



PHOTOGRAPHS BY LEN GRANTHAM

Make an elliptical box from padauk

Len Grantham turns this elliptical box without mechanical aid

I had wanted to turn an elliptical box for some time, but found the necessary equipment very expensive. David Springett has detailed instructions for making an oval chuck in his book, *Adventures in Woodturning*, but the aim of this project was to be able to turn an elliptical shape without using mechanical aids.

It initially occurred to me that perhaps by turning off two pairs of offset centres, a shape very close to an oval could be obtained, and after experimenting on my computer with various sizes, concluded that using a 100mm (4in) diameter blank and 8mm (5/16in) offset either side of the centre would produce a fairly accurate oval shape.

For this project I chose to use a piece of padauk (*Pterocarpus dalbergioides*) measuring 100 x 100

x 85mm (4 x 4 x 3 1/4in) and carefully marked the centre at each end, as well as two points 8mm (5/16in) from the centre, on a diagonal. This was then repeated at the other end to ensure that they coincided.

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Problems

I used 12mm (1/2in) fixed and live steb centres for holding the piece, as these gave clear access to all three centre points. I came across a variety of problems, such as realising I had no

way to determine how to remove the same amount when the piece was set up on the other pair of off-set centres, but this was resolved by cutting an 80mm diameter by 1mm (3/8 x 5/16in) wide spigot on each end.

I found that mounting the piece between the two offset centres produced a reasonable oval shape, but it is important to take into account starting at a slow speed, due to the out of balance element.

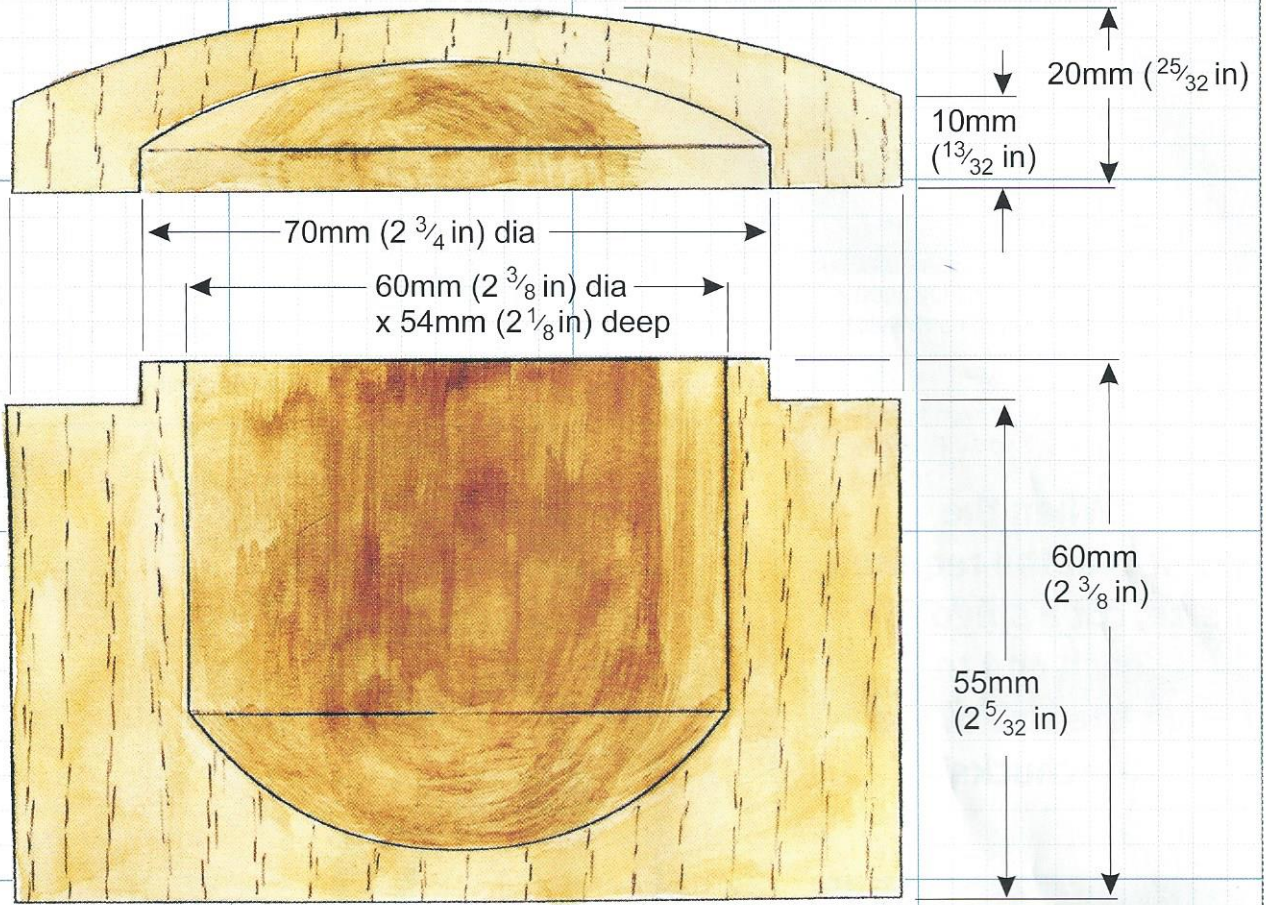
Whilst I am pleased with the project overall, unfortunately I have yet to devise a way to make the inside of the box oval, but this is something, which I wish to overcome in the future.

TOOLS USED

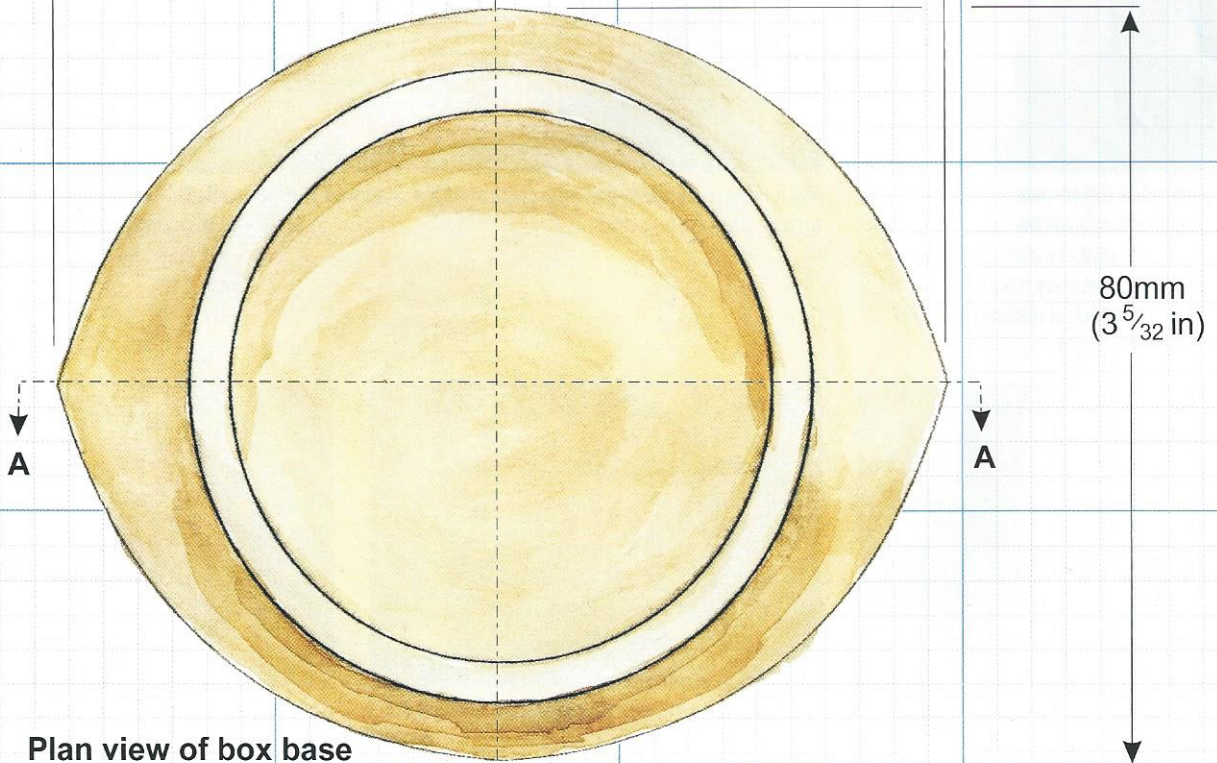
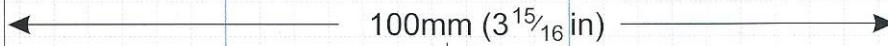
12mm (1/2in) spindle roughing gouge, 8mm (1/4in) spindle gouge, 3mm (1/8in) parting tool, 8mm (1/4in) beading tool

ILLUSTRATIONS BY JOHN LOVATT

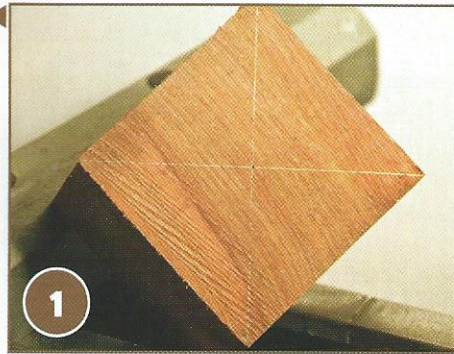
ELLIPTICAL BOX



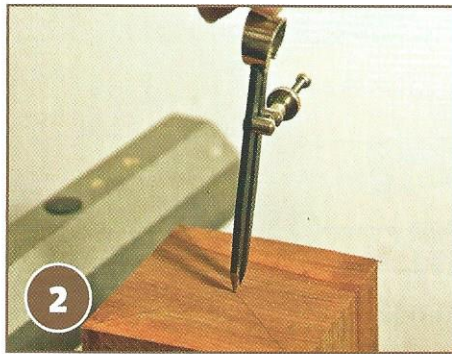
Section at A - A



Elliptical box



1 Start by taking a piece of padauk 100 x 100 x 85mm (4in x 4in x 3 1/4in) and on each end of the blank, mark a centre point



2 With a pair of compasses set at 8mm (1/4in) radius, scribe a circle about the centre of each end and then mount the blank between centres on the lathe



3 You are now ready to start turning the blank. The first few cuts made will remove the corners of the piece, and before long the piece will be round

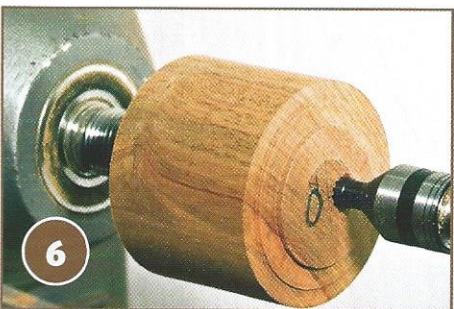
“When the blank is at the required size, cut a spigot on each end to suit the size of the jaw chucks”



4 When the blank is at the required size, cut a spigot on each end to suit the size of the jaw chucks. On each end cut a second spigot of 80mm (3 1/8in) diameter by about half a millimetre thick to provide a datum for when forming the elliptical shape



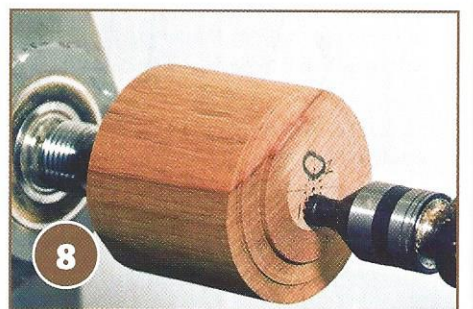
5 Mark centre points at the intersection of the diagonal and the circle on both ends and take care to ensure they correspond



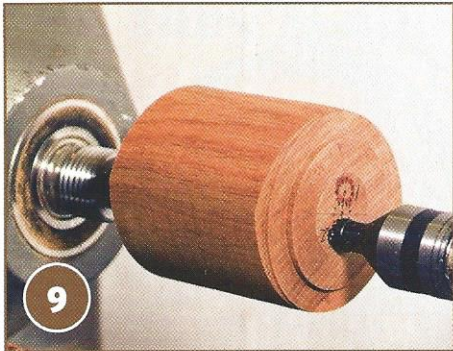
6 Set the piece between centres on the first of the offset centres



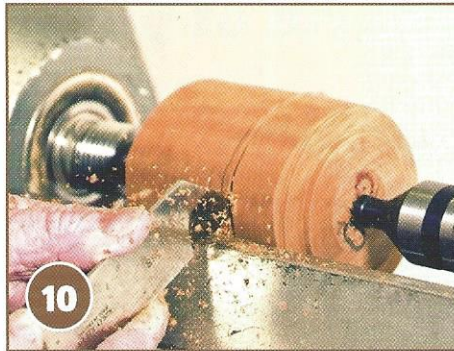
7 With the lathe set at a low speed to counteract the out of balance effect, start to shape the first side of the box



8 Continue shaping until the edge of the datum circle is reached. You will now start to complete the first part of the elliptical shape



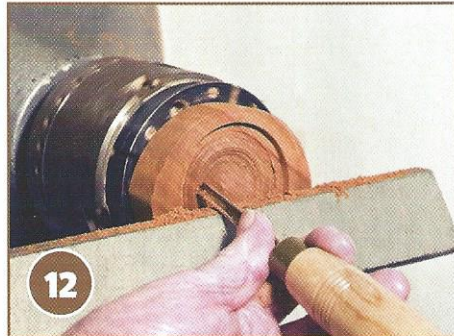
9 Now set up the piece on the other pair of centres and repeat the process, as above



10 Remount centrally and part off at a point to give suitable proportions between the lid and the base



11 With the lid held in the chuck, clean up the face. To achieve the desired shape it is essential that the face of the lid is perfectly flat



12 The inside of the lid can now be hollowed out to the required shape and depth, as well as the recess formed for fitting the lid in the base



13 Check that the side of the recess is square by lining up a steel rule with the bed of the lathe

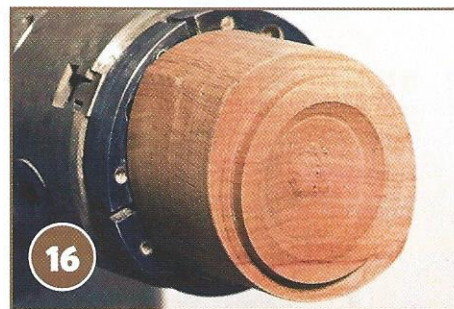
"The inside of the lid can now be hollowed out to the required shape and depth, as well as the recess formed for fitting the lid in the base"



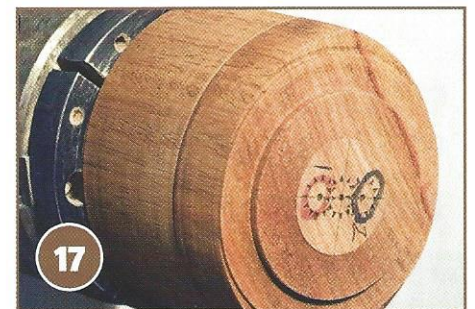
14 Next, sand the inside of the lid, and then complete the process by sealing and polishing



15 Now mount the base in the chuck and remove some of the inside before starting the spigot for the lid. Complete the turning of the spigot to a size that will give a jam fit for the lid



16 Once satisfied of a good fit, the base of the box is now ready for the lid...

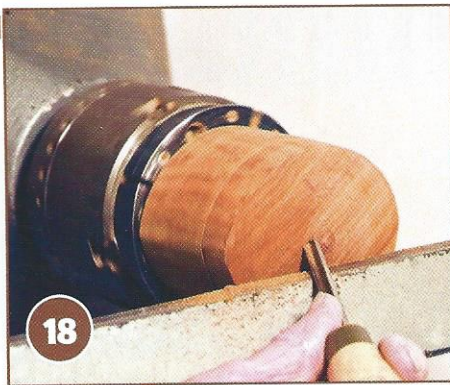


17 ... The lid should now be a snug fit

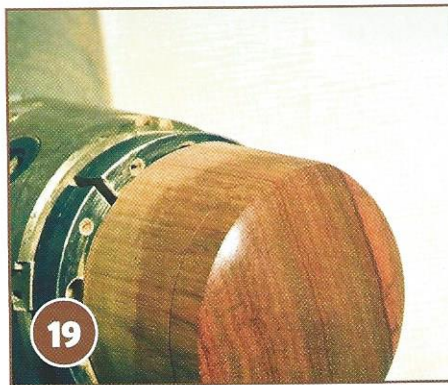
Handy Hints

1. Always complete the inside of the box before fitting the lid
2. After finishing the inside of the box, if possible, leave to settle for a few days to ensure a good fit for the lid
3. Only dry timbers should be used for making boxes. Close-grained woods give the best results
4. When turning pieces off centre, always turn at a low speed for safety reasons

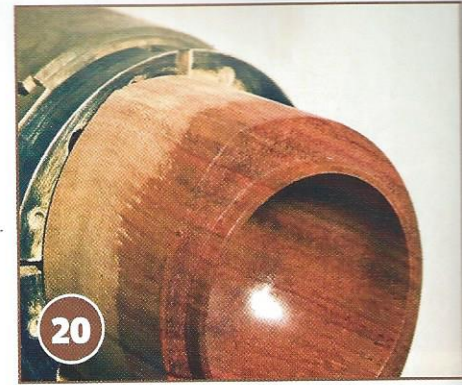
Elliptical box



18 Now it is time to finish the top of the box. Use the box as a jam chuck to hold the lid for turning to its final size and shape



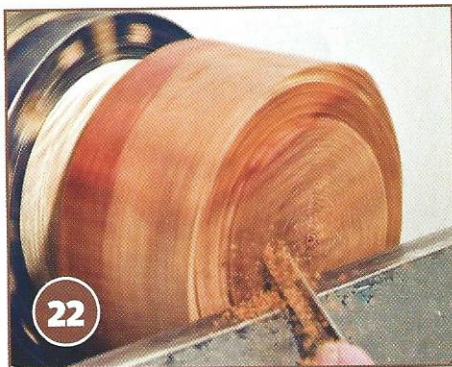
19 The lid of the box now needs to be completed by sanding, sealing and polishing the surfaces



20 Once satisfied with the lid and inside of the box, adjust the spigot a little, sand and then finish



21 In order to finish the bottom, use a piece of scrap wood to make a jam chuck to hold the box



22 The base of the box is cleaned up to give it a slightly concave surface



23 The final process is to polish the complete box on a buffing wheel loaded with a polishing wax

“Check that the side of the recess is square by lining up the steel rule with the bed of the lathe”



The finished padauk elliptical box. ●