MILL OPERATION – CHECK LIST

Note: This document is not a substitute for proper training nor does it give license to operate the mill without proper supervision

- **Power On**
  - Click the *Home* button (On screen upper right corner)
  - This is essential – it automatically resets the absolute origin (world origin) of the mill
  - Occasionally the mill will error while homing – *Retry* will usually fix the error
  - *Home* will change to *Homed* when the action is completed successfully

- **Click on Add job to Queue**
  - Jobs should be in your directory, named by the type of job (rough, finish, etc.)
  - Click on the “jobname.gc” line, then click *OK*
  - Job should appear at the bottom of the queue listing

- **Click on Select as Current Job**
  - Select job from the bottom of queue listing, click *OK*

- **Send job to the controller interface**
  - Click on the *Job Output* button, half way down on the right side of the screen
  - Should load the job into the controller, and change the screen layout

- **Display job in the context of the table**
  - Upper right hand corner, under preview, click on *Table Area*
  - Job should appear at left, showing its orientation and scale – if it doesn’t look the right scale or orientation, it probably isn’t, and you should go back to the CAM or CAD software and check units and orientation relative to the XY
  - The job will appear on the table relative to where the mill head is presently, and will move to where you want the job to be run when you set the origin at the work piece (detailed below)

- **Situate the work piece**
  - Orient the work piece, align it to the bed and fasten it down using the tee-clamps
  - If the work piece is thin, it may need to be shimmed up about a half an inch to help keep the end mill clear of the tee-clamps during operation

- **Adjust the guard**
  - Raise the mill to clear the height of the work piece using the Z jog arrows
  - Jog the mill over the work piece using the XY jog arrows (large moves fast, small moves slow)
  - Loosen the hold-down fasteners and adjust the height of the guard so that the brushes just sit on the top of the work piece. Tighten down the fasteners

- **Install the end mill**
  - Wear gloves – the end mills are sharp
  - Remove the installed end mill by loosening the chuck with the provided tools
  - Remove the chuck and change the collet if necessary to accommodate end mill shaft diameter
  - Insert end mill, replace the assembly on the mill, and thread the chuck a few turns
  - Check the length of the exposed end mill shaft and adjust to the maximum depth of cut, being careful to leave sufficient shaft inside the collet to permit secure fastening

- **Set the Z origin**
  - With the mill over the work piece, slide the Set Z pad on top of the work piece, under the end mill
  - Click on the *Auto Set Z0* button on screen (middle)
  - The mill will slowly descend, touch the pad and return to Z-up
  - The Z0 should update in the upper left *Origin Z* field – the Z origin is now set
Set the XY origin
- Jog the mill over to the work piece where you want to set the origin
- Adjust the location using the small jog arrows for fine adjustment
- Jog speed of the arrows can be adjusted with spinners at the lower left of the screen
- When aligned, click on the Origin button (upper left) to set the XY origin

Set the maximum permissible travel in the Z direction beyond Z0 (Z-M)
- Click on the button Z-Up to raise the end mill above the work piece
- Jog the router in XY until it is over one of the tee-clamps, or any other metal jig that is at a higher Z elevation
- Jog the end mill in Z until it is about ¼” above the tee-clamp (or jig)
- This is the physical location that will give you your Z Max, which is an offset from Z0
  - Subtract the number of the Origin Z0 displayed in the Origin Z field, from the Absolute Origin Z displayed in the Absolute Z field
  - Put the result (as a positive decimal number) into the Z-M field to set the Z Max

Zoom the part on screen
- Click on the Part Origin Zoom button in the upper right corner of the screen
- Display will zoom in on the part

Check job extents
- Click on the Move XY to Origin button found in the center of the jog controls
- Click on the Z-Up button, to clear the end mill of work piece in Z
- Jog the router to the opposite corner of the work piece and note the green line drawn on the screen as it moves, showing the traverse from the origin
- The green line will show you if the work piece and job area are at the same scale, that is, that the extends of the job fall properly within the bounds of the work piece.

Return to origin
- Click on the Move XY to Origin button
- Click on the To Z0 (NOT the Z0 button!)
- The end mill should now be exactly where job origin needs to be

Click on the button Z-Up. Supervisor will set Traverse and Cutting speeds at this point if necessary

Running the job

Clear the table of everything except the work piece and the trackball control

Put on Safety Goggles

Put on dust mask

Turn on the vacuum mounted on the mill

Turn on the exhaust system beside the mill

Make sure everyone around the mill knows you are about to start a job

Click on the Start button on screen
- The mill will start to spin, rise to the mill adjustment level, then spin down
- Click on the Done button
- The job will commence.
- With the track ball, move the on screen cursor over the Stop button (the start button will have changed to the stop button)
- Be ready to hit Stop if the mill does not operate as expected
- This stop button will stop the mill immediately. It can be used to pause the job, or as an emergency stop for any reason. The job can be resumed by hitting the Resume button

The Red Stop Button on the mill table should only be used in an emergency where personal injury or damage to the mill can be prevented by its immediate use. The red stop button resets everything. If you hit it, you will have to begin again from square one.