CBA Vinyl Cutter Guide - Roland GS-24
by Tom

The Roland GS-24 is a CNC knife that can help you score or cut sheets of vinyl for making decals and masks, as well as cutting thin sheets of copper to make flexible circuits.

Start off by checking the knife. You want to make sure the appopriate amount of knife is sticking out, and that there are no fuzzies/scraps to obstruct your cutting. If you don't know who was using it last or what they were doing, you can't rely on either of those things.

Loosen the thumb screw and then swing it over to the right.

 Then swing the other metal piece to the left.
Gently remove the knife holder:
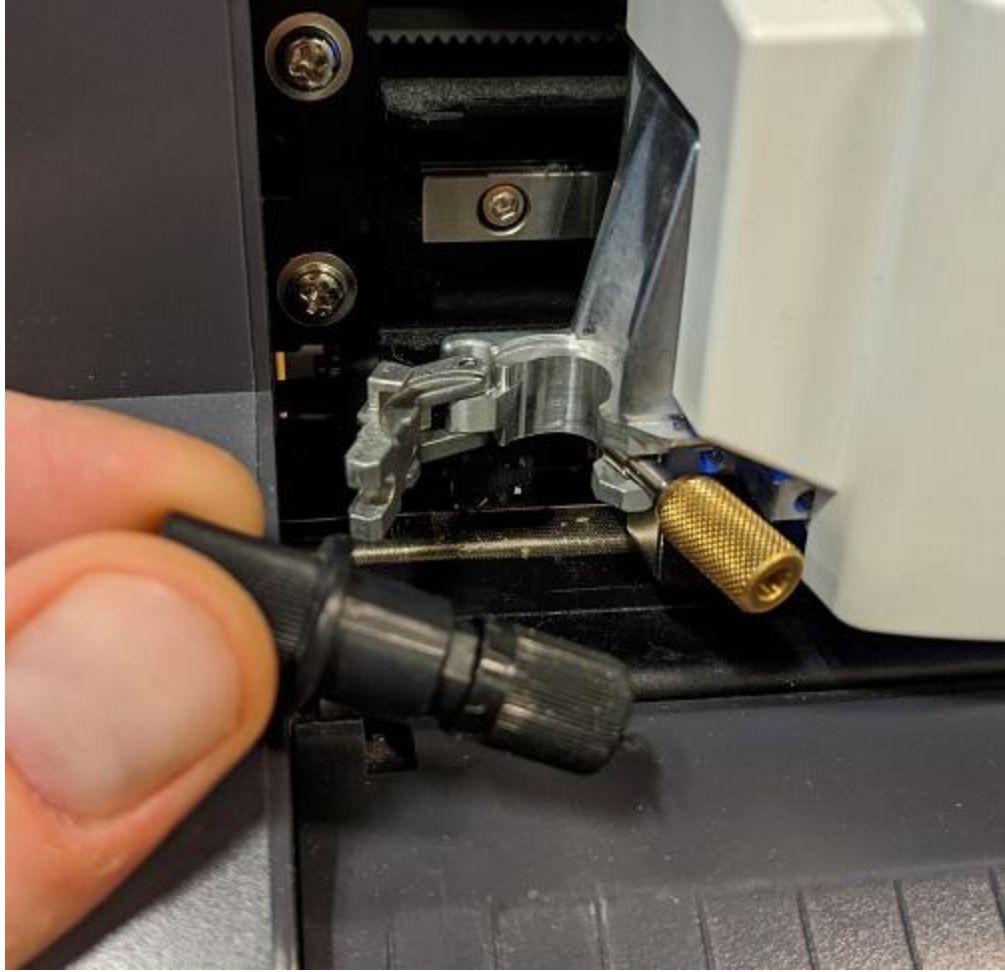
**Unscrew the smaller end cap to expose the knife**

Looks like theres some junk on the knife from previous users. Remove it but be gentle so as not to prick or cut yourself. The knife is small but sharp. It is fine to use tweezers for this step.

This is the knife. They last a while but not forever, so if you're having trouble cutting after playing with the amount of force (we will get to that), ask for help replacing the knife with a new one. Screw the end cap back on, with care not to leave too much knife poking out of the end cap's hole.

Believe it or not this is about the appropriate amount of the knife you want protruding from the end cap (.5mm, 1mm max). Doesn't look like much but it gets the job done.
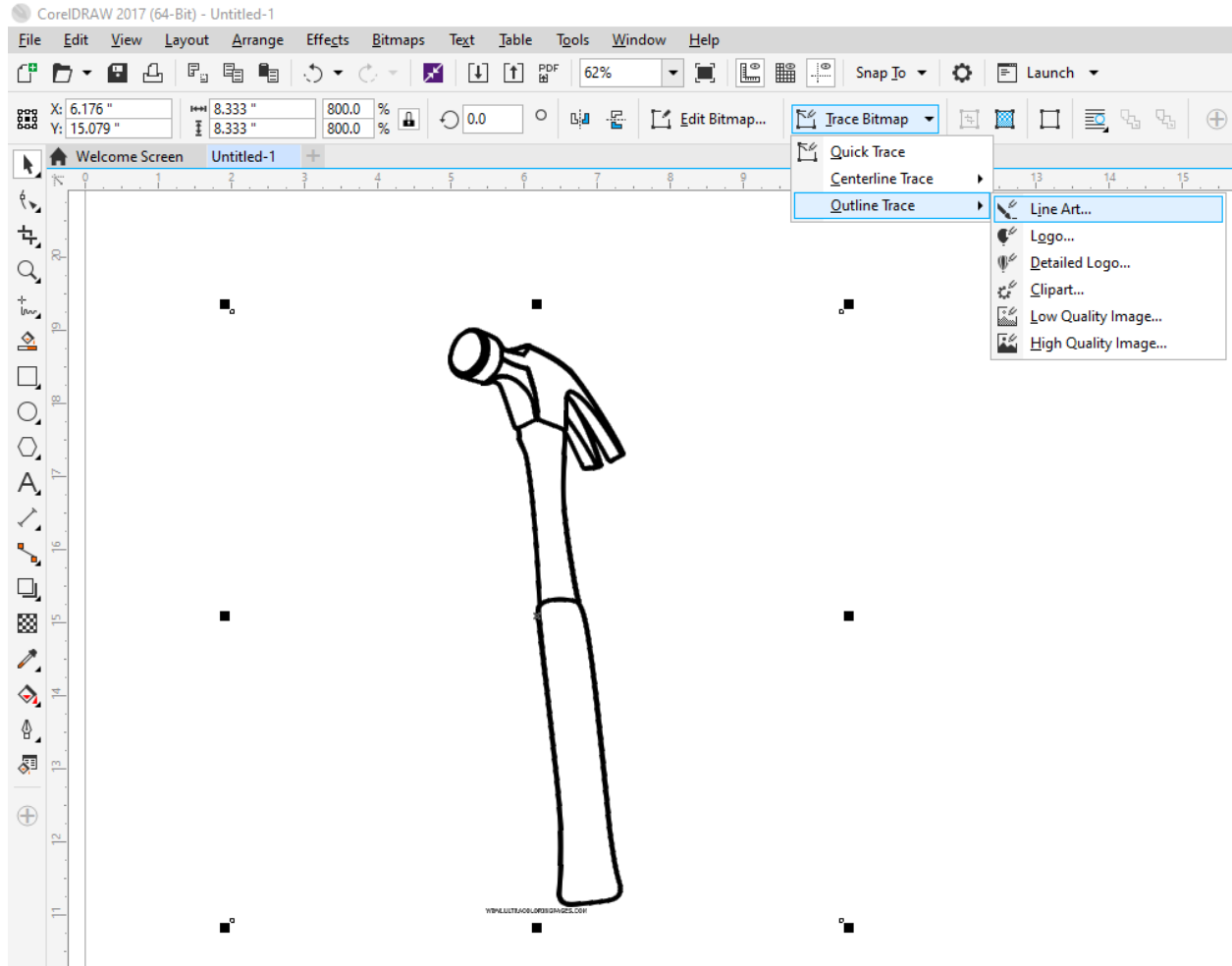
You can create or import vectors for the knife to follow, or in this case I imported a black and white .png of a hammer drawing that I'm going to trace to extract vectors of the edges. Use the method in the above image to access the tracing tools.
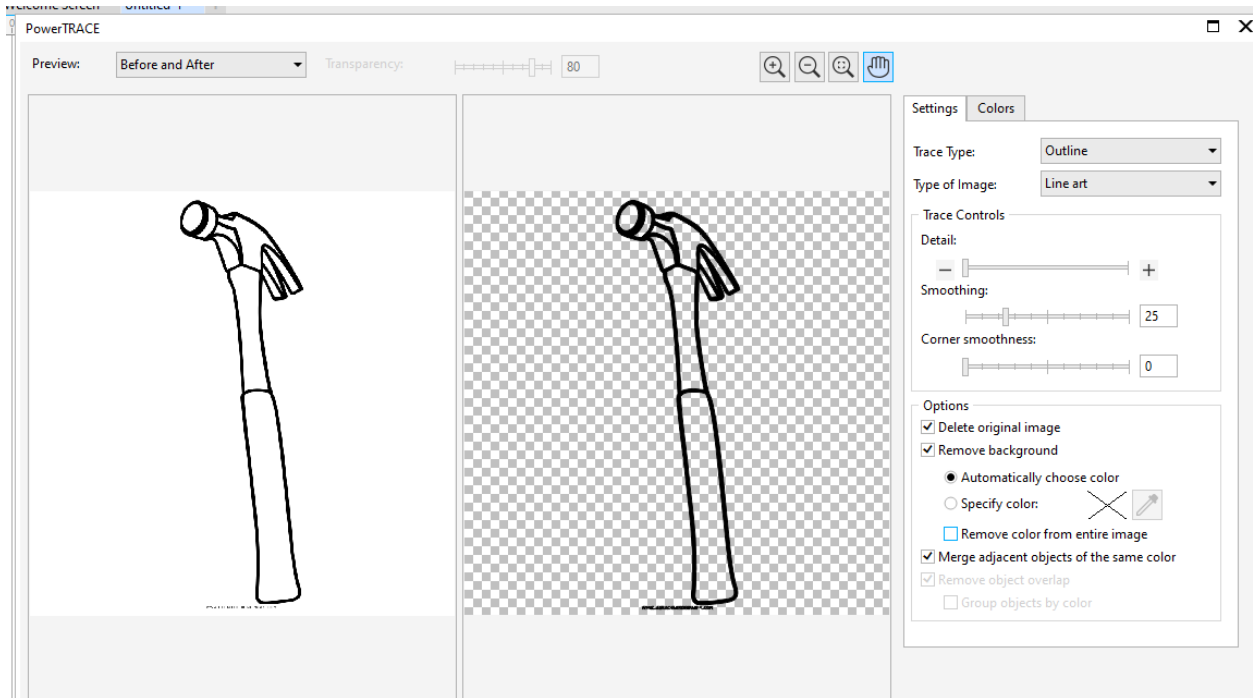
In the tracing dialogue, your settings should look something like this, but it will vary based on the image you import. On the right hand preview, you can see that theres black, and transparent background. If there were say white filled in the handle of the hammer, it would want to create a second vector (one for each the black and the white shapes' edge). That would mean the knife cuts the same path twice. This can actually mess up your results in some cases. Black fill on transparent background, with no additional colors, is what we want in this case.
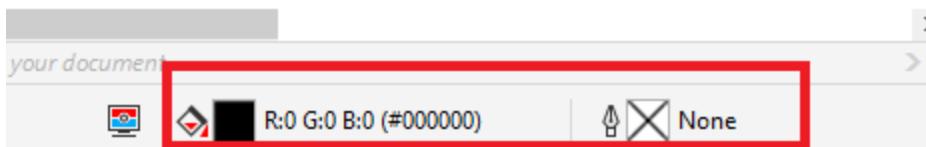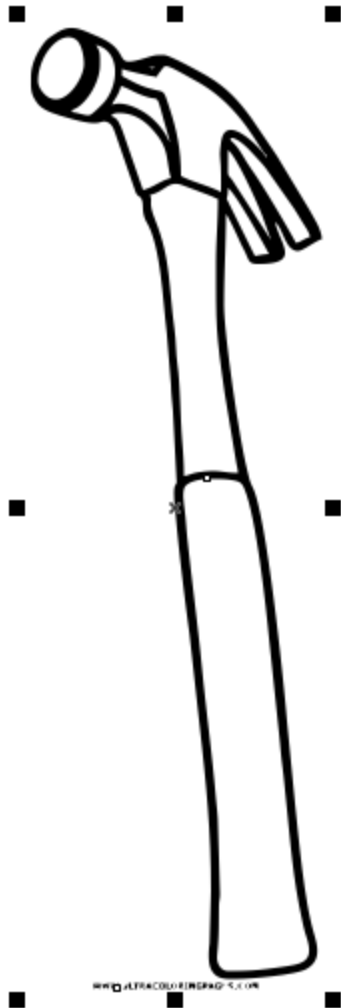
The results of our trace will be a filled shape. In this image the fill is black, and there is no outline information. We want to change that so there is no fill, and we have a HAIRLINE outline for the machine to follow as a toolpath. If you double click the icons for the paint bucket (fill) or fountain pen (outline), dialogue will pop up that will allow you to make changes to them.
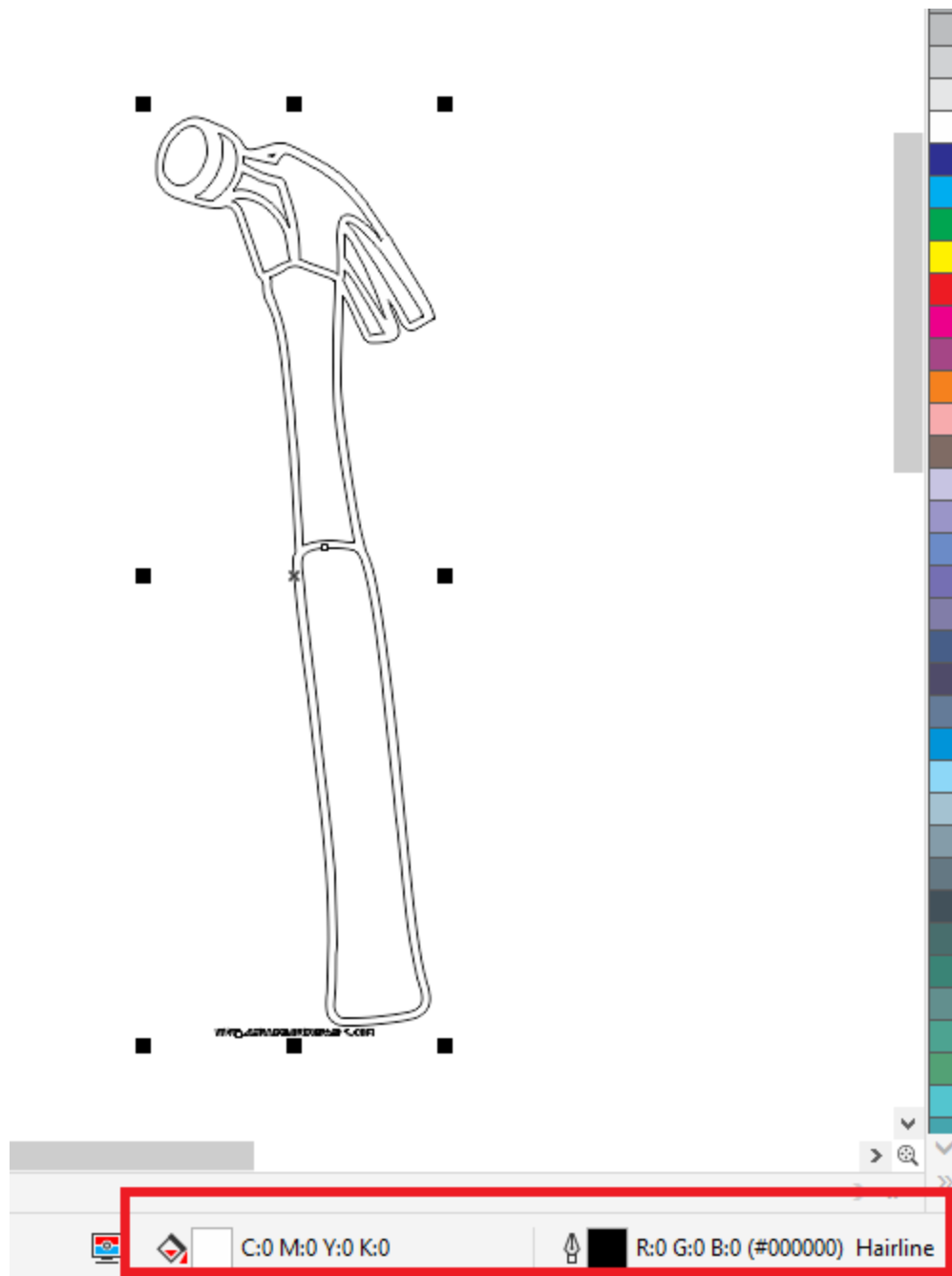
This is how the outline and fill properties look after I've made the appropriate changes. We now have a HAIRLINE outline and no fill.

Next I'm going to cut a piece of vinyl from the rack of rolls outside the laser cutter room. Be careful to cut it nice and rectangular. If there are scraps sticking off, or your scissor cut is not straight, the piece of vinyl will not feed into the machine properly.
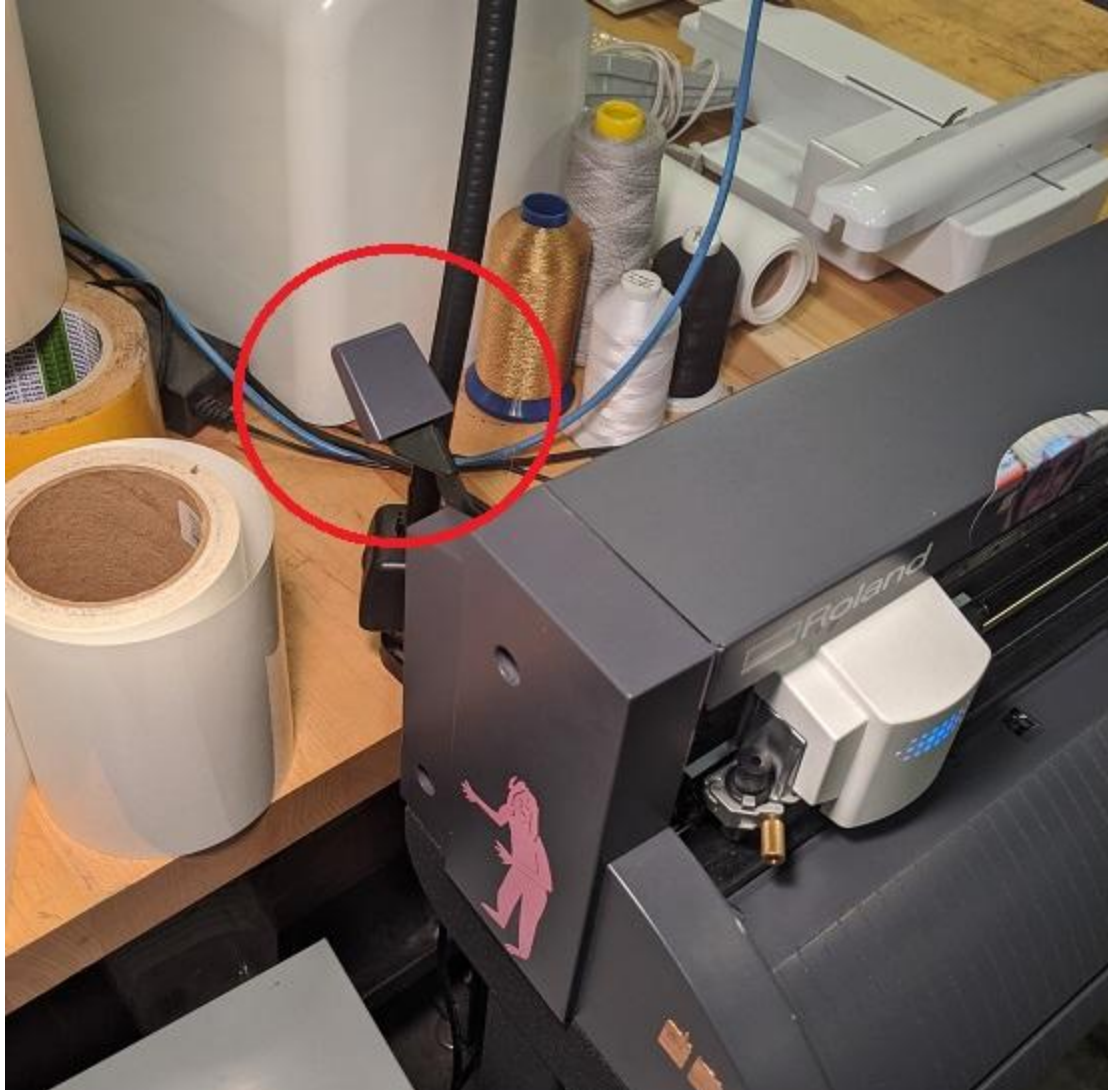
Release the lever on the machine that applies pressure of the rollers, so we can begin to feed material under the rollers.
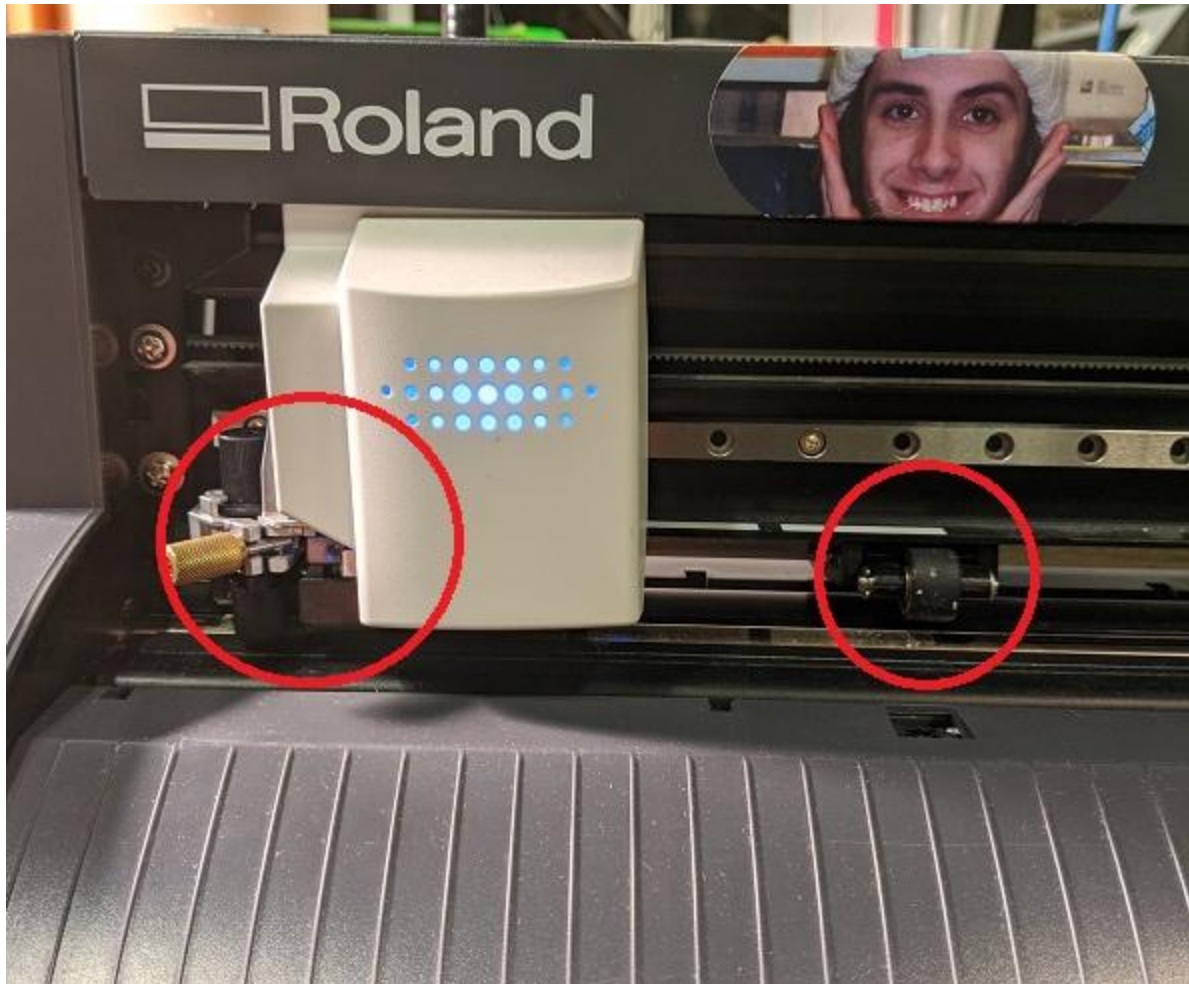
When I got to the machine, it was powered on and the carriage was blocking access to the rollers. If the carriage is blocking access to the rollers, it is OK to power off the machine (by holding the power button) and then gently slide the carriage over so you can get to the rollers.

(powering off machine)

(sliding carriage over to access rollers)

The rollers can be moved, but eventually MUST be positioned underneath the silver stripes in order to properly load your material. If you try to load a piece of material when the rollers are not properly positioned under the silver stripes, you'll get "ERROR: BAD POSITION". The position of the rollers will be used for the machine to measure the amount of X-axis travel we have on our material.

**Flip up the lever to apply roller pressure onto your material.**
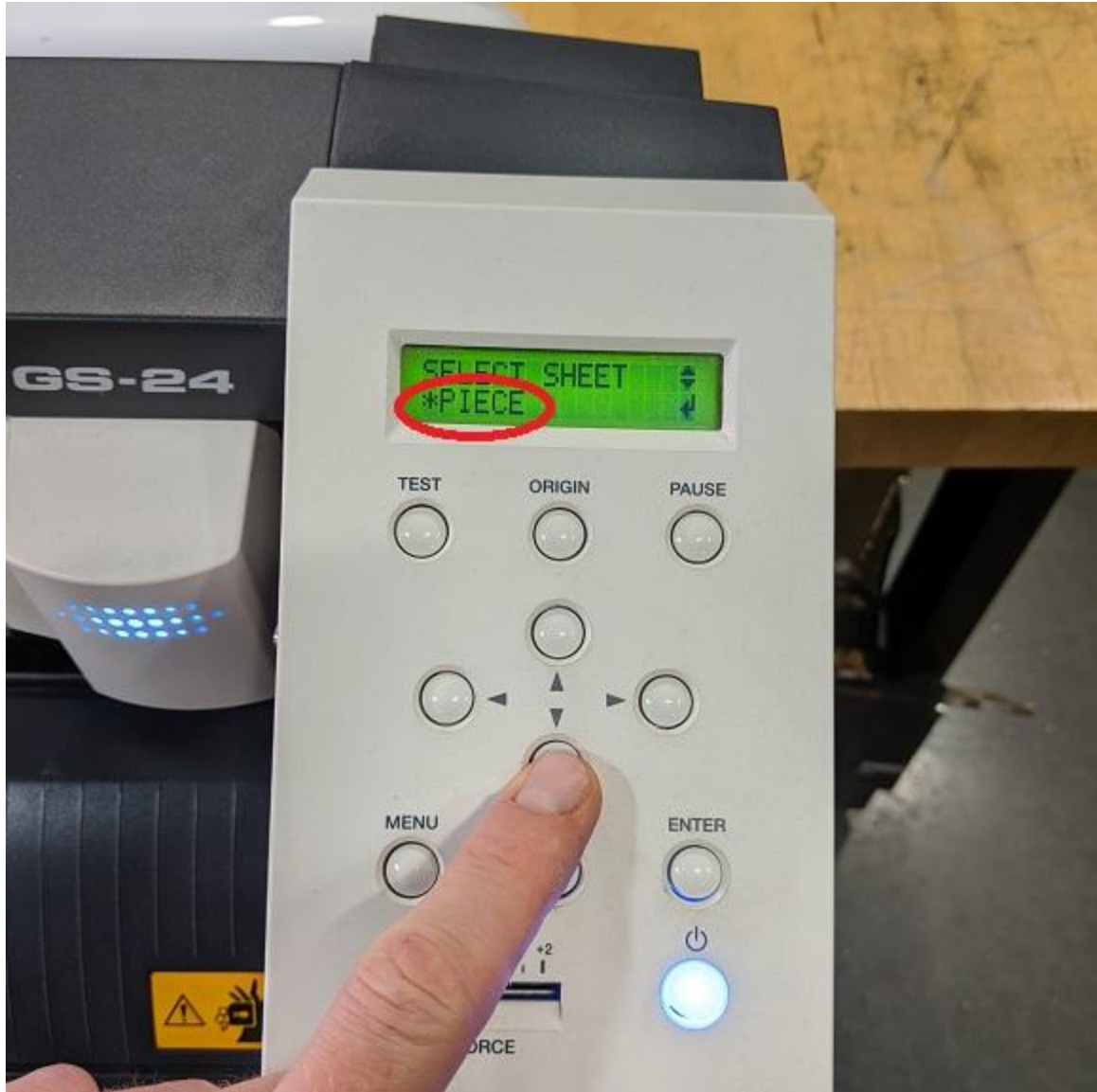
The interface on the machine should now display "SELECT SHEET" and the first option is ROLL. Scroll with the down arrow key until you get to PIECE and then hit enter. The machine will measure what it sees as our available cutting space on our material.

When it finishes measuring, the interface will displace what it sees as the size of our available cutting space. I always load the material first, then change the paper size in Corel to reflect what it gives us as a material size.
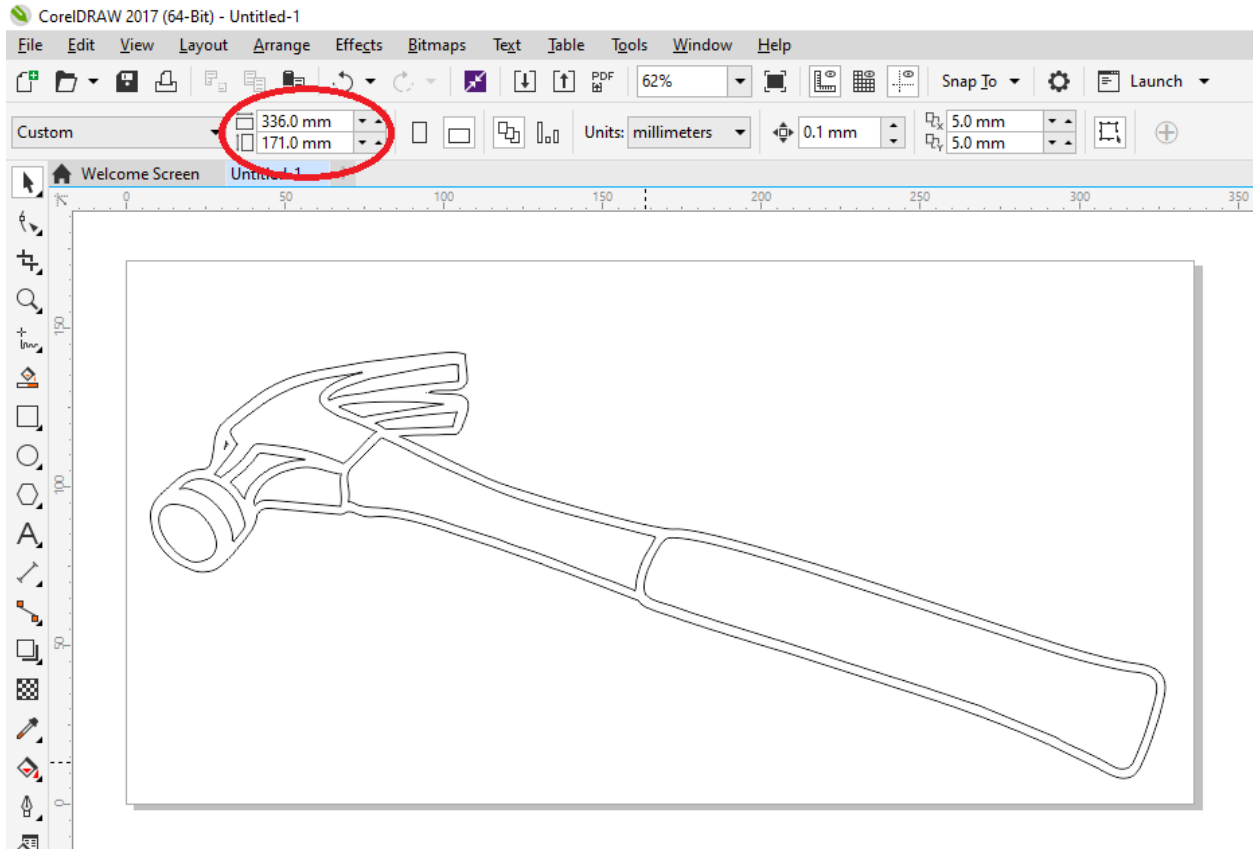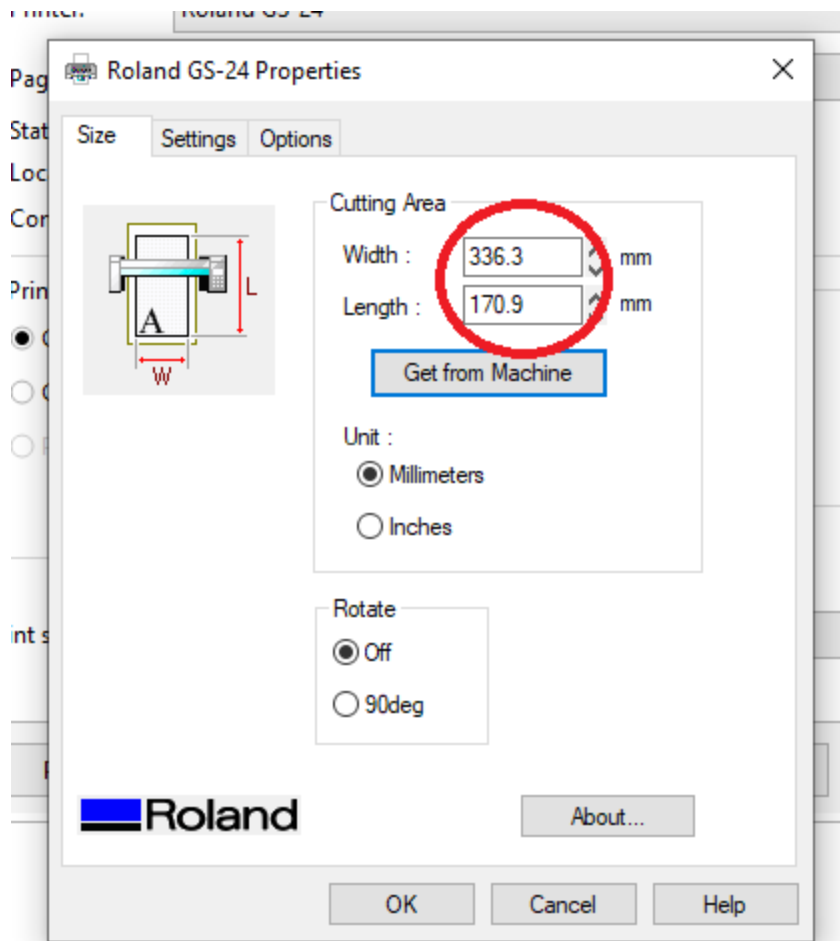
With nothing selected, the bar along the top displays the paper size and units. I've changed the units to MM and entered the numbers for X and Y that the vinyl cutter's display shows. Then I scaled the vectors I want to cut to fit that. This is just a decal for demonstration, so the scale is not important. Keep in mind that in Corel, if you have any shapes or vectors selected, the top bar will display the units of the selected shapes or vectors. Only if nothing is selected will the top bar display the units of the paper size. You can now go to File->Print to prepare to send the job.
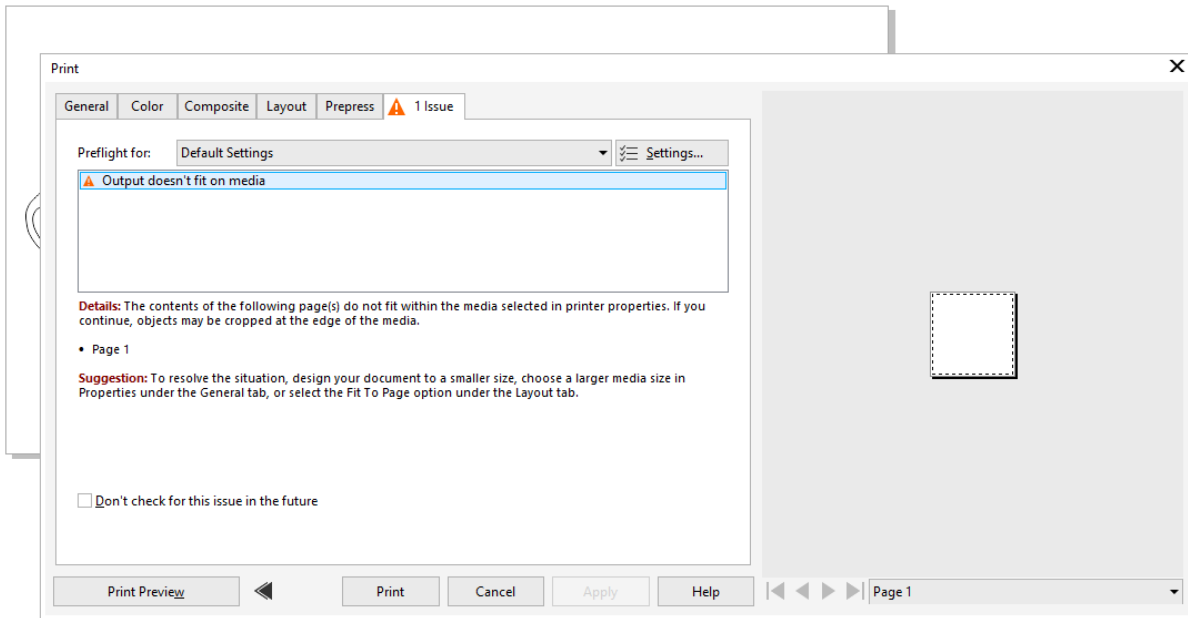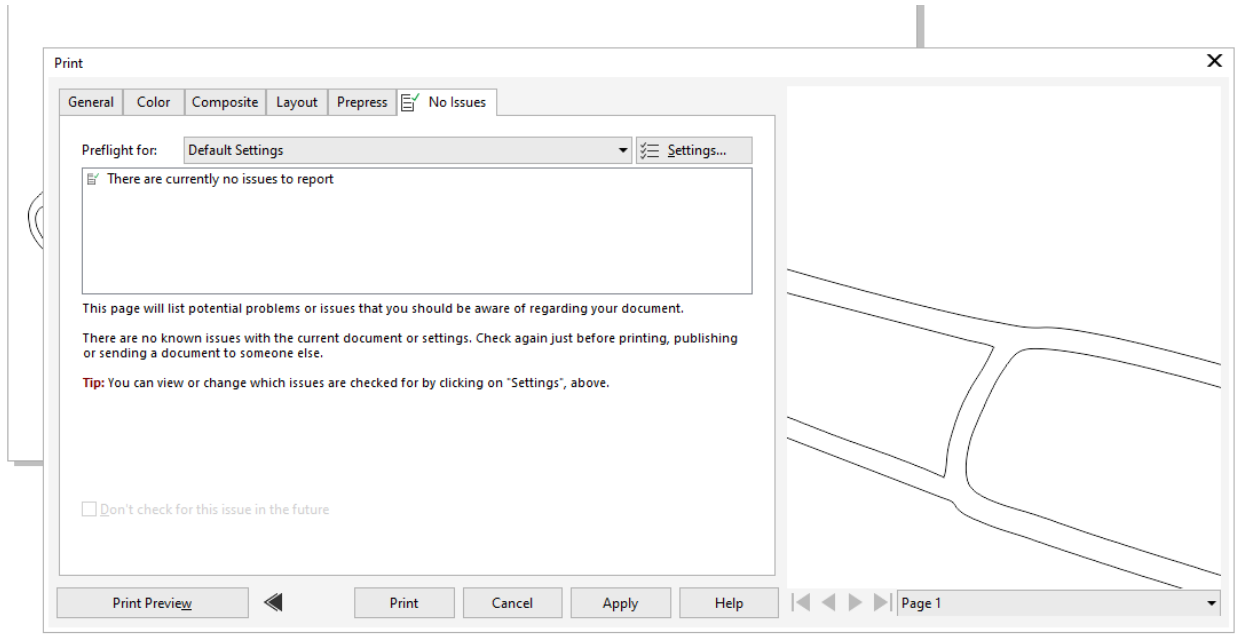
When I enter the print dialogue, the first thing I notice is that we have 1 issue. The issues tab says the output won't fit on our media. We may have changed the paper to reflect our cutting space, but we haven't given that same information the print driver yet.
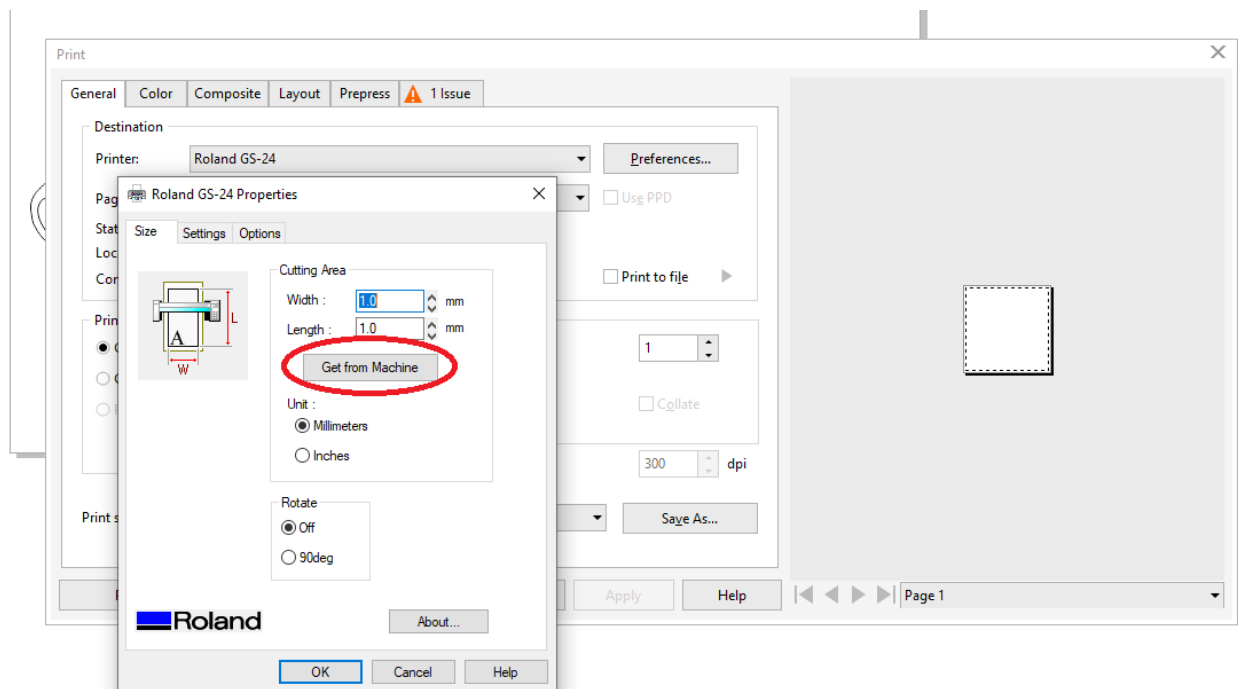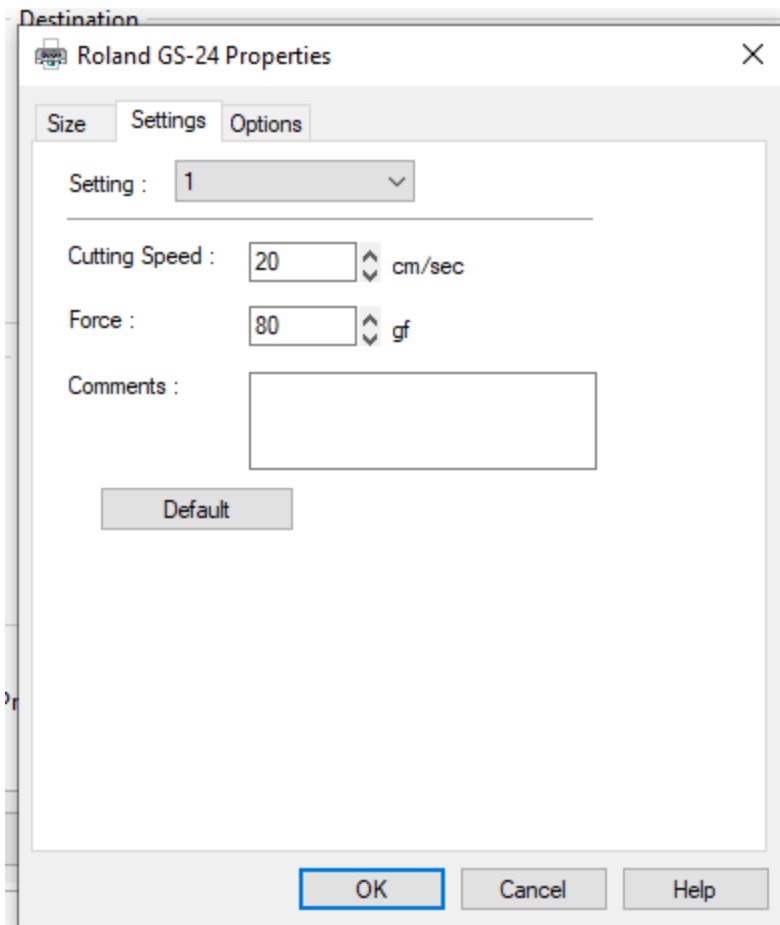

Go into the print preferences and press the button that says Get from Machine. If your material is properly loaded, and the size is displayed on the vinyl cutter's interface, the cutting area should be updated properly once you press Get from Machine.

After pressing Get from Machine

Print

General | Color | Composite | Layout | Prepress | No Issues

Preflight for: Default Settings ▾   ⋮≡ Settings...

▤ There are currently no issues to report

This page will list potential problems or issues that you should be aware of regarding your document.

There are no known issues with the current document or settings. Check again just before printing, publishing or sending a document to someone else.

Tip: You can view or change which issues are checked for by clicking on "Settings", above.

☐ Don't check for this issue in the future

Print Preview | ◀◀ | Print | Cancel | Apply | Help | |◀ ◀ ▶ ▶| Page 1 ▾

No more Issues

Roland GS-24 Properties

Size | Settings | Options

Setting : 1 ▾

Cutting Speed : 20 ⇕ cm/sec

Force : 80 ⇕ gf

Comments :

Default

OK | Cancel | Help

The only other things you should need to change occasionally are the cutting speed and force. The cutting speed at 20 cm/sec is pretty good for vinyl, and 80 grams of force is a good place to start for vinyl. These values will change for working with the copper roll. The amount of force required to get your desired result (usually "kiss cutting"- cutting through the top sheet of our vinyl while not cutting through the bottom sheet of glossy backing) can vary based on the lifetime of the knife.


HIT PRINT! The machine will start dancing

When the machine stops moving, flip up the lever that will release the pressure that the rollers are putting on our material. Then you can slide the material out toward you.

The next step is called weeding. We will use tweezers to remove all pieces of vinyl that are not wanted for the design. I started by removing the entire area outside our external cut. Keep in mind that you will likely create lots of little scraps of vinyl during this process. Please keep them together so its easy for you to clean up afterward. Do not throw scraps on the floor or leave them for the next user or shop staff to deal with!
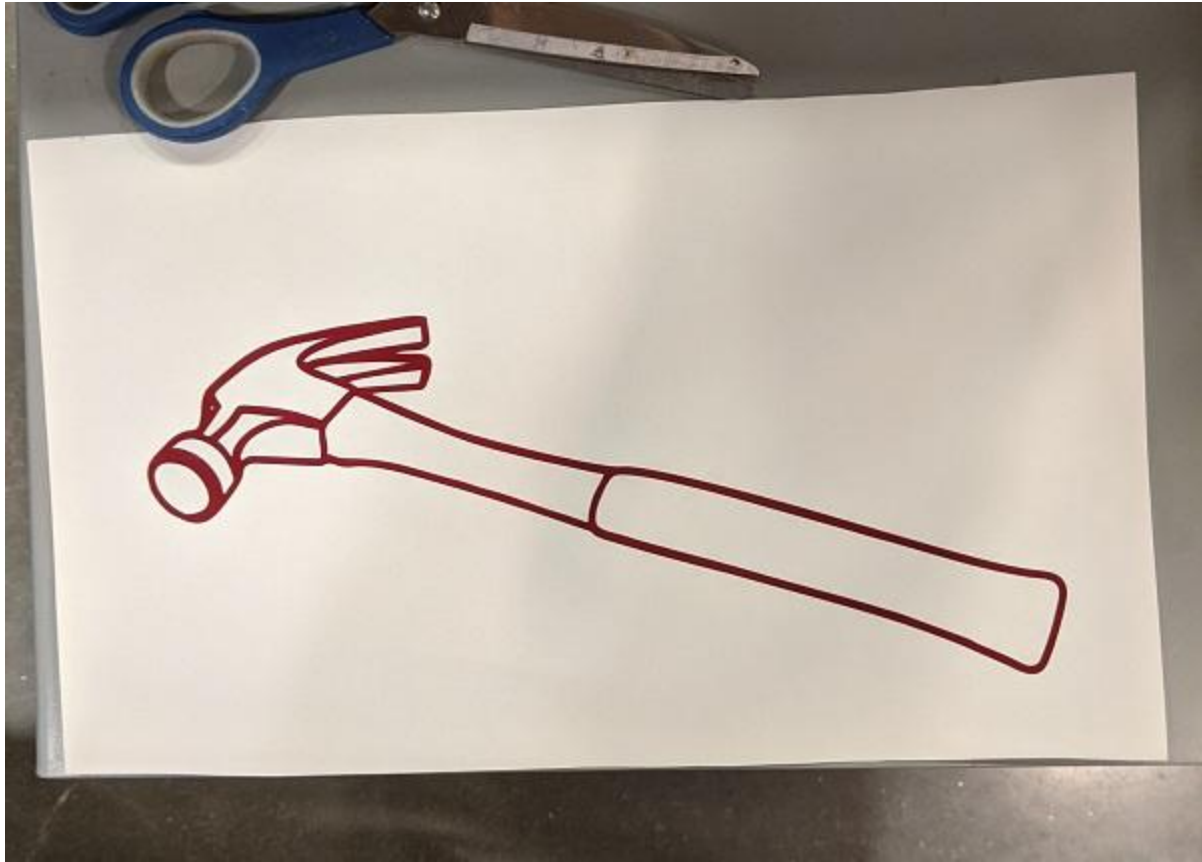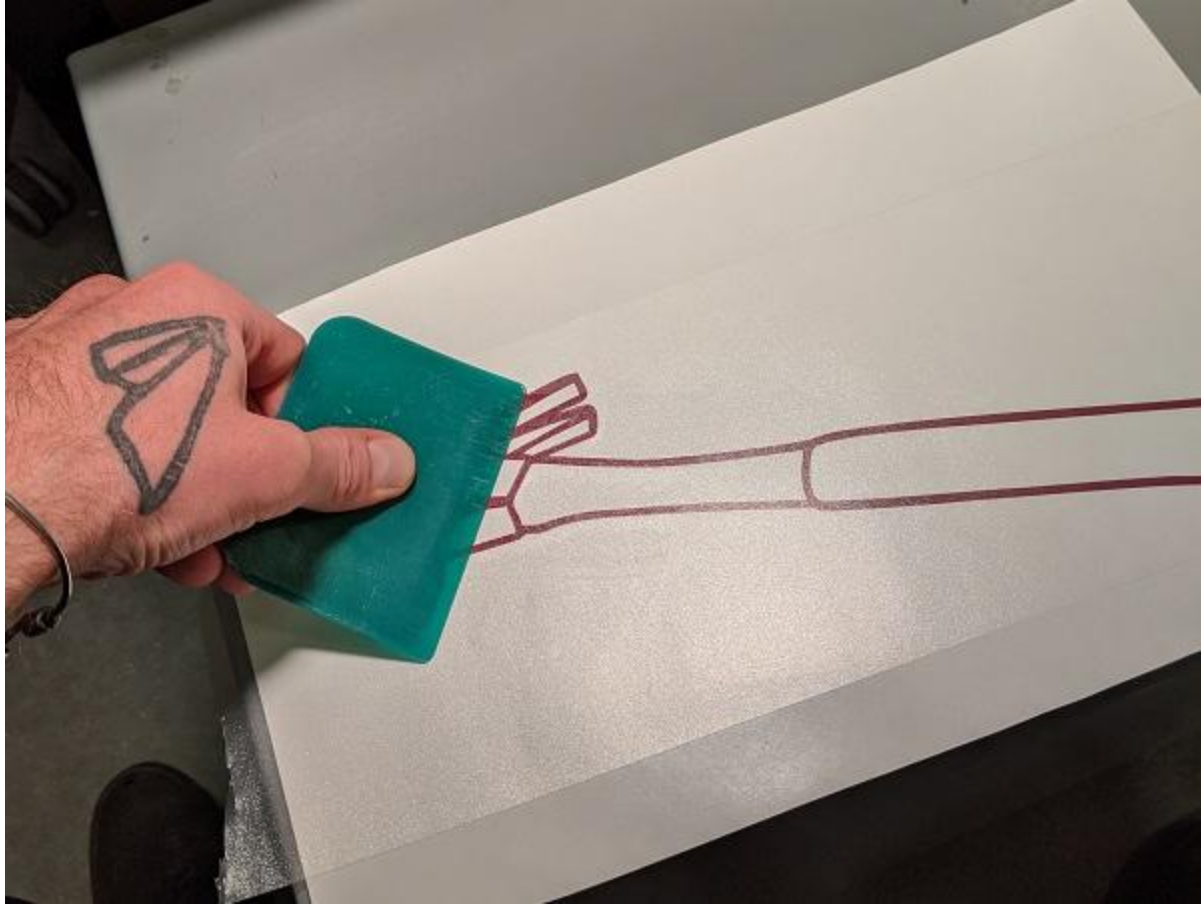
Weeding done! Sometimes it helps to have the lamp on, shining on your material, so you can better see where the actual cuts are. They aren't always very visible!
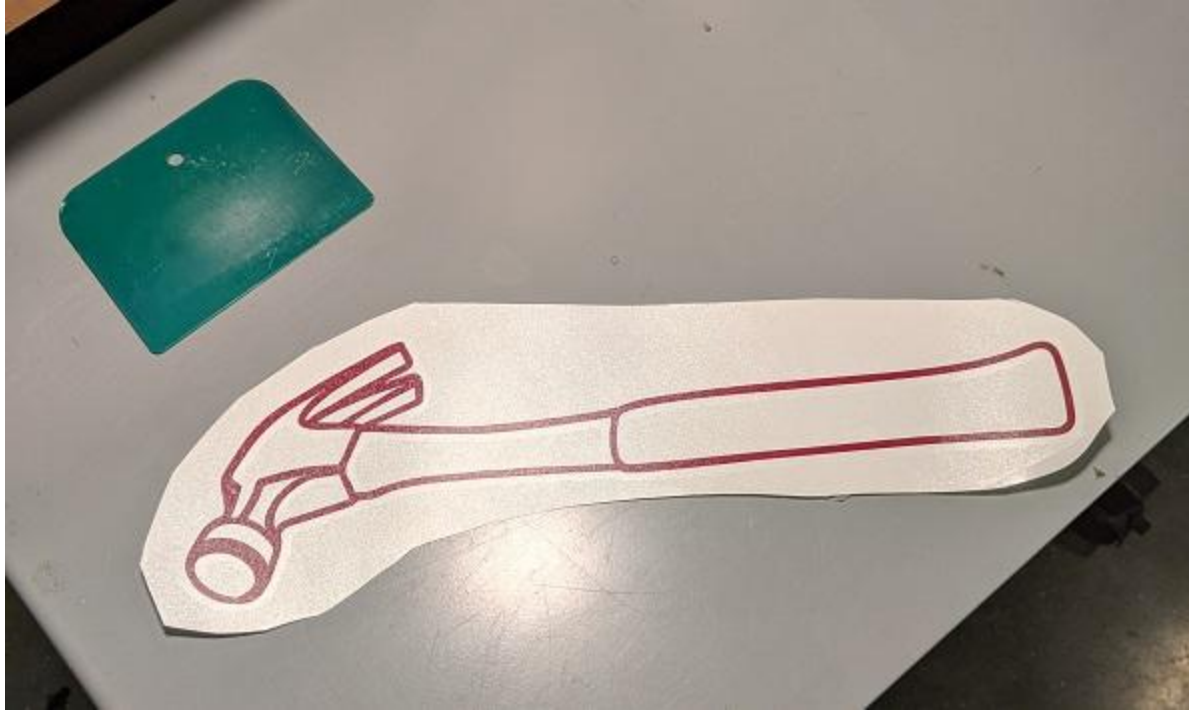
**Next we will cut a piece of the transfer tape and lay it over our weeded design.**

Be careful not to introduce and bubbles, kinks or wrinkles if possible.

Use a squeegee to press the transfer tape down onto your vinyl, so that the vinyl will stick to the transfer tape and release from the glossy backing that the vinyl came on.

I have squeegeed my design with the transfer paper, and then used scissors to cut away extra scrap I don't need. This is just personal preference that will make the design easier to handle while I'm transferring it.
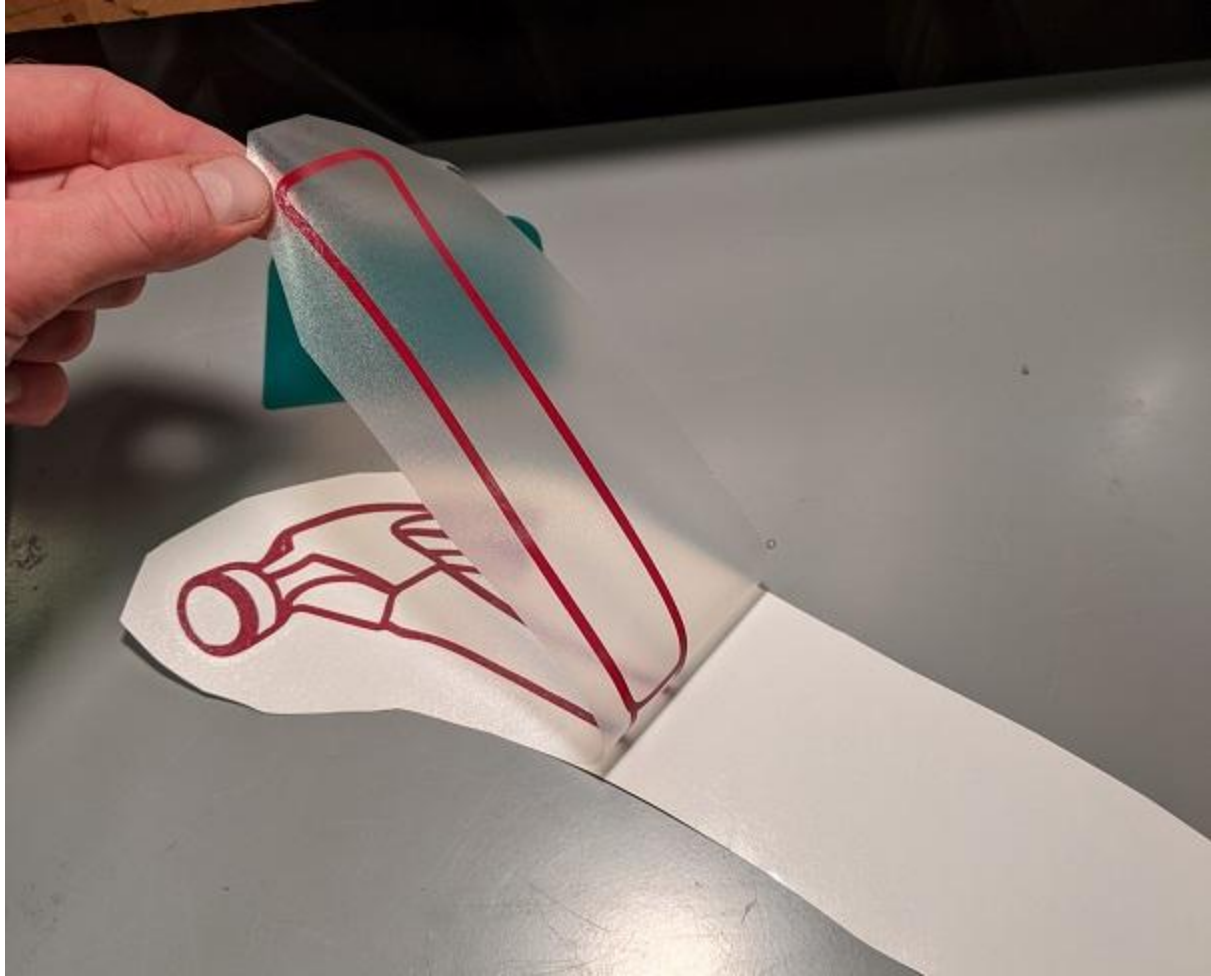
Peel your design away from the glossy paper backing and prepare to stick it on to it's new home. The place you're going to put it should be smooth, flat, hard, and clean. Surfaces like sheet metal and glass work great, while trying to put it on cardboard or drywall will be much trickier to complete the transfer.

Press it down gently at first, and then more firmly. After that, use the squeegee to press it down some more. You want to make sure the vinyl is really stuck down to that new surface we just put it on.

Begin removing the transfer tape by peeling it back against itself. You don't want to lift it back toward you, it will really encourage the vinyl to come off the surface with it.

DONT
PULL
TOWARD
YOU!

WOW! BEAUTIFUL
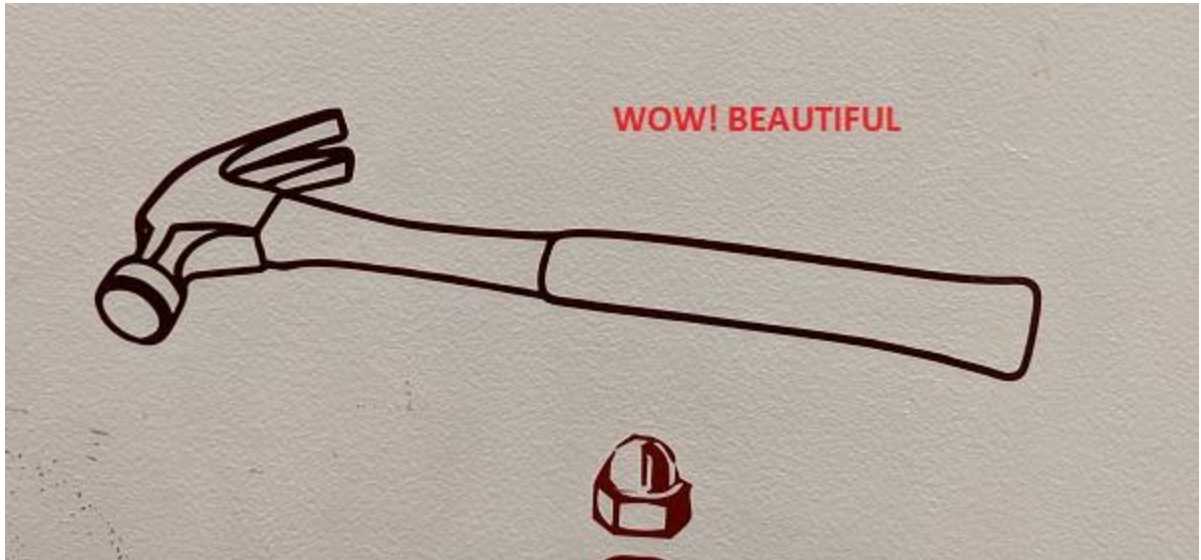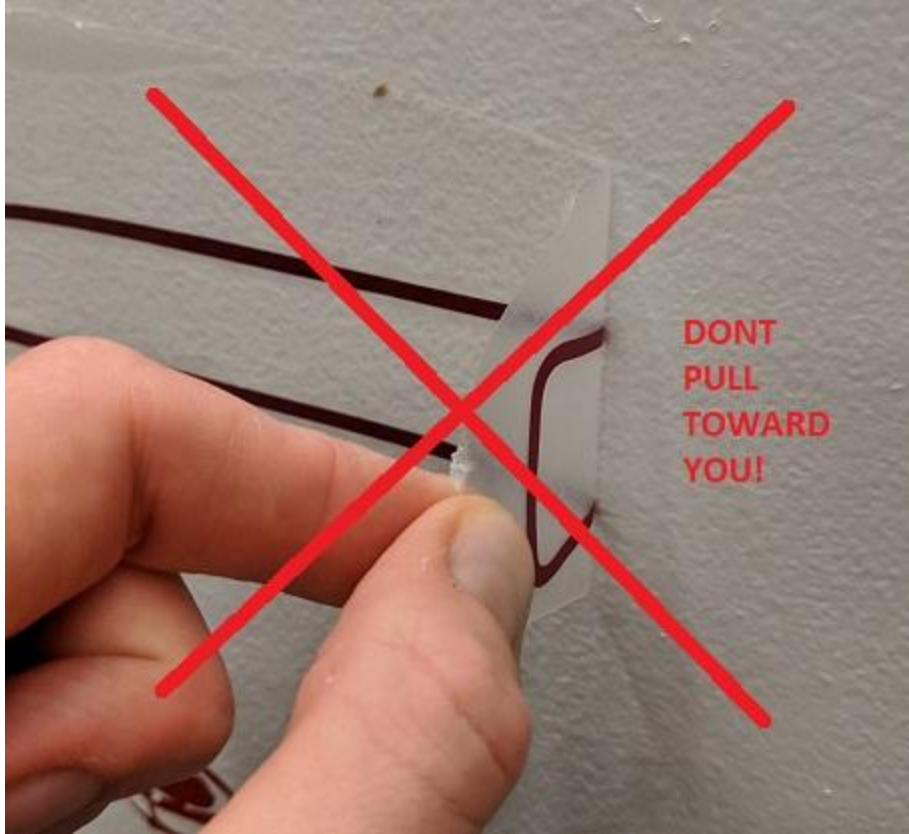
Amazing.
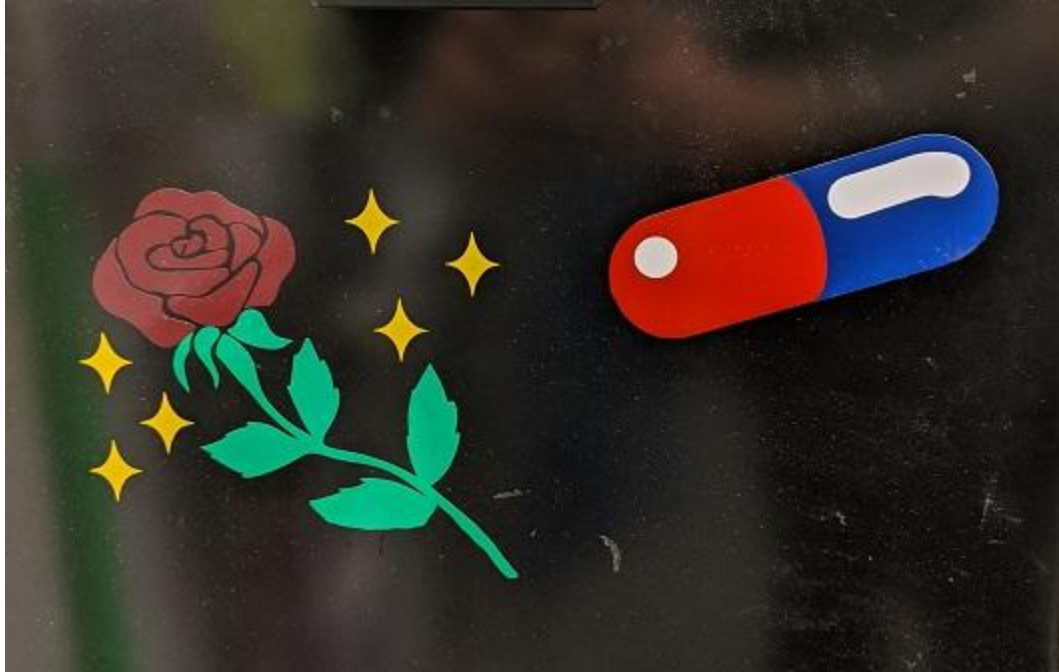
Once you've done it a couple times, ask Tom about expanding your skills to do multi-colored, registered decals!