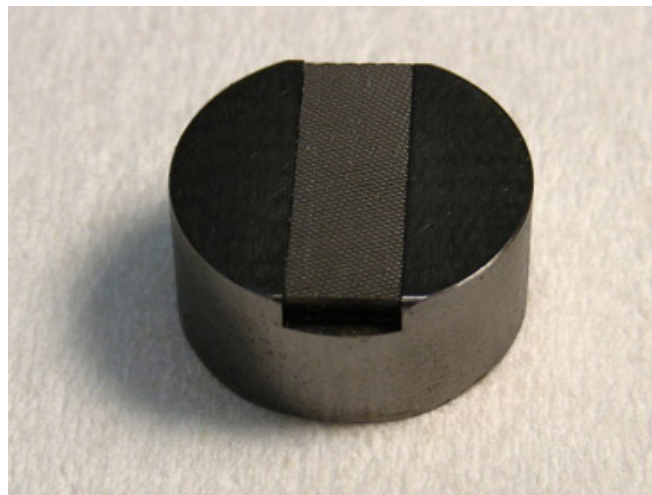


## Tip 70—Making your own “Bull's Foot” file for flat surfaces/Jerry Kieffer

Here is a secret from master model engineer Jerry Kieffer for those who wonder how he and others get perfect finishes on small parts. Have you ever had to file down a pin that sticks up above a flat surface, only to end up making things worse by putting file marks in the whole surface? How do you file the pin without touching the rest of the surface? Horologists (watch and clock makers) have developed a tool for just this purpose called a “Bull’s Foot” file, and you can make one yourself on your Sherline mill. You may have a broken file on hand you can use, or you can sacrifice part of a new one, but it should be sharp and of good quality. Here is what Jerry Kieffer suggests:

“The bull’s foot file consists of a short section of flat file set into a round or square piece of steel stock as in the photo below. In this case it is held into the machined groove with epoxy. The side surfaces of the stock are then machined/stoned/polished to about .0005" above the face of the file section. In other words, the side surfaces of the metal stock hold the file section less than a thousandth of an inch off the part’s surface so it can flush file anything that protrudes above a flat surface without affecting the surrounding area. Note that the sharp corners on both ends of the file sections have been rounded off to avoid any marring of the part’s surface. Because the side surfaces are polished smooth, they will not mark the surface they make contact with.



*A custom made "Bull's Foot" file. The file is recessed just a half a thousandth of an inch below the flat, polished surface.*

The example in the photo above is made from 0.800" diameter steel stock with a #4 cut, .250" wide pillar file section epoxied into the machined groove in the middle. They are generally used for smaller projects; however, they can be made in any size for whatever projects you have in mind. I have my students at the [NAWCC School of Horology](#) make them as a way to fine-tune their machining and hand finishing skills, and I do find myself using this item on a regular basis on all sorts of projects to save time and give my parts a professional looking finish.”