

Stacking Text with V-Carve Pro

by Tex Lawrence, May 17, 2016 Version 2

Thanks to FixitMike on the Vectric Forum for tutoring the tutor!
Original Tutorial on the offset process by "Fleming" Cobblewood Carver on the Vectric Forum

In a post from April 7, 2015, "Fleming" described a method of producing "Text on Text" carvings. He documented his process in a file called "TEXT ON TEXT Vcarving.pdf" and included an image file demonstrating the process.

Keep in mind that I'm a beginner at all CNC work, and (as of this writing) I don't even have a machine yet. Having said that, I am getting good at using the trial software by creating or duplicating the work of others. I learn from challenging myself.

So, I am old, and I have many talents. One of them is documentation caused by a side career in programming. I challenged myself to improve on what "Fleming" has done, with the result included here.



In making a project in V-Carve Pro (VCP), start by creating the layers that take the confusion out of the process. Layers are used as "construction zones" so the original objects can be preserved without changes. (By the way, creating layers by numbering them doesn't make the process easier. Name the layers to describe what you are putting into the layers.)

A process will be described to create a "text on text" or "stacked text" objects. There is a straightforward process that works with either straight bits, v-bits or ballnose bits. In addition to this process, there is also an offset allowance calculation that can be made to adjust some of the text before carving if you are using a v-bit or ballnose bit. The carved look of some fonts will benefit from this offset. See Appendix.

To begin, set up 8 layers with the following names.

TopText	text that you want on top
TopTextDistort	distorted version of TopText
BottomText	text that you want on bottom
BottomTextDistort	distorted version of BottomText
OffsetText	TopText offset so carving BottomText does not destroy the TopText.
WeldedText	TopText (or OffsetText version of it) is welded to the BottomText
Outlines	rectangular outlines of the edges and/or frame
Graphics	any graphic content

Text Preparation

Create your text and vectors and put the vectors/text in the appropriate layer. The straightforward process is described by referencing layer names in the following:

Outlines	draw rectangular outlines of the edges and/or frame
Graphics	scrolls or images that need to be at the same depths as some of the text
TopText	Type in text to appear on the top level such as first name.
TopTextDistort	Copy TopText to here and then distort. Select and group.
BottomText	Type in text to appear on the bottom level such as last name.
BottomTextDistort	Copy BottomText to here and then distort. Select and group.
OffsetText	(Used in offset calculation only. See Appendix.)
WeldedText	Copy BottomText (or BottomTextDistort) to here. With copied text selected, choose Convert object to curves. Group these new vectors. Copy TopText (or TopTextDistort) to here. Choose Convert object to curves and group.
**	OR Copy OffsetText to here. Choose Convert object to curves. Group. See Appendix. Select both groups. Choose Weld Selected Vectors. Group these new vectors.

With the text, outlines and graphics in place, the toolpaths need to be calculated.

Toolpath Calculations

There are two ways to carve the object described above: Pocketing toolpath and V-Carve toolpath. Which one to choose depends on whether the tool used will be a straight end mill or a v-bit / ballnose end mill, respectively. Separate processes for each are provided next.

Toolpath Calculation for Straight End Mill

A pocketing toolpath is used for a straight end mill. (V-carve toolpath is used for other bits.) The depth setting is for the depth of the top text or for another way to describe it, the top of the bottom text.

The carving will be easier if the only layers visible are the ones being carved. Choose Layers and turn off all layers except the TopText (or TopTextDistort), Outlines and WeldedText layers. (Don't forget any Graphics.)

Pocketing The Top Text

Choose Switch to toolpaths

Select the TopText (or TopTextDistort) and the outline. (Don't forget any graphics.)

Choose Pocket Toolpath

Set Start Depth to the top of the material (usually.)

Set Cut Depth to the depth of the top text.

Choose tool to be used. Select Large area cutting tool if necessary.

Choose Clear Pocket Offset/Raster as necessary.

Calculate and preview.



Pocketing The Bottom Text

Select the WeldedText and the outline. (Don't forget any graphics.)

Choose Pocket Toolpath

Set Start Depth to the top of the material (usually.) *Use the same Start Depth as used with TopText.*

Set Cut Depth to the depth of the bottom text.

Choose tool to be used. Select Large area cutting tool if necessary. *Use the same tool as used with TopText.*

Choose Clear Pocket Offset/Raster as necessary.

Calculate and preview.



Toolpath Calculation for V-bit or Ballnose Bit

A V-Carve toolpath is used with a v-bit or ballnose bit. The Start Depth is set to the top of the material (usually.) The Flat Depth setting is for the depth of the top text or for another way to describe it, the top of the bottom text. *Only the Flat Depth changes for the bottom text toolpath.*

The carving will be easier if the only layers visible are the ones being carved. Choose Layers and turn off all layers except the TopText (or TopTextDistort), Outlines and WeldedText layers. (Don't forget any Graphics.)

V-Carving The Top Text

Choose Switch to toolpaths

Select the TopText (or TopTextDistort) and the outline. (Don't forget any graphics.)

Choose V-Carve / Engraving Toolpath

Set Start Depth to the top of the material (usually.)

Set Flat Depth to the depth of the top text.

Choose tool to be used.

Select Large area cutting tool if necessary.

Choose Flat Area Clearance Offset/Raster as necessary.

Calculate and preview.



V-Carving The Bottom Text

Select the WeldedText and the outline. (Don't forget any graphics.)

Choose V-Carve / Engraving Toolpath

Set Start Depth to the *top of the material* (usually.)

Set Flat Depth to the depth of the bottom text.

Choose tool to be used. (Use same tool used for top text.)

Select Large area cutting tool if necessary.

Choose Flat Area Clearance Offset/Raster as necessary.

Calculate and preview.



Appendix

Using v-carve tools (instead of end mills) sometimes requires the curves in WeldedText to be offset an amount to keep the v-bits or ballnose bits from cutting into the TopText when carving the BottomText. This is a problem, because a v-bit or ballnose bit has a diameter at the contact point that depends on the depth of cut. The following is how this allowance is calculated.

****** Copy the text from TopText (or TopTextDistort) to OffsetText and change it to curves. If there is text overlapping other text, use the weld tool to get rid of the overlaps. Group these curves.

Determine The Offset Allowance Needed

Select the OffsetText

Choose Toolpaths

Select the Profile Toolpath

Select Show advanced toolpath options

Set Cut Depth to depth of TopText

Choose the tool to be used

Choose Outside/Right for Machine Vectors

Select the Corners option tab

Within Corners option check Sharp external corners and Sharp internal corners

Calculated value in the next box is the allowance for cut out for the tool chosen at the depth of TopText

Copy or write this value for a later calculation

Close this toolpath unsaved. The calculated allowance is saved.

Go back to Drawing pane.

Creating The Offset Text In Drawing

Select the OffsetText

Choose the Offset Vectors tool in the Drawing tools

Select Outwards/Right

In the Distance box paste or type in the saved allowance value

Uncheck Create sharp offset corners

Check Delete original and Select new.

Choose Offset. Keep in mind that any outline will also have to be offset by the same allowance. An outline offset will be Inwards / Left.

Choose Close.

Group these new vectors.

The text in OffsetText is copied into WeldedText at the previous step marked with ****** and continue there.

Toolpath Calculation Using the OffsetText

Using OffsetText means that a V-Carve toolpath is used as described previously. The difference is that when carving the bottom text *the Start Depth is set to the depth of the top text.*

The carving will be easier if the only layers visible are the ones being carved. Choose Layers and turn off all layers except the TopText (or TopTextDistort), Outlines, OffsetText and WeldedText layers. (Don't forget any Graphics.)

V-Carving The Top Text

Choose Switch to toolpaths

Select the TopText (or TopTextDistort) and the outline. (Don't forget any graphics.)

Choose V-Carve / Engraving Toolpath

Set Start Depth to the top of the material (usually.)

Set Flat Depth to the depth of the top text. Keep in mind that the Start Depth will add to this for the total depth of the bottom text.

Choose tool to be used. (Use same tool used for allowance value calculation)

Select Large area cutting tool if necessary.

Choose Flat Area Clearance Offset/Raster as necessary.

Calculate and preview.



V-Carving The Bottom Text

Select the WeldedText and the outline. (Don't forget any graphics.)

Choose V-Carve / Engraving Toolpath

Set Start Depth to *the depth of the top text.*

Set Flat Depth to the depth of the bottom text.

Choose tool to be used. (Use same tool used for allowance value calculation)

Select Large area cutting tool if necessary.

Choose Flat Area Clearance Offset/Raster as necessary.

Calculate and preview.



Opinion

I found this offset method to work better than the straightforward method on a couple of fonts. It gives very similar results otherwise. – **TEX LAWRENCE**