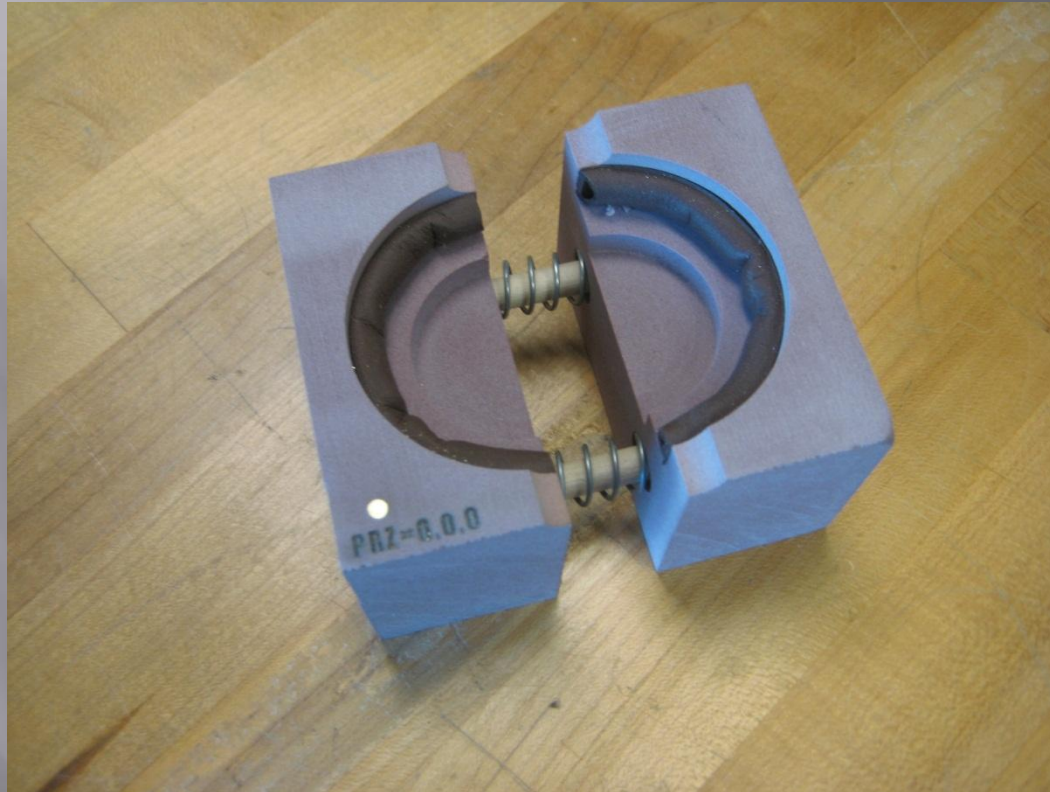
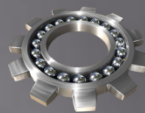


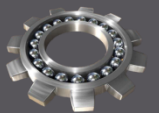
# Yo-Yo Fixture



- ▣ Chris Hurd
- ▣ Chris Lallier

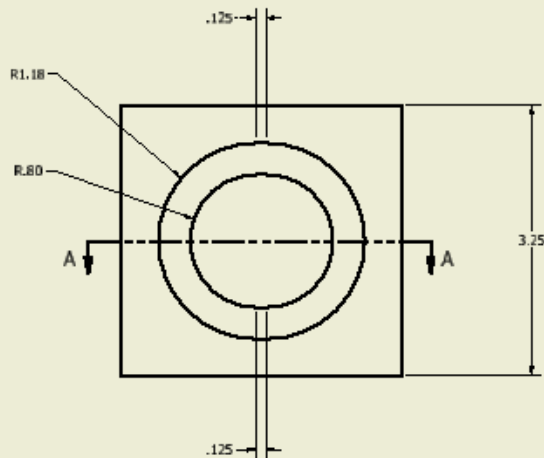
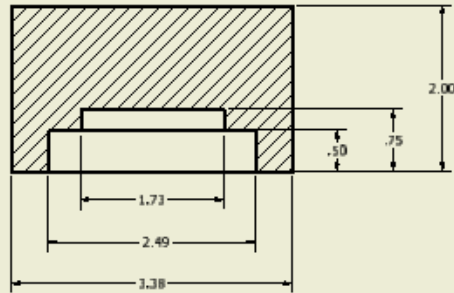


*Chris & Jim CIM*



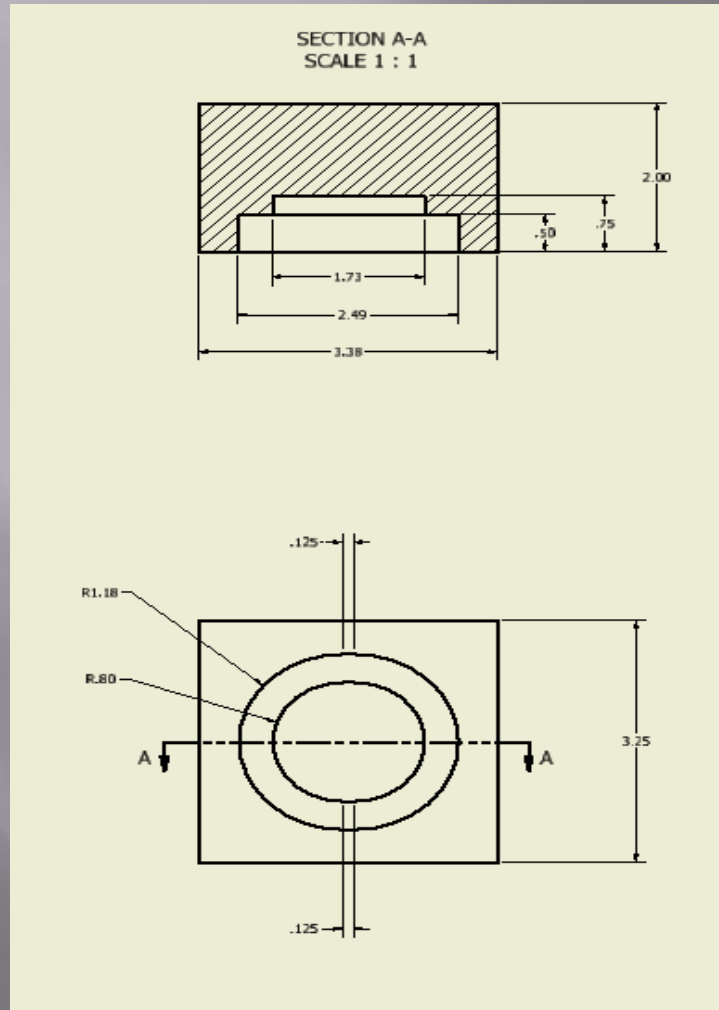
# Important notes before starting:

SECTION A-A  
SCALE 1 : 1



- ▣ The first recess is to hold the Yo-Yo halves.
- ▣ It is dimensioned with a line .125" long in the middle, making the shape slightly oblong.
- ▣ This allows for one blade width of waste in the center, making the shape circular after being ripped.

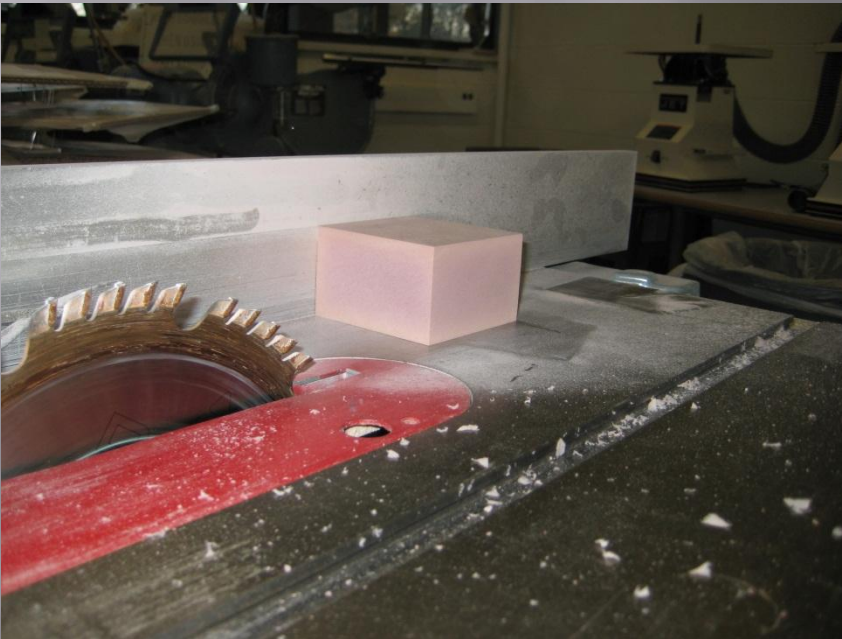
# Important notes before starting Continued:



- ▣ The second recess is to allow for the bottom of the Yo-Yo to sit in.
- ▣ The bottom of the Yo-Yo is not perfectly flat, it would not sit correctly if the recess was not there to allow clearance.

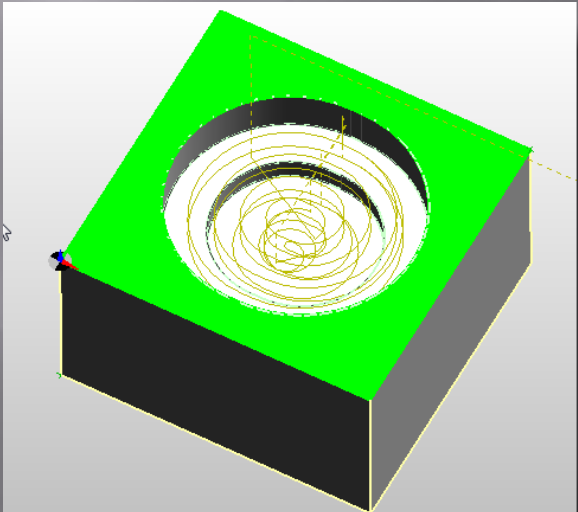
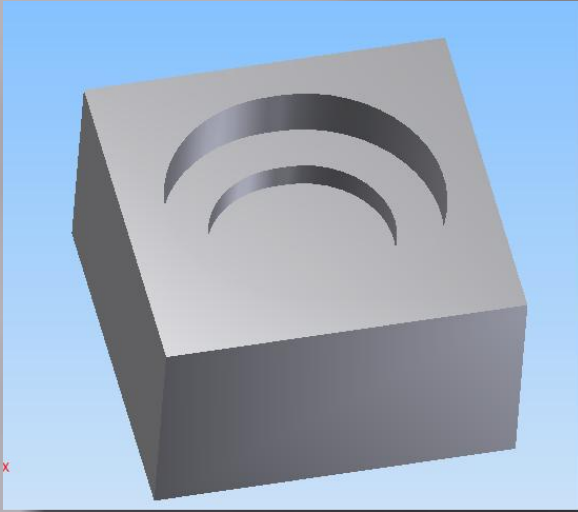
# Step 1

- ▣ Rip REN450 composite into  $3\frac{1}{4}'' \times 3\frac{1}{4}'' \times 2''$  Block.



- ▣ Option: glue up a hardwood blank of the same size.

## Step 2



- ▣ Part file is made in 3-D CAD, then machined in CAM.
- ▣ You can find the 3-D CAD file [here](#).
- ▣ You can find the CAM file [here](#).
- ▣ Machine pocket on the mill.



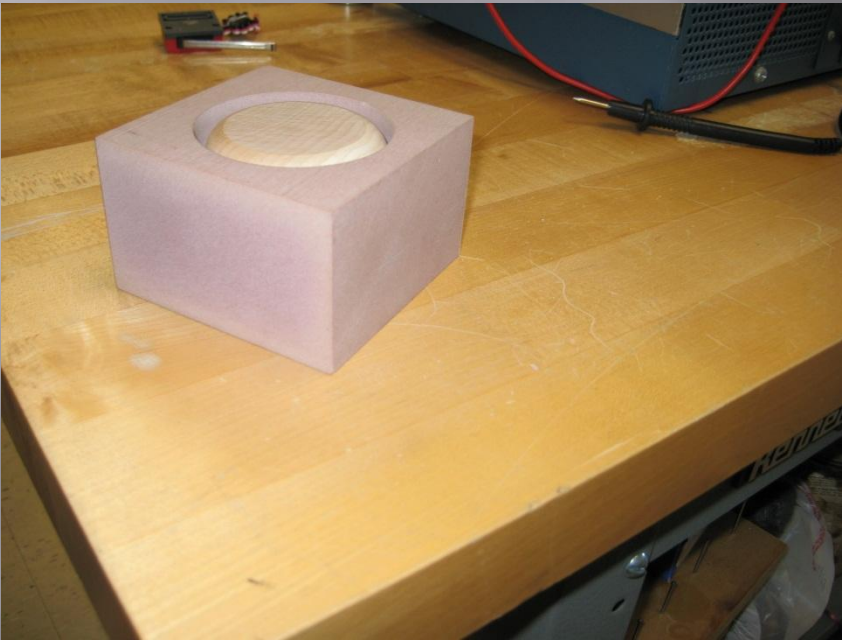
# Step 3

- ▣ Insert block into CNC machine.
- ▣ Mill out circular recesses.



# Step 4

- ▣ Test fit Yo-Yo halves.
- ▣ There should be roughly  $1/8$  " gap around the circumference of the Yo-Yo.
- ▣ Option: Use the NC file with a  $1/2$  " end mill.



# Step 5

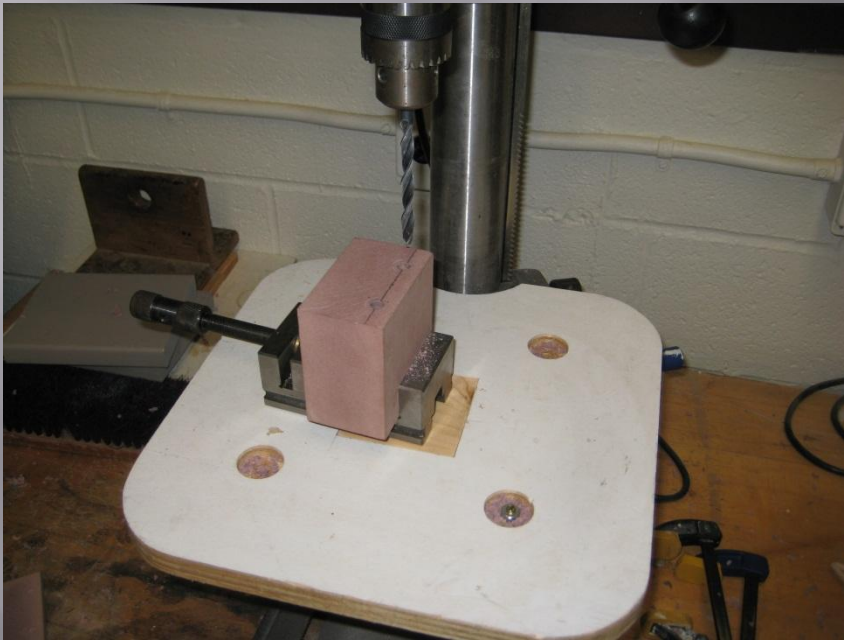
- ▣ Mark location to drill out the dowel holes.
- ▣ Marks should be  $\frac{3}{4}$ " from each side and  $\frac{3}{4}$ " from the bottom.





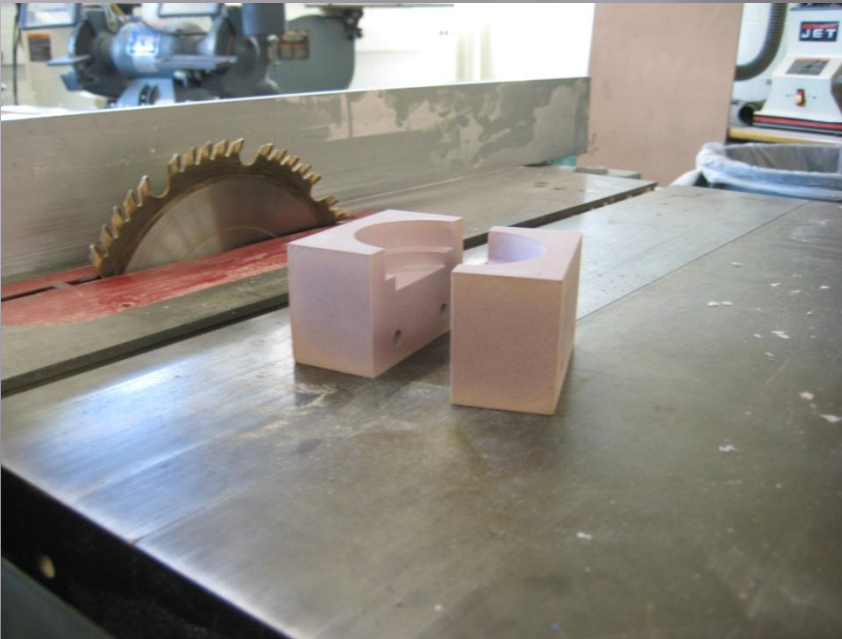
# Step 6

- ▣ Drill out 9/32 size holes through entire block on marks.



# Step 7

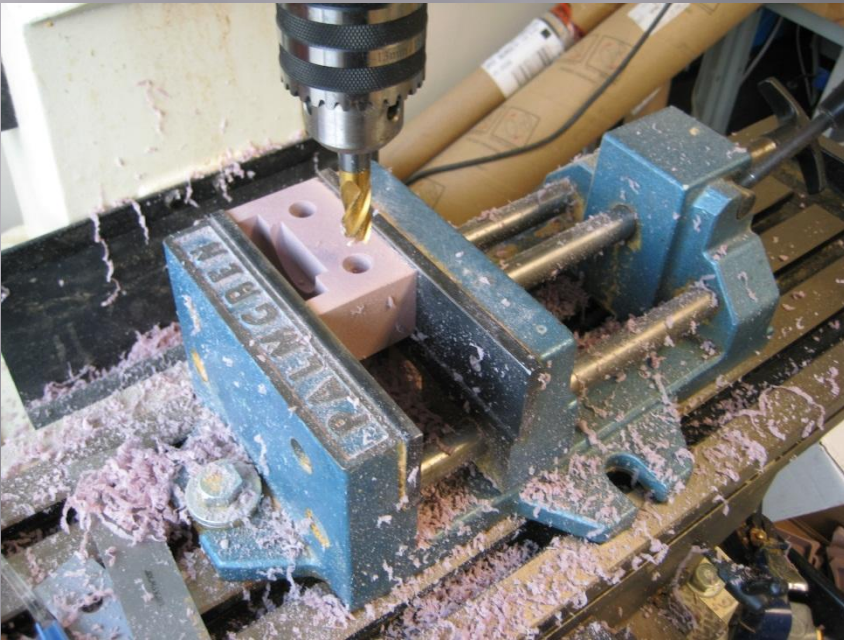
- ▣ Rip block in half 90 degrees relative to the holes drilled previously.



## Step 8

- ▣ Take one half of the divided block and re-drill the previous holes to 19/64.
- ▣ This will allow the dowels to slide freely on one half of the fixture and keep them stationary on the other half.

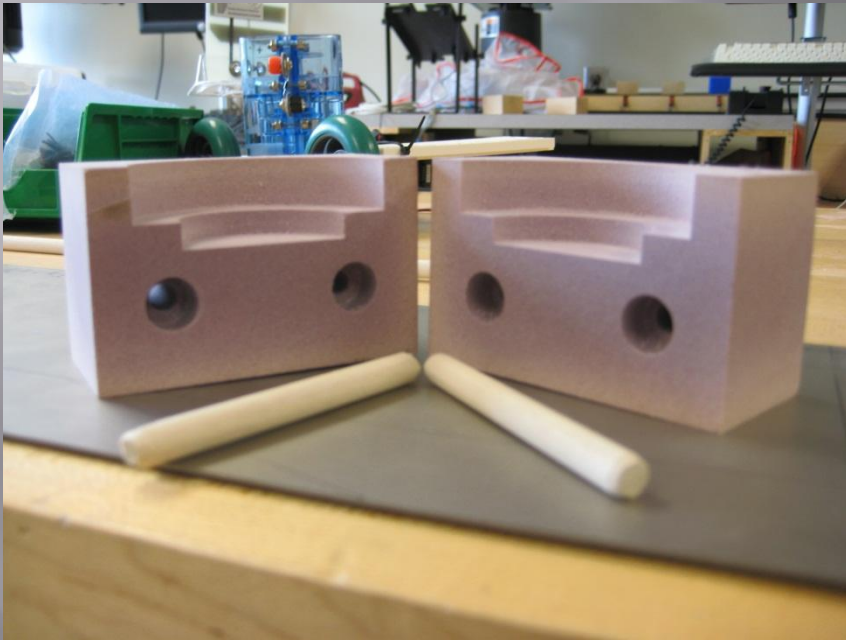
# Step 9



- ▣ Mill out  $\frac{1}{2}$ " recessed holes on each half of the fixture to a depth of .4".
- ▣ This will allow for spring clearance and compression.
- ▣ OPTION: Drill on the drill press.

# Step 10

- ▣ Cut 2 - 5/16" diameter dowels to 3 1/4" long.
- ▣ These are used as index pins to keep the fixture square in the vice.





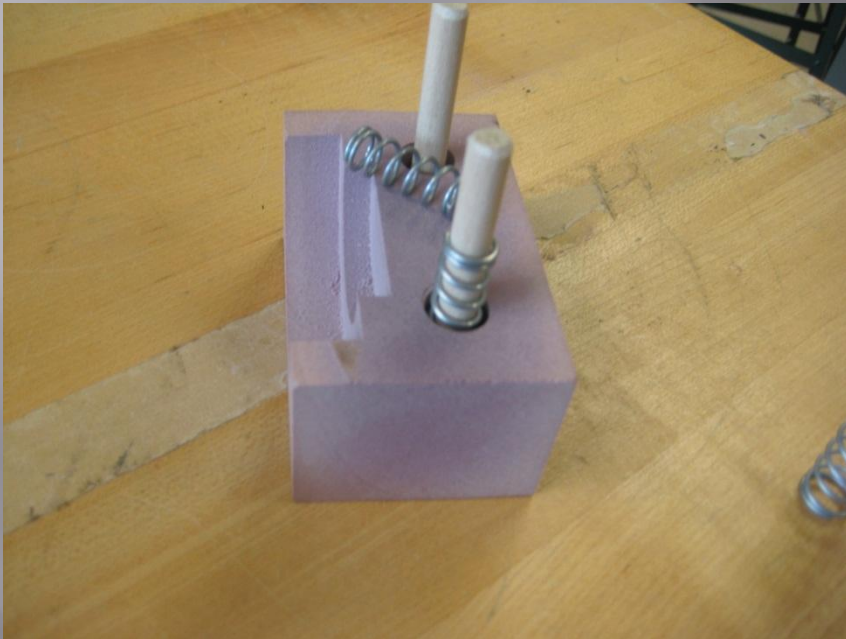
# Step 11

- ▣ Use a hammer to tap the dowels into the 9/32 holes.



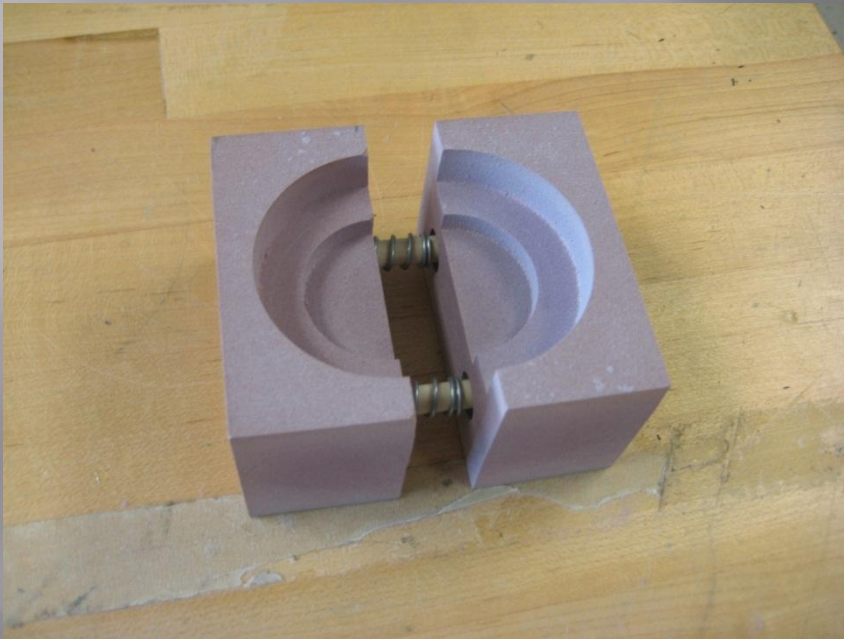
# Step 12

- ▣ Slide the springs down around the dowels into the recessed holes.



# Step 13

- ▣ Slide the dowels into the 19/64 holes in the other half of the fixture.



- ▣ Note: The following pictures show the fixture with a groove down the center.
- ▣ This groove allows for additional finger clearance when getting the Yo-Yo halves in and out of the fixture.
- ▣ The groove can be made in a number of ways, we used a mill and a round tipped bit.

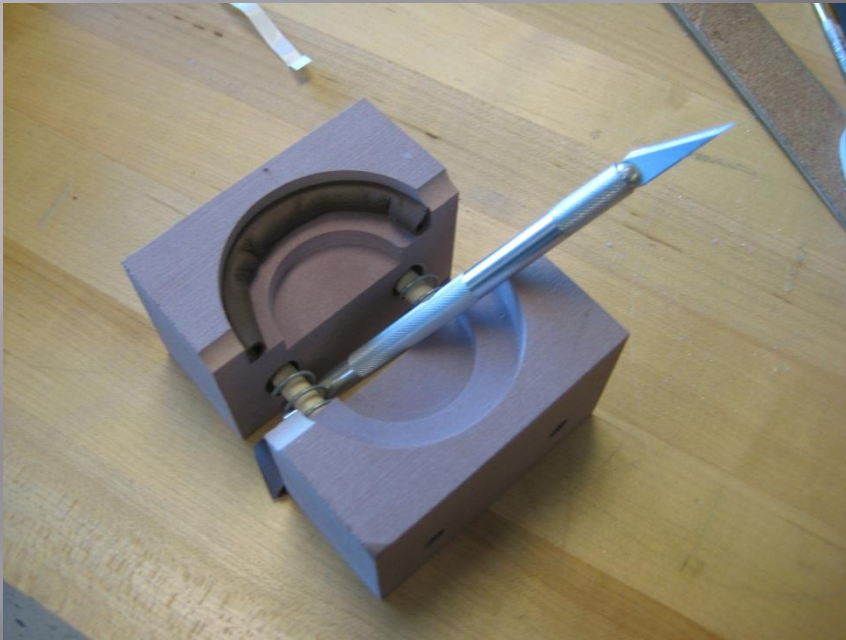
# Step 14

- ▣ Cut gasket material to rough length.



# Step 15

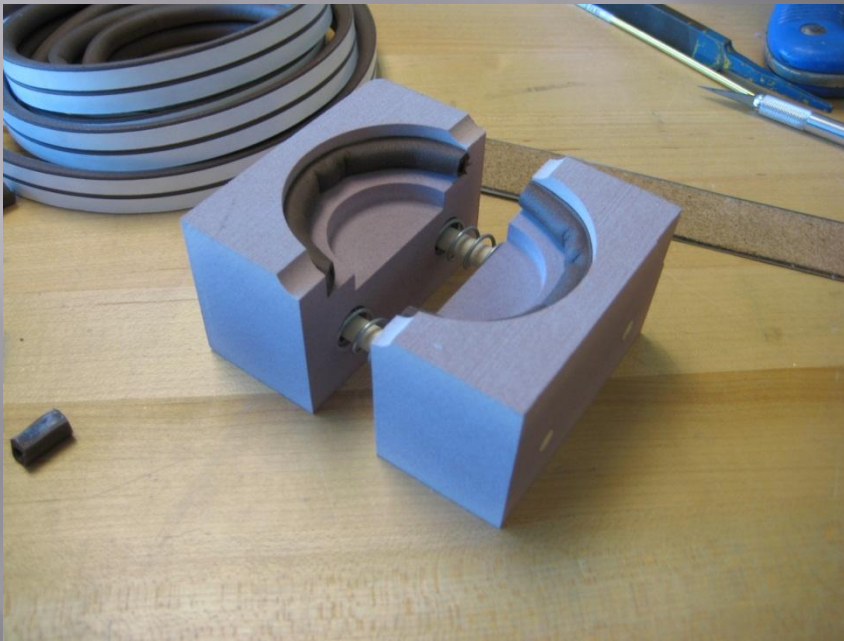
- ▣ Peel off backing on gasket material.
- ▣ Adhere gasket to the fixture on the upper ridge.
- ▣ Once the gasket is firmly in place, cut it to exact length with a sharp blade.





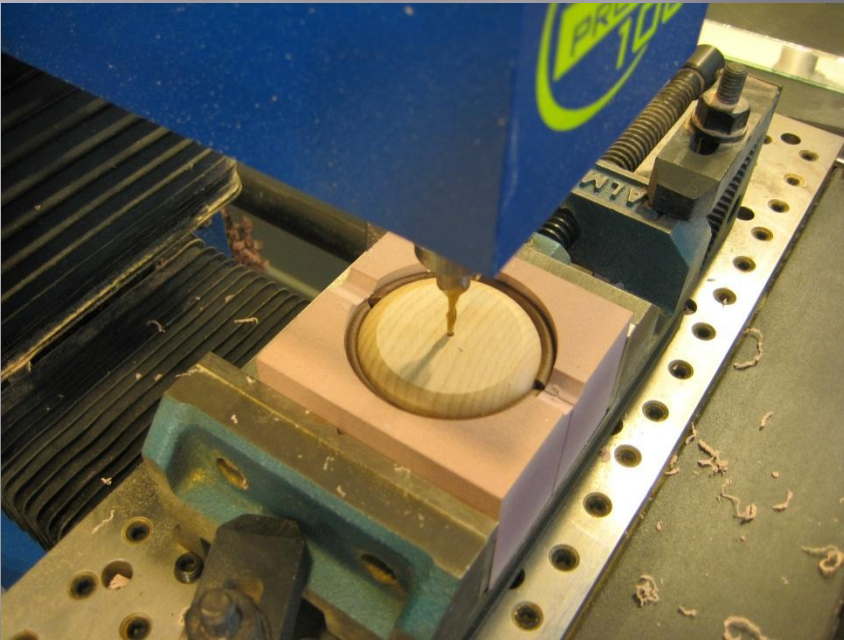
# Step 16

- ▣ Repeat Step 14 on opposite half of fixture.
- ▣ Gaskets will prevent the Yo-Yo halves from slipping while being engraved.



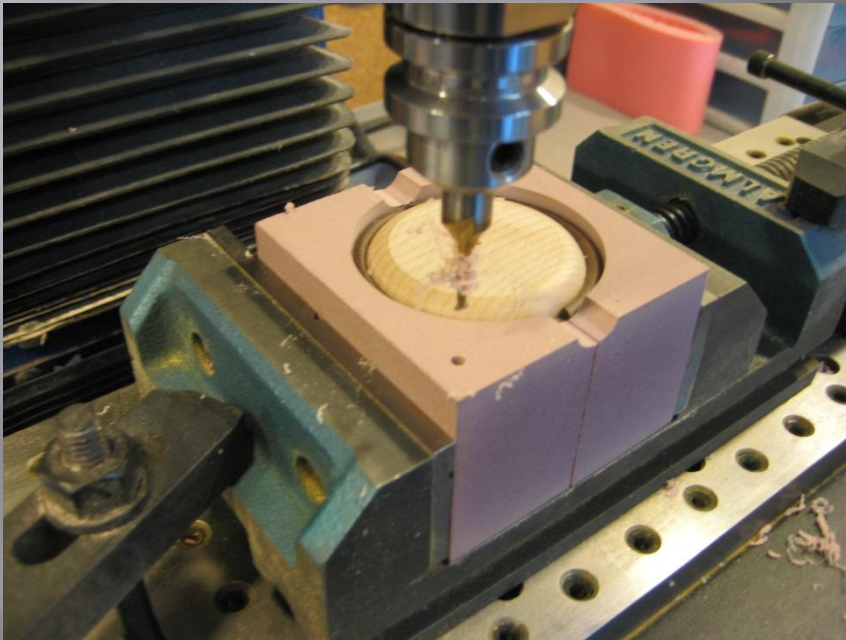
# Step 17

- ▣ Use a sacrificial Yo-Yo half to locate center on fixture.
- ▣ Set coordinates for 0,0,0 in bottom left corner of fixture.



# Step 18

- ▣ Mill out hole for 0,0,0.
- ▣ Hole should be 1/8" diameter by 1/4" deep.



# Step 19

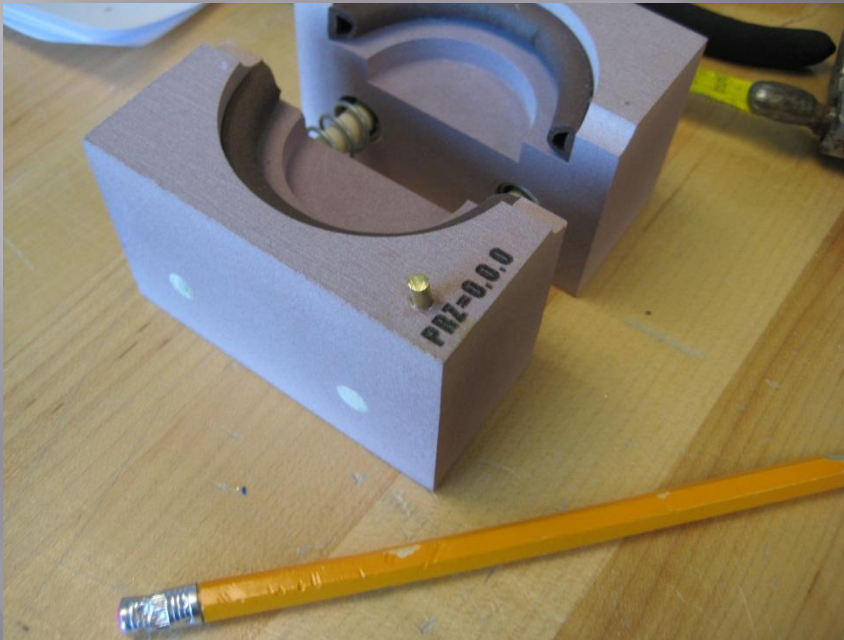
- Cut 1/8" diameter brass rod to roughly 3/8".





# Step 20

- ▣ Place a drop of epoxy on the end of the brass rod and insert into the previously drilled hole.
- ▣ Tap it into the hole with a hammer.





# Step 21

- ▣ File the brass rod down until it is flush with the surface of the fixture.
- ▣ The Yo-Yo fixture is now completed and ready to go!

