1) I found an image on a simple Google search for Phoenix logo. Then I saved it as a JPG file. The idea is to make a coaster from the design.
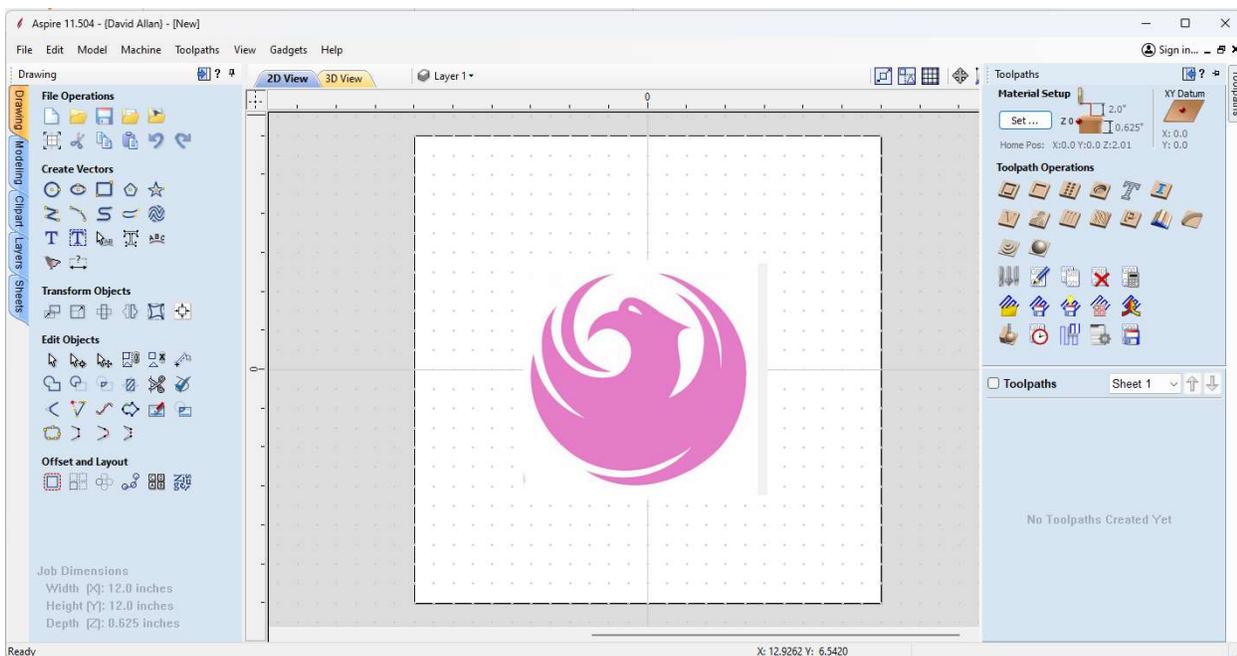
2) I opened my drafting software. I am using the Aspire tool from Vectric. I simply dragged the jpg file from one area of my desktop and then dropped onto a 12" by 12" board in the center screen area. Here is a quick overview of the left and right screen areas.

The left side of the screen has all the **DRAFTING** tools. The side tabs allow for organizing the drafting into logical sections.

Drawing (shown) is for making circles, lines, trimming, rotations, text entry, aligning items, etc.

Modeling is for creating 3 dimensional objects. Think of it as taking a 2D object and adding height to create a 3D object. Various simple 3D objects can be combined to make complex 3D objects. (For common objects, it usually easier to use Clipart)

Clipart is where files with pre-defined 3D objects are stored. It makes a cutting project easier if you can download an image of a bear, for example, instead of making a 3D bear by combining simple 3D objects to look like a bear.

Layers help organize the entities. For example, you might want to put dimensions on one layer, the geometry layout on another layer, and the finished part on another layer. Colors are used to help keep the right entities on the right layer.

Sheets are used if a project uses more than one board. Each sheet sets the dimensions of a board.

The right side of the screen has all the **CUTTING** tool options. The icons represent various types of cutting actions. If the user has drawn a square for example,

One icon is used to cut the outer edge of the square.

Another icon is used to cut away the interior of the defined box.

There is even an icon to generate a cartoon representation of how the tool will perform the cut.

3) The next step in the project is to take the color boundary and create a line or a curve that a tool can cut along. One of the drafting icons on the left side lets me do this.
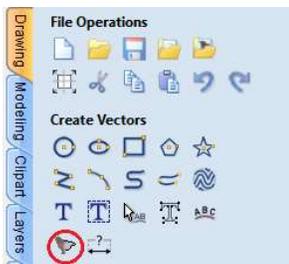

Here is the result:
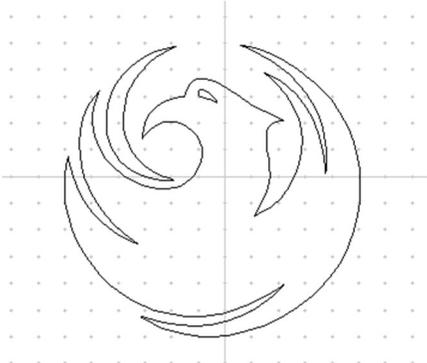
4) The wood working plan:

This set of arcs will be the basis of coaster design. Before I get into details of the actual cutting, let me explain how the two pieces of wood will make one coaster. One piece will be the male piece and the other will be the female piece. The two pieces will be glued together and then the top will be cut off.

.09

.11

Male

Female

1 Glue the 2 pieces together

2 Cut off most of the top piece
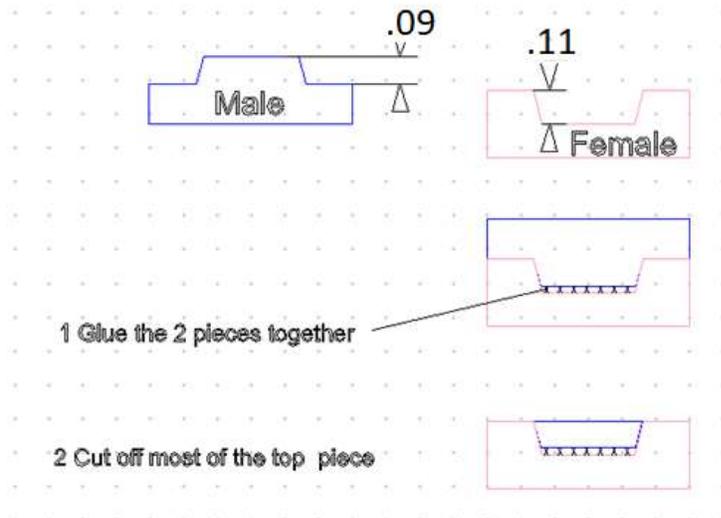
5) So back to the line drawing and expanding it to make the coaster:
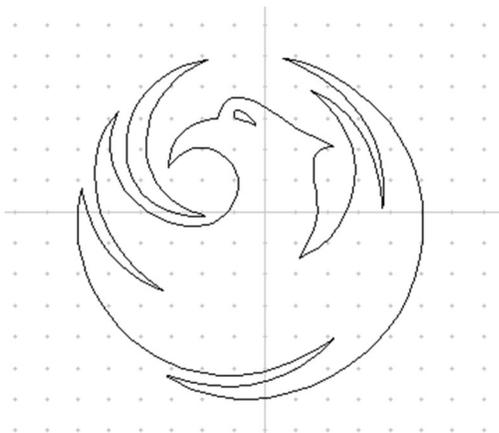
I put the derived set of arcs on the female layer, the pink layer. The outer square will be the final perimeter of the coaster.
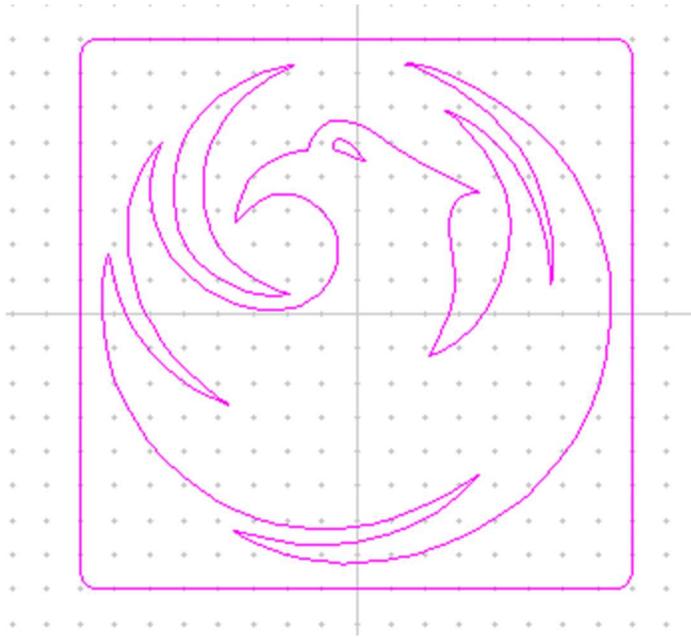
Then I copied the image to the male layer, the blue layer. Next. I had to reverse the image so it will fit into the other part. The outer circle is just some extra wood for temporary use. It will be removed in the final step.
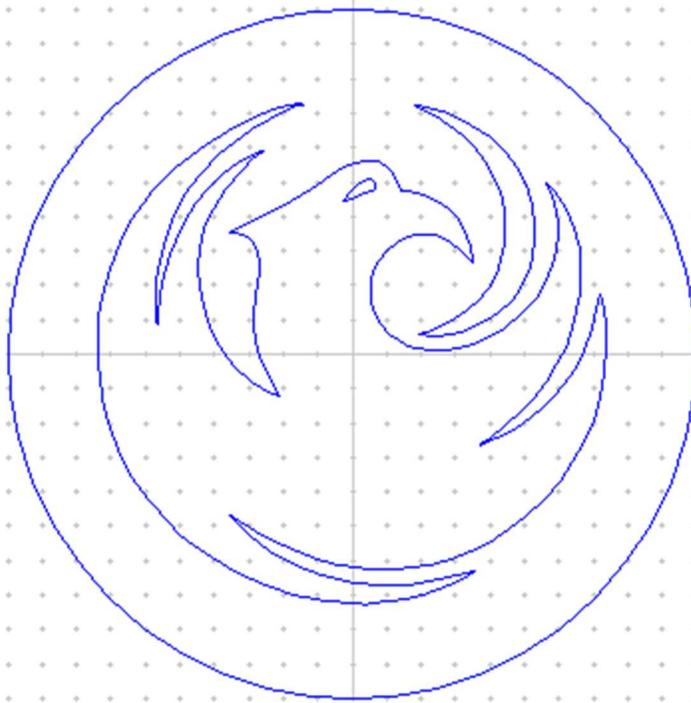
6 Cutting the female part. As shown in the previous cross section view there are two surfaces needed. One is a flat bottom and the other is an angled side. The best way to do this is with two tools. First a flat bottom tool to do most of the cutting. Next an angled tool is needed to cut the sides. From the set of cutting Icons on the left, I used the V-Carve tool icon.
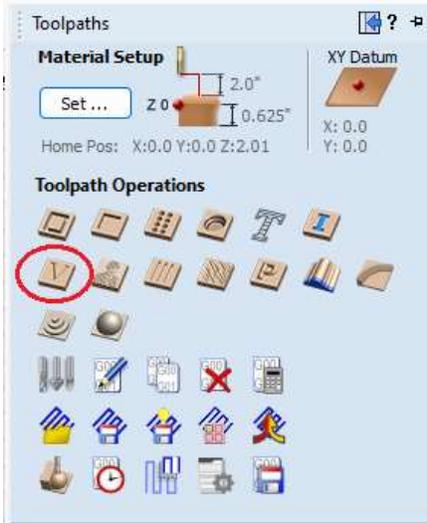
7 Once the icon is selected, several variables must be specified with respect to the cutting actions required.
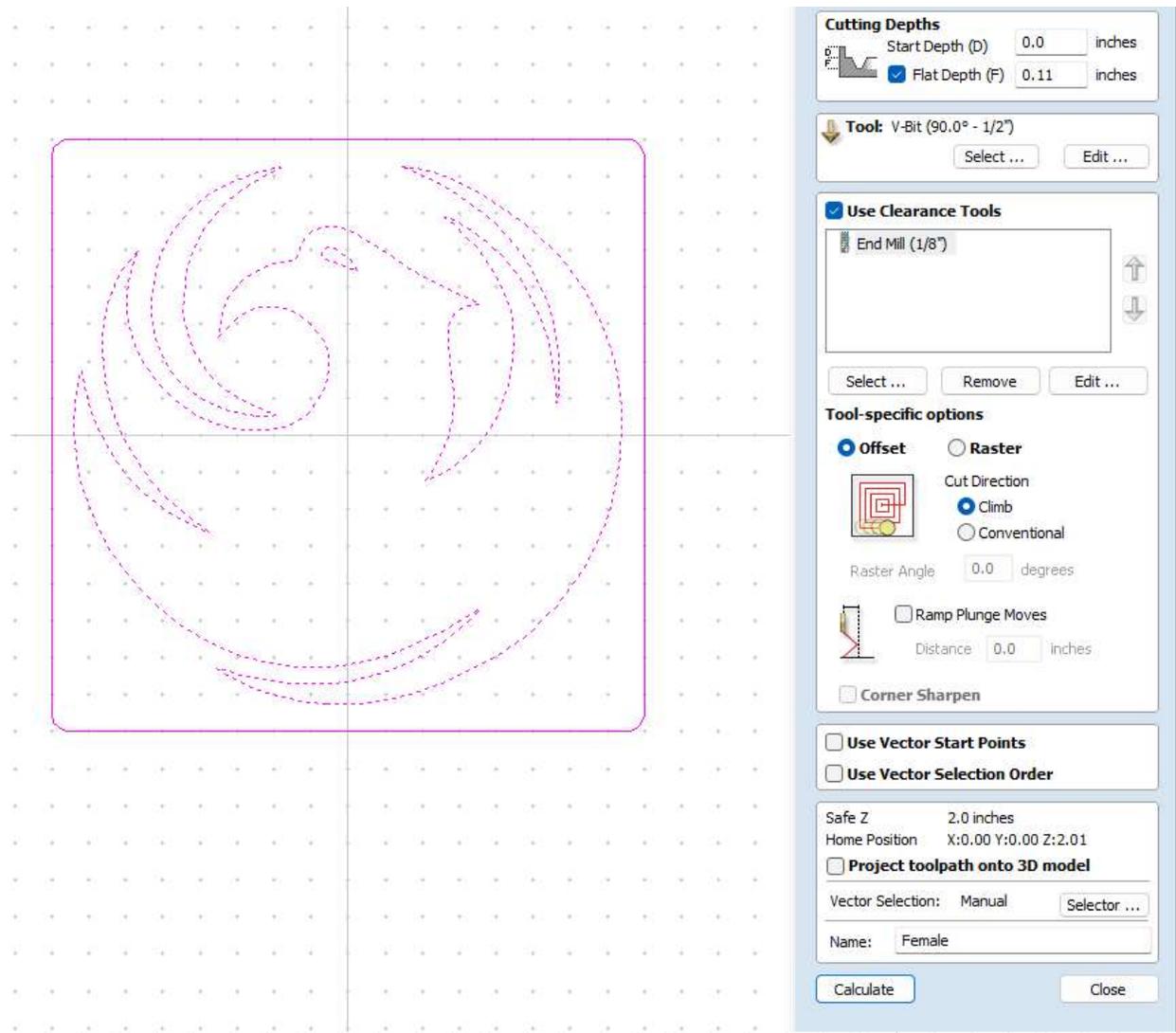
Going from top to bottom with the numbers needed in the V-Carve function:

a) The arcs indicated with the dashes have been set to a cut depth of .11 inches.
b) The finishing tool was selected as a 45-degree V shaped cutting tool.
c) A second tool, one with a flat bottom was selected to clear out the rest of the cavity.

Hitting the calculate button will generate 2 tool paths, one for each tool.

8) Here are the results of the calculations as shown in 2D mode.
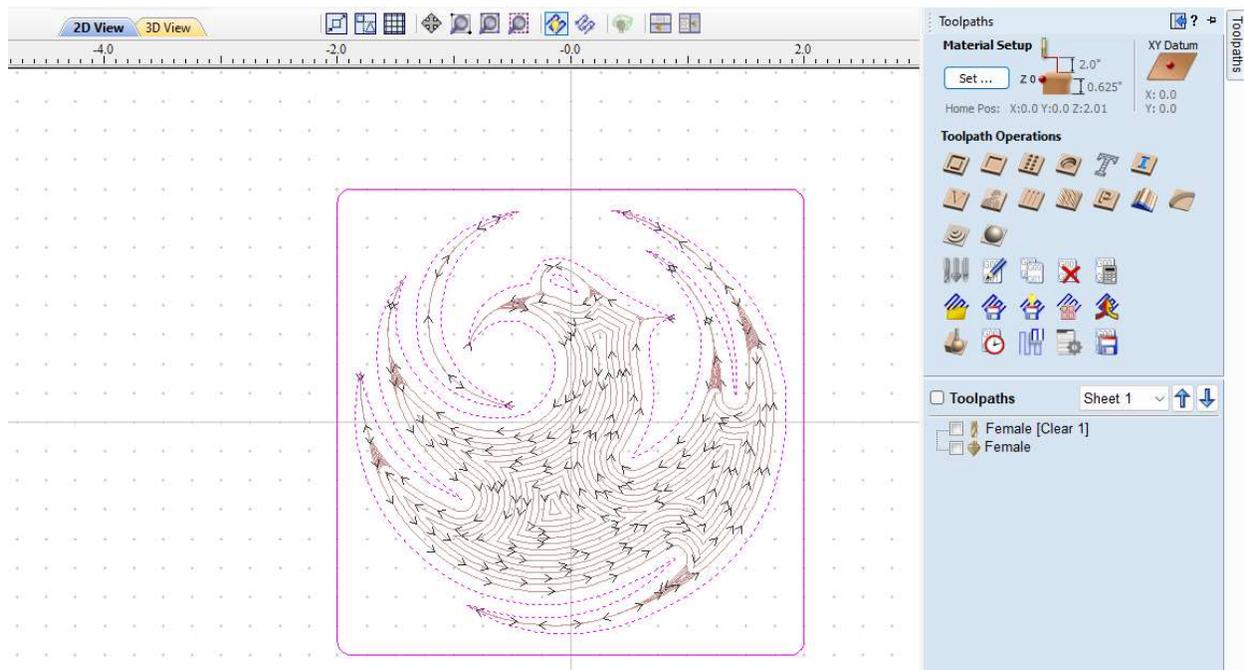
9) The cuts generated are indeed inside the Phoenix bird image, but the 3D view is a bit more helpful. Using a different icon, the one in the lower left, a cartoon of the results of both toolpaths can be shown.

10) To generate the male part of the inlay, the same V-Carve icon from step 7, but with the other image and some slight variable changes.
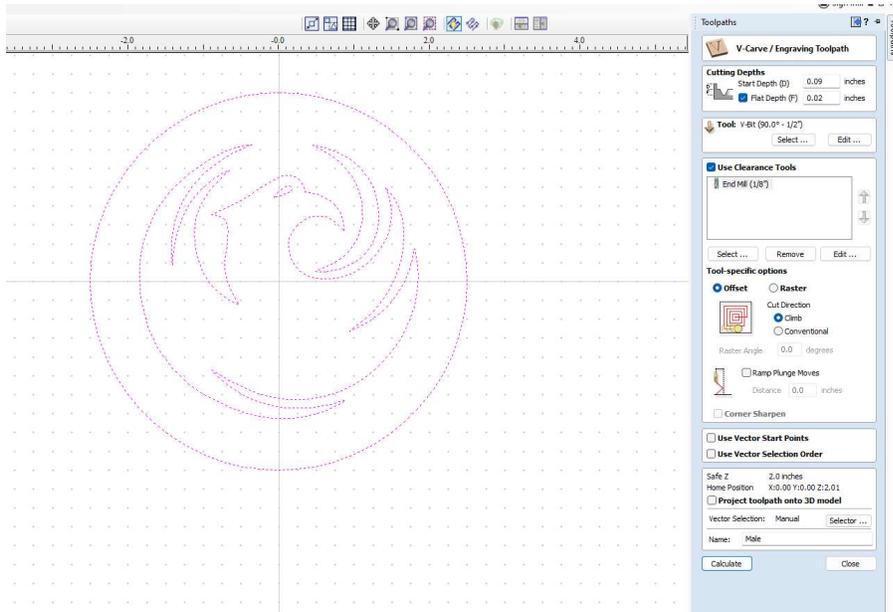
Note the image is reversed.

Note the tools are the same as before, but the depths are different.

Note the outside circle is now included in the selection of the arcs for 2 reasons. First is to create a recess around the inlay. Second is to help cut away just the material needed. The actual board is square. Each corner has a hold down clamp. The last step is to cut the male part out of the board.
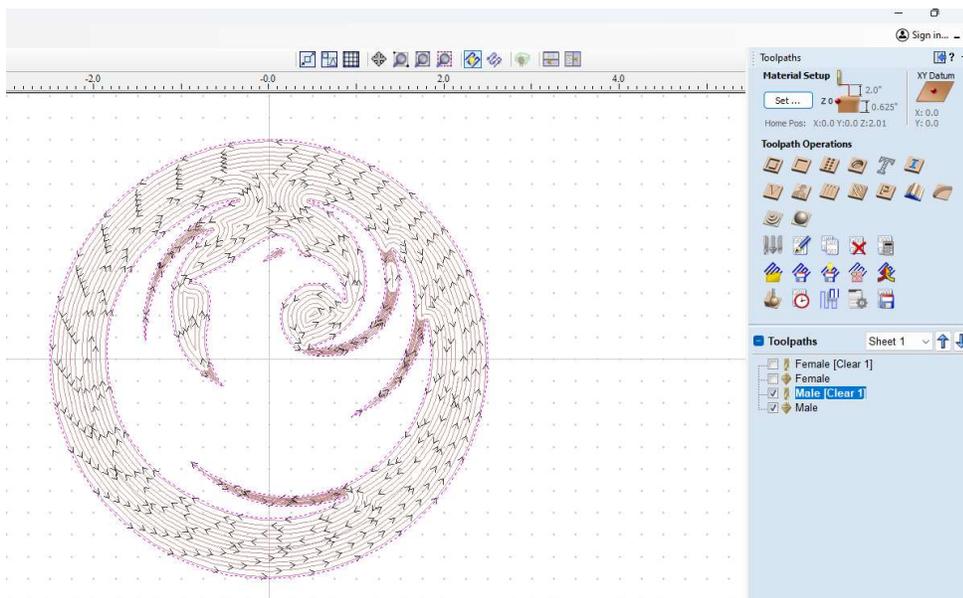
11) Here is the cartoon version of the male part. I added the cut around the perimeter using a different cutting tool.

The remaining steps are to glue the two halves together and then skim off most of the top down to the thickness of the female part.