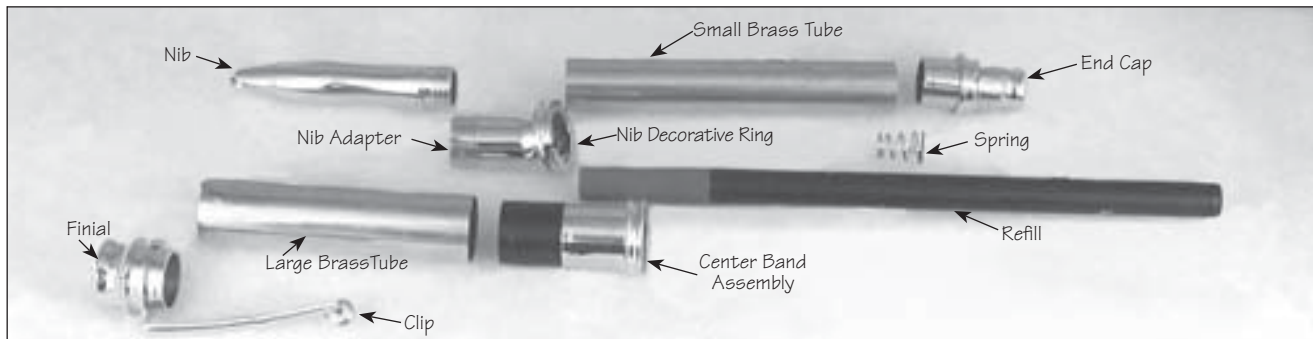


Virage™ Rollerball Pen Hardware Kit

Requires standard “A” mandrel, Virage rollerball pen bushings (88K80.63), 15/32” and 25/64” drill bits, and minimum 5/8” square blank.

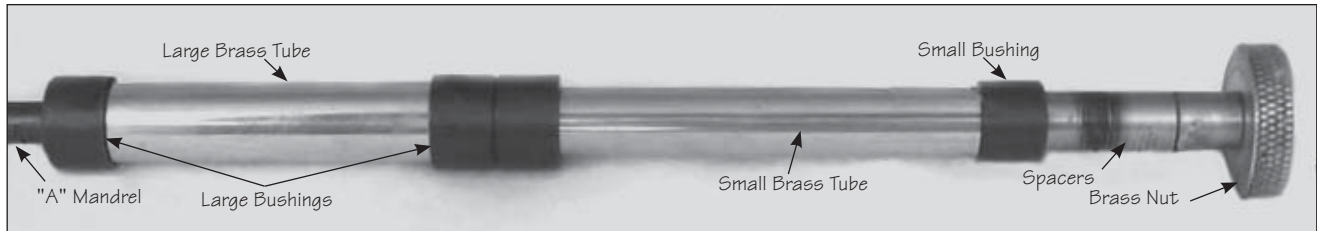


Parts photograph for Virage rollerball pen.

Preparing the Material Blanks

1. Cut the material blanks slightly longer than the brass tubes.
2. Drill the cap blank (the shorter one) with the 15/32” bit. Since this is a large-diameter hole, drilling a small pilot hole is advisable.
3. Drill the barrel blank (the longer one) with the 25/64” bit.
4. 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 tubes so that the glue will have a better adhesion surface.
5. Plug the ends of the tubes with the material of your choice. Some use base wax (a dental product), 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 tubes.
6. Clean the tubes, after plugging, with acetone or alcohol on a rag.
7. Prepare your glue. You can use a fast-drying, two-part epoxy, 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 cyanoacrylates (CAs) can also be used. (If not using epoxy, go to step 10.)
8. Place some of the epoxy into the blanks using a small piece of dowel or other small stick.
9. Roll the appropriate tube in the epoxy.
10. Insert the tube with a twisting motion until it is almost all the way into the material blank. Then use the dowel to push it in until the end is flush with the blank. Use the dowel to rake off the excess glue even with the blank and the tube.
11. 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 ends are equidistant from the ends of the blank.
12. Set it aside for 60 minutes until the epoxy has had time to reach its maximum strength.
13. If you are using CA glue, the wait only about 60 seconds. When using polyurethane the wait will be about 24 hours.
14. 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.
15. 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.
16. Using a barrel trimmer of the proper size, face off each end of the blank until it just touches the brass end of the tube. **Stop** facing at this point. Your pen’s proper operation is dependent on having the proper length tube. This facing operation can also be done with the proper jig and a disc or belt sander.
17. Not having the proper tube length is the #2 cause of pen failure. Sanding, on a disc sander, using a jig to hold the tube square with the disc, 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.
18. 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 disc, just touch the ends to the disc. Once the blank is square and you can see the ends of the tubes brighten, then return the blank 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 blank diameters are the same as the bushings.
4. After turning the blanks, sand the surface in progressive steps until you get to 400 or 500 grit.
5. Apply the finish of your choice and polish.
6. Remove the blanks from the mandrel.

Assembling the Pen

Please refer to the pen parts photograph.

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!

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 two-piece center band by sliding the black threaded insert into the small end of the metal center band.
2. Press the center band into one end of the cap blank (the shorter one).
3. Assemble the clip and finial by sliding the clip over the small end of the finial.
4. Press the finial/clip into the other end of the cap blank. Set the cap aside for the moment.
5. Slide the decorative ring over the unthreaded end of the nib adapter. The nose of the decorative ring should face the external threads of the nib adapter.
6. Press the nib adapter/decorative ring into one end of the barrel blank (the longer one).

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.

7. Press the end cap into the other end of the barrel blank.
8. Drop the spring into the barrel with the small end facing up or towards the refill.
9. Insert the refill.
10. Screw on the nib.

This pen uses a durable ceramic-tipped cartridge.