TreeSoft Cookie Cutter

Cookie Cutter was written by Paul Rowntree, based on information and sample source codes provided by Vectric and other 'gadgeteers'. Any flaws in this package were introduced by me. I believe it works well, but no guarantees are given for its use in any application. **Cookie Cutter** works with Aspire 4.0 (or greater) and VCP 7.0 (or greater). **It will not work with previous versions of either program.** Although Rowntree retains copyright, you are free to use the components in any way you wish, including personal and commercial applications, with no requirement to pay anything, to anyone, ever. You are not permitted to redistribute the files, nor remove the copyright information that they contain, without written permission.

Software development is time-consuming. If you feel that you have derived significant benefit from this or any other of the freely-provided gadgets, contributions to its continued development at **PaulRowntree.weebly.com** would be greatly appreciated. This also lets me know which types of software are most useful to the Vectric community, and allow me to target future projects better.

Change Log

Feb 15, 2014	- Changed to Inside/Outside detection
	- Works with straight/curved vectors identically
	- Added dialog box to configure
	- Added registry storage
	- Cutter can be first or last of selected vectors
	- redundant point removal added
	- Pre-check for unaffected vectors to speed gadget up
Feb 10, 2014	- First version written and working

Disclaimer

By downloading, installing and using this program you are accepting full responsibility for any and all consequences. CNC machinery is potentially dangerous, and the user is 100% responsible for ensuring that the output of **Cookie Cutter** is safe to use, and that it will have the desired effects.

As always with CNC equipment, think many times before running code, and doing air cuts is often a good idea with new files. Verify the Z limits of the loaded files before cutting to ensure that you are not going to destroy your table top, spindle, or both.

Work and Play safely.

What is Cookie Cutter ?

Cookie Cutter is a 'gadget' for Vectric's Aspire 4.0 (and higher) and V-Carve Pro 7.0 (and higher) CAD/CAM tools. It lets you trim any number of 2D vectors all at once to fit the inside or outside shape of another closed vector. This could be done on the vectors individually using the built-in Trim Vectors tool (the scissors) but if using hundreds, or thousands, of closely-spaced vectors to define complex shapes, this becomes impractical; redoing the work to make changes is a daunting thought! Instead, imagine creating a large number of vectors using the built-in copy commands, and then using a shaped vector as a Cookie Cutter to stamp out a particular shape, trimming the vector lengths to make this happen. This gadget can prepare large numbers of vectors for use with the Vectric Fluting toolpath or TreeSoft's **FlutePlus** to make smooth 3D shapes, even in VCP. You get both the inside and the outside parts.

The gadget works with Aspire and VCP in exactly the same way.

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Unpacking Cookie Cutter

If using a Vectric installer, the files are already in their correct locations and are ready to run. Alternatively, the archive can be opened with Windows, WinZip, Z-zip, or any other standard unzipping program. Extract the files to any directory, then move the individual components in the directories shown below.   Aspire or VCP will find the gadgets and show them in the Gadgets menu lists.

| Windows Path	Contents
Aspire and VCP User Gadget directories, created during Aspire or VCP installation **C:\Users\Public\Public Documents\Vectric Files\Gadgets\Aspire Vx.y** or **C:\Users\Public\Public Documents\Vectric Files\Gadgets\VCarve Pro x.y**	**Cookie Cutter.lua** **Cookie Cutter.html** If you want, you can create a subdirectory and place these files inside it. This unclutters the Gadgets menu of Aspire and VCP.
Anywhere you want	**Cookie Cutter.pdf** (this file) ***.crv3d, *.crv**

Using Cookie Cutter

Cookie Cutter trims vector(s) by finding the intersection of the vector(s) with the cutter contour. The cutter must be a closed vector. The start point of the vector(s) could lie inside or outside the cutter vector. Instead of replacing the vector(s) directly, it creates new grouped vectors on a layer called "Cookies"; this makes it easy to redo the operations and refine the design. The first group contains any parts of the vectors that were inside the cookie cutter, plus the cutter. The second group contains any parts of the vectors that were outside, plus the cutter. The sum of these two groups is a copy of the original vector set, so don't be surprised if the contents of the "Cookies" layer look like the original vector set!

1. After installing the files, restart Aspire or VCP, and verify that it has found the Cookie Cutter.lua file by checking the Menu>Gadgets listing.
2. Before running the gadget, create a project and create one of more vectors on the 2D presentation. These examples are from the Cookie Cutter Sandbox file that is included in the gadget package.
3. For these examples, 360 vectors are created as a circular copy of a straight vector, with the start points all at (x,y)=(0,0). Once you are comfortable with these examples, you can try other designs. **Cookie Cutter** can easily deal with 1000 or more straight or curved vectors at once.
4. Draw the cutter vector that you want to work with. For now, make it a closed shape that surrounds (0,0)
5. Select the shape vector, then select the vectors that are to be trimmed. **None of these vectors can be grouped.** If it is difficult to select the cutter first, select it last; you can tell the gadget which one to use with the dialog box.

6. Run the **Cookie Cutter** gadget. It should show a front panel that looks something like this.
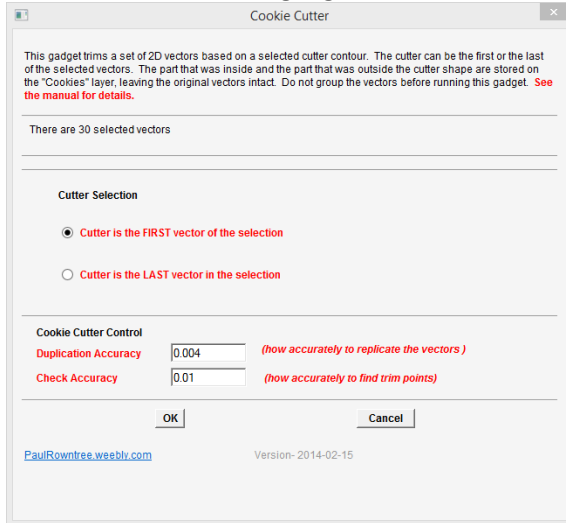
7. Use the "Cutter Selection" radio buttons to choose if the cutter is the first or last of the selected vectors.
8. "Duplication Accuracy" controls how well the produced vectors correspond to the original selected vectors; it is in the current job units (mm or inches). It also controls how closely the gadget finds the intersections between the vectors and the cutter vector; the error will be less than half of the Duplication Accuracy. Smaller values give better results, but cause longer calculation times, and often produce larger vectors.
9. "Check Accuracy" controls how the gadget 'pre-screens' the vectors to find intersections with the cutter. If a vector passes from outside-to-inside-to-outside (or inside-to-outside-to-inside) within this distance along its length, the gadget may not find those two crossings. Smaller values give more accurate detection of crossings, but with longer calculation times.
10. After a few seconds the appearance will change because the 2D display is also showing the contents of the "Cookies" layer.   Restrict the visibility to only the "Cookies" to see the results. Select the region of interest and copy it to where you want to work with it.
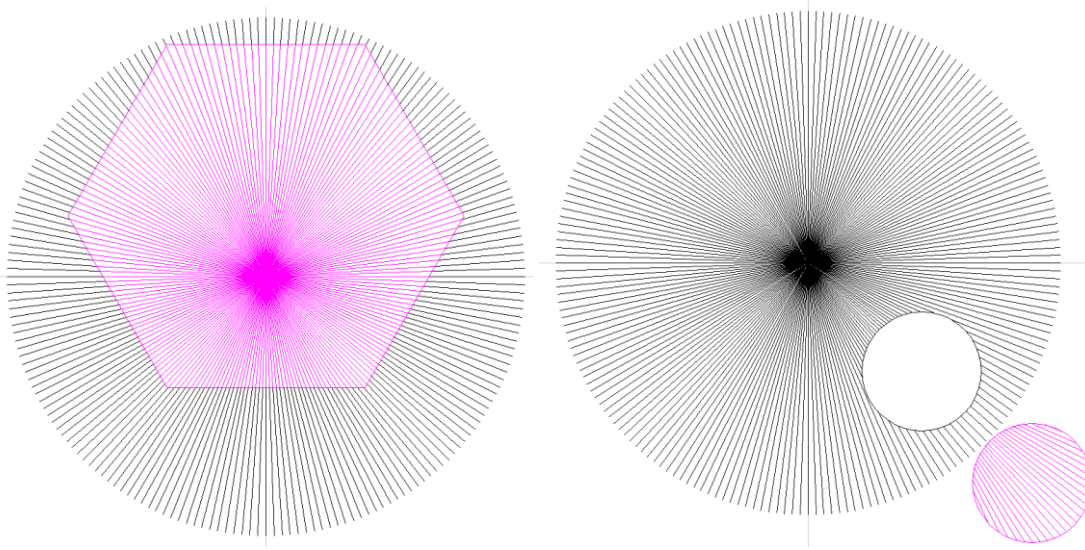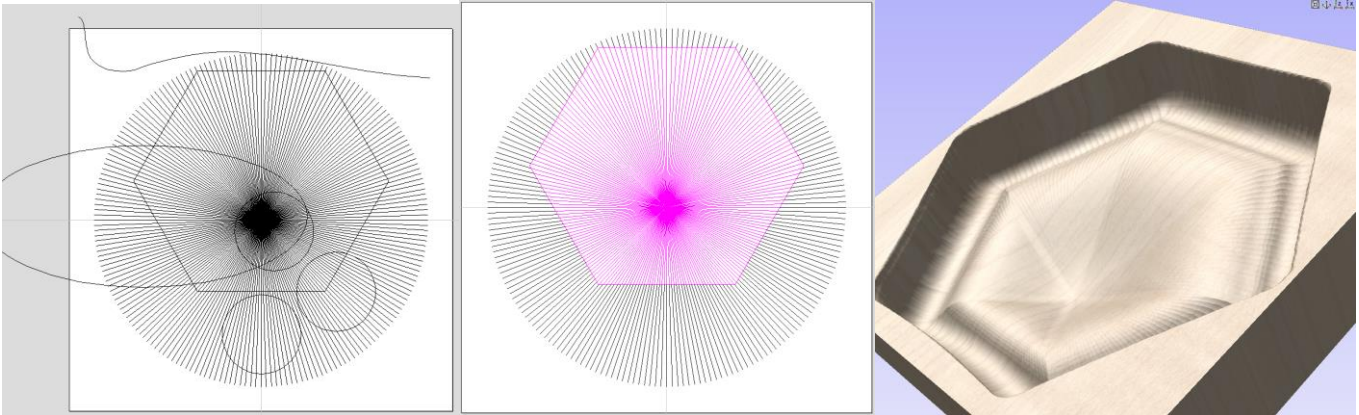
Examples

The Cookie Cutter Playground.crv file can be used to experiment with **Cookie Cutter**. Here are some (perhaps) less obvious ways to use it.

IMPORTANT : The trimmed vectors must be ungrouped before using with **FlutePlus**.

Here is one way to make one shape 'extrude' and morph into another shape as Z goes from top to bottom. This example will make a 3D solid that is hexagonal at the top, and circular at the bottom.

1) Make a straight vector with the start at the (0,0) centre of the material, then make copies with the circular copy tool, with the centre of rotation at (0,0). This is a 4" vector, copied 1000 times. Now make a hexagon, centred at (0,0), with 2" edge lengths.
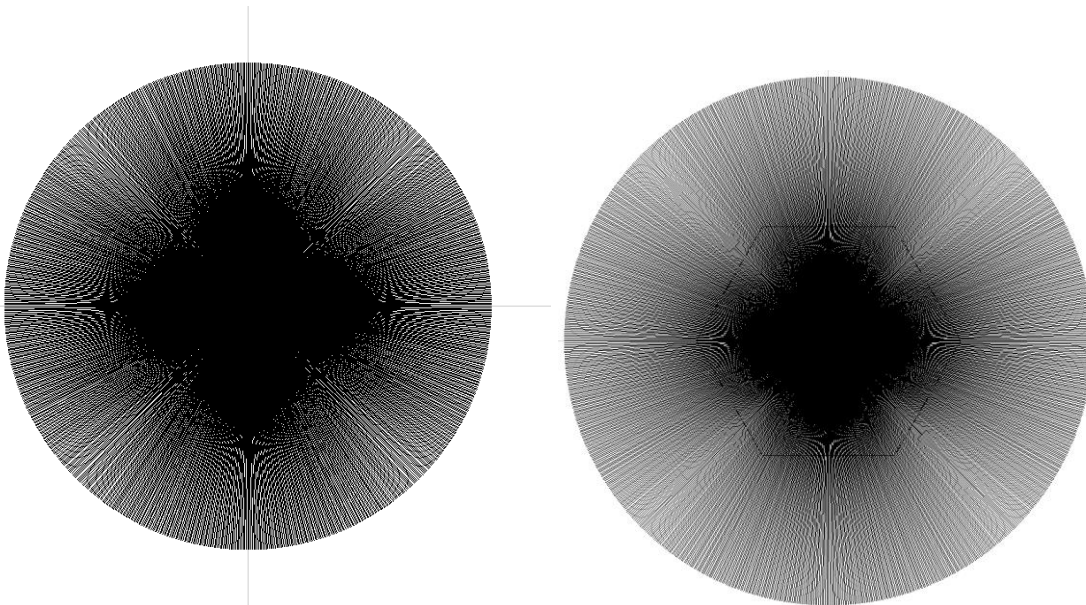

2) Select the hexagon, then select all the radial vectors by drawing a box near the origin from the bottom-right to the top-left. You may have to zoom in to be able to pick out the hexagon edges. Then run the **Cookie Cutter** gadget; these parameters work, but feel free to experiment. Then go to the layers control and turn off the layer

that contains the original vectors, leaving the Cookies layer visible. Select the centre of the figure, then press delete.
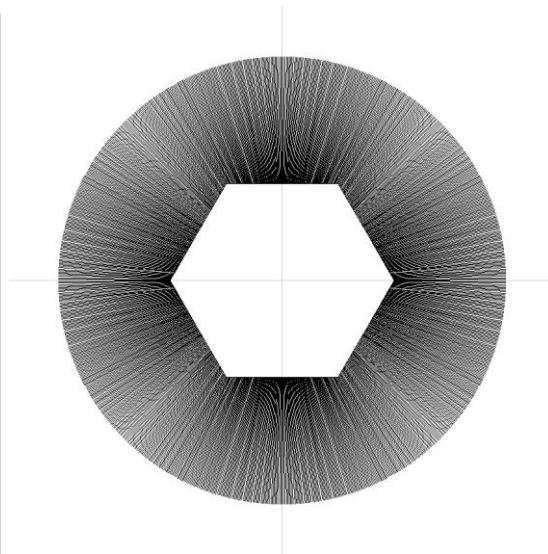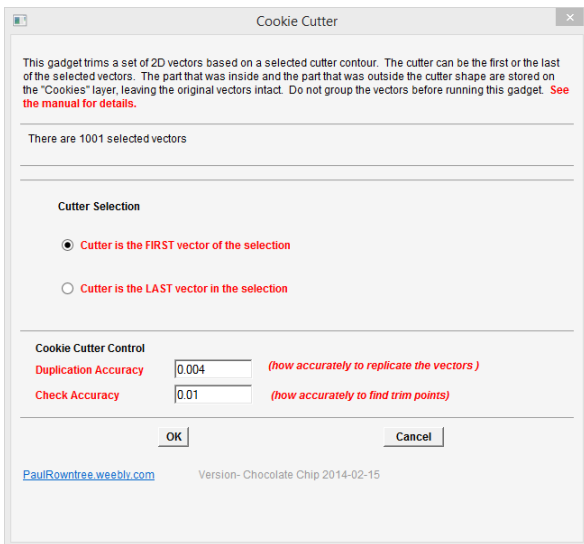

3) Select the remaining grouped figure, and move it to a new layer "Stage 1". Ungroup the pattern, and then either erase the hexagon or take care to not select it for the next operation. Draw a larger circle that will be the size of the base. Making the centre of this circle different from (0,0) makes an interesting pattern, but keep the entire circle within the outside ends of the vectors and outside of the central hexagonal 'hole'. Select the circle, then the lines, and run the **Cookie Cutter** gadget again. Select and delete the outside part of the figure
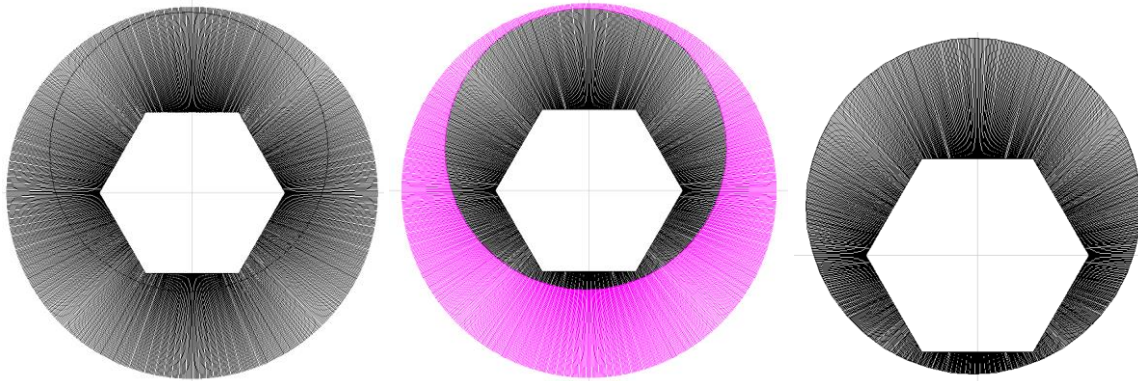

4) Ungroup the remaining set of grouped vectors, select the radial fragments, and then toolpath with the Fluting tool. Use the circle vector to make a profile toolpath to cut out your piece. It will take a while to generate the preview for so many vectors. ..
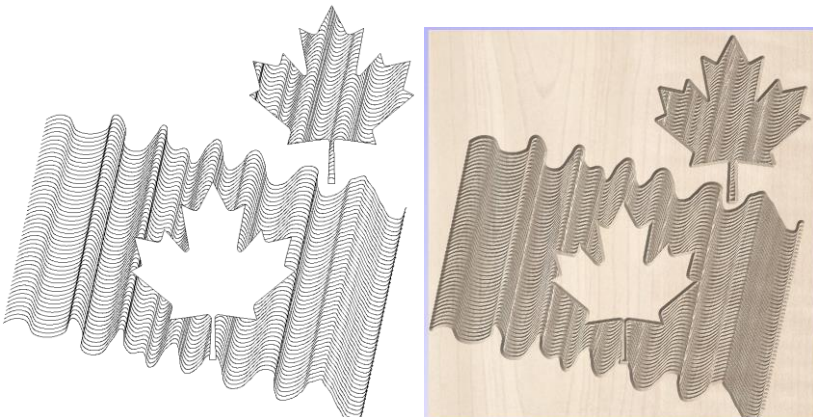
TreeSoft Cookie Cutter
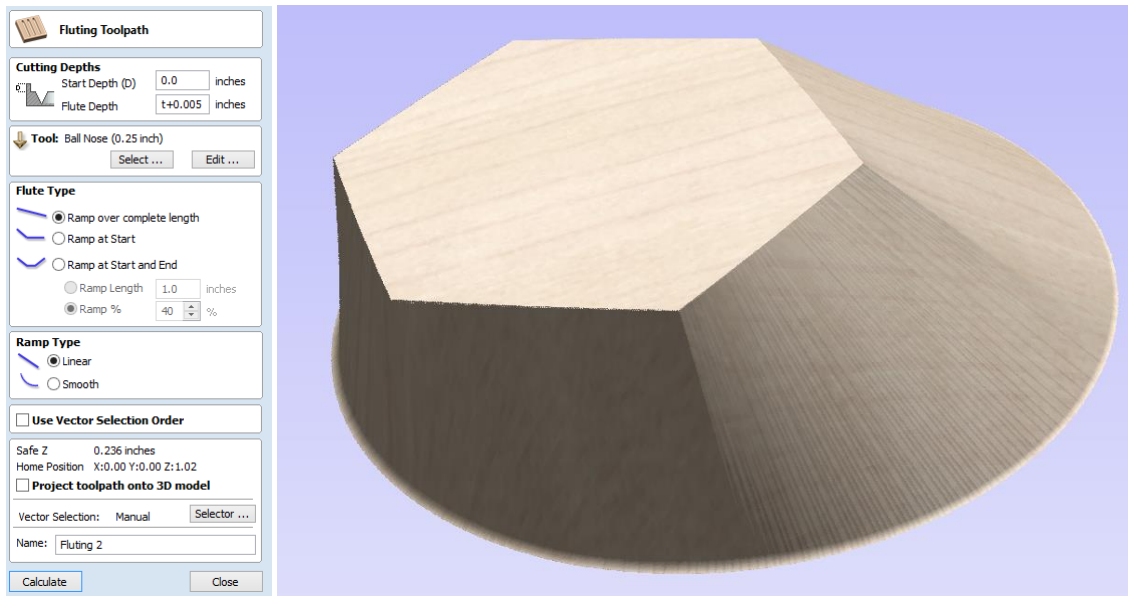
Many smooth shapes become possible if you are not limited to manipulating the vectors manually.
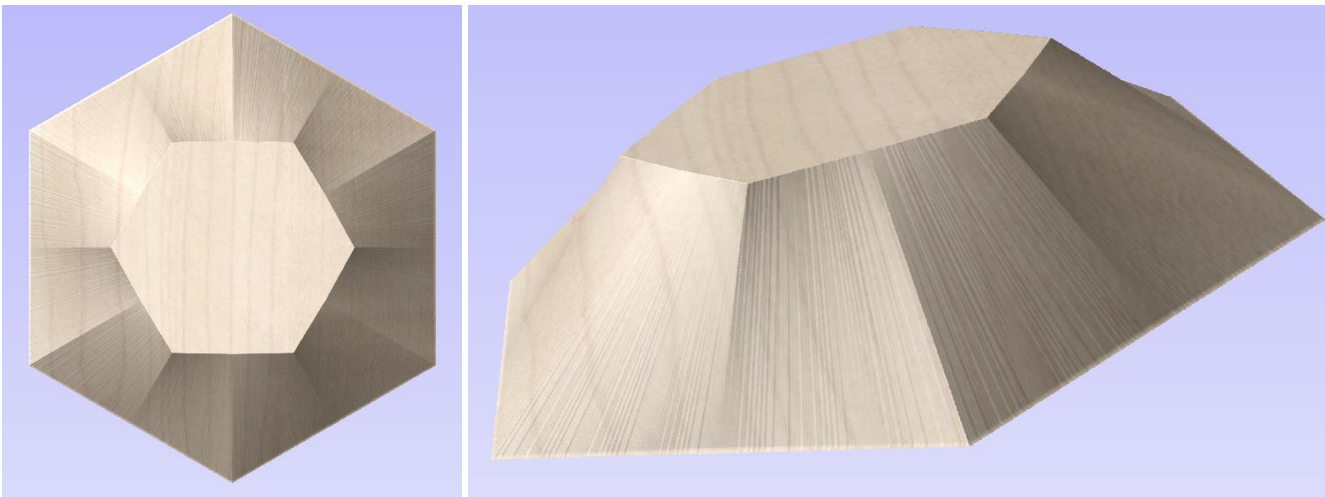
Cookie Cutter will trim curved vectors as well, albeit slowly. Although **Cookie Cutter** will trim closed vectors quite well, it does not close up any openings created; vector shapes that can be V-Carved may no longer be workable without doing some manual rejoining after using **Cookie Cutter**.

If you use these freely distributed gadgets to produce something interesting, please consider posting photos on the Vectric forums. If you have any questions, I am frequently on the Vectric and CNCZone forums as PaulRowntree, or you can reach me via the PaulRowntree.weebly.com website.

Again, if you feel that these gadgets have improved your toolset or assisted your CNC work for pleasure or profit, please consider making an appropriate contribution to support its continued development, at **PaulRowntree.weebly.com**.

Cheers!

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