Running a Job on the Large Mill

Digital Media Tutorial
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Turning On the Machine

Flip the breaker switch on the front right of the lower part of the controller box to the *ON* position.
If the machine does not boot, make sure the main breaker to the mill room (to the left of the door as you walk in) is on.
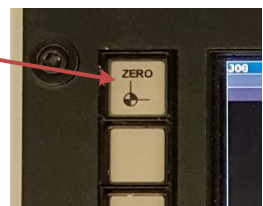
Once the machine has finished booting, press *F4* to enter the *Jog* menu.

Press the blue *Emergency Reset Button* then hit *ESC*.

If the blue light does not go out, rotate all the red *Emergency Stop* buttons to the right then follow any directions on screen.
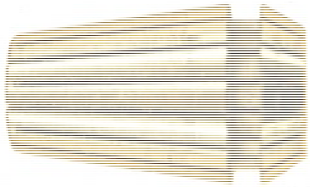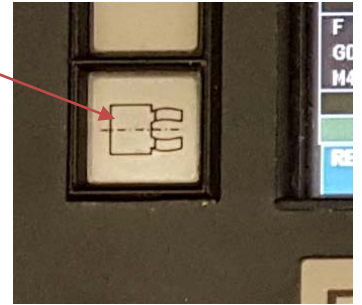

Press the *ZERO* button on the top-left of the control panel to home the machine.

Installing your Endmill

Press the **Tool Change** button, which is the bottom button in the top-left column of the control panel.

Find a collet that fits your endmill. An uncompressed collet should allow the endmill to slide smoothly through it, without any jostling or sticking. Squeezing a collet tightly in your hand should make the endmill inside it lock firmly in place. If your endmill sticks in places as you slide it through in the collet, the collet is damaged and should not be used. If the endmill has any play or jostles in the collet, it is too small for the collet and a different size should be used.

After finding the correct collet for your endmill, place the empty collet inside the nut. Place the nut on a flat surface and press the collet straight down into the nut. It's important for the collet to be mounted straight into the nut and to not be crooked at all.

NOTE: It can take significant force to insert the collet all the way. To help insert it, find a sturdy piece of scrap wood, set it against the narrow end of the collet, and press down on it with both hands.
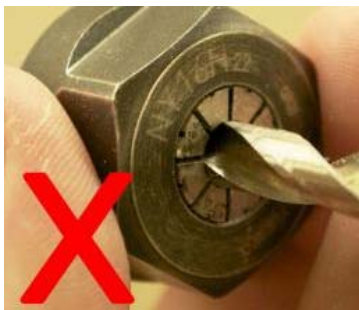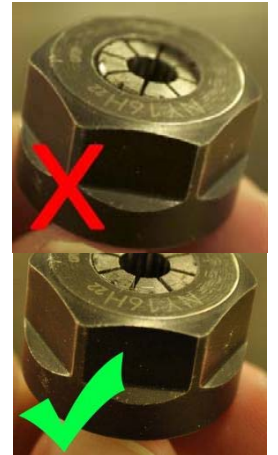

The collet should not compress around any portion of the endmill's cutting blade.

It should also extend all the way through the collet so that a portion, however small, of the endmill protrudes from the small end of the collet.

Once assembled, place the tool back into the mill and finger-tighten the nut onto the spindle. It should look like this once it's in place. Then use the wrenches and give only 1 quarter turn to tighten it.

NOTE: A nut tighter than one quarter turn from finger tight will put **unnecessary** and **dangerous** stress on your endmill.
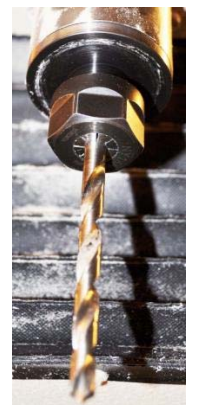
Once the endmill is in place, you must use the *SPINDLE WARM-UP* program to ensure the spindle is settled correctly.

Hit the button below **EXECUTE** (F1), then navigate with the arrow keys to the right of the screen until you have highlighted program number 999996, which is the *SPINDLE WARM-UP*. You can navigate through this list quickly by pressing the *Page-Up* and *Page-Down* buttons above and below the right arrow key

Once highlighted on the *SPINDLE WARM-UP* program, press the yellow **ENTER** button to load the program.
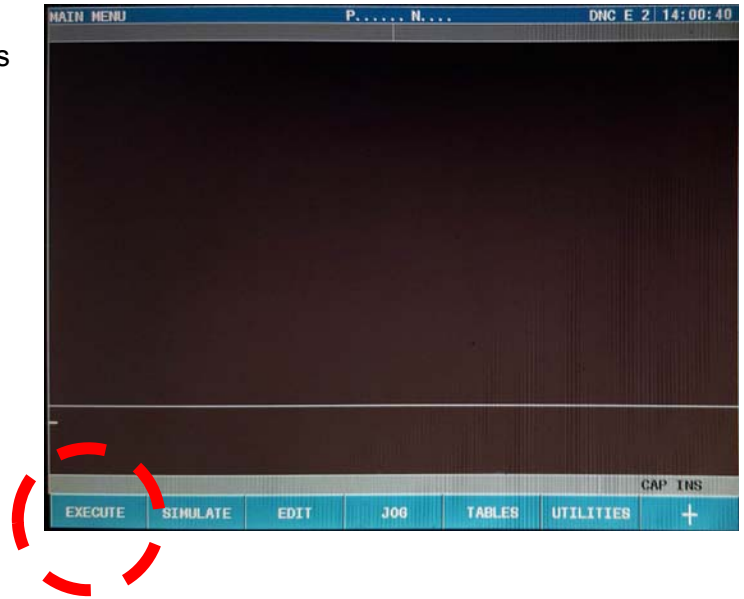
Press the **Green start button** to begin running the program.

The warm-up process takes about four and a half minutes to run. When it's finished, the spindle will stop running and the program will end.

Press the **MAIN MENU** button to return to the home screen.

Loading your Toolpath

After post-processing your toolpath in MadCAM with the **YSOA-Large Mill** post-processor, rename your resulting ***.pim** file as a six digit number lower than **900000**, for example: *123456.pim.* Copy your file to a USB stick which has been formatted **FAT32**.

To check and see if your USB stick is formatted FAT32, right-click on your USB drive in Windows Explorer, select *Format*, and then check the *File system* menu item in the window that appears.

*NOTE:* If you change your USB stick's file system type, it will erase everything on it.
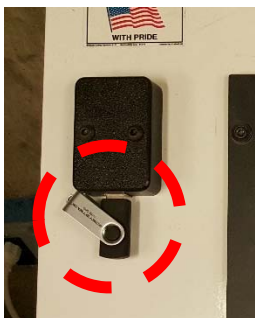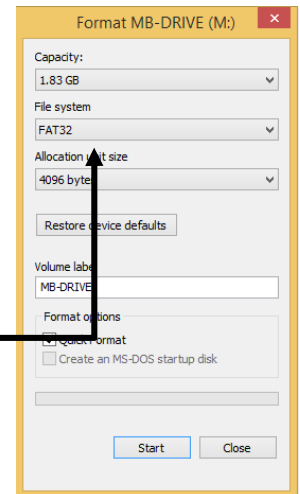
Plug your USB stick into the port on the top-left of the control panel.

From the main menu, press the button below **UTILITIES** (F6).

Then hit the button below **EXPLORER** (F7). Press the left arrow key to move to the **FOLDERS** sidebar. Press the down arrow key until you've highlighted **USB DISK** then press **ENTER**. Use the right arrow key to move back to the explorer window.

Highlight your *.pim* file then press **C** on the keyboard to copy it. Then navigate back to to the **prg** folder under the main hard disk. Press **V** on the keyboard to copy your file to the main hard disk.

You can now remove your USB stick.
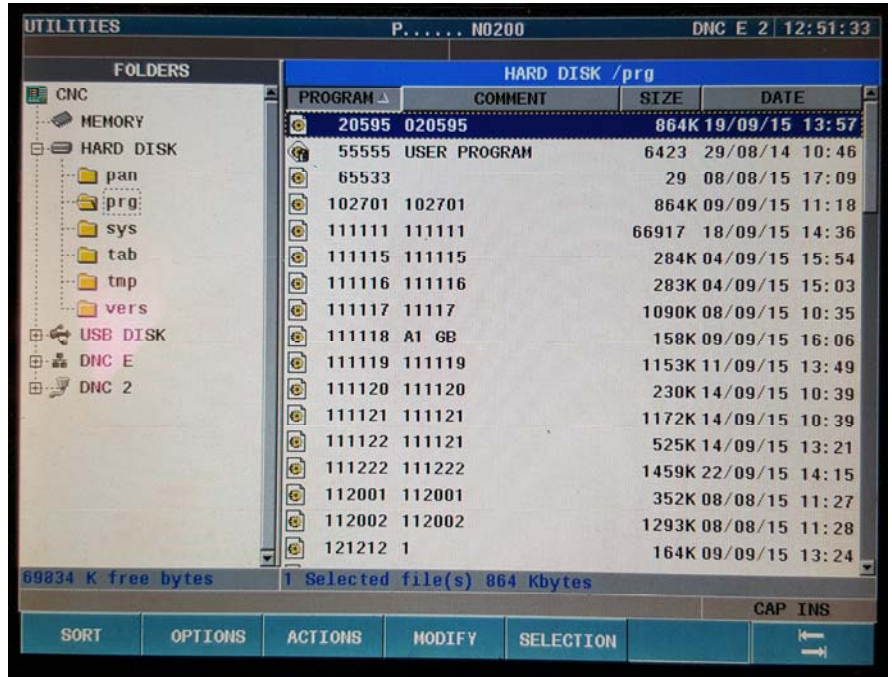
Setting your Origin

First, touch-off your tool head with the tool-tip sensor. Go to the **MAIN MENU** then enter the **JOG** (F6) page. Press the *Touch-Off Tool* button, which is the third button from the bottom on the top-left column of keys on the control board.

The tool head will then move over the touch-off tool and slowly bring the tool tip down onto the touch-off tool and depress it slightly.

DO NOT DO THIS WITH THE SPINDLE RUNNING!

If the spindle is running, hit the red **EMERGENCY STOP** button to stop it. Turn the knob clockwise to release it. Then press the blue *Emergency Stop Reset* button followed by the **ESC** button to re-enable the motion system without the spindle running.

Press the **HOME** button again to move the tool head out of the way.

Now mount your piece to the board according to the posted instructions in the mill room.

The origin of your job should correspond to the Rhino origin, if you followed the toolpath generation tutorial. Place the origin of your part near the origin of the machine.
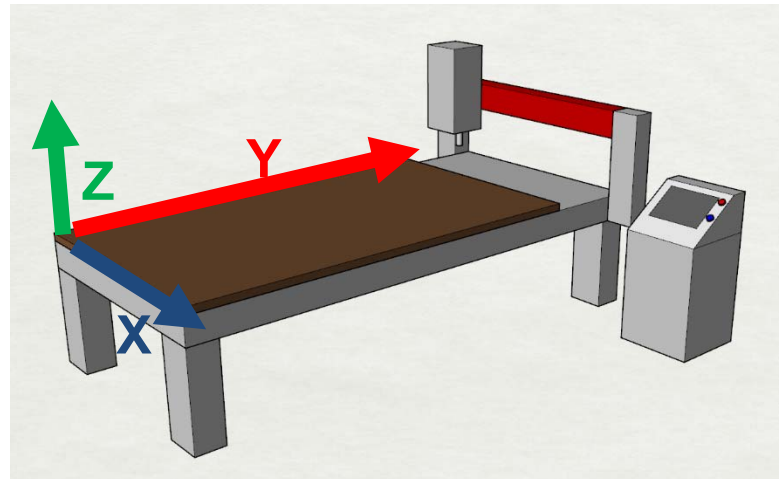
While still in the *JOG* screen, use the *XYZ* control pad on the bottom-left of the control panel to move the gantry and head around manually.

You can control the speed with the *FEED* knob to the right of the *XYZ* control pad. We recommend starting **below 20%** and ramping the speed up gradually as you get a feel for controlling the machine.
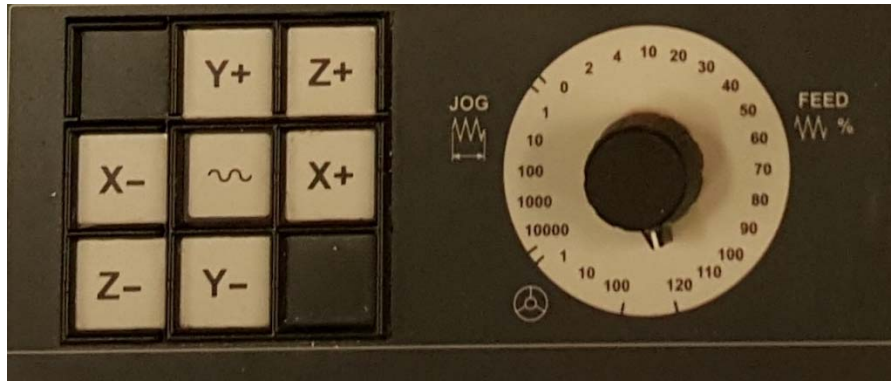
Once the tool head is at the point corresponding to your Rhino origin, press the *USER* (F5) button, then press *LOAD ZERO OFFSETS*, then press *LOAD G54*, then in order press *X G54*, *Y G54*, *Z G54*. Each of the *XYZ* tabs should say that the current origin is *LOADED*. Once all three are set, press *EXIT* (F6) three times to return to the *JOG* menu. Then lift the tool with the *Z+* button so that the tool won't drag through your material as it moves to the starting point.
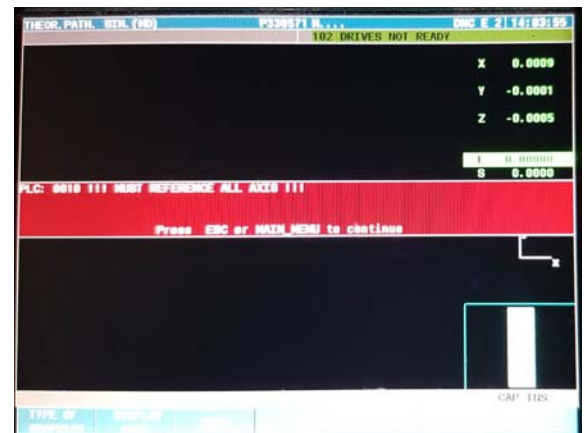
Simulating your Toolpath

From the *MAIN MENU* hit the button below *SIMULATE* (F2). Press *F5* to look at the Hard Disk. Use the arrow keys to navigate to your file. Make sure both the toolpath name and the number match yours. Once highlighted select *THEORETICAL PATH* (F1), *GRAPHICS* (F6), then *CLEAR SCREEN* (F6).

Press the *green start button* to begin the simulation. You'll see a view from the top of your job being run on the table, with your toolpath drawn out in yellow and safe moves drawn out in purple.

If any problem arises with the toolpath, you will see a red bar appear on the screen describing the issue.

NOTE: Typically issues will arise if the toolhead attempts to move beyond a limit. Check to make sure your Rhino origin is set at the top of your object's bounding box and that your object it oriented with the table correctly.

Running your Toolpath

From the *MAIN MENU* hit *EXECUTE* (F1). Use the arrow keys to navigate to your file and then press the yellow *ENTER* key. If your file is not showing in the list, press the *HARD DISK* (F5) button.

Set the *FEED* control knob to *20% or less*. Then press the *green start button* to begin your job. The spindle will come up to speed first and then the tool head will begin to move.

If you need to pause the toolpath press the *red stop button*. Press the start button to resume it.

NOTE: This will not stop the spindle, only the toolhead. Press the *red EMERGENCY STOP* button to stop both the spindle and the toolhead.

You can use the **FEED** control knob to gradually increase the speed that the toolhead moves along your path. Do so carefully, and keep in mind that spindle speed may need to be increased when the toolhead it moving faster.

To adjust the spindle speed press the **%+** and **%-** buttons to the right of the **FEED** control knob.

Turning the Mill Off

When you are finished milling and ready to turn it off, go to the **MAIN MENU** then hit the **EXECUTE** (F1).

Scroll down the list of programs and highlight **GOOD-NIGHT** (P999994). Press **EXECUTE** and the press the **green start button**. The toolhead will move to the XY home position and then take its rest position along the Z-axis. When the toolhead stops moving, press the **red EMERGENCY STOP** button then flip the breaker switch on the front of the controller box to the **OFF** position.