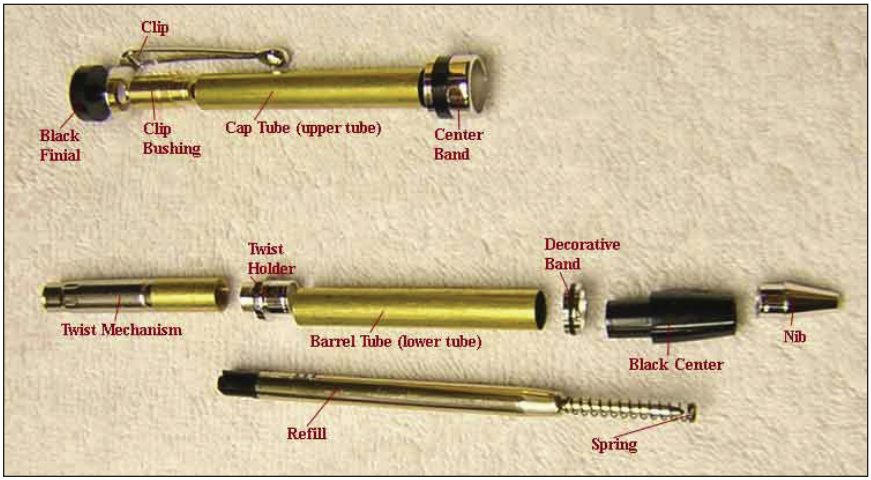
# Flat-Top Double-Twist Pen Hardware Kit

Requires large-diameter "B" mandrel, flat-top double-twist bushings (88K78.78), letter "O" drill bit, and minimum $^{5}/_{8}$″ square blank.




Flat-top pen parts diagram.

### Preparing the Material Blanks

There are two 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 outset, so there will be no need for parting down to the brass tube.
2. Cut the blank for the cap exactly $1^{13}/_{16}$″ long.
3. Cut the other blank to 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 "O" 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.
3. 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 tube.
4. Clean the tube, after plugging, with acetone or alcohol on a rag.
5. 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 8.)
6. Place some of the epoxy into the blank using a small piece of dowel or other small stick.
7. Roll the appropriate tube in the epoxy.
8. 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.
9. 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.

***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.*

10. Set it aside for 60 minutes until the epoxy has had time to reach its maximum strength.
11. If you are using CA glue, the wait is only about 60 seconds. When using polyurethane the wait will be about 24 hours.
12. 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.
13. 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.

14. 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 tubes. This facing operation can also be done with the proper jig and a disc or belt sander.
15. 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.
16. 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 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 blank diameters are the same as the bushings.
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.
6. **If using method 1** – measure $1\frac{13}{16}$″ 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 $1\frac{13}{16}$″ of finished wood and the rest should be bare brass tube.
7. **If using method 2** – your blanks are finished.
8. Apply the finish of your choice and polish.
9. Remove the blanks from the mandrel.

**Assembling the Pen**

***Important:*** *You must do the following, or your pen will not operate properly.*

***Attention:*** *After you have pressed the center cap on the cap blank, but* ***before*** *you press the twist mechanism into the cap blank, slide the twist mechanism through the cap tube. If it does not slide through the cap tube easily, then use a small round file or coarse sandpaper wrapped on a dowel or other suitable rod to clean out the tube in the cap. Retest the fit and repeat the above procedure until the twist mechanism slides freely through the tube.*

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!

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. If the nib assembly is not already assembled, then push the nib into the black center. Slide on the decorative ring and press this into the barrel tip end of the appropriate blank.
2. Press the twist holder into the other end of this blank.
3. Press the center band onto the exposed tube of the other blank.
4. Press the brass clip bushing into the unthreaded end of the twist mechanism.
5. Press the twist assembly, with the clip bushing attached, into the cap clip end of the cap blank. Press it flush with the end of the blank.
6. Put the black finial threads through the hole in the clip and screw into the brass clip bushing pressed in the blank in step 5.
7. Place the refill in the barrel with the spring attached to the tip.
8. Slide the cap over the refill and screw this cap assembly into place.
9. Check to see that the pen operates properly.

This pen uses a standard Parker-style refill.



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