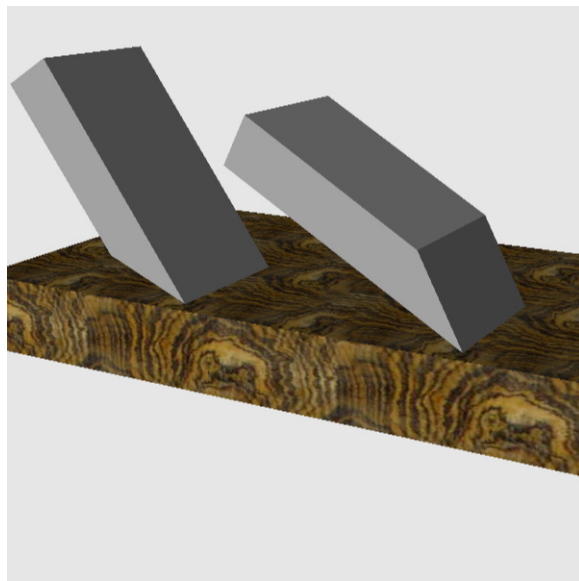
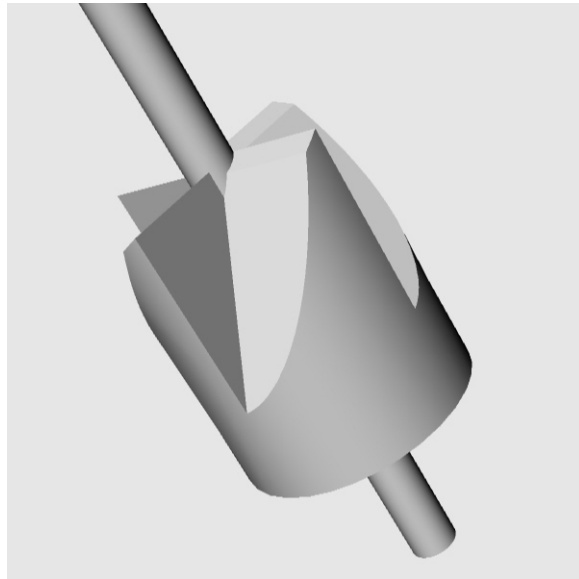


## Sharpening The Pen Mill

Pen mills (a.k.a. barrel trimmers) are used by many people to square pen blanks before turning. They are usually held in a wooden handle, in a drill press, or in a portable drill.

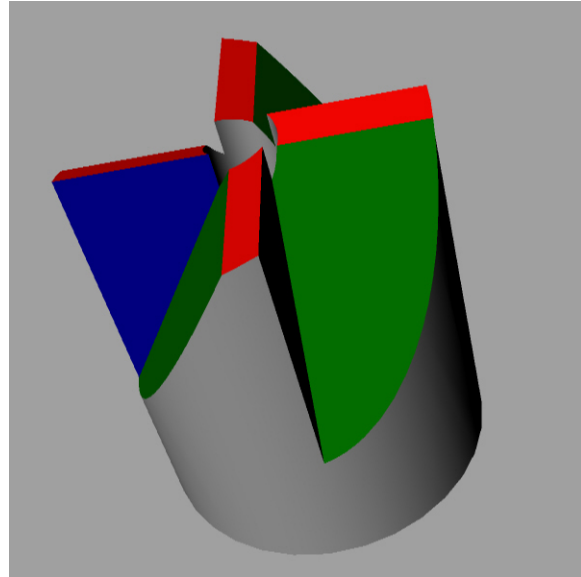
Their primary purpose is to square the ends of a pen barrel, but they are often used to remove excess wood to get the barrel to the right length. They are typically made from hardened steel, but depending on their use and the quality of the cutter, they can dull fairly quickly. Many people have a problem sharpening them, and because there is no standard nomenclature, describing what surface needs to be sharpened appears to be difficult, at least in an understandable way. So a couple of pictures should be helpful, I hope.

Wood cutting of any sort is simply the interaction of some cutting edge with wood. The cutting edge is harder and wins. But, to cut, it does have to be an edge! Picture a plane iron. The steel approaches the wood at an angle. On the left is a block plane, on the right a standard plane. Note in both cases there is a relief angle on the backside of the iron.



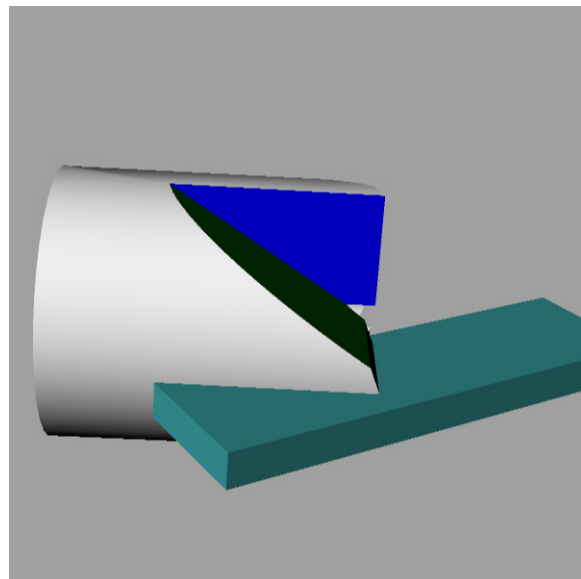
It's no different with the pen mill! Here is the pen mill with relevant surface colored so they are easier to refer to. The center shaft was removed – it either unscrews, or simply slides out after some setscrews are loosened.

Each cutting edge is formed by 2 intersecting planes, the blue one and the red one. The 4 edges lie in 1 plane, it's fairly important that they be in 1 plane so they can share the work, and prevent digging.

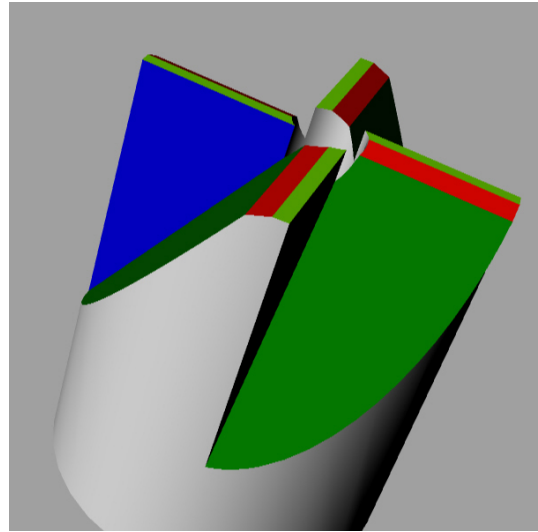
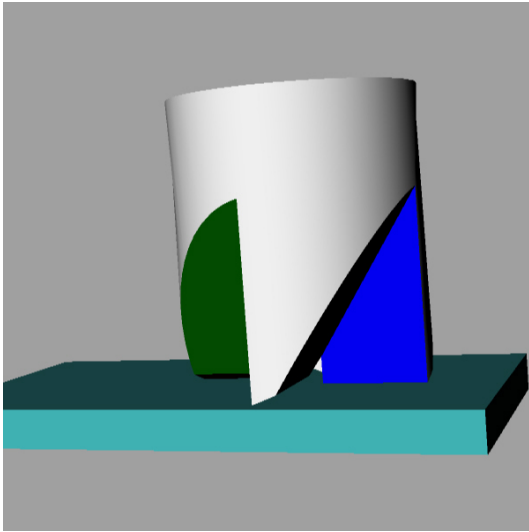


So rather than attempt to sharpen the 4 red surfaces evenly (which can be done, but is more difficult), stone or use a diamond file on the blue surfaces! First remove crud that's caked on the surface (this is important!!!), then take a few strokes with a stone or a fine diamond file. Because of the angle against the red surface, a slight change of the blue surface has a minimal effect in terms of moving the cutting edge, so this is pretty forgiving. If you attempt to sharpen the red surfaces, it's much harder to keep them even, and each surface is very small, so it does not support the stone, and it is easy to change the angle.

It's fairly easy to set the mill on the corner a stone and move it back and forth a few times.



If you were to simply set the mill face down on a stone and mill the front face you'd lose all cutting relief. All you would do is burnish or burn the end grain.



The chartreuse edge is the new bevel. Nobody would dream of using a plane iron with a 90 deg. edge.

An alternate method of sharpening a pen mill on the small edge (red) edge using a metal lathe and Dremel can be found in the [files area](#) .