REVOLUTION

Rotating Axis CNC Router

Getting Started

Revolution Axis Wrapping

The Revolution from BobsCNC is a rotary axis CNC designed to work with Grbl firmware. Since Grbl only works with three Axes (X, Y, and Z) the Y Axis is converted to an A Axis. Think of a 2D project drawing laid out with the X Axis on the long side.

Now imagine taking the drawing a wrapping it around a cylinder. The top and bottom of the drawing which represent the Y Axis are transformed into the A Axis by the rotation of the drawing.

Machine Orientation:
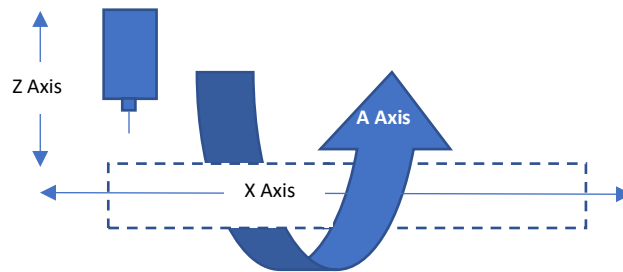
The bit travels across the length of the work piece on the X axis, and the bit travels up and down the Z axis while the workpiece rotates around the A Axis. Because the Y Axis has been converted into an A Axis, the motion is no longer linear along the Y Axis. But, the motion is now rotational around the centerline that passes through the center work piece and is now the A axis. As a result, the Revolution only uses two home switches, one on the Z axis the other on the X axis. The A axis will be manually set.

Also, note that the first 2.25" of the workpiece is not in the cutting range. This was done so that the spindle has clearance in the Z axis in its lower positions. A spacer can be added if you need to get to the edge of the workpiece.

Using UGS until new version is complete.

Please note while the current version of UGS will work with the Revolution, the DRO (digital read out) does not include the A Axis gcode or jogging functions for the A axis. Will Winder, the lead developer for UGS, is working on an update. We will post it as soon as it is ready.

Until then must make sure your UGS is set in millimeters so that the degrees of the A axis are correct.

Before attempting to jog the A Axis, it may be useful macros to Jog and Zero the A axis. Here is a list of macros you may want to enter into the UGS software. These will aid in jogging (1,10, and 100 degrees at 500mm per minute as well as setting the zero for the A axis)
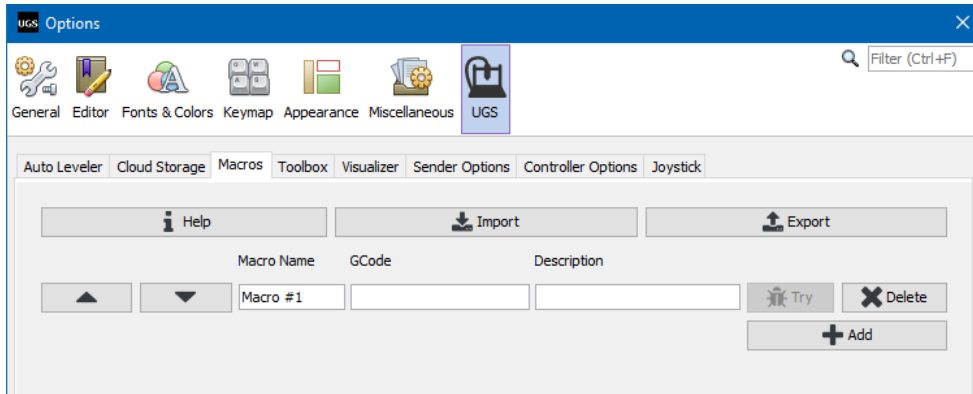
```
A+1:              $J=G21G91A1F500

A- 1:             $J=G21G91A-1F500

A+10:             $J=G21G91A10F500

A- 10:            $J=G21G91A-10F500

A+100:            $J=G21G91A100F500

A- 100:           $J=G21G91A-100F500

Zero A:           G10 P0 L20 A0
```

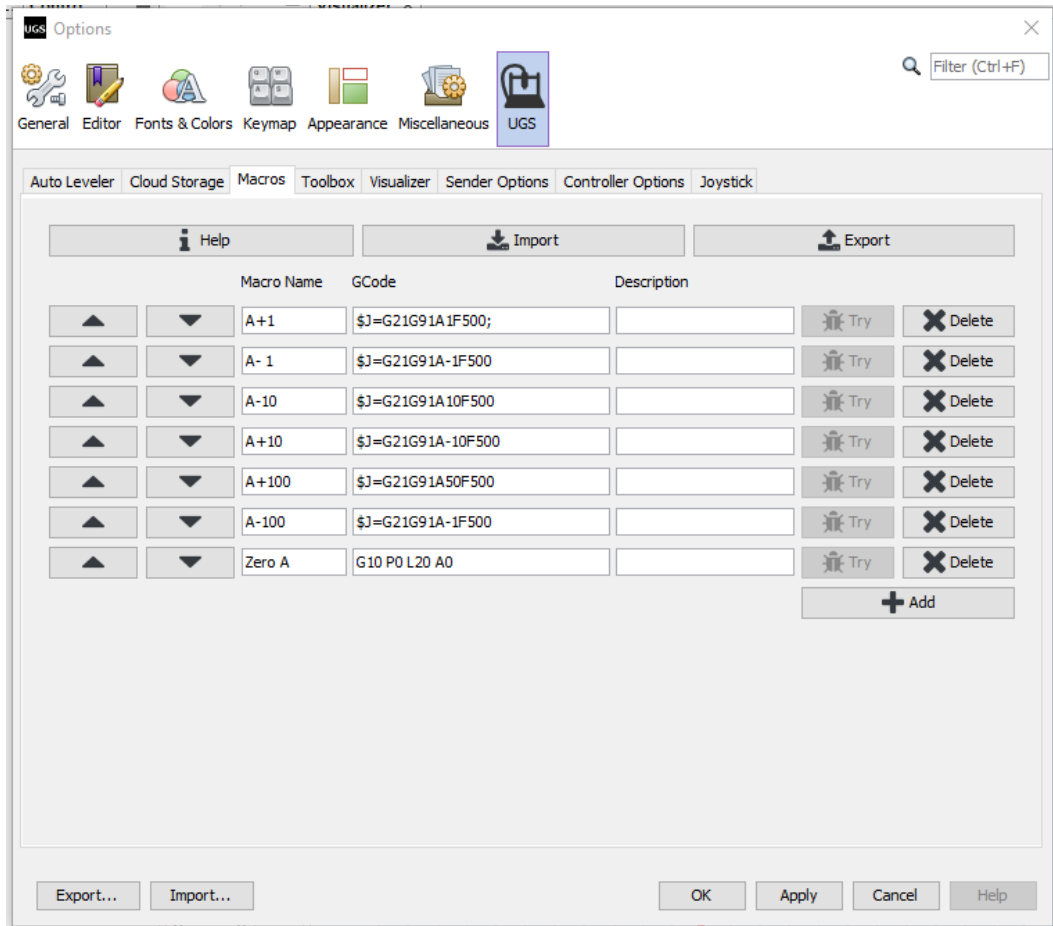## Steps to load the macros into UGS.

**Step 1**   Open UGS and Click the Tool Tab and select Options.
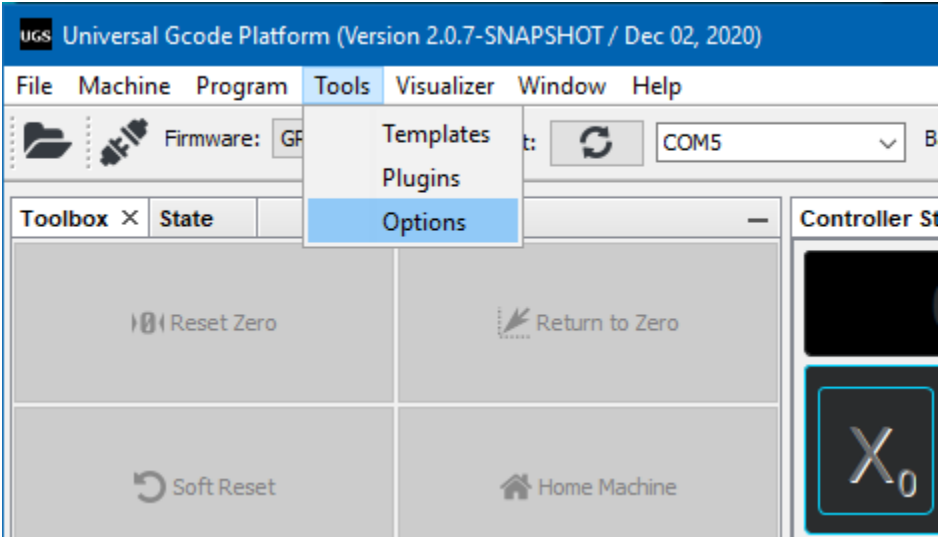
Step 2   When Options opens, Click the UGS icon, and select the Macros Tab.

Step 3 Refer to the macros listed above and enter the Name (i.e., A+1, A-1, etc.) under Macro Name. Then copy and paste the macro in the Gcode box. See illustration below.

Hit **APPLY** and then select **OK** to exit the window. You will notice that in the Macros screen that the macros you added are now available.
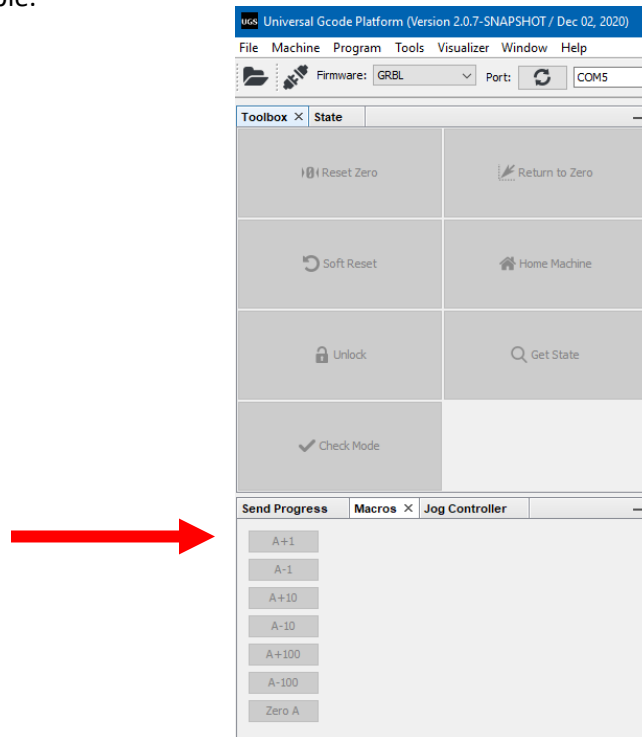
CAM Software setup

To use the Revolution CNC router with Vetric software, you need to install the post processor. This post processor can be found here:

[Revolution Manuals and Documentation – BobsCNC](#)

To use wrapper software like Gcode Ripper, you need to make sure your gcode is the correct size in Y as the circumference of the workpiece you have. To calculate this, multiply the diameter times Pi (3.14159). This will be the Y height. Some wrappers will calculate this for you.

Project setup

Vectric software recommends that the Zero point be calculated from the center of the work piece. This measurement is from the tip of the bit to the point of the Live Center.

There are gauges that will allow you to set you Z height to the center. These gauges are 50.8mm from the live center when placed on the live center. Once you jog the bit to touch the gauge as shown, you will want to set the Z to 50.8 mm (not zero) if your project is defined as zero at the center line.

 UGS will need to be set in mm until the new version is out.

If Z-Zero is defined in the gcode file on the surface of the workpiece, then you will zero the bit at the surface.

PLEASE NOTE: the A axis does not home. Once the CNC is homed, you will jog the workpiece to the desired rotation, note the degrees on the dial indicator, then set the zero for the A axis in UGS. Next jog and zero the X and Z axes.

For example, in the photo below the Y Zero point would be 141°.
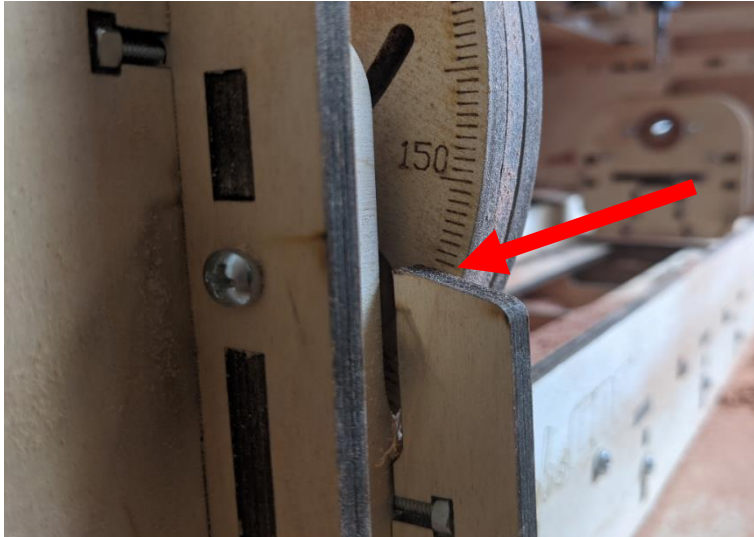
Once you set the Z and the A axes, you will want to zero the X axis.

From here, you can open your toolpath and start cutting.