

# BASIC PEN TURNING

The slimline twist pen is the most popular pen style and is excellent for learning pen-making techniques. Straight-barreled twist pens and pencils are relatively quick and easy to produce, and getting started requires a minimal financial investment.



Fig. 1

## CUTTING THE BLANK

Blanks for twist pens should be cut to approximately 9/16" square by at least 4 5/8" long. (i.e. 9/16" X 9/16" X 4 5/8") One feature of a quality hand-turned pen is proper grain alignment between the two halves. Once the blanks are ripped to 9/16" square, they should be marked with a strong, visible line (see Fig 1). The blanks should then be cross cut into lengths of 2 1/4". Two lengths of 2 1/4" will yield one pen or pencil.



Fig. 2

## DRILLING THE BLANK

The wood blank can now be drilled to receive the brass tube. A variety of methods can be used to hold the wood at a right angle to the table during drilling. A simple method is to secure the wood in a small vise or clamp and then drill using a drill press. The

wood jaws shown in Figure 2 are sufficiently large to provide a solid base during drilling (see Fig 2). This helps to hold the pen blank square to the table.

The feed rate and RPM of the drill press will be determined by how the wood responds to being drilled. This varies greatly between species. Generally, the feed rate is whatever the wood will allow without grabbing or "catching" while drilling. The drill bit used for standard slimline style pens is 7 mm. The drill bit should be retracted after drilling each 1/2" of increased depth. This allows the drill bit to clear itself of chips which can compact in the flute of the bit causing excess heat build up.

## DRILLING TIPS:

*Drilling can be one of the more difficult steps in pen making. Some woods, (particularly harder woods) are prone to crack or split as the bit passes through the bottom of the blank. To prevent this, cut each blank 3/8" longer than the tube, set the depth stop on the drill press to drill the hole 1/8" deeper than required by the tube. This will leave 1/4" of solid wood on the bottom of the blank that can be trimmed off later using a bandsaw.*



Fig. 3

## GLUING IN THE BRASS TUBE

Several types of adhesives are available for gluing the brass tube in the pen blank. These include gap-filling cyanoacrylate "super glue", epoxy, and urethane glue. Here we use gap-filling cyanoacrylate (CA). With 220 grit sandpaper, slightly scuff each brass tube leaving scratches for the glue to adhere to. For best results apply glue to both the outside of the brass tube and the inside of the drilled hole. Glue can be applied to the inside of the hole using a small dowel or a plastic drinking straw (see Fig 3). Insert the tube, starting at the end of the blank that

you want to match up with the opposite tube for proper grain alignment. Once the adhesive has been applied to each piece, push the tube into the wood blank, rotating the tube in a spiral motion as you go to spread the glue evenly around the brass tube and hole. If time allows, we recommend using a urethane glue as it expands while it cures filling all voids creating a complete bond between the tube and blank. Urethane glue requires several hours drying time and may require wetting non-porous materials.



### CLEANING AND TRIMMING

Before mounting the pen blank on the lathe to be turned, excess glue inside of the tube must be removed along with the ends of the barrel trimmed so that the tube is clean and the wood is square to the ends of the brass tube. The best way to do this is with a barrel trimmer. Mounting the barrel trimmer in a cordless drill can do trimming barrels quickly and easily. With the pen blank clamped firmly in place, slide the shaft of the barrel trimmer into the brass tube then trim the wood blank until the cutter reaches the end of the brass tube (see Fig 4). Be careful not to trim away the brass tube as this can result in the length of the brass tube being decreased significantly, which may interfere with the function of the pen mechanism.



### MOUNTING THE BLANK

There are many types of pen mandrel systems available to woodturners. Whether held in a drill chuck or mounted in a morse taper arbor, all mandrel systems require a revolving tailstock cone center. The morse taper mandrel system consists of a morse taper arbor, a steel mandrel that will hold two barrels at a time, bushings and a tightening nut. The bushings provide a reference for the turner to use to determine the finished outside diameter of the wood (see Fig 5). The pen blanks should be mounted on the double mandrel with at least one bushing at each end and one bushing between the two halves of the pen blank. Take care to line up the grain match marks.



### TURNING THE PEN

Use a small roughing gouge for removing the bulk of the wood (see Fig 6). Make the finishing cuts with a 1/2" skew or small gouge (see Fig 7). We recommend a lathe speed of between 3,000 and 3,500 rpm. This allows the turner to be more aggressive and speeds up the process of both turning and finishing.





**Fig. 8**

### SANDING AND FINISHING

Start sanding with 120 grit or finer if the surface left by the tool is sufficiently smooth. (Keep in mind while sanding that the finished diameter of the wood barrel should be the same as or slightly larger than the bushings on the mandrel. Making the barrel too small will result in a poor fit when the pen is assembled). With the lathe spinning, hold the abrasive paper against the wood; apply a moderate amount of pressure while moving the paper quickly from end to end (see Fig 8). When all tool marks and torn grain are removed, progress to the next finer grit and repeat the process. After sanding with 320 grit, turn the lathe off and while rotating the spindle slowly by hand, sand lengthwise with the grain using 320 or 400 grit. This will remove cross-grain circular scratches.



**Fig. 9**

There are many types of finishes available for finishing pens on the lathe. Padding lacquers such as Mylands Friction Polish are very popular as it is easy to apply while the work is still on the lathe and has a short drying time. The first coat of finish should be

applied with the lathe stopped. This allows the finish to penetrate into the open pores of the wood rather than glaze over them. Apply the first coat by rotating the spindle by hand and moving the rag quickly along the wood. Then turn the lathe on and continue the process. The high speed of the lathe and light hand pressure will produce heat, which helps the finish build and cure faster. Keep the rag moving constantly. Once the desired sheen is produced, the finish can be topped off with a light coat of wax (see Fig 9).



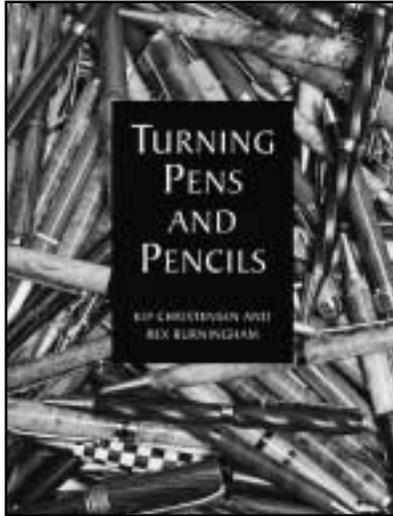
**Fig. 10**

### ASSEMBLING THE PEN

Assembly is the final step that will complete the pen. Several methods can be used to press the pen parts together. We recommend a bench vise. The vise should have wood jaws, as metal jaws can easily damage the wood barrel as well as the plating on the pen mechanism (see Fig 10). Before beginning assembly, carefully read the assembly instructions provided with the pen kit. Assembly procedures vary with the different types of pens. Once you are familiar with the assembly process you may consider making some simple jigs or fixtures to increase efficiency. The procedure for making pens and pencils is identical until you get to the point of assembly. Finally, to assemble a pen or pencil, read and follow the instructions provided with your pen kits.

To further explore the world of pen turning, we recommend *“Turning Pens and Pencils”* by Rex Burningham and Kip Christensen, published by GMC Publications U.K. Information on this handout is used in part from this book.

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**Turning Pens and Pencils**

*by Rex Burningham & Kip Christensen*

Here is the definitive guide to pen turning. Rex Burningham and Kip Christensen have combined their efforts to produce the best pen book on the market. Through clear text and superb photography they describe various ways of approaching the task. The beginner to the seasoned pen maker will find this book a valuable source of information. In addition to turning pens freehand, they demonstrate alternative methods including using a router, Sherline pen lathe, and an ornamental milling machine. 166 pages.

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