

REED MAKING PROCESS

Ashley Rollins

1. Tying on.

- a. Soak cane, at least a half hour. Sinking is a good sign, but not required.
- b. Put staple on mandrel. Measure to be sure it's 47 mm and you know its exact length.
- c. Tie thread onto a solid object like a c-clamp, table leg, or chair leg.
 - i. You can use either a fancy knot (make 2 untightened normal knots, then put the thread down through the first and back up through the second), OR just do like 5 normal knots.
 - ii. Pull HARD on the spool to make sure the thread is secure and won't unknot while you tie.
 - iii. Unwind the spool to arm length and run the wax up and down it a couple of times.
 - iv. Then wrap the spool back up close and set it down while you grab the cane.
- d. Take the cane out of the water and overlap it slightly to the right.
- e. Put the cane evenly on the staple, lined up with the flat part of the oval, and measure, holding the cane still with your non-dominant hand.
 - i. You're probably looking for about 73 mm, though it depends a bit on the cane, shape, and staple opening. If you struggle to get the sides to seal, try tying the cane on lower.
 - ii. As you adjust the cane, try to keep it centered on the staple and straight up and down.
- f. Set down the ruler and grab the thread with your dominant hand. Keep the spool tied close. Make sure the fingers holding the cane are at least a couple of millimeters below the top of the staple.
 - i. (Note that some left-handed students do prefer to tie right-handed; that is not the case for scraping, where students should definitely use their dominant hand for the knife.)
- g. Start wrapping above the fingers holding the cane, going up, a few millimeters below the top of the staple.
 - i. KEEP BOTH STRINGS (the spool one and the one with the knot) PULLED TIGHT AT ALL TIMES.
 - ii. HOLD THE SPOOL, NOT THE THREAD. Guide the thread with your thumb as you tie.
 - iii. Tie in smooth, even, close loops.
 - iv. The spool will go over the thread attached to the knot, NOT under. If this is difficult, change the angle of your reed hand.
- h. After a few wraps, check that the cane is about equally far along to sealing on each side, and that it's straight, and that the overlap is still setting correctly.
 - i. If not, loosen both strings slightly, adjust, and then tighten both ends again.

- ii. Always re-measure after moving the cane, and continuously check for straightness.
- i. Continue wrapping until you get to the top of the staple, likely 47 mm. Measure to be sure; do NOT go over at any point.
 - i. CHECK THAT THE BOTTOM SIDES OF THE CANE COME TOGETHER TIGHTLY ON BOTH SIDES, SO THEY'LL SEAL. Sometimes there's a small gap at the top, but there should NOT be any gaps near the thread at this point.
 - 1. If there are gaps, loosen, adjust, tighten, re-measure, check for straightness, etc., until they seal; you may at that point have to lower the cane height.
- j. Start going down.
 - i. Remember the spool still always goes OVER the thread going to the knot, never under.
 - ii. Keep both strings very tight.
- k. When you get to or near the bottom of the staple, tie it off with several knots (at least 4-5).
 - i. Double check everything before making your knots (sealing, overlap, measurements).
 - ii. To make the knots:
 - 1. Spool in reed hand.
 - 2. Grab the thread between the spool and reed with your tying hand and flip it over to make a knot.
 - 3. Slip it over the top of the reed, use your reed hand's first finger to hold the knot at the bottom of the thread. Pull the spool firmly to tighten the knot.
- l. Use your razor blade to cut both threads.

2. Scraping the reed.

a. Set the back. Long scrape.

- i. Start a few millimeters above the top of the thread, and do a LONG SCRAPE from there off the top of the reed.
 1. Make sure you're scraping one of the four sides, and not directly in the middle or randomly going back and forth.
 2. Maintain the rails and spine! The rails especially, which should be bark; the spine only needs to be a bit thicker than the rest, so it's better to risk the spine than the rails.
- ii. LONG SCRAPE:
 1. It's essential to maintain a consistent 90 degree angle the ENTIRE way on this type of scrape.
 - a. Remember the burr is taking the cane off; we're NOT trying to carve or cut.
 2. This scrape is done mostly with the reed hand – the knife hand should be quite still.
 3. Try to keep the reed-hand thumb on top of the knife as you scrape, but pushing more forward than down (avoid excess downward pressure).
- iii. Do this until you've gotten through the bark and what's under it on each of the four sides. The cane should begin to feel flat under your fingers.

b. Set the tip.

- i. Measure and draw.
 1. Measure 66 millimeters from the bottom of the staple (if you had to tie on much shorter than 73, maybe 65). Draw a line there
 2. Draw a line across the reed at that point. Double check that it matches the measurements on both sides
 3. Draw a triangle with that line as the base, a couple of millimeters tall (do NOT draw it all the way to the top of the reed).
- ii. Scrape.
 1. Start by setting the knife on the angle of the triangle. Scrape all the way off the top. Repeat this many times, being sure you always get all the way down into the bottom outside corner.
 - a. Remember there are no rails on the tip. The outside edges should be thinnest.
 - b. If the pencil drawings disappear before the definition is clear enough to see with certainty without them, redraw the lines.
 2. Once you're well begun, you can add in some BRUSHY STROKES.
 - a. Brushy strokes are done mostly with the knife hand. Start with the knife a little inside of the 90 degree angle you've been using, and turn the wrist to go slightly past it.
 - b. This is a fast but short stroke. Don't try to cross too much ground with each brush.

- c. Do start the brushing motion at the bottom for increased definition, then gradually move it up until eventually it's going off the tip. As you move up, remember that you should do even more strokes as you go further towards the tip of the reed. This works a bit like getting a knot out of hair or sweeping a room.
 - d. This stroke can really help if you have a divot, especially if you alter the left/right angle as you approach it so you're continuously hitting it from different weak points.
 - e. Continue to keep the reed-hand thumb on top of the knife, but without pushing down hard.
 - 3. When scraping the side opposite your dominant hand, remember to use both hands to help you reach – you can turn the reed hand and reed arm as well as the knife hand/arm, and you can alter the angle of the reed with your pinky.
 - iii. Do this until you can clearly see the definition on each of the four sides and the cane at the tip is noticeably thinner than the rest.
 - 1. Remember that the thinnest parts of the tip will be the top and the outsides, but avoid going so far on the outsides that you scrape them off.
 - c. Windows.
 - i. Measure 61 millimeters from the bottom of the staple (if your tip was at 65, maybe 60). Draw a line there.
 - ii. Scrape with a LONG SCRAPE from the bottom of the back up to the line.
 - 1. Stop right on the line every time. It will create a significant divot, and that's fine.
 - 2. Continue to avoid the spine and ESPECIALLY the rails (the rails need to keep the bark, though they can be very narrow).
 - iii. Do this until you can just see a notable difference between the thickness at the top of the windows and the thickness of the heart when looking through the backlit reed.

3. Clipping and finishing.

a. Clipping the hinge

- i. Soak the reed for several minutes. It is essential that the cane be soaked for this step to give it some resilience against cracking.
- ii. Get your cutting block and a sharp razor blade.
- iii. Set the reed tip gently on the cutting block with the reed at an angle. The side facing up will end up shorter.
- iv. Set the razor blade JUST past the hinge (better to clip too little than too much) and push it down hard until you're sure you're all the way through the cane.
- v. Look at the opening to check that you're all the way through the hinge. If not, try again. You may be able to crow the reed at this point

b. Thinning the tip

- i. Put the plaque in the tip, no further than necessary to support the entire tip (down to the very bottom corners).
 1. Avoid letting the reed dry out with the plaque in it or pushing the plaque all the way in to reduce the risks of spreading the sides apart with the plaque.
 2. Never put a plaque in a dry reed.
 3. The plaque will get moved around as you go. Continue to readjust it so that the part of the tip you're scraping stays fully supported, and also so that your knife can reach everywhere.
- ii. Continue to thin the tip, especially the top and outsides of it, until the top and outsides are quite see-through when against the plaque.
 1. Remember you're aiming for 1-2 micrometers on the top and outside border, but more like 10 micrometers in the middle of each side of the tip, and of course a thicker triangle in the middle.
 2. Use some long strokes and A LOT of brushy strokes, always getting all the way off the edge of the tip.
 - a. This does mean you'll hit the plaque periodically and need to sharpen your knife as this dulls it, though you can prolong the time between sharpening by changing up the part of the blade you're using as you go.
- iii. Once all four sides of the tip are thinner (about 10 micrometers in the middle of the tip, 1-2 on the outsides, the reed should crow. Now it is time for Finishing.
 1. Crow regularly to get information on the reed and what it needs.
 2. Read and use the adjustment guides.
 3. Look for anything particularly asymmetrical and try to improve that, but also don't risk quality of sound for quality of appearance.
 - a. Be careful that the heart didn't end up too long due to too-high tip bottom corners or too-low top of windows. A long heart will really slow response.

- b. Look especially for random extra wide or thick parts of the spine going into the heart, or of the sides of the heart near the rails.
 - i. While fixing these, be careful not to go too far in scraping the heart, as that can drop pitch and destabilize tone very quickly.
4. You will probably need to thin the triangle/blend from the heart into the tip as you finish, but be careful – this adds response very fast, but also lowers pitch and makes tone wilder.
5. Note that every time you clip the reed, the pitch will go up and the response/resistance will get harder, so scraping the reed to the point of being a bit flat and wild is a good thing when you still have room to clip.
 - a. We did NOT previously clip the reed all the way to finished length for good reasons.
 - i. Every reed is different, so we want to finish the reed based on the crow.
 - ii. You will end up clipping more off as your scraping drops the pitch. Remember to always go in small bits – you can always take more off, but there’s no undo button.
 - iii. You are likely to make some mistakes and lose some of the tip corners at the top. Remember that as long as these are high enough, you’ll likely be clipping them off.
 - iv. As you clip, you’ll want to pick the side with the most damaged tip to be shortest. If they’re about the same, choose whichever side of the tip looks like it is longer (lower bottom corners) and/or thinner.
6. We eventually want the reed to crow between B-C with at least two audible octaves and good response, but remember that this will also change as you ‘break the reed in’ by playing for a few hours. It is often beneficial to leave the reed just a bit flat, hard, and a hair wild, especially if the tip opening is fairly large.
 - a. If the tip opening is large, you may want to try squishing it.
 - i. Always be sure the reed is WELL soaked first.
 - ii. Squish the tip shut first. You can either just hold the tip shut for a few minutes or try squishing the middle as well.
 1. If squishing the middle, hold the tip shut the entire time you do so, and STOP if you feel excess resistance, especially on a new reed that may still have thick windows.