## Prepping the Small CNC Mills (MDX-540)

Digital Media Tutorial Written by Eric Kurzenberger

This tutorial will walk you through the steps of loading a tool and setting a user origin on the small MDX-540 mills in preparation of milling.

## I. Installing the Tool

## Before loading a tool, make sure the mill is powered off.

If a collet is currently installed, remove the existing collet and the nut holding the collet in place from the mill by unscrewing the nut. The collet is what holds the tool in the spindle.

Get a collet that fits the tool you intend to use. For guidance on what tool to use and obtaining tools and collets, contact the Shop faculty.



Install the collet in the nut. The angled lip on the collet fits into a groove on the nut, and you may need to angle the collet slightly to get it in fully. If the collet is installed properly, the flat end of the collet will be flush with the face if the nut:



Properly installed collet



Improperly installed collet

Once the collet is properly installed in the nut, screw the nut back onto the mill spindle, taking care that the end of the collet remains flush with the nut face. Only screw the nut on enough to hold the collet in place--*do not tighten it yet*. The tighter the nut, the tighter the collet grasps the tool; if there's no tool installed, tightening the nut too much may prevent you from being able to install a tool and could damage the collet.

With the nut back on the mill spindle, install your tool into the collet, making sure that the entire length of the collet is grasping the flat (non-cutting) part of the tool, and tightening the nut by hand to make sure the tool stays in place. No part of the collet should be holding the cutting (fluted) part of the tool.



Bad: collet is grasping cutting part of tool





Good: full length of collet is grasping flat part of tool

With the tool properly installed, you can tighten the nut by hand, then use the two mill wrenches to tighten it fully.

Use the blue wrench on the squared-off section at the top of the spindle and the red wrench on the collet nut, and move the wrench handles towards each other. **Do not overtighten!** 





## II. Setting the Origin on the Mill

With the tool properly installed, now you can load your block. Make sure your block is firmly mounted on the bed of the mill, then power on the mill.

When the mill first turns on, you will be prompted to "Hit ENTER" on the mill pendant. Press the purple **Enter/Pause** key.

The mill will initialize and send the spindle to the machine origin.



The display on the pendant will read "MACHINE (RML1), indicating that the **Machine** coodinate system is being used, and XYZ coordinates of 0,0,0, which is the origin.

For your mill job, you will need to tell the mill where your origin (base point) of your tool path is located. Typically, if you're using the SRP Player software to run your mill job, **the origin will be located at the center of the top of your block**.

Press the **Coord System** button. The pendant display will now read "USER (RML1)", indicating that the **User** coordinate system is being used, along with the XYZ coordinates.

Now, use the **XYZ** buttons to move the tool tip to the center of the top of your block (if that's where your origin is located).

To start, press **X**, then use the scroll wheel on the pendant to move the tool in the X direction. Then do the same for Y and Z, until you have the tip of the tool located at the base point on your block.

Once your tool tip is at the base point, press the **X** button again, then hold the **Origin** button for a second until the pendant beeps. You will see the X coordinate on the display now reads 0, indicating you've set the X origin. Do the same with the **Y** and **Z** buttons. The display should now show XYZ coordinates of 0,0,0.

Now what you've installed the tool and set your origin, you're ready to send your job to the mill using SRP Player or MadCAM.



USER(RML1).	*READY
X-225.000	
7 134.000	S 0
×	[]]]
RATE ×500	100%-XYZ
	100%-S

USER(RML1) X 0.000	*READY
Y 0.000 Z 0.000	s o
RATE ×500	100X-XVZ 100X-S