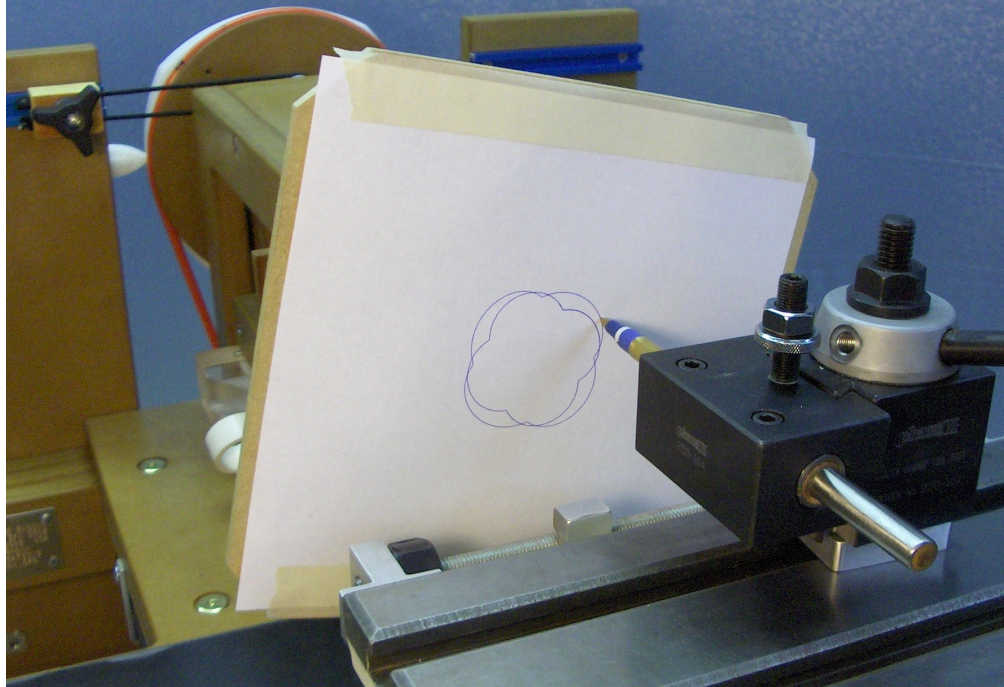
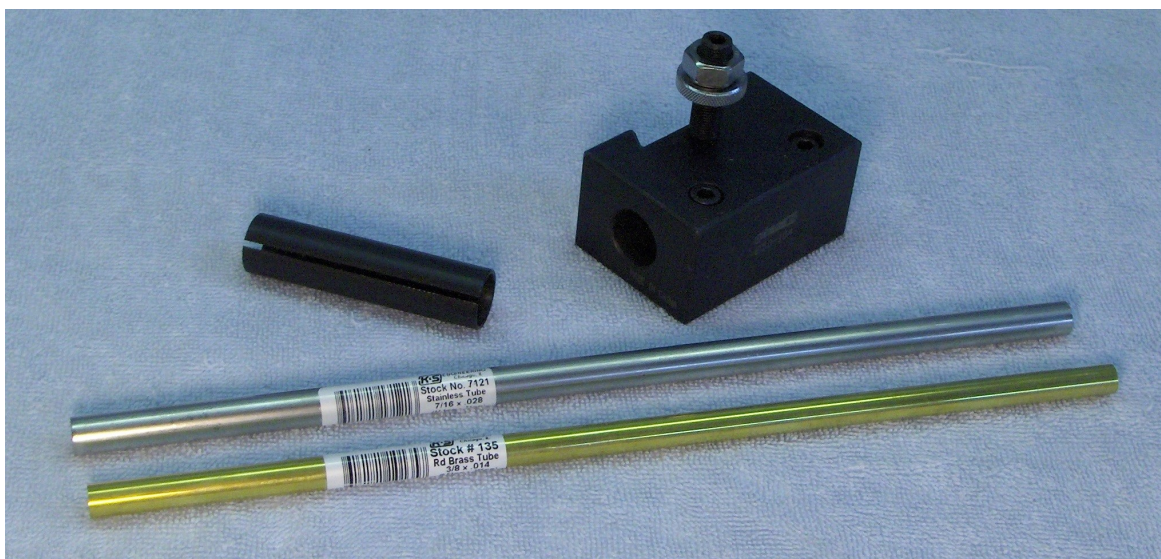


A SIMPLE PEN/PENCIL CHUCK

The pen holder that Dave Arnold described in his “Make your Own Paper Chuck and Pen Holder” article is indeed a fine mechanism. But precision linear slides are somewhat expensive, and sometimes difficult to find. I've come up with a simpler and much less expensive pen (or pencil) chuck that's cheap and easy to make and works with the Phase II QCTP that Jon Magill suggests for use with his MDF Rose Engines.

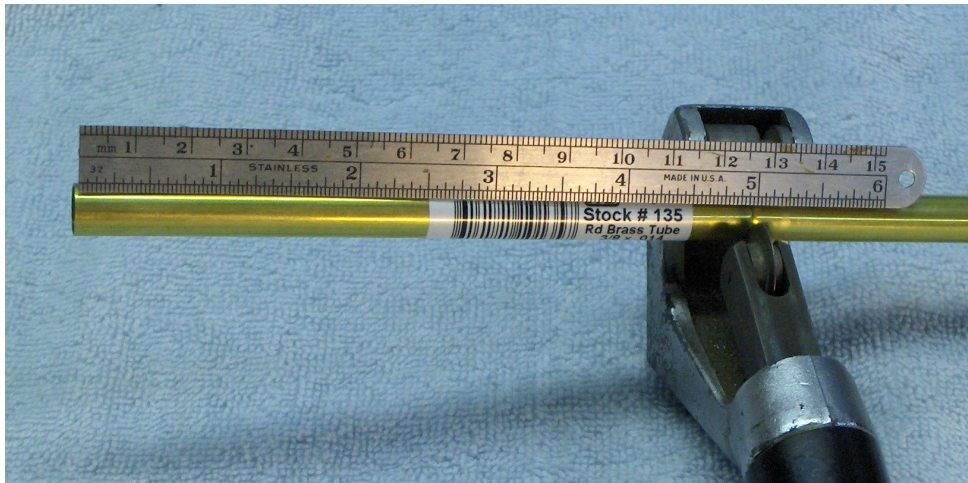
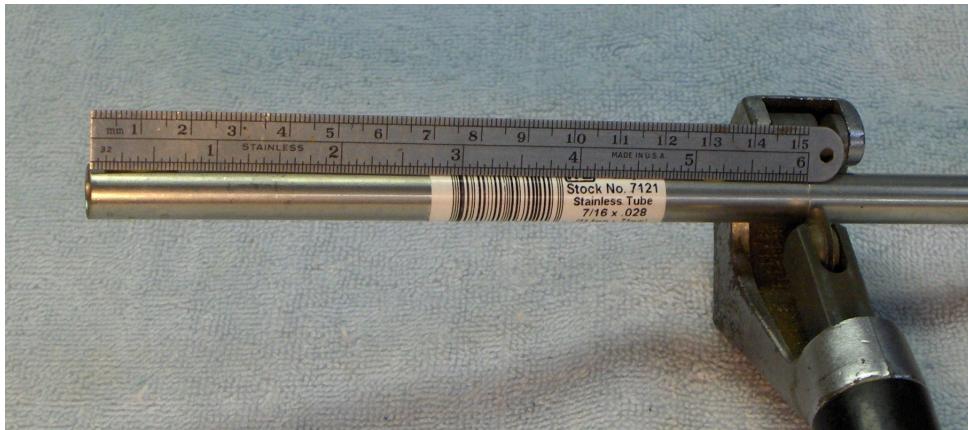


First off, find the steel sleeve that came with the 250-104 tool holder. Then go to your favorite hobby shop and buy two lengths of K&S tubing - one piece of #7121 stainless steel tubing (7/16" OD x .028" wall) and one piece of #135 brass tubing (3/8" OD x .014" wall). My most recent purchase came to \$8.18 for both.



Next, cut the stainless steel tube at about 6" and the brass tube at about 5". I like to use a standard tubing cutter, as the folded-in lip is actually useful (though not essential). You'll have enough tubing left over to make another pen chuck, so you might consider passing it on to a fellow OT'er.

Check that the brass tube slides easily and smoothly inside the stainless steel tube. This is the key to the whole mechanism. If necessary, deburr the ends of the tubes. If one of them gets dented or kinked, it's nearly impossible to repair. Use the leftover tubing.



Then go to your lathe and make the three wood pieces. The first is 5/8"OD and 3" long, bored out to 7/16" or 29/64". I actually use 5/8" dowel rod. The second piece is 3/8"OD (again a dowel rod) about 3/4" long. Drill a small hole (somewhere between 1/16" and 1/8" diameter) through the approximate centerline. The third piece is 11/32" diameter and about 3/4" long.

Find a small compression spring - something under 11/32"OD and about 1" to 2" long. Look for fine wire. If necessary, you can over-extend an extension spring and cut off a suitable section. Tie a length of thread or thin string to one end. Lead this string through the 3/8" plug.



The pen chuck is assembled with epoxy - just about any type will work. After mixing, apply inside the newly cut end of the brass tube, insert the plug all the way through from the other end, and set aside. The lip at the end of the tube will act as a stop for the plug.

Pull on the thread holding the spring, so the spring is held lightly against the plug. Apply some epoxy to the hole and wedge in a toothpick or other small bit of wood to retain the thread. Then glue the plug into the stainless steel tube the same way you did with the other one. The spring should be inside the tube.

Glue the 5/8" wood sleeve inside the steel sleeve.

Once this set of parts has cured, clean off any excess epoxy and cut off the excess thread and toothpick. Be especially thorough cleaning the brass tube. Check it again inside the stainless tube. It should run in and out smoothly, and the spring should push it outward when you release pressure. Note - air resistance will keep the spring from shooting the inner tube all the way out. Also check that the stainless tube can easily be inserted into the wood sleeve. Ream with a 29/64" bit if necessary.

Mix up some more epoxy and glue the stainless steel tube inside the wood sleeve. I like to align the stainless steel tube so its open end protrudes about an inch, but it's not critical. Be careful not to get any glue inside the stainless steel tube. Set the assembly aside to cure, then clean off any excess epoxy.



Now buy a Bic “Round Stic” ballpoint pen. Wrap some masking tape around the barrel near the tip and check that it fits into the brass tube without wiggling. Insert the brass tube into the stainless one. Insert the whole assembly into the 250-104 tool holder and snug up the retaining screws (5mm or 3/16” Allen wrench).

You now have a pen chuck! Note that the inner tube will have just a bit of wiggle inside the outer - but the long supported length of one tube inside the other will minimize the inaccuracy on the paper. If you want a “pencil chuck,” just add a few wraps of tape to a nice sharp pencil of suitable length.



Of course, you'll need a "paper chuck" to go with the pen chuck. Dave Arnold's article tells you how to make a very nice one. If you want something simpler, just glue a piece of round scrap to a piece of 1/4" MDF about 8" square. You might need to bevel the corners about 1" or so, depending on the "swing" of your Rose Engine. Tape a sheet of paper to the front.

Once you mount the pen chuck into your QCTP and the plate into your chuck, you're in business. Keep the pen perpendicular to the paper, so wobble of the MDF plate will not affect the pattern.

- John Herrmann
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