

The Journey from *Penturning to Penmaking*

by Kurt Hertzog

Laser Cut Kits

For many newcomers to the penturning arena, laser cut kits can be quite daunting. Laser cut blanks cost appreciably more than standard blanks and the fear of failure will often make the newer penturners quite apprehensive. Even folks who have completed these kits with varying degrees of success, often, in retrospect, have things they would do differently. Therefore, this issue's column will be an explanation of the way I assemble these kits. I do not proclaim this as THE way to do them; it is only ONE way, and because the method I use differs from the manufacturers' instructions, you need to decide for yourself if my way might work better for you. I can't be responsible for YOUR success or failure, but I can tell you that I have had reasonable success using the method I am sharing with you here.

SELECTING A KIT

I suggest that you pick one of the simpler kits for your first foray into the laser cut world. Get a few successfully under your belt before you launch into the more complicated and expensive versions. Not only will your success rate be higher with the less complicated ones, but it will be less painful should you not be successful. These kits are similar to jigsaw puzzles and starting out with the "thousand-piece forest scene" is inviting frustration.

There are many designs from which to choose and

these range from the simpler, fewer-piece kits to the ones that can be challenging even for someone who has completed many of them (see Fig. 1). The kits are available from several companies, and you can find a wide array of kit subjects, complexity levels, and prices (see Fig. 2).

SET UP A GOOD WORK AREA

Though it may seem like common sense, doing a puzzle in a messy workshop might not be the best idea. I know that many turners have spotless workshops and I'm not suggesting that you don't, but help yourself by setting up a clean, well-lit area where you can work. Each kit comes with exactly what is needed, and any piece that winds up in the dust, in any debris, or on the floor may never be found. Even if it is, the time lost is nonvalue added. If your workshop area permits a good environment for this kind of work, great; if not, find an area where your work will be easy to see, and better yet, easy to find parts when you drop them—and trust me, you will drop pieces on occasion (see Fig. 3).

Whether you use Mag-Eyes, a desktop light and magnifier, or some other visual aid, I highly recommend using some kind of lighted magnification. It helps when fitting the pieces and will aid in getting the spacing correct. Regardless of how good your eyesight is, the larger

Fig. 1



The variety of laser cut kits (available from several companies) is fairly extensive.

Fig. 2



I suggest the less complex kits with fewer parts to start off—save the more complicated and expensive kits until you've perfected your technique.

Fig. 3



A clean and well-lit area will make the task of assembly more enjoyable and successful.



Fig. 4

Though a paper plate might work, I prefer the mass of a heavier dish so that pieces are more secure.



Fig. 5

The time to find out that the kit is missing parts is early on when you can return it or request the missing parts.



Fig. 6

Wrapping the brass tube in wax paper allows it to be inserted into the wooden blank to support the pieces as they are inlaid.

view provided will make it less tiring and allow more precision. I find that having a good place to lay out and manipulate the various pieces is key to success. Rather than pawing through the bags to find things, spreading them out to be seen and sorted is worth doing. A white plate with sides that will contain pieces works nicely for me (see Fig. 4). The advantage to this should be obvious in not only determining what is what, but also in making sure that the proper number of each piece is there. If you wind up with any pieces missing, your finished project will suffer because the replacement concoction won't match as well as the original. The time to find out that you are missing one of the yellow buttons for the jacket front isn't late at night when the kit is nearly finished (see Fig. 5)!

INSTRUCTIONS DEVIATION

For the most part, the manufacturers' instructions that I've seen tell you to insert the tube and then assemble the kit pieces to the wooden blank. Unfortunately, as the individual pieces are oriented and tacked in place, the tube begins to get permanently attached as the cyanoacrylate glue (CA or superglue) wicks into the

assembly; therefore, I do mine differently. Though this could be considered overkill, I use the following method for all the laser kits that I make regardless of complexity.

To avoid any sticking, I wrap the tube that I'm using in wax paper and insert it into the wooden body (see Fig. 6). The tube now acts as a backing board for the insertion and support of each of the laser cut pieces. I usually use a magnifier for the assembly process and a pair of tweezers to handle the pieces. Because things are in the round and there is an intentionally cut taper, there is a top and bottom orientation for each of the pieces and this can be determined easily by looking at the piece. Often, there is a slight color intensity difference on the parts that can be used to advantage as well (see Fig. 7).

All the kit manufacturers provide instructions that will detail the proper assembly sequence. After ensuring that the part is oriented for the curved assembly, it can be positioned and temporarily tacked into position. Most kits supply rubber bands to hold the various pieces in place during assembly placement, which allows you to assemble multiple pieces and tack more than one in place at a time. The advantage of doing it this way is



Fig. 7

Most parts are cut on a taper so that they assemble properly, and it is usually fairly obvious which is the top and which is the bottom.



Fig. 8

The rubber bands provided with the kit allow for multiple pieces to be assembled and then for tacking parts in place with CA.



Fig. 9

Plenty of light and a clean work area make the task much easier.

that it allows you to space the parts to get the best appearance. Because there is some kerf loss and clearances are needed for easy assembly, shifting the various pieces to provide even gaps before tack gluing in place improves the appearance (see Fig. 8).

THE BUILDING PROCESS

Continue the building process by assembling the parts as needed to complete areas for the best fit. There is usually no hurry to glue pieces in place, provided that you use the rubber bands and the parts aren't too small. By building out complete areas, you can position the parts for even spacing and the best overall appearance (see Fig. 9).

If there is any one single piece of advice I could offer, it would be to take your time; hurrying doesn't improve things; if anything, it will reduce the overall quality of the work. Be diligent, when things don't look right or don't fit precisely, you might have made an error. If you are still in the rubber band stage, you can sort things out without too much of a problem. My motto is, "The less glue the better"—a small amount of glue to secure corners of parts into place is all that is needed. You can fill in the gaps between the parts later on; however, for now, you only need to hold the pieces and keep them from shifting out of alignment (see Fig. 10).

Upon completion of the assembly, you'll have a wooden blank with the component parts tacked in place and a tube that is protected with wax paper inside as an assembly support. The tube can now be pressed out to continue the process. If the CA used to tack pieces in place has bonded the tube to some degree, use another tube to push out the original. The wax paper residue that might be stuck on is easily removed with the judicious use of a rat-tail file (see Fig. 11). The goal is to provide a clean glue surface that has enough tooth to create a great adhesive bond.

Notice that the parts are flush on the inside even if they vary to some degree on the outside—remember, the various parts were cut from multiple sources and then assembled into each kit. This variation in thickness

doesn't impact the final result as long as the assembly process focuses on making the inside surface flush (see Fig. 12). Any variation in seating depth or thickness of parts will be filled using the epoxy that is applied next. (I use polyurethane glue for all my tube adhesive applications EXCEPT the laser cut kits. The foaming activity of the curing of polyurethane can push pieces apart, since they are only tacked in place at this point.)

Prep the tube that you are going to use by scuffing off the drawing lube and any oxidation with a coarse grit of abrasive paper (see Fig. 13). Some would suggest that this is unnecessary, but I find that the time it takes is worth the improvement in the bonding surface. Once the tube is prepped, coat the inside of the blank generously with epoxy—use a wooden stick to ensure complete coverage before inserting the tube (see Fig. 14). Slide the tube into place and position it so that the cut design excess is evenly spaced based on the tube's final location. Any glue that finds its way to the inside diameter of the tube should be cleaned out with the wooden stick used to spread the glue on the inside of the blank. However, there is no need to agonize over this, because any epoxy remaining at the end of the curing process can be cleaned out with the rat-tail file (see Fig. 15).

FINAL BLANK PREPARATION

The blank is just about ready for use. My last operation prior to facing the end of the blank is to flood any gaps between the parts with thin CA. This will ensure that the parts are in position to stay and it will also yield a flush surface after the blank is turned. The clear adhesive filler will not be unsightly, provided that the gaps aren't excessive and the gap spacing is relatively uniform (see Fig. 16). Fortunately, if the gaps are too large, you can always use medium CA to fill the spaces. Don't fear getting too much CA on the blank, any that wicks into the wood will be of value; filling the gaps is the most important thing, as it will help with the finished appearance.

It is important that the facing of the end of the blank be done on a sander, because trying to use a pen

Fig. 10



When you are tacking pieces in place, I recommend using a very small amount of glue in the strategic corners of the piece.

Fig. 11



When the assembly is complete, the tube is pushed out and the inside of the wooden blank is cleaned up with a rat-tail file.

Fig. 12



If the cut parts were a good fit and the assembly was done well, the bottom of each laser cut part will be flush with the inside of the hole drilled in the original kit blank.

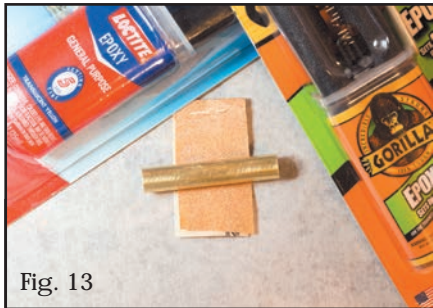


Fig. 13

Depending on who you listen to, the scuffing of the brass tube is either a waste of time or absolutely critical.



Fig. 14

I coat the entire inside of the blank with standard 5-minute epoxy, filling any gaps between the components and the inside wall.

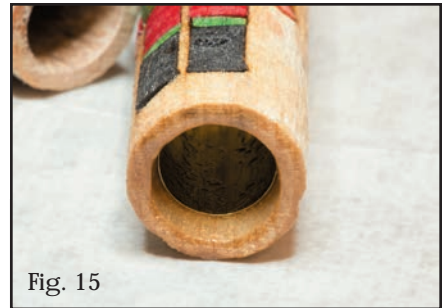


Fig. 15

The scuffed tube is inserted into the blank and located to position the design properly after trimming.

mill will usually lead to trouble. I've tried it many times and have had far too many failures. You can purchase a commercial belt sander jig or make your own (see Fig. 17). Supporting the blank with the proper size mandrel and presenting it correctly to the sander will provide the best faced end perpendicular to the axis of the tube. There will be gaps in the final assembly unless the face of the blank is sanded perpendicular to the axis of the tube, so make certain that your sanding equipment is adjusted properly and locked in place so that it is perpendicular to the belt (see Fig. 18). The properly faced blank will have the wood sanded only up to the very end of the tube (see Fig. 19). Over or undersanding at this point will have a detrimental effect on the final pen, depending on the kit and manufacturer. Most of the kit's "headspace" is based on the tube length, so be careful to be accurate.

THE TURNING PROCESS

A laser cut kit is processed exactly as a standard blank from here on out. Mount the blank on the mandrel just as you would a standard pen blank (see Fig. 20). Note the mandrel saver on the tailstock center—I think the

use of a mandrel saver is key to turning pens. The mandrel saver is an essential part of my penmaking equipment; for without it, there is a risk of bending the mandrel, setting up vibrations, or just plain turning parts eccentrically.

Use any tool that you are comfortable with to turn the pen. In my opinion, nothing beats a spindle roughing gouge to produce nice flowing curves (see Fig. 21). The pen is turned the same as any other for turning, sanding, and finishing with your desired method. The only caution I can give is use fast speeds, sharp tools, and a light touch. Regardless of how well the pieces are glued together, the assembled kits are still a bit fragile, and if you are heavy-handed or use every tool you own that is similar to a scraper, you are asking for trouble.

I use a CA finish on nearly all my pens, including the laser cut kits. My end goal is a pleasing, flowing shape that has a continuous curve from the nib to the clip end. I don't want fat or skinny spots that interrupt the continuous curve (see Fig. 22). The assembled pens (and the yet to be assembled ones) shown in Fig. 22 illustrate the curve idea. You are certainly welcome to shape things as you wish, but I think the interface fits and the curve



Fig. 16

With the tube bonded inside the blank, now is the time to flood the surface of the assembled kit with thin CA to fill any of the gaps between components.



Fig. 17

Don't use a pen mill to face the ends of the blank; making a laser kit pen is the only time I use a belt or disk sander.

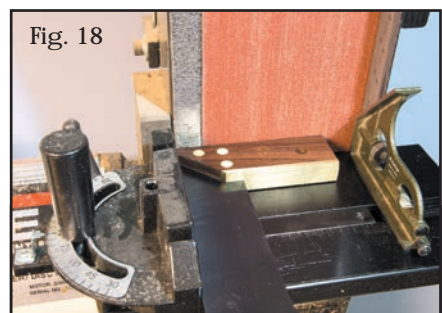


Fig. 18

Regardless of your fixture, if the table and fence aren't square to the sanding surface, you won't get a sanded edge perpendicular to the tube axis.



Fig. 19

With a mandrel supporting the blank on the tube inside diameter axis and the sander squared properly, it is easy to create the correctly faced edge on both ends of the blank.



Fig. 20

There is no need to remove the rubber bands; you can leave them in place along with all the excess glue.



Fig. 21

You can use just about any tool in your kit (from a parting tool to a roughing gouge) if it is sharp and presented properly.

flow show the maker's attention to detail.

CLOSING THOUGHTS

Is the method I presented too much bother? Is the need to use the tube as an assembly aid and then use epoxy to bed the tube a hassle? Is it that important to set and maintain the squareness of your sanding equipment? Can you do it faster another way? Sure, but why? The process I've detailed here works quite nicely and takes little extra time. I have always had good success with it and am willing to pay attention to these few details to get the finished product I want.

If you want to do a little bit extra, you can turn a simple stand for the pen. The presentation can be either with or without a stand, but a turned stand is easily made and, in my opinion, adds value to the finished product (see Fig. 23).

If you have a method for building laser cut kits that works for you and you are satisfied with the results, keep on using it. If you are having difficulties or don't have a current process, I suggest you give my method a try. I think that each step that I use enhances my success rate and adds to the final product, or I wouldn't bother doing it. If you haven't tackled a laser cut kit yet, what are you waiting for?



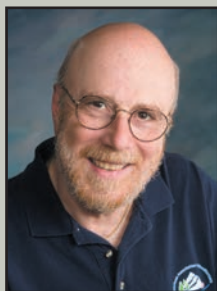
Fig. 22

I pay attention to the shape because I want the shape of the pen body to be a continuous, flowing curve from end to end.



Fig. 23

Whether the pen is in a home-made stand or a purchased funnel stand, the flow of the shape should be a pleasing curve.



Kurt Hertzog

A professional woodturner, demonstrator, and teacher, Kurt Hertzog enjoys the continuum of woodturning, from making his own turning tools to photographing his finished turnings.

Kurt is a regular feature columnist for both *Woodturning Design* and *Woodturning* magazines, 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*, *Woodturning*, *Pen World*, and *Stylus* magazines. You can see his work on his website at www.kurthertzog.com.