

TARGET ARROWS WITH MEDIEVAL FEATURES FOR SCA TOURNAMENTS OR PRACTICE

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INTRODUCTION:

The purpose of this class is to encourage building “medieval-style” arrows which meet the requirements of the current SCA period archery rules. To keep this project as simple as possible, I suggest using purchased supplies and substituting modern materials where needed. It is rule compliance we're after, not strict historical accuracy.

Crafting period arrows is not all that different from building our modern arrows, but even if you are not a period archer, you might choose just some of these steps to give your modern arrows a "medieval flavor". For example, you may not be confident in making self-nocked arrows, but might use wooden nocks, "whipped" fletches or faux-medieval points.

Please note that this paper assumes that the reader already knows how to build arrows. The text has been pruned to cover only the period arrow differences.



Arrows from Gerrit van Honthorst's painting of Saint Sebastian, 1623. The self-nocked shafts are crested, some fletches are red, there are both triangular and shield-back fletches, and there is no whipping or nock reinforcement. While past our period, they are probably not much different from a 16th century upper-class archer's target arrows. The artist likely used real arrows as models.

SHAFTS:

It is likely that only a small number of fancy arrows were made for the wealthy to use for hunting or recreational target shooting during the middle ages. The vast majority of arrows were plain wood, without any color or cresting. Arrows were sealed, often with boiled linseed oil or a mixture of melted beeswax and lard (yecch!), both of which gave the shafts a golden color.

In period, shafts were not turned on a lathe as they are today. They were made from square billets, with the edges planed off using a float, then likely smoothed with a rough stone. This left them with frequent flat spots, tool marks, and sometimes not perfectly round. A simple way to suggest hand manufacture is to use wood with a rough and prominent grain like some Sitka spruce shafts. Do not sand your shafts; just clean them with lacquer thinner/fingernail polish remover/acetone, straighten as needed, and move directly to cutting nocks.

Shafts with an 11/32" diameter are best for self-nocked arrows. It is possible to make self-nocked arrows with 5/16" shafts, but this will require more care in their crafting, and the nocks will not be quite as strong as the 11/32" shafts. I have even seen self-nocked 1/4" inch arrows (expertly crafted by a tiny adult woman who shot a child-sized bow), but that isn't something I want to try.

If you are planning self-nocked arrows, **DO NOT CUT YOUR SHAFTS TO LENGTH UNTIL THE NOCKS ARE DONE.** If you blow making a nock on a full-length shaft, there should be enough wood left for one or two more tries. If you ruin a shaft already cut to length, you have just made yourself a rather expensive plant stake.

NOCK REINFORCEMENT:

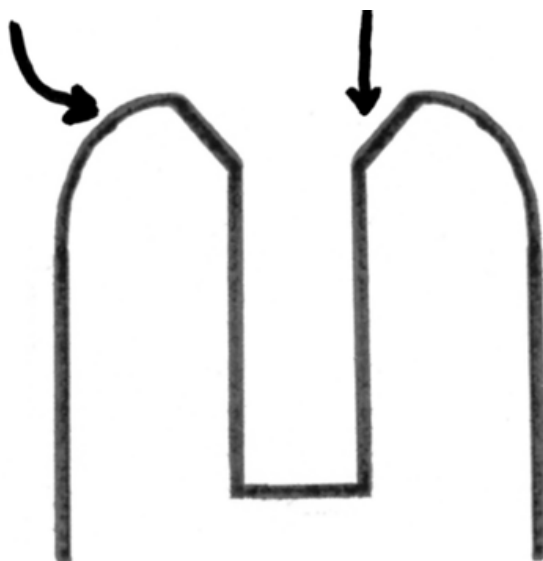
Originally I used thin strips of 100-year old piano key ivory. Even though this was reusing ivory that was legally harvested many years ago, thinking about the suffering of those elephants made me uneasy. So I switched .030" styrene plastic. One of my arrows recently shattered along the reinforcement upon release, so I no longer recommend nock reinforcements. Our sport-weight bows are not powerful enough to require them. Peroid and early 17th century paintings suggest many arrows did not have nock reinforcements anyway.

SELF-NOCKS:

Wrap your shaft with a rubber jar lid opener or other cushioning material, and mount the shaft in a vise. Take care not to crush the shaft in the jaws. Make your initial cut across the grain using a hacksaw or other fine-fine bladed saw. It should be 1/4 to 5/16" deep, just deep enough to comfortably take your string. Deeper nocks only weaken the nock prongs. Widen the cut with a larger saw, and finish with a hobby knife and fine files. A round ("rat tail") file is very useful here. Check your nock frequently on a strung bow. With a flat file, remove a small amount from the square edge around the shaft end to prevent splintering. Also remove about 1/32" at a 45-degree angle from the mouth of the slot on each side. This will give you a funnel shape at the nock mouth that will guide your string into the slot. Smooth everything up with fine sandpaper.

ROUND OUTER EDGES

45° NOCK MOUTH



GLUE-ON NOCKS:

Some period paintings suggest that applied nocks were indeed used in our period. These were probably carved from horn or bone, and I know of no source for these. 3Rivers offers glue-on hardwood nocks which the Society DEM for Target Archery has approved for period shoots. No plastic nocks of any design are legal at SCA period shoots, including Royal Rounds when scores are recorded in the "Period Handbow" category. Arrows with plastic nocks are allowed with period bows if scores are recorded in the general "Recurve" or "Longbow" categories.



Another Saint Sebastian painting, this by Andrea Mantegna dating from 1506. Note the applied nocks, possibly of bone or horn. Saint Sebastian paintings are a goldmine of information on period arrows.

SEALING:

I use Minwax Satin Wipe-On Polyurethane. You could substitute water-based Minwax Satin Polycrylic, similar to thickened floor wax. Polycrylic is not quite as tough as polyurethane, but does clean up with water. With a soft cloth I apply three coats, allowing a 24-hour drying for each coat. Make sure to coat the inside of the nock slot. Remember that you are putting three coats on each side of the nock interior, which will equal six coats vis-a-vis the width of the nock. Make sure the sealant in the nock slot doesn't become so thick that it grabs your string when releasing.

FLETCHING:

According to Roger Ascham's TOXOPHILUS (1545), the proper fletching colors are a black or gray cock feather and two white hen feathers. These are the colors of the lag goose, widely raised in medieval and Tudor England. This isn't much of a color pallet, but we can expand our choices to natural barred, gray barred, and brown barred fletching, representing feathers gathered from pea fowl, pheasants, or kept birds of prey. While slightly out of our era, Gerret van Honthort's 1623 Saint Sebastian painting shows some arrows with red fletches, so I see no reason you cannot use any color you like (well, maybe not hot pink!). Honthort's fletches are a mix of shield-back, square-back and swallow-tail (the latter not shown the partial view presented above).

Fletches on my arrows are usually adapted from TruFlight 5" or 5 1/2" shield-back feathers. Commercial shield-back feathers have a slight "Roman nose" curve (see below), but this will hardly be noticeable. If it bothers you, consider cutting your own fletches from full-length feathers. On my most recent arrows, I hand cut adolescent peafowl feathers, a lovely dark mottled orange seen only on the male birds' first molt. It took me nearly a year to track down enough right wing feathers for a dozen arrows, but was worth the effort.

You may choose from among a "traditional" (swallow-tail), a simple square-end triangle shape, a shield-back cut or even parabolic, all of which can be seen in contemporary illuminations or paintings. If you plan to whip your fletching, when cutting the feathers be sure to leave about 1/4" of bare feather base on the nock end. This

tab will be needed if you choose to tie down (“whip”) the feathers in the next step. If you are using “traditional” swallow-tail feathers, mount the fletches 1/4-3/8” closer to the point end of the shaft to give you some extra finger space when drawing.



Making a swallow-tail feather for whipping from a 5" commercial feather. Cut through the base at 1. Shave off the barbs to the right of line 2.

Your feathers may not turn out to be exactly the same length, and this can cause problems with the whipping step. Match your feathers by length into groups of three as closely as possible, and make sure the pointy ends are aligned at the same distance from the end of the shaft.

Glue your feathers to the shaft using your favorite materials and methods. I use an AAE Fletch III fletching tool, which will accept a self-nocked arrow in its rotating collar (some other fletching tools may not take self-nocked arrows).

I prefer Bohning fletching tape over glues. This tape is easy to apply, and needs no drying time. Fellow archers have complained that fletching tape does not hold well, but after over 4,000 fletches with Bohning tape in 12 years, I have had just ten or so feathers fail. The secret is making a good bond between shaft and the fletching. While still in the clamp, I use a smooth flat tool (like the back end of tweezers) to push the tape firmly onto the feather base. The tape color darkens as it is smooshed down. Only when the color is uniform do I peel off the carrier strip. After mounting the fletching and removing the clamp, I carefully run the tool along the small feather base side extension about five times with firm downward pressure to make sure the glue makes good contact between the feather and the shaft.

My experience with the similar Bear Paw fletching tape was a disaster. I made about 60 modern arrows in a large batch project for our loaner kit. Within two months, nearly half the fletches had raised up from the shaft. I removed and reset all the fletches with Bohning tape, and have had no further problems. I do not recommend Bear Paw fletching tape.

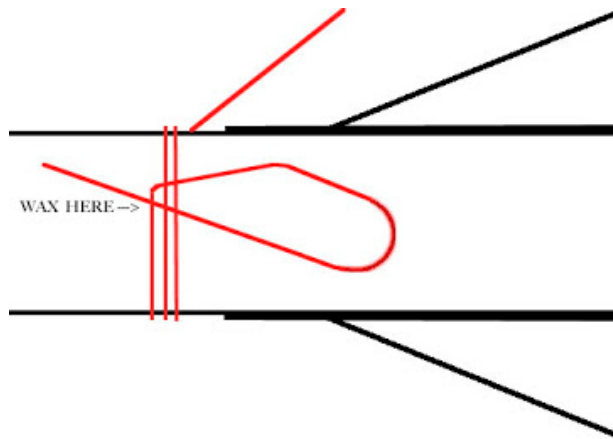
WHIPPING:

Binding (or "whipping") the fletches onto the shaft is not hard, though it does take a bit of practice and more than a little patience. The effect is worthwhile, since nothing says “middle ages” more than a whipped arrow. Cord can be colored if you wish (red or green are mentioned in contemporary sources), or you could choose undyed linen. Initially I used jean-weight sewing thread, and have also tried real silk. Neither lasted long. Now I use nylon serving cord, which is more robust. Remember, if the cord ever breaks or starts to unravel while shooting, that arrow must be taken out of service until repaired.



If you are right-handed, it may be more comfortable wrapping anti-clockwise. Lefties can wrap clockwise.

Snip off about six feet of cord. Begin wrapping at the point end of your feathers using the knot shown in the illustration below (left handers need to make a mirror image). Place a small blob of bow wax where the cord first crosses itself to hold the loop in place until you begin wrapping. Make four or five wraps at the front end of the feather, then work your turns up onto the sloped feather base.



The cord end to the left is the "bitter end". The "working part" (top) will eventually go through the loop on the right. Then the two ends are pulled against each other to cinch the knot tight.

About 1/8-3/16" is all the wrap you will need. Before you begin spiraling the thread up the shaft, stop for a moment. Draw the "working part" of your cord through that loop you left hanging out. Next pull the "bitter end" (sticking out where you started) and the working part you just threaded through the loop. This will cinch the loop around the thread under the wraps tight to prevent unraveling.

If you wish to stop here and not do the spirals, skip ahead to the needle work mentioned below to finish your wrap. Snip off the cord about 1/2" from either side of the wrap. Now repeat this knot and wrap on the nock end of your fletches.

Otherwise, begin spiraling your cord up the shaft, working it into the barbs as you go and rising about 1/16" with each feather. The actual space between each full wrap of the cord should be about 3/16" from the last. This will give you approximately five turns to each inch of shaft, the proper English military whipping. Any less than four turns will look barren, and more than six turns will look excessive (and is a waste of effort). The width between the wraps tends to grow wider near the nock end, and may take several tries to find the right place between the barbs. The cord should rise in an even spiral, but if you get an uneven spacing, it isn't too much to worry about. You can unwrap the cord back to where you went wrong and try again if you wish. Finish the whipping by wrapping the cord around the small feather base tab you left at the nock end of the feather. To secure this last part, thread on a small curved needle and make two knots around the last two or three wraps. Pull each one tight. Cut off the excess at both ends of your cord, except for about 1/2". You will trim this later. I no longer make a wrap around the arrow shaft below the nock (as seen in the photo above of the two arrows). This added nothing to the nock's strength, was an irritation to my fingers when drawing, and often unraveled.

MORE SEALING:

Only seal the whipping at the end wraps. Flood the wraps with cyanoacrylate cement ("Crazy Glue", or similar), making sure the glue seeps down between the threads. Work the glue up onto those tag ends that were left hanging out. This step turns the whipping into one hard mass that rarely comes apart. When the sealant is dry after 24 hours, snip off the little tag ends of cord slightly above any exposed knots. Do not cut right on the knot, which might cause it to unravel.

POINTS:

Finish up by applying the points. Use your favorite method. I prefer to mount my points with J-B Weld gray two-part epoxy. It is rated for 3,980 pounds, one of the highest strength epoxies available for home use. J-B also makes a 5,000 pound epoxy, but this is difficult to find.

Points should be appropriate to the shaft size and arrow length. Most of us will use 100 or 125-grain points on 11/32" shafts. Some specialty points like hand-forged medieval replicas and the 3Rivers Archery "long bodkin" are in the 200 grain range, too heavy for target bows.



(From left): 3Rivers short bodkin, Ace Classic point, Bearpaw Modkin, generic med-head.

3Rivers sells short medieval bodkins, and Ace Classic Medieval Points, both 125 grains for 11/32" shafts. Due to the large surface area on the trailing edge of these points and their thick sockets, they are prone to popping off in targets. I do not recommend these points.

My current favorite points are Bearpaw-brand "Modkins", available online from the Longbow Shop in England. These come in 100 and 125-grain weights for 11/32" shafts, and 65 and 100 grains for 5/16" shafts. Their streamlined design makes them easy to pull from a target. These points are like nothing actually made in the middle ages, but they have a very cool look. The Longbow Shop also sometimes offers generic "Modkins" (also known as "Med-heads" or "Mod-bods").

They are slightly less streamlined than the Bearpaw points, and I have had a few catch in targets. I have also tried blackened steel bullet points, again from the Longbow shop. These are similar to period practice points in the Museum of London collection. They are available as both glue-on or with threads. 3Rivers and the Longbow Shop both sell similar brass bullet points in glue-on and threaded varieties, though I think they are a bit flashy for medieval arrows (before going period, these were my favorite points for modern arrows). Screw-on points usually require a special tool to mount them on the shafts, and I recommend epoxy for all screw-on points.

The Longbow Shop always ships by air to the US. One of my shipments was rerouted by sea, taking 90 days to arrive. It came with a large orange sticker bearing an official heraldic device and said, "Her Majesty's Customs Service has determined that this packet contains weapons or parts of weapons, and it has be rerouted to sea-mail". Yeah, like I'm going to start a war with 60 faux-medieval target points! I wish I had thought to save that sticker. No other orders have been diverted.

If you aren't comfortable ordering from England, the good-old PDP field point is the default choice. Under Society-level rules, field points are allowed on period arrows.

SUGGESTED SUPPLIERS:

The Longbow Shop: www.thelongbowshop.com. Various faux-medieval points.

3Rivers Archery: www.3riversarchery.com. Arrow shafts in various woods; TruFlight feathers; AAE Fletch III fletching tool (right wing only); Bohning fletching tape; serving cord; hardwood nocks; mounting tool for screw-on points.

Kustom King Traditional Archery: www.kustomkingarchery.com. German spruce arrow shafts by the dozen; TruFlight and Bear Paw feathers; Bohning fletching tape.

Lancaster Archery Supply: www.lancasterarchery.com. German spruce arrow shafts sold by the each price. Each pricing is nice when you want to build more or less than a round dozen arrows.

Lowes, Home Depot, or other hardware/paint store: Minwax Satin Wipe-on Polyurethane; Minwax Satin Polycrylic; J-B Weld epoxy; acetone/lacquer thinner (though it usually comes in larger containers that are not easy to pour from).

Drug store or supermarket cosmetics section: Fingernail polish remover (get pure acetone, not a brand with aloe or vitamin E).