

INTRODUCTION TO ARROW BUILDING, PT. 2: TECHNIQUES

PRESENTED BY LORD MUNGO NAPIER ©2019

SHAFTS: Sand your shafts lightly with 320-grit sandpaper to prepare the grain for stain and sealant. Your shafts should next be cleaned with nail polish remover/acetone/lacquer thinner (all the same thing) to remove sanding dust and any residual pitch. Wear vinyl gloves and work outdoors.

Straighten the wood by sighting along the shafts and bending the shaft in the opposite direction of any curves. Do this slowly, and very carefully or you could break the shaft. Shafts can also be rolled under hand pressure on a flat tabletop. No shaft will ever be perfectly straight.

Taper one end of the shaft for the nocks. Use a taper tool to give the correct angle. This tool is similar to a child's pencil sharpener. Some nock brands have a very short cavity. Test fit your first nock for a tight fit. If it isn't tight, cut about 1/16" from the pointed end of the taper and check again.

Measure the shaft to the desired draw length plus two inches, with another 3/4" for the point. The length begins at the "valley" of the nock where the string will rest. Measure twice! Cut the shaft to length using a fine-tooth saw (a hacksaw will work). **DO NOT SAW STRAIGHT THROUGH THE SHAFT!** Make a single stroke and turn the shaft for the next stroke, working your way around until the slot meets the first cut. This will prevent breaking off long splinters on the last stroke. Now gently saw the rest of the way through the shaft.

Taper the point end using the correct slot in the taper tool. Test fit your taper with one of your points for a snug fit. If the fit isn't tight, trim about 1/8" from the tapered point.

SHAFT COLORING: Be as creative as you wish when coloring your shafts. I rarely use paint because it covers the grain, and we will need to see that grain to align the nocks and cock feathers. Stain lets the grain to show through, and is also very attractive. Water-based stains sold for leather come in wild, fun colors. I usually use wood-toned oil stains such as Minwax, Cabot or Zar.

Shafts can be uncolored, a single color, multi-colored, or colored only on the nock end (9-10" looks good) with the point end left bare. The bare lower shaft lets you clean or repair your arrows without having to restrain them. Re-applied stain will never quite match the original. For new loaner sets, I no longer color the shafts at all, though they do receive three coats of sealant.

You can brush on stain, but this leaves heavy streaks. Instead, rub the stain into the wood with a soft cloth. It might take two or more coats to get a deep enough color, especially with water-based stains. Use vinyl gloves, and work outdoors, especially with oil stains. Apply stain to about the first 1/16" of each taper, just enough to be inside the nock or point and not leave a bare ring. Leave the rest of the tapers bare for better glue adhesion. If you are doing a bi-color or half-length design, pull the stain away from the painter's tape to keep it from being forced under the tape and leaving "fingers" of color.

Any bi-color or half-length design will probably require a crestring band to cover the joint and any mistakes. This is usually done with a crestring lathe, and is beyond the scope of this first project. Other possibilities include colored tape, decal stripes, and computer designs printed on special gummed vinyl "paper". Tape and gummed paper will need five or six extra seal coats to smooth down the edges.

Shafts should be sealed with at least three coats of polyurethane. I prefer wipe-on Minwax gloss finish applied with a cloth pad, just like the stain. Once again, do this outdoors and wear vinyl gloves. Minwax also makes a water-based product called Polycrylic, really a super-thick floor wax. Polycrylic is useful for sealing oil-based creting paints, which can be dissolved by the solvents in polyurethane. Once sealed, you can use polyurethane for the rest of your sealing coats, or continue with Polycrylic. Polycrylic is not as durable as polyurethane.

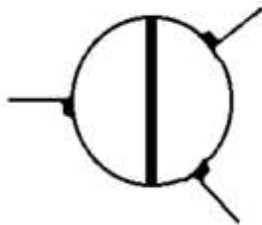
A drying rack is a really useful tool for arrow building. Use a 24" length of 2 x 4. Starting 1" from each edge, and 1" each end, draw two parallel lines. Make a mark on each line every two inches. Drill 3/8" holes at each mark. Make each hole about 3/4" deep. A drill press will give best results, but a hand-held drill also works (though my holes are pretty crooked).

NOCKS: You must align the nock slot so that it is across the grain. The top and bottom of the grain will show on the shaft as long pencil-shaped structures. Note how the nock slot relates to these structures:

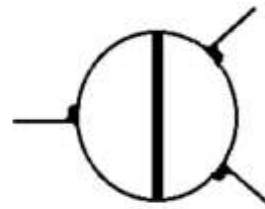


Clean the nock cavities with rubbing alcohol and cotton swabs to remove any mold release compound. Don't bother with cleaning the outsides. Allow the nocks to dry. I usually use Duco Cement. Apply the cement to the taper with a toothpick. Push the nock firmly onto the shaft. With a small piece of paper towel wipe off the excess cement that squirts onto the shaft. Check your nocks in a few minutes. If there is compressed air in the nock cavity, the nock can rise up, causing a weak glue joint and a crooked nock.

FEATHERS: Feathers come in "right-wing" and "left-wing". Right-wing feathers will make an arrow spin clockwise, and left-wing feathers will make an arrow spin anti-clockwise. Despite folklore to the contrary, which wing you choose makes no difference in shooting. The two types should not be mixed on the same arrow. If you wish to use an AAE Fletch III fletching tool like mine (recommended for



RIGHT WING



LEFT WING

beginners) you must buy right-wing feathers because it is a right-wing-only tool. Using left-wing feathers with a right-wing tool will twist the feather against its natural spring, and they may come loose.

Feathers can be any color you like. The *general* convention is that the "cock" feather (the feather at a right angle to the bow) is white or some other light color, and the "hen" feathers will be darker. Both hen feathers can be the same color, or two different colors. What is important is the cock feather should be distinctive to help with proper nocking.

Truflight, Gateway, and Bearpaw all sell high-quality feathers. The brands vary slightly in shape and length, and should not be mixed. Feathers may be "rounded" [aka "parabolic"] or "shield-

back". Both shapes fly equally well. For arrows up to 26", 3" feathers are fine. For 27-28", choose 4" feathers. Arrows above 28" will fly better with 5" feathers. Plastic vanes are **NOT** allowed for SCA use.

FLETCHING: Begin by mounting your arrow in the fletching tool with the side face-up where you want the cock feather. Insert a feather into the clamp. The nock end of the feather should be about 1" from the nock slot to give you enough space for your fingers when you draw (the correct distance is marked on my tool).

I use Bohning Fletching Tape for all my arrows. It is easy to apply, and needs NO drying time. With a bit of practice, you can fletch an arrow in about six minutes. Unroll about 1" of tape and touch it down to the nock end of the feather base. Roll more tape onto the base, keeping it centered, and smoothing it with your finger as you go. When you reach the point end, cut the tape. With a smoothing tool (the back of tweezers works well) press the tape onto the feather base to make sure you have good contact. The color will darken as it is smoothed. Peel away the pink carrier strip, starting at the nock end.

Push the clamp into the holes in the tool base and press it firmly down onto the arrow shaft. Open the clamp and pull straight up. Run the smoothing tool along the feather base five or six times. Press down firmly to seat the feather in the glue. **THIS IS SUPER IMPORTANT!** If you don't press the base down well, the feather will make poor contact with the shaft and may later come loose.

Rotate the shaft and the nock collar a 1/3 turn to bring up the next feather position, and so on.

When all your arrows are fletched, squeeze a shirt button-sized blob of Duco Cement onto a jar lid or other disposable pallet. With a toothpick, apply a dot of glue to both ends of each feather where they meet the shaft. Let the glue dry for 24 hours. This will stop the feather from being torn loose if the arrow blows through a soft target or an archery net.

POINTS: The best points for beginners are PDP brand or similar field points. Buy the diameter that matches your arrow shafts. Generally, for arrows up to 26", a 70-grain weight is fine. Arrows 27-28" can use 100-grain points. Choose 125-grain points for arrows above 28", especially with 11/32" shafts.

Other types of points are allowed in the SCA, including bullets, and "med-heads" or "mod-bods" (the latter two are imitation medieval points). Hand-forged replica bodkin points are allowed, but not recommended because of their weight. Broadheads or any other points with fins are **NOT** allowed for SCA use due to excessive target damage, except in special cases.

Point cavities should be cleaned with acetone and a cotton swab to remove any oil or metal shavings left from the milling process. Let them dry thoroughly. Cleaning the outside is not important.

Mount the points with epoxy the same way you did with the nocks. My preference is 3,980# J-B Weld. Clean any excess epoxy from the shaft with a paper towel. Press the points down firmly onto a wooden block. More epoxy will probably ooze out. Clean again. Allow the glued arrow to dry in your rack in the "points up" position for 24 hours before shooting.

USEFUL TOOLS:

320 Grit Sandpaper or Sanding Block

X-acto Knife

Craft Saw or Hack Saw

Fletching Tool

Taper Tool

Vinyl Gloves

Tweezers

Small Scissors

Drying Rack

Hardwood block (oak works well)

MATERIALS:

Acetone/Nail Polish Remover

Wood Stain

Bohning Fletching Tape

Blue Painters Tape, 3/4" or 1"

Cotton Swabs

J-B Weld 3,980# epoxy

Polyurethane or Polycrylic Sealer

Duco Cement

Rubbing Alcohol

Cocktail Toothpicks

SOURCES:

3Rivers Archery: <http://www.3riversarchery.com/> (shafts, points, feathers, fletching tape, nocks, etc.)

Kustom King Archery: <http://www.kustomkingarchery.com> (spruce shafts, feathers, points, nocks, etc.)

FS Discount Archery: <http://www.fsdiscountarchery.com> (shafts, points, feathers, nocks, etc.)

Lowes, Home Depot, local hardware stores: stains, sealers, glues, sanding blocks

NEED HELP? If you get stuck, or need advice, contact me at sarahsan@embarqmail.com .

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