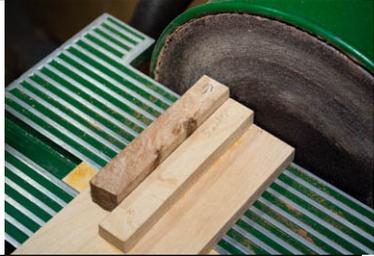
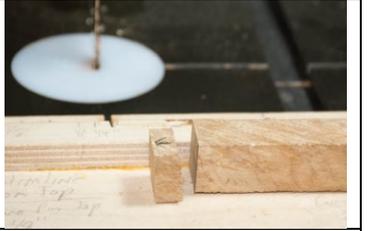


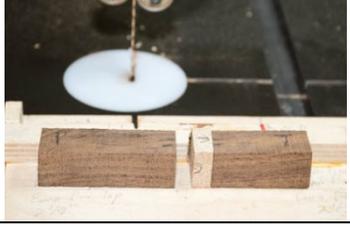
Mount Diablo Woodturning Center
Advanced Slimline Pens – Joel Albert

Overview:

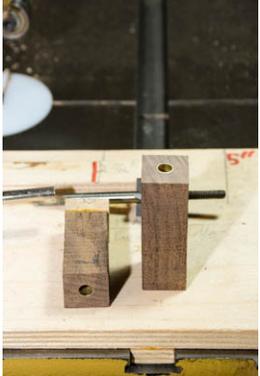
1. **Everything I am going to tell you is probably wrong, but it works for me--usually!**
2. Pen making is **addicting!** Plan on making a bunch! The more you do, the better you get.
3. I **hate** the center-band in Slimline pens—my first step is to always toss it in a box hoping I will figure out a good use for it someday.
4. Once you **get rid of the center-band** you have many more options for how to design your pen. You need to size the dimensions of the pen to match the Point and the Cap of the pen—what happens in between is up to you.
5. **Don't rush turning the pen!** Think about how it flows, who is going to use it, how thick it should be, and how it will look when assembled.
6. **I spend more time sanding and finishing the pen than I do turning it!**
7. I generally have an overall design in mind before I make my first cut on the band or the pen blanks. You have to be ready to adapt as creative opportunities arise as you progress through turning and finishing.
 - a. For Slimline pens, I prefer blanks that are **5/8" x 5/8" x 5"** since this gives me plenty of width to work with. In a pinch (or if I am feeling cheap and want to get extra blanks), I use blanks as thin as **1/2"**
 - b. I like to have the Bottom section of the pen (with the Point) longer than the Top section. Usually, I make this section **2 3/8"** long and custom cut pen tubes to match. Occasionally I have gone to **2 1/2"** if it strikes my fancy.
 - c. I use the same kind of wood for the Bottom and Top of the pen—although for highly figured burls, not necessarily from the same blank.
 - d. Usually I start by choosing a **contrasting** wood for the band unless I decide to choose a similar tone or even skip the band entirely.
 - e. I vary the width of the wooden bands to match how I want to design the pen. Usually it varies from **1/4"-1/2"**.
8. Some equipment I really like:
 - a. I love the **Pen jaws** ([Nova 6034 Pen Jaws](#)) on my Nova chuck and highly recommend a solution that allows you to drill on the lathe.
 - b. **Pen State Mandrel Saver** (Item# [PKMSTS2](#)) really helps to improve holding the pen blanks and bushings on the mandrel. There is also a good package deal on a Pen Mandrel and Saver to consider. (Item# [PKMS2SET](#)).
 - c. Another great innovation is the **Penn State Pen Blank Squaring Jig** (Item# [PKSQUARE](#))—it allows me to accurately flatten the blanks in relation to the pen tubes and is not affected by blanks that aren't square or flat.

Directions for prepping the blanks:

	Cut wood for the center-band	
1.	Square off and sand the face of the band that will be glued. Mark edge with pencil	
2.	Make sure Mitre gauge is giving you a face flat and squared.	
3.	Cut-off center-band using jig. Typically band is between 1/4"-1/2" thick.	
4.	Arrow indicates face that will be glued to the Top portion of the blank.	
	Cut wood for Top and Point Sections of Pen	
5.	Square off the Top of the Pen	
6.	Place wooden band and then the pen blank to correctly establish the overall length. Mark the Top of the Pen (T) and the Witness Marks overlapping the cut to facilitate future grain alignment	

7.	Top of Pen is a fixed length (2 1/8").	
8.	Flip the remaining portion of the blank so the Witness Marks align to the mark for the Point length (2 7/16"). Mark this piece with a (P).	
9.	Leftover section can be saved and re-used for other center bands.	
10.	Square off the Top of Pen at the Witness Marks to insure a clean glue-up with the wooden band.	
11.	Overall Orientation of the Cut Blanks prior to Glue-Up	
Glue up the wooden band and top-blank		
12.	Glue the Sanded face of the Center-Band to the Top Blank at the Witness Mark	
13.	Let glue-up dry for at least 25m before drilling. I like to use the Plastic Bags from pen kits to keep the blanks together and to label the types of wood used in the blanks.	

Drill and Glue in Tubes		
14.	Drill blanks at about 500 RPM (wood) or 200 RPM for Acrylics.	
15.	Make sure you use a 7mm. drill bit. I recommend Pen Jaws (Nova, Vicmarc etc.) or the Penn State Penn Blank Drilling Chuck.	
16.	Drill the Top-Blank of the Pen. Always start with the end the wooden center band is glued to. Drill slowly and frequently back out to clear the drill bit. Blanks should not too hot.	
17.	Drill the Point-Blank of the Pen. Always start with the end with the witness marks.	
18.	<p>Top-Blank should be 2 1/8" long and will take a 2" brass tube that has been roughed up with sandpaper to give the glue a bite.</p> <p>Point-Blank should be 2 1/2" long and will take a 2 3/8" brass tube that has been roughed up with sandpaper to give the glue a bite.</p>	
19.	<ul style="list-style-type: none"> • Test fit the brass tubes to make sure they slide in smoothly. • Use Medium-Thin CA Glue • Top-Blank – Insert starting at the wooden band • Point-Blank – Insert starting at the witness mark. • Put glue on the end of the tube that is first inserted, twirl the tube, move it in-and-out to insure glue coverage. • Tube should end up flush (or just below the wood). • Spritz with Accelerator and let dry for at least 5m 	

<p>20.</p>	<p>Sand blanks using disc-sander and miter gauge just until you can see the outline of the brass tube.</p> <p>You can also use a 7mm Barrel trimmer on a drill press if possible. Be careful to keep the drill speed around 500-800RPM to avoid generating too much heat and loosening the tube.</p>	
	<p>Alternatively, you can also use the Penn State Universal Pen Blank Squaring Jig and your disc-sander.</p>	
<p>21.</p>	<p>After the blanks are trimmed they should look something like this. The ends should be flat and square to the tubes and the tube brass should be visible.</p>	
<p>22.</p>	<p>Now you can mount the blanks on a Pen Mandrel—but now you don't need to put a busing in the middle.</p>	

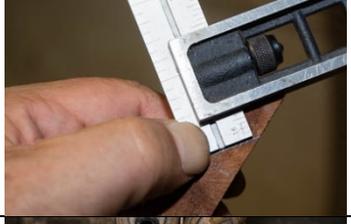
CA/BLO Finish for Fine Pens

<p>1.</p>	<p>Shape Pen as desired and add any decorations (e.g. skew lines, burns etc.), work carefully and cleanly leaving a good starting surface.</p>	
<p>2.</p>	<p>Sand with 150 grit</p> <ul style="list-style-type: none"> a. Sand with lathe on (500-750 rpm) b. With lathe off, sand horizontally (along grain) to remove swirl marks 	
<p>3.</p>	<p>Apply a Sanding Sealer using CA Glue:</p> <ul style="list-style-type: none"> a. Folded Blue Shop paper towel works well b. 1 drop Boiled Linseed Oil (BLO) and 3-5 drops Med-Thin CA glue –don't use too much. <ul style="list-style-type: none"> i. If you want to preserve the lightness of the wood (e.g. Holly or Maple), skip the BLO and just use the CA Glue. Make sure you keep your touch light when using the shop towel since you won't have the lubrication the BLO provides. 	
	<ul style="list-style-type: none"> c. Lightly apply shop towel with CA/BLO to Point to the pen d. Keep towel moving rapidly back and forth across wood, entire surface of pen should be lightly coated. e. Keep moving until glue has dried 	
	<ul style="list-style-type: none"> f. Sand with 150 grit again and remove most of CA finish. g. With lathe off, sand horizontally (along grain) to remove swirl marks h. Surface of the wood should be smooth and the pores filled in. i. Surface may be a bit hazy but will be clear if wet. 	
<p>4.</p>	<p>Continue Sand thru the grits (220, 320, 400, 600, 0000 Steel Wool)</p>	

	<ul style="list-style-type: none"> a. Make sure you stop lathe and sand horizontally (along grain) to remove any swirl marks before moving to next grit. b. Final sanding is with 0000 Steel Wool c. Inspect blanks – make sure they are smooth, polished and perfect. 	
5.	<p>Apply CA Finish – Coats 1-4</p> <ul style="list-style-type: none"> a. Folded Blue Shop paper towel works well b. Lathe Speed: <ul style="list-style-type: none"> i. Variable Speed Lathes – start applying finish at slow speed (about 300 rpm) and then gradual ramp-up speed while moving the towel (to about 2500 rpm). I find the increased speed makes it easier to evenly dry the CA finish. ii. Fixed Speed Lathes – use 500 rpm 	
6.	<p>Apply to each blank separately</p> <ul style="list-style-type: none"> a. 1 drop BLO and 1-3 drops Med-Thin CA glue –don't use too much. b. Lightly apply shop towel with CA/BLO to Point to the pen. Don't grip too hard—this is not a friction polish. c. Keep towel moving rapidly back and forth across wood, entire surface of blank should be lightly coated. d. Keep moving until glue has dried 	
7.	<p>Coats 5-6</p> <ul style="list-style-type: none"> a. Before Coat 5 sand lightly with 0000 Steel wool to make sure surface is smooth. Some of the shine will be lost, but will be regained in the following steps. b. 1 drop BLO and 1 drops Med-Thin CA glue –final coats (5 & 6) should be thin and smoothly applied. 	
8.	<p>Let CA Finish Fully Dry – 24 hours if possible</p>	

9.	Buff Pen Blanks <ul style="list-style-type: none">a. About 1200 rpm.b. Tripolic. White Diamondd. Carnuba Wax	 A photograph showing three pen blanks mounted on a lathe. Each blank is secured with a metal chuck and is being buffed against a white abrasive wheel. The setup is on a workbench with various tools and materials visible in the background.
10.	Inspect Pen Blanks prior to assembly <ul style="list-style-type: none">a. Finish should be perfect! If it isn't now is the time to sand it back and fix it.b. Fit of blanks with wooden band should be perfect! Make sure the CA Glue has not caused any gaps when the pen is put together.	 A photograph of a finished wooden pen lying horizontally on a light blue surface. The pen has a dark wood grain and a silver-colored metal band near the tip. The cap is black and is attached to the end of the pen.

Adding a Decorative Spline

1.	Layout marks for the cut a. Pick the portion of the blank that is going to hold the spline and square off the end using the disk sander. b. Mark where the cut should start, typically between 1/2" - 5/8".	
2.	Cut Blank on Spline cutting jig (angle about 45 degrees) a. Line up the blank so the cut starts at the desired mark b. Hold blank firmly against fence and cut through the blank slowly and carefully.	
3.	Lightly sand cut ends to remove bandsaw marks	
4.	Cut out spline from another pen blank a. Establish cut for 1 st face using the jig b. Lightly sand cut end to remove bandsaw marks	
5.	Establish width of the spline a. Recommend widths from 1/8" to 3/8" b. Add a little extra which will be lost when sanding.	
6.	Cut out spline to desired width a. Cut slowly and carefully b. Lightly sand cut end to remove bandsaw marks.	

7.	Finished spline	
8.	Make sure glue-up jig is clean and waxed	
9.	Layout pieces and inspect fit	
10.	Glue up blank (Titebond II) and clamp into jig a. Let dry at least 25 minutes	
11.	Mark where to cut blank a. For point-section of the blank, typically 2 1/2" (<i>tube will be 2 3/8"</i>) b. For top-section, typically 2 1/8" (<i>tube will be 2"</i>)	
11.	Complete cutting the remaining pieces of the pen a. Cut and sand the band b. Cut and sand the top-section c. See <i>Directions for Prepping Blank</i> , above	

Turning a 7 mm Pen

Objective:

- To learn the techniques for building kit pens without the supplied metal center band.
- To further practice careful, detailed turning techniques
- To learn to sand to the finest level of detail
- Apply a CA Finish

Turning Tools:

- Spindle Roughing gouge
- Shallow fluted gouge
- Skew chisel



Supplies:

- Hardwood pen blanks $\frac{3}{4}$ x $\frac{3}{4}$ x 5 inches
- 7 mm pen kit
- Pen mandrel with 7 mm bushings
- 7 mm drill bit brad point or bullet point with Jacobs chuck
- Medium Thin CA Glue and Boiled Linseed Oil (or Friction polish) and applicator
- Medium CA glue
- 60 Grit sand paper (for roughing the brass)
- Sand paper to 600 grit (for completing the pen) (150, 220, 320, 400, 600).
- Pen press (for assembly)

Optional but recommended

- [Penn State Mandrel Saver](#)
- [Penn State Universal Pen Blank Squaring Jig](#)

Part one: Preparing the blank for turning—see directions above.

- **Cut and Prep blanks to length**
- **Drill and glue brass tubes into blanks**
- **Square blank ends for turning**

Part two: Turning the pen

- **Assemble the blank on the mandrel**
 - Place (1) 7 mm bushings on the mandrel followed by one blank
 - Add the second blank



- The witness mark on this blank should face the head stock (and the other reference mark)
- Add (2) 7 mm bushing and secure in place with the brass end screw (skip brass screw if using Mandrel Saver).
- **Insert mandrel into lathe headstock**
 - Clean the lathe's taper and the matching Morris taper on the mandrel
 - Insert into the lathe and bring up the tail stock
 - Tighten completely
 - Tighten the tailstock only enough to engage the live center point into the dimple on the mandrel's end
 - *Over tightening will damage the mandrel and cause the pen to be turned oval*
 - Set lathe speed to 1800 RPM or greater



- **Rough turn using the spindle roughing gouge**

- **Finish turn the pen**

- Reduce dimensions until approaching the diameter of the bushings
- Leave a small amount of wood proud of the bushing to allow for sanding



- **Sand and Apply appropriate finish**

- See ***Directions Above for Applying a CA Finish.***
- Friction polishes
 - Sand skipping no grits (150, 220, 320, 400, 600, reduce the lathe speed to 500 RPM first
 - Keep sand paper moving at all time to minimize circular scratches
 - After each grit, turn lath off and re-sand with the grain
 - Complete sanding with 0000 steel wool
 - Use small square of shop cloth or cotton rag
 - Apply a thin coat allow to dry
 - Increase lathe speeds and burnish until finger get warm
 - Reapply if desired

Part three: Assemble the Pen

1.	<p>Inspect Pen Blanks prior to assembly</p> <ul style="list-style-type: none"> a. Finish should be perfect! If it isn't now is the time to sand it back and fix it. b. Fit of blanks with wooden band should be perfect! Make sure the CA Glue has not caused any gaps when the pen is put together. 	
2.	<p>Remove the two blanks from the lathe keeping them in exact order. Open kit, inspect parts and layout in order of assembly.</p>	
3.	<p>Assemble the writing tip</p> <ul style="list-style-type: none"> • Insert the pen tip into the far left blank end • Press into place squarely with pen press or wood-faced vice 	
4.	<p>Insert the twist mechanism into the other end of the same blank</p> <ul style="list-style-type: none"> • <i>Brass end first</i> • Press into the blank until the marking band is slightly proud of the blank • Test the position by inserting the pen refill and twisting to full extension 	
5.	<p>Adjust the fit by repressing the mechanism</p> <ul style="list-style-type: none"> • <i>(Do not over press as removal is very difficult)</i> 	
6.	<p>Assemble the top section</p> <ul style="list-style-type: none"> • Insert the clip into the cap and press into the far right blank end 	
7.	<p>Complete pen assembly</p> <ul style="list-style-type: none"> • Press the top portion of the pen into place 	