# ShopBot Basic Operation and Control Layout

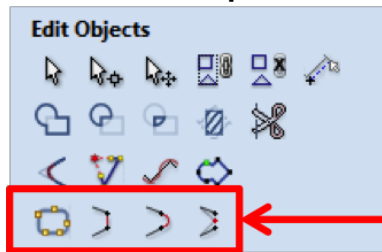**Revision 1.1      May 19, 2015**

## 1. Buttons and E-Stops



## 2. Setting up new file

- Open Vcarve and create a new file
- Measure and input width, height, thickness of stock
- Set coordinate system origin
- Select units

# 3. Creating drawings

- **Option 1**: Import from DXF file
    - File Operation → Import vectors from a file
    - Delete extraneous lines
    - Join open vectors

**Edit Objects**

Tools to close open vectors

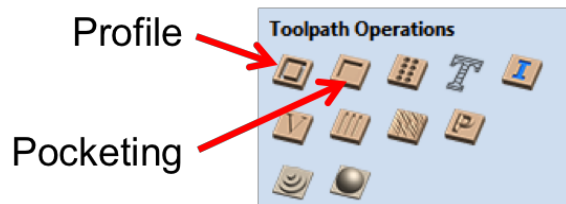- Place in desired position on material, resize, etc. using Transform Objects tools

**Transform Objects**

- **Option 2**: Manually draw in Vcarve
    - Drawing tools:

**Create Vectors**

# 4. Creating toolpaths

- Toolpaths > Show toolpaths tab
- Material Setup > Set…
    - Double check zeros

- Set rapid Z clearance
- **Select toolpath type and edit parameters**
  - Most common: profile and pocketing



  - Input cutting depths
  - Select tool and material (double check feeds/speeds)
  - Double check pass depths
  - Set machine vectors
  - Add tabs, leads, and ramps if necessary
    - Use ramps whenever possible - it's better for the machine
  - All parts must stay attached during machining. If the depth-of-cut is deeper than your material thickness, you **MUST** use tabs to secure parts to the rest of the stock
  - When cutting all the way through material, cut 0.005" - 0.010" beyond material thickness into spoilboard. More than this is unnecessary and will require us to replace the spoilboard more frequently.
  - Calculate and check preview of toolpath
  - Close preview screen and **save toolpath**
  - Rename the file to something meaningful

# Running the Shopbot

## 1. Securing the stock

- All stock must be secured using screws
- Keep all fastening features (screws, clamps, bolts, etc) outside the cutting volume for your job!

  - Pre-drill pilot holes in your stock
  - Make sure tool will not hit screw heads. This may require either countersinking screw holes or adjusting the safe travel height
  - Notify a mentor if the fiberboard base plate needs replacement
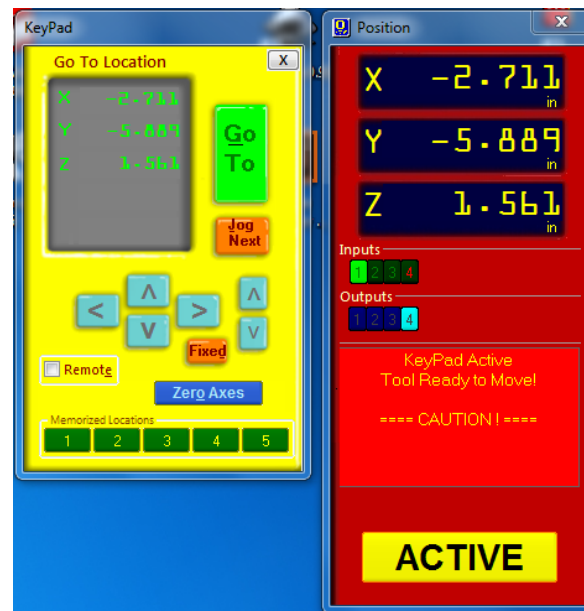
## 2. Turn ON the Shopbot

## 3. Open ShopBot 3 software

Control Panel:



Automatic Z Zero

Open Manual Jog Key Pad
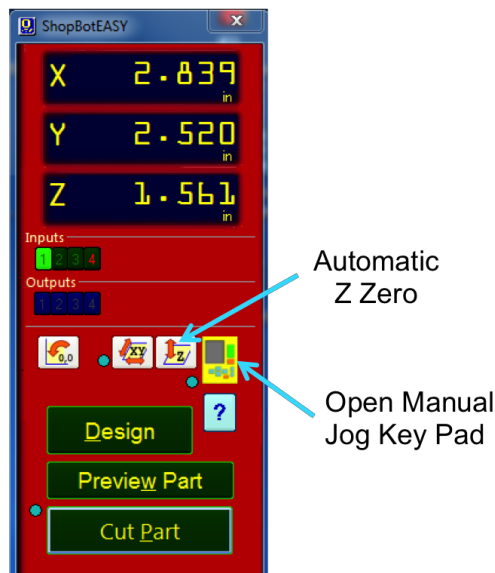
To manually jog spindle:
- Click yellow button on control panel to open manual jog Key Pad:



- Move spindle either by:
    - Clicking on arrows in Key Pad
    - Using arrows on keyboard (page up/down controls z-axis)
    - Typing values (in inches) into the "Go To Location" box and clicking on the green "Go To" button

**If at any point the spindle hits the mechanical travel limits on any of the three axes, the zero of that axis will need to be reset!** This will be very loud. Your part may be ruined if the zeros are not corrected before running a toolpath.

# 4. Load tool

- **<span style="color:red">Power to the spindle MUST BE OFF when performing a tool change.</span>** The spindle power switch is located under the spindle control box. "Green" indicates "ON", "Red" indicates "OFF".
- A mirror has been installed so the state of the spindle power can be easily assessed.
- **<span style="color:red">The software jog window MUST BE CLOSED before performing a tool change.</span>**
- Although spindle power must be OFF, **it is recommended to leave the ShopBot power switch ON during a tool change** (when ON, power is supplied to the stepper motors to prevent you from accidentally moving the gantry and losing your zeros)
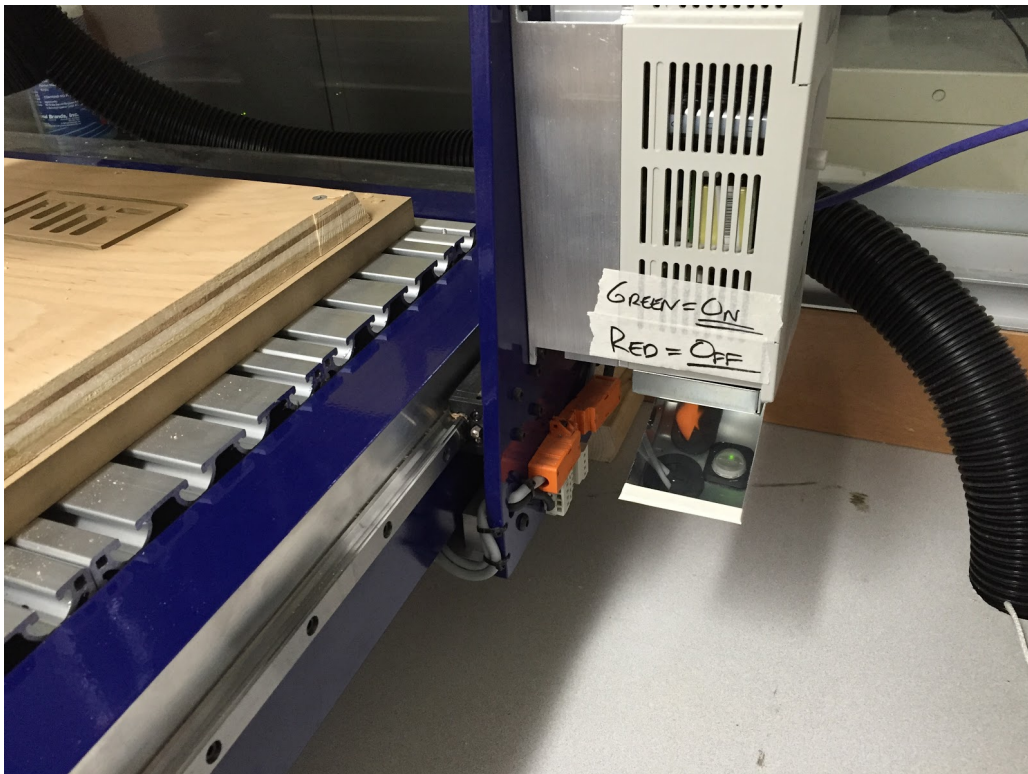
- Remove dust collection skirt. You may need to manually raise the spindle to do this.
- Load tool with appropriate collet using wrench and collet wrench. You do not need to fully remove the collet to change the tool; simply loosen the collet cap until the tool can slide out
- If performing a collet change, ensure the collet is fully snapped into the collet cap before screwing the collet cap back on

## 5. Zero X and Y axes

- Open Key Pad from ShopBot 3 Control window
- Jog spindle to desired zero
- Click Zero Axes button on Keypad
- Check X- and Y-Axis boxes
- Click Zero

## 6. Zero Z axis

- Open Key Pad from ShopBot 3 Control window
- Jog spindle to rough center of cutting area
- Place Z-zero plate directly under tool
- Attach copper clamp to tool
- Ensure no contact between clamp and plate
- Close Keypad
- Click Z zero button on control window and follow on-screen instructions

## 6. Load toolpath file

- When you are confident in your setup, click the "Cut Part" button on the Control Panel
- Select and upload the desired toolpath file
- Follow the onscreen instructions. Spindle will start automatically when toolpath begins. However, **spindle speed is not set by computer**. It must be set manually using the knob on the side of the machine. Pay attention to how the machine is performing and adjust accordingly.

**Do not leave the machine unattended while running!** You must be close enough to hit stop on the computer or to shut off the machine if necessary.