

CHAPTER 4 – PROJECT DESIGNER PRO

MATERIALS TOOL



The **Materials tool** is like our **Textures tool** in that it applies a set background to the area selected but is much more advanced. This tool has several new background options that can be selected from and can be manipulated to fit each individual project.

The **Materials Tool** can be used with any closed shape. If the new tool does not become available for a user created region, this typically can be attributed to end points not being connected.

The math behind the **Materials Tool** is based on Perlin Noise, created by Ken Perlin, which was originally created for the movie industry to generate realistic looking back ground textures. For more information on the techniques please click on the following link http://en.wikipedia.org/wiki/Perlin_noise.

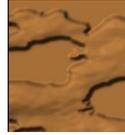
BACKGROUND OPTIONS

Currently there are ten default backgrounds:

- **Cloud Cover**



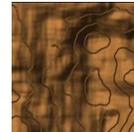
- **Clouds**



- **Concrete**



- **Default**



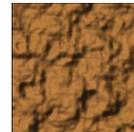
- **Martian Landscape**



- **Sandstone**



- **Stoney**



- **Tree Bark**



- **Water Surface**



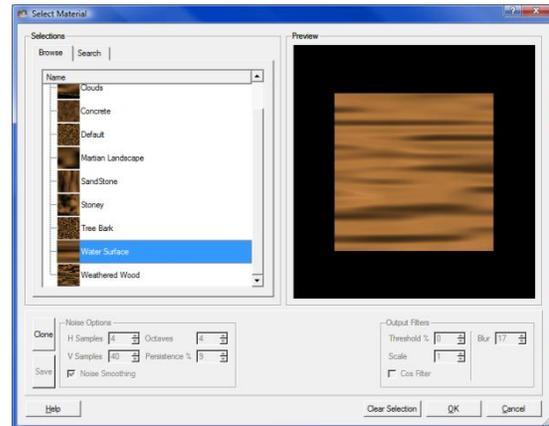
- **Weathered Wood**



MATERIALS MENU OPTIONS

The menu can seem a little daunting at first but through reading and understanding this manual it can be easily worked. There are several options that can be set on the backgrounds and they are **H Samples**, **V Samples**, **Octaves**, **Persistence %**, **Threshold**, **Scale**, **Blur**, **Noise Smoothing**, and **Cos Filter**. These options only become available on created backgrounds. To create a background, select the base background from the list of included backgrounds that best fits the project.

Once the background had been picked select the **Clone** option to create a new customizable option. Once the new background had been created it can be renamed so that it can easily be called from the list. After renaming the pattern it can be modified to fit the project. The rest of the options should be experimented with to gain an understanding of them.



MAKE VECTOR GROUP

The Make Vector Group, introduced in Designer 3.0, is a tool that allows vector drawings to be carved with a V-bit which emulates the chip carving technique. These vector drawing can either be created in the Designer Software or imported DXF as files. To begin using the tool, first place the set of closed loop vectors on the board. All vectors must be closed and cannot intersect. If the regions intersect at any point, the tool will fail to open and an error message will be displayed (Members of a Vector Carving Group may not intersect). The intersecting vectors can be fixed or deleted in the Designer software and the Make Vector Group can be attempted again. If the any vectors are open, the tool will be gray and not accessible. Select all vectors desired for the design and group them together using the **Group** function. Select the vectors in the newly created group and select the **Make Vector Group** icon. This will open a new window for the tool.

The first option to be set is the vector selection mode. This can be set to **Toggle**, **Alternate**, or **All**. **Toggle** allows each individual vector of the group to be selected or deselected, as needed. **Alternate** will select alternating vector loops, starting from the single vector loop selected by the user. **All** will select all of the vectors in the group. Use the **All** selection mode in conjunction with the **Toggle** mode to create custom vector configurations. When selecting vectors, check to ensure that

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the regions are not too close together, or too thin, to avoid chip-out in the finished carving. Once the carve areas have been set, a bit will need to be selected. The default bit is the 90° V-bit, but the 60° V bit can also be selected. With a bit selected, press the OK button to apply the bit and view the resulting carving on the board. If alterations need to be made, select the group from the carving list and click the vector group icon to re-enter the tool. It is important to note that it is required that the tool be opened every time a change is made to the vector group. The carving will not automatically update until the tool is opened.

PATTERN ALONG TRAJECTORY TOOL

Similar to the **Decorate with Text Tool**, the **Pattern Along Trajectory** tool will apply a repeating pattern of carved elements to a selected path on the project board. This tool allows for the creation of many exciting projects that have been difficult or impossible up until now. It is important to note the two ways in which the word pattern is used in this document. First, the **Pattern Along Trajectory** tool implies a pattern of repeating and evenly spaced elements (or instances) along a path. The elements used in this repeating pattern can also be referred to as patterns. These are the same patterns that can be found in the libraries that are used in the Designer software.

CREATING A TRAJECTORY

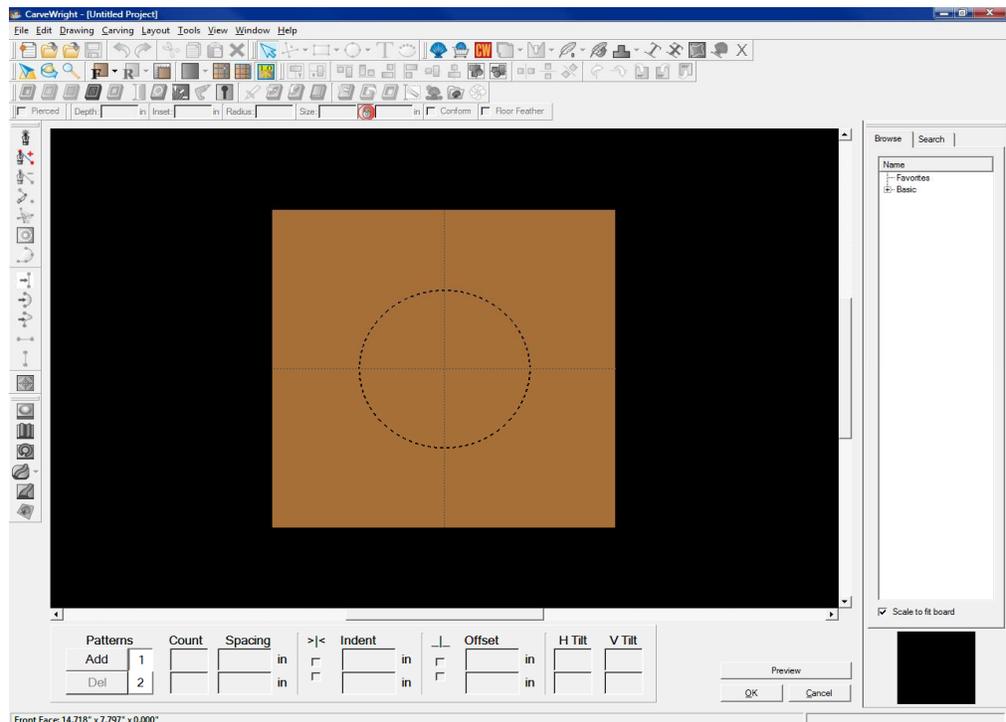
Conceptually this tool is very simple. First a path (or trajectory) is created and then up to two carvings are selected to be repeated along that path. The trajectory can be any line, spline, arc, circle, square, or path that can be drawn with the Designer tools. Trajectories do not have to be closed shapes or have straight lines. Start by drawing the shape or path that the repeating pattern is to follow. The trajectory can be modified at any time, but modifying the shape or size of the path after the patterns have been applied can lead to changes in the spacing of the repeated carvings.

When drawing the trajectory it is important to note and remember what point was drawn first. This first point will always be the **start point** of your trajectory and will be the point on which the first instance is placed. All indenting measurements will also use this point as reference. For example, if a straight line trajectory was drawn from right-to-left, the start point of the trajectory would be its right endpoint and the first instance would be placed there. Conversely, if the trajectory was drawn from left-to-right then the trajectory start point would be placed at the left end.

APPLYING THE CARVING ELEMENTS TO THE TRAJECTORY

Once the path is drawn and selected, enter the select **Pattern Along Trajectory** tool by clicking on the tilted orange shell icon. Another window will open showing the board with a dashed line representing the trajectory. The controls for positioning and spacing the carved elements along the trajectory are displayed along the bottom.

From here there are several inputs needed in order to fully specify the final pattern. We will summarize them here and then discuss them in greater detail later in this document.



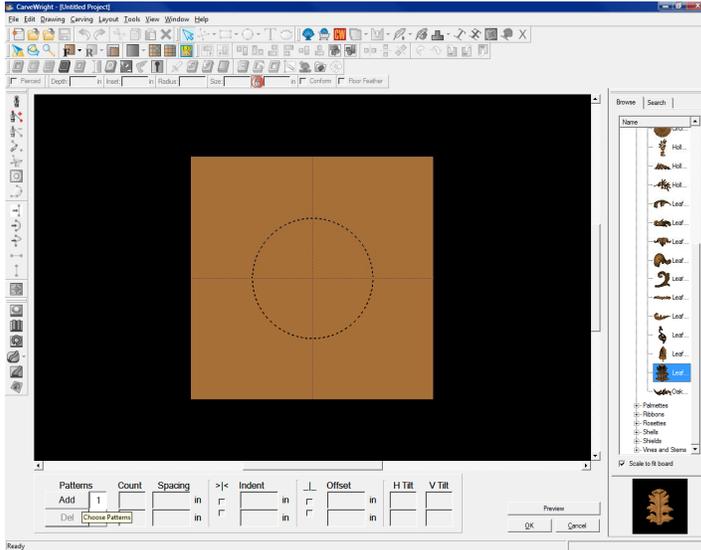
- 1) Select the pattern, or patterns, to apply to the trajectory from the pattern library.
- 2) Adjust the size of the pattern and the rotation angle.
- 3) Specify how many instances of each pattern will be placed on the trajectory. There are two ways of doing this. The first is by specifying the total number of instances and the second is by specifying the spacing between each instance. Given only one of these two inputs the software will calculate the other.
- 4) Specify where the final grouping of carvings should start along the trajectory. The options are to start the pattern at the trajectory start point or to center the entire grouping on the center point of the trajectory's length. This can be thought of like text justification, where left justify pushes a string of characters to the left margin of a column and center justify centers the string in the column.
- 5) Set an indent value. If the pattern is **not** centered then there is an indent control that allows the pattern to be moved along the trajectory away from the start point.
- 6) Apply an offset distance to the pattern grouping either above or below the drawn trajectory path. Both positive and negative numbers are allowed in this field and determine whether the pattern will move above or below the

path. It is important to note that a negative number will not always move the pattern in the same direction for every trajectory (sometimes it may move it above the line and sometime below).

- 7) Decide how the offset distance should be determined. There are two modes that will be discussed below, one using the original trajectory and spacing to set the position of the offset pattern and the second using a internally generated offset trajectory.
- 8) Set the tilt of the carvings into and out of the board. This is similar to the tilt feature in the Designer software and allows for interesting layering options.

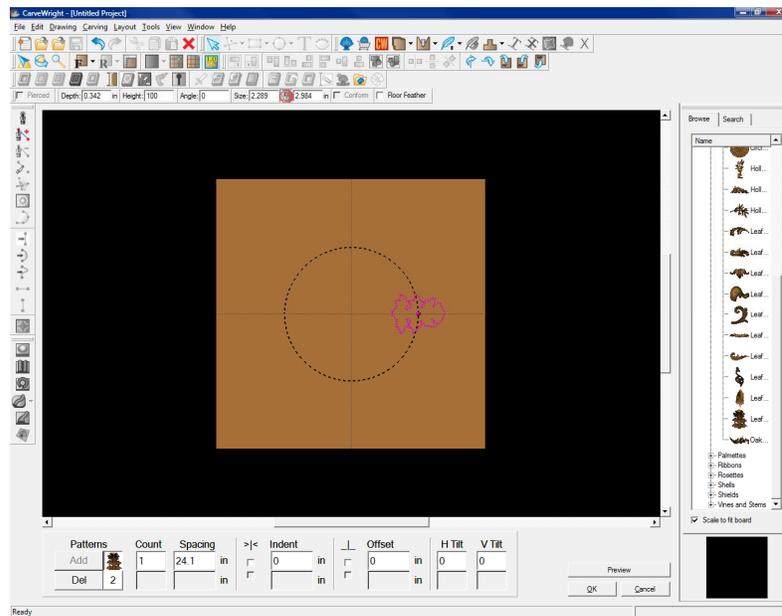
APPLYING A PATTERN TO THE TRAJECTORY

Begin by finding and highlighting the carved pattern to be added onto the trajectory from the library (just as would be done if a pattern was placed on the board in a typical fashion). Once the pattern has been selected, click the Add button in the bottom left corner of the screen. A small picture of the selected pattern will now be displayed next to the **Add** button. You can add up to two patterns to the trajectory by selecting a second pattern and hitting **Add** again.



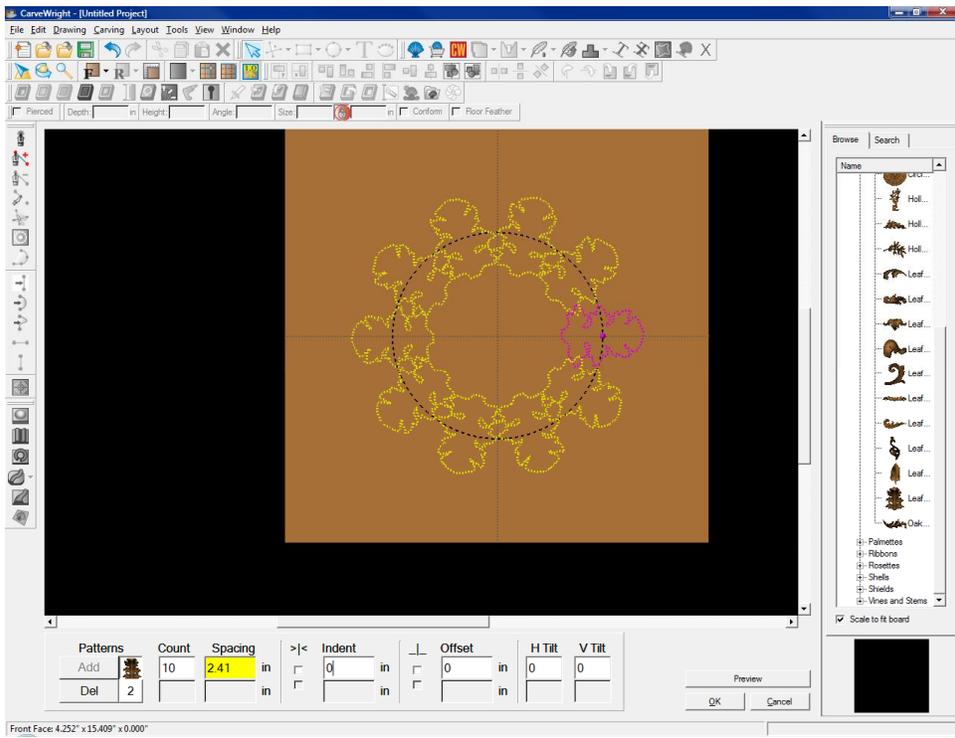
An outline of the pattern now appears along the trajectory. After the pattern has been added new options will become available. These options include **Count, Spacing, Center Patterns on Trajectory, Indent, Offsets Before Projection, Offset, H Tilt, and V Tilt.** Clicking and dragging the outline allows for

placing the first instance in any location along the trajectory (right/left as well as above/below). The **Offset** and **Indent** features can also be used to alter the position of the instances. The standard **Depth, Height, Angle,** and **Size** tools are also available but are discussed in other CarveWright documentation.

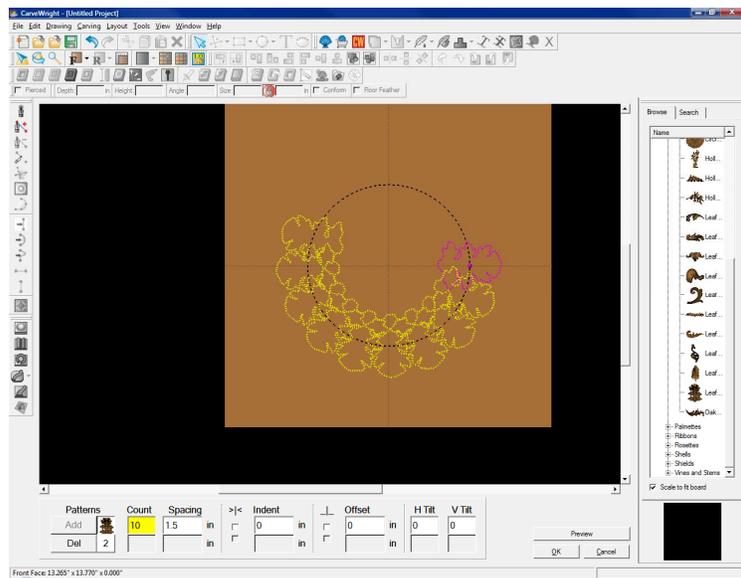


SPECIFYING THE NUMBER OF INSTANCES IN THE PATTERN

The number in the **Count** input field determines how many instances of a pattern will be placed along the trajectory (including the initial instance). The software calculates the length of the drawn trajectory and automatically calculated the spacing based on the number of instances entered.

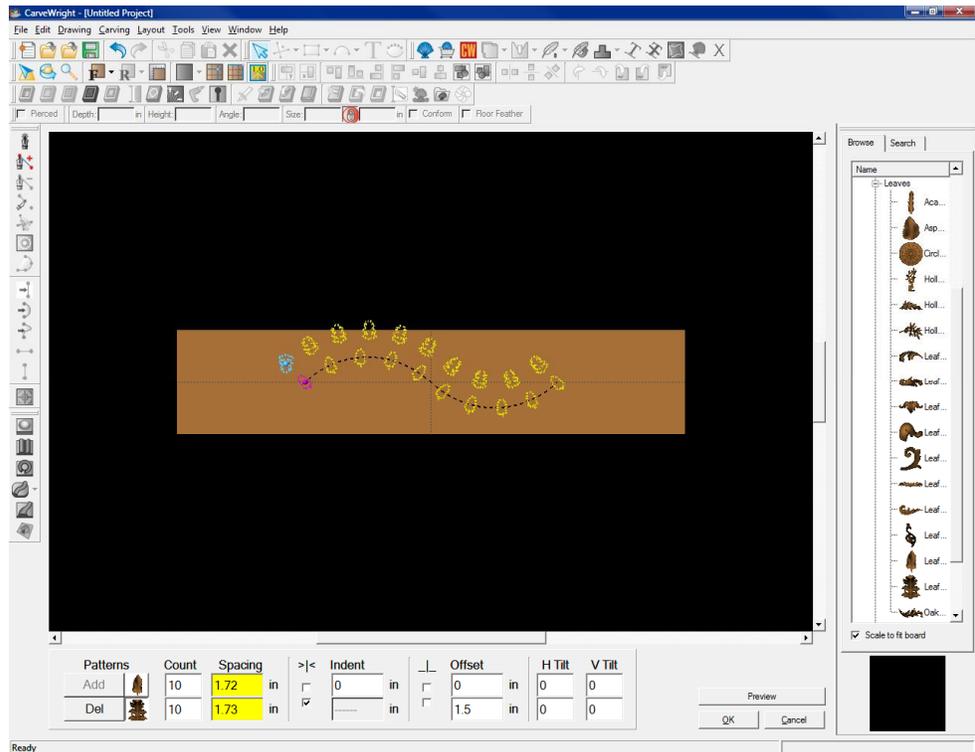


Conversely, if a number is entered into the **Spacing** input field, the number of pattern instances is adjusted based on how many can fit on the trajectory length with the given the spacing. The spacing can also be adjusted if a count is entered without altering the count as long as they can all fit on the trajectory (i.e. smaller spacing).

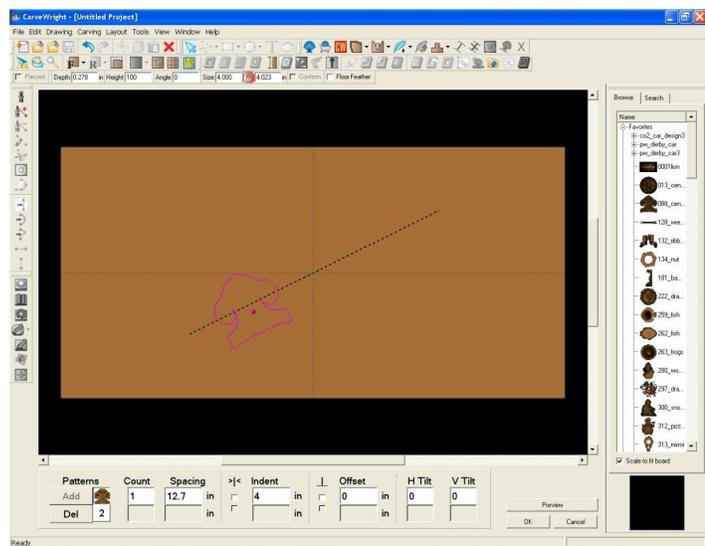


SPECIFYING WHERE THE PATTERN GROUP IS PLACED ON THE TRAJECTORY

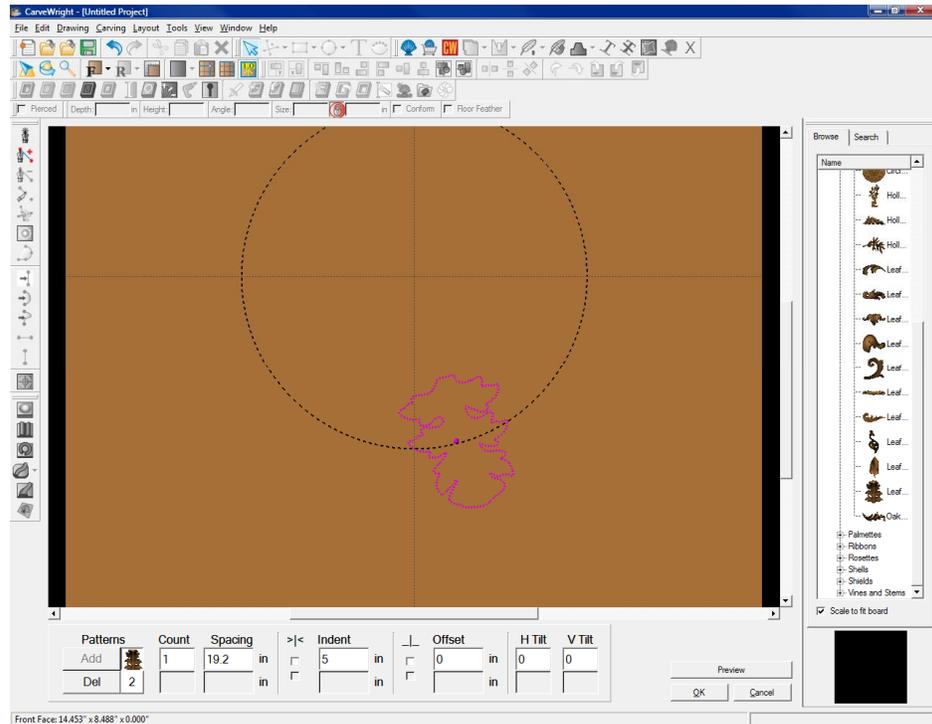
The **Center Patterns on Trajectory** checkbox allows for the pattern group to be centered along the length of the trajectory. Normally the box is unchecked and will align the instances to start point of the trajectory. If however centering the instances on the trajectory is desired, simply check this box. This function also works when the instances are placed above or below the trajectory.



If the grouping is not centered, **Indent** allows for moving the pattern group along the trajectory. If the trajectory is open (e.g. a line or spline) the center of the first instance is placed on the starting point of the trajectory. Indenting the object will shift the pattern along the curve in the direction of the trajectory end point. Only positive numbers are allowed in the indent field.

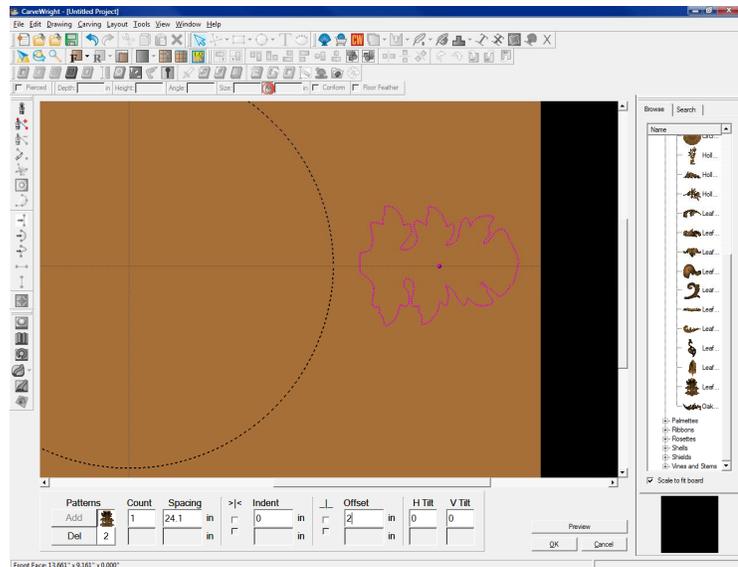


On a circle, the initial instance will be positioned at three o' clock, and as the indent is increased the pattern moves clockwise around the circle.



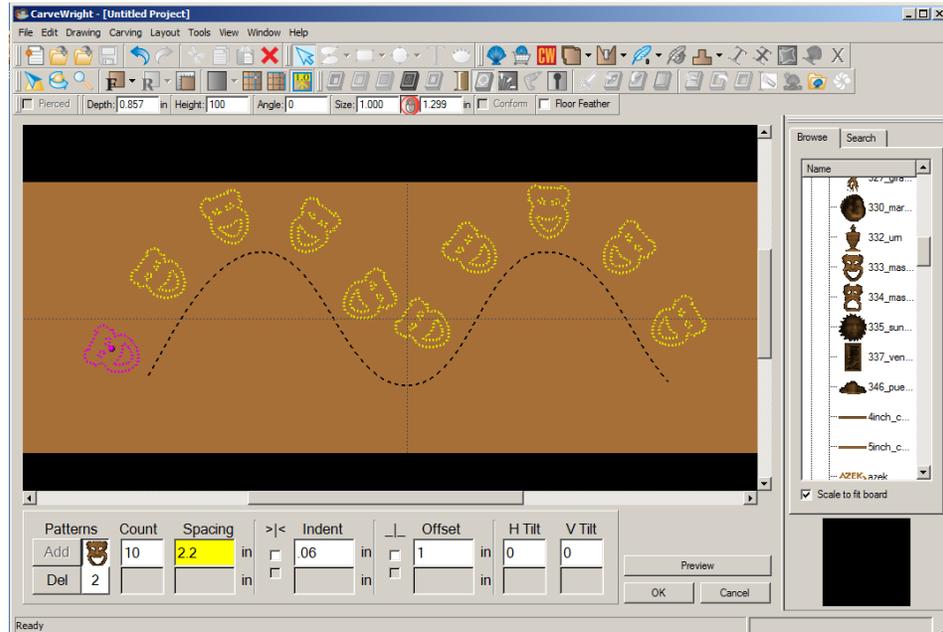
SPECIFYING THE PATTERN GROUP POSITION ABOVE OR BELOW THE TRAJECTORY

The **Offset** field determines how far the center of the pattern lies above or below the trajectory path. Positive and negatives number are allowed in this field. In the case of an open trajectory (one with beginning and ending points), if an instance resides on either

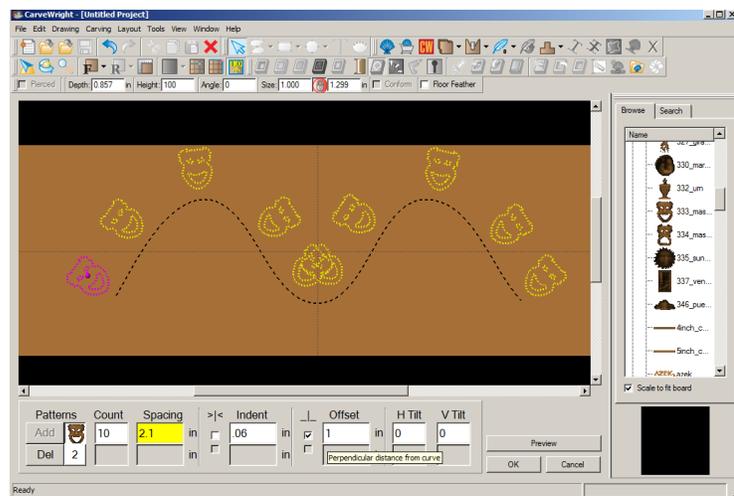


endpoint it can flip orientation if it is offset. If this happens simply indent the instance or change the spacing.

The **Offsets Before Projection** checkbox lets the user choose how to position of offset instances. Normally, the box is unchecked. In this case the software creates a new hidden trajectory path offset from the drawn trajectory by the entered amount. It then calculates the length of this new path, calculates the new spacing given the Count, and places the center of each instance along this path with the new spacing. As you can see the instances follow a perfectly offset path and have equal spacing.

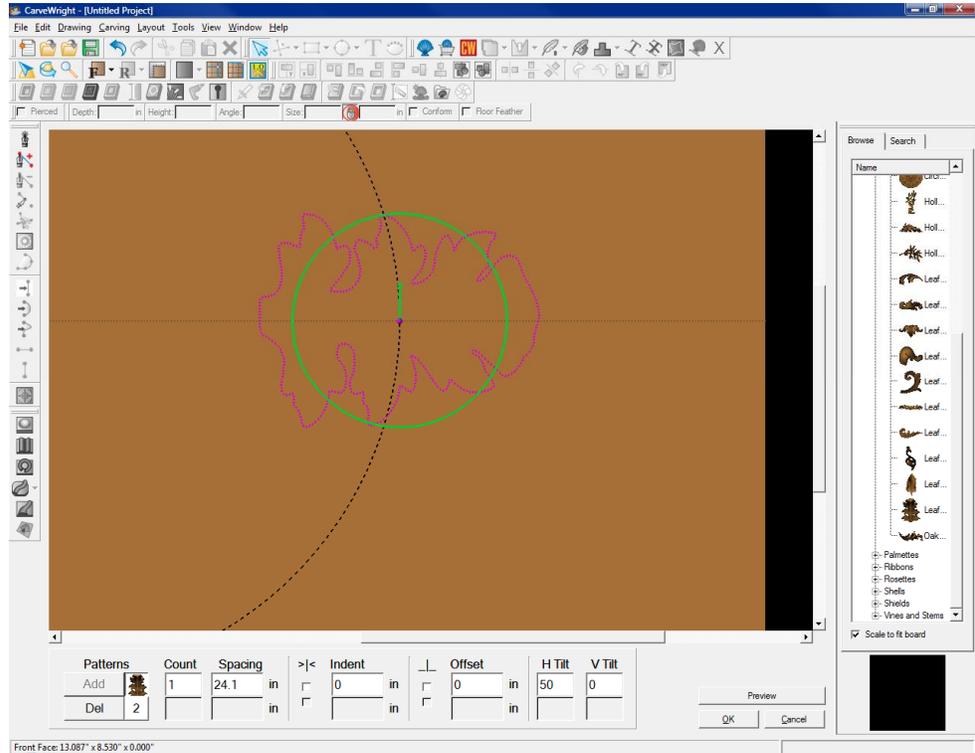


If the box is checked, the software simply moves along the drawn trajectory to the point determined by the spacing, calculates a normal to the path at this point and then moves exactly the offset distance along that normal to place the center of each instance. In this case you can see that in the parts of the trajectory with tight curvature, the instances are placed in different locations because of the slope normal to curve at the location points.

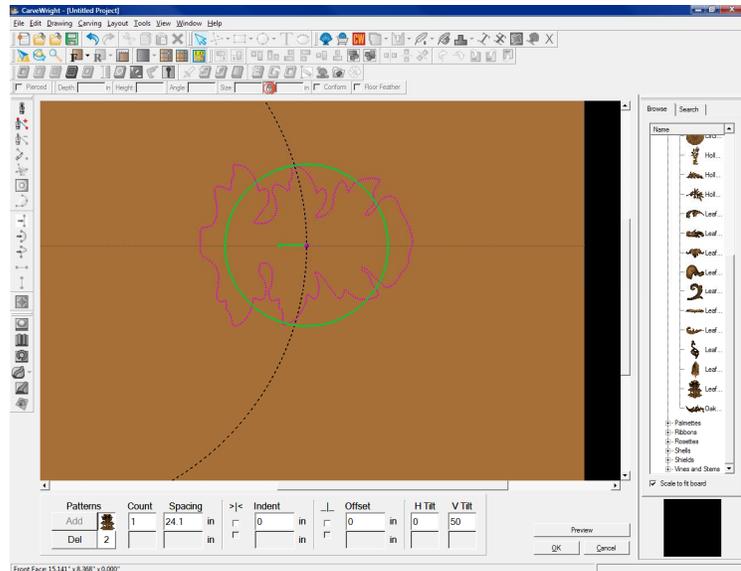


The difference between these two offset methods is usually only seen when the trajectory is very bumpy and folds back on itself. We encourage you to experiment with all of these options in as many different and interesting ways as you can.

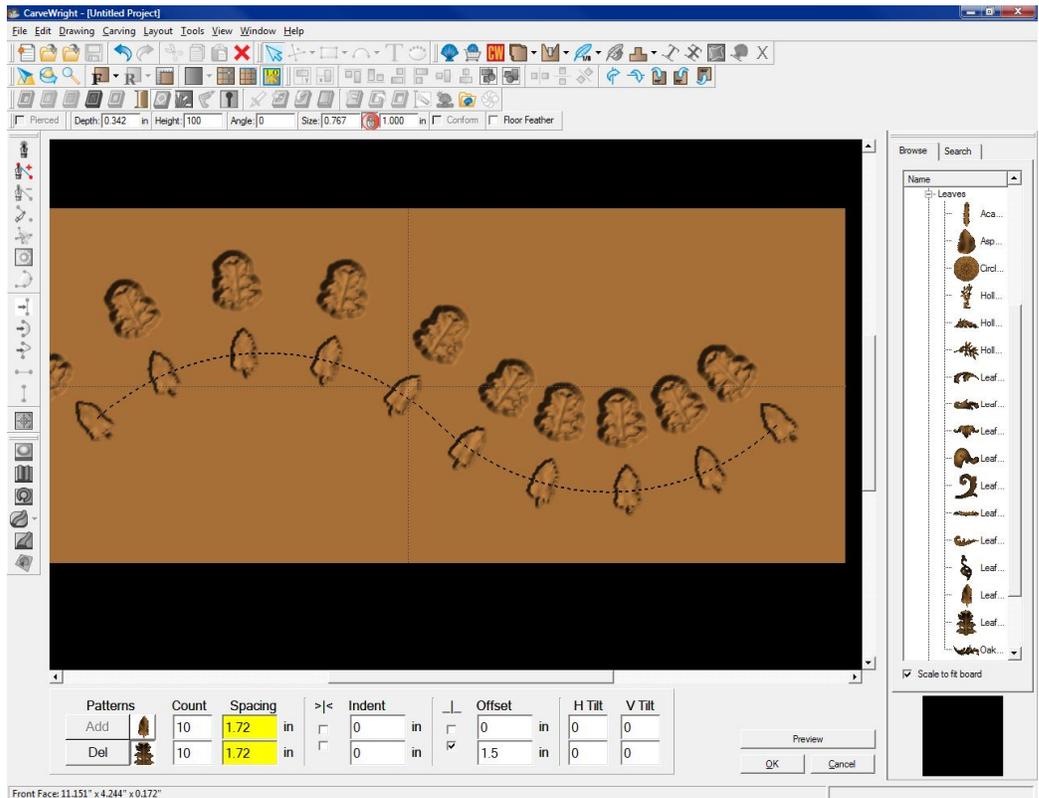
The **H Tilt** will tilt the pattern along its vertical axis into and out of the surface of the wood. The tilt indicator will be displayed by a green arrow inside a circle showing the direction of the tilt. On a circle starting at the original three o' clock position, the **H Tilt** will tilt the top of the pattern down into the wood.



Similarly, the **V Tilt** will tilt the pattern along its vertical axis (displayed by a green arrow inside a circle showing the direction of the tilt). On a circle starting at the original three o' clock position, the **V Tilt** will tilt the left side of the pattern down into the wood.



The **Preview** button will show the patterns being assigned to the trajectory as they will look when carved. This helps with spacing when considering feathering.



The **Depth, Height, Angle, and Size** tools will function the same as they would with a standard pattern addition. Once the patterns are set click the OK button and the pattern will be applied to the project and be ready to carve. To edit any part of the **Pattern Along Trajectory** parameters simply select one of the instance on the board and click the icon again.