The Journey from Penturning to Penmaking

by Kurt Hertzog

Back to Basics

We've visited many topics since the beginning of this column. Some were of interest to the beginner and some appealed to the more advanced turner. We've talked some tech, marketing, continued learning, and more. But now, it's time we get back to basics and offer some tips and tricks for the benefit of the large number of newcomers and perhaps the penmaker wannabees. Don't run away if you are more advanced, because there just may be a nugget or two in here for you as well. Though I'm using the 7mm kit for illustration, the key points presented hold true for other penmaking endeavors as well.

In the never-ending search for that special pen blank, the beginning penturner often overlooks the obvious. There is a lot of extra wood on the standard pen blank (see **Fig. 1**). Cutting it in the middle and then centering the tubes on the blanks misses the opportunity to select the best part. Using the tubes to assist in sizing the blank and then exploring the possibilities is worth the time (see **Fig. 2**). Even after you've found the most interesting area of the blank, you should consider its orientation. For example, which end should be the nib end? Do you want the attraction to be on the nib end or at the clip end (see **Fig. 3**)? Will the interesting grain features still exist after you turn the pieces down to size? By the way, if your design or plan has no interest in grain match, there is no law saying that you can't take the top and bottom blanks from different sections of the pen blank. For that matter, you can take the top and bottom from different blanks of the same species (or maybe a different one) if it yields better end results.

Fig. 1

Most pen blanks have more wood available compared to the amount needed.

Fig. 2

Why not check around the blank for the best-looking area to use?

Fig. 3

Decide which way you would like to orient the blank to give the best exposure to the most interesting wood.

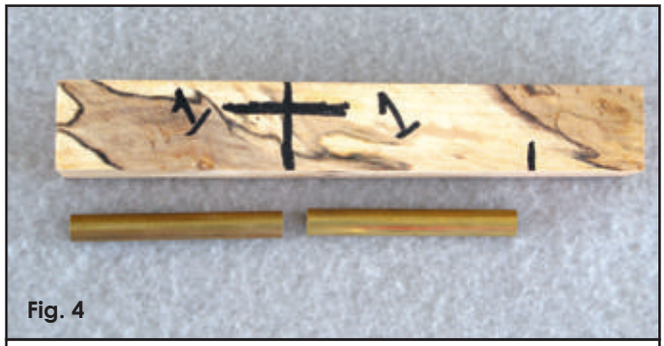


Fig. 4

The cut-marking system shown provides many short- and long-term benefits.

Once you've decided on the area of interest, mark out your plan. **Fig. 4** illustrates the way I mark my blanks. It shows the cutline to be used for the bandsaw cut. The marks perpendicular to the cutline will serve as witness marks that will be evident after the cut, gluing, and facing, and will show the proper orientation for the interface ends. There is also a cut mark to remove excess stock while cutting at the bandsaw. Unless I am sure that I'll process the blank to completion now, the pieces should be numbered. This will allow me to make sure that those matched pieces don't get confused with others of the same species. When I set them aside, I fasten the two matching pieces with a rubber band, but the numbers take so little time and provide the assurance of keeping things straight. Because I often cut blanks from longer lengths of wood (for example, my bocote comes in 36" lengths), the numbering helps keep pieces that look identical properly sorted as pairs.

There are two things that can be done to help minimize grain mismatch at the centerband interface. The first is to minimize the kerf loss at this interface. Don't lose sight of the fact that the loss from the saw blade is only part of it. How much you face off to properly expose the brass tube also comes into play (more on that later). The marking system shown lets me cut the blank into two pieces and shorten it to minimize the drilling required (see **Fig. 5**).

The second thing that can be done to help with the grain match is to drill from the interface ends. Marking the drill point on both pieces from the interface end and then drilling from that end greatly reduces the chance to have mismatch due to drilling errors. With the tubes laid on top of the blanks, **Fig. 6** illustrates that even if you should drill extremely cockeyed, the important end will have no grain error. As long as you have sufficient material for the wall thickness, the pen will match perfectly at the centerband.

Newcomers often agonize over the type of drill bit to use. Should I use a brad point, a standard twist drill, a 118° or 135°, or one of the myriad of special-tipped drills? My simple answer is "it doesn't matter"—stop worrying about the type of bit; instead, worry about its sharpness and your drilling technique (see **Fig. 7**).

Regardless of the drilling method (pistol drill, drill press, or lathe), a good starting point and a sharp drill should be your concern. You can use a spring-loaded center punch or the traditional center punch and hammer. **Fig. 8** shows

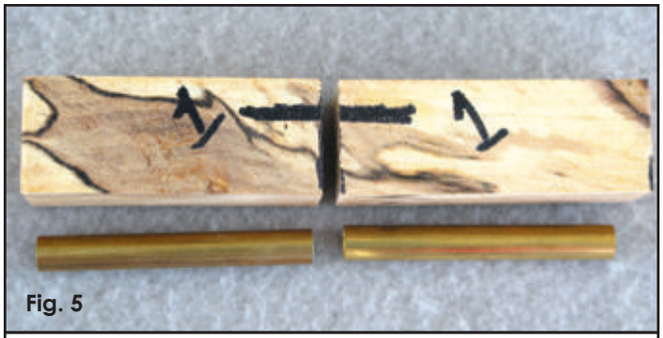


Fig. 5

The blanks are ready for drilling after cutting on the cutline and shortening as is appropriate.

Fig. 6

One key to a good grain match is drilling from the cutline end on both blanks.

Fig. 7

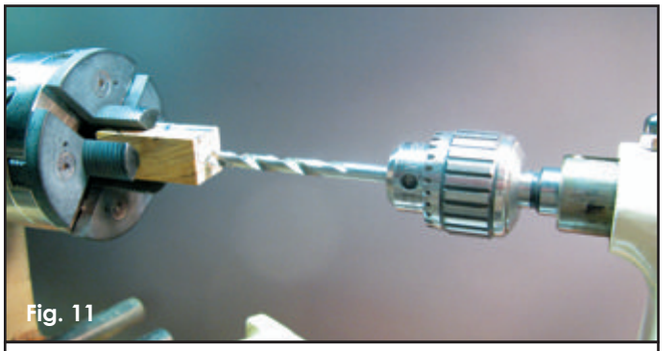
The sharpness of the drill is far more important than the type.

Fig. 8

Three possible instruments are shown to make the center mark that will help keep the drill from wandering at the start of the drilling.

The lathe can produce an accurate center mark, so why not use it to drill the hole?

A center mark isn't usually required if you use the lathe for drilling, because of the rigidity of the workholding and stiffness of the drill size.



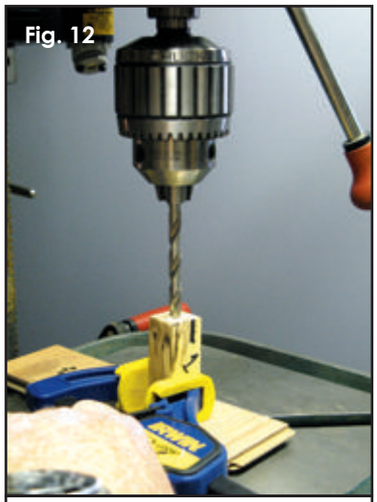
Of all the drilling methods, the lathe offers many advantages.

the more expensive *Starrett* spring-loaded punch along with the same, but very inexpensive *Harbor Freight* model, and the hammer and prick punch. Any of them will do the job nicely. An old nail (hopefully, somewhat straight) and a brick will work if you are really in a bind. Wood is pretty stupid and won't know the difference between the center mark produced by the *Starrett* punch or a rusty nail. Once you are assured that the drill will start exactly where you want it without wandering, then you can be concerned with drilling technique.

How are you going to hold the work? Not only should you hold it in the proper orientation, but you should also be concerned about safety. My suggestion is to use the lathe for drilling—you are turning pens, so you must have a lathe somewhere. It is the most accurate and most controllable drilling device you have. If you are fortunate enough to have a quality drill press with enough quill travel to drill the blanks, you still have the perpendicularity of the table and blank-holding to deal with. All these concerns are removed when using the lathe.

Fig. 9 shows how a center mark can be made using the lathe and the live tail center. It is easy and accurate. The photo is used to lightheartedly show that if you use the lathe, you probably won't need to make a center mark; with things held securely and rigidly, you can drill a hole without a center mark (see **Fig. 10**)—but feel free to use one if you feel it helps. **Fig. 11** shows the drilling setup on a lathe. It is safe, secure, accurate, speed and force controllable, repeatable, etc.; in fact, there is not much downside to this method.

Imagine that you can't use your lathe for some reason. You don't have spigot jaws for the chuck, or perhaps, you don't even have a chuck? Or maybe you just think it is quicker on the drill press. Whatever the reason, it may move you into some other drilling arrangement. With a sharp drill in the drill press, the task at hand is holding the blank safely and keeping it oriented properly. Since you have a center mark and are drilling from the inside face, the only real concern is being on axis enough so that you don't run out of side-wall thickness. One solution is to use a quick clamp to hold the blank. It is secure, and if your drill press table is perpendicular to the quill travel, you should be in good shape. Notice in **Fig. 12** that the quick clamp is gripping at the base of the blank and that it is supported by a backing board underneath the blank. Placement of the blank in the clamp ensures that the clamp aids in the support of the blank, as well as the alignment.



Even a quick clamp offers a useful drilling fixture if you have a good center mark.

If you have a machinist's vise, use that to align and secure the blank. These are available at a modest price through most of the discount machinery houses. Made and machined so that the bottom and sides are perpendicular to each other, this type of vise makes a great drilling clamp. Notice that

both the number and witness marks are facing out in **Fig. 13**. Without going into datums, suffice it to say that if I clamp the other piece in the same orientation with the number facing out, I'll get a better result. **Fig. 14** shows my homemade clamp—no need for the fancy (read expensive) centering drilling vise here. My quick clamp and scrap piece of 2 x 4 work as well as any spiffy purchased vise.


Fig. 13

An inexpensive machinist's vise works well as a drilling fixture.

You can easily make your own drilling fixture, and **Fig. 15** shows mine in all its glory. I took a piece of 2 x 4, laid it on its back, and ran it through the bandsaw, using the fence to trim a very thin amount off one side. That gave me a surface that was perpendicular to the face that was down. Flipping the 2 x 4 so it was now riding on that newly cut face, I cut V-cuts into the original wide face that was down.

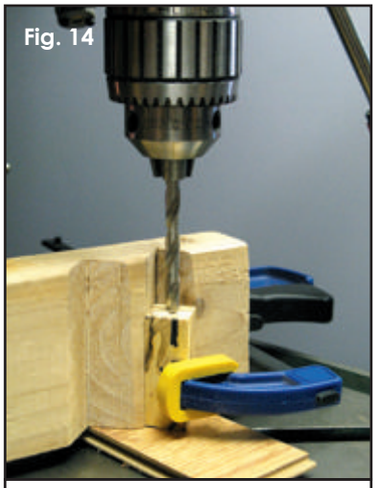


Fig. 14

Made as a lark, my homemade drilling fixture performs admirably, providing all the required functions.

What angle are the V-cuts, you ask? You already know the answer—it doesn't matter! I made two fixtures: One that used 90° cuts and another that was more like 110°. I cut the "handle" (shown at the left in **Fig.15**), so I'm never confused as to which end is up. I grab the grip to hold it and the proper face is automatically down. Why two different angles for the V-cuts? Sometimes the blanks aren't cut perfectly. Any blank (whether square or not) will fit in one of the V-cuts, and I can clamp the blank into the corner and against one surface.

Things are now held securely and safely in one of the above methods. The next question should be: How fast should the drill (or lathe) be running? Speeds and feeds are a bit beyond the scope of this article, but suffice it to say that too slow will cause ragged cutting and too fast will cause burning—especially when working in plastics (melting). Go fast enough so that the bit will cut, yet slow enough so that things don't overheat. A balance between speeds and feeds is what you are striving for. A faster rpm means less force (feed) and vice versa.

For those who have limited drill press quill travel and can't drill through the blank from one side, drill as far into the blank as you can, turn off the drill press, leave the drill in the hole, retract the quill with the drill still in the hole, and put a block underneath the blank to shim the blank and hold the mechanism up higher. Then carefully turn the drill press back on and proceed to drill deeper. As long as the shim has two parallel surfaces, you will get a much better result than trying to flip the blank over and drill from the other side. Meeting in the middle may happen, but rarely on axis.

With proper workpiece mounting, it all comes down to drilling technique. Are you approaching the start mark slowly with the down force? Are you letting it help to center the workpiece? Once you have started the drilling, are the chips being ejected as you go? Are the speeds and feeds proper for the material so that you are cutting efficiently without overheating? Do you retract the drill to clean the flutes as needed, depending on the debris? Are you "breaking the chip" periodically? Drilling a good hole isn't just leaning on the drill press arm until it breaks through the bottom. Speaking of breaking out, do you always have a sacrificial backing board underneath the blank to support it as the drill breaks through? Are you easing off on the drill force as you approach the breakthrough point at the bottom? All these things apply to your drilling technique if you are using the lathe.

I've posed a lot of questions, so where are the answers? Drilling is a cutting process and it is a learned skill. Watch an "old hand" in the machine shop. The speed of the drill and the force applied is selected specifically for the diameter of the hole, the material, the depth of the hole, and more. They'll even control the sharpness of the drill depending on the material, sometimes dulling a bit intentionally for certain materials. We don't need lubricants when working with wood, but when you see smoke, you can assume there is too much speed and force going on. Let the drill do its work. Force is used to keep the bit cutting downward, and easing up on the force (breaking the chip), as well as retracting the drill to allow it to exhaust the debris, is good technique. Don't be afraid to practice drilling. Really! Just because you passed high school shop class "way back when" doesn't mean you are an expert at drilling. Take some wood blocks and practice your drilling technique. See if you can get a clean entry and exit hole. Learn what it feels like to sense the bottom of the hole and ease the force as you begin to


Fig. 15

Not necessarily high tech, it is easily made, works well, and has some great features.

break through. If you are laughing right now, you've missed an important point: Drilling seems like a mindless task that anyone can do, but it really is a cutting process that can be developed to serve you or fight you.

The holes are drilled and it is time to glue in the tubes. My method to minimize material loss at the centerband interface is to glue in the tubes from the interface ends and insert them so that the wood is just barely proud. There should only be enough wood there for me to use the barrel trimmer to expose the brass tube, ensuring a good wood surface that is perpendicular to the tube axis. **Fig. 16** shows the blanks after drilling. Even though my blank was cut on the bandsaw using the miter gauge and care was taken to select the reference surfaces (remember the missing information on datum surfaces), there is no assurance that my centerband cutline will produce a surface perpendicular to the tube axis unless I pilot on that tube to cut that surface. That is why I favor using a pen mill rather than other methods of trimming that face. **Fig. 17** shows how the setback is as minimal as I can make it and still have sufficient material to face the wood and expose the tube end. **Fig. 18** shows examples of how the tube is exposed after gluing and facing with very little additional "kerf" loss.

After beating the cutting and drilling to death, isn't all this really overkill? Have you ever made a pen that was beautiful at the blank-planning stage, but then was boring on completion? Have you ever assembled a pen and the mismatch is pretty obvious? Have you ever made a pen where there is a small, but discernible, gap somewhere in the interface of the pressed parts? In your centerbandless designs, does the interface not match perfectly? (By the way, all your 7mm kits should be centerbandless by now. If not, see "Ditching the Centerband" in *Woodturning Design* #21, Spring 2009, for some guidance.)

The content of this entire column may strike you as somewhat picky and perhaps an unnecessary effort. But I assure you that once these techniques and thought processes are in your workflow, they won't add any appreciable time to the process. I do them as a matter of habit and it hasn't been burdensome to me. Even if it adds some small increment of time or effort, it will be worth it. The attention to detail is what separates the penturner and the penmaker. "Flawless" isn't almost; it either is or isn't. Everything you can do that helps you make "perfect" more achievable will help you on the journey from penturning to penmaking.

Fig. 16

These blanks were drilled in the lathe without any center marks from the cutline outward.

Fig. 17

When gluing the tubes, insert them from the center outward with just enough wood proud for facing.

Fig. 18

Facing should true-up the interface perpendicular to the centerline, removing only enough wood to expose the brass tube.

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Kurt is a regular feature columnist for *Woodturning Design* magazine, one of the five Council Members of the Pen Makers Guild, and a member of the Board of Directors of the American Association of Woodturners.

Kurt's work has been featured in the American Association of Woodturners "Rounding The Corners" Exhibit, and he has been published in *Woodturning Design*, *American Woodturner*, *Pen World*, and *Stylus* magazines.

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