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Traditional Rollerball Pen

A. Cutting Blanks: Cut blanks length of the brass plus 1/8" extra on each side to allow for trimming. Starting with a solid 5/8" to 3/4" square blank free of checks or other defects will help ensure good results and enhance safety.

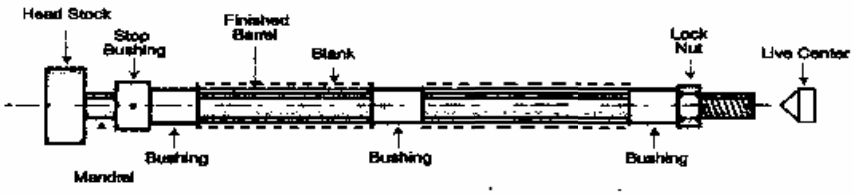
B. Drilling: Drill the blanks using a drill press and clamp or other suitable device suitable for securing the blank in an upright position to ensure stability throughout the drilling process. Ensure the blank is a true 90 degrees to the drill press table. Drill an **10mm** hole through the center of each blank.

C. Glue the Blanks: Lightly sand the exterior of each brass tube with fine sandpaper to ensure adhesion. Using a small cork or potato slice will help keep glue out of the inside of each tube during the process which will improve the ease at which components fit together. Using a good quality wood glue, polyurethane glue or Cyanoacrylate glue, coat the inside of the blank and then the brass tube with your glue of choice. Insert the tube fully into the blank, cork end first. Expel the cork and clean up any remain excess glue. Wait the required wait time for the selected glue as determined by the manufacturer.

D. Dress the Ends: Using a belt sander or barrel trimmer true the ends to an accurate 90 degrees and remove any excess wood until the brass is just revealed. Removing too much brass may hinder future assembly.

E. Turning the Blanks: Slide the bushing and the pen blanks onto the mandrel in the order required, use the diagram to help line up the blanks and bushings. After aligning the bushings and blanks thread the lock nut and hand tighten. The turning unit should now be secure on the mandrel. Slide the tail stock over and set in place next to the mandrel ensuring there is enough pressure to secure the mandrel (do not over tighten or the mandrel and live center could be damaged). Turn the blank down to the approximate diameter of the bushings and then sand to the desired finished diameter.

F. Sanding: Once the pen is turned to approximately 1/16" of the final diameter (more if wood is brittle or hard to turn) switch to sand paper and sand to the diameter of the bushings. Start with course 150 to 220 grit and work consecutively to finer diameter sandpaper, 400 to 600 grit or finer.



G. Finishing: Finish with your desired wax or friction polish. If using a polyurethane finish ensure not to weld the bushings to the blanks.

H. Assembly: Use a clamp or vice with wooden jaws to prevent damage to the pen components. Excess pressure on the components could cause damage so ensure all tubes are free of glue or any burs. A pen press is especially useful for pen assembly. **1.** Press the end cap and threaded coupling into the opposite end of the long tube. **2.** Insert spring and refill and screw on the tip. **3.** Assemble the clip assembly by screwing the plastic snap cap on the threaded male section of the aluminum end cap coupler, **(Note)** the hole of the snap cap may need to be honed with a 5/32" bit, this is easily done by hand. Put the clip on the other side of the aluminum coupler and thread on the plated clip retaining screw. **4**. Press the clip assembly into one end of the short tube. **5**. Press the two halves together. Adjustments to the snap cap can be made by inserting a regular screwdriver into the hole and turning either clockwise or counter-clockwise **(Warning)** Press gently or damage to the snap cap may occur. Congratulations, you have just completed the Traditional Rollerball Pen!