

Slimline Pen Kit

Kit Features

- Simplified construction—same tube length for top and bottom (2-1/32")
- Pen Features a Locking Mechanism
- A Variety of Clip and Band Styles are Available (see PSI catalog)
- Overall Length: 5-1/8"

Required Accessories

- 7mm Pen Mandrel
- Drill Bit: #PK-7MM for Wood, #PK-7MMSG for Plastic
- Bushing Set(3pc): #PKM-BUSH3
- Barrel Trimming: #PKTRIM7 or squaring jig on disc sander
- Live Tailstock or Mandrel Saver
- 2 part Epoxy or Thick CA (Cyanoacrylate) Glue
- Chamferring Tool #BGCAM
- Pen Blank Minimum Size: 9/16" x 9/16" x 4-5/16"L

Step 1 - Cut Wood Blanks

Prior to cutting and gluing, always verify tube length is correct. A set of Digital Calipers are recommended for accuracy (rulers will not measure to 1/128 inch). Select a 9/16" to 5/8" square blank. Draw a diagonal line along the length of the blank to help match grains after cutting. Cut blanks to the length of the tubes plus 1/16".

Step 2 - Drill The Wood Blanks

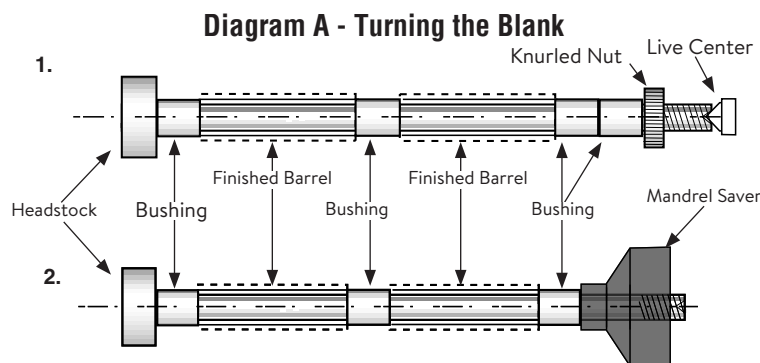
Drill a 7mm centered hole lengthwise through each blank. Excessive pressure will cause the drill bit to wander and/or split the blank. Slow the feed rate and back the bit out repeatedly for chip removal.

Step 3 - Glue The Tubes Into The Blanks

Use epoxy or a gap filling cyanoacrylate. Spread the glue on the tube. Insert into the blank with a twisting motion to spread the glue evenly inside. Center each tube lengthwise in the blank. Allow it to dry.

Step 4 - Square The Ends

With a 7mm barrel trimmer #PKTRIM7 or a squaring jig and disc sander, square the ends of the blanks 90 degrees flush to the ends of the brass tubes. Check progress frequently. Avoid over-trimming and shortening the length of the tube.



Step 5 - Turning The Blanks

Place the Bushings and Barrels (blank and tube combined) onto the Mandrel according to Diagram A(1/2). Make sure the line marked in Step 1 is matched up when mounting the blanks.

A1. If you are not using a Mandrel Saver, place enough bushings so that the last bushing starts to cover threads at the end of the mandrel. Thread the Knurled Nut against the bushing to tighten. Bring the tail stock snug with the mandrel, lock and tighten (do not over tighten, it could damage the mandrel).

A2. If using a Mandrel Saver, only 3 bushings are needed: one at each end and one in between the blanks. The Saver slides over the Mandrel Rod directly against the Bushings. Lock the Tailstock and tighten. No direct pressure goes against the Rod, so tightening will not damage Mandrel Rod.

Turn the blanks down to a diameter slightly larger than the bushings. As you approach the final size be careful since the wood is very thin.

Step 6 - Sand

As with any sanding, progress through a range of grits. PSI carries sanding rolls and systems for 150 grit to 800 grit. Past that, we have polishing pads and compounds to reach grits of 4000 or more.

Sand with blank spinning for the first grit. It is recommended to stop the lathe and cross sand (along the blank) for the next grit. Switching between spinning and cross sanding as you go to the next grit will help you track progress and make sure each step fully erases scratches from the previous one.

Step 7 - Finish

Note that finishing with any product or method takes practice to perfect. Feel free to experiment and keep trying.

Friction Polishes are recommended for wood. Penn State Industries carries a variety of Friction polishes such as Shellawax (# PKSWAXLX) and Aussie Oil (# PKSWAUS2) provide excellent results.

CA Finishes are also popular and Starter Sets (# PKCASTART3) are available. This technique requires applying multiple coats of CA Glue to a wooden blank and then sanding and polishing to smooth and remove all scratches for a hardened high gloss coat.

Finishing Plastic Blanks only requires sanding and polishing to a high grit and applying a polishing compound such as #ONESTEP. Top coats and friction polishes are not necessary.

Step 8 - Touch Up

Remove Barrels from the Mandrel, If both Barrels were cut from the same blank (Step 1) it is important to make sure you track the ends to make sure you do not accidentally turn one around and lose the grain match.

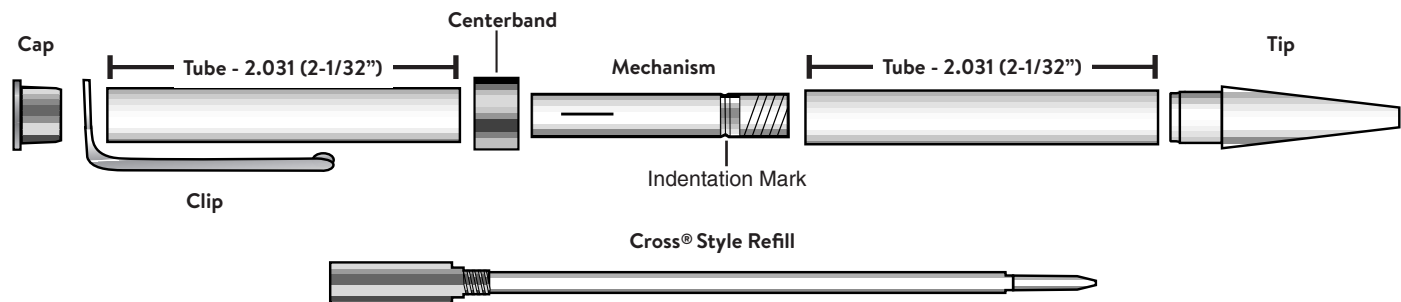
If necessary, a light, angled sanding of the ends of the Barrels will soften the edge and improve the fit during assembly.

If blanks were from pre-cut sections, lay them end to end to decide which directions will look best when assembled. Remember that they will be 5/32" apart (due to Centerband) so minor differences won't show.

Select which end will be the Tip and which end will be the Cap.

NOTE: Assembly instructions are on other side.

Diagram B / Parts Layout

**Assembly:**

- For the best Assembly experience, a dedicated Pen Press is a must.
- It is very important that the interior of the tubes be cleaned. It is recommended to carefully look in tubes and if any debris or traces of glue are found, clean them out with a barrel trimmer, file, sandpaper, etc. Even a small smear of glue can raise the difficulty of pressing.
- Fitting the parts will be eased if the ends of the tubes are deburred or chamfered. Either #MSDEBURR or #BGCAM will do this well.
- Press Tip into front end of the Lower Barrel. The front end would be chosen based on your selection from Step 8 on the previous page.
- Examine the mechanism. Note that there are two ends, one is brass and the other is silver. The brass side presses into the lower Barrel and the upper end twists freely and is a friction fit in the upper barrel. Inside, there is a threaded carriage. By twisting the two parts back and forth, you should see the carriage move up and down. There should be a positive stop in both directions.
- Press the mechanism into the open end of the Lower Barrel up to the indentation line on the mechanism. **Note that pressing to this line will only work on tubes that are 2-1/32" long and will not work if the barrels are over-trimmed or under-trimmed.** To remove the guesswork and improve pressing speed on production runs, the Perfect Press Jig (#PKPPJIG) will center the parts and provide a guide so you press 7mm mechanisms the correct distance from the tip for kits with full size Cross® Style Refills. This creates reliable extension and retraction—even if the tubes are slightly longer or shorter, or from another 7mm kit with a different tube length.
- Insert Refill through the back of the Mechanism and screw it fully into the interior carriage. Twist Mechanism, refill should extend and retract. If you prefer the refill to extend further you can remove the refill and **carefully** push the mechanism deeper. Note that this could push the Mechanism so far forward that the refill will always stick out of the Tip. Using the #PKPPJIG prevents this and can be shortened to reliably deliver your preferred refill position.
- Slide the Centerband over the Mechanism. It will spin freely once it is fully on but should not be able to fall off.
- Combine the Cap and the Clip. This can sometimes be a slip fit and sometimes in can be a press fit because of manufacturing variance. As long as enough of the reduced diameter section of the cap can fit through the Clip and start into the Upper Barrel, it will be okay. Press the Cap, with the Clip, into the back end of the Upper Barrel.
- Insert the back of the Mechanism and Refill into the opening in the bottom of the Upper Barrel. Push the two halves together by hand—do not press.
- To extend and retract the Refill, twist the two halves back and forth.
- To change the refill, pull the Upper Barrel off of the mechanism, unthread the old refill, thread in a new one, and then re-assemble.

