

Three-sided box

Walter Hall makes
a multi-axis
turned
box



Making small boxes can be great fun and getting a good fit between the lid and body requires care and a degree of skill.

Opinions differ as to the nature of the ideal fit, with some turners liking a lid that is a close enough fit to be airtight and make a slight pop as it is removed, while others believe it should be possible to remove the lid with one hand without the box lifting from the surface.

My own view is that the fit should be relevant to the purpose of the box. If there is a chance it may be picked up by the lid and the contents spilled if it comes apart

too easily then a 'pop' fit is appropriate, while if it is likely to need to be opened with one hand then a slightly looser fit is the way to go. Whichever type is chosen, careful turning is needed to achieve it and the level of skill required is the same.

For this project I have chosen to continue my theme of multi-axis turning and decided on a simple three-sided box. As it will primarily be decorative I have made the lid a pop fit. But if you choose, you can make a box where the lid can be removed easily with one hand. You can also add a finial if you want to

Choice of wood

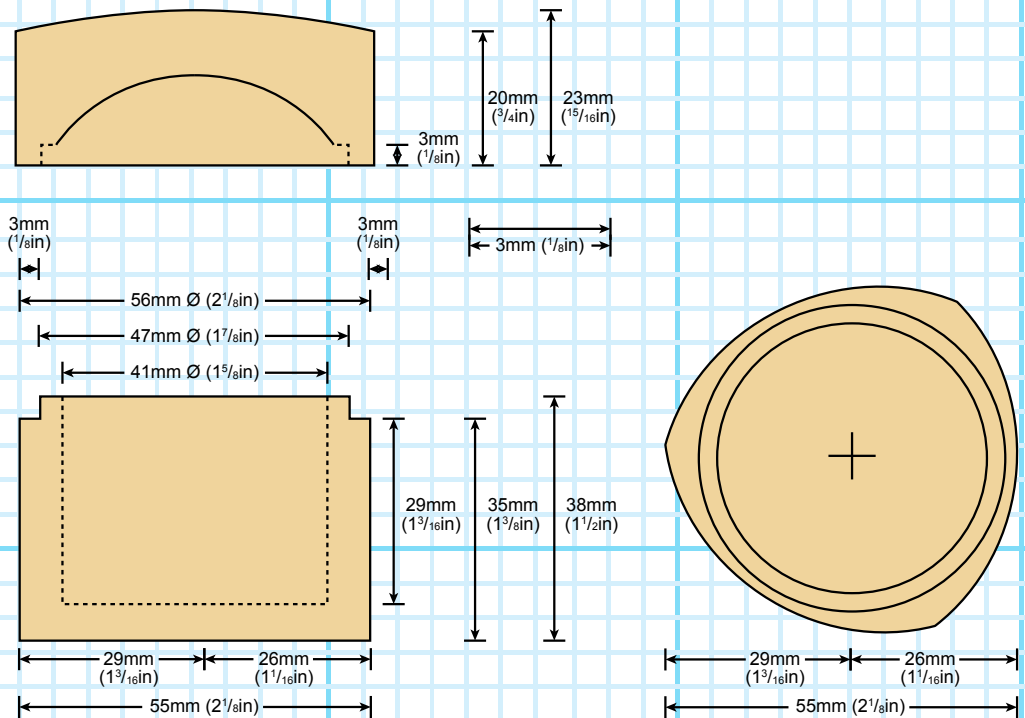
Whether you choose a near-airtight fit or prefer a lid that can be removed one-handed you don't want that fit to change over time through movement of the wood. Do be sure to select straight-grained dry timber that will not twist or warp when the project is completed or your efforts at achieving the desired fit will be wasted. I used some cherry that has been drying in my workshop for about five years. Also, try to avoid blanks that contain the pith of the log and, if possible, leave the wood for a time to acclimatise in an environment similar to that where the finished item will be located.

TOOLS AND MATERIALS

- Personal & respiratory protective equipment
- Spindle roughing gouge
- Beading and parting tool
- Skew chisel
- Bowl gouge
- TCT hollowing tool (optional)
- Parting tool
- Callipers
- Small sanding pad
- Abrasive 120-320 grit
- Abrasive pads 120-320 grit
- Tack cloth
- Dust extraction
- Steb drive and revolving tailstock centres
- Chuck

MATERIALS

- Hardwood spindle blank 60mm x 60mm x (min) 120mm
- Sanding sealer
- Finish of your choice



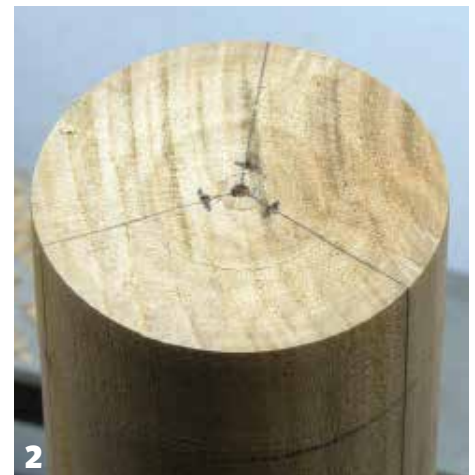
Marking up and off-centre turning

1 Select a straight-grained hardwood blank about 60mm square, mount between centres and true up the ends as necessary. Using the lathe's indexing facility carefully draw three equidistant lines along the length of the timber at positions 120° apart. For example, positions eight, 16 and 24 on the index.

2 Remove the blank from the lathe and extend the lines at each end to the centres. Carefully measure with a ruler or mark with a compass points 7mm from the centre on each line. Mark the positions with a centre punch to make mounting and re-mounting easier. Accuracy at this stage is important to ensure that the sides of the box will be equal.

3 Re-mount the work on the lathe on one of the three pairs of centres and, using the roughing gouge, turn down until the pre-marked lines are only just visible, stopping the lathe as necessary to check progress. Keep firm downward pressure on the toolrest while making light cuts as for much of the time you will be 'cutting air'. Repeat on each of the other marked centres.

4 Once step three is completed the lines marked along the length of the work should be just visible and when viewed from the ends the shape of the three sides should be equal and regular. Any minor wiggles and imperfections can be corrected at sanding but the more accurate the turning the better.





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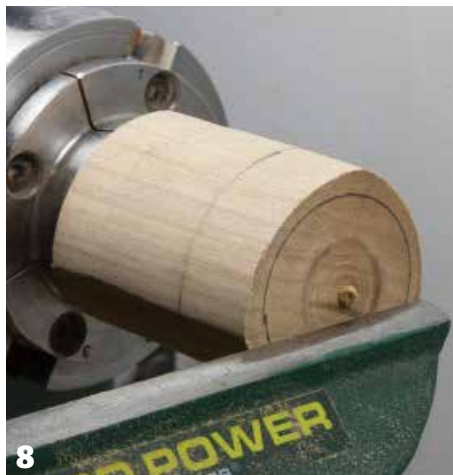
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5 With the beading and parting tool cut a tenon at each end of the blank to fit the jaws of your chuck. Use callipers to check the sizing and then, with the skew chisel, create a dovetail shape. Take care with the sizing to ensure a good hold in the jaws.

6 Mark out the sizes and positions of the body and lid of the box, taking care to achieve an attractive ratio between the sizes of the box and lid and remembering to leave allowance for parting off (see step 19). As you can see from the photograph the blank I used was much longer than needed so I have also marked the area that will be waste to avoid confusion.



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7 Using a thin parting tool separate the body and lid sections. The thinner the tool the better as this will help to maintain the grain match in the completed work. Remember to take care to maintain steady downward pressure on the rest and take light cuts, as when you start the cut the work is not round and initially you will be cutting air again until the cut is well under way.

Turning the inside

8 There is no rule that says you must make the lid before the box or vice versa, but I prefer to start with the lid. Mount the lid in the chuck, reposition the rest at 90° to the lathe bed and mark the position of the inside edge.

9 Use the beading and parting tool to cut the recess into which the top of the body will fit – this should be about 5–6mm deep. Take care to keep the sides straight as this will help to achieve a good fit.



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10 Now hollow out the centre of the lid with the bowl gouge. You could use a spindle gouge for this but I prefer my 10mm long-grind bowl gouge. Cut from the centre towards the previously cut recess leaving a lip about 5mm wide. Arc the cuts to form an even recess.

11 It is best to finish the inside of the lid at this stage as this would be much more difficult later. Sand the inside of the lid through the grits to about 320 or 400 and apply the finish of your choice. I used a good quality wax but if you choose you could leave the inside of the box sanded smooth but without a finish.



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12 Once finished to your satisfaction the lid can be parted off from the waste using the thin parting tool and a low lathe speed. Lightly hold the lid. It is an eccentric shape, so you can only very lightly support it to avoid it flying off and being damaged. In doing so take care to keep any part of the body and loose clothing well away from the chuck. Short-sleeved clothes or a smock with elasticated or Velcro-fastened cuffs are essential for safety. Alternatively, you can part most of the way through the waste and then stop the lathe and use a fine hand saw to remove the lid from the main body section. Use whatever method you are most comfortable with.

◀ **13** Now mount the box body, mark the positions of the lip and the inside of the box and delineate the inner edge of the lip using the parting tool. Take care to leave enough wood to form a step of about 1/8in after the outer edge of the lip is cut away to fit the lid.

14 The body of the box may be hollowed out using a gouge in the same way as the lid, but I prefer to use a TCT hollowing tool such as the Simon Hope tool shown, although I still use a gouge to drill out the initial recess in the centre to start the cut. The bottom of the box may be left as a curved shape as formed by the hollowing tool or a square-ended scraper may be used to create a flat bottom.

Adjustment and refinement

15 Now reposition the rest parallel to the bed and begin to cut the lip for the lid using the thin parting tool. Remembering that once again the initial cut will be intermittent because of the three-sided shape, start by making a narrow cut and cut a little at a time, testing regularly with the lid until the fit you desire is achieved. Once a good fit is obtained the cut can be widened to the depth of the recess in the lid, keeping the diameter the same as the initial cut.

16 As with the lid, the inside of the body of the box is best finished at this stage. A piece of abrasive wrapped around a wooden dowel works well for this and avoids the need for fingers to be placed at risk inside the work. A small Velcro-backed sanding pad can be used to finish the bottom of the recess.

17 Once the inside of the box is finished, re-mount the lid, using one or two layers of paper towel between the parts to make a tight fit. This must give sufficient grip to allow you to carefully form the shape of the top of the lid using the bowl gouge. Sand the top of the lid through the grits to the desired finish.

18 Without removing the paper towel, but ensuring that the grain pattern of lid and box is correctly aligned, you can now finish the outside of the box. This is done by hand with the lathe turned off. A flat sanding pad will help maintain clean junctions between the planes of the three sides and help to eliminate any minor inconsistencies in the shape.

19 Measure the depth of the box and mark off the position at which it will be parted off from the waste to leave sufficient thickness in the base. Part off with the thin parting tool as was done for the lid in step 12.

20 The base of the box may be sanded to a finish by hand or on a belt sander, but as I had a substantial piece of waste with a chucking point already formed I used this to create a jam chuck on which to re-mount the body of the box for sanding. All that then remains is to finish the outside of the box with the finish of your choice. ●

