

WOODWORKING CRAFTS

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Coffee table restoration **Six-board chest** Green wood garden gate **Bird carving**
Turned toys **Hallway storage bench** Unicorn bookends **Butler's tray** Routing

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WOODWORKING CRAFTS

Issue 76



After the blazing heatwave that descended upon us in the summer we are now looking forward to the beauty and colours of autumn. The weather has cooled down, making our workshops bearable to be in again, and now is the time to get out there and embark on some new projects. You may need to get things in the shop working smoothly again, and if you followed advice and maintained your tools it should be an easy matter of giving things a wipe and a dust down to be ready for action.

For the home, we have a nice selection of projects that will keep you and your family happy; you when you make them and your family when they receive them. We start with restoring an heirloom oak coffee table that transforms something that may have found its way into the skip into a thing of beauty that will grace any living room.

The router is used again to make the attractive and useful butler's tray, then you need to break out the scrollsaw to make some bookends in the shape of the ever-popular unicorn. Still in the animal theme you may want to make the Jamaican birds, to hone your carving skills and decorate a lonely corner in your home. Another carving project is our article on how to make a chip-carved rosette. Chip carving is

immensely satisfying and is a great pastime for calming the nerves.

Finally, for the home, we show you how to make a jogger's bench to keep all your stinky running shoes in one place – once it is being used you may want it to live in the garage. Next, we have a project for outside the home on how to make a lovely bench, and what is more we tell you the benefits of enjoying relaxing on the seat once it is made.

We feature another mindfulness article about sustainable homes with a house design that blends contemporary architecture with its rural environment and provides a perfect home for an older couple whose children have flown the nest.

Back in the workshop, we show you how to use a pocket hole jig, and explain why you would want to use this type of joint when there are so many other joints available. Routers, as we all know, are the most versatile tool in the workshop and we take a look at how to make them even more useful by mounting one in a router table and the things that you can do with it.

Happy autumnal woodworking!
Alan Goodsell

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Woodworking is an inherently dangerous pursuit. Readers should not attempt the procedures described herein without seeking training and information on the safe use of tools and machines, and all readers should observe current safety legislation.



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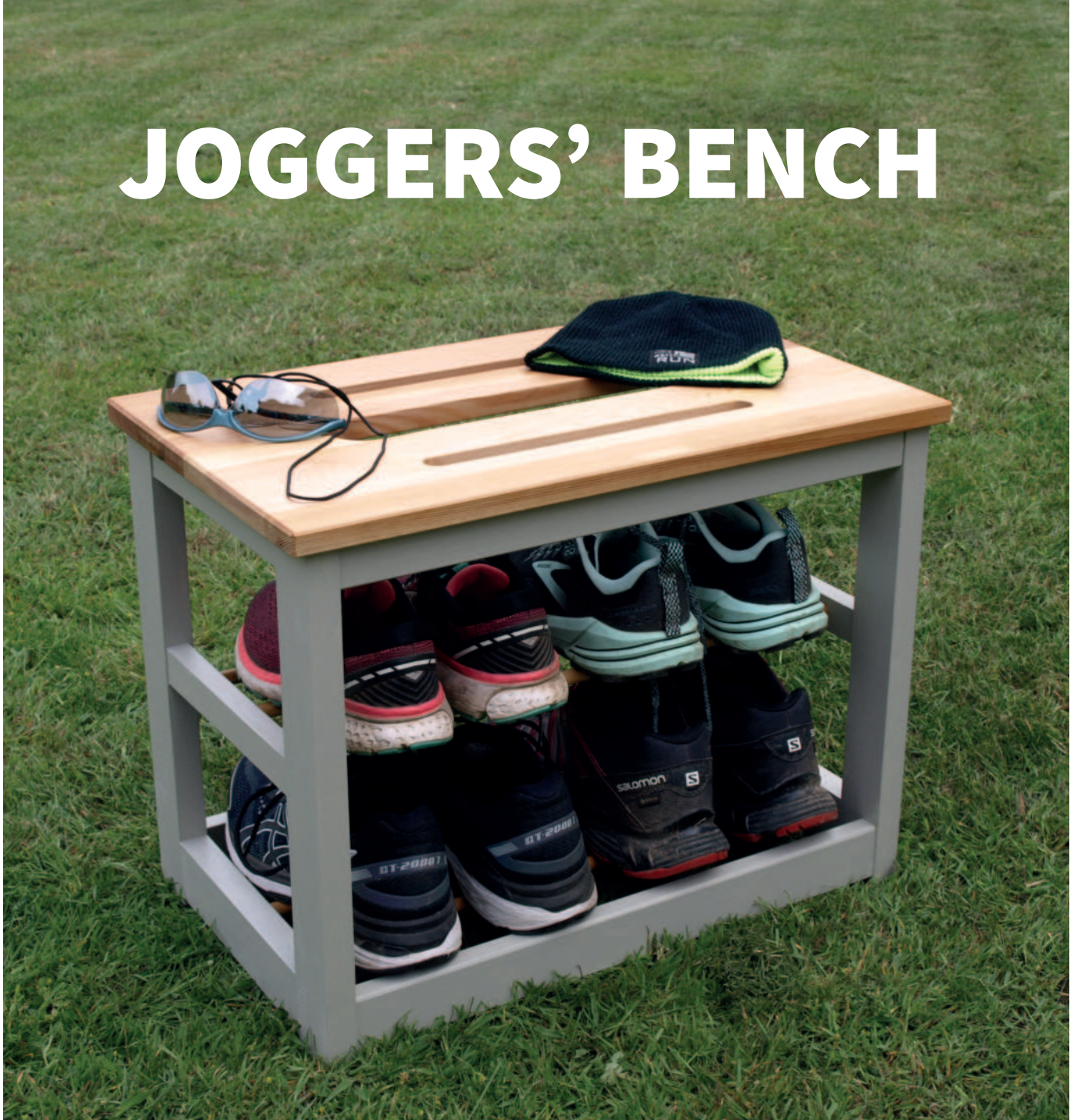
Anthony Bailey looks at the Ohio Tool Company's 16in 'transitional' jack plane



WOODWORKING CRAFTS

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JOGGERS' BENCH



In training for a charity run, Mitch and Julie Peacock needed to air their running shoes in an organised way, and the joggers' bench was born

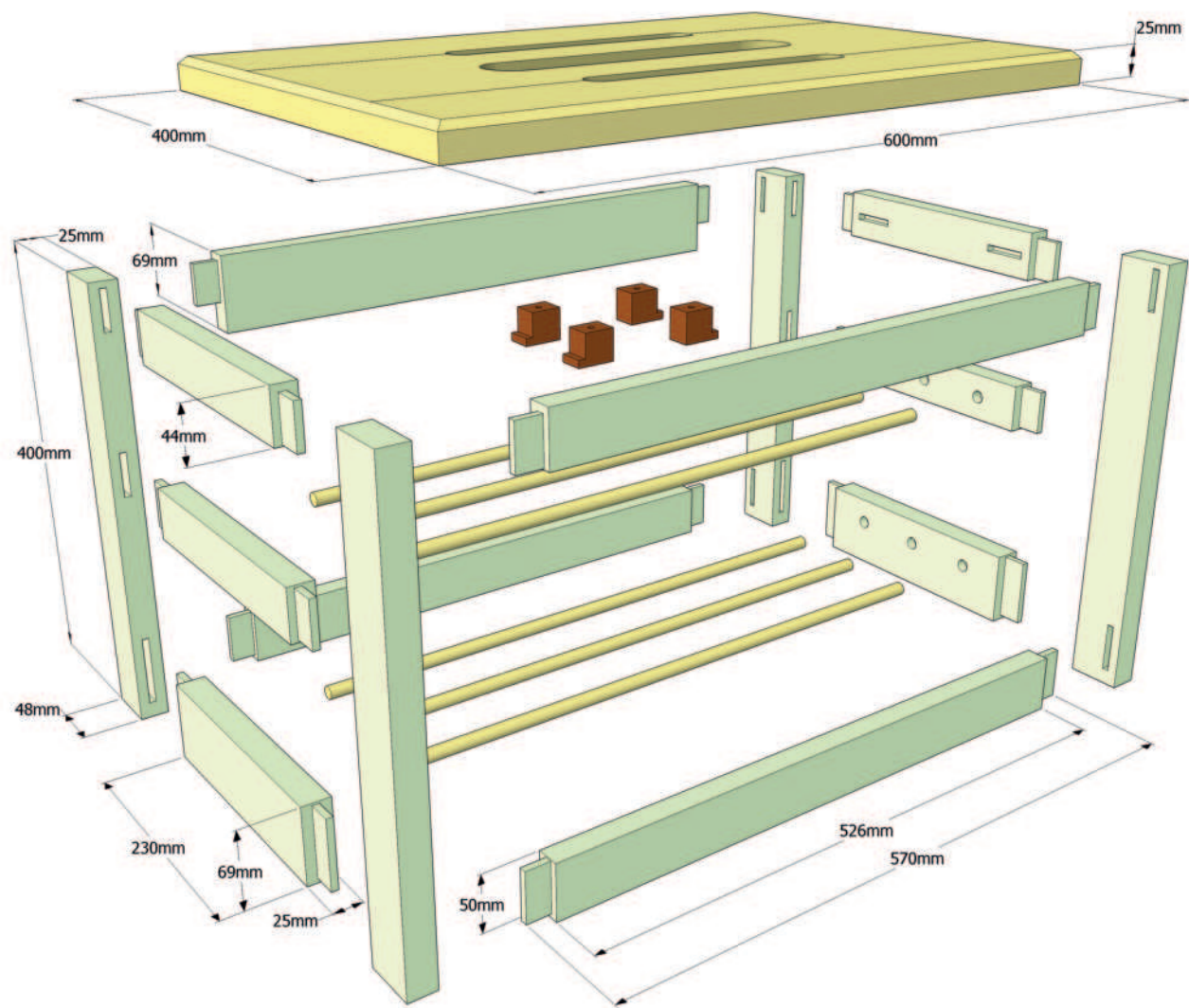
Road and trail trainers were cluttering the floor, blocking the back door and generally looking a mess. My wife and I had just decided to enter the Royal Parks half-marathon, in order to raise money for the specialist hospital I have attended for many years. With the run not happening until autumn, something had to be done to bring order to, and look after, our running shoes. Having designed a successful boot bench for a student several years ago, I was able to adapt the storage space to the different footwear and set about picking out materials in no time at all.

Materials

- 1 I had several short pieces of pine that were ideal to make the bench seat, two leftover lengths of half-inch dowel would support the shoes and various pieces of random whitewood were perfect for what was to be a painted base.

Preparation

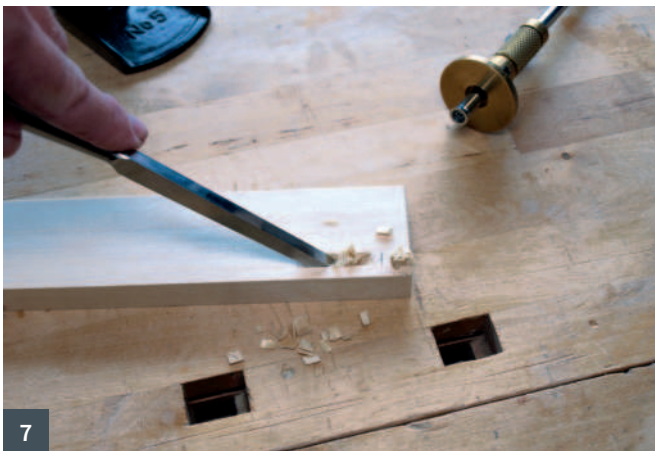
- 2 After the pine had been glued into a panel, it was trimmed to size and planed smooth. Rubber nosed F-clamps make wonderful planing stops on a bench with limited, or no, dogholes.



1



2



- 3 A panel gauge, together with Forstner bits, was used to mark out the three slots in the bench seat. Careful ordering of the boards meant that the only knot lay within the central slot waste.
- 4 With the ends of the slots bored out with the drill, the main waste could be removed with a compass saw or jigsaw. Neither method ever seems to give an accurate result for me, so I always leave the line...
- 5 ... finishing to a smooth and square edge with rasp, file and finally sandpaper. The sharp corners were also sanded over to avoid splinters; the last thing one wants when sitting down in shorts!

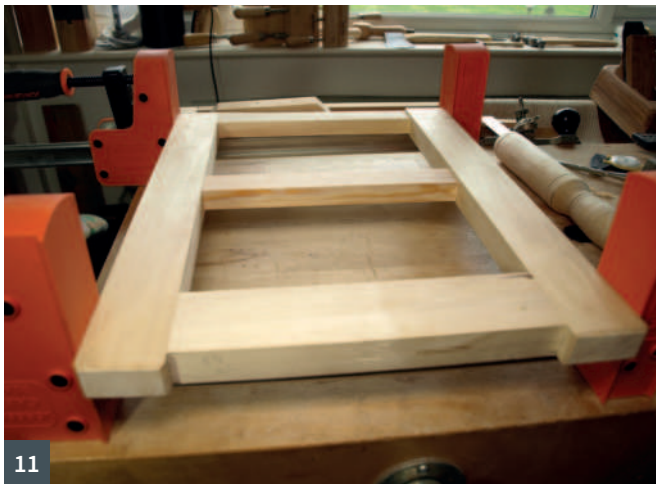
- 6 The joinery of the base is all mortise and tenon, and the mortises were all marked out using the same gauge setting.
- 7 Whitewood has a tendency to crush and tear, so a sharp chisel is an essential piece of kit. By chopping the mortises before cutting the tenons, rough mortise cheeks can be cleaned up if necessary, and tenons prepared to the final thickness, ensuring good glue contact.
- 8 There are 10 rails in all, and these were marked out along six lengths of the dimensioned whitewood.



9



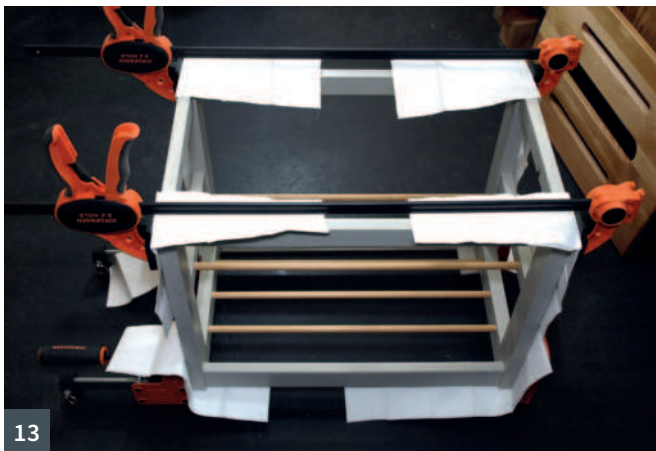
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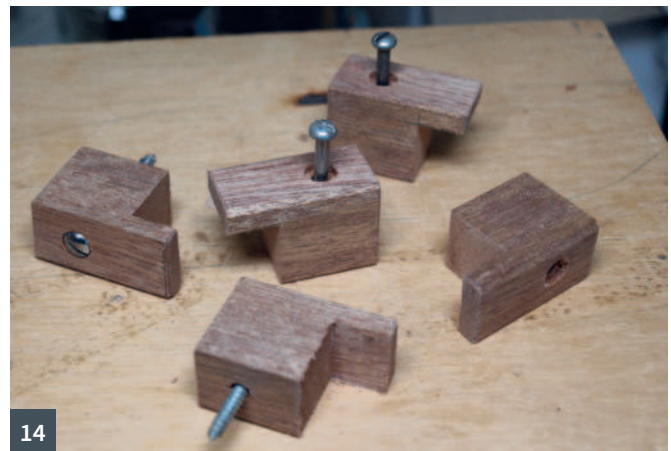
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14

- 9 Tenon shoulders and rail lengths were sawn at the bench hook. The bottom rails are thicker than the rest, so care was taken when marking out and making the shoulder cuts.
- 10 Sawing the tenon cheeks. Setting a rail either side of the vice screw prevents the jaws racking and grips soundly with less pressure.
- 11 The end frames were assembled first, making sure they were clamped square and flat. Notice I chamfered the feet, which would have been more awkward to complete after gluing up.
- 12 The end frames were bored for the dowels, and together with their connecting rails were all primed and painted. The bench seat and dowels were given three coats of melamine lacquer for protection.

- 13 Ideally, the painted components should be left for a week before being subject to clamping pressure. Clamping earlier risks damaging the paint finish, but I was lucky and a soft paper interface probably helped. Fitting the four rails and six dowels all at the same time, before the glue started to go off, was quite a challenge, and an extra pair of hands would have been useful.
- 14 Since the bench seat is likely to expand and contract more than the frame base, I prepared some hardwood buttons with which to attach it.



15

15 The buttons fit into slots cut in the top rails of the end frames, allowing for movement of the seat and base relative to each other.



16

Mitch and Julie are raising money for the St Mark's Hospital Foundation. Find out more at <https://www.justgiving.com/fundraising/meadspeacocks>

Ready to race

16 After the ease of building the bench, comes the pain of putting in the mileage!



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RESTORING AN HEIRLOOM OAK COFFEE TABLE

Charles Mak used his furniture-making skills to restore an English table that was handmade in the 1950s

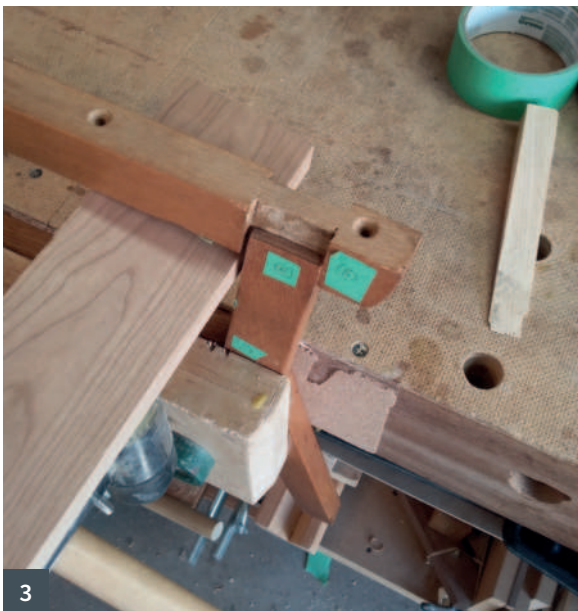
My long-time family friend and neighbour, Ian, brought a coffee table to me for repairs. The stylish table, handmade by his dad in England when a middle school boy, now belongs to one of Ian's twin sons – lucky son and grandson! It suffered from two not uncommon problems seen in furniture pieces of such vintage that have travelled 'across the pond' to North America: a crack on the top and wobbly legs.

Repairing and making are not exactly the same woodworking activity, but some of their tools and techniques do overlap. American antique furniture restorer Thomas Johnson has generously shared his decades of knowledge and skills in the public domain, giving people like myself some understanding of what would otherwise be his trade secrets. Here, I describe how I restored the coffee table, using both my own mistake-fixing experience as a woodworker and insights gained from Johnson's practice.

Disassembly

In a typical furniture restoration job, the first step is to disassemble the parts that need fixing. I, therefore, first unscrewed the top from the base, which is composed of the end aprons, stretchers and legs. As good practice dictates, before breaking the base apart, I kept track of the mating parts with labels.

Mallets, spreader clamps, wedges, pliers, putty knives and pry bars are some of the common disassembly tools. For this repair job, I mostly needed a mallet. Only for a couple of stubborn spots did I have to resort to the use of a heat gun to loosen the joints. The heat gun was used at the joint for about two minutes at a time.



1 The top of the table was cracked **2** The top was unscrewed from the base **3** Mating parts were labelled to make reassembly easier **4** Most of this repair could be done using a mallet ...

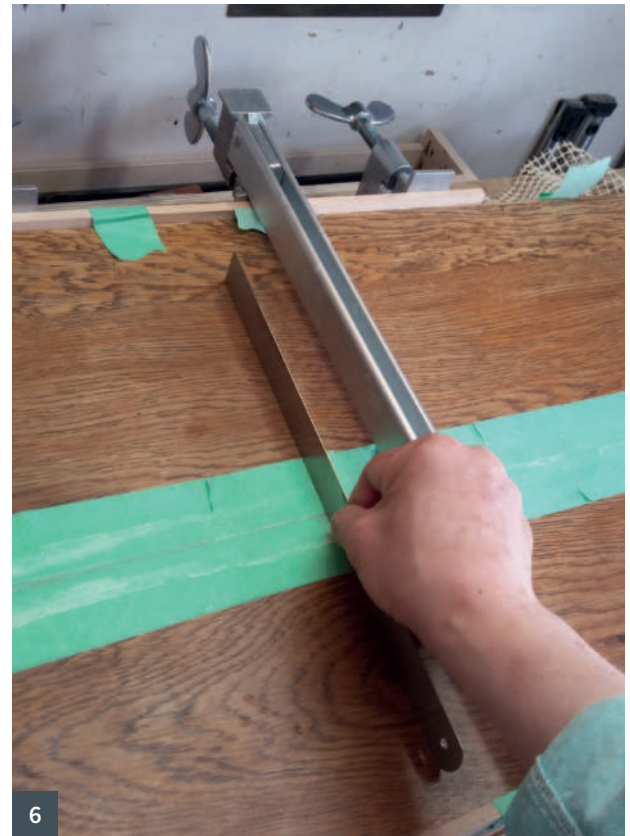
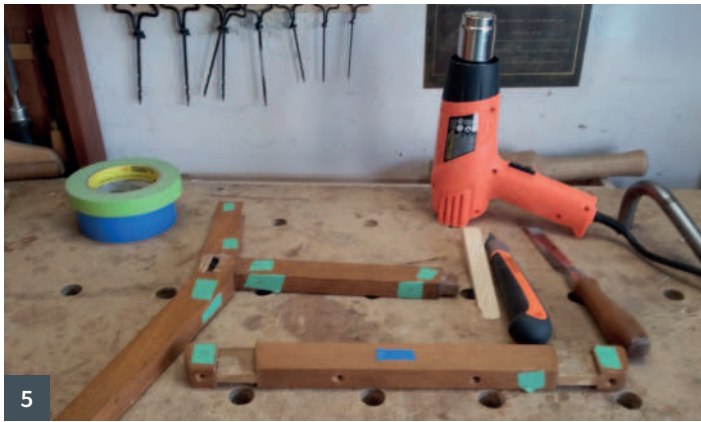
Fixing the top

The crack on the top had formed because the top was apparently screwed to the base with no allowance for wood movement in the screw holes. To fix the problem, I first glued and clamped the top to remove the crack. Then, to prevent the crack from emerging again, I elongated the screw holes on the end aprons to allow for the top to expand and contract.

Fixing the loose legs

The legs are attached to the aprons and stretchers with two types of joinery: the bridle joint, and the mortise and tenon joint. Over time, a couple of them yielded to the racking force. Fixing them involved first removing the old glue from the joints. The tools of choice for removing glue are the scraper and the sharp chisel.

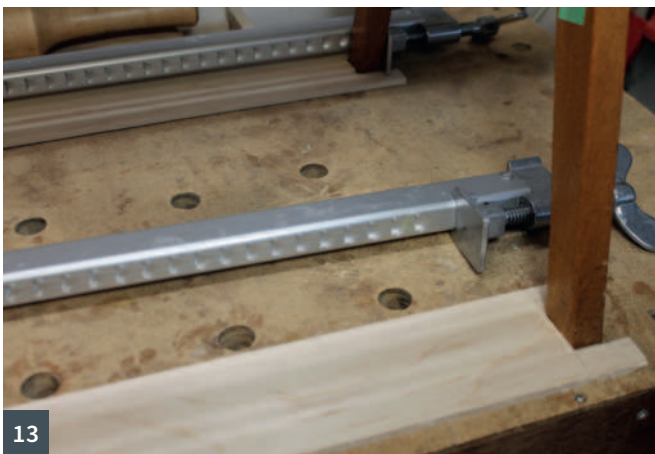
A few of the mortises on the legs were found to have been cut slightly oversize, resulting in a loose fit. To repair them, I glued a veneer to the mortise wall, and used a wedge to hold the veneer in place until the glue cured.



5 ...although a heat gun was needed to loosen the joints **6** The top was glued and clamped... **7** ...and the screw holes on the aprons elongated to prevent the crack from re-emerging **8 & 9** Glue was removed from the leg joints using a scraper and sharp chisel **10** A veneer was glued to the mortise wall, which was held in place with a wedge while the glue dried **11** The mating parts were glued back together



12



13

12 The base was checked for square **13** Notches prevented the cauls from shifting **14** Ian made a maker's label to celebrate his dad's work

Dry-fitting and assembly

After a quick dry-assembly, I proceeded to glue the mating parts one by one, and assemble the table back to its original form.

As in the case of making a new table, I checked the base for square by comparing its diagonals. To ensure the two ends were clamped parallel to each other, I cut a pair of notched battens to the same length as the long stretchers, and used the battens as clamping cauls at the bottom of the legs. The notches kept the cauls from shifting under clamping pressure.

Finishing touch

After attaching the top to the end aprons, I gave the whole piece a wax polish treatment to bring out its former glory. Lastly, Ian proudly produced and affixed a maker's label to his dad's table before returning the heirloom piece to his son.

More than a year and a half has passed, and the lucky grandson has reported that the table is holding up well (of course! – it is the work of two craftsmen collaborating together some seven decades apart). It has been an honour, and most satisfying for me to have worked on this family heirloom. Through this oak table, Mr Paul Churchill, the original maker, now 80 years old, has helped me appreciate how enriching British school life could have been in his younger days.



14



SIX BOARD CHEST

Rick Rich uses vintage handtools to build this storage box from cherry and pine



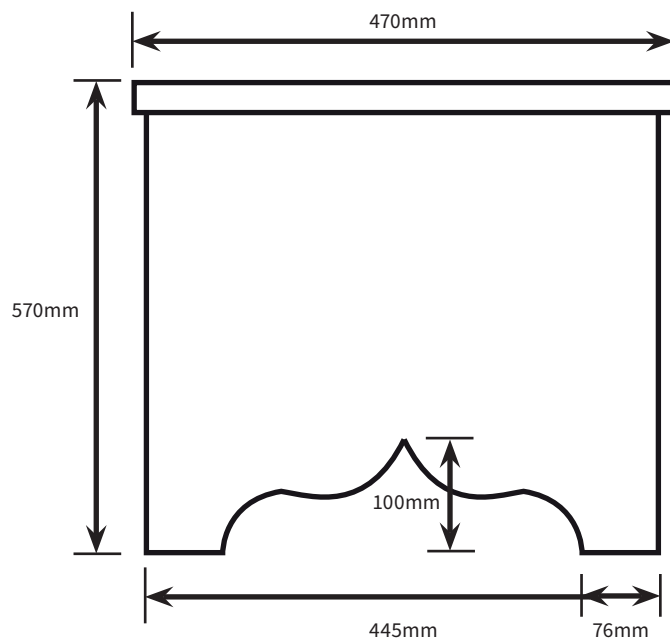
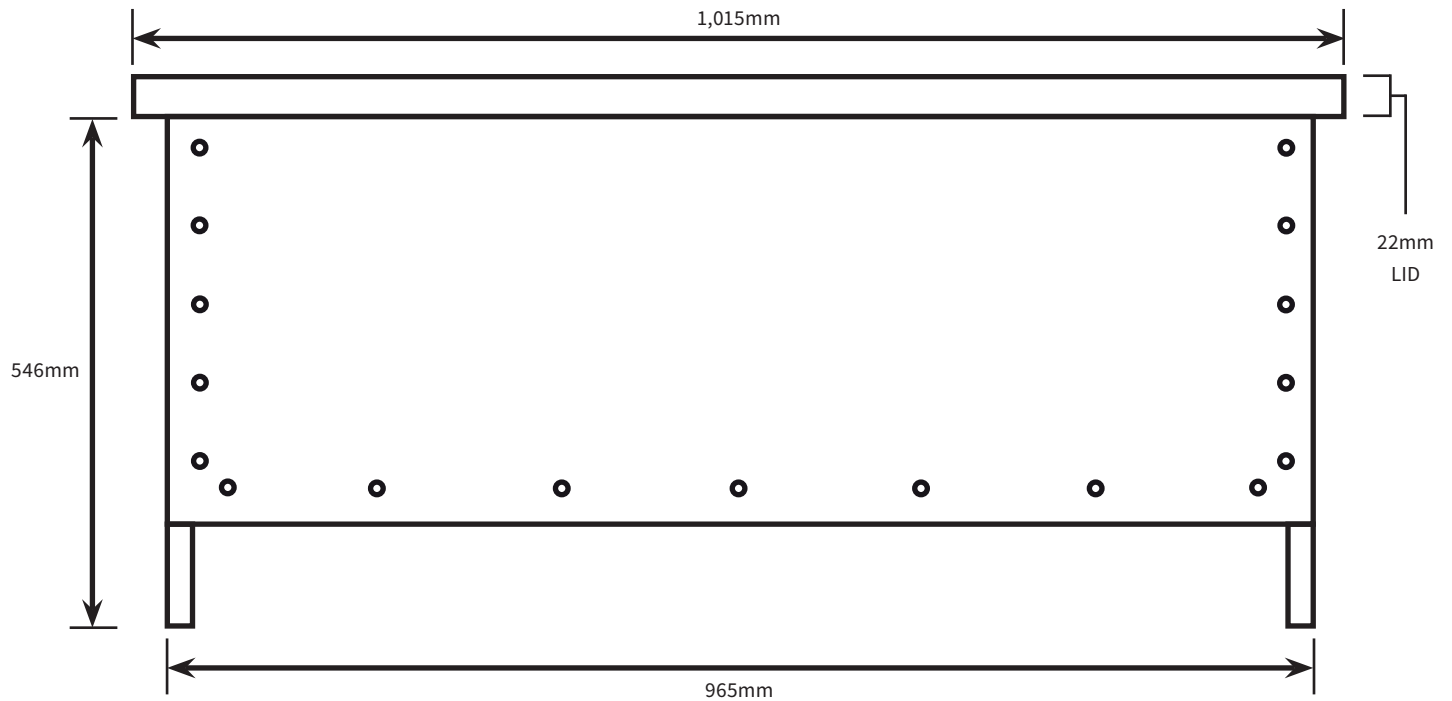
I wasn't sure if I could actually make a decent six board chest using only handtools. I had not made anything with dados or rabbets before. I know the dado can be made with a saw, chisel and mallet, but that seemed a bit prone to disaster as I hadn't ever done that either. My solution was to purchase two speciality tools for my kit to make the chest, which made it all the sweeter.

A vintage Stanley No. 39 $\frac{3}{4}$ to make the dados and a really old Stanley No. 78 for the rabbet cuts were soon delivered to my doorstep. I could have ordered nice new tools from one of the very few manufacturers that still produce handtools, but I really like the look and the feel of old iron and these were a quarter of the price.

I found these tools through vintage woodworking handtool dealers online. I was very pleased with the fast delivery and the tools were exactly as advertised; old, required a little cleaning and then they were ready to use. A quick honing of the blades and I found them entirely useful for the intended purpose. And I must give proper warning: be wary of the siren song of old tools and the unreasonable desire to acquire them for no real purpose other than to pick them up and look at them!

Making the chest

- 1** The hinges and handles were not vintage, but new stock from the DIY store. The hardware pictured is what was available off the shelf. The chest hinges came pre-bent on one leaf, but when pulled from the package, I saw they were bent at an obvious angle. A few minutes in the machinist vice with some hammering fixed them, but I really shouldn't have to do that on new stuff.
- 2** This six board chest started with four 2.4m-long cherry boards. Each of them were just over 230mm wide and came skip planed at 21mm thick. These were crosscut into 1.2m boards with my handsaw. Two pine boards, each 20mm thick, 235mm wide and 1.2m long were for the chest bottom piece. The width of the boards dictated the width, height and depth of the chest. Had they only been 200mm or so wide, the chest would have been sized accordingly.
- 3** Since I was going to make this chest using only hand tools, the 22in jointer plane was working its flattening magic. It got the edges true and ready for gluing with little effort, but a lot of careful checking with a small square. Once they were all cut, glued and readied for assembly, there were six boards – two ends, a front, a back, a lid and a bottom.

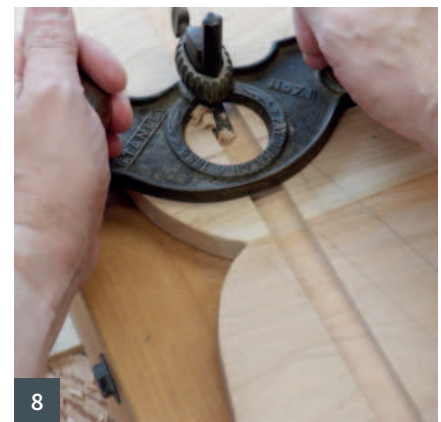
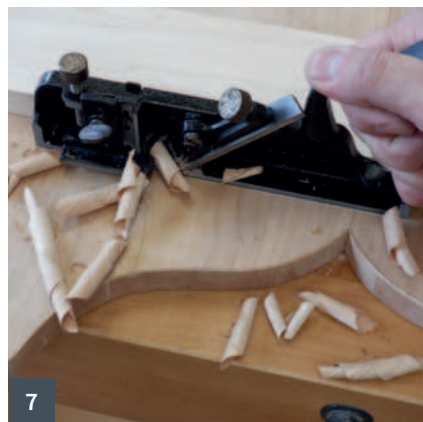


LID = 1,015mm length x 470mm width x 22mm thick
 ENDS = 546mm length x 445mm width x 22mm thick
 FRONT + BACK = 965mm length x 430mm width x 22mm thick
 BOTTOM = Cut to fit, 965mm length x 460mm width x 20mm thick

YOU WILL NEED

- Cherry:**
- 4 x 2.4m boards, 235–240mm wide, 22mm thick
- Pine:**
- 2 x 1.2m boards, 235mm wide, 20mm thick
 - Cut clout head nails, 20 x 50mm and 14 x 38mm
 - 6 x 32mm round head #8 brass screws
 - Chest hardware and supplied screws





- 4 I like to use a 'spring joint' where the middle is slightly concave so that only one clamp is necessary for glue-up. The ends only required a small clamp at the joints to keep them aligned and were able to be taken off within 5 minutes or so. I waited a day to remove the big clamps just to make sure the glue reached full strength.
- 5 I then trued the boards with my jack and jointer planes. The jack has a slightly rounded blade and took off a lot of material quickly. The jointer was set much finer and gave a nice final flatness to the boards. I made sure the ends were the identical size to each other as were the front and back boards. The two boards not cut to final size at this point were the bottom piece and the lid.

- 6 The base of the chest end pieces was cut to an ogee-style design, which I made using a pencil calliper. I started the cut-out with my small coping saw and most aggressive blade, which at 15tpi is hardly aggressive. After 15 minutes and 50mm into the cut, I was off to the bandsaw. So much for only handtools! I cleaned up the bandsaw marks using a chisel and spokeshave, all the while feeling a little guilty about using the power tool. Perhaps a bowsaw is in my future.
- 7 The dado on each of the end boards was easily cut with the Stanley No. 39 3/4, designed for the purpose. Using a scrap for an experimental dado before cutting into the actual project pieces, the 20mm pine board for the chest bottom fit perfectly into the dado. To prevent splelching at the end of the cut, I used a small piece of scrap clamped to the exit side. A piece of maple board was used as a fence to guide the plane as it cut easily and cleanly through the cherry.
- 8 The No. 39 3/4 plane has a fairly small depth stop so the bottom of the dado was a bit rolling. It required some minor clean-up from my (very) old router plane to get it perfectly flat. My router plane has an 1884 patent number on it, which leads me to believe it is easily 120+ years old. I have a new Lie-Nielsen router plane I bought a few years ago, but inexplicably prefer this old one. If I continue to not use the new one, it may end up for sale!
- 9 I was very happy with the dado plane and router follow up. As you can see in the photo, a piece of pine scrap fit neatly and showed the cut was square.



10 The end pieces both have 12mm taken off what will be the back side down to the bottom of the dado. I drew a line from the edge on both sides and the top so I could see if I began to drift when cutting. I cut both at the same time with my rip saw on the waste side of the line. Clean-up of the saw marks was with a block plane and chisel, checked frequently with a square.

11 The rabbets along the ends of the side pieces were cross grain and 22mm wide. Because they were cross grain I sharpened and set the nicker on the rabbet plane for a clean sidewall cut. To remove the chance of splchling the wood at the end of the rabbet cuts, I clamped a piece of sacrificial scrap at the exit end. The bottom of the side pieces received a 20mm rabbet, and because the cut went along the grain, the nicker was reversed and not in use. If you have not used a No. 78 plane, you are missing out. It's enjoyable and cuts amazingly fast with a sharp blade.

12 Now I was able to put the box together by setting the end pieces in the front and back piece rabbets. I used handscrews to hold the end pieces up and keep them from falling while setting it together. Once together, I lightly clamped the box to get the rabbet joints tight for measuring the bottom piece width and length. I used the pinch board method, which is two pieces of thin long scrap, each being shorter than the total length or width and extending them side by side into the rabbet or dado being measured. Once they touch the ends, I made a small mark on the top. Once removed, they can be put back side by side and the mark lined up and the whole length measured. I did it twice just to be sure.



13 The bottom piece was crosscut to length and since there was about 10mm to be removed along the width, I decided to use the scrub plane. The scrub plane does a nice fast job of taking off material with the grain and the jointer plane follows up to make it smooth and true. The bottom piece was then put into the box. I was pleased that it fit very well, even with the 3mm gap on each side for wood movement.

14 Taking the front and back pieces, I marked and pre-drilled the nail points. I had decided on five 50mm nails per side into the end pieces and 32mm down from the edge for the top nail hole. I thought that would be plenty of distance from the top and didn't want to chance the nail splitting the wood on the top exposed end grain.



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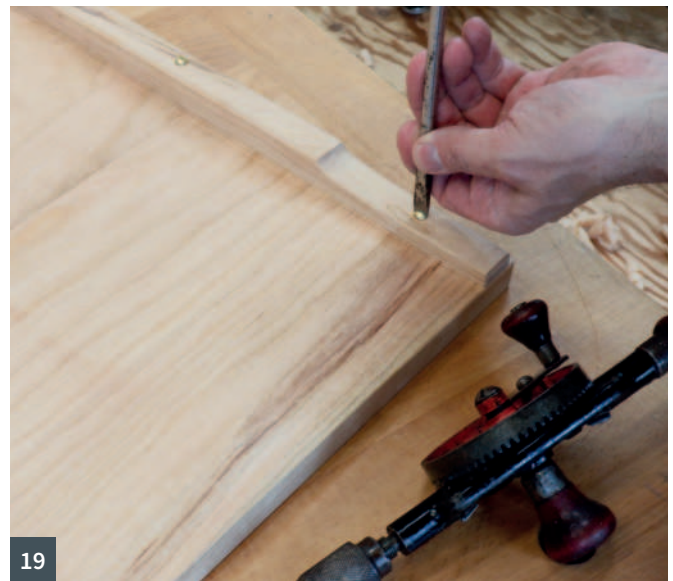
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- 15** The end grain on the left front split as I hammered the nail home. What a sinking feeling! Quickly, I firmly pressed glue into the crack – as much as I could – and clamped it tight. I left it overnight to dry. In the morning, I saw the crack was completely closed after the clamps were removed. I breathed a sigh of relief.
- 16** I finished nailing by putting smaller 38mm nails into the bottom piece. A close examination of the box would have shown that while I managed to seat each nail, I also managed a few glancing blows slightly marring the surrounding wood. Of course, these blemishes easily sanded out later.
- 17** With the box nailed together, I was able to get a measurement for the lid piece. There was about 38mm of excess on what would be the back side, so I used the rip saw to remove it. I ended up putting the

wany edge of the lid board in the front to display it. The non-wany half of the lid was planed smooth and set over the front of the chest by 12mm.

- 18** From the lid material sawn off as excess, I cut into two battens for the sides of the lid. Their purpose is to keep the lid straight and flat. I decided on a bit of artistic design and used a $\frac{5}{8}$ bit to create a round transition between the ends and the middle as you can see in the photo. I cleaned up leftover saw marks and smoothed the sides with a jack plane, chisel and spokeshave.
- 19** The battens get three screws, one in the middle and two on each side. I pre-drilled the holes in the battens the same size as the screw threads and the outside holes got widened with a round file on the underside. This allows the brass screws to move with the lid during the seasons.



20



21

- 20** The hinges went on neatly into the 6mm deep cut on the back edge sized using the hinge. I did remember to dip the screw tips into wax before screwing them in, which made the job much easier, something I forgot to do with the battens.
- 21** Another lesson in attention to detail. If you look closely at photo 1, you will notice the friction lid supports are both labelled in small, yet bold print 'Right side'. I admit not noticing this in the store which is why I returned to the store after putting just one lid support on. The following day I put the 'Left side' lid support on. Another tip I'm glad I followed was 'read the directions'. I did and was glad for it as the installation went smoothly.
- 22** After installing the lid supports, I put the chest handles on. The handles are a little on the light side for such a chest and I will be looking for a slightly more robust set of handles in the future. Overall, I am happy with the chest. Aside from the little slip up with the bandsaw usage, I can report that it is not a difficult project to make using handtools!
- 23** Here you can see the finished chest.



22



23





FALLING OUT OF LOVE WITH YEW

Determined to make more use of local timber, Kevin Alviti
turns a storm-blown yew tree into a garden gate

For a long time now, I have wanted to start using more local timber. Luckily, there is quite a bit of sweet chestnut coppiced locally that I try to use whenever an outdoor project calls for it, however, I also wanted to use the resources growing around us. I strongly believe that we need to see firewood as a last resort for timber and I've started to look at each branch that falls here to see if there can be another use for it. Not saying that I don't need lots of firewood – we have two wood burners to heat our house – but I can always burn my mistakes...

After the last 'named' storm my best mate rang me up and said that they had a yew tree down and was there anything I could do with the timber, otherwise they'd log it up. On the kitchen table, as I spoke to him, was my tattered old copy of *Woodland Crafts in Britain* by H L Edlin and it said in reference to yew:

'It is very durable out of doors, and old tree trunks are still cleft or hewn into fence posts that are claimed, with good reason, to outlast iron.'

It seemed like too good of an opportunity to pass up. I called by the next day with some wedges and a sledgehammer. Sweet chestnut it was not, but it did eventually cleave to reveal a beautiful contrast between the heartwood and the sapwood.

I wanted to make a gate. I read *The Village Carpenter* by Walter Rose annually; this book has become a sort of meditation for me now, the words are so familiar. So many bits in that book interest me (I'd love to build a wooden water pump) but this part about making a gate is especially intriguing: 'The making of a gate was considered a day's work for a qualified carpenter, and was expected to be completed in 10 hours, which at that time constituted a day of labour. No one ever suggested it could be done in less time.' The gate described here, which would often be made as part of winter work when things were quiet, was made from seasoned oak heartwood. I wanted to make mine straight from the log, so I'd give myself no time constraints!

YOU WILL NEED

MATERIALS:

- 4 logs about 200mm in diameter and about 1.5m long. Freshly felled a few months beforehand and stored in the shade
- Galvanised nails
- 4 x 125mm lengths of 12mm hardwood dowel

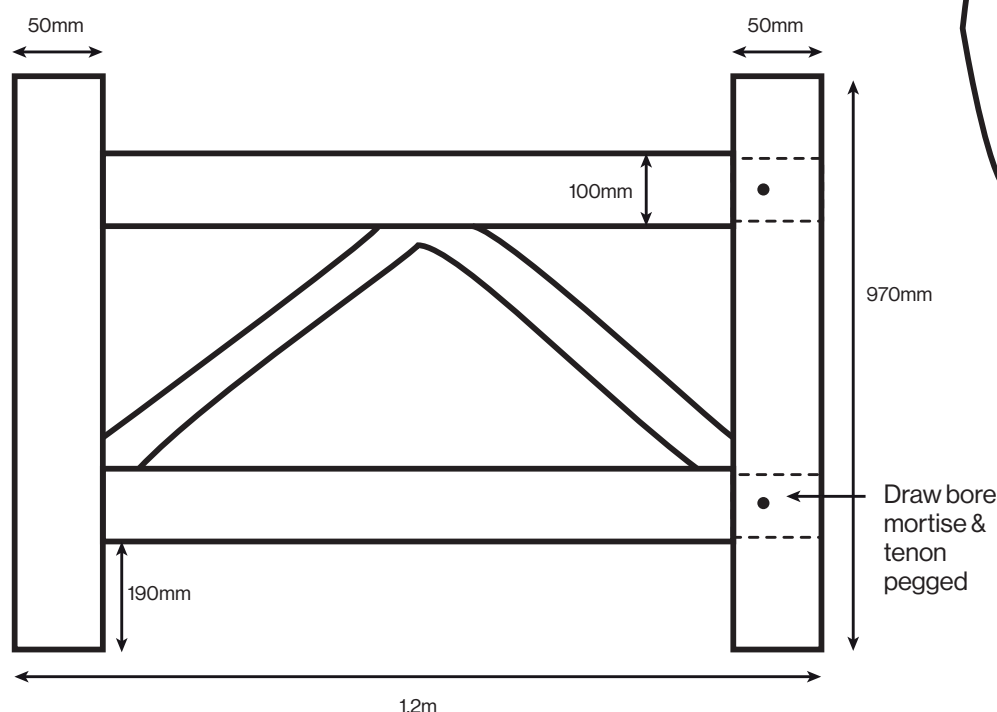
TOOLS:

- Side axe
- Hewing axe
- Broad axe
- Splitting wedges
- Sledgehammer or maul
- Froe
- Draw knife
- Log dogs
- String line
- Jack plane
- Tablesaw (if you wimp out like I did and need it ripped down)
- Tenon saw
- 18mm chisel
- Mallet
- 778 rebate plane
- 20mm drill bit

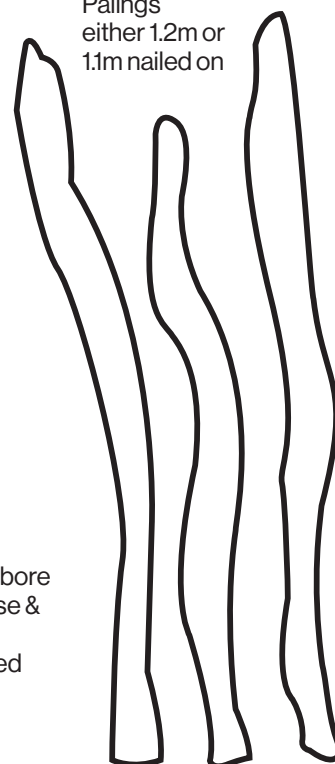
- 3mm drill bit
- Drill
- Marking gauge
- Mortise gauge
- Carving tools (optional, for adding the date)

EQUIPMENT HANDY TO HAVE:

- Raised chopping block
- Low chopping block
- Riving brake
- Shave horse
- Saw horse
- Bench hook



Palings
either 1.2m or
1.1m nailed on



I made a very simple gate at first, using rough quarters of the rounds to form the main parts. I used very undemanding mortise and tenon joints and then pegged it all together. It looked great, very rustic, but it was not quite what I wanted. I wanted the uprights on the frame to be from squared timber, strong enough to stand some woolly animals rubbing against it, and to do that I was going to have to hew the uprights first before I could process them further.

About the materials

Yew is not an ideal timber for this project, or certainly not the yew I used anyway. It was knotty and hard to work. Coppiced poles of sweet chestnut would be the ideal wood, or anything straight-grained and durable. But I was determined to use what I had, and the fact it comes from just under a mile and a half away from my home made me even more sure it was the right thing to do.

In hindsight, it probably wasn't. It's not often that I want to give up on a project but this one nearly beat me! This timber was hard work,

too knotty and unpredictable. But someone who has never made a mistake is someone that has never done anything. I learned loads from this project and gained lots of insight.

If you do consider using yew just be mindful that the wood itself is also potentially harmful. When I was growing up my brother and I had an amazing tree house in two old yew trees; you could even, if you were brave, climb from one tree to the other, about 6m in the air. One day, a friend came round to play, and within 5 minutes of him being in the tree his face had swollen up like a balloon – he was having a bad reaction to the yew, my mum panicked and still talks about it to this day. For this reason, I'd advise against using yew and finding a more suitable timber. I'm lucky in that it has never affected me.

Woodturner Andy Coates has a great article about the potential dangers of some woods in *Woodturning* issue 257 and goes into some detail about the potential dangers of yew and I'd make it recommended reading before using this timber.





For this project, I recommend using either sweet chestnut or oak, something that splits and behaves as you'd expect. But remember: sometimes waiting for the right tree can mean a project never gets done and an opportunity is lost.

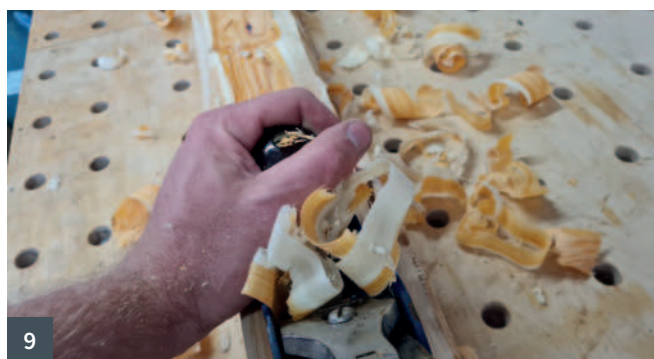
A word on safety

It doesn't take much time hewing to work out that this is hard graft. I mean seriously hard graft. I'm used to using hand tools for hours at a time but swinging an axe is a different level. Make sure you don't work like this when you're already fatigued or tired, as that's when accidents happen.

The whole time you need to think about positioning and where that axe will go if there is a glancing blow where it doesn't connect properly with the timber. Like never having your hand in front of a knife, make sure your leg is never where the axe could end up at the end of a swing. I found myself standing to one side to keep my legs out of harm's way. When making cuts on the palings a raised chopping block made everything safer and easier to manage.

Making the gate

- 1 Select your timber, ideally straight grown, free from knots and of a species that works easily like oak or sweet chestnut. Basically, not what I'm showing in this picture!
- 2 Select a straight section and clear the bark from there so a line will be easier to see. The bark was easy to remove from the yew so I ended up stripping the whole log with the drawknife.
- 3 Secure your log in place. I don't yet own iron dogs to knock into the log to hold it, so instead, I used some batten and nails, plus I knocked in a metal bar on either end to hold it firmly. I also notched two cedar logs to create a cradle for the log to sit in. Take a string line and strike a line across the top of the log, visualising the piece of timber you want from it. Ideally, you don't want the centre pith in the timber, but my logs were too small to avoid this.
- 4 Take a double-bevelled axe and start making vertical chops down the log. These are made at regular spacing or where there are tricky knots. This is called scoring and might not be necessary on smaller and easier logs. The cuts should go down to the line forming a V. On larger logs some stand on top of the log to do this.
- 5 Then, using a hewing or side axe, knock the piece of wood from between the chops off. These are sometimes called joggles and when you take this wood off it's called joggling. Roughly take the wood off first, giving yourself some room for error, then start to work up to the line.
- 6 Using a hewing axe, work up to the chalk line. This is almost a planing cut. Work the shaving back as you chop. Remember the aim



here isn't to get it perfect, just to get it good enough to use.

- 7 The surface doesn't have to be anywhere near perfect. But it does make things easier if it is flat(ish) and not in twist.
- 8 With one side complete, roll the log over and secure it again. Mark up for another cut at 90° to the first one. Strike the line across the top of the log as well. Then just repeat the process. Rest often, using an axe when you're not used to it is tiring work.
- 9 With four sides worked, it's time to tidy them up a little bit. If I had an adze I might consider using that, but instead, I used a jack plane with a slight camber in the blade to plane this knotty wood. It was hard work, even green, and the knots caused me constant problems.
- 10 I got to this stage and realised I'd hewn the logs into 100 x 100mm posts and it was just too big for what I was planning. I admitted a little defeat here and used my friend's large tablesaw to rip them in half. If I had used a predictable timber, like sweet chestnut, I might have been tempted to cleave them to produce the halves, but the yew was not playing ball.
- 11 I only really worried about having two good surfaces from each log, a face side and face edge, that I could work off. I laid out the four pieces how I wanted to assemble them in a simple frame.



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- 12** With the uprights next to each other, I marked out the four mortises. The width of these was sized to my 20mm hand auger bit.
- 13** Drill out as much of the mortise as you can, spacing the holes close together. To reduce tearout on the underside bore into a scrap piece of wood.
- 14** Sit astride your sawhorse with the post under you and square out the mortise with a chisel, working from both sides to leave it as tidy as possible. For centuries carpenters have sat like this to mortise.
- 15** With the mortises cut, use these as references to set up your tenons. I set up two gauges, one mortise gauge that set the cheeks of the tenon, and one marking gauge that set the depth of it to the shoulders. Rather than using a pencil, all marks are just scored onto the wood.
- 16** Cut the shoulders on all the rails using a tenon saw.
- 17** You have two options here, depending on your wood. Either saw the sides of your tenons, or split it with a chisel if the grain looks favourable. Remember, we're making a garden gate, not a coffee table. I split mine using an 18mm chisel, bevel side down so as better to control the split.



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18 When I used to do a lot of green oak framing, we used a 778 rebate plane to clean up the tenons across the grain, this is the perfect job for it and it works well on this green wood.

19 I made my tenons closed so they were stepped on all four sides. Make them so they tap into the mortise without too much force.



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20 When I assembled my frame and checked for square by measuring corner to corner it was perfect. I decided then to peg the mortise and tenons. I drawbored it slightly by drilling through the mortise, then putting the tenon in and marking where that hole would be. When I drilled the hole in the tenon I offset it slightly towards the shoulder.

21 For the dowel, I used some dry hardwood 12mm dowel I had in the rack, but you could easily make some with the drawknife. Chamfer one end before knocking it in, the joints should pull tight.

22 Cleave some timber. Break down some logs into sections to make two braces and enough palings to cover the front. The braces I made from quarters of a smaller diameter log.

23 To make the palings, I placed the log on a low chopping block and knocked the froe into it.

24 I tried to control the split with the froe, a riving brake helps with this. The yew I was using did not like the froe much and I had to resort to using wedges and a maul more than I would have liked.



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25 Remove as much waste as you can with an axe then move on to using the draw knife on the shave horse (or bench vice if you don't have one). Try to shape them so there are no thin edges and no sharp sides.

26 Using a side axe (a normal axe will do if you don't have one) cut tips on your palings. I had two sizes from two different logs to give a staggered appearance.

27 Space your palings out by eye. No need to use a tape measure here. Try to make sure they look right and mark them up. I had to pilot hole all of mine before fixing with some 65mm galvanised nails.

28 Flip the gate over and lay out the bracing. Mark it up and cut them. It might take a bit of time and a bit of trial and error here – it's worth cutting on the side of caution to make sure they're a tight fit.

29 I fixed the braces by spiking in some galvanised nails to hold them in place.

30 As a final flourish, I carved the year into the top rail. Often the last tiny bit of detail can change the whole feel of the piece. This will let me see how long the yew lasts and find out whether *Woodland Crafts In Britain* was right and it will outlast iron!



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CHIP-CARVED ROSETTE

Wayne Barton
carves this stylised
pattern onto a plate,
an ideal project
for chip carving
beginners

Chip carving has been described as the fastest and easiest way to decorate wooden objects – not to mention its attractive and enjoyable qualities with endless design possibilities. As with all handwork, practising the rudiments of chip carving techniques, such as how to hold a knife properly and execute basic chips, will give a beginner the courage and confidence to proceed with a first project.

A beginning project should contain elements already learnt, along with the challenge of combining them with new techniques. When you first start a chip carving project, special attention needs to be given to the accuracy of both the drawing and carving alike.

YOU WILL NEED

- 200mm beaded flat basswood or lime plate
- Pencil
- Compass
- Tracing paper
- Graphite paper
- Stylus
- Cutting knife
- Gel stain

Precision

Since the drawing or layout for chip carving is the road map that will guide your carving along smoothly, it is most helpful if your drawing is complete and accurate. It is not necessary to always have a line for every cut to be made, but the more complete the drawing, the better idea you'll have of how the finished carving will look. All proportions should be indicated, so that the start and finish points for carving are known. Furthermore, since it is the nature of chip carving to normally have motifs repeated and expressed by or within geometric shapes, the repeated geometric shapes should all be of the same size and configuration. If the design calls for a circle, an 'almost round' figure won't do, no more than 'nearly straight' suffices for a truly straight line. Preciseness is one of the qualities of outstanding chip carving.



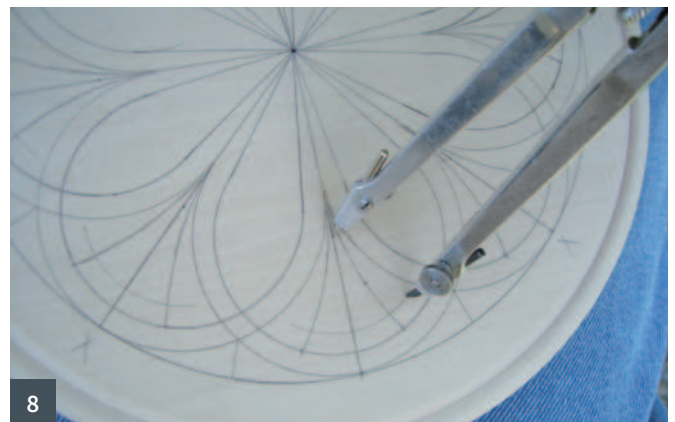
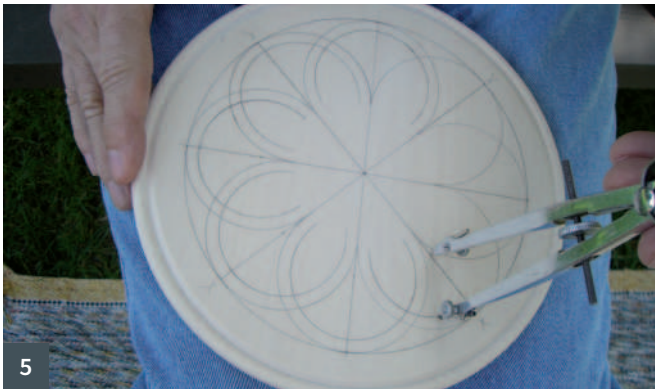
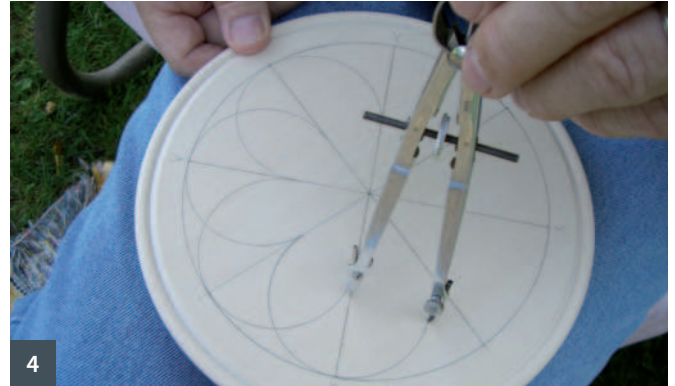
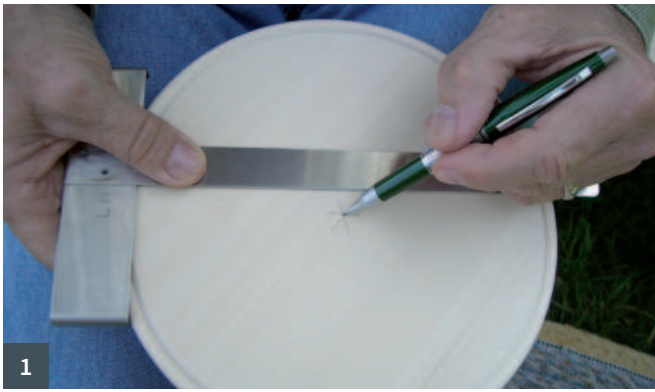
Timber

For this project I've chosen a rosette with only three different motifs to carve. From a design viewpoint, it is a balanced contrast between a positive and negative approach to chip carving with geometric and organic motifs. The design is carved on a 200mm beaded flat basswood plate. This wood has a clear, tight grain, and is an excellent selection for chip carving. Lime is also suitable for this project. When carving a plate, it is best to orient the design with the grain running horizontally. Though subtle in this case, horizontal grain lines suggest a restful attitude and will not be visually intrusive at a subconscious level with the carved design, as vertical or diagonal grain lines tend to be.

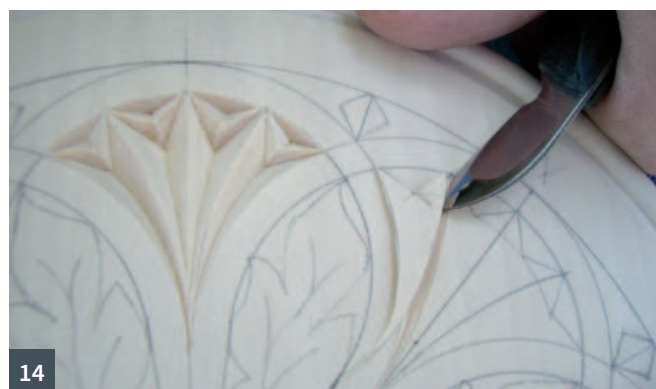
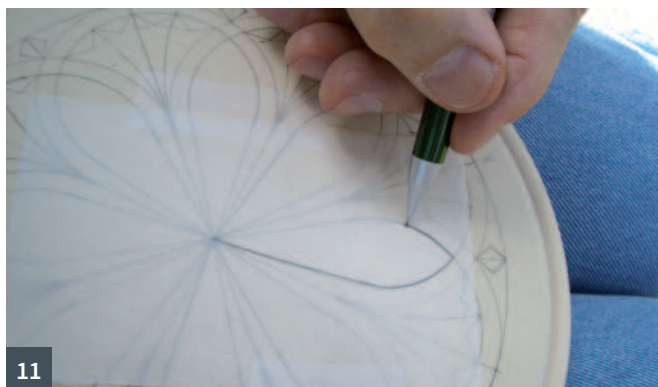
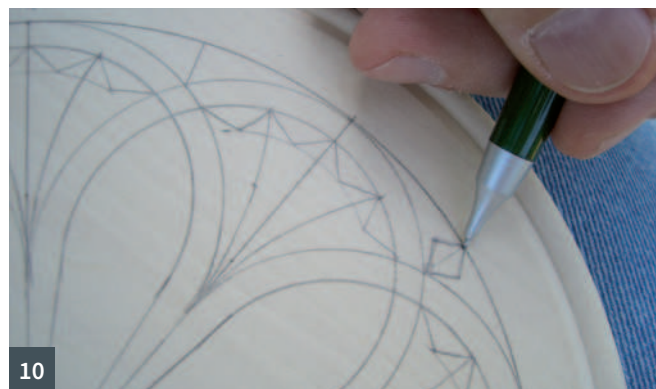
Drawing the rosette

To begin, find the centre point of the plate. While there are several ways this may be accomplished, using a centre-finder is the easiest. Once the centre point is established, divide the plate into quarters and draw the outer circle of the rosette with a 160mm diameter. This size rosette will proportionally fit the plate nicely.

Next, divide the quarters equally, establishing eight equal sections of the circle. Choosing any one of the lines drawn, set your compass point on that line with an opening that will touch the outer circle and the two adjacent lines with a single setting. Now draw an arch touching all three points. Repeat this procedure with all eight lines.



1 Begin laying out the design by finding the centre point of the plate using a centre-finder **2** Draw a line through the centre point parallel with the grain. Bisect this line with a second line perpendicular to the first **3** Draw a 160mm diameter circle. Divide the quartered circle into eight equal segments **4** On any line, find a point that with a single setting will touch the two adjacent lines and the outer circle. Draw an arch touching all three points. Repeat on all eight lines **5** Using the same point, draw a second arch 5mm shorter than the first **6** With a straightedge, connect all the ends of the second arch with the centre point of the rosette **7** By hand, divide the area of each fan motif into four equal segments **8** Lightly draw an arch 5mm below the top line of the fan motif...



9 ...as a guide to pencil in the four darts within each fan motif **10** In the centre of the section above the leaf motif, draw a small diamond **11** From the leaf section of the rosette, trace the outline of this geometric shape **12** Draw a leaf design within the traced area for the leaf pattern **13** Transfer the leaf design to the wood with a stylus **14 & 15** The two outside chips of the fan motif are cut all the way to this motif's bottom centre point

Using the same compass points

On the lines, shorten the compass opening by 5mm and draw a second arch beneath the first, stopping at the same point as the first arch. With a straightedge, draw a line connecting all points of the shortened arch to the centre point of the rosette.

Drawing the fan motif

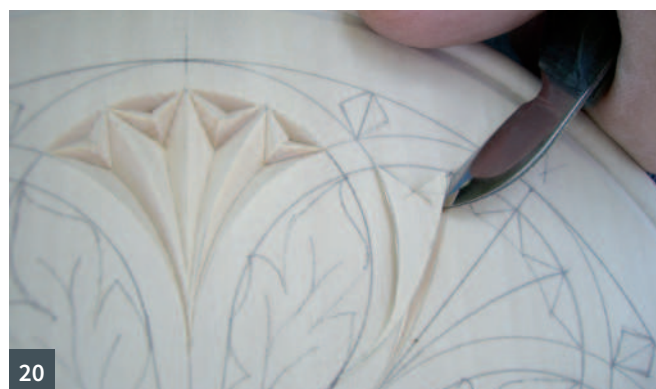
By hand, divide each fan motif area into four equal sections. Lightly draw a guide line 5mm below the top line of the fan motif and pencil in the four darts within each fan motif.

Positive image leaf motif

With a small piece of tracing paper placed over the positive leaf section of the rosette and held firmly with removable tape, trace the outline of this area. Being able to see through the paper will make it easier to place

it in the proper position when transferring the design to the wood. Design within this area an uncomplicated leaf that flows easily. The leaf should fill this area by having its blade sections touch the outside lines of the geometric shape in which it is drawn, giving the impression of a leaf, fresh and lively. If the leaf is drawn smaller than the area in which it is placed, it may appear to be withering. Also, when drawing the veins, put a bit of curve in them, indicating flow and movement. When designing, be sure the chips being drawn can be carved. Chips that are too large or complex should be avoided.

There are two ways to easily transfer the leaf design from the tracing paper to the plate. After placing the tracing paper in position on the wood and securing it, slip graphite paper – not carbon paper – under it and with a stylus, trace the pattern onto the plate. Another way to transfer from paper to wood is to place the drawing, pencil side down, and trace the pattern with a stylus.



16 The two inside chips of the fan motif are held short of the motif's bottom centre point or 'stacked' above the two outside chips **17** The small chip of the fan motif is removed by making the first two cuts away from the elongated chip which is already removed **18** Make the first cut of a 'new' chip away from any chips which have already been removed **19** Remove the two chips on either side of the diamond the same way as the elongated chips in the fan motif **20** To change the diamond into a stylised flower, make a small notch in the centre of each side

The pencil line will transfer to the wood. To facilitate this method, use a soft lead such as grade B in the pencil when drawing the leaf. Be aware using this method will reverse the pattern.

In the area above the leaf motif, draw a small diamond in the centre. When finished this will become a stylised flower.

Carving the fan motif

Since the fans of the rosette are the most difficult of the three motifs to be carved because of their deeper cuts and many sharp ridges, I suggest doing them first.

The large chips of the fan are removed by a method called 'stacking' – this is done by having only the two outside chips brought to the centre point at the bottom of the fan to define the motif.

The two inside chips are held short of the centre point, or 'stacked' just above the outside chips.

Stacking will greatly minimise the possibility of splitting out wood not intended to be removed, while having all four chips appear to converge at the same centre point. The smaller chips at the top of the fan are removed the same as would be done with any simple three cornered chip, making the first two cuts away from the larger chips already removed.

Carving the small flower

The small stylised flower above the leaf is a nice accent contrasting in size to the leaf. The chips on either side of the flower are of the same configuration as the larger fan chips and the cuts that remove them are made in the same sequence. Once the diamond shape of the stylised flower is revealed, notch the diamond by reaching over the centre and making two cuts forming a small V-chip on all four sides.



21 The first cuts relieving the leaf motif are made by tracing the outline of the leaf with the blade facing away from the leaf design **22** The relieving cut of the leaf is made by tracing the geometric outline of the leaf motif. Do not cut any deeper than is necessary to relieve the chips **23** When relieving the veins in the leaves, remove the centre or main section first. Veins should be kept narrow, making their cuts shallow **24** The finished carving should express the elements that make chip carving attractive – single facet cuts, sharp ridges, no wood particles left in the grooves, all drawing lines erased, and a well balanced design **25** Applying a finish will preserve the carving, staining will accentuate the negative and positive design aspects

Carving the leaf motif

The first cut of all the chips that will reveal the leaf is made by cutting the leaf outline, being aware that the width of the chip will determine the depth of the cut. This cut will be made with the blade cutting away from the leaf design. In essence, make this cut by tracing the outline of the leaf. The cuts that free or relieve the chips around the leaf, are made by cutting on the line that defines the geometric shape in which the leaf is drawn. As with all chip carving, do not cut any deeper than is necessary to relieve the chips.

The last cuts to finish the rosette will be the ones creating the veins. These cuts are very shallow because the veins should be made fairly narrow so as not to dominate the appearance of the leaf.

The finished carving should express the elements that make chip carving attractive – single facet cuts, sharp ridges, no wood particles left in the grooves, all drawing lines erased and a well balanced design.

Finishing

Because chip carved pieces often are functional and may be handled frequently, it is recommended that a finish be applied to prevent fingerprints and dirt accumulating over a period of time. Finishing will provide a protected surface that can be dusted and cleaned without harming the wood. Finishing will also enhance the beauty of both the wood and the carving.

Today there are a number of products on the market that will finish a carving nicely, particularly if it is to have a natural finish. If a carving

is to be stained, a gel stain may be recommended as it will not tend to bleed into end grain as liquid stains are known to do when softer woods such as basswood are used. It is also recommended when staining to first run through the procedure on a trial board of the same wood to avoid surprises and possible disappointment.



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JAMAICAN BIRD SCULPTURE

Cedric Boyns carves an impressive sculpture, inspired by his travels



The idea for this relatively simple piece came from a visit to Jamaica, where the local craftsmen create simple sculptures of four to six identical bird shapes appearing to be sitting in a tree. I wanted to extend this idea to include a larger range of bird shapes and construct a larger sculpture incorporating different woods and different finishes.

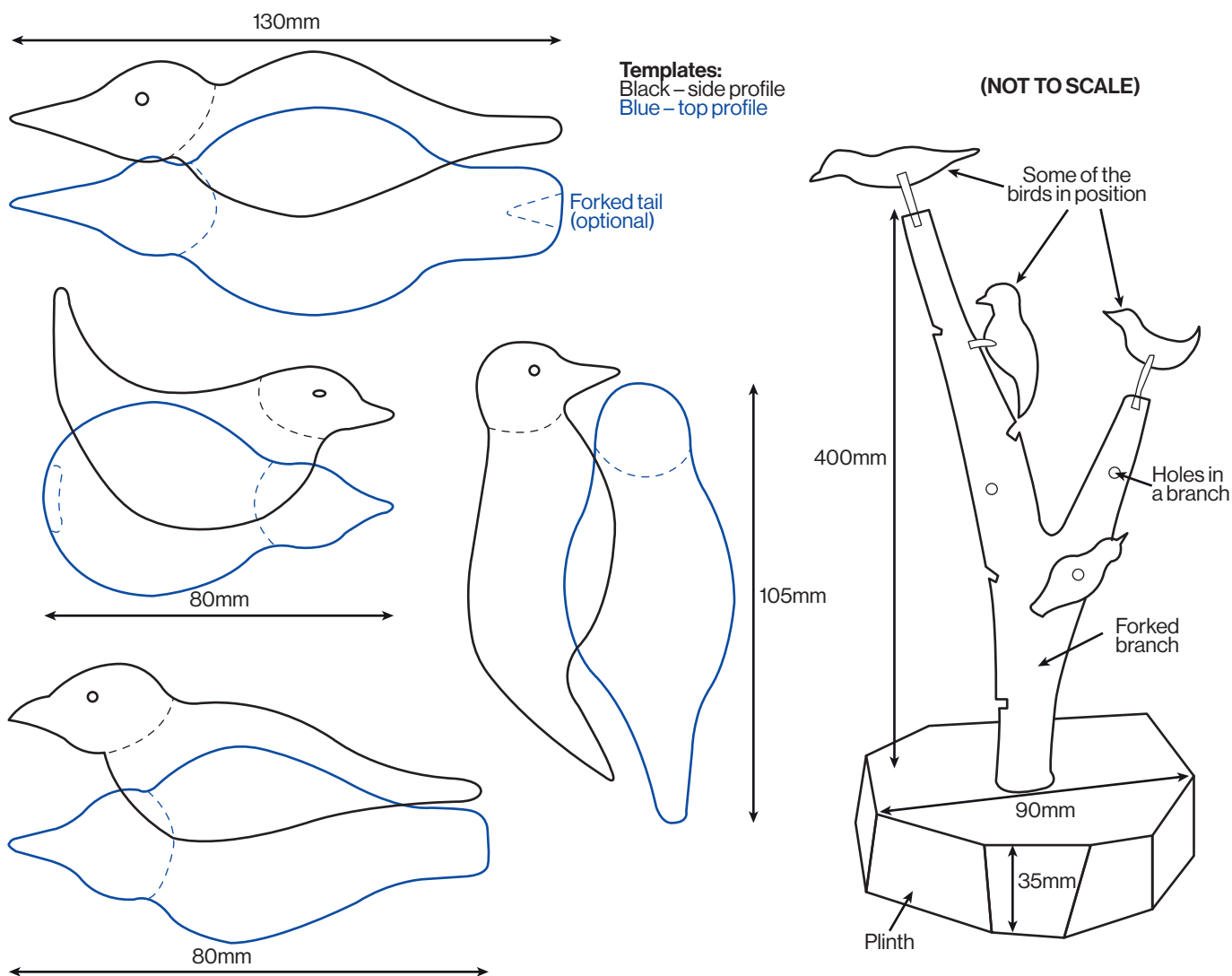
YOU WILL NEED

TOOLS:

- Carver's chops for work holding
- Bandsaw
- Belt sander
- Gouges: No.3 and No.5, 6mm and 10mm or 12mm
- No.9, 12mm
- Detail carving knife
- Pillar and or hand drill
- Twist drills: 5mm, 4mm and 3mm
- Forstner bit: 35mm
- Riffler: 'spoon and knife'
- Abrasives: 100–400 grit

MATERIALS:

- Wood blocks of suitable size: about 130 x 50 x 40mm. Size will differ slightly for the different bird designs, see templates. Woods used are ash, lime, cherry and mahogany
- Block of ash for base plinth: approx 130 x 90 x 35mm
- Length of forked cherry branch wood (length and size depends on the number of birds included)
- Small offcuts of a dark wood (eg black walnut or iroko), and a light wood (eg ash or lime) for the eyes and peg supports
- Wood glue and hot melt glue
- Wood stain (optional)
 - I used Indian rosewood
- Masking tape
- Sanding sealer (cellulose)
- Finish of choice – I used satin and gloss spray lacquer and wax polish
- Suitable PPE



Getting started

- 1 Make a full size copy of the top and side profile templates of the bird to be carved and cut them out. Use the templates to draw the profiles onto the block of wood. Cut out the top profile with the bandsaw and glue back the waste wood with small blobs of hot melt glue (or masking tape if you prefer).
- 2 Once this glue is dry, cut out the side profile with the bandsaw and remove all the waste wood by prising it away. I find that a small straight chisel or screwdriver is effective for doing this.



- 3 Check the position of the bird's neck on the template ...
- 4 ... and draw this onto the block, marking the rough position where the neck will need to be shaped.

Shaping

- 5 Using a suitable small shallow gouge (I used a No.3, 6mm for most of it), start to shape the head down to create the neck region ...
- 6 ... and do the same to the shoulder region of the body.
- 7 You can then start shaping the top side of the bird's body ...
- 8 ... and work your way around to the underside, gradually removing all the straight edges and saw marks from the original block profiles.
- 9 Next, shape the beak, checking that the head remains symmetrical.





- 10** Once you've formed the beak and you're happy with the overall shape of the head, you can then move on to shape the tail end of the body and the tail itself.
- 11** Again, you need to remove all the straight edges and saw marks.
- 12** Once the shaping is complete you then need to decide whether to sand the outer surface smooth, or leave the tool marks. If you decide on the latter, it will be necessary to go over the whole surface to make it as even as possible.
- 13** I carved four basic bird designs for this piece, sanding most of them but leaving a couple with tool marks. Note: the shaping of the birds (steps 5–13) can be completed with a carving knife instead of gouges, if preferred.

Adding the eyes

- 14** The eyes are made of very small dowels whittled from scraps of waste wood of a contrasting colour to the bird body. I used either black walnut or iroko to create the dark eyes of the light coloured birds, and lime or ash for the light eyes of the dark birds. After marking the positions, drill holes to a depth of about 7mm with a suitable sized twist drill – either 3mm or 4mm according to the size of eye you feel is needed for each bird.
- 15** A short length of the dowel, of the appropriate size and colour, is then glued into each eye hole so that it protrudes by just a few millimetres, as shown in the photo.



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16 Once the glue is dry, use a detail knife to round off the dowels so that the 'eyes' are left just proud of the surface as shown. This same result can also be achieved by using a small shallow gouge.

Attaching the birds to the branch

17 Attaching the birds is achieved by producing a short peg, again made from scraps of the same light and dark waste wood. Each peg has its ends whittled into a short dowel, one end of which fits into a 5mm hole drilled into the belly of the bird and the other end into another 5mm hole drilled in the display branch. I varied the angles of these holes in the birds' bellies to create some more variation in the angles of presentation of the individual birds in the final piece.

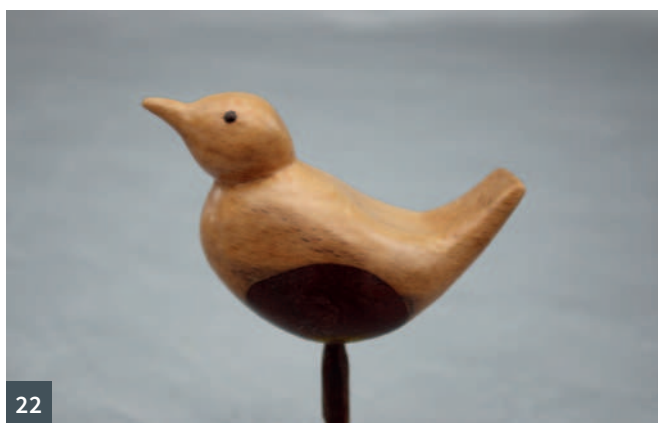
18 I chose not to glue these pegs in, but relied on them forming a 'jam-joint'. This means that the positions of the birds can be changed easily if required.

Finishing the birds

19 I decided to experiment with a range of finishes on my birds, which I'll describe here. Mask off the head and upper body region of one of the birds with masking tape and then stain the lower body with two coats of Indian rosewood stain. When thoroughly dry, you can then finish this stained area with two coats of gloss spray lacquer.

20 Next, remove the tape and those areas masked off are left as bare wood (ash in this case).

21 Other birds can be given a coat of sanding sealer followed by two coats of spray gloss lacquer.



22



23



24



25



26



27

22 Others can be given two coats of satin finish lacquer sprayed over sanding sealer.

23 Alternatively, you can add a couple of coats of clear wax polish over a sanding sealer base and buffed up with a soft brush or cloth.

The display branch

24 I chose a piece of cherry branch wood with a single fork and, as some of the bark was damaged, I felt it would look better with the bark removed, so I stripped it off with a No.9, 12mm gouge, before lightly sanding the bared branch with 320 grit. This left a smooth but slightly undulating surface to it. I was able to round the bottom couple of centimetres of it with a rounding tool so that it could be fitted into a hole in the base. (However, as long as the bottom surface of the branch

is totally flat, it can just as easily be glued to the top of the base perhaps with the aid of a dowel to support it and hold it in place.)

25 Decide where the peg holes need to be (this will probably involve a bit of testing to see how much room the birds need so that they were not touching each other), the holes can then be drilled, slightly angled up in the most part.

The plinth

26 I chose a piece of ash with some interesting figuring. Cut eight faces into the piece of wood with the bandsaw. Drill a 35mm hole in the centre to a depth of about 20mm.

27 The plinth is then sanded on a belt sander.



28



29



30

- 28** The branch can be glued into the hole in the plinth with wood glue.
- 29** The glue is then left to dry.
- 30** The finish that I chose for the plinth and the display branch was a coat of sanding sealer, followed by two coats of clear wax polish. They were then buffed to a shine with a soft brush or cloth.
- 31** Once the whole piece has been assembled, it should look something like this. Note: there is scope to make this sculpture smaller (or bigger) by adjusting the size of the branch used and the number of birds attached to it.



31

A collection of various woodworking tools is scattered across a rustic wooden surface. In the top left, there's a wooden handle and a red-handled tool. To the right, a red square is visible. Below it, a black and red tool lies horizontally. In the bottom left, a hammer with a wooden handle and a black head is positioned. On the right side, a large circular saw blade is partially visible, along with a long metal rod and another tool at the bottom right.

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THE JOURNEY TO WOODEN LUXURY

Caroline Kelly meets Chris Holland of Wooden Luxury Joinery, who is taking on high-end creative projects and combining traditional craftsmanship with a progressive outlook

Chris Holland established Wooden Luxury Joinery 20 years ago, and is dedicated to providing customers with beautiful and luxurious design. Chris thrives on being across a multitude of projects. It's what he does, and it's how he's managed to build the business from a one-man operation to having three offices in Birmingham, the Cotswolds and Shropshire.

THE INDIVIDUAL TOUCH

Wooden Luxury Joinery has positioned itself as a high-end service, creating bespoke solutions for people looking for the individual touch of skilled craftsmen. Providing everything from stylish kitchens to sash windows and oak frame buildings, it's designing front doors that Chris still loves best about his work. He said: 'Our main speciality is front doors, without a doubt. We can get very creative, and I love working with clients and creating a door for them, I absolutely love it.'

Chris isn't afraid to go all in when it comes to a creative front doors, fulfilling customers' desires for stained glass, ornate carvings or whatever else helps them stand out. And it's this obsession with detail that means he's hands-on with every job that passes through

the workshop, coming up with designs and signing off every product that passes through.

Another key area Chris feels passionate about is the quality of the material that goes into every build and every product. Chris explains: 'This is the main thing for me. I'm constantly trying to improve our product and source the best materials. The quality is very important to me. We work so hard on making our product better every day. Our products don't stand still; we are always working to make them better.'

One of the materials Chris is particularly proud of is the ironmongery he sources from a company he believes produce some of the best work in the business.

DEVELOPING A WOODWORKING CAREER

This desire for continual improvement stems in part from an early exposure to perfectionism in practice. Both Chris's parents held the unique job of historical restoration and rebuilding. The couple would painstakingly take down a building of historical importance, brick by brick, and rebuild the entire structure in a museum or elsewhere.



Contemporary oak entrance door and frosted glazed side lights with clear etched border



Cotswold stable door with diamond-shaped astragal glazing bar in top leaf



Gothic arched oak double door entrance with bespoke steelwork



Period/Gothic-style door for an accountancy practice in Birmingham



Part of Wooden Luxury's very talented team



Fitting ironmongery and making sure the complex locks are working smoothly is an art



Casement windows framing the Shropshire countryside perfectly



Oak-framed porch with a crooked head made for a 1700s Cotswold farm house



Richard looking extremely proud after completing the fitting of this period-style door



Aiden Best proving Wooden Luxury are a cut above the rest



Georgian-style bi-folding doors – traditional design meets modern living



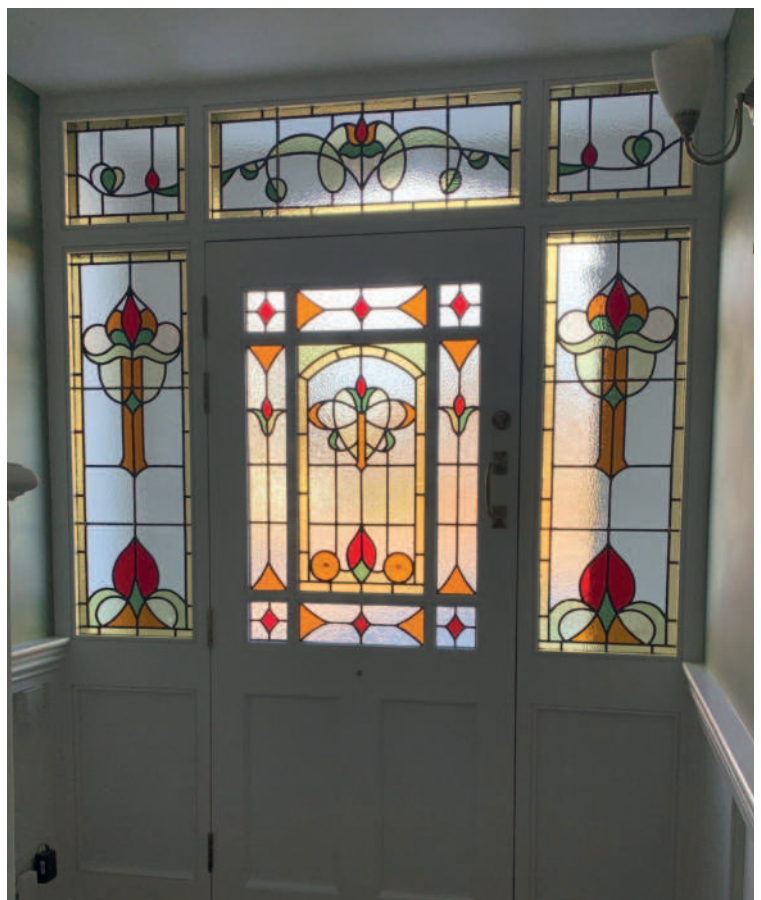
Raised panel oak entrance door finished with ironmongery from The Anvil



Adam Hamlen putting the finishing touches to a Georgian casement window



Victorian period-style entrance door with stained glass and antique brass ironmongery



Stained glass artwork completed by Nadia Lamas – such a talent

Each project could easily take eight or nine months to complete. Chris became involved in the work at an early age and as a result developed a love of woodwork and joinery.

Following this early apprenticeship into the trade, he went to work at Gatacre Hall. This mansion house in Shropshire is set in sprawling grounds and Chris worked on restoring and maintaining the old buildings, many of which date back to the 18th century. Despite loving the work he did there, his reputation as a skilled craftsman soon spread and the odd joinery jobs he carried out for people began mounting up, enough to open his own business.

Today, the business employs a team of 10 but the hunt for skilled craftsmen and women is often frustrating, particularly in the rural locations where the business is based. To combat the staff shortage, Chris and his team, which includes partner Jess, are looking at automated machinery to help with some of the simpler tasks. The company's progressive outlook, combining hands-on, traditional craftsmanship with cutting edge technology is something Chris is particularly keen to build on.

He says: 'We are looking to the future and part of our plan is to increase turnover. Installing modern machinery will help us to achieve that.' It's certainly something his customers approve of and even during the pandemic they were able to press on.

Despite facing a shortage in materials, particularly glass, the business battled through and waiting times for materials appear to have settled down. Work continues apace on new projects including, of course, those front doors.

Working in areas such as the Cotswolds often means the team must create products that stay well within the character of the area. Gaining a reputation as a company who can provide sympathetic solutions alongside modern designs is important.

CHRISTMAS HITS

If you recognise Chris and the team at all, it might be from their annual foray into song writing. Every Christmas, the team writes, records and shoots a video that goes onto their Facebook page. In 2020 the video received more than 8,000 views, while the 2021 edition received over 9,000. Perhaps they'll have another smash hit in 2022!

In the meantime, they will go back to what they do best. Creating bespoke and beautiful products for customers across the west of England.

woodenluxury.co.uk

Instagram: @woodenluxury_joinery



Period-style arched frame entrance door and Louis Frazer hardware



Simon Dunn making sure clients are warm during the colder months

BUTLER'S TRAY

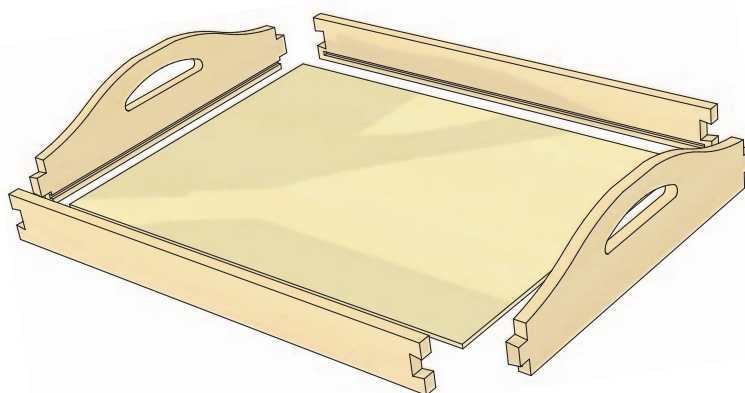


Anthony Bailey

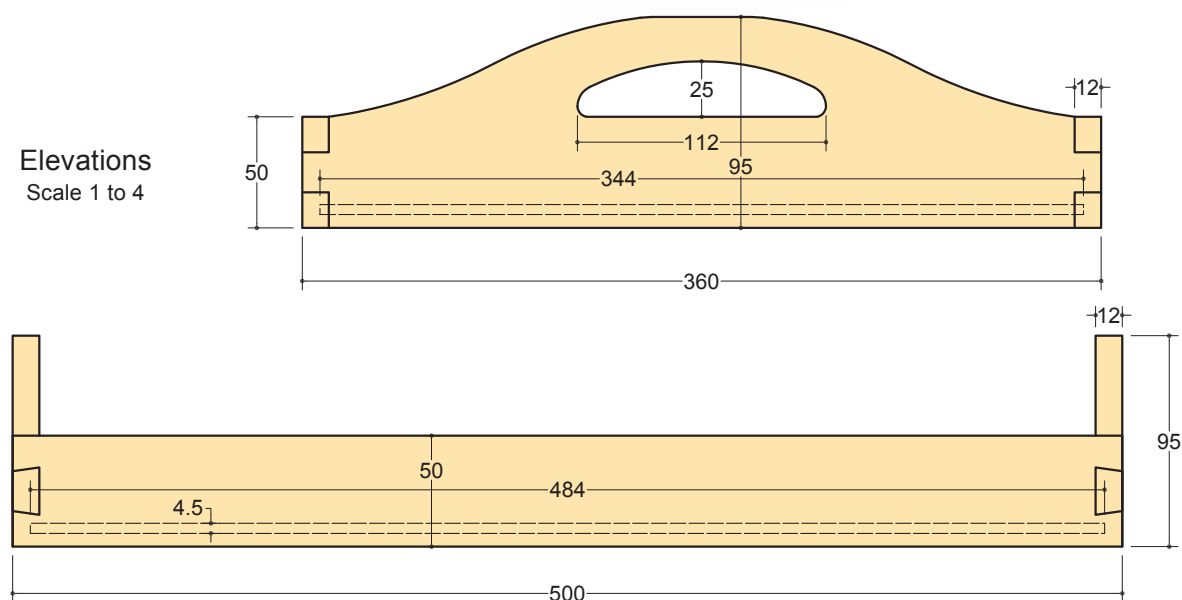
uses his router to make

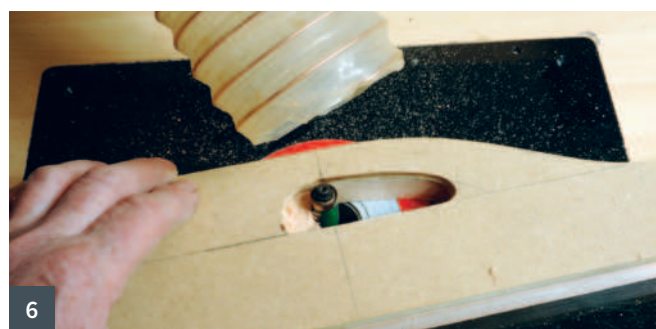
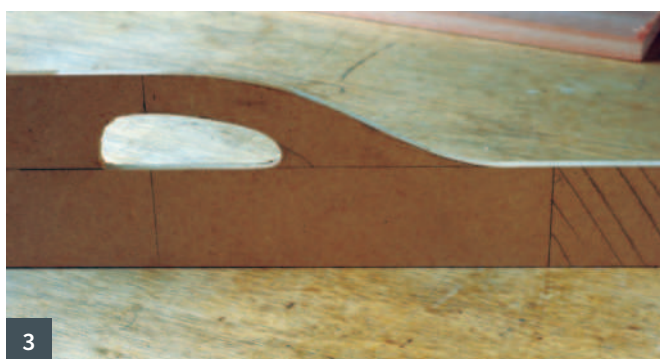
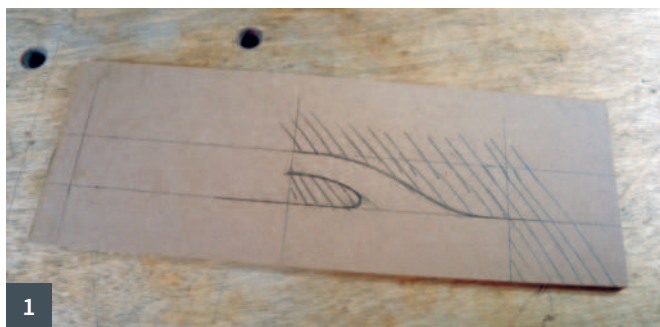
his version of a traditional dining device

This tray is a standard design but it uses quite a lot of routing techniques. I chose luan for the solid components as it is slightly pinky and will colour up easily with dye, and a thin Far Eastern ply for the base which can be coloured to match. It must be noted the luan is rather soft and not easy to cut crisp jointwork.



Elevations
Scale 1 to 4





Making the tray

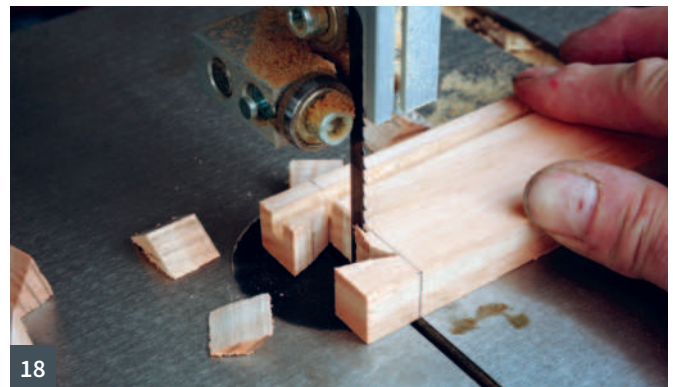
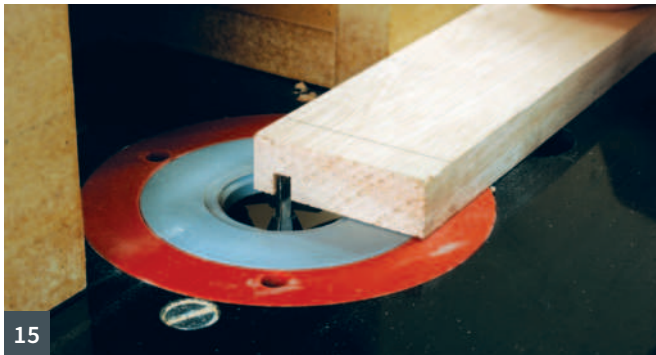
- 1** The tray ends need hand grips so the best way is to make a template that a bottom-bearing guided straight cutter can run off. Because it is easier to make one half of the shape rather than do both – which may not match – that is exactly what I did.
- 2** If you want to batch produce trays use the half template on the opposite page to make a new whole one by cutting it out and turning it over to complete the shape.
- 3** The finished template is ready to use even though the left-hand side is left rough as this is the cutter overrun area. It is shaped slightly to mimic the right-hand part of the opening.
- 4** The template is affixed to one workpiece blank using special fabric-based double-sided tape supplied by Trend Machinery. It is very adhesive but has a slight sponginess that ensures both surfaces stay fixed together. Bandsaw away most of the curved outside edge.
- 5** I used a drill press and a Forstner bit to remove the bulk of the hand grip waste. You can use a flat bit and cordless drill if that is available but do drill into a sacrificial board.
- 6** The next operation is to remove the remainder of the waste using a bottom-bearing guided straight cutter in the router table. This entails gradually 'grousing out' the waste rather than rushing the cutter straight to the template and taking out too much, straining the cutter and causing too much resistance.



- 7** While the template is attached in the same position repeat the trimming operation on the outside of the handgrip. In both cases always machine into the direction of cutter rotation and always machine 'downhill' of the grain. Turn the template over and repeat the last three steps to complete the shaping.
- 8** Using a half-round file smooth the surfaces so they meet sweetly. Keep the file level for a square edge.
- 9** The first templated handgrip end is now double-sided to the other blank and as before, bandsaw the outer curve away leaving enough to trim off on the router table. Safety note: it was during profiling that I found the bearing was burning the wood because it had seized – fortunately I had spares in my kit box. A quick swap over and all was well again, so I could continue the project.
- 10** Using exactly the same procedure as before, the handgrip waste is drilled out ready for profiling.



- 11** Again 'grouse out' the waste layer by layer, but do not be too ambitious trying to rout to the profile. Take time over this operation to get a neat, burn-free result.
- 12** Machine the outside of the curve running 'downhill' of the grain. This is important because if you work up to the top of the hand grip, the wood will tear out. Now lift off and flip over the completed workpiece, tape it down and machine the other half of the part-completed workpiece.



13 You should now have two identical profiled components.

Use a small radius roundover cutter and bearing to shape the top edges. Use a lead-in pin as you will be starting at the leading end of the workpiece.

14 Now repeat the rounding over inside the handgrip on both workpieces. This will make the tray comfortable to hold and admit larger hands.

15 The tray sides will be rounded later as the inside edges are stopped

cuts. Instead slot all components ready to take the tray base.

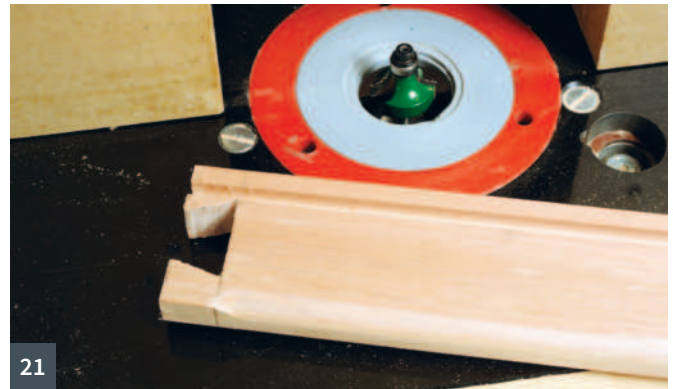
The ply for this was bought as a ready-cut quarter sheet with a thickness of 4.5mm. Luckily I happened to have a 4.8mm straight cutter which was close enough. Set the slot in by about 10mm, enough not to weaken the wood.

16 The sides and ends need to be jointed together and I decided for strength that a single dovetail on the ends would be enough to resist pulling apart. These are marked using a sliding bevel and all the joints should be marked A, B, C and D to avoid mix-up. Hatch the waste so you cut the right parts away.

17 The first light cut is made vertically to create a notch for the blade to sit in when making the angled cuts. Make clean cuts to the line and finish level at the bottom of each cut.

18 A bandsaw with a six skip-tooth blade can be used to cut the waste away working from each direction until you have a neat level cut along the bottom line.

19 Luan is a rather soft wood, not many stages removed from balsa wood, so a very sharp chisel is required when cleaning up the tray corner joints. A good but not over-tight joint is desirable to avoid any splitting.



20 The dovetailed ends also need a bit of cleaning up for a neat, gap-free fit. Note how the dovetail shape just misses the slot that holds the tray bottom.

21 The tray sides are now rounded over after refitting the cutter and using the table fence, not the bearing. Lines are drawn where the roundover needs to run out on the inside edge then a push-on pull-away cut made, but visually starting and stopping before the lines as the outer radius of the cutter will start further than you may imagine.

22 Sand the flat surfaces thoroughly to a finish on the inside faces, removing any pencil markings of course.

23 Sand all radii thoroughly and blend the curves into the flat sections. Now do a dry assembly to check the bottom size. Cut out the ply and check the fit.

24 Apply glue to the joint meeting edges, slide the ply into place and fit all the joints together in the correct order; A-A, B-B and so on.

25 Clamp the tray up tightly without creating distortion and measure from corner to corner to ensure squareness. Readjust the clamps to correct any inaccuracy and wipe off surplus glue.

26 The grooves were machined right through, so once the glue has set clear, remove any glue from the visible slots with a chisel and glue, push in matching fillets of wood and trim off flush. Finally, sand the outside faces with the grain; avoid cross grain scratches as a dark finish will show them up. I swamped the surfaces with a Georgian mahogany spirit dye and wiped off the excess and spray lacquered the tray once the dye had dried.

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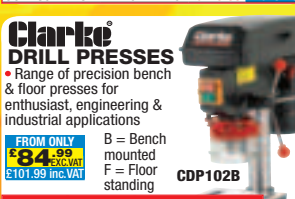
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- Tilting head
- Black & Decker

Model	Motor	Belt Size (mm)	exc.VAT	inc.VAT
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Model	Volts	Batteries	exc.VAT	inc.VAT
CON180LI	18V	2x 2.0Ah Li-Ion	£99.98	£119.98
CON180LI	18V	2x 4.0Ah Li-Ion	£129.00	£154.80



Model	Motor (W)	Speeds	exc.VAT	inc.VAT
CDP5EB	350 / 5		£84.99	£101.99
CDP102B	350 / 5		£99.98	£119.98
CDP152B	450 / 12		£189.98	£227.80
CDP202B	450 / 16		£239.00	£286.80
CDP352F	550 / 16		£298.00	£357.60
CDP452B	550 / 16		£299.00	£358.80
CDP502F	1100 / 12		£739.00	£886.80



Model	WxDxH(mm)	exc.VAT	inc.VAT
150kg	800x300x1500	£35.99	£43.19
350kg	900x400x1800	£54.99	£65.99

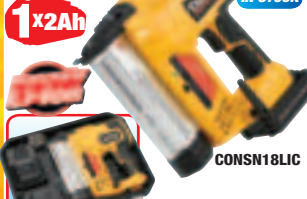
Clarke DUST EXTRACTOR/CHIP COLLECTORS



Model	Motor	Flow Rate	Bag Cap.	exc.VAT	inc.VAT
CWVE1	1100W	163 M3/h	50Ltrs	£119.00	£142.80
CDE35B	750W	450 M3/h	56Ltrs	£179.98	£215.98
CDE7B	750W	850 M3/h	114Ltrs	£189.98	£227.98

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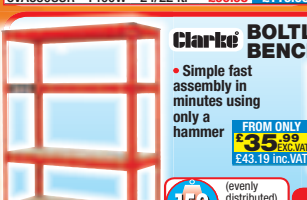
- Includes 300 nails and 400 staples
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Model	Motor	Dry/Wet Capacity	exc.VAT	inc.VAT
CVAC20P	1250W	17/13 ltr	£57.99	£69.99
CVAC20PR2	1400W	14/12 ltr	£71.99	£86.39
CVAC20SS*	1400W	17/13 ltr	£69.98	£83.98
CVAC25SS*	1400W	20/17 ltr	£77.99	£93.59
CVAC30SSR*	1400W	24/22 ltr	£99.98	£119.98



* SS = Stainless Steel

Clarke VENTILATORS



Model	Size	Air Flow	exc.VAT	inc.VAT
CON305 (110V)	12"	3900m ³ /hr	£169.98	£203.98
CON350 (110V)	12"	3900m ³ /hr	£199.98	£239.98
CAM400 (230V)	16"	7200m ³ /hr	£339.00	£406.80
CAM400 (110V)	16"	7200m ³ /hr	£319.00	£382.80
CAM500 (230V)	20"	9900m ³ /hr	£415.00	£498.00
CAM500 (110V)	20"	9900m ³ /hr	£379.00	£454.80

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Model	Motor	Max Cut 90/45 (mm)	exc.VAT	inc.VAT
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CON185B	1600W	63/43	£59.98	£71.98

Clarke SHEET SANDERS

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Model	Sheet Size	Motor	exc.VAT	inc.VAT
COS210	190x90mm	200W	£24.99	£29.99
CON320	230x115mm	320W	£35.99	£43.19



Model	Width of Cut	Motor	exc.VAT	inc.VAT
CEP450	60mm	450W	£36.99	£44.39
CEP720B	82mm	720W	£46.99	£55.99
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CIG81015	4.5 x 3 x 2.4m	£289.00	£348.80
CIG81216	4.9 x 3.7 x 2.5m	£329.00	£394.80
CIG81020	6.1 x 3 x 2.4m	£359.00	£430.80
CIG81220	6.1 x 3.7 x 2.5m	£399.00	£478.80
CIG81224	7.3 x 3.7 x 2.5m	£499.00	£598.80
CIG1432*	9.7x4.3x3.65m	£1159.00	£1390.80
CIG1640*	12x4.9x4.3m	£3250.00	£3900.00

Clarke BELT SANDERS

- Ideal for surface removal, sanding and finishing

Model	Motor	M/Min	exc.VAT	inc.VAT
Clarke BS1	900W	380	£39.98	£47.98
Clarke CBS2	1200W	480	£89.98	£107.98
Makita 9911	650W	75-270	£99.98	£119.98

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CRO53	£36.99	£44.39 inc.VAT



Model	Planing Width	Max Thick Capacity	exc.VAT	inc.VAT
CP1600	6" (152mm)	120mm	£229.00	£274.80
CP1800	8" (204mm)	120mm	£279.00	£334.80
CP1000	10" (254mm)	120mm	£379.00	£454.80

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CS48	£189.00	£226.80 inc.VAT



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Model	exc.VAT	inc.VAT
CS6-9D	£329.00	£394.80 inc.VAT



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This sustainable home design blends contemporary architecture with its rural environment and provides a perfect home for an older couple whose children have flown the nest

A HOUSE FOR THE BEST YEARS





‘Sustainable design integrates consideration of resource and energy efficiency, healthy buildings and materials, ecologically and socially sensitive land-use, and an aesthetic sensitivity that inspires, affirms and ennobles.’

This is the definition of sustainable design used by the International Union of Architects (UIA) and the American Institute of Architects (AIA).

The process of construction affects the environment and surrounding ecosystem. Once buildings are constructed, the occupants and administrators face a series of challenges in their attempt to maintain a healthy, efficient and productive environment.

In order to meet these challenges, innovative and varied building strategies have been developed that can be grouped based on the place they are mainly employed. Strategies related to the building location attempt to minimise environmental impact, integrate the building into the landscape, and increase the alternative transportation options. Strategies centred on energy aim to conserve energy and use renewable energies that guarantee the efficient use of natural resources and reduced public utility costs. Strategies that ensure a state of wellbeing inside the home make use of natural light and ventilation to reduce energy consumption and improve lighting and interior environment. Water-management strategies employ a system of maximum efficiency, reduce public utility costs, and manage rainwater and grey waters. Material strategies involve reducing, recycling and composting materials, and using green construction products where possible. Finally, technology should be used as an ally in sustainable and efficient construction. For instance, automated home thermostats can greatly contribute to developing future sustainable strategies in building design, construction and maintenance.





These strategies and their regulations in standards and certifications contribute to the achievement of environmentally friendly homes that are alive and 'breathe'. One such example is this house in Velesovo, Slovenia, designed by architect Matej Gašperic.

The next stage in family life

This property was designed as the perfect home for an older couple with their own list of expectations and personal preferences. With their children now grown up, the parents are returning to life as a couple, and while the children will still return to the house, they will do so only for visits. The house also needed to be sustainable in the widest sense of the word, with low energy consumption.

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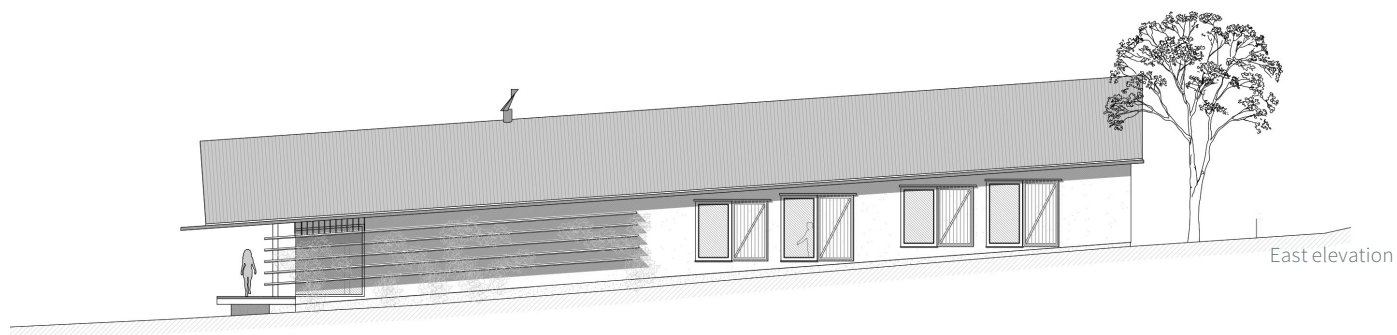


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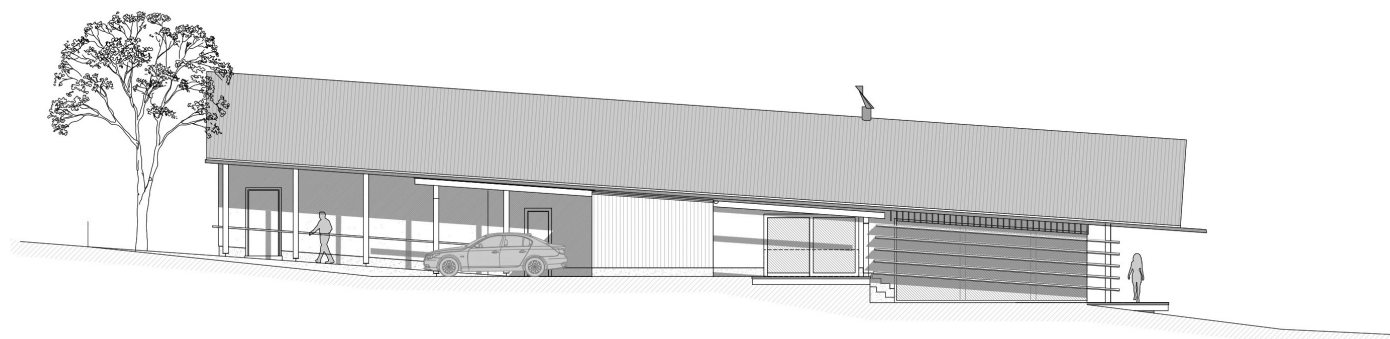
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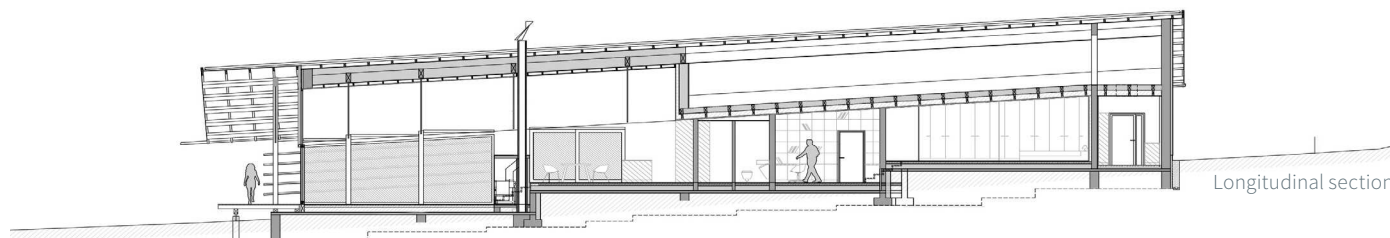
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East elevation



West elevation



Longitudinal section

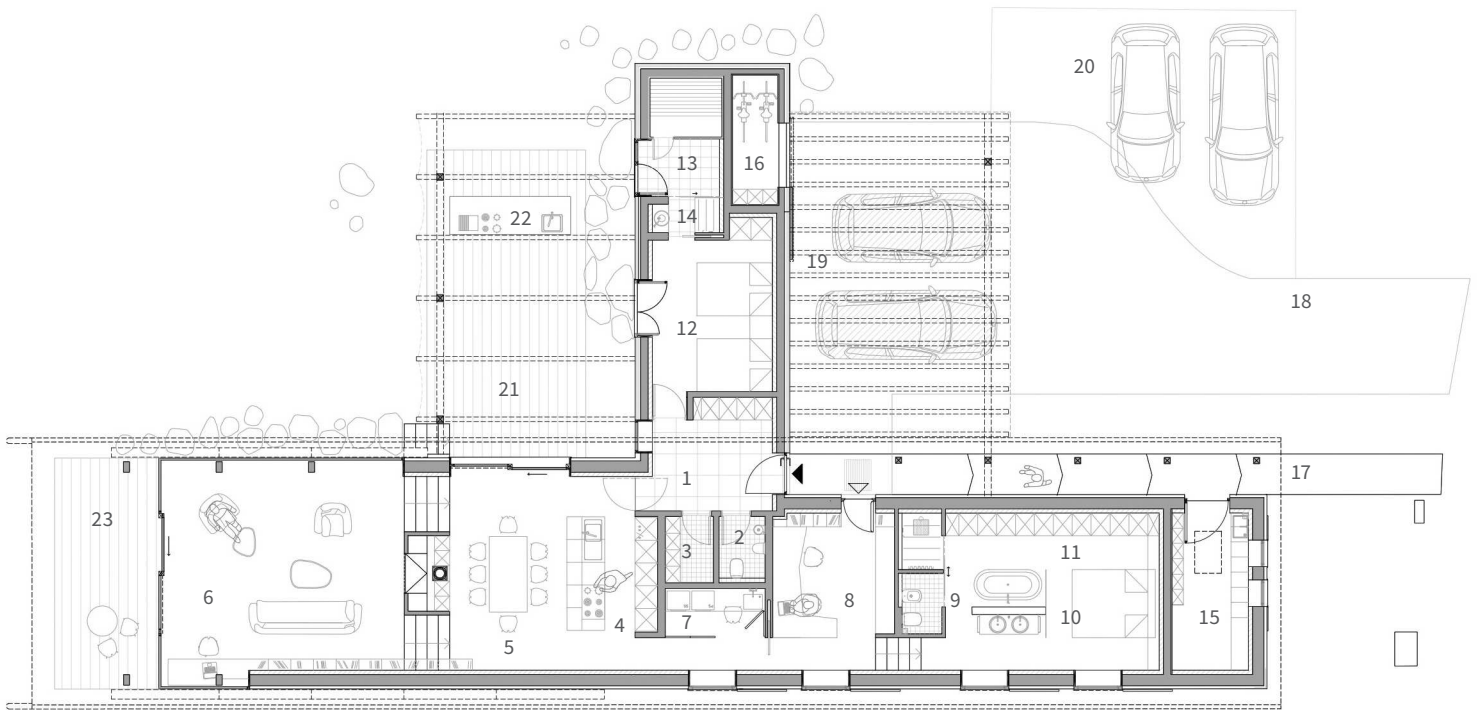


The powerful combination of romantic pastures and contemporary architectural approaches is in tune with the rural environment and fits with the owners' passion for living life in the present. The wrought-iron peacock on the roof that dutifully marks the direction of the wind, together with other details, reinterprets knowledge and forgotten forms that are carefully adopted into modern materials, construction methods and, of course, the new way of life.

The long, thin house, humbly follows the natural slope without being higher at any point. It maintains its proportionality as a fixed-height shape, giving it a unique look. Furthermore, the local architectural heritage, rich in both quality and quantity, was respected on all levels throughout the entire design process.

As the last building of the village, the house acts as a type of transition between the urbanised area and the surrounding meadows and countryside.

The porch entryway offers an unobstructed view. The open layout traps and conserves incoming sunlight from the south and directs it inside through the structure of adjacent spaces.



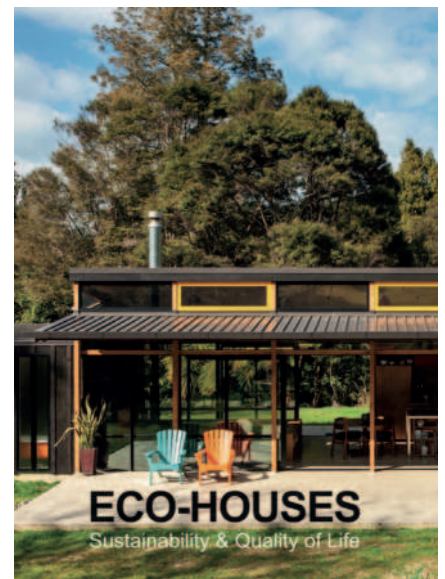
West elevation

1. Entrance
2. Toilet
3. Storage room
4. Kitchen
5. Dining room
6. Living room
7. Utility room
8. Studio
9. Bathroom
10. Master bedroom
11. Wardrobe
12. Guest room
13. Sauna
14. Shower
15. Heating and ventilation
16. Bike storage
17. Walkway
18. Driveway
19. Parking
20. Guest parking
21. Summer terrace
22. Outdoor kitchen
23. Morning terrace





PHOTOGRAPHS BY VIRGINIA VRECL, COURTESY OF MONSA PUBLICATIONS



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TURNED TOYS

Colwin Way makes three fun projects, accompanied by his son



For many of us woodworking is an escape from the day job, a time to relax and unwind and unleash those creative juices. I'm one of the lucky few who can also call my hobby a career. I love woodturning so much that I carry on when I get home, either making for shop orders, commissions or indeed for articles such as this one.

This does mean that sometimes I'm guilty of getting the balance wrong and neglecting those important to me! However, again I'm very lucky that I have a supportive wife behind the camera and that both my sons share a creative interest and started turning at the early age of six. As this article is all about turning wooden toys I thought it might be wise to bring in one of them, a true professional in the toy game, my 12-year-old son Charlie, which meant in turn we all got to spend a day in the workshop together.

The following pretty much tells the story, but if you have as much fun in the workshop as I've had creating these toys with the spinning top master Charlie, then you're in for a real treat. The only problem now is I've opened up a can of worms as I find Charlie booking the workshop and myself for certain nights, in preparation of the next batch of spinning tops, and he is already talking Christmas presents for his school friends!

We're going to look at three simple toy classics; spinning tops,

skipping ropes and yo-yos and they have all been made from lime, which I find an ideal timber for colouring and texturing as it has a tight grain with few knots or features.

Children and workshop safety

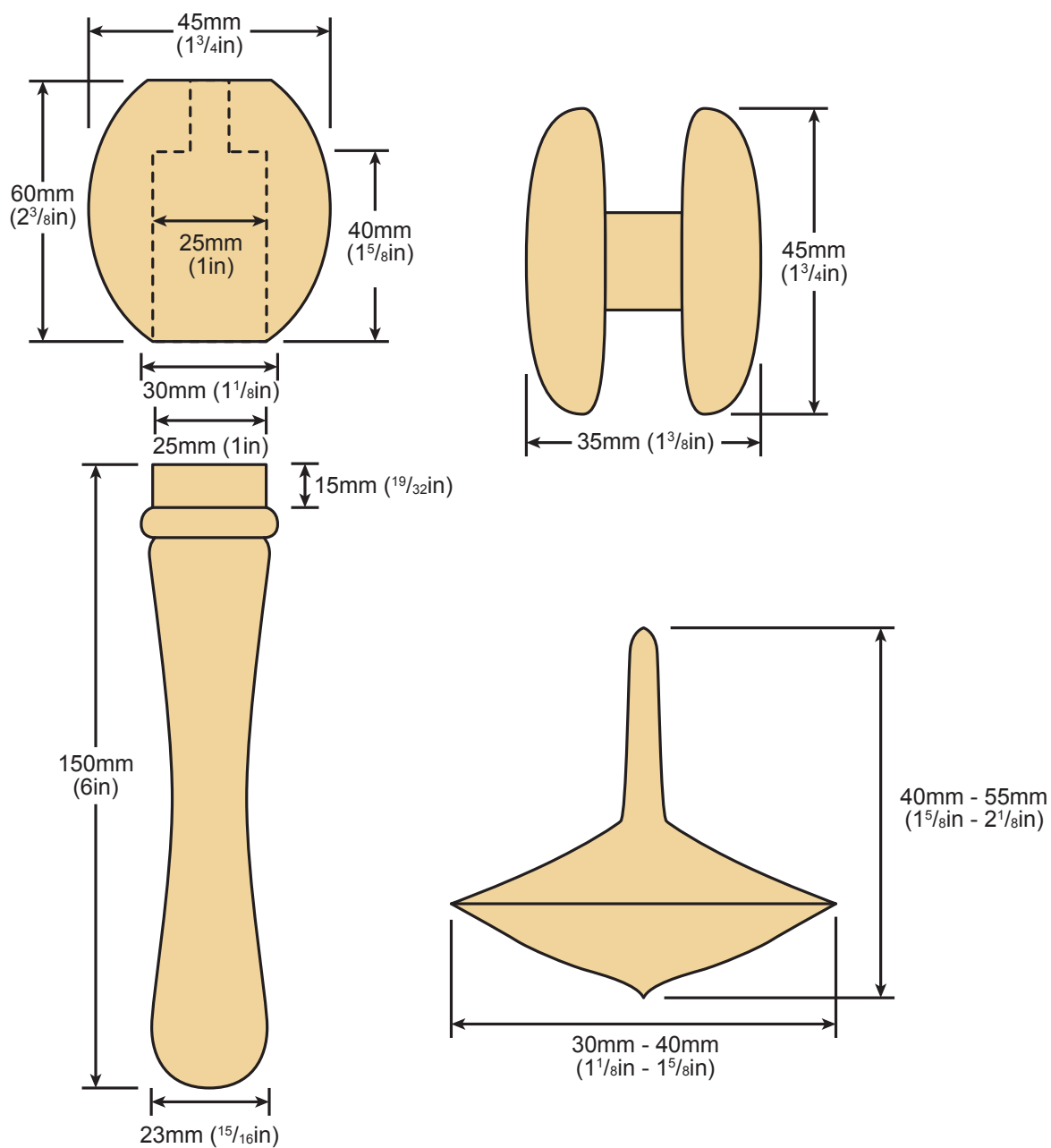
Before we start turning I want to talk about workshop safety and children. A few things need to be considered when teaching youngsters on the lathe and I strongly believe that we need to set the example.

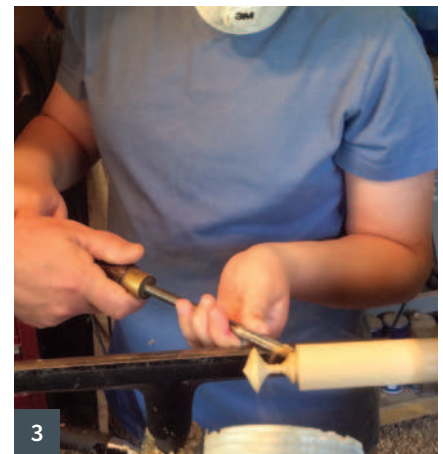
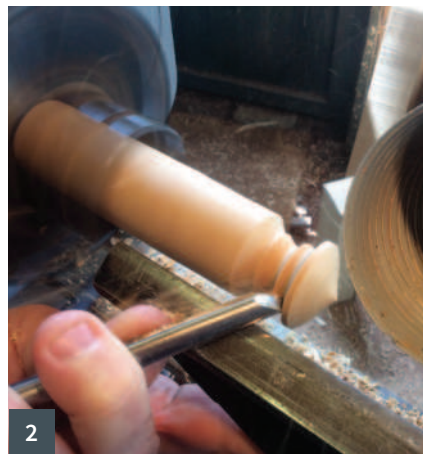
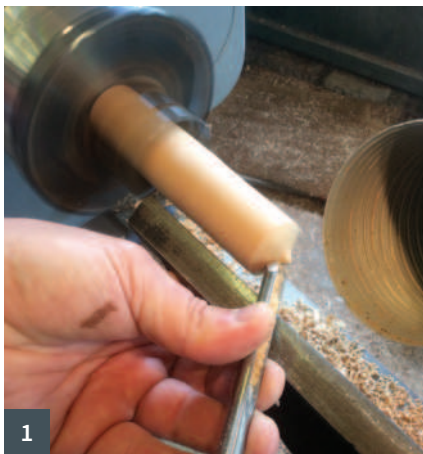
The obvious safety consideration is eye protection and a dust mask, but I run through the lathe controls every time we start turning and remind my sons where the chuck is and that we are going to take our time. The height of the lathe is a consideration and it may be that your child will have to stand on a platform to reach centre height.

Above all though, ensure you are always with them, to watch and give words of encouragement and guidance, and never leave them on their own to turn. A child's attention span may be a lot shorter than yours, so a short burst of fun will be better, rather than keeping them turning after they've become bored. Check the child has nothing on them that could catch on the work including clothing and long hair, which should be tied back. Remember: children are unaware of the dangers and completely fearless, so you have to be their eyes and ears.

YOU WILL NEED

- 10mm spindle gouge
- 3mm parting tool
- 25mm skew chisel
- 19mm roughing gouge
- Coloured felt-tip pens
- Airbrush and paints (optional)
- 10mm drill bit
- 25mm drill bit – sawtooth or Forstner
- String for yo-yo
- 10mm coloured rope





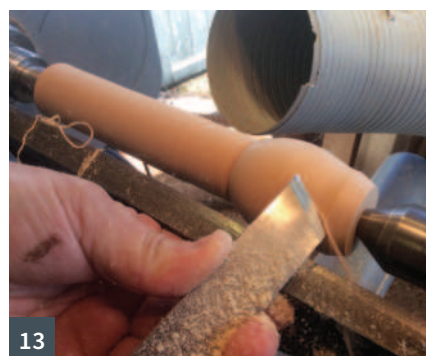
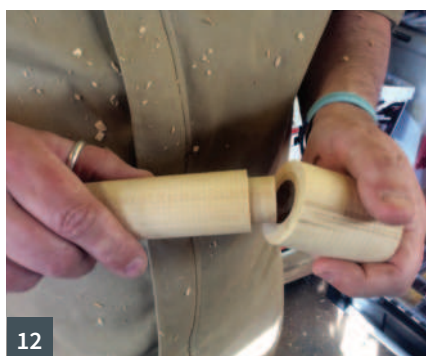
Spinning top

The blank sizes range from 30–40mm diameter x 150–200mm long, which means we can get several tops out of each blank.

- 1 When all the blanks have been turned down to round we can start turning tops. Hold the blank in a four-jaw chuck and a set of dovetail jaws. It's important not to make your blank too long or they will vibrate badly when starting to shape. Start shaping the bottom of the spinning top, making sure they are turned to a sharp point to keep the bearing surface as small as possible and keeping the centre of gravity low to give a stable spin.
- 2 Now start shaping the tops, again remembering to keep the centre of balance low. Use a 6mm bowl gouge, but a 10mm spindle gouge is as good, if not better for this procedure. Remember to point the

flute of the gouge in the direction of travel and take small cuts while the blank is at its longest.

- 3 Make the last few cuts to the top of the spinner.
- 4 Smooth down the spinner and lightly sand, ready for decoration.
- 5 And now the fun begins and we can decorate the small top toy. With our projects, I let Charlie create the bright colour scheme and patterns himself, using felt-tip pens from his own pencil case. Be sure to slow down the lathe speed when decorating the tops to 350rpm, to give strong bold lines and to protect the felt-tips.
- 6 Continue to colour around the top until you are happy with the toy's design.
- 7 Finally, part off to toy with a 10mm skew chisel, and now it's onto the next one!

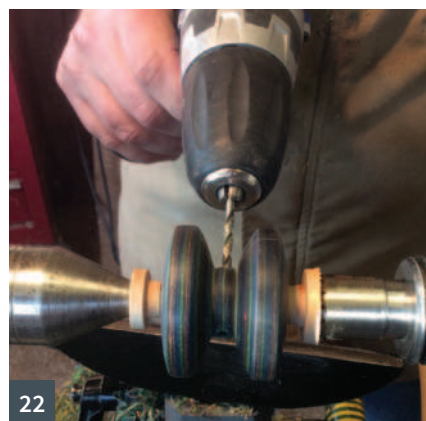


Skipping rope

- 8** Again, the timber choice here is lime. Prepare four blanks, two for the handles and two for the tops. Start by drilling out the tops with two holes. First the main 25mm hole to a depth of 40mm, which will house the knot of the rope and the tenon from the handle, and a second all the way through with a 10mm hole for the rope to pass through.
- 9** Prepare the handles by roughing them down and cut two tenons to fit the large 25mm diameter holes you've just drilled on the tops at a depth of 15mm. Set the callipers by measuring the drill bit used to drill the 25mm hole, and then cut with the parting tool.
- 10** Back to the skipping rope tops. To hold these tops use a friction light pull drive passing into the 10mm hole and the tailstock centre into the 25mm hole the other end. Any friction drive will do and will mean you can cut right down to the centre without worry of hitting any prongs.
- 11** Now mount the tops securely to rough down the blank to a cylinder and true up both ends. This is a good opportunity to make the tops the same diameter.
- 12** Fit the top and the handle together in preparation for turning. Make sure the fit is a firm one, but also remember that you want to get the piece apart once turned so you can fit the rope.
- 13** Now you can start turning the skipping rope handles. Mount them

to the lathe using a pro drive sprung centre to drive and a single pointed revolving tailstock centre the other end. Alternatively, you could use a four prong drive and tailstock centre. Here I'm using the skew to shape the egg shape top.

- 14** Use the skew to shape the main handle, making sure it fits comfortably in the hand. Remember that the hand holding this handle will be much smaller than yours, so make the handle small enough for this. When using the skew, cut with the bottom half of the tool, always have the bevel rubbing and present the cutting edge at roughly 45°.
- 15** And now it's back to the fun bit: adding colour. We started with an airbrush, spraying all over with a day-glo yellow then green and orange stripes. The airbrush is a great tool for this project and again is always popular with kids, but a little bit of practice would be wise to understand how sensitive they can be. Try doodling on some paper first and play around with colours.
- 16** Here are the finished skipping rope handles. You can see the way the rope threads through the top and how the knots at the ends of the rope are hidden within it. We sourced the rope from a local hardware store and it was the inspiration for the colour scheme that Charlie chose for the handles.



Yo-yo

For the yo-yo I wanted to use a material that wouldn't need any decoration afterwards, so I chose a few pieces of diamond wood. Diamond wood is a resin-bonded coloured maple. However, plain timber can also be extremely colourful and dense so the choice is yours.

- 17** Because the coloured wood was only 20mm thick I've joined two pieces together with epoxy resin and added two pieces of scrap wood for the lathe centres to drive with, these pieces will be turned off at the end of the shaping.
- 18** Next, turn down the block to a cylinder, ready for shaping.
- 19** Now turned down to a cylinder, turn away the scrap wood before the basic shaping.
- 20** Use a 3mm parting tool to cut the slot for the string to sit,

leaving 15mm diameter of solid timber in the middle.

- 21** Use a parting tool to do most of the shaping before sanding to a high shine.
- 22** To stop the string from slipping when at the bottom of the swing, drill a hole through the centre spindle to thread the string through.
- 23** When you've finished sanding and have drilled your centre hole, you can polish. Use friction polish to get down into the centre spindle, but then buff with a buffing wheel and Carnauba wax after the yo-yos have been finished. Sand off the waste blocks using a plywood sanding disc on a faceplate.
- 24** To clean up either end after the sanding disc use a jam chuck and gently remove any marks before sanding and polishing, which you need to repeat on both sides. Now the yo-yo is finished, all that's left to do is to wind the string up and start playing!

Flying high

Alan Goodsell takes a workshop break and reflects on the benefits of good organisation

Anyone who knows me is aware that I am quite organised, to say the least. When I am making something in the workshop, I like to have all my components laid out in neat piles, so I know what has been processed and to what stage. I have all the tools I need for the project ready to go, all brushed clean and cutting edges sharp, and my work area free of all debris that might get in my way. This all helps me to be proficient and do my woodworking efficiently and enjoyably, and I think my results and peace of mind tell me that my work ethic is performing well.

Not only do I like to be well organised myself, but I also like others to be well organised. This was exemplified recently when I attended the AAW Woodturning Symposium in Chattanooga, Tennessee. As usual, I was stunned by the amazingly high quality of the turners' work that was on display in the various galleries. The entries were from all age groups and skill levels, and it was lovely to see these artists' commitment to their chosen form of woodworking. I explored the well-organised show and had a great time catching up with people, relaxing



PHOTOGRAPH BY ALAN GOODSSELL

and attending the entertaining and informative demonstrations.

However, the same can't be said of my travel arrangements, both to and from the show! Flights unexplainably delayed, and for some unfortunate people their flights were cancelled with lame excuses given. The airports were filled with angry people who weren't getting what they paid for and conditions on the planes were disgusting. It was such a contrast attending a show that was perfectly organised and a joy to be at, rather than having to endure the repulsive mess that is called travelling by air these days. I can, and probably will, stop flying but nothing will ever stop me woodworking!

Happy woodworking!

WORDSEARCH

Chisel	Lumberjack	Thickneser
Crosscut	Mallet	Vice
Gouge	Mortise	Wenge
Grain	Plane	Whetstone
Jointer	Tenon	Woodworking

E	E	E	E	O	K	C	T	G	O	U	G	E	O
N	E	C	I	V	C	M	H	E	T	E	N	L	H
O	I	L	I	E	A	R	I	H	U	N	I	N	S
T	S	O	S	S	J	W	C	N	C	O	K	S	T
S	G	S	G	I	R	T	K	I	S	N	R	O	L
T	L	S	C	T	E	V	N	A	S	E	O	T	O
E	N	K	A	R	B	W	E	R	O	T	W	K	E
H	I	C	E	O	M	N	S	G	R	C	D	S	G
W	P	W	H	M	U	I	S	S	C	L	O	R	N
E	L	W	I	I	L	O	E	S	A	O	O	M	E
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L	N	T	I	E	E	E	E	M	A	L	L	E	T
H	E	R	N	U	R	H	L	O	E	O	N	A	E
E	J	O	I	N	T	E	R	K	T	D	E	H	O

SUDOKU

Sudoku is a great activity to sharpen the mind.
The object of Sudoku is to fill in the empty spaces of a 9x9 grid with numbers 1-9 in such a manner that every row, every column and every 3x3 box contains all numbers 1 through 9.

		2	9	7		4		6
5	7	9				8		2
			8		5			
	6		5					7
7			3	1	6			8
9					7		6	
			2		1			
4		8				2	7	5
2		6		4	8	1		

Product news

Find out about the latest kit and tools for your workshop

Makita heat gun

Makita UK has introduced the DHG181ZJ Heat Gun to its LXT 18V range. Designed with air volume and temperature adjustment functionality to reach up to 200L/min and 550°C, the new heat gun is ideal for a wide range of applications. The air volume and temperature are both adjustable, so users can easily set the output to suit the job; simply flick a switch to change between the two air volume settings and adjust the air temperature with the dial.

To protect the operator, the DHG181ZJ features an anti-restart function that prevents accidental start-up. There is also a quick release, tool-less mechanism to allow for easy nozzle replacement without the need to touch any hot metal in the process. Supplied in a Makpac Connector Case, Glass Protection, Wide Slot, Reflector, and Reduction Nozzles are all included as standard.



www.makitauk.com

Clarke tool chests and cabinets

Machine Mart's range of Clarke Tool Chests and Cabinets offer a stylish and ergonomic storage option for your workshop, allowing you to safeguard and organise all of your valuable tools.

On the Clarke CBB209C 28in 9 Drawer Tool Chest, each drawer features multi-ball-bearing runners for a smooth sliding action and a special push-lock feature means the drawers will not open accidentally if the unit is tilted. The full width aluminium pull handles allow for easy, comfortable use. For additional security and safety, all drawers also lock simultaneously when the top lid is closed and locked. This allows the user to safely transport the tool chest, and transportation is made easier by the two carry handles on the side of the unit.

The Clarke CBB217C 7 Drawer Tool Cabinet comes with 5in industrial grade chrome spoked wheels for greater mobility around the workshop, with the chromed side handle allowing for controlled movement. As above, each drawer features multi-ball-bearing runners for super smooth sliding action and they also include full width aluminium pull handles and anti-slip liners. There is single key lock security for all drawers together, as well as independent push in soft lock for drawer stability. A soft cushioned matting on top of the cabinet provides a non-slip work surface and ensures less damage when working.



www.machinemart.co.uk

Festool plunge cut saw

The new TS 60 K plunge-cut saw from Festool cuts through wood like a hot knife through butter and is safer and more versatile than ever before. With its unique KickbackStop technology, the new saw minimises the risk of injury, protects the workpiece and makes work safer. Moreover, the greater cutting depth of 60mm (e.g. for fire protection doors or solid wood) enables an unrivalled range of applications. Floor layers will also be pleased because the new TS 60 K can be connected to cross-cutting guide rails.

The latest generation of brushless EC-TEC motor makes the new plunge-cut saw robust, powerful and compact. It is even possible to saw mitre cuts of 45° in solid panels of up to 40mm – and the guide rail can also be used. The saw will be available at specialist retailers from October 2022, see Festool's website for more details.

www.festool.co.uk





REFORESTING EUROPE

We learn about the latest projects supported by the European Forest Institute and His Royal Highness The Prince of Wales

Leading scientists, experts and practitioners met in Sibiu, Romania on 30 May to launch Europe's largest cross border forest restoration project. The ThinkForest science-policy event celebrated a growing movement to restore forest biodiversity and advance the circular bioeconomy, for the benefit of people and the planet.

The event was opened by His Royal Highness The Prince of Wales, who the same day launched a landscape restoration project in the Carpathian mountains, funded by his Circular Bioeconomy Alliance and developed in collaboration with the Horizon 2020 project SUPERB.

The Romanian Minister of Environment, Waters and Forests Barna Tănczos joined HRH for the opening of the event. His Royal Highness emphasised in his opening speech that we have to rethink our economy if we want to rewrite our future. We need a circular bioeconomy, investing in three mutually reinforcing areas: biodiversity, innovation and local and indigenous communities. The rest of the world can learn from the way Romania has relied on regenerative approaches to create rich landscapes in areas such as Transylvania, where man lives in harmony with nature.

The ThinkForest event also marked the launch of the €20m Horizon 2020 project, SUPERB, coordinated by the European Forest Institute. The project involves more than 100 forest science and practice organisations in 20 different countries and includes

12 large-scale forest restoration demonstration sites across Europe. One of the sites is located in the Romanian Carpathian mountains.

Marc Palahí, European Forest Institute Director and chair of the Circular Bioeconomy Alliance said: 'Scientific collaboration is crucial to scale up successfully forest restoration in Europe in a context of rapid environmental changes and increasing demands on our forests. I am proud of EFI's leadership in bringing together some of the leading scientists and practitioners in Europe to demonstrate why and how we can restore forest landscapes for different purposes and benefits.'

A new EFI science-policy study on Forest Biodiversity in Europe was also presented at the event. Written by a group of distinguished scientists from 10 European countries, the study provides policymakers as well as forest and landscape managers with a better understanding of the complex subject of biodiversity in the context of European forests.

THINKFOREST

ThinkForest is a European high-level discussion and information-sharing forum on the future of forests. ThinkForest is facilitated by the European Forest Institute, an independent, science-based international organisation.

www.efi.int



HRH The Prince of Wales gave the opening speech at the ThinkForest event



A panel of experts spoke about the importance of biodiversity in Europe's forests

SUPERB

SUPERB (systemic solutions for upscaling of urgent ecosystem restoration for forest-related biodiversity and ecosystem services) is a four-year, 20 million euro, EU-funded Horizon 2020 project, with 36 project partners and over 90 associate project partners.

forest-restoration.eu

THE CIRCULAR BIOECONOMY ALLIANCE

The Circular Bioeconomy Alliance was established by the Prince of Wales in 2020. It provides knowledge-informed support as well as a learning and networking platform to connect the dots between investors, companies, governmental and non-governmental organisations and local communities to advance the circular bioeconomy while restoring biodiversity globally.

circularbioeconomyalliance.org

PHOTOGRAPH COURTESY OF FUNDATIA CONSERVATION CARPATHIA



The project aims to restore biodiversity in Romanian forests



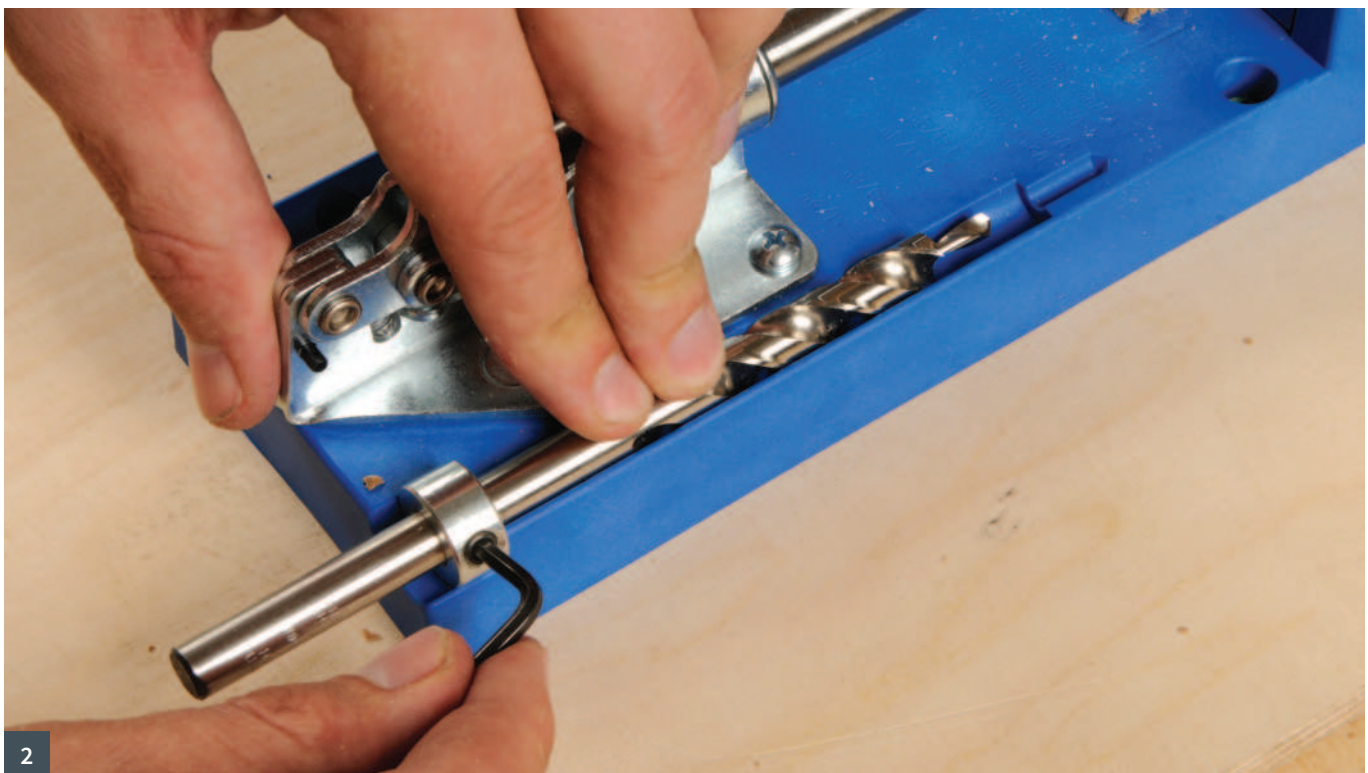
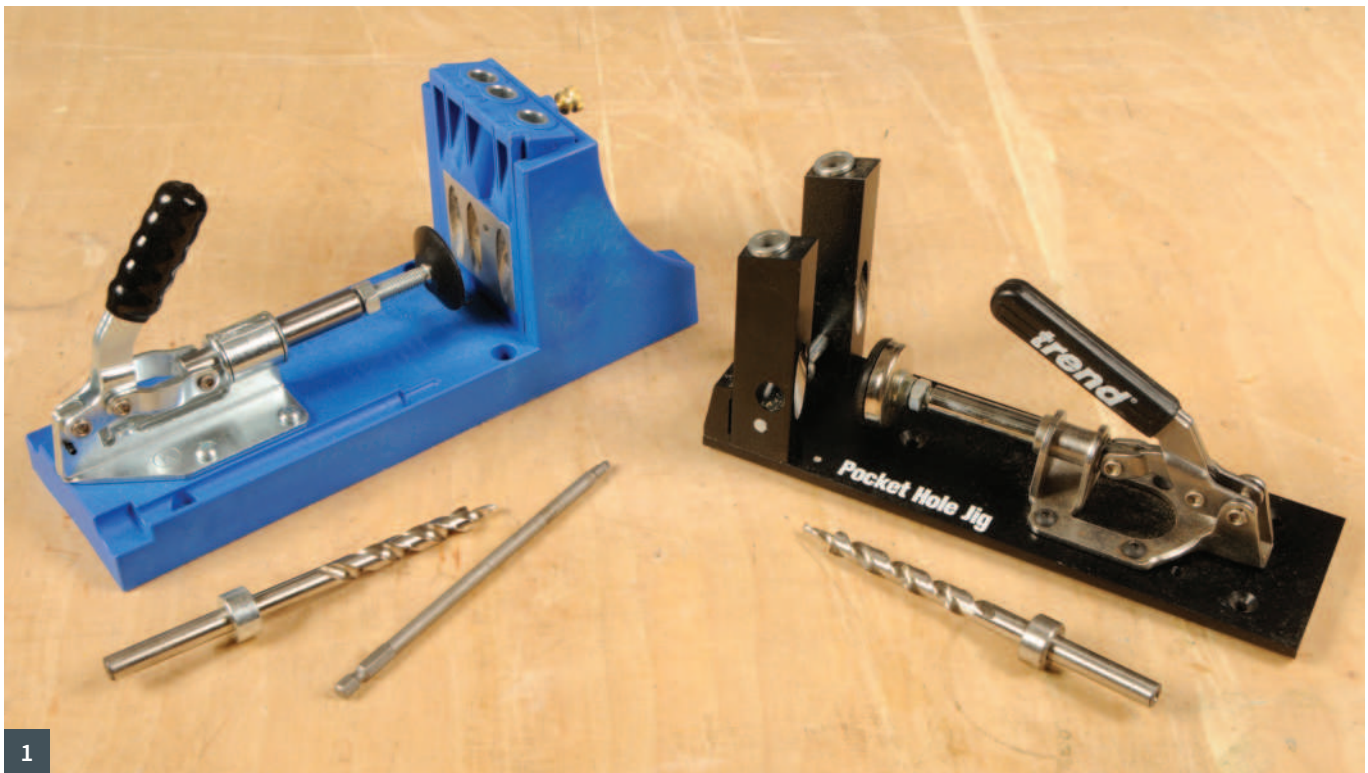
PHOTOGRAPHS COURTESY OF FUNDATIA CONSERVATION CARPATHIA

POCKET HOLE JIG

Anthony Bailey explains the benefits
of using this jig for jointing

When there are so many jointing methods available to us, the pocket hole jointing system may seem superfluous – that is until you try it. It's fast, easy and reliable: the perfect way to assemble frame components with the minimum of fuss and effort. There are a number of jigs on the market but the best known is the Kreg model shown here.





Using the jig

1 The Kreg and the Trend jigs are very similar in principle, with the Kreg having three pre-set drilling spacing positions while the Trend can be infinitely adjusted within its range. Axminster also do a budget model of their own.

2 Use the handy built-in drill rest to set the depth collar position ready for making the pocket holes. On the Kreg there are two rests with different imperial scale ranges. Otherwise follow manufacturers' instructions and use a steel rule for accurate adjustment. This is important so that you avoid the drill going through the material too far. You need enough wood for the screw head to tighten against to keep the joint strong.



- 3** Use a piece of scrap to form a fence against which the pocketed component sits so when you tighten the screws, the pieces remain flush on the outside. You can use conventional screws but they should have a flat underside to the head so they don't pull into the wood too far. The Kreg has its own screws which use a long square-tipped driver. It isn't necessary to make pilot holes in the wood as the screws have drill tips.
- 4** When you check the joint it will be perfectly flush and correctly aligned. Very fast and predictable results are obtained. Kreg also supply bevelled dowels or flush covers to tidy up the pocket holes.



DARTBOARD CABINET

Got a dartboard in the shed? Why not make a cabinet to house it in style

This great little project is just what you need for the dartboard in your ultimate shed, or if you have a dartboard anywhere else for that matter! This version uses painted MDF, but mahogany or a similar timber, such as utile, would work well too, and survive a slightly damp environment.

The basic frame is made from 15mm MDF mitred at the corners. To make assembling and clamping this basic frame easy, you could use biscuit joints perpendicular to the face of the mitres.

Making the cabinet

Before gluing up, you should cut your backing piece of 9mm MDF and your corkboard, ensuring both pieces are exactly square, as this will help with clamping the carcass square. You should cut, glue and nail the quadrant on the inside faces of the basic frame before assembly, too.

With all these pieces in place, glue and clamp the basic frame – biscuits and all – together.

As this is drying, you can then cut and frame the top and plinth. These are both made of 22mm MDF, with an ogee moulding routed along the edges.

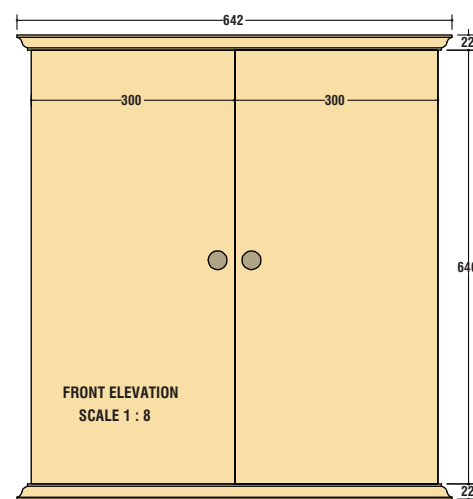
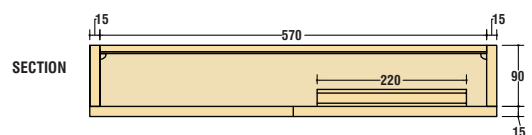
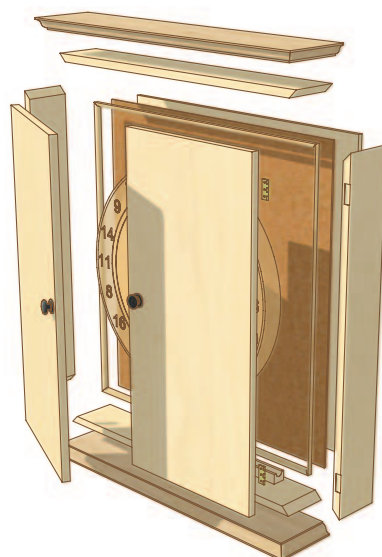
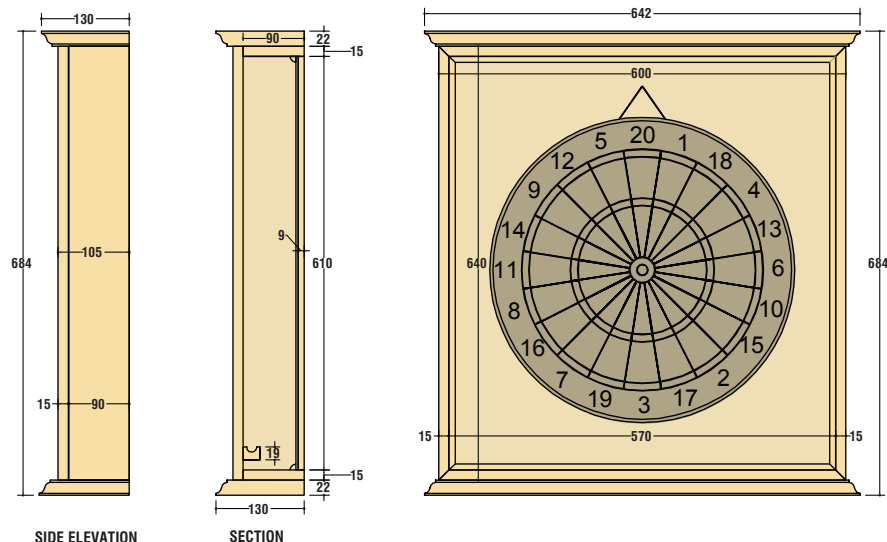
Cut your doors to size from 15mm MDF. Next, glue and screw the top and plinth to the basic carcass when you are sure the glue has gone off. You will then want to check your doors against the cabinet for fit, and mark up and cut your butt hinges.

You could cut your hinges with a chisel but on MDF it's better to use a router with a hinge cutter and hinge jig set-up.

With everything glued and dried, you can then seal your MDF and paint it.

Don't forget to use blackboard paint on the inside of the doors. Then you can screw the chalk holder in place.

Finally, fit your board and you're ready to play a game of darts!



YOU WILL NEED

- 9, 15, 18 & 22mm MDF
- Corkboard
- 9mm quadrant
- 4 x 50mm butt hinges
- Turned knobs
- Biscuit joiner/router
- MDF sealer, gloss, blackboard paint

SPLAYED-LEG BENCH

Peter Brett's project combines a simple Eastern European bench with his own modern design interpretation to create a stylish piece of furniture

YOU WILL NEED

TOOLS:

- Guide-rail saw
- Sliding bevel
- Try square
- Pullsaw
- Fine tenon saw
- Mitre saw
- Straightedge
- Random orbital sander
- Miller dowels and drill
- Glue
- Trigger clamps
- Abrasives
- Danish oil

TIMBER:

- Ash or oak

CUTTING LIST:

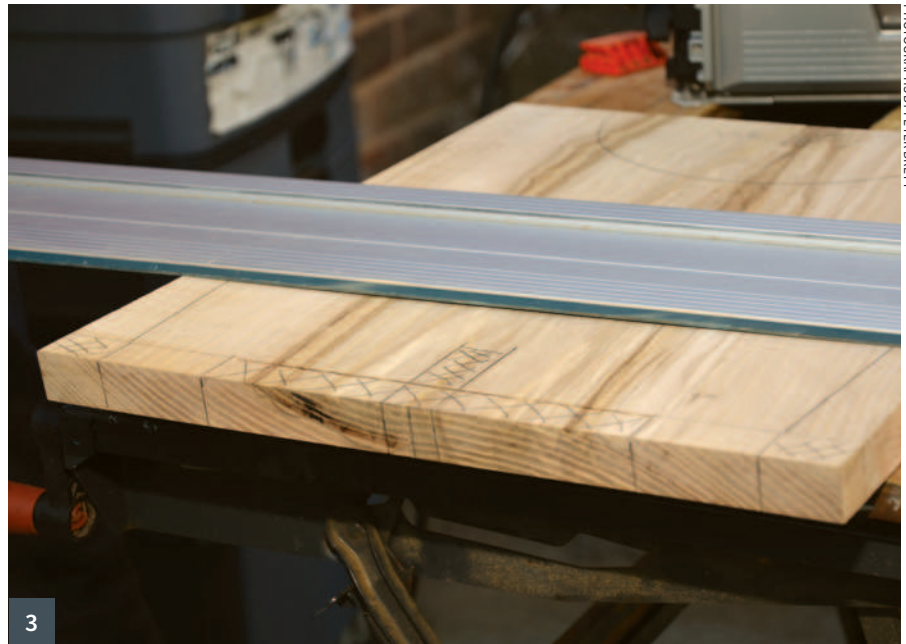
- Seat: 1 x 1,295 x 290 x 22mm
- Legs: 2 x Ex 450 x 345 x 22mm
- Stretcher rail: 1 x 1,084 x 72 x 22mm



I was doing my occasional wander around the local antique shops, when I spotted a long pine bench in a window. It was in a bad shape, ridiculously priced – of course – and further enquiry revealed that it was Eastern European in origin and was meant to be placed along a wall in a long entrance hall, where visitors could sit and remove boots and outdoor clothing. I liked the idea of splayed legs, but wasn't too keen on the supports – I wanted to 'sleek up' the idea for a more modern idiom. Sharp angles, visual joints and simplicity were becoming part of my mental design process. The bench consists of only four pieces – the seat, two legs and a central support underneath, which supports the seat and keeps the legs from splaying further apart than desired. Since many of my pieces have to fit in with the timber I have available, the resulting benches are in many ways determined by the sizes of the timber I have. The first one had a seat of 330 x 1,600mm. The legs were roughly 450mm long, but with the splay angle, the seat was more like 430mm high – about standard seat height.

Timber preparation

- 1 The first version I made of this bench was in ash. This bench found a home rather quickly, so I made another in French oak. Once jointed, the seat needs to be squared off at the ends and made a consistent width. Used with care and with the proper support of trestles, a guide-rail saw is the perfect tool for these jobs. The blade is so good that it leaves an almost planed finish. The seat needs to be perfectly flat and it is fine to sand it to a preliminary finish with 120-grit abrasive at this stage, as long as the edges do not get rounded. All the edges need to be crisp for accurate measurement and fitting. Once this is done, two centrelines are marked on the width and the full length of the underside to serve as a guide for the support stretcher and to help locate the legs.



Legs

- 2 The legs are the key components of this bench and they require most of the jointing work, hence they need to be perfectly edge jointed, flat and square to start with. Once squared off, each leg should measure 380mm wide and 450mm long.
- 3 By trial and error I decided that the angle of the legs should be 10° off the vertical. By setting the rail saw at this 10° angle, you can use the saw and guide rail to trim the top of each leg very precisely. For the moment, leave the bottom of each leg as it is, but it will be cut square later. Each leg needs a centreline, marked from top to bottom. They are laid flat on the bottom of

the seat to line up with the centreline marked on the seat.

A mark on each shoulder of the leg will show where the top meets it. Using this line, measure the width of the joint that will show through the seat. I chose a joint size of 50mm long, being the compromise between strength and visuals. Mark the thickness of the seat along the angled cut at the top of each leg with a marking gauge. It is not possible to do this on both sides of the top edges because the angle precludes marking accurately, so the lines will have to be transferred to the other surfaces using a sliding bevel and try square.

- 4 With the leg firmly held on a bench or Workmate, the rail saw can be lined up perfectly with the mark on the external side of the bench legs. The cut with the saw has to be started in the middle of the marked tenons and moved gently forward and backwards until the blade just touches the marks on each end.
- 5 The waste piece is then removed using a pullsaw held firmly against the established angle, because the circular saw will not cut right into the corners of the tenon joints.
- 6 The legs can now be finished off by cutting the parallel angle along the bottom and cutting out the arc that creates the 'feet' of the bench. An arc is not the only option – straight lines to create an inverted 'V' are also possible. I just liked the contrast of the angles and the arc in the finished piece. I also used the router to bevel the edges of the arc and the feet for a bit of detail.



7



8



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10

Top

- 7 Now that both legs have had the tenons cut, it is necessary to transfer the marks of these to the bench seat. To prevent sitters from upending the bench, you need to place the legs no more than about 250–280mm from each end. This way no more than half an adult bottom can be placed past the leg joint when seated! Mark the thickness of each leg with a pair of parallel lines across the seat. By now I have effectively chosen the face side by marking the lines. Using the sliding bevel, transfer the lines to each edge of the seat on both sides. The lines should be exactly parallel and angle towards the end of the bench, not inwards. On the bench seat face, mark the length of the tenon with either a pencil or marking gauge. With the seat firmly held edge-up in a bench vice, the mortise is cut with a fine tenon saw.
- 8 Cut on the waste side of the line because any slight inaccuracies can be pared away later with a sharp chisel. Repeat on the opposite side of the seat. When the leg tenons are offered up to the slots in the top they should fit perfectly.
- 9 The other slot tenons are cut and, with the legs able to be fitted, it is now time to fit the stretcher.

Stretcher

- 10 The support stretcher holds the splayed legs together and supports the weight of people sitting on the seat. The stretcher should extend a way past the line of the legs at this point because it has not yet been cut to length. Nevertheless, find the middle point of the length and mark it across one width with a try square. With the seat on a flat surface, bottom upwards the stretcher can be lined up with the centre marks already made on the underside of the seat. There should be an 'overhang' past each leg. The parallel lines marking the leg positions are transferred to the stretcher and then extended across the width of the stretcher with a sliding bevel. Now an 'overhang' length needs to be decided. A 10° angle to match the leg angle is marked on each end and cut off with a mitre saw. The angles on each end need to be the opposite of each other and not parallel. A slot that is half the width of the stretcher is cut on each side of the stretcher ends. The long edge of the stretcher is the correct side for the open ends of the slots.



11



12



13

- 11** The legs now need slots cut into them to accommodate the stretcher. The centrelines marked on the legs previously should help to mark in the slot positions.
- 12** Accurate cutting makes for a strong and good-looking joint.

Assembly

- 13** The bench components can be dry-fitted to check for accuracy and the bench should be able to seat a couple of people without even being glued. Mark where the leg tenons overlap the seat and join the lines to the feet with a straightedge. Cut off these lines with a bandsaw and plane them to a finish.



14



15



16

- 14** Sand all components with a random orbital sander before assembly.
- 15** On a dry assembly locate the holes for the Miller dowels holding the stretcher support and drill. Next, glue the centre stretcher into place and hold with clamps.
- 16** When the glue has cured, hold the seat upside down on a bench with the slot mortises clear of the benchtop, so that clamps can be located. Apply glue to the tenons and then slide into place. Assembly of this bench needs to be carefully done. Trigger clamps with adjustable jaws help to maintain pressure at the correct angle for the legs.



17



18

17 Once clamped, check the angles with a sliding bevel and then clean off any excess glue. Wait for the first leg to cure before gluing on the second one because you don't want any movement to disturb the carefully cut angles.

Finishing

18 The whole bench was given a thorough sanding with progressively finer abrasives up to about 240 grit. Ash has a fairly open grain so it may be necessary to dampen it between sandings in order to raise the grain. Danish oil is my finish of choice for domestic pieces, but the downside is that a good Danish oil finish takes time to dry and requires at least three coats. Thin the first coat with white spirit; this will enable deeper penetration of the timber surface.



19



20

19 Danish oil dries well at around room temperature. After each coat, sand the surface and the fine dust produced needs to be wiped off before the next oiling. A final buffing with a sparingly applied quality wax finish gives a subtle lustre to the piece. A safety note: Danish oil is best applied with a cloth, but the cloth needs to be disposed of in a sealed airless bag because of the dangers of spontaneous combustion. Don't just chuck the oily rag into the workshop bin – dispose of it properly.

20 The finished bench will sit well in any room.

TAKE A SEAT

As woodworkers, we are often focused on the construction process of making a bench. However, as Kelly Lewis explains, there are many benefits to spending time sitting on benches

Often unnoticed but always accommodating of anyone who wishes to stop and sit, the humble bench graces public parks, city squares, and rural and coastal footpaths. A steadfast structure, it represents many things to many people – a spot to rest for the weary, a place to watch the world go by for the curious, an area of reflection for the bereaved. In the aftermath of national lockdowns, it also became a symbol of unity as people emerged from confinement to be reunited with friends and family in outdoor spaces that allowed for social distancing. But street furniture has long played a vital role in mental, physical and social wellbeing, especially in urban areas.

Valuable benefits

Its importance was highlighted in Manifesto for the Good Bench, a six-point proclamation that drew on the findings of a 2015 London-based research study, The Bench Project, to promote the value and significance of street furniture in urban neighbourhoods. Produced by the Universities of Sheffield, Sheffield Hallam and Sussex, in collaboration with community organisations, The Bench Project reported that the everyday act of sitting

on a bench for free – and for as long as needed – had many benefits for both solitary reflection and social interaction.

Sense of belonging

It revealed that bench users benefitted from the social opportunities offered by these shared spaces, whether they sat alone or with company. This is partly because the very public nature of a bench encourages a sense of belonging and connection. They become meaningful points where likeminded people can gather, and those who prefer anonymity can sit in the comfort of others without any need to speak.

In particular, The Bench Project research report said: 'Benches are a highly valued resource, particularly for people who may find themselves at the margins of society.' These findings are reflected in the manifesto, which stipulates that 'sitting on benches enables a flexible and undemanding way to enjoy public life'. It also suggests that there are key reasons why a good bench can support happiness, not least because it epitomises an egalitarian society where everyone is welcome.

Egalitarian ideals

Bristol-based Sam Wilmot, who has been reviewing and rating benches on a dedicated Instagram account for three years, supports the principles of the manifesto. 'Benches add value to cities, the countryside and the lives of people,' he says. 'Most seats in everyday life cost something. A seat on the bus, on the tube, in a theatre or cinema all cost money, likewise your sofa at home. The freedom to sit outdoors, taking a moment to rest and watch the world go by, is invaluable.'

Sam started the project as a bit of fun when he was studying Modern History at Swansea University in Wales. Now he has a worldwide following, with fellow enthusiasts sharing guest reviews. Whether from the US, Australia, India or Eastern Europe, all the reviews are connected by a common interest and appreciation for the unassuming bench. 'One of my favourite guest reviews was from Lake Bled in Slovenia,' reveals Sam. 'It's just a lovely bench and a beautiful view.'

The ideal bench is about much more than a view, however. Sam awards marks out of 10 to each one, based on design, material, comfort and whether it has a plaque or dedication.

Of the hundreds featured, those that rate highest are typically made from wood or timber (Sam's preferred material, and of course, ours too!). A backrest, curvature in the seat and armrests are also praised for comfort. The ultimate no-no, it seems, is seat dividers, which are sometimes referred to as 'hostile architecture'.

While there are design, cosmetic and environmental factors that can add to a person's enjoyment of a bench, the reviews on Sam's account suggest it all comes down to personal preference. Some will favour a lone wooden bench in a quiet spot that allows time for quiet contemplation, while others prefer to take a hi-tech seat from one of several that might be on offer in a busy city square. For many, a good bench is one that is full of meaning, with memories literally carved in the wood.



PHOTOGRAPHS BY SHUTTERSTOCK

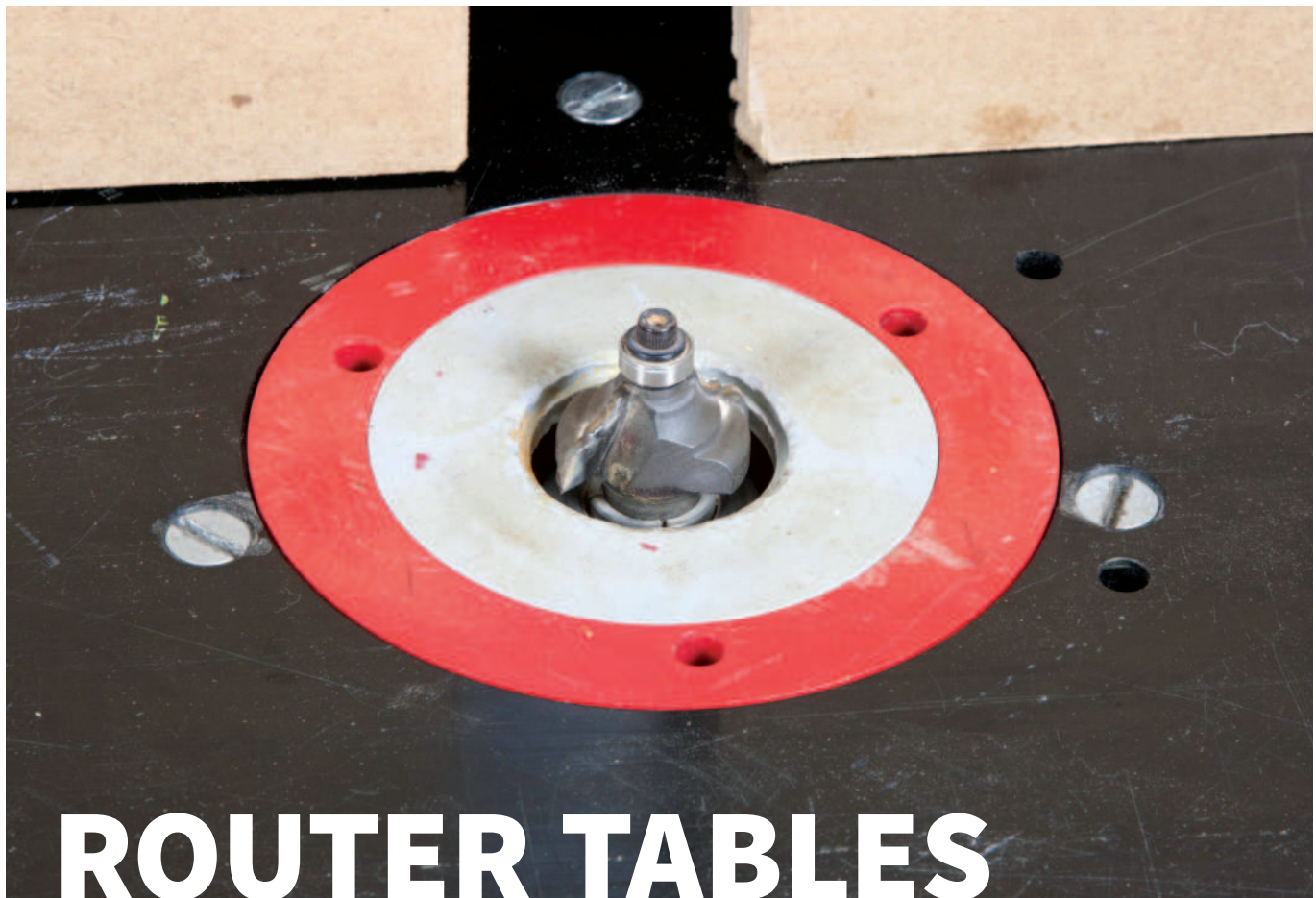
Rest assured

Arguably, however, a well-designed bench is one that encourages people to spend longer outdoors in a safe place. It affords connection, belonging, reassurance and equality. A bench-stop is a place for everyone, regardless of age, mobility, gender, heritage or financial status. 'Taking a moment to sit only costs us time, but in return, we get to pause, talk, engage with strangers, make decisions and to watch the world,' says Sam. What's clear is whether it's used to rest, regale friends with stories, peoplewatch or sit quietly and reflect, recoup and reflect, the humble bench is much more than just a part of the street furniture. It has cemented itself firmly in the hearts and lives of people the world over, even if just as a place to rest weary feet.

Find out more at: the-bench-project.weebly.com

You can find Sam Wilmot on Instagram [@ratethisbench](https://www.instagram.com/ratethisbench)





ROUTER TABLES

Walter Hall discusses the benefits of the router's most useful workshop accessory

I sometimes wonder how we got along before the electric router was invented. It is such a versatile tool and is often the first that comes to mind when designing a new project. While freehand routing is a skill in its own right, most jobs will require the use of guides or jigs to control the movement of the machine and ensure accurate cuts. Perhaps the single most useful such accessory that can be added to a portable router is a router table which, while no substitute for the full-sized spindle moulders found in professional workshops, converts the router into a fixed machine and gives the operator almost endless scope for a wide range of woodworking techniques.

Basic principles

Router tables come in all shapes and sizes, from small bench top versions to large floor-standing designs capable of handling significant workpieces, and from simple shop-made devices to precision tables fitted with fences and guides with micrometer-like accuracy. All, however, have some basic design principles in common, consisting of a flat table mounted on some form of support. The table will have a hole through which the cutter projects, which may be fitted with inserts of various sizes to accommodate differing diameters of cutter. There is a method of holding the router in place inverted underneath the table by means of screws, bolts or clamps. Fences, guides and hold downs, etc. are added as necessary, with provision for dust extraction.

Features

SUPPORT

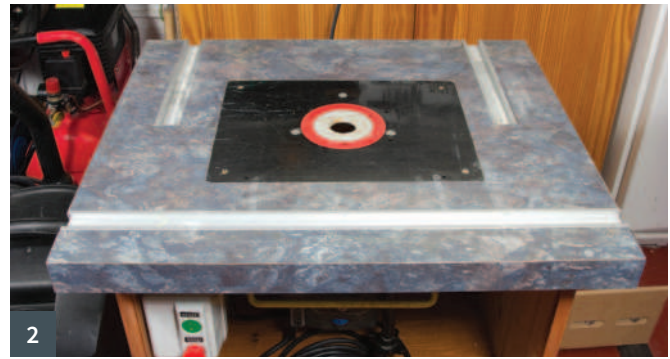
As with all workshop machinery, adequate support must be provided appropriate to the size of the machine and the intended usage. This may range from moulded plastic unitary construction devices for bench top use with small routers, to heavy gauge steel frameworks suitable for use in an industrial environment. My home built table is mounted on a solid pine cabinet with a drawer for cutters and accessories.

TABLE TOP

The table top should be solid enough to support the weight of the router and the work without bending or flexing in use. Proprietary table tops are available in a wide range of materials from phenolic to cast iron. Good choices for a shop-made table are MDF or plywood at least 25mm thick, preferably with a laminate surface so that the work will slide smoothly. I used an old kitchen worktop and added aluminium tracks for the mitre gauge and fence.

INSERTS

Most tables will be fitted with an insert, or inserts, that can be changed to suit the size of bit in use and ensure that maximum support is provided for the work, as near as possible to the cut. Insert units can



1 Adequate support is essential **2** The table top must be solid enough for the weight of the router **3** Inserts are changed to suit the size of the bit **4** The size and power of your router must match the table **5** The bit can be raised and lowered in a variety of ways **6** Collet extensions may be needed on thicker tables **7** A mitre gauge is useful for accurate joint cutting and squaring ends

be purchased to fit into a homemade table and will often be pre-drilled to enable the fitting of a variety of different routers.

MATCHING UP

It is important to match the size and power of your router to the table. While larger machines will be capable of more ambitious projects, small bench top tables will only cope with less powerful routers. Make sure that you buy or build a table that will suit your machine and the scale of the projects you propose to do.

CUTTING HEIGHT

Raising and lowering of the bit to the correct cutting height can be achieved in a number of ways, ranging from using the plunge mechanism or fine adjuster of the router itself, to elaborate chain-driven mechanisms operated from above the table. Some tables are fitted with hinges so that the table can be tilted for access to change cutters or adjust their height. Thicker tables may require collet extensions to be fitted for the full depth of cut to be achieved.

MITRE GAUGE

A mitre gauge running in a slot in the table top is a useful feature for the accurate cutting of joints and squaring of the ends of work.

FENCE

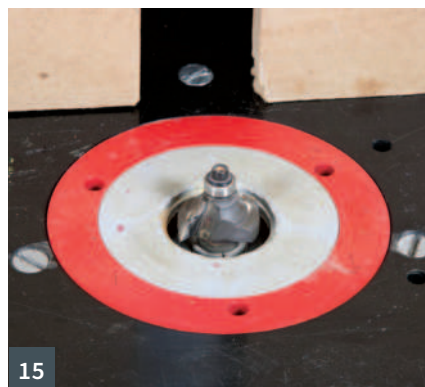
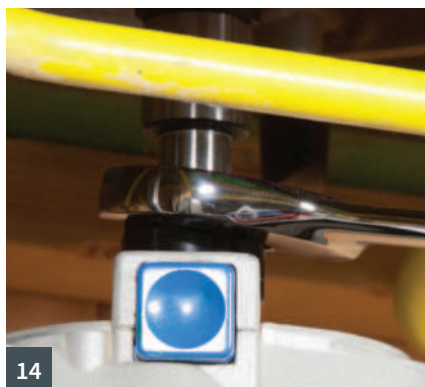
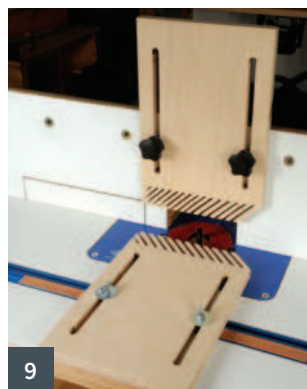
Many jobs will require the use of a fence. This can be as simple as a straight-edged board clamped to the table top, or may be a precision jig with infeed and outfeed fences separately adjustable to within fractions of a millimetre. The fence will often incorporate a dust extraction outlet and the facility to attach stops and hold downs.

HOLD DOWNS

Hold downs and guides will not only ensure that the work is held firmly in place, but will also help to keep fingers away from the cutters.

GUARDS

The fence design should include guarding of the cutter, and a guard should also be provided above the cutter when the fence is not in use.



8 A fence will be needed for most jobs on the router **9** Hold downs keep your work in place and your fingers safe **10** The cutter will need a guard **11** Extraction is essential for dealing with the large volumes of dust **12** A lead-in pin is used when the fence is not in use **13** An NVR switch should be easy to access when the router table is in use **14** Most routers have a spindle lock button **15** Always fit the closest ring size **16** There are proper depth gauges as well as the square shown here

EXTRACTION

Extraction is important, as large volumes of waste are produced both as dust and chippings. This may be built into the fence, but must also be provided for in situations when the fence is not used.

LEAD-IN PIN

A lead-in pin will be provided and should always be used to start off work when the fence is not in use.

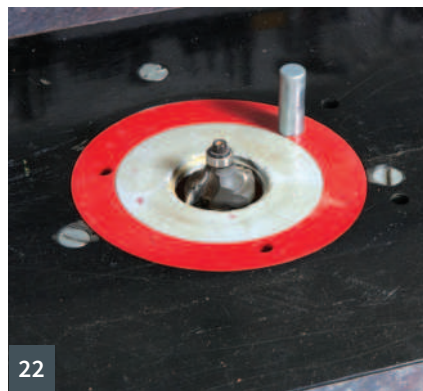
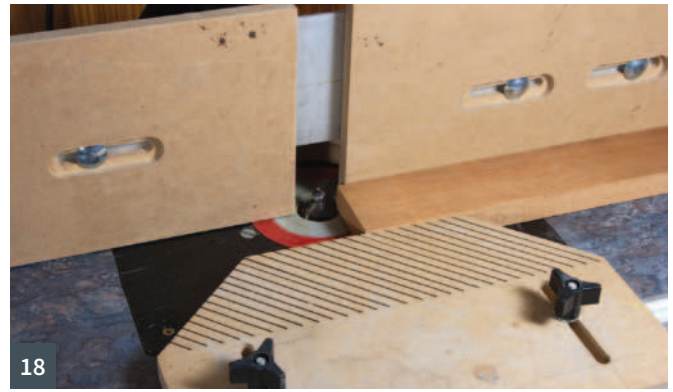
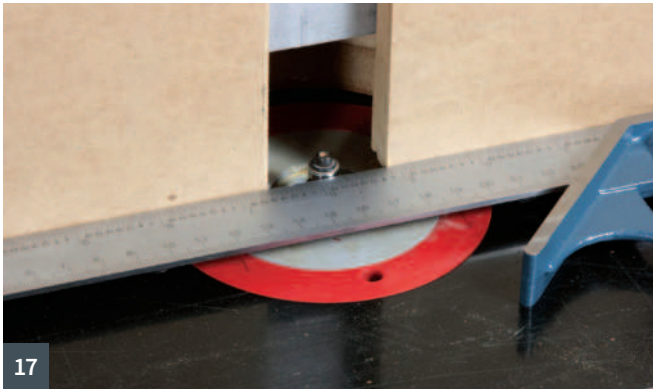
NVR

Switching on simple tables may be through the machine's own switch, but it is preferable to have an NVR switch fitted that can be accessed easily when the machine and table are in use. It may be necessary to find a way of holding down the switch on routers that do not have a 'lock on' facility.

Working safely and getting the best from your router

A short article such as this can only begin to cover the huge range of functions of which a table-mounted router is capable. I will cover the main health and safety considerations and in doing so some of the many possibilities will become apparent.

- Be sure to tighten the cutter firmly into the collet. Serious injury can result if the cutter becomes loose and parts company with the machine at 20,000rpm.
- Using the most appropriately sized insert for the chosen cutter will minimise the gap around the cutter and reduce the risk of small workpieces becoming trapped between the cutter and table. It will also help prevent snipe and other inaccuracies as the work will be supported close to the cutter.



17 Bearing-guided cutters and a straightedge make for fast set-up **18** Homemade fingerboards will hold work safely without 'chatter' **19** A vertical hold down is clamped to the fence **20** Fit extraction wherever possible to remove dust as you work **21** A mitre fence improves safety and will make work accurate **22** A lead-in pin gives vital support to shaped workpieces **23** A guard over the cutter is important for safe working

- Set the height of the cutter with the machine switched off. Never make adjustments when the router is running. Height can be set using a depth gauge or an adjustable square. Make test cuts on a piece of scrap to check the setting.
- A straightedge can be used to align bearing-guided cutters with the fence.
- Use the fence to support the work whenever possible, and hold it in place with finger boards or similar holding devices.
- Use hold downs on the fence to keep the work held firmly against the router table.
- Use extraction at all times. A good fence will have an extraction port fitted and an extractor hose can be clamped to the table near to the

cutter when the fence is not in use. Do not under any circumstances brush sawdust and shavings from the table with your hand when the router is running.

- Use a pushstick or the mitre gauge whenever possible to minimise the risk of fingers getting too close to the cutter. Feed the work steadily past the cutter to avoid the scorching of the finished edge.
- When using the router table without the fence, for example when moulding the edges of curved or shaped components, always install the lead-in pin in order to start the cut safely without catching.
- When the fence is not being used, a guard should be fitted over the cutter and hands kept well clear, by at least 75–100mm. Never wear gloves when using a router table, or indeed any other woodworking machine.

UNICORN BOOKENDS

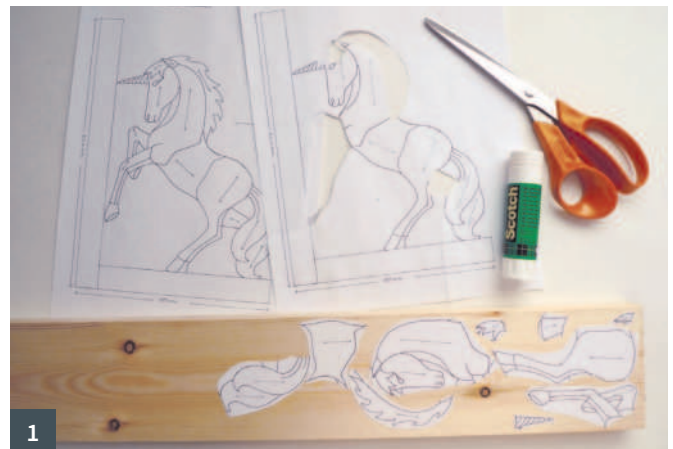


Fred and Julie Byrne use their scrollsaw to make these magical bookends

These sweet unicorn bookends would make a charming addition to any child's bookshelf. And they can be easily made on the scrollsaw using the wood of your choice.

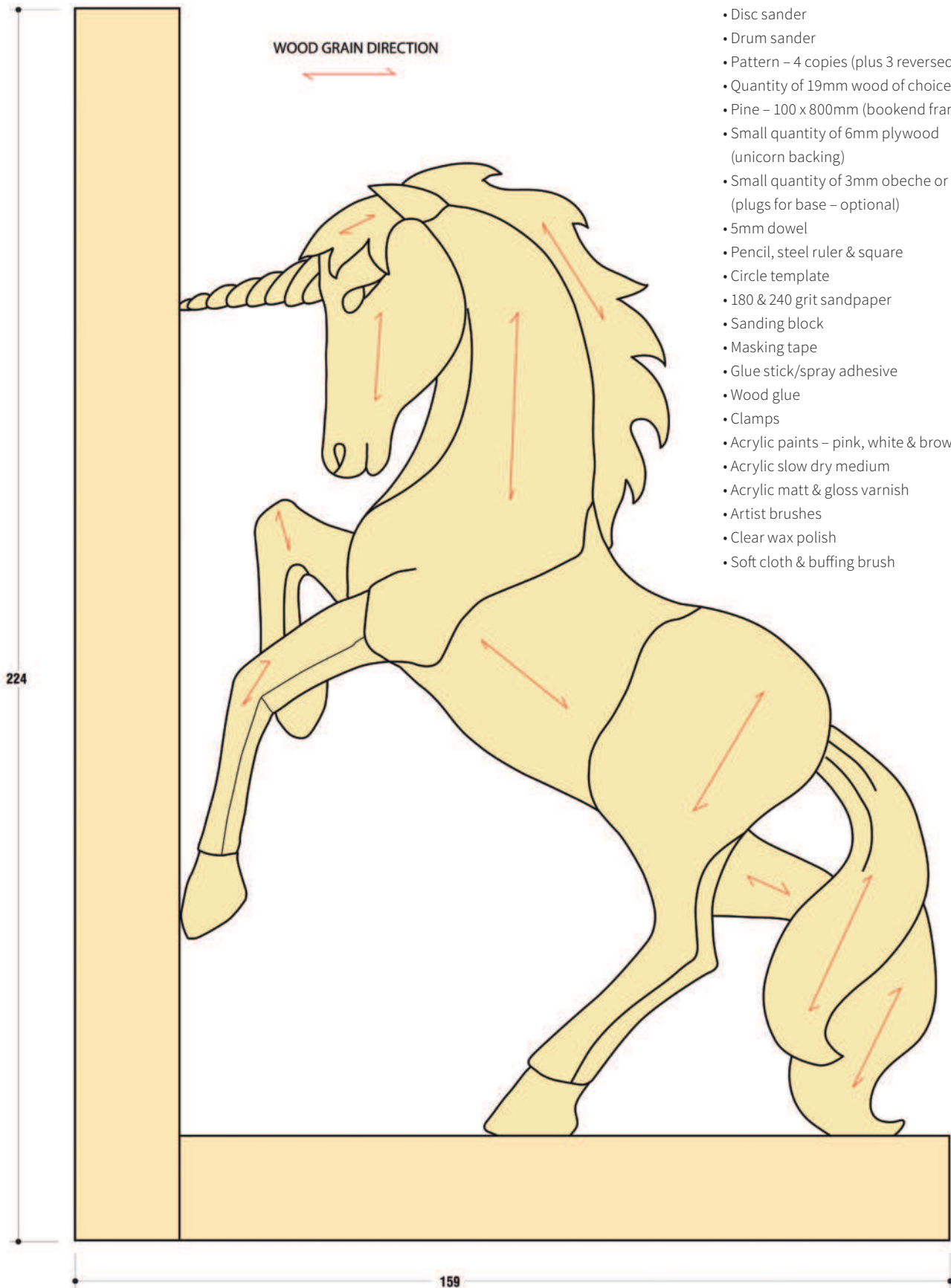
Making the unicorns

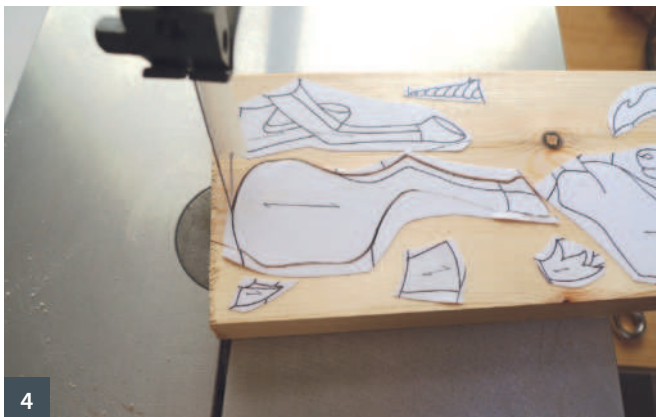
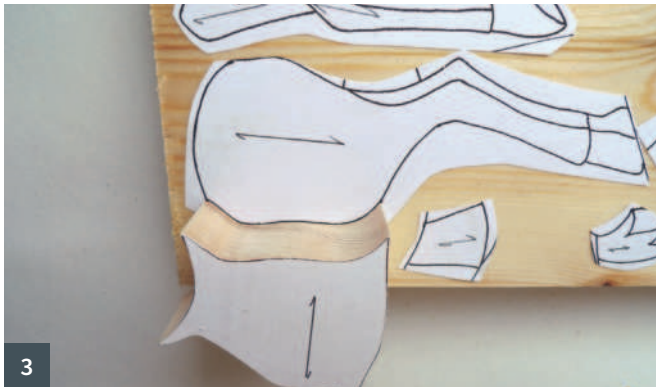
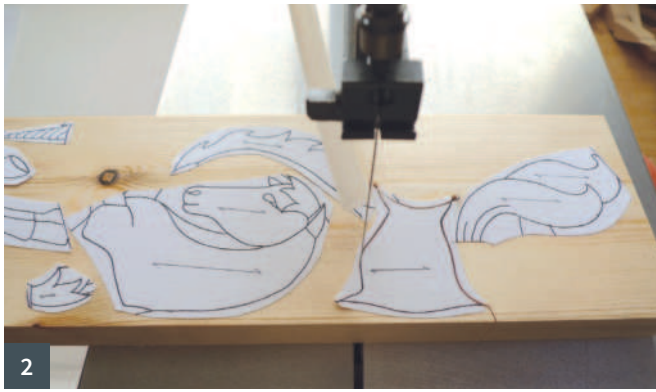
- 1 Make four copies of the unicorn pattern – three to cut into sections, the fourth as a reference. We used the first cut-out unicorn as a template for the second by simply flipping the pieces over onto a wood blank and then tracing around them. Alternatively, you could just make three reversed patterns. Where the grain directions of several parts are the same, cut the parts as a section – lay out the sections onto your wood aligning the directional arrows with the grain.



YOU WILL NEED

- Scrollsaw – No.5 & No.2 blades
- Pillar drill – 5 & 22mm drill bits
- Disc sander
- Drum sander
- Pattern – 4 copies (plus 3 reversed – optional)
- Quantity of 19mm wood of choice (unicorns)
- Pine – 100 x 800mm (bookend frame)
- Small quantity of 6mm plywood (unicorn backing)
- Small quantity of 3mm obeche or ply (plugs for base – optional)
- 5mm dowel
- Pencil, steel ruler & square
- Circle template
- 180 & 240 grit sandpaper
- Sanding block
- Masking tape
- Glue stick/spray adhesive
- Wood glue
- Clamps
- Acrylic paints – pink, white & brown
- Acrylic slow dry medium
- Acrylic matt & gloss varnish
- Artist brushes
- Clear wax polish
- Soft cloth & buffing brush





Cutting out

- 2 Set the scrollsaw with a No.5 blade – check that the table is square to the blade with a small square and then cut around each section, sand away any burr from the underside so the pieces lie nice and flat.
- 3 Check the cutting line of the adjoining pieces prior to cutting the next piece.
- 4 Continue in this way until all the pieces are cut out.
- 5 Once all the sections of the unicorn have been cut, mark the underside of each piece with a letter A for identification.
- 6 Then place the cut pieces upside down onto your wood blank, align with the grain, and carefully trace around each section.
- 7 Cut out as before and mark the undersides with a B.
- 8 Now that all the sections are cut out, change to a smaller No.2 blade before cutting out the pieces within the sections – this will keep the gap between the pieces to a minimum.
- 9 As you continue to cut out the pieces of the A unicorn ...





10 ... you can use these pieces as a template for the B unicorn.

11 Cut out the small eye and nostril pieces before removing the head from the neck.

Sanding and shaping

12 First, mark all the places on the unicorn where one piece meets another.

13 Remove as much of the pattern as you can, the remainder will go in the sanding process.

14 Use the disc sander to sand down all the pieces that appear furthest away i.e. the small piece hind leg, the outer section of the tail, one of the front legs and horn – these can all be lowered down by 5mm, sanding wood from the top of the pieces to keep everything square.

15 Mark the height of these lowered pieces onto all the adjoining pieces.





16 Next, lower the mane by 3mm ...

17 ... then lower the middle section of the body and remaining tail piece by 3mm, continually marking the height of all adjacent pieces as you go. Lower the neck down by approximately 2mm, making sure that it remains slightly higher than the middle section and the mane. Sand the head at an angle so that the jaw line is a little higher than the neck and taper the horn down more towards the tip. Always be careful not to sand any piece lower than your height marks.

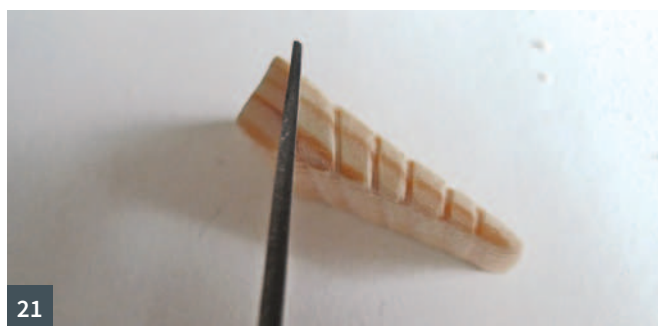
Sanding using a drum sander

18 Now you can sand with the grain of the wood to smooth out the scratches and round over all the outer edges.

19 As you follow the contours of the unicorn, you can really see it taking shape.

20 Hand sand all the pieces smooth, starting with 180- and then 240-grit sandpaper.

21 Use a small needle file to add detail to the horn.



Making the backing

22 Once both unicorns are sanded, they are ready for the plywood backing.



23



24



25

23 Place them onto the 6mm plywood and then carefully trace around the outer edge. Remove one piece at a time and continue to trace around each of the remaining pieces, making a sort of map of the pieces.

24 Using the same No.2 blade, cut out the unicorn backings, sand the edges if needed to remove the burr, then apply a coat of matt varnish to the reverse side and leave to one side to dry.

Colouring and finishing

25 Place all the pieces of both unicorns into groups of colour in preparation for painting.

26 We used white for the mane and tail, and then coloured most of the unicorn in a pale pink and then added a little more red into the pink mix to make a slightly darker shade for the shadowy pieces on the legs and neck. Colour the hooves, nostrils and the round part of the eyes brown.



26



27

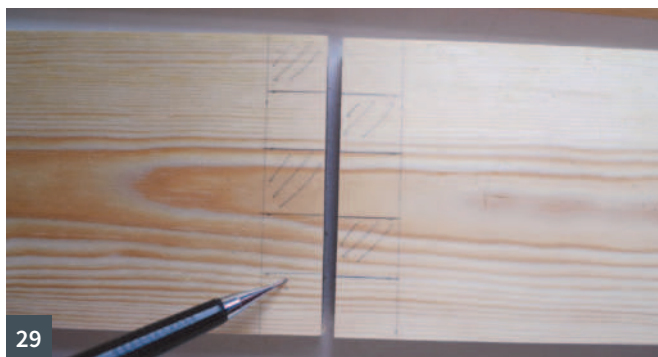


28

27 All the colours are mixed with a slow dry medium so that they could easily be wiped off to reveal the grain of the wood. When dry, lightly nib the pieces as the colouring process may have slightly raised the grain, apply a coat of acrylic matt varnish, and again allow to dry. Give a final nib down and then apply a coat of matt varnish if wished – we used a high gloss varnish for the eyes to give them a nice shine.

Gluing up

28 Position the pieces of both unicorns in order of gluing. Next starting with the head and working down through the body, apply glue to each piece and press firmly in place on the backing, and allow to dry.

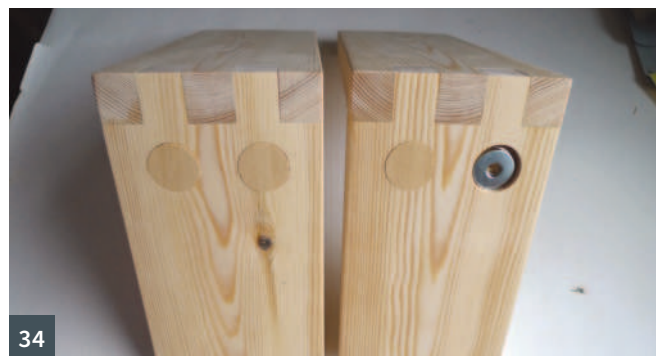
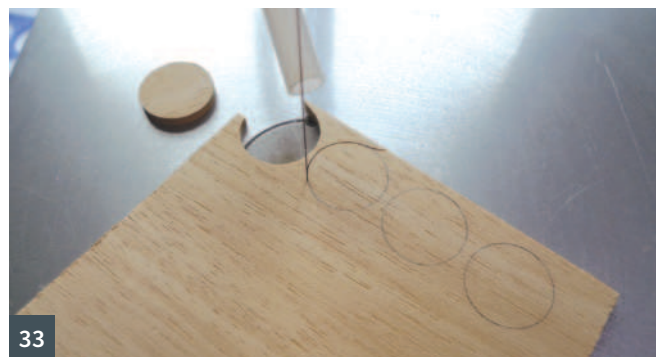


Bookend frame

29 Lengths of 19 x 100mm pine are used for the main upright and base pieces, which are held together with simple finger joints. Referring to the pattern, measure out the finger joints at the correct intervals along the width of pine. With the scrollsaw fitted with a No.5 blade, cut the pieces through to the correct length. Mark the finger joints to be removed – three from the base and two from the upright.

30 Cut out the pieces ...

31 ... and then check the fit and squareness. Next, lay the pattern onto



the base section and secure with masking tape. Fit the pillar drill with a 5mm drill bit and drill the two support holes to a depth of 10mm – a piece of tape wrapped around the drill bit helps to take out the guess work.

32 To make the bookends really functional, you will need to add weights to the underside of the base – do this by drilling two 22mm holes to the depth of 10mm, or to a depth to suit the washers you have, plus a 3mm wood plug. Sand the pieces with a sanding block, going through the grades of paper and then apply glue to the finger joints. Next, secure with masking tape and allow to dry.

33 Using a circle template, mark out the 22mm holes in a small piece of 3mm obeche and then carefully cut out the circles and check the fit.

34 Using plenty of glue, place washers into each hole and then the 3mm obeche plug.

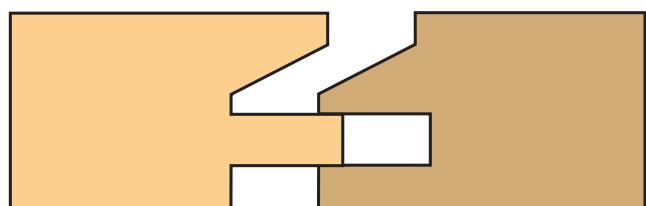
35 Clamp to secure and allow to dry. Apply a coat of matt varnish and when dry, lightly nib down with a fine 220 grade of sandpaper. Lastly, cut four 15mm lengths from the 5mm dowel rod and then apply glue to the holes at the bottom of the rear hoof and tail piece, and into the base section. Push each unicorn firmly into position and allow to dry.

MOULDING PROFILES

Anthony Bailey looks at different types of panel edgings

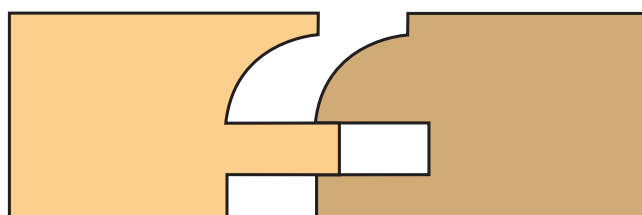
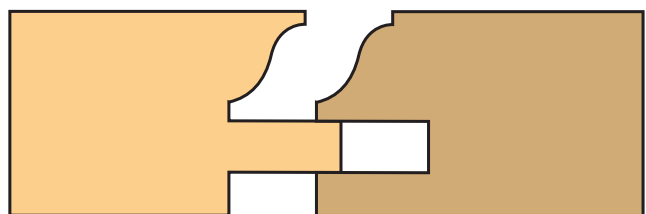
Choosing a moulding can be difficult, so here is a simple guide to the shapes available and the best places for them. The names used for each type vary slightly according to manufacturer, but they follow certain moulding styles.

Another point to consider is the style of the panel that will go in the middle. It can be flat, painted or veneered MDF, alternatively you might want to spend more time and money making solid raised panels. These will need a cutter that goes with the frame moulding. It makes sense to invest in say, two different styles so you can ring the changes between jobs without spending too much on cutters.



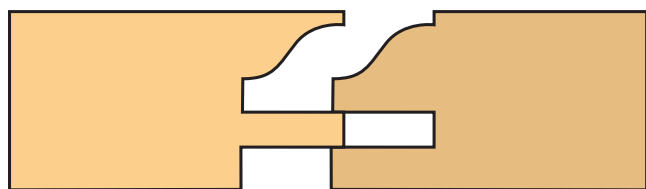
BEVEL

The simplest style which suits a very straightforward design. It is particularly good in a kitchen because it is easy to wipe clean. When assembling the machined joint, the judicious use of a sharp knife can help give a neat straight intersection where they meet.



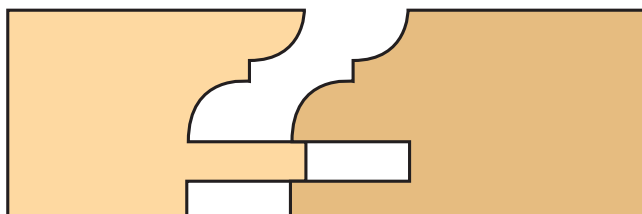
OVOLO

The ovolo is simply a roundover with a small step down and possibly one at the outermost edge too. It works well with a Roman arch top door style, and looks good in most situations.



OGEE

This is a swept in/out profile, easy to keep clean, and its appearance works well in most settings, both traditional and modern. It's best teamed with a similar style of panel cutter if you want a raised panel. It looks good on arched top doors with matching panels.



CLASSICAL

This covers those types which feature two different profiles, i.e. cove and roundover, broken in the middle by a small step. These are suitable for use in lounges and bedrooms, for example, as they have fussier detail and are less easy to clean. Two different types exist: roundover at the outer edge, step, then cove; or the reverse arrangement.

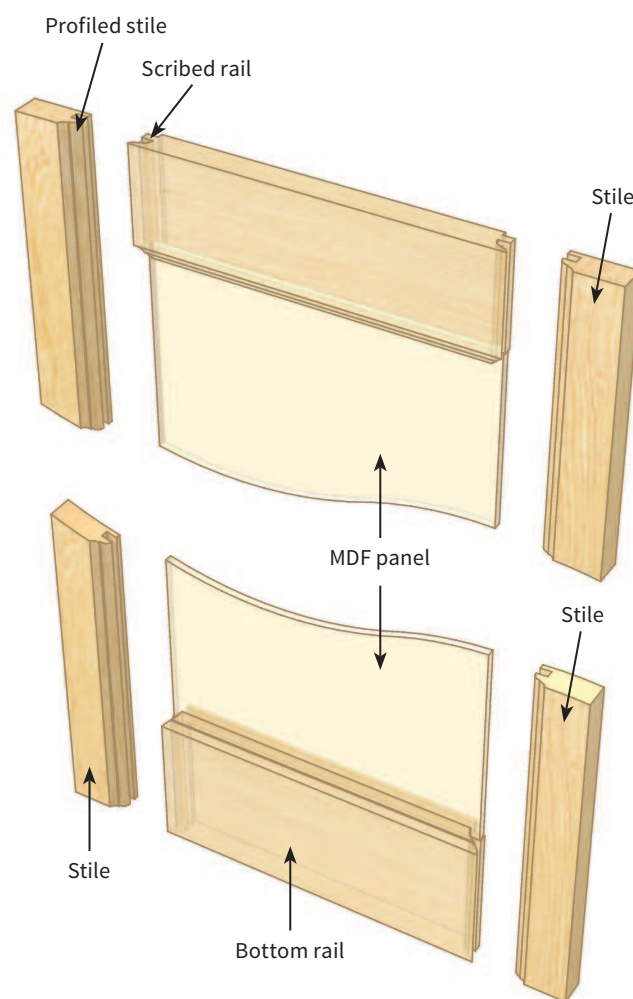
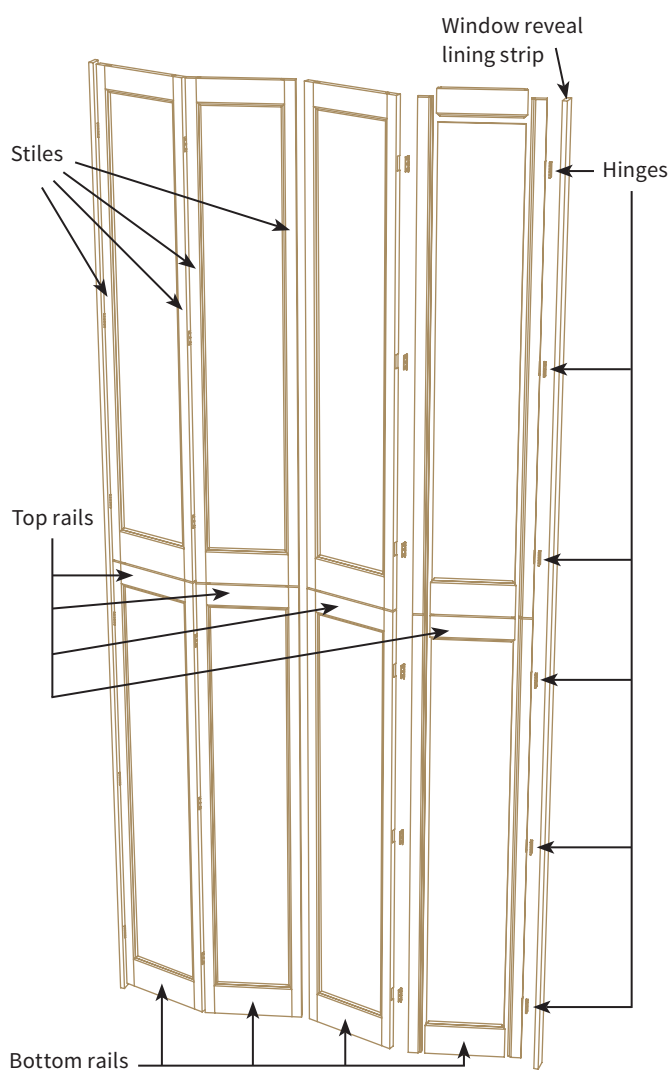
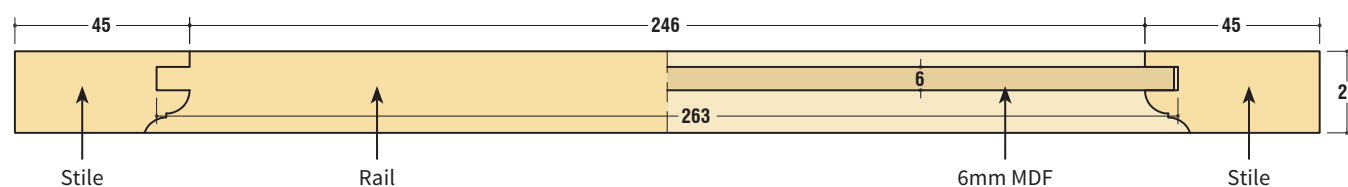
IMAGES BY SIMON RODWAY

BI-FOLD WINDOW SHUTTERS

Matt Long builds bespoke shutters for these very tall and unusual sash windows



SPLIT SECTION

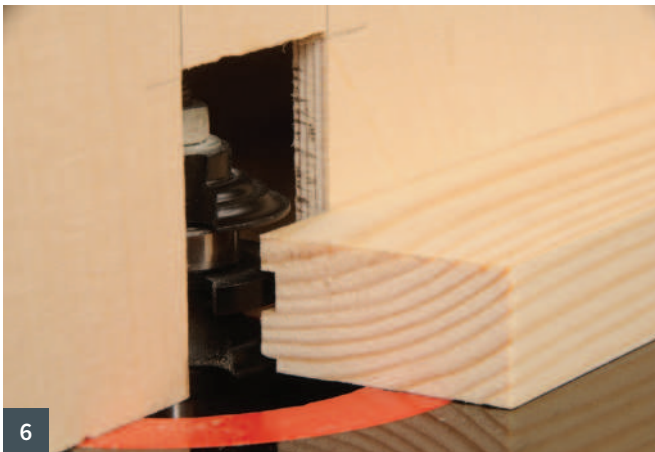


The setting is a spacious lounge in a flat in a Georgian building. There are no shutters present in the deep window reveals so for privacy, and to keep the sun out, a full set of shutters are required for two side-by-side windows. The shutters needed to be lightweight as the windows are so large, and the construction kept simple as there was a tight deadline for making them. Because the windows are so tall – around 3m – that a top and bottom set of shutters was made for each window, which also gives added flexibility when controlling the light entering the room. As they are to be painted white to match the existing woodwork, the panels can be stable 6mm MDF with softwood framing as surrounds. The panels can be fully glued in place as the panels won't shrink. The spaces within the reveals were carefully measured and allowances made for lining strips at the sides for the shutters to hang off, and a limited amount of clearance above and below the shutters.



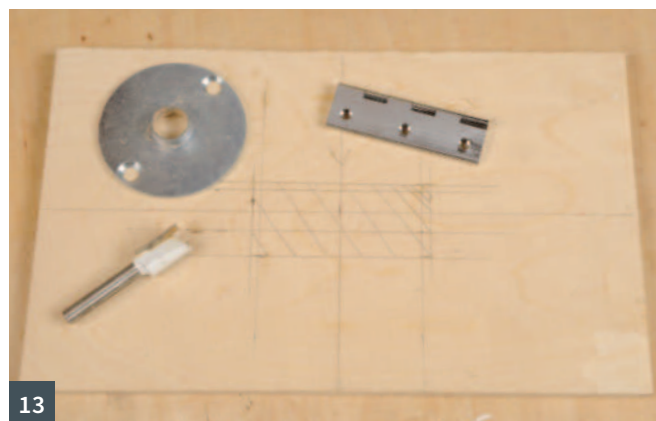
Making the shutters

- 1 After making a cutting list and buying your timber – I used prepared timber where possible – the first job is to crosscut the shutter stiles overlength. The horns left over after glue-up are later cut away.



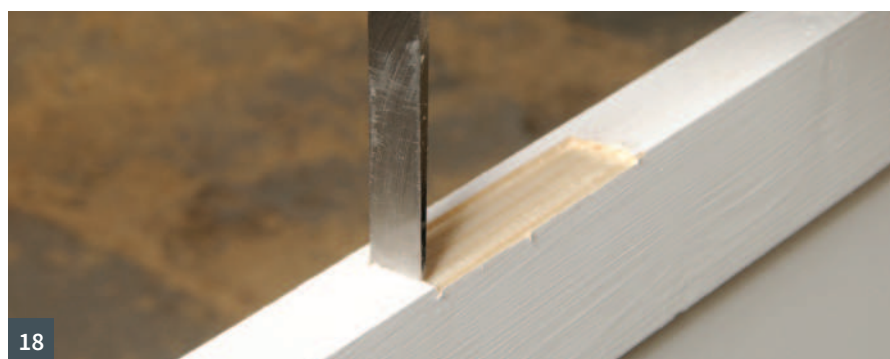
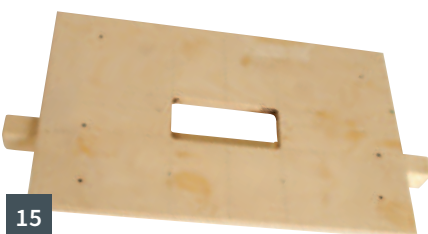
- 2 To make the correct widths of rails, we re-used wide boards and ripped them down, obtaining one top and one bottom rail width out of each. They were then thickened to final size, taking a pre-existing round nosing off in the process.
- 3 To work out the rail lengths, check the scribing allowance on the profile and scribe cutter set you intend using. It should be 19mm overall but can vary slightly. Add this amount to the rails after removing the stile widths in your calculations.
- 4 The panels can now be cut – these are just 1mm less in each direction than the recess allowed by the assembled frames. This ensures the frames are fully supported by the panels when glue is applied all round overall but can vary slightly. Add this amount to the rails after removing the stile widths in your calculations.

- 5 The cutter set-up method varies depending on whether you have a one- or two-part cutter set. The instructions should make the operation method clear. For profiling, the fence doesn't need to be parallel to the table or mitre fence slot as would be the case with scribing. However, you do need to check the bearing is flush with the fence front face.
- 6 Once the cutter and fence are set, fit a sub-fence. The purpose of this is to reduce the cut depth so the first pass is a scoring cut. This will prevent breakout along the slot edges. It will also be used during scribing passes.
- 7 Having machined all profile cuts, remove the sub-fence and do a second pass at full cut depth. All the stiles and rails are done in this way...



- 8** Since the profiles have been done before the scribe cuts, it is necessary to support the rails and profiles when cutting the ends. At one end, the flat edge merely needs support. However, at the other the moulded profile will be facing backwards and will breakout very easily. To counter this, use a piece of offcut with a scribe cut on the long grain edge. This then plugs into the profile and gives complete anti-breakout support.
- 9** Before actually doing the scribing cuts, stack all the components in their correct attitude so the faces to be scribed are upwards and marked with a cross to avoid errors. This is the reverse face to that for profiling.
- 10** Do a test scribe cut and check the fit, and make sure the meeting surfaces are flush to each other. Then it's time to glue-up and clamp all the panels you have made, checking the dimensions are correct after each panel is clamped, and that the panels are square. Re-adjust the clamps if necessary.

- 11** Once the glue has gone off, the protruding horns can be nipped off on the crosscut saw, flush with the frame ends. The frames should have been assembled perfectly square so no other trimming will be required.
- 12** Inevitably, there will be slight surface differences, in which case careful belt sanding will sort it out, followed by general orbital sanding and fine hand sanding of the moulded inner frame edges.
- 13** You need a hinge jig for routing the hinge recesses – in this job there are no less than 48 hinges to install. Use a piece of 6mm birch ply or MDF large enough for the router to sit on. Mark out the hinge area accurately in the middle and allow it to overrun to what will be the outside edge. Now choose the cutter and guidebush you wish to use. Subtract the cutter diameter from that of the guide bush, divide the resulting amount, and mark it around the drawn hinge lines. In retrospect I could have made a jig that machines each recess pair together for the bi-fold pairs, thus saving time and simplifying accuracy.



- 14** Use a 6.4mm straight cutter and fence to accurately machine out the rectangular shape. It will not need any further smoothing if carefully done.
- 15** The last requirement is a narrow batten pinned underneath in the correct position so when the jig is clamped on the job, the hinge knuckle will be half buried in the machined recess.
- 16** To set the correct recess depth, sit the router on the jig and press the stationary cutter on the frame edge. Now insert the opened out hinge under the depth stop so that the area nearest the hinge is under the stop, press it down and lock it. This should give the correct depth of cut.
- 17** The cut is not particularly visible here as the cut is so shallow

- but deep enough for the hinge leaf to sit flush in the recess.
- 18** The ends are squared with a sharp chisel so the hinge fits in. Hopefully, if the jig is the right size, the hinge should fit straightaway. The jig can be enlarged if needs be, but it can't be made smaller – in this case make a new one.
- 19** Make sure all surfaces are fully sanded, including breaking the edges. Undercoat carefully, making sure the brushstrokes are neat and there is no pooling of paint around the inner mouldings. Once the gloss work is done and dried, fit all the hinges in place.
- 20** To hang the shutters, I first assembled them in the workshop, before fitting them to a lining strip I had first screwed to the window reveal.



ARTS & CRAFTS-STYLE BOOKCASE – PART 1

Antonio Medica and Valentina Panichi use modern techniques and tools to make a classic piece of furniture



It has now been more than 20 years since we decided to furnish our house making as much as possible with our own hands. It may have been the financial constraints of a couple of newly married former students who had recently started working, but there was also the desire to pursue a hobby together.

In order to replace the existing bookcase with one in the Art & Crafts style, consistent with the rest of the furniture we had already built for our bedroom, we designed and built the bookcase that we will describe here and in the next issue of WWC.

YOU WILL NEED

EQUIPMENT:

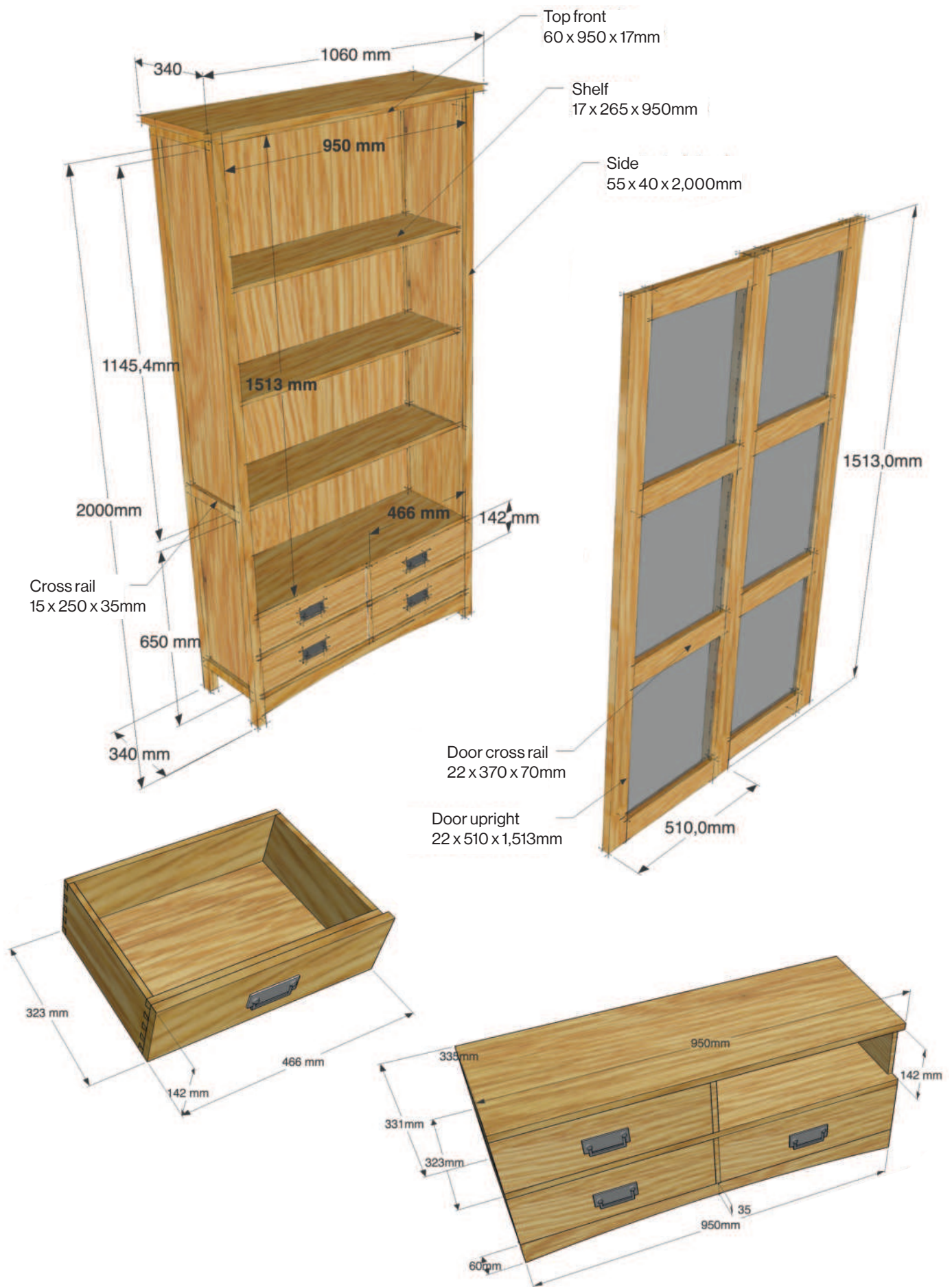
- Bandsaw
- Tablesaw
- Mitre saw
- Planer
- Mortiser
- WoodRat
- Circular saw with guide
- Vacuum pump and bag-press
- Router table
- Biscuit joiner
- Jigsaw
- Hand tools
- Sander
- Airbrush

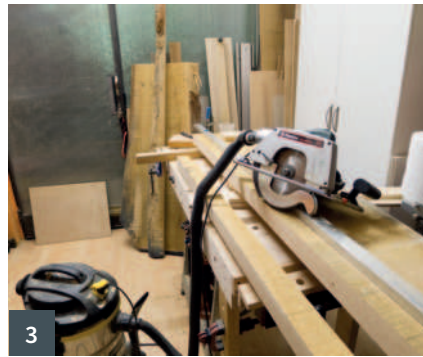
MATERIALS:

- Solid oak: 60mm thick (frame side) and 30mm thick (doors, edges)
- Solid beech: 40mm thick (drawer sides)
- Pine lamellar: 18mm thick (chest of drawers)
- 10/10 oak veneer (shelf veneer, infill)
- Poplar plywood: 18mm thick (infill)
- Birch plywood: 14mm thick (shelves, chest of drawers sides); 4mm thick (drawer bottom)
- Oak melamine plywood: 5mm thick (bookcase bottom)
- Synthetic glass: 5mm thick (sliding doors)

HARDWARE:

- Handles
- Sliding system for doors (trolleys and relative rails)
- Racks and relative shelf hooks
- Water sealers
- Colourless water-based finishing paint





1 The pre-existing bookcase had been used for years but was completely unrelated to the rest of the furniture that we had already built **2** Working with solid timber can be tricky but extra time and effort upfront can prevent many problems later on **3** For cutting the board to length, we used the circular saw run along an aluminium straightedge fixed with clamps **4** A blade with fewer teeth is more suitable for making cuts along the grain on heavy thicknesses **5** We began planing by flattening the wider face at right angles **6** We checked the squaring of the two faces on several points before thickening the other faces **7 & 8** The pillar drill is equipped with an accessory to perform mortising with a square bit/chisel. The final mortise, obtained with two series of square holes placed side by side, will be as wide as the groove for the infill

The project

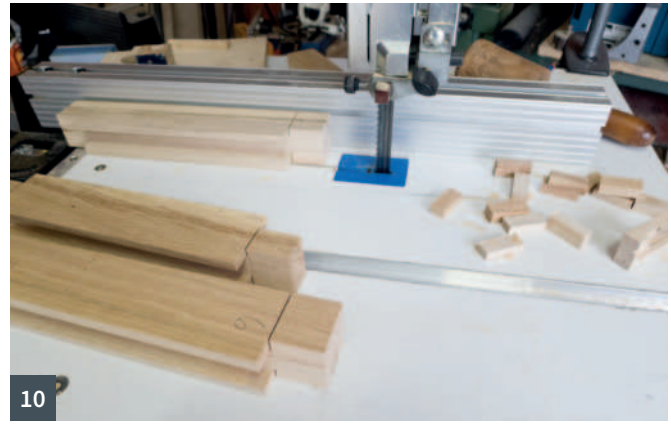
Building this bookcase gave us the opportunity to review and employ almost all the woodworking techniques that we have learned over the years; as we said to ourselves several times, 'with this job we have given ourselves a cruise on a training ship!' So before describing all the processes we used, it is appropriate to make some clarifications about the project itself.

First of all, we would like to reassure those who do not have a complete set of tools that this piece can also be made with much more limited equipment. Because this is a 'training ship' we will suggest alternative techniques and tools throughout. We would also like to reassure the purists who believe in building things faithful to style, that in this case it was our interest to ensure aesthetic consistency but, for reasons of time and practicality, we preferred to make use of many

'poetic licences'. As the craftsmen and the customers in this case were the same people it was easy to agree on everything. During the making of the project some small changes were made to the initial design and some small mistakes were made that we intend to share with those who will have the patience and the desire to read through it all.

The design

The bookcase had to meet a series of requirements, including minimal footprint (that led to the creation of the sliding doors), functionality (storage of books, magazines and documents) and integration with the style of the other furniture in the room (hence the choice for the Arts & Crafts look). With these keywords we began our web search for inspiration, looking to take a cue from similar bookshelves and get a rough idea of what our own design would be.



9 A few light strokes with a hand chisel allow you to square out the rounded corners caused by the router cutter **10** If you work with precision on the bandsaw you can make the cuts for all the tenons for all the rails, moving the parallel fence only at the end of each series. It is advisable to leave the tenons long (by a few tenths) in order to adjust them by hand in the corresponding mortise **11** The tenons made on the bandsaw were adjusted to fit in their corresponding mortises with a shoulder plane and chisel. The parts were then numbered so that each tenon corresponded to its own mortise.

We then thought about how to integrate the project with the rest of the room. We used our computer to design the bookcase, having good familiarity with 2D CAD and a rudimentary knowledge of SketchUp which, thanks to its 3D, renders the idea of proportions very well.

The design required some specialist hardware that we needed to purchase, in particular the sliding system for the doors which requires compliance with certain measures.

Once we had settled on the design, we could begin making it. We were sure there would be some changes as we worked but that is the beauty of making your own furniture!

Tips for working with solid wood

1. The work begins at the sawmill! Choosing a material with few defects and straight fibre is important when making components that need to be stable.
2. We always calculate at least 20% loss of material during subsequent processing and therefore it is always better to get a little in excess. If you go back to buy more later, it will be difficult to find wood from the same plant so you run the risk of having differences in colour and stability.
3. Before you start processing, let the wood settle in your workshop. Remember that wood changes in size and shape with changes in air humidity and it is certainly better that these changes occur before and not during construction.
4. With a brush and a 'coarse' plane (a rough or non-finishing plane

that is best suited to work on rough and dirty surfaces), clean any dirt off the surface of the wood and try to highlight any defects that may affect your choice of subsequent cuts.

5. Check the tops of the boards to make sure there are no steel clips stuck to counteract their cracking; these clips are dangerous when hit by the blades of power tools.
6. Trace the various pieces with a straightedge or a wooden ruler giving a margin for the length (at least 50mm which can be increased if defects or cracks are visible at the end of the board), and for the width (not less than 5mm).
7. Boards are seldom perfectly straight; curves and arches must be identified immediately especially if they affect the longer pieces. In order to avoid excessive planing to eliminate them, with consequent loss of material, it is advisable to choose the best boards for those pieces.
8. If you do not have adequate space and machinery, it is best to start working with portable tools. In this case it is preferable to perform the cutting with the jigsaw rather than with the circular saw because the bending of the pieces at the end of the cut can choke the blade and cause dangerous kickbacks.
9. Measure twice, cut once – always!
10. Once the cuts have been made, it is advisable to wait at least 24 hours before moving on to planing. This is because time must be given for the internal tensions to rebalance themselves.



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12 Here you can see the cuts made on the crosspieces with the mitre saw **13** The oak veneer was joined with paper tape in order to obtain a piece with a symmetrical design (two consecutive pieces of the veneer pack). The veneer protruded 10–15mm from the entire perimeter of the plywood panel. This is the right amount to avoid accidentally uncovering the plywood and to prevent any breakage of the veneer edges during pressing **14** The sizes of the pieces were 250 x 950mm, so the atmospheric pressure was exerting a weight of about 1,900kg

Making the uprights and shelves

The sides of the bookcase consist of a solid wood frame inside which two oak veneered plywood claddings are placed. Each side measures 2,000 x 340 x 40mm and has the first intersection at the bottom at a distance of 120mm from the ground in order to use two small legs. The infill panels are 20mm thick (18mm of plywood plus 2mm of veneer) and give solidity to the structure, which is absolutely necessary since the shelf support racks will be fixed to them.

The construction of the two uprights began with making the oak pieces, starting from a rough board purchased in the sawmill measuring 3,400 x 400 x 60mm (for about 80kg of weight!).

After cutting the board to a length slightly greater than required (2,050mm instead of 2,000mm), the uprights and crosspieces of the two sides of the bookcase were cut. The circular saw was run along an aluminium straightedge fixed with clamps to trim the elements with an excess width of about 45mm. A blade with a few teeth is more suitable for making cuts along the grain on heavy thicknesses.

We began planing by flattening the wider face (which in this case was slightly concave) and then moving on to the face at right angles to it, using the piece just planed as a check on the fence, which must be at a perfect right angles to the plane. Having checked the squaring of the

two faces on several points of the entire length (beginning, centre and end), we could then move on to thickening the other two remaining faces to obtain the final 40 x 56mm section.

Once the pieces of the two frames had been brought to the right section, we moved on to cutting the groove that will house the infill panels. We did this with a 20mm diameter cutter cutting 12mm deep. If you follow the same method, it is preferable to cut the groove in several steps, especially if a 6mm shank cutter is used. In any case, doing more light passes gives you more control and a cleaner cut without tearing.

Groove for the cladding

The router we used to make this groove was equipped with two side fences for easier control. The channel was not cut in the centre of the piece but at 8mm from what would later be the internal face, to bring the rack of the shelf support system almost flush with the uprights. Off-centre routing, not being full length, determines a left and a right piece for each frame. Similarly, the crosspieces, especially the central one which requires two grooves, will have an internal and an external side.

Before mounting the two sides it was necessary to prepare the infill



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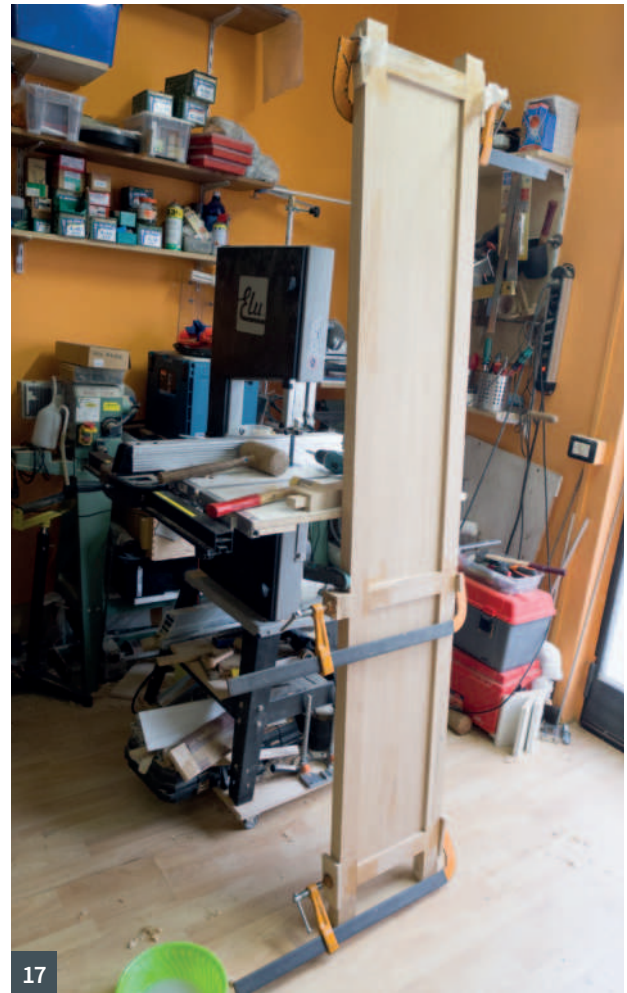
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15 Each veneered piece was trimmed by first removing the excess on the ends with the cutter (cut across the fibre) and then those along the grain. With the planer and a wooden pad that supports the 180-grit sandpaper we could even out along the entire perimeter **16** The filler was made from the powder of the same wood, recovered from the bag of the random orbital sander, mixed with rapid vinyl glue. Using a stainless-steel spatula avoids staining the oak, rich in tannins, with ferrous tools **17** After checking that the joints fit together and everything was square, the excess vinyl glue was removed with a damp sponge. The clamps were tightened just enough – excessive pressure would cause the frame to bend **18** We used a series of planes to smooth the joints and finish the frame **19** The two sides of the shelves were squared and brought to the same size with the portable circular saw. If your construction has gone well, the only wood that will be removed are the protrusions of the two uprights while the crosspiece will be just ‘caressed’ by the blade

panels. They consist of a heart of 18mm poplar plywood veneered with 1mm oak veneer. We made the veneer using the vacuum technique, which was also later used to make the shelves, the top of the bookcase and the top of the chest of drawers.

Safety precautions when vacuum veneering

1. Always veneer both sides of the piece to balance the gluing and avoid the pieces warping.
2. Use a sufficient amount of glue but without excess because it could ooze from the veneer with the action of the vacuum.
3. Place the veneer on a perfectly flat surface otherwise any concavity or convexity will be irreversibly transmitted to the workpiece.
4. Remove the piece from the bag after the initial glue has set or a little further then let it dry flat, perhaps fixing it with clamps so as not to lose the flatness.
5. Protect the bag from sharp edges of the workpiece by using sponges or other soft, porous material.



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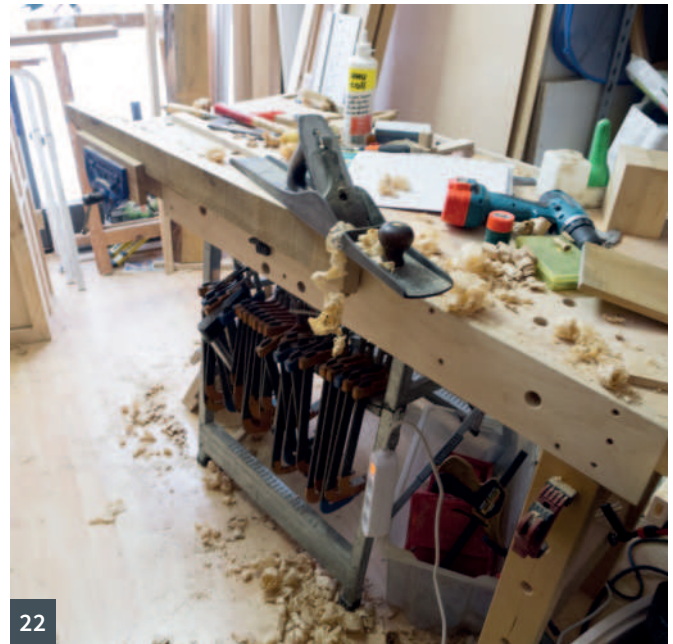
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20 The edging of the shelves was achieved using contact glue, a simple strip of veneer was applied to cover the rear edge of the panel; the strip must be prepared with an excess of a couple of centimetres on the length and 5mm on the width. After trimming the excess parts of the edge, the same method and the same material were used to cover the two sides **21** The pieces to edge the top were made with the bandsaw and the plane: an essential combination when working with solid wood **22** To regularise the edge of the table before the next cutting with the bandsaw, we used an old plane instead of the motor planer **23 & 24** Once the piece glued to the rear edge of the top has been trimmed, the frame was complete in the remaining three sections. Biscuits were used to align and strengthen the joint

The veneers

The veneer was added to the various pieces of plywood that were already cut to size, however some people prefer to veneer larger pieces and then cut them to size later. In this way you avoid trimming the veneer at the edges of the panel and you are more relaxed in the pressing phase because the veneer is always supported and does not risk being broken by the crushing of the bag. In our case, the shelves were being reused from a previous piece, so we could not work in this way.

Each sheet of veneer was trimmed to straighten the edges, and then joined to the next with paper tape, which is more common, although more expensive, than the specific tape for veneer. The glue we used is a classic quick-setting vinyl, applied in a thin layer with a short-haired roller.

Once the gluing was complete and the veneers had been trimmed,

all that remained was to finish the surfaces with a random orbital sander equipped with 120- and then 220-grit abrasives. Any imperfections were easily filled with a mixture of sanding powder and vinyl glue.

The infill panels did not need edging as they were going to be inserted in the grooves of the respective frames. We could now proceed with the assembly. The dry test gave a positive result and all the joints closed correctly, so we applied the glue (ordinary vinyl) and tightened the entire frame with the appropriate clamps.

Once the glue had dried, we could do the last finishing operations. The solid wood parts of each side were finished with planes and scrapers. Obviously, this finishing could also be carried out exclusively with the sander, preferably a random orbital, but with planes it is quite another thing and it also produces less dust.



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25 We smoothed out the various unevenness by hand, using the same planes as before, leaving the final finishing task to the sander with 120 and 220 abrasives **26 & 27** The upper shelf of the chest of drawers is edged with oak pieces through a series of No.10 biscuits. If you use traditional clamps to tighten the gluing, it is better to add transverse pieces to keep the whole flat, in our case aluminium boxes insulated with packaging film. The shelf is still oversized and that will be adjusted later together with the two pine frames



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The last thing that remained to be done was to eliminate the excess length left on the uprights (also called 'ears') with the squaring of the two sides which will also be brought to the same size. The best method is the portable circular saw equipped with its guide rail or alternatively guided with a ruler fixed to the side with the clamps.

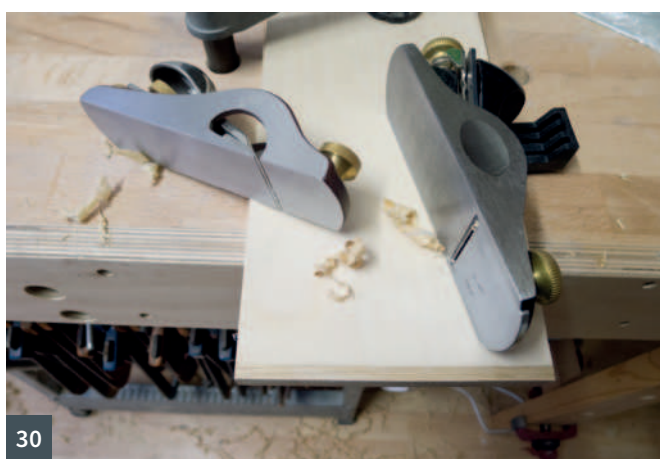
Which planes to use for finishing

We used a series of hand tools to smooth out the joined points and finish the frame. The plane is useful for eliminating any glue residues and for levelling the joins between crosspieces and uprights. For the last task, you may prefer the No.62 plane, which, thanks to the greater mass and the low cutting angle, works faster. To eliminate the irregularities left by the electric planer, i.e. those slight undulations caused by the rotation of the knives, an intermediate-sized finishing plane is normally used. In our case, we also used the scraper plane, which proved to be exceptional for smoothing the surface of the

oak even in the sections where the fibre changes direction suddenly. Although it is a tool that requires more time and attention to be fine-tuned, its use reduces the need for sanders and the dust that inevitably settles on things and in the lungs.

Completing the shelves and the top

The shelves were veneered in the same way as the side panels. After trimming the veneer around the perimeter like the plywood panel, three of the four edges were covered using the same veneer. We used contact glue which was really the most practical in this case as it allows you to join the two parts without the use of clamps and after a couple of hours you can move on to finishing. For the front edge of each shelf, we preferred to use a 15mm-thick oak strip. In addition to stiffening the entire shelf, it gives strength to the edge that will be more subject to wear (think of the rubbing when a book is removed from its place). If you think that your shelf will need to support more than a few books,



28 The three shelves were brought to the same width with the saw bench and then to the same length with a circular saw **29** Using paper tape to glue the lining strip is a quicker solution than using clamps and just as effective **30 & 31** The applied strip is a couple of millimetres wider and longer than the edge and when the glue is dry it can be levelled with a plane. Having two planes means you can set one for an aggressive cut, with which to remove the bulk, and use the other for the last finishing steps

you could consider adding a second strip on the back edge. To fix the strip we decided to use vinyl glue, as it is much more tenacious and rigid than the contact one.

To equalise both types of edging, we used a small trimmer and a plane, finishing the work with a final pass of the random orbital sander to remove any residual glue or imperfections. Having already filled and sanded previously, just a light coat with 220 grit was enough and we could then repeat this work on the top.

For practical reasons, the bookcase is designed so it can be completely disassembled, which is why the top plays an important role in giving solidity to the entire structure. It protrudes by 25mm on the front and on both sides and to make sure that when looking all around you can see only the solid wood, the veneered panel is edged on the three visible sides with oak pieces 65mm wide and 16mm thick.

The meeting of the sides with the top takes place on this frame; on the back, a narrower strip is provided, 40mm is sufficient to create the right support for the back and to make the top reach the necessary width. The choice of this construction solution, thanks also to the 45° front junctions of the frame, completely hides the head of the wood.

The chest of drawers

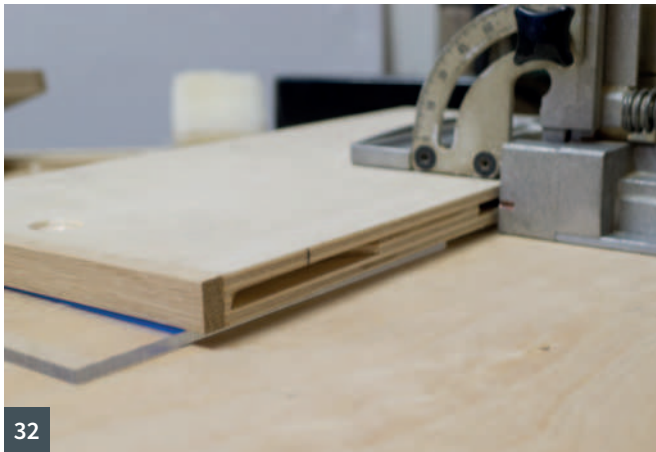
Next we created the chest of drawers to complete the lower part of the cabinet. It is a separate structure enclosed between the uprights,

consisting of a veneered top, placed at the top, and two underlying pine frames, frontally edged in oak, on which the drawers slide. Six small panels act as uprights and define the vertical separation between these three elements. The vertical components rest on the horizontal ones and not vice versa; breaking each upright in two seemed to us the simplest and safest way to ensure parallelism between the horizontal elements and to obtain four identical and perfectly square compartments. All the joints were made with No.20 biscuits, a solution that is not always appreciated by cabinetmaking purists but is both practical and functional.

The construction was relatively simple but required extreme precision because the structure must form perfectly square compartments; in addition to being required for the smooth running of the drawers, they are essential to leave uniform joints as the drawers will close flush.

The first step was to make the upper shelf and the two frames a few millimetres larger than required and then bring them to size together in order to have all three horizontal components perfectly equal and squared.

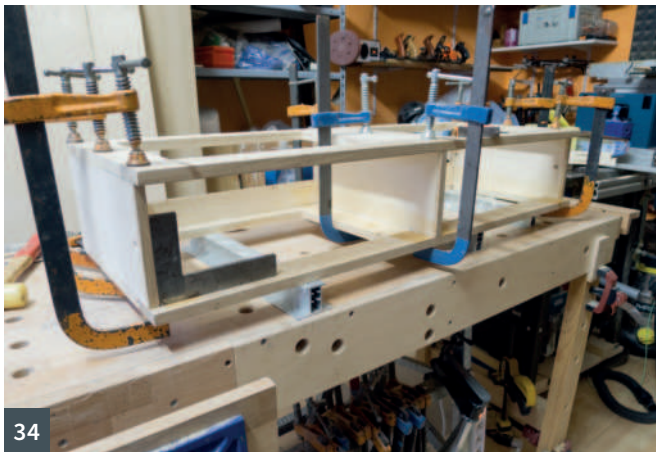
Two oak pieces were glued to the plywood shelf that we had previously veneered, on the front and back, in order to reach the final width of the shelf of 340mm. The pieces are 55mm wide, a size that allows the sliding rails of the doors placed to close the upper part of



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32 The uprights are not very thick and there is a risk that cutting the slots for the biscuits will take place very close to the lower edge, even with the folding fence of the machine lowered to the minimum size. Inserting a shim (a Plexiglas plate, as shown here) under the base of the piece solves the problem **33** When cutting the slots on the frame, care was taken to correctly centre the joints on the central crosspiece so that they are parallel and equidistant from those milled on the sides: with a precision ruler you can measure where to position the wooden guide on which to stop **34 & 35** The lower part of the chest of drawers was glued, we checked that everything was square and when the glue had set, proceeded with the remaining part. Looking at the left upright here, you can see the holes that will allow the assembly of the chest of drawers in the bookcase. You can also see how the side uprights are set back with respect to the front line. In this way the false fronts of the drawers can reach the sides of the bookcase hiding the rear upright

the bookcase to be recessed and the junction between the veneer and the edging hidden.

To make the two frames we started with pieces obtained from an 18mm-thick pine laminated panel. We chose plywood not for technical reasons but simply because it is often cheaper to start from a semi-finished piece than from a raw pine board, especially when there are no leftover pieces from the workshop.

Once the pieces had been trimmed, they were passed through the thicknesser to make the required 17mm height, then they were cut to size and joined together with the biscuits to form the two frames.

Once the shelves were finished, we moved on to the vertical partitions. The four sides consist of as many pieces of birch plywood 12mm thick, 140mm high and 308mm long. The central one required two 17mm-thick 140 x 323mm spruce panels. All the pieces were edged on the visible edge with a 12mm-thick oak strip.

As can be seen from the measurements, the side uprights are set back by 15mm with respect to the central one which falls flush with the shelves. This is to ensure that the front of the drawer overlaps the side upright of the chest of drawers and hides it and ends flush with the side of the bookcase.

Since the bookcase needed the capacity to be dismantled, the chest of drawers is fixed to its sides by means of M6 screws and threaded bushes (to be inserted in the uprights of the bookcase). It is advisable to drill the uprights of the chest of drawers (two holes per piece, one front and one rear) before its assembly, to be able to work more comfortably and with greater precision. We then cut the slots for the biscuits, work that had to be carried out carefully especially for the junction of the central uprights which must be perfectly parallel to the side uprights. It is essential to correctly mark the position of the central uprights and then prepare a guide to cut the horizontal pieces in the desired position.

The glue-up was carried out in two stages: first the two lower compartments were assembled and then, after the glue had started to stretch, the two upper ones were added. Obviously, the greatest care was taken not to distort the structure with the clamps, for this reason the squareness needed to be accurate.

In the next issue, we will make the drawers, the top and finish the assembly.



Aaron Moore shares his techniques for a complete overhaul of a classic eggbeater drill

A basic hand drill, such as an 'eggbeater' drill, is one of the most useful and inexpensive tools to have in your workshop. Few are manufactured new today and those that are don't come close to the quality of the vintage models. The only exception to that was the CT-6 drill made by Bridge City Tool Works, but it is sadly no longer in production. As a result, the CT-6 can easily fetch over £400 these days, so unless you have that kind of coin lying around, let's get back to the abundantly available vintage models. I use two Millers Falls drills all the time – a No.2 and a No.5A – but other quality drills were also made by Stanley and Goodell-Pratt. All three of these brands, as well as several others, are commonly available today.

I can't say enough good things about these tools, but you may be thinking: 'I've used these drills before and they're garbage,' to which I would reply: 'You have never used a nice one.' A properly tuned drill spins effortlessly and with a little practice, provides the user with incredible control. One downside to these drills, however, is they weren't designed to be taken apart for repair. The handles are pinned and peened in place so restoring an old drill presents a few challenges, which can be overcome. What follows in this article is my basic approach to hand drill restoration, which requires no elaborate tools or procedures, just a drill press. I suppose there's some irony in needing a drill press to restore a hand drill, but I digress...

Acquiring the drill

The first thing you need to do is go out and purchase a drill from one of the usual sources – try looking on eBay, at flea markets, tool shows or, if all else fails, steal one from a fellow woodworker! You need to look hard for three things: solid handles without cracks or a loose fit, gears with no chipped or missing teeth and a complete chuck, including all three jaws and the associated springs. Obviously, major flaws, such as missing parts, cracked or welded bodies, or completely rusted out drills are no good, but those are often thrown out and never make it online or to the flea markets. Most drills I've seen for sale are in at least satisfactory condition and can be had for £7–20, although drills in really good condition will often run to somewhere between £45–80.

Disassembly and chuck tune-up

With the drill in hand, the restoration process can begin. Start by taking everything apart as shown. Be sure to use properly sized screwdrivers, preferably with a hollow-ground tip, so the screw heads don't get chewed up. The chuck can be disassembled for a really thorough cleaning, but if everything is working, I just soak the chuck overnight in WD-40. Taking the entire chuck apart can be tricky, especially when putting it back together, so don't go down that road unless you really need to. To get the chuck apart, there are usually two holes or slots on the top of the chuck that allow a tool to unscrew the top portion from the main body. The split-line between the top and main body of the chuck is often hard to see and begins right where the knurling pattern starts.



1 A typical example of a good drill for restoring. The body is worn, the gears are stiff, but everything is there waiting for a little TLC. And opposite, restored to its former glory **2** Using properly sized screwdrivers, disassemble the drill as shown **3** Leave the chuck assembled unless it absolutely requires a full cleaning. You can see the slots on the top of the chuck where a tool can unscrew the top from the body. The top portion of the chuck stops right where the knurling pattern begins **4** Drop the chuck in some penetrating oil, like WD-40, and let it soak for several hours to loosen up jaws and springs **5** Gently chuck the screws into the drill press and file the tops clean of dents, scratches and corrosion **6** After filing, polish up the heads with some abrasive **7** After a few minutes, the screws will be as good as new **8** Chuck the side knob into the drill press and start sanding

Screw cleanup

The few loose screws that were removed can be cleaned up on the drill press in seconds. Place the screw in the chuck with gentle hand pressure so the threads aren't damaged – do not use the chuck key. Then, use a smooth mill file to remove the major dirt, corrosion and dents. After a few seconds of filing, check your work and switch to 220-grit abrasive. Go up to 300–400 grit to achieve a nice polish, then repeat this process for all the screws you removed from the drill.

The side knob

Turning to the handles – that's a lathe joke – there are typically three to deal with. The easiest is the side knob, which should simply unscrew from the body. Chuck it into the drill press just like the screws and start sanding. Both the wooden knob and the metal ferrule can be sanded/polished at this point. Apply your preferred stain, finish and set it aside to dry. The other two handles are a little more difficult in their setup.

The main handle

The main handle can't be separated from the body, which makes sanding it a little frustrating. What I find works well is to wrap the small gear with tape – avoid tapes with a lot of stubborn adhesive like duct tape – and then carry that tape around the body, the screw post for the chuck and back down again. This locks the free-spinning screw post to the body, which means that the screw post can be chucked into the drill press just like the screws and knob. Because of the weight and length of the body, run the drill press at a low speed – something around 400rpm – and sand the handle with even pressure from both sides at once. Pressing the handle between two pieces of abrasive keeps everything balanced. When the handle is sanded to satisfaction, again, apply any stain and finish you like and set it aside to dry.



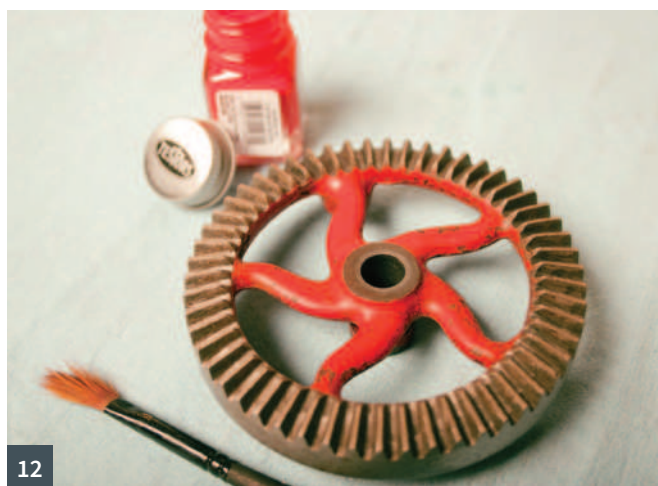
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9 Cleaning up the handle and knobs can be a challenge, but there's a simple solution for each **10** By wrapping tape around the chuck gear and carrying it around the body, the chuck post becomes locked to the body. Mount it in the drill press and run it at a low rpm. Sanding the main handle is now straightforward **11** Clamp a post in the drill press and run a belt from the post to the ferrule on the crank knob. With a little tension, the knob should spin quite easily for sanding and finishing **12** Painting the main gear is simple, just try to avoid getting paint between the gear teeth

The crank knob

The last wooden piece to address is the crank knob. Again, this can't be removed from the crank arm as they are typically riveted/peened in place. To get around this, install a large diameter post into the drill press – I use a 12mm centre punch and track down a timing belt. These are found in a lot of mechanical devices or can be purchased online fairly cheaply. Wrap the belt around the centre punch and the ferrule on the knob, take out the slack with gentle pressure and clamp the crank arm down as shown. You may want to spin the drill press by hand at first to make sure there aren't any wild belt tracking issues that could damage the knob when the press is fired up, but you should find the knob is spun by the timing belt quite easily. Sand and finish the small knob as before. The knob may slip a little when sanding, especially if you're using really aggressive abrasive or pressing too hard. Fortunately, it's small so there isn't a lot of sanding to do. Just take your time and keep your fingers clear of the belt to avoid a pinch. When the knob is done, you can also scrub the crank arm with a steel brush and/or steel wool.

The chuck

With the wooden parts out of the way, we can now turn our attention to the metal. The chuck should already be cleaned and working smoothly, but it may have some rust or staining that you'll want to address, or ignore depending on the severity. For getting rid of rust, I like to use Evapo-Rust. The chuck can be scrubbed with a steel brush, especially to clean out the knurled portion, but there isn't too much you can do here. You can install a matching piece of threaded rod to the chuck so the whole thing can be thrown in the drill press for polishing, but obviously any sanding or polishing you do will start to remove or minimise the knurling pattern. Do the best you can and move on.

The crank gear

For the crank and body of the drill, I like to use enamel paint. I'm sure there are several brands out there, but I use Testors brand and have no



13 It's easiest to paint right over the top edge; this will get sanded clean later on **14** Place a snug-fitting bolt through the gear, lock it down with a nut, then chuck the entire assembly into the drill press **15** Wrap some abrasive around a block of wood and polish the side and top edges. Make sure the paint is completely dry before doing this or the metal dust will get embedded in the paint **16** Wrap the handle in a cloth or cling film to keep it clean then start painting the body. Take your time and keep the paint clear of the gears and oil holes. I like to clamp the chuck post in a rubber-jawed vice so I can rotate the drill as I work and then walk away to let it dry

complaints. I would recommend going with the gloss version instead of the flat finish, typically red on the crank and black on the body. I've tried the flat and it just looks wrong on the metal even though I typically prefer a matt finish on my wood projects. I like to brush the paint on so I can ensure it doesn't get into the gears and oil holes and it flows very nicely, so I've never had an issue with brush marks. Starting with the crank, clean off any obvious grease, rust or dirt and scrub the teeth clean with a steel brush, then the paint can be applied. Two coats will usually be plenty, but make sure it has fully dried between coats and before you start putting the drill to use. Depending on the temperature and humidity, this paint can take anywhere from 2–10 days to completely dry. Basically, if it has any tackiness to it, wait longer. I like to over-paint the gear's edges a little bit to make sure I get full coverage, but do your best to keep the paint out of the gear teeth. The excess paint is removed in the next step.

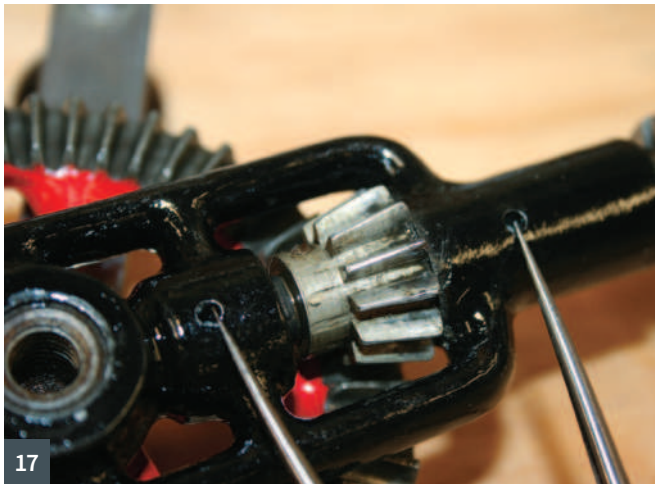
When the paint has dried, slide a bolt through the centre of the gear that matches the diameter as snugly as possible. Clamp it down

with a nut and then chuck the entire assembly in the drill press.

Wrap some 220-grit abrasive around a hard surface like a small block of wood, then grind the top and side edges to remove any dents, dirt or excess paint. Move to a 300–400-grit abrasive for final sanding and add a little oil or wax to help protect the exposed metal from rust.

The body

The body is handled in a similar way to the crank. Again, clean the body as needed to remove any dirt, etc. and you may want to wrap the newly restored handle in some cloth or cling film to avoid accidentally getting paint on it. Using black gloss paint, coat the entire drill being very careful to avoid getting any paint on the gears or plugging up the oil holes. The best way to do this is to use a relatively small brush – about 6mm wide is ideal – and work at a steady pace. If you miss a spot, you may find it's better to let the paint dry, then go back and get the missed area on the second or even third coat. Trying to go back after a few minutes to touch up your work may cause the paint you've already



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17 There are typically two or more oil holes as shown here. Clean the holes out with a nail if need be, then add some lightweight machine oil and work it into the gears **18** If the drill has a handle that unscrews for bit storage, add some wax to the threads to help preserve them **19** Unless you're a collector, you shouldn't feel compelled to track down the original straight-fluted bits – modern bradpoint bits work better and are readily available



laid down to pull, which can create drag or brush marks. It may also be tempting to simply touch up a few chipped areas with the paint and walk away, but the colour and shine of the old paint compared to the new will never be a perfect match and after going to all the effort of restoring the tool, I think it's worth painting the entire body no matter what. After a couple of coats of paint the drill should be ready for re-assembly and fine-tuning.

Re-assembly

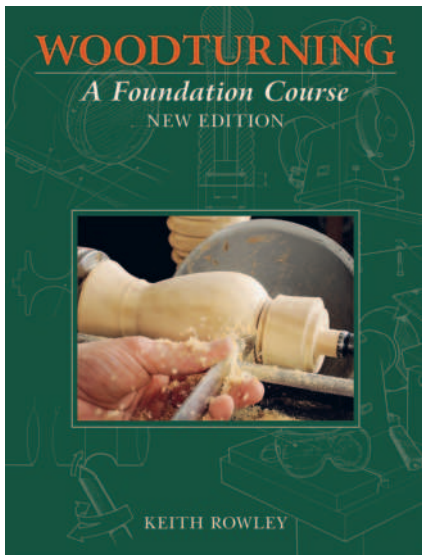
When the paint has fully dried, put the drill back together again using properly sized screwdrivers. Make sure the oil holes are free of any dirt or paint you may have accidentally brushed into the holes. If necessary, clean them out with a nail. Now put a few drops of lightweight machine oil, such as 3-in-One in the chuck and the oil holes. The drill should spin freely and with very little slop between main gears. Too much clearance allows the gear to slide back and forth on its post, which makes drilling harder to control. You can add a shim to the gear to reduce the play, but you will probably need to make your own

from plastic shim stock in order to find something with just the right thickness. To be clear, this shouldn't be necessary on most drills, but if you're noticing a lot of gear movement when drilling and it's throwing you off your game, adding a shim can definitely help you out.

Conclusion

One last note about these drills: many come fitted with a hollow handle that has a cap which unscrews for storage of the original straight-fluted bits. You should wax the wooden threads so the cap will unscrew with ease, but don't worry about using these bits specifically. Hand drills are typically intended for drilling holes up to 6mm diameter – larger than that and you should switch to a hand brace with auger bits. Most drills won't come with the original bits today and they can cost a fair amount to replace. The truth is that modern bradpoint bits work better and are readily available, so unless you're a collector, you shouldn't feel compelled to track down the old bits. Now, regardless of what bit you're using, chuck it in and get to work. Your drill is now ready for another few lifetimes of service.

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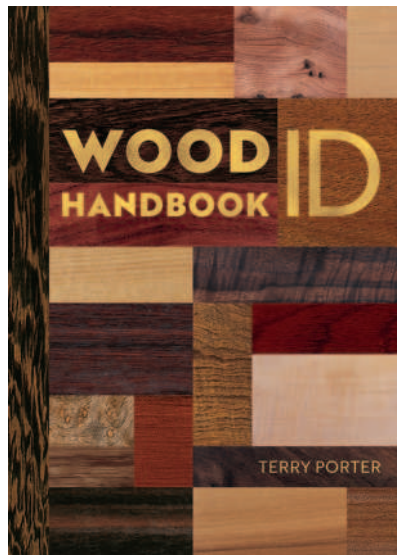
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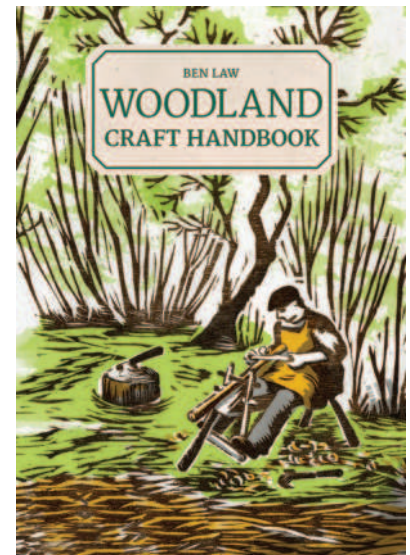


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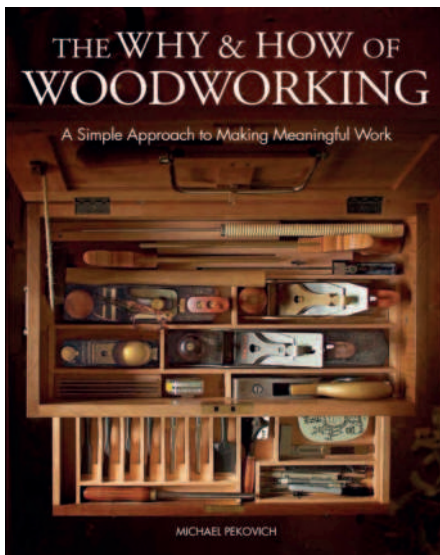


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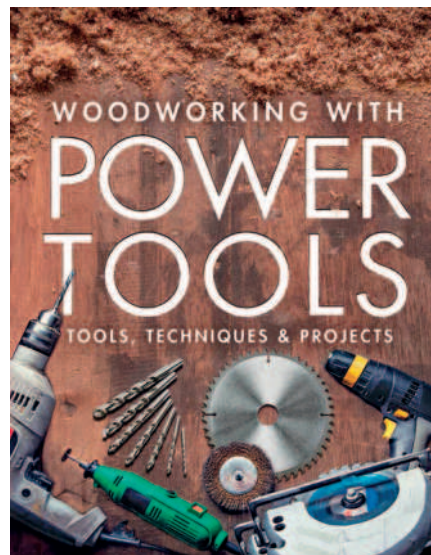


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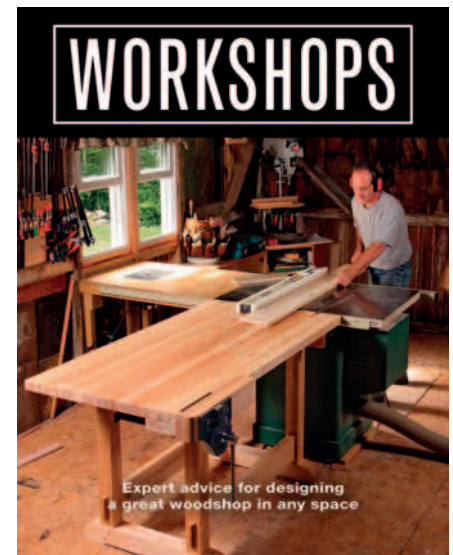


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The vintage toolbox

Anthony Bailey looks at the Ohio Tool Company's 16in 'transitional' jack plane

I saw this unusual jack plane online and was bemused by its rather bodge-together appearance. In fact, the 'transitional' plane design isn't so unusual and they were produced in decent numbers, mainly in the USA, but to a lesser extent in the UK. They were being produced at the same time as both traditional all-wood designs and the newer Bailey pattern that were in production. The term 'transitional' is a more recently adopted term to try and pigeonhole this type of crossbred design, but at the time they were presumably marketed to persuade traditionalists to change over to more modern tools and also bulk out the manufacturers' tool catalogues. Ohio Tool Company produced this model roughly between 1884 and 1910. Up to 1880 they used quite a lot of prison labour building their tools; they then merged with, and effectively subsumed, the Auburn Tool Company NY, who also used prison labour, so this plane with its Auburn 'Thistle' blade mark and Ohio production number 356 may have been through convicts' hands!

The Bailey-type castings sit on the beech wood body, which exhibits hammer marks at both ends for some strange reason. It proved easy to strip off all the parts, although the knurled brass blade depth-adjusting knob wouldn't separate, unlike the Stanley design. A good dewaxing all over, some brass dipping and a body polish before reassembly made it look respectable, even with some paint loss evident on the castings. The tapered blade and cap iron had been 'restored' by some uncaring person but looked reasonable. On sharpening the blade it proved quite hard and slow to get an edge on the grinder and without discolouration, the reason being it was a laminated blade. This meant they had gone to some trouble to create a superior cutting edge for this tool. Unfortunately, the japanning on the 'half frog' had originally slumped into a couple of slight lumps which prevented the blade assembly from seating perfectly – once scraped off I could then align the frog assembly and the blade nicely. I also scraped a lot of paint gunk off the base, presumably from door trimming work, and then checked it was flat and didn't need levelling before it could be used.

When correctly sharpened and set, this plane cuts very well and makes a really good tool not just to collect but also to use. If you keep a keen eye open you may well find one of these unusual but very functional planes, too.



1 & 2 A strange combination of Bailey-type mechanism and wooden body **3 & 4** The tapered laminated blade and cap iron



5 The manufacturer's name and serial number are clearly visible **6** Ohio Tool Company's rather basic frog design

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