

TURNING A PROBE GENERATED SCAN INTO A THREE DIMENSIONAL OBJECT

IN THIS EXERCISE WE WILL SHOW YOU HOW TO TAKE A RELATIVELY SHALLOW OBJECT TAKEN FROM A PROBE SCANNED OBJECT, PUFF UP THE DEPTH, SLICE IT INTO CARVE-ABLE SECTIONS, MIRROR THOSE PIECES AND ASSEMBLE ALL OF THEM INTO A REALISTIC 3D OBJECT.

NOTE: THIS PROJECT REQUIRES BOTH THE PATTERN EDITOR AND STL IMPORT SOFTWARE ALONG WITH A PATTERN THAT IS NOT OPEN DOMAIN. HOWEVER, THIS TUTORIAL CAN BE REPEATED WITH ANY FLAT PATTERN OF YOUR OWN THAT YOU WOULD LIKE TO MAKE SYMMETRICALLY TWO SIDED.

This project covers the following design concepts:

- DOWNLOADING A SCAN INTO THE PATTERN EDITOR
- CLEANING UP THE SCAN
- EXPORTING A SCAN INTO STL FORMAT
- IMPORTING A STL FILE INTO THE 3D STL IMPORTER
- ADDING DEPTH TO THE SCAN
- SLICING THE 3D MODEL FOR CARVING
- EXPORTING SLICES TO THE DESIGNERS SOFTWARE
- MODIFYING A SLICE IN THE PATTERN EDITOR
- LAYING OUT SLICES IN THE DESIGNER SOFTWARE FOR BEST RESULTS

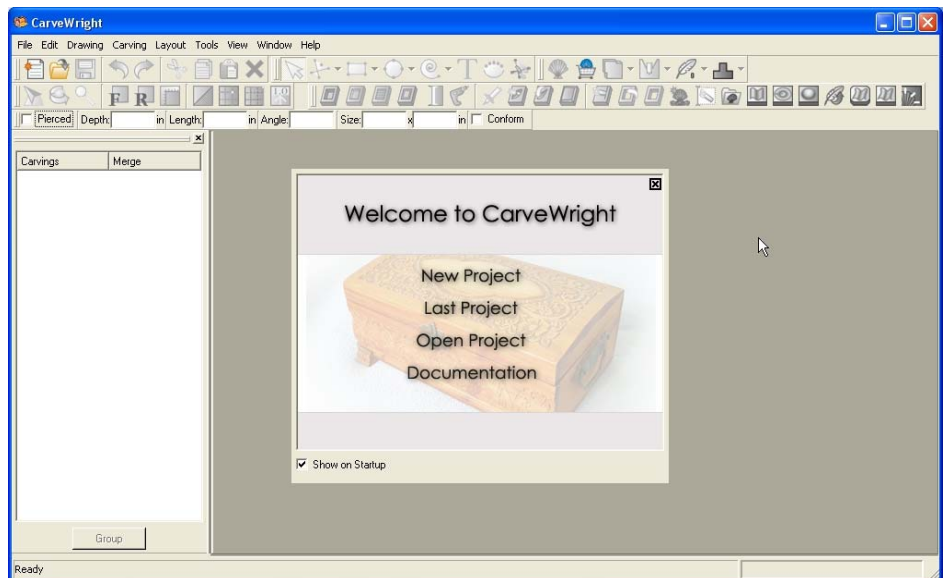


The Welcome Screen will appear upon starting of the Designer Software.

- DOWNLOADING A SCAN INTO THE PATTERN EDITOR

Select “File” from the Main Menu Bar and select “Download Scan” from the drop down menu

Highlight the desired scan from the memory card and select “Download Scan”

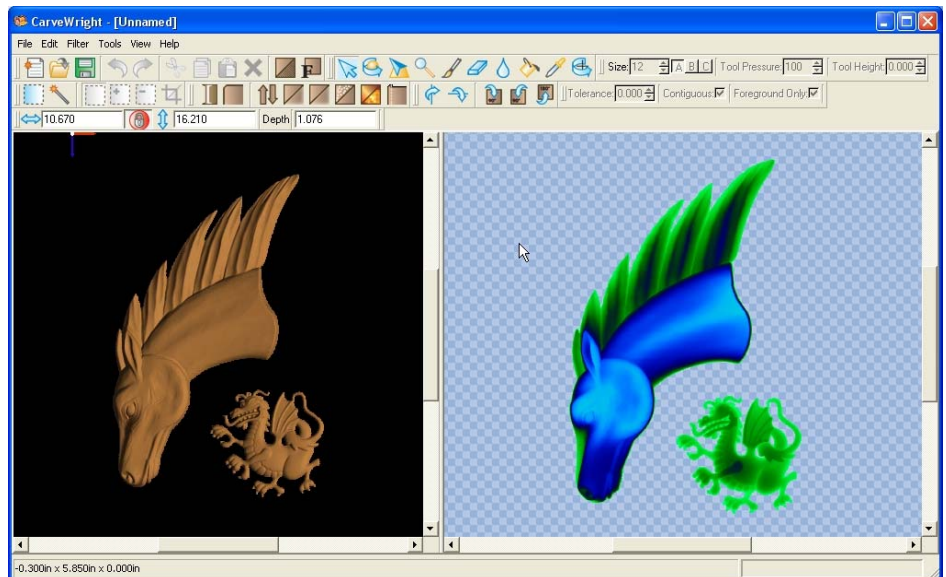


- CLEANING UP THE SCAN



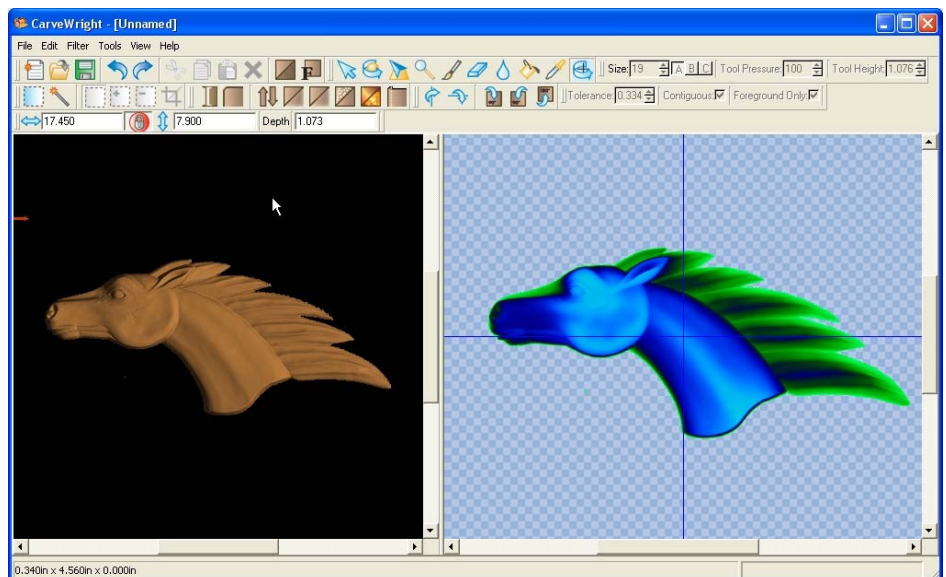
Eraser

Use the “Eraser Tool” to remove the unneeded data in the scan. Hint: you can vary the size of the eraser circle by changing the number in the size box.



Rotate Tweak Tool

Rotate the horse head using the “Rotate Tweak Tool” so that it is roughly horizontal. This will orient the grain of the wood in the direction of the horse’s flowing mane.





Smooth Filter



Blur Filter

Select the “Smooth Filter” Icon and adjust as desired. Do the same for the “Blur Filter”. In this case, each filter was adjusted by only one unit to get the desired surface result.



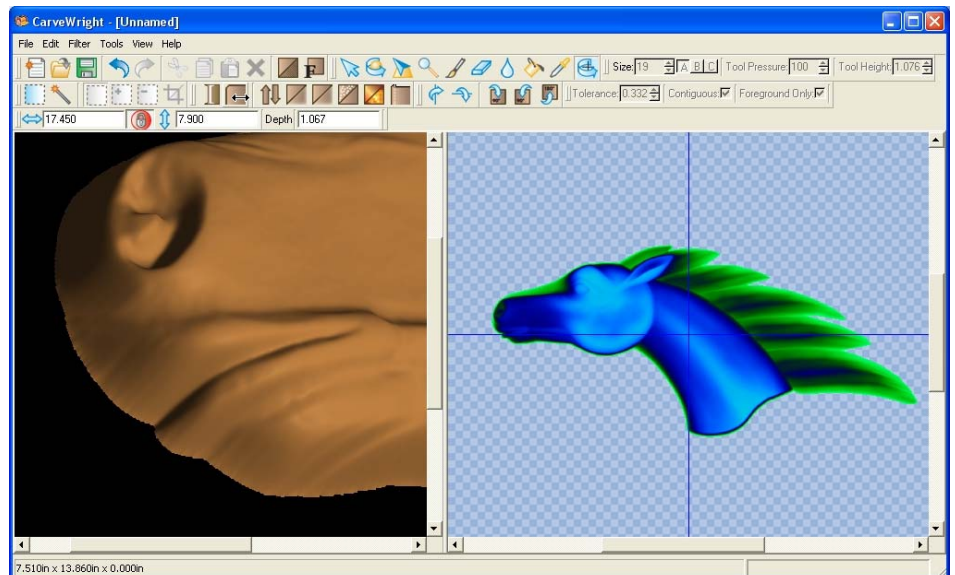
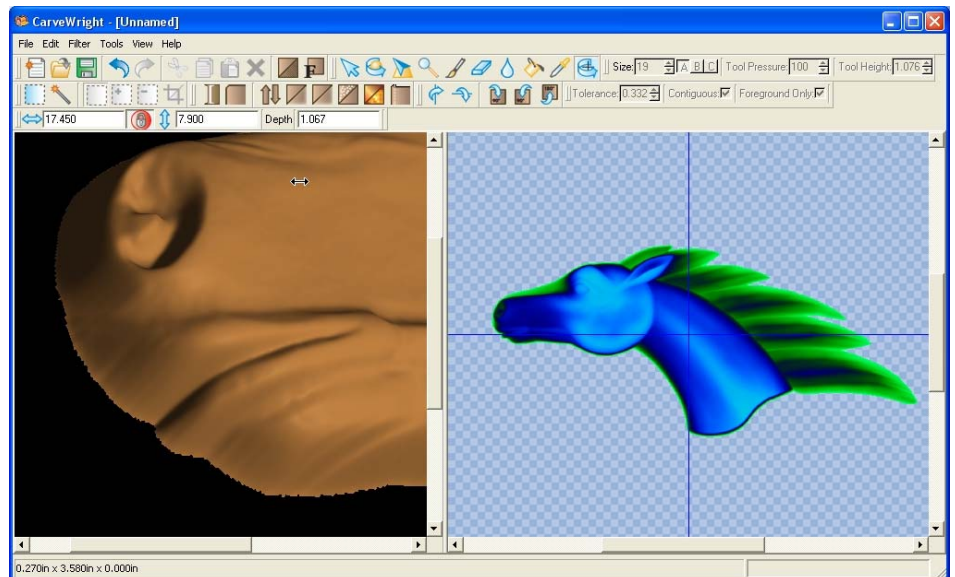
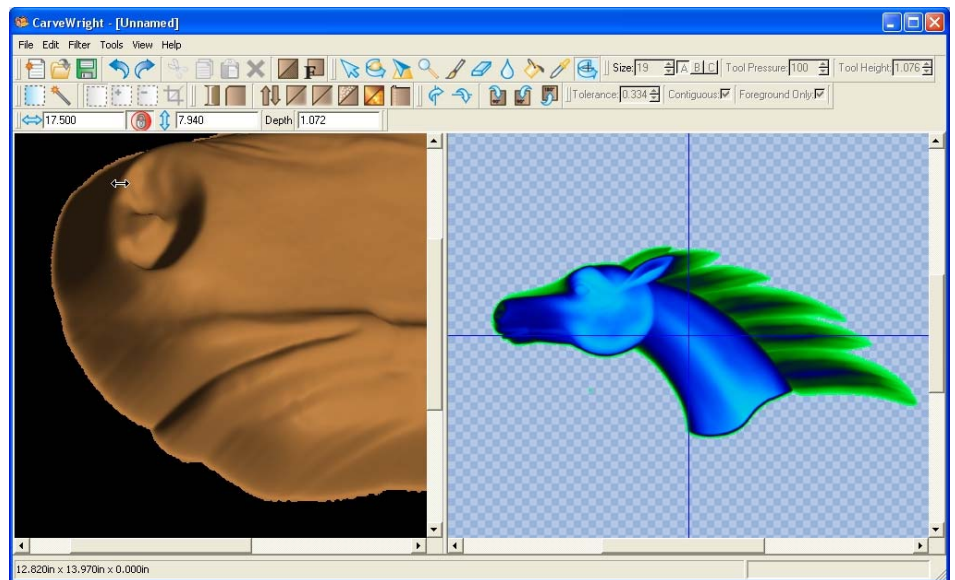
Raise/Lower Levels

Select the “Raise/Lower Levels” Icon to remove the lip that was generated at the base of the scan as a result of the smooth and blur filters. In this example the level was LOWERED by five (5) levels.



Round Edges

Select the “Round Edges” Icon to set each pixel at the edge of the scan to a value of zero. If the edges are not rounded then any feather applied to the carving will be extremely choppy.



➤ EXPORTING A SCAN INTO STL FORMAT

Select “File” from the Main Menu Bar and select “Export to STL” from the drop down menu.

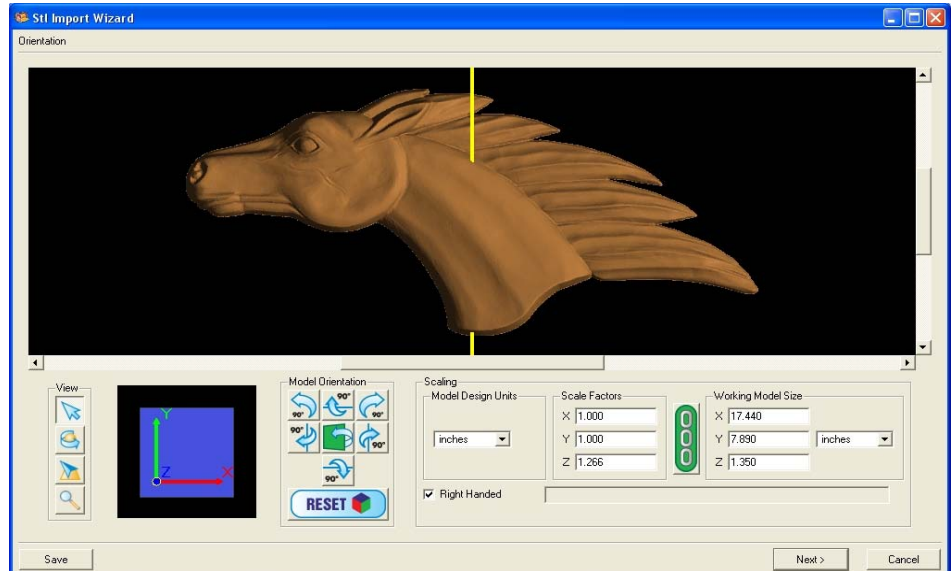
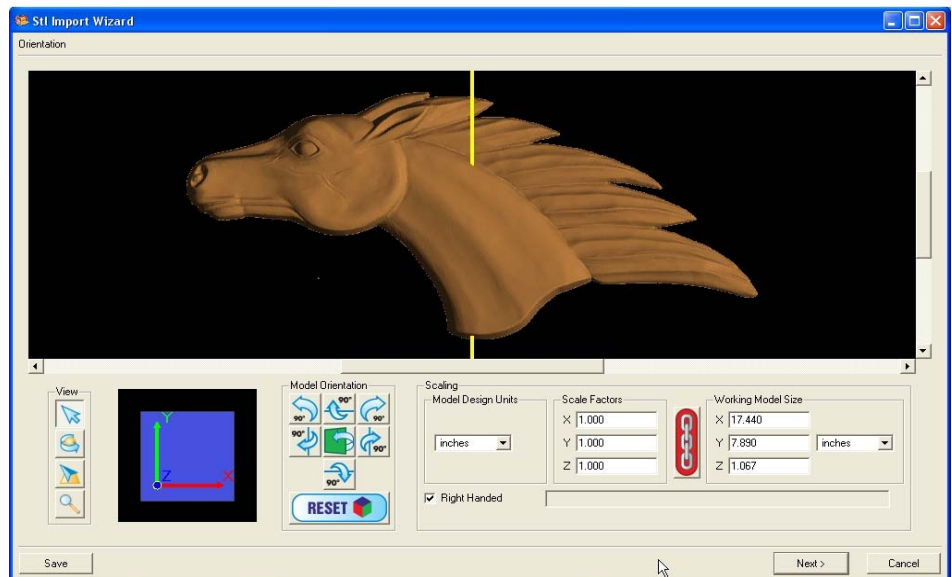
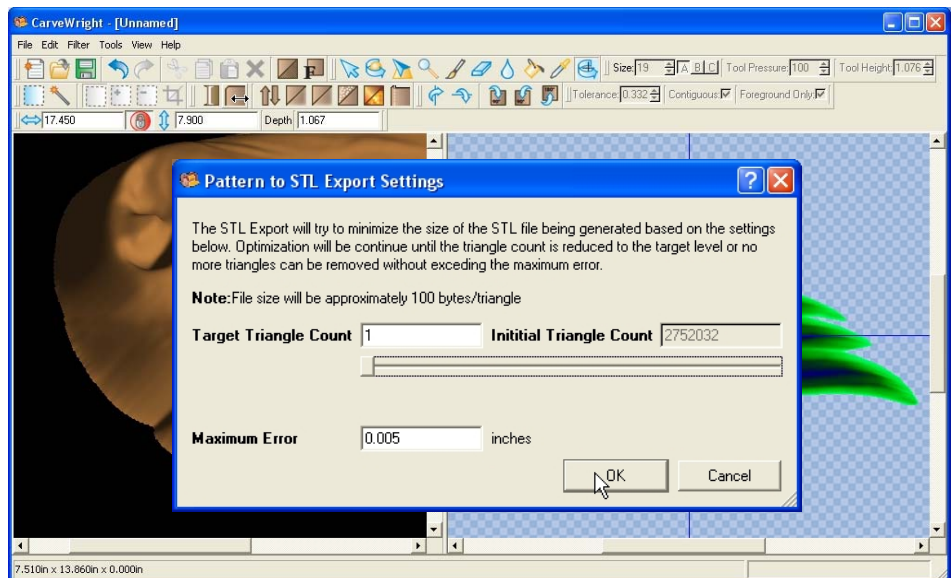
The STL Export Settings box appears and allows you to tweak the output to suit the scan detail. The SMALLER the “Maximum Error” the more triangles will be generated for the surface. This means that the surface will be smoother, but the file size will be bigger.

➤ ADDING DEPTH TO THE SCAN

Once the STL generates, it is displayed in the STL Import Wizard. If the scan is not oriented as shown on the screen then use the “Model Orientation” controls to orient it correctly. The displayed orientation will be the way in which they will be added to the pattern library.



Next we want to “puff” up the scan to give it realistic depth. We can vary any of the X, Y or Z dimensions independently or with a locked aspect ratio. In our simple case we need only increase the Z (depth) dimension. Click the “Lock Scale” button until it becomes green (unlocked aspect ratio) and enter the desired depth.

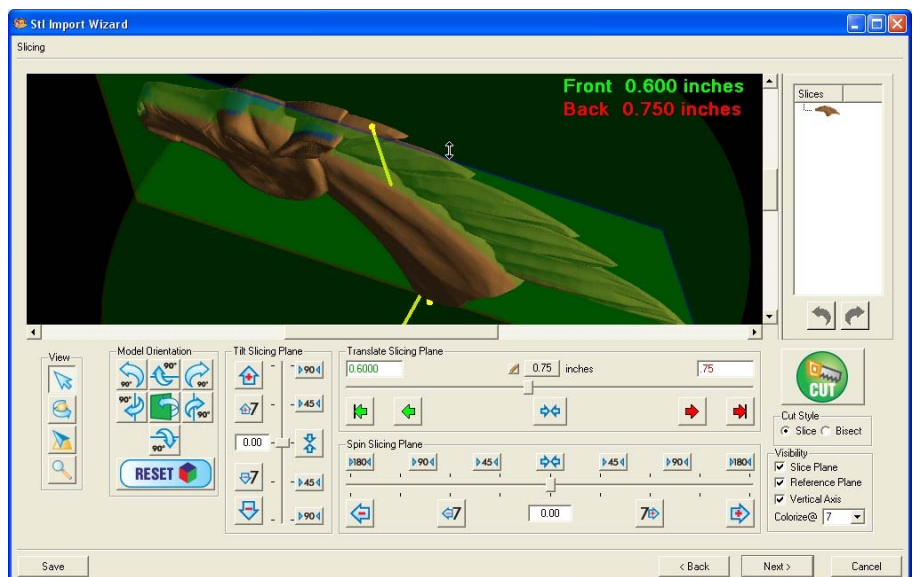
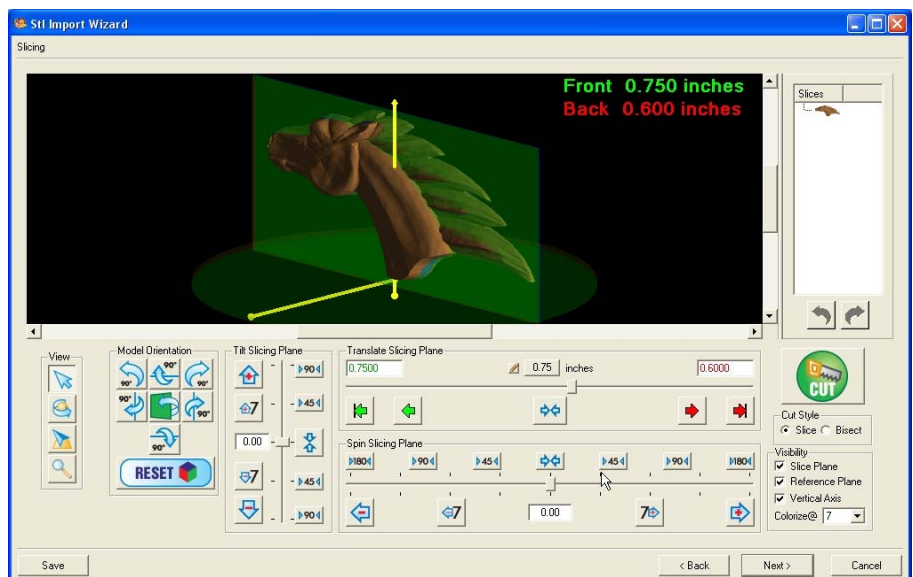
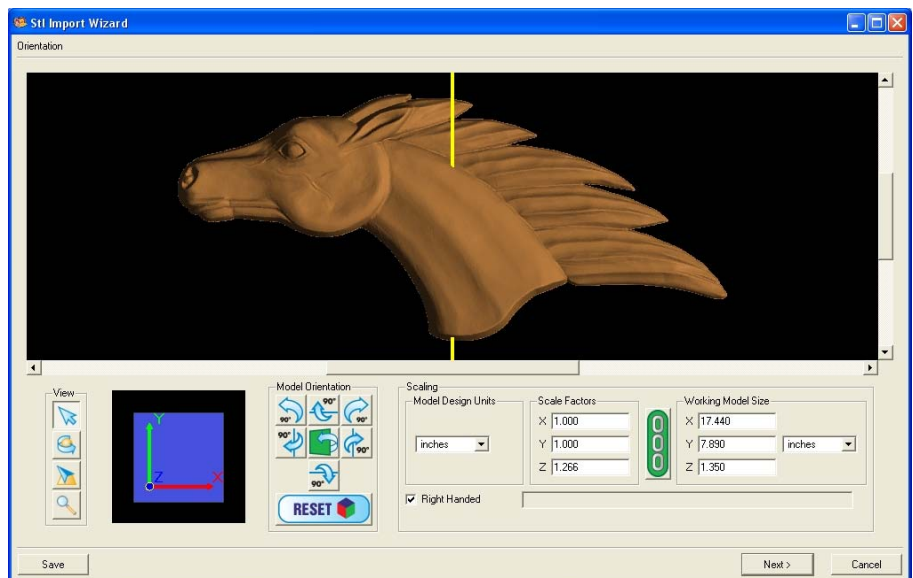


There are several things to consider when changing depth; including the thickness of the material it will be carved from, slicing limitations, and the realism of the final object proportions. Many times setting the dimensions is an iterative process and can not be determined without a little trial and error. In this example we will increase the depth to 1.35 for reasons to be discussed in following slides. Click "Next" to proceed

➤ SLICING THE 3D MODEL FOR CARVING

We now need to manipulate the cut plane to produce slices that can be carved on a 3/4" board. Move the Slicing plane slider or use the arrows to set a slice depth.

As you can see, a back slice of .75" thick and a front slice of .60" thick works nicely. There are no thin areas and only a small slice of the mane that is disassociated from the front slice. It is now evident why the magic depth of 1.35" was chosen – because the detail of our scan segmented cleanly at this depth. It took some effort to arrive at this number in reality. For more detailed information on STL slicing see the one of the associated tutorials.





Cut

Click the “Cut” icon and notice that two slices appear on the “Slices List” at right under the original model.

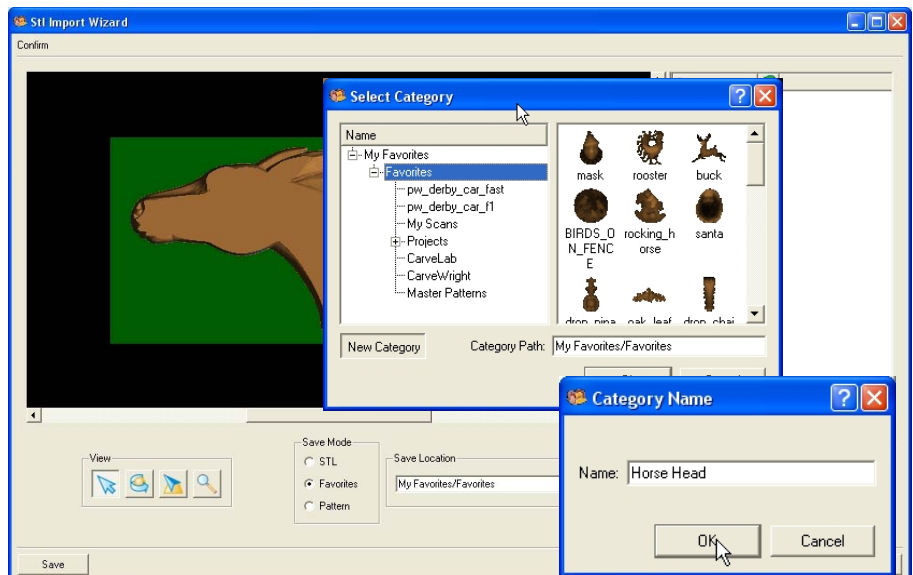
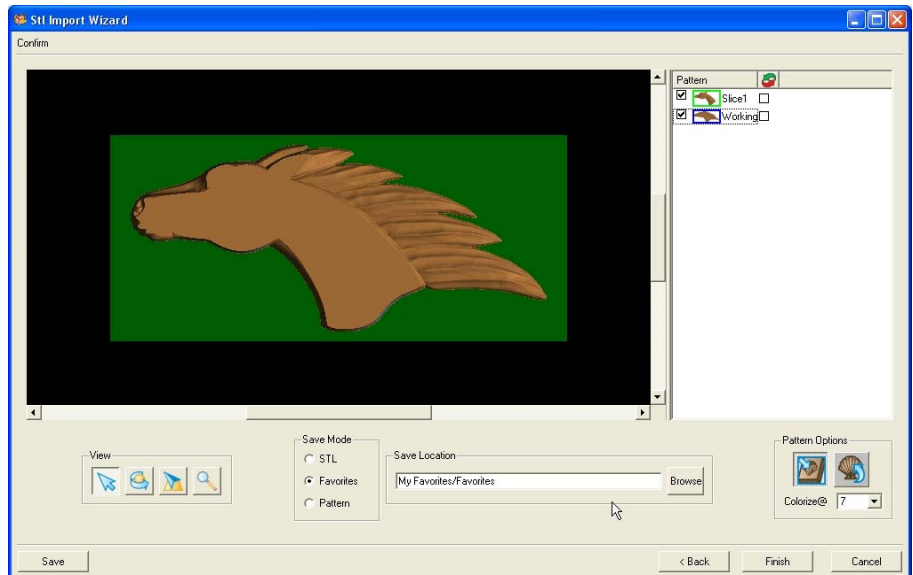
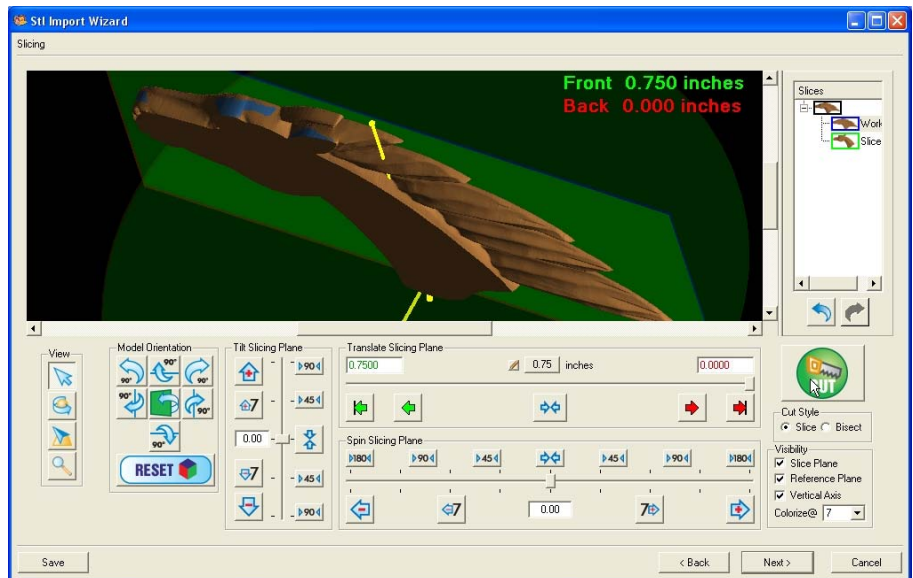
Click “Next” to proceed

➤ EXPORTING SLICES TO THE DESIGNER SOFTWARE

In the Confirmation window make sure that your two newly created slices are preceded by check boxes and that the “Favorites” box is checked and the Save Location is correct.

You can also add a new folder in which to save it into by selecting “Browse” and selecting “New Category”. Enter in the name of the folder that the two slices will be placed.

Click “Finish” to proceed



➤ MODIFYING A SLICE IN THE PATTERN EDITOR

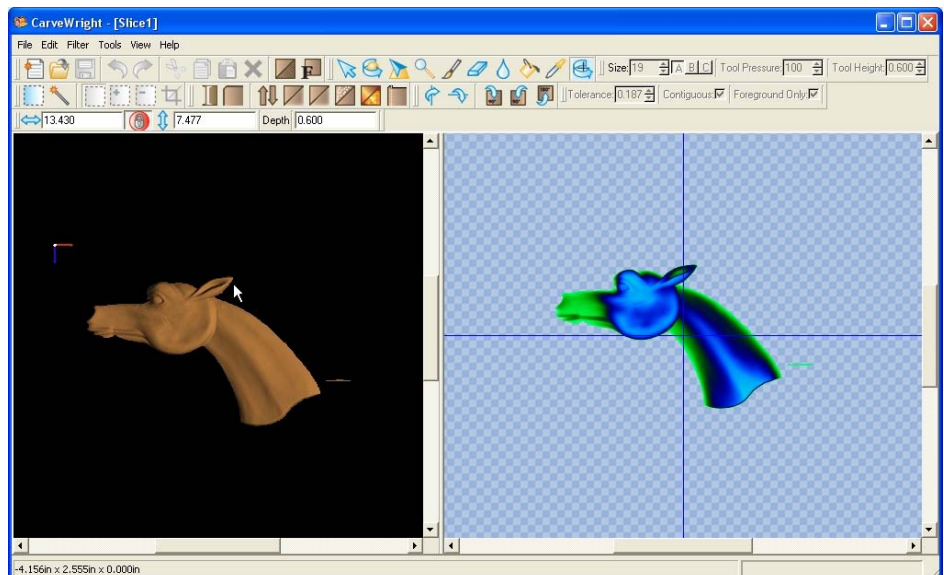
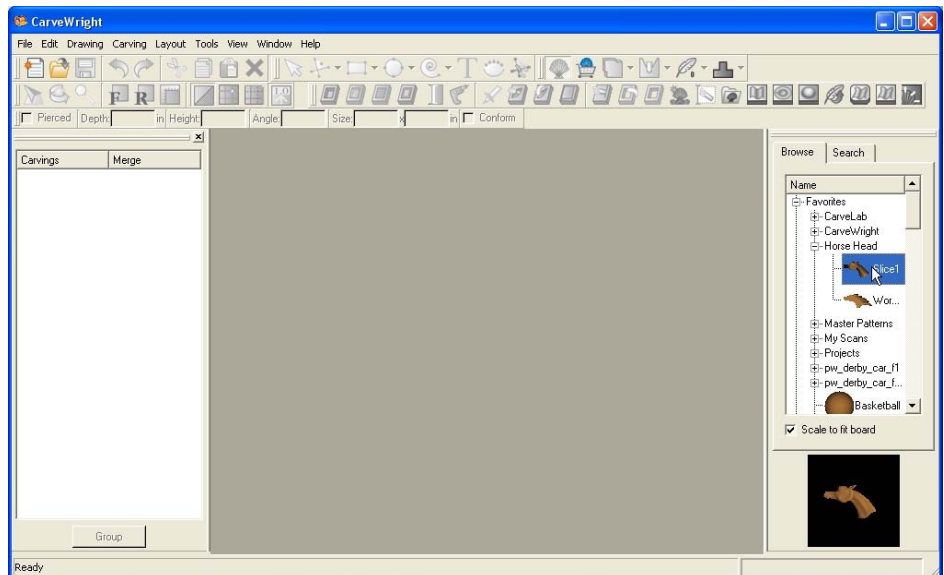
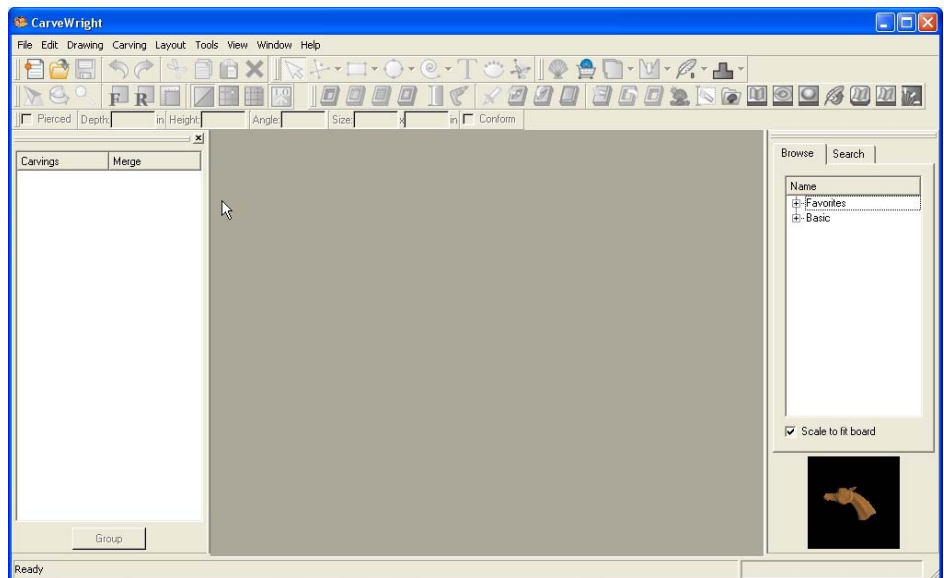
As you remember when we slices the model the front side had a little unattaches piece that we don't need for our model. We can use the Pattern Editor software to remove this.

In the pattern list on the right side of the window find the patterns that we just created. If you do not see the Pattern List go to "View" and select the Patten list item. Double click on the pattern called "Slice1".

The Pattern Editor opens and the front slice appears. Notice the very thin slice at the bottom of the neck.

Use the "Eraser Tool" to remove the unneeded data outside the main pattern.

Select "File" from the Main Menu Bar and select "Save to Pattern Library" from the drop down menu. Make sure to save it into your newly created folder. Close the Pattern Editor.



➤ LAYING OUT SLICES IN THE DESIGNER SOFTWARE FOR BEST RESULTS

Create a new workpiece that will fit your created slices. Remember that we are making both sides to this horse head so there will be four pieces total in this project. In this case I know that I will need a 10" x 52" workpiece.

Select "File" from the Main Menu Bar and select "New" from the drop down menu



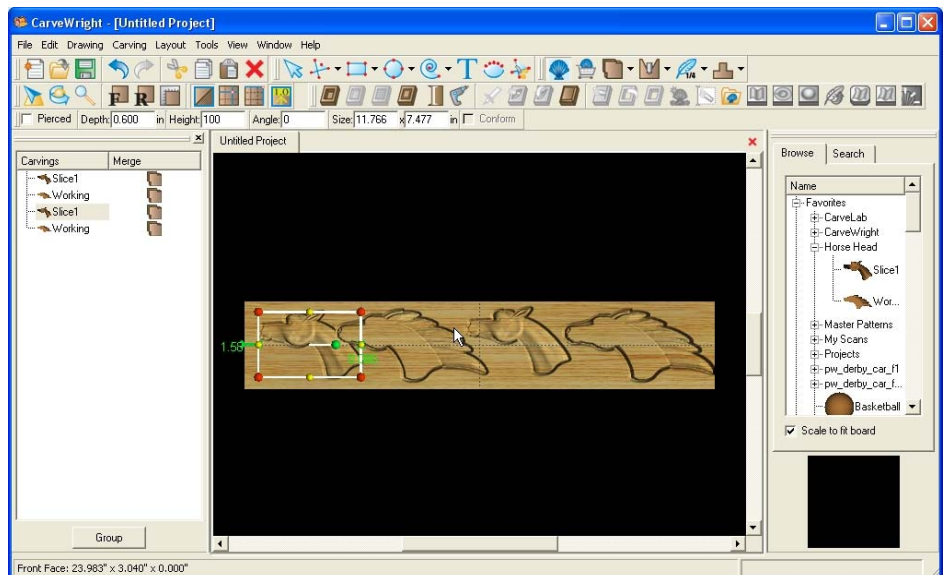
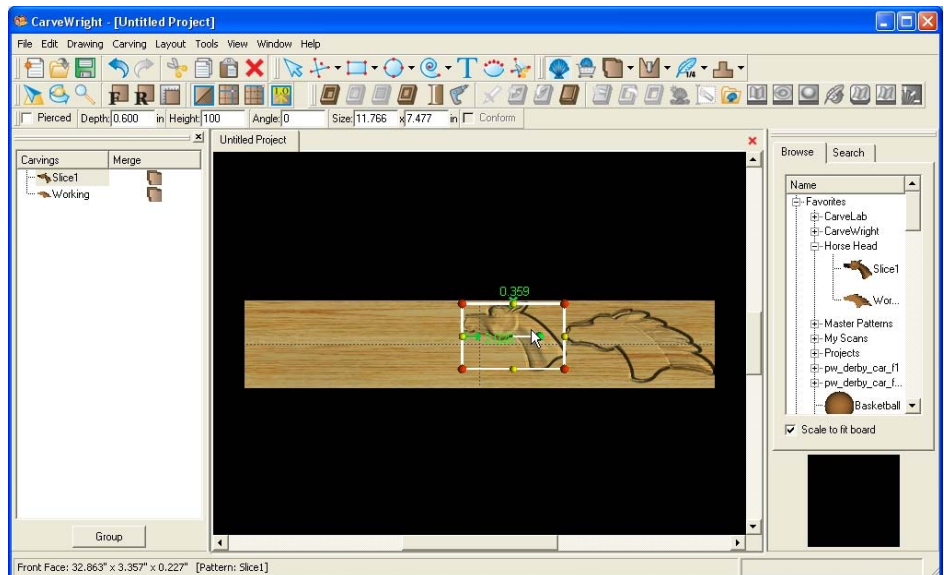
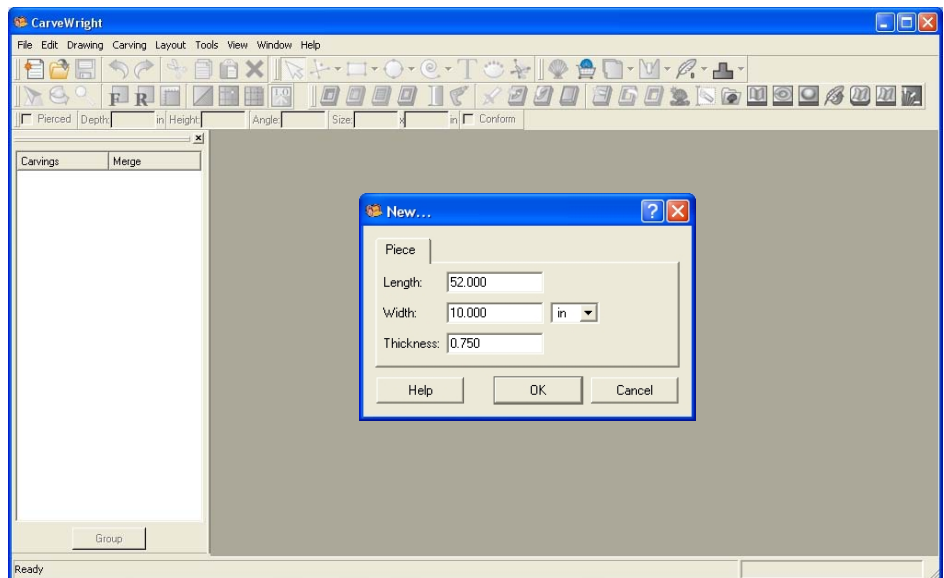
Pattern Tool

Navigate to the two newly created patterns by clicking on the "Pattern Tool" icon and browsing through your Favorites directory until you reach the Horse Head folder.

Place the two created patterns by highlighting them and clicking on a location on the workpiece.

Copy and paste the two patterns but doing a "Copy" and "Paste" under the "File" menu (or a CTRL+C and CTRL+V keystroke combination).

Since the the two sides of the head are mirror images of each other, we will need to flip two of the pieces.



Highlight the pattern that you wish to flip and right click on it. Select “Flip and Rotate” from the drop down menu and select “Flip Horizontally”.

Repeat this step for the other piece to flip.

We now have all four pieces that we need to make our horse head. The next step is to arrange them on our board efficiently and so that they do not overlap.

Using positioning and rotation we can get them all fit into the borders of the workpiece nicely.

For this project we want to keep the grain of the wood flowing left to right and in the direction of the flowing mane. We could pack the patterns in more efficiently by rotating at different angles but I want the grain direction to match across the 4 pieces.

IMPORTANT: Make sure that you offset the two end patterns by 3.5” in order to keep them clamped into the machine at all times during carving.



Select “File”, “Save”

*****IMPORTANT*****

Name file and click “Save” to hard drive.



Select “File”, “Upload”
Save to memory card.

