INSTRUCTION MANUAL – J TECH ROTARY TOOL

Version: 1.3

CONTENTS

GENERAL

OVERVIEW

The J Tech Photonics Rotary accessory extends the laser applications to be able to engrave on cylindrical objects like tumblers, cups, glasses, and wine glasses. It can open up a whole new avenue in your hobby or business by custom engraving cups and tumblers.

SAFETY

- Operate rotary accessory with caution when lasering materials.
- Glasses and cups can be reflective. Use proper safety precautions and wear protective glasses.

GETTING STARTED

UNPACKING

Inspect the shipping container for damage.

Verify the contents of the package:

1. Rotary Base
2. Tumbler Anchor Bag
3. Belt Tensioner and Belt Bag
4. Tapered Cup Holder Bag
5. Motor Cable Bag
6. Black Metal Protection Card for Glass Engraving

Tapered Cup Holder

Rotary Base

Tumbler Anchor

Belt Tensioner

ASSEMBLY AND USE

The belt tensioner and belt need to be installed, but the tumbler anchor is only required when you engrave on non-uniform objects like stainless steel tumblers. Here is how to assemble the unit.

1. Put the belt on the idler pullies.

2. Put the screws and nuts to hold the belt tensioner in place.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022
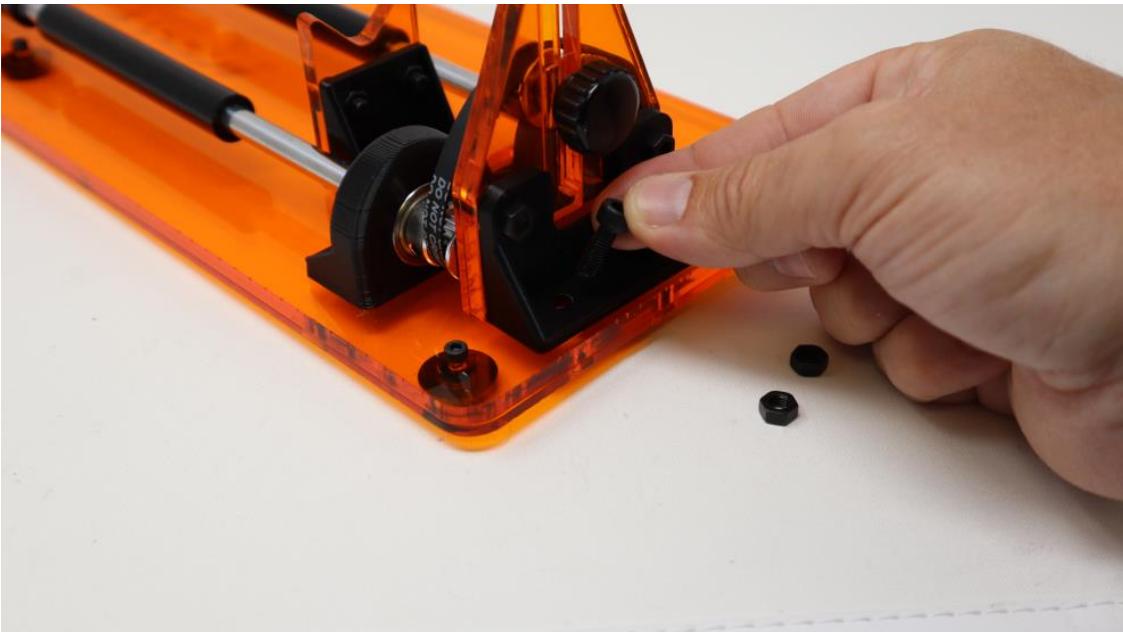
Place the nuts on the back.

Hold the back and tighten the screws in place.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022

Copyright 2022

3. Tighten the belt by lifting it up and then tightening the thumb screw to hold it in place.
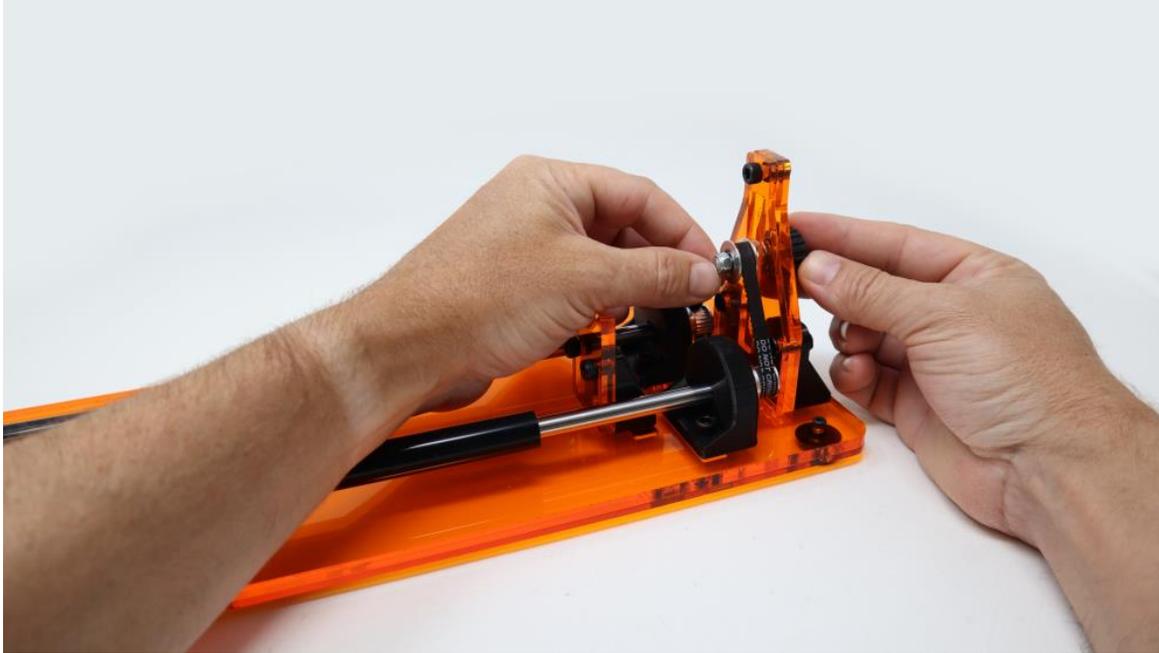
TUMBLER ANCHOR ASSEMBLY

1. Place double t slot backer on the bottom.

J Tech Photonics, Inc. | www.jtechphotonics.com

2. While holding onto the t slot, put the anchor assembly in the front with the screws in it.

3. Tighten it in place.

J Tech Photonics, Inc. | www.jtechphotonics.com
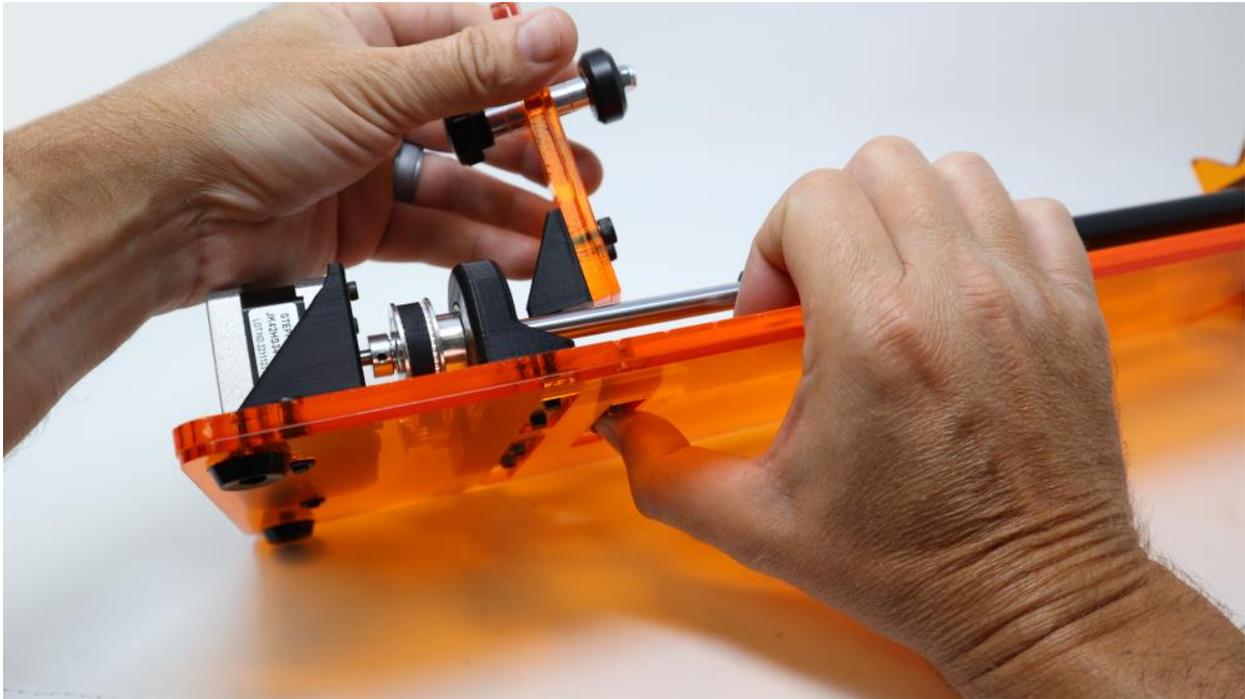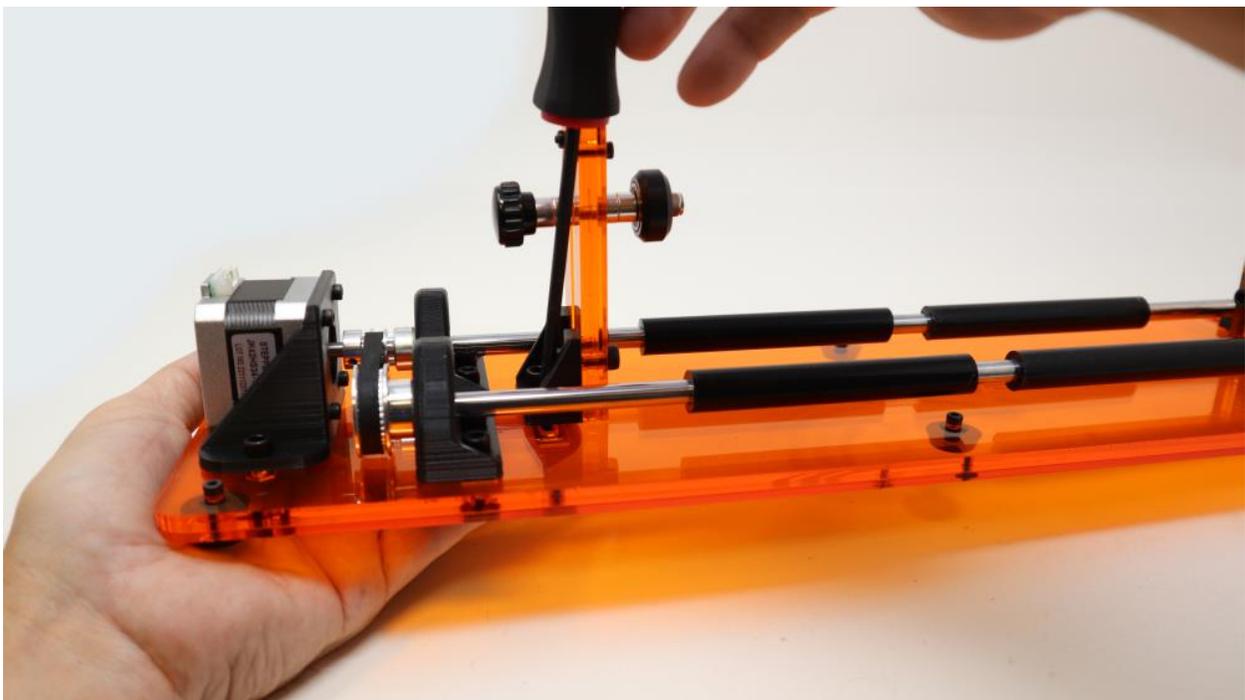
To use the tumbler anchor, place the cup on the rods and adjust the distance between the rods, if required. Loosen the thumb screw and push the wheel down to the bottom edge of the tumbler and then tighten it again.

August 18th, 2022   Copyright 2022

ADJUSTING THE RODS

The rotary is designed to be able to be used with various sizes of cups and tumblers. You can easily adjust the distance between the two rods to accommodate larger cups.

Loosen the screws on both sides to be able to move the rod.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022

Copyright 2022
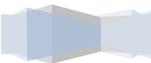
Loosen the belt tensioner.

Move the rod to the desired distance.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022

Tighten the screws on both sides to lock it in place.
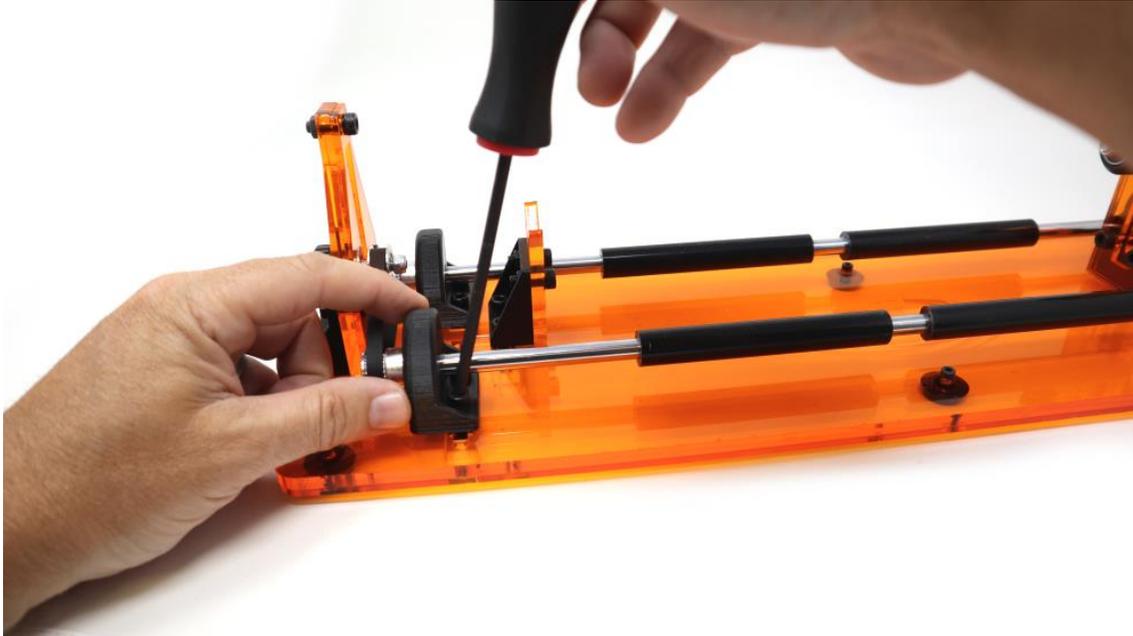
Tighten the belt to finish the process.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022
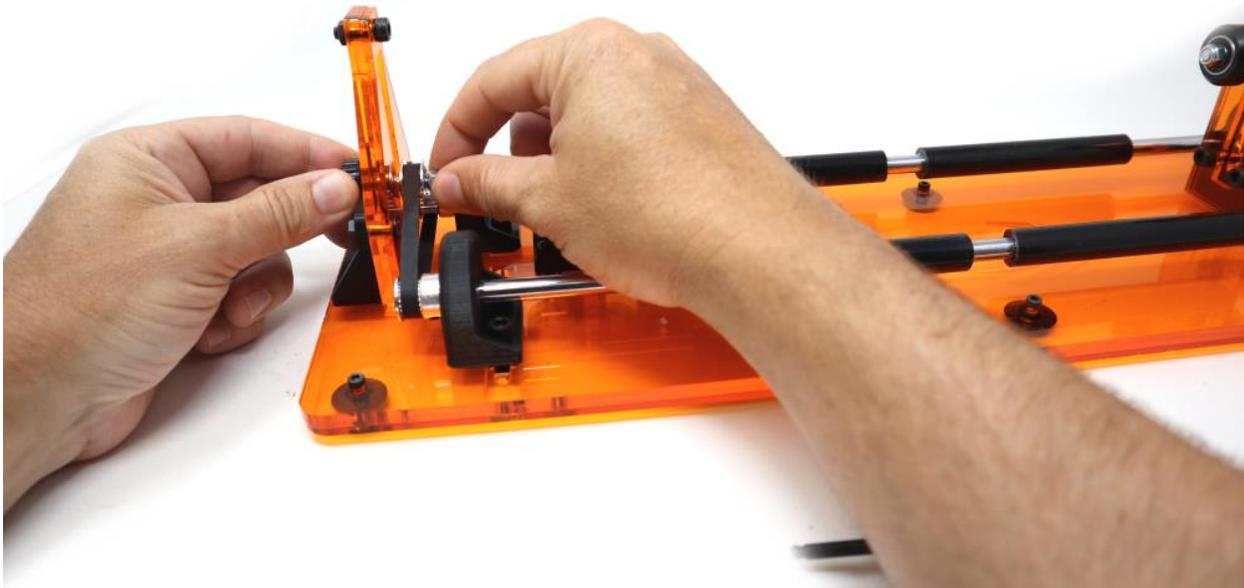
EXAMPLE CUPS YOU CAN USE

There are a lot of cups and containers you can engrave on. The easiest will be flat cylindrical ones.

GLASS ENGRAVING

The rotary can engrave on glass, but it needs a coating to be able to. Since the laser is in the visible wavelength, light will travel right through anything clear. To be able to engrave on clear objects, you will need to put an opaque dark coating on the top where you want to engrave. We like to use a large sharpie marker to coat the area where we want to engrave. After using the laser to engrave, then you can wipe away the rest of the coating with isopropyl alcohol and a towel.

In the kit is included a black metal card to put underneath glass objects when engraving them.
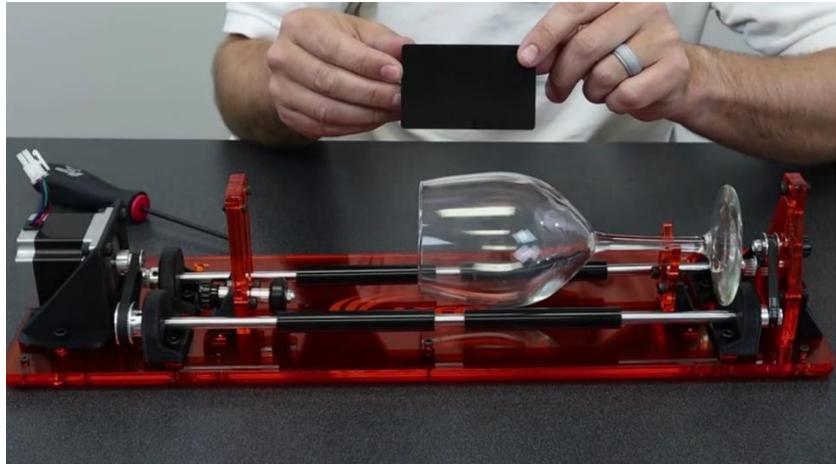
Mark the glass area with the permanent marker.
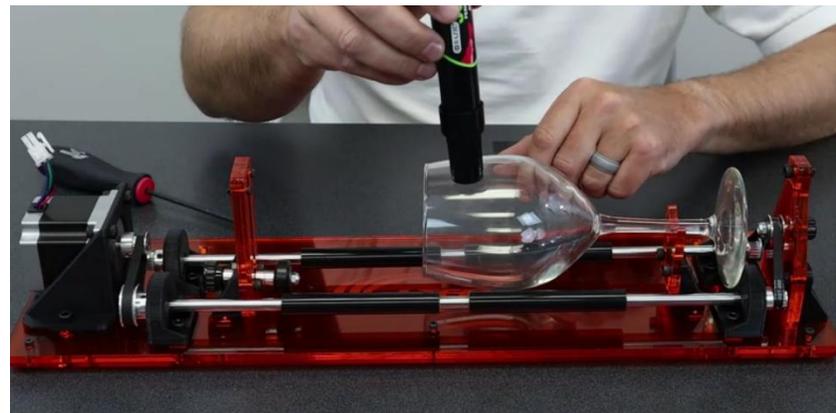
Place the metal card under the glass and then engrave.

Cylindrical

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022

ENGRAVING TAPERED CUPS

Many tumblers and cups are not flat. In this case, you can't put them on the roller and expect it to roll perfectly so you need to hold one end of the cup up on an additional roller to allow perfect rotation. This is where the tapered cup holder comes in.

The tapered cup holder fits on the side of the roller assembly and allows the back of the cup to be lifted on its own rollers.

For example, a constant tapered cup would be set up like in the following pictures.

The back of the cup is supported by the tapered cup holder and the other side is pushed up against the tumbler holder to make sure it doesn't move forward when rolling.

Lay the back of the cup on the holder and adjust the height so the top of the cup is level.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022

For large YETI and RTIC tumblers, you can use the tapered cup holder to lift the smaller bottom part of the cup up.

Push the top of the cup into the tumbler anchor so it doesn't move forward. No need to put the wheel inside the cup.

Adjust the back of the cup with the tapered cup holder to allow the side of the cup to be level.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022
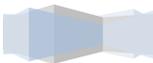
MACHINE INSTALLATION

PRO SERIES MACHINE

For the PRO Series laser machine, we will be taking the Y and A motor cables off the GRBL board and installing the rotary motor cable in the Y plug. Here are the instructions for doing this.

1. Turn the machine off.
2. Place the risers (if needed) to raise the machine up. These pictures show the front and the back.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022
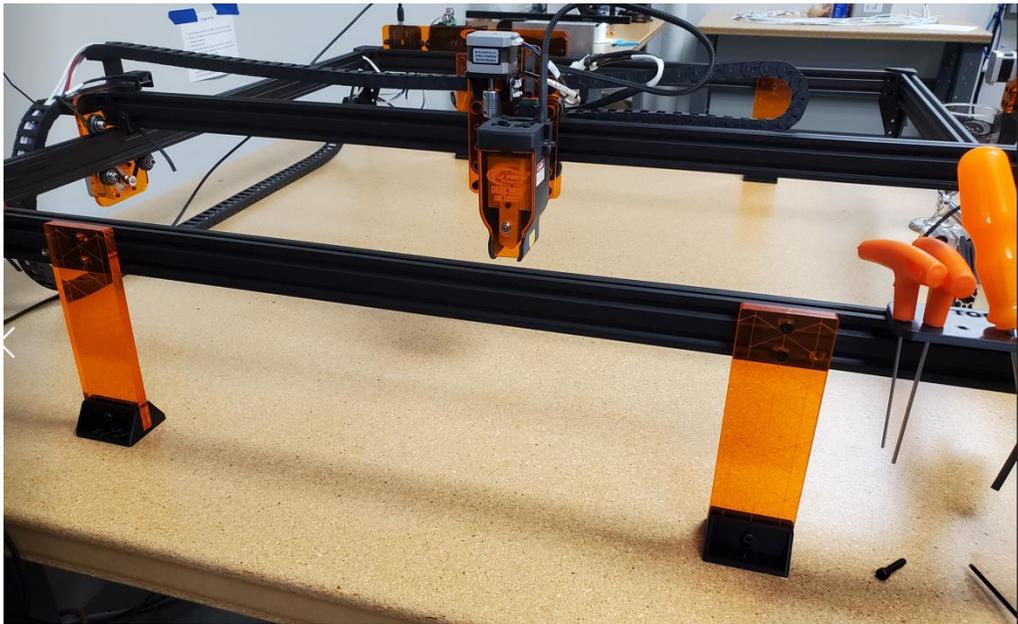
3. Place the rotary on the machine bed with the motor to the left side looking from the front of the machine.
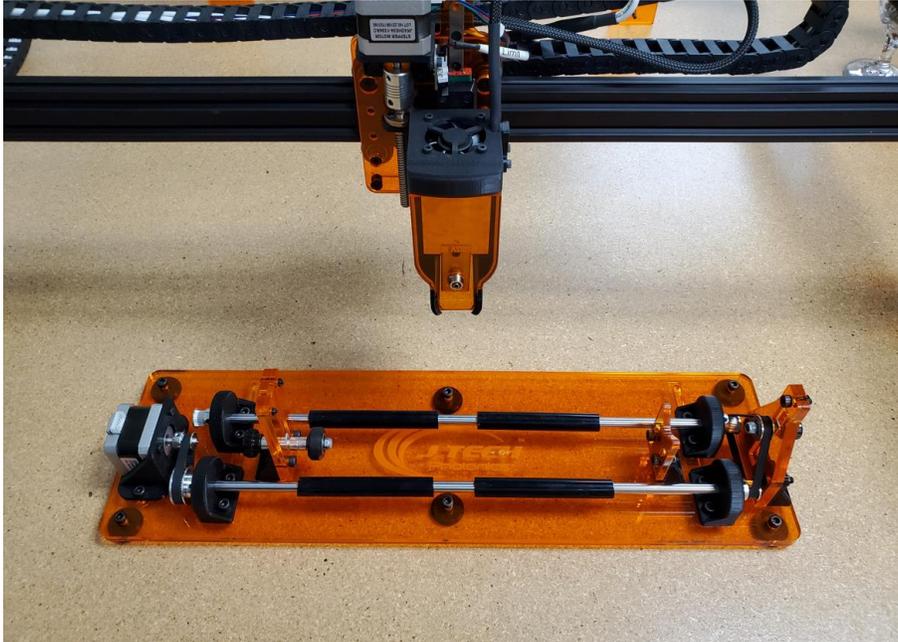
4. Take the Y and the A cables off the GRBL board.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022

5. Put the rotary cable in the Y position.
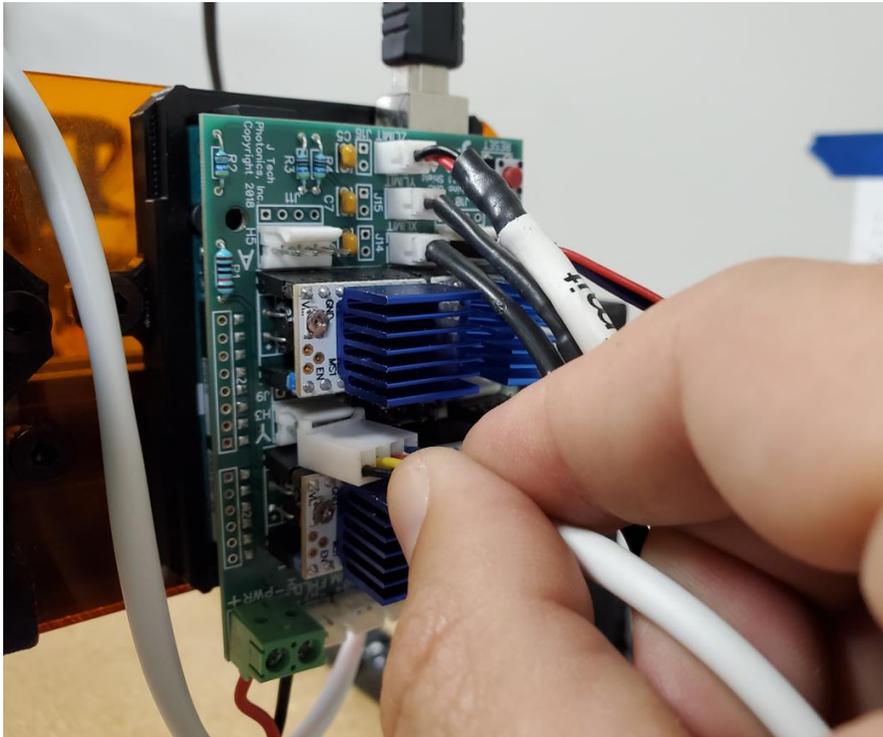
6. Plug the motor cable into the stepper motor on the rotary.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022
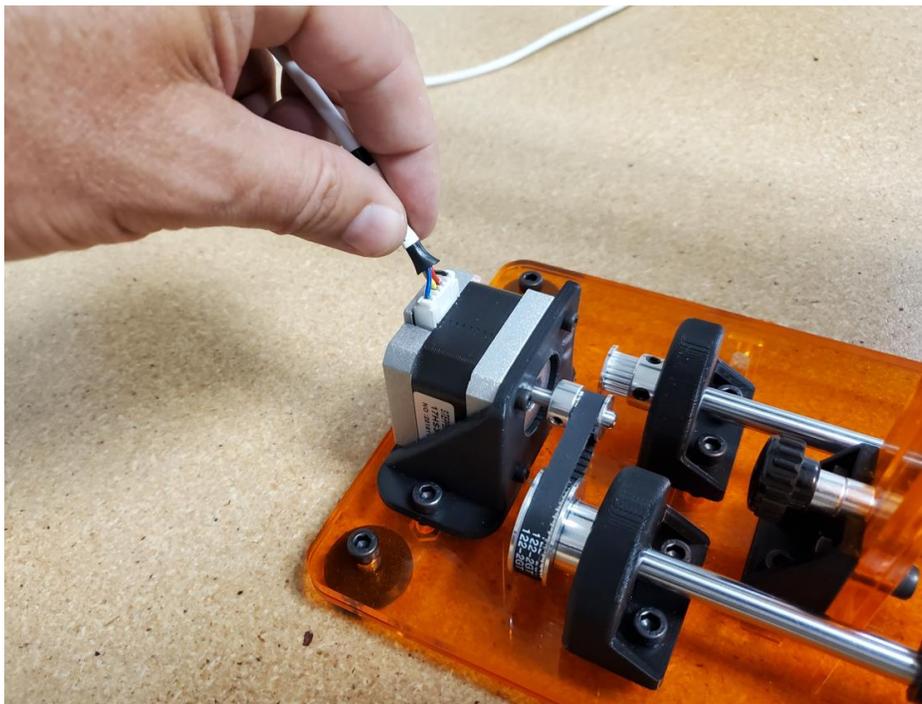
7. Square the rotary to the x axis. We used a scrap board to line it up.
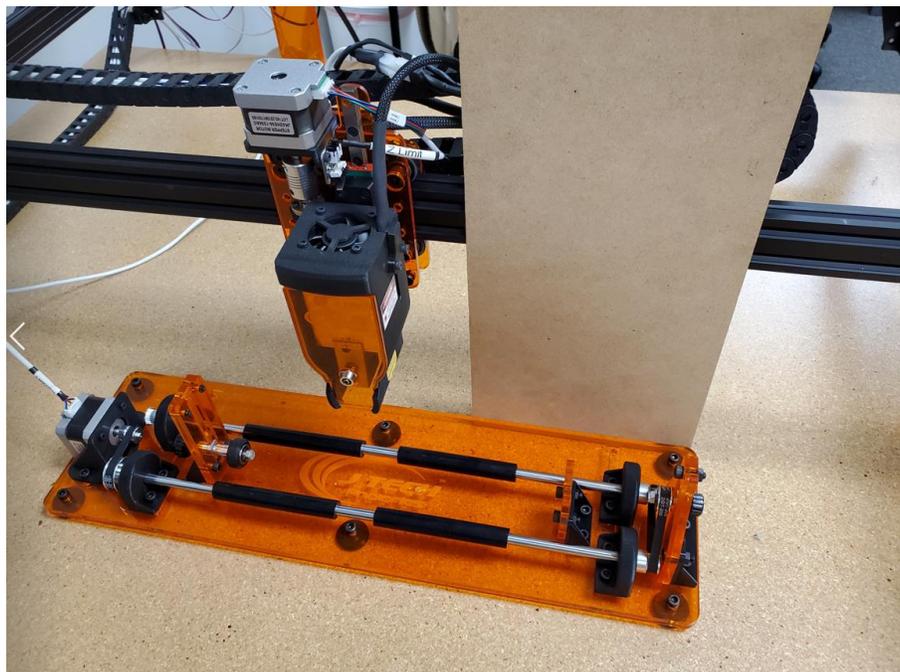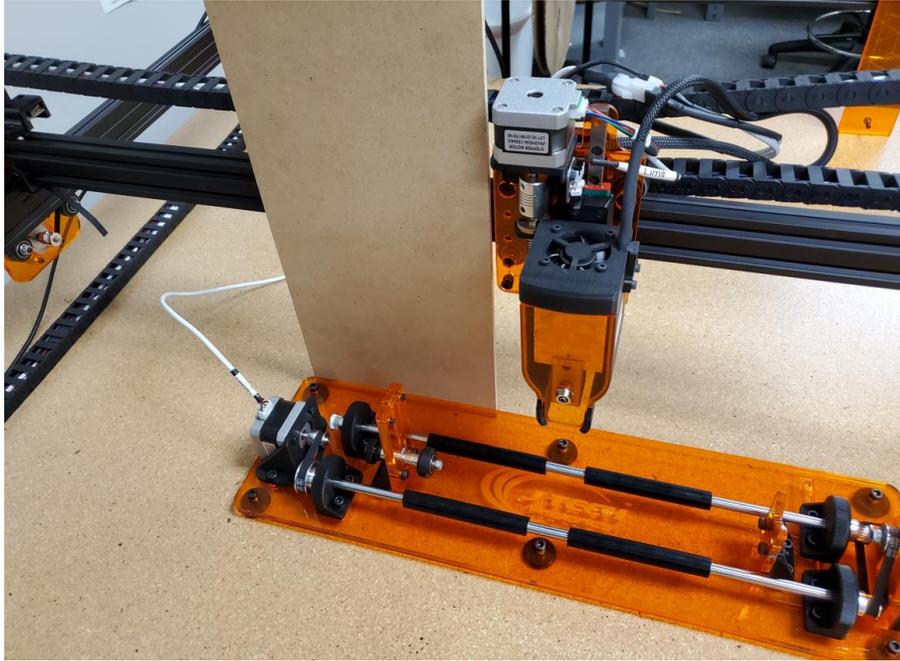
8. You can now turn the machine on and use the rotary.

J Tech Photonics, Inc. | www.jtechphotonics.com

ONEFINITY

The Onefinity machine is great for a rotary tool. It has a tall enough Z axis to accommodate the rotary and large cups. Here is how to hook it up.

Remove the two bottom screws on the mount and move the two-piece mount up as high as it can go. If you don't have the two-piece mount, it is available in the magnetic mounting kits section at the J Tech Photonics website.

Unplug the right side Y axis cable from the machine.

J Tech Photonics, Inc. | www.jtechphotonics.com
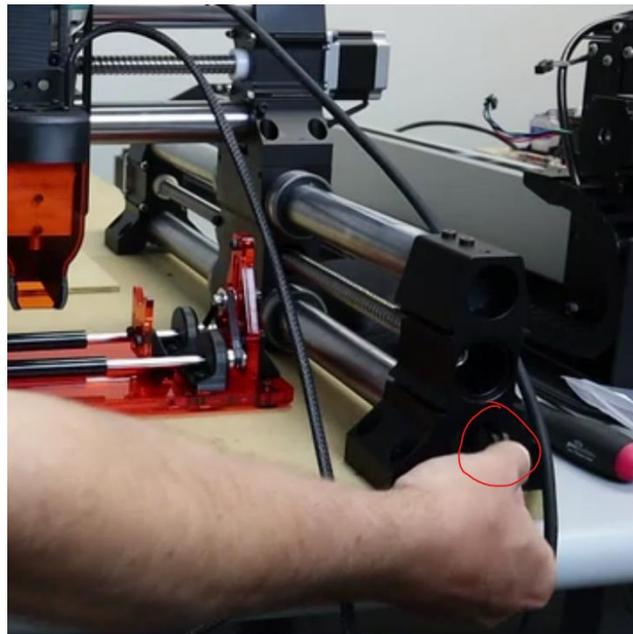
Unplug the Y motor cable in position "M2" and put the rotary cable in it's place.

Plug the motor end of the rotary cable into the rotary.
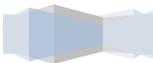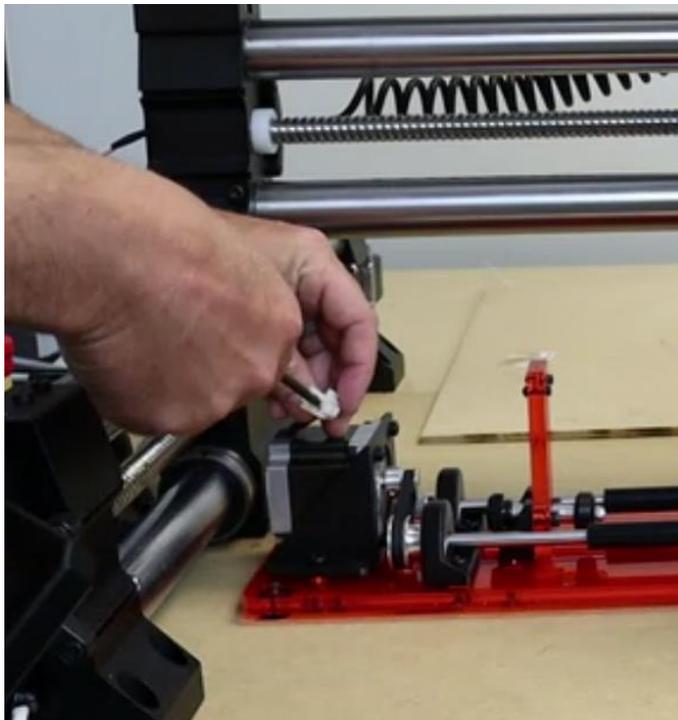
SHAPEOKO 4 AND SHAPEOKO PRO MACHINES

The Shapoko4 and PRO machines can have the rotary in a couple of configurations. If you have the front mount, you can place the rotary in front of the machine off the table to get more z clearance for larger cups. If you don't have the front mount or don't have a big enough table, then you can use the provided side mount for the laser that will raise the laser up to able to fit larger cups.

If you don't have the front mount, you can install the side mount for the laser. There are two screws to mount it on the router holder on the left side.

Depending on where you have your router placed, you may need to lift it up to make room for the rotary.

Connect the rotary cable to the rotary motor.
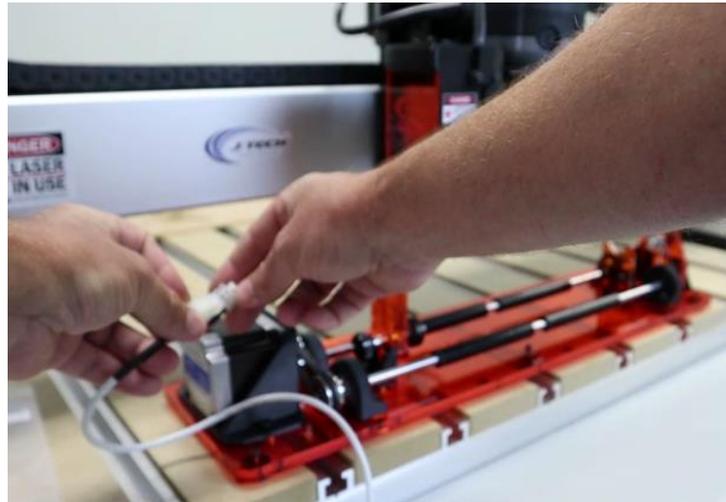
Unplug the Y Right cable and plug in the rotary to it. You can look at the motor on the right side and trace the wires to the Y right connector.

Find the "Y L" connector (Y Left) and unplug it.

SHAPEOKO3

The Shapeoko3 machine is great for the rotary, but the z axis will need a bit more room to do larger cups. The kit includes a new mount that will be placed in the normal holder.

Remove the old mount and replace it with the new smaller mount. Note the placement of the holes. They will be placed so they are on the top of the mount.

Connect the motor cable for the rotary into the rotary motor.

August 18th, 2022   Copyright 2022
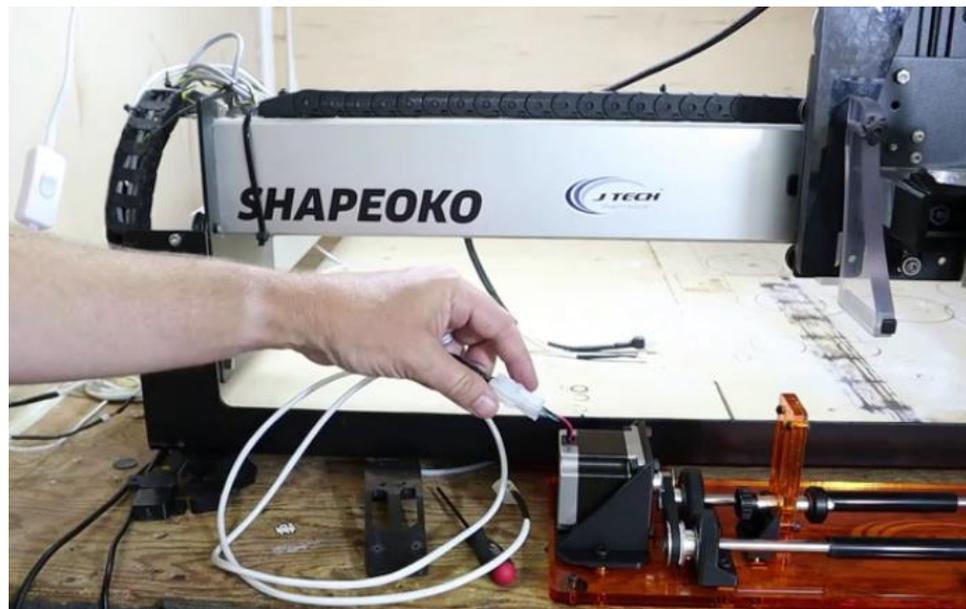
Unplug the Y1 motor cable on the back of the machine and plug in the rotary cable into it.
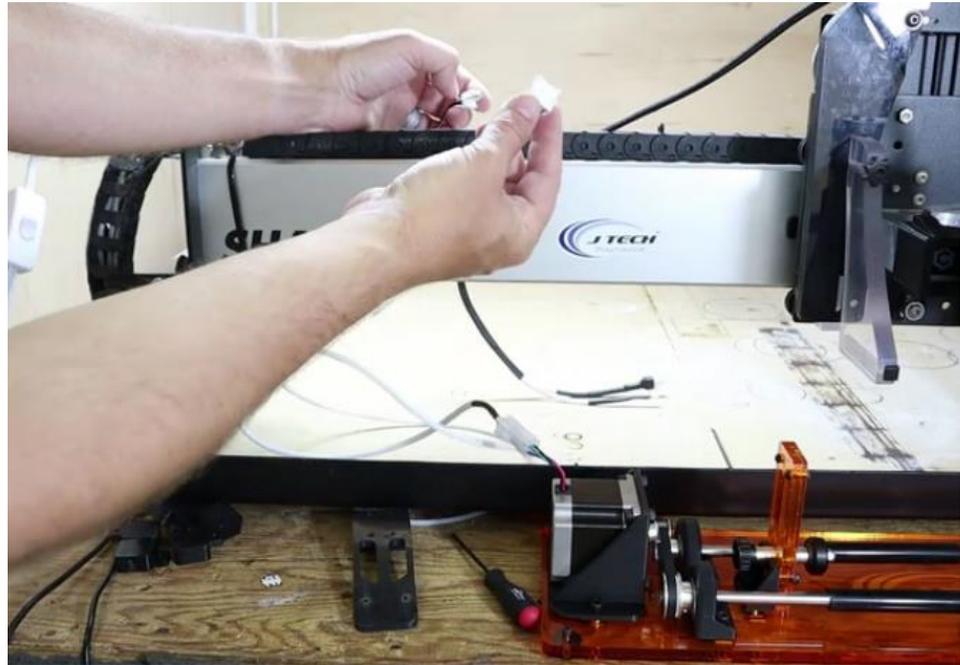
In the center back of the machine you can see the Y2 connector. Unplug this cable when you use the rotary.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022

X CARVE MACHINE

The newest version of the x carve already includes the risers and the dual linear rail z stage with added height, so you won't need to do anything with the machine to get it working. If your machine is an older machine without the risers, then you will need to get the upgrade kit from Inventables for the new z axis and risers before you can use the rotary tool.

If you have the newest version, then you can adjust your front mount on the router holder up if you need more room. You can also move the mount to the higher screws if you need even more room. The z axis has a lot of height, so you might not need to adjust anything.
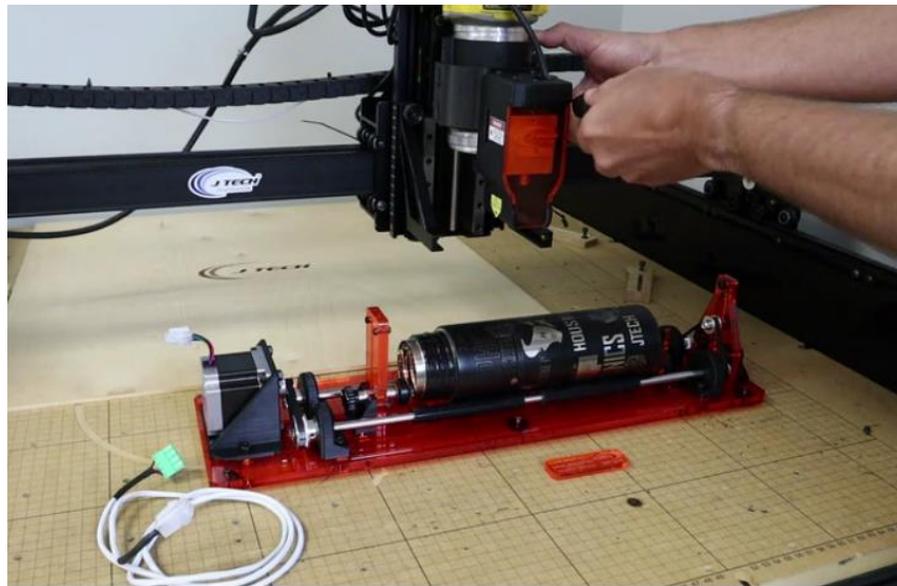
Plug in the rotary connector to the rotary motor.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022
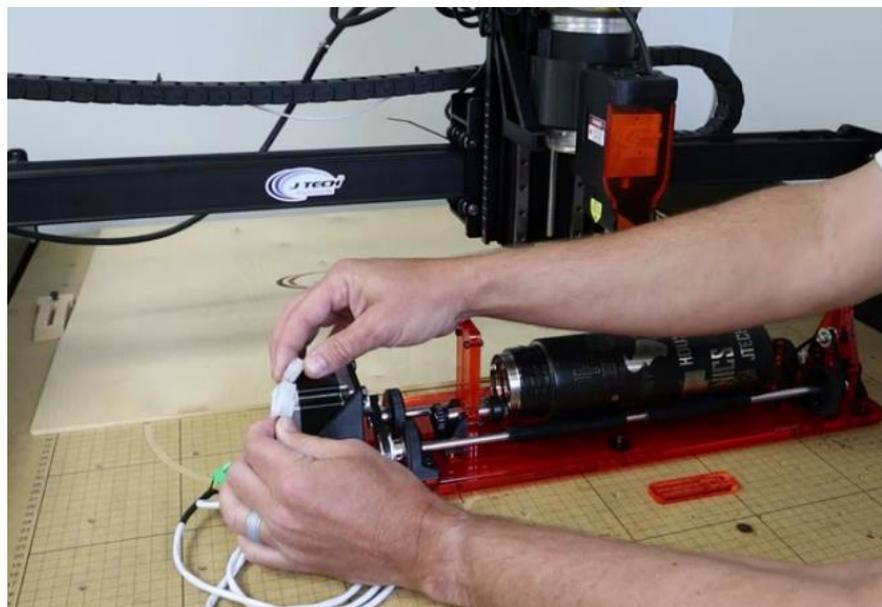
Remove the Y2 connector from the back of the X Controller.

Remove the Y1 connector and replace it with the rotary connector.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022
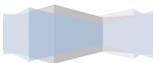
OPENBUILDS MACHINES

There are many configurations for openbuilds machines, but this will cover most of them that use the BlackBox controller.

If you have the extended Z axis, then you might have enough travel in your z axis to accommodate larger cups under your laser using the standard mount. If you don't, then we have included another mount that will raise the laser up to allow for more room. You might need to also move the router out of the way as well when using this mount.

The mount is upside down from the original J Tech mount, so put the mount on the router holder like the picture.
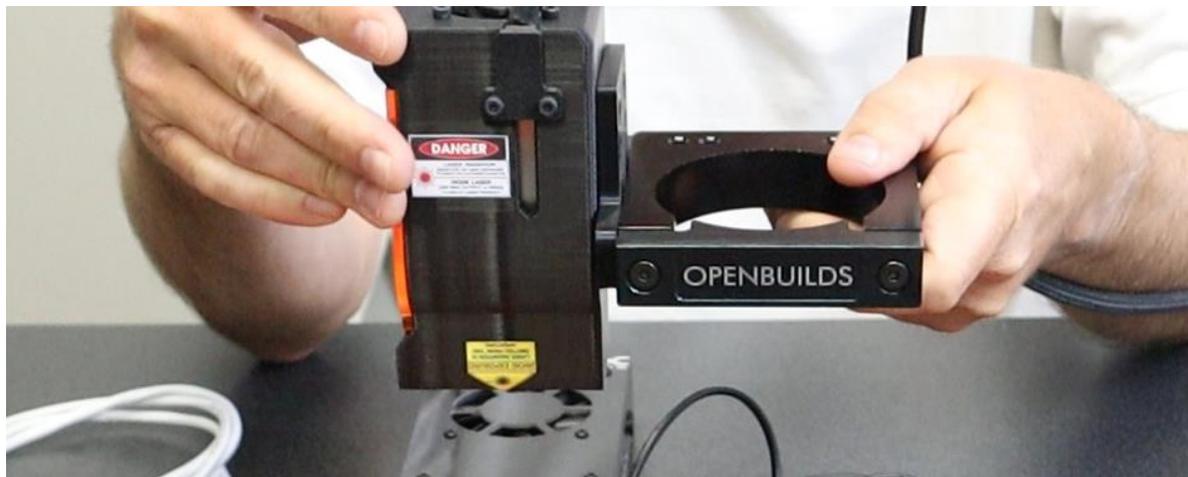
This will allow a lot of room under the laser for engraving large objects.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022

To attach the cable, first start with attaching the cable to the rotary.
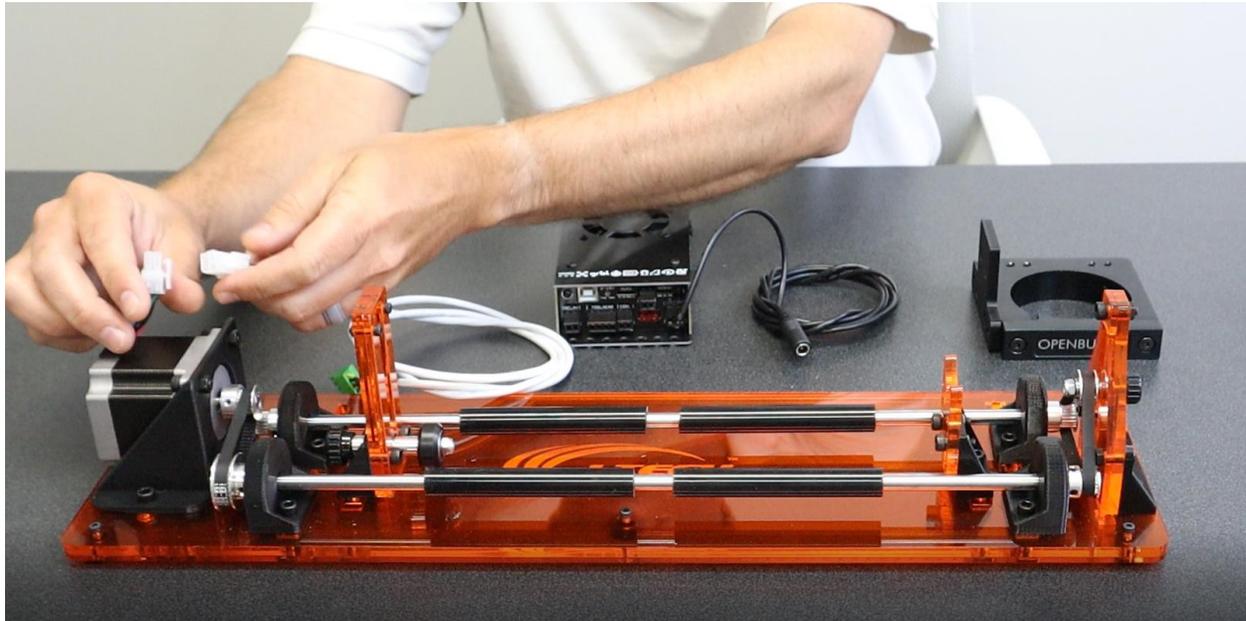
Attach the other side by removing the Y axis connector and replacing it with the rotary connector.

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022
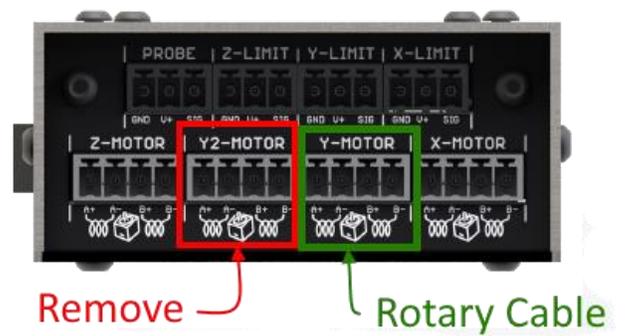
LIGHTBURN CONFIGURATION

In order to use the rotary, we must first configure LightBurn and the machine. We need to save the current machine configuration and then make a new one for the rotary. When you are done with the rotary, you will then put back the original machine configuration file.

1. Access the machine setting menu (Edit – Machine Settings)
    Before making any changes save the current settings by pressing the save button at the bottom of the window. Save the current settings using file name "default machine settings".

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022
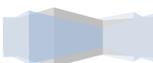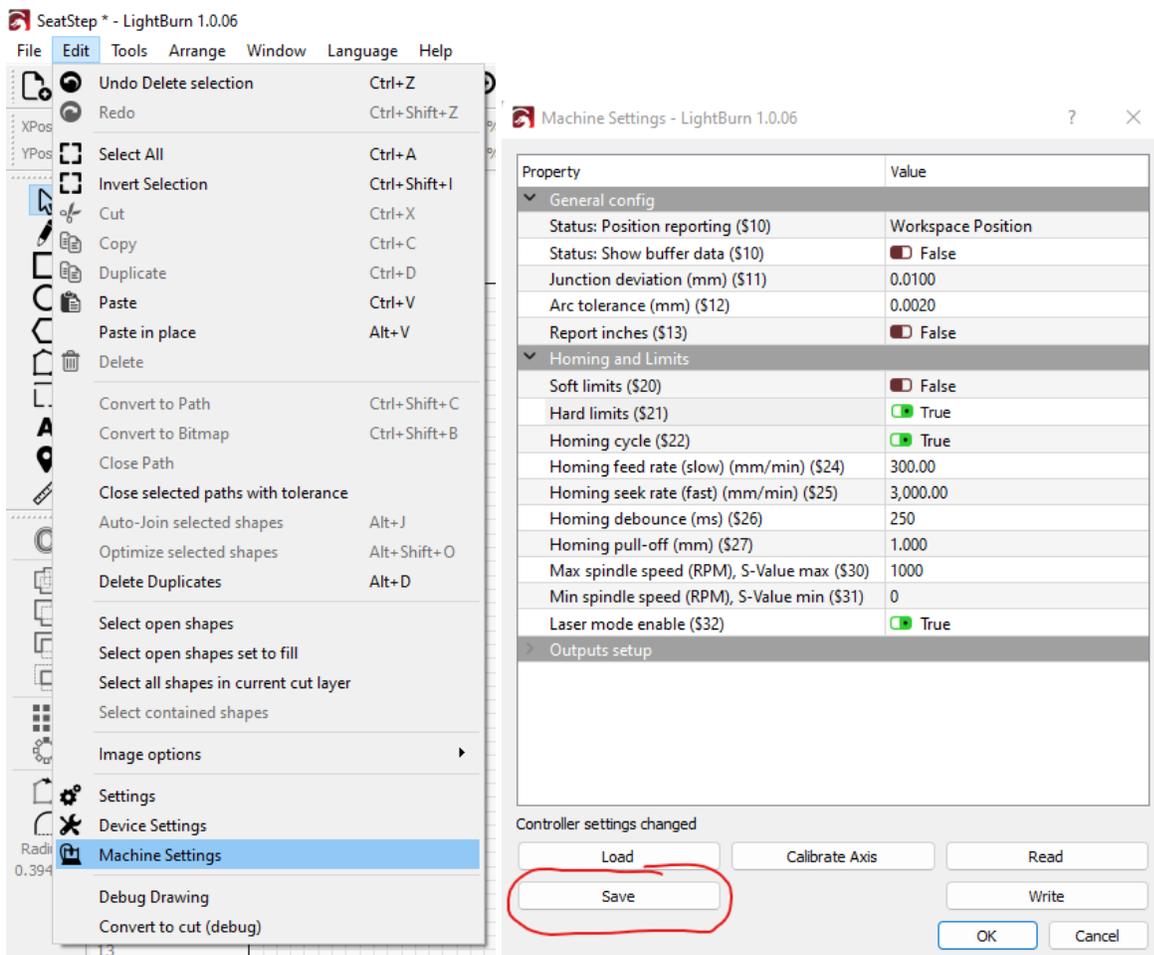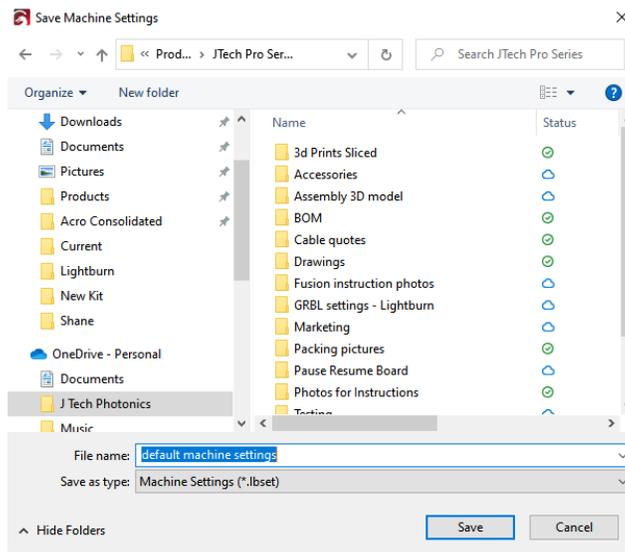
2. Check the following settings to ensure that they are off. Press the "write" button to send the new configuration to the machine.

-Soft limits – OFF

-Hard limits – OFF

-Homing Cycle – OFF
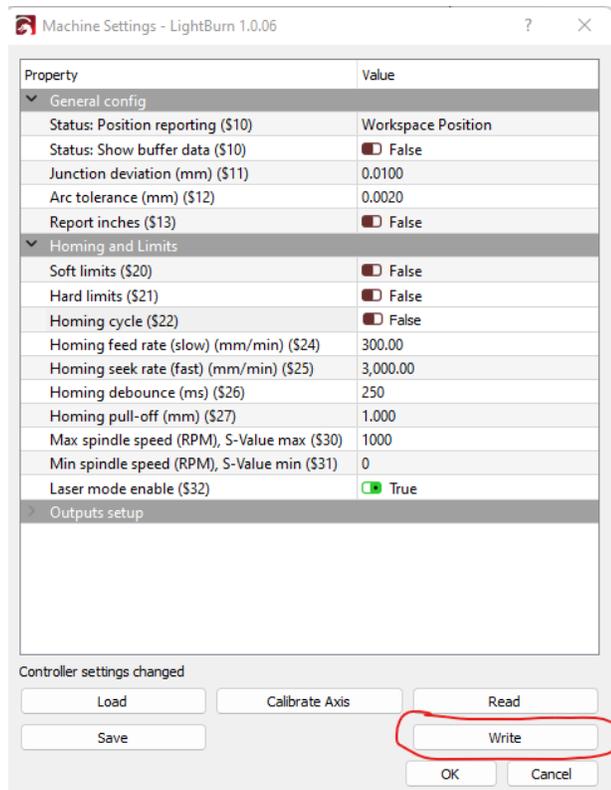
LIGHTBURN ROTARY SETUP

Select the [icon] icon from the top row of buttons or navigate to rotary setup through the menus (Tools – Rotary setup)
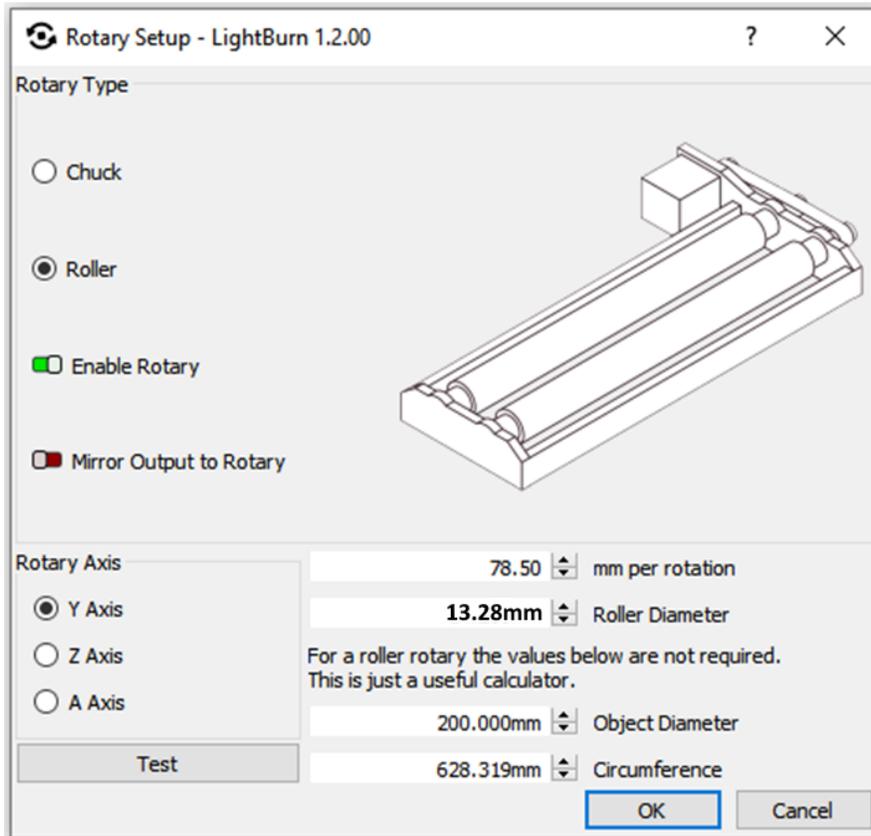
- Rotary Type – Roller
- Enable rotary – ON
- Mirror output to rotary – OFF
- Rotary Axis – Y
- Roller Diameter – 13.28mm / 0.523in

MM per rotation numbers:

PRO Series Machine = 78.5
Shapeoko3, Shapeoko4, Shapeoko PRO, X Carve = 100
Onefinity = 20
Openbuilds = 4000 / Steps per mm (Look in the LightBurn machine settings to find your Y steps per mm)
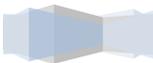
CALCULATING MM PER ROTATION

If you don't know the mm per rotation, then you can find it by setting up a test on the rotary. Here is how to find the number.

1. Place tape on one of the rods to mark the position.
2. Use a wire to mark the position off the rotary.
3. Press the test button to rotate the device the distance in the mm per rotation.
4. Change the mm per rotation until you get exactly one rotation.
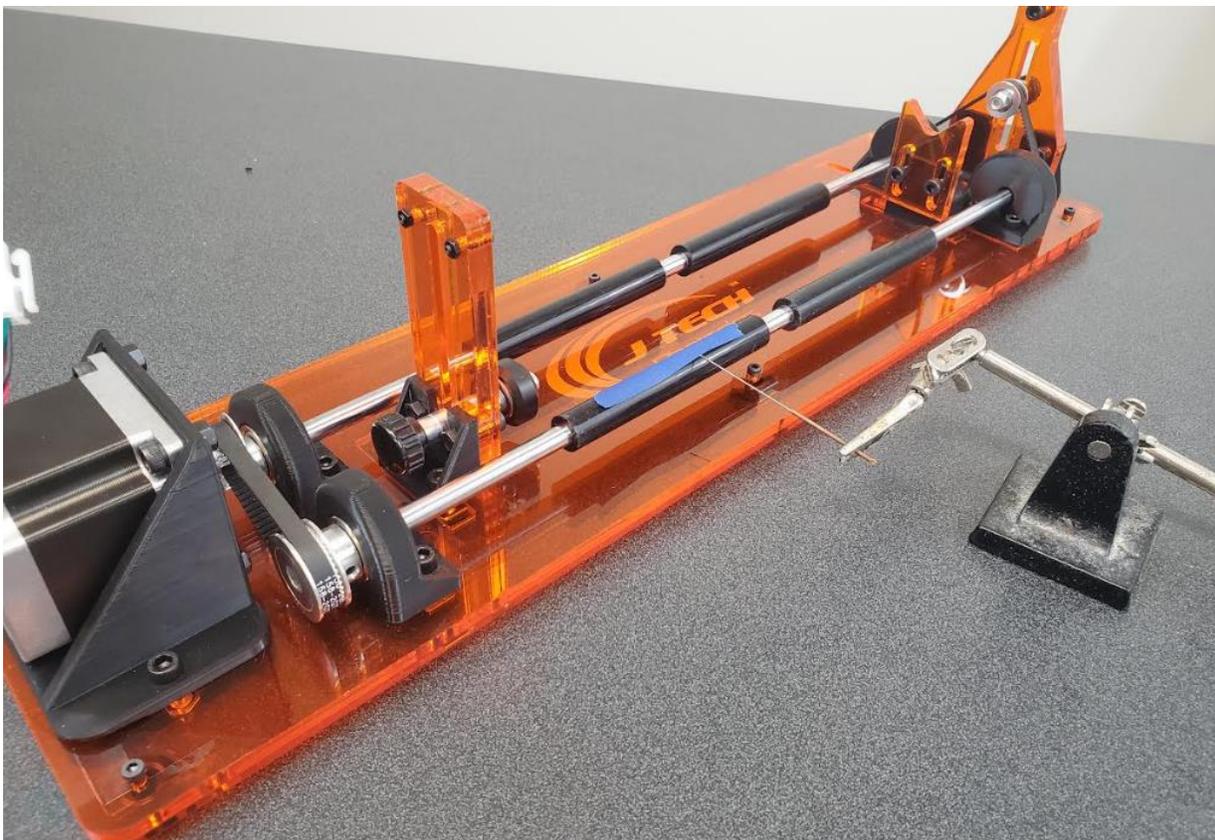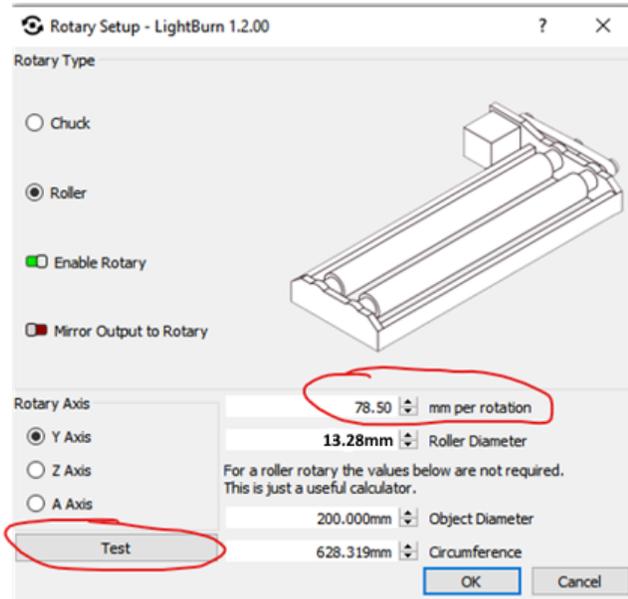
To find a more refined number you can then use a known diameter that is larger than the rod to see if your number is correct.

5. Use a known diameter object and place it on the rotary.
6. Mark a line with tape or a marker on the object.
7. Use something to judge where the mark is located off the rotary. We use a small wire to be able to tell when the tape goes by.
8. Jog the Y axis the circumference and see if it moves exactly one rotation. Change the mm per rotation until it is exact.

For example, we used a 3D printer roll to check.
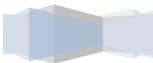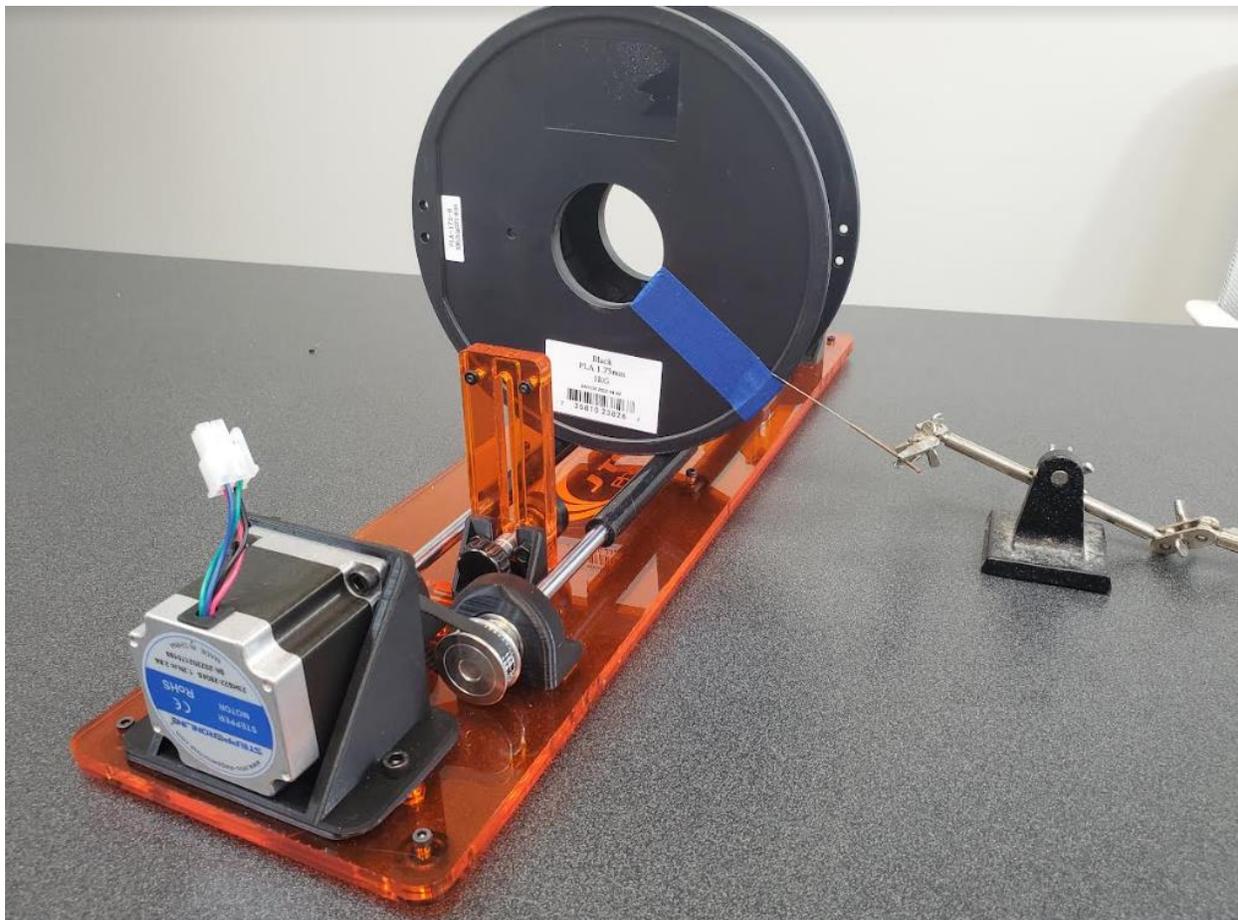
SETTING UP YOUR FIRST FILE

This section outlines the process for setting up your file to engrave on your rotary. Here is the process:

1. Measure the diameter in inches of the object you want to laser.

2. Input that number into the object diameter space under tools-rotary

3. Use the circumference that Lightburn outputs

4. Measure the vertical area of the object

5. Draw a rectangle using the rectangle tool with the circumference as the height dimension and the vertical space on the object as the width

6.   This is now the perimeter of your workspace on your object.

Example: 4in diameter Yeti cup with 3in of laserable space

Enter the diameter of the cup in the rotary setup tab

The circumference of the cup is shown as 12.5664in

Make the rectangle with width of the laserable space 3.00 inches

Make the height of the rectangle 12.5664

J Tech Photonics, Inc. | www.jtechphotonics.com

August 18th, 2022   Copyright 2022
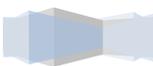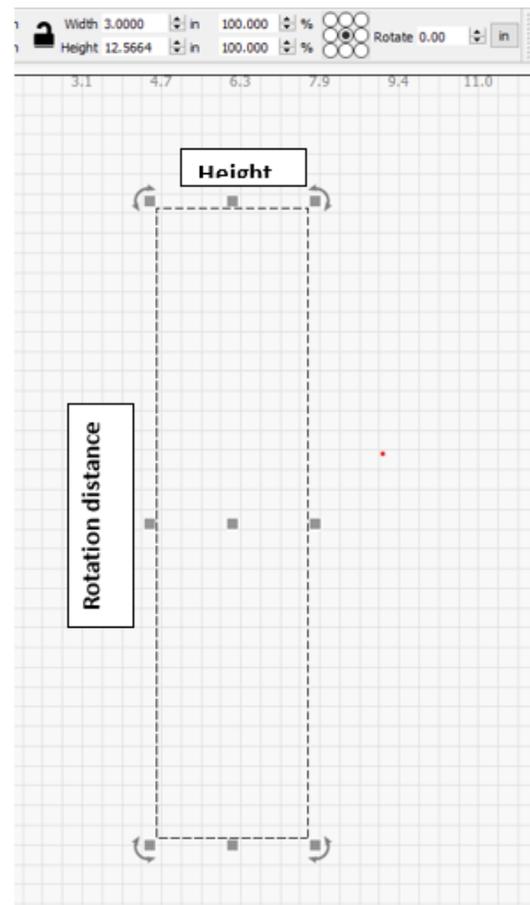
Turn OFF the output of the rectangle

Rotate the file want to laser on the cup 90 degrees counterclockwise

-Select the file

> -Press the comma key once or Arrange – Rotate 90 degrees counterclockwise

Place the file you want to laser in the center of the rectangle

Set the job origin to center

Start from current position

Jog to the position you want to start on the cup/tumbler and then press frame to make sure it is correct and then start your program.

Cuts / Layers

#	Layer	Mode	Spd/Pwr	Output	Show	Air
C02	00	Line	100.0 / 0.0			
C01	01	Fill	80.0 / 15.0			

Layer Color	Speed (in/m)	80
Pass Count	1	Power Max (%)	15.00
Interval (in)	0.0039	Power Min (%)	15.00
	Material (in)	0.000

Console | Move | Cuts / Layers | Shape Properties

Laser

Ready (Mirror output)

❚❚ Pause | ■ Stop | ▶ Start

Frame | Frame | Save GCode | Run GCode

Home | Go to Origin | Start From: Current Position

Enable Rotary

Cut Selected Graphics | Job Origin

Use Selection Origin | Show Last Position

Optimize Cut Path | Optimization Settings

Devices | COM10 | J Tech Pro Series