

# Flute Binding

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Woodwinds crack. It's a fact of nature that almost any wood flute and particularly any bamboo flute will, sooner or later, develop a crack.

This handout describes a technique for binding flutes using a length of string and a special knot-tying technique. You can bind your flute to prevent cracking (especially on bamboo flutes) or as an emergency repair.

Bindings are particularly important if you live in a low-humidity environment or use central heating in the winter.

**Note: You must use some form of eye protection when using this technique. There is a risk of the string breaking and damaging an eye.**

## Materials

You'll need:

- Thread.
- Masking or painter's tape ... something that will not damage the finish of the instrument.
- Needle nose pliers
- Cuticle scissors or a sharp knife or razor blade
- A 16" long or longer dowel

When learning to tie bindings, thicker thread is easier to work with. Bonded thread is an advantage since it does not unravel. For a better look and better performance, thinner thread is preferable. Thinner thread is at least as effective as thicker thread, since you get more wraps on the body of the flute in the same space.

Thread should be high strength for its diameter. It should also be at least slightly elastic, but not highly elastic. You can use waxed thread, but only if you do not wish to apply a finish to the binding. Waxed thread will reject any form of finish.

Here are some thread types that have been recommended:

- Nylon Upholstery Thread - commonly available at sewing, craft, upholstery suppliers and leather working stores in basic colors. Mail Order: Van Dyke's - <http://www.vandykestaxidermy.com/>.
- Nylon Rod Building/Wrapping Thread, size D or E (heaviest) - available in a wide variety of color choices from fishing rod building suppliers or fishing stores. Mail Order: Clemens and Angler's Workshop - <http://www.anglersworkshop.com/>.
- Bainbridge Hand Sewing/Whipping Thread - for sailmaking, white color. This is actually relabeled Hemingway and Bartlett "Dabond" polyester bonded thread in size V69. Mail Order: Boater's World <http://www.boatersworld.com/>.  
Manufacturer/Distributor Contact: [info@bainbridgeint.com](mailto:info@bainbridgeint.com).
- Nylon Thread for Fishing Nets - available at commercial fishing supply retailers. Nylon thread from your neighborhood hardware store is also usable, but it is most likely not bonded, so it will unravel easier. Best if you want to have a rougher looking binding, since it is available in larger diameters Mail Order: Jann's Netcraft - <http://www.jannsnetcraft.com/>.

## Locations for Wraps

There are no hard and fast rules. It is nice to have an even spacing, and for all wraps on a flute to be the same width/number of wraps. Flutes tend to crack more frequently near the mouthpiece/breath hole. Native flutes almost always crack in the slow air chamber.

Bamboo flutes should be bound as close to the nodes as possible. A binding is also an opportunity to hide a blemish on the surface or finish of the flute.

It is key to consider how you hold the flute, and whether the wraps will interfere with playing.

## Wrapping Technique

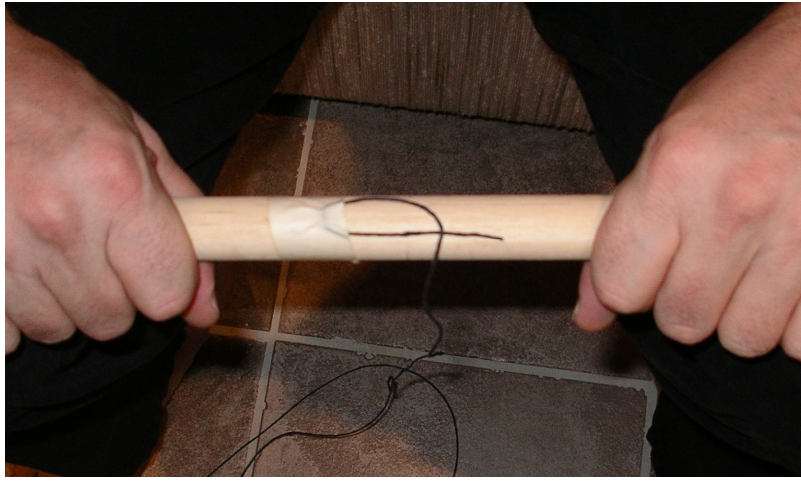
It's a good idea to try several wraps on a scrap piece of dowel or PVC pipe before trying it on a real instrument.

You don't need to pre-cut a length of thread - you can use a minimum amount of thread with this technique:

1. Choose the location of the binding, and where you want the "knot". The knot will actually be underneath the binding, but does appear as a surface "bump" on the binding, so it is best to locate the knot on the back of the flute.
2. Unroll two feet more thread than your height. If you are 6 feet tall, unroll 8 feet of thread.
3. Wrap about 2 feet of thread farthest from the free end around the center of a wooden or PVC dowel that is at least 16" long. Place the dowel on the floor and put your feet to either side of the center of the dowel. You should now have enough free thread to match your height. You should be set up like this:



4. On the side where you want the knot, run about 3" of string lengthwise along the body, make a 180 degree loop and run the string back parallel to the first 3" of string. Place masking tape over the loop portion of the thread:



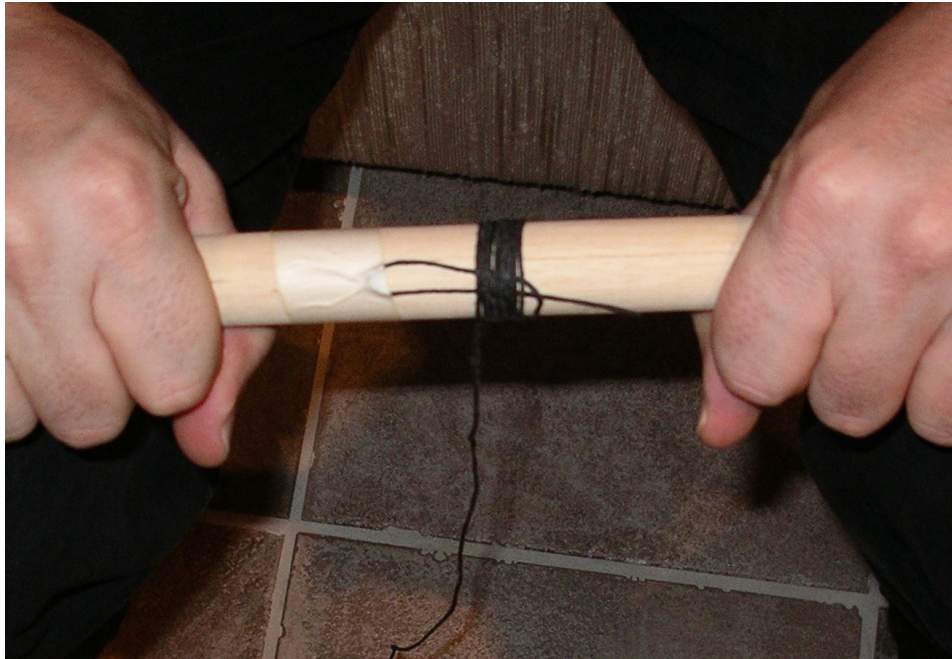
5. Stand up with your feet on the lower dowel and holding the flute in your hands. Begin wrapping the flute so that each new wrap lines up parallel to the previous wrap:



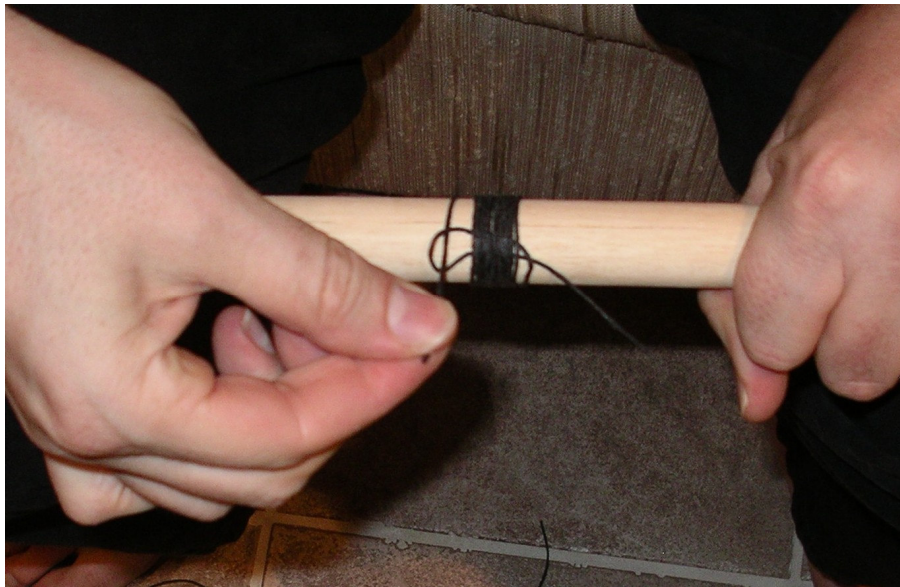
6. You will be wrapping the flute down toward the floor. This setup is designed to allow you to provide significant steady tension on the string. At first, you can only apply light tension, but after a few wraps you can begin applying more and more tension, till you get to 6-7 wraps when you can apply full tension. For demonstration, it looks like this:



7. ... but in reality you should be lining up each wrap right next to the previous one with no space. It should really look like this:



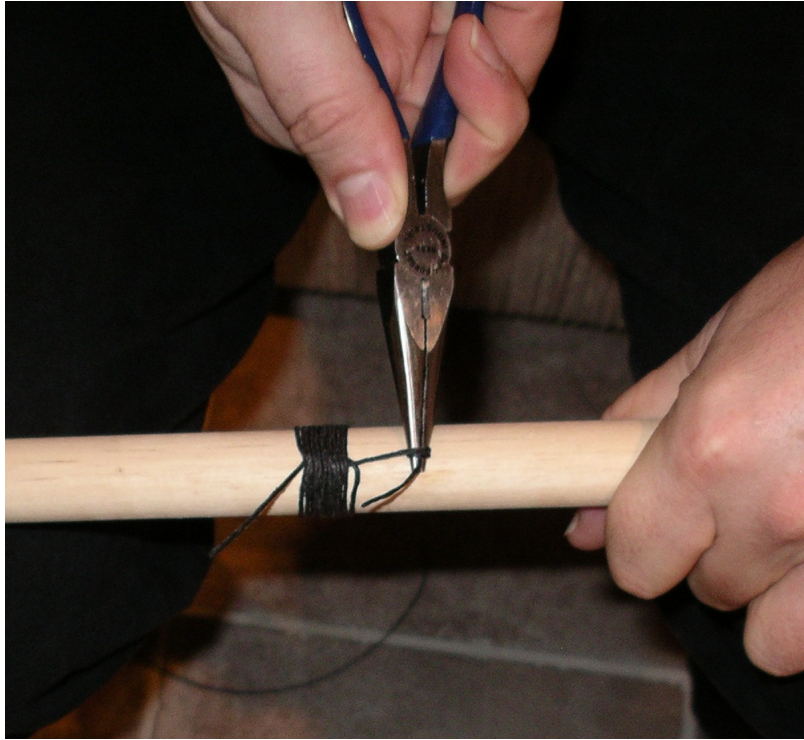
8. After you've taken the right number of wraps ... 12-15 is usually a good number ... cut the string off fairly short, remove the masking tape, and thread it through the loop that the masking tape was holding:



9. It should look like this:



10. Take a pair of needle nose pliers, grab the free end of the string on the opposite side from the loop, take a few wraps so the string does not slip, and pull the string with a firm, steady pull. Pull to move the center of the knot into and under the center of the binding. Other than the overlap, there is no real knot to fasten the ends of the thread - they are held in place by the tension of the wrap itself:



11. Take small scissors or a knife blade and trim the ends as neatly as possible:



12. Examine your handiwork. Is it straight, at maximum tension, and neat? If not, don't hesitate for a moment to remove the wrap and try again.

## Finishing

You may wish to apply a finish to the binding. A finish will keep the tension from loosening and the binding from slipping and unraveling. The idea is to get the finish to soak into the thread. As a side effect, this will actually increase the tension of the thread. Here are some suggested finishes:

- Slow Cure Epoxy - best from the point of view of wear, ease of working and cleanup (use rubbing alcohol).
- Super Glue (cyanoacrylate) - fast drying, but short working time does not allow it to soak into thin thread under tension. Best to use with thicker nylon thread. Cellulose in paper napkins acts as an accelerant for this glue. You can use this to your advantage to speed up drying or wipe with synthetic tissue to avoid this effect. Superglue cures in the presence of water or alcohol, which it absorbs in the form of vapors from the air and the surface of the objects being glued. A moist breath can act as an accelerator. Too much moisture can produce a white, uneven glue surface, not desirable for our purposes. Clean up with Acetone.
- Polyurethane - commonly available wood finish, very durable but does not take a polish.
- Color Preserver (clear acrylic) - soft but sufficiently durable if applied with no buildup, cleans up with water. Definitely non-traditional.

Some tips:

- Apply thin coats and avoid bubbles.
- Saturate the whole binding with the finish of your choice, but avoid any buildup.
- Do not apply any finish to the surface of the flute.
- Clean off any drips on the bamboo immediately.
- Occasionally rotate the flute while it is drying, so that the finish will remain evenly distributed.
- When finished without applying a color preserver (clear acrylic), certain thin nylon threads turn translucent. This can be an interesting visual effect, but you must make a very neat wrapping.