

Aluminum Arrow Pen Tutorial

A Tutorial by:

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This tutorial describes one way to make an arrow pen from an aluminum arrow shaft. Inspired by a project by Turkhunter, it is actually part 1 of a 2 part series. Part 2 will deal with making a pen stand for the arrow pen using a broadhead and a deer antler.

Materials Needed To Make Pen From Scratch (in tutorial there are also some possible alternatives where specialized tools are needed):

- 1 - Slimline pen kit (or Comfort pen kit) – I use chrome, any finish will work
- 1 – Section of Easton XX75 aluminum arrow shaft (size 2117)
- 1 – Section of Easton XX75 aluminum arrow shaft (size 1913)
- 1 – Aluminum Uni-bushing for 2117 arrow shaft
- 1 - Nock to fit uni-bushing above
- 3 – Plastic vanes for arrow
- Medium CA glue (or substitute)
- Baseplate wax (or substitute)

Note: Arrow components can be purchased at a local archery pro shop. The parts (other than pen kits and usual supplies) to make three arrow pens will probably cost around \$20.

Step 1 – Lay out arrow shafts beside brass pen tubes and mark arrow where it will be cut. In the photo below, the 2117 shaft is on top and will be cut as marked (near the ends of the three vanes). The cut by the yellow vane was chosen because it will provide a solid color where the pen will twist (helping hide the joint). The cuts on either side will make the short piece about 1/4” longer than the pen tube and the long piece about 7-3/4” long. These lengths, after trimming and fitting will produce a pen about 11-1/2” long overall. While the short piece must remain the finished length of the brass pen tube, the longer piece may be any length over 2”. For reference, the two slimline pen tubes are shown below the 2117 shaft and a finished arrow pen is shown in two pieces below them.



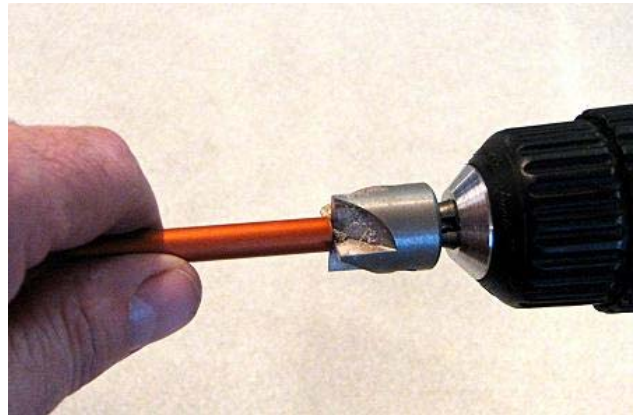
Step 2 – Cut the 2117 shaft in the locations marked. I usually use a shaft cutter that I happen to have from my arrow making days. For this tutorial, I will use a standard tubing cutter used to cut copper water pipes. I expect that a metal blade on a band saw, or a hack saw would also work.



Once the 2117 shaft is cut, mark and cut two pieces from the 1913 shaft. Each of these 1913 pieces should be cut about 1/4" longer than the two brass pen tubes. The 1913 pieces will be used to fill the gap between the brass pen tubes and the 2117 shaft that will become the pen body. In the photo below, the bottom (camo) pieces are from the 2117 shaft, the orange pieces are from the 1913 shaft and the brass pen tubes are above them. Finally, a previously made arrow pen and the tubing cutter are shown above the pieces.



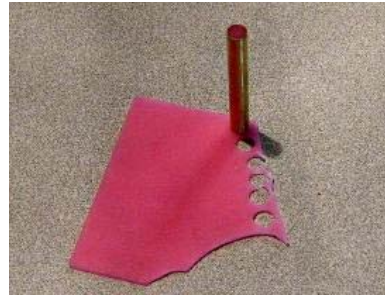
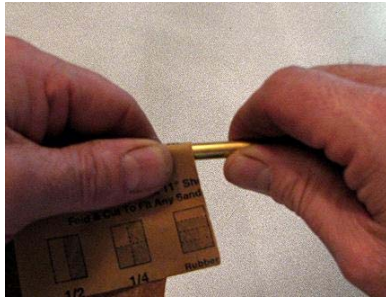
Step 3 – Cutting the arrow shaft in step 2 will leave burrs and ragged edges. If cut with a tubing cutter (as I did here), it will also pinch down the very ends of the shaft. Starting with the 1913 shaft pieces, use a deburring/chamfering tool (shown below left with the 2117 shaft) to remove the inside burrs and open up the inside of the arrow until the brass pen tube will slide into the opening on both ends of both 1913 shafts. Use a barrel trimmer (below right) to square up the ends of the 1913 shaft. Repeat the inside deburring and squaring operations for the two pieces of 2117 shaft.



When the 1913 and 2117 shafts are cleaned up, squared off and deburred, the brass pen tube should slide smoothly into the 1913 shaft and the 1913 shaft should slide smoothly into the 2117 shaft. The shafts were originally cut $\frac{1}{4}$ " long to assure that after deburring and trimming they will not be shorter than the pen tubes.



Step 4 – With a piece of rough (120 grit or so) sandpaper, rough up the outside of the brass pen tubes. Then, using baseplate wax (available from Arizona Silhouette) or by another method, plug the ends of the brass pen tubes so they will not fill with glue while gluing pieces together.

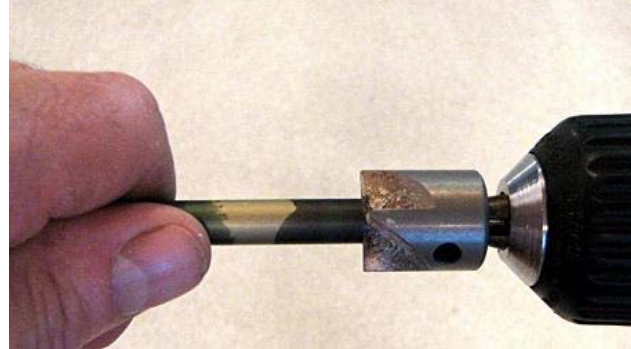
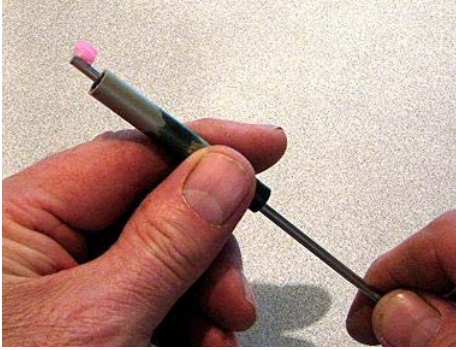


Align the pieces as they will be put together. Remember the center joint on the outside camo shaft should be a solid area if possible to hide the joint when the pen is assembled.



Using medium CA glue (or your glue of choice), glue the brass pen tubes inside the 1913 shafts. Be sure to immediately wipe off any excess glue from the shafts. Wait a few minutes for the glue to dry. Then glue the 1913 shafts inside the 2117 shafts. **Note here that the long 2117 shaft is intended to have the brass tube and 1913 sleeve flush with only one end of the long shaft (after trimming with a barrel trimmer). This end will be the end that slides over the pen transmission when the two sections of the pen are eventually assembled. Because the long 2117 shaft is much longer than the brass tube and 1913 shaft it means that the other end of the long 2117 shaft will be completely “hollow”. This “hollow” end of the long 2117 shaft will not have any internal brass tube or 1913 shaft.** Be sure to immediately wipe off any excess glue from the shafts after gluing. Wait a few minutes for the glue to dry.

Step 5 - Using a piece of coat hanger or other small straight implement, poke the baseplate wax out of the inner pen tubes. With a barrel trimmer, trim the ends of the glued up sections until both arrow shafts are flush with the brass pen tubes (just as you would with a regular slimline pen). Remember that one end of the long shaft has no pieces glued inside and this end should still be square and clean from the work done in step 3.



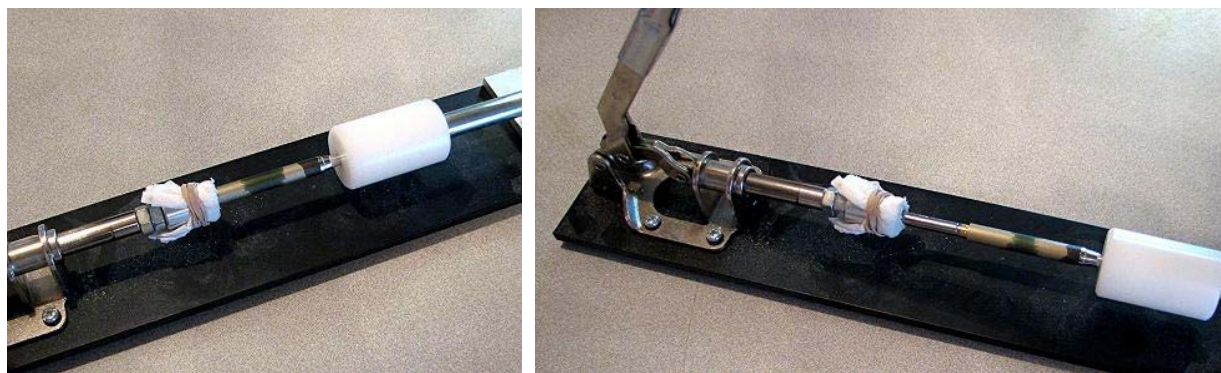
Step 6 – Using a fine sandpaper (I use 400 grit) lightly deburr the outside edges of the 2117 shaft ends. Be careful not to sand too much or you will create a silver bevel area that will show on the finished pen. You just want to remove any burr from the barrel trimming.



Step 7 – Again, using a deburring/chamfering tool, remove any last burrs from the inside of the brass pen tubes. Lay out the parts for pen assembly. Orient the aluminum shafts so the twist joint will be least visible after assembly. For assembly you will also need the pen nib, the refill, the transmission and the uni-bushing that will hold the arrow nock. You may also need a dab of medium CA glue.



With a pen press (or another method), insert the pen nib into the proper (remember orientation above) end of the short section. Then install the transmission in the other end of the short section (as you would normally do with a regular slimline).



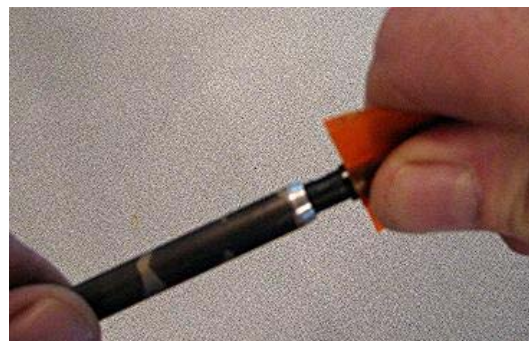
Install the refill in the transmission and the short section of the pen is complete.



Step 8 – The uni-bushing will only fit in one end of the long 2117 shaft –it must go in the “hollow” end without the 1913 shaft and brass pen tube. Place a tiny drop or two of medium CA glue on the small end of the uni-bushing and insert it into the “hollow” end of the long shaft. Quickly press the uni-bushing into place with firm downward hand pressure. Be sure to immediately wipe off any excess glue from the shaft. Wait a few minutes for the glue to dry.

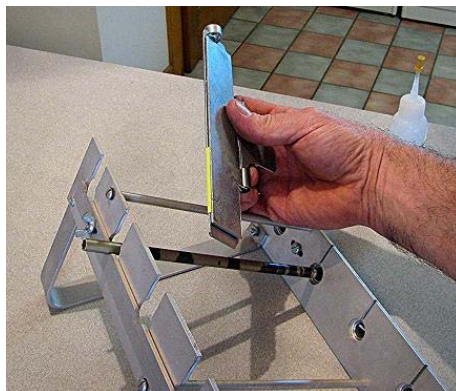
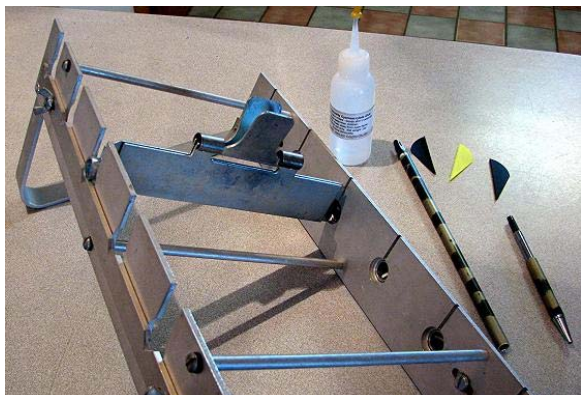


Step 9 – Install the arrow nock into the uni-bushing using a handy little tool available at your archery dealer (or with pliers or a similar alternate tool). The nock is a tight press fit into the uni-bushing **and will insert more easily using a twisting motion.**

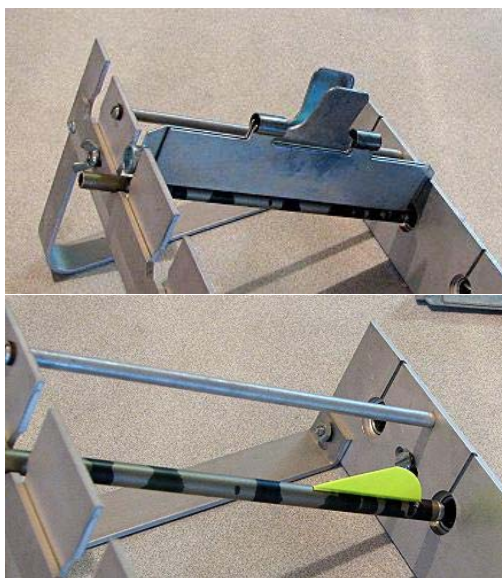
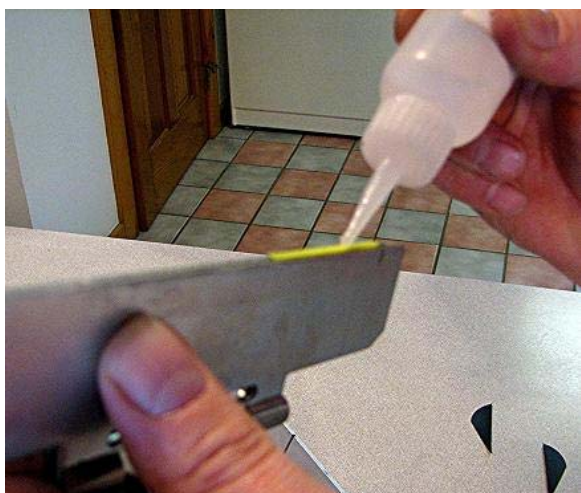


At this point you are ready to attach the vanes to the arrow. I will show you how I do it in “Step 10”. Following that method, I will include a “Step 10 Alternate”, which will allow you to set the vanes without a fletching jig. Since I happen to have a fletching jig that I use in making arrows for archery, my “Step 10” instructions will walk you through that process. If you have (or wish to acquire) a fletching jig – great. If not there are alternatives (including “Step 10 Alternate”). One alternative is to cut your long section from an arrow you bought with fletching already attached. This may limit your choice of vanes (3” to 5” vanes on fletched arrows are most common and I like 1-1/2” to 2” vanes on a pen, but it will work). Also, this limits your pens to one pen per shaft. If you fletch your own, you can get two or three pens per shaft. Another alternative is to find someone who makes their own arrows and ask them to fletch your pen shaft for you. Sportsman’s Clubs, Fish & Game Clubs and Archery Clubs are likely hangouts for guys like this. Or you may know an archer or bow hunter who may be able to help out. A third possibility is to check with a local sporting goods or archery pro shop. These folks often fletch arrows to sell and might accommodate you – especially if you buy your components from them. My fletching jig (shown below) is a Jo-Jan Multi Fletcher that will do six arrows at a time. You can get a Jo-Jan Mono-Fletcher (for one arrow at a time) for about \$40 from Cabelas.

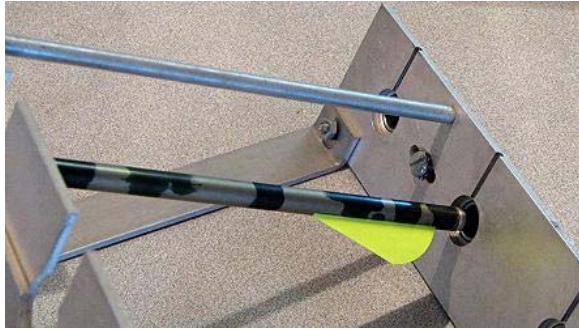
Step 10 – Set up your fletching jig and get out your vanes. You will also need either fletching cement or medium CA glue (which is what I use). Set the shaft in the fletching jig and position the first vane in the clamp.



Apply a thin bead of medium CA glue to the vane and place it in the jig and onto the shaft. Wait a few minutes for it to set up. When dry, carefully remove the clamp. Don't do this on your kitchen counter unless your wife is gone shopping like mine was today.



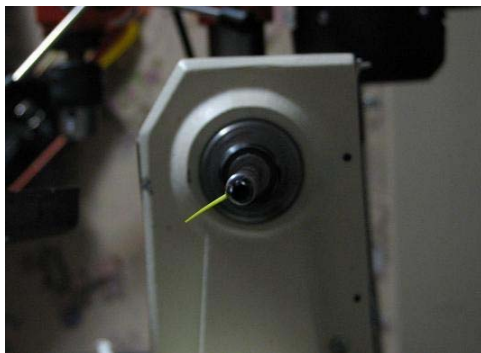
Step 10 (continued) - Rotate the nock end of the jig and repeat vane assembly until all three vanes are attached.



Step 10 ALTERNATE method – This method will make use of your lathe to hold the arrow shaft while you fletch it. You will use the mandrel you use for slimline pen turning (Mandrel A). Remove any nuts, washers or bushings from the mandrel. Move the tailstock of your lathe back far enough to allow you to slide the long arrow shaft section on to the mandrel (in the case of my Jet mini lathe, this means removing the tailstock from the bed of the lathe and setting it aside). Apply a thin coat of medium CA glue to the vane and set it carefully on the arrow shaft at 12 o'clock about ¼" ahead of the uni-bushing that holds the arrow nock. You may have to hold the vane in place for a few seconds while the CA sets up.



Looking at the nock end of the arrow shaft, rotate the shaft on the mandrel until the first vane is at the 8 o'clock position as shown below left. As before, apply a thin coat of medium CA glue to the second vane and set it carefully on the arrow shaft at 12 o'clock. Keep all vanes aligned as best you can about ¼" ahead of the uni-bushing that holds the arrow nock. You may have to hold the vane in place for a few seconds while the CA sets up. Rotate the shaft again on the mandrel until the first two vanes are at 4 o'clock and 8 o'clock as shown below right.



Step 10 ALTERNATE method (continued) – As before, apply a thin coat of medium CA glue to the third vane and set it carefully on the arrow shaft at 12 o'clock. Keep all vanes aligned as best you can about 1/4" ahead of the uni-bushing that holds the arrow nock. You may have to hold the vane in place for a few seconds while the CA sets up. You should now have vanes at 12 o'clock, 4 o'clock & 8 o'clock.



Remove the shaft from the lathe mandrel. Be sure to put any parts removed back on the mandrel and/or lathe (I hate looking for missing parts).

Step 11 – Take the long arrow shaft from Step 10



Or from Step 10 ALTERNATE method



and assemble the two sections of the pen as you would a regular slimline.