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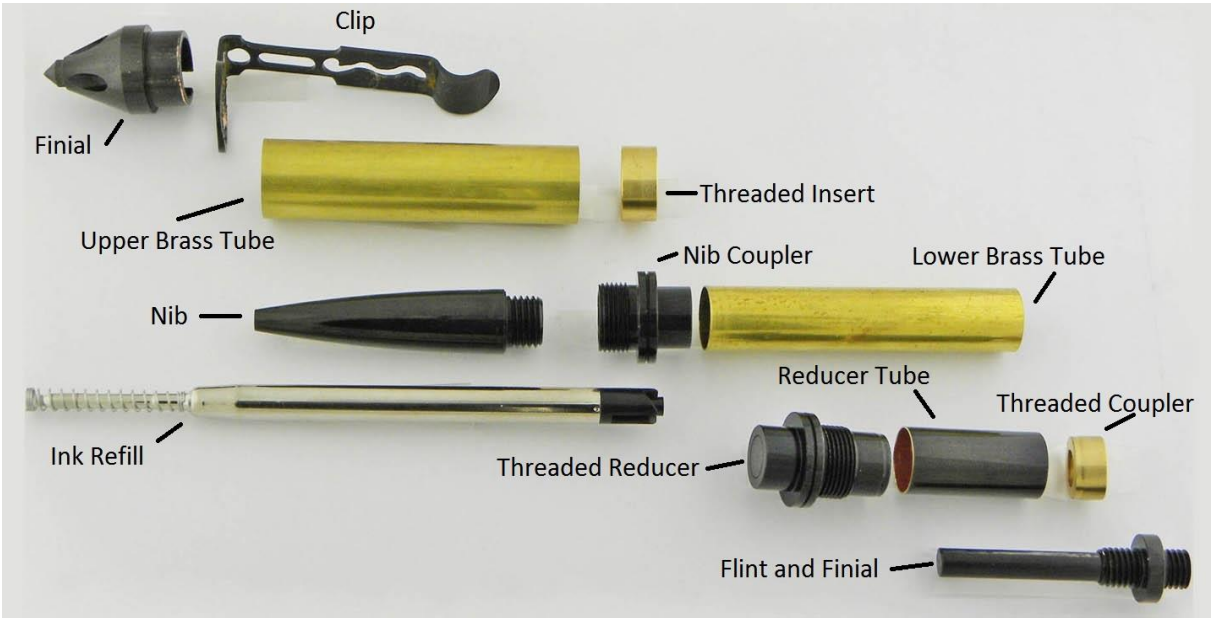
Berea Hardwoods Co., Inc.
Pencil Instructions

Survival Ballpoint Pen (Berea #1602/*x-xxx- x*)

Needed: Mandrel-A
Bushing-61A
Drills- 33/64", 27/64"
Wood Size- ¾" x ¾"



Parts Diagram for the Survival Ballpoint Pen

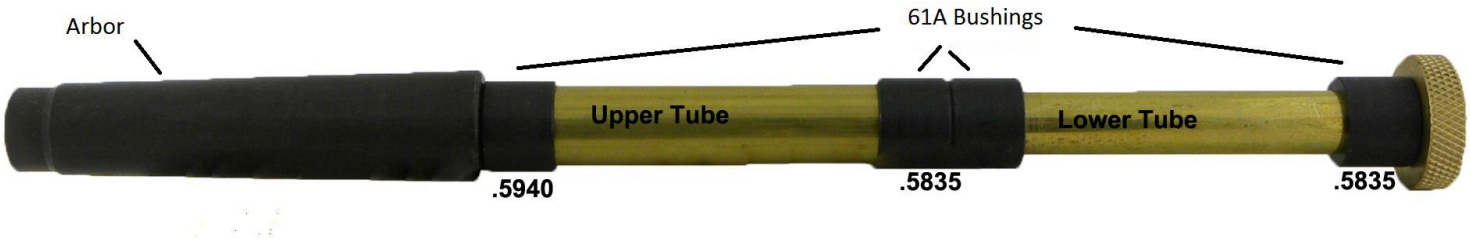
Preparing the Material Blanks

This is a very large diameter pen. Extreme care must be taken when drilling the blanks. Because the bits are very large there is a high probability that the blank will split if the bit is allowed to exit the material. For that reason we recommend that the blank length should be the length of the tube plus ¾". This will allow you to drill the hole in the blank without piercing through the bottom of the blank preventing splitting.

1. Mark each blank the length of each tube plus ¾". Mark the place on the outside of the blank where the tube end will be when completed.
2. Drill one blank with the 33/64" bit. Place the blank in your centering vise or other holder. Move the vise to a position where it is possible to lower the bit in front of the blank.
3. Place the bit in the drill press and lower it until the end of the bevel on the bit is just below the mark made in step 1.
4. Mark this position so that you can return to it easily and exactly. A drill press stop is perfect for this operation.
5. Retract the drill bit.
6. Move the blank until it is perfectly centered under the bit. Marking an X from corner to corner on the end of the blank will establish its center.
7. Drill the hole slowly and deliberately to the depth stop.
8. Remove the blank and trim it off a little longer than the line marked in step 1.
9. Drill the other blank with the 27/64" bit. Place the blank in your centering vise or other holder. Move the vise to a position where it is possible to lower the bit in front of the blank.
10. Place the bit in the drill press and lower it until the bevel on the bit is just below the mark made in step 1.
11. Mark this position so that you can return to it easily and exactly. A drill press stop is perfect for this operation.
12. Retract the drill bit.
13. Move the blank until it is perfectly centered under the bit.
14. Drill the hole slowly and deliberately to the depth stop.
15. Remove the blank and trim off a little longer than the line marked in step 1.
16. 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.
17. 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.
18. Clean the tube, after plugging, with acetone or alcohol on a rag.
19. 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.
20. Place some of the epoxy into the blank using a small piece of dowel or other small stick.
21. Roll the appropriate tube in the epoxy.
22. 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.

23. 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.
24. Move it aside for 60 minutes until the epoxy has had time to reach its maximum strength.
25. If you are using CA glue, the wait is much shorter. When using polyurethane the wait will be about 24 hours.
26. 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 to remove any glue that may have gotten into the tubes.
27. 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.
28. Using a barrel trimmer of the proper size, face off the ends of the blanks until you can just see the bright brass end of the tube. 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.
29. 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.
30. 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 Material Blanks



1. Assemble the blanks on the mandrel with 61A Bushings. The outside diameter on 3 bushings are the same size, the cap finial bushing is slightly larger then the rest.
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. If a higher polish finish is desired continue sanding with Micro Mesh through 12000 grit.
6. Apply the finish of your choice and polish.
7. Remove the blanks from the mandrel.

Assembling the Pen

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 thread lock or epoxy on these parts before pressing them home.

1. Press the nib coupler into one end of the lower tube (this is the small diameter tube). Make sure you choose the appropriate end of the tube to preserve the pattern or grain match on your pen.
2. Press the threaded reducer into the other end of the lower tube.
3. Press on the reducer tube. Be careful not to distort this tube.
4. Press the threaded coupler into the reducer tube.
5. Screw in the Flint and Finial (flint side first)
6. Drop in the ballpoint refill.
7. Screw on the nib.
8. Lay this assembly aside for a minute.
9. Press in the threaded insert into one end of the upper tube (this is the large diameter tube). Make sure you choose the appropriate end of the tube to preserve the pattern or grain match on your pen.
10. Place cap finial into clip.
11. Press cap finial and clip into the other end of the upper tube.
12. Thread the cap on the pen.
13. Your Survival Pen is now finished.

Before making your fire, make sure you have plenty of kindling prepared and ready. Once you get flame from your spark, you only have a short time to turn that small flame into fire.

1. Set up some very small kindling in a teepee shape with a space under it that an egg would fit in - this is where you will place your lit tinder.

2. Prepare a silver dollar size pile of fine tinder and press a small hole in the top with your finger.

3. Place a square of char-cloth in the depression in the tinder and set it on the dry ground or piece of dry bark.

4. Hold the Survival Pen in your left hand (you will need to unscrew the flint and finial and screw it back on so that the flint is exposed) directly over and very close to the char-cloth. The closer to the char-cloth, the hotter the sparks will be when they reach the cloth.

5. Hold the Survival Pen cap in your right hand.

6. Strike the flint with the pen clip at about a 20-30 degree angle.(narrow part of the pen clip) The idea is to use the sharp edge of the clip to scrape off the flint. (like you were shaving)

7. Aim the sparks right into the char-cloth and soon a spark will catch in the cloth.

8. Set down your Survival Pen and pick up the tinder ball with char-cloth and ember.

9. Gently and steadily blow onto the char ember to grow it, forcing the heat into the tinder. If you hold the tinder ball at about eye level or higher, the smoke will not get in your eyes as much.

10. When a flame erupts, quickly place the tinder into your kindling and carefully feed the flame.