

US MH Vinyl Cutter and Plotter

Computation + Construction Lab | Iowa State University

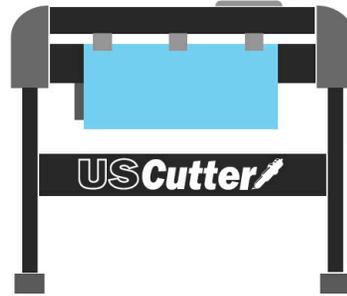
US MH Vinyl Cutter and Plotter



Material and Blades

Oracal Cast and Calendered Sign Vinyl, Heat Transfer Material (Sister Thermo Transfer for Textiles), Craft Paper and Card Stock, and many other materials. Make sure that you use the proper blade for the material that you are cutting.

A good VINYL CUTTER is just the start...



You also need the right media, blade, and application tape to ensure a professional job.

	<ul style="list-style-type: none"> Oracal 8300, 8500, 8510, & 8800 Main Tape GXF-775 or R-Tape AT65 45° Blade 		Glass Application
	<ul style="list-style-type: none"> Oracal 3951 & 3651 HP Gloss & Matte Main Tape GFX-341 45° Blade 		Digital Printed Graphics
	<ul style="list-style-type: none"> Oracal 631 or GreenStar Wall Vinyl Main Tape GXP750 or Oratape HT55 45° Blade 		Indoor Wall Vinyl
	<ul style="list-style-type: none"> EasyWeed (standard fabrics) EasyWeed Extra (nylons/water resistant) 30° Blade (general) 60° Blade (glitter/flock) 		Heat Press
	<ul style="list-style-type: none"> Oracal 651 or GreenStar Intermediate (calendered) for short term Oracal 751 or 951 (cast) for long term GreenStar Layflat Classic or Main Tape GXF-775 45° Blade (general) 60° Blade (reflective) 		Outdoor Signage
	<ul style="list-style-type: none"> Anchor BlastLite Oramask R-Tape 4076RLA 60° Blade 		Stencils & Masks

CHOOSE BLADE

For thin and regular sized media, use a 45° blade.

For thicker materials, such as Siser StripFlock, Siser Glitter, and Hexis CutFlex 600 Reflective, a 60° blade is needed.

Load the blade so that the length of the blade shown is not longer than the media is thick.

Software



Design Setup

- Rhino, Illustrator, a range of software can be used to setup the initial design files to be cut.
- Export files in .SVG formatt (scaleble vector graphic) or as JPEG.

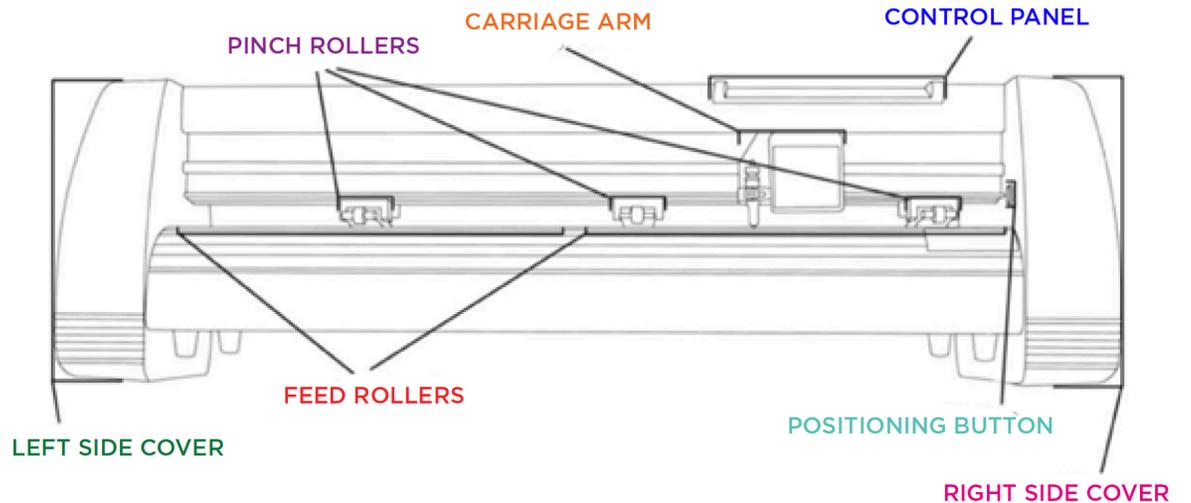
Vinyl Master PRO

- Sizing, rotation, layout adjustments of files
- Measures in Millimeters

Vinyl Cutter Overview

Before you start cutting, you should familiarize yourself with the cutter and its basic parts and functions.

FRONT VIEW



CONTROL PANEL

Used to provide input directly to the cutter. Covered in detail in the "Control Panel" section of this manual.

CARRIAGE ARM

Holds the blade (or pen) carriage.

PINCH ROLLERS

Holds the media tightly to the feed roller below.

FEED ROLLERS

Positions the cutting material during operation.

POSITIONING BUTTON

Used by the cutter to determine the location of the carriage arm.

LEFT SIDE COVER

Contains the power cable port, power switch, and fuse cartridge for the cutter.

RIGHT SIDE COVER

Contains the USB and serial cable ports for the cutter.

Vinyl Cutter Overview (Continued)



RIGHT SIDE VIEW

USB CABLE PORT

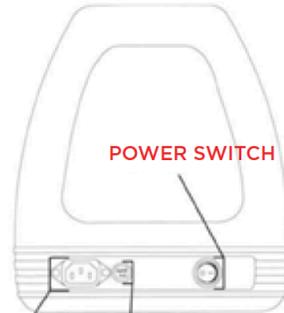
Used to connect a USB cable from the cutter to a computer.

SERIAL (COM) CABLE PORT

Used to connect a serial cable from the cutter to a computer.

USB CABLE PORT

SERIAL (COM) CABLE PORT



LEFT SIDE VIEW

POWER CABLE PORT

Used to connect a power cable from the cutter to a wall outlet or surge protector.

POWER SWITCH

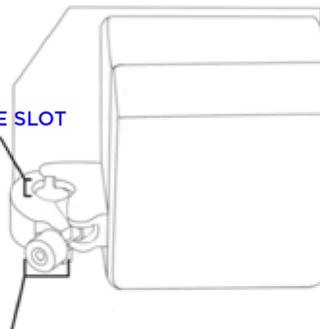
Main power switch for turning the power of the cutter on (1) or off (0).

POWER CABLE PORT

FUSE CARTRIDGE

FUSE CARTRIDGE

Allows access to the fuse inside of the cutter.



CARRIAGE SLOT

LOCKING KNOB

CARRIAGE SLOT

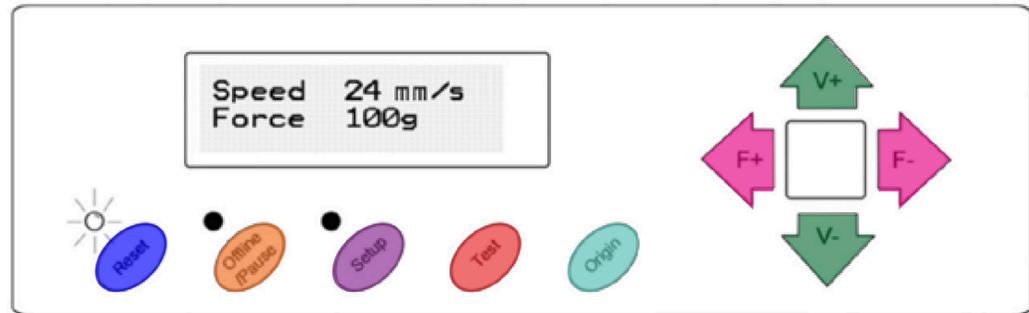
Holds the blade carriage in place.

LOCKING KNOB

Allows access to the blade/pen carriage slots for exchanging/replacing carriages.

Main Screen

The main screen of the cutter allows you to set the main setting of the cutter including the cutting speed and cutting force options. It also allows you to cut a test pattern or check the amount of force that is currently set.



RESET BUTTON

Resets by stopping the cutter, and setting the origin of the carriage arm to its right most position.

OFFLINE/PAUSE BUTTON Accesses the Offline/Pause mode.

SETUP BUTTON

Accesses the Setup mode.

TEST BUTTON

Will cut a small test shape so that the current force and speed settings of the cutter can be tested. You can use this to determine the proper cutting speed and force settings needed for different materials without wasting large amounts of material from cutting full designs.

ORIGIN BUTTON

Used to test z-axis functionality (by dropping the blade down if the carriage is functioning properly) or to set a new origin point when the machine is in its offline mode.

V+ / V- BUTTONS

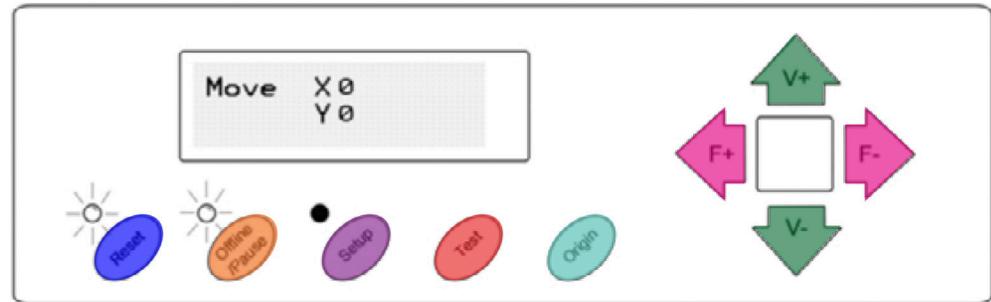
Adjusts the cutting speed. A cutting speed of 300 mm/s is a reasonable default speed that can be used for most cuts. When working with smaller and more detailed images, a slower speed may be required. When working with larger and less detailed images, a higher speed can be used to shorten the operation time.

F+ / F- BUTTONS

Adjusts the cutting force. A cutting force of 100g is a good general starting place to work from when trying to determine the force needed for a specific material. All cuttable materials will differ in the amount of force needed so proper testing should always be made to determine the amount of force to use. The amount of force used should be enough to fully penetrate the material to be cut while not enough to cut through the backing material.

Offline/Pause Screen

Offline mode is used to reposition the cutting material and blade so that a new starting position can be set for the next design. Offline mode can also be accessed while the cutter is in operation and will pause the current cutting process. Although changes can be made to the material and blade positions if Offline/Pause mode is accessed during cutting, making changes to either setting is not normally recommended.



RESET BUTTON

Resets by stopping the cutter, and setting the origin of the carriage arm to its right most position.

OFFLINE/PAUSE BUTTON

Ignores any changes that have been made to the material or blade positions and exits Offline/Pause mode, returning the cutter to the main screen. Resumes any cutting that was taking place when Offline/Pause mode was entered.

SETUP BUTTON

Has no function in this mode.

TEST BUTTON

Accepts any changes that have been made to the material or blade positions and exits Offline/Pause mode returning the cutter to the main screen. Resumes any cutting that was taking place when Offline/Pause mode was entered from the new blade/material positions.

ORIGIN BUTTON

Accepts any changes that have been made to the material or blade positions and exits Offline/Pause mode returning the cutter to the main screen. Resumes any cutting that was taking place when Offline/Pause mode was entered from the new blade/material positions.

V+ / V- BUTTONS

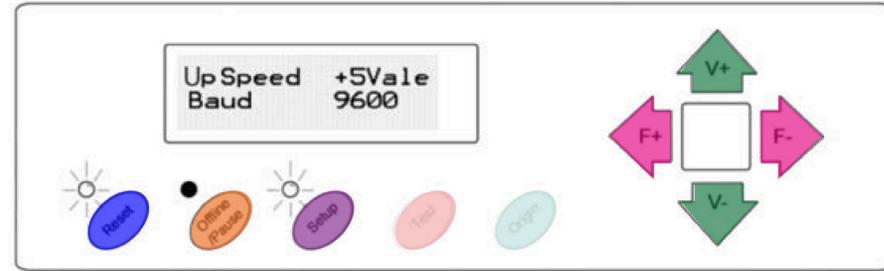
Repositions the material by moving the feed rollers. After movements are made you can confirm the changes by pressing the TEST or ORIGIN buttons or cancel by pressing the OFFLINE/PAUSE button.

F+ / F- BUTTONS

Repositions the blade by moving the carriage arm. After movements are made you can confirm the changes by pressing the TEST or ORIGIN buttons or cancel by pressing the OFFLINE/PAUSE button.

Setup Screen

The Setup screen allows you to adjust some of the more technical settings of the cutter. For most users, these settings should not be changed.



RESET BUTTON

Resets by stopping the cutter, and setting the origin of the carriage arm to its right most position.

OFFLINE/PAUSE BUTTON Has no function in this mode.

SETUP BUTTON

Exits Setup mode and returns to the main screen.

TEST BUTTON

Has no function in this mode.

ORIGIN BUTTON

Has no function in this mode.

V+ / V- BUTTONS

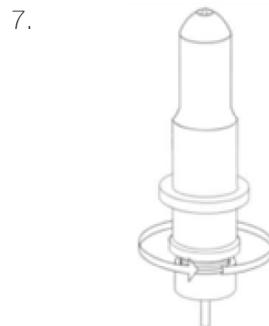
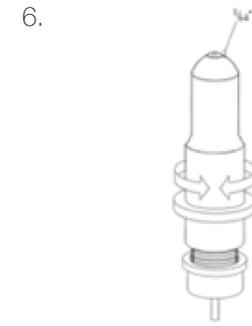
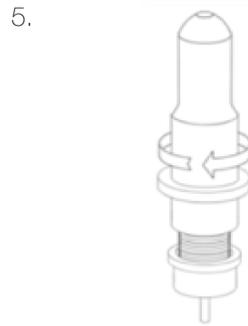
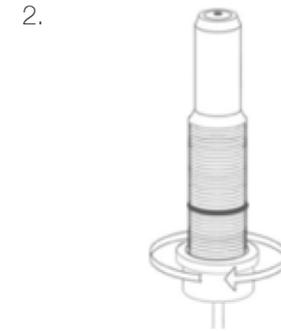
Adjusts the Up Speed of the cutter.

F+ / F- BUTTONS

Adjusts the Baud Rate of the cutter.

Installing the Blade

1. Unscrew the cap from the Blade Carriage
2. Set brass ring on blade carriage to the fully down position.
3. Remove the blade into the top of the blade carriage.
4. Insert the blade into the top of the blade carriage.
5. Screw the cap back onto the blade carriage
6. Adjust the carriage cap until the blade is protruding approximately 1/64th of an inch.
7. Adjust the brass ring until it fits snug against the cap. This will help keep the cap in place during operation.



Pen Carriage

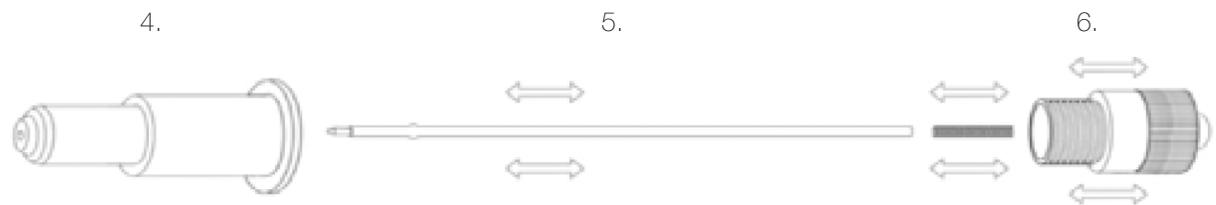
Installing

1. Loosen the locking knob on the carriage arm.
2. Place blade carriage into the carriage arm.
3. Tighten the locking knob on the carriage arm.



Replacing the Pen or Spring

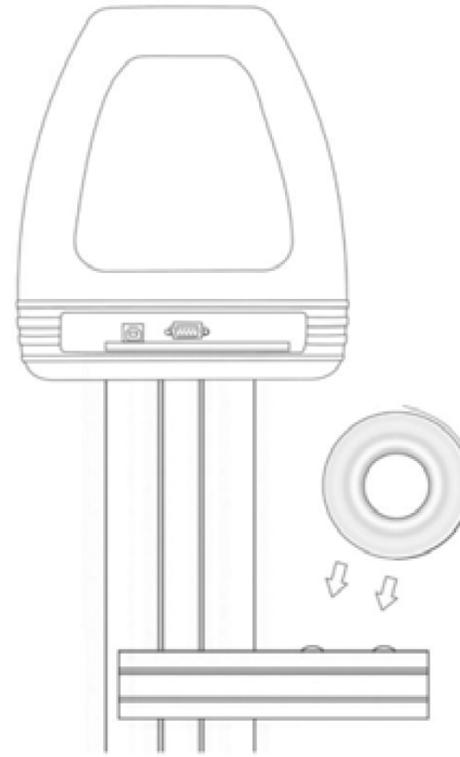
4. Unscrew the top cap from the pen carriage.
5. Remove the top cap, the pen and the spring. Replace the pen and/or spring as necessary.
6. Slide the spring onto the pen from the top and insert it back into the pen carriage.



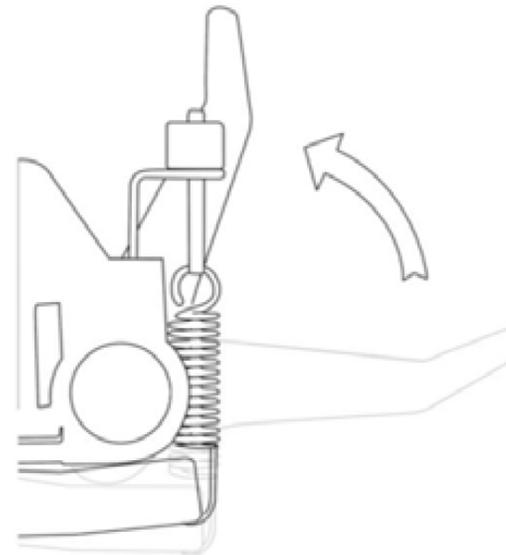
Changing Roll

1. Place the roll on top of the stand rollers. For heat press vinyl, please flip the roll.
2. Release the pinch rollers release levers.

1.



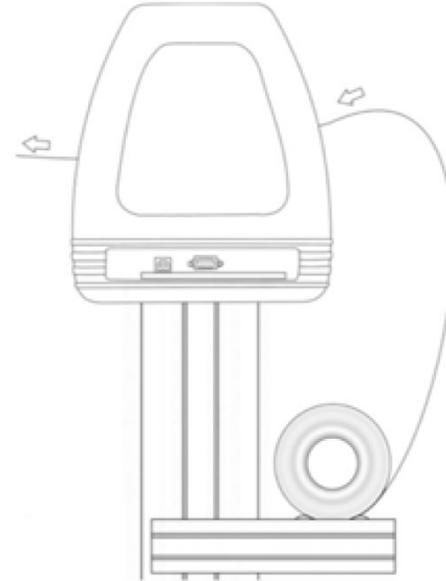
2.



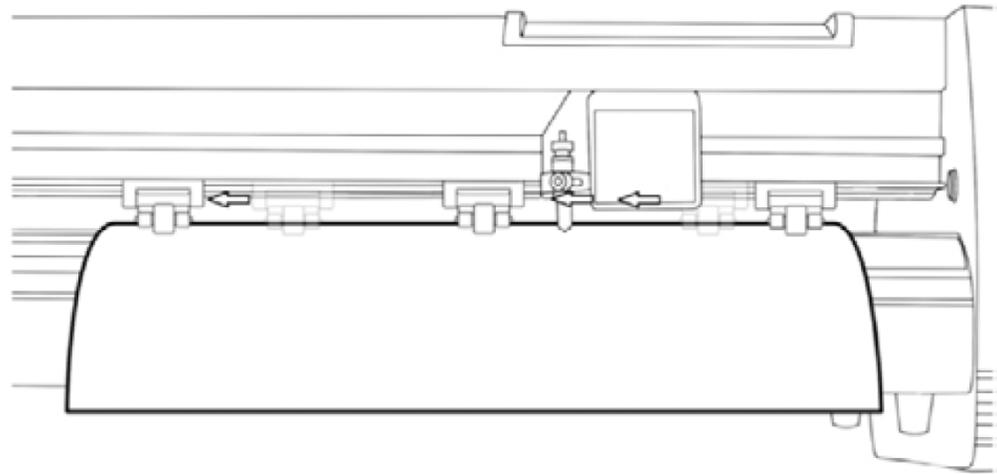
Changing Roll (Continued)

3. Feed the vinyl underneath the pinch rollers (If working from a single sheet instead of a roll, the vinyl can also be feed from the front).
4. Adjust the pinch rollers so there is one roller located on each side of the vinyl (and, on models with 3 or more rollers, one rollers near the center). Avoid lowering a pinch roller to the gap between the two feed rollers.

3.



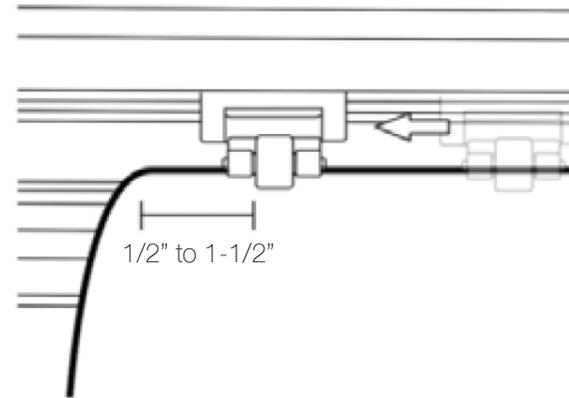
4.



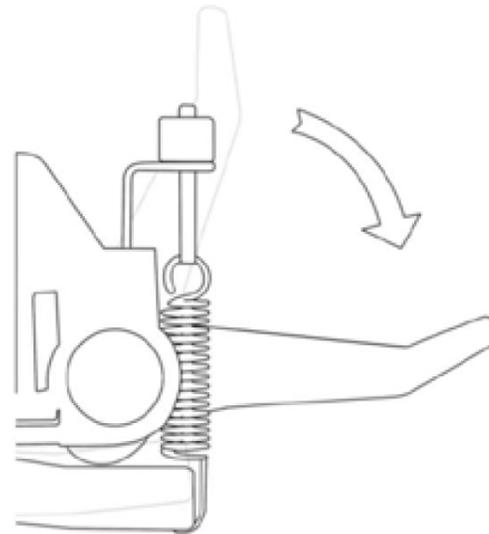
Changing Roll (Continued)

5. Leave a gap of between 1/2" to 1-1/2" from the edge of the roller and edge of the vinyl on both sides.
6. Engage the pinch rollers by pushing down on the pinch rollers release levers.

5.



6.



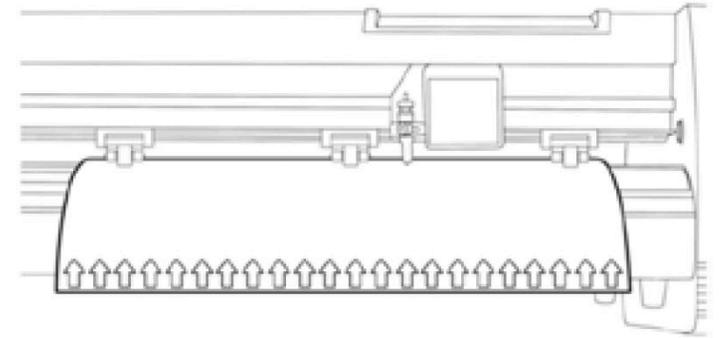
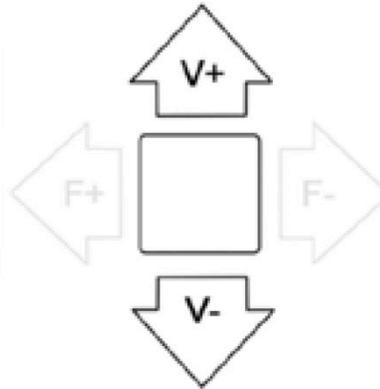
Changing the Cut Position

1. Press the OFFLINE/PAUSE button to enter offline mode.
2. Adjust the vinyl to where you want to make your cut to start by using the Up and Down arrow keys on the control panel.
3. Now, adjust the blade to where you want your cut to start by using the Left and Right arrow keys on the control panel.
4. Now press the Origin button to tell the cutter that this is the location where you would like the cut to begin.

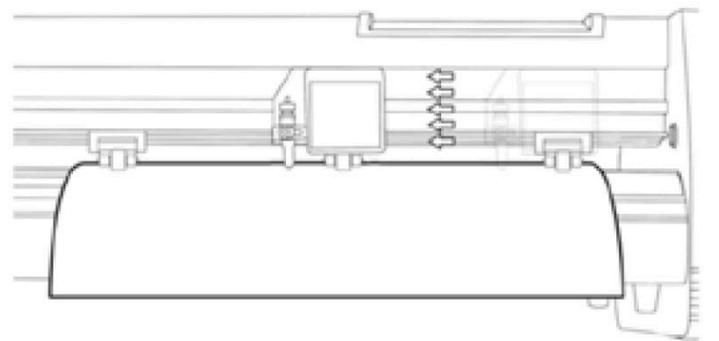
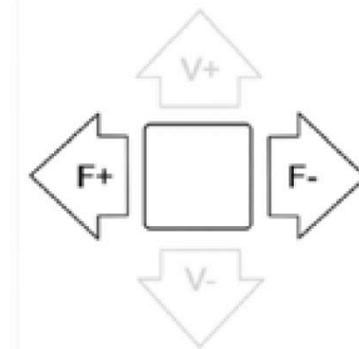
When choosing a starting location for your design, remember that the process will start in the bottom right area of the design. Please leave enough room to the left of and behind the start location to finish your cut.

If you make any adjustments to your cutter, make sure that you return to the main screen before you attempt to cut.

2.



3.



PROBLEM	SOLUTION
The cutter performs erratically during cuts, stops cutting before the cut is finished, or cuts lines that do not appear in the design.	Some computers do not work well when connected via the USB port of the cutters. If you are having problems while cutting and are using the USB cable to connect from your cutter to computer, you may wish to try the serial cable connection to avoid further problems. If a serial cable connection is not available on your computer, you can try a third party USB to serial connector or a PCI card serial adapter for your computer.
After the first cut is made, subsequent cuts are made over the top of the original, or vinyl is fed backwards until it loses contact with the rollers.	After a cut is made, you will need to reset the origin of the cutter. If the origin is not set again, the first origin will remain in the cutter and the cutter will return to this position before making any further cuts. To reset the origin; from the main screen of the cutter, press the Offline/Pause button on and then press the Origin button.
Cuts are jagged or inconsistent.	The Blade may be dulled or damaged. Replace with a new blade and try again. Make sure that the blade can turn freely (by attempting to turn it with your fingers while the release button of the Blade Carriage is pressed). Adjust the blade depth of the Blade Carriage (page 10) and Force setting on the cutter (page 14) until you are getting solid, uniform cuts. Start with a blade depth of around 1/64th of an inch and a pressure setting of 100g and try an increased pressure setting before attempting to increase the blade depth.
Slashes are made across the vinyl from the blade movement during cutting.	If the blade is protruding too far from the Blade Carriage then it can score and cut material during normal operations. If this is occurring, the blade needs to be adjusted so that it is protruding a minimal distance from the carriage.
Vinyl not feeding straight and the right most Pinch Roller will not move.	Sometimes, during shipping or movement of the machine, the right pinch roller will become stuck on a screw located on the back of the machine. If this occurs and is affecting your cutting, press forcefully against the pinch roller until it becomes dislodged from its position. If needed, remove the screw to reposition the pinch roller in the desired position.
Cuts are warped and inconsistent.	Sometimes, during shipping or movement of the machine, the Carriage Arm can be dislodged from its track. Make sure that the 2 white wheels behind the carriage arm are both resting securely on top of (not in front) of the track. If the wheels are not on the track, gently lift the carriage arm and press back until both wheels are resting on the track.

Troubleshooting (Continued)

ISSUE

Cut has dashes or looks perforated.

EXAMPLE



CAUSE

Damaged cutting strip (groove in strip) or too much blade is exposed (friction build up).

SOLUTION

Replace the cutting strip or decrease the blade depth.

ISSUE

Cut line tapers and not cutting towards the end.

EXAMPLE



CAUSE

Dull blade or blade holder isn't secured properly in slot.

SOLUTION

Replace blade, check the blade force, and secure the blade holder.

ISSUE

Blade is skipping turns and corners.

EXAMPLE



CAUSE

Part of the blade is dragging on its side during turns.

SOLUTION

Clean the inside of the blade holder by coating the blade with WD40 and moving it in and out of the blade holder. Clean off any debris that comes out. Replacement blade holder may be needed.

ISSUE

Corners are not cutting correctly.

EXAMPLE

ROUNDED CORNERS CORNERS WITH FLAGS



CAUSE

Offset setting is incorrect.

SOLUTION

Change the offset setting.

