

Rifle Cartridge Bullet Pen Tutorial

By Les Elm

Making pens using rifle cartridges is nothing new. I have seen photos of cartridge pens and read tutorials on various pen making forums and decided to try making a Rifle Cartridge Pen using an actual Copper bullet for the nib. The following instructions are what has worked for me. As you make your own pen you may find different ways to make this pen. These instructions can be used to make .270, .280, 30-06, 303 British, 7mm Magnum and other calibers.

For the Cartridge Pens I purchase new unprimed Brass Cartridges. New cartridges have no primers installed and I don't have to deal with a spent primer when drilling out the primer hole. A spent primer will have an indentation in the end of the primer. With fired brass the neck has to be resized in order to seat the bullet or the bullet can be glued in place.

It would be very dangerous to try and remove a live primer without the proper equipment that is used for reloading ammunition!

The bullets I use to make the nibs are either Full Metal Jacket with a lead core or Solid Copper Bullets which I prefer due to environmental and health concerns with bullets containing Lead.

For the kit hardware I use either a Slimline or European style that uses 7mm tubes. I also use a Slimline finial and rifle clips and Euro Finial and rifle clips can be used.

I have made the cartridge pens with or without center bands. Some people prefer no center band and some like the looks of a center band.

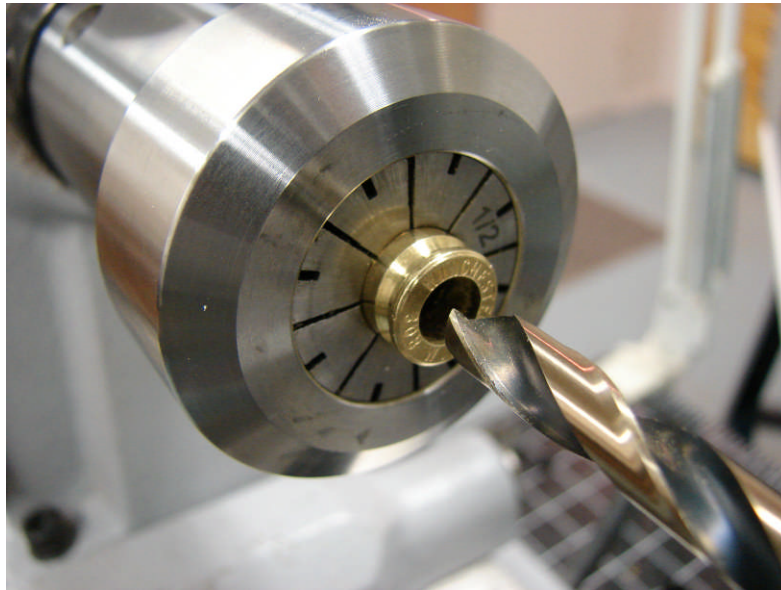
I use a Beall collet chuck and a 1/2 inch collet to hold the brass cartridges which will not mark the brass. Ensure you have the collet tightened enough around the cartridge to keep it from spinning in the collet while you are drilling the primer hole or you will mark the soft brass.

Set lathe at 800 RPM to do the drilling and cutting. When drilling either a bullet containing lead or a solid copper bullet, go slow and drill shallow using Rapid Tap Cutting Fluid, cleaning the drill bits frequently to avoid plugging the hole. If you go too fast the lead will get hot, melt and cause problems.

To finish the brass cartridge and copper bullet to avoid tarnishing, first clean and polish the Brass Cartridge and Copper Bullet with Liquid Brasso and wipe down with Lacquer Thinner. Apply 4 coats of Sherwin - Williams Opex Clear Acrylic Metal Lacquer thinned with Lacquer Thinner to a 40% Lacquer and 60% Lacquer Thinner mixture. I use the dipping method to accomplish this, first by plugging the nib hole with Bee's Wax, installing a piece of tight fitting dowel into the 7mm primer hole and dip into a container of the thinned lacquer and hang vertically to dry.

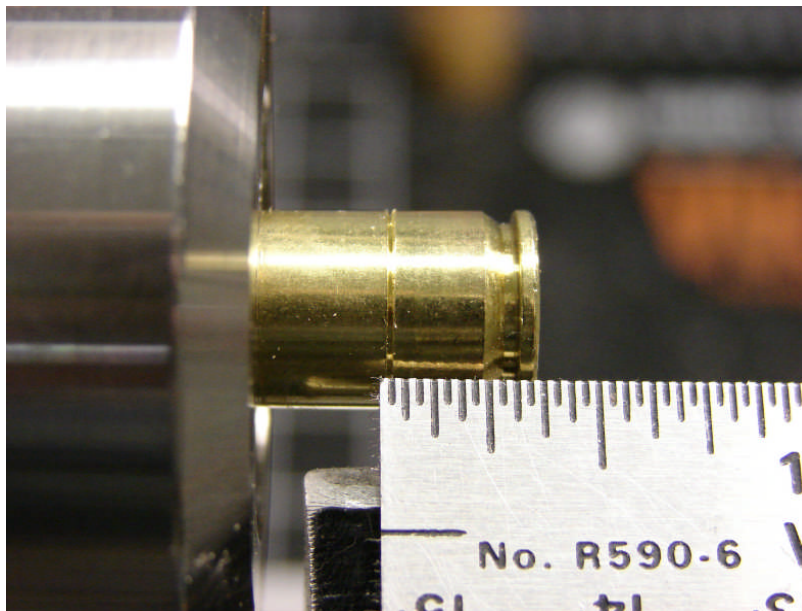
I finish the Deer Antler by first sanding with 400 grit, fill any voids with Medium CA, then sand from 400 through to 1500 and polish with Brasso or Hut Ultra Gloss Plastic Polish.

Step 1. Drilling Out The Primer Hole: I install my Beall Collet Chuck with a 1/2" collet on to the head stock. Install a cartridge into the collet and tighten. Install a drill chuck into the tail stock with a 7mm bit and enlarge the primer hole to 7mm. Ensure the collet is tightened enough to prevent the cartridge from turning and damaging the brass surface of the cartridge.



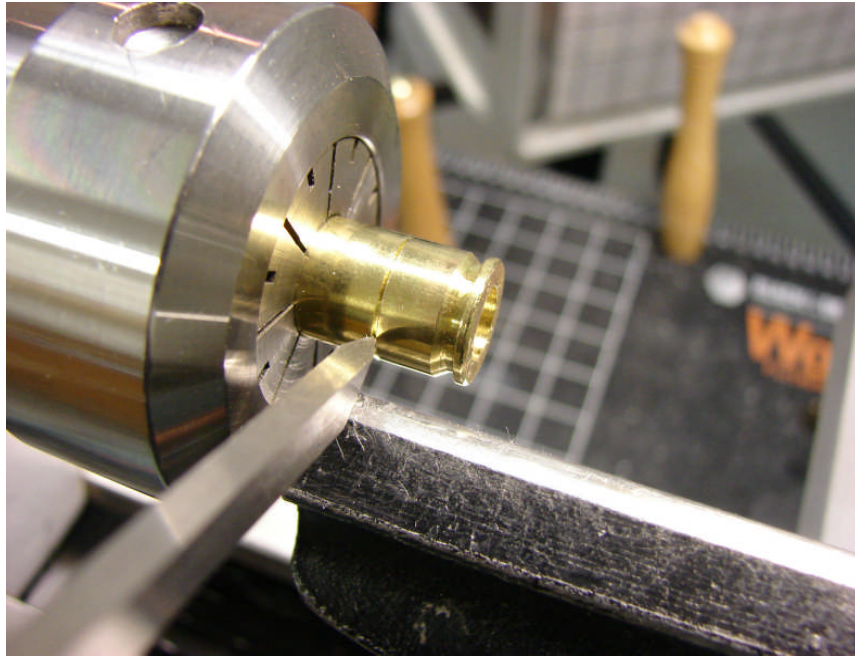
Drilling Out Primer Hole To 7mm

Step 2. Making a Cartridge Head Center Band: Install another cartridge of the same caliber and mark the length of center band you want. I make mine 11/32nds of an inch long.

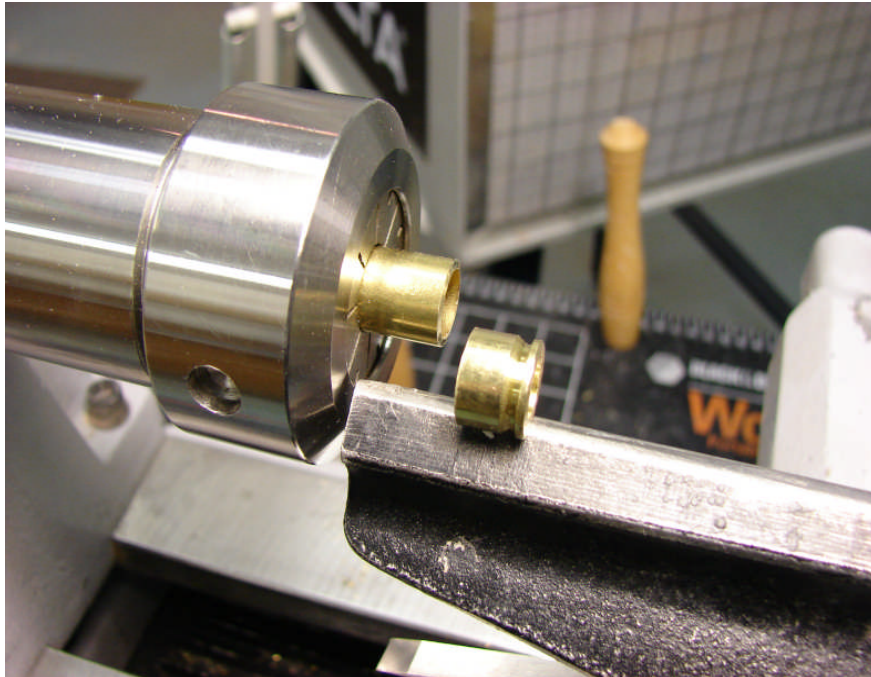


Marking The Cartridge Head Center Band Length

Step 2.1. Parting the Cartridge Head: To part the cartridge head off of the cartridge I use the point of an old HHS Skew placed on my tool rest.

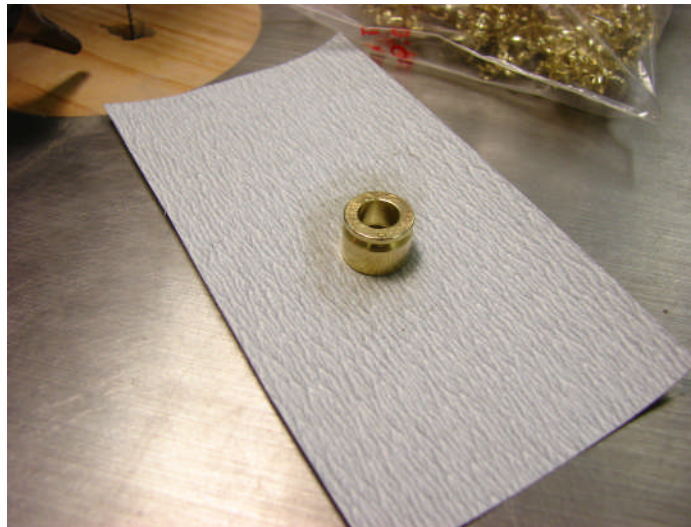


Using Skew To Cut Base Off Of Cartridge Head



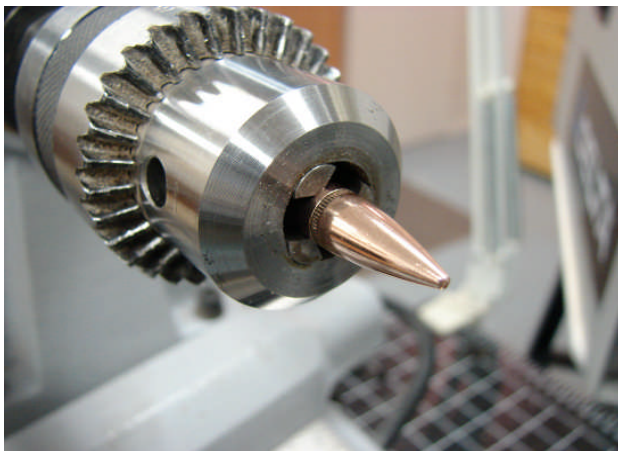
The Cartridge Head Cut Off Of The Cartridge

Step 2.2. To de-burr the cartridge head and get a flush surface I place a piece of 320 grit sand paper on a hard flat surface and sand using a circular motion.

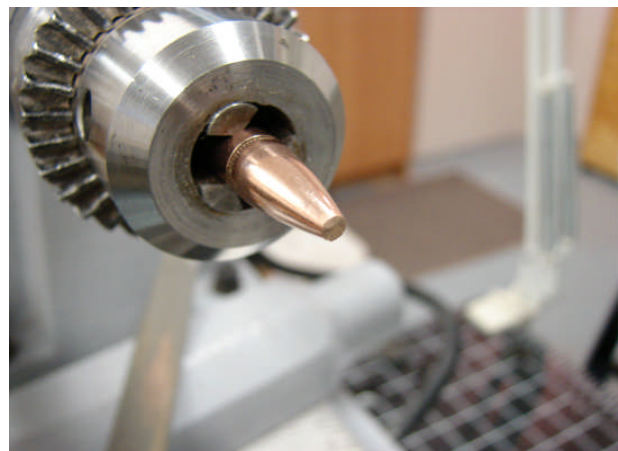


De-burr and Sand Center Band Base Flush

Step 3. Making The Bullet Nib: I install a drill chuck in the headstock and install the bullet with the point facing out. Now I file $3/32$ nds of an inch from the point to get a square flat surface. Always ensure the bullet is tightened on the surface that will not be seen when the bullet is seated into the cartridge neck. In some cases I will wrap the bullet with some masking tape.

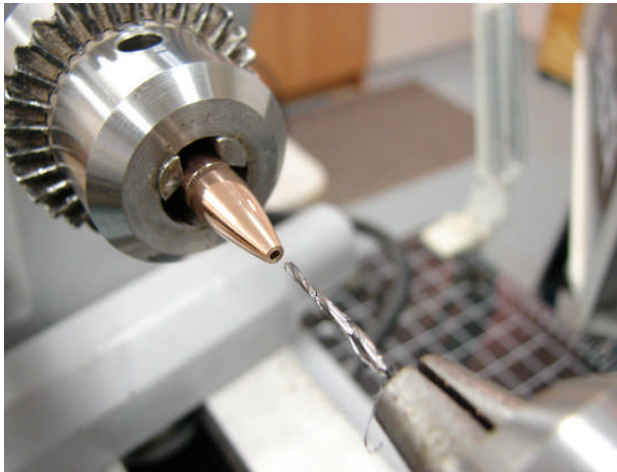


Bullet Installed In Drill Chuck

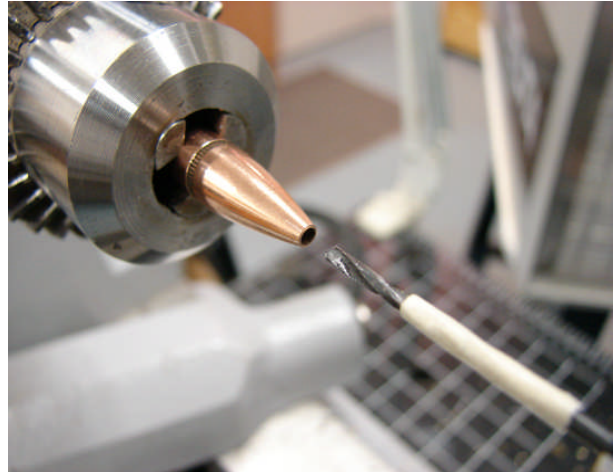


Bullet Tip Filed Square and Flat

Step 3.1. Install a drill chuck in the tailstock and install a #55 drill bit to drill a pilot hole in the center of the flat bullet tip. Drill slowly using Rapid Tap Drilling Fluid and stop drilling once you hit lead. Remove the #55 bit and install a #46 bit and drill through the pilot hole using Rapid Tap Drilling Fluid to a depth of ½ an inch. I place a piece of tape on the #46 bit to act as a depth gauge.

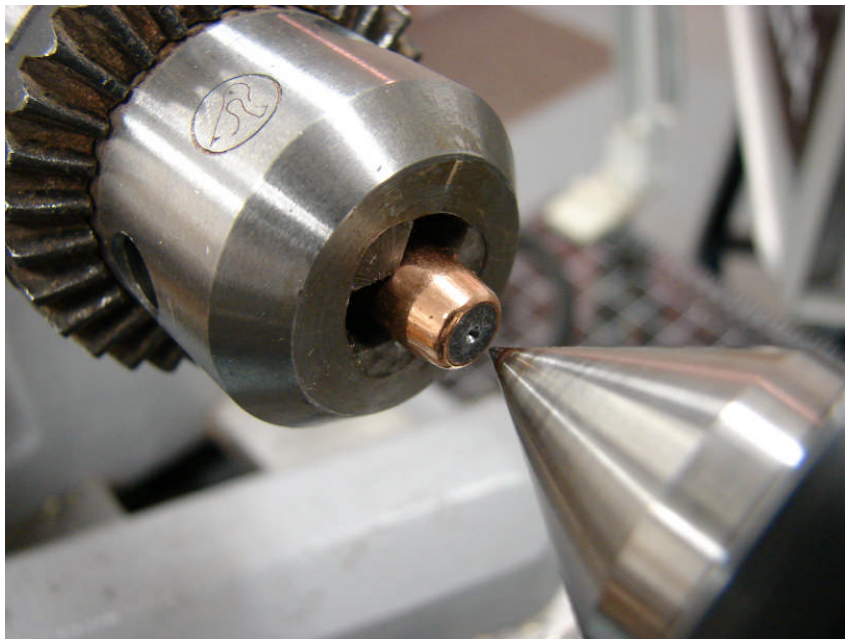


Drilling #55 Pilot Hole



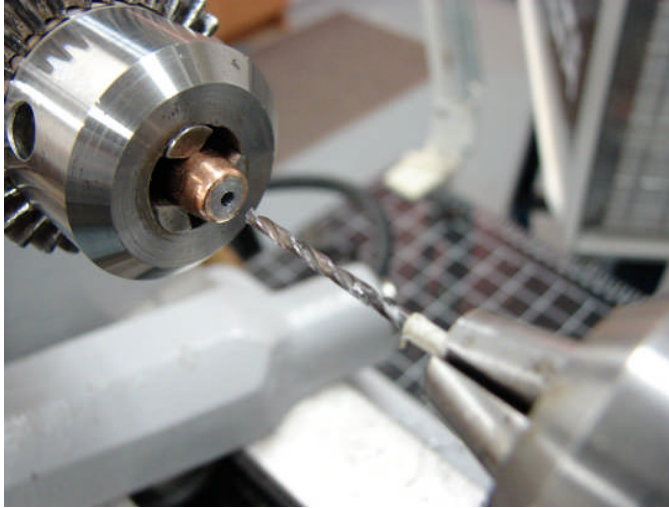
Drilling #46 Nib Hole

Step 3.2. Next I reverse the bullet in the drill chuck with the large end facing out. Install a live center into the tailstock and mark the center of the boat tail end of the bullet.



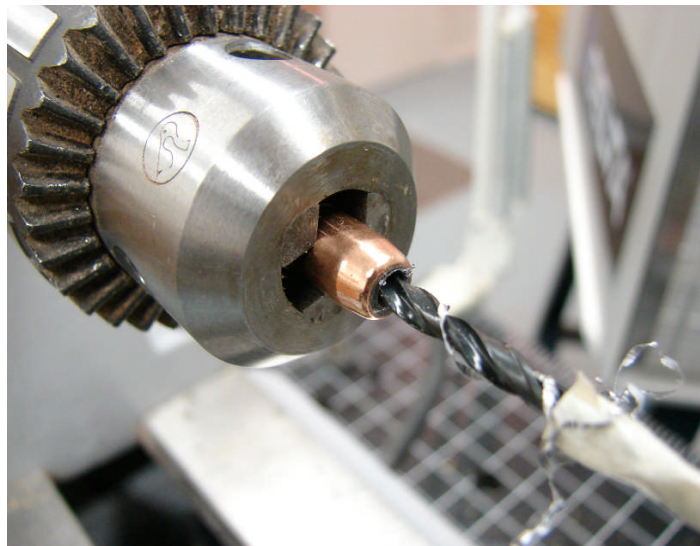
Marking The Center Of The Bullet Boat Tail

Step 3.3. Install a drill chuck in the tailstock with a 5/64th bit and drill a pilot hole to a depth of 15/16ths of an inch. I place a piece of tape on the 5/64th bit to act as a depth gauge. Drill slowly using Rapid Tap Drilling Fluid and clean the hole and bit frequently. De-bur and clean up around the hole.



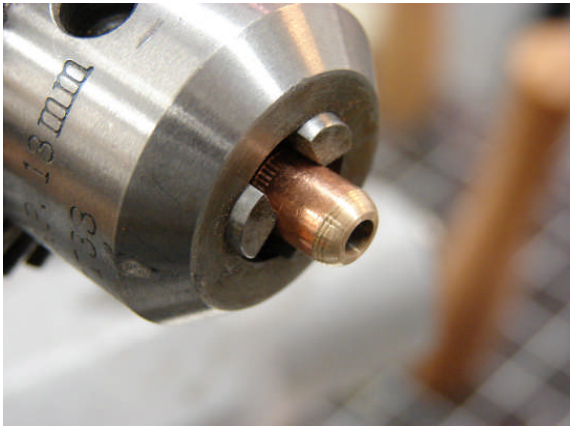
Drilling 5/64ths Pilot Hole

Step 3.4. Remove 5/64th bit and install a 9/64th bit and using Rapid Tap Drilling Fluid, drill through the 5/64th pilot hole stopping frequently to clean hole and bit. Drill to a depth of 15/16ths of an inch to avoid drilling through the sides of pointed end. This will vary depending on the caliber of bullet I am using. I put a piece of masking tape on the 9/64th bit to use as a depth gauge.

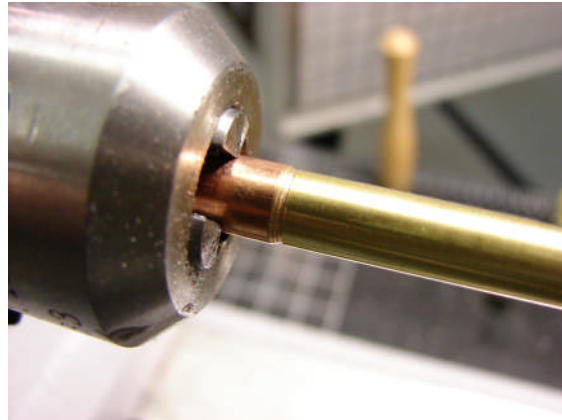


Drilling 9/64ths Pen Refill Hole

Step 3.5 After drilling 9/64ths hole I use a file to taper the bullet enough to allow the 7mm brass tube to fit over the taper and then de-burr and clean up.

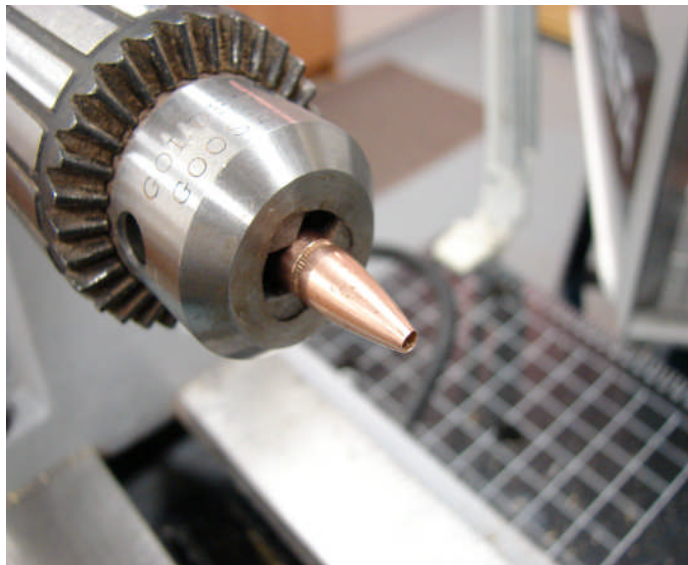


Bullet Tail Tapered For 7mm Brass Tube



Checking Taper With 7mm Tube

Step 3.6. Now I reverse bullet in the chuck, de-burr and clean up the #46 nib hole.



Finished Bullet Nib Hole

Step 3.7. Next I check the #46 nib hole to ensure the refill slides in freely and that there is enough $9/64^{\text{th}}$ hole depth to get the amount of refill tip reveal through the nib hole that I want.



Checking Nib Refill Hole For Reveal

Step 4. Seating The Bullet: Next I press the bullet nib into brass cartridge neck to the normal seating position that you would see on a loaded bullet. I use my drill press to do the seating.



Seating Bullet Into Cartridge Neck

Step 5. Installing 7mm Tube: Insert a piece of dowel into one end of the longer Euro kit 7mm brass tube. Insert the tube into the cartridge and move it around until you feel it drop in place on top of the bullet tail taper. Now mark the tube flush with the top of the cartridge head. I cut tubes with my band saw and then de-bur. Insert the cut tube back into the cartridge to ensure it is flush with the cartridge head.



Mark Tube And Cut Flush With Cartridge base



Check Tube Flush With Cartridge Base

Step 5.1. Remove the tube and insert a piece of dowel into one end of the tube. Run a few drops of Medium CA down and around the inside wall of the cartridge through the primer hole and rotate the cartridge until the CA is just above the bullet boat tail. At the same time put a small amount of Medium CA around the inside of the primer hole. Then insert the tube through the primer hole and move it around until you feel it drop into place on top of the tapered end of the bullet. Wait a few seconds and remove the dowel. **I have to do all this quickly to avoid CA running into the nib hole. Remove any excess glue from the top of the primer hole.** Stand the cartridge upright and let the Medium CA cure over night.

Step 6. Installing The Transmission: First, to make sure the bullet nib hole is not plugged with glue, take the refill and slide it into the tube through the primer hole to ensure the tip will come through the bullet nib hole. Check for and remove any CA from inside the top of the tube. Press in the transmission while checking with the refill until the correct refill tip reveal is achieved.

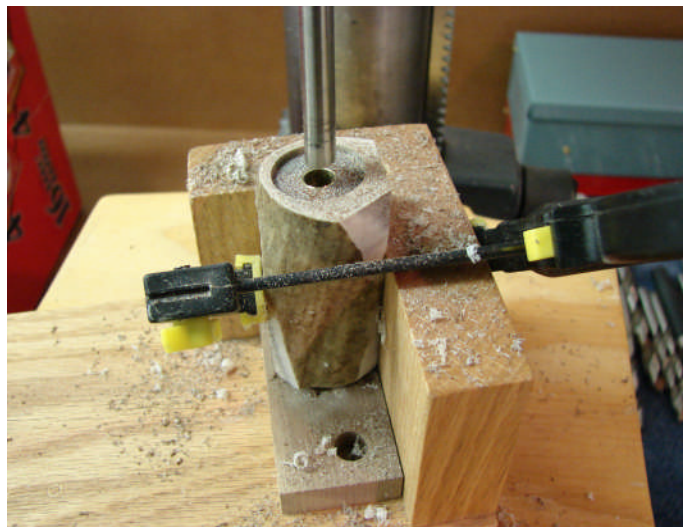


Transmission and Refill Installed

Step 7. Making Deer Antler Cap: Cut a piece of Antler a 1/16th inch longer than the short Euro kit 7mm tube. Drill a 7mm hole in the Antler, rough up the tube with 250 grit sand paper, apply Med. CA around the tube, install in the Antler and square up the ends of the Antler blank with a pen mill.

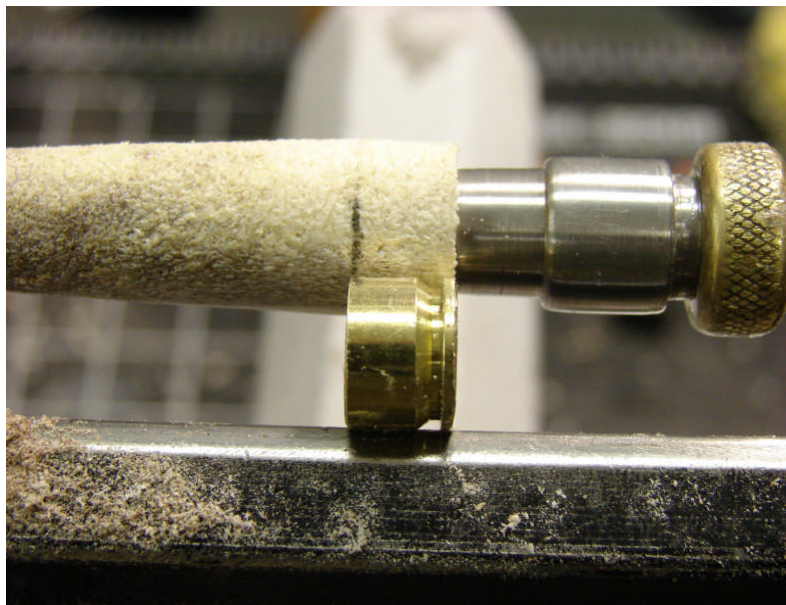


Antler Cut To Length Ready To Glue In Tube



Squaring Up Antler Blank Ends To Brass Tube

Step 7.1. Install the Antler blank on the mandrel and using appropriate pen kit bushings turn the blank down to just proud of the Slimline Finial or the Finial of your choice. Mark the center band end with the casing head cut to use as a center band.



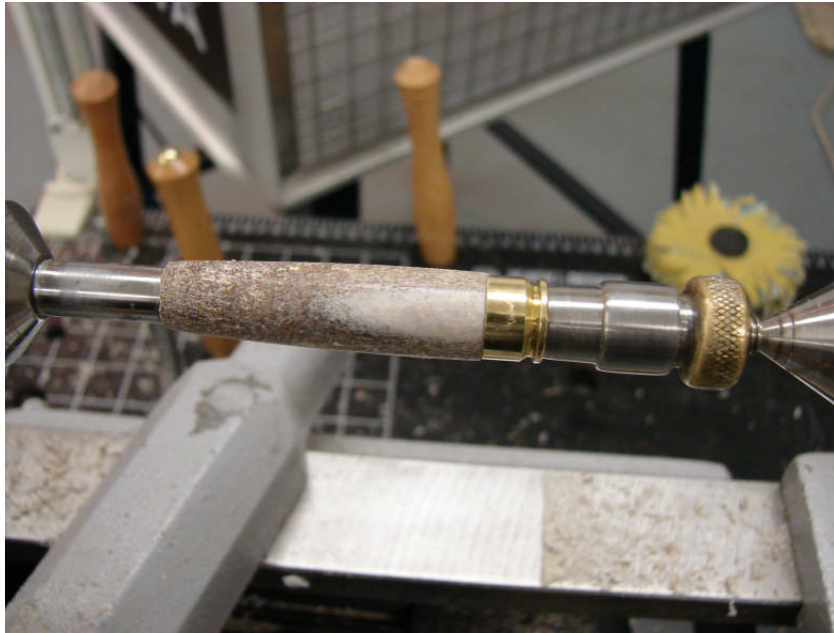
Marking Tenon using Cartridge Head Center Band

Step 7.2. Cut a tenon down to the brass tube leaving enough Med CA on the brass tube to allow a snug fit for the cartridge head center band.



Tenon Cut for Cartridge Head Center Band

Step 7.2. Turn the Antler down just proud of the cartridge head center band. I use various caliber cartridge heads I have cut to use as bushings.



Antler Turned Down Using Cartridge Head As A Bushing

Step 8. Turn and finish the Antler blank flush with the finial, cartridge head center band or cartridge head . To install the cartridge head center band apply some Med CA on the end of the Antler and press on over the brass tube. If you don't want a center band then turn the barrel to match the outside diameter of the of the cartridge base. Install finial and clip of choice to complete pen.

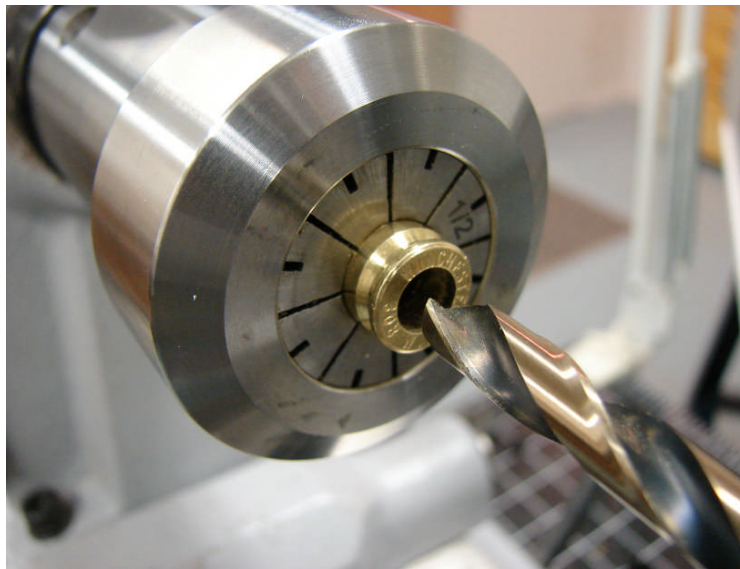


.270 Bullet Pens with Cartridge Head Center Bands and Slimline Finials

Making a Rifle Cartridge Cap

I install my Beall Collet Chuck with a ½” collet on to the head stock. Install a cartridge into the collet and tighten. Install a drill chuck into the tail stock with a 7mm bit and enlarge the primer hole to 7mm. Ensure the collet is tightened enough to prevent the cartridge from turning and damaging the brass surface of the cartridge.

Step 1. Drilling Out The Primer Hole: I install my Beall Collet Chuck with a ½” collet on to the head stock. Install a cartridge into the collet and tighten. Install a drill chuck into the tail stock with a 7mm bit and enlarge the primer hole to 7mm. Ensure the collet is tightened enough to prevent the cartridge from turning and damaging the brass surface of the cartridge.



Drilling Out Primer Hole To 7mm

Step 2. Next cut a 7mm brass tube 1/16” longer than the length of the cartridge being used for the cap.



7mm Brass tube cut 1/16” longer than Cartridge

Step 3. Wrap enough 1/2" Teflon Tape around on one end of the tube to fit inside the cartridge neck. Unwrap the Teflon Tape and place a small drop of Medium CA on the tube and rewrap the Teflon Tape around the tube. Hold the Teflon end of the tube and insert the tube through the cartridge neck to check the fit. Remove the tube.



Teflon Tape Wrapped to Fit Cartridge Neck

Step 4. Insert a piece of 1/4" dowel into the Teflon Tape end of the tube. Place a small drop of Medium CA inside of the cartridge neck and cartridge primer hole. Place a drop of Medium CA on the Teflon Tape and insert the tube ensuring the tube is flush with the bottom of the cartridge head.



Tube Inserted Into Cartridge Neck



Tube Flush with Bottom Of Cartridge Head

Step 5. Square up the tube flush with the end of the cartridge neck by removing the 1/16" section of tube sticking above the cartridge. I use my blank squaring jig but a pen mill will also do the job



Squaring Up Brass Tube with Cartridge neck

Step 6. Press in a Rifle Clip with Slimline Finial into the Cartridge neck.



Press in Slimline Finial with Rifle Clip

Completed Brass 303 British Rifle cartridge Twist Ballpoint Pen



.303 British Brass with .303 British Cap with Gold Rifle Clip



.308 Nickel Plated with .308 Cap and Chrome Rifle Clip