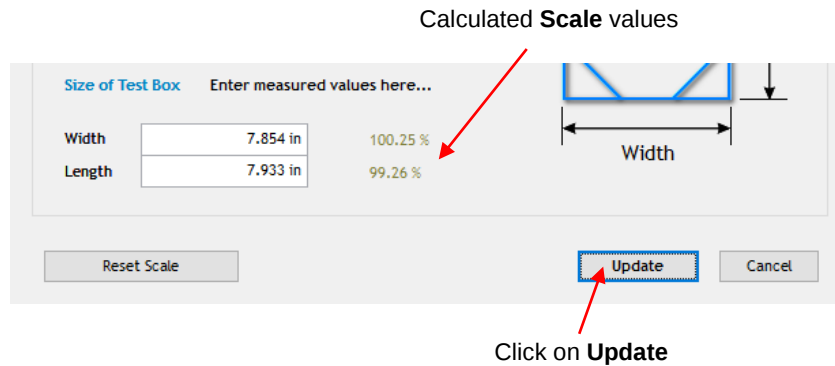
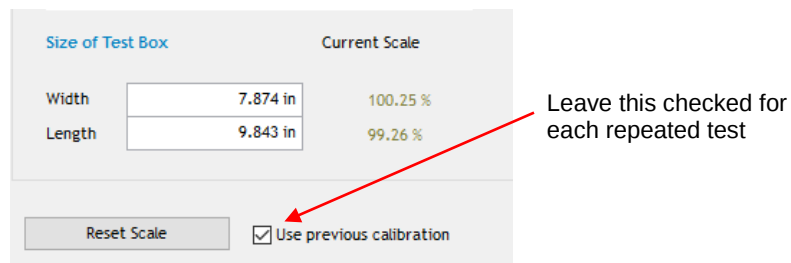


- ◇ After entering each number, the scaling percentage is automatically calculated:



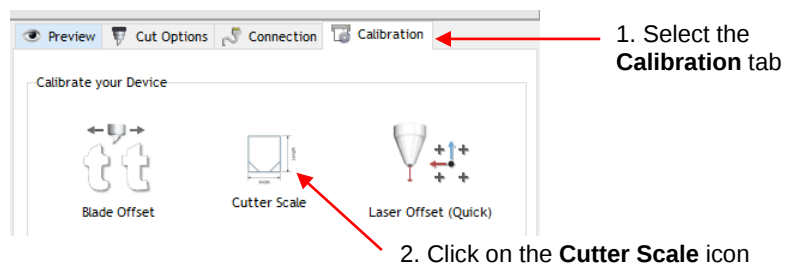
- ◇ Click on **Update** and a prompt window will ask if you want to **Apply Scale Adjustment**. Click on **Yes** and you'll be back in the **Vinyl Spooler** window. To verify the scaling, again click on **Cutter Scale** and repeat the same steps. Make sure you leave your new scale factors in place by having the following option marked:



- ◇ Once your test rectangle is drawing at the correct size, the calibration process is complete.

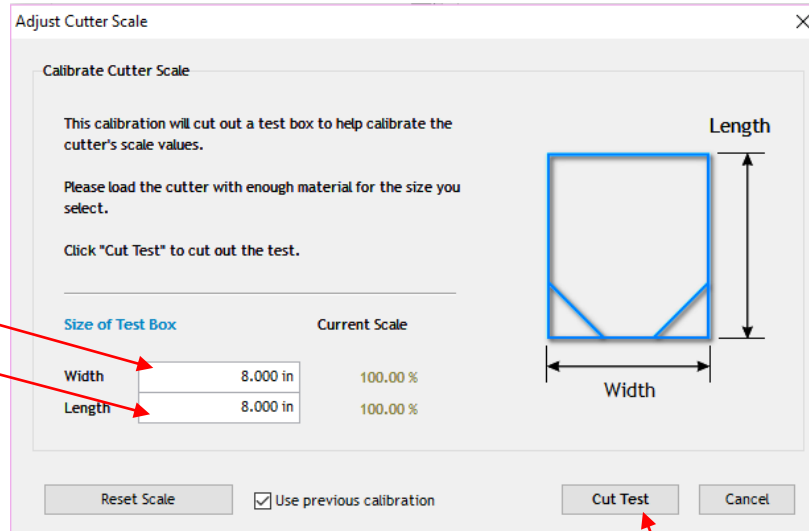
2.08.2 Scale Calibration Using Inches for Measurement

- SignMaster has a built-in resolution routine which can be used to easily perform this calibration:
 - ◇ Go to the **Vinyl Spooler** window and select the **Calibration** tab. Click on the **Cutter Scale** icon:



- ◇ A new window opens where you can enter the dimensions of a square or rectangle to draw with the test pen. It is highly recommended that the dimensions be at least 8 inches:

Enter **Width** and **Length** to use for test shape



Adjust Cutter Scale

Calibrate Cutter Scale

This calibration will cut out a test box to help calibrate the cutter's scale values.

Please load the cutter with enough material for the size you select.

Click "Cut Test" to cut out the test.

Size of Test Box	Current Scale
Width: 8.000 in	100.00 %
Length: 8.000 in	100.00 %

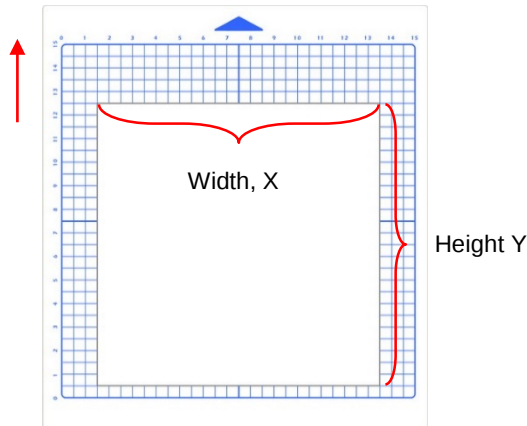
Reset Scale ☒ Use previous calibration Cut Test Cancel

The dialog box includes a diagram of a square test box with dimensions 'Width' and 'Length' indicated by arrows.

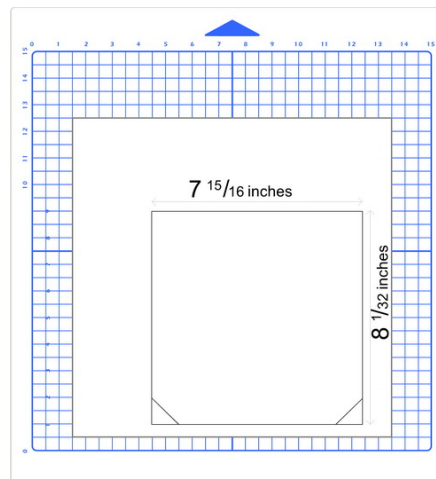
Click here to start the drawing

- ◇ Load a sheet of paper and insert the test pen. Move the test pen to the lower right corner of the paper. Make sure you have proper settings for drawing and click on **Cut Test** to have the shape drawn.
- ◇ Using a ruler, carefully measure the **Width** (left-to-right) and the **Height** (top-to-bottom) that drew:

Feed the mat this direction into the Skycut



- ◇ Write these measurements onto your sheet:



- ◇ Convert the measurements to decimals and enter these values into the same **Width** and **Length** fields. After entering each number, the scaling percentage is automatically calculated:

Calibrate Cutter Scale

After cutting the test box, you will need to accurately measure the Width and Length and enter these values in the area below.

Once you have entered the measured values, click "Update" to apply the scale calibration.

Size of Test Box Enter measured values here...

	Width	Length
Width	7.938 in	100.79 %
Length	8.031 in	99.61 %

Reset Scale Update Cancel

Enter actual **Width** and **Length** Calculated **Scale** values Click on **Update**

- ◇ Click on **Update** and a prompt window will ask if you want to **Apply Scale Adjustment**. Click on **Yes** and you'll be back in the **Vinyl Spooler** window. To verify the scaling, again click on **Cutter Scale** and repeat the same steps. Make sure you leave your new scale factors in place by having the following option marked:

Size of Test Box Current Scale

	Width	Length
Width	7.874 in	100.25 %
Length	9.843 in	99.26 %

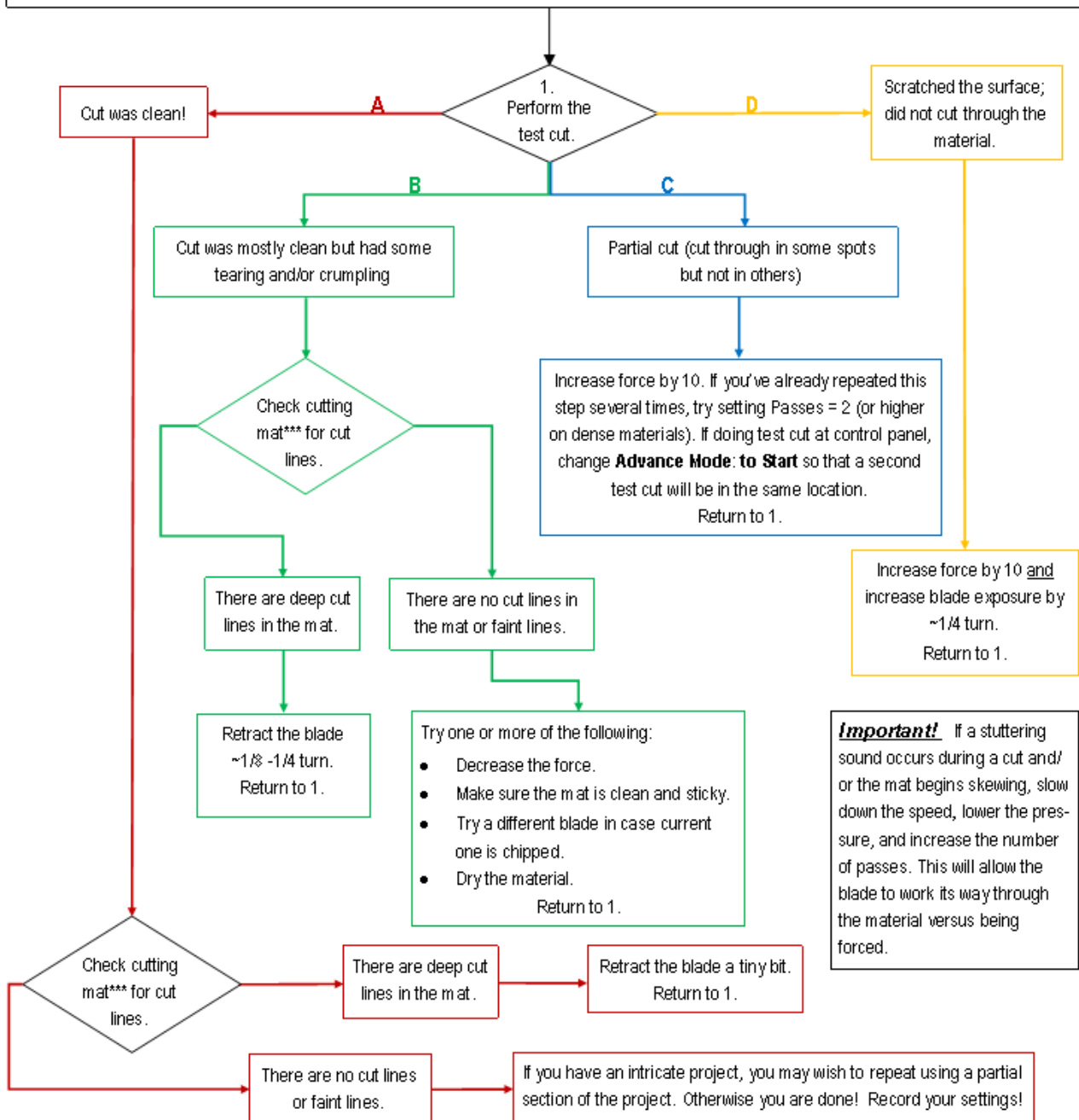
Reset Scale ☒ Use previous calibration

Leave this checked

- ◇ Once your test rectangle is drawing at the correct size, the calibration process is complete.

2.09 Test Cutting Flow Chart for the Skycut

- Select a small test shape. You can use the built-in test on the Skycut if your square cuts an internal circle. Otherwise, select a shape in your design software (such as a ring) that has an internal path. This works better as it allows you to more easily check to see if the blade is cutting into the backing sheet or cutting mat.
- Start with conservative Force and Speed. Refer to a similar material in the *Suggested Settings Table* in Section 2.11.
- Set the blade tip height above the material based on a similar material in the *Suggested Settings Table* in Section 2.11.
- On the control panel: **Set>Advance Mode**, choose **to End** or **to Left** and enter a small distance, such as 0.5" or 10 mm to space each test.
- Set origin in the lower right corner of the material.



*** or backing sheet, such as with vinyl

2.10 Settings Form for Cutting Materials

<u>Material Type</u>	<u>Material Brand or Source</u>	<u>Blade</u>	<u>Force</u>	<u>Speed</u>	<u>Blade Offset</u>	<u># Passes</u>	<u>Ht*</u>	<u>Other Comments</u>

*Number of Post-It notes used to set blade tip distance above material.

2.11 Suggested Cut Settings for Various Materials on Skycut

IMPORTANT: These settings should be used for the initial test cut. Adjustments may be necessary based on the condition of the blade, variations in the material, humidity, condition of the cutting mat, blade tip height*, etc.

ALSO IMPORTANT: Do not use a Blade Ht.* greater than 15 Post-Its with a blue capped blade. It is very fragile!

* **Blade Ht.** = number of Post-It notes used to set blade tip distance above the material: Refer to *Section 2.01.3*.

Material Type	Material Brand/Source	Blade	Passes	Force	Speed	Blade Ht.*	Other Comments
Acetate	5 mil (0.13mm)	R	1	45	(8) 400	20	
Acetate	Apollo Inkjet Transparency Film (0.13mm)	R	1	60	(8) 400	20	Alt 2 passes at Force = 40
Candle Wax	Rayher: 0.025" (0.6 mm)	B	1	20	(5) 250	15	Alt Paper side up, Force 30
Candle Wax	Stockmar: 0.05" (1.2 mm)	B	1	25	(5) 250	10	
Cardstock	AC Textured 216gsm, 80lb cover	R	1	60	(8) 400	20	Alt 2 passes at Force = 50
Cardstock	Bazzill Linen	R	1	55	(8) 400	20	
Cardstock	Carolina C2S Digital 144lb (234gsm)	R	1	75	(8) 400	20	
Cardstock	Darice Core'dinations Premium (65lb)	R	1	45	(8) 400	20	
Cardstock	Georgia Pacific, 110lb index (199gsm)	R	1	55	(8) 400	20	Alt 2 passes at Force = 45
Cardstock	Graphic 45 (0.22mm)	R	1	50	(8) 400	20	6x6 Cardstock Pad
Cardstock	Neenah Astrobrights 176gsm	R	1	50	(8) 400	20	
Cardstock	Neenah Pastel 176gsm (65lb)	R	1	50	(8) 400	20	Alt 2 passes at Force = 40
Cardstock	Recollections 176gsm (65lb)	R	1	50	(8) 400	20	
Cardstock	Recollections 176gsm (65lb) Kraft	R	1	55	(8) 400	20	
Cardstock	Wassau 176gsm (65 lb)	R	1	50	(8) 400	20	Alt 2 passes at Force = 40
Cardstock	Worldwin Colormats (65 lb)	R	1	50	(8) 400	20	Alt 2 passes at Force = 40
Cardstock	Worldwin Cutmates	R	1	50	(8) 400	20	Alt 2 passes at Force = 40
Cardstock	Worldwin Smooth & Silky	R	1	70	(8) 400	20	Alt 2 passes at Force = 60

Material Type	Material Brand/Source	Blade	Passes	Force	Speed	Blade Ht.*	Other Comments
Chipboard	0.022" (0.5 mm)	R	2	100	(5) 250	20	Brayer well and tape edges
Chipboard	Cereal box 0.018" (0.4 mm)	R	2	100	(5) 250	20	Brayer well and tape edges
Chipboard	0.03" (0.76mm)	B	2	120	(5) 250	15	Brayer well and tape edges
Chipboard	0.015" (.38mm)	R	1	80	(5) 250	15	
Construction Paper	Creatology - pink	R	1	30	(7) 350	20	
Construction Paper	Pacon Tru-Ray - black	R	1	35	(7) 350	20	Alt 2 passes at Force = 30
Craft Plastic	0.02" PET-G with blue protection sheets	B	2	130	(3) 150	15	Paper layer peeled off. Corners taped to mat
Craft Plastic	Dick Blick; 0.015" (0.38mm)	B	2	110	(3) 150	15	Paper layer peeled off. Corners taped to mat
Double Sided Adhesive	Sookwang	R	1	60	(8) 400	20	
Fabric - Cork	embroiderygarden.com	Y	2	50	(5) 250	15	Used an extra sticky mat
Fabric - Cotton Batik	with Lite Steam-A-Seam 2	Y	1	65	(5) 250	20	Steam-a-Seam2 fused to wrong side, paper removed and sticky side pressed down to mat
Fabric - Cotton Flannel	with Lite Steam-A-Seam 2	Y	2	75	(5) 250	20	Steam-a-Seam2 fused to wrong side, paper removed and sticky side pressed down to mat
Fabric - Denim	with Heat n Bond applied	Y	3	115	(7) 350	20	Left paper layer on.
Fabric - Quilting Cotton	with Heat n Bond applied	Y	2	65	(7) 350	20	
Fabric - Quilting Cotton	with Lite Steam-A-Seam 2	Y	1	80	(5) 250	20	Alt 2 Passes at Force = 70; Steam-a-Seam2 fused to wrong side, paper removed and sticky side pressed down to mat
Foam (Fun Foam)	Michael's 0.07" (1.8mm)	B	2	20	(6) 300	10	
HTV	refer to Vinyl - Heat Transfer						
Label Sheets: water resistant	Creative Label Concepts	R	1	35	(8) 400	20	The Force is for kiss cutting the labels.
Leather	0.02" Bookbinding quality	R	2	75	(7) 350	20	
Leather	~ 0.06"	B	2	100	(4) 200	10	
Magnet	0.035" (0.9mm)	B	2	120	(5) 250	10	Tape magnet to a sticky mat; may need slower speed for accurate shapes

Material Type	Material Brand/Source	Blade	Passes	Force	Speed	Blade Ht.*	Other Comments
Magnet	Printable Magnet Sheets (.25mm)	R	1	50	(8) 400	20	
Magnet	Printable Magnet Sheets-15 mil (0.4mm)	R	1	70	(8) 400	15	Alt 2 passes at Force = 50
Mylar	5 mil (0.12mm)	R	1	50	(8) 400	20	
Mylar	10 mil (0.25mm)	R	2	100	(5) 250	15	Extra sticky mat; tape corners
Mylar	7 mil (0.18mm)	R	1	65	(8) 400	20	
Paper - Copy Paper	HP Everyday 20lb (75gsm)	R	1	35	(8) 400	20	
Paper - Watercolor	Canson 140lb (300g) Cold Press	R	1	100	(8) 400	20	
Photo Paper	HP Glossy	R	1	80	(8) 400	20	Alt 2 passes at Force = 65
Photo Paper	Royal Brites Matte White - 200 gsm	R	1	70	(8) 400	20	Alt 2 passes at Force = 55
Poster Board	Grocery store 0.013" (0.33mm)	R	1	70	(6) 300	20	Alt 2 passes at Force = 60
Rhinestone Flock	Sticky Flock	R	2	45	(8) 400	20	Backing peeled and sticky side pressed to mat
Rhinestone Rubber	Hartco 425S - green	R	2	60	(8) 400	20	Backing peeled and sticky side pressed to mat
Shrink Film	Grafix clear	R	2	80	(6) 300	20	
Shrink Film	Grafix Ink Jet white	R	2	120	(6) 300	15	
Shrinky Dink	Bright White	R	1	125	(6) 300	20	
Shrinky Dink	Frosted Ruff N' Ready	R	1	125	(6) 300	20	
Shrinky Dink	Printable Ink Jet white	R	1	125	(6) 300	20	
Stencil Blanks (also see Mylar)	Show-Offs 15 mil from Hobby Lobby	R	3	120	(5) 250	15	Place side with protection sheet down; tape corners
Styrene	ASI .02" (.47mm)	R	2	120	(8) 400	20	
Styrene	Evergreen .02" (.47mm)	R	3	155	(5) 250	15	
Styrene	Plastruct .01" (.25mm)	R	1	90	(8) 400	20	Alt 2 passes at Force = 65
Vinyl - Heat Transfer	Glitter Iron On - White	R	1	30	(8) 400	20	Cut on mat

Material Type	Material Brand/Source	Blade	Passes	Force	Speed	Blade Ht.*	Other Comments
Vinyl - Heat Transfer	Easy Weed - white, navy	R	1	40	(6) 300	20	Cut on mat
Vinyl - Heat Transfer	GlitterFlex Ultra - Black	R	1	50	(8) 400	20	Cut on mat
Vinyl - Permanent	Expressions Vinyl 51 Series - Black	R	1	20	(8) 400	20	Cut on mat
Vinyl - Wall (no mat)	Vinyl - Oracal 631 - yellow	R	1	20	(8) 400	20	Not using a mat: note lower Blade Height
Vinyl - Wall (no mat)	Vinyl - Oracal 631 - yellow	R	1	25	(8) 400	20	Not using a mat
Vinyl - Wall (on mat)	Vinyl - Oracal 631 - yellow	R	1	20	(8) 400	20	Cut with vinyl on the mat
Wood Veneer	0.015" (0.4mm) from cardsofwood.com	B	2	100	(5) 250	15	Taped to mat; tested both oak and walnut

3. Contour Cut (Print and Cut)

Video

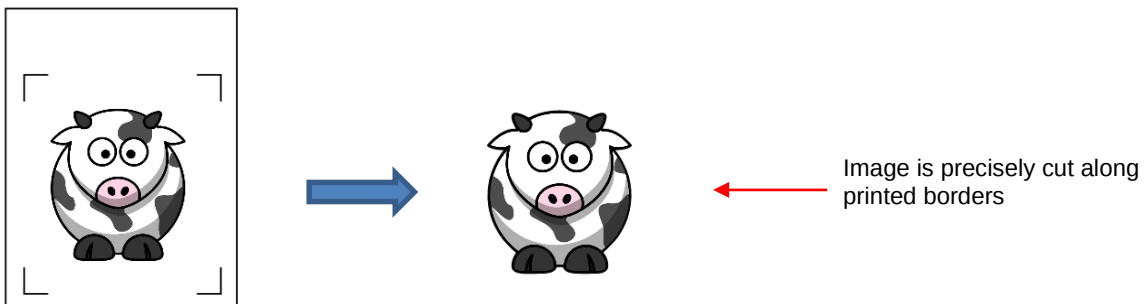
3.00 Quick Reference for Chapter 3

- How to calibrate the camera: *Section 3.03.2*
- How to set up a contour cut: *Section 3.04*
- How to add more registration marks: *Section 3.08*
- How to speed up the scanning process: *Section 3.04.3*
- Troubleshooting inaccurate PNC results: *Section 3.06*
- How to set up repeats: *Sections 3.07 (within contour cut window) and 3.10.1 (on main screen)*
- How to use QR codes in a contour cut application: *Section 3.10*
- How to do a PNC from a USB flash drive file: *Section 3.09.1 and 3.10.3 (with QR Code)*
- How to use the **Array Mark** function on the control panel: *Section 3.09.2*

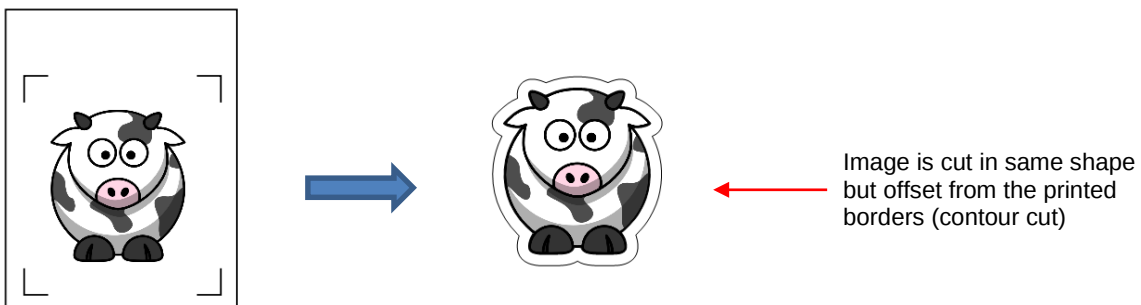
3.01 What Is a Contour Cut?

- The contour cut process (also called print and cut or PNC) involves printing an image from SignMaster to any printer you own (or exporting as PDF) and then, with the aid of the Skycut's camera, having the image or images cut out with perfect precision. Below are three typical kinds of print and cut applications but there can be other kinds.

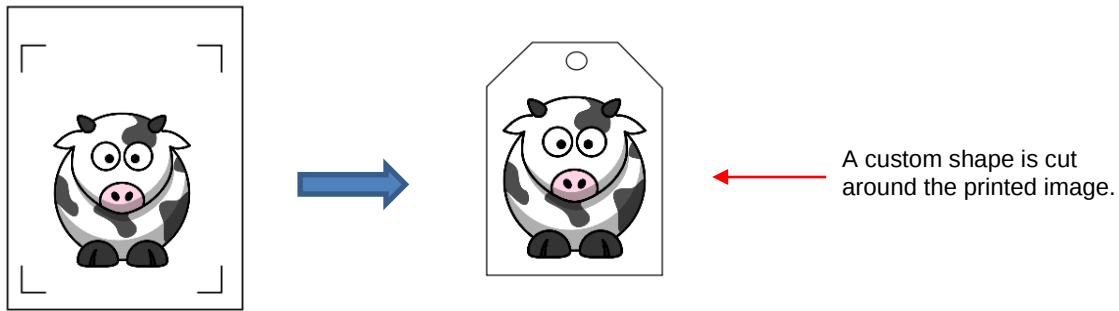
- ◇ Cuts along the actual borders of the printed image(s):



- ◇ Cuts outside of the borders but follows the shape(s) of the printed image(s):



- ◇ Cuts follow a different shape from that of the printed image(s):



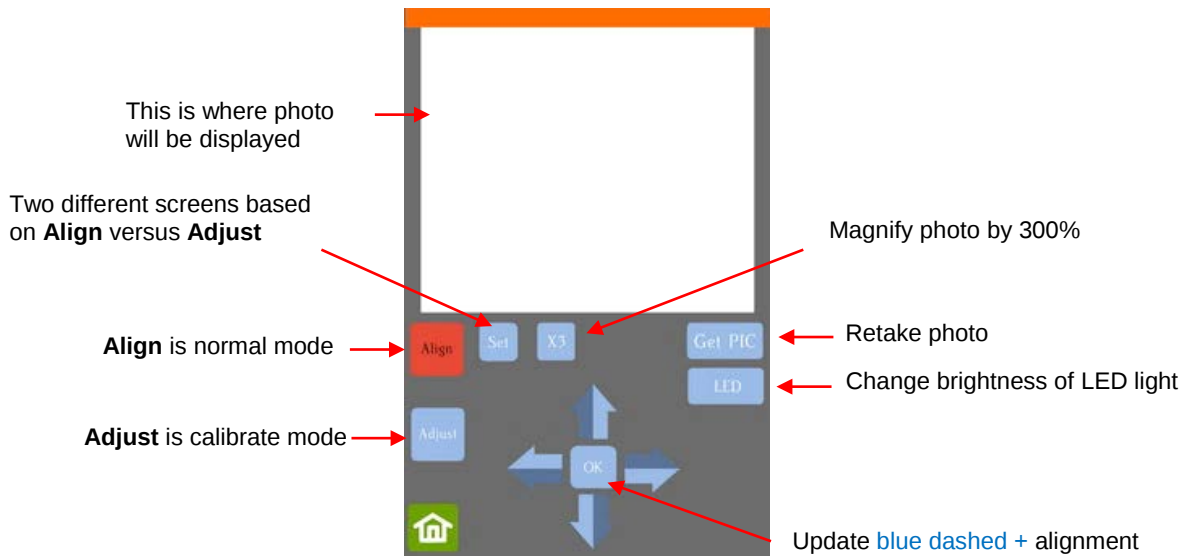
3.02 What is a Camera Calibration?

- In order to get precise results, you must calibrate the camera. This is nothing more than letting the Skycut know how far away the camera lens is located relative to the tip of the blade. Because the camera is manually installed inside the blade carriage, the distance from the camera's center to the tip of the blade can vary slightly from one Skycut to the next.
- This calibration only needs to be done one time. If you have travelled with your Skycut or it's been bumped fairly hard, you might want to run a test to make sure your calibration hasn't changed. It's also recommended that you redo your calibration after any firmware updates are installed.
- The process, which is conducted through the control panel involves:
 - (1) Having the Skycut draw a test shape. At that point the camera takes a photo and displays it on the control panel, along with a red + and a large blue dashed +.
 - (2) Aligning the red + with the center of the test shape display until the blue dashed + is centered with the test shape.

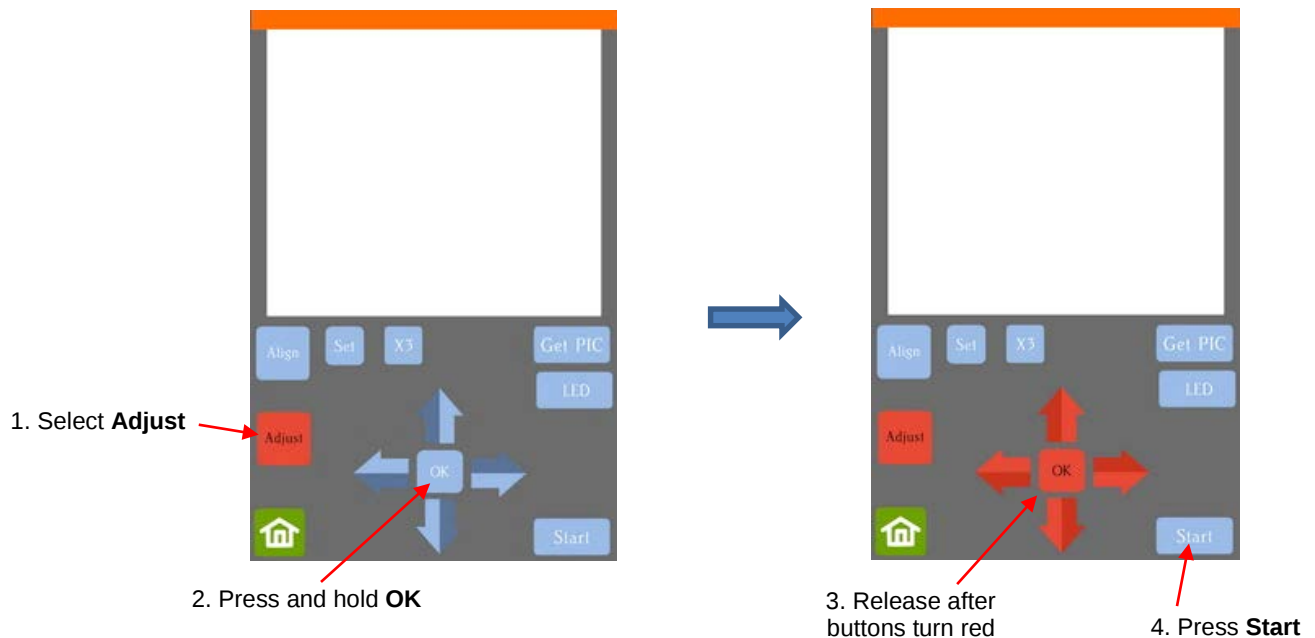
3.03 Camera Calibration Procedure

Video

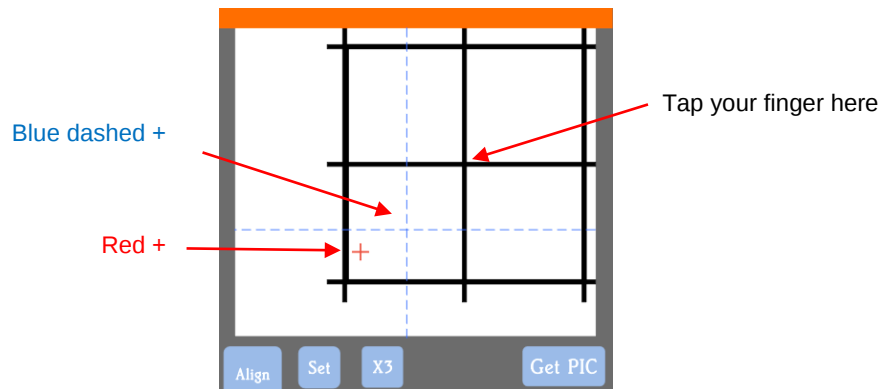
- You need the following items for this calibration:
 - ◇ Sheet of paper
 - ◇ Test pen that came with your Skycut
- (1) Insert the test pen into the Skycut. Place the sheet of paper into the Skycut. You can use the cutting mat to hold the paper or insert the paper directly.
- (2) On the control panel, move the test pen over the sheet of paper.
- (3) Select **Speed/Force** and set **SPEED** to ~ 8 and **FORCE** to ~ 30. Click on **Test** to verify that a square is clearly drawn. If it is too faint, increase **FORCE** as needed and repeat.
- (4) Move the pen an inch or two away from the test so that there is room for the calibration shape to be drawn.
- (5) On the **Main Screen**, press **Set** and then **Camera**:



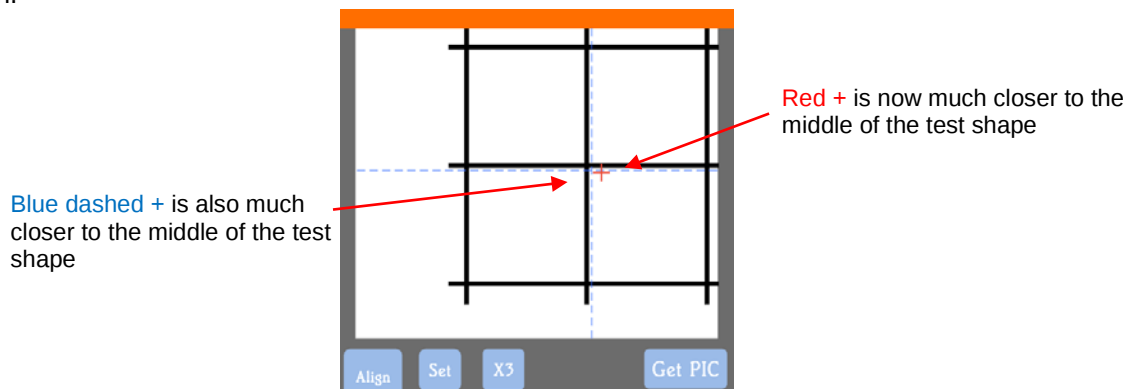
- (6) Press **Adjust** to switch to calibrate mode. Press and hold the **OK** button for several seconds until it and the arrows around it turn red:



- (7) Press **Start**. The test shape, which is a grid of 6 lines, will be drawn on the paper and the camera will move over the test shape, take a photo, and display the photo on the control panel. If you cannot see the test shape clearly, press the LED button once so that it reads LED 50% and press the **Get PIC** button. You should see three items in the photo: the test shape that was drawn with the pen, a red +, and the blue dashed +:

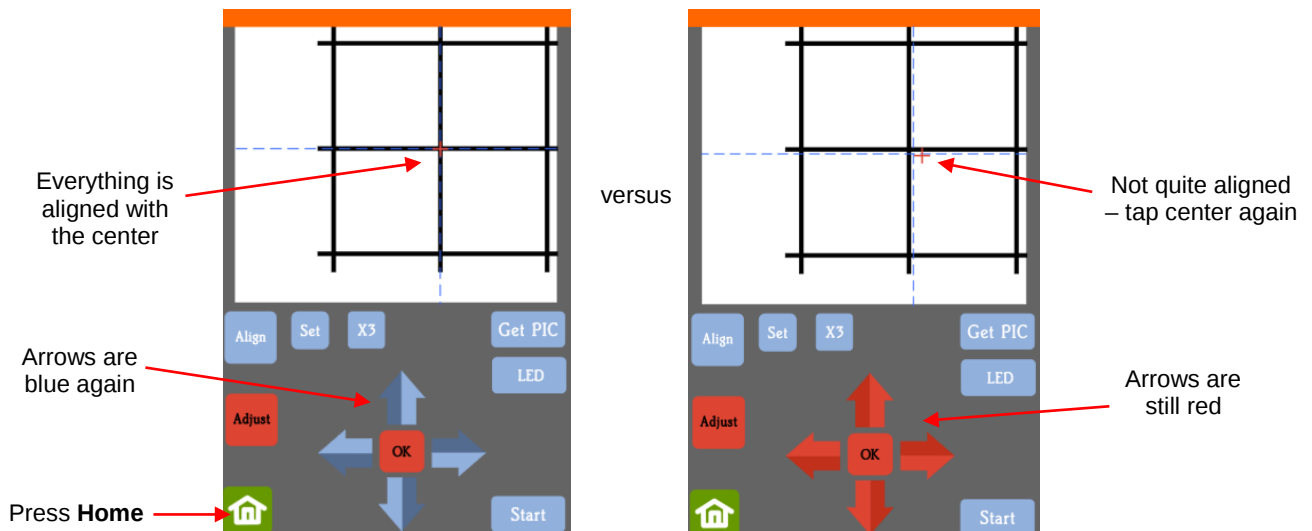


- (8) Tap your finger near the middle of the drawn test shape on the screen. This will move the red + close to that location.



- (9) Press **OK**. A new photo will be taken and one of two things will happen:

- ◇ The red + is so close to the center that the Skycut will now take over and find the true center on its own. You will see the red + and the blue dashed + aligned in the center and the arrows (only) will return to their blue color. Refer to the left side of the next screenshot.
- ◇ The red + and the blue dashed + are still not aligned and the arrows around the **OK** button are still red. Refer to the right side of the next screenshot. You will need to tap the center again and press **OK**. Continue, if needed, until the center is identified.



- (10) Once the alignment is in place and the arrows have turned blue, press the **Home** button and then press **Stop** on the **Main Screen** to save the calibration and conclude the process:



3.04 Performing a PNC in SignMaster

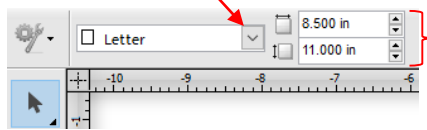
3.04.1 Summary of Steps

- Here are the typical steps when performing a PNC application:
 - ◇ Prepare the image(s) that will be printed which can include the following:
 - o An imported raster image such as a JPG or PNG or BMP file
 - o A vector image (either imported or designed in SignMaster) that will be printed but not cut
 - o Text that will be printed but not cut
 - ◇ Prepare the cut lines which can include:
 - o The resulting cut lines from tracing imported raster files. Refer to *Section 5.01* for details on using the **Trace** function in SignMaster.
 - o A contour cut around the outside of the traced image: Refer to *Section 5.01*.
 - o Any other vector shapes, either imported or designed in SignMaster: Refer to *Section 5.02*.
 - ◇ Print the project, after selecting reg mark properties, location of project on the page, and printer options.
 - ◇ Perform a test cut so that you know the best cut settings to use for the printed material. This test cut can often be performed on the printout itself if there is room in the waste area of the project.
 - ◇ Perform the cutting process.

3.04.2 Step-by-Step Simple PNC Project

- (1) While it's not a requirement, it can be helpful in designing if the **Drawing Area** dimensions match the printout size you plan to use. For this tutorial, **Letter** size (8.5" x 11") will be used. But you can use much larger sizes, if you have the ability to print in those dimensions.
- (2) To change the **Drawing Area**, click on the down arrow to open a drop-down menu with many page options or just enter the dimensions directly:

Click here to open menu of page sizes



Or change the page dimensions directly here

- (3) For a sample project, go to [this link](#) and download the zip. The project used in this tutorial is called *Yellow Ox PNC*. Alternatively, *Section 5.01* presents a tutorial on importing a graphic and adding a contour cut. Note the contour cut around this image:



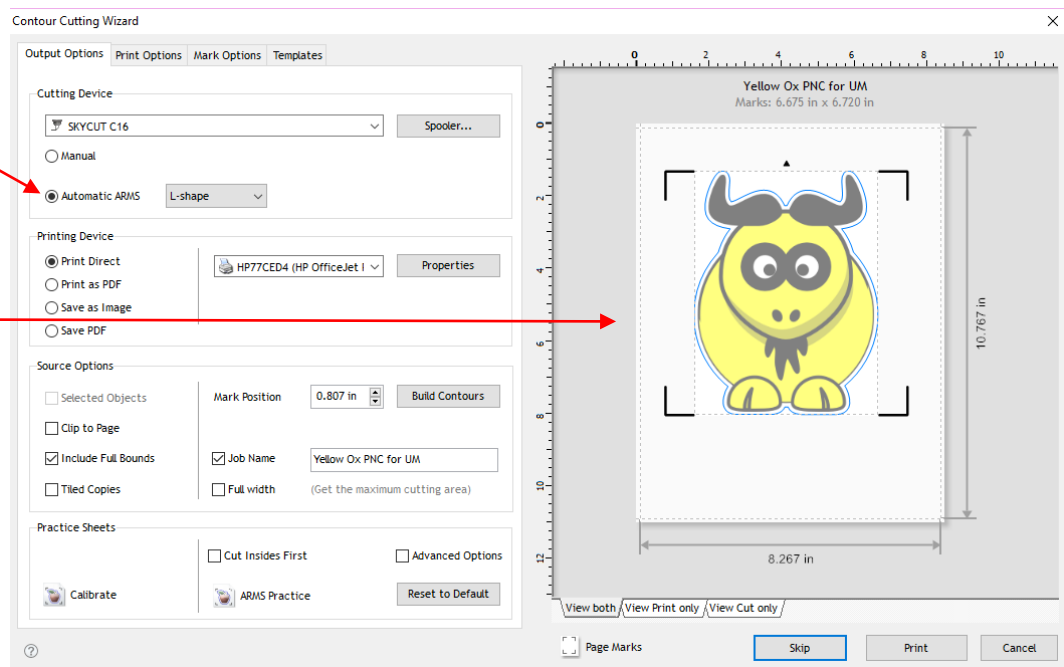
Blue line will be cut but not printed

Yellow and black ox will be printed but not cut

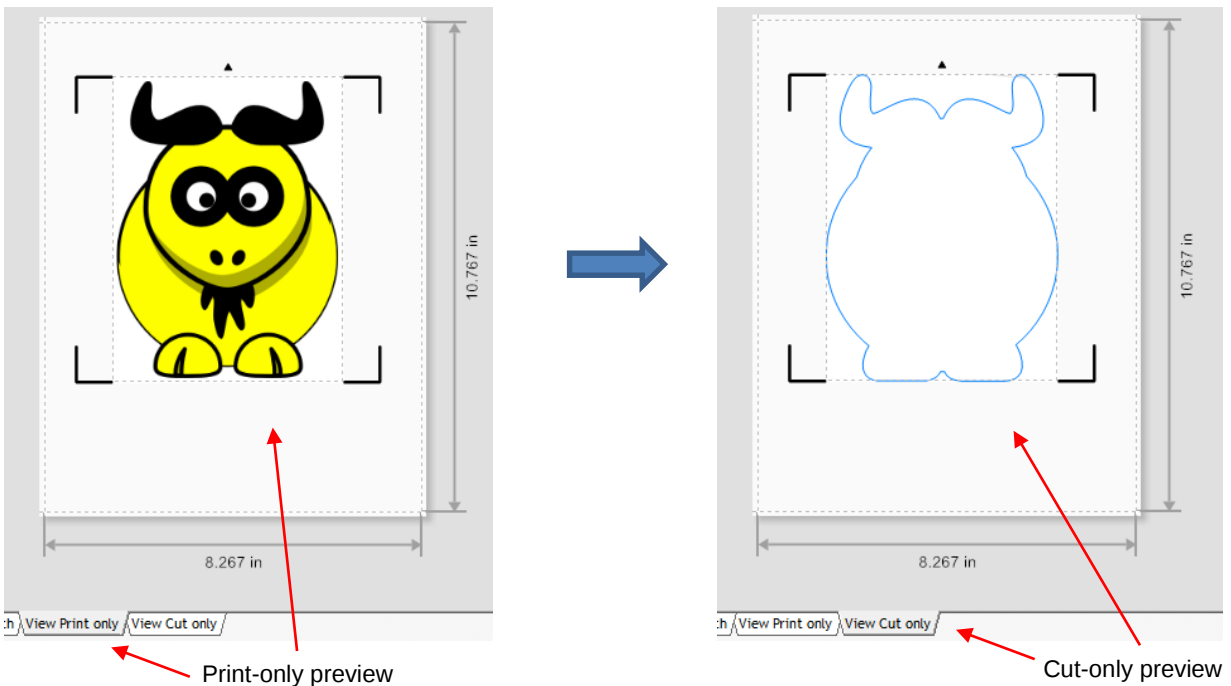
- (4) Click on the **Contour Cutting** icon  and select **Contour Cut Wizard**. The following window opens:

Select **Automatic ARMS**

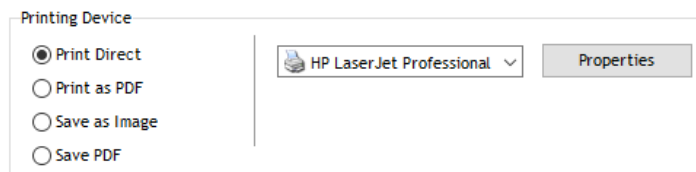
Preview of project with reg marks



- (5) First, verify that **Automatic ARMS** is selected which means the camera will automatically scan the registration marks. Registration marks will appear around the image. Next, to verify “what will print” versus “what will cut”, click on the other tabs below the preview:

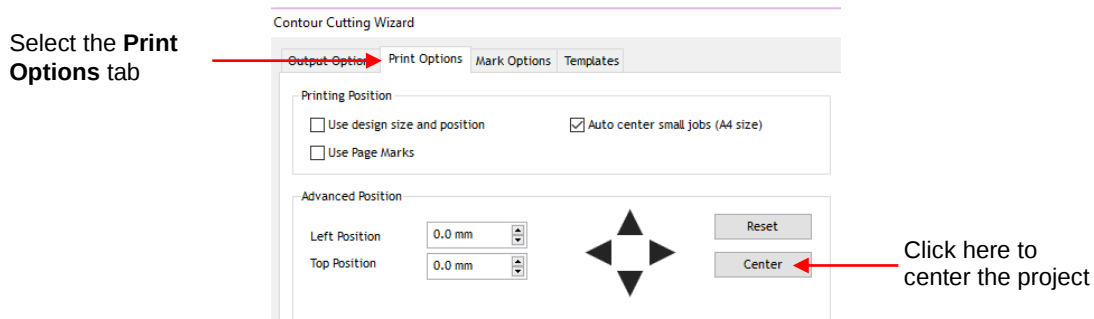


(6) The following options are available for printing:

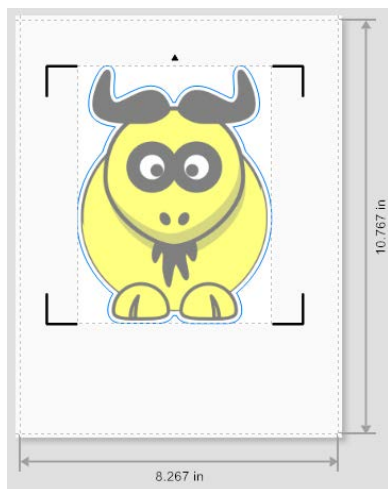


- ◇ **Print Direct** – Select this option if you are printing directly from this window to your own printer. Note that the printer menu and printer properties appear to the right when this option is selected.
- ◇ **Print as PDF** – Select this option to send the file to Adobe Reader to then print to your printer
- ◇ **Save as Image** – Select this option to export your printout as a JPG or TIFF file using the DPI resolution of your choice
- ◇ **Save PDF** – Select this option to export your printout as a PDF file to be saved and printed using a different computer/printer setup (such as taking to a professional printing company)

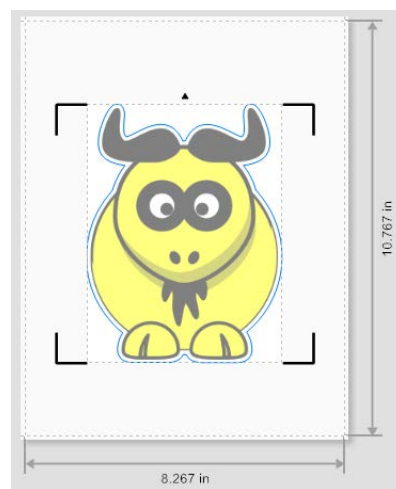
(7) Optional: Before printing, click on the **Print Options** tab and the project can be centered onto the printout by clicking the **Center** button:



- ◇ The shape is moved to the center:

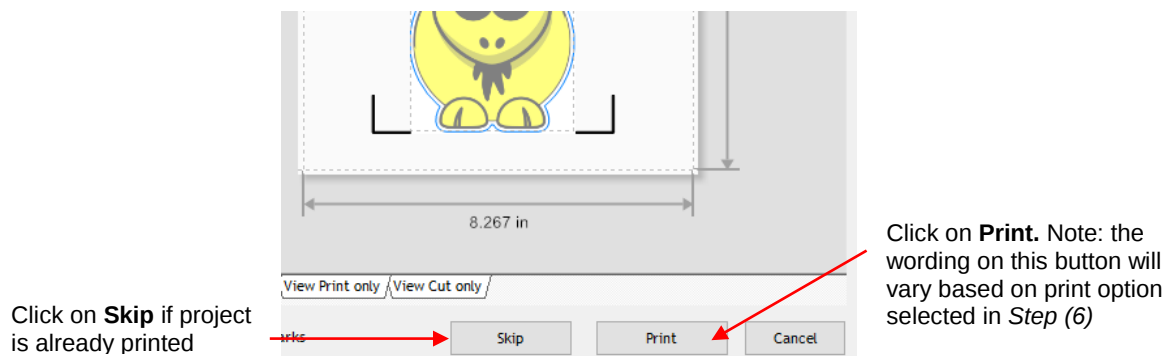


Before applying **Center**

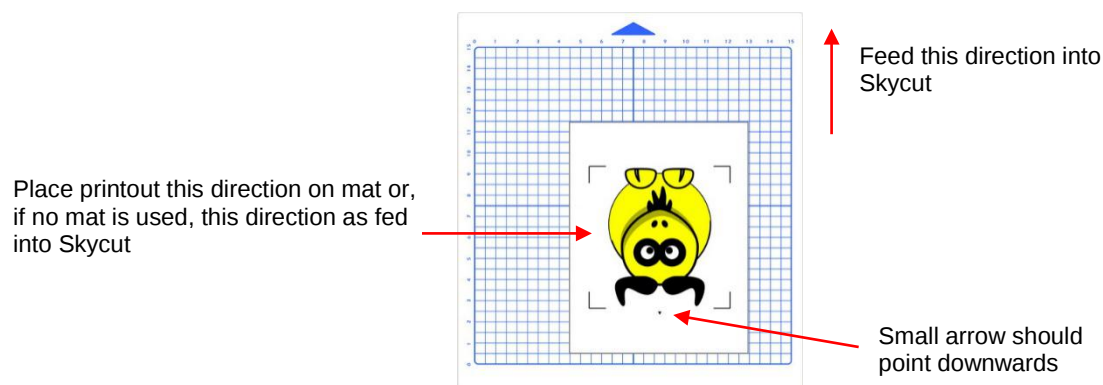


After applying **Center**

- (8) Depending on the print option selected in *Step (6)*, the print button below the **Preview** will vary. Assuming you selected **Print Direct**, you'll see the option to **Print**. Click on it or click on the button in the same location and then complete any popup window options as needed. Note that if you've already printed your project, you will want to click on **Skip** instead:



- (9) Place the printout onto the cutting mat or load the printout directly if a cutting mat isn't required. Note that in SignMaster, a print and cut project is loaded "upside down" as shown in the following screenshot. On the printout is a small arrow which is a reminder to load the printout so that the little arrow is facing towards you as you are facing the Skycut:

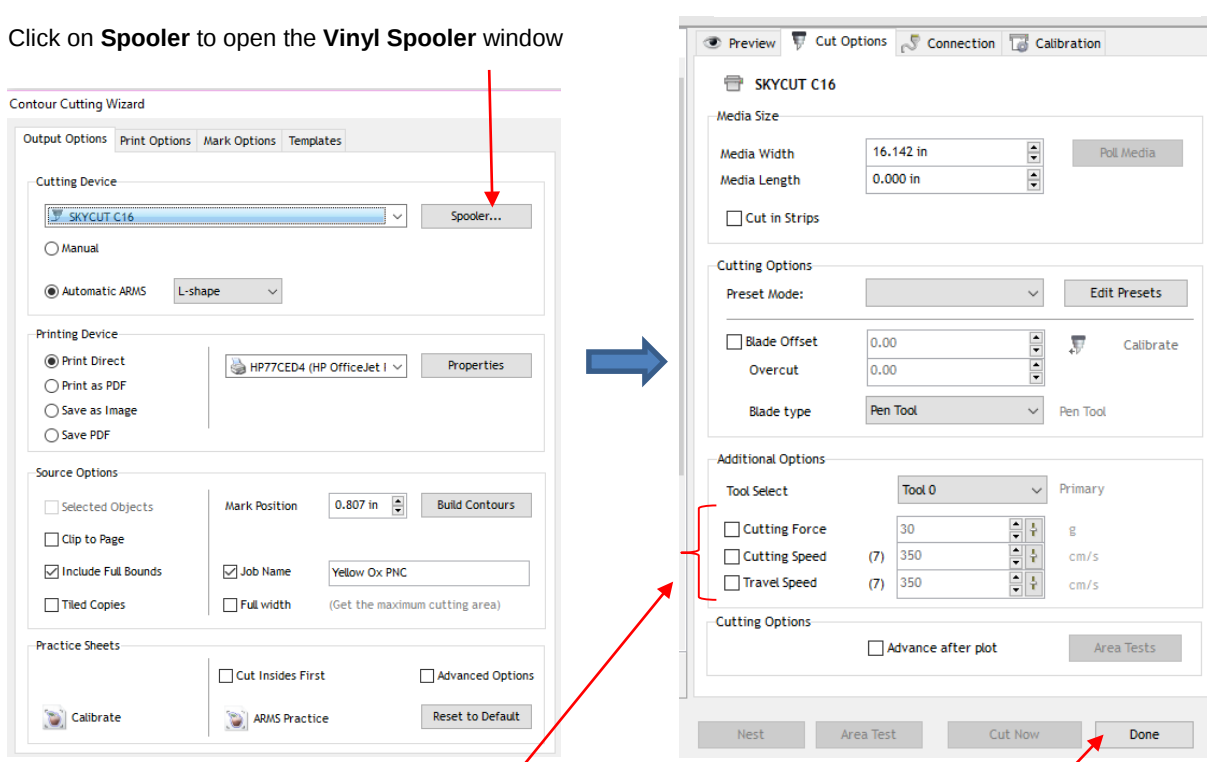


- (10) Load the mat and/or printout so that it is straight, relative to the cutter. The alignment doesn't need to be absolutely perfect but close enough that it will allow for a faster and, of course, successful detection by the camera. Insert the blade holder and perform a test cut, as needed, adjusting the cut settings.

- (11) Click on the **Spooler** and the **Cut Options** tab. If you want to send the cut settings from SignMaster, adjust the **Force** and **Speeds** accordingly or select a **Preset**. Otherwise, if using the cut settings on the Skycut control panel, turn these off. Click on **Done** after making any changes:

Click on **Spooler** to open the **Vinyl Spooler** window

Make any necessary changes in this window

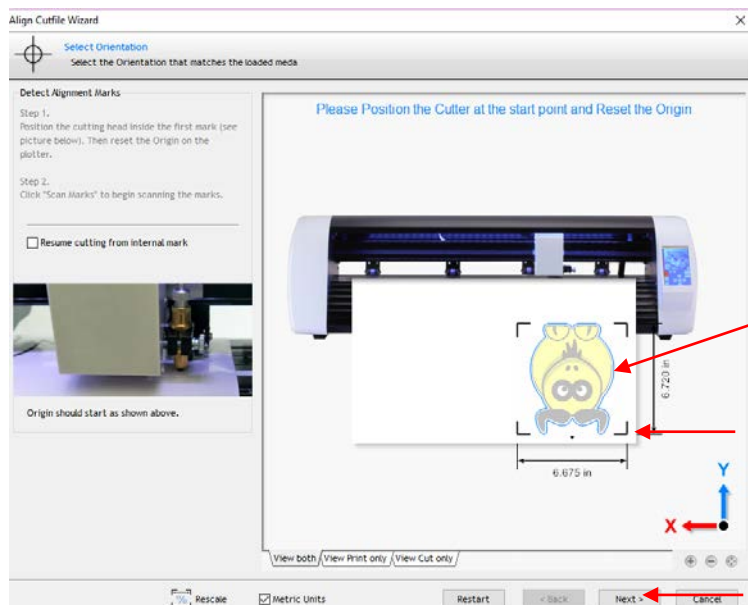


The image shows two windows side-by-side. The left window is the 'Contour Cutting Wizard' with tabs for Output Options, Print Options, Mark Options, and Templates. The 'Output Options' tab is active, showing settings for the Cutting Device (SKYCUT C16), Printing Device (HP77CED4), and Source Options. A red arrow points from the 'Spooler...' button in the Cutting Device section to the right window. The right window is the 'SKYCUT C16' window with tabs for Preview, Cut Options, Connection, and Calibration. The 'Cut Options' tab is active, showing settings for Media Size, Cutting Options, and Additional Options. A red arrow points from the 'Done' button at the bottom right of the SKYCUT C16 window to the text 'Click on Done to close this window'. Another red arrow points from the 'Cutting Force' checkbox in the Additional Options section to the text 'Uncheck these options if settings on control panel will be used'. A blue arrow points from the 'Spooler...' button in the Contour Cutting Wizard to the SKYCUT C16 window.

Uncheck these options if settings on control panel will be used

Click on **Done** to close this window

- (12) Back in the **Contour Cutting Wizard** window, the **Print** button should now read **Cut**. Click on **Cut** and a new **Preview** window opens which indicates the design should be facing downwards:



The image shows the 'Align Cutfile Wizard' window. It has a 'Select Orientation' section with a 'Detect Alignment Marks' button. Below this, there are two steps: Step 1 (Position the cutting head inside the first mark) and Step 2 (Click 'Scan Marks' to begin scanning the marks). There is a checkbox for 'Resume cutting from internal mark'. The main area shows a preview of the design (a yellow cartoon character) on a white background. A red arrow points from the text 'Printout should be facing this way' to the design. Another red arrow points from the text 'Set blade holder over lower right reg mark' to a specific point on the design. At the bottom, there are buttons for 'View both', 'View Print only', 'View Cut only', 'Restart', '< Back', 'Next >', and 'Cancel'. A red arrow points from the text 'Click on Next' to the 'Next >' button.

Printout should be facing this way

Set blade holder over lower right reg mark

Click on **Next**

(13) Click on **Next** and the Skycut's camera will now move over each registration mark and take a photo and make an adjustment. Once it has read all four marks plus the first one a second time, it will proceed to cut out the printed shapes.

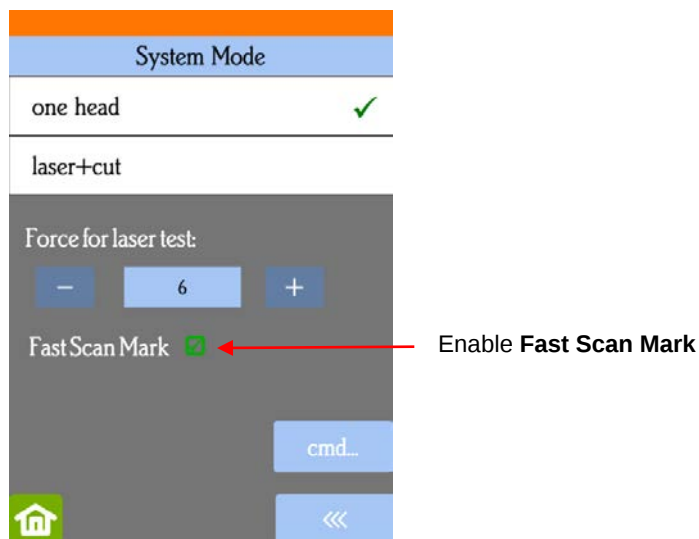
(14) After testing out this process, be sure to check out remaining sections in this chapter to understand additional options, such as:

- ◇ Preparing a vector image for a PNC application – *Section 3.05.2*
- ◇ How to set up a grid of repeats – two methods - *Section 3.07* and *Section 3.10.1*
- ◇ Adding additional registration marks to improve accuracy – *Section 3.08*
- ◇ Performing a PNC using the USB flash drive – *Sections 3.09.1 and 3.10.2*
- ◇ Using QR Codes to link a printout with a saved cutting job – *Section 3.10*
- ◇ How to make the scanning process even faster – *Section 3.04.3*

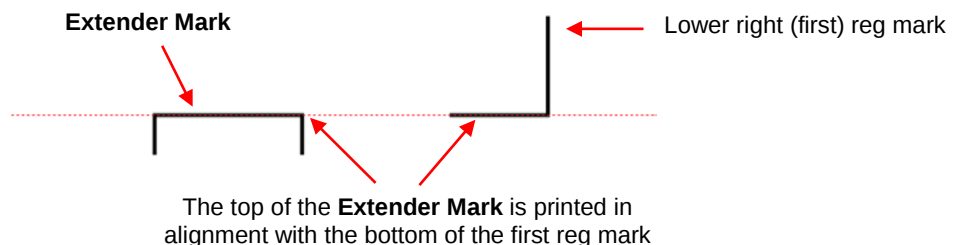
3.04.3 Two Timesavers: Fast Scan Mark and Extender Marks

- Two extra functions provide a quicker way to perform contour cuts and should be of interest to you if you are in a production mode with your contour cutting projects:

- ◇ **Fast Scan Mark:** On the control panel, go to **Set>Advanced settings>System Mode**. Mark the option for **Fast Scan Mark** and the camera will only take one photo at each mark instead of two or more photos:

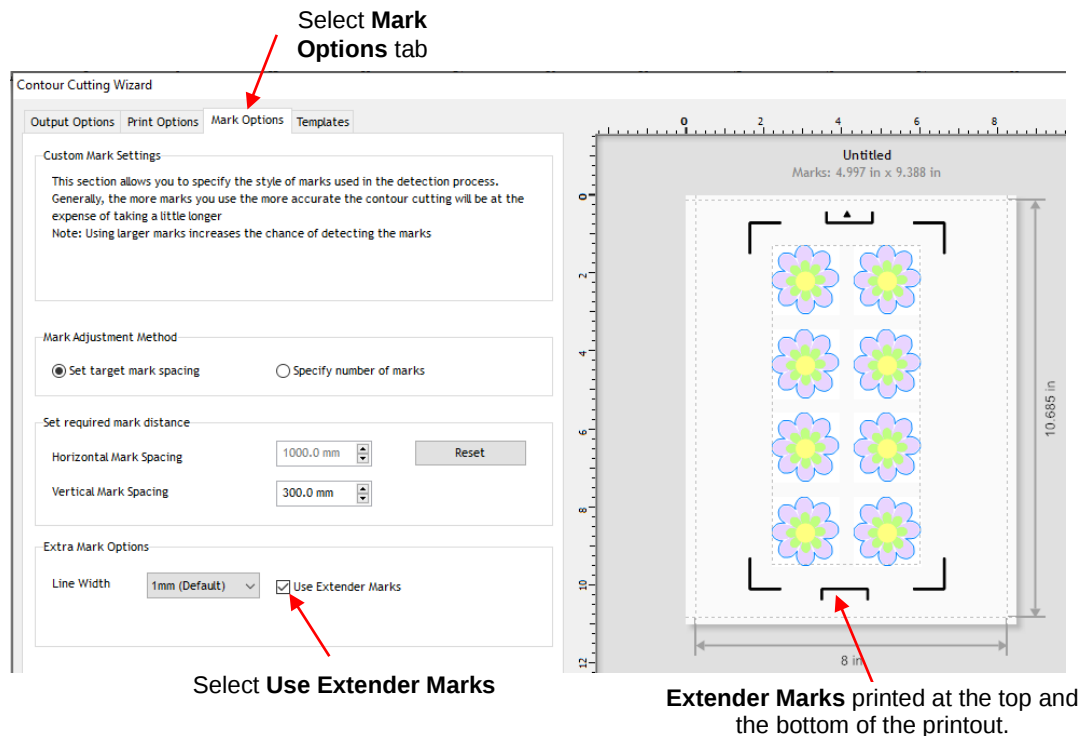


- ◇ An **Extender Mark** is a horizontal mark added to a contour cut printout and situated several inches (~65 mm) to the left of the lower right registration mark:



- ◇ After the first reg mark is identified the camera moves to the **Extender Mark** and takes a photo. It then compares the Y (up/down) location to that of the reg mark to determine if the two are in horizontal alignment with one another. The Skycut's firmware can then make a correction to take this into account.

- ◇ This results in fewer camera photo repeats if the printout is somewhat askew when loaded into the cutter.
- ◇ To use this feature, first make sure you have **L-shaped** registration marks selected in the **Contour Cutting Wizard** window. Then, on the **Mark Options** tab, enable the option for **Use Extender Marks**. The **Preview** will show the extender marks to be added to the printout:

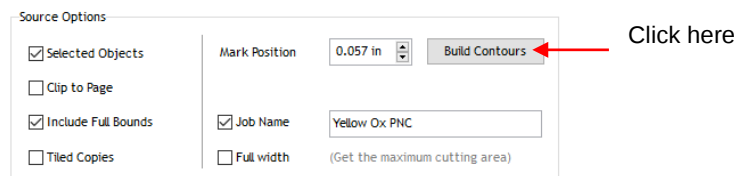


- ◇ The reason there are two **Extender Marks** printed is in the event you also use QR codes, which allow you to insert the printout either direction. Refer to *Section 3.10*.

3.05 Preparing Designs for PNC Applications

3.05.1 Using Raster Images

- Use **File>Import>File** to open a raster image (JPG, BMP, TIFF, PNG, etc) in Signmaster. To add a contour cut around this image, there are two options:
 - ◇ Add the contour while in the main Signmaster window – this process is covered in *Section 5.01*.
 - ◇ Add the contour after entering the **Contour Cut Wizard** window by clicking on **Build Contours**:



- Using **Build Contours** essentially takes you to the same **Create Cut–Contour** window and the process is the same as presented in *Section 5.01*.
- The advantage of tracing images before entering the **Contour Cut Wizard** window is the ability to edit the tracing and save the file with the tracing in place. An example of editing a trace is covered in *Section 5.01.2*.

3.05.2 Using Vector Images

- You can design your own vector images in SignMaster using various design and vectorizing tools. You can also directly import vector files in a variety of common file formats including: AI, DXF, EPS, PDF, PLT, and SVG.
- While vector images are essentially ready-to-cut files, SignMaster will not apply them as contour cuts in print and cut applications without having them assigned as such. Refer to *Section 5.02* for instructions on how to perform a contour cut using a vector image.

3.06 Inaccurate Cuts

- There are several reasons why your print and cut results may not be as accurate as you need:
 - ◇ The contours around the printed image are not accurate
 - ◇ The cut settings are too aggressive
- The following two sections present solutions for each of these.

3.06.1 Inaccurate Tracings

- When tracing imported images, the resulting cut lines may not necessarily follow the original image, especially in tight spots. This can result in tiny bits of white appearing, suggesting the PNC wasn't accurate. Zoom in on the image so that you can see the trace line following the outline of the image. Compare by looking at the same spots where the cut didn't follow the image perfectly. This could be the cause of the inaccurate PNC. There are several ways of handling this situation:
 - ◇ Retrace the imported image using a lower **Smoothing** setting (refer to *Section 5.01*). This will result in a tighter fit around the original graphic.
 - ◇ Use the **Node Editing Tools**  to move the trace lines to more closely fit the original graphic.
 - ◇ Create an inset contour cut line to use for cutting instead of the original trace line.
 - ◇ Create a bleed by choosing **Cutting Contour + Bleed** in the **Create Cut Contour** window.
- Another possibility is that the contour cut line was inadvertently shifted from the graphic to be printed. So, check to see if a misalignment may have occurred when you were moving or simply clicking on the design.

3.06.2 Incorrect Cut Settings

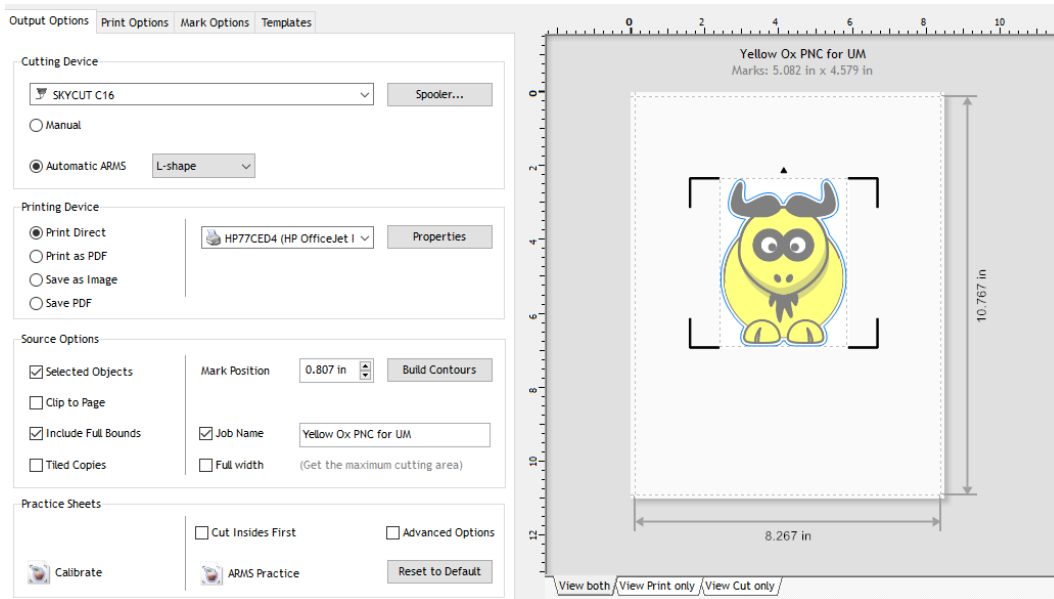
- If a PNC is not precise and the cause is not the calibration nor the alignment of the trace lines, then go through the following check list of other possible causes:
 - ◇ Try slowing down the speed. If the mat is moving numerous times, in and out of the cutter, a slight shifting can occur, especially at high speeds. On the Skycut, try a speed of 7 or lower.
 - ◇ Verify that the pinch wheels are still centered over grit shafts beneath.
 - ◇ Make sure the blade isn't over-extended which can cause it to cut too deeply and drag the cutting mat.
 - ◇ Make sure the bottom of the mat isn't sticky and the pinch wheels and grit shafts are clean and not sticky. Clean with a lint-free cloth and a small amount of isopropyl alcohol or Un-Du.
 - ◇ If the print and cut project contains numerous repeats, use additional registration marks so that additional scans can occur during the cut. Refer to *Section 3.08* for instructions.

3.07 Adding Repeats in Print and Cut Applications

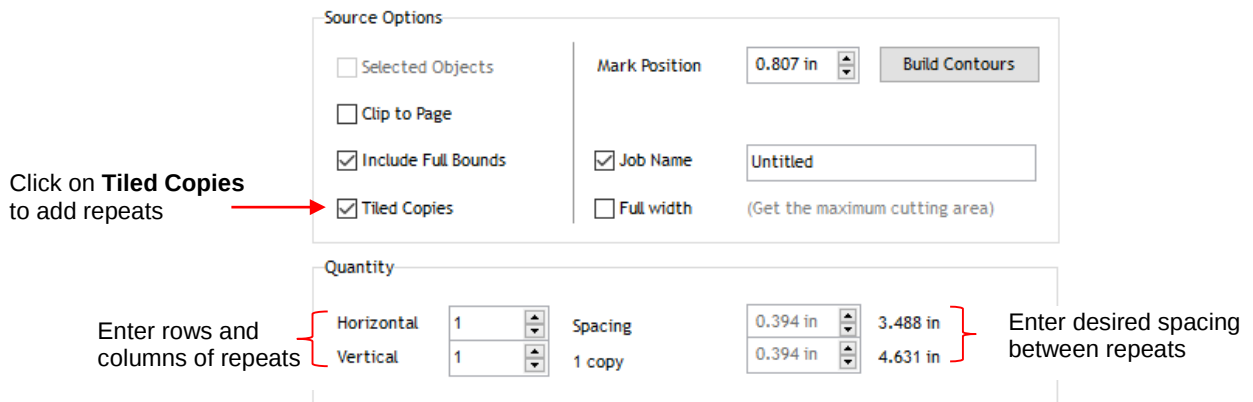
- An array of repeats can be set up in the **Contour Cut Wizard** and this section will present the steps to do that. If you prefer to create the array in the main window of SignMaster, please refer to *Section 3.10.1*.

(1) Create a design with the desired contour cut in place. In this tutorial, the same file is used as the one in *Section 3.04.2*, however the design has been resized to ~ 4.5" in height.

(2) Click on the **Contour Cutting** icon  and select **Contour Cut Wizard**:



(3) To add repeats, click on the **Tiled Copies** option and the **Quantity** settings will appear below that:



(4) As you enter repeats, the **Preview** will update showing the copies and the overall project dimensions. If you need to size the project for a particular printout's dimensions, mark the option for **Print Direct** so that you can verify whether or not the repeats will fit onto the printout. In this case, trying to fit 4 copies on a single Letter-size page will not work:

Select **Print Direct**

4 copies selected

Cutting Device

SKYCUT C16 Spooler...

☐ Manual

☒ Automatic ARMS L-shape

Printing Device

☒ Print Direct HP LaserJet Professional Properties

☐ Print as PDF

☐ Save as Image

☐ Save PDF

Source Options

☐ Selected Objects

☐ Clip to Page

☒ Include Full Bounds

☒ Tiled Copies

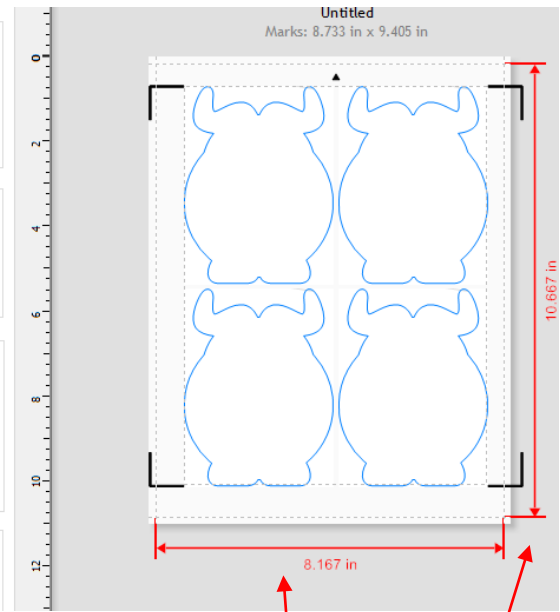
Mark Position 0.807 in Build Contours

☒ Job Name Untitled

☐ Full width (Get the maximum cutting area)

Quantity

Horizontal	2	Spacing	0.144 in	7.119 in
Vertical	2	4 copies	0.144 in	9.405 in



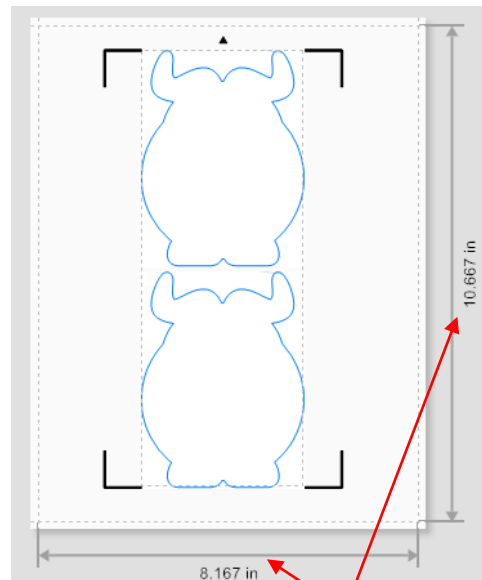
Red margins and dimensions indicate project will not print with this number of copies

(5) In this case, only two shapes will fit, so the **Quantity** is updated and the red margins and dimensions are now black:

Quantity reduced to 2

Quantity

Horizontal	1	Spacing	
Vertical	2	2 copies	



Black margins and dimensions indicate project will print

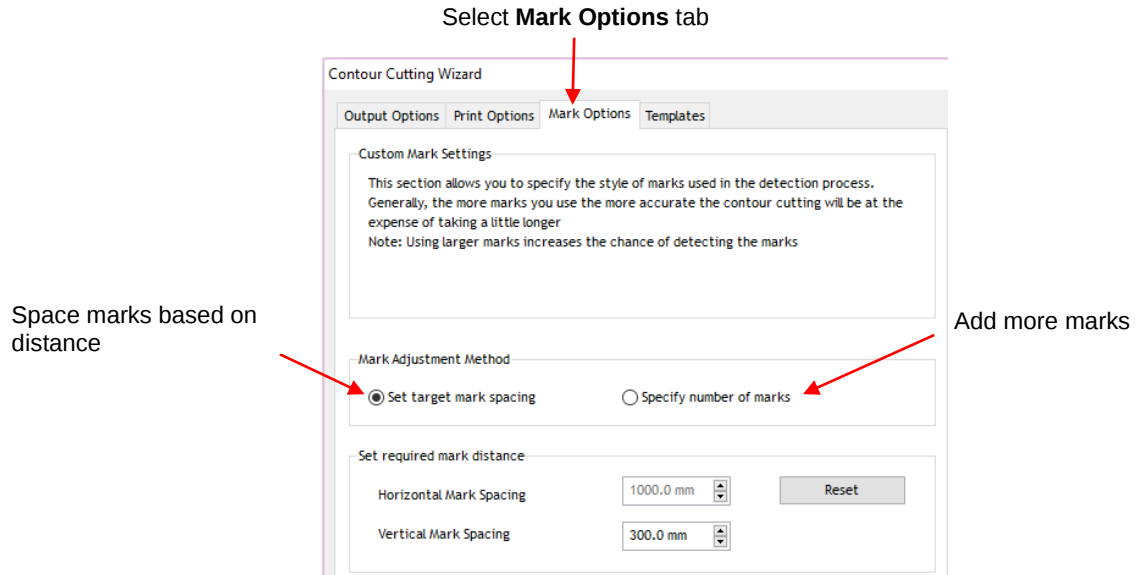
(6) Note that you have two options that can also be used, at times, to permit more copies to be printed:

- ◇ Reduce the **Mark Position** setting, which is how far the registration marks are located from the printed shapes. More about this option and the **Mark Options** tab are covered in *Section 3.08*.
- ◇ Reduce the size of the original by returning to the main window. This, of course, will work in some cases but not others.

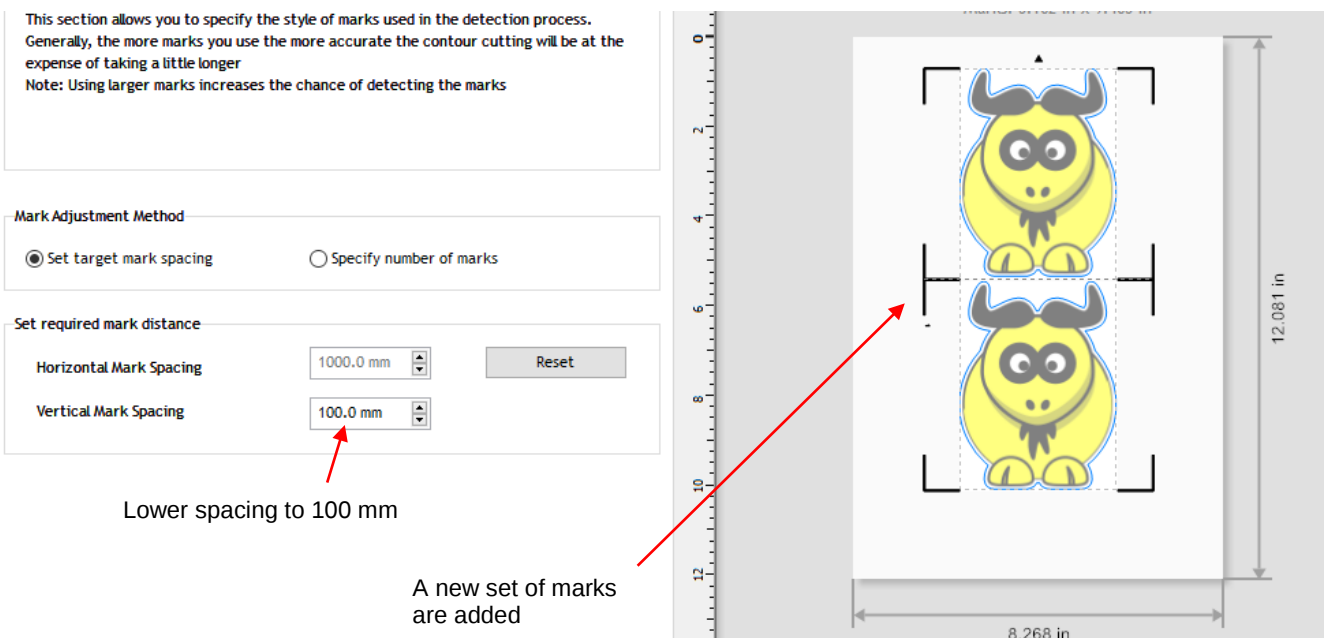
3.08 Registration Mark Settings

3.08.1 Adding Intermediate Registration Marks

- Continuing with the same project from the prior section, to access the registration mark options, click on the **Mark Options** tab in the **Contour Cutting Wizard** window and note the following:



- ◇ **Set target mark spacing:** use this option as a default or if you want to reduce the maximum spacing allowed between marks, thus increasing the number of marks. For example, if **Vertical Mark Spacing** is lowered to 100 mm, in this particular case, a new set of intermediary marks are added:



- ◇ **Specify number of marks:** use this option to force another set of marks to be added:

Custom Mark Settings

This section allows you to specify the style of marks used in the detection process. Generally, the more marks you use the more accurate the contour cutting will be at the expense of taking a little longer
 Note: Using larger marks increases the chance of detecting the marks

Mark Adjustment Method

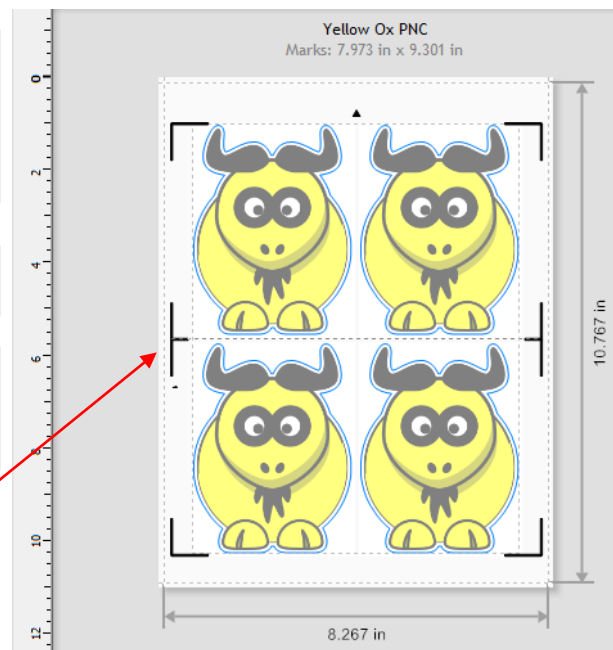
☐ Set target mark spacing ☒ Specify number of marks

Extra Mark Options

Number of horizontal marks	1	3.987 in
Number of vertical marks	2	3.100 in

Change from 1 to 2

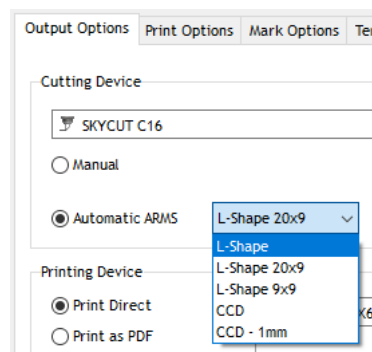
A new set of marks are added



- With these intermediate marks added, they will be scanned, as well. Thus, in this example shown, the bottom four marks will be scanned and the lower two shapes cut out. Then, the top set of four marks will be read and upper two shapes cut out.
- **IMPORTANT:** Using the **Array** plus **Array Mark** options on the Skycut's control panel allows for more flexibility when working with multiple registration marks, such as being able to only scan one mark when there are repeats. This is covered in *Section 3.09.2*.

3.08.2 Registration Mark Types and Sizes

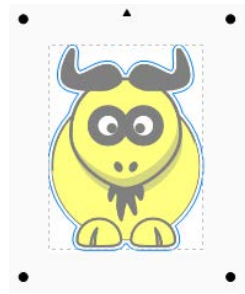
- The dropdown menu next to **Automatic ARMS** contains 9 options for the type and size of registration marks that can be used:



- There are two shapes available:
 - ◇ **L** - which is the right-angle type mark used in the screenshots so far in this chapter
 - ◇ **CCD** - circular dots



L registration marks



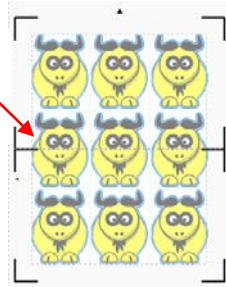
CCD registration marks

- Note the following description and size for the individual options in the menu:

◇ **L-Shape:** L marks that are 20 mm x 20 mm in size

◇ **L-Shape 20x9:** L marks that are 20 mm x 20 mm in size. Any intermediate registration marks will be 20 mm x 9 mm in size:

Note that the intermediate marks will print over the image!



L-Shape

The registration marks are clear of the image



L-Shape 20x9

- ◇ **L-Shape 9x9:** L marks that are 9 mm x 9 mm in size
- ◇ **CCD:** circular marks that are 5 mm in diameter
- ◇ **CCD – 1mm:** circular marks that are 1 mm in diameter

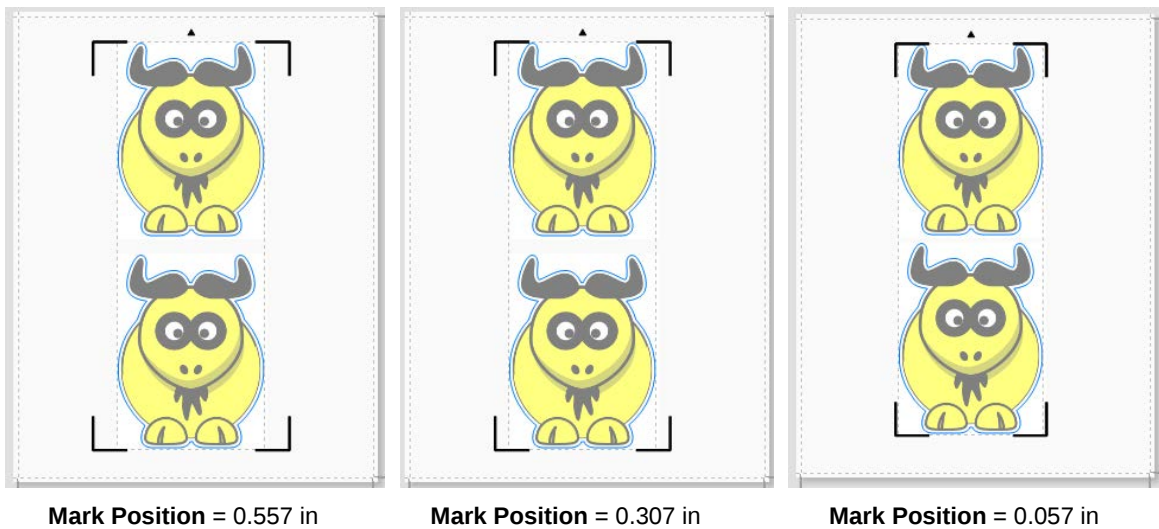
3.08.3 Mark Position (Offset Distance from Design)

- You can also change the offset or distance of the marks from the image. However, you also need to make sure marks are not too close to anything printed so that the camera doesn't incorrectly attempt to scan the image instead of a registration mark:

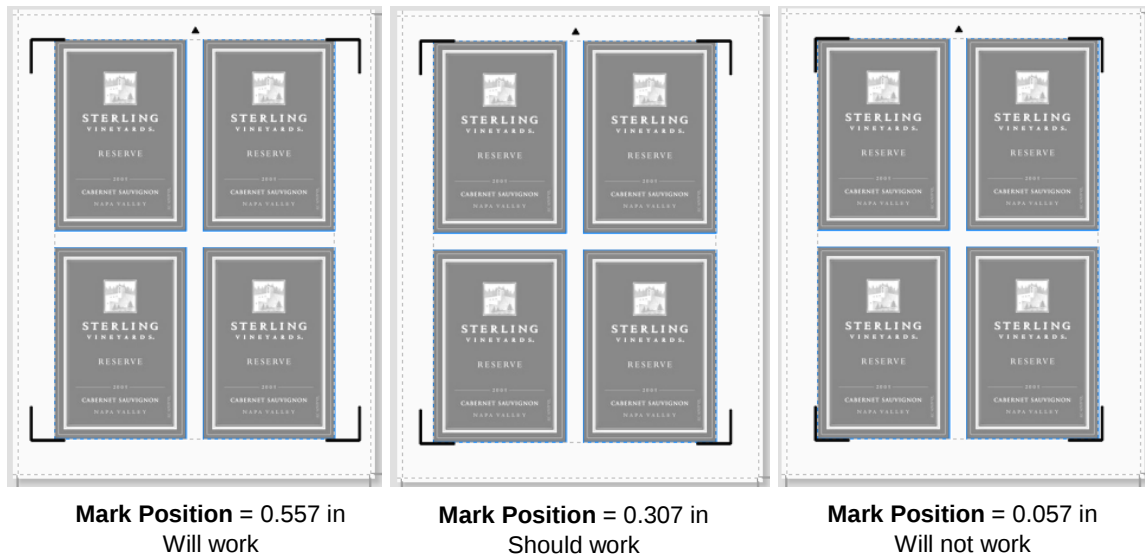
Source Options

☒ Selected Objects	Mark Position	0.807 in	Build Contours
☐ Clip to Page	☒ Job Name	Yellow Ox PNC for UM	
☒ Include Full Bounds	☐ Full width	(Get the maximum cutting area)	
☒ Tiled Copies			

Distance of the marks from the outermost shapes



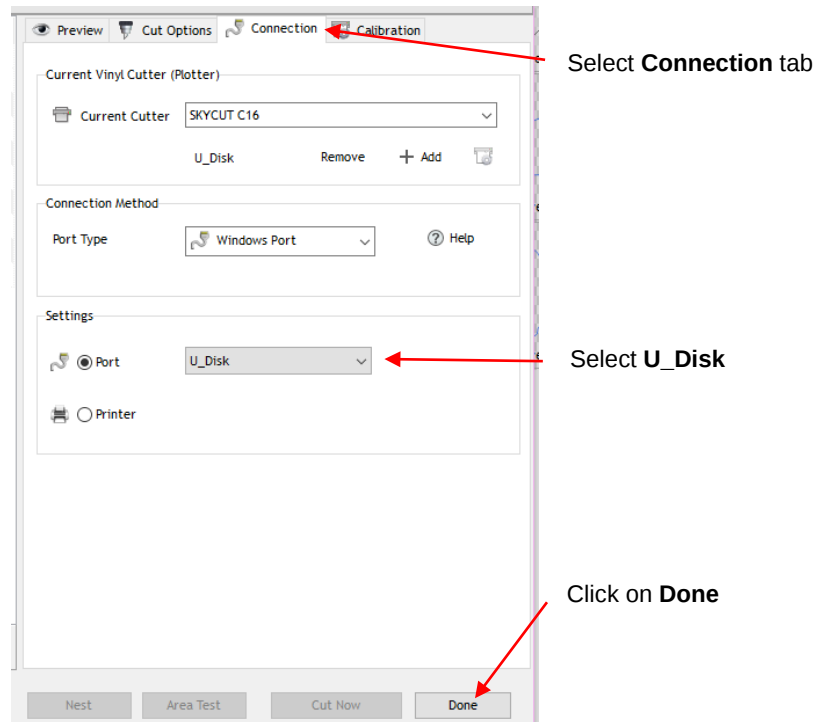
- You can see the movement of the marks towards the image as the **Mark Position** is decreased. Because of the shape of the ox, this shouldn't be an issue with the location of the registration marks relative to the printed image. However, if a design is more rectangular, such as a wine bottle label, then it is much easier to see that it could cause issues if the **Mark Position** is too small:



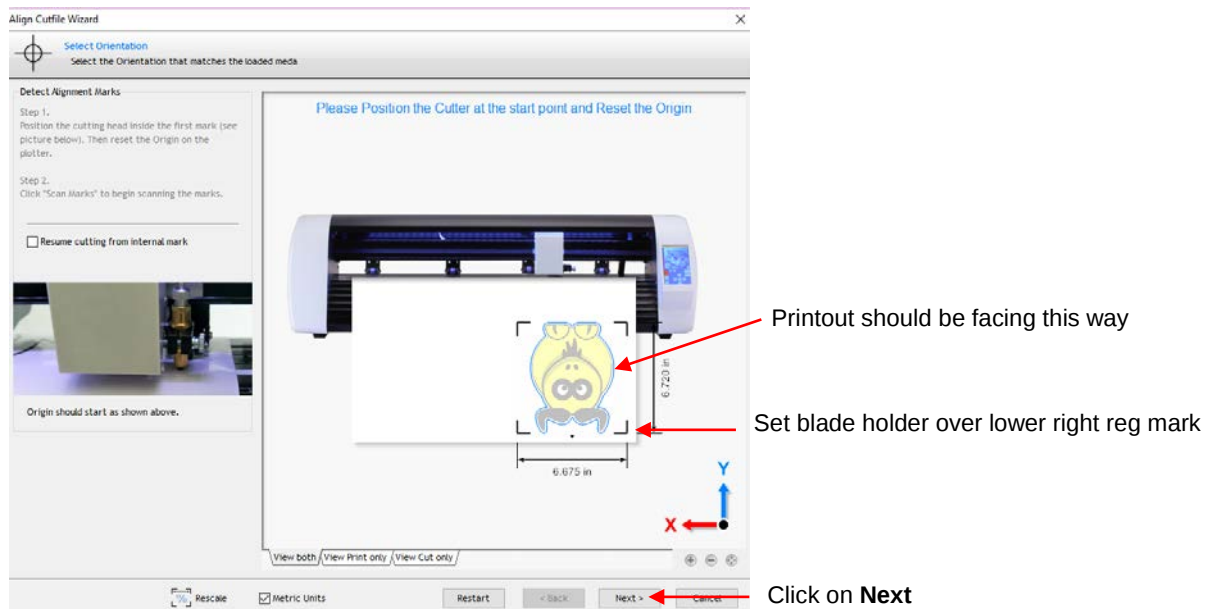
3.09 PNC from USB Flash Drive

3.09.1 PNC from Flash Drive – Single Cut

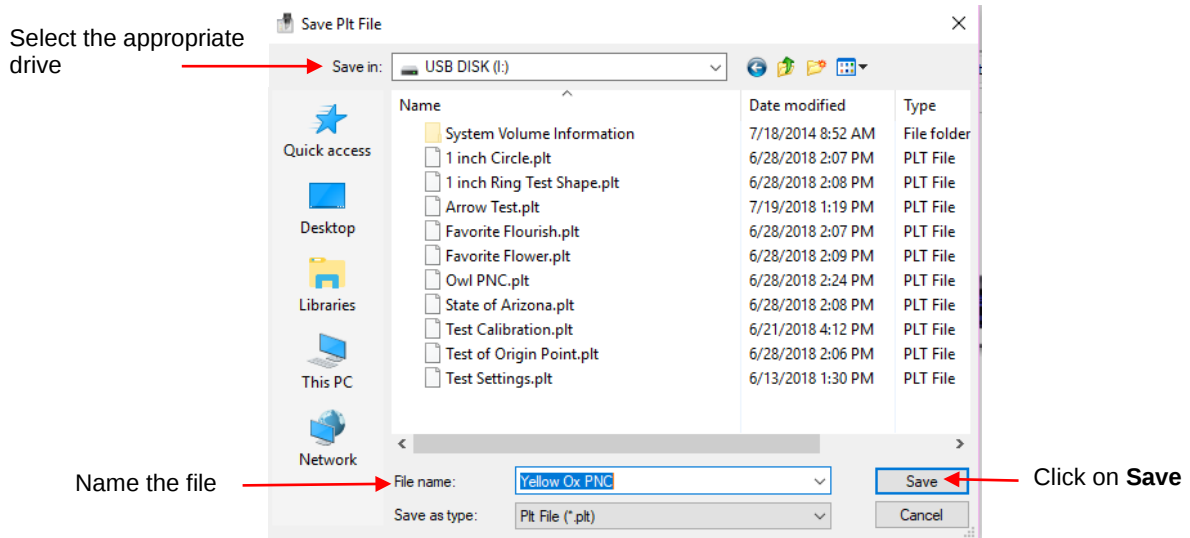
- To perform a print and cut project from the control panel, first perform *Steps (1) – (11)* from *Section 3.04.2*. However, before clicking on **Done** to close the **Vinyl Spooler** window, click on the **Connection** tab and change the **Port** to **U-Disk** from the drop-down menu. Then click on **Done**:



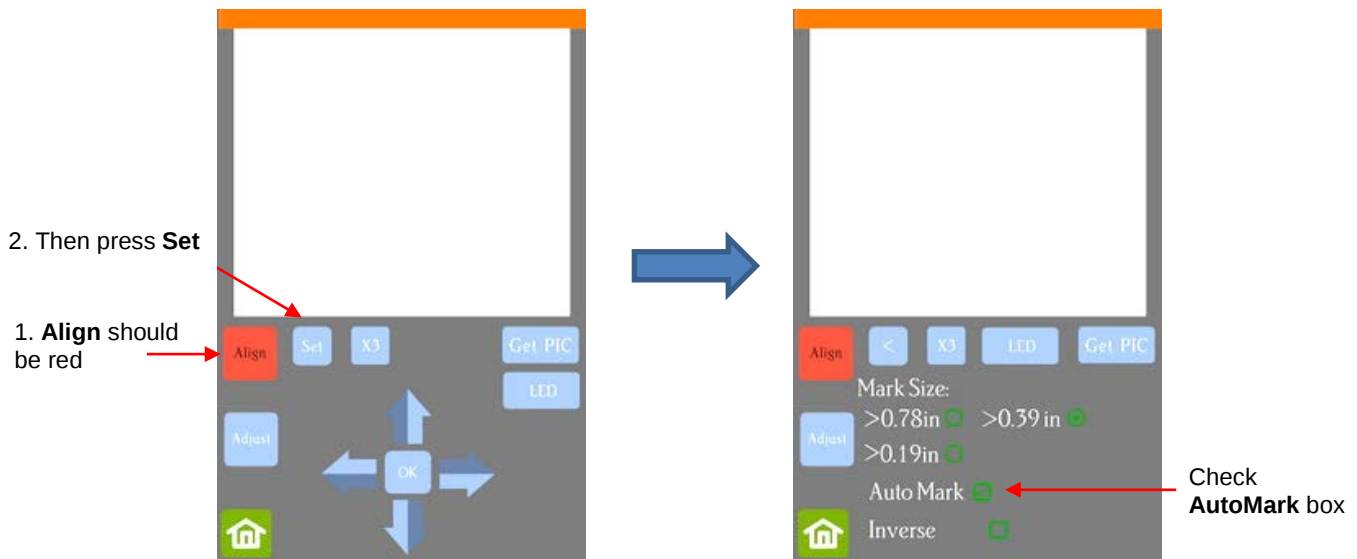
- Back in the **Contour Cutting Wizard** window, proceed as before by clicking on **Cut** and the same **Preview** window opens and again indicates the design should be facing downwards:



- Click on **Next** and the following window will open where you can save the job as a PLT file on a USB flash drive inserted into a port on your computer:

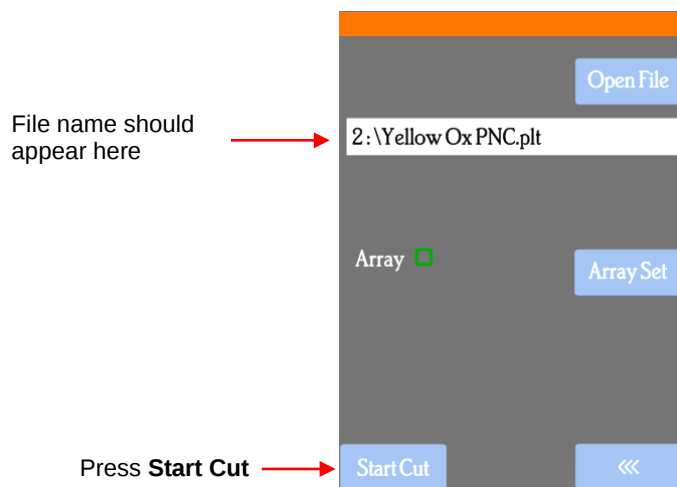


- On the Skycut's control panel, set the **Force** and **Speed**, if you elected not to have them activated in the **Vinyl Spooler** window in *Step 11* in *Section 3.04.2*.
- Go to **Set>Camera**. With **Align** selected, press **Set** and the following window will open:



◇ Verify that **AutoMark** box is checked. Then click on **Home**.

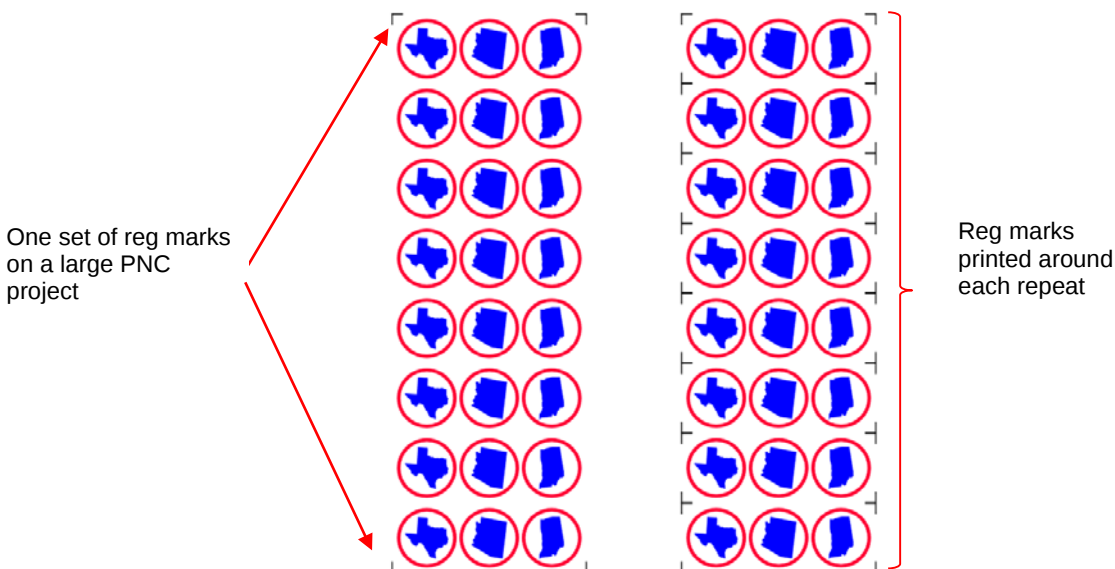
- Insert the flash drive into the right side of the Skycut and use the instructions in *Section 1.12.3* to open the file into the Skycut:



- Click on **Start Cut** and the marks will be scanned by the camera and the shapes cut out.

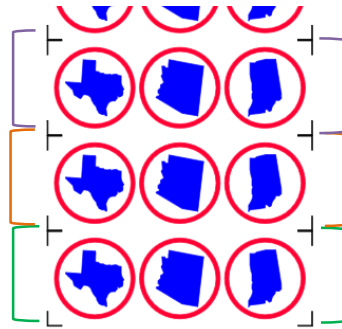
3.09.2 PNC from Flash Drive – Using Array Mark for Repeats

- The Skycut has the ability to set up an array of repeats for PNC applications. The advantage to using the Skycut's control panel for this process is that the **Array Mark** function permits the scanning of additional registration marks as repeats are cut. This is far more accurate than only scanning the original four marks on significantly large projects:



- The **Array Mark** window on the control panel can be opened in two ways:
 - Go to **Set>Advanced Settings>Array>Array mark**
 - Go to **USB>Array Set>Array mark**
- In the **Array Mark** window, you have three options:
 - 4 Mark:** Scan all four marks on every repeat

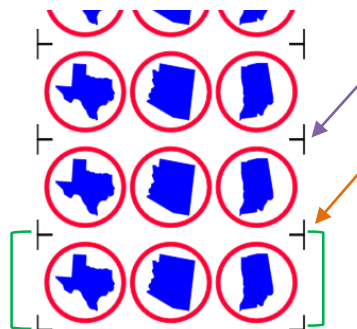
The number of marks	
4 Mark	✓
1 Mark	
Alternate	



1. Four marks in **green set** are scanned first and first three shapes cut.
 2. Four marks in **orange set** scanned, next three shapes cut.
 3. Four marks in **purple set** scanned, next three shapes cut.
- etc.

- **1 Mark:** Scan first four marks on first set only. Then scan one mark only on each remaining repeat

The number of marks	
4 Mark	
1 Mark	✓
Alternate	



1. Four marks in **green set** are scanned first and first three shapes cut.
 2. Single mark by **orange arrow** scanned, next three shapes cut.
 3. Single mark by **purple arrow** scanned, next three shapes cut.
- etc.

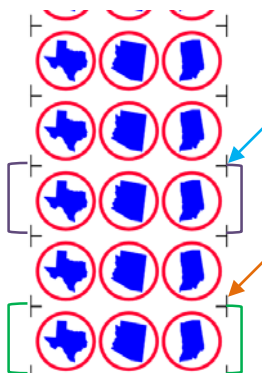
- **Alternate:**

Combination of **4 Mark** and **1 Mark** options

The number of marks	
4 Mark	
1 Mark	
Alternate	✓
changing interval:	
-	2
+	default

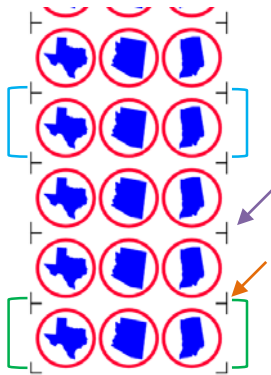
Alternate between scanning all 4 marks and scanning only 1 mark, based on a set **Interval**

Interval set to 1:



1. Marks in **green set** scanned and first three shapes cut.
 2. Single mark by the **orange arrow** scanned, next three shapes cut.
 3. Marks in **purple set** scanned, next three shapes cut.
 4. Single mark by **blue arrow** scanned, next three shapes cut.
- etc.

Interval set to 2



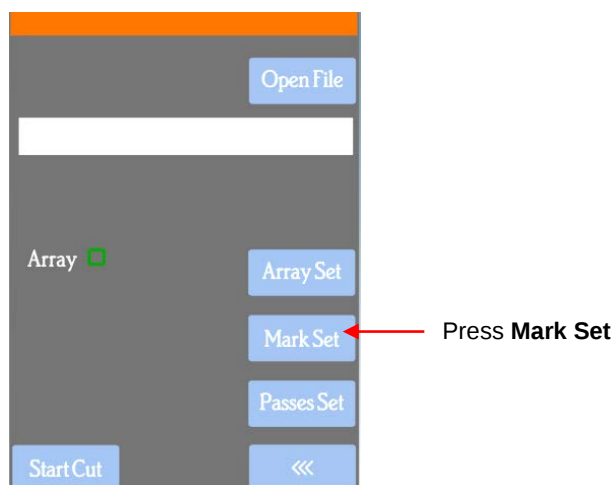
1. Marks in **green set** scanned and first three shapes cut.
2. Single mark by **orange arrow** scanned, next three shapes cut.
3. Single mark by **purple arrow** scanned, next three shapes cut.
4. Marks in **blue set** scanned, next three shapes cut.
- etc.

- When choosing an **Array Mark** option, keep the following in mind:
 - The purpose of having intermediate scans is to correct for any slippage that occurs due to friction or excessively fast cutting speed.
 - Use **4 Mark** in situations where the repeats are quite large, thus there's a larger distance between the repeats and slippage is more likely to occur. It's also a good option when cutting thicker materials because the higher force applied by the blade can cause more drag on the material or cutting mat.
 - Use **1 Mark** in situations where the material is thin, the cuts are simple, and the distance between the repeats is relatively small. Obviously, this is the most time-efficient choice of the three options since a 4 mark scan is only performed one time.
 - Use **Alternate** as a compromise between the other two options. Experience will determine how high of an **Interval** can still yield the accuracy you need.

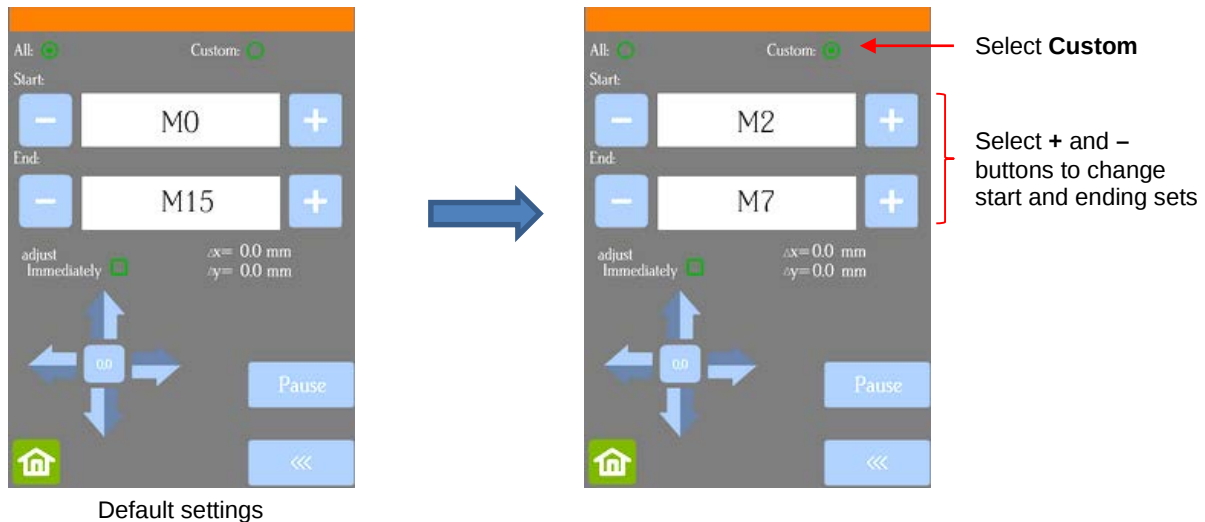
3.09.3 Mark Set Options

- The **Mark Set** window has the following two applications:
 - ◇ Select a specific range of images to cut versus the entire project file.
 - ◇ While the cutting is underway, if you observe that the accuracy is off, you can immediately pause the cutter and tweak the calibration for just that particular cut.
- To open the **Mark Set** window, press **Mark Set** on the **USB** screen:

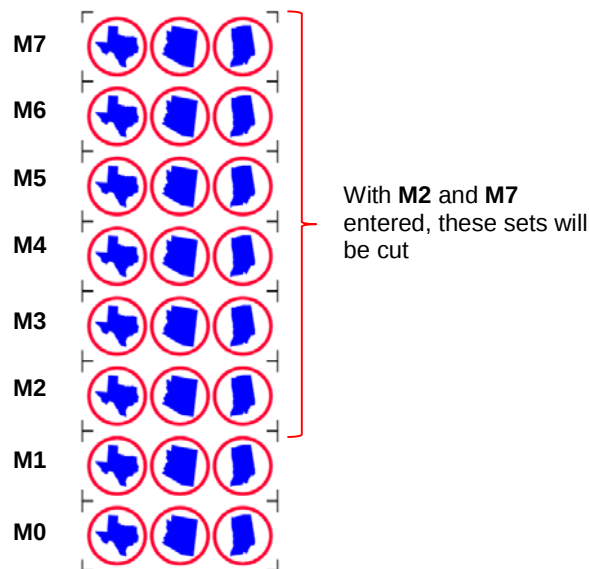
NOTE: If your screen does not have **Mark Set** displayed, please go to *Appendix B* for activation instructions.



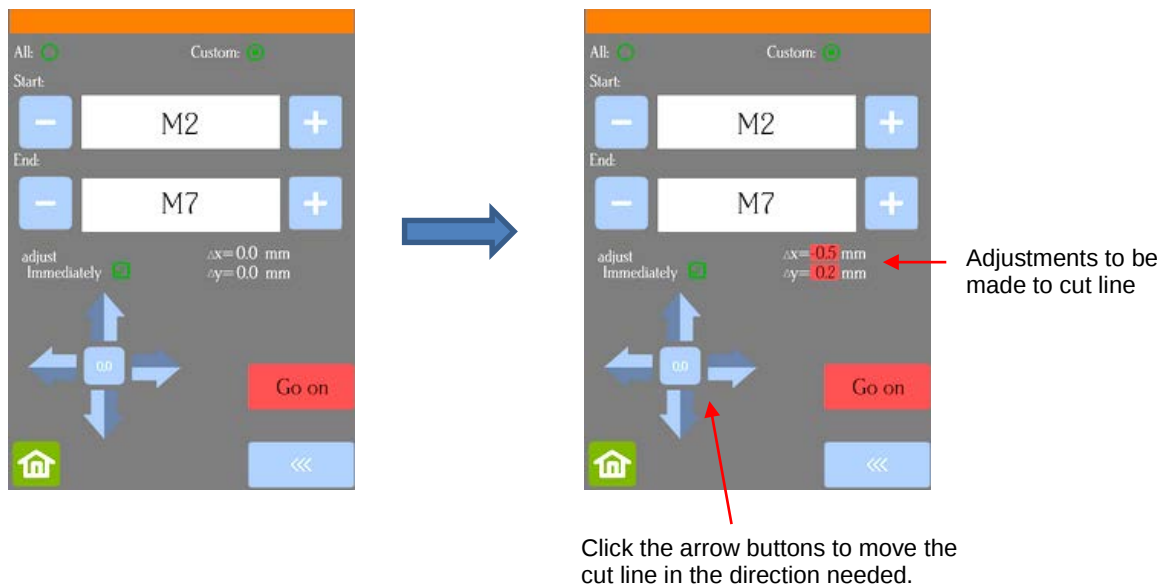
- To select a specific range of images, note the following:
 - ◇ The first set to cut is referred to as **M0** and then subsequent sets are **M1**, **M3**, **M3**, etc.
 - ◇ In the **Mark Set** window, select **Custom** and then enter the start and ending sets. For example, if you want to start with the second set and end with the seventh, you would change to **M2** and **M7**:



- ◇ The resulting sets will be sent versus the entire project:



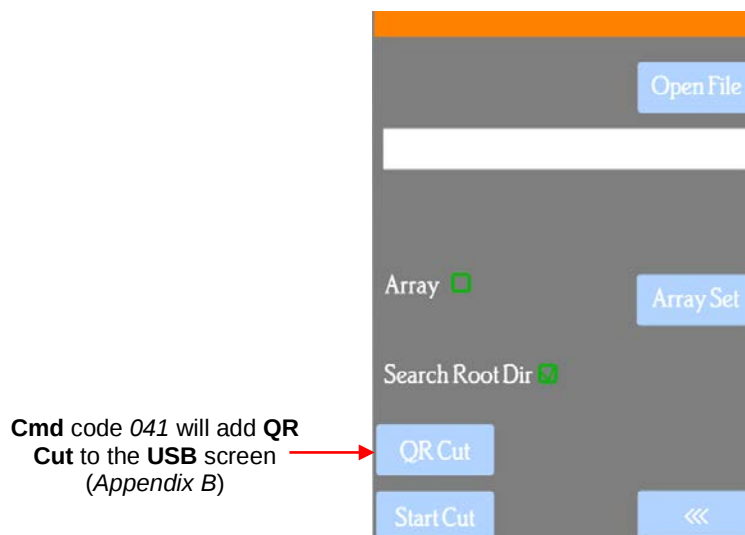
- To tweak the calibration after a cut has begun:
 - ◇ Press the **Pause** button on the **Home** screen to immediately stop the cutting.
 - ◇ Press the **USB** button on the **Home** screen.
 - ◇ Press the **Mark Set** button.
 - ◇ Check or uncheck the **adjust Immediately** option based on the following:
 - o Check the option if you want the adjustment to be made on the current shape that was being cut when you paused the Skycut. Note that the start and end point on that path will not completely close, as a result.
 - o Do not check the option if you want the adjustment to be applied on the next shape that will be cut.
 - ◇ Click on the arrow buttons to adjust the Δx and Δy by the amount and in the direction you need the cut line to move:



- ◇ Once you have entered the Δx and Δy values you wish to use, press the **Go on** button and the cutting will resume.
- **Important:**
 - ◇ If you need to make yet another adjustment, repeat the process. The new Δx and Δy you enter is only an adjustment based on what you are now needing. For example, based on this example, if you need to move another 0.2 mm in the same direction, you would enter 0.2, not 0.4 mm.
 - ◇ Remember that the adjustment is reset at the conclusion of the cut.

3.10 Using a QR Code in Contour Cutting

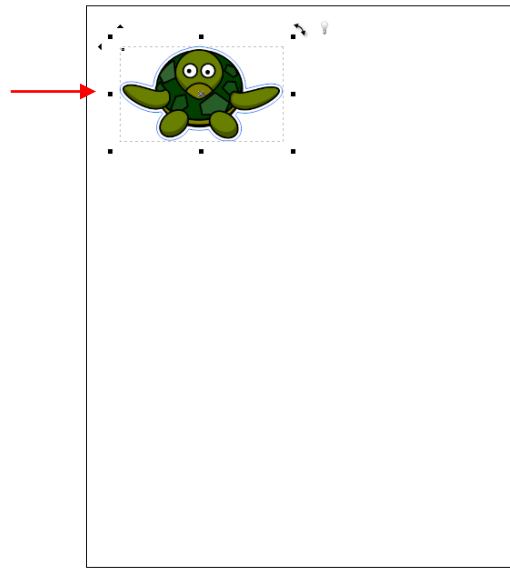
- SignMaster has the ability to add a QR code to a printout, which identifies a timestamp assigned by SignMaster. This QR code can be used when sending the cut directly from SignMaster or when using a PLT file from SignMaster with the **QR Code** option enabled.
- To activate QR code usage on the Skycut, go to **Appendix B** and use the command procedure for adding the **QR Cut** button to the USB screen:



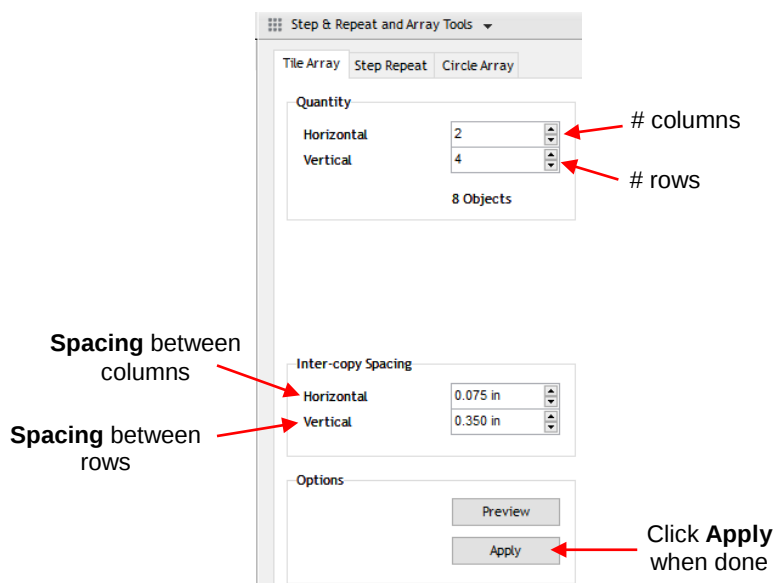
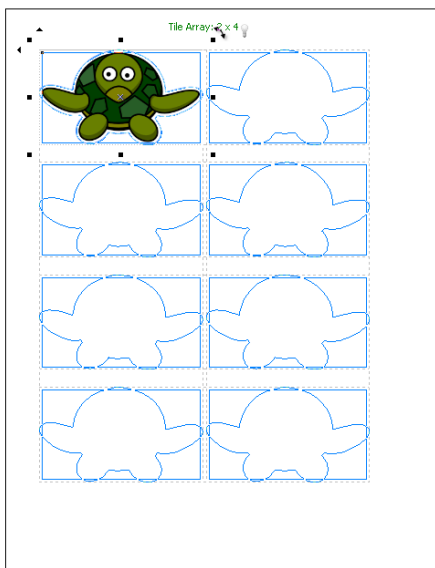
3.10.1 Setting Up an Array of Repeats

- The **QR Cut** process involves enabling a **Page Marks** setting which will be covered in *Section 3.10.2*. At the time of this writing, SignMaster Pro 3.5 does not allow **Tiling** in the **Contour Cut Wizard** window when this setting is used. Therefore, if you need to set up an array of repeats, please use the following method instead:
 - In the main window, set the **Drawing Area** to match the printout dimensions you'll be using.
 - Import (or design) the image for the contour cut. Add a contour cut for your raster or vector image. Refer to *Section 5.01* or *5.02* for instructions. Arrange the traced design in the upper left corner of the **Drawing Area**:

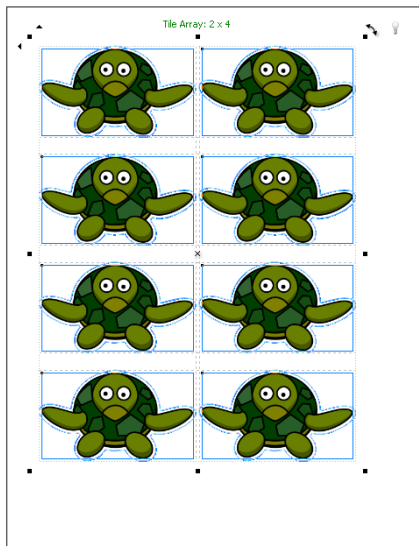
Image is traced and moved near the upper left corner



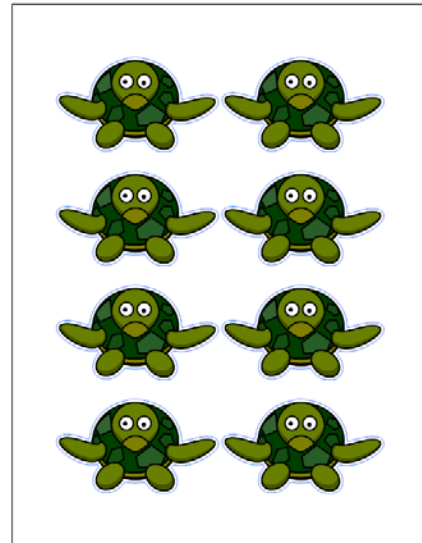
- Select the image and its cut line and go to **Arrange>Tile Array tools**: A new window opens with options for the number of rows (**Horizontal**) and columns (**Vertical**) and their corresponding spacing:



- Note that the raster images will not appear as you create the repeats, but will appear in those repeats upon clicking on **Apply**. At this point, the original image isn't part of the overall selection so use **Ctrl+A** (or **Edit>Select All**) to ensure everything is selected and then drag to the approximate middle of the **Drawing Area** (this seems to work better, at this time, than using **Center** inside the **Contour Cut Wizard**):



Use **Ctrl+A** to select everything



Drag to the ~middle of the
Drawing Area

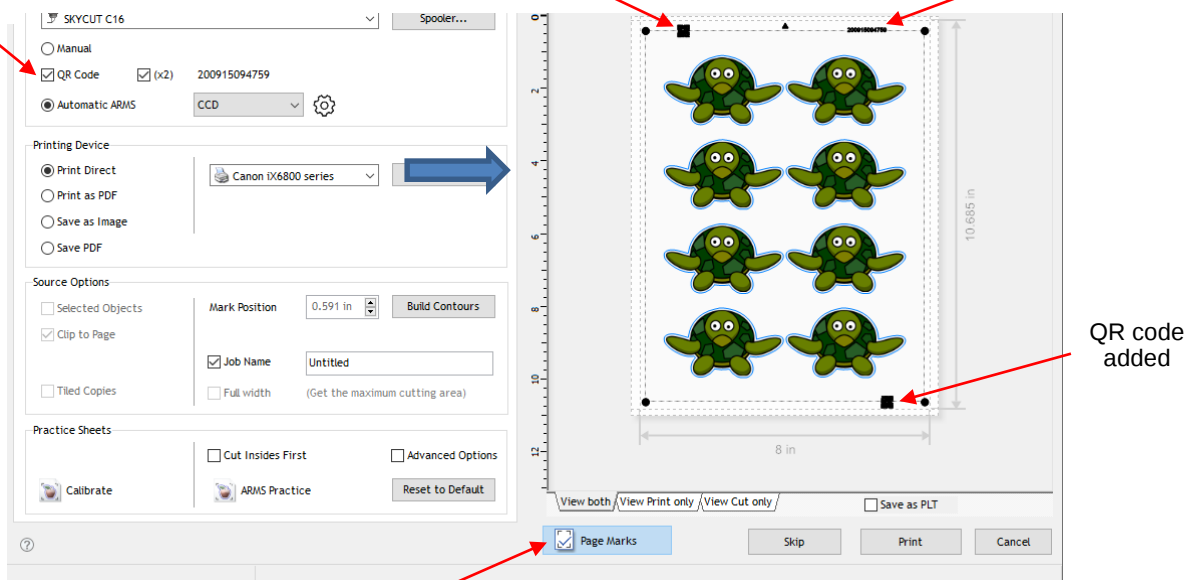
3.10.2 QR Code Cutting Directly from SignMaster

- Open the **Contour Cut Wizard** window. Click on the **Page Marks** option and mark the box by **QR Code**. The **Preview** will now show symbols for the QR code and for the timestamp:

QR Code
enabled

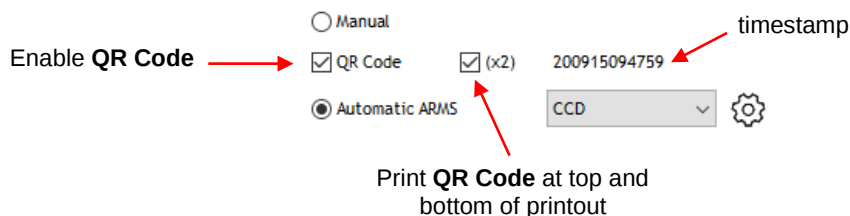
QR code added

Timestamp

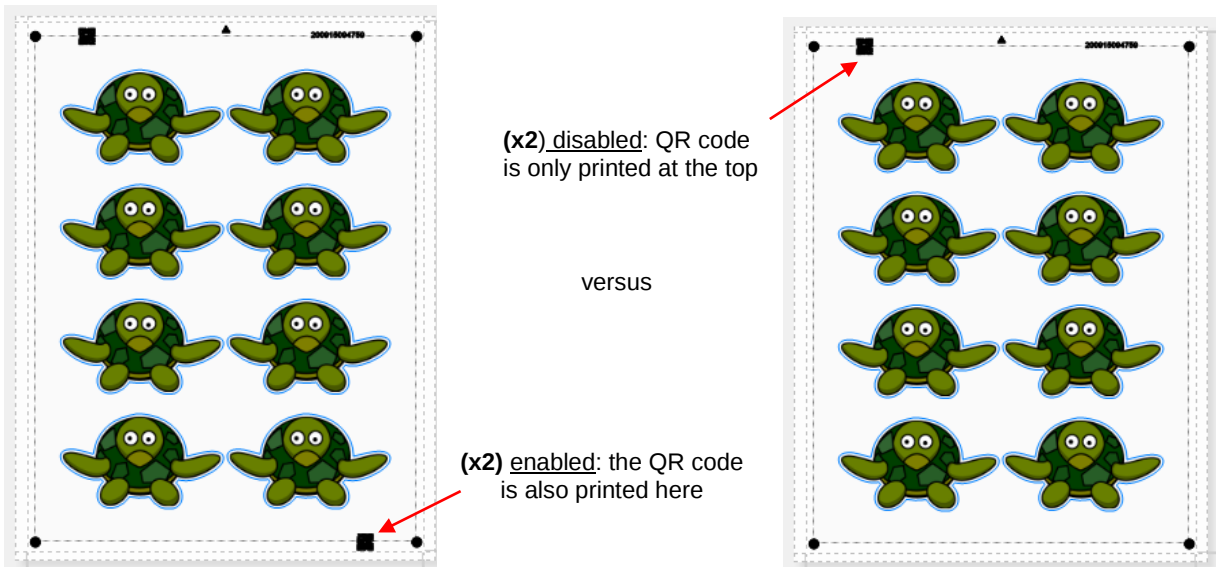


Select **Page Marks**

- ◇ You'll notice that when **QR Code** is enabled, a second option called **(x2)** and the assigned timestamp appear to the right of the **QR Code** option:



- ◇ Printing the QR code at both the top and the bottom of the printout means you can position the printout either way in the cutter:



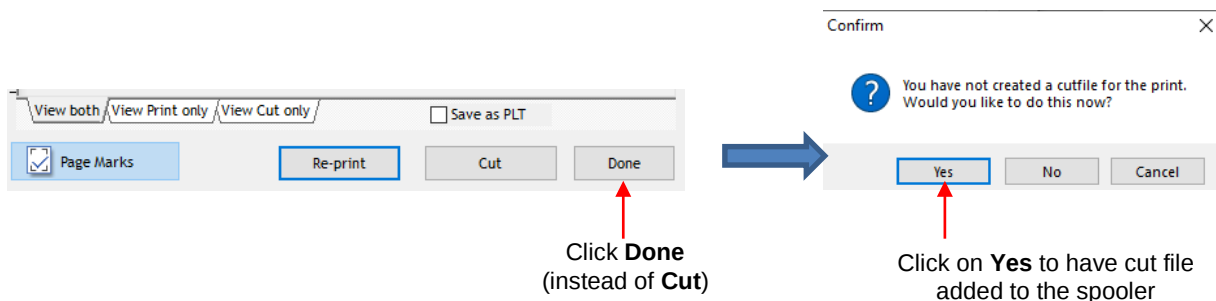
- o Even though the following **Preview** (when using the **(x2)** option) indicates the printout needs to be positioned in this orientation, you can have it rotated 180 degrees and it will still cut correctly because the QR code contains a symbol indicating which orientation is being used:



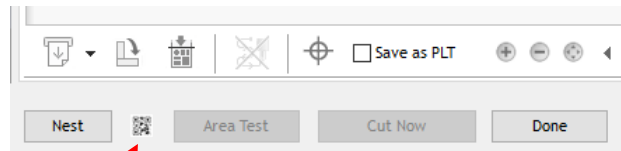
(x2) enabled: two QR codes and the printout can be inserted this way or rotated around

(x2) disabled: only one QR code and the printout must be inserted this way

- ◇ You have the option at this point of proceeding with the normal process of printing and cutting from SignMaster. If everything is working correctly, after the first lower right registration mark is identified, the camera will stop at and scan the QR code before proceeding with the cut.
- ◇ Alternatively, you can print now but perform the contour cut at any point in the future from this same computer by having the cut file created and stored in the **Vinyl Spooler**. To do this, after printing (or exporting as a PLT file), click on **Done** and the following window opens:



- ◇ By clicking **Yes**, this file (with the timestamp as part of the **Job Name**) is added to the **Vinyl Spooler** window and at any point later on, after one or after many other cuts from SignMaster, you can activate this cut by doing the following:
 - o Insert the printout into the Skycut and arrange the blade holder over the lower right registration mark (as per usual).
 - o In SignMaster, go to the **Vinyl Spooler** and click the **QR Code** icon in the bottom right portion of the window:

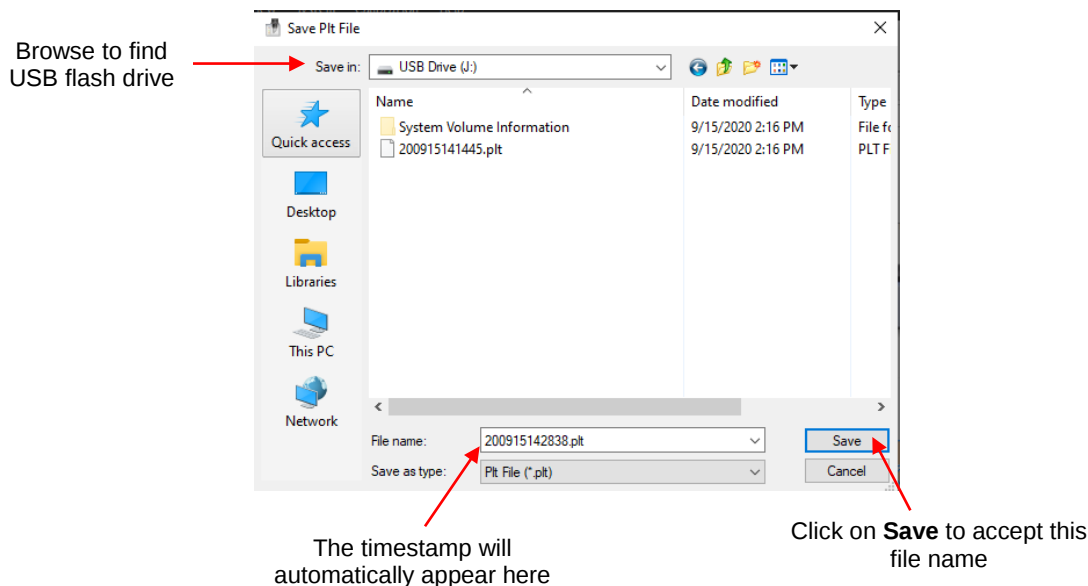


Click on **QR Code** icon

- o The camera will immediately move to the left to read the QR code and select the correct job from the **Spooler** menu by finding the matching timestamp. The rest of the scanning and contour cut will proceed.
- ◇ If you wish to return to regular contour cutting in SignMaster (i.e. not have the camera stop and look for a QR code), remember to deactivate **QR Cut** on the Skycut's control panel using the same procedure presented in **Appendix B**.

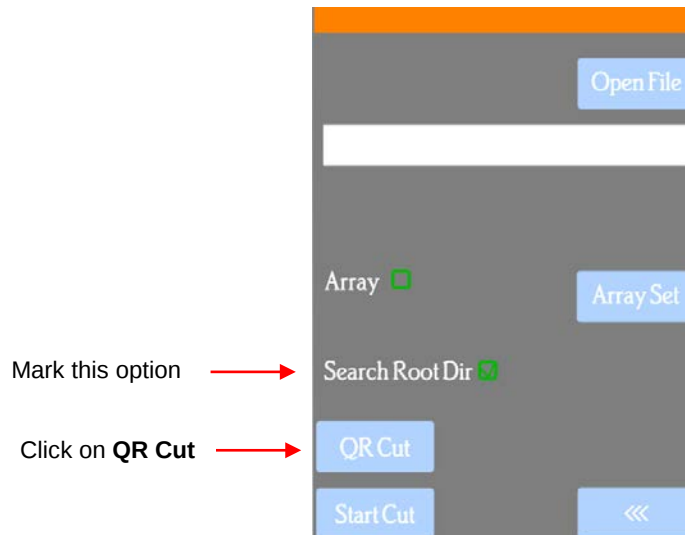
3.10.3 QR Code Cutting from a PLT File

- Follow the same procedures presented in *Sections 3.10.1* and *3.10.2* to set up the contour cutting file. Also use the same procedures present in *Section 3.09* to export your file in PLT format.
- However, when the **Save Plt File** window opens, the timestamp will automatically appear in the **File name** field. **IMPORTANT:**
 - ◇ Use this timestamp as the file name so that the Skycut will be able to pull up this file based on reading the QR code on the printout.
 - ◇ It is highly recommended that these files be saved in the root directory of the flash drive versus inside a subfolder. By doing so, the file will be automatically located when the QR Code is read.



- Load the flash drive into the Skycut. Insert the printout into the Skycut and arrange the blade holder over the lower right registration mark (as per usual).

- In the USB window, you may wish to mark the option for **Search Root Dir** in case the Skycut has already been used to open files in a subfolder on the flash drive:



- Click on **QR Cut** and the camera will
 - (1) Read the first registration mark.
 - (2) Move to the **QR code** to read the timestamp.
 - (3) Locate the file on the flash drive with that same timestamp as its name.
 - (4) Proceed with identifying the rest of the marks and perform the contour cut.
- As mentioned in *Section 3.10.2*, if you wish to return to regular contour cutting in SignMaster (i.e. not have the camera stop and look for a QR code), remember to deactivate **QR Cut** on the Skycut's control panel using the same procedure presented in **Appendix B**.

4. Accessory Tools

4.00 Quick Reference for Chapter 4

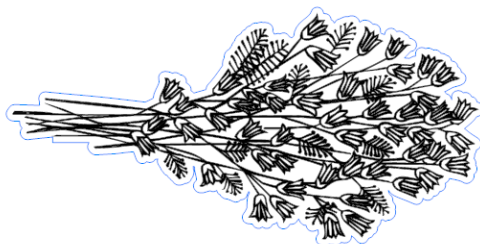
- Settings for test pen, embosser, engraver: *Section 4.05*
- How to draw with the test pen and cut around the drawing: *Section 4.01.1*
- How to score and cut a fold-up project: *Section 4.02.2*
- How to emboss cardstock: *Section 4.02.3*
- How to engrave a metal tag: *Section 4.03.1*

4.01 Drawing with the Test Pen

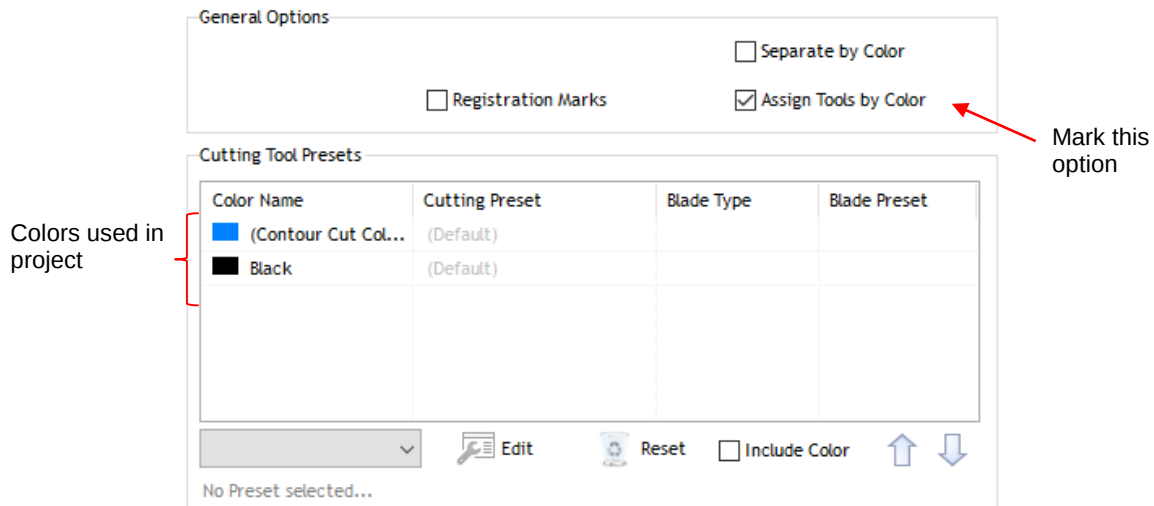
- With the Skycut, you can draw shapes and lettering with the test pen.
- If you wish to fill (i.e. color in) a shape, select the shape and click on the **Plugins** icon  and select **Engraving Module**. Refer to *Section 5.03* for instructions on how to adjust settings to create a line fill.
- Do not have the pen positioned too low in the blade holder seat or the tip of the pen could drag across the paper when moving from one shape to the next. Thus, use the same 20 Post-It note method as with the blade holder.
- Make sure your shapes will not be drawn where any of the pinch wheels travel over the material. Otherwise, the ink might smear.

4.01.1 Draw and Cut

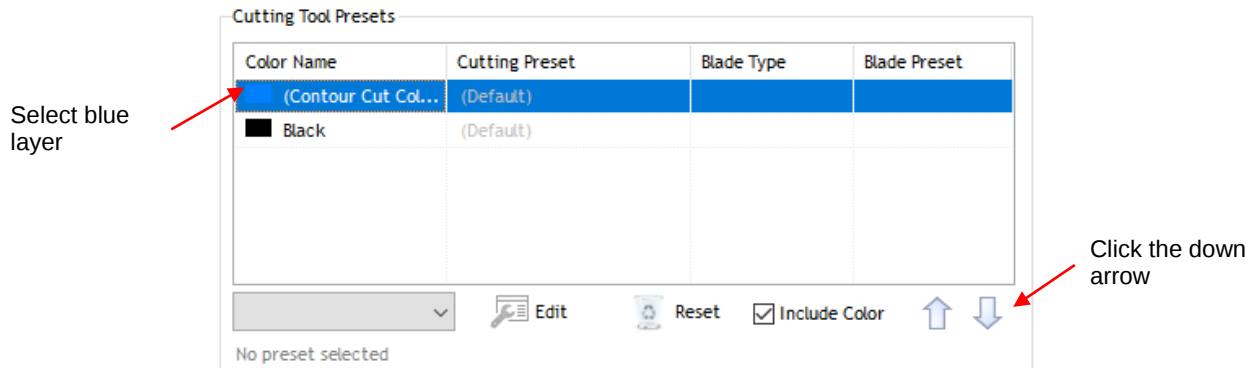
- A draw and cut application involves using the test pen to draw shapes and then using the blade holder to cut them out. This rest of this section covers the process.
- In the following example, a design is selected from **General Clipart** and sized for the project. Then a contour is added using the instructions in *Section 5.01*:



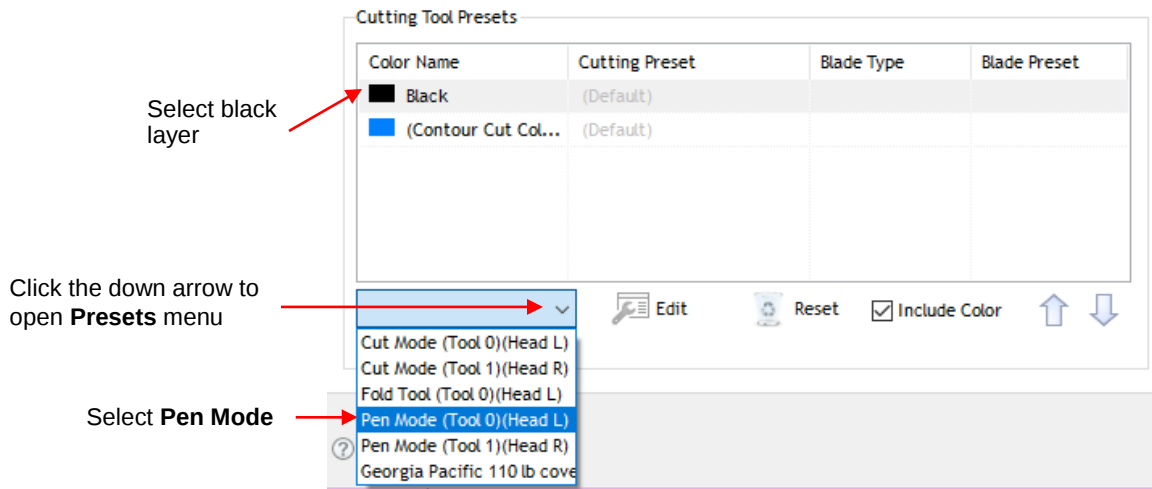
- Note that the contour color (blue) differs from the design's **Fill** color (black). This is important so that the draw and cut can occur separately, providing the opportunity to change out tools.
- Click on the **Cut, Plot, & Engrave Tools** icon and select **Send to Cutter**. In the **Send to be Cut** window, mark the option for **Assign Tools by Color**. You will then see the two colors, blue and black, appear in the **Cutting Tool Presets** list:



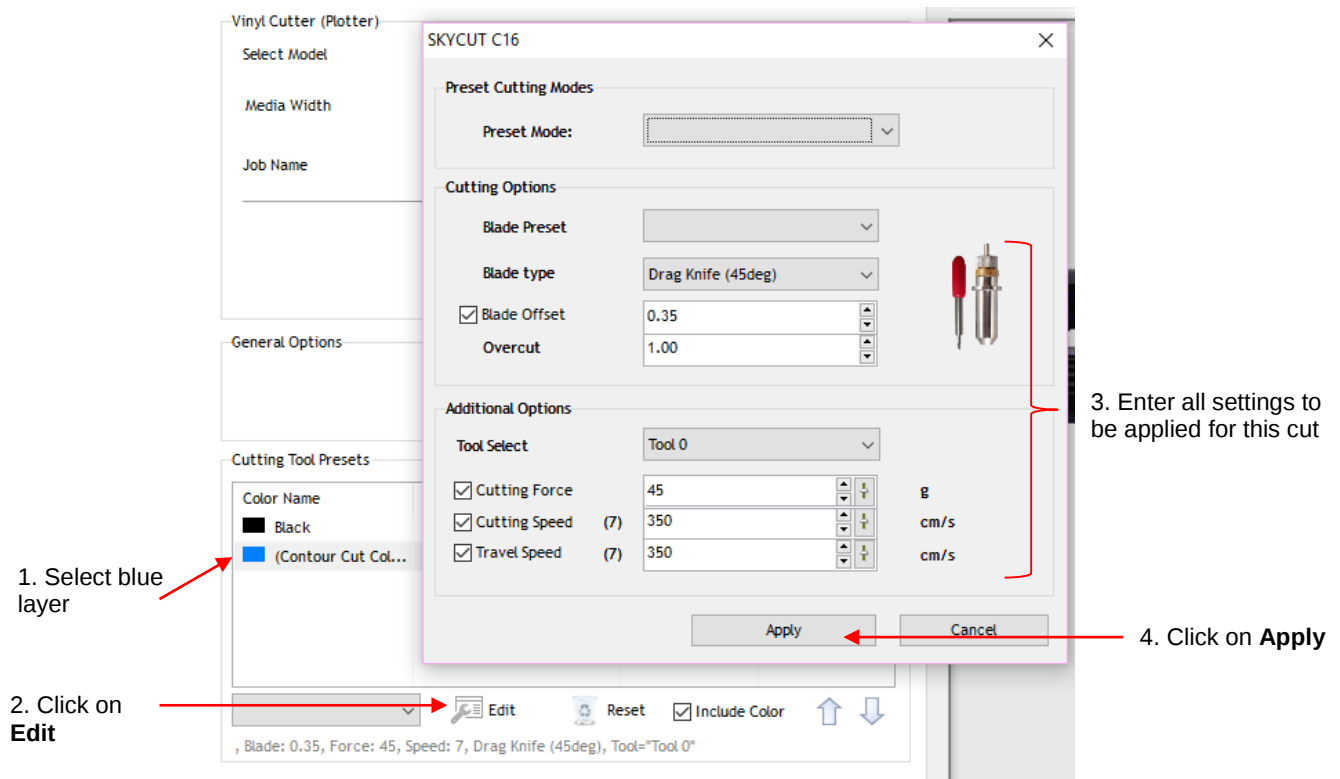
- The layers will be processed in the order shown. However, because it makes more sense to draw first and cut second, the blue layer will be moved down. This is done by selecting the blue layer and clicking on the down arrow below:



- The cut settings for each layer now need to be assigned. If settings have already been entered and saved as **Presets**, you only need to select from the **Preset** menu:

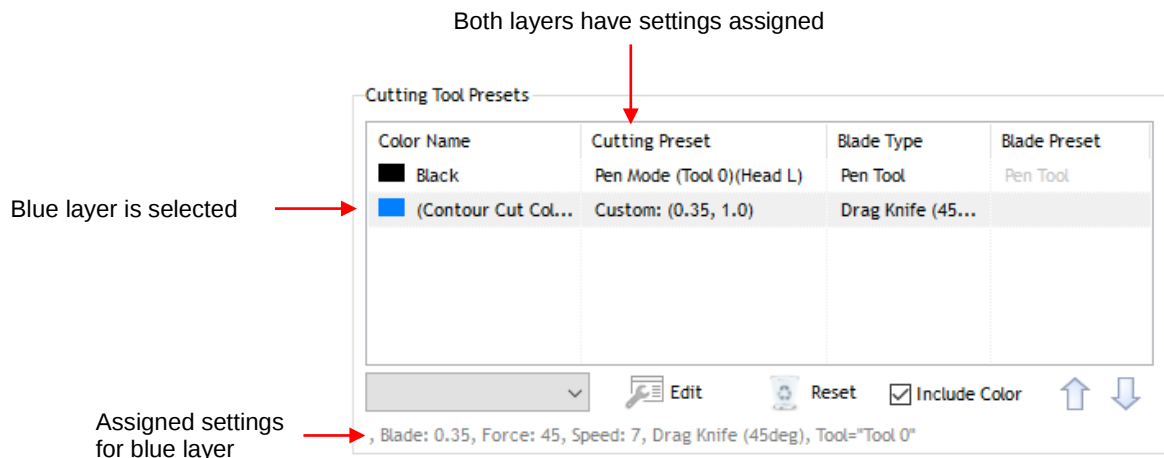


- If you need to enter new settings, which will be done for the contour cut (blue) layer, select that layer and click on **Edit** and the following window opens:

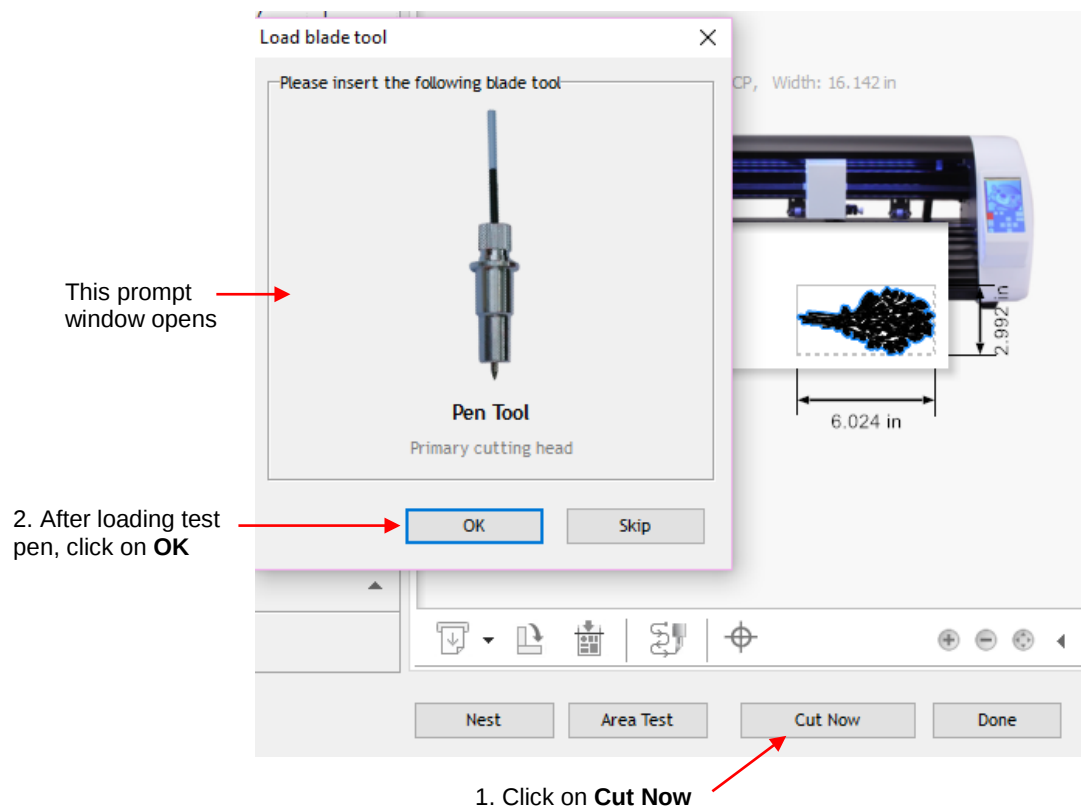


◇ **IMPORTANT:** Note that this window does not allow you to save the settings as a new **Preset**. Thus, if you will be cutting this material often, you might prefer to set up a preset for it using the instructions in *Section 2.04.2*.

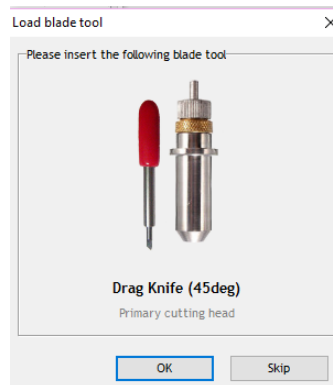
- After clicking on **Apply**, you will see that both colors now have settings assigned. Because the blue layer is still selected, its settings show along the bottom:



- Load the material into the Skycut. Click on **Cut Now** and you will be prompted to load the **Pen Tool**:



- Load the test pen into the Skycut, click on **OK**, and the design will begin drawing. The second prompt window will immediately open:



- As soon as the drawing process has ended, load the blade holder into the Skycut and proceed with the contour cut by clicking on **OK** in the prior window. Once completed, click on **Done** to close the **Send to be Cut** window.



4.02 Embossing and Scoring

4.02.1 General Info on Embossing

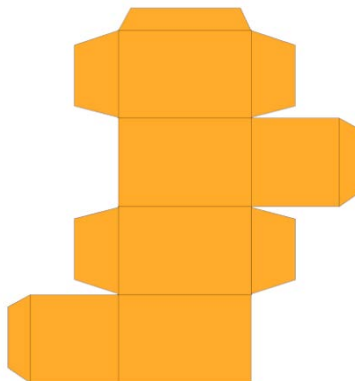
- The Skycut embossing tool has two different sized embossing heads. The smaller one is recommended when scoring cardstock for fold-up projects, such as pop-up cards, gift bags, and small boxes. Either head can be used for embossing shapes.



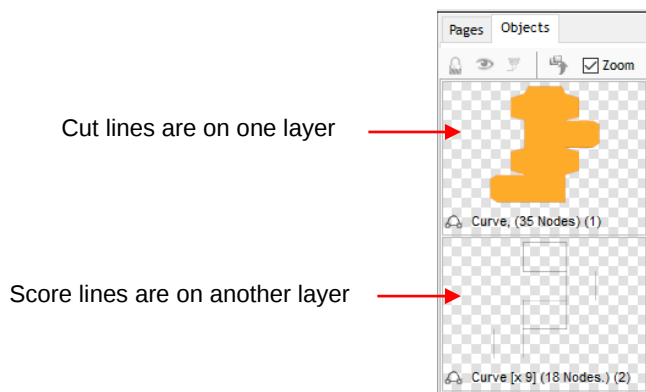
- When embossing cardstock, it is recommended that a soft material be placed beneath the paper or cardstock to allow a deeper impression to be made. One excellent material to use is non-slip shelf liner. Other materials which can be used include rhinestone rubber, craft foam, and felt. Make sure the material is well adhered to the mat (tape it down, if necessary). Then tape your paper or cardstock to the top of this material.
- When using the embossing tool for scoring fold-up projects, the paper or cardstock can be applied directly to the mat, just as you do for cutting. This makes it much simpler when you need to score and then immediately cut. Because the scoring may not be as deep on the underside of the paper or cardstock as the top side, fold all score lines (valley and mountain) forward to establish the fold on both sides. Then flip over and fold any mountain folds the opposite way. This especially works well on pop-up cards.
- Make sure you do some tests first to get the best settings for the scoring or embossing you need. For scoring cardstock, this typically involves a higher force (~160) and two or three passes. Refer to the *Suggested Settings* table at the end of this chapter. If you have a soft material beneath your paper/cardstock, then a lower force will be used, but you may still need several passes. Also, to get more force applied, raise the tool in the blade holder seat the same way you do with the blade holder (i.e. 20 Post-It notes).

4.02.2 Score and Cut Project

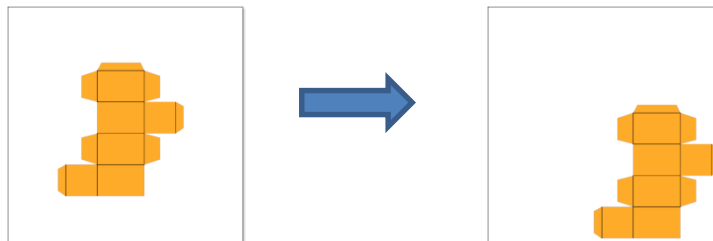
- When a project involves both scoring and cutting, the process used in *Section 4.01.1* cannot be followed. This is because scoring normally requires multiple passes in order to get acceptable folds and the **Passes** setting does not currently work if the **Assign Tools by Color** option is in use. Thus you most likely will need to do the two processes separately.
- In this tutorial, a fold up box project will be used as a typical example. This small box file is provided in the zip file [available here](#).



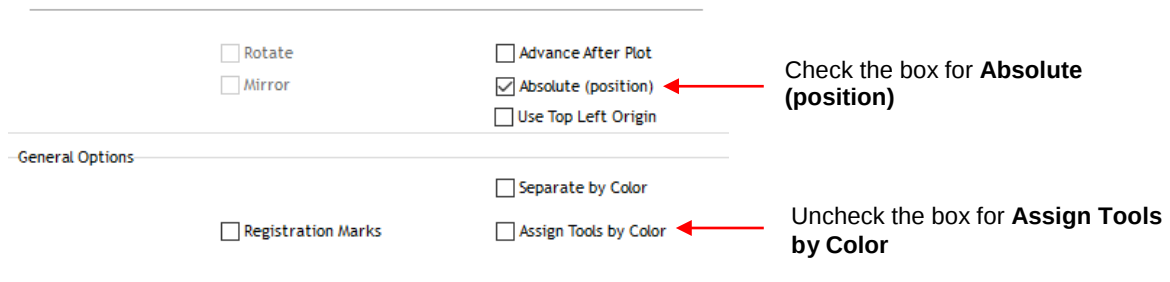
- Always make sure the project is organized so that you can easily select the score lines and the cut lines separately. Click on the **Objects** tab on the **Page Thumbnail Viewer** and verify that the project is organized as such. In this example, the score lines have been grouped together and the cut layer is just a single object:



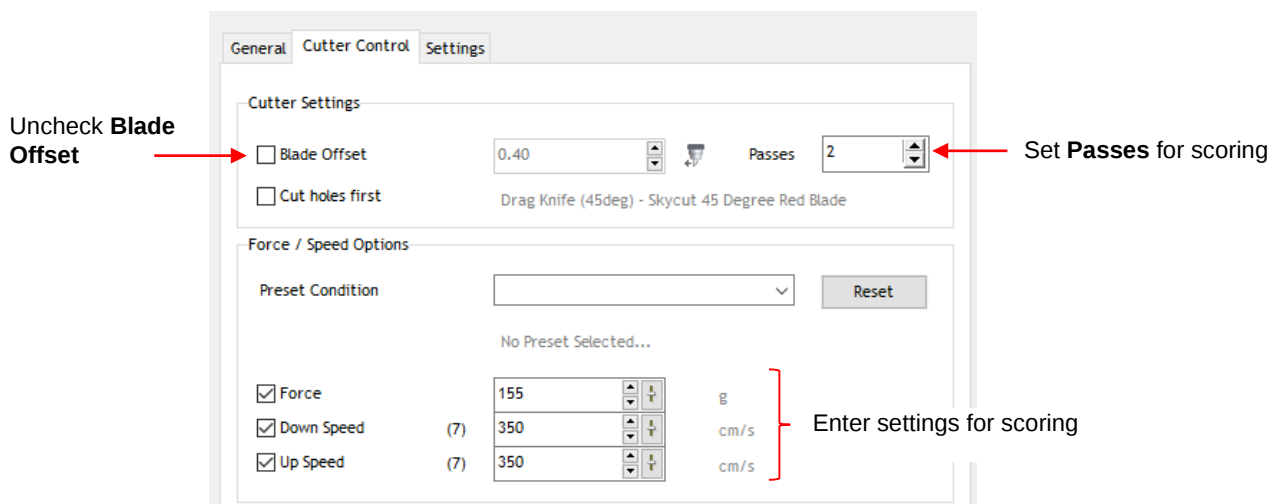
- Because **Absolute (position)** will be needed to make sure the score lines and the cut lines end up aligned properly, you may want to move your project to the lower right corner of the **Drawing Area**, close to the origin you'll use on the material:



- Click on the thumbnail for the score lines since that layer should always be executed first. In the **Send to be Cut** window, check **Absolute (position)** and verify that **Assign Tools by Color** is not marked:



- Click on the **Cutter Control** tab and enter appropriate settings for scoring your material. In this case, cardstock is being scored:



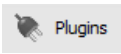
- Note that if you will be performing score and cut projects regularly, setting up a **Preset** for your material will make the selection of the settings much faster. Refer to *Section 2.04.1*.
- Load the material into the Skycut and load the embosser with the small end downwards into the Skycut. Move the embosser to an appropriate origin. Click on **Cut Now**.
- After the scoring is complete, select the thumbnail for the cut lines and repeat the process. Remember to turn on **Blade Offset** in the **Cutter Control** window and switch out the embossing tool for the blade holder.

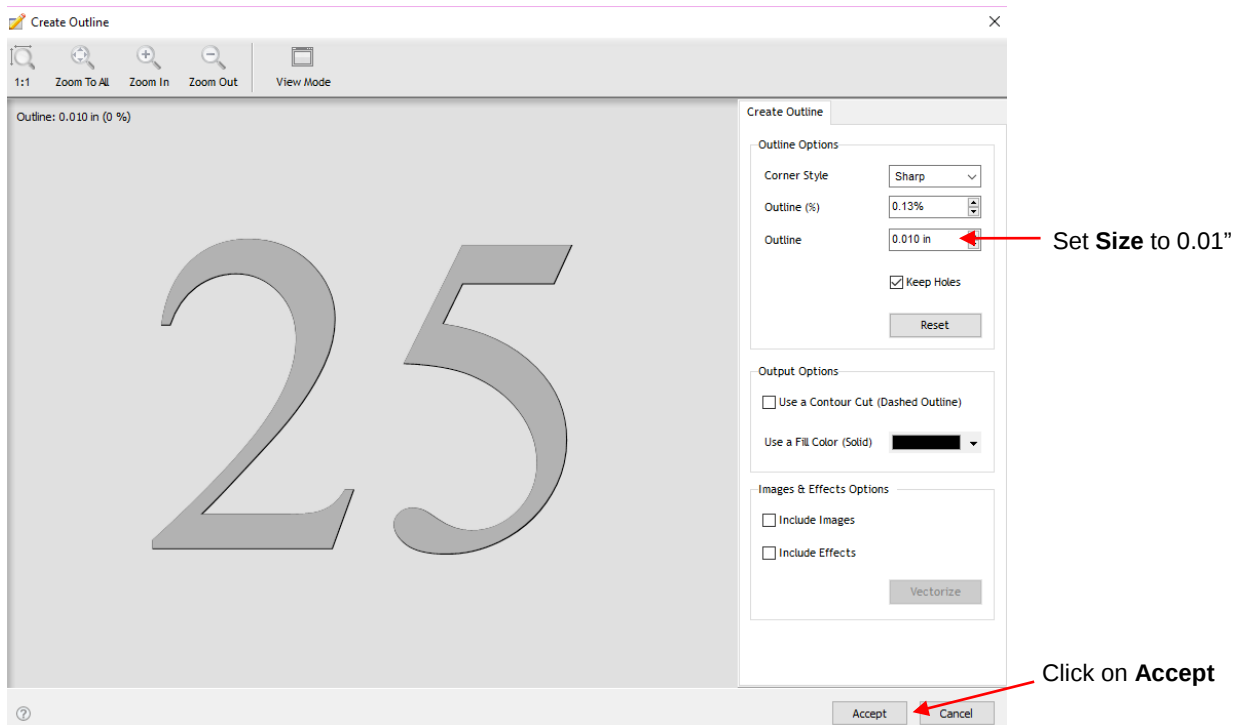
4.02.3 Embossing Paper or Cardstock

- When embossing paper or cardstock, it is recommended that you use an **Outline** effect to create several very small outlines at a thickness of, say, 0.01" (0.25 mm). These tiny offset lines will then produce a slightly thicker overall outline of your shapes. This works better than line-filled embossing which can stress the cardstock and cause wrinkling. Here are the steps:

- ◇ Create the shape you wish to emboss. In this example, the number 25 is used:

25

- ◇ Select the shape and click on the **Plugins** icon  and select **Outlining Module**. The following window opens:



- ◇ After clicking on **Accept**, use the **Objects** panel to select the new outline layer and repeat the process to add a second outline. Now you have three versions of the shape, each one slightly offset from the other. Thus, when using the embossing tool, this will result in a thicker outline made of this shape.
- ◇ **Important:** don't forget to mark the **Mirror** option in the **Send to be Cut** window (or apply **Arrange>Mirror & Rotate>Mirror Horizontally**) so that when you flip over the cardstock after embossing, the design will "read correctly."

4.03 Scratch Engraving

- The Skycut engraving tool can be used to engrave vellum, foils, acrylic, and most metals, including trophy labels, dog tags, and jewelry charms.



- On softer metals, you may not want the engraving tip too far above the metal as it can leave pock marks when it drops to start engraving. If possible, test on scraps first.
- Refer to the *Suggested Settings* table at the end of this chapter for **Force** and **Speed** settings on various materials. Note that in some cases you may want to use more than one pass for a deeper engraving.
- To design an engraving fill pattern, use the **Engraving Module**. Refer to *Section 5.03*

4.03.1 Engraving a Metal Tag

Video

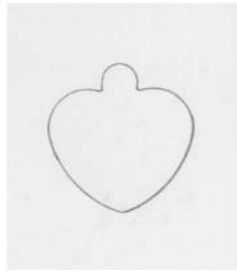
- When engraving items that are already cut (such as metal tags, trophy plates, charms, etc.), it's very important to have precise alignment before proceeding. Therefore, the camera on the Skycut will be used to set the origin for engraving. If you haven't already calibrated the camera, go to *Section 3.03*.
- The following is a list of the items you'll need for this kind of an application:
 - ◇ The item to be engraved
 - ◇ The Skycut engraving tool
 - ◇ Double sided tape to secure the item to the cutting mat. Thermo-web is perfect for this.
- Create a replica of the item to be engraved:
 - ◇ If it's something simple, like a square or a rectangle, use the basic shapes available in SignMaster:



- ◇ If it's not a shape that can easily be recreated in SignMaster, then trace it onto paper:



- ◇ Scan or photograph the trace and use the instructions in *Section 5.01* to import the scan and create a contour of the heart:



Imported scan



Tracing from **Create Contour Cut** window

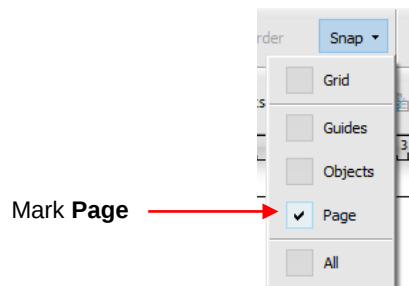
- ***IMPORTANT:*** Carefully measure the actual tag and compare it to the dimensions of the contour. Adjust the size of the contour if needed.
- Create the design. In this case both text and a vector shape of a bone are added:



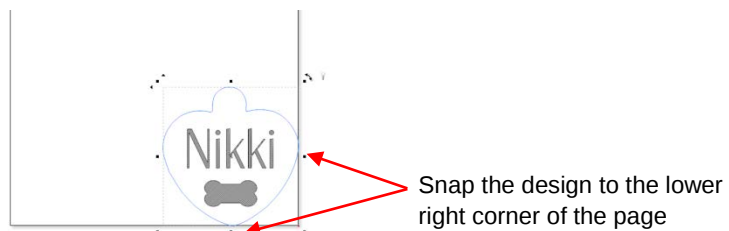
- Because a filled engraving is desired, select the text and the bone shape and use the **Engraving Module** to fill the design with lines. Details on this function are presented in *Section 5.03*.



- To arrange the design in the bottom corner of the **Page**, click on **Snap** in the middle taskbar and select **Page**:



- With both the heart and the design selected, drag to the lower right corner until it snaps to the right and bottom sides of the **Page / Drawing Area** (Note: to better illustrate placement on the page and later in the **Preview**, the design has been made much larger. In reality the design is only about an inch in size):



- Select only the design and not the heart tag shape. In the **Send to be Cut** window, mark the option for **Absolute (position)** so that the design will be positioned the same distance from the origin as it is from the corner of the **Page / Drawing Area**. Also, verify that **Assign Tools by Color** is not marked:

Check **Absolute (position)**

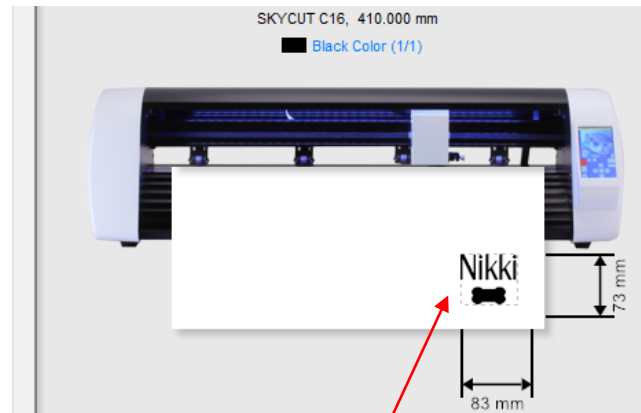
☐ Rotate
 ☐ Advance After Plot
☐ Mirror
 ☒ Absolute (position)
☐ Use Top Left Origin

General Options

☐ Registration Marks
 ☐ Separate by Color
☐ Assign Tools by Color

☐ Auto Speed-Weed
 ☐ Auto Weed-Box

Verify **Assign Tools by Color**
Color is not checked



Design is in same location
as on the **Page**

- Click on the **Cutter Control** tab and enter the settings for engraving:

Uncheck **Blade Offset**

☐ Blade Offset 0.40
 ☐ Cut holes first
 Passes 1
 Drag Knife (45deg) - Skycut 45 Degree Red Blade

Force / Speed Options

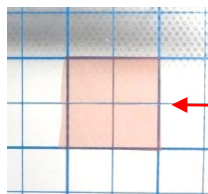
Preset Condition [] Reset

No Preset Selected...

☒ Force	44	g
☒ Down Speed	(9) 450	cm/s
☒ Up Speed	(9) 450	cm/s

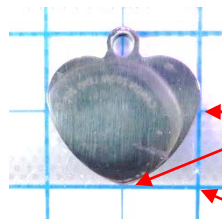
Change to settings for engraving

- On the Skycut, the metal tag needs to be very firmly attached to the cutting mat. Place strips of double-sided tape onto the mat, where the tag will be mounted:



Double sided tape is placed on the mat to cover the size of the tag (note: the pink liner hasn't yet been removed from the top of the tape)

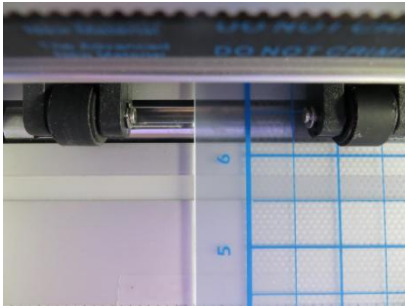
- When placing the tag onto the mat, align the rightmost side of the tag with a vertical grid line and the bottommost side of the tag with a horizontal grid line. The intersection of the two gridlines will be the origin for the engraving process:



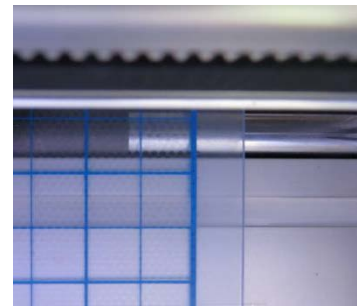
Align the tag with the grid lines on the mat

The origin will be set at this intersection

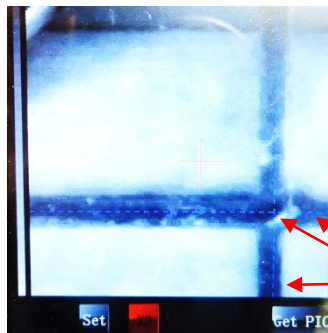
- Load the mat into the Skycut and be very precise in alignment by using the cutting strip to make sure the mat is perfectly straight on both sides:



Align the mat on both sides with the cutting strip



- Load the engraver into the Skycut using 15 Post-It notes, making sure the notes are on top of the tag.
- Move the cutting head so that the engraver tip is over the intersection of the two grid lines bounding the tag. Then use the camera instructions in [Section 2.05.1](#) to set the origin even more precisely by getting the [blue dashed +](#) in the middle of the grid intersection:



Blue dashed lines cross at grid intersection

- After clicking on **Home**, press down on the engraver and verify, once more, that the correct grid intersection was used. Back in SignMaster, click on **Cut Now** and the engraving process will be carried out.:



4.04 Settings Form for Accessory Tools

[illegible]

4.05 Suggested Settings for Various Accessories¹

Make sure **Blade Offset** and **Overcut** are set to 0; test with a small shape first; mirror shapes for embossing.

Tool Height = number of Post-It notes used to set blade tip distance above the material: Refer to *Section 2.01.3*.

Application/Material	Tool Used	Passes	Force	Speed	Tool Height	Surface	Other Comments
Drawing on Cardstock	Test pen	1	30	(11) 550	20	mat	
Embossing Cardstock - 65 lb (177 gsm) Recollections	Embosser - large end	4	80	(6) 300	10	Shelf Liner taped to mat	Used 2 shadow layers of 0.01" (0.25mm) to increase thickness; also tested Fun Foam taped to mat with same results
Engraving Acrylic	Scratch Engraver	1	110	(8) 400	20	mat	Used a Line Fill of 0.004" (0.1 mm)
Engraving Aluminum (36 gauge)	Scratch Engraver	1	20	(11) 550	15	mat	Used a Line Fill of 0.004" (0.1 mm)
Engraving Copper (36 gauge)	Scratch Engraver	1	30	(11) 550	15	mat	Used a Line Fill of 0.004" (0.1 mm)
Engraving Metal Tag (Al)	Scratch Engraver	1	44	(9) 450	15	mat	Used a Line Fill of 0.004" (0.1 mm)
Engraving Vellum	Scratch Engraver	1	38	(11) 550	15	mat	Vellum was medium weight
Scoring Cardstock - Georgia Pacific 110# index	Embosser - small end	2	155	(8) 400	20	mat	

5. SignMaster Functions of Interest

5.00 Quick Reference for Chapter 5

- How to add a contour cut: *Section 5.01*
- How to node edit a contour: *Section 5.01.2*
- How to add a contour cut to a vector image: *Section 5.02*
- How to fill a design with engraving lines: *Section 5.03*

5.01 Adding a Contour Cut Line to an Imported Raster Image

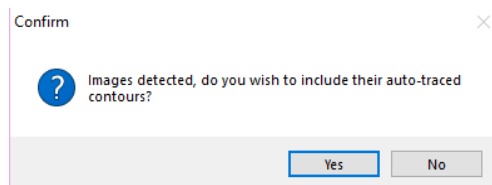
- Graphics such as JPG, PNG, and BMP files are often used for print and cut (contour cut) applications. Because these types of files are raster images (versus vector images), the images must be traced. This is done through a process called vectorization.

5.01.1 Step-by-Step Tracing Process

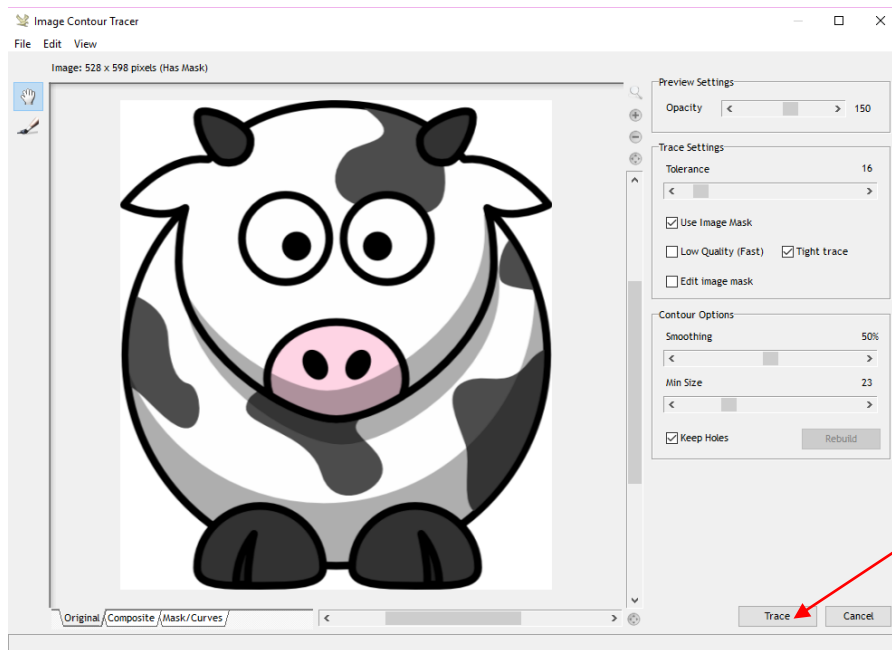
- The following steps are a sample tutorial using the **Create Contour Cut** feature in SignMaster:
 - (1) For this project, go to [this link](#). After extracting, you will find several images that can be used as easy samples for tracing.
 - (2) To import a graphic file, go to **File>Import>File** and select the graphic to be traced. Left click anywhere in the **Drawing Area** to place the image:



- (3) With the graphic selected, click on the **Contour Cutting** icon  and select **Create Cut Contour**. A popup window will open and you will respond **Yes**:

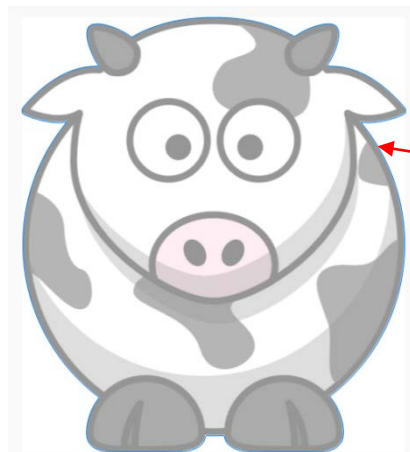


- (4) The **Image Contour Tracer** window displays the various settings available for adding a cut line to the graphic:



Click here to trace at current settings

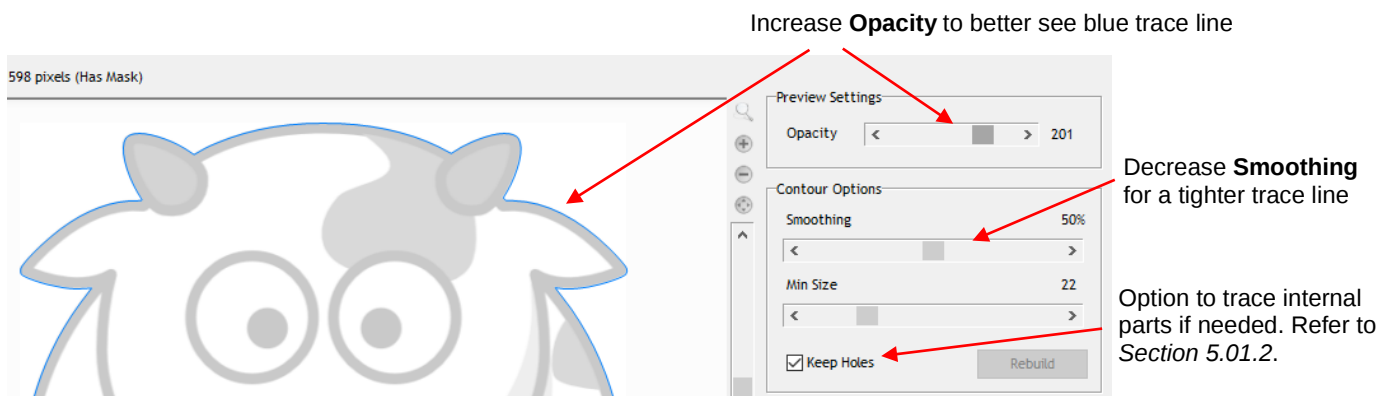
- (5) Without making any changes, click on the **Trace** button to get a preliminary trace which will indicate which settings, if any, need adjustment. The blue line indicates what will cut based on the default settings shown:



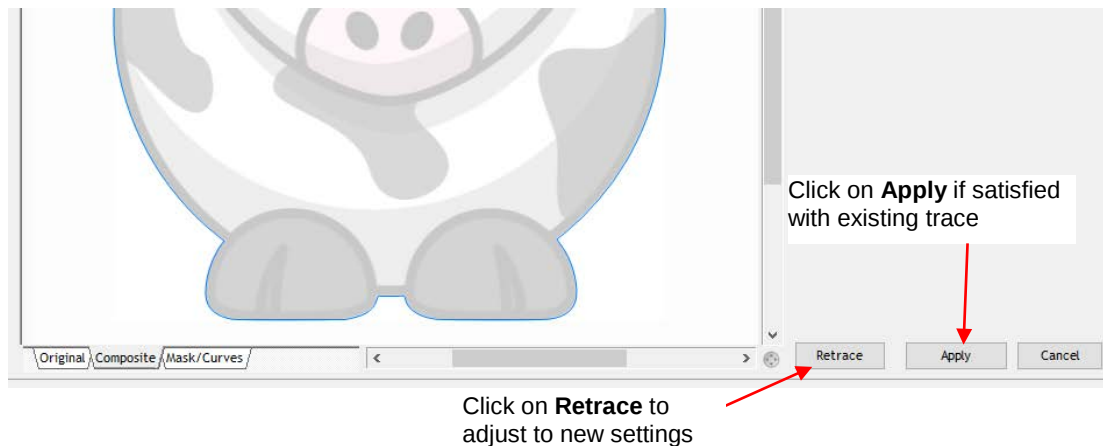
Carefully check blue cut line:

- Are all needed parts traced?
- Is trace line a tight enough fit?

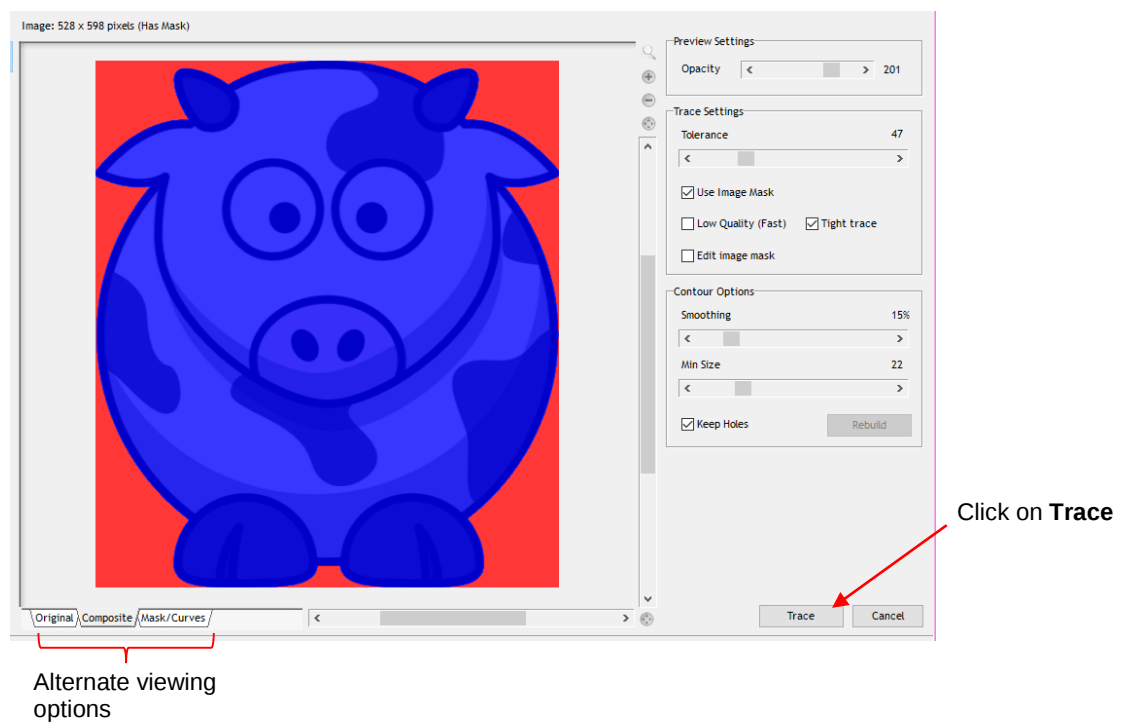
- (6) To see the trace line a little more clearly, adjust the **Opacity** setting at the top. If the “fit” isn’t tight enough, decrease the **Smoothing** setting. After making changes, click **Retrace** to return to the original tracing window and then click on **Trace** again:



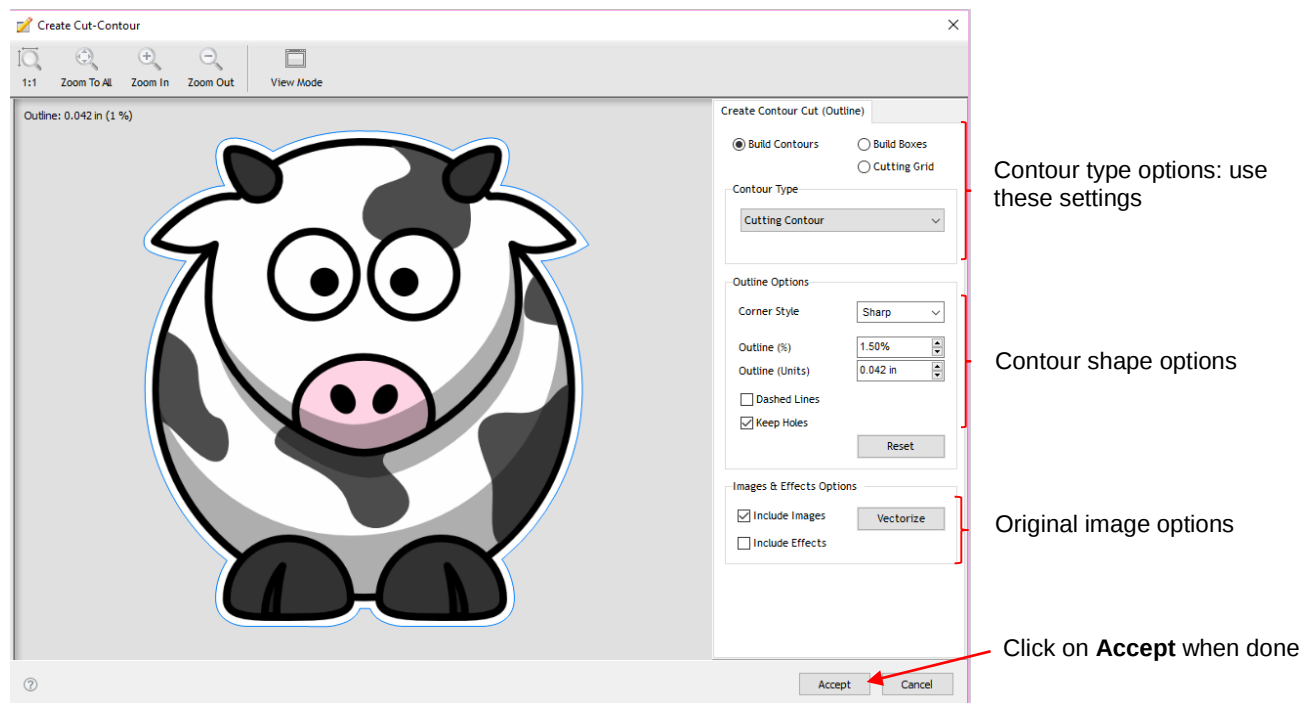
- (7) After making any changes, click on **Retrace** at the bottom of the screen. On the other hand, if you are happy with the trace results, click on **Apply**:



- (8) If you selected **Retrace**, a **Composite** view of the results will appear where blue indicates the part that will be cut out and red indicates the waste material. You can go back to seeing the prior view by clicking on the **Original** tab at the bottom. Click on **Trace** to apply the new settings.

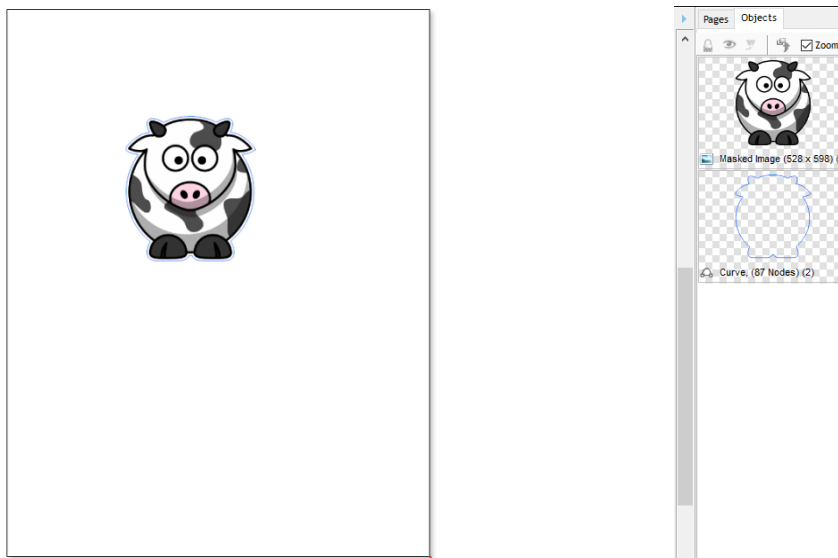


- (9) After clicking on **Apply**, a new group of settings appear, giving you additional options such as:
- ◇ Whether the cut line is continuous or perforated
 - ◇ Whether the cut line fits the image tightly, or is offset a distance or inset a distance
 - ◇ Whether internal cut paths should be removed
 - ◇ The cornering shape of the contour cut (rounded, beveled, mitered, etc.)



- ◇ Choose a **Corner Style**, as desired. For the **Outline %** or **Outline Units** (size), note the following:
 - Set to 0 if the cut line should align with the edges of the printed image
 - Set to a positive number for a contour cut around the outside of the printed image
 - Set to a negative number (normally very small) to cut slightly inside the printed image

(10) Click on **Accept** after making any changes and you will be returned to the **Drawing Area**. If you click on the **Objects** tab on the **Page Thumbnail Viewer**, you will now see both the original image and the contour cut line:



- To print and cut this type of design, refer back to *Sections 3.03* and *3.04*.

5.01.2 Editing a Trace

- Occasionally you may find a need to edit the tracing/contour cut created. This section presents two examples.
- Contour cut doesn't fit the original graphic in certain spots

◇ In the following example, the *Cartoon Owl* image will be used:

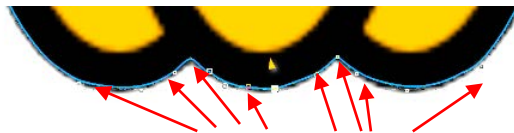


◇ During the process of tracing, it was found that the bottoms of the owl's feet weren't rounded like in the original image. Even trying different adjustments to **Smoothing** didn't result in the desired fit. Note that a slight inline was applied to improve the accuracy of the fit but the bottom of the feet still need tweaking:



Trace line is flat along the bottom of owl's feet

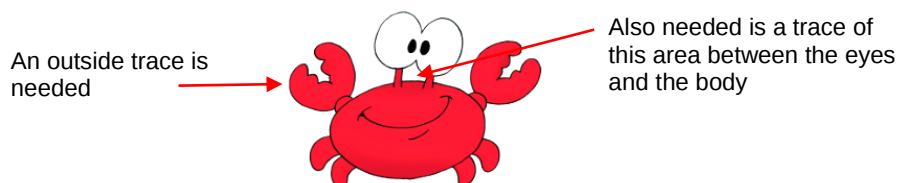
◇ With the trace line selected, click on the **Node Edit Tools** icon  and the nodes making up the path of the cut will appear. Drag nodes, as needed, so that curves are formed:



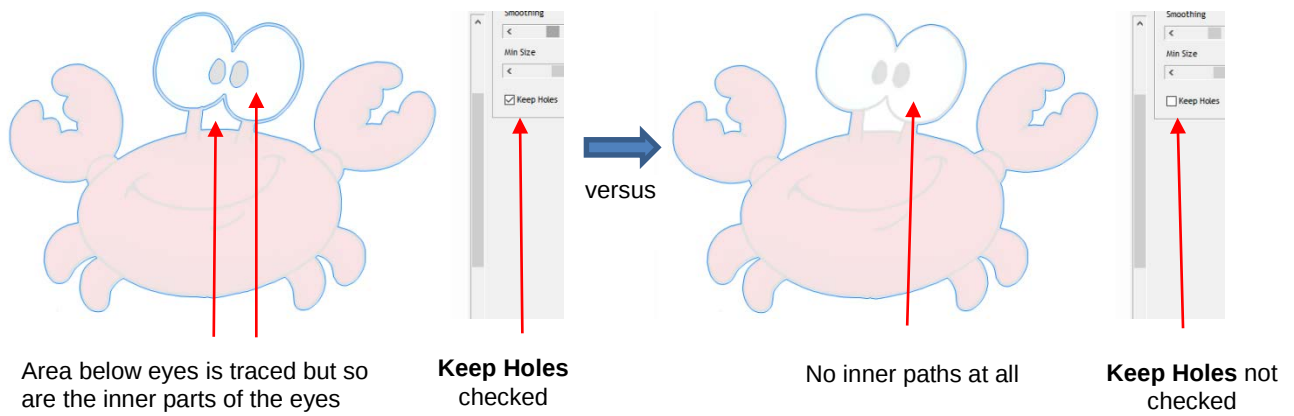
Drag nodes to create curves

- Contour cut contains paths you want deleted

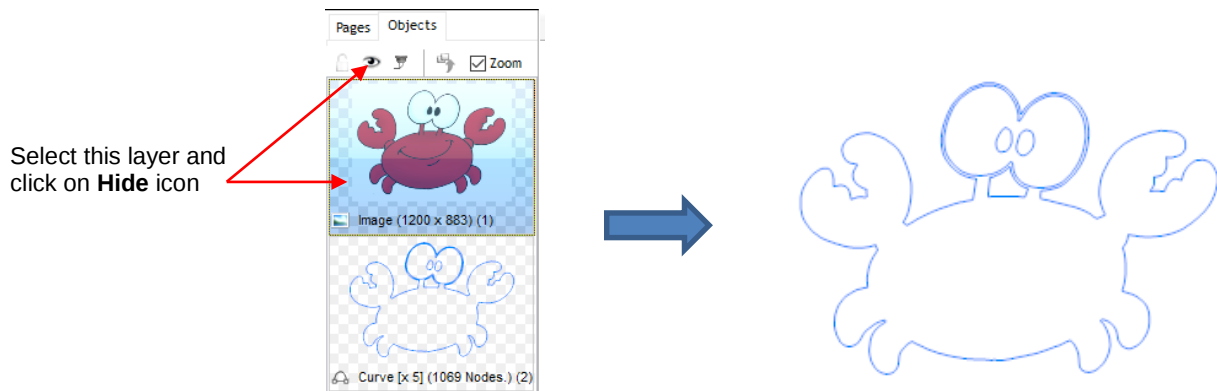
◇ In the following example, a crab cartoon from *Doodle Dragon Studios* is traced:



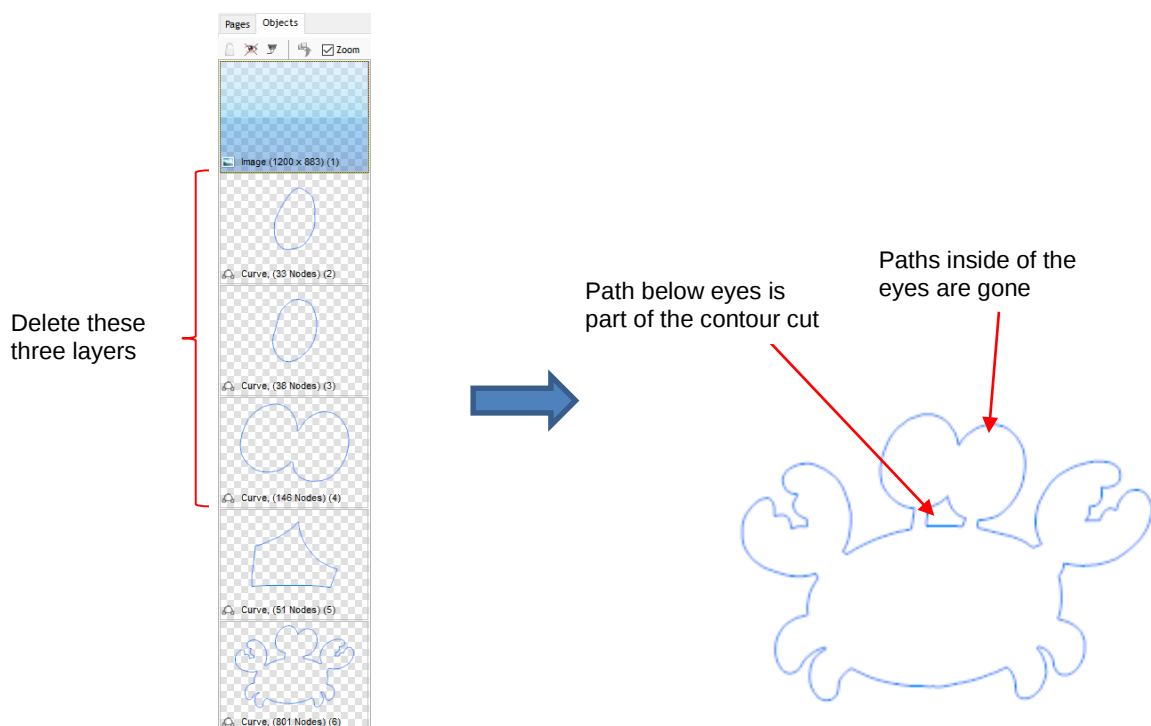
◇ The issue in this example is that the space below the eyes should be cut out but not other internal shapes, such as the pupils of the eyes. Note the difference in what will be cut between marking and not marking the **Keep Holes** option in the **Create Cut-Contour** window:



- ◇ The first option, **Keep Holes**, needs to be selected so that the area beneath the eyes is traced. After accepting the trace, click on the **Objects** tab on the **Page Thumbnail Viewer** and hide the original graphic. You will now only see the contour in the **Drawing Area**:

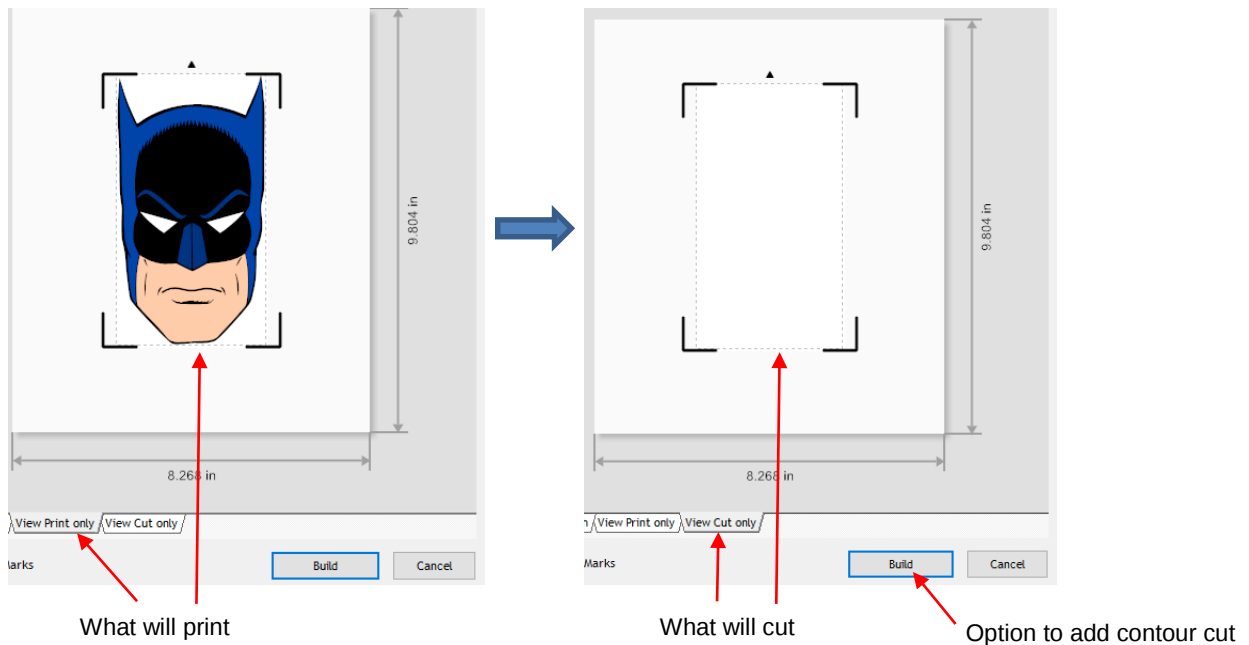


- ◇ Select the contour and go to **Curves>Break Apart**. The individual paths will now be separate layers on the **Objects** tab and you can delete each one that is not needed:



5.02 Adding a Contour Cut to a Vector Image

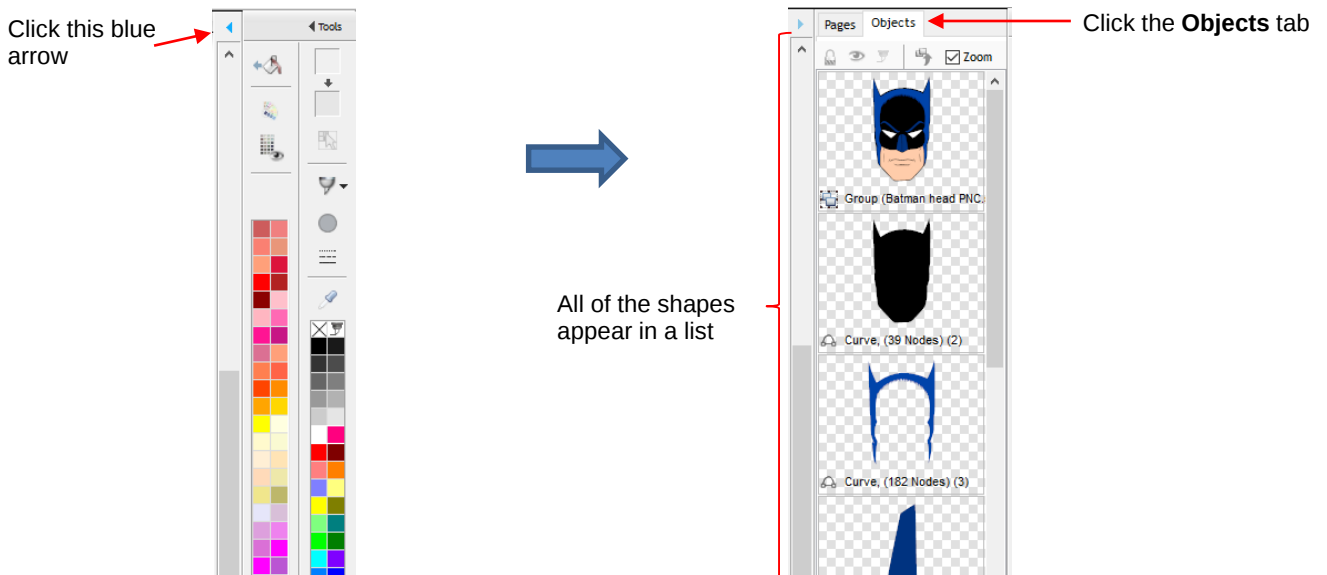
- As mentioned in *Section 3.05.2*, vector images require a contour cut assignment in print and cut applications. For example, the following Batman SVG file is imported into Signmaster and then the **Contour Cut Wizard** window is opened. Note that comparing the **View Print only** preview with the **View Cut only** preview indicates that the vector file is ready to print but there's no cut line for the design:



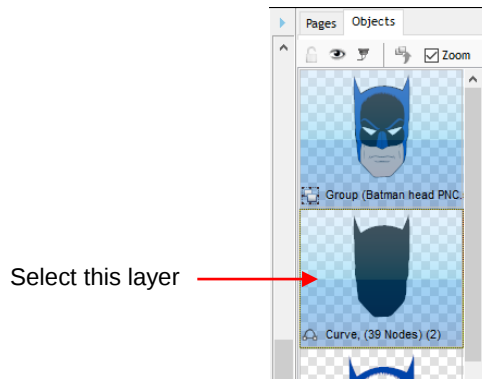
- There are two situations to consider:
 - ◇ A contour cut will be added to follow the printed design (*Section 5.02.1*)
 - ◇ A contour cut will be added and it will be offset from the printed design (*Section 5.02.2*)

5.02.1 Contour Cut Which Follows the Printed Design

- Upon importing the SVG file, open the **Objects** tab of the **Page Thumbnail Viewer** to display the various shapes in the file:



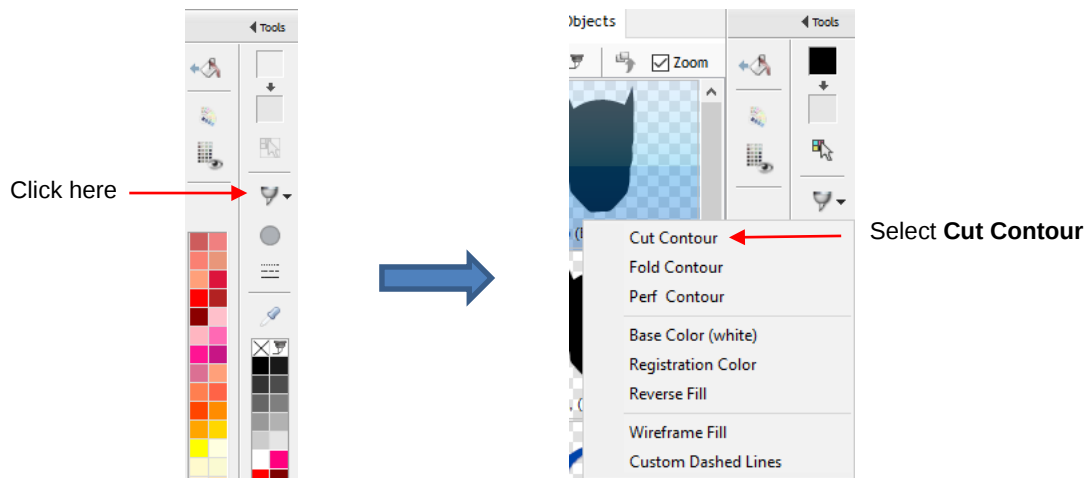
- From the **Objects** list, click on the shape which represents the contour cut line you wish to use. In this example, it is the black shadow layer:



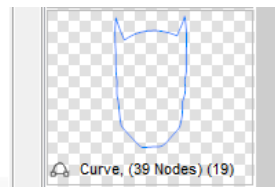
- With that layer selected, go to **Edit>Duplicate**. A new layer will appear at the bottom at the **Objects** list and, thus, will now be arranged on top of the project:



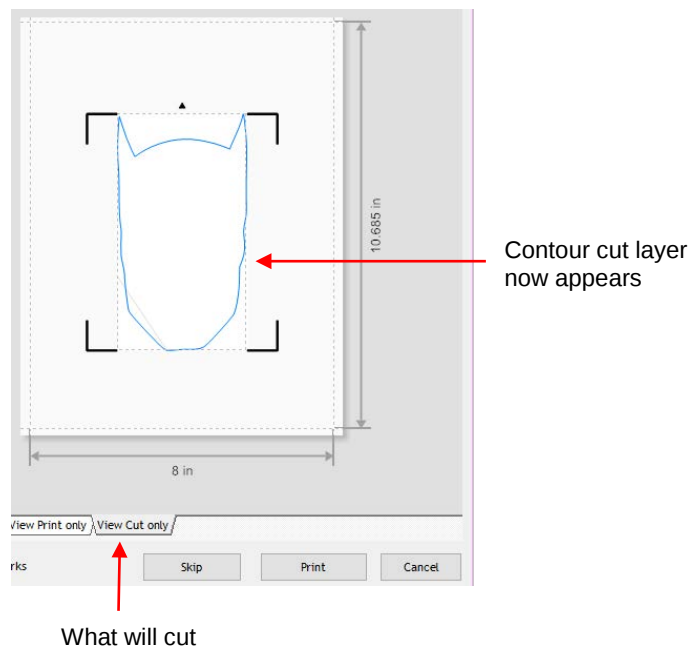
- This new layer will also be selected. To assign it as the contour cut, click on the **Custom Fill** icon that is located on the **Palette** and select **Cut Contour** from the drop-down menu:



- This newly assigned contour cut layer is given an invisible fill color and will no longer appear on top of the imported project.

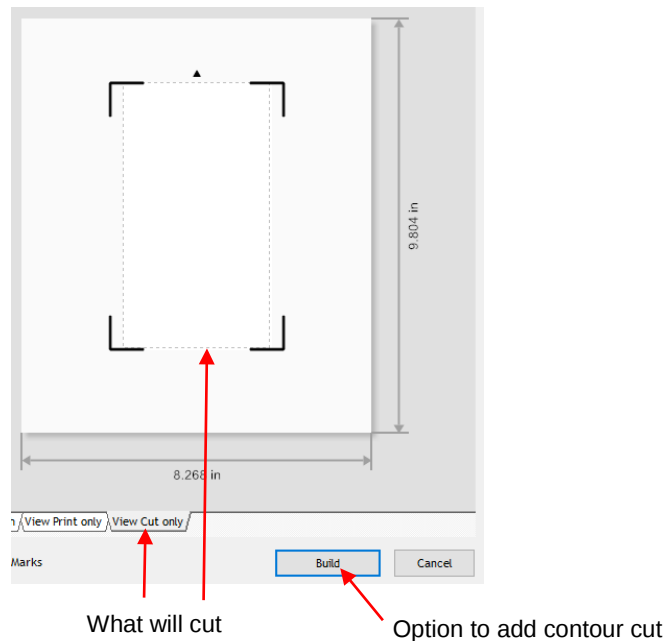


- If you now go to the **Contour Cut Wizard**, you can verify that this new cut layer exists on the **View Cut Only** tab:

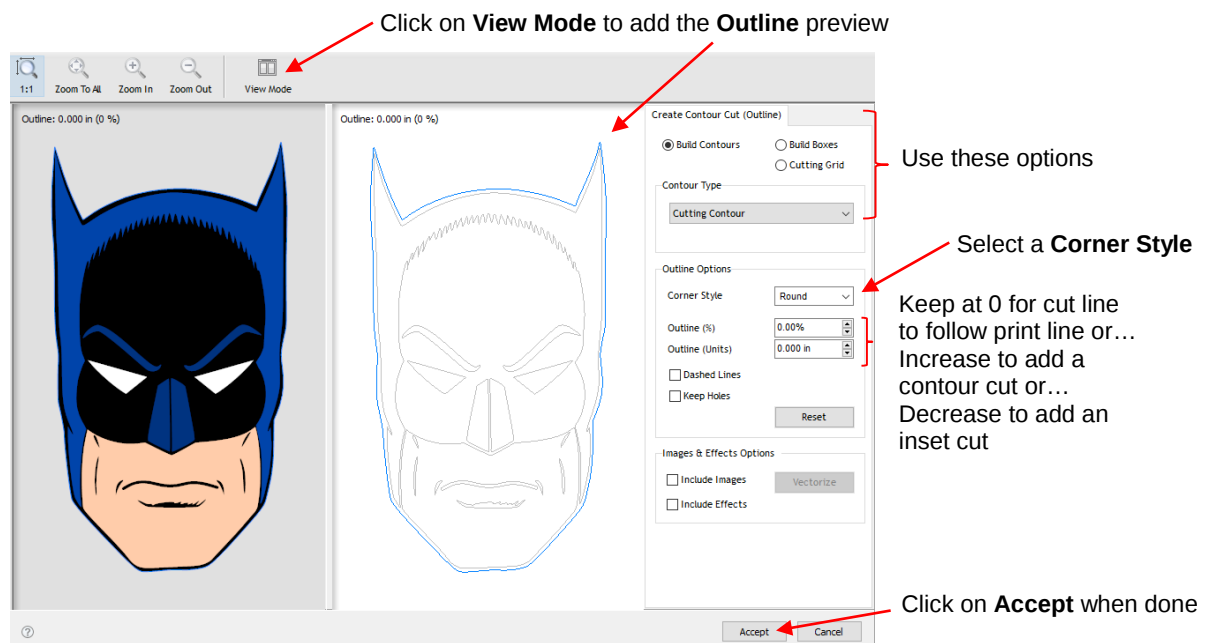


5.02.2 Contour Cut Which Is Offset from the Printed Design

- This section presents the method to be used when the contour cut is not one of the existing vector shapes. While this section accesses the **Create Cut-Contour** window from within the **Contour Cut Wizard** window, note that the same process can be applied by adding the contour from the main screen as was done in *Section 5.01* (i.e. select shape and go to **Contour Cutting>Create Cut Contour**).
- In the earlier screenshot, SignMaster recognizes there is no contour to cut on the **View Cut only** tab and offers the option to add one using the **Build** button below the preview.

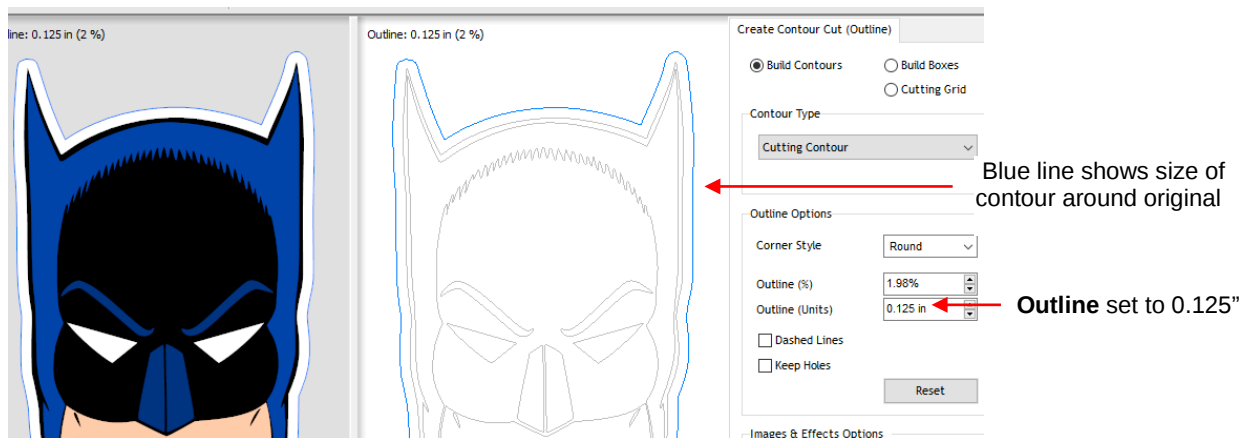


◇ Clicking on **Build** opens the **Create Cut-Contour** window:

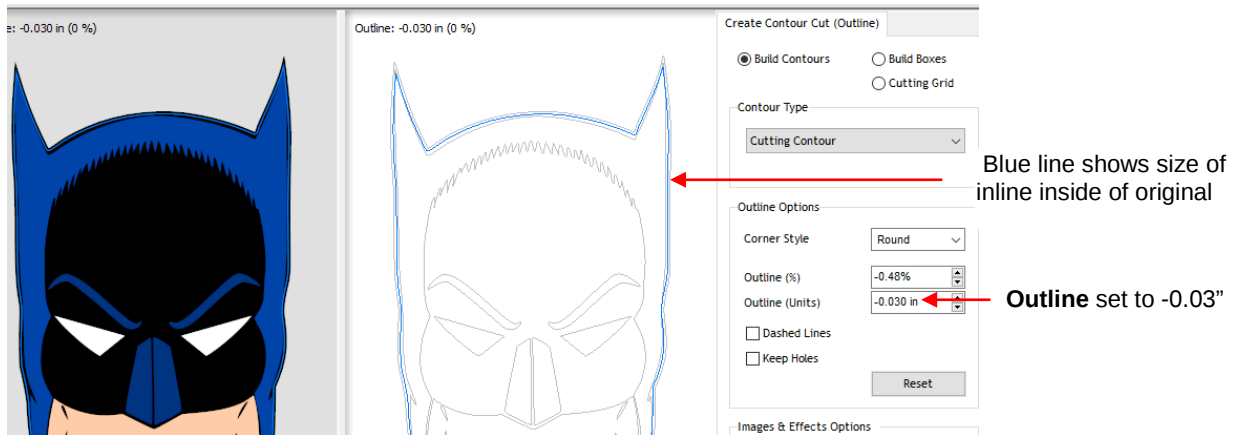


- o **Corner Style:** Usually select either **Round** or **Sharp** depending on the nature of the original vector and your desired contour
- o **Outline (%)** or **Outline (Units):** Enter either a percentage or the actual size for the outline. In the prior screenshot, leaving the **Outline** at 0 results in the contour being the same as the original outside vector line. This would result in the same contour cut as was created in the prior *Section 5.02.1*. For an outset cut around the printed image, increase **Outline** to the desired size. For in inset or inline cut, decrease **Outline** slightly so that it's a negative number:

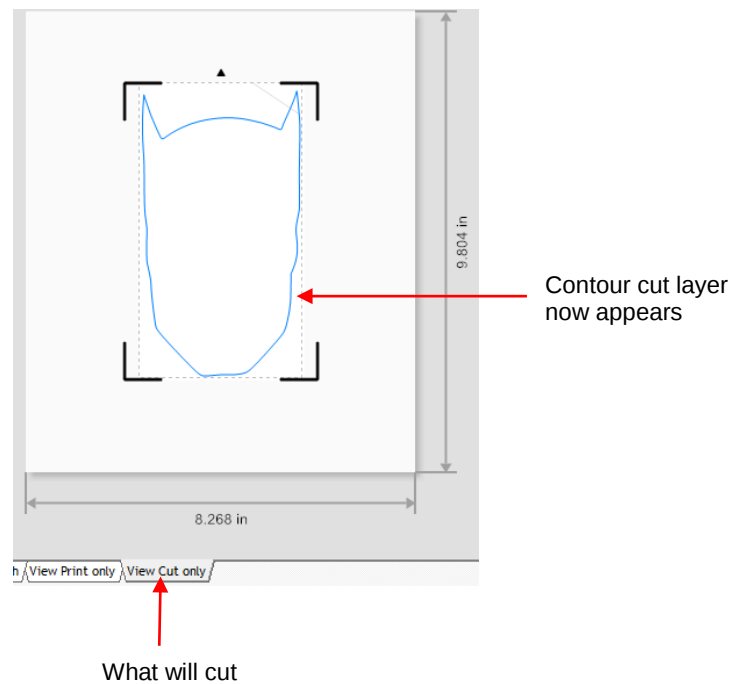
- **Outline** is set to 1/8 (0.125) inches:



- **Inline** is set to -1/32 (0.03) inches:

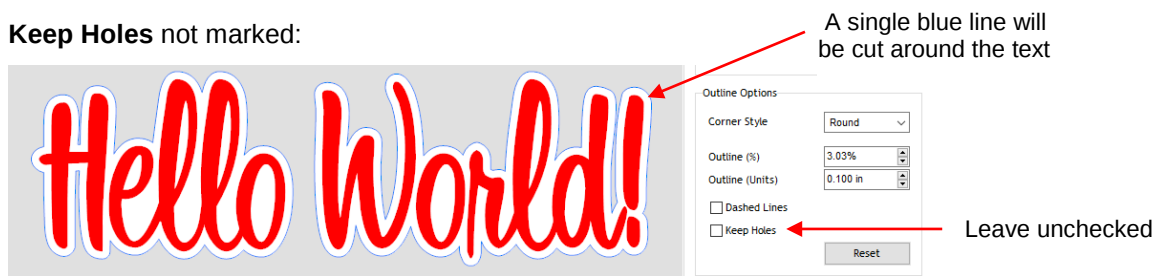


- ◇ After clicking on **Accept**, the **View Cut only** preview now indicates a cut path exists and you're ready to proceed:

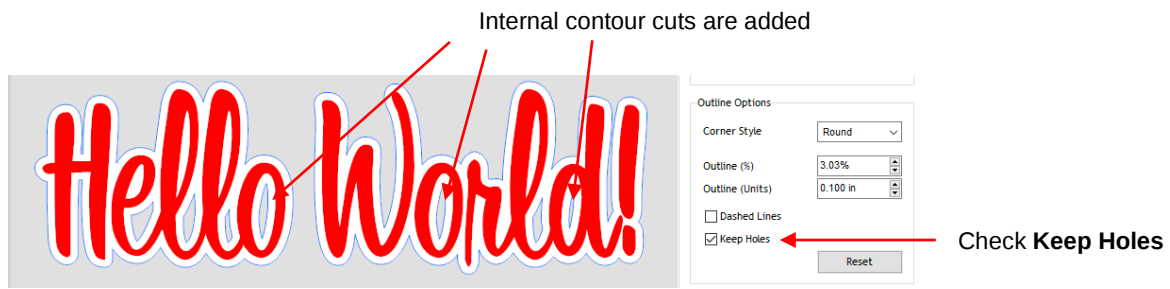


- Note that text is also a vector shape, thus the contour cut on a text object would be created the same way.
- Also note that there is a **Keep Holes** option in the **Create Cut-Contour** window which controls whether or not the contour is a solid outside cut or contains internal cuts following the shape of the vector:

- ◇ **Keep Holes** not marked:

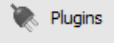


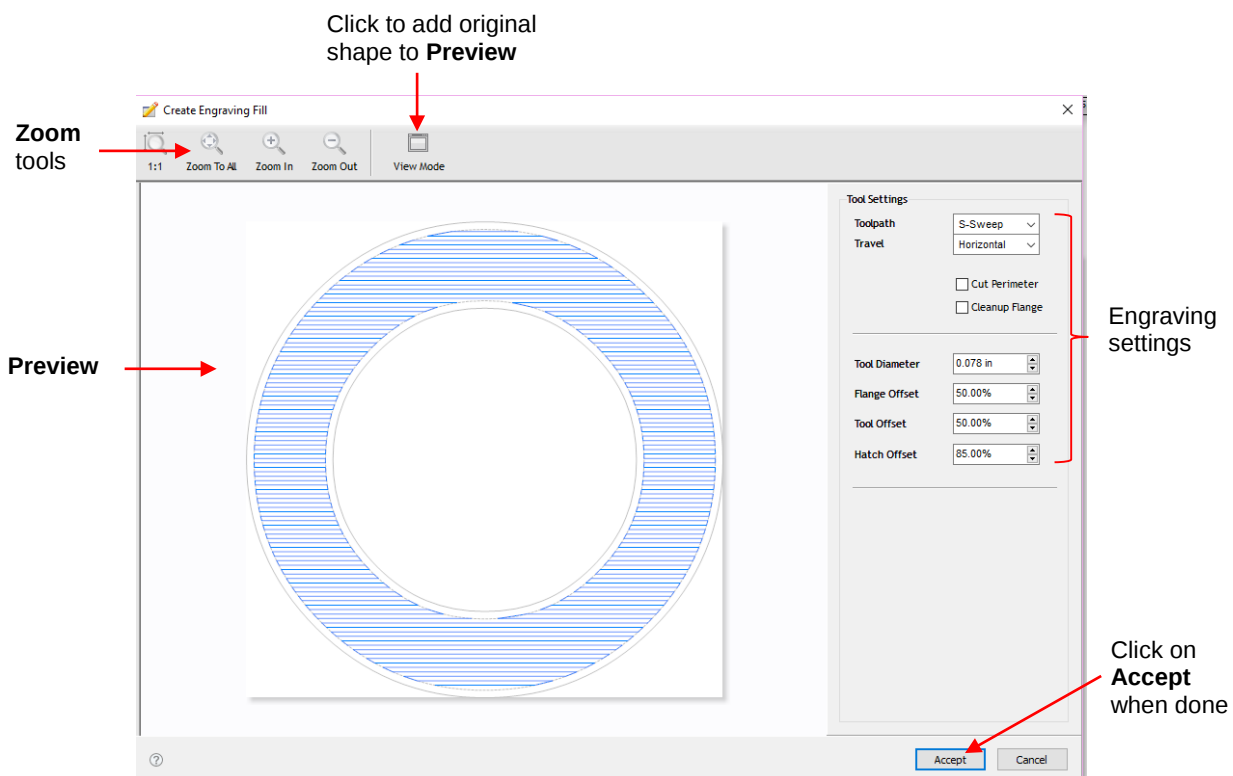
- ◇ **Keep Holes** marked:



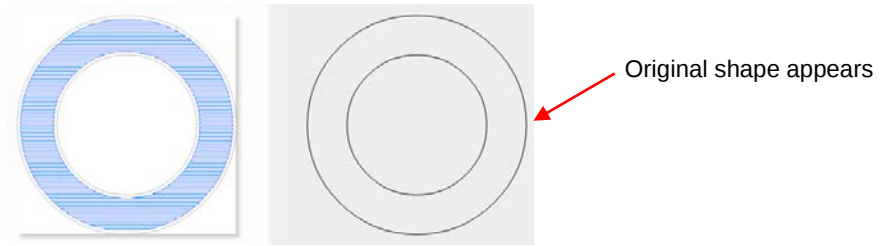
5.03 Engraving Fill

5.03.1 Engraving File Module and Settings

- If you wish to fill in a shape with a line pattern, SignMaster offers an **Engraving Module** which can be opened by clicking on the **Plugins** icon  and selecting **Engraving Module**.
- The following window opens and you will see your selected shape has already filled with lines:

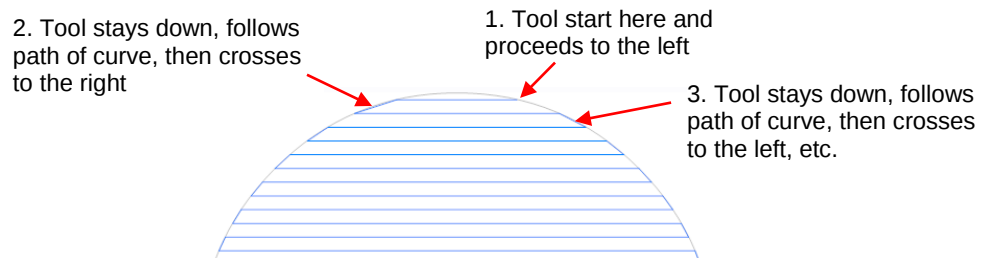


- ◇ In the top left corner are zooming tools. The **View Mode** icon can be toggled to add the original selected shape to the **Preview** window, if desired:

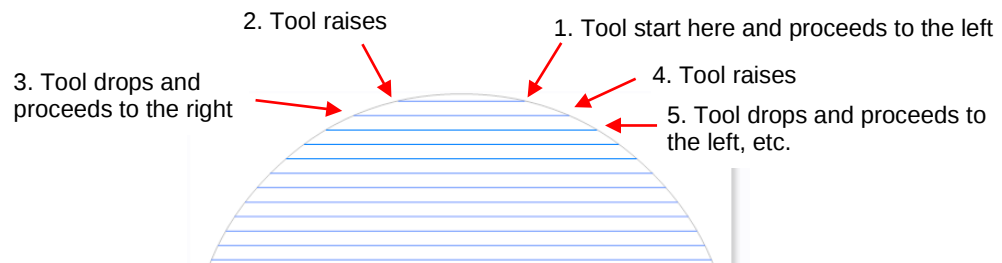


◇ **Toolpath:** There are four options in this menu:

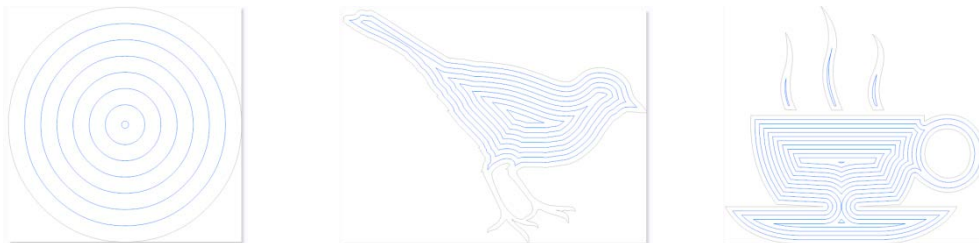
- o **None:** no fill pattern is created
- o **S-Sweep:** a line fill pattern in which the tool stays down while filling the entire shape:



- o **Line Fill:** a line fill pattern in which the tool raises at each side, moves a “row” down, and then proceeds to the other side:

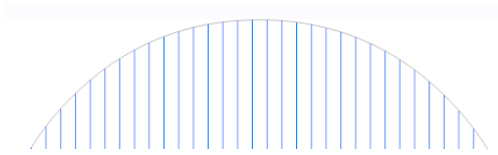


- o **Island Fill:** a progressive inset pattern based on the original shape; the tool drops to complete a path, raises, moves to the next path, drops to complete that path, etc.. Some shapes work better than others with an **Island Fill**:

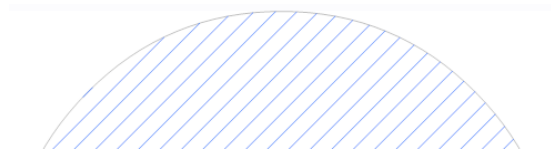


◇ **Travel:** four angles from which to choose, applying only to **S-Sweep** or **Line Fill** patterns:



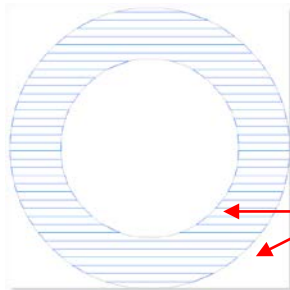


Vertical



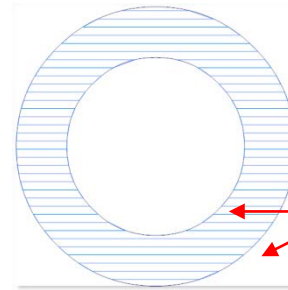
Diagonal - Down

- ◇ **Cut Perimeter:** turn on this option if you want the original shape to be engraved as well:



Cut Perimeter: not checked

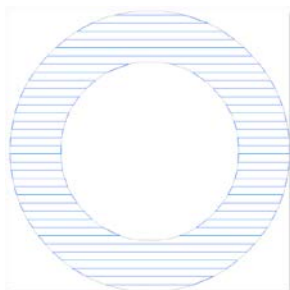
Perimeter of shape is light, indicating it will NOT be engraved



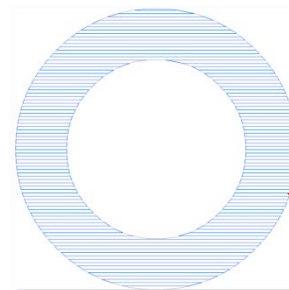
Cut Perimeter: checked

Perimeter of shape is dark, indicating it will also be engraved

- ◇ **Cleanup Flange:** turn on this option to have an engraving of the original shape, but along the edges of the engraving lines. Note that there is also a **Flange Offset** setting which is a percentage distance from the original shape to the engraving lines. These settings are typically not needed with small diameter tools, like the Skycut engraver, so you most likely won't have a need to activate **Cleanup Flange**.
- ◇ **Tool Diameter:** The size of the engraving tip, pen nib, embossing tip, or other tool. For the Skycut engraver, use 0.004 inches or 0.1 mm.
- ◇ **Tool Offset:** This setting is the distance between the engraving lines as a percentage of the **Tool Diameter**. Lowering this setting will decrease the spacing between the lines:



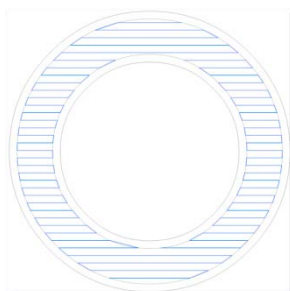
Tool Offset: 34%



Tool Offset: 15%

Engraving lines are much closer together

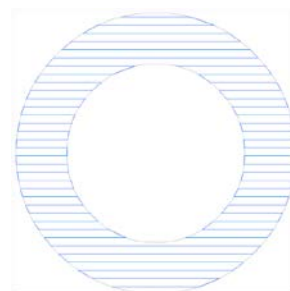
- ◇ **Hatch Offset:** This setting controls the distance from the engraving fill to the outside perimeter of the original shape, again as a percentage of the tool diameter. A setting of 0% will extend the pattern all the way to the perimeter:



Hatch Offset: 35%



Hatch Offset: 25%



Hatch Offset: 0%

5.03.2 Inside Fills Versus Outside Fills

- In certain situations, you might want to reverse the parts of a design that are filled. To do this, add any outside shape to the design, such as a rectangle, an oval, a heart, etc. The engraving fill automatically fills the space between this new outside shape and the original design.

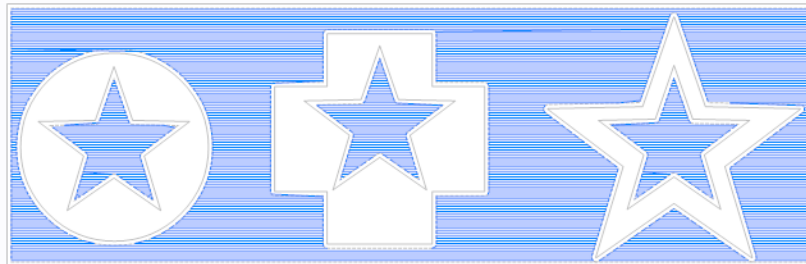
- ◇ For example, if three stars are sent to the **Engraving Module**, then they will immediately fill with lines such as this:



- ◇ If shapes are added around these stars, then the fill pattern reverses to fill the space between the original shapes and the new outside shapes:



- ◇ If another shape is added to the outside of these shapes (a large rectangle is added to encompass the three shapes), then the fill will revert back to the original stars and a line fill is added between the rectangle and the outside shapes that were added:



- If, for some reason, you want the outside shape present but NOT have the area between the two shapes filled, then only select the initial shapes (i.e. the stars) to send to the **Engraving Module**.

Appendix A Troubleshooting FAQ's

A1 Communication Issues

I cannot get the Skycut to power on.

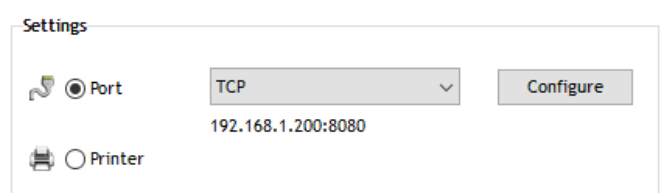
- Make sure the power cable is securely plugged into the adaptor.
 - Make sure the adaptor light is a steady blue light and it is plugged securely into the Skycut.
 - If you still cannot get the Skycut powered on, contact your dealer.
-

I cannot power off the Skycut.

- Press and hold the power button until the light shuts off.
-

I cannot get Wi-Fi to work with my Skycut.

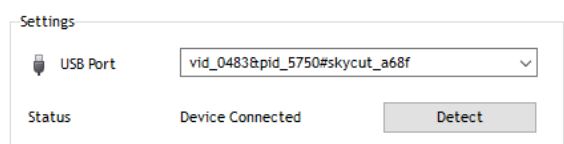
- Set the Skycut close to the router when performing the initial setup presented in *Section 1.12.2*. After establishing communication, you can test how far the Skycut can be located from your router.
- In SignMaster's **Vinyl Spooler** window, under the **Connection** tab, make sure you have selected **TCP** and entered the same **IP address** you selected during setup on the Skycut's control panel:



- Make sure your computer is connected to the same router as your Skycut.
 - Verify that SignMaster is the selected software on the control panel under **Set>Sys Information**.
-

I cannot get USB to work with my Skycut.

- Unplug/replug the USB cable at both the computer and at the Skycut.
- In SignMaster's **Vinyl Spooler** window, under the **Connection** tab, make sure you see **USB Port** and the **Status** says **Device Connected**. If not, repeat the instructions in *Section 1.12.1*.



- Try a different USB port on your computer.
 - Verify that SignMaster is the selected software on the control panel under **Set>Sys Information**.
 - Try a different USB cable.
-

*I had to cancel a cut. Now my Skycut is no longer responding when I click on **Cut Now**.*

- Try restarting the Skycut and SignMaster.
-

A2 Operating Issues

The control panel isn't responding very well.

- Press control panel icons with your finger and not your fingernail. You can also use a black rubber stylus.
 - Make sure the control panel is clean.
-

My mat is rotating when the Skycut starts to cut!

- Two pinch wheels need to be gripping the mat. Move the mat either left or right so that it is under two outer pinch wheels and the pinch wheels are aligned under white arrows. Refer to *Section 1.09*.
 - Make sure you are not trying to force the blade to cut too deeply and/or too quickly through a thick/dense material like chipboard or craft plastic. Slow the speed, decrease the **Force**, and add more passes.
-

My vinyl isn't feeding evenly while cutting. It starts bunching up on the inside of the end cap.

- Even if you feel the vinyl is aligned properly at the start of the cut, a slight "out of alignment" error will become more pronounced with a long cut. When you first drop the pinch wheels, use the arrow keys to feed the vinyl for the length of the cut to make sure it is feeding straight. If not, then about half-way through the length of the vinyl needed, lift the pinch wheels and realign the vinyl. Continue testing the alignment until you can verify that the vinyl is sufficiently aligned for the entirety of your project.
-

The pinch rollers are not tight enough to hold the vinyl I'm cutting. The vinyl is slipping and rotating when I start the cut.

- The pinch wheels need to be over grit shafts (the dark gray rough areas along the revolving shaft. The white arrows will help you align the pinch wheels in correct locations. Also, use outside locations versus having, say, one pinch on the far right of the vinyl and a second pinch wheel only in the middle.
-

I hear a terrible stuttering sound when trying to cut chipboard (or other thick dense material).

- That can be a symptom of forcing the blade to cut too deeply and/or too quickly through the chipboard. Slow the speed, decrease the **Force**, and add more passes.
-

I'm trying to do a PNC application and the camera can't read the marks.

- Make sure you have calibrated the Skycut's camera. The procedure is covered in *Section 3.03*.
 - On the control panel, go to **Set>Camera** and press **Set**. Make sure the **Auto PNC** option is marked.
 - If using the cutting mat, make sure the printout is aligned fairly straight on the cutting mat and the mat is fairly straight in the cutter.
 - Make sure the blade holder is over the lower right registration mark when starting the cut.
 - Are the registration marks printed dark with no streaking or missing ink?
 - Did you make any changes in the **Contour Cutting Wizard** after printing and before trying to cut?
-

The Skycut stopped during a cut.

- If the Skycut stops with the head over on the left side of the cutter, you have most likely exceeded the cutting range. Several things to consider:
 - ◇ Check the width (**W**) of your project (or the height **H** if in **Landscape** mode). It cannot exceed 16".
 - ◇ Check how far you are moving the head to the left when setting the origin. If your project is 15" and you moved the head more than 1" to the left, you will send the cut out of range and the cutter will stop.
 - If the Skycut stops and the head is not located near the left side:
 - ◇ Make sure it's not a communication issue.
 - ◇ You may have exceeded a buffer limit. Try reducing the number of nodes. Select the shapes and go to **Curves>Node Editing>Reduce Nodes (Object)**.
-

A3 Cutting/Drawing Issues

My shapes are drawing (cutting) off the material. What am I doing wrong?

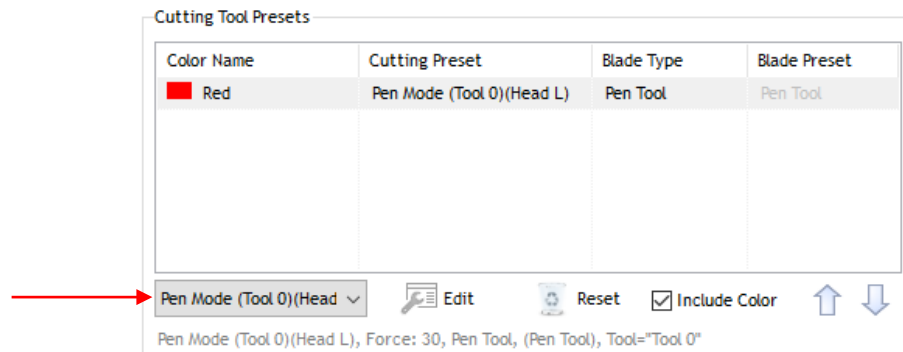
- When setting the origin, make sure you are using the tip of the blade as the reference point and set the tip inside the corner of the material (not too close to an outside edge).
 - Verify that the preview window in SignMaster matches where you expect the shapes to cut as you view the material loaded into the Skycut itself.
-

When drawing with the test pen (or cutting with the blade holder), I have extra lines being drawn (or cut).

- Make sure you raise the pen (or blade holder) in the blade holder seat on the Skycut before tightening the screw. The blade holder seat needs to be able to drop the tool down when it reaches the spot to start the shape. Otherwise, the tool tip will be dragging across the material from the origin to where the shape will begin and then back to the origin at the end of the "cut".
-

I'm drawing with a pen and there are bubbles at the corners.

- For perfect corners when using a pen, go to the **Send to be Cut** window and select **Pen Mode** so that **Blade Offset** is set to 0. You do not need an offset for pens (or other tools like embossers and engravers).



My cut started out fine but by the end of the cut, it's not cutting through the material.

- Make sure the blade holder housing doesn't have any bits of material inside of it.
- Make sure the screw on the blade holder seat is tight so that the blade holder isn't slipping upwards during the cut.
- Make sure the cutting mat is clean and sticky and the material is pressed down completely, so that the material remains stabilized during the cut.
- Make sure the blade isn't cutting too deep into the mat. This can sometimes cause the material to be pulled up and away from the mat as the blade releases from the plastic it is cutting.
- Try increasing the cutting force by ~ 5 – 10.

My cut is clean in some places but not in others. Why am I not getting consistent cutting?

- Try raising the blade holder in the blade holder seat. If the blade is too close to the material, not enough force is being applied. Refer to *Section 2.01.3, Set the Blade Height Above the Material*.
- Make sure your material is pressed firmly onto a clean and sticky mat (assuming you are cutting a material such as paper or cardstock).
- Your material may require two passes if it's not homogenous or if it is heavily textured. Sometimes intricate shapes also cut better with two passes.
- Also, if the material has been exposed to humidity, then it will become difficult to cut in one pass. You can dry both paper and cardstock using a blow dryer or in a very low-temperature oven.
- If you are cutting vinyl without a cutting mat, check the cutting strip to make sure it is still in good condition.

I have the outside edges of my chipboard completely taped but I'm not getting clean cuts, even after lots of passes.

- Taping the edges prevents shifting of the chipboard but it's not enough for stabilizing. You need to thoroughly press the entire surface of the chipboard onto a clean and sticky mat. Using a brayer is recommended.

I am getting a lot of tearing in my cuts.

- A number of things can cause tearing so work through this check list:
 - ◇ Too much blade is exposed. If you see cut lines in your mat or the backing sheet, shorten the blade exposure. You should only be cutting through the material itself.
 - ◇ The blade is chipped. Try a different blade.
 - ◇ The paper is not adhered well to the mat. Make sure the mat is clean, sticky, and the paper is pressed smoothly and evenly on the surface.
 - ◇ You may be using too much cutting force. Try reducing it and doing test cuts.
 - ◇ You may have too many nodes in the shape. Select the shapes and go to **Curves>Node Editing>Reduce Nodes (Object)**.
 - ◇ The material itself may be subject to tearing, especially on intricate cuts. Also, if the cardstock has been exposed to humidity, then the moisture in the material can make it difficult to cut cleanly. You can dry paper and cardstock using a blow dryer or in a very low-temperature oven.
-

I'm cutting very small lettering and the letters are a bit distorted.

- Verify that you are using the correct **Blade Offset**.
 - Try slowing down the cut. Small lettering needs slower speed.
-

My cut shapes are not the same dimensions as what they are set to in SignMaster.

- Perform the calibration procedure shown in *Section 2.08*.
-

My shapes are not completely cutting out. They are still attached to the waste part of the material.

- Make sure you have set an appropriate **Overcut** setting.
 - Make sure the mat is not skewing during the cut. This can happen if even one of the pinch wheels is no longer centered under a white arrow. It can also happen if the speed and/or pressure is set too high.
-

My cardstock is not cutting all the way through. I have the blade all the way out and using the maximum force.

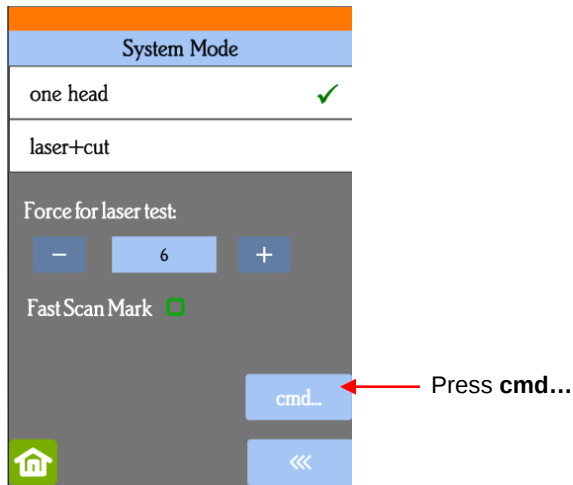
- Please refer to *Section 1.07.3*. It's important to only have as much blade exposed as is necessary to penetrate the cardstock. You may also need to raise the blade tip height (*Section 2.01.3*). Reduce your force back to suggested values for the material you are cutting and do a test cut.
 - Do not use more force than is needed. If the cardstock is cutting through about 90% of the cut, then turn on **Multi-Cut**. Some cardstocks do better with a second pass at a lower force.
-

I calibrated the camera for print and cut and the cuts start off accurate but, by the end of the cut, there is a lot of error.

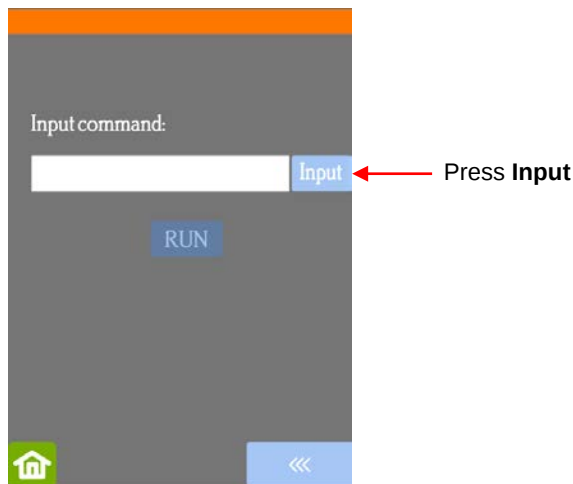
- This is called "drift" and can sometimes be corrected by slowing the speed and making sure the cuts aren't so deep that the blade is causing some drag to occur.
 - An alternative solution is to add intermediate registration marks. Refer to *Sections 3.08* and *3.09.2*.
-

Appendix B Activating Commands

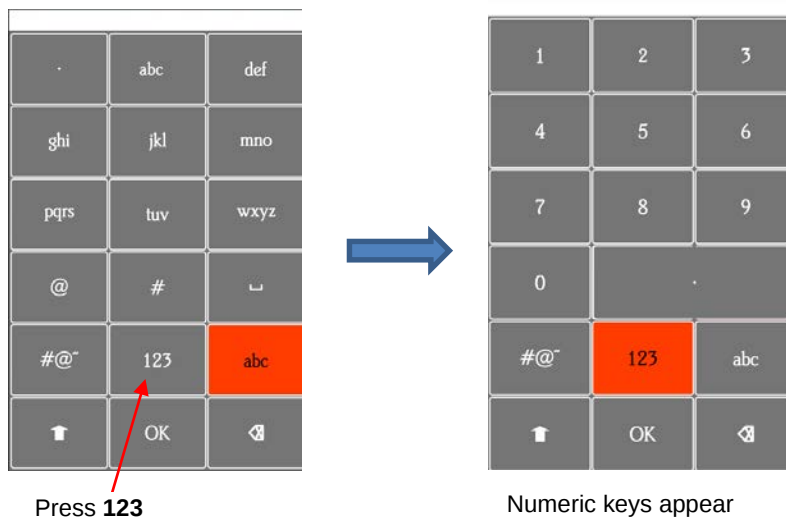
- This section shows you how to activate commands in order to add certain functions to the control panel.
- Go to **Set>Advance settings>System Mode** and press the **cmd...** button:



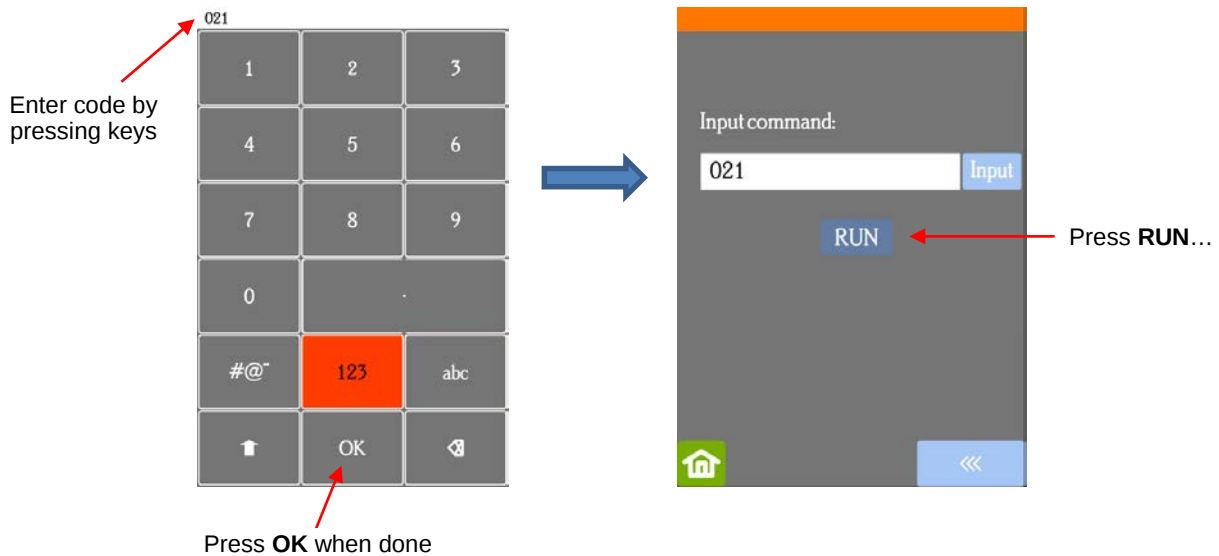
- The following screen opens. Press **Input**:



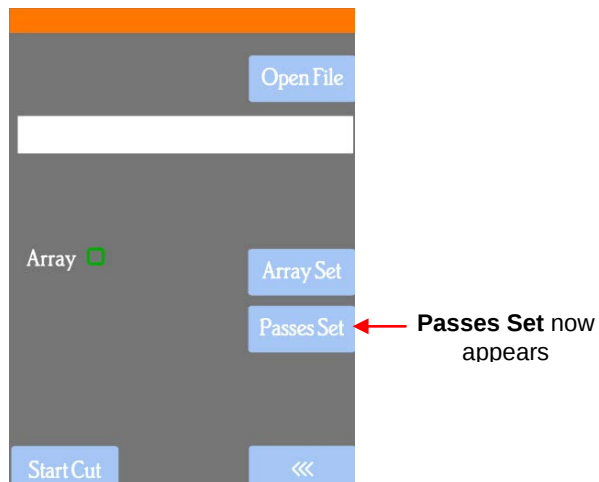
- The **Input** code is entered in the same way as you entered your **Network** password but since it's a 3-digit code, you'll begin by pressing the **123** button:



- Enter the required **Input** code according to the following:
 - ◇ 021: Activate **Mark Set**
 - ◇ 020: Deactivate **Mark Set**
 - ◇ 031: Activate **Passes Set**
 - ◇ 030: Deactivate **Passes Set**
 - ◇ 141: Activate **QR Cut**
 - ◇ 140: Deactivate **QR Cut**
- After entering the **Input** code you need, click on **OK** and the **Input** screen will return. The word **RUN** will now be highlighted and you can press it. The Skycut will beep once.



- Return to the main screen and press **USB**, the activated button will now appear:



FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

NOTE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an

uncontrolled environment. This equipment should be installed and operated at least 20cm between the radiator & your body.