KNK Zing Orbit with Sure Cuts A Lot 5

December 29, 2019

You can expect updates to this manual over the next few months

Do NOT read this entire manual... unless you want to.

- Chapters 1 and 2 are <u>very important</u> in terms of setting up your Zing Orbit to work with SCAL and learning the ins and outs of cutting.
- Chapters 3 10 are <u>specific to SCAL</u> and present every function in the software, many of which you may never need.
- Chapter 11 is for those owners wanting to perform <u>print and cut</u> applications.
- Chapter 12 covers using the Zing Orbit accessory tools.

It's not practical to print this entire manual because:

- It's a waste of paper and ink if you only ever need certain sections.
- The live links to videos, blog posts, products, etc. will not work.
- This manual will be updated from time to time.
- You cannot search on individual words.

Also:

- Having the Table of Contents continuously viewable makes navigation easier. It's also useful to know how
 to search for specific words or terms. Here is a link to a tutorial which covers how to do these two things:
 How to Get the Most from your KNK UM.
- Note the Free Video icons which link to videos related to the section in which they are located. These videos will enhance your learning experience.

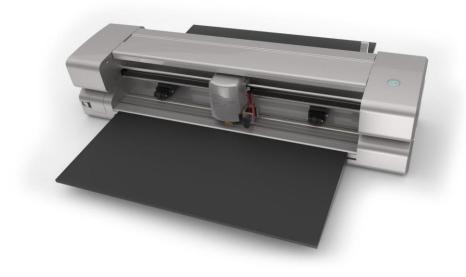


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1. Introduction and Setting Up

1.00 Quick Reference for This Chapter

- How to download and set up SCAL: Section 3.01
- How to set up communication between a computer and the Zing Orbit: Section 1.12
- How to adjust the blade holder: Section 1.07.2 and 2.01.5
- Where to position the pinch wheels: Section 1.09
- The cutting mat is too sticky (or not sticky enough): Section 1.08

Important Notes:

- Please read Section 1.02 regarding safe operation of the Zing Orbit.
- Report any damage or missing contents to your dealer promptly.
- Retain the original box and packing materials in case you ever need to ship your Zing Orbit.

1.01 Support

- Thank you for choosing a Klic-N-Kut digital die cutter. Before using a <u>blade</u> in your new cutter, we urge you to read *Chapters 1 and 2* and watch the videos provided via links in these two chapters.
- If you run into difficulties with the operation of your Zing Orbit, turn off the power and look for a solution in this manual. Note that *Appendix B* is a Troubleshooting section. If you continue to have technical questions or issues, please contact <u>your KNK dealer</u> as soon as possible.
- If anything is missing from your order or you have mechanical issues with your Zing Orbit, please contact KNK USA by either:
 - ♦ Calling 800-268-3672
 - ♦ Starting a support ticket at this link: https://knkusa.com/support/
- For additional information and support with the Zing Orbit, please check out the following:
 - ♦ Zing Orbit Facebook group: https://www.facebook.com/groups/KNKZing/
 - ♦ Zing Yahoo group: https://groups.yahoo.com/neo/groups/KNK_Zing/info
 - I Love KNK support site: http://www.iloveknk.com/support/knk-zing-orbit-support-page/
 - ♦ Cutterpunk KNK support site: https://cutterpunk.com/zing-orbit/
 - ♦ For inspiration and tips on cutting specific materials: http://teamknk.com/
- For SCAL support, please check the list of resources in Section 3.12.

1.02 Safety and Warnings

Please be aware of the following safety guidelines when working with the Zing Orbit:

- Pinch Points: Keep hands, long hair, loose clothing, jewelry, etc. away from the moving parts.
- Risk to Children and Pets: Please supervise children around the cutter, when it is in use.
- Movement and Touching: Do not move the Zing Orbit or touch any circuitry while it is plugged in.
- ONLY use the included power adaptor. Attempting to use a different model can result in seriously damaging the Zing Orbit.

- DO NOT touch or jam the plotter's track while it is operating. If the cutter is damaged, it is the owner's responsibility.
- DO NOT shake the cutter while it is operating.
- DO NOT cut any materials that have staples or other embellishments attached.
- DO NOT touch the cutter with a magnet. It is safe, however, to cut magnetic materials, such as those used on refrigerators and car exteriors.
- Do NOT allow any liquids to spill into the cutter or any small items to fall into the cutter.
- Place the Zing Orbit on a sturdy and stable table, desk, or trolley. The optional Zing Orbit stand can also be used.
- Always <u>turn off the Zing Orbit</u> when not in use. Leaving the cutter turned on for extended periods of time can
 possibly damage the machine.
- Always <u>turn off the Zing Orbit</u> before unplugging the power adaptor or removing the power cable from the wall outlet or power strip.
- <u>Unplug the Zing Orbit</u> from a wall outlet or power strip during an electrical storm or when the cutter will not be used for an extended period of time.
- <u>Transporting:</u> When transporting the cutter, move the pinch wheel lever into the upward position. Remove the blade from the blade holder and cover the tip with the plastic cap.

1.03 Warranty

- **IMPORTANT!** If your Zing Orbit is damaged during shipment or appears to be defective, then your dealer should be notified <u>as soon as possible</u>. If damages are reported later than three weeks after delivery, then it will be the responsibility of the owner to ship the damaged cutter back to KNK USA for repair.
- The one year parts and labor warranty covers manufacturer's defects only and does not include normal wear and tear. If warranty work is required, the owner is responsible for shipping costs to and from KNK USA.
- Zing Orbit owners <u>outside the USA</u> should contact their dealer for procedures regarding warranty work or shipping damage.
- It is also recommended that you retain the original box with packing materials in case you ever need to ship your Zing Orbit.

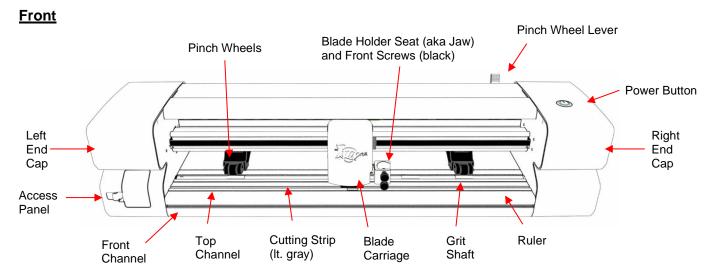
1.04 Unpacking

- Verify that you have received all contents. There is a checklist in Section 1.05. Please notify your Zing Orbit supplier immediately if anything is missing.
- Remove all foam pieces and other packaging before turning on the Zing Orbit. Currently, the ZO ships with
 two end cap foam protectors and one small foam piece tucked behind the head. There are also two plastic
 zip ties that will need to be cut. Be very careful to only cut those ties and not the black cable behind them.
- Because the cutting mat must be folded over to fit into the box, it may have become slightly rounded during shipping. Gently roll the mat in the opposite direction to remove the roundness and place on a flat table to make sure the mat now lies horizontally to the surface. Refer to Section 1.10 for additional instructions on preparing the mat for use.
- <u>Use the enclosed test pen</u> as you experiment and become familiar with operating the Zing Orbit. Place scrap paper on the mat and simply draw shapes rather than cut them. This will prevent possible damage to the blade, mat, and cutting strip as you learn where shapes will cut and the basic operating procedures.
- Always <u>turn off the Zing Orbit</u> when not in use. Leaving the cutter turned on for extended periods of time can
 possibly damage the machine.

1.05 Contents

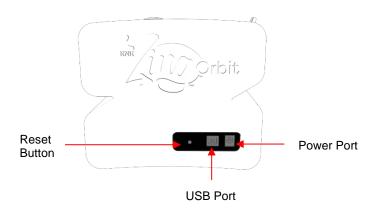
- Your KNK Zing Orbit package comes with the following:
 - ♦ KNK Zing Orbit digital die cutter
 - ♦ 15" x 15" cutting mat (refer to Section 1.08 for instructions)
 - ♦ Blade holder (refer to Section 1.07.2 for instructions)
 - ♦ Two blades: thin material blade (red cap) and thick material blade (blue cap)
 - ♦ Two small springs for the blades
 - ♦ Test pen with extra insert
 - ♦ Calibration pin for print and cut (also with a red cap)
 - ♦ Power cord and AC/DC adaptor
 - ♦ USB Cable
 - ♦ Attachable tables (24" model only) (refer to Section 1.10 for instructions) Tables for the 15" model can be purchased at this link.

1.06 Parts of the KNK Zing Orbit

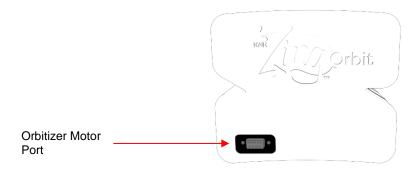


- Access Panel: for attaching accessory tools, such as the optional Orbitizer
- Blade Carriage: moves the Blade Holder Seat left and right
- Blade Holder Seat (Jaw): holds the blade holder, test pen, markers, and other tools
- Cutting Strip: protects blade from cutting metal beneath
- Front Channel with Accessory Nuts: for attaching front table and optional Orbitizer
- Front Screws: secure the blade holder, test pen, markers, and other tools into blade holder seat
- Grit Shafts (4 on 15" ZO; 5 on 24" ZO): move the mat or material in and out of cutter (post January 2019, the right two grit shafts have been combined into one wide grit shaft)
- Pinch Wheels (3 on 15" ZO; 4 on 24" ZO): grip mat or material so that grit shaft (beneath) will feed mat or material in and out
- Pinch Wheel Lever: lifts pinch wheels up and down for loading of mat or material
- Power Button: turns cutter on or off
- Ruler: for measuring and aligning rolled materials
- Top Channel with Accessory Nuts: For attaching optional Obitizer

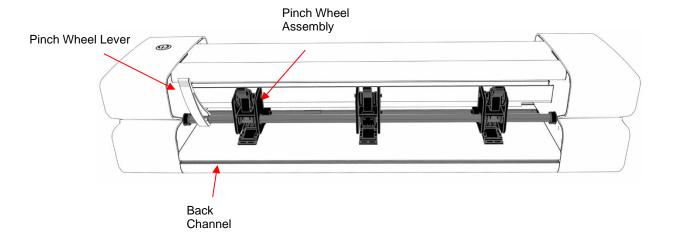
Right Side



Left Side



Back



1.07 Accessories

1.07.1 Zing Orbit Blades

• There are three kinds of blades that fit inside the KNK Zing Orbit blade holder:



Red Blue Yellow

- ♦ The 45 degree <u>red capped blade</u> is suited for cutting thinner materials such as paper, all cardstock types, iron-on transfer, and vinyl.
- The 60 degree <u>blue capped blade</u> is a much longer blade and is well-suited for cutting thicker materials, such as gum paste, craft plastic, craft foam, and rhinestone template material. <u>IMPORTANT!</u>
 This blade is extremely thin at the tip and can be chipped if excessive settings are applied.
- ♦ Sold separately is the 30 degree <u>yellow capped blade</u>. It is a wide blade and is well suited for cutting fabric and felt. It has been reported that it also works well with cardstock that has been exposed to humidity.
- Also included with the blades is an alignment pin used in the initial calibration for print and cut (refer to *Chapter 11*) and is used in the alignment process with tools of different diameters (refer to *Section 12.01.2*). This pin fits into the blade holder:



- Note that the red capped blade and blue capped blade have a cut back on the opposing side of the blade (right side, in the earlier photo). This reduces the blade offset value and allows for better detailed cutting of small shapes.
- There are three blade holders sold for the Zing Orbit: a <u>red one</u>, a <u>blue one</u>, and a <u>yellow one</u>. These three blade holders are identical, other than the color. Thus, any color of blade holder can house any of the three blade types.
- Owners who change materials often find it convenient to have the blade holders assigned to blade types
 whose caps match the color of the holder itself. In other words, they will only use red capped blades in their
 red blade holder, blue capped blades in their blue blade holder and yellow capped blades in their yellow
 blade holder. Again, this is a personal choice. Any of the three blade types can be used in any of the three
 Zing Orbit blade holders.
- Additionally, there are other tools sold separately, including an <u>engraving tool</u>, <u>embossing/scoring tool</u>, and a <u>punch/piercing tool</u>. Details on these are covered in *Chapter 12*.

1.07.2 Blade Installation

Free Video

- The blade must be carefully inserted into the blade holder. Do this over a soft surface (e.g. over a hand towel). It's important to protect the fragile blade!
- The little springs that come with the blades are easy to lose, which is another reason to do this over a towel so that a dropped spring doesn't roll off the table
- Remove the bottom cap from the blade holder:



• Stand the blade holder up. Note the little hole inside the center:



• Remove the protective cap from the blade. Place the non-sharp end of the blade into the hole so that the blade is standing vertically. Then slide one of the tiny springs over the blade:



Spring is placed over the blade

 Holding the blade holder in one hand and the cap in another, gently guide the cap over the top of the blade and then begin screwing the cap on. Do NOT try to force it. You may need to wiggle the cap slightly for the cap to catch the threads and screw onto the main part of the blade holder:



IMPORTANT! Do not force the cap. Wiggle gently until the threads catch.

Screw the cap tight. Then, as you screw the main part of the blade holder (the top), the blade will begin to show through the hole in the cap. You only need as much blade exposed as is necessary to penetrate the material you are cutting. More blade does NOT result in better cutting. In fact, the opposite is true.

The blade depth should be just a tiny bit longer than the thickness of the material you are cutting.



Turn clockwise to expose more blade. Turn counterclockwise to retract the blade.

• Please read *Chapter 2* before cutting. There are some tips on setting the blade exposure as well as other important information you need to be successful with your cutting.

1.08 Preparing and Caring for the Cutting Mat

Mat too sticky: Free Video Adding more adhesive to a mat: Free Video

1.08.1 Tips on Using the Cutting Mat

- Always use a mat to hold the material to be cut unless the material has its own protective backing. For
 example, vinyl and iron-on transfer both come with a layer that you do not cut. Thus, this backing layer
 serves as the carrier for cutting. Paper and cardstock do not have a backing, thus they must be cut on the
 mat
- <u>IMPORTANT!</u> A new mat may be <u>too sticky</u> if you are cutting certain products. This can cause difficulty in removing cut items without tearing. Place an old but clean <u>bath towel</u> over the surface of the mat and <u>press</u> <u>with a brayer or rolling pin</u>. Then pull up. Test the stickiness by pressing the palm of your hand in the middle of the mat and lifting. If the mat remains stuck to your hand, repeat until the mat can still be lifted but will release. It should only take a few pressings to greatly reduce the stickiness, as tiny (too small to be visible) fibers from the towel are added to the surface.
- Do not leave the pinch wheels in a down position when the Zing Orbit isn't in use. This warps the plastic sooner, shortening the useful life of the cutting mat.
- <u>IMPORTANT!</u> Once a mat begins to warp, the right side can interfere with the movement of the blade when setting an initial origin. Refer to this issue in *Appendix B2* when you notice the right side is beginning to curl up.

1.08.2 Cleaning and Replenishing the Cutting Mat

- When mats begin to lose their stickiness, they can be washed:
 - Use a mild dishwashing detergent, warm water, and a soft brush to thoroughly clean the surface. You're not trying to scrub the adhesive but just wet the invisible fibers that have been deposited from your cutting materials and get them released from the glue.
 - Rinse well, shake off excess water, and place sticky side down onto a bath towel.
 - Thoroughly dry the non-sticky side of the mat with another towel.
 - Pull the mat up and the sticky side should now be dry enough for immediate use. Test by making sure the mat will stick to your hand.
- While washing with soap and water should revive the original adhesive, you can add more adhesive if necessary:
 - ♦ Virtually any repositionable adhesive may be used on the cutting mat. Some of the popular choices include: Krylon Easy Tack, Aleene's Tack It Over and Over (view the video at the start of this section), Crafter's Companion Stick and Spray, Zig 2 Way Glue with wide tip, Craft Smart Off 'N On, and Scotch Repositionable Craft Stick. There's another spray adhesive, Scotch Super 77, which does not leave a sticky surface but is excellent for stabilizing paper and cardstock. Use a light coating and only add more, if needed.
 - If you are cutting thicker materials, such as oil board or styrene, then you may want to experiment with a stronger adhesive <u>and</u> use painter's tape to secure the material to the mat. If you are cutting thin paper, then you may want to experiment with a lighter adhesive.
 - With most repositionable adhesives, you can control the tackiness based on the amount applied. Thus, always add a little bit at a time. As mentioned above, if you add too much, just apply a layer or two of cotton fibers by pressing with a bath towel.
- Other reported methods for cleaning mats:
 - Use a plastic scraper (an old credit card will suffice) to scrape off any random material pieces remaining on the mat after a cut.

- ♦ For finer particles of paper or lint, you can use a lint roller. Tear off a sheet and then press down and pull up across the surface of the mat to clean in sections. Baby wipes can accomplish the same task.
- ♦ To completely remove adhesive from the mat, apply Goo Gone, Duck Adhesive Remover, or Avon's Skin So Soft Bath Oil (thank you, Joyce Wilson) across the surface. Allow a minute to soak in and then scrape off with a sharp metal spatula. Repeat, as necessary until the mat is thoroughly clean and no longer sticky. Wash, dry and then add any repositionable adhesive.
- When necessary, the rubber wheels and the grit shafts may be cleaned with isopropyl alcohol or Un-Du. Apply the cleaner to a clean lint-free rag and rub the entire wheel and/or grit shaft until free of adhesive.

1.09 Pinch Wheels

- The pinch wheels can be raised and lowered using the pinch lever located at the back-right side of the machine. Press down on the lever and the pinch wheels will be raised. Pull the lever up to lower the pinch wheels so that they can grip the mat or the material inserted in the cutter.
- There is also a small black lever on each individual pinch wheel. When the lever is raised, there is less
 downward pressure exerted. <u>IMPORTANT:</u> Only push these small levers down when an extra tight grip is
 needed, such as when cutting a thick chipboard. For normal cutting of most materials, it will not be required
 and you do not want the black levers down extensive periods of cutting as it can damage the pinch wheels
 themselves.

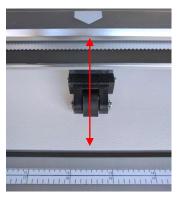
Lever is in up position. This is recommended for most cutting.





Lever is in down position. Do NOT use this position except for limited cutting of dense materials.

Note that for a pinch wheel to grip properly, it <u>must be positioned over a grift shaft</u>. To facilitate alignment, note the white arrows positioned along the horizontal bar below the cover. Slide the pinch wheels along the bar, as needed.



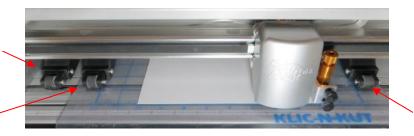
Wheels should be centered under white arrows

• When using the cutting mat, it is recommended that the material be placed in the middle of the mat and the left most pinch wheel moved to the far-left side. Then slide the middle pinch wheel to serve as the left side grip and the right pinch wheel left in the far-right position as shown in the following photo. This keeps the pinch wheels off the material and provides an equal balance while the mat moves in and out during cutting:

Left pinch wheels is on far left side (not in use)

Middle pinch wheel is

under left-most arrow

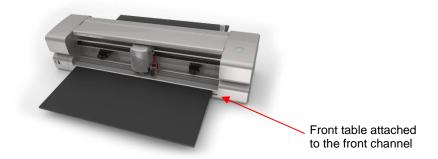


Right pinch wheel is under white arrow on right side.

- ♦ This photo was taken with the 15" ZO. Adjust accordingly with the 24" ZO.
- Note that if your material is very wide, then it is fine to have the pinch wheels over the material. However, you may need to be extra careful when removing any cut shapes or waste material in those locations.

1.10 Attaching the Flatbed Tables

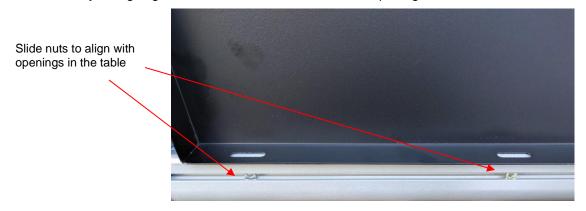
• The flatbed tables attach to the front and back channels (refer to the *Front* and *Back* diagrams in *Section* 1.06). Here is a photo of a ZO with the tables attached:



• Each channel has more than enough nuts to attach the tables using screws that were included with the tables. Note that the 15" tables come with 6 screws and the 24" tables come with 8 screws.



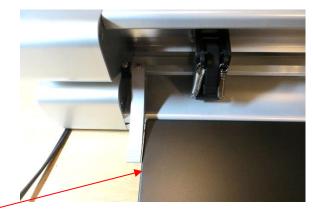
• Start with either table. Using a pencil, pen, or other pointy tool, slide the nuts in the channel so that they will approximately line up with the holes in one of the tables. Note that the wide opening in the table will allow for some leeway in aligning the nuts. Also, note that the middle opening is not used with the 24" tables.



• Once you can visually see all of the nuts through the openings in the table, use the included thumb screws to securely attach the table to the channel:



• <u>IMPORTANT!:</u> The front table can be positioned, as desired. Typically, one might want to center it. However, the back table needs to be attached so that it doesn't interfere with the pinch wheel lever. So, facing the back of the ZO, the table needs to be far enough to the right to allow this lever to be moved to the downward position:



Make sure table doesn't touch pinch wheel lever

• If you are attaching these tables without assistance, it is easier to attach the second table by positioning the ZO at the edge of a work surface with the attached table hanging over the edge. <u>Warning</u>: please make sure no children or pets are nearby as the cutter could be knocked off the table while in this position!



1.11 Registering and Installing Drivers and SCAL

- The driver can be obtained from this link: http://www.ftdichip.com/Drivers/D2XX.htm
- Scroll down to the table and select the driver for your computer's current operating system. Note: if you use Windows, clicking on "setup executable" in the rightmost column is the easiest way to get the driver.
- Install the driver <u>before</u> connecting to the KNK Zing Orbit. Once the driver installs, restart your computer.
- To install SCAL, please go through all of Section 3.01. Then return here to continue setting up your Zing Orbit.

1.12 Connecting the Zing Orbit to Your Computer

- Place your Zing Orbit on a sturdy horizontal surface. Be sure to allow enough free room in both the front and the back for the mat to extend during cutting.
- <u>Powering On</u>: Connect the power cord to the right side of the cutter and plug into a wall outlet or power strip. Turn on the power using the power button on the top. Press and hold for a second to power on the cutter. The light inside the ZO should now be turned on. <u>After about 20 seconds, you will hear a beep</u> indicating the ZO is now ready to communicate with your computer.
- Powering Off: Press and hold the power button until it beeps and the light shuts off.
- You have three options for connecting the Zing Orbit to your computer: USB, Stand-Alone, or Wi-Fi. Review the information in the following table to understand the differences between these options. <u>If you are unfamiliar with network configurations, USB will be the easiest option</u>.

Connection Options for the Zing Orbit

<u>Option</u>	<u>USB</u>	Stand-Alone (Ad Hoc)	Wireless (Wi-Fi)
Description	The ZO is connected to the computer via a USB cable.	The ZO is wirelessly connected to the computer.	The ZO is wirelessly connected to a network router.
Requirements	USB cable (included)		Wireless network router and knowledge of router's IP address and password
<u>Pros</u>	Easiest to install; Simplest and fastest form of communication.	Easy to install; Can be set up anywhere as no router is required; Other computers can cut to the ZO.	ZO can be located anywhere within range of the router; Other computers can cut to the ZO.
<u>Cons</u>	ZO is physically connected to the computer; ZO cannot be accessed by other computers at the same time.	Computer is now connected to the ZO, thus no wireless access to the Internet or to other wireless devices.	Requires more steps to set up; Some routers may require adjustments in order to work with the ZO.

- Note that implementing any of these options does not preclude you from changing to another one, as needed.
- The following sections present what steps are required for each type of connection. If you run into connectivity issues, please contact your KNK dealer first. If your dealer is unavailable, please contact KNK USA for assistance.

1.12.1 Connecting to a PC

Option 1: USB Connection on a PC

Connect the USB cable to the right side of the cutter and into an available USB port on your computer. The
 Windows Hardware Manager will identify the USB connection. If the Hardware Installation window pops
 open, accept all defaults. Proceed to Section 1.13.

Option 2: Stand-Alone (Ad Hoc) Connection on a PC

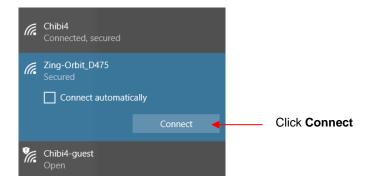
- <u>Important!</u> While in standalone mode <u>with a wireless computer</u>, you will no longer be connected to your regular network, thus you will not have a connection to the Internet or to other wireless devices, such as a wireless printer. This will also affect access to SCAL's online store and other Internet sites for support.
- Close all unnecessary applications. It is also recommended that you temporarily disable your virus protection software and your firewall.
- (1) With the Zing Orbit powered on, open your network menu:



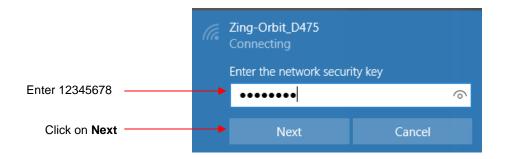
(2) Click on the listing for the Zing Orbit:



(3) Uncheck the box for Connect automatically and click on Connect:



(4) A window opens requesting a security key. Enter 12345678 and click on **Next:**



(5) Wait about 30 seconds and then verify that the Zing Orbit appears in your network menu:



- (6) If anything goes awry during this setup, the Zing Orbit can be reset by pressing the small black button on the right side with a pointed object like a pencil or pen nib. A beep will immediately occur. Wait about 20 seconds for a second beep and then proceed with Step (1) again or another form of connection.
- (7) Your computer is now wirelessly connected to the Zing Orbit. The IP Address you'll be using in SCAL is 192.168.16.254. Proceed to Section 1.13.

Option 3: Wi-Fi Connection on a PC

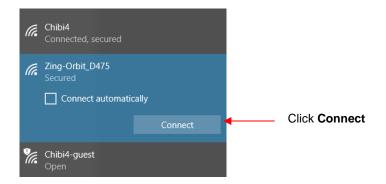
- What you'll need:
 - Name of your home/office network
 - ♦ The IP address for your router (e.g. 192.168.1.1)
 - ♦ The password for your network
- Carefully complete the following steps. At any point, if you need to start over, skip to Step (12) and follow
 the reset instructions.
- (1) With the Zing Orbit powered on, open your network menu:



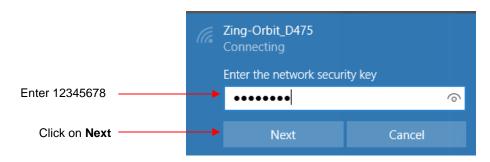
(2) Click on the listing for the Zing Orbit:



(3) Uncheck the box for Connect automatically and click on Connect:



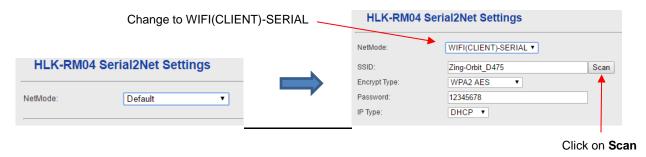
(4) A window opens requesting a security key. Enter 12345678 and click on Next:



(5) Wait about 30 seconds. Then open your Internet browser and, in the URL field, type in: 192.168.16.254 and press Enter. The following window will open. Enter "admin" for both the User Name and Password. Then click on Log In:



(6) The following window will open. Change NetMode as shown and click on Scan.

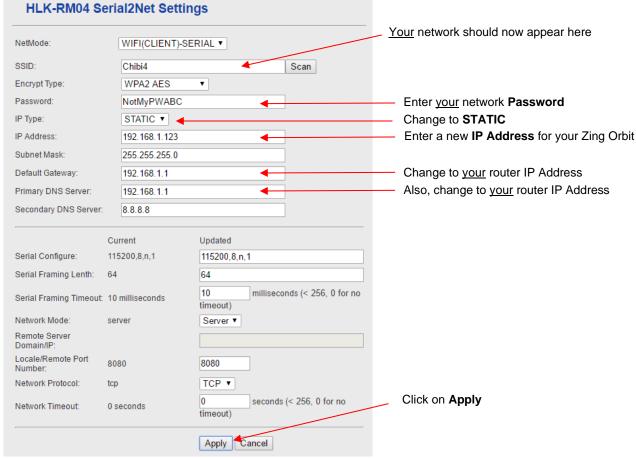


(7) Select your home/office network and click on Apply:

Mark the circle next to your network



(8) Enter the password for your network. Select a new **IP address** for your Zing Orbit, preferably one that's outside the range of your other devices. For example, I chose "123" (i.e. 192.168.1.123) so that it would be easy for me to remember. Make the other changes as shown and then click on **Apply**:



- (9) Wait about 30 seconds. A message should pop up saying the connection has been reset. If no message occurs after a minute, proceed with the next step.
- (10) Go to your network menu. Connect to your usual home/office network and verify that your network is working, as normal.
- (11) Verify the new IP address you selected for the Zing Orbit by typing it into your browser. It should now open the same window where you just established these settings. Write down your IP address so that you'll have it handy when you get ready for your first test drawing from SCAL. Proceed to Section 1.13.
- (12) If anything goes awry during this setup, the Zing Orbit can be reset by pressing the small black button on the right side with a pointed object like a pencil or pen nib. A beep will immediately occur. Wait about 20 seconds for a second beep and then proceed with Step (1) again or another form of connection.

1.12.2 Connecting to a Mac

Option 1: USB Connection on a Mac

 Connect the USB cable to the right side of the cutter and into an available USB port on your computer. Your Mac should identify the USB connection automatically. Proceed to Section 1.13.

Option 2: Stand-Alone (Ad Hoc) Connection on a PC

- <u>Important!</u> While in standalone mode <u>with a wireless computer</u>, you will no longer be connected to your regular network, thus you will not have a connection to the Internet or to other wireless devices, such as a wireless printer. This will also affect access to SCAL's online store and other Internet sites for support.
- (1) With the Zing Orbit powered on, open your network menu:



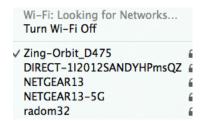
(2) Click on the listing for the Zing Orbit:



(3) A window opens requesting a security key. Enter 12345678 and click on Join:



(4) Wait about 30 seconds and then verify that the Zing Orbit appears in your network menu:



- (5) If anything goes awry during this setup, the Zing Orbit can be reset by pressing the small black button on the right side with a pointed object like a pencil or pen nib. A beep will immediately occur. Wait about 20 seconds for a second beep and then proceed with Step (1) again or another form of connection.
- (6) Your computer is now wirelessly connected to the Zing Orbit. The IP Address you'll be using in SCAL is 192.168.16.254. Proceed to Section 1.13.

Option 3: Wi-Fi Connection on a Mac

- What you'll need:
 - ♦ Name of your home/office network
 - ♦ The IP address for your router (e.g. 192.168.1.1)
 - ♦ The password for your network
- Carefully complete the following steps. At any point, if you need to start over, skip to Step (6) and follow the
 reset instructions.
- (1) With the Zing Orbit powered on, open your network menu:



(2) Click on the listing for the Zing Orbit:



(3) A window opens requesting a security key. Enter 12345678 and click on Join:



(4) Wait about 30 seconds. Then open your Internet browser and, in the URL field, type in: 192.168.16.254 and press **Enter**. The following window will open. Enter "admin" for both the **User Name** and **Password**. Then click on **Log In**:



- (5) The rest of the setup is identical to that on a PC. Go to Step (6) in Section 1.12.1 Option 3 and continue from there. Note that in Step (9), you may not receive notification that Setup in complete. After waiting about a minute, proceed with Step (10).
- (6) If anything goes awry during this setup, the Zing Orbit can be reset by pressing the small black button on the right side with a pointed object like a pencil or pen nib. A beep will immediately occur. Wait about 20 seconds for a second beep and then proceed with Step (1) again or another form of connection.

1.13 Verify Communication and Test Draw Shapes

- New owners tend to be VERY eager to try out their Zing Orbit. It's important to test your cutter to ensure that
 data is being sent properly from your computer to the cutter. The following steps will allow you to do some
 testing with the pen tool. But note that <u>the following steps are for DRAWING</u>, not cutting. Before
 inserting the blade tool into your KNK, please read the following Sections 1.07.1, 1.07.2, 2.01 and 2.02.
- It is also very important to understand where shapes will cut based on various available options in SCAL.
 This is partially addressed in the next section; complete details are covered in Section 10.07.

1.13.1 Setup for Drawing

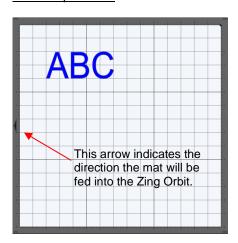
Before setting up a file for testing, if you are new to Sure Cuts A Lot, please watch the following videos:

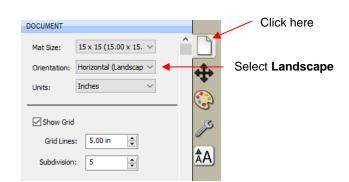
Workspaces: Free Video Virtual Mat Setup: Free Video SCAL User Interface: Free Video

Landscape Versus Portrait: Which do you prefer?

- Based on your own past experience with SCAL or other cutting programs and cutters, you may have a
 particular mode (landscape or portrait) that you are accustomed to using. There is no right or wrong mode,
 only the mode that works best for you; the mode that makes the most sense!
- In SCAL, the orientation is set on the **Document Panel**. Other settings on this panel are presented in detail
 in Section 3.06. For now, just note the location of the **Mat Configuration** settings for **Landscape** and
 Portrait:

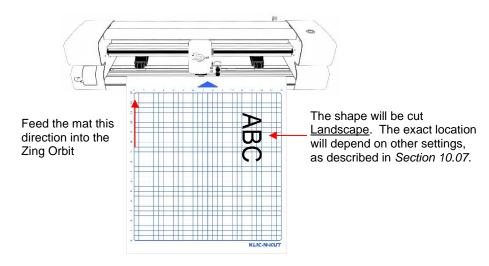
♦ Landscape Mode



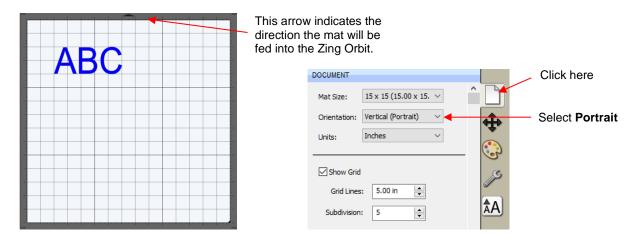


Note: in the screenshot above, a custom mat has been set up in SCAL to match the Zing Orbit mat. To create a mat with these same dimensions, refer back to the video linked at the start of this section or refer to Section 3.06.

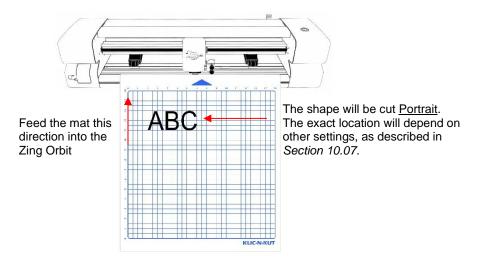
 In Landscape mode, the arrow/triangle on the Cutting Mat will point to the left. When you draw or cut out the "ABC" shown on a Landscape Cutting Mat, it will be drawn or cut top to bottom as you face the Zing Orbit:



♦ Portrait Mode



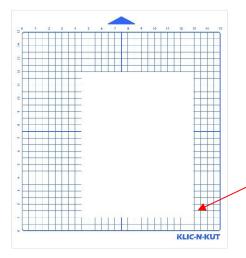
• In **Portrait** mode, the arrow/triangle on the **Cutting Mat** will point upwards. When you draw or cut out the "ABC" shown on a **Portrait Cutting Mat**, it will be drawn or cut left to right as you face the Zing Orbit:



1.13.2 Drawing Your First Shape

- This first test will show you how <u>Origin Point</u> mode works. This is a very useful setting because it is easy to
 know where your shapes will cut on your material, plus it economizes the use of your materials. Instead of
 cutting shapes where they are located on the <u>Cutting Mat</u> in SCAL, the shapes will be moved and aligned
 to <u>cut where you set the origin on the material</u>, using the <u>blade tip</u>.
 - (1) Place an 8.5" x 11" sheet of paper on the mat, using any of the grid lines. Place the paper onto the mat like this:

Feed the mat this direction into the Zing Orbit



Align the paper along one of the grid lines on the cutting mat.

(2) Before installing the test pen, make sure the pen will write by scribbling on scrap paper. To insert the test pen, push down on the blade holder seat. With the seat all the way down, insert the test pen and tighten the front screws. Then release. This will allow the pen to be slightly above the paper when you insert the mat.



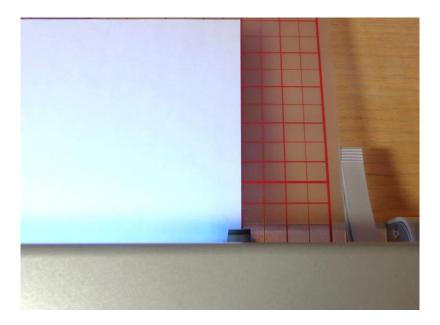
Push the blade holder seat all the way down.



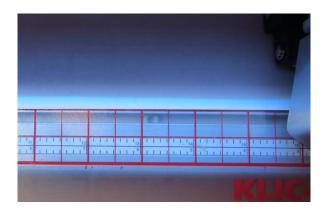
While holding the seat down, insert the test pen and with your other hand tighten the front screws

<u>IMPORTANT!</u> This is NOT the recommended method for loading the blade holder into the cutter. This is presented as a quick way to insert the <u>test pen</u> so that it is in a good position for drawing. The instructions for inserting the blade holder and setting a blade distance above the material will be covered in *Section 2.01*.

(3) Insert the mat into the cutter. Slide the mat <u>towards the back</u> and align the right side of the mat with the left side of the pinch wheel lever:



(4) Use any of the horizontal markings at the front of the Zing Orbit (such as the ruler) to align the mat so that it's straight:

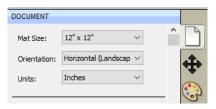


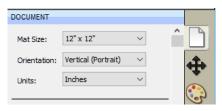
(5) Lift the pinch lever to drop the pinch wheels onto the cutting mat. <u>Most of the mat and the paper should now be behind the cutter</u>, not in the front:



As of 2019, the right two grift shafts were combined into a single one, thus some photos may not match your model precisely.

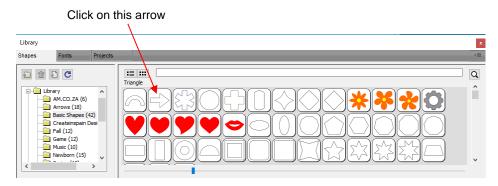
(6) Select either **Landscape** or **Portrait**, on the **Document Panel**, depending on your personal preference (as described at the beginning of *Section 1.13.1*):



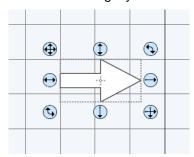


Select your preferred mode: Landscape or Portrait

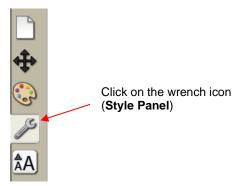
(7) If you closed the **Library** when you opened SCAL, click on this icon at the top to reopen it. Click on the arrow thumbnail to add that shape to your screen. An arrow will help you better compare where a shape gets drawn versus how you see it on the screen:



(8) After clicking the arrow, you should see it on the screen. In this test, it doesn't matter where you place the arrow on the grid, as it will be drawn at the origin you set on the machine.



(9) Because you are drawing and not cutting, you need to assign this shape to be drawn. The default is always cut, unless you make the change. Select the shape on the screen or click on the shape's layer on the **Layers Panel**. Then click on the **Style Panel** icon on the right side of the screen:

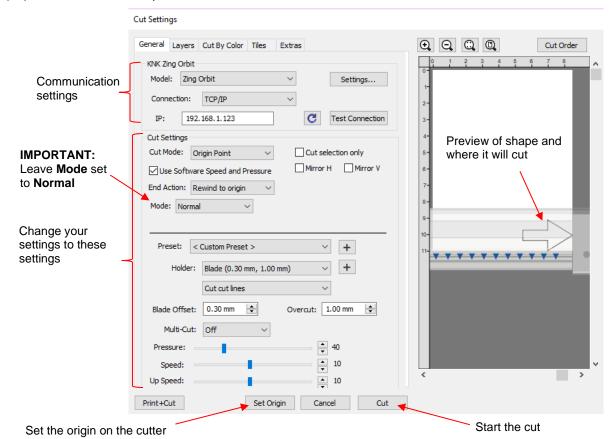


(10) Change the Cut Line Type to Draw (Pen):

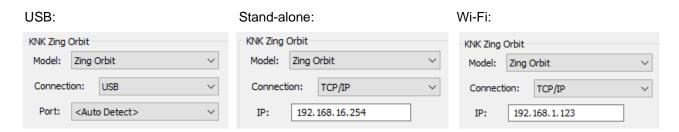


Change to Draw (Pen)

- (11) In Section 3.01.4, you installed the KNK Zing Orbit in SCAL. To now open the Cut Settings window, either:
 - Go to Cutter> Cut with KNK Zing Orbit
 - Click on the Cutter icon at the top
- (12) The follow window opens:

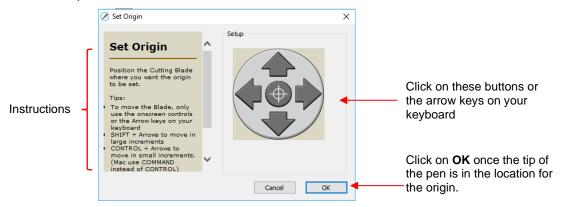


- ♦ Model: Should indicate Zing Orbit. If not, then you need to return to Cutter>My Cutter>Manage Cutters and add the KNK Zing Orbit to the menu.
- ♦ Connection, select USB or TCP/IP (for Stand-Alone or Wi-Fi). If using USB, leave Auto-Detect selected. If using Stand-alone, enter 192.168.16.254 as the IP Address. If using Wi-Fi, enter the IP address you previously chose in Section 1.12.

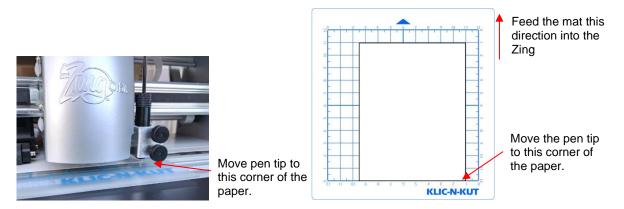


- Click on **Test Connection** to verify that the head will move a small distance to the left and back again. If the test connection fails, click on the **Reload** icon and try again. If it still fails after several attempts, refer to **Appendix A**, first question.
- ♦ Cut Mode: Set to Origin Point. Later you can test WYSIWG mode, as well.

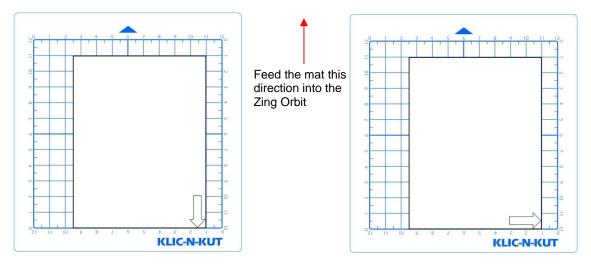
- Change the remaining settings to match the prior screenshot. More details about these settings will be covered in other sections.
- (11) Click on **Set Origin** at the bottom of the **Cut Settings** window. The Zing Orbit fan will turn on and the following window will open:



♦ Click on the buttons or the arrow keys on your keyboard to move the head left or right and the mat in and out. The goal is to have the tip of the pen close to the lower right corner of the paper:



- Note the following ways to control the increments when setting the origin:
 - Shift + arrow key: move in a larger increment
 - Ctrl + arrow key: move in a smaller increment (on a Mac: Command + arrow key)
 - Shift + Ctrl + arrow key: move in the smallest increment possible (on a Mac: Shift + Command + arrow key)
- Once the pen tip is in the lower right corner, you can do any of the following to close the window:
 - Click the middle button in the window
 - Click on OK
 - o Press the Enter key on your keyboard
- (12) Click on the Cut button at the bottom of the Cut Settings window and the arrow will be drawn to align with the origin you set. After the cut is complete, the cut window will close. Your arrow will be drawn as shown, with the direction related to whether you originally chose Landscape or Portrait for your Cutting Mat:



<u>Landscape Results</u>: The arrow is drawn at the origin and points downwards.

<u>Portrait Results:</u> The arrow is drawn at the origin and points to the right.

- (13) To draw again, return to the cut window and choose a different origin. Practice moving the origin to different locations. This is how **Origin Point** mode works.
- (14) If you wish to change to a different shape or add more shapes, remember to change the **Cut Line Type** to **Draw (Pen)**, as you did in *Step (10)* and change the **Holder** to **Pen** in the **Cut Settings** window. Again, these two changes won't be needed when you are cutting with the blade holder.
- (15) If you want the image to draw where you have it located on the virtual **Cutting Mat** in SCAL, then you need to switch to **WYSIWYG** mode. Set the origin in the lower right corner of the mat's grid and then place the paper in the correct location on the mat to correspond to where the shape is positioned on the **Cutting Mat** in SCAL. Refer to Section 10.07 for more details on controlling where images will cut.

IMPORTANT: Please read Section 2.01 before cutting!

1.14 Updating Firmware

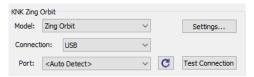
- Occasionally, there will be firmware updates available for your Zing Orbit. Before presenting the steps, please read the following three bullets:
 - ♦ <u>IMPORTANT</u>: Do <u>NOT</u> update the firmware if you received your Zing Orbit new <u>after</u> March 1, 2018. At this time, you are using the latest firmware designed for your model.
 - If you know with certainty that your Zing Orbit was manufactured and sold before March 1, 2018, then use this link to download the firmware version for that particular model:

https://www.iloveknk.com/Support/Software/ZO-Firmware-Update/

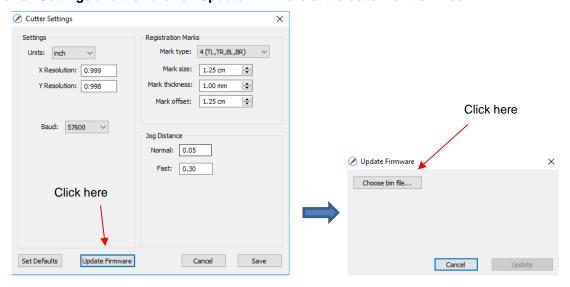
- If you are uncertain about when your Zing Orbit was first sold new, then use this tutorial to determine the manufacturing date for the main board:
 - https://www.iloveknk.com/Support/Tutorials/Klic-N-Kut/Zing-Orbit/ZingOrbit-Check-Version.pdf
- To install the firmware update, please use the following instructions:
- (1) You must be using a <u>USB connection</u> between your computer and the Zing Orbit. Thus, if you are currently using Wi-Fi, connect the USB cable that came with your ZO to your computer. If you cannot locate that original USB cable, you can use others, such as those that accompany some printers.
- (2) To verify which firmware update you should be installing, please go through the following document which will verify the manufacturing date for your Zing Orbit mainboard:

https://www.iloveknk.com/Support/Tutorials/Klic-N-Kut/Zing-Orbit/ZingOrbit-Check-Version.pdf

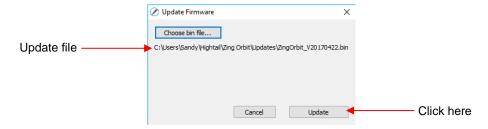
(3) In the cut settings window, make sure the Connection reads USB and the Port is set to <Auto Detect>:



- (4) Click on the **Reload** icon and then click on the **Test Connection** button. Verify the Zing Orbit is now communicating via the USB cable.
- (5) Click on **Settings** and then click on **Update Firmware** at the bottom of the window.



- (6) Browse to locate the update file you downloaded and click on **OK**.
- (7) The file location will then appear and you can click on **Update**:



- (8) The Zing Orbit's light will switch off, but the power button's light should remain on. Do not press the power button during this update. Wait patiently for the update to occur. You should receive an "Update ok" message.
- (9) If the update fails or if the Zing Orbit powers off for more than 15 minutes, press the power button briefly to see if the power will be restored. Repeat the update process after verifying that the USB cable is in place.

1.15 Maintenance

Klic-N-Kut machines do not require any kind of lubrication or routine checks. However, here are a few things to keep in mind for successful operation of your cutter:

• <u>Keep the pinch wheels clean</u>. Depending on the adhesive being used on the cutting mat, it's possible for the pinch wheels to become sticky and pick up small pieces of cardstock or other material being cut. This can lead, in some cases, to the mat skewing or ruining materials during subsequent cuts. To clean the pinch

wheels, use a lint-free cloth and an adhesive remover such as isopropyl alcohol or Un-Du to clean the pinch wheels thoroughly.

- <u>Keep the grit shafts clean</u>. Equally important as the pinch wheels, the grift shafts beneath the cutting mat should also be free of adhesive and tiny bits of material. They can be cleaned the same way as the pinch wheels. Note: Do not pour cleaner onto a grit shaft. Instead, dab some adhesive remover onto the lint-free cloth and then use the damp cloth to clean the shafts. You can also use tweezers to remove any material or adhesive that is stuck to a shaft.
- <u>Keep the cutting mat clean and sticky</u>. As mentioned in the *Section 1.06.2*, the cutting mat can be washed with soap and water to remove small invisible pieces of material which are reducing the tackiness of the cutting mat. After drying, you can add more repositionable adhesive, if needed.
- <u>Check your blade holder, as needed</u>. If suddenly you cannot get a clean cut, check the blade holder for any tiny slivers of material that may have been caught up by the blade and fed up inside the blade holder.
- If you move your cutter frequently, it is possible for the optic eye to shift slightly. Periodically, you may want to do a check of the print and cut accuracy to make sure the calibration is still precise. Refer to *Chapter 11*, if you plan to use your Klic-N-Kut for print and cut applications.
- If you cut vinyl or other backed materials regularly, you may need to replace the cutting strip at some point.
 You will be able to tell based on seeing deep cuts in the strip and an inconsistency in the cutting. Contact KNK USA for information on obtaining a replacement.
- For any other questions or concerns about maintaining your KNK, please post at our user forum: http://knkusa.com/forums/

1.16 Other Useful Tools and Supplies

- The following list has items you may or may not need while enjoying your. These are suggestions based on ten years of collecting information from cutter owners:
 - Brayer or Rolling Pin: (1) to apply lint from a towel onto an overly sticky mat (2) to press materials evenly onto a mat for cutting
 - Post-It Notes: (1) for setting blade/tool tip height above a material (2) for draw and cut applications
 - Old Fluffy Bath Towel: (1) to dry a washed mat (2) to apply an invisible layer of lint onto an overlysticky mat
 - Dishwashing Soap: (1) to remove visible and invisible fibers, thus renewing the adhesive (2) to clean the mat well before adding more adhesive
 - ♦ Soft Brush: (1) to gently remove waste scraps during the washing of a mat. Refer to Section 1.08.2.
 - Artist Palette Knife: (1) to gently remove cut shapes from a mat (2) to scrape off small waste pieces from a mat
 - Blue Painter's Tape: (1) to tape around the edges of thicker materials that might slip during cutting
 - ♦ Repositionable Adhesives: (1) to add more adhesive to a cutting mat (most any brand or type can be used, provided it is repositionable). Refer to Section 1.08.2 for instructions.
 - Awl or Paper Piercer (or other sharp pointed tool): (1) to pick or lift out a test cut to verify results
 - Stabilizers: A stabilizer is an adhesive material that is applied to the bottom of the material you are cutting so that cleaner cuts can be achieved. The stabilizer works in one or more of the following ways (1) provides firmer contact with the cutting mat (2) provides a final layer that does not need to be cut if the stabilizer will be removed after cutting (3) prevent some slightly-elastic materials from being stretched by the blade. Recommended stabilizers for particular materials will be listed in relevant sections of the user manual.
 - Double-sided Tape: (1) For securing metal tags or charms to the cutting mat for engraving
 - Non-slip Shelf Liner: (1) To place under cardstock and other materials when embossing

2. Zing Orbit: Cutting

2.00 Quick Reference for this Chapter

- How to properly mount the blade holder: Section 2.01.5
- How to control which shapes get cut: Section 2.02.1
- How to control where shapes get cut: Section 2.02.2
- Understanding Blade Offset and Overcut: Section 2.03.3 and Section 2.03.5
- How to get shapes to cut to precise dimensions: Section 2.08
- How to know which settings to adjust to solve cutting issues: Section 2.09
- Suggested settings for cutting materials: Section 2.11

The Most Common New Owner Mistakes:

- Too much blade is exposed on the blade holder (material is lifting up and/or tearing) refer to Section 2.01.5
- The blade tip (or pen nib) is too close to the material (inconsistent cutting) refer to Section 2.01.6
- The pinch wheels are not properly positioned (material or mat is sliding around during the cut) refer back to Section 1.09
- Failing to do a test cut (recommended cut settings are not working) refer to Section 2.01.8 and 2.09
- Not practicing enough with the test pen and paper (shapes are not cutting in the correct locations) refer to Section 2.02.2

2.01 What You Need to Understand About Cutting

IMPORTANT: Please read all of 2.01!!!

2.01.1 You Have to Make Mistakes

- The key to becoming successful at cutting is to do a lot of it! Those who shy away from using their Zing Orbit will never get to the stage of mastering it. It's very normal for new owners to be intimidated by their cutter, so remember the following key things:
 - ♦ You won't break your new Zing Orbit by cutting paper, vinyl, cardstock, rhinestone rubber, and other easy-to-cut materials. The worst thing that might *possibly* happen is that you'll break a blade. That's it! And the likelihood of even that happening is low.
 - ♦ You need to start cutting so that you'll make a lot of mistakes! We ALL do that. It's in making these mistakes that you start to learn. You realize that those mistakes didn't result in a broken cutter. Plus, you'll stop making the same mistakes as you remember more of the things you need to check before every cut.
 - As you make fewer mistakes you begin to build confidence and you begin to have more cutting success! From there, you begin to experiment more and produce more. Thus, your best course of action is to just start cutting... a lot! But first, read the rest of this section.

2.01.2 Begin with Easy Materials and Easy Shapes

• You didn't begin your first driving lesson on the freeway. You probably started driving on a farm or in a parking lot. Then you progressed to the neighborhood and other low-traffic streets. Then you began driving on major streets and, finally, the freeway. Think of your cutting in the same way and don't start your first cuts with thick difficult materials or detailed cutting files! Instead, start cutting basic shapes from inexpensive

materials or just scraps you have on hand. Work your way up to more difficult cuts after you master the easy ones.

2.01.3 Record Your Successes

As you have successful cuts, take note of the settings you just used, such as Pressure, Speed, blade type, number of passes, brand of material, etc. There is a blank form in Section 2.10 that you can print and use to record your results. There are also suggested settings for common materials at the end of this chapter. Use these as starting guides but remember that your results may vary based on the many factors which can affect cutting.

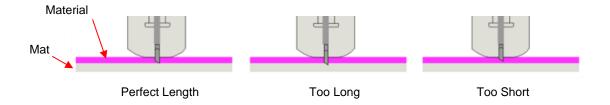
2.01.4 Use the Correct Blade for the Material You Are Cutting

- The Zing Orbit comes with a 45° blade (red cap) and a 60° blade (blue cap). An optional fabric blade (yellow cap) is also sold. Use the following as a guide for choosing the appropriate blade for the material you are cutting:
 - The 45° blade (red cap) should be used to cut vinyl, paper, most cardstock, thin plastic, iron-on transfer, and vellum.
 - ♦ The 60° blade (blue cap) should be used to cut chipboard, stiffened felt, craft foam, rhinestone rubber, thicker craft plastic, self-adhesive magnet, and Shrinky Dink. *IMPORTANT!* This blade is very fragile!
 - The fabric blade (yellow cap) should be used to cut all fabrics and unstiffened felt.
- Refer back to Section 1.07.2 for directions on properly installing a blade into the blade holder.

2.01.5 Set the Blade Length/Exposure To Match the Material Thickness

Free Video (This video was made for the original Zing but the method also applies to the Zing Orbit.)

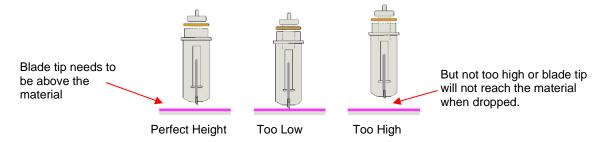
- The **Blade Length** (also called **Blade Exposure**) is how much blade is exposed at the bottom of the blade holder. You want this length to match the thickness of the material for optimal cutting. It is controlled by rotating the top of the blade holder. Rotating clockwise extends the blade (longer blade length). Rotating counter-clockwise retracts the blade (shorter blade length).
- When setting the blade length, hold the blade holder up next to the material before pressing the material to the mat, so that you can more accurately set the length to match the thickness of the material. For really thin materials, like vinyl and thin paper, just the very tip of the blade will be protruding from the bottom of the blade holder. In fact, you should just barely be able to feel it with your fingertip and not be able to see it very well, if at all.
- A good way to test your blade length is to fold a piece of the material onto itself and then cut a line into the material by hand, as shown in the video linked in this section. Press firmly but not too hard, as more force will not determine if the blade is set to the right length. If the blade cannot cut through the material, you will need to extend the blade. If the blade cuts through the material and cuts into the next layer, you need to retract the blade. If the blade cuts through the material but does not cut into the layer below, you have the perfect length.
- Having the blade fully extended will <u>never</u> result in better cutting. In fact, it can cause skewing, tearing of the material, damage to the blade, and damage to the mat.
- When conducting a test cut, be sure to check your mat for cut lines after the test. You should be able to set the length to get clean cuts but with <u>only fine lines or no lines in the mat</u>. If you do see deep cut lines in your mat, retract the blade length by turning the top of the blade holder ~¼ of a turn counterclockwise. You do not need to remove the blade holder from the Zing Orbit. Repeat your test cut.



2.01.6 Set the Blade Height Above the Material

(This video was made for the original Zing. A slightly different height is recommended for the Zing Orbit as presented below)

- The **Blade Height** is the distance from the tip of the blade to the top of the material you are about to cut. You have control over that height and will need to raise the blade holder up a little higher before locking it into place with the front screws on the blade holder seat.
- Adjust the blade height so that:
 - ♦ The blade tip will not be dragging across the material you are cutting when moving to the point to begin the cut. This will ensure that the dropping of the blade will invoke more downward force... to a point!



- In Section 1.13.2, you were instructed to set the blade tip height by holding down the blade holder seat while inserting the test pen. This needed to be done before inserting the cutting mat. However, this does not optimize the cutting force on the Zing Orbit.
- The recommended method for getting the same height set from one cut to the next is to use a spacer of some kind:
 - Place the spacer on top of the material you are cutting.
 - Loosen the front screw and insert the blade holder so that the tip of the blade is touching the top of the spacer.
 - Now tighten the front screws carefully making sure you are NOT pushing down on the blade holder seat. Once tight, remove the spacer. You should feel the blade gently scratching the top of the spacer.
 - This distance will provide the blade some "punch room" to give extra force and more consistent cutting of your material.
- What to use for this spacer?
 - Post-It notes, which are the same thickness as 20 lb (~75 gsm) copy paper, work well.
 - For materials such as cardstock, vinyl, and fabric, use 15 Post-It notes or 15 sheets. This is approx.
 1.5 mm.
 - When cutting thin chipboard with the red blade, use 15 Post-It notes. When cutting any material with the blue blade, only use 10 Post-It notes. <u>IMPORTANT!</u> The blue blade is a sliver blade which means it is cut thinner on both sides. This makes the tip very fragile!
 - For very thick materials, such as balsa or craft foam, use 10 Post It notes. Otherwise the blade holder ends up mounted too high in the jaw and that can compromise the force, as well.

 The table at the end of Chapter 2 includes a column for blade height based on the number of Post-It note sheets used by the testers.



2.01.7 Adjust the Speed, Force, and Number of Passes Based on the Material and Shapes

• Using correct cut settings is equally important as the type of blade, blade length, and blade height. Refer to Section 2.03 for details. Again, some suggested settings are located in Section 2.11 and settings for using the various Zing Orbit accessory tools are located in Section 12.06.

2.01.8 Perform Test Cuts!

- Select a shape from the SCAL Library and size it to be around 0.3" 0.5" (~ 8 mm 13 mm):
 - I personally like using one of the shapes with an internal circle (such as a flower, the gear or the ring). You can then easily see if the blade is cutting into the mat when you lift out the cut shape.
 - Make sure you can get a very clean cut without deep cuts into the mat before proceeding with your project.
 - When cutting intricate shapes, use a small letter or a shape will lots of sharp turns for testing. For a rhinestone project, use a small portion of your rhinestone pattern as a test.
- There is a flow chart in Section 2.09 which will help you determine which settings to change when test cutting a material.

2.01.9 Know Where Your Images Will Cut

Practice with the test pen until you know, with 100% confidence, where your images will be drawn. This is
important since you do not want to be guessing when you begin actually cutting with a blade. Refer to
Sections 2.02.2 and 10.07 for details on controlling the locations of your cuts.

2.01.10 Keep the Cutting Mat Clean and Sticky

- Press your materials evenly to the mat. Consider using a brayer both before AND after cutting. Repressing
 the material after cutting can greatly aid in weeding the cut shapes from the waste.
- When necessary, tape thicker materials to the mat to keep them from slipping during the cut.
- If you cut a range of materials, you might need more than one mat so that you can use stickier mats for certain materials.

2.01.11 Don't Get Frustrated, Get Help!

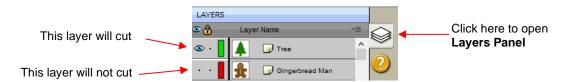
• Besides having your own Zing Orbit dealer as <u>your first line of contact</u>, there are user forums, message boards, and Yahoo groups where you can post questions and get answers from other users, dealers, and Sure Cuts a Lot experts. Utilize the resources listed in *Section 1.01*.

2.02 Choices Before Cutting

- There are a number of factors under your control for cutting:
 - ♦ What shapes to send to the cutter: Section 2.02.1
 - Where the shapes will be cut from the material: Section 2.02.2
 - What tool(s) will be used for cutting (or drawing, scoring, engraving, etc.): Section 2.02.3
 - ♦ What settings will be used: Section 2.02.4

2.02.1 Controlling What Shapes Will Cut

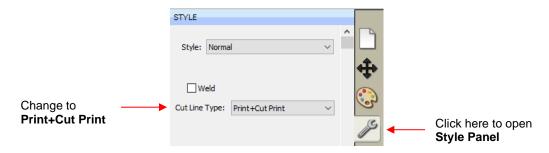
- There are four ways to control whether a shape will be cut or ignored:
 - Option 1: Show/hide shapes on the Layers Panel (refer to Sections 4.04 and 5.09) anything hidden will not be sent to the Cut Settings window. By clicking on the left side icon, a layer can be hidden. This is the most common way to control what shapes will cut.



Option 2: Select/highlight which shapes you want to cut (refer to Section 5.02). Then, in the Cut Settings window, mark the option for only cutting those that are selected. This is useful if you have shapes you want to cut that are in the same folder with other shapes you do not want to cut. You still have the option to hide those other shapes, as in the prior option, but this could be quicker if there are a lot of shapes to omit:



Option 3: For shapes you do <u>not</u> wish to cut, change the **Cut Line Type** (on the **Style Panel**) to **Print+Cut Print.** Those shapes can then only be printed and will not be sent to the **Cut Settings** window. This is typically used in **Print and Cut** applications (refer to *Sections 10.01* and *11.04*).



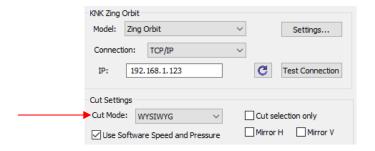
Option 4: For shapes you do <u>not</u> wish to cut, change the Cut Line Type (on the Style Panel) to Draw (Pen). Those shapes will not be cut if you then have Cut cut lines selected in the Cut Settings window (refer to Section 10.01).



Select Cut cut lines

2.02.2 Controlling Where Shapes Will Cut

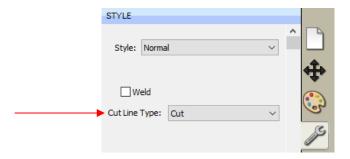
In the Cut Settings window is a Cut Mode option:



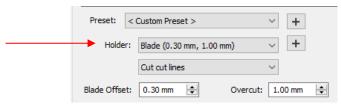
- This was briefly covered in Section 1.13.2. Cut Mode has three choices:
 - ♦ **WYSIWYG:** Cuts the shapes where they are positioned on the **Cutting Mat.** Refer to Section 10.07.3.
 - Origin Point: Moves the shapes to align with the origin you have set based on the blade tip. Refer to Section 10.07.2.
 - ♦ **Center Point:** Moves the shapes to center around the origin you have set based on the blade tip. Refer to *Section 10.07.4.*
- A fourth mode is called **Print+Cut** (aka **Print and Cut** or **PNC**):
 - This is the mode selected when you want to print images on your printer and then have the Zing Orbit cut them out.
 - Four registration marks are printed, along with your images, from SCAL to your home or office printer. The printout is placed on the cutting mat. The optic eye automatically locates and aligns with each printed mark. The Zing Orbit will then cut out your shapes based on triangulation. This is far more precise than **WYSIWYG** because it takes into account not only any misalignment of your printout on the mat, but also any errors in the printing. Most printers do not print images precisely in the location on the paper as they are located on the screen.
 - Note that raster images (.JPG, .BMP, .PNG etc.) will need to be traced first so that cut lines are created. Refer to Section 7.03 for tutorials on how to do the tracing
 - ♦ Access to the **Print+Cut** mode is located in the bottom left corner of the **Cut Settings** window. Refer to *Chapter 11* for complete instructions on calibrating the optic eye and examples of PNC applications.

2.02.3 Selecting the Tool to be Used for Cutting

When using the blade holder, you will leave the Cut Line Type (on the Style Panel) set to Cut:



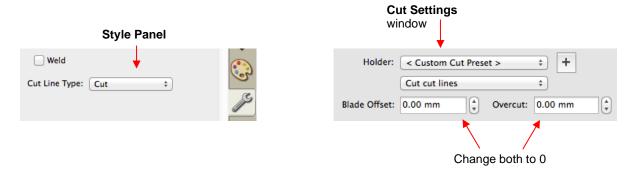
In the Cut Settings window, make sure Blade is selected under Holder:



• You have a choice of three blade types to use in your blade holder, as was covered in *Section 2.0.1*. Based on the blade type, you will need to set a **Blade Offset** value for that type of blade (refer to *Section 2.03.9*).

Pen (or Engraving Tool, Embossing Tool, Punch/Piercing Tool)

- There are two options for setting up SCAL to either draw with a pen or use one of the accessory tools:
- Option 1: When only using a single pen or tool, you can leave the Cut Line Type, on the Style Panel, set to Cut, as with the blade holder. You will then need to change the Blade Offset and Overcut to 0:

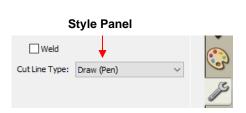


Option 2: When only using a single pen or tool, change the Cut Line Type on the Style Panel to Draw
(Pen) and then change the Holder to Pen, just as you did in when you first tested the Zing Orbit (Section 1.13.2):



• Option 3: If, however, you are using both the blade holder and a pen (or more than one pen) in your project and wish to change out tools during the process, then you will need to set the **Cut Line Type** to **Draw (Pen)**

(<u>for those particular layers</u>). Then, in the **Cut Settings** window, change **Cut cut lines to Blade/Pen Prompt:**





• When using both the pen and the blade holder, a specific procedure is needed to insure perfect alignment of the two. This is covered in *Section 12.07.2*.

2.02.4 Determining the Cut Settings

- In the lower half of the **Cut Settings** window, there are a number of settings which should be understood thoroughly, as you will be checking them before every cut. *Section 2.03* covers each setting in detail.
- Presets is a feature that allows you to add your own settings for cutting certain materials or performing certain applications, such as scoring or engraving. Refer to Section 2.04.
- The table at the end of this chapter contains recommended settings for your <u>initial test cut</u>. If you cannot find your material in the table, use the flow chart in *Appendix D1* while test cutting your material to determine optimum settings.

2.03 Cut Settings

2.03.1 Pressure

- The cutting Pressure (also called Force) ranges from 1 to 160 where the maximum of 160 represents ~1000g of cutting force. If it is set too low, the material cannot be cut. If it is set too high, you will get bad cutting (even incomplete cutting at times) and tearing of the material. Use suggested settings for the material you are cutting and perform small test cuts before cutting your actual project. Make adjustments in order to get a clean test cut before proceeding with your larger cut.
- Dull blades will need more force than new blades, thus anticipate increasing the force over the life of the blade.
- When cutting materials that can use either blade, the 45° blade (red cap) will need a little more force than the 60° blade (blue cap), because of the extra contact with the material being cut and because the 60° blade is cut much thinner, making it a "sliver blade."
- Recommended settings for a wide range of materials are available in *Section 2.11* and also in *Section 12.06*.

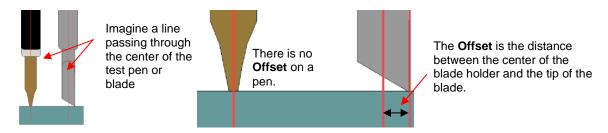
2.03.2 Speed and Up Speed

- **Speed** (also called **Cut Speed**) is how fast the blade travels while it is in the "down" or cutting position. **Up Speed** is how fast the blade travels while in the "up" position, such as when moving between individual shapes and when traveling to and from the origin.
- The Zing Orbit has 20 speed settings ranging from "snail's pace slow" to "insanely fast."
 - ♦ The settings from 1 through 9 are the slow speeds and should be used when cutting dense difficult materials, such as chipboard, craft plastic, styrene, and balsa.
 - The settings from 10 through 15 are medium speeds and should be used for easy-to-cut materials, such as cardstock, vinyl, iron-on transfer, and rhinestone template material.

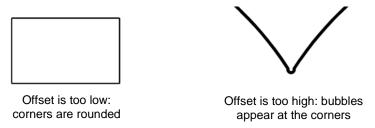
- ♦ The settings above 15 are the fast speeds and are useful for engraving, embossing, and drawing. You may, however, find that some materials will cut well at the faster speeds.
- **Cut Speed** is normally more important than **Up Speed** since some materials need more contact time with the blade to yield the best cuts. Up Speed can usually be set quite high although, for print and cut accuracy, it should be lowered if there are many shapes to be cut on the printout.

2.03.3 Blade Offset

• **Blade Offset** is the horizontal distance from the center of the blade shaft to the tip of the blade. A pen or engraving tool has an offset of 0 because the tip is centered with the center of the pen/engraving tool shaft. But a blade is different:



• If you set the **Blade Offset** to 0 when cutting with a blade, corners will be rounded. On the other hand, if it is set too high, bubbles will be cut on sharp corners:



- Below are the current Blade Offset settings to use for each of the three types of KNK Zing blades:
 - Red capped blade: 0.3 mm
 Blue capped blade: 0.4 mm
 Yellow capped blade: 0.75 mm
- Any time you order new blades, check for the recommended Blade Offset on the packaging. However, it's
 not unusual for blades to be slightly off-spec. Based on cutting a rectangle or square, increase or decrease
 the Blade Offset in increments of 0.1 or smaller.

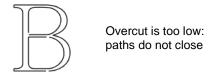
2.03.4 Multi-Cut

- The **Multi-cut** setting causes each individual path to be cut the set number of passes before the blade moves to the next path to cut. This is better than just repeating the entire cut as each repeated pass is cut with the blade held down throughout the repeated passes, resulting in cleaner cutting.
- In general, when increasing **Multi-Cut**, the **Pressure** setting can be decreased. For example, you may find a cardstock that requires a **Pressure** of 55 to cut in a single pass will only need a **Pressure** of 45 if cutting in two passes.
- **Multi-cut** is recommended in the following situations:
 - Cutting thicker denser materials, such as chipboard, where multiple passes allow the blade to progressively "carve" through the material

- Cutting of certain fibrous materials, such as fabric, where a second pass will insure that all of the fibers have been cleanly cut.
- Cutting intricate or detailed shapes (such as script titles) from certain materials, such as cardstock, where a single pass may leave certain spots not cleanly cut.
- Cutting rhinestone template material where a second pass results in much cleaner weeding of the cut circles.

2.03.5 Overcut

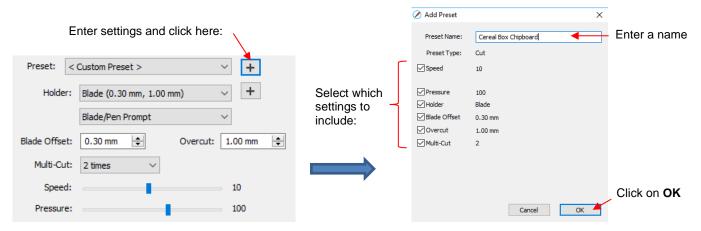
Overcut is related to Blade Offset in that it isn't needed when using a pen, embosser, engraver, and so
forth, because the tips of those tools are aligned with the center of the tools themselves. However, leaving
Overcut at 0 when using the blade holder will result in large shapes not quite closing:



- In some cutting programs, Overcut is not a separate setting but rather automatically calculated and applied based on the Blade Offset entered. However, in SCAL, you enter an actual Overcut setting and should any time a blade is used.
- In general, the blade type doesn't greatly affect the **Overcut** required. Try using 1.00 mm. In the event you cut a large closed shape, like an 8" circle, you may find that you'll need to increase **Overcut** to 2.00 mm.

2.04 Presets

• Presets allow you to save your settings for a particular material or blade type. To do this, enter the settings you wish to save. Then click on the "+" to the right of **<Custom Preset>**:



- After clicking on OK, the new preset will be found at the bottom of the list.
- In a similar manner, you can also add other Holders to your list, which would typically be blades with other
 Blade Offset values. For example:

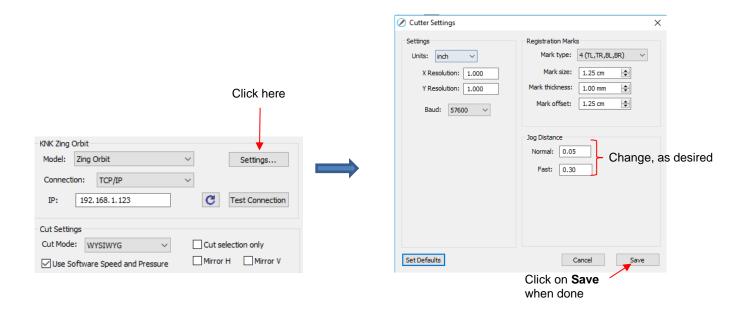


• To delete either type of preset that you personally added, select it from the menu and then a " – " button will appear. Clicking on that button will then remove it from the list:



2.05 Set Origin

- Every time you turn on the Zing Orbit, the blade carriage will be moved to the same spot. This is called the **Home Origin**.
 - With rolled materials and no cutting mat, you can always use that spot to start your cuts and never set a new origin. You just need to make sure your material is positioned under the blade.
 - With the cutting mat, however, you cannot move far enough to the right side because of the pinch wheel lever. Thus, you will need to move the head to the left so that the blade tip is over the material on the mat.
 - ♦ Important! The 15" Zing Orbit is a 15 inch cutter. If you move the head too far to the left to set the origin and your project is wide, you may exceed the left side limit and cutting will stop at that point with no option but to abort. With the mat aligned next to the pinch wheel lever, you can then move the head to the rightmost grid line, set an origin, and still have a 15" cutting range. But beyond that, perhaps not. Thus, when cutting wide projects, it's a good idea to remove the blade holder, after setting the origin, and "cut air" to make sure the cut completes before risking an actual cut.
- The **Set Origin** window allows you to move the blade carriage to a new location and define that location as the new origin for that cut. This was covered in *Section 1.13.2*. As a reminder, when using the buttons in this window or using the keys on your keyboard:
 - ♦ Each click of an arrow moves a specific distance called the **Normal Jog Distance**.
 - ♦ Holding **Shift** with each click of an arrow moves a specific distance called the **Fast Jog Distance**.
 - ♦ Holding Ctrl (or, on a Mac, Command) with each click of the arrow moves a shorter distance.
 - Holding Shift + Ctrl (or, on a Mac, Shift + Command) with each click of an arrow moves the minimum possible distance.
- The **Normal** and **Fast Jog Distance** can be changed under **Cutter>Cutter Settings** or by clicking on the **Settings** button near the top of the **Cut Settings** window. These defaults can be made larger or smaller according to your preference:



2.06 Other Output Functions

There are other functions and features in the Cut Settings window. Some of these, such as Weeding and Tiling, are only present in the PRO version of SCAL. Refer to Section 10.06 for details on all of the settings.

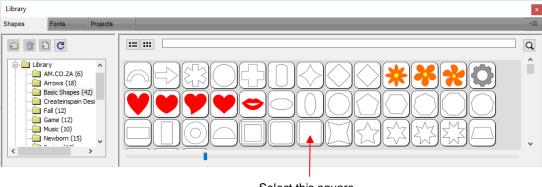
2.07 Important Checklist Before You Cut!

- Do you have your material on the mat and the mat inserted into the Zing Orbit? (Note: materials with a backing sheet, such as vinyl and iron-on transfer do not require a mat for cutting)
- Do you have the pinch wheel lever raised (so that the pinch wheels are down)?
- Have you set the blade length based on the thickness of the material you are cutting?
- Do you have the blade holder firmly mounted in the blade holder seat and the blade tip at the correct height above the material?
- Have you set the Origin at the bottom right corner of your material (or wherever you need the origin to be)?
- Have you set the Pressure? And the Speed?
- Have you selected the correct **Blade Offset** for the blade you are using?
- Do you need to turn on Multi-cut for this material?
- Have you selected the Orientation and Cut Mode you wish to use? Do you know, with confidence, where
 your shapes are going to cut?

2.08 Resolution Calibration

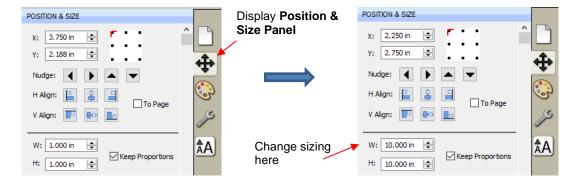
• If you were to cut out any particular shape, for example, a 10" x 10" square, you might find that it actually measures 9-15/16" x 10-1/32". It will be <u>very close</u> to 10" x 10" but perhaps just slightly smaller or larger in either or both dimensions. Now this might be perfectly acceptable for the type of cutting you do. Therefore, it may not even be necessary to do this particular calibration. However, if you do want to make sure your shapes are cut precisely, the following procedure will allow you to calibrate your Zing Orbit.

- IMPORTANT: This Resolution calibration is needed for accuracy in print and cut applications. Therefore, if you plan to do print and cuts, complete this calibration before performing the optic eye calibration in Chapter 11.
- Go to the **Library** and select the square shape:

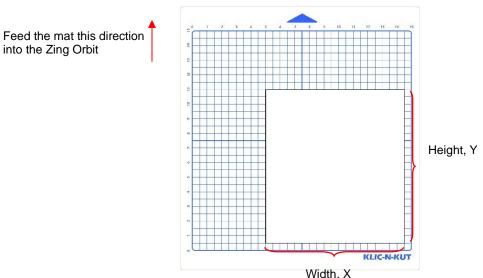


Select this square

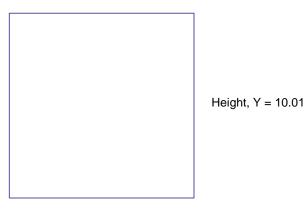
- Make sure you have selected the square and not the rounded square to the left of it because you will be measuring this square with a ruler after drawing it.
- To resize the square, select it and then click on the **Position & Size** icon to display that panel. The square will be 1" x 1". Change the size (W and H) to the largest size that will fit on the paper you have available. It is recommended that at least 10" x10" (or at least 250 mm x 250 mm) be used:



Draw the square on your paper using the test pen or some other thin line pen. Then carefully measure the Width (the left-to-right length that drew) and the Height (the top-to-bottom length that drew:

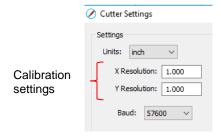


• Because the Zings are so very accurate, only take note if the sides are slightly larger than 10" or slightly smaller than 10" because it will probably be so close that you cannot even measure how much larger or smaller than 10 inches it might be. Instead, let's say the **Height** is just the tiniest bit over 10". Mark that side as being 10.01". Let's say the **Width** is just a tiny bit less than 10." Mark that side as 9.99". Now, if you feel you can measure accurately, with a ruler, then do so. But just estimating should work fine, too. Write those measurements onto your sheet:



Width, X = 9.99

• Go to Cutter>Cutter Settings. In the top left corner of that window you will see the calibration settings:

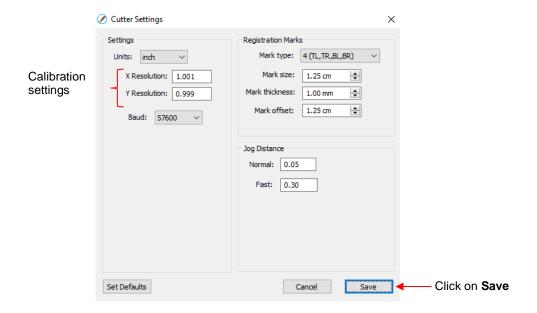


Use a calculator to calculate the X Resolution and Y Resolution based on the measurements you obtained versus the size in SCAL. Note that it doesn't matter if you used Portrait or Landscape mode, the X Resolution is based on left-to-right (width) and the Y Resolution is based on top-to-bottom (height):

New **X Resolution** = Current X **Resolution** multiplied by the desired value divided by the actual value = 1.0 * 10 / 9.99 = 1.001

New Y Resolution = Current Y Resolution multiplied by the desired value divided by the actual value =
$$1.0*10.00 / 10.01$$
 = 0.999

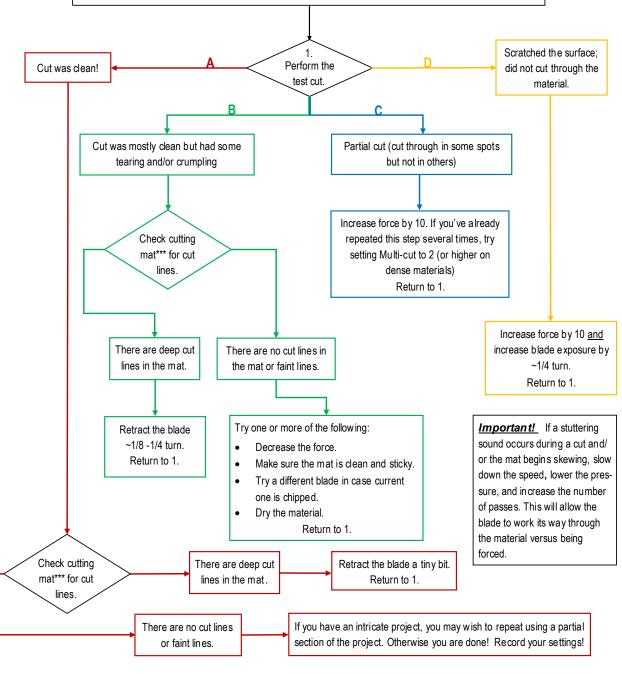
Enter those new values into the Cutter Settings window and click on Save:



- If, after testing again, you find that the sizing is still slightly off, then just repeat again. Note that in the calculations the second time, instead of using 1.00 for the **Current X Resolution** and/or **Y Resolution**, you will use whatever values you entered into the **Cutter Settings** window prior to drawing the square the second time.
- Once you have your calibration set, please record these values in your "little black book" in case you have a computer crash. Also, software updates can sometimes cause defaults to be reset. Thus, also verify the calibration is still in place after any update.

2.09 Guide to Test Cutting

- Create a small shape or use a shape from the SCAL Library.
- Start with conservative settings. Refer to a similar material in the Suggested Cut Settings Table.
- Use Origin Point mode and set origin in the lower right corner of the material.
- Set the Blade Tip Height above the material based on a similar material in the Suggest Settings Table.
- After each test, slide the mat forward so that the next test will be directly above the prior one.



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2.10 Settings Form for Cutting Materials

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

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2.11 Suggested Cut Settings for Various Materials on KNK Zing Orbit

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

ALSO IMPORTANT: Do not use a Blade Tip Height* greater than 10 with a blue capped blade. It is very fragile!

* Blade Height = number of Post-It notes used to set blade tip distance above the material: Refer to Section 2.01.6

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

Material Type	Material Brand/Source	Blade	Multi- Cut	Pressure	Speed	Blade Height	Other Comments
Chipboard	0.022" (0.5 mm)	R	2	100	10	15	Brayer well and tape edges
Chipboard	Cereal box 0.018" (0.4 mm)	R	2	100	10	15	Brayer well and tape edges
Chipboard	KNKUSA 0.03" (0.76mm)	В	2	120	10	10	Brayer well and tape edges
Chipboard	Silhouette .015" (.38mm)	R	1	80	10	10	
Construction Paper	Creatology - pink	R	1	30	13	15	
Construction Paper	Pacon Tru-Ray - black	R	1	35	13	15	Alt 2 passes at Pressure = 30
Craft Plastic	0.02" PET-G with blue protection sheets	В	2	130	8	10	Paper layer peeled off. Corners taped to mat
Craft Plastic	Dick Blick; 0.015" (0.38mm)	В	2	110	8	10	Paper layer peeled off. Corners taped to mat
Double Sided Adhesive	Sookwang	R	1	60	15	15	
Dura-Lar	Grafix: 5 mil (0.005", 0.13 mm)	R	1	80	10	15	
Fabric - Cork	embroiderygarden.com	Y	2	50	10	10	Used an extra sticky mat
Fabric - Cotton Batik	with Lite Steam-A-Seam 2	Y	1	65	10	15	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	10	15	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	13	15	Left paper layer on.
Fabric - Quilting Cotton	with Heat n Bond applied	Y	2	65	13	15	
Fabric - Quilting Cotton	with Lite Steam-A-Seam 2	Y	1	80	10	15	Alt: 2 Passes at Pressure = 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)	В	2	20	12	10	
HTV	refer to Vinyl - Heat Transfer						
Label Sheets: water resistent	Creative Label Concepts	R	1	35	15	15	The pressure is for kiss cutting the labels.
Leather	0.02" Bookbinding quality	R	2	75	13	15	
Leather	~ 0.06"	В	2	100	9	10	

Material Type	Material Brand/Source	Blade	Multi- Cut	Pressure	Speed	Blade Height	Other Comments
Magnet	0.035" (0.9mm)	В	2	120	10	10	Tape magnet to a sticky mat, may need slower speed for accurate shapes
Magnet	Cricut Printable Magnet Sheets (.25mm)	R	1	50	15	15	
Magnet	KNK USA - Printable Magnet Sheets-15 mil (0.4mm)	R	1	70	15	15	Alt 2 passes at Pressure = 50
Mylar	5 mil (0.12mm)	R	1	50	15	15	
Mylar	KNK USA - 10 mil (0.25mm)	R	2	100	10	15	Extra sticky mat, tape corners
Mylar	KNK USA - 7 mil (0.18mm)	R	1	65	15	15	
Paper - Copy Paper	HP Everyday 20lb (75gsm)	R	1	35	15	15	
Paper - Watercolor	Canson 140lb (300g) Cold Press	R	1	100	15	15	
Photo Paper	HP Glossy	R	1	80	15	15	Alt 2 passes at Pressure = 65
Photo Paper	Royal Brites Matte White - 200 gsm	R	1	70	15	15	Alt 2 passes at Pressure = 55
Poster Board	Grocery store 0.013" (0.33mm)	R	1	70	12	15	Alt 2 passes at Pressure = 60
Poster Board - metallic	Fine Touch from Hobby Lobby	В	1	35	15	15	
Rhinestone Flock	KNK USA (Rock-It)	R	2	55	15	15	Backing peeled and sticky side pressed to mat
Rhinestone Flock	Sticky Flock	R	2	45	15	15	Backing peeled and sticky side pressed to mat
Rhinestone Rubber	KNK USA (green Hartco)	R	2	60	15	15	Backing peeled and sticky side pressed to mat
Shrink Film	Grafix clear	R	2	80	12	15	
Shrink Film	Grafix Ink Jet white	R	2	120	12	15	
Shrinky Dink	Bright White	R	1	125	12	15	
Shrinky Dink	Frosted Ruff N' Ready	R	1	125	12	15	
Shrinky Dink	Printable Ink Jet white	R	1	125	12	15	
Stencil Blanks (also see Mylar)	Show-Offs 15 mil from Hobby Lobby	R	3	120	10	15	Place side with protection sheet down; tape corners

Material Type	Material Brand/Source	Blade	Multi- Cut	Pressure	Speed	Blade Height	Other Comments
Styrene	ASI .02" (.47mm)	R	2	120	15	15	
Styrene	Evergreen .02" (.47mm)	R	3	155	10	15	
Styrene	Plastruct .01" (.25mm)	R	1	90	15	15	Alt 2 passes at Pressure = 65
Tint Vinyl Film - self adhesive	F&D LED Lights on Amazon, red	R	1	40	12	15	Blade set to only cut through the vinyl and not the backing sheet easier to separate from the sheet
Vinyl - Heat Transfer	Cricut Glitter Iron On - White	R	1	30	15	15	Cut on mat
Vinyl - Heat Transfer	Easy Weed - white, navy	R	1	40	12	15	Cut on mat
Vinyl - Heat Transfer	GlitterFlex Ultra - Black	R	1	50	15	15	Cut on mat
Vinyl - Permanent	Expressions Vinyl 51 Series - Black	R	1	20	15	15	Cut on mat
Vinyl - Wall (no mat)	Vinyl - Oracal 631 - yellow	R	1	20	15	15	Not using a mat note lower Blade Height
Vinyl - Wall (no mat)	Vinyl - Oracal 631 - yellow	R	1	25	15	15	Not using a mat
Vinyl - Wall (on mat)	Vinyl - Oracal 631 - yellow	R	1	20	15	15	Cut with vinyl on the mat
Wood Veneer	0.015" (0.4mm) from cardsofwood.com	В	2	100	10	10	Taped to mat, tested both oak and walnut

3. SCAL: Installation, Preferences, and Workspace

3.01 Installing SCAL

3.01.1 Selecting and Downloading the Software

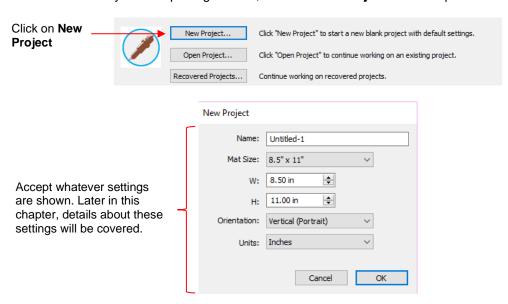
 Sure Cuts A Lot 5 (SCAL) can be downloaded from the following link. Note that there are four choices -Mac or PC and then regular or PRO:

http://www.craftedge.com/download/download.html

 The additional features in the PRO version are listed below. You can also find out more details about these features at the following link:

http://www.iloveknk.com/wp-content/uploads/Info/SCAL5_Pro_Features.pdf

- ♦ Ability to cut longer than 72 inches
- Weeding add weeding boxes and internal lines
- ♦ Tiling splitting large designs into sections for cutting
- Duplicate cutting setting up a grid of repeats in the cutting window
- ♦ Cut by color
- ♦ Cut by layer use different settings, as needed
- ♦ Cut order control
- ♦ End action options where cutting head moves at the end of a cut
- ♦ Color layer alignment
- ♦ 3D extrude
- ♦ Importing DXF, PLT
- Install the downloaded file and open SCAL. An initial window will open where you can choose if you are starting a new project, opening an existing project, or recovering a project after a software crash. Because this is the first time you are opening SCAL5, choose **New Project** and accept the defaults shown:

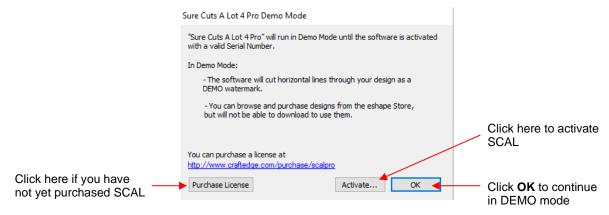


- The software will run in DEMO mode until a registration is purchased. This mode will have the following limitations:
 - When cutting, horizontal lines will be added across the design
 - Digital shapes from the eshape Store cannot be downloaded
 - Exporting will add a DEMO watermark
- Note that the demo version of SCAL5 will expire after 15 days.

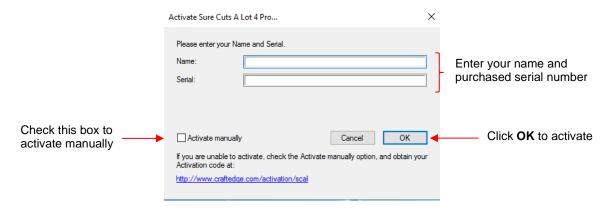
3.01.2 Activating the Software



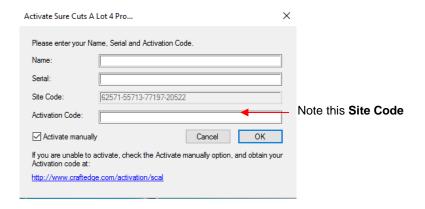
 To convert the DEMO version into a registered version, click on Activate when opening the software and seeing this popup screen:



- **IMPORTANT**: Make sure the version of SCAL you installed matches the registration you purchased. You can verify this by going to **Help>About Sure Cuts a Lot**. If the wrong version is installed, uninstall this current version and download the correct one.
- After clicking on Activate, enter your name and the Serial Number you received after purchasing SCAL:



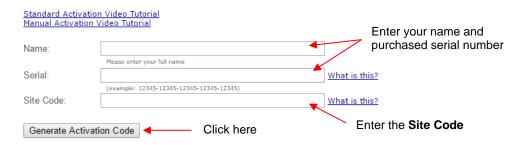
- If you do not have an Internet connection on this computer or the automatic activation fails, use the **Activate** manually option in the prior screenshot.
 - ♦ The window will then pop up a **Site Code**:



Next, go to the following link:

http://www.craftedge.com/activation/scal/

Enter your Name, Serial Number and the Site Code. Then click on Generate Activation Code:



- An Activation Code will be generated and it can be copied and pasted into the Activate manually screen.
- The purchased Serial Number can be registered on any two computers you own. If you want to register **SCAL** on a new computer:
 - Go to Help>Deactivate on the computer no longer needing SCAL and confirm you wish to deactivate.
 - Go to the new computer and activate SCAL.
- If you need to activate your Serial Number on both a PC and a Mac, go to Help>Support>Technical Support and click on Contact Support Team.

3.01.3 Installing the USB Driver

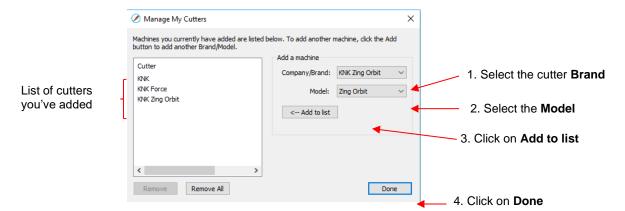
If the cutter you are using connects via a USB cable, download and install the correct driver by going to Help>Install Driver. If you own a Klic-N-Kut, please go the following link to download the appropriate driver for your model:

http://knkusa.com/resources/

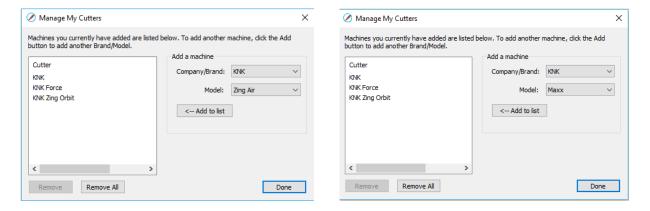
3.01.4 Installing Your Cutter



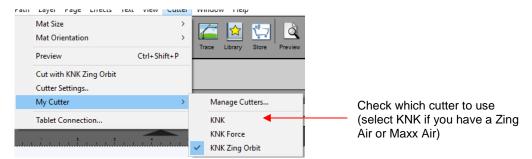
Go to Cutter>My Cutter>Manage Cutters and the following window will open:



- As shown in the prior screenshot, select your cutter Brand and Model from the drop-down menus. Then
 click on Add to list. The cutter will then be added to the menu on the left side. Add all cutters you plan to
 use with SCAL.
- Note that with some brands, such as KNK, adding multiple models may not give separate listings. While KNK Force and the KNK Zing Orbit show up separately, selecting both Maxx and Zing Air from the model menu only displays once as KNK. Some models will need to be separately selected later in the Cut Settings window.

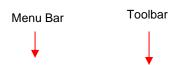


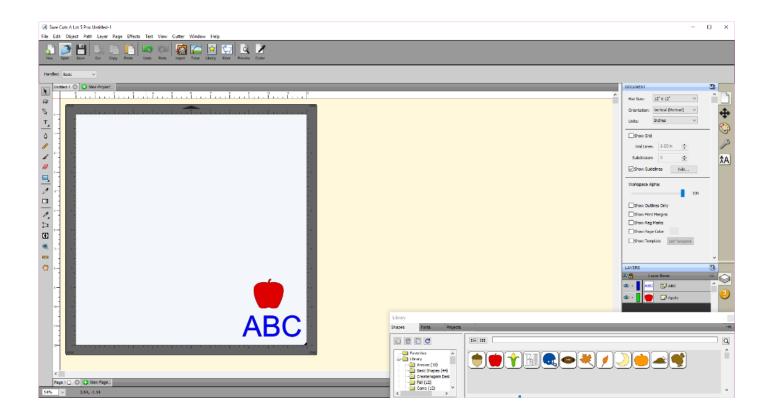
 Click on **Done** to save and close the window. Now, when you are ready to cut, the cutter you use will be selected by going to **Cutter>My Cutter** and picking which cutter you wish to use:



3.02 Main SCAL Screen Wild

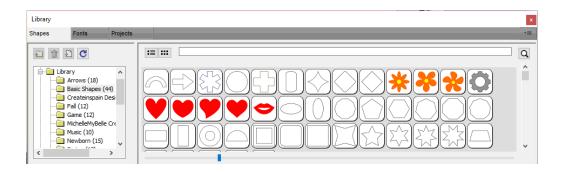
 Below is a screen shot of the main screen in SCAL identifying various elements. Note the names of the items shown as they will be referenced throughout this user manual:





- Hovering your mouse over most of the screen icons will pop up the icon's name and, in some cases, details
 about usage.
- In order to better remember where major elements are located, note that the term "bar" is used when components are laid out horizontally (such as the **Toolbar**) and the term "panel" is used when components are laid out vertically (such as the **Tools Panel**).
- The **Toolbar** and the **Status Bar** can be hidden, when desired, by going to **View>Hide Toolbar** and **View>Hide Status Bar**. On a Mac, there's also an option to **Enter Full Screen** in the **View** menu.
- Throughout this manual, Cutting Mat (capitalized and in bold type) refers to the on-screen simulation of the
 physical cutting mat, which will be written with lower case, normal type.
- The **Rulers** can be toggled on and off by right-clicking on the screen and selecting **Show Rulers**. Note that when hiding the rulers, click again on the screen for it to take effect. To change the units displayed on the **Rulers**, refer to *Section 3.06.3*.
- **Shapes** are the objects or images that you will be adding to your projects. They can be created from scratch or imported from other sources, such as the **Library**, your computer, or the **eshape Store**. As you will see throughout sections of this user manual, you have many options and resources available to you.
- This manual also presents information by topics versus location on the screen. If you need to look up all of the functions on one particular element, for example the **Tool Panel**, refer to **Appendix C**.





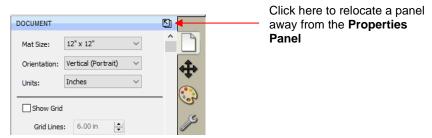
- The SCAL **Library** provides a number of useful functions:
 - It contains a collection of over 300 pre-installed shapes, organized into 16 subfolders \Diamond
 - It displays complete character sets for all fonts currently installed
 - You can organize your own shapes and projects into separate folders and view thumbnails for selecting \Diamond
 - You can assign commonly-used shapes and projects to a Favorites folder for quicker access \Diamond
 - It provides access to designs and projects downloaded from the eshape Store
- The **Library** automatically opens every time you open SCAL. If you've closed it, the **Library** can be reopened by using one of the following:
 - Click on Library icon on the upper Toolbar
 - \Diamond Press Ctrl+1
 - Go to Window>Library
- To add a shape from the Library to the Cutting Mat, click on the thumbnail for that shape or drag the shape onto the Cutting Mat. Note there are other categories within the Library listed on the left side. Check out the various subfolders of shapes as they are a great resource while learning SCAL and testing out your cutter.
- Further details on organizing and fully utilizing the Library is covered in Section 4.03.

3.04 Properties Panel Video

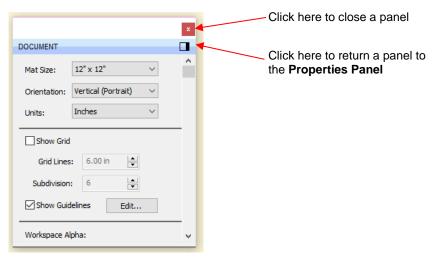


- The **Properties Panel** is located on the right side of the screen. Seven large icons represent seven different panels that you will frequently switch between:
 - **Document Panel** contains the properties related to the Cutting Mat. Refer to Section 3.06.
 - Position & Size Panel contains properties and manipulation functions related to any currentlyselected shapes in the project. Refer to Sections 5.04, 5.05.1, 5.06, 5.08, 5.18.
 - : contains properties for the fill and for the stroke on any currently-selected Fill & Stroke Panel shapes in the project. Refer to Sections 5.14 and 5.15.

- **Style Panel** contains properties pertaining to how selected shapes will be cut or printed. Refer to Section 8.01.
- contains properties pertaining to how text will appear. Refer to Section 6.05.
- lists all shapes in the current project with options to organize, hide/show, **Layers Panel** \Diamond lock/unlock and more. Refer to Section 4.04.
- Help Panel : opens a user guide to a section based on the currently selected tool. More tips and instructions can be found under Help>Help.
- Clicking on the icon for any the seven panels will open that panel. To expand a panel for easier viewing, click on the small icon to the right of the panel name. This will open the panel in the area to the left of the **Properties Panel:**



To return a panel to the **Properties Panel** or close a panel, click on the following:



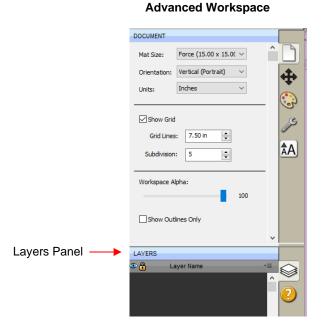
A panel which has been moved out, can be dragged from either the top or the bottom in order to view more properties and settings.

3.05 Customizing the Properties Panel / Workspace

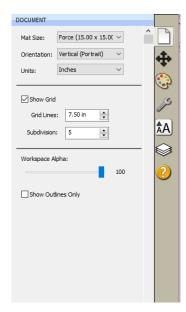


In SCAL, the Workspace refers to the arrangement of panels and whether or not you want the Library to be open or closed by default. There are two versions already set up: Basic and Advanced. You can then make changes and name and save others, as desired.

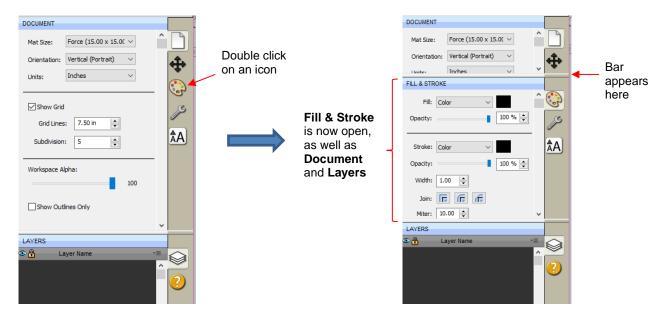
• By default, the **Advanced Workspace** opens. To switch to **Basic**, go to **Window>Workspace>Basic**. The only difference between **Advanced** and **Basic** is the former has the **Layers Panel** open:



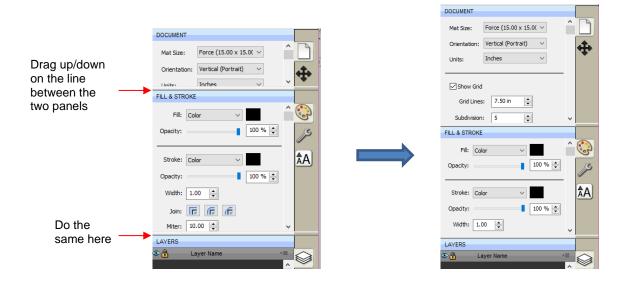
Basic Workspace



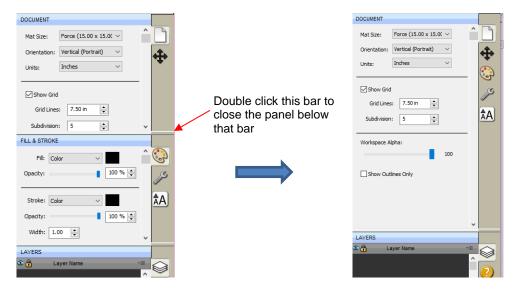
To switch to other panels, click on the icons along the right side. If there's a particular panel you access
often, then you can create a custom workspace. For example, let say you want the Fill & Stroke Settings
panel to always be open. Double-click that icon and the Properties Panel will now have that panel open
and separated:



• These separate panels can also be resized by dragging them up or down:



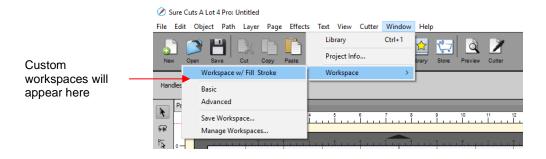
To close a panel, double-click on the bar on the right side:



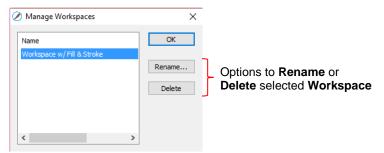
- By default, the SCAL Library opens every time you open the software, start a new project, or open an
 existing project. You might prefer to have the Library closed and only open it when needed. This can be
 accomplished by having it either opened or closed and then saving it along with your preferred Properties
 Panel layout.
- To save workspace changes, go to Window>Workspace>Save Workspace. A window will open and you
 can name this new configuration:



• When you now go to Window>Workspace, the new workspace will appear at the top:

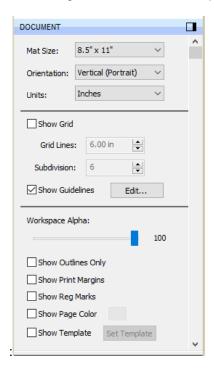


 To rename or delete a custom workspace, go to Window>Workspace>Manage Workspaces and a window will open with Delete and Rename options:



3.06 Document Panel Wideo

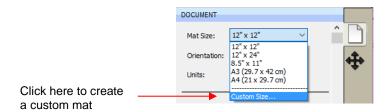
• The **Document Panel** contains settings for the **Cutting Mat** which serves as a design area for the software as well as to indicate, in some cutting modes, where the shapes will be cut.



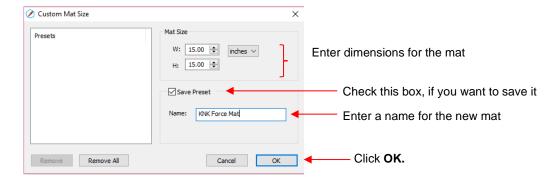
3.06.1 Mat Size

- There are three ways to access the Mat Size menu:
 - ♦ Click on the drop-down menu next to **Mat Size** on the **Documents Panel**

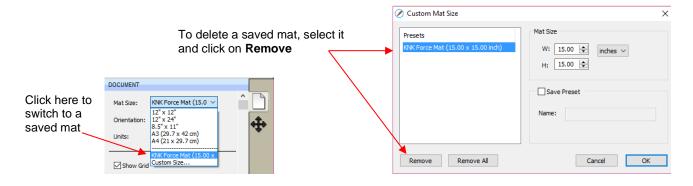
- Right-click on the screen and select Mat Size
- ♦ Go to Cutter>Mat Size
- There are five options for setting Cutting Mat dimensions under Mat Size. There is also the option to create
 a Custom Size for a mat:



The following window will open where you can enter the dimensions of the mat and provide a name, if you
wish to store it for future use:



A saved mat will now appear at the bottom in the Mat Size menu and will be listed under Presets when you
return to the Custom Mat Size window:

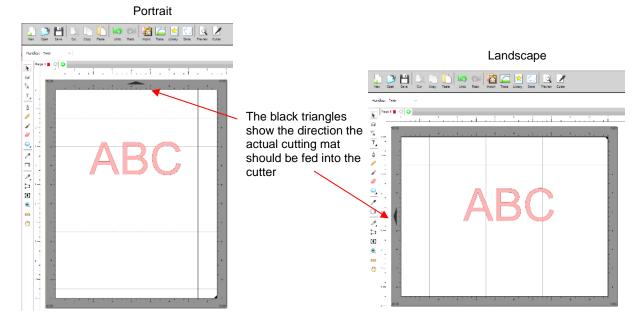


• To remove a custom **Cutting Mat** from the menu, go back to the **Custom Mat Size** window and select the mat under **Presets**. Click on **Remove**.

3.06.2 Orientation



• A Cutting Mat can appear in either Portrait mode or Landscape mode with a triangle indicating the direction the mat will be fed into the cutter. To better illustrate this, a letter-size Cutting Mat is selected:



- There are three ways to change the mat orientation:
 - On the Documents Panel under Mat Size:



- ♦ Right-click on the screen and select **Mat Orientation**
- ♦ Go to Cutter>Mat Orientation

3.06.3 Units

By default, the unit setting is in inches. To switch to mm or cm, click on the drop-down menu next to Units
on the Documents Panel:



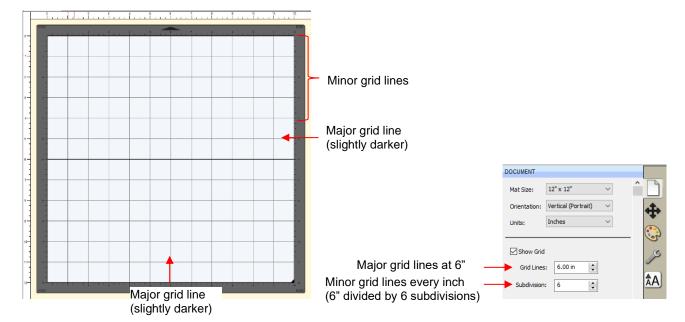
- The units can also be changed in either of the following locations:
 - ♦ Go to View>Ruler Units
 - Right-click on the screen and select Ruler Units

3.06.4 Show Grid

- The mat grid can be toggled on or off by either of these two ways:
 - ♦ Go to View>Show Grid
 - ♦ Check or uncheck the **Show Grid** box on the **Documents Panel**:



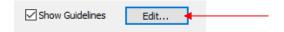
• The grid lines can also be customized. For example, with this 12" x 12" mat, major grid lines are set at 6" and then minor grid lines are set at 1" (by specifying 6 **Subdivisions** be used):



• A final grid option involves circular grid lines which can, as an example, be used for cake design. Go to View>Show Mat Cake Circles:

3.06.5 Show Guidelines

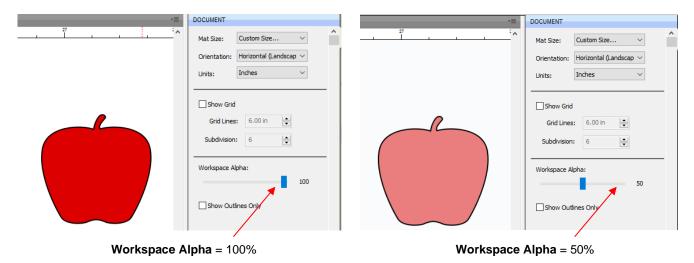
- Guidelines are very useful when designing projects, such as boxes or pop-up cards, from scratch. They can be added to the **Cutting Mat** in two ways:
 - ♦ By dragging your mouse from the horizontal or vertical rulers on the screen
 - ♦ By manually adding in the Guidelines Edit window
- You can toggle guidelines on and off by clicking on the box next to Show Guidelines on the Document
 Panel. To open the Guidelines window, either go to View>Guidelines>Edit Guidelines or click on the Edit
 button next to Show Guidelines:



• Details on adding, changing, and deleting guidelines is covered in Section 9.03.

3.06.6 Workspace Alpha

 The Workspace Alpha setting on the Document Panel affects the opacity of filled shapes on the Cutting Mat:



You can also change the opacity of individual shapes versus all shapes. Refer to Section 5.14.5.

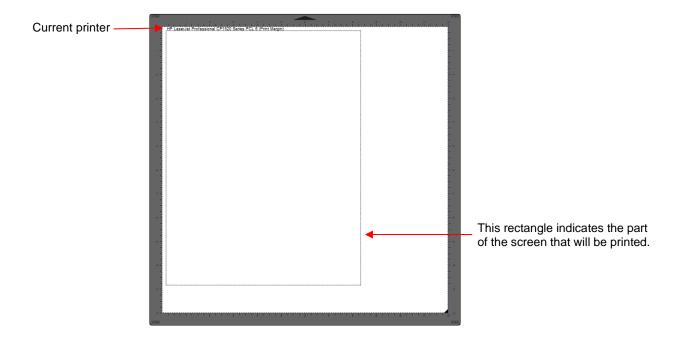
3.06.7 Show Outlines Only

This option determines whether shapes are displayed with a fill or not:



3.06.8 Show Print Margins

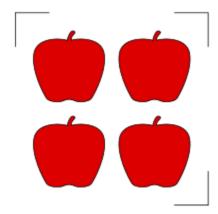
This option shows the boundaries of a printout if you send a file to your printer:



3.06.9 Show Reg Marks



This option will show the registration marks that will be printed and used in a print and cut application:



• The number of reg marks, their location, type, length, thickness, etc. will vary depending on the selected cutter in use, as well as properties that can be changed under **Cutter>Cutter Settings**. Refer to *Section 8.06.1*.

3.06.10 Show Page Color

• The default color of the **Cutting Mat** is a grayish white. To change the color to any other desired color, mark the option for **Show Page Color** and then click on the box next to it and select.



Note that the color can be different for each page in a project, if desired.

3.06.11 Show Template

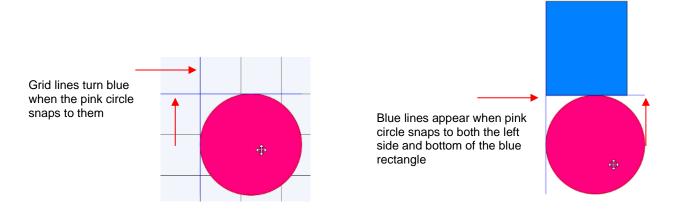
- SCAL5 has the ability to add templates to the Cutting Mat that are non-selectable shapes to aid in designing. Typically these templates are representations of actual objects onto which cut shapes will be applied. Here are several examples:
 - Designing an etching stencil for a champagne glass
 - Designing a decoration for a light switch
 - ♦ Designing a rhinestone template or HTV pattern for a T-Shirt
- To show or hide a template, mark the box next to Show Template:



Details on customizing and organizing templates is covered in Section 9.04.

3.07 Snap To

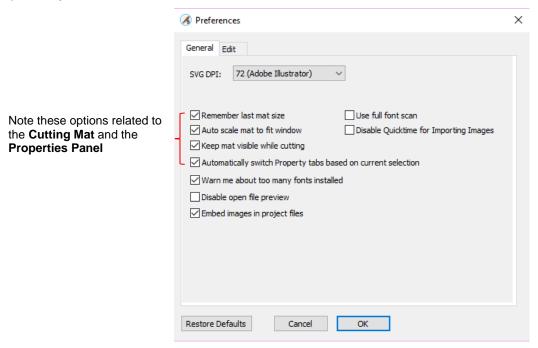
- The Snap To option allows you to choose how shapes behave as they are being moved. Being able to snap
 to other objects, to guidelines or to the grid can help align shapes more easily when designing or editing a
 project.
- To access the Snap To options, go to View>Snap To and mark your preferences based on the following options:
 - ♦ Grid: selected shape will snap to the grid lines
 - ♦ **Guidelines:** selected shape will snap to guidelines (refer to Section 9.03)
 - Objects (Bounds): selected shape will snap to other shapes' boundaries
 - ♦ **Objects (Centers):** selected shape will snap to other shapes' centers
 - Object (Sublayers): selected shape will also snap to shapes inside other shapes (child shapes)
- When you first access the **Snap To** menu, you will most likely see the last two grayed out. In order to access those options, make sure **Objects (Bounds)** is checked. Then you will able to go back to the menu and change any of the options.
- When snapping to the grid, the grid can be showing or hidden.
- When a shape snaps to the grid, a guideline, or to another shape, blue lines appear indicating the shape is aligned at that point. Here are two examples:



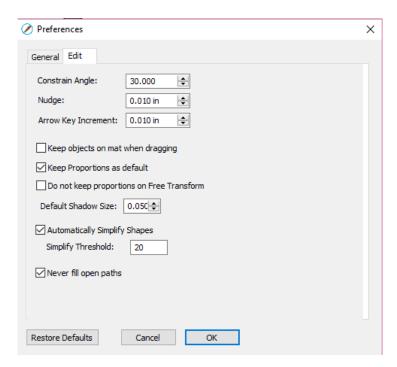
3.08 Other Preferences Video



- Under Edit>Preferences, you will find a number of other options, some of which you will probably never need to change. Others will be covered in later sections, as they pertain to the function involved.
- For now, note the following preferences that do relate to the material covered so far. These should be selfexplanatory based on their names:



If you click on the Edit tab, more preferences are listed. As with the preferences on the General tab, most will be covered in later sections of the manual:

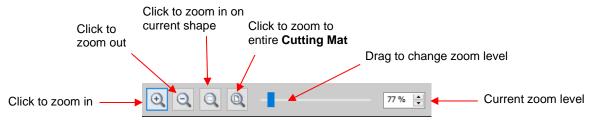


For more details on these settings, go to Appendix C4.

3.09 Zooming and Panning

3.09.1 Zooming **Video**

- To zoom in and zoom out, use any of the following methods:
 - ♦ Hold down the **Alt** key (**Option** key on a Mac) while rolling the mouse wheel
 - Access the **Zoom** menu on the **Status Bar** in the lower left corner of the screen
 - ♦ Go to View>Zoom In or View>Zoom Out
 - Use the following shortcut keys:
 - o Ctrl+ ++... (hold Ctrl key (Command key on a Mac) and repeatedly click on + key): Zoom in
 - o Ctrl+ ---... (hold Ctrl key (Command key on a Mac and repeatedly click on key): Zoom out
 - o Right-click on the screen and select **Zoom In** or **Zoom Out**
 - Click the Zoom in Tool icon on the Tools Panel
 Then use the icons in the Tool Options at the top:



- Note that while the Zoom in Tool is activated, you can also marquee-select an area of the screen to zoom to that location.
- To zoom in on a selected shape or shapes, use one of the following:
 - ♦ Click on the icon while the **Zoom in Tool** is activated (see prior screenshot)
 - ♦ Use the shortcut Ctrl+ Shift+ = (on a Mac: Control+ Shift+ =)
 - ♦ Go to View>Zoom Selection
- To zoom to the Cutting Mat, use one of the following:
 - ♦ Click on the icon while the **Zoom in Tool** is activated (see prior screenshot)
 - ♦ Use the shortcut Ctrl+ F (Command + F on a Mac)
 - ♦ Right click on the screen and select Fit to Window
 - Select Fit to Window from the Zoom menu on the Status Bar
- To change the zoom level so that a selected shape will be the same size on the screen as its actual size, go
 to View>Actual Size.

3.09.2 Panning **Video**

- To move the workspace up and down, roll the mouse wheel.
- To pan the workspace, use either of these methods:
 - ♦ Press and hold the **Spacebar** while dragging the left mouse button
 - ♦ Click the **Hand tool** icon on the **Tools Panel** . Then drag the left mouse button.

3.10 Undo/Redo Video

3.10.1 Undo

- As with most Windows applications, there is an **Undo** function to reverse the most recent steps performed. You can use any of the following to execute the **Undo** function:
 - Click on the **Undo** icon on the upper **Toolbar**



- \Diamond Press Ctrl+Z
- Go to Edit>Undo

3.10.2 Redo

- As with most applications, there is also a **Redo** function in case you **Undo** too many steps or simply change your mind. You can use any of the following to execute the **Redo** function:
 - Click on the Redo icon on the upper Toolbar

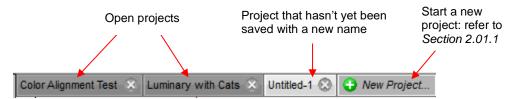


- Press Ctrl+Shift+Z
- Go to Edit>Redo

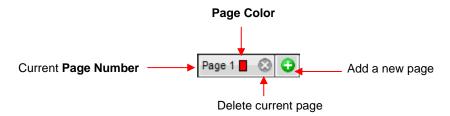
3.11 Projects and Pages Video



The Project Bar is located right above the Ruler and shows what projects (files) are open and have been named, new projects that have been started but not named, and an option to open a new project:



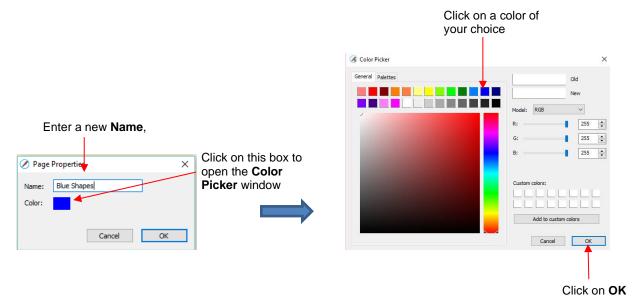
- Clicking on any Project Tab on the Project Bar will then access that project. Note that you can copy/paste and cut/paste between open projects. Refer to Section 5.17.
- Projects can contain one page or many pages. The option to add multiple pages can be convenient for organizing projects with many shapes and or layers.
- The Page Bar is located just below the Cutting Mat and displays the current page, a color for quickly identifying pages, and icons for adding and deleting pages:



To add a page, either go to Page>Add Page or click the green icon on the Pages Bar itself and the following window will open:



♦ Either accept the default **Page** number as the new **Name** or provide your own. The same with color – you can click on the default color provided and select a new color from the **Color Picker** window that opens. For example, you might want to have all of the blue shapes on their own page:



- Note: You can create your own custom colors within the Color Picker window. This will be covered in Section 5.14.2.
- ♦ After clicking on **OK**, the new page appears on the **Page Bar**:



- Note: The color selected for the page tab will also be the color of the **Cutting Mat** if you mark the **Show Page Color** option on the **Document Panel**.
- If you change your mind and want to edit the Name and/or Color, either go to Page>Page Properties or double-click on the Page Name and the same Page Properties window will open, allowing you to make changes.
- To switch between pages, click on the Page name or go to Page on the Menu Bar and the menu will have all pages listed.
- To delete a page, make sure it's selected and then either go to **Page>Delete Page** or click on the **Delete**Page icon

 A window will open asking for confirmation.

3.12 Help Resources

- The following steps within SCAL will take you to help resources (note that some of these will require an Internet connection):
 - ♦ Go to **Help>Help** for access to a user guide
 - Click on the Help Panel icon on the Properties Panel to open the user guide to a section based on the currently selected tool

- ♦ Go to Help>Forums to access the SCAL user forum
- ♦ Go to **Help>Online Video Tutorials** to access a page with links to both videos and written tutorials
- ♦ Go to **Help>Support>Technical Support** for the following:
 - o Contact the SCAL team
 - Retrieve your serial code
 - Download latest updates
 - o Access the forum
 - o Access tutorials
- Other online support groups for SCAL include:
 - ♦ Let's Learn Cricut, SCAL, & MTC Facebook Group
 - ♦ SCAL Facebook Page
 - ♦ MTC and SCAL Facebook Group
 - ♦ SCAL Users Yahoo Group
- An online training program, with over 9 hours of videos which can be viewed as often as you need, is available at this link: <u>Sure Cuts a Lot 5 Beginner Class</u>.

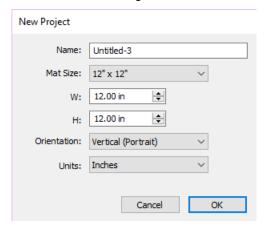
4. SCAL: Handling Files and Organizing Layers

4.01 Opening Files



4.01.1 Opening a New File/Project

- When you launch SCAL, a new blank Cutting Mat will appear with a new blank project opened.
- To open a new file (start a new project), any of the following can be used:
 - ♦ Click on **New Project** when you first open SCAL
 - ♦ Click on the **New Project** icon on the upper **Toolbar**
 - ♦ Click on the **New Project tab** above the **Cutting Mat**
 - ♦ Press Ctrl+N
 - ♦ Go to File>New Project
- When you elect to start a **New Project**, a window will open where you can specify the following settings. These settings can be modified later, if needed, using the **Document Panel**.

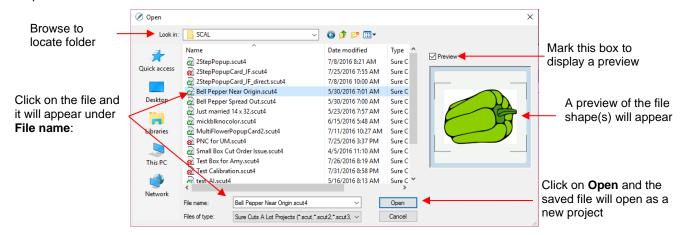


Note that as of SCAL5, you can have more than one project open at a time.

4.01.2 Opening an Existing .SCUT File

- An existing .SCUTx file (where x is blank, 2, 3, 4, or 5 indicating which SCAL version created it) can be
 opened in SCAL5 using any of the following:
 - ♦ Click on Open Project when you first open SCAL Open Project...
 - Click on the thumbnail, if it appears, when you first open SCAL.
 - ♦ Click on the Open Project icon on the upper Toolbar
 - ♦ Press Ctrl+O
 - ♦ Go to File>Open Project
 - Go to File>Recent Projects, if the file is one of the last five you had open in SCAL
 - ♦ Double-click a .SCUTx file in Windows Explorer or attached to an email
 - Drag and drop a .SCUTx file onto the main screen of SCAL
 - ♦ Import from the **Library** (refer to Section 4.03.3)

 In the first three options above, a window will open where you can browse to locate the file you wish to open:



- In the case of opening a file from Windows Explorer, an email, or using a drag and drop method, the file will automatically open.
- In the opening window of SCAL, you also have the option of opening a **Recovered Project** which will be an auto-saved project or projects that were open before a software crash.
- Note that other file formats, besides .SCUT can be imported into SCAL5. Refer to Section 4.06.

4.02 Saving SCAL Files Video

- A file can be saved in .SCUT5 format using any of the following:
 - ♦ Click on the Save Project icon on the upper Toolbar
 - ♦ Press Ctrl+S (for save) or Ctrl+Shift+S (for save as)
 - ♦ Go to File>Save Project or File>Save Project As
- If you've made changes and wish to save under a different file name, choose **File>Save As**. Name the file, choose a location, and click on **Save**.
- You can include notes about your file by going to Window>Project Info. This can be handy for your own future reference or for others using your files. Refer to Section 9.02.
- You can also export files in a host of other formats. Refer to Section 4.07.

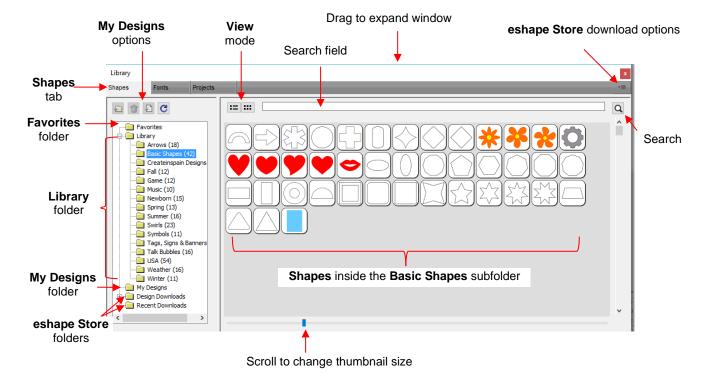
4.03 Customizing the Library Video

- The Library was briefly introduced in Section 3.03. The purpose of this section is to expand on how to fully utilize it.
- The Library consists of three tabs: Shapes, Fonts, and Projects. Each is covered in the following subsections:

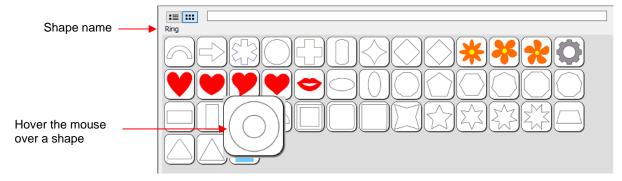
4.03.1 Shapes Tab 1000

When you first open the Library, the Shapes tab will be selected.

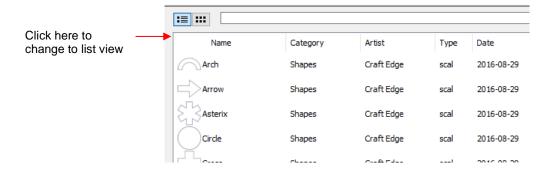
• In order to see all of the contents under this tab, drag the top of the window upwards until you see the following screenshot. Note the various parts of this window:



- On the left side you will see the Library folder which contains the included 300 shapes. The number in
 parentheses, after each subfolder, indicates how many shapes are assigned to that subfolder. Basic
 Shapes, as an example, has 42 assigned to it.
- Because the Basic Shapes subfolder is currently selected, thumbnails for all shapes contained in that subfolder are shown in the larger area on the right side. To add one of these shapes to the Cutting Mat either:
 - ♦ Click on the shape and it will be placed in a certain location on the Cutting Mat
 - Orag the shape to a desired location on the Cutting Mat
- To change subfolders or folders, click on the folder name on the left side and its contents will then appear on the right.
- A scroll bar at the bottom of the Library window can be used to make the thumbnails larger or smaller.
- As you hover over a shape, its thumbnail will get larger and its name will appear near the top:



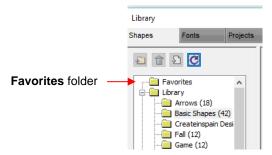
You can toggle between the thumbnail view and a list view using these icons at the top



 A search function enables you to see all of the shapes with a particular word in the name. For example, enter the word leaf and click on the search button:



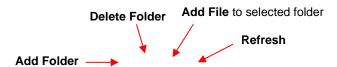
Favorites: Above the Library folder is a folder called Favorites:

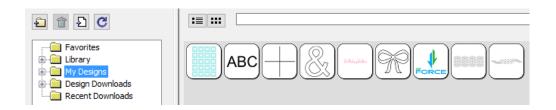


The **Favorites** folder is for storing the shapes you access often. Locate the shape you want to add, right-click, and select **Add to Favorites** from the popup menu.

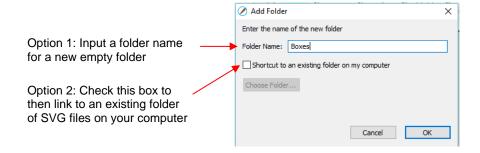


- ♦ This popup menu also has these options:
 - Delete File (only active in the My Designs folder)
 - Reveal File opens the location on your computer where file is stored
 - Instructions some files from the eshape Store may include instructions for the user
- My Designs: This folder is for storing your own SVG files for easy access.
 - Once you click on My Designs, the icons above the folder menu will become active:

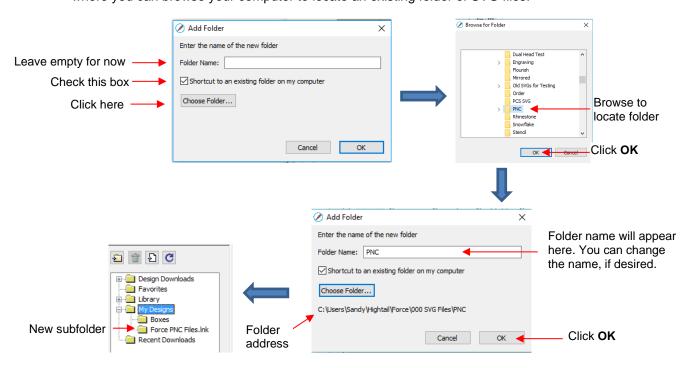




- ♦ Add subfolders: The shapes in the above screenshot have been added to My Designs but not into subfolders. To create subfolders for additional organizing:
 - Click on the Add Folder icon
 - o Right-click on **My Designs** and select **Add Folder** from the popup menu
- After choosing to add a folder, the following window opens where you have two options:

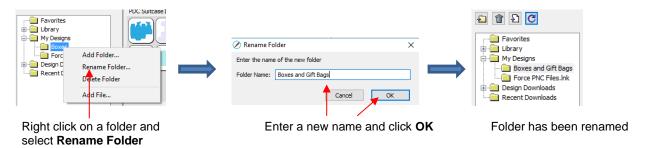


If you select Option 2, the **Choose Folder** button will activate and clicking it will bring up this window where you can browse your computer to locate an existing folder of SVG files:



- Note that the **Folder Name** was changed to *Force PNC Files* before clicking on **OK**. The name will have a .lnk extension added indicating that it is linked to another folder on your computer.
- ♦ To <u>add files</u> to a folder inside **My Designs**:
 - o Select the folder and do either of the following:

- Click on the **Add File** icon
- Right-click and select Add File from the popup menu
- A window will open where you can then browse to find the SVG file to be added. You also have the option of selecting multiple files at once to import into that folder.
- ♦ To delete a file from a folder, right-click and select Delete File from the popup menu.
 - <u>IMPORTANT</u>: Note that deleting the file could also delete it from your computer unless it has been backed up elsewhere.
 - After deleting files, you will need to click on the Refresh icon to update the thumbnail images.
- ♦ To delete a folder, select it and then do one of the following:
 - o Click on the **Delete Folder** icon
 - o Right-click and select **Delete Folder** from the popup menu
- To rename a folder, right-click and select **Rename Folder** from the popup menu:



• **Design Downloads** and **Recent Downloads**: These two folders, along with the menu icon at the top right are part of the **eshape Store** functions. These will be covered in *Section 4.03.1*.

4.03.2 Fonts Tab

of each installed

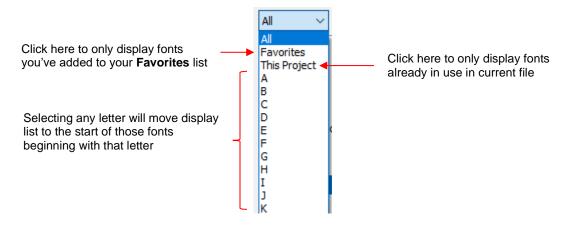


• The **Fonts** tab lists all of the currently installed fonts on your computer. Selecting any font in the list will show the entire character set on the right side of the window. It will also then make it the default font that will be used when adding text with any of the methods available in SCAL. Refer to Section 6.02.





- Scroll the bar at the bottom to change the size of the lettering. To add a character to the **Cutting Mat**, left-click on it. While it is far quicker to type out text using the **Type** tool (refer to *Section 6.04.1*), this window is the best way to add special characters within a font or when using dingbat fonts.
- The menu icon in the upper right corner can be used to temporarily add a font that's not installed on your computer. Click on it and then browse to the folder containing the font you wish to add. Refer to Section 6.02.3 regarding temporary font usage.
- Font Selection Menu: Clicking on the down arrow next to All will open the following menu:

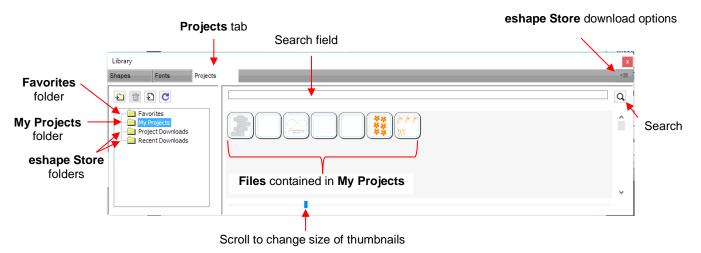


- Favorites: With a font selected, you can click on the icon to add that font to your Favorites folder.
- For alternative methods for selecting fonts, refer to Section 6.02.

4.03.3 Projects Tab

- The Projects tab is similar to the Shapes tab. Instead of .SVG files, however, it helps you organize and access your .SCUT files, also referred to as projects.
- As with the **Shapes** tab, there are no default categories or pre-added files. However, you will notice these
 other similar features:
 - ♦ Favorites folder select any project, right-click, and select Add to Favorites from the popup menu
 - ♦ My Projects folder virtually identical to My Designs folder (more information follows)
 - Search field and search icon ____ for locating files with a particular word in the file name

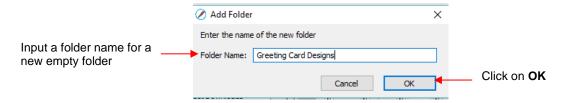
- Project Downloads and Recent Downloads folders and top right icon : these pertain to eshape Store. Refer to Section 4.05.
- Scroll bar to change the size of the thumbnails.
- ♦ Hover over a thumbnail and it will get larger. The project name will appear below the **Search** field.



- My Projects: This is the main folder where you can organize your own projects for easy access.
 - Once you click on **My Projects**, the icons above the folder menu will become active:



- ♦ Add subfolders: The projects in the above screenshot have been added to **My Projects** but are not in subfolders. To create subfolders for additional organizing:
- ♦ Click on the **Add Folder** icon
- ♦ Right-click on My Projects and select Add Folder from the popup menu
- ♦ After choosing to add a folder, the following window opens and you can name this folder:



- To add files to a folder inside My Projects:
 - Select the folder and do either of the following:
 - Click on the Add File icon
 - Right-click and select Add File from the popup menu

- A window will open where you can then browse to find the SCUT file to be added. You also have the option of selecting multiple files at once to import into that folder.
- After adding the files, the thumbnails for those projects will appear when the folder is selected:



- To delete a file from a folder, right-click and select Delete File from the popup menu.
 - <u>IMPORTANT</u>: Note that deleting the file could also delete it from your computer unless it has been backed up elsewhere.
 - After deleting files, you will need to click on the Refresh icon to update the thumbnail images.
- ♦ To delete a folder, select it and then do one of the following:
 - Click on the **Delete Folder** icon
 - o Right-click and select **Delete Folder** from the popup menu
- To rename a folder, right-click and select **Rename Folder** from the popup menu.

4.04 Layers Panel Video

Because of the importance of the **Layers Panel** in successfully using SCAL, it is being presented before the other file handling sections.

4.04.1 Introduction to the Layers Panel



- The Layers Panel is used for the following:
 - Assigning or grouping shapes into separate layers to better organize a project
 - More easily applying changes to a group of shapes
 - ♦ Selecting one shape or a layer of shapes on the screen
 - Controlling what is sent to the cutter or printer
- The **Layers Panel** can be displayed by double-clicking its icon and hidden by double-clicking the small bar just above its icon:



Note that single clicking the icon will hide other panels, allowing the Lavers Panel to fill the right column

- allowing the Layers Panel to fill the right column.

 You do not have to worry about adding shapes to the Layers Panel. They will automatically be assigned to new layers as you add them. You will want to learn how to move shapes to new layers or combine shapes into the same layer, depending on the circumstances. This is covered in Section 4.04.
- Here are a few examples of when shapes need to be on different layers:

- Paper piecing or shadowed shape projects where some shapes will be cut from one color and other shapes from another color (or a number of other colors).
- Fold-up projects (boxes, envelopes, popup cards, etc.) where the fold lines will need to have different settings and/or different tools used than your cut lines.
- Ahinestone template projects where you need to cut two different templates, such as a fill that will be done in one color of rhinestones and an outline in another color.
- Other benefits of assigning shapes to specific layers include:
 - ♦ Ability to select, with one click of the mouse, all shapes assigned to a layer
 - Ability to hide or lock layers so that the shapes on that layer are not inadvertently selected, moved, resized, etc.
 - Ability to change the color, line style, and tool choice on all of the shapes assigned to a particular layer.

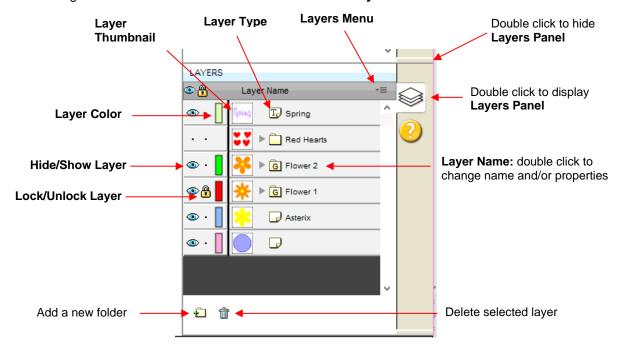
4.04.2 Parts of the Layers Panel



The next few sections will use the following simple project to illustrate the Layers Panel:



The following screenshot identifies the various icons on the Layers Panel:

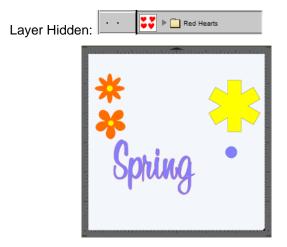


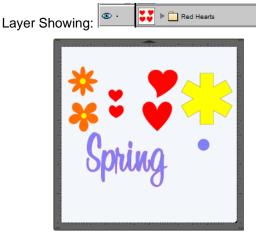
- <u>Layer Thumbnail</u>: Each layer has a thumbnail showing the shapes assigned to that layer. Click on that thumbnail and all shapes on that layer will be selected. If you wish to add the shapes from another layer to the section, hold the **Shift** key and click on the other thumbnail.
- <u>Layer Type:</u> To the right of the <u>Layer Thumbnail</u> is the <u>Layer Type</u>, represented by one of four different icons:

- ♦ Regular shape
- Text shape which is still able to be edited as text, such as changing the font
- Regular folder of individual shapes: When the folder is opened, by clicking the gray triangle, the icon changes and all layers or subfolders within are displayed.
- Group folder where one or more of the shapes have been grouped together: When the folder is opened, by clicking the gray triangle, the icon changes and all layers or subfolders within are displayed.
- <u>Layer Name</u>: In the prior <u>Layers Panel</u> screenshot, the last layer has no name. To add one, double-click that layer to open the <u>Layer Properties</u> window. Here you can change the name of that layer as well as some other settings. Note that the <u>color assignment is for use on the <u>Layers Panels</u> only. It doesn't change the color of the shape assigned to that layer:</u>



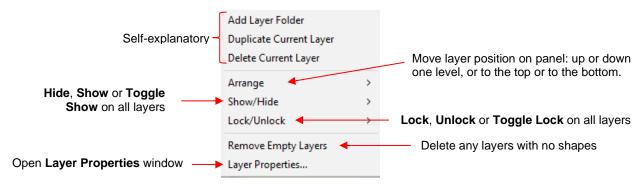
- Hiding layers, locking layers, and assigning layer colors can also be done on the **Layers Panel**:
 - hide/Show Layer: Click on the eye icon to hide that layer. The icon will be replaced with a dot as shown for the Red Hearts layer and the shapes on that layer will no longer be seen on the Cutting Mat and will not be included when printing or cutting the project. Clicking on the dot icon will restore the layer to the Cutting Mat:



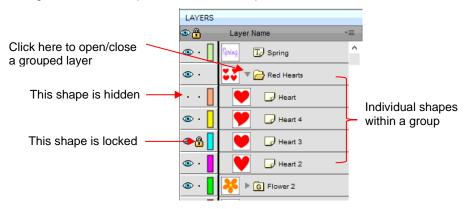


- Lock/Unlock Layer: Click on the dot to the right of the eye icon and the layer will become locked such as shown for the *Flower 1* layer. The shapes on that layer will still be included in printing and in cutting, however cannot be selected on the **Cutting Mat**. This can be useful when shapes should not be inadvertently moved or if you are having problems selecting shapes nearby.

<u>Layers Menu:</u> At the top of the <u>Layers Panel</u> is an icon for the <u>Layers Menu</u>. This menu is also available by clicking on <u>Layer</u> on the <u>Menu Bar</u> at the top of the screen. The following functions are available in this menu:



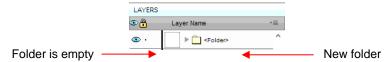
- Icons for adding a new layer and deleting a selected layer are also available at the bottom of the Layers Panel.
- Individual shapes within a group folder can also have individual properties changed. For example, let's say
 you have various shapes grouped together and you want to keep some locked and you want to hide others.
 Opening the grouped layer displays each thumbnail and the **Show/Hide** and **Lock/Unlock** icons can be
 individually changed. In this example, some basic shapes have been used for a clearer understanding:



4.04.3 Creating Folders and Moving Layers



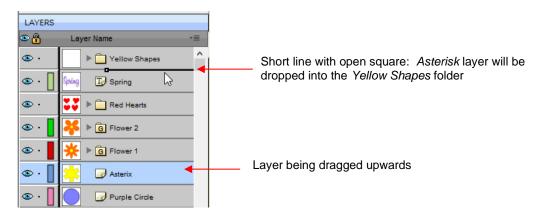
- As mentioned in Section 4.04.1, each new shape added to the Cutting Mat will initially be assigned to a
 new layer. This can quickly clutter the Layers Panel. The ability to combine shapes into folders and
 subfolders helps organize a project and make things easier for printing and/or cutting.
- There are three ways to create a new folder:
 - ♦ Click on the Add layer folder icon at the bottom of the Layers Panel
 - ♦ Click on the Layers Menu icon and select Add Layer Folder
 - ♦ Go to Layer>Add Layer Folder
- When a new folder is added, it will appear at the top and look like this:



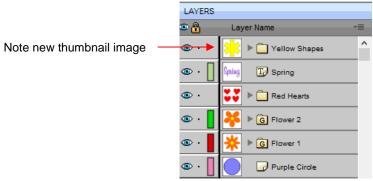
• Just as covered in the prior section, if you double-click on this new folder, you can rename it:



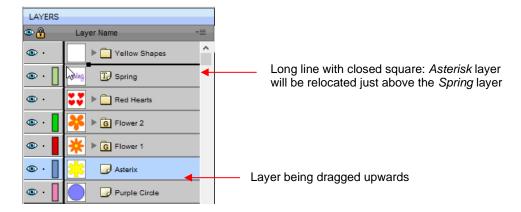
- In the prior section, it was also noted that layers can be re-ordered using the **Arrange** option in the **Layers Panel Options** menu. Alternatively, layers and folders can also be moved directly on the **Layers Panel** by dragging them up or down.
- There are two possible outcomes when dragging layers:
 - ♦ The layer is moved to a new location
 - ♦ The layer is moved into an existing folder
- The way to control where the layer "lands" is by moving it straight up and down or by dragging a little to the left while moving it up and down.
 - If you drag a layer without moving to the left, you will see a short line with an open square. This means it will be added to the folder directly above it:



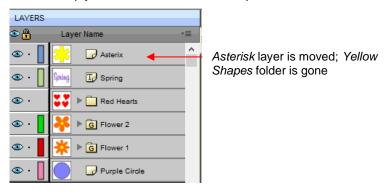
Now the Asterisk layer is inside of the Yellow Shapes folder and can be seen in the thumbnail for that folder:



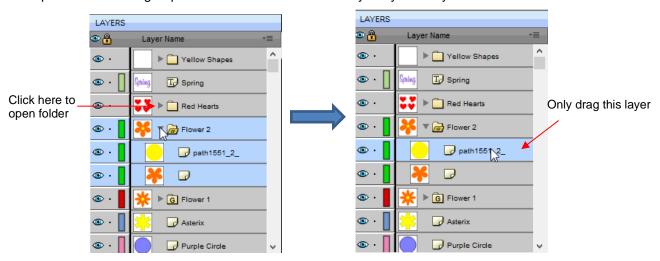
If you drag a layer while moving it to the left, you will see a longer line with a closed black square. This means it will be added directly above that line:



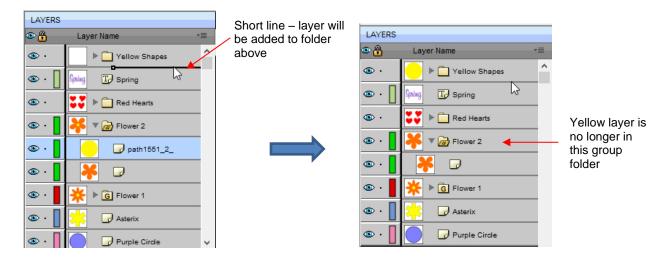
♦ <u>IMPORTANT:</u> Once you've created a new empty folder, like the *Yellow Shapes* folder, you cannot move that layer or other layers without the empty folder being deleted. So, in the case above, if the *Asterisk* layer had been simply relocated, the *Yellow Shapes* folder would then be gone:



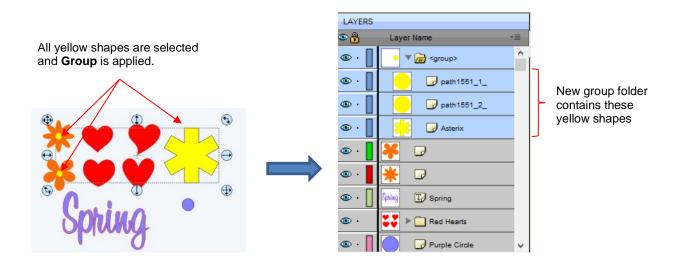
- Layers can also be moved out of an existing folder into other folders. In this example, the yellow centers of the flowers in the layers named *Flower 1* and *Flower 2*, can be similarly dragged and dropped into the *Yellow Shapes* folder:
 - Open the Flower 2 group folder and then make sure only the yellow layer is selected:



♦ Then drag the yellow layer up to the *Yellow Shapes*, again making sure only a short line is present. The yellow layer is then moved out of the *Flower 2* group:



- Repeat for the yellow shape inside the Flower1 folder.
- Note: This was just one way to achieve this goal. Another way would have been to ungroup the Flower 1 and Flower 2 layers. Then to select all of the yellow shapes on the Cutting Mat and go to Object>Group. A new group folder would be added to the Layers Panel with those shapes moved to it. Specific instructions on Grouping and Ungrouping are covered in Section 5.11.



4.05 The eshape Store

4.05.1 Importing from the eshape Store

- The **eshape Store** is an online shopping site linked within SCAL. Cutting files and fonts can be purchased through the store and downloaded into SCAL.
- To get started, access the eshape Store in any of the following ways:
 - ♦ Click on the **eshape Store** icon on the **Toolbar**
 - ♦ Go to File>eshape Store
- The eshape Store window will open and you can either sign up for a free account or log in, if you have already registered:



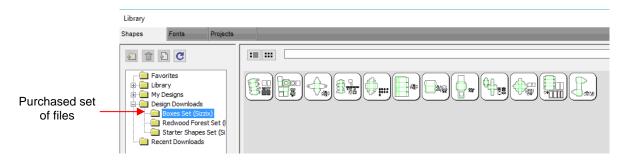
 Next, browse the site to find files of interest. After payment, the following screen shows your order number and a green **Download Order** button can be clicked to download the files you purchased:



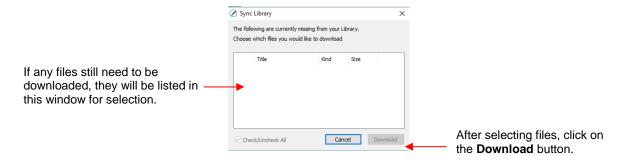
• The following **Download Manager** window will open and the files you purchased will begin downloading:



Now open the Library to access the eshape Store files. Depending on the file type, the downloaded files will either appear on the Shapes tab, under Design Downloads or on the Projects tab, under Project Downloads:



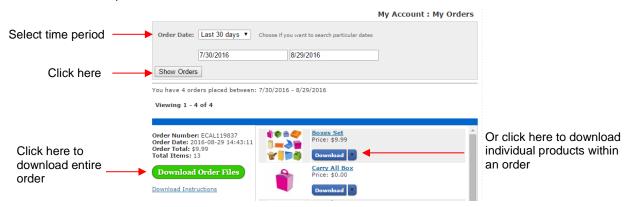
- If you fail to download at the time of the purchase, your downloads can also be accessed in the following ways:
 - ♦ Go to File>Sync My Library and the following window will open:



- Click on the top right icon in the **Library** window and select **Sync Library**. The same window will open and you can select any files not already downloaded.
- ♦ At the eshape Store:
- ♦ Log in and click on **My Account** at the top.
- ♦ Then click on My Orders:

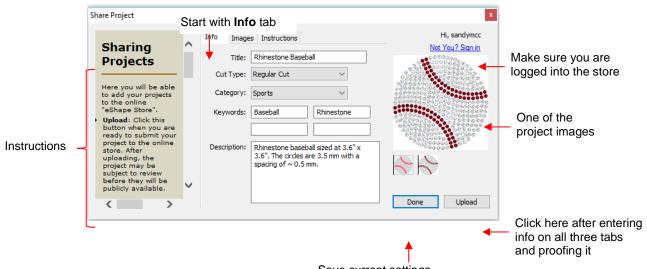


♦ Select a time period for the order and click on **Show Orders**. Then click on the **Download** icon:

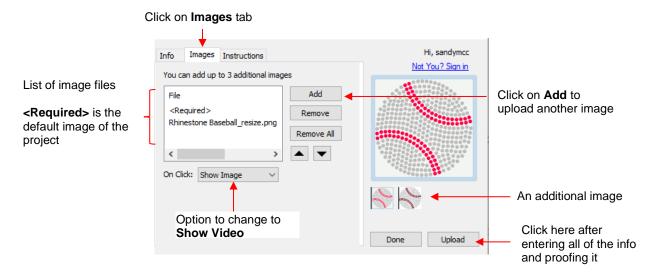


4.05.2 Exporting to the eshape Store

• To freely share your own SCAL creations, go to File>Share Project. The following window will open:

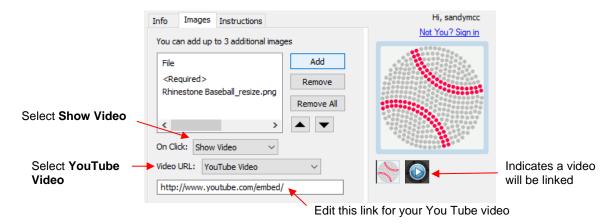


- There are instructions on the left-hand side.
 <u>Importa</u>
 Save current settings of following settings have been completed before clicking on **Upload**:
 - ♦ Title: Provide a descriptive name for your project.
 - ♦ Cut Type: Select from the following:
 - ♦ Regular Cut: typical cutting projects
 - ♦ Print2Cut: print and cut projects
 - ♦ Doodle: projects drawn with a pen rather than cut with a blade
 - ♦ Category: Select from a long menu of choices. Review carefully to make sure the best choice is selected.
 - Keywords: Enter keywords based on what other SCAL owners might use to locate a file like yours.
 - Description: Enter information about the file that will help an owner know if it's what they might want or need.
- After completing the settings on the **Info** tab, click on the **Images** tab:



- Additional images can be uploaded, such as the rhinestone simulation version shown. Other examples where more images are appropriate might include final versions of finished greeting cards, fold-up boxes, and detailed paper-piecing projects.
- On Click: the default indicates Show Image. For videos, change this to Show Video from the menu.

 If you have a YouTube video associated with your project, choose YouTube video and the window changes to include the start of an embedded YouTube video link:

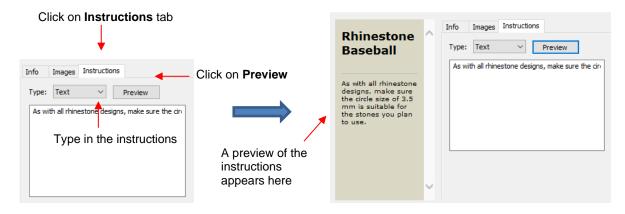


Alternatively, you can link to an MP4 video located elsewhere:

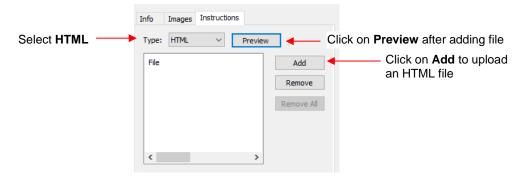


Enter video dimensions

- Finally, click on the **Instructions** tab and enter any instructions for the project. You have two options:
 - ♦ Type the instructions directly:



♦ Import an HTML formatted file by clicking on Add and then selecting the file:



- Once the desired choices and information are added for your file, check it all one last time. Then go back to
 the Info tab and click on Upload. Note that clicking on Done will save this information with your file for
 uploading at a later time.
- After clicking on Upload, a progress window will open indicating your file is being sent to the eshape Store.
 A final Upload Finished window will open and notify you that the uploaded file will be reviewed for approval before being available.

4.06 Importing Other File Formats

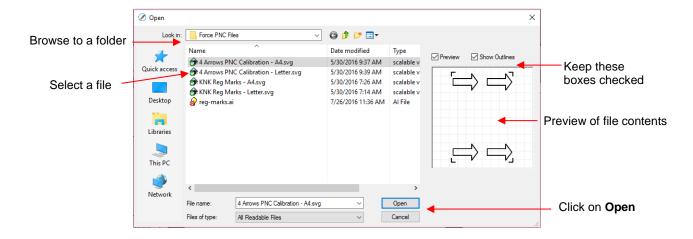
4.06.1 Importing Vector Files



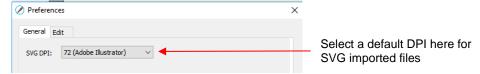
- The following vector formats can be imported into SCAL:
 - SVG: common export format for vector programs, thus popular format used for sharing files on blogs and selling files in online design sites
 - SCUT5: format used to save projects in SCAL5
 - ♦ SCAL: format used by eshape Store
 - PDF: While a PDF can be created from a raster image, a vector image, or both, only the vector parts of a PDF will import into SCAL.
 - Al (Adobe Illustrator): common format due to the popularity of Adobe Illustrator
 - EPS: another common export format for many vector programs
 - Nine embroidery file formats: .DST, .EXP, .HUS, .YEF, .PEC, .PES, .SEW, .VIP, .XXX
 - ♦ FCM: format used by the Brother ScanNCut machines
 - GSD: format created by RoboMaster, RoboMaster Pro and Wishblade Advance. This format was used with the Craft Robos, Wishblade, and original Silhouette cutter.
 - PLT (SCAL PRO version only): developed by HP for their plotters, the PLT file evolved into a standard format used by early vinyl cutters
 - ♦ DXF (SCAL PRO version only): common format exported by CAD programs
 - WPC: format used in programs developed by Sign Max, which include WinPC Sign, Funtime, Pazzles Inspiration, and Gazelle.
- There are two ways to open the import window:



- ♦ Click on the **Import** icon on the upper **Toolbar**
- ♦ Go to File>Import
- Either choice will open the following window where you can browse to locate the file you need. Note there are options to see a **Preview** and **Show Outlines**:



- You can also drag and drop any of the file formats directly onto the SCAL screen to import that file.
- If the file is in SVG format, it can also be imported via the **Library**. Refer to *Section 4.03.1*. Also, SVG files vary in size depending on the program which exported them. Thus, always check the imported size before cutting your project. If you are regularly importing SVG files from one of the following programs: Adobe Illustrator, Inkscape, Corel Draw, or you know the DPI used by the exporting program, you can set it under **Edit>Preferences** (on a Mac, press **Command +**,) so that you will not need rescale the file:



- PDF files can contain multiple pages. If this is the case with a PDF file you wish to import, note the following:
 - Use Adobe Reader or some other PDF browser to locate which page you wish to import
 - After selecting the PDF file to import, a second window will open where you can select which page you want to import. Note that if there are many pages, there will be a delay in opening the **Preview** window and you may wish to uncheck that box.
 - Only vector shapes in a PDF will be imported. Raster shapes will be ignored.
- <u>IMPORTANT:</u> Depending on the original source of the vector file, double lines may exist which will result in cutting a design twice. This is usually due to the source program having a **Stroke** width applied to the lines. Therefore, any time you import a vector file, you should test cut it using scrap materials before using "the good stuff." If you find that the file is double cutting, first try applying **Ungroup** to the design so that you can delete one of the duplicates. If **Ungroup** does not separate the duplicates, apply **Break** instead. Refer to Sections 5.11.2 and 5.12.1.

4.06.2 Importing Raster Files



- There are several ways to import a raster file (JPG, BMP, GIF, PNG) depending on the intended purpose for that file:
 - ♦ **File>Import**: will import PNG files with a transparent background, simultaneously adding a vector cut line along the transparent border. This is very useful for PNC applications. This is the only raster format that will work using this method.
 - ♦ **File>Place Image**: will import JPG, BMP, GIF, and PNG files for the purpose of printing or manually tracing in the event the auto-tracing function doesn't adequately perform due to the image quality. It's also another way to load an image for the **Trace Image** window. Refer to Section 7.03.
 - Copy and Paste from an outside source, such as the Internet.

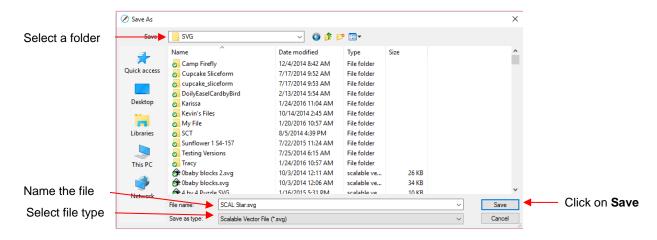
File>Trace Image (or click the Trace icon on the Toolbar): will import and auto-trace JPG, BMP, GIF and PNG files. Various options and settings can be applied to obtain the desired results. Refer to Section 7.03.

4.06.3 Importing Fonts

 SCAL will display and utilize all fonts currently installed on your computer. You can also open non-installed fonts for temporary use. The formats supported include TTF, OTF, and OPF (open path / single line fonts).
 For more details, refer to Section 6.02.3.

4.07 Exporting in Other File Formats

- Besides saving as a .SCUT5 file, you can also export in the following formats: SVG, JPG, BMP, PNG, PDF, TIFF, FCM, and PLT. Only SVG, FCM, PDF, and PLT are vector formats. The others are raster.
- If there are only certain shapes in the file that you want to export, you have two options:
 - Select those particular shapes before exporting and then mark a box called **Selection only** in the export window.
 - Place those shapes on one or more separate layers and hide them on the Layers Panel. Refer to Sections 4.04.2 and 5.10.
- To export a file, use either of the following options:
 - ♦ Go to File>Export
 - ♦ Press Ctrl+Shift+E
- The following window will open where you can name the file, select the file format, and the location for saving:

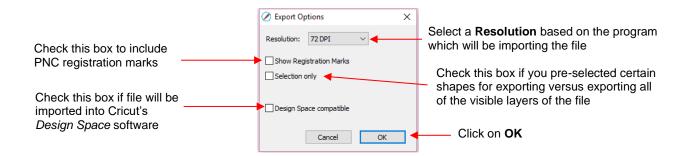


 Depending on the type of file selected, an export window will open. The following subsections will cover these types in more detail.

4.07.1 Exporting in SVG Format



The SVG Export Options are shown in the following screenshot:

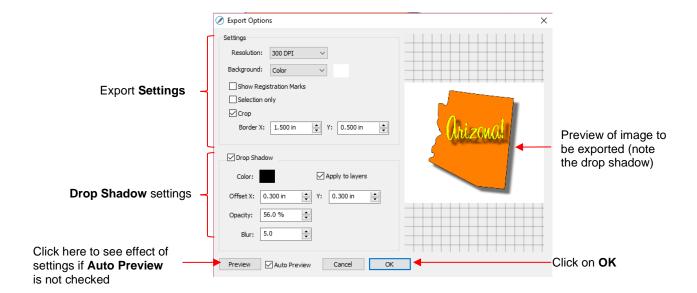


- The Resolution setting affects the dimensions of the shapes upon importing into another program:
 - For example, Adobe Illustrator uses 72, Inkscape uses 90, and Corel Draw uses 96. Unless you know the intended program's **DPI**, leave it at 72.
 - If the project is designed with specific dimensions affecting the final result, such as an envelope for a card, include a separate *Read Me* text file noting the dimensions of the project in SCAL so that the imported SVG can be resized accordingly.
- The Selection Only setting was mentioned earlier as the option to mark when specific shapes have been selected for export versus exporting all of the shapes in the file.

4.07.2 Exporting in JPG, PNG, BMP and TIFF Formats

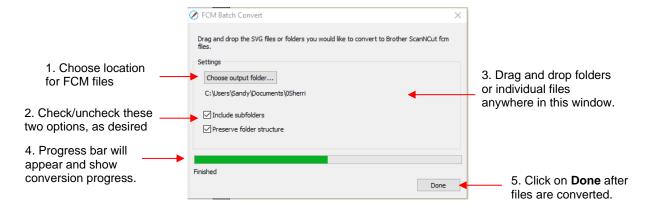


- There are various reasons why you might want to export your file as a raster. For example:
 - ♦ The image is going to be posted on a web site or blog
 - ♦ The image will be shared with a friend or a customer
 - You wish to use the image in a digital scrapbooking program
 - ♦ You want to print a PNC project from a printer without SCAL installed
- If you choose any of the raster export formats, the same window will open offering options for:
 - ♦ **Resolution:** if the image will be printed, you usually choose 200 or 300
 - Background: choose a color or, with PNG export, you can also choose transparent
 - ♦ Show Registration Marks: option to print with the registration marks that will be used for a PNC application
 - Selection only: when specific shapes have been selected for export versus exporting all of the shapes in the file
 - ♦ **Crop**: increase or decrease the background border around the exported image
 - ♦ Drop Shadow: add a shadow effect to the image
- The following screenshot shows an example of an export in a raster format:



4.07.3 Exporting in FCM Format

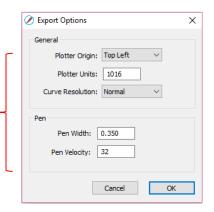
- The FCM format is used by the Brother ScanNCut models. To export a project, go to File>Export and, in
 the drop down menu, change from SVG(* .svg) to ScanNCut (*.fcm). After clicking on Save, the FCM file
 will be located in the folder you chose in the Save As window.
- There is also a batch SVG-to-FCM converter available in SCAL. Go to File>FCM Batch Convert and the
 following window will open. Note that you have the option to convert entire folders of SVG files at one time:



4.07.4 Exporting in PLT Format

• PLT files were originally developed for HP plotters. They are also used by some of the cutters outside of the hobby world. The **Export Options** for PLT are as follows:

Because PLT files are usually sent directly to the plotter or cutter, the settings are specific to the device. Thus, these settings will need to be determined based on that intended device.



4.07.5 Exporting to SCAL2

• If you still use SCAL2, you can send a file from SCAL5 to SCAL2 by going to **File>Send to> Sure Cuts A Lot 2**. You will need both versions of SCAL open at the time.

5. SCAL: Manipulating and Coloring Shapes

This chapter covers all of the ways to modify shapes. Note that while the singular term "shape" will be repeatedly used when describing various functions, it also refers to a selection of shapes. For example, resizing a selection of three shapes uses the same menu functions or mouse movement as a single shape.

5.01 Basic Shapes



- Besides the shapes included in the Library, SCAL also offers the ability to add various geometric shapes to the Cutting Mat: Rectangle, Rounded Rectangle, Circle, Triangle, Polygon, Star, and Spiral. Some of these have customizing functions which will appear on the Tool Options bar and will be detailed in the following subsections.
- To access these various shapes, hold down the left mouse button on the **Rectangle** icon on the **Tools Panel** and then select the desired shape from the popup menu.
- Once a different shape is selected, that shape's icon will then replace the Rectangle icon on the Tools
 Panel.

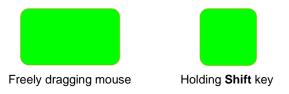
5.01.1 Rectangle

- After selecting the Rectangle shape , drag the left mouse button to form a rectangle.
- Holding the Shift key while dragging the mouse will constrict the proportions, resulting in a square:

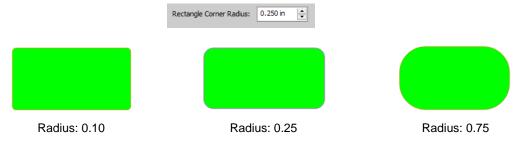


5.01.2 Rounded Rectangle

- After selecting the **Rounded Rectangle** shape , drag the left mouse button to form a rectangle with rounded corners.
- Holding the **Shift** key while dragging the mouse will constrict the proportions, resulting in a rounded square:

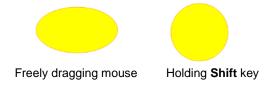


In the Tool Options, a setting will appear. This can be used to control the roundness of the corners:



5.01.3 Circle and Oval

- After selecting the Circle shape , drag the left mouse button to form an oval.
- Holding the Shift key while dragging the mouse will constrict the proportions, resulting in a circle:



5.01.4 Triangle

- After selecting the Triangle shape After selecting the Triangle shape
- Holding the Shift key while dragging the mouse will constrict the proportions, resulting in a triangle in which
 the height will equal the width:



5.01.5 Polygon

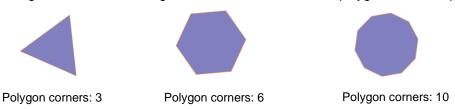
After selecting the Polygon shape , drag the left mouse button to form a polygon:



• In the Tool Options, a Polygon corners setting will appear:



This setting can be used to change the number of sides on the polygon. For example:



5.01.6 Star

After selecting the Star shape , drag the left mouse button to form a star:



• In the **Tool Options**, two settings will appear:



♦ The **Star points** setting can be used to change the number of points on the star. The **Inner radius** setting can be used to change the angle of the inner points:

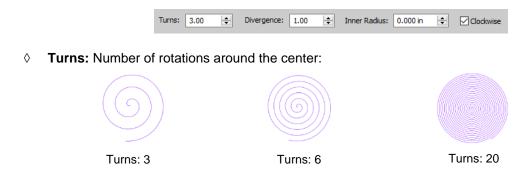


5.01.7 Spiral

• After selecting the **Spiral** shape ____, drag the left mouse button to form a spiral:



• In the **Tool Options**, four settings will appear:



Divergence: Tightness of the spiral: larger = looser; smaller = tighter:



♦ Inner Radius: Starting point of the spiral



♦ Clockwise: Whether spiral rotates clockwise or counter-clockwise from center:



5.02 Selecting



- To select a shape, make sure the **Selection Tool** is indented on the **Tools Panel**. Then
 - Olick anywhere on the shape (along an edge or inside a closed shape):



Note that the cursor will change once the shape can be selected. For example, when selecting a line, wait for the cursor to change before clicking:



Shape cannot yet be selected.

Cursor has changed. Shape can be selected.

♦ Another way to select: drag the mouse to enclose the entire shape (aka marquee-select).



A third way: hold the **Shift** key and marquee-select just a portion of the shape.



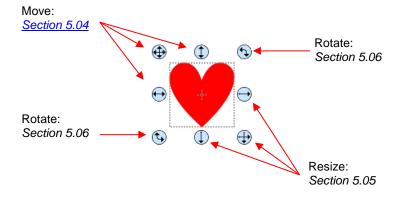
A fourth way: click on the layer which contains this shape:



5.02.1 Basic Selection Handles



 Once selected, a shape will have 8 handles surrounding it. The functions of these handles are covered in other sections as indicated:

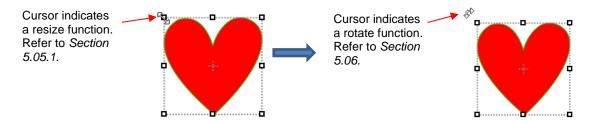


5.02.2 Advanced Selection Handles

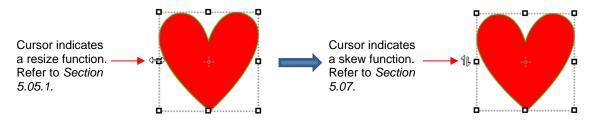
• While in the Selection Tool mode, the Tool Options bar indicates a setting called Handles. The drop-down menu offers another option called Advanced:



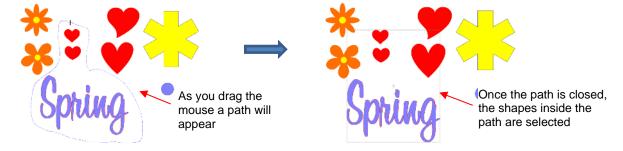
• In **Advanced** mode, a selected shape will appear with six identical handles. However, each handle now has two functions, depending on whether the mouse hovers directly over the handle or is moved slightly away from the handle:



• All four corner handles offer the same resizing and rotating functions. The middle handles along the four sides offer resizing and skewing:



- There are several ways to select more than one shape:
 - ♦ Select the first shape and hold down the **Shift** key while clicking on additional shapes.
 - Drag the mouse (marquee-select) to encompass the shapes. Always make sure you start clearly outside the boundaries of the images you want to select.
 - If all of the shapes are on the same layer, click on the thumbnail for that layer or hold the **Shift** key while clicking on more than one layer. Refer to Section 4.04.
 - Use the **Lasso Selection** tool on the **Tools Panel**. Freely drag the mouse around the shapes you want to include in the selection:



- If you wish to select all of the shapes on the screen, there are several options:
 - ♦ Press Ctrl+A
 - Right-click on the screen and choose **Select All** from the menu
 - ♦ Go to Edit>Select All

- To unselect all shapes, use one of the following ways:
 - ♦ "Click away" click anywhere else on the screen and the shapes will be de-selected
 - ♦ Press Ctrl+Shift+A
 - ♦ Go to Edit>Deselect All

5.03 Deleting



- To delete a selected shape, use any of the following options:
 - ♦ Press the **Delete** key on the keyboard
 - Right-click on the screen and choose **Delete** from the menu
 - ♦ If the shape is on its own layer, click on the **Delete Layer** icon:
- To delete all of the shapes in the current project:
 - ♦ Use one of the methods from Section 5.02 to select all shapes
 - ♦ Then delete using any of the prior options listed for deleting a selected shape
- You can also delete a layer of shapes at one time from the Layers Panel. Refer to Section 4.04.2.

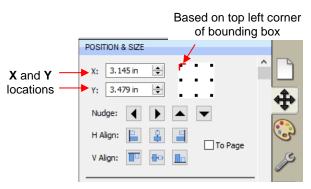
5.04 Moving

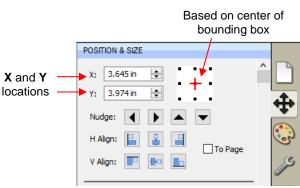


• To move a selected shape, hold down the left mouse button on the upper left corner icon or anywhere within the shape and drag to another location. Note that if you see this cursor, the shape can be moved:

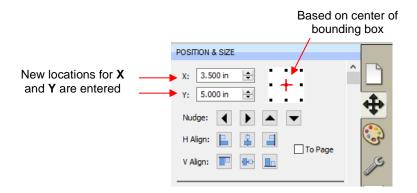


- To move a shape and maintain horizontal or vertical alignment, hold the **Shift** key while dragging or use the arrow keys on your keyboard.
- With a shape selected, the Position & Size Settings on the Properties Panel indicate the exact location of
 the bounding box around a selected shape. Note that this location is how far the shape is from the top left
 corner of the grid on the mat and the red mark indicates which part of the bounding box is being referenced.
 For example:





You can enter new values into either or both of the X: and Y: windows to move the shape to a new location:



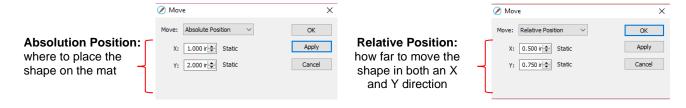
• The **Nudge** icons, which are just below the **X** and **Y** entries, can also be used to move a selected shape. These move in the same increments as the keyboard arrows:



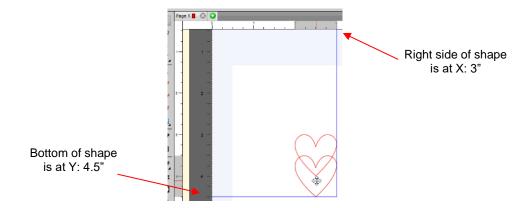
The increment size for both the keyboard moves and the Nudge moves can be changed by going to
Edit>Preferences and then selecting the Edit tab. This window also offers the option to force shapes to
remain within the boundaries of the Cutting Mat while being moved with the mouse:



- There is also a **Move** function available which can be accessed these two ways:
 - ♦ Right-click on a selected shape and go to **Transform>Move**
 - ♦ Go to Object>Transform>Move
- This Move windows provides two moving options:
 - ♦ Move the shape to a specific position on the **Cutting Mat** (called **Absolute Position**)
 - Move the shape a certain distance from its current location (called Relative Position)



- Important: After applying a move in the **Move** window, click on **OK** and then re-enter the window if you need to make subsequent move.
- You can also use the Rulers to estimate a new location for moving shapes. Blue lines will appear when the shape is aligned with a major marking, such as shown below:



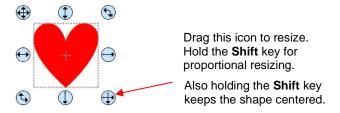
• Finally, you can add guidelines to the **Cutting Mat** at specific locations and then turn on **Snap To** in order to move shapes to snap to those guidelines. Refer to *Section 9.03*.

5.05 Resizing, Scaling, Auto fit

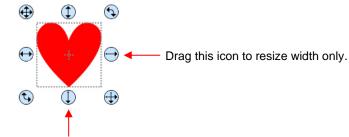
5.05.1 Resizing



• With the shape selected, use your mouse to drag the lower right corner of the shape to freely resize. If you want to keep the width and height proportional, hold the **Shift** key down before dragging that icon. If you want the resize to occur with the shape remaining in the same spot, hold the **Alt** key:

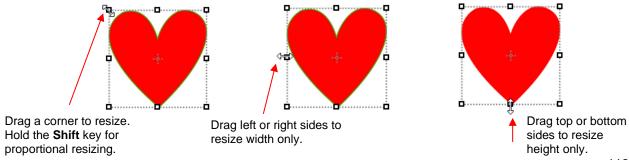


• To resize only the width or the height, drag the middle right or the middle bottom icons, respectively:

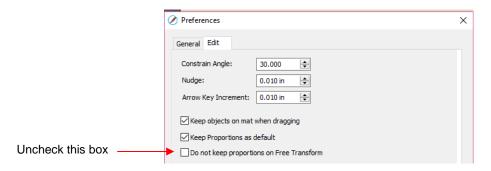


Drag this icon to resize height only.

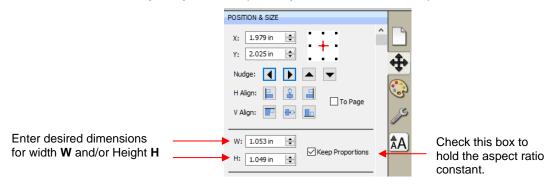
• If the **Handles** are in **Advance** mode, then drag a corner or a side when the cursor is directly over the handle. Again, holding the **Shift** key will resize height and width proportionately:



 If you prefer that proportional sizing be the default, thus <u>not</u> requiring the pressing of the **Shift** key, go to Edit>Preferences and click on the Edit tab. Uncheck the box shown below:

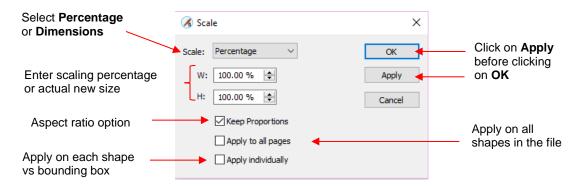


- <u>Important:</u> Unchecking this box does not then affect shapes created using the **Shapes** tool on the **Tools**Panel. You will need to hold the **Shift** key to maintain proportions when resizing by dragging the lower right corner.
- If you need to make the shape an exact size, then enter the dimension in the W or H box on the Position & Size Panel. Check the Keep Proportions option if you want to hold the aspect ratio constant:



5.05.2 Scaling

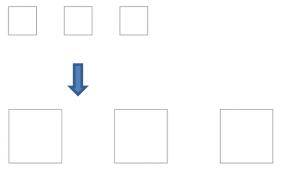
- To access the Scale function, select one or more shapes and then use either of the following:
 - ♦ Right-click the selected shape and go to **Transform>Scale**
 - ♦ Go to Object>Transform>Scale
- The following window opens:



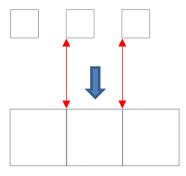
- Scale: Select Dimensions if you wish to specify the exact width and height for your selection or select Percentage if prefer to resize that way.
- **W:** and **H:** Enter the new dimensions or scaling percentage

- ♦ **Keep Proportions:** Leave the option checked if you want to enter into either **W** or **H** and have the other automatically calculated so that the aspect ratio remains the same.
- ♦ **Apply to all page:** Mark this option and the dimension change or percentage will be applied to every shape in the project that is showing and not locked.
- Apply Individually: Mark this option and the dimension change or percentage will be applied as if there were no bounding box around the shapes.
 - For example, take three 1-inch squares that are 1 inch apart from one another. Select all three and apply a 200% scale.
 - o Here are the results depending on whether or not **Apply Individually** is marked:

Apply Individually not checked:



Apply Individually checked:



The space between the shapes is also scaled 200%

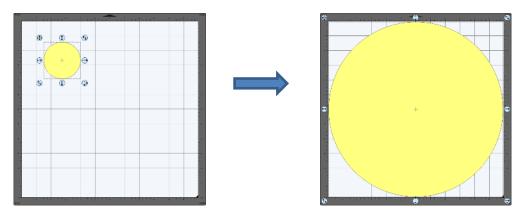
The shapes do not change locations

- When Apply Individually is not checked, the spacing between the shapes is also scaled and the squares end up 2 inches apart.
- When **Apply Individually** is checked, the spacing ends up filled by the expanding size of each square. Another way to look at it - the position of the shapes (the upper left corner) of each square does not change, as shown by the red arrows.

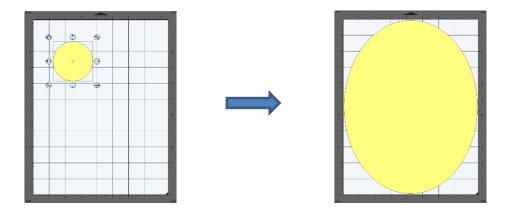
5.05.3 Auto Fit



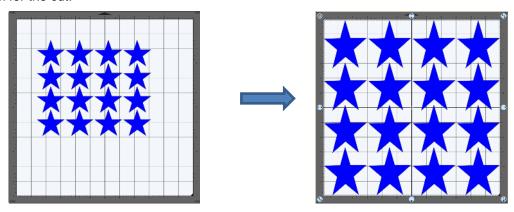
- The **Auto Fit** function will resize a shape or selection of shapes to fit the boundaries of the **Cutting Mat** with a slight (1/16") margin. It is accessed by going to **Object>Transform>Auto Fit**.
- Example: Select a circle on a 12" x 12" Cutting Mat and go to Object>Transform>Auto Fit:



- ♦ The new size of the circle is 11.875" x 11.875".
- ♦ If the circle is placed on a 15" x 15" mat, then it resizes to 14.85" x 14.875". However, if the circle is placed on letter size mat (8.5" x 11"), then it becomes an oval:



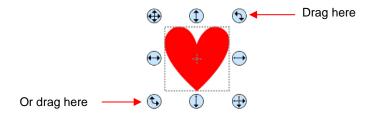
• A practical example might be something like this: You have one 12 x 12 sheet of cardstock and you want to cut out 16 stars for a party decoration and you want those stars as large as possible. Rather than having to "do the math", you can create a grid of stars (refer to Section 5.17.4) and then use the Auto Fit function to resize them for the cut:



5.06 Rotating



 With the Handles set to Basic mode and the shape selected, dragging the top right icon will freely rotate the shape:



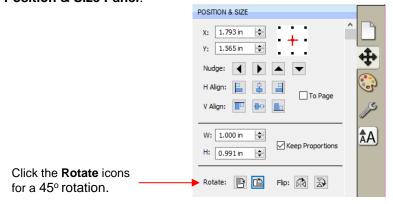
♦ Holding the **Shift** key, while rotating, will rotate the shape in 15° increments. However, if you need to rotate in increments other than 15°, go to **Edit>Preferences**, click on the **Edit** tab, and change the **Constrain Angle** to the desired increment (from 1 to 180°). Click on **OK** to save the change:



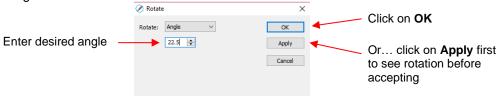
The **Status Bar** at the bottom of the screen will indicate the current degree of rotation:



- Note: the Status Bar will continue to show the last degree of rotation until another shape is selected and rotated.
- A selected shape can be rotated exactly 45° clockwise or counter-clockwise, by clicking the **Rotate** icons on the **Position & Size Panel**:



- To rotate a specific angle, open the Rotate window in either of two ways:
 - ♦ Right-click on a selected shape and go to **Transform>Rotate**
 - ♦ Go to Object>Transform>Rotate
- Enter the desired angle:

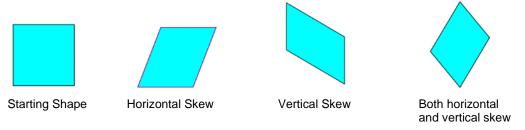


5.07 Skewing and Distorting

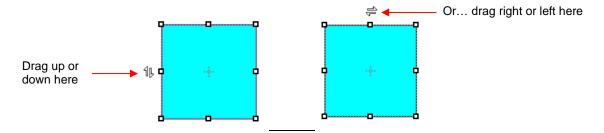
5.07.1 Skewing



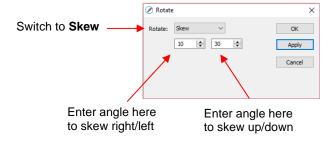
Shapes can be skewed either horizontally or vertically:



- There are two ways to skew a shape:
 - With the shape selected and Advanced selected on the Tool Options, rest your mouse <u>slightly outside</u> of a handle in the middle of a side. The skew mode cursor will appear and it can be dragged to skew the shape:



- With the shape selected, open the Rotate window by using one of these two methods:
 - o Right-click and select Transform>Rotate
 - o Go to Object>Transform>Rotate
- ♦ Then switch from Angle to Skew and enter a skew angle:



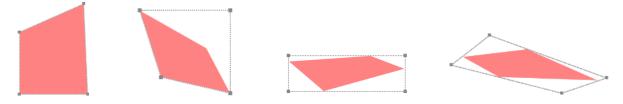
5.07.2 Distorting



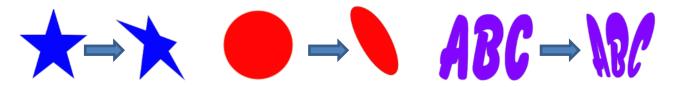
• The **Distort** tool is the 5th icon from the bottom on the **Tools Panel**. Select a shape and then click on the icon. The four corners of the bounding box will display small boxes:



• The shape can now be distorted in countless ways by dragging any of the corners:



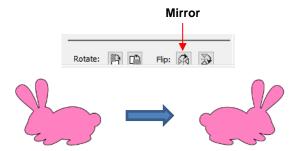
• Of course, the shape doesn't have to be rectangular. The **Distort** tool can be applied to anything:



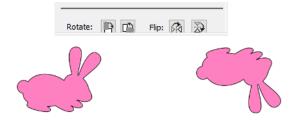
5.08 Mirroring and Flipping



- To horizontally mirror a shape, select it and then use one of the following:
 - ♦ Right-click on the screen and select Transform> Flip Horizontal (Mirror)
 - **♦ Go to Object>Transform> Flip Horizontal (Mirror)**
 - ♦ Click on the Mirror icon, next to Flip, on the Position & Size Panel:



- To vertically flip a shape, select it and then use one of the following:
 - ♦ Right-click on the screen and select **Transform> Flip Vertical**
 - ♦ Go to Object>Transform>Flip Vertical
 - ♦ Click on the Flip icon on the Position & Size Panel:



5.09 Locking and Unlocking



- Locking a shape is normally done to prevent accidental selection and movement of that shape.
- To lock a selected shape, use any of the following options:
 - ♦ Right-click and select Lock from the menu
 - ♦ Go to Object>Lock
 - ♦ Press Ctrl+Alt+L
 - ♦ Locate the shape on the Layers Panel and click on the unlock icon or double-click and check the Lock option.
- To lock all shapes:
 - ♦ Right-click and choose **Select All**, then right-click and choose **Lock**
 - ♦ Click on the Layers Menu icon and select Lock/Unlock>Lock All Layers
- To unlock a single shape or a folder of shapes, locate the shape or folder on the **Layers Panel** and click on the **Lock** icon or double-click and uncheck the **Lock** option.
- To unlock all locked shapes, use any of the following options:

- ♦ Right-click on a selected <u>unlocked</u> shape and select **Unlock All** from the menu
- ♦ Go to Object>Unlock All
- ♦ Press Ctrl+Shift+Alt+L
- ♦ Click on the Layers Menu icon and select Lock/Unlock>Unlock All Layers
- To toggle the lock/unlock status of all layers on the Layers Panel, click on the Layers Menu icon select Lock/Unlock>Toggle All Layers

5.10 Hiding and Showing



- To hide a selected shape, use either of the following options:
 - ♦ Right-click and select **Hide** from the menu
 - ♦ Go to Object>Hide
 - Locate the shape on the **Layers Panel** and click on the hide icon or double-click and uncheck the **Show** option.
- To hide all shapes:
 - ♦ Right-click and choose Select All, then right-click and choose Hide
 - ♦ Click on the Layers Menu icon and select Show/Hide>Hide All Layers
- To unhide a single shape or a folder of shapes, locate the shape or folder on the **Layers Panel** and click on the unhide icon or double-click and check the **Show** option.
- To unhide all hidden shapes, use any of the following options:
 - Right-click on a selected unhidden shape and select Show All from the menu
 - ♦ Go to Object>Show All
 - ♦ Select any shape (including a hidden one) on the **Layers Panel**, right-click and select **Show All** from the menu.
 - ♦ Click on the Layers Menu icon and select Show/Hide>Show All Layers
- To toggle the hide/unhide status of all layers on the Layers Panel, click on the Layers Menu icon select Show/Hide>Toggle All Layers

5.11 Grouping and Ungrouping



5.11.1 Group

- The **Group** function is used to combine shapes into a new folder on the **Layers Panel** so that they can be more easily moved, resized, rotated, etc.
- After selecting two or more shapes, the Group function can be applied in any of the following ways:
 - ♦ Right-click and select **Group** from the popup menu
 - ♦ Go to Object>Group
 - ♦ Press Ctrl+G

The following example shows three shapes before and after grouping.



Before applying Group

After applying Group

5.11.2 Ungroup

- The Ungroup function is used to separate a grouped layer of shapes into individual layers.
- After selecting a group, the Ungroup function can be applied in any of the following ways:
 - ♦ Right-click and select **Ungroup** from the popup menu
 - ♦ Go to Object>Ungroup
 - ♦ Press Ctrl+Shift+G
- The following screenshot shows the same grouped folder from the prior example both before and after ungrouping:



Before applying Ungroup

After applying Ungroup

 Another example shows what happens when you ungroup a word. The individual letters of the word can now be selected:



♦ On the Layers Panel:



5.12.1 Break Apart

- The Break Apart function goes one step further than Ungrouping. It is used to separate a combined shape
 into the individual parts that make up that shape.
- After selecting a combined shape, the Break Apart function can be applied in any of the following ways:
 - ♦ Right-click and select Break Apart from the popup menu
 - ♦ Go to Object>Break Apart
 - ♦ Press Ctrl+B
- The following screenshot shows **Break Apart** being applied to the same word "Bob" to separate the internal closed paths (also called child shapes) from the external paths (also called parent shapes):

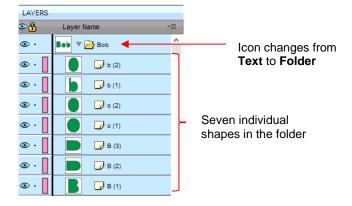


On the Layers Panel:



Before applying Break Apart

After applying Break Apart



Once you apply Break Apart, you have complete editing control over each individual shape within a design.
But be careful! It's also easy to inadvertently move an individual shape (especially the tiny ones) and you
can risk messing up the design. Thus, only use Break Apart when needed and then, more importantly,
know how to rejoin your shapes, which is covered in the next section.

5.12.2 Merge

- The **Merge** function is used to combine individual paths, curves, and lines into a single shape. This is basically the opposite function to **Break Apart**.
- After selecting two or more shapes, the **Merge** function can be accessed in either of the following ways:
 - ♦ Go to Object>Merge
 - ♦ Press Ctrl+Shift+B

• If the **Merge** function is applied to the prior "Bob" example, after having **Break Apart** applied, the word will now become all one shape again. Separated child paths no longer exist and even the individual letters can no longer be selected:



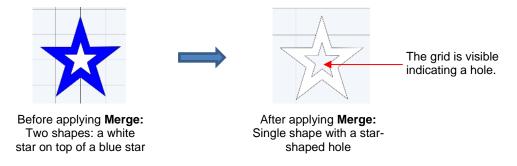
On the Layers Panel, this is what will appear:



• Note that if you apply **Merge** to shapes of different colors, they will all become one color because a merged shape is regarded as a single shape, even if the parts being merged do not touch:



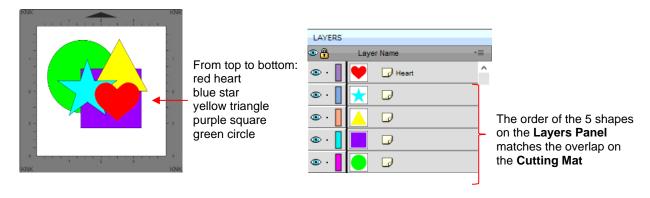
A child shape that is merged with a parent shape essentially becomes a hole in that shape. This can be proven by having the grid showing when merging:



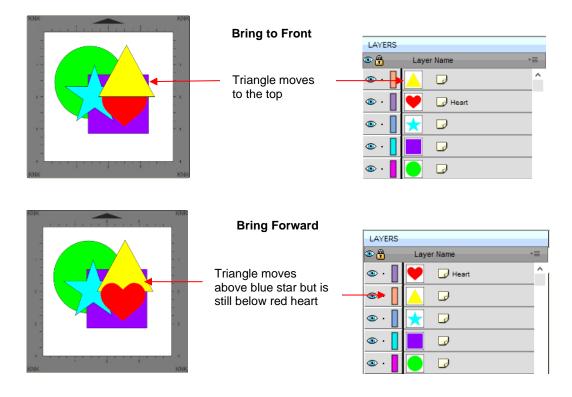
5.13 Arranging (Ordering) Shapes

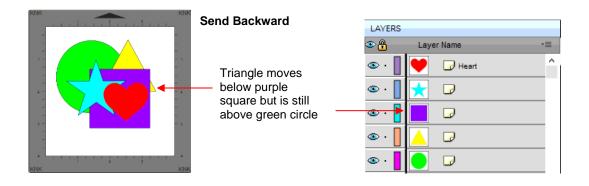


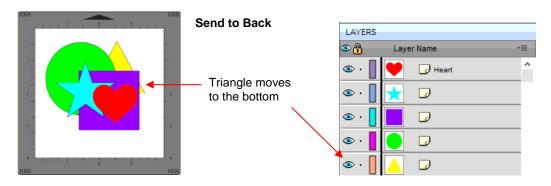
- The shape order affects the visual appearance on the **Cutting Mat**. A shape that is above or on top of another shape will appear above it on the **Layers Panel**.
- The following example shows five overlapping shapes and how they appear on the Layers Panel:



- In Section 4.04.3, moving layers was presented and could be used here to change the order of the shapes. However, another way to reorder these shapes is to select one and then access the **Arrange** functions using one of the following:
 - ♦ Go to Object>Arrange
 - ♦ Right-click and select **Arrange** from the popup menu
 - ♦ Click on the Layers Menu icon and select Arrange
- Four options will then appear:
 - ♦ **Bring to Front** (or **Layer to Top**): Move selection to the very top
 - ♦ Bring Forward (or Raise Layer): Move selection up one level
 - ♦ Send Backward (or Lower Layer): Move selection down one level
 - ♦ Send to Back (or Layer to Bottom): Move selection to the very bottom
- In the above example, the yellow triangle is selected and each option shows what would have changed if it had been applied:





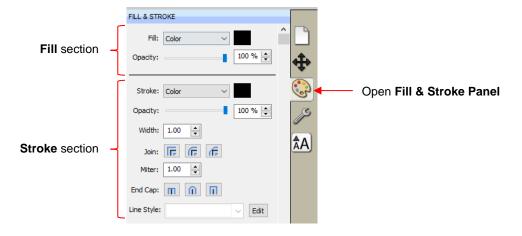


- It is worth noting that if any of the other layers had been locked or hidden, the movement of the triangle would have been the same. In other words, if the red heart had been hidden and/or locked, the triangle would still have ended up above it using **Bring to Front**.
- There are also shortcut keys (Windows version only) for these four **Arrange** functions:
 - ♦ Bring to Front Ctrl+Shift+Up
 - ♦ Bring Forward Ctrl+Up
 - ♦ Send Backward Ctrl+Shift+Down
 - ♦ Send to Back Ctrl+Shift+Down

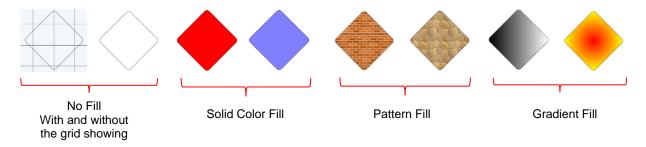
5.14 Fill & Stroke: Fill



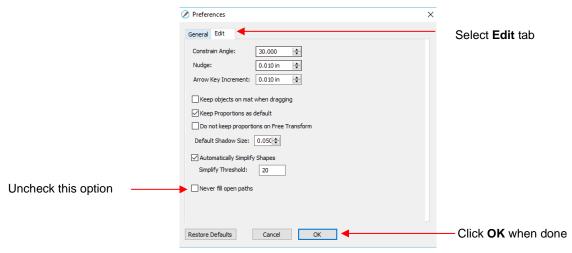
- The **Fill & Stroke Panel** provides options for changing how a shape or open path appears on the screen and, in the case of **Line Style** (solid versus dashed), how it cuts. This can be helpful in designing a project and also in print and cut applications.
- To open this panel, click on the Fill & Stroke icon on the Properties Panel:



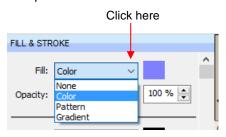
• Shapes can be filled with nothing, a solid color, a pattern or a gradient:



• By default, only closed shapes can display a fill. However, you can opt to have open shapes filled by going to **Edit>Preferences**, clicking on the **Edit** tab, and then unchecking the box next to **Never fill open paths.**

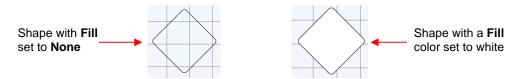


• To select a type of Fill, click on the drop-down menu and select from the four options:



5.14.1 No Fill

From the Fill menu, select None and shape will be empty. Note that this is not the same as having a white
fill. When None is selected, the grid will show through the shape if the Show Grid option (on the
Document Panel) is turned on:



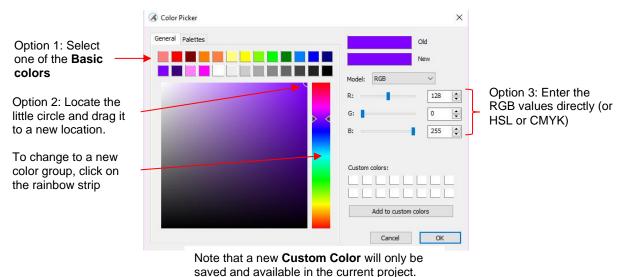
5.14.2 Color Fill



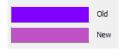
From the Fill menu, select Color and then click on the color box to the right:



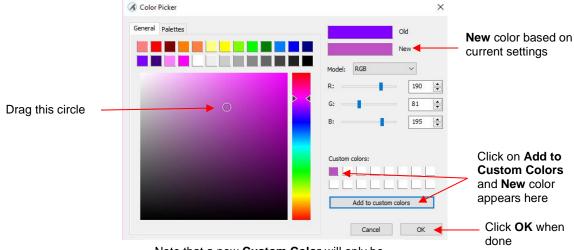
• The following **Color Picker** window opens where you have the option to select a basic color or create a custom color:



- Option 1: Select any of the 13 colored squares. You can then adjust that new color, if desired, using Option 2 or Option 3.
- Option 2: Locate the tiny circle in one of the corners and drag it to change the tone and brightness for that color. Alternatively, you can click anywhere along the rainbow strip to change to a completely different color and then drag the smaller circle to refine that color.
- Option 3: From the Model menu, select RGB, HSL, or CMYK and enter the color values for the color you want to use.
- ♦ As you make changes, the **New** color box will change so you can immediately see the effects:



Once you have the color you wish to use, click on **OK**. However, if you want that same color available to select again within this same file, click on Add to custom colors before clicking on OK.

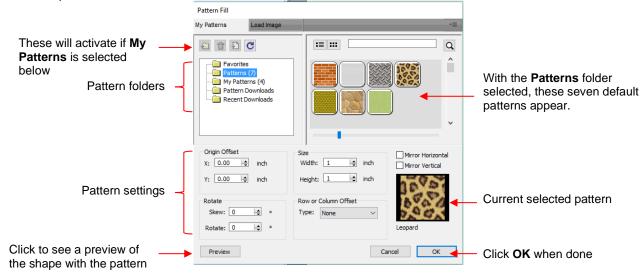


Note that a new Custom Color will only be saved and available in the current project.

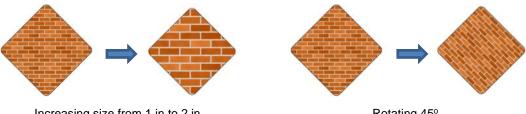
5.14.3 Pattern Fill



From the Fill menu, select Pattern and then click on the color box to the right to open the following window where a pattern can be selected:



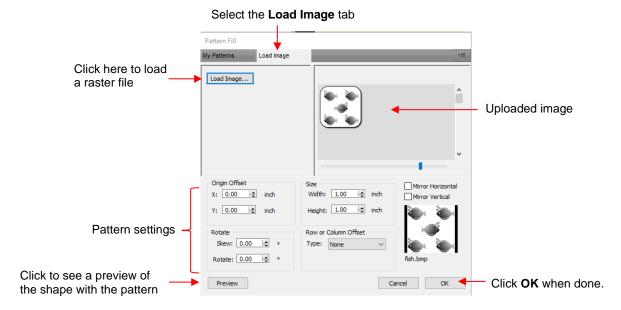
- Many of the functions in the **Pattern Fill** window are identical to those under the **Shapes** tab in the **Library**. Refer to Section 4.05.1 for directions on searching, adding new folders, adding new files, adding to Favorites, etc.
- When adding your own patterns under My Patterns, select common raster file formats (e.g. BMP, PNG, JPG).
- The pattern settings can be used to modify how the pattern appears in the filled shape, for example:



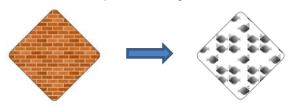
Increasing size from 1 in to 2 in

Rotating 45°

• The other tab, **Load image**, can be used to load a raster file to use as a pattern, if you do not wish to save it under **My Patterns.** It has pattern settings, as well:



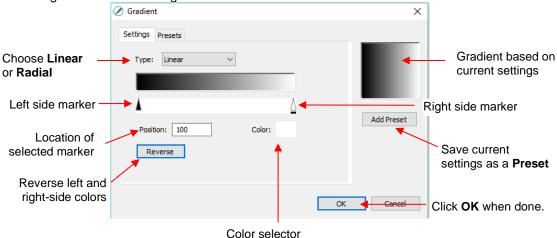
The selected shape now fills with the uploaded image:



• If you need to fill a shape with a raster image, such as a photo, using the **Clip Path** and **Clip Mask** functions are easier alternatives. Refer to Section 9.07.

5.14.4 Gradient Fill Video

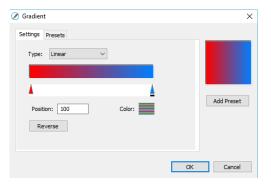
 From the Fill menu, select Gradient and then click on the color box to the right to open the following window where a gradient can be designed:

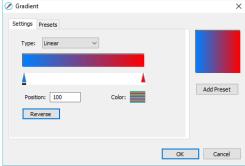


• Type: Choose Linear for a left-to-right gradient. Choose Radial for a center outwards gradient:



- ♦ To change colors, click on one of the markers, then click on the color selector box and choose a color from the Color Picker window. Repeat for the other marker. As with other color selections, you can choose a base color or create a custom color. Refer to Section 5.14.2 for details on using the Color Picker window.
- After selecting new colors, the thumbnail image will update. Note that clicking on Reverse will switch the two chosen colors:

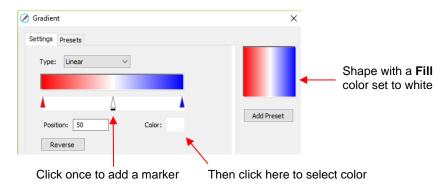




After selecting new colors

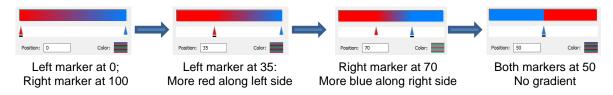
After applying Reverse

More markers can be added by clicking on the **Position Bar** and then clicking on the **Color** selector. For example, white could have been added to the middle:



- If you inadvertently add a marker or decide you don't want one or more of the new ones, drag the marker downward and it will be removed.
- ♦ **Position:** The **Position** value is a location from 0 to 100 and applies to whichever marker is selected.

 Note the little black line under a selected marker.
- Changing the **Position** moves the marker and resets where the gradient begins on that side. You can also manually slide the markers to change the **Position**, as well. Returning to the two-color example:



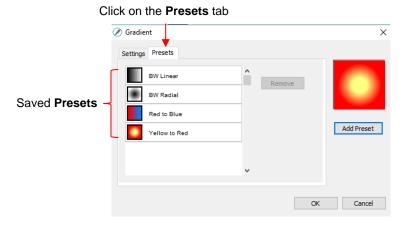
The **Position** can also be changed after the shape is filled and the **Gradient** window i sed. On the **Tools Panel** is a **Gradient** tool. After selecting the shape, click on the **Gradient** icon and then drag the mouse across the shape to change the **Positions** and even rotate the gradient:



If you want to save a particular gradient for future applications, click on Add Preset and a window will open where you can name this Preset:



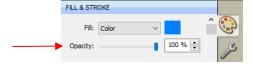
♦ To access your saved **Gradient Presets**, click on the **Presets** tab and the menu will appear:



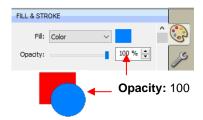
5.14.5 Opacity

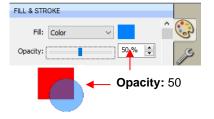


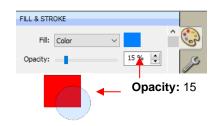
Just below the Fill setting is Opacity:



- Decreasing the **Opacity** setting will make a shape more transparent. This can be used for changing the appearance for printing or for revealing shapes that are completely or just partially hidden by other shapes.
 - ♦ In the following example, the **Opacity** is decreased on the <u>blue circle</u>, allowing the blocked portion of the red square to be seen:







♦ Lowering the **Opacity** can be applied to shapes filled with **Patterns** and **Gradients**, as well:



If you want to decrease the Opacity for all shapes, the Workspace Alpha setting on the Documents Panel can be reduced from 100% to the desired level:

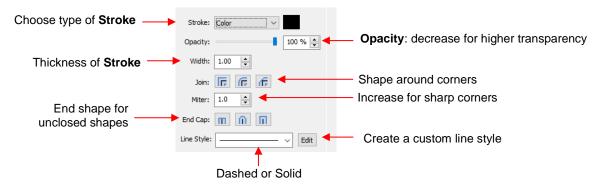


5.15 Fill & Stroke: Stroke

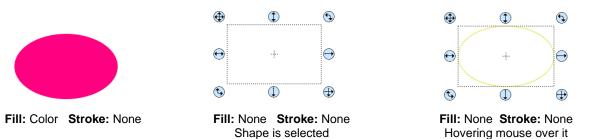
5.15.1 Stroke Settings



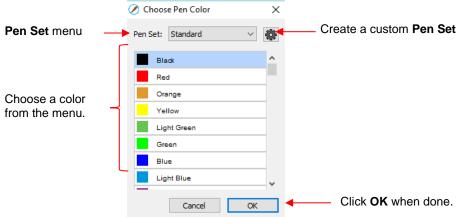
The Stroke settings are located below the Fill settings on the File & Stroke Panel. Note the following:



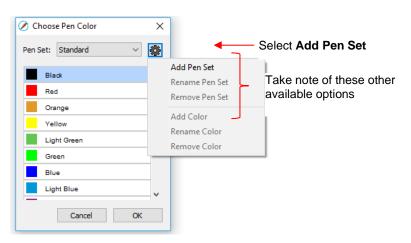
- Stroke: All shapes have a Stroke assignment using one of the following choices:
 - None: The shape will not have an outline. Note that if you also choose **None** for the **Fill**, then you will not be able to see the shape at all unless you hover the mouse over it:



- ♦ Color: Once Color is selected, click on the box to the right and the Color window will open. This is the same window that opened when Color was selected under Fill. As with other color selections, you can choose a base color or create a custom color.
- Pen Color: Choose this if you are recoloring lines based on selecting actual pens or other tools to switch out during the cut.
- When you choose **Pen Color** and then click on the box to the right, the **Choose Pen Color** window opens:



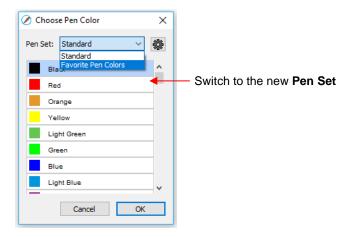
Select the desired color from the menu and click **OK**. You also have the option to create your own custom **Pen Set** by clicking on the small icon in the upper right corner appears and you can then select **Add Pen Set**:



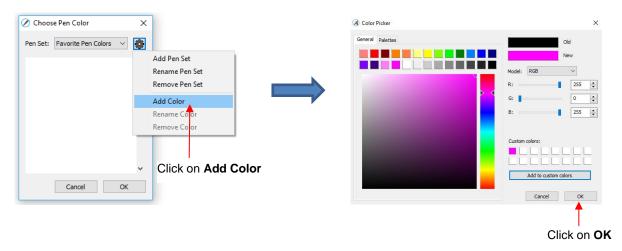
Next, name the pen set:



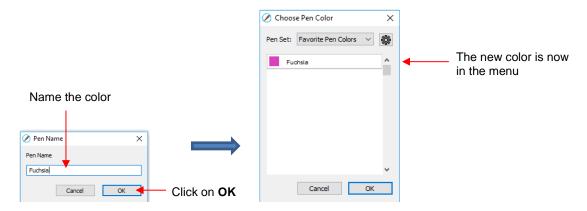
o In the **Pen Set** menu, you can now select the new **Pen Set Name**:



Again, click on the small icon in the upper right corner and you can begin adding pen colors with their respective color values or just scroll to create colors you like:



♦ After clicking on **OK**, you will be prompted to name this color and then it will show up in the menu:



- ♦ In the same menu where you can add new colors, are options to **Remove Color** or **Rename Color**. Before you can use these options, you will need to close and reopen SCAL.
- Opacity: Decreasing the Opacity setting will make the Stroke color more transparent. It's not particularly noticeable until you increase the Stroke Width, thus examples will be shown in the next bullet.
- Width: Increasing the Width will make the Stroke thicker. The units are in pixels thus the same values give
 the same results whether your SCAL Units are set to inches, cm, or mm.



Stroke Width: 1 Opacity: 100%



Stroke Width: 10 Opacity: 100%

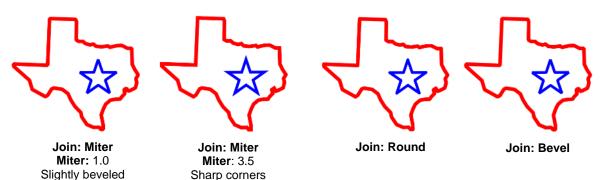


Stroke Width: 20 Opacity: 100%



Stroke Width: 20 Opacity: 50%

- ♦ <u>IMPORTANT:</u> The **Stroke Width** does not affect how a shape or line is cut or drawn. It's only used for display and printing purposes.
- **Join** consists of three options which affect how sharp corners are handled:
 - ♦ Miter : Corners are sharp but will become beveled at low values of Miter
 - Round : Corners are rounded off.
 - ♦ Bevel : Corners are clipped at a 45° angle.
- Just as with Opacity, there's not a strong visual difference if the Stroke Width is small. Thus to illustrate
 Join, a Stroke Width of 20 will be used:



- End Caps: Unclosed shapes, such as lines and arcs, can have the Stroke shape on the ends changed, similar to the Join setting. The choices are:
 - ♦ Butt : The end is squared off, aligned with the actual end of the path
 - ♦ Round : The end is rounded.
 - Square : The end is squared off and extends beyond the actual end based on the Stroke Width.



• To better illustrate the difference between **Butt** and **Square**, the original line is shown in a close up:



End Cap: Butt - cap ends at the line end

End Cap: Square - cap extends beyond end

5.15.2 Stroke Line Style

- One additional **Stroke** setting deserves its own subsection because it also affects how a shape will be drawn or cut by your cutter.
- The **Line Style** can be either solid or dashed. If dashed is selected, then one of the default patterns can be selected or you can specify the dash length and spacing desired by clicking on **Edit**:

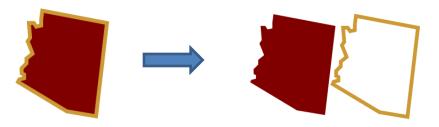


The **Line Style** selected will be displayed on the screen and will be cut or drawn with that style by the cutter. Again, the **Stroke Width**, however, is ignored by the cutter.

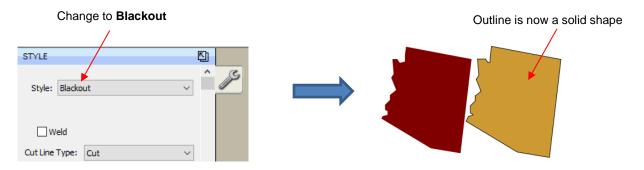
5.15.3 Converting Strokes into Closed Shapes



• In the event you decide the stroke should be its own shape, select the shape and go to **Path>Stroke to Path**. You can now drag the stroke shape away from the original:



• If you want the new outline shape to be a solid background instead of an open frame, select it and then, on the **Style Panel**, change the **Style** settings from **Normal** to **Blackout**:



More about the Style setting is covered in Section 8.01. There are also other ways to create shadow layers.
 Refer to Path Offset (Section 8.05) and Shadow Layer (Section 9.05).

5.16 Dropper Tool Video

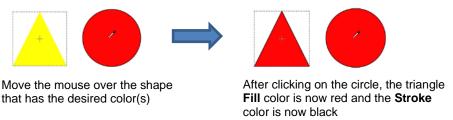
- Shapes can also have the **Fill**, **Stroke** or both changed based on the settings for another shape. This is accomplished using the **Dropper** tool on the **Tools Panel**.
- To use this function:
 - Select the shape to be recolored. In this example, it will be a yellow triangle with no **Stroke**:



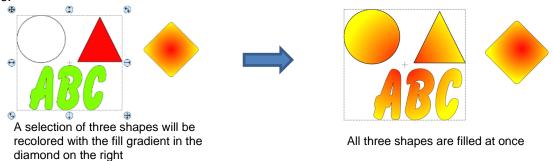
♦ Click on the **Dropper** tool icon and choose a setting from the **Tool Options**:



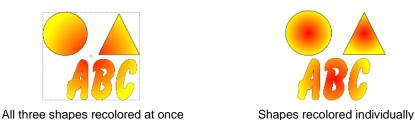
♦ Finally, click on the shape that has the color property you wish to use. In this case, it's the red circle with the black **Stroke**. The selected triangle is recolored to match.



Note that other properties, such as Stroke Width or Opacity, will not be copied onto the selected shape.
 On the other hand, if the Fill is a pattern or gradient, it will be copied. You can also fill multiple shapes at once:



 Note, however, that the three shapes were treated as one object when filling with the gradient. A different result is obtained if each shape had been filled separately:



5.17 Cutting, Copying, Pasting, Duplicating

5.17.1 Cutting to the Clipboard



- To cut shapes to the clipboard (copy to the clipboard and delete from the **Cutting Mat**), first select the shape or shapes and then use any of the following:
 - ♦ Click on the **Cut** icon located on the upper **Toolbar**



- ♦ Right-click on the screen and select Cut
- ♦ Press Ctrl+X
- ♦ Go to Edit>Cut

5.17.2 Copying to the Clipboard



- To copy shapes to the clipboard, first select the shape or shapes and then use any of the following:
 - ♦ Click on the **Copy** icon located on the upper **Toolbar**
 - ♦ Right-click on the screen and select Copy
 - ♦ Press Ctrl+C
 - ♦ Go to Edit>Copy
- To make multiple copies, refer to the **Duplicate** function described later in this section.

5.17.3 Pasting from the Clipboard



- There are three Paste functions in SCAL:
 - ♦ **Paste:** pastes the shape offset slightly (0.25") from the original
 - Paste in Place: pastes the shape in exactly the same location as the original
 - ♦ Paste (Auto Fill): pastes enough copies to auto-fill the Cutting Mat
- To **Paste** shapes from the clipboard, use any of the following:

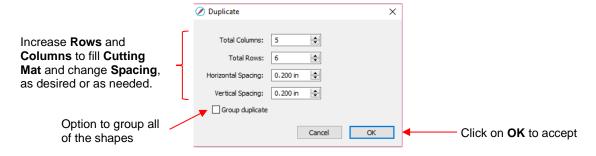


- ♦ Click on the icon located on the upper **Toolbar**
- A Right-click on the screen and select Paste
- ♦ Press Ctrl+V
- ♦ Go to Edit>Paste
- To Paste in Place shapes from the clipboard, use any of the following:
 - ♦ Right-click on the screen and select **Paste in Place** (without any shapes selected)
 - ♦ Press Ctrl+Shift+V
 - ♦ Go to Edit>Paste in Place
- To Paste (Auto Fill): use either of the following:
 - ♦ Press Ctrl+Shift+Alt+V
 - ♦ Go to Edit>Paste (Auto Fill)

5.17.4 Duplicating - Duplicate



- The **Duplicate** function allows you to make multiple copies of a shape aligned in rows and/or columns, with the spacing you desire. To access **Duplicate**, first select the shape(s) and then use either of the following:
 - ♦ Press Ctrl+D
 - ♦ Go to Object>Duplicate
- To fill your grid with images, move the selected shape(s) to the top left corner of the gridded part of the **Cutting Mat**. With the shape(s) still selected, use **Ctrl-D** (or **Object>Duplicate**) to open the **Duplicate** window. As you begin clicking on **Total Columns** and **Total Rows**, the mat will fill with the shapes. Change the **Spacing**, as needed, to better fit the duplicates. Click on **OK** to accept:



- To create a single row of repeats, set the **Rows** value to 1. For a single column of repeats, set the **Columns** value to 1. To overlap the repeats, enter a negative number under **Spacing**. Refer to *Section* 9.06.1 for a tutorial on how this function can be used to create a border.
- There is also a **Duplicate Rotated** function to arrange the duplicates in a circular formation. Because this is more typically used for design purposes, it is covered in *Section 9.08*.

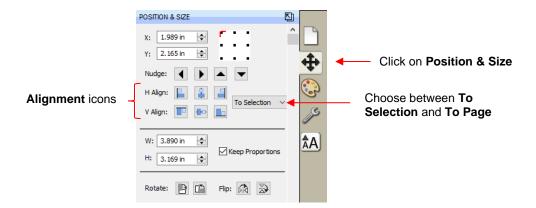
5.17.5 Quick Duplicate



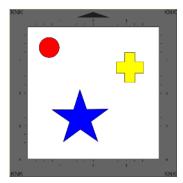
- A quick way to make a single copy of a shape is to hold the **Alt** key while dragging the shape. The original will be left behind and new copy will be moved with the mouse.
- You can also hold the Alt key and left-click on a shape and it will duplicate that shape leaving the copy on top of the original.

5.18 Alignment

- There are fourteen functions used to align shapes, seven of them with respect to the Cutting Mat (referred
 to as Page) and another seven with respect to one another (referred to as Selection). After selecting two or
 more shapes, these functions can be accessed using either of the following:
 - ♦ Go to Object>Alignment
 - Click on an alignment icon from the Position & Size window on the Properties Panel:



• The following three shapes, in their current relative positions, will be used to illustrate what happens when each alignment function is applied. Note that a small custom mat was created to facilitate screenshots:



5.18.1 Align to Page



- Make sure the alignment mode is set to Align to Page. To do this, either:
 - ♦ Go to **Object>Alignment** and make sure **Align to Page** is checked
 - ♦ Select **To Page** on the **Position & Size** panel
- With the shapes selected, the horizontal alignment options are:
 - ♦ Align Left aligns shapes along the left side of the Cutting Mat.



♦ Align Horizontal Center aligns shapes through the center of the Cutting Mat.

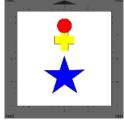


♦ Align Right aligns shapes along the right side of the right side of the Cutting Mat.





Align Left



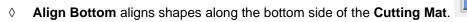
Align Horizontal Center

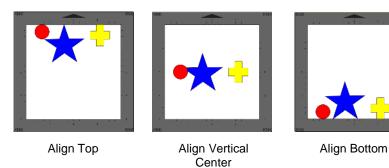


Align Right

• With the shapes selected, the vertical alignment options are:

- ♦ Align Top aligns shapes along the top side of the Cutting Mat.
- ♦ Align Vertical Center aligns shapes through the center of the Cutting Mat.





- To center all three shapes in the middle of the Cutting Mat, use either:
 - ♦ A combination of **Align Horizontal Center** and **Align Vertical Center**:
 - ♦ Go to Object>Alignment>Align Centers

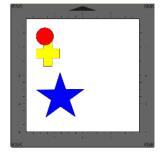


Align Centers

5.18.2 Align to Selection



- First, make sure the alignment mode is set to Align to Selection. This is done by either making sure To
 Selection is chosen on the Position & Size panel or by going to Object>Alignment and making sure Align
 to Selection is checked.
- With the shapes selected, the horizontal alignment options are:
 - ♦ Align Left aligns shapes along the left side of the leftmost shape of the group.
 - \diamond $\;$ Align Horizontal Center aligns shapes to a vertical axis through the center.
 - Align Right aligns shapes along the right side of the rightmost shape of the group.





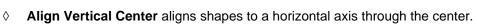


Align Horizontal Center

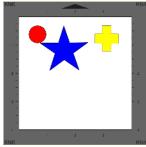


Align Right

- With the shapes selected, the vertical alignment options are:
 - ♦ Align Top aligns shapes along the top side of the uppermost shape of the group.







Align Top



Align Vertical Center

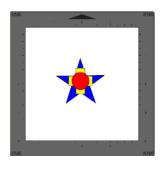


Align Bottom

- To center all three shapes, use either:
- ♦ A combination of Align Horizontal Center and Align Vertical Center:



Go to Object>Alignment>Align Centers



Align Centers

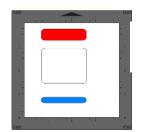
5.19 Distribute



- The **Distribute** function rearranges the spacing between shapes. Similar to the **Alignment** function, you can **Distribute to Page** (**Cutting Mat**) or you can **Distribute to Selection** (selected shapes). There's also a third, called **Distribute to Selection Below**, which distributes based on whatever shape is positioned at the lowest level on the **Layers Panel** and its difference in size relative to the outermost shape in the opposite direction of the distribute option (and yes, this is confusing, but will be explained in *Section 5.19.3*)
- After selecting the shapes, these functions can be accessed by going to **Object>Distribute**.
- The following three shapes, in their current relative positions, will be used to illustrate what happens with each distribute function when **Distribute to Selection** or **Distribute to Page** is applied. Note that a small custom mat was created to facilitate screenshots:



Will be used for horizontal distribute examples

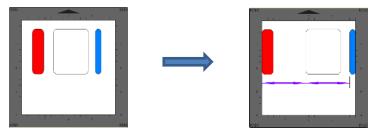


Will be used for vertical distribute examples

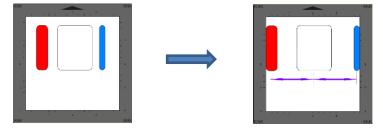
5.19.1 Distribute to Page



- Select the shapes and go to Object>Distribute and then make sure the Distribute to Page option is checked. In this mode, the two outermost shapes will align with the Cutting Mat and then other shapes will be evenly spaced from one side of the mat to the other, according to which additional option is chosen. All options, with screenshots, are presented. The purple arrows indicate equal spacing.
- With the shapes selected, the horizontal distribute options are:
 - Distribute Left: spaces shapes so that the left sides of each shape are the same distance apart:



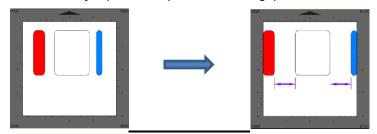
Distribute Center Horizontally: spaces shapes so that the centers of each shape are the same distance apart:



Distribute Right: spaces shapes so that the right sides of each shape are the same distance apart:



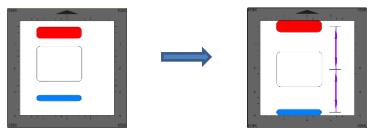
Distribute Space Horizontally: spaces shapes so that the gaps between the shapes are the same.



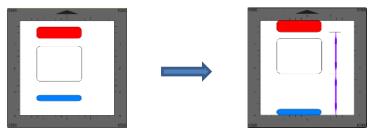
- With the shapes selected, the vertical distribute options are:
 - **Distribute Top:** spaces shapes so that the top sides of each shape are the same distance apart:



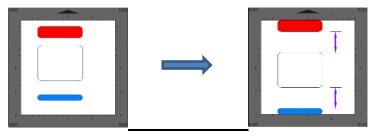
Distribute Center Vertically: spaces shapes so that the centers of each shape are the same distance apart:



Distribute Bottom: spaces shapes so that the bottom sides of each shape are the same distance apart:



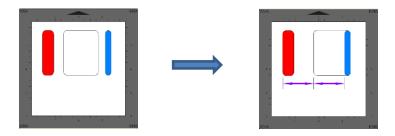
♦ **Distribute Space Vertically:** spaces shapes so that the gaps between the shapes are the same.



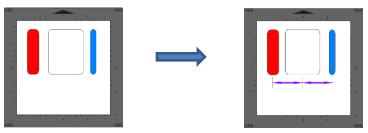
5.19.2 Distribute to Selection



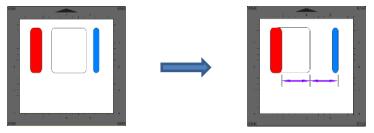
- Select the shapes and go to Object>Distribute and then make sure Distribute to Selection is checked. In this mode, the two outermost shapes will remain in position and then other shapes will be evenly spaced, according to which additional option is chosen. All options, with screenshots, are presented. Again, the purple arrows indicate equal spacing.
- With the shapes selected, the horizontal distribute options are:
 - Distribute Left: spaces shapes so that the left sides of each shape are the same distance apart:



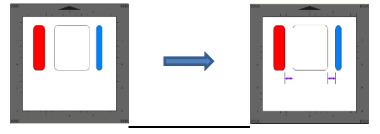
Distribute Center Horizontally: spaces shapes so that the centers of each shape are the same distance apart:



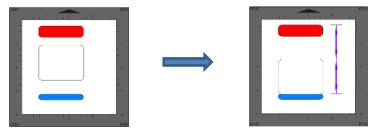
Distribute Right: spaces shapes so that the right sides of each shape are the same distance apart:



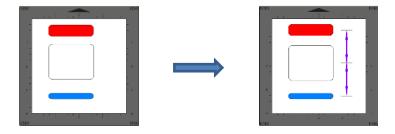
♦ **Distribute Space Horizontally:** spaces shapes so that the gaps between the shapes are the same.



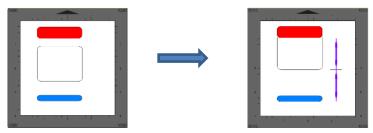
- With the shapes selected, the vertical distribute options are:
 - ♦ **Distribute Top:** spaces shapes so that the top sides of each shape are the same distance apart:



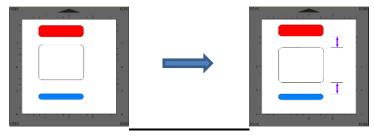
Distribute Center Vertically: spaces shapes so that the centers of each shape are the same distance apart:



Distribute Bottom: spaces shapes so that the bottom sides of each shape are the same distance apart:

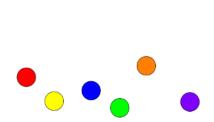


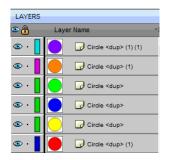
♦ **Distribute Space Vertically:** spaces shapes so that the gaps between the shapes are the same.



5.19.3 Distribute to Selection Below

- This function is, hands down, the strangest function I have encountered in 10 years of writing technical
 manuals. I have no practical applications to share and the developer hasn't responded to my request for
 assistance. Thus, I can only explain what happens when you apply it. Maybe one of our readers will figure
 out a great use for it and share with me so that I can add it to this section.
- Given a selection of shapes, applying one of the **Distribute to Selection Below** options will space the shapes based on the difference in size between the bottommost shape of the selection and then the shape that is the furthest away in the opposite direction to the distribute option.
- As an example, here is a random scattering of 1" circles. The red one is the bottommost of the selection, as shown on the **Layers Panel**:

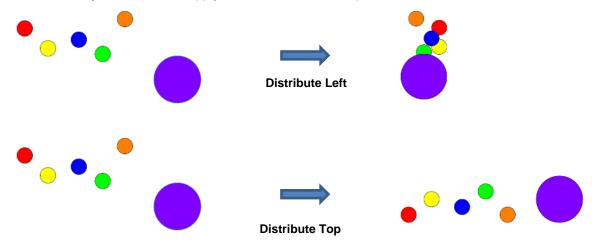




Applying **Distribute Left** will move all of the circles to align with the left side of the red one. Applying **Distribute Top** will move all of the circles to align with the top side of the red one. Because the circles are all the same size, there is no spacing applied, only alignment:



- ♦ Distribute Left: Note that the up/down Y locations remain the same for all of the circles.
- ♦ **Distribute Top:** The left/right **X** locations remain the same for all of the circles.
- Now, let's make the purple circle that's both furthest to the right and furthest towards the bottom equal to 3" in size instead of just 1" and then apply the same **Distribute** options:



♦ **Distribute Left:** The new location for the 3" purple circle is now 2" to the left of the 1" red circle, which was, again, the bottommost shape. The 2" is a result of subtracting 1" from 3". The locations of the other circles are an equal spacing of that 2 inches, however note that one of the circles, the yellow one, is aligned with the red one and starts the distribution:

	Location of Left Side
Red	5"
Yellow	5"
Blue	4.5"
Green	2.0"
Orange	3.5"
Purple	1.0"

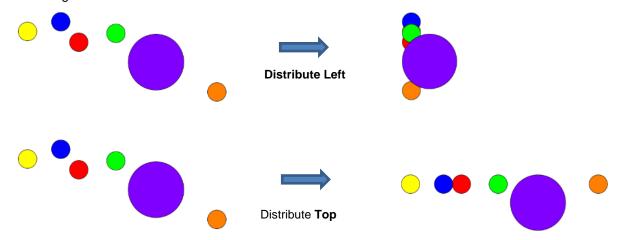
Distribute Top: The same kind of new arrangement happened in this case as well, only in a vertical way. The red circle is still in the same location, but the top of the purple circle is now 2" higher than the red one and the other circles are evenly distributed, with the orange one first aligning with the red one:

	Location of Top Side
Red	3"
Orange	3"
Blue	2.5"
Yellow	2.0"
Green	1.5"
Purple	1.0"

• Now, this distribution happened because the purple circle was both larger than the red one AND it was the outermost circle in both of the opposite directions. In other words, when applying **Distribute Left**, the

purple circle was the rightmost shape. When applying **Distribute Top**, the purple circle was the bottommost shape.

• If another one of the 1" circles had been the outermost, then both of those **Distribute** options would have yielded the same alignment when all of the circles were the same size. Note also that the bottommost red circle doesn't have to be on the far left or on the top. It can be located anywhere but the other circles will be moved to align with it:



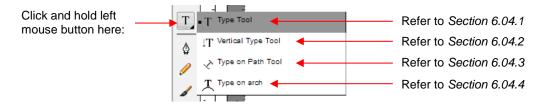
 At this time, no further details will be presented. However, if a practical application comes to light, I will be happy to include it.

6. SCAL: Working with Text

6.01 Text Options



- There are four modes for adding text to the **Cutting Mat**:
 - Type Tool: normal left to right typing of text
 - Vertical Type Tool: vertical aligned lettering
 - Type on Path Tool: text is aligned along the path of your choosing
 - Type on arch: text is arranged in a circular pattern
- To select a mode, hold down the mouse button on the **Type Tool** icon ____ on the **Tools Panel**. The screenshot below indicates where to go for further instructions on using that text mode:



6.02 Selecting a Font

6.02.1 Choosing a Font from the Font Menu Video

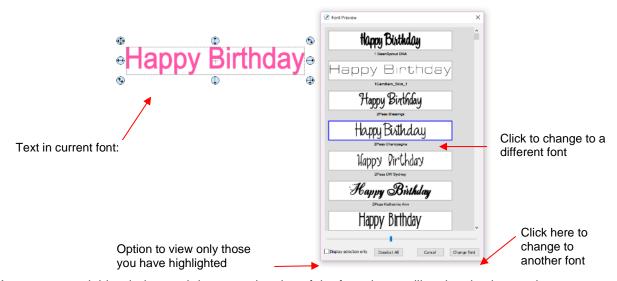


- There are three places to select an installed font:
 - Click the **Text Settings** icon and on the **Properties Panel** to open the **Text Panel**. Select from the Font drop-down menu.
 - Go to Text>Font
 - Click on the Fonts tab in the Library (refer to Section 4.03.2).
- If you are looking for a particular font in any of those three menus, type the first letter of the font name and you will be taken to the fonts that begin with that letter.

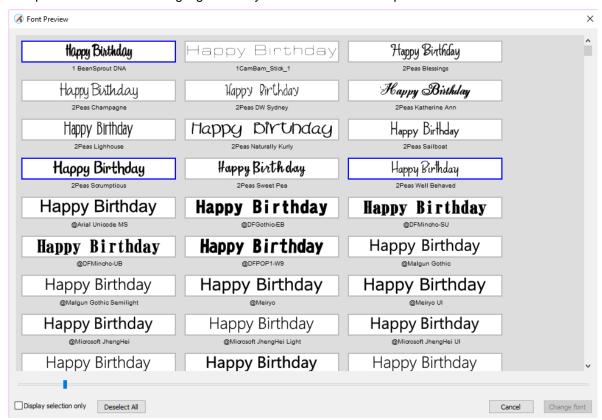
6.02.2 Choosing a Font via Font Preview Wideo



To view the text you're using in different fonts, first type out the text using the instructions in Sections 6.03 and 6.04. Then select the text and go to Text>Font Preview. There you can scroll through all of the fonts currently installed in SCAL to view others you might prefer:



- You can expand this window and decrease the size of the fonts by scrolling the size bar to view mores samples. Also, you can highlight those of interest and then click **Display selection only** to more easily decide which ones you might like to use:
 - ♦ Expand the window and highlight those you want to further compare:



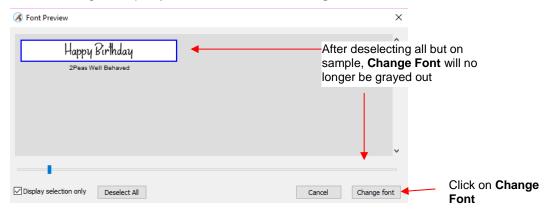
After scrolling through fonts and highlighting only those of further interest, click on **Display selected** only:



At this point, as you left click any sample, it will be removed from the display, allowing you to refine your selection:



Once you are down to a single sample, you can then click on **Change Font**:



♦ The text will now be changed to the new font:

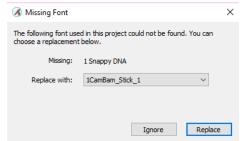


6.02.3 Temporarily Installing a Font



- If you want to load a new font that's not already installed on your computer, there are three ways:
 - ♦ Go to Text>Load Font File

- ♦ Click on the Load a Font File icon on the Text Panel
- ♦ Open the **Library**, click on the **Fonts** tab, and then click on the **Menu** icon
- Any font file with a format of .TTF, .OTF, or .OPF) can be opened and will be available until SCAL is closed.
- When you open a font file for temporary use, that font will be uninstalled upon closing SCAL. If you have saved that file without first converting the text, the next time the file is reopened, you will receive the following message:

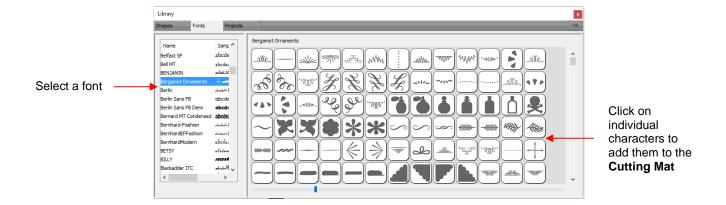


- ♦ Two options are provided:
 - Ignore: The text with the missing font will be converted to an outline (no longer editable as a text object)
 - Replace: The text will be replaced with the font shown or another font you select from the dropdown menu
- If you have no plans to edit the text, then you can avoid the message by converting text before saving the file. To do this, select the text and apply one of the following:
 - Go to Text>Convert Text to Outlines
 - Go to Path>Object to Path
 - o Right-click and select Path>Object to Path

6.03 Adding Text Options



- There are three ways to add text to the Cutting Mat:
 - ♦ Click on the **Type Tool** icon on the **Tools Panel**, click anywhere on the **Cutting Mat**, and begin typing. This is the easiest method when adding ordinary text.
 - Copy and paste text from another application, such as from Word, Excel, or from an email, onto the Cutting Mat. Before pasting, click on the Type Tool icon on the Tools Panel
 - ♦ Click on the **Fonts** tab in the **Library** and click on characters shown in the character map. This is the easiest method when using dingbat fonts:



6.04 Four Modes of Text

6.04.1 Type Tool





- Hold down the mouse button on the **Type Tool** icon on the **Type Tool** on the **Tools Panel** and select the top choice: **Type Tool**.
- Click anywhere on the **Cutting Mat** and begin typing. Note that:
 - Pressing the Enter key will move the cursor to a new line and you can continue typing
 - ♦ Clicking elsewhere on the **Cutting Mat** will allow you to begin adding new text at that location
 - ♦ When done, either press the **Esc** key or click on the **Select** icon on the **Tools Panel**

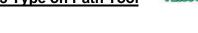
6.04.2 Vertical Type Tool





- Hold down the mouse button on the **Type Tool** icon on the **Tools Panel** and select the second choice: **Vertical Type Tool**.
- Click anywhere on the Cutting Mat and begin typing. Note that:
 - ♦ Clicking elsewhere on the **Cutting Mat** will allow you to begin adding new text at that location
 - ♦ When done, either press the **Esc** key or click on the **Select** icon on the **Tools Panel**

6.04.3 Type on Path Tool

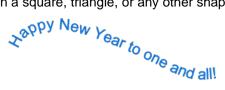




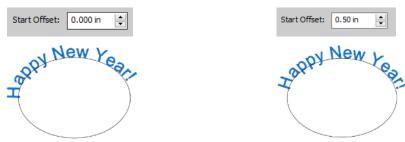




 Determine which shape you want to use for the path. In the prior screen shot, ovals, spiral and a rectangle were used. But it could have been a square, triangle, or any other shape, even a curve path:



- To use this function:
 - Add the shape to the **Cutting Mat**. **IMPORTANT:** If you want to retain the original shape so that it can be printed or cut, make a duplicate of the shape first and hide the copy.
 - ♦ Hold down the mouse button on the **Type Tool** icon on the **Tools Panel** and select the third choice: **Type on Path Tool**.
 - ♦ Click on or inside the shape and begin typing. In the **Tools Options**, a setting appears which allows you to move the start point for the text further along the path. Otherwise it will start at the leftmost side:



When done, either press the **Esc** key or click on the **Select** icon on the **Tools Panel**. Note that if you no longer need the path for your project, go to **Text>Convert Text to Outlines** and the path will be deleted.



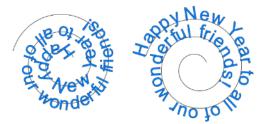
- If you want the text on the inside of the shape:
 - ♦ First apply **Path>Reverse Path** to the shape. Then type the text:



♦ Again, use **Text>Convert Text to Outlines** to delete the path:



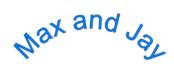
• In a similar manner, using **Reverse Path** can change how text is applied along a spiral:



♦ After applying Text>Convert Text to Outlines:



6.04.4 Type on Arch Tool



- With this function, text is typed as if it were following an imaginary circle.
- Hold down the mouse button on the **Type Tool** icon on the **Tools Panel** and select the last choice: **Type on arch.**
- Click anywhere on the Cutting Mat and begin typing. In the Tools Options, three settings will appear allowing you to customize the results:



• For example:

Decreasing the Arch Radius from 1.0 to 2.0:



Changing the **Start Angle** from 0 to 180:



Changing Text from Outside to Inside:

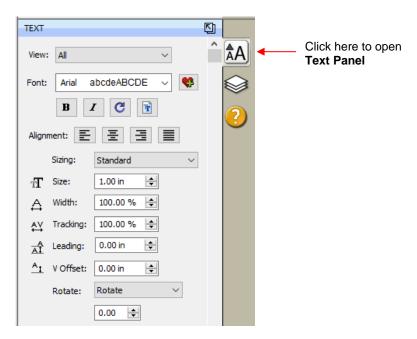


• When done, either press the **Esc** key or click on the **Select** icon on the **Tools Panel**.

6.05 Text Settings



• The **Text Panel** offers an array of settings related to the creation and editing of text. To open, click on the **Text** icon and editing of text. To open, click on the **Text** icon on the **Properties Panel**:



- To apply a change to any of these settings:
 - Type some text using the instructions in Section 8.04. Then click on the Selection Tool icon at the top of the Tools Panel.
 - With the text selected, you can now change any of these various settings and the changes will immediately be applied to that selected text.
 - If you only want to apply a change to a portion of the text, click on the **Text Tool** icon on the **Tools**Panel and drag your mouse to highlight whatever part you want to change.
- The following is a list of the settings and how to apply them:
 - View: Controls which fonts show in the menu under Font:
 - All: Displays all installed fonts plus any that have been temporarily installed during this session of SCAL
 - Favorites: Displays all fonts you have assigned as a Favorite
 - This Project: Displays all fonts currently used since starting this particular project during this session

- Font: Menu of installed fonts which can be used for new or ex text. Note that you can also add to your Favorites list by selecting a font and then clicking on the icon to the right.
- ♦ Bold and Italic
 - <u>IMPORTANT:</u> Some fonts will change significantly if the Bold option is selected. The same is true of the Italic option. Make sure these icons are not indented/blue unless you are confident you want to use either or both of them.
 - With either option highlighted, the text may not immediately reflect that option. If not, highlight the text and then try applying again.
 - Instead of using **Bold**, you can use **Effects>Shadow Layer** (refer to Section 9.05) or **Path>Offset Path** (Section 8.05).
 - o Instead of using **Italic**, you can use the **Skew** function (refer to *Section 5.07*).
- Reload is only needed if you have separately installed new fonts on your computer since opening the current SCAL session.
- ♦ **Load a Font File** is used to open a .TTF, .OTF, or .OPF font that is not already installed on your computer. Refer to *Section 6.02.3*.
- ♦ Alignment: Standard text justify options: Left Align, Center Align, and Right Align and Justified.
- Sizing: The setting determines the height of the letters in the selected text based on these options:
 - o **Standard:** A character's height is based on how the font was designed

KNK Zing Orbit

Fixed Height: All characters will be made the same height, based on the Size setting

KNK Zing Orbit

 Fixed Height Proportional: All characters will be made the same height, based on the Size setting and the width will be adjusted to maintain the original aspect ratio for that character

KNK Zi**n**g O**r**bit

- This example doesn't necessarily illustrate a typical application for the Sizing setting. Refer to Section 6.14 for examples of its usefulness.
- ♦ **Size:** Approximate height of lettering based on an ascender and descender. For example, if text is set to 1.0 inches, then the height of the word "Baby" would be ~ 1.0." However, the "B" typed by itself might only be 0.7" in height because there is no descender, such as the letter "y".
- Width: Increasing the width will widen the letters leaving the height unchanged. Note that letter spacing will not be altered, thus the letters may end up overlapping unless **Tracking** is increased, as well.
- ♦ Tracking: This is the spacing between letters. Increasing will spread letters apart while decreasing will force them closer together and can result in overlapping:

KNK Force KNK Force KNK Force

Tracking: 100% Tracking: 120% Tracking: 80%

♦ Leading: Changes the spacing between lines of text:

KNK Force KNK Force & Zing Orbit

Leading: 0 inches

Leading: 0.2 inches

V Offset: Raises or lowers a line of text or, more commonly, can be used to raise and lower individually selected letters:

KNK Force & Zing Orbit

Rotate: Rotates a line of text or can be applied to individual letters:

KNK Force & Zing Orbit

- Skew: In the same menu with **Rotate** is the **Skew** option which can also be applied to a line of text or to individual letters. There are two settings: one for X axis skew and one for Y axis skew:
 - X Axis Skew set to 30:



Y Axis Skew set to 30:



KNK Zing Orbit

6.06 Other Text Editing



- Ungroup: To split a selection of text into individual letters, apply the Ungroup function using one of the following ways:
 - ♦ Right-click and select **Ungroup** from the popup menu
 - ♦ Go to Object>Ungroup
 - ♦ Apply Ctrl+Shift+G
- Break: To break a selection of text into individual paths, apply the Break Apart function using one of the following ways:
 - ♦ Right-click and select Break Apart from the popup menu
 - ♦ Go to Object>Break Apart
 - ♦ Apply Ctrl+B
- For more information on Ungroup and Break Apart, refer to Sections 5.10.2 and 5.12.1.

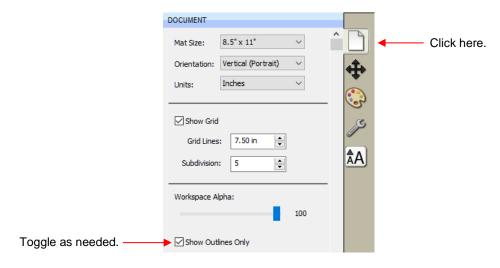
6.07 Creating a Connected Letter Title



• Using the instructions from Section 6.04.1, type the letters of your title:

Happy anniversary

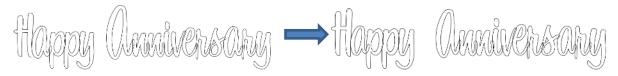
- Because you will be working with the letters individually, select the title and apply Ungroup (Section 6.06).
- With the letters split, you can select one or more and use the left and right arrow keys to change the spacing between letters, overlapping as desired. It is advisable to zoom in on the text to get a more accurate view of the actual positioning of the letters. You may also want to check the text both with and without Show Outlines Only option turned on (which can be changed on the Document Panel):



- Also, you should turn off Snap to Grid so that you can more freely move letters. This is located under View>Snap To.
- Begin overlapping the letters. It's usually advisable to move letters either by using the arrow keys on the keyboard or by using the left center icon:



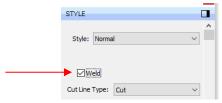
• Continue arranging letters as desired. Remember that you can customize freely to get the desired look. For example, in this font called 1 Bean Sprout DNA, the vowels tend to be a bit oversized compared to other characters in the font. Thus, the uppercase "A" can be sized smaller to better match the other letters:



 When you are satisfied with the overlap, select all of the letters and go to Path>Union. The overlap will be removed:

Happy Amiversory

Alternatively, if you do not want to make the weld permanent, you can select the shapes and mark the weld option on the Style Panel:



• To create an outline/shadow for titles and other shapes or if you need to thicken a font that turns out to be too thin for cutting, refer to Section 9.05.

6.08 Incorporating Shapes into a Title

- A quick way to incorporate a shape into a welded title is to use any of thousands of dingbat fonts available
 from the Internet for free or even check the SCAL Library for a shape. In this example, a script font is being
 used for the title and a turkey, found in the Library under the Fall folder, will be used for the shape.
- Using the steps in Section 6.04.1, create the title:

Happy Thanksgiving

• Select the title and go to **Object>Ungroup**. Then move the "Thanksgiving" part to the right to add some spacing for the turkey. In this example, other parts were also moved so that all letters in "Happy" and all letters in "Thanksgiving" overlap.

Happy Thanksgiving

In the Library, locate the turkey shape and click on it to add to the Cutting Mat. Resize and arrange to
overlap with the lettering:



 Go to Path>Union or press Ctrl+Shift+U to remove the overlap or mark the Weld option on the Style Panel:



 Note that dingbat fonts and Library shapes are not the only shapes that can be welded to letters. Any shape imported or created within SCAL can be used!

6.09 Welding Titles in Imaginative Ways

• Some fonts simply do not work well with the traditional overlapping of the letters to be welded into one piece for cutting. For example, let's take an extreme case with Arial font and the name, "Billy". Note what happens when you overlap the letters in this particular font:



Most crafters will start looking for a different font... one with ligatures (extenders) that easily connect the
letters to one another. However, many fonts with ligatures are script fonts and may not convey the desired
look. Instead, look for objects that can be used to connect the letters. A basic thin rectangle is an easy
solution. Just align it along the bottom of the letters and weld:



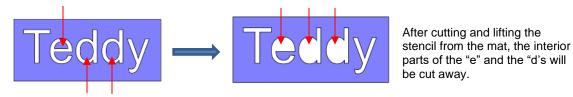
However, the objects to use as a base do not have to be so basic. Look for objects that will tie into a theme.
 Here are just a few examples:



6.10 Stenciling Letters



• When creating a stencil, you keep the "waste" or "negative" of a cut. When using regular fonts, such as Arial, some of the letters, such as a "B", "a", and "e", will not work because they have interior paths called child shapes. Those child shapes are not connected to the waste portion of the material and will be lost from the stencil as shown below. The red arrows indicate the child shapes inside parent shapes for the letters "e" and "d":

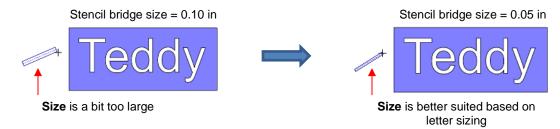


- To avoid this, a procedure called stenciling can be used to connect the area outside of the letters to the child shapes, essentially eliminating them. There is a feature on the **Tools Panel** called the **Stencil Bridge** which can be used to connect the interior parts to the surrounding area.
- Before using this function, select the text and go to **Object>Ungroup**. Failure to do this can cause distortion of other letters as the stencil function is applied. Then click on the **Stencil Bridge** icon

Zoom in close on the lettering so that you'll be able to see exactly where you need to connect. Click on the
 Stencil Bridge icon and, in the Tools Options at the top, a setting for the width or thickness of the bridge
 can be set:

Stendil bridge size: 0.10 Enter the **Size** (thickness) to use

• The **Size** you enter will normally relate to the height and style of the lettering you are stenciling. In this example, the name "Teddy" was typed at a height of ~1 inch. The **Stencil bridge size** is set at 0.10, but it could be smaller or larger depending on your personal preference. Before applying, you can drag the mouse in an empty area of the screen to see the size that will be used and adjust accordingly:



Before applying, hide the outside rectangle, so that it's not affected. You can now drag the mouse across a
letter to create a bridge. Hold down the **Shift** key, while dragging, and the bridge will be either perfectly
vertical or perfectly horizontal:



Repeat the process with the other letters containing child shapes:



• Note that just one part of the letter could have been bridged instead of both the top and the bottom:



Unhide the rectangle and the stencil is ready to cut:



Completed stencil

6.11 Open Path Fonts (OPF)

Besides TTF and OTF, a third type of font, Open Path Font (.OPF) can also be opened in SCAL. This font
consists of single lines/curves only. Here's a comparison to help you understand the difference:





TTF version

OPF version of the same font

 These fonts are useful when using a pen or engraving tool in your cutter or for designing single line rhinestone titles:



- Currently, this font type only works in a few applications like SCAL and does not install into Windows or on a Mac O/S for use in programs such as Word.
- To try out using Open Path Fonts, there are some free ones to download here:

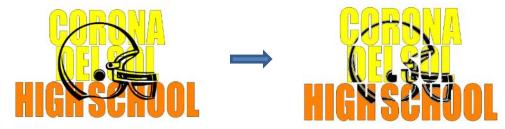
http://www.iloveknk.com/Support/Software/Open-Path-Fonts/

- Because these are open path, they may not appear on the Cutting Mat when you first add them. You will need to select a Stroke color on the Fill & Stroke Panel. Refer to Section 5.15.
- You can purchase Open Path Fonts (also called Thin Fonts) from www.letteringdelights.com and from www.letteringdelights.com and from www.letteringdelights.com and from www.letteringdelights.com and from www.netinefonts.com to use in SCAL. Note that these also come with the TTF equivalents, which are not actual single lines and curves, but are still very thin.

6.12 Knockout



• The **Knockout** function involves overlaying one image on top of another and then merging the two so that the overlap between the two images is, essentially, cut out and replaced with that part of the top image. This is a popular design technique for HTV (heat transfer vinyl) applications so a typical high school design is used as an example:



To open the Knockout function window, select two or more shapes and go to Effects>Knockout:



The Gap will create an offset between the top image and the bottom image. This is not only pleasing to the
eye but also makes alignment of two layers of HTV easier to manage. Here's an example showing how the
gap affects the overall appearance:





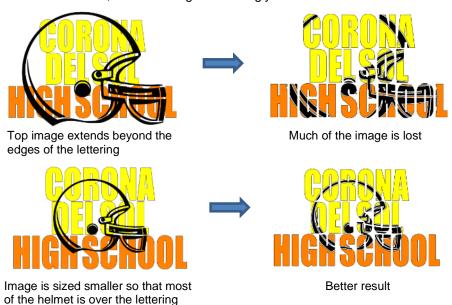
Knockout with 0 Gap

Knockout with 0.05" Gap

- <u>IMPORTANT!</u> When you click on **Preview**, it will take a few seconds or longer for the image to update. Be patient. Also, in cases where you have multiple images on top, such as the hearts in the prior screenshot, it is recommended that those shapes be joined first using **Object>Merge**.
- When preparing text, you want as little "white space" as possible. Thus, here are some guidelines:
 - ♦ Select a thick dark font. In the examples in this section, *Impact* was used.
 - ♦ After creating the text, move rows of letters together until they almost touch.
 - ♦ Reduce spacing between words, but make sure the text is still readable.
 - ♦ The text does not need to be all one shape. Thus, you can recolor parts of it if you wish.



 When aligning the top image over the lettering, note that anything extending outside of the image or over white areas will be deleted. So, size the image accordingly:



Note that the Knockout function isn't just for text. It can be used on any vector shapes. Because it is so
popular with lettering, its presentation in this chapter seemed appropriate.

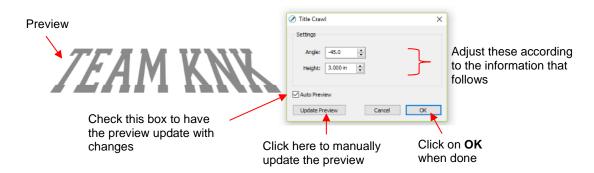
6.13 Title Crawl



• Title Crawl distorts text (or any shape) so that it appears to be stretching towards you or away from you:

TEAM KNK -> /ZAM KWK TEAM KWK

• To apply Title Crawl, select the text and go to Effects>Title Crawl. The following window opens:



Angle: As the Angle setting is increased, the top of the title will rotate towards you. Decreasing the Angle setting will rotate away:



 Angle: -45
 Angle: -25
 Angle: -145

 Height: 1.0
 Height: 1.0
 Height: 1.0

Height: This setting works in an opposite manner to how one would expect. Increasing Height will make the text less rotated whereas decreasing it will make the text more rotated:



Height: 4.0

 Multiple lines of text can have Title Crawl applied to create the famous Star Wars "in a galaxy far far away" effect:

ANK USA selected

designers to present

three new projects every

week to inspire and educate

customers on using their KNK

Cutters. Visit www.teamknk.com

6.14 Applications Using the Sizing Function

Height: 1.0

• In Section 6.05, the **Sizing** setting on the **Text Panel** was briefly explained. The following examples better illustrate how you might be using this setting in your designing.

Height: 2.0

6.14.1 Sizing Lettering for Particular Fonts



- One of my favorite free fonts is called 1 Bean Sprout DNA. The only problem with this font is that some of its
 characters are unusually large. For years, I've simply manually resized the letters that were too high relative
 to others in that font. With the
- The word "Great!" is typed using this font:



 I recommend making a copy of the text and then applying both the Fixed Height option and the Fixed Height Proportional option for comparison:





Fixed Height

Fixed Height Proportional

 Note that the letters do not necessarily end up aligned along the bottom. To achieve that, apply Object>Ungroup, reselect all of the letters, and then select any of the Vertical Align icons





Fixed Height

Fixed Height Proportional

You now the option to choose whichever result suits your needs.

6.14.2 Sizing Letters for Welding Inside Rectangles



A second application for the Sizing setting would be to even out upper-case letters when applying
 Path>Front Minus Back. In the next example, the letters ABC have been typed out using Cooper Black
 font. Notice how the letter B is shorter than the A and C. When applying Path>Front Minus Back, the result
 would be:



Letters typed and rectangle added

Path>Front Minus Back applied

The letters are selected and Fixed Height Proportional is applied. The letters are then resized to fit the
rectangle and the Path>Font Minus Back can be applied with the desired results:



6.15 Other Text Effects

SCAL offers many other design functions to customize text for your projects. Refer to Sections 9.14 - 9.19 for more ideas.

7. SCAL: Tracing and Drawing

7.01 Raster versus Vector



- All graphics are either raster or vector and there is no third type. While you can often tell by the file format, even that isn't always a good way to know for certain. For example, a PDF file can be made from either raster images or vector images and some PDF's will contain both types.
- You may not be able to tell, at first glance, whether an image is a raster or a vector. For example, this screen shot shows the same image in both formats:



Raster Vector

Most everyone today has a digital camera and, at the very least, has heard the term "mega-pixel." A pixel is
a square that is black, white, or colored. Photographs are made up of millions of these pixels to create the
image you see. If you zoom in close enough on any raster image, you can see these tiny pixels. But when
you zoom in close on the same area in the vector version, you will instead see lines and curves, not
squares/pixels:



 A vector image isn't made up of pixels. Instead, a vector is like a connect-the-dot puzzle in which little dots (called nodes or points) are connected to each another with paths (either straight lines or curves). Digital die cutters need those paths so that they can communicate to the cutter where the blade should travel in order to cut what you want... kind of like a road map. In SCAL, the nodes look like this:



As mentioned earlier, you can often tell whether a file is a raster or a vector based on the file format. Here
are some guidelines:

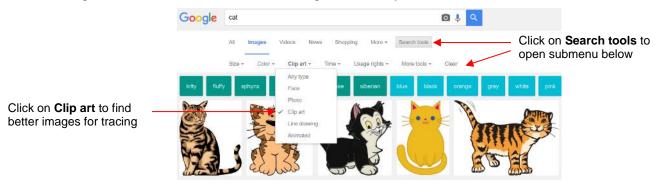
Raster: BMP, JPG, GIF, PNG Vector: AI, EPS, DXF, SVG Either: PDF, sometimes EPS & WMF

To convert a raster into a vector, SCAL offers both an automatic and a manual trace function. Because the automatic Trace feature in SCAL is so fast and powerful, it is always worth trying it first. The only situation in which it may not be able to provide the results you need are (1) the image is very tiny or has a very poor resolution or (2) the image has poor contrast between one part and the next. For example, imagine a brown dog lying on brown carpet. How would the software know what part is the dog and what part is the carpet? Thus, you may need to manually trace some images, so both functions are covered, in detail, in this chapter.

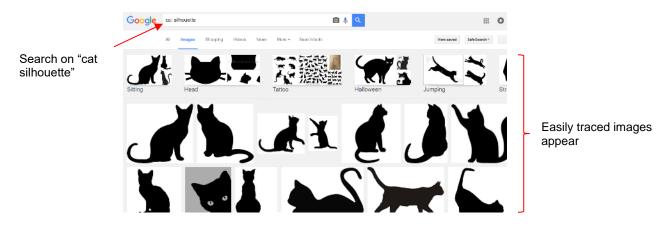
7.02 Finding Easy Images to Trace



- What qualifies as an easy image? The obvious answer is "an image which gives you the results you want!" But those who are new to the vectorizing process do not always realize which images are going to be easy and which ones are not. Note that you shouldn't be discouraged from trying to trace anything. But when you are learning the process, working with easier images will make the learning stage go smoother. So here are a few guidelines in selecting images:
 - ♦ Black and white images are easier to vectorize than colored images
 - ♦ Colored images with flat colors are easier to trace than those with variegated colors
 - ♦ Large, high resolution images are easier to trace than tiny, low resolution images
 - Images with tiny details will be more difficult to trace than simpler images with fewer details
 - Photographs are usually the most difficult to trace, especially when some of the colors blend (such as the brown dog on the brown carpet, mentioned earlier).
- For your own personal use, there are many images that can be found on the Internet. Use <u>Google Images</u> to search and find images based on keywords. Google Images also has filters at the top of the window (under **Search Tools**) to limit your search to black and white, as well as to clipart or line drawings. For example, after searching on the word cat, one can limit the images in this way:



Adding the word "Silhouette" in a search, will also produce images that are typically very easy to auto-trace:



- When you find an image you want to trace, click on it first to bring up a larger version. Then right-click and select Save image as from the popup menu. Note: If you use a browser other than Chrome, the popup menu may have slightly different wording for saving a file.
- <u>IMPORTANT!</u> Before tracing any Internet images, be sure to check the *Terms of Use* at the site hosting the image.

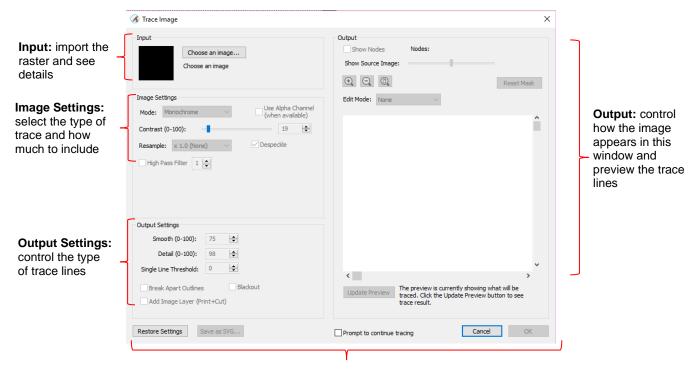
7.03 Trace Function

Images used in this tutorial can be downloaded at: http://iloveknk.com/Images/

7.03.1 Trace Settings



- To begin the tracing process, open the Trace Image window using one of the following ways:
 - Click on the **Trace** icon on the **Toolbar**
 - ♦ Go to File>Trace Image
 - ♦ Press Ctrl+Shift+T
- There are five sections to the **Trace Image** window: **Input**, **Image Settings**, **Output Settings**, **Output**, and then the bottom bar. Note the location of each section and its main purpose. More details about each section follows:



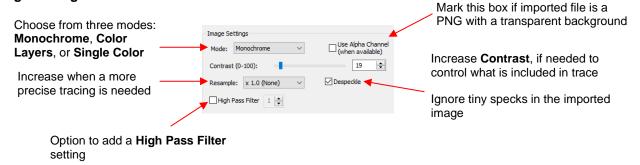
Additional "bottom of the screen" settings

Input

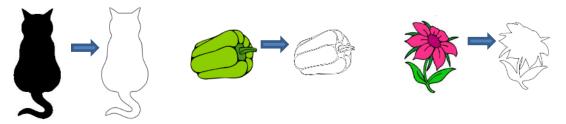


- ♦ Click on **Choose an image** and browse to locate the raster file (BMP, GIF, JPG, or PNG). Upon opening, a thumbnail appears, along with the name of the file and the size in pixels.
- Alternatively, before opening the Trace Image window, you can import the raster file using File>Place Image or even copy/paste from an outside source. Then, with the image selected, open the Trace Image window and this image will be loaded and ready for changes to trace settings.

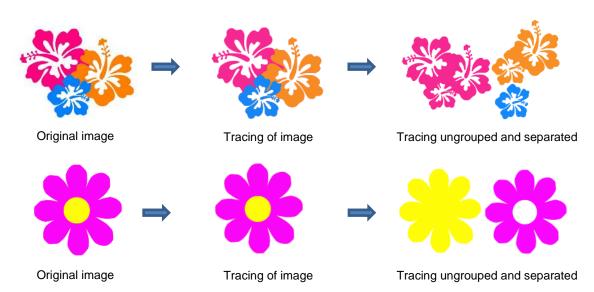
Image Settings



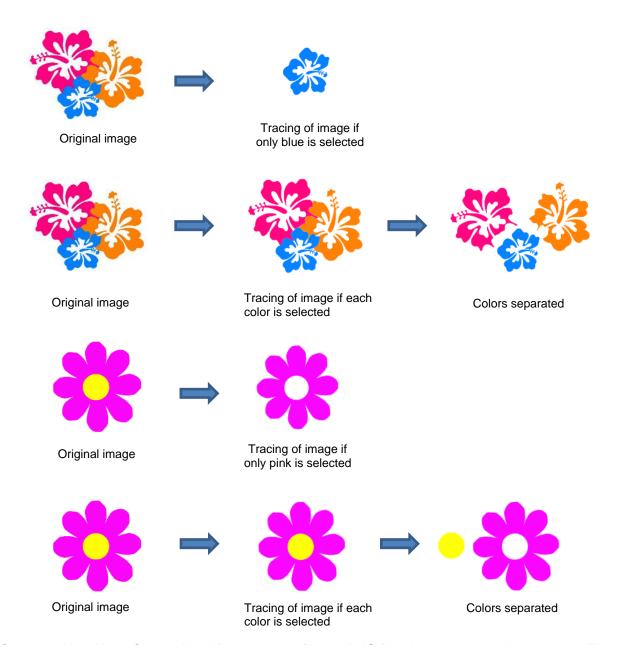
- ♦ The Mode you choose is determined by the desired outcome / project application, as follows:
 - Monochrome: choose this mode when you only need a black and white trace of the image. (Note: Sections 7.03.2 7.03.7 cover Monochrome examples in more detail.)



Color Layers: choose this mode for multi-color images where you need separate colors, such as for a paper piecing or layered vinyl project and you want under-layers to use for alignment. Two examples follow which illustrate what is produced when Color Layers is chosen. (Note: Section 7.03.9 covers Color Layers in more detail.)



Single Color: choose this mode when you want to single out a certain color to be traced or when the multi-color image needs to have colors traced exactly as displayed. This would be a typical choice for an HTV application where you do not want layers of material to overlap. The same examples are used again to demonstrate the difference. (Note: Section 7.03.10 covers Single Color in more detail.)



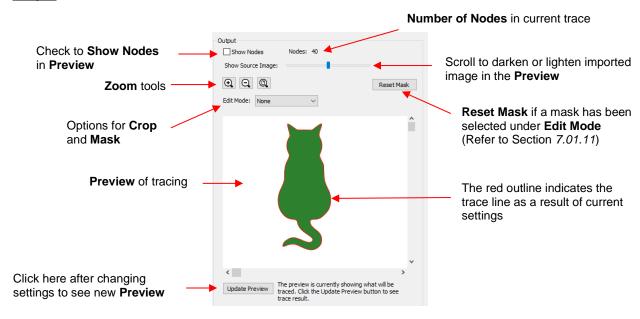
- Check the **Use Alpha Channel** box if the imported file is a PNG file with a transparent background. The transparent background is easily identified by the trace program requiring very little adjustment to other settings. Refer to Section 7.03.6.
- Contrast controls the level of color differentiation included in the trace: lower will include less, higher will include more. Refer to Section 7.03.2.
- Resample: choose x 1.0, x 2.0, x 3.0, or x 4.0 to increase the pixels in the image which typically provides a more precise tracing of the image. More nodes result but increasing the setting can be especially important in some PNC (print and cut) applications where the cut line needs to precisely follow the printed image. Refer to Sections 7.03.7 and 7.03.8.
- ♦ **Despeckle**: mark this option to eliminate the tracing of tiny shapes that are not needed for cutting. Refer to *Section 7.03.4.*
- High Pass Filter: used to improve the tracing of photographs and other challenging images. Refer to Section 7.03.12

Output Settings

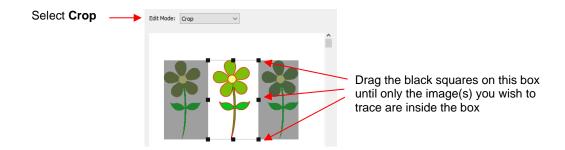


- ♦ **Smooth:** Adjust according to type of image. For example, decrease (make sharper) if tracing a shape with sharp corners like an envelope template. Increase (make smoother) if tracing a shape with soft curves, like a teddy bear. Refer to *Section 7.03.3.*
- Detail: If tiny undesired shapes appear, decrease to filter those shapes out. Refer to Section 7.03.4.
- ♦ **Single Line Threshold:** When tracing coloring book images (image with black outlines), use to convert those double lines to single lines. Refer to *Section 7.03.5*
- Break Apart Outlines: Checking the Break Apart Outlines box will save a step if different parts of the tracing need to be edited separately or placed on separate layers.
- ♦ **Blackout:** Check this box so that internal shapes (child shapes) are not included in the tracing. Refer to *Section 7.03.5.*
- Add Image Layer: Check this box if a copy of the imported image will be needed, such as for a print and cut application. The result will be two layers grouped: one will be labeled "Print" and the other layer will be labeled "Cut." Refer to Section 7.03.7.

Output



- Most of the settings in the **Output** section do not affect the final result, with the exception of the **Crop** and **Mask** functions in the **Edit Mode** menu. The other settings only affect the **Preview** so adjust as desired.
- ♦ **Edit Mode: Crop** When you select the **Crop** option, a rectangle will appear that can be resized to fit around the desired part of the image. This is useful when there are multiple images in a raster file and you only want to trace some of them. For example:



♦ Edit Mode: Draw Mask This option allows you to add or subtract parts of the image you want to include or exclude from the trace. Refer to Section 7.03.11 for details on how to use this function.

• Bottom of the Screen Settings

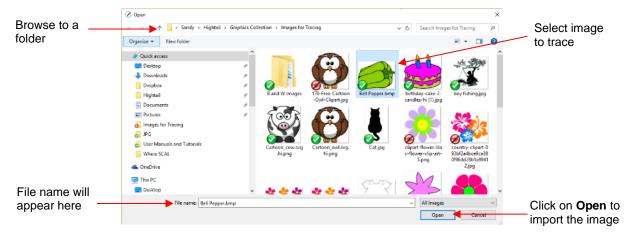


- ♦ **Restore Settings:** Click this button to change settings to the values that were in place when you entered the **Trace Image** window. To restore to original default SCAL settings, close and reopen SCAL.
- Save as SVG: Click this button to export the current tracing as an SVG file.
- Prompt to Continue Tracing: Mark this option if you want to remain in the Trace Image window after clicking on OK so that other trace settings can be used/tested with the same image or another image imported.

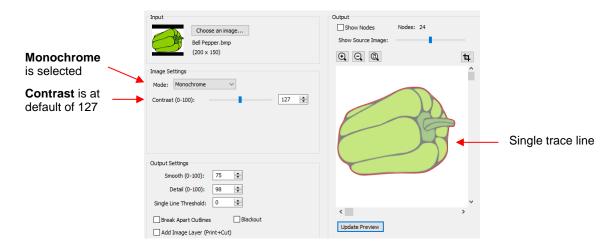
7.03.2 Monochrome Trace of a Colored Image: Effects of Contrast



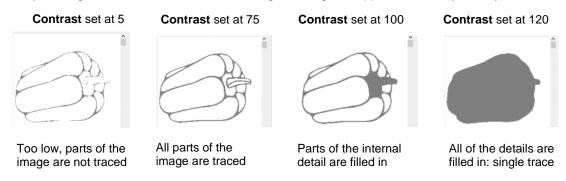
• Start by clicking on **Choose an image** in the **Input** section and then browse to locate the raster file you wish to trace:



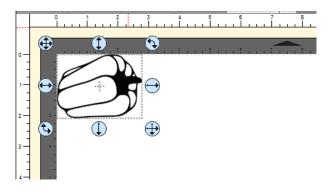
• In this example, a bell pepper image is imported for tracing and the **Preview** indicates a single trace path around the image:



• Let's experiment with the **Contrast** setting to fully understand how it works on an image of this type. Note that as you drag the **Contrast** scroll bar, the original image disappears so that you only see the trace lines:



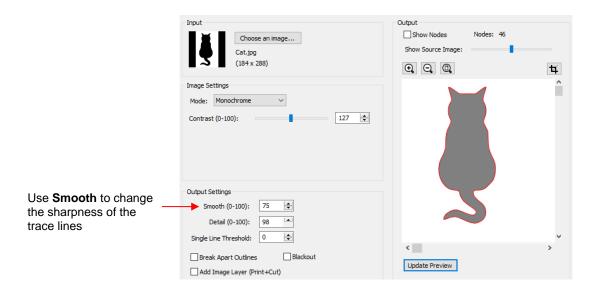
 Thus, for any given image, scroll the Contrast setting to see the effects and determine which version best suits your project needs. Once satisfied, click on OK and the image will appear in the top left corner of the Cutting Mat, ready to be resized and cut out:



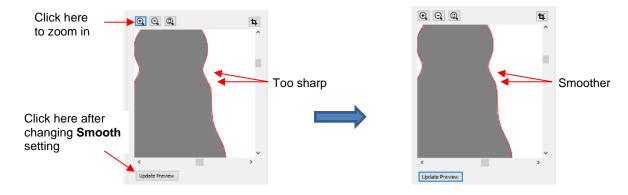
7.03.3 Monochrome Trace of a Silhouette Image: Effects of Smooth



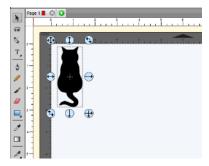
As mentioned at the end of Section 7.02, silhouette images typically offer an easy trace. In this next
example, a silhouette cat image is imported into the Trace Image window. Because this is a silhouette
image, Monochrome mode is chosen and the image appears to have traced very well. However, upon a
closer look at the right side of the cat, it appears that the neck area is a bit sharp:



To soften the outline of the cat, zoom in on that area and then increase the Smooth setting until a desired
result is obtained. In the following screenshot, the Smooth setting is increased from 75 to 85. Remember to
click on Update Preview after every adjustment to settings:



• After clicking on **OK**, the cat shape appears on the **Cutting Mat** and is ready to be sized and cut:



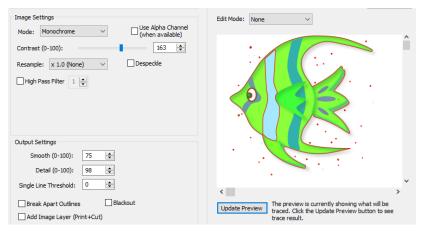
7.03.4 Monochrome Trace of a Detailed Image: Effects of Despeckle and Detail



- Either the **Despeckle** option or the **Detail** setting can be used to filter out small shapes. Sometimes these shapes are just random pixels that show up from, say, a dirty scanner bed. Other times they are shapes that make up the design but will be too small to cut and are not needed.
- Before showing examples, note that there will be times when some small shapes might be needed but not all of them. In those situations, it's best to include them and then they can be edited out using other tools in SCAL.

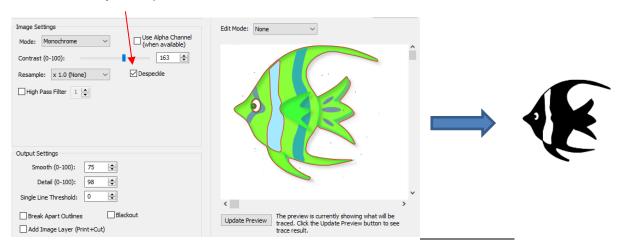
Despeckle

• Since **Despeckle** is simply an on/off option, it makes sense to try it first when you see a lot of tiny unwanted shapes being included in the trace. For example, with the following clipart image of an angel fish, tiny specks surround the image in the **Preview**:



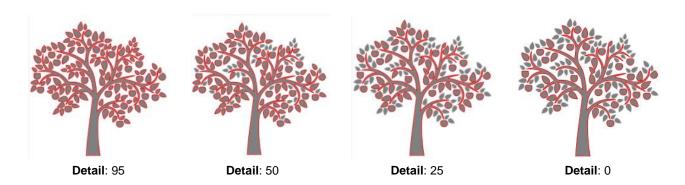
Marking the option for **Despeckle** and clicking on **Update Preview**, removes the specks and the image is ready to import:

Check the **Despeckle** option



Detail

- The Detail setting allows one to control the size of the small shapes that are eliminated.
 - ♦ The following tree image is imported into the **Trace Image** window. You have decided that not all of the leaves are needed. The **Detail** setting can be lowered to filter out some of the smaller ones:



- Even with **Detail** set at 0, there are still shapes of a certain size in that particular image that will be included in the trace. Again, there are editing tools that can be used in case more of the small shapes need to be removed. Refer to *Section 8.06*.
- Note that if **Despeckle** had been applied to the tree image, instead of deleting the smaller shapes, it would have included them in the trace:



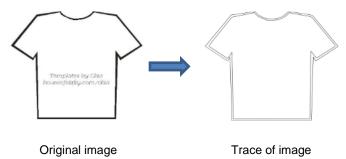
Despeckle: Off Despeckle: On

♦ This result indicates that when the small shapes are extremely close to a large shape, they will become part of that larger shape instead of being filtered out.

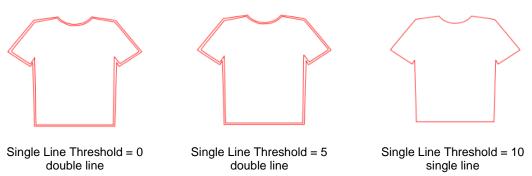
7.03.5 Monochrome Trace: Single Line Threshold and Blackout



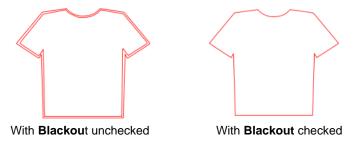
• The **Single Line Threshold** setting is useful when the imported image had a black border around it and you do not want a double line trace. For example, if the following T-shirt image is traced using default settings, two trace lines result: one line is following the outside of the black border while the other line is following the inside of the black border:



• To have only one trace line, increase the **Single Line Threshold** setting until there is only a single line showing in the **Preview** window:



Because the T-shirt image is a simple closed shape, the **Blackout** option could have been used instead of **Single Line Threshold**:



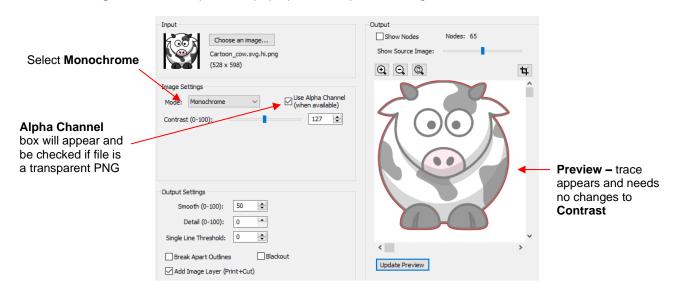
However, if the T-shirt had internal details, such as a pocket, then **Blackout** could not be used as the entire pocket would have been ignored. In this situation, **Single Line Threshold** is the better choice:



7.03.6 Monochrome Trace: PNG Files and the Alpha Channel Option



• PNG files with a transparent background are the easiest files to trace because the software can readily identify where the invisible background starts and ends. Furthermore, when you load a PNG file into the **Trace Image** window, an option will pop up if a transparent background is identified:

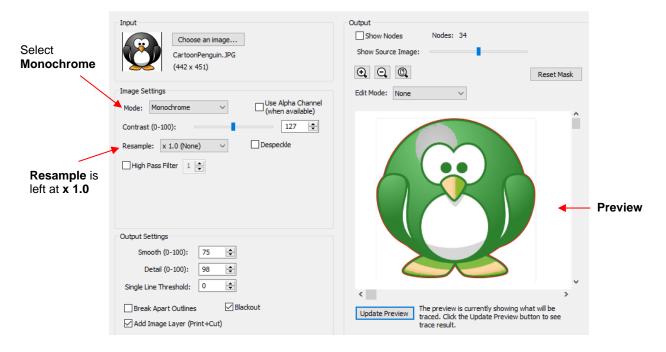


- Note that it wasn't necessary to adjust the Contrast setting because of the transparent background. This
 will not always be the case if there are internal cut lines that are needed. But in a case where just an outside
 trace is required, then leaving Contrast at the default of 127 will usually work.
 - ♦ Contrast: It shouldn't be necessary to adjust this setting because of the transparent background
 - ♦ **Smooth:** In some cases, it might be necessary to decrease **Smooth** to get a tighter fit for a print and cut application. Alternatively, you can also create an **Inset** after the trace, when needed. Refer to the **Inset Offset** option in *Section 8.05*.

7.03.7 Monochrome Trace for a Print and Cut Application: Effect of Resample



- In many print and cut applications, a raster image is imported with the intention of printing that image and then cutting precisely along the edges of that image. For this reason, it's very important to get as accurate of a trace as possible.
- The **Resample** setting multiplies the number of pixels in the image allowing a more precise scan of the border between the image and the background color. The following image is imported and traced with the default of **x 1.0** left as the **Resample** setting:



- Before clicking on **OK**, note two settings that have also been marked:
 - Blackout: apply if there are internal cut lines that are not needed. In this example, only the outside of the penguin needs to be traced. Thus, applying Blackout will remove the internal cut lines showing in the Preview:

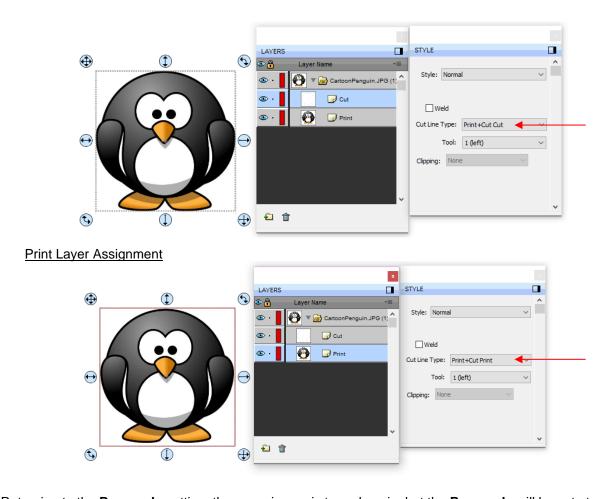


Preview of trace with **Blackout** not checked. Note the internal red lines that would be cut.

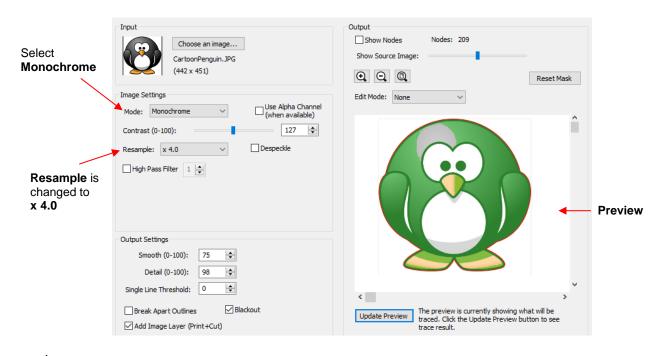


Preview of trace after **Blackout** is checked. The internal red cut lines are removed.

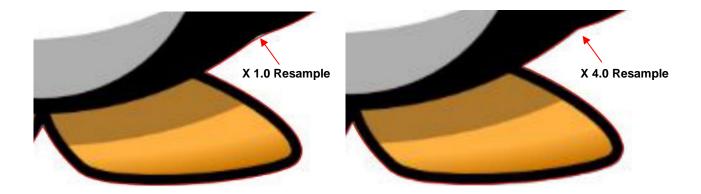
Add Image Layer (Print + Cut): Mark this box so that the original image is also imported onto the Cutting Mat. Note that if you check the Style Panel settings on each layer, one will be assigned as Print + Cut Cut (layer can only be cut, not printed) and the other will be assigned as Print + Cut Print (layer can only be printed, not cut). Click on OK and the following layers appear:



Returning to the Resample setting, the same image is traced again, but the Resample will be set at a
maximum value of x4:



If you compare the Preview in both cases, there doesn't appear to be a difference in the trace. However, if
you select the Print + Cut Cut layer on the Layer Panel and change the Stroke to a bright color and then
zoom in closely, you can clearly see places where the x 4.0 Resample resulted in a tighter fit:



• In Section 7.03.3, it was shown how the **Smooth** setting affects the trace line. This setting can also be tested on PNC tracings as a way of getting a better fit, by decreasing the value. Alternatively, you can also create an **Inset** after the trace, if needed, to create a path that will cut just inside the image. Refer to the **Inset Offset** option in Section 8.05.

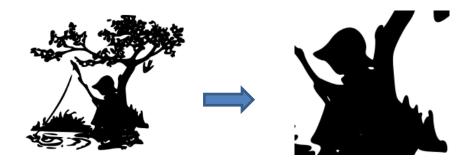
7.03.8 Resample Versus Smooth and the High Pass Filter



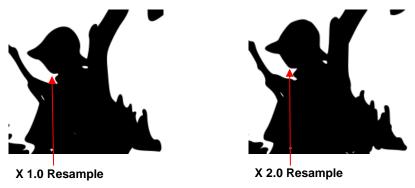
- In many respects, the **Resample** setting appears to have the same effect as the **Smooth** setting. However, the **Resample** is applied to the imported raster image ahead of tracing, while the **Smooth** setting is applied to the actual trace lines.
- While there is no definite way of knowing which setting to use in any given tracing, keep in mind the following:
 - ♦ The purpose of **Resample** is to help the tracing algorithm "see" more pixels and provide a tighter, more precise trace.
 - The purpose of the **Smooth** setting is to make the trace less angular or more angular. Thus, the **Smooth** setting would probably be set high when tracing something like a stuffed toy but set very low when tracing something like a box pattern with lots of right angles.
- In general, you'll just need to test them to see which one is better or if applying both is the best option.
- In the example below, it will be shown that Resample improves the accuracy of the trace over Smooth.



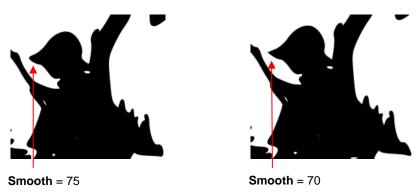
♦ Using a **Resample** of **x 1.0** and other settings set (which will again be used when **Smooth** is tested), the trace results in the following. Since an important focal point would be on the boy's face and hat, note that the resulting trace isn't as sharp as one might want:



♦ By increasing the **Resample** to **x 2.0**, the shape of the hat and the face become closer to the original image:



On the other hand, if one leaves the **Resample** at **x 1.0** and, instead, decreases **Smooth** from 75 to 70, the hat becomes too pointed/angular without improving the shape of the face:



- ♦ Thus, in this particular example, increasing the **Resample** had a more desirable outcome than decreasing **Smooth**.
- Another setting, called the **High Pass Filter**, can even further sharpen a tracing. When it was applied in this same example, note the remarkable improvement in detail:



- ♦ Based on my initial experience, there are two downsides to using this setting:
 - o Getting the optimum setting in combination with the Resample and Contrast settings, is tricky

- After applying and getting the trace onto the Cutting Mat, you'll need to apply Object>Break Apart
 and eliminate some unwanted paths. Alternatively, you can use the Draw Mask option to edit while
 still in the Trace Image window. Refer to Section 7.03.11.
- ♦ For more details on the **High Pass Filter**, refer to *Section 7.03.12*.

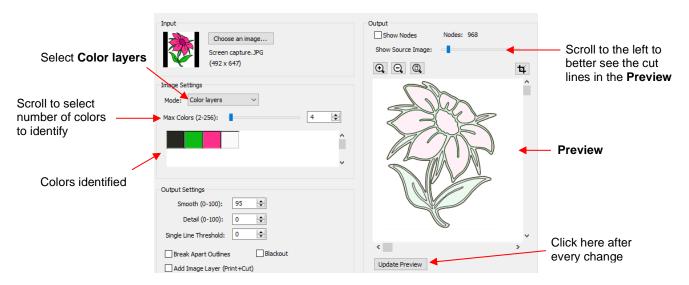
7.03.9 Color Layers Trace



• As mentioned in Section 7.03.1, Color Layers might be a good mode to choose for a paper piecing or layered vinyl project if you want under-layers present. In this section, a flower that has two shades of pink and two shades of green is chosen:



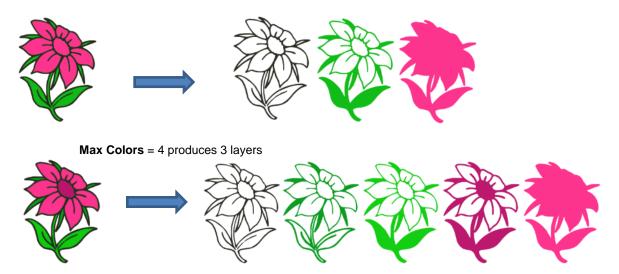
After loading the image and then selecting Color layers, the window will update to show new settings:



- The **Max Colors** setting shows the current number of identified colors. Below that are icons of these colors. Note that white (or whatever has been used for the background color of the graphic, will also be included in the count. If you do not see those color samples, click on **Color layers** a second time.
- Depending on the image and what you want in your final trace, the Max Colors can be increased or decreased. Because this image has two shades of pink and two shades of green, those can be added to the count:

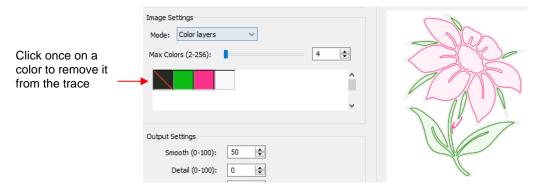


After accepting OK in both cases, the layers are ungrouped and compared:



Max Colors = 6 produces 5 layers

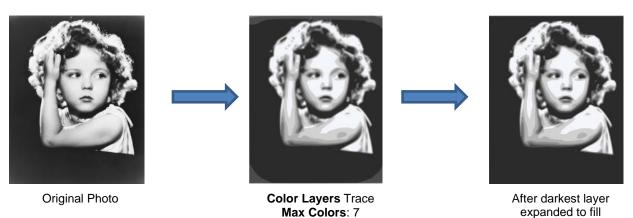
 You can also turn off colors by clicking on them. For example, if you do now want the black background traced:



• The result is this:



 A useful application for the Color Layers trace option is converting a photo (or another image) into a contoured cut project. Thanks to Leslie Merriett for sharing this on the KNK & Zing Users group:



background

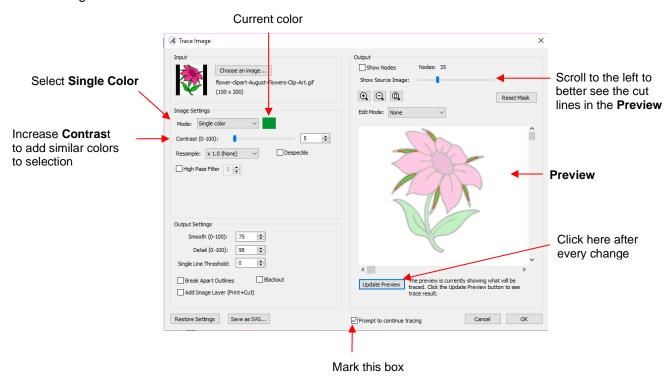


After cutting and assembling

7.03.10 Single Color Trace



- With the **Single Color** option, each desired color is selected and traced individually. The advantage is that only the visible part of each color is traced. The disadvantage is that it takes a bit more effort.
- Again, the same flower image that was used in the prior section will be opened into the Trace Image
 window. When Single Color is selected from the drop-down menu, the window will update to show new
 settings:



- Mark the option for **Prompt to continue tracing.** After you import each color to the **Cutting Mat**, the **Trace Image** window can be kept open to trace the next color.
- In the screenshot, the initial color identified was a shade of green. In the **Preview**, you can see how many parts of the flower were included as being in the range of that shade.
- If you want to add more of the green parts of the flower, then increase the Contrast. As you hold down the
 left mouse button and scroll, the image will turn gray so that you can more clearly see what is being added.
 - With a **Contrast** of 26, the outline of the flower stem and leaf appear:



♦ With a **Contrast** of 41, the leaves and stem fill:



• Once you are satisfied, click on **OK** and you will be asked if you wish to continue tracing. Answer **Yes**:



• Click on the color box next to **Single Color.** A message will pop up indicating you are to click on another color on the **Preview:**



 One of the petals is clicked and the color box turns to that color. The Preview shows how much of the image is now included at the current Contrast of 5:



• The process is then repeated whereby the **Contrast** is increased. At a value of 30 more of the same petals are filled out, thus it is recommended to always tweak the **Contrast** some:



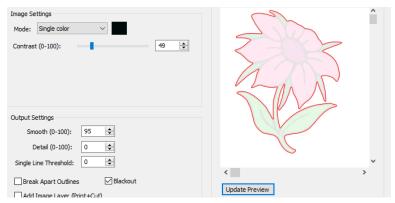
• If the **Contrast** is increased even higher, the center part of the flower gets added. Just as in the case of using **Color Layers**, this is optional.



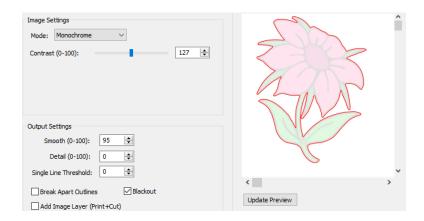
• After deciding on the **Contrast** for pink, click on **OK.** Now, let's assume that you did the petals and center in two parts and you are now at this point:



- You now have several options for completing the trace which involves adding a final outline/shadow layer to the flower:
 - ♦ Continue to use **Single Color**, click on the part of the image that is black, mark the **Blackout** option:



♦ Switch to **Monochrome** mode, mark the **Blackout** option:



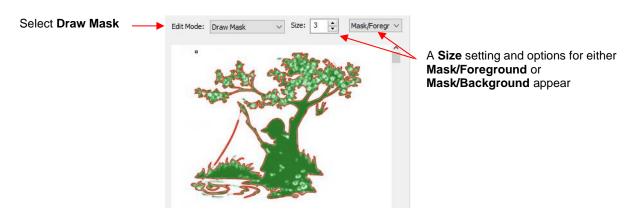
- Forgo using the **Trace** window. Select the layers traced so far and use the **Shadow Layer** function to add a black outline. Details of this procedure are covered in *Section 9.05*.
- The final results, using the three options, are virtually identical:



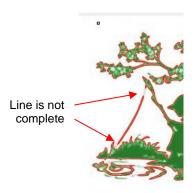
7.03.11 Draw Mask Function



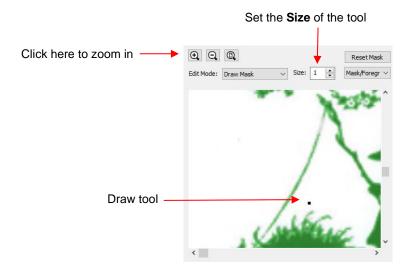
- In the **Output** section of the **Trace Image** window, under **Edit Mode** is a **Draw Mask** option which can be used to erase or add to a trace. With some images, finding the trace optimum settings can be tricky. You'll end up with some parts not quite traced and, perhaps, other parts not needed. This function allows you to "complete the task."
- When **Draw Mask** is selected, another option menu appears:



• **Mask/Foreground:** This option allows you to freely draw shapes to be added to the trace. For example, in the prior screenshot, you'll observe that the fishing pole line is not completely traced:



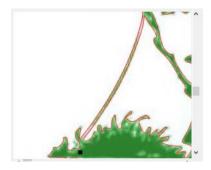
♦ Zoom in using the **Zoom In** icon and change the **Size** setting until the circle ~ matches the size of the fishing line. In this instance, the minimum of 1 will work best because the fishing line is so thin:



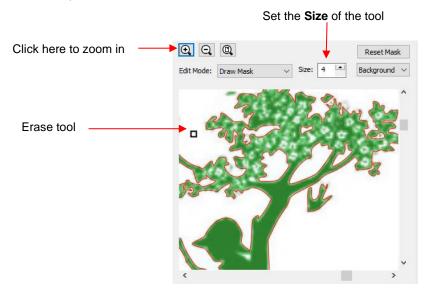
Drag the mouse along the image where the fishing line wasn't trace. A pale green path appears:



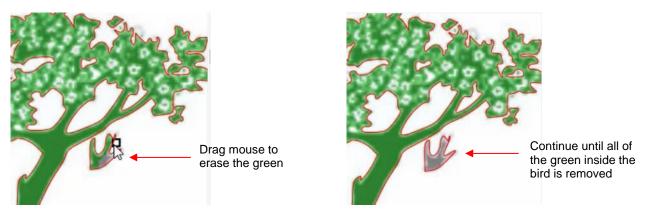
Click on **Update Preview**. The added paths will be automatically welded to the part of the fishing line that was traced:



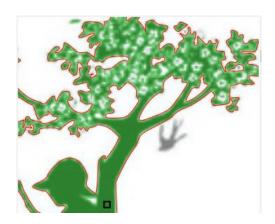
- Background: This option allows you to erase anything that's not wanted in the current tracing. For
 example, the bird just to the right of the tree, can be removed.
 - ♦ As before, zoom in and set a **Size** for the tool:



Drag the mouse across the image of the bird and the green shading indicating a traced image will begin to be erased. Continue until there's no longer any green:



♦ Click on **Update Preview** and the red outline and green fill of the bird is now gone:



• Click on **OK** and the resulting changes from both masks have been applied:



7.03.12 High Pass Filter Application



• The **High Pass Filter** setting is used to improve the tracing of photographs and other challenging images. The setting ranges from 0 to 20.

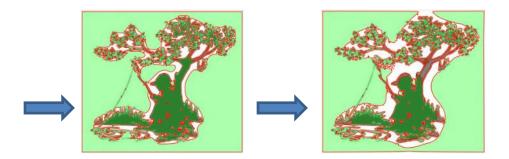
Improved Detail

In the following example, the first image is with **High Pass Filter** turned off. The subsequent images show what happens as the **High Pass Filter** is set a 0, 1, 10, and 20. Obviously, none of these appear to be what you would want:





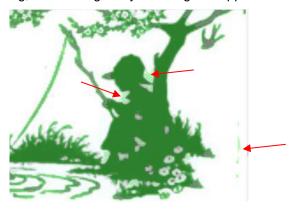




The first step is to lower the Contrast back to the default setting of 127. The High Pass Filter setting is
then set at 1 and a double trace line appears. As High Pass Filter is increased, the internal lines start to
diminish:



• However, with too high of a setting, new tracings may also begin to appear:



• At this point, you can try adjusting the **Contrast**. However, if you are satisfied with most of the trace lines, you can then use the **Draw Mask** function, from *Section 7.03.11*, to erase these extra unwanted lines and to fill in any areas within the image. The final result:



• The **High Pass Filter** setting will allow a much better conversion of a photo to a black and white image. The following photo of a rose will be used as the example:



- The best monochrome tracing <u>without</u> using the **High Pass Filter** required tracing in stages: one to get an overall outline, another to get the internal details of the rose, and a third to get the internal details of the leaves.
- Object>Merge was then applied and the resulting traced image looked like this:



• Instead of using three separate traces, the **High Pass Filter** could have been set instead:



 Obviously, it was not only quicker to simply apply the High Pass Filter, but the results turned out much better.

7.04 Draw Functions

7.04.1 The Draw Tool

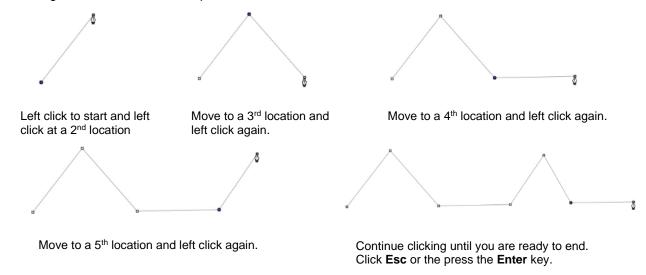
• The **Draw Tool** is accessed by clicking on the 5th icon on the **Tools Panel**. This tool is used to draw straight lines and Bézier curves. It can be a bit tricky to master but just like with many good things- practice makes perfect!

Drawing Straight Lines

• To draw a single straight line, use your mouse to click once where you want to start the line and click again where you want to end the line. Then immediately press **Esc** or the **Enter** key:



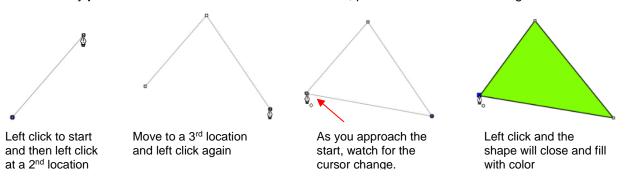
• If you wish to continue drawing a connecting straight-line path, keep left-clicking each time you need to change directions. Each click produces a node:



 If you want to draw perfectly vertical lines, perfectly horizontal lines, or lines at a 45° angle, hold the Shift key while clicking:

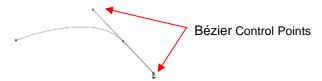


- Note that if you are on a Mac and you draw a 45° diagonal, you need to release the Shift key before clicking.
- If are drawing a closed path then, just as the mouse cursor approaches the starting node, a small diamond will appear next to the cursor and you can click one last time to end the process. The shape will automatically join the first and last nodes and fill with color, provided a **Fill** color is assigned:



Drawing Bézier Curves

- Drawing curves is a bit more difficult. The key is to take it one step at a time, practice the technique a lot, and remember that you can later correct your curves using the **Shape Tool** (refer to *Section 8.10*).
- To draw a curve, use your mouse to left-click once where you want to begin the curve. Then, instead of left-clicking, hold the left mouse button down and begin dragging the mouse. Continue holding the left button and notice a second line appears with two circles at either end. These are called Bézier control points:



As you drag the mouse, you'll see that you have full control over how long this line will be, as well as where
the control points are positioned. Remember to just keep pressing the left mouse button. Experiment with
longer and shorter control lines, as well as rotating the line to bend the curve in a range of different ways:



- When you are satisfied with the curve, you have two choices at this point:
 - ♦ Release the left mouse button, move the mouse to a new spot, left-click, and you'll begin creating a new curve connected to the prior curve:

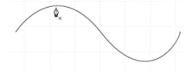


Release the left mouse button and press the **Esc** key or press the **Enter** key to stop the drawing process:

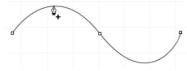


Adding and Deleting Nodes

- Zoom in on the curve, select it, and then click on the **Draw Tool** icon.
- To add a node, move the cursor next to the path and watch for the cursor to change. With the cursor right on the path, left-click to add a node:



Note the cursor has a small x next to it as it approaches the curve



After cursor changes, left click once and a node is added

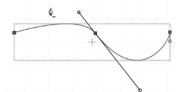


New node has been added

 To delete a node, move the cursor over an existing node until the cursor changes and you can see the node turn blue. Left-click once to delete that node:



Once the cursor changes and the node turns blue, left click

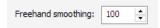


The node is deleted and the curve will change accordingly

7.04.2 Freehand Drawing



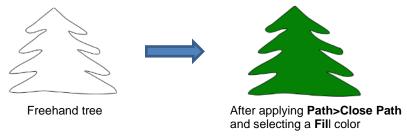
- The **Freehand** tool is accessed by clicking on the 6th icon on the **Tools Panel**. This tool is used to freely draw thin lines with your mouse or, better yet, a graphics tablet.
- In the **Tool Options**, there is a setting called **Freehand smoothing**. Increase that setting if you want the software to reduce "shakiness" as much as possible:



• The two extremes for the **Freehand smoothing** setting clearly demonstrate the difference:



 When drawing closed shapes, the shape will remain an open path regardless of how precise you attempt to be in returning to the start. To close the shape, select it and go to Path>Close Path:



7.04.3 Brush Drawing



- The **Brush** tool is accessed by clicking on the 7th icon on the **Tools Panel**. It is used to freehand draw thick lines. As with the **Freehand** tool, using a stylus with a graphics tablet will provide the most control.
- In the Tool Options is a Size setting for the thickness of the Brush tool:



• Select the Size you desire and freehand draw:







 One fun application is to use the Brush tool to easily add circles to a design. Select the Size and then just left-click without dragging the mouse. For example, the tree drawn with the Freehand tool in the prior section is now decorated:



Note that if a path drawn with the Brush tool crosses itself, the overlap will be removed:



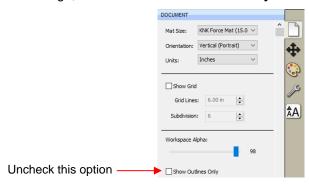
Overlaps automatically removed

7.05 Manual Tracing of an Imported Image

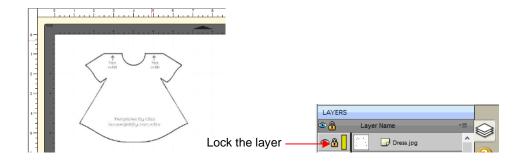
- Sometimes the quality of an image will fail to yield a good auto-trace. It could be that the image is too small
 or too detailed. If the image is important to you, then manually tracing offers another option for conversion to
 a vector cut line.
- The easiest way to manually trace a raster graphic is using the **Draw Tool** presented in *Section 7.04.1*. However, instead of trying to create the Bézier curves as you go, it's faster and easier to simply and quickly click, click around the image placing a node wherever the path changes directions. Then you can go back and manually move nodes and drag curves to fit the original image. This process is presented in the next few subsections.

7.05.1 Importing an Image for Manual Tracing

- Since you won't be trying to auto-trace the raster image, use File>Place Image to import it onto the Cutting
 Mat. In this tutorial, the *Dress.ipg* file shared at the link in *Section 7.03* will be used.
- While this dress could easily be auto-traced, it provides a great example of how the **Draw Tool** can be used to fit a shape such as this. So, it will be used for the manual tracing example.
- In order to see the image, make sure Show Outlines Only is not checked on the Document Panel:



To avoid inadvertently selecting the image while tracing, lock that layer on the Layers Bar:

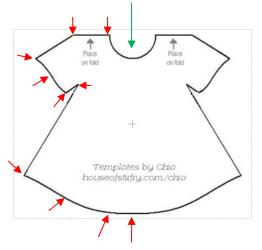


7.05.2 Manual Tracing Using the Draw Tool

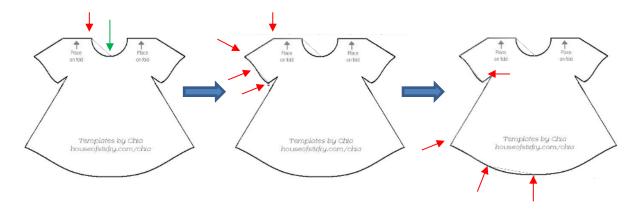
- Make sure you have read Section 7.04.1 to learn how to comfortably and successfully use the Draw Tool.
- Now, the best method for tracing a symmetrical image is to only trace one half. Then you can make a copy
 of it, mirror the copy, and weld the two together to create a perfectly symmetrical shape. This is what will be
 done in this case because the dress is symmetrical.
- Before beginning the trace, visually note how many changes in curves and straight lines exist. This will help you understand where to click as you work around the image. But don't overthink it. Remember that you can add nodes, delete nodes and move nodes during the editing process:

Trace will begin and end at the middle of the neckline, moving counter- clockwise around the dress.

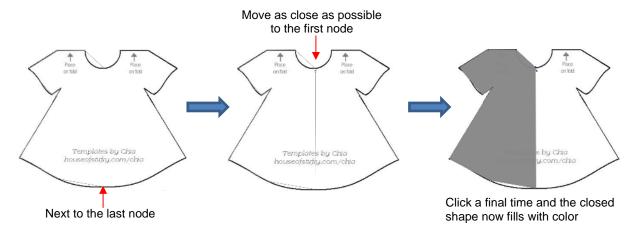
Red arrows indicate where a change in direction or curvature occurs



- The process is as follows:
 - Zoom in as close as possible, but make sure the entire image can still be seen. Click on the **Draw Tool** icon.
 - ♦ Left-click once in the middle of the neckline (see green arrow below). Then click at each point where the curve changes. A series of <u>straight line segments</u> will be made, one right after another:



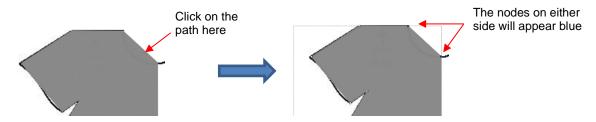
Once you've reached the next to the last node, click as close as possible on the first node and the shape will close and fill with color (based on the color currently assigned on the Fill & Stroke Panel



7.05.3 Editing the Trace



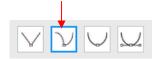
- The next step is to move nodes and convert any straight lines into curves, as needed. This is done using the
 Shape Tool which is the 3rd icon on the Tools Panel. Note that more details about using the Shape
 Tool will be presented in Section 8.10. For now, only a portion of this function's capability is needed.
- Using the **Shape Tool** will take a bit of patience and attention. But following the steps exactly as presented should yield successful results:
 - With the **Shape Tool** selected, click on the neckline path. The two nodes on either side will be blue:



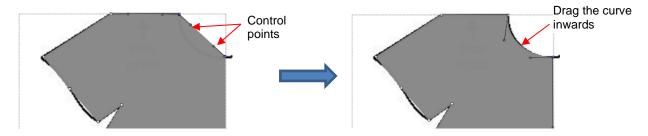
- If you need to move either node, click on the node to be moved and the other node will turn white. Be very precise in clicking as it is easy to miss the node. If that happens, you will need to click the path again to show the nodes.
- Once you have the single node highlighted in blue, you can now move the blue node by using the arrow keys on your keyboard:



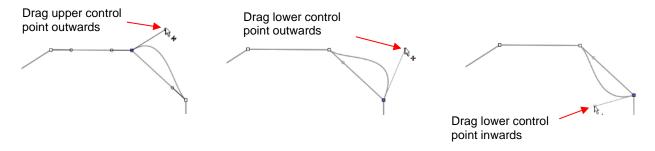
Next, click on the second icon on the Tool Options:



Then click again on the neckline path and you will see Bézier control points. This means you can now drag the middle of the path inwards to form the neckline:

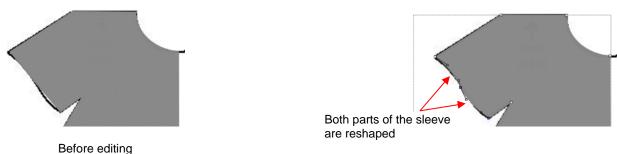


Alternatively, the Bézier control points can also be dragged. This is useful if the curve isn't symmetrical. Here are a few examples of how that curve could be altered:



- ♦ Just like with nodes, when selecting a Bézier control point, you need to click precisely on the little circle. If you inadvertently see all of the nodes disappear, just click on the path again.
- Once the neckline is curved, go over to the sleeve and repeat the process for both parts of the sleeve since one side curves inwards and the other side curves outwards. Again, click on the path, click on the

2nd icon on the **Tool Options** , click on the path again and then drag the curve:

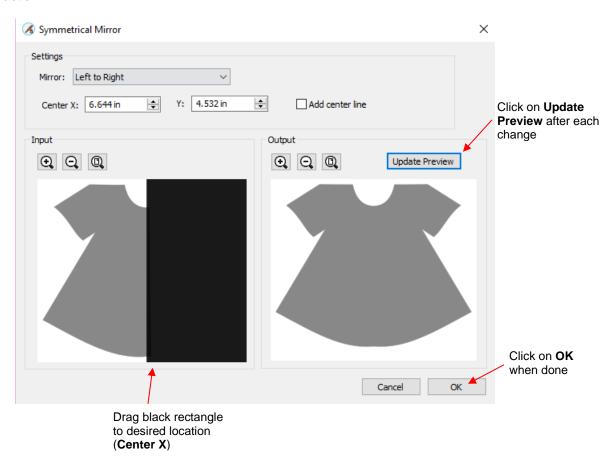


Repeat on the bottom of the dress. The shape you traced should now fit the original image. If it's not a perfect fit, don't worry about it! No one will ever know. ©

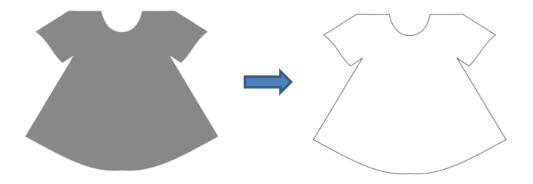


7.05.4 Using Symmetrical Mirror to Complete the Trace

- The final step to complete the dress involves making a mirror image copy and then welding it to the original.
 - ♦ Select the dress and go to **Effects>Symmetrical Mirror**. Increase **Center X** or drag the black rectangle to the right and click on **Update Preview**. Continue adjusting **Center X** until the image is to your satisfaction:



After clicking on **OK**, the dress is complete and the original image is no longer needed. Turning on **Show Outlines Only** on the **Document Panel** confirms that the symmetrical copy has been welded to the original:



• Other applications for **Symmetrical Mirror** are covered in *Section 9.23*.

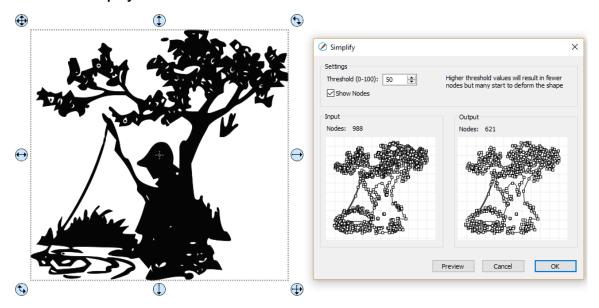
8. SCAL: Editing

This chapter covers functions that are used to modify shapes in SCAL as well as prepare shapes for cutting. For functions used in designing, refer to *Chapter 7*.

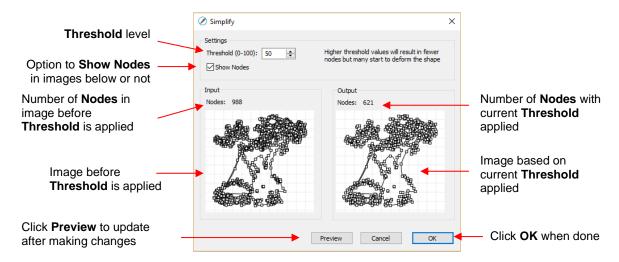
8.01 Simplify



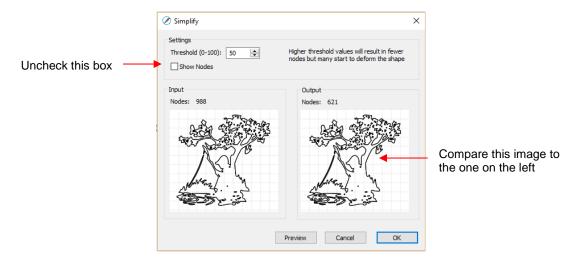
- The purpose of the Simplify function is to reduce the number of nodes. This can be important when cutting small vector shapes in which clustering of nodes in tight locations can sometimes lead to poor cutting.
- There are two ways to open the **Simplify** window after selecting a shape:
 - ♦ Right-click and select Path>Simplify
 - ♦ Go to Path>Simplify



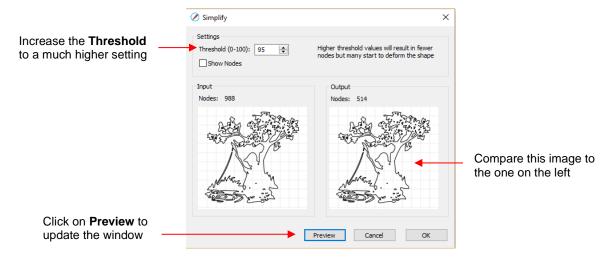
The Simplify window shows the nodes of the selected image in two side-by-side windows: an Input and an
Output, along with the number of Nodes in each one. That count is based on the current Threshold
setting:



To see the effect of Threshold, uncheck the Show Nodes box. Make sure the shapes haven't become
distorted as a result of applying the current Threshold setting:



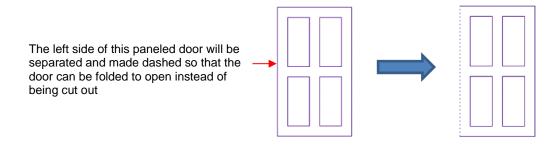
 Try increasing the Threshold setting to reduce more nodes. In general, you should be able to use a high Threshold without compromising the image:



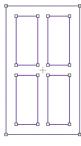
8.02 Split Path



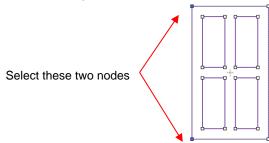
- The Split Path function allows you to break the connection between two paths.
- Select a node using the **Shape Tool** on the **Tools Panel**. Note that it's usually easier to select a node by zooming in on the shape and, as you move your cursor towards the node, the cursor icon will change when you are close enough to click on it. Then you can access **Split Path** using either of the following:
 - ♦ Right-click and select Path>Split Path
 - ♦ Go to Path>Split Path
- You can also select two nodes at one time and apply Split Path. The following door shape will be used as
 an example to show the steps. The goal is to change the left side of the door from a solid cut line to a
 dashed cutline:



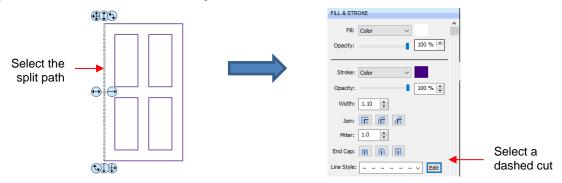
Select the shape and click on the **Shape Tool** icon on the **Tools Panel**. The nodes will appear on the shape:



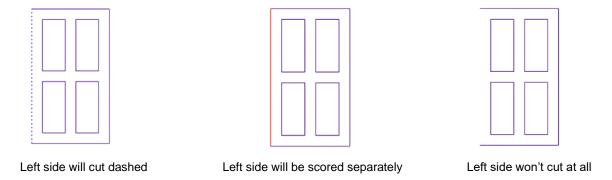
♦ Drag your mouse to marquee-select the two nodes on the left side of the window:



♦ Break that path by going to **Path>Split Path**. Then click on the **Select** icon separately select that left side line and change to a dashed cut on the **Fill& Stroke Panel**:



The left side of the window will now cut dashed. Alternatively, the left side could have been left solid and scored with an embosser in the cutter or the left side could have been deleted and the fold made by hand:



IMPORTANT: Use this function cautiously. In some cases more than one break can occur on a closed path.

8.03 Close Path



• The **Close Path** function can be applied to any open shape, other than a straight line, to join the start and ending nodes with a straight line:





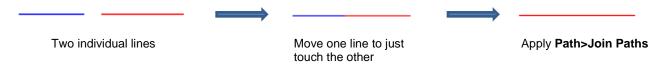


- To apply Close Path, select an open shape and use either of the following:
 - ♦ Go to Path>Close Path
 - ♦ Right-click and select Path>Close Path
- The path will then fill with whatever **Fill** property is currently assigned to that shape.

8.04 Join Paths



- **Join Paths** will connect two nodes from two different open paths if those nodes are in <u>very close proximity</u> to one another.
- To access Join Paths, select the two open shapes and go to Path>Join Paths:

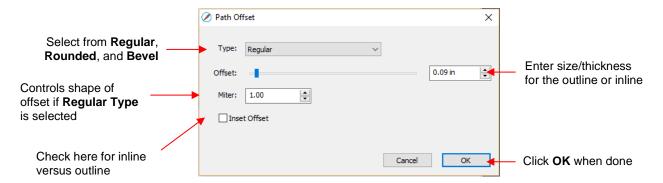


• If you are joining several lines at once, such as these four lines to create a box, then all four lines can be selected at one time and be joined. However, for the new shape to be an actual closed shape, you must then apply **Path>Close Path**:

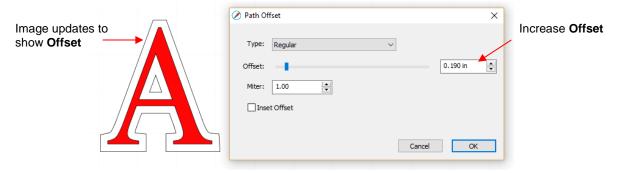


8.05 Path Offset Video

- Path Offset creates an outline or inline of a shape and will delete the original upon clicking on OK. Note that
 if you want the original, either make a backup copy or use the Shadow Layer function presented in Section
 9.05.
- To access Path Offset, select the shape and go to Path>Path Offset:



• As you increase the **Offset**, you will begin to see the outline form on your selected shape:



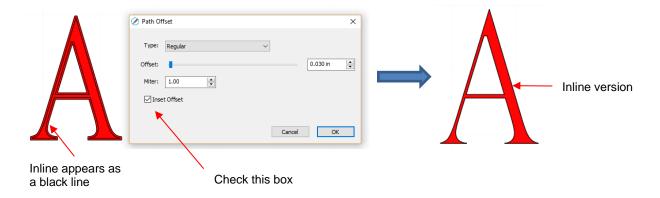
• After clicking on **OK**, the **Offset** will fill with the same color and the original will be deleted:



Type controls the style or shape of the offset at the corners. There are three choices:



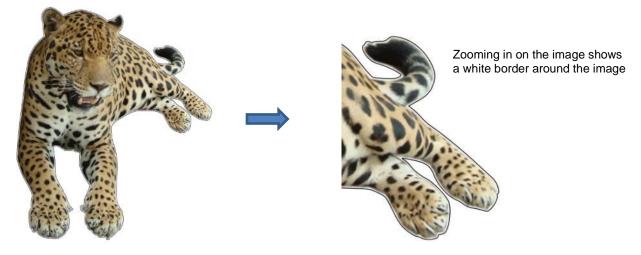
- Note that the first choice, Regular, also has a Miter setting which should work in the same way as Miter
 affects the Stroke (refer to Section 5.15). However, at this time, it appears that the Miter setting is not
 working.
- Checking the Inset Offset box creates an inline instead of an outline:



• A practical example of using **Path Offset** is when you have a font that is too thin to cut at the size you need. Applying a very small **Offset** can make the difference in whether or not text can be cut at certain small sizes. In the case below, the 1" lettering was offset by only 0.005":



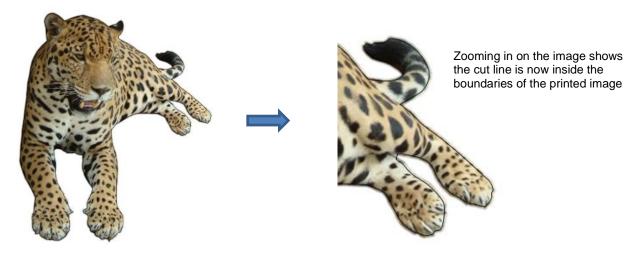
A second practical example showing the use of Inset Offset, is the following print and cut application. A
PNG with a transparent background was traced using the Trace function. However, based on the location of
the cut line, relative to the printed image, there will be small amount of white surrounding the image:



♦ Select the **Cut** layer only on the **Layers Panel**:



♦ Open the **Path Offset** window. Set the **Offset** to a small size, such as 0.03". Be sure to mark the box for **Inset Offset**. The result is a cut line which will eliminate that white border around the image:



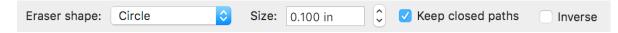
8.06 Eraser



• The **Eraser** is the 8th icon on the **Tools Panel**. Use this tool to erase parts of a shape by dragging your mouse across the shape:



• The **Tool Options** for the **Eraser** include the following:



Eraser Shape: Choose either Circle or Square:



- ♦ Size: select a thickness for the erasure. Scroll up and down or enter a specific size.
- Keep closed paths: Mark this option if you split a shape and you want the two resulting shapes to be closed. Otherwise you end up with two open shapes:







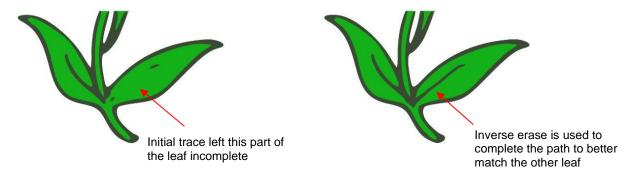
Keep closed paths checked

Keep closed paths unchecked

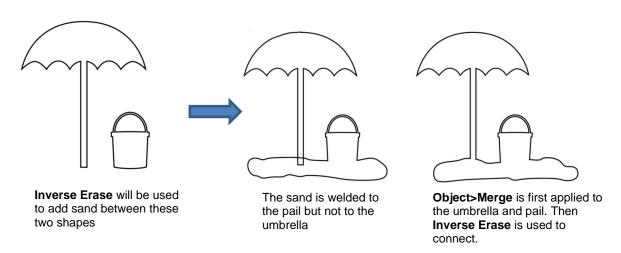
Keep closed paths checked

Keep closed paths unchecked

♦ **Inverse:** when this option is marked, the **Eraser** will "add to" shapes. This can be used to fill in holes connect broken paths, serve as a brush tool, etc.:



 Note: If you use Inverse Erase to connect two or more separate shapes, those shapes should first have Object>Merge applied. Otherwise the connection will not become part of the new shapes:



8.07 Knife and Crop

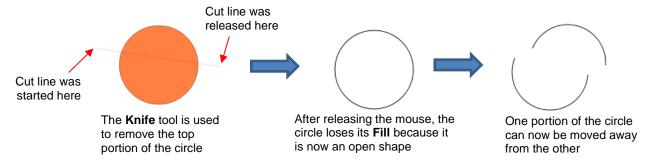
• The **Knife** tool can be accessed by clicking this icon on the **Tools Panel**. Note the tiny triangle in the icon, indicating there are other options available. The **Crop** tool left mouse button on this icon and then selecting **Crop** from the popup menu.



8.07.1 Using Knife



 The Knife tool always makes a straight line cut. Starting outside the shape, click and hold the left mouse button and drag across the shape at the desired location for the cut. When you release the mouse button the cut will be applied and one shape can be moved away from the other:



- There are four ways to control the angle of the cut:
 - ♦ Click and hold the left mouse button you can freely drag the red cut line to cut at any angle (as shown in the screenshot)
 - Hold the Shift key and click and hold the left mouse button and drag left or right: the red cut line will be perfectly horizontal
 - ♦ Hold the **Shift** key and click and hold the left mouse button and drag up or down: the red cut line will be perfectly vertical
 - Hold the Shift key and click and hold the left mouse button and drag diagonally: the red cut line will be at exactly 45°
- If you wish to close the cut shapes, select them and either:
 - ♦ Go to Path>Close Path
 - ♦ Right-click and select Path>Close Path



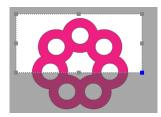
8.07.2 Using Crop



 With the Crop tool, you drag the mouse to marquee-select an area to be retained. Then you press the Enter key to complete the crop. Everything outside of the selected area will be deleted:



The top part of this shape will be cropped



Marquee-select the area to be retained



After pressing the **Enter** key

• There are two options when using the **Crop** tool based on a setting on the **Options Bar**:



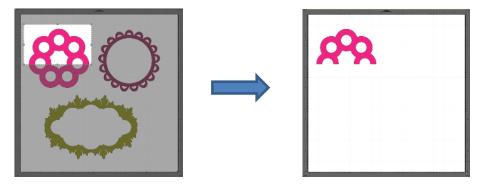
✓ Crop Selection Only

<u>IMPORTANT:</u> If left unchecked, only the marqueeselected part of the shape will be retained. The rest of that shape and <u>every other shape</u> on the page will be deleted, even those that might be hidden or locked! If checked, the marquee-selected part of the selected shape will be retained, as well as all other shapes on the page.

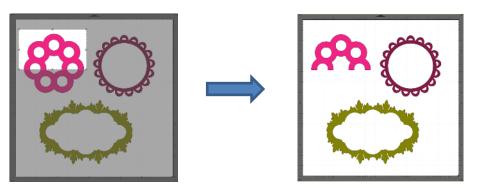
• Here is an example to show what would happen in both cases. The file has three shapes and the top right shape will be cropped just as in the prior screenshot:



With the Crop Selection Only box <u>not</u> checked, the other shapes are deleted as well as the lower half of the pink doily:



With the Crop Selection Only box checked, the shape is selected first and then only the bottom half is deleted:

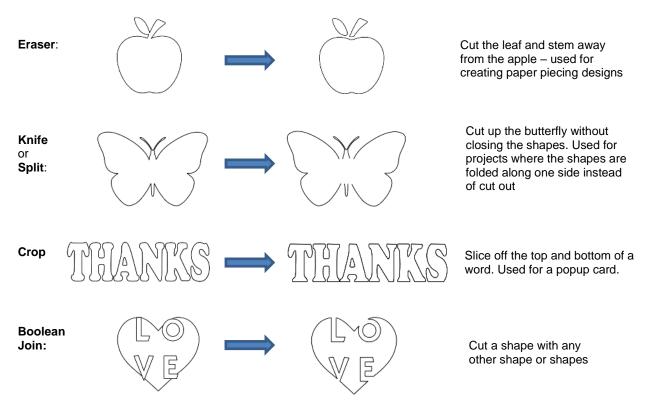


8.08 Which Cutting Tool to Use?

- Having so many cutting functions to use can make it difficult to know which one to use in a particular
 instance. Experience will be your best guide, as well as testing them out. But a summary of the functions is
 presented in this section and this may prove to be helpful when selecting which tool to try first.
- The following table summarizes the capabilities of the various options for cutting shapes. Note that Boolean
 Join has also been added but isn't covered until Section 9.06 because it is more often used for designing
 than for editing.

	Can make straight line cuts	Ihorizontal.	Can force diagonal cuts	freehand		Can cut using square or circle shapes	ICan cut using	Can cut with open shapes remaining	Can cut with closed shapes remaining
Eraser				✓	✓	✓		✓	✓
Knife	✓	✓	✓					✓	
Crop	✓	✓			✓				✓
Split								✓	
Boolean Join	✓	✓	✓		✓	✓	✓		✓

• Here are a few samples to show which functions would be the best choices for making the cut:



Knife and Split have the same effect. Split is a bit more limiting because there needs to be nodes present
in the location where the cut will occur. It might be useful if you are already in the Shape Tool mode where
you can then select the nodes and apply the Split. Otherwise, Knife is probably the easier tool to use.

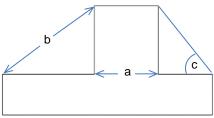
8.09 Ruler

• The **Ruler** function allows you to measure the distance and angle between any two points on the screen. It is accessed by clicking on the second icon from the bottom on the **Tools Panel**.

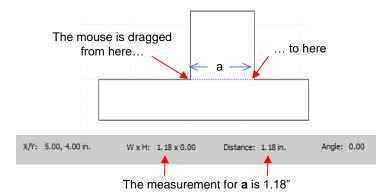
 No shapes need to be preselected. Just hold down left mouse button at any location and then drag the mouse to a new location. The **Tool Options** provide the following information:



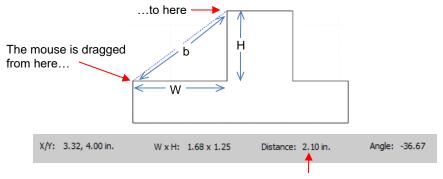
 To better illustrate these variables, the following shape will be used and the various measurements will be determined using the Ruler:



- ♦ **X/Y:** This is the starting position on the screen and will match the X/Y grid location on the **Cutting Mat**. You can extend beyond the boundaries of the mat, if needed.
- ♦ W x H: Indicates how far the mouse has been dragged away from the starting point. Note that as the mouse is dragged, a blue dotted line will appear. In this example, when measuring for the distance "a", the H should be zero since it's a vertical measurement only. In fact, making sure H is 0 is one way to make sure the W is the correct measurement needed:



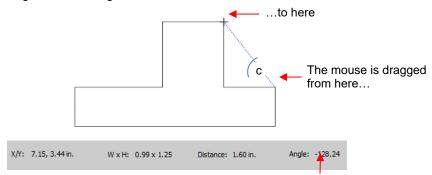
♦ Distance: This is the actual measurement between the starting location and the ending location. In the prior measurement, W is the same as Distance because the measurement was a horizontal one. But measuring the length of "b" is not:



The measurement for **b** is 2.10"

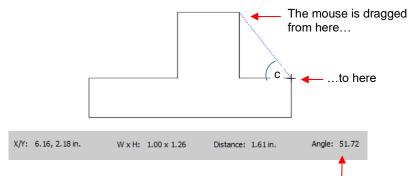
♦ Angle: This is the angle of the Distance line relative to the X axis.

- In the first measurement of "a", the angle was 0 because it was a horizontal line. On the other hand, if the mouse had been dragged from the right side to the left side instead of the other way around, the angle would have read 180.
- o If the measurement had been vertical, then the **Angle** would have read 90 if measured from the top to the bottom. It would have read -90 if measured from the bottom to the top.
- o In the example being used, the angle "c" is measured to be -128.24:



The measurement for c is -128.24

- Obviously, "c" is an acute angle so -128.24 doesn't represent the actual angle shown in the screenshot. To get the true value, you subtract -128.24 from 180 (degrees in a straight line) to get 51.76 degrees.
- However, the other way to get "c" without having to do a calculation is to drag from the other direction:



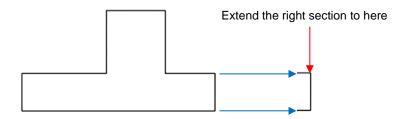
The measurement for **c** is 51.72

8.10 The Shape Tool - Path and Node Editing

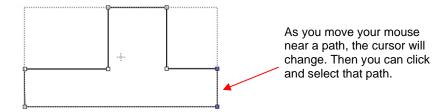
- Path editing involves moving paths as well as reshaping them. This topic was first introduced in *Section 7.05* where you were shown how to draw with the **Draw Tool** and then curve a straight-line path. If you haven't read *Section 7.05*, please do so before proceeding with the rest of this section.
- To use the **Shape Tool**, click on the third icon on the **Tools Panel** and then click on a shape. You should see the nodes which currently define that shape. If you do not see any nodes, then most likely you have clicked on a group of shapes. Go to **Object>Ungroup** and then try again.
- Path editing involves dragging path or dragging **Bezier** control points to reshape them. Node editing involves moving nodes and changing the type of node to then form desired curves.
- The most likely mistake you'll make while learning path and node editing is failing to zoom in close enough so that you can click precisely on paths and nodes. Keep that in mind while experimenting.

8.10.1 Moving a Path

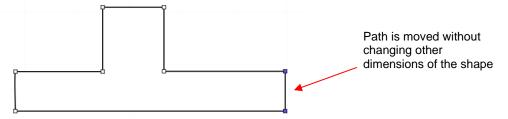
Sometimes a path needs to be extended without resizing the rest of the shape. For example: let's say you
need to extend the right section of this shape by a few inches:



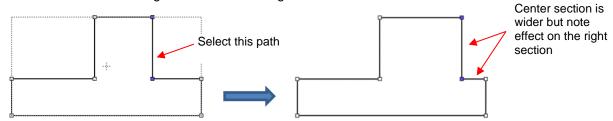
♦ Select the **Shape Tool** on the **Tools Panel** and then click on that path:



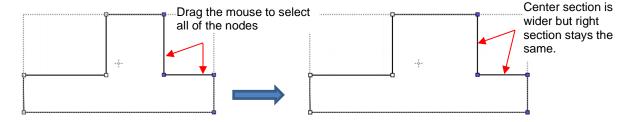
You can now use the arrow keys on your keyboard to move that path. Holding the **Shift** key while clicking on an arrow key will move it in larger increments:



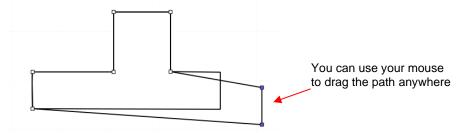
If instead, the center section had been widened by selecting the path on its right side, then that would have resulted in shortening the section to the right of it:



Thus, to maintain the dimensions of the right section, both paths need to be moved at the same time. To do this, marquee-select the nodes as shown and then move with the keyboard arrow:



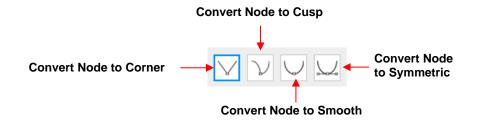
• If the shape is made up of straight line segments, versus curves, you can also drag the segments with your mouse instead of using the keyboard arrows. Note that it can be a bit tricky getting the cursor in the perfect spot to start dragging. However, you won't have the same control if you wish to keep the paths perfectly horizontal or vertical:



• Some practical examples of moving paths include resizing boxes and envelopes where you need the overall dimensions of the final project to be different but you do not want to change the size/thickness of the flaps.

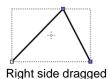
8.10.2 Reshaping a Path

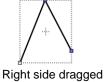
• With the **Shape Tool** selected, you'll observe four icons in the **Tool Options.** The purpose of each option is to convert one or more selected nodes to that type of node:

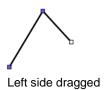


- One or more nodes are highlighted and then the appropriate icon selected. These same four functions can also be accessed by right-clicking and selecting **Path>Convert Node to**.
- To illustrate each one of these options, a simple path with a sharp corner will be used. This shape is already
 in Corner Node mode. To change to a different mode (in the examples that follow the first one), the top
 node is selected and then the option is clicked from the Tool Options or using the right-click and
 Path>Convert Node to menu option.
 - Corner Nodes: These are the nodes that make up straight-line shapes such as rectangles, squares, triangles, stars, etc. Once selected, the shape will appear as below and either path can be moved as was demonstrated in the prior Section 8.10.1.









Cusp Nodes: In this mode the Bézier control points appear and can be moved independently. First note how the paths appear when in this mode, depending on how many of the adjacent nodes are selected:



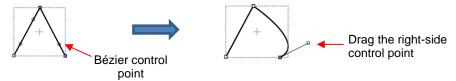




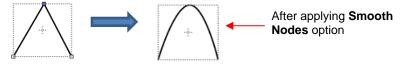
o The dots alo Top node only € Bézier : Left side nodes hich are nc All three nodes another. You can freely drag € selected create c selected selected



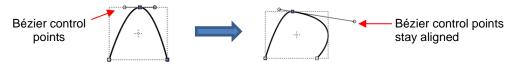
 In the case where there is a single Bézier control point on the right side, you can again drag the control point to create a curve:



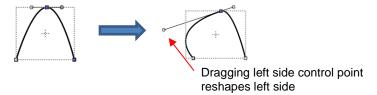
Smooth Nodes: In this mode the Bézier control points always stay in a straight line. Notice that when you convert to **Smooth Nodes**, the shape immediately forms a curve:



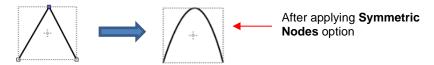
When the newly formed shape is selected again, the Bézier control points appear in a straight line.
 If you move one, the other will move as well, in order to maintain that straight line:



 The left side Bézier control point controls the curve on the left side. Thus, if it had been moved instead this would have resulted:



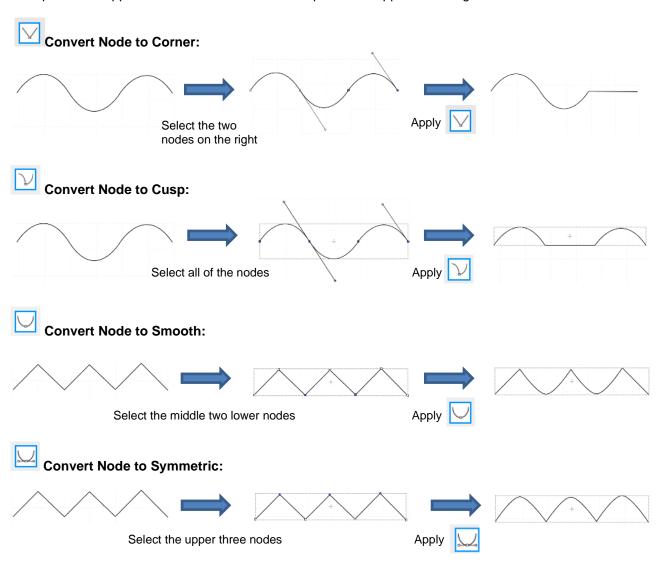
Symmetric Nodes: In this mode the Bézier control points not only stay in a straight line, they also stay the same length. As with Smooth Nodes, when you convert to Symmetric Nodes, the shape immediately forms a curve:



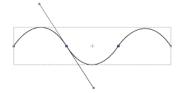
When the newly formed shape is selected again, the Bézier control points appear in a straight line and the image appears the same as with **Smooth Node** status. However, when you now move one control point, the other will not only maintain that straight line, but also the same length. And the curves on both sides of the selected node will change:



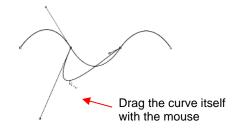
• To further illustrate these options, marquee-select a group of nodes to select more than one path and then click on whichever option you want to apply. The following examples show what occurs when the first two options are applied to curves and the last two options are applied to straight lines:



- As was shown in Section 7.05.3, you can also drag the path itself to reshape it, if one of the nodes has been converted to Cusp, Smooth, or Symmetric. For example:
 - ♦ The following curve has the lower path selected and the option marked:



♦ The path can now be dragged with the mouse:



- You will recall that when a node is in either Smooth or Symmetric mode, adjusting one Bézier control point
 will automatically affect the other one and the curves on either side will change. To avoid this, hold the Alt
 key while dragging the control point and the other control point will remain in place:
 - For example, with the following **Smooth** node shape, the same change is made with and without holding the **Alt** key during the adjustment:

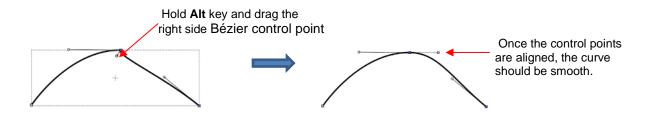


8.10.3 Examples of Smoothing Curves

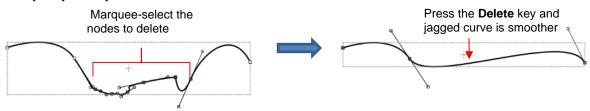
- The last method shown in the prior section can be used to correct kinks in what should be a smooth curve.
 - ♦ For example, let's say you want to make the following shape have a nice smooth curve:



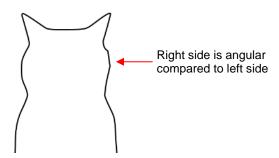
Using the **Shape Tool**, click on the curve to reveal the node. Then click on the third icon needed, so that option will be highlighted. Hold the **Alt** key and drag the Bezier control point that's closest to the curve needing adjustment until the two control points are in a straight line:



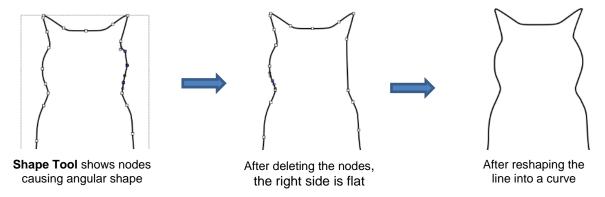
In Section 7.04.1, you were shown how to add or delete nodes while in the **Draw Tool** mode. Any time you want to add nodes to an existing path, you will need to be in this mode. However, you can delete nodes while in the **Shape Tool** mode. Select a node or marquee-select a group of nodes and press the **Delete** key on your keyboard:



- Based on such a drastic change, it's worth noting that deleting smaller numbers of nodes at a time is usually
 advisable to avoid losing the original structure of the shape.
 - ♦ As a practical example, here is a traced image of a cat. Note the right side of the cat's head is not smooth and rounded like the left side:

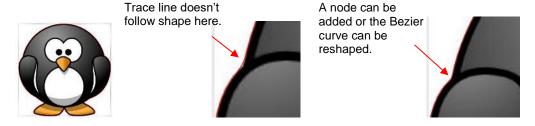


• Using the **Shape Tool**, the nodes causing the angular shape are marquee-selected and deleted. Then the path is reshaped:



8.10.4 Applications for the Shape Tool

- It's not always obvious when the **Shape Tool** might be needed. Here are a few examples to keep in mind:
 - ♦ Editing of pixel traced images: Sometimes a pixel trace will appear to be perfect until, for example, you use it for a print and cut and discover that some of the paths are slightly outside the printed areas of the original image:



- Manual tracing: As shown in Section 7.05, one of the quickest ways to manually trace a raster image is to use the **Draw Tool** and simply click/click/click around the image and then use the **Shape Tool** to create curves and move nodes to more closely align with the original image.
- Improving a cut: If you have problems with a particular location on a cut shape, examine the nodes in that location. You may find a cluster of nodes or a sharp cusp. Delete those excess nodes, reform the path, and then retest the cut.
- Modifying poorly designed files: Sometimes you will pick up free files that don't quite cut the way you expected. Examples are often fold-up templates where corners and fold lines do not quite meet. Having the ability to move paths and nodes can correct these kinds of files and provide cleaner and more professional end products.

9. SCAL: Designing

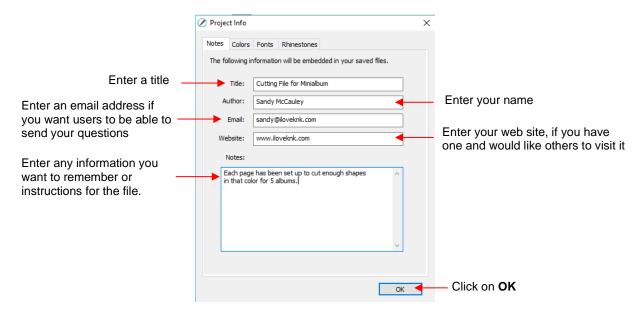
9.01 Where Do I Start with Learning to Design?

SCAL offers some excellent easy-to-use designing tools to assist you in creating whatever you can imagine.
 The best way to learn these tools is to focus on only one at a time and play with settings. You aren't going to break anything in the software by experimenting and you never know what you might discover!

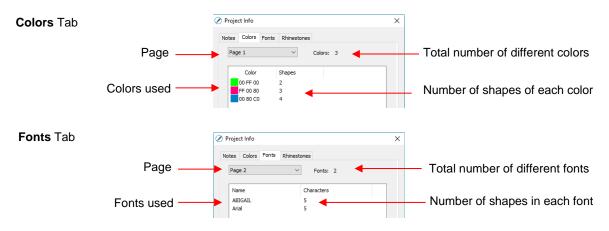
9.02 Project Info

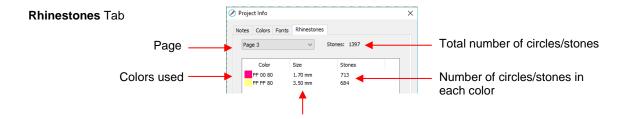


- Before getting started on the fun and amazing design capability of SCAL, it's worth noting a feature that
 allows you to add your name and some other details to your file. This can save you time later when you're
 not remembering some of the original details and also help others with whom you share your files. Using
 this feature is, of course, entirely optional.
- To open the Project Info window, go to Window>Project Info. The following example shows some of the
 optional information you can add in this window that will be saved with your actual project:



Note the other tabs in this window: Colors, Fonts, and Rhinestones. These do not require your input.
Instead, they automatically track, by Page, those elements that are currently present in the file. For example:





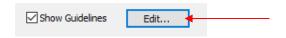
Note: When changing tabs, such as from **Colors** to **Fonts**, always take note of the **Page** number. It will not automatically update to the page you were just checking. Thus, if you are on *Page 2* when on the **Colors** tab, you may discover you're on *Page 1* on the **Fonts** tab. Simply change to the page you need from the drop-down menu.

Diameter of the circles for that color

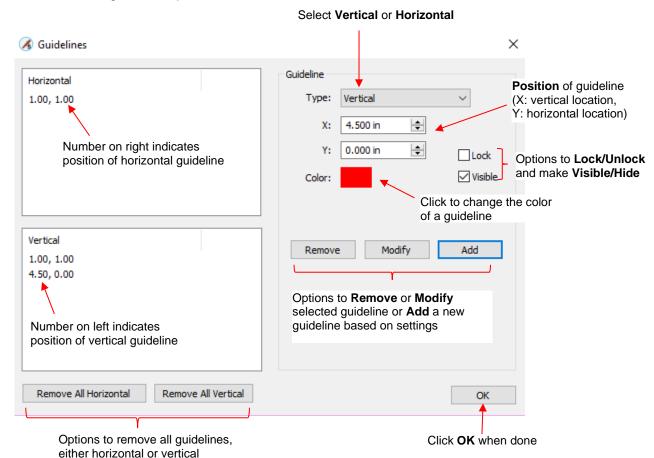
9.03 Guidelines



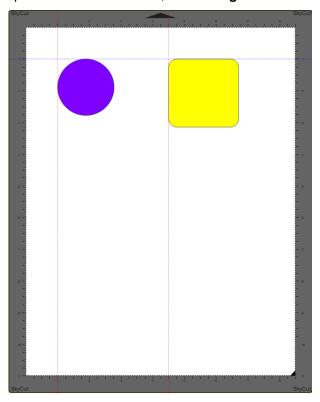
- Guidelines were first introduced in Section 3.06.5. It was noted that they can be added to the **Cutting Mat** in two ways:
 - Observe the bound of the screen of the sc
 - Sy manually adding in the Guidelines Edit window
- You can toggle guidelines on and off by clicking on the box next to Show Guidelines on the Document
 Panel. To open the Guidelines Edit window, either go to View>Guidelines>Edit Guidelines or click on the
 Edit button next to Show Guidelines:



The following window opens:



- This window serves three functions:
 - Ability to delete guidelines: Select a guideline on the left and then click on **Remove**. You can also remove all of the horizontal guidelines and/or all of the vertical guidelines using the buttons shown.
 - Ability to edit an existing guideline: Select a guideline on the left and make changes such as position, color, lock/unlock and show/hide. Then click on **Modify**.
 - ♦ Ability to add a new guideline: Enter desired settings and click on **Add**.
- Based on the setting in the prior **Guidelines** window, the **Cutting Mat** would look like this:



- The ability to show/hide all guidelines, lock/unlock all guidelines and delete (clear) all guidelines is also available under View>Guidelines.
- To have shapes snap to the guidelines, go to **View>Snap To>Guidelines** and make sure that option is checked. More about **Snap To** is covered in *Section 3.07*.

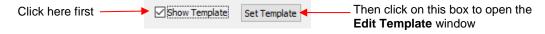
9.04 Templates



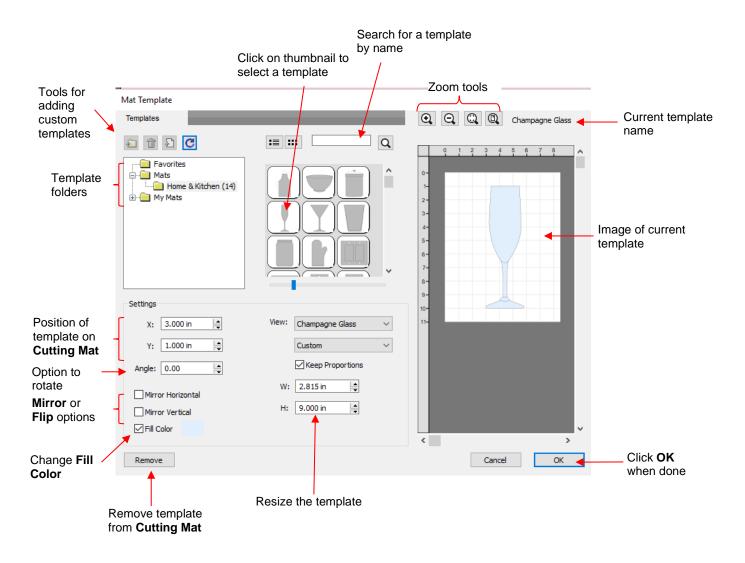
• As was first presented in *Section 3.06.11*, SCAL5 has the ability to add templates to the **Cutting Mat** that are non-selectable shapes to aid in various designing situations.

9.04.1 Mat Template Window

- There are fourteen templates included in SCAL5. However, you can import your own templates if they are in .SVG format or .SCALMAT format.
- To access templates, mark the option for Show Template and then click on the Set Template button:



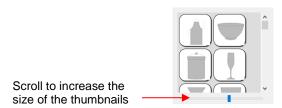
The following Mat Template window opens:



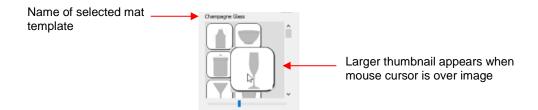
- The Mat Template window has a lot in common with the Shapes tab in the Library:
 - The Mats folder contains templates that come with SCAL. The number in parentheses indicates how many templates are included in that folder:



A scrollbar beneath the thumbnails window can be used to resize the thumbnails:



Output Description of the template:
Output Description



♦ Templates can be displayed either with a thumbnail image or a list view:



- You can assign templates to a Favorites folder for quicker access. To do that, right click on a thumbnail image and select Add to Favorites. That popup menu also has two other options:
 - o Delete File: This option isn't used except when you import your own template files
 - Reveal File: Opens the location on your computer where the template file is located
- You can create your own subfolders and import templates. Details are covered in Section 9.04.3.

9.04.2 Template File Settings

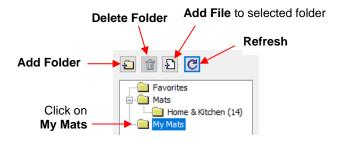
- The right side of the **Mat Template** window has a preview of the selected template on a simulation of the **Cutting Mat.** This preview is useful while customizing the settings.
- Once a template is selected, you have the following settings for customizing:
 - Size: adjust the W and H settings to change the width and height of the template. The optional Keep Proportions box, when checked, will maintain the aspect ratio as you change either the width or height.
 - ♦ Position: Increasing **X** and/or **Y** will move the template away from the upper left corner of the **Cutting** Mat.
 - ♦ Rotate: increase the **Angle** setting to rotate the template, if needed.
 - Color: Mark the Fill Color box and then click on the colored box to open a color selection window.
- When you are satisfied with the settings, click on **OK** to add the template to the **Cutting Mat**. Note that the template will not print or cut. Again, it's a tool for designing:



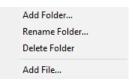
- To replace the template, reopen the **Mat Template** window and select a different template file.
- To remove the template from your Cutting Mat either uncheck the Show Template option on the Document Panel or return to the Mat Template window and click on Remove button.

9.04.3 Importing Your Own Templates

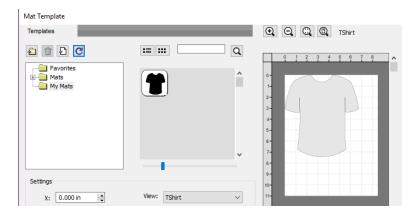
- SVG files can be imported into the **Mat Template** window. If you are designing them in SCAL, use a **DPI** of 72 in the SVG export window and the size of your imported template will match that of your original design.
- Once an SVG file is imported it is saved as a SCALMAT file. These files can be located in the following folder on your computer: Documents>Craft Edge>My Mats.
- To import and organize templates, first click on My Mats. The following functions are now available:



- You can import new template files into the My Mats folder by clicking Add File. You can also create new subfolders within My Mats by clicking on Add Folder.
- These same two functions are also accessible when you right click while **My Mats** is selected. Note: this is also how you would rename one of your custom folders:



- If you need to delete a folder, first empty it by right clicking on each thumbnail and selecting **Delete File**. Then you will be able right click on the folder name and select **Delete Folder**.
- Sometimes you may need to click on the Refresh icon in order to see new folders or to see deleted folders removed.
- When you select Add File, browse to locate the SVG file you wish to add as a template. It will then appear
 as a thumbnail image. Clicking on the thumbnail adds the shape to the simulated Cutting Mat on the right:



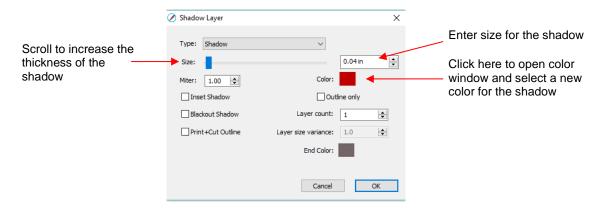
• <u>IMPORTANT!</u> As mentioned before, when an SVG file is imported, its file format changes to SCALMAT. This is important to note because this is where a significant difference lies between the **Mat Template**

window and the **Library**. Referring back to *Section 4.03.1*, it was noted that you can import an entire folder at one time into **My Designs** in the **Library**. While it appears that the same functionality is available when creating a new folder in **My Mats**, you cannot import an entire folder of SVG files that same way. Instead, the folder you wish to import (create a shortcut to) must contain .SCALMAT files.

9.05 Shadow Layer

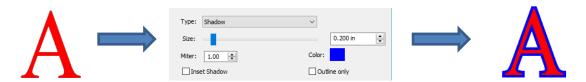


- The **Shadow Layer** function allows you to create an outline or an inline of any shape including, of course, text. After selecting a shape, you can access the function in either of two ways:
 - ♦ Go to Effects>Shadow Layer (Contour Cut)
 - ♦ Right-click and select Appearance>Add Shadow Layer
- The following window will open:



9.05.1 Shadow Layer Settings

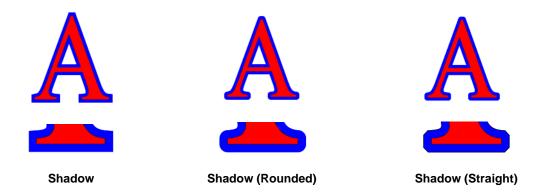
- **Size** changes the thickness of the shadow layer. You can either scroll the **Size** bar or type in a size in the input window to the right.
- **Color** refers to the color of the shadow. Clicking on the color box opens the standard color window where a new color can be selected.
- As an example, a Times New Roman upper-case A is used. After increasing the Size and changing the Color to blue, the following result is obtained:



The Layers Panel shows the addition of a new Shadow Layer:



• Type controls the style or shape of the shadow at the corners. There are three choices:



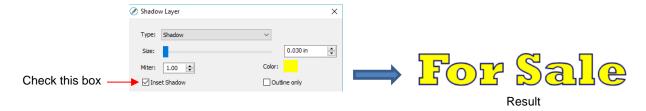
- Note that the first choice, Shadow, also has a Miter setting which should work in the same way as Miter affects the Stroke (refer to Section 5.15). However, at this time, it appears that the Miter setting is not working.
- **Inset Shadow** is the opposite of **Shadow** instead of creating a contour that is larger than the original shape, a contour is created that is smaller and fits inside the original shape.
 - ♦ For example, let's say you are going to create a two-color vinyl sign that says "For Sale":

For Sale

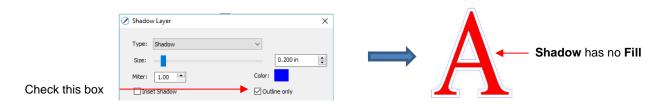
If a normal **Shadow** is used to create the second layer, the letters will automatically be welded because of their proximity to one another. This may not be suitable for your application:



Instead, create an Inset Shadow by checking the Inset Shadow option:



 Outline only can be checked to set the Fill on the shadow to None. The Stroke color will be whatever is set in Color:



• Blackout Shadow can be used to remove any interior shadow lines, leaving only a single outset:



Print +Cut Outline creates a shadow with a Fill and Stroke both set to None. The shadow will be invisible
unless you hover the mouse over the shadow:



- Two print and cut examples for this function are:
 - To add a contour cut around a printed shape
 - To cut just inside the boundaries of a printed image (in this case you also use the Inset Shadow option)
- Layer settings: There are three additional settings in the Shadow Layer window used to create multiple shadows on a shape:
 - ♦ Layer count: Total number of shadow layers to be created
 - Layer size variance: If left at 1.0, the increasing thickness of each layer will be based on the original Size of the first shadow. If less than 1, the increasing thickness of each layer will be progressively less than the prior, based on the variance. If greater than 1, the increasing thickness of each layer will be progressively larger based on the variance.
 - For example, a square is used where the original shadow Size is 0.25 and the Layer count is set to 5. Outline only mode is also chosen so that the individual layers are easier to see. Note the different results when Layer size variance is set 1, 0.75 and 1.25:



♦ End color: If the End color is chosen to be different from the original Color, a gradual transition between the two colors will be created. This can be used to create some beautiful designs for a print and cut:







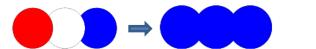
9.06 Boolean Operations

• Under **Path** on the **Menu Ba r**, there are five Boolean operations that are very useful when designing cutting files. This section illustrates how each works and provides a practical example for each one.

9.06.1 Union



• The **Union** operation, also commonly called welding, removes the overlap between two or more selected shapes. The color of the new shape will be that of the bottom-most shape:

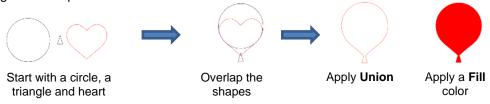




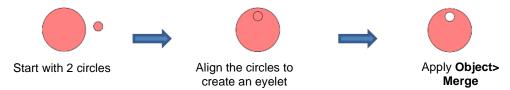
With no Fill: before and after Union

With a Fill color: before and after Union

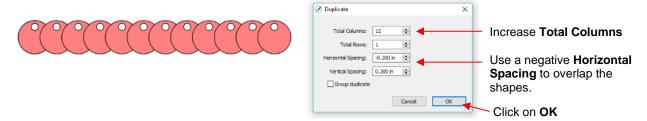
- To apply this operation, select two or more shapes and use one of the following:
 - ♦ Go to Path>Union
 - ♦ Press Alt+U
 - Right-click and select Path>Union
- Sections 6.07 6.09 showed several examples of the **Union** operation applied to text. Here's an example using basic shapes and the **Union** function to create a balloon:



- In this next example, a scalloped border will be designed:
 - ♦ Start with two circles that will be used to create an eyelet circle:



Select this new shape and use Object>Duplicate to open the Duplicate window:



Add a long rectangle and align with the pattern of circles. Apply the **Union** function:



9.06.2 Intersection



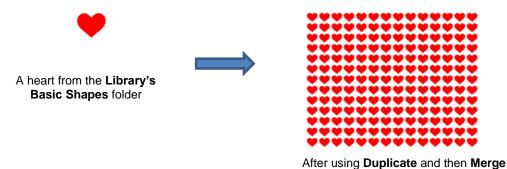
• The **Intersection** operation is the opposite of the **Union** operation. Instead of removing overlap, the overlap is what remains. The color of the new shape will be that of the bottom shape:



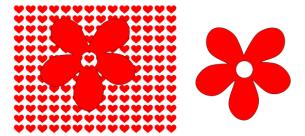
With a Fill color: before and after Intersection

With no Fill: before and after Intersection

- To apply this operation, select two shapes and use one of the following:
 - ♦ Go to Path>Intersection
 - ♦ Right-click and select Path>Intersection
- One example involves filling a shape with a pattern:
 - ♦ This pattern was designed by using the **Duplicate** function to create a grid of hearts. Then, by applying **Object>Merge** on the hearts, it is now a single shape:



Arrange the shape to be filled (in this case, a flower) over the pattern. Also, set aside a copy or the flower shape to use later as a border.



♦ Select the pattern and flower and apply **Path>Intersection**:



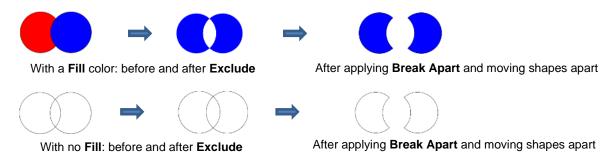
♦ Recolor the spare flower white with a red **Stroke.** Then center the pattern with the spare flower. Perfect for a print and cut!



9.06.3 Exclude



• The **Exclude** operation subtracts the intersection of <u>two</u> shapes from both of the shapes. The color of the new shapes will be that of the upper shape.



- To apply this operation, select two shapes and use one of the following:
 - ♦ Go to Path>Exclude
 - ♦ Right-click and select Path>Exclude
- After applying, use **Object>Break Apart** if you need to move one shape away from the other.
- As an example, use the heart-filled flower from the prior section as a cut design on the front of a greeting card:
 - ♦ Start with a rounded rectangle as the card base (refer to Section 5.01.2):



Add the pattern from *Section 9.06.2*, without the spare flower shape. Arrange the pattern so that it will cut from the front of the card:



♦ Select the card and pattern and apply Path>Exclude:



9.06.4 Front Minus Back



• The **Front Minus Back** operation subtracts the intersection of <u>two</u> shapes from the front (or upper) shape, leaving only that front shape:



With a Fill color: before and after Front Minus Back



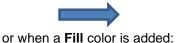
With no Fill: before and after Front Minus Back

- To apply this operation, select two shapes and use one of the following:
 - ♦ Go to Path>Front Minus Back
 - ♦ Right-click and select Front Minus Back
- As an example, add the word HELLO to the card designed in Section 9.06.3.
 - ♦ Select a font and type out the letters. Add a rectangle (with no **Fill** color) so that the tops and the bottoms of the letters will just overlap the rectangle:



Select the rectangle and the lettering and apply **Path>Front Minus Back**:







♦ Arrange the greeting on the front of the card designed in *Section 9.06.3*. Select both and apply either **Object>Merge** or **Path>Exclude** so that all internal shapes are cut before the outside card base:



9.06.5 Back Minus Front



• The **Back Minus Front** operation is the opposite of **Front Minus Back**. It subtracts the intersection of <u>two</u> shapes from the back (or bottom) shape, leaving only that back shape:













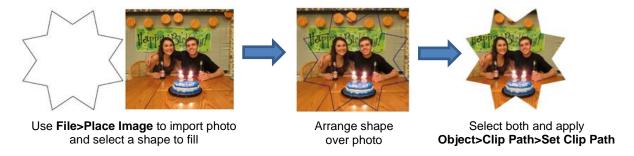
- To apply this operation, select two shapes and use one of the following
 - **♦ Go to Path>Back Minus Front**
 - ♦ Right-click and select Back Minus Front
- Any examples for **Back Minus Front** are essentially the same as for **Front Minus Back**. When choosing which to use, check the **Layers Panel** and think about which one you need to remain. Alternatively, just try one and, if it's the wrong choice, use **Undo** to back up one step and then pick the other function. ©

9.07 Clip Path and Clip Mask

9.07.1 Clip Path



• Clip Path applies one selected shape as a die cutter onto another selected shape (vector or raster) positioned below it:



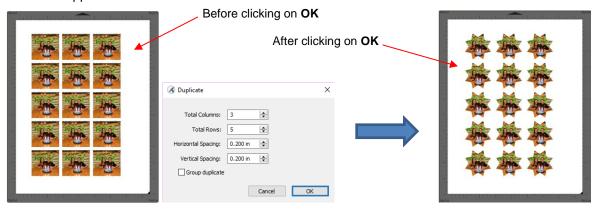
- There are two ways to access the **Clipping** function:
 - ♦ Select both shapes and go to Object>Clip Path>Set Clip Path
 - ♦ Select the two layers and, on the **Style Panel**, change **Clipping** from **None** to **Path**:



- Unlike other path functions in SCAL (**Union**, **Intersection**, **Exclude**, etc.), the original two shapes are still intact. To restore the original shapes:
 - ♦ Go to Object>Clip Path>Release Clip Path
 - ♦ Reset the Clipping option to None on the Style Panel
 - Note that the shapes will be grouped, thus you'll need to apply **Object>Ungroup** in order to individually select one of the shapes but not the other.
- A few other things to note about Clip Path:
 - ♦ If you apply Clip Path to two <u>vector</u> shapes, both shapes will still cut out. To avoid that, select the shape that you do not want to cut, and change the Cut Line Type, on the Style Panel, to Print + Cut Print. Then apply Clip Path to the two vector shapes.



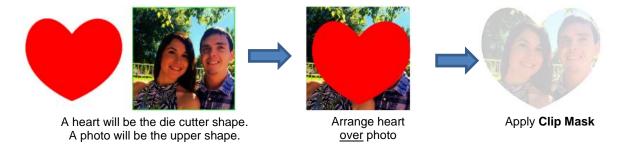
When applying the **Duplicate** or **Rotated Duplicate** function on shapes that have **Clip Path** applied, you will initially see the copies in their original "unclipped" format. But once you click on OK, the correct result will appear:



9.07.2 Clip Mask



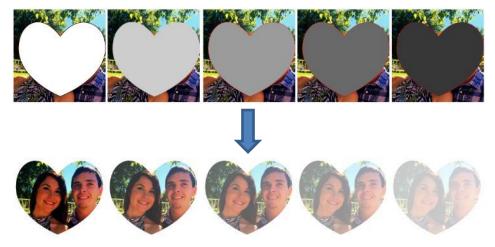
- Clip Mask is similar to Clip Path except the shape performing the die cut will alter the opacity of the other shape based on its color intensity.
- As with Clip Path the die cut shape is placed on top of the other image:



- To apply **Clip Mask** to selected shapes, either
 - ♦ Go to Object>Clip Mask>Set Clip Mask
 - ♦ Select the two layers and, on the **Style Panel**, change **Clipping** from **None** to **Mask**:



• In the following five examples, the color of the heart ranges from white to dark gray. Notice the differences in the five results after **Clip Mask** is applied:



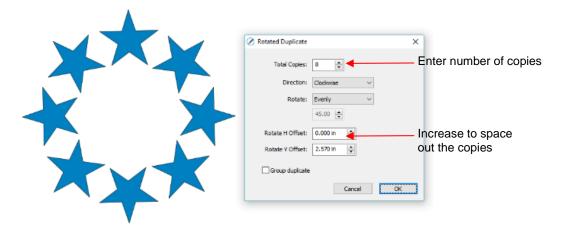
- To restore the original shapes, either:
 - ♦ Go to Object>Clip Mask>Release Clip Mask
 - Reset the Clipping option to None on the Style Panel
 - Note that the shapes will be grouped, thus you'll need to apply **Object>Ungroup** in order to individually select one of the shapes but not the other.
- The same additional things to note that applied to **Clip Path** also apply to **Clip Mask**. Refer to the last bullet in *Section 9.07.1*.

9.08 Duplicate Rotated

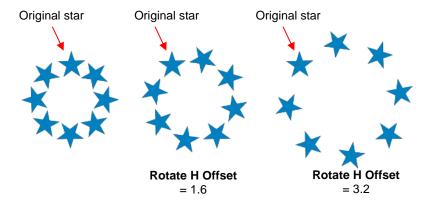
9.08.1 Duplicate Rotated Settings



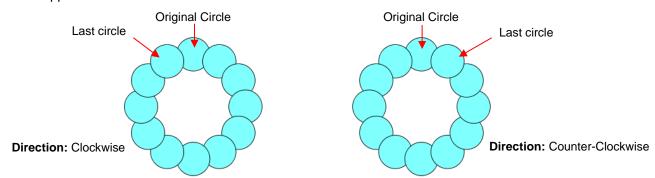
- The **Duplicate Rotated** function allows you to make duplicates arranged in a circle or partial circle pattern.
- To access Duplicate Rotated, first select the shape(s) and then use either of the following:
 - ♦ Go to Object>Duplicate Rotated
 - ♦ Press Ctrl+Shift+D
- To illustrate how this works, start with a small shape. Select it and then activate the **Duplicate Rotated** function using either of the methods just mentioned. The following window opens:



Start by increasing the number of copies. If the shapes are overlapping too much, increase Rotate V Offset which is the distance from the center. Increasing the Rotate H Offset setting shifts the center of rotation toward the right, leaving the original in the same location on the Cutting Mat:

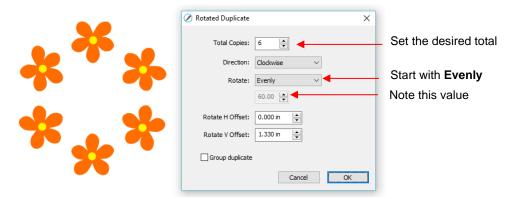


- Because the stars must spread out in order to keep the original in its same position, one can then decrease the **Rotate V Offset** at the same time as increasing the **Rotate H Offset**, if you need to spread the shapes but keep the design in the current display area of SCAL.
- ♦ The **Direction** setting changes the order of the duplicates around the circle.
 - With clockwise selected, the order of the shapes follows a clockwise progression so that the last copy is just to the left of the original at the top. You can visually see that circle is on top. The opposite is true if counter-clockwise is selected.

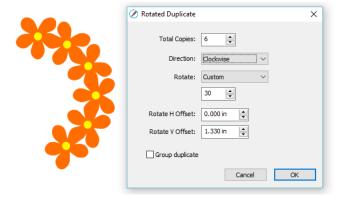


- Does it matter which **Direction** is used? Most likely, it would only matter for display or possibly in a print and cut design.
- ♦ Rotate has two options: Evenly and Custom. With Evenly selected, the copies are distributed evenly in a full 360° circle. But let's say you want a semi-circle of shapes:

 First, create a circle pattern using the desired number of shapes. Note that the greyed-out box below **Rotate** is changing as you add more shapes:



 Change the Rotate to Custom and then, because you want a semi-circle of shapes, divide that value by 2. Thus, in this example, it will be changed to 30:



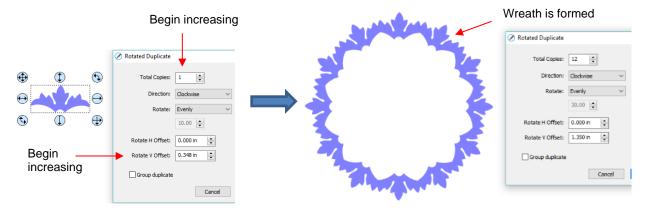
 If you want the shapes to be grouped, mark the Group duplicate box. Otherwise leave it unchecked.

9.08.2 Using Duplicate Rotated to Design a Wreath

• Begin with a desired shape. In this example, a shape from the **Library's Swirls** folder will be used.



Select and go to Object>Duplicate Rotated. Begin increasing Total Copies and the Rotate V Offset until
a desired overlapping pattern is obtained:



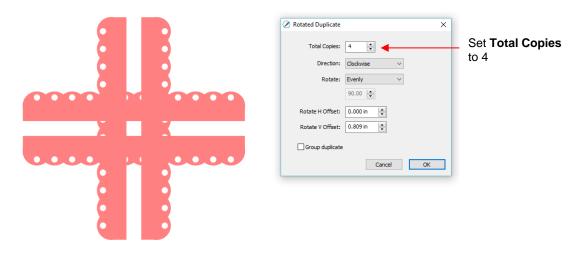
• After creating the pattern, go to Path>Union to remove the overlap and the shape is ready to cut.

9.08.3 Using Duplicate Rotated to Design a Frame

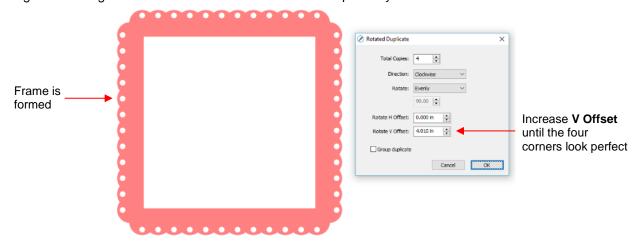
• In Section 9.06.1, the **Duplicate** and **Union** functions were used to create this scalloped border:



Select the shape, go to Object>Duplicate Rotated, and enter 4 for Total Copies:



Begin increasing the Offsets until the four corners overlap evenly:



Click on **OK** and then apply **Path>Union**.

9.09 Object on Path

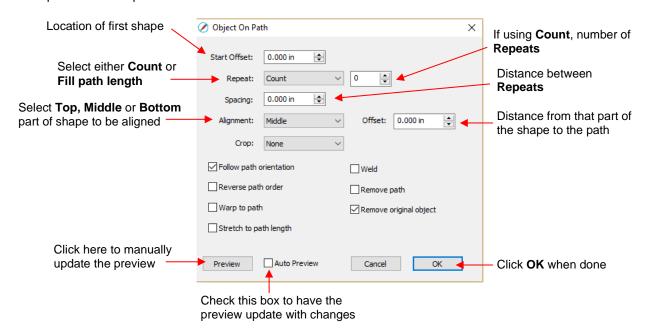
The Object on Path function can be used to align repeats of a shape along the path of another shape:



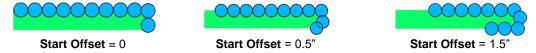
• <u>IMPORTANT:</u> Before applying the function, check the **Layers Panel** to make sure the shape to be repeated is on a higher layer than the path:



• To open the **Object on Path** window, select both the path and the shape to be repeated and go to **Effects>Object on Path**. Because there are so many settings in this window, only about half will be explained at this point:



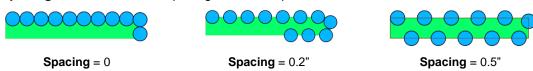
Start Offset: This is the distance from the left side of the path to the location of the first shape:



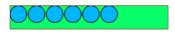
Repeat: Choose Count if you want to specify how many copies to place along the path. Choose Fill Path length if you want the program to automatically fill in the number of repeats that will fill the path using the spacing you enter:



Spacing: Enter the desired spacing between repeats:



♦ **Alignment:** This refers to the object being repeated. Choose **Top** to have the top of the shape aligned along the path. Choose **Bottom** to have the bottom of the shape aligned along the path. Choose **Middle** to have the center of the shape aligned along the path:







Alignment: Top

Alignment: Middle

Alignment: Bottom

♦ **Offset:** This is how far away from the path you want the repeats to be. For example, if you choose **Bottom** for **Alignment** and then 0.15" or 0.25" for **Offset**, then the bottom of the shapes will be 0.15" or 0.25" above the path:







Offset = 0

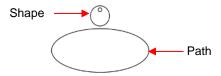
Offset = 0.15"

Offset = 0.25"

9.09.1 Designing a Scalloped Oval



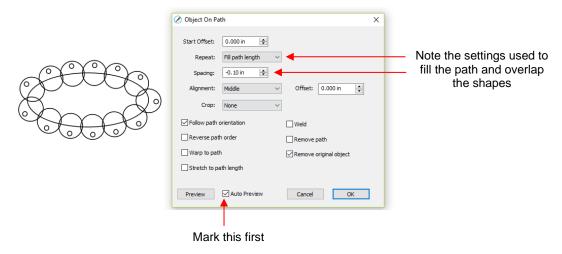
• Create an eyelet circle like the one shown in *Section 9.06.1*. Also, use the **Circle** tool to create an oval for the path:



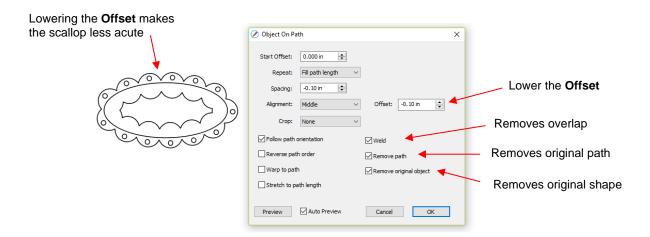
 Before using the Object on Path function, make sure the eyelet shape is above the oval path on the Layers Panel:



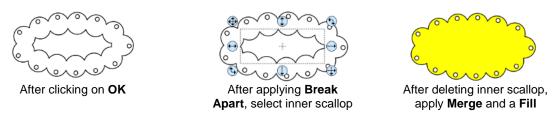
• Select the shapes and open the **Object on Path** window using **Effects>Object on Path**. Begin by marking the **Auto Preview** option so that all changes will be immediately reflected. Then choose **Fill path length** so the shapes will be distributed over the entire path. Set the **Spacing** to a negative number so that the shapes will overlap:



 Next the Offset can be decreased to soften the scallop. Also a few new settings are noted as shown and described below:



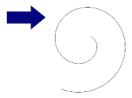
- Weld: Mark this option if you want the repeated shapes welded together, as shown in the screenshot
- ♦ Remove path: Mark this option if you will no longer need the path shape (in this case, the oval)
- Remove original object: Mark this option if you will no longer need the original shape (in this case, the eyelet circle)
- Click on OK and the scalloped oval is mostly complete. To remove the internal scallop, apply Object>Break
 Apart. Carefully select the internal scallop shape and delete. Then marquee-select the remaining scallop
 border with eyelet circles and apply Object>Merge:



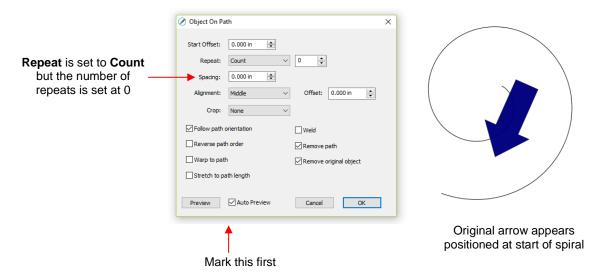
9.09.2 Warp a Shape to a Path



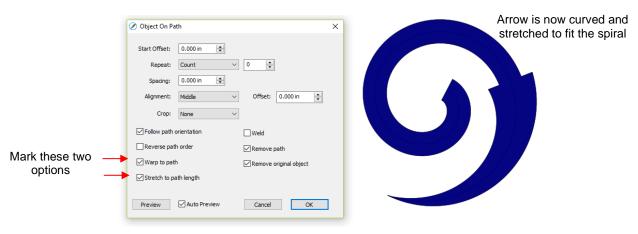
• The **Object on Path** function can also be used to stretch a shape to fit a path. For example, let's start with an arrow (from the **Library's Arrows**) and a spiral (refer to *Section 5.01.7*):



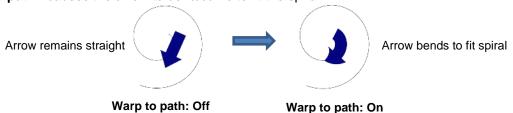
Verify that the arrow is above the spiral on the Layers Panel. Then select both and go to Effects>Object
on Path. Note that since there is only one shape involved, Repeat is left at Count and set to 0:



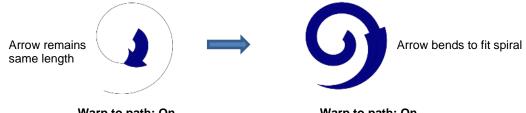
Next, two new settings are applied:



Warp to path: causes the arrow to bend/curve to fit the spiral:



Stretch to path length: causes the arrow to be elongated so that it starts and ends at the same locations as the spiral:



Warp to path: On Stretch to path length: Off

Warp to path: On Stretch to path length: On

9.09.3 Remaining Settings



• The two remaining settings in the **Object On Path** window are:

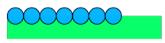
♦ **Follow path orientation:** With this setting turned on, the repeats will rotate so that they stay aligned with the path. With the setting turned off, the shapes never rotate:



♦ Reverse path order: Changes the direction the shapes are applied. With Reverse path order turned off, the shapes are applied clockwise around the path. With Reverse path order selected, the shapes are applied counter-clockwise:









Reverse path order: Off

Reverse path order: On

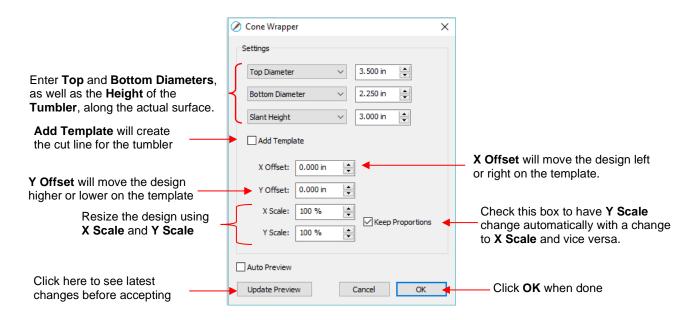
9.10 Wrapper



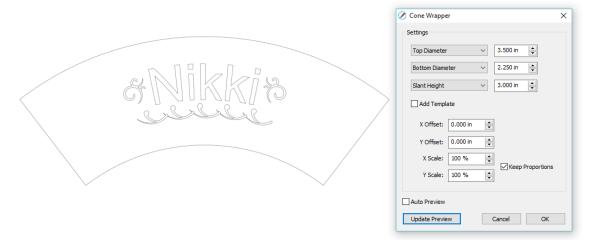
- The Wrapper feature can be used for shaping designs to fit around conical shapes in which the top is a
 different diameter than the bottom. Some typical applications include tumblers and cupcake wrappers.
- This function can be accessed by selecting one or more shapes and going to **Effects>Wrapper**. For this example, the following design was created with the intention of having it applied to a small cup:



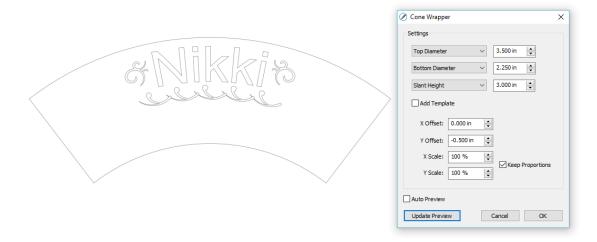
Select the design and go to Effects>Wrapper. The following window will open:



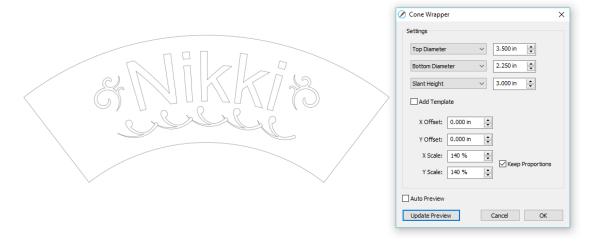
- Measure the cup: diameter of the top, diameter of the bottom, and length along the side from bottom to top. Enter those as shown in the screenshot. Alternatively, you can measure the radius or the circumference, as well as use the actual vertical height versus the slant height. These other choices are in the drop-down menus.
- Once these measurements are entered, click on **Update Preview** to see how the design will fit on the cup. Note that the design will be displayed in outline mode while working in this window:



- ♦ The template is the outside pattern based on the cup's dimensions. If you plan to cut that template, then check the box next to **Add Template**. Otherwise, it won't be on the **Cutting Mat** after you click on **OK**.
- Adjust the **X Offset** and/or **Y Offset** to move the design, if needed. For example, making **Y Offset** a negative value moves the design higher up on the template:



Adjust the X Scale and/or Y Scale to resize the design, if needed. If you want to scale proportionately, mark the Keep Proportions box:

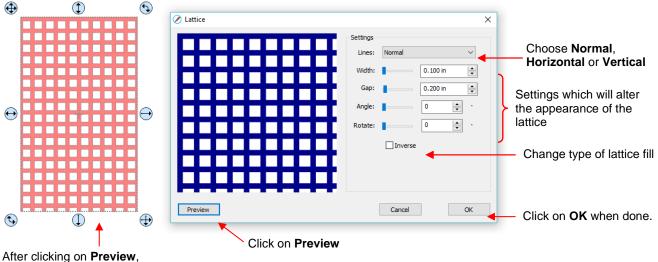


• After clicking on **OK**, the fill color returns to the design and the project is ready for completion:



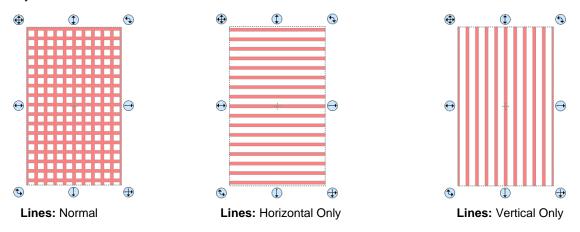
9.11 Lattice Video

- The **Lattice** feature can be used to create a lattice design within a shape or as part of the shape itself. To access this feature, select one or more shapes and then use either of the following:
 - ♦ Go to Effects>Lattice
 - ♦ Right-click and select Appearance>Lattice
- In this example, a rectangle is used to show the effects of the settings in the **Lattice** window:

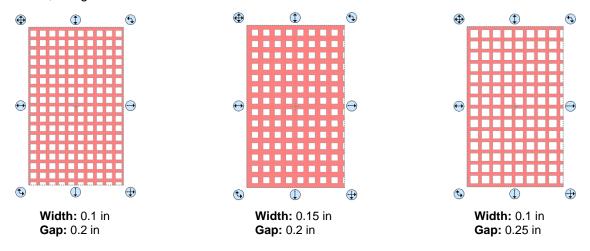


selected shape will display lattice based on current settings

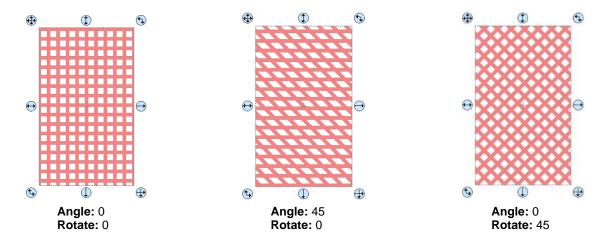
♦ Lines: Besides the traditional crisscross pattern, you can also choose to only have horizontal lines or only have vertical lines:



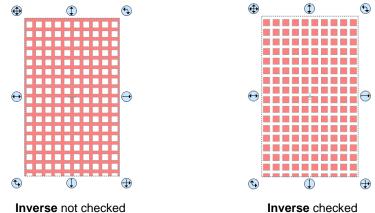
♦ Change **Width** and **Gap** to produce desired appearance. Remember that if the lattice pattern is too small, it might be difficult to cut:



♦ The **Angle** setting will skew the lattice shape while the **Rotate** setting will simply rotate the overall pattern:



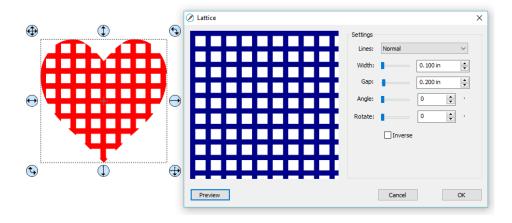
Inverse is used to create a kind of negative lattice. An example will follow later in this section:



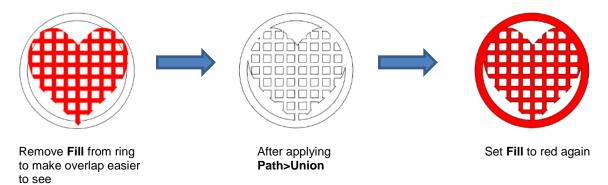
- An example of when Inverse would not be checked is when you want to attach/weld a latticed shape to something else. In the following example, a latticed heart is attached to the center of a ring:
 - ♦ A ring is created by applying **Object>Merge** to two centered circles:



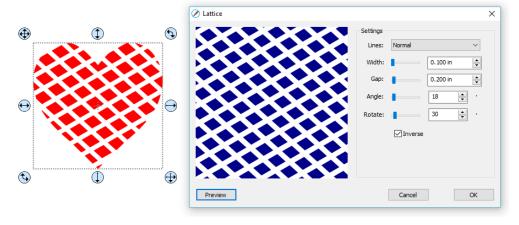
♦ Select a heart shape from the **Library** and apply **Effects>Lattice**:



♦ Align the latticed heart in the center of the ring and weld using **Path>Union**:



- An example of when **Inverse** <u>would be</u> checked is when you want a lattice aperture cut from the front of a greeting card:
 - ♦ Using the same heart as above, make sure **Inverse** is selected:



♦ Arrange the latticed heart over a base greeting card:



Select all and go to **Object>Merge**. The card is complete:



• If you have a shape that has the **Lattice** effect applied and want to remove it (even after the file has been saved and re-opened), select the shape and go to **Object>Remove Effects**.

9.12 Rhinestones

- SCAL's Rhinestones feature provides both outlining and horizontal fill of shapes with the size of circles
 needed for your rhinestones and the desired spacing. After selecting a shape, the feature can be accessed
 in either of the following ways:
 - ♦ Go to Effects>Rhinestones
 - ♦ Right-click and select Appearance>Rhinestones

9.12.1 Guidelines for Rhinestone Pattern Design



- There are some guidelines to follow when designing a rhinestone pattern:
 - In general, you want to size the shape before applying the rhinestone circles. If you later want to resize the design, SCAL does have the ability to regenerate the rhinestone pattern, maintaining the original selected stone size and spacing. But in order to have a good sense of how the design is going to appear on your garment and to make sure the lettering is readable, you want to design close to the target size.
 - ♦ IMPORTANT: Always make a backup copy of your design before entering the Rhinestone window because the original design will be replaced with the new rhinestone pattern. You might later want to use that same original design but apply a different size rhinestone or create a shadow layer from it, or some other change.
 - ♦ The circle size selected will need to be larger than the stone size you purchase. As a general rule, select a size three numbers larger than your stones. Thus, if you purchased SS10 stones, then in the rhinestone design window, you would select SS13 stones. This larger size will allow the SS10 stones to more easily brush into the holes, saving a lot of time and tedium.
 - When selecting a font to use, be leery of "fancy fonts." You want the lettering to be readable after it is converted to circles. When in doubt, have someone who doesn't know the words you've used attempt to read the rhinestone design on your monitor or from a printout of the design. If they cannot easily decipher the words, then try a more basic font.
 - ◊ If you plan to do a lot of rhinestone applications, create and cut a template with small patterns (~ 15 20 circles) in different sizes so that you can test brush your rhinestones to find out the optimum size to use when designing. A difference of just 0.1 or 0.2 mm can affect how easily the stones will brush into a pattern right side up. If the size is too small, the stones will tend to not fall in. If the size is too large, then the ones that land right side up will tend to get flipped over by the brush. Also, stones can vary slightly in size from one manufacturer to the next and also from one color to the next. Further, the size of the cut holes can vary slightly from one template material to the next.

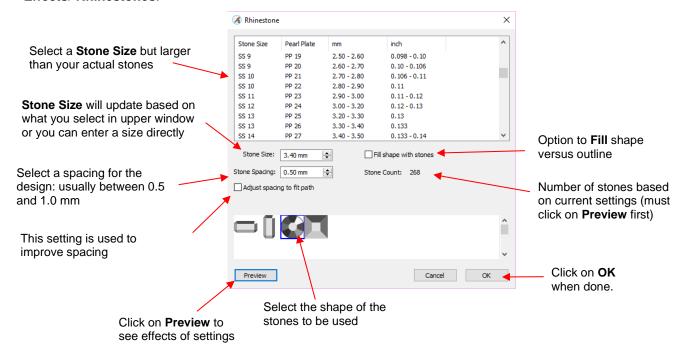
9.12.2 Rhinestone Outline



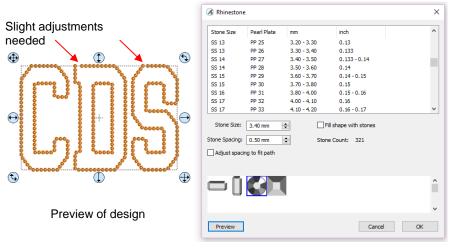
• In this example, the initials from a high school will be outlined. As mentioned previously, the first step is to size the width and height of the design. Make sure there is enough space between the letters so that the circles will not overlap. Also, you may want to resize the lettering vertically, leaving the width the same. This will better fill a T-shirt, allow more circles to be applied, and will improve the readability of the design:



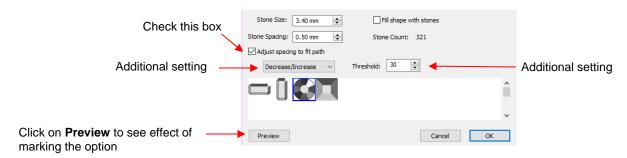
 To apply a rhinestone outline, first make a backup copy of the shape. Then select the shape and go to Effects>Rhinestones:



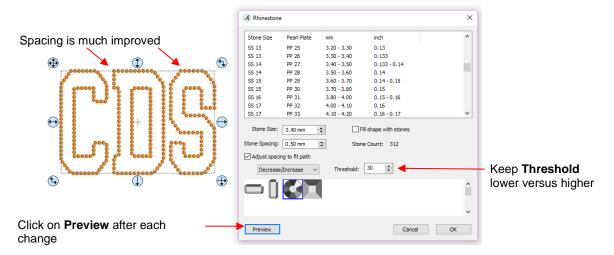
 After inputting the initial settings, click on **Preview** and your selected design will be outlined with simulated stones:



• The preview shows that the spacing is off a bit at the top of the "D" and the "S". There is an option which can be used to make adjustments. Check the box next to **Adjust spacing to fit path** and additional settings will appear:



 These settings will require experimenting in order to optimize equal spacing between the stones. Initially, however, just click on **Preview** after marking the box and the spacing should change. This is often all that is required. However, from the drop-down menu, you can also choose to only **Decrease** or only **Increase** the spacing. The **Threshold**, which controls how much spacing will be used, is also available to adjust.

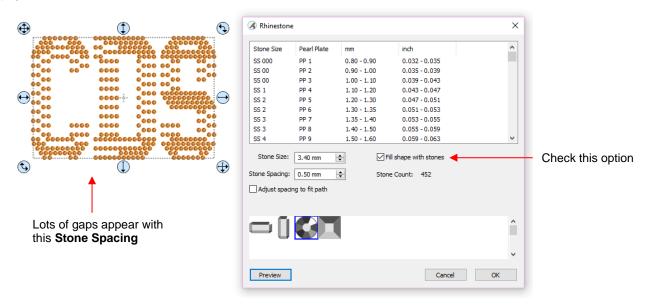


- Note that the higher the **Threshold**, the more increase in spacing you may see. So typically you want to keep that value lower versus higher.
- If additional stone-by-stone editing will be needed, note that the simulation will initially be lost. If you want to restore it, write down the **Stone Size** before clicking on **OK**. Also note, however, that the simulation is not needed when cutting the design from your template material. For guidelines on editing, refer to *Section* 9.12.4.

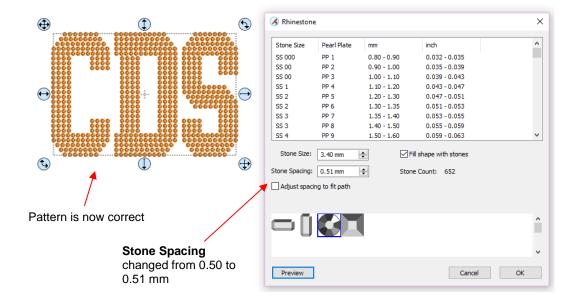
9.12.3 Rhinestone Fill



Another option in the Rhinestone window is Fill shape with stones. Instead of outlining the shape, the
image will be filled with circles in horizontal rows. In our prior example, the same letters will now appear like
this:



 The gaps in the design can be easily corrected by adjusting the **Stone Spacing**. Instead of 0.50, the spacing is increased slightly to 0.51 mm. The result is a complete correction of the spacing and the design looks great:

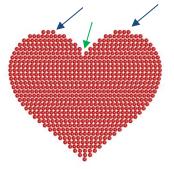


- Also, note the increase in the number of stones as a result of switching to a line fill. Rhinestones are
 typically sold by the gross and 1 gross equals ~ 144 stones. Thus, this design would require over 5 gross of
 stones compared to just under 2 gross for the outline version.
- As with the outline option, any stone-by-stone editing will cause a loss of the simulation. If you wish to restore the simulation after editing, <u>write down the **Stone Size** before clicking on **OK**</u>. Also note, however, that the simulation is not needed when cutting the design from your template material. For guidelines on editing, refer to the following section.

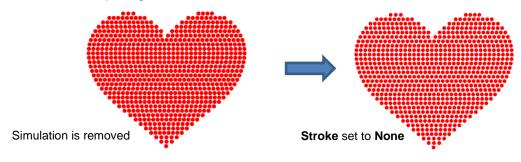
9.12.4 Editing Rhinestone Designs



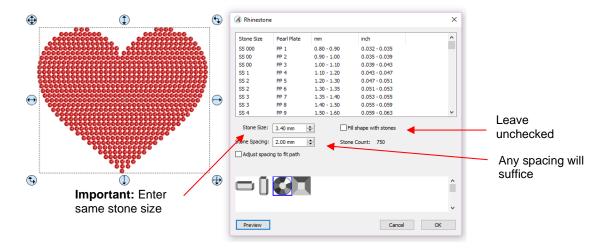
- Before editing, make a backup of the design created by the Rhinestone function. As was mentioned earlier
 you can resize rhinestone designs but if certain editing has occurred, you might or might not get the results
 you want after editing.
- Rhinestone designs will sometimes need "tweaking" which involves adding, deleting, moving, or re-spacing circles. In the following example, there are two corrections required:
 - 1. The blue arrows indicate the top row on each side does not contain the same number of circles.
 - 2. The green arrow indicates a gap in that row that can easily be corrected.



• The first step is to break the design so that a row of circles or even individual circles can be moved. Select the pattern and apply **Object>Break Apart** or **Ctrl-B**. You may wish to turn off **Stroke** to have a better sense of the actual spacing:



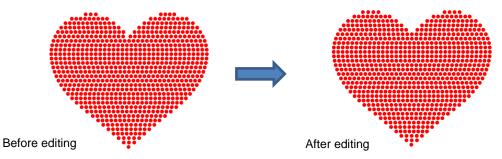
- The simulation can be restored now or after editing or not at all. The circles will still remain as individual
 shapes. Again, this does not affect how the design cuts; the simulation is only for displaying or printing. If
 the design is extremely large or you have a slow computer, you may find that the simulation causes more
 lagging as you are editing the design. In that case, save the following step until after editing is completed.
- To restore the simulation, select the design and reopen the Rhinestone window. Enter the same Stone
 Size setting used to create the design. Note that the Spacing doesn't matter any longer, nor is it necessary to select the Fill option:



- Click on **OK** and the simulation will return. But you will now be able to individually select stones and move them or delete them.
- The following list shows the most common functions applied when editing rhinestone designs:
 - Use the **Zoom** functions (Section 3.09) to move in close for easier selection of individual or small groups of circles
 - ♦ Use the **Lasso Selection** tool (Section 5.02.2) to more easily select a group of circles
 - ♦ To quickly add a circle, hold the **Alt** key and left click once on a circle. A duplicate is created in the same spot.
 - ♦ To delete multiple circles, hold the **Delete** key while clicking on individual circles
 - Use the Nudge arrow keys on the Position & Size Panel to move circles to new locations
 - ♦ Alternatively, use the arrow keys on your keyboard to move a circle or row of circles. If needed, change the increment to 0.01" (0.25 mm) by going to **Edit>Preferences** (or, on a Mac, press **Command + ,**). Then click on the **Edit** tab and change the **Arrow Key Increment**, as shown here:



- ♦ To realign a row or column of circles, use the alignment functions covered in Section 5.18.2.
- ♦ To respace a row or column of circles, use the spacing functions covered in Section 5.19.2.
- In the heart example, an additional heart is added at the top to balance the two sides. Also, the sixth row of circles are selected and **Distribute Center Horizontally** is applied:

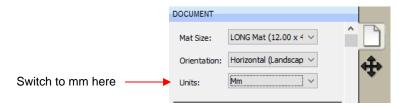


- Sometimes the circles you want to re-space equally may fall closer to a 45^o angle versus vertically or horizontally. Select your entire design and rotate until the line of circles is closer to vertical or horizontal. Re-space the circles and then rotate back into place.
- After editing the design, you may wish to group the design to avoid inadvertently moving one or more stones
 out of place. To do that select the design and go to **Object>Group** or apply **Ctrl+G**.
- If you have a shape that has a **Rhinestone** effect applied and want to remove it (even after the file has been saved and re-opened), select the shape and go to **Object>Remove Effects**.

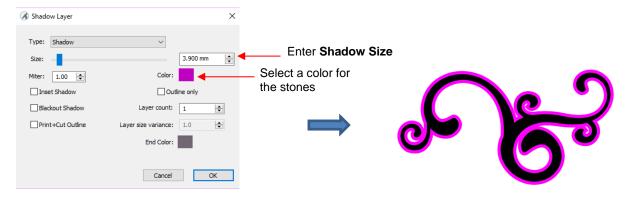
9.12.5 Adding an Outline to a Rhinestone Design



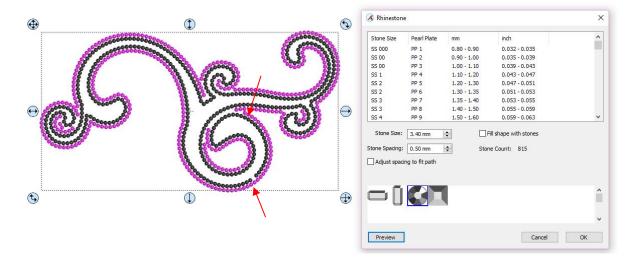
• If you want to outline your design, then create the outline first using the **Shadow Layer** function (*Section 9.05*). Choose a **Shadow Size** at least the size of the circles plus the spacing. Otherwise, the stones will overlap. Since rhinestone design programs work in metric, it's easier if you temporarily change the units in SCAL to mm. This setting is on the **Document Panel**:



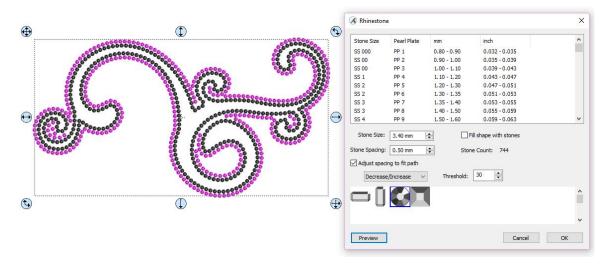
For the following example, a swirl design from the Library is added to the Cutting Mat and sized for a T-shirt. The same settings for SS 10 stones will be used - the circles will be 3.4 mm in diameter and the spacing will be 0.5 mm. Thus, the Shadow Size needs to be 3.9 mm:



- Note: this was the **Shadow Size** to use <u>if the same size stones are used</u> for both the original design and the shadow layer. At the end of this section, the **Shadow Size** formula is shown for the situation when the stones are not identical in size.
- Next, select the design and the shadow and make a backup copy. Then go to the **Rhinestone** window.
 Since the same settings will be used for both the original design and the outline, both can have the rhinestone effect applied in the same step:



• The red arrows indicate that the spacing should be adjusted. In this case the **Adjust spacing to fit path** was again used to improve the design:



• However, additional editing is needed to improve the overall look. After removing some of the circles, the final design is ready to cut:



- If the stones are not the same size, the average should be used, plus the spacing:
 Shadow Size = (Size of circle for smaller stone + Size of circle for larger stone) / 2 + Spacing
 - ♦ Thus, if the circle sizes were 3.4 mm and 4.6 mm, with a desired **Spacing** of 0.5 mm, then:

Shadow Size =
$$(3.4 + 4.6) / 2 + 0.5$$
 mm
= $8.0 / 2 + 0.5$
= 4.5 mm

Note that this is the same calculation if the outline is using the smaller circles or the larger circles.

9.12.6 Using Purchased Rhinestone Fonts and Designs



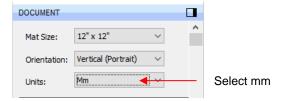
- One of the best investments you can make if you are planning to do a lot of rhinestone applications is to buy files instead of trying to make your own. While the disadvantage is that you will be somewhat limited in the sizing of the final design, the time-saving advantage can make it well worth the cost.
- This section will explain how to properly size a purchased font. The same technique would be used with a
 design. You can find beautiful rhinestone designs and fonts at the following two web sites:
 - ♦ Synergy 17
 - ♦ The Rhinestone World
- The first step with a rhinestone font is to install it the same way you would install any TTF font on your computer. Then open SCAL and the font should appear in your font menu.
- Enter text using the same method with any font. This was presented in *Section 6.04.1*. In this tutorial, the phrase "Irish at Heart" will be typed out in a rhinestone font called *Dreamer*.

Irish at Heart

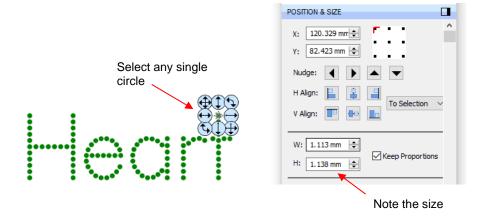
• If the circles seem too close together, set the **Stroke** to **None** on the **Fill & Stroke panel**:

Inshall ear

 Remember that it's pointless to resize the design. The goal is to scale it so that the circles will be the correct size for the rhinestones you plan to use. Since rhinestone designing typically uses mm for measurement, change the **Units** to **mm**. Later you can switch back to inches, if needed, to know how large the final design will be at the size of rhinestones you'll be using:



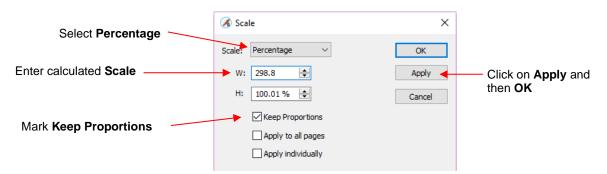
To find out what size these circles are, select the text and go to Object>Break Apart. Then select just one circle and check the size on the Position & Size Panel:



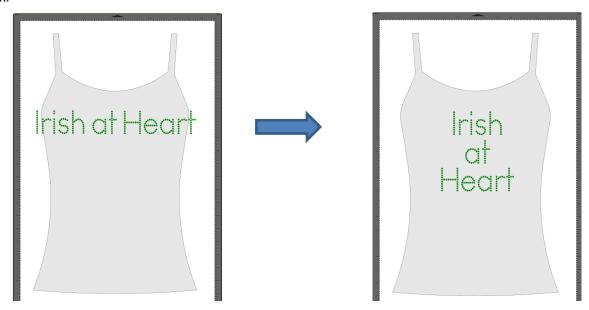
• The circle size in this case is 1.138 mm but let's say the size needs to be 3.4 mm in order for the template holes to work with the SS10 rhinestones purchased. The **Scale** factor is always calculated as:

Size Needed divided by Current Size multiplied by 100

- \Diamond Thus, in this case, the **Scale** = 3.4 divided by 1.138 times 100 = 298.8 %.
- To now scale the phrase to the correct size, select all of the wording and go to Object>Transform>Scale.
 In the window that opens, switch to Percentage, make sure the Keep Proportion option is marked, enter the Scale calculated and then click on Apply:



- The text is resized. You can then select a single circle and verify the new size is what you need (3.4 mm in this example) or within several hundredths of a mm.
- If you normally work in inches, switch back to inches to check the final size of your design to make sure it will fit onto your shirt or other medium. In this case, the phrase is now over 12" in width and will not fit onto the shirt in this arrangement. However the words can be arranged in a different manner and the design will work:

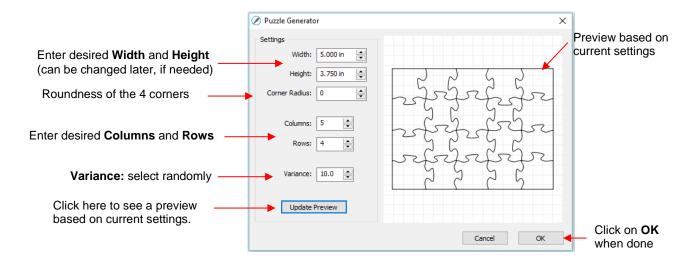


- The other alternative would have been to use size SS8 or size SS6 stones instead.
- Resizing patterns involves the same process. Insert the purchased file, Break Apart, determine the size of
 a circle and then calculated the needed Scale factor. Use the Scale window to resize the design and
 determine if it will work with the size of stones you plan to use.

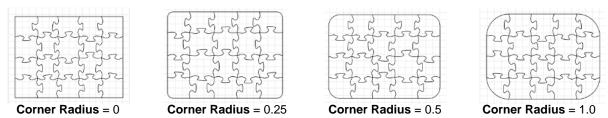
9.13 Jigsaw Puzzle



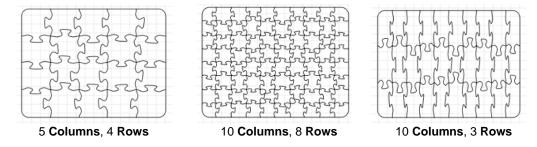
The Jigsaw Puzzle feature will generate a rectangular jigsaw pattern with a number of options from which
to choose. To open the window, go to Effects>Puzzle Generator:



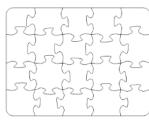
- Width and Height: If you plan to apply this puzzle over a specific image, you may want to choose dimensions that correspond to your image. For example, let's assume you have a photo that is 5" x 3.75" and plan to make a print and cut jigsaw puzzle. Enter those dimensions into the **Puzzle Generator**, as shown in the prior screenshot.
- **Corner Radius:** With a setting of 0, the corners of the rectangle are 90°. If you want rounded corners, increase this setting:



Columns and Rows: To keep the shapes from becoming too distorted, make the number of Columns and Rows similar to the dimensions. If you want more pieces, then increase the number of Columns and Rows proportionately. For example, instead of having 5 Columns and 4 Rows, double the number to 10 Columns and 8 Rows. But don't use, for example, 10 Columns and 3 Rows with these dimensions:



- Variance: This setting can be used to make sure one puzzle is not identical to the next, if all other settings are the same.
- When you are satisfied with the appearance of your puzzle pieces, click on **OK** and the puzzle will be on the **Cutting Mat**:

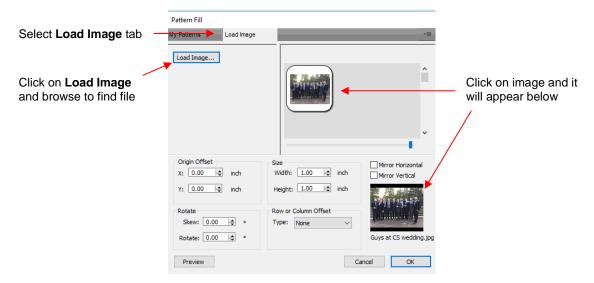


For a print and cut application:

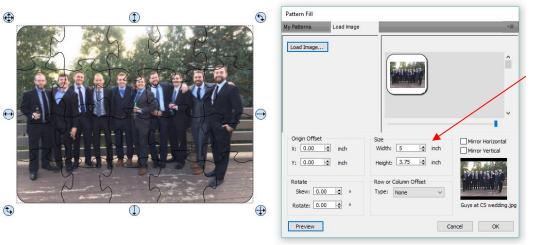
♦ Select the shape and, on the **Fill & Stroke Panel**, select **Pattern** from the **Fill** menu:



♦ The **Pattern Fill** window will open. Click on the **Load Image** tab and then click on the **Load Image** button to browse and find the image you want to use. It will then appear on the right side and can be selected:



Enter the same **Size** (**Width** and **Height**) used when the jigsaw pattern was created and then click on **Preview**:



Enter same dimensions as were used in the **Generate Puzzle** window

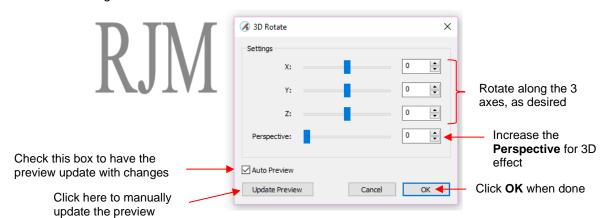
♦ Click on **OK** and the jigsaw puzzle is ready for a print and cut application:

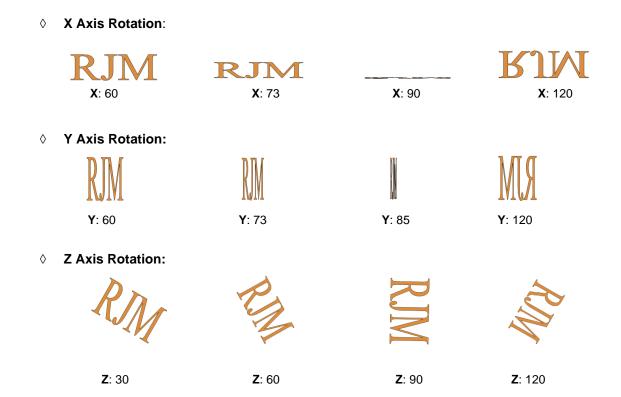


9.14 3D Rotate



• The **3D Rotate** function is used to rotate a shape along the X, Y, and/or Z axis. To access this function, select a shape and go to **Effects>3D Rotate**. In the following example, text will be used to show the effects of the settings:





Perspective: This is where the fun begins. Combining this setting with another rotation provides the 3D illusion. Here are examples:



X: 0 Y: -50 Z: 0 Perspective: 65



X: 0 Y: 50 Z: 0 Perspective: 65



X: 50 Y: 0 Z: 0 Perspective: 100

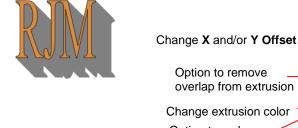


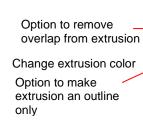
X: -26 Y: 26 Z: -20 Perspective: 100

9.15 3D Extrude (SCAL PRO only)

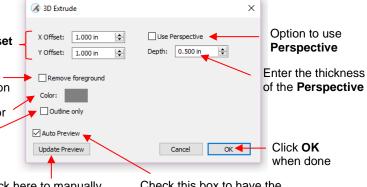


The 3D Extrude is used to create the illusion of a shape being pushed or thrust outward. To access this function, select a shape and go to Effects>3D Extrude. In the following example, text will be used to show the effects of the settings:





Click here to manually update the preview



Check this box to have the preview update with changes

X Offset: Increasing X Offset will extend the extrusion to the right while decreasing it will retract the extrusion towards the left. Note that Y Offset has been set to 0 and Depth is at the default of 0.5:



X Offset = 0.25Y Offset = 0



X Offset = 0.35Y Offset = 0



X Offset = -0.25Y Offset = 0



X Offset = -0.35Y Offset = 0

Y Offset: Increasing Y Offset will extend the extrusion downwards while decreasing it will retract the extrusion towards the top. Note that **X Offset** has been set to 0 and **Depth** is at the default of 0.5:



X Offset = 0Y Offset = 0.25



X Offset = 0Y Offset = 0.35



X Offset = 0Y Offset = -0.25



X Offset = 0Y Offset = 1.0 **Depth:** Adds the actual 3D effect by increasing the extension of the extrusion:



X Offset = 0.35Y Offset = 0.35**Depth** = 0.25



X Offset = 0.35Y Offset = 0.35Depth = 0.5

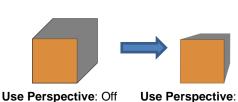


X Offset = -0.35Y Offset = -0.35**Depth** = 0.25



X Offset = -0.35Y Offset =-0.35Depth = 0.5

Use Perspective provides a vanishing point effect:







Use Perspective: Off Use Perspective: On

Remove Foreground:

With this option off, when you separate the shape from the extrusion, you see that the extrusion is filled beneath the original. In other words, in a paper piecing or layered vinyl project, the original shape would need to be aligned over the top of the 3D extrusion:



With Remove Foreground checked, the original shape will be cut away from the extrusion. This would be the typical choice when layering HTV where some types cannot be pressed on top of each other (such as glitter HTV):



Color: Clicking on the colored box to the right of Color will allow you to select the color of your choice for the extrusion.



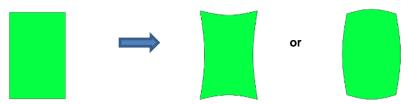
Outline Only: If you prefer the extrusion not have a Fill color, select this option. The outline color will be that of the **Color** you selected in the **3D Extrude** window:



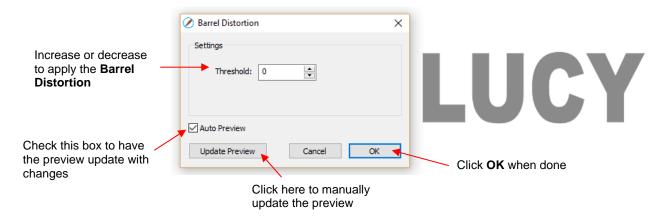
9.16 Barrel Distortion



• The **Barrel Distortion** feature will warp a shape by narrowing or thickening the middle part of the shape:



• In the following example, text will again be used to show the effects of the settings. To open the **Barrel Distortion** window, select the text and go to **Effects>Barrel Distortion**:



As you increase the Threshold, you will see a narrowing of the shape in the middle:



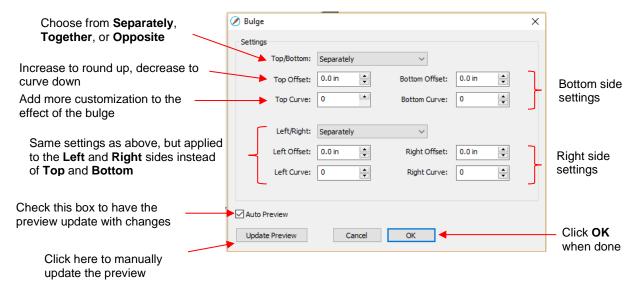
• As you decrease the **Threshold**, you will see a thickening of the shape in the middle:



9.17 Bulge



- The **Bulge** feature allows you to apply various expanding or shrinking distortions to a shape. These distortions can be applied to the top side of the shape, the bottom side, or both. They can be applied to the left side, the right side, or both. And the distortions can be expanding on both sides, shrinking on both sides, or a combination.
- To open the Bulge window, select the shape and go to Effects>Bulge:

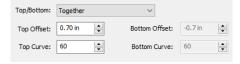


- In the top portion of the window are settings for applying **Bulge** to the top or bottom of a shape. The **Top/Bottom** setting allows you to choose if you want to apply the settings in one of three ways:
 - Separately: The Offset and Curve settings can be different for the top versus the bottom



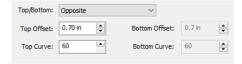


♦ Together: The Offset and Curve settings will be applied equally to both the top and the bottom. In this case the Bottom Offset and Bottom Curve settings will be grayed out.





Opposite: The Offset and Curve settings will be applied opposite to one another on the top and the bottom. In this case, the Bottom Offset and Bottom Curve settings will again be grayed out.





• The **Top Offset** rounds the top side of the shape up or down depending on whether a positive or negative value is applied. The **Bottom Offset** does the same, but applies it to the bottom side of the shape:



Top Offset = 1.0 Bottom Offset = 0



Top Offset = 0.0Bottom Offset = 1.0



Top Offset = 2.0 Bottom Offset = 0



Top Offset = 0.0 Bottom Offset = 2.0



Top Offset = -0.5 Bottom Offset = 0



Top Offset = 0.0**Bottom Offset** = -0.5

• The **Top Curve** setting will alter the roundness of the **Top Offset** to add even more customization to the **Bulge** effect. Likewise, the **Bottom Curve** setting does the same to the **Bottom Offset**:



Top Offset = 1.5 Top Curve = 0



Top Offset = 1.5 **Top Curve** = 50



Top Offset = 1.5 **Top Curve** = 90

TEDDY

Bottom Offset = 1.5 **Bottom Curve** = 0 TEDDY

Bottom Offset = 1.5 **Bottom Curve** = 50 TEDDY

Bottom Offset = 1.5 **Bottom Curve** = 90

- The **Left/Right** settings all work in the same manner, except they affect the shape horizontally versus vertically. Here are some examples similar to the prior **Top/Bottom** ones:
 - ♦ Left/Right: choose from Separately, Together, or Opposite:

LEG

LEG

LEO

Separately

Together

Opposite

Effect of Left Offset and Right Offset:

LEO

Left Offset = 1.0

TEO

Left Offset = -1.0

LEO

Right Offset = 1.0

Effect of Left Curve and Right Curve:







Left Offset = 1.0 Left Curve = 50 Left Offset = 1.0 Left Curve = 90 Right Offset = 1.0 Right Curve = 75

Or just have some fun with it:



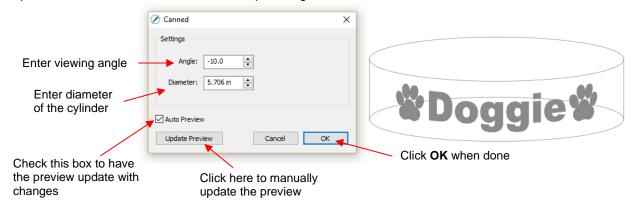
9.18 Canned



• The **Canned** effect will curve lettering as if it were wrapped around a cylinder (can) and viewed at an angle:



To open the Canned window, select the shape and go to Effects>Canned:



 Decreasing the Angle setting (i.e. making the setting more negative) will increase the perspective and cause a greater roundness to the lettering.







Angle = -10

Angle = -45

Angle = -90

• Increasing the **Angle** has the opposite effect. At an **Angle** of 0, the lettering is horizontal. A positive **Angle** setting results in curving the lettering in the other direction:







Angle = 0

Angle = 45

Angle = 90

 The Diameter of the cylinder can be increased or decreased, as well. A larger Diameter, applied at the same Angle, will lessen the roundness, while a smaller Diameter will increase it.







Angle = -30Diameter = 3.0 **Angle** = -30 **Diameter** = 7.5

Angle = -30Diameter = 3.5

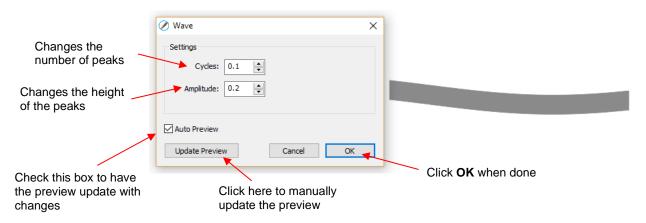
9.19 Wave



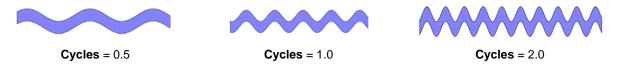
• The **Wave** function will transform any shape into a wave:



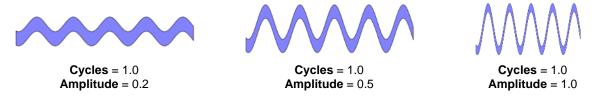
To open the Wave window, select a shape and go to Effects>Wave:



• Increasing Cycles adds more peaks along the shape:



• Increasing Amplitude make the peaks higher:



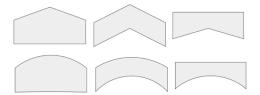
• The Wave function can be used on text to achieve this effect:

Twinkle Twinkle Little Star Twinkle Twinkle Little Star

9.20 Bridge Warp



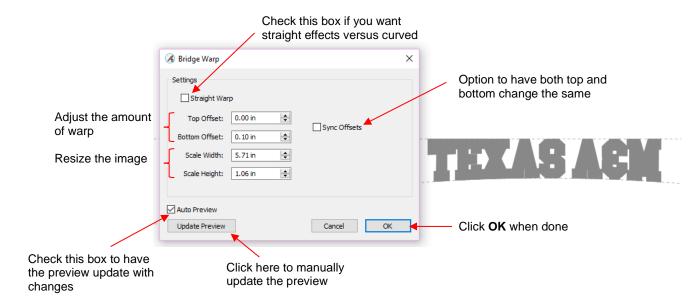
The Bridge Warp function will transform shapes into the following styles:



• For this example the following text will be used:



To open the Bridge Warp window, select the shape and go to Effects>Bridge Warp:



Increasing Top Offset warps the top of the shape:







Top Offset = 0.3 in

Top Offset = 0.6 in

Top Offset = 1.0 in

• With these same settings, note the difference if the **Straight Warp** setting is marked:



Top Offset = 0.3 in

Top Offset = 0.6 in

Top Offset = 1.0 in

• In a similar way, when **Bottom Offset** is increased the bottom is warped:



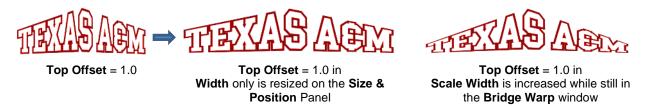
If the Sync Offset option is checked, then both the top and the bottom will be warped together:



With both the Straight Warp and Sync Offset options marked, then these are results with the same settings:



• Finally, there is a **Scaling** setting which can be used to rescale and, essentially, exaggerate the effect of the warp. Notice the difference between using Bridge Warp to rescale the width versus simply resizing to the same width normally:



♦ The two examples on the right have the same overall width and height, but the lettering from scaling in the **Bridge Warp** window is compressed more towards the two ends

9.21 Drop Shadow



The Drop Shadow function is yet another way to produce a 3-dimensional shadow effect:





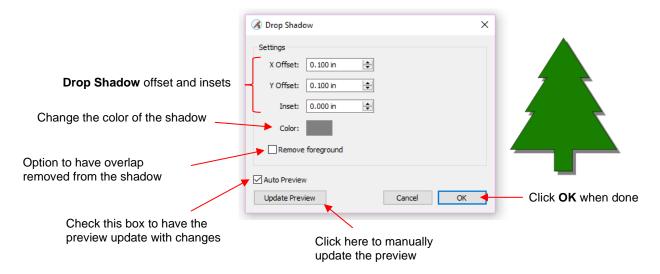




For this example the following shape from the Library will be used:



• To open the **Drop Shadow** window, select the shape and go to **Effects>Drop Shadow**:



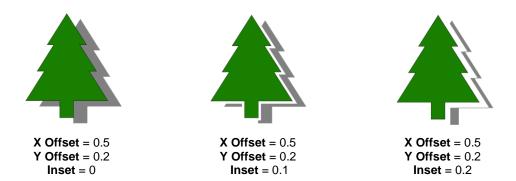
• Increasing X Offset moves the shadow to the right, while decreasing it moves the shadow to the left:



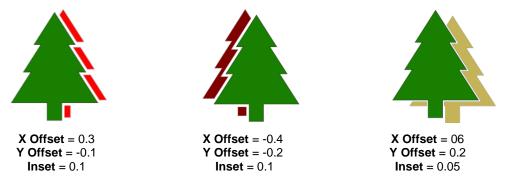
• Increasing Y Offset moves the shadow down, while decreasing it moves the shadow up:



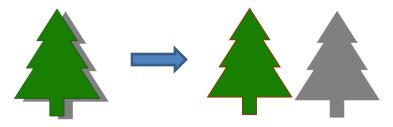
The Inset option can be used to create a gap between the original and the shadow, similar to the Knock
 Out function in SCAL:



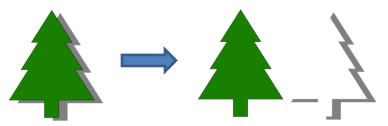
• The color of the shadow can be changed by clicking on the color box next to **Color** and then selecting any available color or entering actual color values. The following three samples are just a few of the thousands of possibilities:



- The **Remove foreground** option is the same as that used in the **3D Extrude** function. It removes the overlap so that one piece is not covering the other. This option is obviously not needed when the **Inset** value is greater than 0.
 - ♦ Remove foreground not marked:



♦ Remove foreground marked:

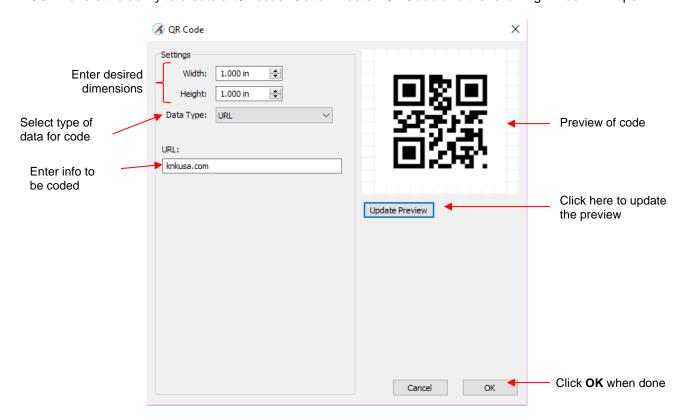


9.22 QR Code **Video**

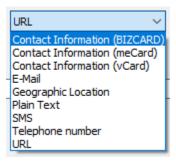
A Quadratic Response Code is a machine-readable optical label that contains information about the item
to which it is attached. They have become quite commonplace in product advertising. One can download
free apps for smart phones and tablets to scan these codes with a camera to obtain that additional item of

information about the product. For example, if a web site link is encoded, then the app will pop up that link and you can then click on it to be taken to the web site.

• SCAL offers the ability to create a QR code. Go to Effects>QR Code and the following window will open:



• Enter the dimensions for the code and select the **Data Type**, which includes the following options:

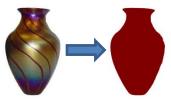


- Each Data Type has its own specific fields to complete. In some cases, like the URL option, there is only
 one field. In a case such as the Contact Information options, more data fields are provided.
- <u>IMPORTANT!</u> Once data is entered, you must click on **Update Preview** to generate the correct QR code. Note that if you have a QR code app on your phone you can launch it, hold the phone up to your monitor so that the camera can scan the code, and immediately verify that the information you entered correctly appears.
- After clicking on **OK**, the QR code appears on the **Cutting Mat**. It can now be used as needed, including being exported in any of the available file formats.

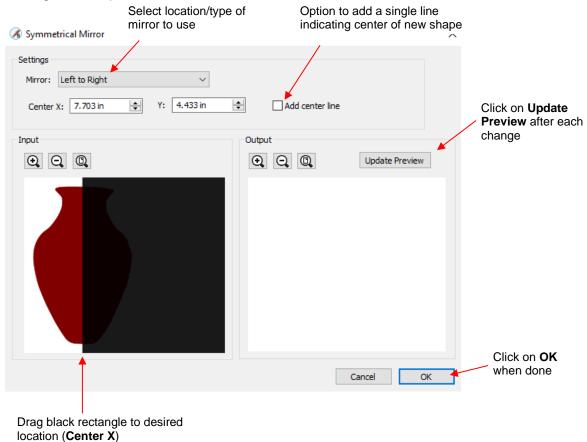
9.23 Symmetrical Mirror



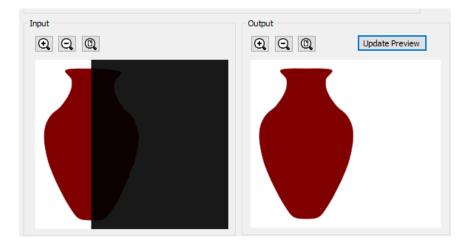
 The Symmetrical Mirror function creates a symmetrical copy of a selected shape and welds that copy onto the original. • For example, when tracing symmetrical images, the resulting trace may not appear perfectly symmetrical when can then appear unbalanced and unappealing. For example, here is a trace of a vase from a photo:



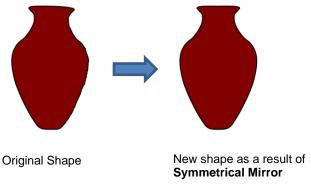
- Notice how the left side traced nicely but the right side isn't smooth and, overall, the vase doesn't appear symmetrical.
- To use Symmetrical Mirror to correct this image, select the traced shape and go to Effects>Symmetrical Mirror. The following window opens:



- Mirror: the default is **Left to Right** which is the correct option for this example since the right side is the half that needs to be replaced. Other options include **Right to Left**, **Top to Bottom**, and **Bottom to Top**.
- Center X and Y: You can manually enter the location for the mirror to be positioned. The default is the center of the currently-selected shape, but that can be changed to any location along the shape. Note that you can also drag the edge of the black rectangle to move the mirror, as well.
- ♦ Update Preview: Click on this button right away so that you can see how the current settings will change the shape:



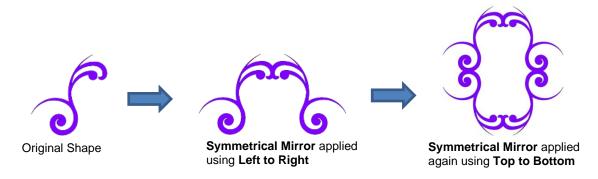
- ♦ Zoom tools can be used on either or both of the Input and Output views to more accurately position the mirror and to verify the resulting shape is what you need it to be.
- Add Center Line: This will add a single line at the location of the mirror. This line might be needed as either a cut line or a fold line, depending the application for the design.
- When you are satisfied with the image in the Preview window, click on OK and the new shape will replace the prior one on the Cutting Mat:



• **Symmetrical Mirror** can also be used in designing. The following shape was created by welding several flourishes together from the *Swirl* folder in the **Library**:



♦ **Symmetrical Mirror** can be used to expand this one element into more designs:

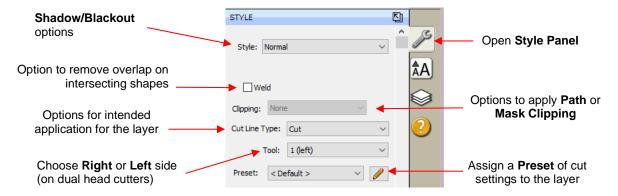


10. SCAL: Output

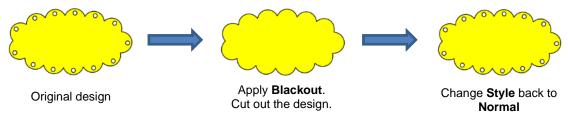
10.01 The Style Panel



- The Style Panel has various settings that are typically, but not necessarily, applied for the purpose of cutting and printing:
 - ♦ Set a contour cut (**Shadow**)
 - ♦ Remove any interior shapes (Blackout)
 - ♦ Apply a weld (Union) on any overlapping shapes (only applied during printing and/or cutting)
 - ♦ Assign an intended use for the layer (called Cut Line Type)
 - ♦ Assign a layer to a particular tool (for cutters with more than one head)
 - ♦ Assign **Presets** to a layer (for **Cut by Layer** applications in SCAL5 Pro)
- To open this panel, click on the Style icon on the Properties Panel:

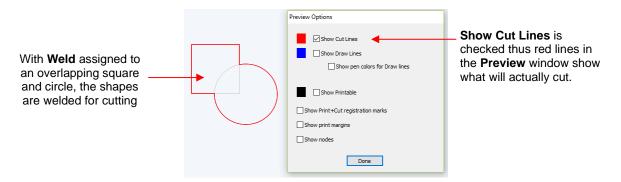


- **Style**: In this menu are various combinations of **Shadow** and **Blackout** applications. Refer to *Section 9.05* for instructions and examples. Note, however, that if you later change your mind and you haven't applied any subsequent changes (such as those in the **Path** menu), then re-selecting **Normal** from the **Style** dropdown menu will restore the original style.
 - ♦ For example, let's say you've applied **Blackout** to a shape and then cut it out. You can now select that same shape and return the style to **Normal**:



- Weld: This option applies the Union function (refer to Section 9.06.1) to any overlapping shapes.
 - Note that if the shapes are on different layers, the **Weld** option needs to be marked on each layer.

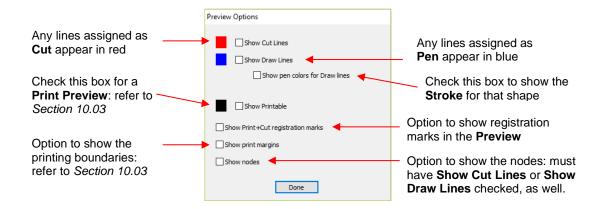
As mentioned before, settings in the **Style** window do not become permanent changes to the shapes on the **Cutting Mat**. However, you can verify the **Weld** effect by clicking on the **Preview** icon on the **Toolbar** (for more details on **Preview**, refer to *Section 10.02*):



- **Clipping**: options are available for either **Clip Path** or **Clip Mask**. Refer to Section 9.07. The clipping is only applied during the cutting process.
- Cut Line Type: There are five options in this menu:
 - Cut: choose this option for regular cutting. Because this is the default, you don't normally need to select it.
 - Pen: choose this option when using a pen, embosser, engraver, glue pen, rotary tool or other device that doesn't require a blade offset
 - Print+Cut Cut: in print and cut applications, choose this option for the layer that will be cut. It will not be printed.
 - Print+Cut Print: in print and cut applications, choose this option for the layer that will be printed only. It will not appear in the cut window.
 - ♦ Color layer alignment (Pro version only): in applications such as vinyl where several layers will be cut from different colors and aligned, choose this option for the layer that has registration shapes that need to be cut from every color along with that color's shapes. These registration shapes can then be used to layer the colors perfectly. Refer to last part of Section 10.06.3.
- **Tool:** for cutters with more than one head, such as the KNK Force, choose if the layer should be executed by the left side or by the right side.
- Preset (Pro version only) allows you to assign saved cut settings, called Presets, to individual layers. Refer
 to Section 10.06.2.

10.02 Preview

• To see what your cutter will cut or what your printer will print, click on the **Preview** icon on the **Toolbar**. The following window will open. Note that settings applied on the **Style Panel** are reflected in the **Preview** window:



• The following example shows what would be seen in the **Preview** window compared to how it appears on the **Cutting Mat**:

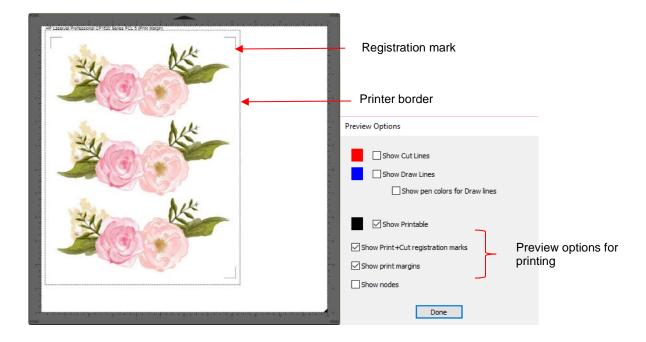
On the Cutting Mat:



♦ In the Preview Options window:



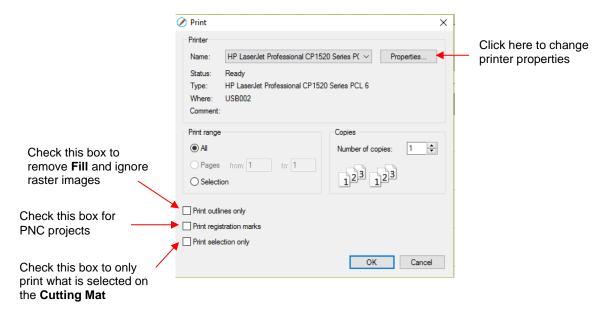
• For print and cut applications (PNC), you might wish to verify what will be printed, along with where it will be printed and where the registration marks will print:



- NOTE: If you mark the option for Show Print + Cut registration marks and they do not appear:
 - Verify that you have set up a cutter (refer to Section 3.01.4)
 - Verify that the layer(s) with cut lines are not hidden on the Layers Panel
 - o In the Cut Settings window, verify that you have not marked the option for Cut selection only

10.03 Printing

• To print from SCAL, go to File>Print or press Ctrl+P. The following window will open:

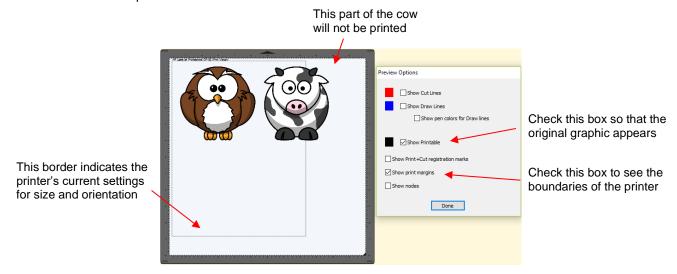


- ♦ To set up printer settings, click on the Properties button. (Note that you can also access your printer's properties by going to File>Print Setup and clicking on Properties.) The window which opens should be familiar to you and will not be covered in this user manual.
- Print outlines only: Only vector shapes will be printed. Imported raster images (.JPG, .PNG, .BMP, etc.) will not appear. If you've applied a Fill to shapes including colors, gradients, or patterns, then those will not appear either.

- ♦ **Print registration marks**: If your application is a print and cut, then you will want to check this option. Note that If you have not yet set up a cutter (refer to *Section 3.01.4*), then registration marks will not be sent to the printer.
- Print selection only: This is one way to control what is printed. You will need to select the shapes to be printed prior to entering the Print window. Alternatively, you can hide layers on the Layers Panel that you do not want printed.
- If your **Cutting Mat** is larger than the printout dimensions, then make sure the shapes are located in the upper left portion of the **Cutting Mat** or else any shapes outside of the printout boundary will be omitted or cut off. To verify, click on the **Preview** icon on the **Toolbar** and select **Show Print Margins**.
- For example, let's say you have a PNC application and your shapes are arranged like this on a 12" x 12"
 Cutting Mat:



When you click on the **Preview** icon and mark **Show print margins**, you can see that a portion of the cow will not be printed:



♦ You have two choices. You can either switch to **Landscape** printing under **File>Print Setup** or you can move the shape on the right to be below the left shape:



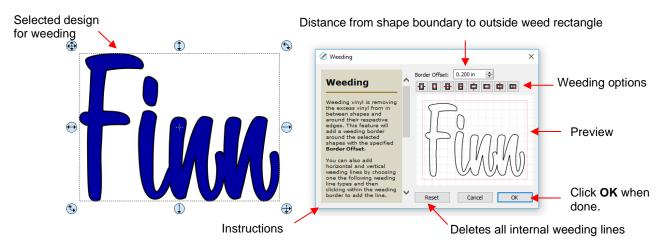


Option 1: Switch to Landscape under File>Print Setup

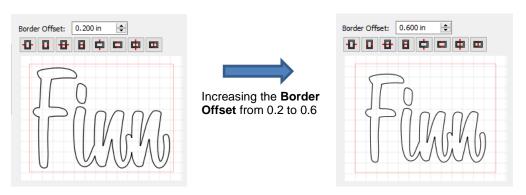
Option 2: Rearrange the shapes

10.04 Weeding (SCAL PRO only)

- Weeding is an important function for those who do vinyl applications. When removing the waste vinyl from around the cut shapes, it's very helpful to have extra cut lines. This way you don't end up trying to weed out large pieces at one time.
- To set up a weed, select the shapes and go to **Effects>Weeding**. The following window will open:



Border Offset: Increase or decrease to set the spacing between the shapes and the outside weeding rectangle. The red line represents that outer cut. For example:

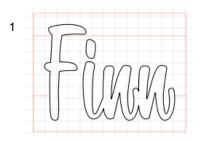


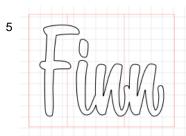
Border Options: These icons can be used to add additional cut lines inside the outer weed border. Each icon in the following screenshot indicates where the lines will be added but a description and

example are also shown. Note that once you select an option, you can click at the desired location on the preview image to add the cut line or lines:

1 2 3 4 5 6 7 8

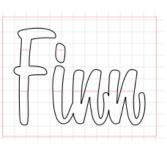
o 1 or 5: Add horizontal or vertical weed cuts between shapes and outer weed border



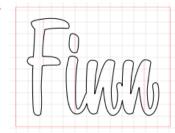


 2 or 6: Add horizontal or vertical weed cuts inside the shapes (this is used for applications such as glass etching where the outside "waste vinyl" is actually kept and the shapes themselves are weeded out)



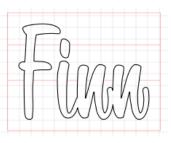


6

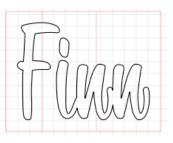


 3 or 7: Add horizontal or vertical weed cuts in between shapes and outer weed border and also inside and between shapes

3

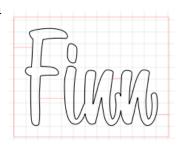


7



o 4 or 8: Add horizontal or vertical weed cuts anywhere you like

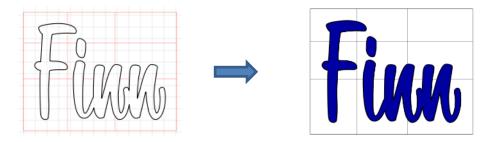
4



8



- Reset: At any point, you can click on Reset to remove any of the internal cut lines and begin again.
- Once you are satisfied with the weeding line, click on OK:



On the Layers Panel you will observe a new layer called Weeding:



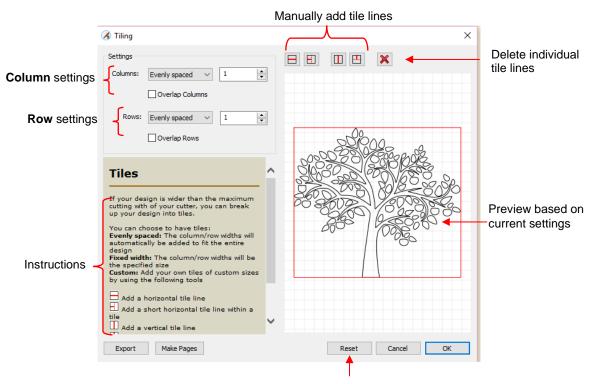
10.05 Tiling (SCAL PRO only)



- The Tiling function is used to split large designs into rectangular sections for cutting.
 - ♦ In the following example, a design that is 40" wide and 36" tall cannot be cut on a cutter that only has a maximum 15" wide cutting range (such as the KNK Force or Zing Orbit):

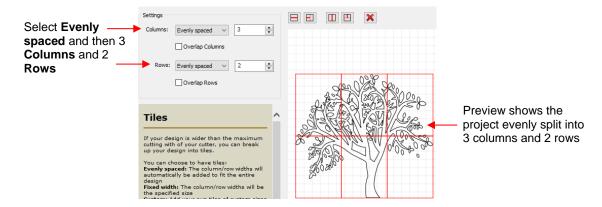


To open the Tiling window, select the shape and go to Effects>Tiling:

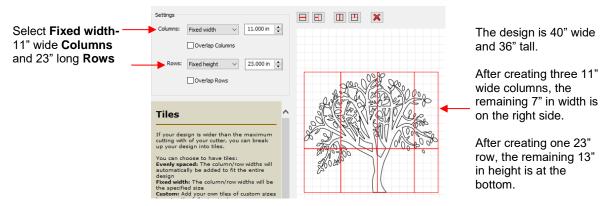


Reset to clear settings

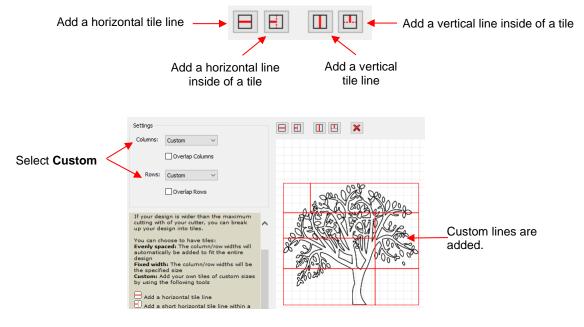
- ♦ **Columns** and **Rows**: Under both of these you have the following choices:
 - Evenly spaced: Enter a number and that many columns (or rows) are created, all the same width.
 For example, you could enter 3 columns and 2 rows:



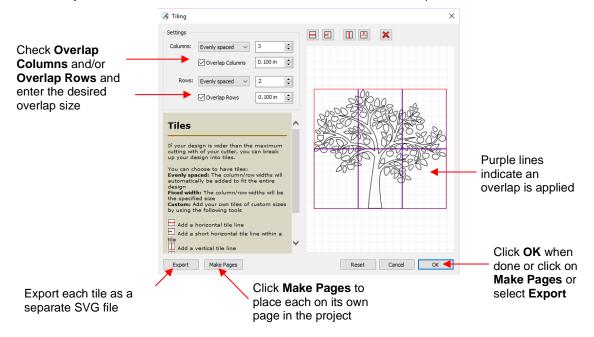
Fixed width: Enter a specific width for the columns. This is probably the most useful choice since you should know the dimensions of the material being used. For example, if you have 12" wide vinyl, then you will probably want the columns to be no wider than ~ 11" or, possibly, 11.5". Also, let's say your vinyl is in 24" long pieces:



Custom: Because the tiling line can sometimes fall into undesirable spots resulting in, for example, slivers or extremely tiny shapes, using Custom is another option. With it selected, you can then use the icons above the preview to add cut lines wherever you like:



- ♦ To delete any of the lines, click on the **Delete** icon and then click on the line inside the **Preview** window.
- Overlap Columns and Overlap Rows: If you want an overlap created so that each tile slightly overlaps with an adjacent one, check the box and then enter the desired overlap:



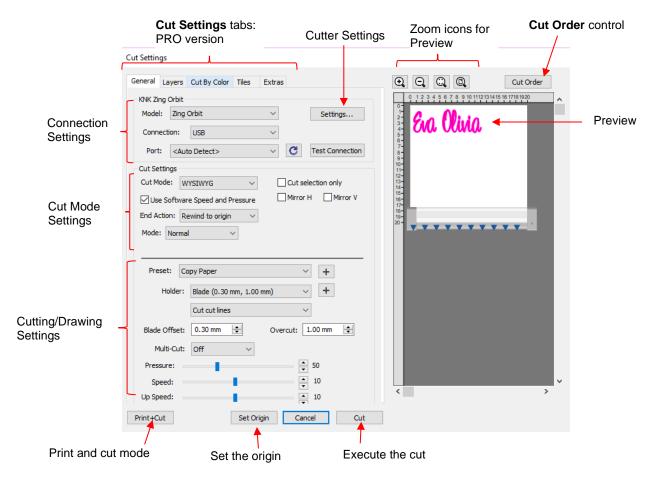
- Once you are satisfied with the settings, you have three options:
 - (1) Click on **OK**. You won't observe any changes on the **Cutting Mat** or on the **Layers Panel**. However, the results of the **Tiling** process will appear once you enter the **Cut Settings** window and click on the **Tiles** tab. Refer to *Section 10.06.4*.
 - (2) Click on Make Pages and each tile will be placed on its own page in the file. The first page will retain the original image with no tiling. Thus, it's not necessary to use the Tiles tab in the Cut Settings window.
 - (3) Click on **Export** and the **SVG Export** window will open. After you name the file, select the export settings, and click on **OK**, wait while the export files (one for each tile) are saved as separate SVG files, numbered with the file name you chose. Once the **Tiling** window closes, you are back to the same situation as in option (1).

10.06 Cut Settings

The **Cut Settings** vary from one cutter to the next based on the brand and model of the cutter and its built-in functionality. For this reason, the information presented may or may not apply to your cutter.

10.06.1 Cut Window Settings

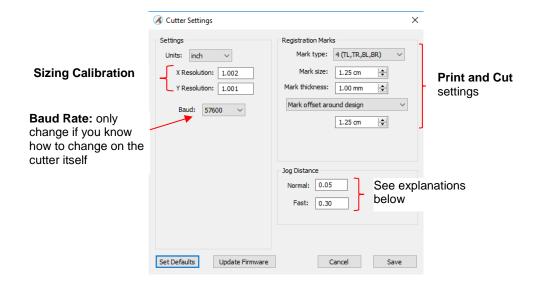
- When you are ready to execute a cut (or draw), the cut window can be opened using either of the following:
 - ♦ Click on the Cutter icon on the Toolbar
 - ♦ Go to Cutter>Cut With KNK Zing Orbit (or select the model you have added to SCAL)
- The following window will open:



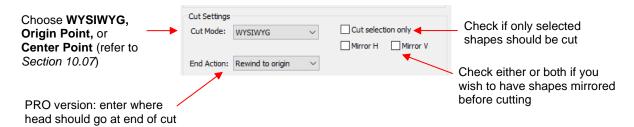
- Cut Settings tabs: The regular version of SCAL will only have the General tab. The PRO version has four additional tabs:
 - Layers (refer to Section 10.06.7)
 - Cut by Color (refer to Section 10.06.3),
 - o Tiles (refer to Section 10.06.4)
 - o **Extras** (refer to Section 10.06.5).
- ♦ **Zoom** icons apply to the **Preview** window. Use this **review** to confirm where shapes will cut relative to the cutter itself, which is also shown.
- ♦ The **Cut Order** button is located in the top right corner and opens the **Cut Order** window. Refer to *Section 10.06.6.*
- ♦ Connection Settings: Choose the model of cutter being used and the connection settings. For the Zing Orbit choose either USB or TCP/IP (Wi-Fi):



Cutter Settings, which can also be accessed by going to Cutter>Cutter Settings, opens a new window with additional settings relevant to that model. For the KNK Zing Orbit:



- Sizing Calibration: Most cutters are subject to cutting slightly different dimensions than what the shape is assigned in the software. For example, a 200 mm square might measure 199 mm x 201 mm.
 - X Resolution (also called Belt Resolution) = left to right error (width) as you face the cutter
 and Y Resolution (also called Wheel Resolution) = up and down (height) as you face the
 cutter.
 - In both cases, you calculate **Resolution** = What the measurement should be / what the measure actually is. Then enter those numbers into the **Cutter Settings** window and test again.
- Baud Rate: The is the speed at which date travels from the computer to the cutter. In general, this
 is not a setting you would ever change. Refer to your cutter's user manual if you ever feel it may be
 in error.
- Registration Marks: These settings are used in print and cut applications where, depending on the
 cutter brand/model, you might be able to adjust the number, size, thickness and distance of the reg
 marks from either the shapes you're cutting or set to a specific location on the printout.
- o **Jog Distance:** The following settings apply when setting the origin:
 - Normal: the distance the head or mat moves with each arrow key increment
 - Fast: the distance the head or mat moves while holding Shift with each arrow key increment
- ♦ Cut Mode Settings: This section covers the following:

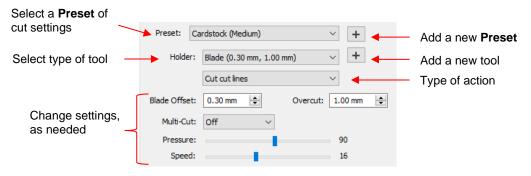


- o Cut Mode: Refer to Section 10.07 which covers controlling where shapes will cut.
- End Action (PRO version only): controls what happens at the conclusion of the cut. There are three
 choices:
 - Rewind to origin: default setting in which the head returns to the origin set before the cut began

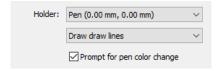
Advance Amount: when this option is selected, the head moves to the end of the cut, over to the right side, and then advances the mat or rolled material forward based on a value you enter into a new window:



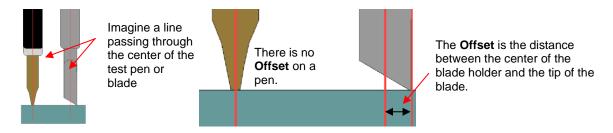
- Do Nothing: the head stops at the location where it finished cutting
- Cut selection only: If you only want the shapes you have selected on the cutting mat to cut, then
 mark this box.
- Mirror H and Mirror V: Use one or the other options to if you want the shapes mirrored for cutting.
 This is very handy when cutting HTV or embossing. In both cases, you will be flipping over the
 material once the cutting or embossing is complete.
- Cutting/Drawing Settings: As mentioned earlier, this section will vary from one brand/model of cutter to the next:



- Preset is a customizable menu where you can store settings for a particular material or application.
 Refer to Section 10.06.2 for directions.
- Holder has choices for Blade or Pen. Like Preset, you can enter your own menu choices, such as other blades. Again, refer to Section 10.06.2.
 - If you select Pen under Holder, then Draw draw lines is typically selected. There is also a Prompt for pen color change option. Marking that option will cause the cutter to pause after each pen color is executed so that a different pen or tool can be mounted:



Blade Offset is the horizontal distance from the center of the blade shaft to the tip of the blade. A pen or engraving tool has an offset of 0 because the tip is centered with the center of the pen/engraving tool shaft. But a blade is different:



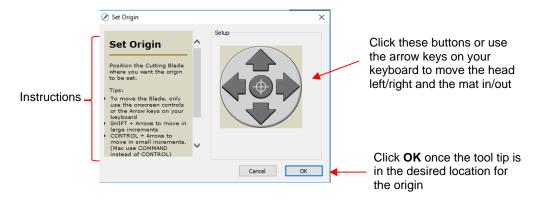
 If you set the Blade Offset to 0 when cutting with a blade, corners will be rounded. On the other hand, if it is set too high, bubbles will be cut on sharp corners:



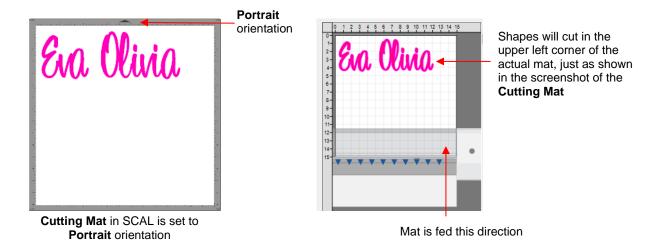
- Adjust Blade Offset, as needed, using 0.1 increments in order to get perfect corners.
- Overcut is related to Blade Offset in that it isn't needed when using a pen, embosser, engraver, and so forth, because the tips of those tools are aligned with the center of the tools themselves. However, leaving Overcut at 0 when using the blade holder will result in large shapes not quite closing:



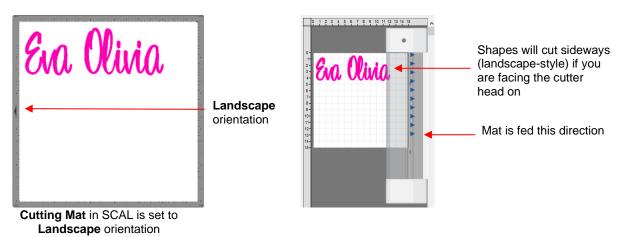
- In some cutting programs, Overcut is not a separate setting but rather automatically calculated and applied based on the Blade Offset entered. However, in SCAL, you can enter an actual Overcut setting and should do so any time a blade is used.
- o In general, the blade type doesn't greatly affect the **Overcut** required. Try using 1.00 mm. In the event you cut a large closed shape, like an 8" circle, you may find that you'll need to increase **Overcut** to 2.00 mm.
- Multi-cut is used when cutting thicker or denser materials where more than one pass is recommended. Each shape is cut the number of passes selected before the blade moves to the next shape to cut.
- Pressure and Speed (or other settings for your brand of cutter) should be covered in the user manual provided with your cutter.
- Print+Cut: Clicking on this button opens the Print and Cut window. Because this function differs for each cutter, refer to for detailed instructions available for your cutter or read the on-screen instructions.
- ♦ **Set Origin:** Click on this button to set the origin for cutting on cutters that do not have the function on the control panel itself. The following window will open:



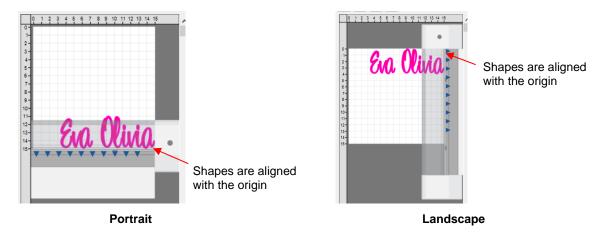
- Preview: The preview displays the shapes that will cut and their orientation plus location based on other settings.
 - For example, with a Portrait orientation and WYSIWYG cut mode, the Preview indicates the shapes will cut exactly in the same location and orientation as you see on the Cutting Mat:



 Using the same WYSIWYG cutting mode, but having the Cutting Mat orientation set as Landscape, the Preview changes indicating the shapes will be cut in a landscape position:



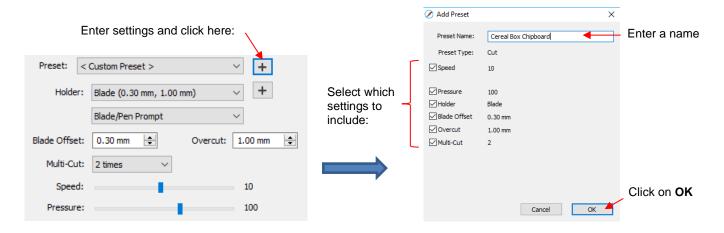
In Origin Point mode, it doesn't matter where the shapes are located on the Cutting Mat, they will
cut so as to align with the origin you set:



Additional details on controlling where shapes are cut are presented in Section 10.07.

10.06.2 Presets

• **Presets** allow you to save your settings for a particular material or blade type. To do this, enter the settings you wish to save. Then click on the "+" to the right of **<Custom Preset>**:



- After clicking on OK, the new preset will be found at the bottom of the list.
- In a similar manner, you can also add other **Holders** to your list, which would typically be blades with other **Blade Offset** values. For example:

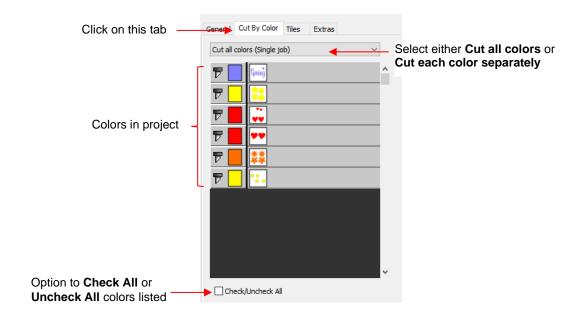


• To delete either type of preset that you personally added, select it from the menu and then a " – " button will appear. Clicking on that button will then remove it from the list:



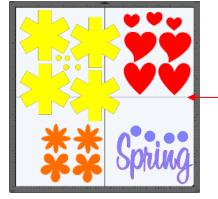
10.06.3 Cut by Color (SCAL PRO only)

- The Cut by Color function offers two capabilities:
 - ♦ Turn on and off colors to be cut without the need to hide layers on the Layers Panel or pre-select shapes to cut. In fact, you don't even need to ungroup mixed-color groups.
 - Cut all of the colors at once or have the cutter pause between colors, thus permitting the change out of materials
- To access Cut by Color, click on the Cut by Color tab in the Cut Settings window:



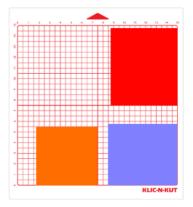
- Cut all colors (Single job): In this mode all of the colors marked in this window will be cut at one time.
 - As an example, here are some shapes laid out on the **Cutting Mat.** Note how the grid is set to divide the mat into four quadrants:

The shapes of each color have been arranged into quadrants on the **Cutting Mat**

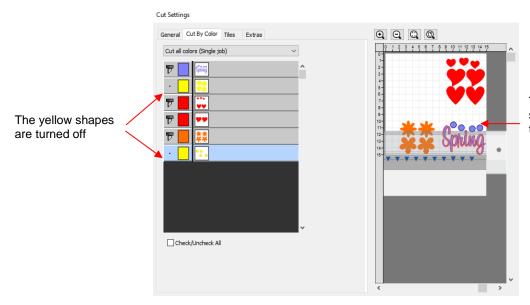


The **Cutting Mat** is divided into quadrants for easier placement of the scraps onto the actual cutting mat

Let's say you also have scraps you want to use, however the yellow scrap you plan to use won't fit onto the mat with the other scraps. So, you want to cut lilac, red, and orange first. You place those colors into quadrants on the mat that match the layout on the **Cutting Mat** in SCAL:



♦ In the **Cut Settings**, make sure **WYSIWYG** mode is selected and you have the other settings selected. Then select the **Cut by Colors** tab and click on the blade icon next to the yellow shapes to hide those from cutting:



The **Preview** shows where the shapes will cut and shows that the yellow ones are excluded

The cut is executed and the red, orange, and lilac shapes are cut. Then the same procedure can be used for the remaining yellow shapes:





The yellow scrap is placed in the upper left corner of the mat to match the **Preview** window

- Cut each color separately (Separate jobs): In this mode you can also turn or off colors for cutting. However, SCAL will prompt for each color before executing the cut.
 - ♦ As an example, here is a layered design to be cut from vinyl:

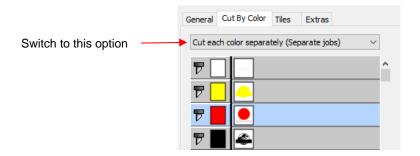


- ♦ Choosing the option to **Cut each color separately** is logical because:
 - The shapes are arranged on top of one another
 - The size is so large that the individual colors cannot be placed on the cutting mat to cut all at one time

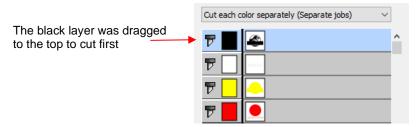
However, before sending the project to the cutter, take note of any colors that might have shapes that need to be moved. In this example, the thin red lettering "Jurassic Park" would cut through the background red circle, hence it needs to be moved away:



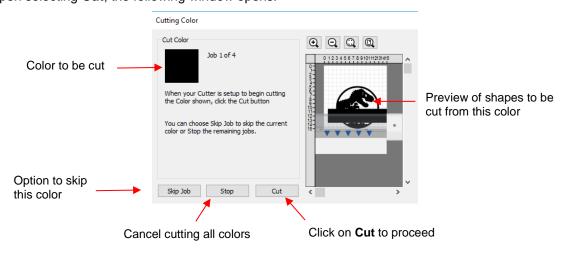
♦ In the Cut Settings, Origin Point should be chosen so that each color is moved to align with the origin and, thus, the material loaded each time in the same location. In the Cut by Color tab, the Cut each color separately option is chosen:



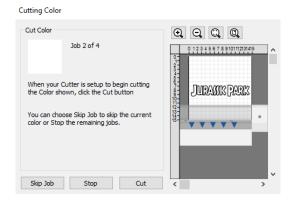
Note that you can change the cut order by dragging the colors up or down the menu. For example, let say you already have black vinyl loaded into the cutter and the origin set to cut:



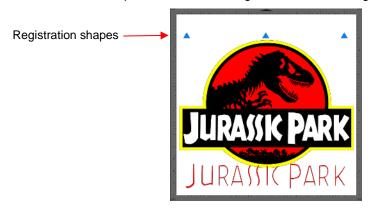
♦ Upon selecting Cut, the following window opens:



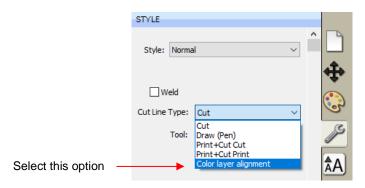
If you decide not to cut this color, click on **Skip Job** and the next color in the menu will be selected. If you clicked on **Cut**, then the black shapes are cut out and then this same next color window will open:



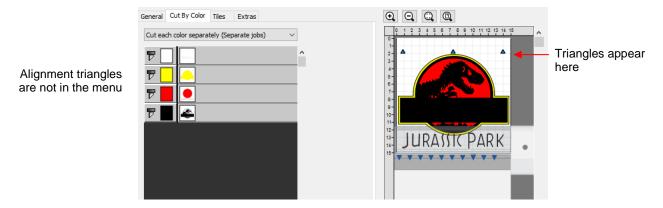
- ♦ And the process continues until all colors have been cut.
- In Section 10.01, Color Layer Alignment was mentioned as one of the options under Cut Line Type on the Style Panel. In applications, such as the one just presented, it can be tricky aligning the various colors after cutting. To make the job easier, small registration shapes can be added to the design and cut with every color so that they can then be lined up when layering color.
 - ♦ In the *Jurassic Park* example, three small triangles are added and grouped to be on the same layer:



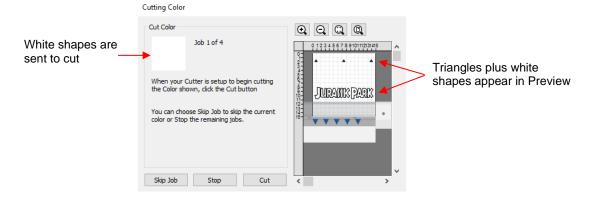
♦ The layer is selected and the **Cut Line Type** for this layer is changed to **Color Layer Alignment**:



When the **Cut by Color** tab is then selected, the registration triangles are not in the menu however they do appear in the **Preview:**

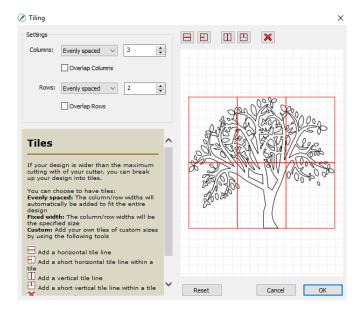


Then, as each color window opens, the triangles will appear in the Preview for that color:

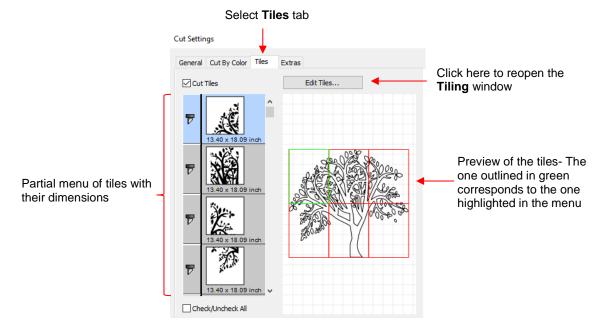


10.06.4 Tiles (SCAL PRO only)

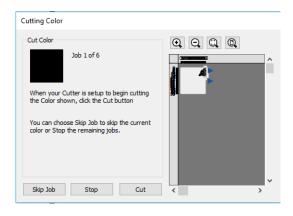
• In Section 10.05, you were shown how to use the **Tiling** function to split a design that is too large to cut based on the limits of your cutter:



 After clicking on OK, but before sending the design to cut, make the Cutting Mat dimensions fit the design. If any of the design extends beyond the boundaries of grid, those tiles will not cut. Open the Cut Settings window, click on the Tiles tab and check the box next to Cut Tiles to then open a
menu showing the individual tiles with additional options:



- ♦ Cut Tiles: Mark this option first so that the menu and preview appears.
- ♦ Edit Tiles: clicking this button will take you back to Effects>Tiling in case you need to edit the settings.
- As with **Cut by Color**, clicking on the blade icon next to any tile will prevent that tile from cutting. You can also drag tiles up or down in the menu to change the cutting order.
- After you click on **Cut**, be patient. It can take a minute or more for a large and/or detailed design to be processed by the software. Eventually, a window will open showing the first tile to be cut:



♦ Just as with Cut by Color, you can

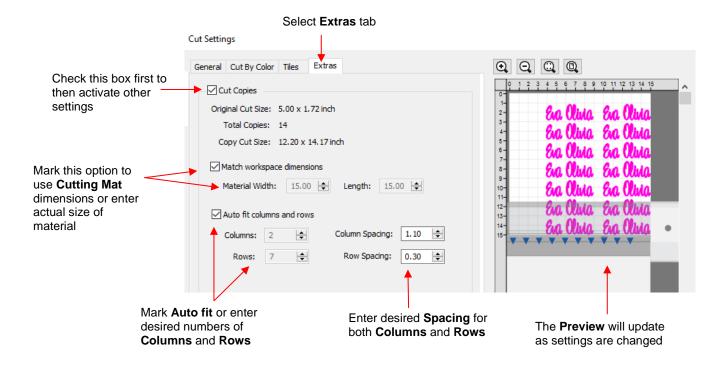
Click on Cut to proceed with cutting that tile. After it is cut the next tile will be selected.

Click on Skip Job to skip cutting that tile and bring up the next tile

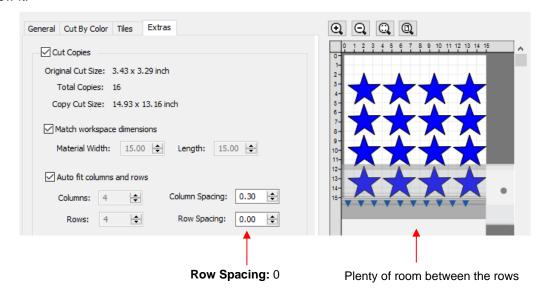
Click on Stop to cancel all cutting.

10.06.5 Extras (SCAL PRO only)

The Extras feature allows you to duplicate shapes for cutting, without having to set it up on the Cutting
 Mat. To use this feature, click on the Extras tab in the Cut Settings window:



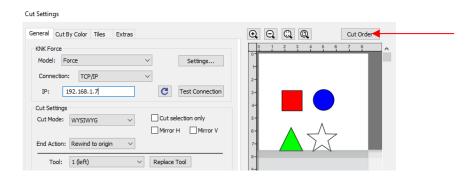
- Cut Copies: Mark this option first so that other settings become editable
- Match workspace dimensions: If your material is the same size as the Cutting Mat, then mark this option. Otherwise, enter the Width and Length of the material to be used. Pay attention to the Preview window to make sure you have the orientation correct to match how the material is placed on the cutting mat.
- Auto fit columns and rows: Mark this option if you want as many duplicates as possible cut from the material. Otherwise, enter the desired number of Columns and Rows to match the number of copies needed.
- ♦ **Spacing:** Adjust the spacing as desired. In general, shapes can be quite close together when cutting from thinner materials, such as vinyl and cardstock. In some cases, such as with a star, you can even use 0 for the **Row Spacing**, since the bottom of the shape is not close to the top of the shape in the row below it:



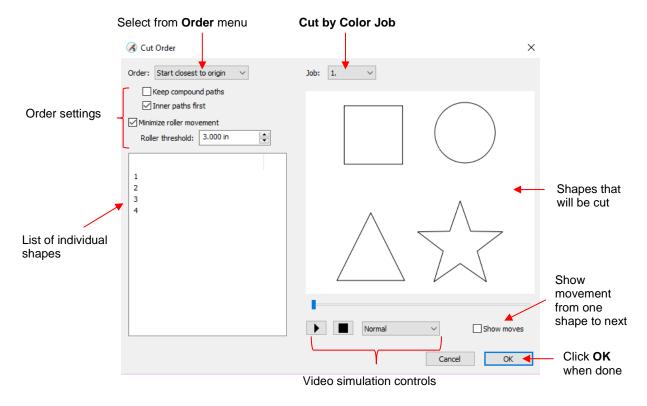
Make sure you have all of the cut settings made under the General tab of the Cut Settings window. Once
you click on Cut, all of the duplicates will be cut out and it appears that using Cancel, in the current version
of SCAL, will not abort the cut.

10.06.6 Cut Order (SCAL PRO only)

The Cut Order function provides control over the order in which shapes will be cut on your cutter. To access
this function, go to the Cut Settings window and, in the upper right corner, click on Cut Order:

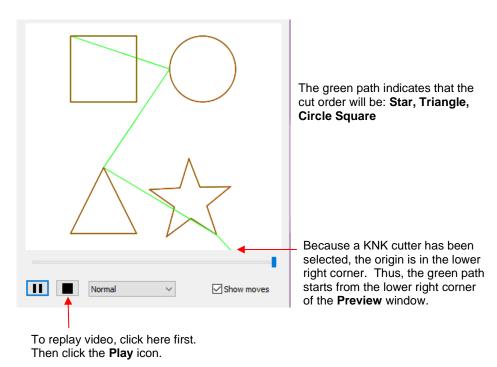


When you click on Cut Order, the following window will open, displaying the shapes that will be cut:



- ♦ Order Select start location preference from the following:
 - Start closest to origin The first shape to cut will be the one closest to the cutter's origin based on where the blade drops down to cut that shape.
 - Start farthest from origin The first shape to cut will be the one farthest from the cutter's origin, again based on where the blade drops down to cut that shape.
 - Layer order (Back to Front) The shapes will cut from bottom to top on the Layers Panel
 - o Layer order (Front to Back) The shapes will cut from top to bottom on the Layers Panel

- ♦ **Keep compound paths** If two or more shapes have been joined using **Object>Merge**, they will be treated as a single shape in the cutting order.
- ♦ Inner paths first It's almost always desirable to have an inner/child shape cut before an outer/parent shape due to stability of cutting the inner shape. However, that option can be turned off and inner shapes will be treated independently in the cutting order.
- Minimize roller movement The accuracy of cut location (very important in print and cut applications) can be affected if the material or mat is rolling in and out over long distances throughout the cut. This option is also usually left marked.
- ♦ Roller threshold Select from 0.01 inches to 10 inches based on the maximum roller movement allowed when cutting a series of shapes before advancing the mat/material to the next series. Note that if the **Keep compound paths** option is marked, it will take precedence over **Roller threshold.**
- A video simulation is available so that you can verify the cut order:
 - ♦ Click on the **Play** icon . The shapes will be sequentially highlighted in the order in which they will cut.
 - ♦ There are three speeds in which this video can be played: **Slow**, **Normal**, **Fast**. As an example, verifying the cut order for a rhinestone pattern is probably best set at **Fast**.
 - Marking the **Show moves** option will draw a green path between the shapes indicating the cut order. It also shows the starting location on each shape and the map will remain displayed at the end of the video:



To replay the video, click the black square icon clicked.

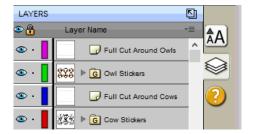
first. Then the **Play** icon will return and can be

10.06.7 Layers (SCAL PRO only)

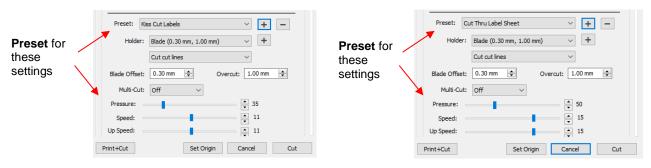
 There may be occasions where you want certain layers of your project to cut at different settings than other layers. Three examples would be:

- Cutting adhesive stickers where by you only want to kiss cut the stickers themselves, but then full cut around groups of them.
- Cutting a thick or dense material whereby you might want the first few passes to be at a lower pressure, followed by a heavier pressure for the last few layers.
- Using a rotary tool in the KNK Force whereby you want to engrave parts of the design before fully cutting out outside of the design.
- The Cut by Layer feature of SCAL5 involves four steps:
 - (1) Create **Presets** for the different settings to be used. This was covered in Section 10.06.2.
 - (2) On the Style Panel, assign a Preset to each layer and order layers by Preset.
 - (3) In the **Cut Order** window (refer to *Section 10.06.6*) change the **Order** to match the **Layers Panel** order you wish to use.
 - (4) On the **Layers** tab in the **Cut Settings** window, select which layers will be cut and whether or not there needs to be a pause between cutting the layers to change out a tool.
- Using the first example, cutting adhesive stickers, let's assume that you have two blade holders set to cut
 out stickers. One has the blade barely exposed so that the stickers will be kiss cut without penetrating the
 backing sheet and the other blade holder is set to cut through the sticker material and the backing sheet.
 - ♦ A project is designed with two sets of stickers and outside cuts around each set:

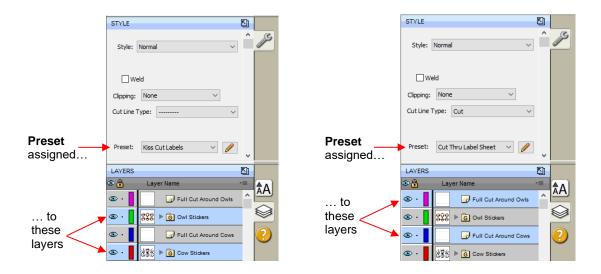




Create two presets in the Cut Settings window. (Again, for directions on creating Presets, refer to Section 10.06.2):



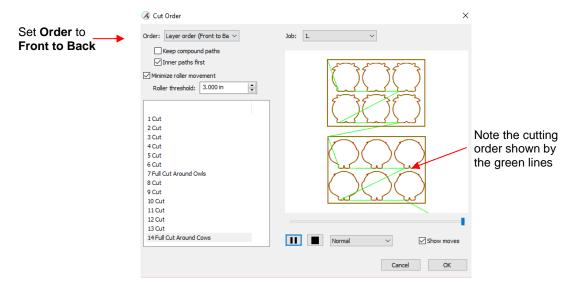
♦ On the **Style Panel**, select each pair of layers and assign the required **Preset** to that pair:



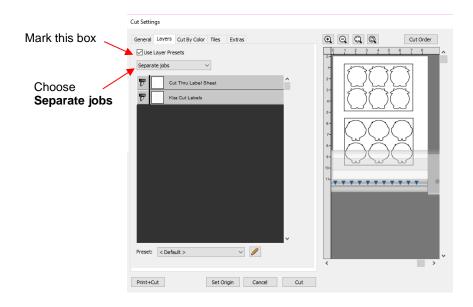
Order the layers so that those cutting with the kiss cut blade holder are at the top and the layers with the more-exposed blade holder are at the bottom:



♦ Go to the Cut Settings window and click on the Cut Order tab. In the Order menu, select Front to Back and the cut order will then be top to bottom on the Layers Panel. The video simulation confirms this:



Click on **OK** to close the **Cut Order** window. Now click on the **Layers** tab and the following window will open:

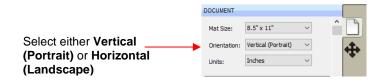


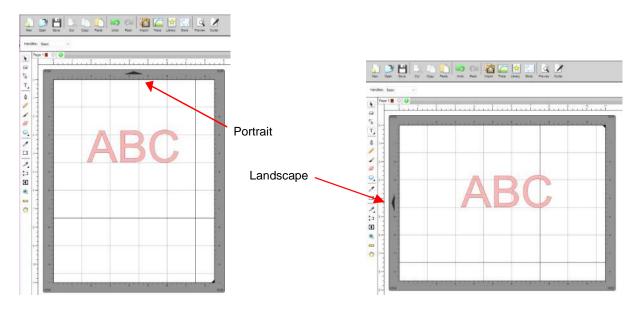
Mark the option for Use Layers Presets and select Separate Jobs. Click on the Print + Cut button and the print and cut process can be carried out as normal. Watch for the job prompt windows to pop up and follow all instructions.

10.07 Controlling Where Shapes Will Cut

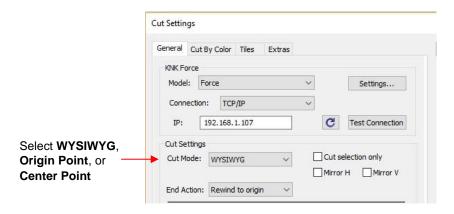
10.07.1 Overview

- There are two **Orientations** for cutting:
 - ♦ Portrait Shapes will cut in the same orientation you see on the Cutting Mat
 - ♦ Landscape Shapes will cut 90° clockwise to the orientation you see on the Cutting Mat
- There are 4 available Cut Modes when cutting to the KNK Zing Orbit:
 - WYSIWYG Shapes will cut relative to their position on the virtual Cutting Mat
 - ♦ Origin Point Shapes will cut to align with the origin set before cutting
 - ♦ Center Point Shapes will cut to center around the origin set before cutting
 - ♦ Print and Cut Shapes will cut based on manual or automatic alignment with printed registration marks (refer to Chapter 11)
- The Orientation is set on the Document Panel:

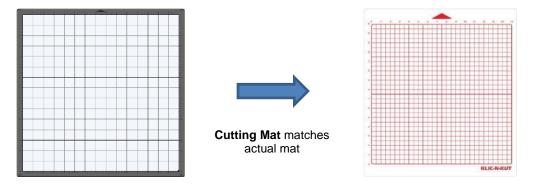




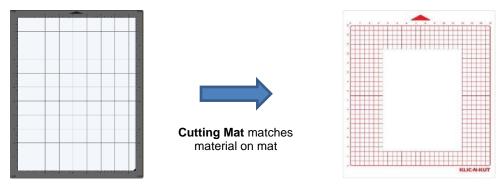
- The choice between **Portrait** and **Landscape** is a personal one use whichever one makes the most sense to you. For long projects, such as for large vinyl cuts, **Landscape** is usually chosen because the project displays better on the computer monitor. However, you still have the option to use **Portrait**, if desired.
- The Cut Mode is set in the Cut Settings window:



- <u>IMPORTANT:</u> All three **Cut Modes** are based on setting an XY origin on the cutter. On the Zing Orbit, this origin is set by moving the blade tip to a chosen location on the mat grid or on the material, depending on the application or your preference.
- The following sections show where shapes will cut based on the possible combinations of Cut Mode and Orientation. Note that with WYSIWYG mode, there will be two options and the one that makes the most sense to you, is the one to use:
 - Cutting Mat Method: The virtual Cutting Mat is the same dimensions as the actual cutting mat:



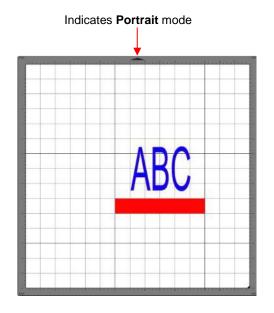
Material Method: Create a custom virtual Cutting Mat that matches the dimension of the material to be cut:



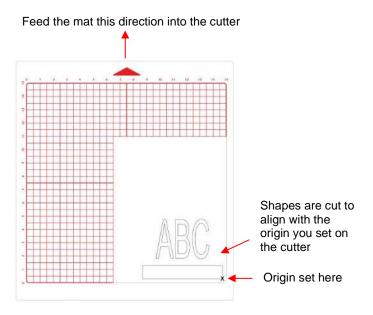
• The best way to learn how these settings affect where shapes cut is to recreate what you see in these screen shots and test them out with the test pen and paper. Eventually, it will all make sense to you and, of course, there's help available if you need it.

10.07.2 Origin Point

- This is the mode recommended for most applications as it economizes the use of your cutting materials.
- Shapes can be located anywhere on the virtual **Cutting Mat**. The shapes will be moved and aligned to cut with the origin you set on the material. As mentioned earlier, the origin is set using the position of the blade tip and is typically set just inside the lower right corner of the material being cut.
- When more than one shape will be cut, the shape closest to the origin will be cut at the origin and any other shapes will be cut the distance and direction from that shape as positioned on the screen. The following figures show examples of where images will cut. Use the arrow on the Cutting Mat as a guide to the direction to insert the actual mat or material into your cutter.
 - ♦ Origin Point Portrait Mode

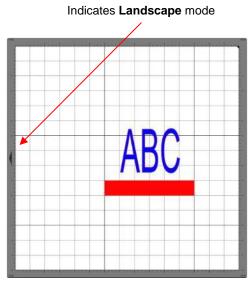


Location of shapes in SCAL

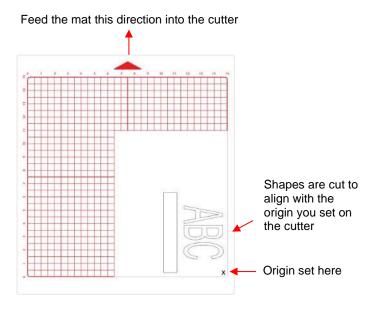


Where shapes will draw or cut on the material

♦ Origin Point – Landscape Mode

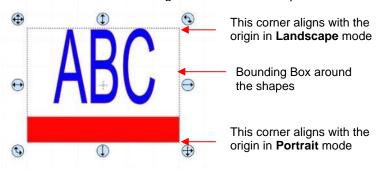


Location of shapes in SCAL

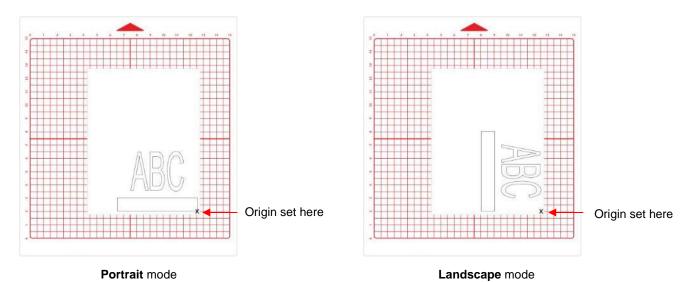


Where shapes will draw or cut on the material

• Note that the alignment is based on the bounding box around the shapes:

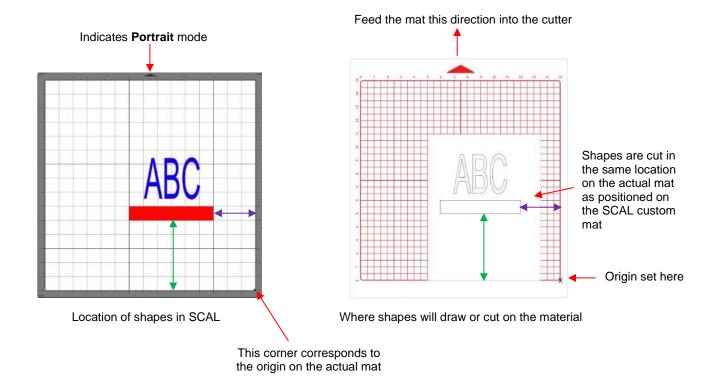


Also, note that the material can be located anywhere on the cutting mat because you are setting the origin
on the material itself. It is usually advisable to set that origin just a little way inside the corner of the material
so that you do not inadvertently cut off the edge.

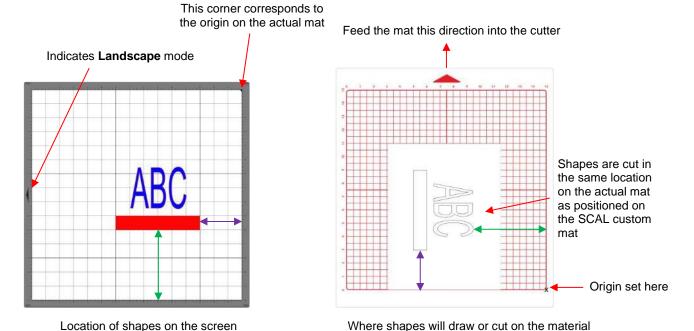


10.07.3 WYSIWYG

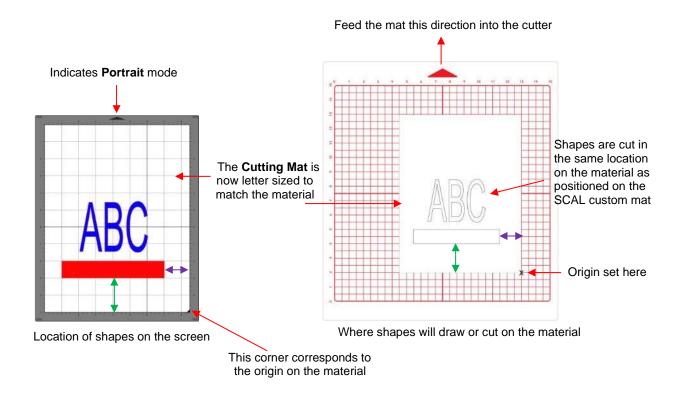
- This is the mode recommended when you need to cut shapes in a very specific location relative to the
 onscreen Cutting Mat or when you are utilizing multiple tools in applications such as draw and cut or
 emboss and cut.
- Shapes are cut based on where they are located on the virtual Cutting Mat. There are two methods used:
 - ♦ Cutting Mat Method: The virtual Cutting Mat dimensions should match those of the grid on the actual cutting mat. The origin is set in the exact lower right corner of the mat's grid. The material needs to be placed on the cutting mat so that it covers the area where the shapes will be cut.
 - ♦ Material Method: The virtual Cutting Mat dimensions should match those of the material being placed on the actual cutting mat. The origin is set in the lower right corner of the material regardless of where the material is placed on the mat. In the example later on, the material is assumed to be letter size (8.5" x 11").
- In the following diagrams the purple and green arrows are used to indicate the equivalent distances between the shapes and the origin on the virtual **Cutting Mat** and on the actual mat.
 - ♦ WYSIWYG Portrait Cutting Mat Method



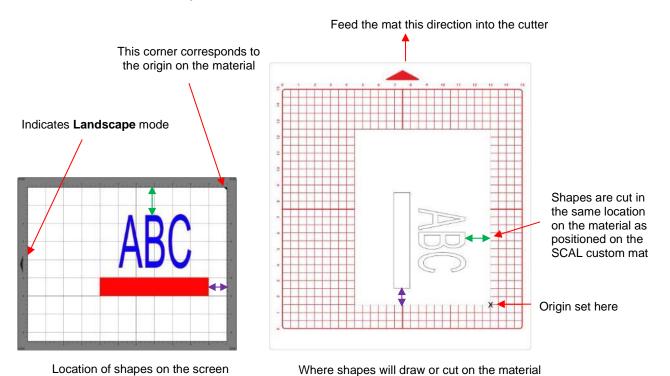
♦ WYSIWYG – Landscape – Cutting Mat Method



WYSIWYG - Portrait - Material Method



♦ WYSIWYG - Landscape - Material Method

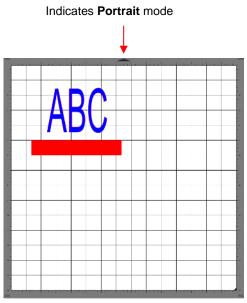


10.07.4 Center Point

• This is a mode not available with most other cutters in SCAL. It was needed for use with the Orbitizer but can also have other useful applications, such as cutting a shape from the center front of a greeting card.

Shapes can be located anywhere on the virtual Cutting Mat. The shapes will be moved and centered around the origin you set on the material. While in the other two cut modes, the origin is typically set just inside the lower right corner of the mat or material, with Center Point mode, you want to set the origin in the center of the material or mat:

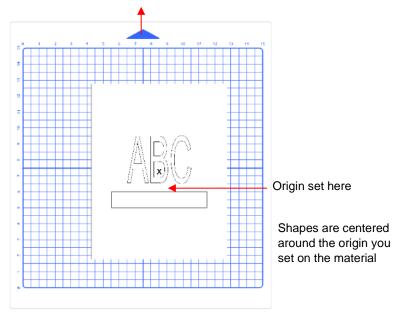
Center Point - Portrait



Location of shapes in SCAL

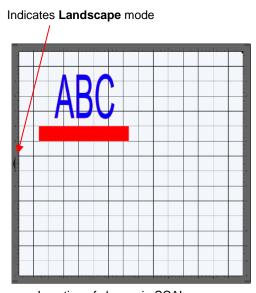
Center Point - Landscape Mode

Feed the mat this direction into the cutter

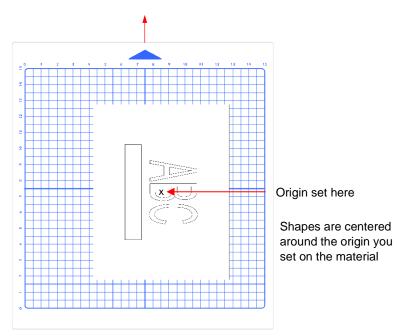


Where shapes will draw or cut on the material

Feed the mat this direction into the cutter

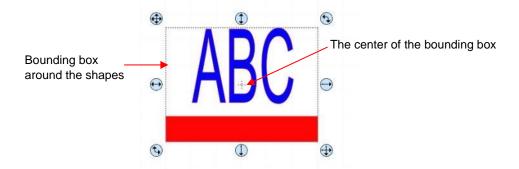


Location of shapes in SCAL



Where shapes will draw or cut on the material

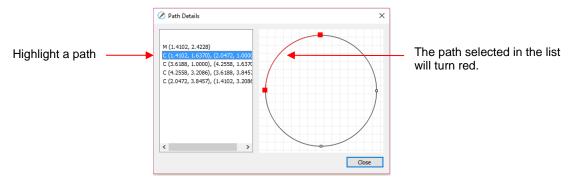
Note that the alignment is based on the <u>center</u> of the bounding box around the shapes:



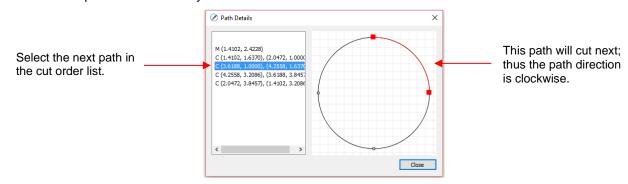
- Also, note that the material can be located anywhere on the cutting mat because you are setting the origin on the material itself. If you need the centering to be perfect:
 - Measure the material with a ruler to determine the center and mark the center with a pencil dot
 - Use the alignment pin in the blade holder to set the origin. It is far easier to see the tip of the pin than the tip of the blade.

10.08 Path Details and Reverse Path

- Sometimes a cutting issue can be resolved by reversing the direction of a cut. In SCAL, the cut direction (clockwise versus counterclockwise) can be checked using the following steps:
 - ♦ Select the shape, right-click and select Path>Path Details.
 - A window will open. On the left side is a list of the paths in the order they will cut. Click on any path in the list and that path will turn red:



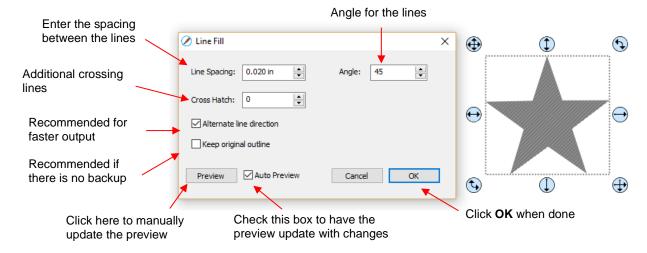
Select the next path in the list and you will then be able to determine the direction of the cut:



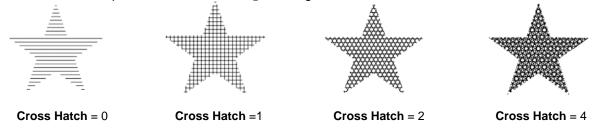
- To reverse the direction of a path, use either of the following after selecting the shape:
 - ♦ Right-click and select Path>Reverse Path
 - ♦ Go to Path>Reverse Path

10.09 Line Fill

- The **Line Fill** function creates a line or hatch fill pattern, typically used for engraving with an engraving tool. It can also be used for coloring in shapes with a pen or embossing some materials with an embosser.
- To access this function, select a shape and go to Effects>Line Fill:



- ♦ **Line Spacing:** This is selected based on the width of the line produced by the tool to be used. If it's too small to accurately measure, use 0.02" or 0.5 mm for a small test shape and then adjust, as needed, to fit the tool and application.
- Angle: Choose an angle for the Line Fill. An Angle of 0 results in horizontal lines and an Angle of 90 results in vertical lines. Note the diagonal pattern in the prior screenshot using an Angle of 45.
- Cross Hatch: Increasing Cross Hatch adds additional intersecting lines to the pattern which can result in a more complete fill but will take longer to engrave or draw:



Alternate Line Direction: This controls whether the tool always returns to the same side before dropping down to engrave or draw. In some applications, it may need to be unchecked to provide a more even appearance, however it will take much longer to execute:



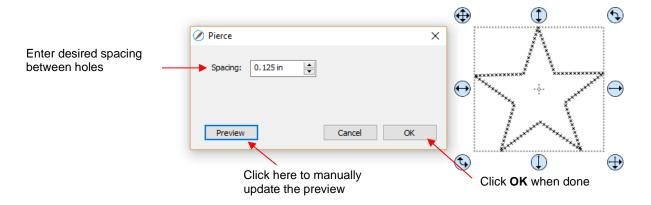
♦ **Keep Original Outline:** Usually a good idea in case you want to revise your pattern later on. Also, when working with lettering, having the outline improves readability:



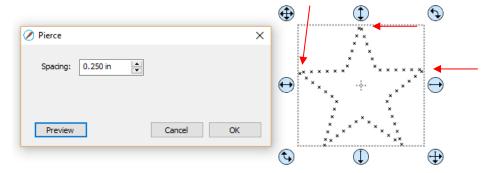


10.10 Pierce

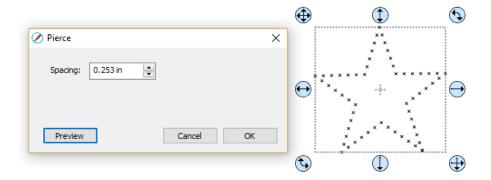
- The **Pierce** function creates holes for punch tools. This can be used to create Pergamum designs and paper embroidery patterns.
- To access this function, select a shape and go to Effects>Pierce:



- Note that even though you see "X" shapes on the screen, the cutter head will be making downward punch movements.
- At this time, there is no editing available for a pattern created using the **Pierce** function. If you find that your
 design has holes that are not evenly spaced, try altering the spacing by tiny increments and clicking on **Preview**.
 - ♦ For example, the star shape used above shows uneven spacing when a value of 0.25" is entered. Note how the star has holes too close to one another at the upper points:



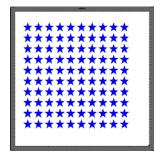
♦ Gradually increasing the **Spacing** didn't immediately result in an acceptable pattern until 0.253" was entered. Then the pattern looked even:



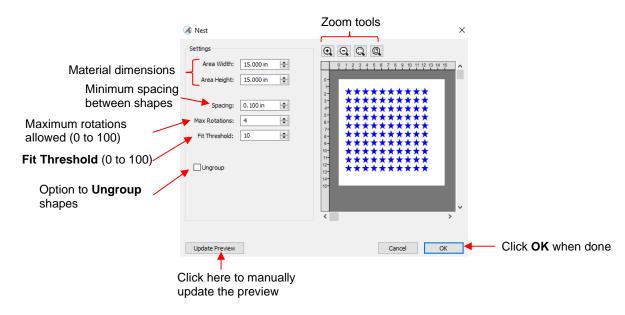
- If you have a shape that has the **Pierce** effect applied and want to remove it (even after the file has been saved and re-opened), select the shape and go to **Object>Remove Effects**.
- If you are unable to get an even pattern, then try using the **Rhinestone** effect instead. Refer to *Section 9.12* and enter the smallest rhinestone circle size available: SS000.

10.11 Nest

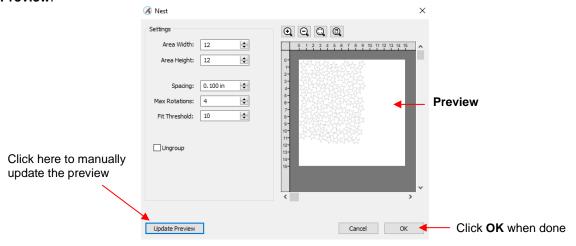
- The Nest function rearranges all of the shapes on the current page in an effort to economize the area occupied.
- For example, let's say you want to cut out these 100 stars from a sheet of 12 x 12 cardstock:



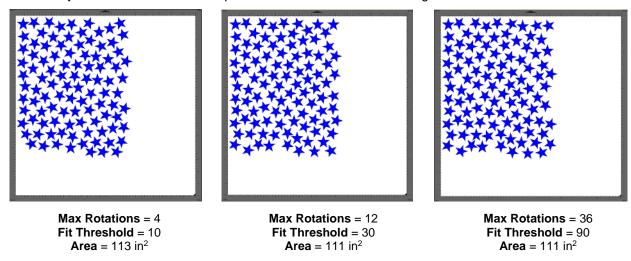
• To access the **Nest** function, go to **Effects>Nest**. The following window opens:



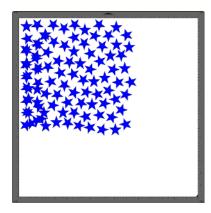
- ♦ Area Width and Area Height: Enter the dimensions of the material from which you will be cutting so that the nesting will arrange the shapes within that available area, if possible.
- Spacing: Enter the minimum distance allowed between shapes.
- Max Rotations: Shapes will be rotated in an effort to pack them together more closely. The maximum rotations allowed can be set between 0 and 100. However, the more rotations you select, the longer the rendering time for the nesting function. Note: When cutting from a material, such as patterned paper, where the shapes need to be oriented as designed on the Cutting Mat, set Max Rotations to 0 so that none of the shapes will be rotated during the nesting process.
- ♦ **Fit Threshold**: A setting between 1 and 100, with a higher value attempting to pack the shapes closer together than a lower value. As with **Max Rotations**, the higher the number, the longer the rendering time for the nesting function.
- ♦ **Ungroup**: If any of the shapes are grouped together, but you do not want them treated as a group when nesting, mark this option.
- Clicking on Update Preview will perform the nesting process and the resulting arrangement will appear in the Preview:

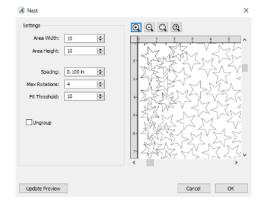


• <u>IMPORTANT:</u> Choosing very high values for **Max Rotations** and **Fit Threshold**, when there are many shapes on the page, can lead to freezing of the software. Testing has shown that the amount of space saved may not amount to much compared to more conservative settings:

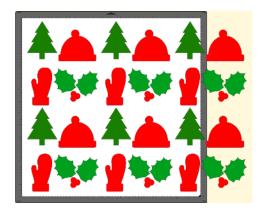


• **IMPORTANT:** Be sure to check the arrangement before cutting to make sure there is no overlap. For example, if the available cardstock had only been 10" x 10", then overlap between the shapes would have occurred:





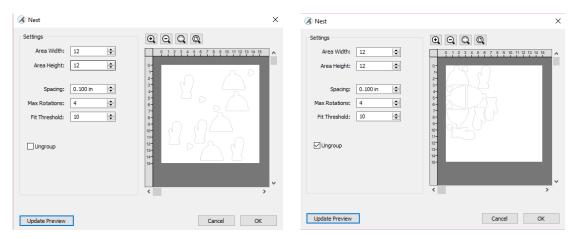
- This could also have been caught while still in the **Nest** window by carefully checking the **Preview** and zooming in, as shown above.
- Nesting isn't restricted to identical shapes. In this next example, Christmas shapes are to be cut from red and green cardstock:



- Note that the shapes extend beyond the boundary of the Cutting Mat. This is not an issue for the Nest function.
- ♦ The green shapes are all selected and grouped together on the **Layers Panel**, as are the red shapes:



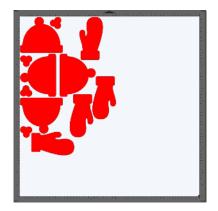
- ♦ <u>IMPORTANT:</u> Even if you were to lock or hide one of the layers, the **Nest** function will attempt to include it. Thus, separate the layers onto their own pages.
- ♦ Taking the red layer onto a new page, in the **Nest** window the dimensions of the cardstock are entered, along with the other settings.
- IMPORTANT: Because the shapes are grouped, the option for Ungroup should be marked before clicking on Update Preview. Otherwise the group will be treated as a single object and the individual shapes will not be nested at all:

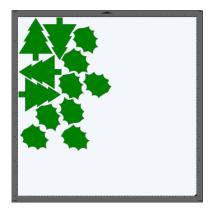


Ungroup not checked: shapes are not nested

Ungroup checked: shapes are nested

♦ The process is repeated for the green shapes, again making sure there are no other hidden layers and that the **Ungroup** box is checked before applying **Update Preview**. End result: two pages with the red shapes nested on one and the green shapes nested on the other:



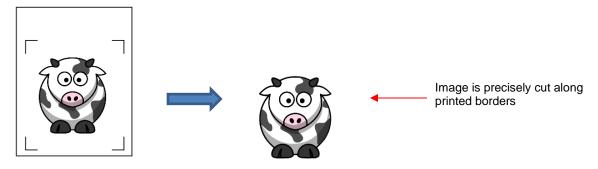


11. Zing Orbit: Print And Cut

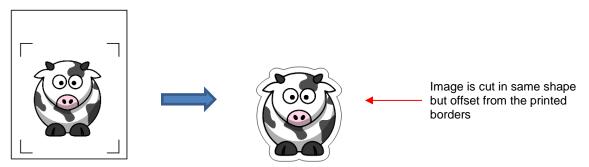
Free Video

11.01 What Is a Print and Cut (PNC)?

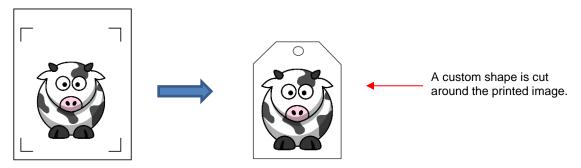
- The print and cut process involves printing an image from SCAL to any printer you own and then, with the aid of the Zing Orbit's optic eye, having the image or images cut out with perfect precision. Below are three typical kinds of print and cut applications but there can be other kinds.
 - ♦ Cuts along the actual borders of the printed image(s):



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



Outs follow a different shape from that of the printed image(s):



11.02 What is a PNC Calibration?

In order to get precise PNC results, you must calibrate the optic eye. This is nothing more than letting the ZO know how far away the optic eye light is located relative to the tip of the blade. Because the optic eye is manually installed inside the blade carriage, the distance from the optic eye light to the tip of the blade will vary from one KNK to the next. Also, you will want to use the same blade holder with all of your PNC applications, as the distance can also change with larger or smaller diameter holders.

- This calibration only needs to be done one time for a given blade holder. If you have travelled with your ZO 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 check your calibration after any updates are installed.
- The process involves:
 - Printing some test sheets. It is recommended that arrows be used so that you can be sure the printout is in the correct orientation on the cutting mat as it is on the screen.
 - Performing an initial alignment with the calibration pin that came with your ZO.
 - Performing the auto-registration detection and cutting on one of the test sheets.
 - Adjusting offset values to tweak the calibration and repeating the auto-registration detection and cut. You SHOULD be able to get perfect PNC's so several adjustments will be in order.

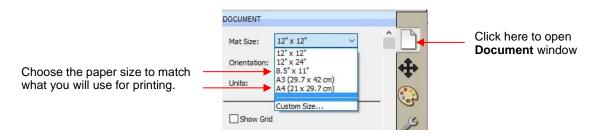
11.03 Optic Eye Calibration Procedure

11.03.1 What You Need for Calibrating

- You need to be well rested! You don't want to start learning the PNC process when you are tired, stressed, or in a hurry. Mastering a PNC comes when you have the time to repeat it about 4 times in a row. At that point, you will not only have repeated the process enough times to feel very comfortable with the order of the steps, but you'll have your calibration perfected and then be ready to do future PNC's quickly and with ease.
- **IMPORTANT:** You need to make sure the Zing Orbit is running the latest firmware update. Therefore, please go to Section 1.14 and perform this update.
- It is recommended that the **Resolution/Sizing Calibration** presented in *Section 2.08* be performed <u>before</u> proceeding with the optic eye calibration.
- Next, you will need the following items:
 - ♦ Printer
 - Blade holder (you cannot do this calibration with the test pen; it must be the same blade holder you'll be using for your PNC applications)
 - ♦ Red capped blade
 - Alignment pin that came with your Zing Orbit
 - ♦ Copy/printer paper in either Letter size (8.5" x 11") or A4 (21 x 29.7 cm)
- <u>Important!</u> In order to facilitate the calibration process, <u>please follow all instructions exactly</u>. Later, after calibration, you can change up settings to suit your needs. Also, if you use a second computer, you must follow the steps in Section 11.06 to update that computer correctly with your calibration.

11.03.2 Preparing the Calibration File and Printing

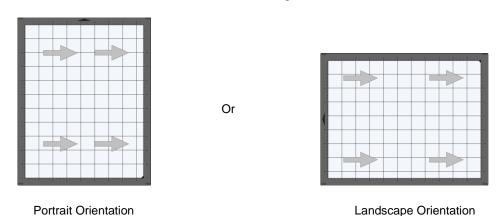
(1) It is strongly recommended that you set the dimensions to match the paper size you'll be using for the calibration. Working closer to the origin reduces unnecessary movement that can introduce factors which may affect accuracy. In the **Document** window, open the **Mat Size** dropdown menu and select either 8.5" x 11" or A4 (21 x 29.7cm):



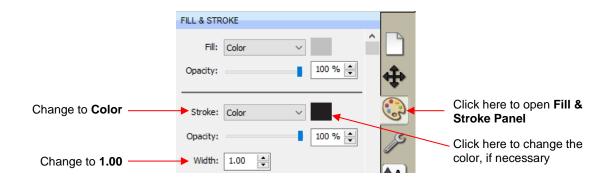
(2) For **Orientation**, you may work in either **Vertical (Portrait)** mode or **Horizontal (Landscape)** mode, whichever one you're most accustomed to using:



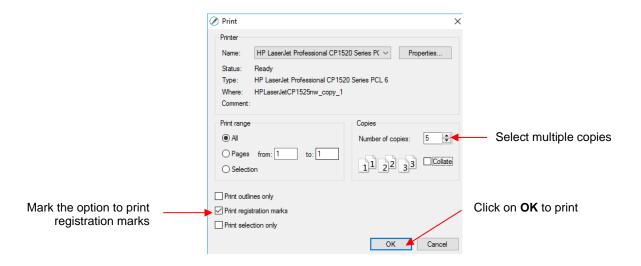
(3) Open the **Library** and select the right facing arrow inside the **Basic Shapes** folder. It's recommended that you have several arrows spread out on the **Cutting Mat** as shown below. They do not have to be perfectly aligned with one another. However, do allow a margin of about ¾ inch (2 cm) from the edge of the mat. Later it will be shown how to make this allowance less stringent.



(4) It is also recommended that the arrows be outlined for printing as shown above. This will make it easier to see if the cut lines are above or below the printed lines. To add an outline to a shape, select that layer and click on the **Fill & Stroke** icon on the **Document Panel**. Change the **Stroke** from **None** to **Color** and then click on the box to the right of that to open a color selection menu.



(5) Go to **File>Print** and mark the box next to **Print Registration Marks** and then set the **Copies** to ~ 4 or 5. Click on **OK** to print the calibration test sheets. Note that on some printers, you may need to switch to **Landscape** mode (under **Properties**) if using the **Landscape Orientation** in SCAL.

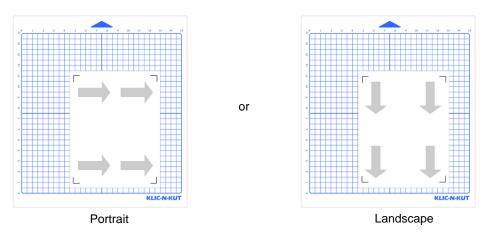


11.03.3 Preparing the Zing Orbit

- (1) Replace the blade in the blade holder with the alignment pin. It's not necessary to use the tiny spring with this pin.
- (2) Extend the exposure to the maximum so that most of the pin is sticking out of the cap:



- (3) Place one of the printouts onto the mat using the following guidelines:
 - ♦ The arrows should point to the right (if using **Portrait** mode) or pointing down (if using **Landscape** mode).
 - Place the printout towards the center of the mat versus along the far-right side. If the pinch wheels are too close to the reg marks, it can cause the optic eye to fail.
 - Align the printout along grid lines so that it's straight. If you take note of which gridmark is being used, it will make things faster with subsequent tests.
 - Make sure the printout is smoothly pressed to the mat. If there are any wrinkles in the paper, autodetection of the registration marks might fail.



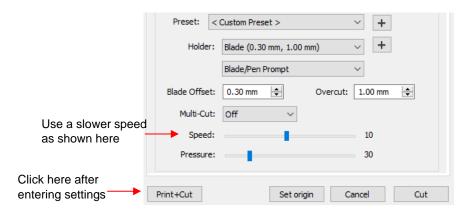
(4) Insert the mat into the cutter, aligning one of the grid lines with the ruler or some other horizontal line visible through the mat. While the alignment doesn't need to be perfect, you do want it fairly straight so that the optic eye will move to within a short distance of each mark.

- (5) <u>IMPORTANT:</u> Make sure you're using pinch wheel locations as was shown in *Section 1.09* so that the wheels are near the outside edges of the mat and centered over the grit shafts beneath. You need secure and balanced pinch wheels to feed the mat evenly.
- (6) Insert the blade holder into the blade holder seat so that the tip of the pin will be above the paper.

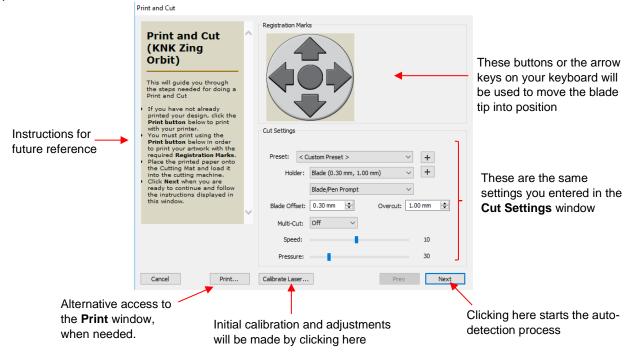
11.03.4 Conducting the Initial Calibration

The following procedure should only be conducted <u>one time</u>. Repeating this process <u>does not</u> improve the accuracy of your calibration. Instead, you will use the steps in *Section 11.03.5* to fine-tune the calibration.

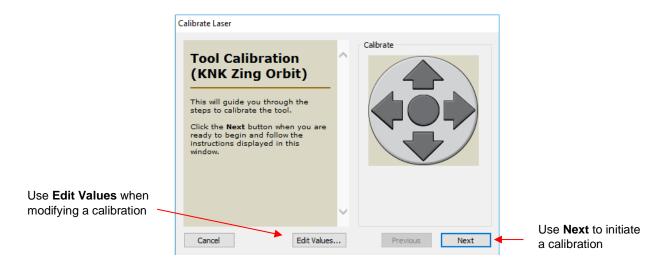
- (1) Click on the Cutter icon to open the cut window.
- (2) Enter the settings in the following screenshot. If you know you need a higher or lower **Pressure** for the paper you're cutting, use that pressure instead:



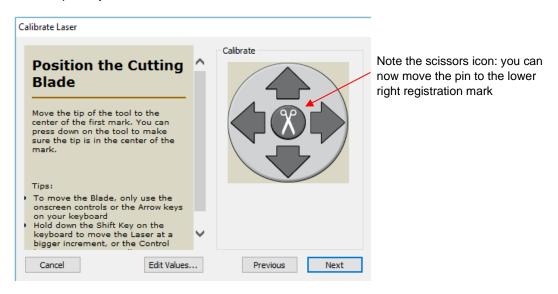
(3) At the bottom of the Cut Settings window, click on Print+Cut. The following Print and Cut window will open:



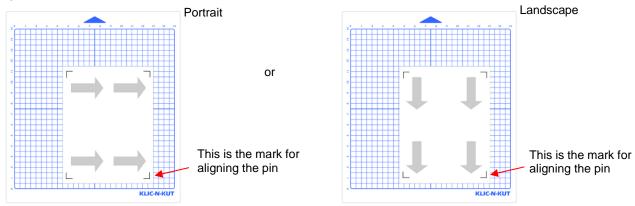
(4) Click on **Calibrate Laser**. The following window will open:



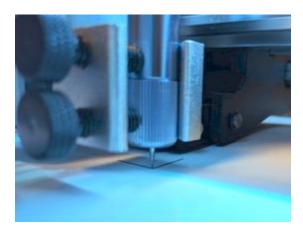
- (5) Note these two options in this window:
 - ♦ **Edit Values**: This is the option you will use <u>later</u> when tweaking the calibration
 - Next: This is the option for initially calibrating the optic eye. Click on it now and the window will update. Note that the instructions have updated and there is now a scissors icon in the middle of the arrow buttons. At this point, you can use those buttons to move the head:



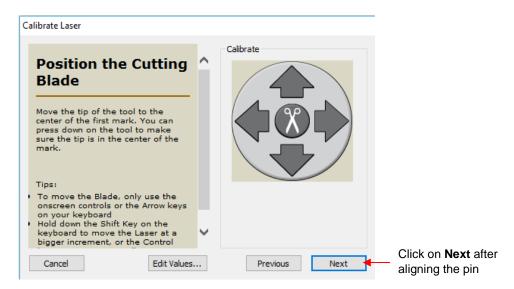
(6) Use the arrows in that window or the arrow keys on your keyboard to move the head over to the lower right registration mark: The goal is to have the tip of the alignment pin directly centered in the corner of that mark. Push down on the blade holder, as needed, so you can carefully look at the tip's location relative to that corner:



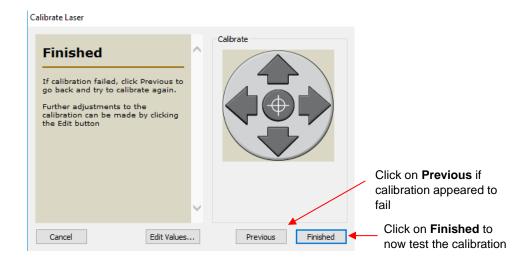
(7) The goal is to have the tip of the alignment pin directly centered in the corner of that mark. Push down on the blade holder, as needed, so you can carefully look at the tip's location relative to that corner:



- (8) Just like when setting the origin, you can control the distance moved with each arrow click using these keys:
 - ♦ Holding the **Shift** key will increase the size of the increment
 - ♦ Holding the **Ctrl** key (**Command** key on the Mac) decreases the size of the increment
 - Holding both the Shift key and Control key (Mac: Command key) minimizes the size of the increment.
- (9) Once the pin appears to be dead center at that corner, click on **Next:**



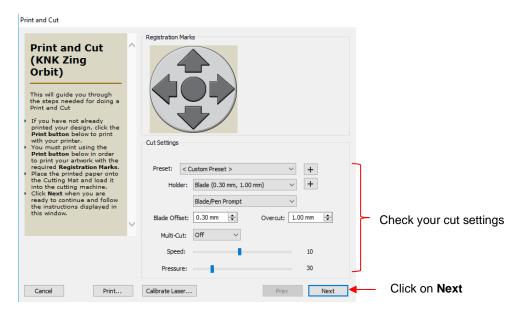
- (10) The optic eye will begin scanning that single registration mark:
 - If the optic eye is properly detecting the registration mark, the optic eye will read both horizontally and vertically along that mark <u>several times</u>.
 - If the optic eye fails to read the mark, the optic eye will only attempt to read it once or twice and will stop.
- (11) The following window will then open:



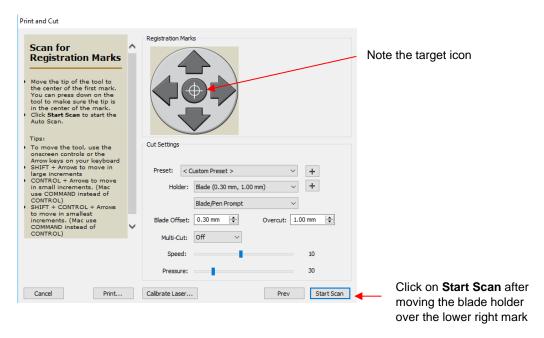
- (12) Click on **Finished** to have the calibration stored and to return to the **Print and Cut** window. If the optic eye did not read the mark multiple times, click on **Previous** to repeat the process. If it continues to fail, please go to *Appendix B2* for information on optic eye failures.
- (13) <u>IMPORTANT:</u> Once you have successfully completed this section, you have an approximate calibration to use for testing in the next *Section 11.03.5*. Do not repeat it unless instructed to do so by KNK tech support. Repeating it only resets the calibration numbers and doesn't allow you to hone in on a more precise set of numbers.

11.03.5 Testing the Calibration

(1) After completing the initial calibration, a test of this calibration should be performed to see how much adjustment will be needed. At this point you should be back in the **Print and Cut** window. Again, verify your cut settings are correct:



(2) Click on **Next** and a target icon will appear in the center of the arrow buttons:



- (3) Move the blade holder to the left until you can comfortably remove it from the seat and switch out the pin for the blade.
- (4) Again, position the blade holder over the lower right registration mark corner. You do not have to be as accurate as during the calibration. The method I use is to first make sure the vertical line of the reg mark is ~ centered with the front screws. Then, I slide the mat back until the horizontal line appears ~ centered with the blade holder:

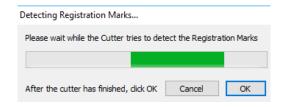


1. Align vertical line with center of front screws.



2. Slide mat back until horizontal line is centered with blade holder

- (5) Click on **Start Scan** and the automatic detection of the registration marks will be carried out. There are two possible outcomes:
 - All of the registration marks are successfully read. After the blade holder returns to the first mark and reads it a second time, the following window will still be open. At this point, click on **OK** and then click on **Cut**. Note that if you're using a PC, you can also just press the **Enter** key twice on your keyboard:



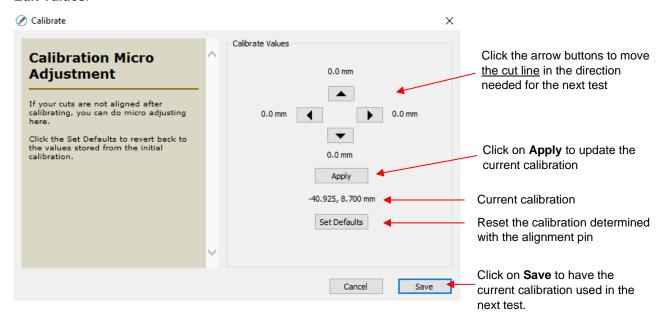
If the registration fails at any point, the detection will stop at that spot and the ZO light will turn red. The same window as above will still be active. However, you will need to click on **Cancel** to return to the

Print and Cut window <u>and</u> you will need to do a "quick press" of the power button to return to white light mode. The most common reasons why the process failed are:

- The blade tip wasn't close enough to the corner of the lower right mark
- o The printout is not smoothly pressed to the mat
- The mat is warped
- ♦ Other causes for a failed reading are covered in *Appendix B2*.
- (6) If the registration was successful and the four arrows are now cut out, proceed to Section 11.03.6. If the registration failed and the cutter did NOT enter red light mode you need to update the firmware. Go to Section 1.14. If the cutter did enter red light mode and you clicked on **Cancel** and pressed the power button, you are ready to try again from Step (2). It is not necessary to repeat the steps in Section 11.03.4.

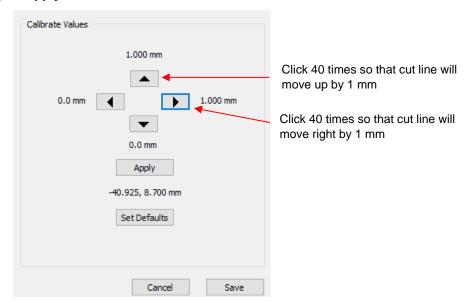
11.03.6 Adjusting the X and Y Values

- (1) After the print and cut is completed, examine how the cut lines are located relative to the printed lines. Are they above or below? Are they too far right or too far left? Only focus on horizontal and vertical lines for now, not the diagonal cuts.
- (2) Also, examine the four arrows. If you see a difference in how the four cut out, focus on the <u>lower right one</u> for now. After the calibration is complete, if you still see an inconsistency, then refer to the checklist later in this section.
- (3) To open the Calibrate Values window, go to the Print and Cut window, click on Calibrate Laser and then Edit Values:

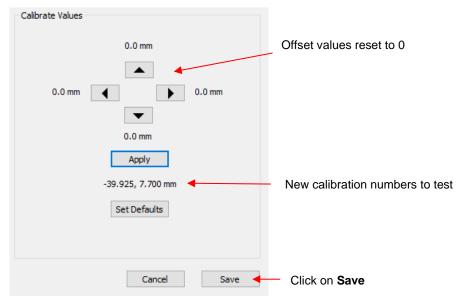


- (4) This window provides an easy way to adjust your calibrations. <u>Before making any changes, write down</u> the current calibration onto your first printout. In the above example, you would write down -40.925 and 8.700 and also write down the number 1 to indicate it was your first test. You might also want to write the number 1 on one of the cut arrows in case it gets separated from the printout. In other words, it's highly recommended you keep each test, for reference, until you have a perfect calibration. If you do NOT see current calibration numbers or they read 0,0 then you need to update the firmware. Refer to Section 1.14.
- (5) Each click on a button will move the next cut by 0.025 mm in that direction. Note that 0.025 mm is extremely small, so when you perform your second calibration, you will want to <u>use a much larger value</u>. Typically, <u>moving at least 1 mm</u> in each direction needed is recommended. Even if you overshoot, it will help you determine how far back you'll need to move for the 3rd test.

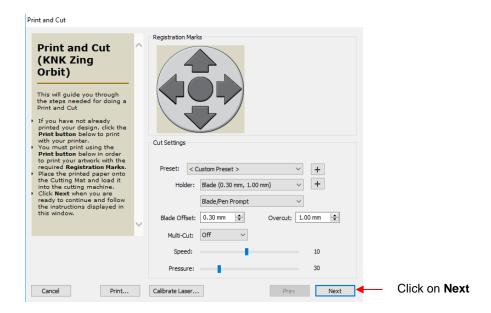
(6) Thus, note the direction you need to move and click the appropriate button 40 times in that direction. Let say, in the prior example, the cut line needed to move up and to the right. The Edit Values window would then look this before clicking on Apply:



(7) After clicking on **Apply** the current calibration numbers will update and you can write these on your 2nd printout before testing (or wait until after the cut):



<u>IMPORTANT REMINDER:</u> At this point you want to be careful NOT to repeat the single calibration procedure you used in *Section 11.03.4*. <u>It will do nothing</u> to improve your calibration but rather set you back to "ground zero." Thus, avoid clicking on the <u>Calibrate Laser</u> button <u>except for the purpose of going to the <u>Edit Values window</u>. When you click on <u>Save</u> in the <u>Edit Values</u> window, you will then be at the correct window to test again. Click on <u>Next</u>:</u>

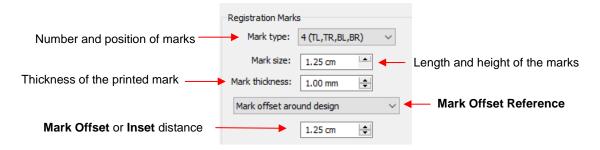


- (8) On your next test, if you place the printout along the same grid line, you should able to insert the mat with the lower right registration mark corner approximately centered under the blade holder. Then just press **Start Scan** and the next scan will begin. Otherwise, move the head so that the center of the blade holder is again, over the lower right registration mark and then click on **Start Scan**.
- (9) Note again what direction to move the cut lines based on the horizontal and vertical lines of the arrow. If you still need to move further in the same direction as before, increase again by 1 mm (40 clicks) or if the cut is very close now to the printed line, use only 0.5 mm (20 clicks). If you have overshot the line, then use 0.5 mm (or 20 clicks) in the opposite direction.
- (10) Continue this process, gradually decreasing the distance being moved until the cut is virtually perfect. If you still see some error on the diagonal, then closely examine the printout to see if it's not still off by a hairline in one or the other direction. Use only 1 or 2 clicks (0.025 mm or 0.05 mm) to achieve a calibration to your satisfaction. Then write down that final calibration in your little black book!
- If you find that one or two arrows are perfect but the others are off:
 - ♦ Check the **Cut Speed** setting. Too high of a speed can cause inaccuracies.
 - Make sure the pinch wheels are still centered under the white arrows.
 - Make sure the bottom of the mat, the pinch wheels, and the grit shafts are clean.
 - Make sure nothing is interfering with the smooth traveling of the mat.
 - Make sure the blade isn't cutting too deeply into the mat. Lessen the blade exposure by retracting it a tiny bit back into blade holder.

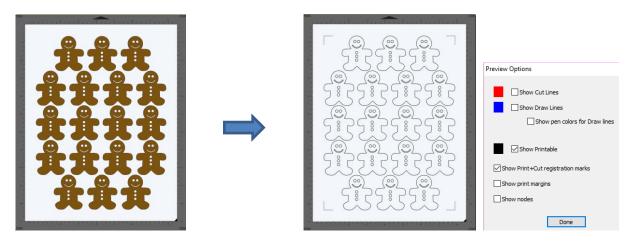
11.04 Preparing an Actual Print and Cut Application

- Here are the typical steps when preparing a PNC application:
 - Prepare the image that will be printed which can be either or both of the following:
 - An imported raster image such as a JPG or PNG which will need tracing (refer to Section 7.03)
 - A vector image (either imported or designed in SCAL) that will be printed but not cut
 - Make sure shapes that will only be printed are on a different layer than the shapes that will be cut.
 - ♦ For each layer, open the Style Panel (refer to Section 10.01). Under Cut Line Type choose:
 - Print+Cut Cut: for a layer that will be cut
 - Print+Cut Print: for a layer that will be printed

- ♦ Print the project, making sure to mark the option to **Print registration marks**. You can print a project using either **File>Print** or by clicking the **Print** button in the **Print and Cut** window.
- If needed, perform a test cut so that you know the best settings to use. This test cut can often be performed on the printout itself if there is room in waste area of the project.
- Perform the cutting process, selecting Print+Cut from the Cut Settings window and following the instructions.
- You have some control over the size and location of the registration marks. Under Cutter>Cutter Settings, the upper right section of that window shows the default settings for creating registration marks:



- ♦ **Mark type:** The Zing Orbit's optic eye uses four marks, thus this option will always remain the same.
- Mark size: In order for the optic eye to locate the locations of the marks, the size needs to remain fairly large. You can try reducing to a smaller size but the optic eye might then fail.
- Mark thickness: Testing has shown that the lower limit is about 0.75 mm. Thinner than that and the optic eye will fail to see the mark. If your ZO is having issues consistently finding the marks, try increasing the Mark thickness to 1.50 mm or even 2.00 mm.
- Mark Offset Reference: There are three options in this menu:
 - Mark offset around design: The marks will be positioned based on the bounding box around the layer(s) that will be cut
 - Mark inset from print bounds: The marks will be positioned based on the paper size specified in vour printer properties
 - Mark inset from page bounds: The marks will be positioned based on the Mat Size specified on the Document Panel
- Mark Offset or Inset Distance: This is the distance from the registration marks to whatever reference point was selected. This can be reduced if you need more space on your printout for your images. Note, however, that if you have images too close to the registration marks, then the scanning process can fail.
 - When using Mark Offset around design, some users prefer to set the Mark Offset or Inset close to 0, but then remove any shapes that are close to the corners:



When using Mark inset from print bounds, you may need to turn on Borderless printing in your printer properties window. This can introduce a problem with the reg marks being relocated. Please refer to the following tutorial before using Borderless printing:

https://www.iloveknk.com/Support/Tutorials/Klic-N-Kut/Borderless-Printing-Issues-with-PNC.pdf

11.05 Other Print and Cut Tips

- When tracing imported images, the trace lines will not necessarily be perfectly aligned with the image. This
 can result in tiny bits of white appearing in certain spots, 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. Look at the same spots
 where the cut didn't follow the image perfectly. This could be the cause of the inaccurate PNC. There are
 three ways of handling this situation:
 - Retrace the imported image, using a lower **Contrast** and/or **Smooth** setting to get a tighter fit of the trace line to the original graphic (refer to *Section 7.03*).
 - ♦ Use **Path Editing** to move the trace lines to more closely fit the original graphic (refer to Section 8.10.2.
 - ♦ Create an inset line to use for cutting instead of the original trace line (refer to Section 8.05).
- If a PNC is not precise and the cause is not the alignment of the trace lines, then 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 Zing Orbit, use a speed of 10 or lower.
- Remember that the calibration of the Optic Eye is specific to the blade holder type being used. Thus, if you change brands, the optic eye calibration will need to be modified.
- If your test arrow is cutting perfectly, thus indicating you have the correct calibration, but your next print and cut is way off, then perhaps your situation is something outside of the ordinary. Get help at one of the recommended online support groups listed in on the first page of this manual.
- If the optic eye is failing to read the reg marks more than one out of ten times, refer to *Appendix B2* for things to check.

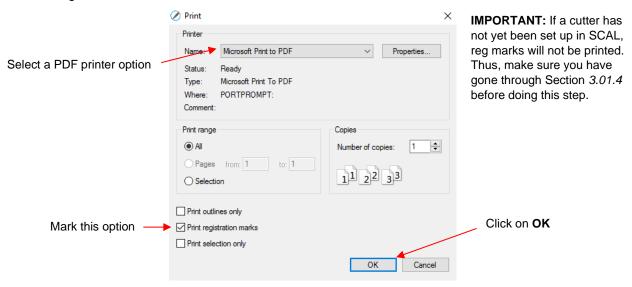
11.06 Setting Calibration Numbers on Another Computer

- If you have another computer you wish to use with your Zing Orbit for PNC applications, there are a few things to keep in mind:
 - ♦ The current calibration numbers are stored both in SCAL and on the Zing Orbit itself. Whenever you send a PNC to the Zing Orbit, it will update and use the calibration numbers from the installation of SCAL on that computer.
 - Whenever the Edit Values window in SCAL is opened, whatever calibration numbers are showing will be immediately transmitted to the Zing Orbit. Even if you click on Cancel, those numbers have already been transmitted. This can result in losing your "successful calibration" if you have not recorded it in your little black book.
 - When you make a change in the **Edit Values** window and you **Apply** and **Save**, the Zing Orbit's values are <u>not</u> updated until either (a) you reopen that **Edit Values** window OR (b) you proceed with an actual PNC process.
- Use the following steps to enter your numbers into a second computer:
 - (1) Turn on the Zing Orbit and make sure communication is established.
 - (2) <u>IMPORTANT:</u> Do <u>not</u> open the **Edit Values** window on the second computer until you locate your "perfect calibration." In *Step 10* of *Section 11.03.6*, you were advised to write down those numbers. If you neglected to do that, then again, do NOT open the **Edit Values** window on the second computer. Instead, proceed to the following step. If you do have your numbers <u>already recorded</u>, go to *Step (4)*.

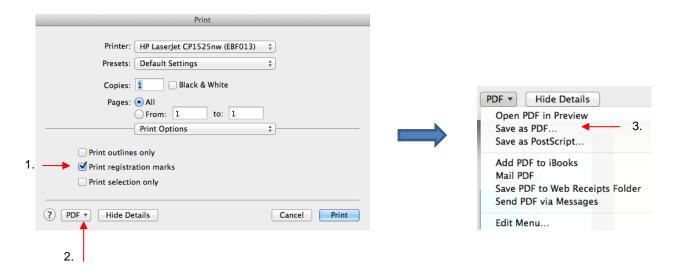
- (3) Find the calibration numbers from the first computer by opening the Edit Values window on that computer. Carefully write down those numbers and then close that window. Close out of the PNC window.
- (4) On the second computer, open the **Edit Values** window. Remember that at this point, the ZO will now update with whatever current calibration appears in that window.
- (5) Click on the arrow buttons and click on **Apply** until the same calibration appears as the one you have written down.
- (6) Click on Save.
- (7) Either open that window again or perform a PNC using this second computer. The latter is a better idea so that it can be verified that the Zing Orbit has correctly updated.

11.07 Printing a PNC Project from Outside of SCAL

- Sometimes users prefer to print their designs from other applications, such as Adobe Illustrator or Photoshop. The following procedure cover this process somewhat generically. If you have problems, do not hesitate to post in one of the forums or groups mentioned in *Section 1.01*.
 - (1) Open the file in the alternative program. To make things easier, make sure the document size matches that which will be used for printing.
 - (2) If the program is a raster designing program, such as Photoshop, export the file as PNG. If the program is a vector designing program, such as Illustrator, export the file as AI. For vectors, only export the cut lines.
 - (3) In SCAL, set the document/cutting mat dimensions to also match that which will be used for printing.
 - (4) If the file to be imported is PNG, then import and trace the design. It is not necessary to also include the original image. You only need the vector trace line. If the file to be imported is AI, then import as you would any other vector file.
 - (5) Save this file so that it can later be used for cutting.
 - (6) For PC owners: Go to File>Print and mark the option for Print registration marks. For printer, select Microsoft Print to PDF. (If you have an older version of Windows, you may need to download and install a PDF printer. There are free ones like Cute PDF.) Click on OK. Name the file and note where it is being saved.



For Mac owners: Go to **File>Print** and mark the option for **Print registration marks.** Click on the **PDF** button in the lower left corner and, in the popup menu, select **Save as PDF**:



- (7) In the design software, import the PDF file. Make sure the imported cut lines are properly aligned with the shapes to be printed so that the registration marks will print in the correct location. This is where having the document sizes match should allow for easy placement. But you may want to do <u>a complete test print and cut on copy paper</u> before printing on expensive materials.
- (8) Before printing the design, make sure the registration marks show but the cut lines do not. Change layer position or delete cut lines shapes, as needed. In some cases, it might be best to go back to SCAL, change the **Fill** to white and the **Stroke** to **None** so that the images will be properly hidden from printing.
- (9) Print the design. Then place the printout onto your cutting mat and proceed, from SCAL with the cutting process under Print+Cut. Remember that it's very important to maintain alignment so do not alter the shapes to be cut or the Mark Offset setting under Cutter>Cutter Settings.

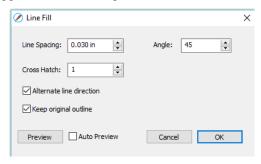
12. Zing Orbit: Accessory Tools

12.01 Drawing with a Pen or Glue Pen or the WRMK Foil Quill

• With the Zing Orbit, you can draw with any pen, pencil, marker, or glue pen that can be securely gripped by the blade holder seat. However, if you were to draw and then cut, it is unlikely that the two will be aligned because of the difference in diameter between the pen and the blade holder.



- If your pen and blade holder have the exact same diameter, then refer to Section 12.07.1 for instructions on doing a draw and cut. If, more likely, your pen is a different diameter than your blade holder, then refer to Section 12.07.2 on how to do a draw and cut with corrected alignment. But first, continue reading the remainder of this section for tips on drawing.
- If you wish to fill in a drawn shape, refer back to Section 10.09 which covers how to add a Line Fill pattern to a shape. Here are some suggestions on settings to use in the Line Fill window:



- To fully color in a shape, measure the width of the pen stroke and then use a slightly smaller width in
 the Line Fill window. For example, a Sharpie Fine Point pen is ~ 1 mm or 0.04" thick. So, for the Line
 Spacing setting, use 0.9 mm or 0.03".
- Adding a **Cross Hatch** will insure a more complete fill, although it will add to the time it takes to color in the shape.
- Checking the option for **Keep original outline** will better define the shape. Although, in some cases, you might want to outline the shape in a different color, thus you would leave this unchecked and have the outline repeated on a different layer with a different pen color assigned.
- 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 or glue could smear.
- The Sakura Quickie glue pens work well in the Zing Orbit. They will fit directly into the blade holder seat.
- Open path fonts work well for drawing as they provide single drawn lines and curves versus an outline form that usually then requires a fill. Refer to Section 6.11.
- For the WRMK Foil Quill pen, please refer to the tutorials and videos available on this page:

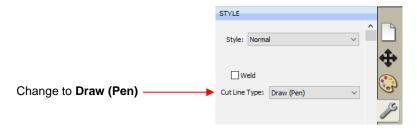
https://www.iloveknk.com/support/foil-quill-support/

12.01.1 Draw and Cut: When the Pen and Blade Holder Are Aligned

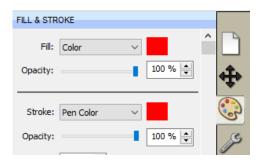
- Although it is unlikely your pen will be identical in diameter to the blade holder, there are plans to come out with a Zing Orbit pen holder that will auto-center a pen and the following procedure can then be used.
- Before using the following method, test the alignment by sending the same shape to draw first and then cut, making sure the alignment is satisfactory for your planned project. If it's not, then refer to Section 12.07.2.
 - (1) Make sure the shapes to be drawn are on different layers than the shapes to be cut. For example, let's say you were going to draw the ABC and its shadow in two different colors (red and blue), followed by cutting out a rounded rectangle around the letters:

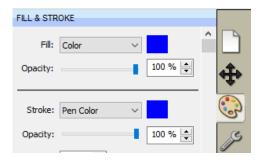


(2) Open the **Style Panel** and select the two layer(s) to be drawn (*ABC* and *Shadow Layer*) and change **Cut Line Type** to **Draw (Pen)**:



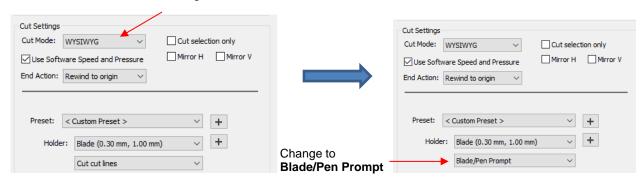
Open the Fill & Stroke Panel and assigned a different Stroke color to those two layers:



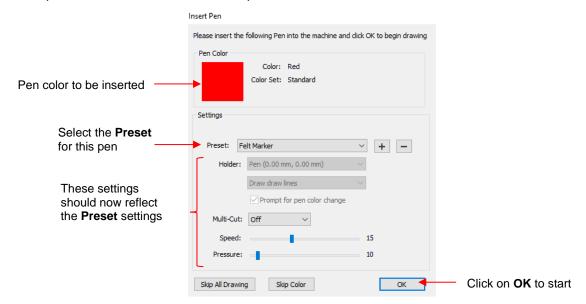


• In the Cut Settings window, make sure Cut Mode is set to WYSIWYG. Then, change Cut cut lines to Blade/Pen Prompt:

Change to WYSIWYG



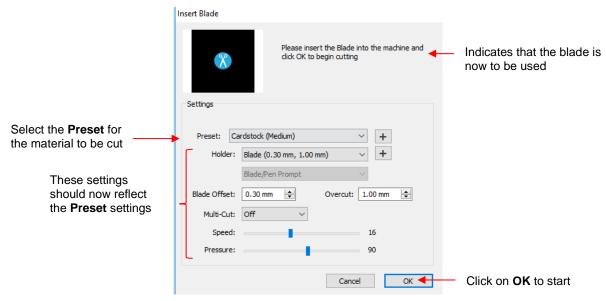
- Before you begin, make sure you know the settings you'll need for each pen and for the blade. Because of a
 current bug in SCAL, you will need to set up **Presets** for these various combinations of settings so that the
 preset can be selected at each tool prompt. Refer back to Section 2.04 for directions on how to create
 presets.
- Set the origin and then click on **Cut**. A window will pop open prompting you to use the first pen color. From the dropdown menu, choose the needed preset:



- The settings should change to reflect those used for the Preset you choose. Click on OK to start the
 drawing of that selected color using those settings.
- After the shapes are drawn, the next prompt will be for the blue shapes. Change out the pen and, again, choose the desired Preset and click on OK.



 Finally, the prompt for cutting will open. Switch out the pen for the blade holder and choose the Preset for the material you are cutting. Then click on OK.



· After cutting, you will be returned to the main window in SCAL

12.01.2 Draw and Cut: When the Pen and Blade Holder Are Not Aligned

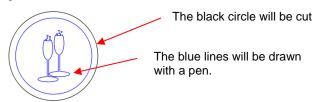
If you plan to use two tools with different diameters, then you will face an alignment problem. In the following
example, two glasses and an inner circle will be drawn with a silver gel pen and then the outside circle cut
out.



 Because the gel pen is thin, it sits further back in the blade holder seat than the blade holder. With no adjustments made, the resulting drawn image and cut circle are out of alignment:



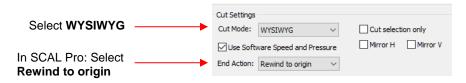
- Fortunately, there is a straight-forward method one can use to compensate for tools with different diameters. It involves drawing first and then, before switching tools, making a small mark on paper so that the same origin can again be set with the other tool. Here are the steps:
 - (1) You will need the following items besides your material and cutting mat:
 - ♦ The pen you wish to use for drawing
 - ♦ Your blade holder and appropriate blade
 - Alignment pin that came with your Zing Orbit (because it's much easier to see the tip compared to the blade)
 - Post it note (or small piece of paper and some tape) (Note: you will not need this if it is okay to add a pen mark on your material.)
 - (2) The following screenshot shows the image to be drawn and cut:



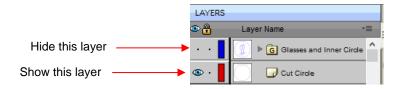
(3) Verify that the layers for drawing and cutting are on separate layers on the **Layers Panel**. Also, hide the layer that will be cut (in this case, the *Cut Circle* layer):



(4) Open the **Cut Settings** window and verify that the **Cut Mode** is set to **WYSIWYG**. If you are using SCAL Pro, then make sure **End Action** is set to **Rewind to Origin**:



- (5) To save time, the layer to be drawn was left with the **Cut Line Type** set to **Cut**. Doing this means you only need to change both the **Blade Offset** and **Overcut** to 0. Enter the other settings required for drawing with the pen you chose.
- (6) Set the origin. Click on **Cut** to have the shapes drawn.
- (7) Important! After the drawing is completed, do NOT move the mat. Do NOT turn off the Zing Orbit.
- (8) On the Layers Panel, hide the layer that was drawn and unhide/show the layer to be cut:



- (9) At this point, you will push down on the pen so that it will leave a mark indicating the origin that was just used for drawing. If this will ruin your project or if the origin is over the mat area itself, then place a Post-It note or tape down a scrap of paper under the pen nib and then push down to leave a small dot of ink.
- (10) Open the **Cut Settings** window again. Click on **Set Origin** and the head will move to the far right. The goal now is to bring the head back over the origin mark. Remember these shortcut keys to control the movement:
 - ♦ Holding the Shift key will increase the size of the increment
 - Holding the Ctrl key (Command key on the Mac) decreases the size of the increment
 - Holding both the Shift key and Control key (Mac: Command key) minimizes the size of the increment.
- (11) Once the pen is close to the mark again, remove the pen from the blade holder seat. Insert the alignment pin into the blade holder (no spring is needed) and then mount the blade holder. Continue setting the origin until the tip of the alignment pin is dead center with the dot made by your pen. Click on **OK** to close the **Origin** window.
- (12) You can now remove the small piece of paper if you used one. Also, remove the blade holder and exchange the pin for the blade. Remount the blade holder into the Zing Orbit.
- (13) Enter the settings needed for cutting and make sure the **Blade Offset** and **Overcut** are back to the values you used. Click on **Cut**. The end results should be a near-perfect alignment:



12.02 Embossing and Scoring

General Info on Embossing

- The <u>Zing Embossing Tool</u> 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 the project involves both embossing/scoring and cutting, you will need to use WYSIWYG for the cut
 mode so that the shapes will be aligned. Also, set Blade Offset and Overcut to 0.
- When embossing cardstock, it is recommended that a soft material be place 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 scoring, 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.

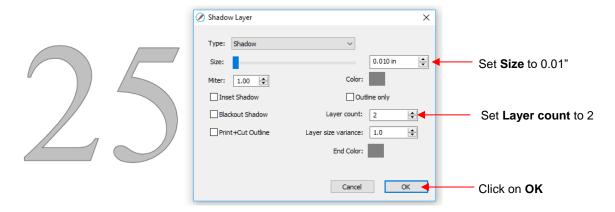
• Make sure you do some tests first to get the best settings for the scoring or embossing you need. For scoring cardstock, this typically involves a higher force (~160) and two or three passes. Refer to the Suggested Settings table at the end of this chapter. If you have a soft material beneath your 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.

Embossing Paper or Cardstock

- When embossing paper or cardstock, it is recommended that you use the Shadow Layer 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 fill 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:



♦ Select the shape and go to Effects>**Shadow Layer** function and perform the following:



Now you have three versions of the shape, each one slightly outset from the other. Thus, when using the embossing tool, you will have a thicker outline made of this shape.

Embossing Leather

Thank you to Lidia Pallo for providing the following information on embossing leather on a Zing. Note that this same method would apply to other KNK cutters.

- Use craft-store tooling leather the kind that comes in ~ 8" X 11" sheets and is about 2-3mm thick. These can usually be found at the major craft stores.
- Once you are ready to emboss, use a spray bottle of water to saturate the leather piece. This is key
 because if you try to emboss over it without "getting it ready first" the leather will retain very little of the
 embossing. Saturating it with water preps the surface. Spray the entire surface two or three times while
 waiting in between for it to soak in (it doesn't take long). If, after drying, the leather becomes cracked-looking
 then it's possible you over-saturated it and it became distorted in the drying process.
- You do not want the rollers to travel over the leather. Thus, arrange the leather on the mat just as one
 would do when using a glue pen or certain inks that might smear.

- The small end of the embossing tool should be used. Insert with the tip of the embosser just above the leather surface. Refer to the settings table at the end of this chapter for recommended settings.
- To finish off the leather piece you can do a number of things, like dyeing it, staining it, or doing any
 additional hand-tooling. Tandy Leather has a lot of video tutorials on YouTube for just about any project.
 One can also apply a gloss coat to make it shiny. To ensure the leather is well taken care of and lasts, you
 can also use leather conditioner.

12.03 Engraving

Engraving Precut Items: Free Video

- The Zing Engraving Tool can be used to engrave vellum, foils, acrylic, and most metals, including trophy labels, dog tags, and jewelry charms.
- The same basic guidelines apply to engraving as in embossing and scoring:
 - ♦ You will probably need to use WYSIWYG mode
 - ♦ You will need to set Blade Offset and Overcut to 0
 - ♦ You will probably need to use multiple passes to get the desired results.
- 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 **Pressure** and **Speed** settings on various materials. Note that you can engrave on materials that cannot be cut on the Zing Orbit, such as jewelry charms, dog tags, and trophy plates.
- To design an engraving fill pattern, use the **Line Fill** function. Refer to *Section 10.09*. Also, open path fonts should work well for engraving. They contain single path lines and curves versus outlines and are usually more desirable when engraving letters. Refer to *Section 6.11*.

Project: Engraving a Dog Tag

- When engraving items that are already cut (such as the items listed previously), it can sometimes be tricky
 getting the perfect alignment you need. Here's a method that works well (thank you to Michelle Hessler for
 posting this technique):
 - ♦ Carefully measure the dimensions of the item. For example, it if is a circular dog tag, then measure the diameter. Recreate the shape in SCAL and size it to be the same. In the follow example, the diameter of the dog tag is 1-1/8", so a circle of the same size is drawn:

Photo of actual dog tag



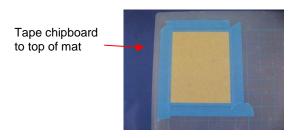


Circle created in SCAL at the same diameter as the tag

- Because this shape will be cut from another material to use in the alignment process, the shape is resized to be a tiny bit larger. For a circle, you can simply resize it in the **Position & Size Panel**. If the shape is non-symmetrical, then use the **Shadow Layer** effect with a shadow **Size** of about 0.04".
- Next the desired lettering and/or shapes are added. In this case, the dog's name and a phone number with "Please Call" are chosen. Because there is also a hole near the top of this dog tag, a ¼" high square is added just to show the top limit of where the lettering could be located. This is deleted as soon as the lettering is added and positioned:



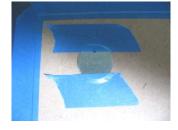
- The lettering is placed on one layer in SCAL while the circle is place on a different layer. <u>IMPORTANT:</u> Make sure the location of the cut circle will be far enough from the origin that you will be able remove it easily. You won't be able to move the mat after cutting this circle and before engraving the tag.
- A sheet of thin chipboard is placed on the cutting mat. Using WYSIWYG cut mode, the circle is sent to cut:





Circle layer is sent to cut and removed from the rest of the chipboard.

After the hole is cut in the chipboard, the mat is left in place in the Zing Orbit! <u>This is important</u>. The cut circle is removed and the actual dog tag is placed inside the cut hole. Tape is used to secure the tag:



 The blade holder is replaced with the Zing engraving tool. The settings are changed for engraving metal. The letter is engraved in the same location on the tag as was designed on the Cutting Mat:





12.04 Using the Punch Tool

- The <u>Zing Punch Tool</u> can be used for creating decorative designs (such as pergamano and other parchment arts) or for creating small holes for paper embroidery.
- To protect the mat and the thin punch, it is recommended that a thick soft cushion, such as Fun Foam be applied between the paper/cardstock and the cutting mat.
- To avoid the possibility of breaking the tip, do not insert the punch tool until after the blade holder seat is over the foam. Also, if you need to reset the origin, remove the punch tool. Again, it is very easy to break the pinch.

- As with embossing and scoring, treat the punch tool as a pen, making sure Blade Offset and Overcut are set to 0.
- Refer to the Suggested Settings table at the end of this chapter or force and speed settings on various materials.
- To design a punch pattern, use the **Pierce** function (Section 10.10) or use the **Rhinestone** function with the minimum size circle (Section 9.12).
- As with the other tools, testing is necessary to get the perfect settings for the particular material you are punching. Don't forget to set the punch tip height higher, just as you do with the blade holder, in order to get more force applied.

Settings Form for Accessory Tools

Application/Material	<u>Tool</u>	<u>Force</u>	Speed (Cut/Up)	# Passes	<u>Surface</u>	Other Comments

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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 is based on number of Post-It notes used when inserting tool above material.

Application/Material	Tool Used	MultiCut	Pressure	Speed	Tool Height	Surface	Other Comments
Drawing on Cardstock	Sharpie: ultra fine tip	1	25	18	10	mat	
Drawing on Cardstock	Test pen	1	35	18	15	mat	
Drawing with Glue	Quickie Glue Pen	2	40	10	15	mat	
Embossing - Georgia Pacific 110# index (199gsm)	Embosser - small end	3	15	18	10	Fun foam taped to mat	Used a shadow layer of 0.01" (0.25mm) to increase thickness
Engraving Acrylic	Engraver	2	120	15	20	mat	Used a Line Fill of 0.01" (0.25mm)
Engraving Aluminum (36 gauge)	Engraver	1	15	18	10	mat	Used a Line Fill of 0.01" (0.25mm)
Engraving Dog Tag (AI)	Engraver	3	65 - 85	10	5	mat	Used a Line Fill of 0.005" (0.13 mm)
Punching Cardstock	Punch/Piercer	1 or 2	70	10	10	Fun foam taped to mat	Be very careful as the punch tool can easily break
Scoring Cardstock - Georgia Pacific 110# index	Embosser - small end	2	160	10	25	mat	

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Appendix A Shortcuts and Icons in SCAL5

Shortcut Icon Description Menu (m:) and/or Icon (i:) Location

Main Screen and Project Functions

Ctrl+N	New	Open a new file/project	m:File>New Project i:Toolbar
Ctrl+O	Open	Open an existing .scut file/project	m:File>Open Project i:Toolbar
Ctrl+S	Save	Save a file/project	m:File>Save Project i:Toolbar
Ctrl+Shift+S		Save file/project in new location	m:File>Save Project As
Ctrl+W		Close current project	m:File>Close Project
Ctrl-Shift+W		Close all projects	m:File>Close All Projects
Ctrl+P		Print	m:File>Print
Ctrl+Z	Undo	Undo last action	m:Edit>Undo i:Toolbar
Ctrl+Shift+Z	Redo	Redo last action	m:Edit>Redo i:Toolbar
		Open Document Panel	i:Properties Panel
		Pop out a panel	i:Properties Panel
		Return panel to Properties Panel	i:Properties Panel
Right click>Mat Size		Change the size of the Cutting Mat	m:Cutter>Mat Size
Right click>Mat Orientation		Toggle between Landscape and Portrait	m:Cutter>Mat Orientation
Right click>Show Rulers		Toggles Rulers on and off	
Right click>Ruler Units		Set units for software: in, cm, mm	m:View>Ruler Units
Alt+F4		Close SCAL	m:File>Exit

Zooming and Panning Tools

Click icon and drag mouse	•	Zoom in on selected area	i:Tools Panel
Ctrl+ +++ (or right click>Zoom In)	• •	Zoom in	m:View>Zoom In i:Tools Panel>Tool Options
Ctrl+ (or right click>Zoom Out)	• Q	Zoom out	m:View>Zoom Out i:Tools Panel>Tool Options
Ctrl + Shift + = (or click on Zoom tool and drag mouse)	Q	Zoom to selected shape	m:View>Zoom Selection i:Tools Panel>Tool Options
Ctrl+F	•	Zoom so cutting mat fits in window	m:View>Fit to Window i:Tools Panel>Tool Options
Alt+roll mouse wheel		Zoom in and out, centered on middle of cutting mat	
Spacebar+drag left mouse button	€	Pan workspace	i:Tools Panel

<u>Shortcut</u>	<u>lcon</u>	<u>Description</u>	Menu (m:) and/or Icon (i:) Location
Help			
	?	Open Hints window	i:Properties Panel
F1		Open Help window	m:Help>Help
Importing and Exporting			
Ctrl+Shift+I	Import	Import a file	m:File>Import i:Toolbar
Ctrl+Shift+E		Export a file (save in a different format)	m:File>Export
Ctrl+Shift+T	Trace	Open Trace Image window	m:File>Trace Image i:Toolbar
Ctrl+1	Library	Open the Library window	m:Window>Library i:Toolbar
	Store	Open the eshape store window	m:File>eshape Store i:Toolbar
Selecting and Moving Shapes			
Click on shape	K	Left click on shape to select it	i:Tools Panel
Shift + click on shape		Add additional shapes to selection	
Freely drag mouse around shapes	#	Lasso select shapes	i:Tools Panel
Ctrl+A (or right click>Select All)		Select all shapes	m:Edit>Select All
Ctrl+Shift+A (or right click>Deselect All)		Deselect all shapes	m:Edit>Deselect All
Right click>Transform>Move		Move a shape to a new location	
Duplicating Shapes			
Alt + drag shape		Creates a duplicate of the shape being dragged	
Alt + click on shape		Creates a duplicate of shape on top of original	
Ctrl+C (or right click>Copy)	Сору	Copy to clipboard	m:Edit>Copy i:Toolbar
Ctrl+V (or right click>Paste)	Paste	Paste from clipboard	m:Edit>Paste i:Toolbar
Ctrl+Shift+V (or right click>Paste in Place)		Paste in place from clipboard (on top of original)	m:Edit>Paste in Place

Fill the grid with selection from clipboard

Create duplicate copies in a circular

formation

Create duplicate copies of selected shape (s) m:Object>Duplicate

Ctrl+Alt+Shift+V

Ctrl+D

Ctrl+Shift+D

m:Edit>Paste (Auto Fill)

m:Object>Duplicate Rotated

Shortcut Icon Description Menu (m:) and/or Icon (i:) Location

Cutting/Deleting Shapes

Ctrl+X (or right click>Cut)	Cut	Cut to clipboard	m:Cut to clipboard
Del (or right click>Delete)		Delete selected shape(s)	
Hold Del and click on one shape at a time		Deletes each shape as it is left clicked	

Text and Font Icons

ÂA	Open Text Panel	i:Properties Panel
В	Bold	i:Text Panel
I	Italic	i:Text Panel
G	Reload installed fonts list	i:Text Panel
T	Load a font	i:Text Panel
	Left align text	i:Text Panel
王	Center align text	i:Text Panel
	Right align text	i:Text Panel
	Justify text	i:Text Panel
*	Add font to Favorites	i:Text Panel i: Library>Fonts tab
T	Type text	i:Tools Panel
↓T_	Vertical type	i:Tools Panel
₹.	Type on path	i:Tools Panel
T	Type on arch	i:Tools Panel
0	Stencil Bridge: Connect interior shapes to the outside	i:Tools Panel

Library

Ctrl+1	Library	Open the Library window	m:Window>Library i:Toolbar
	2	Add tolder	i:Library>Shapes tab i:Library>Project tab
		I Delete tolder	i:Library>Shapes tab i:Library>Project tab
	5	Mad tile to colocted tolder	i:Library>Shapes tab i:Library>Project tab
	C	l Retresh	i:Library>Shapes tab i:Library>Project tab

Shortcut	<u>lcon</u>	<u>Description</u>	Menu (m:) and/or Icon (i:) Location
Library (cont.)			
	: ≣	Change to List View	i:Library>Shapes tab i:Library>Project tab
		Change to Thumbnail View	i:Library>Shapes tab i:Library>Project tab
	Q	Search on keyword	i:Library>Shapes tab i:Library>Project tab
	*≣	Sync with eStore or access Download Manager	i:Library>Shapes tab i:Library>Project tab
	*	Temporarily open a font	i:Library>Fonts tab
	*	Add font to Favorites	i:Library>Fonts tab

Manipulating and Coloring Shapes

wanipulating and Coloring Snape	<u> </u>		
	‡	Open Position & Size Panel	i:Properties Panel
Right click>Transform>Scale		Resize a selected shape	
Right click>Transform>Rotate		Rotate a selected shape	i:Position & Size Panel
Right click>Transform>Flip Horizontal	€ [®]	Mirror/Horizontally flip a selected shape	i:Position & Size Panel
Right click>Transform>Flip Vertical	3	Vertically flip a selected shape	i:Position & Size Panel
Ctrl+Shift+Up (or right click>Arrange>Bring to Front)		Bring selected shape to top	m:Object>Arrange>Bring to Front
Ctrl+Up (or right click>Arrange>Bring Forward)		Bring selected shape up one level	m:Object>Arrange>Bring Forward
Ctrl+Down (or right click>Arrange>Send Backward)		Send selected shape down one level	m:Object>Arrange>Send Backward
Ctrl+Shift+Down (or right click>Arrange>Send to Back		Send selected shape to the bottom	m:Object>Arrange>Send to Back
Ctrl+Alt+L (or right click>Lock)		Lock selected shape	m:Object>Lock
Ctrl+Alt+Shift+L (or right click>Unlock All)		Unlock all shapes	m:Object>Unlock All
Right click>Hide		Hide select shape	m:Object <hide< td=""></hide<>
Right click>Show All		Show all shapes	m:Object>Show All
Ctrl+G (or right click>Group)		Group selected shapes	m:Object>Group
Ctrl+Shift+G (or right click>Ungroup)		Ungroup selected shapes	m:Object>Ungroup
Ctrl+B (or right click>Break Apart		Break a shape into all of its individual paths	m:Object>Break Apart
Ctrl+Shift+B		Join selected shapes into a single shape	m:Object>Merge

Shortcut	<u>lcon</u>	<u>Description</u>	Menu (m:) and/or Icon (i:) Location
Manipulating and Coloring Shape	s (cont.)		
		Open Fill & Stroke Panel	i:Properties Panel
		Stroke with pointed corners	i:Fill & Stroke Panel
	Œ	Stroke with rounded corners	i:Fill & Stroke Panel
	(-	Stroke with beveled corners	i:Fill & Stroke Panel
	П	Butt end cap	i:Fill & Stroke Panel
	$ \ \bigcirc$	Round end cap	i:Fill & Stroke Panel
		Extended end cap	i:Fill & Stroke Panel
	8	Copy a Fill and/or Stroke color from one shape to another	i:Tools Panel
		Edit a gradient start and end points	i:Tools Panel
	Δ	Distort a shape	i:Tools Panel

Layers Panel

Layers Failer		1	
		Open Layers Panel	i:Properties Panel
Right click>Hide	•	Hide a layer	m:Object>Hide i:Layers Panel
	-	Show a layer	i:Layers Panel
	+≣	Open Layer Options Menu	i:Layers Panel
Right click>Hide all (or click icon > Show/Hide>Hide All Layers	+≣	Hide all layers	m:Layer>Show/Hide>Hide All Layers i:Layers Panel
Right click>Show All (or click icon > Show/Hide>Show All Layers)	*	Show all layers	m:Layer>Show/Hide>Show All Layers i:Layers Panel
Ctrl+Alt+L (or right click>Lock)		Lock a layer	m:Object>Lock i:Layers Panel
	-	Unlock a layer	i:Layers Panel
Right click>Lock All (or click icon > Lock/Unlock>Lock All Layers)	*=	Lock all layers	m:Layer>Lock/Unlock>Lock All Layers i:Layers Panel
Ctrl+Alt+Shift+L (or right click>Unlock All) (or click icon > Lock/Unlock>Unlock All Layers)	≠ ≣	Unlock all layers	m:Layer>Lock/Unlock>Unlock All Layers i:Layers Panel
Right click>Delete	â	Delete the selected layer	m:Layer>Delete Current Layer i:Layers Panel
		Create a new layer	m:Layer>Add Layer Folder i:Layers Panel

Designing Tools

Alt+U (or right click>Path>Union)		Weld selected shapes to remove overlap	m:Path>Union
Right click>Path>Intersection		Apply the Boolean Join intersection to two shapes	m:Path>Intersection
Right click>Path>Exclude		Apply the Boolean Join exclude to two shapes	m:Path>Exclude
Right click>Path>Front Minus Back		Apply the Boolean Join front minus back to two shapes	m:Path>Front Minus Back
Right click>Path>Back Minus Front		Apply the Boolean Join back minus front to two shapes	m:Path>Back Minus Front
	�	Draw straight lines and Bézier curves	i:Tools Panel
		Freehand draw thin lines	i:Tools Panel
		Freehand draw thick lines	i:Tools Panel
		Draw rectangle or square	i:Tools Panel
		Draw rounded rectangle or rounded square	
		Draw circle or oval	
		Draw triangle	
		Draw polygon	
	☆	Draw star	
	6	Draw spiral	
		Measure distances and angles on screen	i:Tools Panel
Right click>Appearance>Add Shadow Layer		Add an outline or inline to a selected shape	m:Effects>Shadow Layer
Right click>Appearance>Lattice		Create a lattice design in a selected shape	m:Effects>Lattice
Right click>Appearance>Rhinestones		Create a rhinestone outline or fill on a selected shape	m:Effects>Rhinestones

Editing Tools

		Move or reshape a path or move and edit nodes	i:Tools Panel
		Erase parts of a shape	i:Tools Panel
	A.	Knife: Make thin, straight-line cuts through a shape	i:Tools Panel
		Crop: Drag the mouse to marquee-select an area to be retained	i:Tools Panel
Alt + drag Bezier control point	The second	Only reshape the current path and not adjoining path	i:Tools Panel

<u>Shortcut</u>	<u>lcon</u>	<u>Description</u>	Menu (m:) and/or Icon (i:) Location
Editng Tools (Cont.)			
Right click>Path>Simplify		Reduce the number of nodes in the selected shape	m:Path>Simplify
Right click>Path>Split Path	The	Break the path between the two selected nodes	m:Path>Split Path i:Tools Panel
Right click>Path>Reverse Path		Reverses the direction the path will cut	m:Path>Reverse Path
Right click>Path>Object to Path		Remove the text, rhinestone or lattice status	m:Path>Object to Path
Right click>Path>Close Path		Close shape by adding a straight line between the start and ending nodes	m:Path>Close Path
Right click>Path>Convert Node to Corner	15 V	Convert current selected node to corner	i:Tools Panel>Tool Options
Right click>Path>Convert Node to Cusp	The V	Convert current selected node to cusp	i:Tools Panel>Tool Options
Right click>Path>Convert Node to Smooth	₽	Convert current selected node to smooth	i:Tools Panel>Tool Options
Right click>Path>Convert Node to Symmetric	F	Convert current selected node to symmetric	i:Tools Panel>Tool Options
Right click>Path>Path Details		Show path to be travelled when shape cuts	

Output

	Cutter	Open controller window for current default cutter	m:Cutter>Cut with (name of cutter) i:Toolbar
Ctrl+Shift+P	Preview	Show preview of cut shapes and/or print shapes	m:Cutter>Preview i:Toolbar
Ctrl+P		Open print window	m:File>Print
	J.	Open Style Panel	i:Properties Panel

Appendix B Troubleshooting FAQ's

B1 Communication Issues

W

When setting up Wi-Fi, I inadvertently typed in a non-valid IP address!
With the ZO powered on, use a pen or pencil to push the little black reset button on the right side of the cutter. You will hear it beep after a bit and you can begin the Wi-Fi set up from Step (1).
In the last step of the Wi-Fi setup, I never receive the message about the connection being reset.
For some reason, some computers or the browsers being used never show that message. Proceed as if everything is okay.
I cannot get the settings to work when setting up Wi-Fi. Sometimes I can't even get the Scan part to bring up the list of networks.
 Make sure you have turned off any anti-virus or firewall programs. Then try again. Once you have it working, you can then resume those security programs.
 Some routers have security settings that may need adjustment within the router's control panel. Unfortunately, with so many makes and models of routers, there's no "generic solution." Perhaps an Internet search on your particular router might provide a solution. Otherwise, you have the USB and stand-alone options to use.
After completing the Wi-Fi setup, the Zing Orbit is no longer listed in my menu of network connections.
That's correct. The Zing Orbit is now a <u>device</u> connected to your network just like other wireless devices such as a printer, phone or tablet. It's no longer an available network itself.
I had to push the Power button to cancel a cut. Now my Zing Orbit is no longer responding when I click on Cut .
 In the Cut Settings window, check the setting for Connection. For example, it may have reset to USB whereas you had your ZO setup wirelessly and need TCP/IP selected.
My initial testing went fine but now I cannot get my shapes to draw with the test pen. Nothing happens when I click on Cut.

First check to see if there's a preview of your image on the right side of the **Cut Settings** window:

- If there's no image, then check to see if you have **Pen** selected under **Holder** in the **Cut Settings** window. If you do, then go back to the main window, select any layers you wish to draw and, on the Style Panel, change the Cut Line Type to Draw (Pen).
- If the image is showing, check your **Connection** settings.

B2 Operating Issues

My mat is rotating when the Zing Orbit starts to cut!

Both pinch wheels need to be gripping the mat. Move the mat either left or right so that it is under two
outer pinch wheels.

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 pressure, and add
more passes.

I hear a terrible stuttering sound when trying to cut chipboard!

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 pressure, and add more passes.

When I try to set a new origin, the blade is catching on the right edge of the mat as it moves to the left.

- Your mat has probably become warped due to the tight gripping of the pinch wheels. You have several
 options:
 - ♦ Rotate the mat 90 degrees and continue using the mat. <u>However</u>, you will need to move your material away from the warped areas, thus using only the middle of the mat.
 - Completely strip the adhesive from the mat, flip it over, and apply adhesive to the back side of the mat. Instructions on stripping a mat are presented in Section 1.08.2.
 - Obtain a mat guide which will secure the right side of the cutting mat. Refer to Section D2.
 - Replace the mat with a new one. Here is a link to KNK mats that will work in the Zing Orbit: http://knkusa.com/product-category/accessories/zing-orbit-accessories/

I'm trying to do a PNC application and the optic eye can't even read the first registration mark.

- Are the registration marks printed dark with no streaking or missing ink? Try increasing the Mark Thickness to 1.50 mm under Cutter>Cutter Settings.
- Is the project printed on a white non-transparent material? While other light colors can be used, it could be that the mark isn't dark enough to be identified. You can try gluing white paper over the corners where the reg marks will be printed.
- Is the project printed on a very shiny material, such as white shrink film or vinyl? This can result in too much light being reflected. Try placing a single layer of Scotch tape across the registration marks.
- Did you make changes to the reg mark settings under **Cutter>Cutter Settings**? Lowering the **Mark Size**, **Thickness**, and/or **Offset** can make the identification more difficult.
- Is the reg mark too close to the edge of the printout? The optic eye might be picking up a grid line on the cutting mat instead. You can try adding strips of paper around the printout to mask those marks.
- Is the printout close to the right side of the mat? Any bowing of the cutting mat can cause issues with the marks being read. Move the printout to the middle of the mat.

I'm trying to do a PNC application. The first mark is read successfully, but the optic eye will fail at one of the marks after this.

- Review the possibilities in the prior question regarding a failure at the first mark. Some of these may not be causing a problem at the first mark but could be in play with others.
- Did you turn on Borderless Printing in your printer's properties window? If so, please read the following tutorial: https://www.iloveknk.com/Support/Tutorials/Klic-N-Kut/Borderless-Printing-Issues-with-PNC.pdf
- Is the printout smoothly and completely pressed onto the mat?
- Is the printout aligned along grid lines on the mat?
- Is the mat inserted into the ZO so that the horizontal grid lines align with "something horizontal" on the cutter, such as the cutting strip, the ruler, or the top channel.
- Was the project printed outside of SCAL? Using another program for printing may result in the registration marks not printing in the same location where SCAL expects to find them during the PNC process. Refer to Section 11.07.
- In some cases, the optic eye was mounted too low during installation. Refer to the document on adjusting the height at this link: http://www.iloveknk.com/Support/Tutorials/Klic-N-Kut/Zing-Orbit/

B3 Cutting/Drawing Issues

I am getting large lines sliced through all of my cuts.

• Your Sure Cuts a Lot software is still in trial mode. You need to register your copy of SCAL. Refer to Section 3.01.2.

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.
- Check whether your **Cutting Mat** is in **Portrait** or **Landscape** mode. This will change whether your image appears the same way you see it on the screen or rotated 90 degrees relative to the screen.
- Check which Cut Mode is set in the Cut Settings window.
- Details on these various settings are covered in Section 10.07.

My shapes do not match what is shown on the screen. The width looks correct but they are too short.

• Go the **Cut Settings** window and make sure that **Mode** is still set to **Normal**. The other two modes in that menu are only for use with the Orbitizer accessory.

When drawing with the test pen, I have extra lines being drawn.

- Make sure you raise the pen in the blade holder seat on the Zing Orbit before tightening the front screw. The blade holder seat needs to be able to drop the pen down when it reaches the spot to draw the shape. Otherwise, the pen tip will be dragging across the paper from the origin to where the shape will begin to be drawn and then back to the origin at the end of the "cut".
- Make sure you have registered your copy of SCAL. Watermark lines are made in the trial version.

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

• For perfect corners when using a test pen turn off **Blade Offset** (set to 0) since you do not need an offset for pens (or other tools like embossers and engravers). Refer to Section 2.03.4.

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 at least one of the front screws 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.

-____-

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 (~0.1" or ~ 2.5 mm). If the blade is too close to the
 material, not enough force is being applied. Refer to Section 2.01, 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.
- If the material has been exposed to humidity, then it will become difficult to cut in one pass. You can dry paper and cardstock using a blow dryer or in a low-temperature oven.

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. Refer to Section 8.01.
- 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 low-temperature oven.

-____-

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 2.01. 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. Reduce your force back to
 suggested values for the material you are cutting and do a test cut.
- Do not use more pressure 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.

Some of my shapes are cut and some are barely scratched. I also have some random long cuts.

• Chances are the head is getting stuck in the down position. This can happen when the blade holder is loaded too high in the cutter initially and too much downward thrust can cause the holder to get stuck in the downward position. Try using 5 fewer Post It notes when installing the holder. For example, if you were using 20 Post It notes, try 15 instead. If you are already only using 5 Post It notes, then start a support ticket with KNK USA. https://knkusa.com/support/

The Zing Orbit stopped during a cut.

- If the Zing Orbit stops with the head over on the left side of the cutter, you have most likely exceeded the 15" cutting range. Several things to consider:
 - ♦ Check the width (**W**) of your project (or the height **H** if in **Landscape** mode). It cannot exceed 15".
 - ♦ Check how far you are moving the head to the left when setting the origin. If your project is 14" and you moved the head more than 1" to the left, you will send the cut out of range and the Zing Orbit will stop.
 - If you are working in WYSIWYG mode, move your shapes towards the bottom right of the Cutting Mat when working in Portrait mode or towards the top right when working in Landscape mode. This will then locate your cuts closer to the origin and reduce the likelihood of sending them outside of the 15" cutting range.
- If the Zing Orbit 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: Refer to Section 8.01.
B4 Software Issues
I noticed that some of the settings I see in the screenshots in this manual are not in my version.
 As long as you are staying up to date with SCAL releases, then these are most likely settings only available in the Pro version of SCAL.
The Shapes tab in the Library doesn't show any shapes. Do I need to install them separately? I'm on a Mac.
This occurs when the user has dragged the Sure Cuts A Lot program to the desktop. It needs to remain in the Applications folder. ———————————————————————————————————
I set the Cut Line Type to Draw (Pen) but my shapes are not being drawn. Nothing is happening.
In the Cut Settings window, you need to change the Holder setting to Pen.
I installed some fonts inside of SCAL but they are no longer there!
 SCAL allows you to open a font for temporary use but once you close SCAL, it is uninstalled. That's why you also need to convert any text that was created with that font before saving your file. Refer back to Section 6.02.3 for more details.
I'm trying to use the Pattern Fill feature to fill some shapes with a digital scrapbooking paper file. The pattern doesn't look right.
 Most digital scrapbooking papers are designed for 12" x 12" printing. Thus, in the Pattern Fill window, set the Width and Height equal to 12 inches.
I'm doing a PNC project and the registration marks are not printing. I have the option selected in the Print settings but I also don't see them under Preview or when I turn on the Show Reg Marks on the Document Panel .
 Go to the Cut Settings window and verify that you do not have the option for Cut Selection Only checked.
Make sure you have the layer that will be cut showing on the Layers Panel.

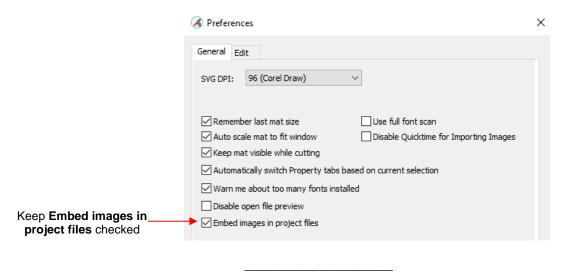
• Make sure you have a cutter added that has print and cut functionality. Refer to Section 5.01.4.

Help! I created and saved a file but I can't get it to reopen. It says that it's invalid or corrupt.

• This can happen if you close SCAL before the file has finished saving. Unfortunately, there's no fix.

Every time I open a SCUT file where I've previously imported a JPG (or PNG, BMP) image, the image isn't there. How do I fix it so that it will save the image?

Go to Edit>Preferences and make sure the Embed images option is marked:



I've read that SCAL is regularly updated but when I click on **Help>Check for Updates**, it always says "You're up to date."

That feature never seems to work in SCAL. Instead, check this link to download the latest version.

http://www.craftedge.com/download/download.html

Also note that it probably doesn't show the latest version at the web site. For example, in this
screenshot, it indicates that 5.000 is the latest version but when the download is made, the version is
actually 5.020:



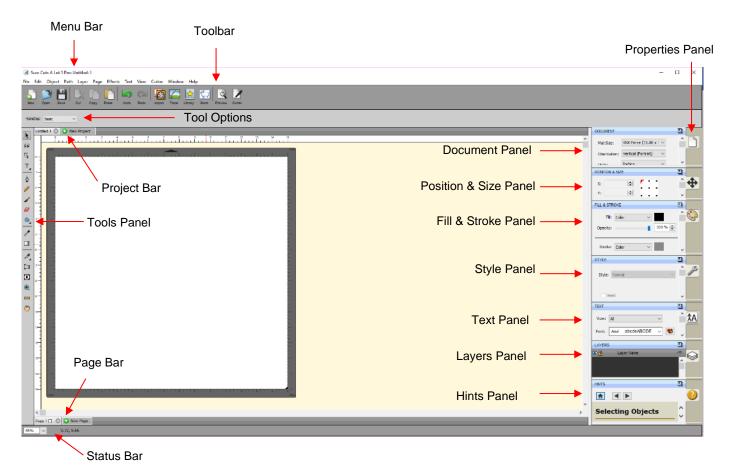
SCAL is suddenly not opening. I get an error message about a problem with the Library.

- This can happen when there's a new file in the **Library** that is invalid for some reason.
 - ♦ On your computer, go to **Documents>Craft Edge**.
 - ♦ There are two personal folders there that are accessed by the **Library**: **My Projects** and **My Designs**.
 - ♦ Copy and paste those two folders to a new location outside of the **Craft Edge** folder.
 - ♦ Delete all files in those two folders that are still in the **Craft Edge** folder.
 - Verify that you can now open SCAL successfully. If not, start a support ticket at CraftEdge.com. Otherwise, you can now begin copying/pasting back the older files based on their **Modified Date** since it's most likely a newer file in one of those two folders that caused the issue.

Appendix C SCAL Details

C1 Screenshot of SCAL Screen

Below is a screen shot of the main screen in SCAL identifying ONLY Bars and Panels.



C2 Bars

• The bars in SCAL have components positioned left to right. The following sections present the five bars and where to find more information for each item on that bar.

C2.1 Menu Bar

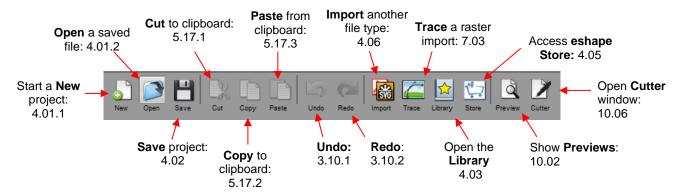
• Like most computer applications, the **Menu Bar** is located at the top of the screen and provides access to most of the functions in the software.

File Edit Object Path Layer Page Effects Text View Cutter Window Help

- Throughout the user manual, a reference such as this: Go to Path>Simplify refers to using the Menu Bar
 to access a function. In this case, you would click Path on the Menu Bar and then click on Simplify in the
 submenu that appears.
- Because there are dozens of submenu options, each one isn't listed with a reference. Instead, it is recommended that you use a search function to locate any given listing within the user manual.

C2.2 Toolbar

The Toolbar is located at the top of the screen, just below the Menu Bar.



C2.3 Projects Bar

The Projects Bar is presented in Section 3.11.



C2.4 Pages Bar

The Pages Bar is presented in Section 3.11.



C2.5 Status Bar

• The **Status Bar** is located at the bottom of the screen:



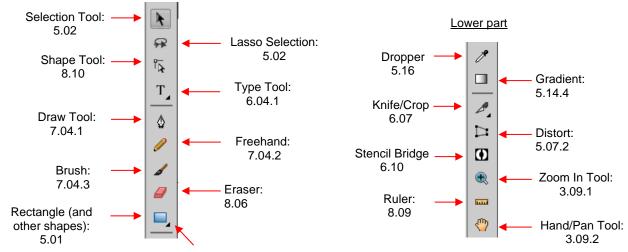
C3 Panels

 The panels in SCAL have components positioned top to bottom. The following sections present the panels and where to find more information for each item on that panel.

C3.1 Tools Panel

• The **Tools Panel** is located along the left side of the screen:

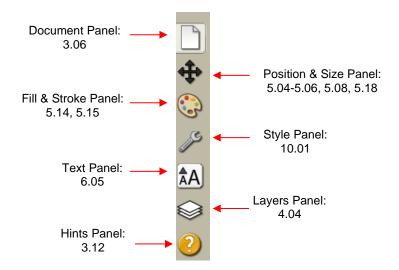
Upper part



Note: Icons with a small black arrow have more options when left mouse button is held down

C3.2 Properties Panel

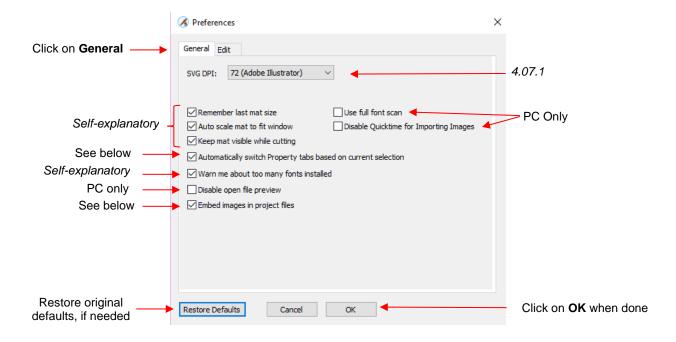
• The **Properties Panel** is located on the right side of the screen and contains 7 subpanels:



C4 Preferences

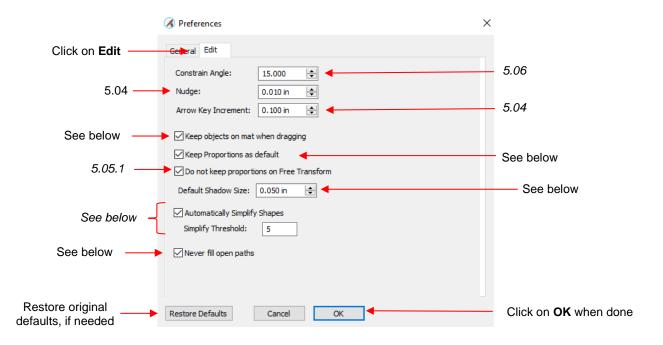
• The following preferences can be found under **Edit>Preferences** (or, on a Mac, press **Command + ,**). If the preference was already presented in other sections, it is noted in the screen shots. For those not previously mentioned, details are presented if they are considered important.

C4.1 Preferences: General Tab

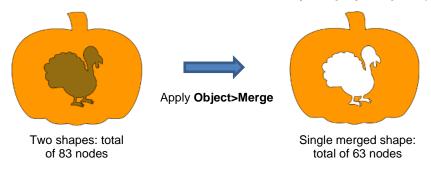


- Automatically switch Property tabs based on current selection: with this option turned on, the
 Properties Subpanel related to the task at hand will open. For example, when you select a shape, the
 Position & Size Panel will open. When you click on the Type Tool, the Text Panel will open.
- Embed images in project files: With this option marked, any imported raster images (PNG, BMP, JPG, and GIF) will be retained in the file when the file is saved. Unmarking this option will cause imported raster images to not be saved, thus not present when you reopen a saved file. Thus, when doing print and cut applications, you're most likely going to want that original image saved, so it is highly recommend that this option remain checked.

C4.2 Preferences: Edit Tab



- **Keep objects on mat when dragging**: With this option checked, you cannot drag shapes beyond the outside borders of the **Cutting Mat**. You can, however, move them beyond the **Cutting Mat** by entering the desired **X**, **Y** location on the **Position & Size Panel**.
- Keep Proportions as default: With this option checked, the Keep Proportions setting on the Position &
 Size Panel will automatically be checked when you launch SCAL and will remain checked until you uncheck
 it. If you choose to uncheck this option, you will need to relaunch SCAL and the Keep Proportions setting
 will be unchecked.
- Default Shadow Size: This affects the initial Size shown under Effects>Shadow Layer.
- Automatically Simplify Shapes: With this option checked, nodes will be reduced after certain functions are
 applied. For example, the following two shapes (pumpkin and turkey) have a total of 83 nodes. If you select
 them and apply Object>Merge so that the inside turkey will cut before the outside pumpkin, the total
 number of nodes is reduced to 63 because of the Automatically Simplify Shapes option being checked.



- Never fill open paths: Unlike most other vector programs, SCAL offers the ability to fill open shapes by applying an invisible straight line to close the shape. By unchecking this option and selecting a Fill Color, Pattern, or Gradient, the open shapes on your Cutting Mat will contain that Fill.
 - For example, here is a circle with a section cut off. The option to **Never fill open paths** is still checked:



♦ The **Never fill open paths** is now unchecked and various **Fills** options applied:



Note that even though the shape appears to be closed, it is not. If you were to cut this shape, it would still be attached to the outside material.

ACKNOWLEDGEMENTS

Please send an email to smccauley45@cox.net if any errors are found in this manual or if you have suggestions for additions or changes.

Thank you to Sharon Serguta for proof-reading.

Thank you to the following people for their technical contributions:

Darrel Farris: http://cutterpunk.com/ and https://www.youtube.com/c/CutterPunkCrafts

Robert Fenn: http://www.kutnkraft.co.uk/

Judy Keating

Rob Vanarsdall: https://classroom.scrappydew.com/

Ron Smith: http://knkusa.com/

Chad Youngblut: http://knkusa.com/

Butch Zaborniak

Thank you to Brandon Kuroda, owner of <u>Craft Edge</u>, for responding so promptly to our requests for changes in *Sure Cuts A Lot*.

And a really big thank-you to my family and friends for their patience and their support of my Klic-N-Kut passion!

Sandy McCauley: http://www.iloveknk.com/