



Graphtec Vinyl Cutter



Training:	Required
Reservation:	Required

Please check with Library staff to confirm minimum age certification requirements to use this machine with supervision and without supervision as provided on the Equipment Usage Chart.

Certification

To become certified on this piece of equipment you will need to attend a training class that lasts approximately 30 minutes. By the end of the class you will be able to:

- Load and unload vinyl
- Create designs
- Cut vinyl using the Cutting Plotter
- Process vinyl stickers
- Apply vinyl stickers

To sign up for a training session please see the training binder (available at the front desk).

Reservation

To reserve this piece of equipment you will need to first be certified on this equipment. After you have attended a training for the equipment you may sign up for a time slot. To see available time slots and sign up for one please see the Reservation Binder (available at the front desk).

Your reservation reserves the equipment for you to use during that time, if you are more than 5 minutes late to your reservation time you will lose your reservation and the machine may be used on a first come-first served basis.

Reference Sheet

Approved Materials:

Thin paper and vinyls

Max Cutting Area:

23.7" (603 mm)

Max Media Thickness:

.01" (0.25 mm)

Machine Accessories:

- Cutoff knife
- Self Healing Cutting Mat
- Craft Knife (XACTO Knife)
- Transfer Paper

Important Information:

The machine uses a cutting knife and XACTO/craft knives are used for post processing, multiple cutting hazards exist with this process

Workflow:

Download or Design
Send to Cutting Master
Load vinyl into machine
Cut vinyl
Remove waste vinyl

Software:

CorelDraw
Graphtec Cutting Master
Graphtec Studio

Graphtec Vinyl Cutter



Materials and Software:

Graphtec CE6000-60 Cutting Plotter
Oracal Vinyl
Craft Knife (XACTO Knife)
Tape Measure

Cutoff Knife
Self Healing Cutting Mat
Transfer Paper
Burnisher

Overview

Makers will learn how to operate the cutting plotter and remove waste material from an example vinyl sticker

Safety

- Hair and loose clothing may be caught in cutter head. Long hair should be tied back, necklaces removed, sweatshirt strings tucked in, and long sleeve shirts rolled up.
- Multiple knives are used during the machine cutting and post processing. Do not touch the cutter head while it is in motion and properly store knives when not in use.

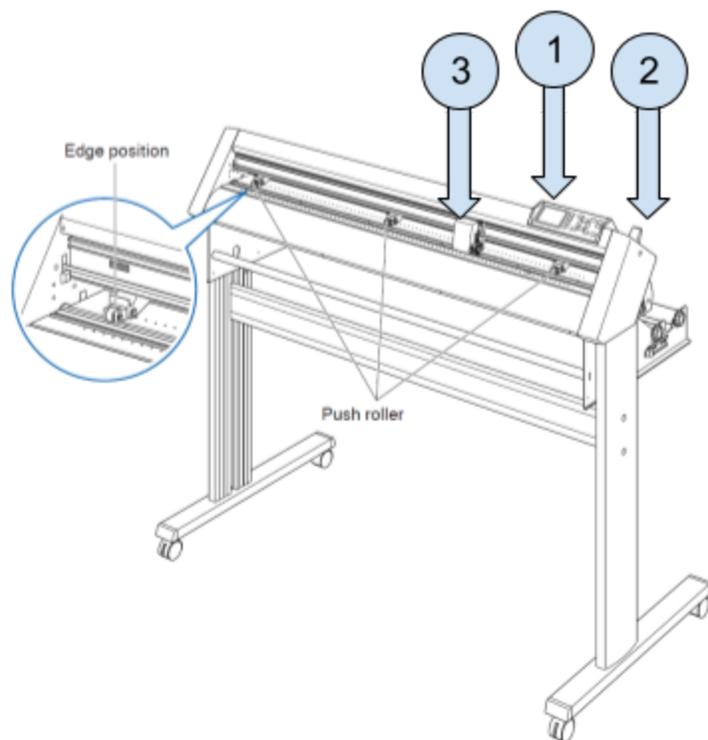
Set Up

Ensure machines are connected and powered on. Download the Corel file in advance, an example file may be found at:

<http://nlc.nebraska.gov/grants/innovationstudios/fake/VinylExample.cdr>

Machine layout

1. Screen Interface
2. Lever Lock
3. Cutter Head

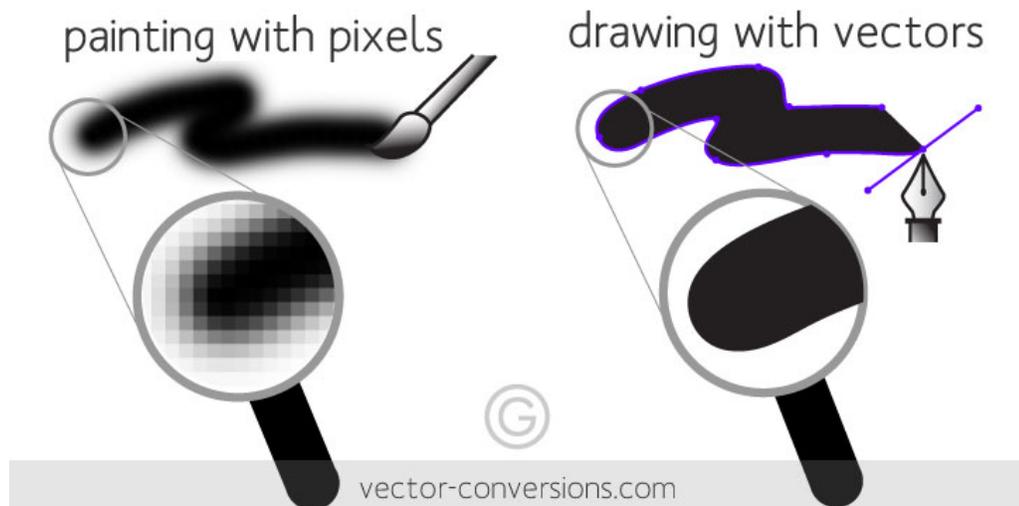


Key Concepts

Raster vs. Vector

Two-dimensional images can be created using two different methods, either a raster or a vector. Raster images are composed of pixels and are capable of capturing a lot of detail, photographs are an example of raster images. Vector images are composed of perfect mathematical curves and can be infinitely scaled without a loss of quality, text in a text editor is an example of a vector image.

The vinyl cutter requires vector drawings to correctly operate. Raster images will not be visible to the vinyl cutter and will need to be converted to vector drawings prior to cutting.



CorelDRAW

CorelDRAW is an image manipulation program, used to create and modify images. CorelDraw focuses on vector images and may be used to convert raster images into vector images prior to use on equipment.

Vinyl Decals

Vinyl decals are decorative stickers that can be applied to a variety of objects. Designs are sent from CorelDRAW to the vinyl cutter using another program called Cutting Master 4. The design is cut into the thin layer of vinyl but not into the paper support backing. After the machine has cut the design the waste vinyl must be removed in a manual process called weeding. Finally transfer paper is applied to the vinyl to assist in applying the decal.

Remove Vinyl

1. If there is no vinyl in the machine proceed to "Install Vinyl". Release the lock by lowering the lock lever (Figure 1). Rotate the roll of vinyl to retract the sheet from the machine. As you lift the roll from the machine take care to not unravel the roll. Before storing the roll secure the loose end with a piece of tape.



Figure 1 - Lowering the Lock Lever

Install Vinyl

1. Remove the new vinyl roll from the rolling cart and remove the tape securing the roll. Place the roll so that it unspools from the top (Figure 2). You may need to adjust the lock collars to allow the roll to sit directly on the feed axles.



Figure 2 - Loading Direction

2. Unlock the lock lever by pressing it down (Figure 1) and feed the sheet through the plotter. Pull through about 6 inches of vinyl and let it overhang (Figure 3).
3. Check that the edge of the sheet runs parallel to the raised lines in the outfeed tray (Figure 3). Also check that the vinyl is under both drive wheels and that the drive wheels are located under the blue wheel locators (Figure 3). Engage the lock lever by pulling it up.
4. On the display press "1" to select "ROLL 1 - FRONT EDGE". The Cutting Plotter head will automatically detect the location of both wheels and it will retract the sheet to minimize waste material. The machine is now loaded and ready to receive a job.

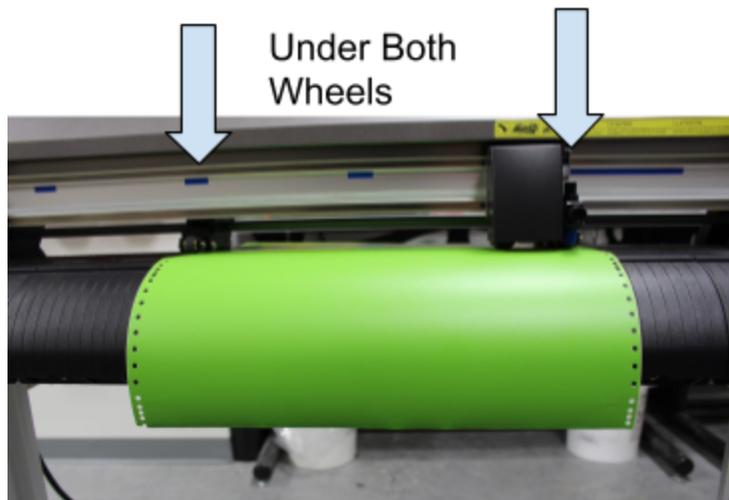


Figure 3 - Loaded Vinyl

Prepare File

1. On the computer open CorelDraw and start a new file. Using a tape measure measure the width of your vinyl roll. Set the width and height of your new file to this dimension. By setting this dimension to the width of your roll you will ensure your design will fit correctly on the roll.
2. Import the example file by selecting File -> Open and selecting the example file. Left click and drag to highlight all the objects of the example file and select Edit -> Copy. Switch back to your file and select Edit -> Paste. You should see the Library Innovation Studios logo in your file (Figure 4)

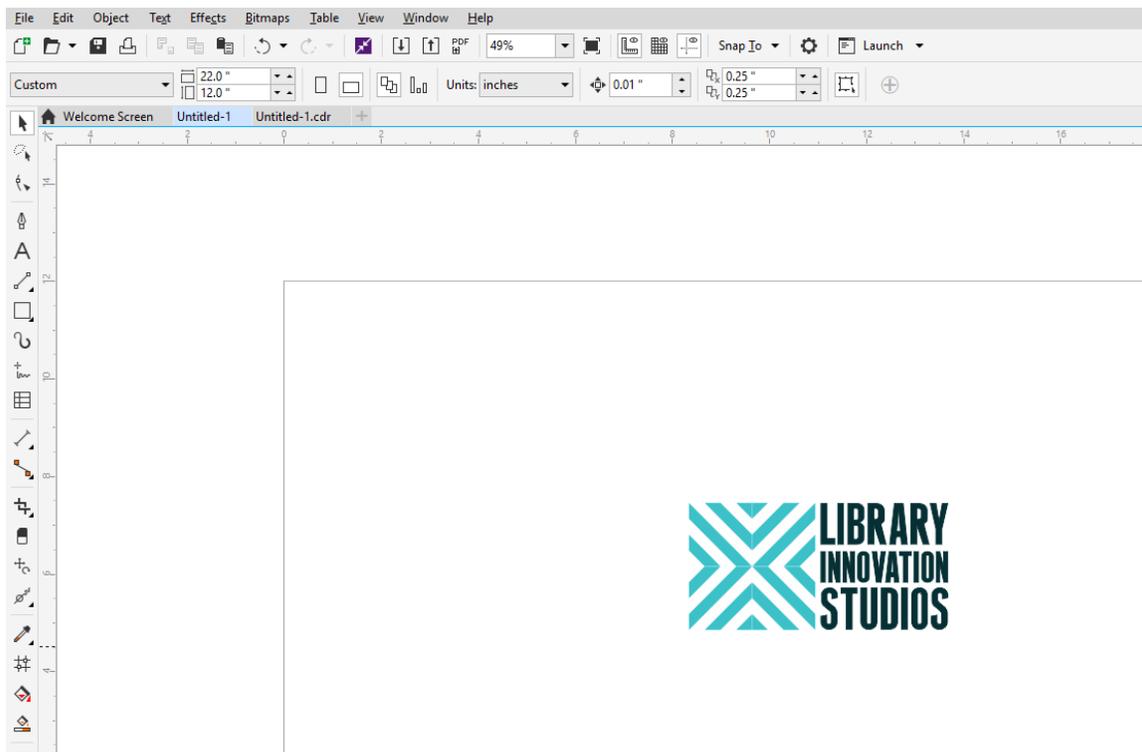


Figure 4 - Library Innovation Studios Logo

Send File to the Cutter

1. Send the design to the plotter by selecting Launch -> Cut/Plot (CM4) (Figure 5)

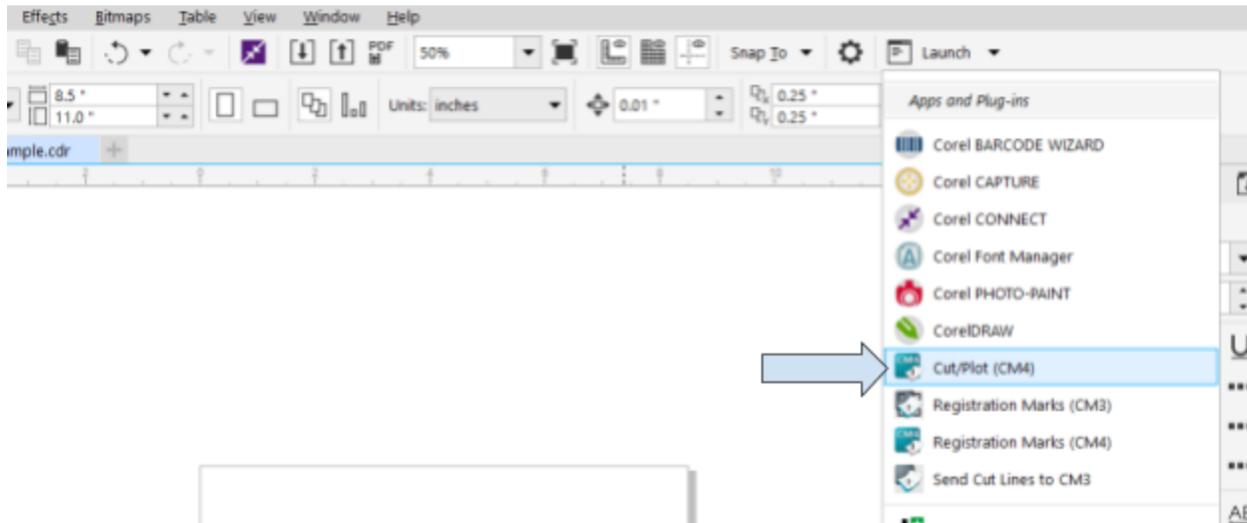


Figure 5 - Sending to Cutting Master 4

2. Two windows will open, the one titled Cutting master 4 will show what jobs the Vinyl Cutter is on, and the window titled Cut/Plot will allow you to make adjustments to the settings (Figure 6)

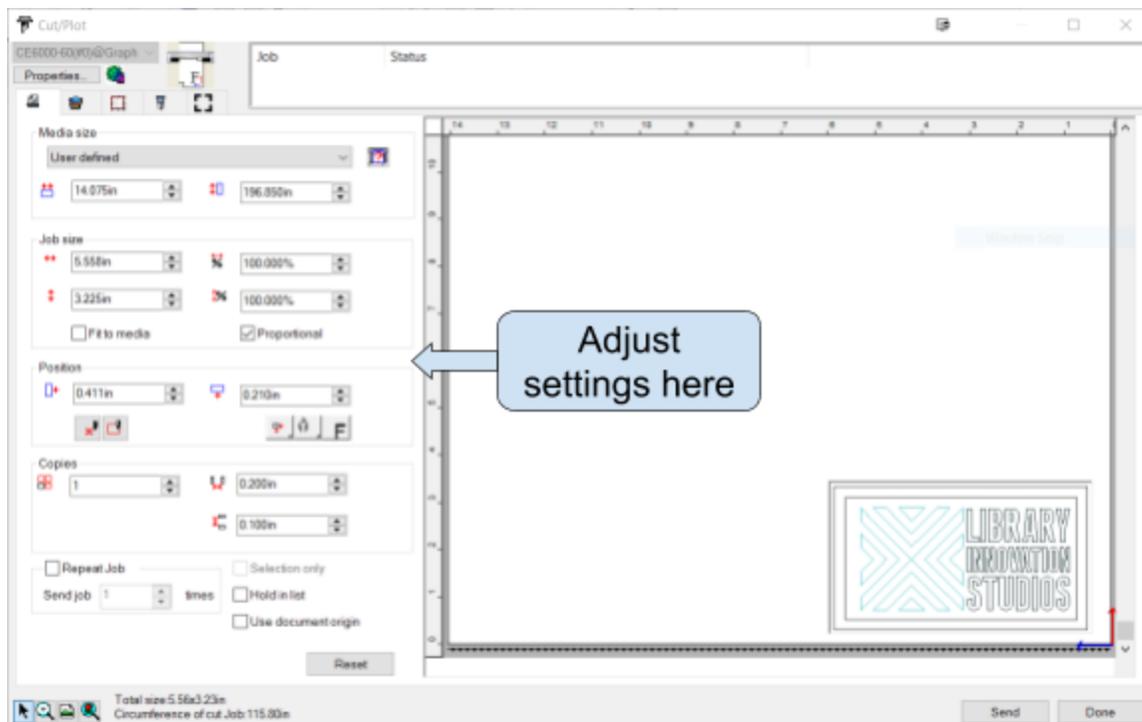


Figure 6 - Cut/Plot Window

3. In the left hand side of the Cut/Plot Window there are multiple tabs to change the properties of your job. The first tab is "General" and it allows you to change the size of your media, the size and position of the job, and the number of copies.
4. The remaining tabs allow for advanced settings and manufacturing designs that are too large to fit on one width (a process called tiling).
5. Send the job to the cutter by pressing Send in the lower right hand corner of the Cut/Plot Window.
6. The Cutting plotter will begin cutting your vinyl. When it's finished it will stop moving the cutter head and the screen on the machine will return to the main menu.

Process the Vinyl

1. Unlock the roll by pressing down on the lock lever and pull the vinyl out about two inches. Pull the lever up to lock the vinyl in place.
2. Extend the cutoff knife and pull it through the cutoff slot to completely cut off the vinyl (Figure 7). Turn off the vinyl cutter and bring the cutoff vinyl sheet to the self healing cutting mat.



Figure 7 - Cutting the Vinyl

3. Keeping the vinyl sheet on the self healing cutting mat use the craft knife to pick up the edges of the waste vinyl and remove it (Figure 8). Continue this process until you've removed all of the waste vinyl.



Figure 8 - Weeding

4. Contact paper is used to apply your vinyl sticker and keep all of the separate pieces properly aligned. Unroll enough to fit your design and then cut it off of the roll. Apply the contact paper to your vinyl sticker and scrape the burnisher over the contact paper so that it properly adheres to the vinyl (Figure 9)



Figure 9 - Burnishing Contact Paper

5. To apply your sticker peel the paper backing off of the contact paper, the vinyl will stay stuck to the contact paper (Figure 10). Press the contact paper and vinyl up against your desired object and again, scrape the burnisher over the contact paper. Slowly peel the contact paper back at a sharp angle (Figure 11). Your design will stay adhered to your desired object.



Figure 10 - Removing Backing

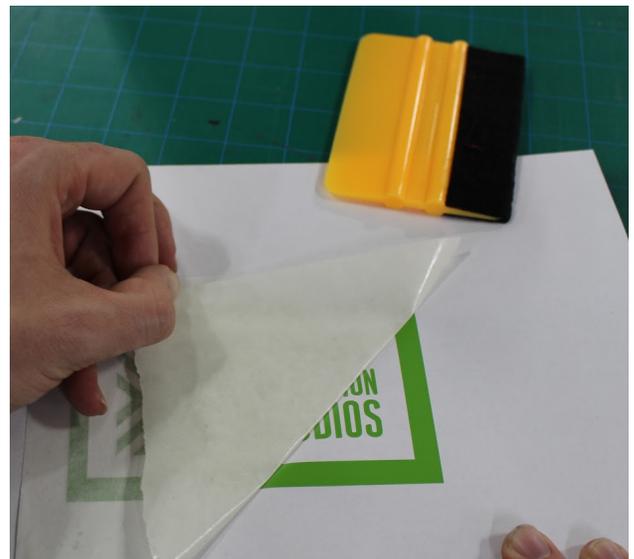


Figure 11 - Peeling Contact Paper

Troubleshooting

Problem: The vinyl cutter is cutting lines twice, and therefore pulling up some of the design.

Solution: The file likely has two shapes with that line, one interior and one exterior. Revisit your design and confirm only one line exist.

Problem: The vinyl cutter is cutting through the vinyl and paper backing

Solution: Remove the cutter blade by unscrewing the holder screw and lift up, rotate the blue collar until blade height is back to standard height, Figure 14



Figure 14 - Correct Blade Height

CorelDRAW Trace Guide

Most equipment with the Library Innovation Studios requires vectors to operate. The vinyl cutter specifically will only cut vector lines. There are two options to convert an image from a raster to a vector. First is manually recreating the design using CorelDRAW's drawing tools. This option can be more accurate to the actual design but it takes a lot of time and expertise. Tracing is a function in CorelDRAW that will automatically convert raster images to vector images based on a few parameters.

Begin by pasting or importing an image into an artboard.

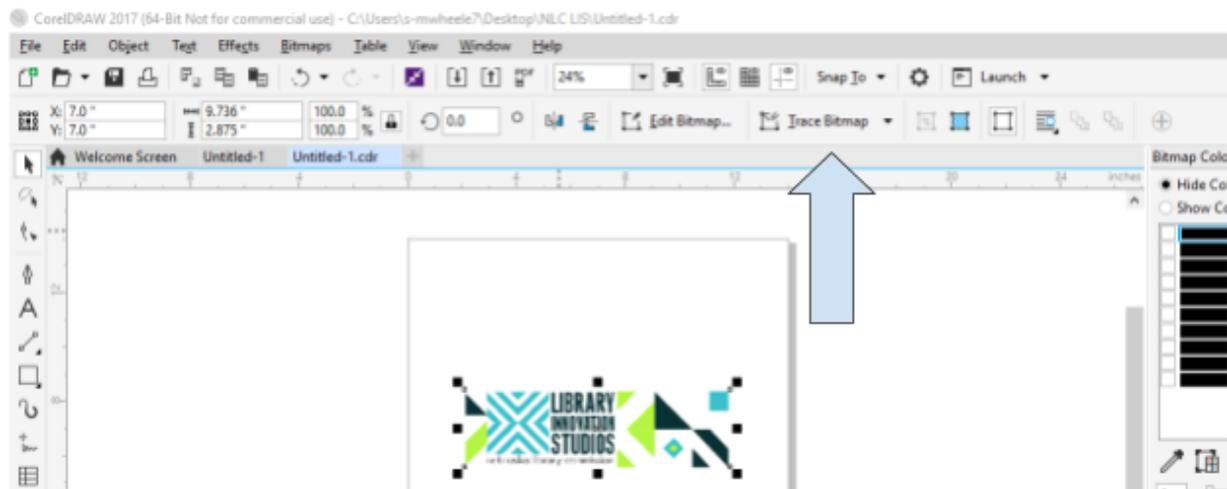
Copy/Paste

Right clicking on an image and selecting "Copy" places the picture on the computer's virtual clipboard, right clicking on the artboard in CorelDRAW and selecting "Paste" will add the image to the artboard. Not all images can be put onto the artboard in this way. If this fails move onto the Import option.

Import

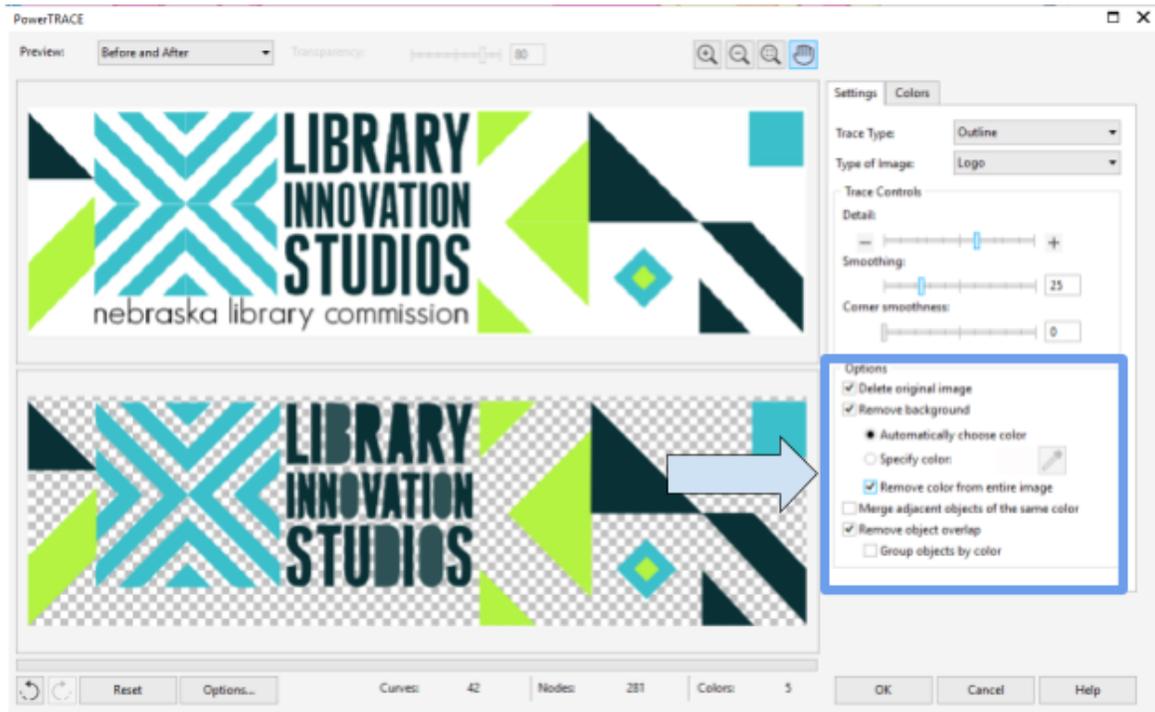
Save the file to the computer (either the desktop or a flashdrive) and then go to your CorelDRAW file. Select "File" and then "Import." Navigate to your file and select "Import." A single left click will place the image on the artboard, or by left clicking and dragging you can specify the size of the object.

With the object now on the artboard and the object selected click "Trace Bitmap" in the upper toolbar. There are different preset Traces depending on what sort of image you're tracing, try experimenting with them to find the one that works best for your image.



Each trace will show the original image and a preview of the Traced image. By adjusting the Detail, Smoothing, and Corner Smoothness you may find more or less accurate results. You will find there are some details that do not trace well. Overly complicated designs or small text will often be ignored by the Trace function.

For best results with the Vinyl Cutter make sure to remove the background color from the image. Under options select “Remove Background” and also “Remove color from entire image.” This will keep the vinyl cutter from cutting the same line twice, a common problem with highly detailed jobs. The grey and white checkered background shows where there are no objects.



After clicking “OK” the design has now been converted to a vector design and it may be sent to the vinyl cutter.