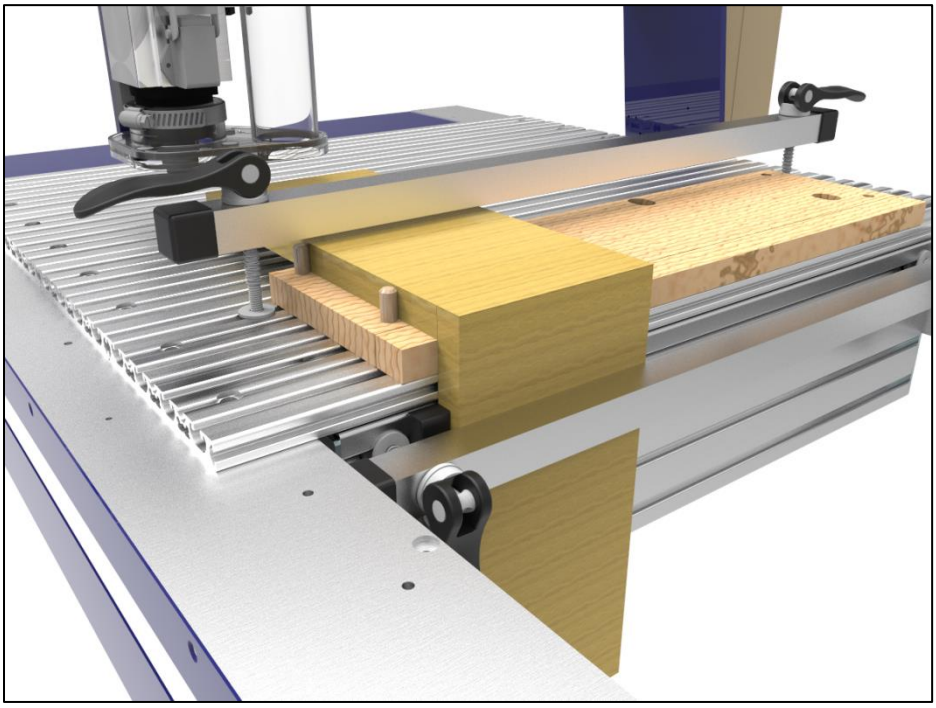
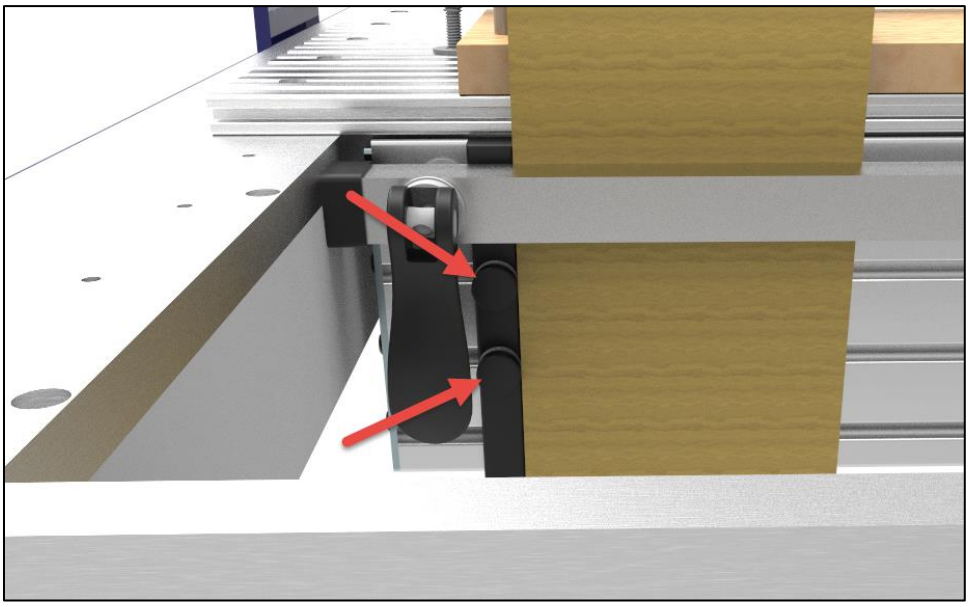
5. Unclamp the vertical board and adjust the height to until flush with the top of the clamped horizontal board, then tighten the clamp into place.



6. Loosen the thumb knobs on the fence of the lower extrusion and slide the fence against the edge of the vertical board. Then, tighten the thumb knobs.



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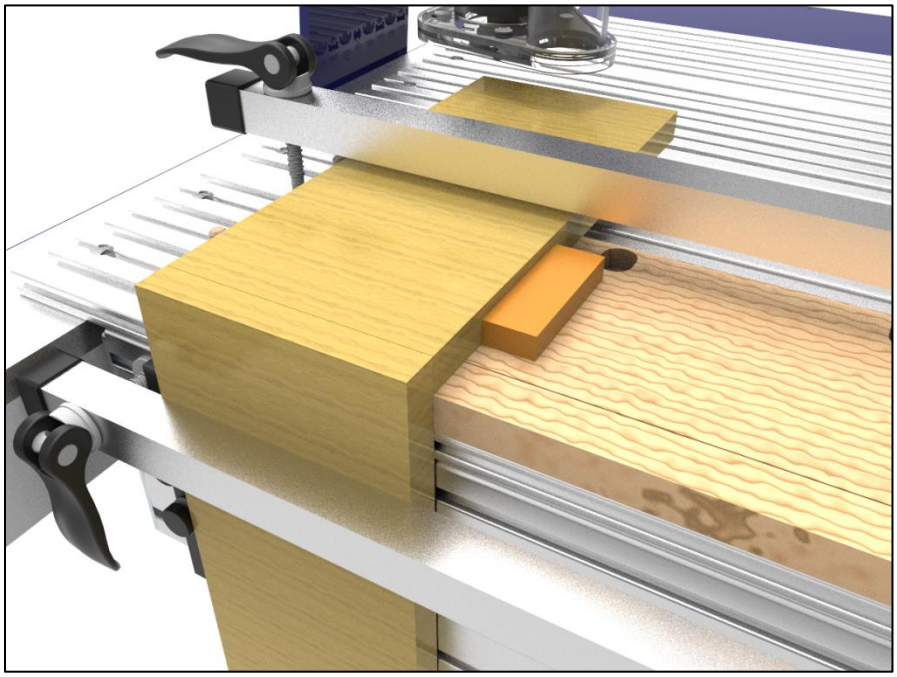
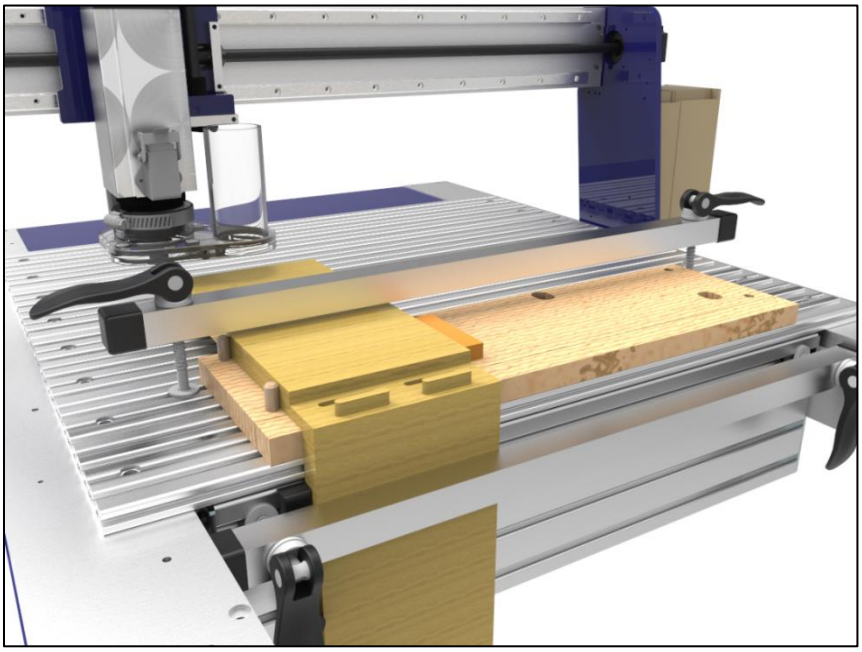
7. To aid in the hold down, a scrap piece of wood may need to be secured to the right side of the horizontal board, effectively wedging it in place.



8. The X and Y zero have been completed in the Machine Setup section on page 8.
9. Use the Z zero plate to zero the Z to the top of the material.
10. The final step is to run the saved cut file. Click Cut Part on the red position screen, navigate to the location of the files saved in the prior step, select the file and click Start.



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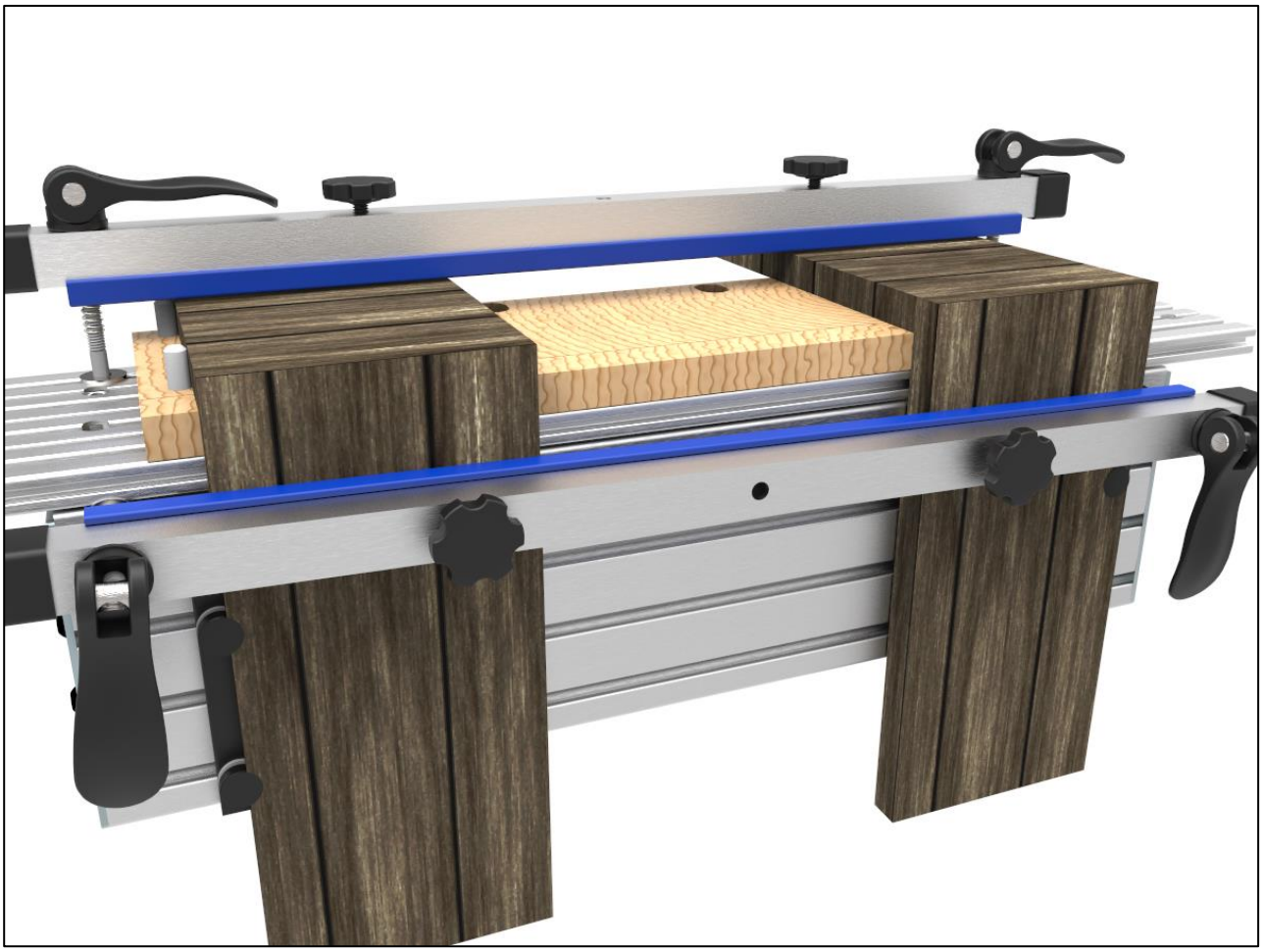
When clamping two boards in place - as in the below picture - the clamping bar may deflect slightly, resulting in less holding force towards the center. To correct this there, are three tapped holes with two 5/16” bolts and thumb knobs. These bolts will go through the 1” x 1” aluminum bar and put pressure on the blue plastic, reducing the deflection.



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## Using the jig after first time setup

After setting up the jig for the first time and recording the axes location values, the setup does not need to be run through again if using the jig in the same location as before.

To set it back up, first run the C3 (XY Zero routine). Once the C3 completes, send the Z Car (Y for DT, X for Max) and the gantry (X for DT, Y for Max) to the location previously recorded. Once in position, zero the gantry, send the Z car to 3.25” and zero it. It is now set up once again.

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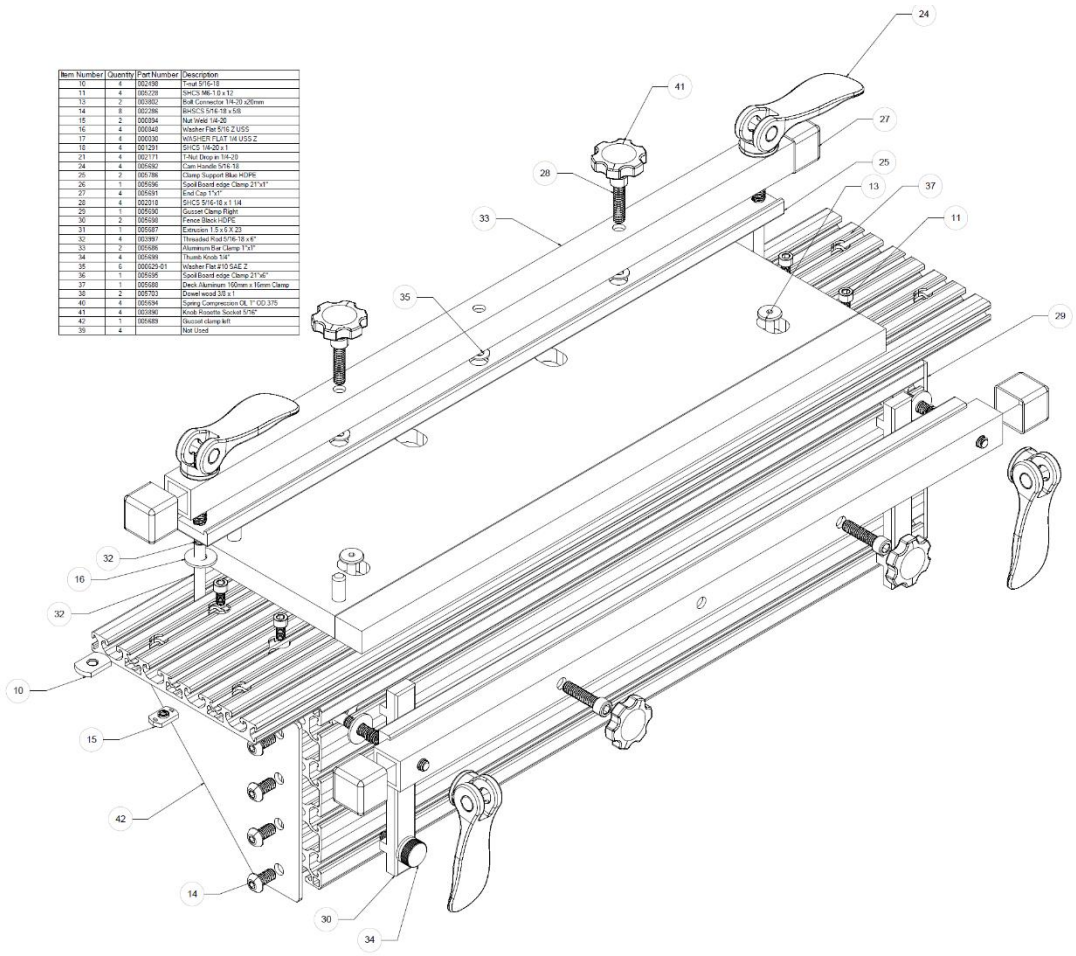
| Item Number | Quantity | Part Number | Description |
|---|---|---|---|
| 10 | 4 | 002498 | Tnut 5/16-18 |
| 11 | 4 | 005228 | SHCS M6-1.0 x 12 |
| 13 | 2 | 003802 | Bolt Connector 1/4-20 x26mm |
| 14 | 8 | 002286 | BHSCS 5/16-18 x 5/8 |
| 15 | 2 | 000394 | Nut Weld 1/4-20 |
| 16 | 4 | 000648 | Washer Flat 5/16 Z USS |
| 17 | 4 | 000030 | WASHER FLAT 1/4 USS Z |
| 18 | 4 | 001291 | SHCS 1/4-20 x 1 |
| 21 | 4 | 002171 | T-Nut Drop in 1/4-20 |
| 24 | 4 | 005692 | Cam Handle 5/16-18 |
| 25 | 2 | 005786 | Clamp Support Blue HDPE |
| 26 | 1 | 005696 | Spoil Board edge Clamp 21"x1" |
| 27 | 4 | 005691 | End Cap 1"x1" |
| 28 | 4 | 002010 | SHCS 5/16-18 x 1 1/4 |
| 29 | 1 | 005690 | Gusset Clamp Right |
| 30 | 2 | 005698 | Fence Black HDPE |
| 31 | 1 | 005687 | Extrusion 1.5 x 5 X 23 |
| 32 | 4 | 003997 | Threaded Rod 5/16-18 x 6" |
| 33 | 2 | 005686 | Aluminum Bar Clamp 1"x1" |
| 34 | 4 | 005699 | Thumb Knob 1/4" |
| 35 | 6 | 000229-01 | Washer Flat #10 SAE Z |
| 36 | 1 | 005695 | Spoil Board edge Clamp 21"x6" |
| 37 | 1 | 005688 | Deck Aluminum 160mm x 16mm Clamp |
| 38 | 2 | 005703 | Dowel wood 3/8 x 1 |
| 40 | 4 | 005694 | Spring Compression OIL 1" OD.375 |
| 41 | 4 | 003890 | Knob Rosette Socket 5/16" |
| 42 | 1 | 005689 | Gusset clamp left |
| 39 | 4 | | Not Used |

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