Making 7 mm Barrel Hinge Boxes

By Keith Larrett (VisExp at the IAP)

I am making four pen boxes, two from hickory and two from oak. I find it more efficient to make a production run of a number of boxes than just a single box. These four boxes took me two hours to make, not including the finishing. Short of breaking child labour laws you can't make these boxes for less than what you buy them. However, they are a fun project and enable you to use special wood for pen boxes which you can't get commercially.

You can click on any of the images below to see a larger version.

The hinges used are the 7mm barrel hinges. Two 6x3mm rare earth magnets are used to keep the box closed.

Prepare your stock first. You will need two pieces of wood 2 1/2" x 6" x 5/8" for each box.

The key to the hinges is to get the holes lined up on the base and the lid. I've seen a number of different ways to achieve this, and either most of the ways are to complicated or I'm not that smart, but this is what I came up with.

I chucked the 7mm bit in my drill press and set the fence 1/4" back from the centre of the bit. I also set the drill depth so that the hole would be a hair deeper than half the length of the hinge. It's a good idea at this point to drill a couple of holes in some scrap, insert the hinge and check that the two pieces of wood are flush.

I wanted the holes to be 3/4" from each end of the box. I cut a set up block which was 5 3/4" long. I then placed the set up block against the left hand side of the bit and attached a stop block to the fence.

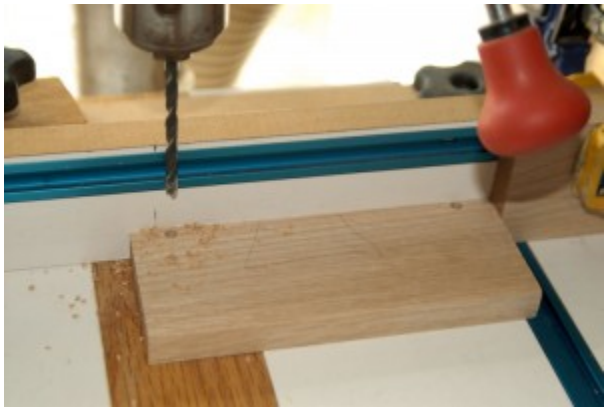
Place the set up block on the right hand side of the bit and attach a stop block to the fence.

The drill press is now set up for a production run of drilling.

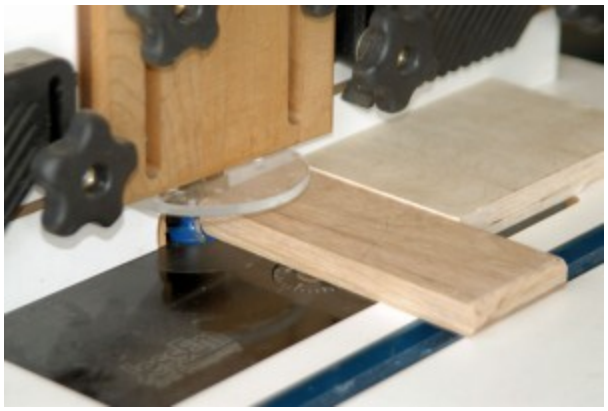
Take your stock and choose the best face of each piece, this will be the outside of the box. Arrange each piece as the finished box will look and then "open" the two pieces as if you were opening the box. Mark the two pieces with a triangle. You will now easily be able to see which side of the piece is the inside of the box and along which edge you need to drill the holes for the hinges.

Drill the left and right holes in the lid.

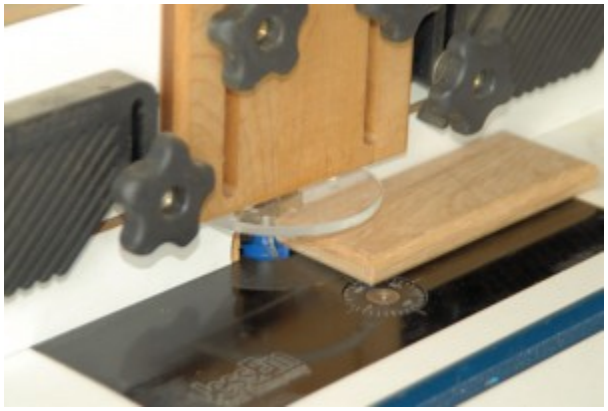
Drill the left and right holes in the base.



Chuck a 1/4" rounder over bit in your router table, adjust the height and set the fence flush with the bearing on the bit. Rout the end grain of the box first. I use a square piece of scrap plywood both as a backer board and to hold the piece perpendicular to the fence while routing.



Rout the long grain edges of the base and lid.



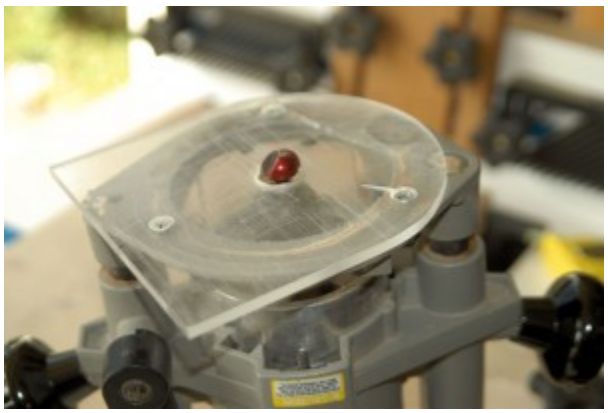
Now is a good time to dry fit the hinges and check that the base and lid sit flush to one another and the box opens and closes easily. You can see in the picture below how part of the hinge is now exposed and how the roundover allows the base and lid to rotate and open.

The next step is to rout a groove in the base and the lid to accept the pen. I use a 3/4" core box bit. The first time I made these boxes I used my router table and lowered the box onto the bit using start and end stop blocks. It was pretty scary and I messed up a number of pieces! I now use my hand held plunge router and the jig in the picture below to hold the piece.

The jig is made from some scrap 3/4" plywood. It has an adjustable fence on the left. I adjust it so that the bit will route the groove along the centerline of the piece. There are two stop blocks clamped to the fence to start and stop the cut. The adjustable block on the right holds the piece securely. I clamp the whole jig to my router table to hold it secure. Place both the base and the lid in the jig with the holes for the hinges on the right hand side. That way if the groove is not perfectly centered on the piece the base groove will still line up with the lid groove. Set the depth of your plunge router so that the final depth of the groove will be 1/2". I've found that a 3/8" groove will not allow the box to close on a Jr. Gent or

Statesman. Set the stop blocks so that the start and end of each groove are the same from each end of the piece and that the groove will be long enough for the pen.

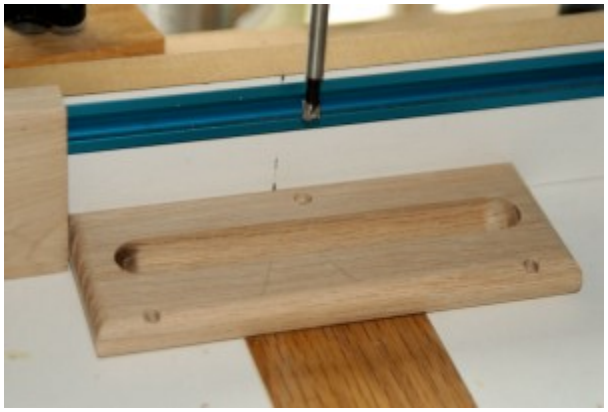
I have a home made base for my router which has one straight side. I use this side up against the fence of the jig.



Rout the grooves in the base and the lid. Because of the depth of the groove it is best to do it five or six passes.

Now would be a good time to check that the pen will fit in the groove and the box will close flush.

The last thing left to do is to drill the holes for the rare earth magnets. One magnet in the base and one in the lid will hold the box closed nicely. The rare earth magnets are really strong for their size. I use a 6x3mm magnet. I use a 1/4" forstener bit as it is the closest bit I have to 6mm. Chuck the bit in the drill press and set the fence so the hole will be about equidistant from the groove to the start of the round over. Set the depth a hair deeper than the thickness of the rare earth magnet. Drill a piece of scrap to test the hole is the right depth. Set a stop block 3 1/4" from the center of the bit.



The base and lid are now ready for sanding and finishing. I find it easier to sand and finish the boxes before I glue in the hinges or the magnets.

A few tips about gluing in the hinges:

- Don't use CA to secure them. It will drip down and glue the hinges shut. DAMHIKT
- Use just a drop of 5 min epoxy. If you use to much it will overflow the hole and glue the hinges. DAMHIKT
- Do a couple of dry runs inserting the hinges in the base and lid before you apply the epoxy. DAMHIKT
- After you have epoxied the hinges in, open and close the box a couple of times before the epoxy dries. This will ensure the hinges are aligned properly so that the box can open and close. DAMHIKT

A few tips about gluing in the magnet:

- There is a right side and a wrong side to each magnet. One side will attract another magnet and the other side will repel another magnet. Make sure you have the sides with the attraction or your box will not close. DAMHIKT
- Put a drop of CA in the hole in the base and set the magnet in the hole. Wait until the CA has dried, reorientate the box so the lid is now flat and then glue the magnet in the lid. Don't try and glue both magnets in at the same time, the CA glue will drip out the hole, the magnets will try suck each other out the holes and it is pretty much a nightmare. DAMHIKT

As you can tell, I've ruined a few boxes trying to glue the hinges and magnets in. Just take it slowly and do a few dry runs.