EBF Checklist - Long

Prior to Turning On the EBF

- ☐ Check the oil in the vacuum pump through the sight glass on back of the unit. Use your phone to take a photo.
- ☐ Check dust collector bags outside and make sure they are not all full. Change if necessary.
- ☐ Move the control cabinet into the red taped area on the floor to be clear of the machine and the metal shop door
- ☐ Make sure that the large air compressor outside is on. Press the green button on the electrical box to the right as you're facing the EBF machine. Make sure that compressed air is supplied to the table. Connection is on the front lower left corner of the machine near the floor. The regulator is on the wall to the left of the machine and should read at least 70PSI. If the compressed air is not supplied to the machine, it won't pickup tools.
- ☐ Load cutters/endmills into the tool holders and tool holders into the correct slots. They are numbered 1-8 left to right. This can be done at any time prior to setting tool heights.
- ☐ Adjust the dust hood if necessary via the allen head screws on the sides. This should not normally be necessary.
- ☐ If you are using the vacuum table (which is almost always the case), move rubber gasket material to the correct positions for the piece you will be vacuum holding to the table.

Turning Machines On

- ☐ Turn on the EBF on the main circuit breaker in the metal shop.
- ☐ Turn on the local power disconnect via the big red lever to the left of the machine.
- ☐ Make sure the rotary switch on back of the control cabinet is to 'Marche'
- ☐ Turn on the control cabinet power - black switch on left side of the control cabinet.
- ☐ Open the cabinet and push the power button on the computer.

Setting Up To Cut

- ☐ Launch WinCNC
- ☐ Make sure nothing is in the way of the machine's movement either on or next to the machine.
- ☐ Press "Home" on WinCNC
- ☐ Type "G90" into the text input window in WinCNC. This will set the machine to use absolute coordinates in case someone else has used the machine and set it to use relative coordinates.

- ☐ Once the machine is homed, press the "Set X0 Y0 Z0" button or manually input a "G92 X0 Y0 Z0" command on the machine. This sets the initial 0,0,0 position.
- ☐ Move the spindle out of the way so that you can position your spoil board/fixture. Use the arrow keys on WinCNC, the arrow keys on the keyboard, or issue a G00 with coordinates command.
- ☐ Position your spoilboard/fixture.
    - ☐ If using the machine pins for positioning
        - ■ Be sure fixtures and spoil boards are clear of the pins.
        - ■ Click "Pins Up" in WinCNC.
        - ■ Position spoilboard/fixturing surface against side and front pins
    - ☐ If not using the machine pins, position spoil board/fixture as needed on the table.
- ☐ Position your material on your spoil board/fixture. This will be either with vacuum hold down, screws, or a fixturing table, depending on how you will secure your work piece.
- ☐ Load your tool table in WinCNC if needed (not frequently used).
- ☐ Touch-off each tool.
    - ☐ Place the touch-off button on the machine base (aluminum) on the side of the machine - the spot is marked. Load each tool one by one (T#) and move tool to touch-off position using the button "Move to X2 Y17" or issuing the command "G00 X2 Y17" and then click the "Set Tool Z" button on the WinCNC screen. Do this process for each tool using the T# command to change between tools.
- ☐ Determine the number of vacuum zones required and turn the switches to on (up) on the front of the machine. The zones are 1-4, front to back on the machine with 2 vacuum holes in the table per zone. The switches correspond to zones 1-4 from left to right.
- ☐ Cover any holes in the vacuum table that are not being used. These will be loose but will ensure that chips don't get down into the vacuum tubes.
- ☐ Turn on the vacuum by pressing the "Vacuum" button on WinCNC.
- ☐ Check the security of your spoilboard, fixture, and/or work piece.
- ☐ With your last tool (after touching off all tools) move the touch-off button to a suitable place on top of your work piece. This should be the highest point on your work surface. If your work surface is completely flat, you can set the touch-off button anywhere.
- ☐ Jog the spindle so that it is over the touch-off button, or move the button to underneath the spindle.
    - ☐ If you are using the vacuum table, make sure to turn on the vacuum before the next step. Setting the material height with the vacuum off will result in the machine thinking the top of the material is higher than it actually is and your first cutting pass either cutting air, or a more shallow cut than you would expect.
- ☐ Press the "Set Material Z" button to set the Z height. As long as you touched off all of the other tools first, the machine will now know where the top of your material is for all tools.
- ☐ Jog the spindle to where you want your material X and Y zero to be.
- ☐ Note down the X and Y coordinates before the next step. This is not mandatory but is valuable if you need to restart your toolpath for some reason.

☐ Press the "Set Work X0 Y0" button or issue the command "G92 X0 Y0" to set the work piece X,Y zero position.

Loading the GCode and Cutting

☐ Save your GCode file from your flash drive to the computer.   There is a USB hub on the left side of the machine.

☐ Load your GCode from the computer hard drive in WinCNC. (File, Open, yourfile) but DO NOT PRESS ENTER YET! Pressing Enter will start the toolpath.

☐ Click the "eye" icon   which will let you preview the cut.
    ☐ The red circle shows the current position of the endmill. You can jog the machine to the edges of your project to make sure that you are going to be cutting where you expect to be cutting.

☐ As an additional safety measure, you can jog the machine away from the start position of your project. This way you have a few extra seconds between pressing start and the spindle moving to the first cutting position to stop the project if you need to.

☐ Turn on the main workshop dust collector. Make sure that all of the other gates in the shop are closed and that the gate above the machine is open. Turn on Vacuum (if not already on)

☐ Drop the machine pins if you raised the pins for aligning your work piece.

☐ If you have copied the suggested header into your GCode, the machine will turn on the vacuum table if it isn't already on, grab the first tool in your file, drop the dust hood, start the coolant, and wait for you to press Enter before it begins.

☐ Listen for or look to make sure that the spindle has started before pressing Enter to begin the project.

☐ Press Enter - Cutting will begin

Post Cut

☐ If you used the suggested Footer code, the T0 command turns off the spindle, returns the last tool used to the tool changer, the M12C7 turns off the vacuum table and the G53 command sends the machine to the Parking position.

☐ If you did not use the suggested Footer
    ☐ Wait till the spindle stops spinning before doing anything.
    ☐ Jog the machine out of the way of your material as needed
    ☐ Turn the vacuum off via the button in WinCNC
    ☐ Issue the T0 command to return the last tool used

☐ Turn dust collection off

☐ Press the "Go To Parking" button to move the machine to sit over top of the parking space at the back of the machine. If you turn off the computer, the spindle will drop quickly, so the parking position has had a pad added.

- ☐ Lower the spindle Z height to just over the pad in the parking position.
- ☐ Exit WinCNC
- ☐ Remove your material
- ☐ Vacuum top, under and around machine
- ☐ Empty dust collection bag(s) if full
- ☐ Restore/adjust tools in tool holders and tool order as needed.
- ☐ Shut down Windows
- ☐ Turn off cabinet (black switch on left side of cabinet)
- ☐ Turn switch on the back of the cabinet to "Arrete".
- ☐ Turn off power at the local breaker box behind the cabinet - big red lever.
- ☐ Turn off EBF breaker in the breaker box in the metal shop.
- ☐ Clear any custom fixtures and make machine ready for next user
- ☐ Move the PC cabinet back out of the way and so that the metal shop door can be opened.