

A Cartridge Pen –
Presented to the SWAT Symposium 2006 in Temple, Texas



By Don Ward

Thanks to Jay Pickens for teaching me how

A picture of special tools used is at the end of the article. Improvised tools can be used without purchasing these, but they are nice to have and can also be used for other things...deburring tool, V-blocks, drimmel tool and cut off disks (which I don't use any longer. .

Making pens with rifle and pistol cartridges is not my idea. I saw a picture of a pen using pistol brass and loved it. During my next phone call to Bill Baumbeck (the owner of Arizona Silhouette) I asked about the availability of kits using cartridge bass. Bill told me he once had a kit using cartridge brass. It was brought to him from Australia by Dick Sing. Bill sent it to Jay Pickens, pen-turner and artist extraordinaire. Bill told me "Jay can do more with less than any one I know." I found Jay on Yahoo Pen-turners and was excited he lived only 120 miles from me and in a town I travel through regularly. I contacted Jay and parts of this article are Jay's instructions to me. Having developed a friendship with Jay has been the most important thing I've done to sharpen my pen-turning skills. Thanks Jay for being willing to share, honestly critique my work and offer suggestions on ways to improve. Jay is an elder in the Yahoo Pen-Makers-Guild and his work can be seen in the PMG gallery at <http://www.penmakersguild.com> the instructions that follow are a combination of Jay's instructions to me and the things I've learned by making these pens.

A main concern I had with the brass cartridges was the tarnishing of the brass. Some like the look. Personally, I like the polished brass look. Polishing the brass is not a problem, just an inconvenience, especially after the pen is assembled. But 5 minutes with a semichrome polish and the brass is shiny again. I tried lacquer and other clear coatings and did not like that look either. That's when I was introduced to powdercoating. I powdercoat the brass on the cartridge pens I make. (Besides, another reason for getting a new toy/tool)

I use 25-06 because that is a popular caliber in Tex right now. 30 caliber works fine...just about any caliber as long as the primer end OD does not exceed the diameter of the clip end where the finial goes. Other calibers that have been used are .223, .243, .270, .308, 7mm magnum, 38 caliber pistol, 357 pistol, 45 auto, 7mm and 9mm pistol. Different size casings make different size pens....from large to small. The primer end rim may need a notch to allow the clip to clear. Rifle brass is tapered and that causes some fitting problems. The tapered cartridge also causes problems with squaring the "cut" so the fit on the wood is nice. I've solved that by holding the cartridge in a Beall Collet chuck and using an inexpensive skew or parting tool to cut the brass. It makes a nice square cut. Some clean-up of the burrs and such is necessary but not difficult to figure out. The extra work is worth if for me since I like to use the entire cartridge. I don't care for the pens that use the "whole cartridge", although I have made some by request.

After making a few of these pens, you will better understand how to change the design to use the whole cartridge, or just the primer end, or use the kit nib instead of the lead bullet. Browse the photo albums of the IAP (<http://www.penturners.org>) and the Y! PT group (<http://groups.yahoo.com/group/penturners>). Search the two sites for cartridge pens, casing pens, bullet pens, etc... and you will find many variations on this theme.

Special thanks to Craft Supplies USA, in Provo, Utah, for supplying complimentary pen kits for these pen turning demonstrations. They can be found on the web at <http://www.woodturnerscatalog.com>

NOTE: If using shell casings that have been fired and if you want to use the lead bullet as the nib, then the neck of the brass must be crimped back to its original size. A tool for this is available where reloading supplies are sold. Otherwise, the lead will be loose and it will not work. This is why I use new brass. I do not reload so I don't have the tool to crimp the neck of the brass back to where it should be. Brass that has been fired can be used without crimping the neck, but a drop of CA is needed to secure the lead to the brass.

STEP 1: The first thing I do is drill the lead bullet for use as the nib. Lead is difficult to drill...not because it is hard, but because it is so soft. The lead shavings tend to wrap around the bit and clog the hole. Using WD-40 or a silicone spray applied to the hole helped the drilling process tremendously. Drill shallow and clean out often. Going too deep causes problems.

(1) First drill from the pointed end with a 5/64^{ths} bit and drill all the way through. Holding the lead bullet proved to be a problem but Jay introduced me to the V-block and holding the lead became much easier.

(2) Next, turn the lead bullet over and drill from the large end with a 9/64^{ths} bit, stopping about 3/16^{ths} from the end before going out.

STEP 2: My next is to cut and prepare the brass casing. I have used the bandsaw. I tried copper tubing cutters but the wheels left marks around the brass. A drimmel tool with a cut-off disk was used and works very well. Be careful of flying brass dust. It is not fun to get it in the eyes. After cutting, the brass parts need to be squared. This proved to be Problematic for me. The brass casings are not a perfect cylinder, but are tapered. This tapered construction made squaring them difficult. I have now moved to holding the brass with my Beall chuck and one of the ER-32 collets. The casing is parted in two and squared at the same time. I like this method best. It is quick and three jobs are finished with one. No matter how the casing is cut, burrs must be removed from the inside and from the outside.

STEP3: The lead bullet must be pressed in place. I have no set depth. I just press it in until the proportions of exposed lead with the brass looks nice. I use a hand held pistol grip clamp, the pen press, or an arbor press. Polishing and powdercoating would be done here. I often prepare 10 sets brass parts and powdercoat them all at the same time. Then when I need to make a cartridge pen, the brass parts are ready to use.

STEP 4: The wood blanks need to be prepared if not already done. Maybe this should be step 1.

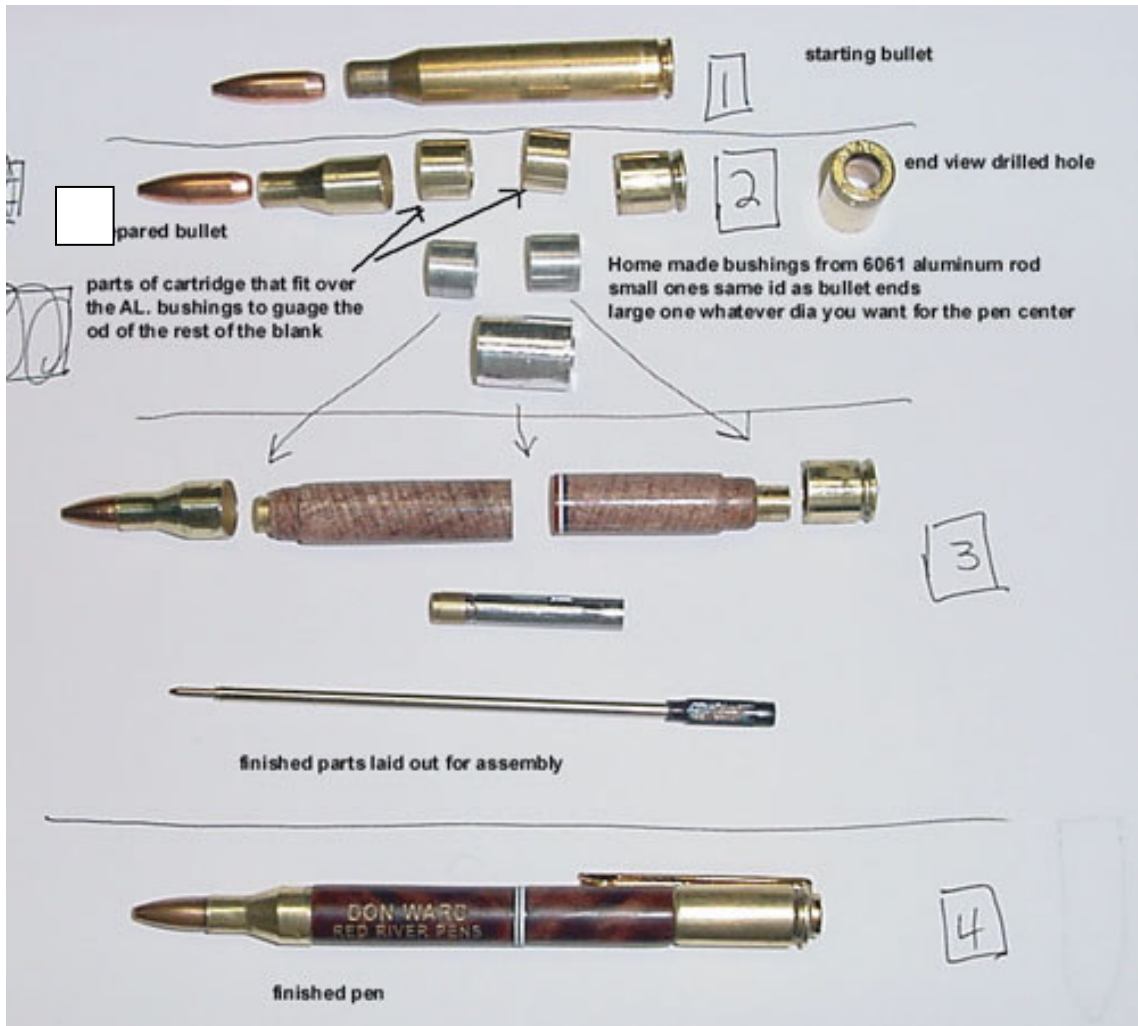
STEP 5: The blanks need to be turned and the ends prepared for acceptance of the casings. This is the tedious part. The ends need a tennon that fits inside the brass. **This fit is critical...take your time...the better the fit, the better the pen will look.** Look at the shape of the brass parts and you can see it will be a little challenging. Turn...remove...fit...replace....turn...remove...fit...replace....etc. The investment of a set of calipers really helped here. Measure the ID and OD of the brass and turn close to dimensions. I have started using a pin chuck to hold single blanks with the modified end at the end of the chuck. I don't completely turn on a pin chuck because the 1/4" mandrel shaft does not make the sturdiest of pin chucks. But, I can shorten it using my Beall chuck and it is a little stronger. That way, the brass parts can be fit without removing the blank. When the brass parts fit, I place both blanks on one mandrel, complete the turning, sanding and applying the finish. The brass tube on the bullet end may need to be shorted. The brass tube does not touch the lead bullet.

STEP 6: I almost passed this step. We are so accustomed to pressing in the nib at this point, it is easy to glue on the brass/lead bullet assembly here. **The transmission needs to be pressed in and fitted prior to gluing on the bullet/casing end.** Applying pressure to the lead bullet is not a good thing to do. Ask me how I know.

STEP 7: Time to glue on the two brass parts. I use two parts 5 min epoxy. Use your glue of choice. If the tenons are a bit too small, polyurethane glue has been proved useful...it foams and fills the space between the tenon and the brass. The glue is the only thing holding these parts to the wood, but it has proved to be quite adequate.

STEP 8: Assemble the clip and finial and press in. A small notch may be needed on the rim of the primer end to allow the clip to clear. I use a drimmel with a thicker cut-off disk.

STEP 9: Finish the assembly of the pen.



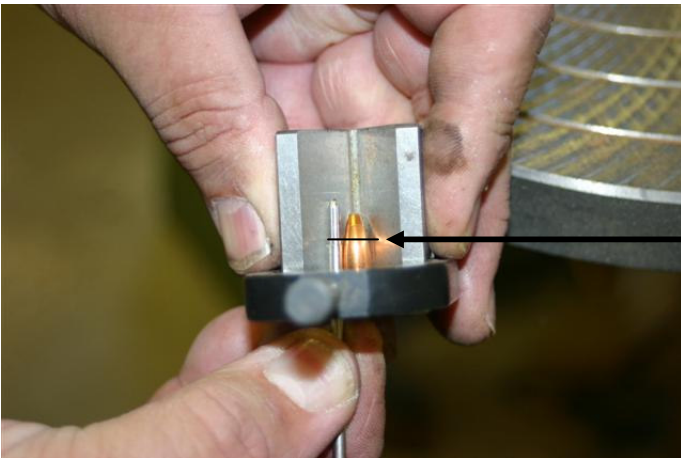
Not a necessity, but powdercoating the brass parts with clear powdercoating paint makes them retain their polished shine. The brass will never tarnish under this stuff. It is tougher than woodpecker lips.

I have stopped using the homemade bushing. I turn the two parts on a 7mm pin chuck and I don't have the need remove the blanks repeatedly to measure.

The pen above is my first successful attempt at making this style of pen. It looks a little rough, and it is, but the quality is getting better.



Drilling through the lead from the small end...using the hollow point hole as a guide. 5/64 bit drilled all the way through.



Compare the refill to the lead nib. Flip the lead over and drill with 9/64 to about 3/16 before exit out the small tip.

Stop the 9/64^{ths} hole here.



Drill out the primer end with a 5/32 bit to allow the 7mm tube to pass through and flush with the flat surface.



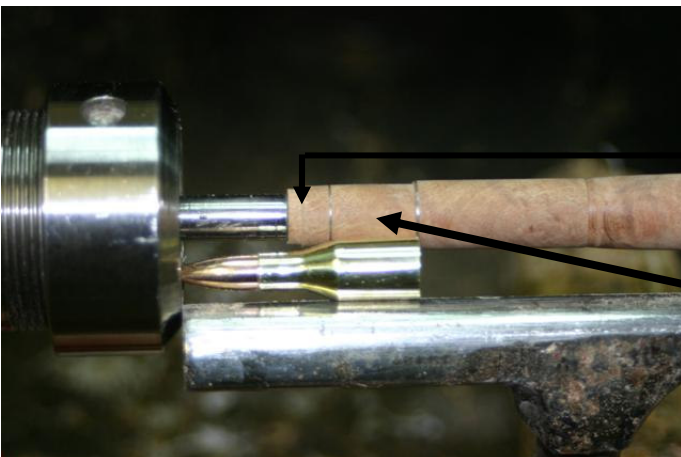
Cutting the brass on the band saw works. I use a blade that is too dull for wood. Hate to change blades so I don't use the band saw very often. However the brass is cut, some cleanup is needed to remove burrs. This will become evident as you make these pens. Just be careful..Sanding scars the brass and the



A drimmel tool with a cut-off disk can be used. Cut and turn until the brass is cut. Or, the brass can be sliced through, rotated and sliced again to finish the separation. Squaring the cut has proved to be difficult for me. Rifle brass is not a perfect cylinder which presents a squaring problem.



After the purchase of the Beall Collet chuck, parting the brass cartridge has proved to be the most efficient way. It parts off square and the cut just needs to be cleaned of nasty burrs. I use a piece of 180 grit sandpaper on a pen blank to sand the face of the cut. A deburring tool is used to remove the burr inside the brass and a parting tool is used to smooth up the outside of the casing.

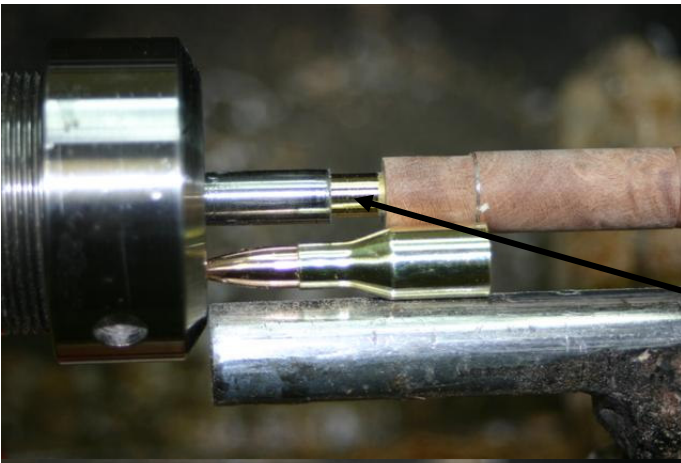


After rounding the blanks, mark critical areas to help guide next turning.

Remove: part off and sand off most of the brass tube underneath. The tube does not touch the big end of the lead bullet.

Shape this tenon to fit inside the brass shell.

Look at next picture:



End of brass tube needs to be removed so it doesn't hit the end of the lead bullet.



Shaping to fit: almost there.



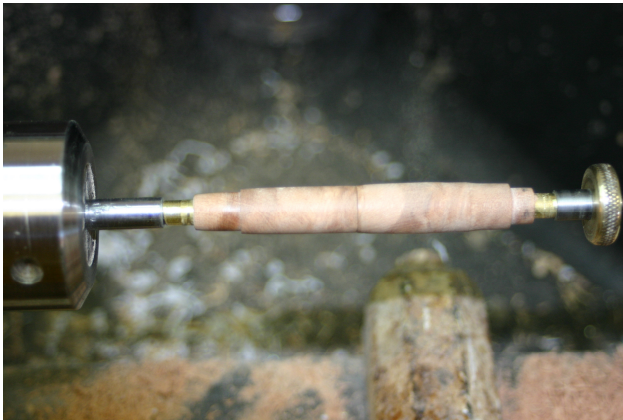
Finished with this end. Same procedure on the shirt pocket clip end.



Do the same for this end as we did on the bullet end. Measure, mark and cut the tennon to fit inside the brass. Notice some of the wood has been parted off. This is necessary for the brass tube to fit flush with the flat surface on the primer end of the brass



Finished tennon and fit. The two blanks are ready to mount on a mandrel and completed. Turn to desired shape, sand and finish.

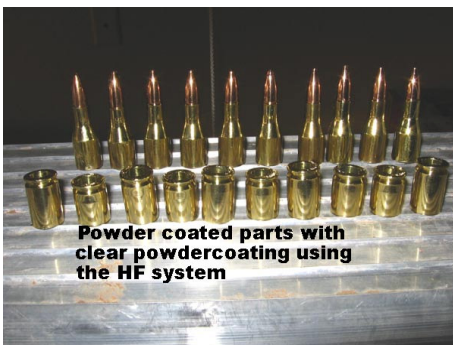


Both blanks on the mandrel. Continue to shape the pen. Sand and finish with your finish of choice.

The pen is now ready to assemble. Press in the transmission and dry fit the nib assemble and test the refill for correct extension and retraction. Glue on the two brass parts. Assemble the clip and finial and press into place. Join the two halves and you have a rifle shell pen. Congratulations.



The two pictures above are pens made by James Mann, aka Fangar. You can see more of his work at <http://www.penturners.org> and navigate to the photo album or use this URL: <http://tinyurl.com/nn2sq>



Powder coated parts with clear powdercoating using the HF system

These parts have been powdercoated with clear powder and they will remain nice and shiny. Powdercoating is harder than woodpecker lips. Some like this look and others like for the brass to tarnish. It is not necessary, but a nice embellishment.

ENJOY! And HAVE FUN!