

# THE Berea Hard Woods CO. Inc

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Berea Hardwoods Co., Inc.  
Pen Instructions

## Series 2000 Screw Cap Roller Ball or Fountain Pen (Berea # 4177/R-xxx)



This pen is a beautiful pen. The barrel has the characteristic black spacer on the finial.



Needed: Mandrel-B  
Bushing Set-2B  
Drill-V  
Blank Size- 5/8" x 5/8"

### Preparing the material blanks

There are 2 methods for cutting your blanks for this pen. While one may suit some craftsmen the other may be more suitable for others. Read both carefully and select the one that you feel would suit you the best.

## Method 1

1. Cut the blanks the length of each brass tube giving a little extra length for the facing of the blank after the tubes have been glued in.
2. This method will require cutting a tenon to the depth of the brass tube to accept the center band.

## Method 2

1. This method will cut the blank for the cap the size needed at the out set. Therefore, there will be no need for parting the tenon.
2. Cut the blank for the cap exactly 1 7/8" long.
3. Cut the other blank the size of the tube plus a little extra for facing the blank.

Follow these steps for both methods.

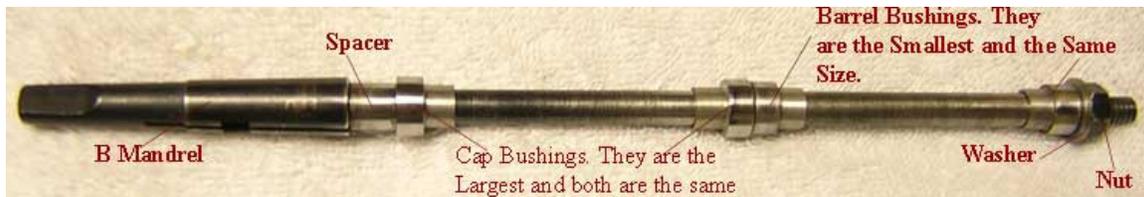
1. Drill each blank with the letter "V" drill bit.
2. Polish the brass tubes with sandpaper. This can be done by hand or on a power machine such as a belt sander. The purpose of the sanding is to clean off the oxidation and roughen the tube so that the glue will have a better adhesion surface.
4. Plug the ends of the tubes with the material of your choice. Some use base wax or Play Dough or even a slice of potato. Just push the ends of the tubes into a thin section of the material. This will form a plug to keep the glue from getting into the tube.
5. Clean the tube, after plugging, with acetone or alcohol on a rag.
3. Prepare your glue. We recommend two part epoxy glue that is available in all hardware stores. Use a fast drying type, one hour or less. Be sure to mix it thoroughly. (A Post-it Note Pad makes an excellent mixing place. When you are finished just tear it off and throw it away.) Polyurethanes and thick flexible CA's can be used, but they each have their drawbacks.
4. Place some of the epoxy into the blank using a small piece of dowel or other small stick.
5. Roll the appropriate tube in the epoxy.
6. Insert the tube with a twisting motion until it is almost in the material blank. Then use the dowel to push it until the end is flush with the blank. Use the stick to rake off the excess glue even with the blank and the tube.
7. Push the brass tube through the blank until the other end is flush with the blank. Then rake the glue flush with that end. Now push the tube back into the blank until the tube is equidistant between both ends of the blank.

**Note:** If using Method 2, push the brass cap tube until one end is flush. This will leave a portion of the brass tube exposed on the other end. This will receive the center band.

8. Move it aside for 60 minutes until the epoxy has had time to reach its maximum strength.
9. If you are using CA glue, the wait is much shorter. When using polyurethane the wait will be about 24 hours.

10. When the glue has cured, use a hobby knife to remove the plugs from the ends. It is also a good idea to clean the tubes with a brass gun cleaning brush or a rolled up piece of sandpaper to remove any glue that may have gotten into the tubes.
11. Not cleaning out all glue from the tubes is the most common cause of pen failure. BE CERTAIN that all dried glue is removed from inside the tubes before proceeding.
12. Using a barrel trimmer of the proper size, face off the ends of the blanks until you can just see bright brass. STOP facing at this point. Your pen's proper operation is dependent on having the proper length tubes. This facing operation can also be done with the proper jig and a disk or belt sander.
13. Not having the proper tube length is the #2 cause of pen failure. Sanding, on a disk sander, using a jig to hold the tube square with the disk, is a more sure way of getting the proper length. It should be tried if you have any doubt as to your abilities to square the material with the barrel trimmer.
14. Another good method of squaring the ends of the blank is to turn the blank until it is just round. Using a miter gauge to maintain the blank perpendicular to the sanding disk, just touch the ends to the disk. Once the blanks are square and you can see the ends of the tubes brighten, then return the blanks to the mandrel and finish the turning until the desired contour is accomplished.

### Turning the Blanks



1. Assemble the blanks on the mandrel with the right bushings in the right place. The right bushing can be found by comparing the diameter of the bushing to the piece of hardware that will be placed in that place. For instance, the bushing that is the same size as the clip will fit on the end of the blank that will eventually become the top of the cap.
2. Tighten the tailstock before tightening the blanks on the mandrel. This will center the mandrel first. Then tighten the nut that holds the blanks.
3. Turn the blanks to the desired contour making sure that the area next to the bushing is turned to the size of the adjacent bushing.
4. After turning the blank, sand the surface in progressive steps until you get to 400 or 500 grit.
5. After sanding, stop the lathe and,
6. **IF USING METHOD 1-** measure 1 7/8" from the cap clip end and mark. With a sharp parting tool remove the wood all the way to the brass tube and all the way to the end of the tube, on the cap center band end. This will receive the center band of your pen. Your cap blank should then have 1 7/8" of finished wood and the rest should be bare brass tube.
7. **IF USING METHOD 2-**Your blanks are finished.
8. If a higher polish finish is desired continue sanding with Micro Mesh through 12000 grit.

9. Apply the finish of your choice and polish.
10. Remove the blanks from the mandrel.

### Pen Assembly

Please refer to the Pen Parts diagram

The third most common error resulting in a non-functional or damaged pen is the misalignment of the parts when pressing them in place. The use of a good pen press or small arbor press is recommended, but it can be accomplished with a good “C” clamp and much care. When pressing in the various parts, by any means, BE SURE that the parts are straight and in line with the blanks. If the part is cocked or otherwise misaligned, at the very least, a poor fitting pen will result. At the worst, you may have a pen that is not usable. Exercise caution here!

One other word about pen parts. Occasionally, you will encounter parts that are a little loose fitting. This can be corrected by using a SMALL spot of glue, usually CA, on these parts before pressing them home.

1. Assemble the 3 piece center band. The black ring goes on first.
2. Press the center band on the exposed brass tube of the cap blank.
3. Press the finial bushing into the other end of the barrel.
4. Screw the finial through the clip and into the finial bushing.
5. Press the nip holder into one end of the barrel blank. **IMPORTANT NOTE:** if you are matching grain or pattern you should place the nib in the nib holder and just snug it into the barrel. You can then screw the nib/nib holder into the cap and then turn the barrel for matching. Once you are satisfied with the match carefully unscrew the nib from the holder, without moving the reference to the barrel, and proceed to press the nib holder into the barrel.
6. Press the barrel finial in the into the black tube. Be careful not to press in too far. If you do the black tube can swell to the point where the cap will not fit or post on the end of the pen.
7. Press the reducer bushing into the other end of the barrel.
8. Press the finial/black tube assembly onto the reducer bushing. Use the same caution here as outlined in step 6. Do not swell the black tube.
9. Drop the spring into the barrel with the small end facing up or towards the refill.
10. Insert the refill.
11. Screw on the nib.
12. Screw on the cap and admire what you have accomplished.