ShopBot
PartWorks

ShopBot PartWorks comes with several options for machining your work.

Below is a brief description of the options and an example of the look that is created with each of the toolpathing options. This tutorial is intended as a brief overview of Part Works. Play with the software, and click on options everywhere to see what happens. See instruction videos and tutorials for more details.

Toolpath Operations

Open the ToolPath options by clicking on the Toolpaths tab at the right side of the screen.

Float the cursor over the icons under Toolpath Operations to see their labels.

Toolpathing Options

Profile: Creates a cut line along the vectors (the design lines): **Outside** and **Inside** work with closed vectors only. **On** will work with either open or closed vectors.

    Outside moves the toolpath outside the vectors (design lines) the radius of the bit to leave you a part the correct size

    Inside moves the cut line inside the vectors the radius of the bit to give you a "hole" the correct size

    On the vector gives no compensation for waste from the router bit.

Pocket: Pockets (clears) an area. Can also be used to create raised letters or designs

V-Carve: Any closed vector, whether text or artwork, can be V-Carved, so that it looks engraved with nice sharp corners.
    The **V-Carve Flat** option works well for larger projects, or with thinner material.

Drill: Drills a hole the diameter of the bit in the center of the chosen object.
   .
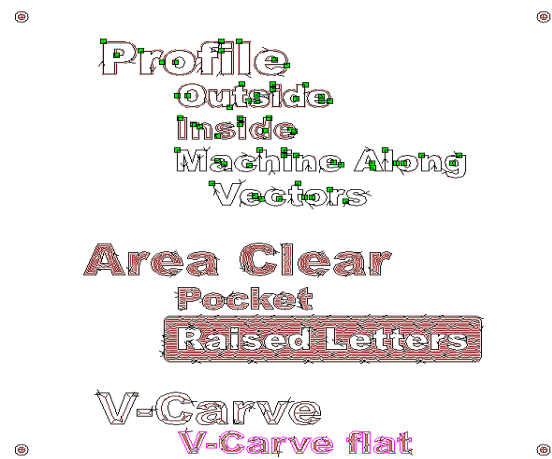
CREATING THE VECTOR ARTWORK

The **Draw Text** tool in Drawing screen was used to create the words on the 24" x 24" project.

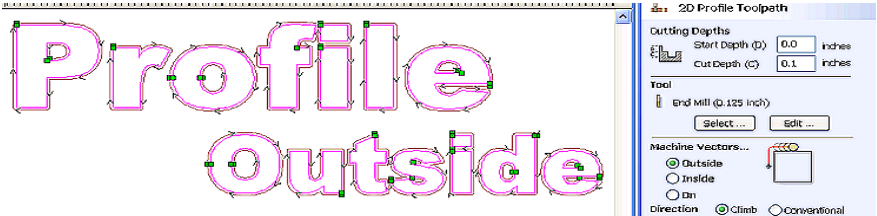For this example, all text was Arial Black. Text was moved into position and resized as desired.

The **Draw Rectangle** tool was used to create a box with rounded corners around the Raised Letters text

The **Draw Circle** tool was used to place a .25" diameter circle 2" in from each corner
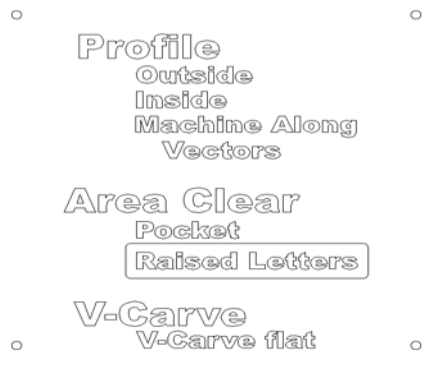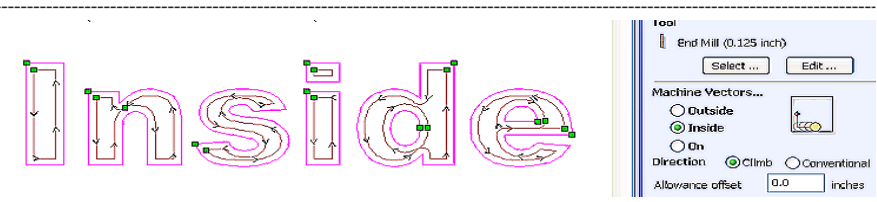
Create Profile Toolpath:

To get the part the right size, Machine Vectors **Outside**.

To get the negative space (the hole) the right size, Machine Vectors **Inside**

The "**On**" Option creates the toolpath right on the vector lines

Create Pocket Toolpath:

Pocket out the inside of the design by selecting the design.
Contour follows the contour of the design.
**Raster** goes back and forth in the design. You can change the angle of the raster

Create a **raised** design by creating a border around the design, then selecting the design and the border before creating the toolpath

For this example, the stepover was set to 50% to create ridges in the background. Use the **Create Texturing Tool** to create more interesting background textures. Note that the .125" bit does not fit into some spaces clearing around the s's.

Create V-Carve/Engraving Toolpath: The v-shape of the bit and the 3D movement of the ShopBot create a 2.5D file. The angle of the bit (60, 90, or 120 degrees) determines how deep the engraving will be. For shallower letters, especially large letters, use a wider V bit. For thinner material, consider the V-Carve with Flat Depth option.

In the top example, note that the depth is set to .5" deep. The toolpath follows the centerline of the lettering, and the corners and bottom of the lettering will be sharp.
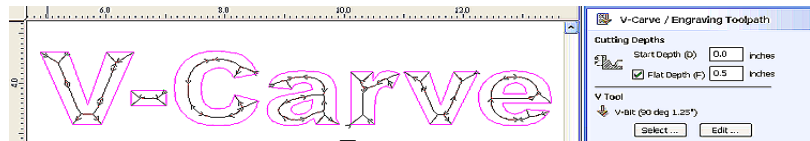
In the bottom examples, the **Flat Depth** is checked and the depth set to .05" deep. Although the corners are still sharp, the center area of the lettering is cleared with a second .125" bit. *This toolpath option requires a bit change!!!*
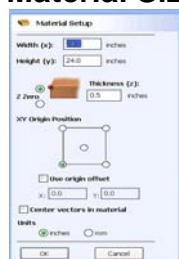
Part carved with 90 degree V-Bit

Part carved with .125" end mill
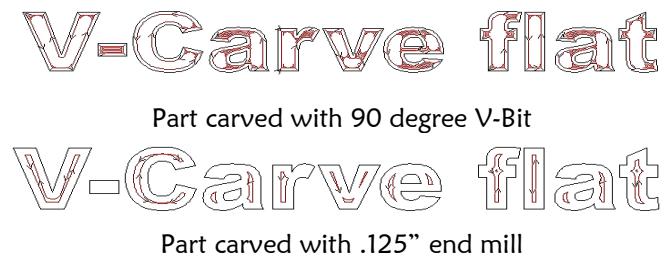
Create Drilling Toolpath:
The drill bit plunges straight into the center of the vector object, and pulls straight up again. Peck drilling pulls the bit up to clear chips in cases where the holes are deep.
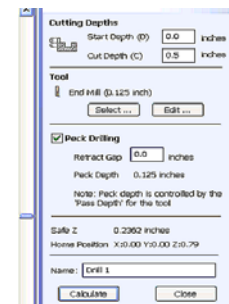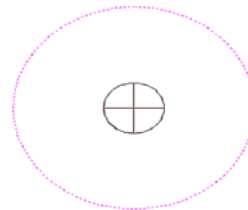
To change the size of your model, from the toolbar, go to **Edit>Material Size**

To change the height the Z travels above the material when jogging (**Rapid clearance gap**) and the **Home Position**, open the Toolpaths tab and click on the **Setup Material** icon.

You must re-toolpath after changing material thickness or clearance gap/home position

Checking your work:

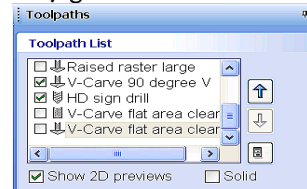You can simulate the toolpaths by clicking on the Preview Toolpaths icon.
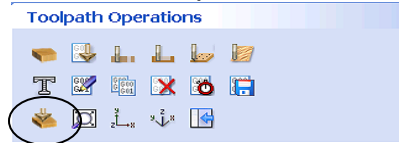
Reset the preview and then re-Preview when you make changes

Click on the boxes next to the toolpaths to make them visible again after creating a simulation. Clicking on the **Solid** box will show where the toolpath actually goes in 2D view.

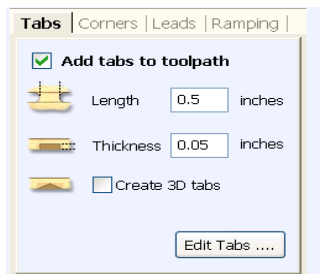Toolpath preview viewed from Z (top) without fill.

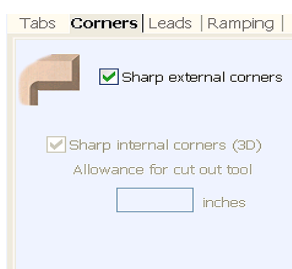Isometric view of the Toolpath Preview with fill added

2D view of the toolpaths with the Solid box checked. Does the bit go deep enough into the corners?
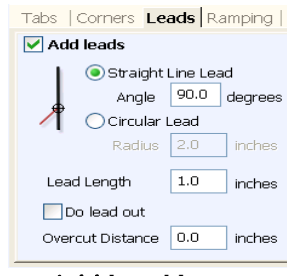
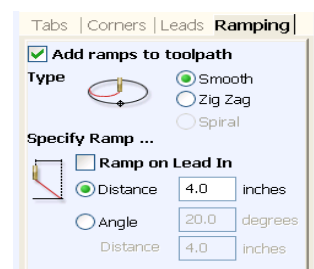Check out some of the options available to you in the **Create Profile Toolpath** screen:

Add **Tabs** to help hold down your work

Check out the **Corner** options

Add **Lead Ins** to plunge outside the cut line

Ramp into the material when plunging

Tool Datebase:

You set the depth of cut in each pass, the stepover for pocketing an area, the move and plunge speed for each bit, and more in the **Tool Database**.

You can add and modify tools to your specifications. Check out the buttons available to you, and play.