

TIP 47 — Mounting a Microscope on a Lathe or Mill/Jerry Kieffer

Good vision the key to making small parts accurately

“How can you see what you are doing on such small parts?” Jerry Kieffer is noted for working to total scale on very small projects, and he’s probably heard that question a thousand times. The smallest parts he makes are so tiny, some form of magnification is needed to see what is going on. Jerry has solved this by coming up with a mount to add a stereo microscope to his Sherline lathe and mill. The mount shown here is used as an example, but because microscopes vary so much from model to model it is not possible to present plans that would be of use to everyone. The idea is that once you see how it is done you can figure out how to adapt it to your particular application. The mount itself is fairly simple. It attaches to the cross slide table, allowing the microscope to track with the tool. This is a “boom-type” microscope made to be mounted to a steel boom. The boom arm allows the scope to be swung out of the way for changing parts. Jerry recommends a magnification of from between 3x and 12x power. Being able to switch to several different powers within that range is very useful. A comfortable working distance between the objective lens and the work piece would be between about 95 mm (3.75") and 130 mm (5.1").

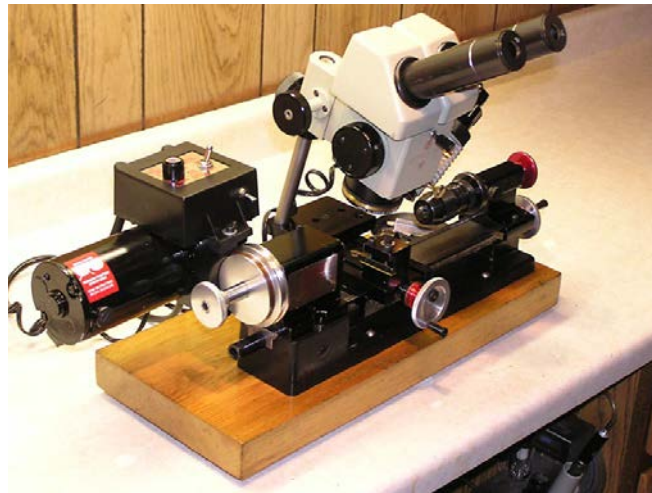


Photo 1 — A stereo microscope mounted on a Sherline lathe gives you the ability to view tiny operations in great detail while keeping a safe distance.

The same fitting can be mounted to a mill table. The head on the scope is rotated 180° to accommodate this installation. On both the lathe and mill a standard clear camera filter should be installed over the objective lens to protect it from cutting fluid, metal chips, etc. It can be easily removed for cleaning or replaced if it becomes scratched. Because a good used stereo microscope can cost \$500 or more (around \$2000 new), this application may not be for everyone, but for the watchmaker or modeler working on extremely tiny parts, it will take a lot of the frustration out of the work when you can see exactly what you are doing and make it possible to take your work to a higher level of accuracy and quality.

Submitted by Jerry Kieffer, DeForest, WI

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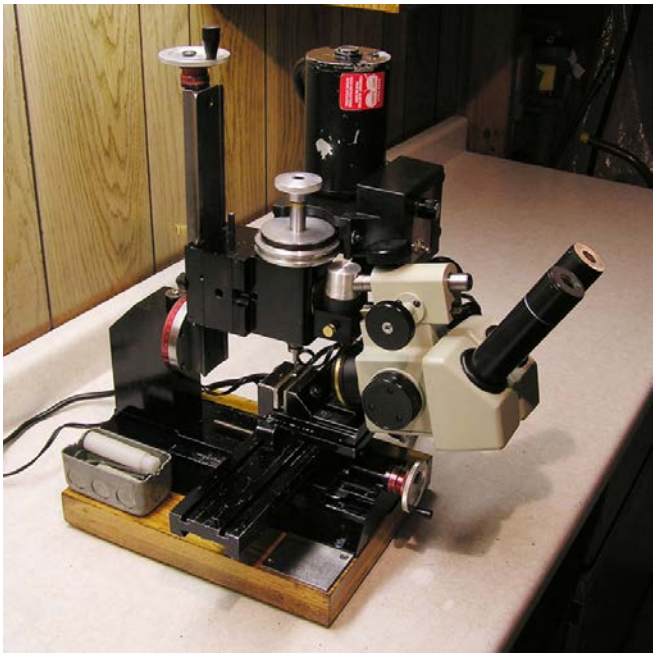


Photo 2 — Shows a scope mounted to the milling machine in a similar manner.

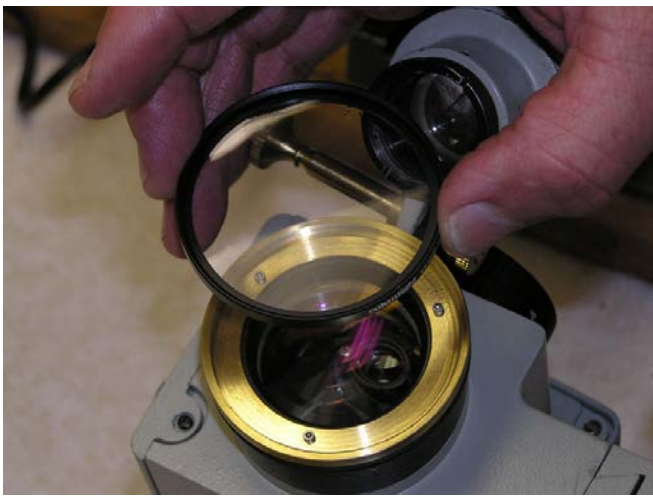


Photo 3 — A clear camera filter protects the lens from chips.

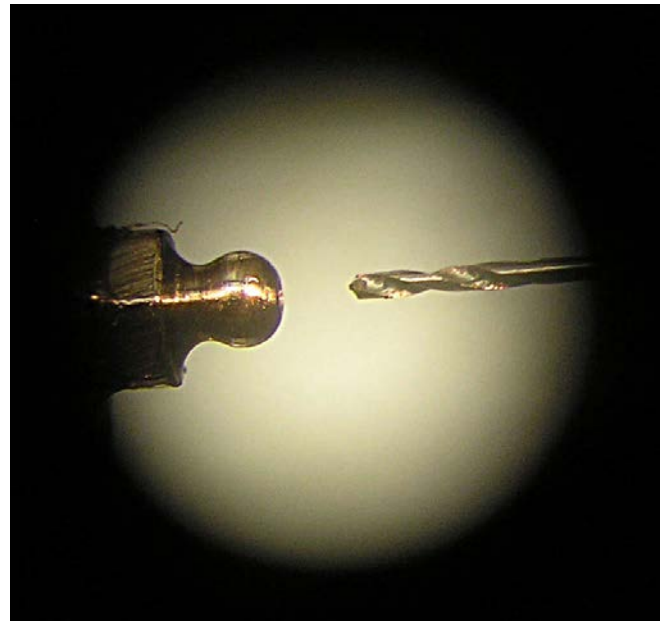


Photo 4 — A view through the lens. Note that the camera does not capture as large a field of view as you would see looking through the lens yourself, and the image is not as sharp as the real thing. This view shows a .035" fitting being drilled with a .0095" (0.24 mm) drill.