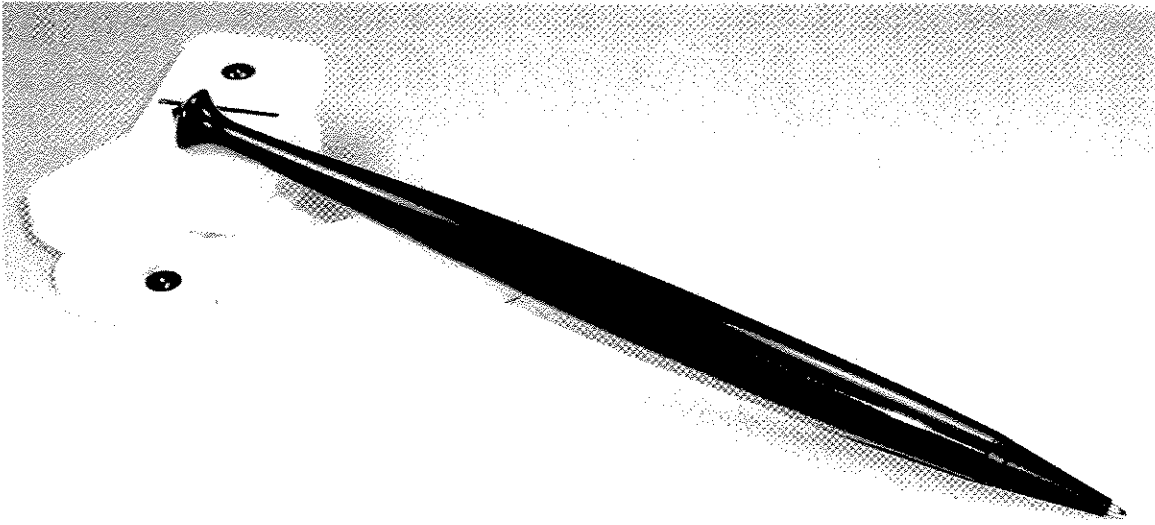


**JOHN SOLBERG**

# The Design and Construction of a Closed End Pen

by John Solberg



## Supplies and Equipment

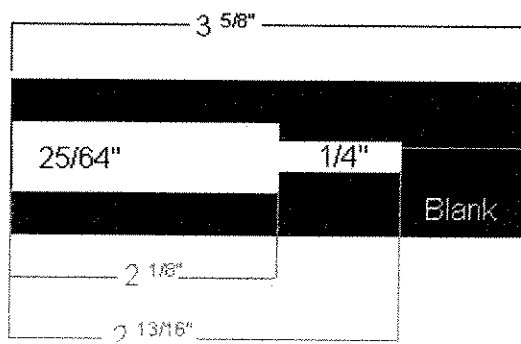
- Pen Blank of your choice – approximately  $\frac{3}{4}$  x  $\frac{3}{4}$  x 6" long <sup>1</sup>
- Pen kit of choice <sup>2</sup>
- Drill for the tubes – dependent upon pen kit
- Bushing – dependent upon pen kit
- Barrel Trimmer system – your choice...pen mill, disc sander, lathe
- Pen mandrel and/or pin chuck
- Holding devices optional – drill chuck, Beall collet chuck<sup>3</sup>, 2MT collet chuck<sup>4</sup>, scroll chuck with long nose jaws, pin chuck
- Drill rod – for making pin chucks <sup>5</sup>
- Glue of choice – CA or epoxy
- Abrasive paper of assorted grits
- Finish of choice.

## Source of supply

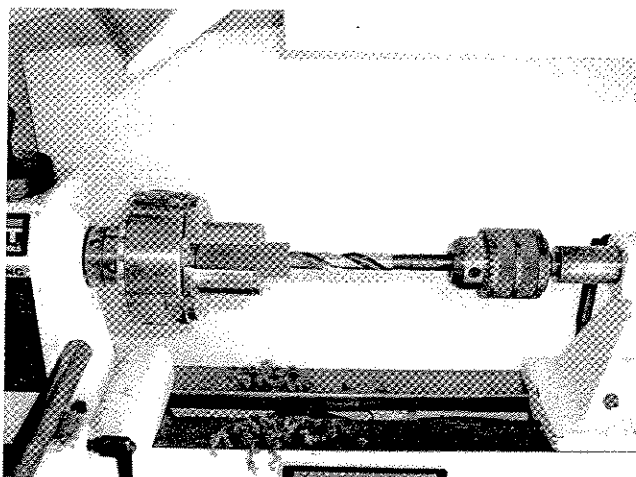
1. Pen blanks used in demonstration supplied by Ron McIntire: [www.woodenpen.com](http://www.woodenpen.com)
2. Pen kit for demonstration is a Baron purchased from Arizona Silhouette. [www.arizonasilhouette.com](http://www.arizonasilhouette.com)
3. Beall collet chuck: Craft Supplies USA. [www.woodturnerscatalog.com](http://www.woodturnerscatalog.com)
4. Collets – 2MT: Little Machingshop. [www.littlemachineshop.com](http://www.littlemachineshop.com)
5. Drill rod by MSC Industrial Supply Company. [www.mscdirect.com](http://www.mscdirect.com)

## Procedures

- **Select a blank:** The blank for a closed end pen needs to be longer than a normal blank as all of the pen parts need to fit within the blank and still have wood remaining at the end. (6" long blanks usually work well)
- **Select choice of pen kit:** The pen kit selected will determine if and how the blank is to be cut and drilled. ( for this demonstration the **Baron** is the kit of choice)
- **Cutting the blank:** If the selected pen is to be a two-piece, the blank should be cut to accommodate the brass tube for the cap and the lower barrel will be the remaining length. For a one piece pen no cutting is required. ( the Baron requires cutting the blank into 2 pieces approximately 2" and 4" )
- **Drilling:** Before drilling the blank, the inside geometry of the closed end must be determined. It is dependant upon the type of kit used. If the choice is a rollerball pen the spring must be placed within the 1/4" hole at the end of the blank. The initial drilling will accommodate the required kit tube. ( the main body of the Baron will be drilled per the following diagram )



- **Drilling Procedure:** Because of the accuracy required for these holes they will be drilled on the lathe. The  $25/64"$  hole will be drilled first to the depth of the tube. The  $1/4"$  hole will then be drilled to a depth of about  $3/4"$  while the blank is still on the lathe. Drilling on the lathe is accomplished as follows:

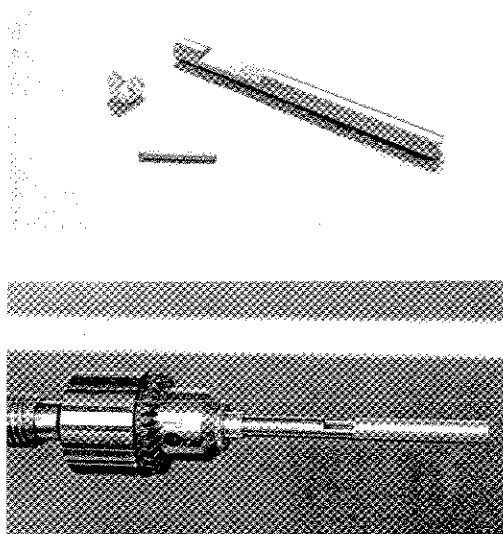


- **Glue in tubes:** Use glue of choice; CA, epoxy or polyurethane. Epoxy was used on the blanks for this demonstration. Be sure to rough up the tubes to give the glue a better surface to grip.
- **Square the ends of the blank to the brass tube:** A sharp pen mill can be used, or since the tube is centered in the blank from drilling on the lathe, a skew or scraper can be used with the lathe. Use a light touch.

- **Chuck and Turn:** The closed end blank can be held on the lathe in a number of ways but the best method is via a pin chuck. These are relatively easy to make and with proper sizing can be made for any pen kit.

This is a picture of a standard pin chuck with a homemade bushing. When using a pin chuck it will need to be held in a chuck of some sort.

The Beall collet chuck is the best choice. You could also use a high quality drill chuck, a 2MT collet chuck, or even a scroll chuck with pin jaws attached. The 2MT collet chucks are not available in all sizes. Once the pin chuck is on the lathe it is just a matter of placing the pen blank on it and giving it a slight clockwise twist to tighten in place. Note: if using other than a 7mm pin chuck, standard bushings are not available. They will have to be made and a caliper will be needed to determine the correct turned diameter of the blank. ( the Baron bushing diameter is .482" so the blank will be turned to about .490" to allow for some sanding. The cap portion will be turned on a standard 7mm mandrel with standard Baron bushings ). During initial turning use the tail stock with a live center to give extra support. Now just turn the blank to the desired shape and part it off to the desired length being, careful to note the location of the tube and the added hole inside.



- **Sand and finish:** Sanding will start at 220 grit and continue through 400 grit. Depending on finish material Micro Mesh may be used through 12000 if desired. Any durable finish can be used that will withstand day to day usage.
- **Assemble:** Complete the assembly per the kit instructions. If the pen will be assembled as a fountain pen and ink cartridges are to be used, the 1/4" hole may require enlargement to accommodate the cartridges.

**Have fun and be creative!**